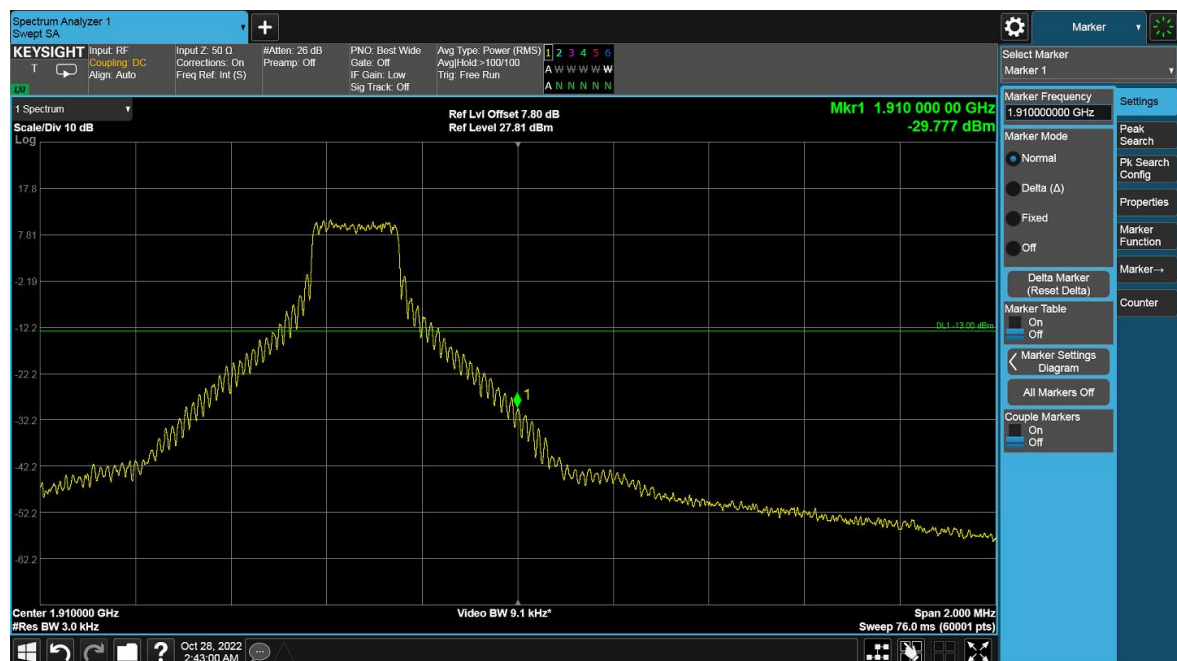




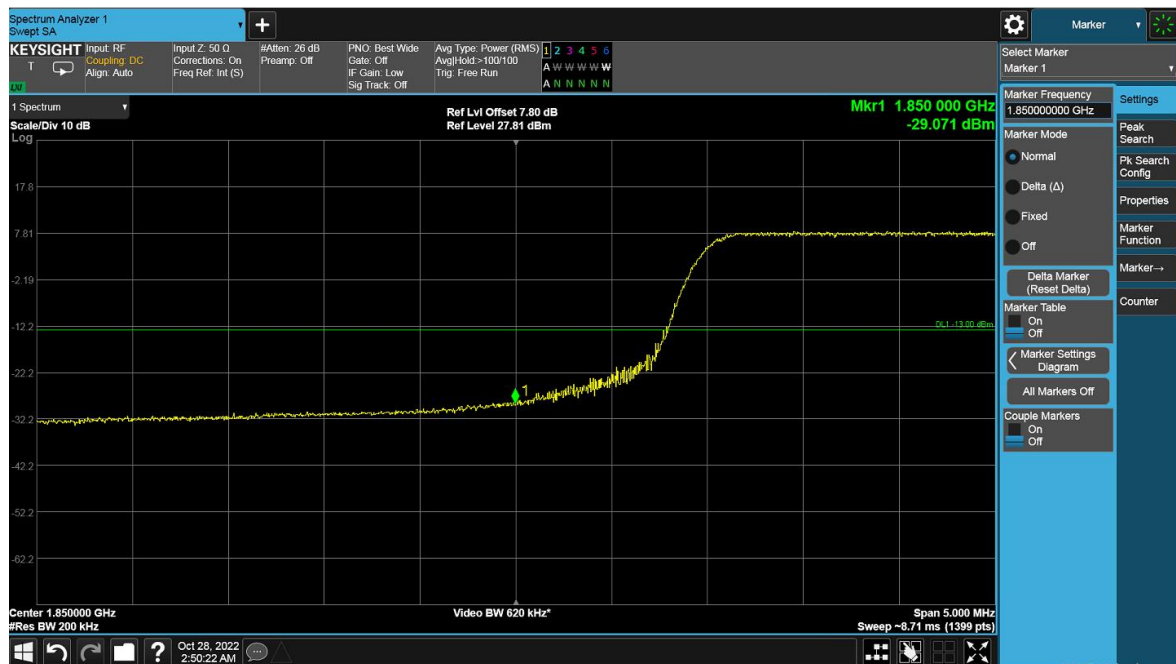
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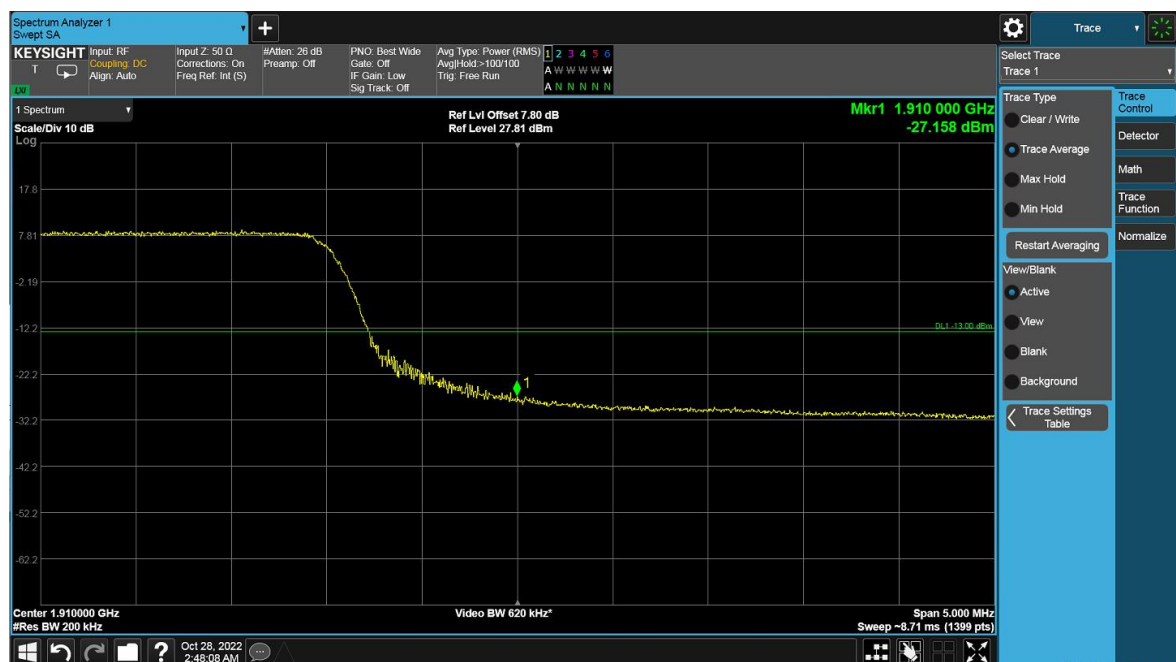
LOW BAND EDGE BLOCK-FULL RB-20MHz+10M1RB_offset

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HIGH BAND EDGE BLOCK-FULL RB-20MHz+10M1RB_offset



LTE band 12@CA_2A-12A

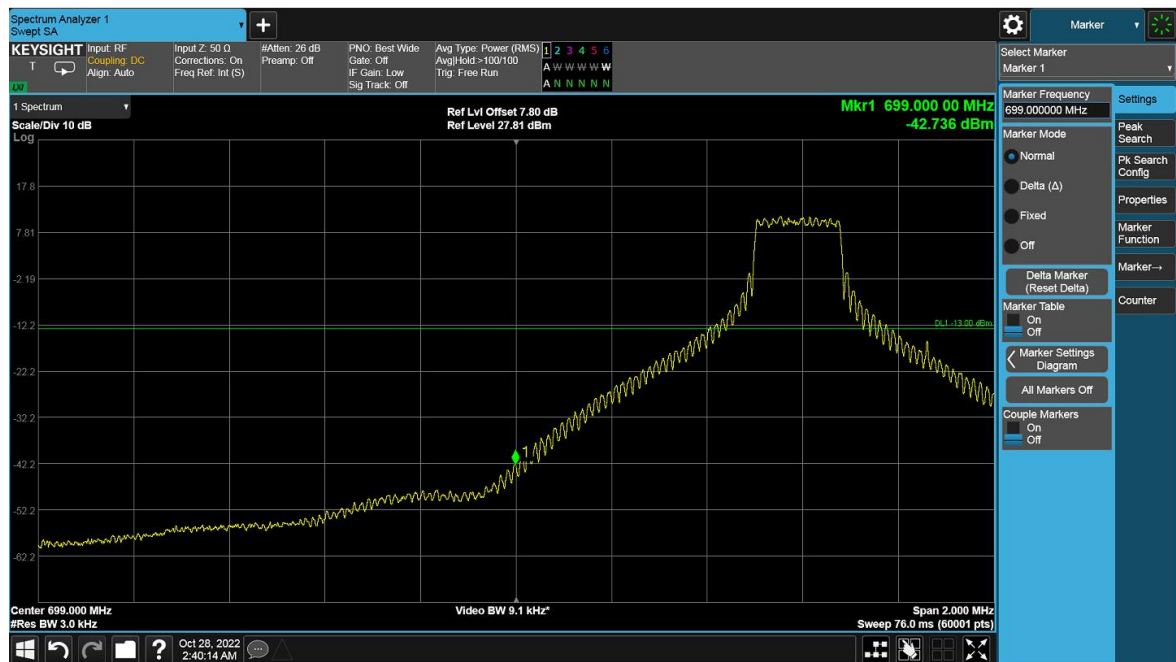
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LOW BAND EDGE BLOCK-1RB-5MHz+10M1RB_offset



