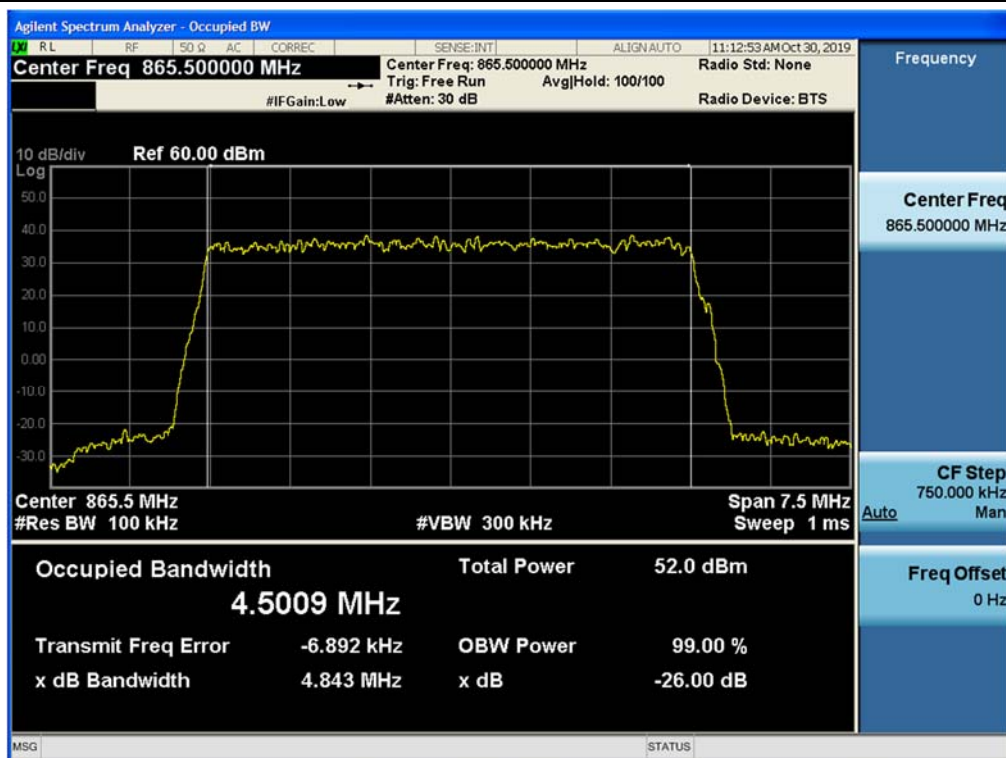
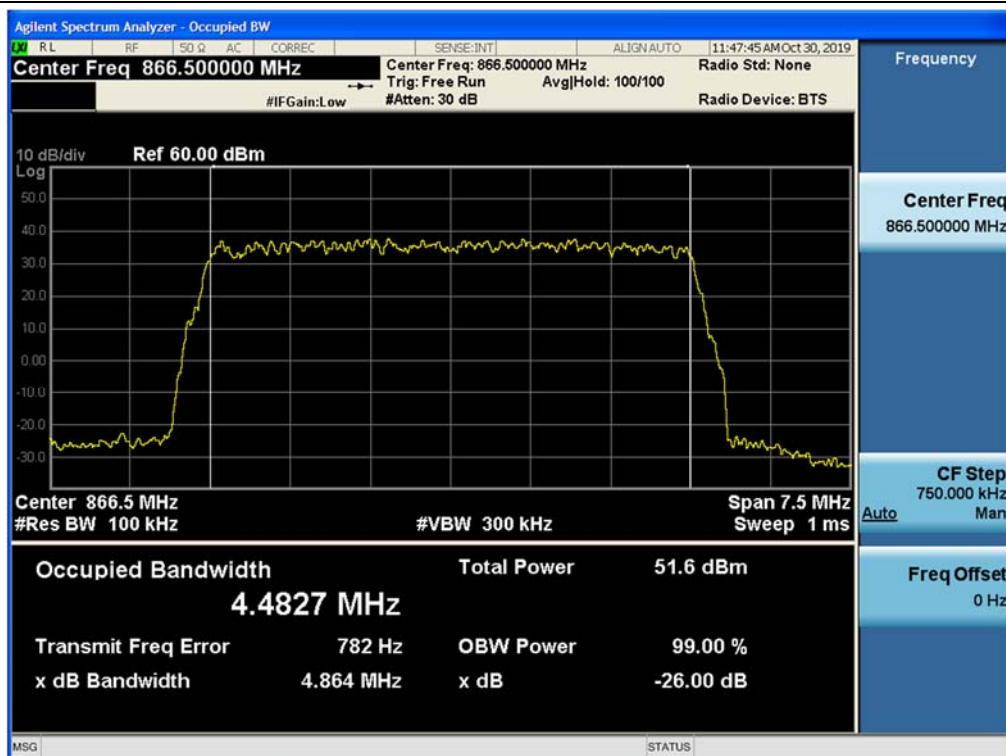


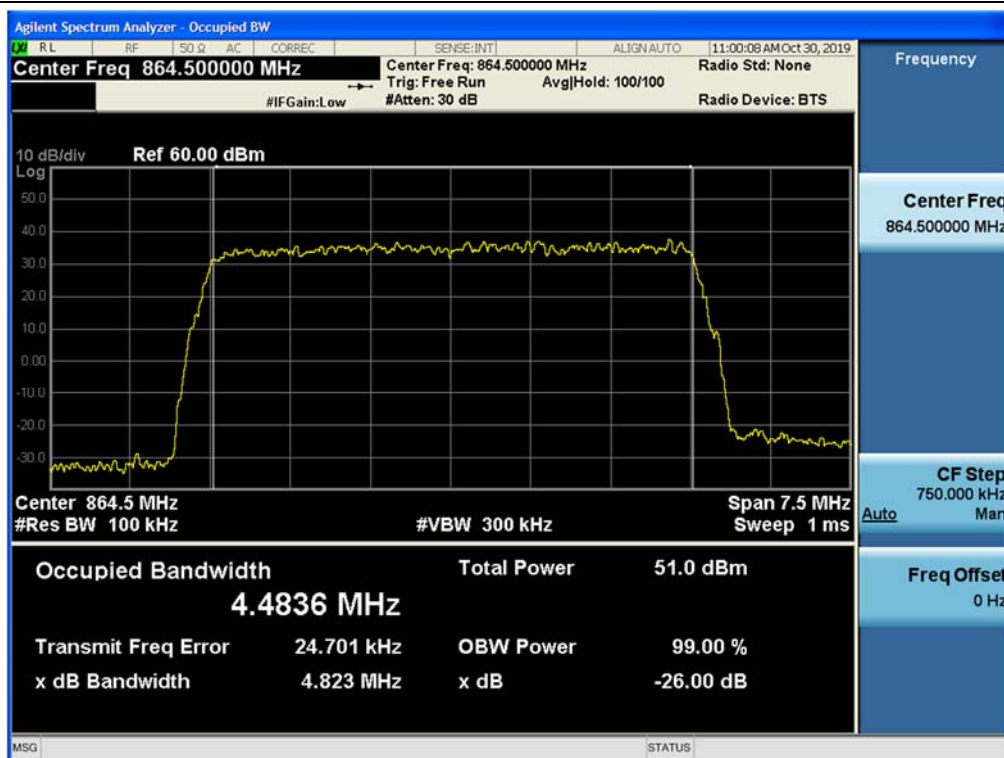
Antenna 1 / LTE 5 MHz 1 Carrier / 16QAM / Middle



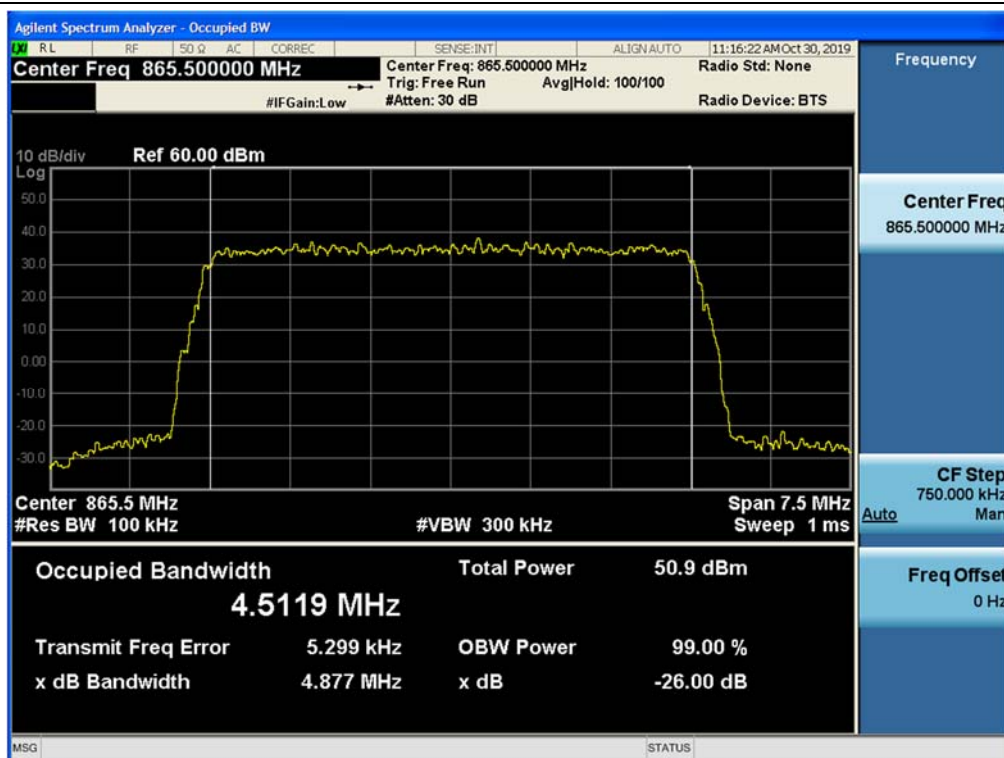
Antenna 1 / LTE 5 MHz 1 Carrier / 16QAM / High



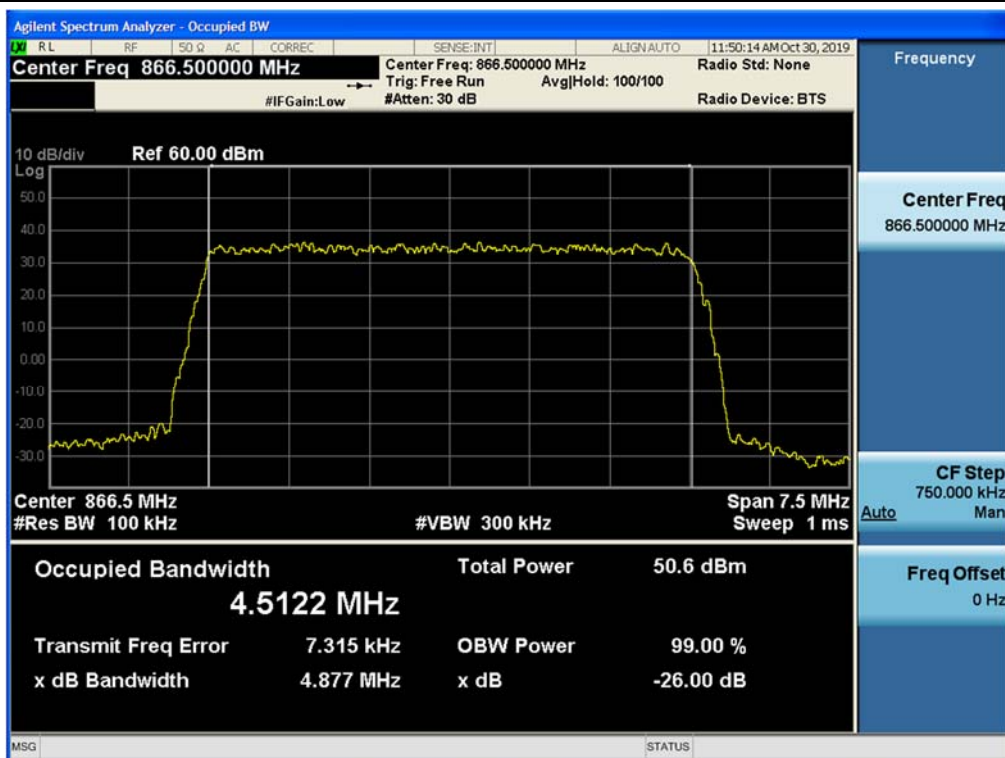
Antenna 1 / LTE 5 MHz 1 Carrier / 64QAM / Low



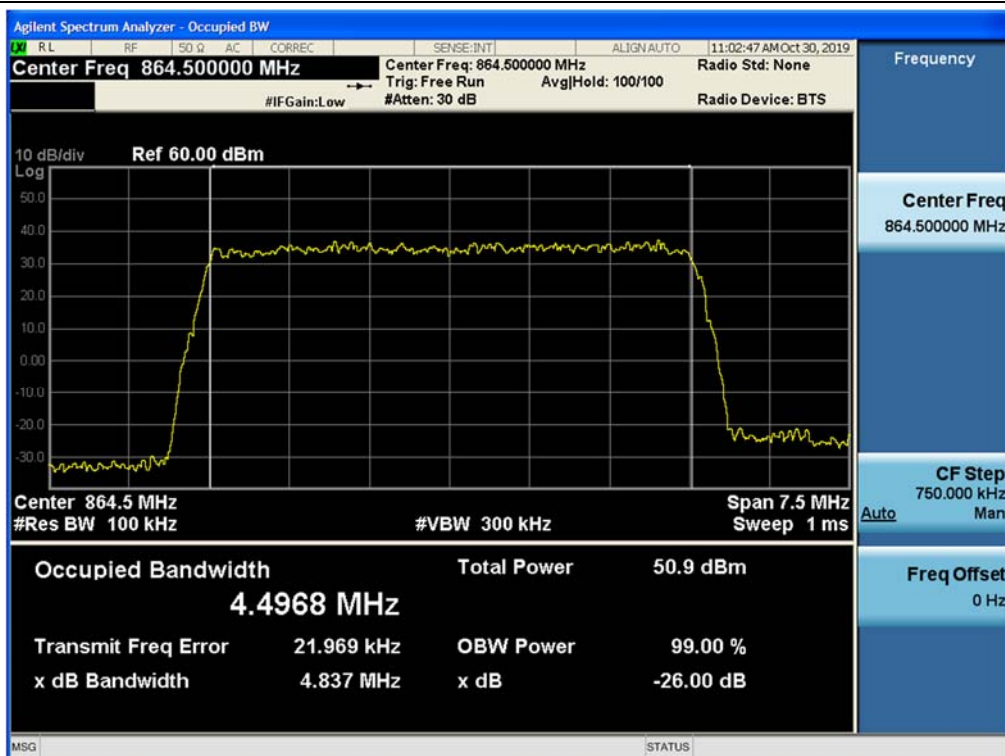
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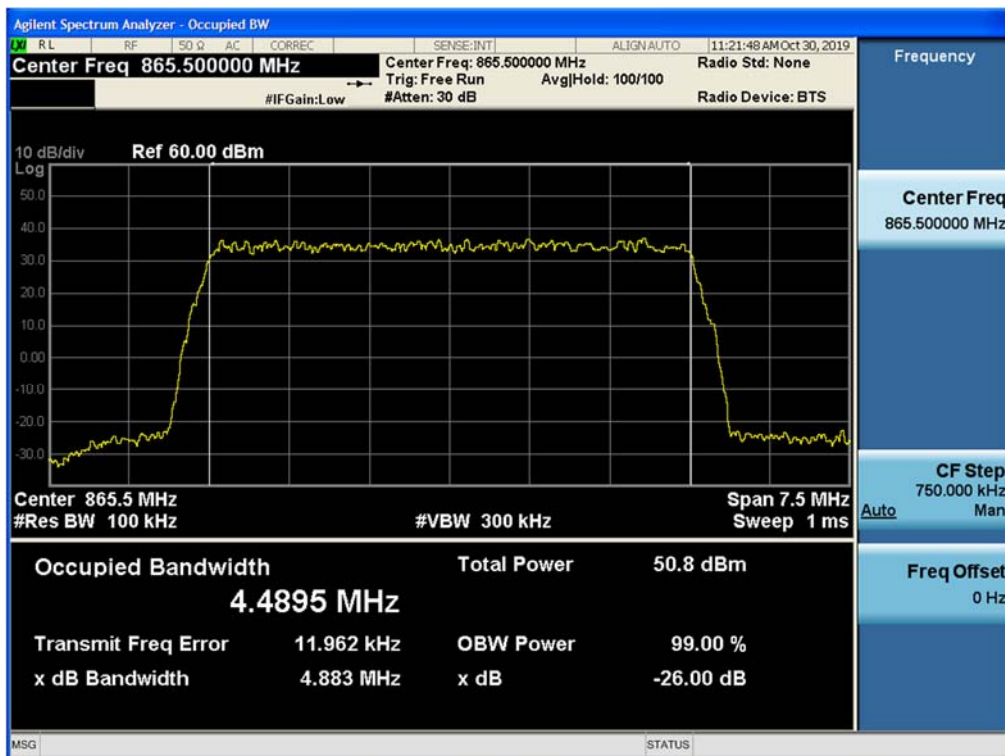
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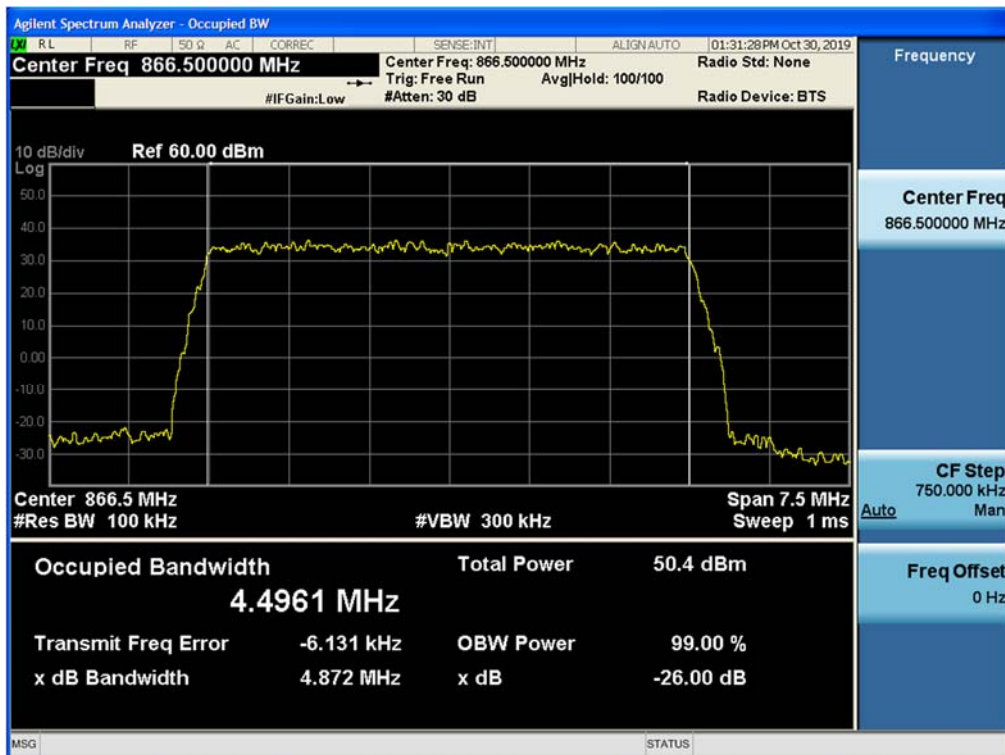
Antenna 1 / LTE 5 MHz 1 Carrier / 256QAM / Low



