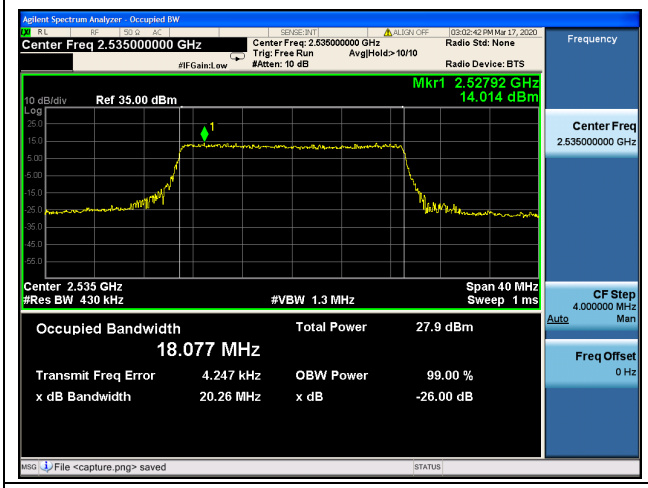
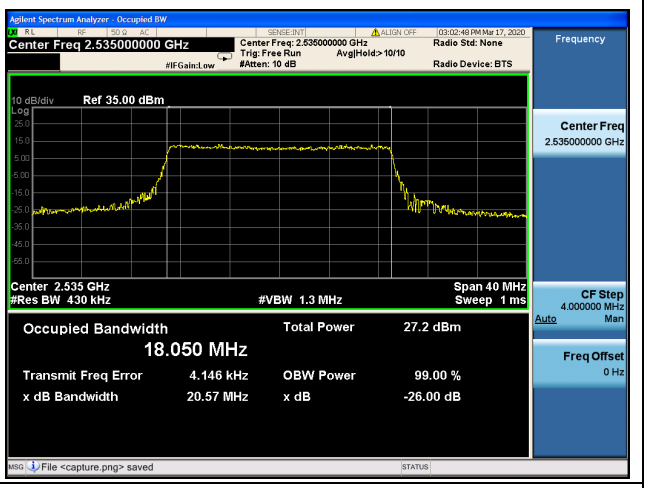
Band7 / 20MHz / Mid CH / QPSK