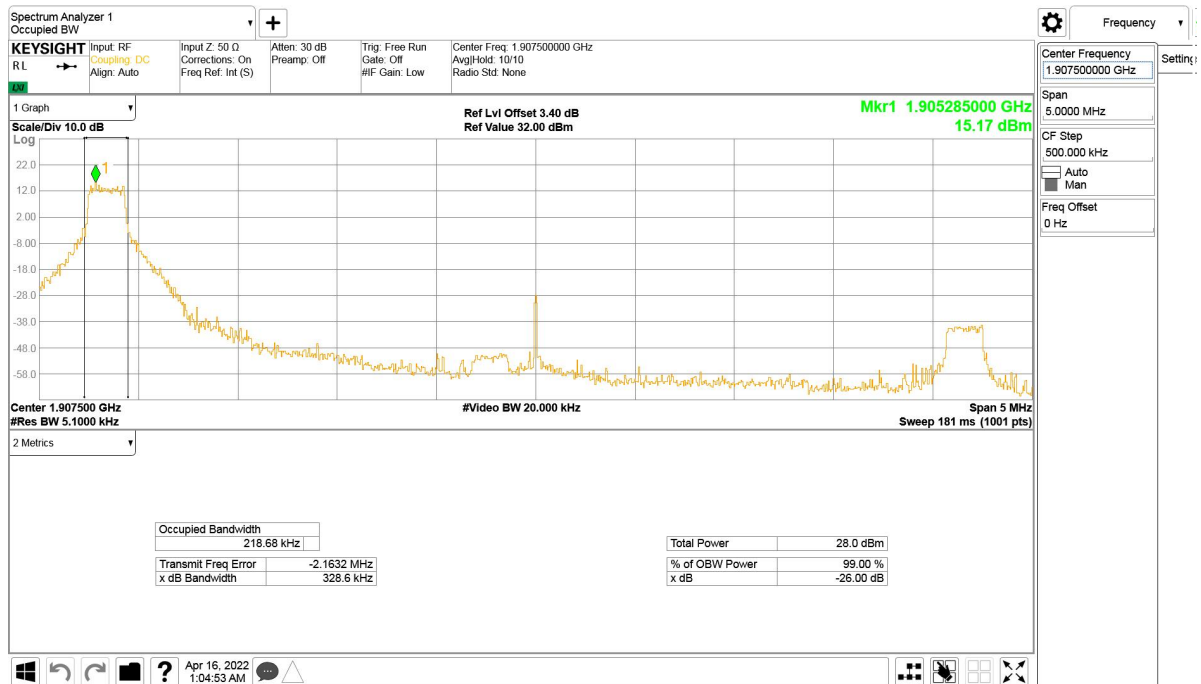
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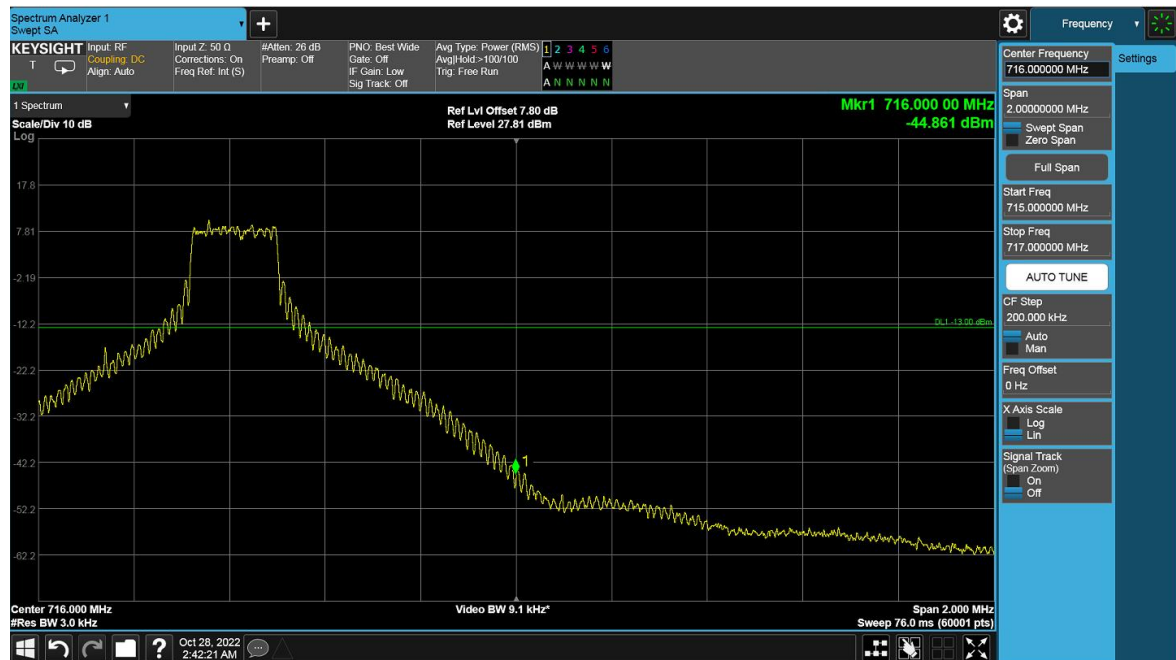
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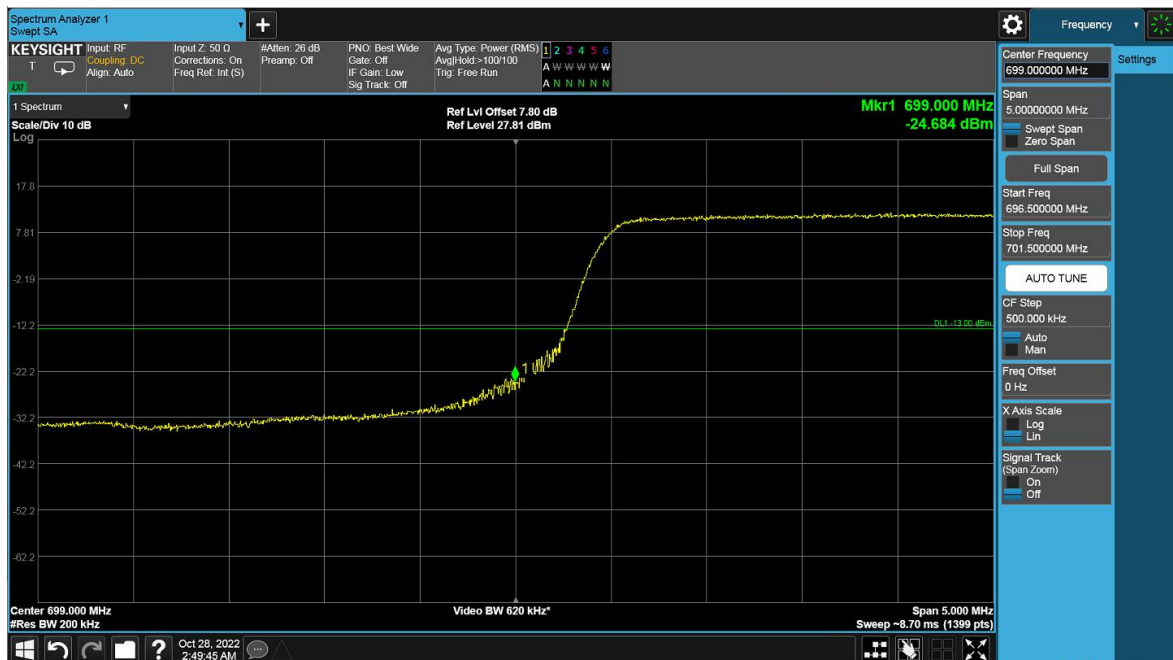
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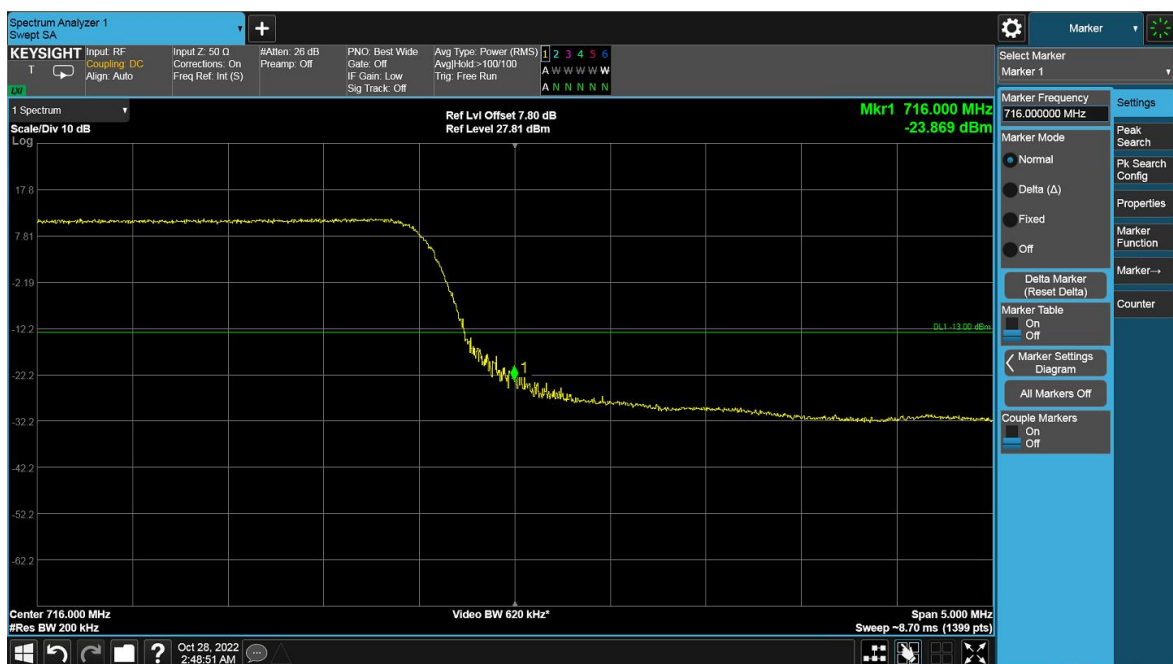
LOW BAND EDGE BLOCK-FULL RB-20MHz+10M1RB_offset

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HIGH BAND EDGE BLOCK-FULL RB-20MHz+10M1RB_offset



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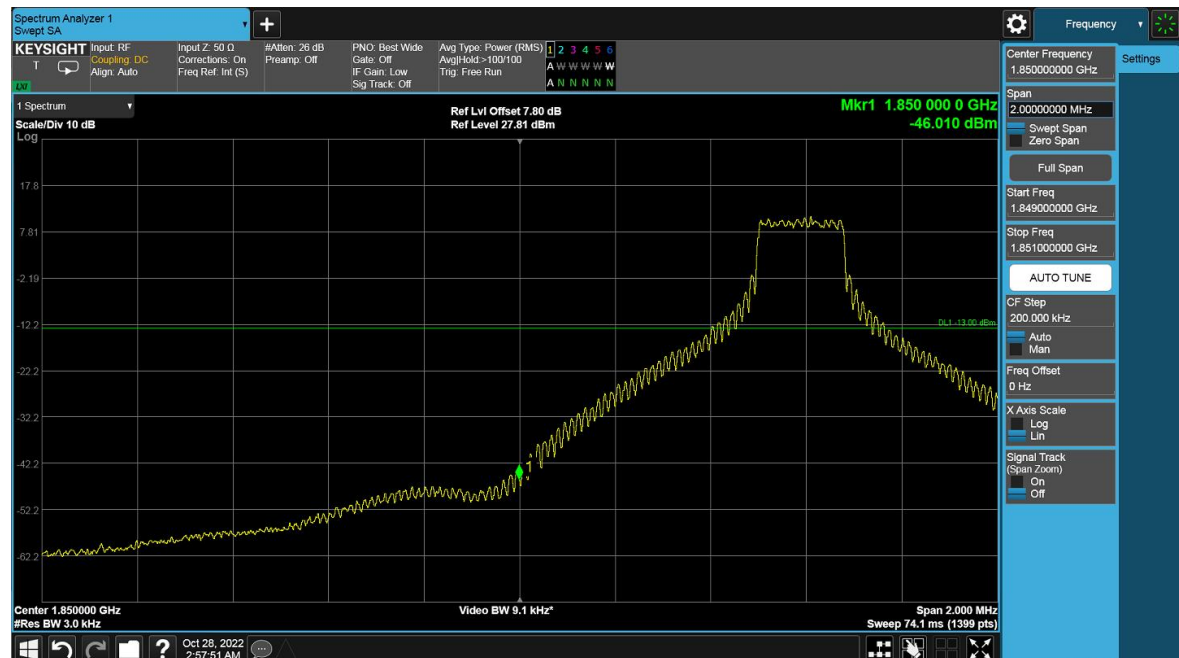
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LTE band 2@CA_2A-66A

