



Figure 251: 16QAM 5MHz B.W.; 1932.5MHz, 15kHz Output



Figure 252: 16QAM 5MHz B.W.; 1932.5MHz, 30kHz Output



Figure 253: 16QAM 5MHz B.W.; 1962.5MHz, 15kHz Output



Figure 254: 16QAM 5MHz B.W.; 1962.5MHz, 30kHz Output



Figure 255: 16QAM 5MHz B.W.; 1992.5MHz, 15kHz Output



Figure 256: 16QAM 5MHz B.W.; 1992.5MHz, 30kHz Output



Figure 257: 16QAM 10MHz B.W.; 1935.0MHz, 15kHz Output

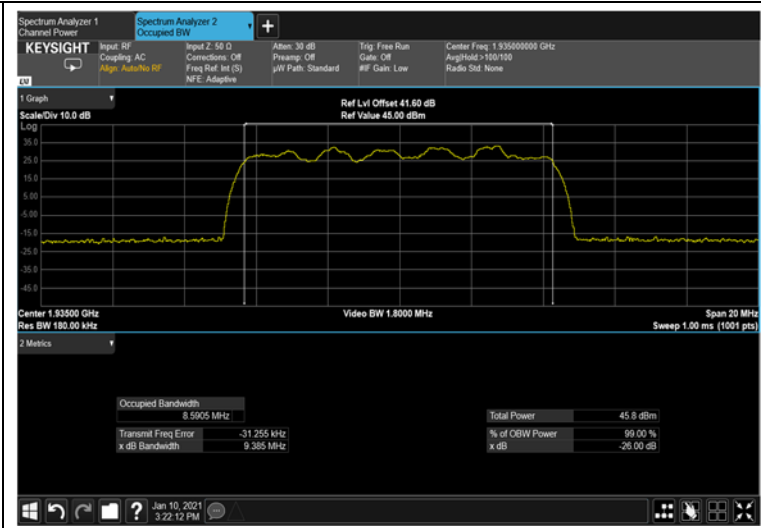


Figure 258: 16QAM 10MHz B.W.; 1935.0MHz, 30kHz Output



Figure 259: 16QAM 10MHz B.W.; 1962.5MHz, 15kHz Output



Figure 260: 16QAM 10MHz B.W.; 1962.5MHz, 30kHz Output



Figure 261: 16QAM 10MHz B.W.; 1990.0MHz, 15kHz Output



Figure 262: 16QAM 10MHz B.W.; 1990.0MHz, 30kHz Output



Figure 263: 16QAM 15MHz B.W.; 1937.5MHz, 15kHz Output



Figure 264: 16QAM 15MHz B.W.; 1937.5MHz, 30kHz Output



Figure 265: 16QAM 15MHz B.W.; 1962.5MHz, 60kHz Output

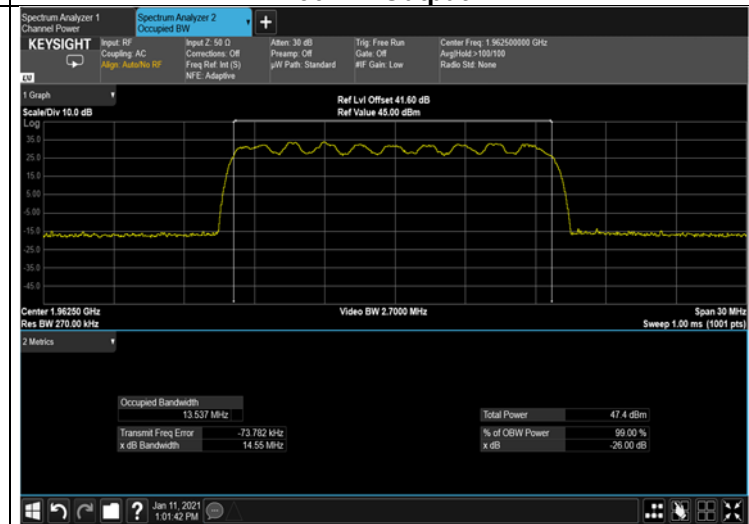


Figure 266: 16QAM 15MHz B.W.; 1962.5MHz, 15kHz Output



Figure 267: 16QAM 15MHz B.W.; 1990.0MHz, 15kHz Output



Figure 268: 16QAM 15MHz B.W.; 1990.0MHz, 30kHz Output



Figure 269: 64QAM 5MHz B.W.; 1937.5MHz, 15kHz Output



Figure 270: 64QAM 5MHz B.W.; 1937.5MHz, 30kHz Output



Figure 271: 64QAM 5MHz B.W.; 1962.5MHz, 15kHz Output

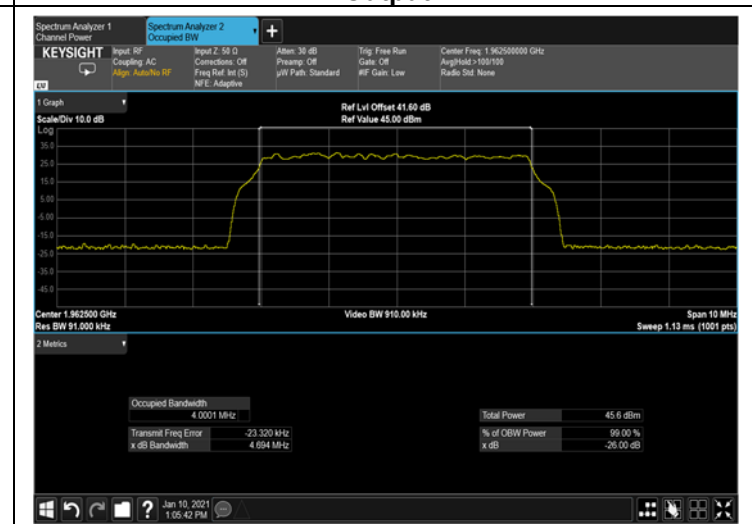


Figure 272: 64QAM 5MHz B.W.; 1962.5MHz, 30kHz Output

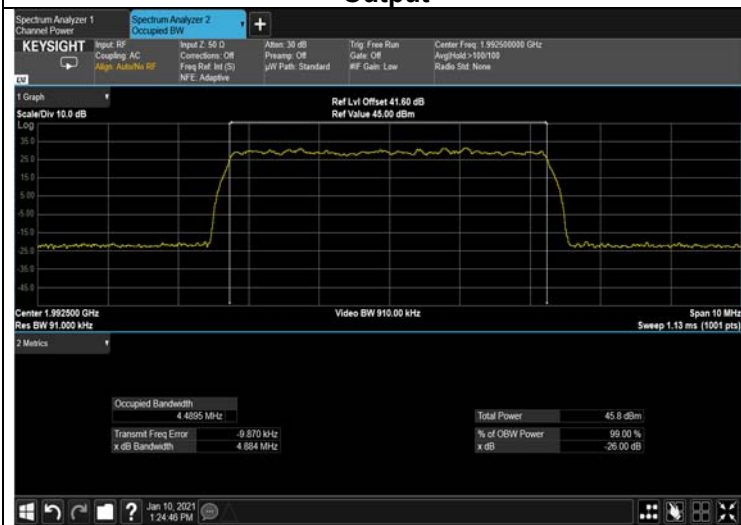


Figure 273: 64QAM 5MHz B.W.; 649.5MHz, 15kHz Output

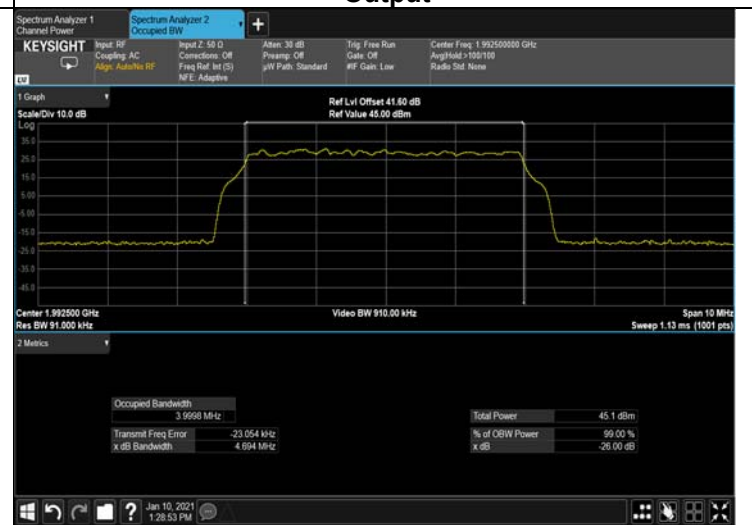


Figure 274: 64QAM 5MHz B.W.; 649.5MHz, 30kHz Output



Figure 275: 64QAM 10MHz B.W.; 1935.0MHz, 15kHz Output



Figure 276: 64QAM 10MHz B.W.; 1935.0MHz, 30kHz Output



Figure 277: 64QAM 10MHz B.W.; 1962.5MHz, 15kHz Output

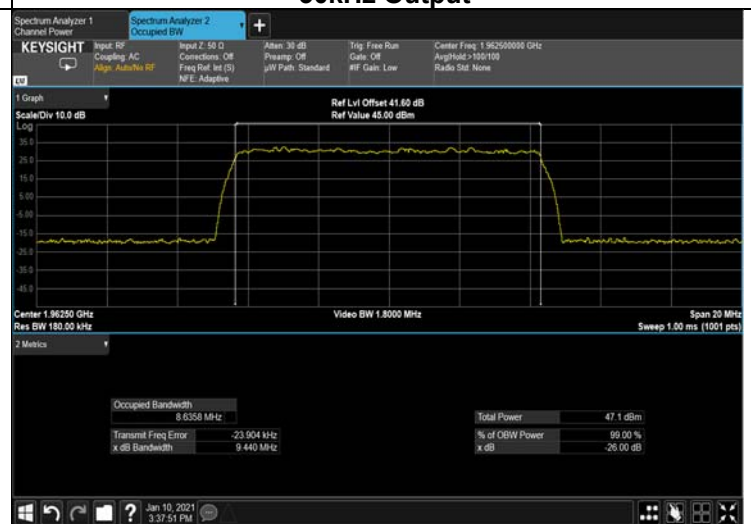


Figure 278: 64QAM 10MHz B.W.; 1962.5MHz, 30kHz Output



Figure 279: 64QAM 10MHz B.W.; 1990.0MHz, 15kHz Output



