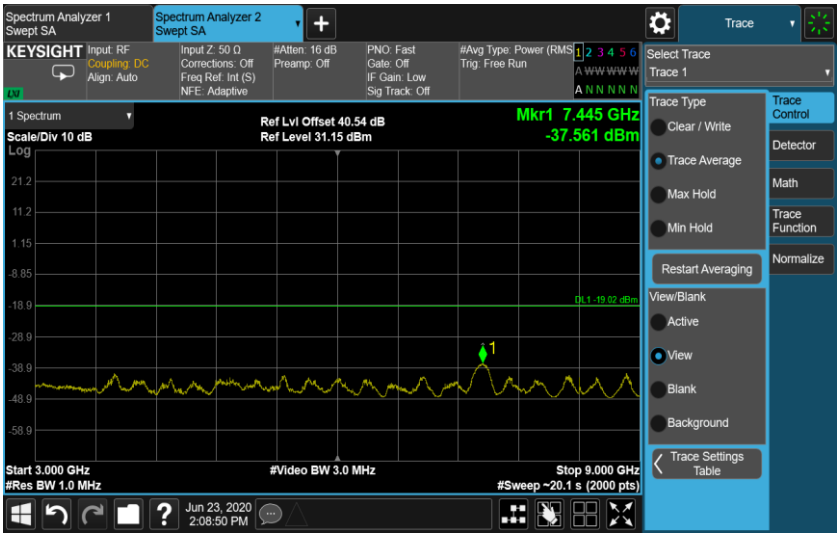
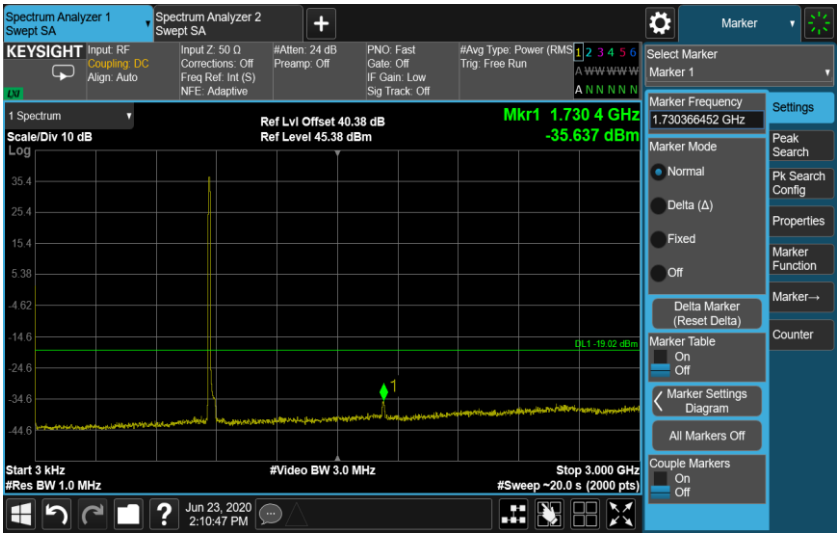
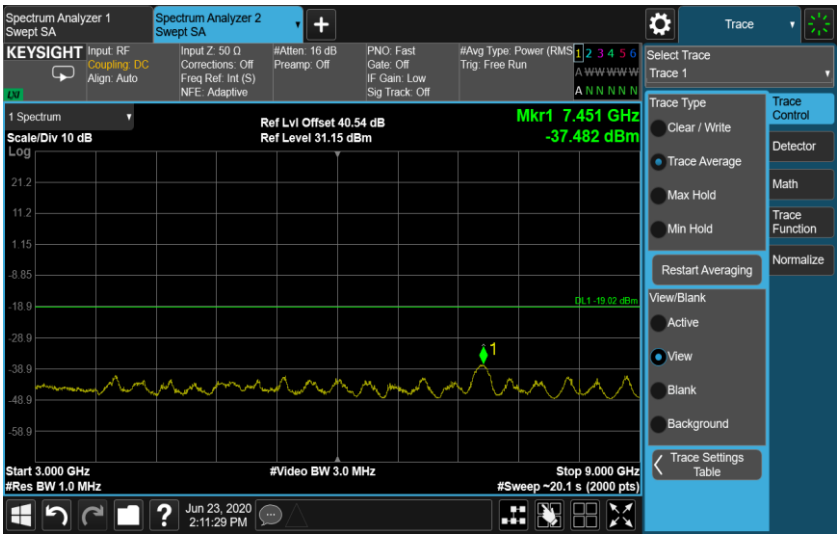


