



5 Occupied Bandwidth

5.1 Test Specification

FCC Part 2, Section 1049

5.2 Test Procedure

(Temperature (22°C)/ Humidity (35%RH))

The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator and an appropriate coaxial cable. The spectrum analyzer was set to proper resolution B.W.

OBW function (99%) was employed for this evaluation.

Occupied bandwidth measured was repeated for each modulation.

5.3 Test Limit

N/A

5.4 Test Results

JUDGEMENT: Passed

See additional information in Table 8 to Table 19 and Figure 152 to Figure 439.

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
16QAM	5	15	2498.5	4.5531
		30	2498.5	3.9939
		15	2593.0	4.5464
		30	2593.0	4.0007
		15	2687.5	4.5552
		30	2687.5	3.9902
	10	15	2501.0	9.3318
		30	2501.0	8.6254
		60	2501.0	8.0277
		15	2593.0	9.2807
		30	2593.0	8.6222
		60	2593.0	8.0365
		15	2685.0	9.3259
		30	2685.0	8.6311
		60	2685.0	8.0321
	15	15	2503.5	14.361
		30	2503.5	13.824
		60	2503.5	13.842
		15	2593.0	14.314
		30	2593.0	13.825
		60	2593.0	13.021
		15	2682.5	14.338
		30	2682.5	13.857
		60	2682.5	12.990

Table 8 Occupied Bandwidth 16QAM Input

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
16QAM	20	15	2506.0	19.121
		30	2506.0	18.542
		60	2506.0	12.275
		15	2593.0	19.115
		30	2593.0	18.530
		60	2593.0	17.266
		15	2680.0	19.128
		30	2680.0	19.621
		60	2680.0	17.281
	40	15	2516.0	39.185
		30	2516.0	38.267
		60	2516.0	37.192
		15	2593.0	32.129
		30	2593.0	38.315
		60	2593.0	37.035
		15	2670.0	39.004
		30	2670.0	38.301
		60	2670.0	37.064
	60	30	2526.0	58.359
		60	2526.0	57.168
		30	2593.0	58.450
		60	2593.0	57.207
		30	2660.0	58.515
		60	2660.0	57.182

Table 9 Occupied Bandwidth 16QAM Input

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
16QAM	5	15	2498.5	3.9543
		30	2498.5	3.559
		15	2593.0	4.4878
		30	2593.0	4.4909
		15	2687.5	3.9690
		30	2687.5	3.9703
	10	15	2501.0	7.8897
		30	2501.0	7.8976
		60	2501.0	7.8925
		15	2593.0	7.8973
		30	2593.0	7.902
		60	2593.0	7.8960
		15	2685.0	7.9354
		30	2685.0	7.9295
		60	2685.0	7.9318
	15	15	2503.5	12.794
		30	2503.5	12.773
		60	2503.5	12.790
		15	2593.0	12.794
		30	2593.0	12.782
		60	2593.0	12.779
		15	2682.5	12.902
		30	2682.5	12.917
		60	2682.5	12.899

Table 10 Occupied Bandwidth 16QAM Output

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
16QAM	20	15	2506.0	18.310
		30	2506.0	18.309
		60	2506.0	18.298
		15	2593.0	18.310
		30	2593.0	18.311
		60	2593.0	18.333
		15	2680.0	17.315
		30	2680.0	17.310
		60	2680.0	17.308
	40	15	2516.0	36.606
		30	2516.0	36.574
		60	2516.0	36.622
		15	2593.0	36.600
		30	2593.0	36.607
		60	2593.0	36.588
		15	2670.0	38.144
		30	2670.0	38.108
		60	2670.0	38.104
	60	30	2526.0	56.518
		60	2526.0	56.564
		30	2593.0	58.078
		60	2593.0	58.121
		30	2660.0	57.908
		60	2660.0	57.897

Table 11 Occupied Bandwidth 16QAM Output

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
64QAM	5	15	2498.5	4.5440
		30	2498.5	3.9848
		15	2593.0	4.5357
		30	2593.0	3.9898
		15	2687.5	4.5417
		30	2687.5	3.9836
	10	15	2501.0	9.4482
		30	2501.0	8.7324
		60	2501.0	8.0149
		15	2593.0	9.4569
		30	2593.0	13.651
		60	2593.0	8.0116
		15	2685.0	9.4685
		30	2685.0	9.4327
		60	2685.0	8.0109
	15	15	2503.5	14.333
		30	2503.5	13.803
		60	2503.5	13.098
		15	2593.0	14.353
		30	2593.0	13.774
		60	2593.0	13.087
		15	2682.5	14.344
		30	2682.5	13.775
		60	2682.5	13.118

Table 12 Occupied Bandwidth 64QAM Input

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
64QAM	20	15	2506.0	19.231
		30	2506.0	18.531
		60	2506.0	17.487
		15	2593.0	19.229
		30	2593.0	13.774
		60	2593.0	13.087
		15	2680.0	19.155
		30	2680.0	19.152
		60	2680.0	18.554
	40	15	2516.0	39.422
		30	2516.0	38.615
		60	2516.0	37.183
		15	2593.0	39.417
		30	2593.0	38.628
		60	2593.0	37.205
		15	2670.0	39.241
		30	2670.0	38.594
		60	2670.0	37.217
	60	30	2526.0	59.193
		60	2526.0	57.683
		30	2593.0	59.121
		60	2593.0	27.759
		30	2660.0	59.182
		60	2660.0	27.689

Table 13 Occupied Bandwidth 64QAM Input

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
64QAM	5	15	2498.5	3.9580
		30	2498.5	3.9624
		15	2593.0	3.9615
		30	2593.0	3.9559
		15	2687.5	3.9823
		30	2687.5	3.9820
	10	15	2501.0	8.6128
		30	2501.0	8.6112
		60	2501.0	8.6167
		15	2593.0	7.9134
		30	2593.0	7.9114
		60	2593.0	7.9107
		15	2685.0	8.5973
		30	2685.0	8.5973
		60	2685.0	8.6008
	15	15	2503.5	13.613
		30	2503.5	13.610
		60	2503.5	13.615
		15	2593.0	12.921
		30	2593.0	12.914
		60	2593.0	12.925
		15	2682.5	14.123
		30	2682.5	14.120
		60	2682.5	14.114

Table 14 Occupied Bandwidth 64QAM Output

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
64QAM	20	15	2506.0	18.309
		30	2506.0	18.319
		60	2506.0	18.301
		15	2593.0	18.308
		30	2593.0	18.318
		60	2593.0	18.303
		15	2680.0	17.161
		30	2680.0	17.156
		60	2680.	17.160
	40	15	2516.0	37.962
		30	2516.0	37.971
		60	2516.0	37.977
		15	2593.0	36.633
		30	2593.0	36.640
		60	2593.0	36.633
		15	2670.0	36.556
		30	2670.0	36.558
		60	2670.0	36.574
	60	30	2526.0	58.007
		60	2526.0	58.008
		30	2593.0	56.676
		60	2593.0	56.644
		30	2660.0	57.943
		60	2660.0	57.935

