Configuration LTE-MIMO-1C

-26dBc Occupied Bandwidth

Modulation/ Bandwidth	Occupied Bandwidth (MHz)		
	Channel position B	Channel position M	Channel position T
QPSK/ 5.0MHz	4.724	4.740	4.732
QPSK/ 10.0MHz	9.393	9.403	9.344
QPSK/ 15.0MHz	13.97	14.04	14.02
QPSK/ 20.0MHz	18.56	18.61	18.62

-26dBc Occupied Bandwidth

Bandwidth	Occupied Bandwidth (MHz)		
	Modulation 16QAM/ Channel position M	Modulation 64QAM/ Channel position M	Modulation 256QAM/ Channel position M
5.0MHz	4.709	4.731	4.718
10.0MHz	9.303	9.376	9.422
15.0MHz	13.95	13.98	13.99
20.0MHz	18.56	18.57	18.61

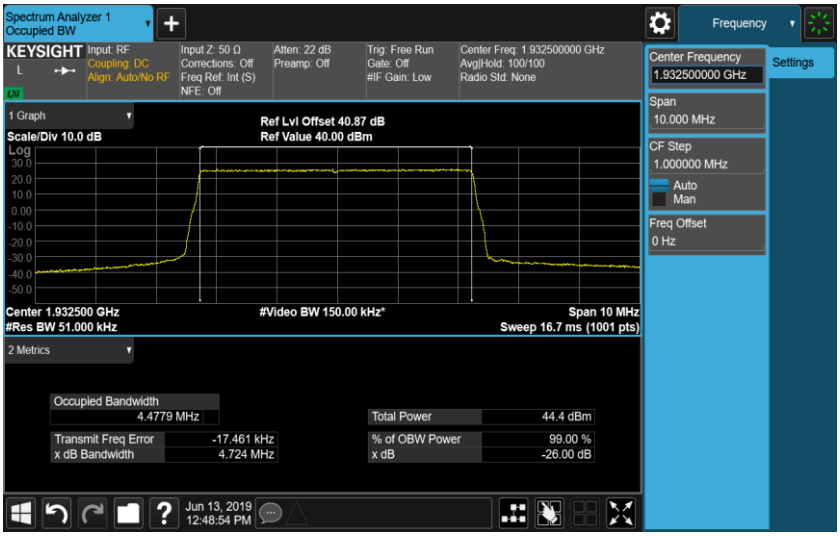
99% Occupied Bandwidth

Modulation/ Bandwidth	Occupied Bandwidth (MHz)		
	Channel position B	Channel position M	Channel position T
QPSK/ 5.0MHz	4.4779	4.4775	4.4771
QPSK/ 10.0MHz	8.9356	8.9386	8.9432
QPSK/ 15.0MHz	13.401	13.402	13.389
QPSK/ 20.0MHz	17.843	17.855	17.861

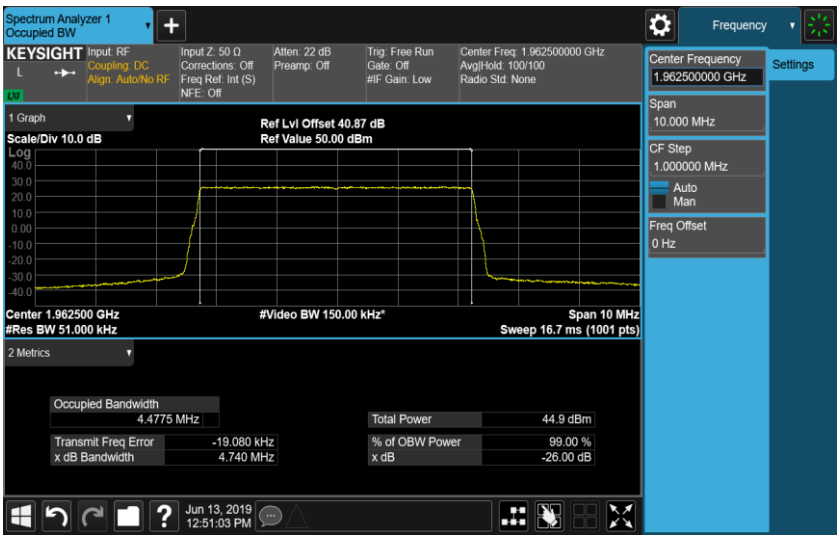
99% Occupied Bandwidth

Bandwidth	Occupied Bandwidth (MHz)		
	Modulation 16QAM/ Channel position M	Modulation 64QAM/ Channel position M	Modulation 256QAM/ Channel position M
5.0MHz	4.4634	4.4799	4.4765
10.0MHz	8.9424	8.9399	8.9430
15.0MHz	13.398	13.397	13.400
20.0MHz	17.825	17.854	17.867

