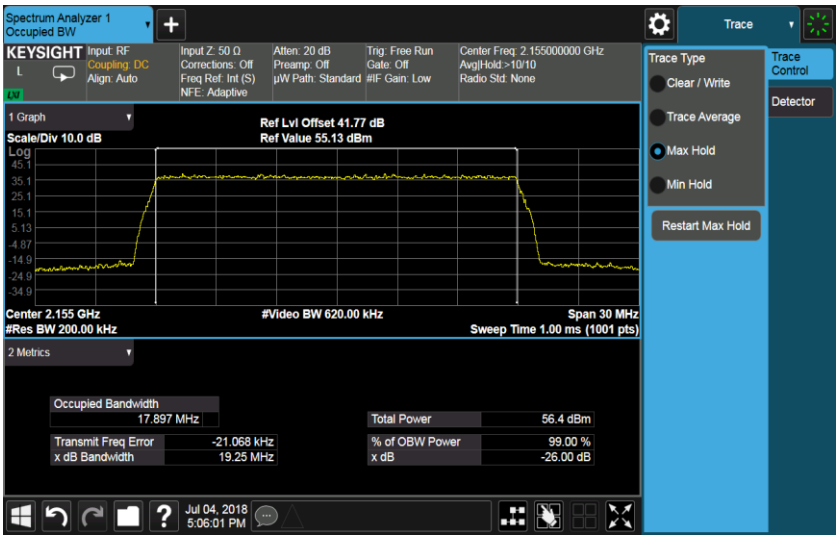
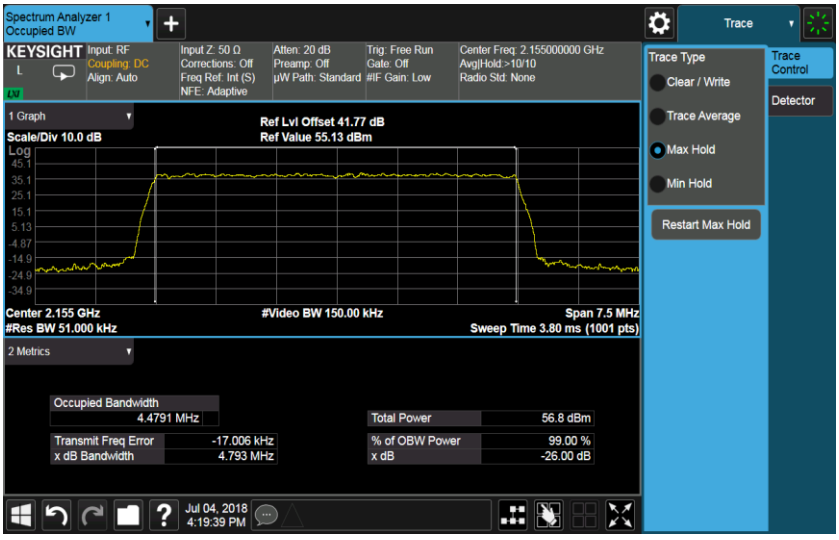
Port B , QPSK 20.0M Channel position M



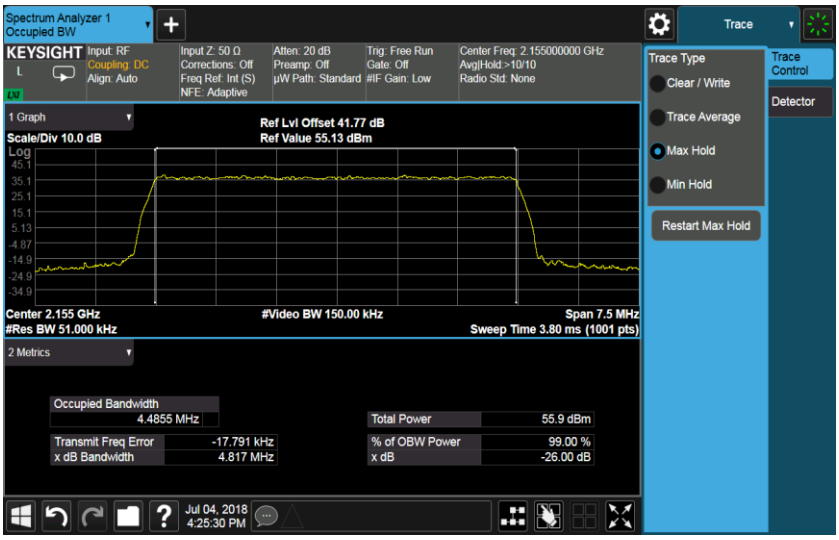
Port B , QPSK 20.0M Channel position T

Port B , 16QAM 5.0M Channel Position M

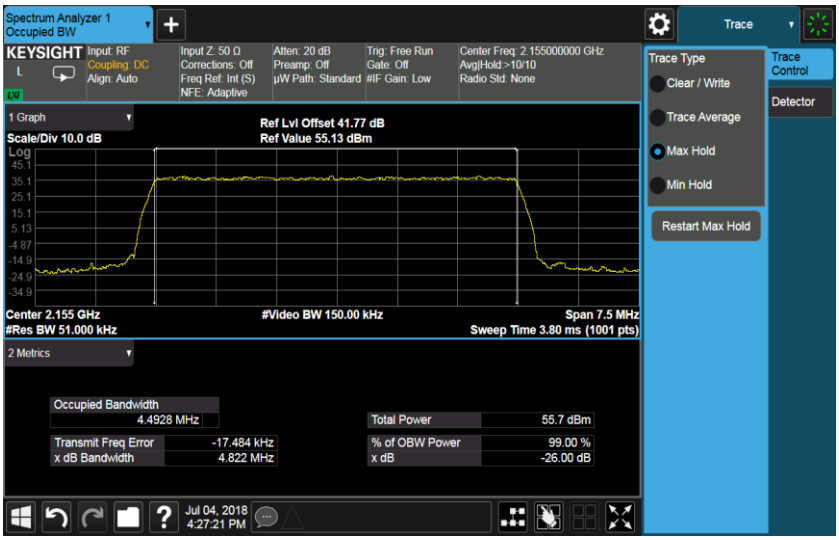


©Copyright. All rights reserved by CTTL.