Table 15 Occupied Bandwidth 64QAM Output

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
256QAM	5	15	2498.5	4.5386
		30	2498.5	3.9959
		15	2539.0	4.5457
		30	2539.0	3.9925
		15	2687.5	4.5459
		30	2687.5	3.9940
	10	15	2501.0	9.4302
		30	2501.0	8.7160
		60	2501.0	8.0302
		15	2593.0	9.4346
		30	2593.0	8.7210
		60	2593.0	8.0371
		15	2685.0	9.4393
		30	2685.0	8.7210
		60	2685.0	8.0324
	15	15	2503.5	14.369
		30	2503.5	13.824
		60	2503.5	13.118
		15	2593.0	14.361
		30	2593.0	13.827
		60	2593.0	13.105
		15	2682.5	14.386
		30	2682.5	14.324
		60	2682.5	13.090

Table 16 Occupied Bandwidth 256QAM Input

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
256QAM	20	15	2506.0	19.227
		30	2506.0	18.578
		60	2506.0	17.457
		15	2593.0	19.253
		30	2593.0	18.576
		60	2593.0	13.105
		15	2680.0	19.243
		30	2680.0	18.577
		60	2680.0	17.409
	40	15	2516.0	38.999
		30	2516.0	38.594
		60	2516.0	37.217
		15	2593.0	39.383
		30	2593.0	38.591
		60	2593.0	37.224
		15	2670.0	39.441
		30	2670.0	38.565
		60	2670.0	37.290
	60	30	2526.0	59.028
		60	2526.0	57.627
		30	2593.0	58.939
		60	2593.0	57.727
		30	2660.0	59.064
		60	2660.0	57.0707

Table 17 Occupied Bandwidth 256QAM Input

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
256QAM	5	15	2498.5	3.9733
		30	2498.5	3.9719
		15	2593.0	3.9722
		30	2593.0	3.9713
		15	2687.5	4.5555
		30	2687.5	4.5571
	10	15	2501.0	8.6249
		30	2501.0	8.6307
		60	2501.0	8.6165
		15	2593.0	7.9317
		30	2593.0	7.9439
		60	2593.0	7.9435
		15	2685.0	7.9667
		30	2685.0	7.9422
		60	2685.0	7.9682
	15	15	2503.5	13.622
		30	2503.5	12.957
		60	2503.5	12.944
		15	2593.0	13.647
		30	2593.0	13.644
		60	2593.0	13.650
		15	2682.5	13.169
		30	2682.5	13.188
		60	2682.5	13.177

Table 18 Occupied Bandwidth 256QAM Output

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
256QAM	20	15	2506.0	18.313
		30	2506.0	18.315
		60	2506.0	18.309
		15	2593.0	19.026
		30	2593.0	19.012
		60	2593.0	19.029
		15	2680.0	19.054
		30	2680.0	19.052
		60	2680.0	19.032
	40	15	2516.0	36.578
		30	2516.0	36.565
		60	2516.0	36.570
		15	2593.0	36.620
		30	2593.0	36.622
		60	2593.0	36.637
		15	2670.0	37.988
		30	2670.0	37.976
		60	2670.0	37.975
	60	30	2526.0	56.599
		60	2526.0	56.609
		30	2593.0	58.145
		60	2593.0	58.174
		30	2660.0	57.940
		60	2660.0	57.933

