



6 Peak to Average Power Ratio

6.1 Test Specification

FCC Part 27, Subpart C, Section 50

6.2 Test Procedure

(Temperature (20°C)/ Humidity (40%RH))

The method used is detailed in FCC KDB 971168 D03 v01
Measurements was using CCDF function for each modulation.

6.3 Test Limit

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

6.4 Test Results

JUDGEMENT: Passed

For additional information see Table 11 to Table 14 and Figure 168 to Figure 263.



| Modulation | Bandwidth | Sub Carrier | Operation Frequency | 0.1% PAPR | Limit |
|------------|-----------|-------------|---------------------|-----------|-------|
| | (MHz) | (kHz) | (MHz) | (dB) | (dB) |
| 16QAM | 5 | 15 | 619.5 | 8.49 | 13 |
| | | 30 | | 8.48 | |
| | | 15 | 634.5 | 8.65 | |
| | | | | 30 | |
| | | 15 | 649.5 | 8.75 | |
| | | | | 30 | |
| | 10 | 15 | 622.0 | 8.57 | |
| | | | | 30 | |
| | | 15 | 634.5 | 8.59 | |
| | | | | 30 | |
| | | 15 | 647.0 | 8.63 | |
| | | | | 30 | |
| | 15 | 15 | 624.5 | 8.95 | |
| | | | | 30 | |
| | | 15 | 634.5 | 8.99 | |
| | | | | 30 | |
| | | 15 | 644.5 | 8.99 | |
| | | | | 30 | |
| | 20 | 15 | 627.0 | 8.58 | |
| | | | | 30 | |
| | | 15 | 634.5 | 8.59 | |
| | | | | 30 | |
| | | 15 | 642.0 | 8.51 | |
| | | | | 30 | |

Table 11 Test Results Peak to Average Power Ratio 16 QAM



| Modulation | Bandwidth | Sub Carrier | Operation Frequency | 0.1% PAPR | Limit |
|------------|-----------|-------------|---------------------|-----------|-------|
| | (MHz) | (kHz) | (MHz) | (dB) | (dB) |
| 64QAM | 5 | 15 | 619.5 | 8.30 | 13 |
| | | 30 | | 8.09 | |
| | | 15 | 634.5 | 8.47 | |
| | | | | 30 | |
| | | 15 | 649.5 | 8.47 | |
| | | | | 30 | |
| | 10 | 15 | 622.0 | 8.31 | |
| | | | | 30 | |
| | | 15 | 634.5 | 8.30 | |
| | | | | 30 | |
| | | 15 | 647.0 | 8.19 | |
| | | | | 30 | |
| | 15 | 15 | 624.5 | 8.17 | |
| | | | | 30 | |
| | | 15 | 634.5 | 8.24 | |
| | | | | 30 | |
| | | 15 | 644.5 | 8.29 | |
| | | | | 30 | |
| | 20 | 15 | 627.0 | 8.37 | |
| | | | | 30 | |
| | | 15 | 634.5 | 8.39 | |
| | | | | 30 | |
| | | 15 | 642.0 | 8.45 | |
| | | | | 30 | |

Table 12 Test Results Peak to Average Power Ratio 64 QAM



| Modulation | Bandwidth | Sub Carrier | Operation Frequency | 0.1% PAPR | Limit |
|------------|-----------|-------------|---------------------|-----------|-------|
| | (MHz) | (kHz) | (MHz) | (dB) | (dB) |
| 256QAM | 5 | 15 | 619.5 | 8.44 | 13 |
| | | 30 | | 8.42 | |
| | | 15 | 634.5 | 8.58 | |
| | | | | 8.56 | |
| | | 15 | 649.5 | 8.56 | |
| | | | | 8.64 | |
| | 10 | 15 | 622.0 | 8.53 | |
| | | 30 | | 8.39 | |
| | | 15 | 634.5 | 8.60 | |
| | | | | 8.47 | |
| | | 15 | 647.0 | 8.43 | |
| | | | | 8.47 | |
| | 15 | 15 | 624.5 | 8.46 | |
| | | 30 | | 8.36 | |
| | | 15 | 634.5 | 8.53 | |
| | | | | 8.46 | |
| | | 15 | 644.5 | 8.55 | |
| | | | | 8.50 | |
| | 20 | 15 | 627.0 | 8.38 | |
| | | 30 | | 8.42 | |
| | | 15 | 634.5 | 8.32 | |
| | | | | 8.39 | |
| | | 15 | 642.0 | 8.35 | |
| | | | | 8.36 | |

Table 13 Test Results Peak to Average Power Ratio 256 QAM



| Modulation | Bandwidth | Sub Carrier | Operation Frequency | 0.1% PAPR | Limit |
|------------|-----------|-------------|---------------------|-----------|-------|
| | (MHz) | (kHz) | (MHz) | (dB) | (dB) |
| QPSK | 5 | 15 | 619.5 | 8.18 | 13 |
| | | 30 | | 8.72 | |
| | | 15 | 634.5 | 8.27 | |
| | | 30 | | 8.88 | |
| | | 15 | 649.5 | 8.25 | |
| | | 30 | | 8.86 | |
| | 10 | 15 | 622.0 | 8.41 | |
| | | 30 | | 8.45 | |
| | | 15 | 634.5 | 8.51 | |
| | | 30 | | 8.48 | |
| | | 15 | 647.0 | 8.48 | |
| | | 30 | | 8.43 | |
| | 15 | 15 | 624.5 | 8.47 | |
| | | 30 | | 8.47 | |
| | | 15 | 634.5 | 8.40 | |
| | | 30 | | 8.49 | |
| | | 15 | 644.5 | 8.46 | |
| | | 30 | | 8.69 | |
| | 20 | 15 | 627.0 | 8.37 | |
| | | 30 | | 8.23 | |
| | | 15 | 634.5 | 8.45 | |
| | | 30 | | 8.34 | |
| | | 15 | 642.0 | 8.47 | |
| | | 30 | | 8.43 | |