Figure 280: 64QAM 10MHz B.W.; 1990.0MHz, 30kHz Output



Figure 281: 64QAM 15MHz B.W.; 1937.5MHz, 15kHz Output



Figure 282: 64QAM 15MHz B.W.; 1937.5MHz, 30kHz Output



Figure 283: 64QAM 15MHz B.W.; 1962.5MHz, 15kHz Output



Figure 284: 64QAM 15MHz B.W.; 1962.5MHz, 30kHz Output



Figure 285: 64QAM 15MHz B.W.; 1987.5MHz, 15kHz Output



Figure 286: 64QAM 15MHz B.W.; 1987.5MHz, 30kHz Output



Figure 287: 256QAM 5MHz B.W.; 1932.5MHz, 15kHz Output

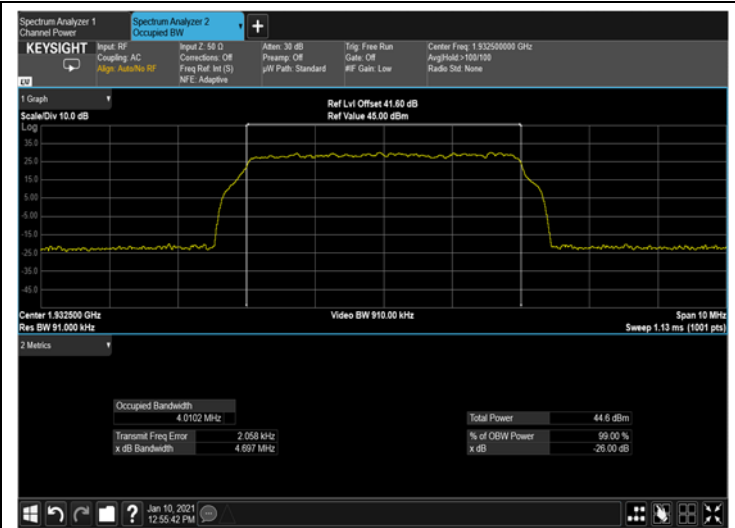


Figure 288: 256QAM 5MHz B.W.; 1932.5MHz, 30kHz Output



Figure 289: 256QAM 5MHz B.W.; 1962.5MHz, 15kHz Output

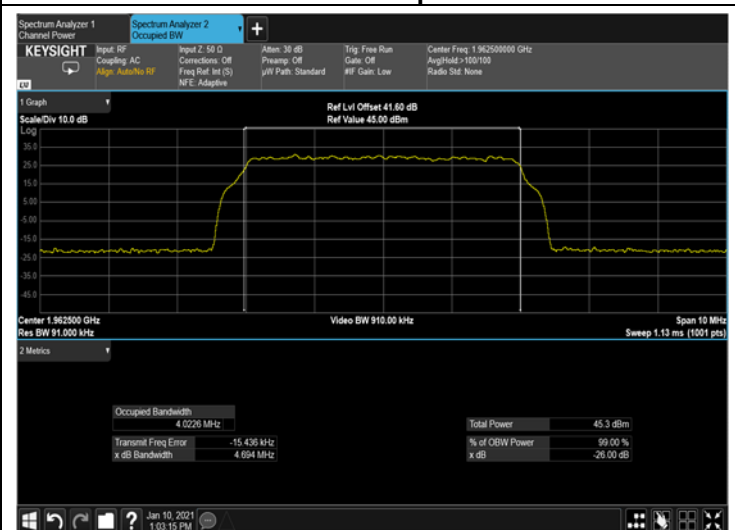


Figure 290: 256QAM 5MHz B.W.; 1962.5MHz, 30kHz Output

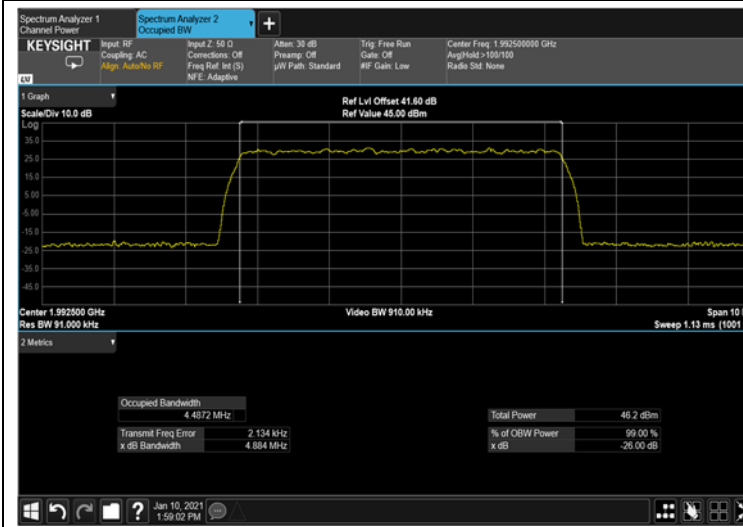


Figure 291: 256QAM 5MHz B.W.; 1992.5MHz, 15kHz Output



Figure 292: 256QAM 5MHz B.W.; 1992.5MHz, 30kHz Output



Figure 293: 256QAM 10MHz B.W.; 1935.0MHz, 15kHz Output



Figure 294: 256QAM 10MHz B.W.; 1935.0MHz, 30kHz Output



Figure 295: 256QAM 10MHz B.W.; 1962.5MHz, 15kHz Output



Figure 296: 256QAM 10MHz B.W.; 1962.5MHz, 30kHz Output



Figure 297: 256QAM 10MHz B.W.; 1990.0MHz, 15kHz Output

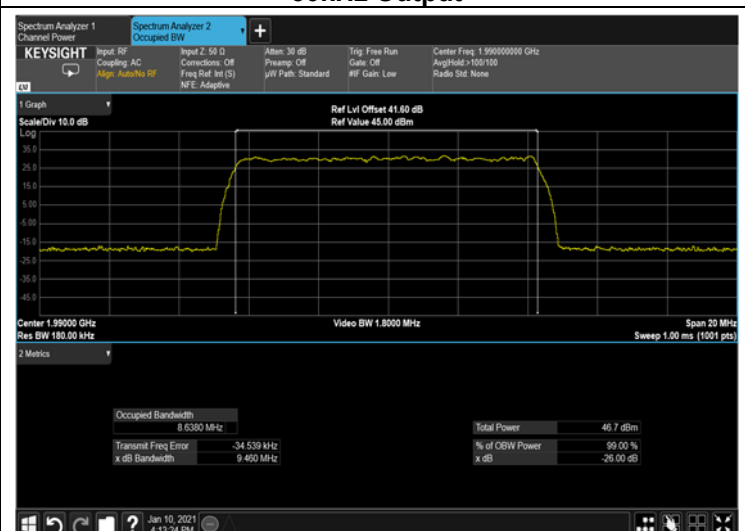


Figure 298: 256QAM 10MHz B.W.; 1990.0MHz, 30kHz Output



Figure 299: 256QAM 15MHz B.W.; 1937.5MHz, 15kHz Output



Figure 300: 256QAM 15MHz B.W.; 1937.5MHz, 30kHz Output



Figure 301: 256QAM 15MHz B.W.; 1962.5MHz, 15kHz Output



Figure 302: 256QAM 15MHz B.W.; 1962.5MHz, 30kHz Output



Figure 303: 256QAM 15MHz B.W.; 1987.5MHz, 15kHz Output

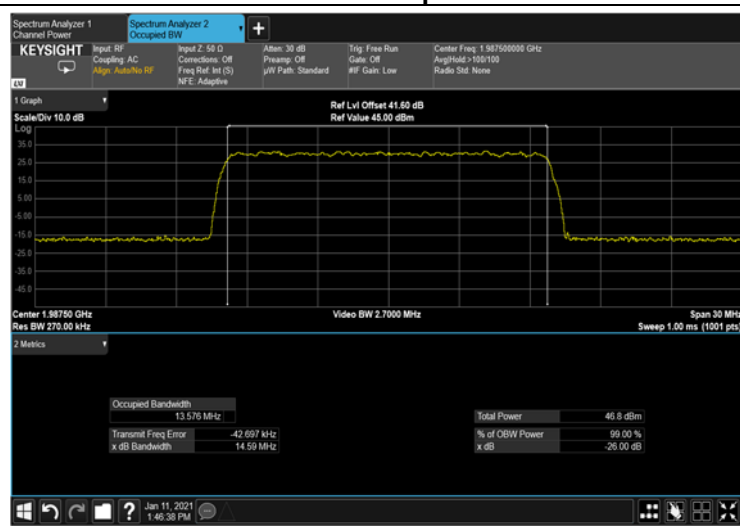


Figure 304: 256QAM 15MHz B.W.; 1987.5MHz, 30kHz Output

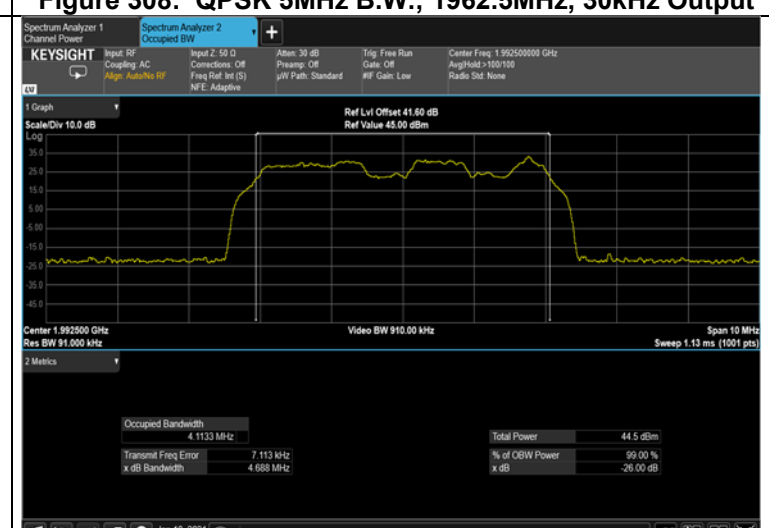
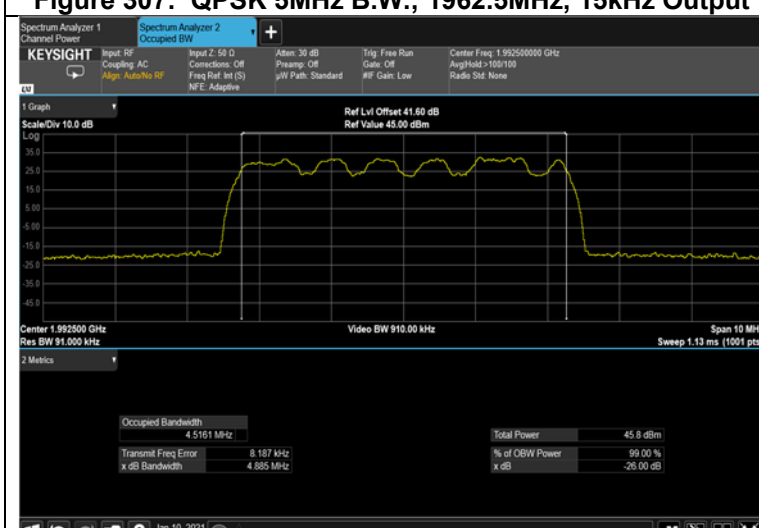
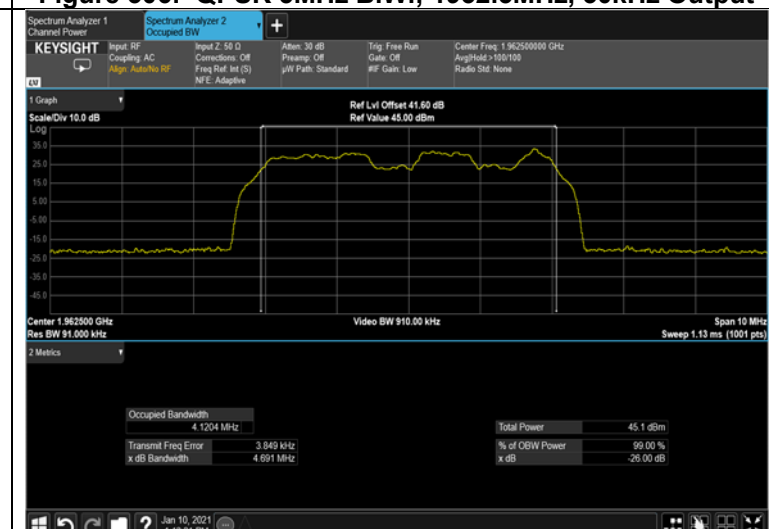
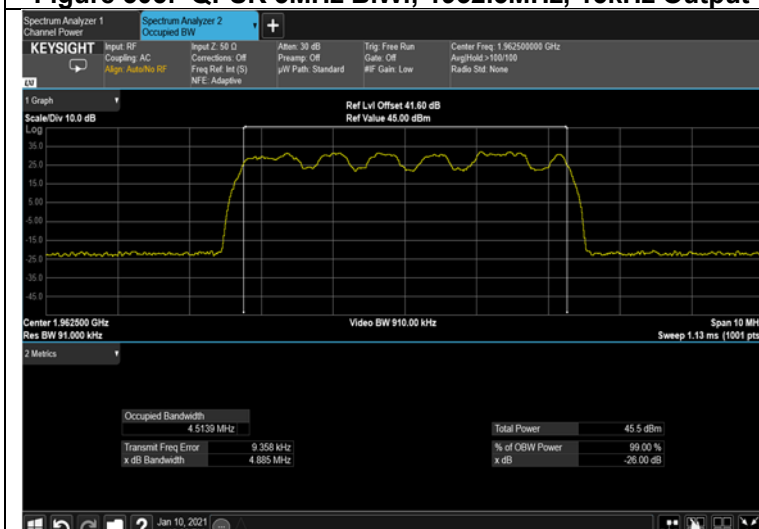
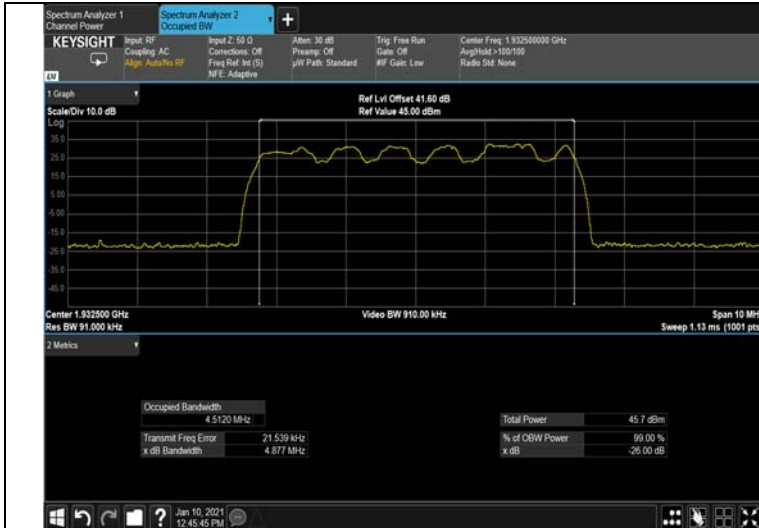




