

A.3 FREQUENCY STABILITY

A.3.1 Method of Measurement

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

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

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

A.3.2 Measurement results

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

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1850.890	1909.200		
50				0.53	0.0003
40				0.42	0.0002
30				0.20	0.0001
10				0.69	0.0004
0				1.06	0.0006
-10				0.87	0.0005
-20				0.84	0.0004
-30				1.26	0.0007

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	1850.890	1909.200	0.92	0.0005
4.3				0.77	0.0004

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

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1710.780	1754.210		
50				-0.07	0.0000
40				-0.60	0.0003
30				0.29	0.0002
10				-0.01	0.0000
0				-1.10	0.0006
-10				-0.07	0.0000
-20				-0.17	0.0001
-30				-0.96	0.0006

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	1710.780	1754.210	-0.39	0.0002
4.3				0.74	0.0004

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

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	824.380	848.620		
50				0.13	0.0002
40				-0.02	0.0000
30				0.19	0.0002
10				0.21	0.0003
0				-0.32	0.0004
-10				-0.06	0.0001
-20				0.33	0.0004
-30				0.89	0.0011

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	824.380	848.620	0.17	0.0002
4.3				0.11	0.0001

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

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	2500.520	2569.480		
50				-0.60	0.0002
40				0.10	0.0000
30				-0.27	0.0001
10				0.37	0.0001
0				-0.34	0.0001
-10				0.42	0.0002
-20				0.26	0.0001
-30				-0.40	0.0002

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	2500.520	2569.480	0.23	0.0001
4.3				-0.29	0.0001

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

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	699.460	715.540		
50				0.14	0.0002
40				0.29	0.0004
30				-0.34	0.0005
10				0.10	0.0001
0				-0.33	0.0005
-10				-0.33	0.0005
-20				-0.30	0.0004
-30				-0.23	0.0003

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	699.460	715.540	-0.16	0.0002
4.3				-0.09	0.0001

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

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	777.470	786.530		
50				-0.03	0.0000
40				-0.16	0.0002
30				-0.23	0.0003
10				-0.49	0.0006
0				-0.79	0.0010
-10				-0.10	0.0001
-20				-0.16	0.0002
-30				0.46	0.0006

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	777.470	786.530	-0.06	0.0001
4.3				-0.34	0.0004

LTE band 14, 10MHz bandwidth QPSK(worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	788.450	797.550		
50				-0.07	0.0001
40				0.10	0.0001
30				0.37	0.0005
10				-0.11	0.0001
0				-0.33	0.0004
-10				0.16	0.0002
-20				-0.20	0.0003
-30				0.09	0.0001

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	788.450	797.550	0.26	0.0003
4.3				0.01	0.0000

LTE band 25, 20MHz bandwidth QPSK(worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1850.780	1914.120		
50				-1.40	0.0007
40				-1.26	0.0007
30				-0.62	0.0003
10				-0.52	0.0003
0				-0.13	0.0001
-10				-0.97	0.0005
-20				0.13	0.0001
-30				-0.06	0.0000

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	1850.780	1914.120	-0.89	0.0005
4.3				-0.82	0.0004

LTE band 26_Part22, 15MHz bandwidth QPSK(worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	824.610	848.380		
50				-0.52	0.0006
40				-0.04	0.0000
30				-0.10	0.0001
10				0.29	0.0003
0				-0.24	0.0003
-10				0.39	0.0005
-20				-0.63	0.0008
-30				-0.01	0.0000

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	824.610	848.380	-0.14	0.0002
4.3				0.00	0.0000

LTE band 26_Part90, 10MHz bandwidth QPSK(worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	814.430	823.570		
50				0.99	0.0012
40				0.95	0.0012
30				0.13	0.0002
10				0.23	0.0003
0				1.16	0.0014
-10				1.20	0.0015
-20				0.47	0.0006
-30				-0.60	0.0007

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	814.430	823.570	0.25	0.0003
4.3				0.75	0.0009

LTE band 30, 10MHz bandwidth QPSK(worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	2305.430	2314.560		
50				0.33	0.0001
40				0.07	0.0000
30				0.70	0.0003
10				0.29	0.0001
0				0.57	0.0002
-10				1.47	0.0006
-20				1.20	0.0005
-30				1.22	0.0005

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	2305.430	2314.560	0.37	0.0002
4.3				-0.29	0.0001

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

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	2570.540	2619.480		
50				-0.58	0.0002
40				-0.77	0.0003
30				-0.46	0.0002
10				-0.19	0.0001
0				-0.10	0.0000
-10				-0.01	0.0000
-20				0.29	0.0001
-30				-0.86	0.0003

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	2570.540	2619.480	-0.82	0.0003
4.3				0.15	0.0001

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

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	2496.440	2689.520		
50				-0.51	0.0002
40				0.48	0.0002
30				0.54	0.0002
10				0.15	0.0001
0				0.09	0.0000
-10				0.18	0.0001
-20				0.80	0.0003
-30				-0.14	0.0001

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	2496.440	2689.520	-0.89	0.0003
4.3				0.26	0.0001

LTE band 42_Part27, 20MHz bandwidth QPSK(worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	3450.460	3549.540		
50				-0.24	0.0001
40				0.32	0.0001
30				-0.07	0.0000
10				-0.39	0.0001
0				0.21	0.0001
-10				-0.77	0.0002
-20				0.08	0.0000
-30				0.02	0.0000

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	3450.460	3549.540	-0.81	0.0002
4.3				0.15	0.0000

LTE band 42_Part96, 20MHz bandwidth QPSK(worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	3550.937	3599.063		
50				-0.31	0.0001
40				0.33	0.0001
30				0.02	0.0000
10				0.28	0.0001
0				-0.41	0.0001
-10				0.45	0.0001
-20				1.06	0.0003
-30				1.28	0.0004

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	3550.937	3599.063	-0.44	0.0001
4.3				0.18	0.0000

LTE band 43_Part96, 20MHz bandwidth QPSK(worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	3600.946	3699.054		
50				0.18	0.0000
40				0.19	0.0001
30				1.38	0.0004
10				1.89	0.0005
0				1.96	0.0005
-10				1.60	0.0004
-20				0.70	0.0002
-30				0.75	0.0002

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	3600.946	3699.054	1.16	0.0003
4.3				2.18	0.0006

LTE band 48, 20MHz bandwidth QPSK(worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	3550.946	3699.073		
50				-0.86	0.0002
40				-0.90	0.0002
30				0.07	0.0000
10				-0.74	0.0002
0				-0.24	0.0001
-10				-1.10	0.0003
-20				-0.65	0.0002
-30				-0.86	0.0002

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	3550.946	3699.073	-0.77	0.0002
4.3				-1.88	0.0005

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

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1710.880	1779.110		
50				0.57	0.0003
40				-0.27	0.0002
30				-0.09	0.0000
10				0.23	0.0001
0				0.46	0.0003
-10				0.41	0.0002
-20				0.76	0.0004
-30				-1.63	0.0009

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	1710.880	1779.110	-0.52	0.0003
4.3				-0.59	0.0003

LTE band 71, 20MHz bandwidth QPSK(worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	663.880	697.110		
50				0.40	0.0006
40				-0.07	0.0001
30				0.44	0.0007
10				-0.32	0.0005
0				0.57	0.0008
-10				-0.33	0.0005
-20				-0.62	0.0009
-30				0.23	0.0003

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.65	20	663.880	697.110	-0.33	0.0005
4.3				-0.06	0.0001

Expanded measurement uncertainty is 10Hz, k = 2

A.4 OCCUPIED BANDWIDTH

A.4.1 Occupied Bandwidth Results

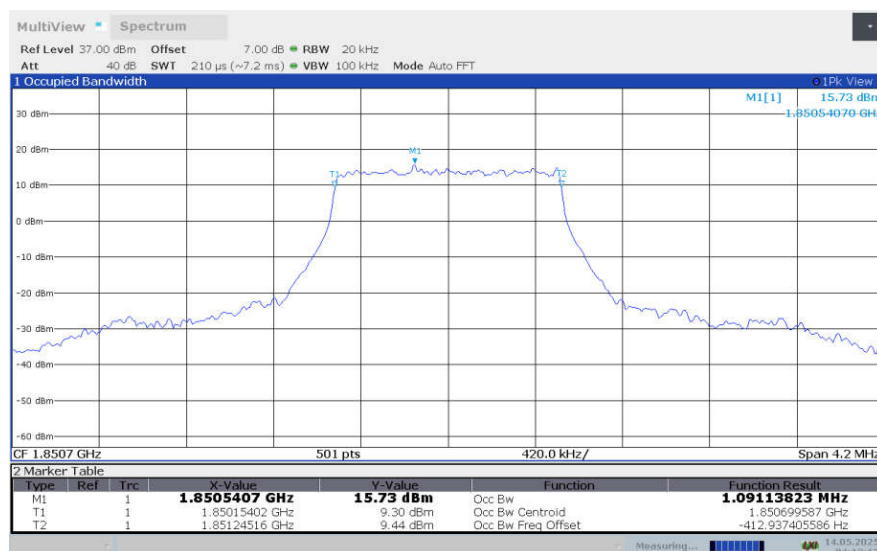
Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the US Cellular/PCS frequency bands. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the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

- 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 (i.e., two to five times the OBW).
- The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
- Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.
- Set the detection mode to peak, and the trace mode to max hold.
- Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

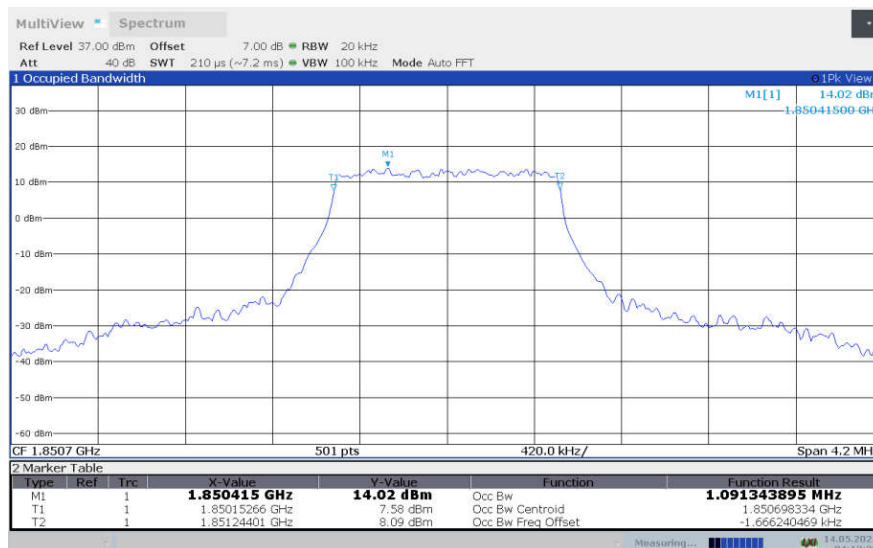
LTE band 2,1.4MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)			
	QPSK	16QAM	64QAM	256QAM
1850.7	1.091	1.091	1.096	1.095
1880	1.102	1.099	1.095	1.090
1909.3	1.090	1.097	1.091	1.091

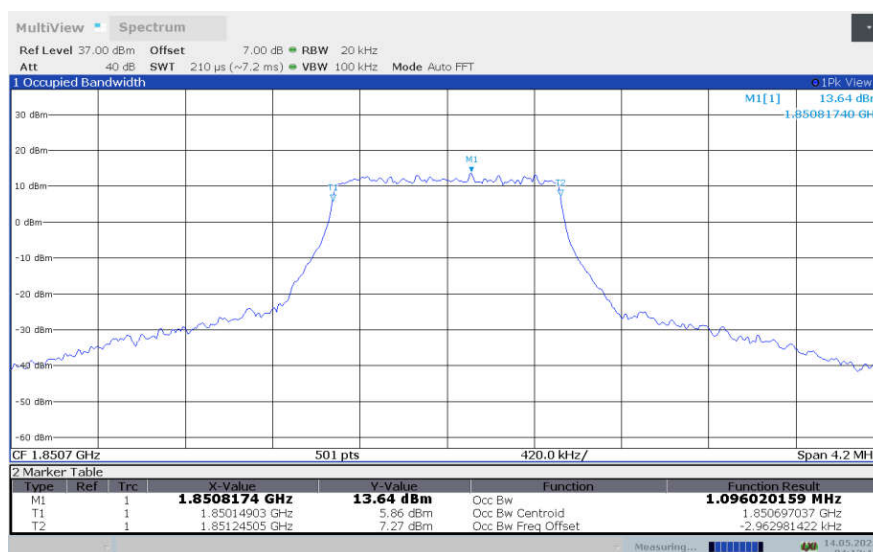
LTE band 2 , 1.4MHz Bandwidth,LOW,QPSK (99% BW)



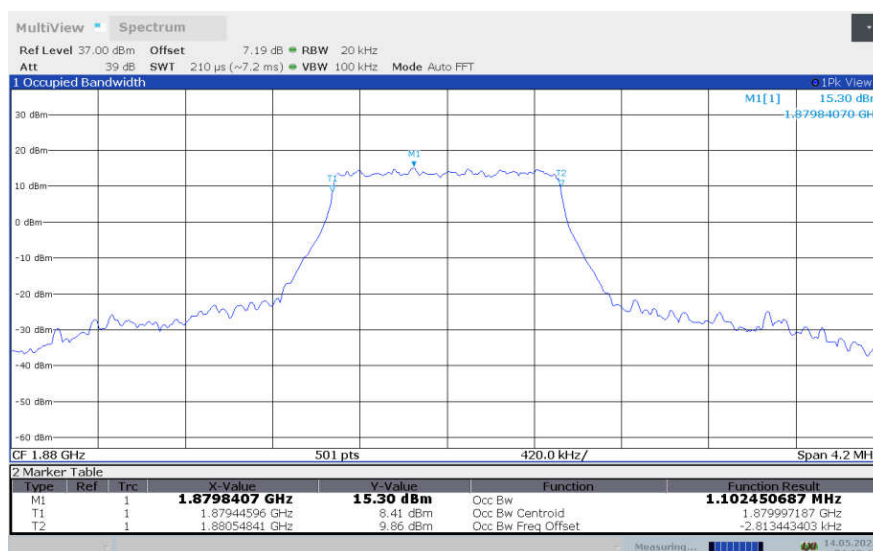
LTE band 2 , 1.4MHz Bandwidth,LOW,16QAM (99% BW)



LTE band 2 , 1.4MHz Bandwidth,LOW,64QAM (99% BW)