Port A, Channel Position M 10.0 MHz

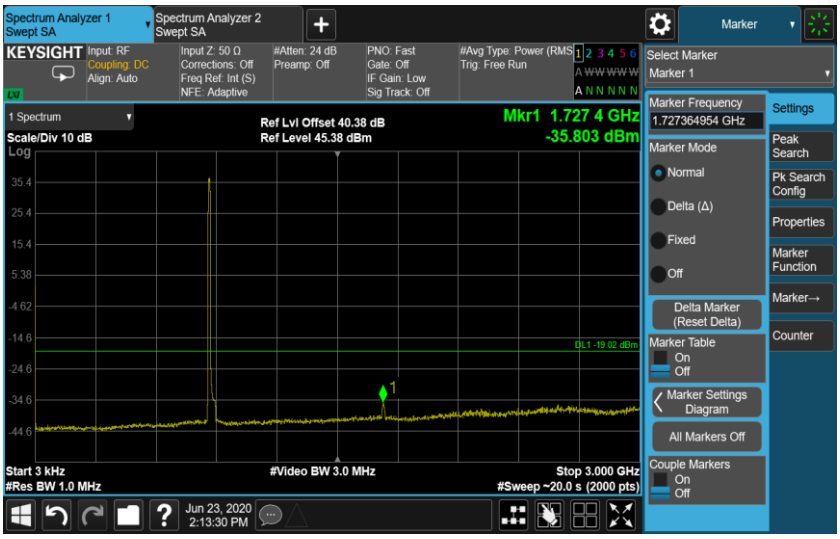


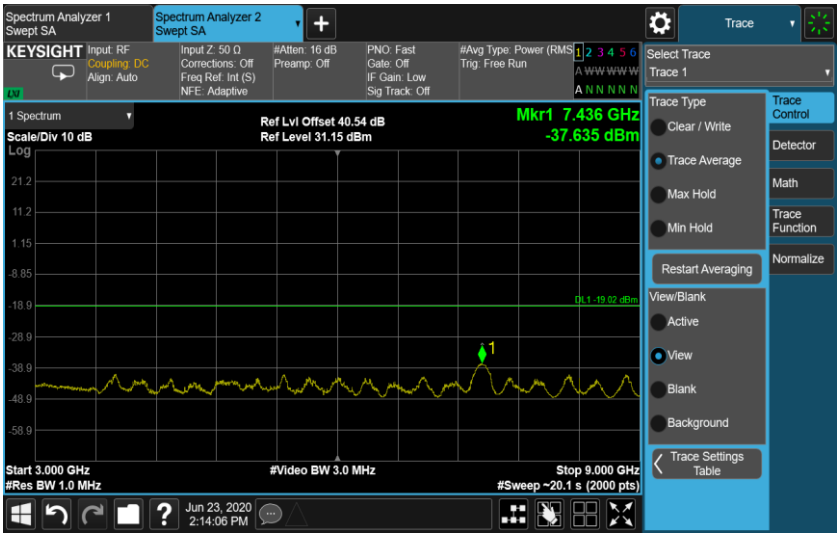


Configuration NR-MIMO-2C QPSK

Channel Bandwidth	RBW (MHz)	Limit (dBm)
5.0 MHz	1.0	-19.02

Port A, Channel Position M 5.0 MHz

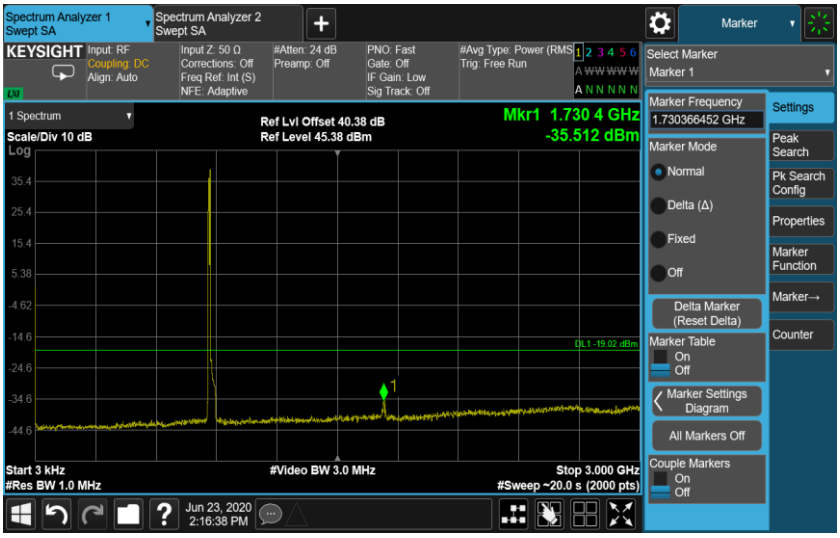


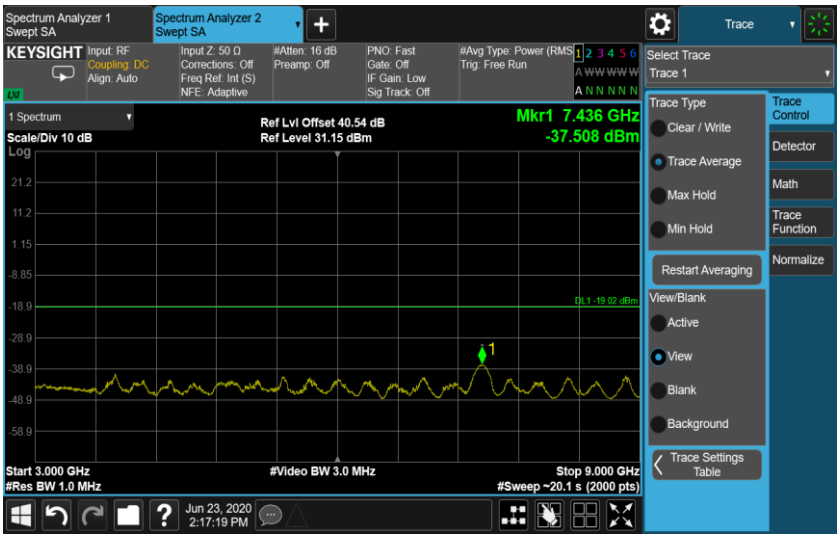


Configuration LTE+NR-MIMO-MC-1 (1L QPSK+1NR QPSK)

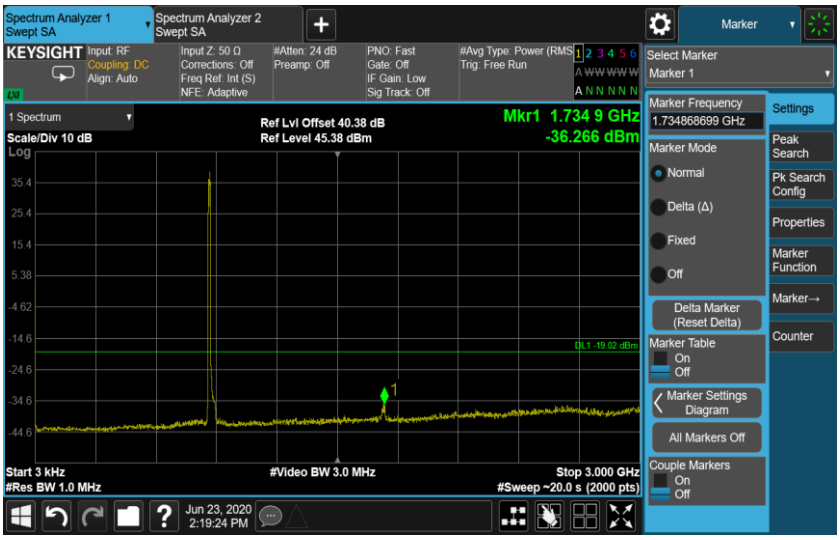
Channel Bandwidth	RBW (MHz)	Limit (dBm)
L: 1.4 MHz NR: 5.0 MHz	1.0	-19.02
L: 3.0 MHz NR: 5.0 MHz	1.0	-19.02
L: 5.0 MHz NR: 5.0 MHz	1.0	-19.02

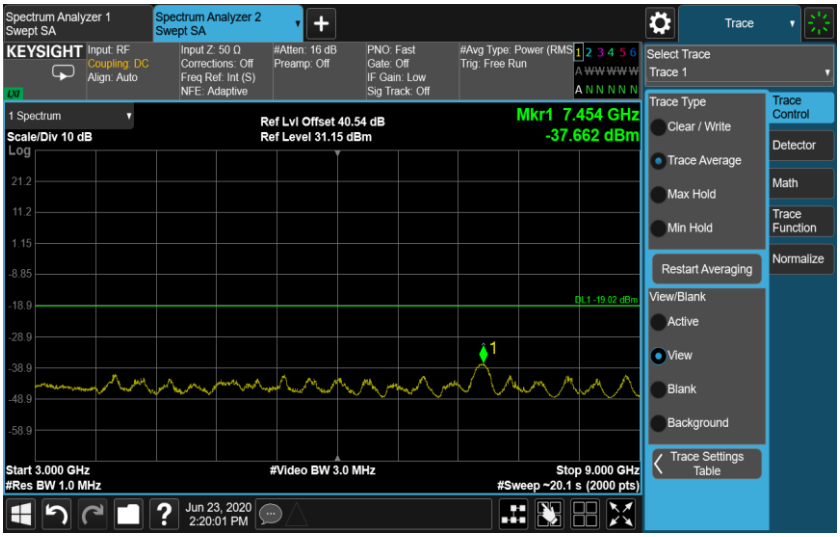
Port A, Channel Position M, L 1.4 MHz, NR 5.0 MHz



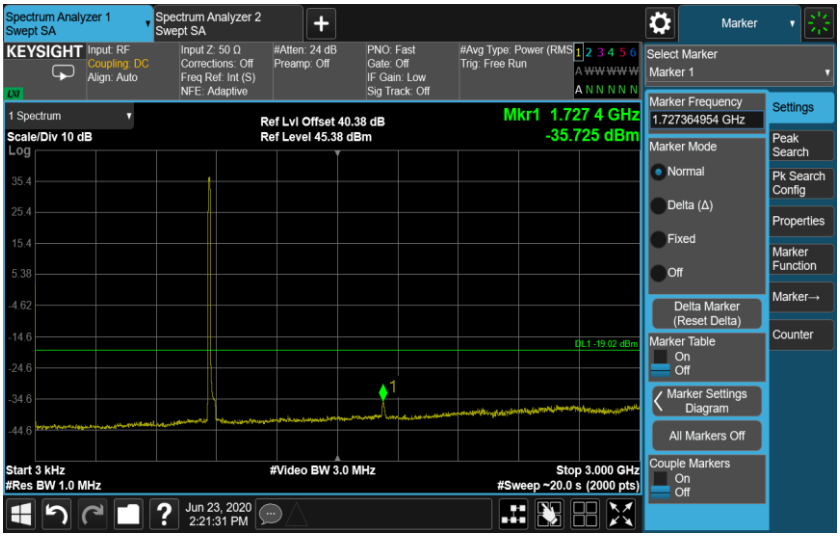


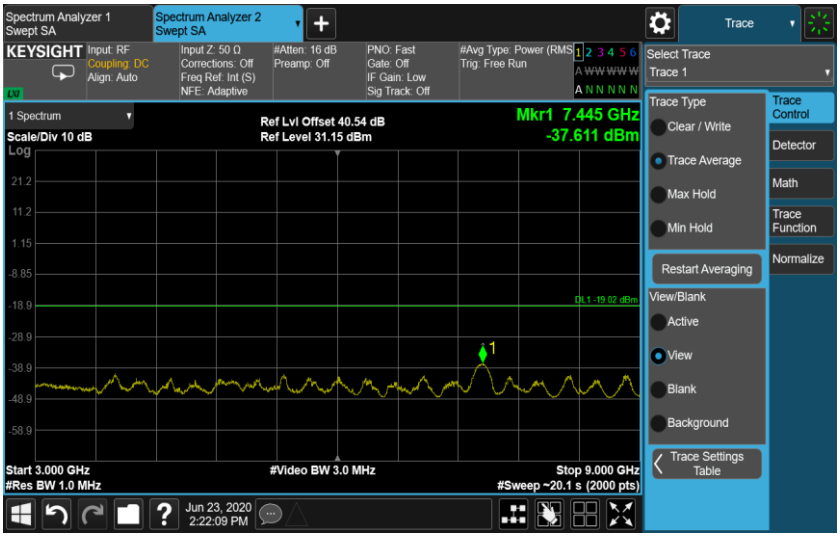
Port A, Channel Position M, L 3.0 MHz, NR 5.0 MHz





