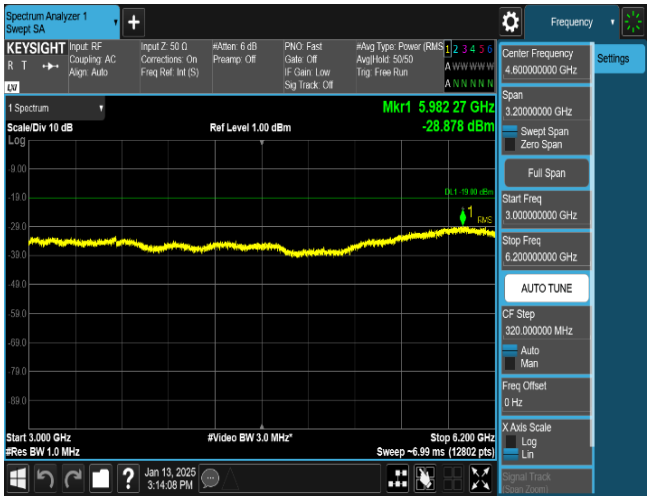
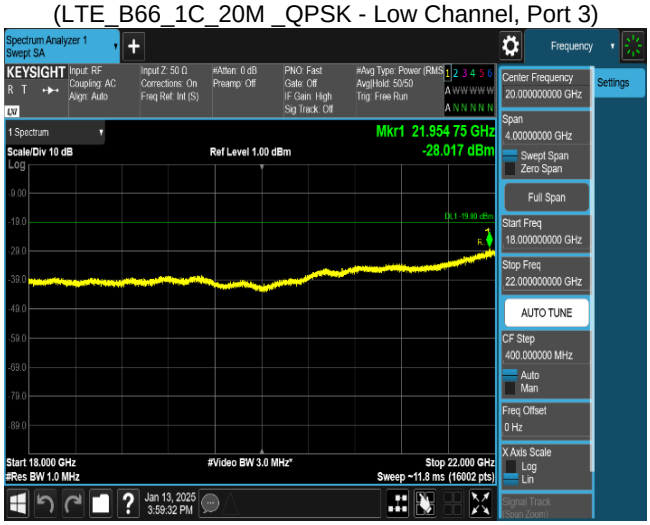
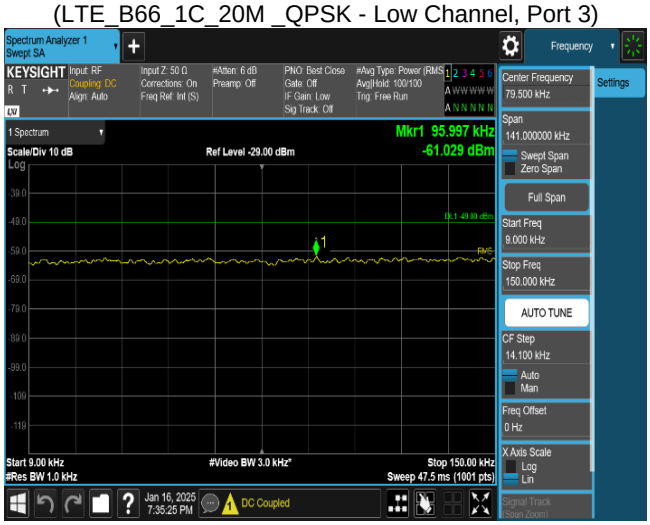


Plot 8-100. Conducted Spurious Emission Plot
3 GHz to 6.2 GHz
(LTE_B66_1C_20M _QPSK - Low Channel, Port 3)

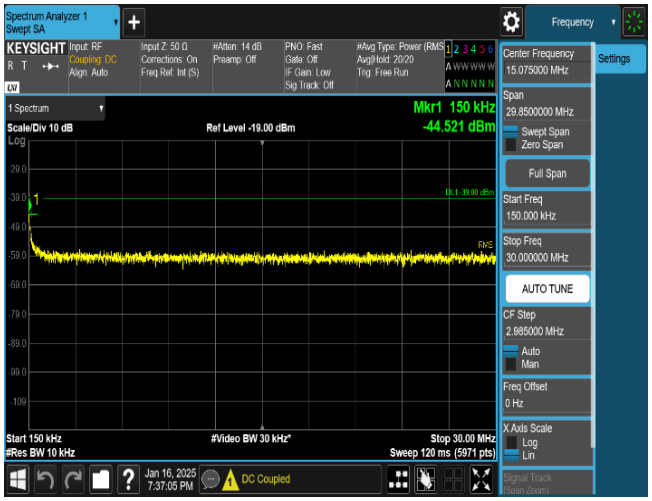
Plot 8-101. Conducted Spurious Emission Plot
6.2 GHz to 18 GHz
(LTE_B66_1C_20M _QPSK - Low Channel, Port 3)



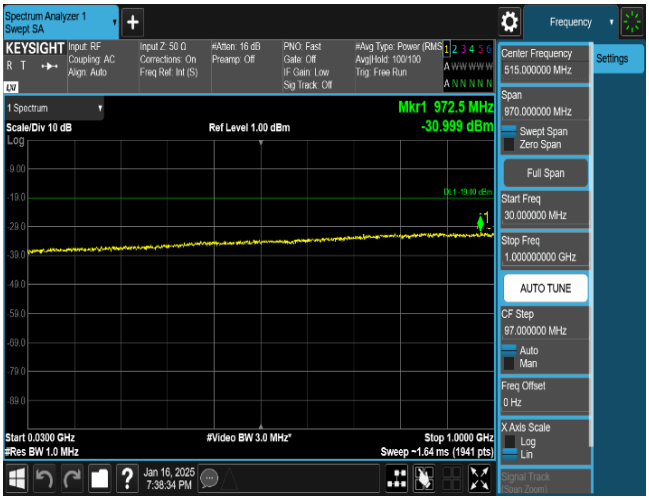
Plot 8-102. Conducted Spurious Emission Plot
18 GHz to 22 GHz
(LTE_B66_1C_20M _QPSK - Low Channel, Port 3)



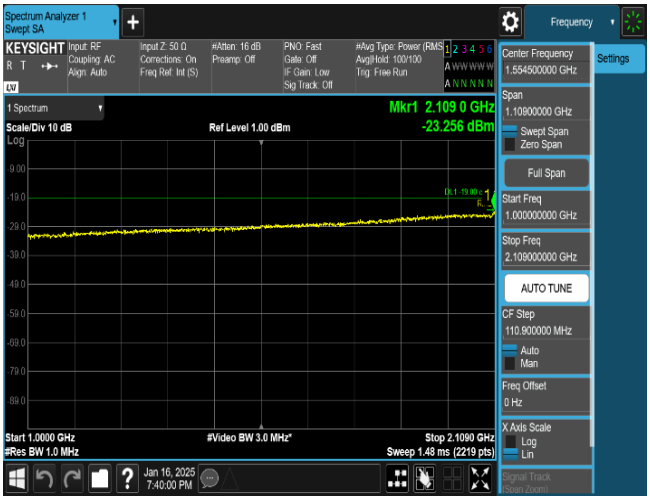
Plot 8-103. Conducted Spurious Emission Plot
9 kHz to 150 kHz
(NR_n66_1C_10M _256QAM - High Channel, Port 1)



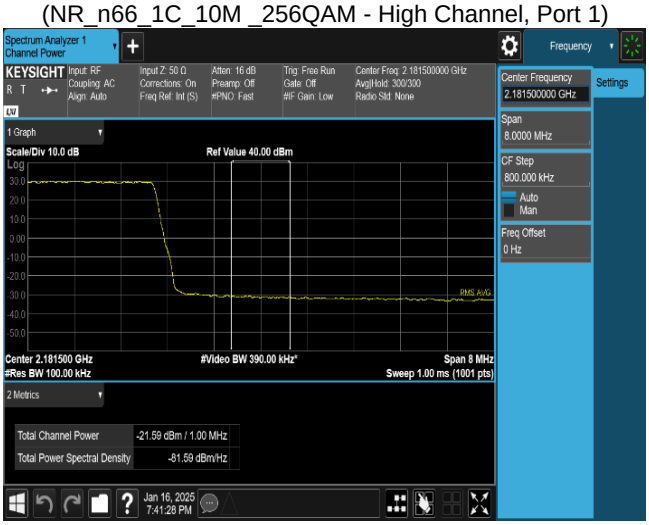
Plot 8-104. Conducted Spurious Emission Plot
150 kHz to 30 MHz
(NR_n66_1C_10M _256QAM - High Channel, Port 1)



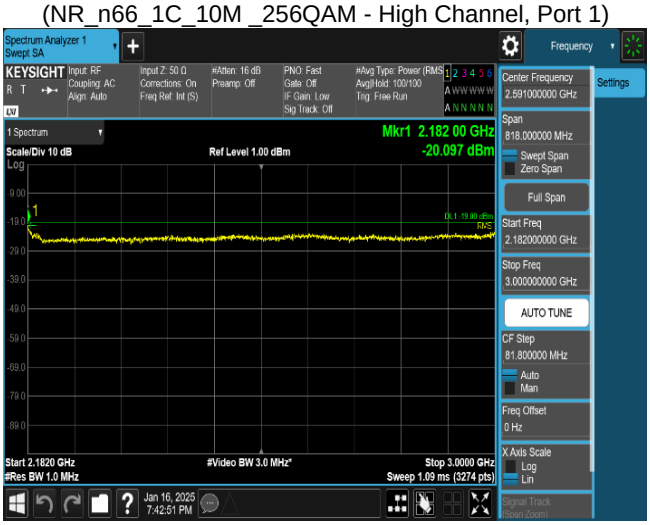
Plot 8-105. Conducted Spurious Emission Plot
30 MHz to 1 GHz
(NR_n66_1C_10M _256QAM - High Channel, Port 1)



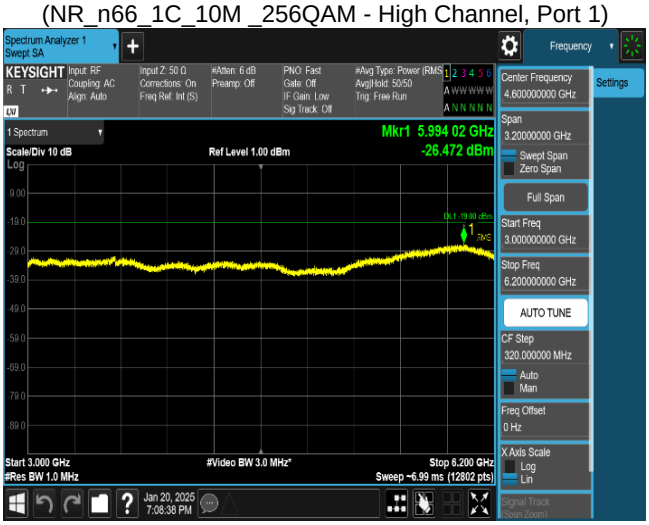
Plot 8-106. Conducted Spurious Emission Plot
1 GHz to 2.109 GHz
(NR_n66_1C_10M _256QAM - High Channel, Port 1)



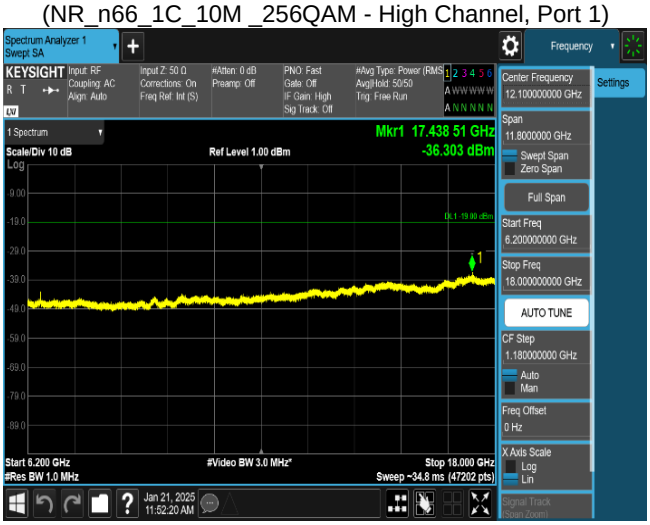
Plot 8-107. Conducted Spurious Emission Plot
2.181 MHz to 2.182 GHz
(NR_n66_1C_10M _256QAM - High Channel, Port 1)



