7 Occupied Bandwidth

7.1 Test Specification

FCC Part 2, Section 1049

7.2 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 (loss=20.8 dB). The spectrum analyzer was set to proper resolution B.W.
OBW function (99%) was employed for this evaluation.
Occupied bandwidth measured was repeated in the input terminal of the E.U.T.

7.3 Test Limit

N/A

7.4 Test Results

JUDGEMENT: Passed

See additional information in Table 16 to Table 23 and Figure 359 to Figure 622.

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
16QAM	5	15	619.5	4.5287
		30	619.5	3.9871
		15	634.5	4.5359
		30	634.5	3.9867
		15	649.5	4.5337
		30	649.5	3.9815
	10	15	622.0	9.2954
		30	622.0	8.5888
		60	622.0	7.9890
		15	634.5	9.2949
		30	634.5	8.5816
		60	634.5	7.9848
		15	647.0	9.2979
		30	647.0	8.5926
		60	647.0	7.9891
	15	15	624.5	14.278
		30	624.5	13.733
		60	624.5	12.891
		15	634.5	14.271
		30	634.5	13.753
		60	634.5	12.896
		15	644.5	14.271
		30	644.5	13.748
		60	644.5	12.878
	20	15	627.0	19.037
		30	627.0	18.400
		60	627.0	17.172
		15	634.5	19.039
		30	634.5	18.416
		60	634.5	17.184
		15	642.0	19.050
		30	642.0	18.398
		60	642.0	17.174

Table 16 Occupied Bandwidth 16 QAM Input

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
16QAM	5	15	619.5	4.5385
		30	619.5	4.0006
		15	634.5	4.5639
		30	634.5	4.0084
		15	649.5	4.5345
		30	649.5	4.0009
	10	15	622.0	9.3002
		30	622.0	8.5961
		60	622.0	7.9765
		15	634.5	9.3231
		30	634.5	8.6022
		60	634.5	7.9886
		15	647.0	9.2660
		30	647.0	8.5748
		60	647.0	7.9719
	15	15	624.5	14.262
		30	624.5	13.751
		60	624.5	12.884
		15	634.5	14.289
		30	634.5	13.771
		60	634.5	12.885
		15	644.5	14.235
		30	644.5	13.711
		60	644.5	12.836
	20	15	627.0	19.069
		30	627.0	18.390
		60	627.0	17.179
		15	634.5	19.116
		30	634.5	18.398
		60	634.5	17.163
		15	642.0	19.058
		30	642.0	18.398
		60	642.0	17.101

Table 17 Occupied Bandwidth 16QAM Output

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
64QAM	5	15	619.5	4.5018
		30	619.5	3.9869
		15	634.5	4.4999
		30	634.5	3.9850
		15	649.5	4.5023
		30	649.5	3.9873
	10	15	622.0	9.3187
		30	622.0	8.6257
		60	622.0	7.9432
		15	634.5	9.3180
		30	634.5	8.6223
		60	634.5	7.9414
		15	647.0	9.3162
		30	647.0	8.6264
		60	647.0	7.9374
	15	15	624.5	14.159
		30	624.5	13.672
		60	624.5	12.930
		15	634.5	14.147
		30	634.5	13.663
		60	634.5	12.948
		15	644.5	14.158
		30	644.5	13.674
		60	644.5	12.919
	20	15	627.0	18.942
		30	627.0	18.277
		60	627.0	17.253
		15	634.5	18.943
		30	634.5	18.329
		60	634.5	17.252
		15	642.0	18.956
		30	642.0	18.282
		60	642.0	17.240

Table 18 Occupied Bandwidth 64QAM Input

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
64QAM	5	15	619.5	4.5194
		30	619.5	4.0091
		15	634.5	4.5277
		30	634.5	4.0151
		15	649.5	4.5213
		30	649.5	4.0059
	10	15	622.0	9.3090
		30	622.0	8.6086
		60	622.0	7.9292
		15	634.5	9.3192
		30	634.5	8.6203
		60	634.5	7.9432
		15	647.0	9.2919
		30	647.0	8.6089
		60	647.0	7.9252
	15	15	624.5	14.140
		30	624.5	13.650
		60	624.5	12.919
		15	634.5	14.147
		30	634.5	13.667
		60	634.5	12.923
		15	644.5	14.112
		30	644.5	13.638
		60	644.5	12.903
	20	15	627.0	18.916
		30	627.0	18.297
		60	627.0	17.217
		15	634.5	18.915
		30	634.5	18.275
		60	634.5	17.222
		15	642.0	18.868
		30	642.0	18.232
		60	642.0	17.194

Table 19 Occupied Bandwidth 64QAM Output

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
256AM	5	15	619.5	4.5153
		30	619.5	3.9820
		15	634.5	4.5141
		30	634.5	3.9841
		15	649.5	4.5189
		30	649.5	3.9827
	10	15	622.0	9.3139
		30	622.0	8.6673
		60	622.0	7.9466
		15	634.5	9.3344
		30	634.5	8.6594
		60	634.5	7.9447
		15	647.0	9.3260
		30	647.0	8.6662
		60	647.0	7.9448
	15	15	624.5	14.251
		30	624.5	13.684
		60	624.5	13.080
		15	634.5	14.229
		30	634.5	13.668
		60	634.5	13.066
		15	644.5	14.253
		30	644.5	13.707
		60	644.5	13.063
	20	15	627.0	18.963
		30	627.0	18.305
		60	627.0	17.330
		15	634.5	18.956
		30	634.5	18.313
		60	634.5	17.326
		15	642.0	18.947
		30	642.0	18.290
		60	642.0	17.334

Table 20 Occupied Bandwidth 256QAM Input

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
256QAM	5	15	619.5	4.5389
		30	619.5	3.9980
		15	634.5	4.5493
		30	634.5	4.0054
		15	649.5	4.5323
		30	649.5	3.9993
	10	15	622.0	9.3549
		30	622.0	8.6985
		60	622.0	8.0099
		15	634.5	9.3753
		30	634.5	8.7116
		60	634.5	8.0180
		15	647.0	9.486
		30	647.0	8.6866
		60	647.0	7.9919
	15	15	624.5	14.320
		30	624.5	13.744
		60	624.5	13.136
		15	634.5	14.296
		30	634.5	13.763
		60	634.5	13.133
		15	644.5	14.268
		30	644.5	13.686
		60	644.5	13.112
	20	15	627.0	19.012
		30	627.0	18.358
		60	627.0	17.387
		15	634.5	19.046
		30	634.5	18.356
		60	634.5	17.396
		15	642.0	18.984
		30	642.0	18.304
		60	642.0	17.325

Table 21 Occupied Bandwidth 256QAM Output

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
QPSK	5	15	619.5	4.4983
		30	619.5	3.9814
		15	634.5	4.4962
		30	634.5	3.9820
		15	649.5	4.4941
		30	649.5	3.9831
	10	15	622.0	9.2995
		30	622.0	8.6478
		60	622.0	7.9503
		15	634.5	9.2980
		30	634.5	8.6423
		60	634.5	7.9456
		15	647.0	9.2975
		30	647.0	8.6460
		60	647.0	7.9495
	15	15	624.5	14.221
		30	624.5	13.770
		60	624.5	13.065
		15	634.5	14.223
		30	634.5	13.771
		60	634.5	13.065
		15	644.5	14.222
		30	644.5	13.771
		60	644.5	13.066
	20	15	627.0	18.902
		30	627.0	18.279
		60	627.0	17.295
		15	634.5	18.895
		30	634.5	18.273
		60	634.5	17.296
		15	642.0	18.895
		30	642.0	18.274
		60	642.0	17.291

Table 22 Occupied Bandwidth QPSK Input

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
QPSK	5	15	619.5	4.5128
		30	619.5	4.0109
		15	634.5	4.5219
		30	634.5	4.0140
		15	649.5	4.5136
		30	649.5	3.9987
	10	15	622.0	9.2978
		30	622.0	8.6544
		60	622.0	7.9611
		15	634.5	9.3104
		30	634.5	8.6626
		60	634.5	7.9638
		15	647.0	9.2830
		30	647.0	8.6483
		60	647.0	7.9428
	15	15	624.5	14.290
		30	624.5	13.870
		60	624.5	13.116
		15	634.5	14.290
		30	634.5	13.919
		60	634.5	13.127
		15	644.5	14.257
		30	644.5	13.918
		60	644.5	13.077
	20	15	627.0	18.967
		30	627.0	18.366
		60	627.0	17.411
		15	634.5	18.995
		30	634.5	18.362
		60	634.5	17.434
		15	642.0	18.886
		30	642.0	18.298
		60	642.0	17.398