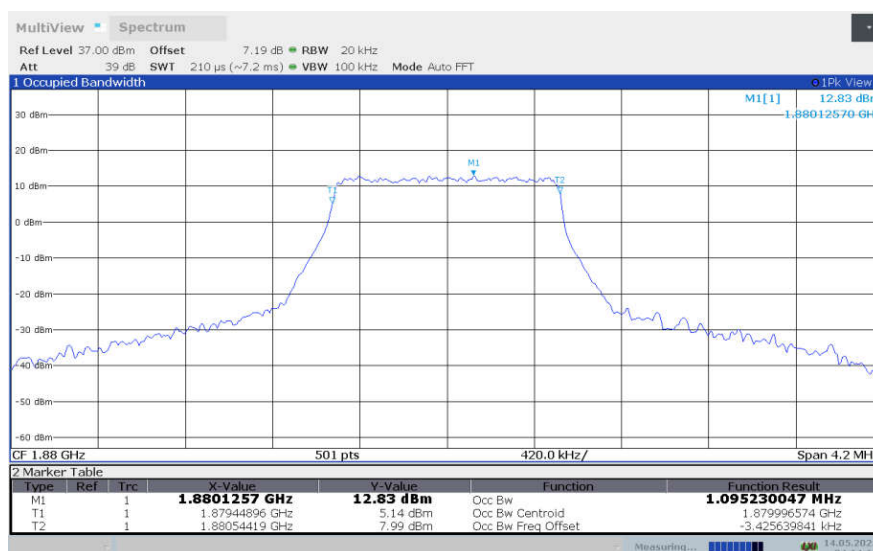
LTE band 2 , 1.4MHz Bandwidth,MID,QPSK (99% BW)



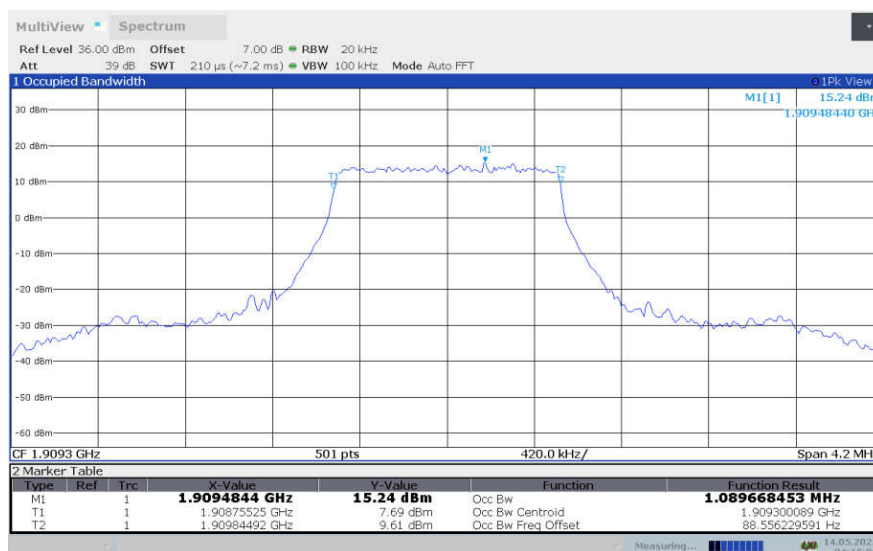
LTE band 2 , 1.4MHz Bandwidth,MID,16QAM (99% BW)



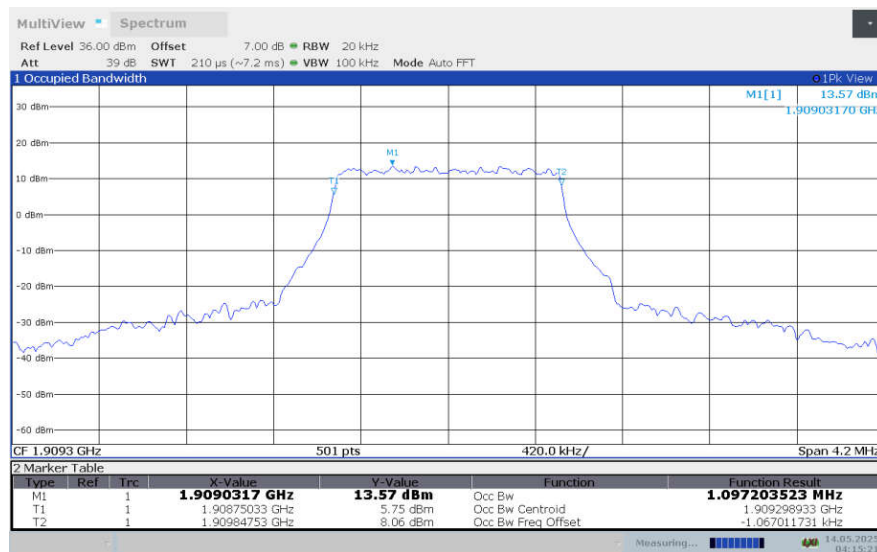
LTE band 2 , 1.4MHz Bandwidth,MID,64QAM (99% BW)



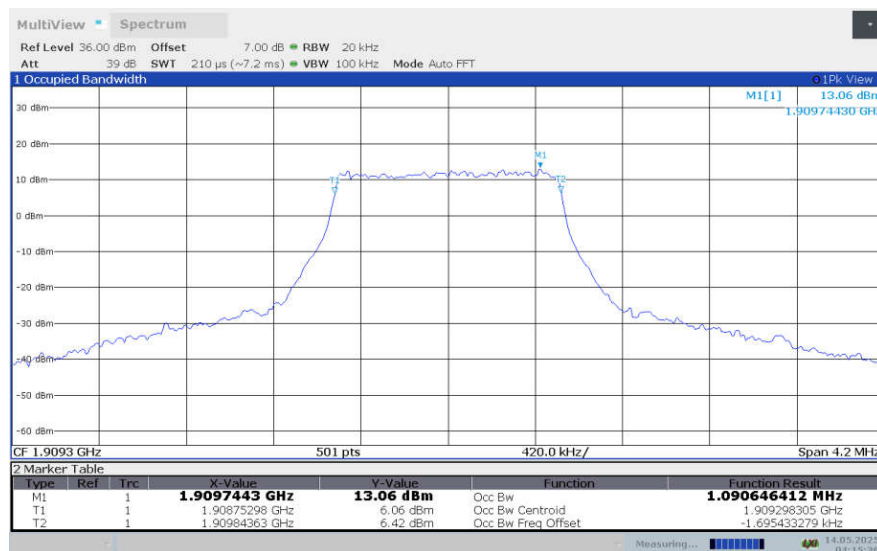
LTE band 2 , 1.4MHz Bandwidth,HIGH,QPSK (99% BW)



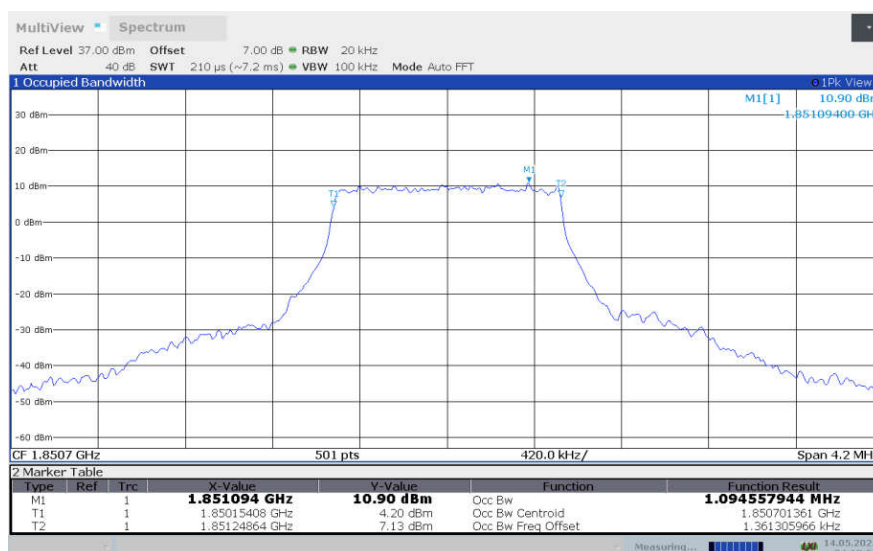
LTE band 2 , 1.4MHz Bandwidth,HIGH,16QAM (99% BW)



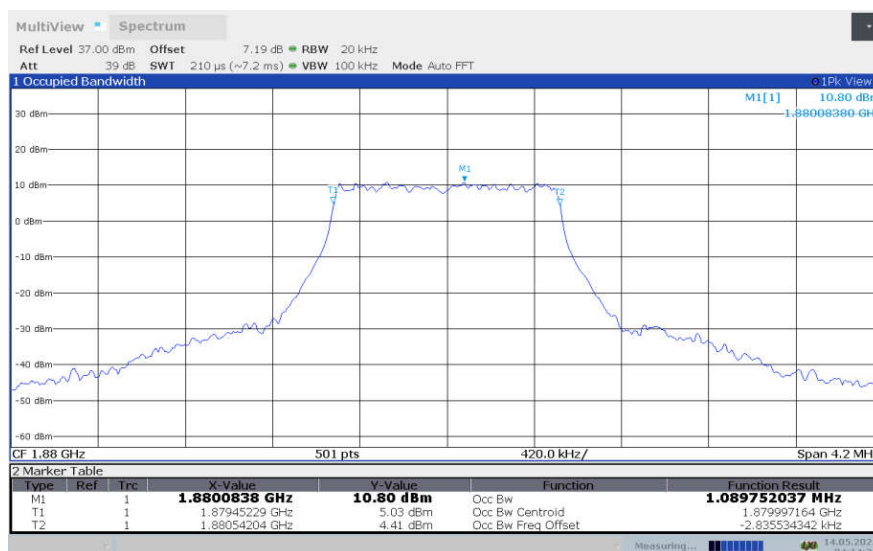
LTE band 2 , 1.4MHz Bandwidth,HIGH,64QAM (99% BW)



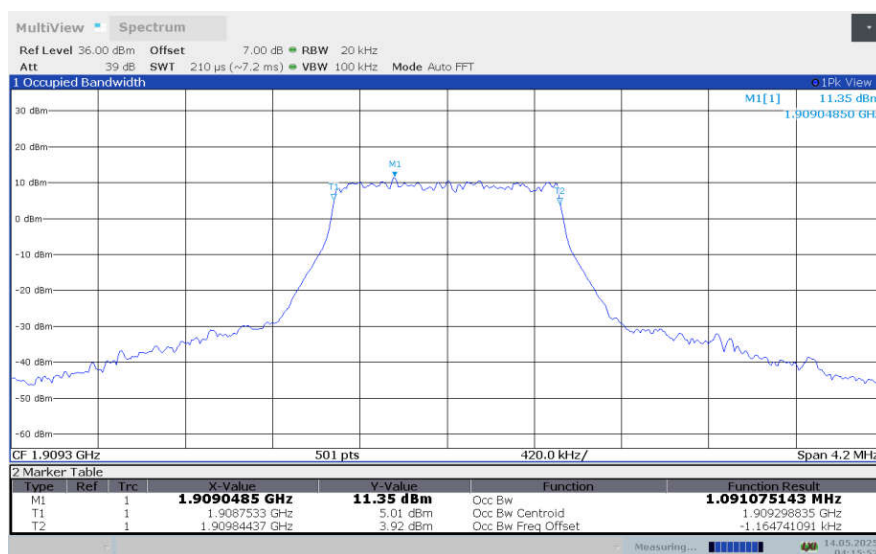
LTE band 2 , 1.4MHz Bandwidth,LOW,256QAM (99% BW)



LTE band 2 , 1.4MHz Bandwidth,MID,256QAM (99% BW)



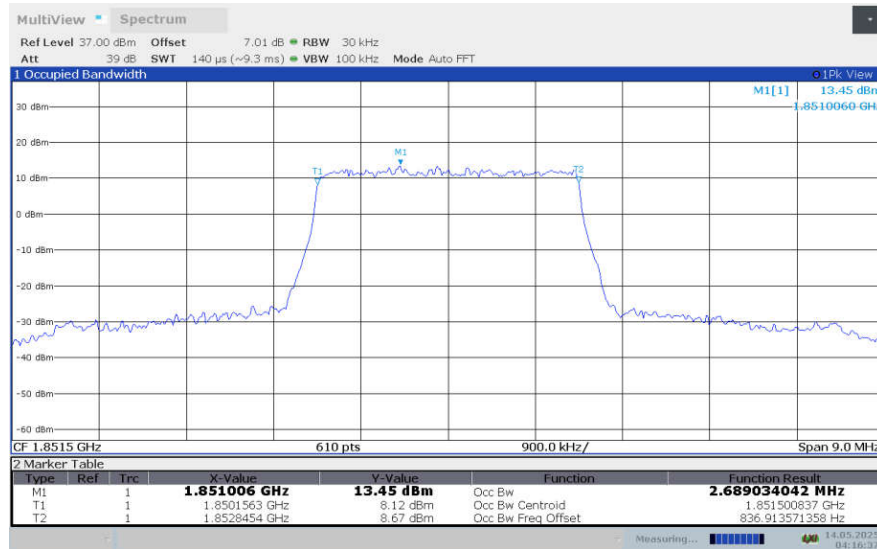
LTE band 2 , 1.4MHz Bandwidth,HIGH,256QAM (99% BW)



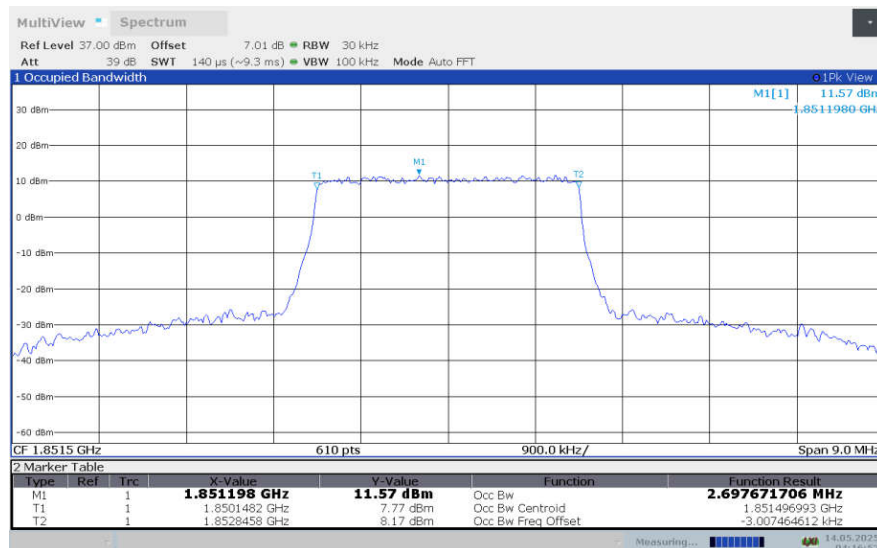
LTE band 2,3MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)			
	QPSK	16QAM	64QAM	256QAM
1851.5	2.689	2.698	2.691	2.692
1880	2.698	2.697	2.701	2.701
1908.5	2.694	2.698	2.697	2.698

