64QAM Modulation ANT1/Main						
120.0	-30.0	21.56337	0.008	129	0.05	compliant
120.0	-20.0	35.17779	0.014	129	0.05	compliant
120.0	-10.0	-44.79677	-0.017	129	0.05	compliant
120.0	0.0	-29.78207	-0.011	129	0.05	compliant
120.0	10.0	-52.77064	-0.020	129	0.05	compliant
120.0	30.0	-64.44873	-0.025	129	0.05	compliant
120.0	40.0	-49.14789	-0.019	129	0.05	compliant
120.0	50.0	-40.18944	-0.015	129	0.05	compliant
64QAM Modulation ANT1/Div						
120.0	-30.0	-52.37402	-0.020	129	0.05	compliant
120.0	-20.0	-54.17753	-0.021	129	0.05	compliant
120.0	-10.0	-34.04153	-0.013	129	0.05	compliant
120.0	0.0	-19.17312	-0.007	129	0.05	compliant
120.0	10.0	-30.96749	-0.012	129	0.05	compliant
120.0	30.0	-32.42463	-0.013	129	0.05	compliant
120.0	40.0	28.80579	0.011	129	0.05	compliant
120.0	50.0	-32.15665	-0.012	129	0.05	compliant
64QAM Modulation ANT2/Main						
120.0	-30.0	-41.74727	-0.016	129	0.05	compliant
120.0	-20.0	-43.69986	-0.017	129	0.05	compliant
120.0	-10.0	28.79437	0.011	129	0.05	compliant
120.0	0.0	-40.36251	-0.016	129	0.05	compliant
120.0	10.0	41.51135	0.016	129	0.05	compliant
120.0	30.0	34.15421	0.013	129	0.05	compliant
120.0	40.0	-41.73272	-0.016	129	0.05	compliant
120.0	50.0	-39.68870	-0.015	129	0.05	compliant
64QAM Modulation ANT2/Div						
120.0	-30.0	-31.29796	-0.012	129	0.05	compliant
120.0	-20.0	26.12074	0.010	129	0.05	compliant
120.0	-10.0	-33.46539	-0.013	129	0.05	compliant
120.0	0.0	35.97635	0.014	129	0.05	compliant
120.0	10.0	-34.47737	-0.013	129	0.05	compliant
120.0	30.0	34.41104	0.013	129	0.05	compliant
120.0	40.0	-39.16081	-0.015	129	0.05	compliant
120.0	50.0	39.45604	0.015	129	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 40 Frequency stability with temp. var. (10 MHz Channel BW)

Config C:

Carrier Frequency: 2593.0 MHz						
Supply Voltage (AC) [V]	Ambient Temperature [°C]	Frequency Deviation		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1/Main						
120.0	-30.0	15.72060	0.006	129	0.05	compliant
120.0	-20.0	-14.95322	-0.006	129	0.05	compliant
120.0	-10.0	32.02870	0.012	129	0.05	compliant
120.0	0.0	20.00359	0.008	129	0.05	compliant
120.0	10.0	-15.57637	-0.006	129	0.05	compliant
120.0	30.0	-26.75161	-0.010	129	0.05	compliant
120.0	40.0	-18.53830	-0.007	129	0.05	compliant
120.0	50.0	-40.59745	-0.016	129	0.05	compliant
QPSK Modulation ANT1/Div						
120.0	-30.0	15.96595	0.006	129	0.05	compliant
120.0	-20.0	-23.81948	-0.009	129	0.05	compliant
120.0	-10.0	-26.99355	-0.010	129	0.05	compliant
120.0	0.0	-50.26374	-0.019	129	0.05	compliant
120.0	10.0	-19.02278	-0.007	129	0.05	compliant
120.0	30.0	-31.66948	-0.012	129	0.05	compliant
120.0	40.0	-45.28580	-0.017	129	0.05	compliant
120.0	50.0	-16.78690	-0.006	129	0.05	compliant
QPSK Modulation ANT2/Main						
120.0	-30.0	-20.26796	-0.008	129	0.05	compliant
120.0	-20.0	-15.83853	-0.006	129	0.05	compliant
120.0	-10.0	-46.47231	-0.018	129	0.05	compliant
120.0	0.0	-25.06187	-0.010	129	0.05	compliant
120.0	10.0	29.27395	0.011	129	0.05	compliant
120.0	30.0	-35.21475	-0.014	129	0.05	compliant
120.0	40.0	-31.39458	-0.012	129	0.05	compliant
120.0	50.0	-33.20260	-0.013	129	0.05	compliant
QPSK Modulation ANT2/Div						
120.0	-30.0	20.47799	0.008	129	0.05	compliant
120.0	-20.0	-18.67415	-0.007	129	0.05	compliant
120.0	-10.0	12.57218	0.005	129	0.05	compliant
120.0	0.0	-38.09868	-0.015	129	0.05	compliant
120.0	10.0	33.86906	0.013	129	0.05	compliant
120.0	30.0	-49.95715	-0.019	129	0.05	compliant
120.0	40.0	-30.97230	-0.012	129	0.05	compliant
120.0	50.0	33.93405	0.013	129	0.05	compliant

16QAM Modulation ANT1/Main						
120.0	-30.0	34.37475	0.013	129	0.05	compliant
120.0	-20.0	14.21667	0.005	129	0.05	compliant
120.0	-10.0	-29.66810	-0.011	129	0.05	compliant
120.0	0.0	-25.26622	-0.010	129	0.05	compliant
120.0	10.0	-19.72591	-0.008	129	0.05	compliant
120.0	30.0	-20.00041	-0.008	129	0.05	compliant
120.0	40.0	23.51974	0.009	129	0.05	compliant
120.0	50.0	-36.38697	-0.014	129	0.05	compliant
16QAM Modulation ANT1/Div						
120.0	-30.0	-26.76614	-0.010	129	0.05	compliant
120.0	-20.0	-27.22547	-0.010	129	0.05	compliant
120.0	-10.0	32.91798	0.013	129	0.05	compliant
120.0	0.0	-65.39568	-0.025	129	0.05	compliant
120.0	10.0	-25.37460	-0.010	129	0.05	compliant
120.0	30.0	-42.23637	-0.016	129	0.05	compliant
120.0	40.0	-25.71982	-0.010	129	0.05	compliant
120.0	50.0	-38.68184	-0.015	129	0.05	compliant
16QAM Modulation ANT2/Main						
120.0	-30.0	-21.64964	-0.008	129	0.05	compliant
120.0	-20.0	36.05088	0.014	129	0.05	compliant
120.0	-10.0	-46.80588	-0.018	129	0.05	compliant
120.0	0.0	32.87438	0.013	129	0.05	compliant
120.0	10.0	34.93848	0.013	129	0.05	compliant
120.0	30.0	-37.58647	-0.014	129	0.05	compliant
120.0	40.0	15.77016	0.006	129	0.05	compliant
120.0	50.0	28.56566	0.011	129	0.05	compliant
16QAM Modulation ANT2/Div						
120.0	-30.0	-23.53054	-0.009	129	0.05	compliant
120.0	-20.0	-23.20562	-0.009	129	0.05	compliant
120.0	-10.0	-35.70705	-0.014	129	0.05	compliant
120.0	0.0	-22.01083	-0.008	129	0.05	compliant
120.0	10.0	33.86906	0.013	129	0.05	compliant
120.0	30.0	-56.08499	-0.022	129	0.05	compliant
120.0	40.0	-41.44379	-0.016	129	0.05	compliant
120.0	50.0	-31.81313	-0.012	129	0.05	compliant
64QAM Modulation ANT1/Main						
120.0	-30.0	-23.51544	-0.009	129	0.05	compliant
120.0	-20.0	-17.37830	-0.007	129	0.05	compliant
120.0	-10.0	-18.58692	-0.007	129	0.05	compliant
120.0	0.0	-16.07104	-0.006	129	0.05	compliant
120.0	10.0	-36.69412	-0.014	129	0.05	compliant

120.0	30.0	25.97242	0.010	129	0.05	compliant
120.0	40.0	-21.47911	-0.008	129	0.05	compliant
120.0	50.0	-22.76858	-0.009	129	0.05	compliant
64QAM Modulation ANT1/Div						
120.0	-30.0	23.84001	0.009	129	0.05	compliant
120.0	-20.0	18.85531	0.007	129	0.05	compliant
120.0	-10.0	-25.12514	-0.010	129	0.05	compliant
120.0	0.0	-62.30960	-0.024	129	0.05	compliant
120.0	10.0	-38.57600	-0.015	129	0.05	compliant
120.0	30.0	-49.30834	-0.019	129	0.05	compliant
120.0	40.0	-24.95899	-0.010	129	0.05	compliant
120.0	50.0	20.69850	0.008	129	0.05	compliant
64QAM Modulation ANT2/Main						
120.0	-30.0	-27.11153	-0.010	129	0.05	compliant
120.0	-20.0	-22.66605	-0.009	129	0.05	compliant
120.0	-10.0	-27.52079	-0.011	129	0.05	compliant
120.0	0.0	-19.29344	-0.007	129	0.05	compliant
120.0	10.0	40.89274	0.016	129	0.05	compliant
120.0	30.0	22.33433	0.009	129	0.05	compliant
120.0	40.0	-38.90724	-0.015	129	0.05	compliant
120.0	50.0	-24.66879	-0.010	129	0.05	compliant
64QAM Modulation ANT2/Div						
120.0	-30.0	-13.73317	-0.005	129	0.05	compliant
120.0	-20.0	-12.77885	-0.005	129	0.05	compliant
120.0	-10.0	-13.57230	-0.005	129	0.05	compliant
120.0	0.0	-24.33117	-0.009	129	0.05	compliant
120.0	10.0	23.02162	0.009	129	0.05	compliant
120.0	30.0	-17.47269	-0.007	129	0.05	compliant
120.0	40.0	-24.81141	-0.010	129	0.05	compliant
120.0	50.0	-21.09316	-0.008	129	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 41 Frequency stability with temp. var. (15 MHz Channel BW)

Config E:

Carrier Frequency: 2593.0 MHz						
Supply Voltage (AC) [V]	Ambient Temperature [°C]	Frequency Deviation		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1/Main						
120.0	-30.0	36.01429	0.014	129	0.05	compliant
120.0	-20.0	-33.32621	-0.013	129	0.05	compliant
120.0	-10.0	-41.58862	-0.016	129	0.05	compliant
120.0	0.0	34.00355	0.013	129	0.05	compliant
120.0	10.0	-44.24359	-0.017	129	0.05	compliant
120.0	30.0	-27.28770	-0.011	129	0.05	compliant
120.0	40.0	-30.19642	-0.012	129	0.05	compliant
120.0	50.0	-69.91019	-0.027	129	0.05	compliant
QPSK Modulation ANT1/Div						
120.0	-30.0	-37.66715	-0.015	129	0.05	compliant
120.0	-20.0	33.83816	0.013	129	0.05	compliant
120.0	-10.0	-29.60012	-0.011	129	0.05	compliant
120.0	0.0	34.83017	0.013	129	0.05	compliant
120.0	10.0	-28.60516	-0.011	129	0.05	compliant
120.0	30.0	-29.84990	-0.012	129	0.05	compliant
120.0	40.0	26.37931	0.010	129	0.05	compliant
120.0	50.0	-76.66847	-0.030	129	0.05	compliant
QPSK Modulation ANT2/Main						
120.0	-30.0	26.36648	0.010	129	0.05	compliant
120.0	-20.0	35.05859	0.014	129	0.05	compliant
120.0	-10.0	-26.58961	-0.010	129	0.05	compliant
120.0	0.0	-17.65807	-0.007	129	0.05	compliant
120.0	10.0	-20.51122	-0.008	129	0.05	compliant
120.0	30.0	-50.56669	-0.020	129	0.05	compliant
120.0	40.0	-24.42797	-0.009	129	0.05	compliant
120.0	50.0	-43.01971	-0.017	129	0.05	compliant
QPSK Modulation ANT2/Div						
120.0	-30.0	41.35973	0.016	129	0.05	compliant
120.0	-20.0	-52.11365	-0.020	129	0.05	compliant
120.0	-10.0	-29.93879	-0.012	129	0.05	compliant
120.0	0.0	-34.30574	-0.013	129	0.05	compliant
120.0	10.0	-20.38552	-0.008	129	0.05	compliant
120.0	30.0	-59.19621	-0.023	129	0.05	compliant
120.0	40.0	-42.49923	-0.016	129	0.05	compliant
120.0	50.0	-43.36970	-0.017	129	0.05	compliant

16QAM Modulation ANT1/Main						
120.0	-30.0	-46.57282	-0.018	129	0.05	compliant
120.0	-20.0	-63.85722	-0.025	129	0.05	compliant
120.0	-10.0	-42.84063	-0.017	129	0.05	compliant
120.0	0.0	26.84739	0.010	129	0.05	compliant
120.0	10.0	-32.07901	-0.012	129	0.05	compliant
120.0	30.0	-41.75015	-0.016	129	0.05	compliant
120.0	40.0	29.08609	0.011	129	0.05	compliant
120.0	50.0	-46.47495	-0.018	129	0.05	compliant
16QAM Modulation ANT1/Div						
120.0	-30.0	-28.71114	-0.011	129	0.05	compliant
120.0	-20.0	-23.08899	-0.009	129	0.05	compliant
120.0	-10.0	-47.53419	-0.018	129	0.05	compliant
120.0	0.0	-32.32048	-0.012	129	0.05	compliant
120.0	10.0	29.76086	0.011	129	0.05	compliant
120.0	30.0	-30.40689	-0.012	129	0.05	compliant
120.0	40.0	-45.75562	-0.018	129	0.05	compliant
120.0	50.0	-40.96479	-0.016	129	0.05	compliant
16QAM Modulation ANT2/Main						
120.0	-30.0	-24.79735	-0.010	129	0.05	compliant
120.0	-20.0	-33.68000	-0.013	129	0.05	compliant
120.0	-10.0	-31.73231	-0.012	129	0.05	compliant
120.0	0.0	35.02243	0.014	129	0.05	compliant
120.0	10.0	19.31558	0.007	129	0.05	compliant
120.0	30.0	-40.72766	-0.016	129	0.05	compliant
120.0	40.0	29.24045	0.011	129	0.05	compliant
120.0	50.0	-68.46717	-0.026	129	0.05	compliant
16QAM Modulation ANT2/Div						
120.0	-30.0	23.77972	0.009	129	0.05	compliant
120.0	-20.0	-32.28816	-0.012	129	0.05	compliant
120.0	-10.0	32.61474	0.013	129	0.05	compliant
120.0	0.0	46.81619	0.018	129	0.05	compliant
120.0	10.0	34.93046	0.013	129	0.05	compliant
120.0	30.0	-67.15754	-0.026	129	0.05	compliant
120.0	40.0	-49.64670	-0.019	129	0.05	compliant
120.0	50.0	-52.28935	-0.020	129	0.05	compliant
64QAM Modulation ANT1/Main						
120.0	-30.0	-45.27745	-0.017	129	0.05	compliant
120.0	-20.0	-46.18167	-0.018	129	0.05	compliant
120.0	-10.0	-45.77291	-0.018	129	0.05	compliant
120.0	0.0	-25.86438	-0.010	129	0.05	compliant
120.0	10.0	-45.17162	-0.017	129	0.05	compliant

120.0	30.0	-37.52190	-0.014	129	0.05	compliant
120.0	40.0	28.60783	0.011	129	0.05	compliant
120.0	50.0	-48.86482	-0.019	129	0.05	compliant
64QAM Modulation ANT1/Div						
120.0	-30.0	-18.06047	-0.007	129	0.05	compliant
120.0	-20.0	-27.71610	-0.011	129	0.05	compliant
120.0	-10.0	-41.29380	-0.016	129	0.05	compliant
120.0	0.0	-26.24019	-0.010	129	0.05	compliant
120.0	10.0	-34.50488	-0.013	129	0.05	compliant
120.0	30.0	-39.07103	-0.015	129	0.05	compliant
120.0	40.0	-39.03801	-0.015	129	0.05	compliant
120.0	50.0	-45.37436	-0.017	129	0.05	compliant
64QAM Modulation ANT2/Main						
120.0	-30.0	44.17337	0.017	129	0.05	compliant
120.0	-20.0	-21.69234	-0.008	129	0.05	compliant
120.0	-10.0	-23.10179	-0.009	129	0.05	compliant
120.0	0.0	-27.86270	-0.011	129	0.05	compliant
120.0	10.0	-20.88268	-0.008	129	0.05	compliant
120.0	30.0	-52.52474	-0.020	129	0.05	compliant
120.0	40.0	-29.03809	-0.011	129	0.05	compliant
120.0	50.0	-48.23101	-0.019	129	0.05	compliant
64QAM Modulation ANT2/Div						
120.0	-30.0	38.66632	0.015	129	0.05	compliant
120.0	-20.0	-41.73258	-0.016	129	0.05	compliant
120.0	-10.0	-35.74450	-0.014	129	0.05	compliant
120.0	0.0	-35.75179	-0.014	129	0.05	compliant
120.0	10.0	-34.53804	-0.013	129	0.05	compliant
120.0	30.0	-36.50703	-0.014	129	0.05	compliant
120.0	40.0	-32.38187	-0.012	129	0.05	compliant
120.0	50.0	-52.50231	-0.020	129	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 42 Frequency stability with temp. var. (20 MHz Channel BW)

Frequency Stability with Voltage Variation:

The EUT was placed in a climatic chamber and allowed to stabilize at +20 degrees Celsius for at least 60 minutes. With the supply voltage of the EUT set to 85% of the nominal value, the frequency error was measure. This procedure was repeated at 100% and 115% of the nominal supply voltage value.