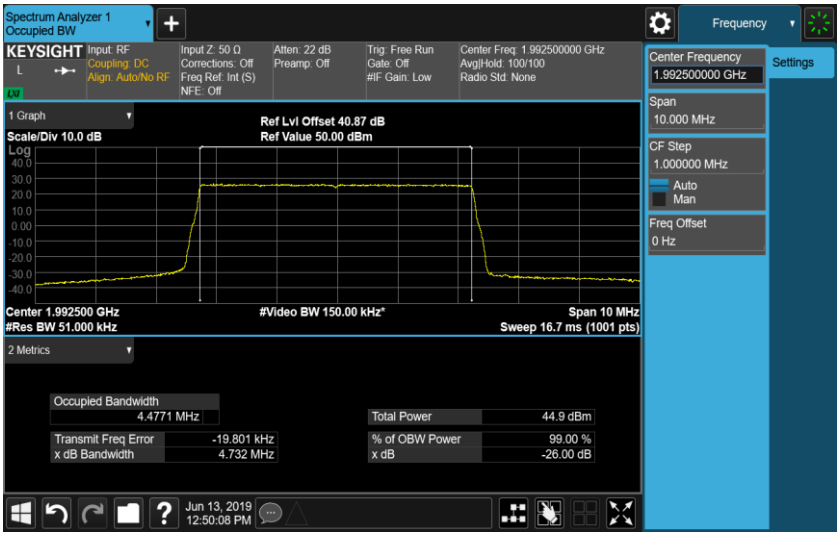
Port B, QPSK/5.0MHz Channel Position B



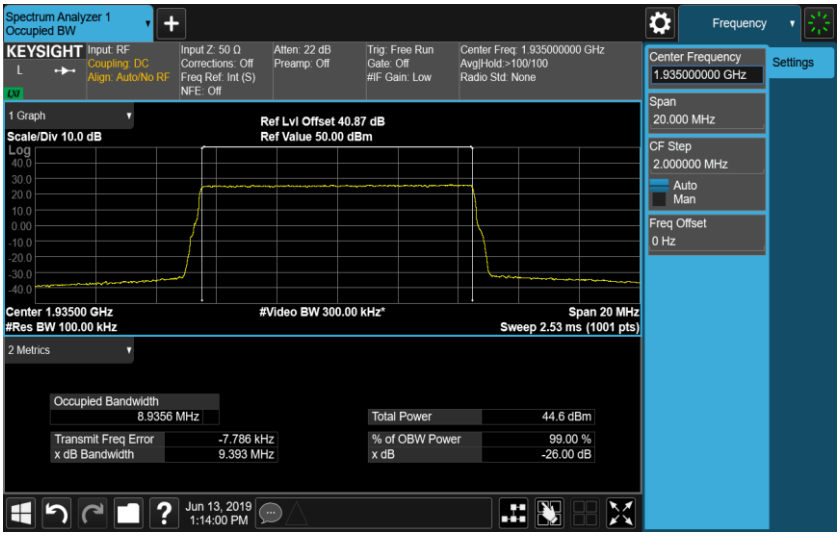
Port B, QPSK/5.0MHz Channel Position M



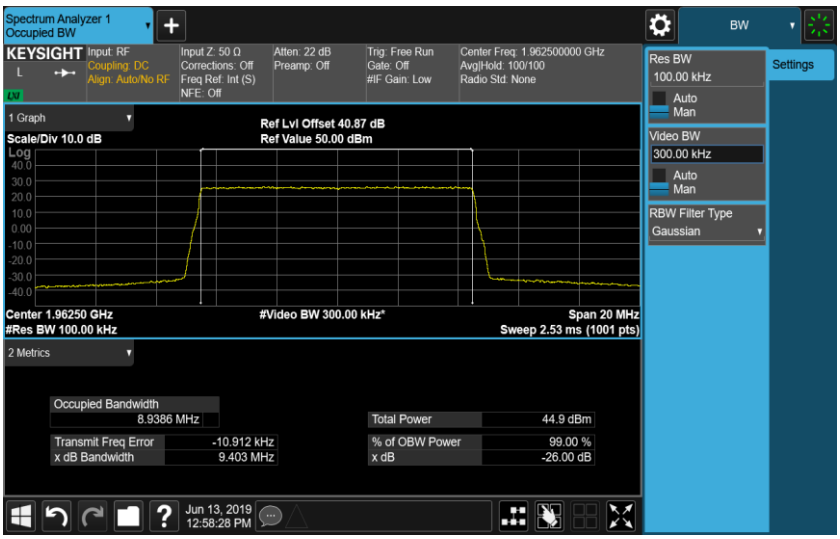
Port B, QPSK/5.0MHz Channel Position T



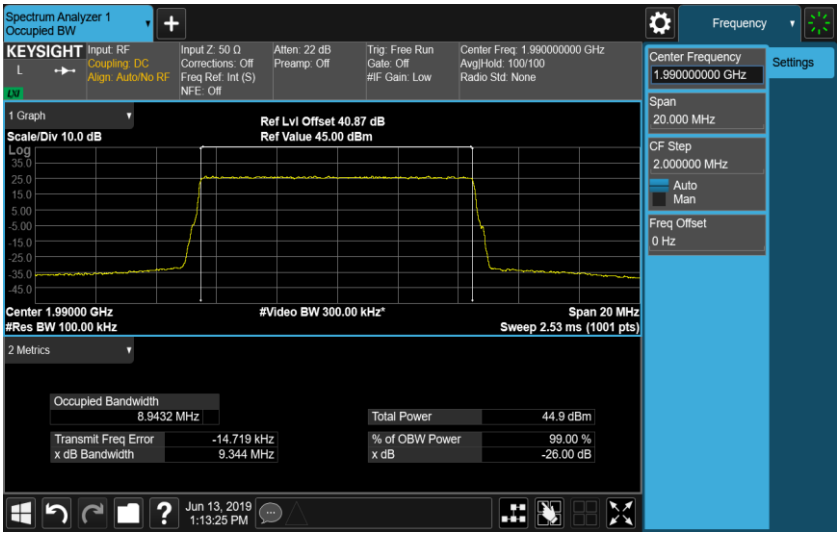
Port B, QPSK/10.0MHz Channel Position B



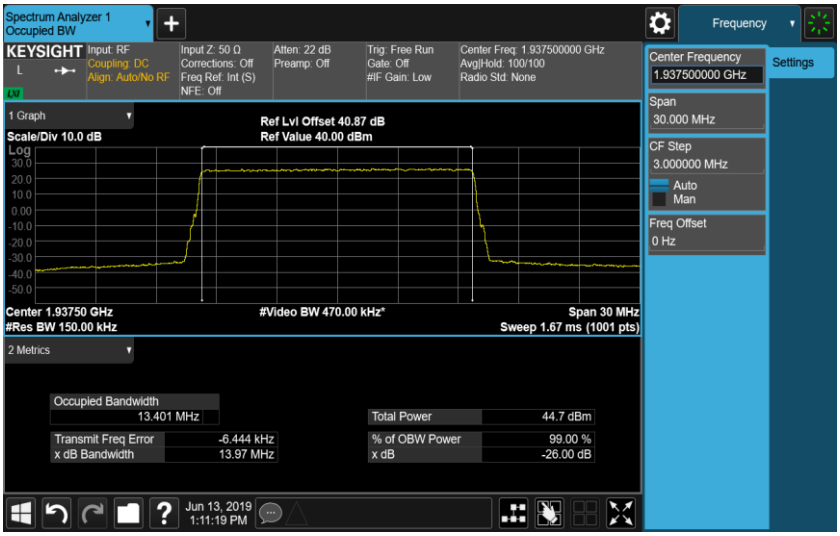
Port B, QPSK/10.0MHz Channel Position M



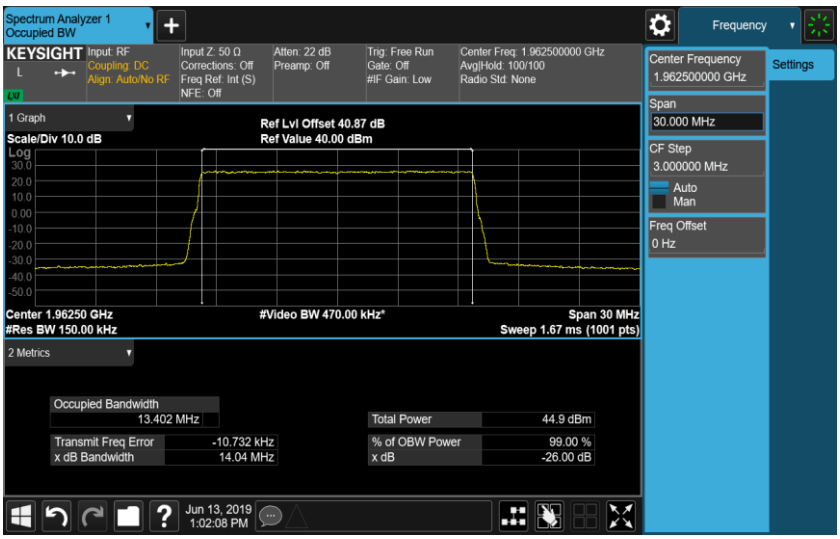
Port B, QPSK/10.0MHz Channel Position T