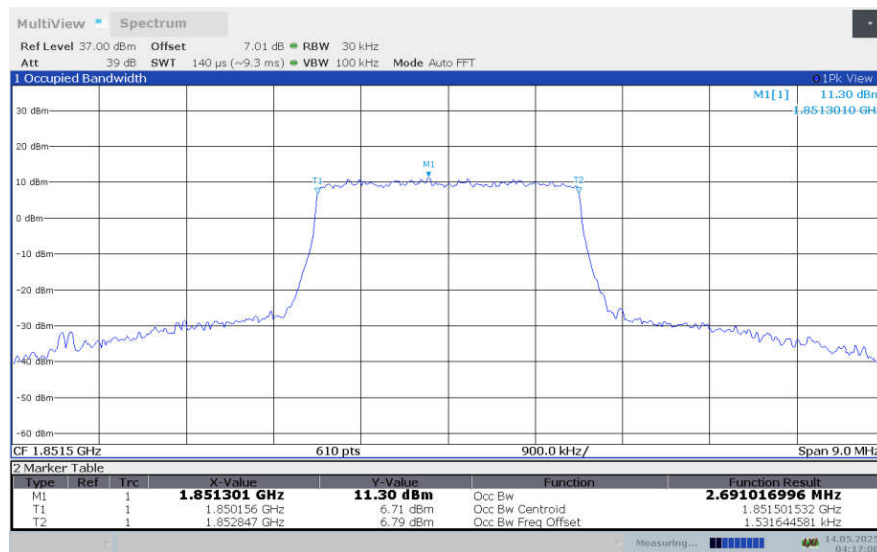
LTE band 2 , 3MHz Bandwidth,LOW,QPSK (99% BW)



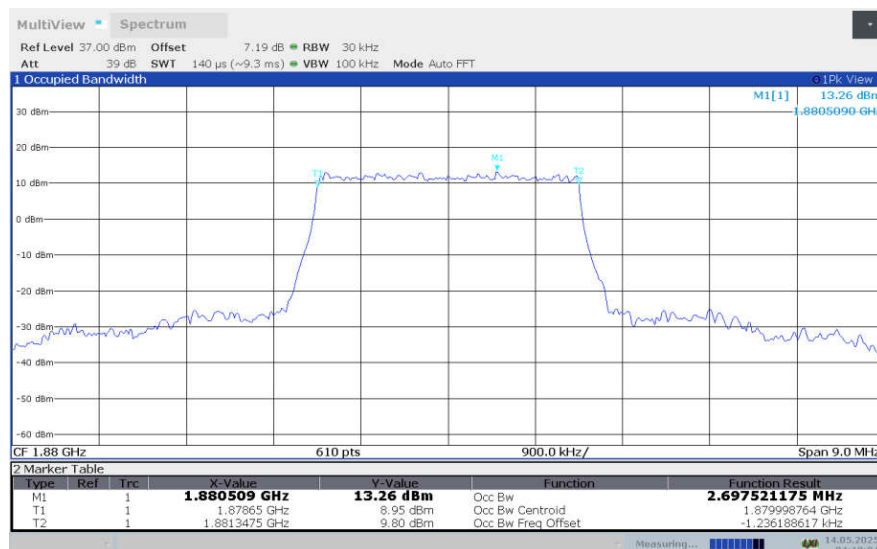
LTE band 2 , 3MHz Bandwidth,LOW,16QAM (99% BW)



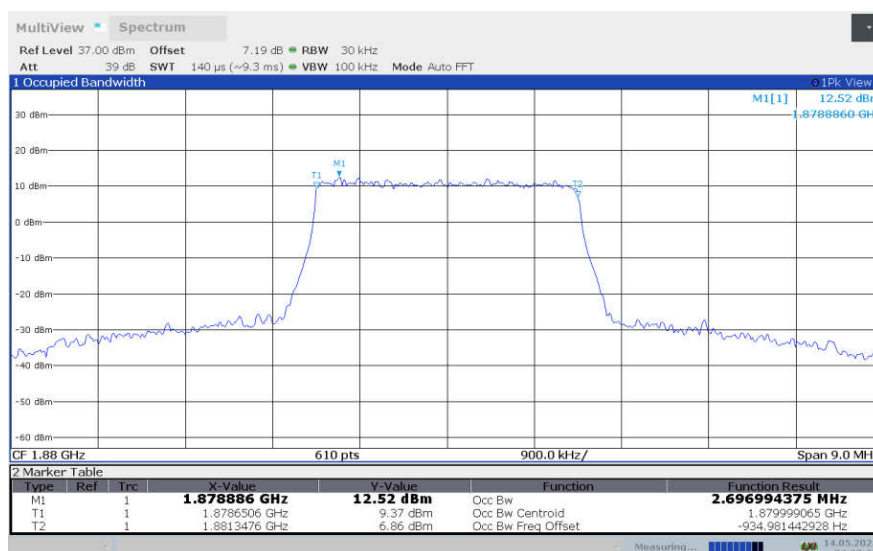
LTE band 2 , 3MHz Bandwidth,LOW,64QAM (99% BW)



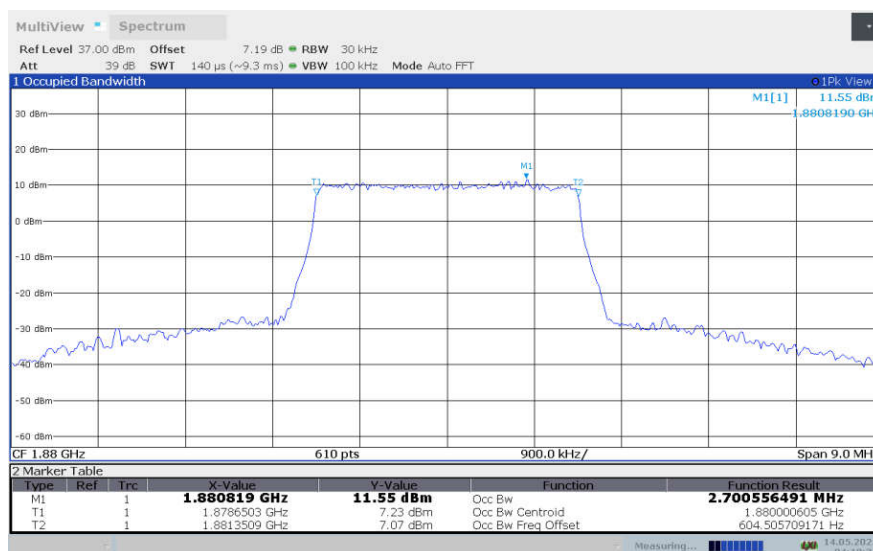
LTE band 2 , 3MHz Bandwidth,MID,QPSK (99% BW)



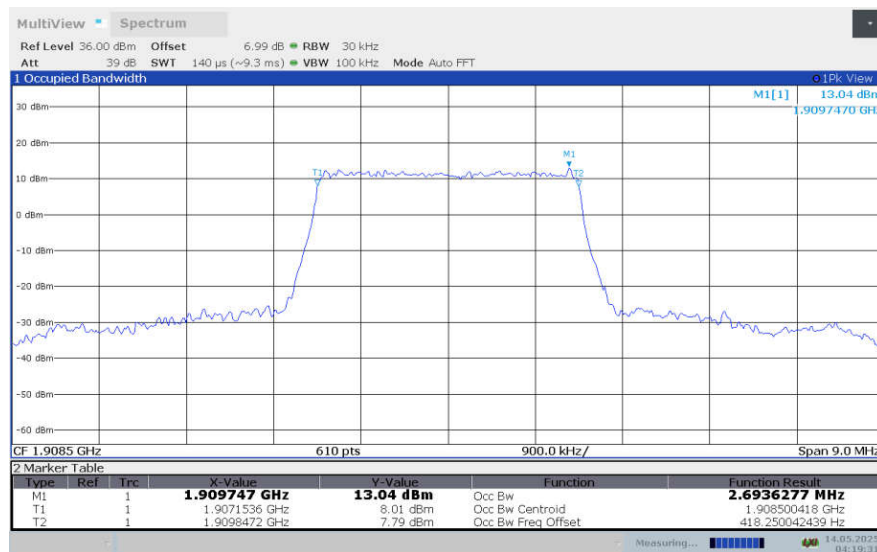
LTE band 2 , 3MHz Bandwidth,MID,16QAM (99% BW)



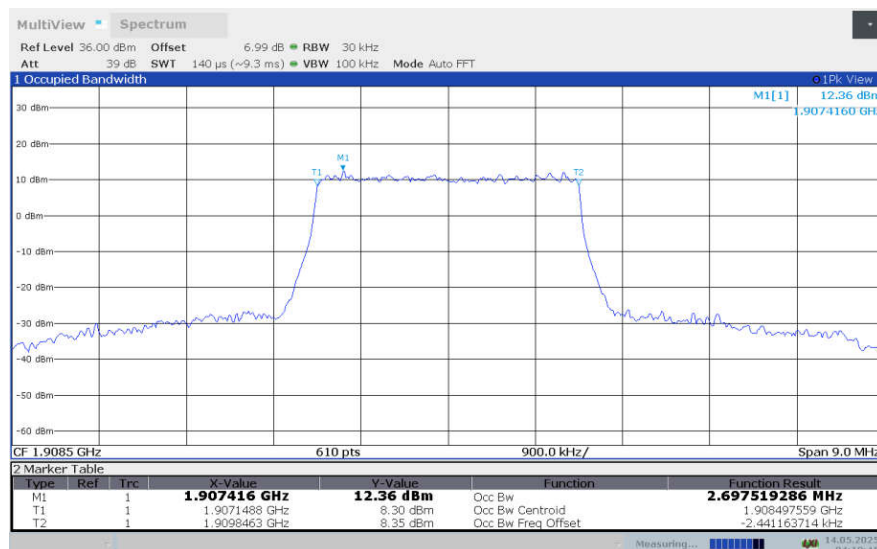
LTE band 2 , 3MHz Bandwidth,MID,64QAM (99% BW)



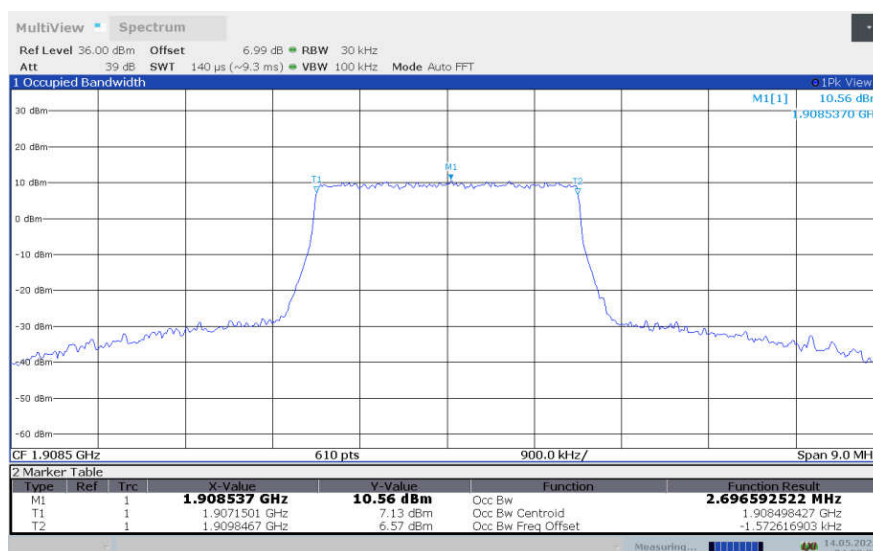
LTE band 2 , 3MHz Bandwidth,HIGH,QPSK (99% BW)



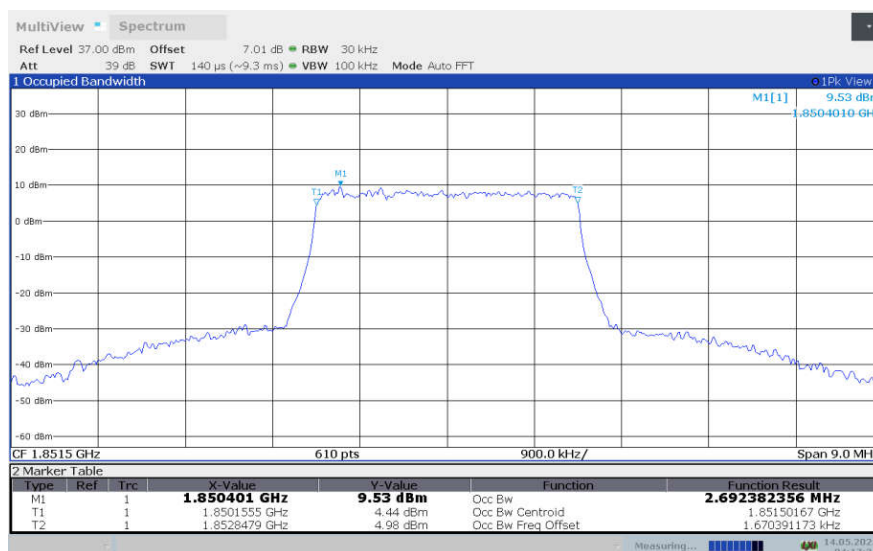
LTE band 2 , 3MHz Bandwidth,HIGH,16QAM (99% BW)



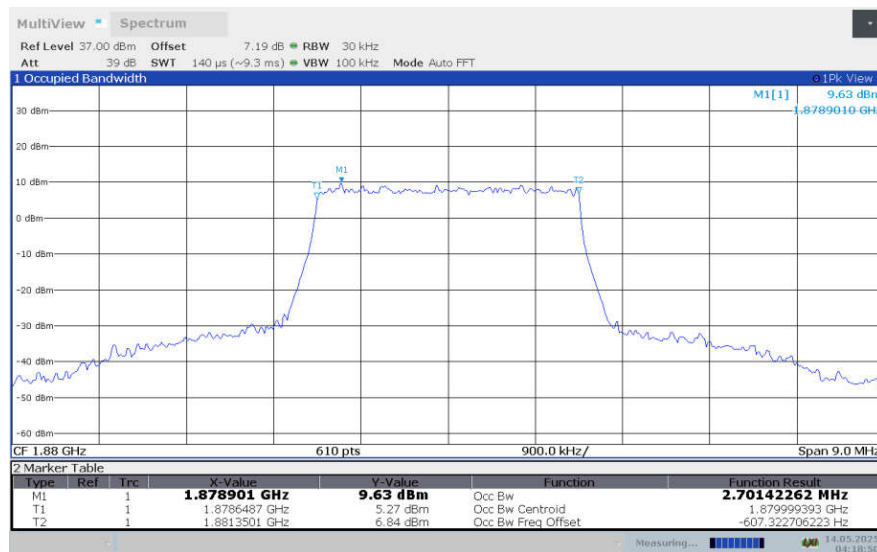
LTE band 2 , 3MHz Bandwidth,HIGH,64QAM (99% BW)