Port B , 64QAM 5.0M Channel Position M



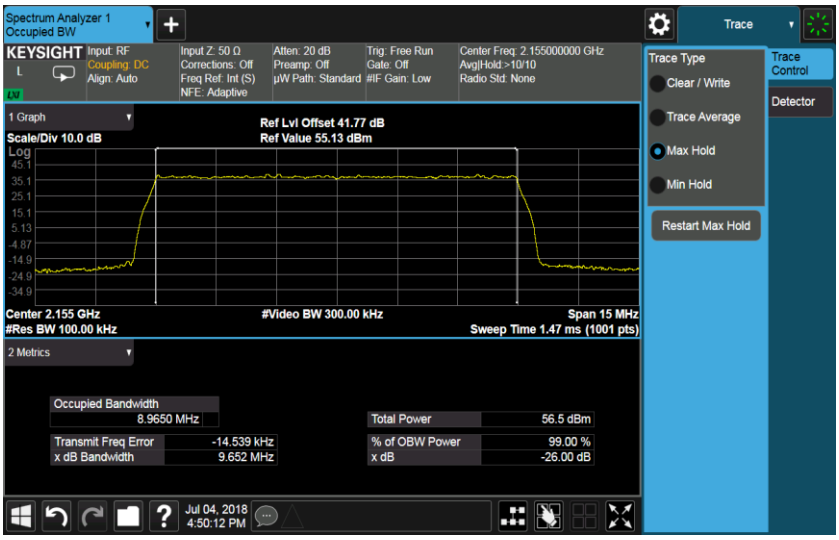
Port B , 256QAM 5.0M Channel Position M



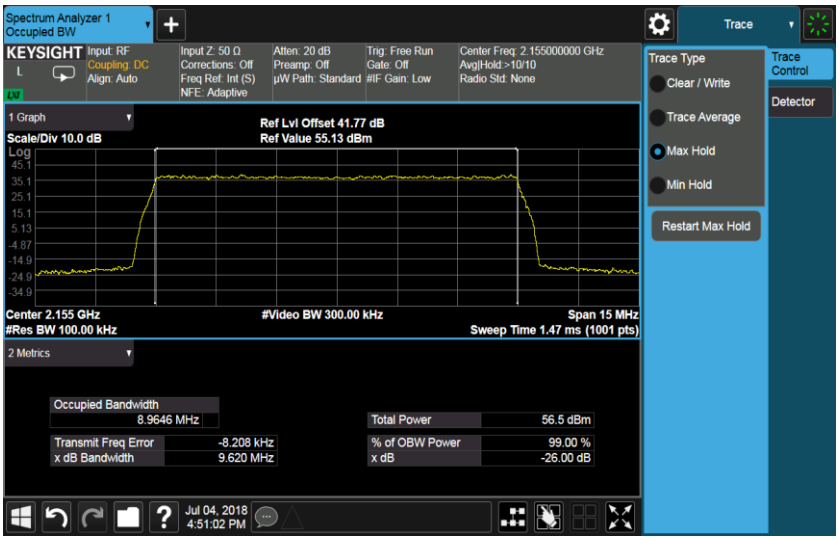
Port B , 16QAM 10.0M Channel Position M

©Copyright. All rights reserved by CTTL.

Port B , 64QAM 10.0M Channel Position M



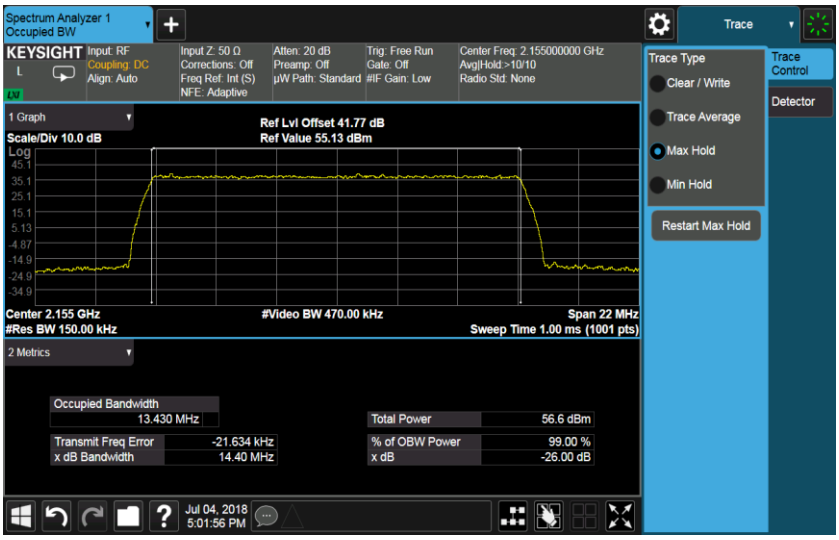
Port B , 256QAM 10.0M Channel Position M



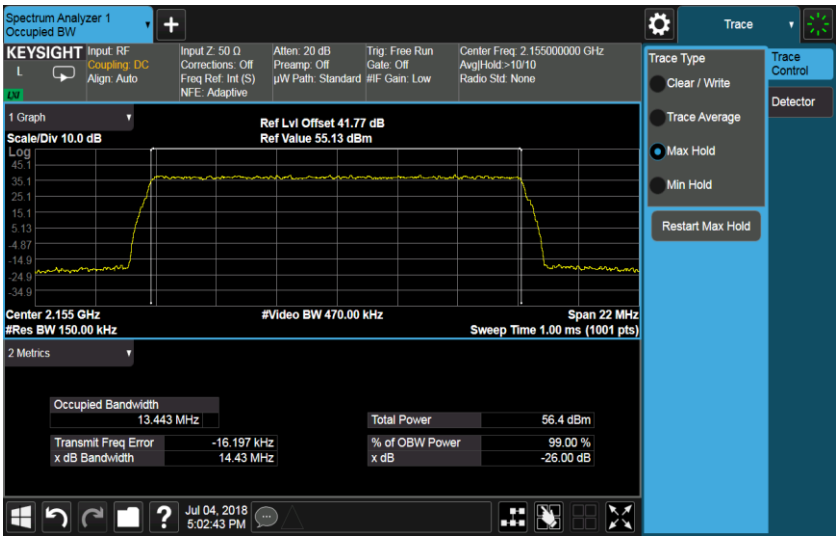
Port B , 16QAM 15.0M Channel Position M

©Copyright. All rights reserved by CTTL.