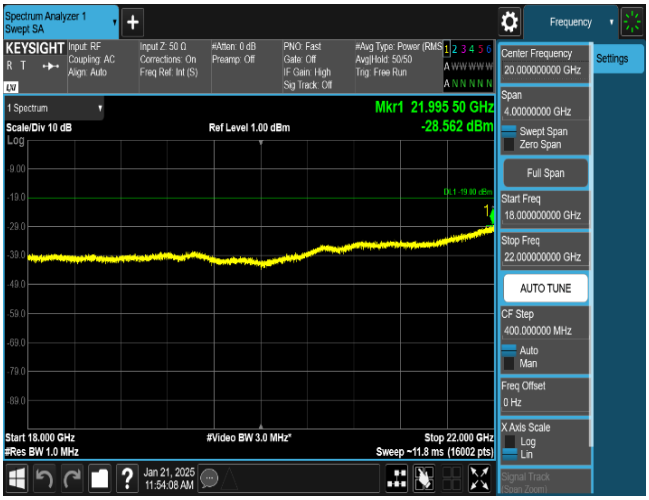
Plot 8-108. Conducted Spurious Emission Plot
2.182 GHz to 3 GHz
(NR_n66_1C_10M _256QAM - High Channel, Port 1)



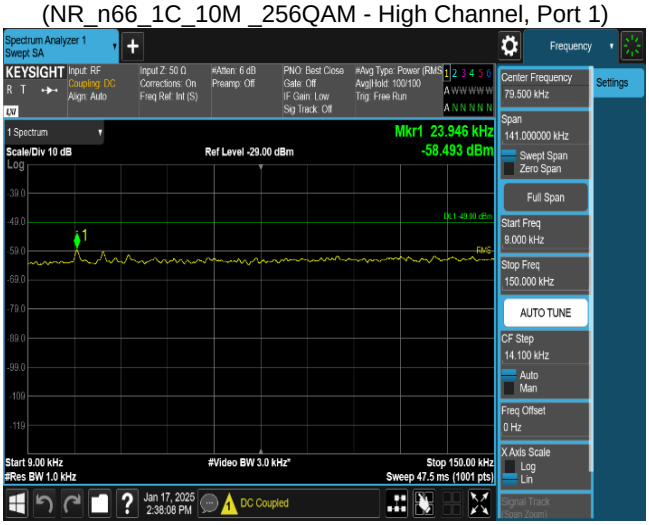
Plot 8-109. Conducted Spurious Emission Plot
3 GHz to 6.2 GHz
(NR_n66_1C_10M _256QAM - High Channel, Port 1)



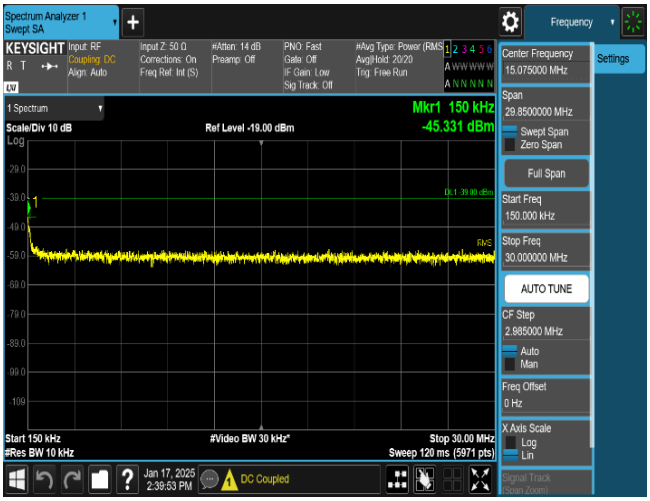
Plot 8-110. Conducted Spurious Emission Plot
6.2 GHz to 18 GHz
(NR_n66_1C_10M _256QAM - High Channel, Port 1)



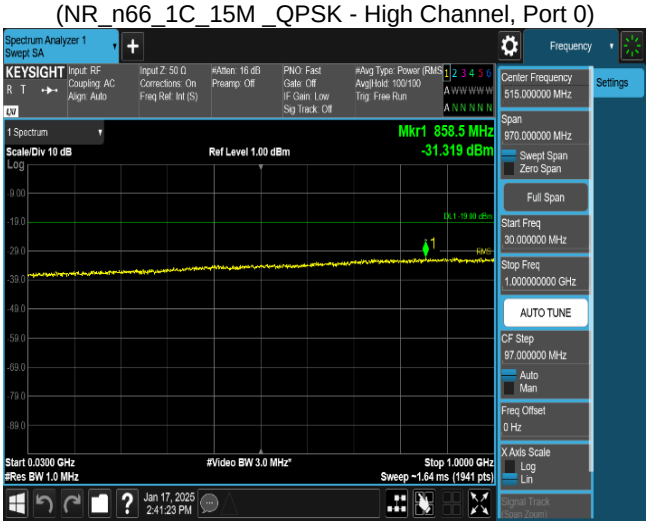
Plot 8-111. Conducted Spurious Emission Plot
18 GHz to 22 GHz
(NR_n66_1C_10M _256QAM - High Channel, Port 1)



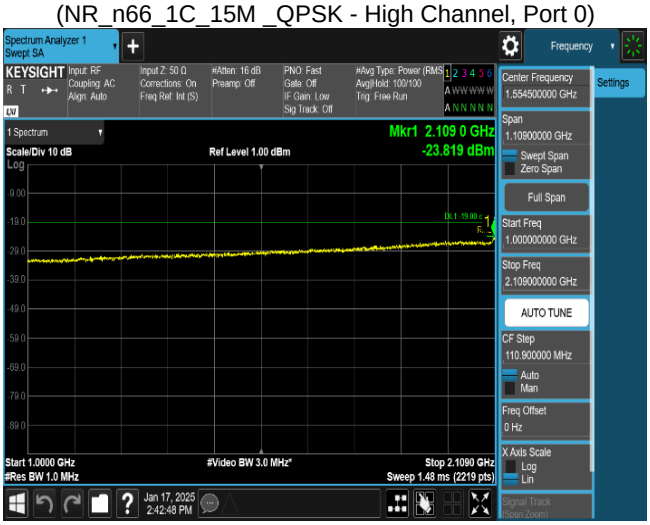
Plot 8-112. Conducted Spurious Emission Plot
9 kHz to 150 kHz
(NR_n66_1C_15M _QPSK - High Channel, Port 0)



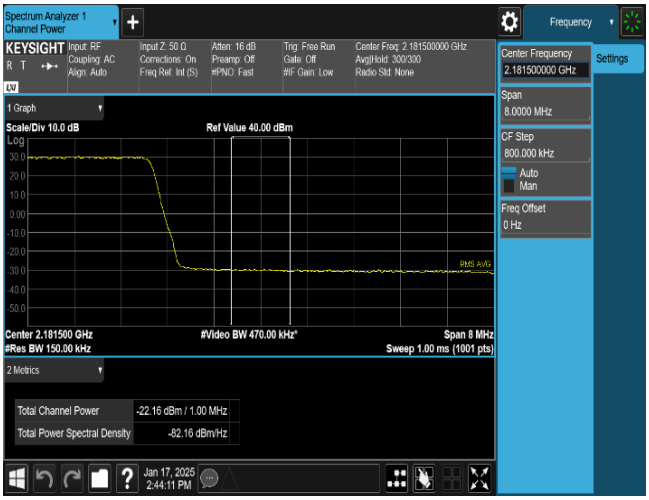
Plot 8-113. Conducted Spurious Emission Plot
150 kHz to 30 MHz
(NR_n66_1C_15M _QPSK - High Channel, Port 0)



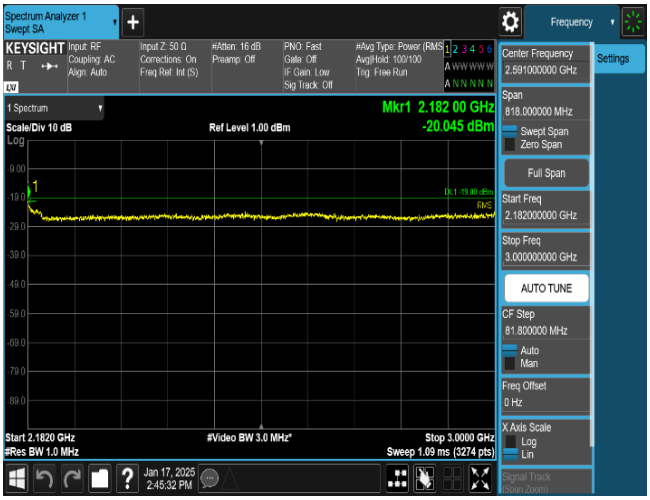
Plot 8-114. Conducted Spurious Emission Plot
30 MHz to 1 GHz
(NR_n66_1C_15M _QPSK - High Channel, Port 0)



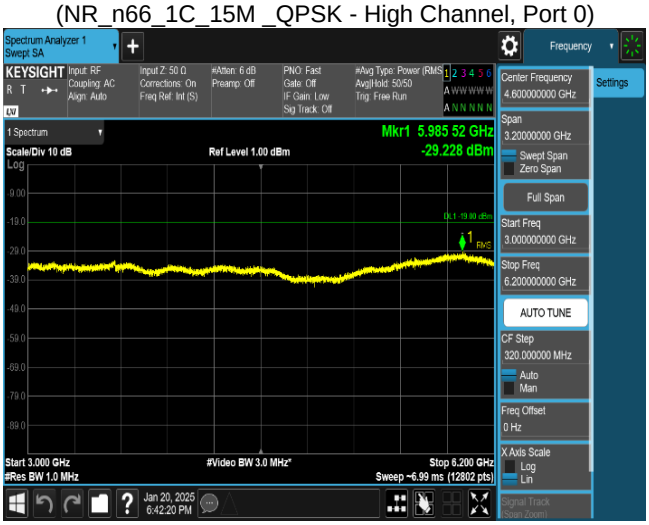
Plot 8-115. Conducted Spurious Emission Plot
1 GHz to 2.109 GHz
(NR_n66_1C_15M _QPSK - High Channel, Port 0)



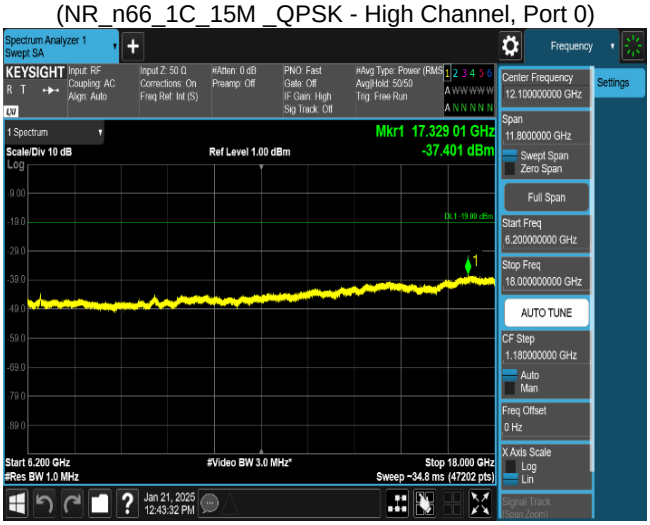
Plot 8-116. Conducted Spurious Emission Plot
2.181 MHz to 2.182 GHz
(NR_n66_1C_15M _QPSK - High Channel, Port 0)