Table 14 Test Results Peak to Average Power Ratio QPSK

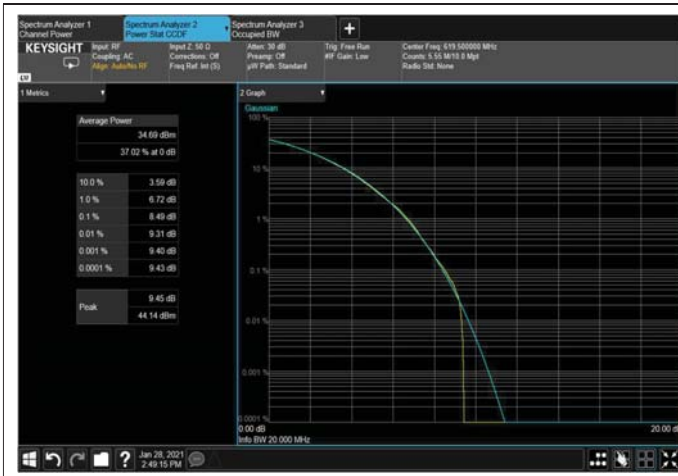


Figure 168: 16QAM 5MHz B.W; 619.5MHz, 15kHz

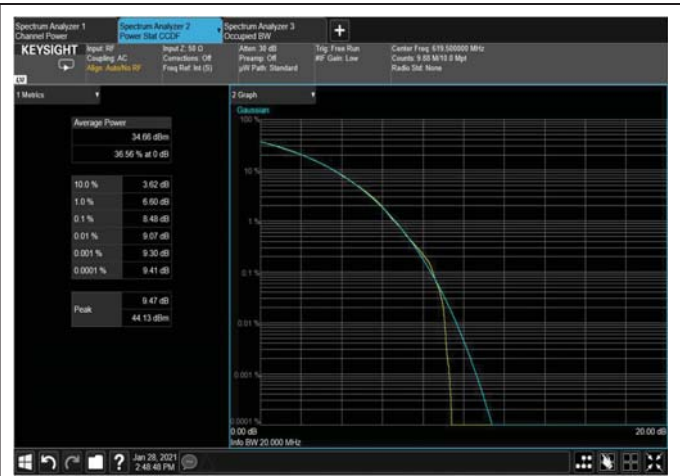


Figure 169: 16QAM 5MHz B.W; 619.5MHz, 30kHz

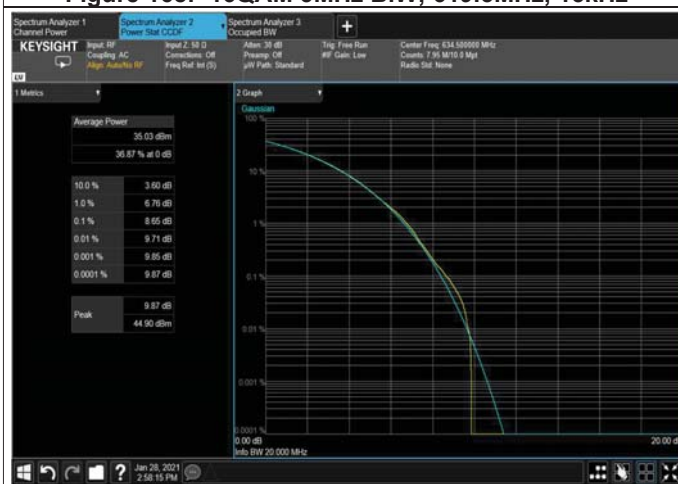


Figure 170: 16QAM 5MHz B.W; 634.5MHz, 15kHz

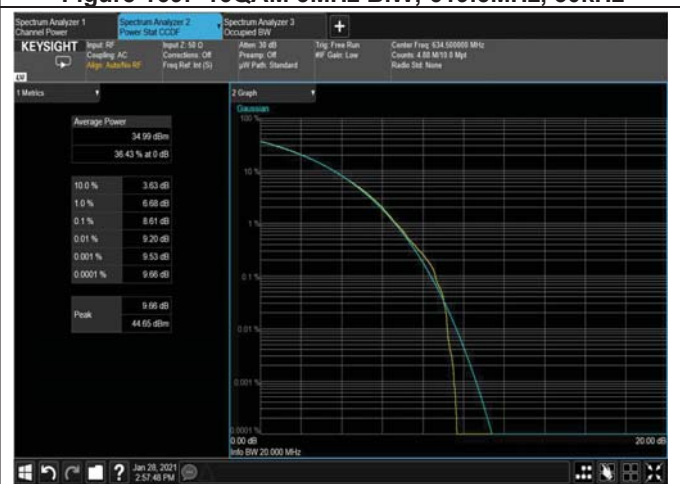


Figure 171: 16QAM 5MHz B.W; 634.5MHz, 30kHz

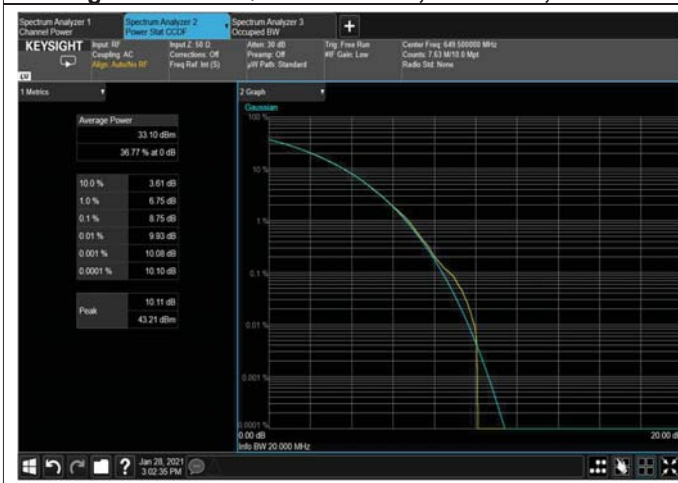


Figure 172: 16QAM 5MHz B.W; 649.5MHz, 15kHz

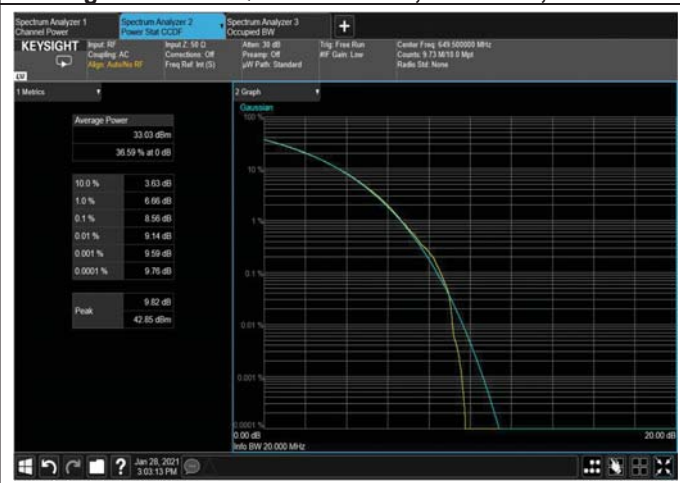


Figure 173: 16QAM 5MHz B.W; 649.5MHz, 30kHz

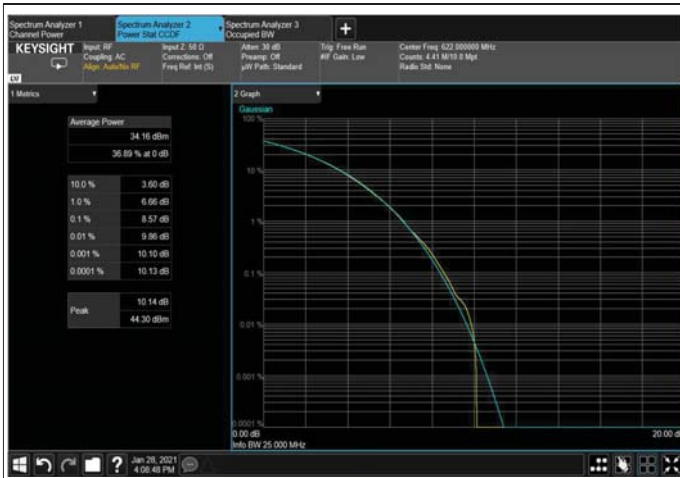


Figure 174: 16QAM 10MHz B.W; 622.0MHz, 15kHz

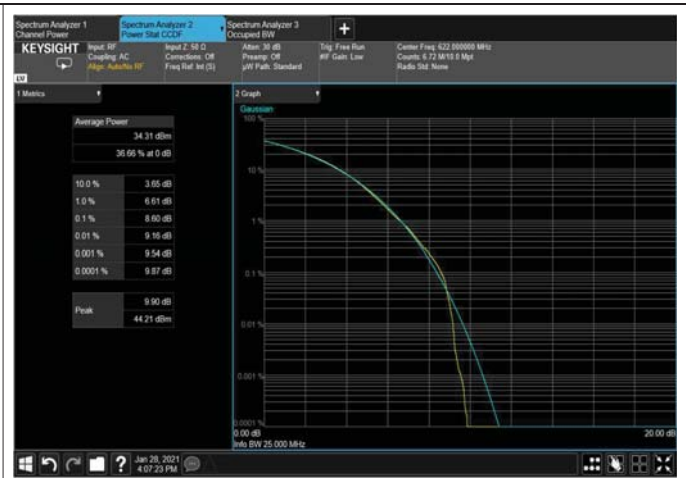


Figure 175: 16QAM 10MHz B.W; 622.0MHz, 30kHz

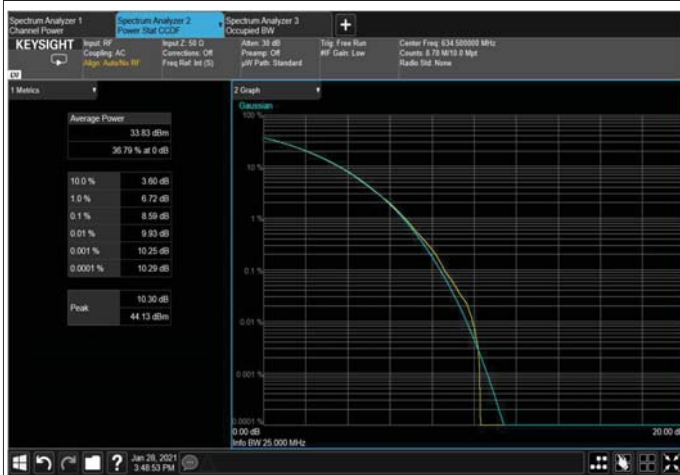


Figure 176: 16QAM 10MHz B.W; 634.5MHz, 15kHz

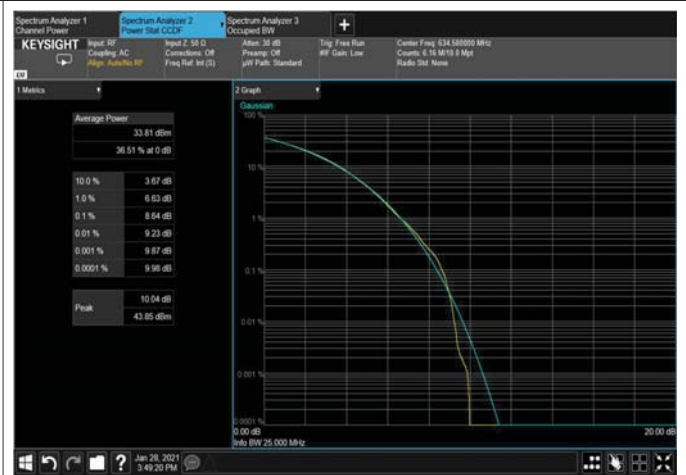


Figure 177: 16QAM 10MHz B.W; 634.5MHz, 30kHz

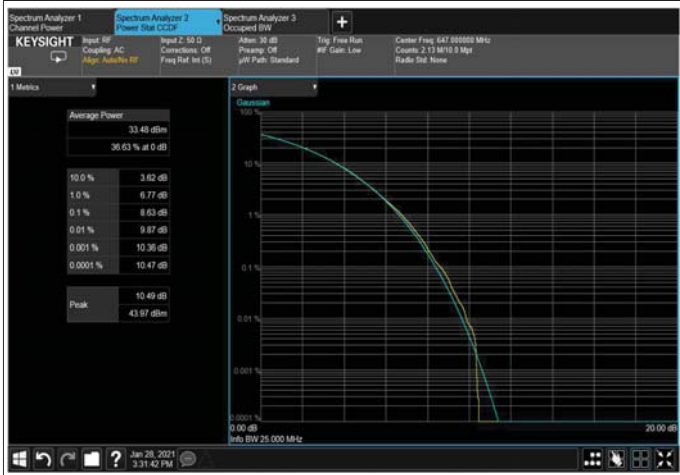


Figure 178: 16QAM 10MHz B.W; 647MHz, 15kHz

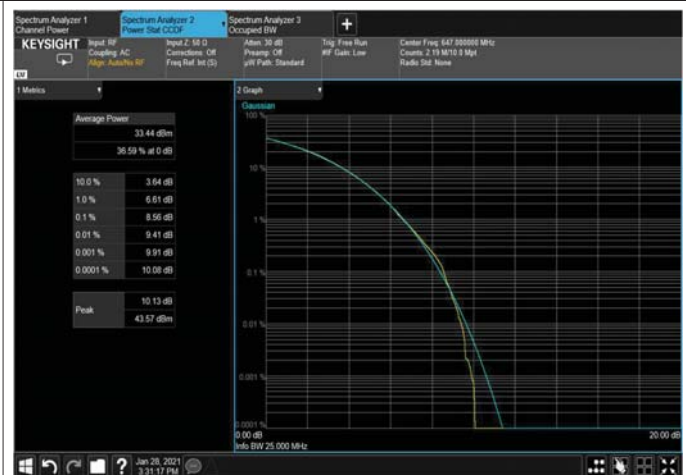


Figure 179: 16QAM 10MHz B.W; 647.0MHz, 30kHz



Figure 180: 16QAM 15MHz B.W; 624.5MHz, 15kHz

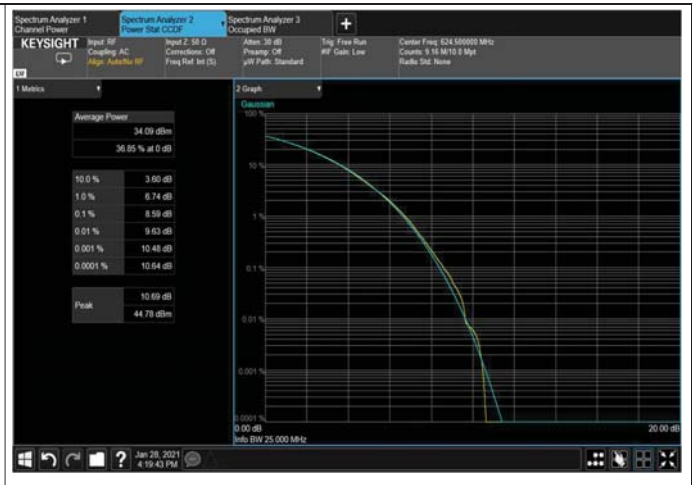


Figure 181: 16QAM 15MHz B.W; 624.5MHz, 30kHz

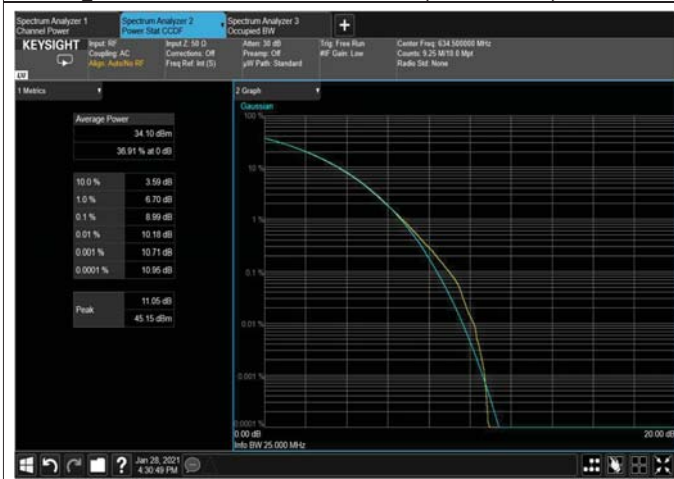


Figure 182: 16QAM 15MHz B.W; 634.5MHz, 15kHz

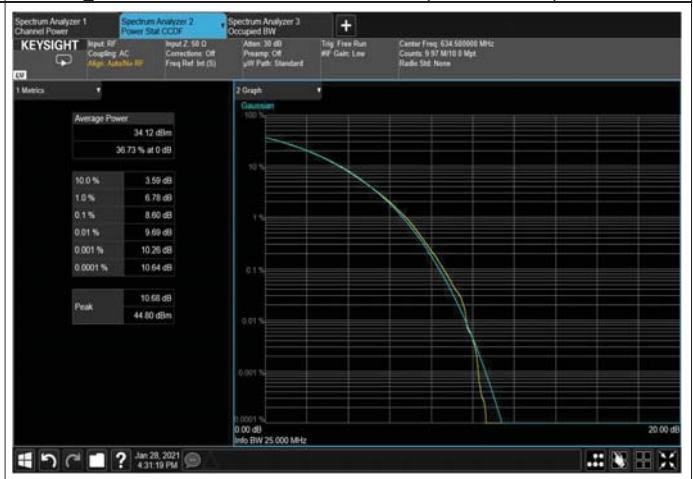


Figure 183: 16QAM 15MHz B.W; 634.5MHz, 30kHz

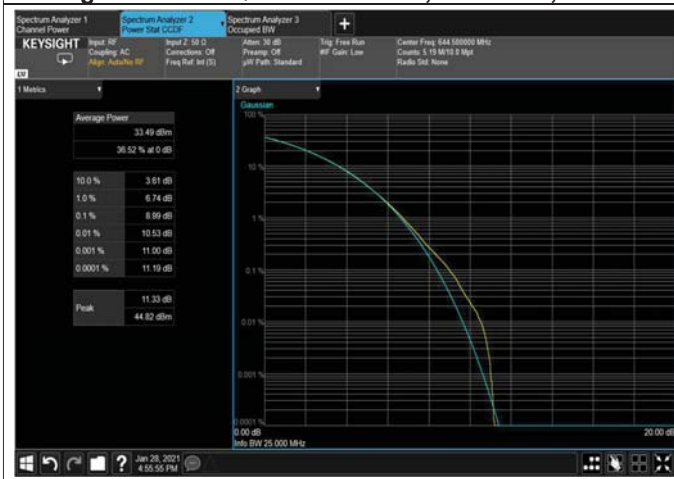


Figure 184: 16QAM 15MHz B.W; 644.5MHz, 15kHz

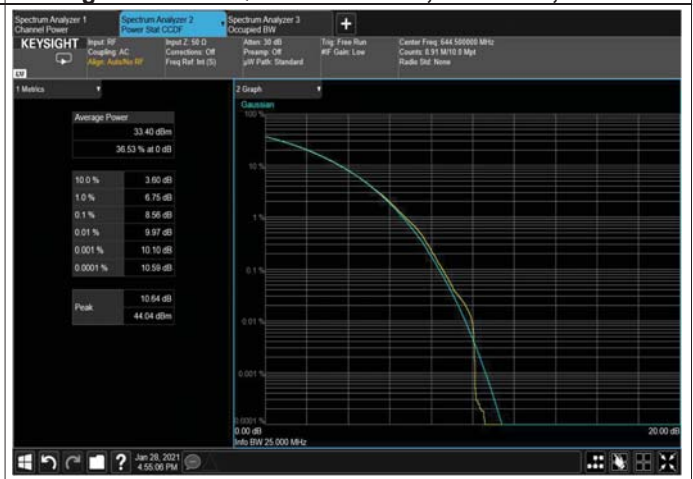


Figure 185: 16QAM 15MHz B.W; 644.5MHz, 30kHz

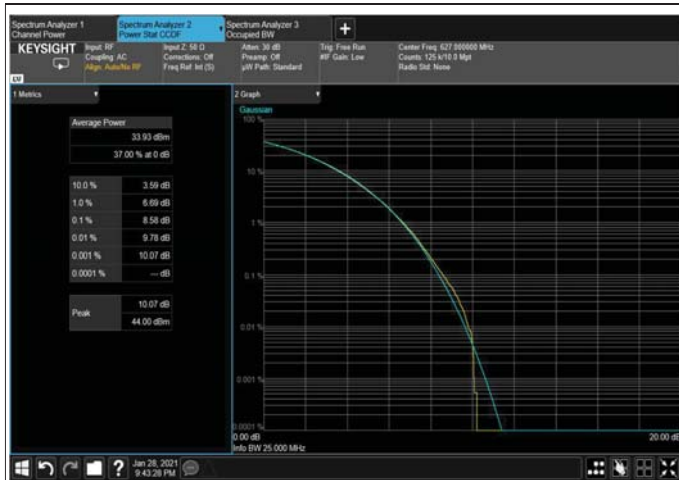


Figure 186: 16QAM 20MHz B.W; 627.0MHz, 15kHz

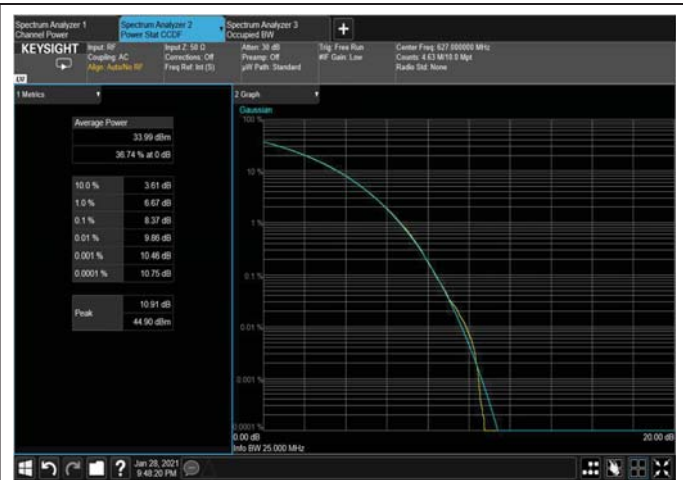


Figure 187: 16QAM 20MHz B.W; 627.0MHz, 30kHz

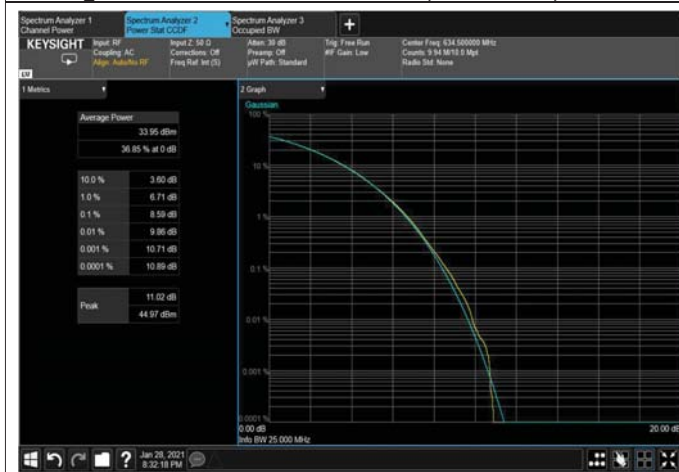


Figure 188: 16QAM 20MHz B.W; 634.5MHz, 15kHz

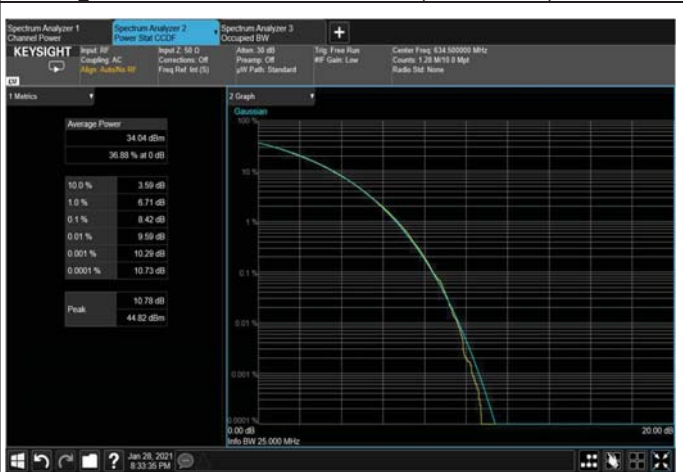


