A.2 Emission Limit

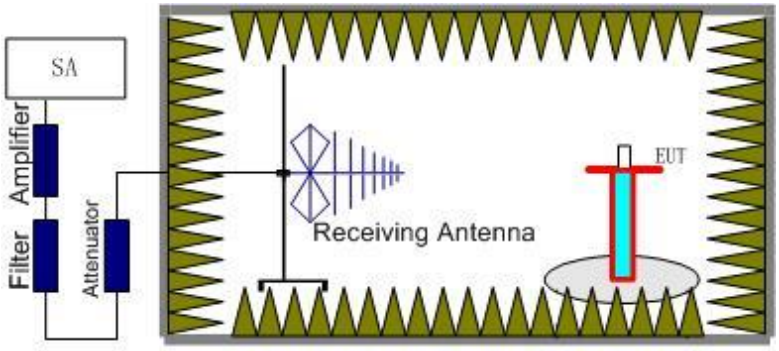
A.2.1 Measurement Method

The measurements procedures in ANSI C63.26 are used. This measurement is carried out in fully-anechoic chamber.

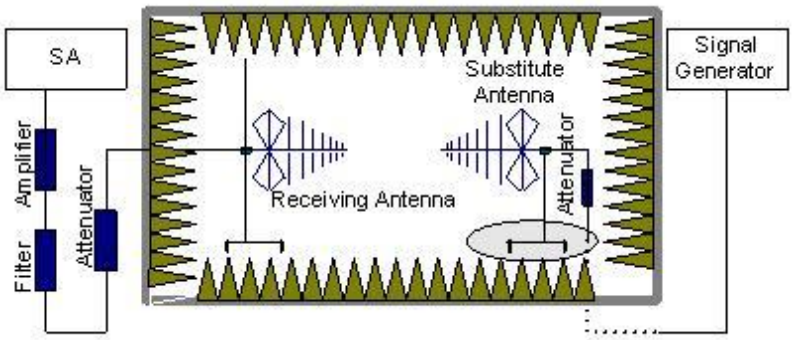
The spectrum was scanned from 9 kHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of each LTE Band.

The procedure of radiated spurious emissions is as follows:

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

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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:
   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 - 2.15dB.

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 that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

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

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Part 27.53(g) states for operations in the 600 MHz band and the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

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 $116Log_{10}(f/6.1)$ decibels or $50 + 10 Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz. For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

A.2.3 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of each LTE Band. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of each LTE Band into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

All mode of operation were investigated and the worst case configuration results are reported in this section.

The range of evaluated frequency is from 9 kHz to 26GHz. Measurement value show only up to 6 maximum emissions noted.

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LTE Band 2, 1.4MHz, QPSK, Channel 18607

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3702.02	-55.68	6.42	8.48	-53.62	-13.00	40.62	V
5553.02	-55.76	7.18	10.59	-52.35	-13.00	39.35	H
7436.01	-52.79	8.22	12.12	-48.89	-13.00	35.89	V
9245.01	-52.74	9.03	13.25	-48.52	-13.00	35.52	H
11059.01	-50.34	9.91	13.19	-47.06	-13.00	34.06	V
12975.01	-46.72	10.48	13.49	-43.71	-13.00	30.71	H

LTE Band 2, 1.4MHz, QPSK, Channel 18900

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3760.02	-55.53	6.26	8.56	-53.23	-13.00	40.23	V
5640.02	-54.69	7.27	10.57	-51.39	-13.00	38.39	H
7482.01	-52.90	8.34	12.18	-49.06	-13.00	36.06	V
9387.01	-53.12	9.05	13.33	-48.84	-13.00	35.84	V
11272.01	-49.30	9.83	13.15	-45.98	-13.00	32.98	V
13131.01	-44.20	10.80	13.68	-41.32	-13.00	28.32	V

LTE Band 2, 1.4MHz, QPSK, Channel 19193

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3819.02	-57.79	6.08	8.65	-55.22	-13.00	42.22	V
5728.02	-56.63	7.30	10.55	-53.38	-13.00	40.38	H
7608.01	-54.54	8.01	12.29	-50.26	-13.00	37.26	V
9549.01	-52.32	9.36	13.35	-48.33	-13.00	35.33	V
11460.01	-46.07	9.91	13.11	-42.87	-13.00	29.87	V
13358.01	-43.81	10.57	14.00	-40.38	-13.00	27.38	V

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LTE Band 4, 1.4MHz, QPSK, Channel 19957

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3422.02	-60.77	5.38	8.01	-58.14	-13.00	45.14	V
5133.02	-68.08	6.86	10.09	-64.85	-13.00	51.85	H
6844.01	-63.90	7.83	11.41	-60.32	-13.00	47.32	V
8589.01	-64.34	8.51	13.02	-59.83	-13.00	46.83	V
10301.01	-61.76	9.64	13.02	-58.38	-13.00	45.38	V
11982.01	-58.56	10.14	13.00	-55.70	-13.00	42.70	V

LTE Band 4, 1.4MHz, QPSK, Channel 20175

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3465.02	-62.96	5.46	8.12	-60.30	-13.00	47.30	V
5199.02	-69.18	6.96	10.18	-65.96	-13.00	52.96	H
6880.01	-65.30	7.78	11.46	-61.62	-13.00	48.62	V
8613.01	-64.39	8.48	13.02	-59.85	-13.00	46.85	V
10444.01	-61.18	9.74	13.08	-57.84	-13.00	44.84	V
12132.01	-59.19	10.25	13.05	-56.39	-13.00	43.39	V

LTE Band 4, 1.4MHz, QPSK, Channel 20393

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3509.02	-64.53	5.54	8.21	-61.86	-13.00	48.86	V
5263.02	-68.32	6.99	10.27	-65.04	-13.00	52.04	H
7020.01	-63.44	8.27	11.62	-60.09	-13.00	47.09	V
8755.01	-64.04	8.53	13.05	-59.52	-13.00	46.52	V
10479.01	-61.53	9.68	13.09	-58.12	-13.00	45.12	V
12244.01	-59.08	10.03	13.10	-56.01	-13.00	43.01	V

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LTE Band 5, 1.4MHz, QPSK, Channel 20407

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1655.01	-54.22	3.57	5.22	2.15	-54.72	-13.00	41.72	H
2481.00	-41.75	4.60	6.04	2.15	-42.46	-13.00	29.46	V
3311.02	-61.96	5.29	7.75	2.15	-61.65	-13.00	48.65	V
4129.02	-50.32	6.05	9.03	2.15	-49.49	-13.00	36.49	V
4955.01	-57.92	6.68	9.86	2.15	-56.89	-13.00	43.89	V
5787.01	-56.46	7.21	10.54	2.15	-55.28	-13.00	42.28	H

LTE Band 5, 1.4MHz, QPSK, Channel 20525

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1673.01	-53.83	3.58	5.19	2.15	-54.37	-13.00	41.37	H
2510.00	-41.46	4.63	6.12	2.15	-42.12	-13.00	29.12	H
3351.02	-61.24	5.32	7.84	2.15	-60.87	-13.00	47.87	V
4185.02	-49.05	6.17	9.09	2.15	-48.28	-13.00	35.28	V
5026.01	-58.18	6.56	9.94	2.15	-56.95	-13.00	43.95	V
5869.01	-56.83	7.30	10.53	2.15	-55.75	-13.00	42.75	V

LTE Band 5, 1.4MHz, QPSK, Channel 20643

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1697.01	-54.25	3.60	5.15	2.15	-54.85	-13.00	41.85	H
2545.00	-39.97	4.66	6.18	2.15	-40.60	-13.00	27.60	H
3385.02	-61.46	5.35	7.92	2.15	-61.04	-13.00	48.04	V
4244.02	-47.41	6.25	9.14	2.15	-46.67	-13.00	33.67	V
5080.01	-56.88	6.72	10.01	2.15	-55.74	-13.00	42.74	H
5941.01	-56.67	7.47	10.51	2.15	-55.78	-13.00	42.78	V

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LTE Band 7, 5 MHz, QPSK, Channel 20775

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5006.02	-57.77	6.59	9.91	-54.45	-25.00	29.45	H
7508.01	-51.78	8.36	12.21	-47.93	-25.00	22.93	V
10012.01	-46.61	9.21	12.90	-42.92	-25.00	17.92	V
12529.01	-48.76	10.26	13.22	-45.80	-25.00	20.80	V
15007.00	-43.89	11.22	14.00	-41.11	-25.00	16.11	V
17537.00	-40.75	12.87	14.95	-38.67	-25.00	13.67	H

LTE Band 7, 5 MHz, QPSK, Channel 21100

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5070.02	-53.68	6.69	10.00	-50.37	-25.00	25.37	H
7606.01	-48.50	8.00	12.28	-44.22	-25.00	19.22	V
10146.01	-43.98	9.39	12.96	-40.41	-25.00	15.41	V
12665.01	-48.71	10.36	13.30	-45.77	-25.00	20.77	H
15207.00	-44.78	11.39	13.88	-42.29	-25.00	17.29	V
17757.00	-41.19	12.50	15.26	-38.43	-25.00	13.43	H

LTE Band 7, 5 MHz, QPSK, Channel 21425

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5135.02	-52.82	6.86	10.09	-49.59	-25.00	24.59	H
7704.01	-48.44	8.42	12.36	-44.50	-25.00	19.50	H
10275.01	-43.61	9.56	13.01	-40.16	-25.00	15.16	V
12828.01	-47.00	10.69	13.40	-44.29	-25.00	19.29	H
15388.00	-43.86	11.38	13.77	-41.47	-25.00	16.47	V
17956.00	-40.89	12.89	15.54	-38.24	-25.00	13.24	H

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LTE Band 12, 1.4MHz, QPSK, Channel 23017

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1334.01	-56.62	3.15	4.64	2.15	-57.28	-13.00	44.28	H
2008.00	-49.86	4.08	4.62	2.15	-51.47	-13.00	38.47	H
2667.00	-45.70	4.76	6.40	2.15	-46.21	-13.00	33.21	H
3345.02	-61.24	5.31	7.83	2.15	-60.87	-13.00	47.87	V
4020.02	-58.67	6.05	8.92	2.15	-57.95	-13.00	44.95	H
4688.02	-59.00	6.50	9.59	2.15	-58.06	-13.00	45.06	V

LTE Band 12, 1.4MHz, QPSK, Channel 23095

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1415.01	-56.36	3.25	5.06	2.15	-56.70	-13.00	43.70	H
2123.00	-48.39	4.21	4.97	2.15	-49.78	-13.00	36.78	V
2833.00	-45.90	4.95	6.70	2.15	-46.30	-13.00	33.30	H
3538.02	-57.94	5.70	8.25	2.15	-57.54	-13.00	44.54	H
4255.02	-58.11	6.24	9.16	2.15	-57.34	-13.00	44.34	V
4959.01	-58.06	6.67	9.86	2.15	-57.02	-13.00	44.02	V

LTE Band 12, 1.4MHz, QPSK, Channel 23173

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1431.01	-54.42	3.28	5.14	2.15	-54.71	-13.00	41.71	H
2146.00	-48.22	4.24	5.04	2.15	-49.57	-13.00	36.57	V
2875.00	-46.16	4.97	6.78	2.15	-46.50	-13.00	33.50	H
3577.02	-55.06	6.10	8.31	2.15	-55.00	-13.00	42.00	V
4299.02	-57.55	6.19	9.20	2.15	-56.69	-13.00	43.69	V
4993.01	-57.59	6.62	9.89	2.15	-56.47	-13.00	43.47	H

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LTE Band 13, 5MHz, QPSK, Channel 23205

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1559.32	-64.55	3.47	5.39	0.00	-64.78	-40.00	24.78	V
2338.98	-47.14	4.44	5.62	2.15	-48.11	-13.00	35.11	H
3118.52	-58.36	5.38	7.28	2.15	-58.61	-13.00	45.61	H
3898.52	-55.07	6.11	8.76	2.15	-54.57	-13.00	41.57	H
4673.52	-57.56	6.48	9.57	2.15	-56.62	-13.00	43.62	V
5458.51	-58.27	6.90	10.54	2.15	-56.78	-13.00	43.78	V

LTE Band 13, 5MHz, QPSK, Channel 23230

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1564.36	-65.60	3.48	5.38	0.00	-65.85	-40.00	25.85	V
2346.70	-46.22	4.45	5.64	2.15	-47.18	-13.00	34.18	H
3128.52	-58.22	5.40	7.31	2.15	-58.46	-13.00	45.46	V
3911.02	-51.78	6.12	8.78	2.15	-51.27	-13.00	38.27	V
4689.52	-58.79	6.50	9.59	2.15	-57.85	-13.00	44.85	V
5473.01	-58.07	6.96	10.56	2.15	-56.62	-13.00	43.62	V

LTE Band 13, 5MHz, QPSK, Channel 23255

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1569.47	-64.94	3.48	5.37	0.00	-65.20	-40.00	25.20	H
2354.16	-45.99	4.46	5.66	2.15	-46.94	-13.00	33.94	H
3139.02	-58.87	5.38	7.33	2.15	-59.07	-13.00	46.07	H
3923.52	-55.37	6.12	8.79	2.15	-54.85	-13.00	41.85	V
4699.52	-58.44	6.50	9.60	2.15	-57.49	-13.00	44.49	V
5478.51	-57.47	6.98	10.57	2.15	-56.03	-13.00	43.03	V

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LTE Band 14, 5MHz, QPSK, Channel 23305

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1581.29	-65.55	3.50	5.35	0.00	-65.85	-40.00	25.85	H
2371.72	-49.02	4.48	5.72	2.15	-49.93	-13.00	36.93	H
3158.52	-59.67	5.36	7.38	2.15	-59.80	-13.00	46.80	V
3953.52	-58.25	6.10	8.83	2.15	-57.67	-13.00	44.67	V
4739.02	-58.83	6.55	9.64	2.15	-57.89	-13.00	44.89	V
5538.01	-57.66	7.17	10.59	2.15	-56.39	-13.00	43.39	V

LTE Band 14, 5MHz, QPSK, Channel 23330

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1586.34	-64.36	3.50	5.34	0.00	-64.67	-40.00	24.67	V
2379.37	-47.87	4.49	5.74	2.15	-48.77	-13.00	35.77	H
3172.52	-59.71	5.34	7.41	2.15	-59.79	-13.00	46.79	H
3965.52	-58.57	6.09	8.85	2.15	-57.96	-13.00	44.96	H
4758.01	-58.78	6.59	9.66	2.15	-57.86	-13.00	44.86	V
5546.01	-57.66	7.18	10.59	2.15	-56.40	-13.00	43.40	H

LTE Band 14, 5MHz, QPSK, Channel 23355

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1591.28	-63.79	3.51	5.34	0.00	-64.11	-40.00	24.11	V
2387.01	-46.12	4.50	5.76	2.15	-47.01	-13.00	34.01	V
3182.52	-58.38	5.32	7.44	2.15	-58.41	-13.00	45.41	V
3978.52	-53.82	6.08	8.87	2.15	-53.18	-13.00	40.18	H
4775.51	-58.76	6.62	9.68	2.15	-57.85	-13.00	44.85	H
5567.51	-55.99	7.20	10.59	2.15	-54.75	-13.00	41.75	V

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LTE Band 25, 1.4MHz, QPSK, Channel 26047

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3702.02	-53.31	6.42	8.48	-51.25	-13.00	38.25	V
5553.02	-56.09	7.18	10.59	-52.68	-13.00	39.68	H
7420.01	-53.61	8.17	12.10	-49.68	-13.00	36.68	V
9272.01	-52.67	9.09	13.26	-48.50	-13.00	35.50	V
11104.01	-49.84	9.82	13.18	-46.48	-13.00	33.48	V
12962.01	-47.66	10.48	13.48	-44.66	-13.00	31.66	V

LTE Band 25, 1.4MHz, QPSK, Channel 26365

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3765.02	-56.14	6.25	8.57	-53.82	-13.00	40.82	V
5648.02	-54.11	7.27	10.57	-50.81	-13.00	37.81	H
7487.01	-53.66	8.36	12.18	-49.84	-13.00	36.84	V
9367.01	-53.50	9.07	13.32	-49.25	-13.00	36.25	V
11252.01	-49.32	9.71	13.15	-45.88	-13.00	32.88	V
13166.01	-44.53	10.65	13.73	-41.45	-13.00	28.45	V

LTE Band 25, 1.4MHz, QPSK, Channel 26683

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3829.02	-51.90	6.06	8.66	-49.30	-13.00	36.30	V
5761.02	-58.49	7.25	10.55	-55.19	-13.00	42.19	H
7621.01	-54.92	8.07	12.30	-50.69	-13.00	37.69	V
9587.01	-54.00	9.23	13.31	-49.92	-13.00	36.92	H
11485.01	-48.25	9.85	13.10	-45.00	-13.00	32.00	V
13408.01	-43.73	10.57	14.07	-40.23	-13.00	27.23	H

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

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1650.01	-53.22	3.57	5.23	2.15	-53.71	-13.00	40.71	H
2481.00	-39.97	4.60	6.04	2.15	-40.68	-13.00	27.68	H
3282.02	-60.78	5.28	7.68	2.15	-60.53	-13.00	47.53	H
4126.02	-49.75	6.04	9.03	2.15	-48.91	-13.00	35.91	V
4931.01	-57.92	6.72	9.83	2.15	-56.96	-13.00	43.96	V
5782.01	-57.02	7.22	10.54	2.15	-55.85	-13.00	42.85	V

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

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1673.01	-50.89	3.58	5.19	2.15	-51.43	-13.00	38.43	H
2510.00	-42.41	4.63	6.12	2.15	-43.07	-13.00	30.07	H
3332.02	-59.90	5.30	7.80	2.15	-59.55	-13.00	46.55	V
4185.02	-49.77	6.17	9.09	2.15	-49.00	-13.00	36.00	V
5035.01	-57.32	6.59	9.95	2.15	-56.11	-13.00	43.11	V
5838.01	-55.67	7.20	10.53	2.15	-54.49	-13.00	41.49	V

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

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1697.01	-51.34	3.60	5.15	2.15	-51.94	-13.00	38.94	H
2545.00	-41.61	4.66	6.18	2.15	-42.24	-13.00	29.24	H
3394.02	-60.15	5.36	7.95	2.15	-59.71	-13.00	46.71	V
4242.02	-52.62	6.25	9.14	2.15	-51.88	-13.00	38.88	H
5092.01	-56.68	6.75	10.03	2.15	-55.55	-13.00	42.55	H
5925.01	-56.54	7.47	10.51	2.15	-55.65	-13.00	42.65	V

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

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1629.01	-53.85	3.55	5.27	2.15	-54.28	-13.00	41.28	H
2444.00	-45.14	4.57	5.93	2.15	-45.93	-13.00	32.93	V
3259.02	-59.29	5.28	7.62	2.15	-59.10	-13.00	46.10	H
4074.02	-51.62	6.04	8.97	2.15	-50.84	-13.00	37.84	H
4903.01	-57.57	6.73	9.80	2.15	-56.65	-13.00	43.65	V
5685.01	-56.54	7.28	10.56	2.15	-55.41	-13.00	42.41	H

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

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1636.01	-53.22	3.56	5.26	2.15	-53.67	-13.00	40.67	H
2457.00	-44.97	4.58	5.97	2.15	-45.73	-13.00	32.73	V
3276.02	-59.36	5.28	7.66	2.15	-59.13	-13.00	46.13	H
4094.02	-50.52	6.04	8.99	2.15	-49.72	-13.00	36.72	V
4894.01	-57.05	6.73	9.79	2.15	-56.14	-13.00	43.14	V
5752.01	-55.23	7.26	10.55	2.15	-54.09	-13.00	41.09	V

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

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1647.01	-52.59	3.56	5.24	2.15	-53.06	-13.00	40.06	H
2470.00	-43.16	4.59	6.01	2.15	-43.89	-13.00	30.89	V
4119.02	-49.15	6.04	9.02	2.15	-48.32	-13.00	35.32	V
4941.01	-58.31	6.71	9.84	2.15	-57.33	-13.00	44.33	H
5764.01	-57.70	7.24	10.55	2.15	-56.54	-13.00	43.54	H
6589.01	-54.93	7.76	11.11	2.15	-53.73	-13.00	40.73	V

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LTE Band 30, 5MHz, QPSK, Channel 27685

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
4616.02	-66.90	6.45	9.52	-63.83	-40.00	23.83	V
6924.01	-64.61	7.72	11.51	-60.82	-40.00	20.82	V
9249.01	-63.32	9.04	13.25	-59.11	-40.00	19.11	V
11526.01	-59.95	9.81	13.09	-56.67	-40.00	16.67	V
13864.01	-55.25	10.73	14.42	-51.56	-40.00	11.56	H
16139.00	-53.01	11.81	13.67	-51.15	-40.00	11.15	H

LTE Band 30, 5MHz, QPSK, Channel 27710

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
4622.02	-66.17	6.45	9.52	-63.10	-40.00	23.10	V
6932.01	-64.64	7.77	11.52	-60.89	-40.00	20.89	V
9242.01	-63.17	9.02	13.25	-58.94	-40.00	18.94	V
11542.01	-59.86	9.81	13.09	-56.58	-40.00	16.58	V
13875.01	-55.01	10.75	14.43	-51.33	-40.00	11.33	H
16172.00	-53.10	11.76	13.67	-51.19	-40.00	11.19	H

LTE Band 30, 5MHz, QPSK, Channel 27735

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
4626.02	-71.47	6.44	9.53	-68.38	-40.00	28.38	V
6929.01	-65.83	7.75	11.51	-62.07	-40.00	22.07	V
9249.01	-63.18	9.04	13.25	-58.97	-40.00	18.97	V
11557.01	-60.06	9.81	13.09	-56.78	-40.00	16.78	V
13887.01	-54.80	10.78	14.43	-51.15	-40.00	11.15	H
16175.00	-52.99	11.76	13.66	-51.09	-40.00	11.09	H

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LTE Band 38, 5MHz, QPSK, Channel 37775

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5125.02	-59.03	6.84	10.08	-55.79	-25.00	30.79	V
7720.01	-34.68	8.40	12.38	-30.70	-25.00	5.70	V
10306.01	-51.55	9.65	13.02	-48.18	-25.00	23.18	V
12852.01	-47.49	10.63	13.41	-44.71	-25.00	19.71	H
15437.00	-43.51	11.45	13.74	-41.22	-25.00	16.22	V
17980.00	-40.78	12.90	15.57	-38.11	-25.00	13.11	H

LTE Band 38, 5MHz, QPSK, Channel 38000

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5215.02	-59.27	6.98	10.20	-56.05	-25.00	31.05	H
7789.01	-37.92	8.30	12.43	-33.79	-25.00	8.79	H
10388.01	-49.76	9.78	13.06	-46.48	-25.00	21.48	V
13006.01	-46.97	10.49	13.51	-43.95	-25.00	18.95	H
15535.00	-43.57	11.52	13.70	-41.39	-25.00	16.39	H
16897.00	-40.18	12.00	13.76	-38.42	-25.00	13.42	H

LTE Band 38, 5MHz, QPSK, Channel 38225

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5236.02	-58.33	7.00	10.23	-55.10	-25.00	30.10	V
7854.01	-37.04	8.36	12.48	-32.92	-25.00	7.92	H
10476.01	-49.00	9.69	13.09	-45.60	-25.00	20.60	V
13113.01	-45.11	10.88	13.66	-42.33	-25.00	17.33	V
15734.00	-43.55	11.63	13.70	-41.48	-25.00	16.48	H
17030.00	-40.25	12.46	13.87	-38.84	-25.00	13.84	V

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LTE Band 41, 5MHz, QPSK, Channel 39675

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5000.02	-56.61	6.60	9.90	-53.31	-25.00	28.31	V
7496.01	-40.67	8.38	12.20	-36.85	-25.00	11.85	H
9995.01	-52.82	9.18	12.90	-49.10	-25.00	24.10	V
12489.01	-49.45	10.20	13.20	-46.45	-25.00	21.45	H
14987.00	-43.22	11.21	14.01	-40.42	-25.00	15.42	H
17490.00	-40.66	12.70	14.88	-38.48	-25.00	13.48	V

LTE Band 41, 5MHz, QPSK, Channel 40620

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5165.02	-60.00	6.91	10.13	-56.78	-25.00	31.78	H
7780.01	-38.82	8.31	12.42	-34.71	-25.00	9.71	H
10376.01	-49.99	9.76	13.05	-46.70	-25.00	21.70	V
12959.01	-47.14	10.48	13.48	-44.14	-25.00	19.14	H
15570.00	-43.84	11.50	13.70	-41.64	-25.00	16.64	V
16869.00	-40.70	12.03	13.75	-38.98	-25.00	13.98	H

LTE Band 41, 5MHz, QPSK, Channel 41565

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5375.02	-57.86	6.88	10.43	-54.31	-25.00	29.31	V
8063.01	-50.45	8.32	12.65	-46.12	-25.00	21.12	V
10762.01	-50.93	9.46	13.15	-47.24	-25.00	22.24	V
13418.01	-44.34	10.58	14.09	-40.83	-25.00	15.83	H
16137.00	-42.83	11.81	13.67	-40.97	-25.00	15.97	H
17451.00	-39.78	12.61	14.79	-37.60	-25.00	12.60	V

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LTE Band CA41_20MHz+5MHz_CH39750_QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
4982.01	-59.87	6.63	9.88	-56.62	-25.00	31.62	H
7503.01	-53.88	8.38	12.20	-50.06	-25.00	25.06	V
10005.01	-53.79	9.20	12.90	-50.09	-25.00	25.09	H
12494.00	-48.95	10.19	13.20	-45.94	-25.00	20.94	H
15020.00	-43.40	11.24	13.99	-40.65	-25.00	15.65	H
17510.00	-39.30	12.76	14.91	-37.15	-25.00	12.15	V

LTE Band CA41_20MHz+5MHz_CH40595_QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5153.01	-59.52	6.89	10.11	-56.30	-25.00	31.30	V
7757.01	-54.13	8.35	12.41	-50.07	-25.00	25.07	V
10318.01	-50.32	9.67	13.03	-46.96	-25.00	21.96	V
12895.00	-47.66	10.52	13.44	-44.74	-25.00	19.74	H
15496.00	-43.08	11.53	13.70	-40.91	-25.00	15.91	H
16807.00	-40.77	12.11	13.72	-39.16	-25.00	14.16	H

LTE Band CA41_20MHz+5MHz_CH41440_QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5362.01	-60.12	6.91	10.41	-56.62	-25.00	31.62	V
7978.01	-53.98	8.35	12.58	-49.75	-25.00	24.75	V
10645.00	-50.62	9.29	13.13	-46.78	-25.00	21.78	V
13360.00	-44.74	10.57	14.00	-41.31	-25.00	16.31	V
16032.00	-43.42	11.83	13.69	-41.56	-25.00	16.56	H
17362.00	-38.44	12.45	14.60	-36.29	-25.00	11.29	V

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LTE Band CA41_20MHz+20MHz_CH39750_QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5040.01	-59.75	6.60	9.96	-56.39	-25.00	31.39	V
7526.01	-53.70	8.28	12.22	-49.76	-25.00	24.76	V
10030.01	-52.43	9.27	12.91	-48.79	-25.00	23.79	V
12529.00	-48.19	10.26	13.22	-45.23	-25.00	20.23	V
15055.00	-43.55	11.29	13.97	-40.87	-25.00	15.87	V
17548.00	-39.22	12.91	14.97	-37.16	-25.00	12.16	H

LTE Band CA41_20MHz+20MHz_CH40521_QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5153.01	-59.82	6.89	10.11	-56.60	-25.00	31.60	V
7721.01	-54.21	8.40	12.38	-50.23	-25.00	25.23	H
10315.01	-50.88	9.67	13.03	-47.52	-25.00	22.52	V
12920.00	-47.55	10.50	13.45	-44.60	-25.00	19.60	H
15470.00	-43.67	11.49	13.72	-41.44	-25.00	16.44	H
16771.00	-40.19	12.00	13.71	-38.48	-25.00	13.48	H

LTE Band CA41_20MHz+20MHz_CH41292_QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5301.01	-60.58	6.99	10.32	-57.25	-25.00	32.25	H
7986.01	-53.78	8.34	12.59	-49.53	-25.00	24.53	V
10635.00	-51.32	9.29	13.13	-47.48	-25.00	22.48	V
13300.00	-44.72	10.58	13.92	-41.38	-25.00	16.38	V
15965.00	-43.34	11.75	13.70	-41.39	-25.00	16.39	H
17315.00	-39.31	12.39	14.49	-37.21	-25.00	12.21	V

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LTE Band 48, 1.4MHz QPSK, Channel 55265

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
6456.00	-55.57	7.55	10.96	-52.16	-40.00	12.16	V
7796.00	-54.19	8.29	12.44	-50.04	-40.00	10.04	V
9094.00	-53.35	8.95	13.16	-49.14	-40.00	9.14	V
10368.00	-52.56	9.75	13.05	-49.26	-40.00	9.26	H
11661.00	-51.78	9.68	13.07	-48.39	-40.00	8.39	V
12976.00	-51.87	10.48	13.49	-48.86	-40.00	8.86	H

LTE Band 48, 1.4MHz, QPSK, Channel 55990

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
6459.00	-55.96	7.54	10.96	-52.54	-40.00	12.54	V
7751.00	-55.33	8.36	12.40	-51.29	-40.00	11.29	V
9076.00	-54.89	9.00	13.15	-50.74	-40.00	10.74	H
10381.00	-53.16	9.77	13.05	-49.88	-40.00	9.88	H
11689.00	-52.32	9.63	13.06	-48.89	-40.00	8.89	V
12955.00	-51.01	10.48	13.47	-48.02	-40.00	8.02	V

LTE Band 48, 1.4MHz, QPSK, Channel 56715

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
7386.00	-55.27	8.11	12.06	-51.32	-40.00	11.32	V
9237.00	-54.73	9.01	13.24	-50.50	-40.00	10.50	V
11093.00	-52.50	9.85	13.18	-49.17	-40.00	9.17	H
12927.00	-51.86	10.50	13.46	-48.90	-40.00	8.90	V
14801.00	-48.44	11.13	14.16	-45.41	-40.00	5.41	V
16649.00	-47.17	11.88	13.66	-45.39	-40.00	5.39	H

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LTE Band 66, 1.4MHz QPSK, Channel 131979

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3422.02	-61.75	5.38	8.01	-59.12	-13.00	46.12	V
5133.02	-68.36	6.86	10.09	-65.13	-13.00	52.13	H
6845.01	-64.21	7.83	11.41	-60.63	-13.00	47.63	V
8598.01	-64.13	8.50	13.02	-59.61	-13.00	46.61	V
10307.01	-61.48	9.65	13.02	-58.11	-13.00	45.11	V
11983.01	-58.13	10.13	13.00	-55.26	-13.00	42.26	V

LTE Band 66, 1.4MHz, QPSK, Channel 132322

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3490.02	-62.86	5.50	8.18	-60.18	-13.00	47.18	V
5236.02	-67.95	7.00	10.23	-64.72	-13.00	51.72	H
6980.01	-63.38	8.14	11.58	-59.94	-13.00	46.94	V
8746.01	-63.76	8.50	13.05	-59.21	-13.00	46.21	V
10456.01	-60.82	9.72	13.08	-57.46	-13.00	44.46	V
12250.01	-58.76	10.03	13.10	-55.69	-13.00	42.69	V

LTE Band 66, 1.4MHz, QPSK, Channel 132665

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3559.02	-58.63	5.92	8.28	-56.27	-13.00	43.27	V
5338.02	-68.42	6.96	10.37	-65.01	-13.00	52.01	H
7158.01	-65.56	8.18	11.79	-61.95	-13.00	48.95	V
8945.01	-63.38	9.01	13.09	-59.30	-13.00	46.30	V
10728.01	-61.32	9.37	13.15	-57.54	-13.00	44.54	V
12407.01	-58.54	10.42	13.16	-55.80	-13.00	42.80	V

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LTE Band71 _5MHz_CH133147_QPSK

Frequency (MHz)	PMea (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1331.01	-52.75	3.15	4.62	2.15	-53.43	-13.00	40.43	H
1997.01	-46.33	4.04	4.61	2.15	-47.91	-13.00	34.91	H
2685.00	-44.58	4.77	6.43	2.15	-45.07	-13.00	32.07	H
3351.02	-60.61	5.32	7.84	2.15	-60.24	-13.00	47.24	V
3994.02	-58.38	6.07	8.89	2.15	-57.71	-13.00	44.71	H
4652.02	-58.84	6.47	9.55	2.15	-57.91	-13.00	44.91	V

LTE Band71 _5MHz_CH133297_QPSK

Frequency (MHz)	PMea (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1361.01	-53.47	3.19	4.78	2.15	-54.03	-13.00	41.03	H
2042.00	-46.65	4.14	4.73	2.15	-48.21	-13.00	35.21	H
2713.00	-44.31	4.80	6.48	2.15	-44.78	-13.00	31.78	H
3404.02	-61.36	5.37	7.97	2.15	-60.91	-13.00	47.91	V
4075.02	-57.31	6.04	8.98	2.15	-56.52	-13.00	43.52	V
4770.01	-58.26	6.61	9.67	2.15	-57.35	-13.00	44.35	H

LTE Band 71_5MHz_CH133447_QPSK

Frequency (MHz)	PMea (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1391.01	-53.99	3.22	4.93	2.15	-54.43	-13.00	41.43	H
2103.00	-49.84	4.19	4.91	2.15	-51.27	-13.00	38.27	V
2806.00	-45.20	4.92	6.65	2.15	-45.62	-13.00	32.62	V
3486.02	-59.67	5.49	8.17	2.15	-59.14	-13.00	46.14	H
4174.02	-56.30	6.15	9.07	2.15	-55.53	-13.00	42.53	V
4893.01	-57.47	6.73	9.79	2.15	-56.56	-13.00	43.56	V

Note: The maximum value of expanded measurement uncertainty for this test item is U = 4.69 dB, k = 2.