Port B, QPSK/15.0MHz Channel Position B

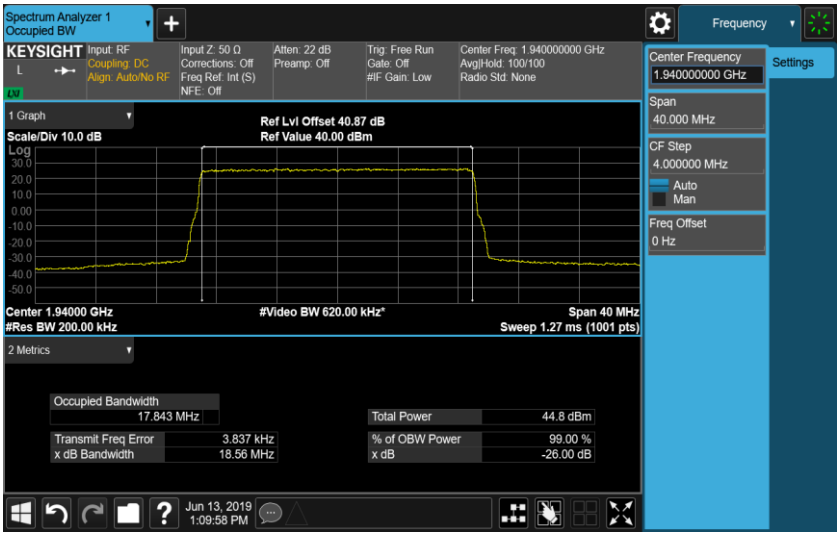


Port B, QPSK/15.0MHz Channel Position M

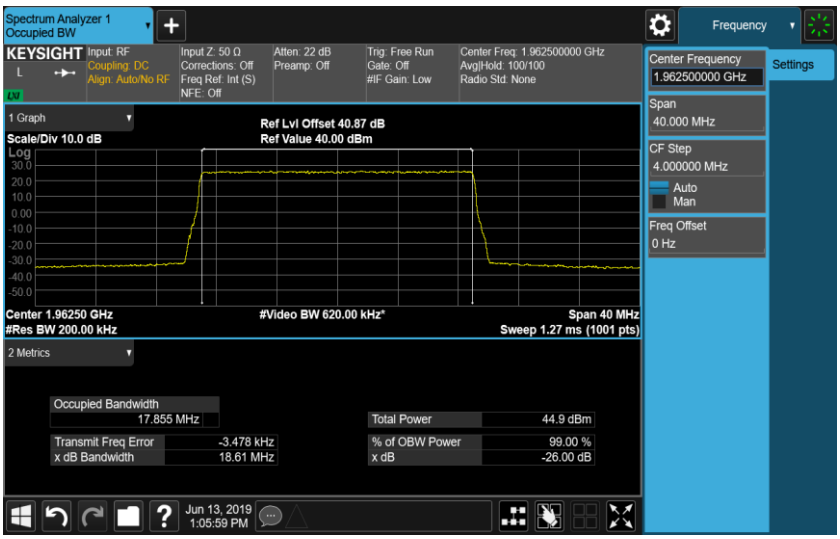


Port B, QPSK/15.0MHz Channel Position T

Port B, QPSK/20.0MHz Channel Position B



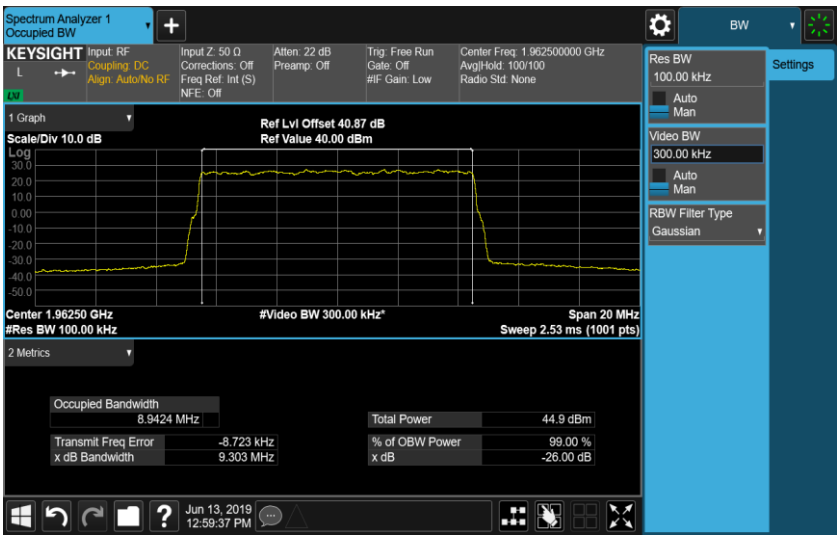
Port B, QPSK/20.0MHz Channel Position M



Port B, QPSK/20.0MHz Channel Position T

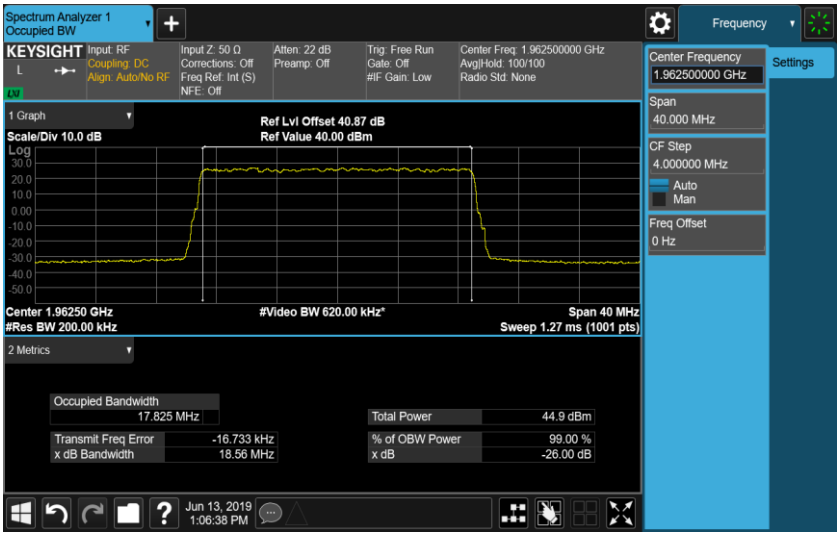
Port B, 16QAM/5.0MHz Channel Position M

Port B, 16QAM/10.0MHz Channel Position M