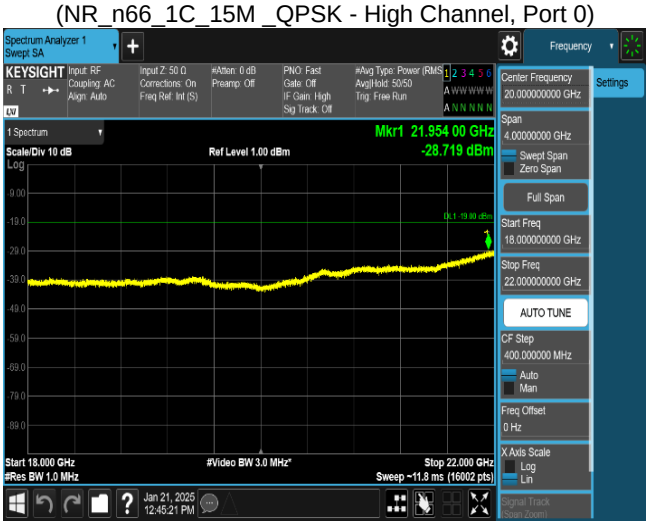
Plot 8-117. Conducted Spurious Emission Plot
2.182 GHz to 3 GHz
(NR_n66_1C_15M _QPSK - High Channel, Port 0)



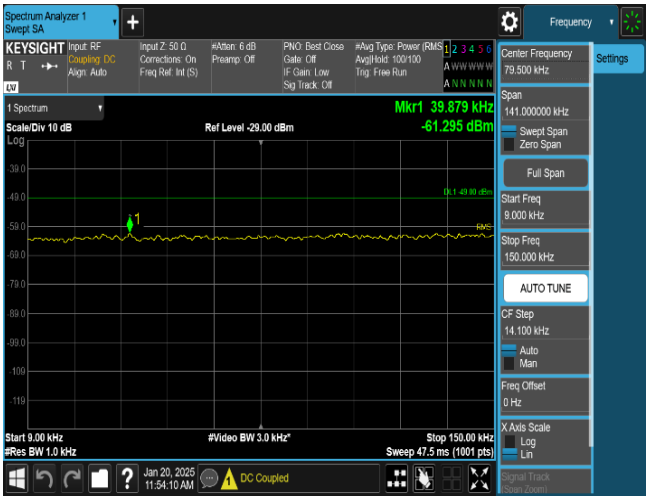
Plot 8-118. Conducted Spurious Emission Plot
3 GHz to 6.2 GHz
(NR_n66_1C_15M _QPSK - High Channel, Port 0)



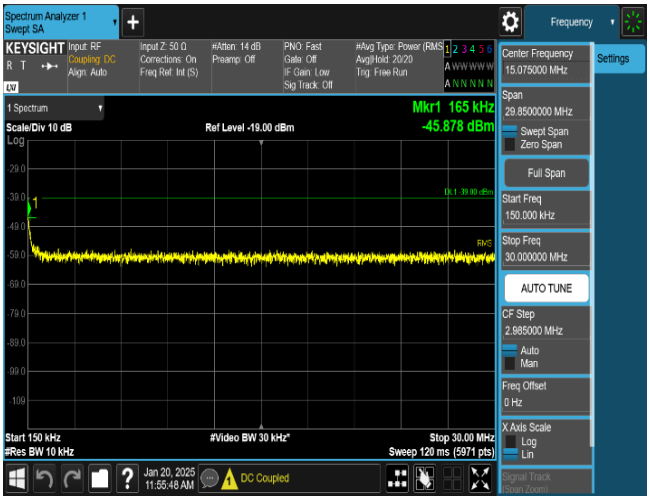
Plot 8-119. Conducted Spurious Emission Plot
6.2 GHz to 18 GHz
(NR_n66_1C_15M _QPSK - High Channel, Port 0)



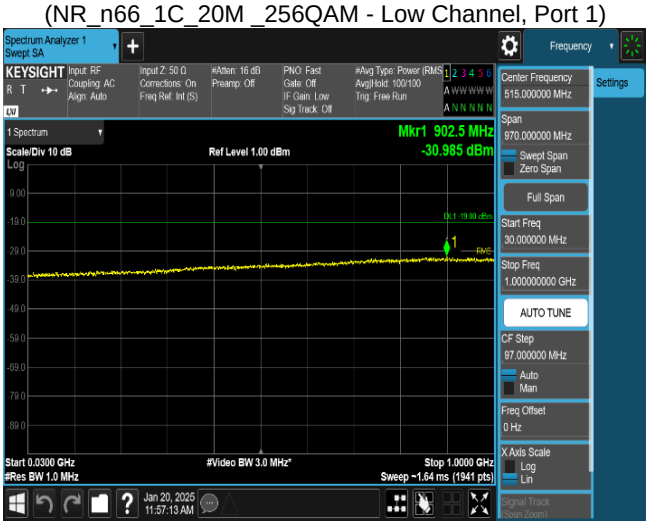
Plot 8-120. Conducted Spurious Emission Plot
18 GHz to 22 GHz
(NR_n66_1C_15M _QPSK - High Channel, Port 0)



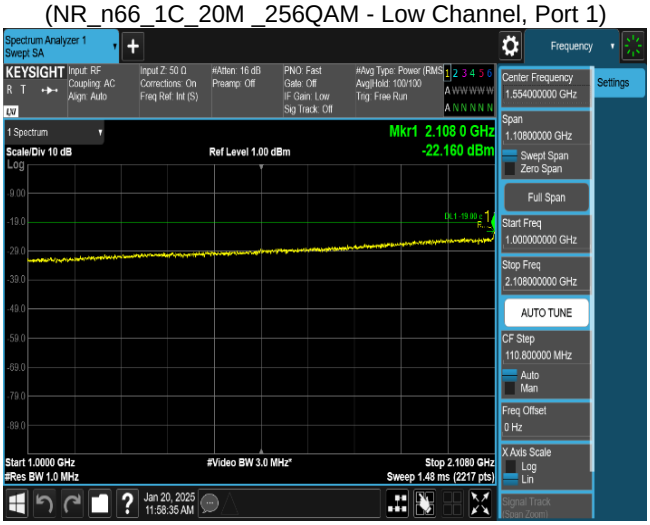
Plot 8-121. Conducted Spurious Emission Plot
9 kHz to 150 kHz
(NR_n66_1C_20M _256QAM - Low Channel, Port 1)



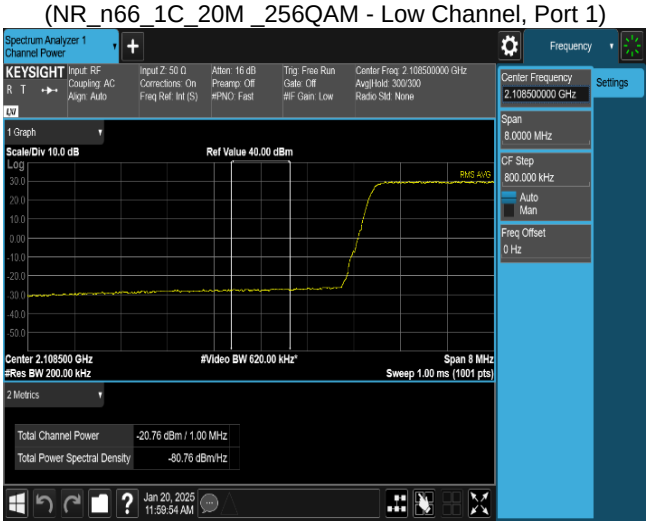
Plot 8-122. Conducted Spurious Emission Plot
150 kHz to 30 MHz
(NR_n66_1C_20M _256QAM - Low Channel, Port 1)



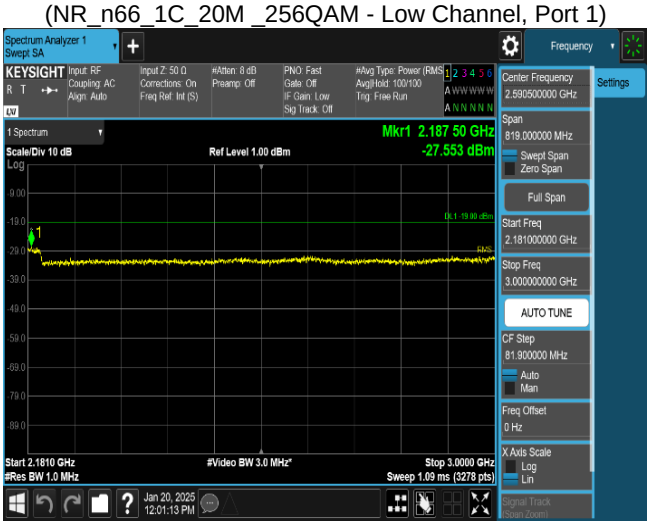
Plot 8-123. Conducted Spurious Emission Plot
30 MHz to 1 GHz
(NR_n66_1C_20M _256QAM - Low Channel, Port 1)



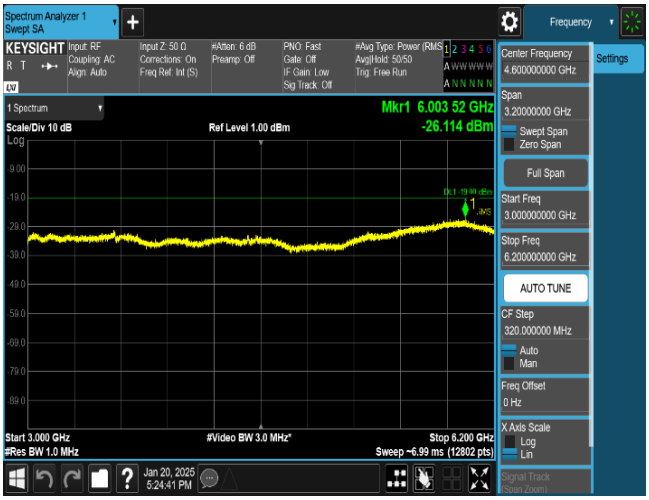
Plot 8-124. Conducted Spurious Emission Plot
1 GHz to 2.108 GHz
(NR_n66_1C_20M _256QAM - Low Channel, Port 1)



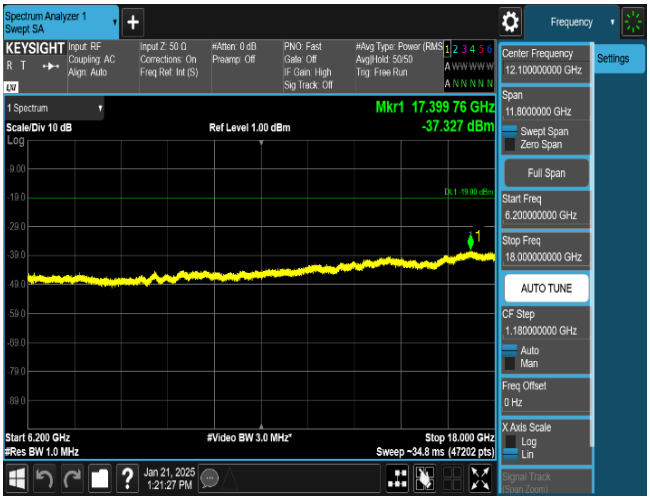
Plot 8-125. Conducted Spurious Emission Plot
2.108 MHz to 2.109 GHz
(NR_n66_1C_20M _256QAM - Low Channel, Port 1)



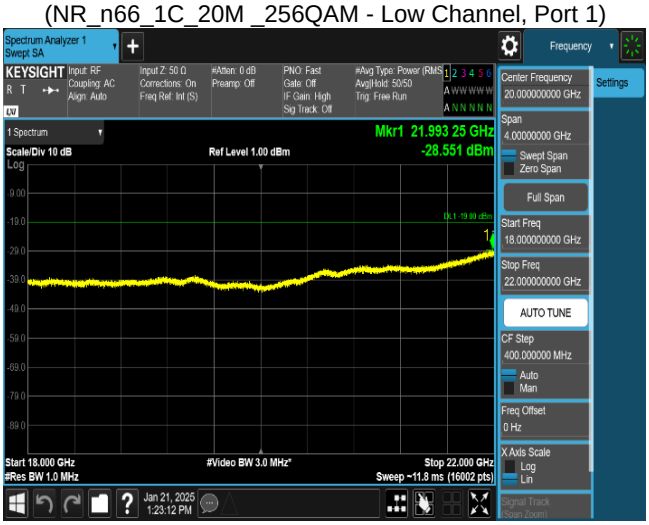
Plot 8-126. Conducted Spurious Emission Plot
2.181 GHz to 3 GHz
(NR_n66_1C_20M _256QAM - Low Channel, Port 1)