Table 19 Occupied Bandwidth 256QAM Output

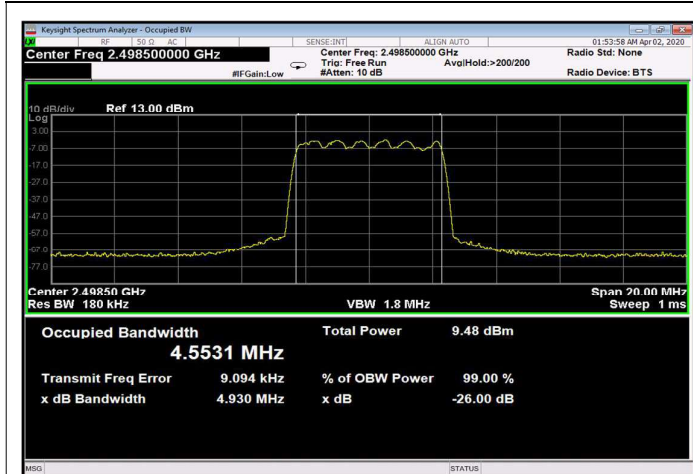


Figure 152: 16QAM 5MHz B.W.; 2498.5MHz, 15kHz Input

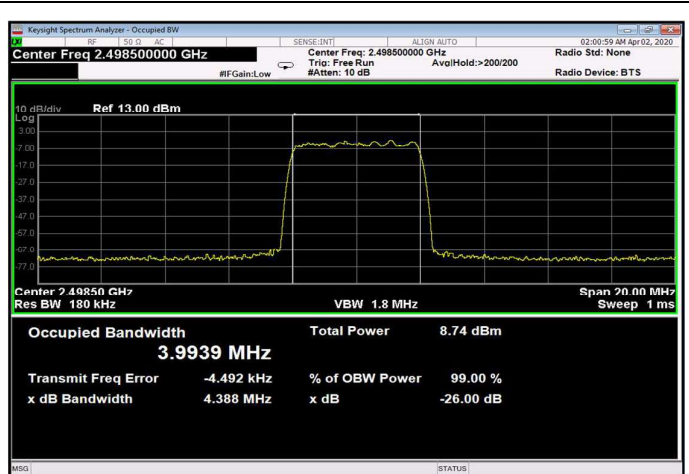


Figure 153: 16QAM 5MHz B.W.; 2498.5MHz, 30kHz Input

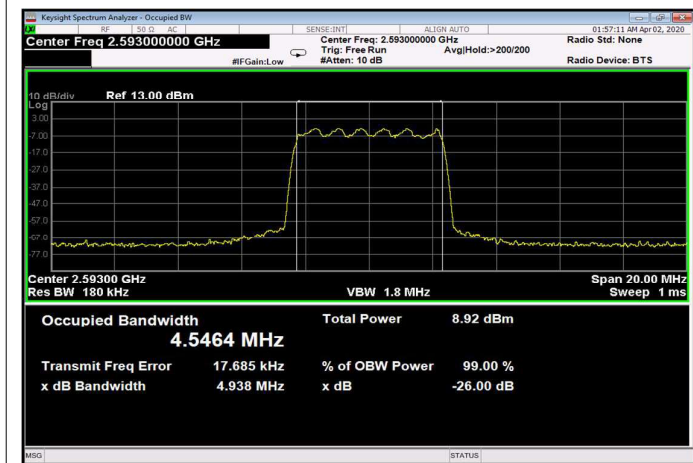


Figure 154: 16QAM 5MHz B.W.; 2593.0MHz, 15kHz Input

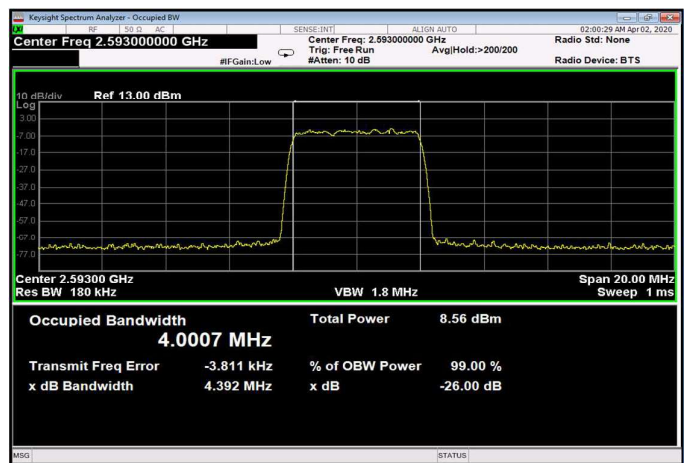


Figure 155: 16QAM 5MHz B.W.; 2593.0MHz, 30kHz Input

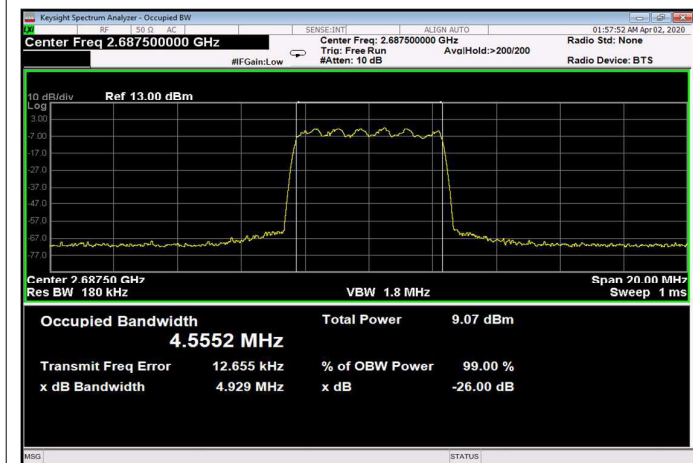


Figure 156: 16QAM 5MHz B.W.; 2687.5MHz, 15kHz Input

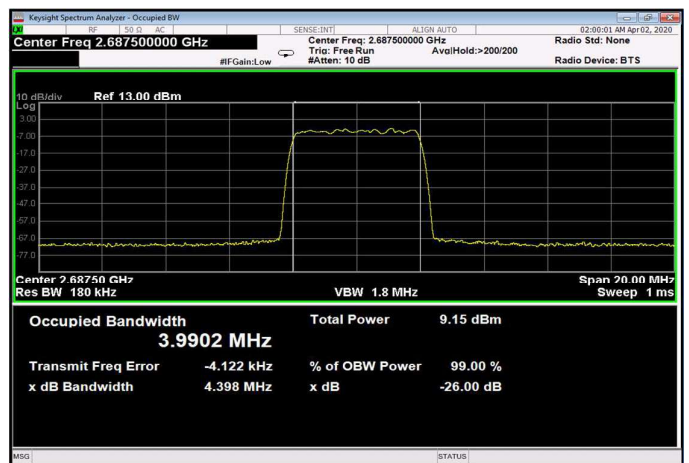


Figure 157: 16QAM 5MHz B.W.; 2687.5MHz, 30kHz Input

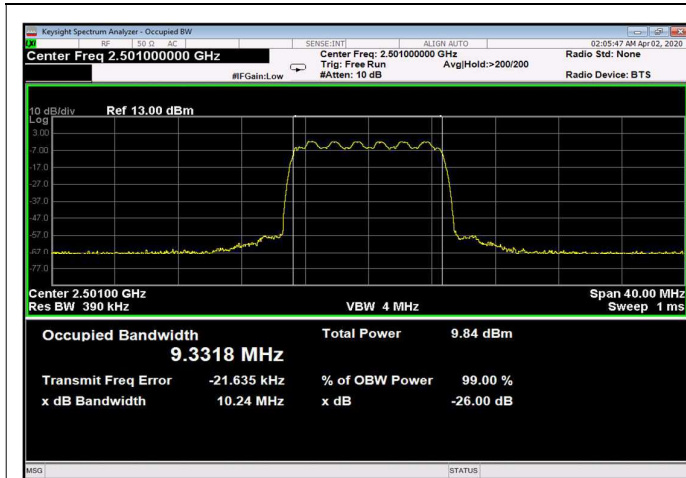


Figure 158: 16QAM 10MHz B.W.; 2501.0MHz,