Config A:

Carrier Frequency: 2593.0 MHz						
Supply Voltage (AC) [V]	Ambient Temperature [°C]	Frequency Deviation		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1/Main						
102.0	20.0	-35.42535	-0.014	129	0.05	compliant
120.0	20.0	-26.78226	-0.010	129	0.05	compliant
138.0	20.0	-38.72450	-0.015	129	0.05	compliant
QPSK Modulation ANT1/Div						
102.0	20.0	22.86310	0.009	129	0.05	compliant
120.0	20.0	40.40382	0.016	129	0.05	compliant
138.0	20.0	39.39455	0.015	129	0.05	compliant
QPSK Modulation ANT2/Main						
102.0	20.0	-25.41519	-0.010	129	0.05	compliant
120.0	20.0	-26.83433	-0.010	129	0.05	compliant
138.0	20.0	33.86392	0.013	129	0.05	compliant
QPSK Modulation ANT2/Div						
102.0	20.0	-35.40470	-0.014	129	0.05	compliant
120.0	20.0	-33.34683	-0.013	129	0.05	compliant
138.0	20.0	-38.49479	-0.015	129	0.05	compliant
16QAM Modulation ANT1/Main						
102.0	20.0	-16.39700	-0.006	129	0.05	compliant
120.0	20.0	-18.54926	-0.007	129	0.05	compliant
138.0	20.0	-42.11890	-0.016	129	0.05	compliant
16QAM Modulation ANT1/Div						
102.0	20.0	-20.65954	-0.008	129	0.05	compliant
120.0	20.0	24.46419	0.009	129	0.05	compliant
138.0	20.0	29.14325	0.011	129	0.05	compliant
16QAM Modulation ANT2/Main						
102.0	20.0	28.37883	0.011	129	0.05	compliant
120.0	20.0	-30.34253	-0.012	129	0.05	compliant
138.0	20.0	46.47205	0.018	129	0.05	compliant
16QAM Modulation ANT2/Div						
102.0	20.0	-23.58762	-0.009	129	0.05	compliant

120.0	20.0	40.29325	0.016	129	0.05	compliant
138.0	20.0	-28.15136	-0.011	129	0.05	compliant
64QAM Modulation ANT1/Main						
102.0	20.0	-39.67578	-0.015	129	0.05	compliant
120.0	20.0	22.74002	0.009	129	0.05	compliant
138.0	20.0	-30.99016	-0.012	129	0.05	compliant
64QAM Modulation ANT1/Div						
102.0	20.0	-20.08309	-0.008	129	0.05	compliant
120.0	20.0	-37.98987	-0.015	129	0.05	compliant
138.0	20.0	20.87723	0.008	129	0.05	compliant
64QAM Modulation ANT2/Main						
102.0	20.0	-29.05627	-0.011	129	0.05	compliant
120.0	20.0	28.39658	0.011	129	0.05	compliant
138.0	20.0	-24.43089	-0.009	129	0.05	compliant
64QAM Modulation ANT2/Div						
102.0	20.0	40.09055	0.015	129	0.05	compliant
120.0	20.0	-29.09799	-0.011	129	0.05	compliant
138.0	20.0	29.76290	0.011	129	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 43 Frequency stability with voltage var. (10 MHz Channel BW)

Config C:

Carrier Frequency: 2593.0 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1/Main						
102.0	20.0	-28.15360	-0.011	129	0.05	compliant
120.0	20.0	-30.40760	-0.012	129	0.05	compliant
138.0	20.0	-39.15521	-0.015	129	0.05	compliant
QPSK Modulation ANT1/Div						
102.0	20.0	-24.95811	-0.010	129	0.05	compliant
120.0	20.0	-27.07261	-0.010	129	0.05	compliant
138.0	20.0	-30.84857	-0.012	129	0.05	compliant
QPSK Modulation ANT2/Main						
102.0	20.0	-29.94483	-0.012	129	0.05	compliant
120.0	20.0	46.14010	0.018	129	0.05	compliant
138.0	20.0	-11.09130	-0.004	129	0.05	compliant
QPSK Modulation ANT2/Div						
102.0	20.0	-32.69082	-0.013	129	0.05	compliant
120.0	20.0	-44.43791	-0.017	129	0.05	compliant

138.0	20.0	-47.30063	-0.018	129	0.05	compliant
16QAM Modulation ANT1/Main						
102.0	20.0	-42.02937	-0.016	129	0.05	compliant
120.0	20.0	-38.02777	-0.015	129	0.05	compliant
138.0	20.0	-16.68298	-0.006	129	0.05	compliant
16QAM Modulation ANT1/Div						
102.0	20.0	-18.77266	-0.007	129	0.05	compliant
120.0	20.0	-21.51234	-0.008	129	0.05	compliant
138.0	20.0	-26.64549	-0.010	129	0.05	compliant
16QAM Modulation ANT2/Main						
102.0	20.0	31.17328	0.012	129	0.05	compliant
120.0	20.0	-23.23511	-0.009	129	0.05	compliant
138.0	20.0	-36.49310	-0.014	129	0.05	compliant
16QAM Modulation ANT2/Div						
102.0	20.0	-45.69382	-0.018	129	0.05	compliant
120.0	20.0	35.94634	0.014	129	0.05	compliant
138.0	20.0	-37.42972	-0.014	129	0.05	compliant
64QAM Modulation ANT1/Main						
102.0	20.0	-33.40341	-0.013	129	0.05	compliant
120.0	20.0	-31.84763	-0.012	129	0.05	compliant
138.0	20.0	-28.62201	-0.011	129	0.05	compliant
64QAM Modulation ANT1/Div						
102.0	20.0	-55.26673	-0.021	129	0.05	compliant
120.0	20.0	-33.61673	-0.013	129	0.05	compliant
138.0	20.0	-32.53179	-0.013	129	0.05	compliant
64QAM Modulation ANT2/Main						
102.0	20.0	-41.26994	-0.016	129	0.05	compliant
120.0	20.0	23.88595	0.009	129	0.05	compliant
138.0	20.0	-14.25285	-0.005	129	0.05	compliant
64QAM Modulation ANT2/Div						
102.0	20.0	-58.71842	-0.023	129	0.05	compliant
120.0	20.0	-39.70623	-0.015	129	0.05	compliant
138.0	20.0	-27.54616	-0.011	129	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 44 Frequency stability with voltage var. (15 MHz Channel BW)

Config E:

Carrier Frequency: 2593.0 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1/Main						
102.0	20.0	-45.24205	-0.017	129	0.05	compliant
120.0	20.0	-38.06831	-0.015	129	0.05	compliant
138.0	20.0	-47.56262	-0.018	129	0.05	compliant
QPSK Modulation ANT1/Div						
102.0	20.0	-47.97084	-0.019	129	0.05	compliant
120.0	20.0	-31.75413	-0.012	129	0.05	compliant
138.0	20.0	-42.98462	-0.017	129	0.05	compliant
QPSK Modulation ANT2/Main						
102.0	20.0	42.85150	0.017	129	0.05	compliant
120.0	20.0	-15.42356	-0.006	129	0.05	compliant
138.0	20.0	-35.42064	-0.014	129	0.05	compliant
QPSK Modulation ANT2/Div						
102.0	20.0	-25.09552	-0.010	129	0.05	compliant
120.0	20.0	24.02904	0.009	129	0.05	compliant
138.0	20.0	31.24782	0.012	129	0.05	compliant
16QAM Modulation ANT1/Main						
102.0	20.0	-46.13613	-0.018	129	0.05	compliant
120.0	20.0	-41.94247	-0.016	129	0.05	compliant
138.0	20.0	-24.89333	-0.010	129	0.05	compliant
16QAM Modulation ANT1/Div						
102.0	20.0	-30.33525	-0.012	129	0.05	compliant
120.0	20.0	-56.71012	-0.022	129	0.05	compliant
138.0	20.0	-34.24242	-0.013	129	0.05	compliant
16QAM Modulation ANT2/Main						
102.0	20.0	-33.77154	-0.013	129	0.05	compliant
120.0	20.0	28.09684	0.011	129	0.05	compliant
138.0	20.0	-31.27309	-0.012	129	0.05	compliant
16QAM Modulation ANT2/Div						
102.0	20.0	34.52983	0.013	129	0.05	compliant
120.0	20.0	37.00935	0.014	129	0.05	compliant
138.0	20.0	-23.81096	-0.009	129	0.05	compliant
64QAM Modulation ANT1/Main						
102.0	20.0	-52.51935	-0.020	129	0.05	compliant
120.0	20.0	-45.64625	-0.018	129	0.05	compliant
138.0	20.0	-51.70594	-0.020	129	0.05	compliant

64QAM Modulation ANT1/Div						
102.0	20.0	-48.01058	-0.019	129	0.05	compliant
120.0	20.0	-46.25485	-0.018	129	0.05	compliant
138.0	20.0	-34.41338	-0.013	129	0.05	compliant
64QAM Modulation ANT2/Main						
102.0	20.0	-30.42504	-0.012	129	0.05	compliant
120.0	20.0	-29.62819	-0.011	129	0.05	compliant
138.0	20.0	-31.58789	-0.012	129	0.05	compliant
64QAM Modulation ANT2/Div						
102.0	20.0	36.37471	0.014	129	0.05	compliant
120.0	20.0	38.49355	0.015	129	0.05	compliant
138.0	20.0	-27.72850	-0.011	129	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 45 Frequency stability with voltage var. (20 MHz Channel BW)

The measured frequency stability was found to be compliant with the manufacturer's specifications and with all requirements of the FCC rules.

5. TEST DATA AND SCREENSHOTS

5.1 Part List of the RF Measurement Test Equipment

No.	Test Equipment	Manufacturer & Type	Serial Number	Calibration date	Calibration due	Test No.
1	Signal Analyzer	Rohde & Schwarz: FSV 30	100781	07/2014	07/2015	1, 2, 3, 4, 6
2	Signal Analyzer	Rohde & Schwarz: FSW43	100747	07/2014	07/2015	1
2	Vector Network Analyzer	Rohde & Schwarz: ZVA40	100146	01/2014	01/2015	1, 2, 3, 4, 6
3	Vector Network Analyzer	Rohde & Schwarz: ZVL13	101177	07/2014	07/2015	1, 2, 3, 4, 6
4	Frequency Standard	Datum 8040	0030007339	01/2014	07/2015	6
5	Multimeter	Fluke 83	65870302	01/2014	01/2015	1, 2, 3, 4, 6
6	Humidity and Temperature Indicator	Vaisala: HMI 31	P3730008	12/2013	12/2014	1, 2, 3, 4, 6
7	AC Power Supply	Hewlett Packard 6843A	3531A00208	cnn	-	1, 2, 3, 4, 6
8	Temperature Chamber	Espec ARS-0608	410000357	08/1014	08/2015	6
9	Attenuator	Aeroflex/Weinschel: 66-20-33	CF0630	cnn	-	1, 2, 3, 4, 6
10	EMI Test Receiver	R&S ESU40	100262	05/2014	05/2015	5
11	Horn Antenna	Emco 3115	0102A06346	11/2013	11/2014	5
12	Bilog Antenna	Chase CBL6112B	2694	07/2014	07/2015	5
13	Log Periodic Antenna	R&S 1-26.5GHz	356749/012	09/2014	09/2015	5
14	Amplifier	Miteq AFSX4	902638	cnn	-	5
15	Antenna Mast	Deisel HD240	2401323194	cnn	-	5
16	Mast Controller	Deisel HD100	1001331	cnn	-	5

Table 46 Part List of the RF Measurement Test Equipment

5.2 Spectral Plots

5.2.1. Test No. 2: Modulation Characteristics

No additional measurements are required for the modulation characteristics. Please refer to test no. 3, occupied bandwidth on page 18.

Screenshots below shows information about the modulations I/Q constellation form and modulation information table, displaying error to ideal modulation symbols.