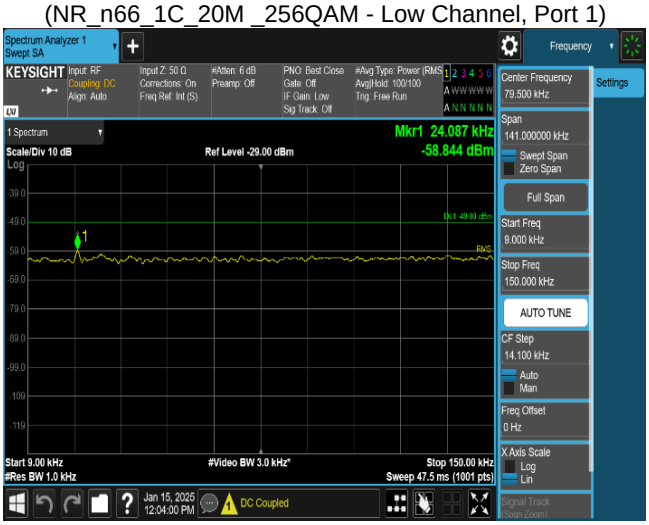
Plot 8-127. Conducted Spurious Emission Plot
3 GHz to 6.2 GHz
(NR_n66_1C_20M _256QAM - Low Channel, Port 1)



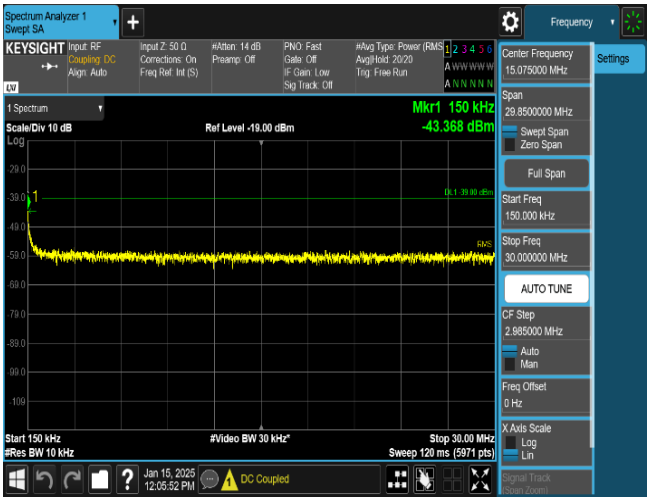
Plot 8-128. Conducted Spurious Emission Plot
6.2 GHz to 18 GHz
(NR_n66_1C_20M _256QAM - Low Channel, Port 1)



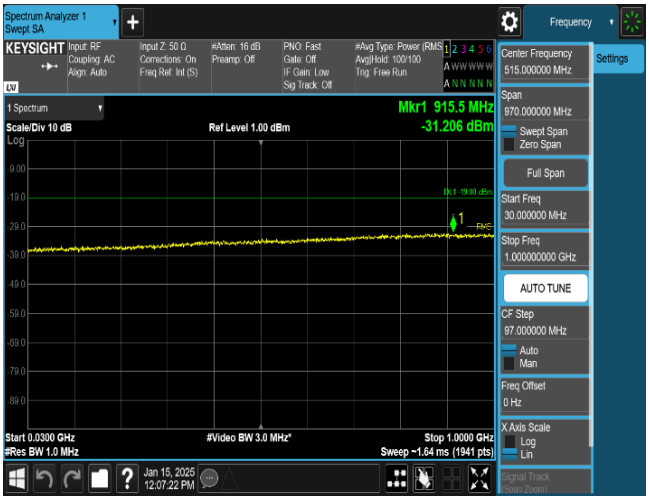
Plot 8-129. Conducted Spurious Emission Plot
18 GHz to 22 GHz
(NR_n66_1C_20M _256QAM - Low Channel, Port 1)



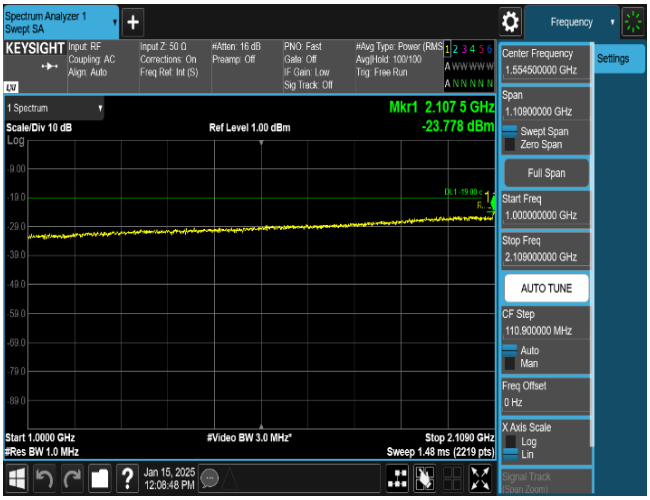
Plot 8-130. Conducted Spurious Emission Plot
9 kHz to 150 kHz
(LTE_B66_2C_5M+5M _QPSK - High Channel, Port 0)



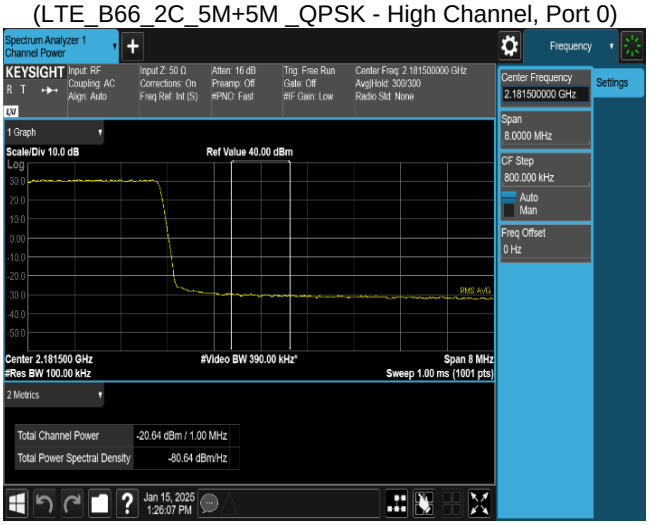
Plot 8-131. Conducted Spurious Emission Plot
150 kHz to 30 MHz
(LTE_B66_2C_5M+5M _QPSK - High Channel, Port 0)



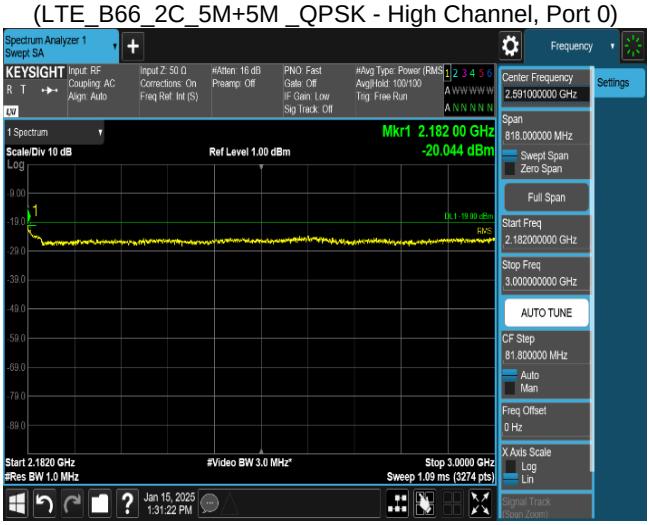
Plot 8-132. Conducted Spurious Emission Plot
30 MHz to 1 GHz
(LTE_B66_2C_5M+5M _QPSK - High Channel, Port 0)



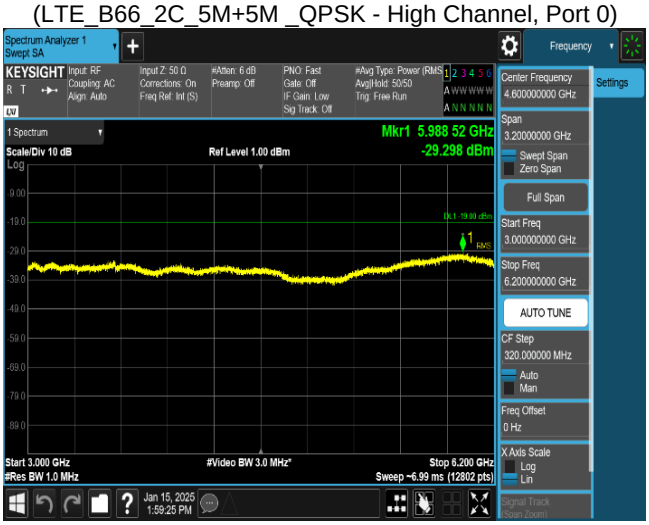
Plot 8-133. Conducted Spurious Emission Plot
1 GHz to 2.109 GHz
(LTE_B66_2C_5M+5M _QPSK - High Channel, Port 0)



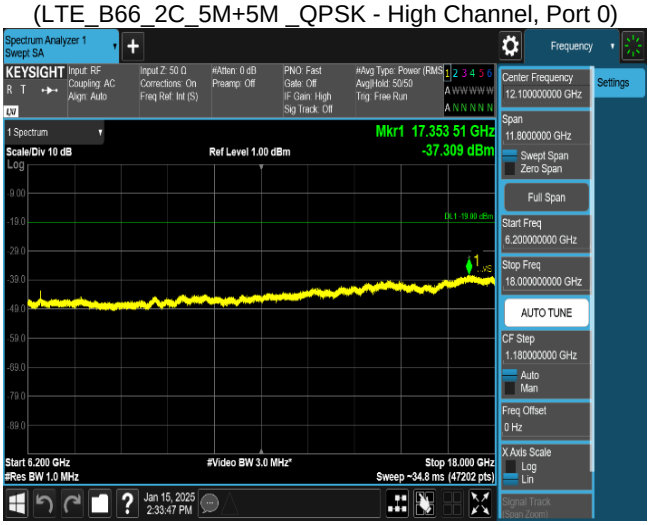
Plot 8-134. Conducted Spurious Emission Plot
2.181 MHz to 2.182 GHz
(LTE_B66_2C_5M+5M _QPSK - High Channel, Port 0)



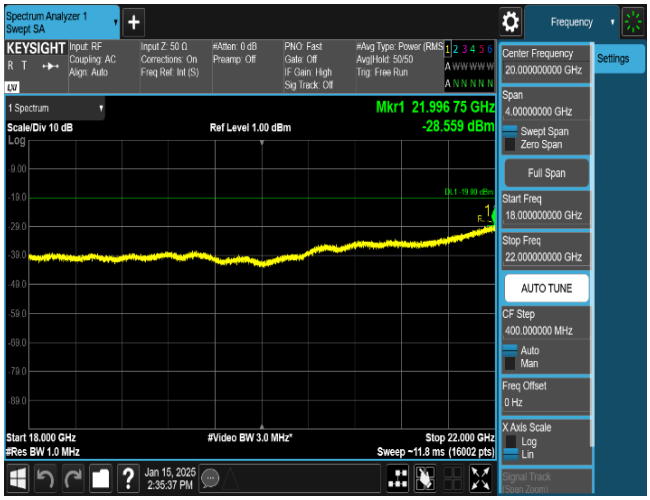
Plot 8-135. Conducted Spurious Emission Plot
2.182 GHz to 3 GHz
(LTE_B66_2C_5M+5M _QPSK - High Channel, Port 0)