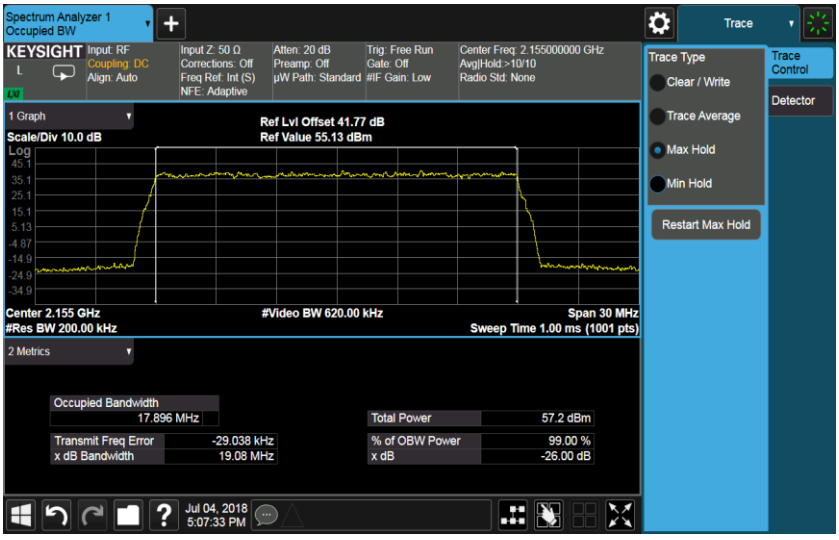
Port B , 64QAM 15.0M Channel Position M



Port B , 256QAM 15.0M Channel Position M

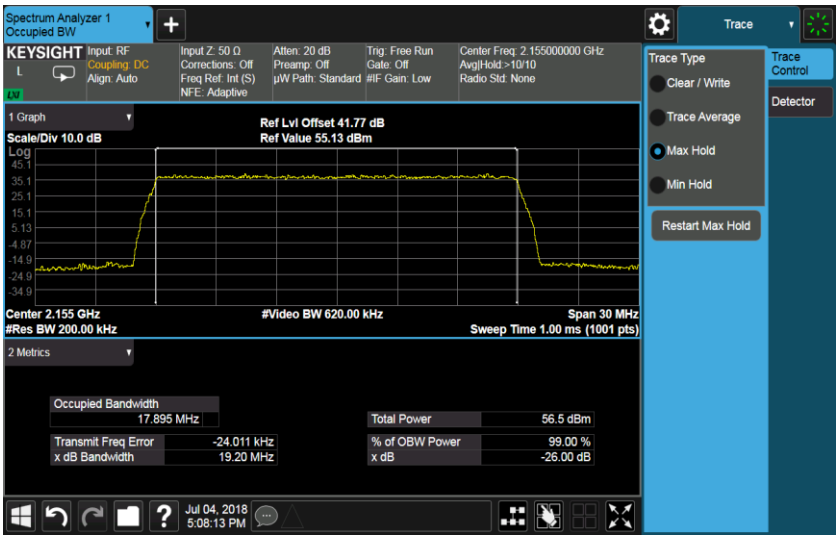


Port B , 16QAM 20.0M Channel Position M

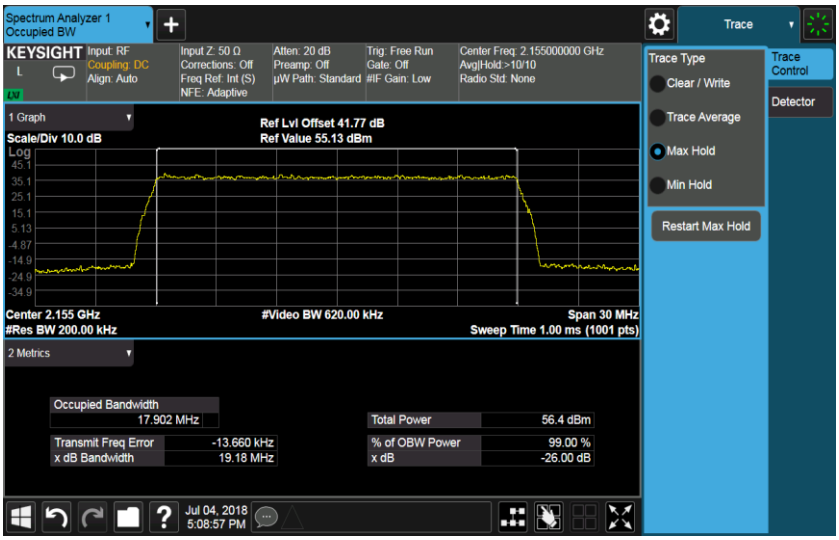


©Copyright. All rights reserved by CTTL.