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A.3 Frequency Stability

A.3.1 Method of Measurement

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

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of CMW500.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30℃.
3. With the EUT, powered via nominal voltage, connected to the CMW500, and in a simulated call on middle channel for each LTE band, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10℃ increments from -30℃ to +50℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50℃.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the center channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 ℃ decrements from +50℃ to -30℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

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

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A.3.2 Measurement results

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	1850.801	1909.199		
50				-0.74	0.0004
40				-4.19	0.0022
30				10.14	0.0054
10				-16.59	0.0088
0				-3.30	0.0018
-10				10.03	0.0053
-20				-2.42	0.0013
-30				0.94	0.0005

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	1850.801	1909.199	-2.12	0.0011
4.4				-2.13	0.0011

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	1710.801	1754.199		
50				-4.86	0.0028
40				-1.56	0.0009
30				-1.62	0.0009
10				13.45	0.0078
0				-2.27	0.0013
-10				12.85	0.0074
-20				13.69	0.0079
-30				-2.32	0.0013

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	1710.801	1754.199	-0.54	0.0003
4.4				12.13	0.0070

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	824.417	848.583		
50				-0.60	0.0007
40				-1.37	0.0016
30				0.83	0.0010
10				0.36	0.0004
0				-0.83	0.0010
-10				10.44	0.0125
-20				1.46	0.0017
-30				0.20	0.0002

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	824.417	848.583	-0.79	0.0009
4.4				-0.84	0.0010

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	2500.577	2569.391		
50				27.28	0.0108
40				20.79	0.0082
30				21.00	0.0083
10				22.02	0.0087
0				-3.49	0.0014
-10				-2.20	0.0009
-20				22.53	0.0089
-30				-1.39	0.0005

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	2500.577	2569.391	-3.52	0.0014
4.4				-3.50	0.0014

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	699.481	715.519		
50				0.53	0.0007
40				0.19	0.0003
30				-1.13	0.0016
10				0.77	0.0011
0				-2.23	0.0032
-10				1.90	0.0027
-20				0.43	0.0006
-30				0.53	0.0007

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	699.481	715.519	1.83	0.0026
4.4				-0.54	0.0008

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	777.465	786.535		
50				1.53	0.0020
40				-0.20	0.0003
30				1.29	0.0016
10				12.66	0.0162
0				-0.06	0.0001
-10				0.92	0.0012
-20				111.34	0.1424
-30				0.40	0.0005

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	777.465	786.535	0.23	0.0003
4.4				1.66	0.0021

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LTE Band 14, 10MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	788.471	797.524		
50				0.46	0.0006
40				-0.14	0.0002
30				-1.27	0.0016
10				0.86	0.0011
0				1.47	0.0019
-10				0.74	0.0009
-20				2.69	0.0034
-30				1.52	0.0019

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	788.471	797.524	1.53	0.0019
4.4				1.62	0.0020

LTE Band 25, 20MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	1850.801	1914.199		
50				19.38	0.0103
40				4.25	0.0023
30				4.84	0.0026
10				5.39	0.0029
0				17.12	0.0091
-10				18.94	0.0101
-20				17.55	0.0093
-30				18.30	0.0097

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	1850.801	1914.199	3.25	0.0017
4.4				17.64	0.0094

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	814.380	823.615		
50				-10.69	0.0131
40				-12.20	0.0149
30				-9.74	0.0119
10				-12.76	0.0156
0				-12.10	0.0148
-10				1.85	0.0023
-20				-11.49	0.0140
-30				-12.25	0.0150

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	814.380	823.615	-12.93	0.0158
4.4				-11.79	0.0144

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	824.553	848.471		
50				-1.30	0.0016
40				-3.52	0.0042
30				-2.10	0.0025
10				11.92	0.0142
0				11.96	0.0143
-10				-0.19	0.0002
-20				-1.75	0.0021
-30				0.30	0.0004

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	824.553	848.471	-2.56	0.0031
4.4				-2.50	0.0030

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LTE Band 30, 10MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	2305.417	2314.583		
50				0.51	0.0002
40				-3.46	0.0015
30				15.11	0.0065
10				-1.73	0.0007
0				0.34	0.0001
-10				-8.33	0.0036
-20				2.32	0.0010
-30				14.36	0.0062

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	2305.417	2314.583	-1.85	0.0008
4.4				2.10	0.0009

LTE Band 38, 20MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	2570.577	2619.455		
50				-17.42	0.0067
40				-16.89	0.0065
30				-19.10	0.0074
10				-15.58	0.0060
0				-18.44	0.0071
-10				-13.48	0.0052
-20				-16.18	0.0062
-30				-35.82	0.0138

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	2570.577	2619.455	-16.87	0.0065
4.4				-16.84	0.0065

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	2496.353	2689.551		
50				1.90	0.0007
40				0.93	0.0004
30				0.94	0.0004
10				-0.11	0.0000
0				1.92	0.0007
-10				0.23	0.0001
-20				0.94	0.0004
-30				-1.33	0.0005

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	2496.353	2689.551	21.67	0.0084
4.4				1.29	0.0005

LTE Band 48, 20MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	3550.833	3699.199		
50				-29.64	0.0082
40				-27.09	0.0075
30				-28.45	0.0078
10				-30.28	0.0084
0				-27.18	0.0075
-10				-27.35	0.0075
-20				0.56	0.0002
-30				5.12	0.0014

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	3550.833	3699.199	-28.60	0.0079
4.4				-25.88	0.0071

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	1710.801	1779.231		
50				-2.63	0.0015
40				0.51	0.0003
30				-0.46	0.0003
10				-20.11	0.0115
0				2.90	0.0017
-10				1.50	0.0009
-20				-18.00	0.0103
-30				2.53	0.0014

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	1710.801	1779.231	-15.38	0.0088
4.4				1.12	0.0006

LTE Band 71, 20MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	663.994	697.006		
50				-0.23	0.0003
40				0.39	0.0006
30				1.77	0.0026
10				-0.53	0.0008
0				-2.13	0.0031
-10				-1.87	0.0027
-20				0.74	0.0011
-30				-0.34	0.0005

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	663.994	697.006	-0.54	0.0008
4.4				0.87	0.0013

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	2496.940	2689.060		
50				0.37	0.0001
40				0.53	0.0002
30				-0.69	0.0003
10				0.96	0.0004
0				1.25	0.0005
-10				0.70	0.0003
-20				-1.13	0.0004
-30				0.50	0.0002

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	2496.940	2689.060	-0.44	0.0002
4.4				-1.03	0.0004

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

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A.4 Occupied Bandwidth

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

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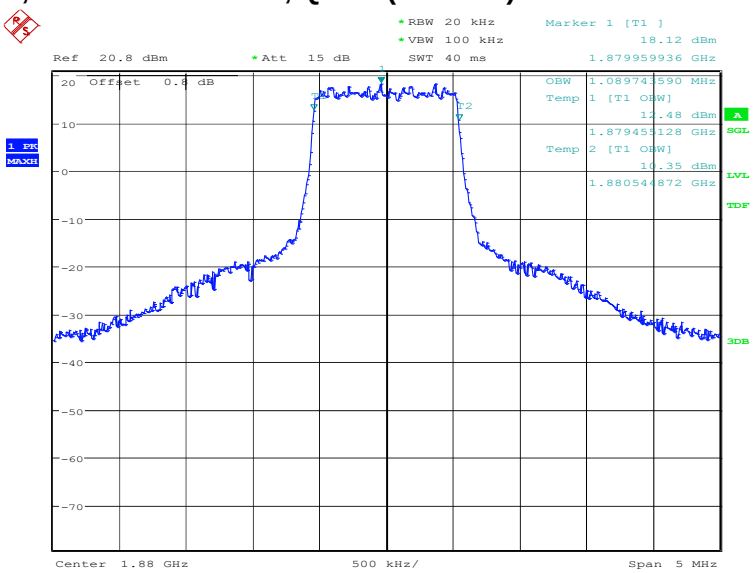
LTE band 2, 1.4MHz (99%)

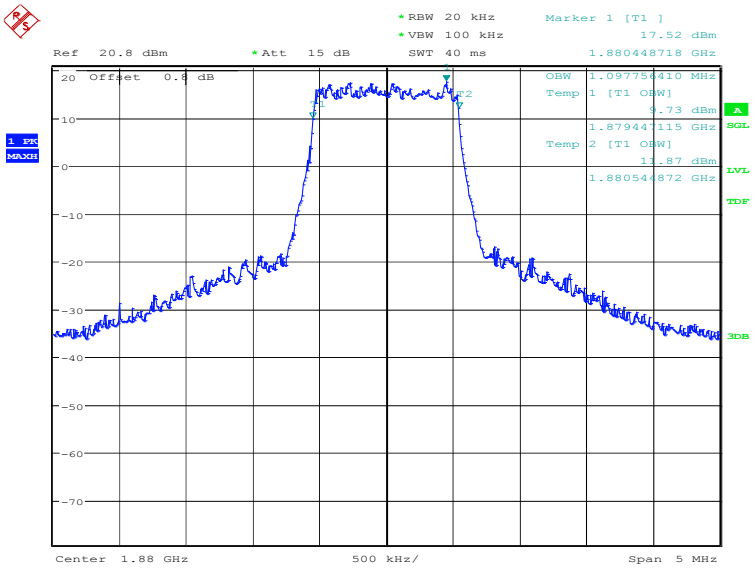
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	1089.74	1097.76

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



Date: 23.SEP.2022 09:15:21

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



Date: 23.SEP.2022 09:16:01

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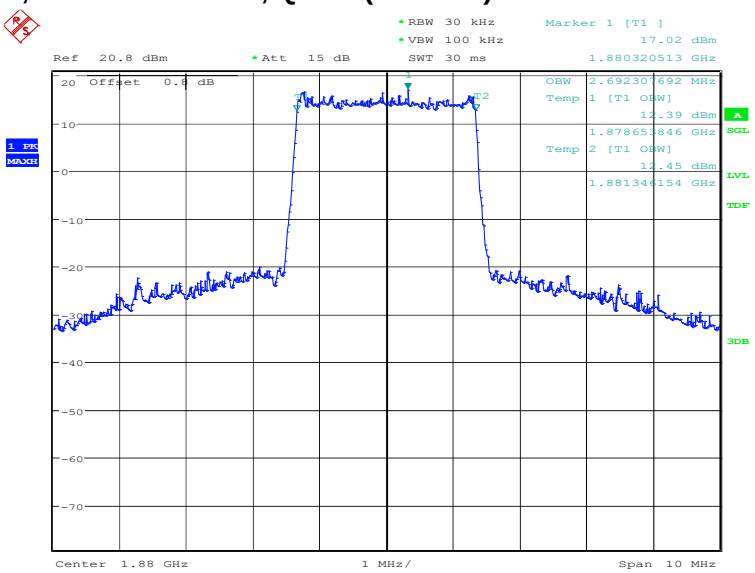
LTE band 2, 3MHz (99%)

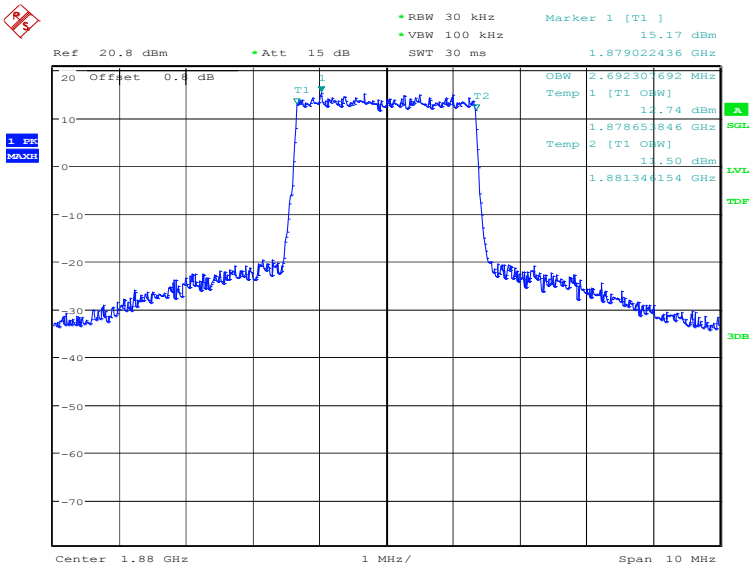
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	2692.31	2692.31

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



Date: 23.SEP.2022 09:16:44

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



Date: 23.SEP.2022 09:17:24

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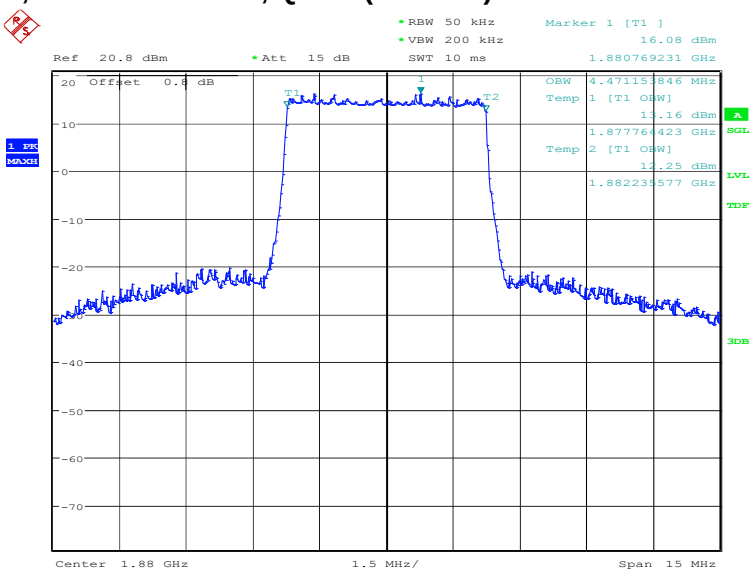
LTE band 2, 5MHz (99%)

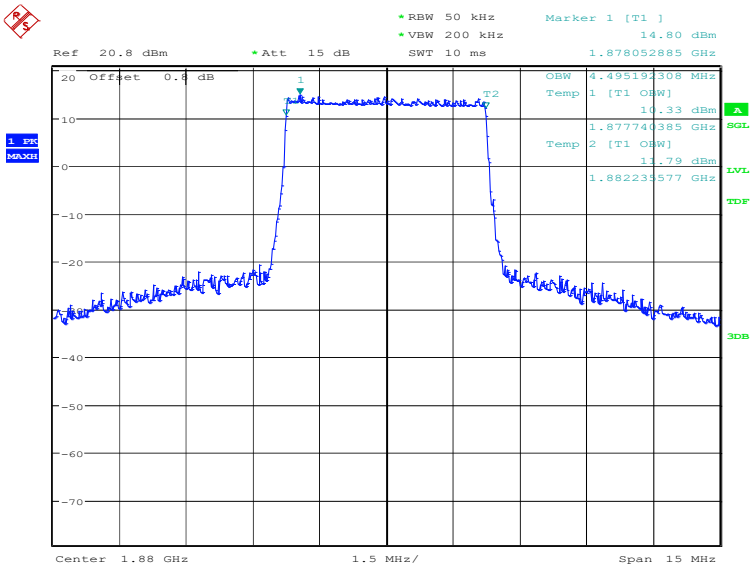
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	4471.15	4495.19

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



Date: 23.SEP.2022 09:18:06

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



Date: 23.SEP.2022 09:18:46

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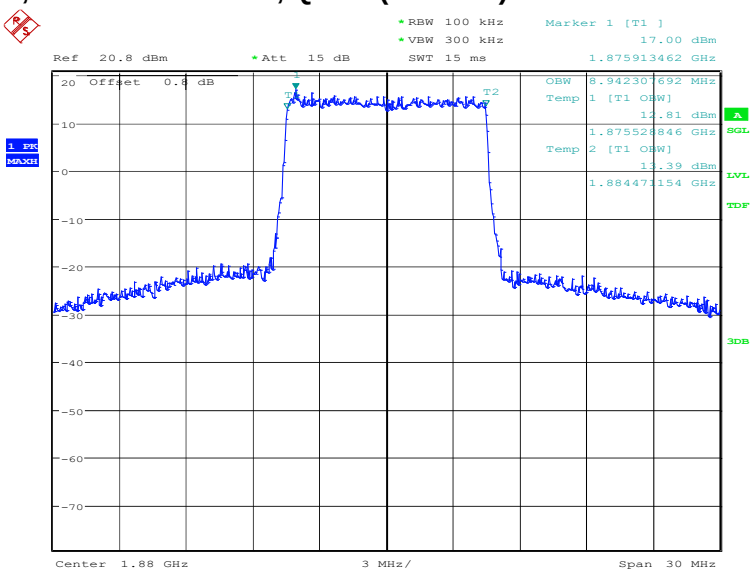
LTE band 2, 10MHz (99%)

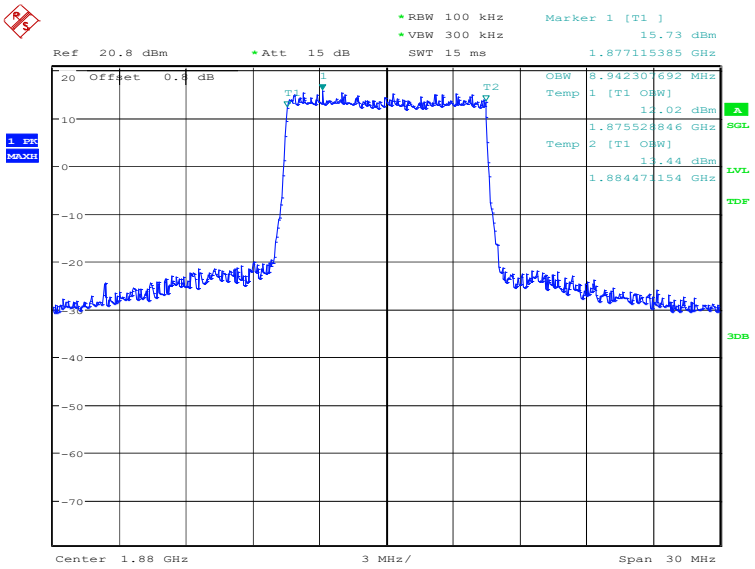
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 23.SEP.2022 09:19:28

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



Date: 23.SEP.2022 09:20:08

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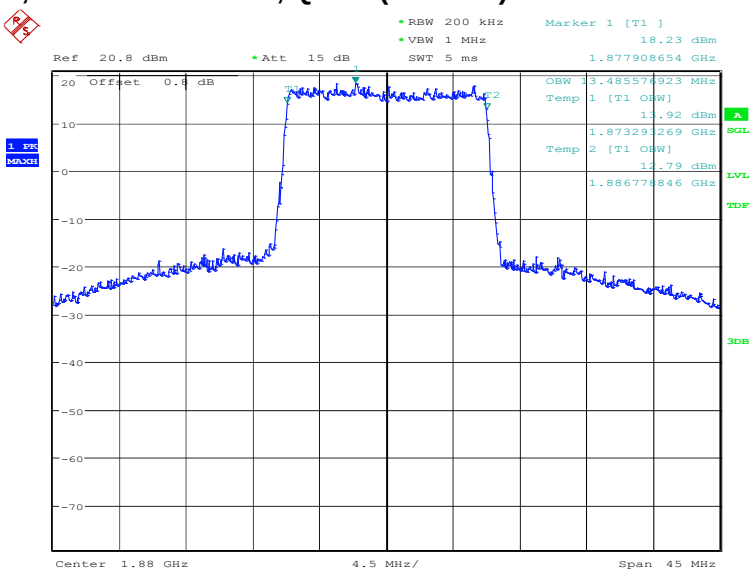
LTE band 2, 15MHz (99%)

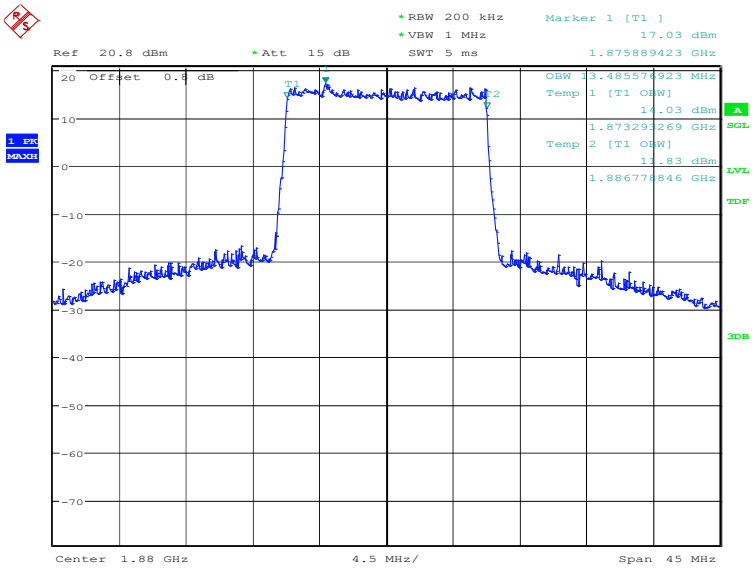
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	13485.58	13485.58

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



Date: 23.SEP.2022 09:20:50

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



Date: 23.SEP.2022 09:21:30

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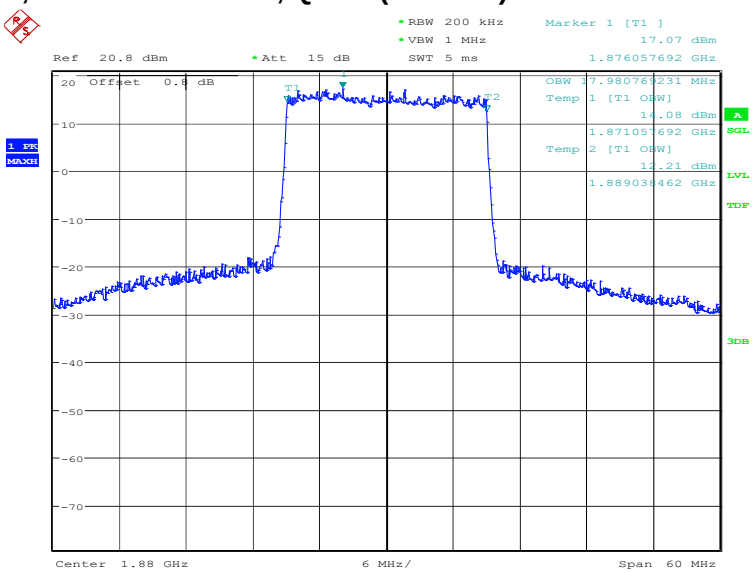
LTE band 2, 20MHz (99%)

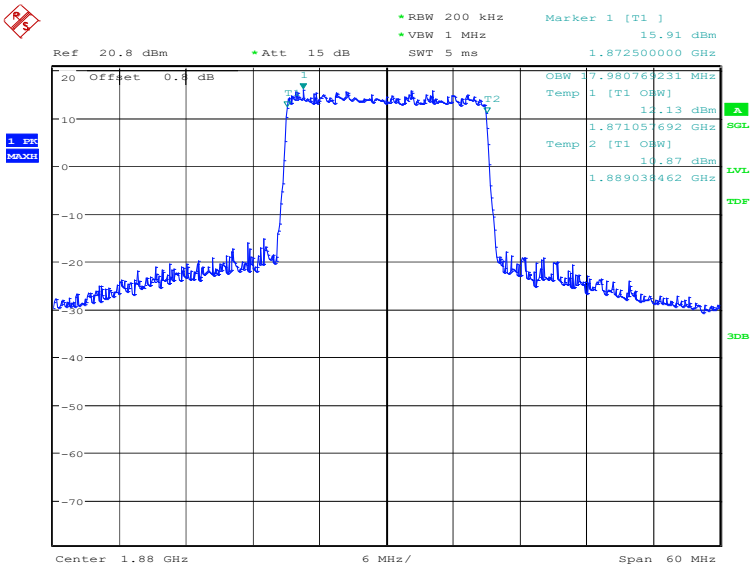
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	17980.77	17980.77

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



Date: 23.SEP.2022 09:22:13

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



Date: 23.SEP.2022 09:22:53

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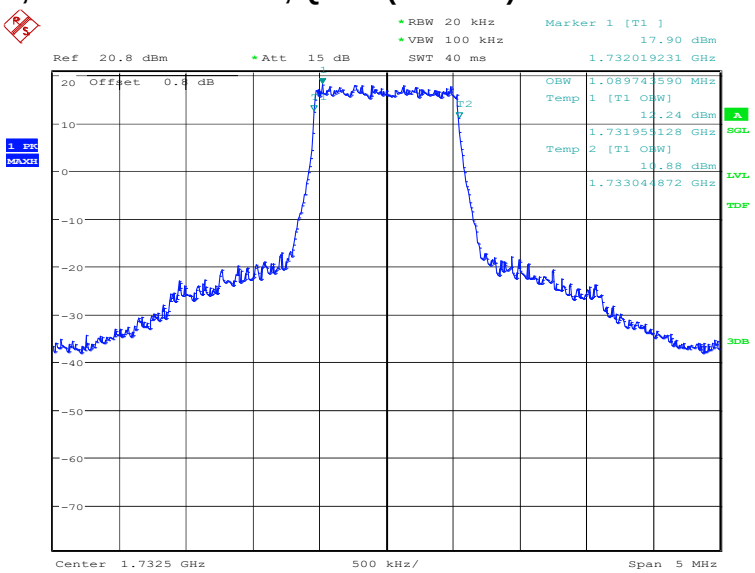
LTE band 4, 1.4MHz (99%)

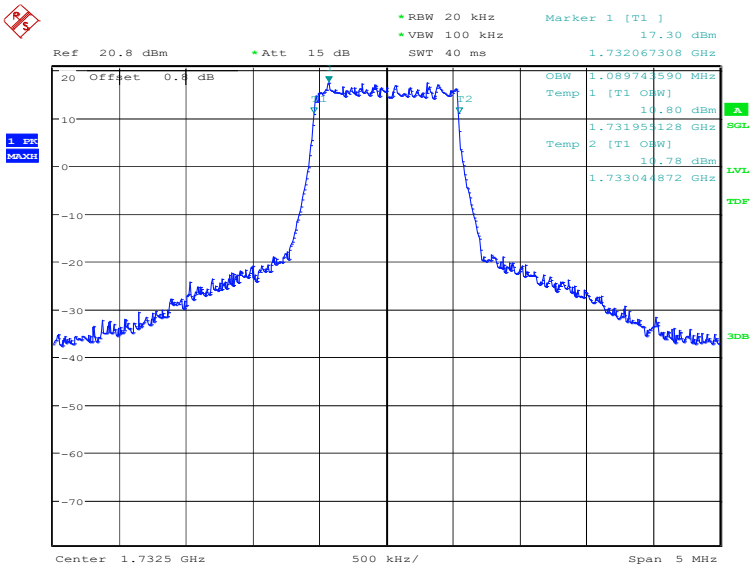
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1732.5	QPSK	16QAM
	1089.74	1089.74

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



Date: 23.SEP.2022 09:23:36

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



Date: 23.SEP.2022 09:24:17

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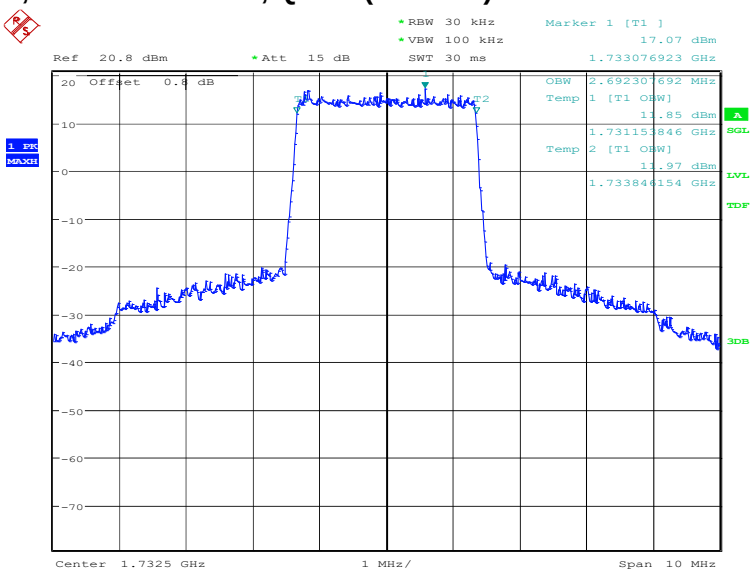
LTE band 4, 3MHz (99%)

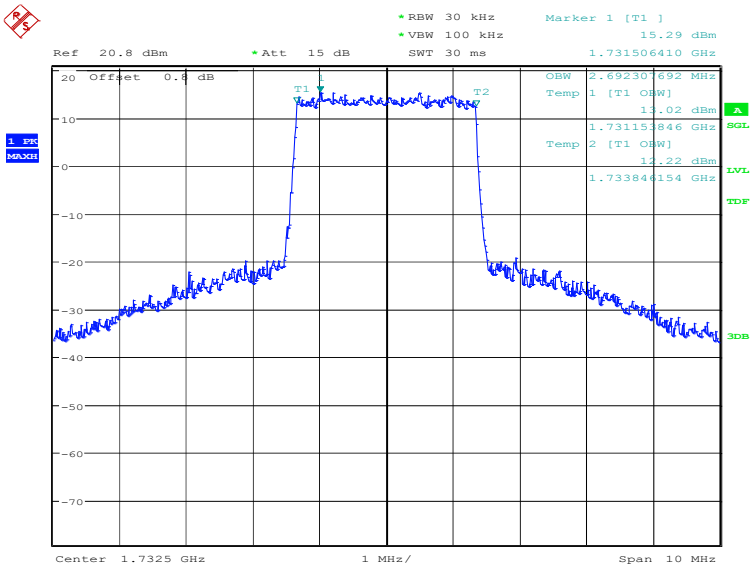
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1732.5	QPSK	16QAM
	2692.31	2692.31

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



Date: 23.SEP.2022 09:24:59

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



Date: 23.SEP.2022 09:25:39

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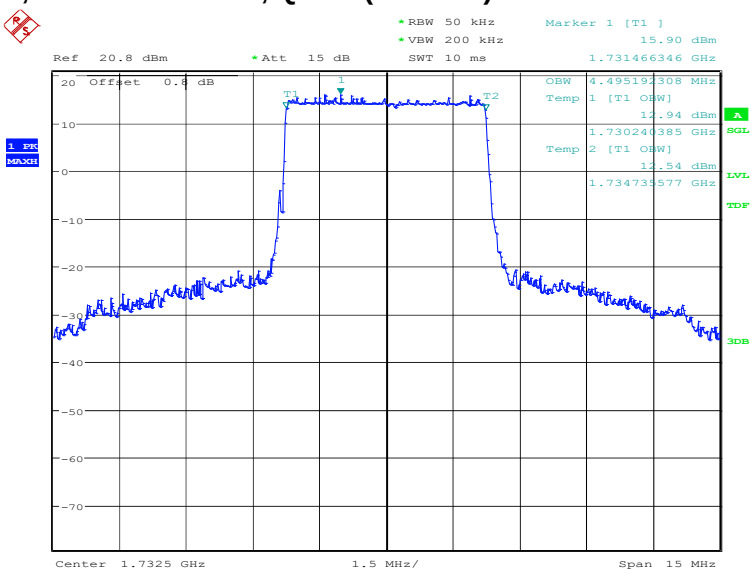
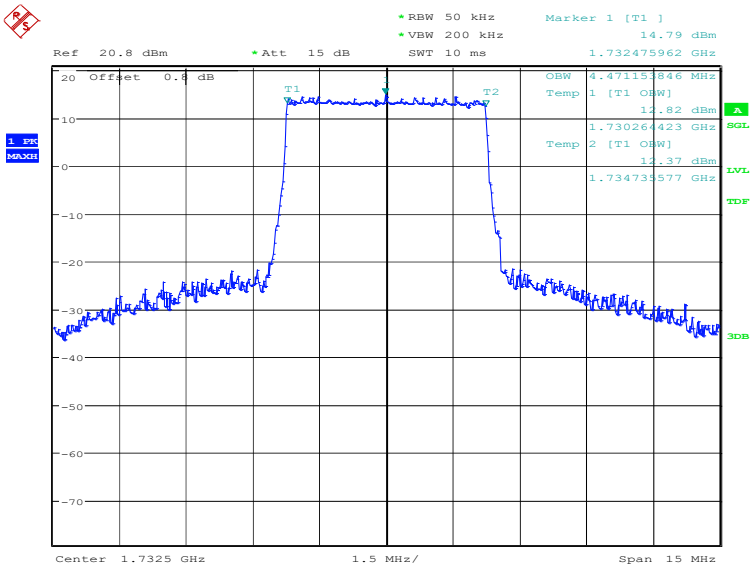
LTE band 4, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1732.5	QPSK	16QAM
	4495.19	4471.15