Figure 189: 16QAM 20MHz B.W; 634.5MHz, 30kHz

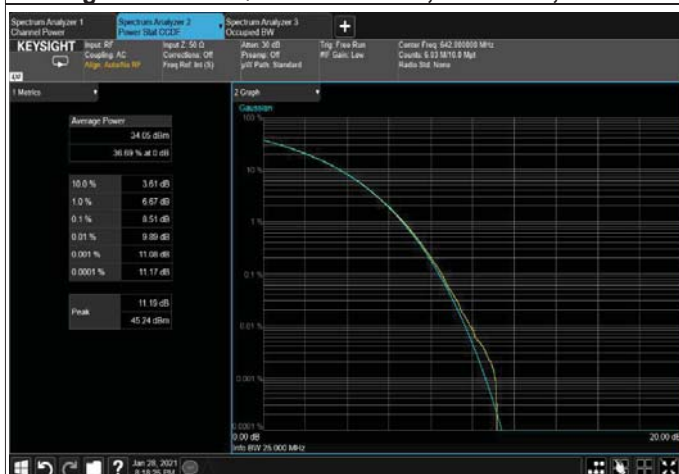


Figure 190: 16QAM 20MHz B.W; 642.0MHz, 15kHz

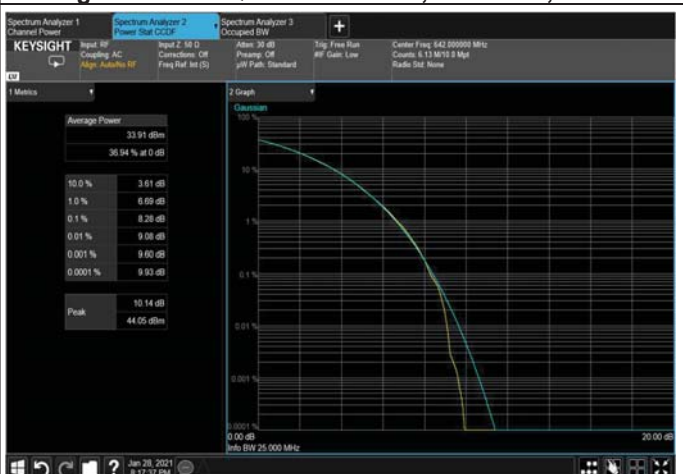


Figure 191: 16QAM 20MHz B.W; 642.0MHz, 30kHz

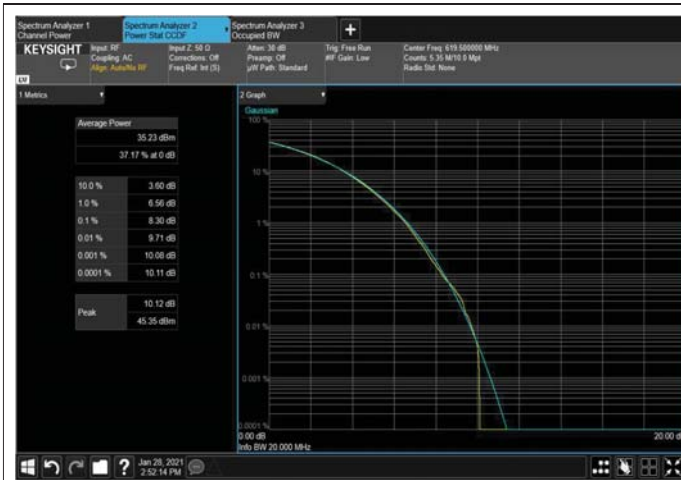


Figure 192: 64QAM 5MHz B.W; 619.5MHz, 15kHz

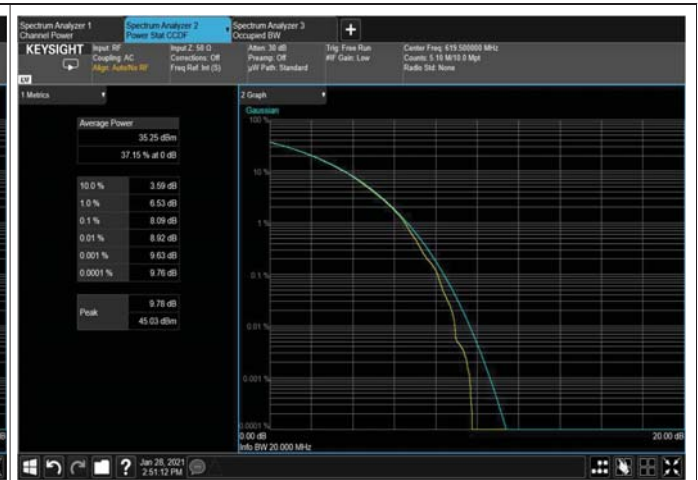


Figure 193: 64QAM 5MHz B.W; 619.5MHz, 30kHz

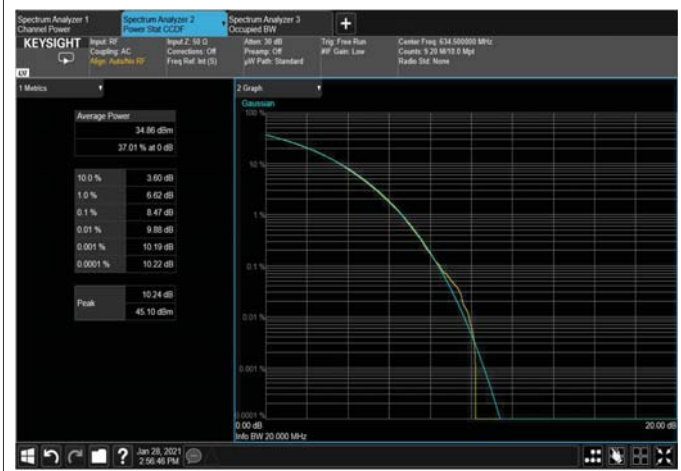


Figure 194: 64QAM 5MHz B.W; 634.5MHz, 15kHz

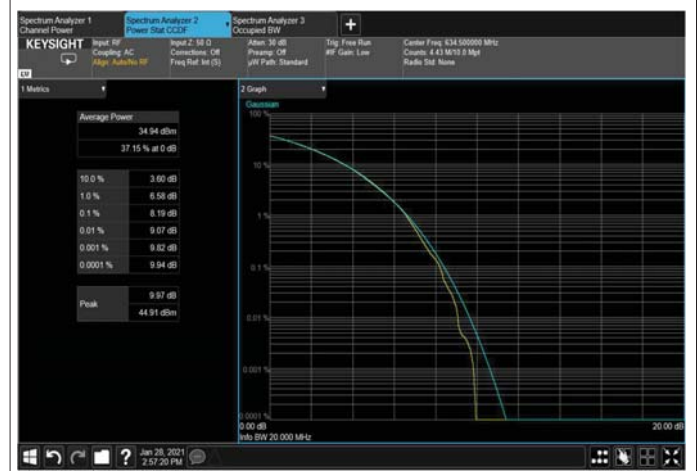


Figure 195: 64QAM 5MHz B.W; 634.5MHz, 30kHz

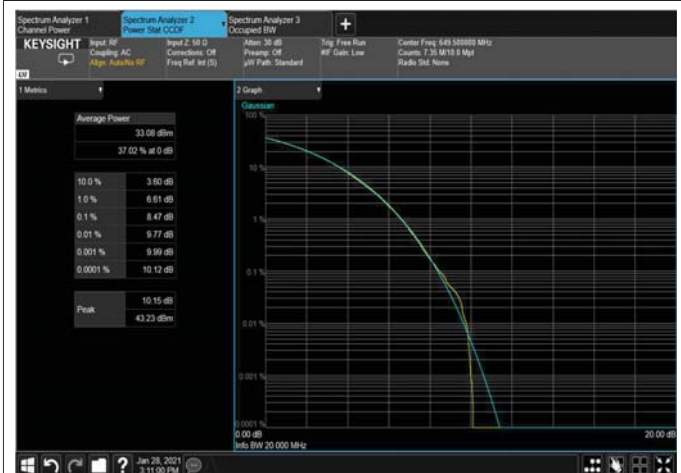


Figure 196: 64QAM 5MHz B.W; 649.5MHz, 15kHz

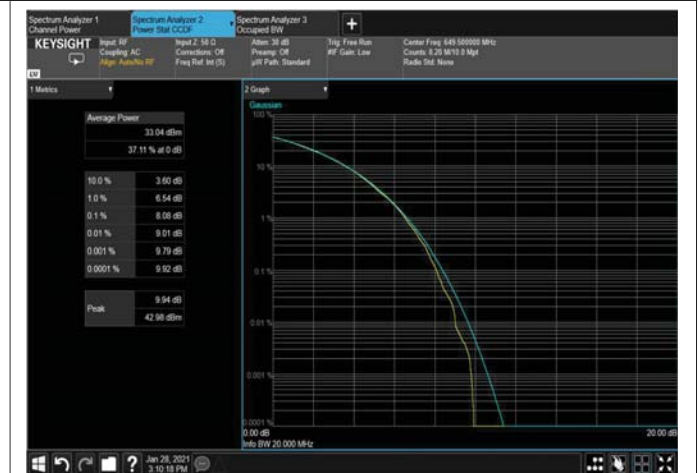


Figure 197: 64QAM 5MHz B.W; 649.5MHz, 30kHz

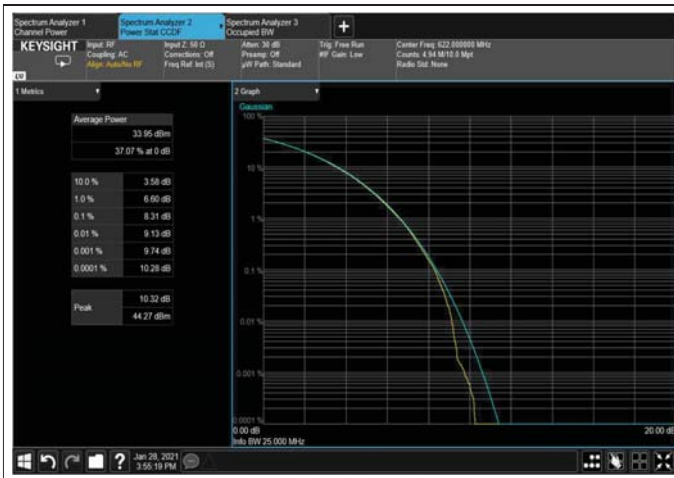


Figure 198: 64QAM 10MHz B.W; 622.0MHz, 15kHz

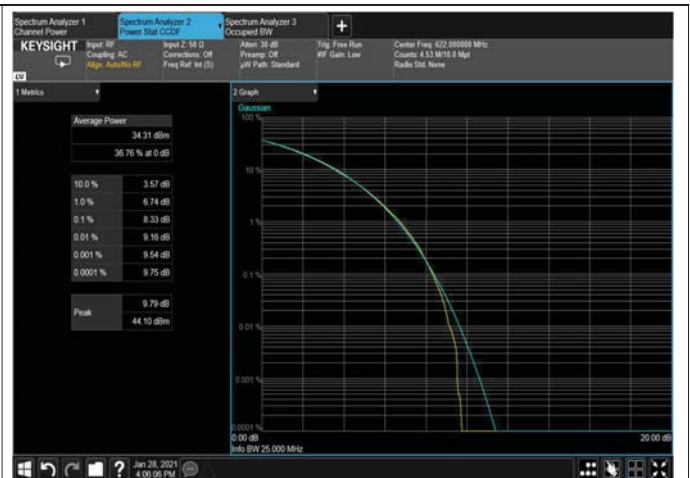


Figure 199: 64QAM 10MHz B.W; 622.0.5MHz, 30kHz

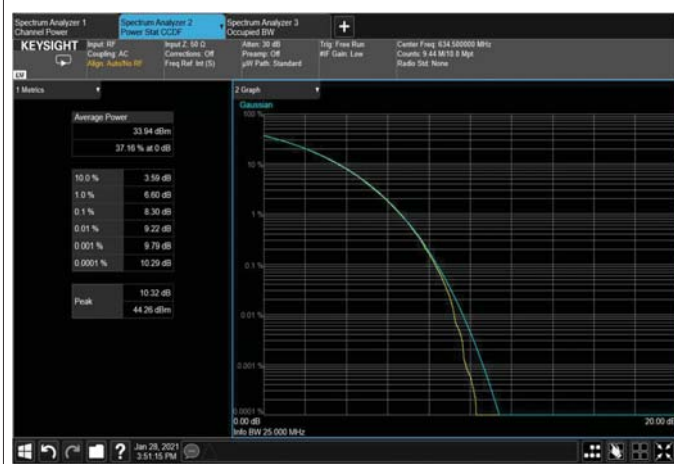


Figure 200: 64QAM 10MHz B.W; 634.5MHz, 15kHz

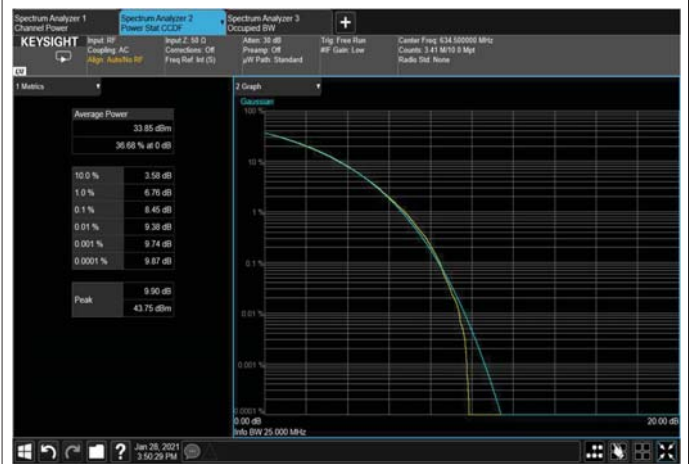


Figure 201: 64QAM 10MHz B.W; 634.5MHz, 30kHz

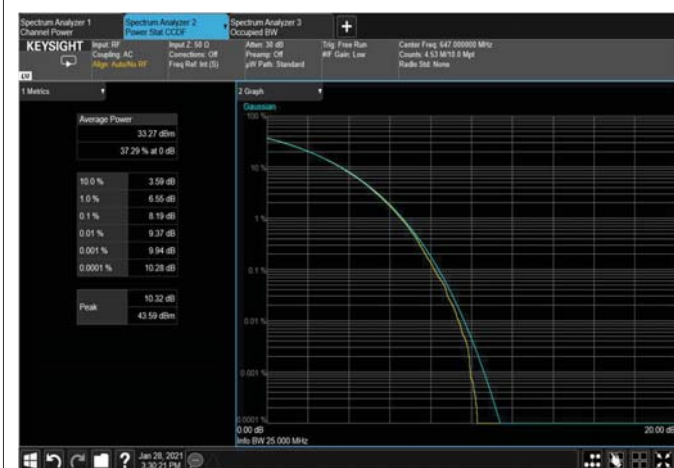


Figure 202: 64QAM 10MHz B.W; 647.0MHz, 15kHz

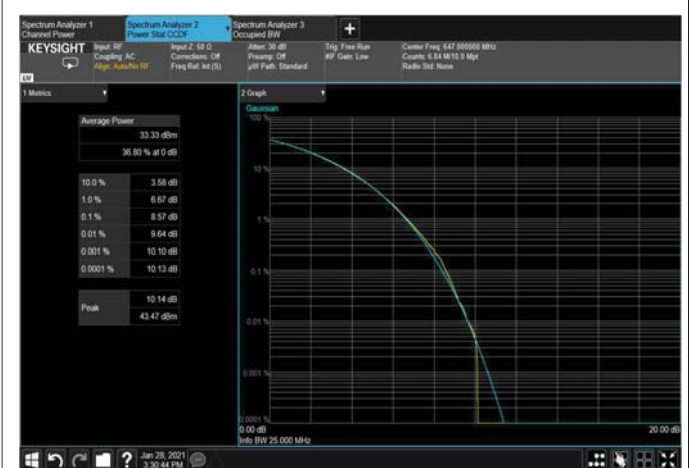


Figure 203: 64QAM 10MHz B.W; 647.0MHz, 30kHz

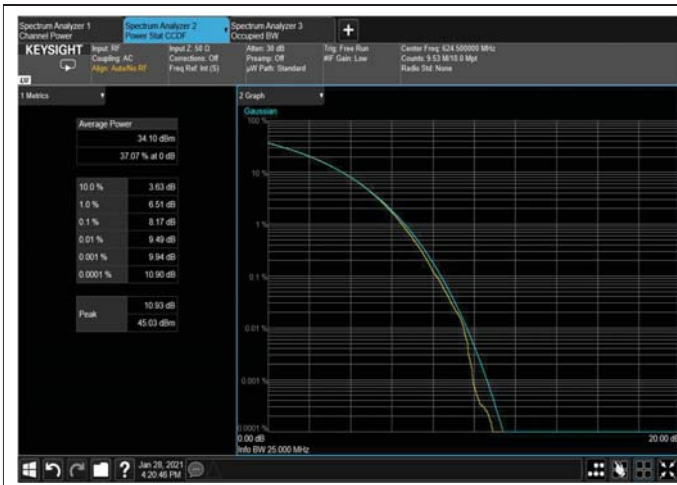


Figure 204: 64QAM 15MHz B.W; 624.5MHz, 15kHz

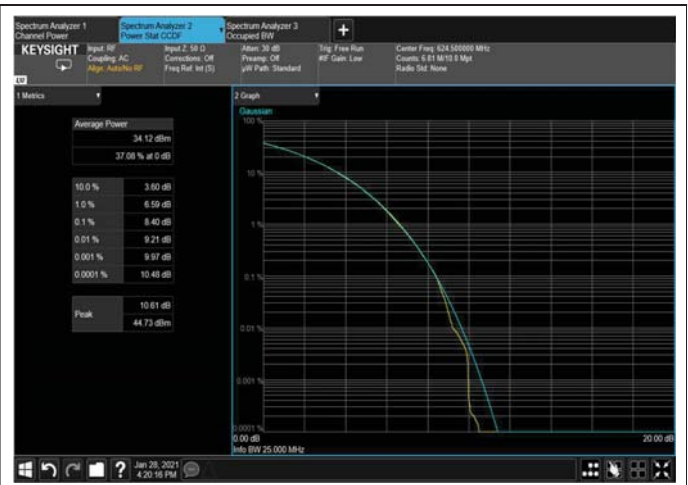


Figure 205: 64QAM 15MHz B.W; 624.5MHz, 30kHz

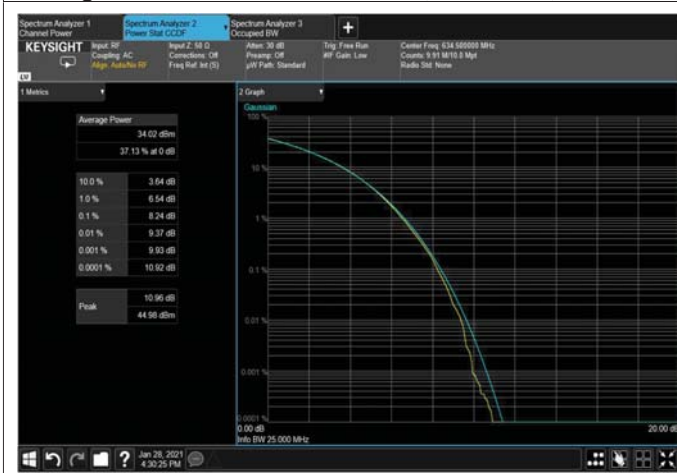


Figure 206: 64QAM 15MHz B.W; 634.5MHz, 15kHz

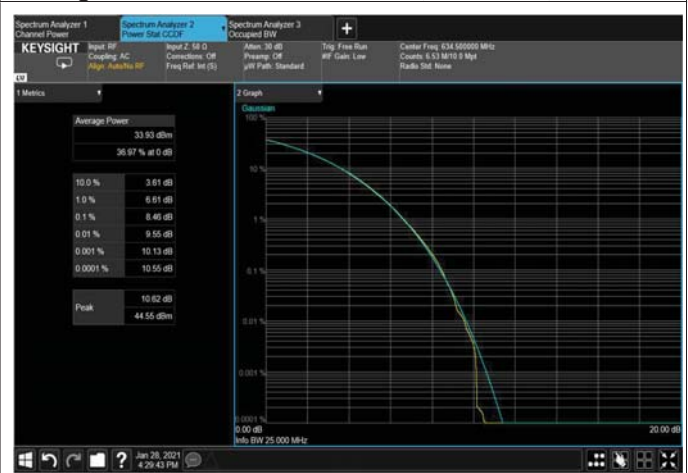


Figure 207: 64QAM 10MHz B.W; 634.5MHz, 30kHz

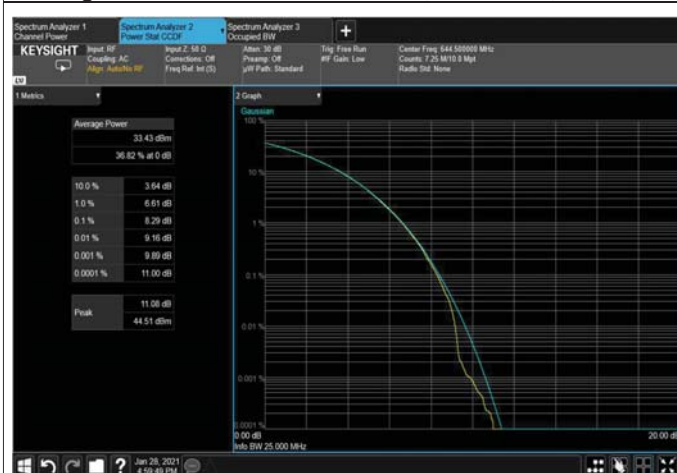


Figure 208: 64QAM 15MHz B.W; 644.5MHz, 15kHz

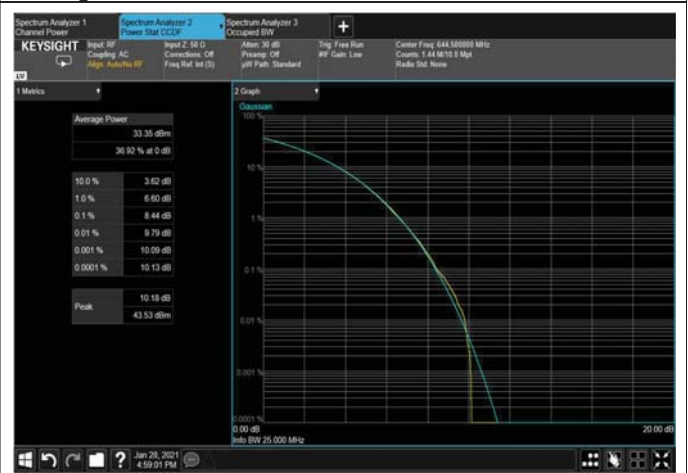


Figure 209: 64QAM 15MHz B.W; 644.5MHz, 30kHz

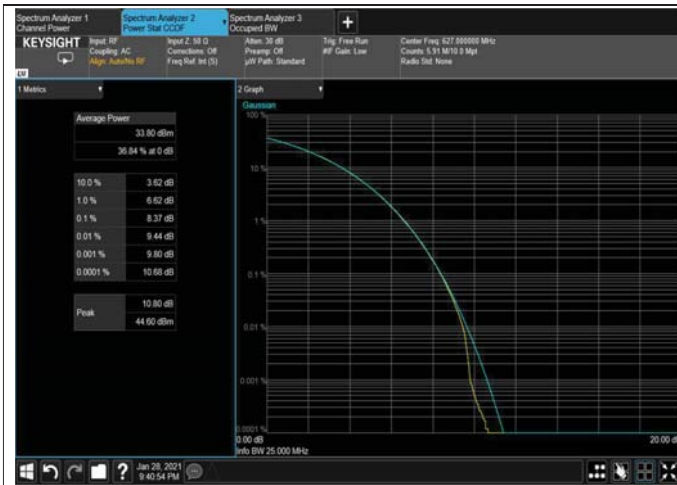


Figure 210: 64QAM 20MHz B.W; 627.0MHz, 15kHz