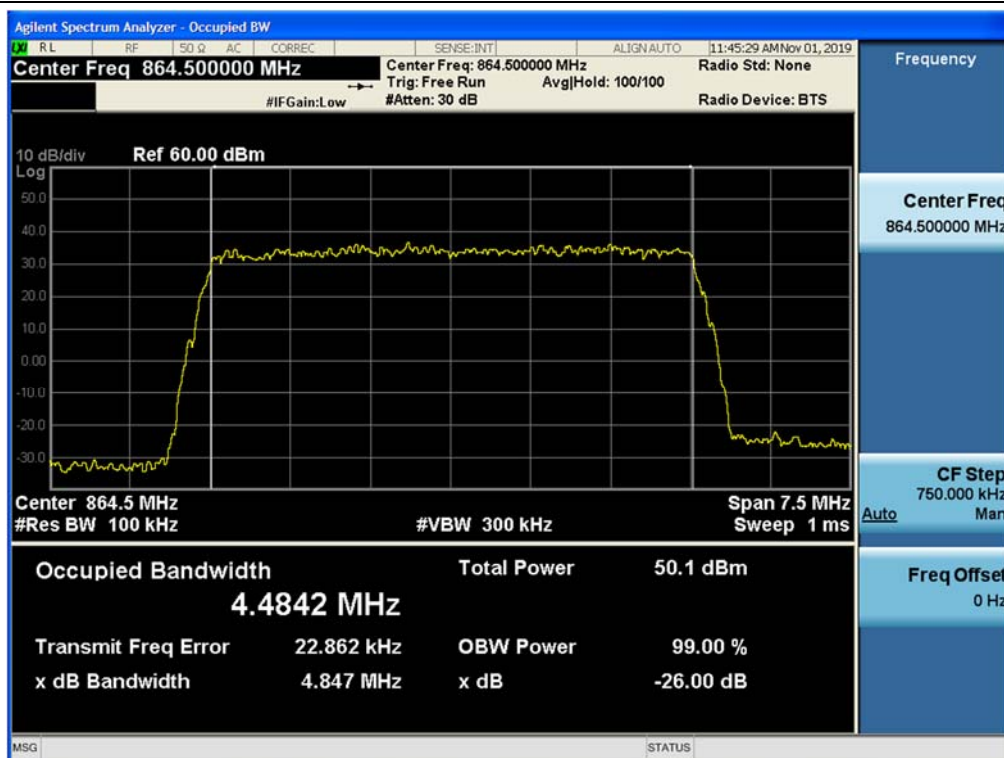
Antenna 1 / LTE 5 MHz 1 Carrier / 256QAM / Middle



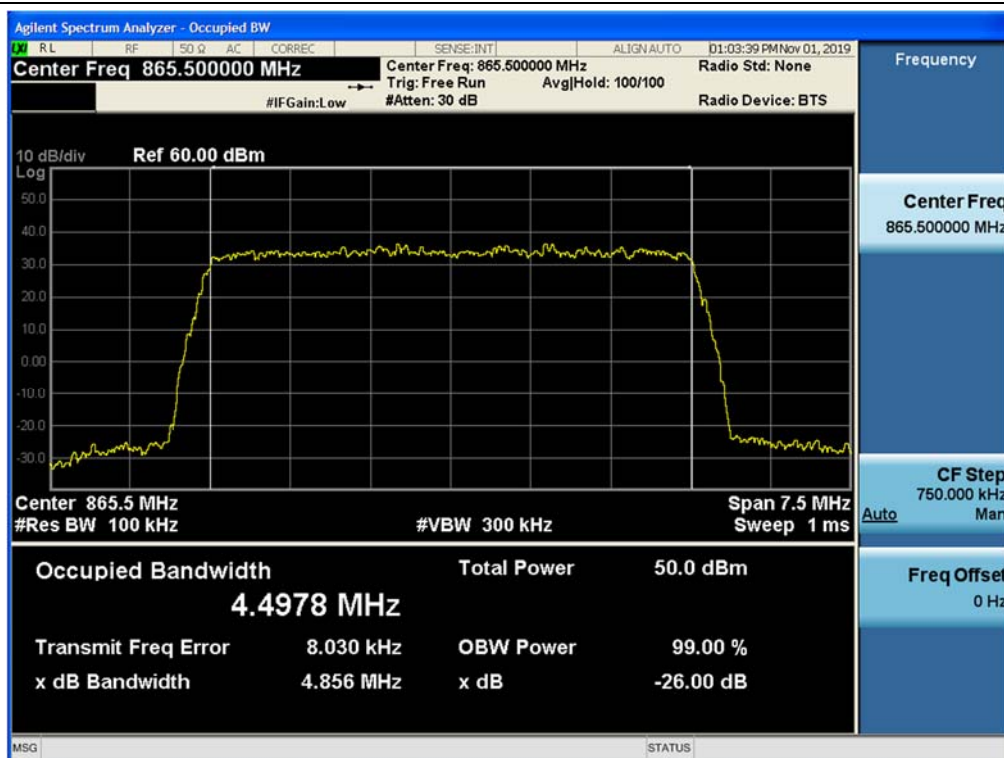
Antenna 1 / LTE 5 MHz 1 Carrier / 256QAM / High



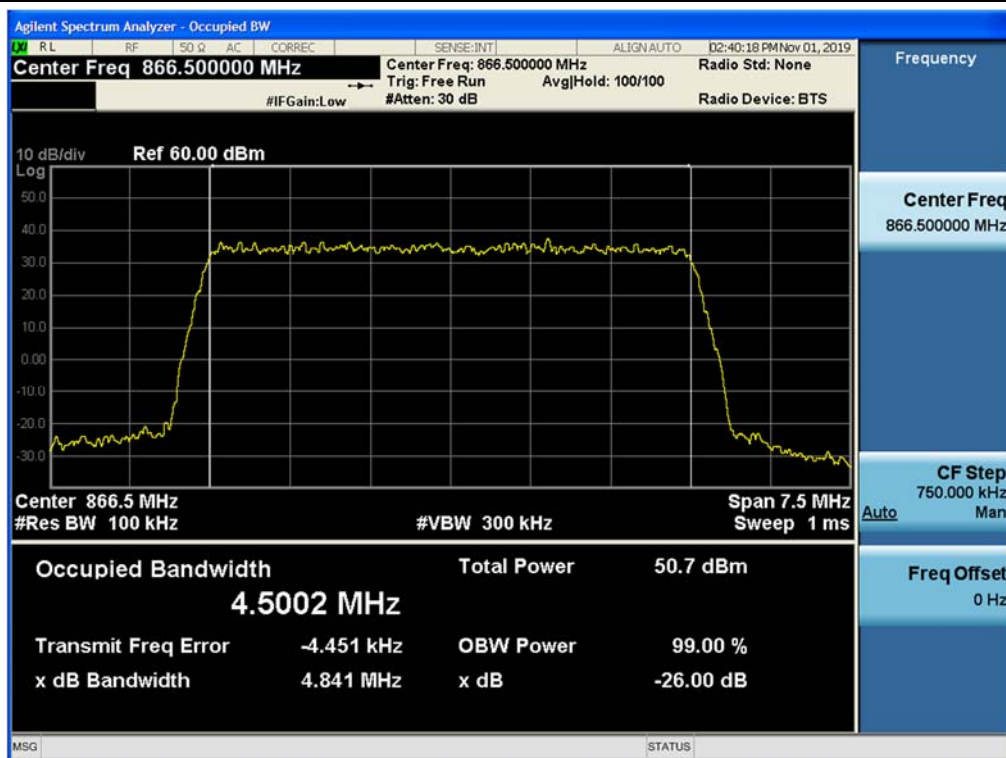
Antenna 2 / LTE 5 MHz 1 Carrier / QPSK / Low



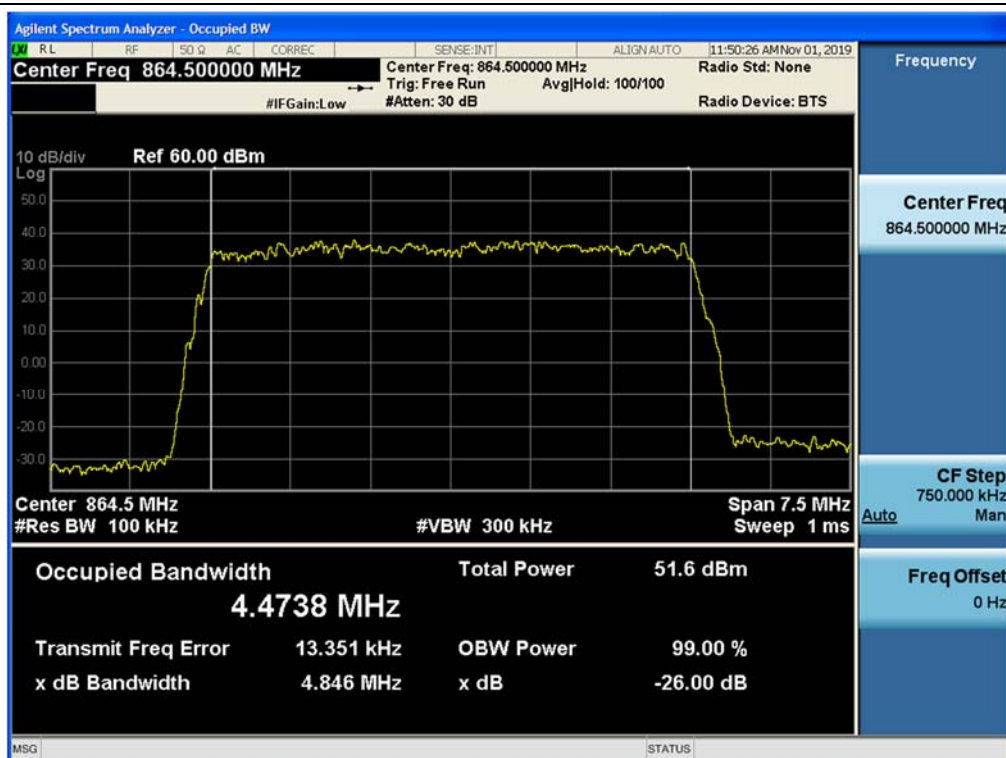
Antenna 2 / LTE 5 MHz 1 Carrier / QPSK / Middle



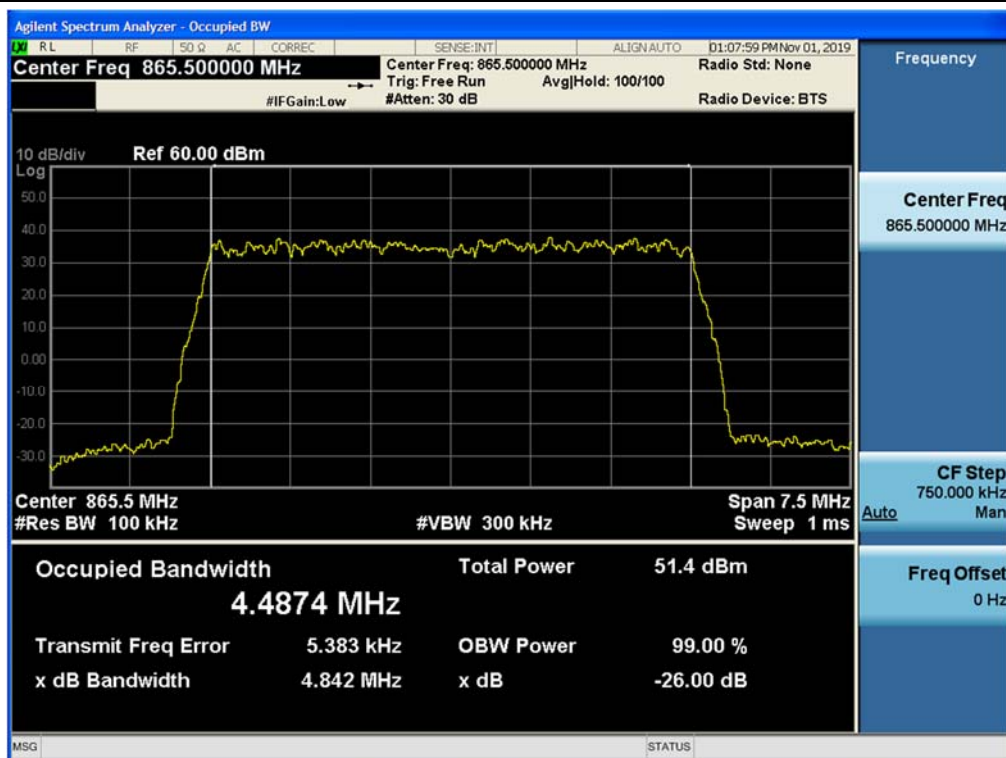
Antenna 2 / LTE 5 MHz 1 Carrier / QPSK / High



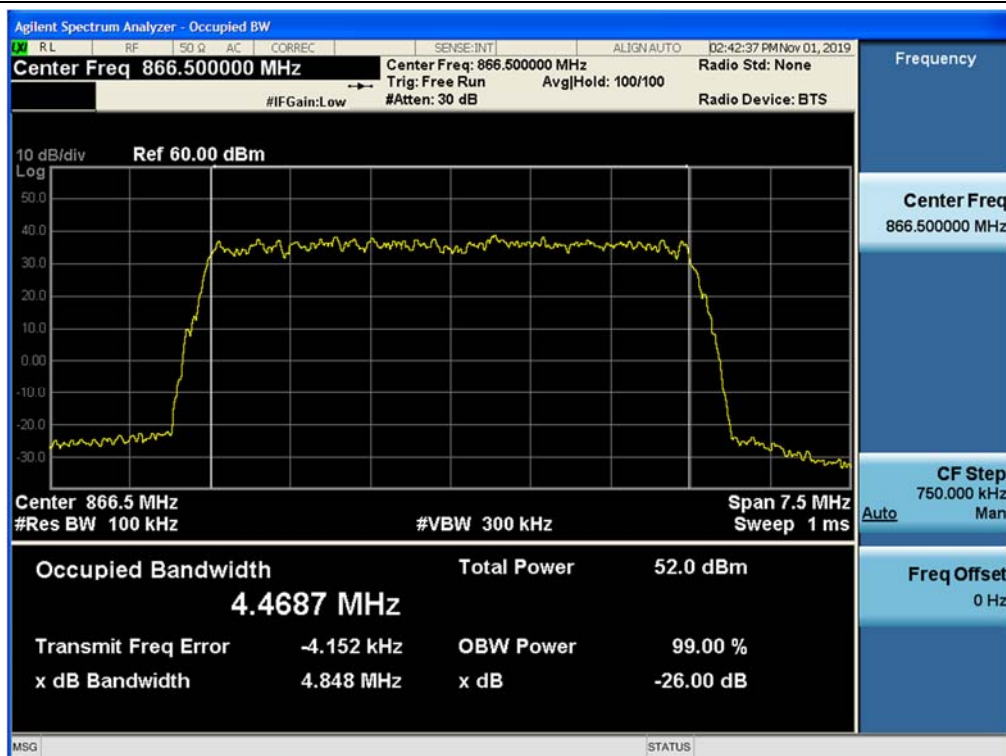
Antenna 2 / LTE 5 MHz 1 Carrier / 16QAM / Low



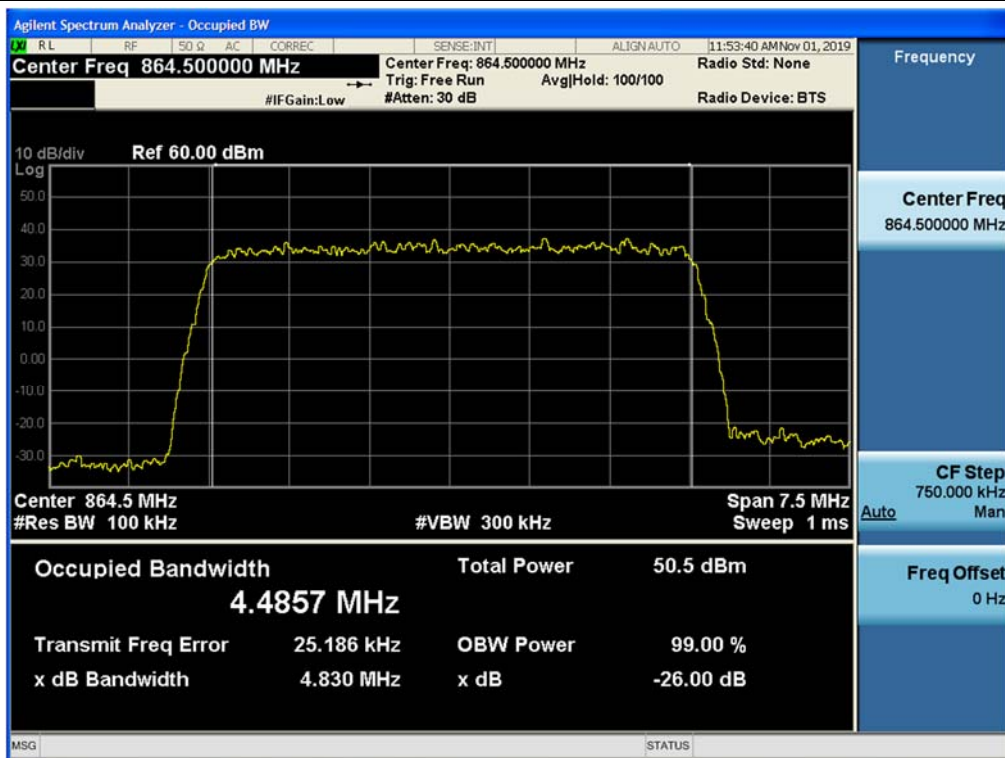
Antenna 2 / LTE 5 MHz 1 Carrier / 16QAM / Middle