Port A, Channel Position M, L 5.0 MHz, NR 5.0 MHz

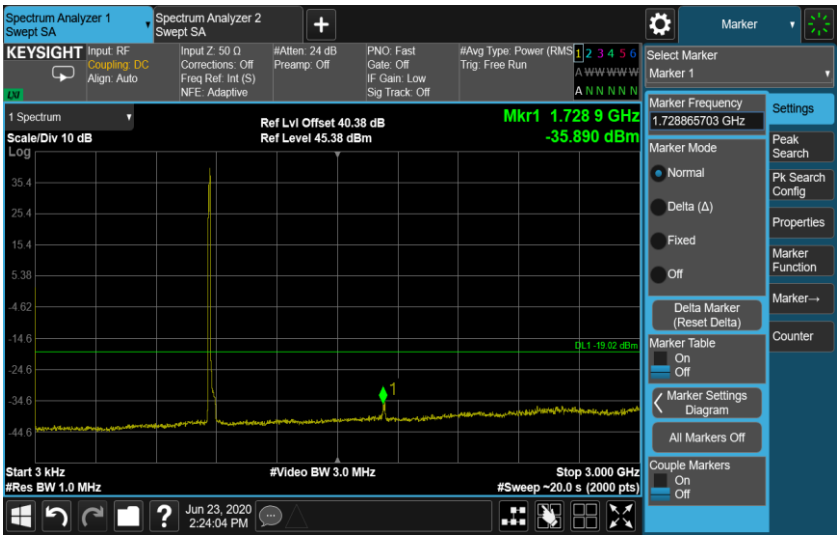


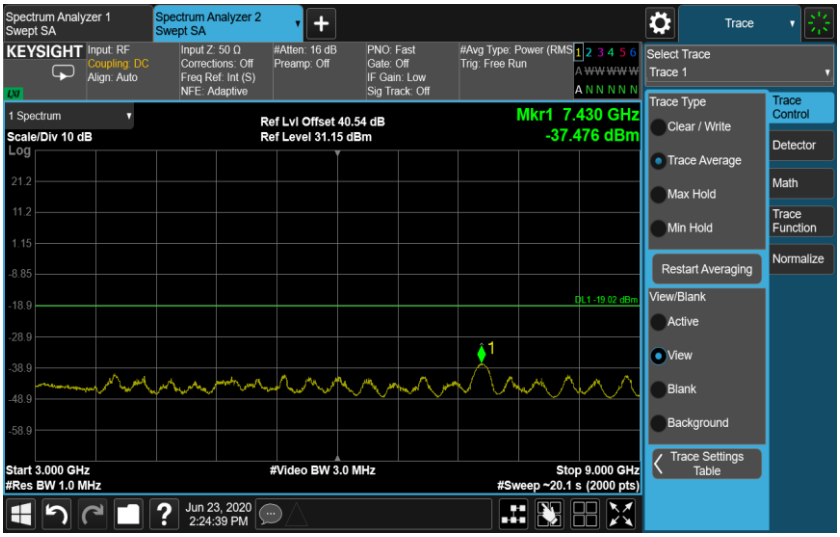


Configuration LTE+NR-MIMO-MC-2 (2L QPSK+1NR QPSK)

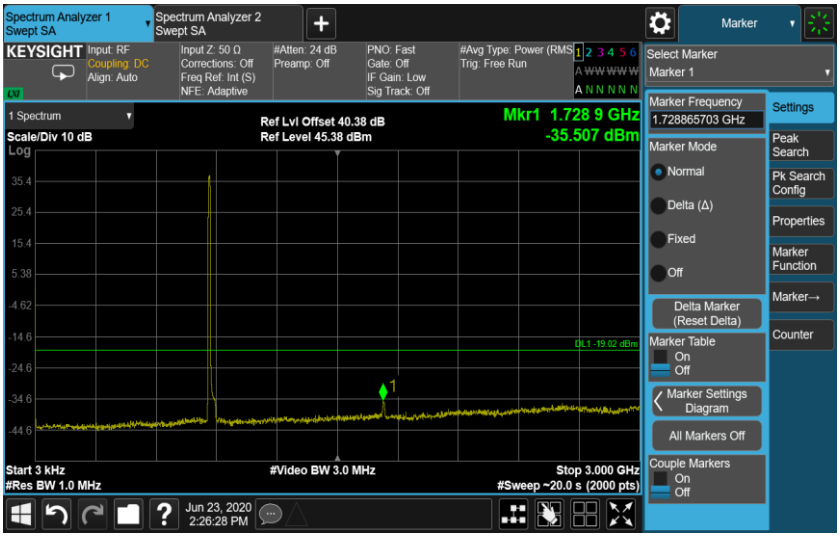
Channel Bandwidth	RBW (MHz)	Limit (dBm)
L: 1.4 MHz NR: 5.0 MHz	1.0	-19.02
L: 3.0 MHz NR: 5.0 MHz	1.0	-19.02

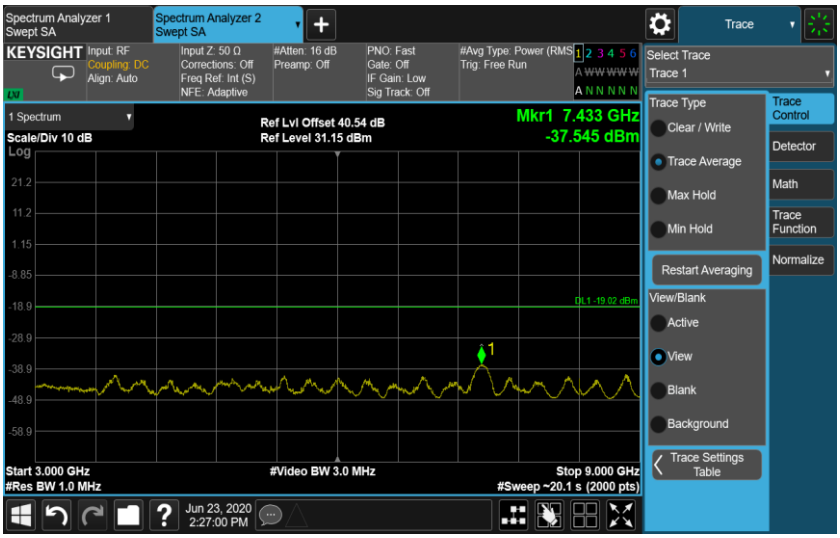
Port A, Channel Position M, L 1.4 MHz, NR 5.0 MHz





