



5 Occupied Bandwidth

5.1 Test Specification

FCC Part 2, Section 1049

5.2 Test Procedure

(Temperature (25°C)/ Humidity (34%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 10 and Figure 205 to Figure 303.

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
16QAM	5	15	1932.5	4.5476
		30	1932.5	4.0351
		15	1962.5	4.5515
		30	1962.5	4.0455
		15	1992.5	4.5504
		30	1992.5	4.0420
	10	15	1935.0	9.2388
		30	1935.0	8.6020
		60	1935.0	8.0948
		15	1962.5	9.2498
		30	1962.5	8.6228
		60	1962.5	8.1225
		15	1990.0	9.2471
		30	1990.0	8.6175
		60	1990.0	8.1163
	15	15	1937.5	14.271
		30	1937.5	13.613
		60	1937.5	12.818
		15	1962.5	13.341
		30	1962.5	13.646
		60	1962.5	12.823
		15	1987.5	14.325
		30	1987.5	13.632
		60	1987.5	12.825
	20	15	1940.0	19.067
		30	1940.0	18.516
		60	1940.0	17.287
		15	1962.5	19.085
		30	1962.5	18.510
		60	1962.5	17.325
		15	1985.0	19.078
		30	1985.0	18.509
		60	1985.0	17.308

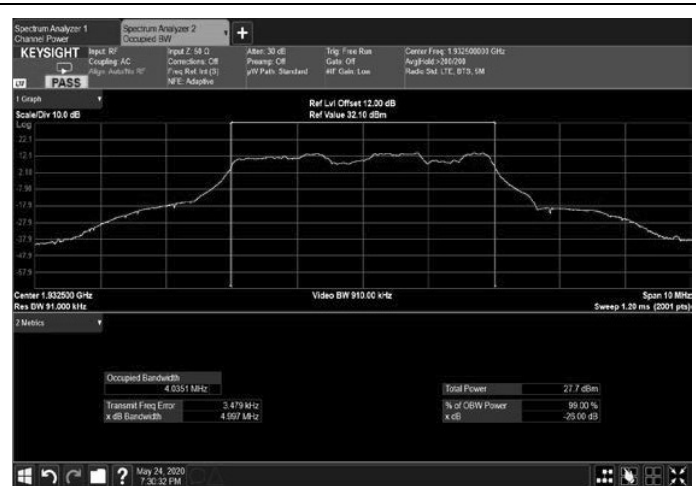
Table 8 Occupied Bandwidth 16QAM Output

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
64QAM	5	15	1932.5	4.5167
		30	1932.5	4.0064
		15	1962.5	4.5152
		30	1962.5	4.0122
		15	1992.5	4.5145
		30	1992.5	4.0113
	10	15	1935.0	9.3488
		30	1935.0	8.6995
		60	1935.0	8.0231
		15	1962.5	9.3636
		30	1962.5	8.7131
		60	1962.5	8.0475
		15	1990.0	9.3595
		30	1990.0	8.7075
		60	1990.0	8.0429
	15	15	1937.5	14.210
		30	1937.5	13.708
		60	1937.5	12.962
		15	1962.5	14.245
		30	1962.5	13.747
		60	1962.5	12.989
		15	1987.5	14.234
		30	1987.5	13.739
		60	1987.5	12.979
	20	15	1940.0	19.045
		30	1940.0	18.328
		60	1940.0	17.492
		15	1962.5	19.076
		30	1962.5	18.372
		60	1962.5	17.484
		15	1985.0	19.068
		30	1985.0	18.361
		60	1985.0	17.479