15kHz Input

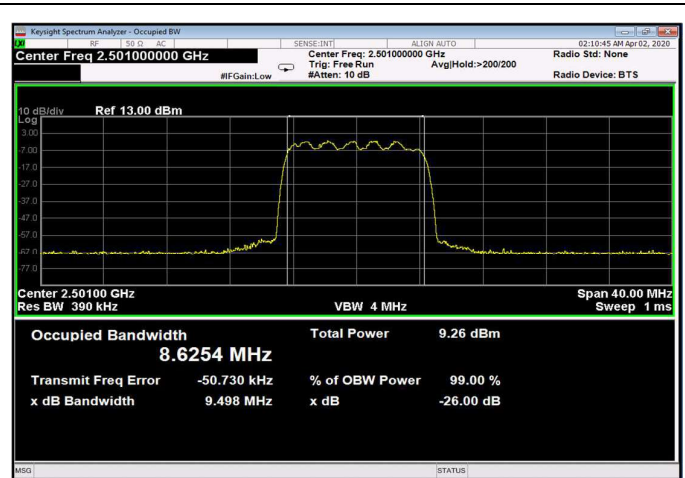


Figure 159: 16QAM 10MHz B.W.; 2501.0MHz,
30kHz Input

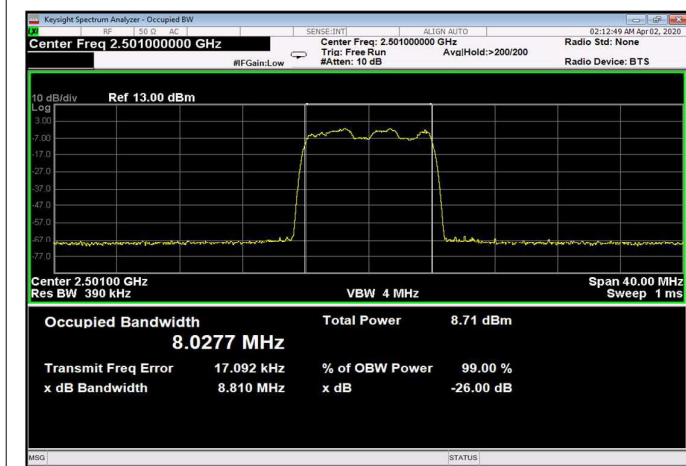


Figure 160: 16QAM 10MHz B.W.; 2501.0MHz,
60kHz Input

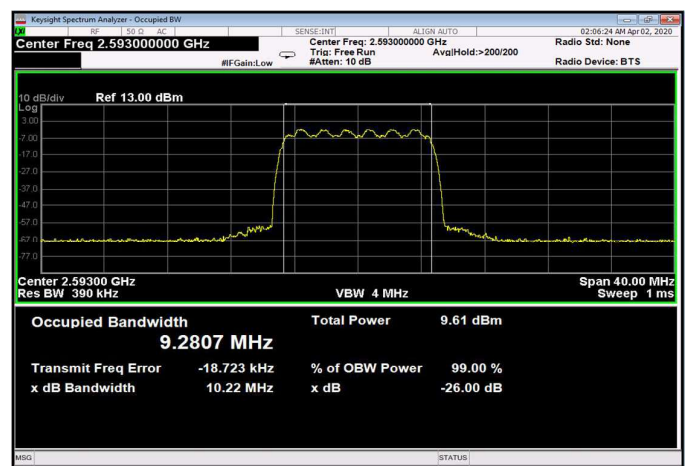


Figure 161: 16QAM 10MHz B.W.; 2593.0MHz,
15kHz Input

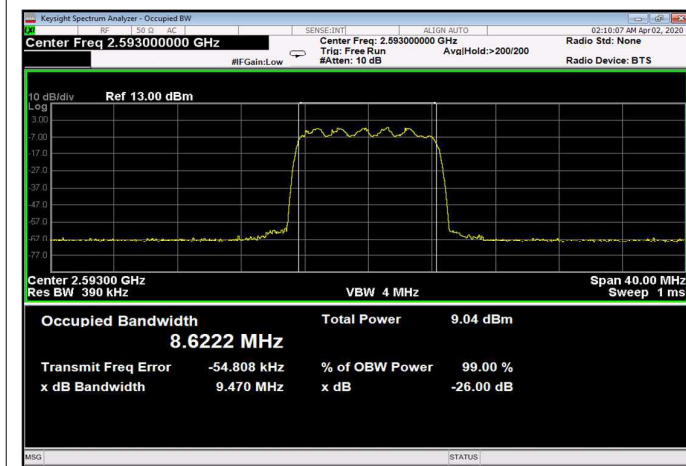


Figure 162: 16QAM 10MHz B.W.; 2593.0MHz,
30kHz Input

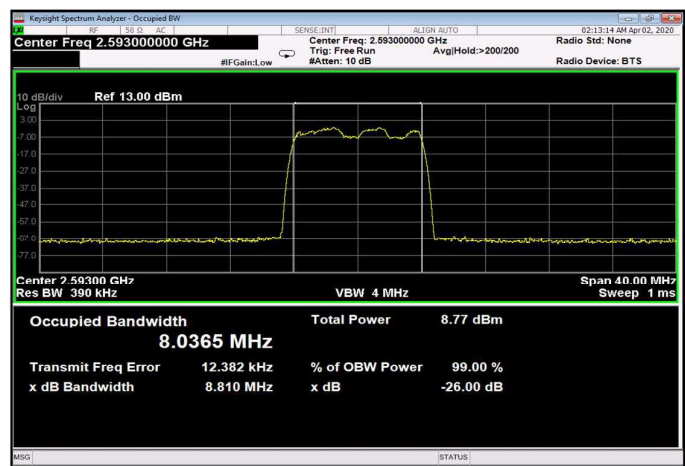


Figure 163: 16QAM 10MHz B.W.; 2593.0MHz,
60kHz Input

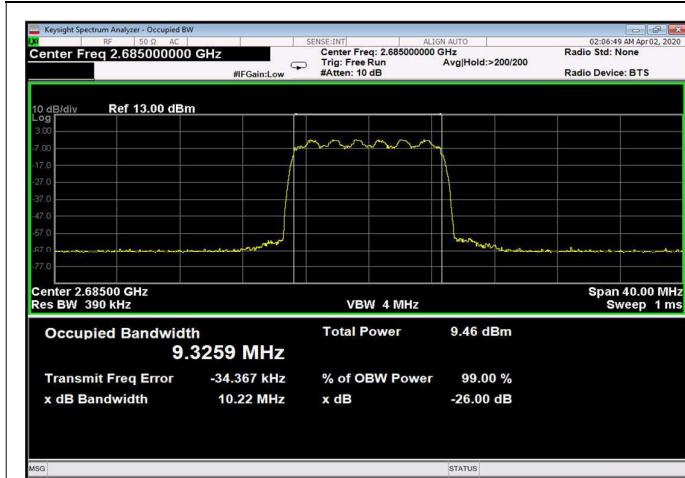


Figure 164: 16QAM 10MHz B.W.; 2685.0MHz,
15kHz Input

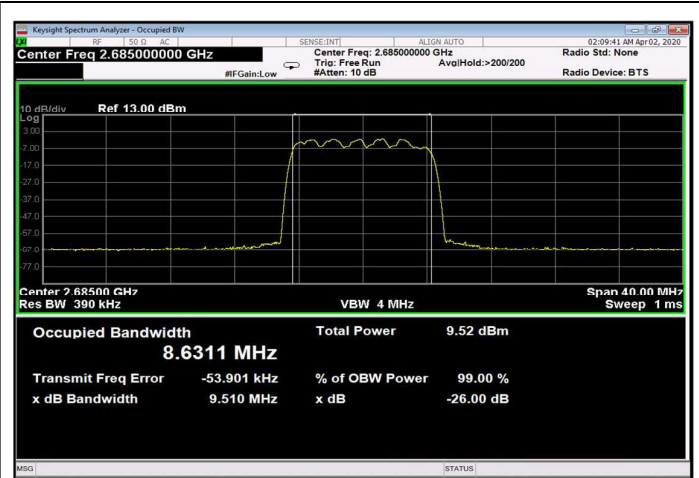


Figure 165: 16QAM 10MHz B.W.; 2685.0MHz,
30kHz Input