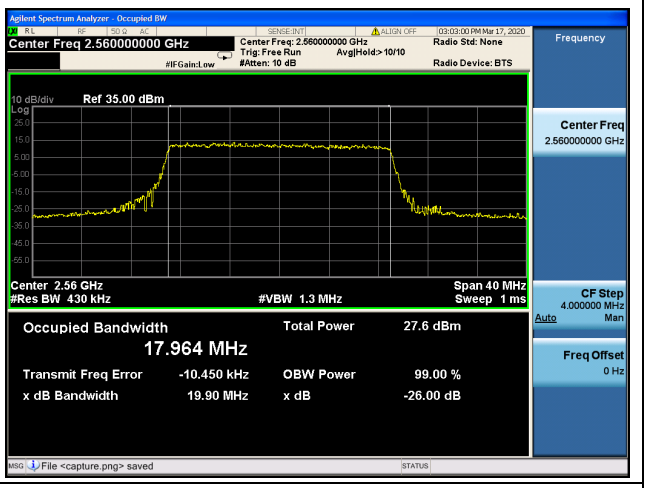


Band7 / 20MHz / Mid CH / 16QAM

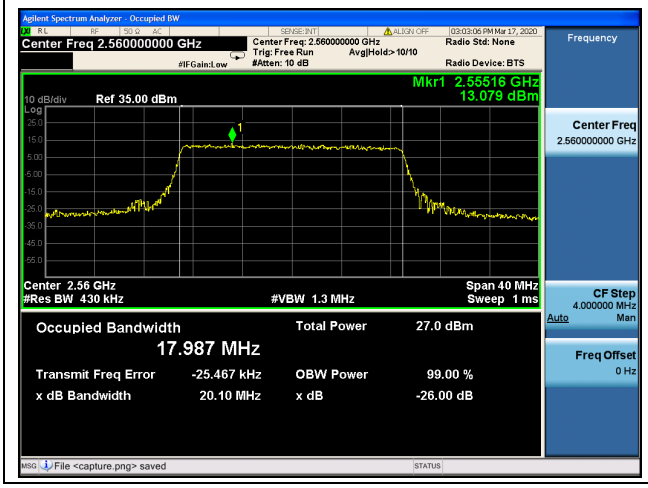


Band7 / 20MHz / Mid CH / 64QAM

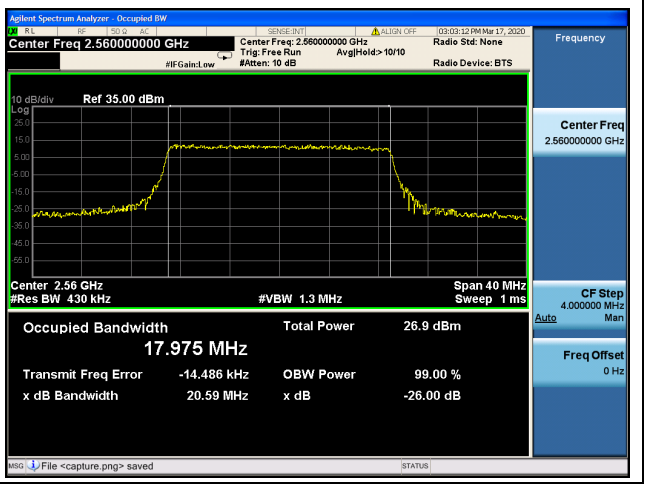
Band7 / 20MHz / High CH / QPSK



Band7 / 20MHz / High CH / 16QAM

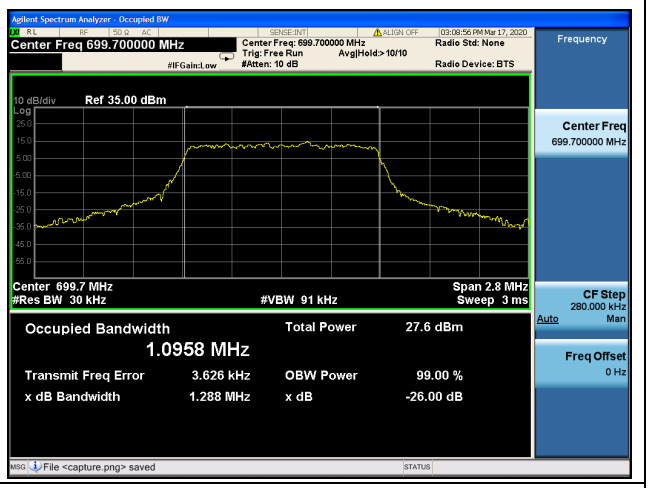


Band7 / 20MHz / High CH / 64QAM

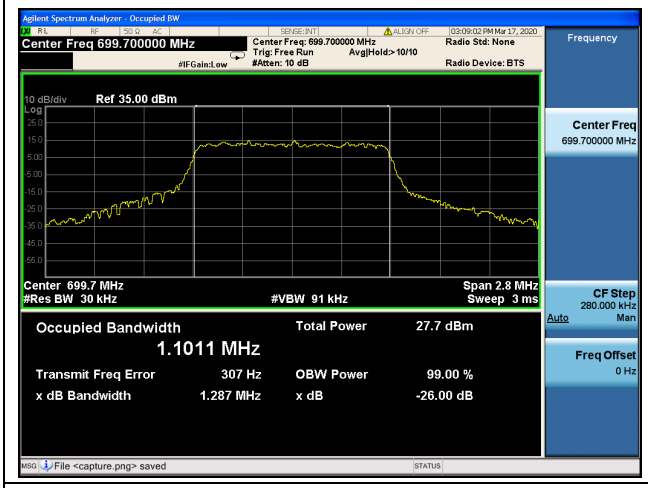


Band12 / 1.4MHz / Low CH / QPSK

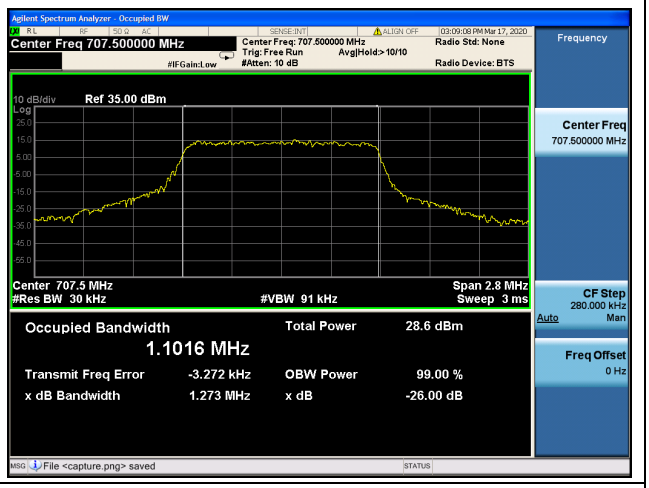
Band12 / 1.4MHz / Low CH / 16QAM



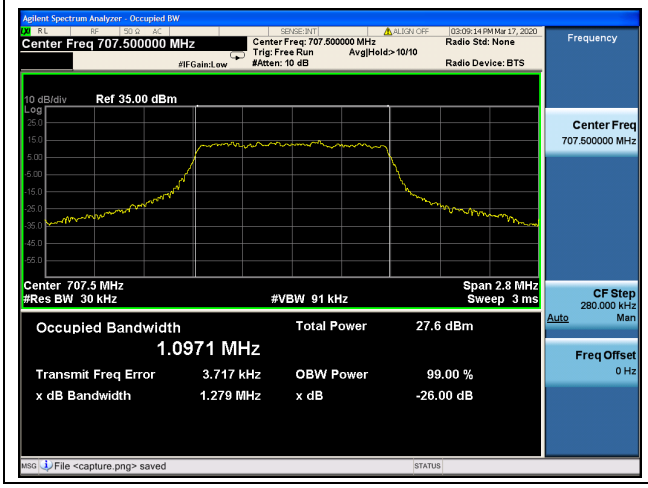
Band12 / 1.4MHz / Low CH / 64QAM



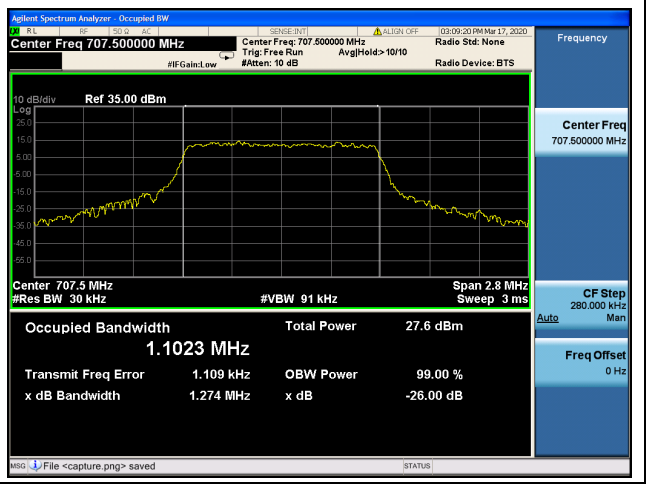
Band12 / 1.4MHz / Mid CH / QPSK



Band12 / 1.4MHz / Mid CH / 16QAM

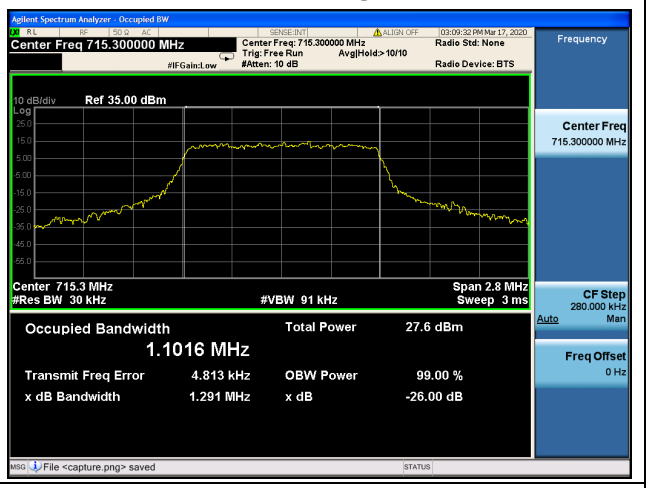


Band12 / 1.4MHz / Mid CH / 64QAM

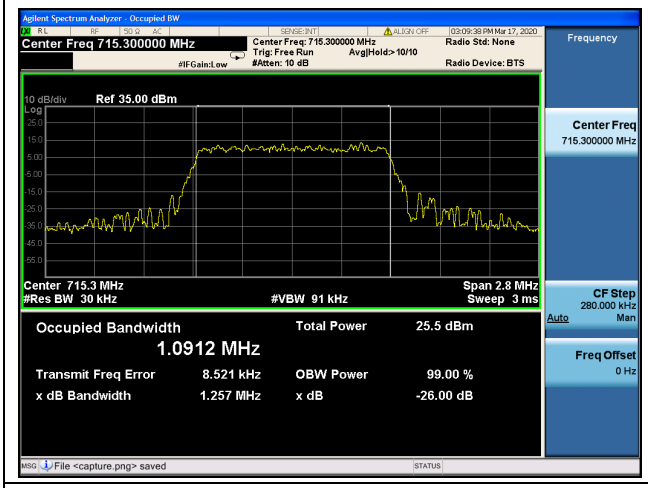


Band12 / 1.4MHz / High CH / QPSK

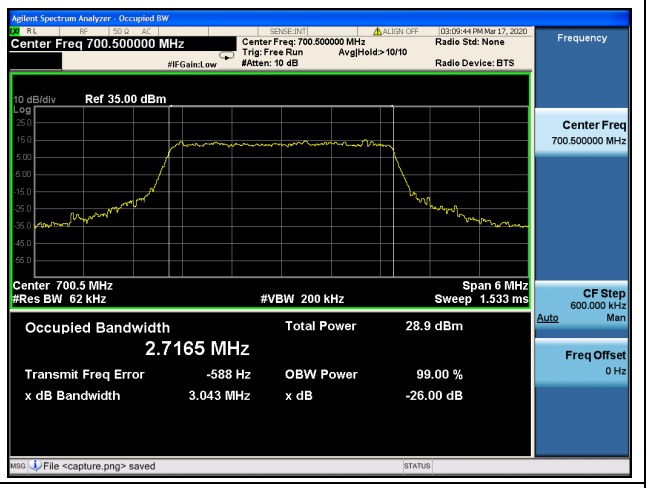
Band12 / 1.4MHz / High CH / 16QAM



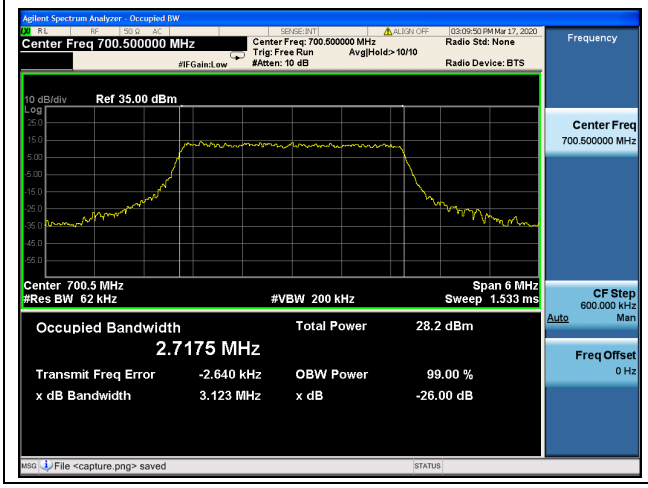
Band12 / 1.4MHz / High CH / 64QAM



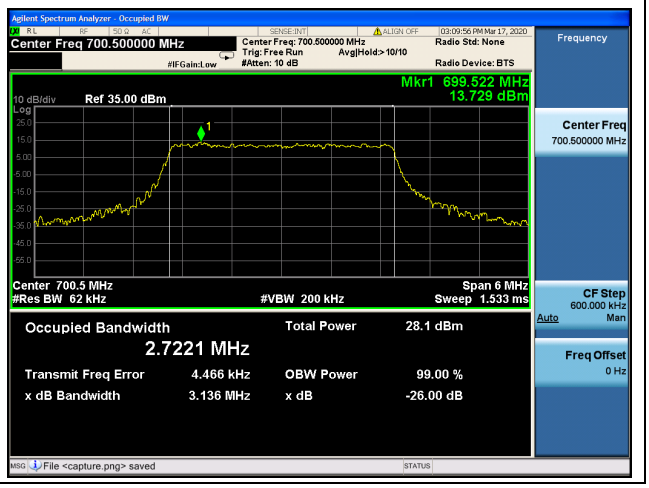
Band12 / 3MHz / Low CH / QPSK



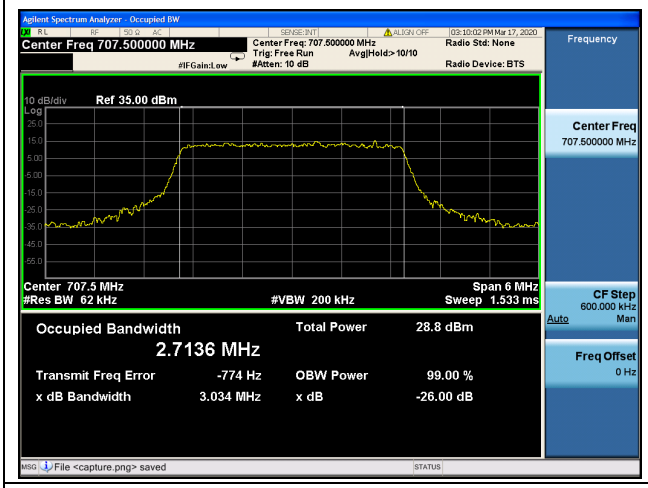
Band12 / 3MHz / Low CH / 16QAM



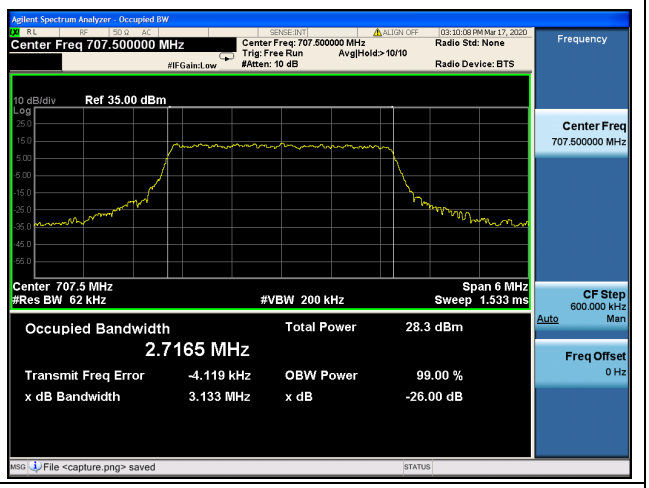
Band12 / 3MHz / Low CH / 64QAM



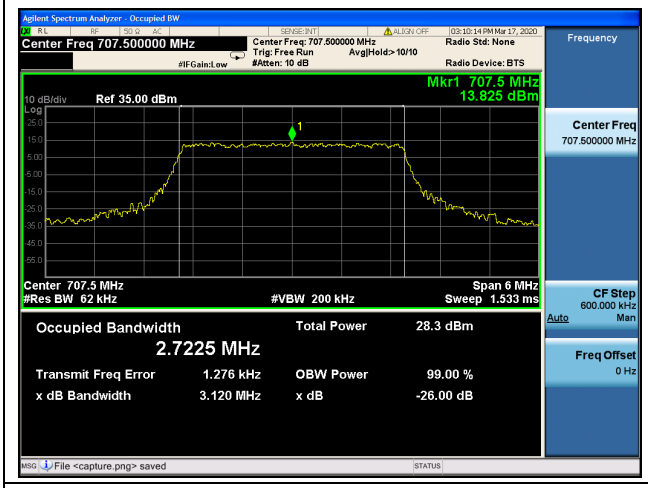
Band12 / 3MHz / Mid CH / QPSK



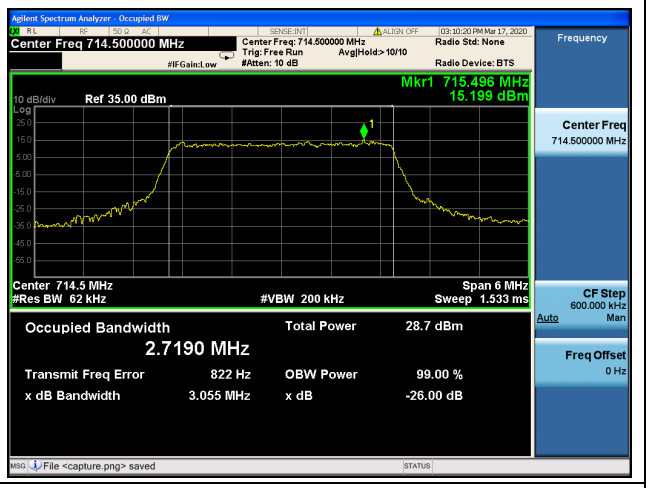
Band12 / 3MHz / Mid CH / 16QAM



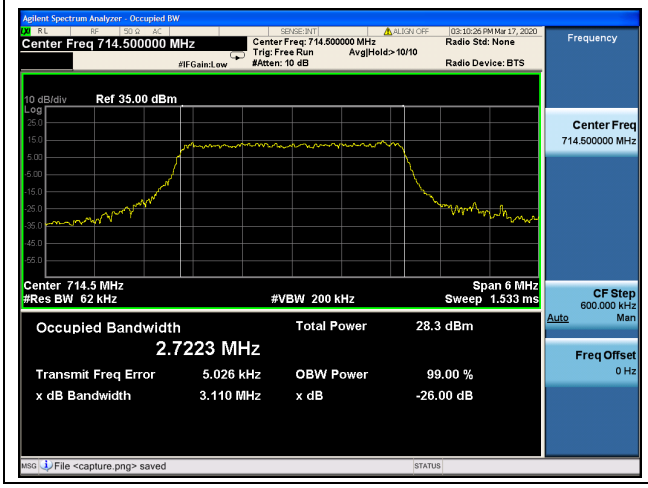
Band12 / 3MHz / Mid CH / 64QAM



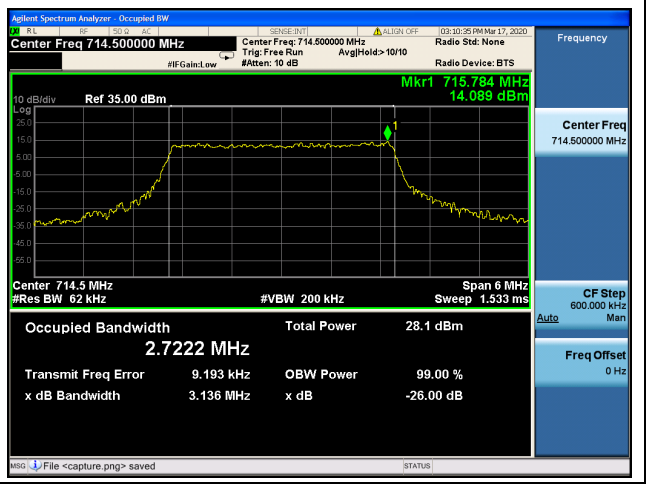
Band12 / 3MHz / High CH / QPSK



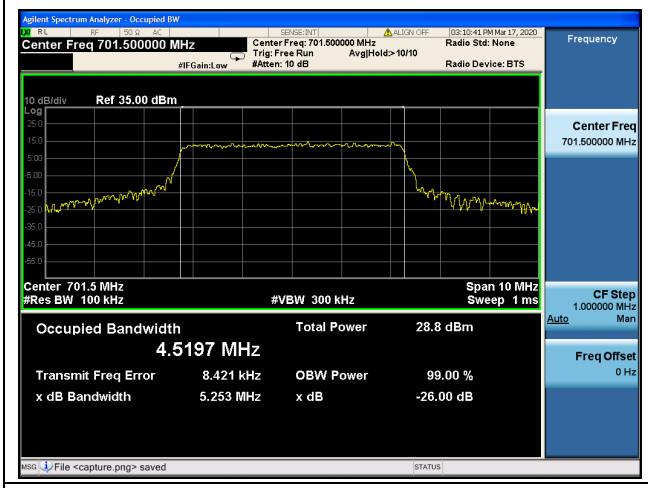
Band12 / 3MHz / High CH / 16QAM



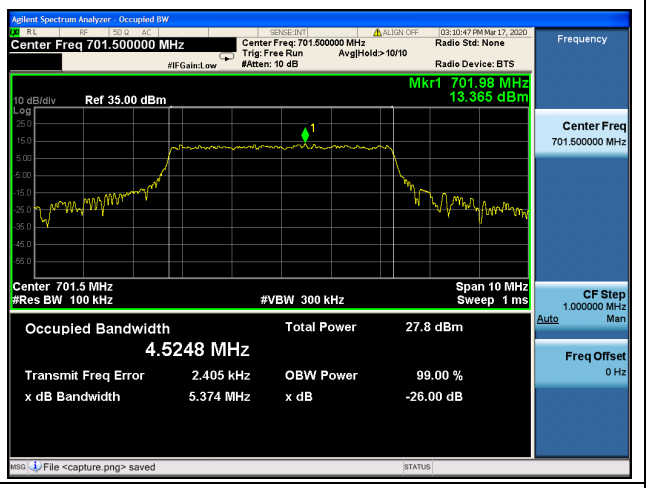
Band12 / 3MHz / High CH / 64QAM



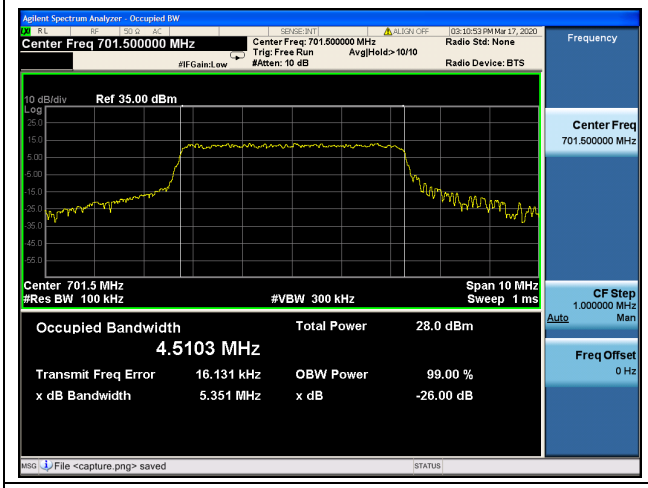
Band12 / 5MHz / Low CH / QPSK



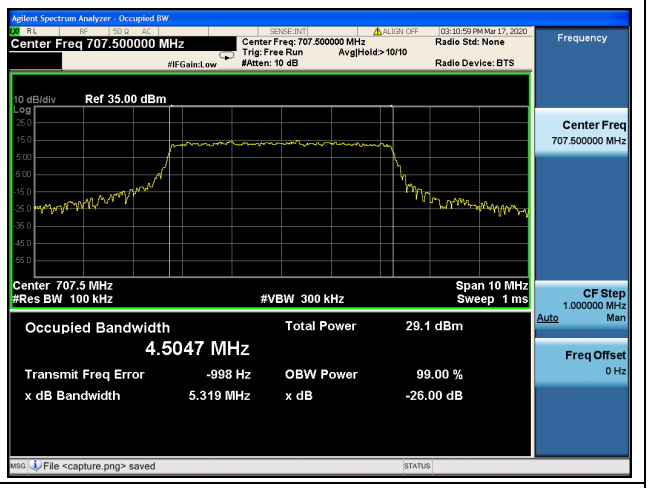
Band12 / 5MHz / Low CH / 16QAM



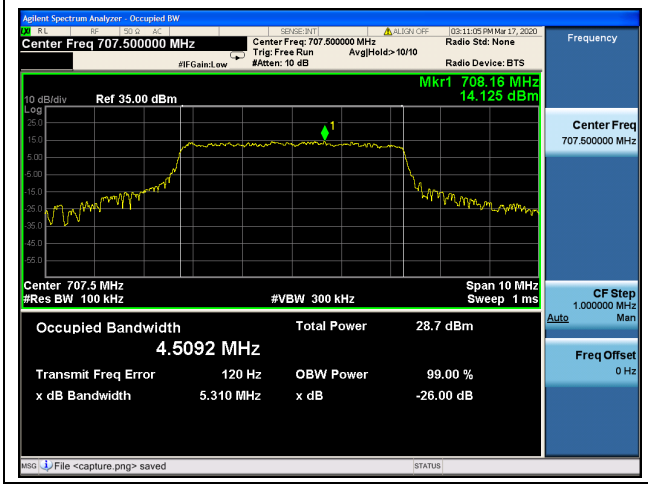
Band12 / 5MHz / Low CH / 64QAM



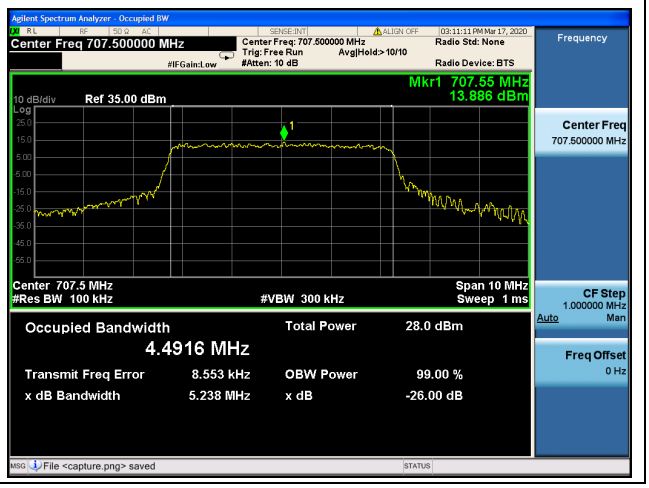