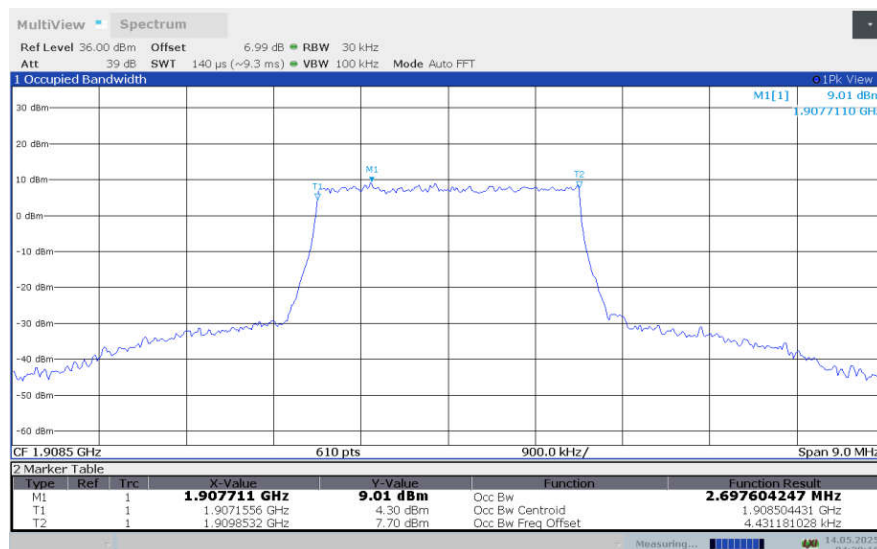
LTE band 2 , 3MHz Bandwidth,LOW,256QAM (99% BW)



LTE band 2 , 3MHz Bandwidth,MID,256QAM (99% BW)



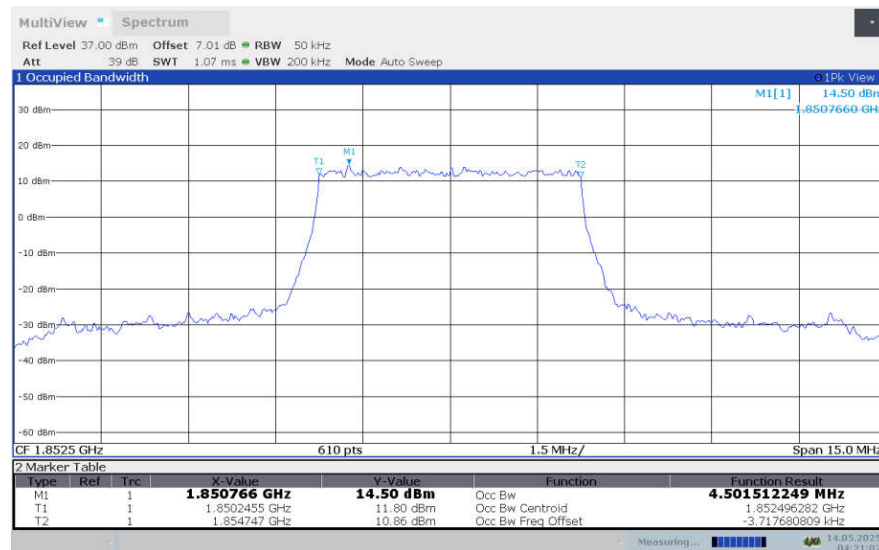
LTE band 2 , 3MHz Bandwidth,HIGH,256QAM (99% BW)



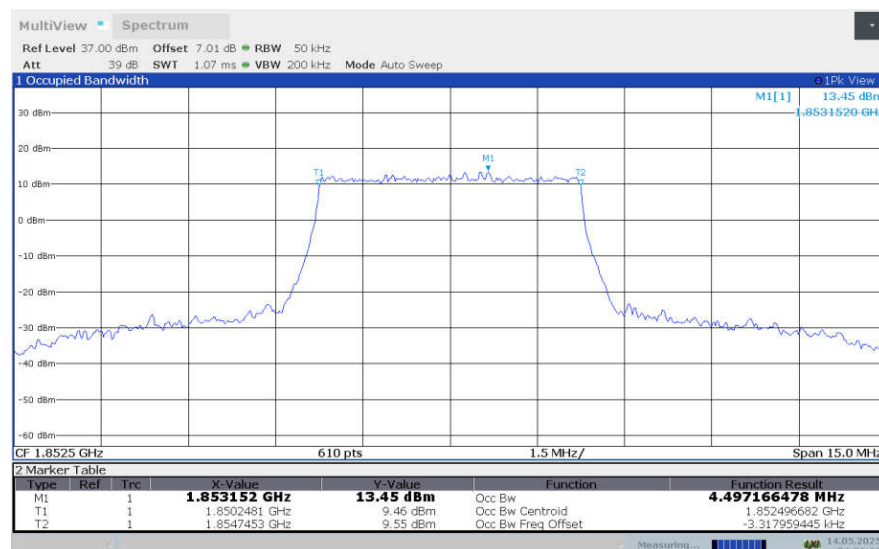
LTE band 2,5MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)			
	QPSK	16QAM	64QAM	256QAM
1852.5	4.502	4.497	4.497	4.504
1880	4.492	4.503	4.500	4.499
1907.5	4.493	4.500	4.505	4.498

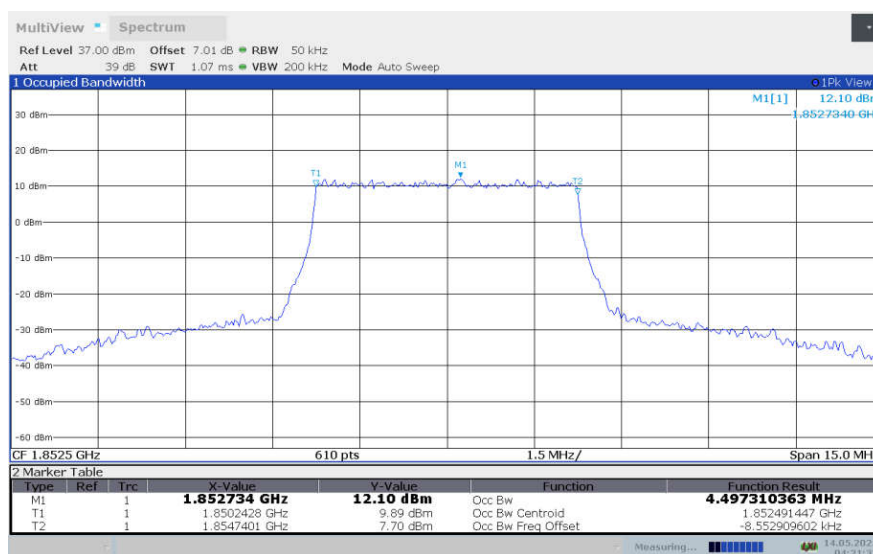
LTE band 2 , 5MHz Bandwidth,LOW,QPSK (99% BW)



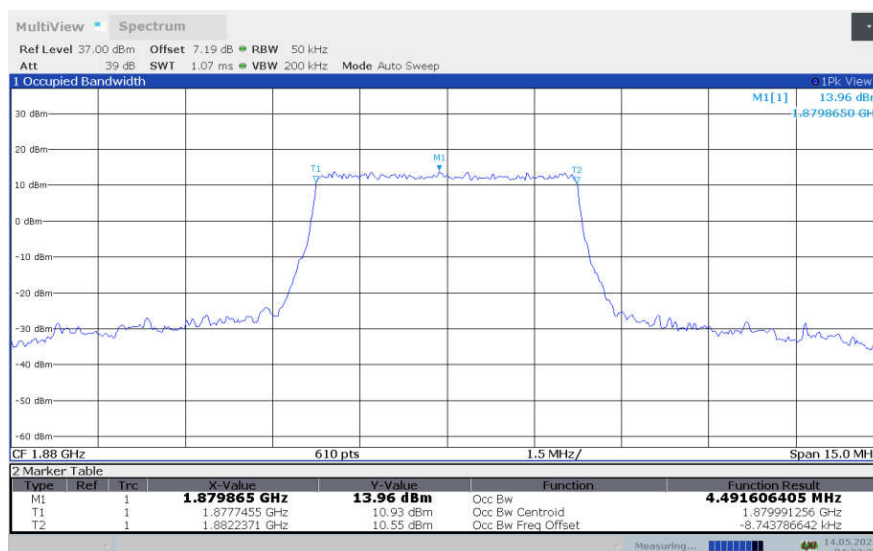
LTE band 2 , 5MHz Bandwidth,LOW,16QAM (99% BW)



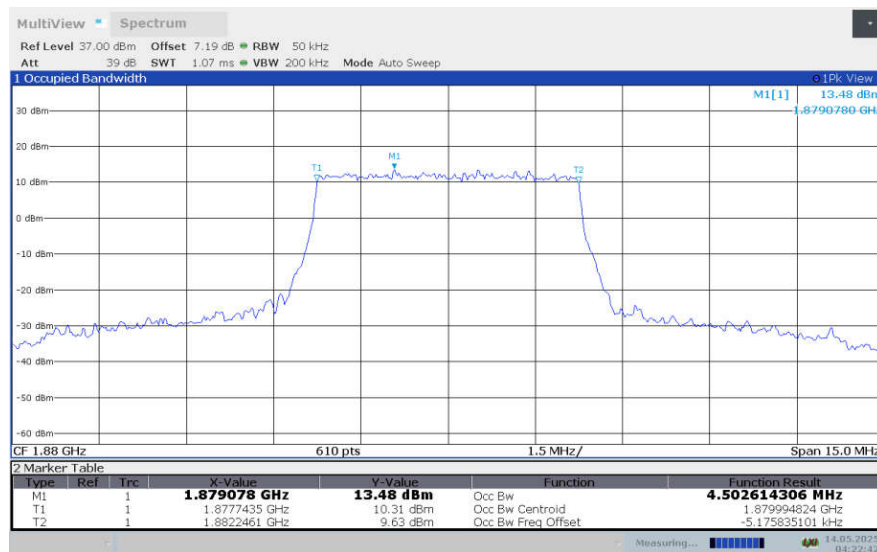
LTE band 2 , 5MHz Bandwidth,LOW,64QAM (99% BW)



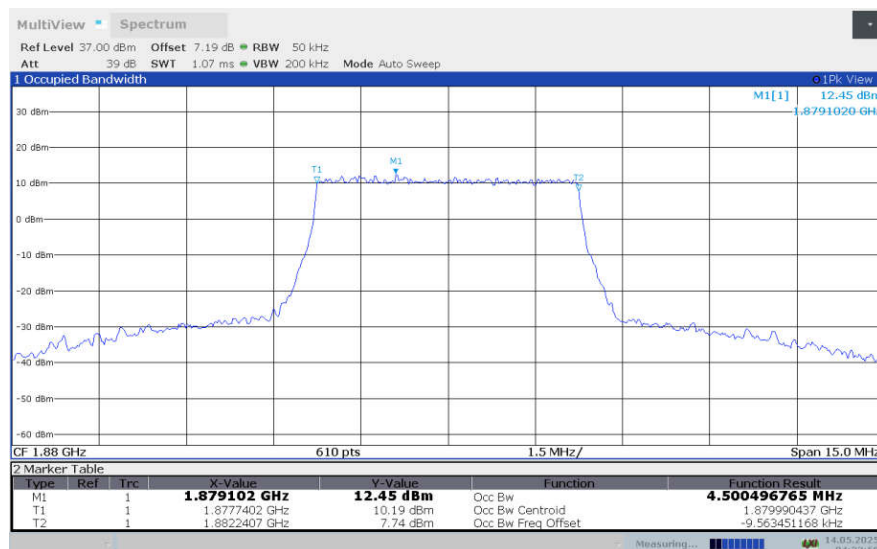
LTE band 2 , 5MHz Bandwidth,MID,QPSK (99% BW)



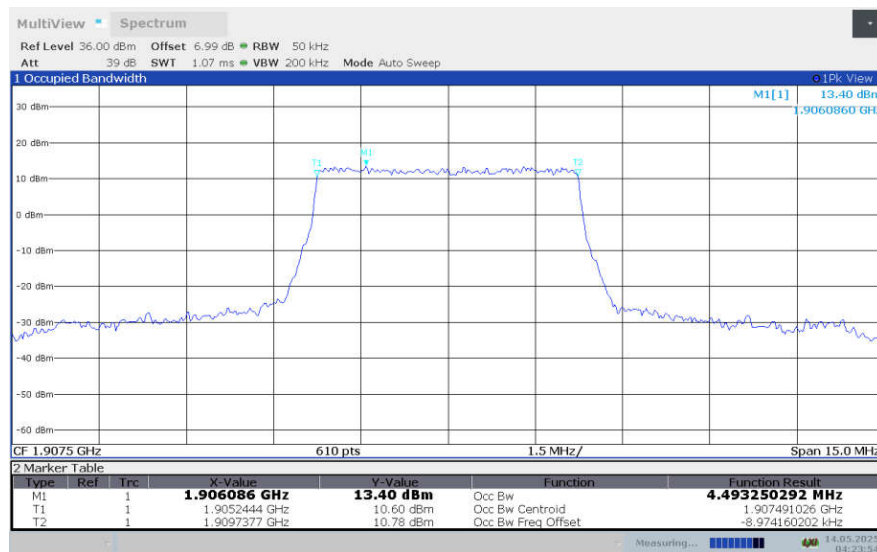
LTE band 2 , 5MHz Bandwidth,MID,16QAM (99% BW)



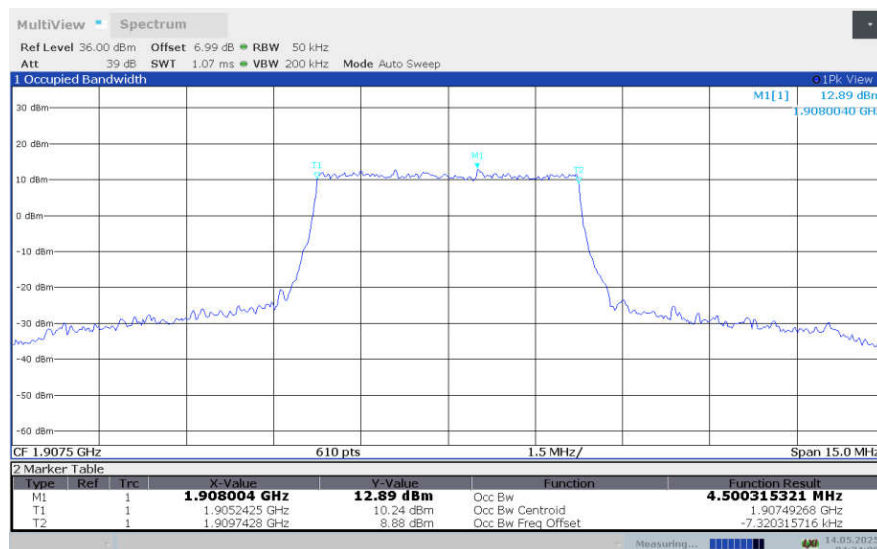
LTE band 2 , 5MHz Bandwidth,MID,64QAM (99% BW)