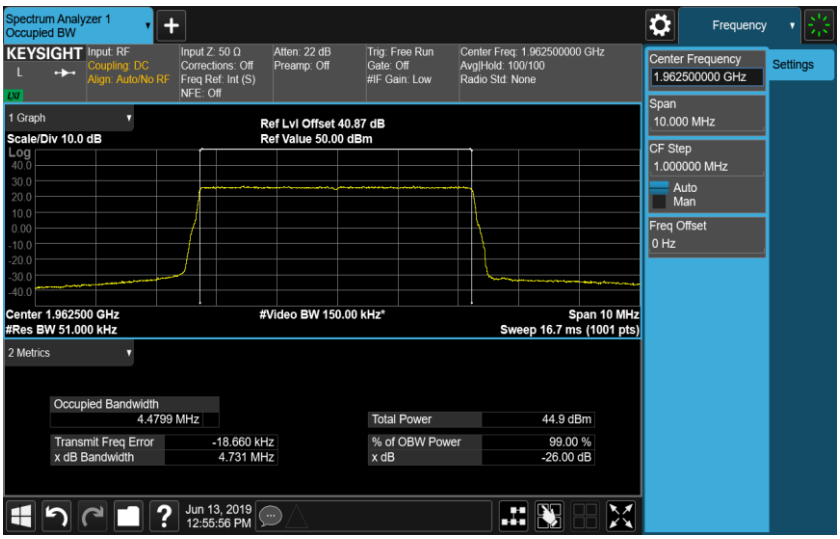


Port B, 16QAM/15.0MHz Channel Position M

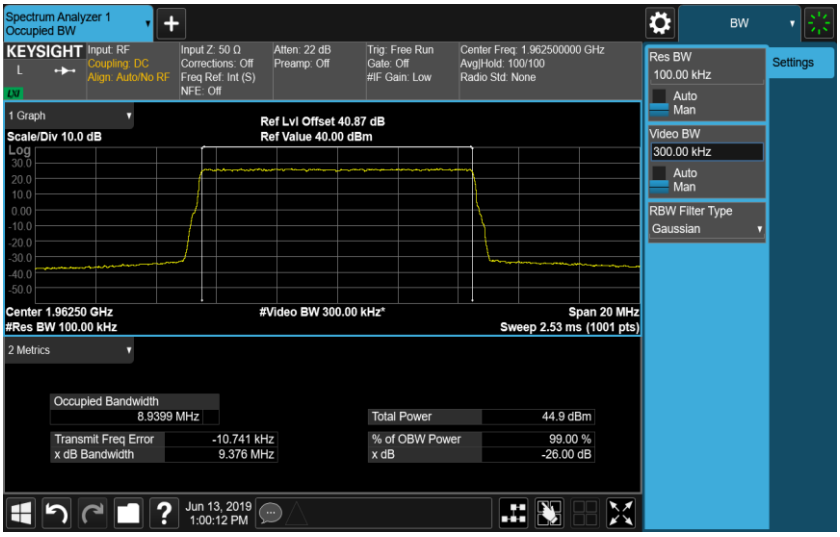
Port B, 16QAM/20.0MHz Channel Position M



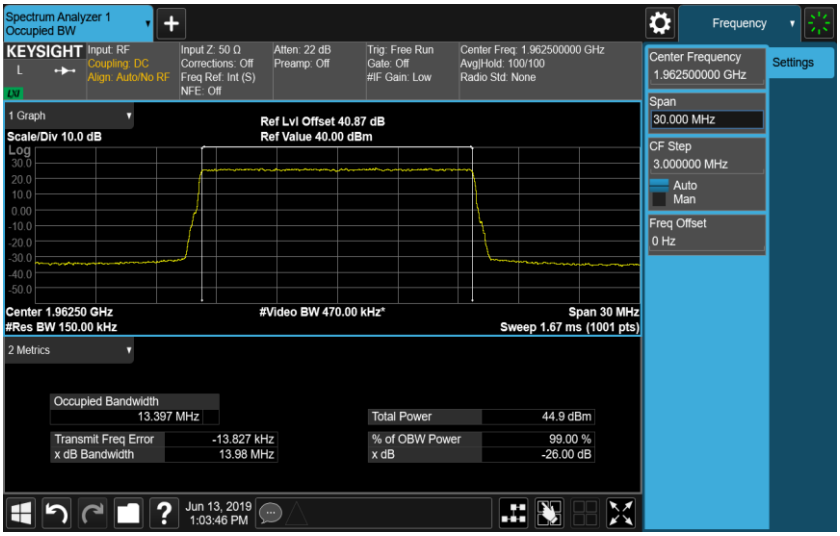
Port B, 64QAM/5.0MHz Channel Position M



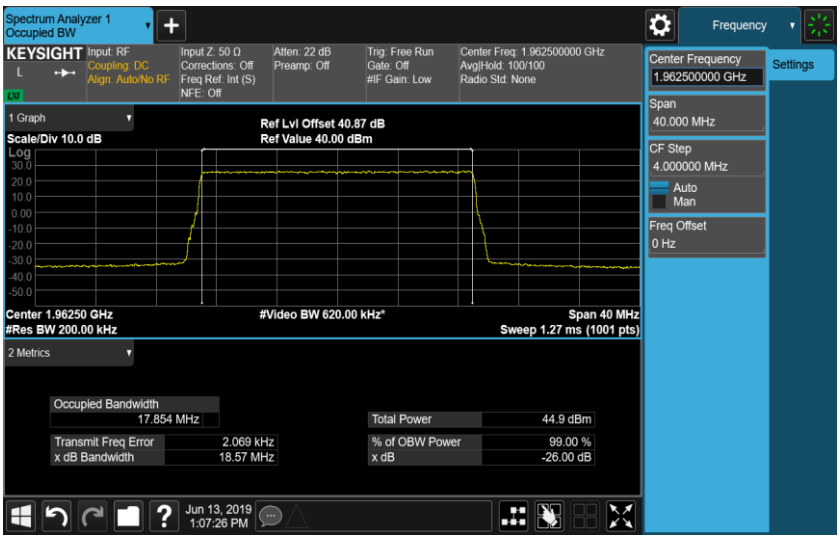
Port B, 64QAM/10.0MHz Channel Position M



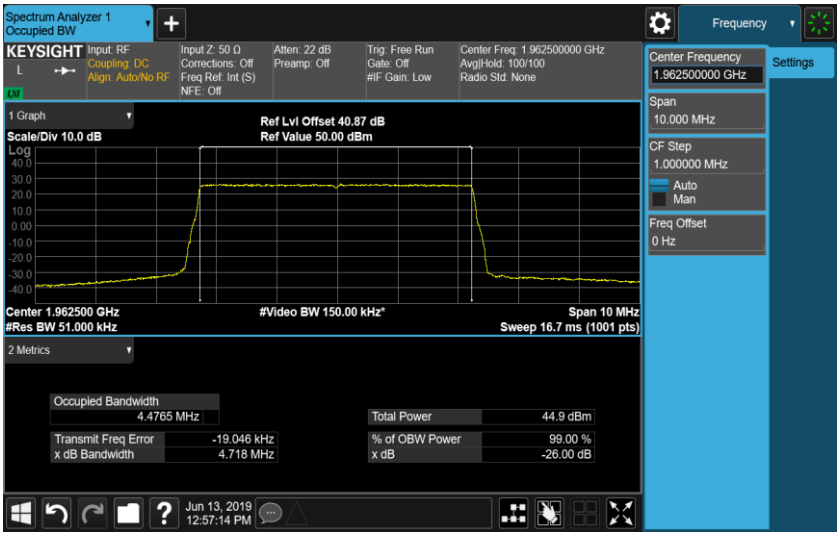
Port B, 64QAM/15.0MHz Channel Position M



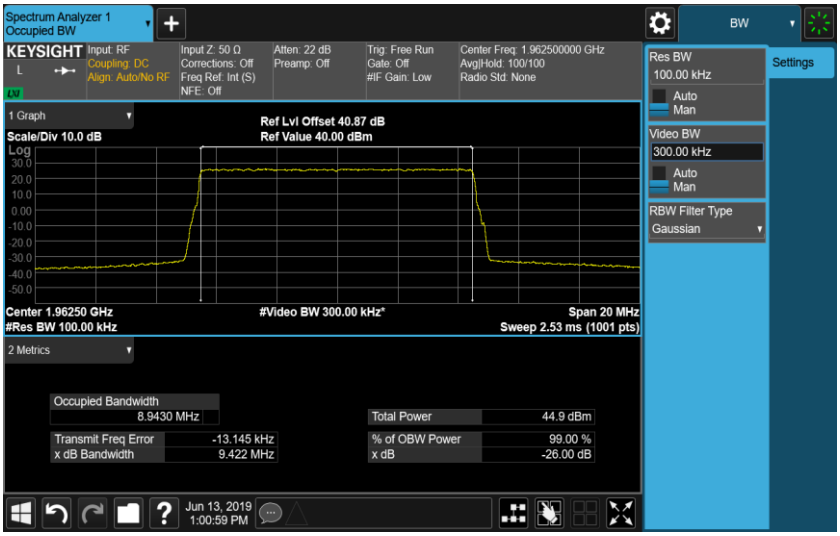
Port B, 64QAM/20.0MHz Channel Position M