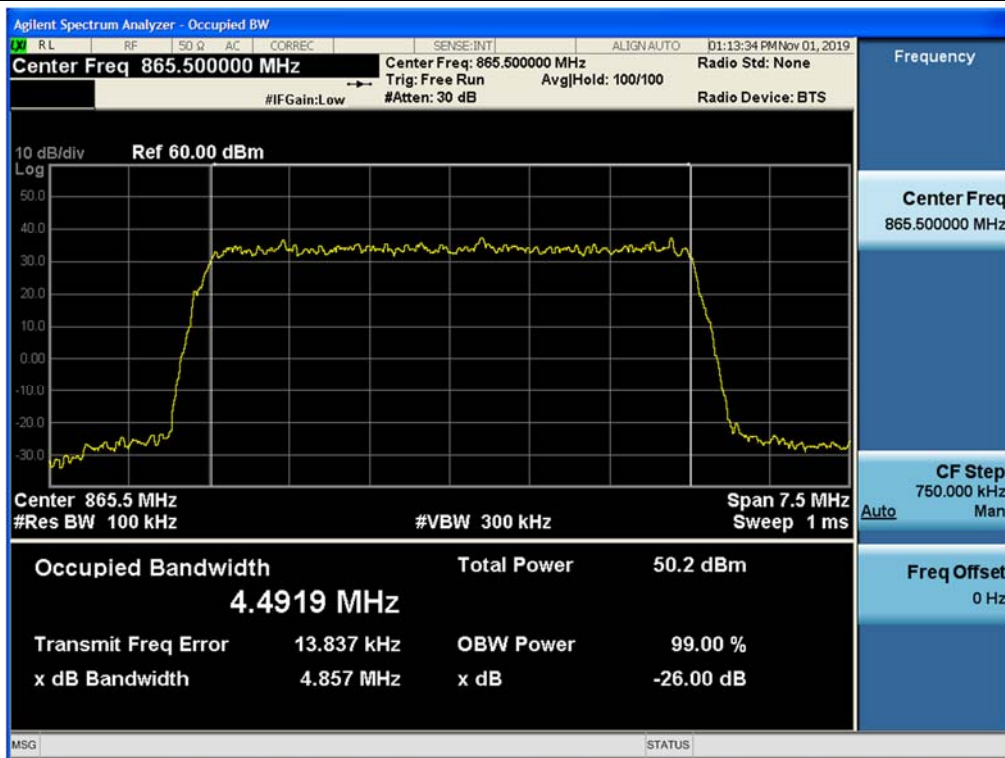
Antenna 2 / LTE 5 MHz 1 Carrier / 16QAM / High



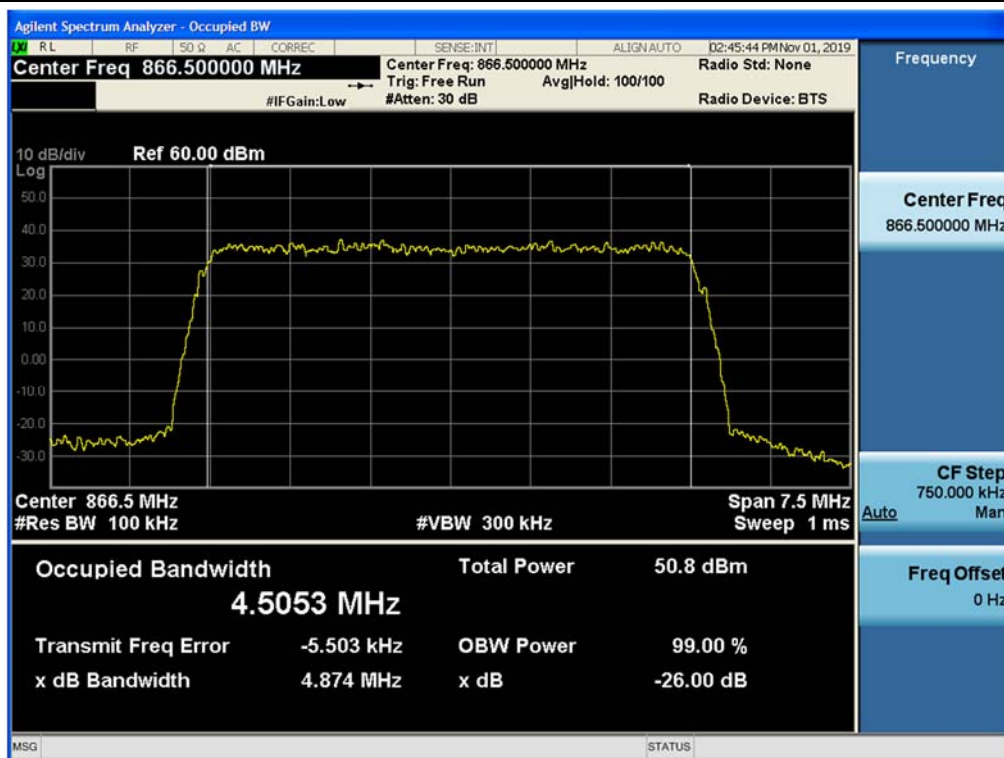
Antenna 2 / LTE 5 MHz 1 Carrier / 64QAM / Low



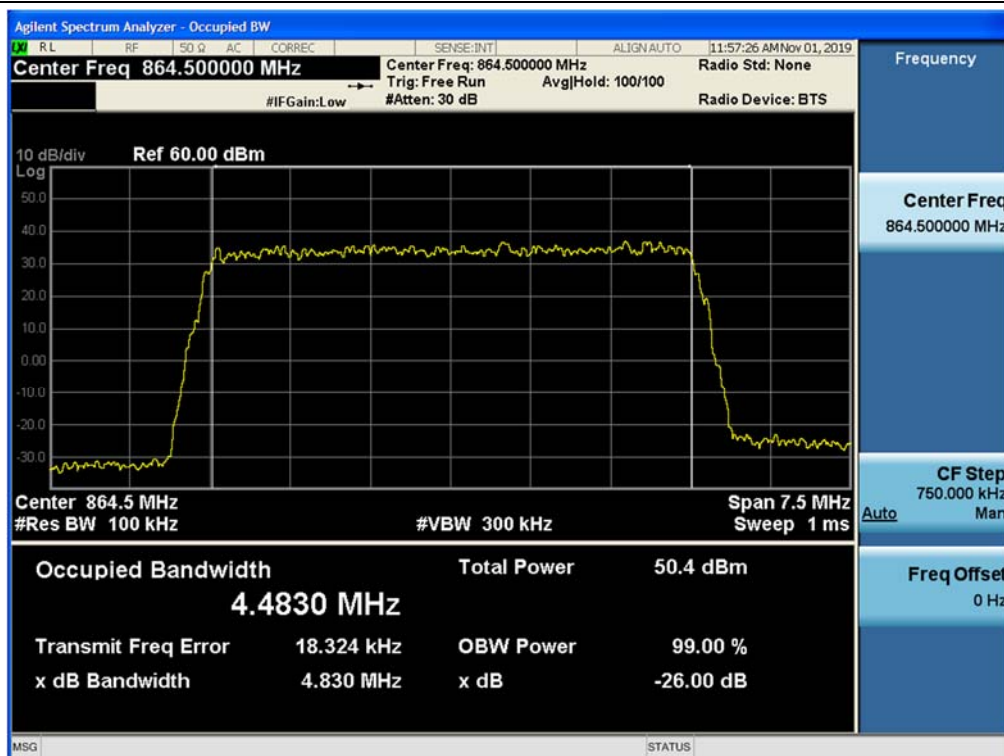
Antenna 2 / LTE 5 MHz 1 Carrier / 64QAM / Middle



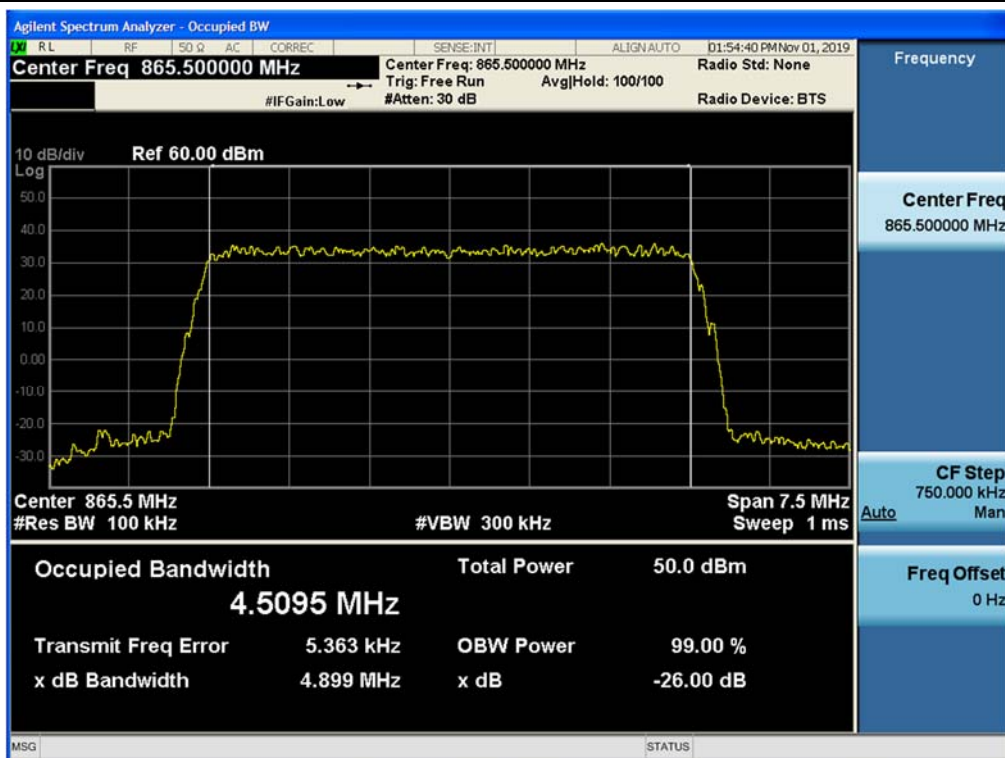
Antenna 2 / LTE 5 MHz 1 Carrier / 64QAM / High



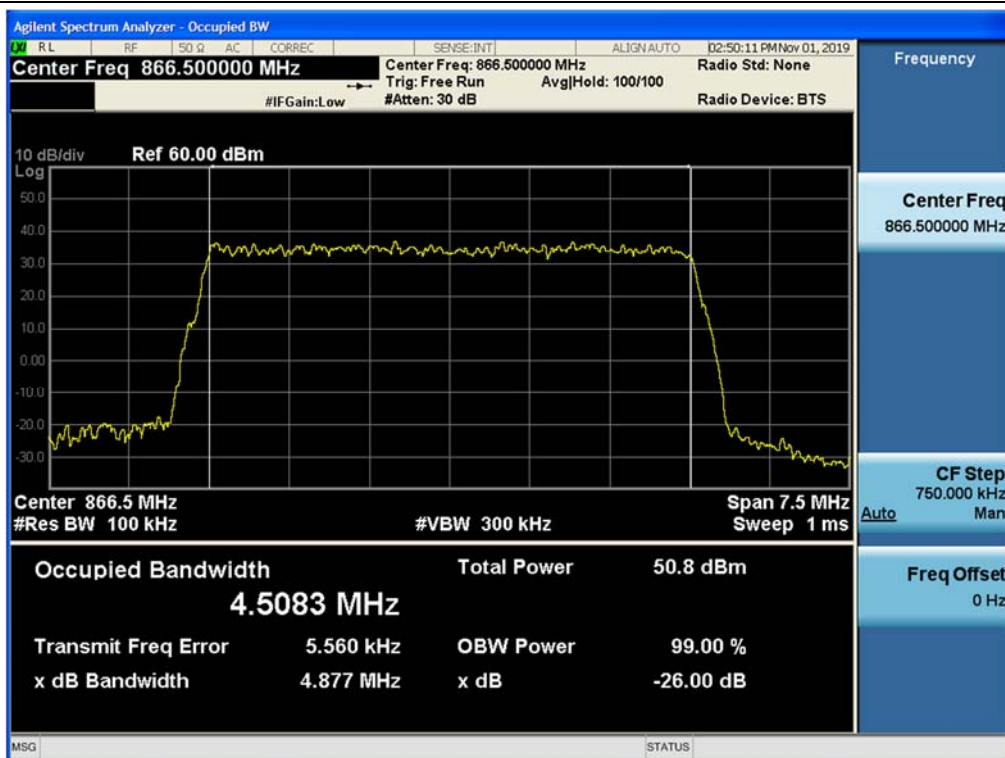
Antenna 2 / LTE 5 MHz 1 Carrier / 256QAM / Low



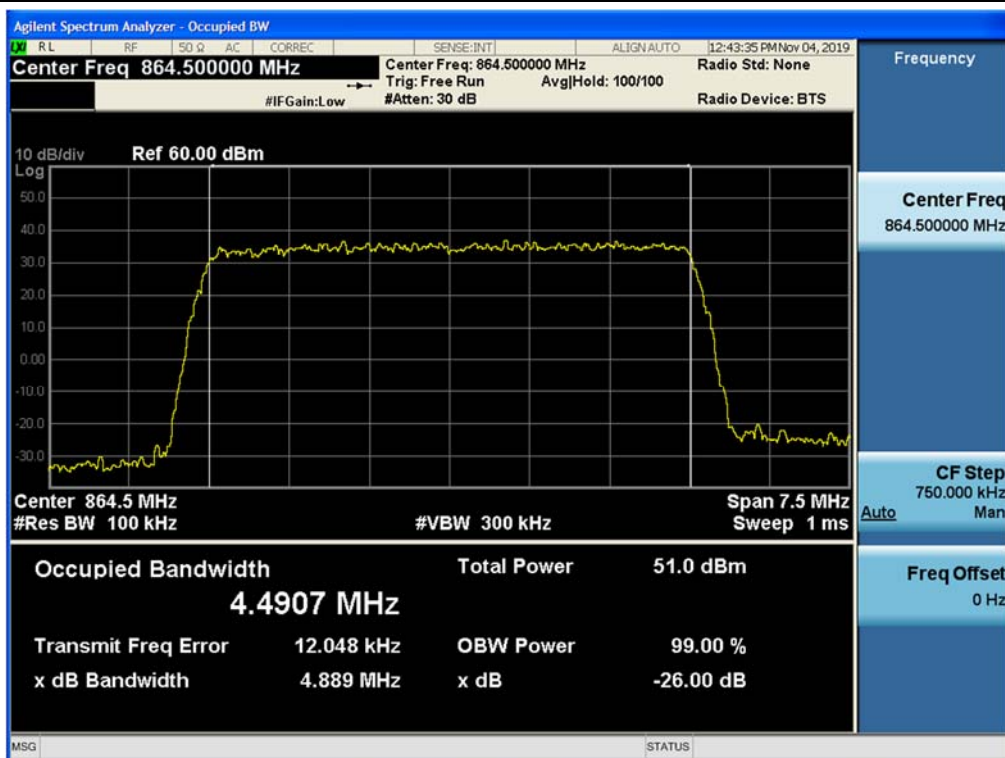
Antenna 2 / LTE 5 MHz 1 Carrier / 256QAM / Middle



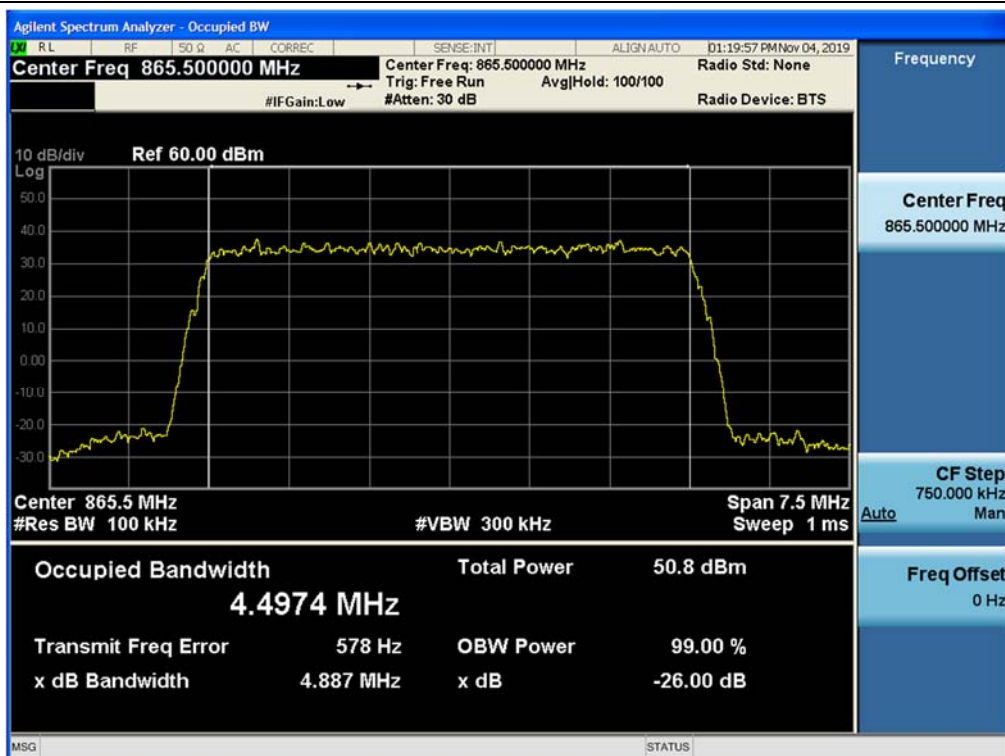
Antenna 2 / LTE 5 MHz 1 Carrier / 256QAM / High



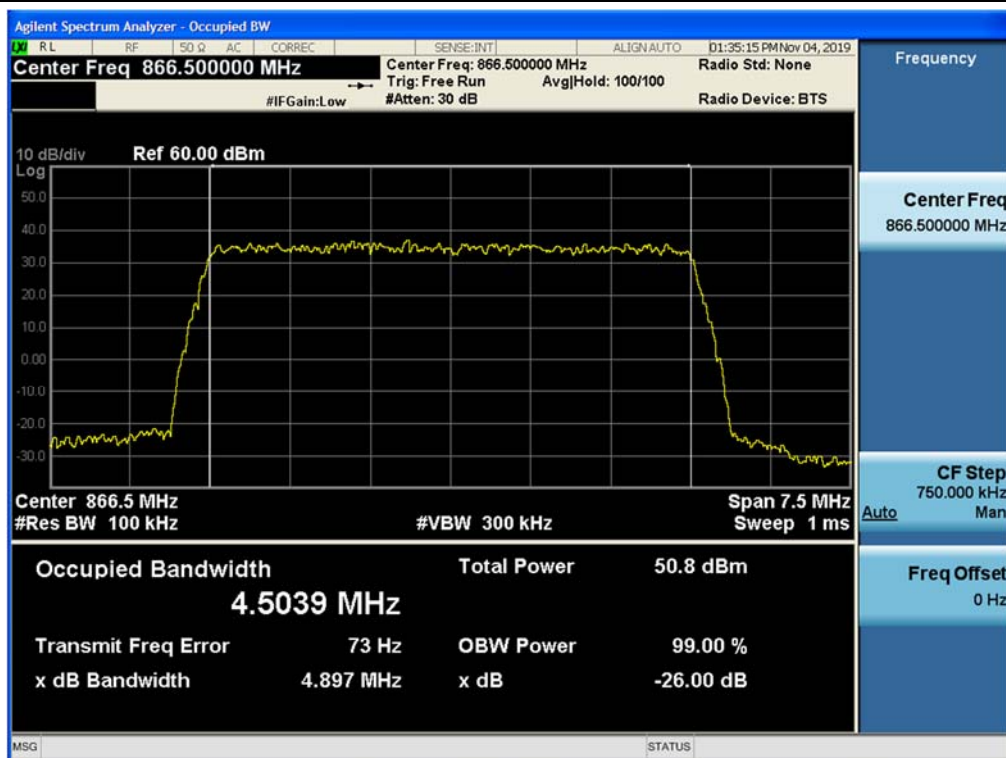
Antenna 3 / LTE 5 MHz 1 Carrier / QPSK / Low