Table 23 Occupied Bandwidth QPSK Output

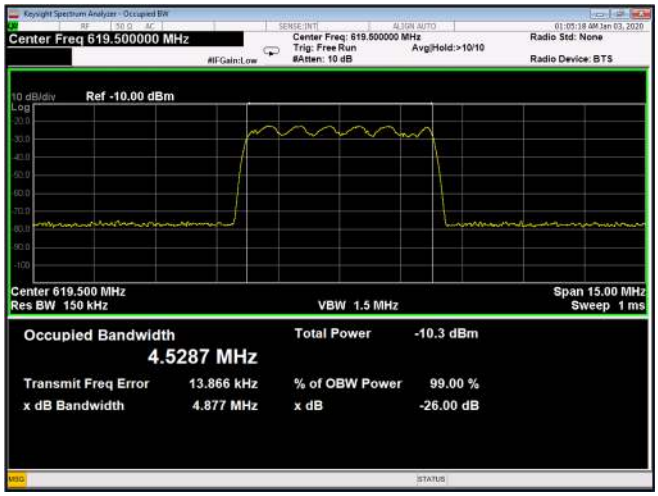

Figure 359: 16QAM 5MHz B.W; 619.5MHz, 15kHz Input

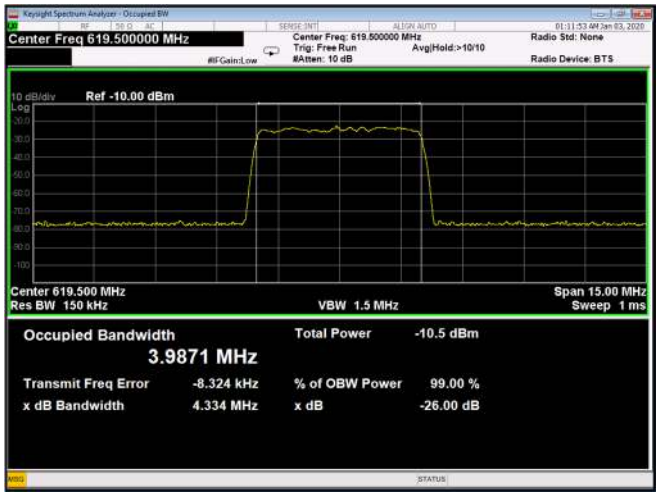

Figure 360: 16QAM 5MHz B.W; 619.5MHz, 30kHz Input

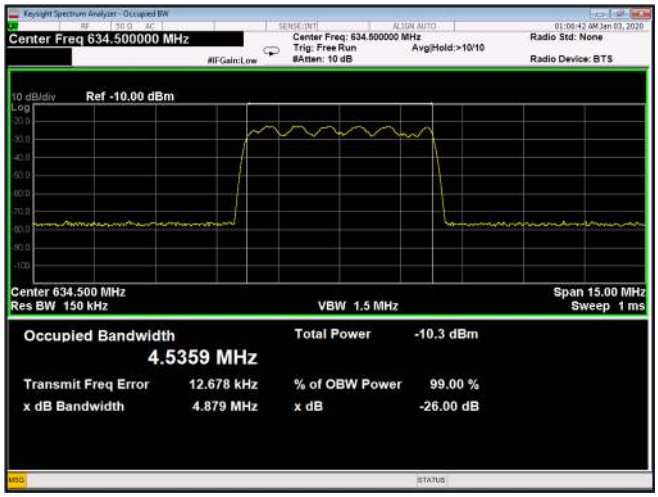

Figure 361: 16QAM 5MHz B.W; 634.5MHz, 15kHz Input

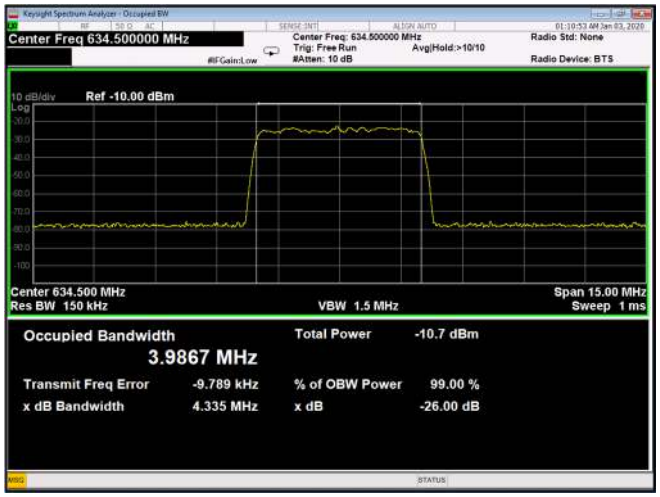

Figure 362: 16QAM 5MHz B.W; 634.5MHz, 30kHz Input

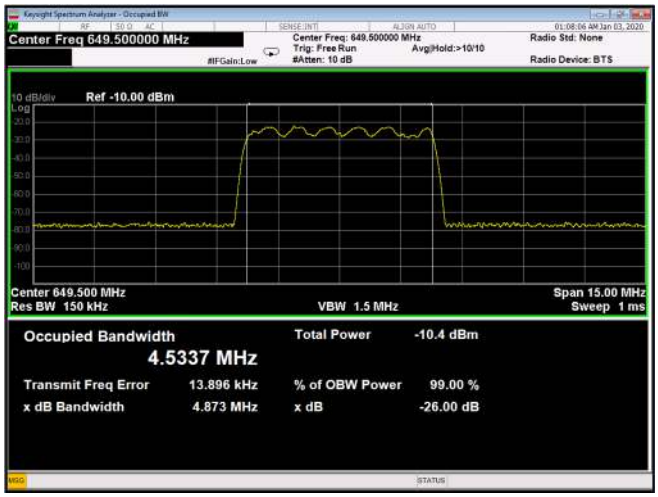

Figure 363: 16QAM 5MHz B.W; 649.5MHz, 15kHz Input

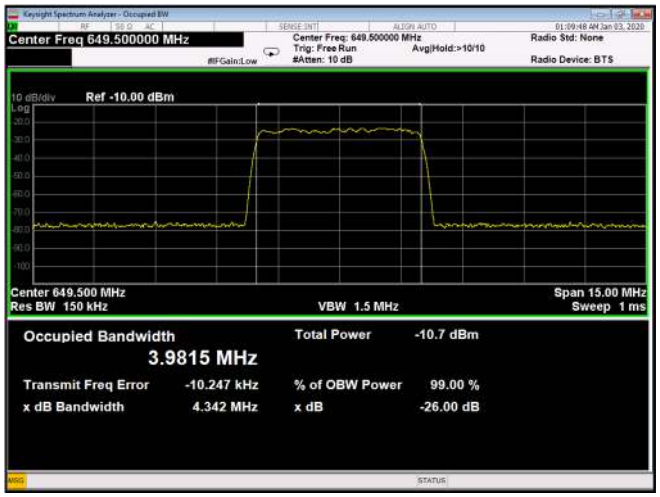

Figure 364: 16QAM 5MHzC.S; 649.5MHz, 30kHz Input

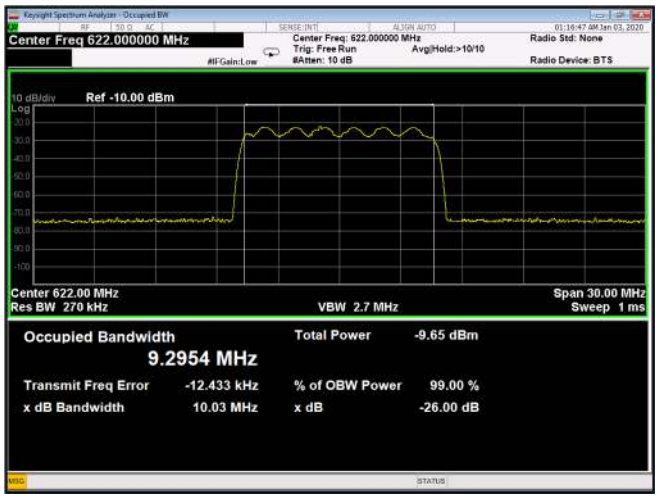

Figure 365: 16QAM 10MHz B.W; 622.0MHz, 15kHz Input

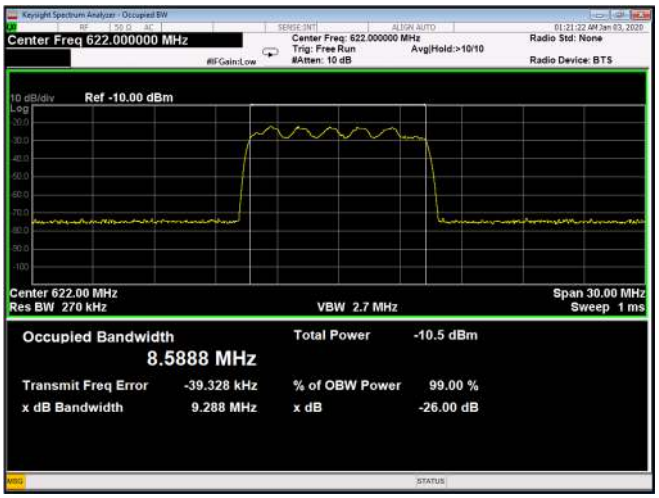

Figure 366: 16QAM 10MHz B.W; 622.0MHz, 30kHz Input

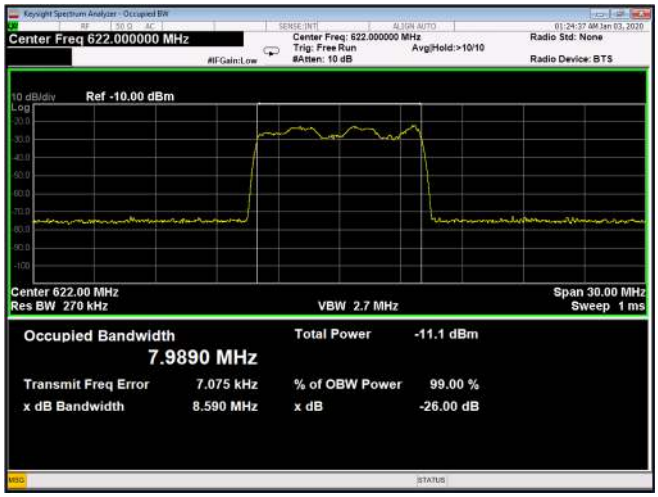

Figure 367: 16QAM 10MHz B.W; 622.0MHz, 60kHz Input

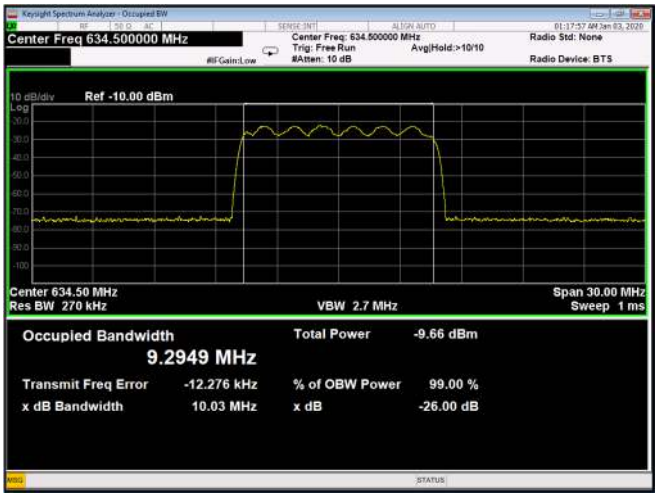

Figure 368: 16QAM 10MHz B.W; 634.5MHz, 15kHz Input

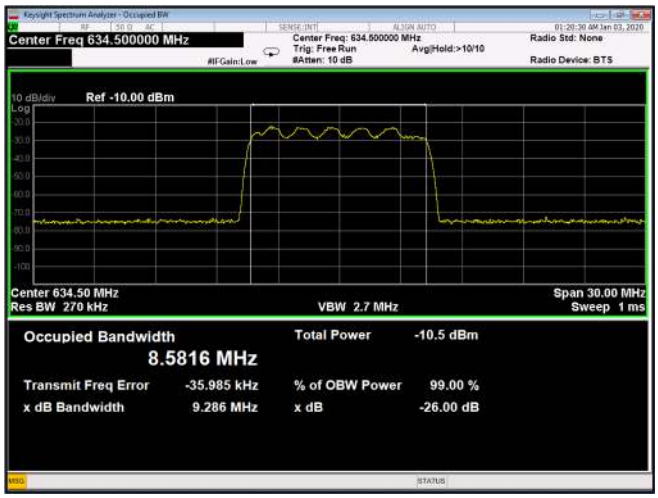

Figure 369: 16QAM 10MHz B.W; 634.5MHz, 30kHz Input

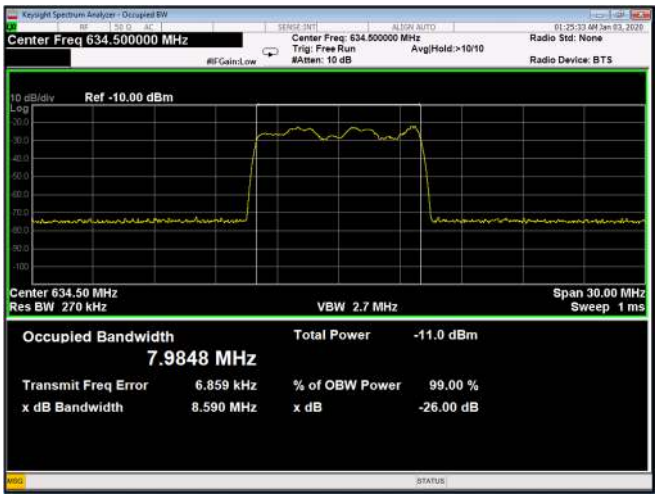

Figure 370: 16QAM 10MHz B.W; 634.5MHz, 60kHz Input

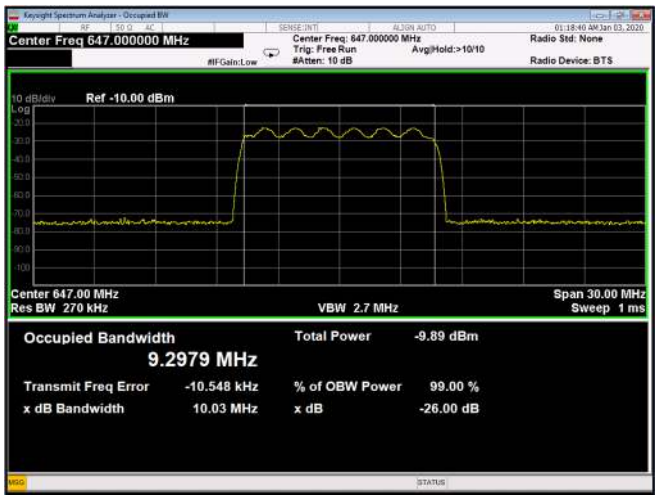

Figure 371: 16QAM 10MHz B.W; 647.0MHz, 15kHz Input

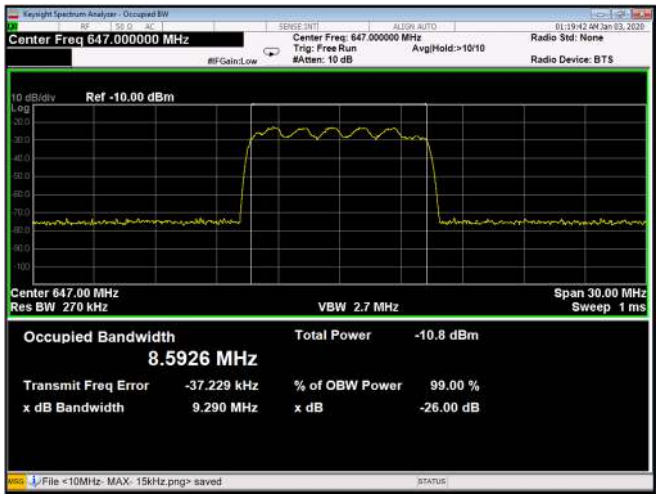

Figure 372: 16QAM 10MHz C.S; 647.0MHz, 30kHz Input

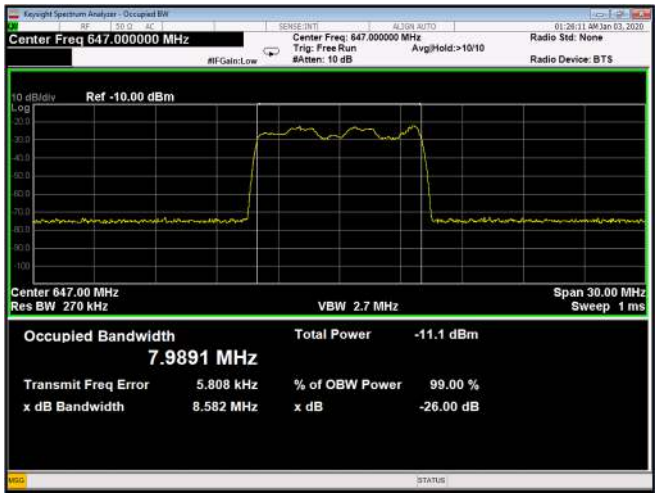

Figure 373: 16QAM 10MHz B.W; 647.0MHz, 60kHz Input

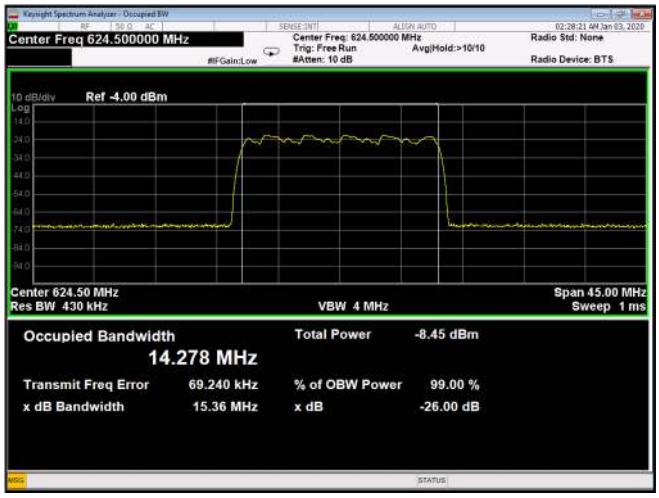

Figure 374: 16QAM 15MHz B.W; 624.5MHz, 15kHz Input

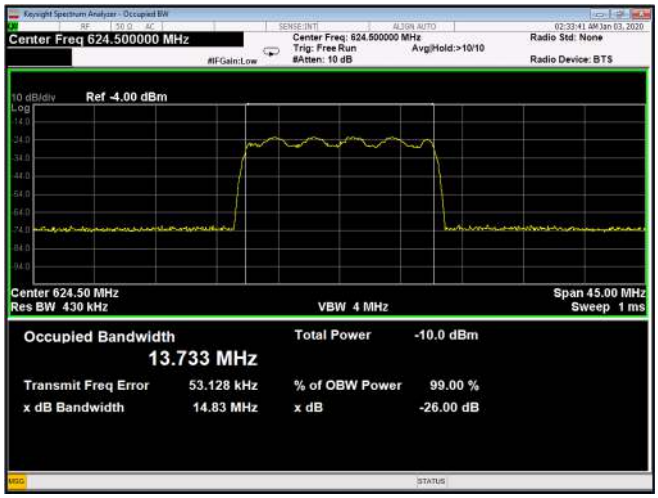

Figure 375: 16QAM 15MHz B.W; 624.5MHz, 30kHz Input

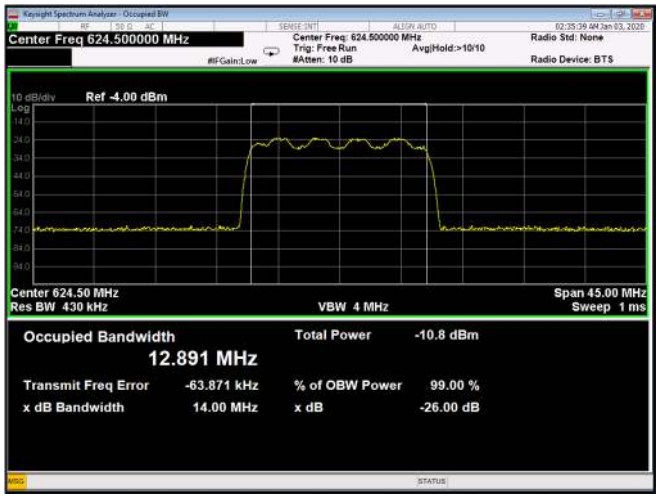

Figure 376: 16QAM 15MHz B.W; 624.5MHz, 60kHz Input

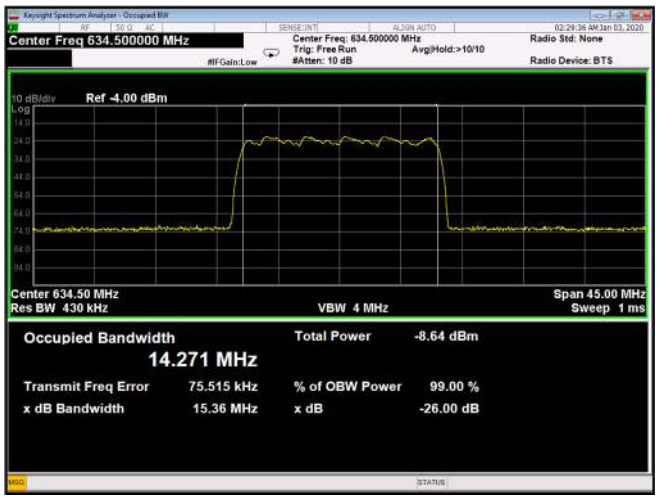