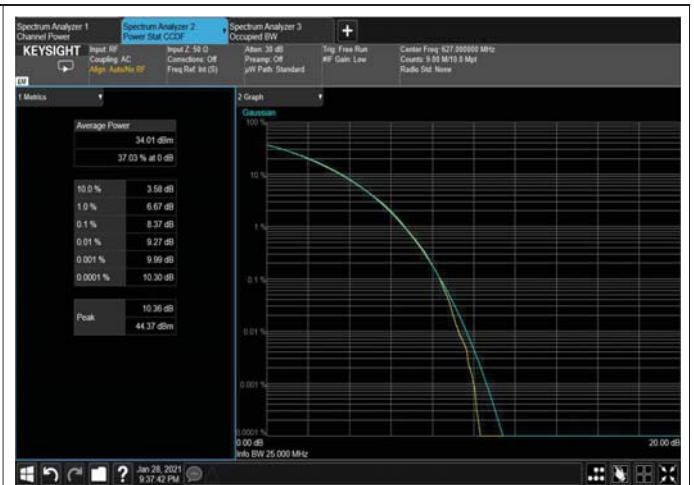


Figure 211: 64QAM 20MHz B.W; 627.0MHz, 30kHz

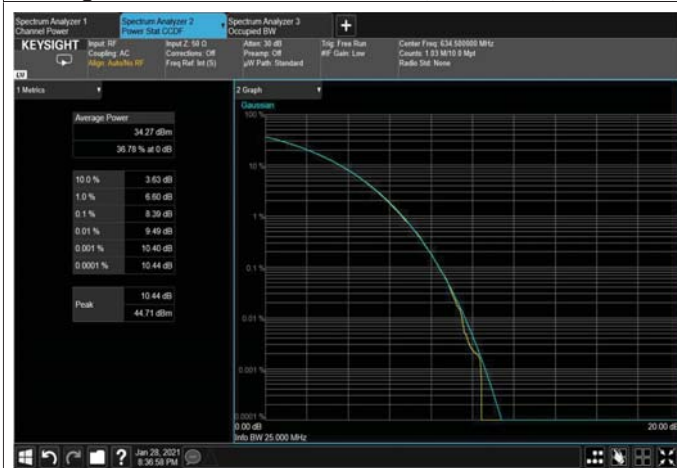


Figure 212: 64QAM 20MHz B.W; 634.5MHz, 15kHz

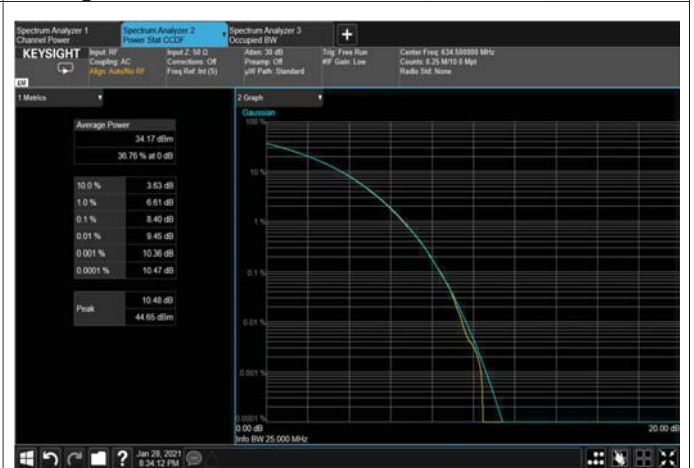


Figure 213: 64QAM 20MHz B.W; 634.5MHz, 30kHz

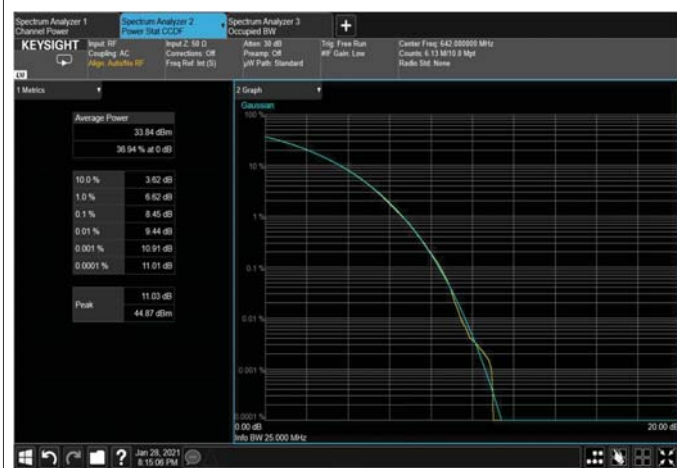


Figure 214: 64QAM 20MHz B.W; 642.0MHz, 15kHz

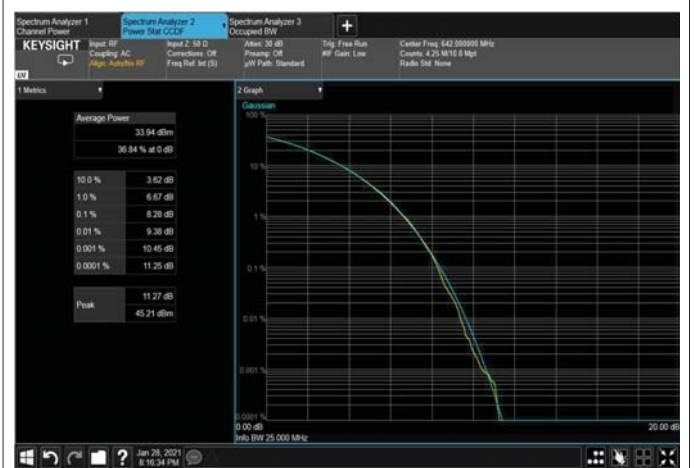


Figure 215: 64QAM 20MHz B.W; 642.0MHz, 30kHz

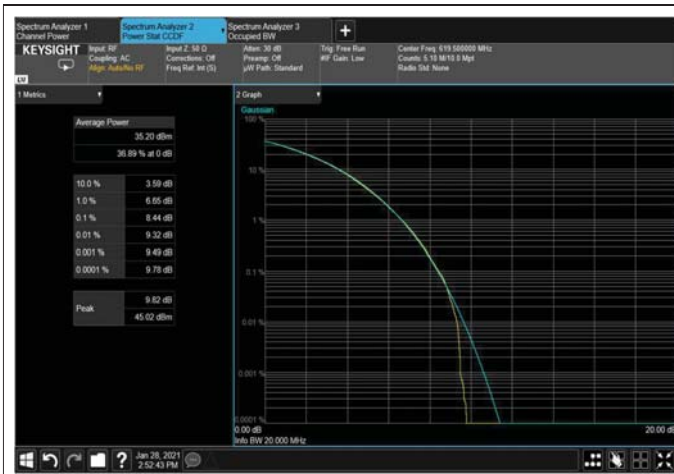


Figure 216: 64QAM 5MHz B.W; 619.5MHz, 15kHz

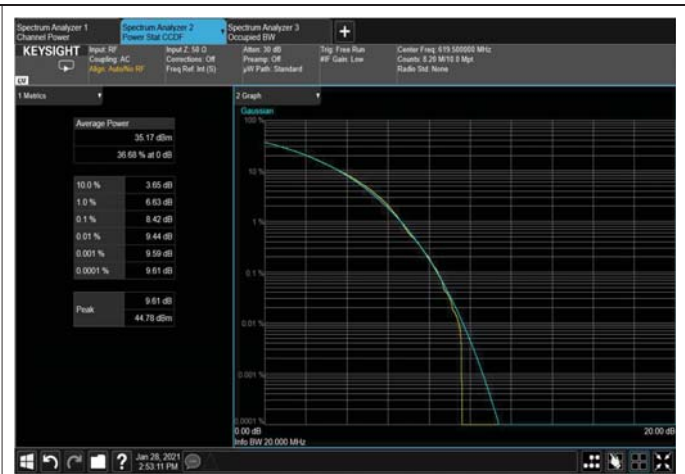


Figure 217: 256QAM 5MHz B.W; 619.5MHz, 30kHz

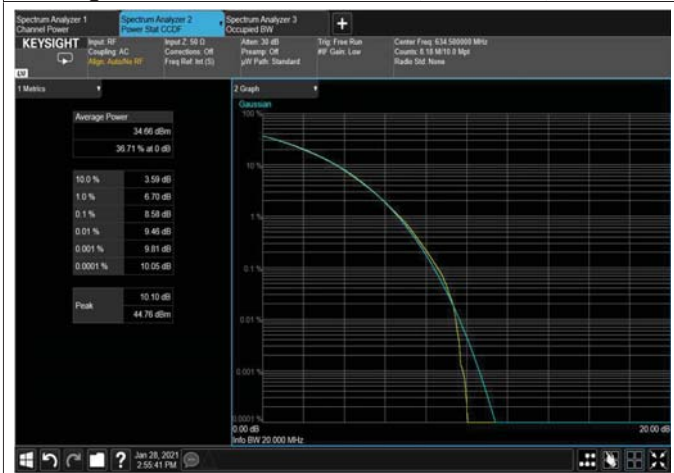


Figure 218: 256QAM 5MHz B.W; 634.5MHz, 15kHz

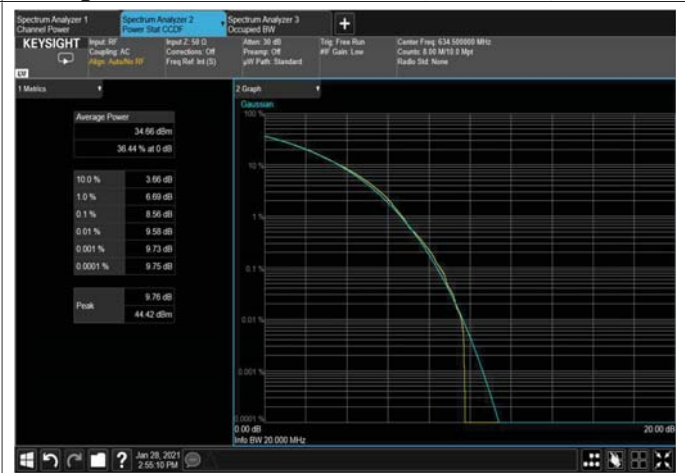


Figure 219: 256QAM 5MHz B.W; 634.5MHz, 30kHz

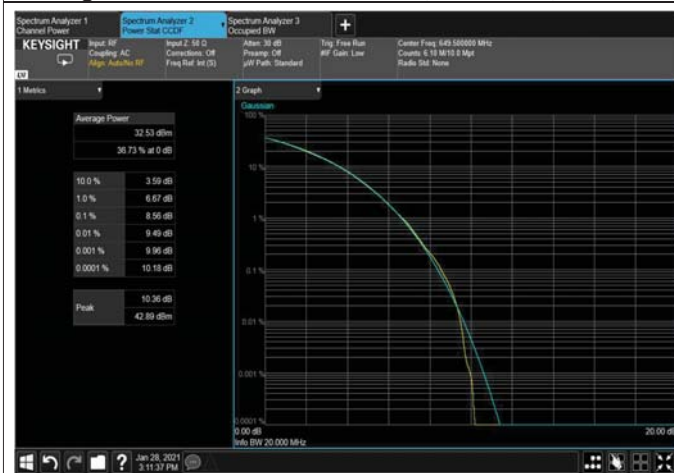


Figure 220: 256QAM 5MHz B.W; 649.5MHz, 15kHz

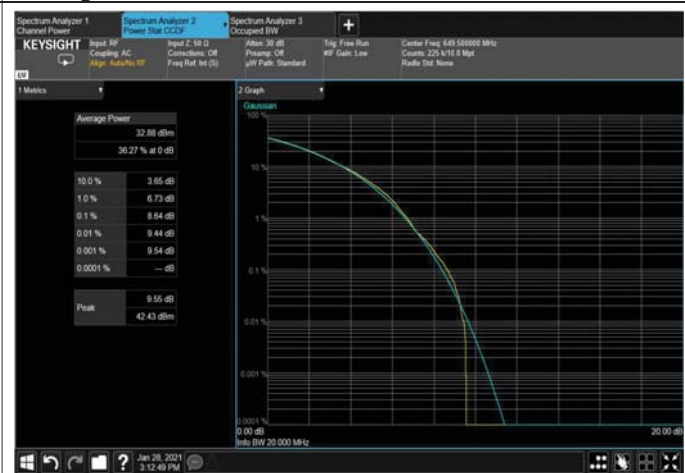


Figure 221: 256QAM 5MHz B.W; 649.5MHz, 30kHz

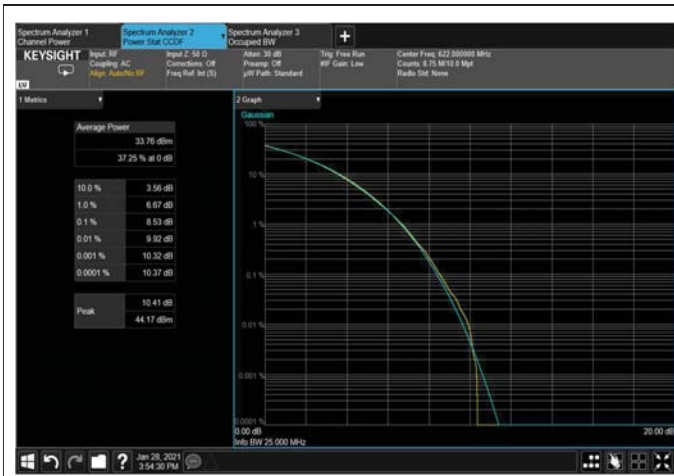


Figure 222: 256QAM 10MHz B.W; 622.0MHz, 15kHz

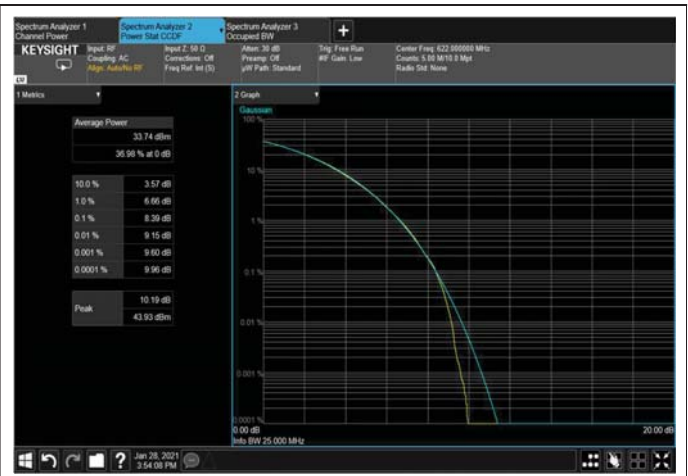


Figure 223: 256QAM 10MHz B.W; 622.0MHz, 30kHz

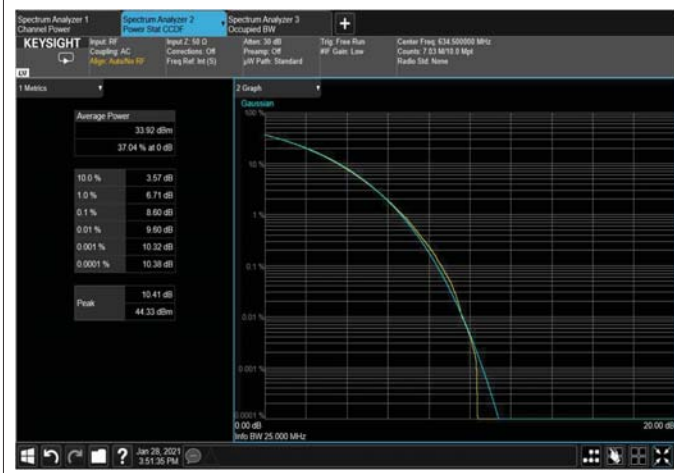


Figure 224: 256QAM 10MHz B.W; 634.5MHz, 15kHz

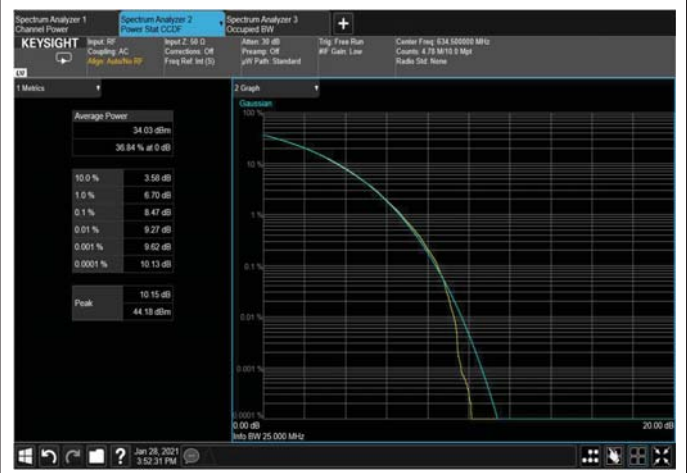


Figure 225: 256QAM 10MHz B.W; 634.5MHz, 30kHz

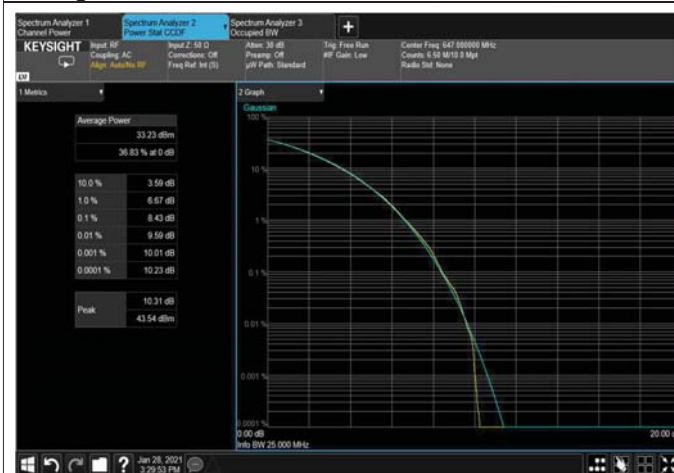


Figure 226: 256QAM 10MHz B.W; 647.0MHz, 15kHz

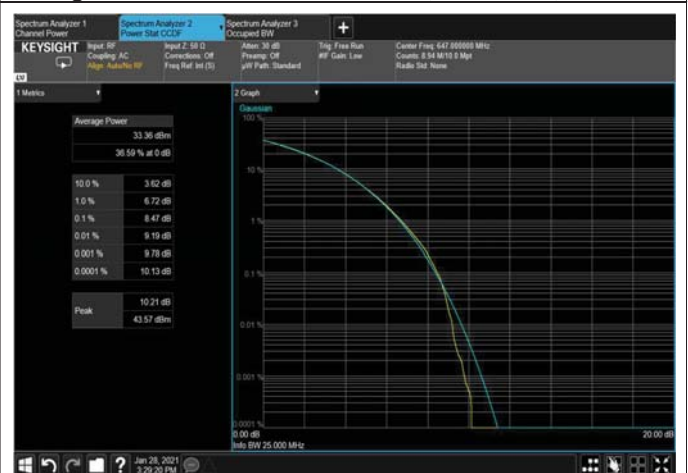


Figure 227: 256QAM 10MHz B.W; 647.0MHz, 30kHz

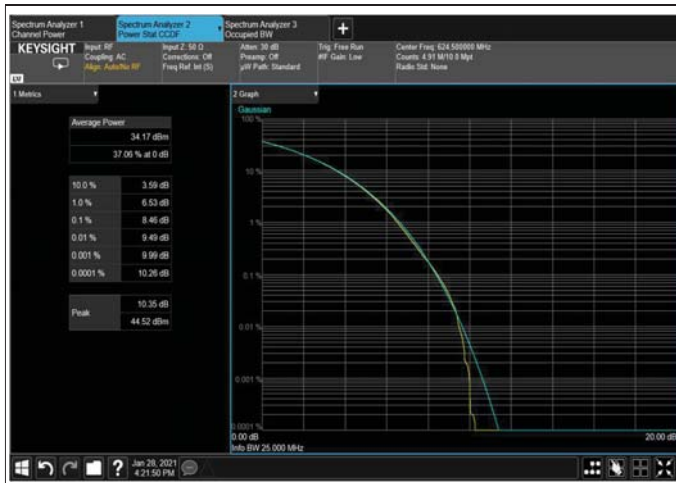


Figure 228: 256QAM 15MHz B.W; 624.5MHz, 15kHz

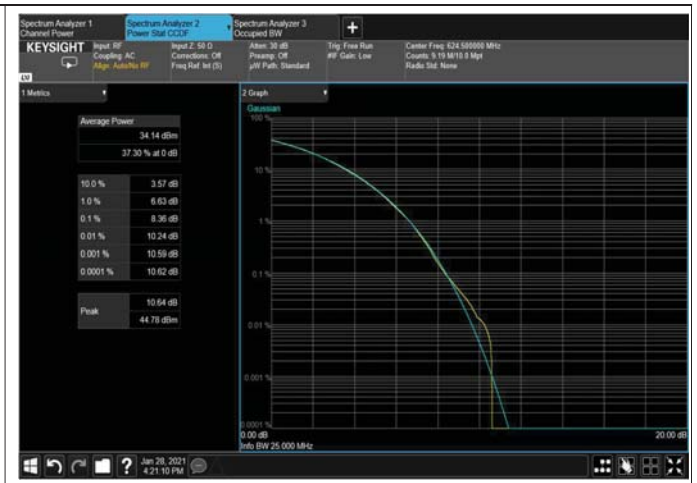


Figure 229: 256QAM 15MHz B.W; 624.5MHz, 30kHz

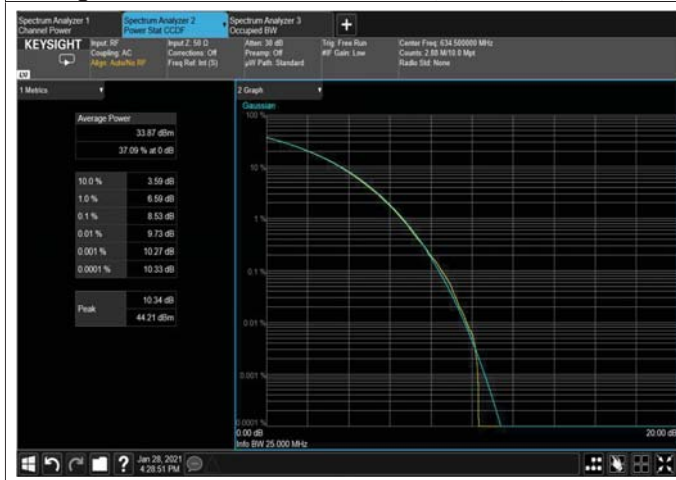


Figure 230: 256QAM 15MHz B.W; 634.5MHz, 15kHz

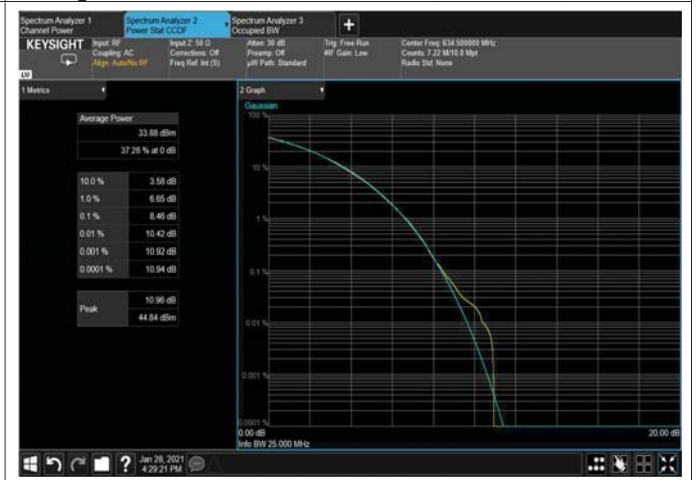


Figure 231: 256QAM 15MHz B.W; 634.5MHz, 30kHz

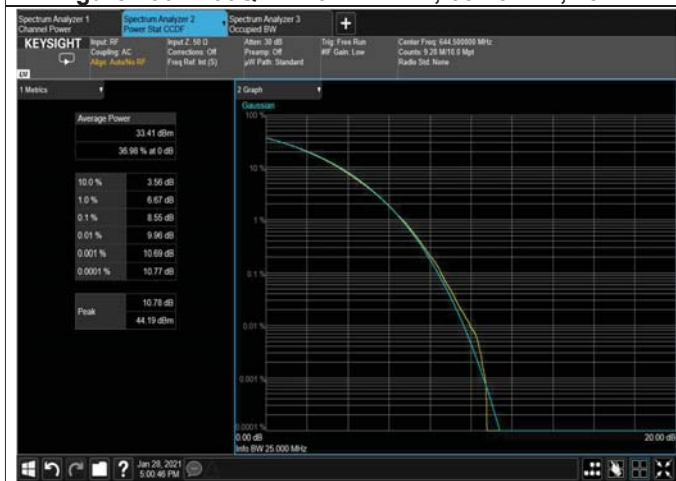