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



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



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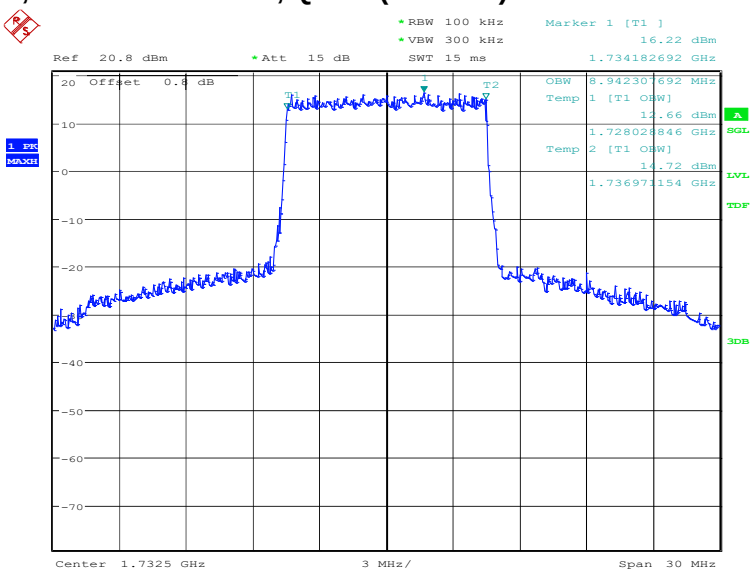
LTE band 4, 10MHz (99%)

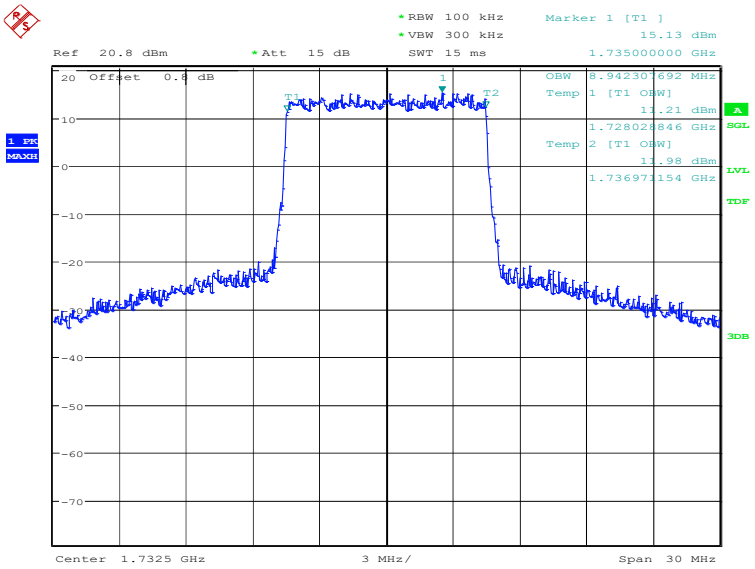
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1732.5	QPSK	16QAM
	8942.31	8942.31

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



Date: 23.SEP.2022 09:27:43

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



Date: 23.SEP.2022 09:28:24

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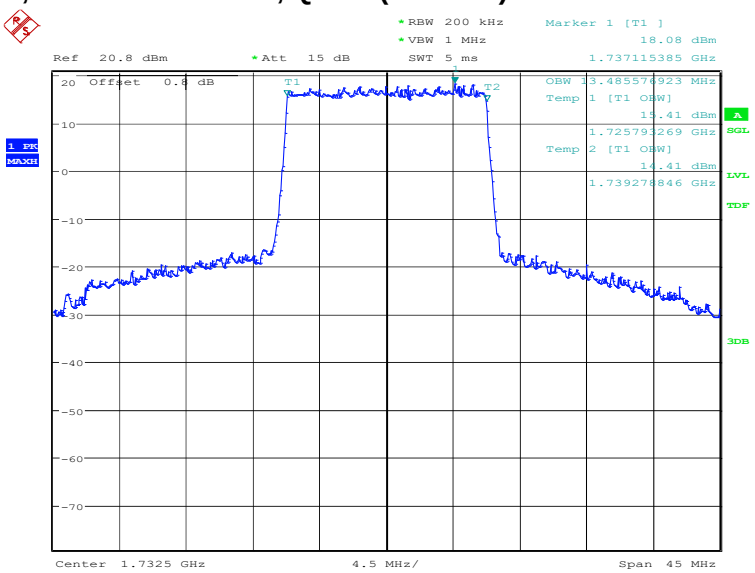
LTE band 4, 15MHz (99%)

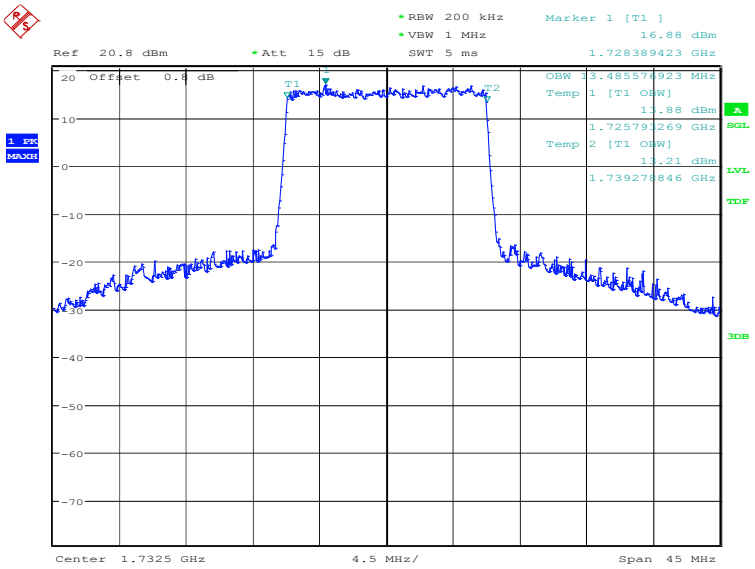
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1732.5	QPSK	16QAM
	13485.58	13485.58

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



Date: 23.SEP.2022 09:29:06

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



Date: 23.SEP.2022 09:29:46

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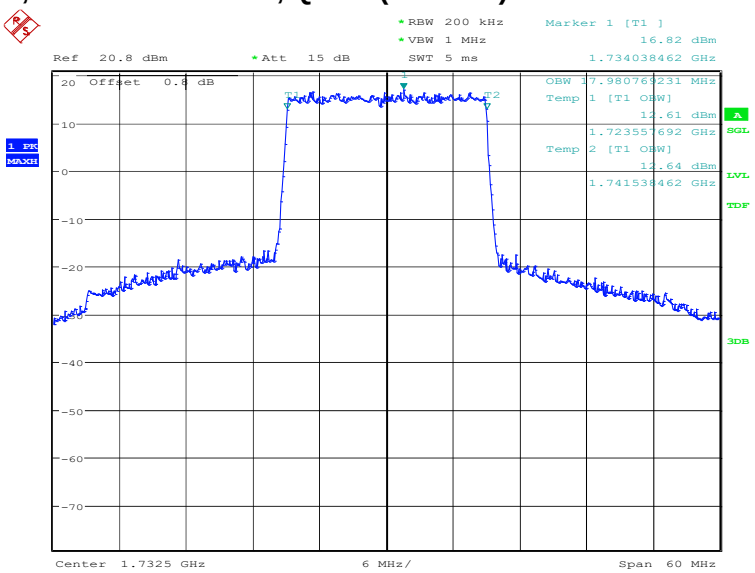
LTE band 4, 20MHz (99%)

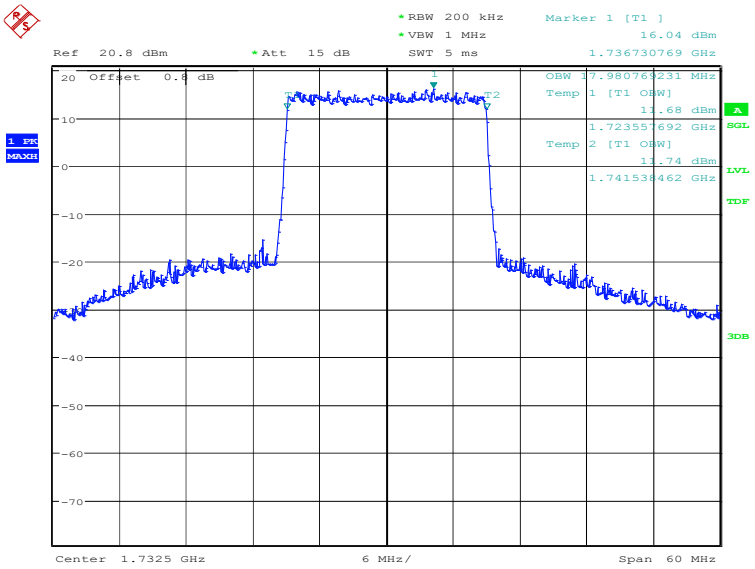
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1732.5	QPSK	16QAM
	17980.77	17980.77

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



Date: 23.SEP.2022 09:30:28

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



Date: 23.SEP.2022 09:31:08

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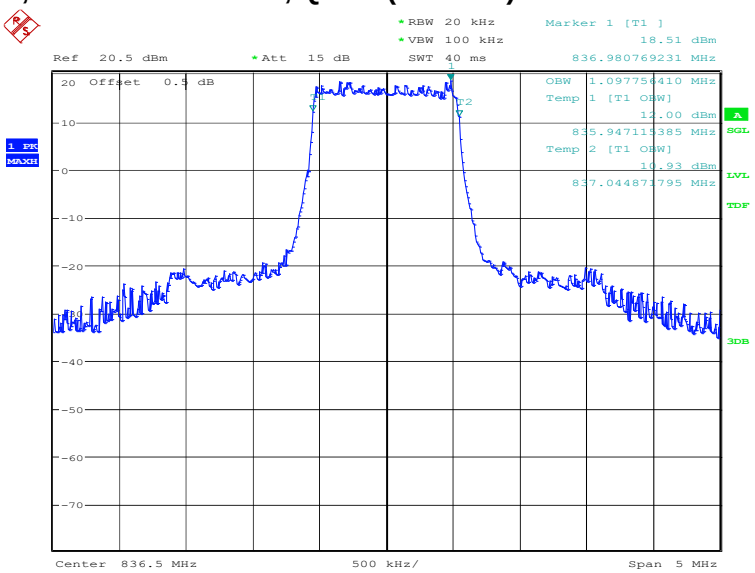
LTE band 5, 1.4MHz (99%)

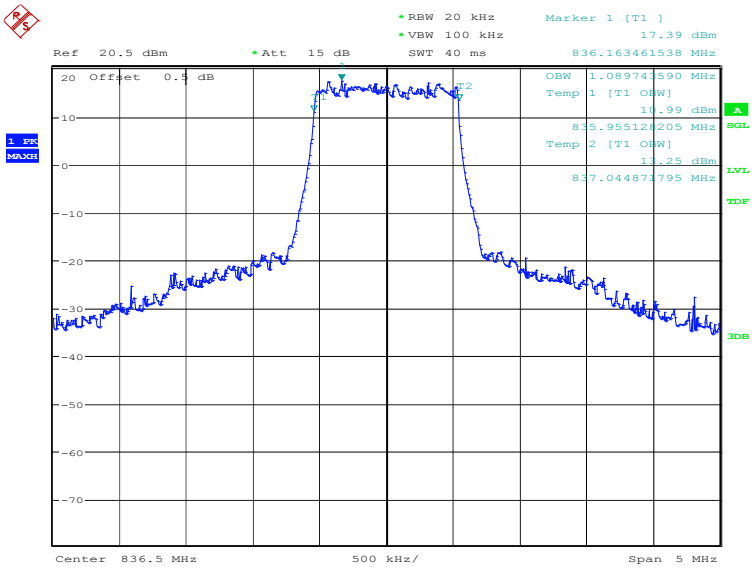
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	1097.76	1089.74

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



Date: 20.SEP.2022 14:02:06

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



Date: 20.SEP.2022 14:02:46

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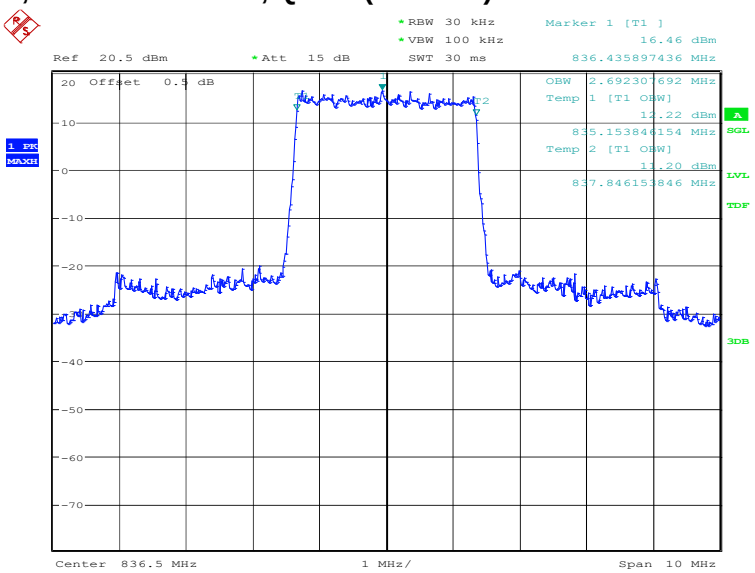
LTE band 5, 3MHz (99%)

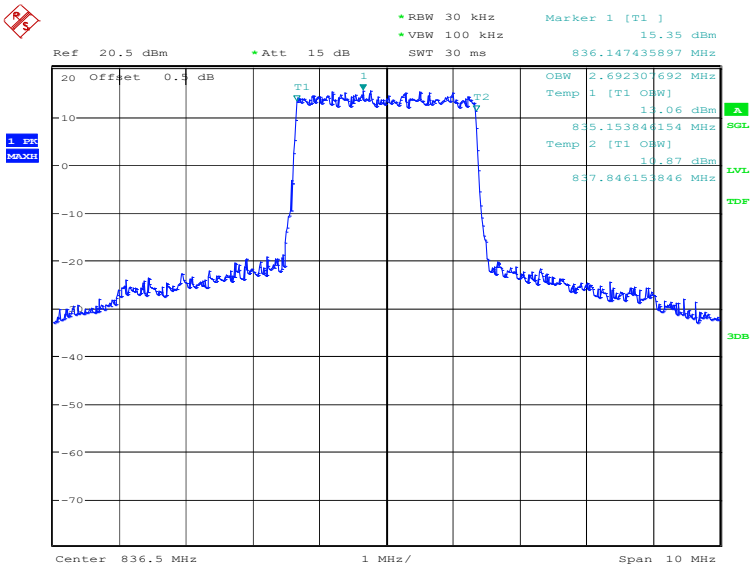
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	2692.31	2692.31

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



Date: 20.SEP.2022 14:03:28

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



Date: 20.SEP.2022 14:04:08

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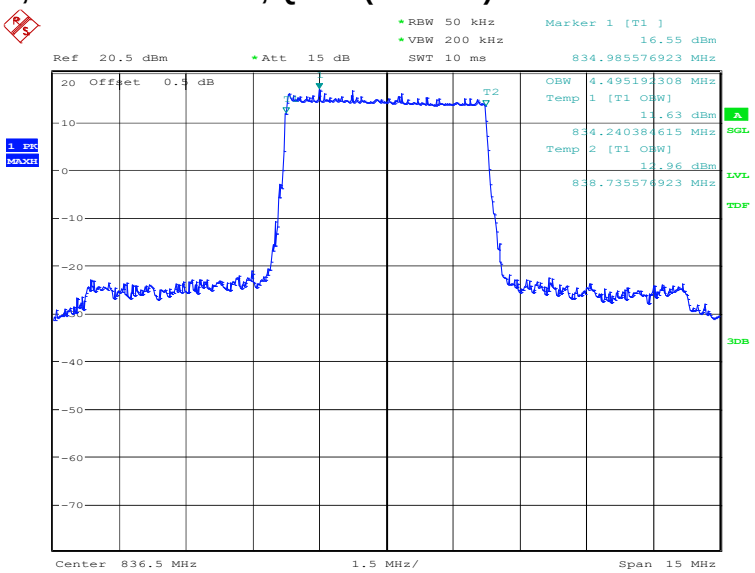
LTE band 5, 5MHz (99%)

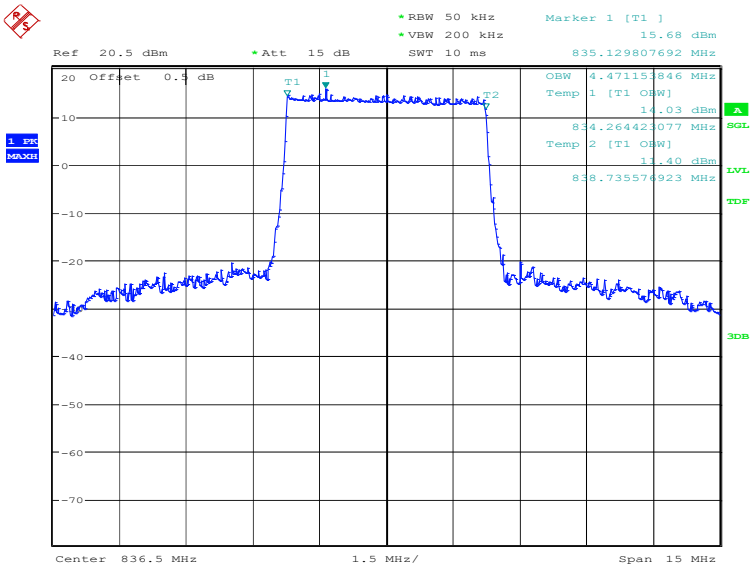
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	4495.19	4471.15

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



Date: 20.SEP.2022 14:04:50

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



Date: 20.SEP.2022 14:05:30

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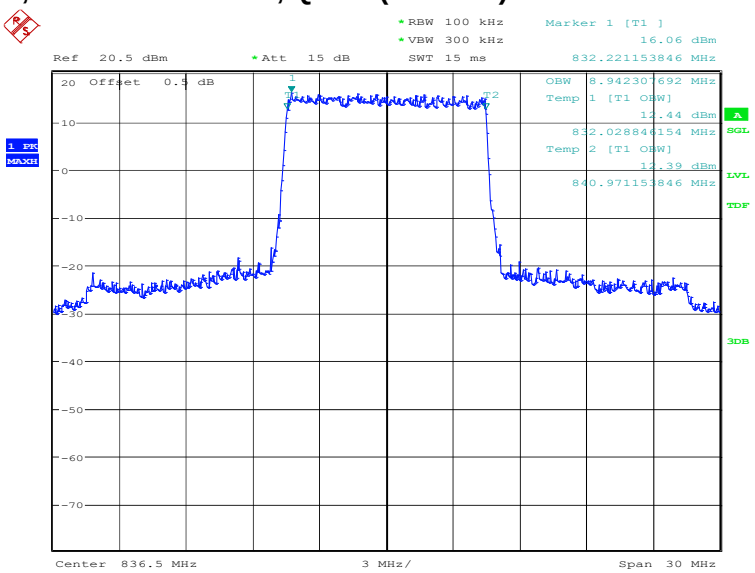
LTE band 5, 10MHz (99%)

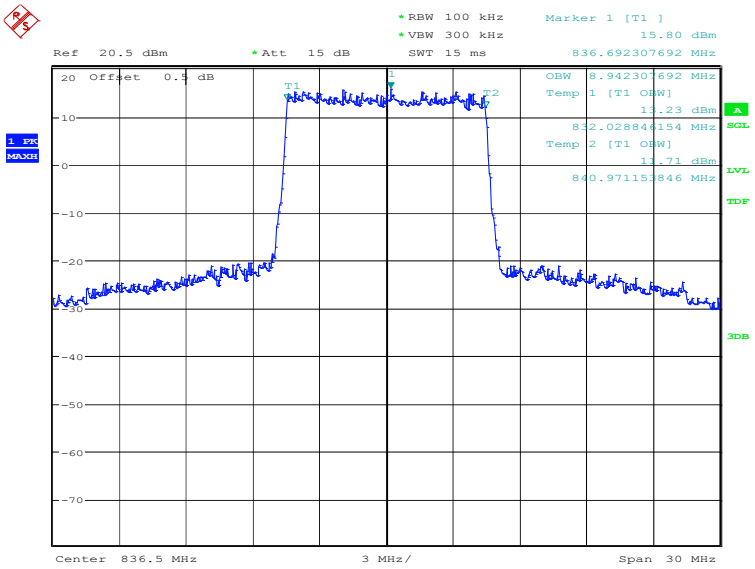
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	8942.31	8942.31

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



Date: 20.SEP.2022 14:06:12

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



Date: 20.SEP.2022 14:06:52

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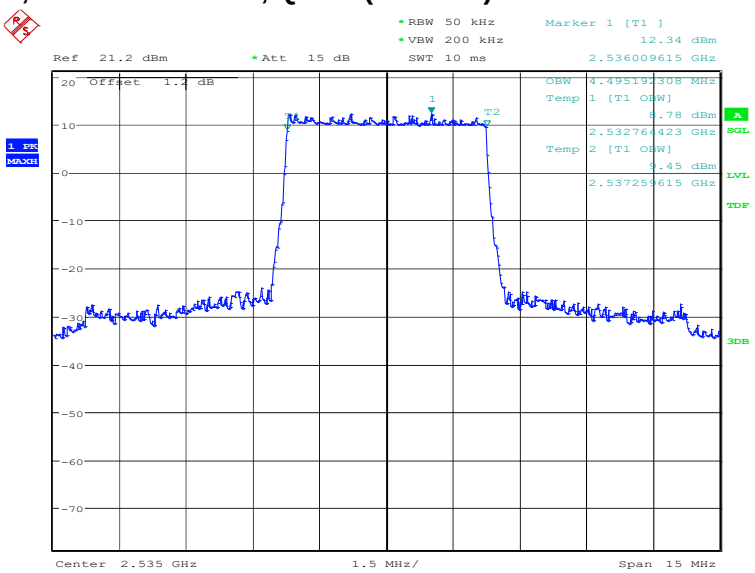
LTE band 7, 5MHz (99%)

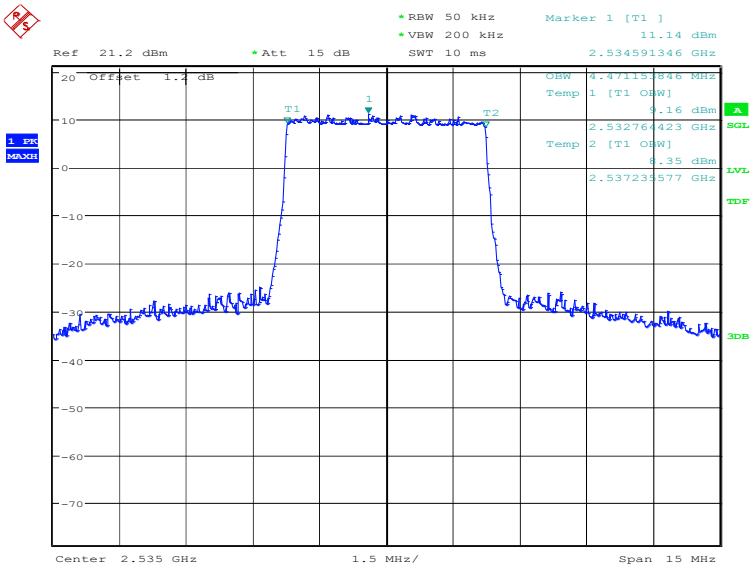
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	4495.19	4471.15

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



Date: 20.SEP.2022 14:08:30

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



Date: 20.SEP.2022 14:09:10

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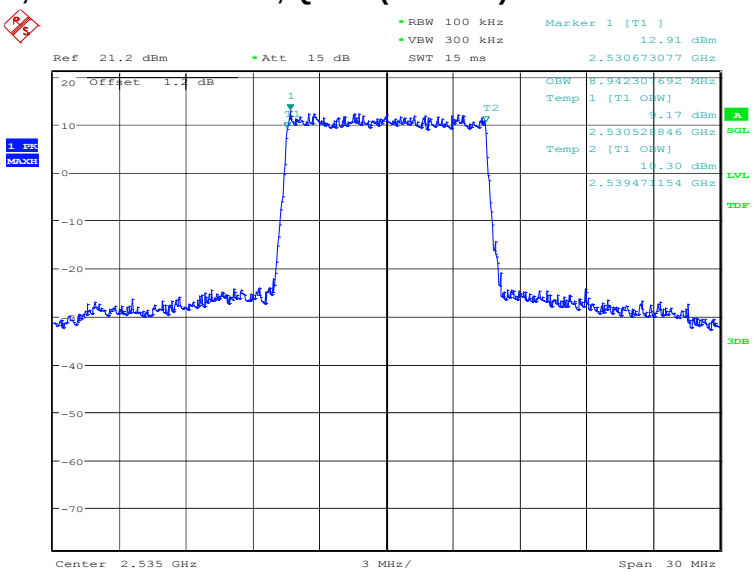
LTE band 7, 10MHz (99%)

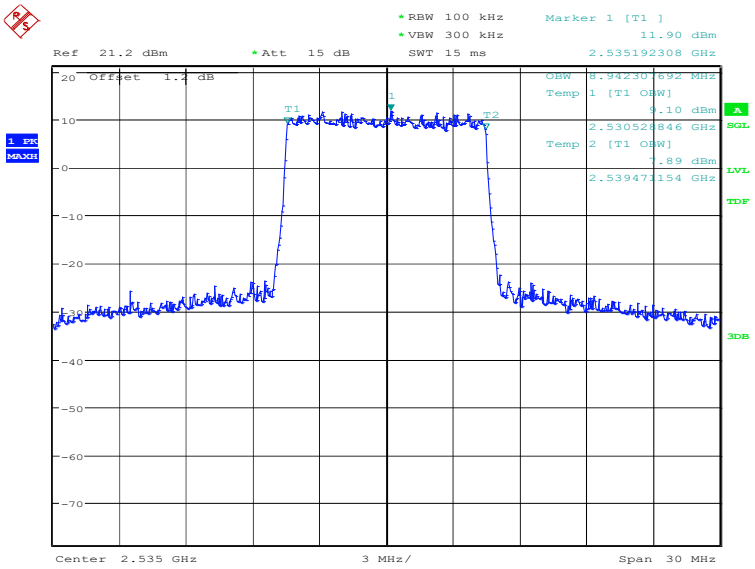
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 20.SEP.2022 14:09:52

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



Date: 20.SEP.2022 14:10:32

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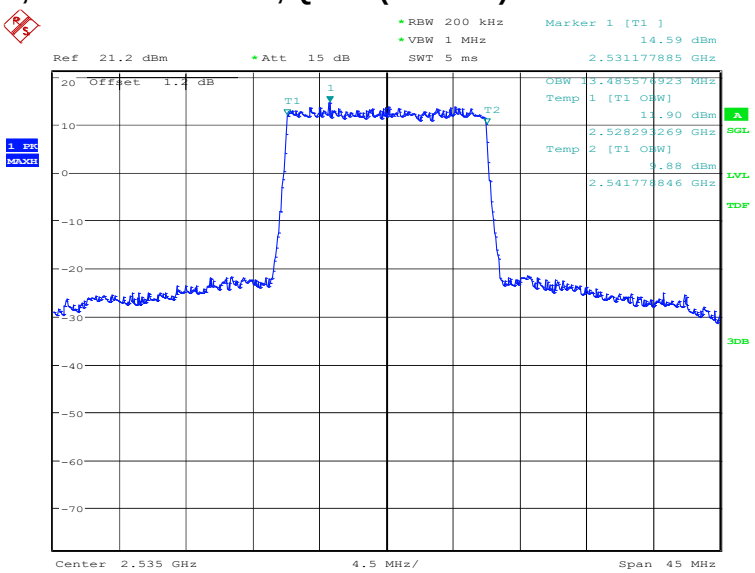
LTE band 7, 15MHz (99%)

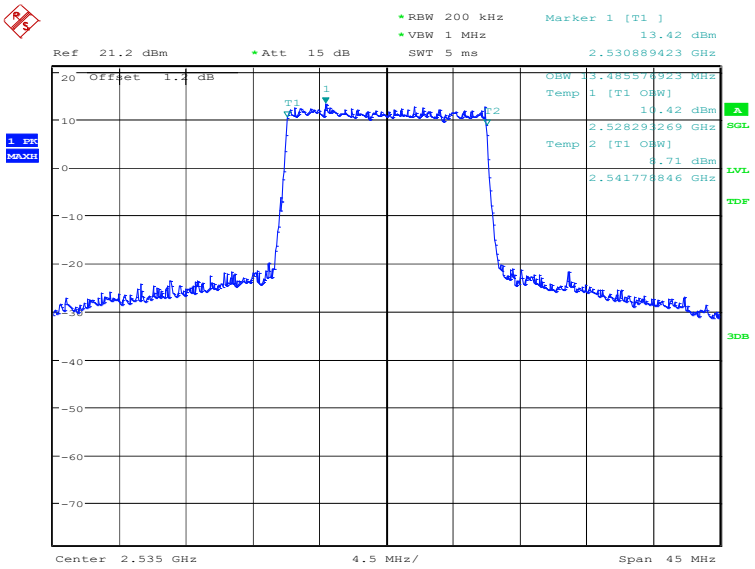
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	13485.58	13485.58

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



Date: 20.SEP.2022 14:11:14

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



Date: 20.SEP.2022 14:11:54

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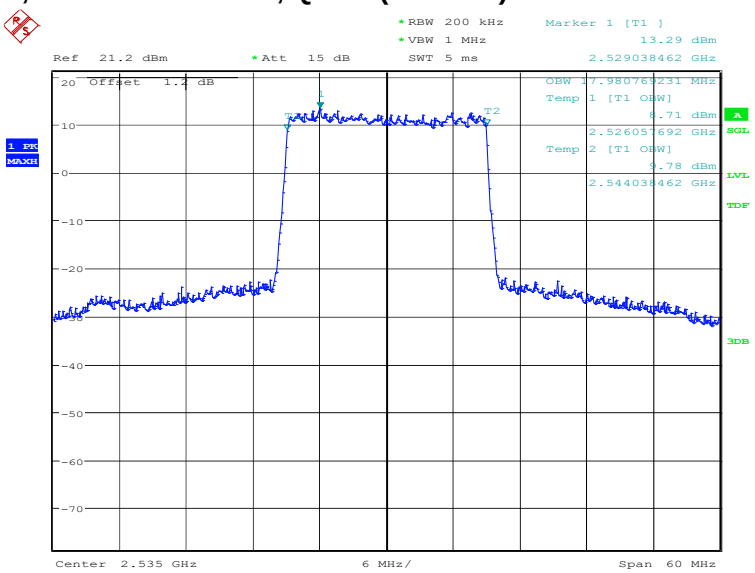
LTE band 7, 20MHz (99%)

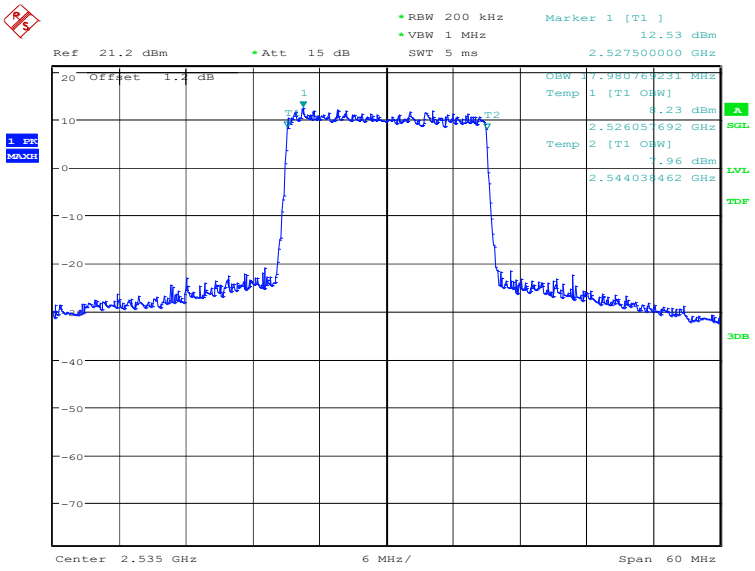
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	17980.77	17980.77