Port A, Channel Position M, L 3.0 MHz, NR 5.0 MHz

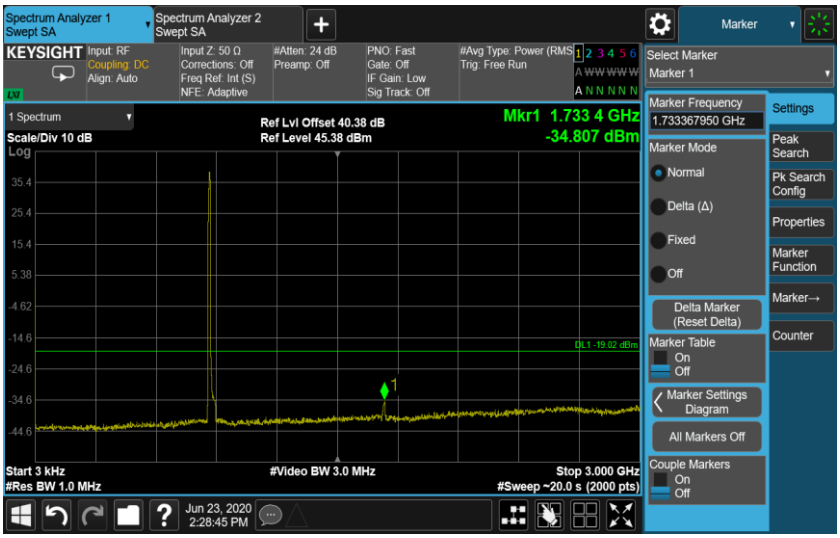


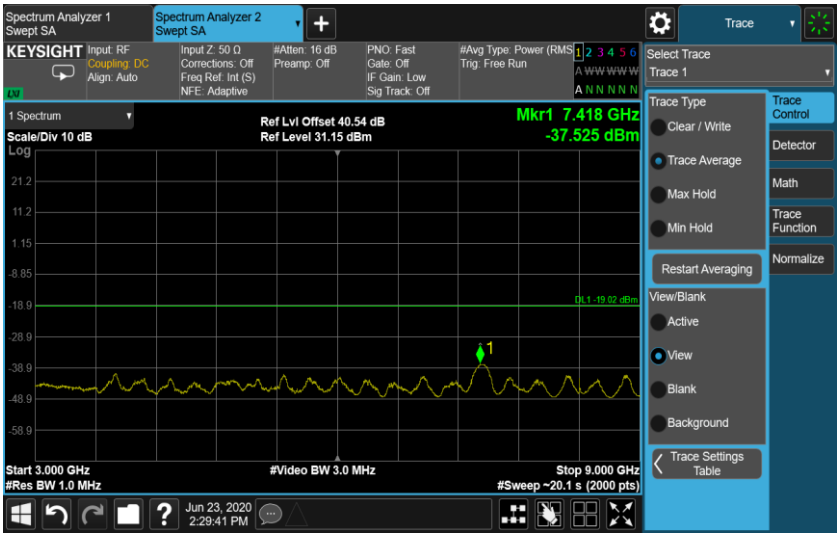


Configuration LTE+NR-MIMO-MC-4 (3L QPSK+1NR QPSK)

Channel Bandwidth	RBW (MHz)	Limit (dBm)
L: 1.4 MHz NR: 5.0 MHz	1.0	-19.02

Port A, Channel Position M, L 1.4MHz, NR 5.0 MHz

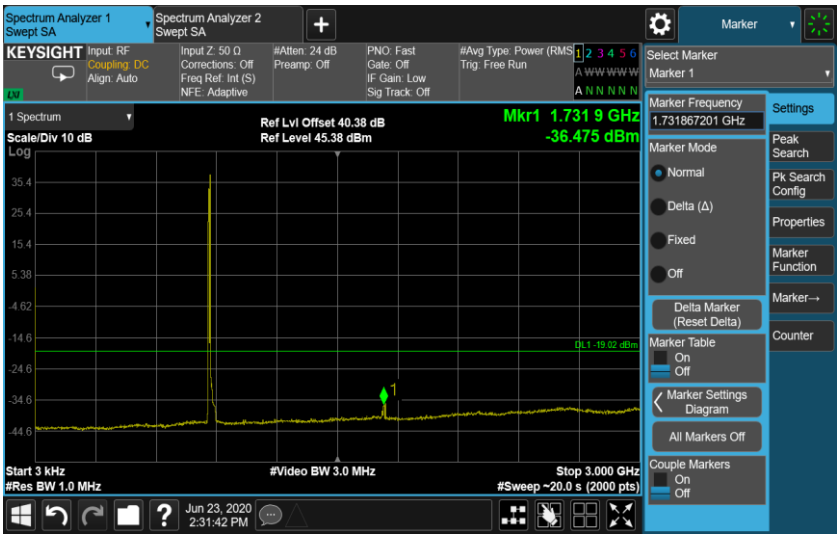


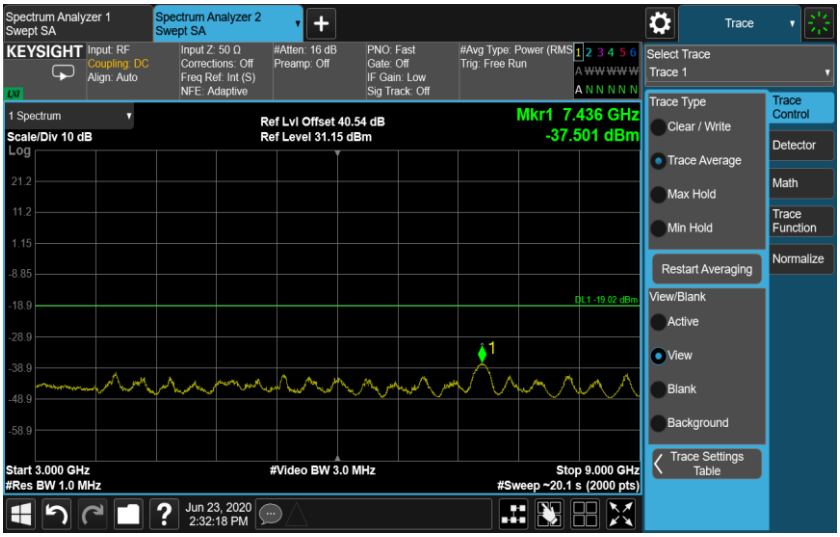


Configuration NB-IoT+NR-MC-1(1SA QPSK+1NR QPSK)

Channel Bandwidth	RBW (MHz)	Limit (dBm)
SA: 250 KHz NR: 5.0 MHz	1.0	-19.02

Port A, Channel Position M , NR 5.0 MHz

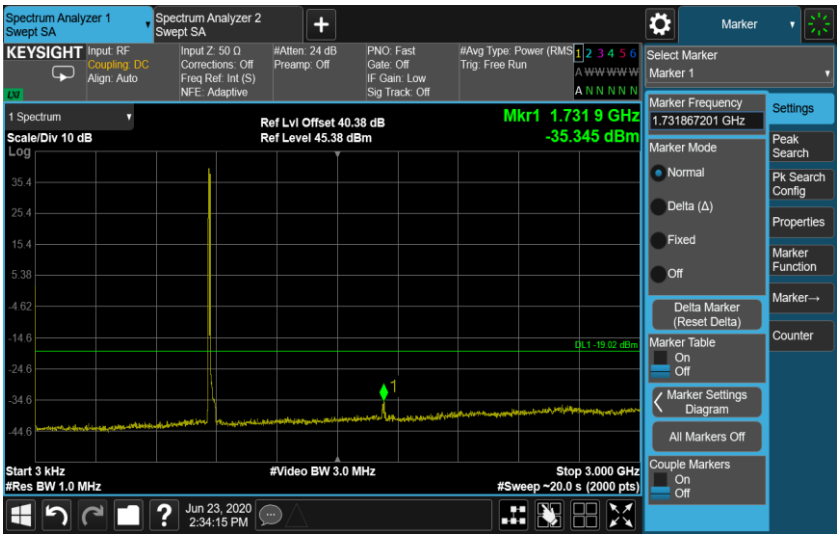


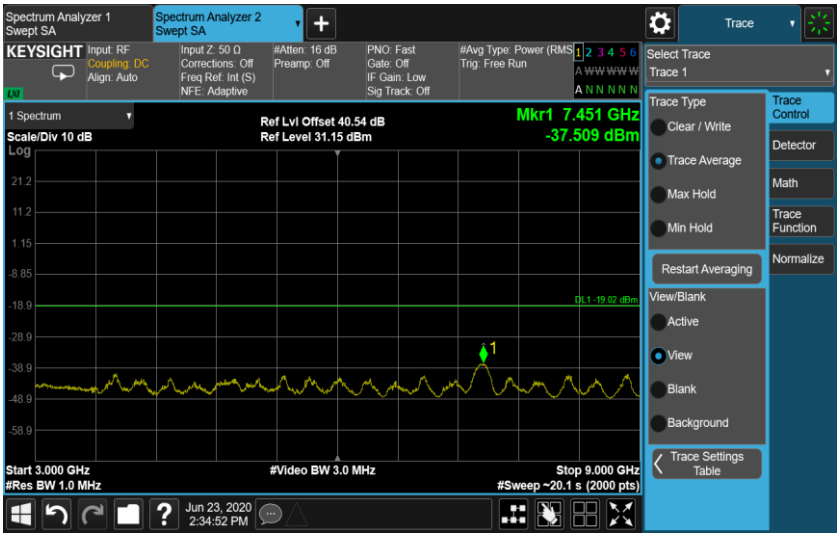


Configuration NB-IoT+NR-MC-2(2SA QPSK+1NR QPSK)