OBW: 1RB-LOW_offset



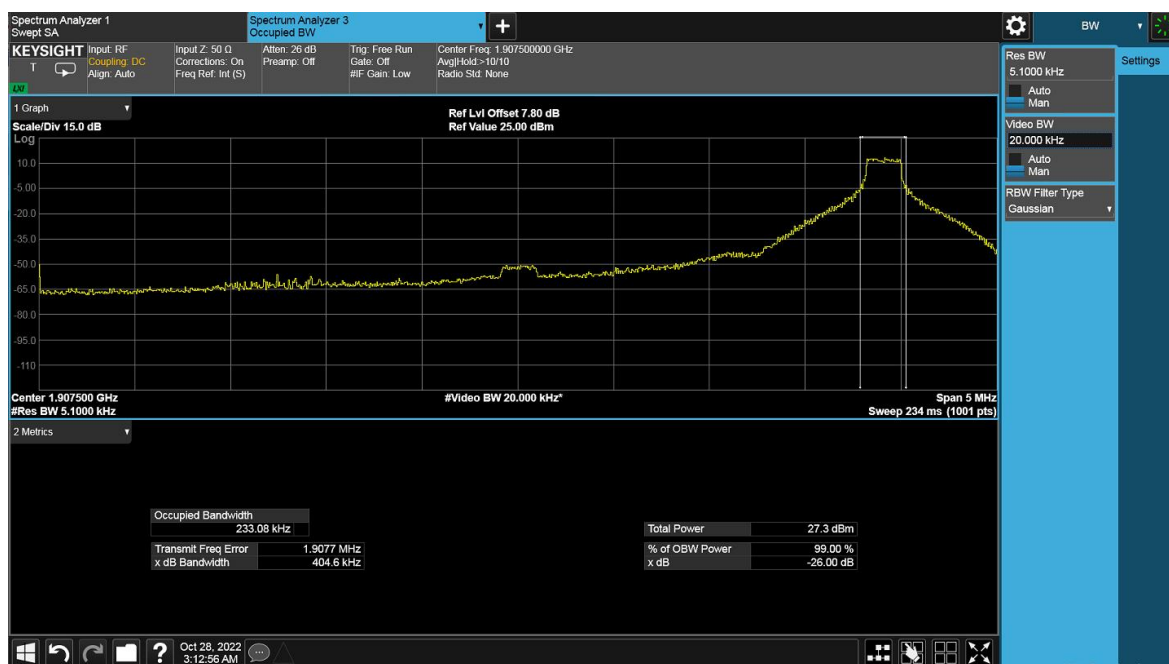
LOW BAND EDGE BLOCK-1RB-10MHz+10M1RB_offset



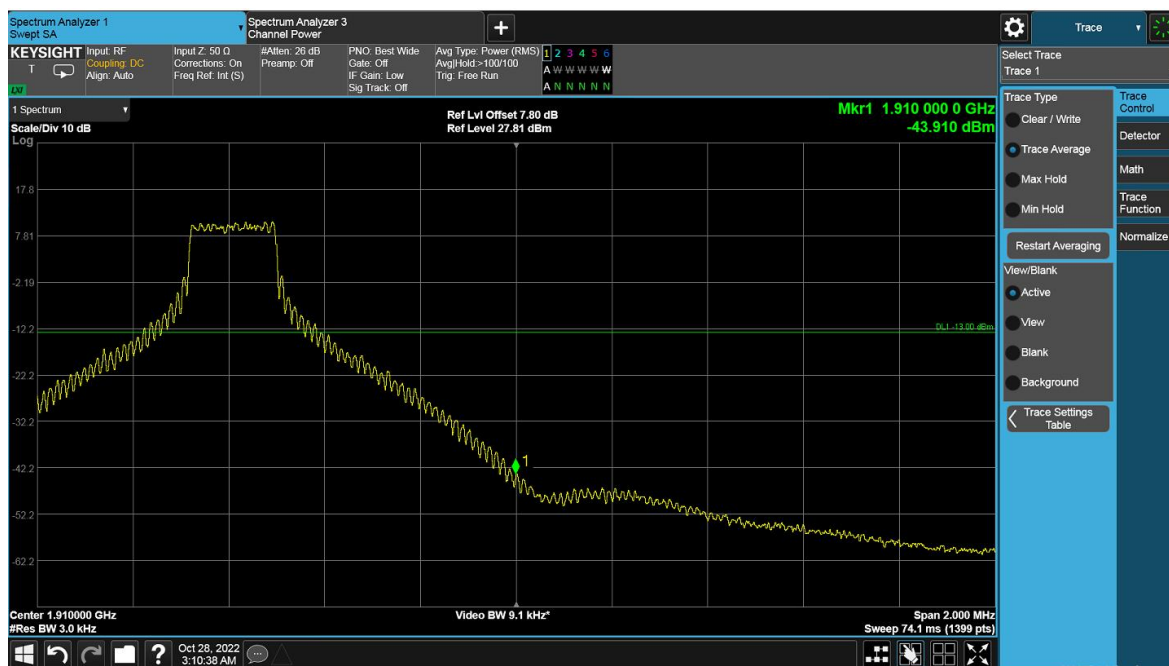
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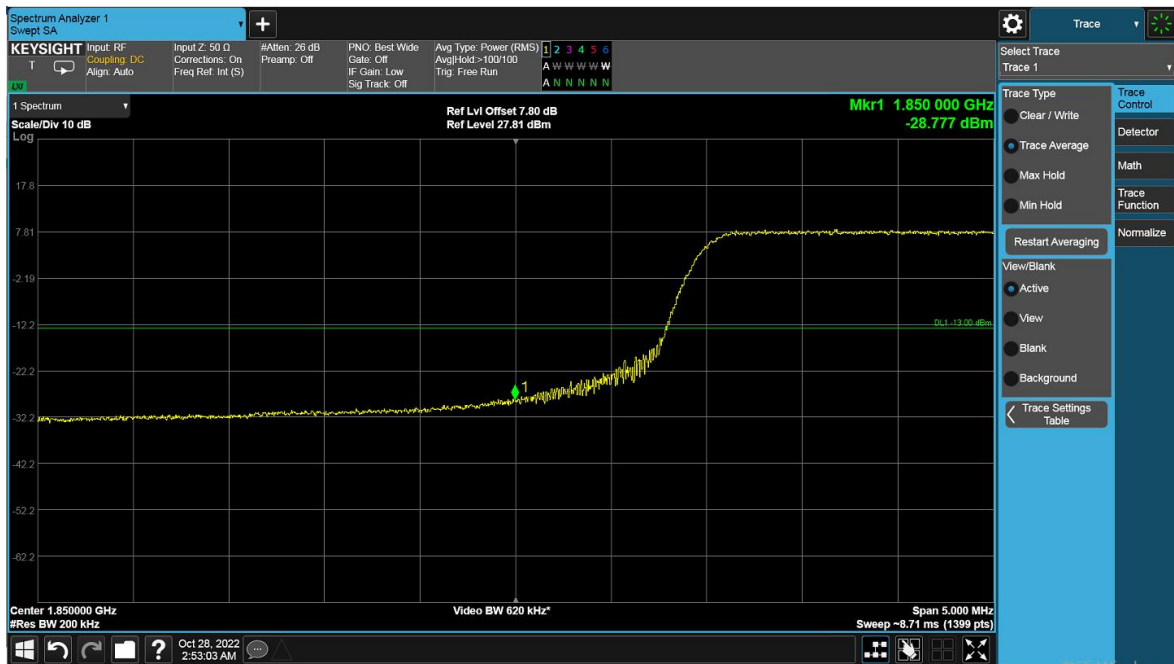
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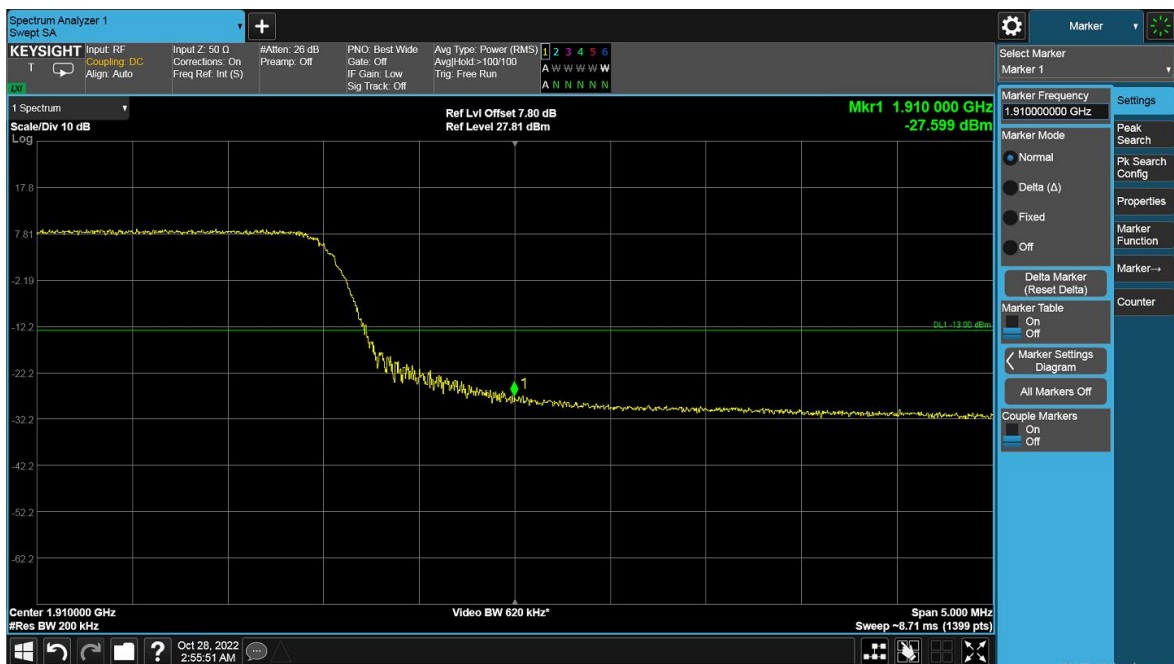
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HIGH BAND EDGE BLOCK-FULL RB-20MHz+20M1RB_offset