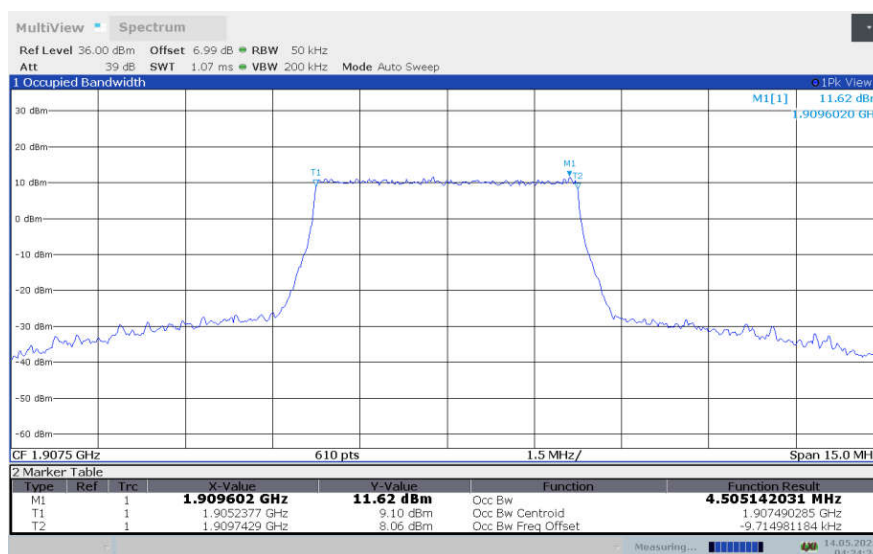
LTE band 2 , 5MHz Bandwidth,HIGH,QPSK (99% BW)



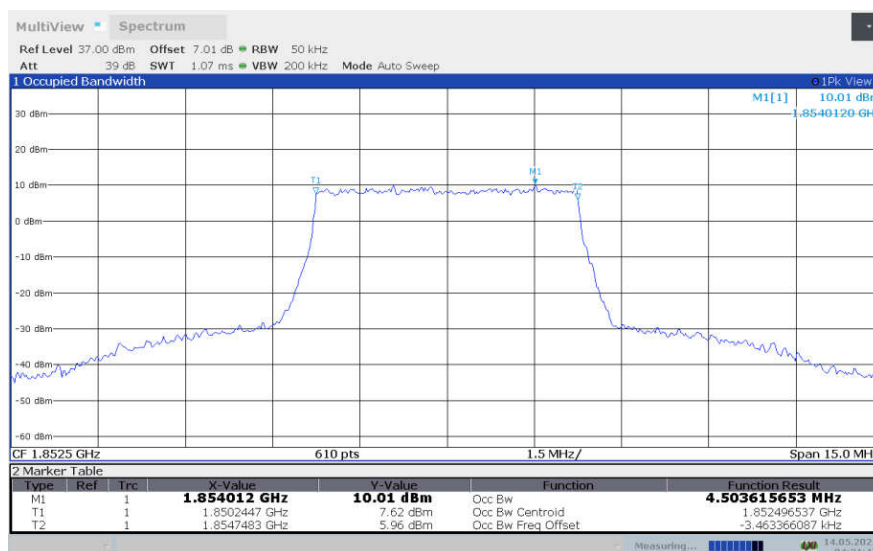
LTE band 2 , 5MHz Bandwidth,HIGH,16QAM (99% BW)



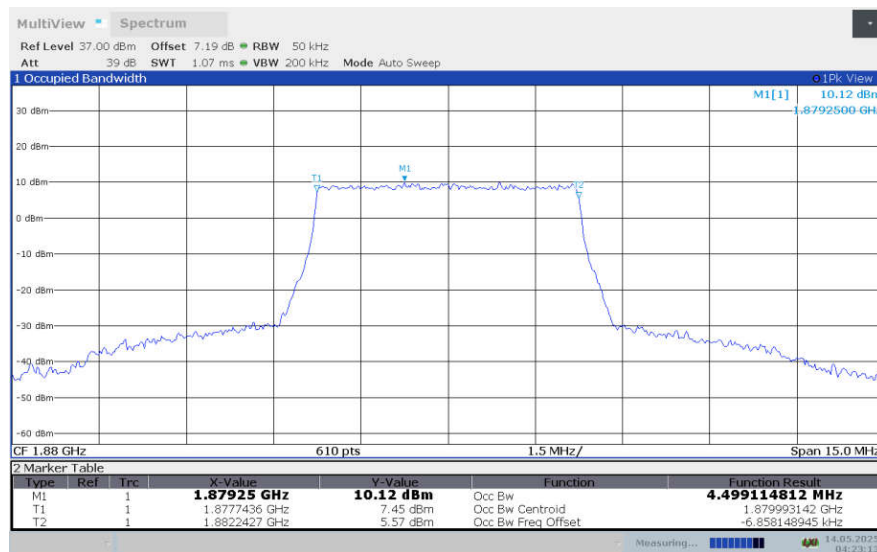
LTE band 2 , 5MHz Bandwidth,HIGH,64QAM (99% BW)



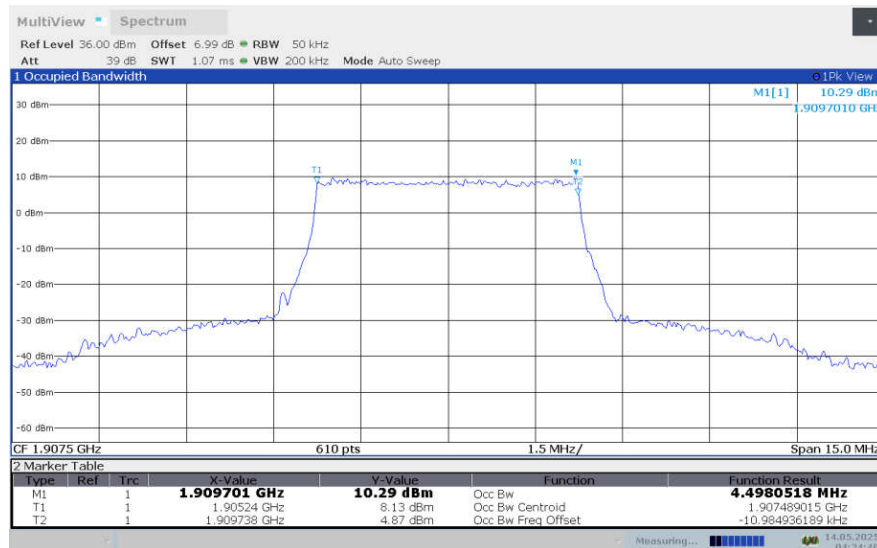
LTE band 2 , 5MHz Bandwidth,LOW,256QAM (99% BW)



LTE band 2 , 5MHz Bandwidth,MID,256QAM (99% BW)



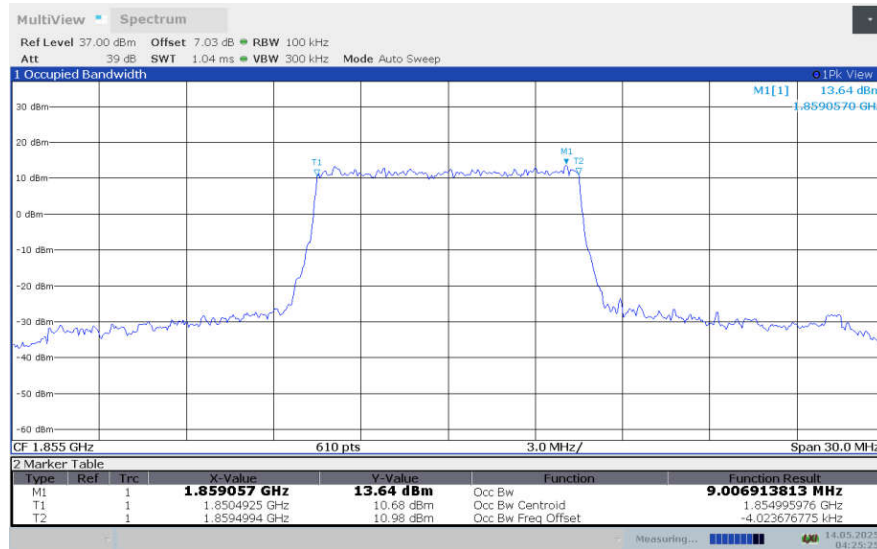
LTE band 2 , 5MHz Bandwidth,HIGH,256QAM (99% BW)



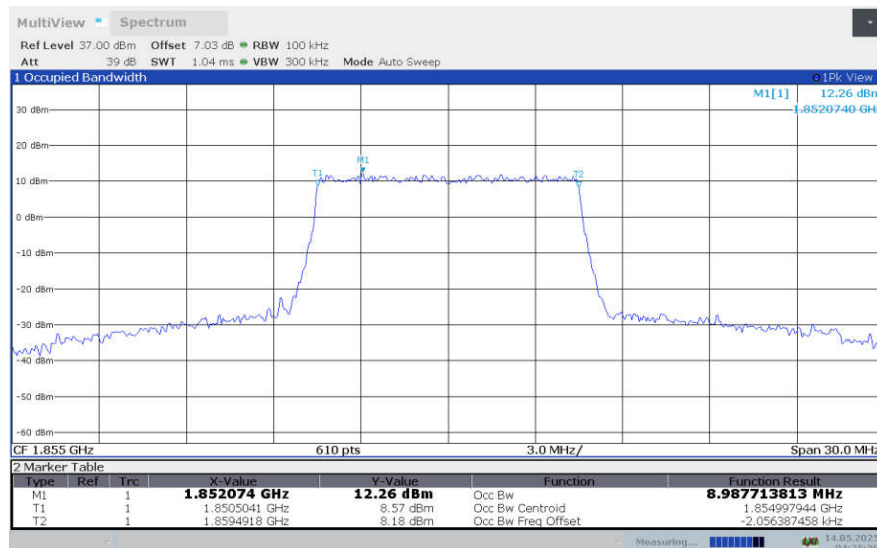
LTE band 2,10MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)			
	QPSK	16QAM	64QAM	256QAM
1855	9.007	8.988	8.967	9.000
1880	8.972	8.980	8.976	8.981
1905	8.988	8.979	8.992	9.002

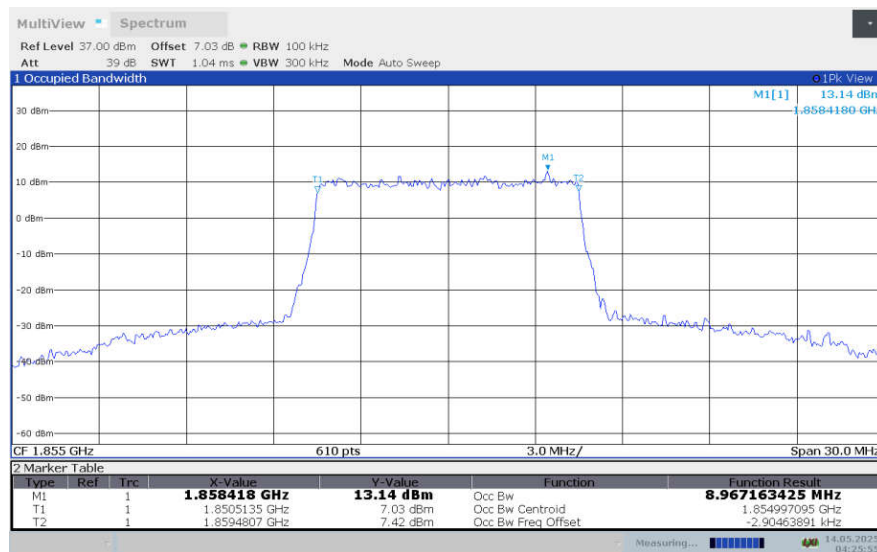
LTE band 2 , 10MHz Bandwidth,LOW,QPSK (99% BW)



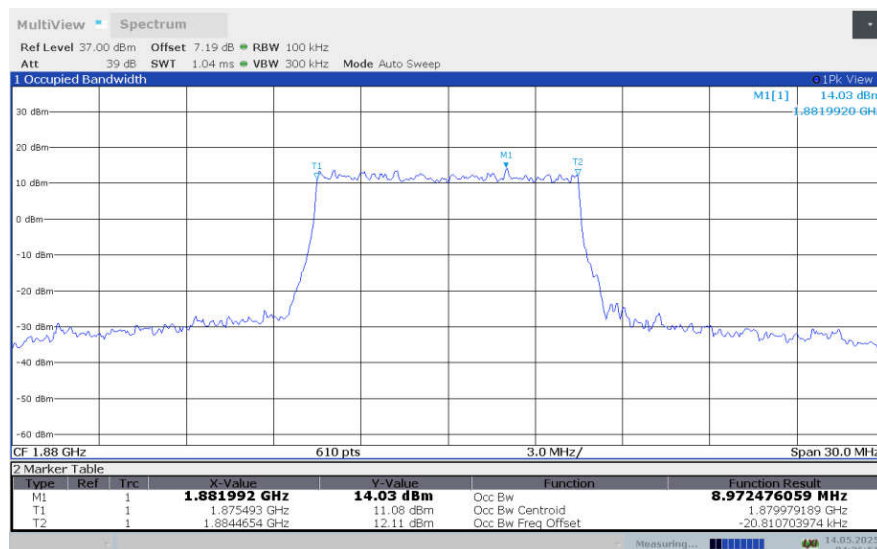
LTE band 2 , 10MHz Bandwidth,LOW,16QAM (99% BW)



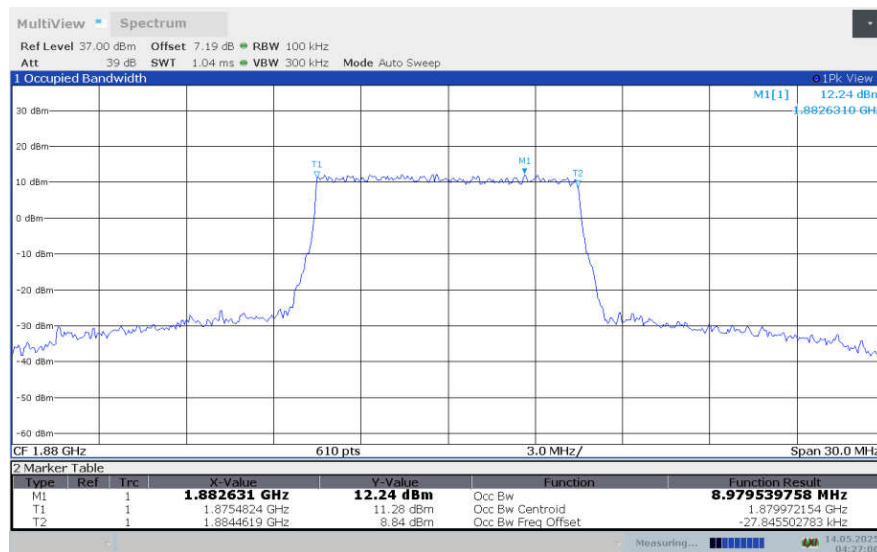
LTE band 2 , 10MHz Bandwidth,LOW,64QAM (99% BW)