Table 9 Occupied Bandwidth 64QAM Output

Modulation	Bandwidth	Sub Carrier	Operation Frequency	Reading
	(MHz)	(kHz)	(MHz)	(MHz)
256QAM	5	15	1932.5	4.5071
		30	1932.5	4.0185
		15	1962.5	4.5088
		30	1962.5	4.0321
		15	1992.5	4.5093
		30	1992.5	4.0308
	10	15	1935.0	9.3194
		30	1935.0	8.6176
		60	1935.0	8.0354
		15	1962.5	9.3414
		30	1962.5	8.6340
		60	1962.5	8.0741
		15	1990.0	9.3375
		30	1990.0	8.6316
		60	1990.0	8.0637
	15	15	1937.5	14.243
		30	1937.5	13.645
		60	1937.5	12.899
		15	1962.5	14.252
		30	1962.5	13.690
		60	1962.5	12.934
		15	1987.5	14.249
		30	1987.5	13.682
		60	1987.5	12.923
	20	15	1940.0	19.027
		30	1940.0	18.309
		60	1940.0	17.305
		15	1962.5	19.049
		30	1962.5	18.326
		60	1962.5	17.339
		15	1985.0	19.043
		30	1985.0	13.682
		60	1985.0	17.330

Table 10 Occupied Bandwidth 256QAM Output



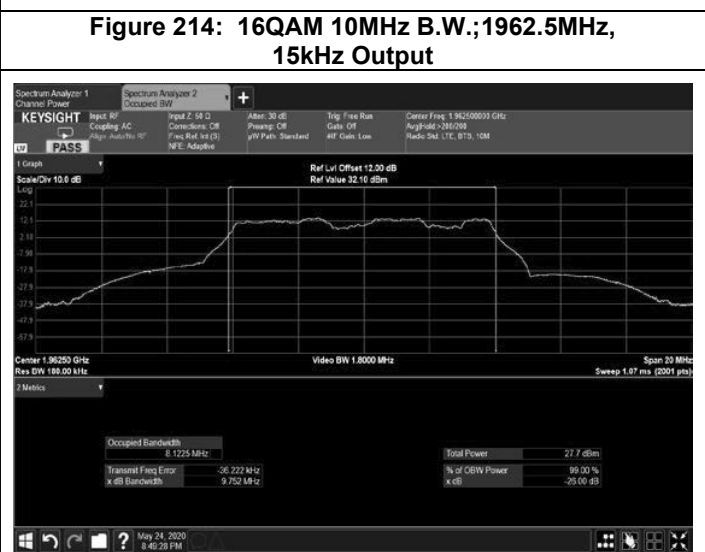
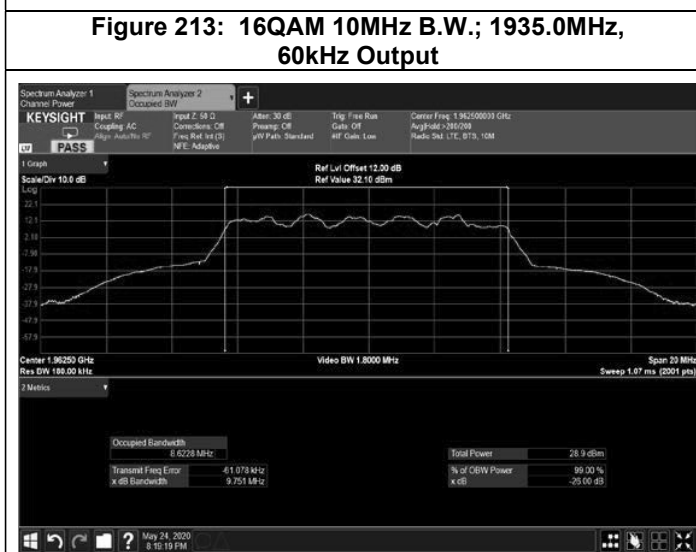
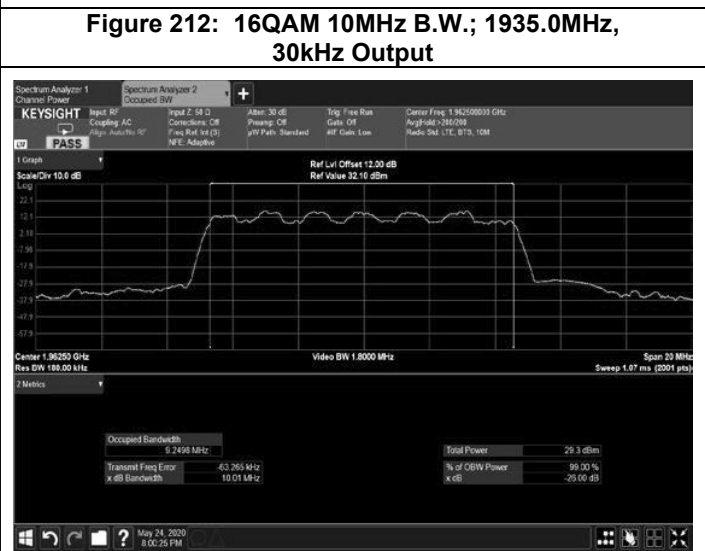
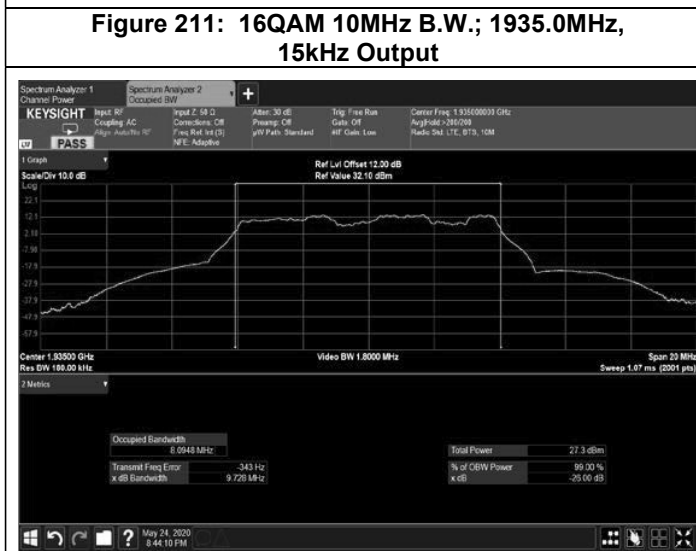