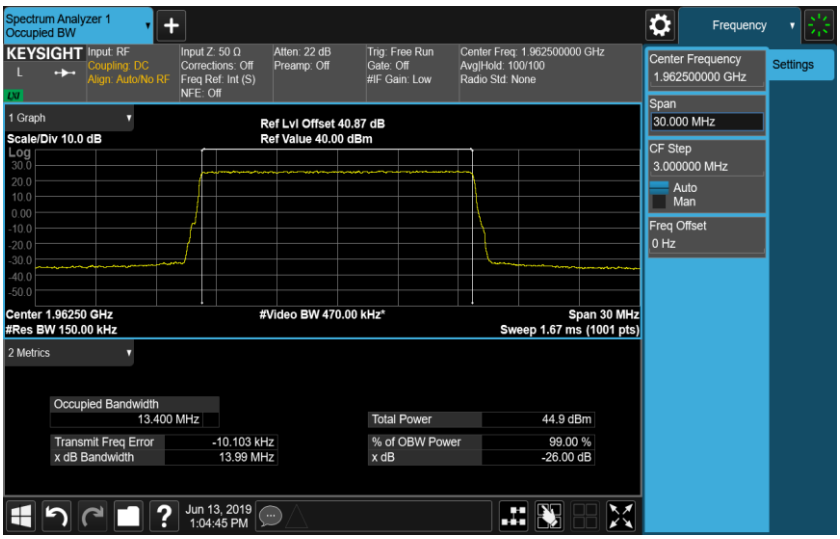
Port B, 256QAM/5.0MHz Channel Position M



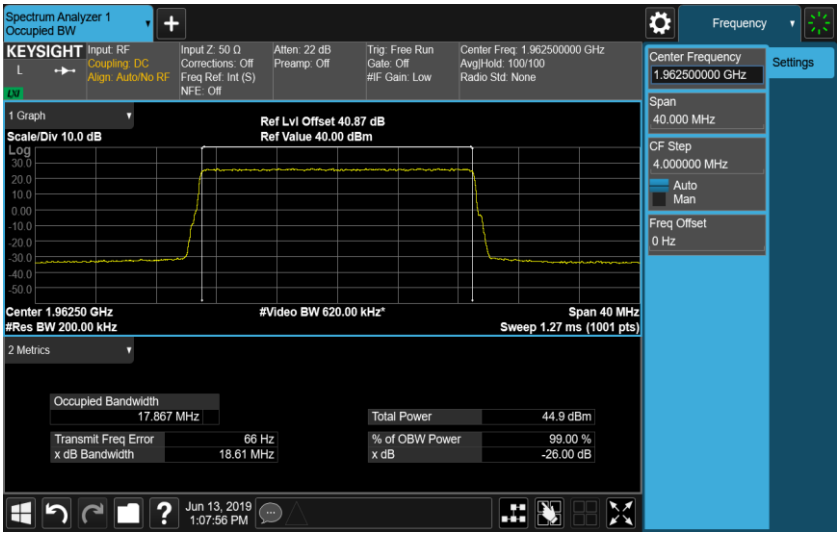
Port B, 256QAM/10.0MHz Channel Position M



Port B, 256QAM/15.0MHz Channel Position M



Port B, 256QAM/20.0MHz Channel Position M



Configuration NB-IoT-Standalone-1C

-26dBc Occupied Bandwidth

Modulation	Occupied Bandwidth (KHz)		
	Channel position B	Channel position M	Channel position T
QPSK	269.2	269.2	269.1

99% Occupied Bandwidth

Modulation	Occupied Bandwidth (KHz)		
	Channel position B	Channel position M	Channel position B
QPSK	193.10	193.96	192.61

Port B, QPSK Channel Position B

Port B, QPSK Channel Position M

Port B, QPSK Channel Position T

Configuration NB-IoT-InBand-1C

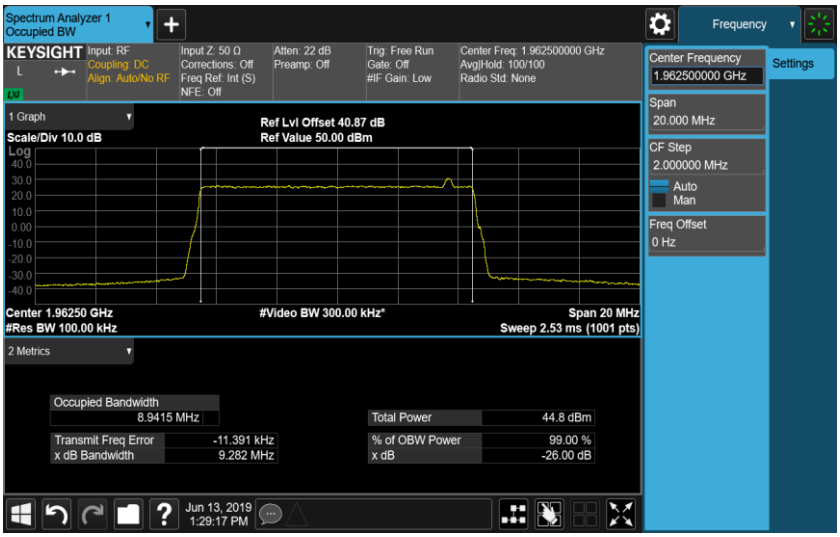
-26dBc Occupied Bandwidth

Modulation	Occupied Bandwidth (MHz)		
	Channel position B	Channel position M	Channel position T
QPSK	-	9.282	-

99% Occupied Bandwidth

Modulation	Occupied Bandwidth (MHz)		
	Channel position B	Channel position M	Channel position B
QPSK	-	8.9415	-

Port B, QPSK/10.0MHz Channel Position M



Configuration NB-IoT-GuardBand-1C

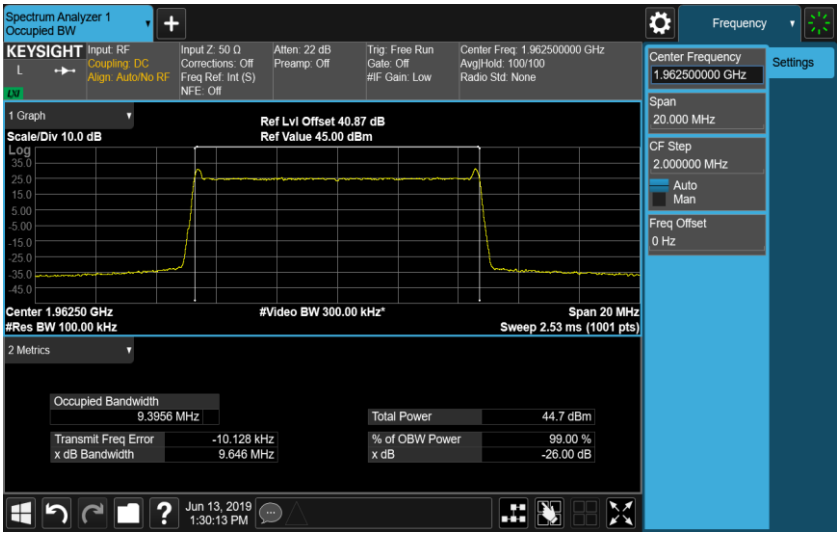
-26dBc Occupied Bandwidth

Modulation	Occupied Bandwidth (MHz)		
	Channel position B	Channel position M	Channel position T
QPSK	-	9.646	-

99% Occupied Bandwidth

Modulation	Occupied Bandwidth (MHz)		
	Channel position B	Channel position M	Channel position B
QPSK	-	9.3956	-

Port B, QPSK/10.0MHz Channel Position M



A.3 Spurious Emissions at Band Edge

A.3.1 Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 24, Clause 24.238 (b)
RSS-133, Clause 6.5

A.3.2 Method of measurement

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 + 10log(P) dB.