Figure 377: 16QAM 15MHz B.W; 634.5MHz, 15kHz Input

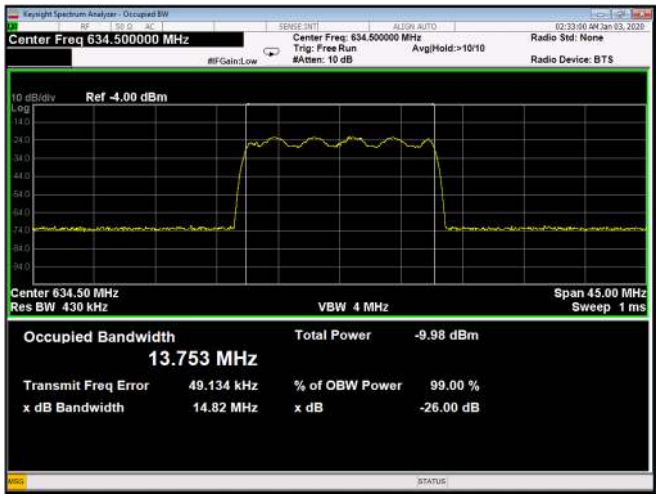

Figure 378: 16QAM 15MHz B.W; 634.5MHz, 30 kHz Input

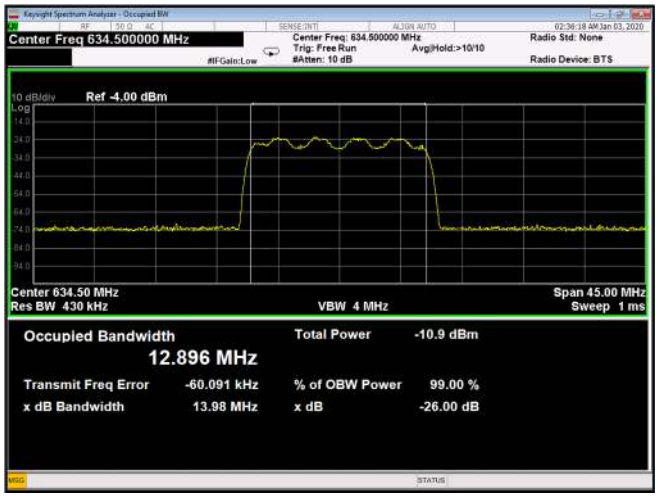

Figure 379: 16QAM 15MHz B.W; 634.5MHz, 60kHz Input

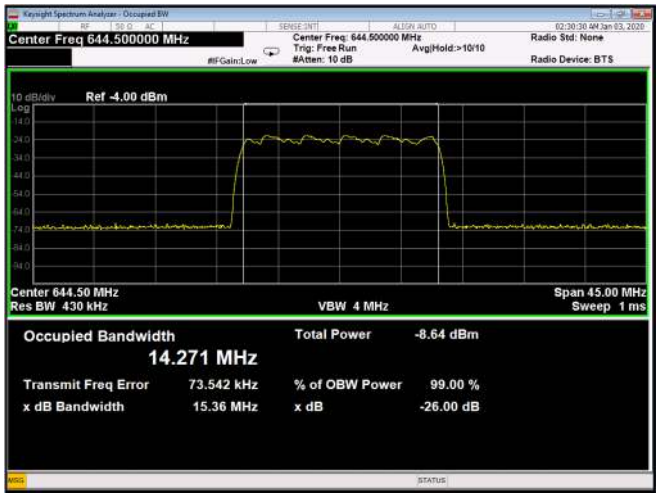

Figure 380: 16QAM 15MHz B.W; 644.5MHz, 15kHz Input

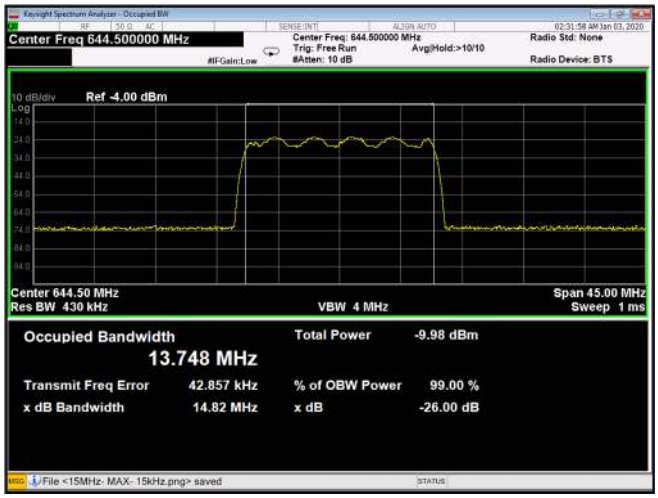

Figure 381: 16QAM 15MHz B.W; 644.5MHz, 30kHz Input

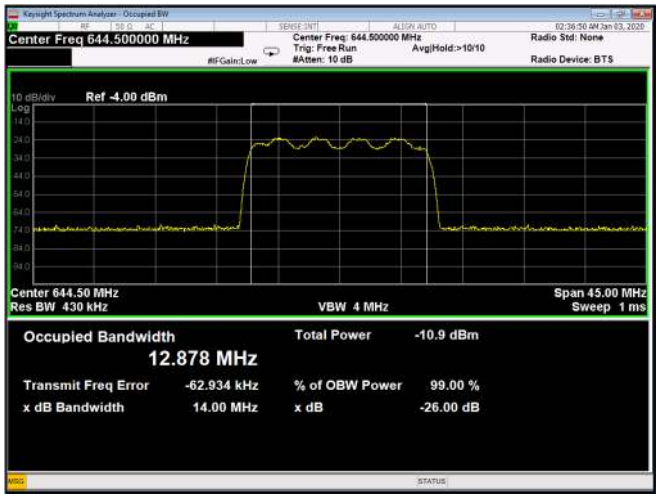

Figure 382: 16QAM 15MHz; 644.5MHz, 60kHz Input

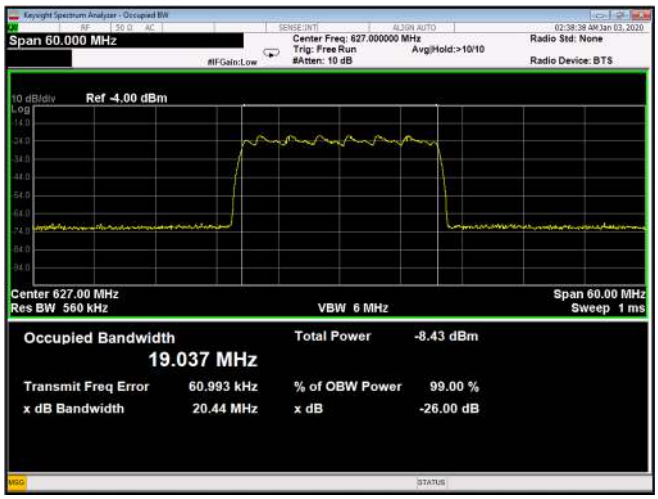

Figure 383: 16QAM 20MHz B.W; 627.0MHz, 15 kHz Input

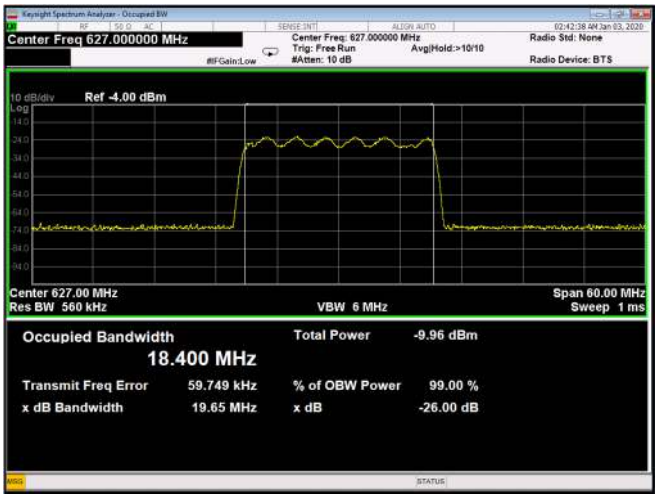

Figure 384: 16QAM 20MHz B.W; 627.0MHz, 30kHz Input

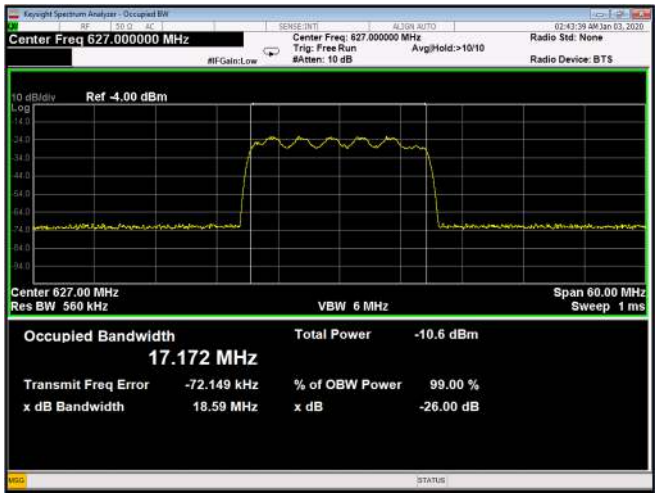

Figure 385: 16QAM 20MHz B.W; 627.0MHz, 60kHz Input

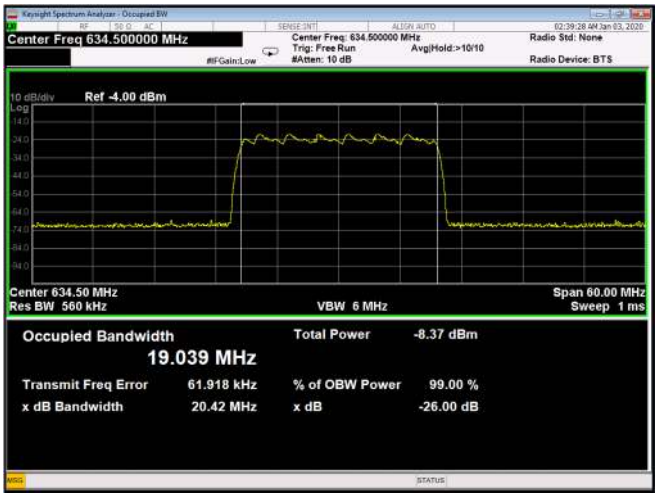

Figure 386: 16QAM 20MHz B.W; 634.5MHz, 15kHz Input

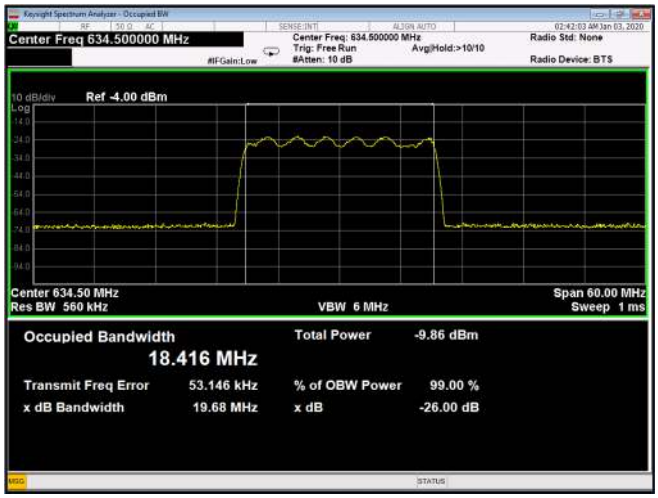

Figure 387: 16QAM 20MHz B.W; 634.5MHz, 30kHz Input

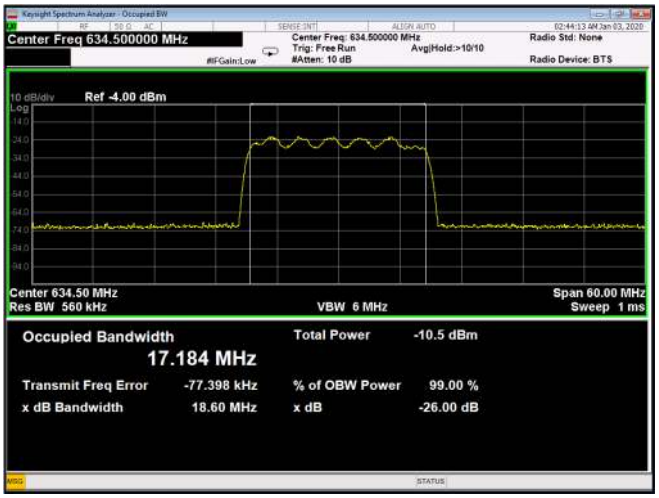

Figure 388: 16QAM 20MHz B.W; 634.5MHz, 60kHz Input

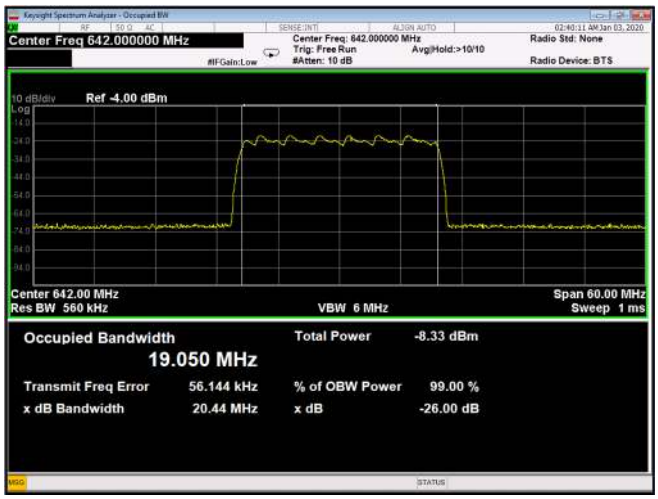

Figure 389: 16QAM 20MHz B.W; 642.0MHz, 15kHz Input

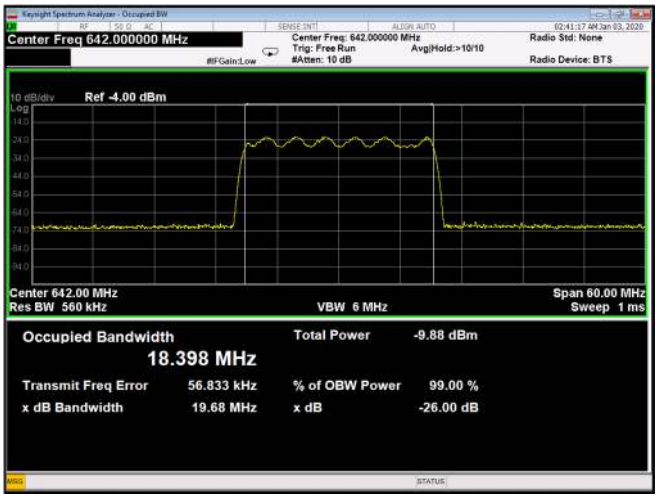

Figure 390: 16QAM 20MHz B.W; 642.0MHz, 30kHz Input

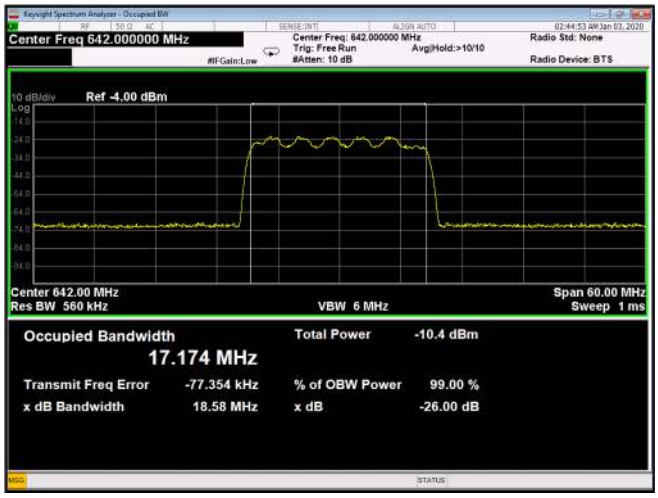

Figure 391: 16QAM 20MHz B.W; 642.0MHz, 60kHz Input

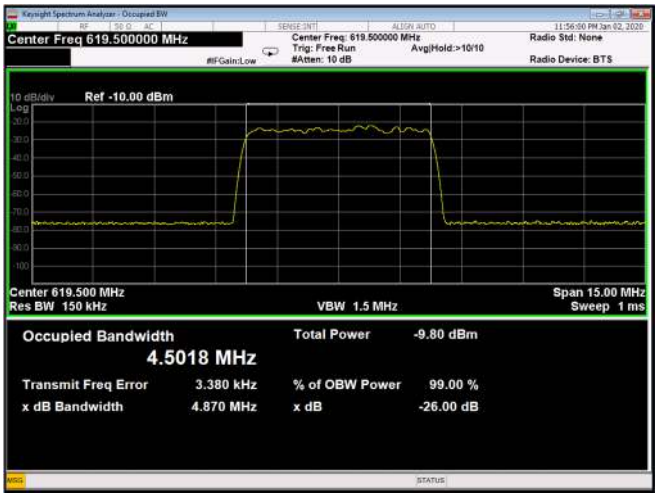

Figure 392: 64QAM 5MHz B.W; 619.5MHz, 15kHz Input

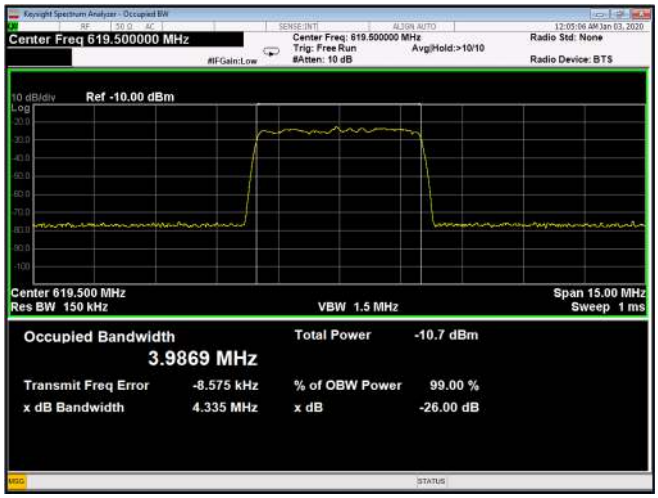

Figure 393: 64QAM 5MHz B.W; 619.5MHz, 30kHz Input

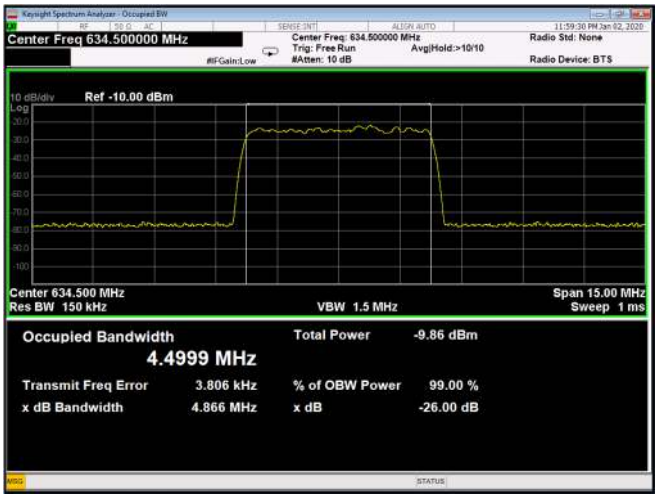

Figure 394: 64QAM 5MHz B.W; 634.5MHz, 15kHz Input

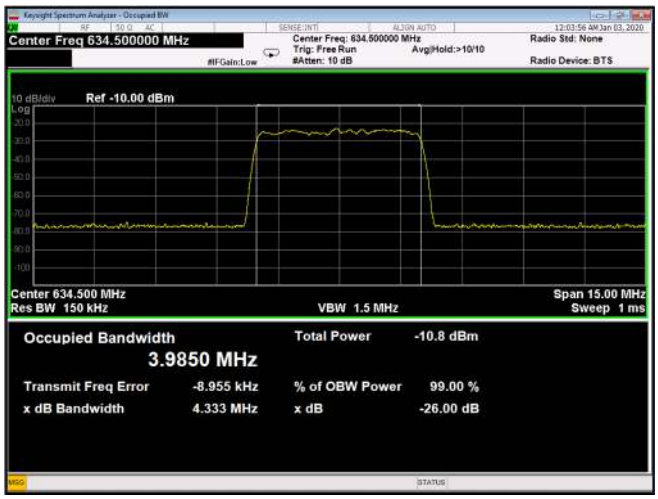

Figure 395: 64QAM 5MHz B.W; 634.5MHz, 30kHz Input

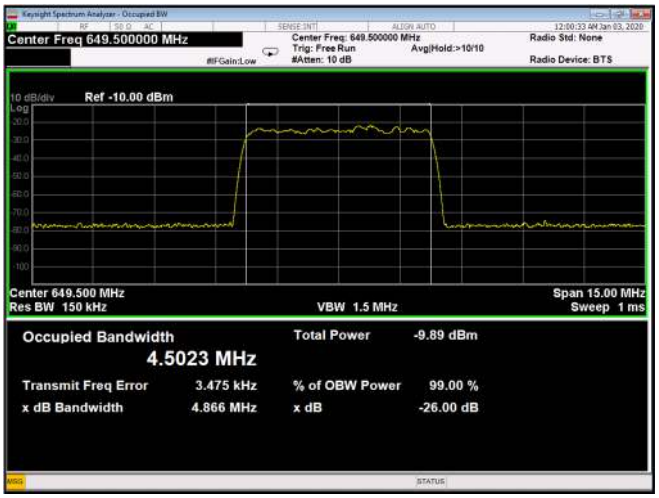