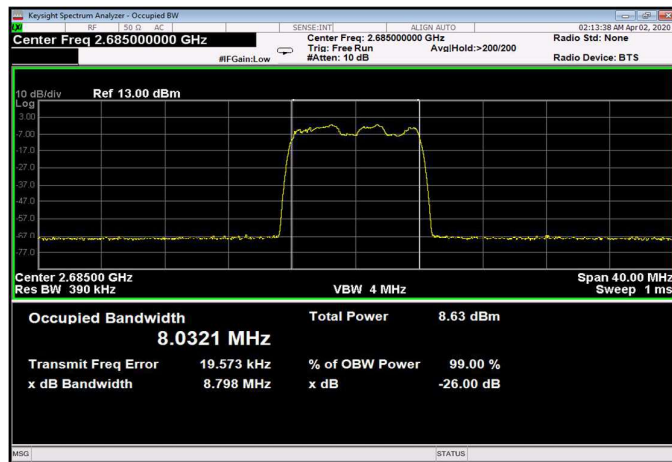


Figure 166: 16QAM 10MHz B.W.; 2685.0MHz,
60kHz Input

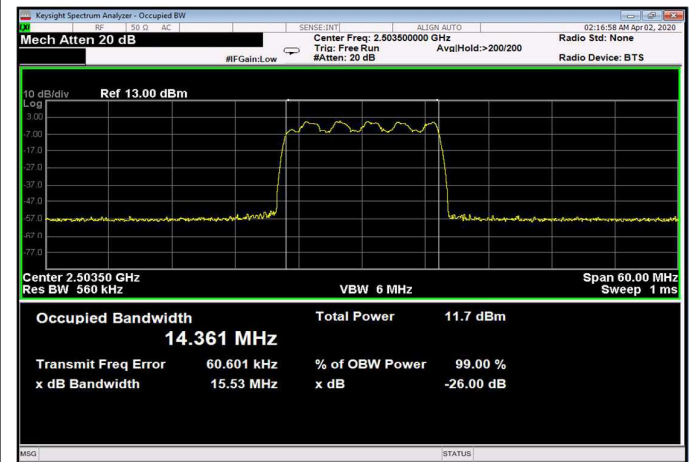


Figure 167: 16QAM 15MHz B.W.; 2503.5MHz,
15kHz Input

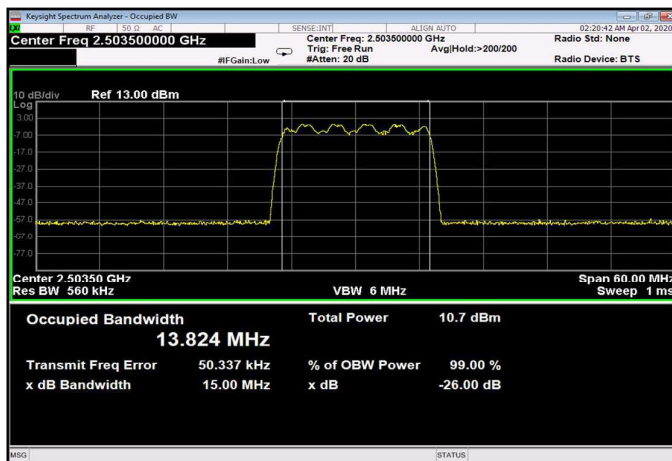


Figure 168: 16QAM 15MHz B.W.; 2503.5MHz,
30kHz Input

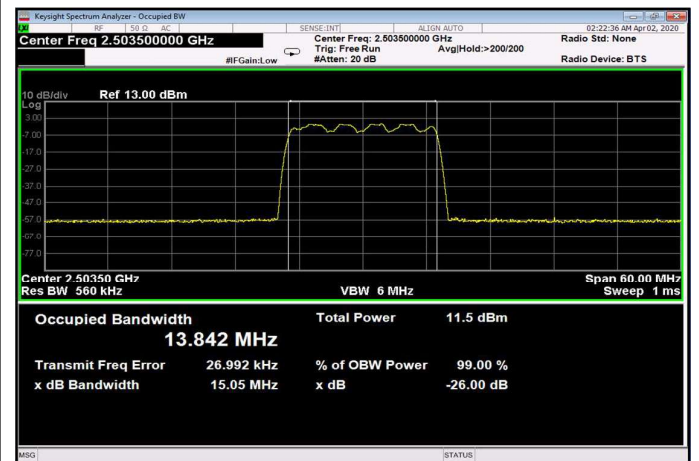


Figure 169: 16QAM 15MHz B.W.; 2503.5MHz,
60kHz Input

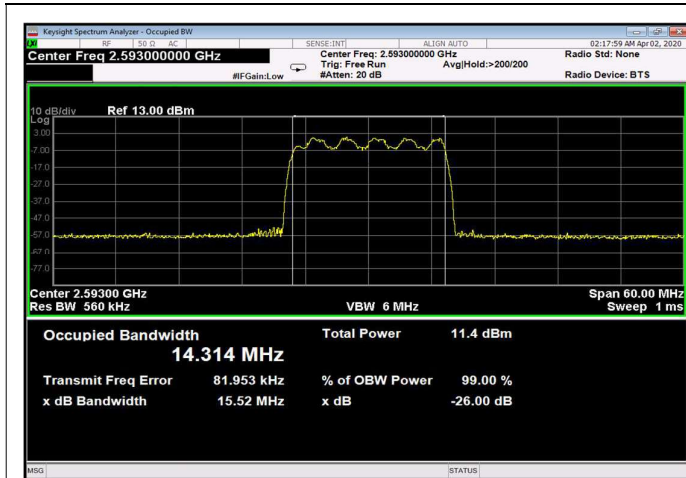


Figure 170: 16QAM 15MHz B.W.; 2593.0MHz,
15kHz Input

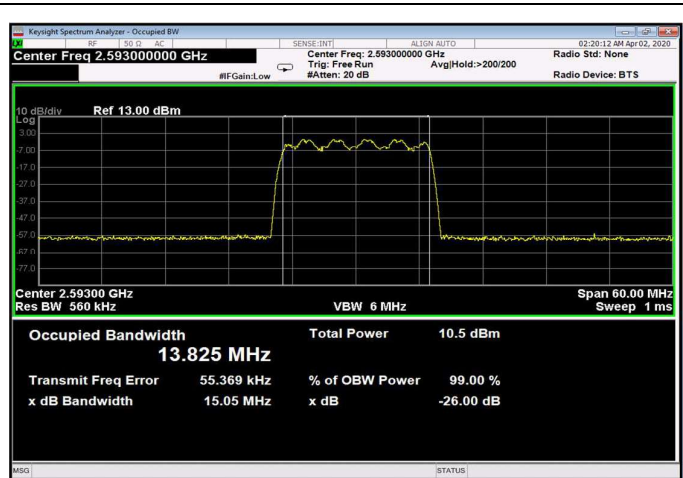


Figure 171: 16QAM 15MHz B.W.; 2593.0MHz,
30 kHz Input

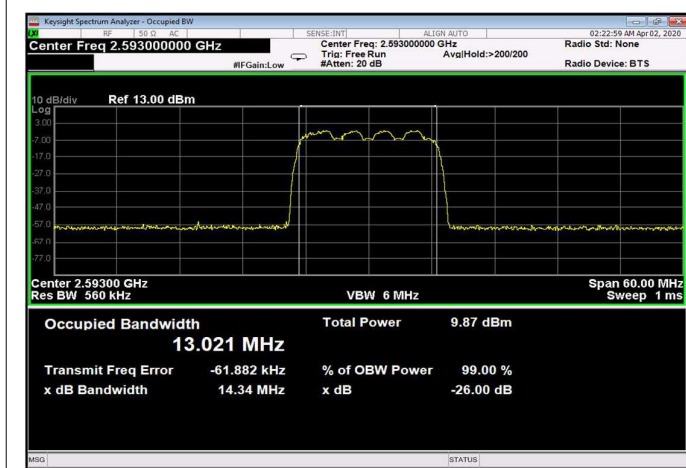


Figure 172: 16QAM 15MHz B.W.; 2593.0MHz,
60kHz Input