Port B , 64QAM 20.0M Channel Position M



Port B , 256QAM 20.0M Channel Position M



Configuration NB-IoT-InBand-1C

-26dBc Occupied Bandwidth

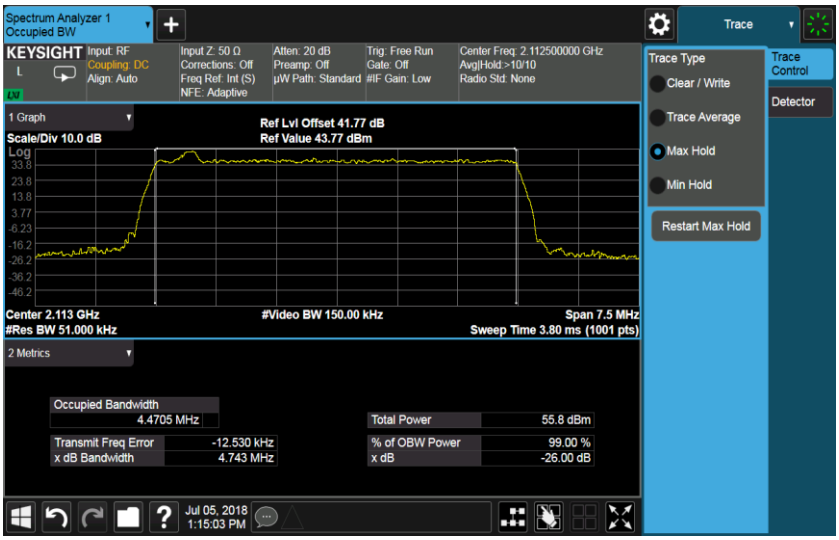
Antenna	Modulation / Bandwidth	Occupied Bandwidth (MHz)		
		Channel Position B	Channel Position M	Channel Position T
B	QPSK/ 5.0 MHz	4.74	4.74	4.72
	QPSK/ 10.0 MHz	9.51	9.54	9.53
	QPSK/ 15.0 MHz	14.31	14.30	14.26
	QPSK/ 20.0 MHz	19.06	19.06	18.44

©Copyright. All rights reserved by CTTL.

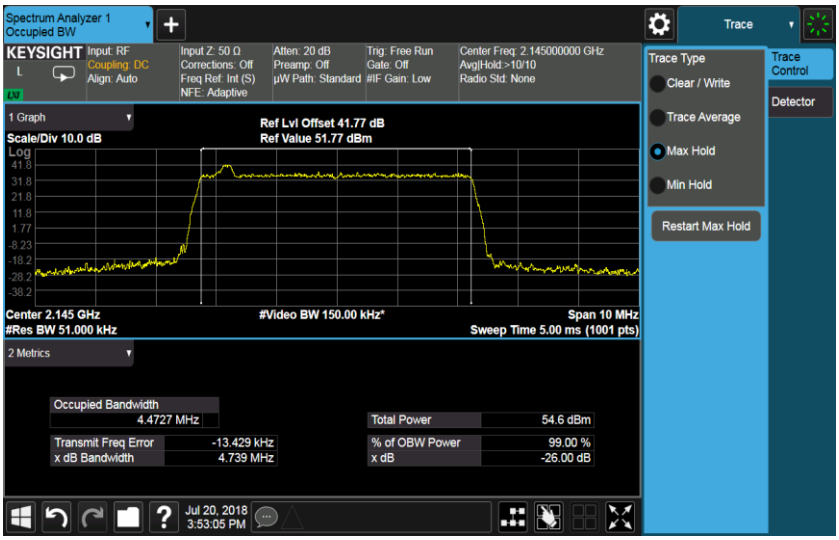
99% Occupied Bandwidth

Antenna	Modulation / Bandwidth	Occupied Bandwidth (MHz)		
		Channel Position B	Channel Position M	Channel Position T
B	QPSK/ 5.0 MHz	4.471	4.473	4.465
	QPSK/ 10.0 MHz	8.947	8.938	8.938
	QPSK/ 15.0 MHz	13.457	13.437	13.432
	QPSK/ 20.0 MHz	17.889	17.865	17.860

Port B , QPSK 5.0M Channel position B



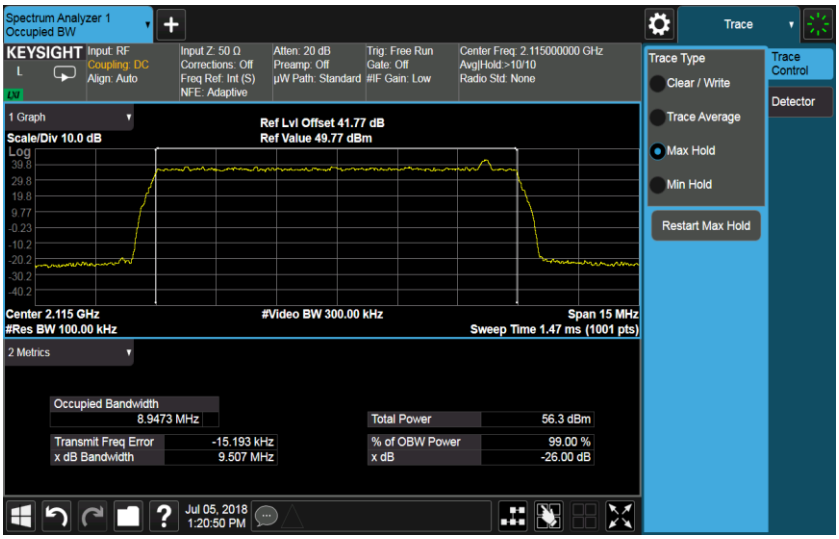
Port B , QPSK 5.0M Channel position M



©Copyright. All rights reserved by CTTL.