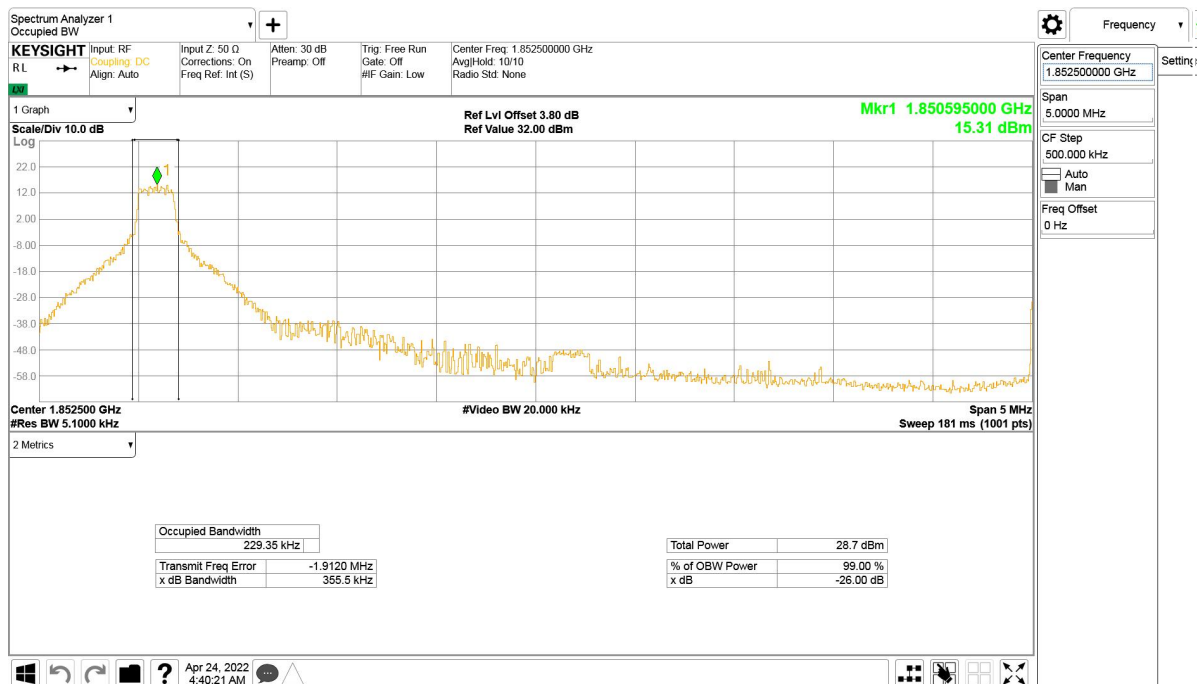


LTE band 66@CA_2A-66A

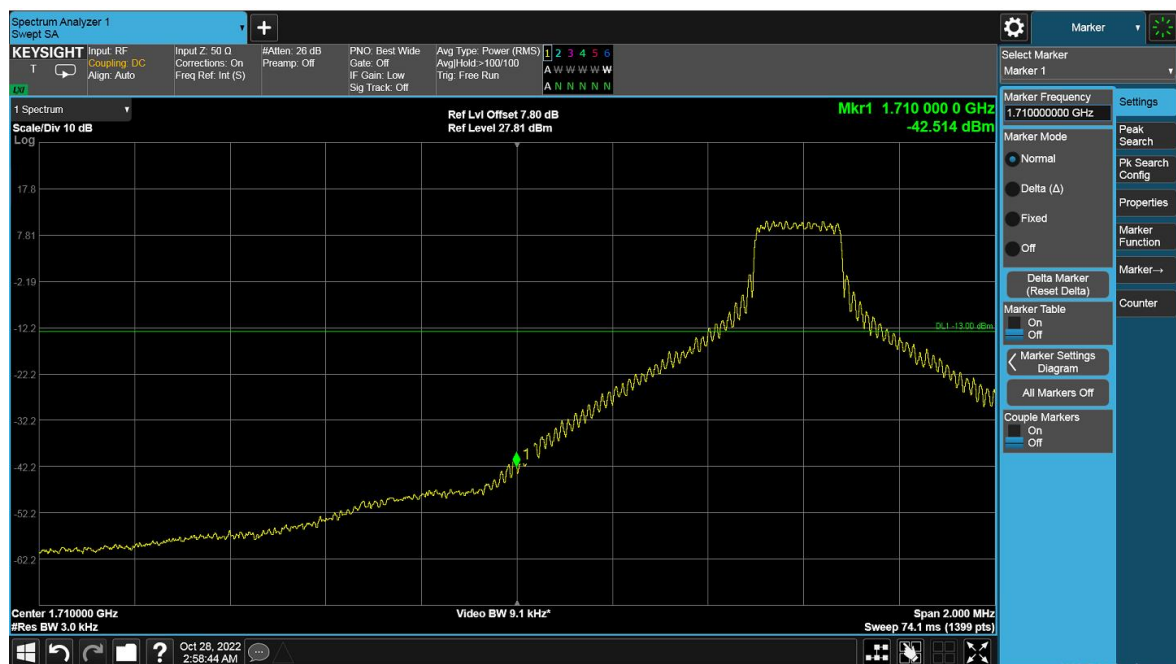
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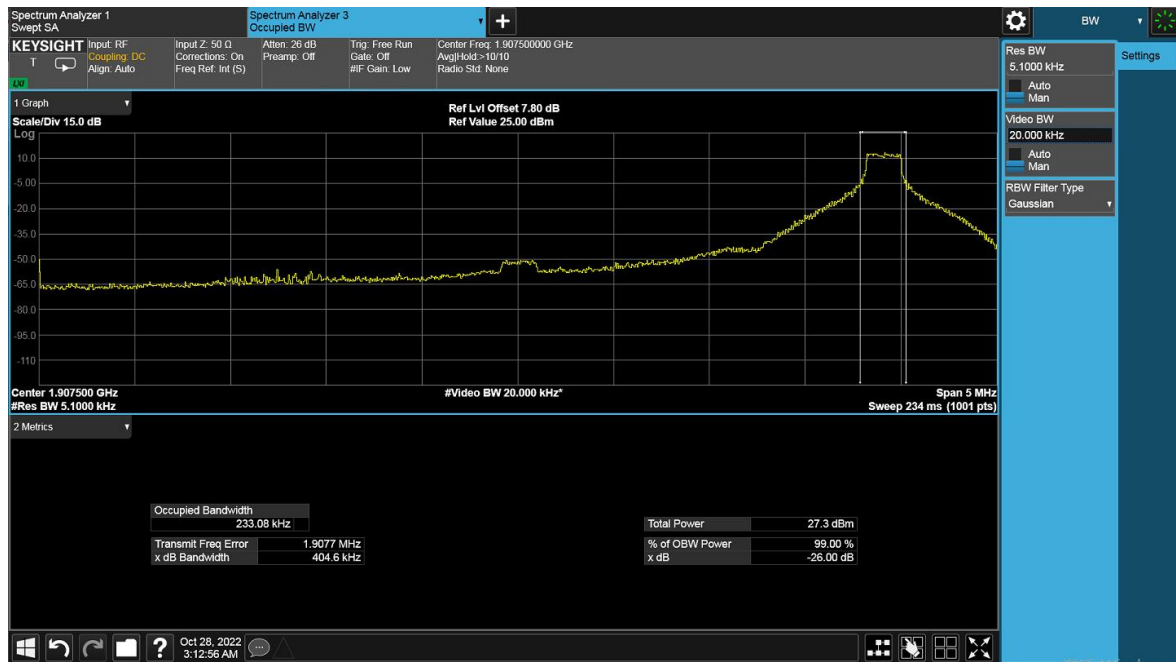
LOW BAND EDGE BLOCK-1RB-10MHz+10M1RB_offset



OBW: 1RB-HIGH_offset

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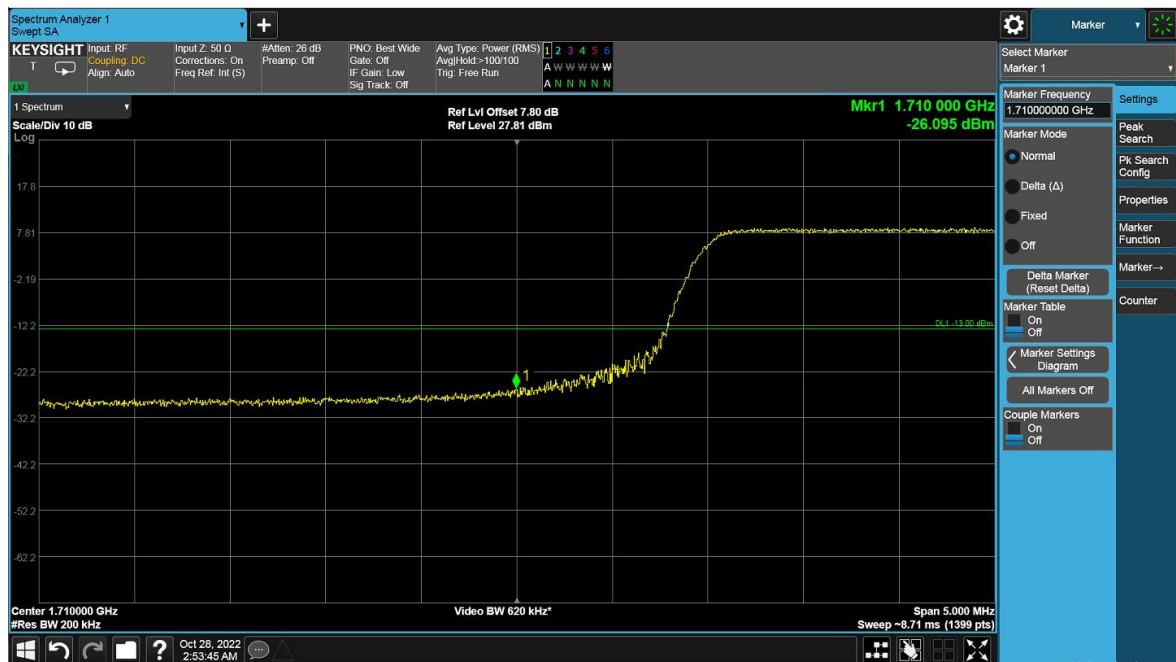
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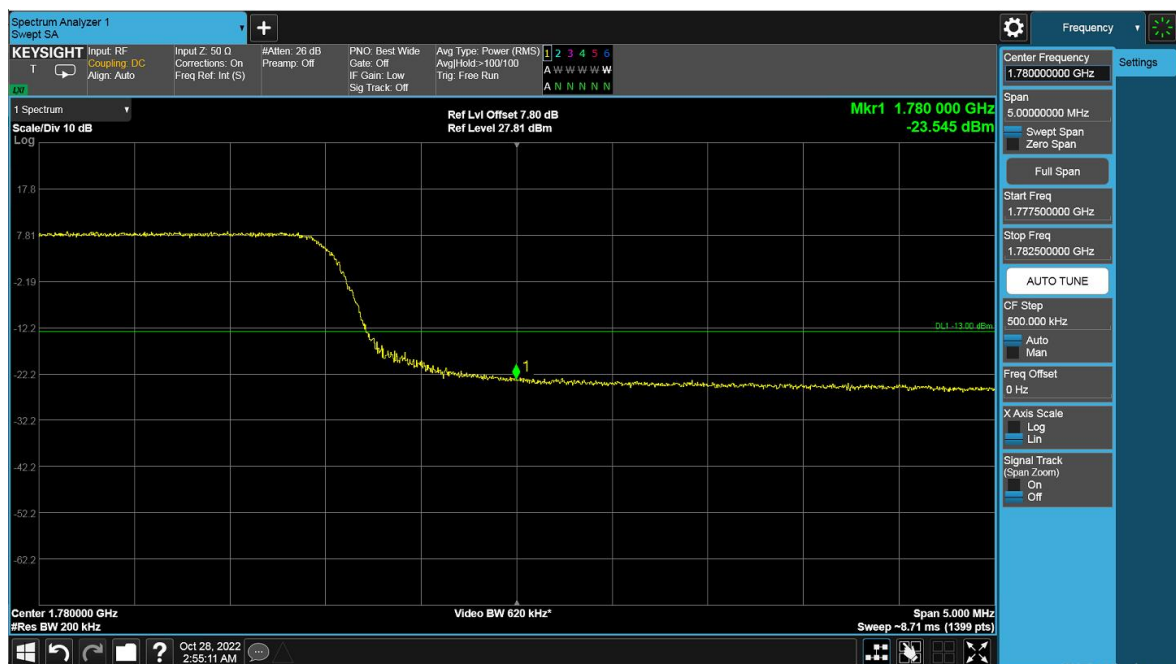
LOW BAND EDGE BLOCK-FULL RB-20MHz+20M1RB_offset