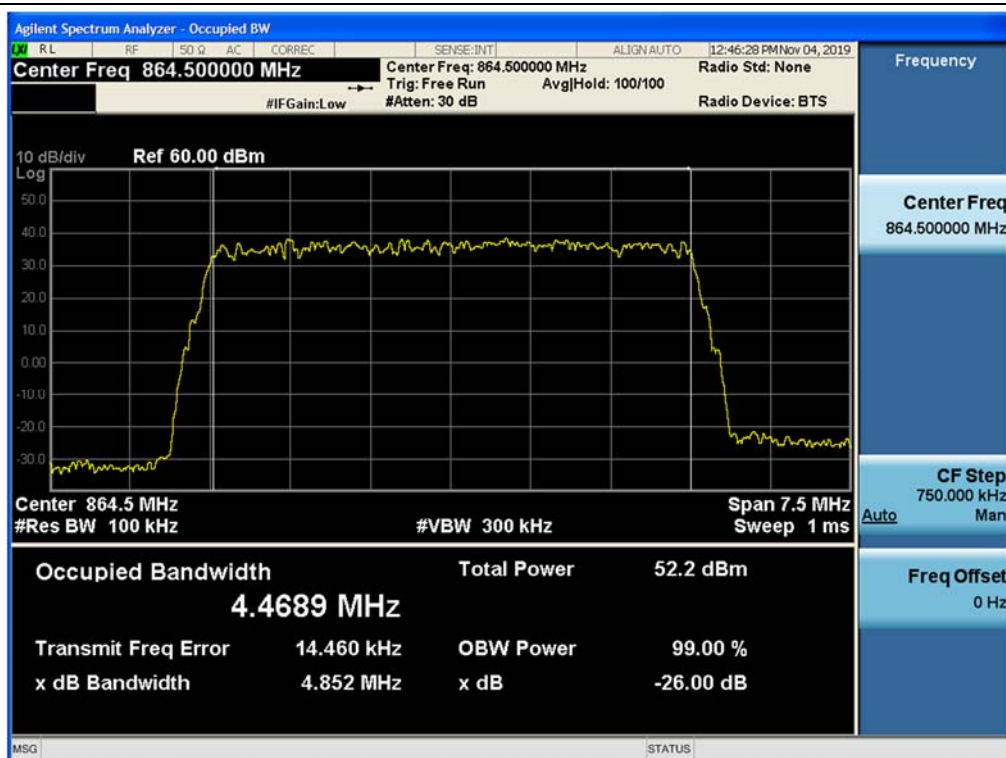
Antenna 3 / LTE 5 MHz 1 Carrier / QPSK / Middle



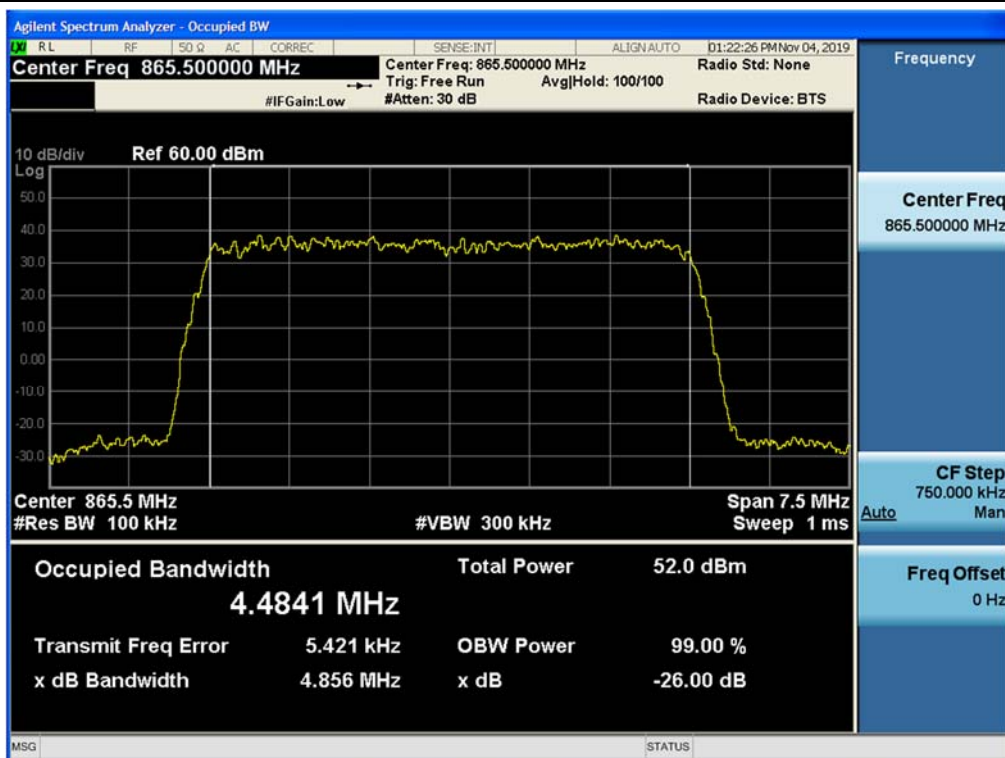
Antenna 3 / LTE 5 MHz 1 Carrier / QPSK / High



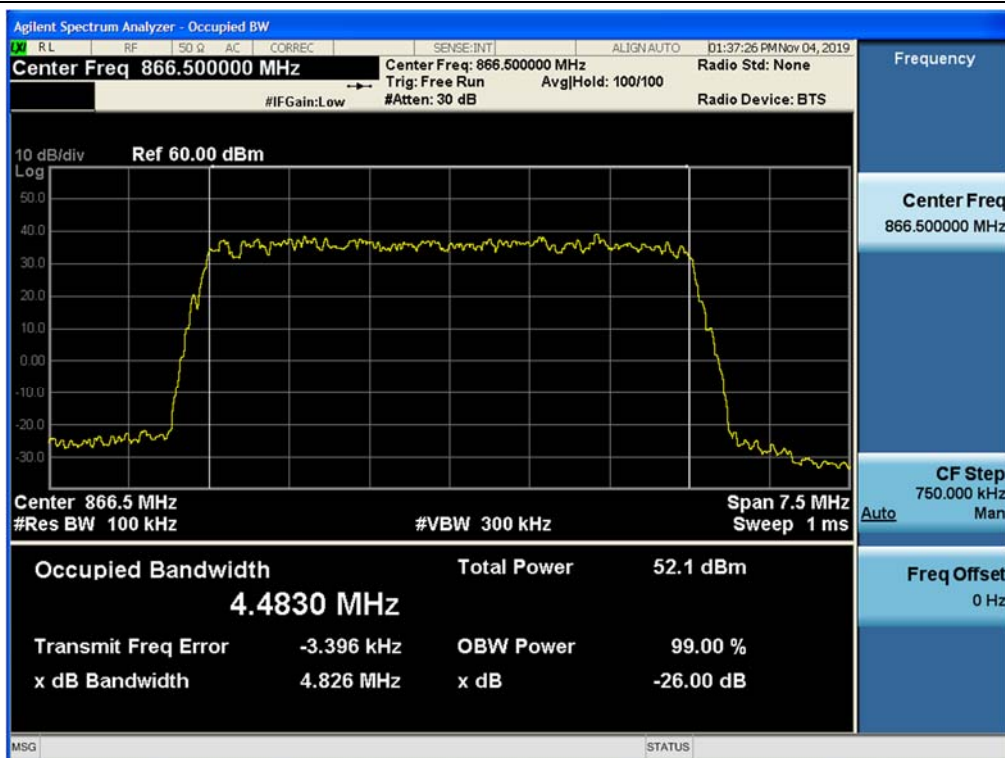
Antenna 3 / LTE 5 MHz 1 Carrier / 16QAM / Low



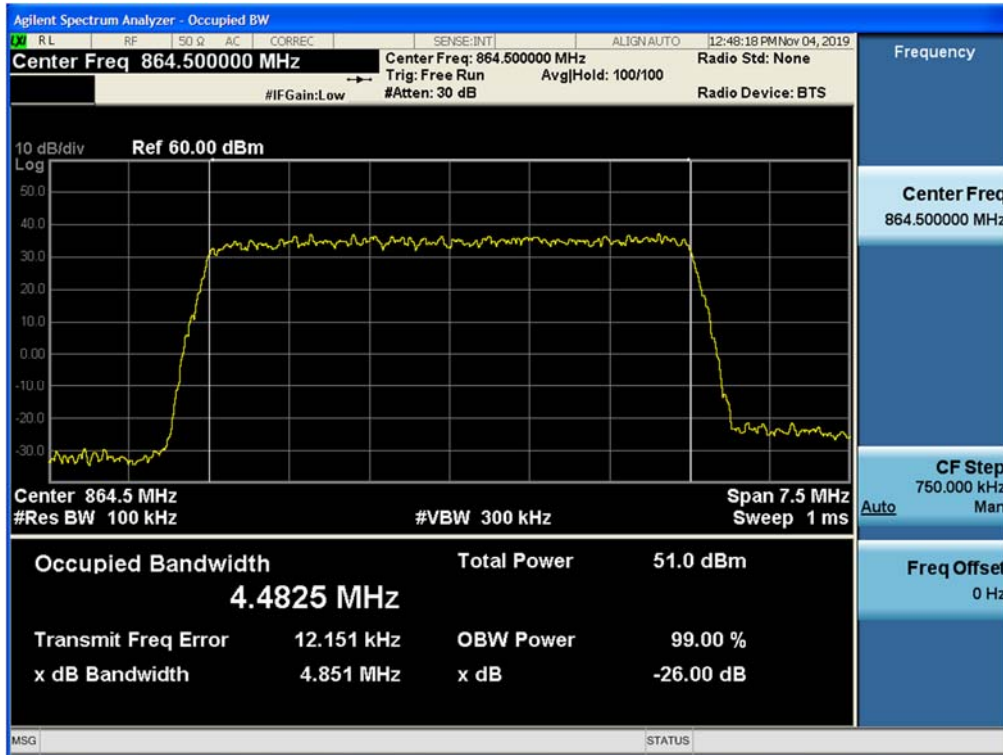
Antenna 3 / LTE 5 MHz 1 Carrier / 16QAM / Middle



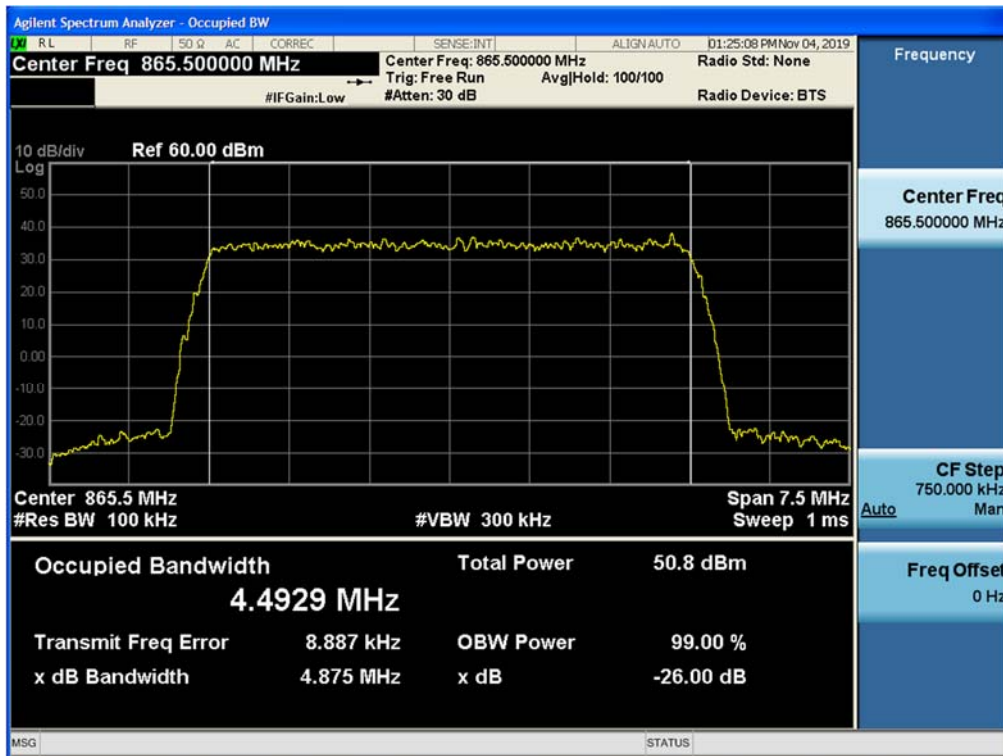
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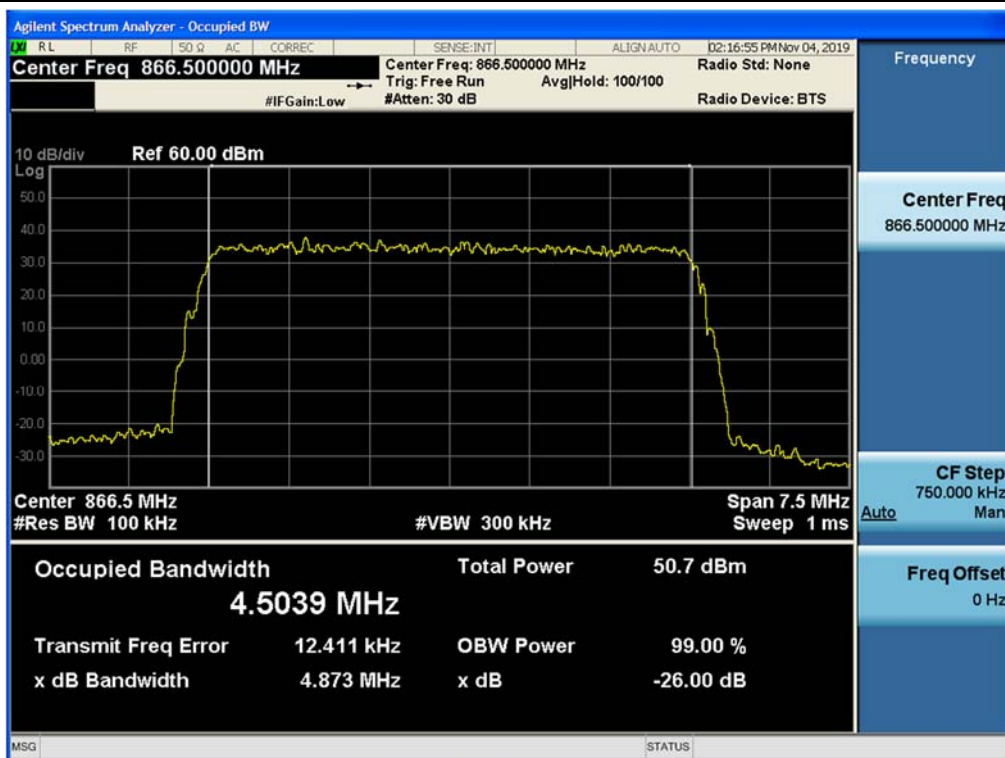
Antenna 3 / LTE 5 MHz 1 Carrier / 64QAM / Low



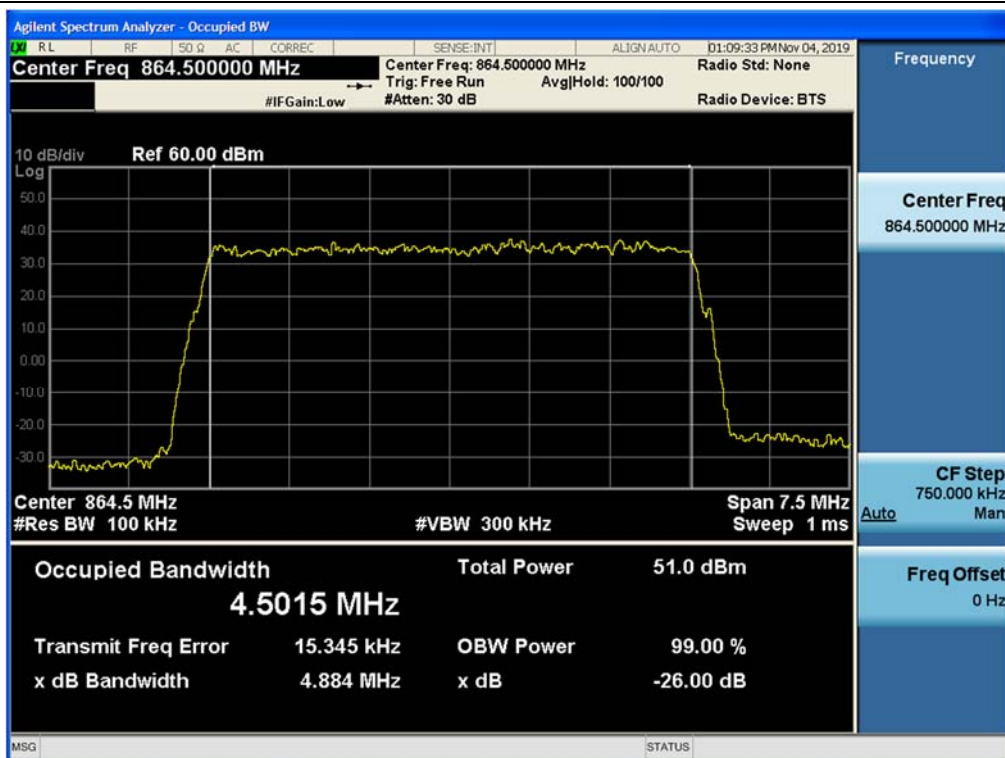
Antenna 3 / LTE 5 MHz 1 Carrier / 64QAM / Middle



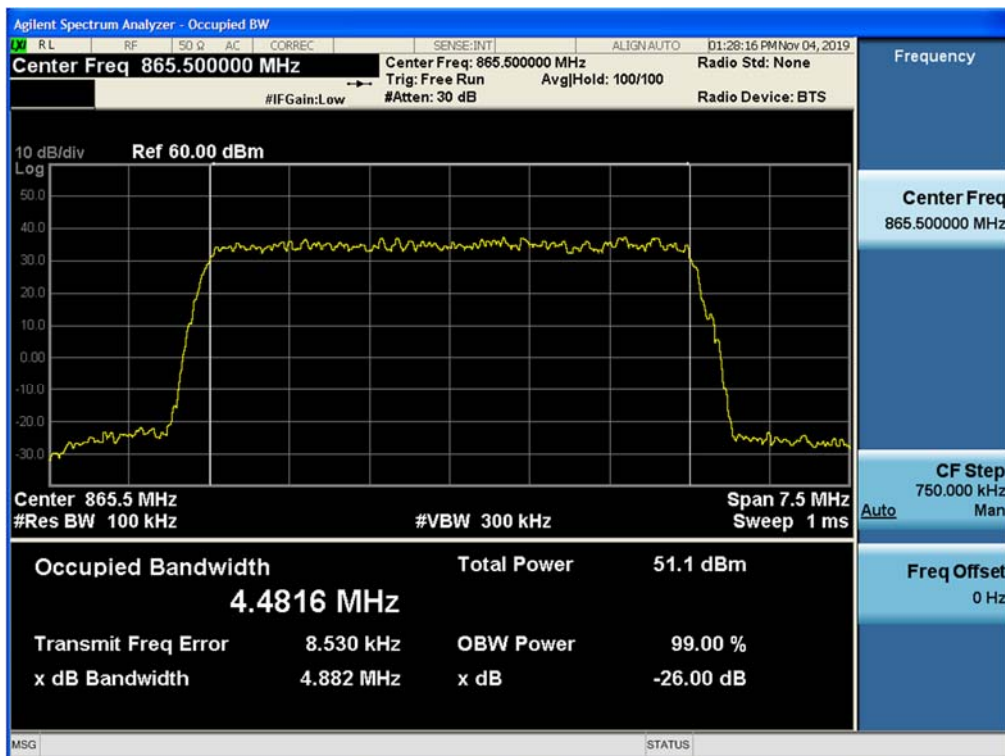
Antenna 3 / LTE 5 MHz 1 Carrier / 64QAM / High