Figure 232: 256QAM 15MHz B.W; 644.5MHz, 15kHz

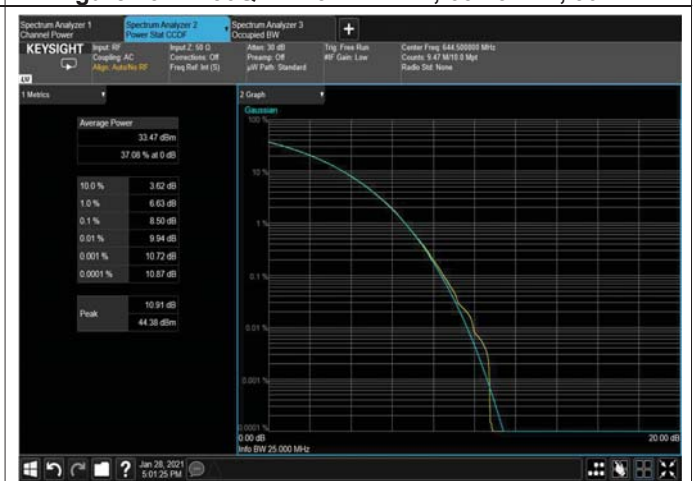


Figure 233: 256QAM 15MHz B.W; 644.5MHz, 30kHz

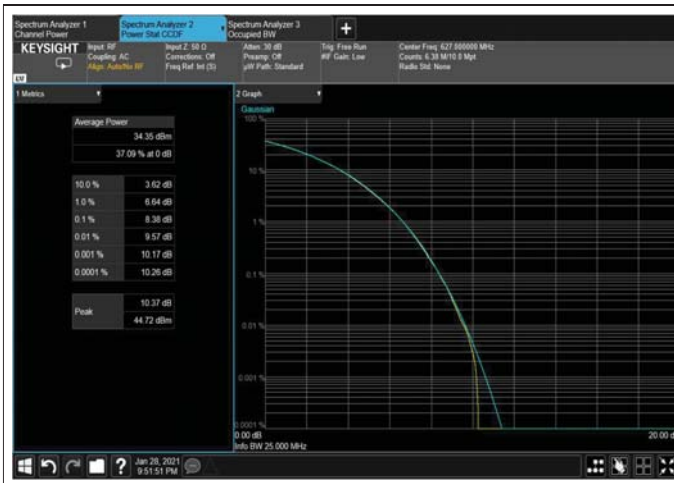


Figure 234: 256QAM 20MHz B.W; 627MHz, 15kHz

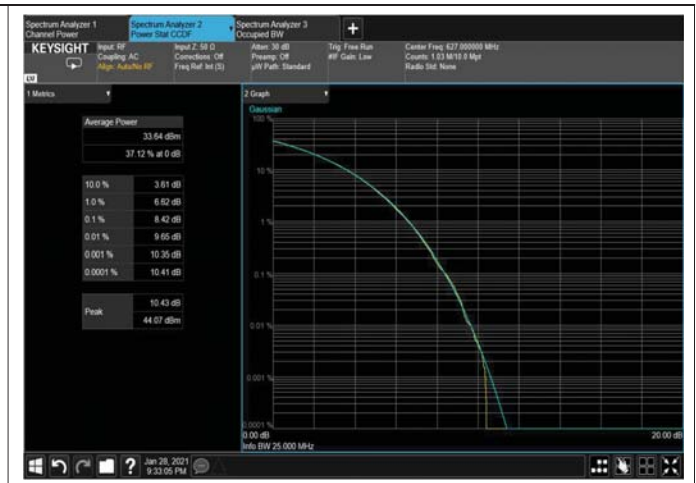


Figure 235: 256QAM 20MHz B.W; 627.0MHz, 30kHz

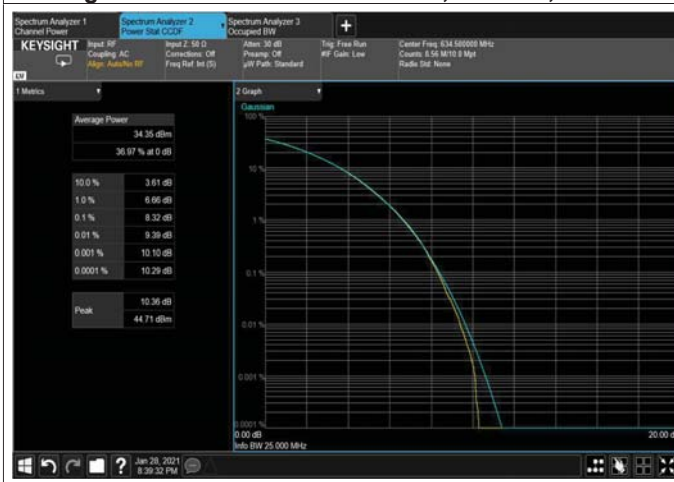


Figure 236: 256QAM 20MHz B.W; 634.5MHz, 15kHz

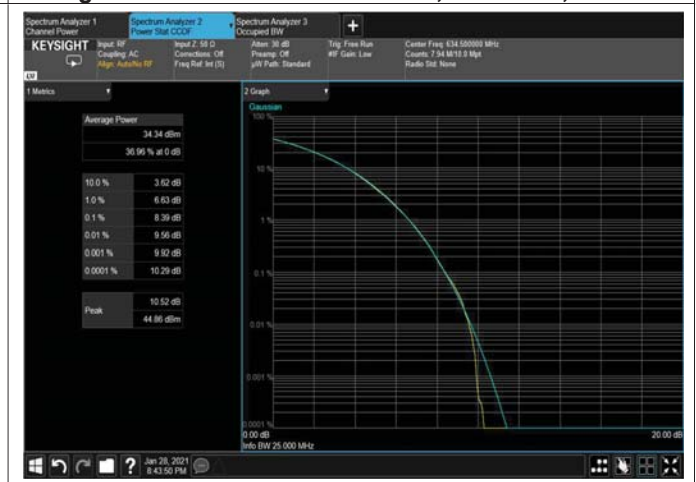


Figure 237: 256QAM 20MHz B.W; 642.0MHz, 30kHz

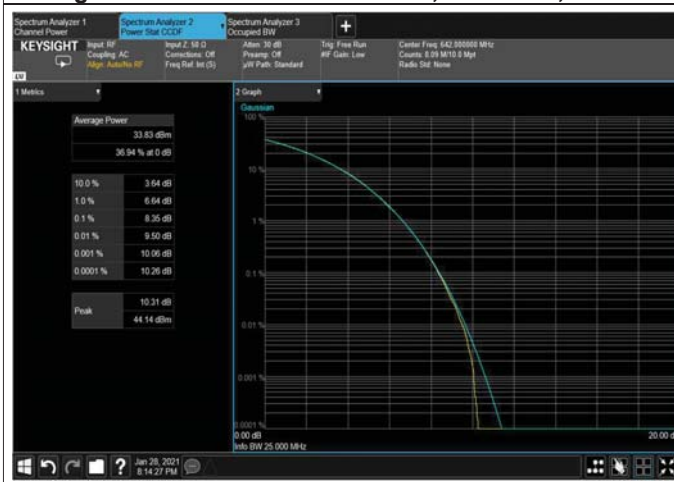


Figure 238: 256QAM 20MHz B.W; 642.0MHz, 15kHz

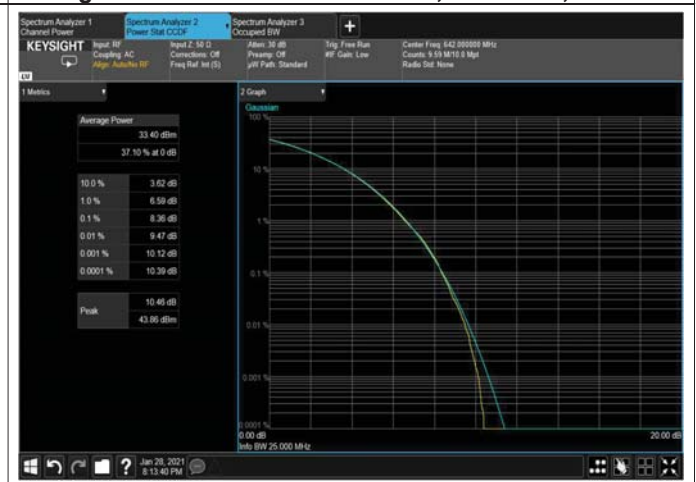


Figure 239: 256QAM 20MHz B.W; 642.0MHz, 30kHz



Figure 240: QPSK 5MHz B.W; 619.5MHz, 15kHz

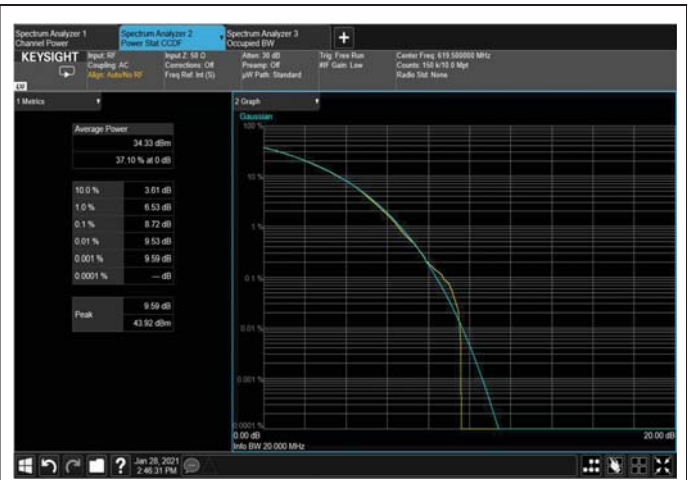


Figure 241: QPSK 5MHz B.W; 619.5MHz, 30kHz



Figure 242: QPSK 5MHz B.W; 634.5MHz, 15kHz

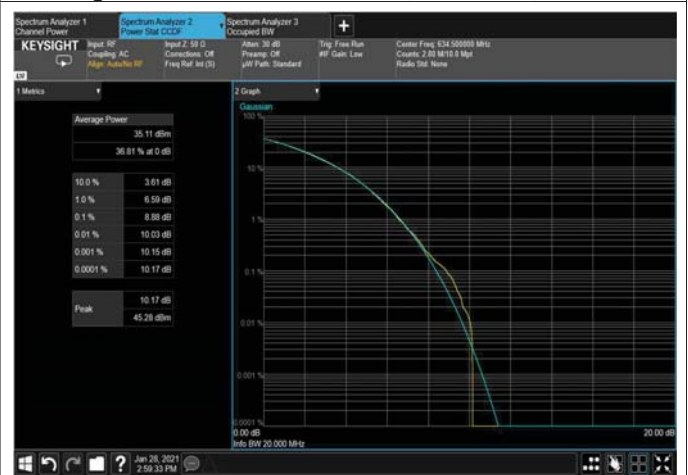


Figure 243: QPSK 5MHz B.W; 634.5MHz, 30kHz

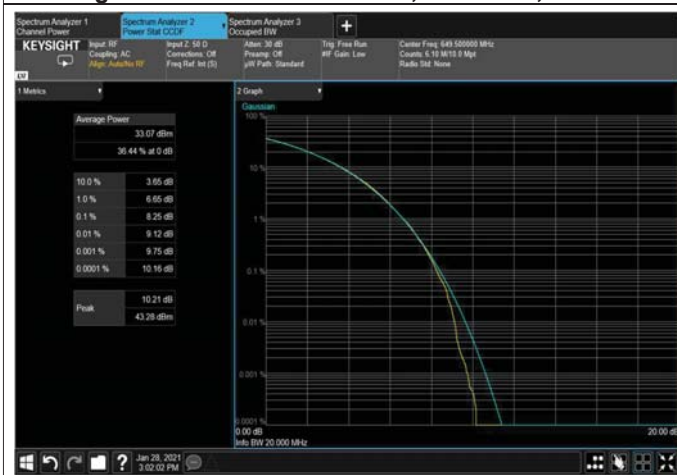


Figure 244: QPSK 5MHz B.W; 649.5MHz, 30kHz

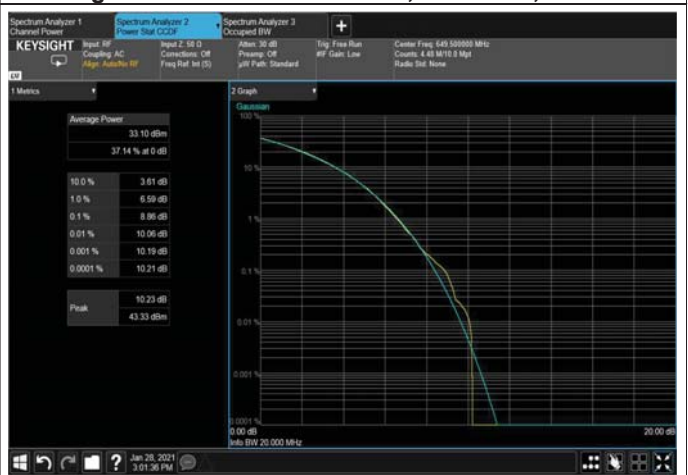


Figure 245: QPSK 5MHz B.W; 649.5MHz, 30kHz

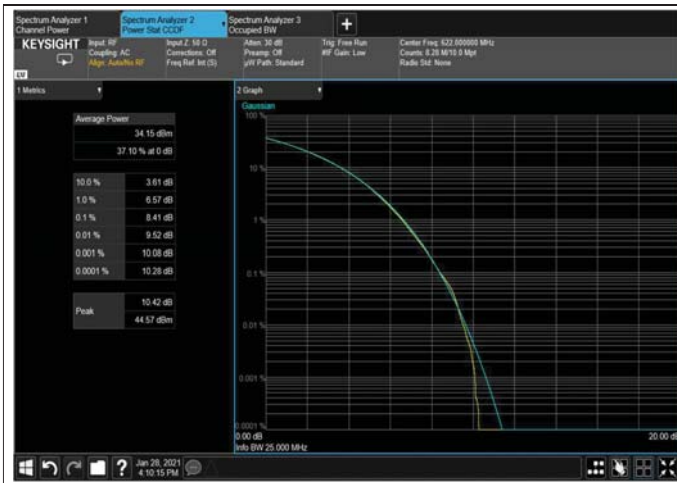


Figure 246: QPSK 10MHz B.W; 622.0MHz, 15kHz

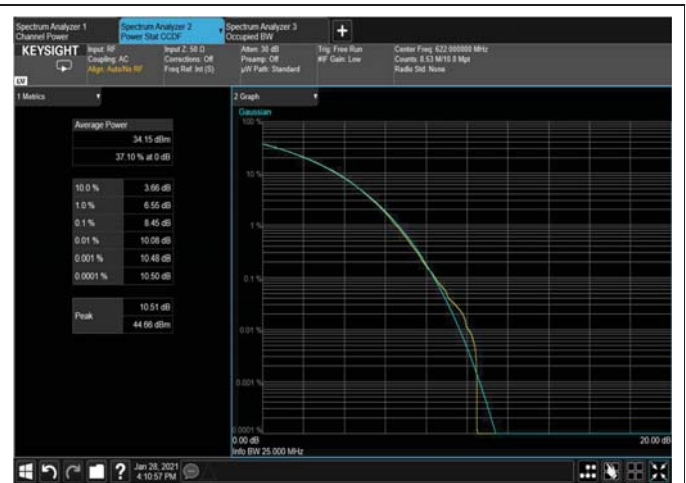


Figure 247: QPSK 10MHz B.W; 622MHz, 30kHz

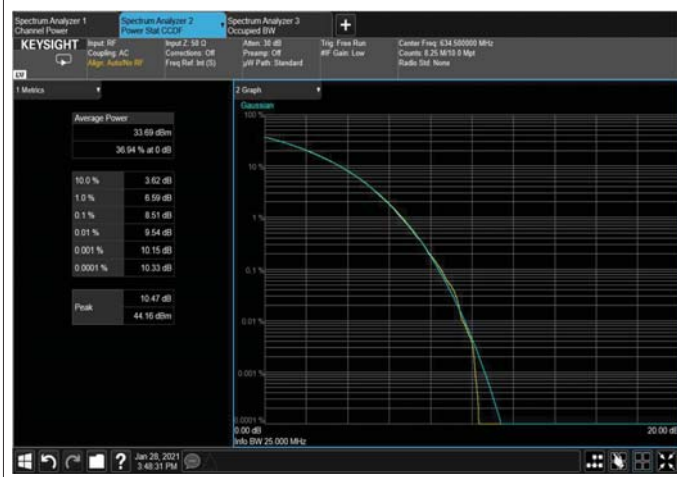


Figure 248: QPSK 10MHz B.W; 634.5MHz, 15kHz

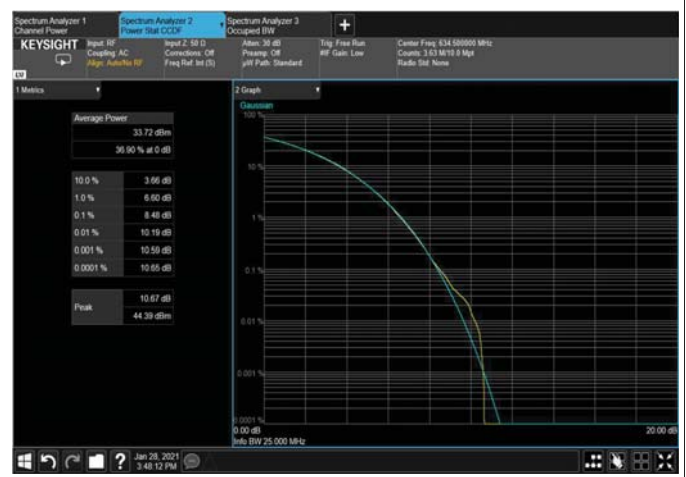


Figure 249: QPSK 10MHz B.W; 634.5MHz, 30kHz

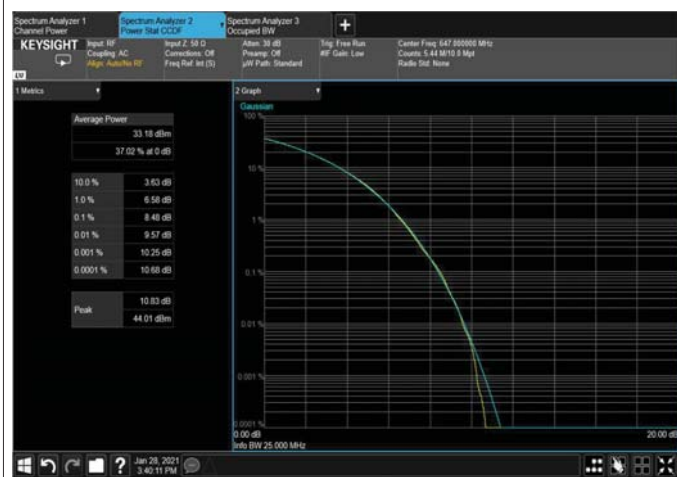


Figure 250: QPSK 10MHz B.W; 647.0MHz, 15kHz

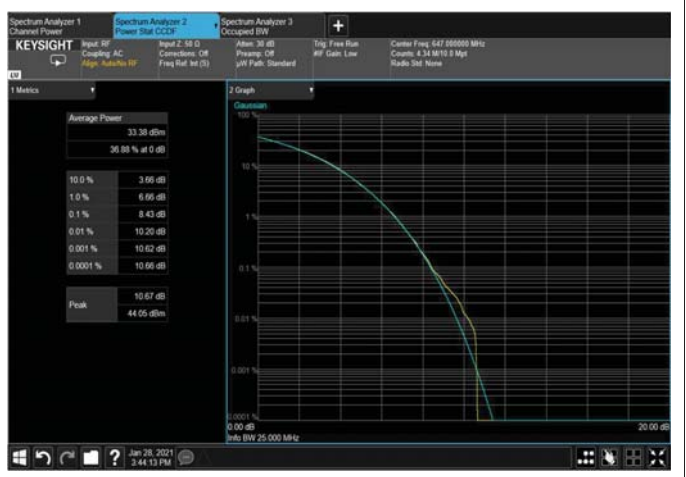


Figure 251: QPSK 10MHz B.W; 647.0MHz, 30kHz

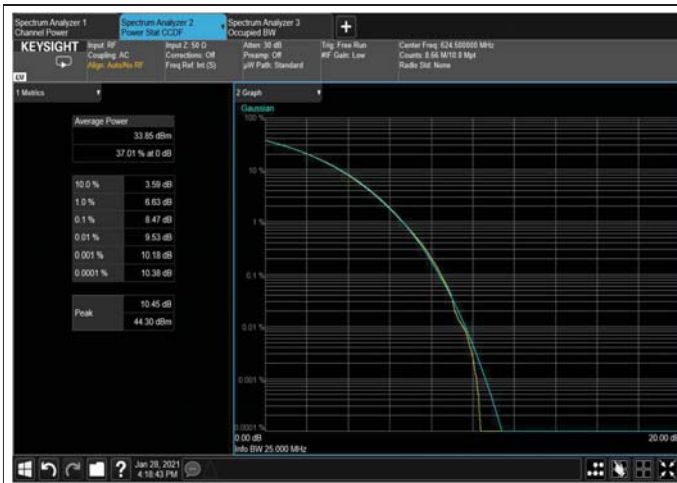


Figure 252: QPSK 15MHz B.W; 624.5MHz, 15kHz

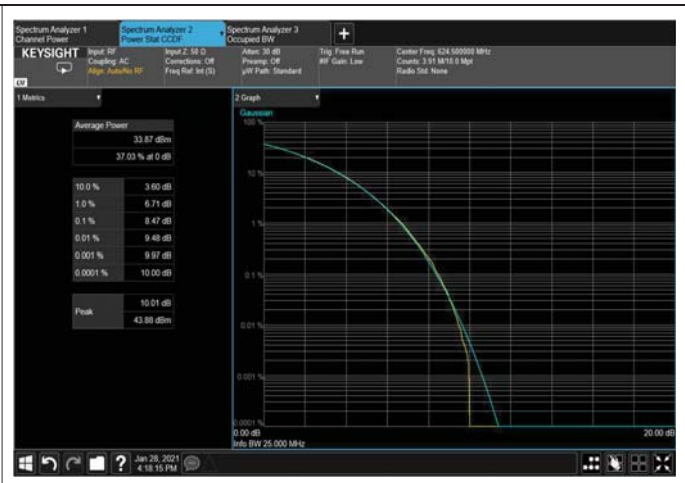


Figure 253: QPSK 15MHz B.W; 624.5MHz, 30kHz

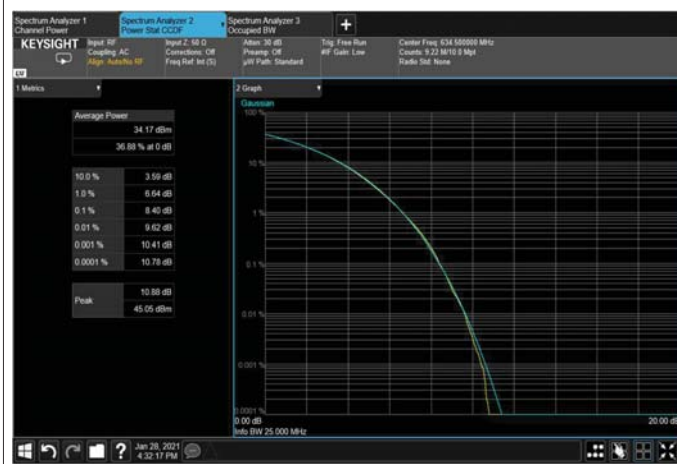


Figure 254: QPSK 15MHz B.W; 634.5MHz, 15kHz