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HIGH BAND EDGE BLOCK-FULL RB-20MHz+20M1RB_offset

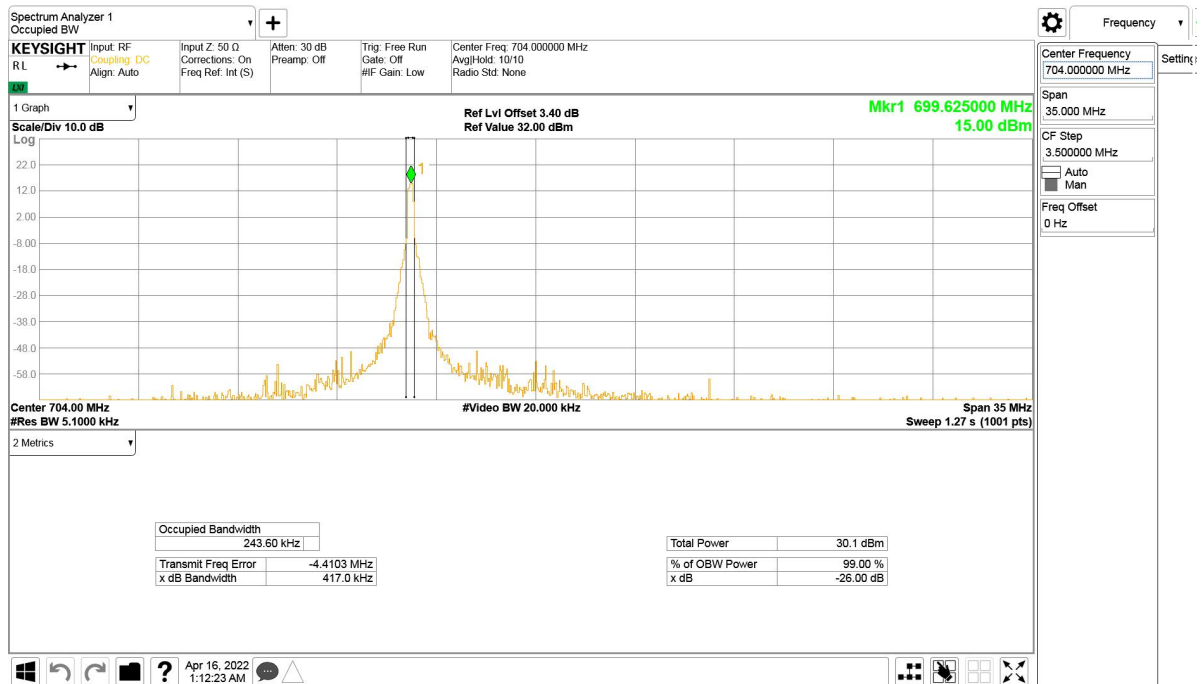


LTE band 12@CA_12A-66A

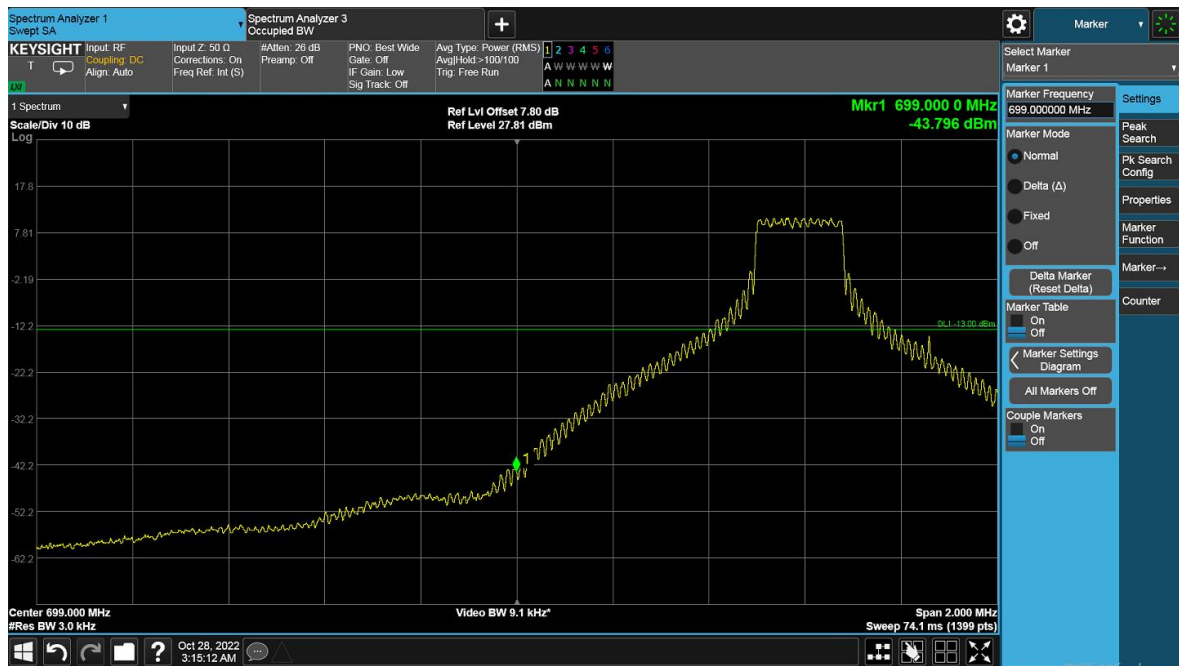
OBW: 1RB-LOW_offset

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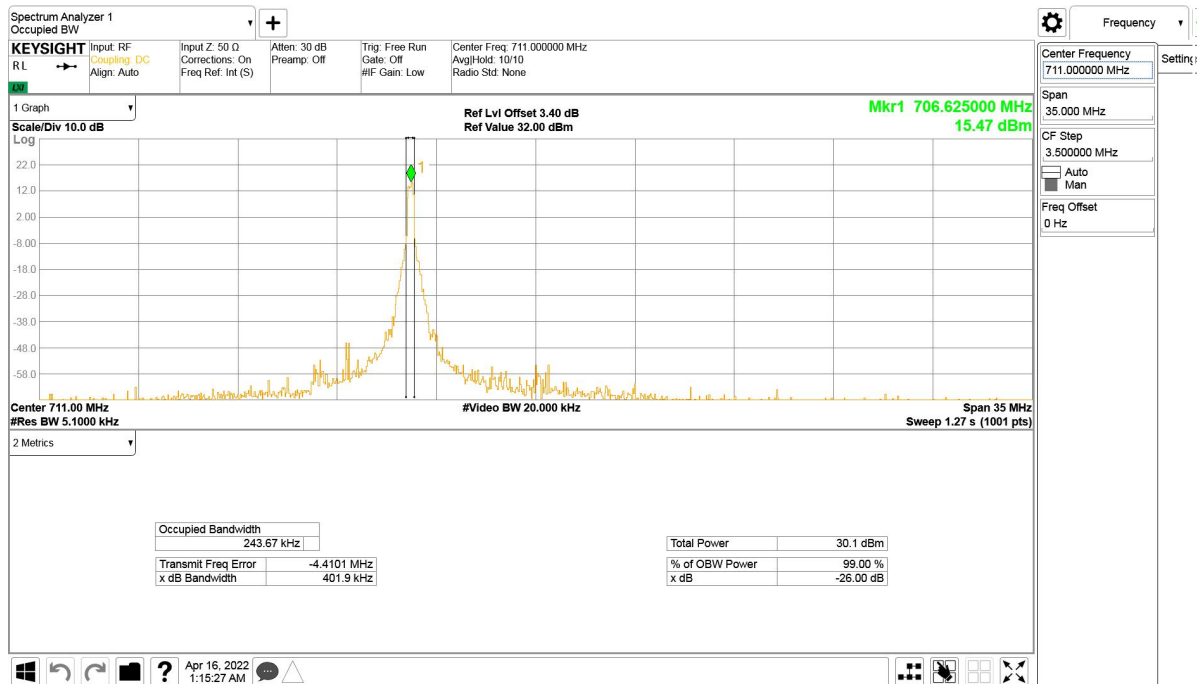
LOW BAND EDGE BLOCK-1RB-10MHz+BW1_4M1RB_offset



OBW: 1RB-HIGH_offset

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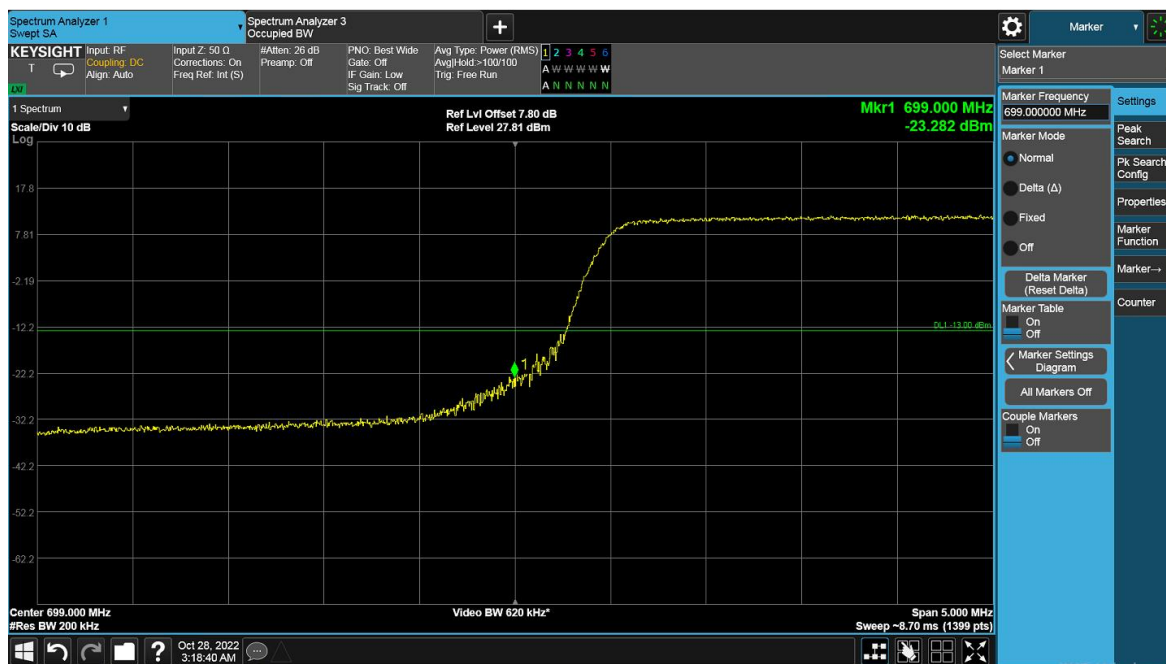
HIGH BAND EDGE BLOCK-1RB-10MHz+BW1_4M1RB_offset