Figure 311: QPSK 10MHz B.W.; 1935.0MHz, 15kHz Output



Figure 312: QPSK 10MHz B.W.; 1935.0MHz, 30kHz Output

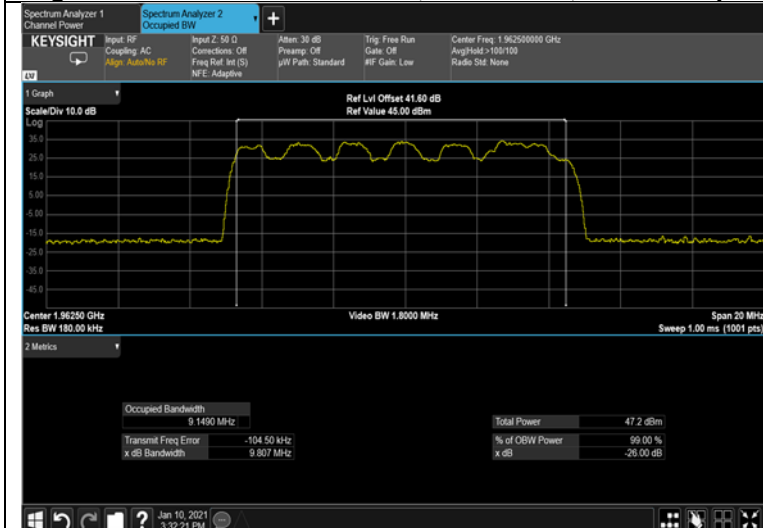


Figure 313: QPSK 10MHz B.W.; 1962.5MHz, 15kHz Output

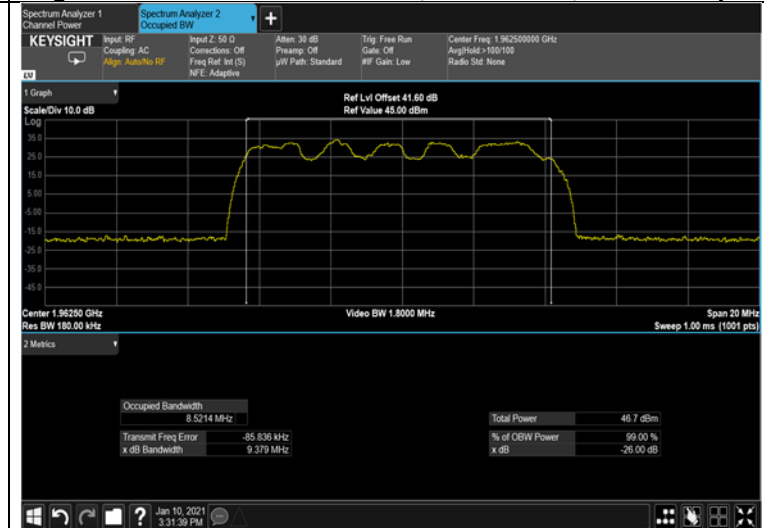


Figure 314: QPSK 10MHz B.W.; 1962.5MHz, 30kHz Output

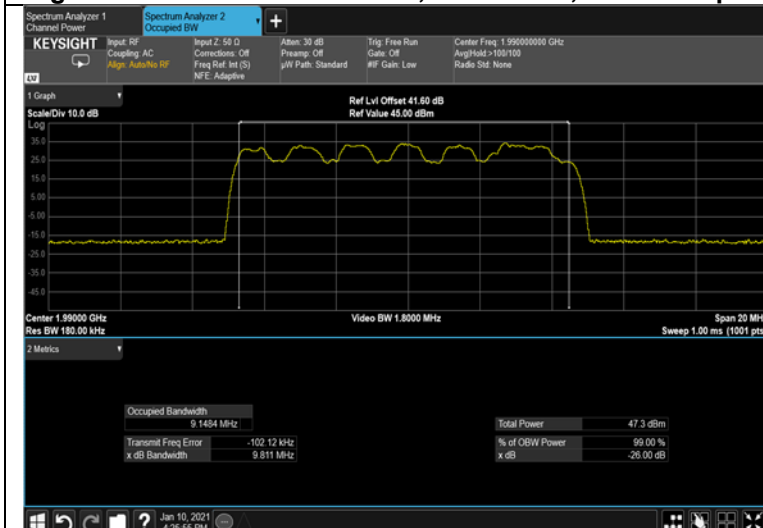


Figure 315: QPSK 10MHz B.W.; 1990.0MHz, 15kHz Output

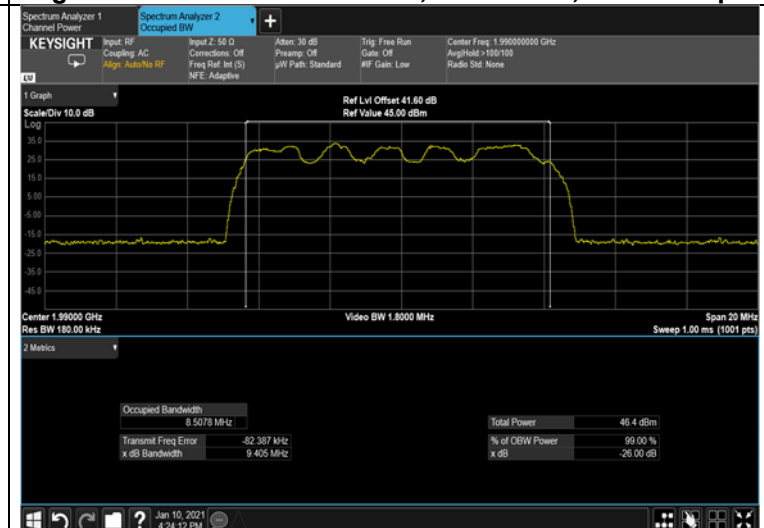


Figure 316: QPSK 10MHz B.W.; 1990.0MHz, 30kHz Output



Figure 317: QPSK 15MHz B.W.; 1937.5MHz, 15kHz Output



Figure 318: QPSK 15MHz B.W.; 1937.5MHz, 30kHz Output



Figure 319: QPSK 15MHz B.W.; 1962.5MHz, 15kHz Output

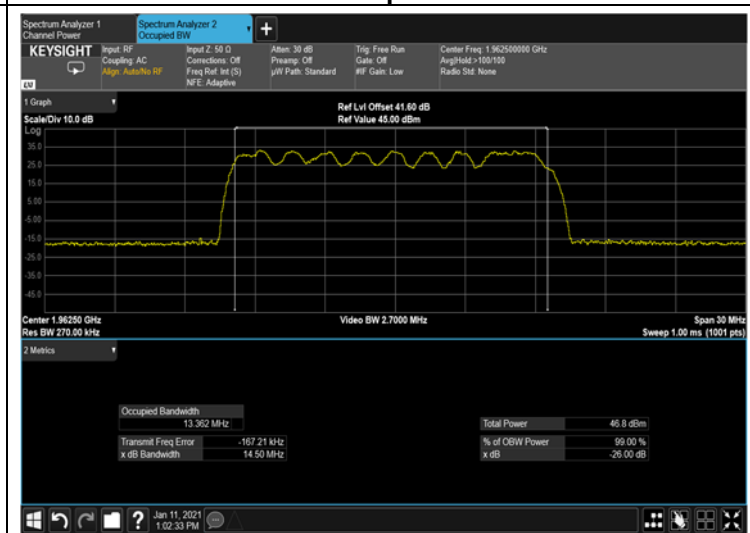


Figure 320: QPSK 15MHz B.W.; 1962.5MHz, 30kHz Output



Figure 321: QPSK 15MHz B.W.; 1987.5MHz, 15kHz Output



Figure 322: QPSK 15MHz B.W.; 1987.5MHz, 30kHz Output



8.5 Test Equipment Used; Occupied Bandwidth

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration Date	Next Calibration Due
EXA signal Analyzer	Keysight	UXA N9040B	MY56080119	January 31, 2020	January 31, 2022
EXG Vector Signal Generator	Agilent Technologies	N5172B	MY53051952	January 17, 2019	January 17, 2022
40 dB Attenuator	Weinschel Associates	WA 39-40-33	-	November 1, 2020	November 1, 2021
RF Coaxial Cable	Huber-Suner	SLLS210B	-	November 1, 2020	November 1, 2021

Table 29 Test Equipment Used



9 Occupied Bandwidth – 3G and 4G

9.1 Test Specification

FCC Part 2, Section 1049

9.2 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=41.1 dB). The spectrum analyzer was set to proper RBW

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

Occupied bandwidth measured was repeated in the input terminal of the E.U.T.

9.3 Test Limit

N/A

9.4 Test Results

JUDGEMENT: Passed

See additional information in Table 30 to Table 37 and Figure 323 to Figure 382.

Modulation	Bandwidth	Operation Frequency	Reading
	(MHz)	(MHz)	(MHz)
WCDMA	5	1932.5	4.1537
		1962.5	4.1576
		1992.5	4.1568

Table 30 Occupied Bandwidth WCDMA Input – 3G

Modulation	Bandwidth	Operation Frequency	Reading
	(MHz)	(MHz)	(MHz)
WCDMA	5	1932.5	4.1530
		1962.5	4.1616
		1992.5	4.1587

Table 31 Occupied Bandwidth WCDMA Output – 3G

Modulation	Bandwidth	Operation Frequency	Reading
	(MHz)	(MHz)	(MHz)
16QAM	5	1932.5	4.4707
		1962.5	4.4731
		1992.5	4.4702
	10	1935.0	8.9403
		1962.5	8.9423
		1990.0	8.9382
	15	1937.5	13.396
		1962.5	13.400
		1987.5	13.392

Table 32 Occupied Bandwidth 16QAM Input – 4G

Modulation	Bandwidth	Operation Frequency	Reading
	(MHz)	(MHz)	(MHz)
64QAM	5	1932.5	4.4814
		1962.5	4.4826
		1992.5	4.4838
	10	1935.0	8.9432
		1962.5	8.9417
		1990.0	8.9435
	15	1937.5	13.392
		1962.5	13.392
		1987.5	13.397

Table 33 Occupied Bandwidth 64QAM Input – 4G

Modulation	Bandwidth	Operation Frequency	Reading
	(MHz)	(MHz)	(MHz)
QPSK	5	1932.5	4.4795
		1962.5	4.4787
		1992.5	4.4792
	10	1935.0	8.9367
		1962.5	8.9293
		1990.0	8.9364
	15	1937.5	13.383
		1962.5	13.375
		1987.5	13.374

Table 34 Occupied Bandwidth QPSK Input – 4G

Modulation	Bandwidth	Operation Frequency	Reading
	(MHz)	(MHz)	(MHz)
16QAM	5	1932.5	4.1234
		1962.5	4.4695
		1992.5	4.7125
	10	1935.0	8.9244
		1962.5	8.9310
		1990.0	8.9325
	15	1937.5	13.374
		1962.5	13.332
		1987.5	13.391

Table 35 Occupied Bandwidth 16QAM Output – 4G

Modulation	Bandwidth	Operation Frequency	Reading
	(MHz)	(MHz)	(MHz)
64QAM	5	1932.5	4.4799
		1962.5	4.4808
		1992.5	4.4806
	10	1935.0	8.9251
		1962.5	8.9445
		1990.0	8.9407
	15	1937.5	13.376
		1962.5	13.392
		1987.5	13.387

Table 36 Occupied Bandwidth 64QAM Output – 4G



Modulation	Bandwidth	Operation Frequency	Reading
	(MHz)	(MHz)	(MHz)
QPSK	5	1932.5	4.4728
		1962.5	4.4748
		1992.5	4.4744
	10	1935.0	8.9184
		1962.5	8.9316
		1990.0	8.9257
	15	1937.5	13.352
		1962.5	13.374
		1987.5	13.378