Figure 217: 16QAM 10MHz B.W.; 1990.0MHz, 15kHz Output



Figure 218: 16QAM 10MHz B.W.; 1990.0MHz, 30kHz Output



Figure 219: 16QAM 10MHz B.W.; 1990.0MHz, 60kHz Output

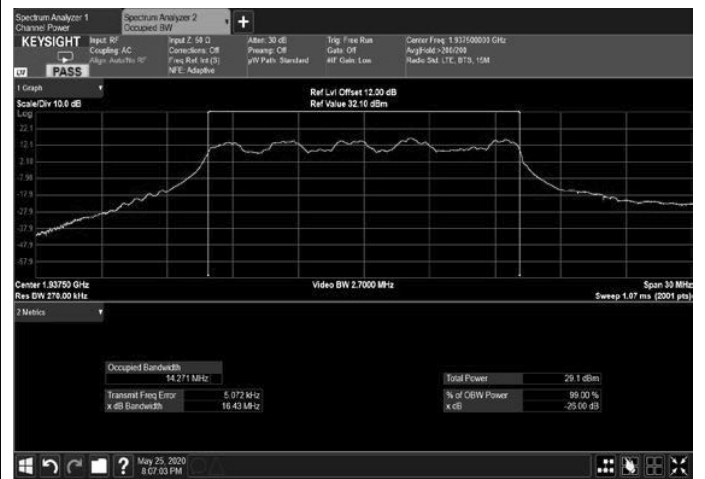


Figure 220: 16QAM 15MHz B.W.; 1937.5MHz, 15kHz Output



Figure 221: 16QAM 15MHz B.W.; 1937.5MHz, 30kHz Output

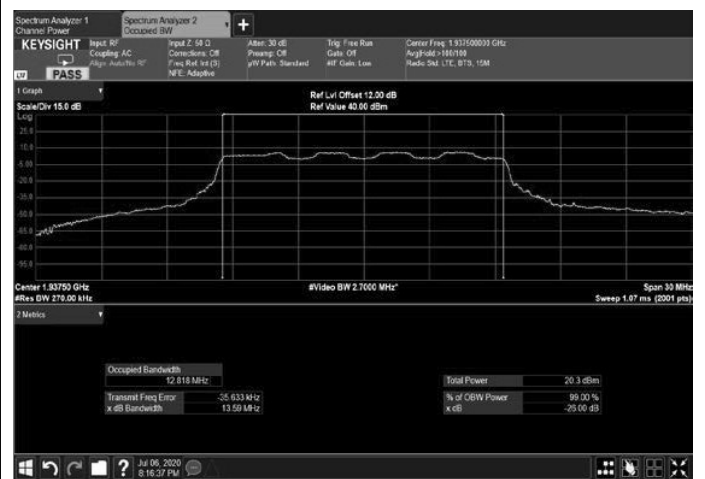


Figure 222: 16QAM 15MHz B.W.; 1937.5MHz, 60kHz Output









Figure 241: 64QAM 5MHz B.W.; 1962.5MHz,
30kHz Output



Figure 242: 64QAM 5MHz B.W.; 1992.5MHz,
15kHz Output



Figure 243: 64QAM 5MHz B.W.; 1992.5MHz,
30kHz Output



Figure 244: 64QAM 10MHz B.W.; 1935.0MHz,