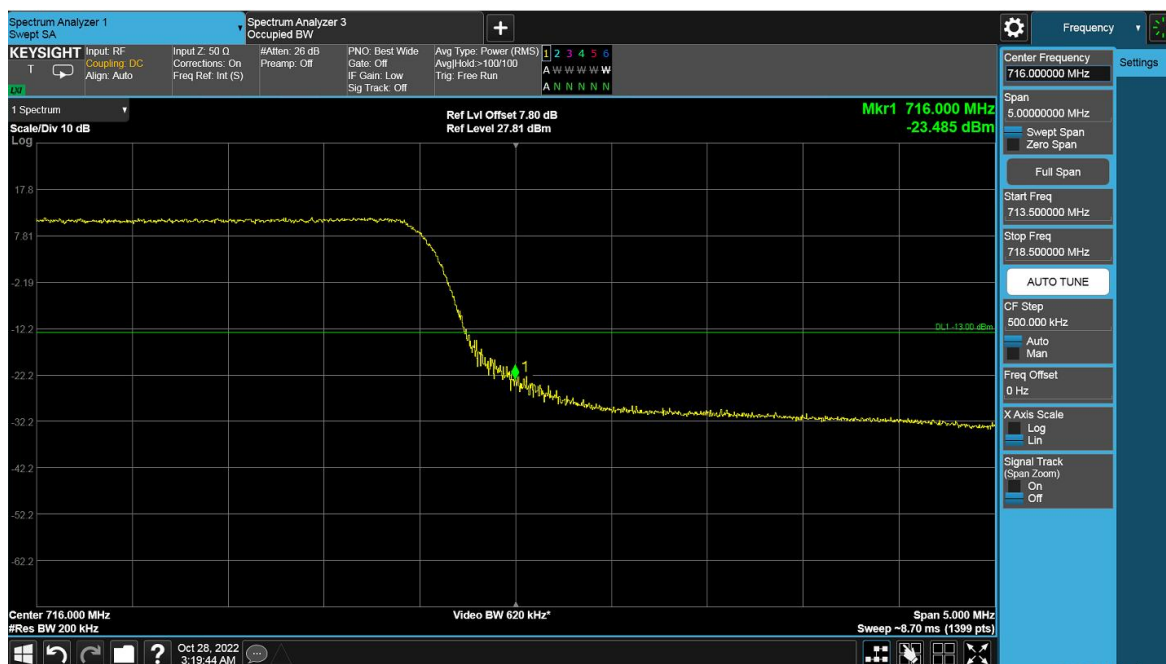
LOW BAND EDGE BLOCK-FULL RB-10MHz+20M1RB_offset

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HIGH BAND EDGE BLOCK-FULL RB-10MHz+20M1RB_offset



LTE band 66@CA_12A-66A

OBW: 1RB-LOW_offset

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Spectrum Analyzer 1

+

▼

KEYSIGHT

Input RF

Coupling DC

Align: Auto

Input Z: 50 Ω

Corrections: On

Ref Freq: Int (S)

Atten: 30 dB

Preamp: Off

Trig: Free Run

Gate: Off

#IF Gain: Low

Center Freq: 704.000000 MHz

Avg/Hold: 10/10

Radio Std: None

1 Graph

▼

Scale/Div 10.0 dB

Log

Ref Lvl Offset 3.80 dB

Ref Value 32.00 dBm

Mkr1 699.625000 MHz

15.97 dBm

Center 704.00 MHz

#Res BW 5.1000 kHz

#Video BW 20.000 kHz

Span 35 MHz

Sweep 1.27 s (1001 pts)

2 Metrics

▼

Occupied Bandwidth

244.39 kHz

Transmit Freq Error

-4.4099 MHz

x dB Bandwidth

413.3 kHz

Total Power

30.9 dBm

% of OBW Power

99.00 %

x dB

-26.00 dB

Windows Taskbar

Start

Back

Forward

Search

Help

Network

Volume

Power

Apr 16, 2022

1:13:31 AM

Icons

Grid

Zoom In

Zoom Out

Full Screen

Frequency

▼

Center Frequency

704.000000 MHz

Span

35.000 MHz

CF Step

3.500000 MHz

Auto

Man

Freq Offset

0 Hz

Spectrum Analyzer 1
Sweet 5A

Spectrum Analyzer 3
Occupied BW

Input RF
Coupling: DC
Align: Auto

Input Z: 50 Ω
Corrections: On
Freq Ref: Int (S)

#Att: 26 dB
Preamp: Off

PNO: Best Wide
Gate: Off
IF Gain: Low
Sig Track: Off

Avg Type: Power (RMS)
Aval Hold: >100/100
Trig: Free Run

1 2 3 4 5 6
A W W W W W
A N N N N N

Center Frequency
1.71000000 GHz

Span
2.00000000 MHz

Start Freq
1.709000000 GHz

Stop Freq
1.711000000 GHz

AUTO TUNE

CF Step
200.000 kHz

Freq Offset
0 Hz

X Axis Scale
Log

Signal Track
(Span Zoom)
On

1 Spectrum
Scale/Div 10 dB
Log

Ref Lvl Offset 7.80 dB
Ref Level 27.81 dBm

Mkr1 1.710 000 0 GHz
-26.097 dBm

0.1 -13.00 dBm

Center 1.710000 GHz
#Res BW 3.0 kHz

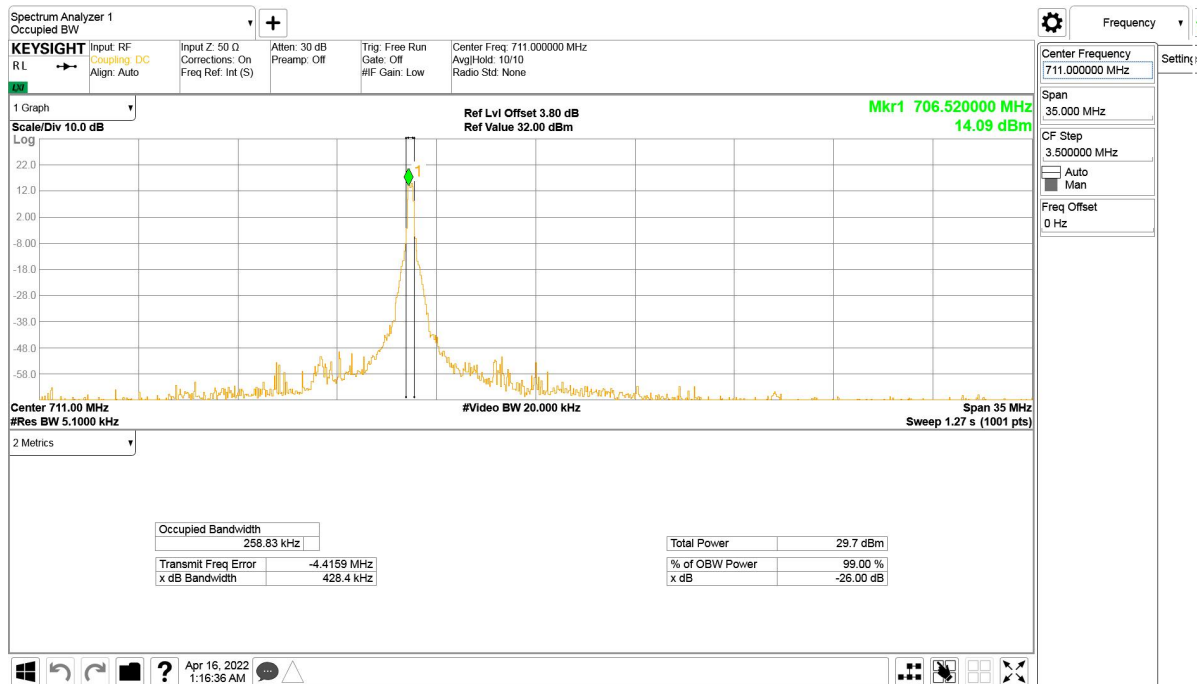
Video BW 9.1 kHz

Span 2.000 MHz
Sweep 74.1 ms (1399 pts)

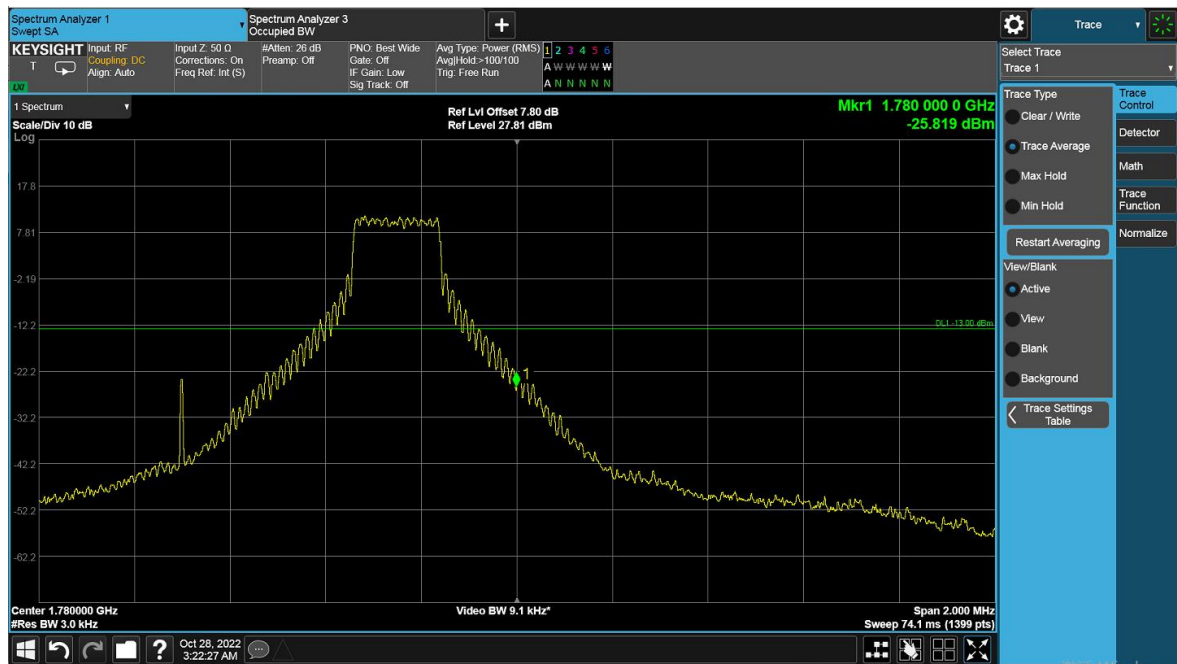
Oct 28, 2022
3:16:09 AM

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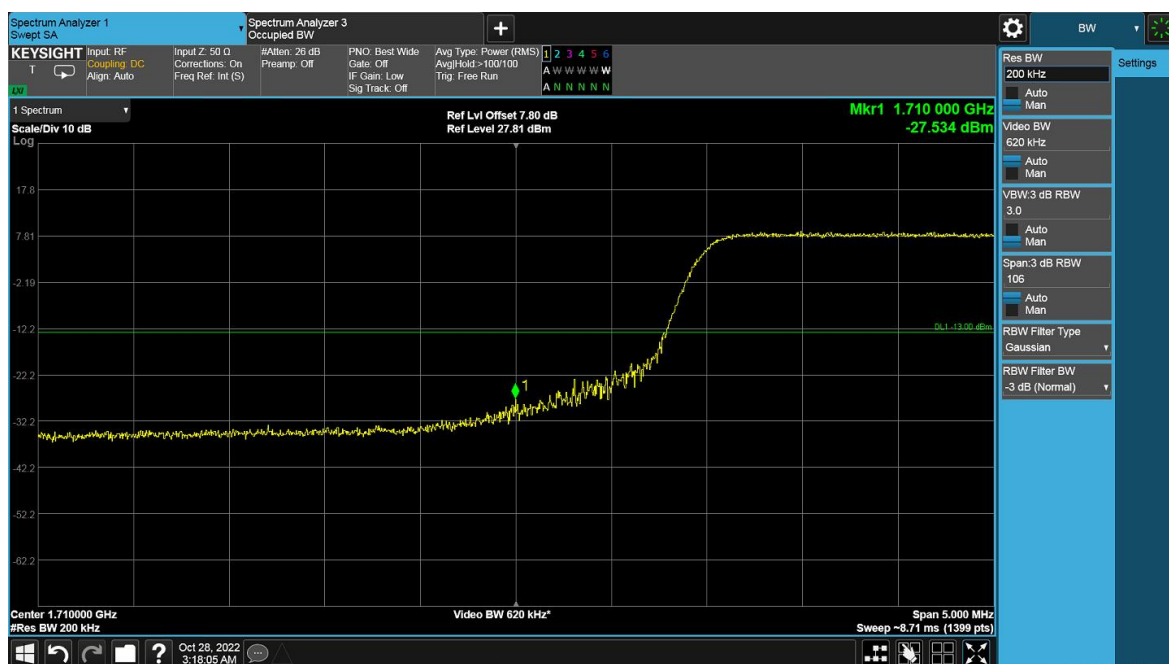
HIGH BAND EDGE BLOCK-1RB-10MHz+BW1_4M1RB_offset