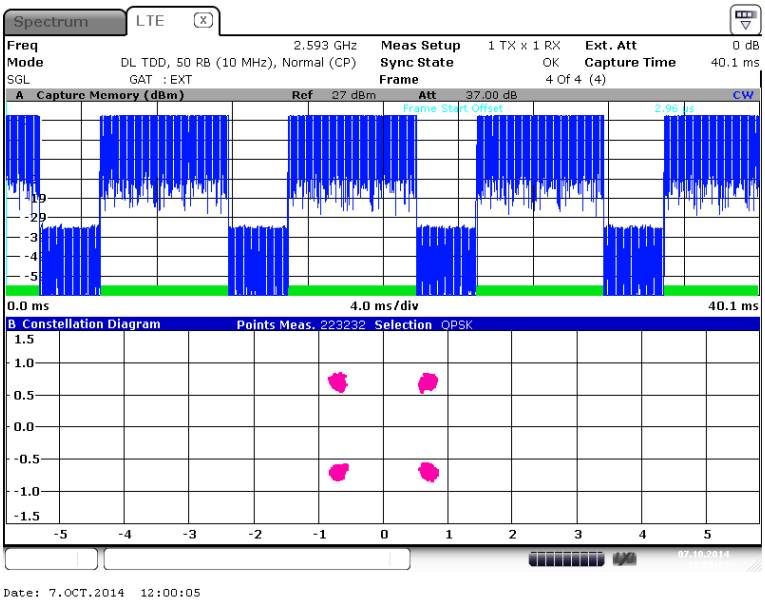

Figure 5 I/Q constellation diagram with capture buffer – QPSK (2593.0 MHz) (20MHz Channel BW)

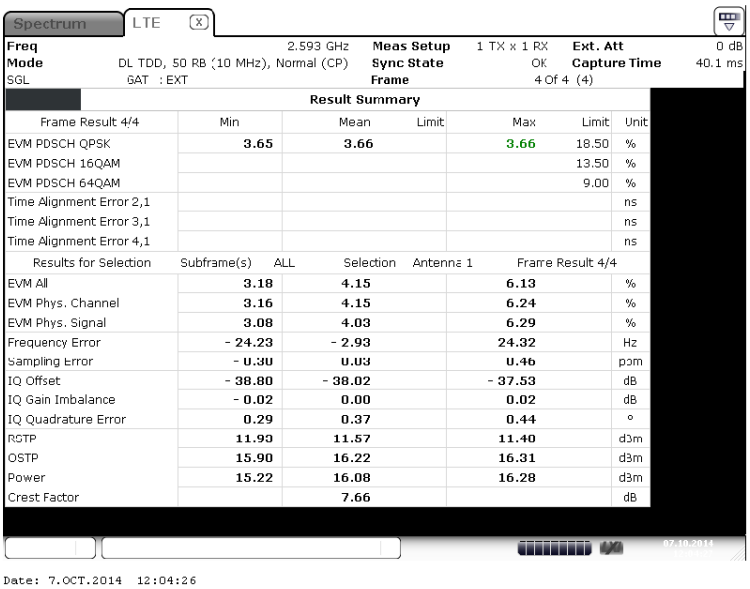

Figure 6 I/Q constellation table with I/Q error – QPSK (2593.0 MHz) (20MHz Channel BW)

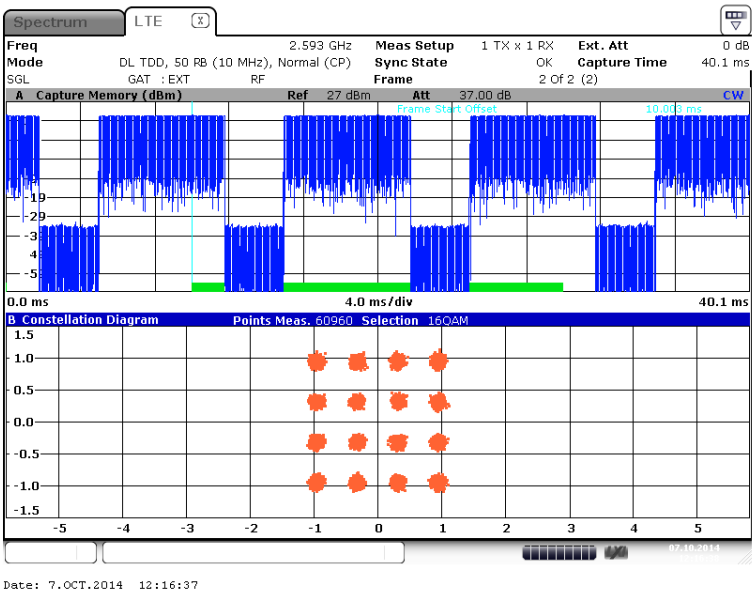

Figure 7 I/Q constellation diagram with capture buffer – 16QAM (2593.0 MHz) (20MHz Channel BW)

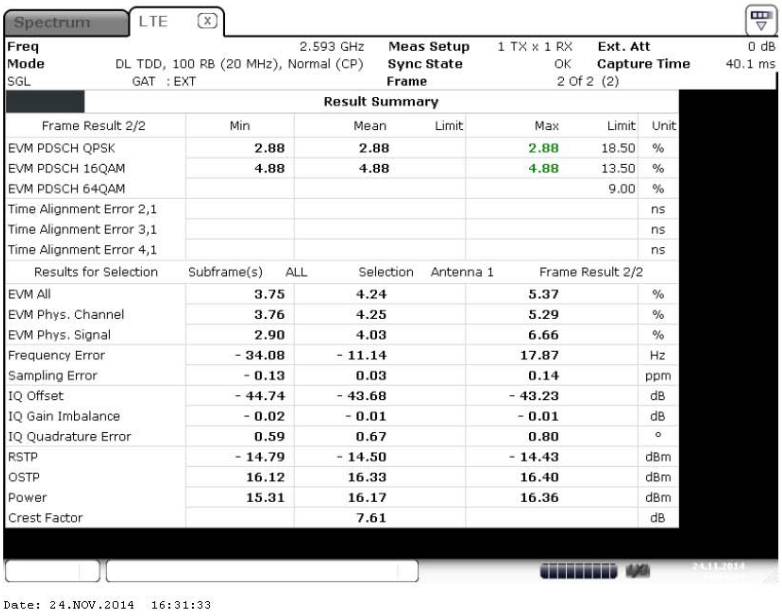

Figure 8 I/Q constellation table with I/Q error – 16QAM (2593.0 MHz) (20MHz Channel BW)

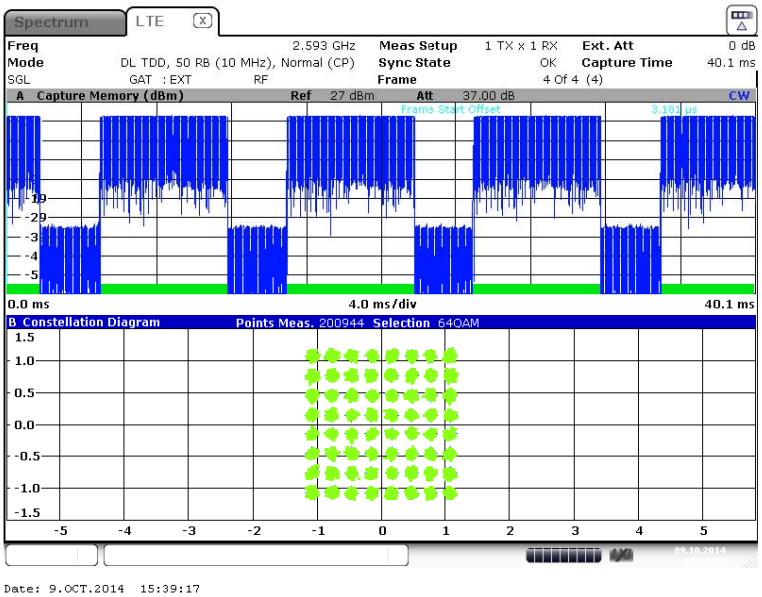

Figure 9 I/Q constellation diagram with capture buffer – 64QAM (2593.0 MHz) (20MHz Channel BW)

Spectrum | LTE

Freq	2.593 GHz	**Meas Setup**	1 TX x 1 RX	**Ext. Att**	0 dB
Mode	DL TDD, 50 RB (10 MHz), Normal (CP)	**Sync State**	OK	**Capture Time**	40.1 ms
SGL	GAT : EXT RF	**Frame**	4 Of 4 (4)		

Result Summary

Frame Result 4/4	Min	Mean	Limit	Max	Limit	Unit
EVM PDSCH QPSK					18.50	%
EVM PDSCH 16QAM					13.50	%
EVM PDSCH 64QAM	**3.41**	**3.42**		**3.42**	9.00	%
Time Alignment Error 2,1						ns
Time Alignment Error 3,1						ns
Time Alignment Error 4,1						ns
Results for Selection	Subframe(s) ALL	Selection	Antenna 1	Frame Result 4/4		
EVM All	**2.71**	**3.73**		**4.89**		%
EVM Phys. Channel	**2.69**	**3.73**		**4.98**		%
EVM Phys. Signal	**2.62**	**3.65**		**5.95**		%
Frequency Error	**- 33.66**	**- 5.51**		**19.36**		Hz
Sampling Error	**- 0.55**	**0.07**		**0.60**		ppm
IQ Offset	**- 47.50**	**- 46.24**		**- 44.85**		dB
IQ Gain Imbalance	**- 0.02**	**- 0.01**		**0.01**		dB
IQ Quadrature Error	**0.37**	**0.45**		**0.54**		°
RSTP	**- 11.79**	**- 11.51**		**- 11.43**		dBm
OSTP	**16.23**	**16.32**		**16.42**		dBm
Power	**15.28**	**16.14**		**16.34**		dBm
Crest Factor		**7.93**				dB

Date: 9.OCT.2014 15:39:57

Figure 10 I/Q constellation table with I/Q error – 64QAM (2593.0 MHz) (20MHz Channel BW)

5.2.2. Test No. 3: Occupied Bandwidth

Config A ANT1/Main:

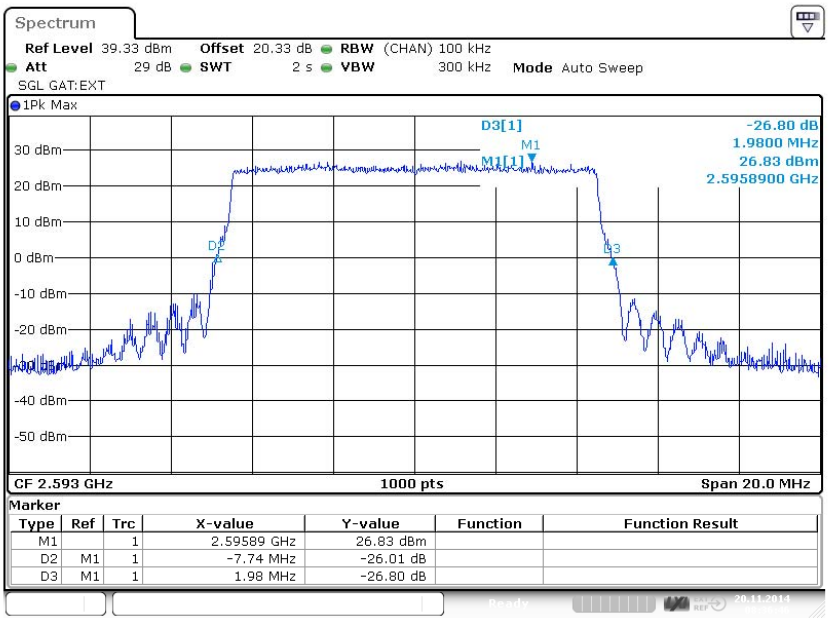

Figure 11 Occupied Bandwidth – QPSK (2593.0 MHz) (10MHz Channel BW)

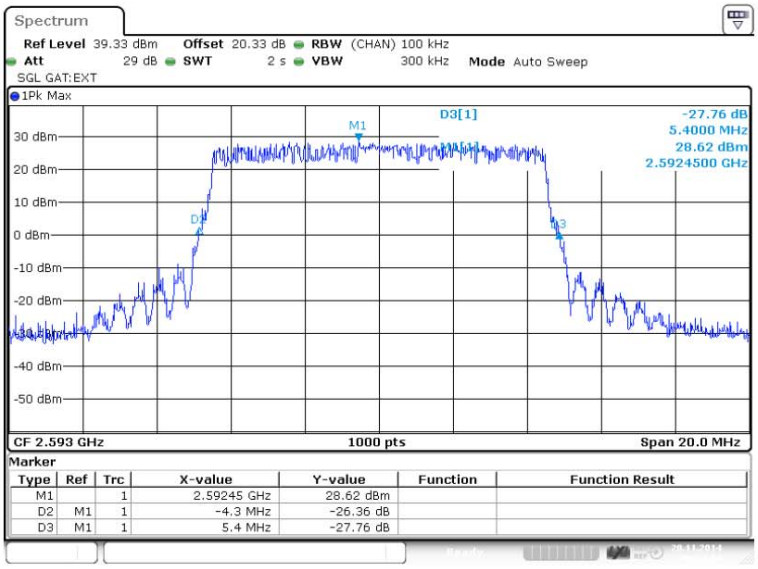

Figure 12 Occupied Bandwidth – 16QAM (2593.0 MHz) (10MHz Channel BW)

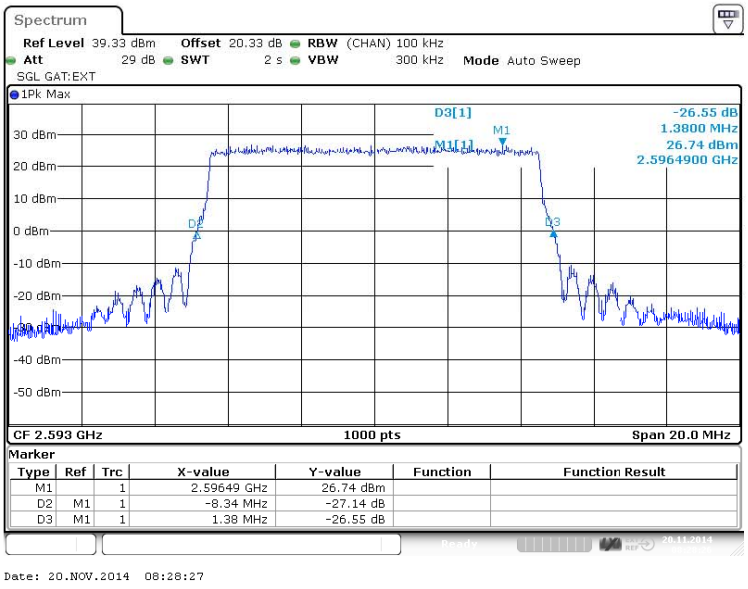

Figure 13 Occupied Bandwidth – 64QAM (2593.0 MHz) (10MHz Channel BW)

Config A ANT1/Div:

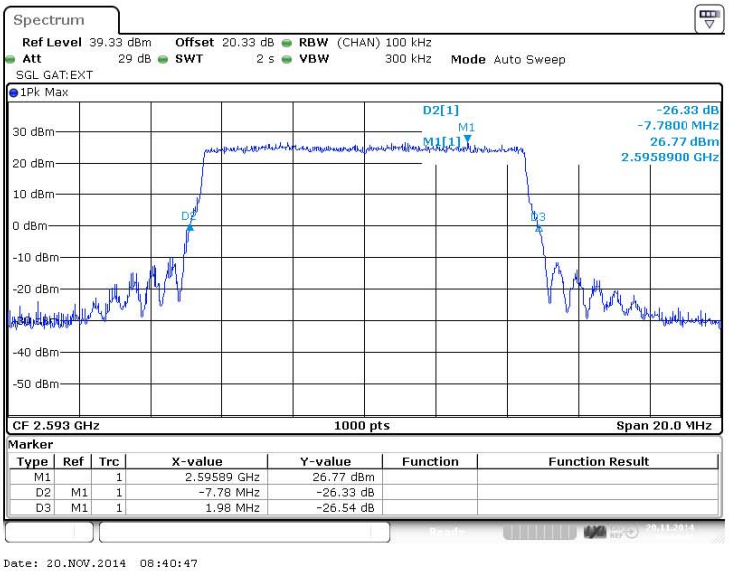

Figure 14 Occupied Bandwidth – QPSK (2593.0 MHz) (10MHz Channel BW)