Port B , QPSK 5.0M Channel position T

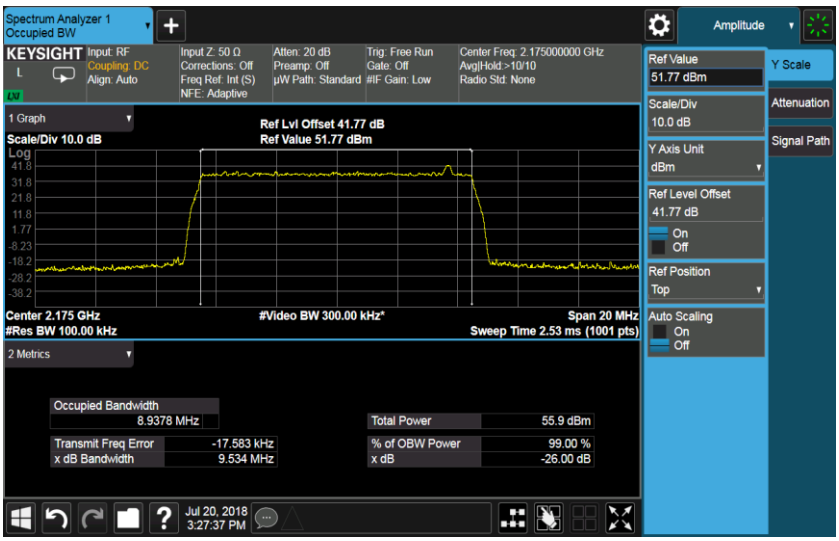
Port B , QPSK 10.0M Channel position B



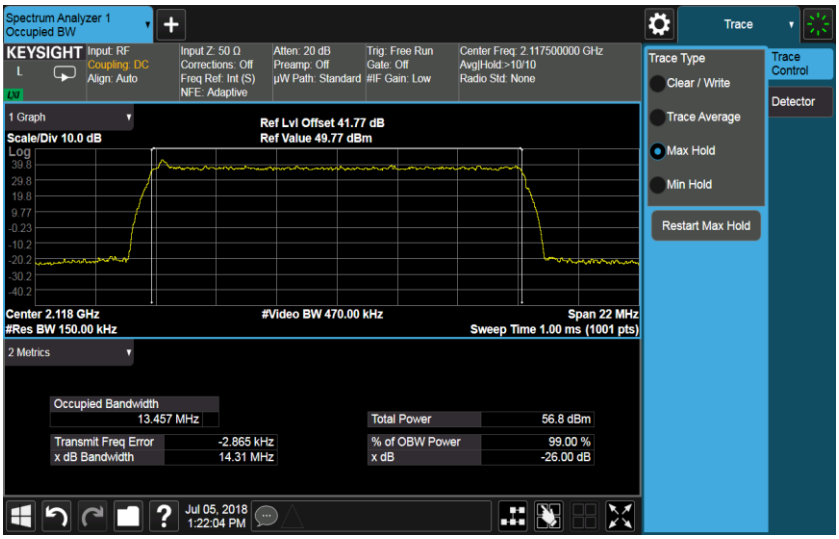
Port B , QPSK 10.0M Channel position M

©Copyright. All rights reserved by CTTL.

Port B , QPSK 10.0M Channel position T



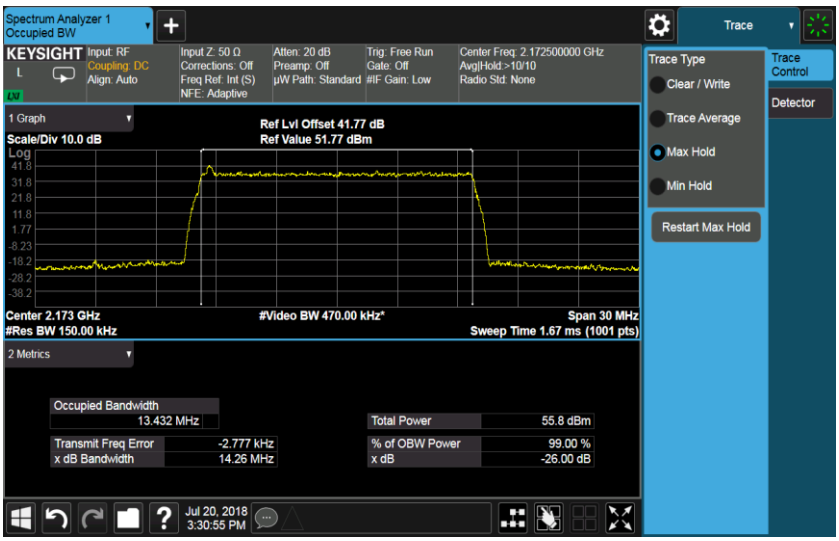
Port B , QPSK 15.0M Channel position B



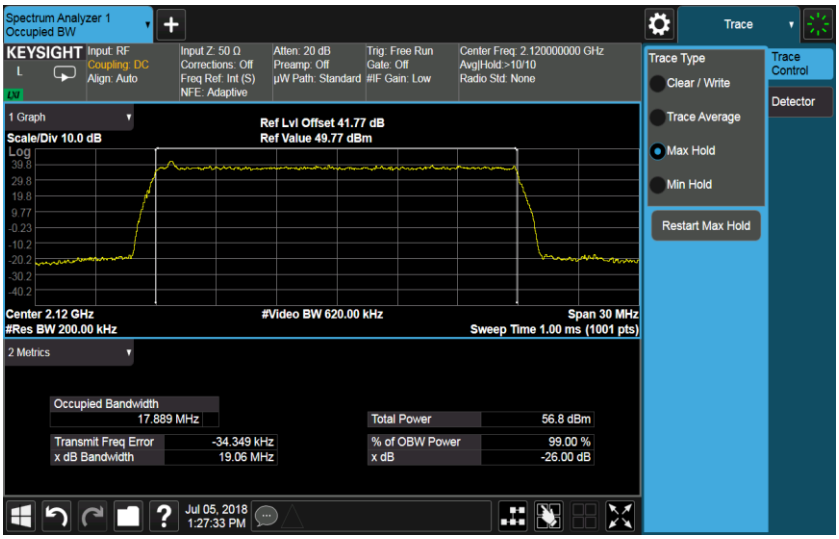
Port B , QPSK 15.0M Channel position M

©Copyright. All rights reserved by CTTL.