Figure 396: 64QAM 5MHz B.W; 649.5MHz, 15kHz Input

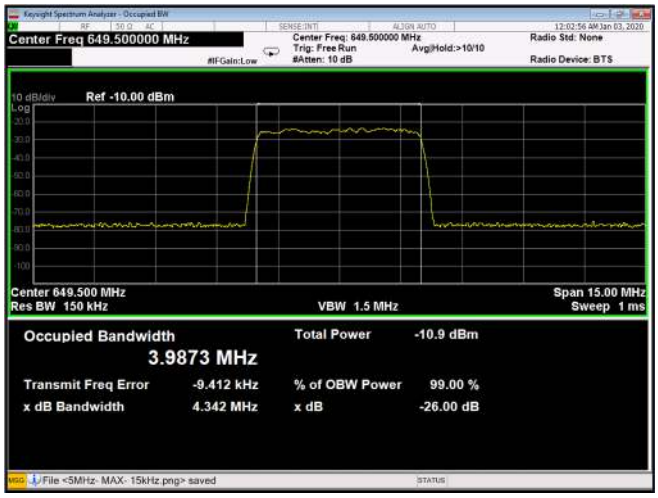

Figure 397: 64QAM 5MHz B.W; 649.5MHz, 30kHz Input

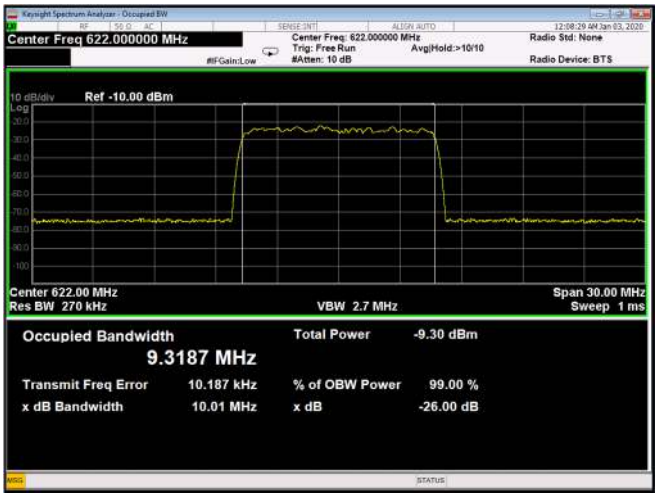

Figure 398: 64QAM 10MHz B.W; 622.0MHz, 15kHz Input

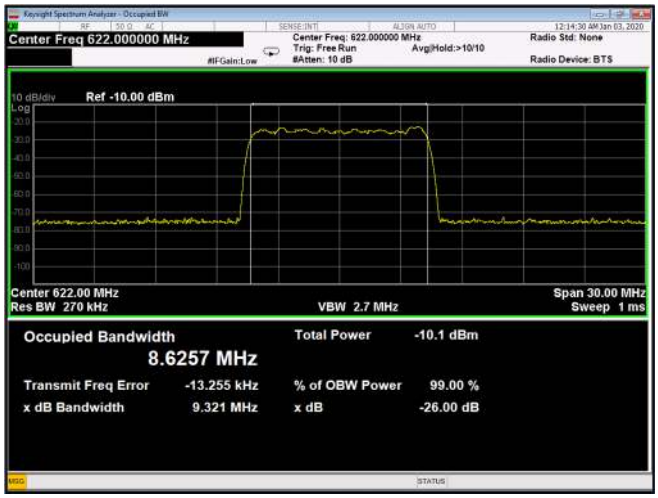

Figure 399: 64QAM 10MHz B.W; 622.0MHz, 60kHz Input

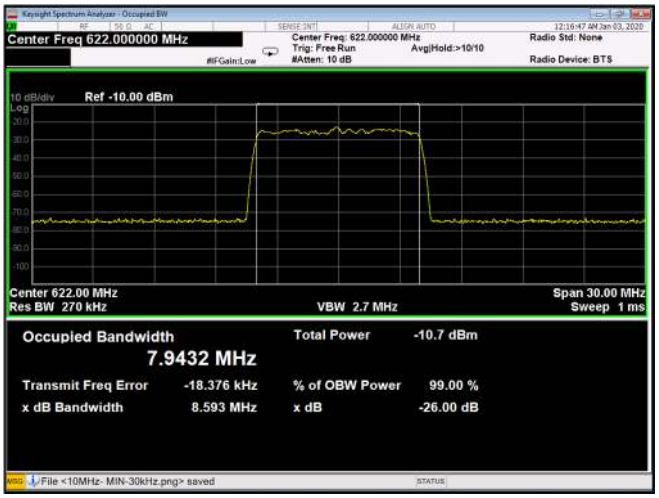

Figure 400: 64QAM 10MHz B.W; 622.0MHz, 60kHz Input

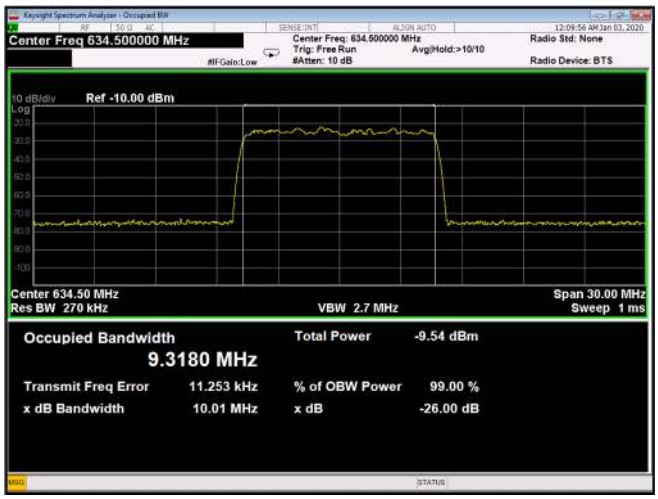

Figure 401: 64QAM 10MHz B.W; 634.5MHz, 15kHz Input

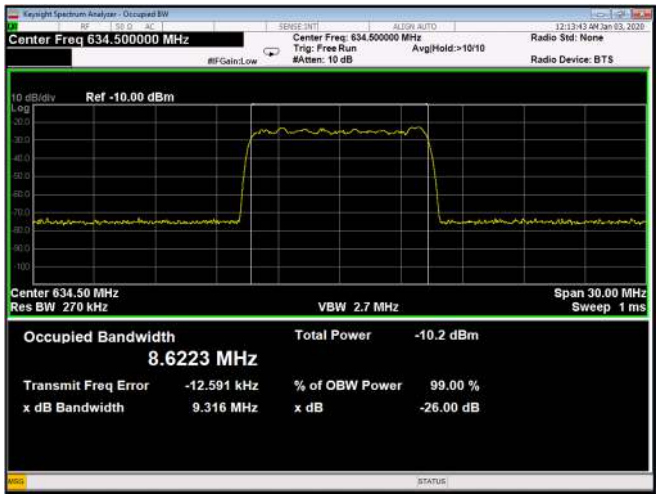

Figure 402: 64QAM 10MHz B.W; 634.5MHz, 30kHz Input

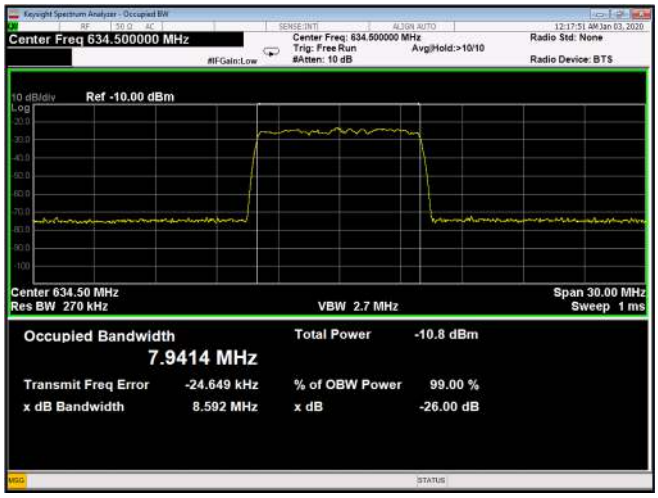

Figure 403: 64QAM 10MHz B.W; 634.5MHz, 60kHz Input

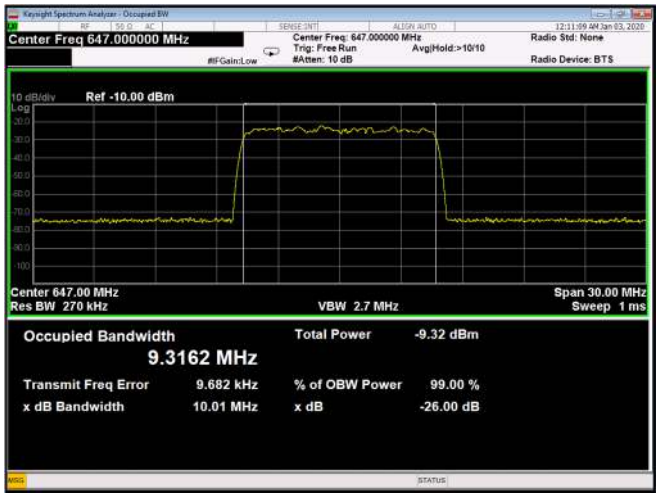

Figure 404: 64QAM 10MHz B.W; 647.0MHz, 15kHz Input

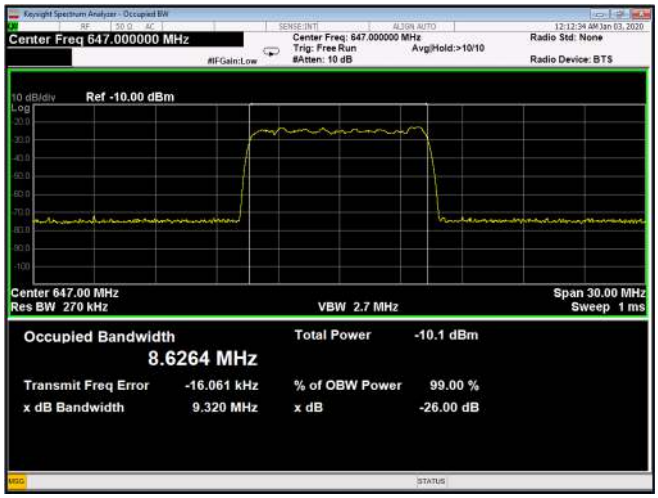

Figure 405: 64QAM 10MHz B.W; 647.0MHz, 30kHz Input

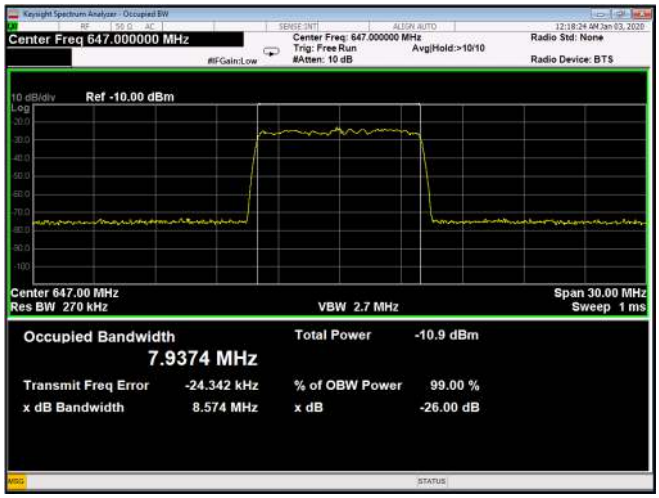

Figure 406: 64QAM 10MHz B.W; 647.0 MHz, 60kHz Input

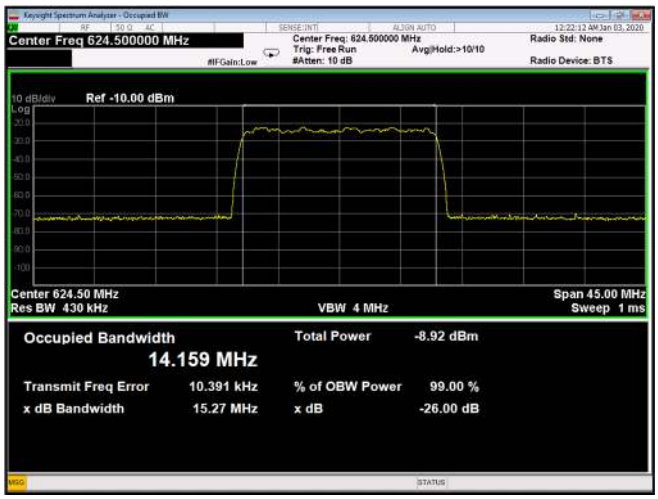

Figure 407: 64QAM 15MHz B.W; 624.5MHz, 15kHz Input

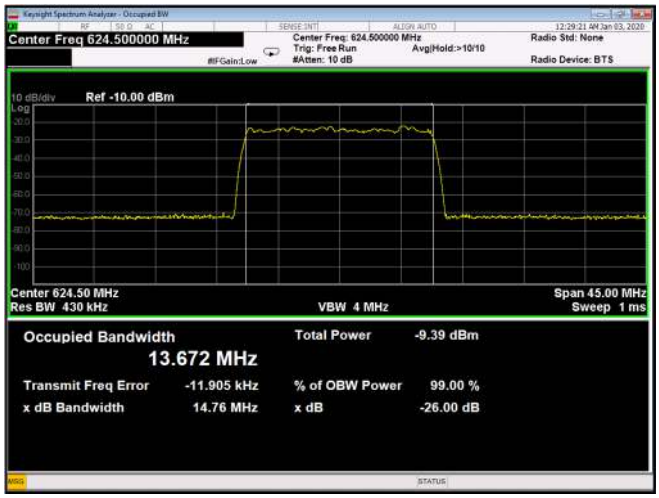

Figure 408: 64QAM 15MHz B.W; 624.5MHz, 30kHz Input

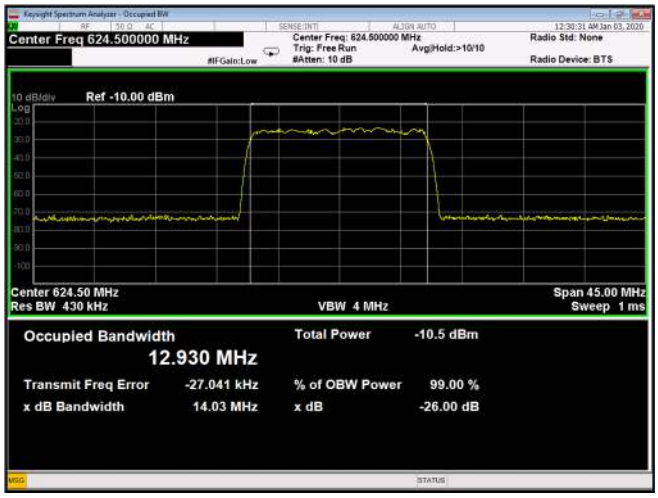

Figure 409: 64QAM 15MHz B.W; 624.5MHz, 60kHz Input

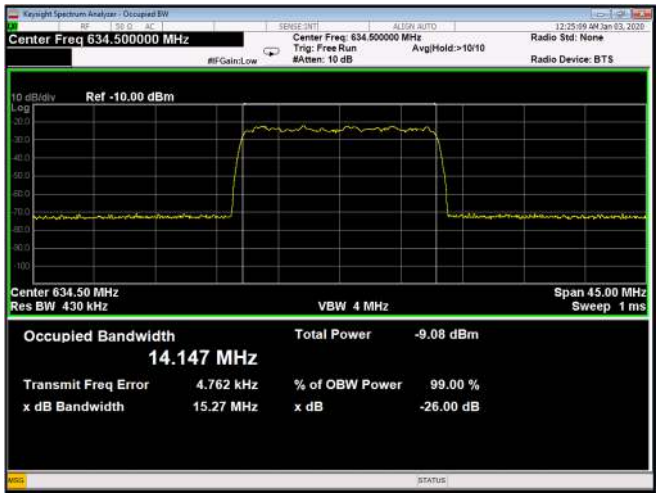

Figure 410: 64QAM 15MHz B.W; 634.5MHz, 15kHz Input

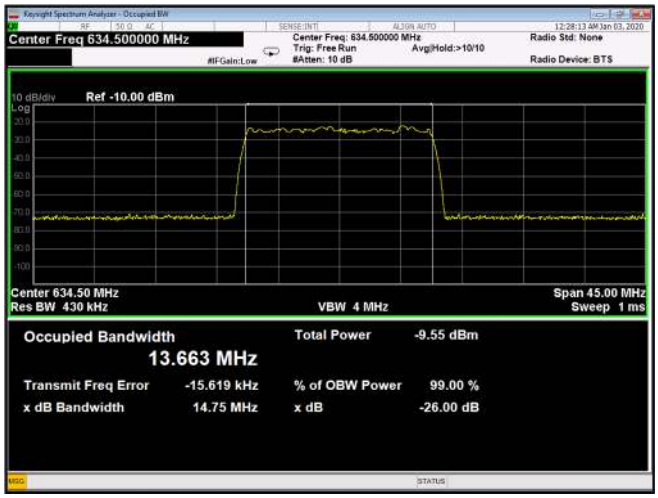

Figure 411: 64QAM 15MHz B.W; 634.5MHz, 30kHz Input

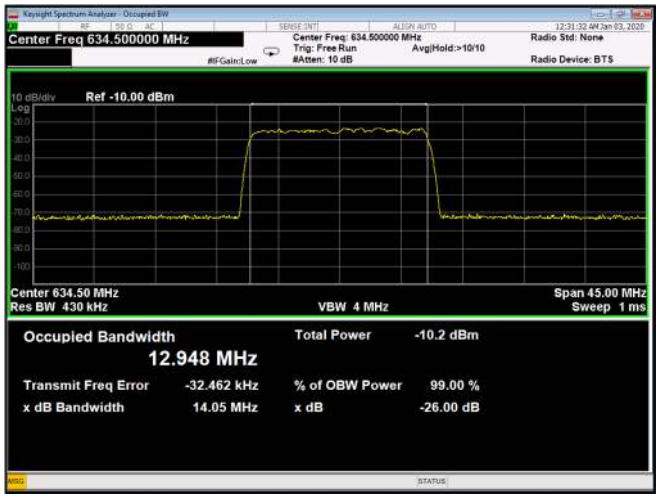

Figure 412: 64QAM 15MHz B.W; 634.5MHz, 60kHz Input

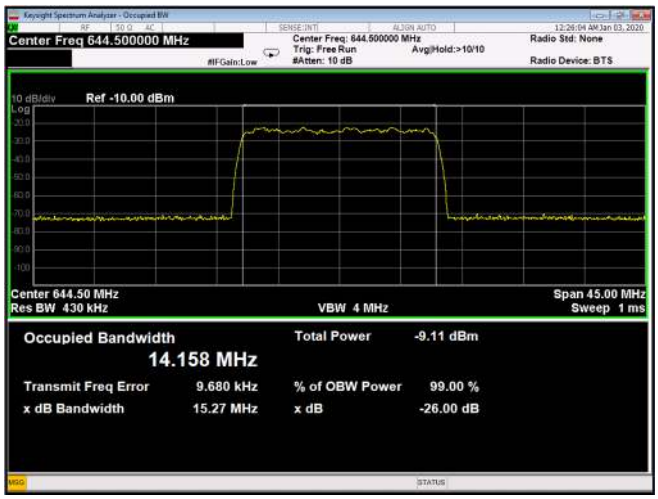

Figure 413: 64QAM 15MHz B.W; 644.5MHz, 15kHz Input

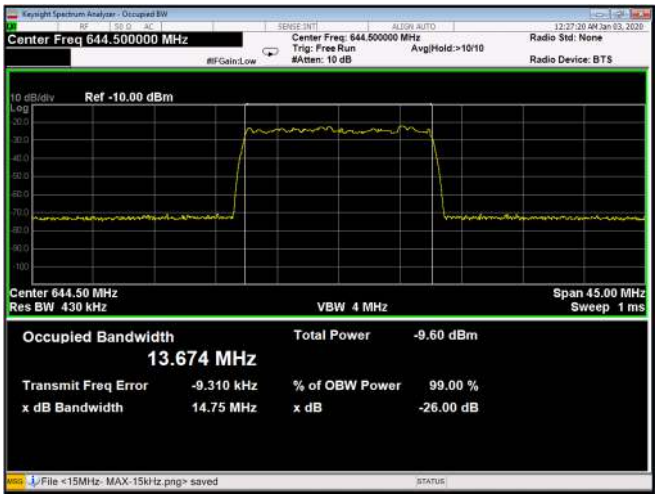

Figure 414: 64QAM 15MHz B.W; 644.5MHz, 30kHz Input

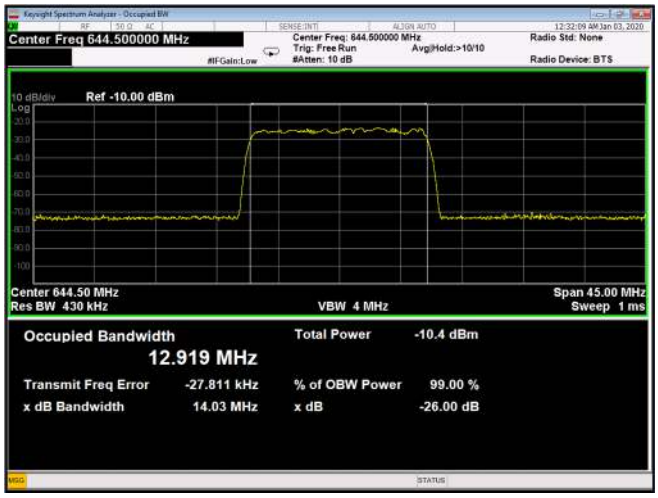