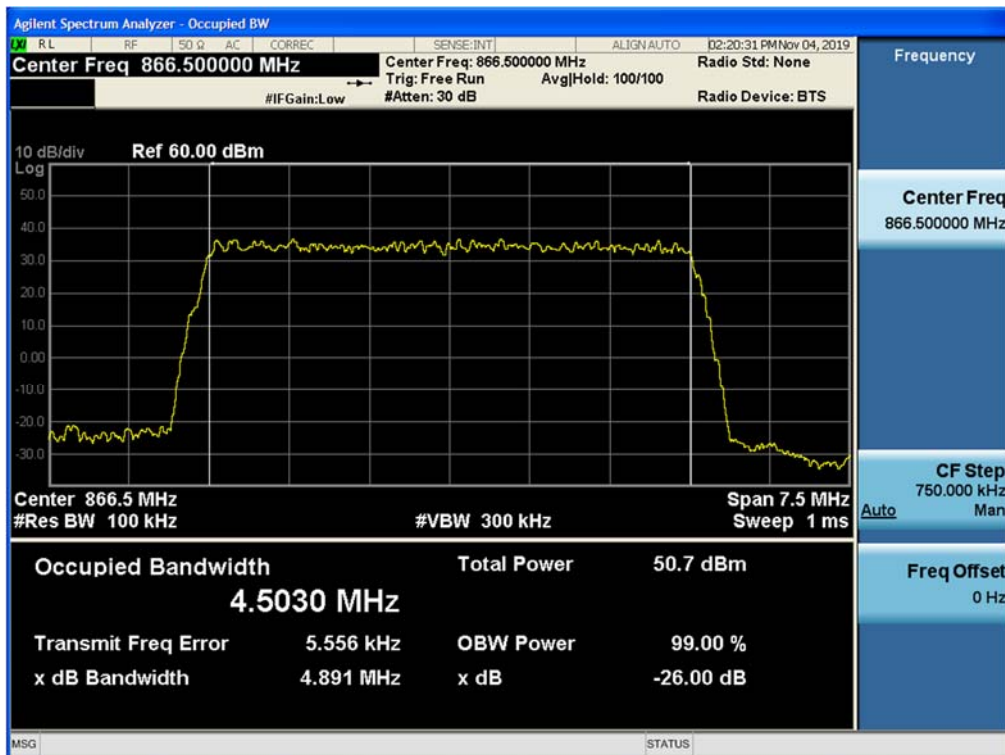
Antenna 3 / LTE 5 MHz 1 Carrier / 256QAM / Low



Antenna 3 / LTE 5 MHz 1 Carrier / 256QAM / Middle



Antenna 3 / LTE 5 MHz 1 Carrier / 256QAM / High



5.3. SPURIOUS EMISSION AT ANTENNA TERMINAL

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.

§ 90.691 Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

(b) 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 RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.

The resolution bandwidth of the spectrum analyzer was set at 100 KHz (Under 1 GHz), 1MHz (Above 1 GHz). Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Notes:

1. In 9 KHz-150 KHz and 150 KHz-30 MHz bands, RBW was reduced to 1% and 10% of the reference bandwidth for measuring unwanted emission level (typically, 100KHz if the authorized frequency band is below 1GHz) and power was integrated. (1% = +20 dB, 10% = +10 dB)
2. Due to 4x4 MIMO operation, limit is -19.02 dBm (-13 dBm – $10 \cdot \log(4)$) per FCC KDB 662911D01v02r01.

Test Results:
Tabular Data of Radiated Spurious Emissions
CDMA
Test Result for Output Port 0

Mod.	Channel	Measured Level (dBm)					
		9 kHz ~ 150 kHz	150 kHz ~ 30 MHz	30 MHz ~ 857.3 MHz	873.88 MHz ~ 1 GHz	1 GHz ~ 3 GHz	3 GHz ~ 12.75 GHz
BPSK	Low	-21.839	-33.779	-45.656	-48.411	-25.093	-32.480
	Middle	-21.580	-33.916	-45.556	-48.437	-25.433	-32.043
	High	-22.356	-32.527	-45.864	-48.350	-24.826	-32.159
QPSK	Low	-22.063	-33.244	-45.914	-48.352	-25.175	-32.393
	Middle	-22.497	-34.388	-45.861	-48.515	-25.156	-31.986
	High	-21.381	-32.599	-46.118	-48.346	-24.954	-31.867
16QAM	Low	-22.554	-34.033	-46.366	-48.451	-25.113	-32.275
	Middle	-21.949	-33.740	-46.213	-48.390	-25.439	-31.725
	High	-21.965	-33.953	-46.079	-48.368	-25.033	-31.196

LTE 3 MHz / 1 Carrier
Test Result for Output Port 0

Mod.	Channel	Measured Level (dBm)					
		9 kHz ~ 150 kHz	150 kHz ~ 30 MHz	30 MHz ~ 762 MHz	762 MHz ~ 859 MHz	872 MHz ~ 969 MHz	969 MHz ~ 10 GHz
QPSK	Low	-22.835	-24.951	-39.939	-29.672	-29.478	-23.735
	Middle	-22.321	-25.156	-40.105	-29.511	-29.374	-23.373
	High	-22.504	-23.023	-39.938	-29.618	-29.242	-23.655
16QAM	Low	-23.113	-23.057	-35.712	-29.537	-29.241	-23.015
	Middle	-22.498	-23.480	-34.059	-29.282	-29.297	-22.008
	High	-23.580	-23.032	-40.704	-29.716	-29.301	-23.651
64QAM	Low	-23.737	-25.331	-40.124	-29.665	-29.199	-21.316
	Middle	-21.958	-23.855	-32.530	-29.762	-29.398	-22.545
	High	-24.022	-24.544	-40.176	-29.694	-29.269	-25.064
256QAM	Low	-23.832	-23.378	-39.853	-29.663	-29.452	-25.041
	Middle	-23.391	-25.713	-36.116	-29.628	-29.306	-19.907
	High	-22.558	-23.886	-38.440	-29.630	-29.338	-22.108

Test Result for Output Port 1

Mod.	Channel	Measured Level (dBm)					
		9 kHz ~ 150 kHz	150 kHz ~ 30 MHz	30 MHz ~ 762 MHz	762 MHz ~ 859 MHz	872 MHz ~ 969 MHz	969 MHz ~ 10 GHz
QPSK	Low	-25.119	-25.153	-39.576	-29.660	-29.260	-22.727
	Middle	-22.669	-25.466	-38.279	-29.441	-29.315	-21.246
	High	-24.485	-23.313	-39.343	-29.720	-29.460	-23.275
16QAM	Low	-22.860	-25.051	-39.458	-29.584	-29.288	-24.427
	Middle	-23.456	-24.951	-39.755	-29.630	-29.466	-23.915
	High	-22.615	-24.814	-38.932	-29.774	-29.158	-24.255
64QAM	Low	-22.392	-23.347	-38.491	-29.722	-29.129	-23.455
	Middle	-21.174	-25.278	-40.076	-29.759	-29.521	-22.359
	High	-21.662	-26.000	-38.661	-29.662	-29.457	-24.755
256QAM	Low	-22.828	-23.769	-39.127	-29.707	-29.326	-25.509
	Middle	-22.164	-24.926	-38.507	-29.622	-29.560	-22.335
	High	-23.865	-23.434	-36.671	-29.528	-29.098	-21.733

Test Result for Output Port 2

Mod.	Channel	Measured Level (dBm)					
		9 kHz ~ 150 kHz	150 kHz ~ 30 MHz	30 MHz ~ 762 MHz	762 MHz ~ 859 MHz	872 MHz ~ 969 MHz	969 MHz ~ 10 GHz
QPSK	Low	-23.546	-23.165	-39.822	-29.554	-29.465	-23.991
	Middle	-22.505	-23.414	-38.269	-29.675	-29.187	-21.688
	High	-23.051	-25.447	-36.268	-29.632	-29.248	-21.064
16QAM	Low	-25.105	-23.221	-36.634	-29.367	-29.300	-22.586
	Middle	-24.114	-23.130	-38.684	-29.527	-29.207	-21.652
	High	-22.635	-24.834	-39.401	-29.639	-29.340	-24.891
64QAM	Low	-23.506	-23.145	-39.524	-29.593	-29.352	-22.751
	Middle	-22.563	-26.156	-38.293	-29.553	-29.442	-23.177
	High	-22.128	-24.495	-36.524	-29.384	-29.332	-22.137
256QAM	Low	-22.934	-23.638	-38.895	-29.417	-29.347	-23.186
	Middle	-21.925	-25.037	-36.475	-29.591	-29.271	-22.707
	High	-24.022	-24.013	-39.830	-29.405	-29.351	-22.168

Test Result for Output Port 3

Mod.	Channel	Measured Level (dBm)					
		9 kHz ~ 150 kHz	150 kHz ~ 30 MHz	30 MHz ~ 762 MHz	762 MHz ~ 859 MHz	872 MHz ~ 969 MHz	969 MHz ~ 10 GHz
QPSK	Low	-23.273	-23.650	-35.859	-29.477	-29.219	-23.367
	Middle	-24.045	-24.854	-39.301	-29.542	-29.420	-24.071
	High	-22.013	-24.572	-37.615	-29.602	-29.419	-21.692
16QAM	Low	-22.140	-25.627	-38.900	-29.584	-28.749	-24.756
	Middle	-23.582	-24.404	-40.360	-29.531	-29.390	-23.540
	High	-22.805	-23.247	-36.324	-29.666	-29.313	-22.959
64QAM	Low	-24.146	-25.550	-39.320	-29.368	-29.164	-26.237
	Middle	-22.760	-23.989	-40.472	-29.643	-29.461	-22.636
	High	-23.502	-23.620	-40.099	-29.955	-29.291	-21.877
256QAM	Low	-23.392	-25.318	-40.258	-29.599	-29.401	-22.650
	Middle	-24.016	-23.434	-40.402	-29.525	-29.457	-23.418
	High	-23.784	-24.699	-40.026	-29.464	-29.380	-22.045

LTE 5 MHz / 1 Carrier
Test Result for Output Port 0

Mod.	Channel	Measured Level (dBm)					
		9 kHz ~ 150 kHz	150 kHz ~ 30 MHz	30 MHz ~ 762 MHz	762 MHz ~ 857 MHz	874 MHz ~ 969 MHz	969 MHz ~ 10 GHz
QPSK	Low	-22.335	-20.300	-40.882	-29.549	-29.343	-22.892
	Middle	-23.661	-23.653	-40.423	-29.514	-28.925	-24.390
	High	-23.044	-22.731	-39.866	-29.526	-29.228	-23.181
16QAM	Low	-22.147	-24.140	-38.745	-29.523	-29.311	-24.320
	Middle	-23.696	-21.571	-39.635	-29.644	-29.334	-23.886
	High	-22.681	-24.899	-34.008	-29.679	-29.191	-24.328
64QAM	Low	-24.066	-22.957	-35.911	-29.661	-29.249	-26.494
	Middle	-23.026	-24.167	-39.454	-29.600	-29.241	-24.418
	High	-23.611	-23.840	-36.091	-29.370	-29.378	-27.156
256QAM	Low	-24.456	-24.236	-40.436	-29.519	-29.390	-28.236
	Middle	-22.656	-24.923	-34.654	-29.603	-29.395	-23.045
	High	-23.013	-25.230	-34.876	-29.672	-29.255	-25.032

Test Result for Output Port 1

Mod.	Channel	Measured Level (dBm)					
		9 kHz ~ 150 kHz	150 kHz ~ 30 MHz	30 MHz ~ 762 MHz	762 MHz ~ 857 MHz	874 MHz ~ 969 MHz	969 MHz ~ 10 GHz
QPSK	Low	-24.085	-23.824	-39.410	-29.649	-29.380	-24.302
	Middle	-22.843	-23.492	-36.112	-29.436	-29.165	-23.822
	High	-22.643	-24.036	-40.108	-29.651	-28.759	-25.431
16QAM	Low	-22.079	-25.418	-38.676	-29.307	-29.343	-24.002
	Middle	-23.912	-24.743	-37.338	-29.534	-29.134	-23.407
	High	-22.512	-24.820	-38.873	-29.573	-29.199	-23.604
64QAM	Low	-23.759	-24.344	-39.202	-29.815	-29.045	-24.473
	Middle	-23.831	-24.729	-36.603	-29.615	-29.280	-22.675
	High	-24.031	-24.963	-39.465	-29.619	-29.177	-24.930
256QAM	Low	-21.784	-24.967	-39.579	-29.310	-29.188	-24.421
	Middle	-23.255	-23.500	-38.820	-29.706	-29.131	-23.739
	High	-22.041	-23.584	-39.272	-29.667	-29.311	-25.197

Test Result for Output Port 2

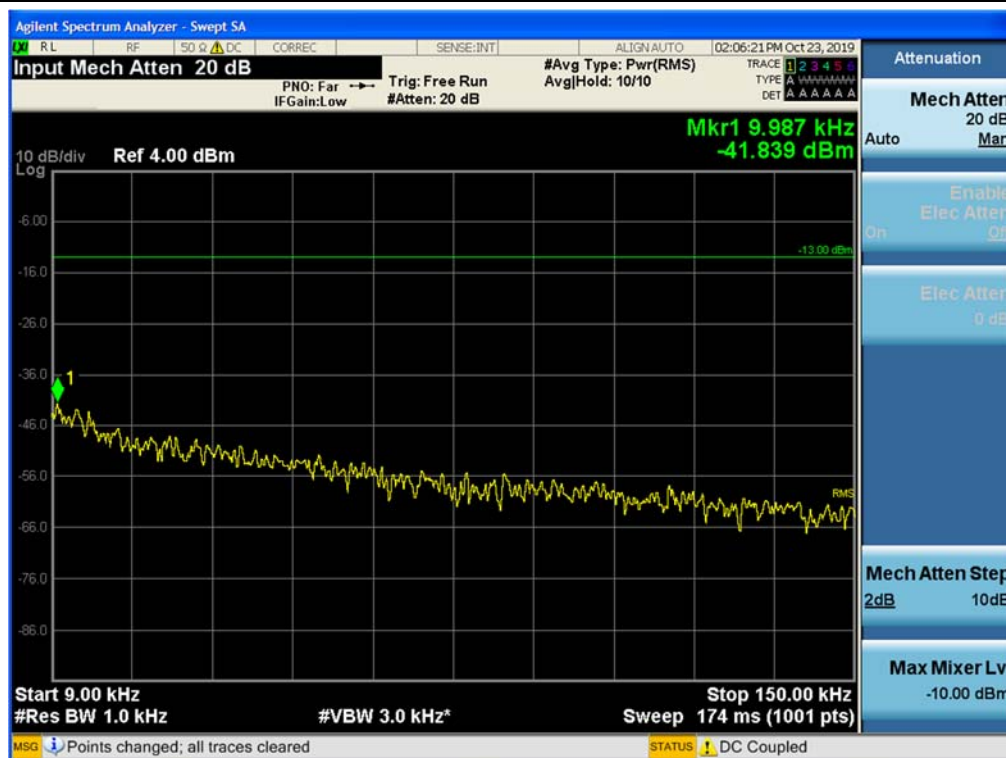
Mod.	Channel	Measured Level (dBm)					
		9 kHz ~ 150 kHz	150 kHz ~ 30 MHz	30 MHz ~ 762 MHz	762 MHz ~ 857 MHz	874 MHz ~ 969 MHz	969 MHz ~ 10 GHz
QPSK	Low	-22.971	-25.619	-39.773	-29.414	-28.900	-23.945
	Middle	-21.666	-25.866	-39.752	-29.692	-29.273	-24.221
	High	-24.041	-24.147	-39.144	-29.592	-29.171	-24.543
16QAM	Low	-24.261	-25.075	-39.482	-29.689	-29.442	-25.147
	Middle	-23.132	-25.256	-39.992	-29.613	-29.453	-26.372
	High	-23.628	-24.545	-38.954	-29.509	-29.361	-23.381
64QAM	Low	-22.372	-24.375	-39.706	-29.519	-28.806	-25.772
	Middle	-22.880	-23.579	-40.581	-29.608	-29.238	-24.633
	High	-21.468	-23.676	-39.858	-29.466	-29.350	-25.202
256QAM	Low	-23.597	-24.221	-39.766	-29.607	-29.337	-24.173
	Middle	-24.165	-24.126	-40.449	-29.673	-29.298	-27.058
	High	-22.812	-23.998	-40.043	-29.539	-29.060	-23.424

Test Result for Output Port 3

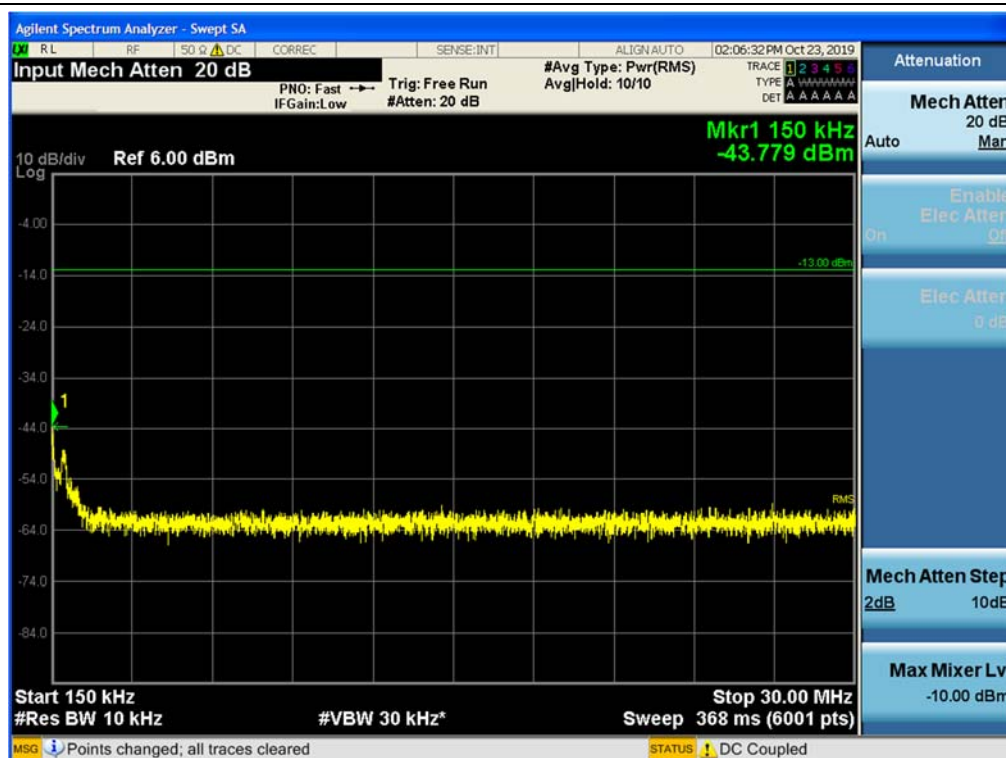
Mod.	Channel	Measured Level (dBm)					
		9 kHz ~ 150 kHz	150 kHz ~ 30 MHz	30 MHz ~ 762 MHz	762 MHz ~ 857 MHz	874 MHz ~ 969 MHz	969 MHz ~ 10 GHz
QPSK	Low	-22.882	-24.272	-36.379	-29.356	-29.275	-24.826
	Middle	-22.800	-23.958	-35.577	-29.508	-29.071	-25.620
	High	-23.498	-23.926	-39.745	-29.710	-29.446	-24.534
16QAM	Low	-23.229	-25.364	-39.545	-29.444	-29.163	-23.132
	Middle	-23.001	-24.041	-39.405	-29.485	-29.414	-25.221
	High	-23.593	-25.542	-38.412	-29.398	-29.373	-24.775
64QAM	Low	-24.082	-24.658	-39.840	-29.388	-29.267	-21.920
	Middle	-22.870	-25.777	-39.400	-29.524	-28.859	-23.772
	High	-23.802	-24.749	-39.666	-29.410	-29.154	-24.046
256QAM	Low	-24.441	-23.206	-39.771	-29.534	-29.189	-23.710
	Middle	-21.993	-24.515	-39.755	-29.745	-29.140	-25.278
	High	-23.351	-24.111	-40.460	-29.587	-29.467	-24.824