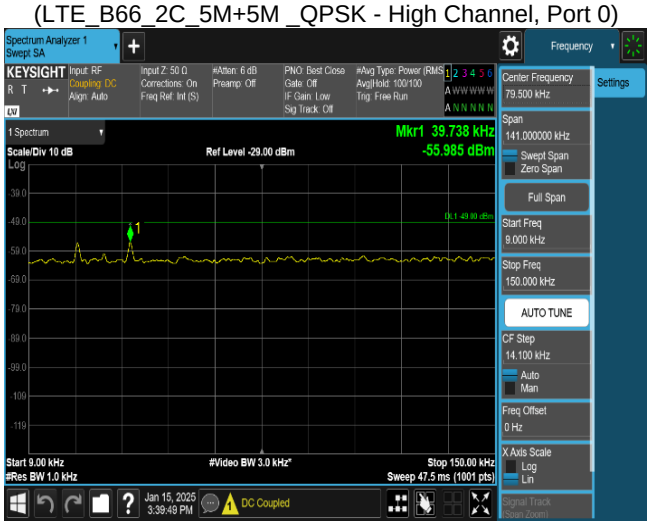
Plot 8-136. Conducted Spurious Emission Plot
3 GHz to 6.2 GHz
(LTE_B66_2C_5M+5M _QPSK - High Channel, Port 0)



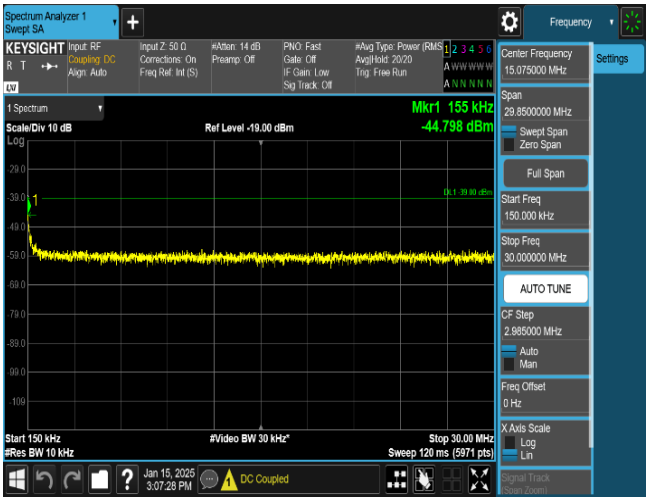
Plot 8-137. Conducted Spurious Emission Plot
6.2 GHz to 18 GHz
(LTE_B66_2C_5M+5M _QPSK - High Channel, Port 0)



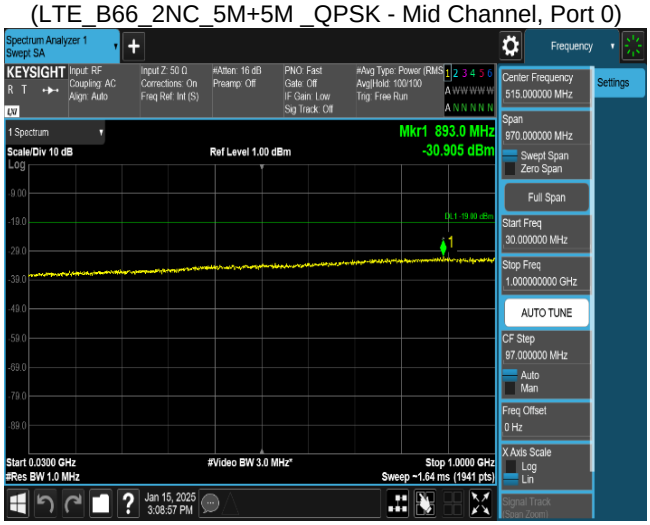
Plot 8-138. Conducted Spurious Emission Plot
18 GHz to 22 GHz
(LTE_B66_2C_5M+5M _QPSK - High Channel, Port 0)



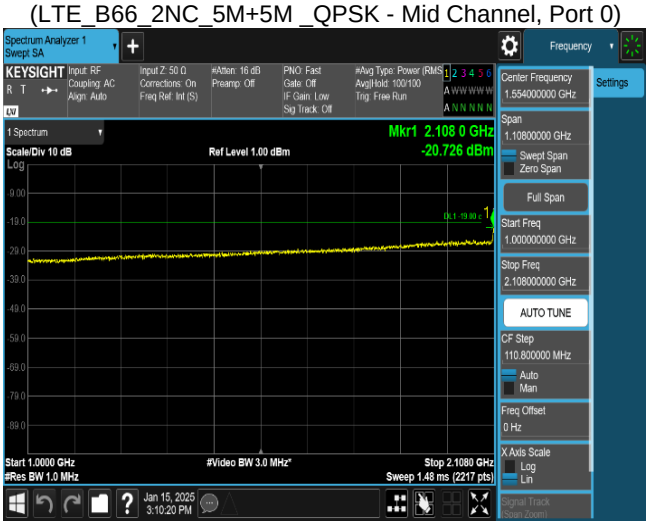
Plot 8-139. Conducted Spurious Emission Plot
9 kHz to 150 kHz
(LTE_B66_2NC_5M+5M _QPSK - Mid Channel, Port 0)



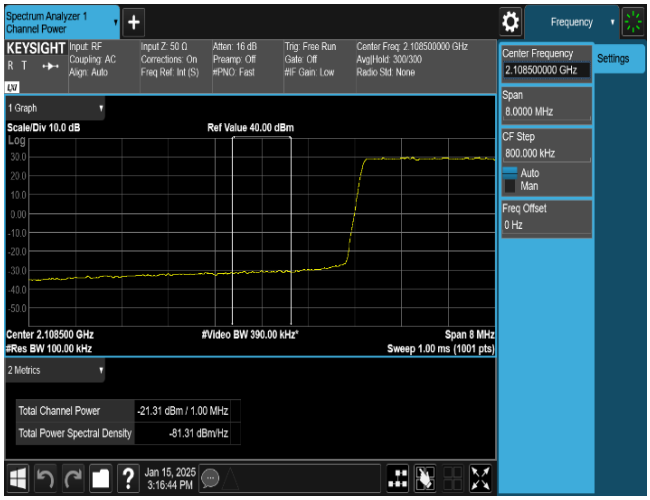
Plot 8-140. Conducted Spurious Emission Plot
150 kHz to 30 MHz
(LTE_B66_2NC_5M+5M _QPSK - Mid Channel, Port 0)



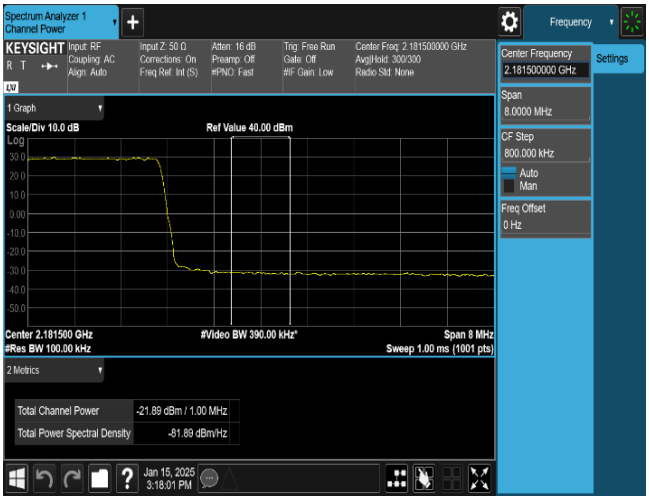
Plot 8-141. Conducted Spurious Emission Plot
30 MHz to 1 GHz
(LTE_B66_2NC_5M+5M _QPSK - Mid Channel, Port 0)



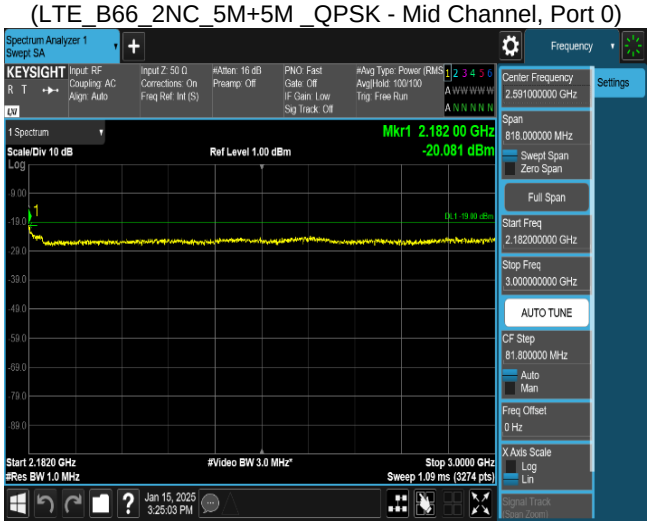
Plot 8-142. Conducted Spurious Emission Plot
1 GHz to 2.108 GHz
(LTE_B66_2NC_5M+5M _QPSK - Mid Channel, Port 0)



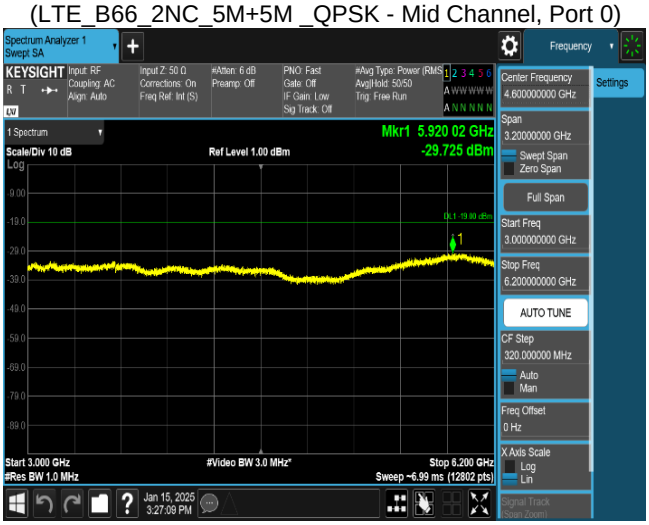
Plot 8-143. Conducted Spurious Emission Plot
2.108 MHz to 2.109 GHz
(LTE_B66_2NC_5M+5M _QPSK - Mid Channel, Port 0)



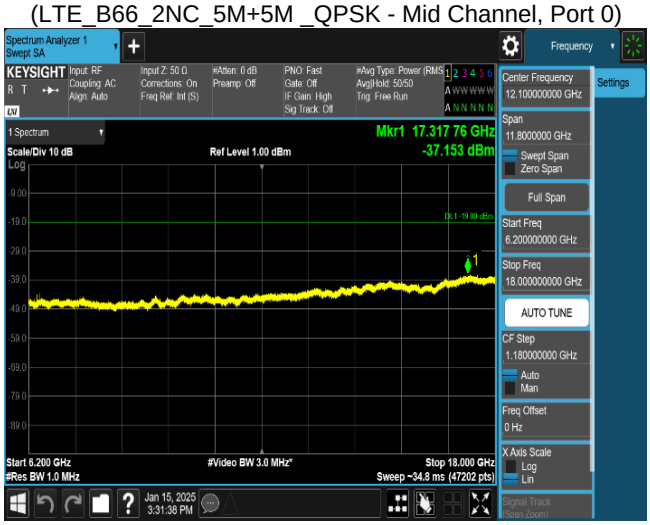
Plot 8-144. Conducted Spurious Emission Plot
2.181 GHz to 2.182 GHz
(LTE_B66_2NC_5M+5M _QPSK - Mid Channel, Port 0)



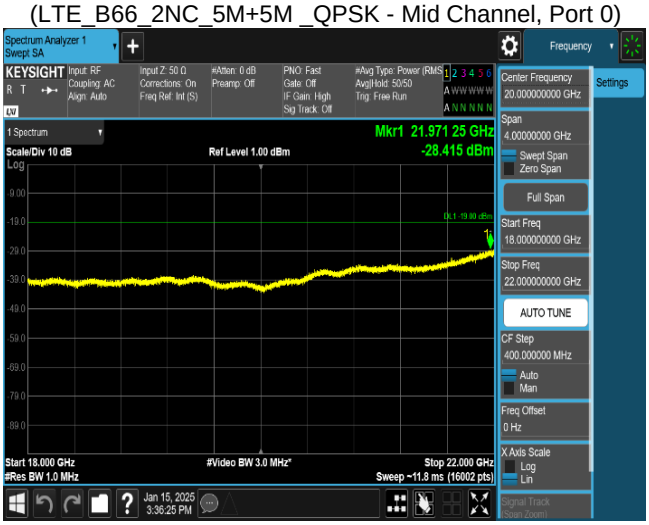
Plot 8-145. Conducted Spurious Emission Plot
2.182 GHz to 3 GHz
(LTE_B66_2NC_5M+5M _QPSK - Mid Channel, Port 0)



Plot 8-146. Conducted Spurious Emission Plot
3 GHz to 6.2 GHz
(LTE_B66_2NC_5M+5M _QPSK - Mid Channel, Port 0)



Plot 8-147. Conducted Spurious Emission Plot
6.2 GHz to 18 GHz
(LTE_B66_2NC_5M+5M _QPSK - Mid Channel, Port 0)



Plot 8-148. Conducted Spurious Emission Plot
18 GHz to 22 GHz
(LTE_B66_2NC_5M+5M _QPSK - Mid Channel, Port 0)

8.7 Frequency Stability

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of KDB 971168 D01 v03r01.
The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for DC powered equipment.