Figure 415: 64QAM 15MHz B.W; 644.5MHz, 60kHz Input

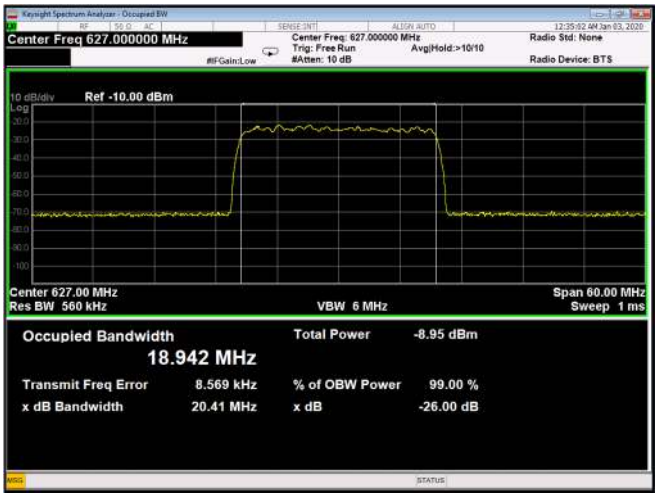

Figure 416: 64QAM 20MHz B.W; 627.0MHz, 15kHz Input

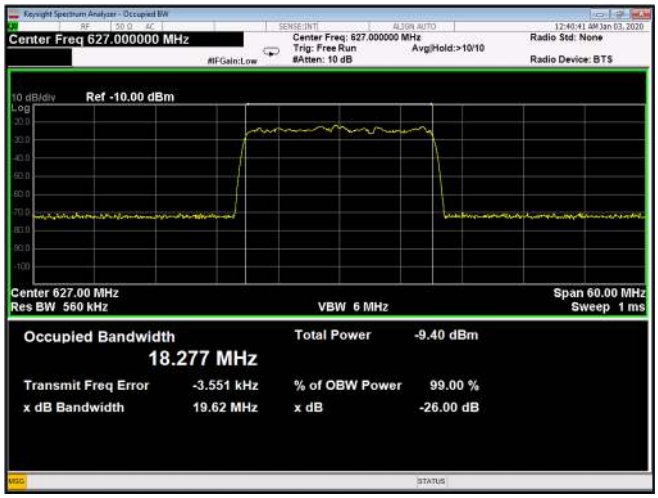

Figure 417: 64QAM 20MHz B.W; 627.0MHz, 30kHz Input

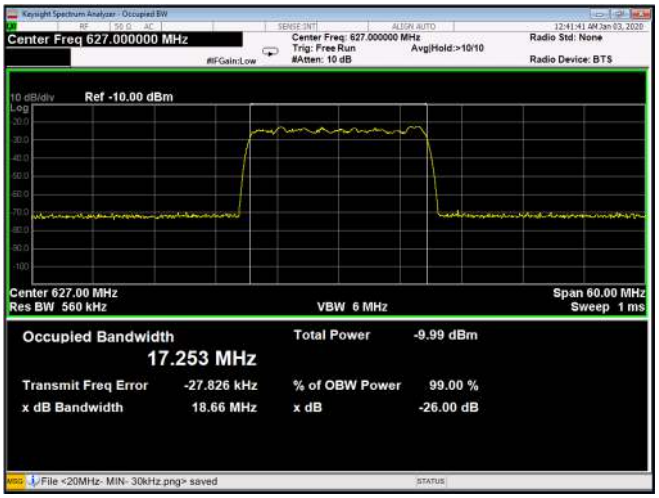

Figure 418: 64QAM 20MHz B.W; 627.0MHz, 60kHz Input

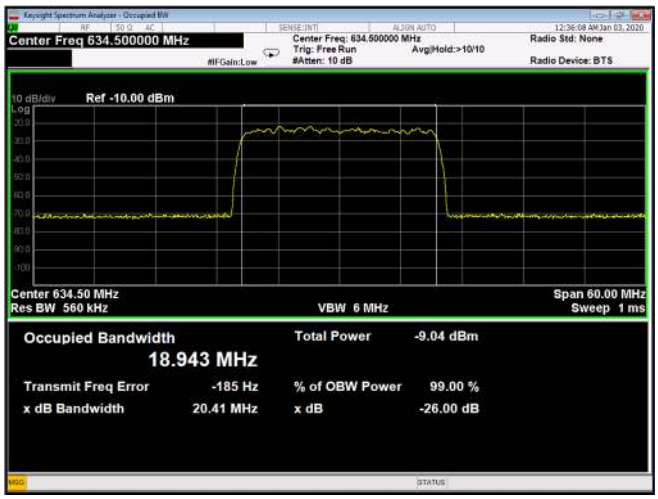

Figure 419: 64QAM 20MHz B.W; 634.5MHz, 15kHz Input

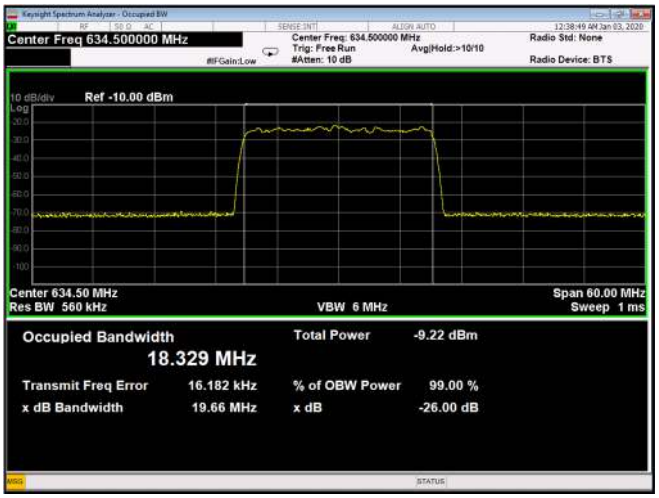

Figure 420: 64QAM 20MHz B.W; 634.5MHz, 30kHz Input

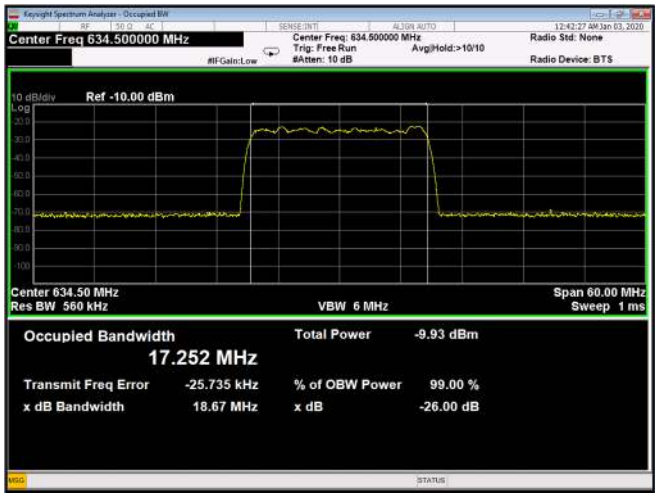

Figure 421: 64QAM 20MHz B.W; 634.5MHz, 60kHz Input

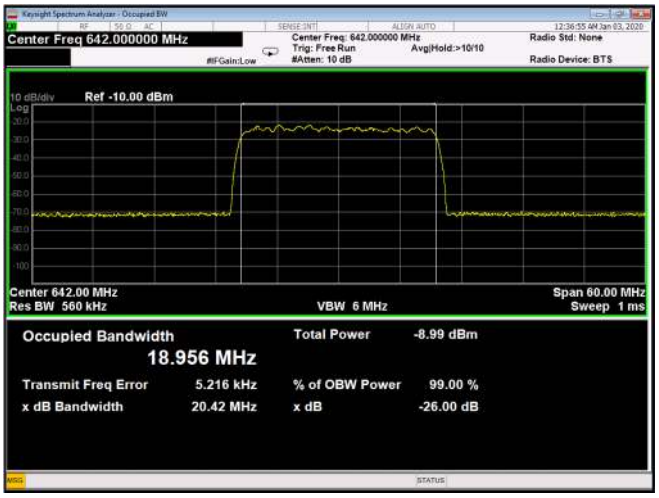

Figure 422: 64QAM 20MHz B.W; 642.0MHz, 15kHz Input

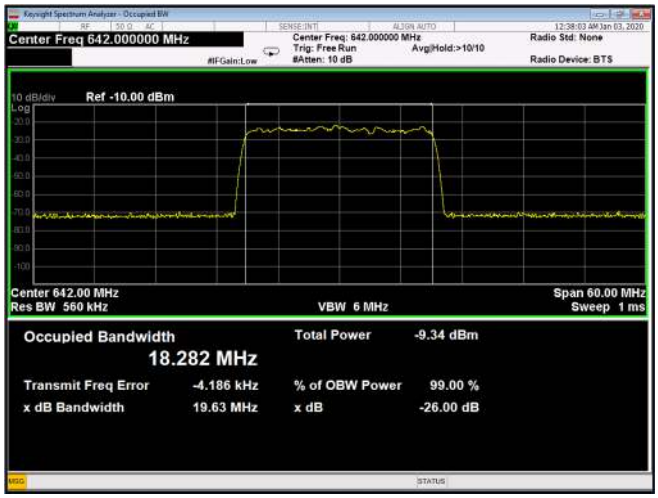

Figure 423: 64QAM 20MHz B.W; 642.0MHz, 30kHz Input

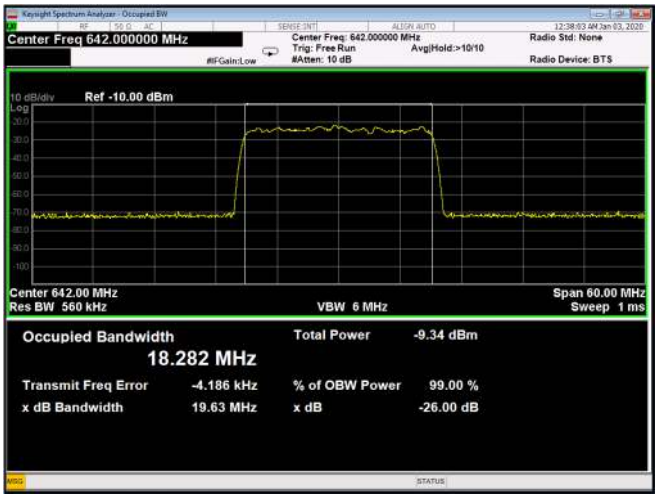

Figure 424: 64QAM 5MHz B.W; 642.0MHz, 60kHz Input

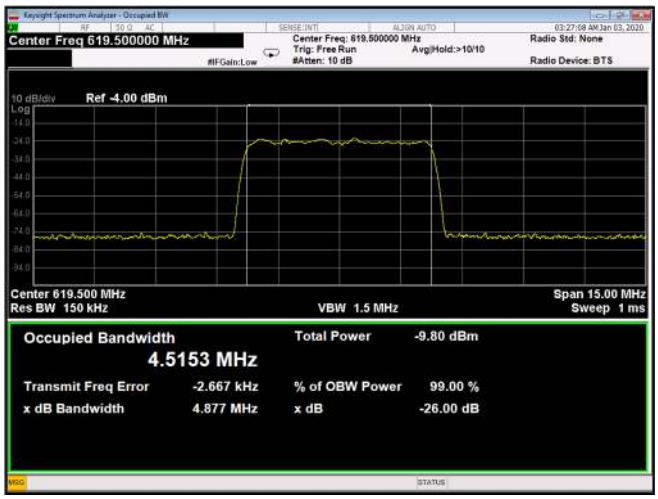

Figure 425: 256QAM 5MHz B.W; 619.5MHz, 15kHz Input

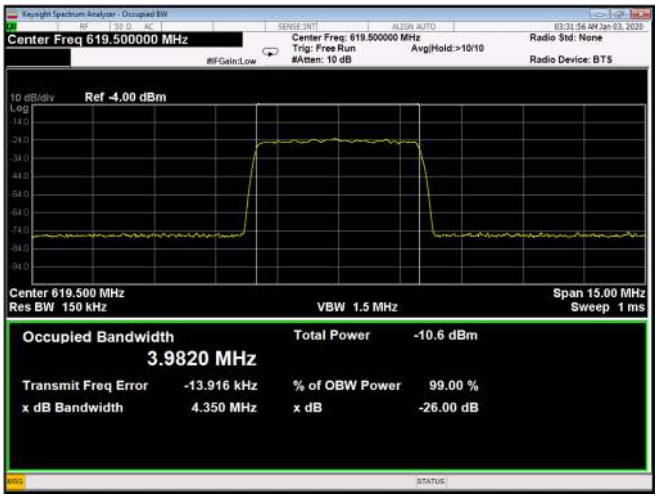

Figure 426: 256QAM 5MHz B.W; 619.5MHz, 30kHz Input

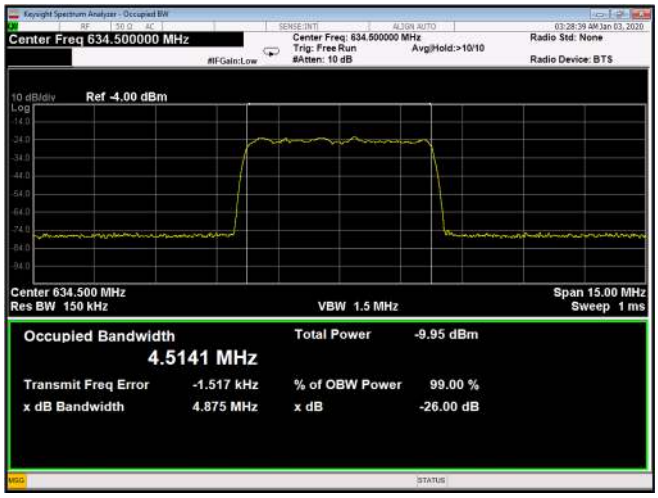

Figure 427: 256QAM 5MHz B.W; 634.5MHz, 15kHz Input

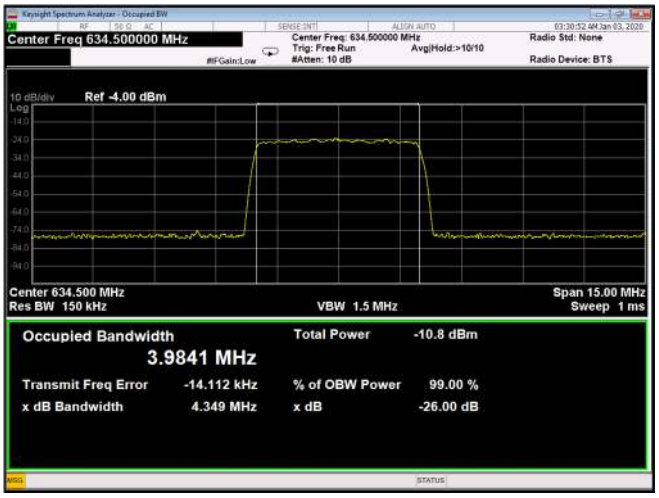

Figure 428: 256QAM 5MHz B.W; 634.5MHz, 30kHz Input

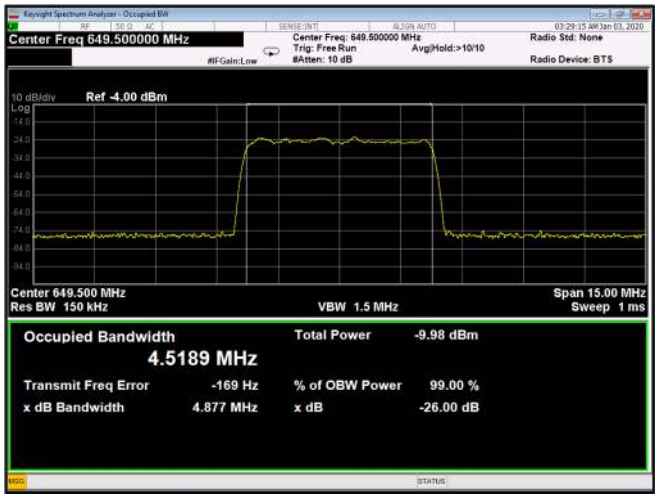

Figure 429: 256QAM 5MHz B.W; 649.5MHz, 15kHz Input

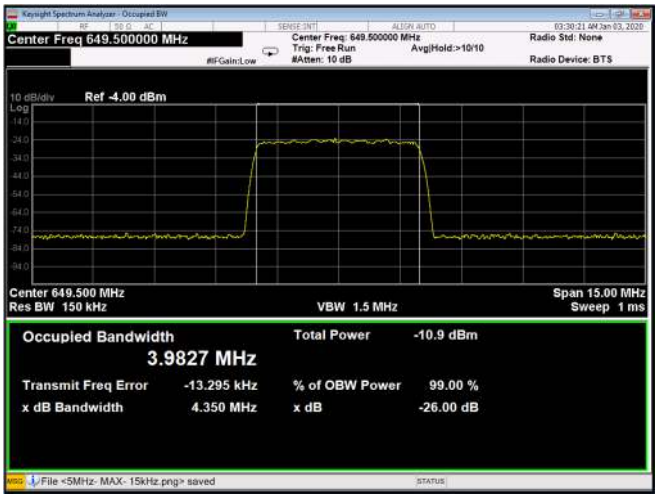

Figure 430: 256QAM 5MHz B.W; 649.5MHz, 30kHz Input

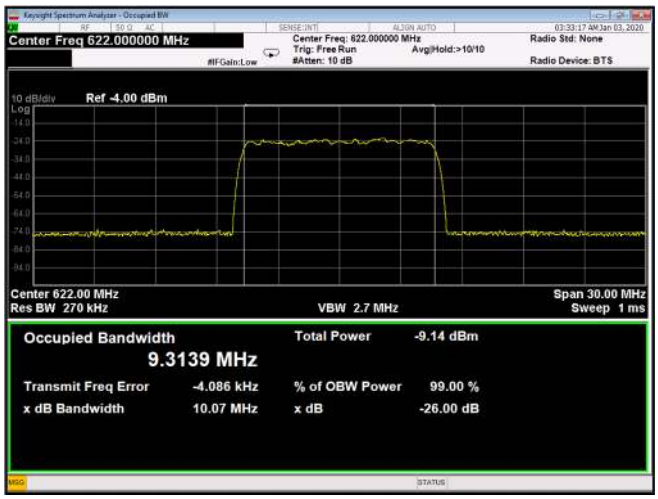

Figure 431: 256QAM 10MHz B.W; 622.0MHz, 15kHz Input

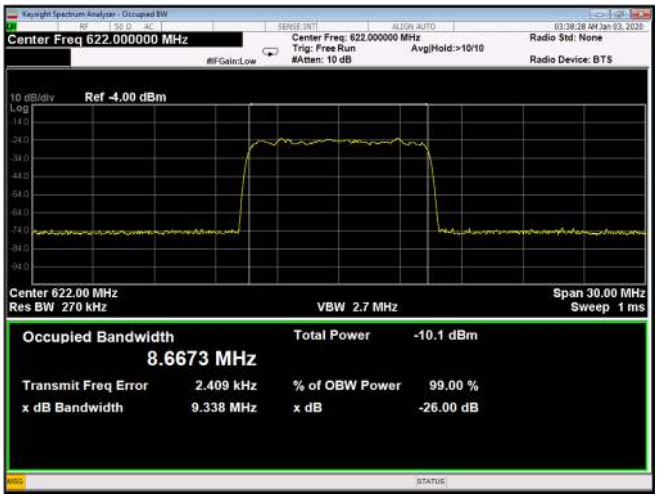

Figure 432: 256QAM 10MHz B.W; 622.0MHz, 30kHz Input

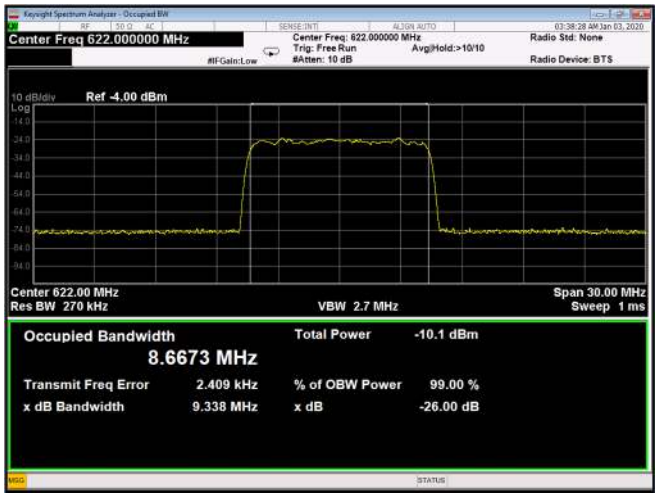

Figure 433: 256QAM 10MHz B.W; 622.0MHz, 60kHz Input