For MIMO mode configurations, the limit was adjusted with a correction of -6.02dB [10Log4] by using the Measure and Add 10Log(N) dB technique according to FCC KDB 662911 D01 Multiple Transmitter Output accounting for simultaneous transmission from antenna ports RF A,B,C and D.

According to FCC rules, in the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed and a RBW of 1MHz for measurements of emissions > 1MHz away from the band edges. The limit was adjusted with -13.01dB [10Log(50/1000)] to compensate for the reduce measurement bandwidth 50KHz for emission more than 1MHz away from the band edges. For MIMO mode, the limit of -32.03dBm was used for emission more than 1MHz away from the band edges. For Non-MIMO mode, the limit of -26.01dBm was used for emission more than 1MHz away from the band edges. Spectrum analyser detector was set as RMS.

A.3.3 Measurement limit

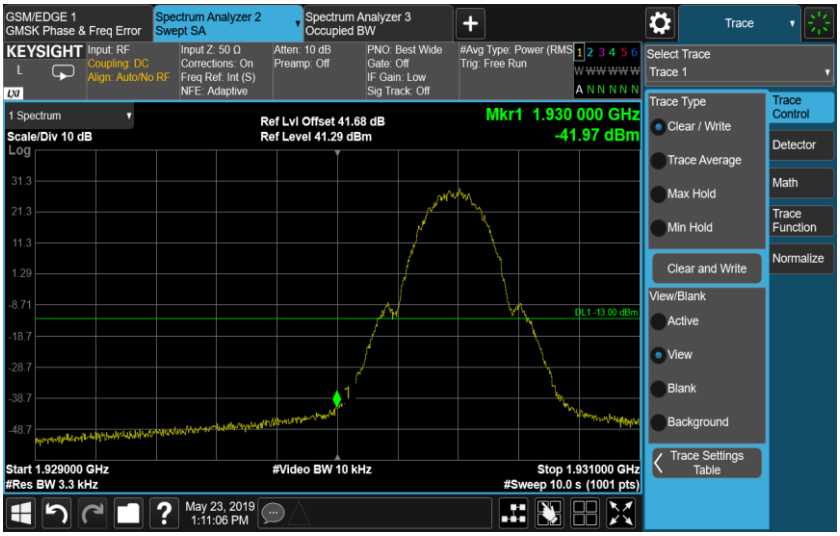
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

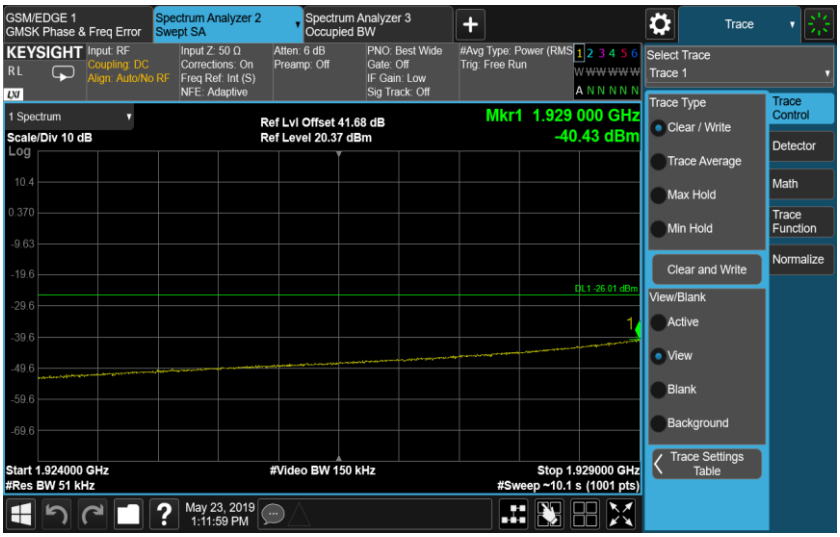
A.3.4 Measurement result

Configuration GSM-1C-BE, GMSK

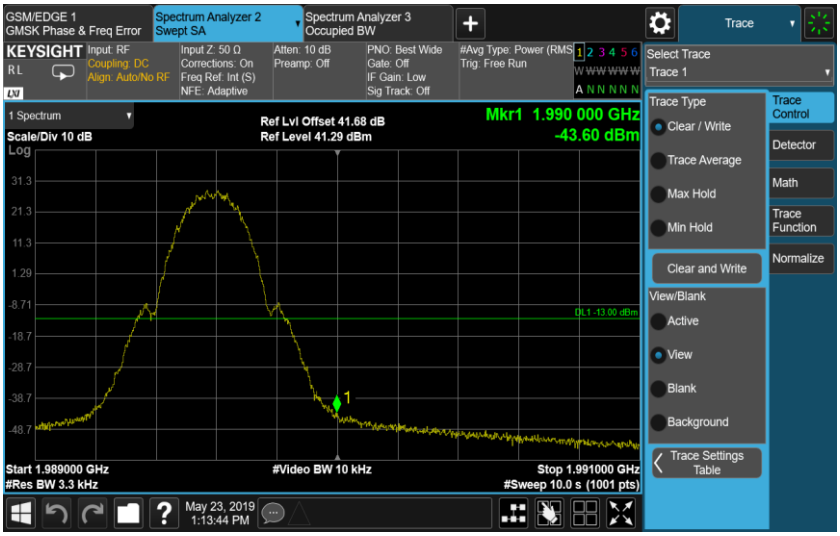
Band Edge Frequency	Channel Bandwidth	RBW (KHz)	Limit (dBm)
Channel Position B 1930.0MHz	250KHz	3.3	-13.00
Channel Position T 1990.0MHz	250KHz	3.3	-26.01