Test Description

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).

2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.

   Frequency measurements are made -30°C to +50°C in 10°C increments. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Limit

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

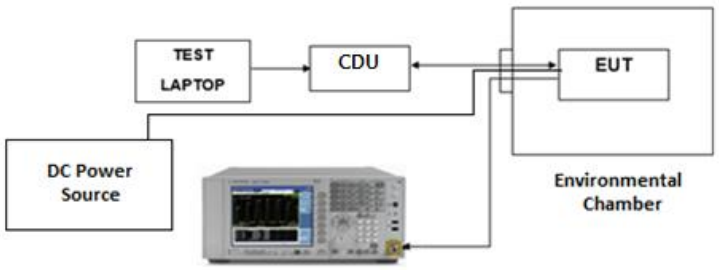


Figure 8-6. Test Instrument & Measurement Setup

Test Notes

None.

OPERATING FREQUENCY: 2145,000,000 Hz
REFERENCE VOLTAGE: 48.00 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (ºC)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	52.0	- 30	2,145,000,009	0.65	0.00000003
100 %		- 20	2,145,000,006	-1.60	-0.00000007
100 %		- 10	2,145,000,011	2.75	0.00000013
100 %		0	2,145,000,010	1.86	0.00000009
100 %		+ 10	2,145,000,006	-1.70	-0.00000008
100 %		+ 20(Ref)	2,145,000,008	0.00	0.00000000
100 %		+ 30	2,145,000,005	-3.17	-0.00000015
100 %		+ 40	2,145,000,009	0.61	0.00000003
100 %		+ 50	2,145,000,007	-1.27	-0.00000006
85 %	44.2	+ 20	2,145,000,005	-2.58	-0.00000012
111.5 %	58.0	+ 20	2,145,000,004	-4.28	-0.00000020

Table 8-49. Frequency Stability Summary Data (LTE_B66_1C_5M)

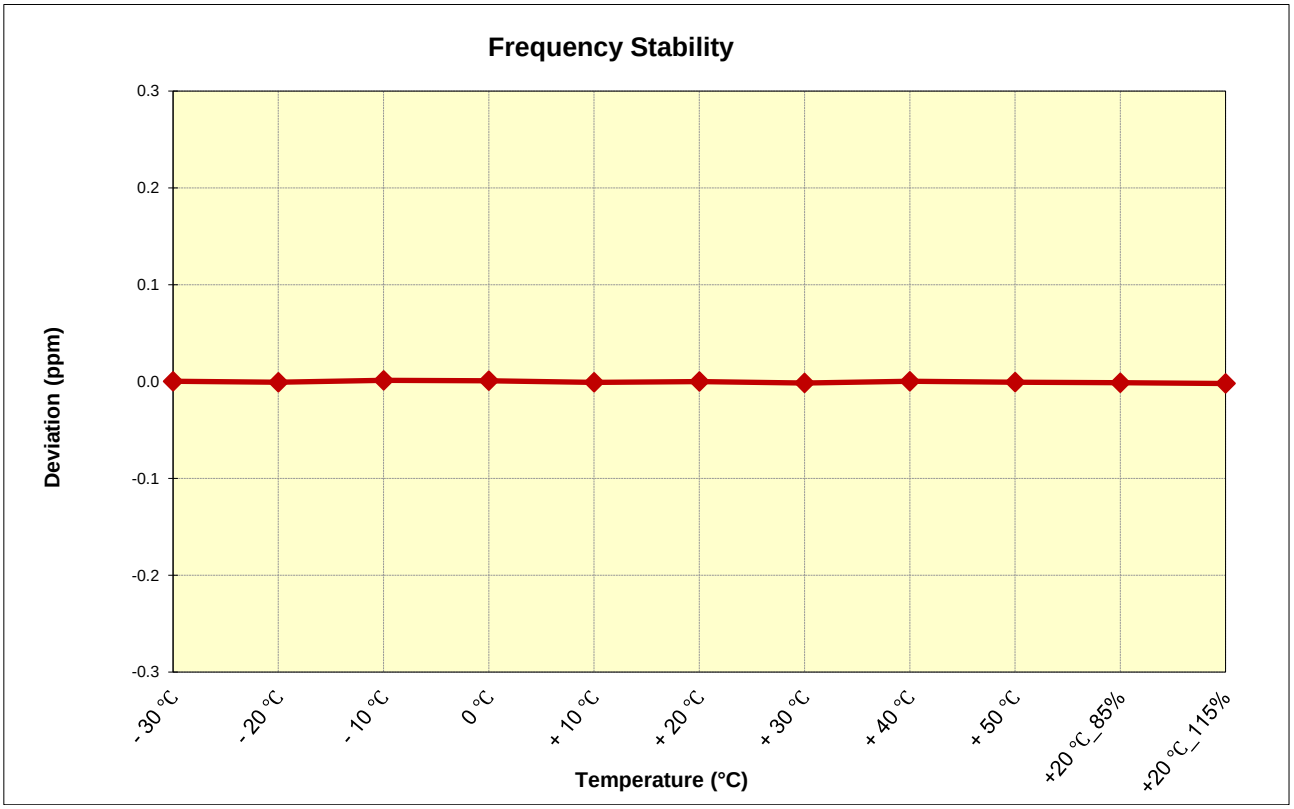


Figure 8-7. Frequency Stability Graph (LTE_B66_1C_5M)

8.8 Radiated spurious emission

Test Overview

Radiated spurious emissions measurements are performed using the field strength method described in ANSI C63.26-2015 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized broadband tri-log antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas.

Test Procedure Used

ANSI C63.26 - Section 5.5.3.2

Test Setting

1. Start frequency was set to 30 MHz and stop frequency was set to at least 10 * the fundamental frequency
2. RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1GHz
3. VBW ≥ 3 x RBW
4. No. of sweep points ≥ 2 x span / RBW
5. Detector = RMS
6. Trace mode = Max Hold (In cases where the level is within 2 dB of the limit, the final measurement is taken using triggering/gating and trace averaging.)
7. The trace was allowed to stabilize.

Limit

§ 27.53(h)

(1) General protection levels. Except as otherwise specified below, for operations in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz, and 2180–2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

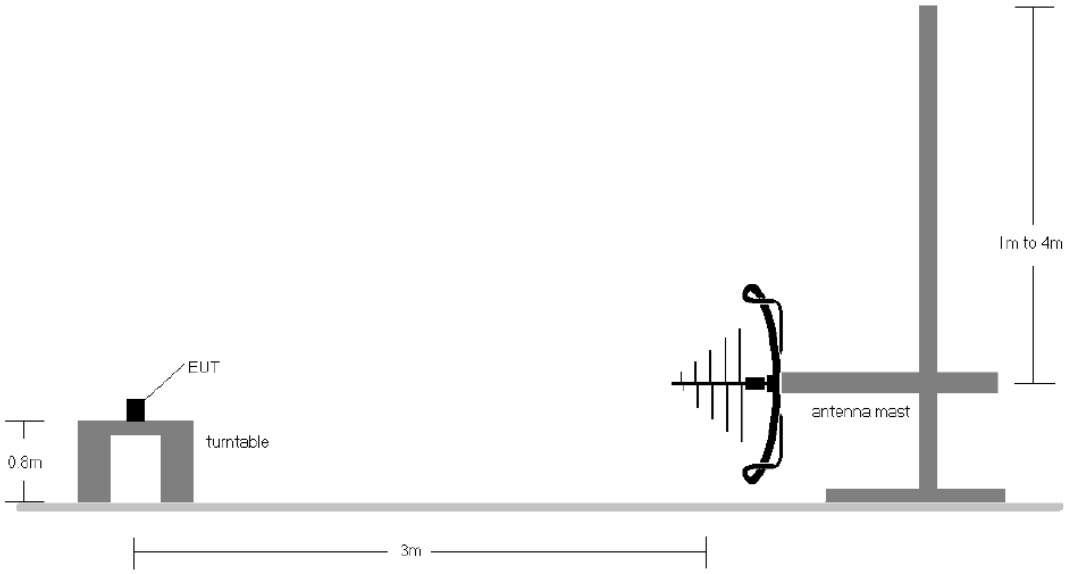


Figure 8-8. Test Instrument & Measurement Setup < 1 GHz

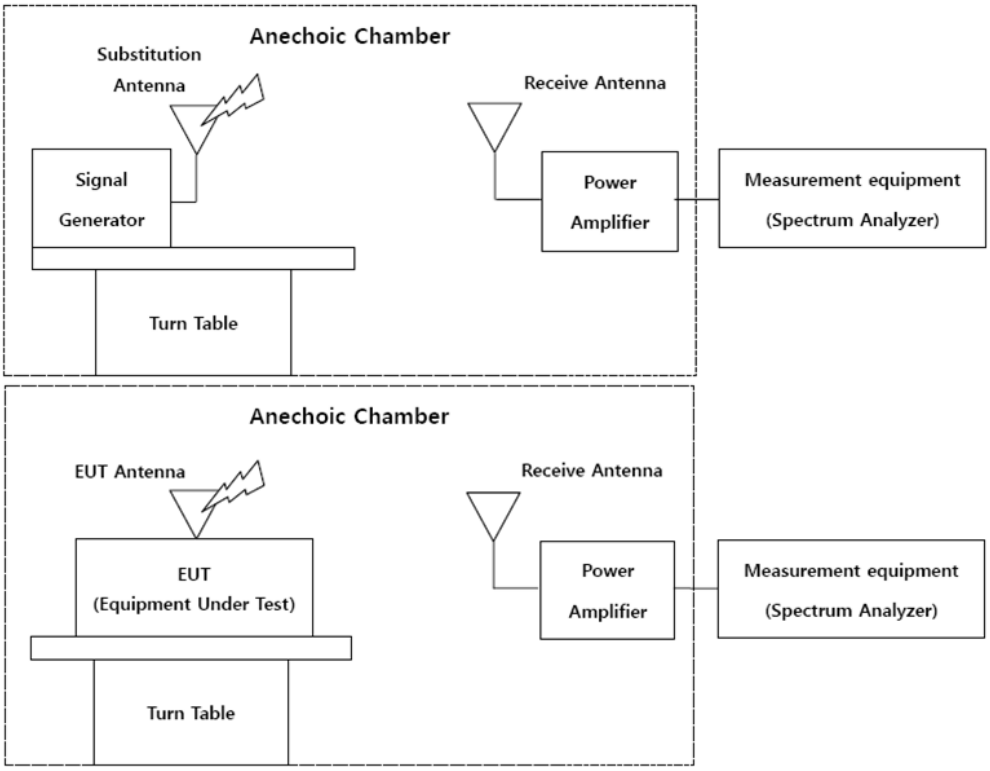


Figure 8-9. Test Instrument & Measurement Setup > 1 GHz

Test Notes

1. The below 1GHz average EIRP reported below is calculated per 5.2.7 of ANSI C63.26-2015 which states:

   The measured E-field in V/m is converted to e.i.r.p in dBm.