Port B , QPSK 15.0M Channel position T



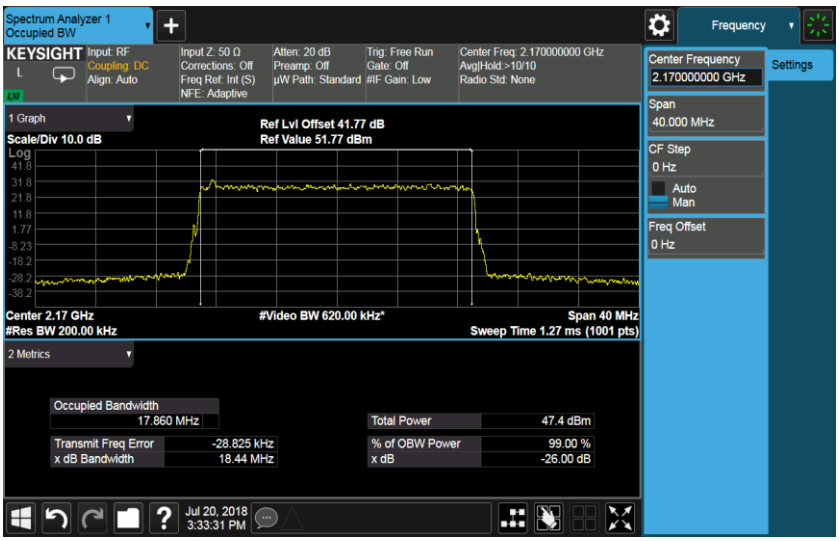
Port B , QPSK 20.0M Channel position B



Port B , QPSK 20.0M Channel position M

©Copyright. All rights reserved by CTTL.

Port B , QPSK 20.0M Channel position T



Configuration NB-IoT-GuardBand-1C

-26dBc Occupied Bandwidth

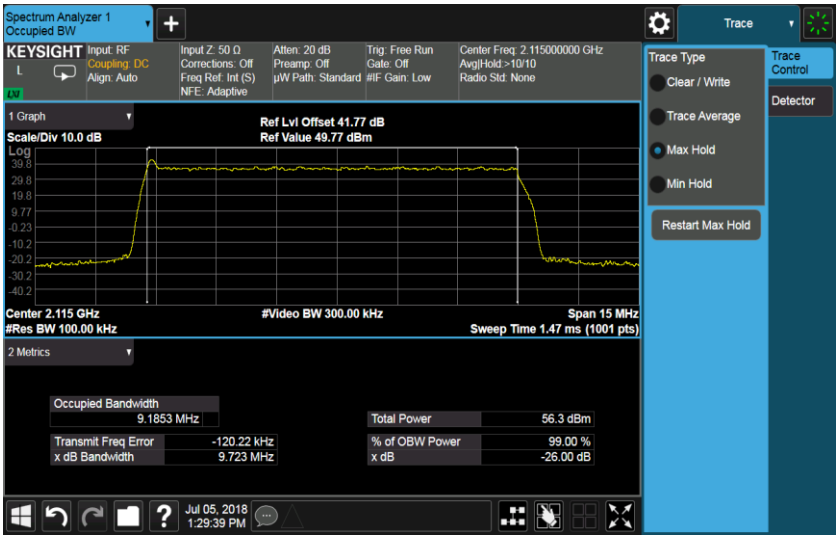
Antenna	Modulation / Bandwidth	Occupied Bandwidth (MHz)		
		Channel Position B	Channel Position M	Channel Position T
B	QPSK/ 10.0 MHz	9.72	9.71	9.68
	QPSK/ 15.0 MHz	14.52	14.48	14.51
	QPSK/ 20.0 MHz	19.32	19.27	19.24

99% Occupied Bandwidth

Antenna	Modulation / Bandwidth	Occupied Bandwidth (MHz)		
		Channel Position B	Channel Position M	Channel Position T
B	QPSK/ 10.0 MHz	9.185	9.178	9.184
	QPSK/ 15.0 MHz	13.706	13.699	13.719
	QPSK/ 20.0 MHz	18.166	18.142	18.160

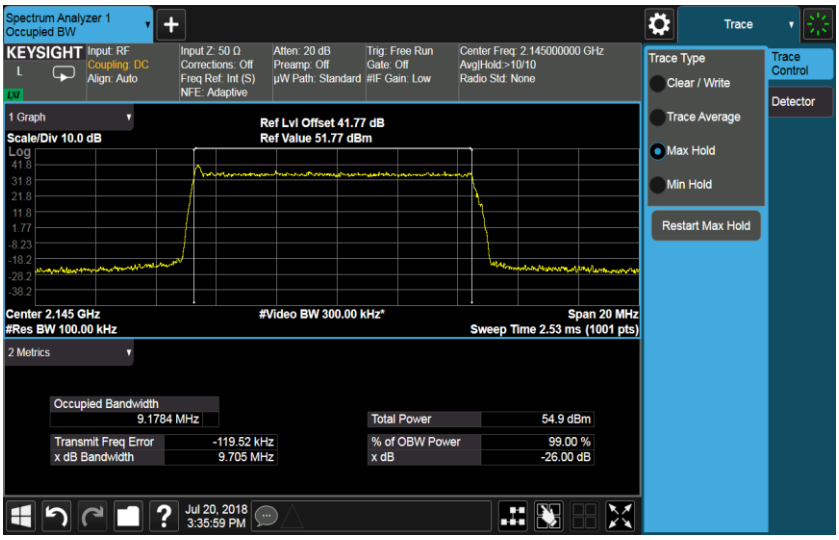
Port B , QPSK 10.0M Channel position B

©Copyright. All rights reserved by CTTL.

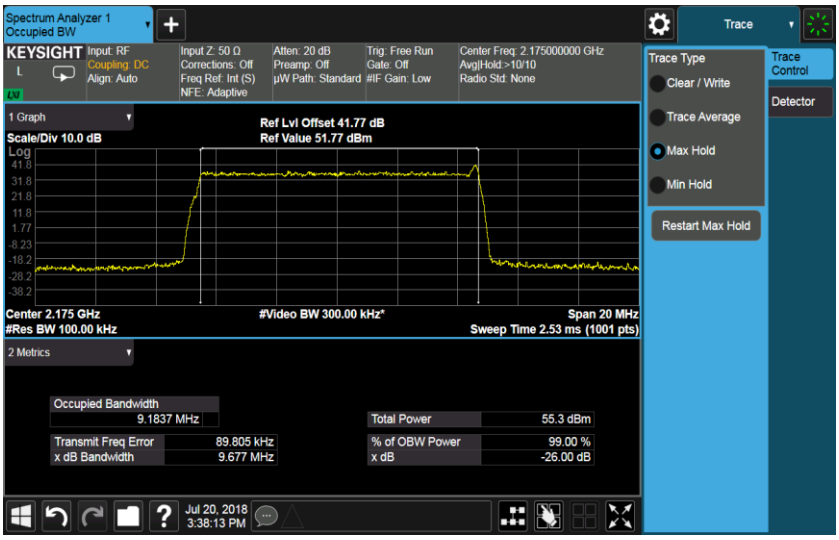


©Copyright. All rights reserved by CTTL.