Plot Data of Conducted Spurious Emissions

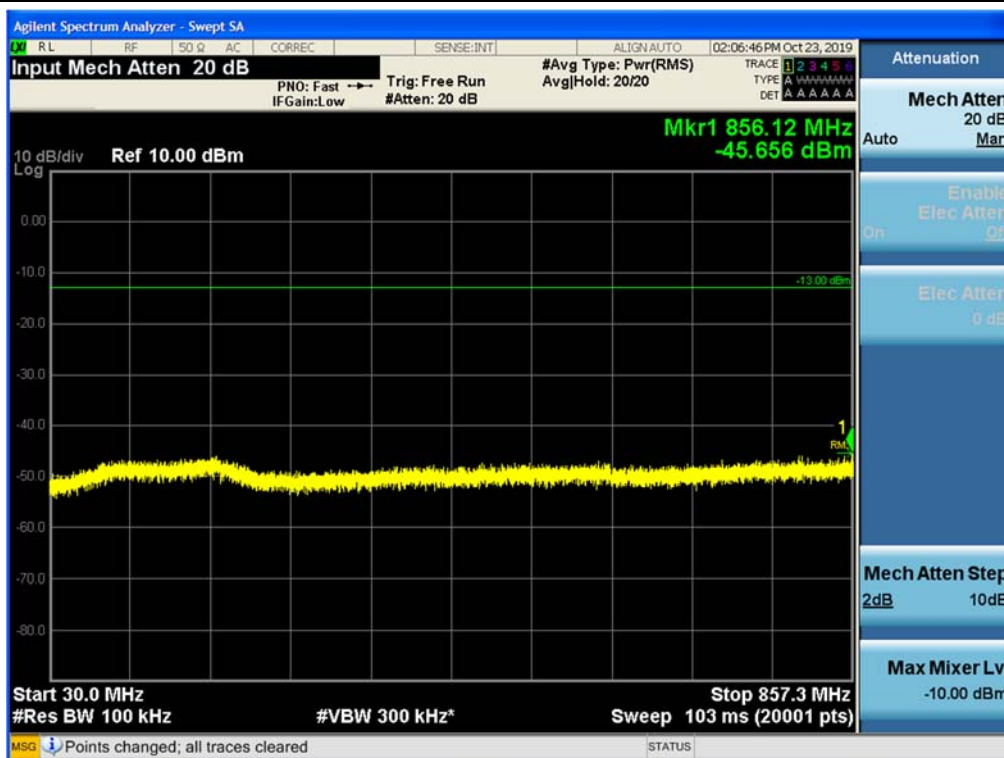
Antenna 0 / 9 kHz ~ 150 kHz / CDMA / BPSK / Low



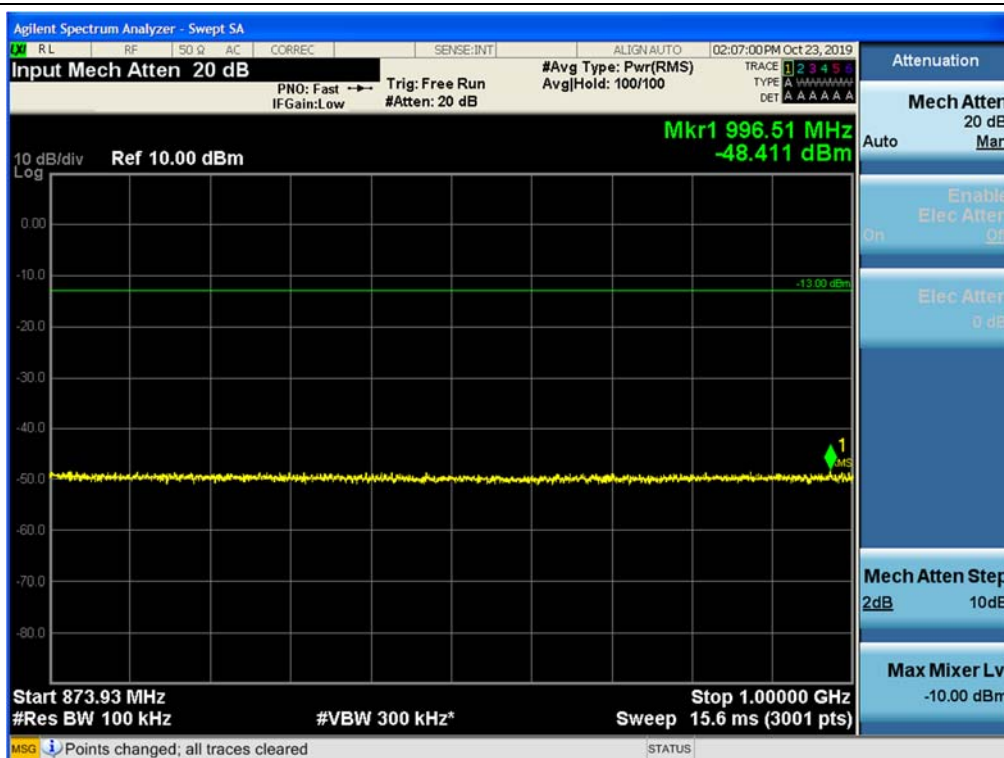
Antenna 0 / 150 kHz~ 30 MHz / CDMA / BPSK / Low



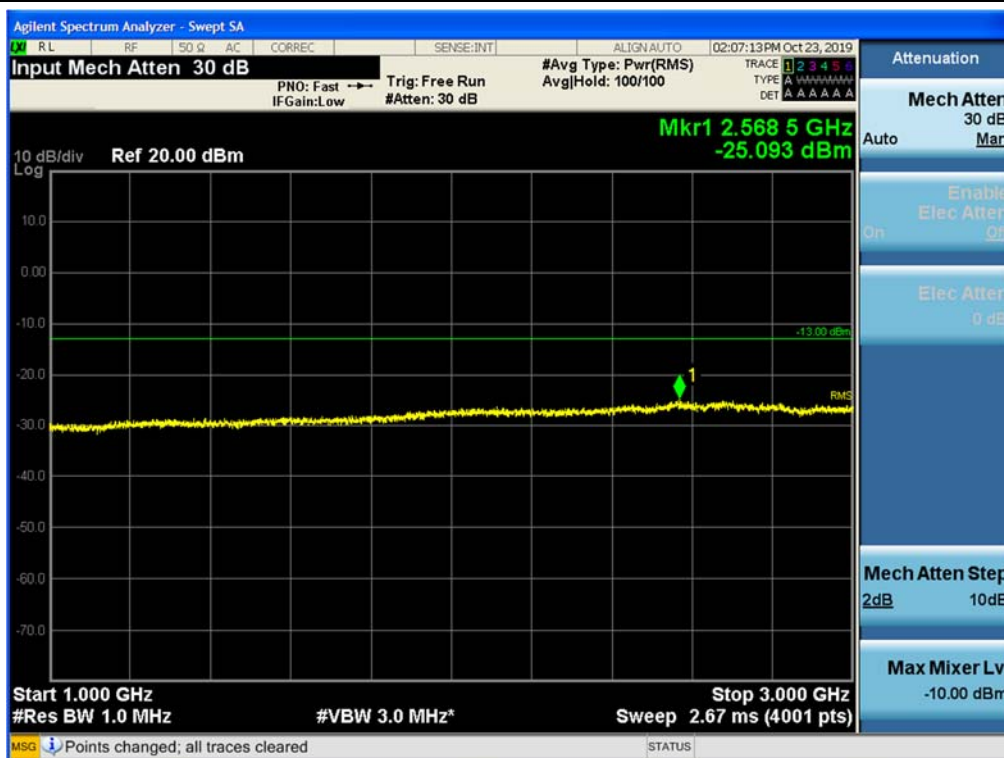
Antenna 0 / 30 MHz ~ 857.3 MHz / CDMA / BPSK / Low



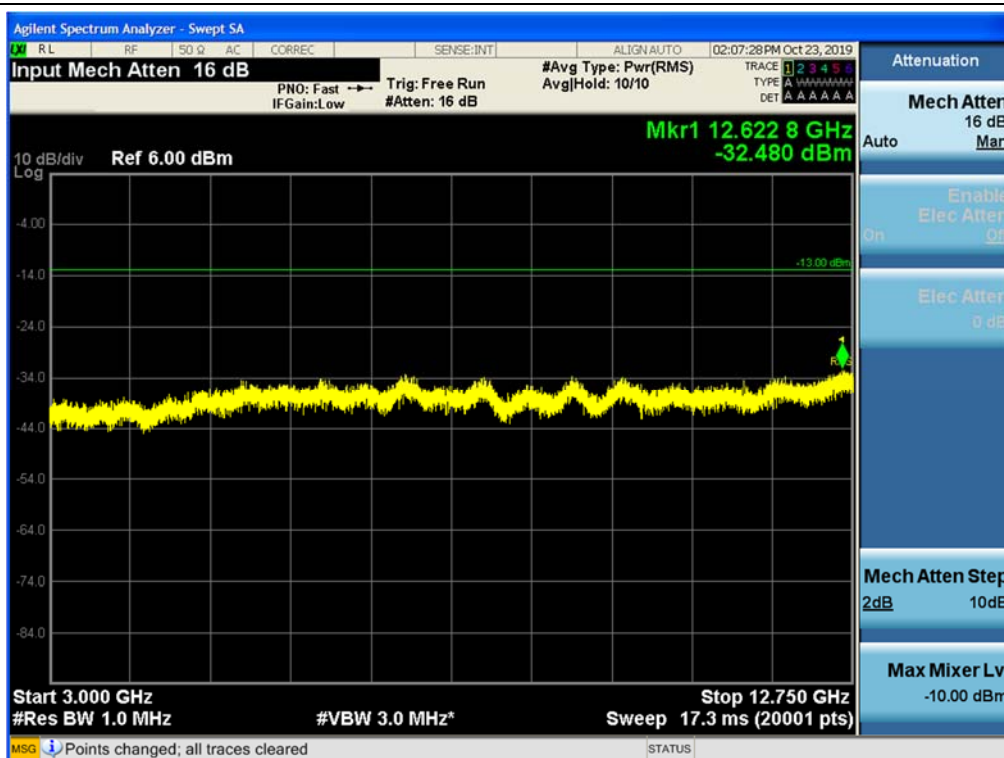
Antenna 0 / 873.88 MHz ~ 1 GHz / CDMA / BPSK / Low



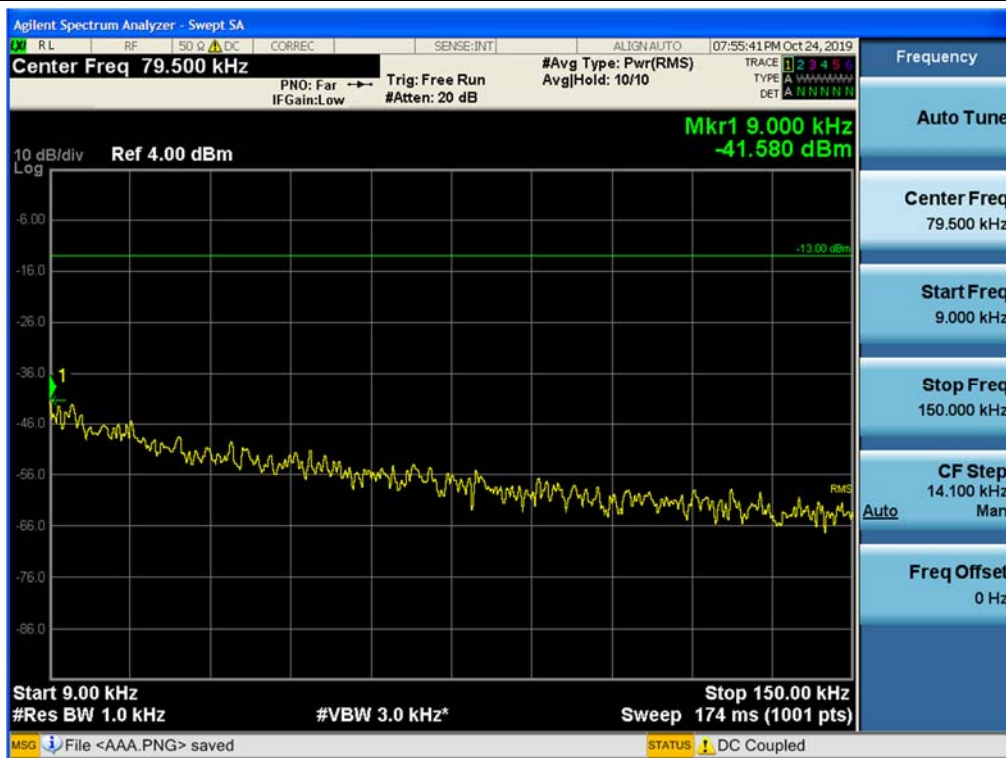
Antenna 0 / 1 GHz ~ 3 GHz / CDMA / BPSK / Low



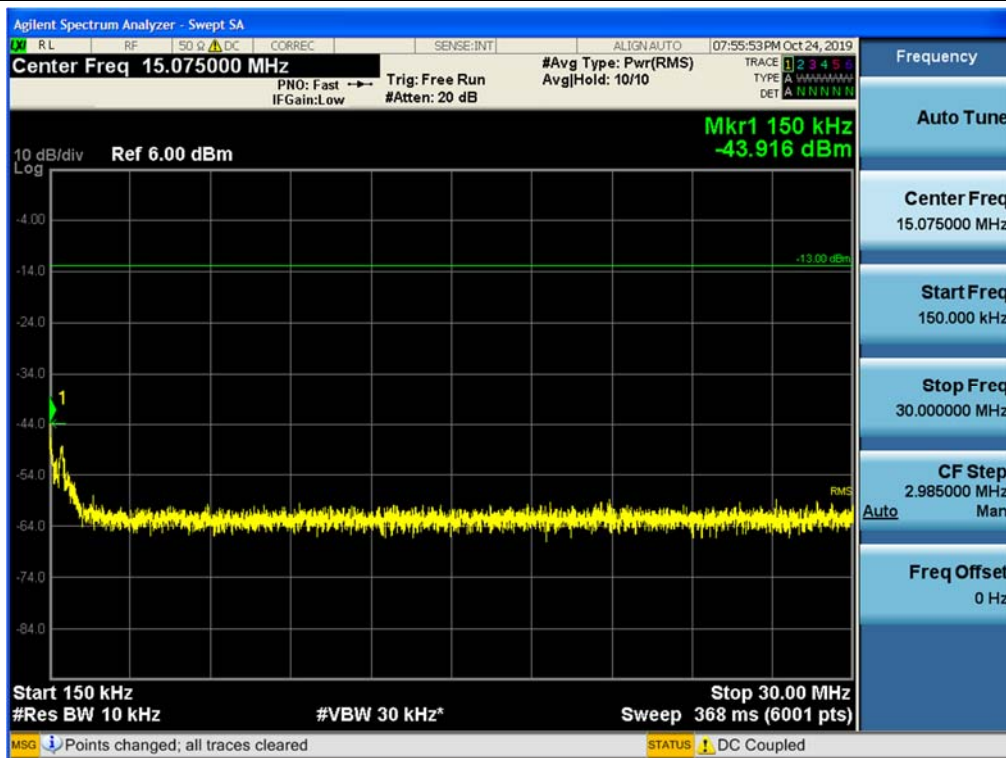
Antenna 0 / 3 GHz ~ 12.75 GHz / CDMA / BPSK / Low



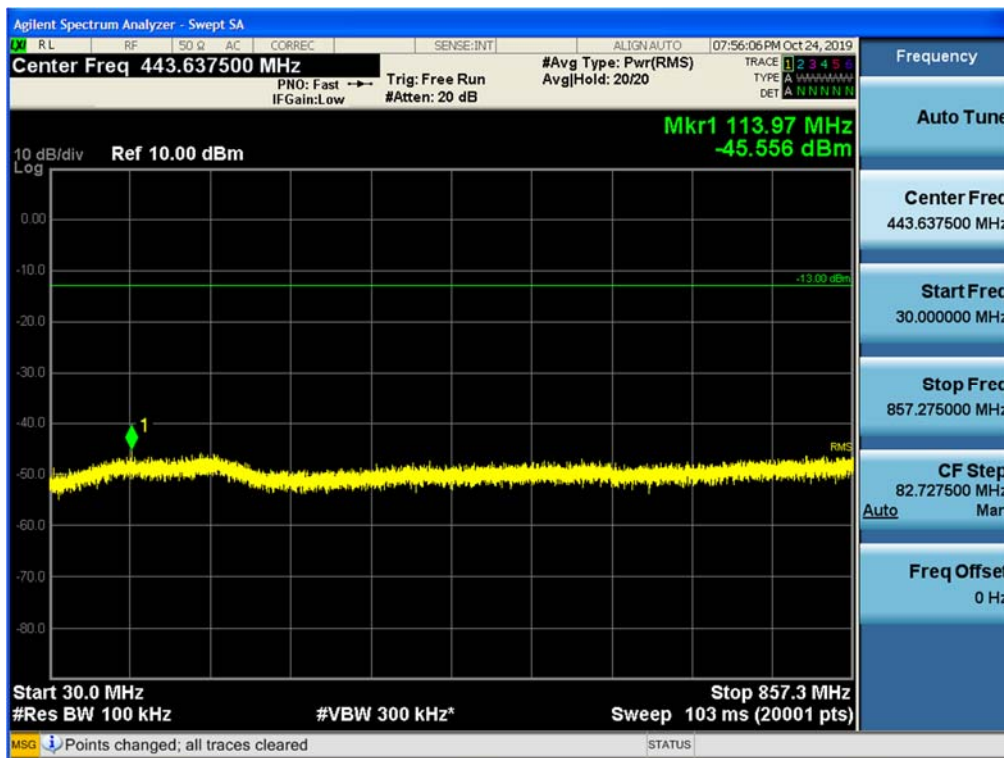
Antenna 0 / 9 kHz ~ 150 kHz / CDMA / BPSK / Middle