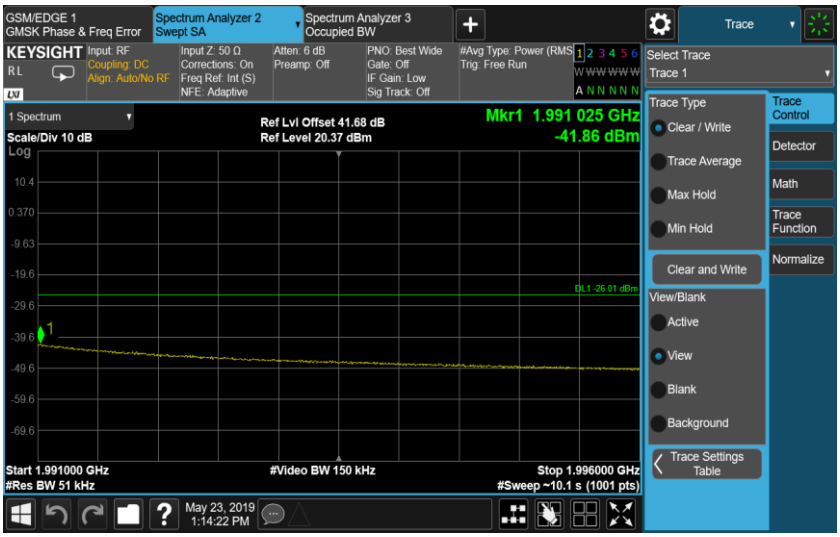
Port A , Channel Position B





Port A , Channel Position T

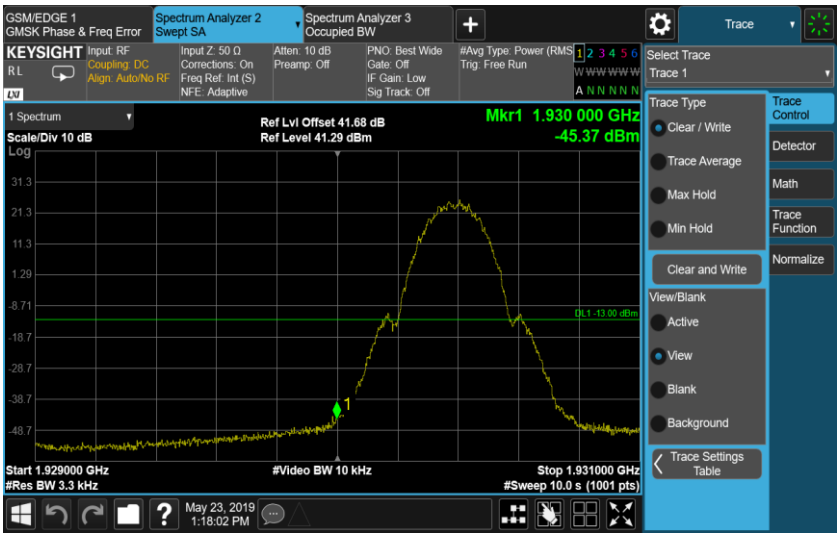


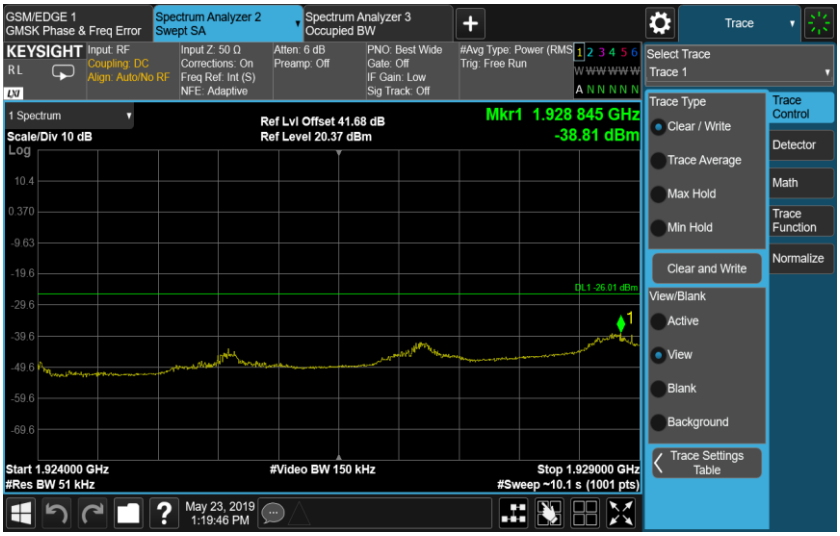


Configuration GSM-2C-BE, GMSK

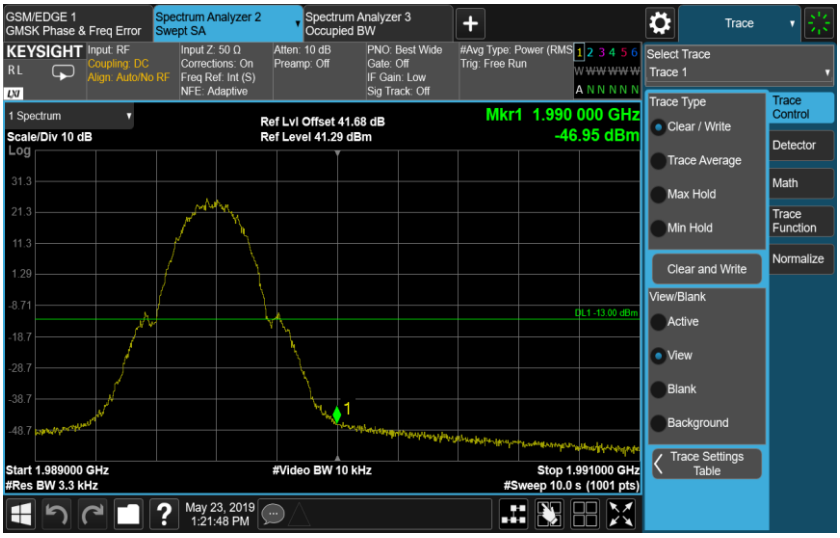
Band Edge Frequency	Channel Bandwidth	RBW (KHz)	Limit (dBm)
Channel Position B 1930.0MHz	250KHz	3.3	-13.00
Channel Position T 1990.0MHz	250KHz	3.3	-26.01