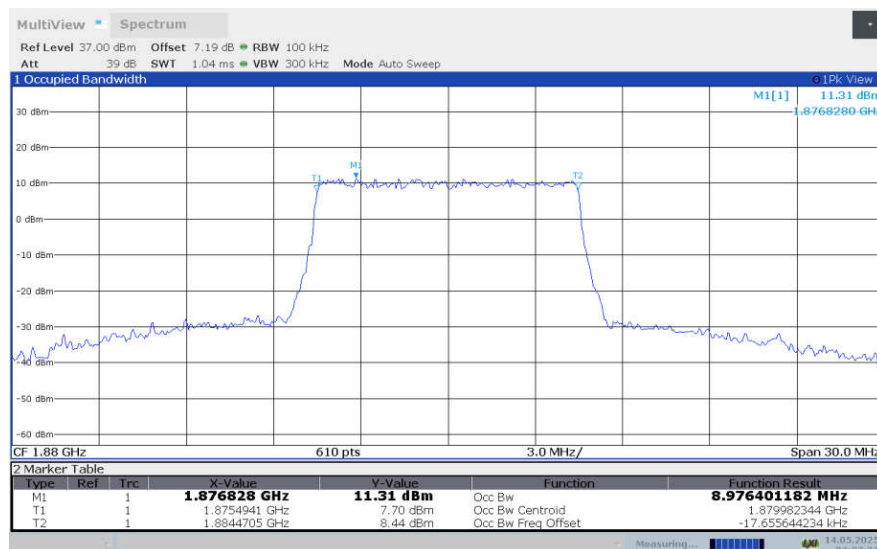
LTE band 2 , 10MHz Bandwidth,MID,QPSK (99% BW)



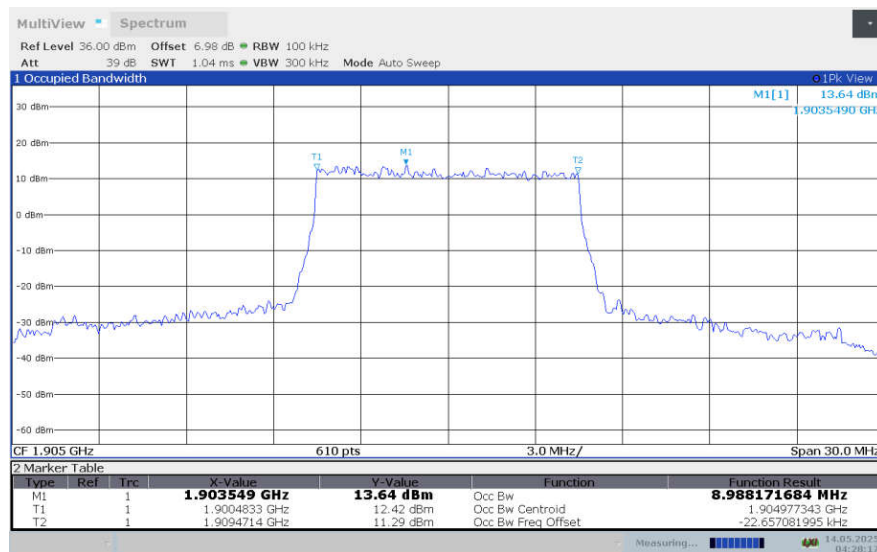
LTE band 2 , 10MHz Bandwidth,MID,16QAM (99% BW)



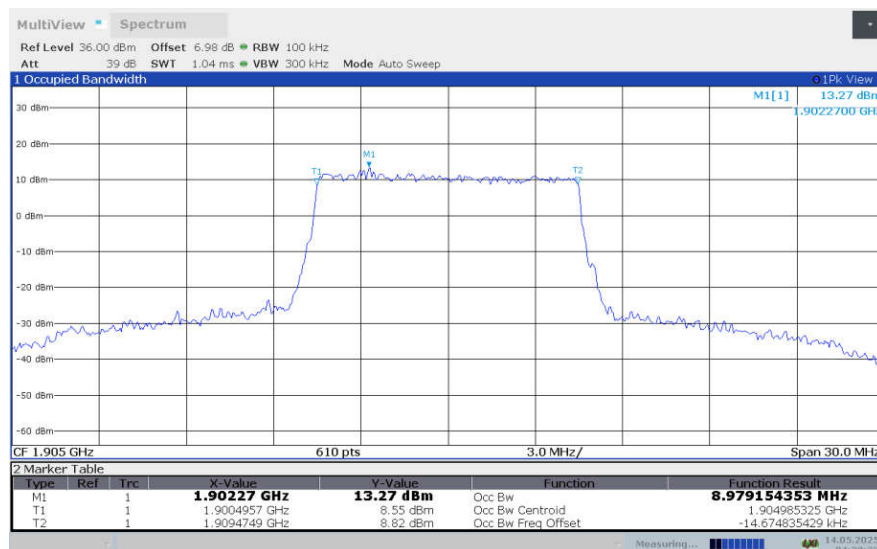
LTE band 2 , 10MHz Bandwidth,MID,64QAM (99% BW)



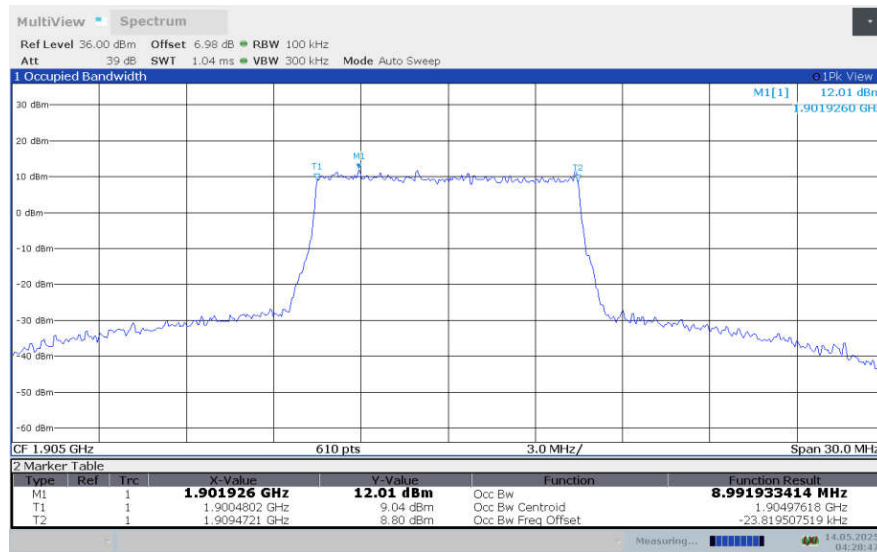
LTE band 2 , 10MHz Bandwidth,HIGH,QPSK (99% BW)



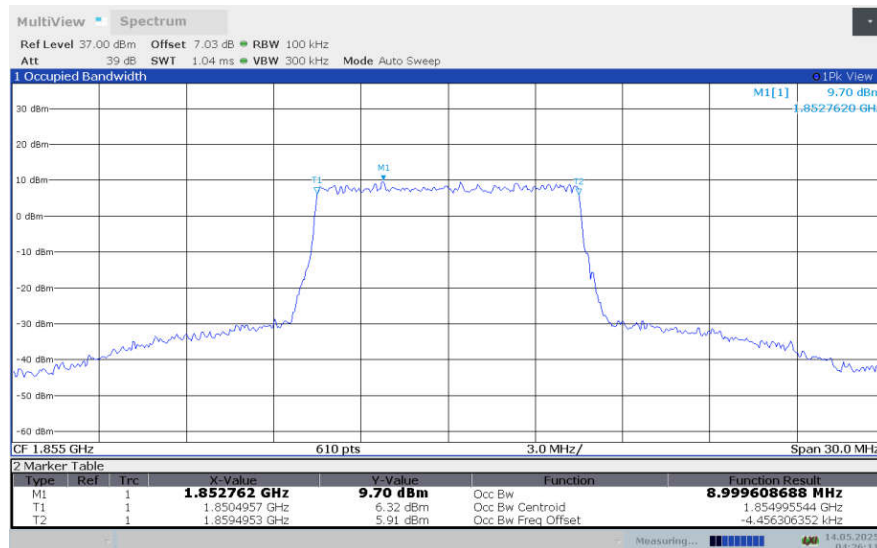
LTE band 2 , 10MHz Bandwidth,HIGH,16QAM (99% BW)



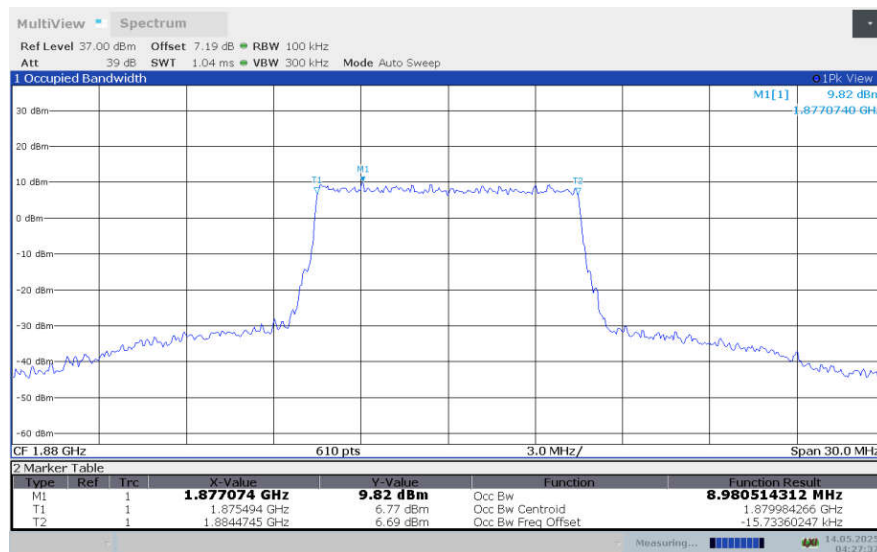
LTE band 2 , 10MHz Bandwidth,HIGH,64QAM (99% BW)



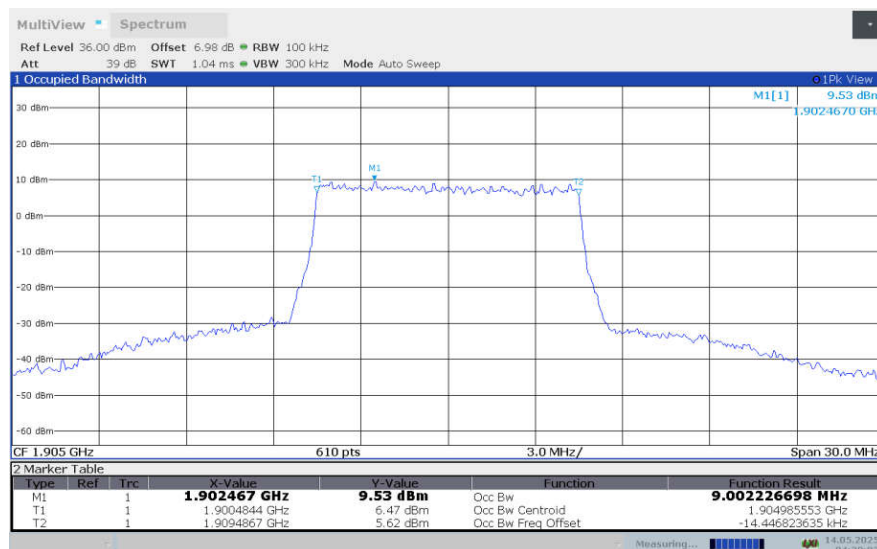
LTE band 2 , 10MHz Bandwidth,LOW,256QAM (99% BW)



LTE band 2 , 10MHz Bandwidth,MID,256QAM (99% BW)



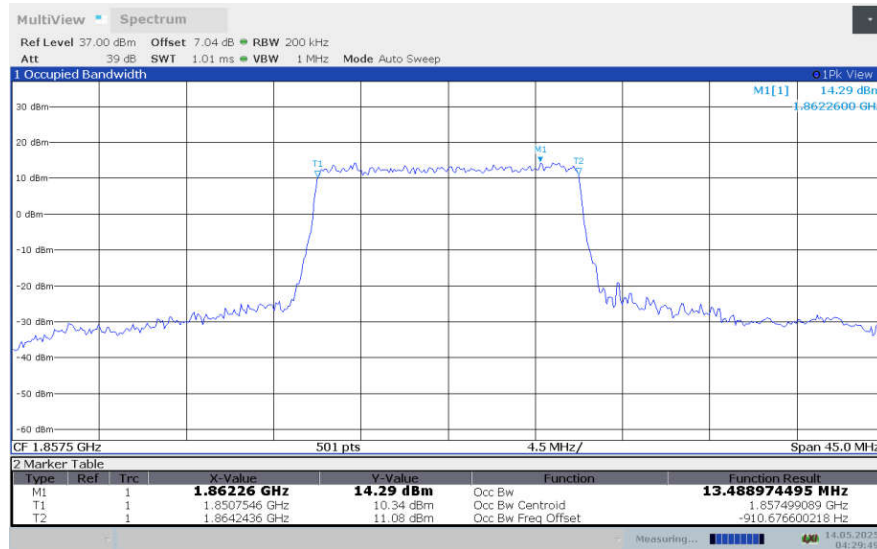
LTE band 2 , 10MHz Bandwidth,HIGH,256QAM (99% BW)



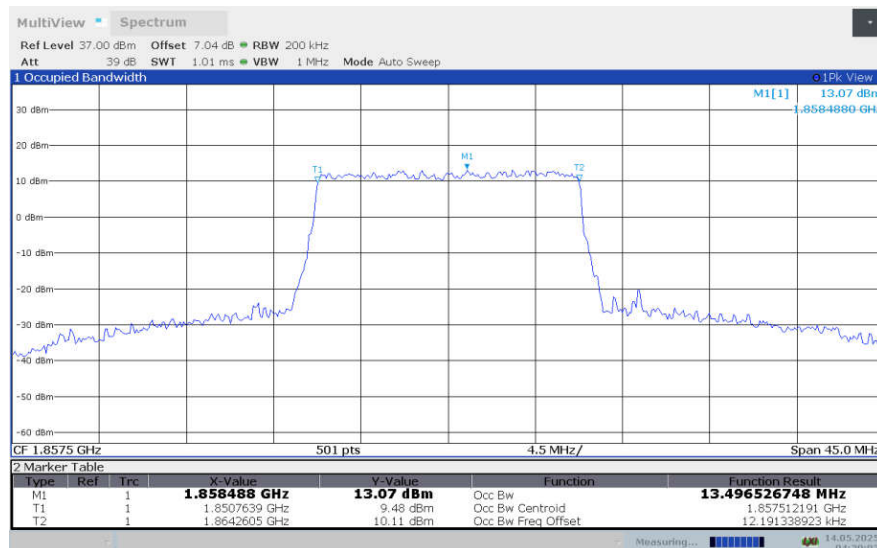
LTE band 2,15MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)			
	QPSK	16QAM	64QAM	256QAM
1857.5	13.489	13.497	13.511	13.474
1880	13.503	13.493	13.462	13.522
1902.5	13.481	13.530	13.503	13.492