Band12 / 5MHz / Mid CH / QPSK



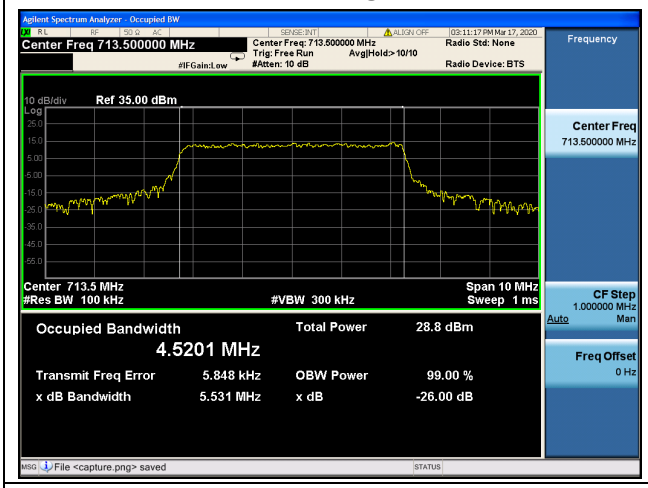
Band12 / 5MHz / Mid CH / 16QAM



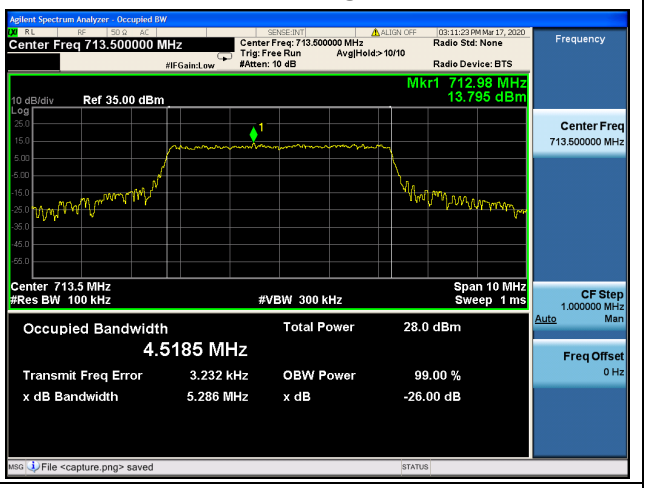
Band12 / 5MHz / Mid CH / 64QAM



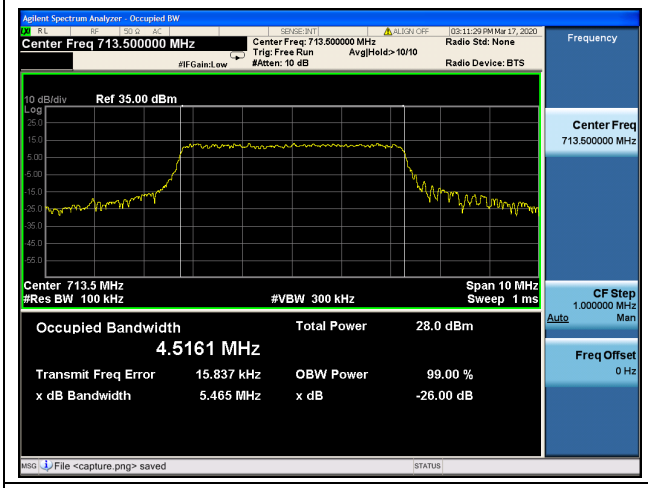
Band12 / 5MHz / High CH / QPSK



Band12 / 5MHz / High CH / 16QAM

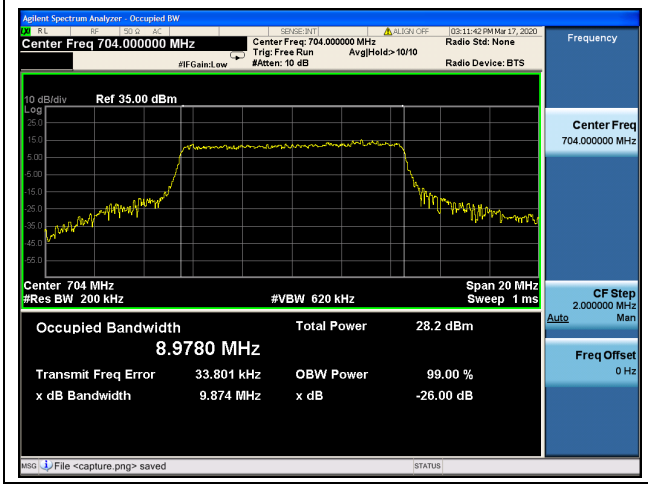


Band12 / 5MHz / High CH / 64QAM

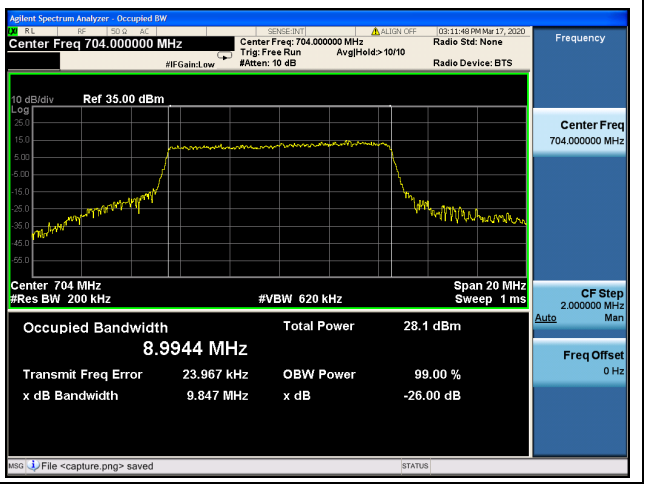


Band12 / 10MHz / Low CH / QPSK

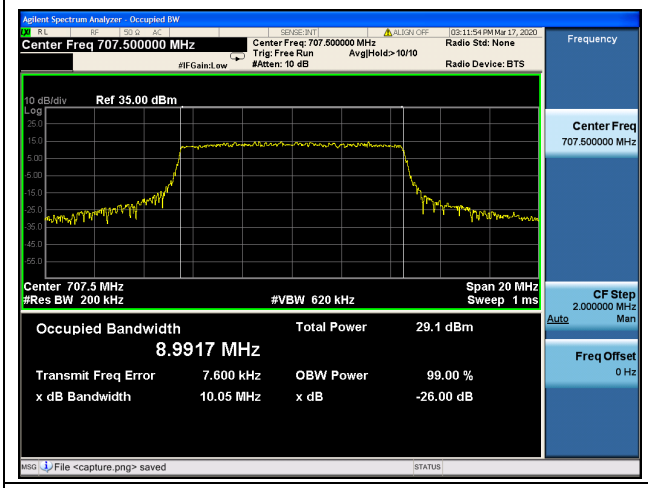
Band12 / 10MHz / Low CH / 16QAM



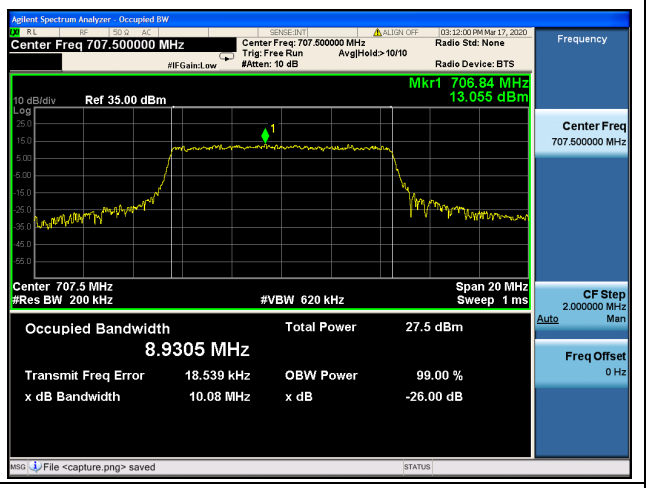
Band12 / 10MHz / Low CH / 64QAM



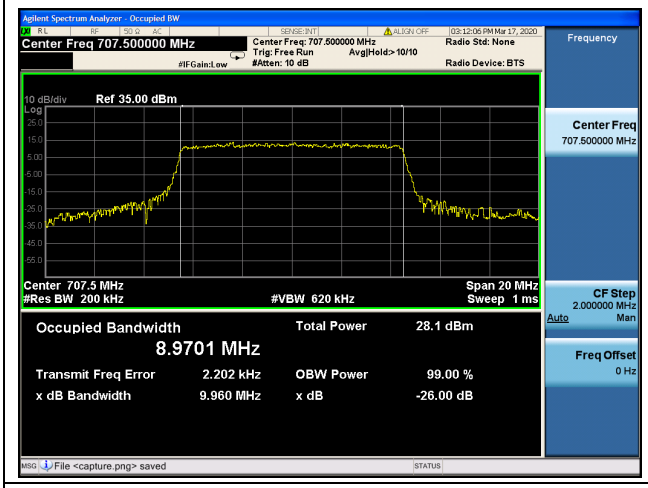
Band12 / 10MHz / Mid CH / QPSK



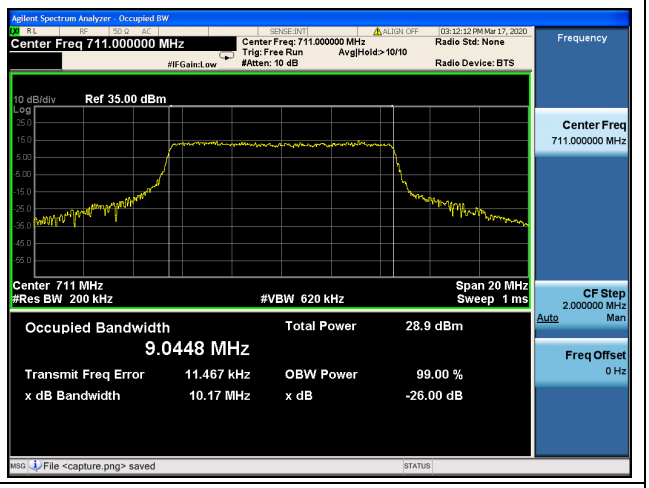
Band12 / 10MHz / Mid CH / 16QAM



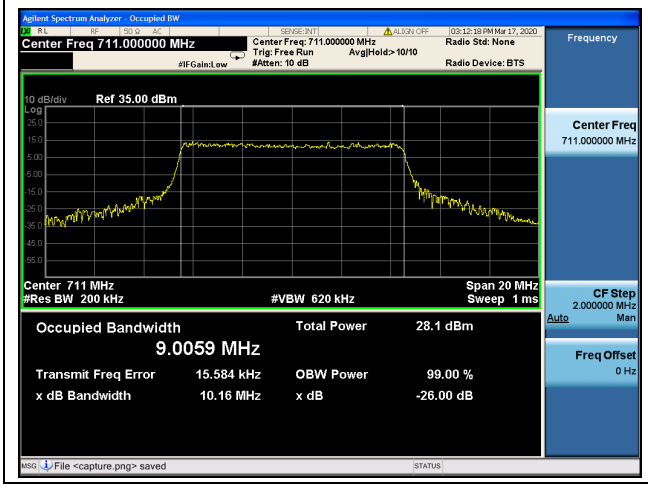
Band12 / 10MHz / Mid CH / 64QAM



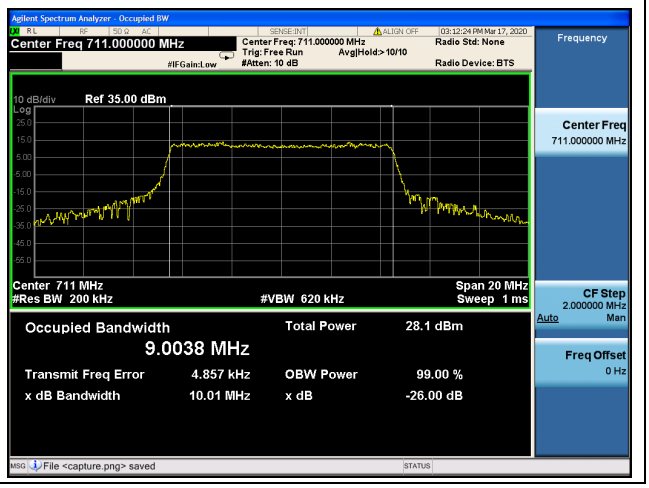
Band12 / 10MHz / High CH / QPSK



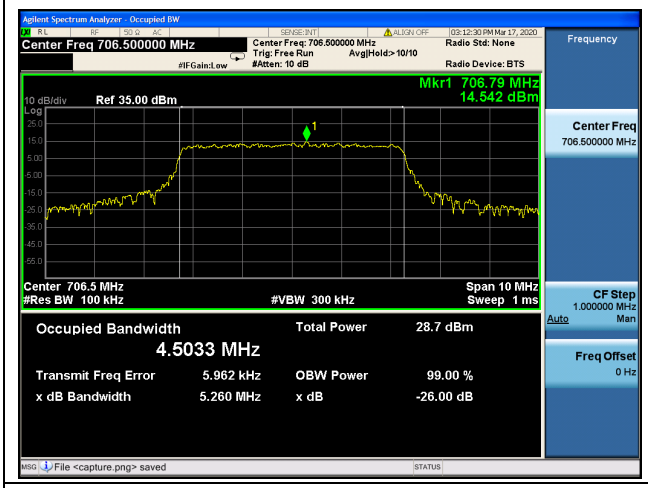
Band12 / 10MHz / High CH / 16QAM



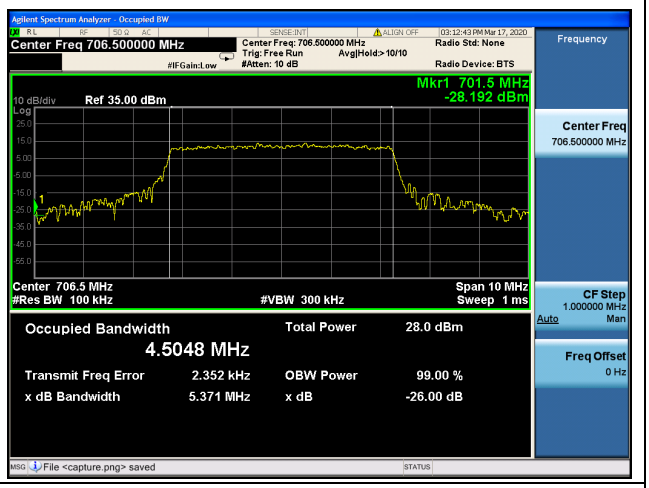
Band12 / 10MHz / High CH / 64QAM



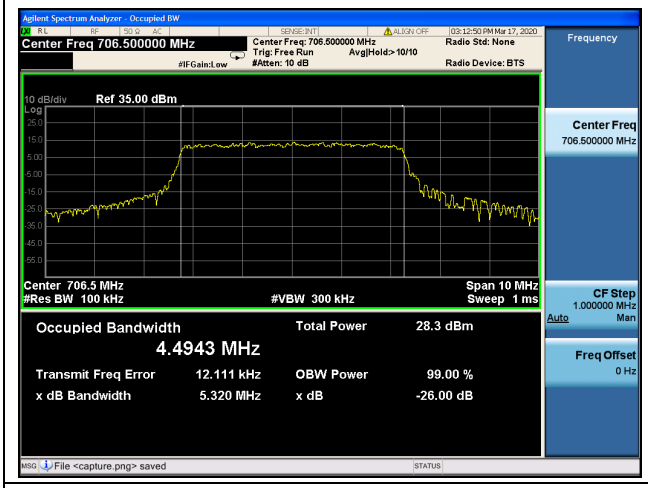
Band17 / 5MHz / Low CH / QPSK



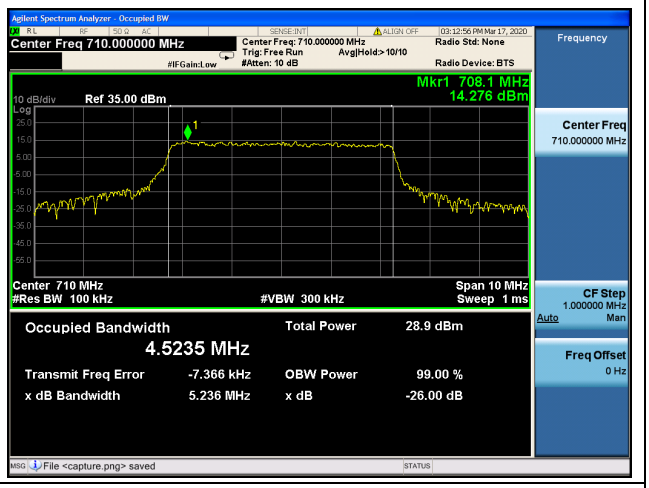
Band17 / 5MHz / Low CH / 16QAM



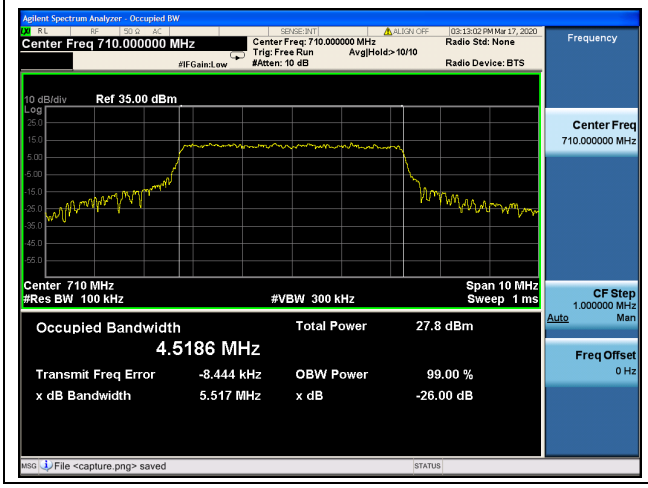
Band17 / 5MHz / Low CH / 64QAM



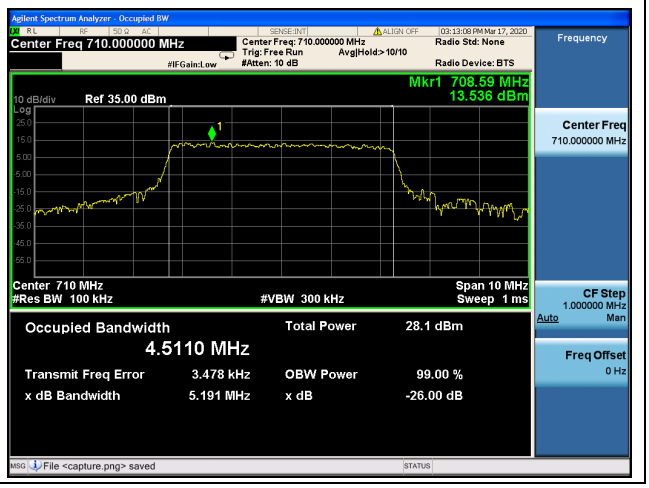
Band17 / 5MHz / Mid CH / QPSK



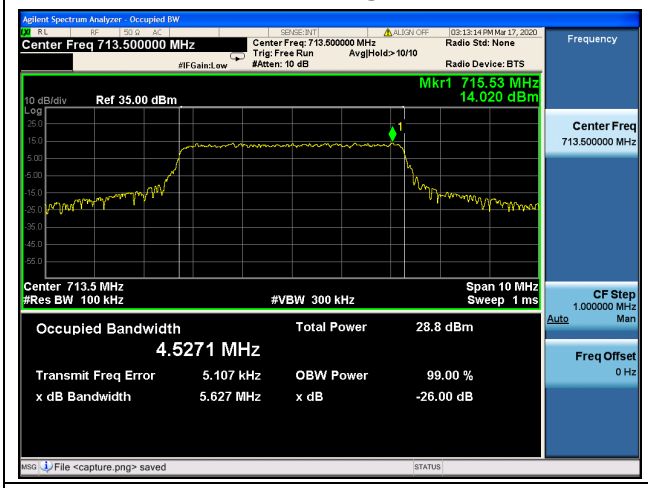
Band17 / 5MHz / Mid CH / 16QAM



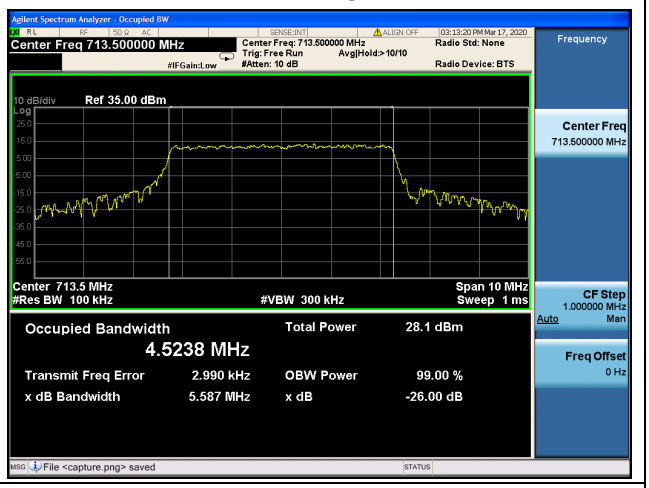
Band17 / 5MHz / Mid CH / 64QAM



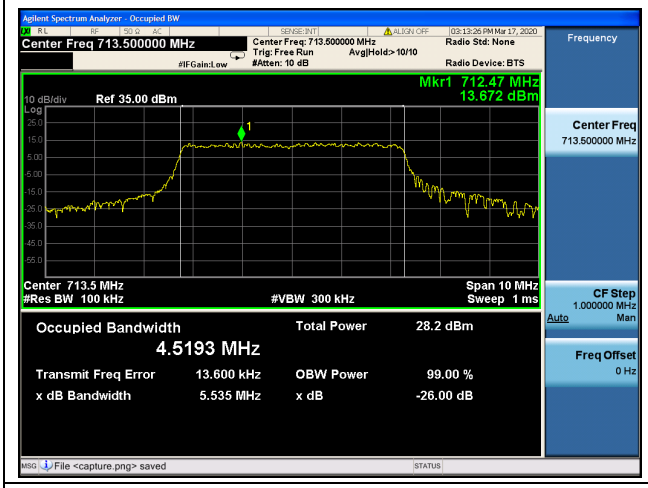
Band17 / 5MHz / High CH / QPSK



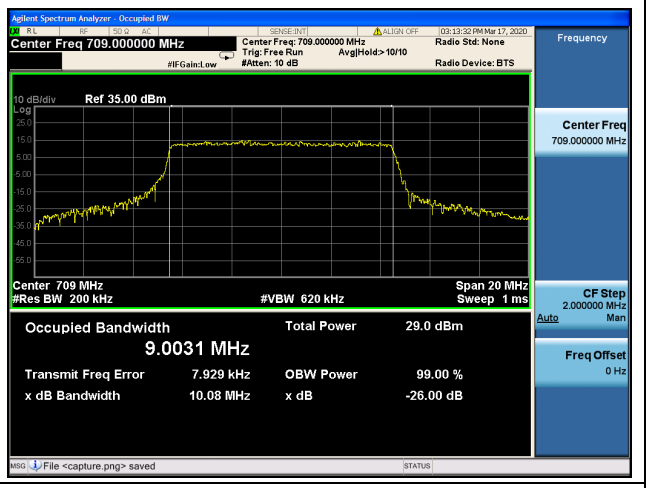
Band17 / 5MHz / High CH / 16QAM



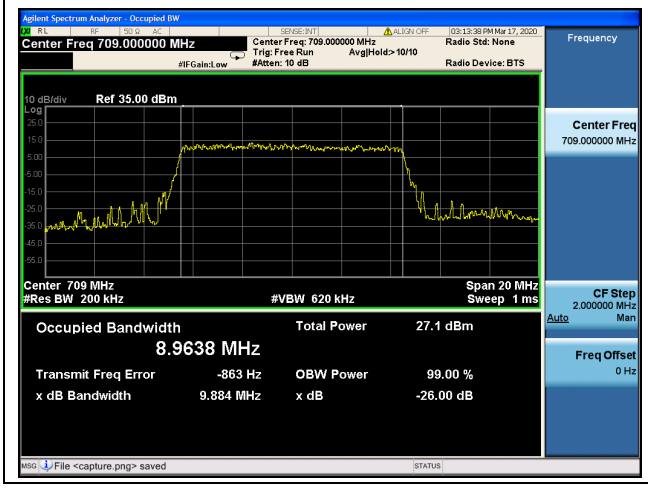
Band17 / 5MHz / High CH / 64QAM



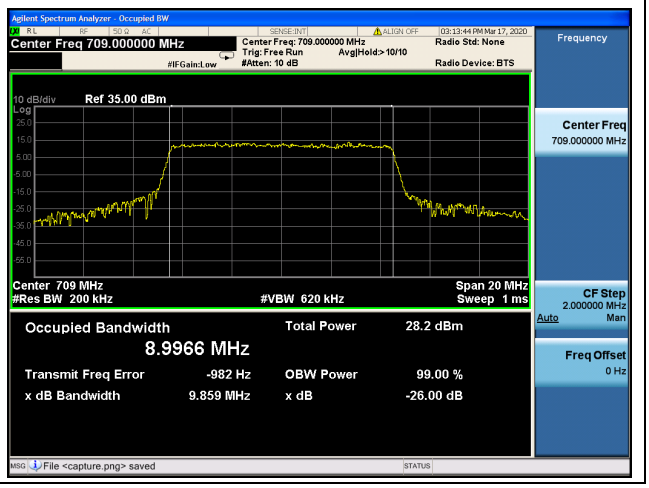
Band17 / 10MHz / Low CH / QPSK



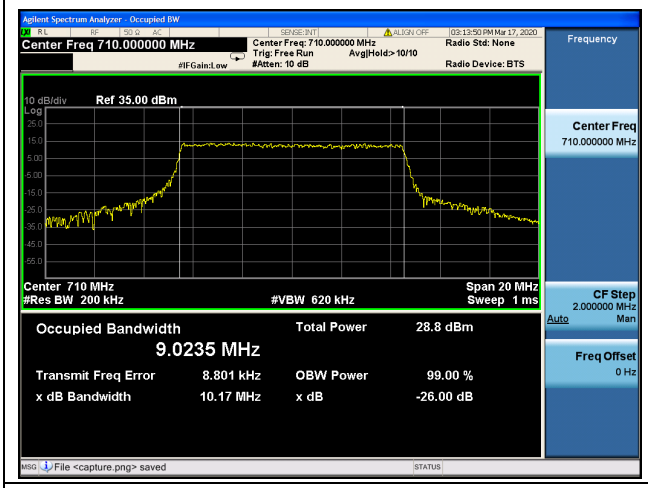
Band17 / 10MHz / Low CH / 16QAM



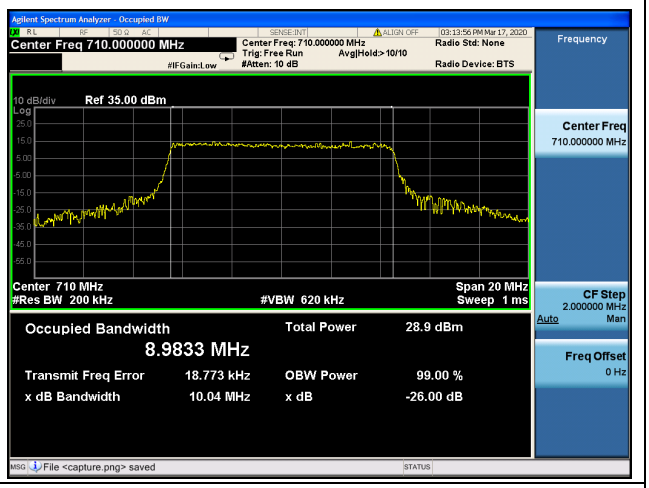