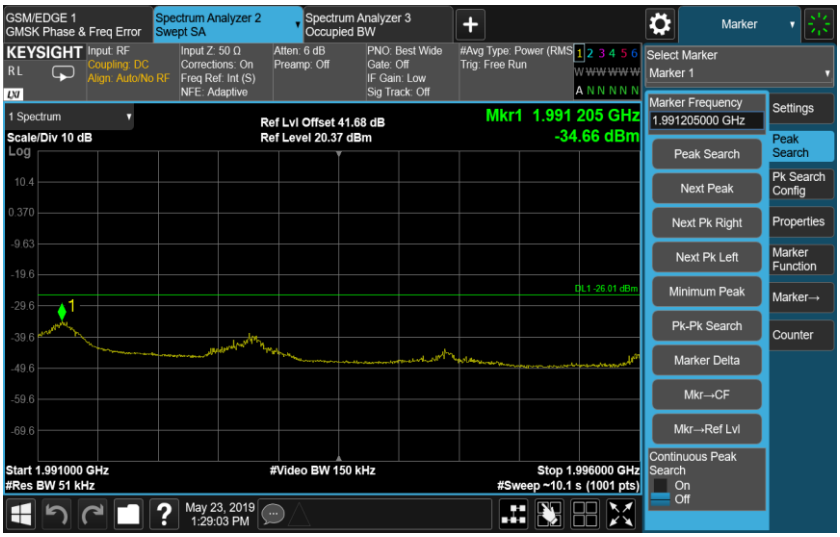
Port A , Channel Position B





Port A , Channel Position T

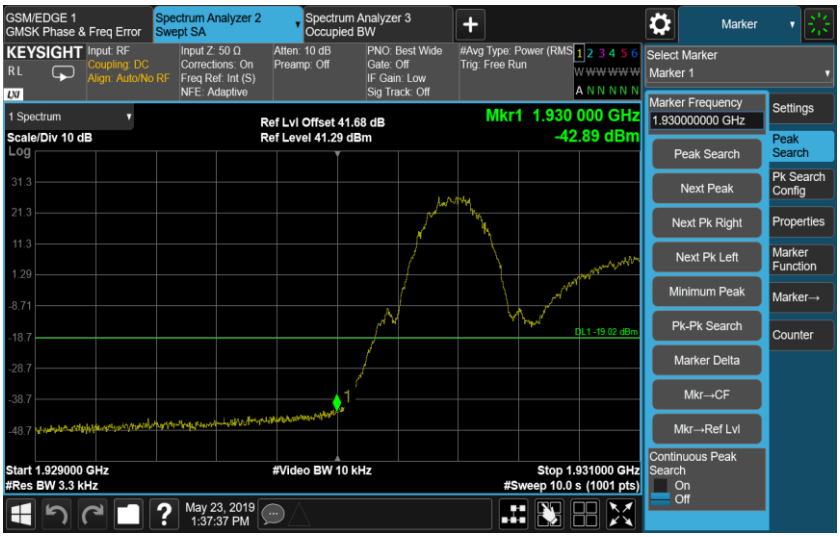


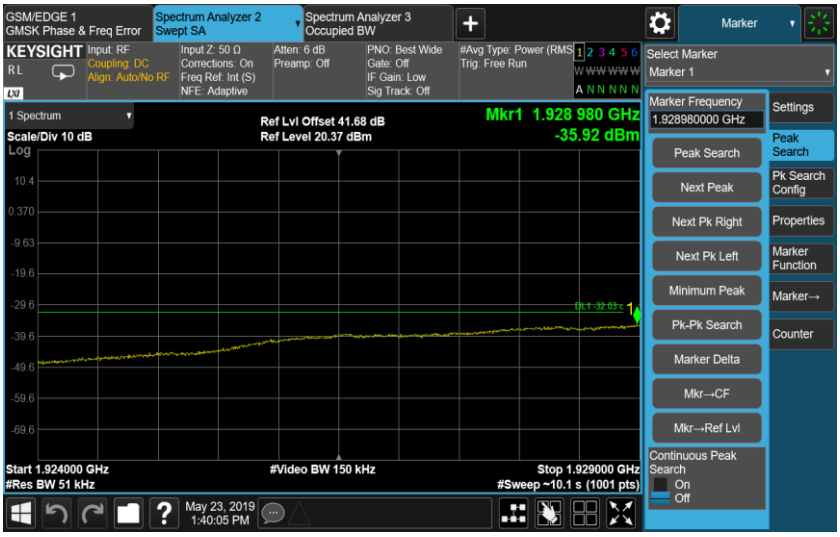


Configuration GSM+WCDMA-MIMO-MC-3-BE (1GSM, GMSK + 1WCDMA, 64QAM)

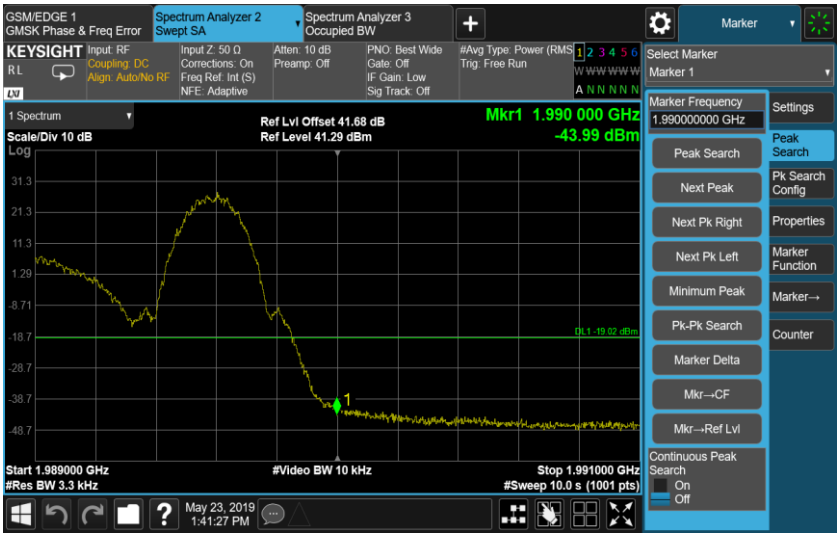
Band Edge Frequency	Channel Bandwidth	RBW (KHz)	Limit (dBm)
Channel Position B 1930.0MHz	(W) 5.0MHz, (G) 250KHz	3.3	-19.02
Channel Position T 1990.0MHz	(W) 5.0MHz, (G) 250KHz	3.3	-32.03

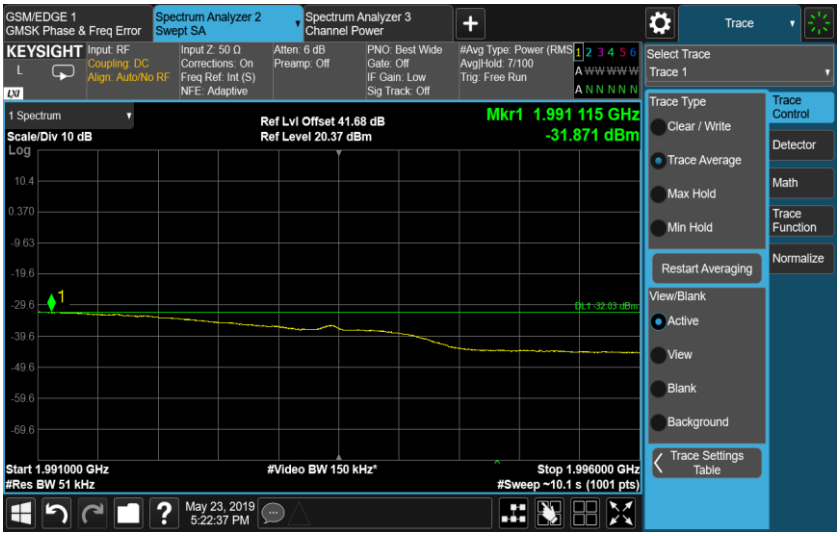
Port A , Channel Position B

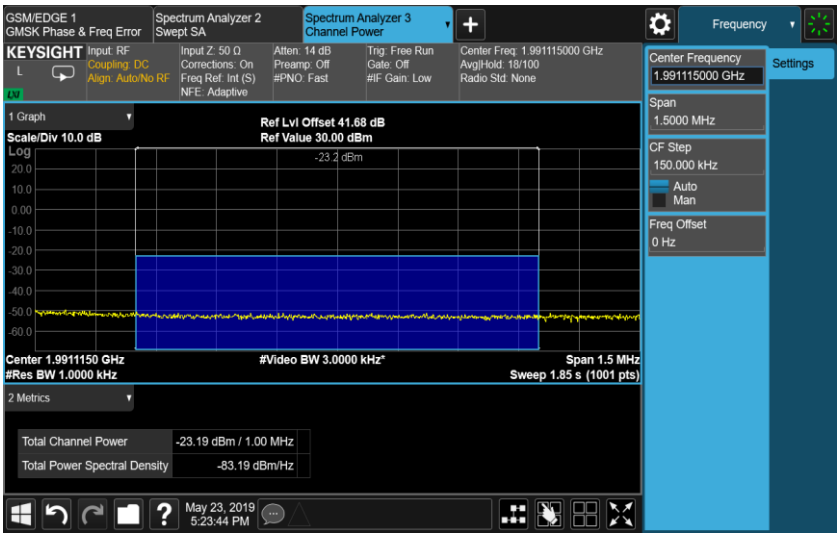




Port A , Channel Position T







The channel power of 1MHz for 1991.115MHz is -23.19dBm, which is within the limit of -19.02dBm.

Configuration GSM+WCDMA-MIMO-MC-4-BE (2GSM, GMSK +1WCDMA, 64QAM)

Band Edge Frequency	Channel Bandwidth	RBW (KHz)	Limit (dBm)
Channel Position B 1930.0MHz	(W) 5.0MHz, (G) 250KHz	3.3	-19.02
Channel Position T 1990.0MHz	(W) 5.0MHz, (G) 250KHz	3.3	-32.03

Port A , Channel Position B