Table 37 Occupied Bandwidth QPSK Output – 4G

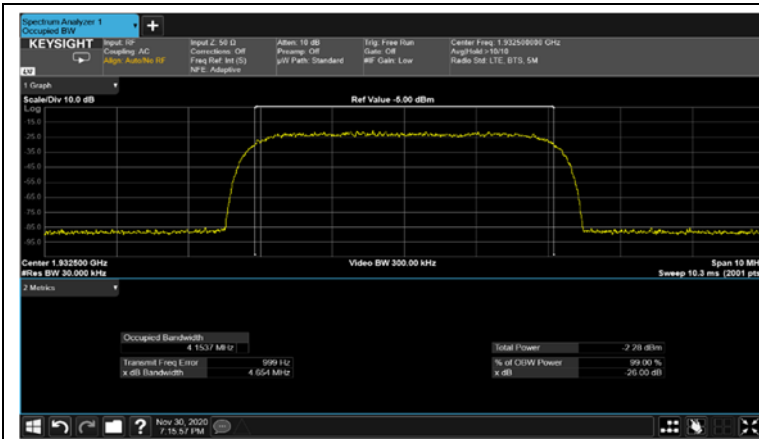


Figure 323: WCDMA 5MHz B.W.; 1932.5MHz Input – 3G

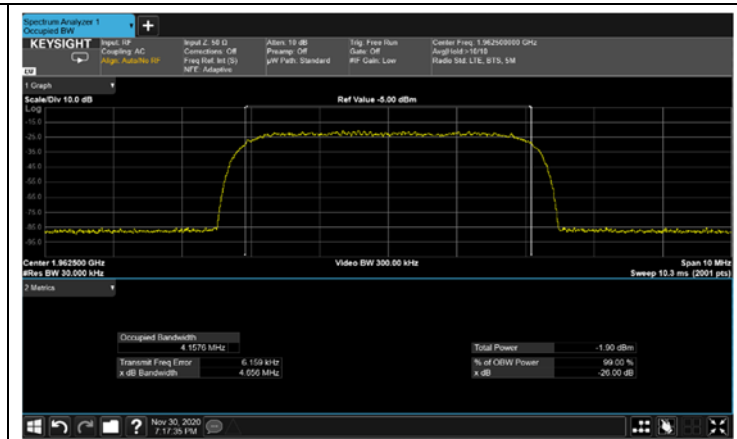


Figure 324: WCDMA 5MHz B.W.; 1962.5MHz Input – 3G

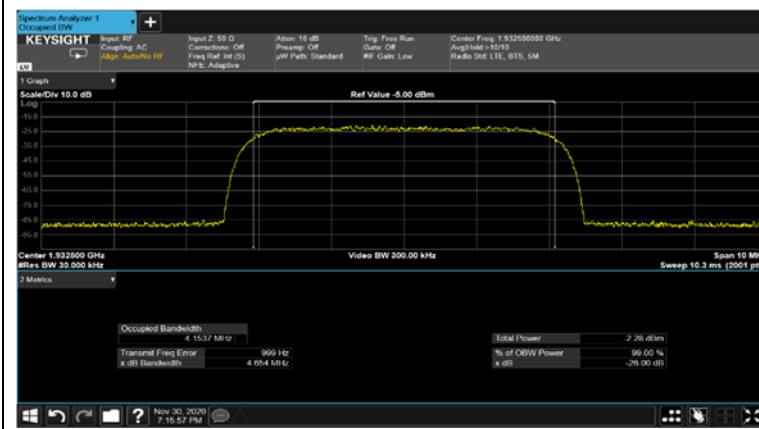


Figure 325: WCDMA 5MHz B.W.; 1992.5MHz Input – 3G

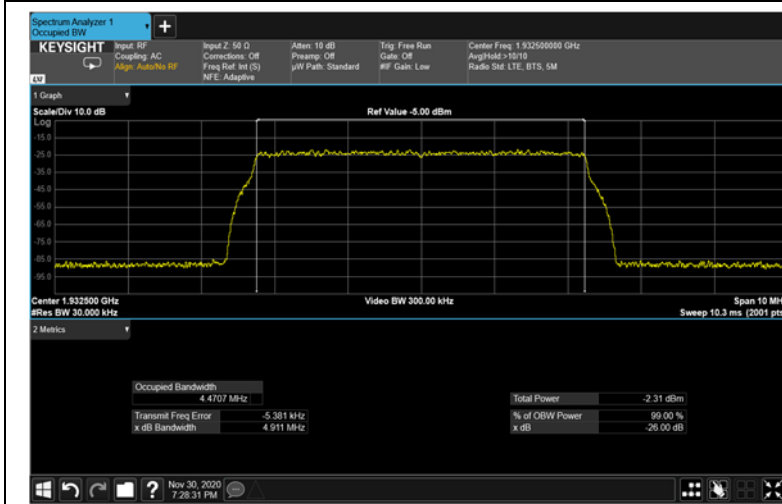


Figure 326: 16QAM 5MHz B.W.; 1932.5MHz Input – 4G

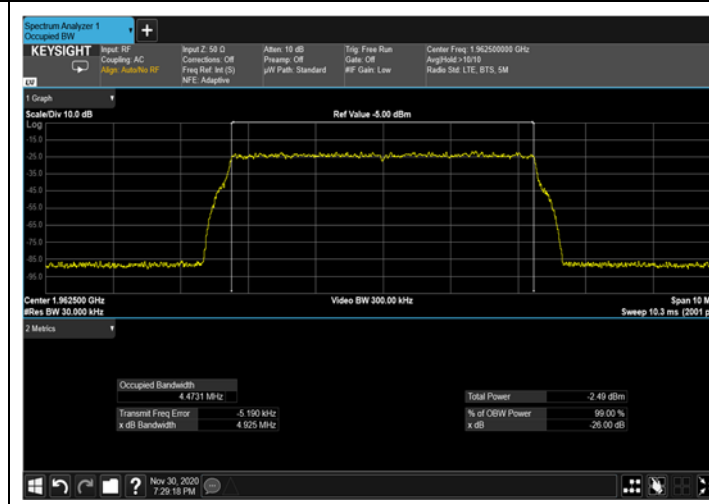


Figure 327: 16QAM 5MHz B.W.; 1962.5MHz Input – 4G

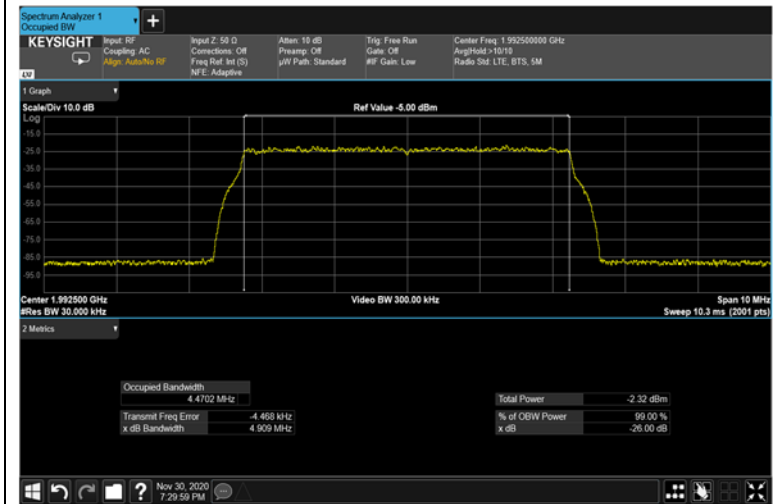


Figure 328: 16QAM 5MHz B.W.; 1992.5MHz Input – 4G

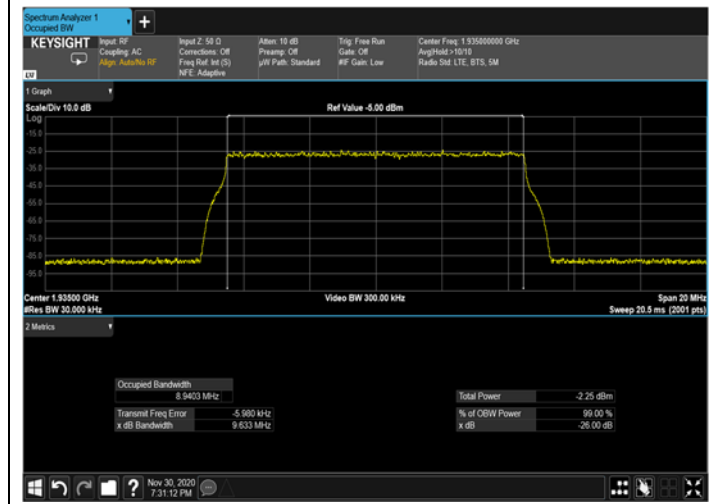


Figure 329: 16QAM 10MHz B.W.; 1935MHz Input – 4G

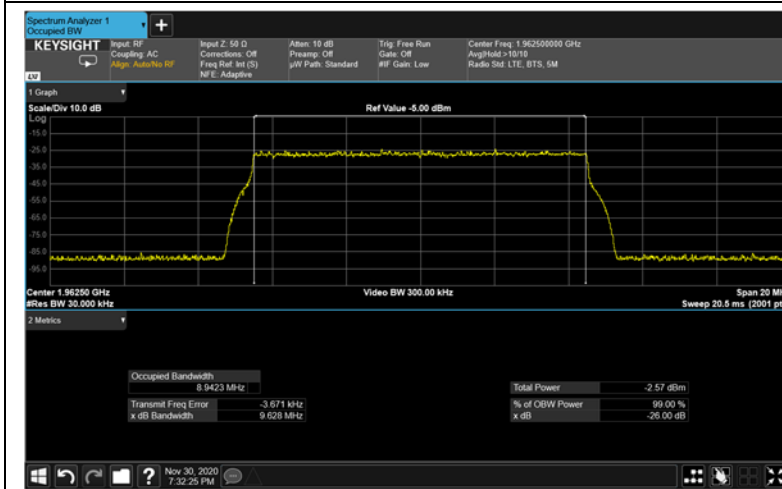


Figure 330: 16QAM 10MHz B.W.; 1962.5MHz Input – 4G

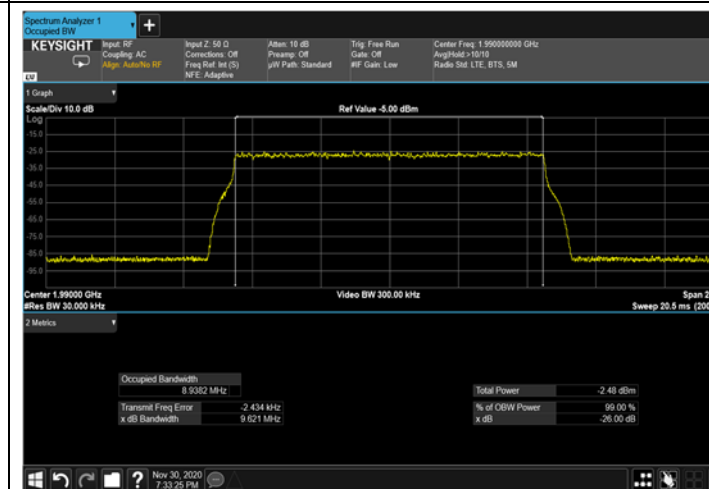


