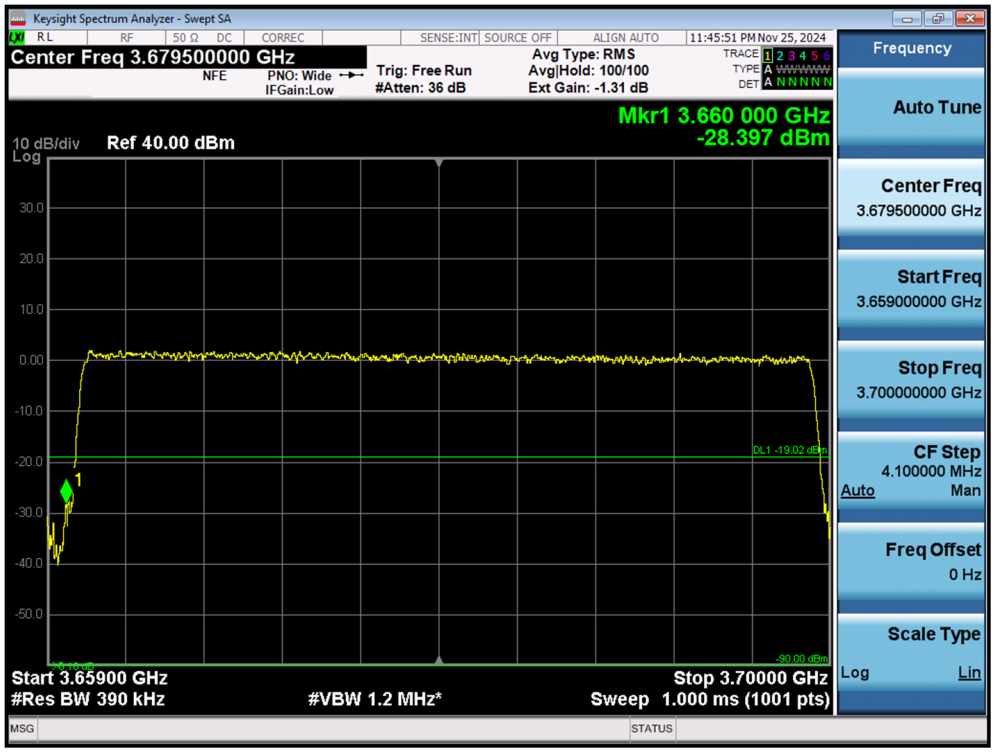
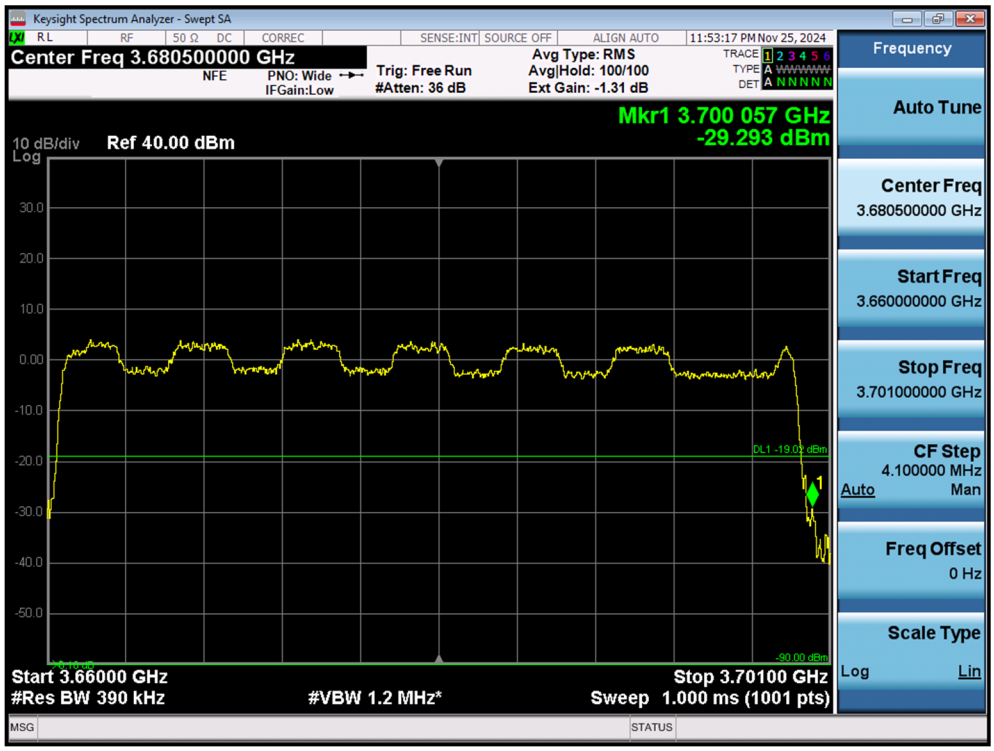
Antenna 3 / (4 Port) 5G NR n48 40 MHz 1 Carrier / QPSK / High / Left



Antenna 3 / (4 Port) 5G NR n48 40 MHz 1 Carrier / 16QAM / High / Right



The report shall not be (partly) reproduced except in full without approval of the laboratory.

5.5. SPURIOUS UNWANTED EMISSIONS

Test Requirements:

§ 2.1051 Measurements required: Spurious emissions at antenna terminals.

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

96.41(e) General radio requirement: 3.5 GHz Emissions and Interference Limits.

(1) General protection levels.

(i) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any CBSD emission outside the fundamental emission bandwidth as specified in paragraph (e)(3) of this section (whether the emission is inside or outside of the authorized band) shall not exceed −13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any CBSD emission shall not exceed −25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

(ii) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed −13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed −25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

(2) Additional protection levels.

Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed −25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

(3) Measurement procedure.

(i) Compliance with this provision is based on the use of measurement instrumentation employing a

The report shall not be (partly) reproduced except in full without approval of the laboratory.

resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's authorized frequency channel, a resolution bandwidth of no less than one percent of the fundamental emission bandwidth may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full reference bandwidth (i.e., 1 MHz or 1 percent of emission bandwidth, as specified). The fundamental emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(ii) When measuring unwanted emissions to demonstrate compliance with the limits, the CBSD and End User Device nominal carrier frequency/channel shall be adjusted as close to the licensee's authorized frequency block edges, both upper and lower, as the design permits.

(iii) Compliance with emission limits shall be demonstrated using either average (RMS)-detected or peak-detected power measurement techniques.

(4) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

Test Procedures:

The measurement is performed in accordance with Section 5.7.4 of ANSI C63.26.