Band17 / 10MHz / Low CH / 64QAM



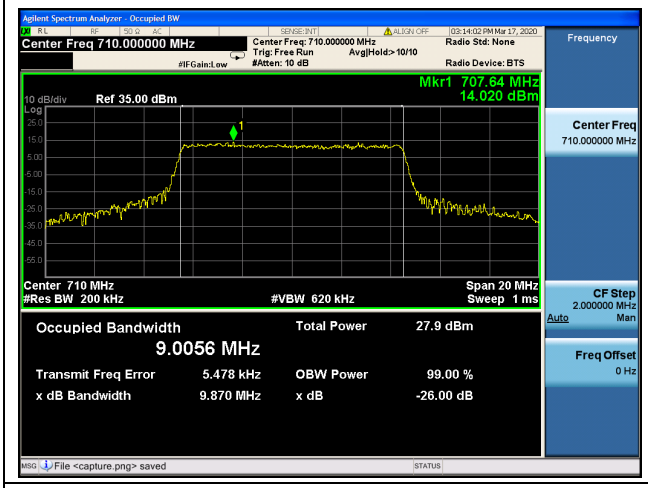
Band17 / 10MHz / Mid CH / QPSK



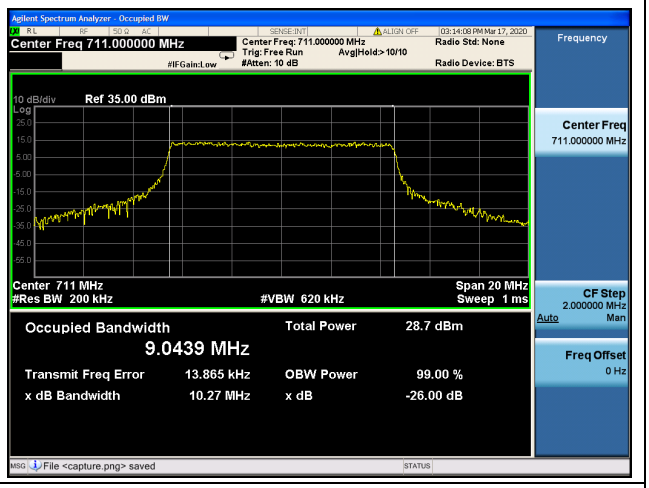
Band17 / 10MHz / Mid CH / 16QAM



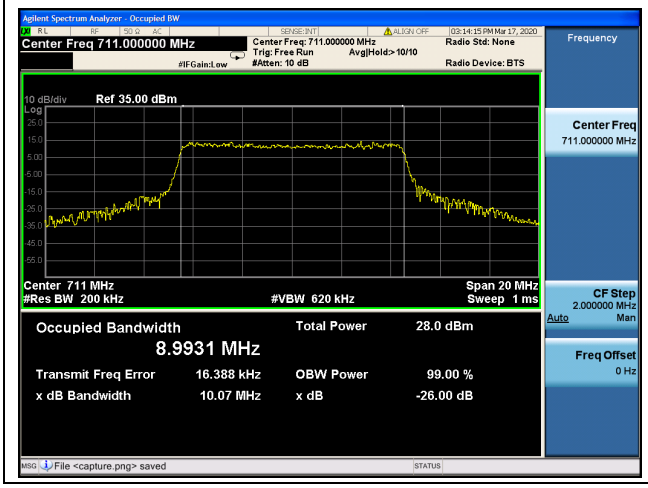
Band17 / 10MHz / Mid CH / 64QAM



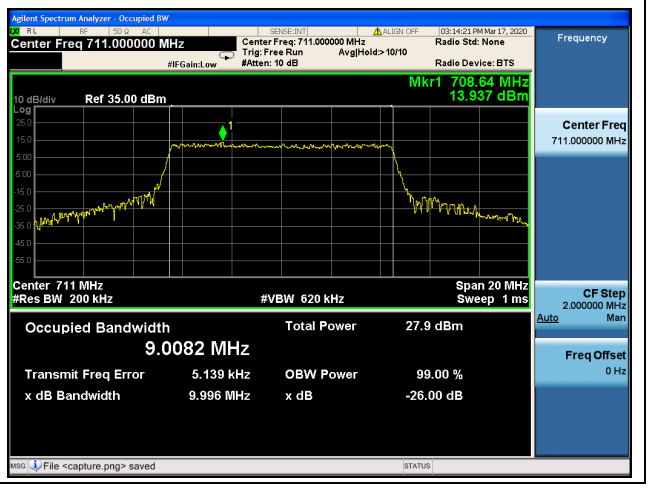
Band17 / 10MHz / High CH / QPSK



Band17 / 10MHz / High CH / 16QAM



Band17 / 10MHz / High CH / 64QAM



2.3. Frequency Stability

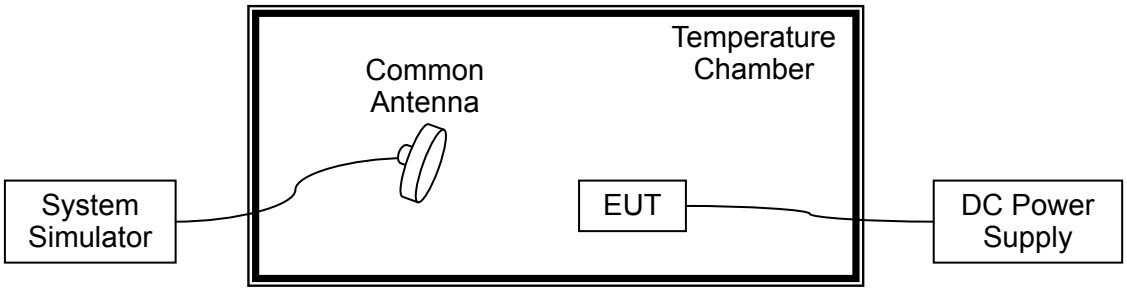
2.3.1. Requirement

According to FCC section 2.1055 & 24.235 & 27.54, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. **According to** FCC section 2.1055, the test conditions are:

(a) The temperature is varied from 0°C to +55°C at intervals of not more than 10°C.

(b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

2.3.2. Test Description



The EUT which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT is commanded by the System Simulator (SS) to operate at the maximum output power. A call is established between the EUT and the SS via a Common Antenna.

2.3.3. Test procedure

KDB 971168 D01v03 Section 9.0 and ANSI/TIA-603-E-2016.

2.3.4. Test Result

The nominal, highest and lowest extreme voltages are separately 3.85VDC, 4.40VDC and 3.5VDC, which are specified by the applicant; the normal temperature here used is 20°C.

LTE Band 2, QPSK, Channel 18900, Frequency 1880.0MHz Limit =Within Authorized Band					
Voltage(%)	**Power(VDC)**	**Temp(°C)**	**Fre. Dev.(Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20（Ref）	53	0.028	PASS
100		0	66	0.029	
100		+10	-58	-0.031	
100		+20	42	0.022	
100		+30	-16	-0.009	
100		+40	-47	-0.025	
100		+50	-66	-0.029	
100		+55	43	0.022	
115	4.40	+20	-15	-0.008	
85	3.50	+20	53	0.028	

LTE Band 4, QPSK, Channel 20175, Frequency 1732.5MHz Limit =Within Authorized Band					
Voltage(%)	**Power(VDC)**	**Temp(°C)**	**Fre. Dev.(Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20（Ref）	53	0.031	PASS