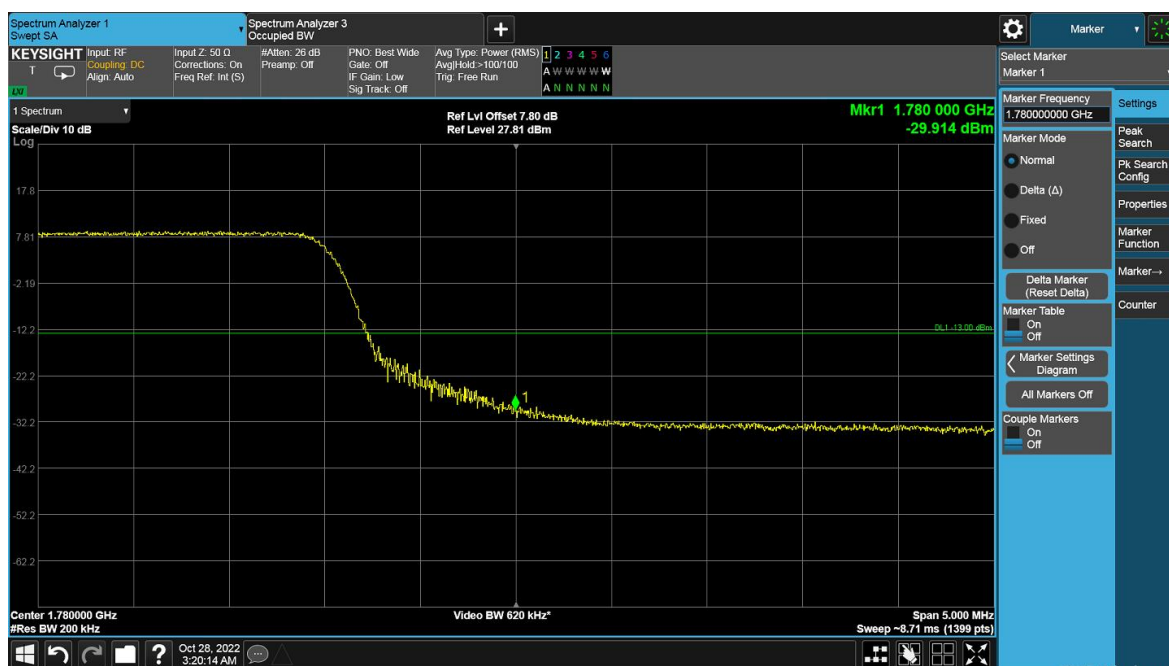
LOW BAND EDGE BLOCK-FULL RB-10MHz+20M1RB_offset

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HIGH BAND EDGE BLOCK-FULL RB-10MHz+20M1RB_offset



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6.8.Frequency Stability

Specifications:	FCC Part 2.1055, 22.355,24.235, 27.54,90.213
DUT Serial Number:	864284040456399/864284040456696
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit	
Frequency deviation [ppm]	±2.5

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	1.54 Hz (k=2)

Test Method

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 FL and FH respectively.

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

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

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

6.8.1 Frequency Stability over Temperature Variation Results

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

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1880	-1.38	-0.0007
50			-1.75	-0.0009
40			-1.25	-0.0007
30			-1.42	-0.0008
10			-1.35	-0.0007
0			-1.13	-0.0006
-10			-1.96	-0.0010
-20			-1.66	-0.0009
-30			-1.92	-0.0010

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	1880	-2.76	-0.0015
4.4			-2.58	-0.0014

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LTE band 4, 20MHz bandwidth QPSK(worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1732.5	-0.38	-0.0002
50			-0.86	-0.0005
40			-0.92	-0.0005
30			-1.00	-0.0006
10			-1.17	-0.0007
0			-0.62	-0.0004
-10			-1.10	-0.0006
-20			-1.76	-0.0010
-30			-1.35	-0.0008

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	1732.5	-1.69	-0.0010
4.4			-1.59	-0.0009

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

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	836.5	-1.30	-0.0016
50			-0.13	-0.0002
40			-1.86	-0.0022
30			-1.49	-0.0018
10			-1.85	-0.0022
0			-0.52	-0.0006
-10			-1.36	-0.0016
-20			-0.30	-0.0004
-30			-1.27	-0.0015

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	836.5	-0.99	-0.0012
4.4			-0.33	-0.0004

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

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	2535	-0.82	-0.0003
50			-0.94	-0.0004
40			-0.56	-0.0002
30			-0.62	-0.0002
10			-0.39	-0.0002
0			-0.42	-0.0002
-10			-0.92	-0.0004
-20			-0.76	-0.0003
-30			-0.60	-0.0002

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	2535	-0.82	-0.0003
4.4			-0.33	-0.0001

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

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	707.5	-0.18	-0.0003
50			0.36	0.0005
40			-0.57	-0.0008
30			-1.26	-0.0018
10			-0.76	-0.0011
0			-1.27	-0.0018
-10			-0.53	-0.0007
-20			-0.03	0.0000
-30			-0.79	-0.0011

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	707.5	-0.67	-0.0009
4.4			-0.83	-0.0012

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

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	782	0.62	0.0008
50			-0.34	-0.0004
40			-0.26	-0.0003
30			-0.40	-0.0005
10			-0.49	-0.0006
0			0.32	0.0004
-10			0.26	0.0003
-20			-0.83	-0.0011
-30			0.39	0.0005

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	782	-1.22	-0.0016
4.4			-0.03	0.0000

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

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	793	0.38	0.0005
50			-0.43	-0.0005
40			0.44	0.0006
30			-0.47	-0.0006
10			-0.32	-0.0004
0			0.34	0.0004
-10			0.79	0.0010
-20			0.23	0.0003
-30			0.79	0.0010

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	793	-0.46	-0.0006
4.4			0.07	0.0001

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

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	710	0.45	0.0006
50			-0.99	-0.0014
40			0.23	0.0003
30			0.37	0.0005
10			-0.03	0.0000
0			-0.49	-0.0007
-10			-0.11	-0.0002
-20			-0.46	-0.0006
-30			0.14	0.0002

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	710	-0.10	-0.0001
4.4			-0.96	-0.0014

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

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1882.5	-1.30	-0.0007
50			-1.53	-0.0008
40			-2.32	-0.0012
30			-1.89	-0.0010
10			-1.79	-0.0010
0			-1.56	-0.0008
-10			-1.56	-0.0008
-20			-1.09	-0.0006
-30			-1.99	-0.0011

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	1882.5	-2.49	-0.0013
4.4			-2.83	-0.0015

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LTE band 26PART22, 15MHz bandwidth QPSK(worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	836.5	-0.39	-0.0005
50			-1.26	-0.0015
40			-0.86	-0.0010
30			-0.40	-0.0005
10			-0.92	-0.0011
0			-0.32	-0.0004
-10			-0.13	-0.0002
-20			-0.04	0.0000
-30			-0.89	-0.0011

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	836.5	-0.23	-0.0003
4.4			-0.87	-0.0010

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LTE band 26PART90, 10MHz bandwidth QPSK(worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	819	1.14	0.0014
50			-0.37	-0.0005
40			-0.32	-0.0004
30			0.70	0.0009
10			0.43	0.0005
0			0.56	0.0007
-10			0.66	0.0008
-20			1.23	0.0015
-30			1.30	0.0016

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	819	-0.27	-0.0003
4.4			1.00	0.0012

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

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	2593	-2.35	-0.0009
50			-2.85	-0.0011
40			-2.25	-0.0009
30			-2.83	-0.0011
10			-2.83	-0.0011
0			-2.58	-0.0010
-10			-3.52	-0.0014
-20			-2.53	-0.0010
-30			-2.39	-0.0009

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	2593	-2.28	-0.0009
4.4			-2.33	-0.0009

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

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1745	-1.02	-0.0006
50			-0.96	-0.0006
40			-1.03	-0.0006
30			-0.82	-0.0005
10			-0.82	-0.0005
0			-1.59	-0.0009
-10			-1.69	-0.0010
-20			-1.20	-0.0007
-30			-1.09	-0.0006

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	1745	-0.67	-0.0004
4.4			-1.12	-0.0006

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

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	680.5	0.72	0.0011
50			-0.20	-0.0003
40			-1.57	-0.0023
30			-0.56	-0.0008
10			0.34	0.0005
0			-0.62	-0.0009
-10			0.36	0.0005
-20			1.23	0.0018
-30			-0.93	-0.0014

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	680.5	-1.37	-0.0020
4.4			-1.23	-0.0018

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

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	2593	-34.38	-0.0133
50			-34.73	-0.0134
40			-35.42	-0.0137
30			-35.06	-0.0135
10			-34.30	-0.0132
0			-34.06	-0.0131
-10			-34.36	-0.0133
-20			-33.96	-0.0131
-30			-34.63	-0.0134

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	2593	-33.98	-0.0131
4.4			-33.63	-0.0130

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LTE band 2@CA_2+4, 20MHzbandwidth 20MHz(worst case of all bandwidths)
Frequency Error vs Voltage

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1880	-1.69	-0.0009
50			-1.95	-0.0010
40			-1.69	-0.0009
30			-2.35	-0.0013
10			-2.52	-0.0013
0			-2.70	-0.0014
-10			-2.22	-0.0012
-20			-1.76	-0.0009
-30			-2.62	-0.0014

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	1880	-2.66	-0.0014
4.4			-1.70	-0.0009

LTE band 4@CA_2+4, 20MHzbandwidth 20MHz(worst case of all bandwidths)
Frequency Error vs Voltage

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1732.5	-1.42	-0.0008
50			-1.32	-0.0008
40			-1.62	-0.0009
30			-1.49	-0.0009
10			-1.42	-0.0008
0			-1.37	-0.0008
-10			-1.62	-0.0009
-20			-1.80	-0.0010
-30			-2.13	-0.0012

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	1732.5	-2.40	-0.0014
4.4			-1.67	-0.0010

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LTE band 2@CA_2+12, 20MHzbandwidth 20MHz(worst case of all bandwidths)
Frequency Error vs Voltage

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1880	-1.08	-0.0006
50			-1.39	-0.0007
40			-1.04	-0.0006
30			-1.12	-0.0006
10			-1.53	-0.0008
0			-1.10	-0.0006
-10			-1.16	-0.0006
-20			-1.02	-0.0005
-30			-1.12	-0.0006