5.7.4 Spurious unwanted emission measurements

a) Set the spectrum analyzer start frequency to the lowest frequency generated by the EUT, without going below 9 kHz, and the stop frequency to the lower frequency covered by the measurements previously performed in 5.7.3. As an alternative, the stop frequency can be set to the value specified in 5.1.1, depending on the EUT operating range, if the resulting plot can clearly demonstrate compliance for all frequencies not addressed by the out-of-band emissions measurements performed as per 5.7.3.

b) When using an average power (rms) detector, ensure that the number of points in the sweep $\geq 2 \times$ (span / RBW). This may require that the measurement range defined by the start and stop frequencies be subdivided, depending on the spectrum analyzer capabilities. This requirement does not apply to peak-detected power measurements. When average power is specified by the applicable regulation, a peak-detector can be utilized for preliminary measurements to accommodate wider frequency spans. Any emissions found in the preliminary measurement to exceed the applicable limit(s) shall be further examined using a power averaging (rms) detector with the minimum number of measurement points as defined above.

c) The sweep time should be set to auto-couple for performing peak-detector measurements. For measurements that use a power averaging (rms) detector, the sweep time shall be set as described for out-of-band emissions measurements in item d) of 5.7.3.

d) Identify and measure the Highest spurious emission levels in each frequency range. It is not necessary to re-measure the out-of-band emissions as a part of this test. Record the frequencies and amplitudes corresponding to the measured emissions and capture the data plots.

e) Repeat step b) through step d) for the upper spurious emission frequency range if not already captured by a wide span measurement performed as per the alternative provided in step a). The upper frequency for this

The report shall not be (partly) reproduced except in full without approval of the laboratory.

measurement is defined in 5.1.1 as a function of the EUT operating range.

f) Compare the results with the corresponding limit in the applicable regulation.

g) The test report shall include the data plots of the measuring instrument display and the measured data.

Note:

1. In some frequency ranges, the RBW was reduced to 0.1%, 1%, and 10% of the reference bandwidth for measuring out-of-band and unwanted spurious emissions levels. Therefore, the limit lines were compensated according to section 5.7.2 of ANSI C63.26-2015.

Reduced RBW	0.1 %	1 %	10 %
Limit line compensation	-30 dB	-20 dB	-10 dB

2. Due to MIMO operations, a correction has been added to the limit according to KDB 662911 D01 v02r01.
   - 4Tx MIMO correction: 10 log(N_{ANT}) = 10 log(4) = 6.02 dB

     From Channel Edge to Channel Edge ± 10 MHz -13 dBm/MHz – 10 log (2) = -19.02 dBm/MHz

     From Channel Edge ± 10 MHz to 3 530 or 3 720 MHz -25 dBm/MHz – 10 log (2) = -31.02 dBm/MHz

     For the rest, -40 dBm/MHz – 10 log (2) = -46.02 dBm/MHz
3. The measured value already includes the duty correction value.
4. The results of the Spurious Unwanted Emissions shown below the frequency measured values are very small and similar trend for each port, so we are attached only the worst case plot.

The report shall not be (partly) reproduced except in full without approval of the laboratory.

Test Results:

Tabular Data of RF Spurious Unwanted Emissions

(4 Port) 5G NR n48 10 MHz 1 Carrier

Test Result for Output Port 0

Modulation	Channel	Measured Level (dBm/MHz)								
		9 kHz ~ 300 kHz	300 kHz ~ 30 MHz	30 MHz ~ 3 530 MHz	3 530 MHz ~ LowEdge - 10 MHz	LowEdge - 10 MHz ~ LowEdge - 1 MHz	HighEdge + 1 MHz ~ HighEdge + 10 MHz	HighEdge + 10 MHz ~ 3 720 MHz	3 720 MHz ~ 18 GHz	18 GHz ~ 40 GHz
QPSK	Low	-56.959	-68.716	-54.215	-47.826	-42.511	-40.901	-49.745	-48.685	-49.237
	Middle	-50.433	-67.384	-53.689	-47.735	-43.054	-43.666	-51.232	-48.383	-48.872
	High	-46.875	-66.980	-53.787	-46.882	-40.764	-41.577	-51.825	-48.817	-49.407
16QAM	Low	-51.662	-68.377	-54.568	-54.740	-40.647	-41.796	-49.736	-48.879	-49.381
	Middle	-53.341	-67.856	-53.308	-48.559	-42.208	-44.382	-51.589	-49.169	-49.098
	High	-46.839	-68.053	-53.579	-47.270	-40.581	-43.029	-51.937	-47.922	-48.901
64QAM	Low	-57.340	-68.299	-54.737	-54.490	-40.969	-41.425	-50.429	-48.996	-48.555
	Middle	-53.944	-66.343	-52.897	-48.353	-41.617	-44.756	-52.594	-48.485	-48.421
	High	-47.178	-67.527	-54.031	-47.150	-40.699	-43.418	-51.457	-47.888	-48.754
256QAM	Low	-50.616	-68.128	-54.235	-55.662	-41.624	-40.650	-49.547	-47.821	-49.343
	Middle	-54.243	-67.990	-54.578	-48.112	-42.158	-41.645	-52.680	-48.581	-48.601
	High	-46.558	-68.231	-53.553	-46.456	-40.718	-41.367	-51.683	-48.458	-48.205
Limit		-46.02	-46.02	-46.02	-31.02	-19.02	-19.02	-31.02	-46.02	-46.02

Test Result for Output Port 1

Modulation	Channel	Measured Level (dBm/MHz)								
		9 kHz ~ 300 kHz	300 kHz ~ 30 MHz	30 MHz ~ 3 530 MHz	3 530 MHz ~ LowEdge - 10 MHz	LowEdge - 10 MHz ~ LowEdge - 1 MHz	HighEdge + 1 MHz ~ HighEdge + 10 MHz	HighEdge + 10 MHz ~ 3 720 MHz	3 720 MHz ~ 18 GHz	18 GHz ~ 40 GHz
QPSK	Low	-52.777	-68.004	-53.645	-55.284	-42.376	-40.852	-50.241	-48.931	-49.627
	Middle	-52.400	-67.698	-55.215	-51.353	-56.096	-56.803	-56.003	-48.511	-49.713
	High	-46.605	-67.184	-53.981	-46.893	-41.545	-39.999	-51.045	-48.577	-49.757
16QAM	Low	-52.028	-67.302	-52.131	-55.055	-42.505	-41.345	-50.299	-48.345	-49.373
	Middle	-52.182	-66.734	-53.722	-51.117	-42.368	-42.918	-54.734	-48.762	-51.025
	High	-47.376	-68.000	-53.227	-47.017	-41.036	-41.896	-50.891	-48.182	-49.367
64QAM	Low	-52.178	-68.058	-53.590	-54.800	-40.550	-40.701	-49.667	-49.063	-49.452
	Middle	-51.888	-68.532	-53.783	-52.116	-42.385	-40.893	-51.285	-48.084	-49.170
	High	-50.213	-67.477	-53.472	-47.310	-40.818	-41.540	-50.754	-49.197	-48.661
256QAM	Low	-52.549	-67.832	-52.907	-55.276	-41.840	-41.053	-49.080	-48.590	-48.870
	Middle	-54.277	-67.926	-53.763	-48.655	-40.899	-41.352	-51.319	-48.733	-49.230
	High	-46.097	-67.819	-52.835	-47.050	-41.322	-39.762	-50.771	-48.471	-49.422
Limit		-46.02	-46.02	-46.02	-31.02	-19.02	-19.02	-31.02	-46.02	-46.02

The report shall not be (partly) reproduced except in full without approval of the laboratory.