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



Date: 20.SEP.2022 14:12:37

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



Date: 20.SEP.2022 14:13:17

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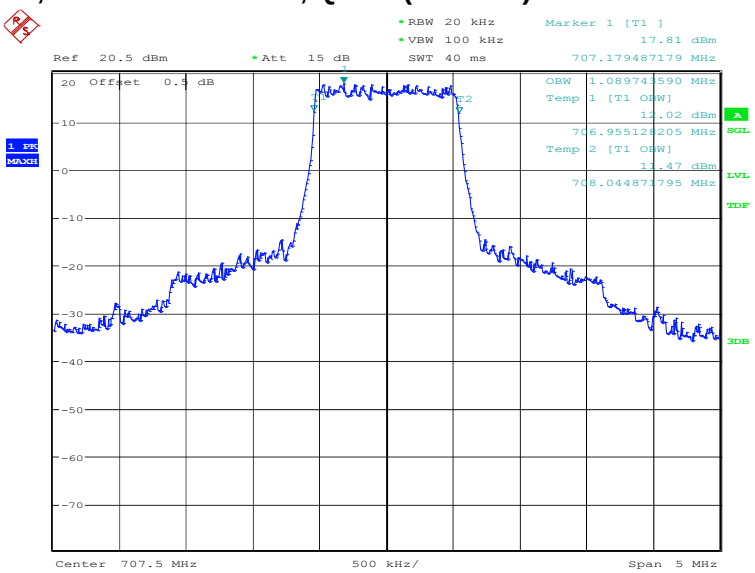
LTE band 12, 1.4MHz (99%)

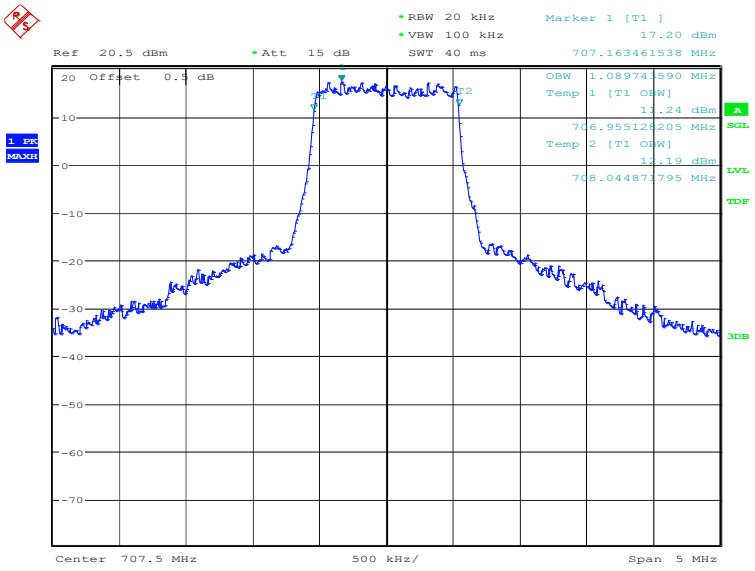
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	1089.74	1089.74

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



Date: 20.SEP.2022 14:14:55

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



Date: 20.SEP.2022 14:15:35

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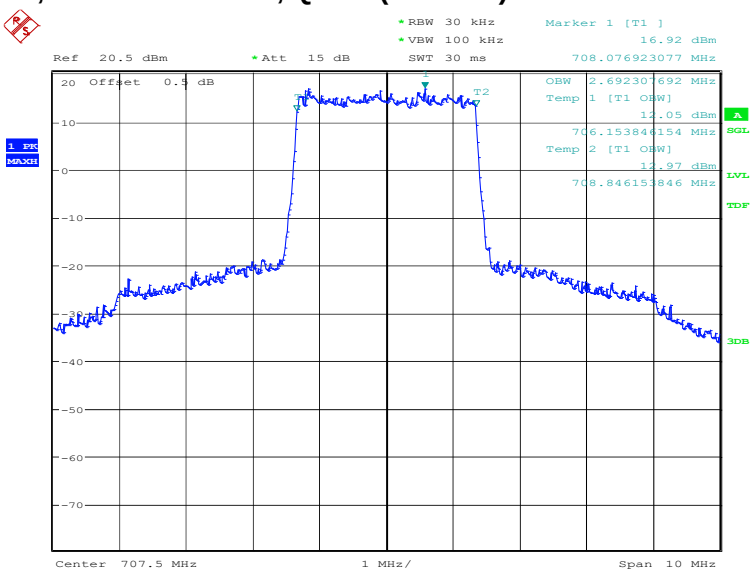
LTE band 12, 3MHz (99%)

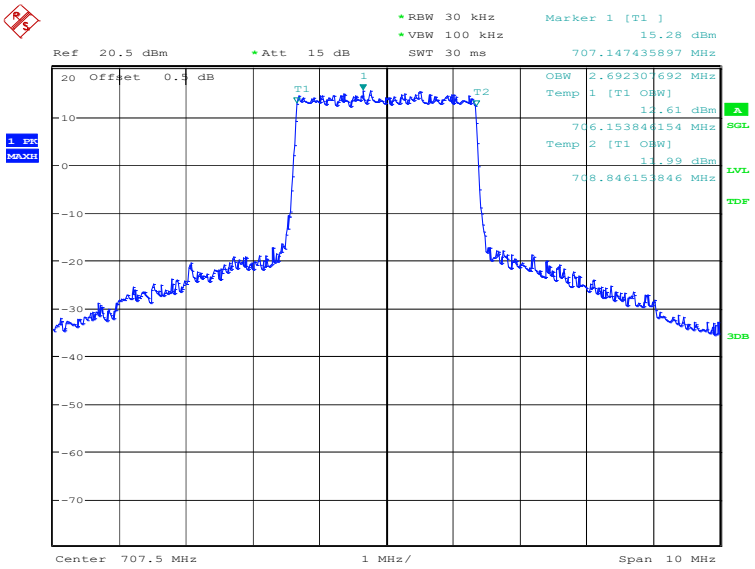
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	2692.31	2692.31

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



Date: 20.SEP.2022 14:16:17

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



Date: 20.SEP.2022 14:16:57

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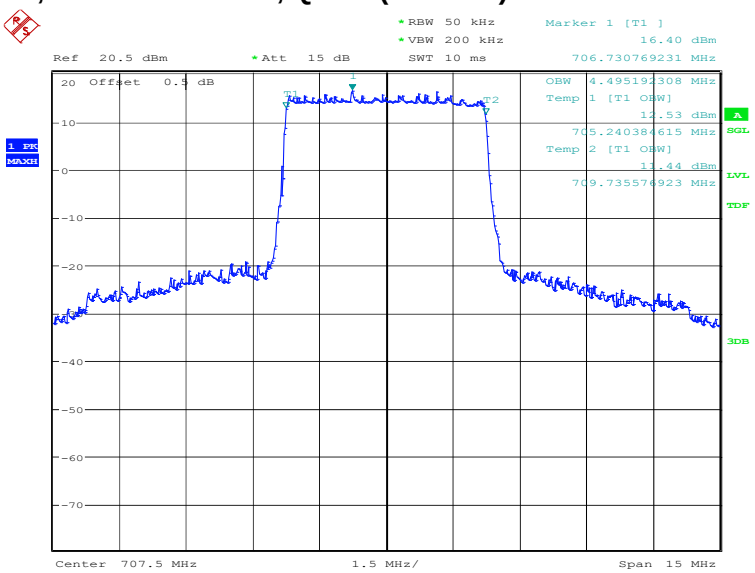
LTE band 12, 5MHz (99%)

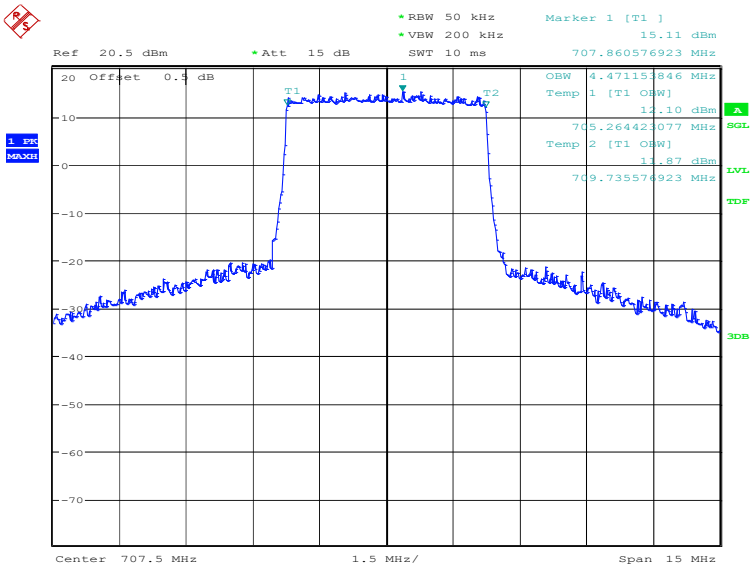
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	4495.19	4471.15

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



Date: 20.SEP.2022 14:17:39

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



Date: 20.SEP.2022 14:18:19

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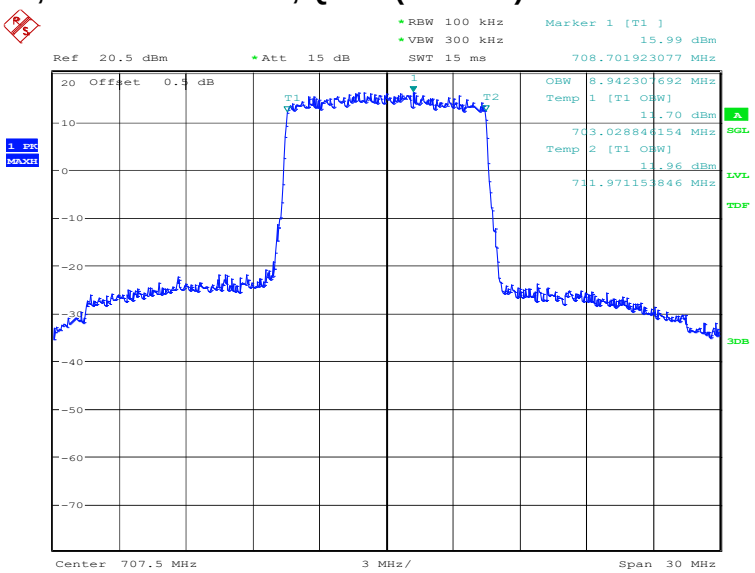
LTE band 12, 10MHz (99%)

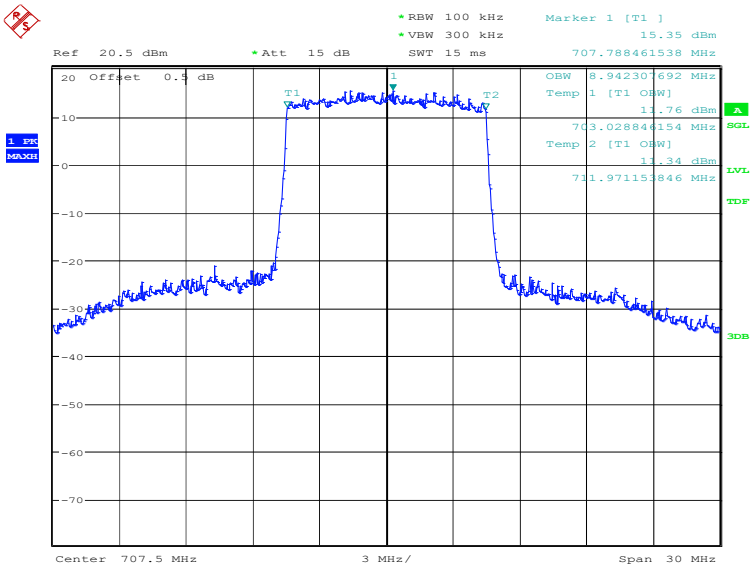
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	8942.31	8942.31

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



Date: 20.SEP.2022 14:19:01

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



Date: 20.SEP.2022 14:19:41

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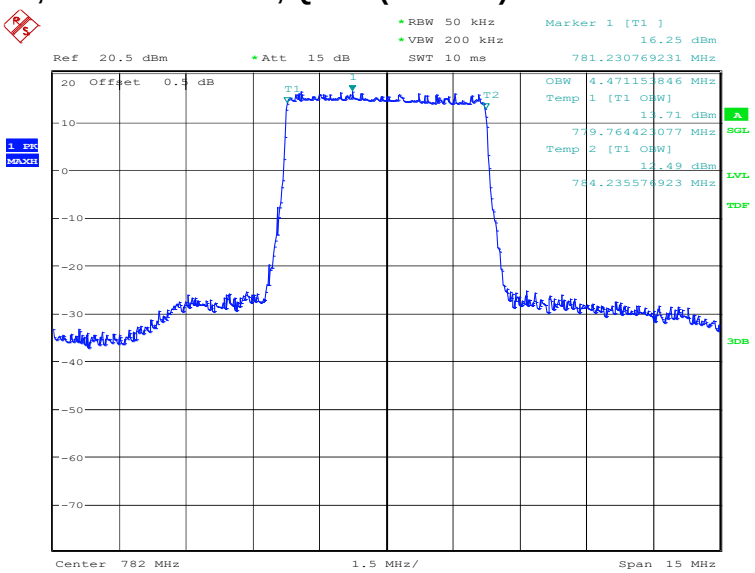
LTE band 13, 5MHz (99%)

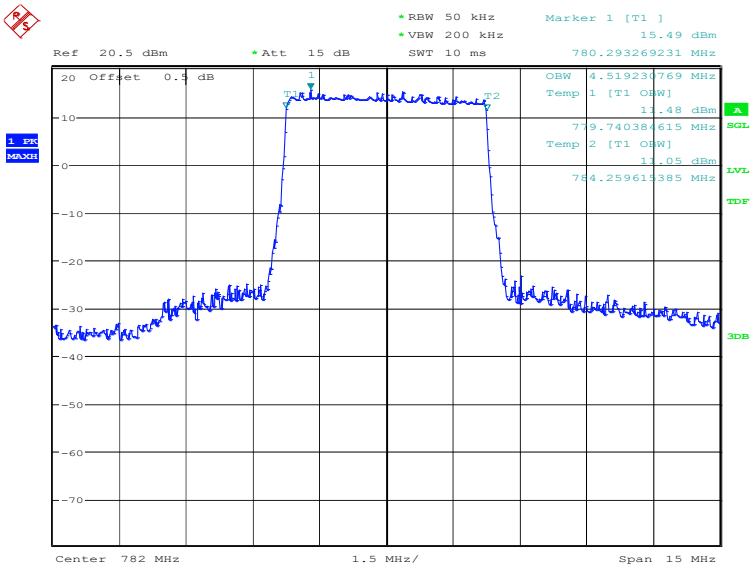
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
782.0	QPSK	16QAM
	4471.15	4519.23

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



Date: 20.SEP.2022 14:20:25

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



Date: 20.SEP.2022 14:21:05

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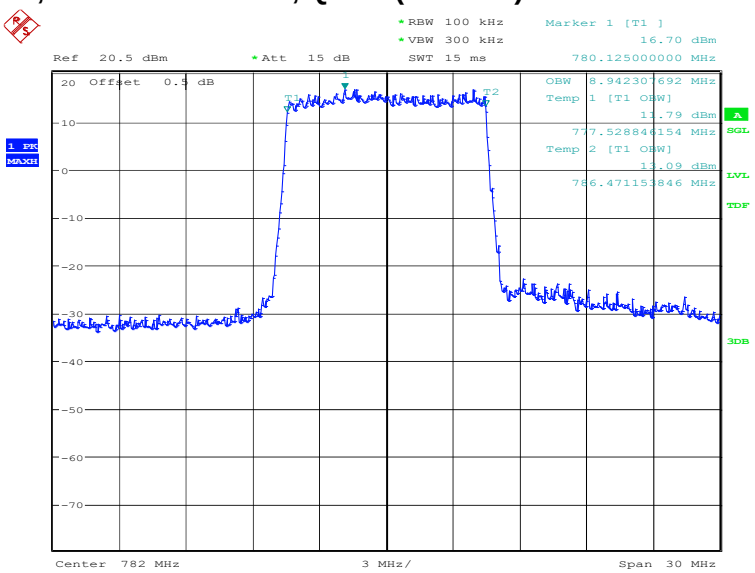
LTE band 13, 10MHz (99%)

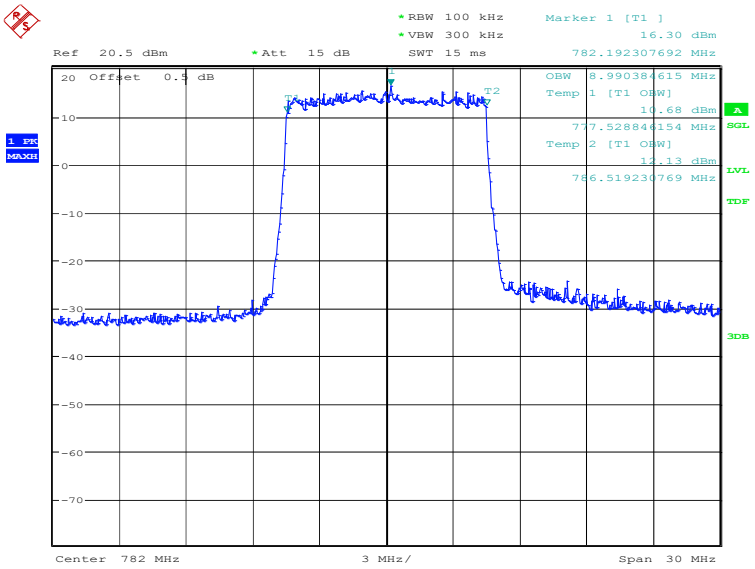
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
782.0	QPSK	16QAM
	8942.31	8990.38

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



Date: 20.SEP.2022 14:21:47

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



Date: 20.SEP.2022 14:22:27

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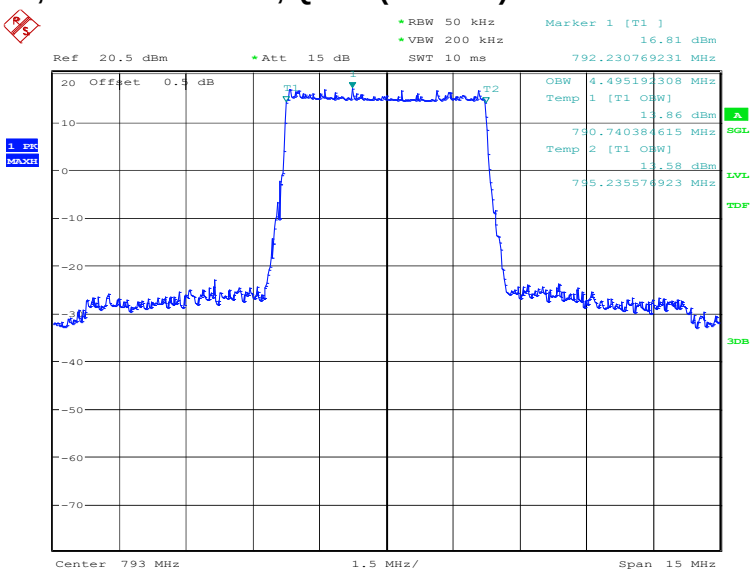
LTE band 14, 5MHz (99%)

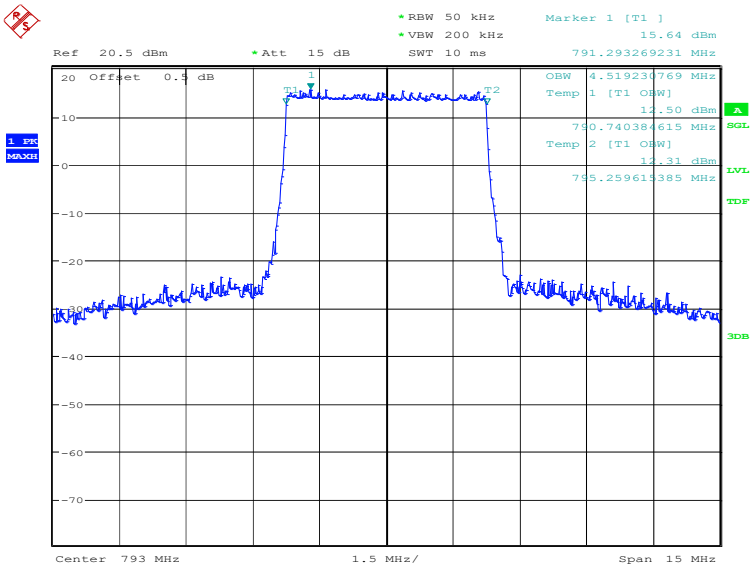
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
793.0	QPSK	16QAM
	4495.19	4519.23

LTE band 14, 5MHz Bandwidth, QPSK (99% BW)



Date: 20.SEP.2022 14:23:11

LTE band 14, 5MHz Bandwidth,16QAM (99% BW)



Date: 20.SEP.2022 14:23:51

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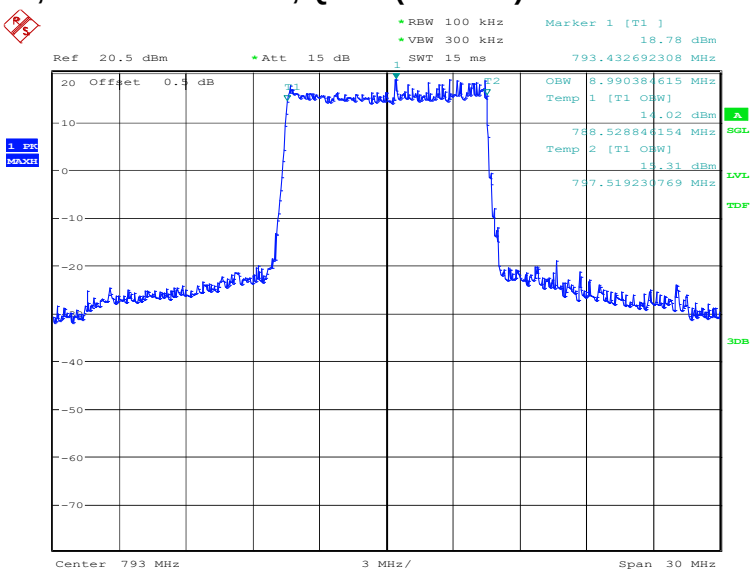
LTE band 14, 10MHz (99%)

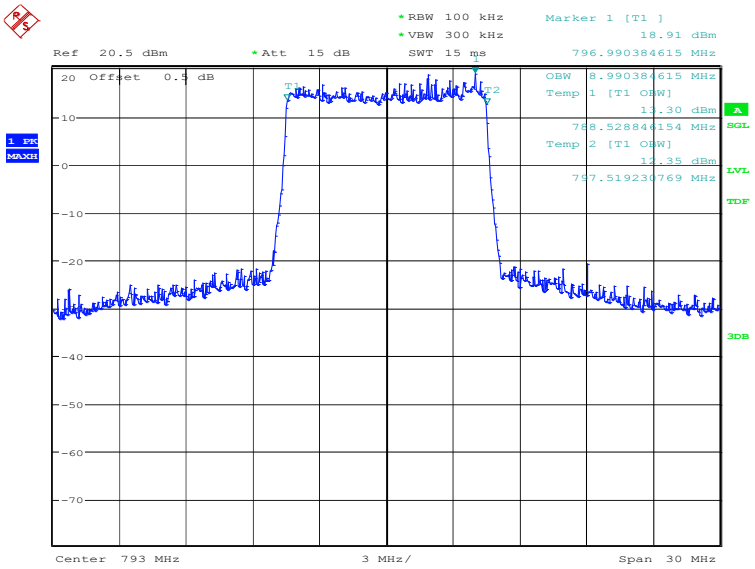
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
793.0	QPSK	16QAM
	8990.38	8990.38

LTE band 14, 10MHz Bandwidth, QPSK (99% BW)



Date: 20.SEP.2022 14:24:33

LTE band 14, 10MHz Bandwidth,16QAM (99% BW)



Date: 20.SEP.2022 14:25:13

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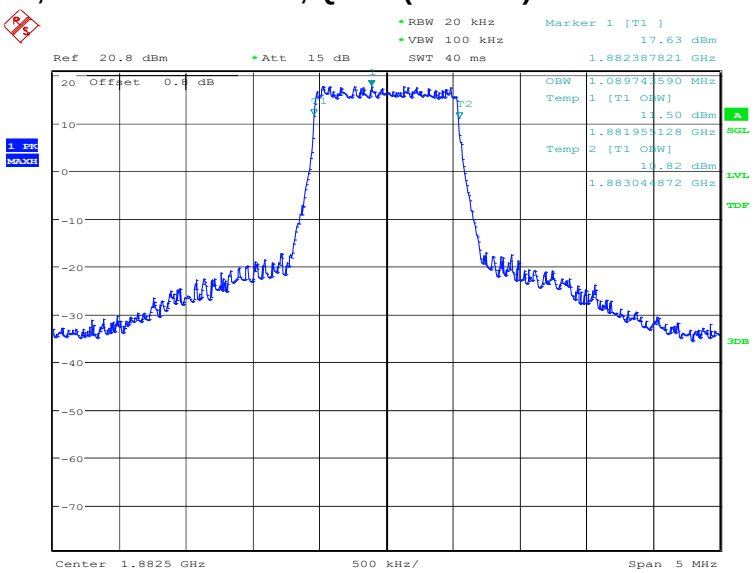
LTE band 25, 1.4MHz (99%)

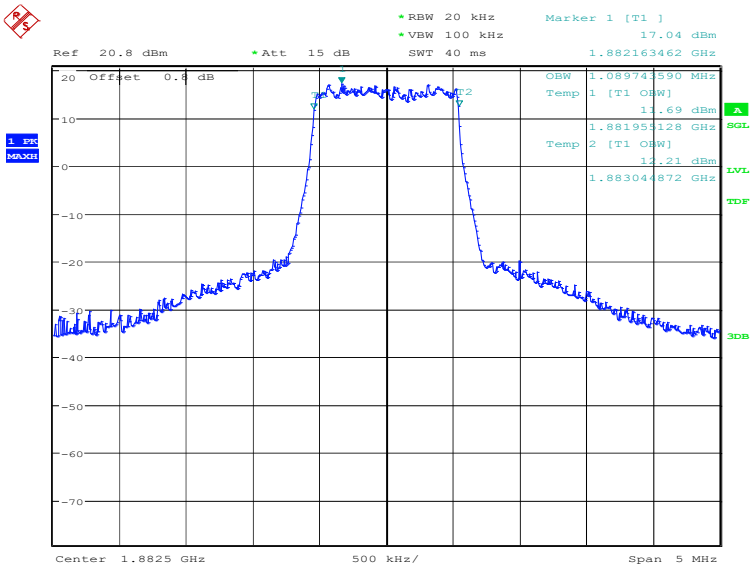
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1882.5	QPSK	16QAM
	1089.74	1089.74

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



Date: 23.SEP.2022 09:31:52

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



Date: 23.SEP.2022 09:32:32

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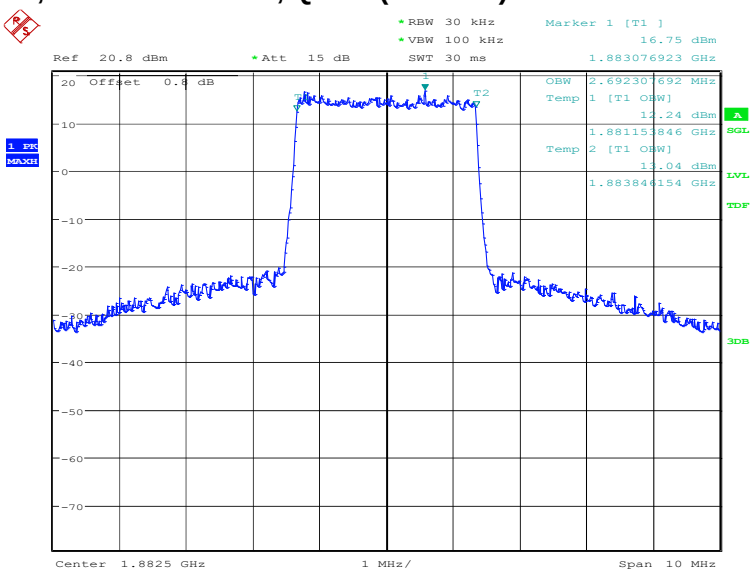
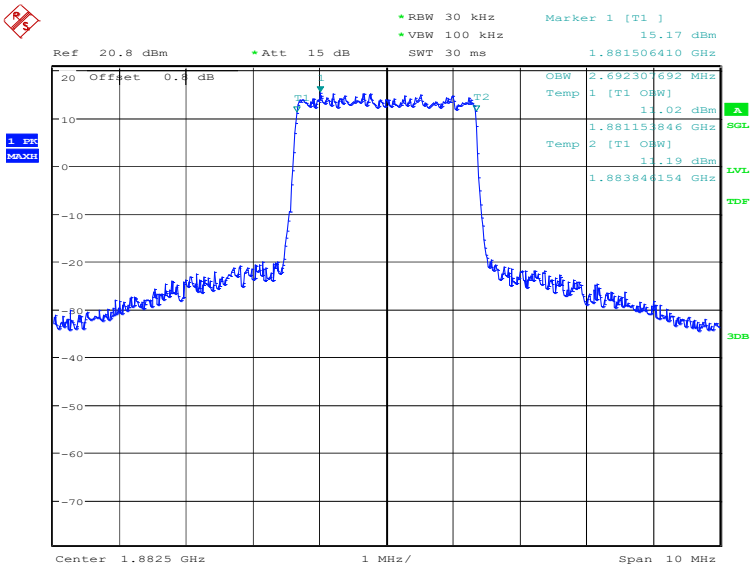
LTE band 25, 3MHz (99%)

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

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



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



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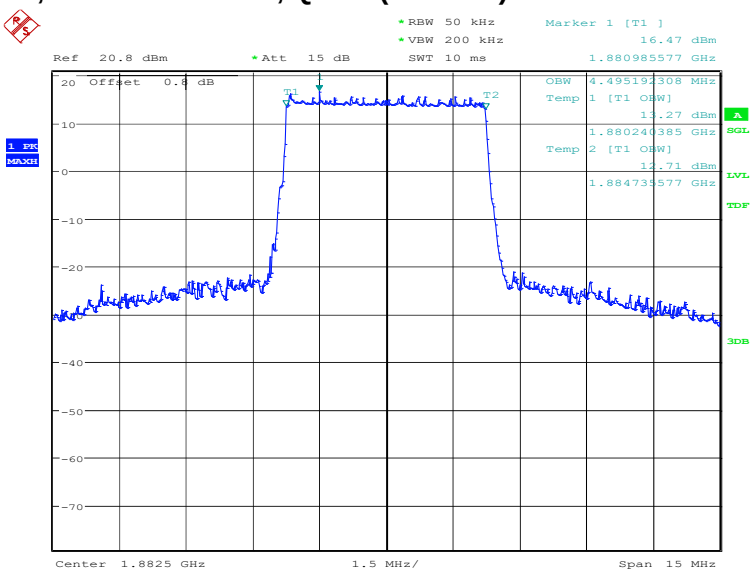
LTE band 25, 5MHz (99%)

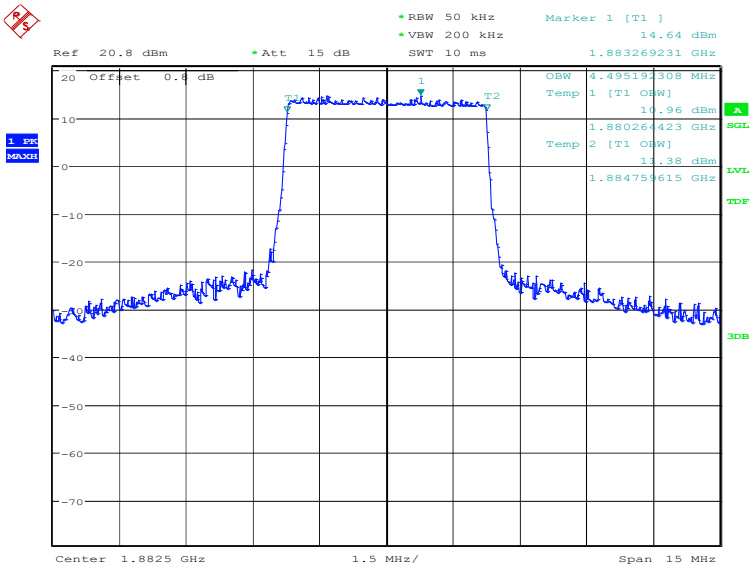
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1882.5	QPSK	16QAM
	4495.19	4495.19