Figure 331: 16QAM 10MHz B.W.; 1990MHz Input – 4G

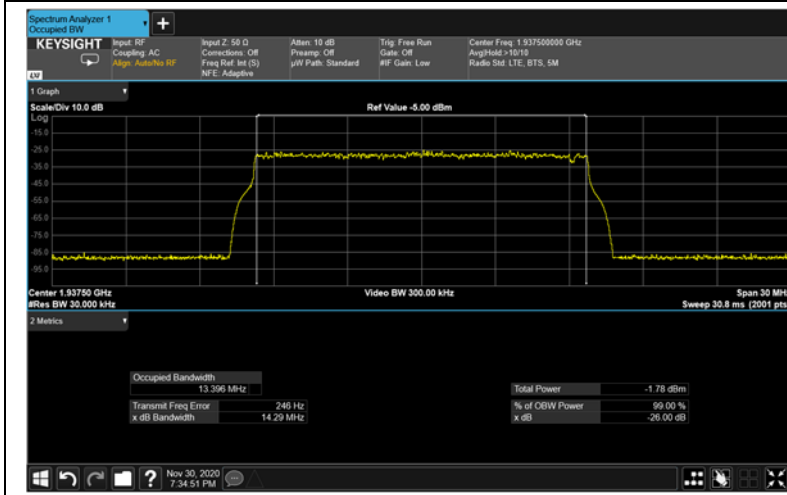


Figure 332: 16QAM 15MHz B.W.; 1937.5MHz Input – 4G

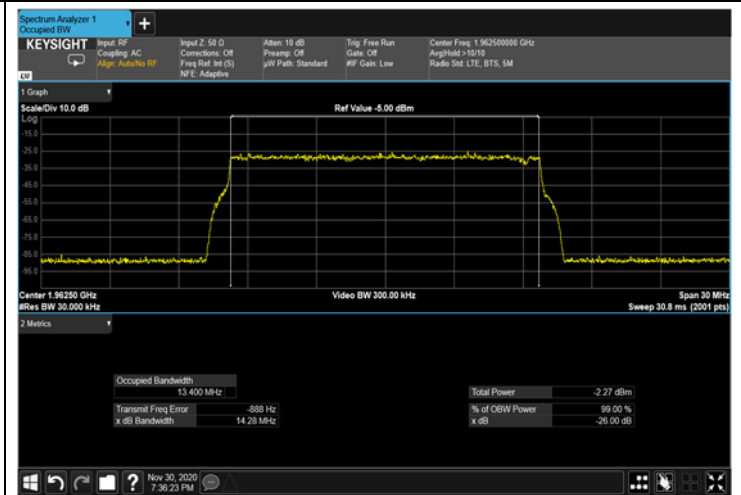


Figure 333: 16QAM 15MHz B.W.; 1962.5MHz Input – 4G

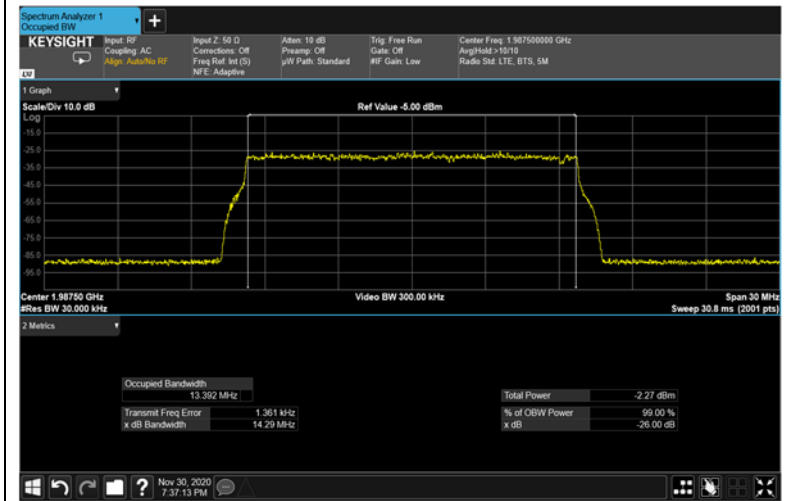


Figure 334: 16QAM 15MHz B.W.; 1987.5MHz Input – 4G



Figure 335: 64QAM 5MHz B.W.; 1932.5MHz Input – 4G

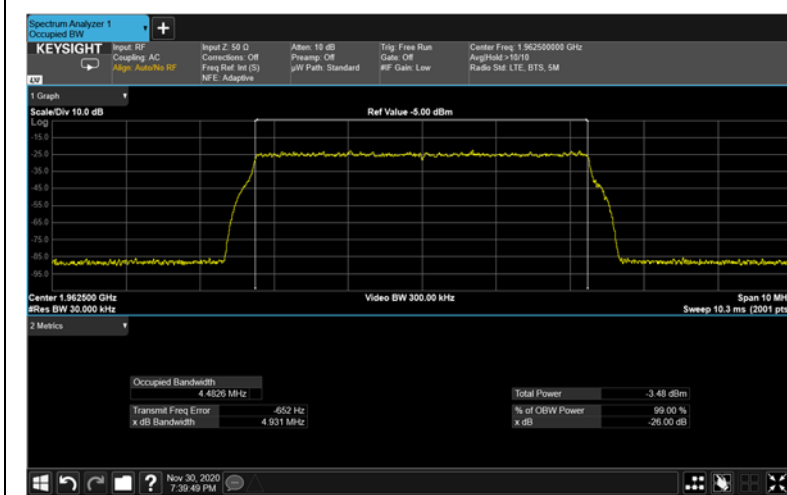


Figure 336: 64QAM 5MHz B.W.; 1962.5MHz Input – 4G

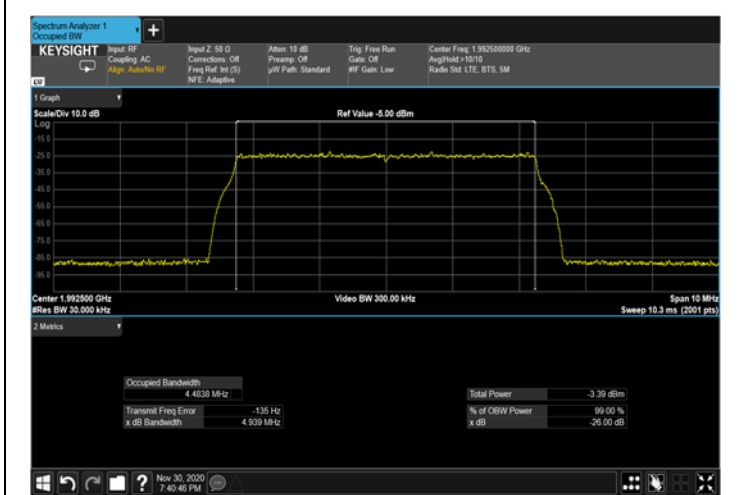


Figure 337: 64QAM 5MHz B.W.; 1992.5MHz Input – 4G



Figure 338: 64QAM 10MHz B.W.; 1935MHz Input – 4G

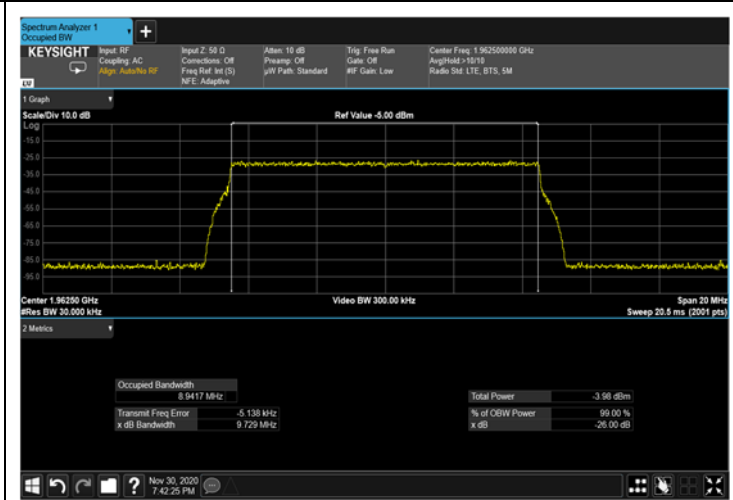


Figure 339: 64QAM 10MHz B.W.; 1962.5MHz Input – 4G

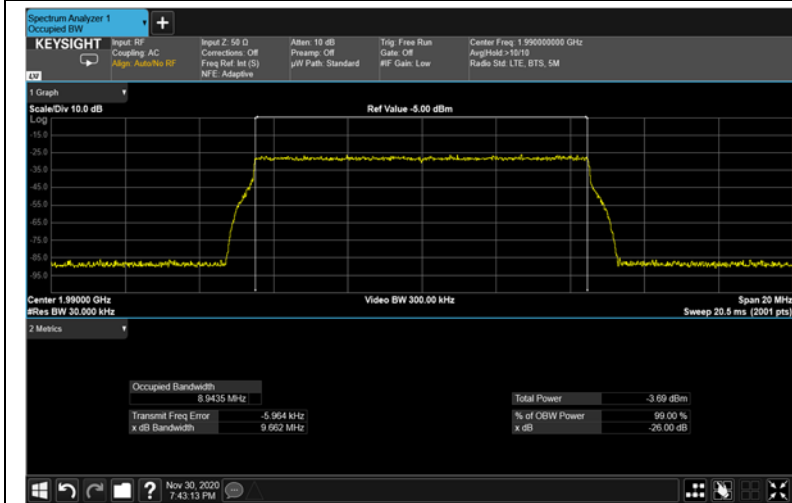


Figure 340: 64QAM 10MHz B.W.; 1990MHz Input – 4G



Figure 341: 64QAM 15MHz B.W.; 1937.5MHz Input – 4G