Test Result for Output Port 2

Modulation	Channel	Measured Level (dBm/MHz)								
		9 kHz ~ 300 kHz	300 kHz ~ 30 MHz	30 MHz ~ 3 530 MHz	3 530 MHz ~ LowEdge - 10 MHz	LowEdge - 10 MHz ~ LowEdge - 1 MHz	HighEdge + 1 MHz ~ HighEdge + 10 MHz	HighEdge + 10 MHz ~ 3 720 MHz	3 720 MHz ~ 18 GHz	18 GHz ~ 40 GHz
QPSK	Low	-50.898	-68.313	-54.242	-54.265	-41.200	-41.963	-50.262	-48.993	-49.371
	Middle	-55.759	-66.834	-54.501	-48.311	-40.563	-40.573	-50.033	-48.351	-48.168
	High	-46.774	-67.423	-53.532	-47.286	-40.642	-41.066	-51.042	-48.911	-48.478
16QAM	Low	-52.689	-67.913	-54.107	-47.480	-42.231	-41.616	-50.759	-48.835	-49.249
	Middle	-51.390	-67.647	-54.358	-48.552	-42.749	-42.821	-52.248	-49.301	-49.545
	High	-48.723	-68.121	-53.631	-47.271	-41.019	-40.765	-50.709	-48.426	-48.586
64QAM	Low	-50.477	-67.288	-54.151	-53.364	-41.609	-41.530	-48.846	-48.877	-49.241
	Middle	-51.987	-67.955	-53.742	-48.073	-42.016	-44.018	-51.730	-48.778	-48.377
	High	-47.100	-67.421	-54.133	-46.720	-40.981	-40.889	-51.688	-48.419	-49.125
256QAM	Low	-54.998	-68.700	-53.687	-54.287	-39.706	-40.031	-50.179	-47.898	-49.272
	Middle	-51.157	-67.681	-53.535	-48.045	-42.493	-43.833	-51.140	-48.435	-49.155
	High	-49.674	-68.286	-53.675	-47.586	-40.928	-40.857	-51.698	-48.433	-48.680
Limit		-46.02	-46.02	-46.02	-31.02	-19.02	-19.02	-31.02	-46.02	-46.02

Test Result for Output Port 3

Modulation	Channel	Measured Level (dBm/MHz)								
		9 kHz ~ 300 kHz	300 kHz ~ 30 MHz	30 MHz ~ 3 530 MHz	3 530 MHz ~ LowEdge - 10 MHz	LowEdge - 10 MHz ~ LowEdge - 1 MHz	HighEdge + 1 MHz ~ HighEdge + 10 MHz	HighEdge + 10 MHz ~ 3 720 MHz	3 720 MHz ~ 18 GHz	18 GHz ~ 40 GHz
QPSK	Low	-54.743	-66.944	-54.335	-56.019	-42.169	-41.005	-49.137	-49.264	-49.778
	Middle	-51.881	-67.836	-53.966	-48.211	-41.809	-43.088	-50.474	-48.619	-48.558
	High	-51.192	-67.078	-53.452	-48.341	-41.039	-40.852	-52.390	-49.235	-49.666
16QAM	Low	-55.982	-67.701	-54.186	-55.361	-42.304	-41.311	-49.474	-49.607	-49.474
	Middle	-52.023	-67.180	-53.733	-47.628	-40.095	-43.840	-51.270	-49.297	-49.484
	High	-52.177	-67.785	-53.363	-47.600	-41.186	-42.959	-51.787	-49.200	-49.279
64QAM	Low	-54.687	-67.612	-53.695	-55.906	-42.597	-42.039	-50.012	-48.288	-49.165
	Middle	-52.907	-66.884	-53.812	-47.653	-42.152	-42.327	-50.395	-49.095	-48.202
	High	-51.492	-67.649	-53.440	-47.497	-41.395	-43.167	-51.666	-49.711	-49.524
256QAM	Low	-51.500	-68.273	-54.866	-54.617	-40.940	-41.101	-50.521	-48.633	-49.565
	Middle	-51.189	-67.241	-53.620	-47.286	-42.541	-43.156	-49.486	-48.673	-48.448
	High	-48.879	-67.856	-53.650	-47.438	-40.100	-41.390	-51.593	-49.124	-49.836
Limit		-46.02	-46.02	-46.02	-31.02	-19.02	-19.02	-31.02	-46.02	-46.02

The report shall not be (partly) reproduced except in full without approval of the laboratory.

(4 Port) 5G NR n48 20 MHz 1 Carrier

Test Result for Output Port 0

Modulation	Channel	Measured Level (dBm/MHz)								
		9 kHz ~ 300 kHz	300 kHz ~ 30 MHz	30 MHz ~ 3 530 MHz	3 530 MHz ~ LowEdge - 10 MHz	LowEdge - 10 MHz ~ LowEdge - 1 MHz	HighEdge + 1 MHz ~ HighEdge + 10 MHz	HighEdge + 10 MHz ~ 3 720 MHz	3 720 MHz ~ 18 GHz	18 GHz ~ 40 GHz
QPSK	Low	-54.968	-68.265	-54.163	-54.196	-42.876	-43.103	-49.193	-48.114	-49.442
	Middle	-54.109	-68.249	-52.955	-47.791	-43.127	-42.182	-50.990	-48.931	-49.251
	High	-50.650	-66.569	-53.142	-47.648	-41.051	-41.417	-51.299	-48.919	-48.908
16QAM	Low	-54.002	-67.530	-54.112	-53.205	-41.212	-41.160	-50.255	-48.292	-48.693
	Middle	-55.030	-68.512	-52.926	-47.050	-42.787	-41.761	-50.019	-47.799	-48.895
	High	-56.459	-67.889	-54.011	-48.960	-42.620	-43.105	-54.099	-47.659	-49.200
64QAM	Low	-55.414	-67.928	-54.620	-53.681	-42.283	-42.719	-48.582	-47.756	-49.498
	Middle	-54.675	-67.805	-53.358	-47.116	-43.313	-42.520	-50.332	-48.410	-49.298
	High	-48.669	-67.512	-53.678	-47.196	-41.438	-41.267	-51.648	-48.678	-48.881
256QAM	Low	-54.609	-67.181	-52.901	-53.713	-42.871	-41.711	-48.710	-48.807	-49.703
	Middle	-54.880	-67.724	-53.451	-46.623	-43.054	-42.682	-49.418	-48.293	-49.062
	High	-47.292	-66.607	-52.374	-46.825	-42.369	-42.614	-50.344	-48.492	-46.739
Limit		-46.02	-46.02	-46.02	-31.02	-19.02	-19.02	-31.02	-46.02	-46.02