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



Date: 23.SEP.2022 09:34:37

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



Date: 23.SEP.2022 09:35:17

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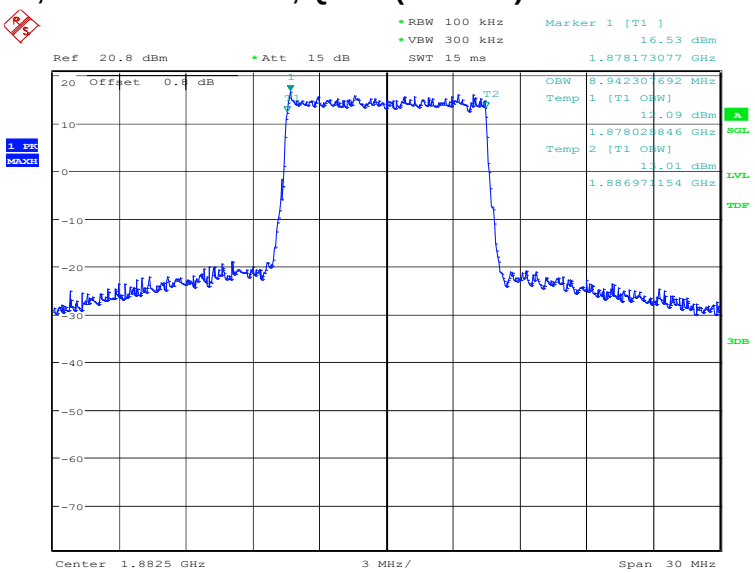
LTE band 25, 10MHz (99%)

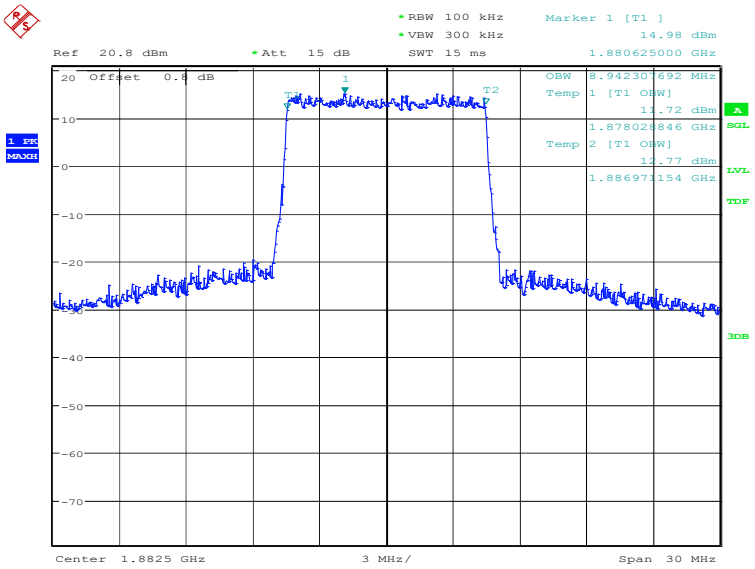
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1882.5	QPSK	16QAM
	8942.31	8942.31

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



Date: 23.SEP.2022 09:35:59

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



Date: 23.SEP.2022 09:36:40

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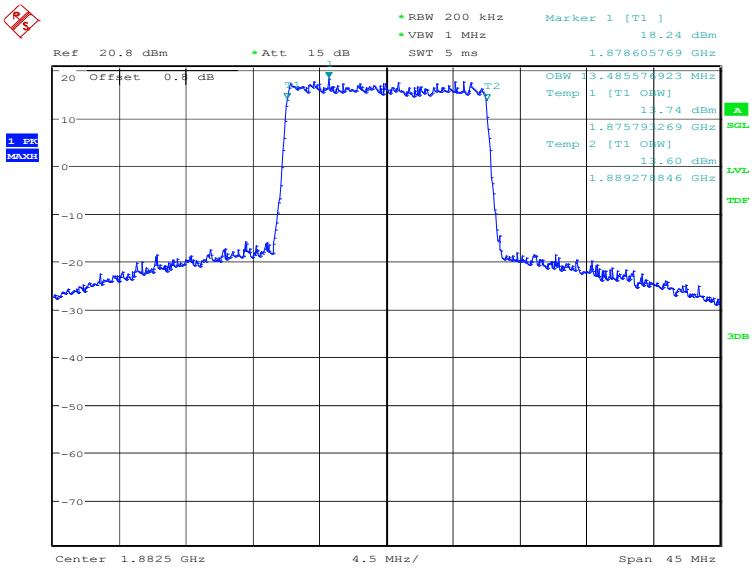
LTE band 25, 15MHz (99%)

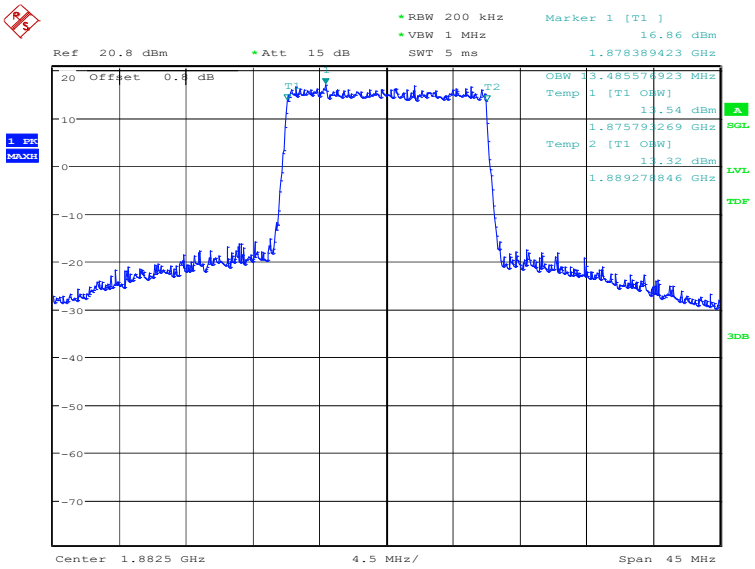
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1882.5	QPSK	16QAM
	13485.58	13485.58

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



Date: 23.SEP.2022 09:37:22

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



Date: 23.SEP.2022 09:38:02

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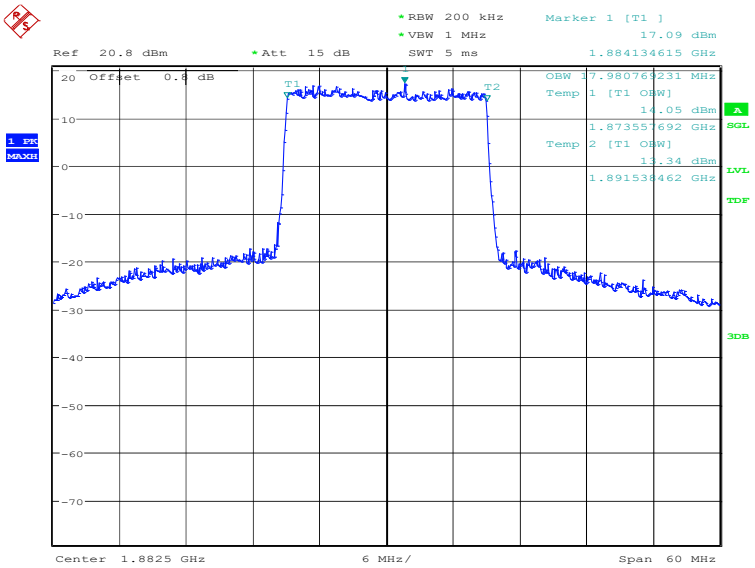
LTE band 25, 20MHz (99%)

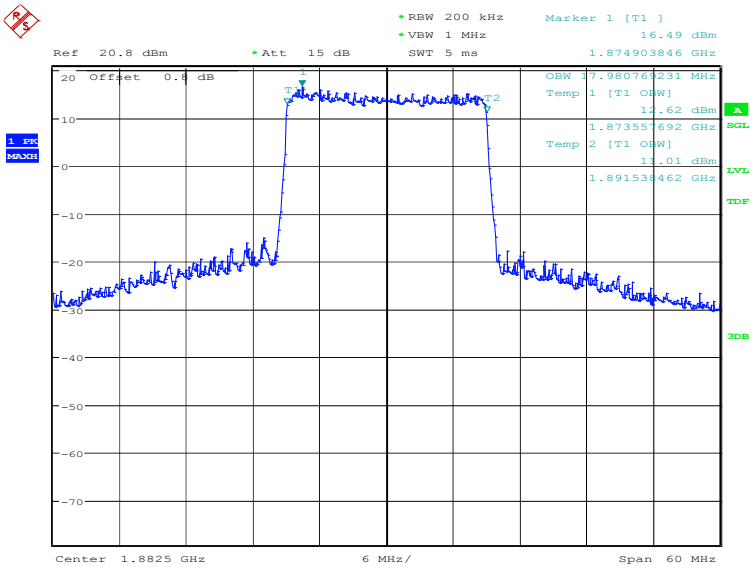
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1882.5	QPSK	16QAM
	17980.77	17980.77

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



Date: 23.SEP.2022 09:38:45

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



Date: 23.SEP.2022 09:39:25

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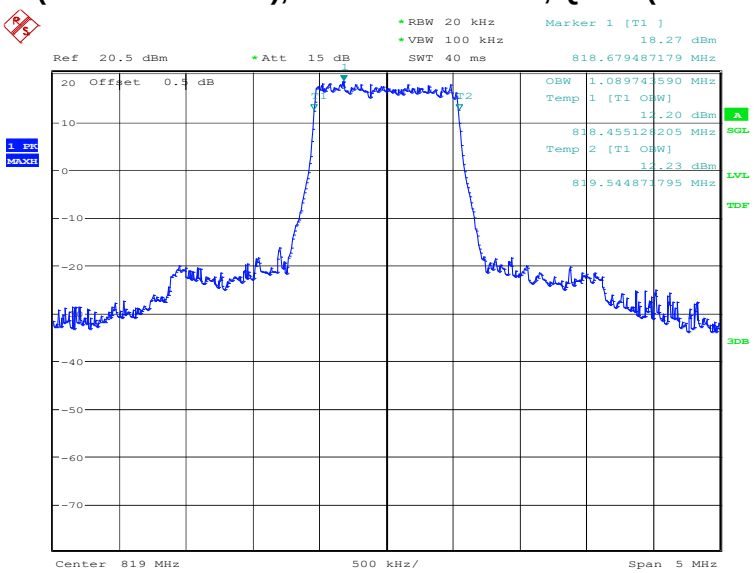
LTE band 26(814MHz~824MHz), 1.4MHz (99%)

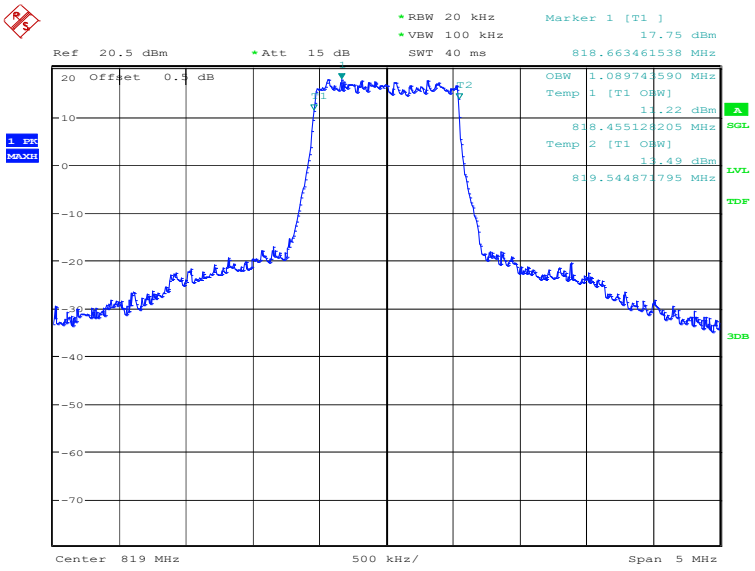
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	1089.74	1089.74

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



Date: 20.SEP.2022 14:33:27

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



Date: 20.SEP.2022 14:34:07

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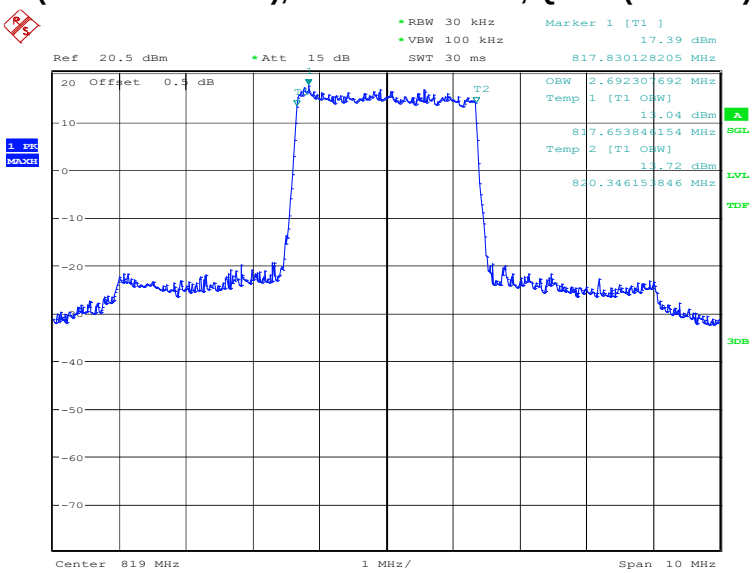
LTE band 26(814MHz~824MHz), 3MHz (99%)

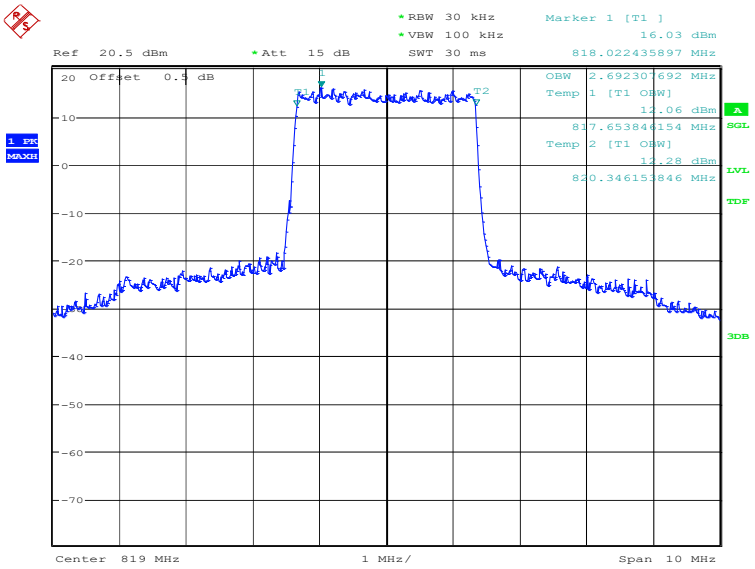
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	2692.31	2692.31

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



Date: 20.SEP.2022 14:34:49

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



Date: 20.SEP.2022 14:35:29

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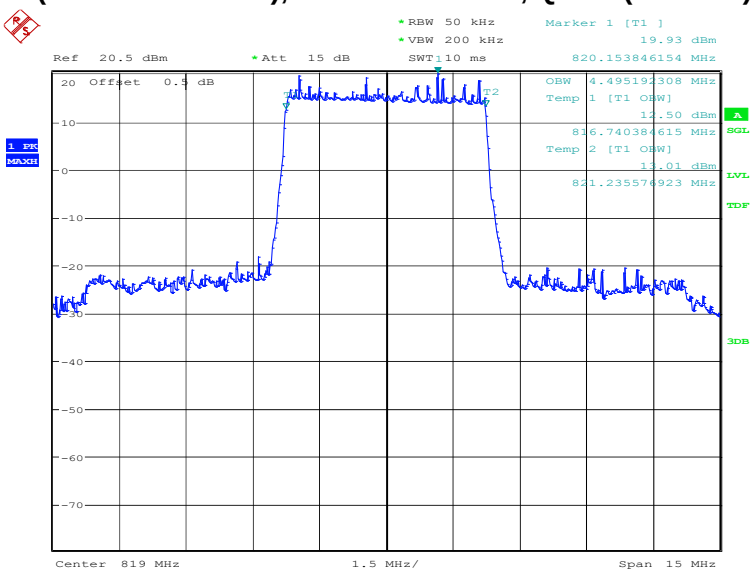
LTE band 26(814MHz~824MHz), 5MHz (99%)

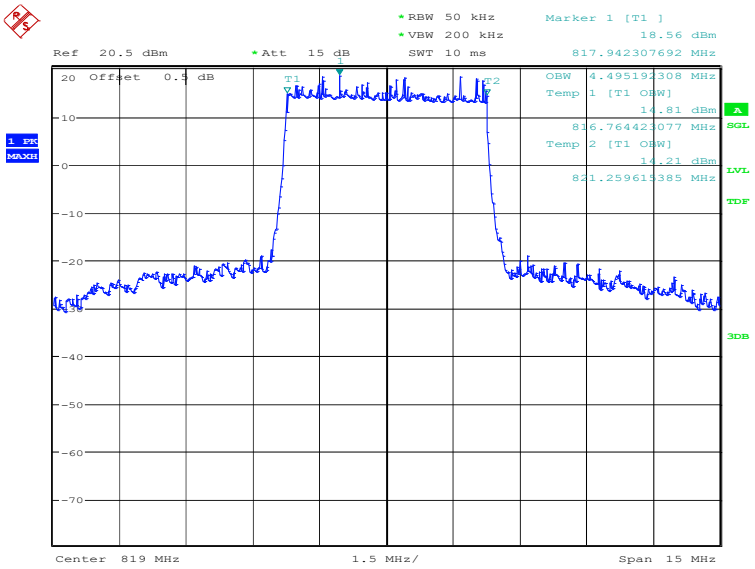
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	4495.19	4495.19

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



Date: 20.SEP.2022 14:36:11

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



Date: 20.SEP.2022 14:36:51

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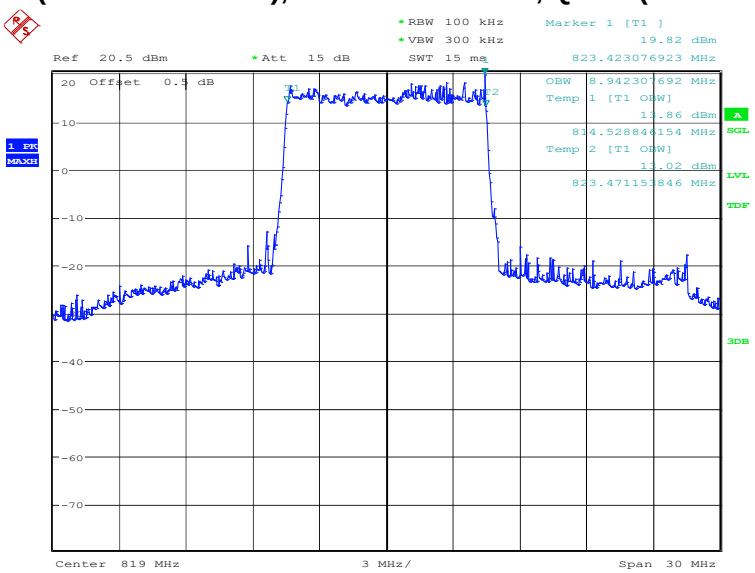
LTE band 26(814MHz~824MHz), 10MHz (99%)

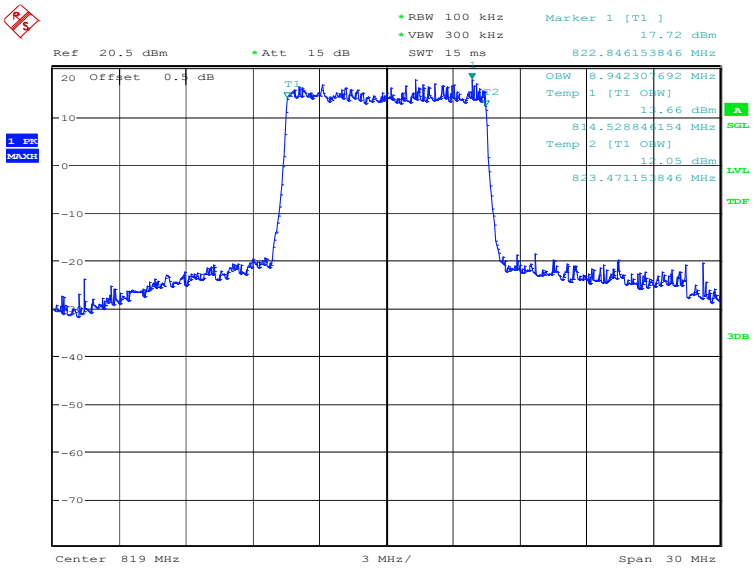
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 20.SEP.2022 14:37:33

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



Date: 20.SEP.2022 14:38:13

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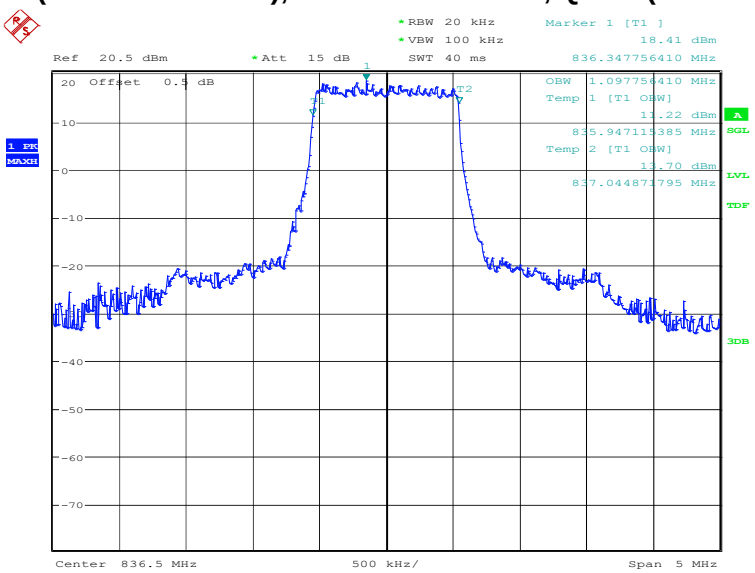
LTE band 26(824MHz~849MHz), 1.4MHz (99%)

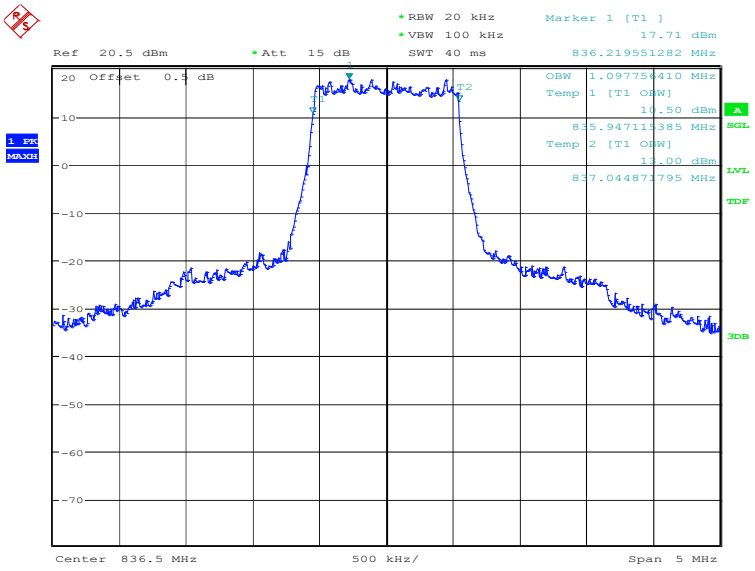
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	1097.76	1097.76

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



Date: 20.SEP.2022 14:25:57

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



Date: 20.SEP.2022 14:26:37

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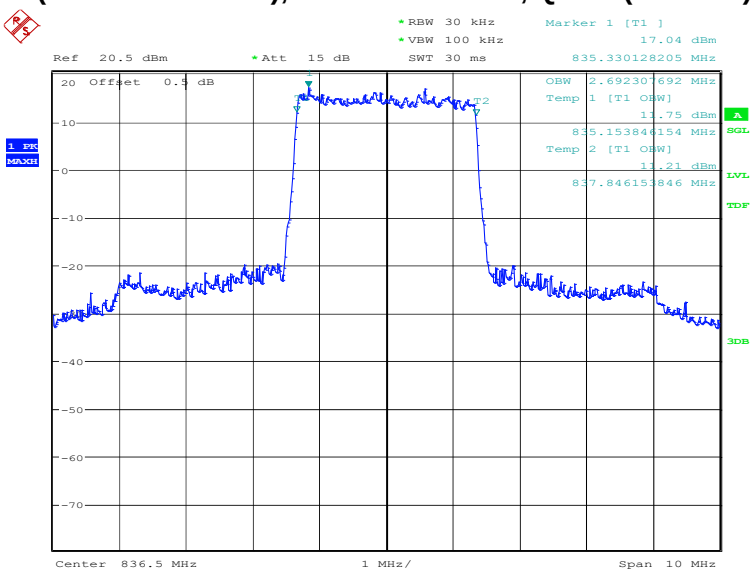
LTE band 26(824MHz~849MHz), 3MHz (99%)

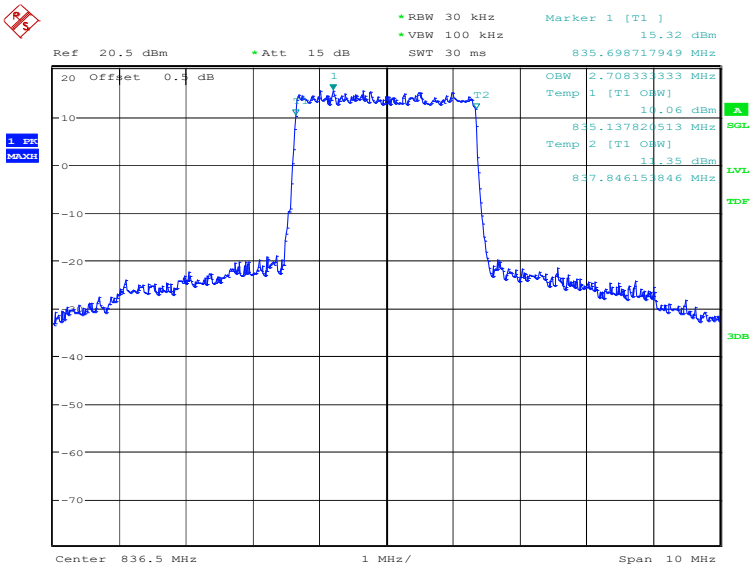
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	2692.31	2708.33

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



Date: 20.SEP.2022 14:27:18

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



Date: 20.SEP.2022 14:27:58

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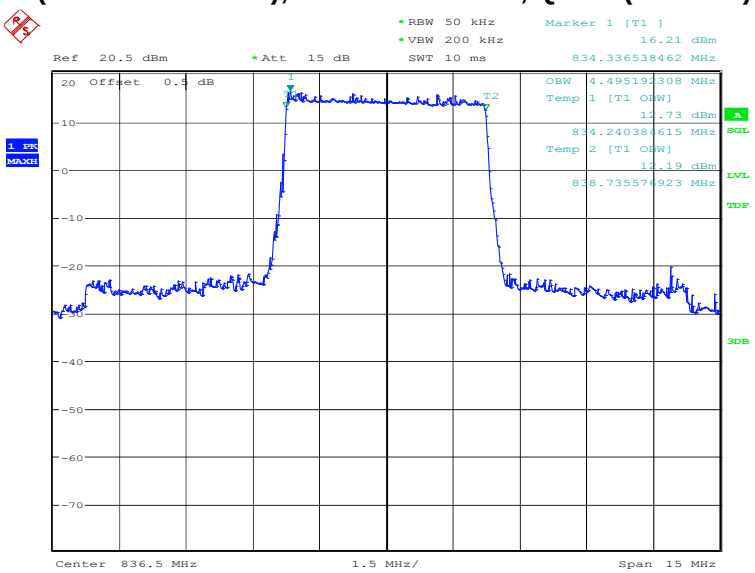
LTE band 26(824MHz~849MHz), 5MHz (99%)

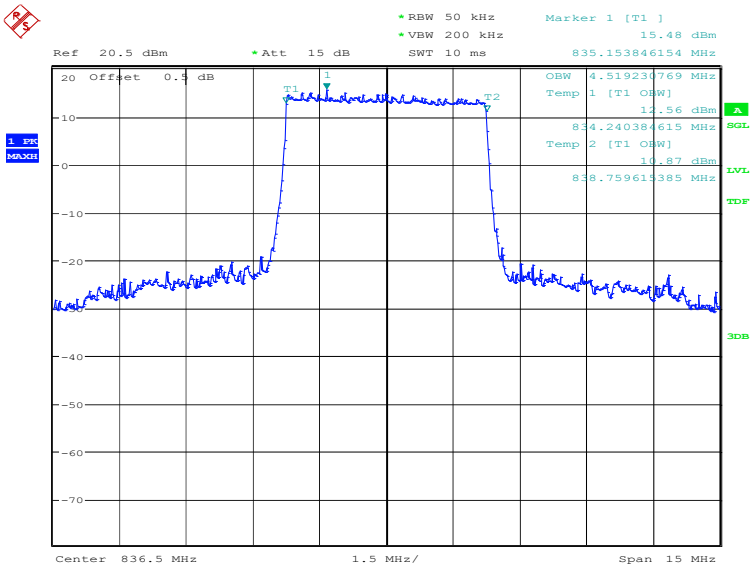
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	4495.19	4519.23

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



Date: 20.SEP.2022 14:28:40

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



Date: 20.SEP.2022 14:29:20

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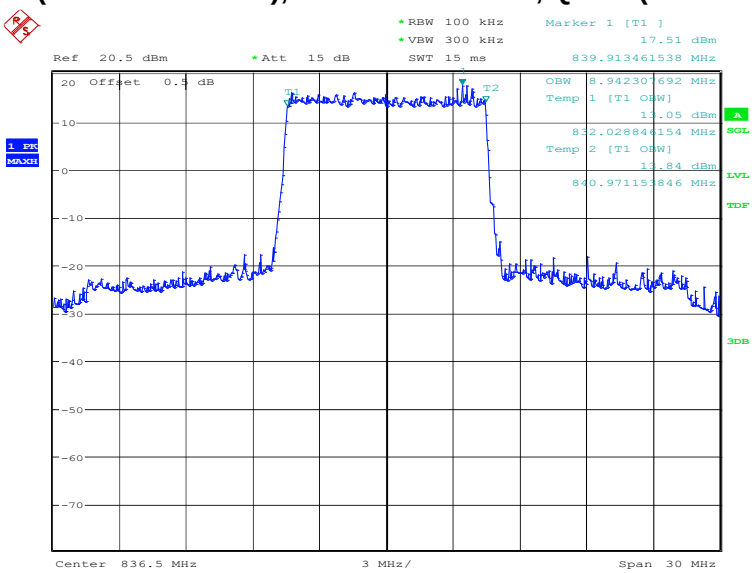
LTE band 26(824MHz~849MHz), 10MHz (99%)

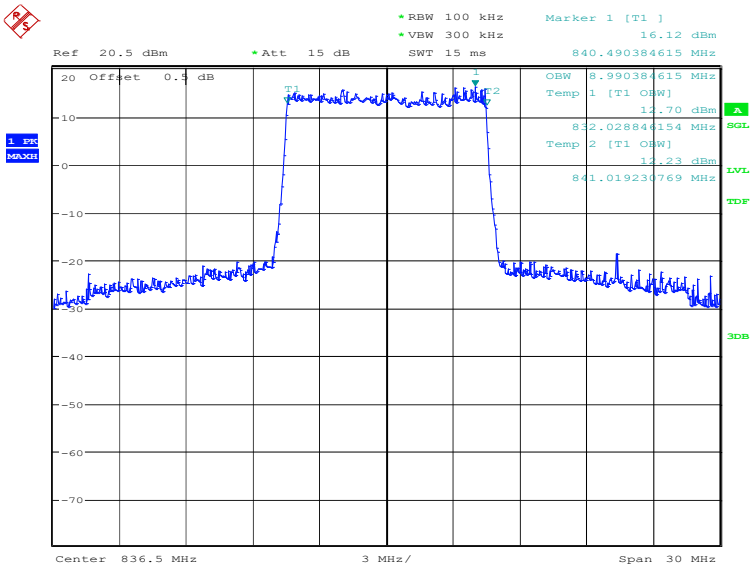
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	8942.31	8990.38

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



Date: 20.SEP.2022 14:30:02

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



Date: 20.SEP.2022 14:30:42

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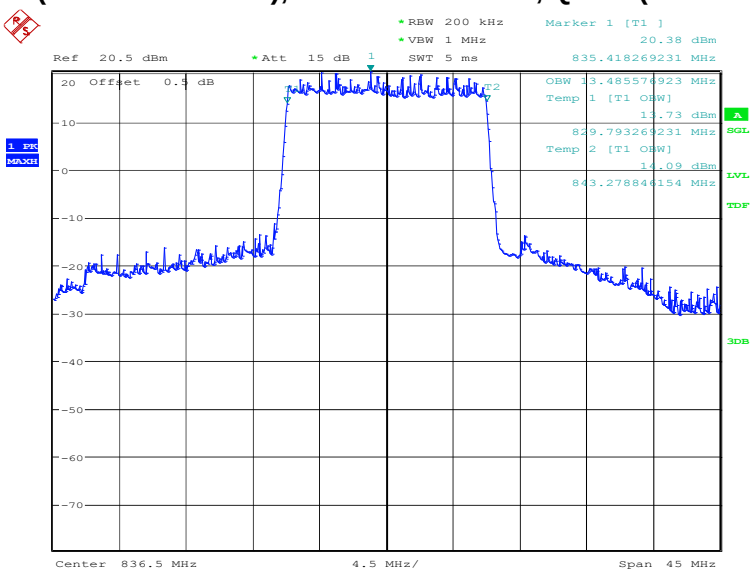
LTE band 26(824MHz~849MHz), 15MHz (99%)