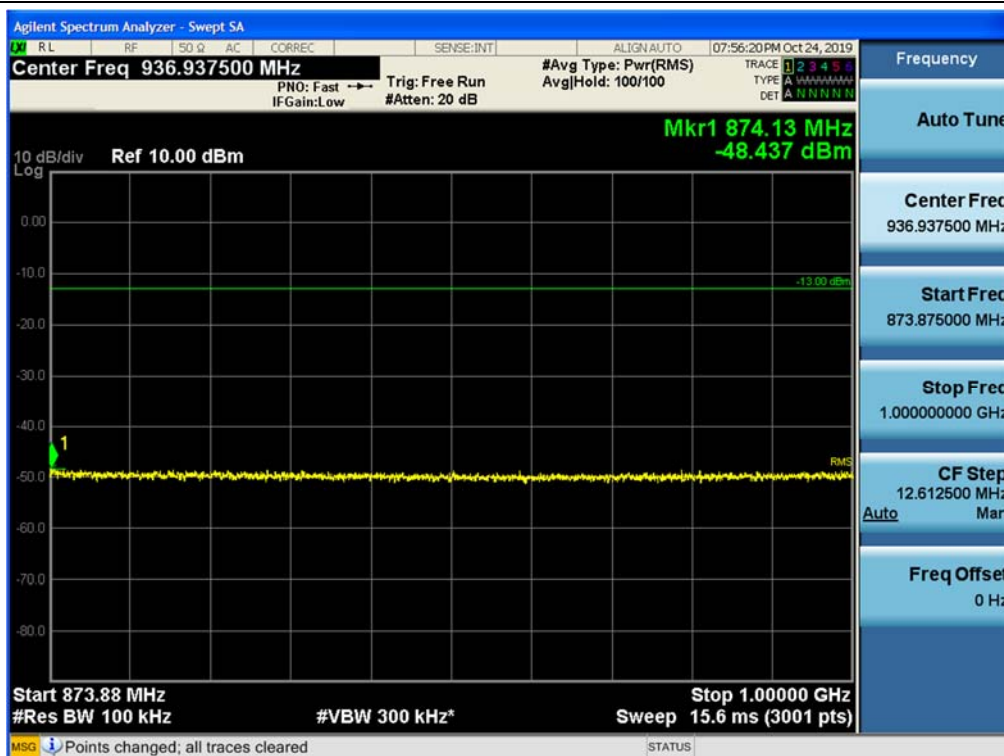
Antenna 0 / 150 kHz ~ 30 MHz / CDMA / BPSK / Middle



Antenna 0 / 30 MHz ~ 857.3 MHz / CDMA / BPSK / Middle



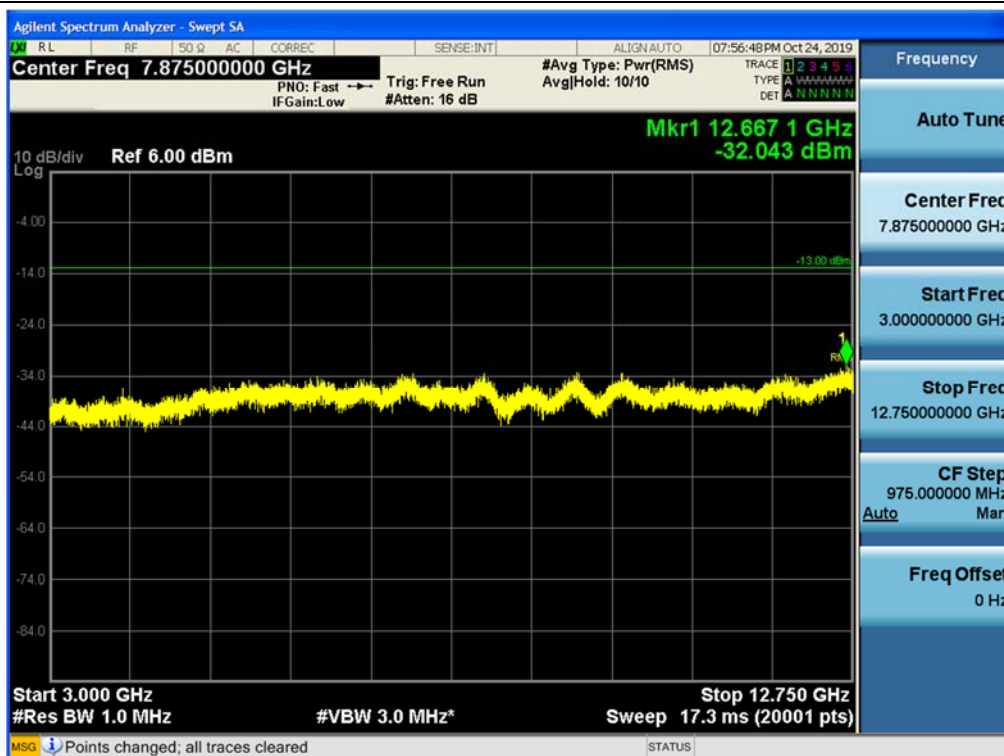
Antenna 0 / 873.88 MHz ~ 1 GHz / CDMA / BPSK / Middle



Antenna 0 / 1 GHz ~ 3 GHz / CDMA / BPSK / Middle



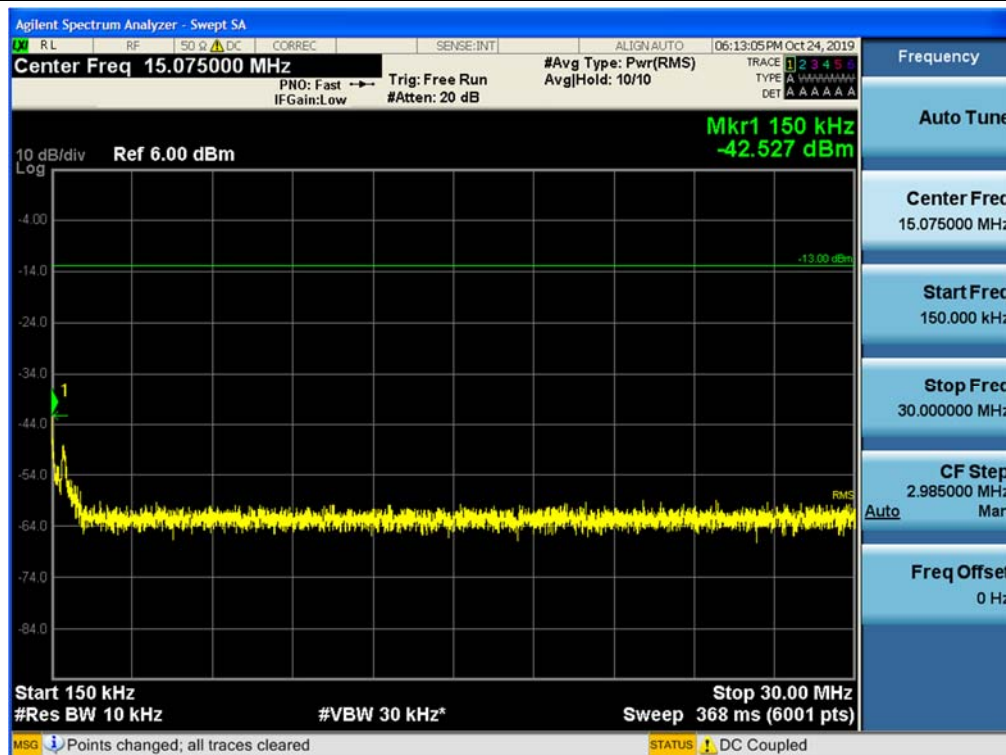
Antenna 0 / 3 GHz ~ 12.75 GHz / CDMA / BPSK / Middle



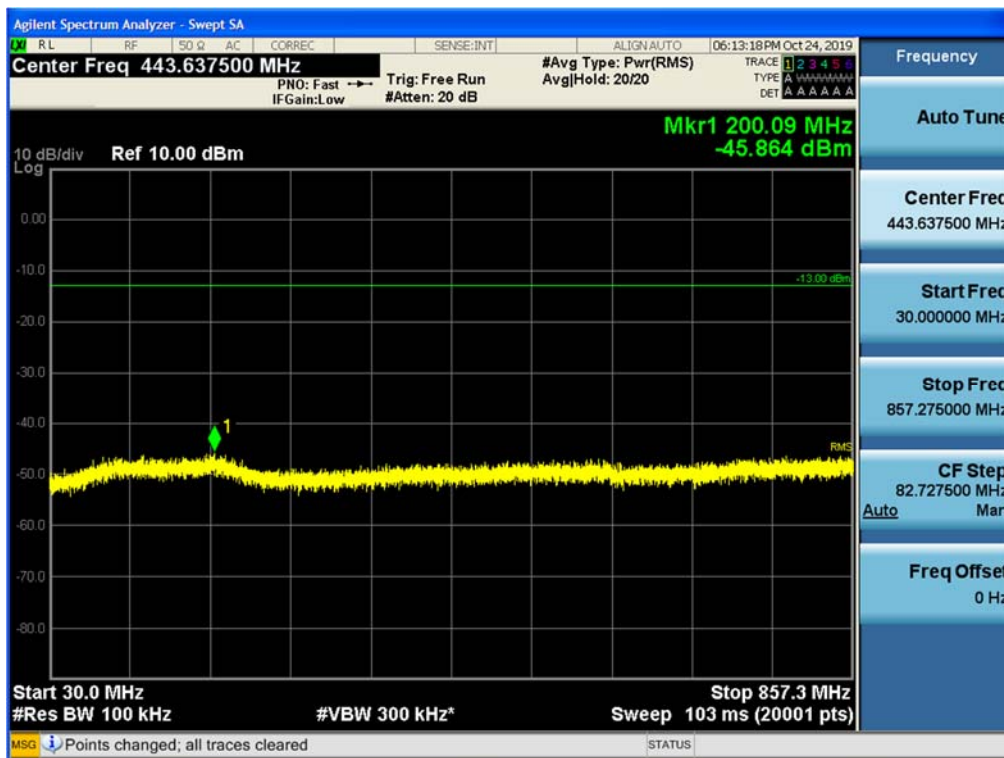
Antenna 0 / 9 kHz ~ 150 kHz / CDMA / BPSK / High



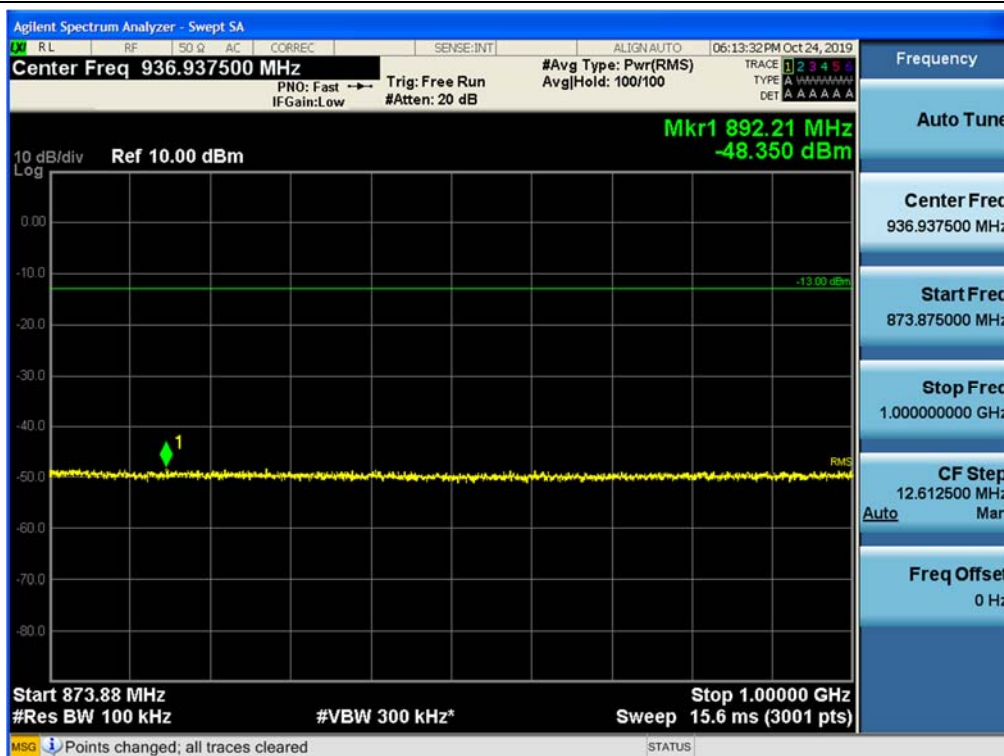
Antenna 0 / 150 kHz~ 30 MHz / CDMA / BPSK / High



Antenna 0 / 30 MHz ~ 857.3 MHz / CDMA / BPSK / High



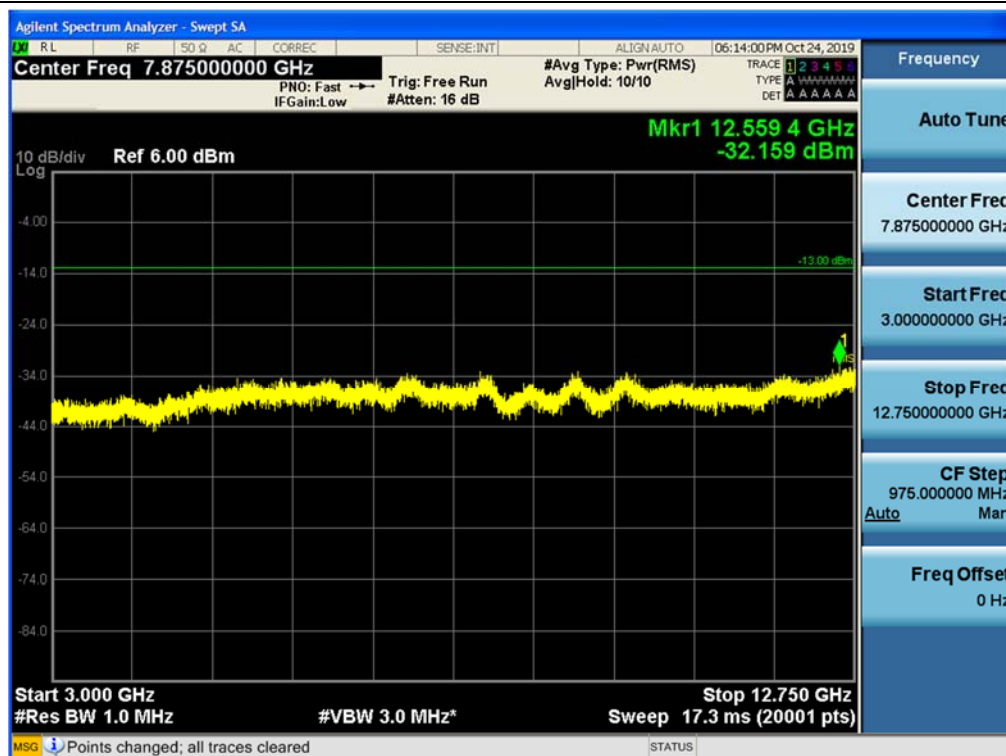
Antenna 0 / 873.88 MHz ~ 1 GHz / CDMA / BPSK / High



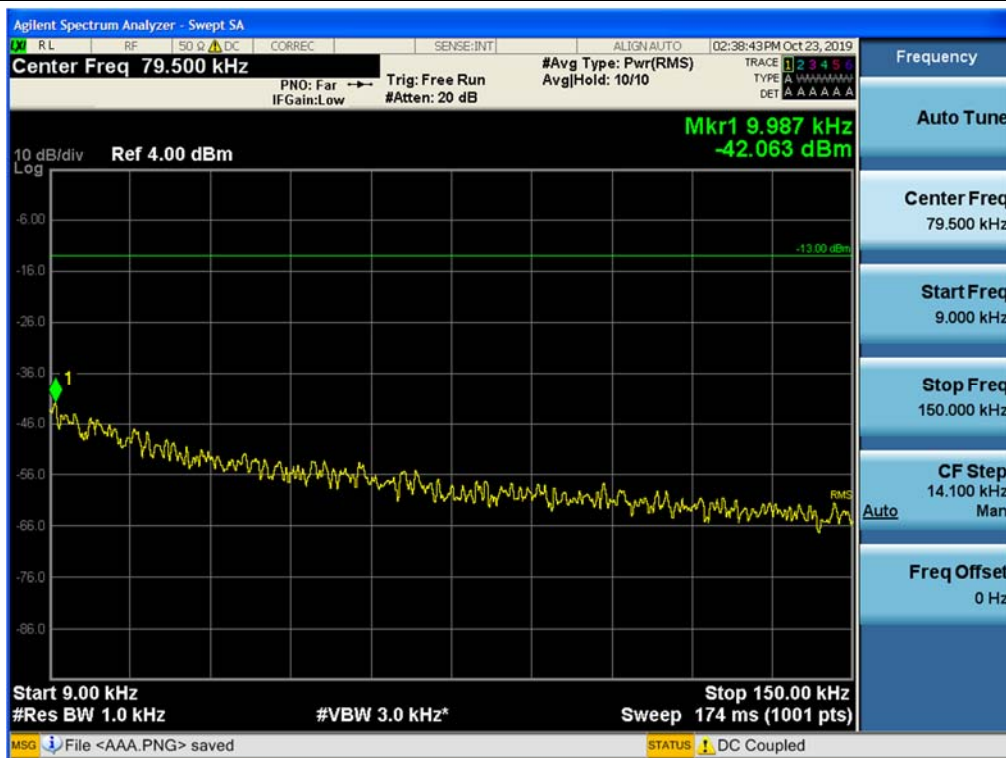
Antenna 0 / 1 GHz ~ 3 GHz / CDMA / BPSK / High



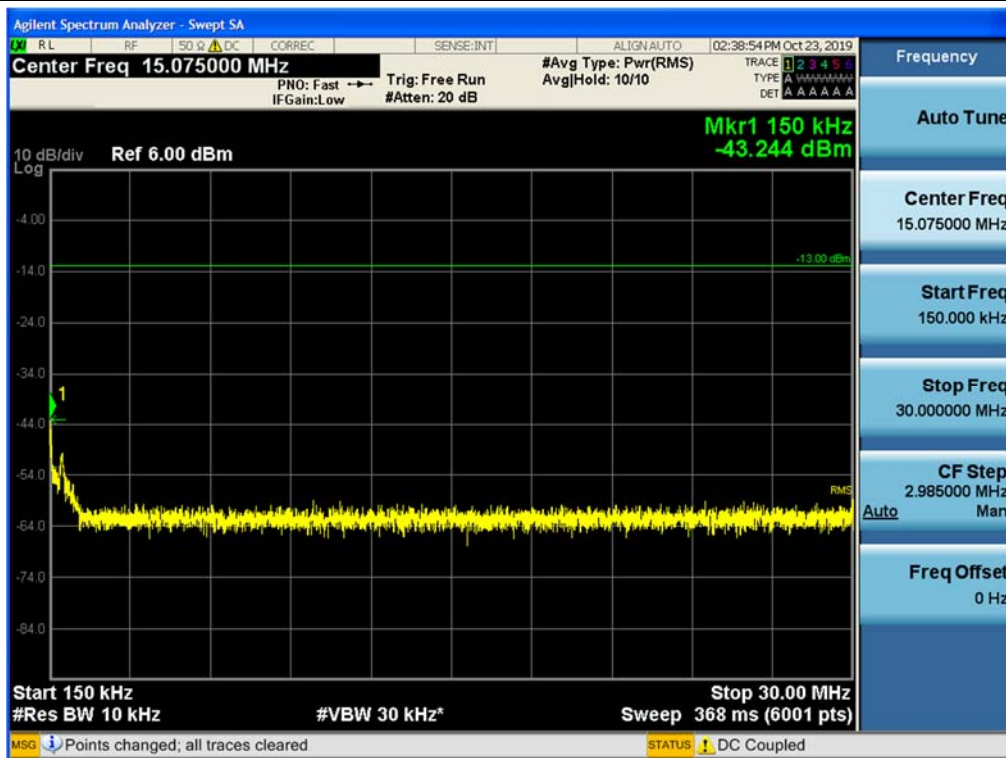
Antenna 0 / 3 GHz ~ 12.75 GHz / CDMA / BPSK / High