15kHz Output



Figure 245: 64QAM 10MHz B.W.; 1935.0MHz,
30kHz Output



Figure 246: 64QAM 10MHz B.W.; 1935.0MHz,
60kHz Output



Figure 247: 64QAM 10MHz B.W.; 1962.5MHz, 15kHz Output



Figure 248: 64QAM 10MHz B.W.; 1962.5MHz, 30kHz Output



Figure 249: 64QAM 10MHz B.W.; 1962.5MHz, 60kHz Output



Figure 250: 64QAM 10MHz B.W.; 1990.0MHz, 15kHz Output



Figure 251: 64QAM 10MHz B.W.; 1990.0MHz, 30kHz Output

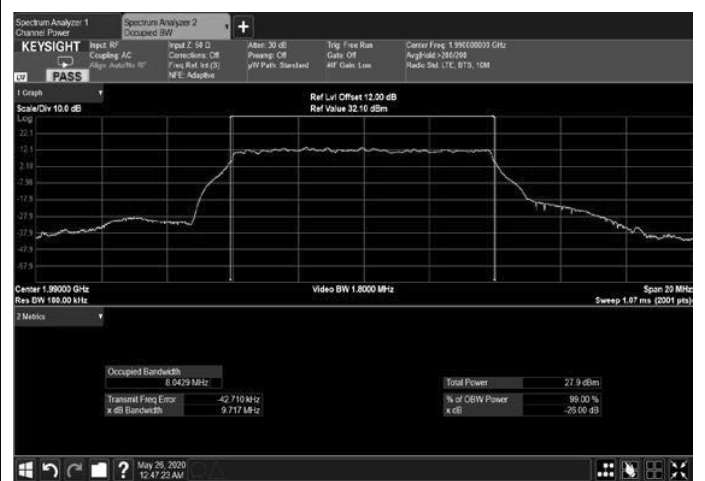
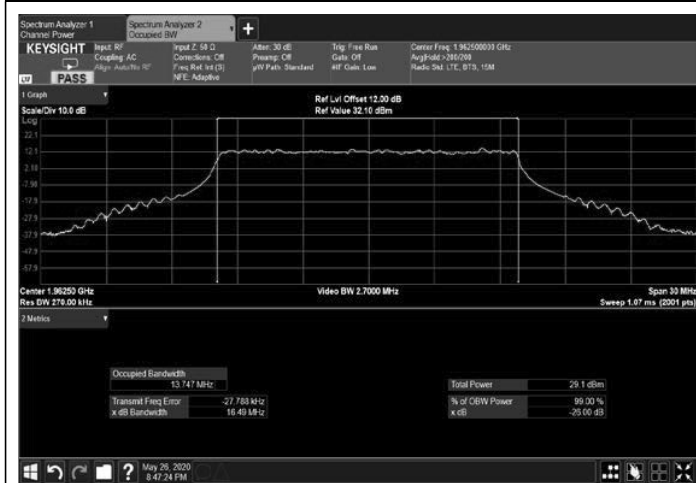
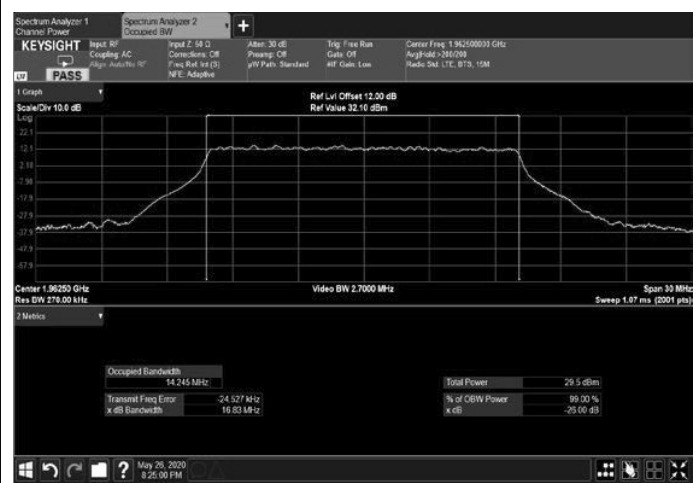
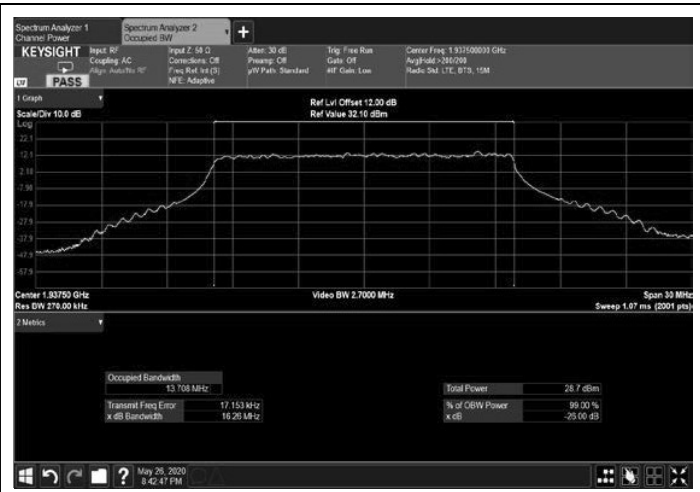
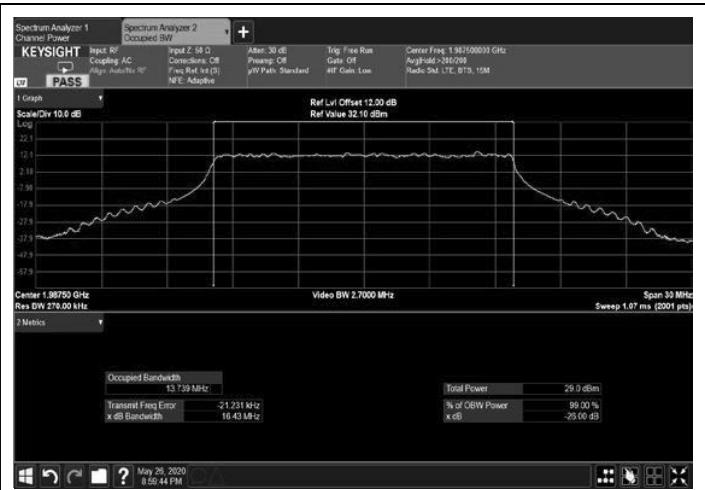