100		0	42	0.024	
100		+10	-43	-0.025	
100		+20	-47	-0.027	
100		+30	31	0.018	
100		+40	47	0.027	
100		+50	38	0.018	
100		+55	52	0.025	
115	4.40	+20	-15	-0.009	
85	3.50	+20	53	0.031	

LTE Band 5, QPSK, Channel 20525, Frequency 836.5MHz Limit=±2.5ppm					
Voltage (%)	**Power (VDC)**	**Temp (°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20（Ref）	52	0.025	PASS
100		0	38	0.018	
100		+10	-43	-0.021	
100		+20	-37	-0.018	
100		+30	73	0.035	
100		+40	47	0.022	
100		+50	-41	-0.021	
100		+55	53	0.031	
115	4.40	+20	-42	-0.020	
85	3.50	+20	52	0.025	

LTE Band 7, QPSK, Channel 21100, Frequency 2535MHz Limit=±2.5ppm					
Voltage (%)	**Power (VDC)**	**Temp (°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20（Ref）	54	0.026	PASS
100		0	33	0.017	
100		+10	-41	-0.021	
100		+20	-32	-0.018	
100		+30	75	0.031	
100		+40	44	0.018	
100		+50	45	0.025	
100		+55	26	0.015	
115	4.40	+20	-41	-0.023	
85	3.50	+20	50	0.022	

LTE Band 12, QPSK, Channel 23095, Frequency 707.5MHz Limit =Within Authorized Band					
Voltage(%)	**Power(VDC)**	**Temp(°C)**	**Fre. Dev.(Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20（Ref）	26	0.015	PASS
100		0	45	0.025	
100		+10	-27	-0.015	
100		+20	-27	-0.015	
100		+30	25	0.014	
100		+40	56	0.032	
100		+50	-27	-0.030	
100		+55	-65	0.015	
115	4.40	+20	-25	-0.014	
85	3.50	+20	26	0.015	

LTE Band 17, QPSK, Channel 23790, Frequency 710MHz Limit =Within Authorized Band					
Voltage(%)	**Power(VDC)**	**Temp(°C)**	**Fre. Dev.(Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20（Ref）	-49	0.029	PASS
100		0	-54	0.024	
100		+10	-17	-0.004	
100		+20	-49	-0.022	
100		+30	-65	0.015	
100		+40	41	0.021	
100		+50	-25	-0.014	
100		+55	-27	-0.015	
115	4.40	+20	72	-0.031	
85	3.50	+20	-58	0.029	

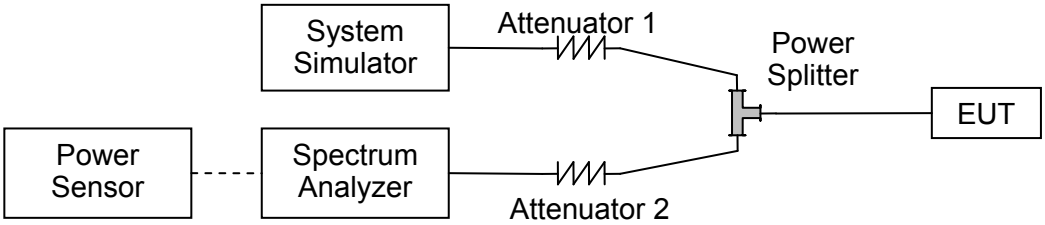
2.4. Peak to Average Radio

2.4.1. Requirement

According to FCC section 24.232(d) and 27.50(d), the peak to average ratio (PAR) of the transmission may not exceed 13dB.