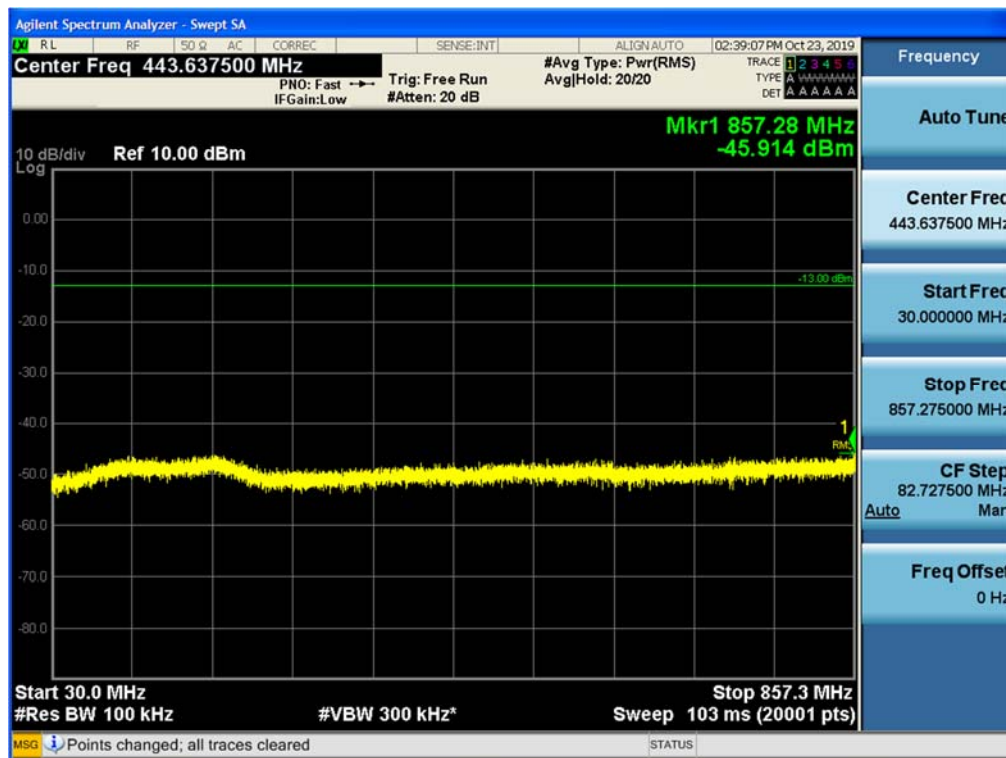
Antenna 0 / 9 kHz ~ 150 kHz / CDMA / QPSK / Low



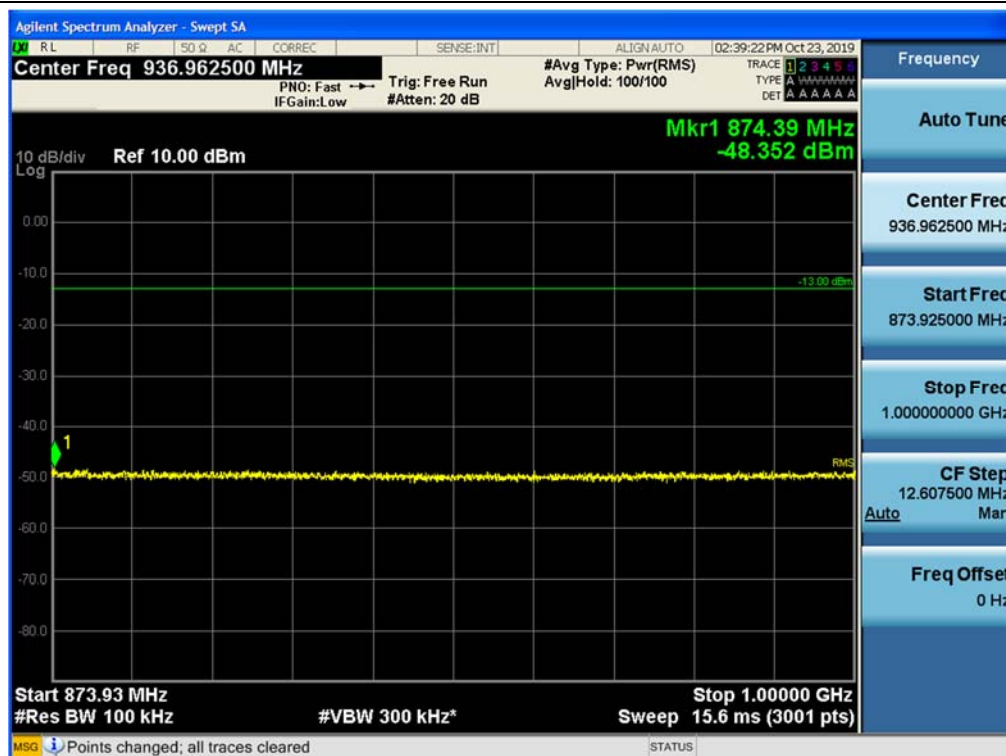
Antenna 0 / 150 kHz ~ 30 MHz / CDMA / QPSK / Low



Antenna 0 / 30 MHz ~ 857.3 MHz / CDMA / QPSK / Low



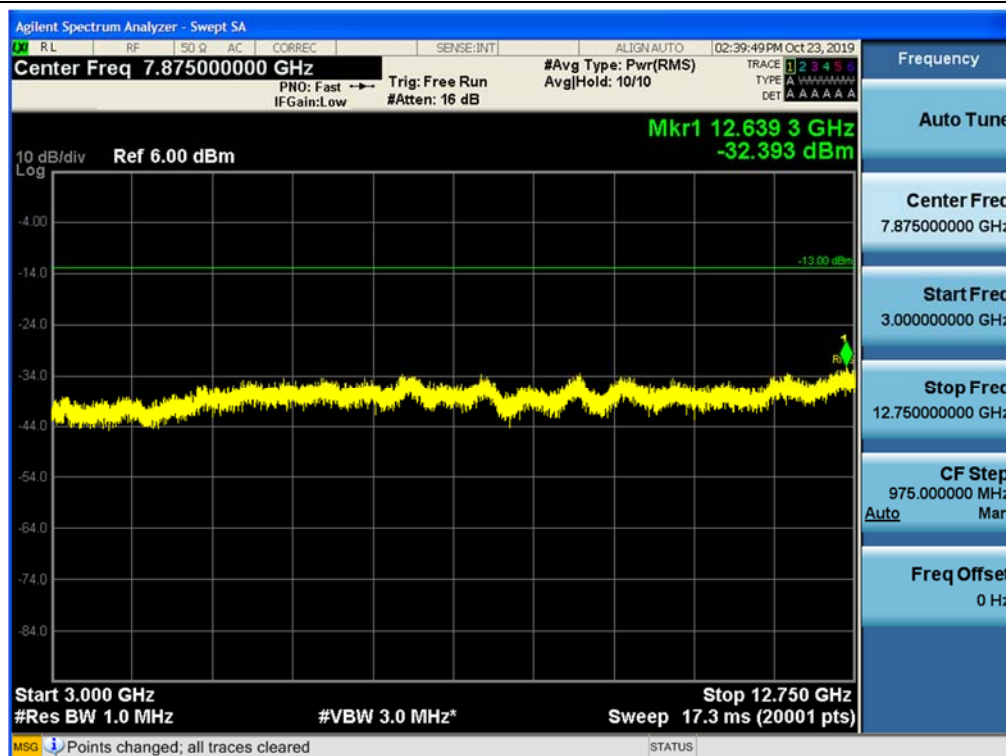
Antenna 0 / 873.88 MHz ~ 1 GHz / CDMA / QPSK / Low



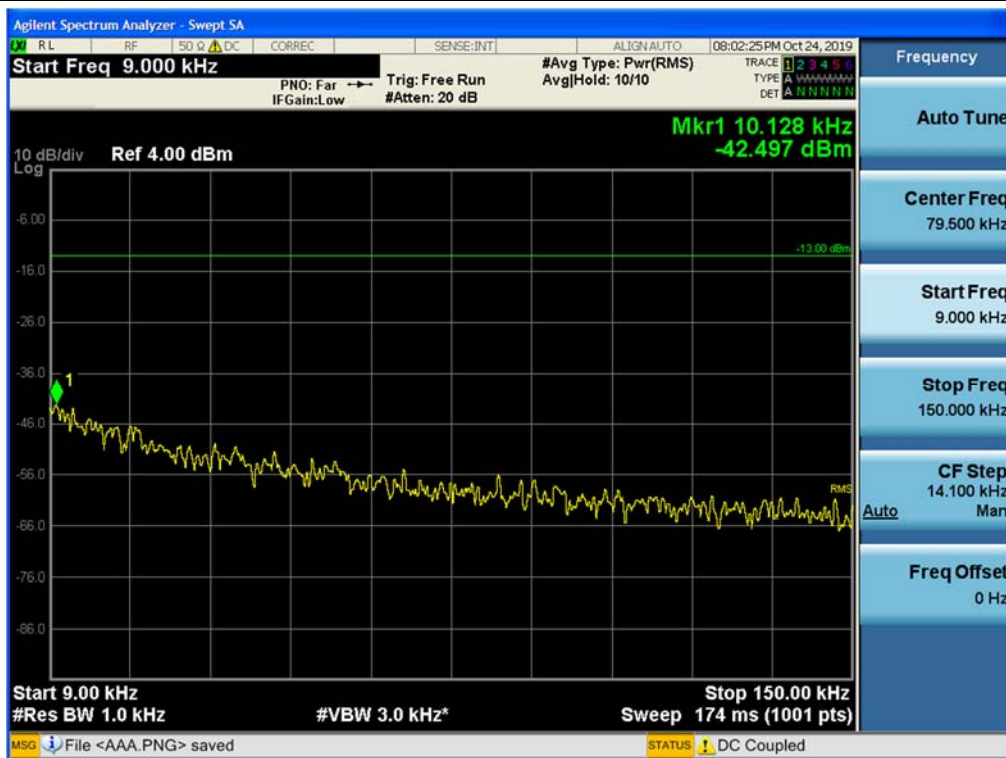
Antenna 0 / 1 GHz ~ 3 GHz / CDMA / QPSK / Low



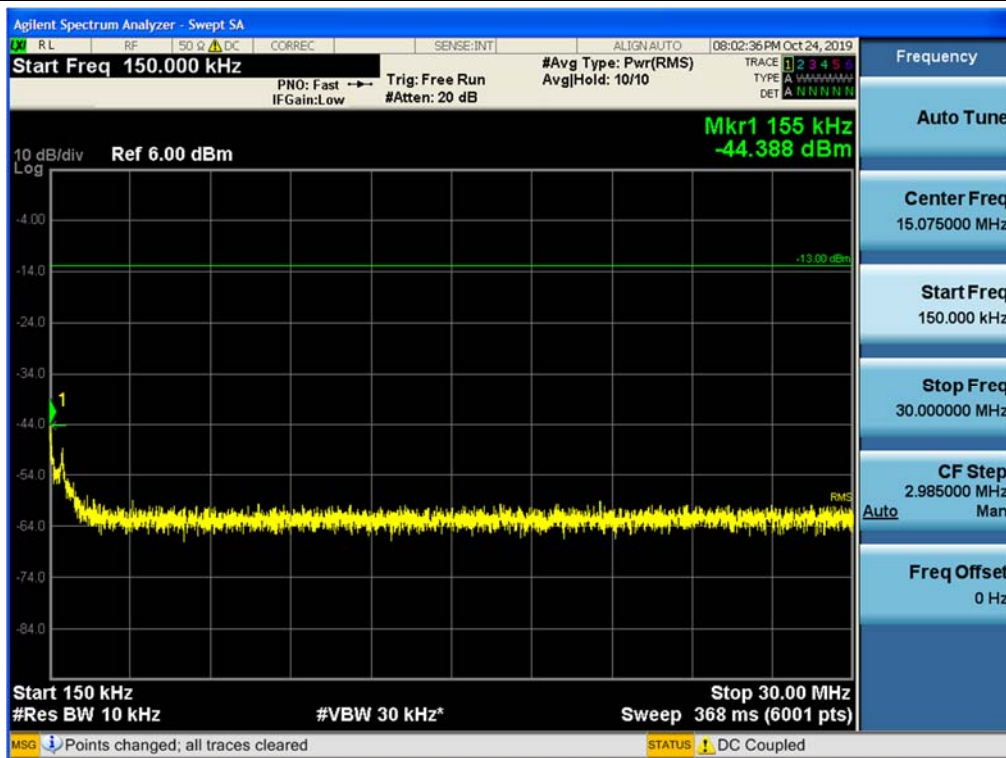
Antenna 0 / 3 GHz ~ 12.75 GHz / CDMA / QPSK / Low



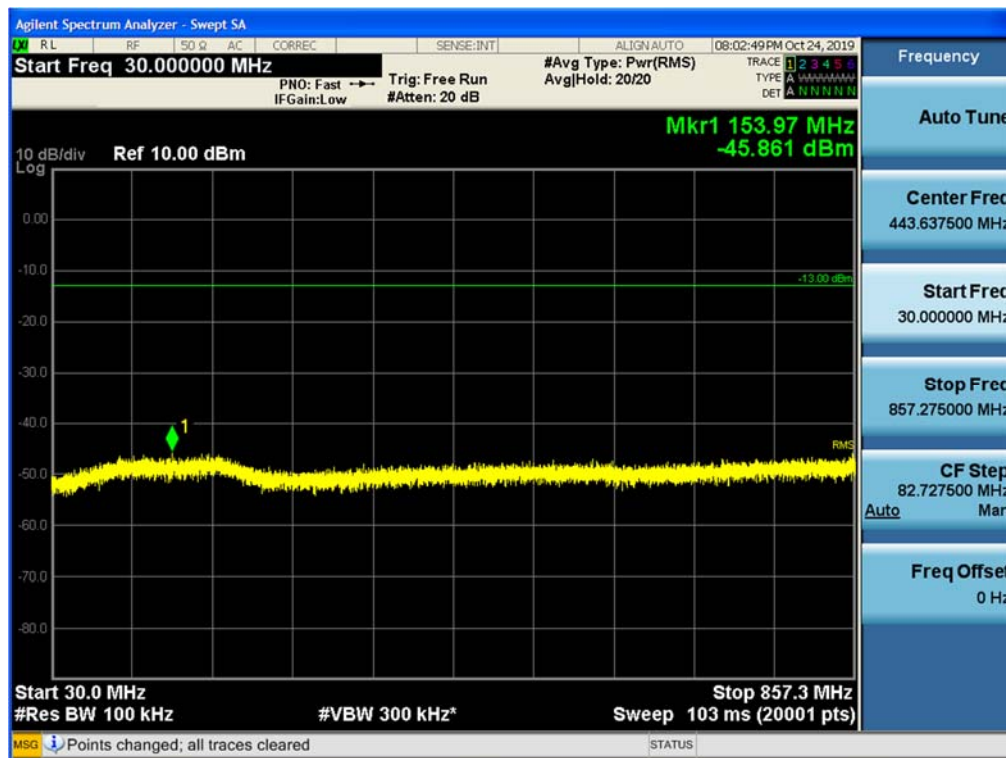
Antenna 0 / 9 kHz ~ 150 kHz / CDMA / QPSK / Middle



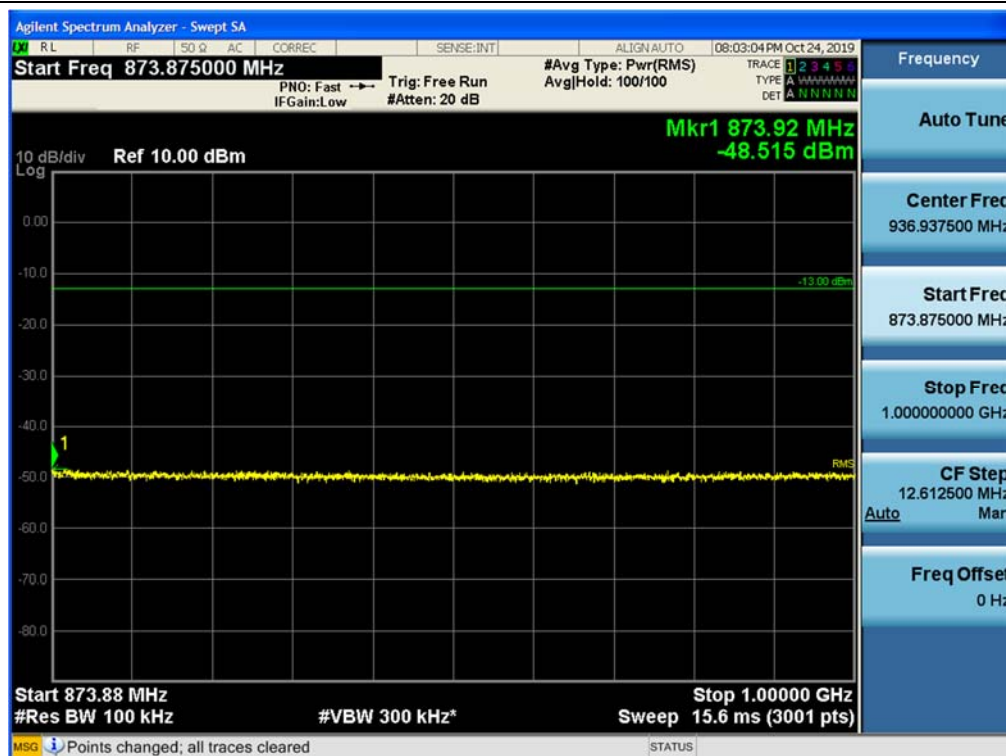
Antenna 0 / 150 kHz~ 30 MHz / CDMA / QPSK / Middle



Antenna 0 / 30 MHz ~ 857.3 MHz / CDMA / QPSK / Middle



Antenna 0 / 873.88 MHz ~ 1 GHz / CDMA / QPSK / Middle



Antenna 0 / 1 GHz ~ 3 GHz / CDMA / QPSK / Middle



Antenna 0 / 3 GHz ~ 12.75 GHz / CDMA / QPSK / Middle