Figure 252: 64QAM 10MHz B.W.; 1990.0MHz, 60kHz Output





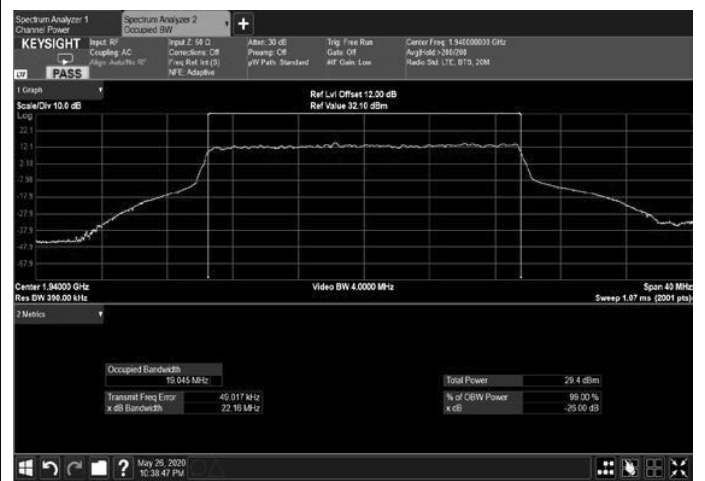
**Figure 259: 64QAM 15MHz B.W.; 1987.5MHz,
15kHz Output**