2.4.2. Test Description

Test Set:



The EUTis coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2.4.3. Test procedure

KDB 971168 D01v03 Section 5.7 and ANSI/TIA-603-E-2016.

2.4.4. Test Result

Record the maximum PAPR level associated with a probability of 0.1%.

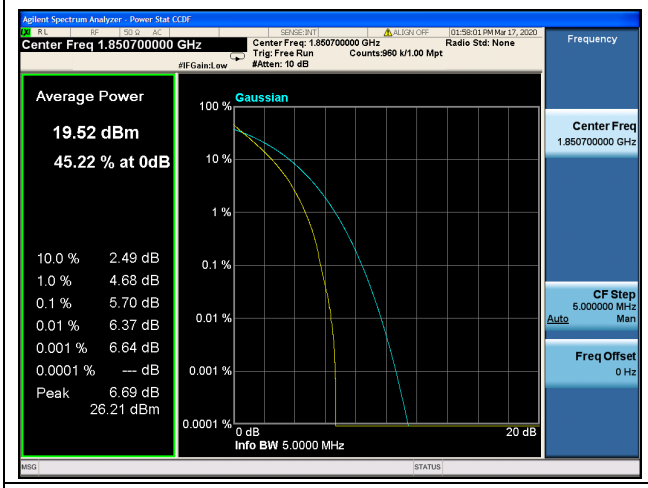
LTE Band 2					
BW(MHz)	Channel Level	Modulation	Peak to Average Radio(dB)	Limit (dB)	Verdict
1.4	Low	QPSK	5.70	<=13	PASS
1.4	Low	16QAM	6.73	<=13	PASS
1.4	Low	64QAM	6.53	<=13	PASS
1.4	Mid	QPSK	6.03	<=13	PASS
1.4	Mid	16QAM	6.80	<=13	PASS
1.4	Mid	64QAM	6.58	<=13	PASS
1.4	High	QPSK	5.92	<=13	PASS
1.4	High	16QAM	6.60	<=13	PASS
1.4	High	64QAM	6.48	<=13	PASS
3	Low	QPSK	5.99	<=13	PASS
3	Low	16QAM	6.73	<=13	PASS
3	Low	64QAM	6.50	<=13	PASS
3	Mid	QPSK	5.92	<=13	PASS
3	Mid	16QAM	6.71	<=13	PASS
3	Mid	64QAM	6.53	<=13	PASS
3	High	QPSK	5.86	<=13	PASS
3	High	16QAM	6.61	<=13	PASS
3	High	64QAM	6.40	<=13	PASS
5	Low	QPSK	5.87	<=13	PASS
5	Low	16QAM	6.57	<=13	PASS
5	Low	64QAM	6.45	<=13	PASS
5	Mid	QPSK	5.84	<=13	PASS
5	Mid	16QAM	6.49	<=13	PASS
5	Mid	64QAM	6.40	<=13	PASS
5	High	QPSK	5.78	<=13	PASS
5	High	16QAM	6.39	<=13	PASS
5	High	64QAM	6.51	<=13	PASS
10	Low	QPSK	5.96	<=13	PASS
10	Low	16QAM	6.55	<=13	PASS
10	Low	64QAM	6.58	<=13	PASS
10	Mid	QPSK	5.95	<=13	PASS
10	Mid	16QAM	6.53	<=13	PASS
10	Mid	64QAM	6.47	<=13	PASS
10	High	QPSK	5.87	<=13	PASS

10	High	16QAM	6.44	<=13	PASS
10	High	64QAM	6.38	<=13	PASS
15	Low	QPSK	5.96	<=13	PASS
15	Low	16QAM	6.58	<=13	PASS
15	Low	64QAM	6.52	<=13	PASS
15	Mid	QPSK	5.90	<=13	PASS
15	Mid	16QAM	6.49	<=13	PASS
15	Mid	64QAM	6.45	<=13	PASS
15	High	QPSK	5.77	<=13	PASS
15	High	16QAM	6.42	<=13	PASS
15	High	64QAM	6.40	<=13	PASS
20	Low	QPSK	5.90	<=13	PASS
20	Low	16QAM	6.58	<=13	PASS
20	Low	64QAM	6.53	<=13	PASS
20	Mid	QPSK	5.89	<=13	PASS
20	Mid	16QAM	6.54	<=13	PASS
20	Mid	64QAM	6.52	<=13	PASS
20	High	QPSK	5.78	<=13	PASS
20	High	16QAM	6.47	<=13	PASS
20	High	64QAM	6.45	<=13	PASS

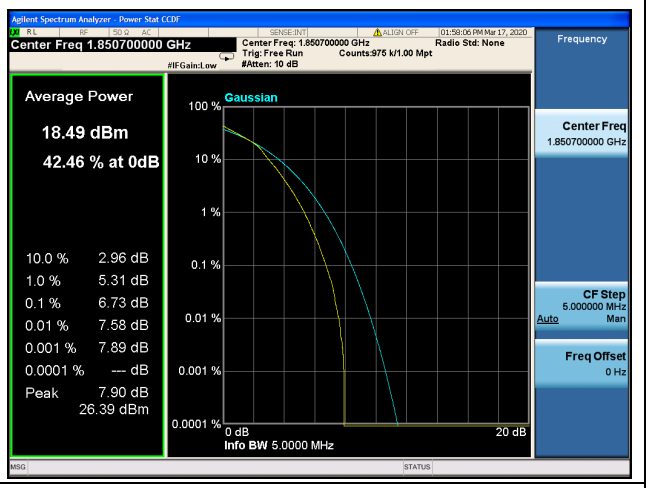
LTE Band 4					
BW(MHz)	Channel Level	Modulation	Peak to Average Radio(dB)	Limit (dB)	Verdict
1.4	Low	QPSK	6.02	<=13	PASS
1.4	Low	16QAM	6.83	<=13	PASS
1.4	Low	64QAM	6.67	<=13	PASS
1.4	Mid	QPSK	6.06	<=13	PASS
1.4	Mid	16QAM	6.88	<=13	PASS
1.4	Mid	64QAM	6.64	<=13	PASS
1.4	High	QPSK	5.99	<=13	PASS
1.4	High	16QAM	6.76	<=13	PASS
1.4	High	64QAM	6.66	<=13	PASS
3	Low	QPSK	6.03	<=13	PASS
3	Low	16QAM	6.83	<=13	PASS
3	Low	64QAM	6.58	<=13	PASS
3	Mid	QPSK	6.02	<=13	PASS
3	Mid	16QAM	6.80	<=13	PASS
3	Mid	64QAM	6.61	<=13	PASS
3	High	QPSK	5.95	<=13	PASS
3	High	16QAM	6.73	<=13	PASS
3	High	64QAM	6.59	<=13	PASS
5	Low	QPSK	5.98	<=13	PASS
5	Low	16QAM	6.63	<=13	PASS
5	Low	64QAM	6.53	<=13	PASS
5	Mid	QPSK	5.93	<=13	PASS
5	Mid	16QAM	6.60	<=13	PASS
5	Mid	64QAM	6.52	<=13	PASS
5	High	QPSK	5.87	<=13	PASS
5	High	16QAM	6.59	<=13	PASS
5	High	64QAM	6.51	<=13	PASS
10	Low	QPSK	6.05	<=13	PASS
10	Low	16QAM	6.65	<=13	PASS
10	Low	64QAM	6.65	<=13	PASS
10	Mid	QPSK	5.98	<=13	PASS
10	Mid	16QAM	6.51	<=13	PASS
10	Mid	64QAM	6.57	<=13	PASS
10	High	QPSK	5.97	<=13	PASS

10	High	16QAM	6.63	<=13	PASS
10	High	64QAM	6.58	<=13	PASS
15	Low	QPSK	6.02	<=13	PASS
15	Low	16QAM	6.67	<=13	PASS
15	Low	64QAM	6.64	<=13	PASS
15	Mid	QPSK	5.92	<=13	PASS
15	Mid	16QAM	6.61	<=13	PASS
15	Mid	64QAM	6.53	<=13	PASS
15	High	QPSK	5.95	<=13	PASS
15	High	16QAM	6.56	<=13	PASS
15	High	64QAM	6.50	<=13	PASS
20	Low	QPSK	5.96	<=13	PASS
20	Low	16QAM	6.68	<=13	PASS
20	Low	64QAM	6.65	<=13	PASS
20	Mid	QPSK	5.88	<=13	PASS
20	Mid	16QAM	6.64	<=13	PASS
20	Mid	64QAM	6.61	<=13	PASS
20	High	QPSK	5.90	<=13	PASS
20	High	16QAM	6.64	<=13	PASS
20	High	64QAM	6.59	<=13	PASS