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	1880	-2.75	-0.0015
4.4			-0.99	-0.0005

LTE band 12@CA_2+12, 10MHzbandwidth 10MHz(worst case of all bandwidths)
Frequency Error vs Voltage

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	707.5	-1.29	-0.0018
50			-0.84	-0.0012
40			-1.16	-0.0016
30			-0.86	-0.0012
10			-1.66	-0.0023
0			-0.84	-0.0012
-10			-1.55	-0.0022
-20			-1.30	-0.0018
-30			-1.59	-0.0022

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	707.5	-1.33	-0.0019
4.4			-0.92	-0.0013

LTE band 2@CA_2+66, 20MHzbandwidth 20MHz(worst case of all bandwidths)
Frequency Error vs Voltage
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Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1880	-2.27	-0.0012
50			-2.40	-0.0013
40			-2.17	-0.0012
30			-1.52	-0.0008
10			-1.73	-0.0009
0			-2.39	-0.0013
-10			-2.02	-0.0011
-20			-2.29	-0.0012
-30			-2.32	-0.0012

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	1880	-2.63	-0.0014
4.4			-2.55	-0.0014

LTE band 66@CA_2+66, 20MHzbandwidth 20MHz(worst case of all bandwidths)
Frequency Error vs Voltage

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1745	-1.82	-0.0010
50			-2.26	-0.0013
40			-2.29	-0.0013
30			-2.55	-0.0015
10			-2.49	-0.0014
0			-1.80	-0.0010
-10			-1.70	-0.0010
-20			-2.53	-0.0014
-30			-2.26	-0.0013

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	1745	-2.17	-0.0012
4.4			-1.52	-0.0009

LTE band 12@CA_12+66, 10MHzbandwidth 10MHz(worst case of all bandwidths)
Frequency Error vs Voltage

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
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20	3.8	707.5	0.45	0.0006
50			-0.16	-0.0002
40			-0.03	0.0000
30			-0.57	-0.0008
10			1.04	0.0015
0			-0.06	-0.0001
-10			1.55	0.0022
-20			0.23	0.0003
-30			1.57	0.0022

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	707.5	1.59	0.0022
4.4			2.43	0.0034

LTE band 66@CA_12+66, 20MHzbandwidth 20MHz(worst case of all bandwidths)
Frequency Error vs Voltage

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	1745	1.39	0.0008
50			2.73	0.0016
40			1.26	0.0007
30			1.40	0.0008
10			2.33	0.0013
0			0.24	0.0001
-10			2.36	0.0014
-20			2.53	0.0014
-30			0.90	0.0005

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	1745	0.89	0.0005
4.4			0.10	0.0001

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6.9. Peak to Average Ratio

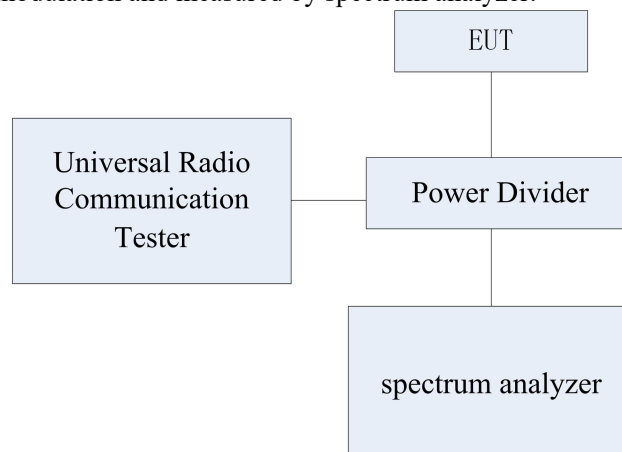
Specifications:	FCC Part 24.232, 27.50
DUT Serial Number:	864284040456399/864284040456696
Test conditions:	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit

The EUT meets the requirement of having a peak to average ratio of less than 13dB.

Test Setup

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	0.22 dB (k=2)

Test Method

The transmitter output was connected to a CMW500 through a coaxial RF cable and directional coupler, and configured to operate at maximum power. The peak to average ratio was measured at the required operating frequencies in each Band on the Spectrum Analyzer.

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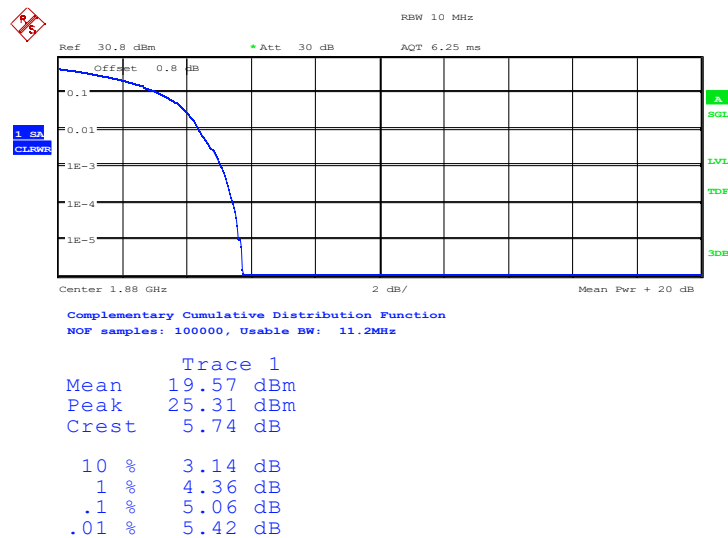
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6.9.1 Peak to Average Ratio Results

LTE Band 2, 20MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1880	100%,0	5.06	6.47

LTE band 2 , 20MHz Bandwidth,QPSK

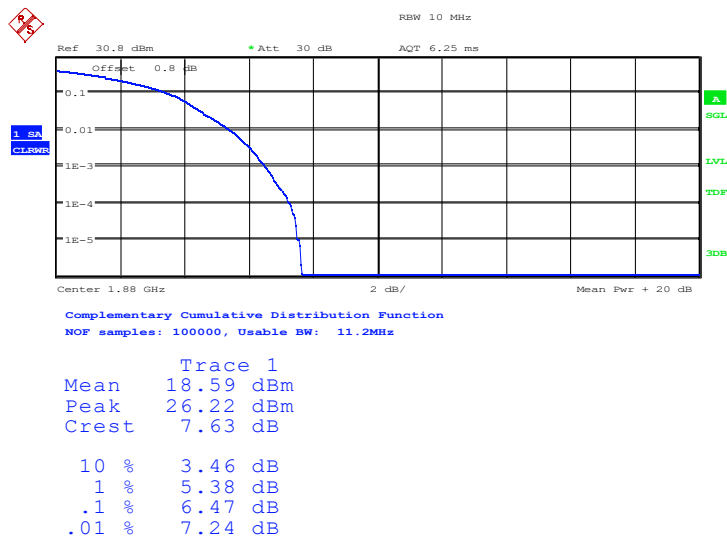


Date: 31.MAR.2022 23:55:58

LTE band 2 , 20MHz Bandwidth,16QAM

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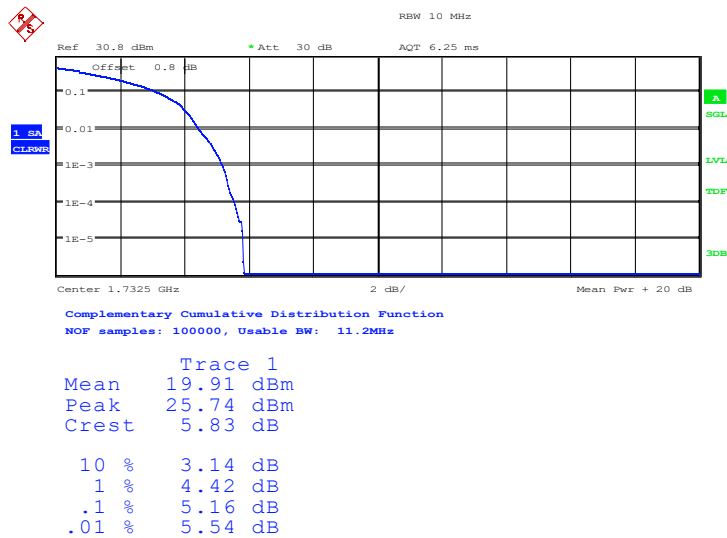


Date: 31.MAR.2022 23:56:14

LTE Band 4, 20MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1732.5	100%,0	5.16	6.44

LTE band 4 , 20MHz Bandwidth,QPSK

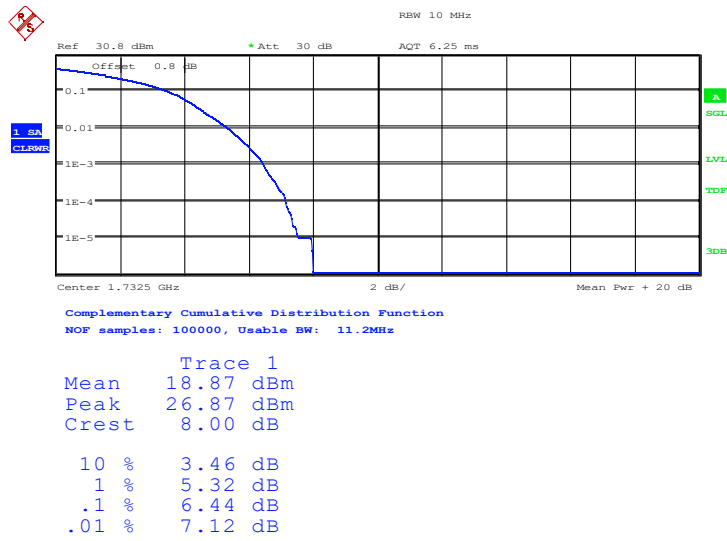


Date: 31.MAR.2022 23:56:32

LTE band 4 , 20MHz Bandwidth,16QAM

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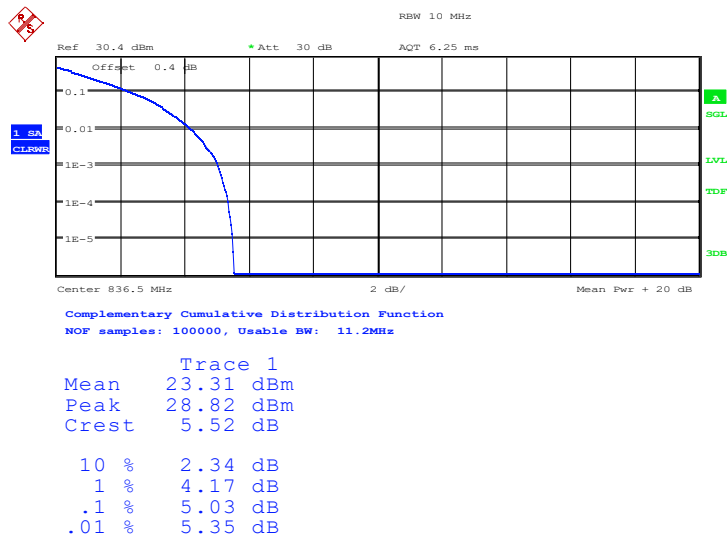


Date: 31.MAR.2022 23:56:45

LTE Band 5, 10MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
836.5	100%,0	5.03	5.87

LTE band 5 , 10MHz Bandwidth,QPSK



Date: 1.APR.2022 05:31:51

LTE band 5 , 10MHz Bandwidth,16QAM

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