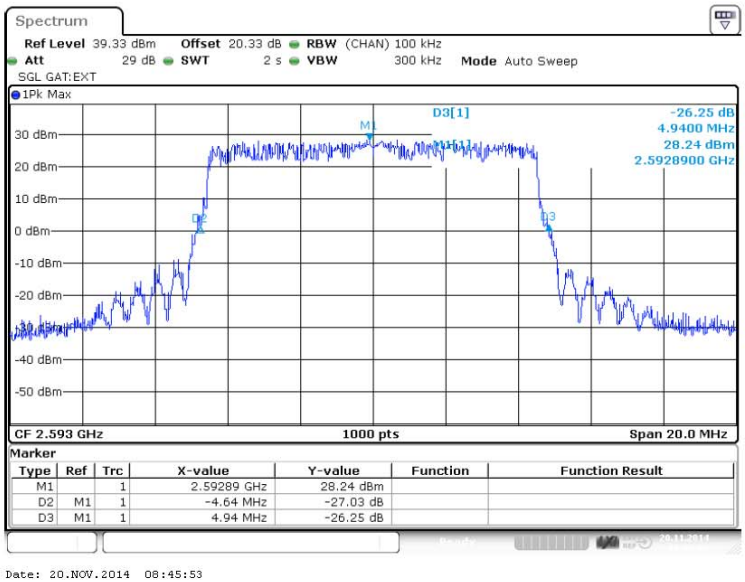

Figure 15 Occupied Bandwidth – 16QAM (2593.0 MHz) (10MHz Channel BW)

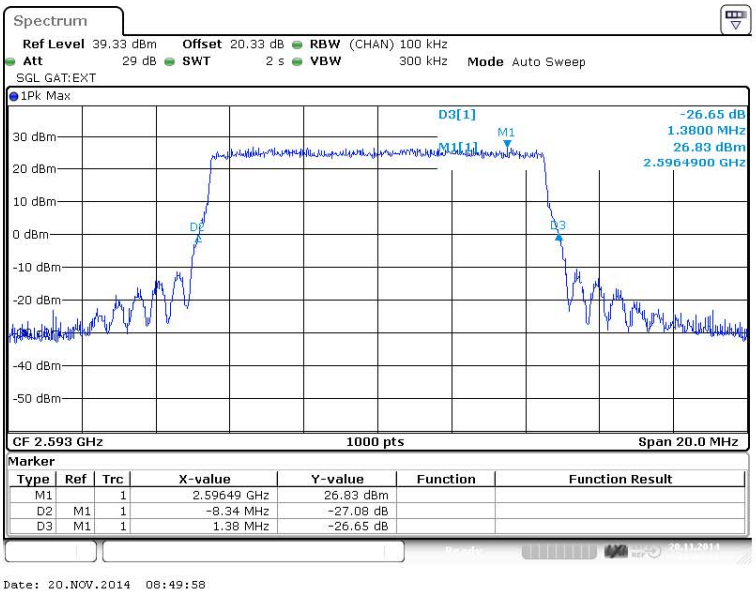

Figure 16 Occupied Bandwidth – 64QAM (2593.0 MHz) (10MHz Channel BW)

Config A ANT2/Main:

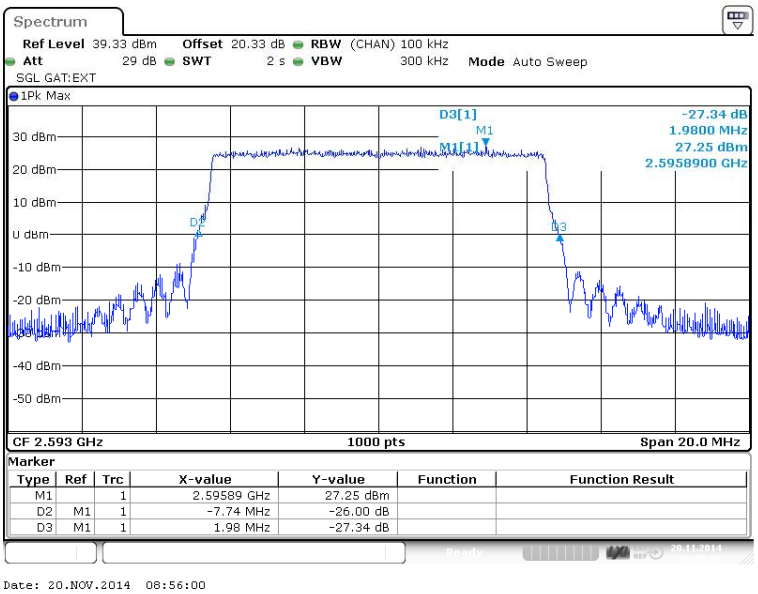

Figure 17 Occupied Bandwidth – QPSK (2593.0 MHz) (10MHz Channel BW)

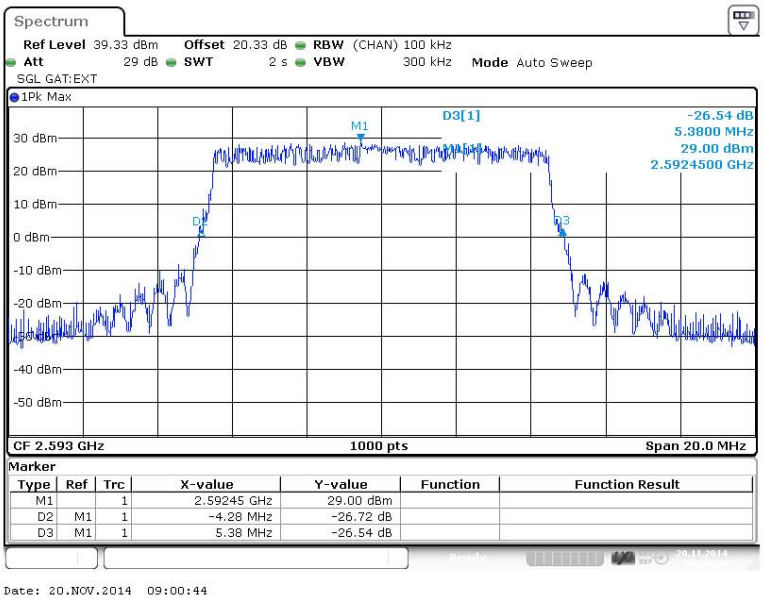

Figure 18 Occupied Bandwidth – 16QAM (2593.0 MHz) (10MHz Channel BW)

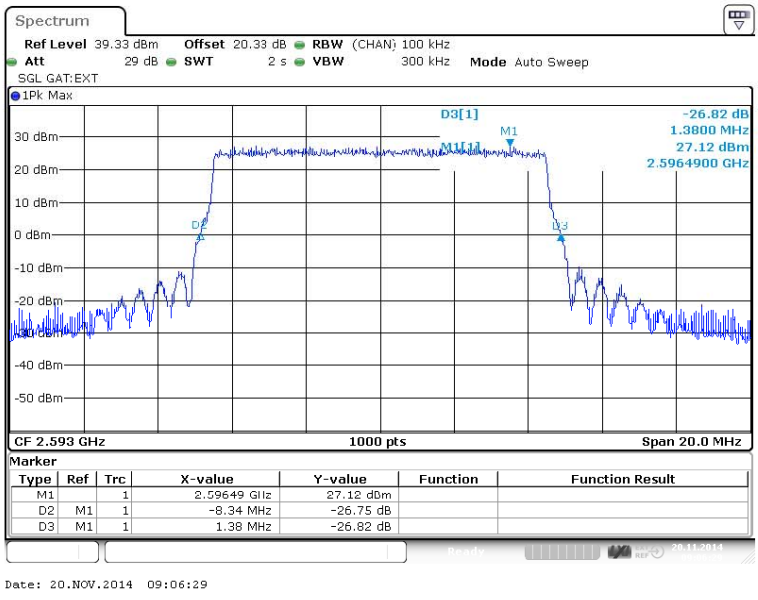

Figure 19 Occupied Bandwidth – 64QAM (2593.0 MHz) (10MHz Channel BW)

Config A ANT2/Div:

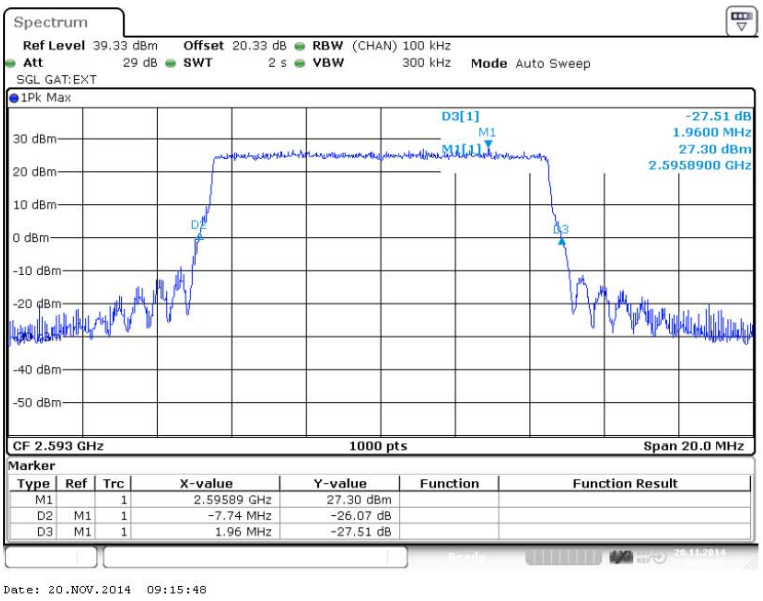

Figure 20 Occupied Bandwidth – QPSK (2593.0 MHz) (10MHz Channel BW)

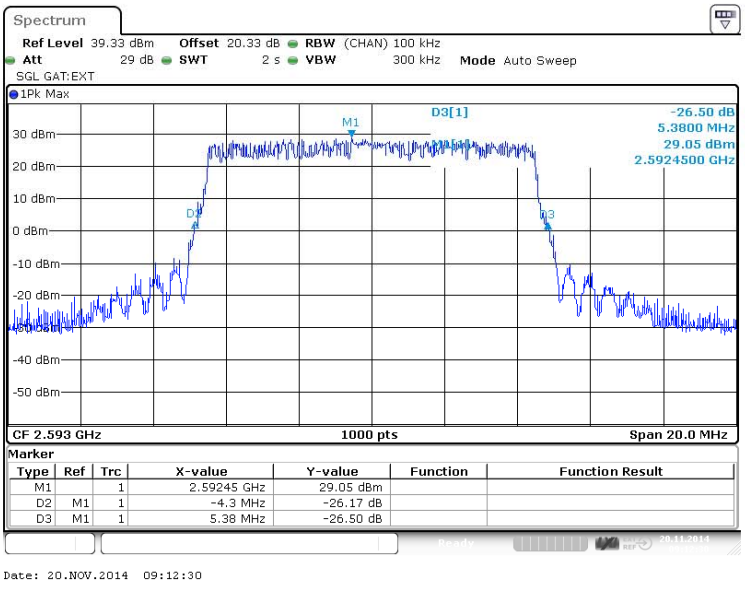

Figure 21 Occupied Bandwidth – 16QAM (2593.0 MHz) (10MHz Channel BW)

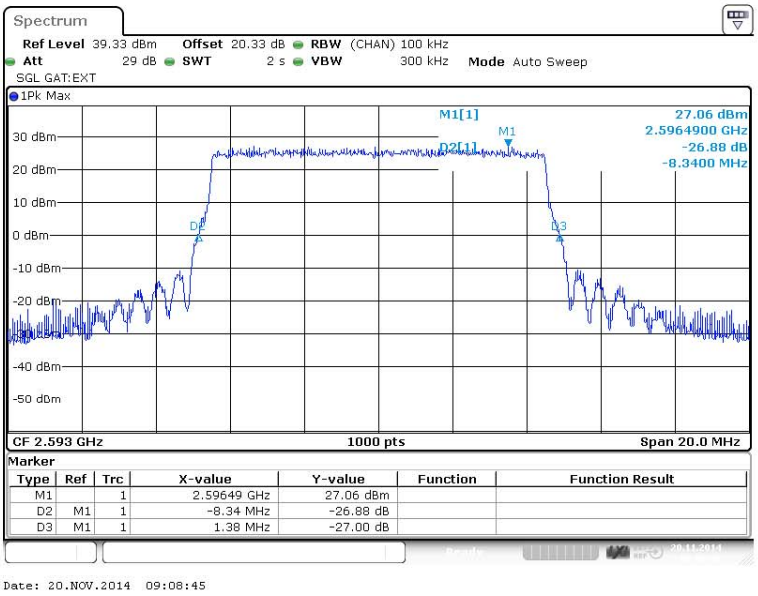

Figure 22 Occupied Bandwidth – 64QAM (2593.0 MHz) (10MHz Channel BW)

Config C ANT1/Main:

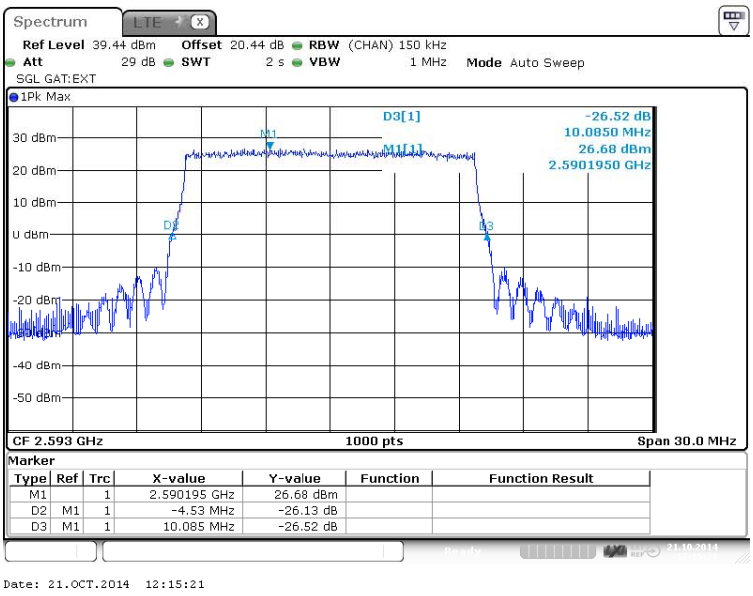

Figure 34 Occupied Bandwidth – QPSK (2599.0 MHz) (15MHz Channel BW)

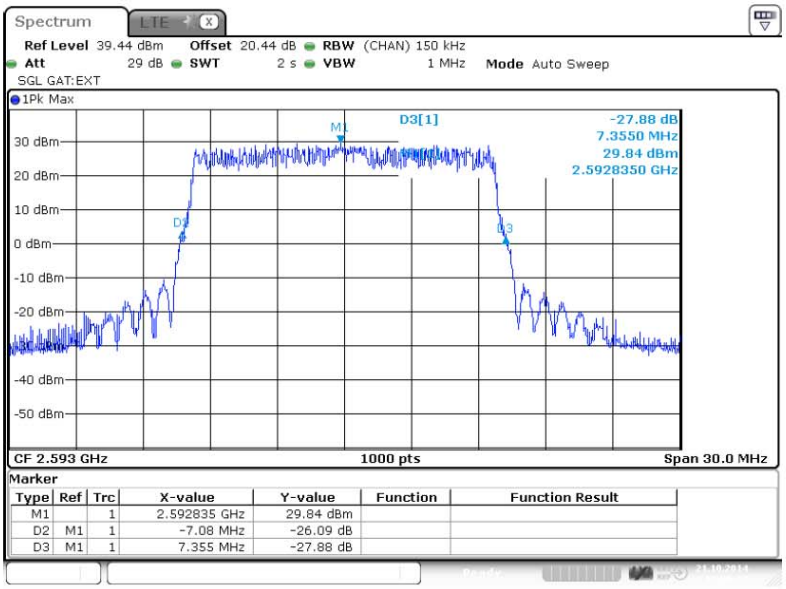

Figure 24 Occupied Bandwidth – 16QAM (2593.0 MHz) (15MHz Channel BW)