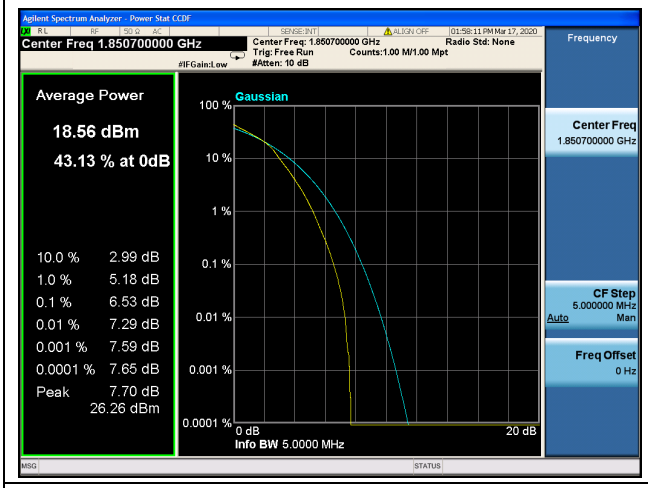
Band2 / 1.4MHz / Low CH / QPSK



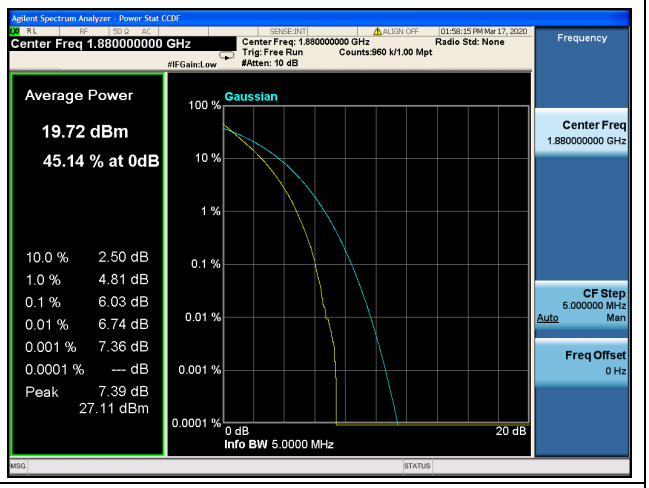
Band2 / 1.4MHz / Low CH / 16QAM



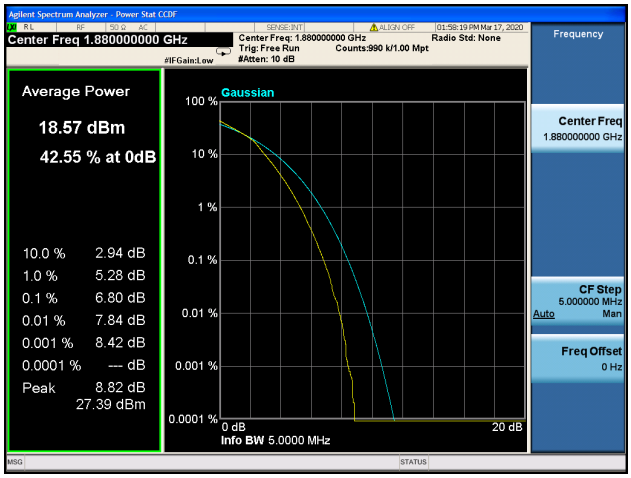
Band2 / 1.4MHz / Low CH / 64QAM



Band2 / 1.4MHz / Mid CH / QPSK

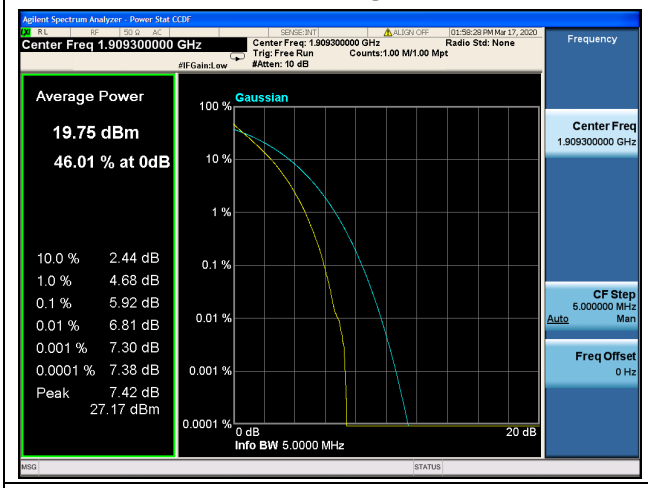


Band2 / 1.4MHz / Mid CH / 16QAM

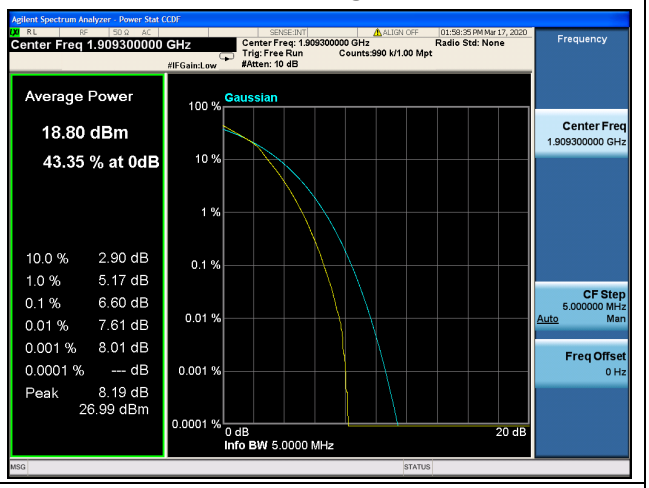


Band2 / 1.4MHz / Mid CH / 64QAM

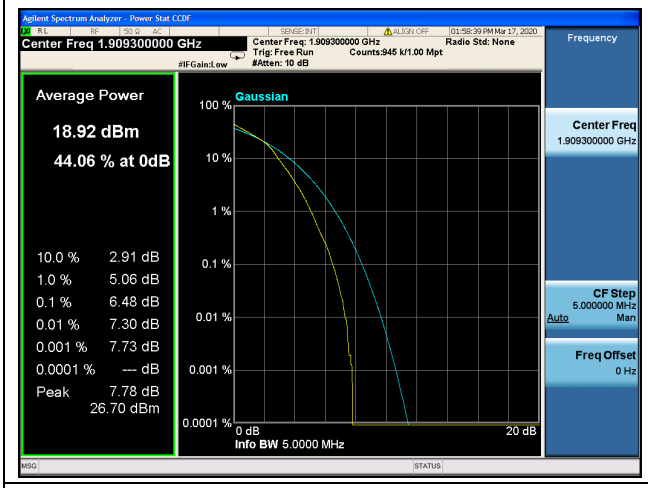
Band2 / 1.4MHz / High CH / QPSK



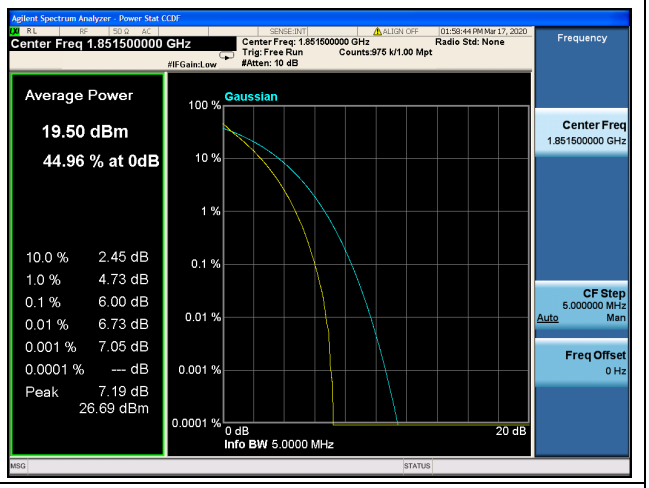
Band2 / 1.4MHz / High CH / 16QAM



Band2 / 1.4MHz / High CH / 64QAM

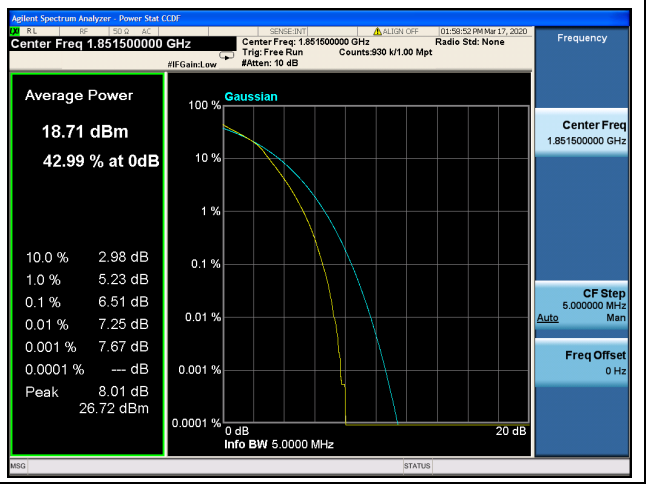


Band2 / 3MHz / Low CH / QPSK

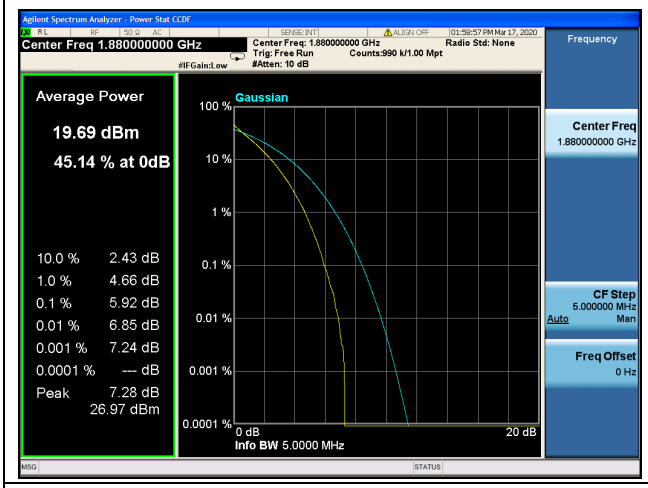


Band2 / 3MHz / Low CH / 16QAM

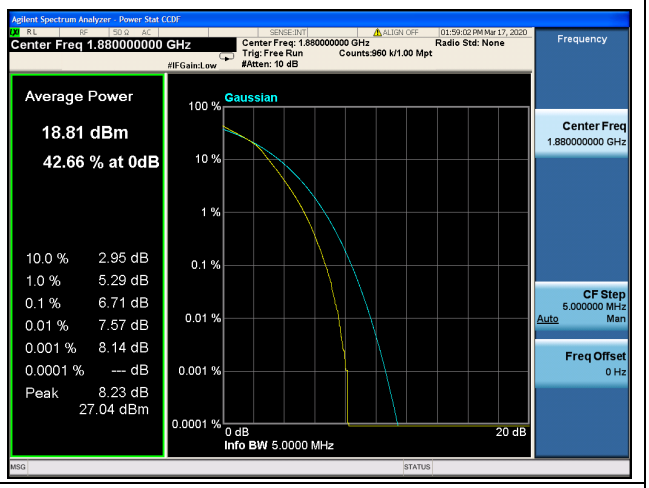
Band2 / 3MHz / Low CH / 64QAM



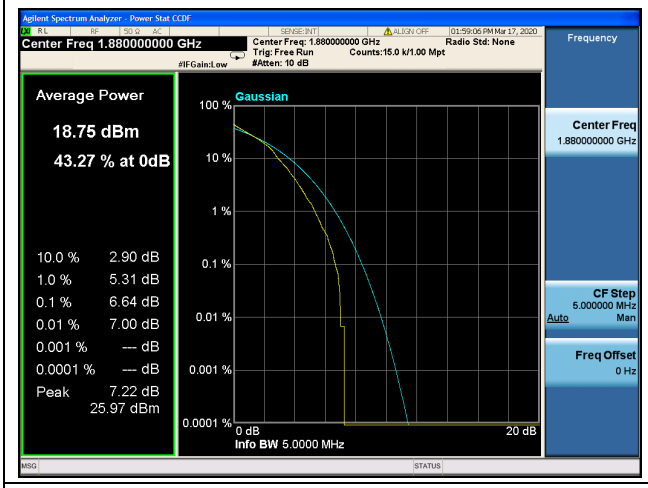
Band2 / 3MHz / Mid CH / QPSK



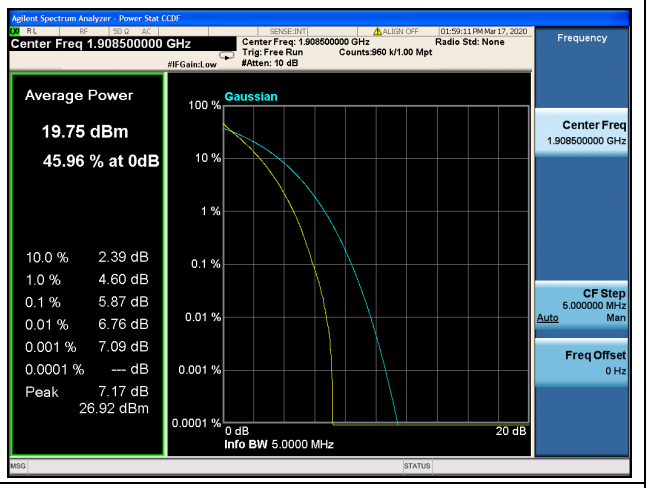
Band2 / 3MHz / Mid CH / 16QAM



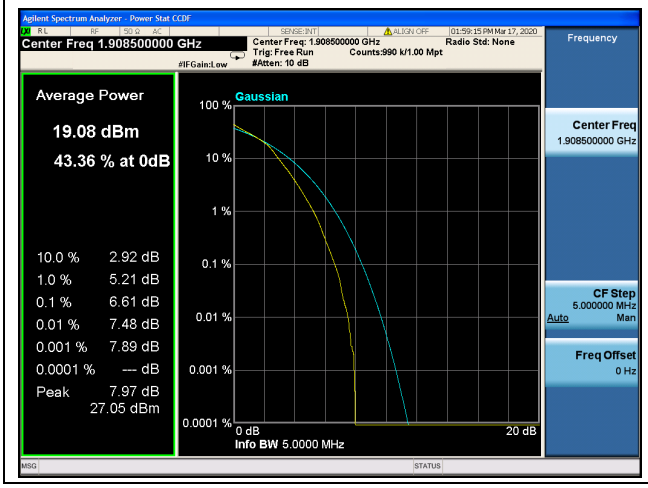
Band2 / 3MHz / Mid CH / 64QAM



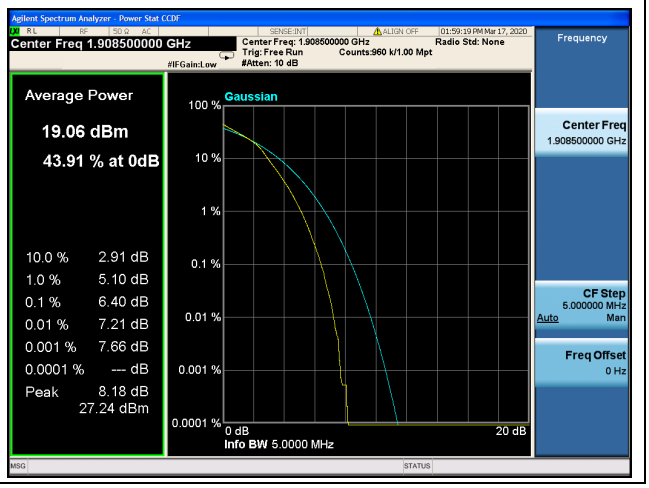
Band2 / 3MHz / High CH / QPSK



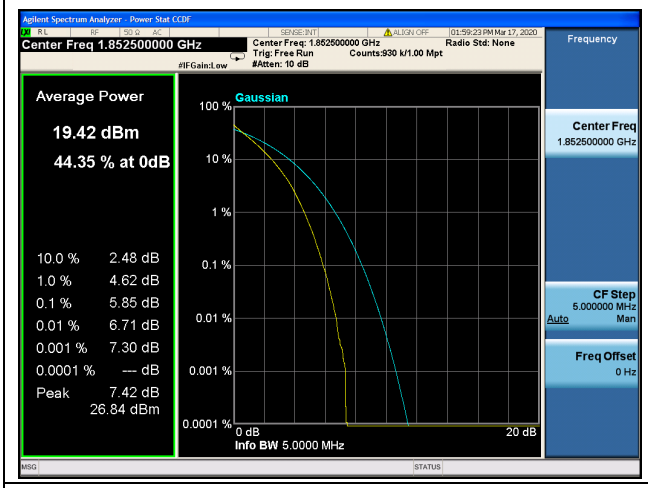
Band2 / 3MHz / High CH / 16QAM