Test Result for Output Port 1

Modulation	Channel	Measured Level (dBm/MHz)								
		9 kHz ~ 300 kHz	300 kHz ~ 30 MHz	30 MHz ~ 3 530 MHz	3 530 MHz ~ LowEdge - 10 MHz	LowEdge - 10 MHz ~ LowEdge - 1 MHz	HighEdge + 1 MHz ~ HighEdge + 10 MHz	HighEdge + 10 MHz ~ 3 720 MHz	3 720 MHz ~ 18 GHz	18 GHz ~ 40 GHz
QPSK	Low	-56.730	-68.248	-53.331	-53.619	-42.537	-41.047	-50.916	-48.860	-49.042
	Middle	-52.738	-68.165	-52.578	-47.600	-41.763	-43.571	-50.803	-48.988	-48.610
	High	-48.698	-65.729	-53.284	-47.701	-41.542	-38.996	-51.701	-48.437	-48.471
16QAM	Low	-54.680	-68.423	-53.334	-53.957	-43.784	-39.417	-49.863	-48.275	-49.607
	Middle	-55.845	-67.285	-53.931	-47.432	-42.849	-41.809	-49.735	-49.009	-49.112
	High	-52.353	-68.483	-53.464	-46.768	-42.068	-42.186	-51.461	-47.728	-49.429
64QAM	Low	-55.178	-66.971	-54.000	-53.789	-42.527	-41.082	-50.141	-48.009	-49.196
	Middle	-53.881	-68.637	-54.132	-47.746	-42.717	-43.801	-50.752	-48.824	-48.926
	High	-47.897	-68.286	-54.077	-47.632	-41.653	-42.995	-51.580	-48.796	-49.124
256QAM	Low	-53.364	-68.269	-53.580	-54.189	-42.764	-39.582	-49.666	-48.526	-48.395
	Middle	-54.663	-67.662	-54.677	-46.664	-43.411	-42.076	-50.448	-48.270	-48.958
	High	-48.718	-66.925	-53.647	-47.029	-41.634	-40.458	-51.783	-48.396	-48.613
Limit		-46.02	-46.02	-46.02	-31.02	-19.02	-19.02	-31.02	-46.02	-46.02

The report shall not be (partly) reproduced except in full without approval of the laboratory.

Test Result for Output Port 2

Modulation	Channel	Measured Level (dBm/MHz)								
		9 kHz ~ 300 kHz	300 kHz ~ 30 MHz	30 MHz ~ 3 530 MHz	3 530 MHz ~ LowEdge - 10 MHz	LowEdge - 10 MHz ~ LowEdge - 1 MHz	HighEdge + 1 MHz ~ HighEdge + 10 MHz	HighEdge + 10 MHz ~ 3 720 MHz	3 720 MHz ~ 18 GHz	18 GHz ~ 40 GHz
QPSK	Low	-54.131	-68.174	-54.136	-54.763	-43.074	-40.663	-49.771	-48.898	-49.483
	Middle	-55.193	-67.763	-54.889	-47.869	-43.070	-44.158	-49.779	-48.145	-49.092
	High	-48.681	-68.422	-53.206	-47.171	-43.116	-41.559	-50.560	-48.681	-48.182
16QAM	Low	-54.584	-67.291	-54.271	-54.173	-41.927	-39.857	-49.969	-49.027	-48.829
	Middle	-48.562	-67.400	-54.205	-47.785	-41.692	-42.436	-50.730	-48.697	-49.009
	High	-50.738	-67.861	-53.945	-50.283	-43.131	-41.616	-56.993	-48.831	-50.538
64QAM	Low	-54.225	-67.375	-54.474	-55.380	-42.698	-41.513	-50.154	-47.805	-49.670
	Middle	-54.581	-67.029	-53.185	-48.124	-42.966	-42.265	-50.148	-47.591	-48.561
	High	-53.583	-67.314	-54.311	-48.891	-42.716	-40.683	-57.330	-48.451	-51.888
256QAM	Low	-54.172	-67.237	-53.735	-54.493	-43.584	-41.236	-50.175	-49.244	-49.545
	Middle	-57.374	-67.901	-54.265	-47.922	-42.799	-44.787	-50.523	-48.366	-49.144
	High	-49.143	-68.032	-53.308	-47.010	-41.973	-42.778	-50.890	-48.199	-49.252
Limit		-46.02	-46.02	-46.02	-31.02	-19.02	-19.02	-31.02	-46.02	-46.02

Test Result for Output Port 3

Modulation	Channel	Measured Level (dBm/MHz)								
		9 kHz ~ 300 kHz	300 kHz ~ 30 MHz	30 MHz ~ 3 530 MHz	3 530 MHz ~ LowEdge - 10 MHz	LowEdge - 10 MHz ~ LowEdge - 1 MHz	HighEdge + 1 MHz ~ HighEdge + 10 MHz	HighEdge + 10 MHz ~ 3 720 MHz	3 720 MHz ~ 18 GHz	18 GHz ~ 40 GHz
QPSK	Low	-55.567	-66.931	-54.492	-54.679	-43.853	-41.312	-49.164	-49.288	-49.634
	Middle	-49.326	-67.639	-54.038	-47.862	-42.831	-43.844	-51.196	-48.619	-49.259
	High	-53.282	-68.428	-54.168	-48.470	-42.584	-41.175	-52.274	-48.468	-48.480
16QAM	Low	-55.131	-68.193	-53.525	-55.646	-43.427	-40.179	-50.651	-48.890	-49.277
	Middle	-52.737	-67.774	-53.211	-47.456	-43.460	-42.476	-50.461	-49.613	-49.109
	High	-48.972	-67.128	-53.745	-48.490	-43.137	-42.138	-54.592	-49.271	-49.021
64QAM	Low	-55.896	-67.556	-53.496	-54.915	-44.245	-42.471	-49.354	-48.929	-48.641
	Middle	-51.387	-68.108	-54.587	-47.583	-43.471	-44.046	-50.209	-49.555	-48.719
	High	-48.616	-68.330	-53.843	-48.333	-42.164	-43.620	-52.175	-48.913	-48.492
256QAM	Low	-55.103	-68.387	-53.168	-54.988	-44.416	-40.758	-51.088	-48.429	-49.523
	Middle	-48.345	-66.570	-54.191	-47.500	-41.675	-44.286	-51.504	-48.718	-49.470
	High	-48.938	-68.022	-53.949	-48.445	-42.645	-42.068	-53.134	-49.609	-49.336
Limit		-46.02	-46.02	-46.02	-31.02	-19.02	-19.02	-31.02	-46.02	-46.02

The report shall not be (partly) reproduced except in full without approval of the laboratory.