Channel Bandwidth	RBW (MHz)	Limit (dBm)
SA: 250 KHz NR: 5.0 MHz	1.0	-19.02

Port A, Channel Position M, NR 5.0 MHz

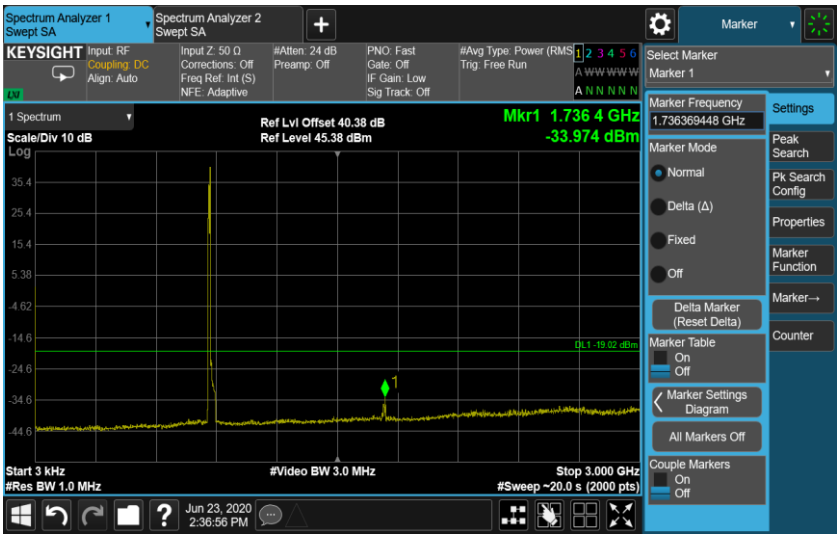


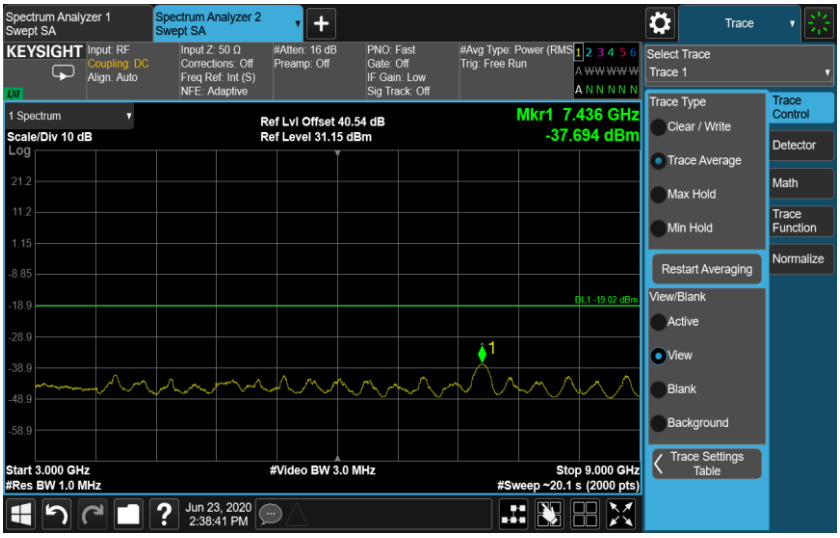


Configuration LTE+NB-IoT+NR-MC-1 (1L QPSK+1SA QPSK+1NR QPSK)

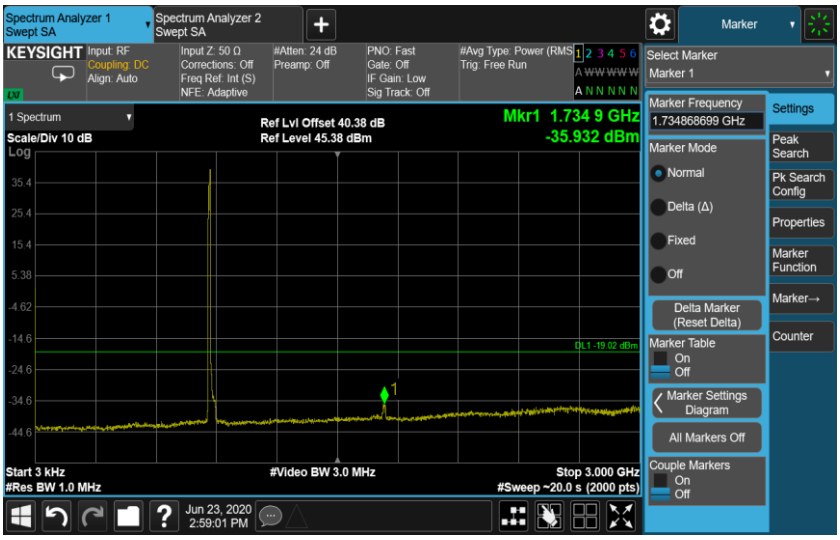
Channel Bandwidth	RBW (MHz)	Limit (dBm)
SA: 250 KHz L: 1.4 MHz NR: 5.0 MHz	1.0	-19.02
SA: 250 KHz L: 3.0 MHz NR: 5.0 MHz	1.0	-19.02

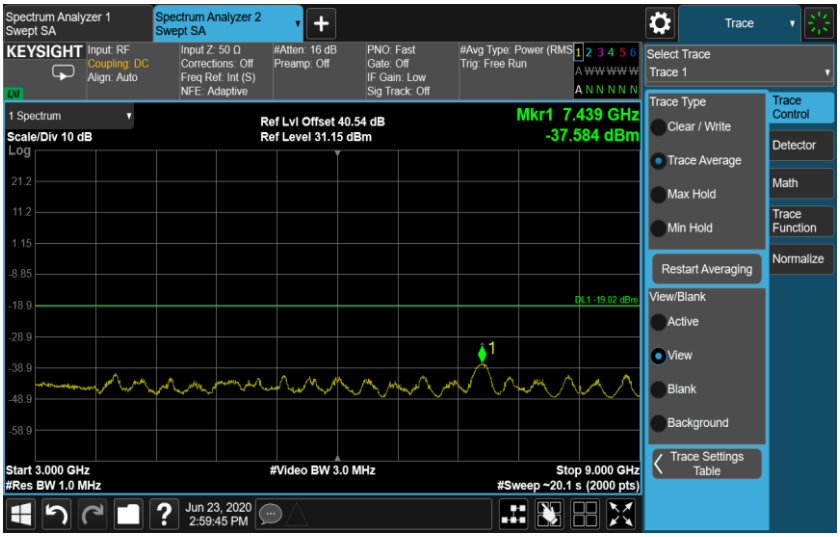
Port A, Channel Position M, L 1.4 MHz, NR 5.0 MHz