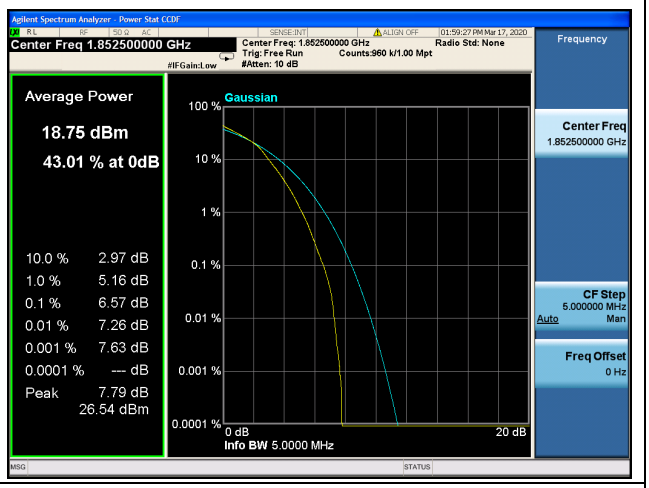
Band2 / 3MHz / High CH / 64QAM



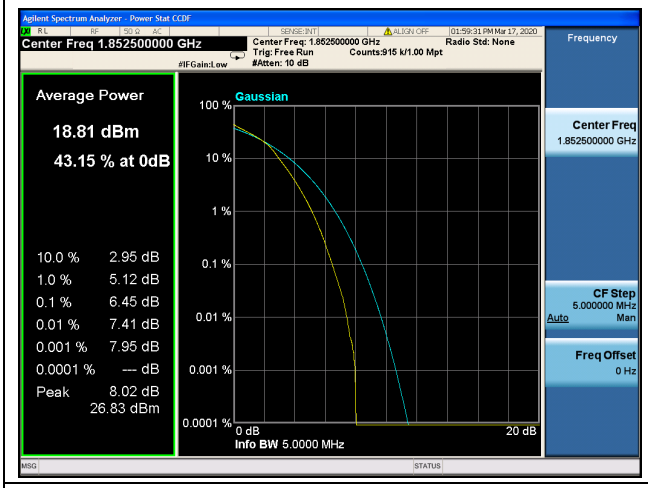
Band2 / 5MHz / Low CH / QPSK



Band2 / 5MHz / Low CH / 16QAM

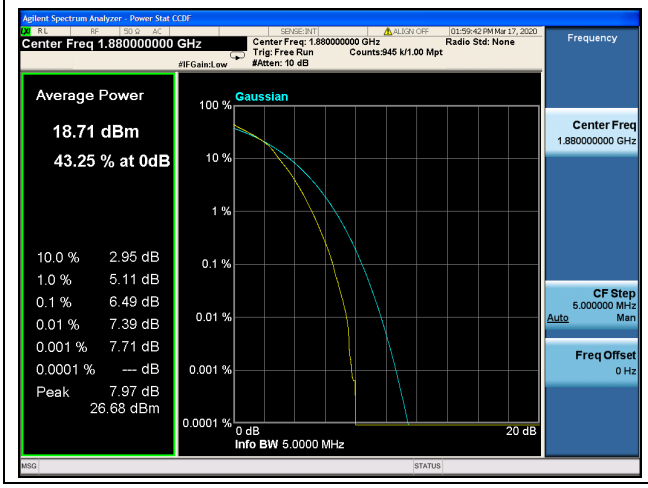


Band2 / 5MHz / Low CH / 64QAM

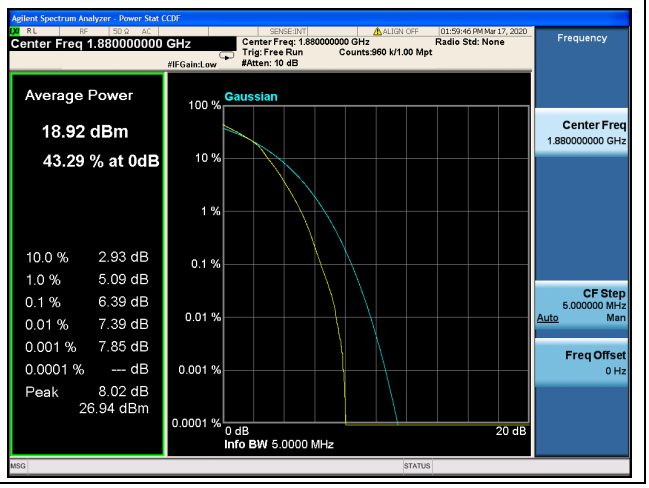


Band2 / 5MHz / Mid CH / QPSK

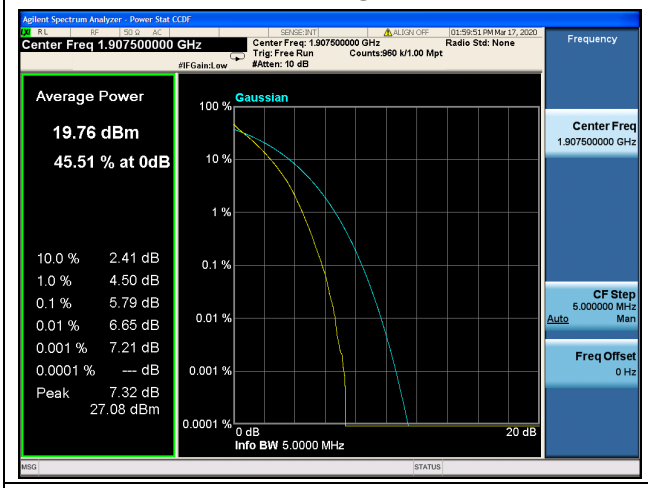
Band2 / 5MHz / Mid CH / 16QAM



Band2 / 5MHz / Mid CH / 64QAM

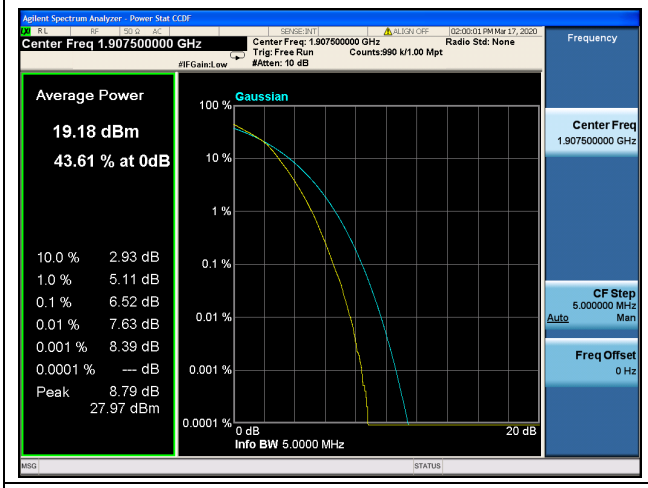


Band2 / 5MHz / High CH / QPSK

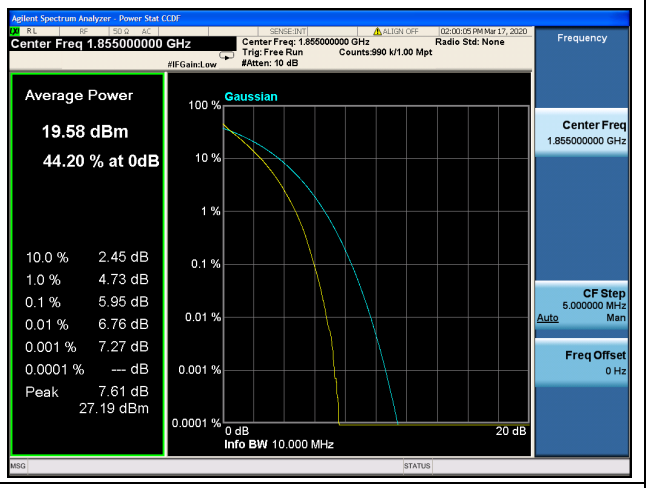


Band2 / 5MHz / High CH / 16QAM

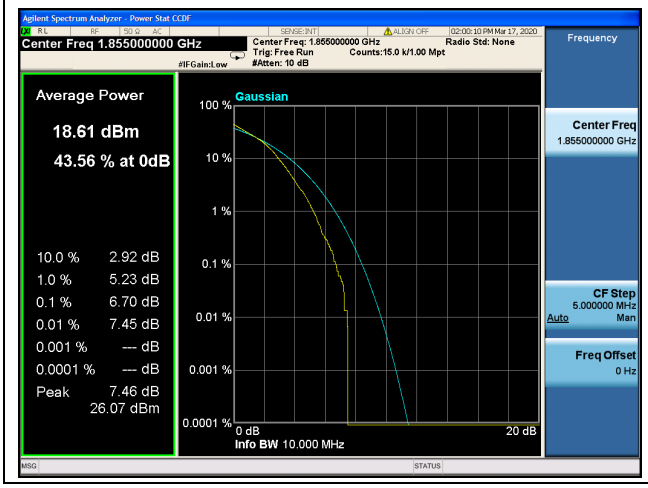
Band2 / 5MHz / High CH / 64QAM



Band2 / 10MHz / Low CH / QPSK

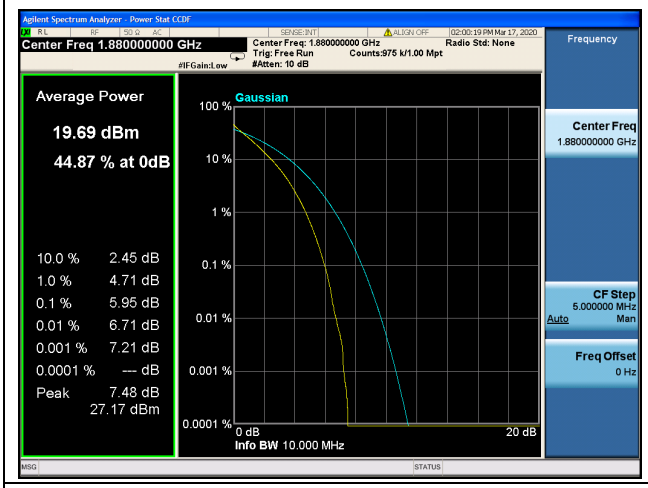


Band2 / 10MHz / Low CH / 16QAM

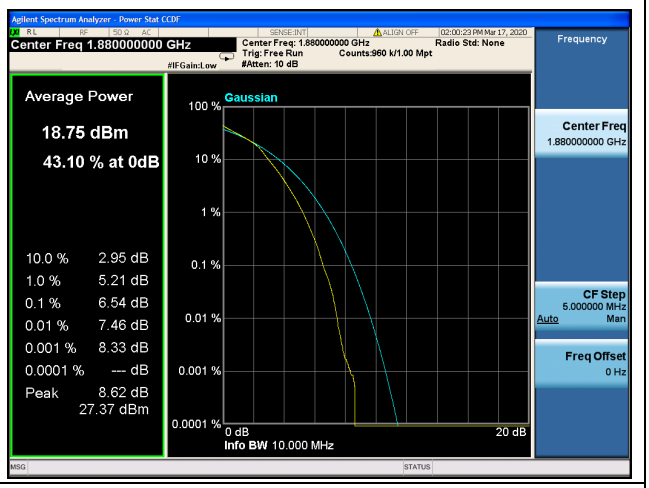


Band2 / 10MHz / Low CH / 64QAM

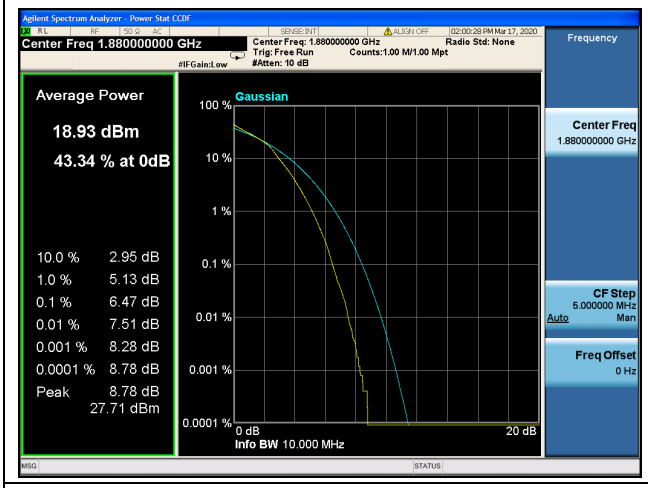
Band2 / 10MHz / Mid CH / QPSK



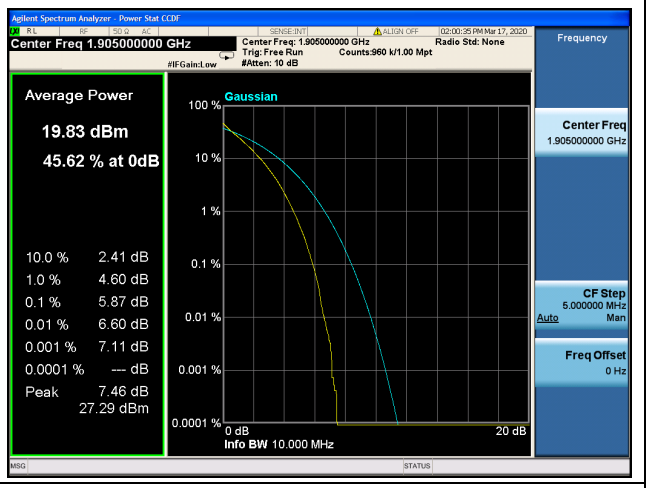
Band2 / 10MHz / Mid CH / 16QAM



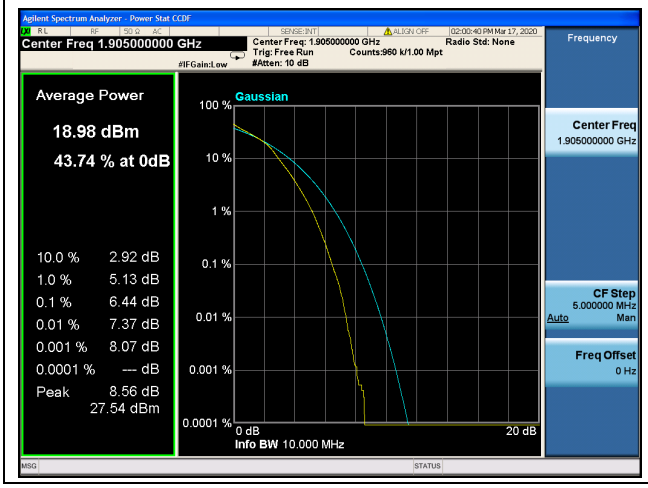
Band2 / 10MHz / Mid CH / 64QAM



Band2 / 10MHz / High CH / QPSK



Band2 / 10MHz / High CH / 16QAM



Band2 / 10MHz / High CH / 64QAM