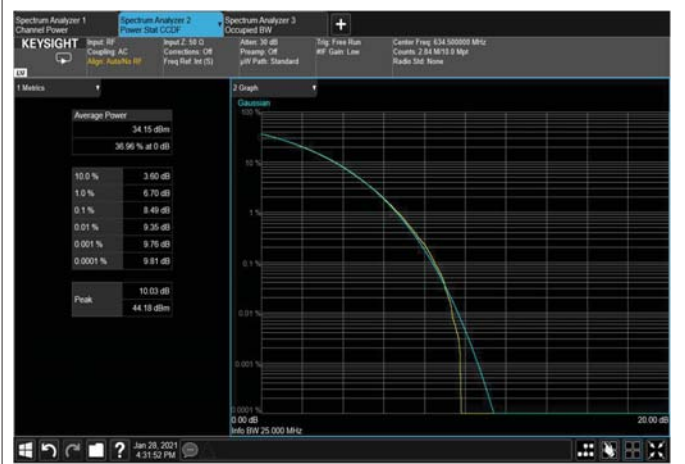


Figure 255: QPSK 15MHz B.W; 634.5MHz, 30kHz

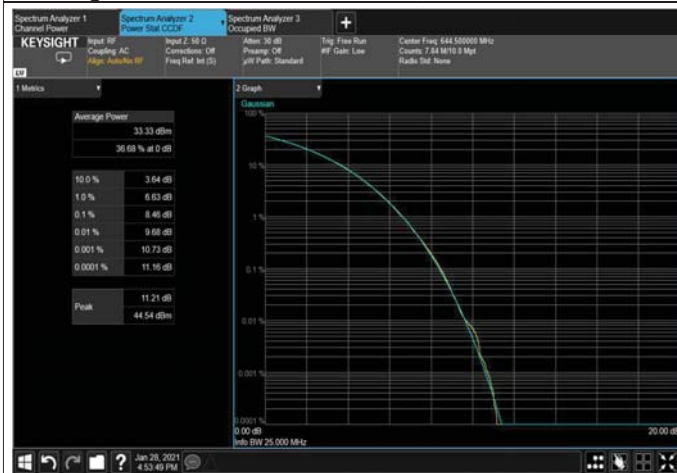


Figure 256: QPSK 15MHz B.W; 644.5MHz, 15kHz

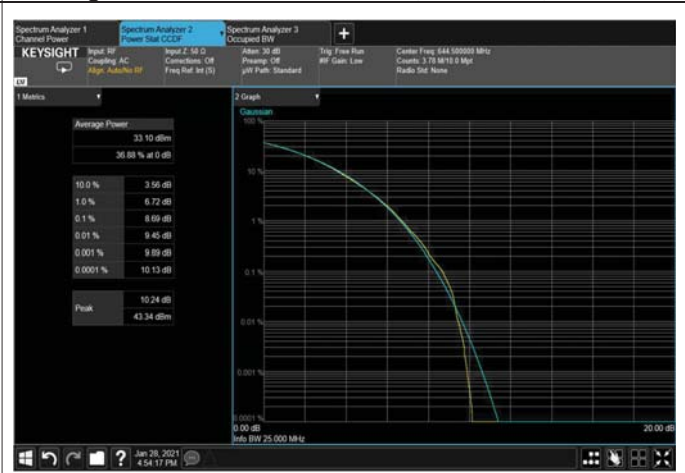


Figure 257: QPSK 15MHz B.W; 644.5MHz, 30kHz

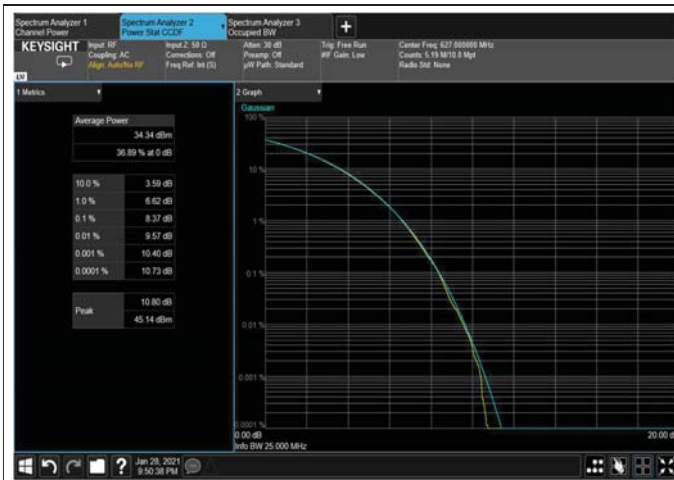


Figure 258: QPSK 20MHz B.W; 627.0MHz, 15kHz

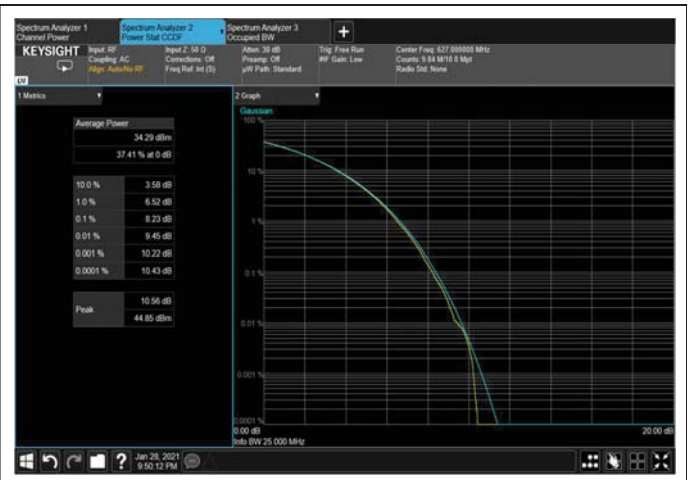


Figure 259: QPSK 20MHz B.W; 627.0MHz, 30kHz

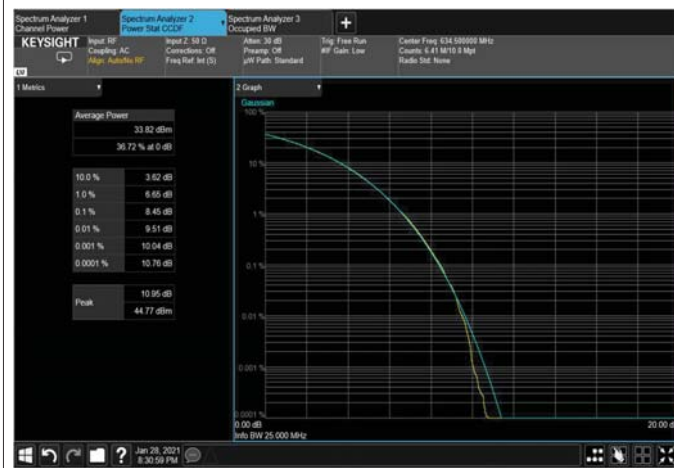


Figure 260: QPSK 20MHz B.W; 634.5MHz, 15kHz

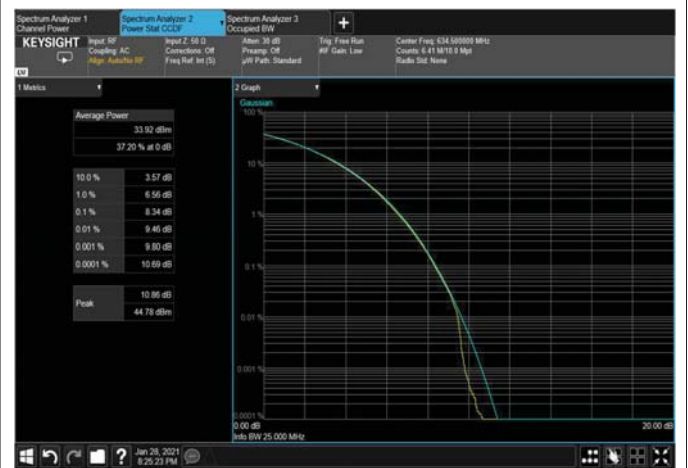


Figure 261: QPSK 20MHz B.W; 634.5MHz, 30kHz

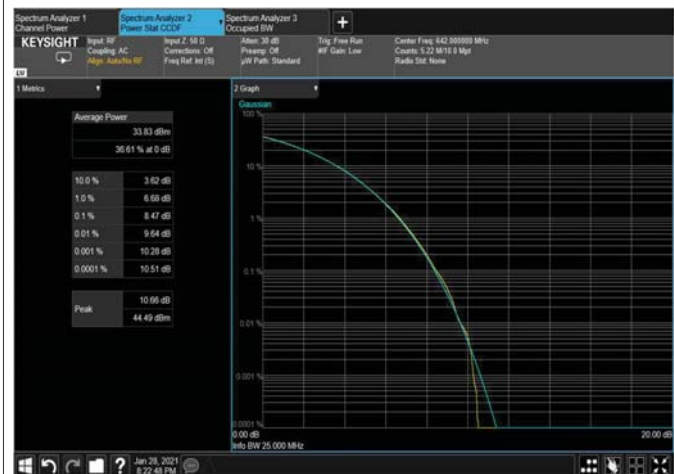


Figure 262: QPSK 20MHz B.W; 642.0MHz, 15kHz

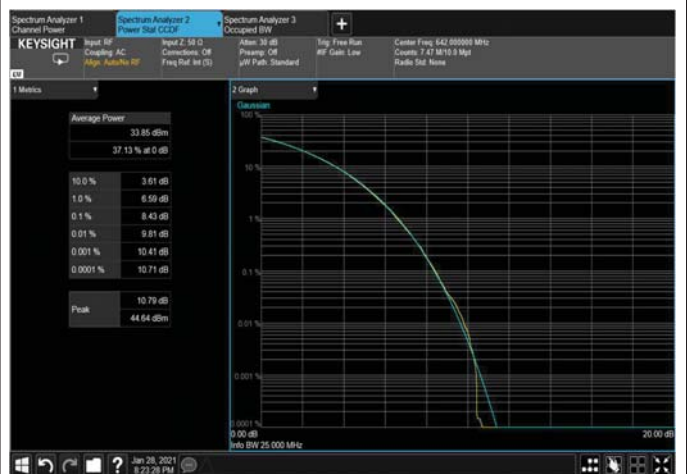


Figure 263: QPSK 20MHz B.W; 642.0MHz, 30kHz



6.5 Test Equipment Used; 0.1% PAPR

| 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 15 Test Equipment Used



7 Occupied Bandwidth

7.1 Test Specification

FCC Part 2, Section 1049

7.2 Test Procedure

(Temperature (20°C)/ Humidity (46%RH))

The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator and an appropriate coaxial cable (loss=40.7 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.

7.3 Test Limit

N/A

7.4 Test Results

JUDGEMENT: Passed

See additional information in Table 16 to Table 23 and Figure 264 to Figure 455.



| Modulation | Bandwidth | Sub Carrier | Operation Frequency | Reading |
|------------|-----------|-------------|---------------------|---------|
| | (MHz) | (kHz) | (MHz) | (MHz) |
| 16QAM | 5 | 15 | 619.5 | 4.5363 |
| | | 30 | | 4.0607 |
| | | 15 | 634.5 | 4.5333 |
| | | 30 | | 4.0601 |
| | | 15 | 649.5 | 4.5356 |
| | | 30 | | 4.0595 |
| | 10 | 15 | 622.0 | 9.2479 |
| | | 30 | | 8.6051 |
| | | 15 | 634.5 | 9.2498 |
| | | 30 | | 8.5912 |
| | | 15 | 647.0 | 9.2427 |
| | | 30 | | 8.5964 |
| | 15 | 15 | 624.5 | 14.180 |
| | | 30 | | 13.540 |
| | | 15 | 634.5 | 14.175 |
| | | 30 | | 13.551 |