(4 Port) 5G NR n48 40 MHz 1 Carrier

Test Result for Output Port 0

Modulation	Channel	Measured Level (dBm/MHz)								
		9 kHz ~ 300 kHz	300 kHz ~ 30 MHz	30 MHz ~ 3 530 MHz	3 530 MHz ~ LowEdge - 10 MHz	LowEdge - 10 MHz ~ LowEdge - 1 MHz	HighEdge + 1 MHz ~ HighEdge + 10 MHz	HighEdge + 10 MHz ~ 3 720 MHz	3 720 MHz ~ 18 GHz	18 GHz ~ 40 GHz
QPSK	Low	-52.907	-67.784	-54.102	-54.788	-42.617	-40.652	-54.525	-48.258	-50.460
	Middle	-52.679	-67.292	-53.436	-51.033	-48.138	-50.173	-50.091	-48.033	-48.755
	High	-51.964	-67.132	-53.788	-47.462	-42.374	-42.895	-50.653	-48.173	-48.304
16QAM	Low	-52.211	-67.427	-53.989	-51.855	-41.218	-39.649	-50.132	-47.299	-51.306
	Middle	-54.452	-67.667	-53.930	-51.661	-48.460	-52.481	-49.514	-47.920	-49.034
	High	-51.177	-67.882	-53.729	-46.923	-41.419	-42.347	-50.657	-49.129	-49.785
64QAM	Low	-53.150	-67.272	-54.937	-55.005	-43.180	-41.140	-51.909	-48.139	-51.404
	Middle	-54.971	-67.812	-53.291	-48.808	-40.670	-41.686	-49.014	-48.519	-49.084
	High	-52.051	-66.628	-53.841	-47.901	-42.685	-42.511	-49.460	-49.144	-49.092
256QAM	Low	-54.877	-67.924	-54.573	-54.068	-41.285	-39.759	-53.149	-48.666	-48.543
	Middle	-55.393	-67.499	-53.590	-49.154	-42.412	-42.985	-49.702	-48.971	-49.591
	High	-51.830	-67.195	-53.789	-47.619	-42.832	-42.999	-50.435	-48.307	-49.447
Limit		-46.02	-46.02	-46.02	-31.02	-19.02	-19.02	-31.02	-46.02	-46.02

Test Result for Output Port 1

Modulation	Channel	Measured Level (dBm/MHz)								
		9 kHz ~ 300 kHz	300 kHz ~ 30 MHz	30 MHz ~ 3 530 MHz	3 530 MHz ~ LowEdge - 10 MHz	LowEdge - 10 MHz ~ LowEdge - 1 MHz	HighEdge + 1 MHz ~ HighEdge + 10 MHz	HighEdge + 10 MHz ~ 3 720 MHz	3 720 MHz ~ 18 GHz	18 GHz ~ 40 GHz
QPSK	Low	-56.599	-66.427	-53.798	-51.171	-41.892	-40.275	-49.237	-47.435	-49.349
	Middle	-53.701	-67.208	-54.350	-49.610	-41.720	-42.382	-49.312	-48.916	-48.756
	High	-55.332	-67.141	-53.079	-46.047	-41.318	-41.331	-48.624	-48.896	-48.600
16QAM	Low	-55.702	-67.353	-54.264	-50.887	-41.054	-39.982	-48.772	-47.973	-48.525
	Middle	-52.850	-67.477	-54.285	-48.551	-41.245	-42.102	-50.319	-47.446	-48.568
	High	-51.463	-67.652	-52.196	-47.268	-40.328	-42.129	-50.085	-48.444	-49.840
64QAM	Low	-55.132	-66.544	-53.696	-50.868	-39.401	-40.764	-48.981	-49.373	-48.909
	Middle	-53.574	-67.496	-52.861	-48.500	-42.270	-42.419	-48.439	-48.409	-48.884
	High	-50.099	-67.400	-53.229	-47.508	-41.453	-40.407	-50.196	-48.451	-49.595
256QAM	Low	-54.659	-66.926	-53.308	-51.199	-41.463	-40.780	-50.075	-48.794	-48.849
	Middle	-53.766	-66.738	-54.369	-49.013	-41.765	-42.727	-49.560	-47.110	-49.204
	High	-55.552	-66.723	-53.416	-47.114	-41.309	-41.351	-49.582	-48.797	-48.512
Limit		-46.02	-46.02	-46.02	-31.02	-19.02	-19.02	-31.02	-46.02	-46.02

The report shall not be (partly) reproduced except in full without approval of the laboratory.

Test Result for Output Port 2

Modulation	Channel	Measured Level (dBm/MHz)								
		9 kHz ~ 300 kHz	300 kHz ~ 30 MHz	30 MHz ~ 3 530 MHz	3 530 MHz ~ LowEdge - 10 MHz	LowEdge - 10 MHz ~ LowEdge - 1 MHz	HighEdge + 1 MHz ~ HighEdge + 10 MHz	HighEdge + 10 MHz ~ 3 720 MHz	3 720 MHz ~ 18 GHz	18 GHz ~ 40 GHz
QPSK	Low	-51.862	-66.236	-53.810	-49.772	-40.658	-39.905	-49.194	-48.621	-48.347
	Middle	-54.835	-67.085	-52.693	-49.276	-42.748	-43.022	-50.068	-47.755	-48.198
	High	-51.146	-67.195	-52.682	-47.286	-41.521	-41.903	-49.717	-47.985	-48.753
16QAM	Low	-54.885	-66.773	-53.141	-50.021	-41.010	-40.583	-48.419	-47.191	-49.136
	Middle	-57.287	-67.717	-53.570	-49.372	-42.545	-42.284	-49.782	-49.054	-49.459
	High	-51.516	-67.582	-53.280	-46.096	-41.582	-40.951	-49.114	-49.315	-49.273
64QAM	Low	-55.427	-67.166	-54.076	-51.046	-41.908	-39.905	-48.639	-48.568	-48.693
	Middle	-55.030	-67.336	-53.996	-49.721	-42.943	-43.444	-50.235	-48.848	-49.358
	High	-51.481	-67.235	-53.443	-46.933	-41.428	-40.924	-49.393	-48.710	-50.049
256QAM	Low	-54.229	-66.653	-53.655	-50.748	-40.656	-40.058	-47.585	-49.170	-49.260
	Middle	-56.975	-67.803	-53.461	-49.136	-42.293	-42.772	-50.404	-48.617	-49.568
	High	-50.530	-66.825	-52.349	-47.387	-41.892	-41.142	-49.219	-48.852	-49.757
Limit		-46.02	-46.02	-46.02	-31.02	-19.02	-19.02	-31.02	-46.02	-46.02