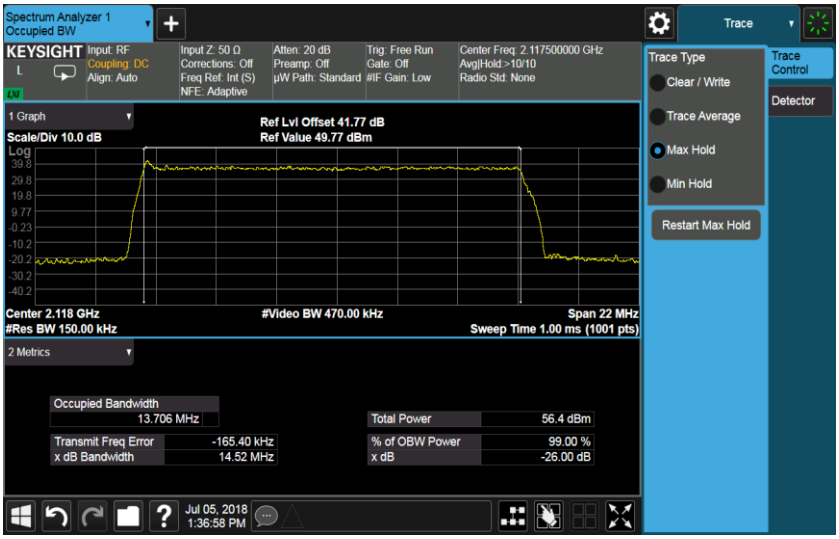
Port B , QPSK 10.0M Channel position M



Port B , QPSK 10.0M Channel position T

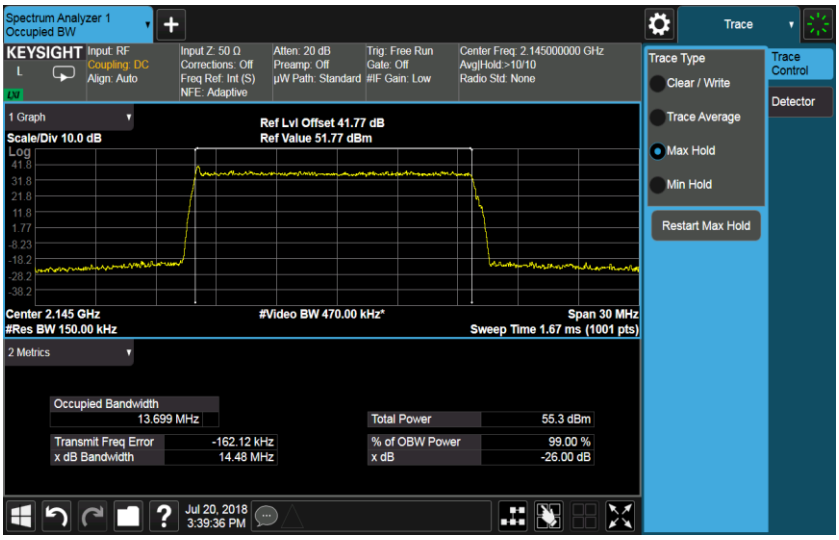


Port B , QPSK 15.0M Channel position B



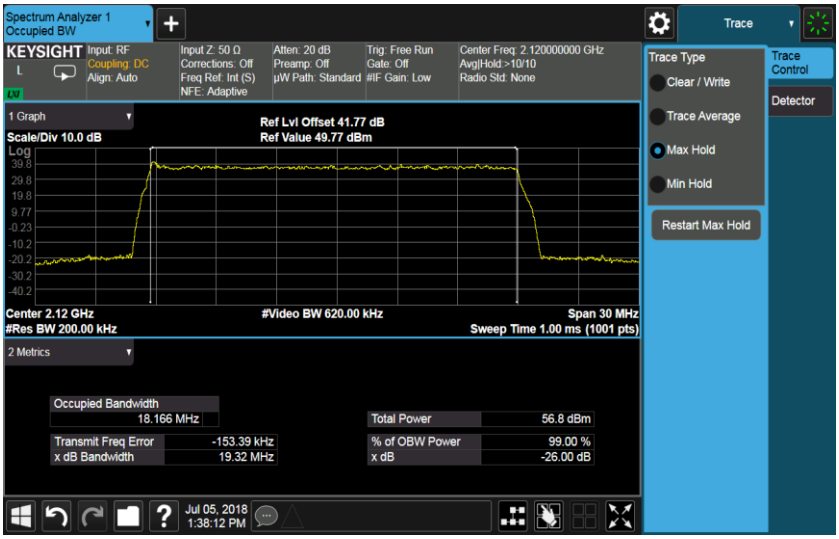
©Copyright. All rights reserved by CTTL.