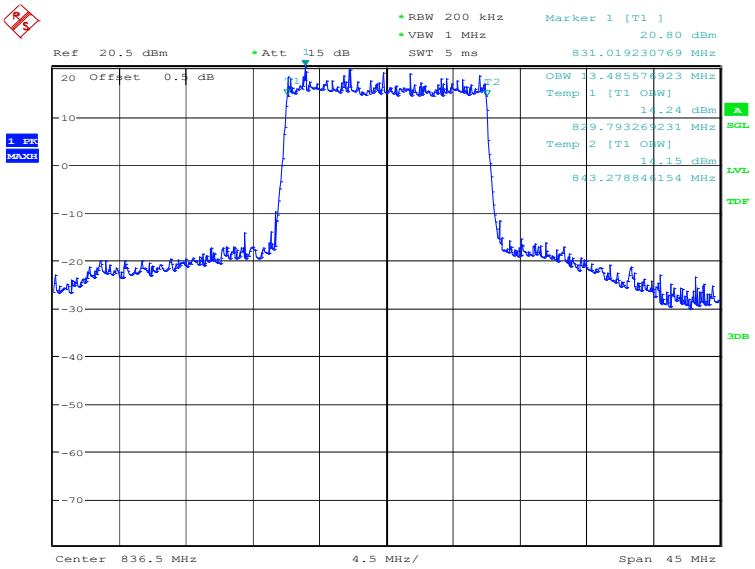
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	13485.58	13485.58

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



Date: 20.SEP.2022 14:31:24

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



Date: 20.SEP.2022 14:32:04

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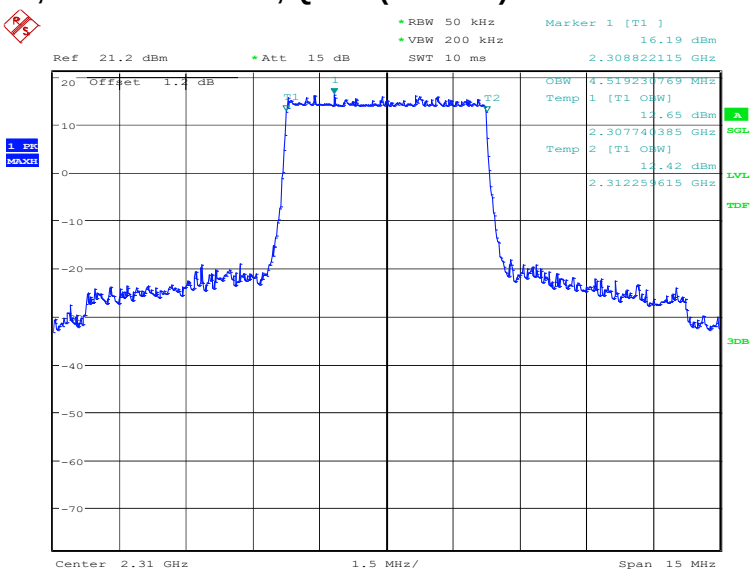
LTE band 30, 5MHz (99%)

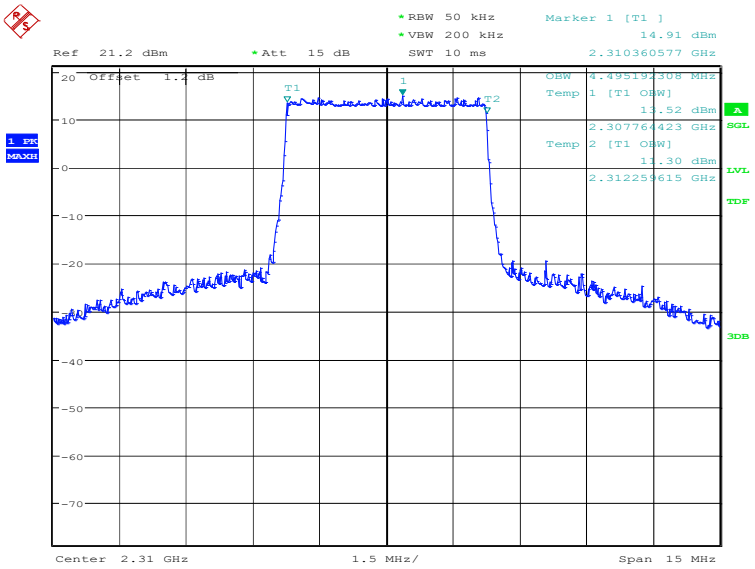
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2310.0	QPSK	16QAM
	4519.23	4495.19

LTE band 30, 5MHz Bandwidth, QPSK (99% BW)



Date: 23.SEP.2022 13:17:28

LTE band 30, 5MHz Bandwidth,16QAM (99% BW)



Date: 23.SEP.2022 13:18:07

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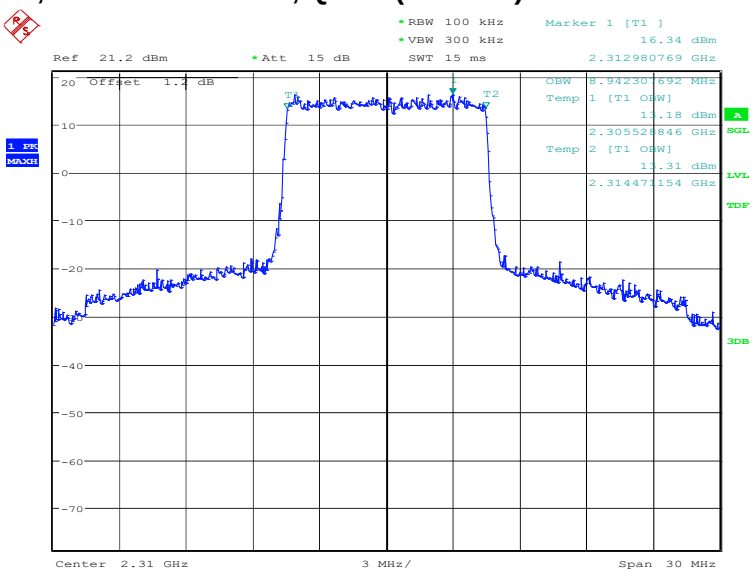
LTE band 30, 10MHz (99%)

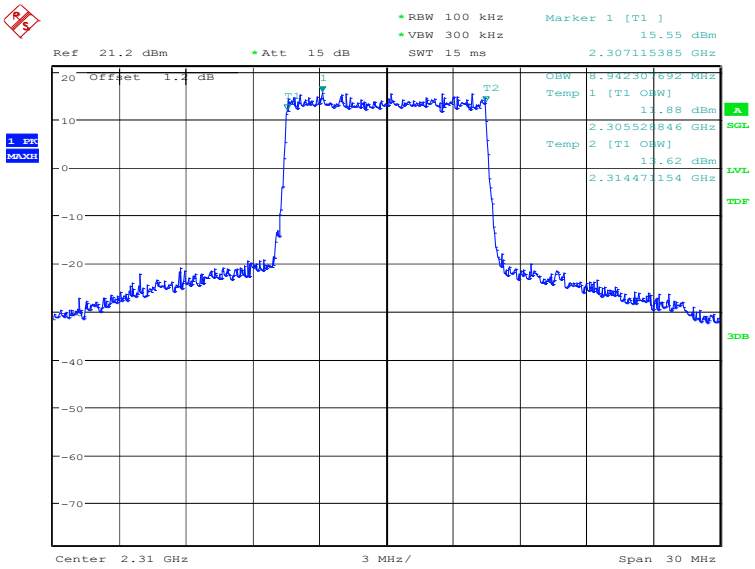
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2310.0	QPSK	16QAM
	8942.31	8942.31

LTE band 30, 10MHz Bandwidth, QPSK (99% BW)



Date: 23.SEP.2022 13:18:49

LTE band 30, 10MHz Bandwidth,16QAM (99% BW)



Date: 23.SEP.2022 13:19:29

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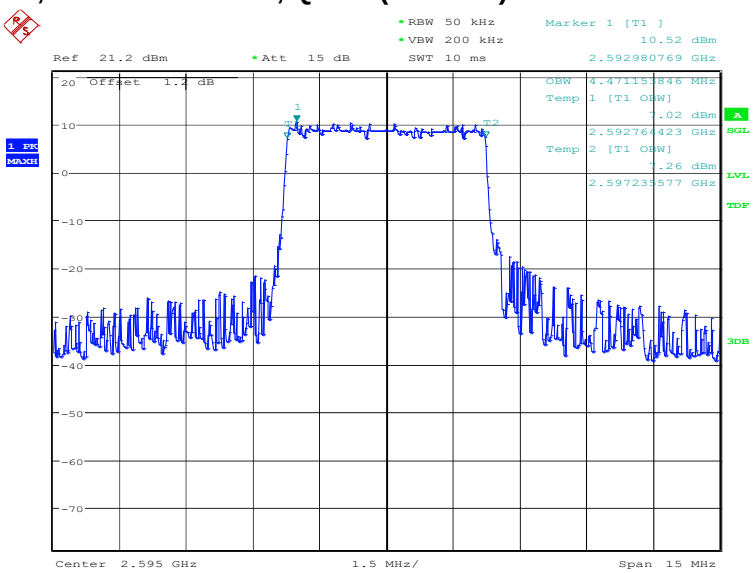
LTE band 38, 5MHz (99%)

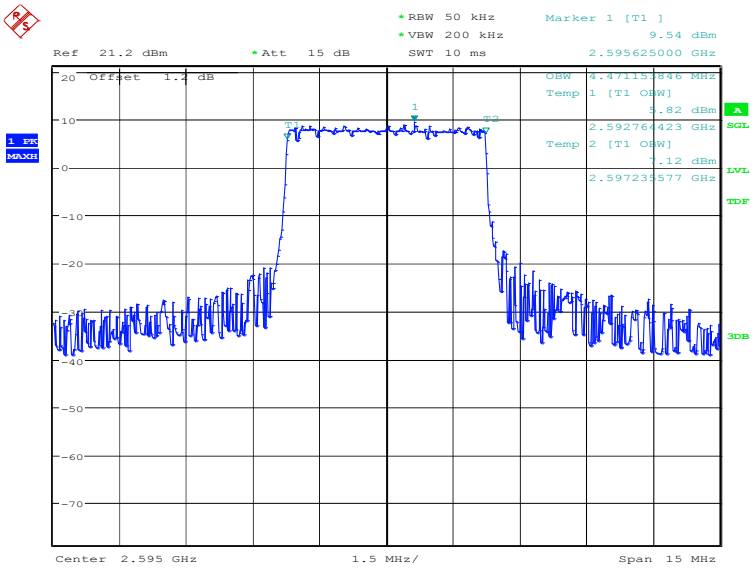
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2595.0	QPSK	16QAM
	4471.15	4471.15

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



Date: 23.SEP.2022 09:49:08

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



Date: 23.SEP.2022 09:49:48

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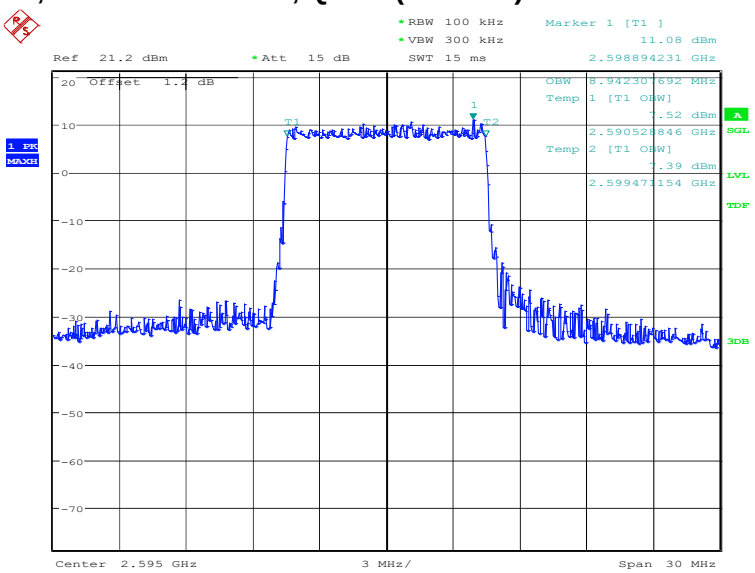
LTE band 38, 10MHz (99%)

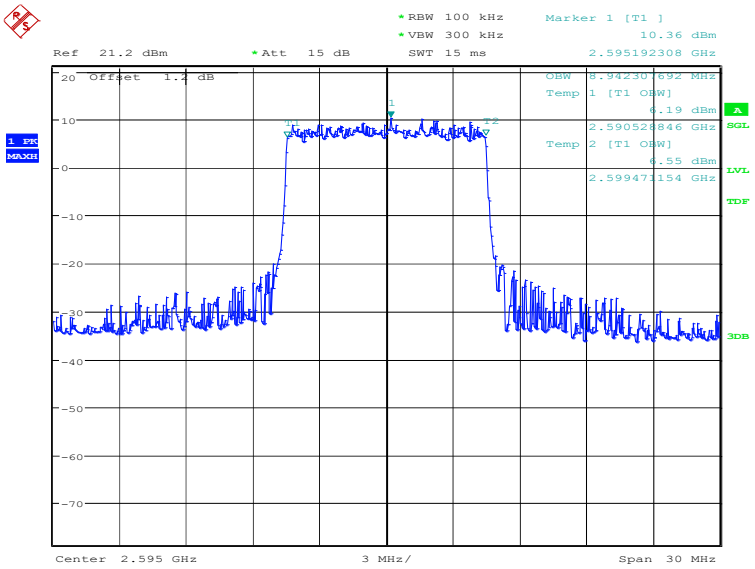
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2595.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 23.SEP.2022 09:50:31

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



Date: 23.SEP.2022 09:51:11

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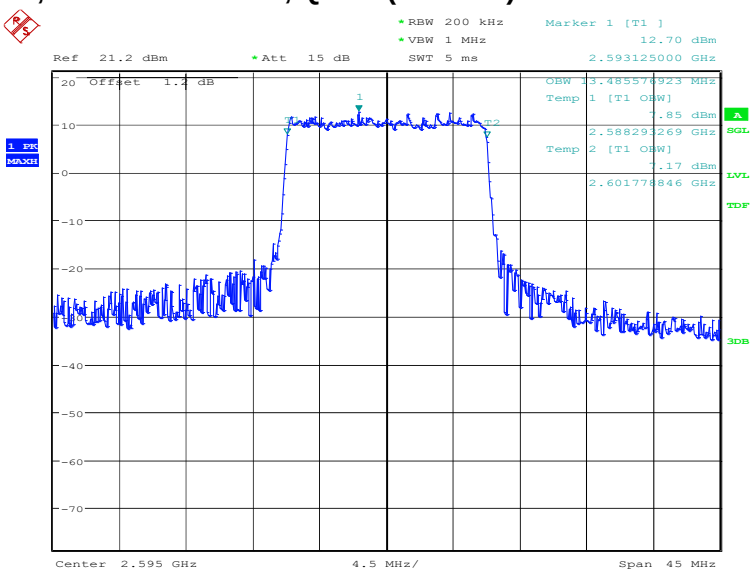
LTE band 38,15MHz (99%)

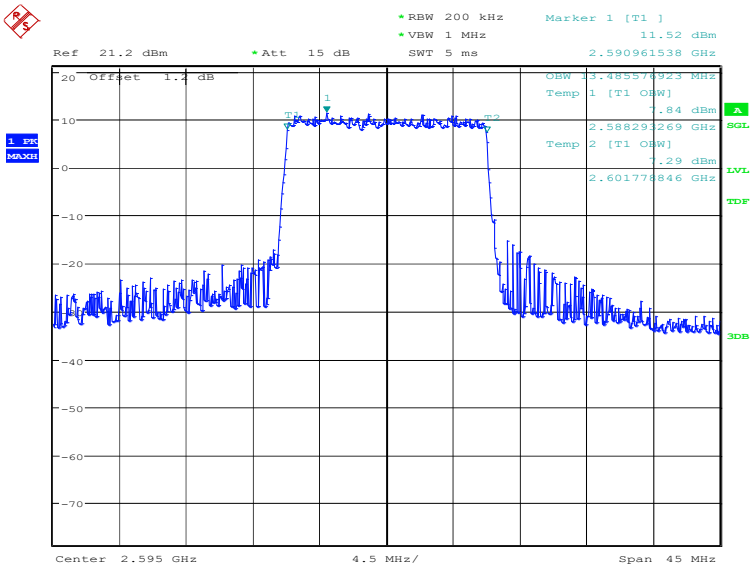
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2595.0	QPSK	16QAM
	13485.58	13485.58

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



Date: 23.SEP.2022 09:51:53

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



Date: 23.SEP.2022 09:52:33

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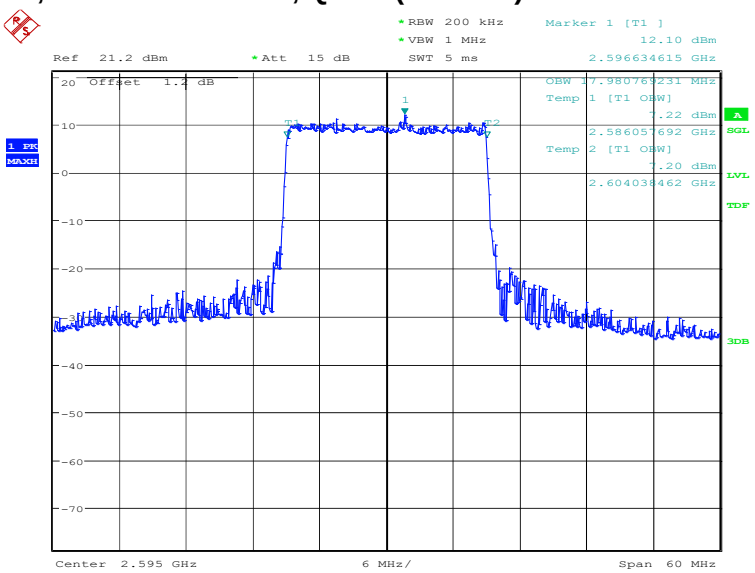
LTE band 38, 20MHz (99%)

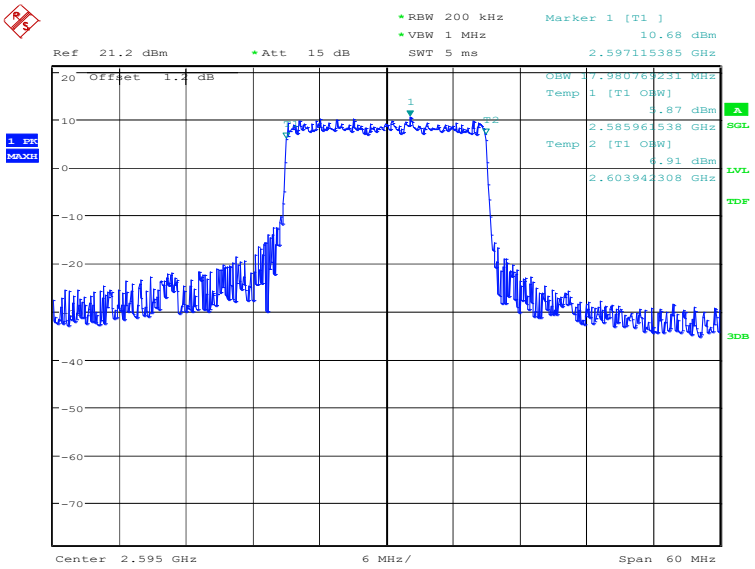
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2595.0	QPSK	16QAM
	17980.77	17980.77

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



Date: 23.SEP.2022 09:53:16

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



Date: 23.SEP.2022 09:53:56

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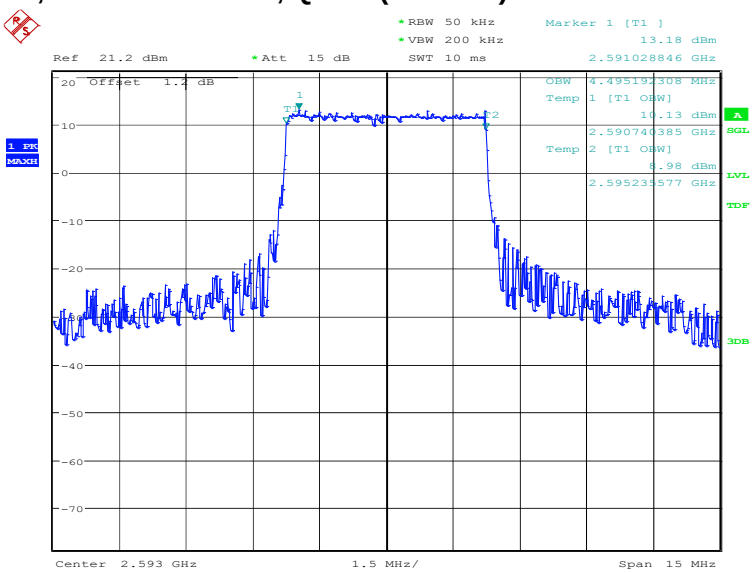
LTE band 41, 5MHz (99%)

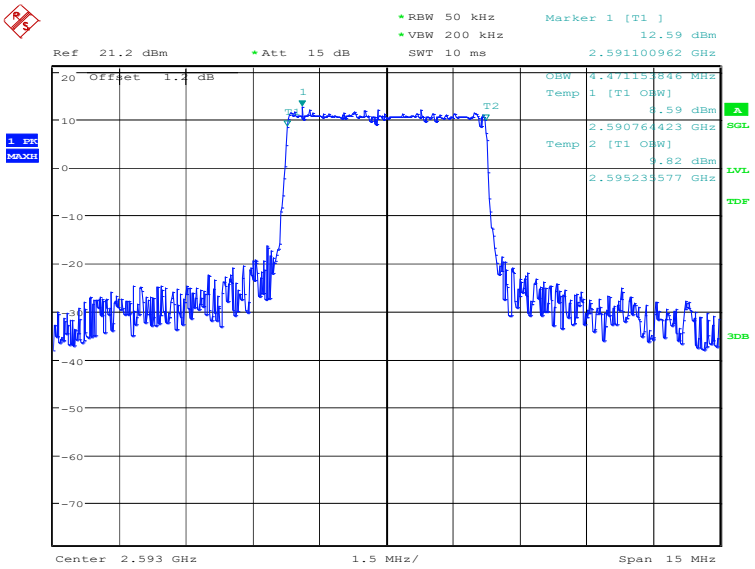
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	4495.19	4471.15

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



Date: 23.SEP.2022 09:54:41

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



Date: 23.SEP.2022 09:55:21

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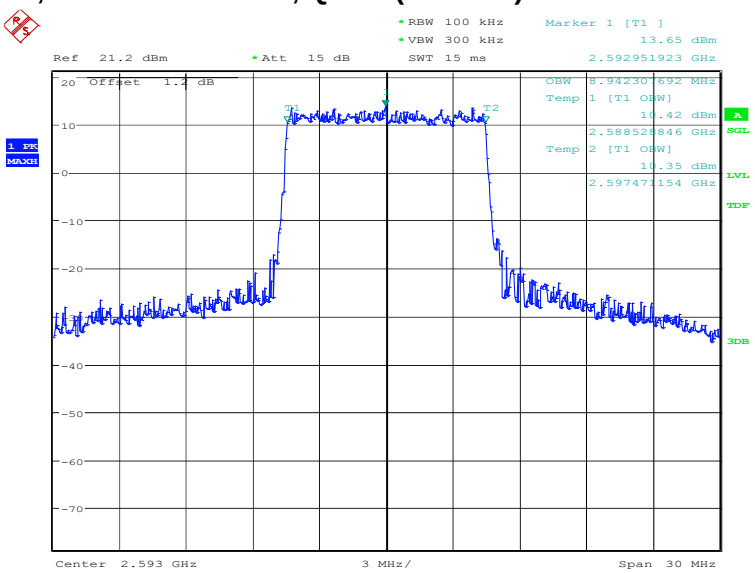
LTE band 41, 10MHz (99%)

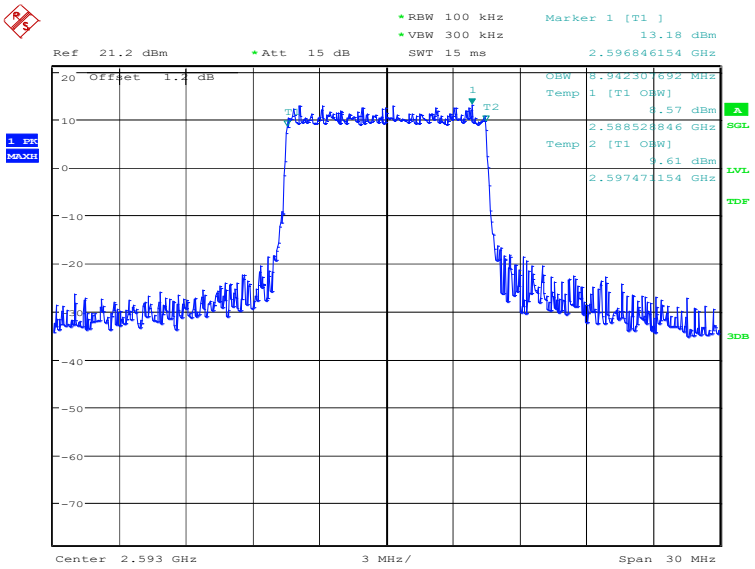
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 23.SEP.2022 09:56:04

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



Date: 23.SEP.2022 09:56:44

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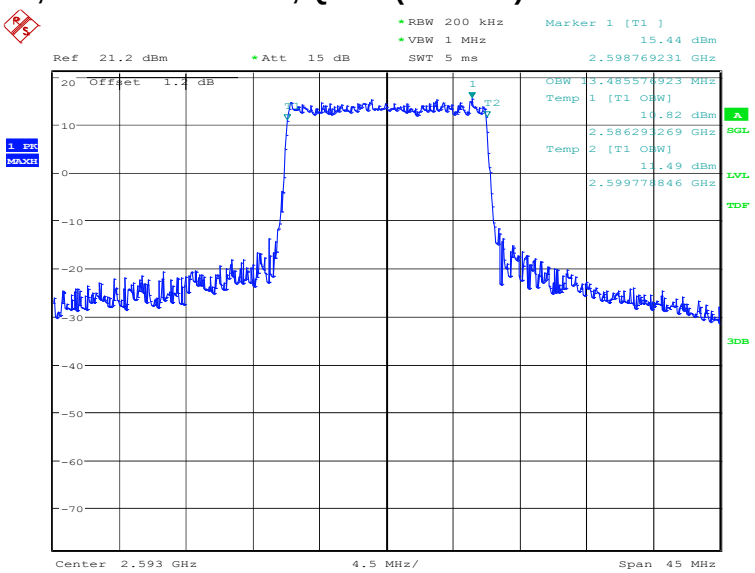
LTE band 41, 15MHz (99%)

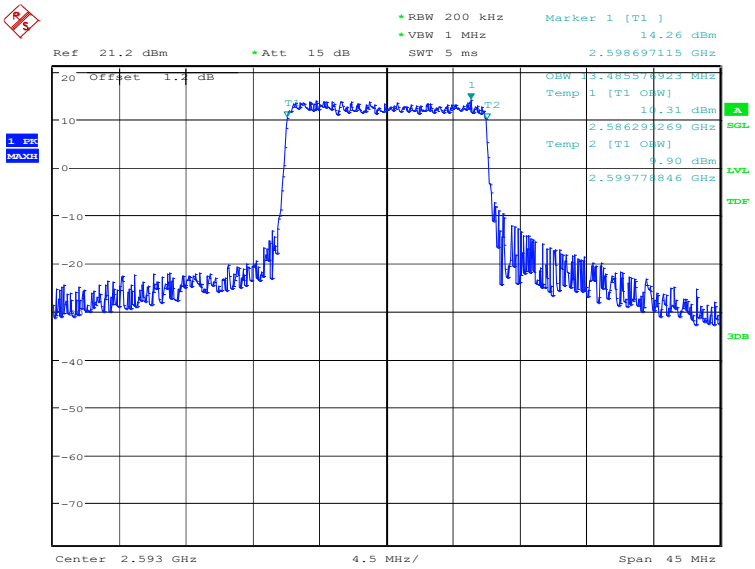
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	13485.58	13485.58

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



Date: 23.SEP.2022 09:57:26

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



Date: 23.SEP.2022 09:58:07

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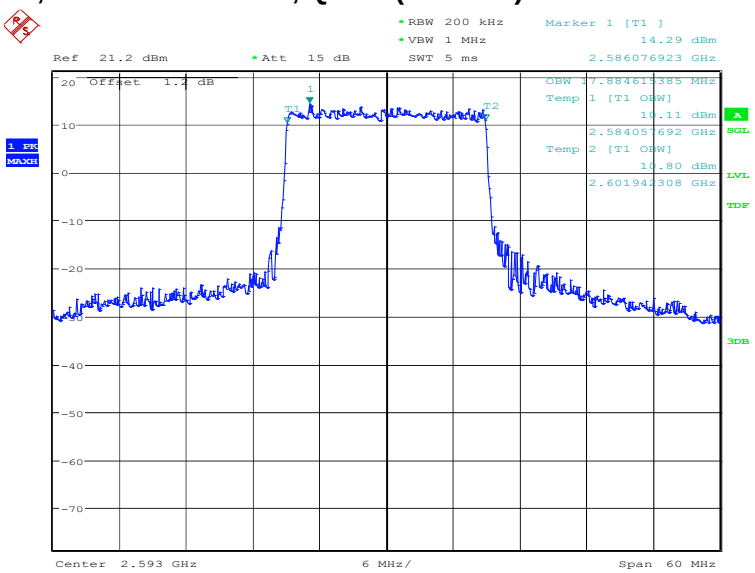
LTE band 41, 20MHz (99%)

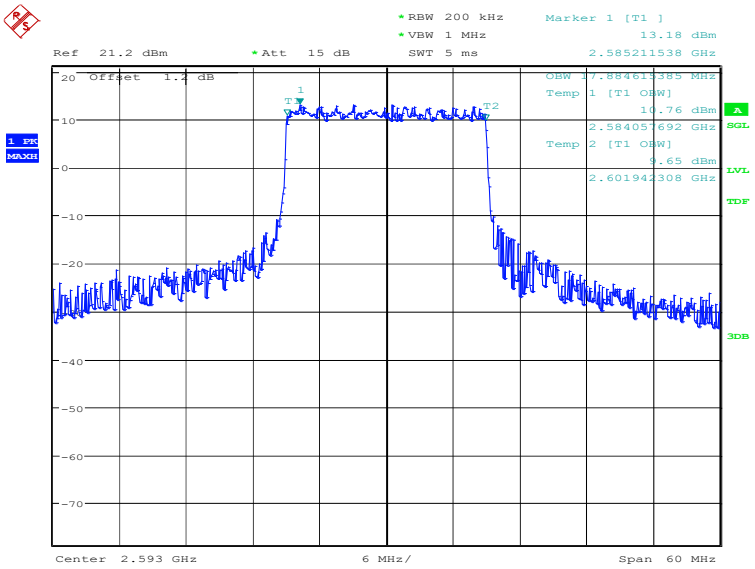
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	17884.62	17884.62

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



Date: 23.SEP.2022 09:58:49

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



Date: 23.SEP.2022 09:59:29

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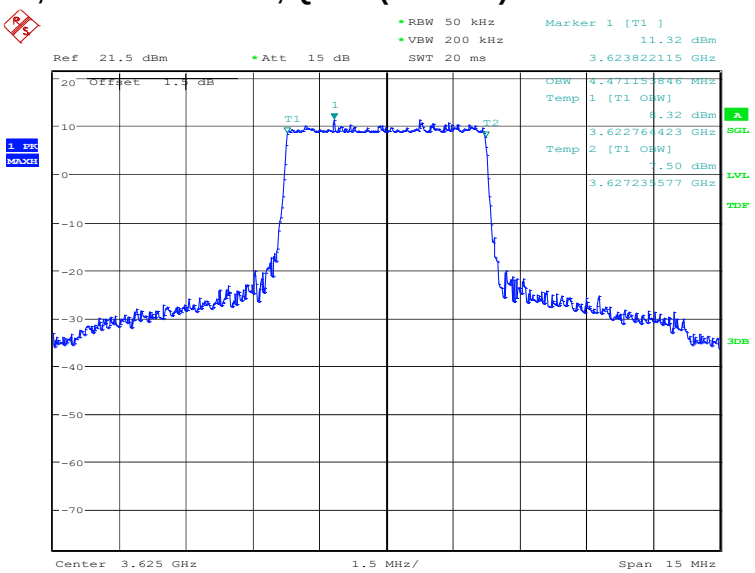
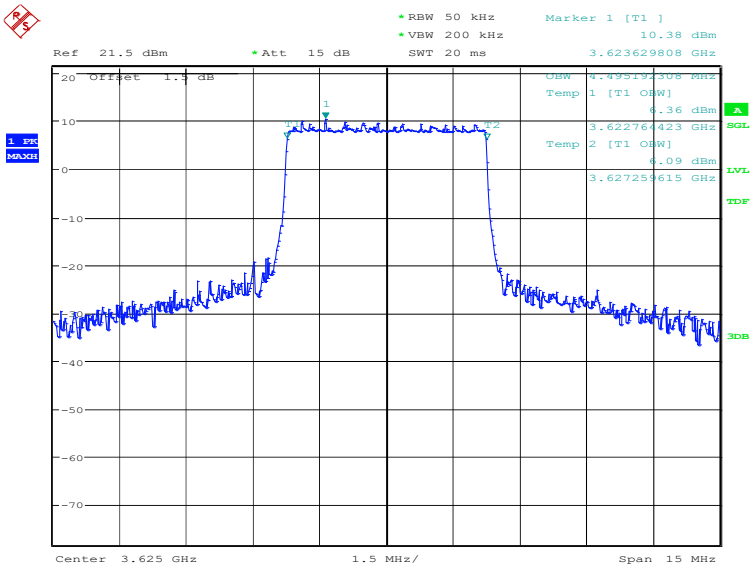
LTE band 48, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
3625.0	QPSK	16QAM
	4471.15	4495.19