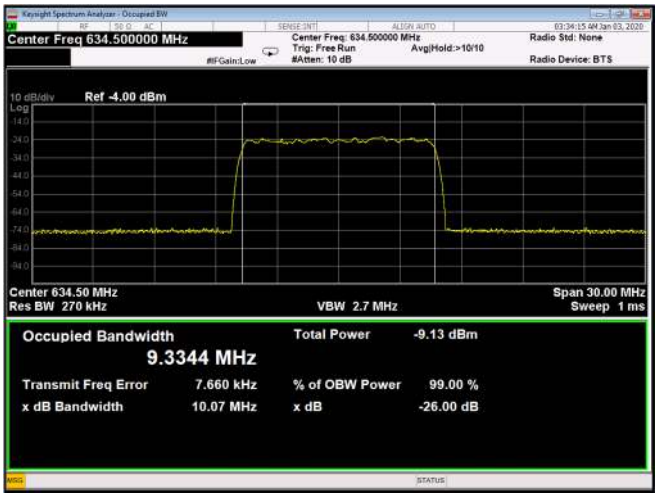

Figure 434: 256QAM 10MHz B.W; 634.5MHz, 15kHz Input

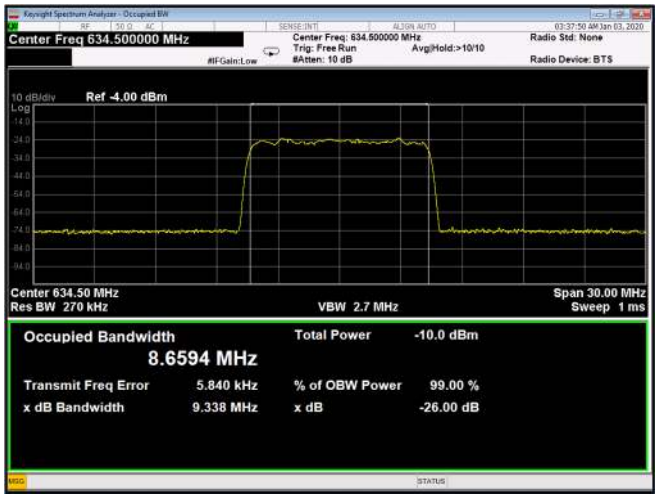

Figure 435: 256QAM 10MHz B.W; 634.5MHz, 30kHz Input

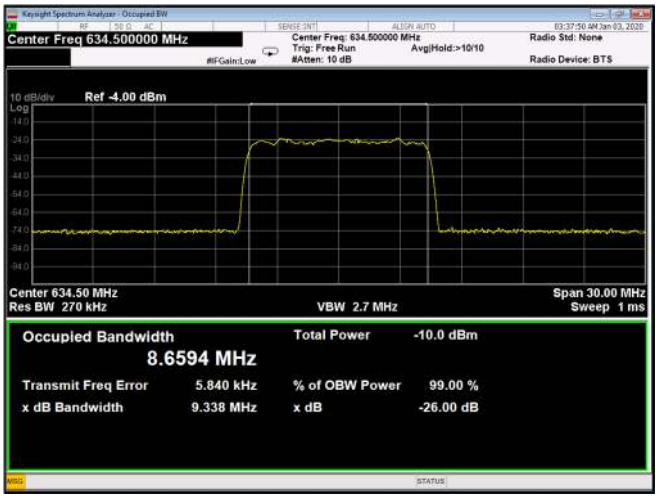

Figure 436: 256QAM 10MHz B.W; 634.5MHz, 60kHz Input

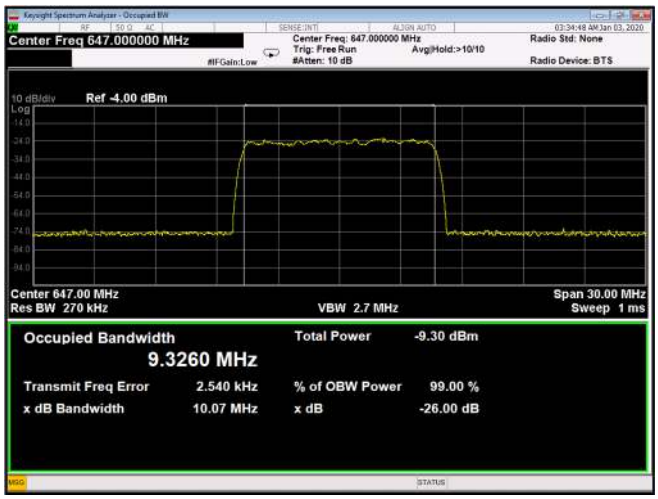

Figure 437: 256QAM 10MHz B.W; 647.0MHz, 15kHz Input

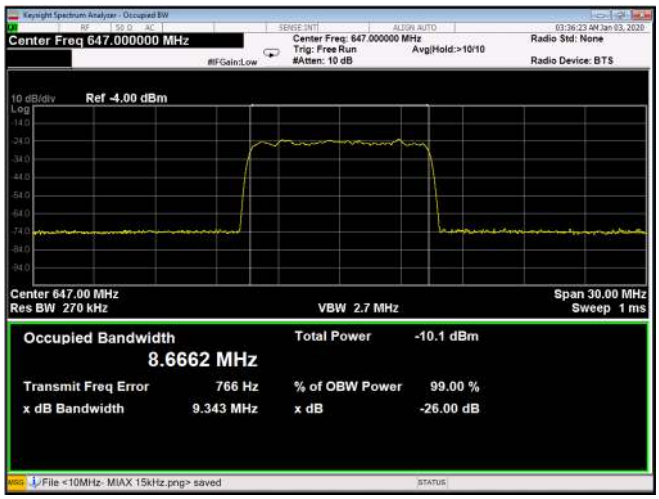

Figure 438: 256QAM 10MHz B.W; 647.0MHz, 30kHz Input

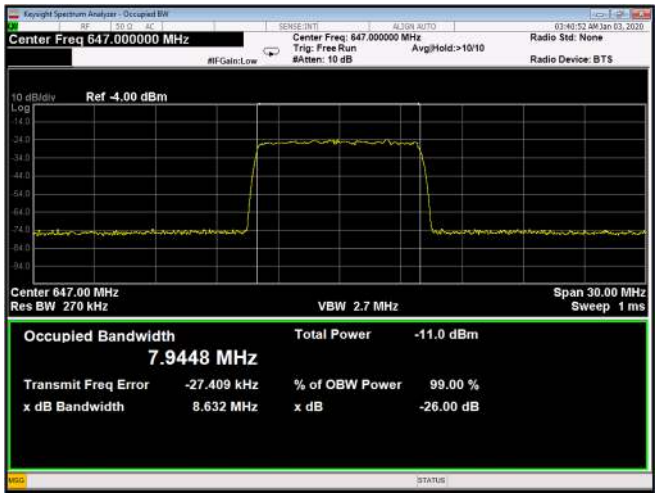

Figure 439: 256QAM 10MHz B.W; 647.0MHz, 60kHz Input

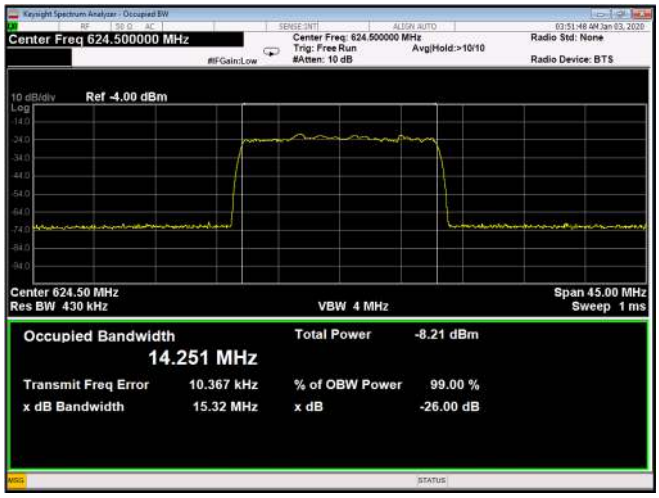

Figure 440: 256QAM 15MHz B.W; 624.5MHz, 15kHz Input

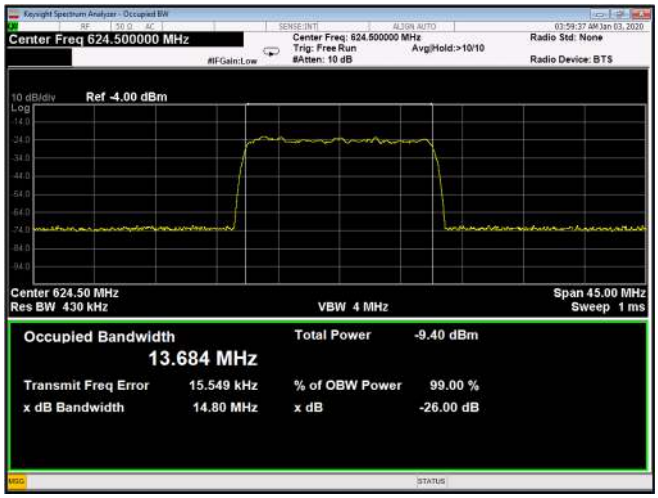

Figure 441: 256QAM 15MHz B.W; 624.5MHz, 30kHz Input

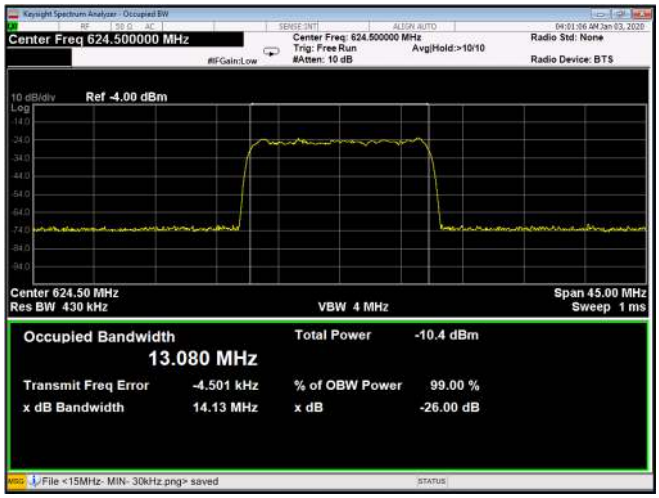

Figure 442: 256QAM 15MHz B.W; 624.5MHz, 60kHz Input

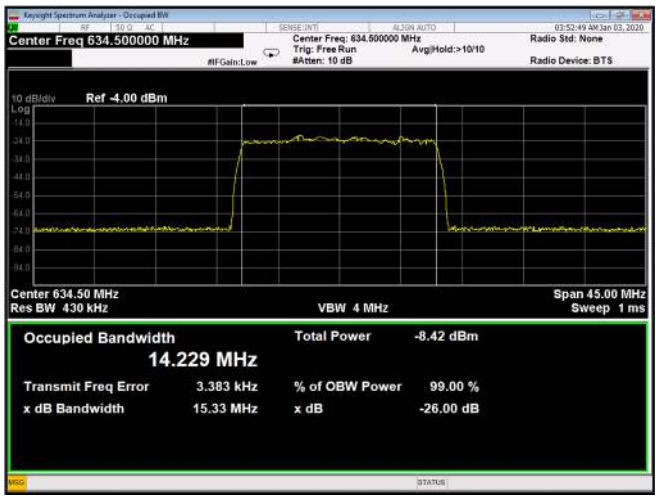

Figure 443: 256QAM 15MHz B.W; 634.5MHz, 15kHz Input

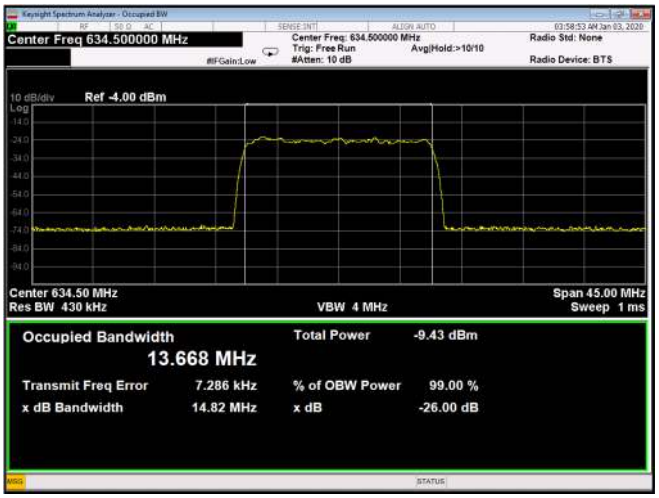

Figure 444: 256QAM 15MHz B.W; 634.5MHz, 30kHz Input

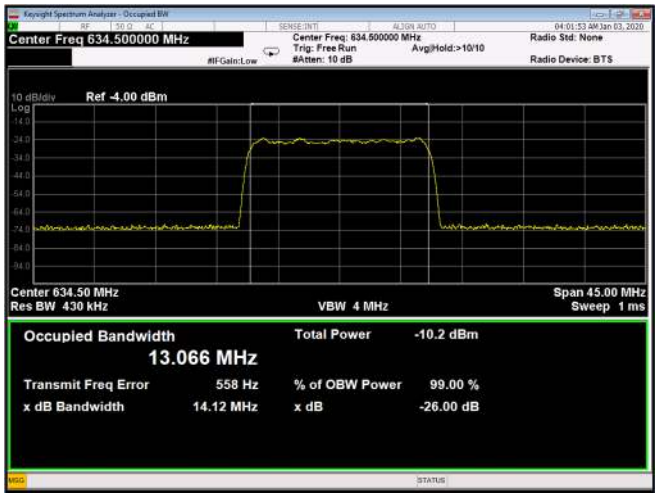

Figure 445: 256QAM 15MHz B.W; 634.5MHz, 60kHz Input

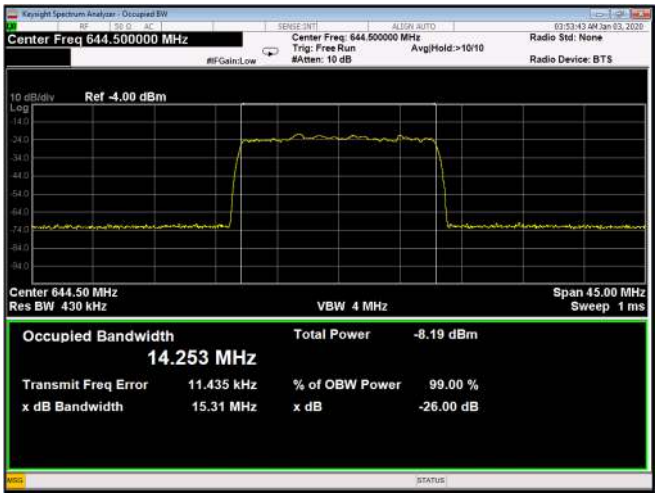

Figure 446: 256QAM 15MHz B.W; 644.5MHz, 15kHz Input

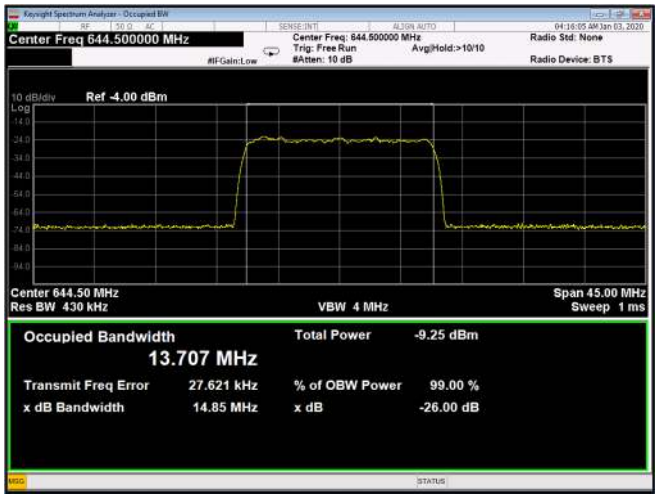

Figure 447: 256QAM 15MHz B.W; 644.5MHz, 30kHz Input

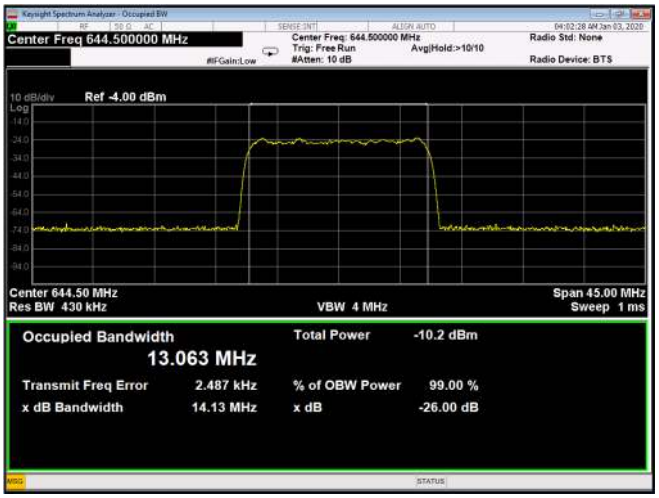

Figure 448: 256QAM 15MHz B.W; 644.5MHz, 60kHz Input

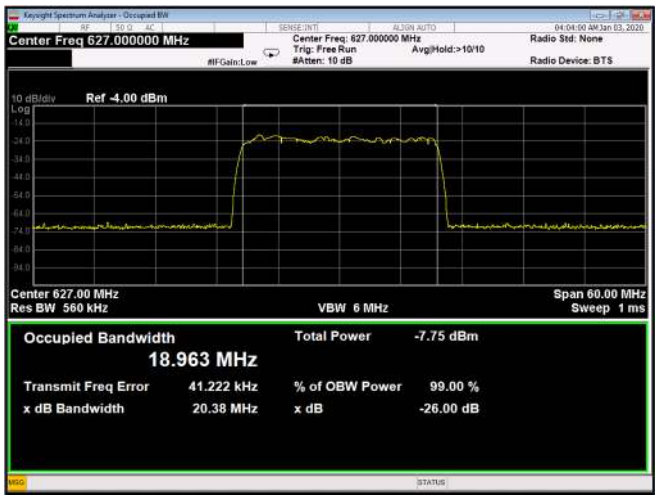

Figure 449: 256QAM 20MHz B.W; 627.0MHz, 15kHz Input

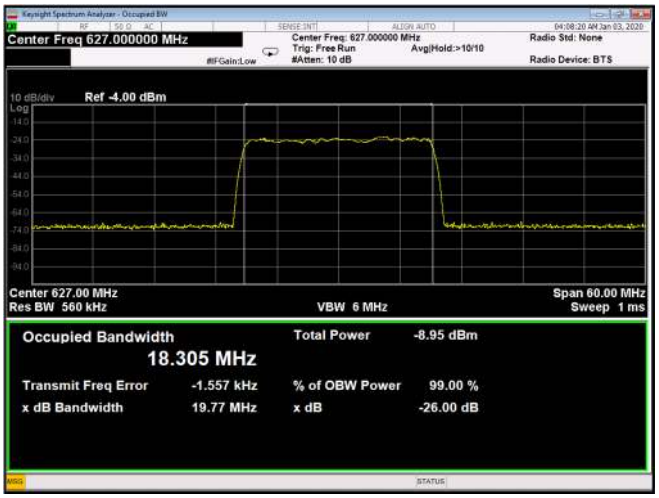

Figure 450: 256QAM 20MHz B.W; 627.0MHz, 30kHz Input

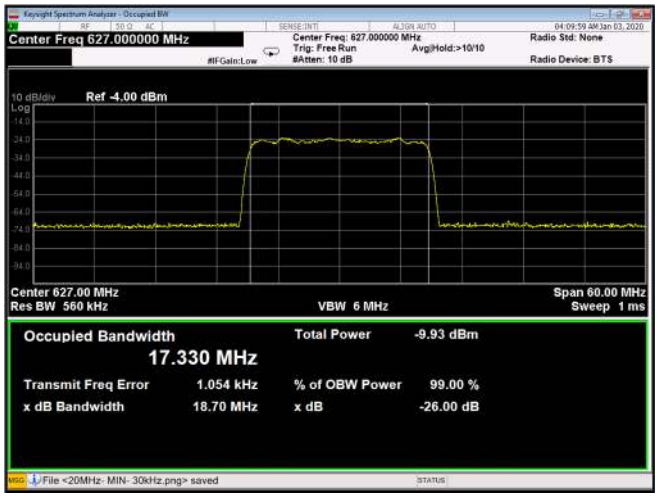

Figure 451: 256QAM 20MHz B.W; 627.0MHz, 60kHz Input

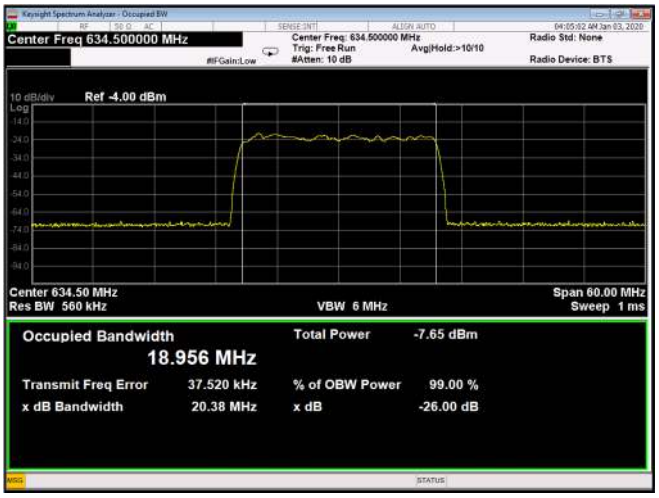

Figure 452: 256QAM 20MHz B.W; 634.5MHz, 15kHz Input