Port A, Channel Position M, L 3.0 MHz, NR 5.0 MHz

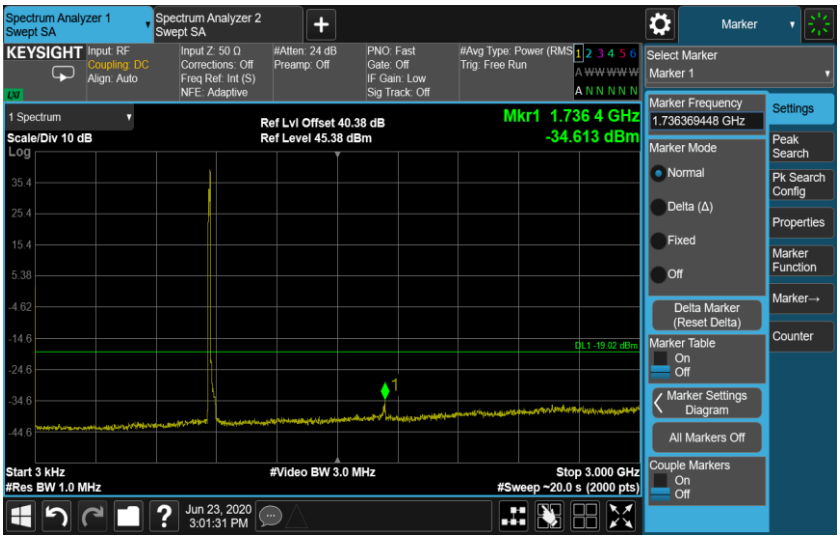


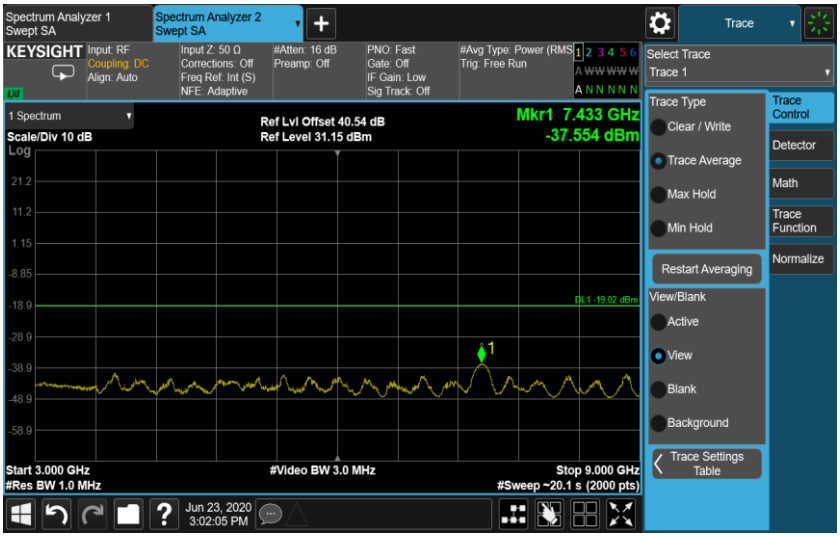


Configuration LTE+NB-IoT+NR-MC-2 (1L QPSK+2SA QPSK+1NR QPSK)

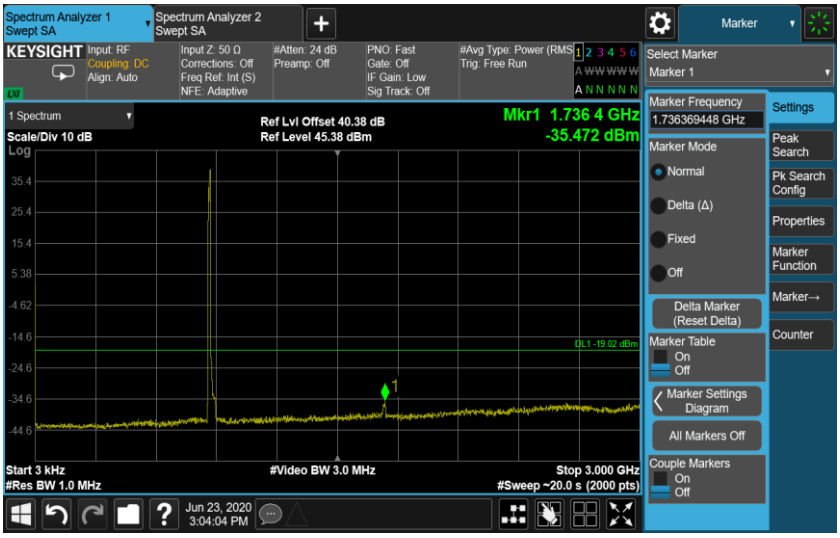
Channel Bandwidth	RBW (MHz)	Limit (dBm)
SA: 250 KHz L: 1.4 MHz NR: 5.0 MHz	1.0	-19.02
SA: 250 KHz L: 3.0 MHz NR: 5.0 MHz	1.0	-19.02

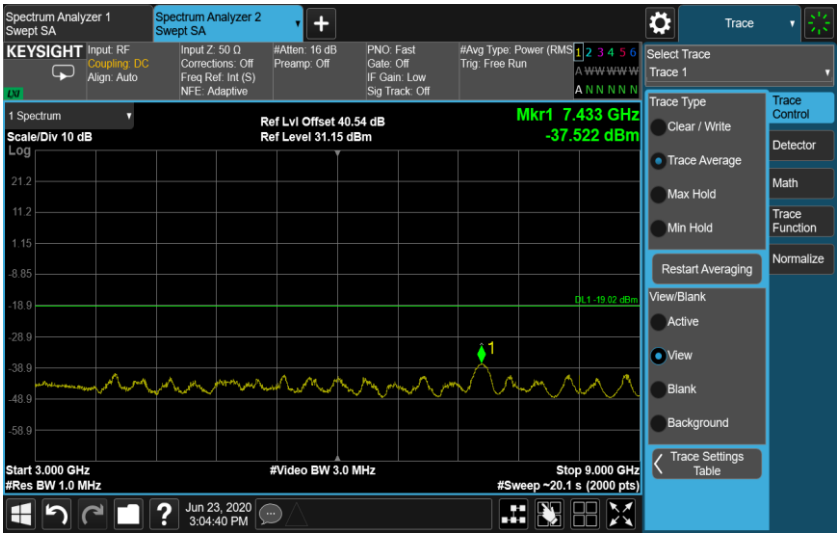
Port A, Channel Position M, L 1.4 MHz, NR 5.0 MHz