   ## Effective Isotropic Radiated Power Sample Calculation

Field Strength [dBµV/m] = Measured Value [dBµV/m] + AFCL [dB/m]
= 51.0 [dBµV/m] -19.3 [dB/m] = 31.7 dBµV/m

e.i.r.p. [dBm] = E[dB μV/m] + 20 $\log_{10}$(d[m]) - 104.8
= 31.7 dB[μV/m] + (20*log (3)) - 104.8
= -63.56 dBm

2. The above 1GHz average EIRP reported below is calculated per 5.5.3 of ANSI C63.26-2015 which states:

   ## Effective Isotropic Radiated Power Sample Calculation

Substitution measurement
e.i.r.p. [dBm] = EUT_{Prec} [dBm EIRP] + P_L [dB]
= -75.0 dBm + 59.8
= -15.2 dBm

3. The EUT was tested in both horizontal and vertical antenna polarizations and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, channel bandwidth configurations shown in the tables below.

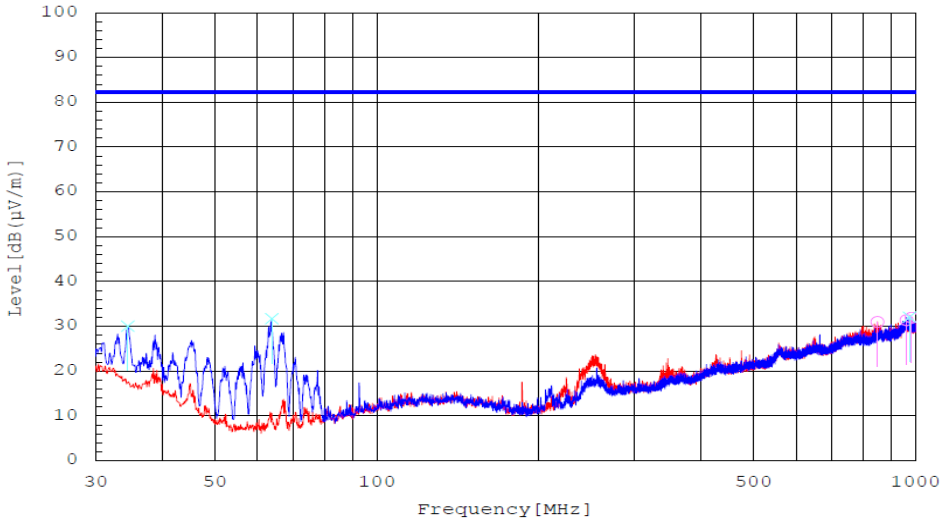
4. The spectrum is measured from 30 MHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

5. All emissions were measured at a 3-meter test distance.

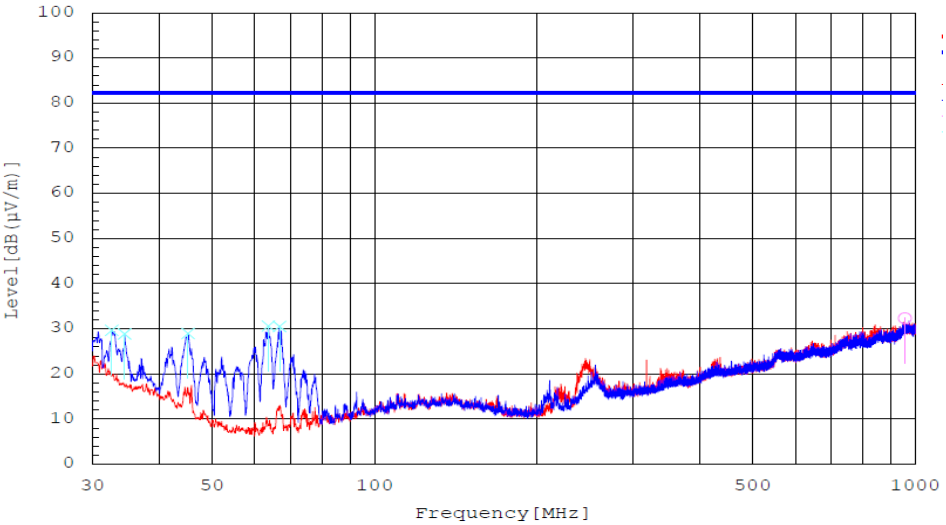
6. Spurious emissions were measured with all EUT antennas transmitting simultaneously and all antenna ports terminated.

7. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

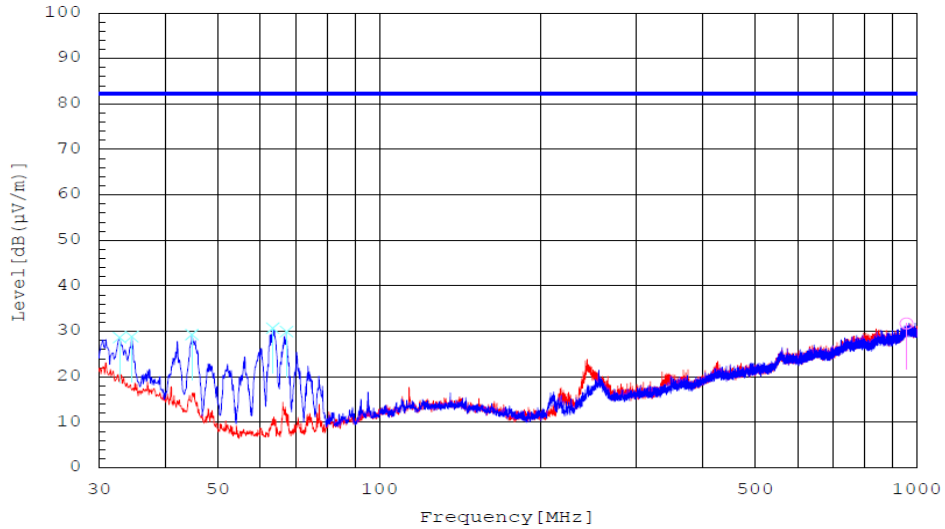
8. All modes of operation were investigated and the worst case configuration results are reported in this section.



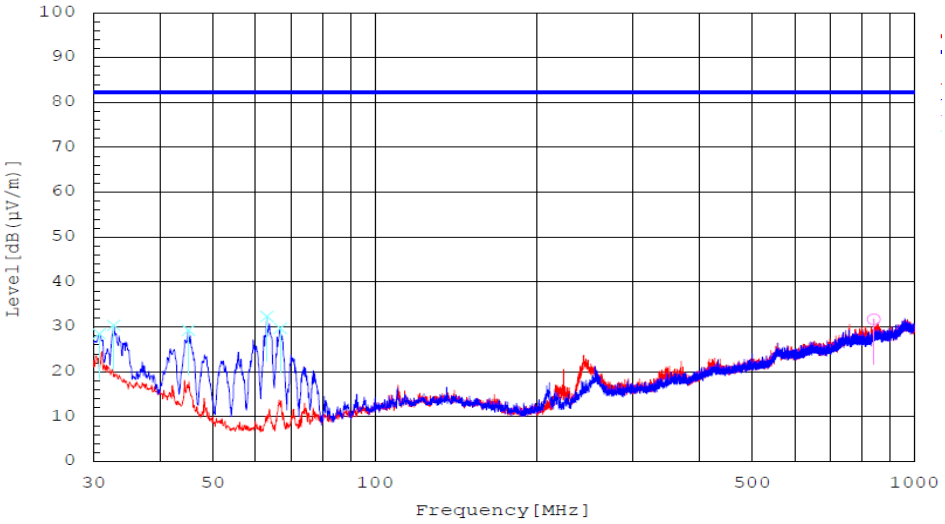
Plot 8-149. Radiated spurious emission Plot_30 MHz to 1000 MHz (LTE_B66_1C_20M_Low Channel)



Plot 8-150. Radiated spurious emission Plot_30 MHz to 1000 MHz (NR_n66_1C_20M_High Channel)



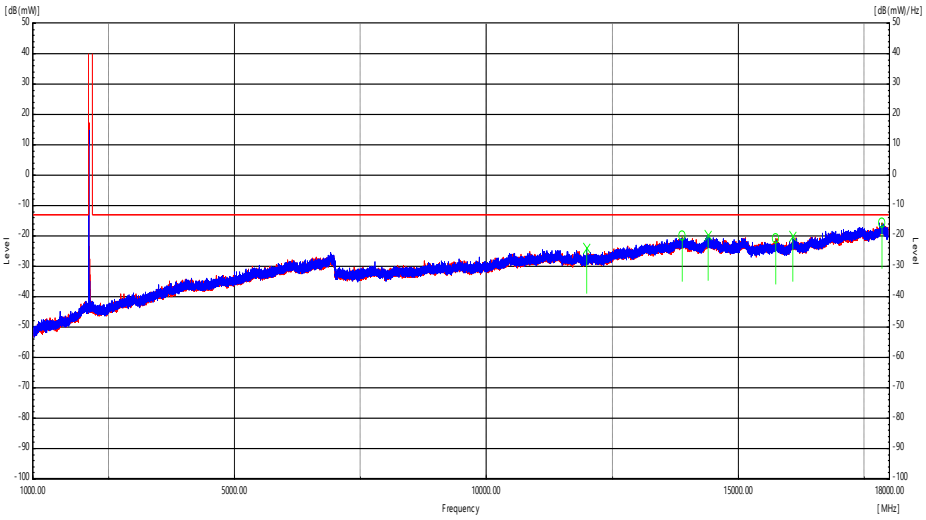
Plot 8-151. Radiated spurious emission Plot_30 MHz to 1000 MHz (B(n)66_2C_LTE_10M+NR_10M_Mid Channel)



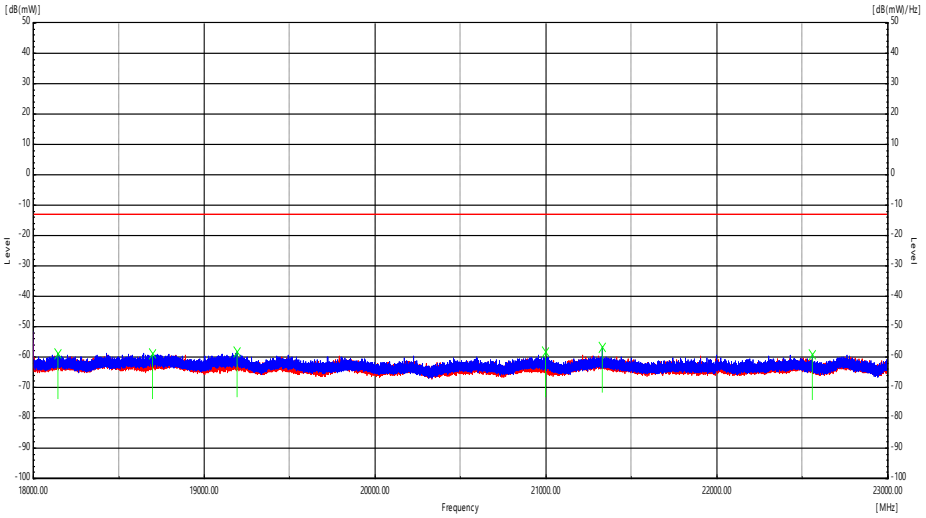
Plot 8-152. Radiated spurious emission Plot_30 MHz to 1000 MHz (LTE_B66_4C_5M+5M+5M+20M_High Channel)

Mod	Frequency [MHz]	Ant. Pol. [H/V]	Analyzer Level [dBμV/m]	AFCL [dB]	Field Strength [dBμV/m]	EIRP [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]]	Antenna Heigh [cm]	Turntable azimuth [degree]
LTE_B66_1C_ 20M_Low	63.76	V	51.0	-19.3	31.7	-63.56	-13	-50.6	200	70.4
NR_n66_1C_ 20M_High	All detected emissions are compliant with attenuated more than 20 dB below limit.									
B(n)66_2C_ LTE_10M+NR _10M_Mid										
LTE_B66_4C_ 5M+5M+5M+ 20M_High										