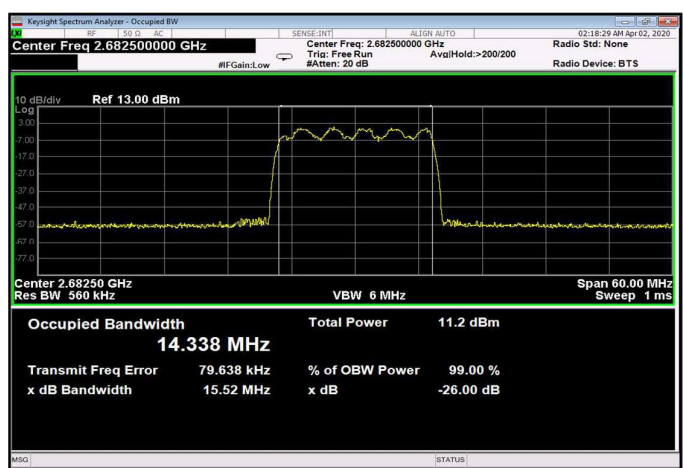


Figure 173: 16QAM 15MHz B.W.; 2682.5MHz,
15kHz Input

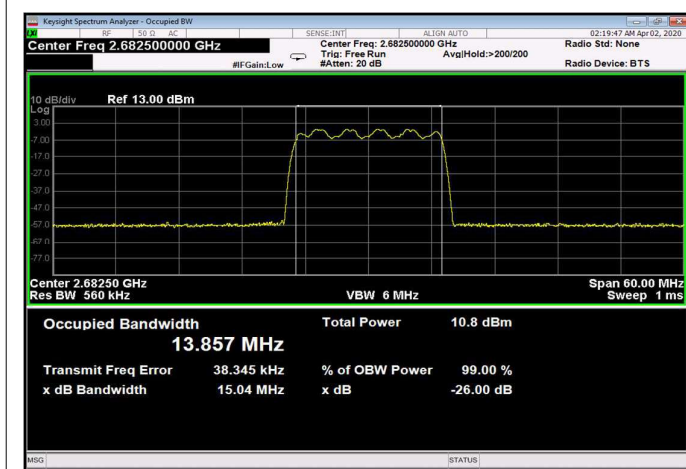


Figure 174: 16QAM 15MHz B.W.; 2682.5MHz,
30kHz Input

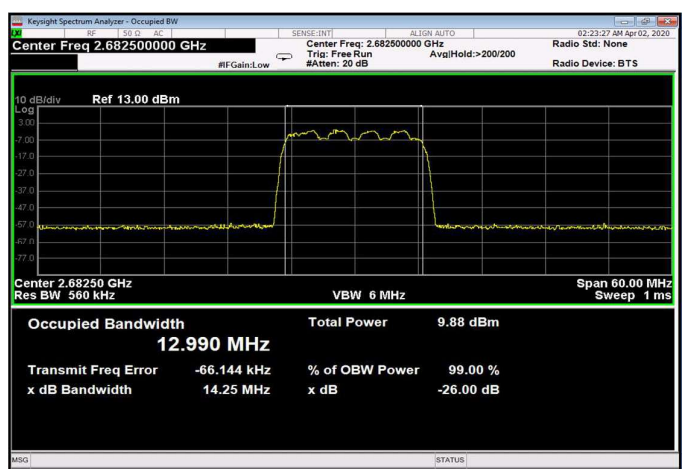
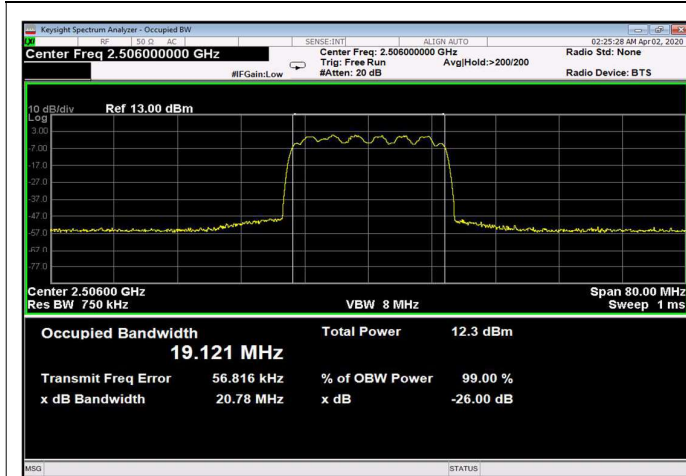
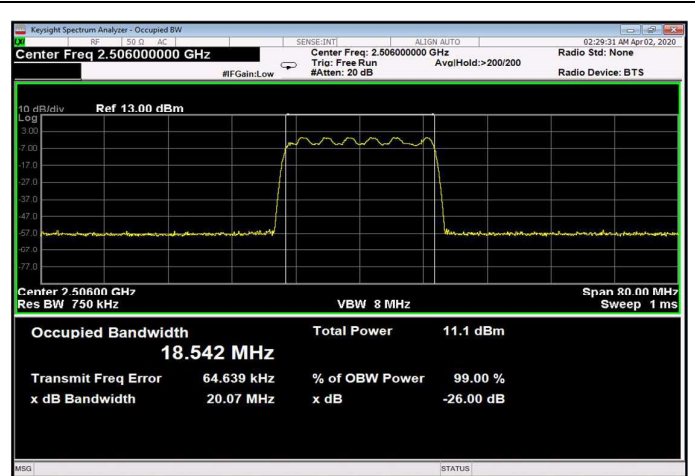


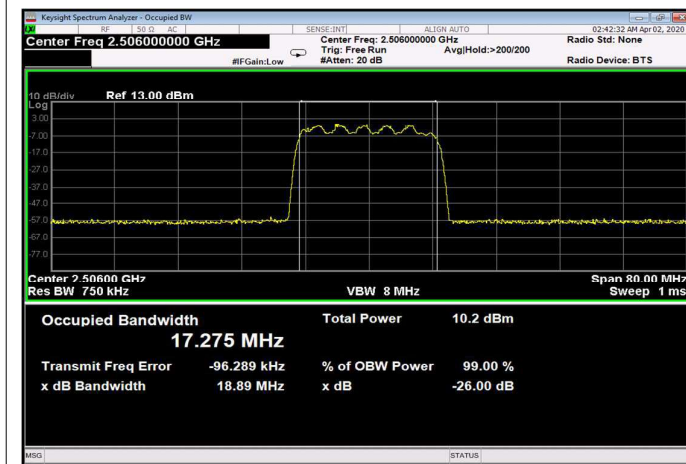
Figure 175: 16QAM 15MHz B.W.; 2682.5MHz,
60kHz Input



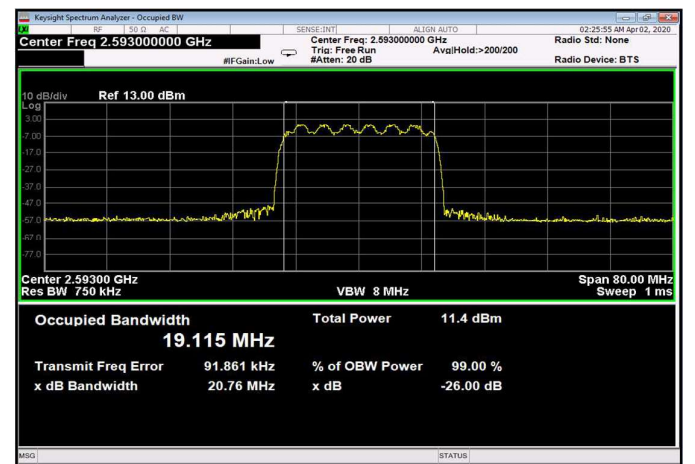
**Figure 176: 16QAM 20MHz B.W.; 2506.0MHz,
15 kHz Input**



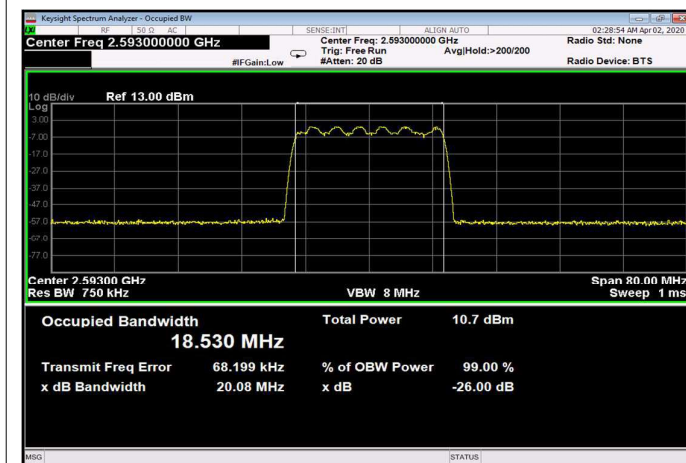
**Figure 177: 16QAM 20MHz B.W.; 2506.0MHz,
30kHz Input**



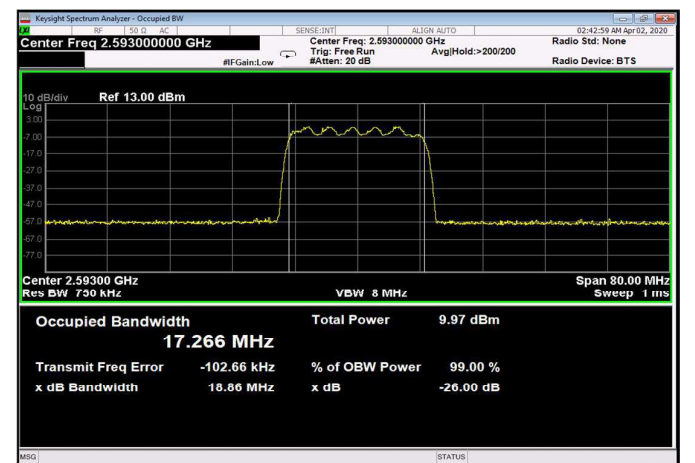
**Figure 178: 16QAM 20MHz B.W.; 2506.0MHz,
60kHz Input**