Port A, Channel Position M, L 3.0 MHz, NR 5.0 MHz

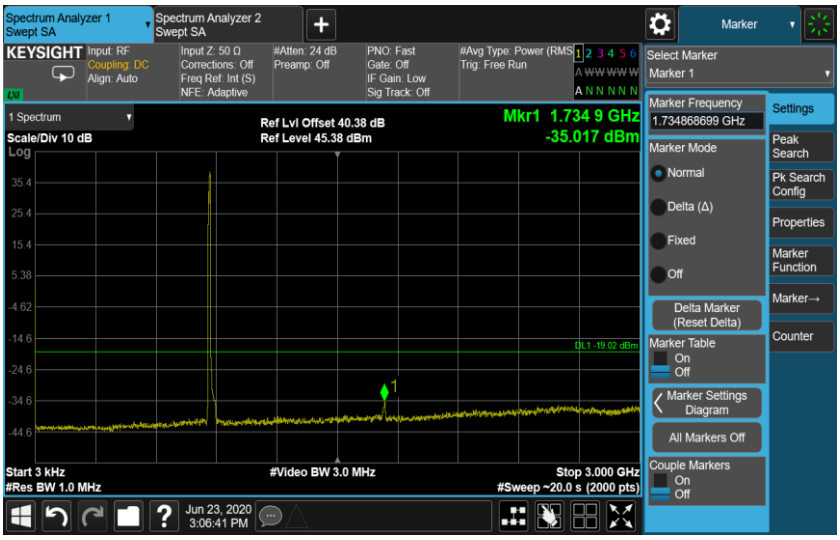


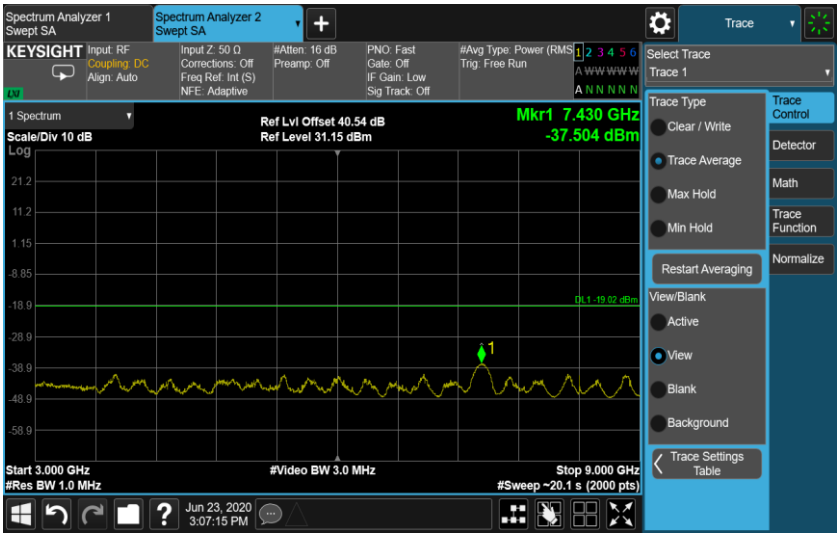


Configuration LTE+NB-IoT+NR-MC-4(2L QPSK+2SA QPSK+1NR QPSK)

Channel Bandwidth	RBW (MHz)	Limit (dBm)
SA: 250 KHz L: 1.4 MHz NR: 5.0 MHz	1.0	-19.02

Port A, Channel Position M, L 1.4 MHz, NR 5.0 MHz





A.5 Radiated Spurious Emission

A.5.1 Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 90, Clause 90.210

A.5.2 Method of measurement

The measurements procedures in TIA-603-E: 2016 are used. This measurement is carried out in semi-anechoic chamber.
A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within the chamber. Measurements of emissions from the EUT were obtained with the measurement antenna in both horizontal and vertical polarizations.
The measurements in the frequency range 30 to 1000MHz was performed with a RBW of 100kHz.
The measurements in the frequency range 1 to 8GHz was performed with a RBW of 1MHz.
Emissions identified within the range 30MHz to 8GHz were then formally measured using a peak detector as the worst case.
The limits for outside a licensee's frequency band(s) of operation the power of the spurious emissions have been calculated, as shown below using the following formula:

Field Strength of Carrier - (43 + 10Log (P)) dB

Where:

Field Strength is measured in dBμV/m

P is measured Transmitter Power in Watts

The EUT was measured with the antenna height varied between 1 and 4 m with the turntable rotated between 0 and 360 degrees. The emission of any outside a licensee's frequencies within 20dB of the limit were measured with the substitution method used according to the standard.
The measurements were performed at a 3m distance unless otherwise stated.

A.5.3 Measurement limit

The field strength of the carrier has been calculated assuming that the power is to be fed to a half-wave tuned dipoles as per 2.1053 (a).

$E_{(v/m)}=(30 \times G_i \times P_o)^{0.5} / d$

Where

G_i is the antenna gain of ideal half-wave dipoles,

P_o is the power out of the transceiver in W,

d is the measurement distance in meter.

Therefore at 3m measurement distance the field strength using the lowest transceiver output power would be:

$E_{(v/m)}=(30 \times 1.64 \times 16.56)^{0.5} / 3 = 9.51V/m = 139.57 dB\mu V/m$

As per 90.210 For operations in the 854-869 MHz bands, 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 all frequencies between 854-869 MHz, by a factor not less than 43 + 10 log (P) dB.
this gives:
43 + 10log(16.56) = 55.19 dB
Therefore the limit at 3m measurement distance is:

139.57 – 55.19 = 84.4 dBμV/m

These limits have been used to determine Pass or Fail for the harmonics measured and detailed in the following results.

A.5.4 Measurement results

Configuration NR-MIMO-1C 5M; QPSK;

Channel Position	Channel Frequencies
Channel Position B	861.5MHz
Channel Position M	864.0MHz
Channel Position T	866.5MHz

Channel Position B

No emissions were detected within 20dB of the limit.

Channel Position M

No emissions were detected within 20dB of the limit.

Channel Position T

No emissions were detected within 20dB of the limit.

Configuration NR-MIMO-2C 5M; 16QAM;

Channel Position	Channel Frequencies
Channel Position M	864.0MHz

Channel Position M

No emissions were detected within 20dB of the limit.

Configuration LTE+NR-MIMO-MC-1

Channel Position	Channel Frequencies
Channel Position M	NR 861.5MHz+LTE868.3MHz

Channel Position M

No emissions were detected within 20dB of the limit.

Configuration LTE+NR-MIMO-MC-2 (2LTE +1NR)

Channel Position	Channel Frequencies
Channel Position M	NR 861.5 MHz +LTE868.3MHz

Channel Position M

No emissions were detected within 20dB of the limit.

Configuration LTE+NR-MIMO-MC-4 (3LTE +1NR)

Channel Position	Channel Frequencies
Channel Position M	NR 861.5 MHz +LTE865.5 MHz +866.9 MHz +868.3 MHz

Channel Position M

No emissions were detected within 20dB of the limit.

Configuration NB-IoT+NR-MC-1(1SA+1NR)

Channel Position	Channel Frequencies
Channel Position M	NR861.5 MHz +SA868.8 MHz

Channel Position M

No emissions were detected within 20dB of the limit.

Configuration NB-IoT+NR-MC-2(2SA+1NR)

Channel Position	Channel Frequencies
Channel Position M	NR864.5 MHz +SA863.2 MHz +868.8 MHz

Channel Position M

No emissions were detected within 20dB of the limit.

Configuration LTE+NB-IoT+NR-MC-1(1LTE +1SA+1NR)

Channel Position	Channel Frequencies
Channel Position M	NR861.5 MHz +L867.1 MHz +SA868.8 MHz

Channel Position M

No emissions were detected within 20dB of the limit.

Configuration LTE+NB-IoT+NR-MC-2(1LTE+2SA+1NR)

Channel Position	Channel Frequencies
Channel Position M	NR861.5 MHz +L867.3 MHz +SA868.2 MHz +868.8 MHz

Channel Position M

No emissions were detected within 20dB of the limit.

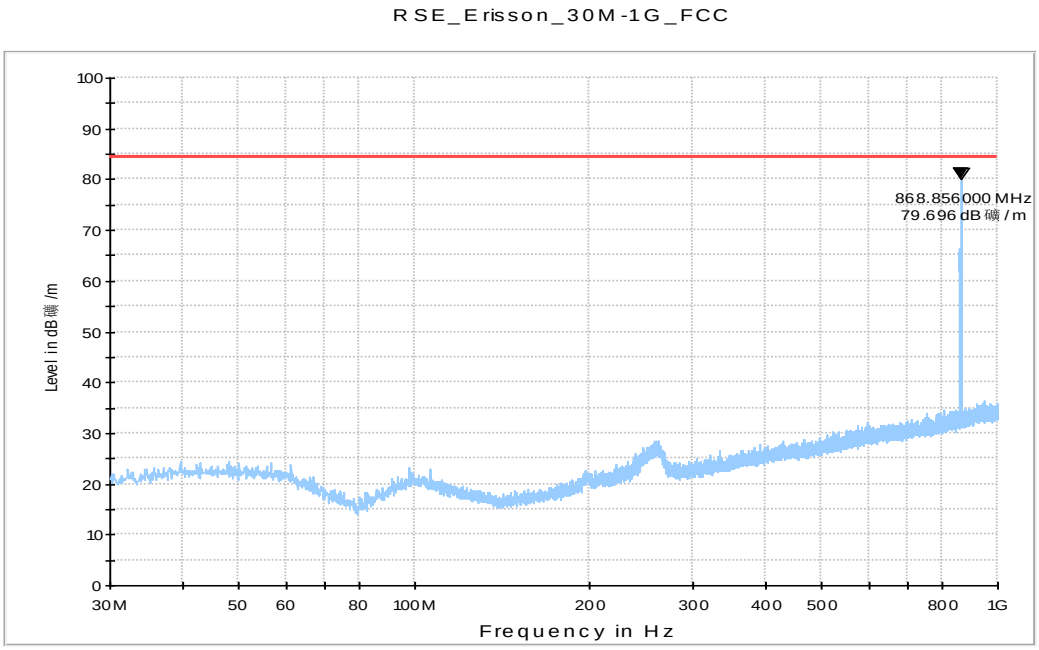
Configuration LTE+NB-IoT+NR-MC-4(2LTE+2SA+1NR)