Port B , QPSK 15.0M Channel position M



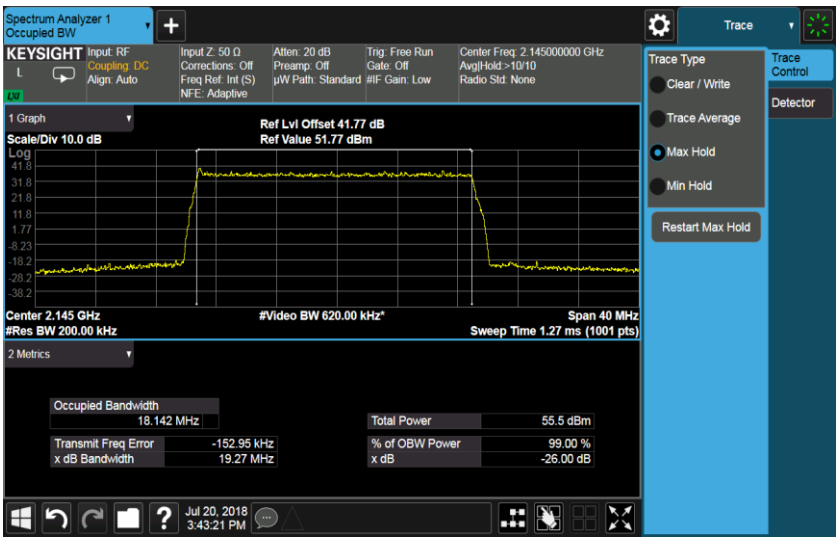
Port B , QPSK 15.0M Channel position T

Port B , QPSK 20.0M Channel position B

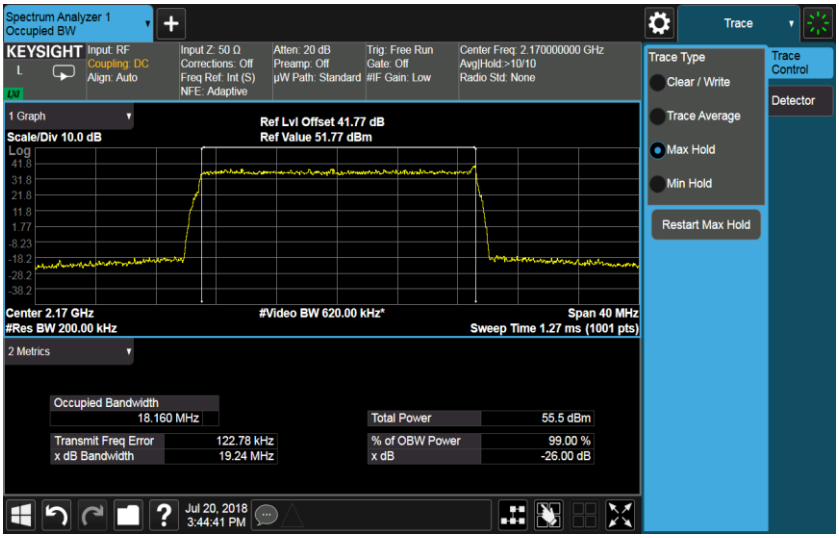


©Copyright. All rights reserved by CTTL.

Port B , QPSK 20.0M Channel position M



Port B , QPSK 20.0M Channel position T



©Copyright. All rights reserved by CTTL.

Configuration NBIoT-StandAlone-1C

-26dBc Occupied Bandwidth

Antenna	Modulation	Occupied Bandwidth (kHz)		
		Channel Position B	Channel Position M	Channel Position T
B	QPSK	306.7	306.2	309.4

99% Occupied Bandwidth

Antenna	Modulation	Occupied Bandwidth (kHz)		
		Channel Position B	Channel Position M	Channel Position T
B	QPSK	211.02	209.90	210.06

Port B , QPSK Channel Position B

©Copyright. All rights reserved by CTTL.

Port B , QPSK Channel Position M

Port B , QPSK Channel Position T

©Copyright. All rights reserved by CTTL.

A.3 Spurious Emissions at Band Edge

A.3.1 Reference

FCC CFR 47 Part 27, Clause 27.53(h)

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 accounting for simultaneous transmission from all antenna ports.

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 analyzer detector was set as RMS.

For NB-IoT-StandAlone configurations, EUT can transmit in Tx diversity mode(TM2). The limit was adjusted with a correction of -3.01dB [10Log2]

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

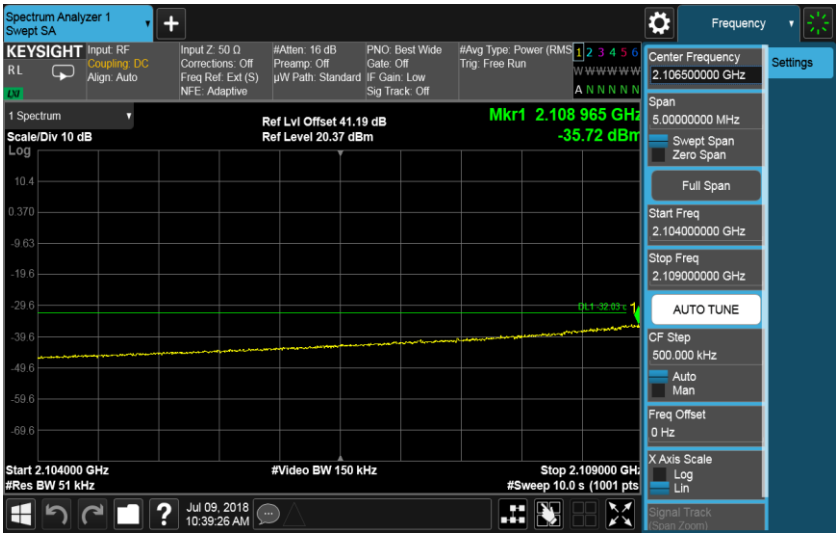
©Copyright. All rights reserved by CTTL.

Configuration LTE-MIMO-1C-BE, QPSK

Band Edge Frequency	Channel Bandwidth	RBW(KHz)	Limit(dBm)
Channel Position B 2110.0MHz	5.0 MHz	51	-19.02
	10.0 MHz	100	-19.02
	15.0 MHz	150	-19.02
	20.0 MHz	200	-19.02
Channel Position T 2200.0MHz	5.0 MHz	51	-19.02
	10.0 MHz	100	-19.02
	15.0 MHz	150	-19.02
	20.0 MHz	200	-19.02

Port C, Channel Position B, 5.0MHz

©Copyright. All rights reserved by CTTL.



Port C, Channel Position T, 5.0MHz

©Copyright. All rights reserved by CTTL.