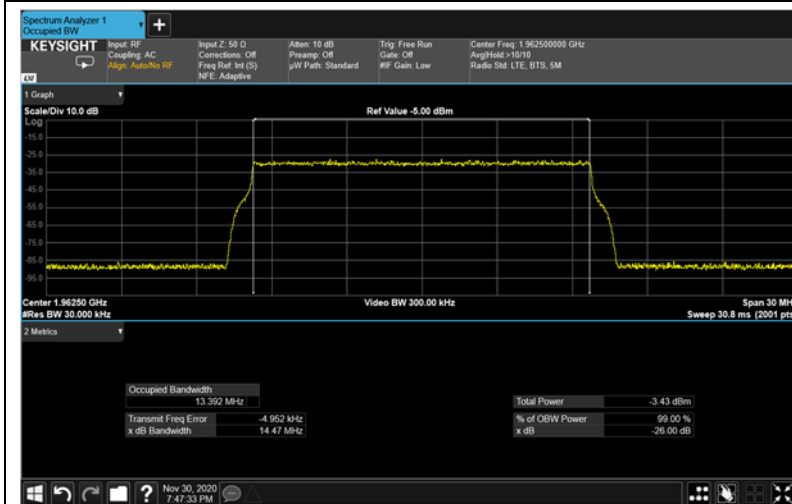


Figure 342: 64QAM 15MHz B.W.; 1962.5MHz Input – 4G



Figure 343: 64QAM 15MHz B.W.; 1987.5MHz Input – 4G

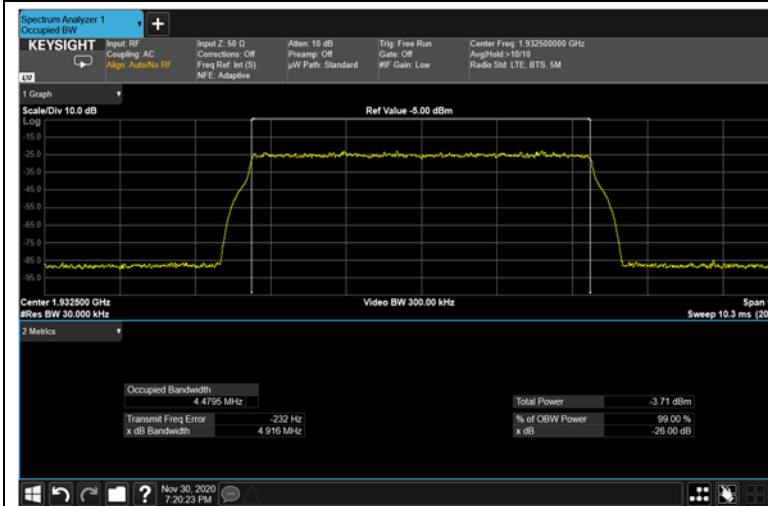


Figure 344: QPSK 5MHz B.W.; 1932.5MHz Input – 4G

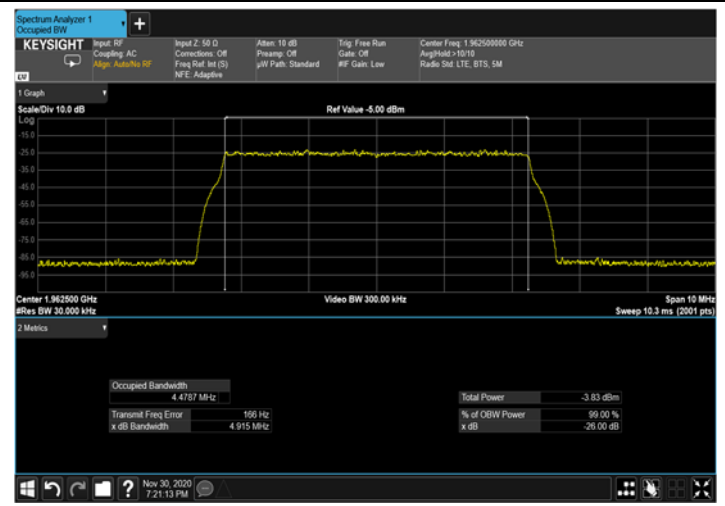


Figure 345: QPSK 5MHz B.W.; 1962.5MHz Input – 4G

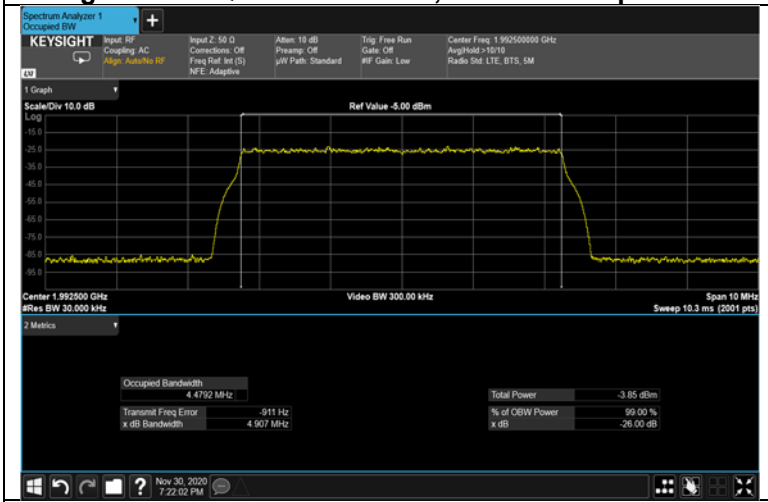


Figure 346: QPSK 5MHz B.W.; 1992.5MHz Input – 4G

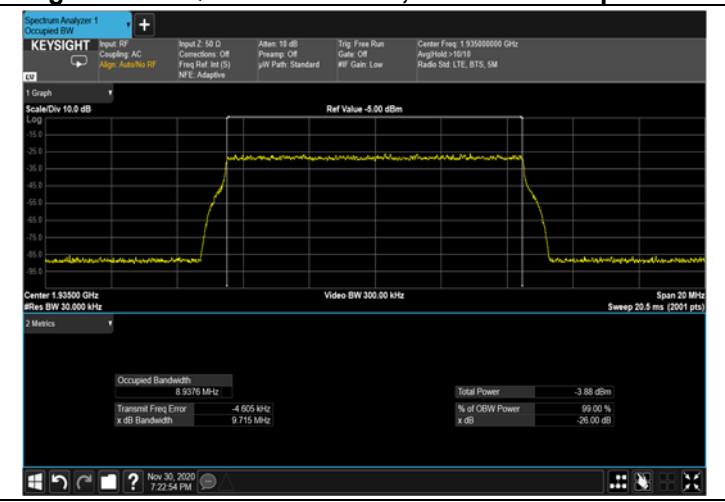


Figure 347: QPSK 10MHz B.W.; 1935MHz Input – 4G



Figure 348: QPSK 10MHz B.W.; 1962.5MHz Input – 4G

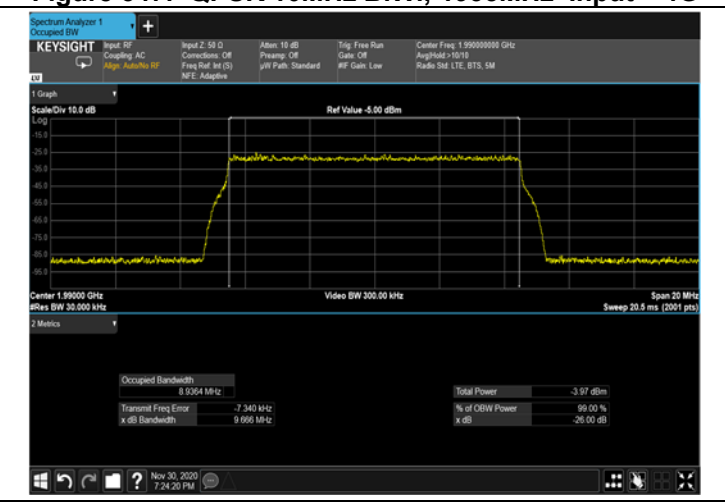
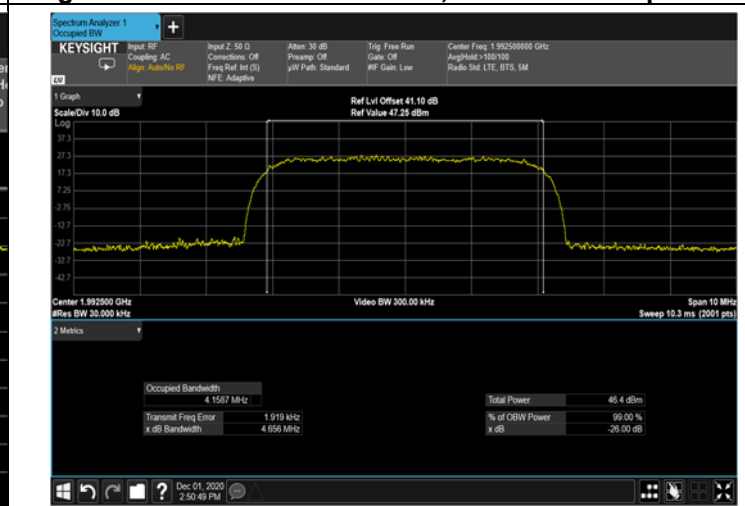
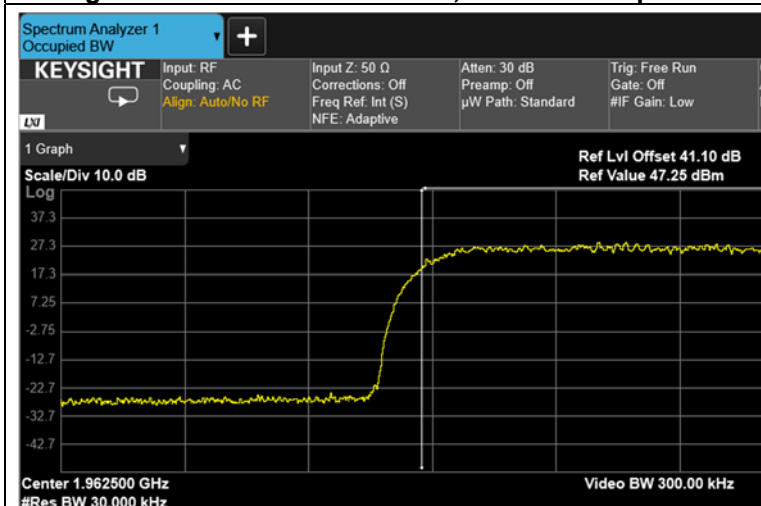
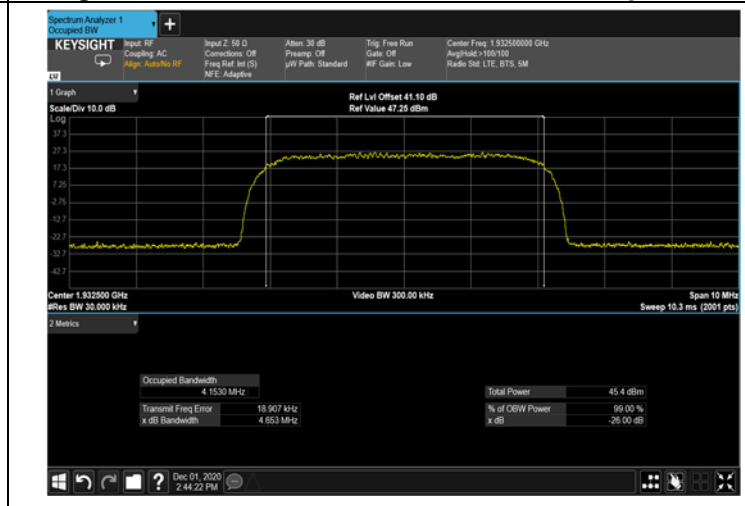
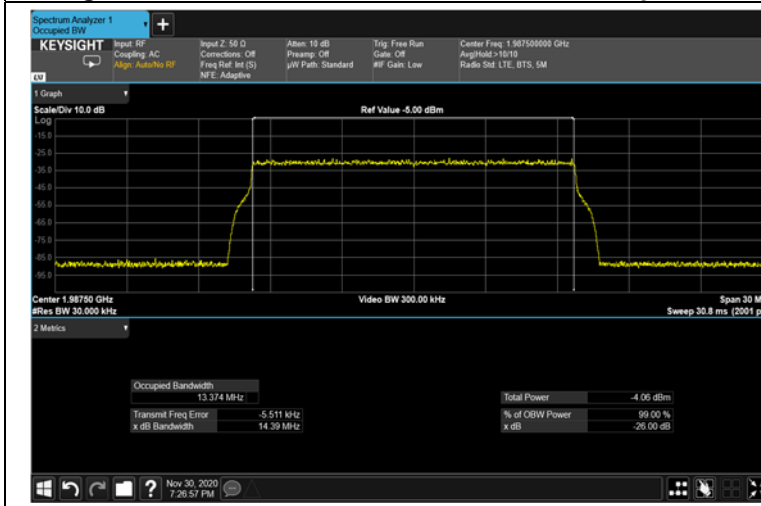
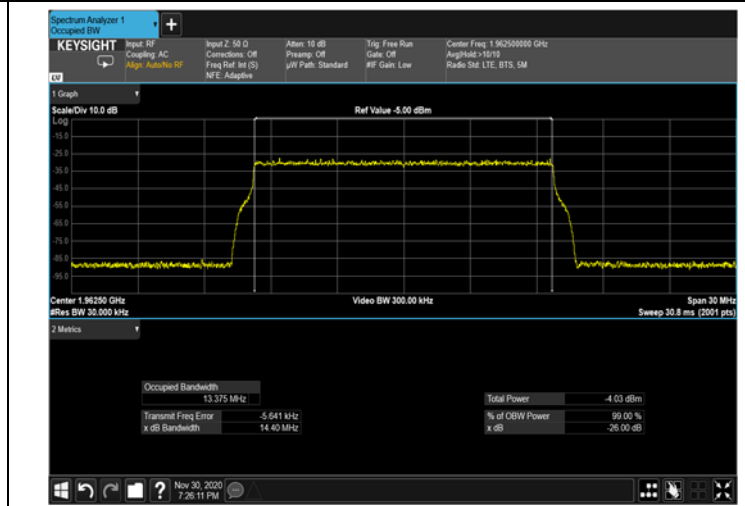
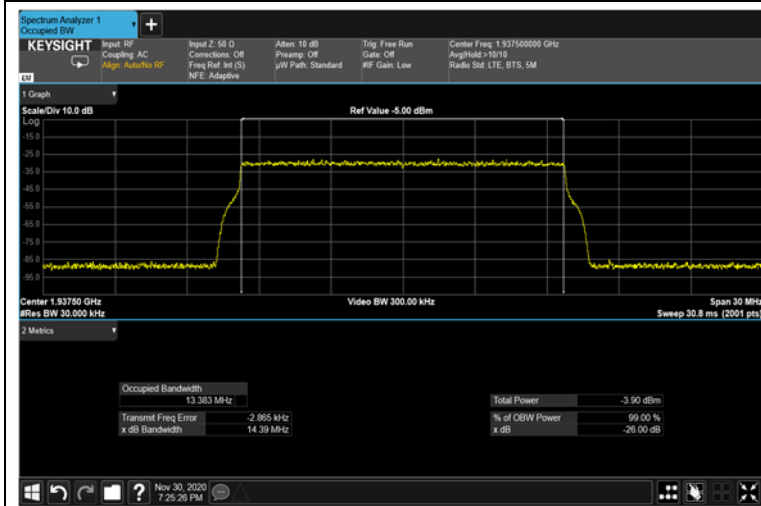