LTE band 48, 5MHz Bandwidth, QPSK (99% BW)



LTE band 48, 5MHz Bandwidth,16QAM (99% BW)



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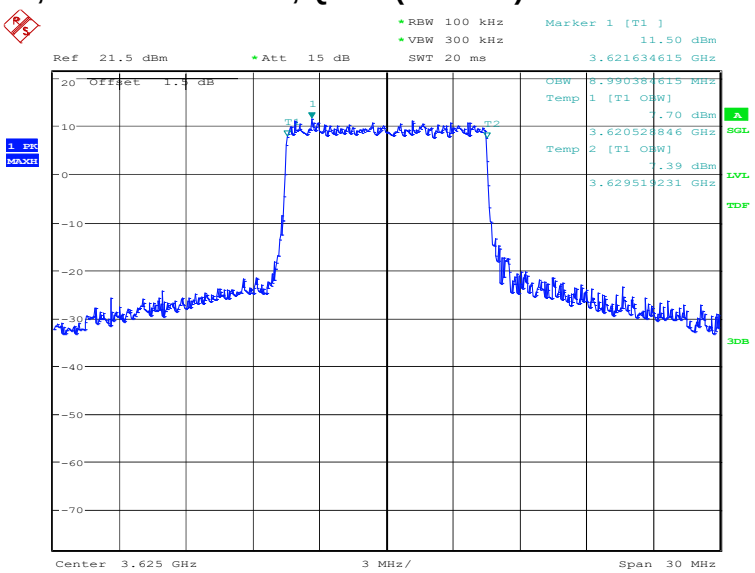
LTE band 48, 10MHz (99%)

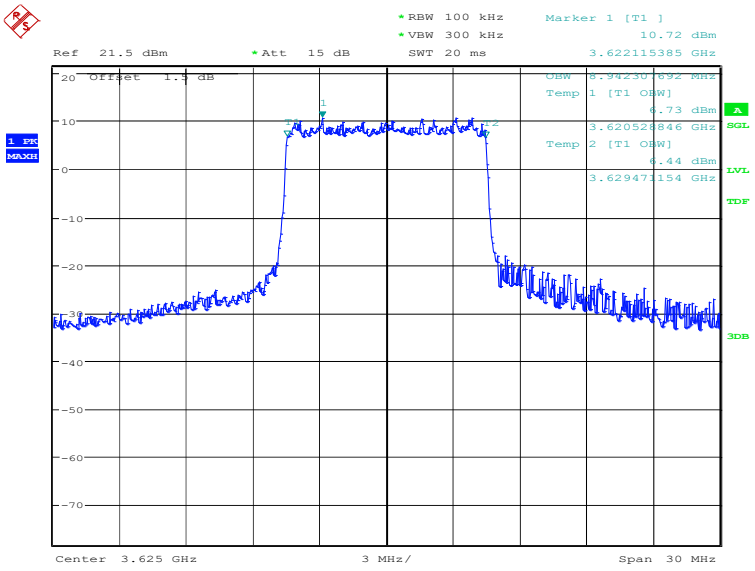
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
3625.0	QPSK	16QAM
	8990.38	8942.31

LTE band 48, 10MHz Bandwidth, QPSK (99% BW)



Date: 23.SEP.2022 14:35:40

LTE band 48, 10MHz Bandwidth,16QAM (99% BW)



Date: 23.SEP.2022 14:36:20

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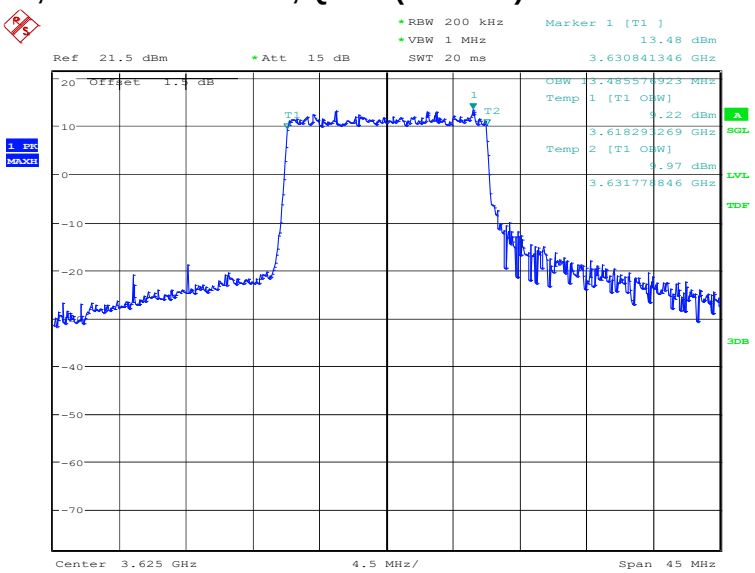
LTE band 48, 15MHz (99%)

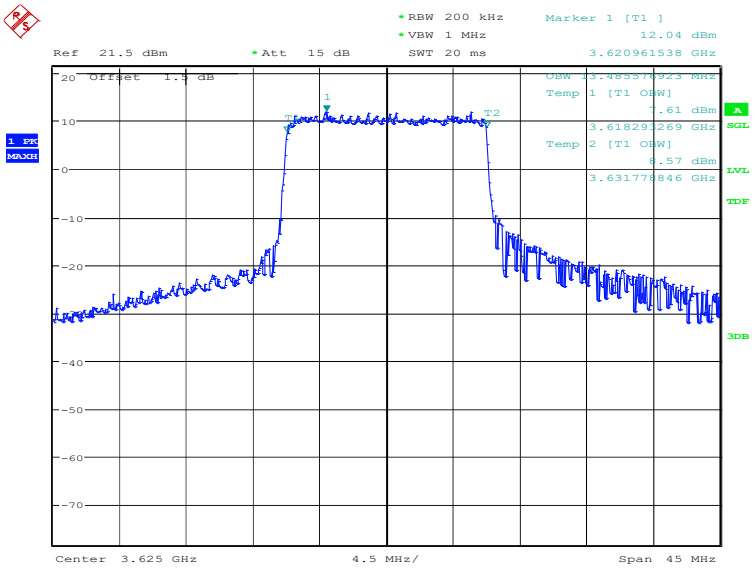
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
3625.0	QPSK	16QAM
	13485.58	13485.58

LTE band 48, 15MHz Bandwidth, QPSK (99% BW)



Date: 23.SEP.2022 14:37:02

LTE band 48, 15MHz Bandwidth,16QAM (99% BW)



Date: 23.SEP.2022 14:37:42

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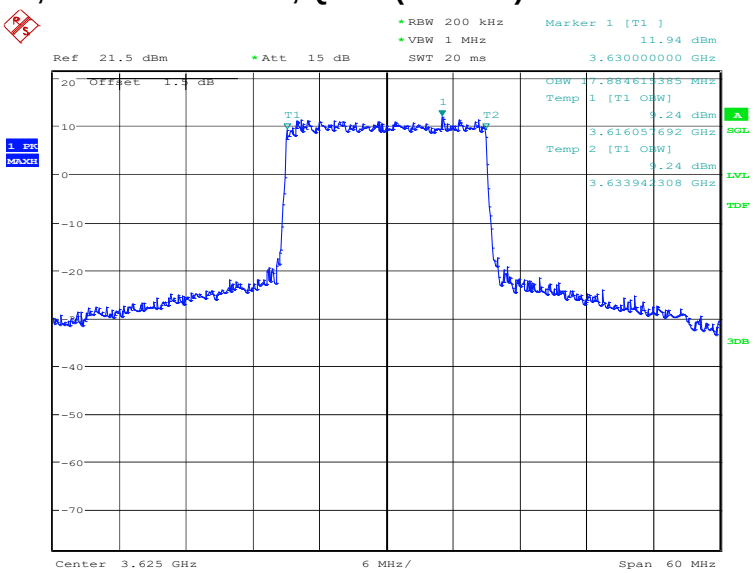
LTE band 48, 20MHz (99%)

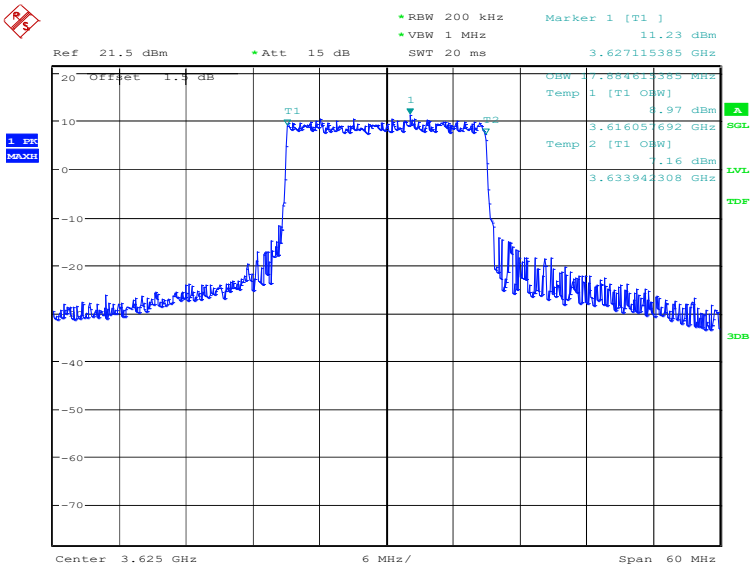
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
3625.0	QPSK	16QAM
	17884.62	17884.62

LTE band 48, 20MHz Bandwidth, QPSK (99% BW)



Date: 23.SEP.2022 14:38:24

LTE band 48, 20MHz Bandwidth,16QAM (99% BW)



Date: 23.SEP.2022 14:39:04

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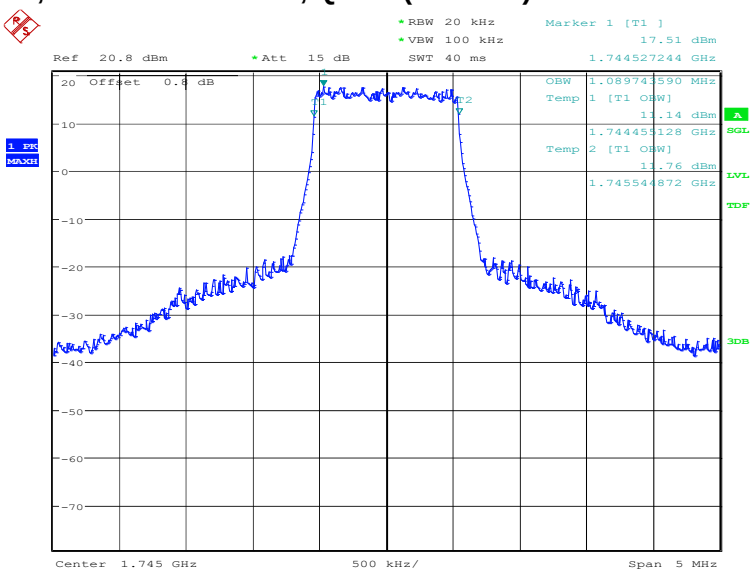
LTE band 66, 1.4MHz (99%)

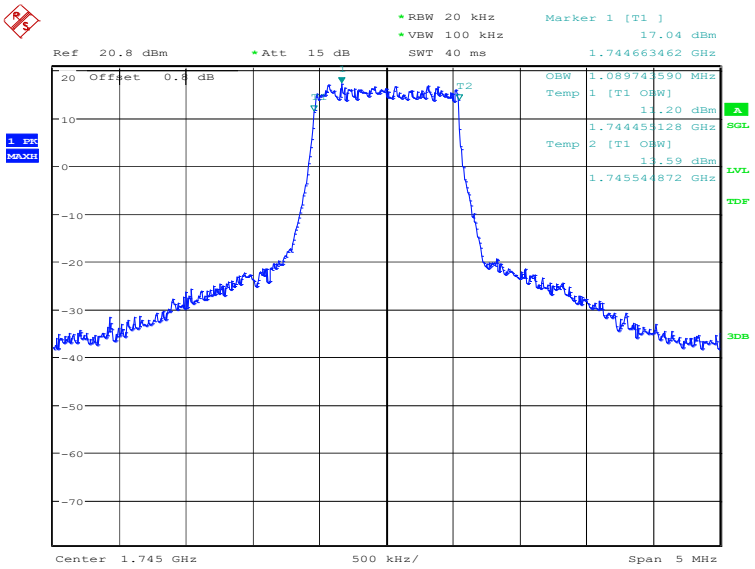
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	1089.74	1089.74

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



Date: 23.SEP.2022 09:40:09

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



Date: 23.SEP.2022 09:40:49

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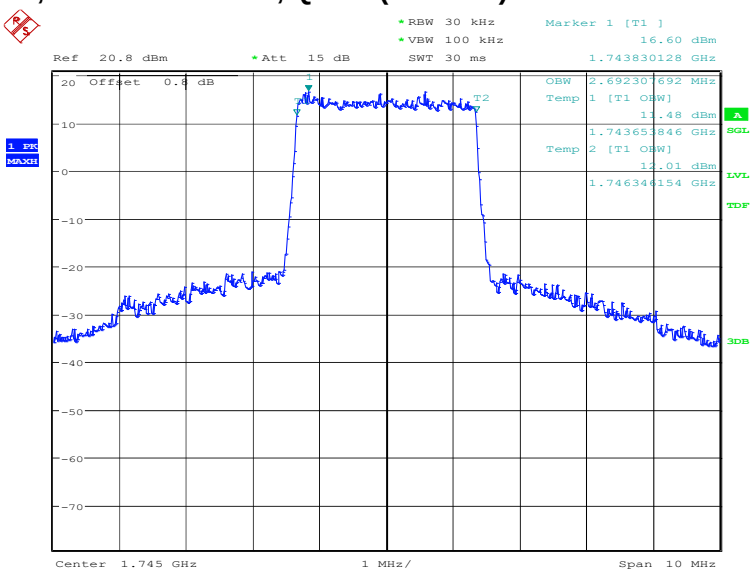
LTE band 66, 3MHz (99%)

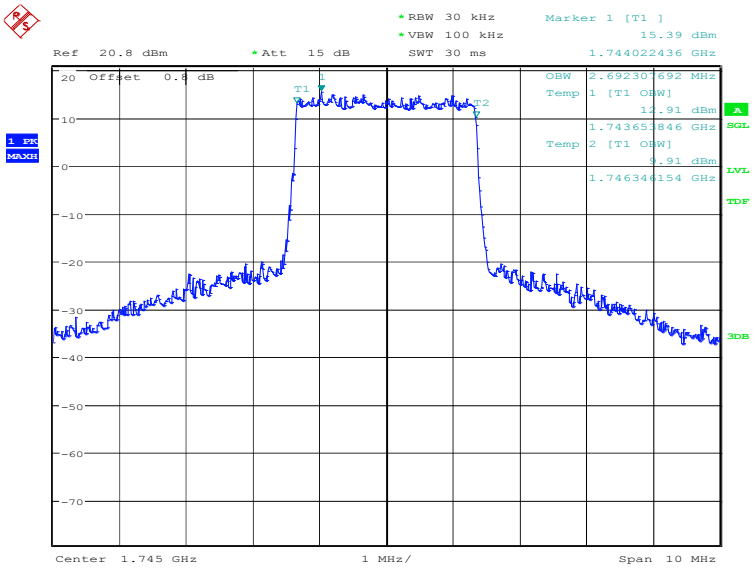
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	2692.31	2692.31

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



Date: 23.SEP.2022 09:41:31

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



Date: 23.SEP.2022 09:42:11

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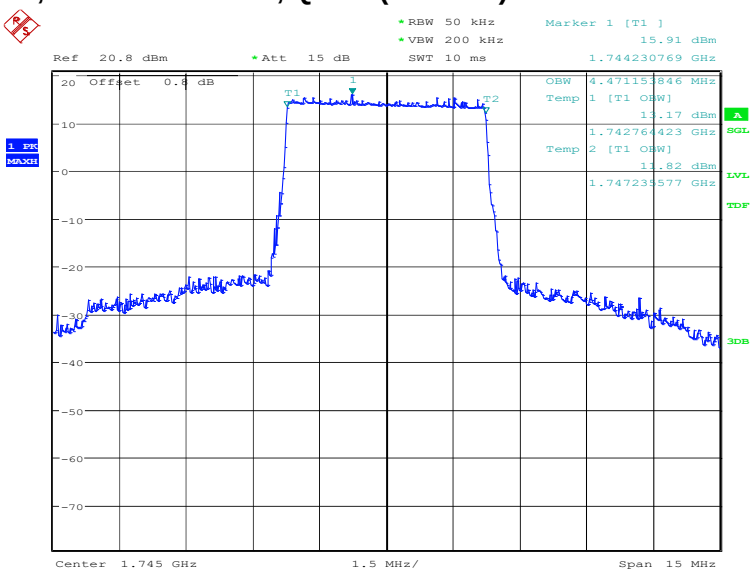
LTE band 66, 5MHz (99%)

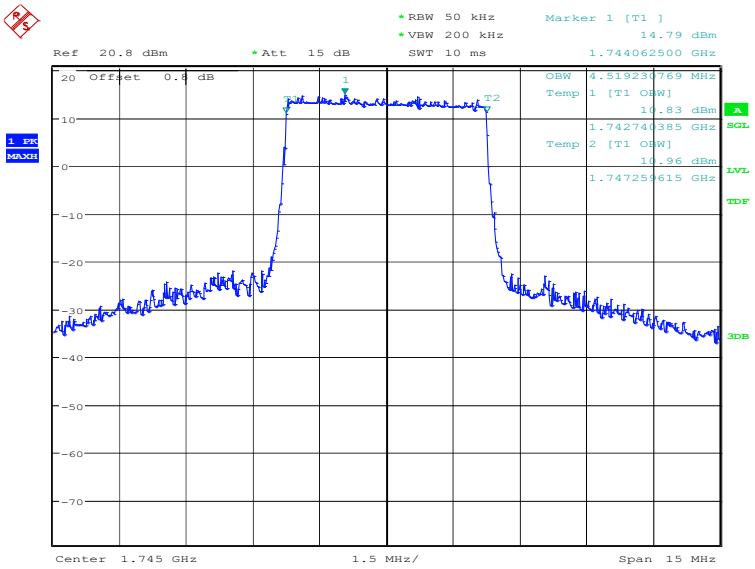
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	4471.15	4519.23

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



Date: 23.SEP.2022 09:42:53

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



Date: 23.SEP.2022 09:43:33

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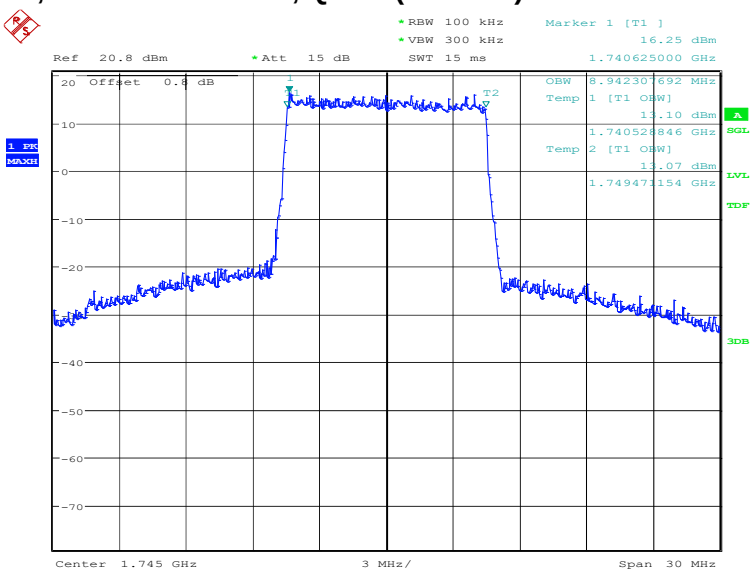
LTE band 66, 10MHz (99%)

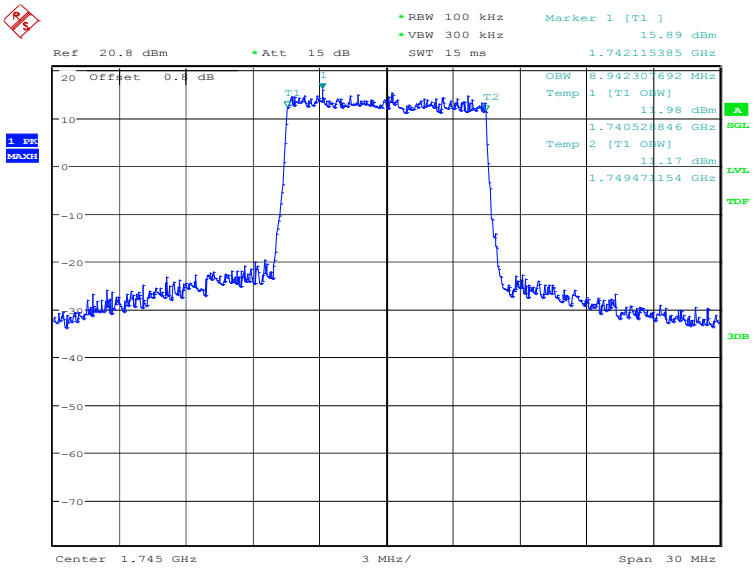
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 23.SEP.2022 09:44:15

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



Date: 23.SEP.2022 09:44:55

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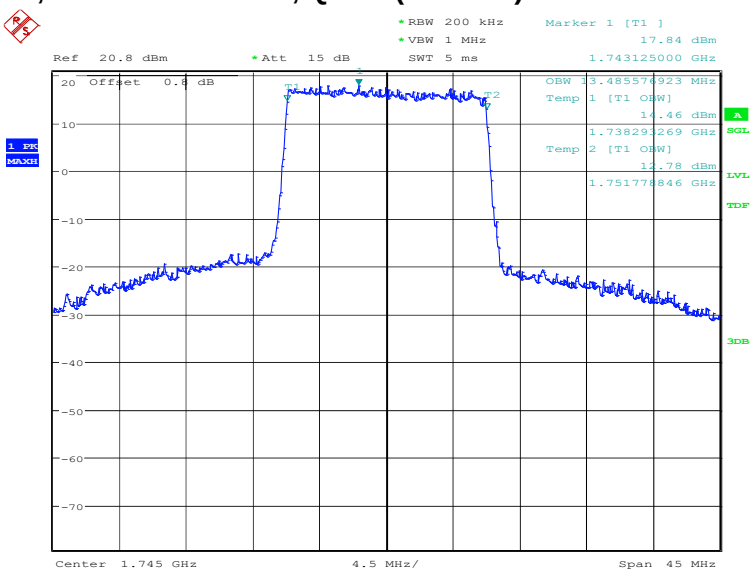
LTE band 66, 15MHz (99%)

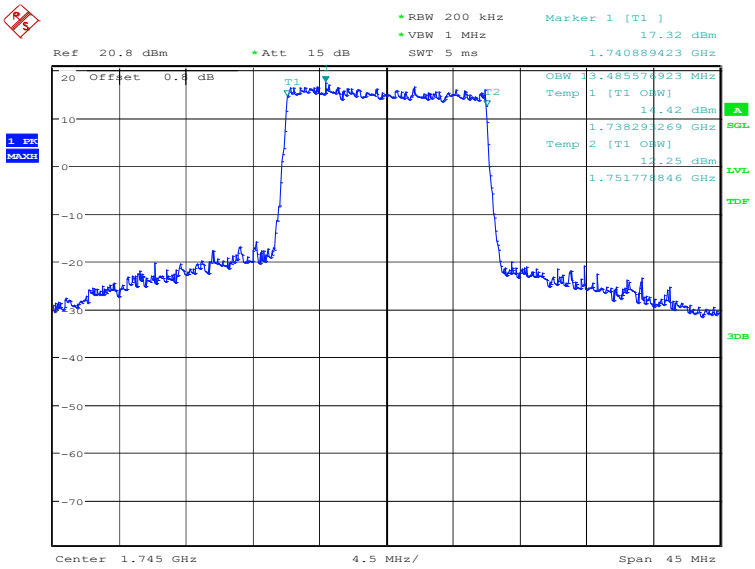
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	13485.58	13485.58

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



Date: 23.SEP.2022 09:45:38

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



Date: 23.SEP.2022 09:46:18

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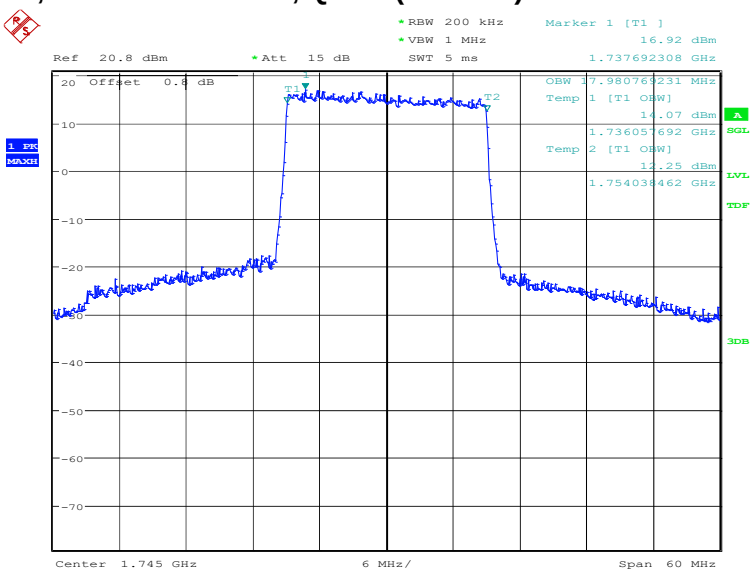
LTE band 66, 20MHz (99%)

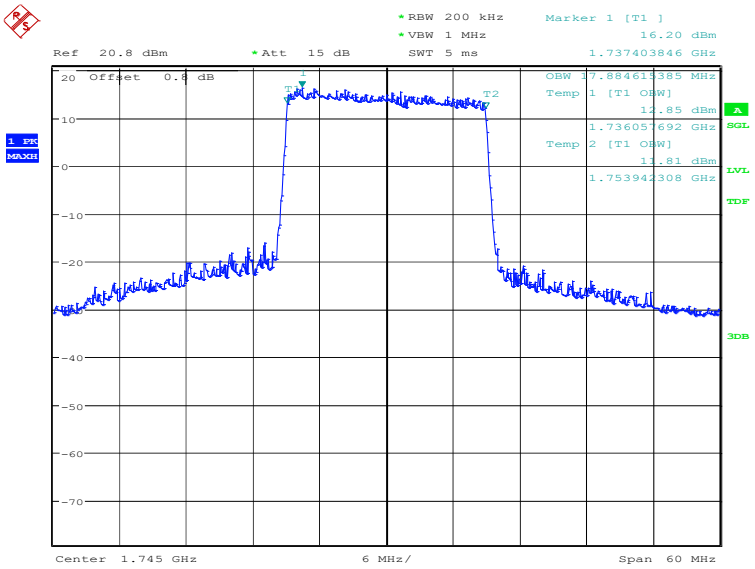
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	17980.77	17884.62

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



Date: 23.SEP.2022 09:47:00

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



Date: 23.SEP.2022 09:47:40

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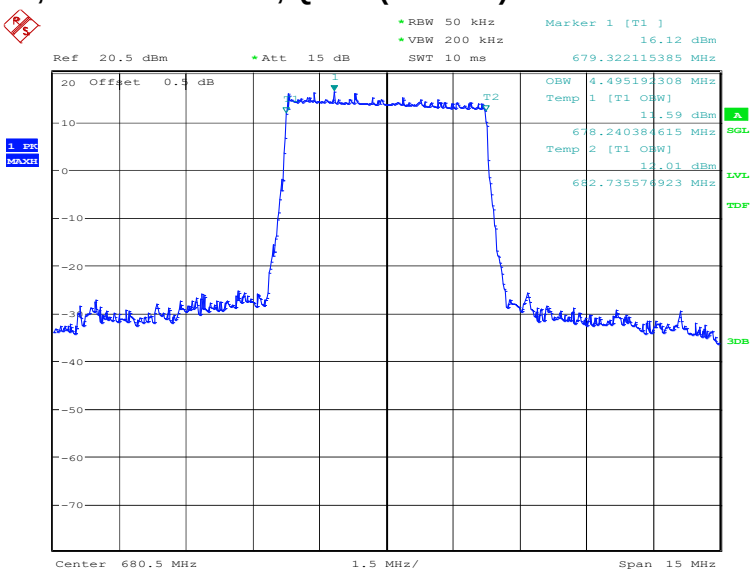
LTE band 71, 5MHz (99%)

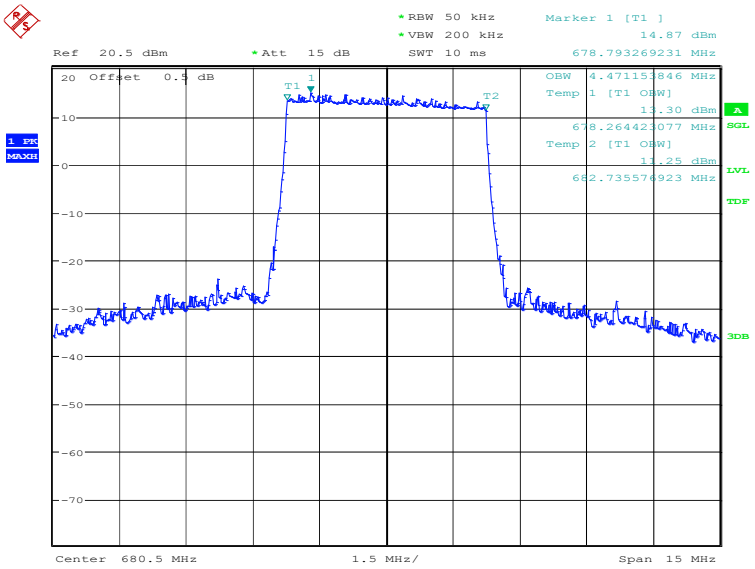
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
680.5	QPSK	16QAM
	4495.19	4471.15

LTE band 71, 5MHz Bandwidth, QPSK (99% BW)



Date: 20.SEP.2022 13:55:52

LTE band 71, 5MHz Bandwidth, 16QAM (99% BW)



Date: 20.SEP.2022 13:56:32

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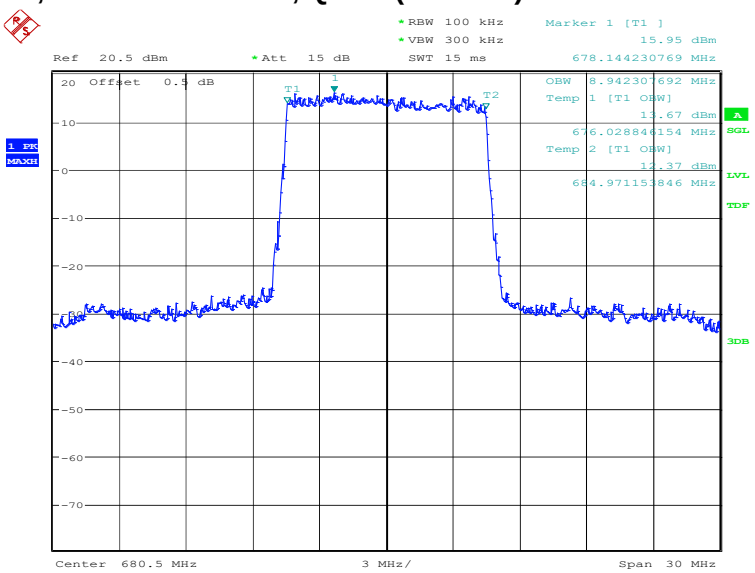
LTE band 71, 10MHz (99%)

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

LTE band 71, 10MHz Bandwidth, QPSK (99% BW)