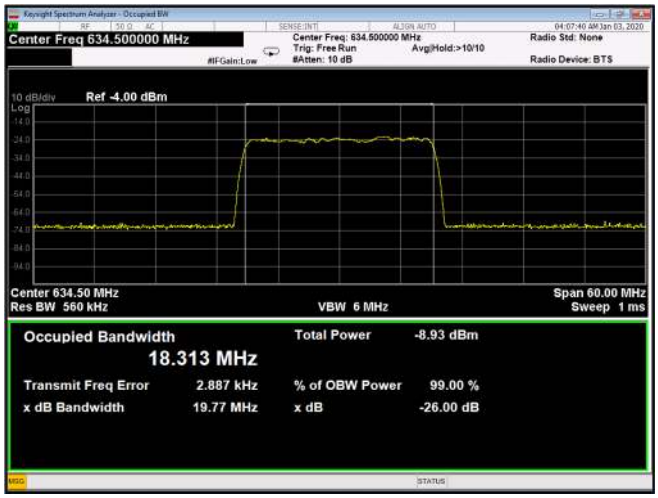

Figure 453: 256QAM 20MHz B.W; 634.5MHz, 30kHz Input

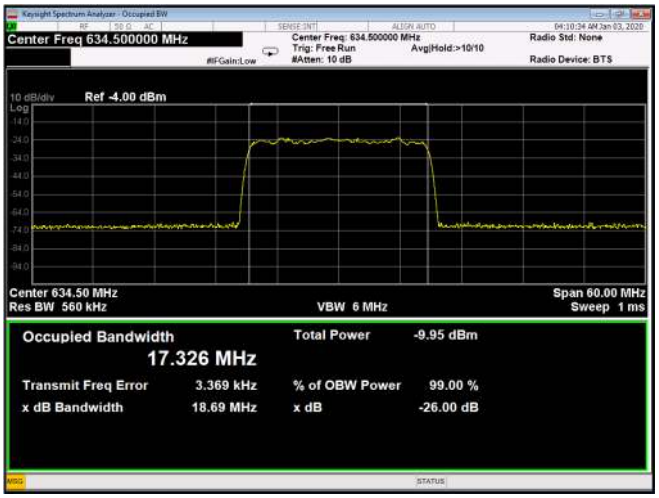

Figure 454: 256QAM 20MHz B.W; 634.4MHz, 60kHz Input

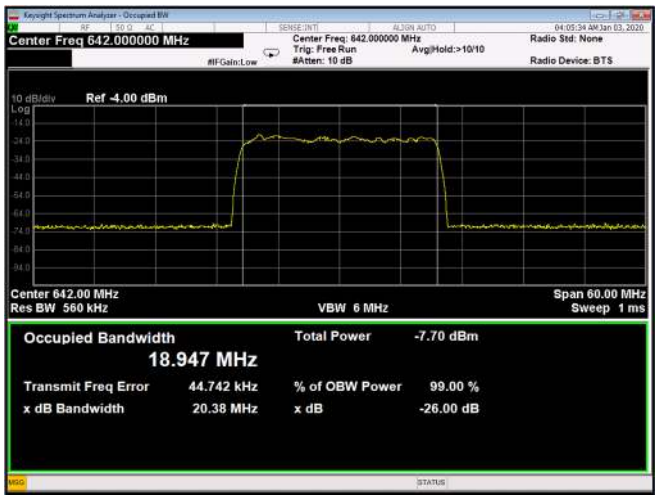

Figure 455: 256QAM 20MHz B.W; 642.0MHz, 15kHz Input

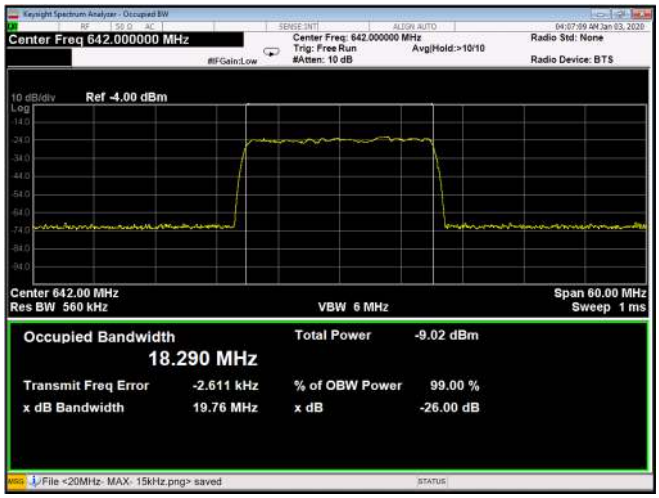

Figure 456: 256QAM 20MHz B.W; 642.0MHz, 30kHz Input

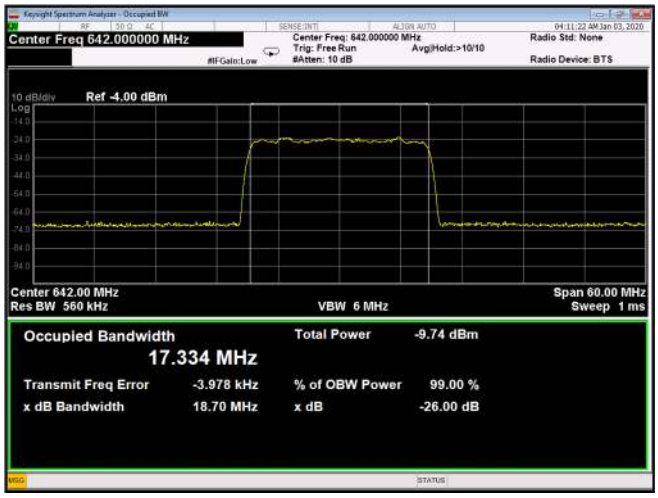

Figure 457: 256QAM 20MHz B.W; 642.0MHz, 60kHz Input

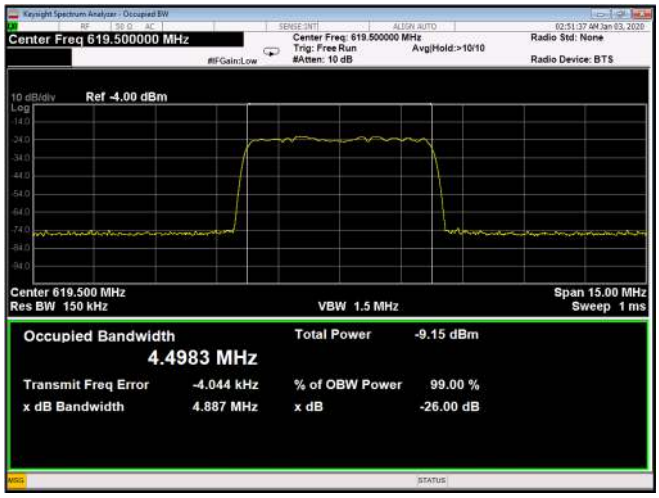

Figure 458: QPSK 5MHz B.W; 619.5MHz, 15kHz Input

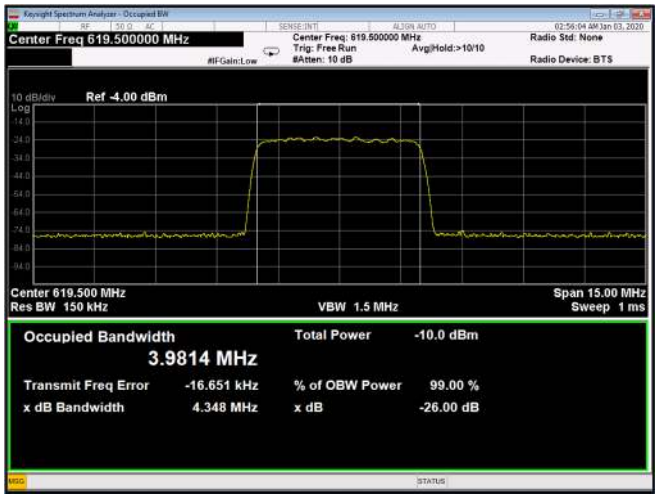

Figure 459: QPSK 5MHz B.W; 619.5MHz, 30kHz Input

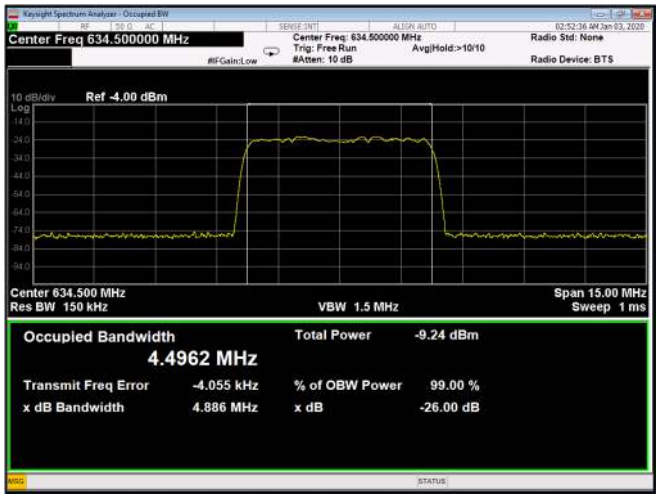

Figure 460: QPSK 5MHz B.W; 634.5MHz, 15kHz Input

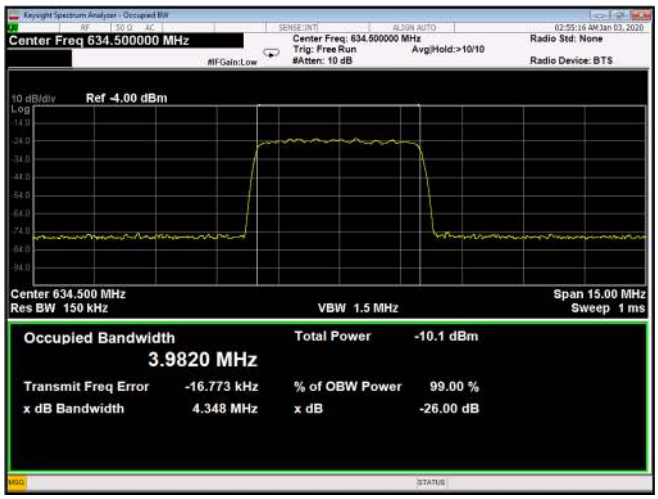

Figure 461: QPSK 5MHz B.W; 634.5MHz, 30kHz Input

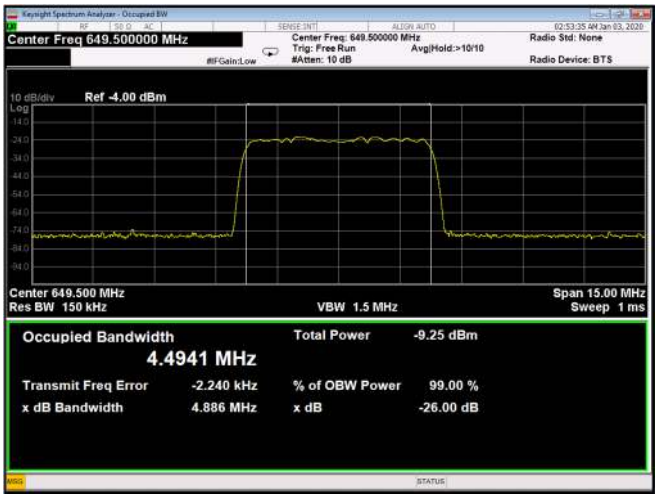

Figure 462: QPSK 5MHz B.W; 649.5MHz, 15kHz Input

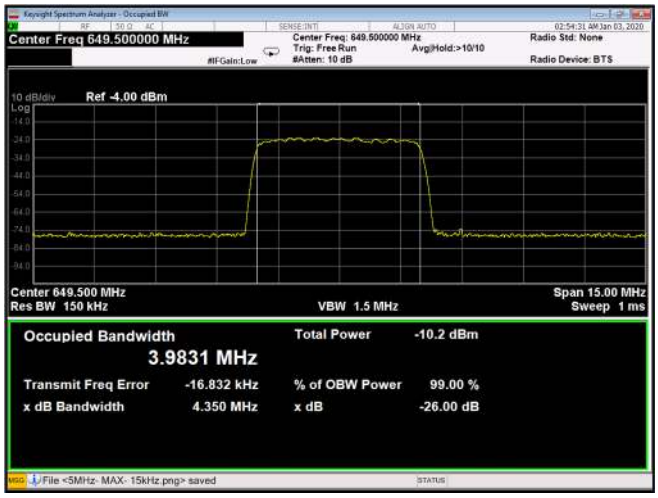

Figure 463: QPSK 5MHz B.W; 649.5MHz, 30kHz Input

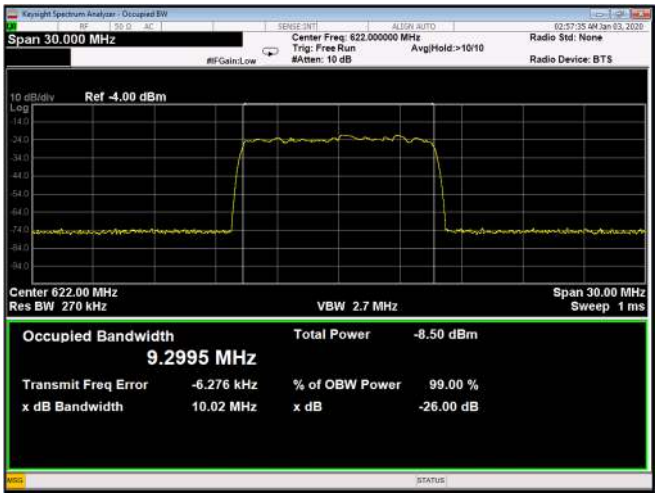

Figure 464: QPSK 10MHz B.W; 622.0MHz, 15kHz Input

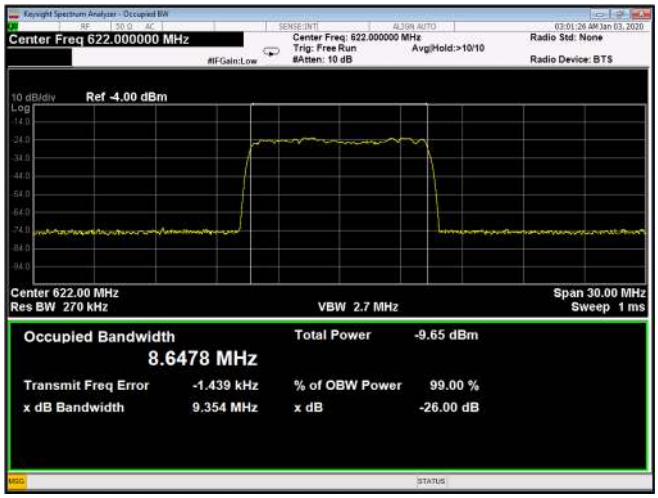

Figure 465: QPSK 10MHz B.W; 622.0MHz, 30kHz Input

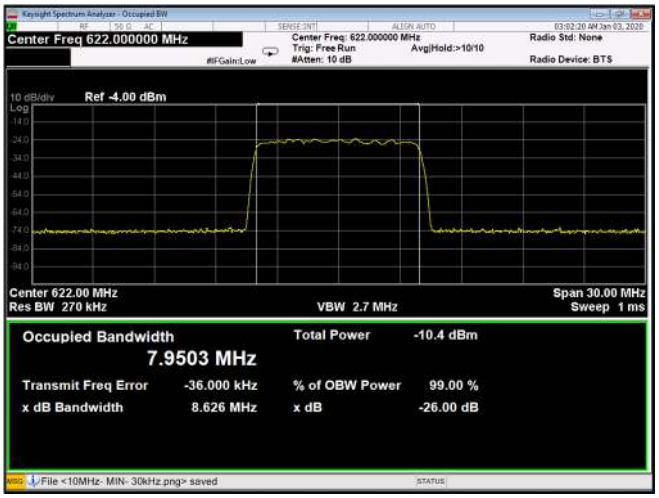

Figure 466: QPSK 10MHz B.W; 622.0MHz, 60kHz Input

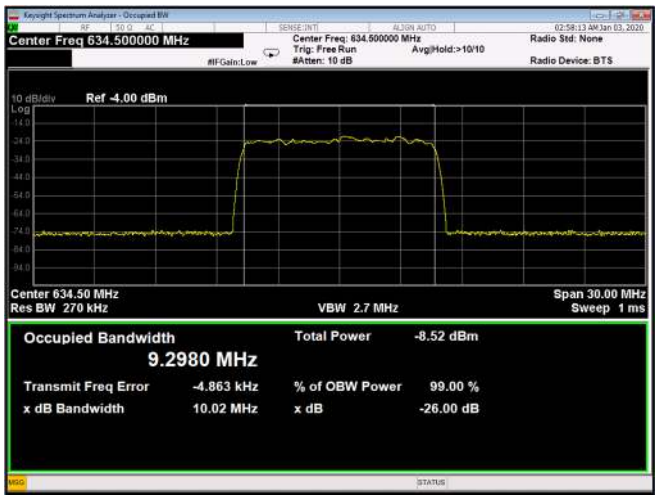

Figure 467: QPSK 10MHz B.W; 634.5MHz, 15kHz Input

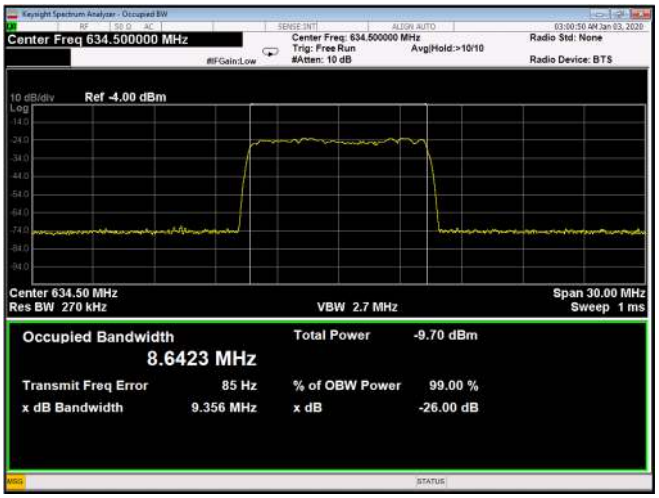

Figure 468: QPSK 10MHz B.W; 634.5MHz, 30kHz Input

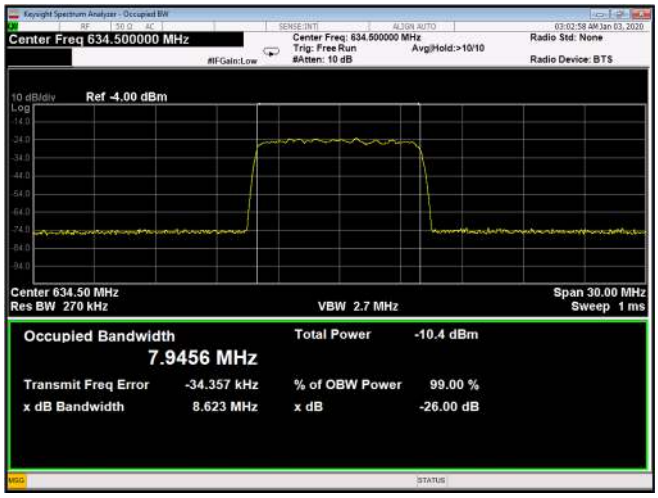

Figure 469: QPSK 10MHz B.W; 634.5MHz, 60kHz Input

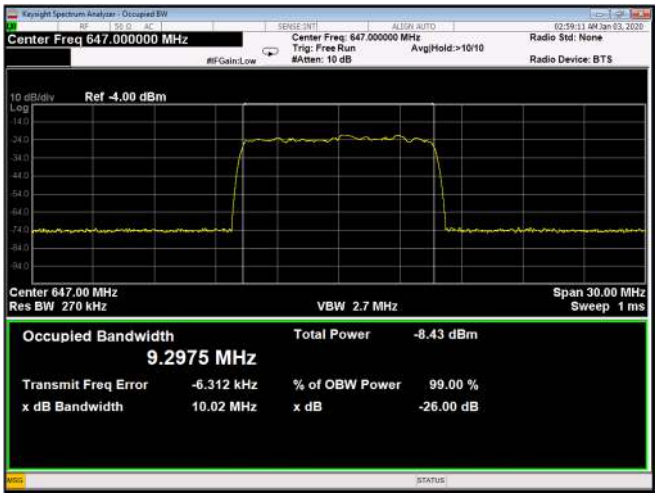

Figure 470: QPSK 10MHz B.W; 647.0MHz, 15kHz Input

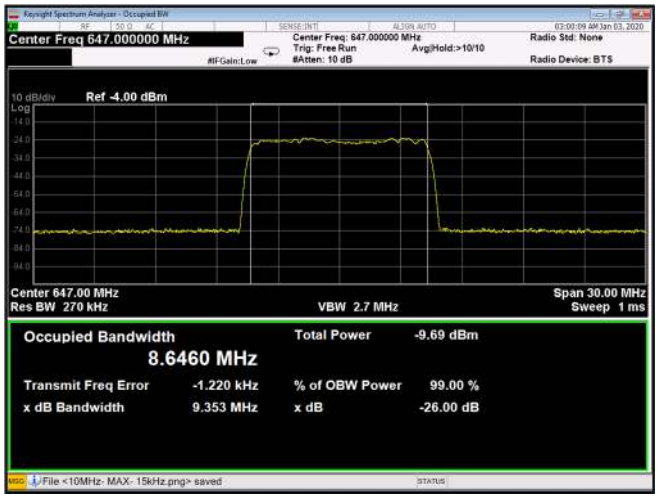

Figure 471: QPSK 10MHz B.W; 647.0MHz, 30kHz Input