**Figure 179: 16QAM 20MHz B.W.; 2593.0MHz,
15kHz Input**



**Figure 180: 16QAM 20MHz B.W.; 2593.0MHz,
30kHz Input**



**Figure 181: 16QAM 20MHz B.W.; 2593.0MHz,
60kHz Input**

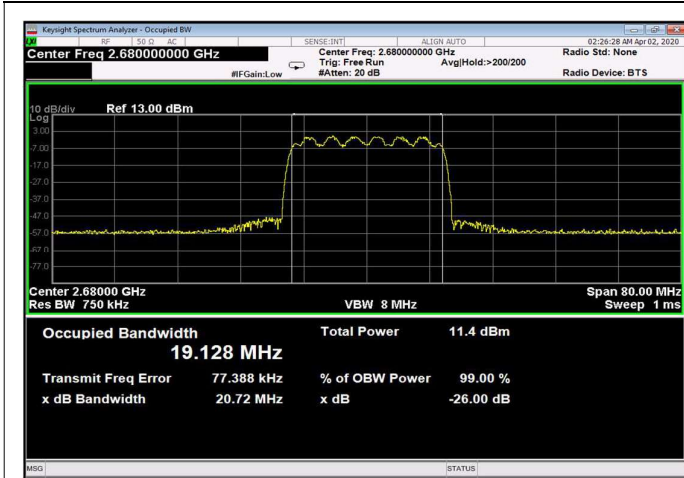


Figure 182: 16QAM 20MHz B.W.; 2680.0MHz,
15kHz Input

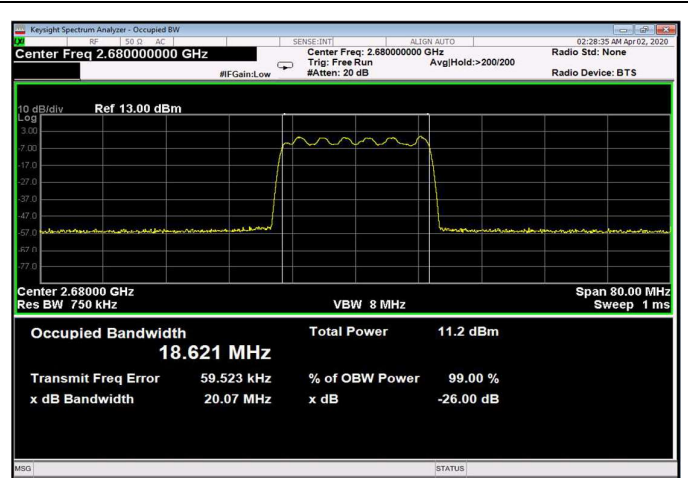


Figure 183: 16QAM 20MHz B.W.; 2680.0MHz,
30kHz Input

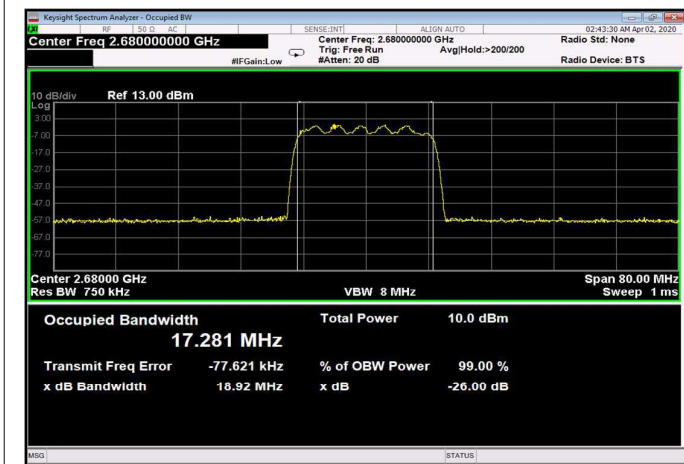


Figure 184: 16QAM 20MHz B.W.; 2680.0MHz,
60kHz Input

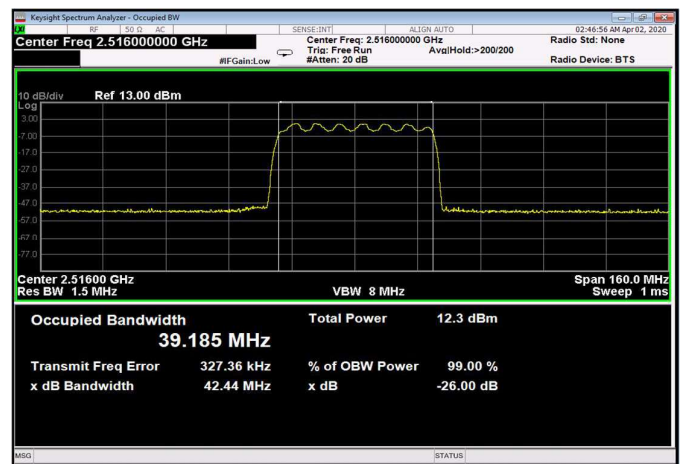


Figure 185: 16QAM 40MHz B.W.; 2516.0MHz,
15kHz Input

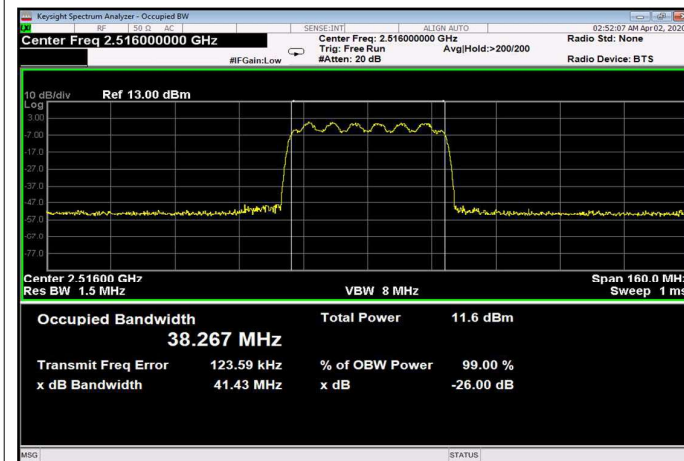


Figure 186: 16QAM 40MHz B.W.; 2516.0MHz,
30kHz Input