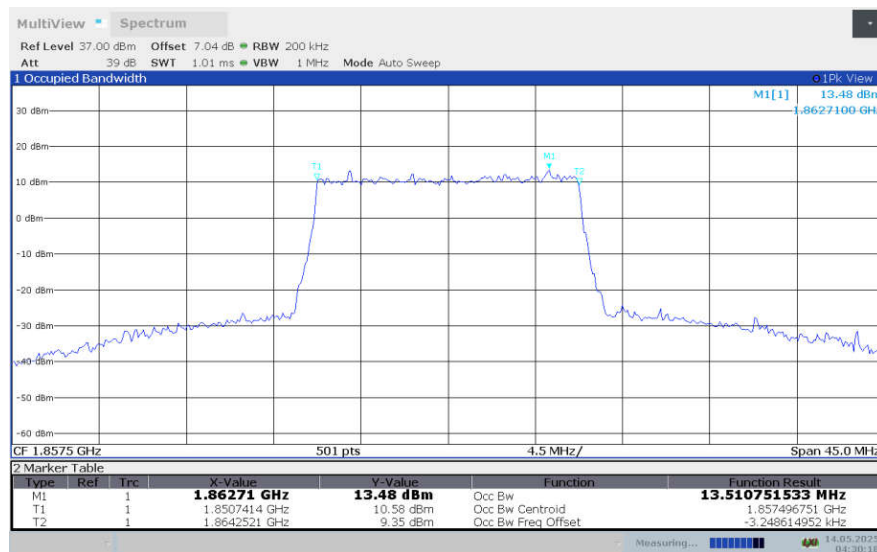
LTE band 2 , 15MHz Bandwidth,LOW,QPSK (99% BW)



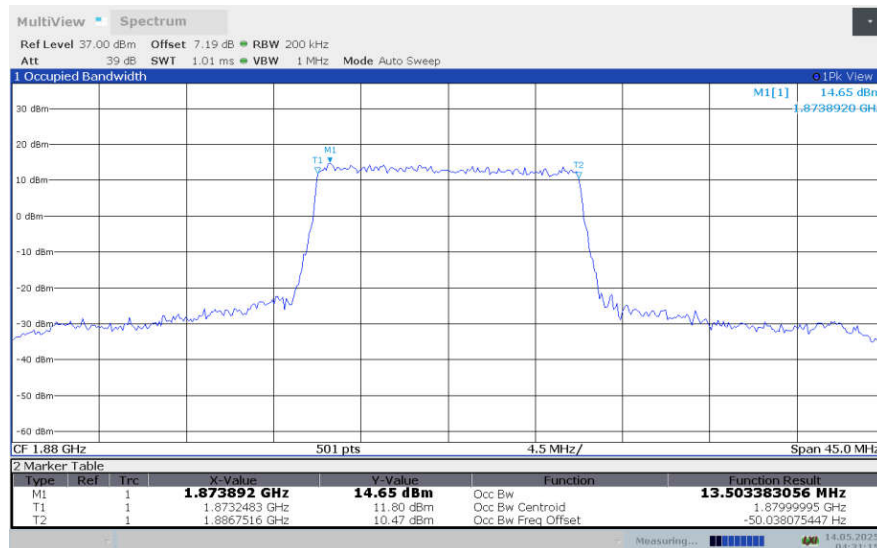
LTE band 2 , 15MHz Bandwidth,LOW,16QAM (99% BW)



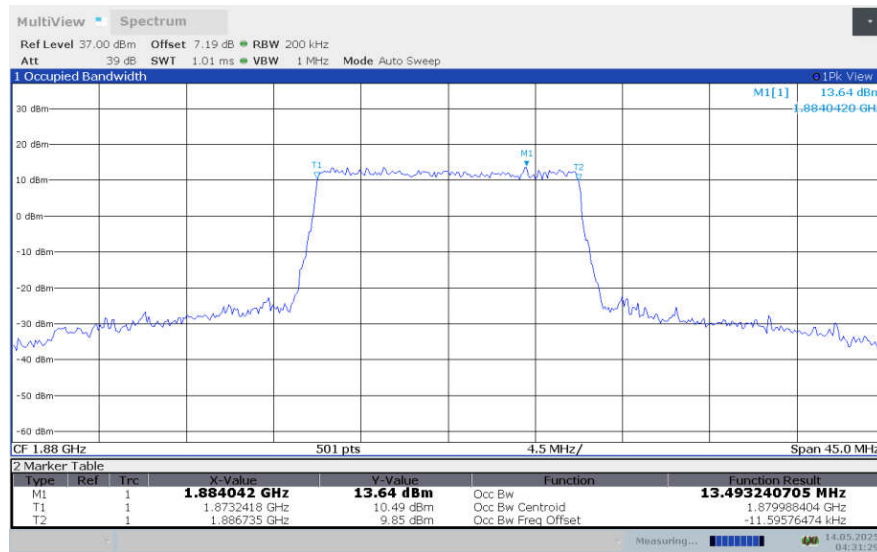
LTE band 2 , 15MHz Bandwidth,LOW,64QAM (99% BW)



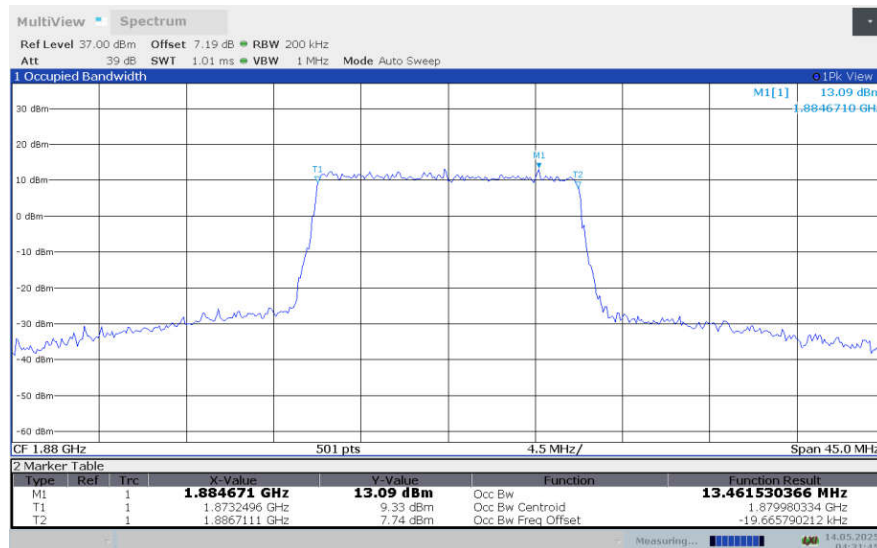
LTE band 2 , 15MHz Bandwidth,MID,QPSK (99% BW)



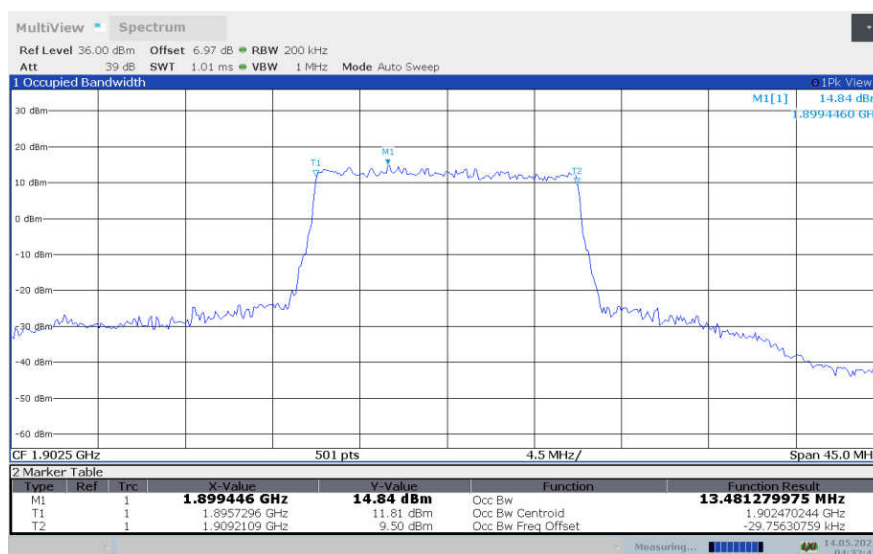
LTE band 2 , 15MHz Bandwidth,MID,16QAM (99% BW)



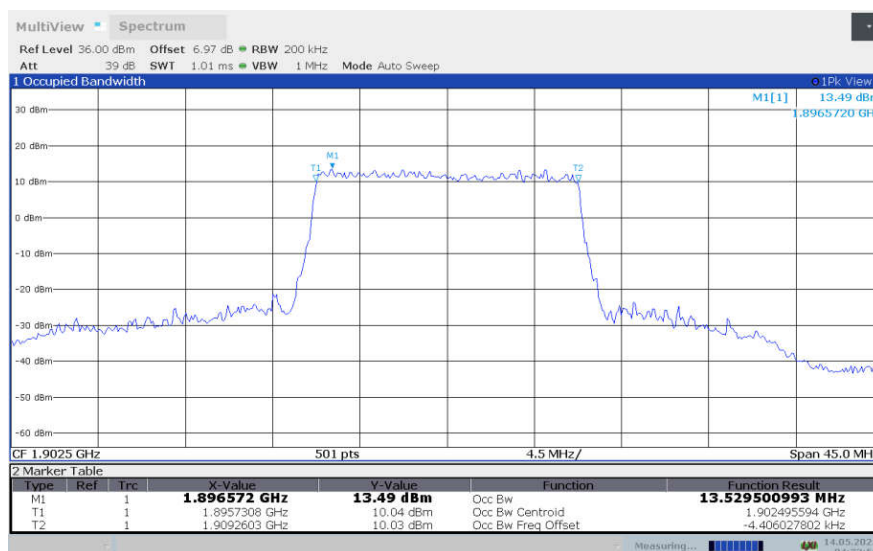
LTE band 2 , 15MHz Bandwidth,MID,64QAM (99% BW)



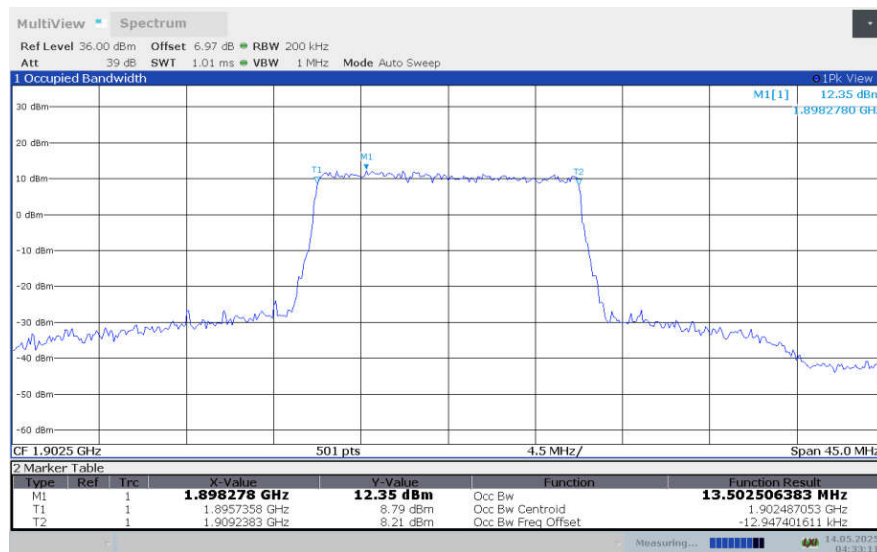
LTE band 2 , 15MHz Bandwidth,HIGH,QPSK (99% BW)



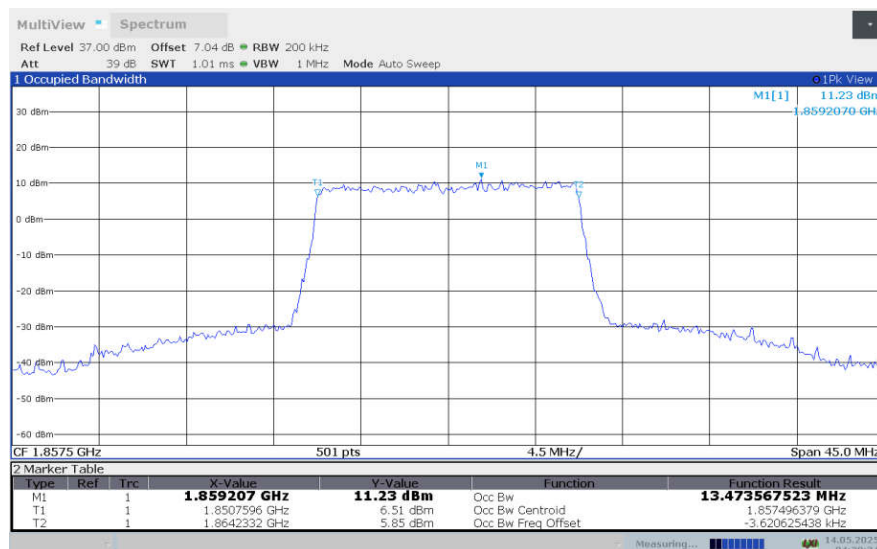
LTE band 2 , 15MHz Bandwidth,HIGH,16QAM (99% BW)



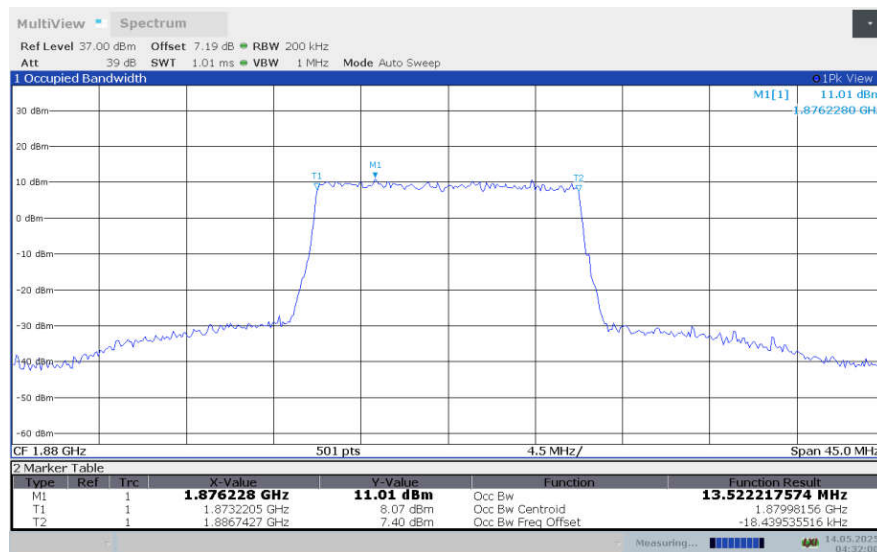
LTE band 2 , 15MHz Bandwidth,HIGH,64QAM (99% BW)