| | | 15 | 644.5 | 14.175 |
| | | 30 | | 13.551 |
| | 20 | 15 | 627.0 | 19.038 |
| | | 30 | | 18.348 |
| | | 15 | 634.5 | 19.037 |
| | | 30 | | 18.359 |
| | | 15 | 642.0 | 19.050 |
| | | 30 | | 18.355 |

Table 16 Occupied Bandwidth 16 QAM Input



| Modulation | Bandwidth | Sub Carrier | Operation Frequency | Reading |
|------------|-----------|-------------|---------------------|---------|
| | (MHz) | (kHz) | (MHz) | (MHz) |
| 64QAM | 5 | 15 | 619.5 | 4.4929 |
| | | 30 | | 3.9965 |
| | | 15 | 634.5 | 4.4923 |
| | | 30 | | 3.9990 |
| | | 15 | 649.5 | 4.4925 |
| | | 30 | | 4.0002 |
| | 10 | 15 | 622.0 | 9.3355 |
| | | 30 | | 8.6337 |
| | | 15 | 634.5 | 9.3343 |
| | | 30 | | 8.6380 |
| | | 15 | 647.0 | 9.3342 |
| | | 30 | | 8.6326 |
| | 15 | 15 | 624.5 | 14.141 |
| | | 30 | | 13.653 |
| | | 15 | 634.5 | 14.139 |
| | | 30 | | 13.655 |
| | | 15 | 644.5 | 14.147 |
| | | 30 | | 13.658 |
| | 20 | 15 | 627.0 | 18.975 |
| | | 30 | | 18.318 |
| | | 15 | 634.5 | 18.963 |
| | | 30 | | 18.315 |
| | | 15 | 642.0 | 18.947 |
| | | 30 | | 18.308 |

Table 17 Occupied Bandwidth 16QAM Output



| Modulation | Bandwidth | Sub Carrier | Operation Frequency | Reading |
|------------|-----------|-------------|---------------------|---------|
| | (MHz) | (kHz) | (MHz) | (MHz) |
| 256QAM | 5 | 15 | 619.5 | 4.4907 |
| | | 30 | | 4.0229 |
| | | 15 | 634.5 | 4.4902 |
| | | 30 | | 4.0208 |
| | | 15 | 649.5 | 4.4883 |
| | | 30 | | 4.0222 |
| | 10 | 15 | 622.0 | 9.3158 |
| | | 30 | | 8.6500 |
| | | 15 | 634.5 | 9.3048 |
| | | 30 | | 8.6307 |
| | | 15 | 647.0 | 9.3265 |
| | | 30 | | 8.6346 |
| | 15 | 15 | 624.5 | 14.148 |
| | | 30 | | 13.612 |
| | | 15 | 634.5 | 14.122 |
| | | 30 | | 13.607 |
| | | 15 | 644.5 | 14.121 |
| | | 30 | | 13.605 |
| | 20 | 15 | 627.0 | 18.958 |
| | | 30 | | 18.269 |
| | | 15 | 634.5 | 18.977 |
| | | 30 | | 18.270 |
| | | 15 | 642.0 | 18.947 |
| | | 30 | | 18.259 |

Table 18 Occupied Bandwidth 64QAM Input