**Figure 260: 64QAM 15MHz B.W.; 1987.5MHz,
30kHz Output**



**Figure 261: 64QAM 15MHz B.W.; 1987.5MHz,
60kHz Output**



**Figure 262: 64QAM 20MHz B.W.; 1940.0MHz,
15kHz Output**



**Figure 263: 64QAM 20MHz B.W.; 1940.0MHz,
30kHz Output**



**Figure 264: 64QAM 20MHz B.W.; 1940.0MHz,
60kHz Output**

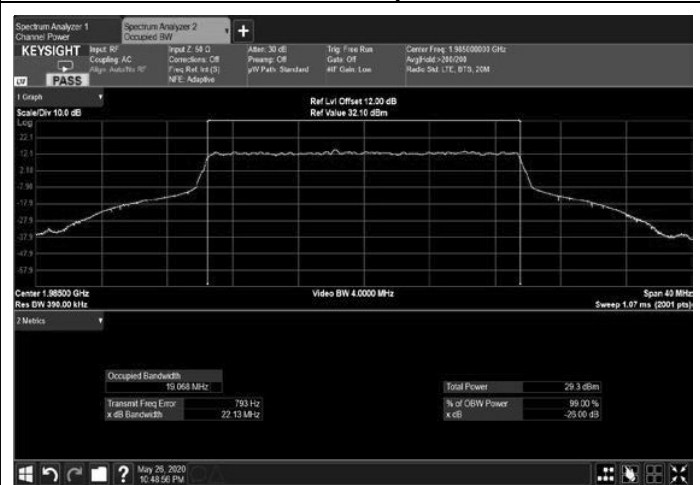








Figure 283: 256QAM 10MHz B.W.; 1990.0MHz, 15kHz Output



Figure 284: 256QAM 10MHz B.W.; 1990.0MHz, 30kHz Output



Figure 285: 256QAM 10MHz B.W.; 1990.0MHz, 60kHz Output

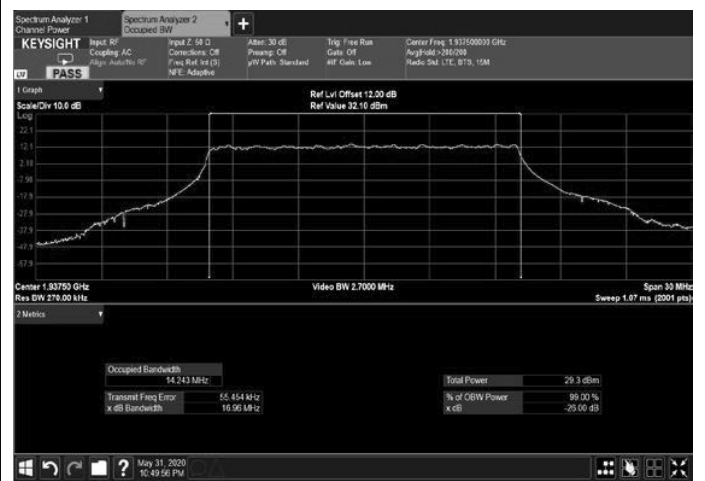


Figure 286: 256QAM 15MHz B.W.; 1937.5MHz, 15kHz Output



Figure 287: 256QAM 15MHz B.W.; 1937.5MHz, 30kHz Output



Figure 288: 256QAM 15MHz B.W.; 1937.5MHz, 60kHz Output

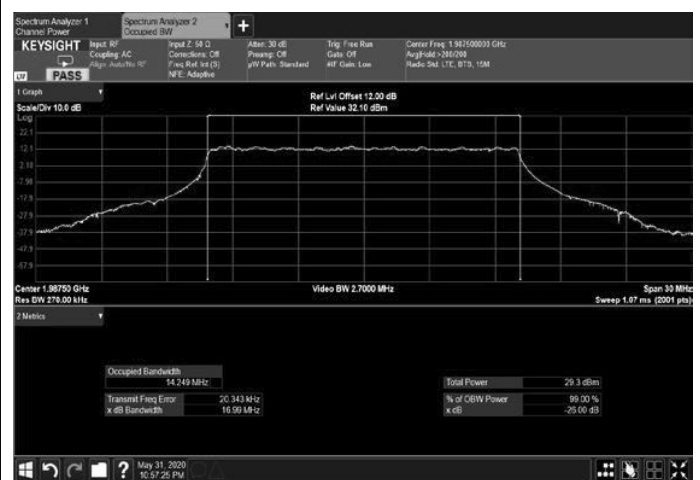