Test Result for Output Port 3

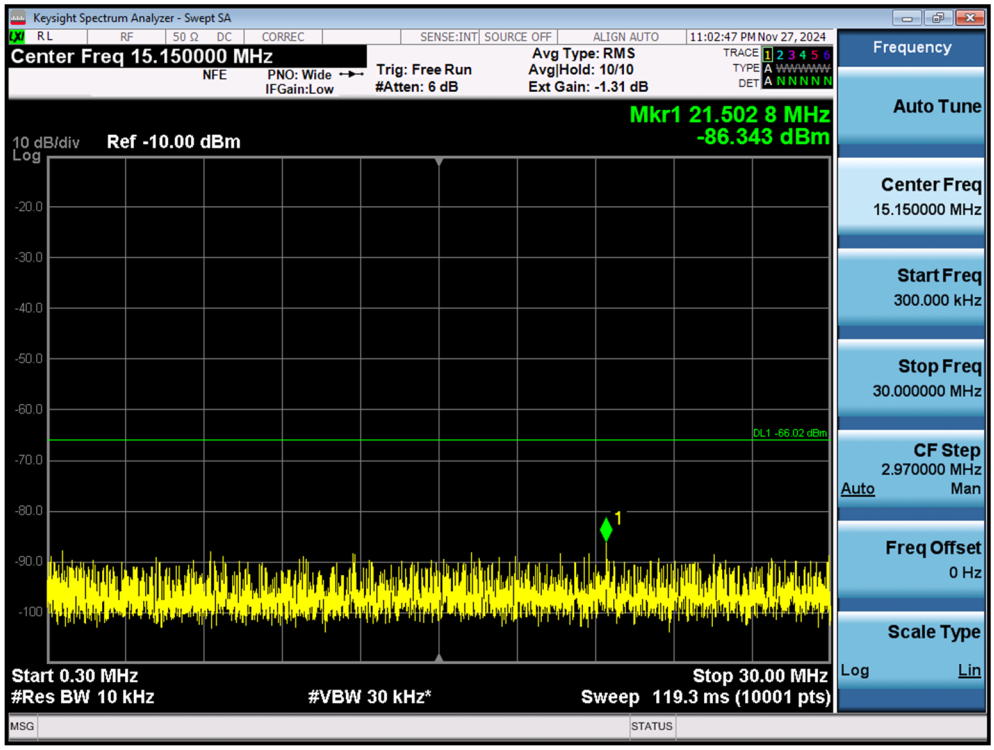
Modulation	Channel	Measured Level (dBm/MHz)								
		9 kHz ~ 300 kHz	300 kHz ~ 30 MHz	30 MHz ~ 3 530 MHz	3 530 MHz ~ LowEdge - 10 MHz	LowEdge - 10 MHz ~ LowEdge - 1 MHz	HighEdge + 1 MHz ~ HighEdge + 10 MHz	HighEdge + 10 MHz ~ 3 720 MHz	3 720 MHz ~ 18 GHz	18 GHz ~ 40 GHz
QPSK	Low	-55.658	-67.840	-53.759	-52.862	-41.899	-41.726	-47.818	-49.067	-49.875
	Middle	-54.783	-68.156	-53.985	-49.550	-43.516	-42.714	-49.830	-49.216	-50.081
	High	-49.232	-67.653	-53.187	-47.338	-42.687	-42.143	-49.892	-49.114	-48.606
16QAM	Low	-55.003	-68.140	-54.408	-53.103	-42.892	-41.162	-48.438	-48.371	-49.490
	Middle	-56.225	-67.037	-54.341	-49.616	-41.481	-42.602	-49.049	-49.473	-49.114
	High	-49.616	-67.564	-53.809	-47.444	-42.895	-43.530	-49.931	-49.913	-49.606
64QAM	Low	-54.199	-66.407	-52.470	-53.409	-41.347	-40.430	-48.664	-48.833	-49.584
	Middle	-59.195	-67.613	-53.274	-49.103	-43.354	-43.126	-50.596	-49.228	-49.740
	High	-49.349	-66.141	-53.373	-47.145	-42.721	-42.630	-49.468	-48.707	-49.026
256QAM	Low	-55.537	-67.560	-52.710	-52.362	-42.206	-39.385	-50.409	-49.344	-49.592
	Middle	-53.451	-67.399	-52.430	-49.224	-42.150	-43.133	-49.303	-48.733	-48.997
	High	-53.075	-66.550	-52.848	-47.563	-42.769	-42.657	-50.394	-48.592	-48.908
Limit		-46.02	-46.02	-46.02	-31.02	-19.02	-19.02	-31.02	-46.02	-46.02

The report shall not be (partly) reproduced except in full without approval of the laboratory.

Plot Data of Spurious Unwanted Emissions

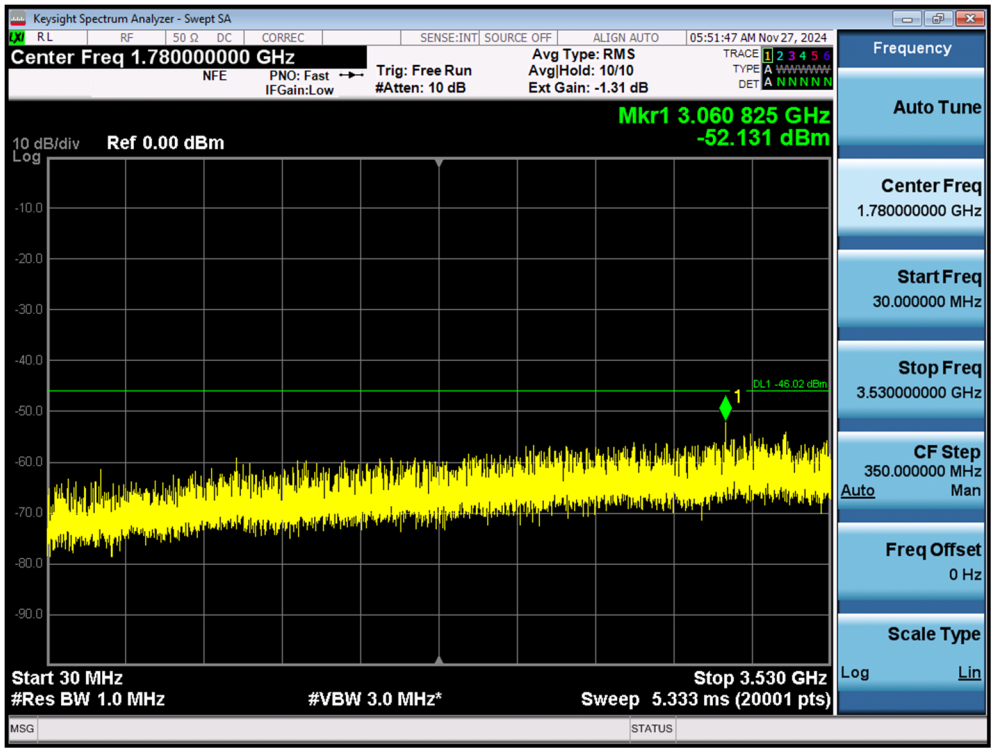
Antenna 1 / (4 Port) 5G NR n48 10 MHz 1 Carrier / 9 kHz ~ 300 kHz / 256QAM / High