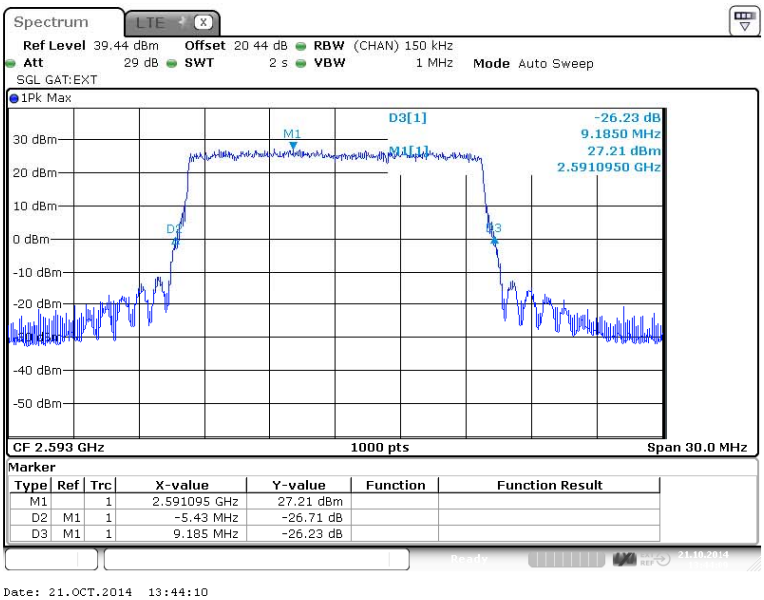

Figure 25 Occupied Bandwidth – 64QAM (2593.0 MHz) (15MHz Channel BW)

Config C ANT1/Div:

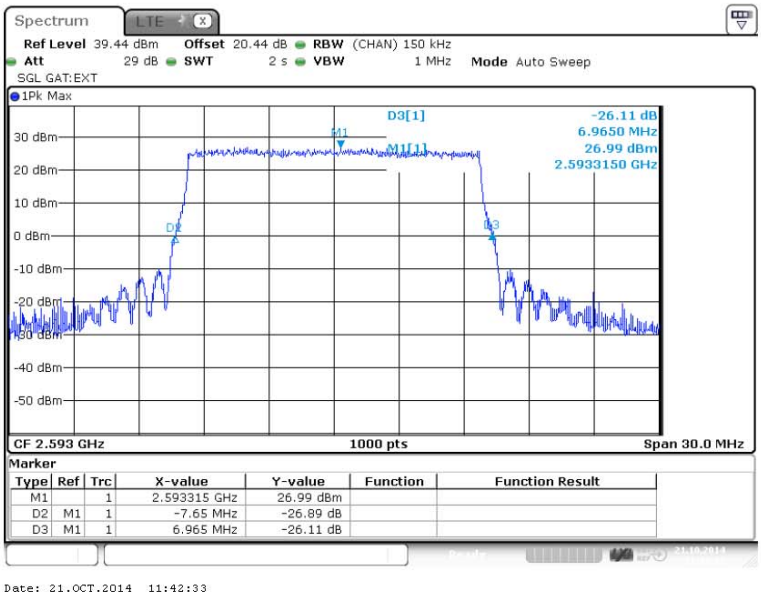

Figure 26 Occupied Bandwidth – QPSK (2593.0 MHz) (15MHz Channel BW)

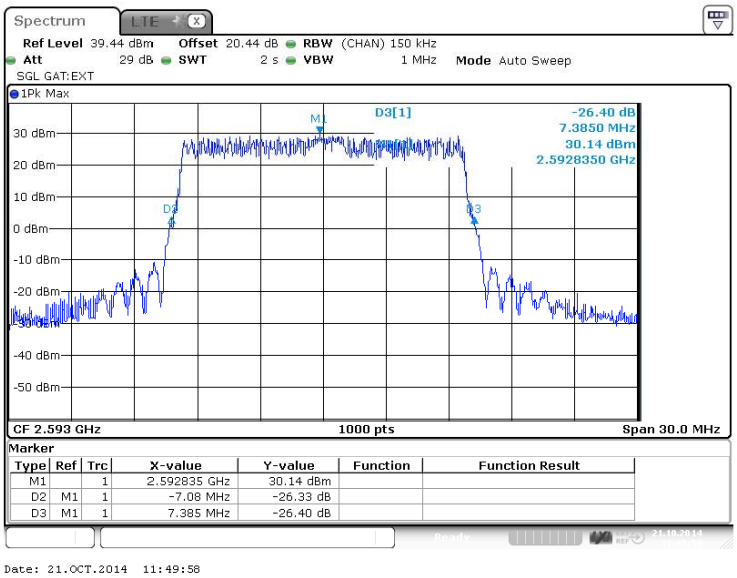

Figure 27 Occupied Bandwidth – 16QAM (2593.0 MHz) (15MHz Channel BW)

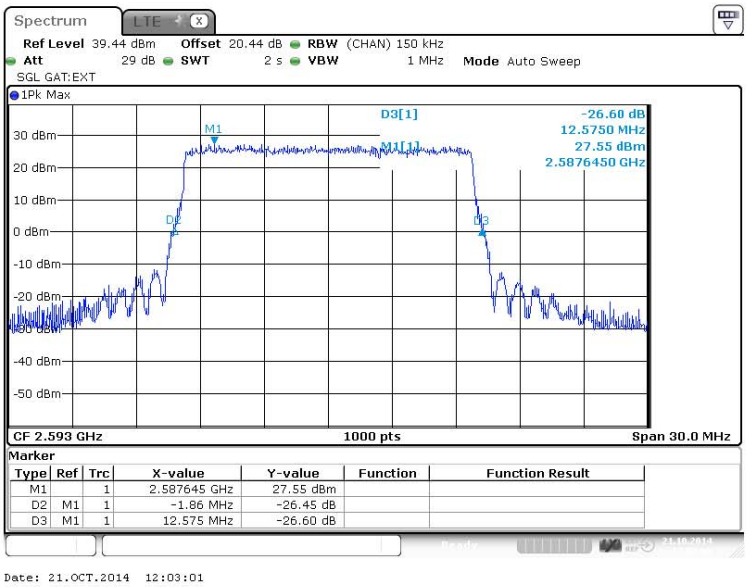

Figure 28 Occupied Bandwidth – 64QAM (2593.0 MHz) (15MHz Channel BW)

Config C ANT2/Main:

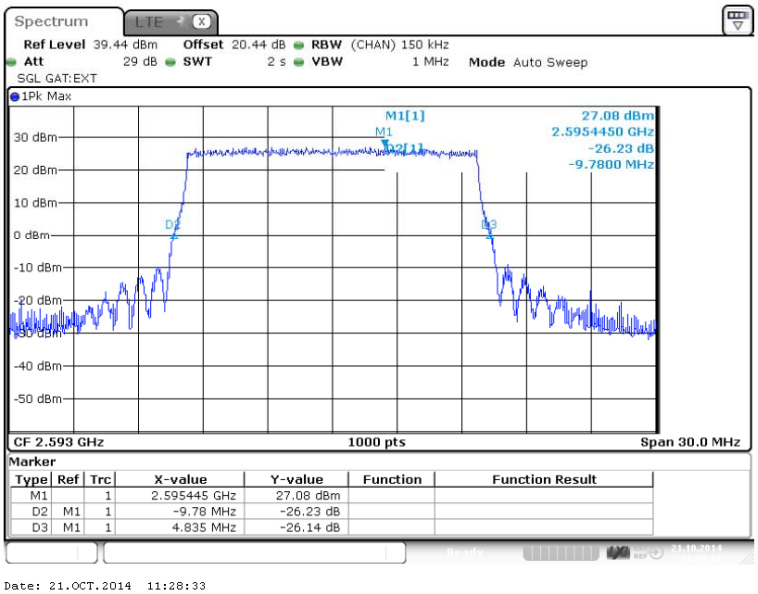

Figure 29 Occupied Bandwidth – QPSK (2593.0 MHz) (15MHz Channel BW)

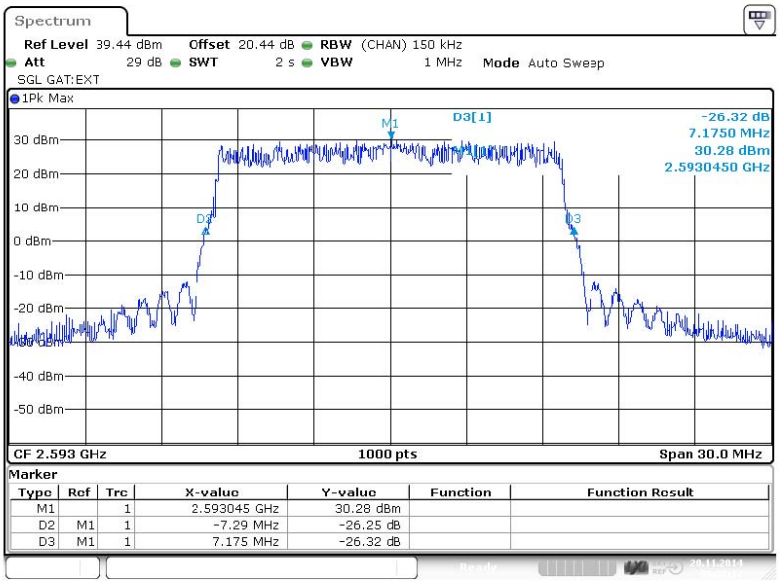

Figure 30 Occupied Bandwidth – 16QAM (2593.0 MHz) (15MHz Channel BW)

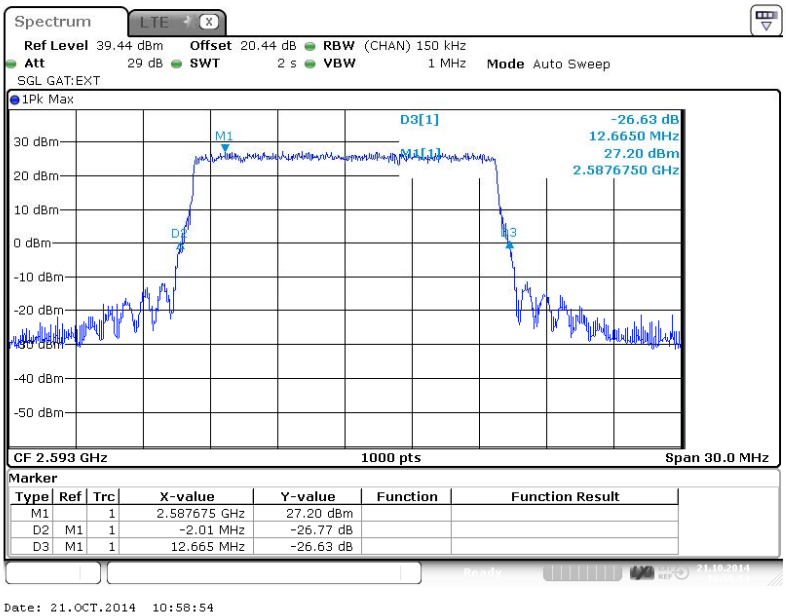

Figure 31 Occupied Bandwidth – 64QAM (2593.0 MHz) (15MHz Channel BW)

Config C ANT2/Div:

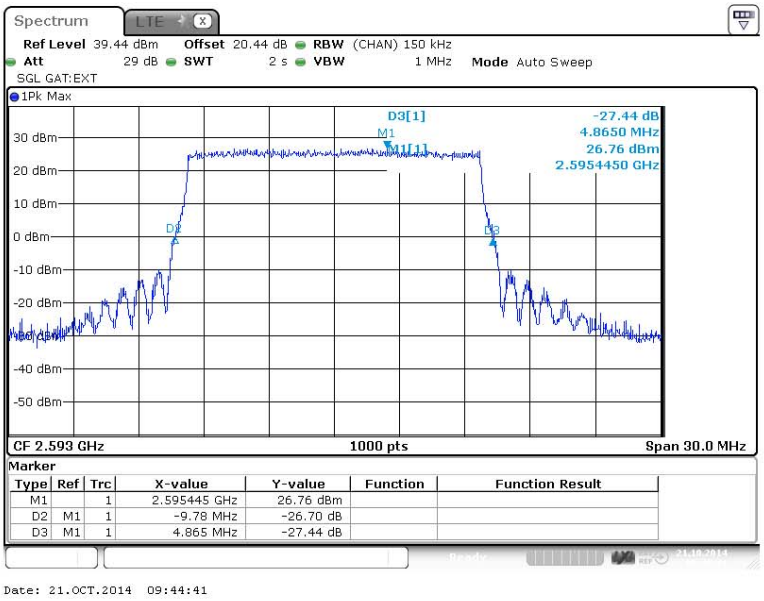

Figure 32 Occupied Bandwidth – QPSK (2593.0 MHz) (15MHz Channel BW)

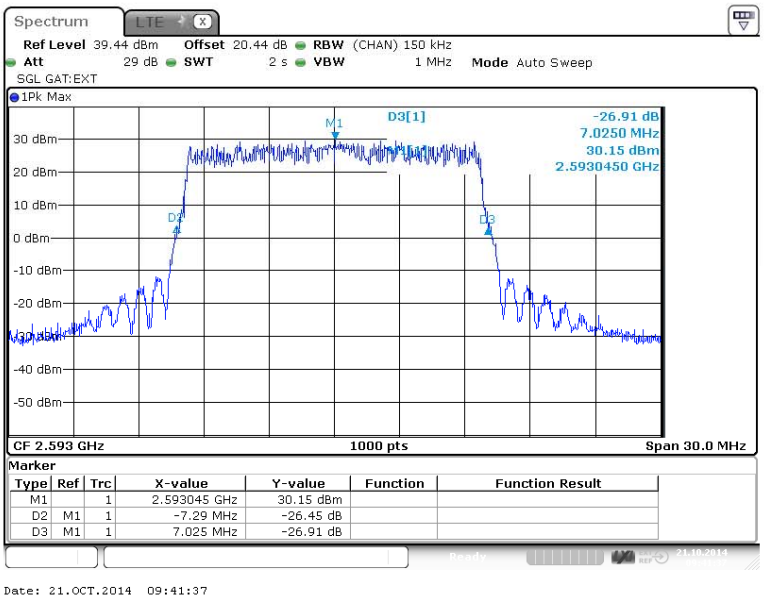

Figure 33 Occupied Bandwidth – 16QAM (2593.0 MHz) (15MHz Channel BW)

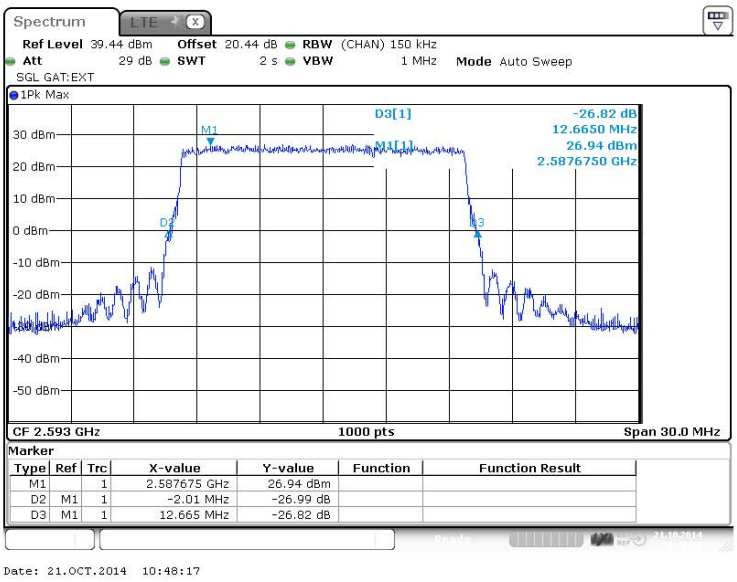

Figure 23 Occupied Bandwidth – 64QAM (2593.0 MHz) (15MHz Channel BW)