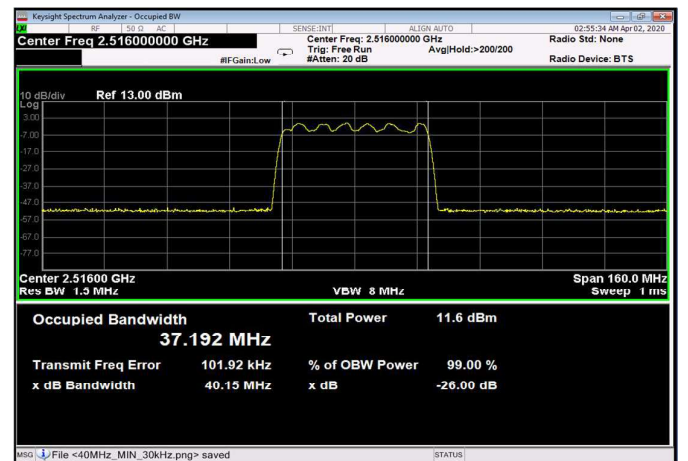


Figure 187: 16QAM 40MHz B.W.; 2516.0MHz,
60kHz Input

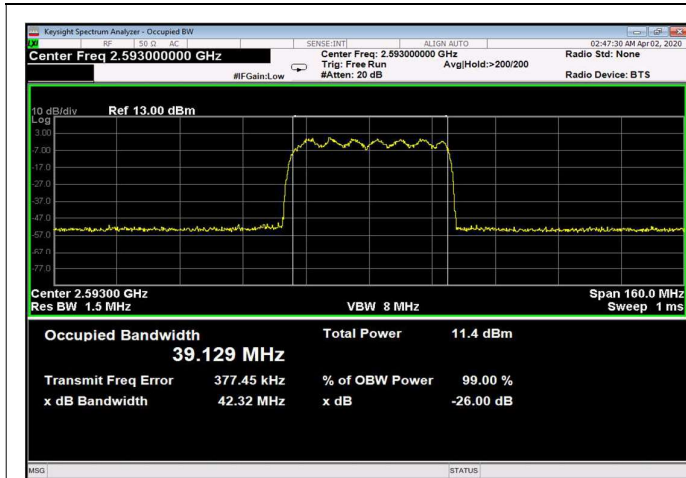


Figure 188: 16QAM 40MHz B.W.; 2593.0MHz,
15kHz Input

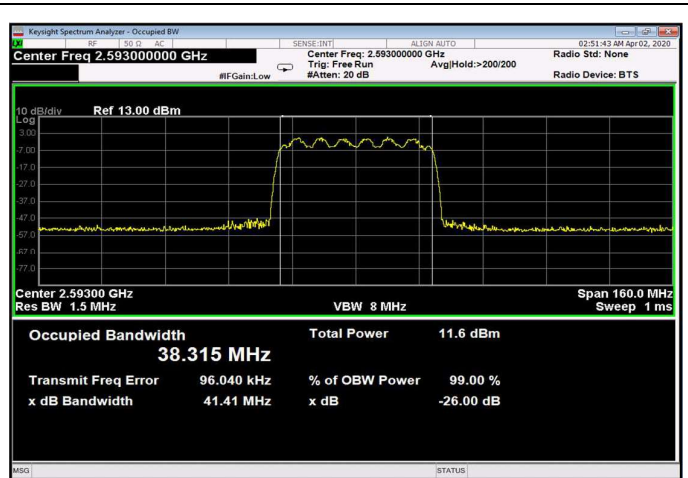


Figure 189: 16QAM 40MHz B.W.; 2593.0MHz,
30kHz Input

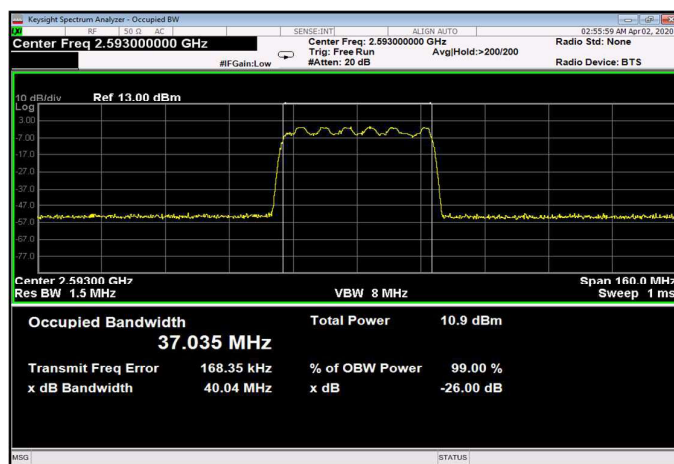


Figure 190: 16QAM 40MHz B.W.; 2593.0MHz,
60kHz Input

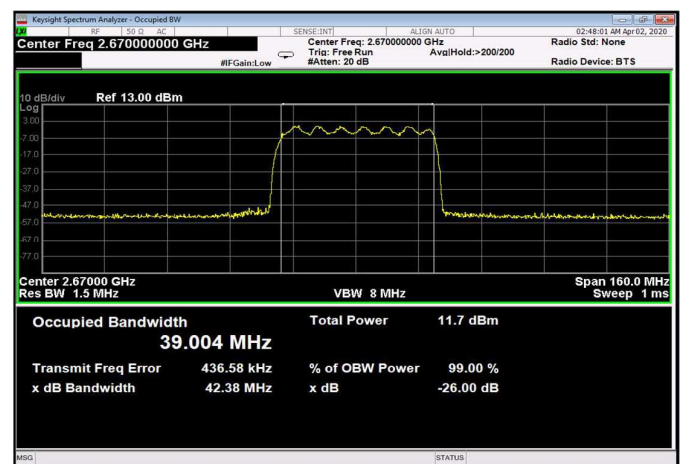


Figure 191: 16QAM 40MHz B.W.; 2670.0MHz,
15kHz Input

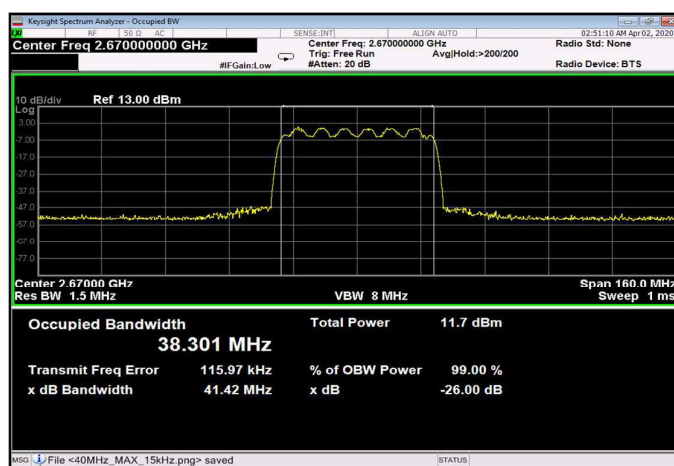


Figure 192: 16QAM 40MHz B.W.; 2670.0MHz,
30kHz Input

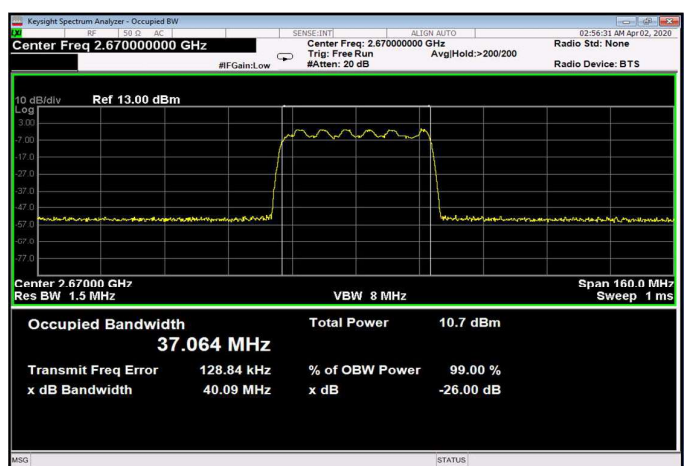


Figure 193: 16QAM 40MHz B.W.; 2670.0MHz,
60kHz Input