Figure 349: QPSK 10MHz B.W.; 1990MHz Input – 4G



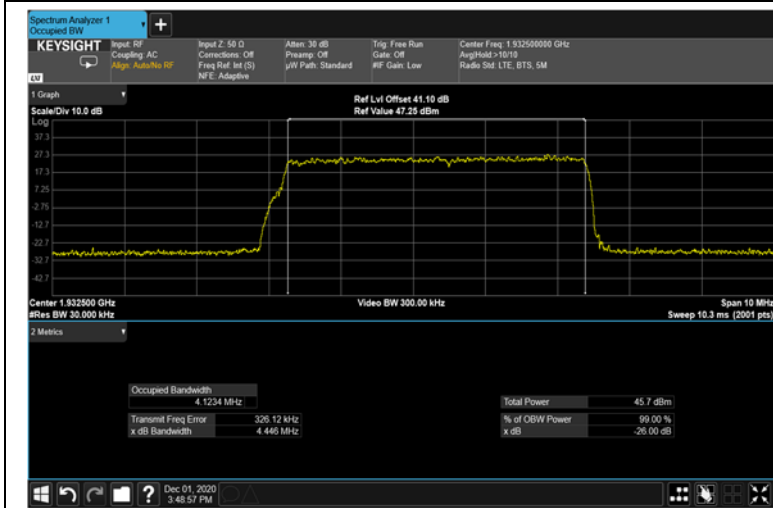


Figure 356: 16QAM 5MHz B.W.; 1932.5MHz Output – 4G



Figure 357: 16QAM 5MHz B.W.; 1962.5MHz Output – 4G



Figure 358: 16QAM 5MHz B.W.; 1992.5MHz Output – 4G

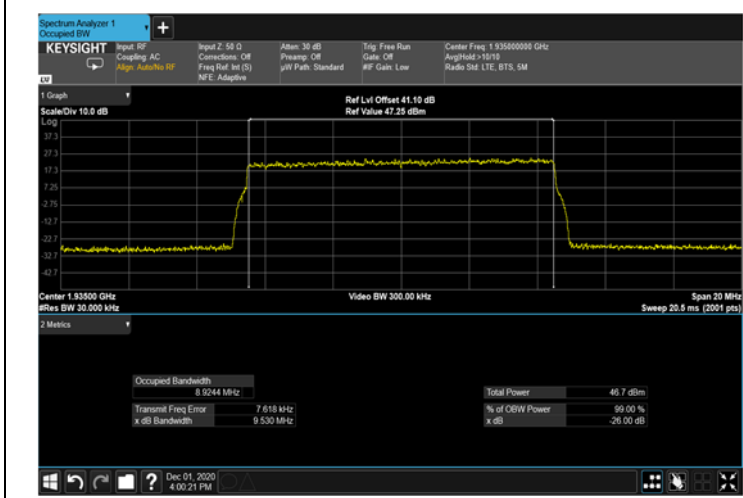


Figure 359: 16QAM 10MHz B.W.; 1935MHz Output – 4G

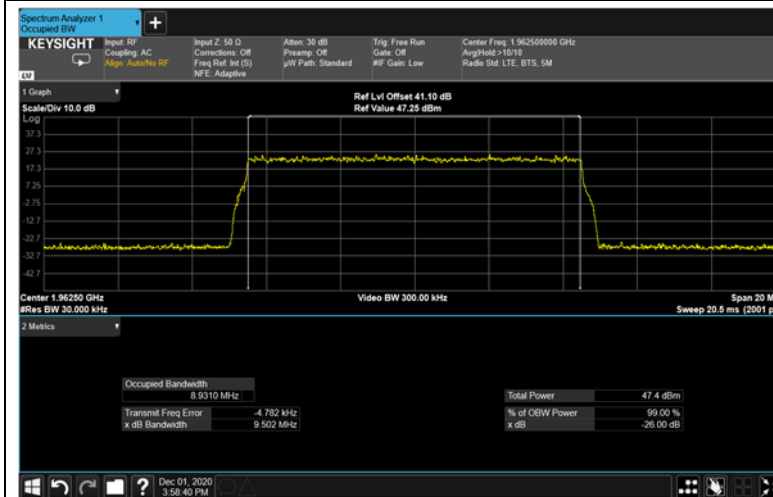


Figure 360: 16QAM 10MHz B.W.; 1962.5MHz Output – 4G

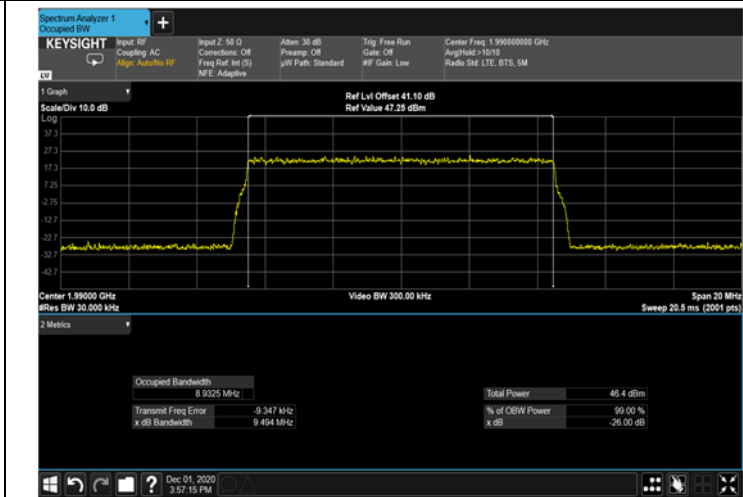


Figure 361: 16QAM 10MHz B.W.; 1990MHz Output – 4G

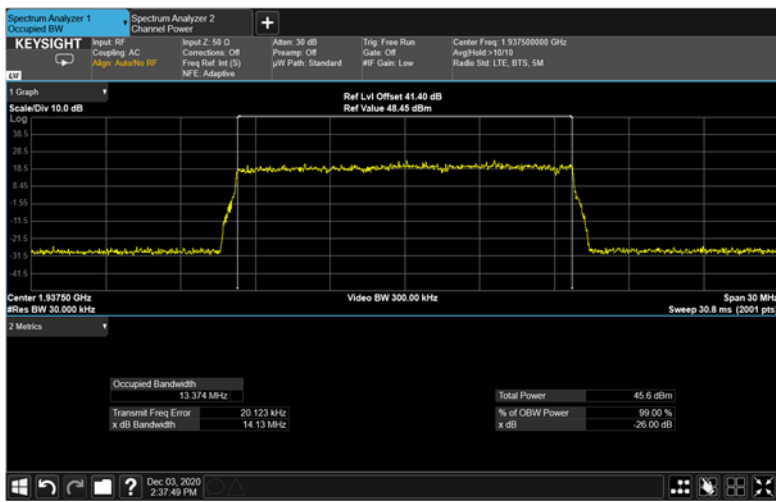


Figure 362: 16QAM 15MHz B.W.; 1937.5MHz Output – 4G

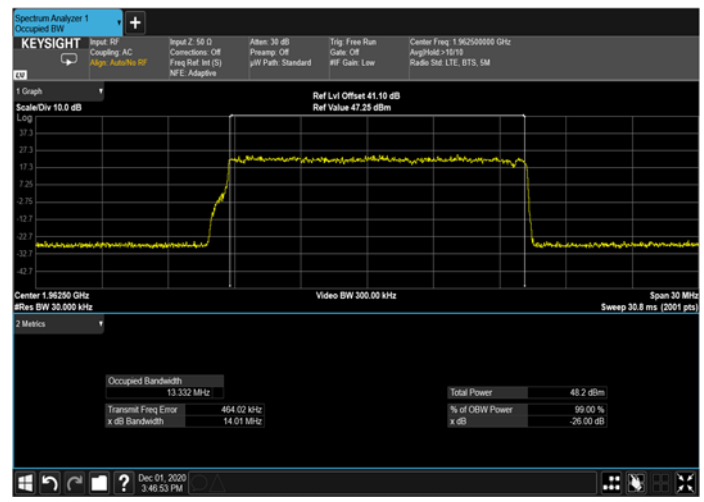


Figure 363: 16QAM 15MHz B.W.; 1962.5MHz Output – 4G

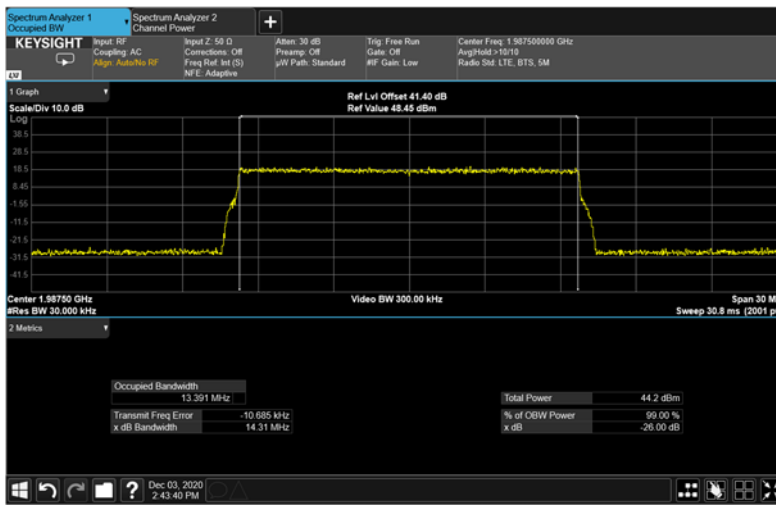


Figure 364: 16QAM 15MHz B.W.; 1987.5MHz Output – 4G

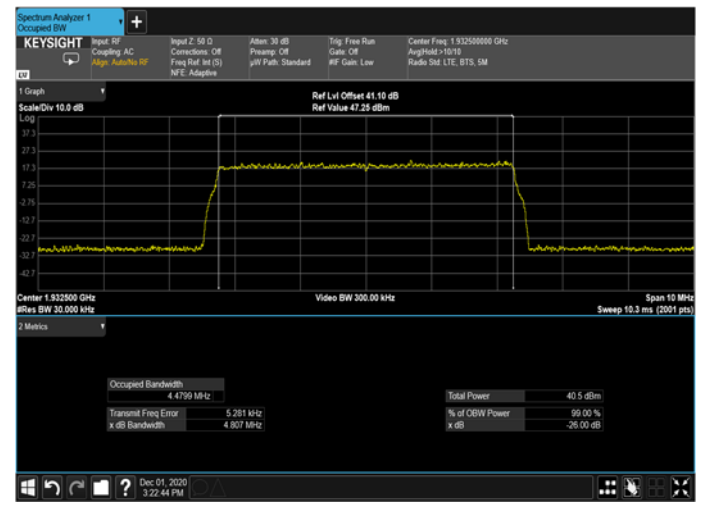


Figure 365: 64QAM 5MHz B.W.; 1932.5MHz Output – 4G