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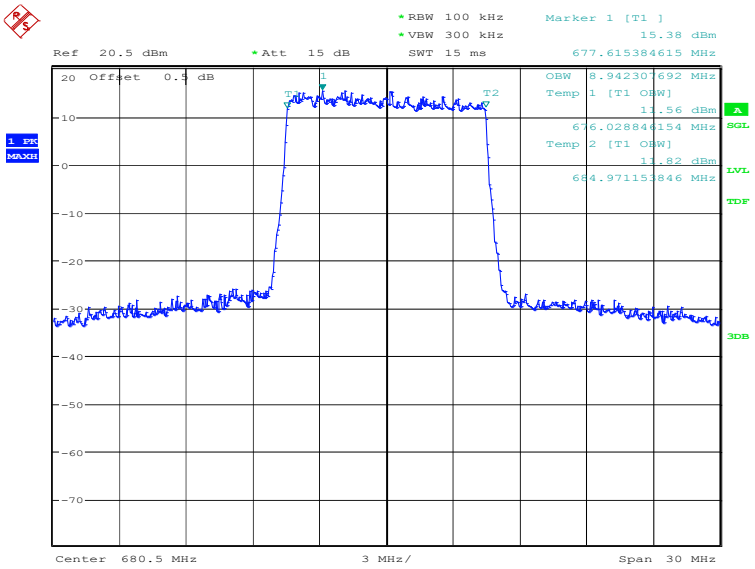
LTE band 71, 10MHz Bandwidth, 16QAM (99% BW)



Date: 20.SEP.2022 13:57:53

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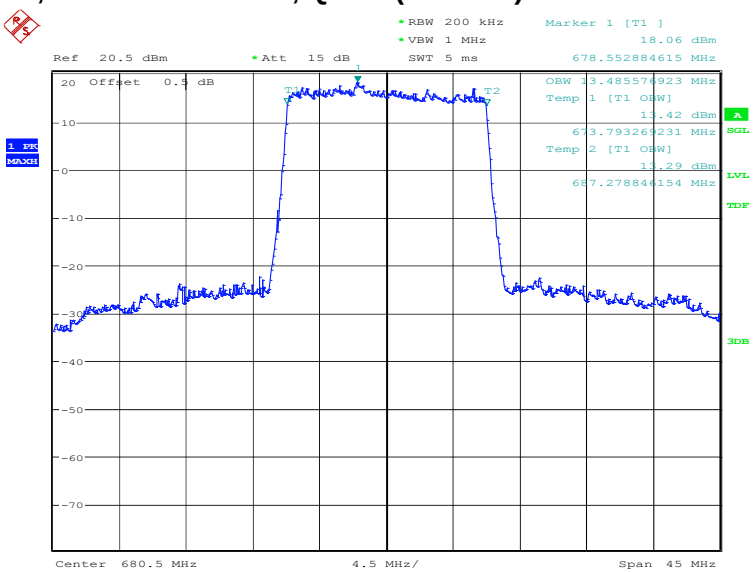
LTE band 71, 15MHz (99%)

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

LTE band 71, 15MHz Bandwidth, QPSK (99% BW)



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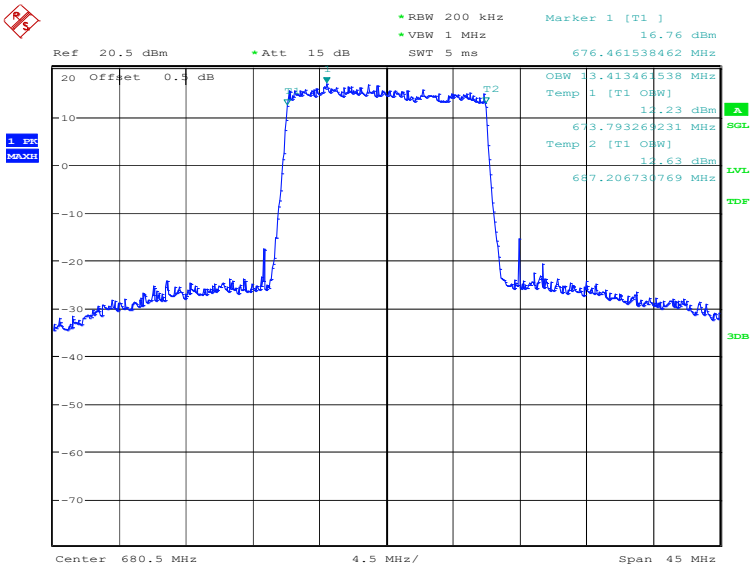
LTE band 71, 15MHz Bandwidth, 16QAM (99% BW)



Date: 20.SEP.2022 13:59:15

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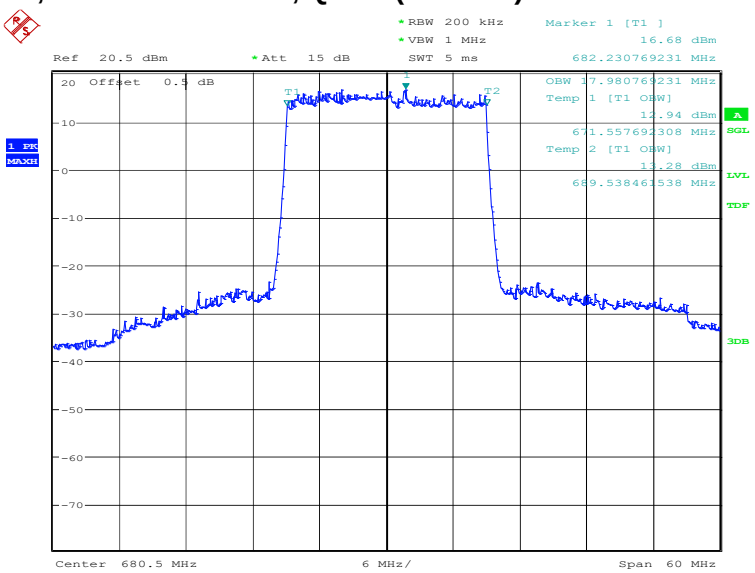
LTE band 71, 20MHz (99%)

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

LTE band 71, 20MHz Bandwidth, QPSK (99% BW)



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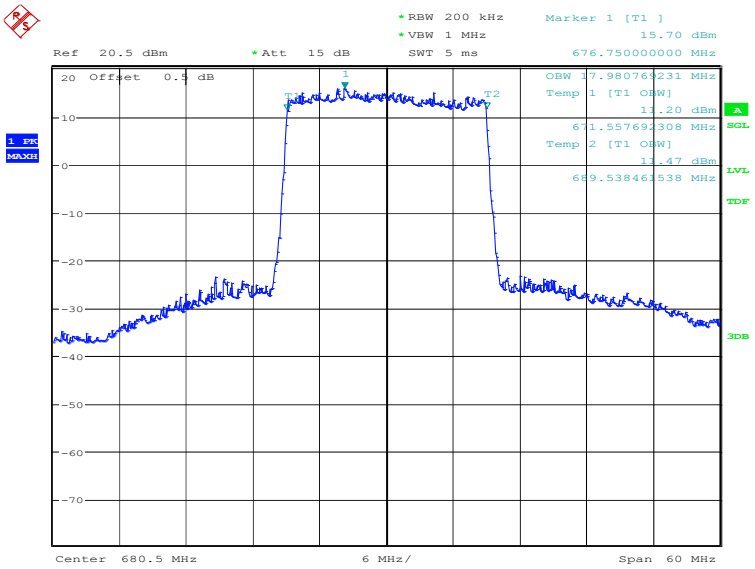
LTE band 71, 20MHz Bandwidth, 16QAM (99% BW)



Date: 20.SEP.2022 14:00:37

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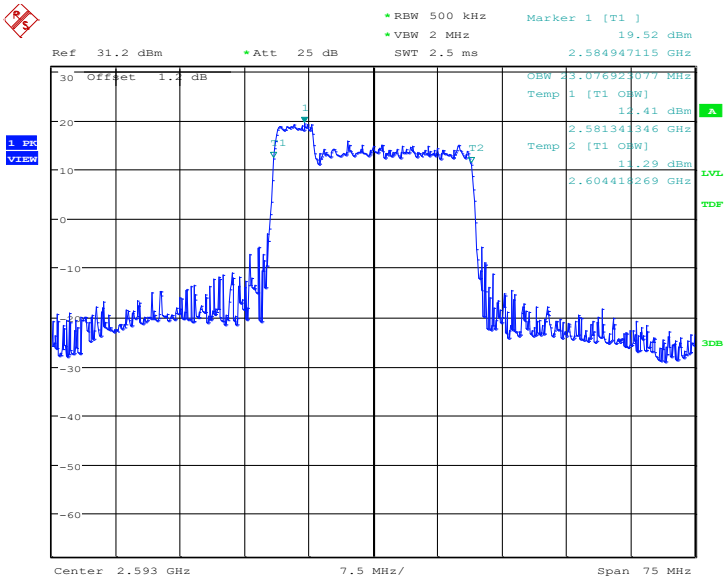
LTE CA Band 41C, 5MHz+20MHz (99%)

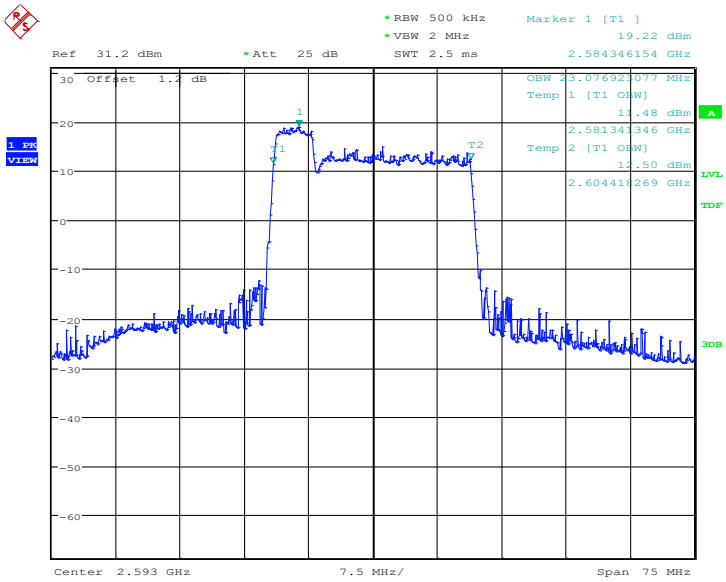
Frequency (MHz)	Occupied Bandwidth (99%) (MHz)	
	QPSK	16QAM
2593	23.077	23.077

LTE CA Band 41C, 5MHz+20MHz Bandwidth, QPSK (99% BW)



Date: 20.SEP.2022 12:46:10

LTE CA Band 41C, 5MHz+20MHz Bandwidth, 16QAM (99% BW)



Date: 20.SEP.2022 12:46:32

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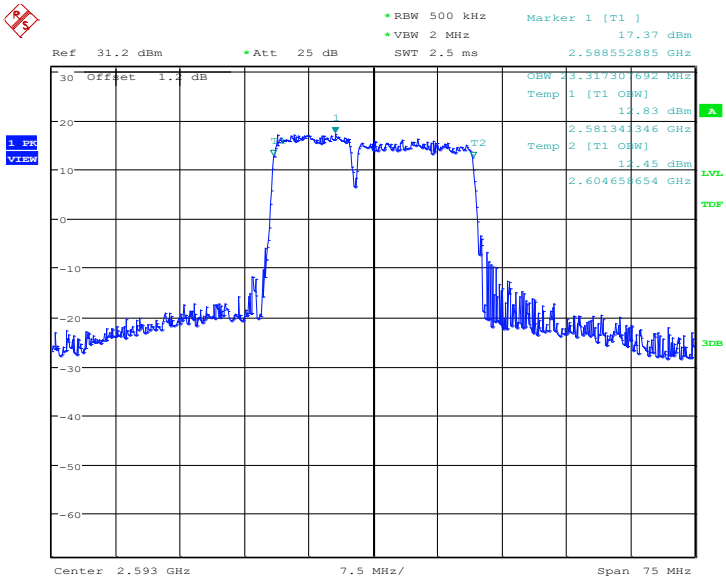
LTE CA Band 41C, 10MHz+15MHz (99%)

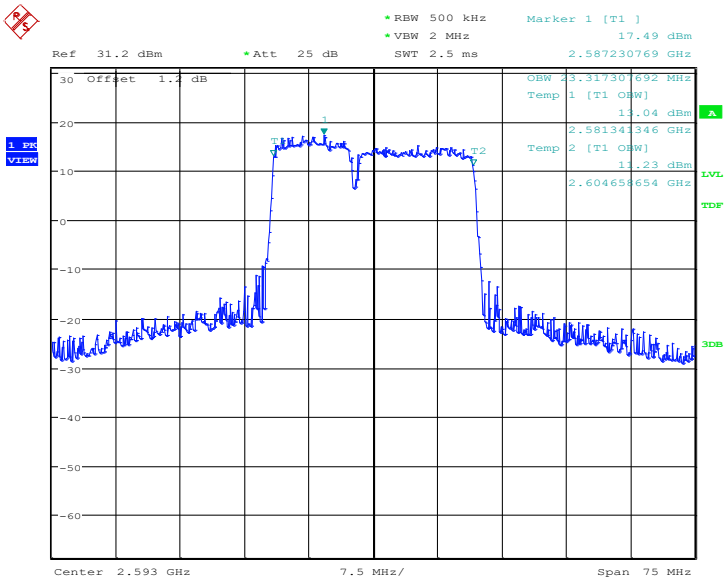
Frequency (MHz)	Occupied Bandwidth (99%) (MHz)	
	QPSK	16QAM
2593	23.317	23.317

LTE CA Band 41C, 10MHz+15MHz Bandwidth, QPSK (99% BW)



Date: 20.SEP.2022 12:47:34

LTE CA Band 41C, 10MHz+15MHz Bandwidth, 16QAM (99% BW)



Date: 20.SEP.2022 12:47:56

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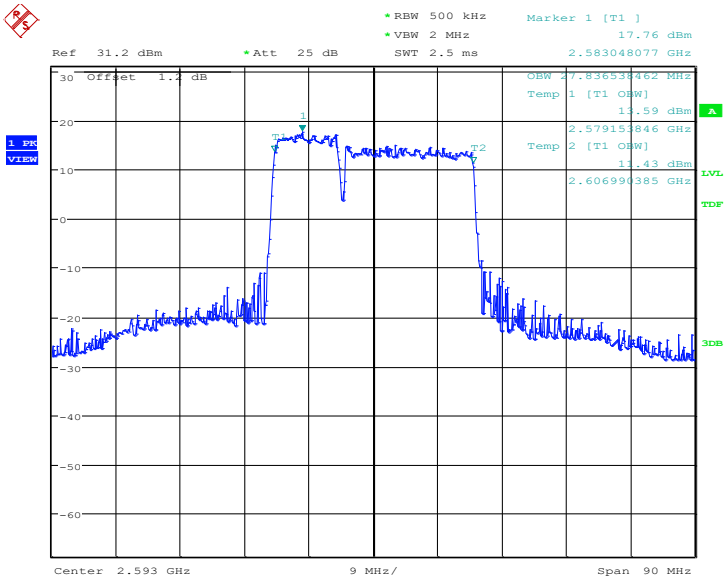
LTE CA Band 41C, 10MHz+20MHz (99%)

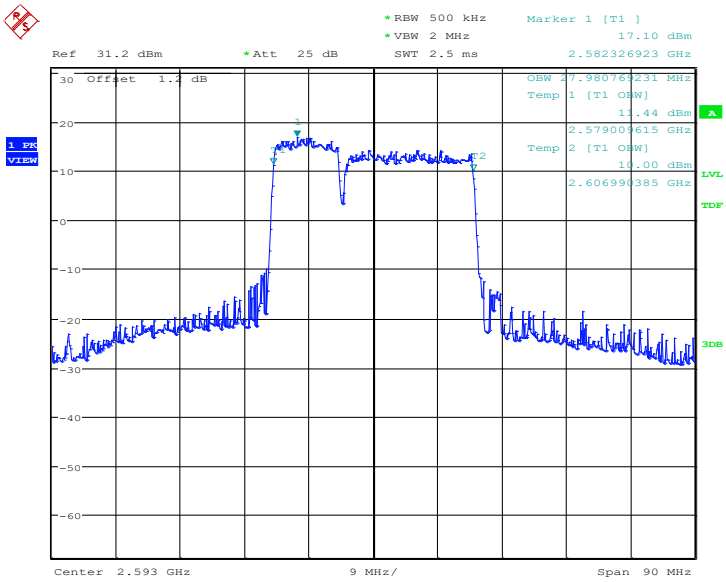
Frequency (MHz)	Occupied Bandwidth (99%) (MHz)	
	QPSK	16QAM
2593	27.837	27.981

LTE CA Band 41C, 10MHz+20MHz Bandwidth, QPSK (99% BW)



Date: 20.SEP.2022 12:48:57

LTE CA Band 41C, 10MHz+20MHz Bandwidth, 16QAM (99% BW)



Date: 20.SEP.2022 12:49:20

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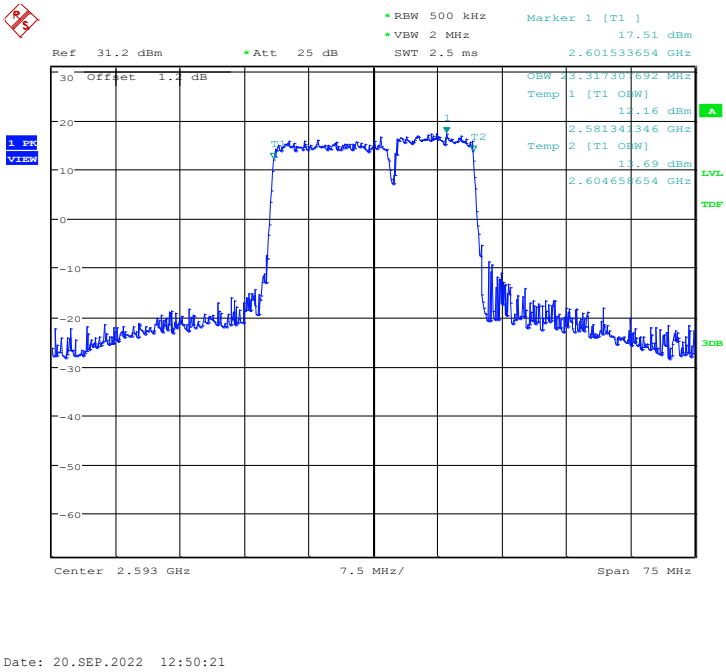
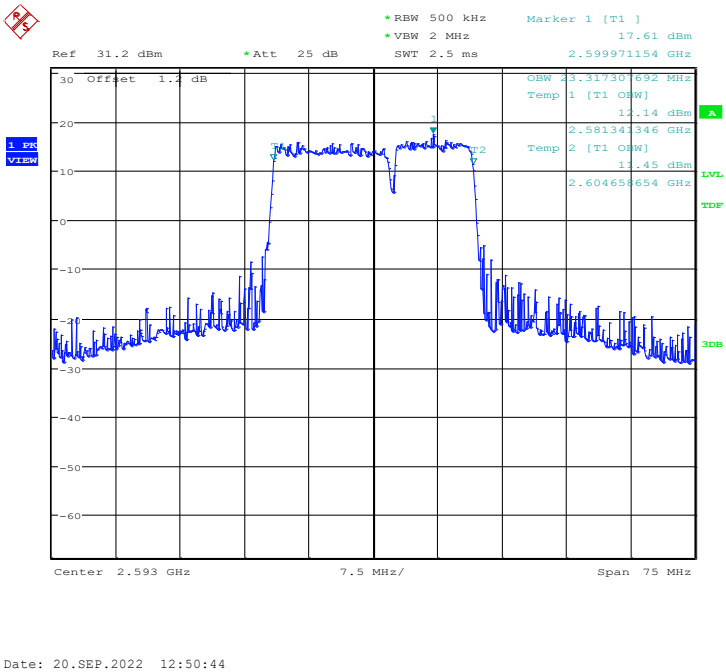
LTE CA Band 41C, 15MHz+10MHz (99%)

Frequency (MHz)	Occupied Bandwidth (99%) (MHz)	
	QPSK	16QAM
2593	23.317	23.317

LTE CA Band 41C, 15MHz+10MHz Bandwidth, QPSK (99% BW)



LTE CA Band 41C, 15MHz+10MHz Bandwidth, 16QAM (99% BW)



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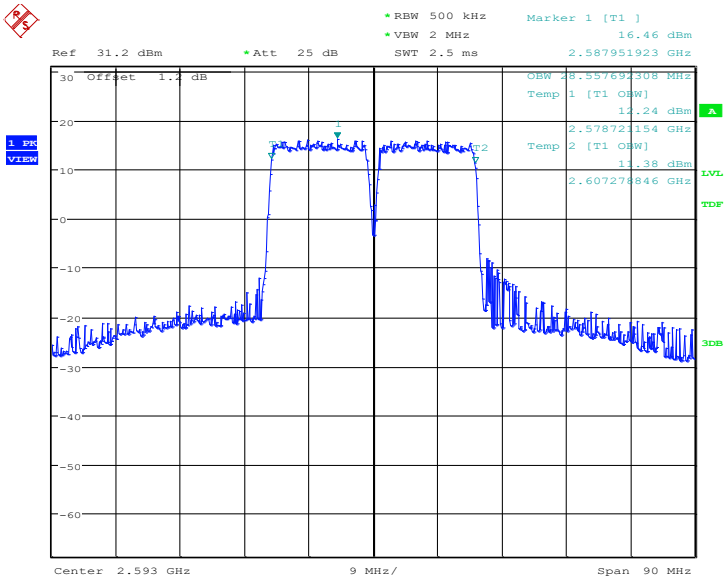
LTE CA Band 41C, 15MHz+15MHz (99%)

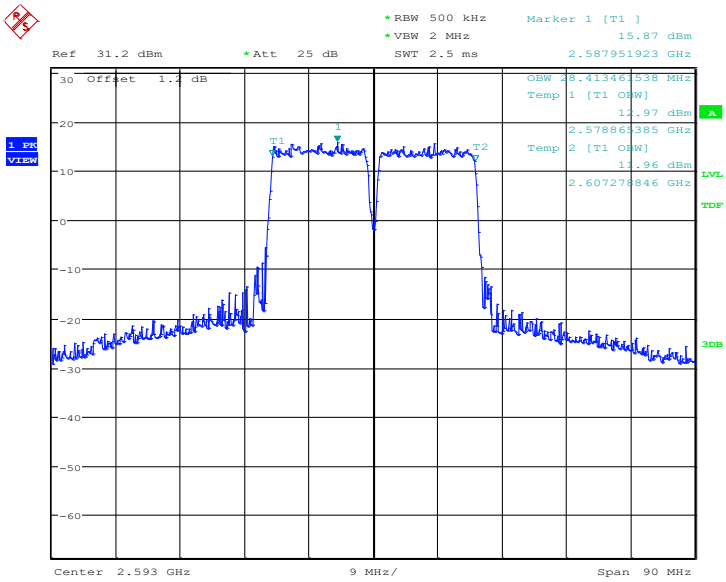
Frequency (MHz)	Occupied Bandwidth (99%) (MHz)	
	QPSK	16QAM
2593	28.558	28.413

LTE CA Band 41C, 15MHz+15MHz Bandwidth, QPSK (99% BW)



Date: 20.SEP.2022 12:51:50

LTE CA Band 41C, 15MHz+15MHz Bandwidth, 16QAM (99% BW)



Date: 20.SEP.2022 12:52:13

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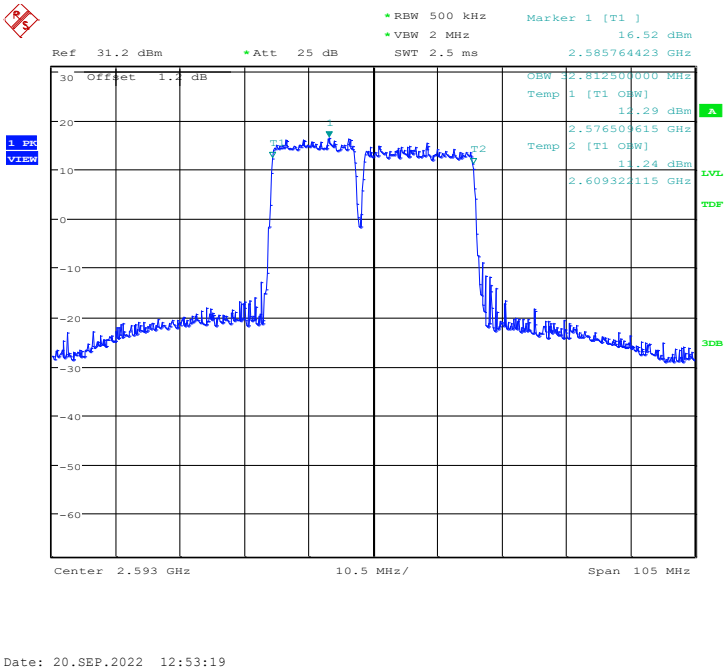
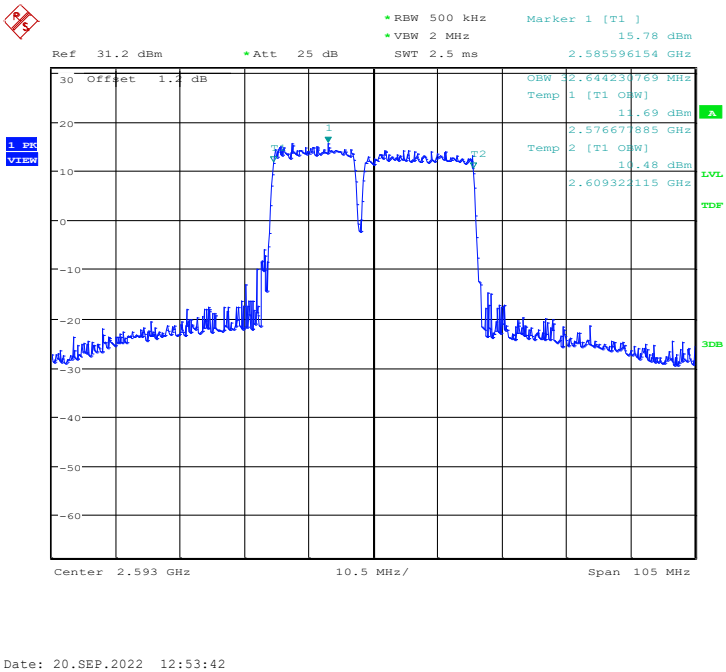
LTE CA Band 41C, 15MHz+20MHz (99%)

Frequency (MHz)	Occupied Bandwidth (99%) (MHz)	
	QPSK	16QAM
2593	32.812	32.644

LTE CA Band 41C, 15MHz+20MHz Bandwidth, QPSK (99% BW)



LTE CA Band 41C, 15MHz+20MHz Bandwidth, 16QAM (99% BW)



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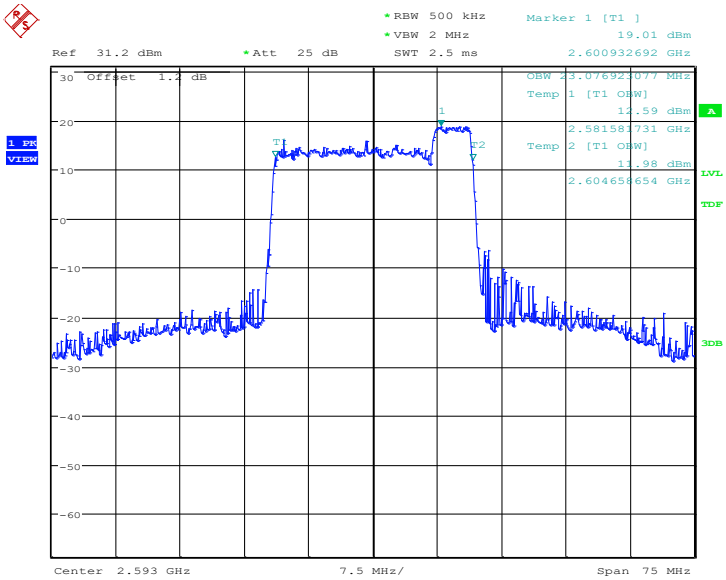
LTE CA Band 41C, 20MHz+5MHz (99%)

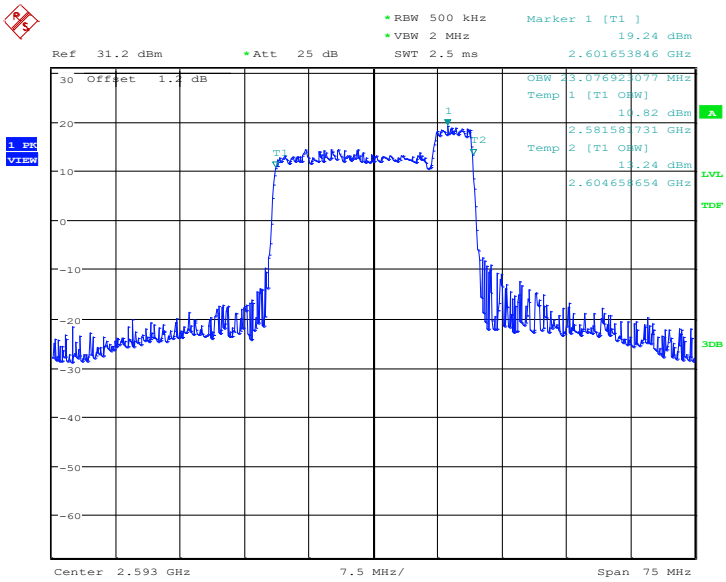
Frequency (MHz)	Occupied Bandwidth (99%) (MHz)	
	QPSK	16QAM
2593	23.077	23.077

LTE CA Band 41C, 20MHz+5MHz Bandwidth, QPSK (99% BW)



Date: 20.SEP.2022 12:54:43

LTE CA Band 41C, 20MHz+5MHz Bandwidth, 16QAM (99% BW)



Date: 20.SEP.2022 12:55:06

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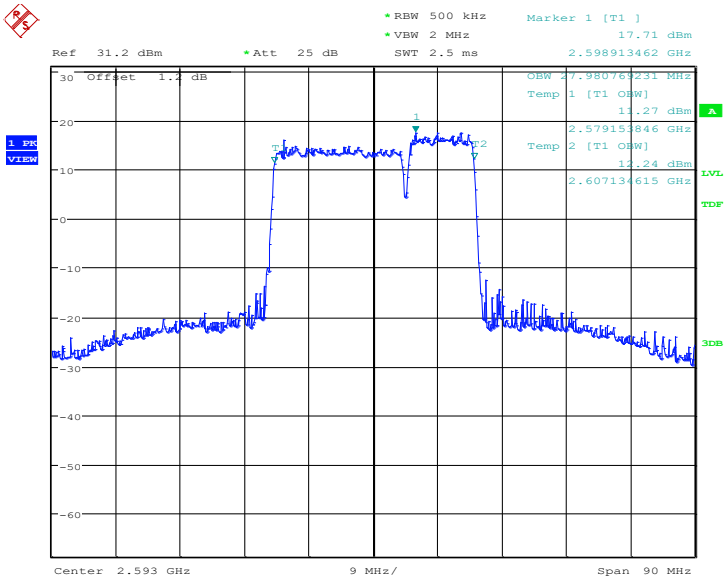
LTE CA Band 41C, 20MHz+10MHz (99%)

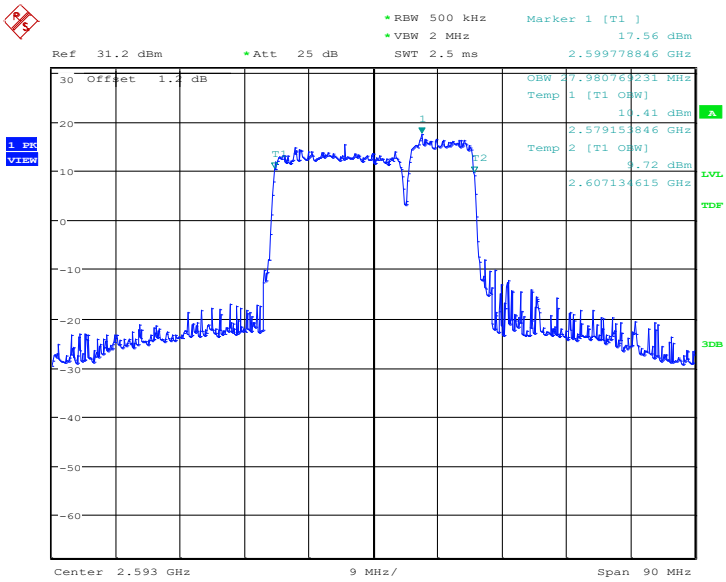
Frequency (MHz)	Occupied Bandwidth (99%) (MHz)	
	QPSK	16QAM
2593	27.981	27.981

LTE CA Band 41C, 20MHz+10MHz Bandwidth, QPSK (99% BW)



Date: 20.SEP.2022 12:56:12

LTE CA Band 41C, 20MHz+10MHz Bandwidth, 16QAM (99% BW)



Date: 20.SEP.2022 12:56:35

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