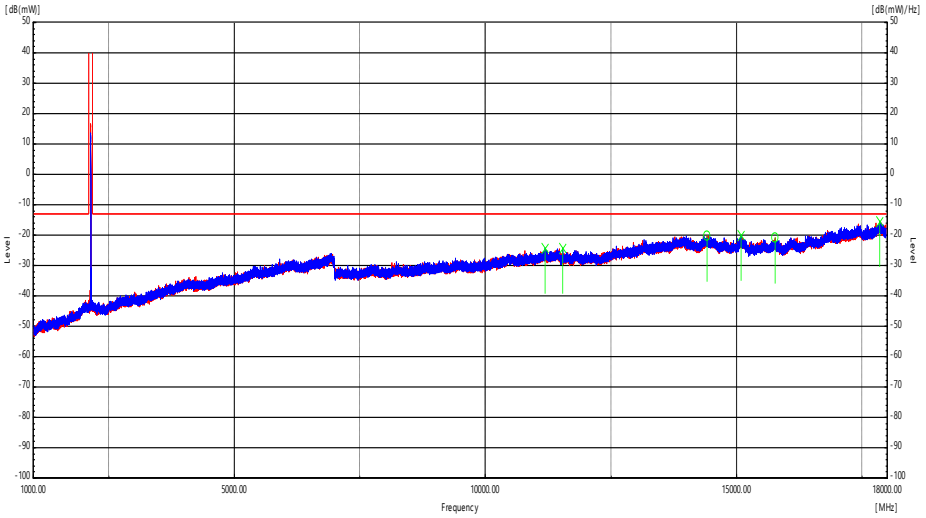
Table 8-50. Radiated spurious emission below 1GHz Worst mode Summary Data



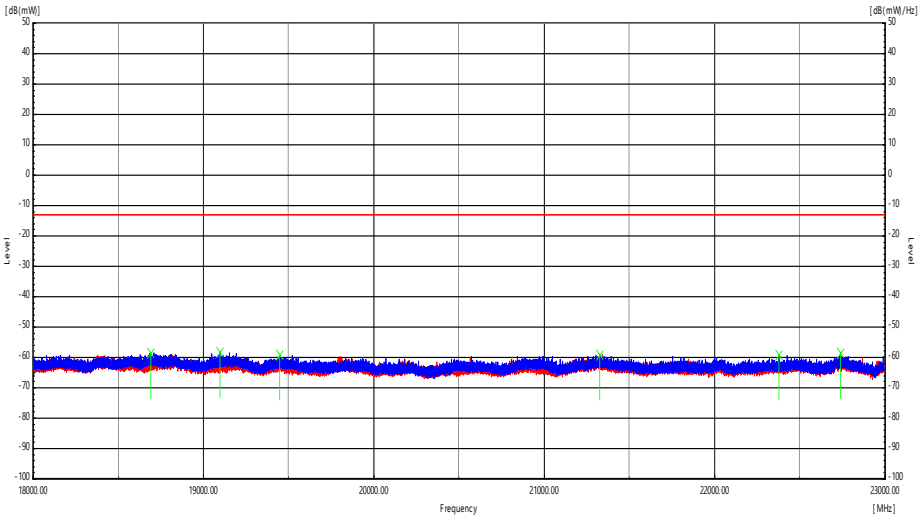
Plot 8-153. Radiated spurious emission Plot_1 GHz to 18 GHz (LTE_B66_1C_5M_Low Channel)



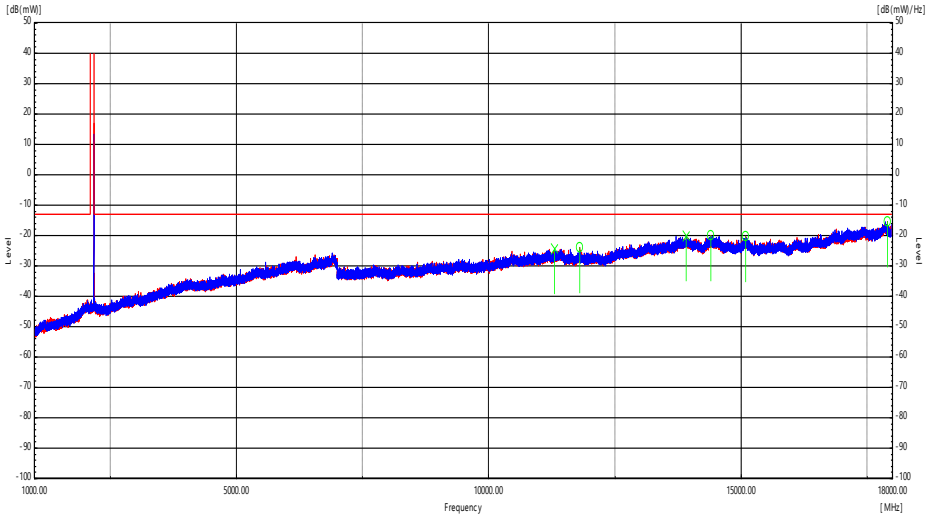
Plot 8-154. Radiated spurious emission Plot_18 GHz to 23 GHz (LTE_B66_1C_5M_Low Channel)



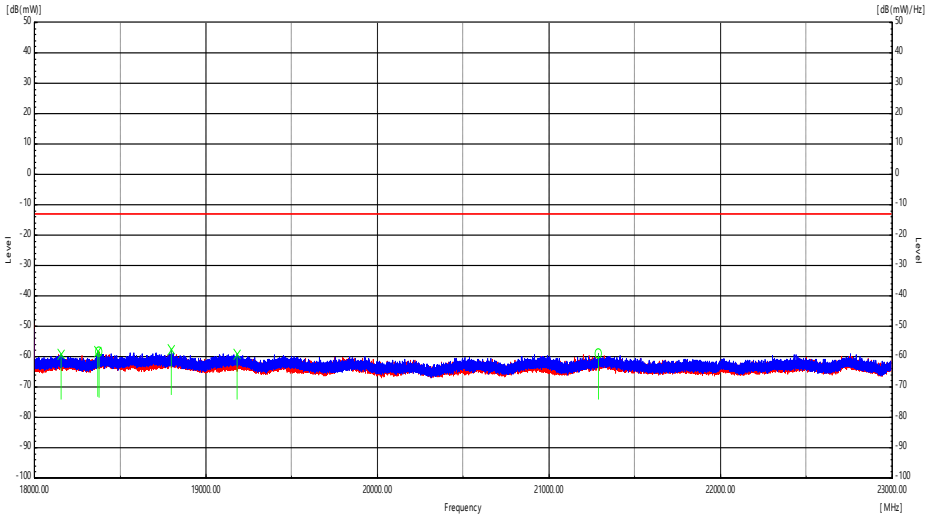
Plot 8-155. Radiated spurious emission Plot_1 GHz to 18 GHz (LTE_B66_1C_5M_Mid Channel)



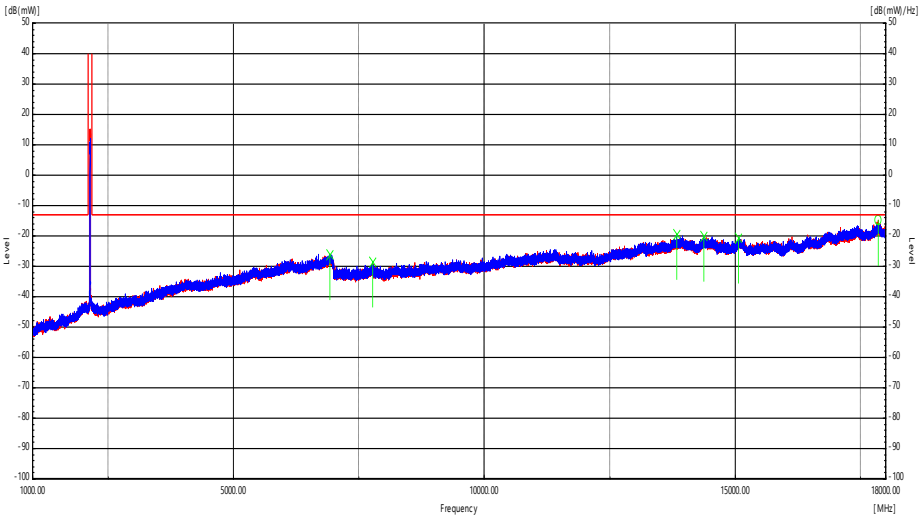
Plot 8-156. Radiated spurious emission Plot_18 GHz to 23 GHz (LTE_B66_1C_5M_Mid Channel)



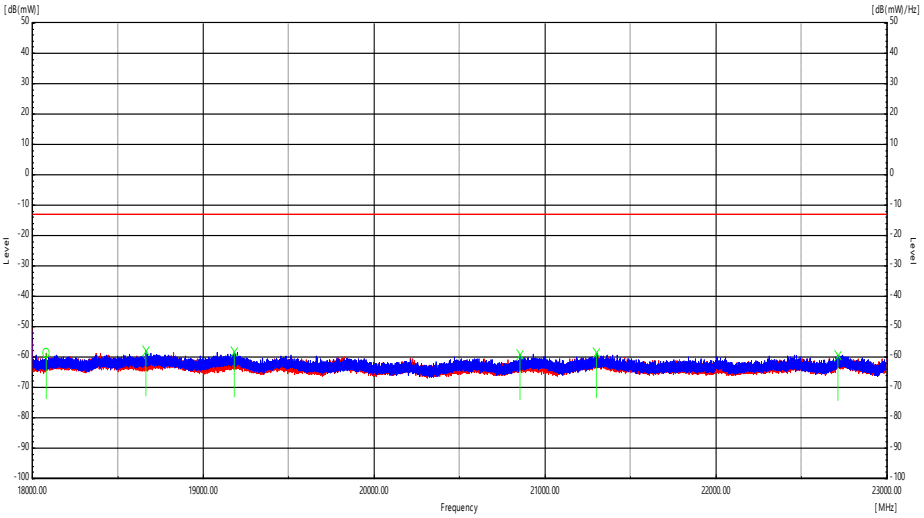
Plot 8-157. Radiated spurious emission Plot_1 GHz to 18 GHz (LTE_B66_1C_5M_High Channel)



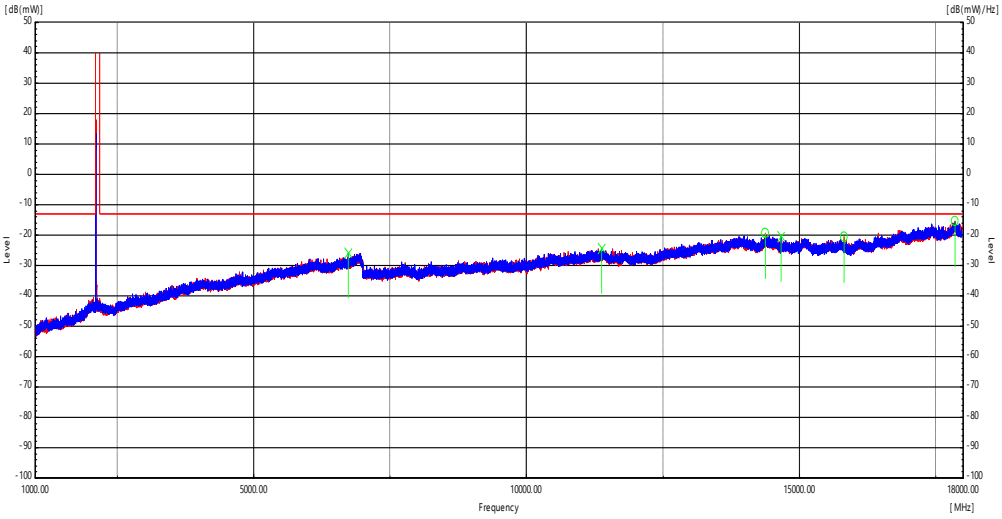
Plot 8-158. Radiated spurious emission Plot_18 GHz to 23 GHz ((LTE_B66_1C_5M_High Channel)



Plot 8-159. Radiated spurious emission Plot_1 GHz to 18 GHz (LTE_B66_1C_20M_Mid Channel)



Plot 8-160. Radiated spurious emission Plot_18 GHz to 23 GHz (LTE_B66_1C_20M_Mid Channel)



Plot 8-161. Radiated spurious emission Plot_1 GHz to 18 GHz (NR_n66_1C_10M_Low Channel)