Antenna 0 / (4 Port) 5G NR n48 10 MHz 1 Carrier / 300 kHz ~ 30 MHz / 64QAM / Middle

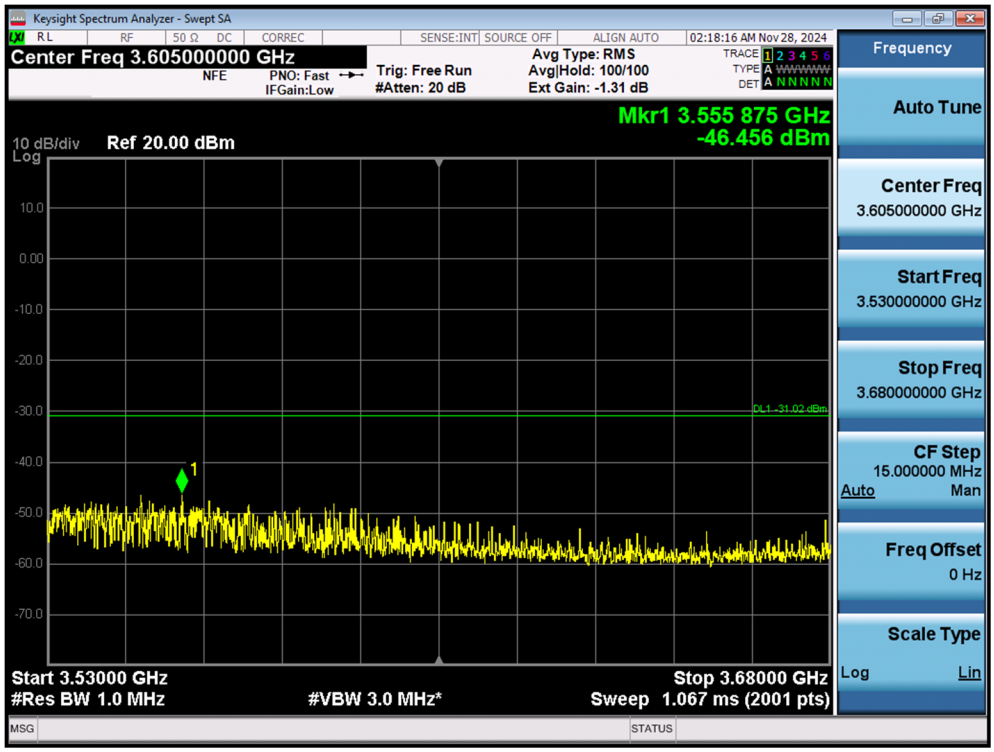


The report shall not be (partly) reproduced except in full without approval of the laboratory.

Antenna 1 / (4 Port) 5G NR n48 10 MHz 1 Carrier / 30 MHz ~ 3 530 MHz / 16QAM / Low

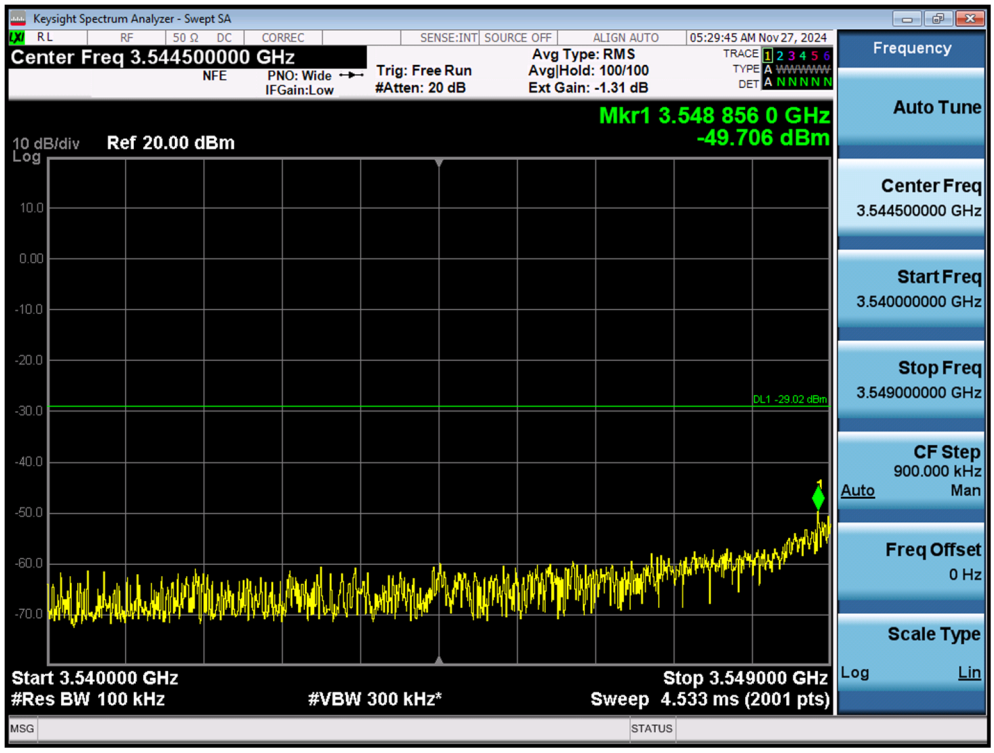


Antenna 0 / (4 Port) 5G NR n48 10 MHz 1 Carrier / 3 530 MHz ~ LowEdge - 10 MHz / 256QAM / High

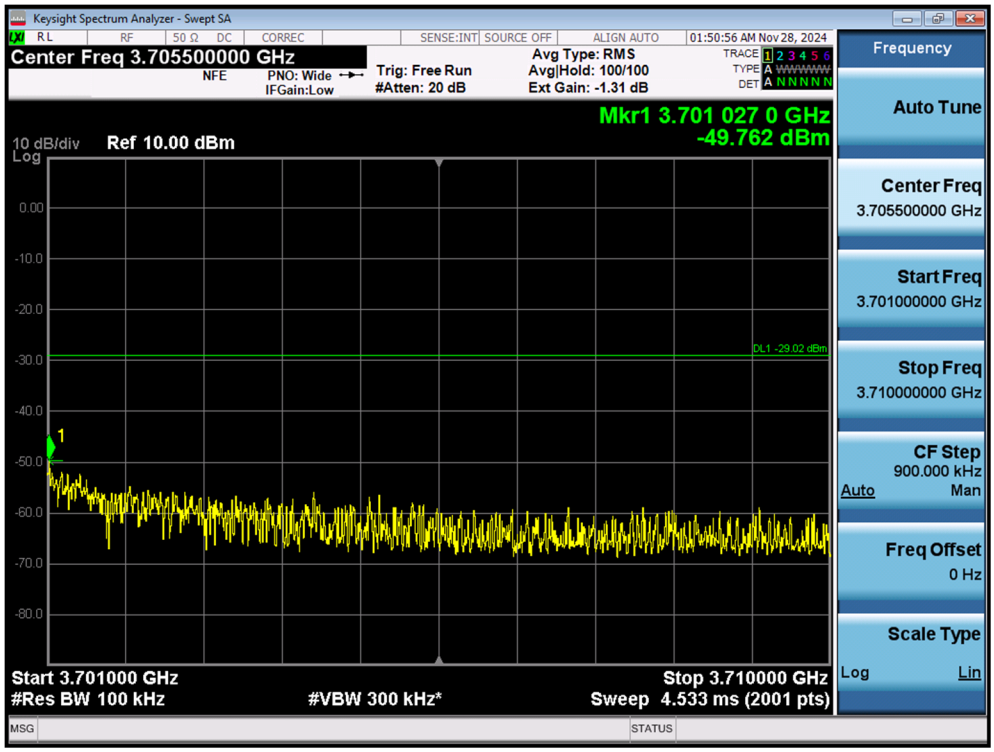


The report shall not be (partly) reproduced except in full without approval of the laboratory.