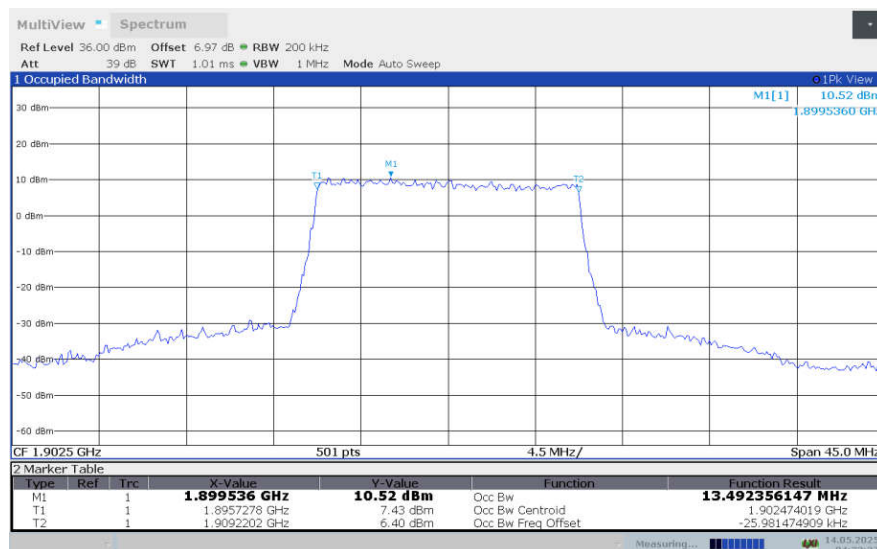
LTE band 2 , 15MHz Bandwidth,LOW,256QAM (99% BW)



LTE band 2 , 15MHz Bandwidth,MID,256QAM (99% BW)



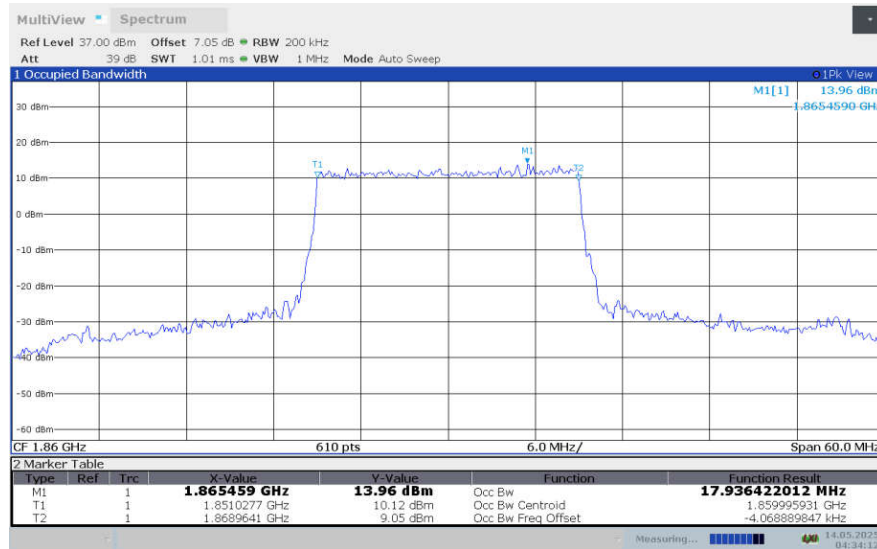
LTE band 2 , 15MHz Bandwidth,HIGH,256QAM (99% BW)



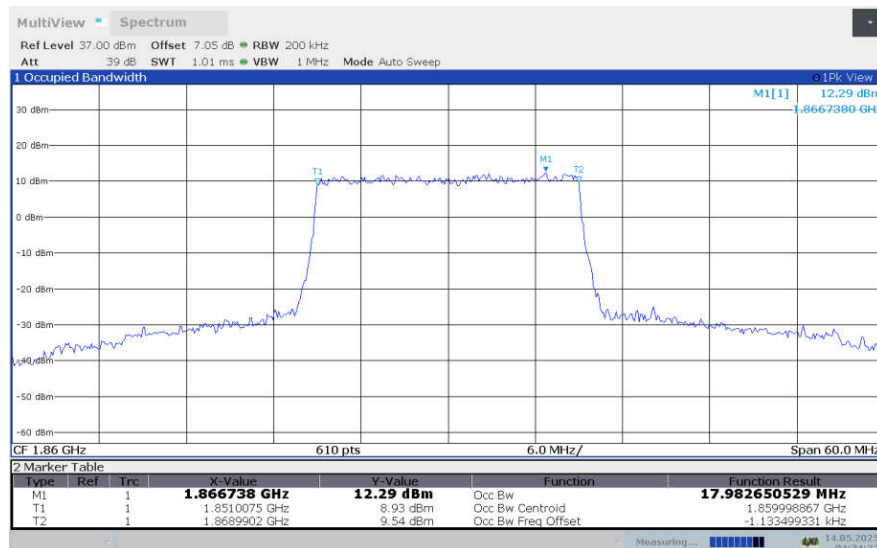
LTE band 2,20MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)			
	QPSK	16QAM	64QAM	256QAM
1860	17.936	17.983	17.954	17.931
1880	17.964	17.932	17.940	17.969
1900	17.918	17.893	17.907	17.930

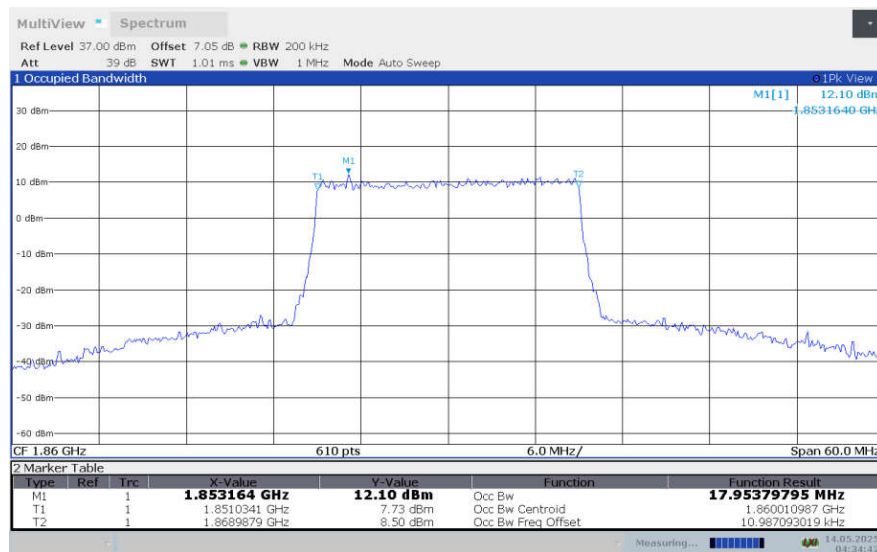
LTE band 2 , 20MHz Bandwidth,LOW,QPSK (99% BW)



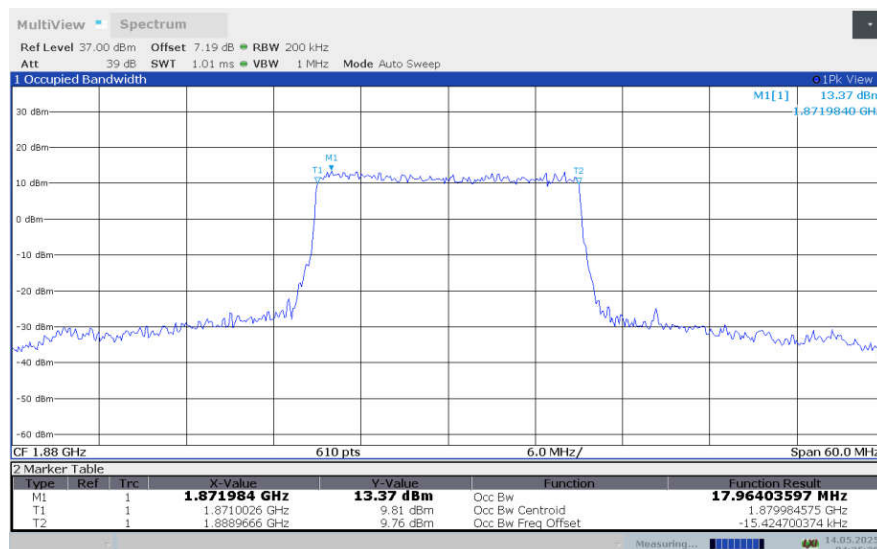
LTE band 2 , 20MHz Bandwidth,LOW,16QAM (99% BW)



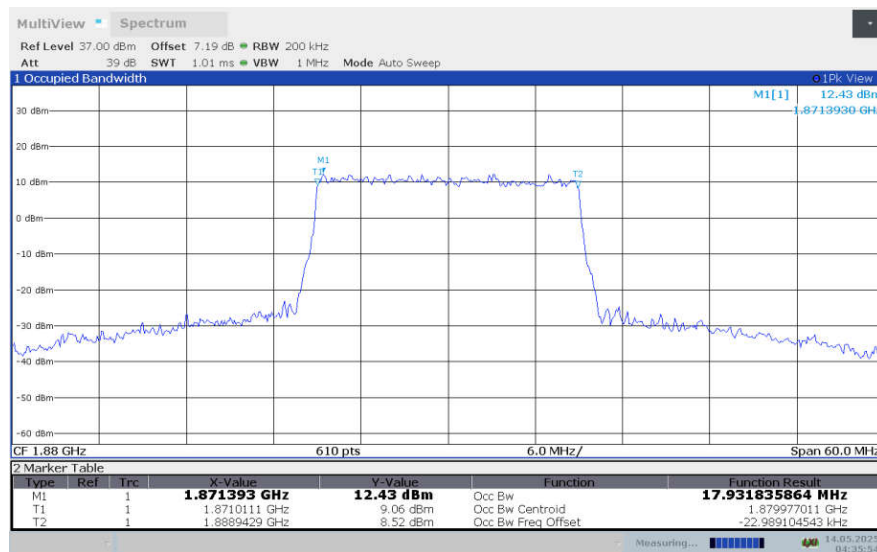
LTE band 2 , 20MHz Bandwidth,LOW,64QAM (99% BW)



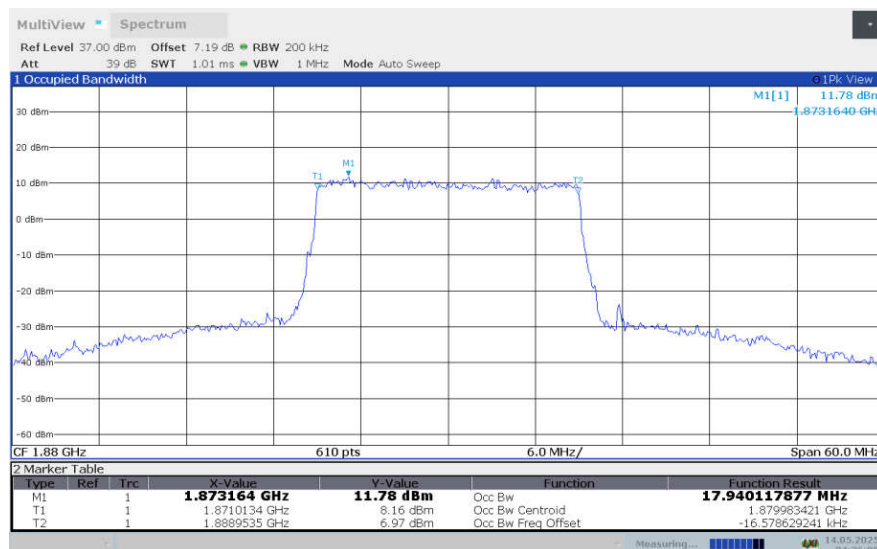
LTE band 2 , 20MHz Bandwidth,MID,QPSK (99% BW)



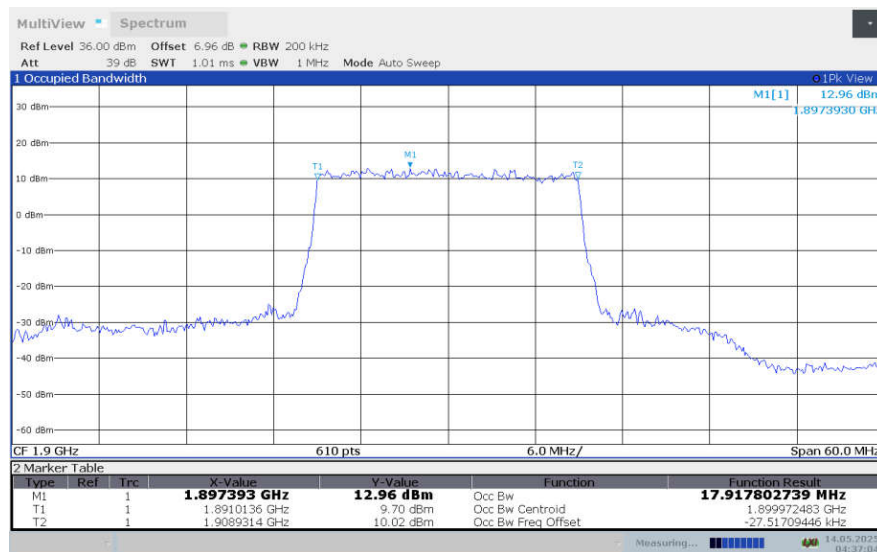
LTE band 2 , 20MHz Bandwidth,MID,16QAM (99% BW)



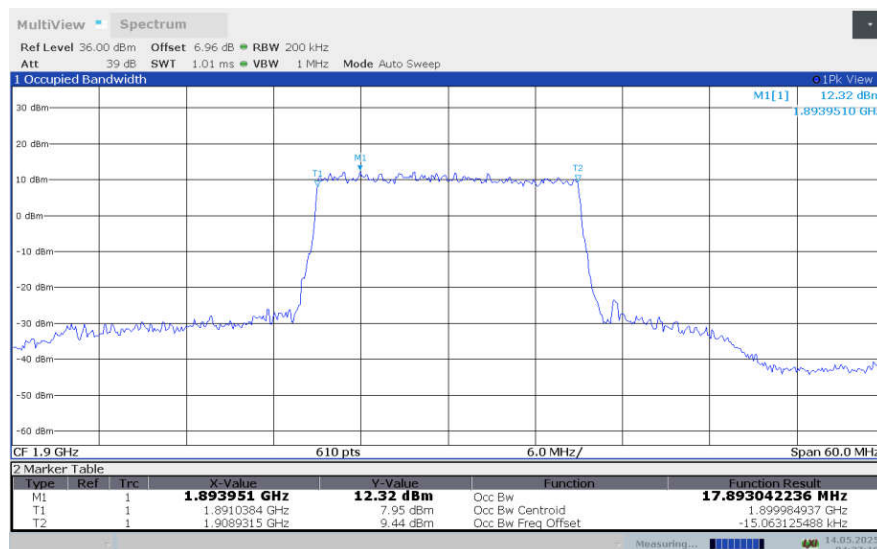
LTE band 2 , 20MHz Bandwidth,MID,64QAM (99% BW)



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



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



LTE band 2 , 20MHz Bandwidth,HIGH,64QAM (99% BW)