Figure 295: 256QAM 20MHz B.W.; 1940.0MHz, 15kHz Output



Figure 296: 256QAM 20MHz B.W.; 1940.0MHz, 30kHz Output



Figure 297: 256QAM 20MHz B.W.; 1940.0MHz, 60kHz Output



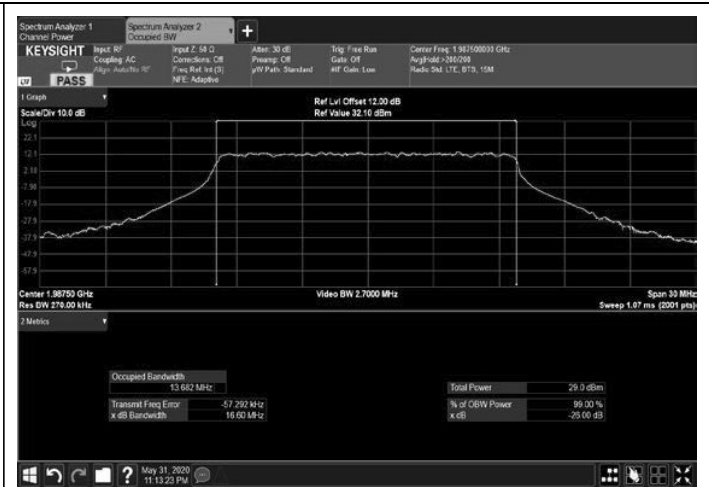
Figure 298: 256QAM 20MHz B.W.; 1962.5MHz, 15kHz Output



Figure 299: 256QAM 20MHz B.W.; 1962.5MHz, 30kHz Output



Figure 300: 256QAM 20MHz B.W.; 1962.5MHz, 60kHz Output



5.5 Test Equipment Used; Occupied Bandwidth

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration Date	Next Calibration Due
EXA signal Analyzer	Agilent Technologies	N9010A	MY52220686	28 November 2018	28 November 2020
Sarokal Signal Generator	Mentor® (A Siemens Business)	X-Step-V	1904008	*	*
30 dB Attenuator	MCL	BW-S30W5	533	24 December 2019	24 December 2020

Table 11 Test Equipment Used

* New test equipment, purchased during January 2020.