Figure 366: 64QAM 5MHz B.W.; 1962.5MHz Output – 4G

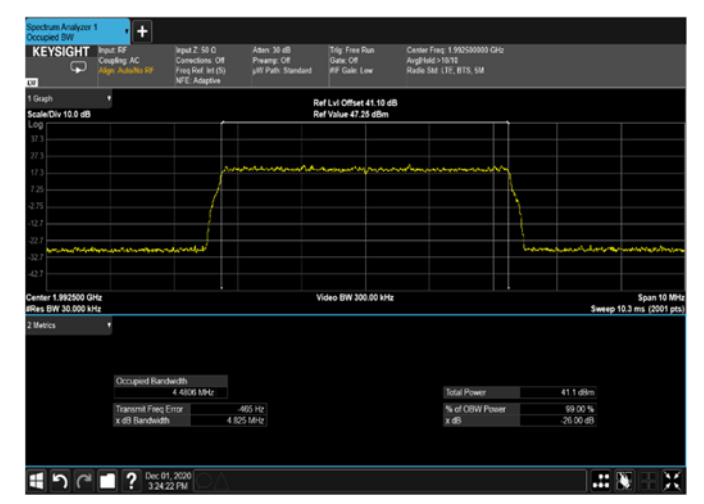
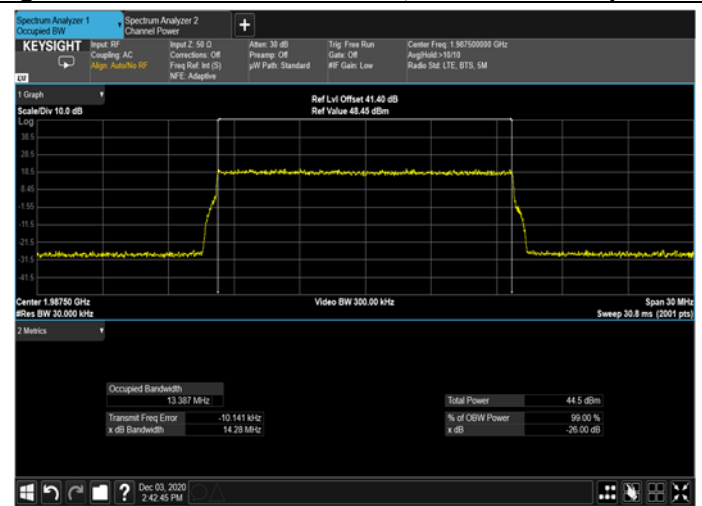
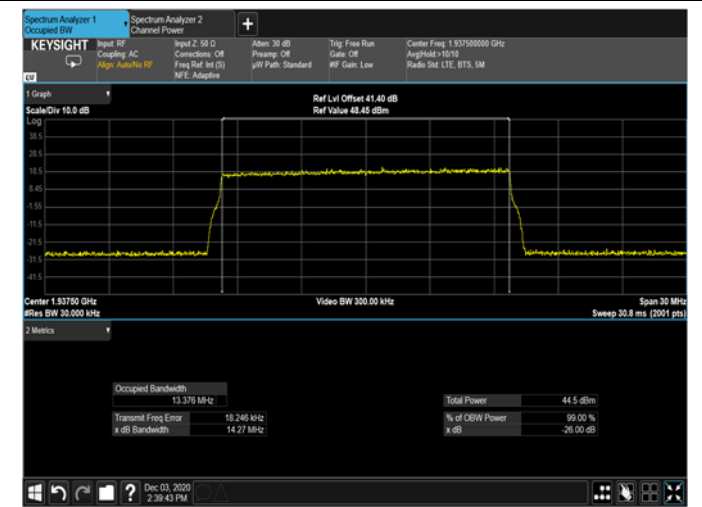
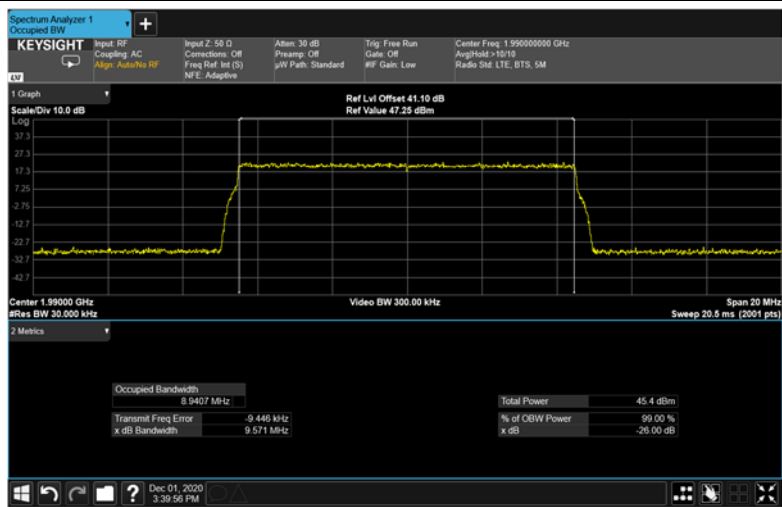
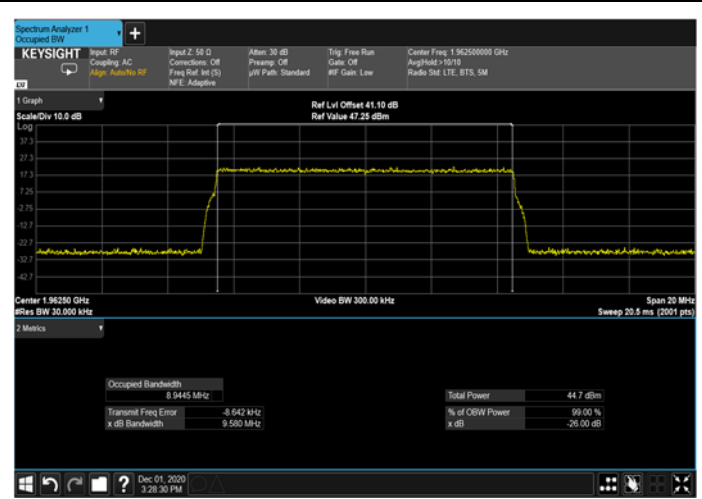
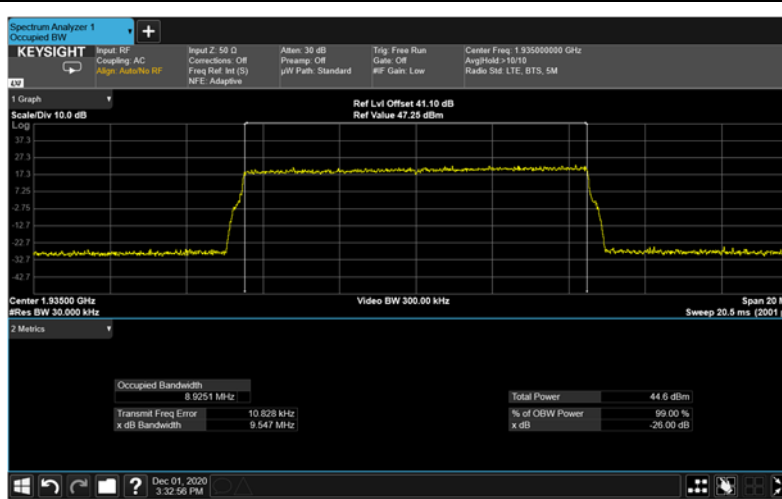


Figure 367: 64QAM 5MHz B.W.; 1992.5MHz Output – 4G



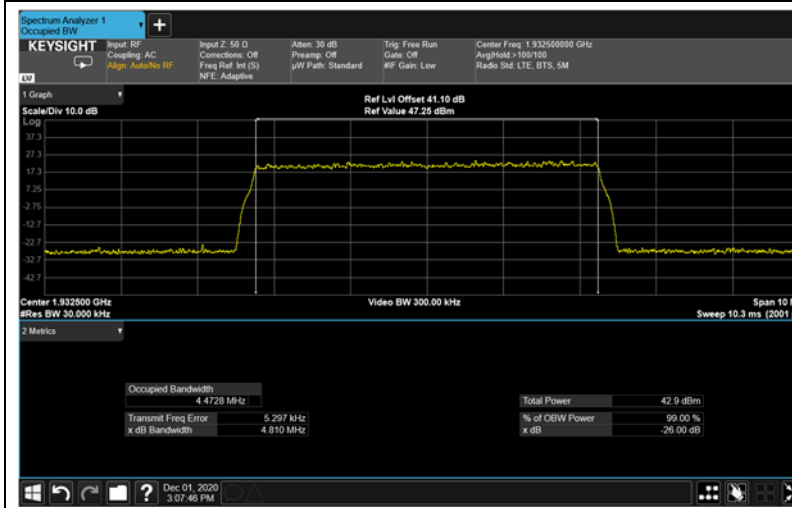


Figure 374: QPSK 5MHz B.W.; 1932.5MHz Output – 4G

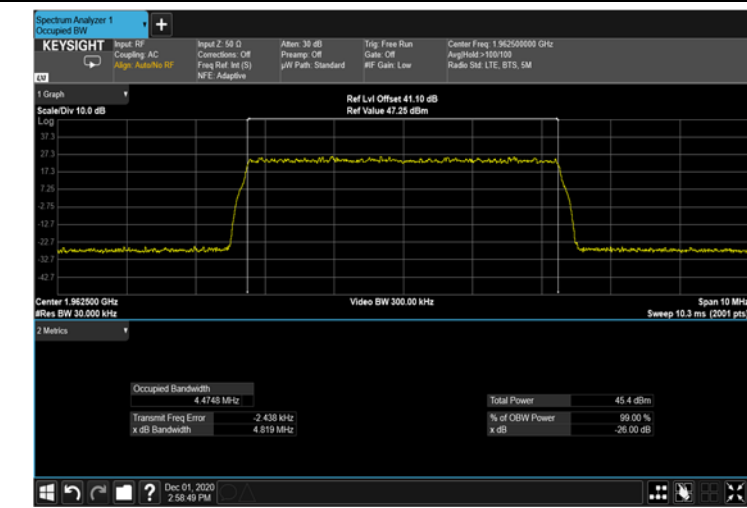


Figure 375: QPSK 5MHz B.W.; 1962.5MHz Output – 4G

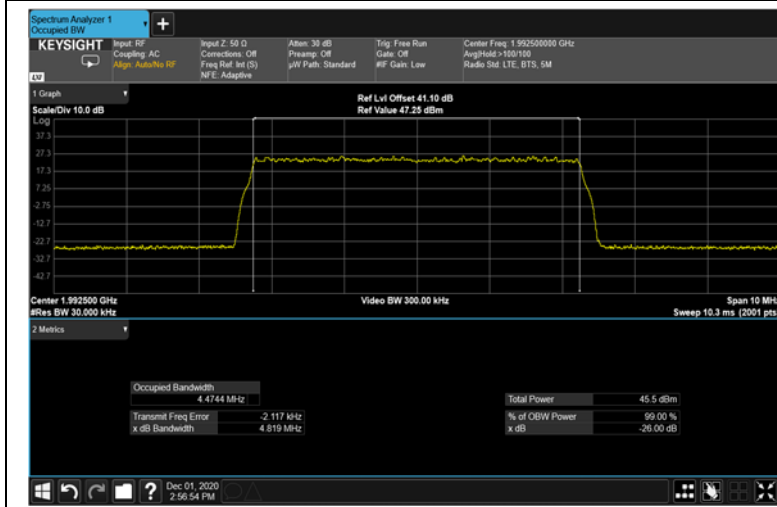


Figure 376: QPSK 5MHz B.W.; 1992.5MHz Output – 4G

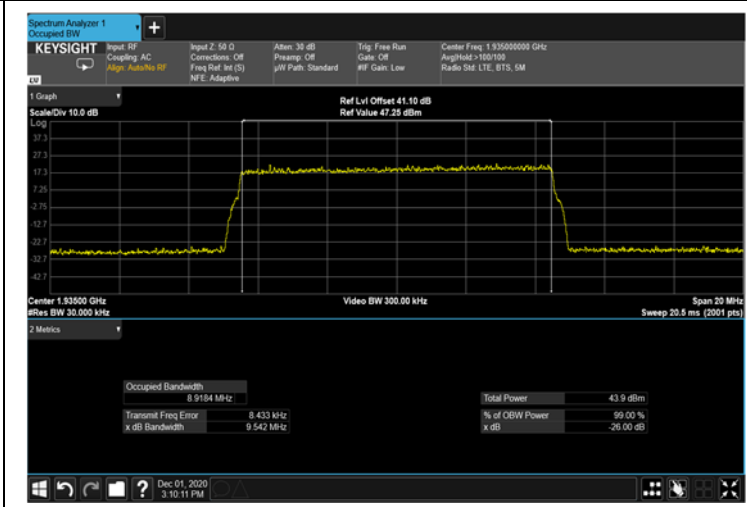


Figure 377: QPSK 10MHz B.W.; 1935MHz Output – 4G

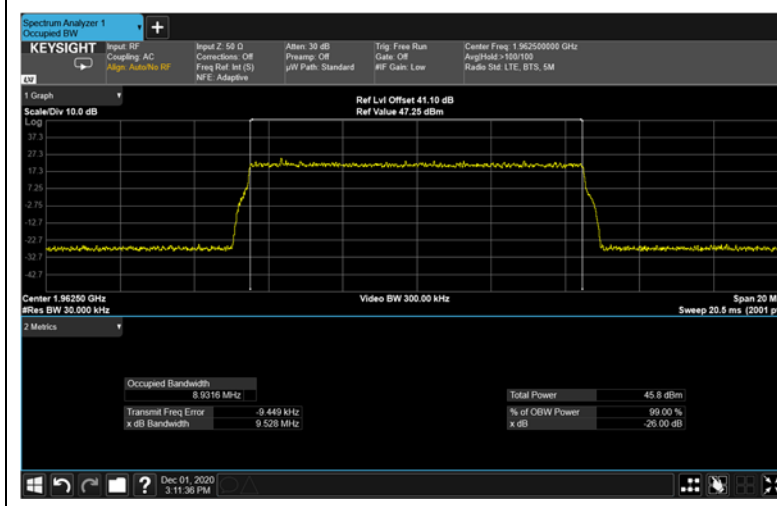


Figure 378: QPSK 10MHz B.W.; 1962.5MHz Output – 4G

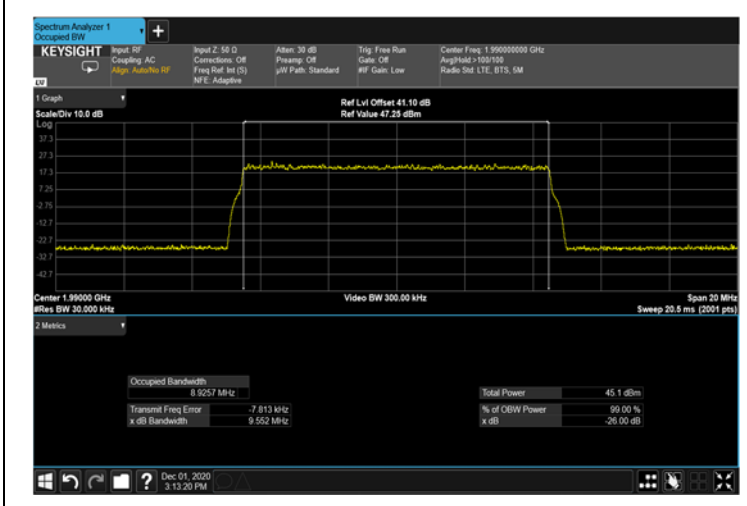


Figure 379: QPSK 10MHz B.W.; 1990MHz Output – 4G