Config E ANT1/Main:

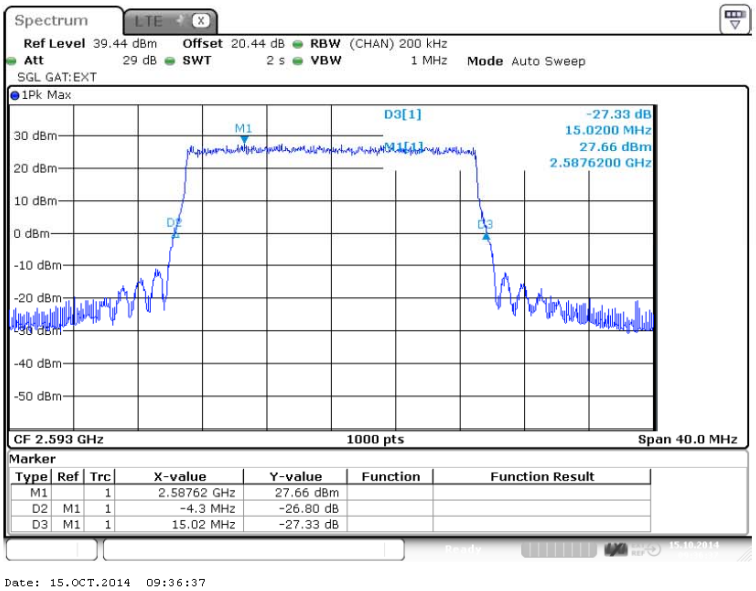

Figure 35 Occupied Bandwidth – QPSK (2593.0 MHz) (20MHz Channel BW)

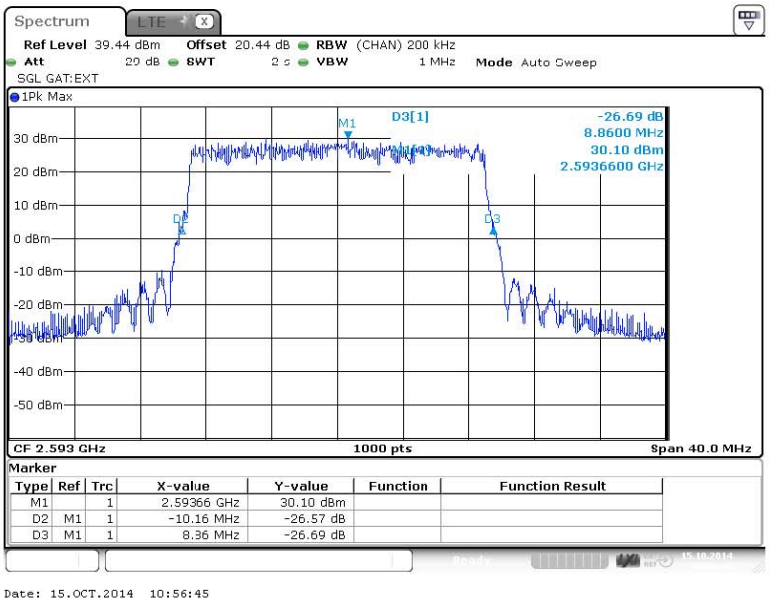

Figure 36 Occupied Bandwidth – 16QAM (2593.0 MHz) (20MHz Channel BW)

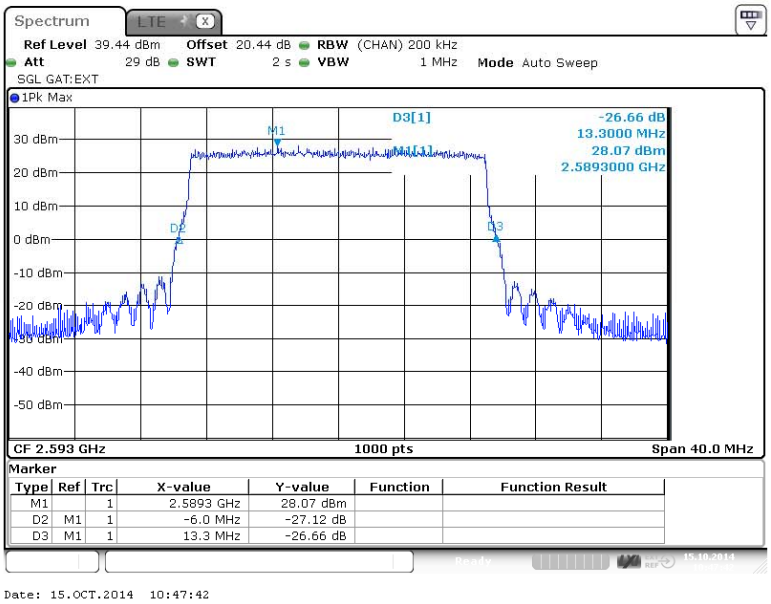

Figure 37 Occupied Bandwidth – 64QAM (2593.0 MHz) (20MHz Channel BW)

Config E ANT1/Div:

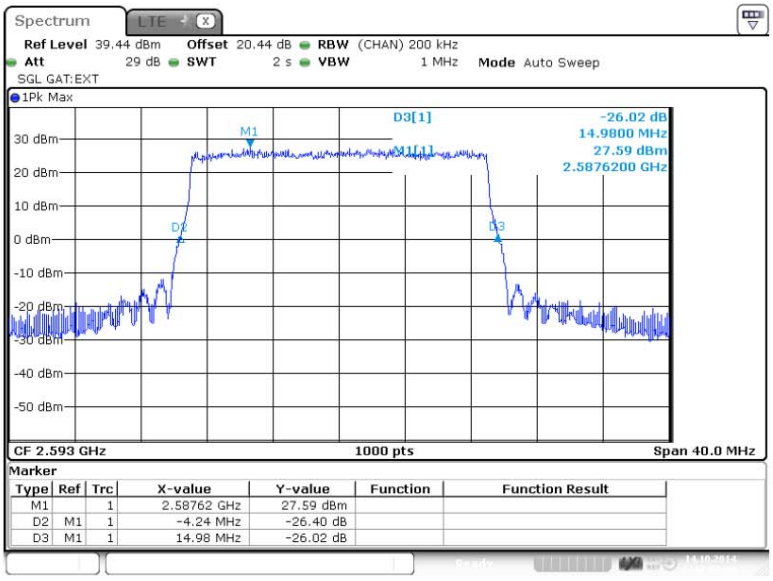

Figure 38 Occupied Bandwidth – QPSK (2593.0 MHz) (20MHz Channel BW)

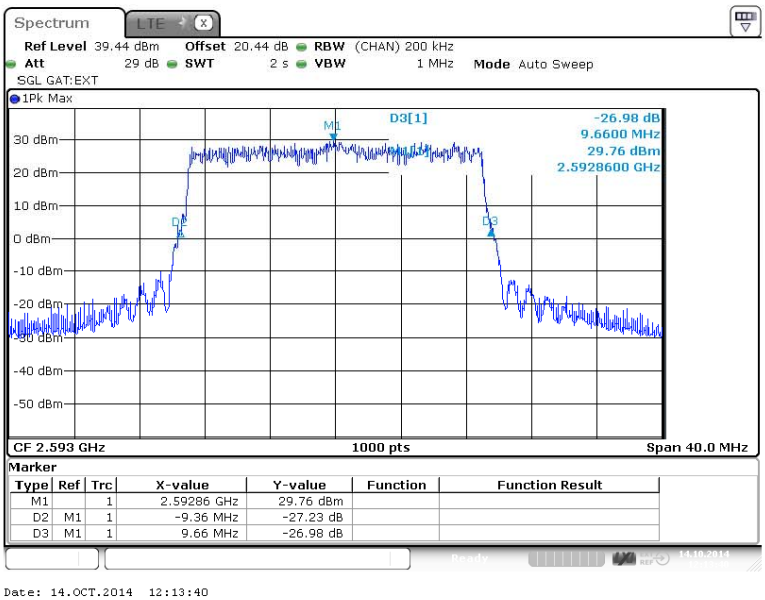

Figure 39 Occupied Bandwidth – 16QAM (2593.0 MHz) (20MHz Channel BW)

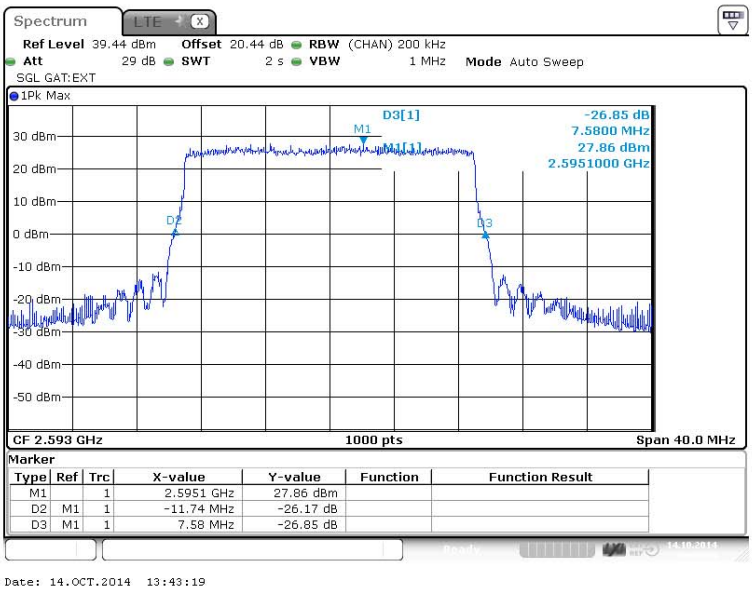

Figure 40 Occupied Bandwidth – 64QAM (2593.0 MHz) (20MHz Channel BW)

Config E ANT2/Main:

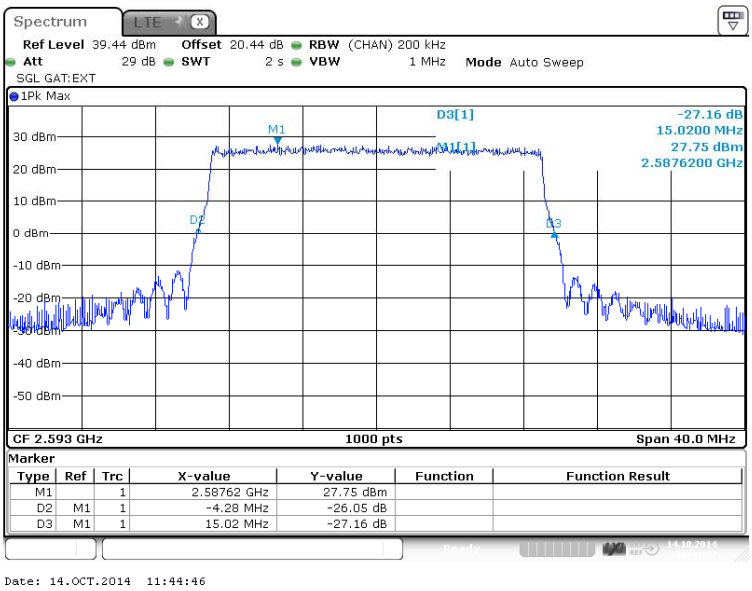

Figure 41 Occupied Bandwidth – QPSK (2593.0 MHz) (20MHz Channel BW)

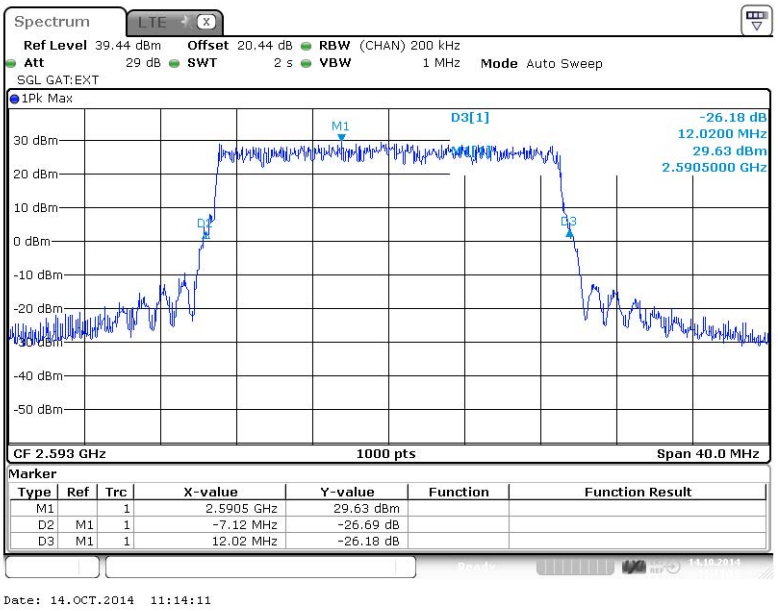

Figure 42 Occupied Bandwidth – 16QAM (2593.0 MHz) (20MHz Channel BW)

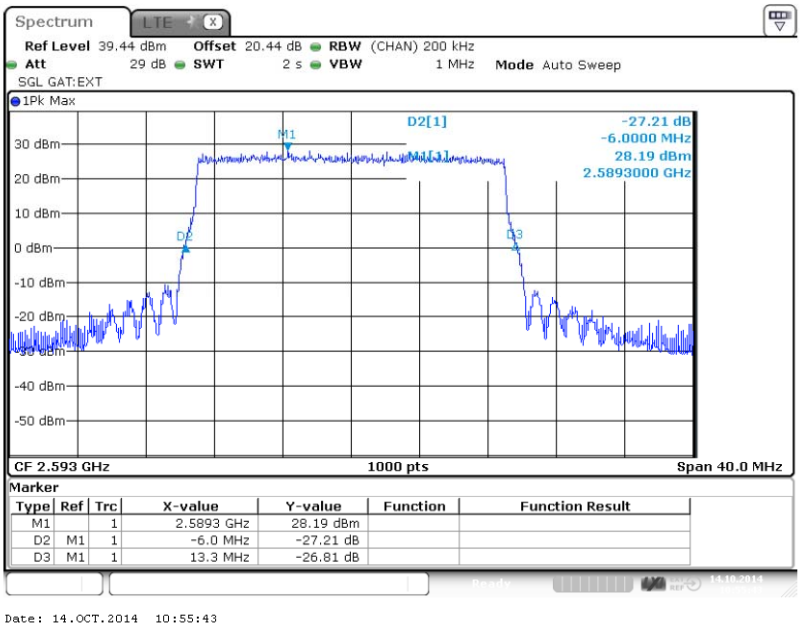

Figure 43 Occupied Bandwidth – 64QAM (2593.0 MHz) (20MHz Channel BW)

Config E ANT2/Div:

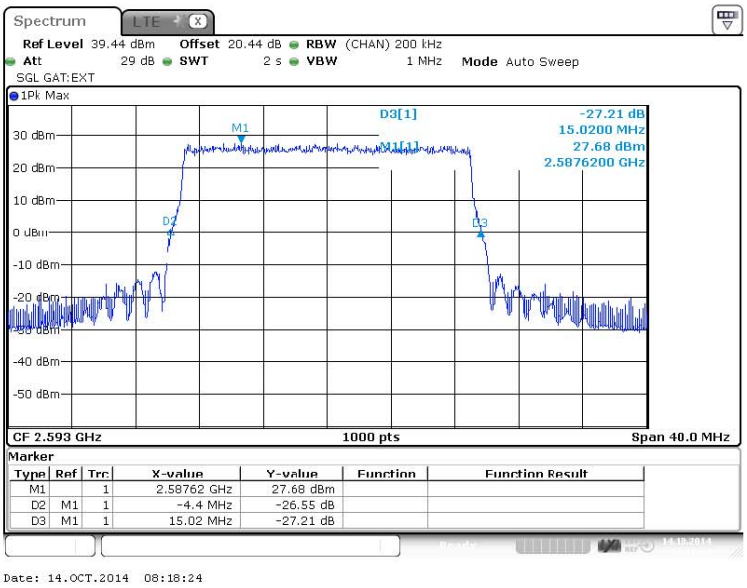

Figure 44 Occupied Bandwidth – QPSK (2593.0 MHz) (20MHz Channel BW)

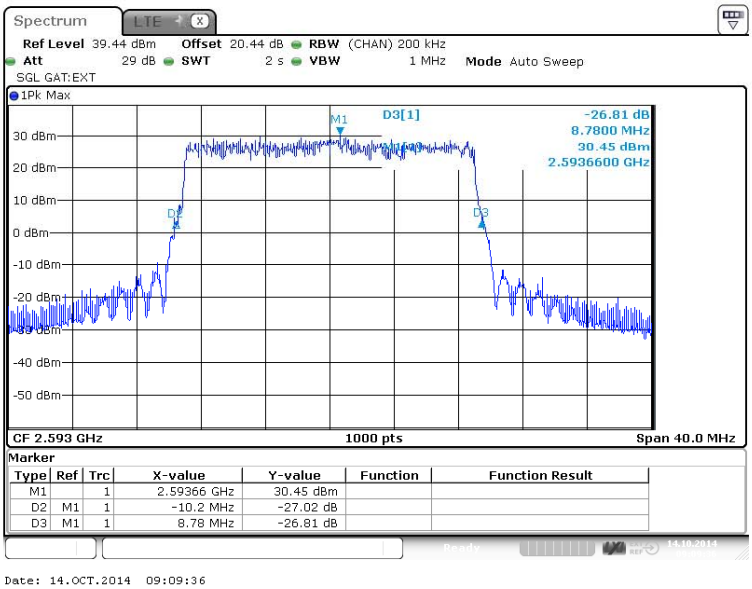

Figure 45 Occupied Bandwidth – 16QAM (2593.0 MHz) (20MHz Channel BW)

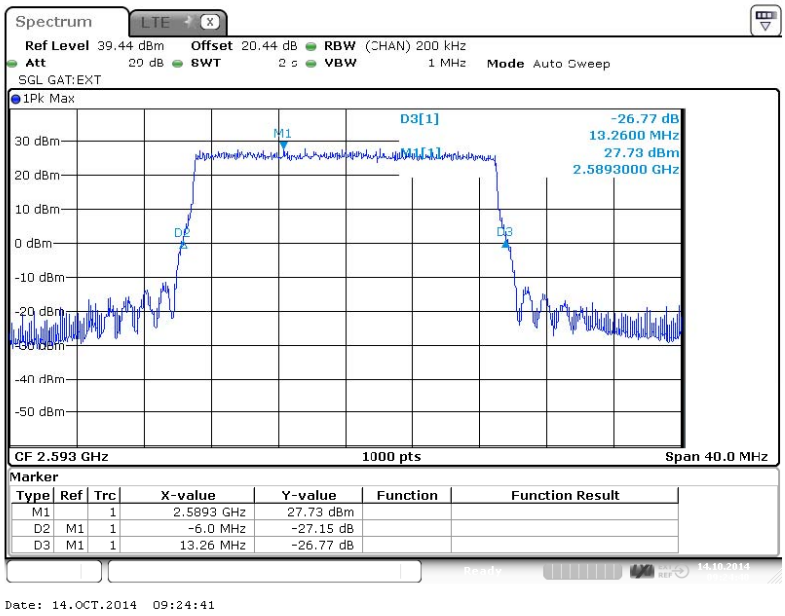

Figure 46 Occupied Bandwidth – 64QAM (2593.0 MHz) (20MHz Channel BW)

5.2.3. Test No. 4: Spurious Emissions at the Antenna Terminals

The external attenuation (cable loss of the setup) can be seen as the 'Offset' value in the screenshots. The external attenuation is frequency dependant. Thus the various 'Offset' values in the screenshots may differ.

Config A ANT1/Main:

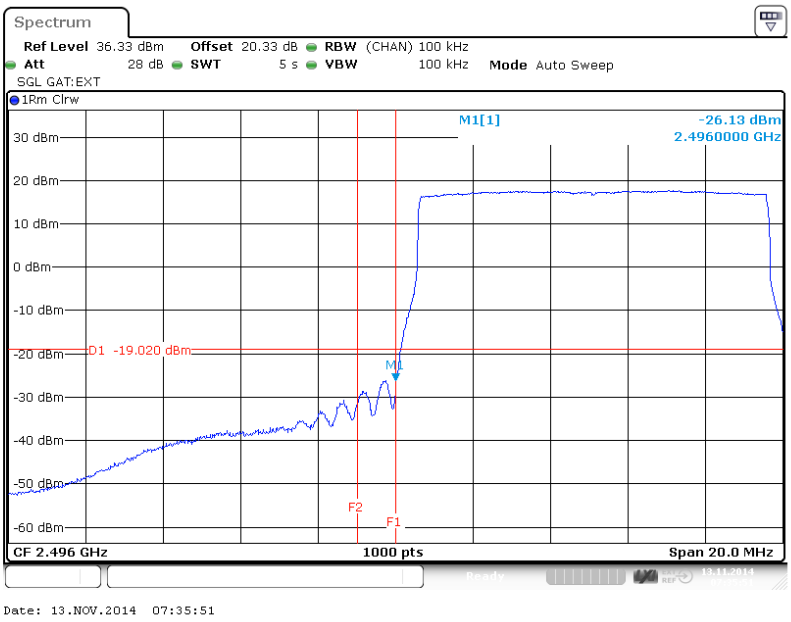

Figure 47 Spurious Emissions (Lower Band Edge) – QPSK (2501.1 MHz) (10MHz Channel BW)

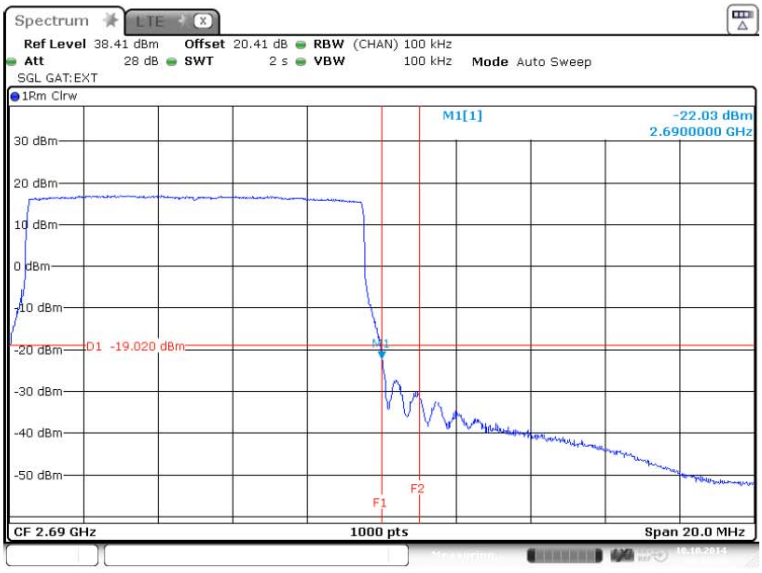

Figure 48 Spurious Emissions (Upper Band Edge) – QPSK (2685.0 MHz) (10MHz Channel BW)

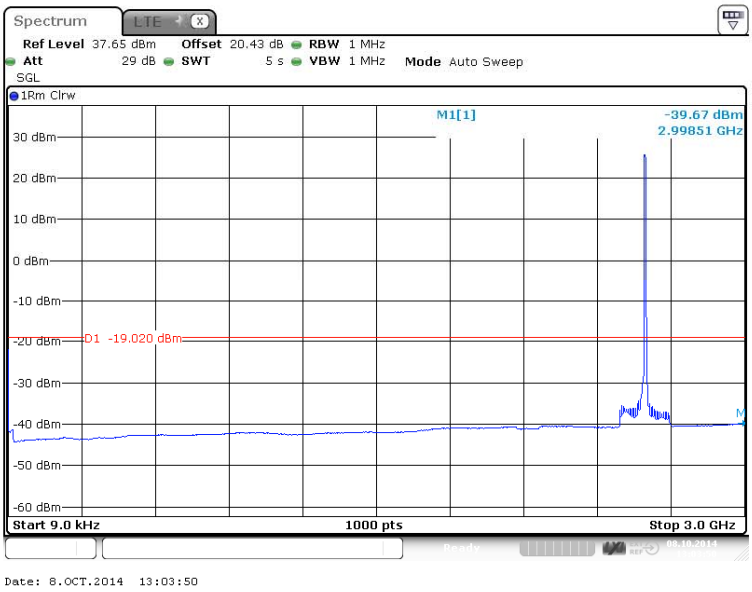

Figure 49 Spurious Emissions (9kHz – 3GHz) - QPSK (2593.0 MHz) (10MHz Channel BW)

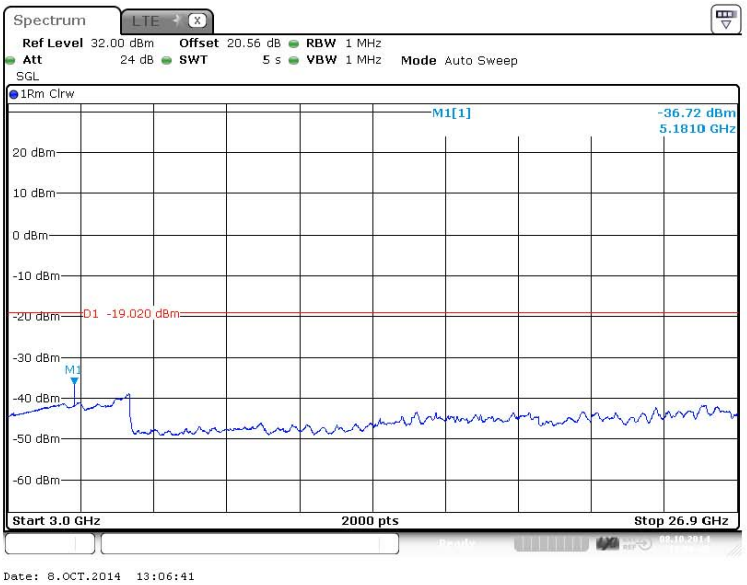

Figure 50 Spurious Emissions (3GHz – 26.900GHz) – QPSK (2593.0 MHz) (10MHz Channel BW)

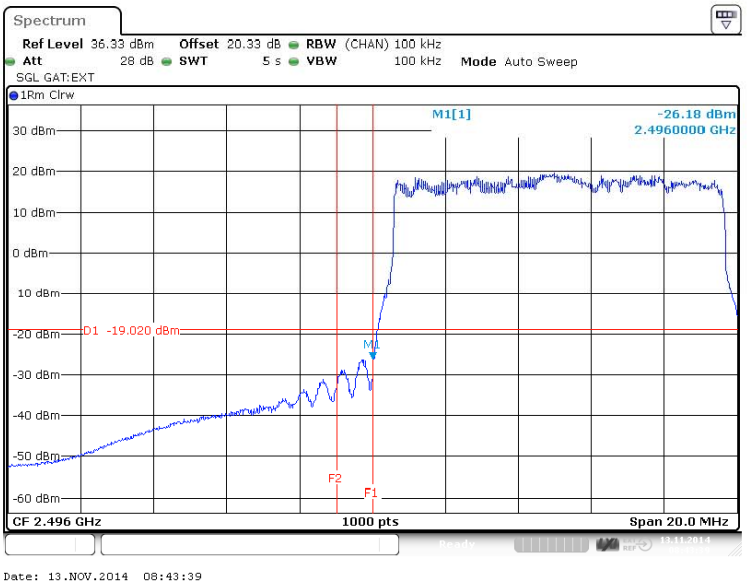

Figure 51 Spurious Emissions (Lower Band Edge) – 16QAM (2501.1 MHz) (10MHz Channel BW)

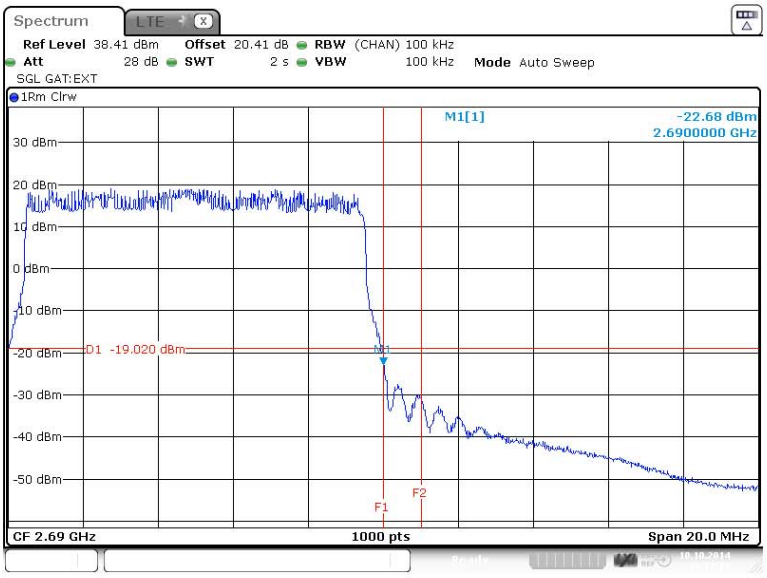

Figure 52 Spurious Emissions (Upper Band Edge) – 16QAM (2685.0 MHz) (10MHz Channel BW)

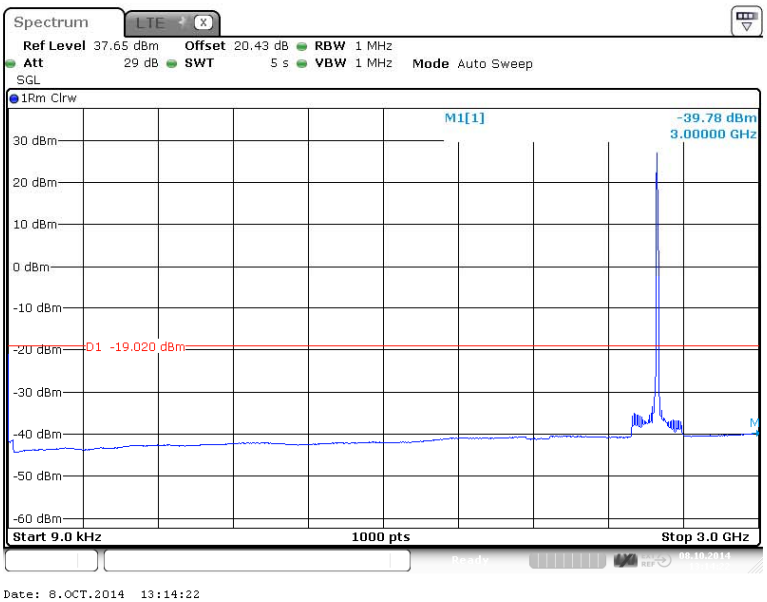

Figure 53 Spurious Emissions (9kHz – 3GHz) – 16QAM (2593.0 MHz) (10MHz Channel BW)