Antenna 2 / (4 Port) 5G NR n48 10 MHz 1 Carrier / LowEdge - 10 MHz ~ LowEdge - 1 MHz / 256QAM / Low

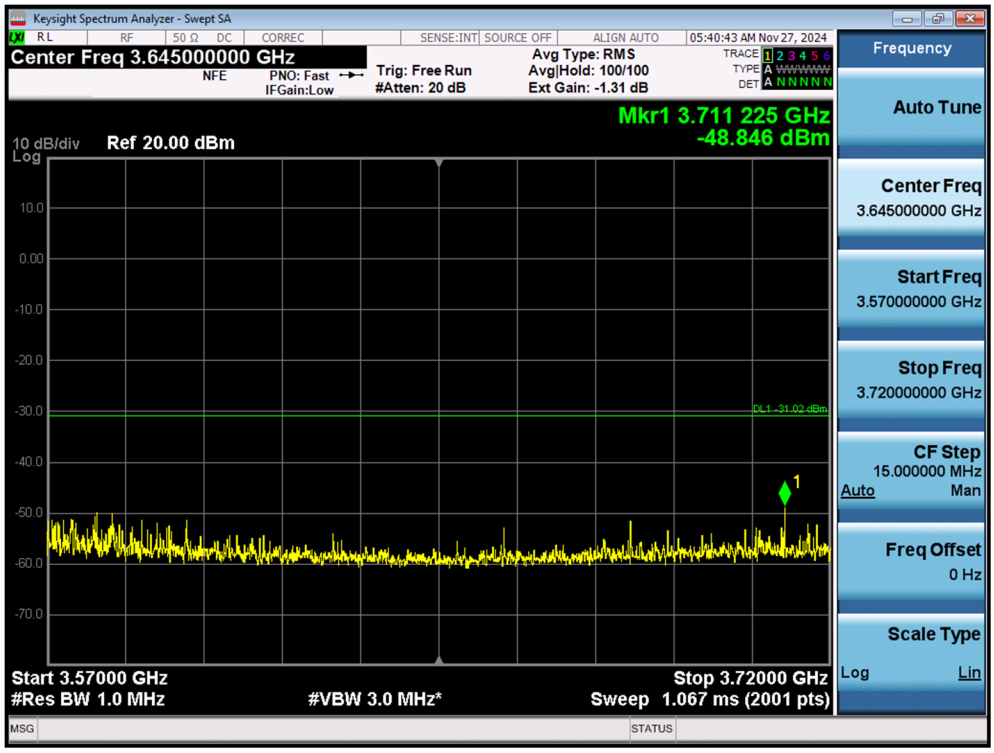


Antenna 1 / (4 Port) 5G NR n48 10 MHz 1 Carrier / HighEdge + 1 MHz ~ HighEdge + 10 MHz / 256QAM / High

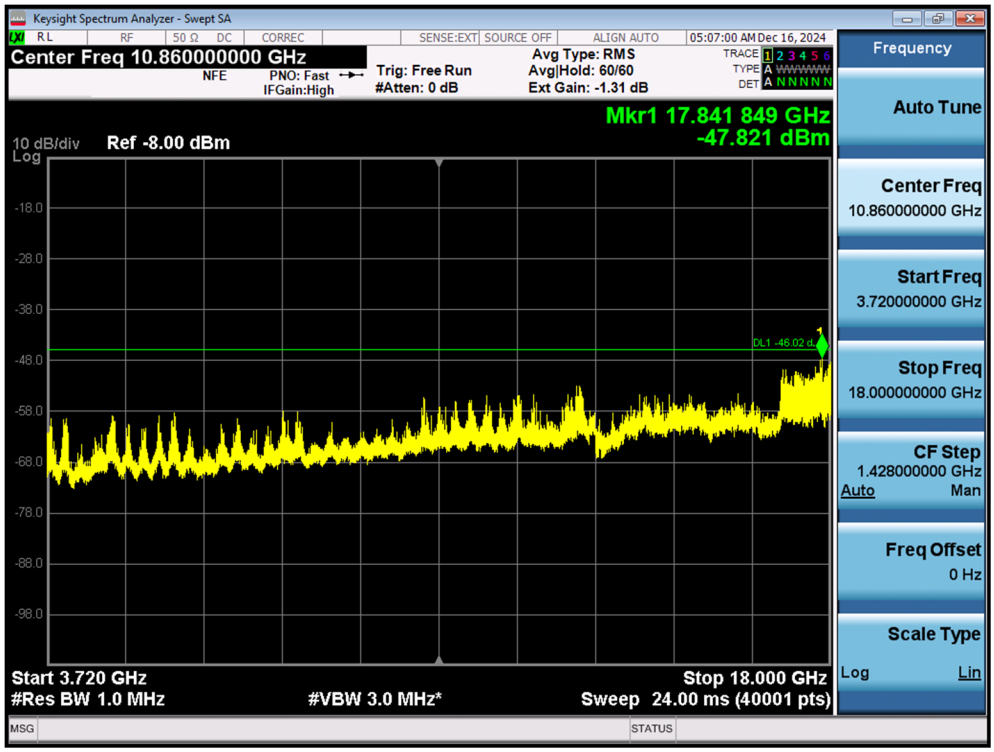


The report shall not be (partly) reproduced except in full without approval of the laboratory.

Antenna 2 / (4 Port) 5G NR n48 10 MHz 1 Carrier / HighEdge + 10 MHz ~ 3 720 MHz / 64QAM / Low



Antenna 0 / (4 Port) 5G NR n48 10 MHz 1 Carrier / 3 720 MHz ~ 18 GHz / 256QAM / Low



The report shall not be (partly) reproduced except in full without approval of the laboratory.

Antenna 2 / (4 Port) 5G NR n48 10 MHz 1 Carrier / 18 GHz ~ 40 GHz / QPSK / Middle

The report shall not be (partly) reproduced except in full without approval of the laboratory.