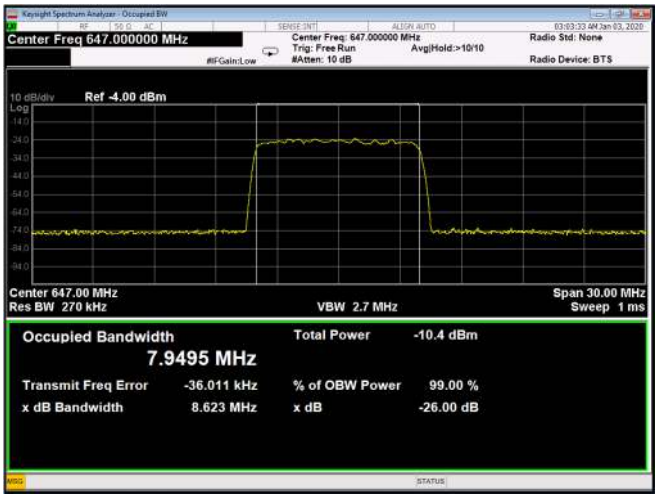

Figure 472: QPSK 10MHz B.W; 647.0MHz, 60kHz Input

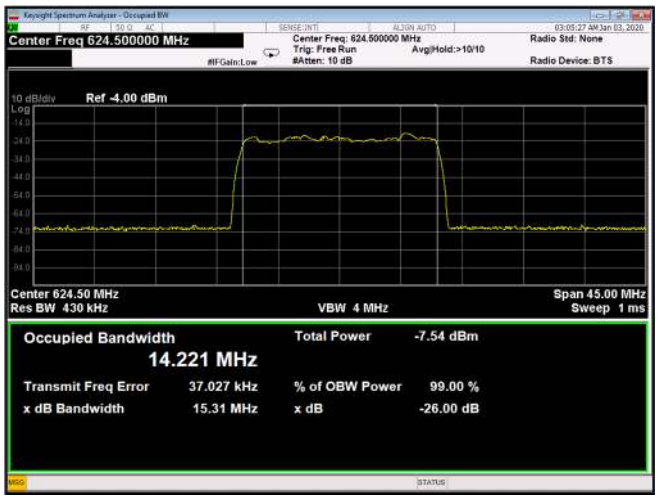

Figure 473: QPSK 15MHz B.W; 624.5MHz, 15kHz Input

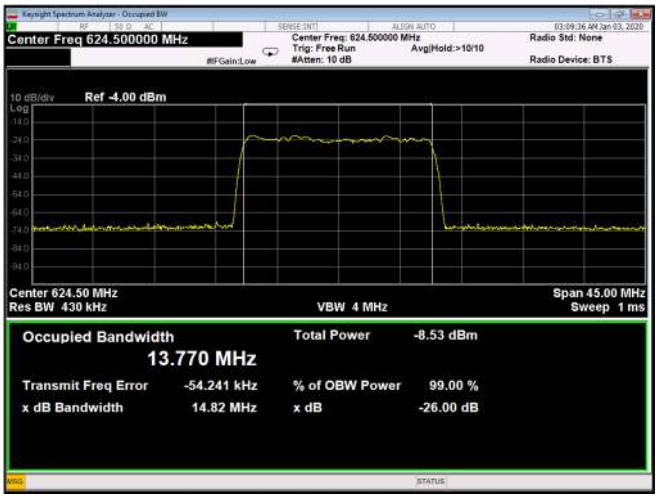

Figure 474: QPSK 15MHz B.W; 624.5MHz, 30kHz Input

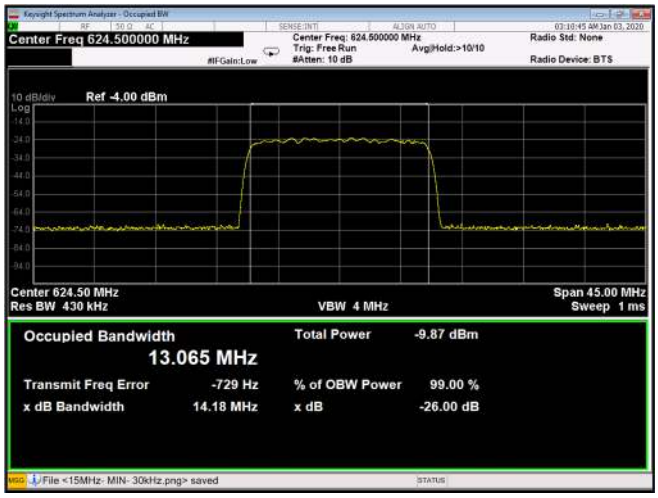

Figure 475: QPSK 15MHz B.W; 624.5MHz, 60kHz Input

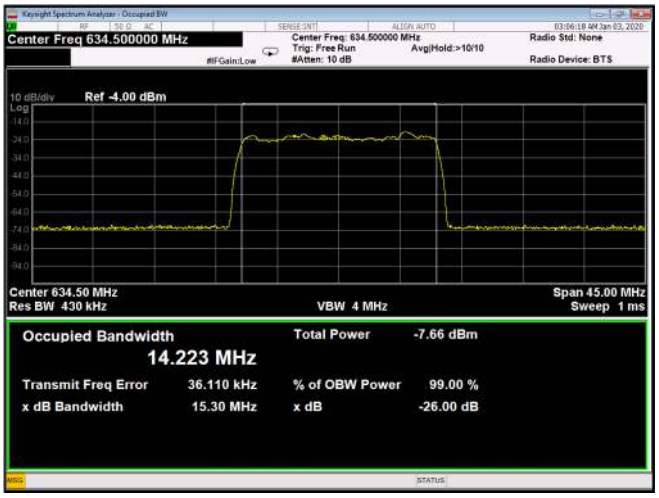

Figure 476: QPSK 15MHz B.W; 634.5MHz, 15kHz Input

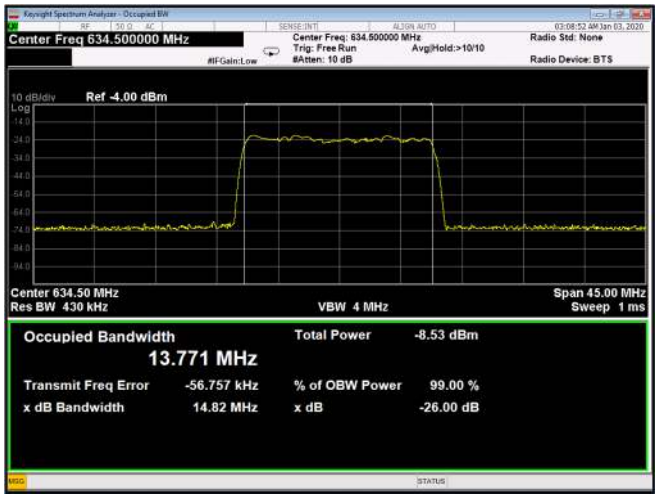

Figure 477: QPSK 15MHz B.W; 634.5MHz, 30kHz Input

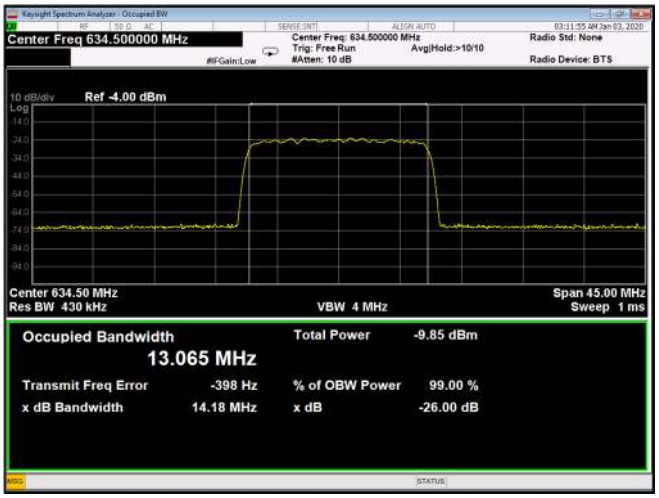

Figure 478: QPSK 15MHz B.W; 634.5MHz, 60kHz Input

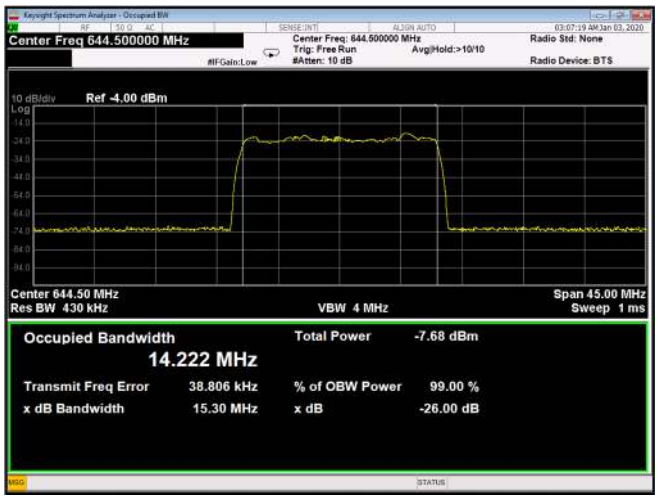

Figure 479: QPSK 15MHz B.W; 644.5MHz, 15kHz Input

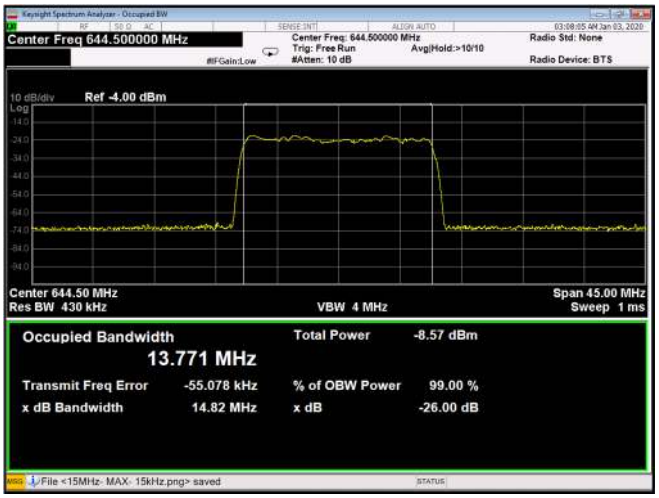

Figure 480: QPSK 15MHz B.W; 644.5MHz, 30kHz Input

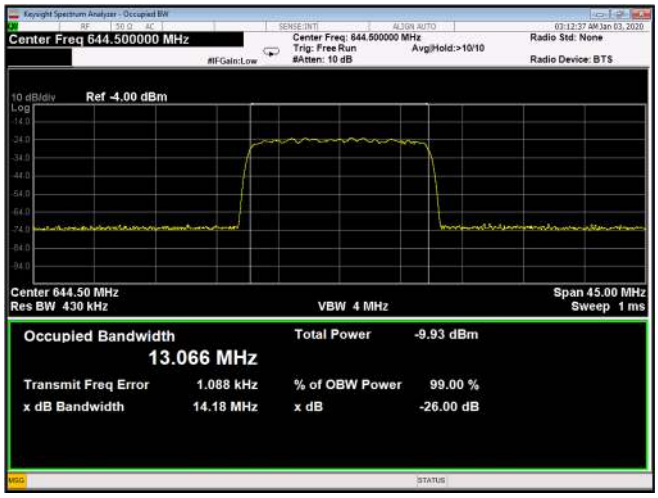

Figure 481: QPSK 15MHz B.W; 634.5MHz, 60kHz Input

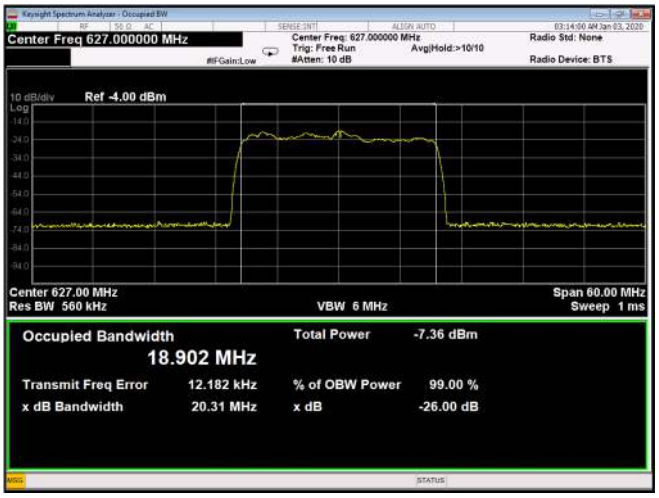

Figure 482: QPSK 20MHz B.W; 627.0MHz, 15kHz Input

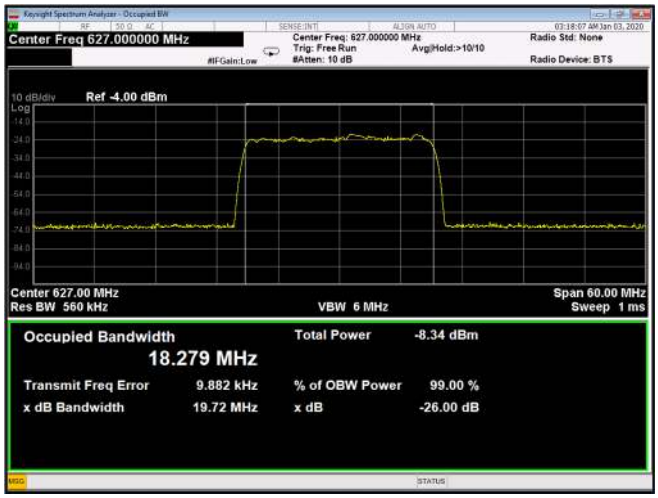

Figure 483: QPSK 20MHz B.W; 627.0MHz, 30kHz Input

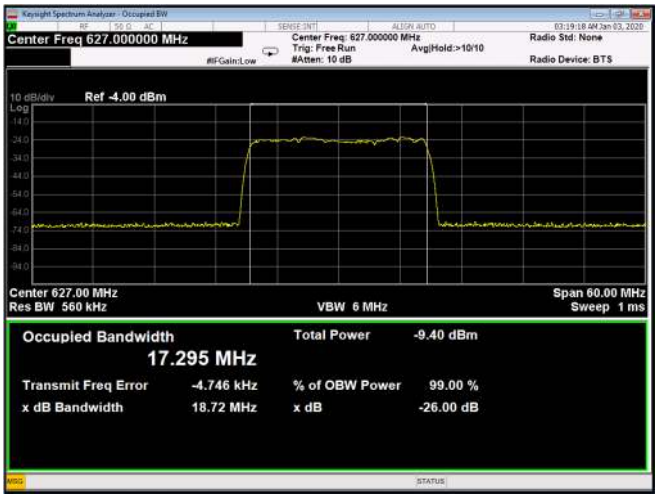

Figure 484: QPSK 20MHz B.W; 627.0MHz, 60kHz Input

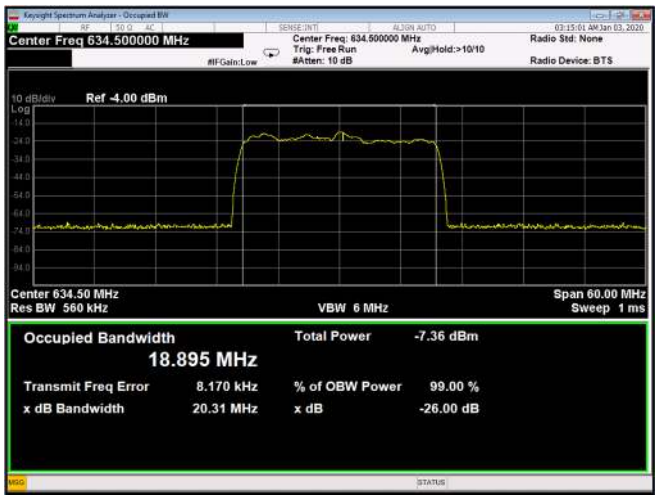

Figure 485: QPSK 20MHz B.W; 634.5MHz, 15kHz Input

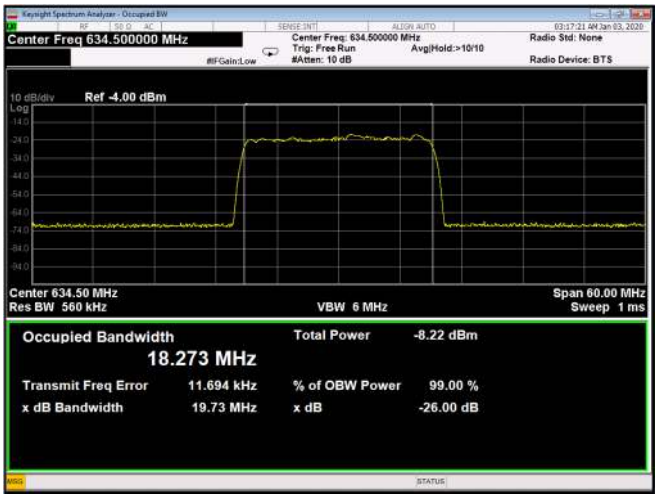

Figure 486: QPSK 20MHz B.W; 634.5MHz, 30kHz Input

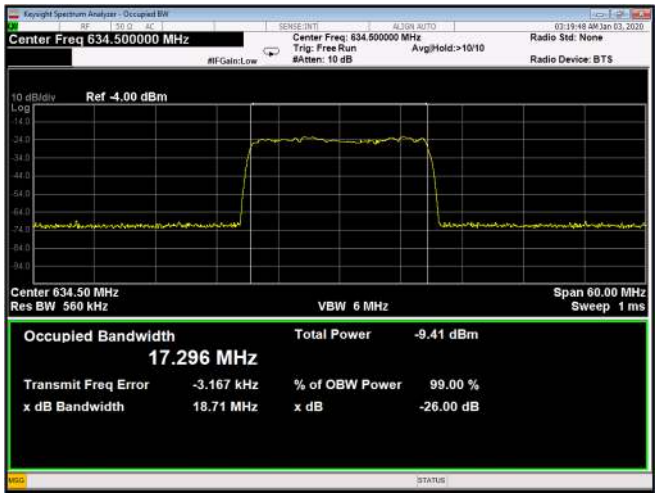

Figure 487: QPSK 20MHz B.W; 634.5MHz, 60kHz Input

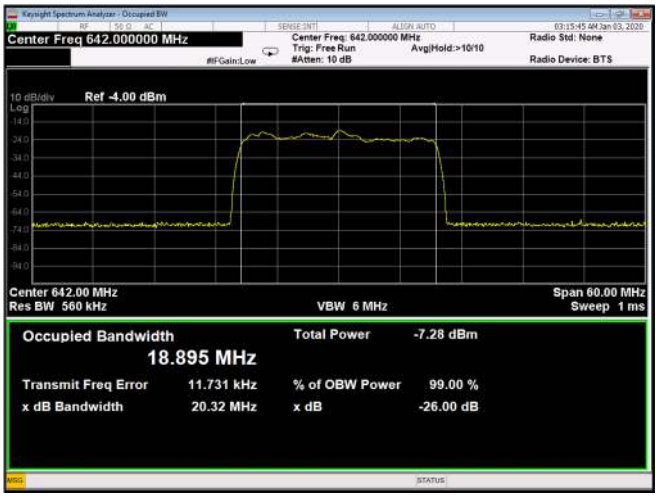

Figure 488: QPSK 20MHz B.W; 642.0MHz, 15kHz Input

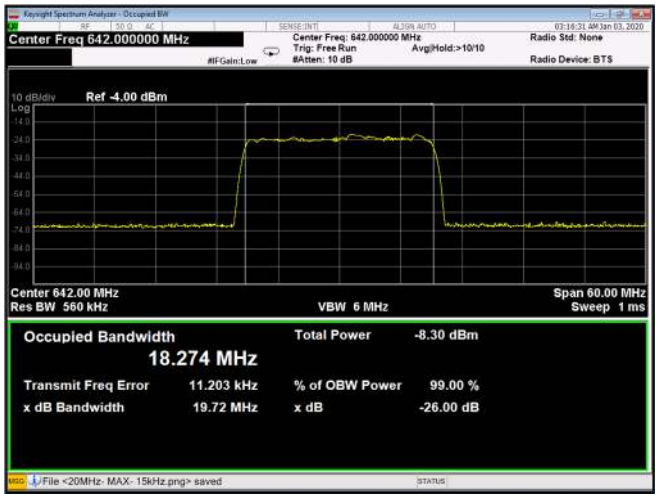

Figure 489: QPSK 20MHz B.W; 642.0MHz, 30kHz Input

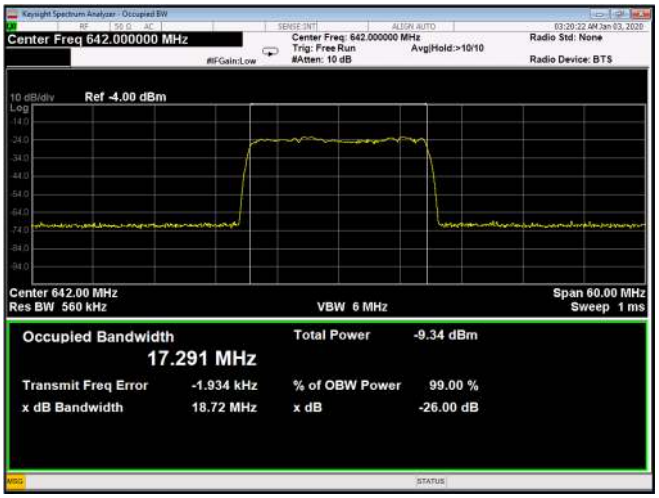

Figure 490: QPSK 20MHz B.W; 642.0MHz, 60kHz Input