Channel Position	Channel Frequencies
Channel Position M	NR864.5 MHz +LTE865.9 MHz +867.3 MHz +SA868.2 MHz +868.8MHz

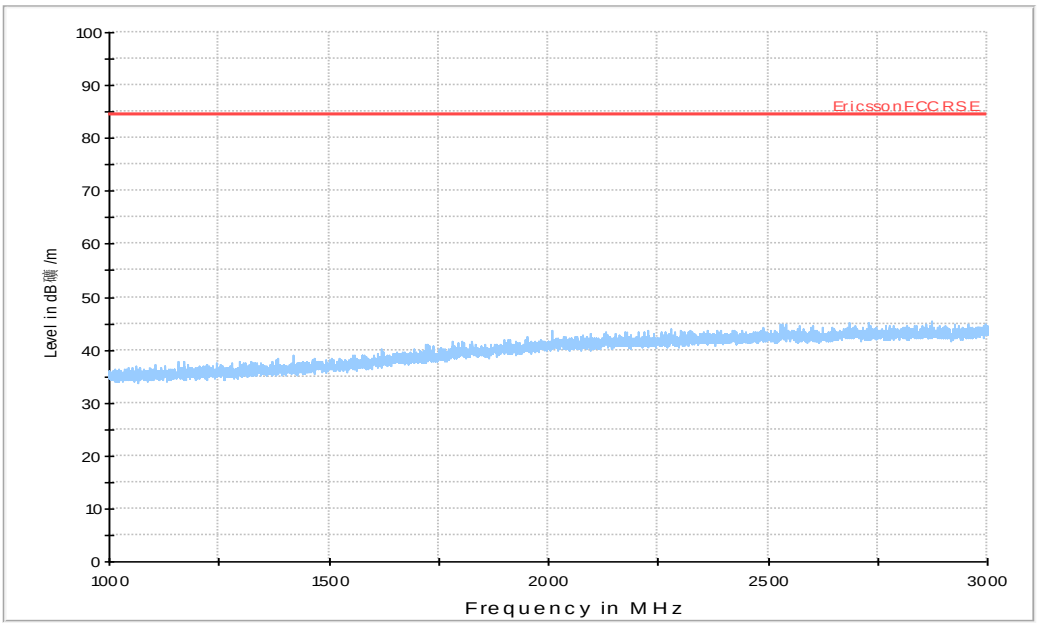
Channel Position M

No emissions were detected within 20dB of the limit.

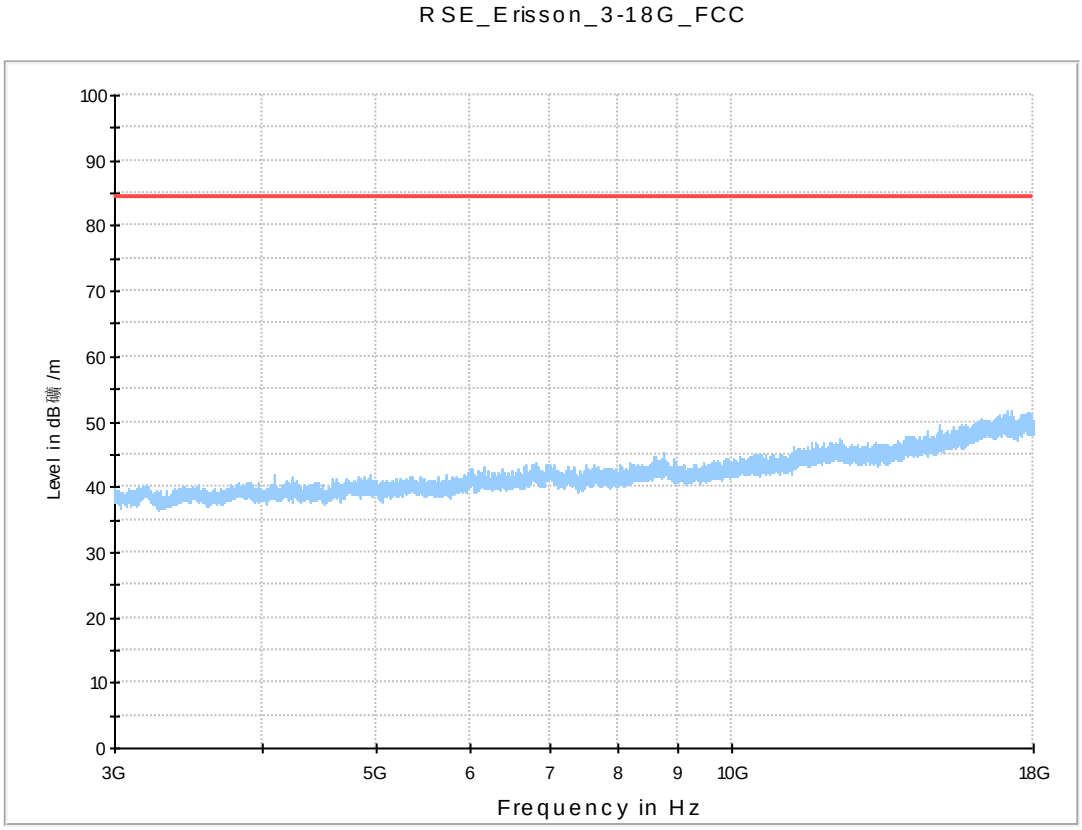
Configuration 1SA+1NR-MIMO-1-5M+5M_M_QPSK



Configuration 1SA+1NR-MIMO-1-5M+5M_M_QPSK



Configuration 1SA+1NR-MIMO-1-5M+5M_M_QPSK



A.6 Frequency Stability

A.6.1 Reference

FCC CFR 47 Part 2, Clause 2.1055
FCC CFR 47 Part 90, Clause 90.213

A.6.2 Method of measurement

Temperature Variation

The EUT was tested over the temperature range -30°C to +50°C in 10°C steps with -48 VDC Power Supply. At each temperature step, the Base Station was configured to transmit a [RAT]* at maximum power on the bottom, middle and top channel of the operating band. After achieving thermal balance, the averages of 200 transmission bursts were measured and the result recorded.

Voltage Variation

The EUT was tested at the supplied voltages varied from 85 to 115 percent of the nominal value of -48 VDC. At +20°C, the Base Station was configured to transmit a [RAT]* at maximum power on the bottom, middle and top channel of the operating band. The average of 200 transmission bursts was measured and the result recorded.

[RAT]*:
NR - QPSK modulation

A.6.3 Measurement limit

1.5ppm.

A.6.4 Measurement results

Frequency Error – Temperature Variation
Configuration NR-MIMO-1C,QPSK,Port A
Maximum Output Power 46.02Bm per port, Channel Bandwidth 5MHz

Supply Voltage DC(V)	Temperature	Frequency Stability (Hz)		
		Channel position B	Channel position M	Channel position T
48	-30	-0.11	0.19	-0.17
	-20	0.16	-0.16	0.18
	-10	-0.26	0.16	0.13
	0	0.13	0.15	0.08
	10	-0.27	0.22	0.16
	20	0.16	0.27	0.16
	30	0.11	0.14	0.19
	40	-0.24	0.14	0.16
	50	0.22	-0.17	0.11

Frequency Error – Voltage Variation

Configuration NR-MIMO-1C,QPSK,Port A

Maximum Output Power 37.0dBm per port, Channel Bandwidth 5MHz

Supply Voltage DC(V)	Temperature(°C)	Frequency Stability (Hz)		
		Channel position B	Channel position M	Channel position T
40.8	20	0.21	0.35	0.19
55.2	20	0.27	0.15	0.15

ANNEX B: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2019-09-26 through 2020-09-30
Effective Dates

For the National Voluntary Laboratory Accreditation Program

*****END OF REPORT*****