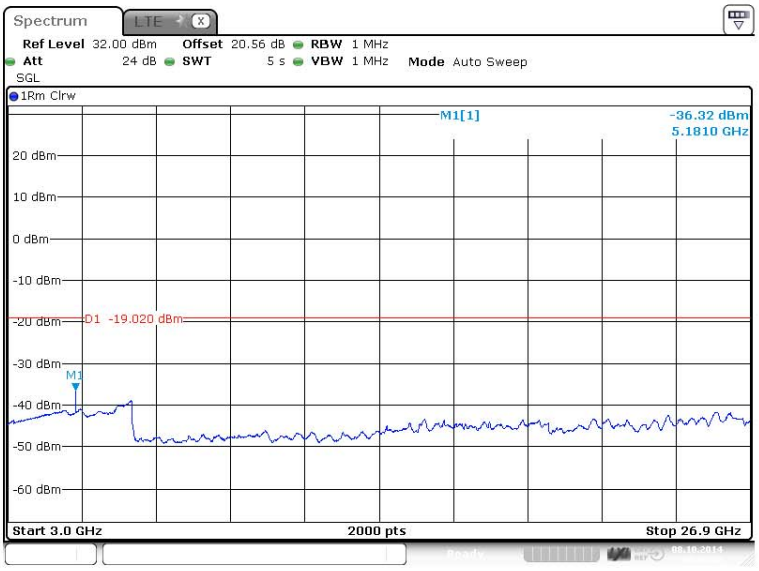

Figure 54 Spurious Emissions (3GHz – 26.900GHz) – 16QAM (2593.0 MHz) (10MHz Channel BW)

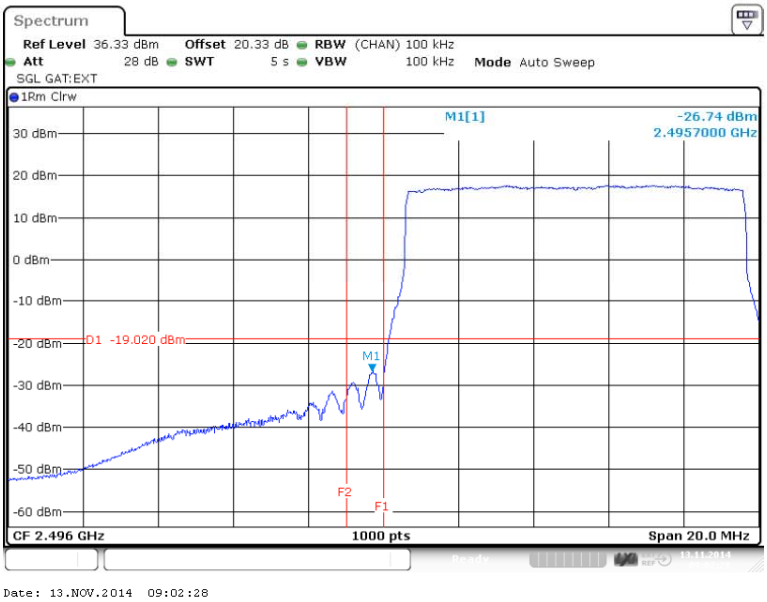

Figure 55 Spurious Emissions (Lower Band Edge) – 64QAM (2501.1 MHz) (10MHz Channel BW)

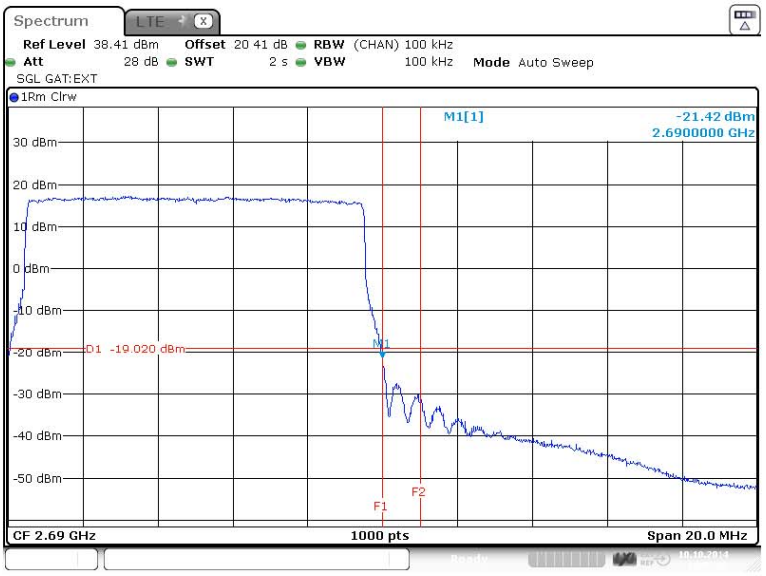

Figure 56 Spurious Emissions (Upper Band Edge) – 64QAM (2685.0 MHz) (10MHz Channel BW)

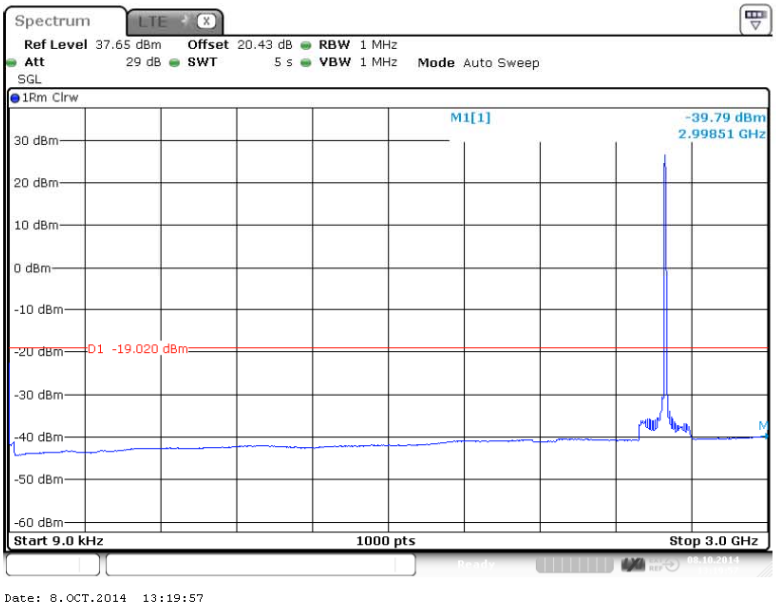

Figure 57 Spurious Emissions (9kHz – 3GHz) – 64QAM (2593.0 MHz) (10MHz Channel BW)

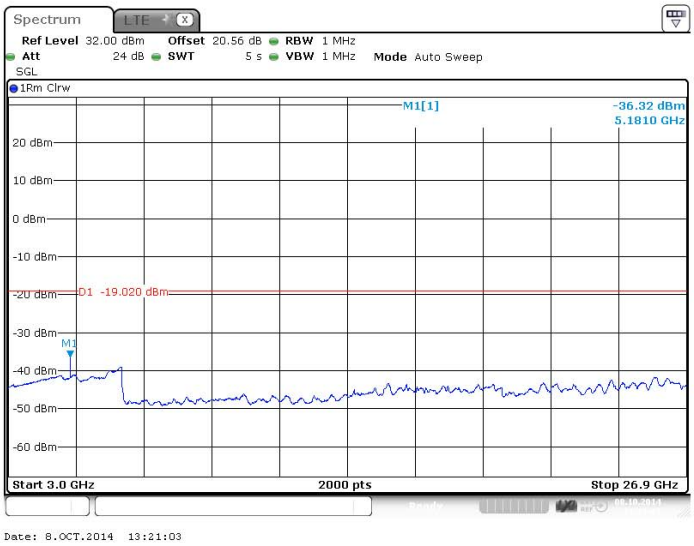

Figure 58 Spurious Emissions (3GHz – 26.900GHz) – 64QAM (2593.0 MHz) (10MHz Channel BW)

Config A ANT1/Div:

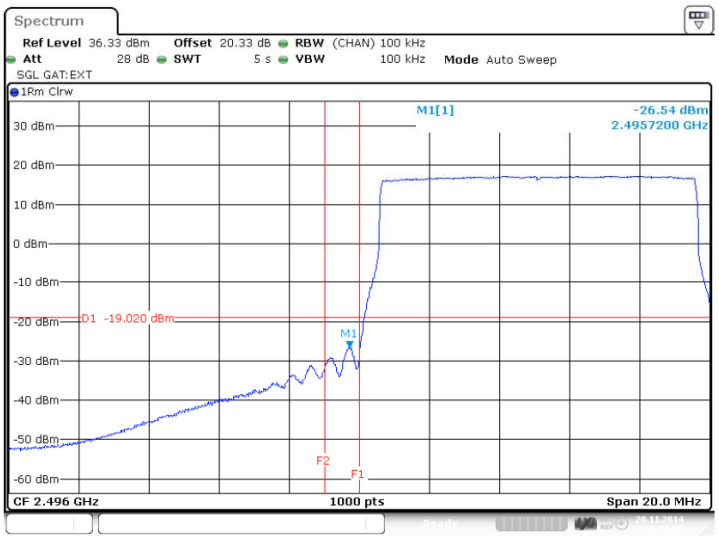

Figure 59 Spurious Emissions (Lower Band Edge) – QPSK (2501.1 MHz) (10MHz Channel BW)

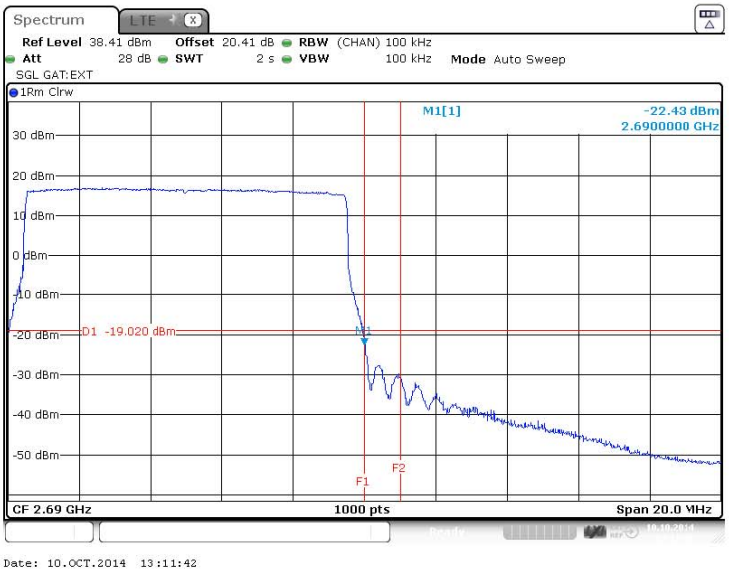

Figure 60 Spurious Emissions (Upper Band Edge) – QPSK (2685.0 MHz) (10MHz Channel BW)

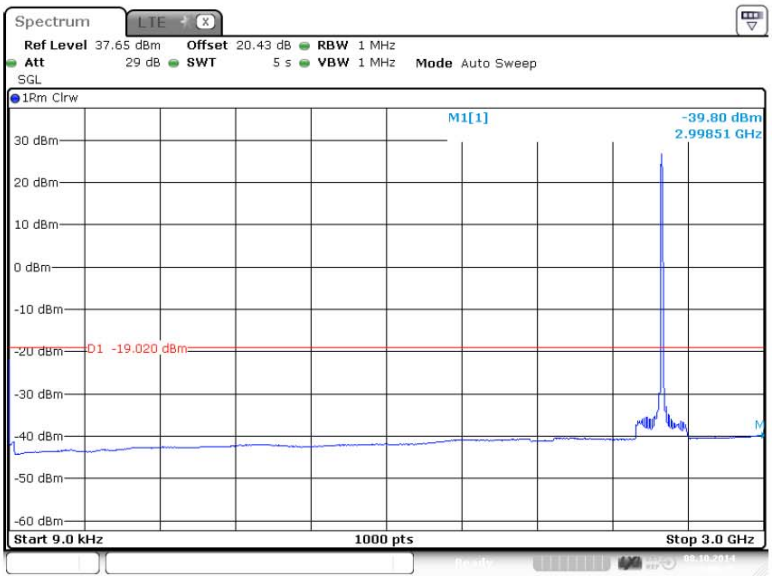

Figure 61 Spurious Emissions (9kHz – 3GHz) - QPSK (2593.0 MHz) (10MHz Channel BW)

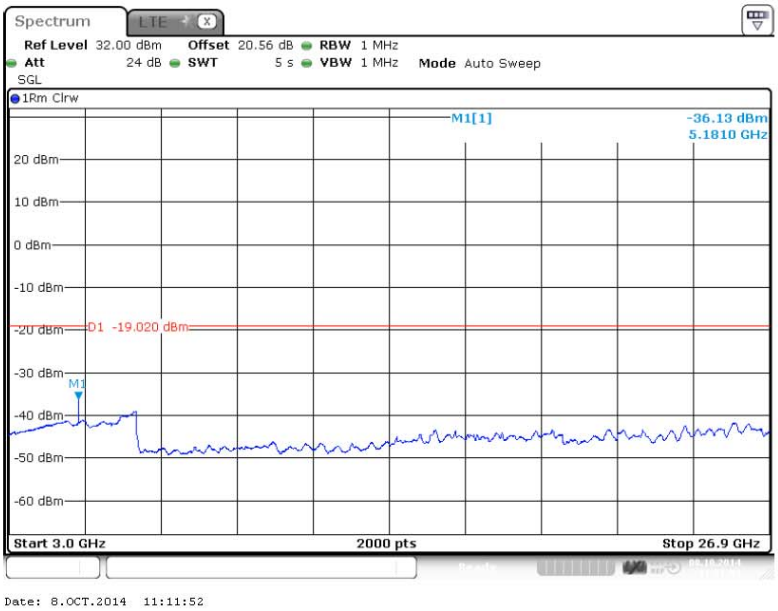

Figure 62 Spurious Emissions (3GHz – 26.900GHz) – QPSK (2593.0 MHz) (10MHz Channel BW)

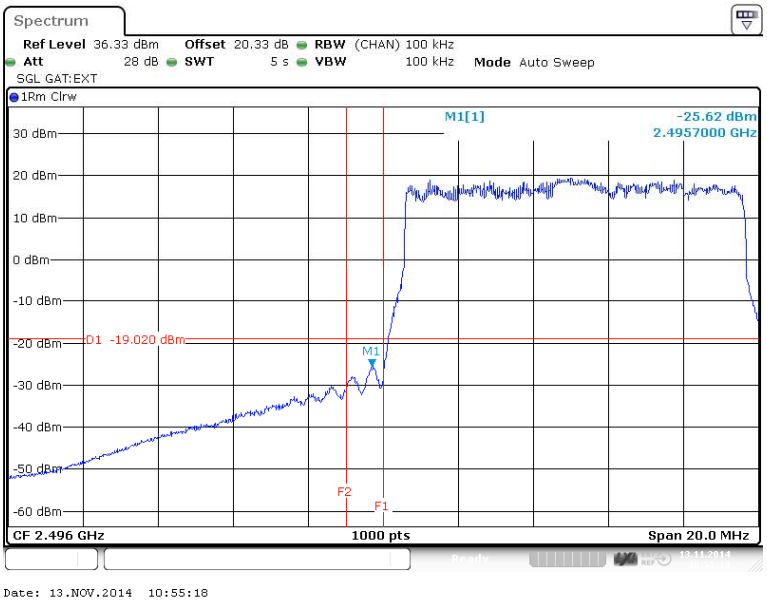

Figure 63 Spurious Emissions (Lower Band Edge) – 16QAM (2501.1 MHz) (10MHz Channel BW)