| Modulation | Bandwidth | Sub Carrier | Operation Frequency | Reading |
|------------|-----------|-------------|---------------------|---------|
| | (MHz) | (kHz) | (MHz) | (MHz) |
| QPSK | 5 | 15 | 619.5 | 4.5206 |
| | | 30 | | 4.1141 |
| | | 15 | 634.5 | 4.5217 |
| | | 30 | | 4.1150 |
| | | 15 | 649.5 | 4.5213 |
| | | 30 | | 4.1164 |
| | 10 | 15 | 622.0 | 9.1576 |
| | | 30 | | 8.5157 |
| | | 15 | 634.5 | 9.1621 |
| | | 30 | | 8.5245 |
| | | 15 | 647.0 | 9.1669 |
| | | 30 | | 8.5213 |
| | 15 | 15 | 624.5 | 14.182 |
| | | 30 | | 13.389 |
| | | 15 | 634.5 | 14.183 |
| | | 30 | | 13.378 |
| | | 15 | 644.5 | 14.186 |
| | | 30 | | 13.372 |
| | 20 | 15 | 627.0 | 19.039 |
| | | 30 | | 18.489 |
| | | 15 | 634.5 | 19.036 |
| | | 30 | | 18.496 |
| | | 15 | 642.0 | 19.033 |
| | | 30 | | 18.495 |

Table 19 Occupied Bandwidth 64QAM Output



| Modulation | Bandwidth | Sub Carrier | Operation Frequency | Reading |
|------------|-----------|-------------|---------------------|---------|
| | (MHz) | (kHz) | (MHz) | (MHz) |
| 16QAM | 5 | 15 | 619.5 | 4.5281 |
| | | 30 | | 4.0569 |
| | | 15 | 634.5 | 4.5319 |
| | | 30 | | 4.0586 |
| | | 15 | 649.5 | 4.5206 |
| | | 30 | | 4.0483 |
| | 10 | 15 | 622.0 | 9.2249 |
| | | 30 | | 8.5837 |
| | | 15 | 634.5 | 9.2324 |
| | | 30 | | 8.5830 |
| | | 15 | 647.0 | 9.2032 |
| | | 30 | | 8.5519 |
| | 15 | 15 | 624.5 | 14.158 |
| | | 30 | | 13.510 |
| | | 15 | 634.5 | 14.159 |
| | | 30 | | 13.517 |
| | | 15 | 644.5 | 14.146 |
| | | 30 | | 13.478 |
| | 20 | 15 | 627.0 | 19.004 |
| | | 30 | | 18.331 |
| | | 15 | 634.5 | 19.017 |
| | | 30 | | 18.340 |
| | | 15 | 642.0 | 18.977 |
| | | 30 | | 18.307 |

Table 20 Occupied Bandwidth 256QAM Input



| Modulation | Bandwidth | Sub Carrier | Operation Frequency | Reading |
|------------|-----------|-------------|---------------------|---------|
| | (MHz) | (kHz) | (MHz) | (MHz) |
| 64QAM | 5 | 15 | 619.5 | 4.4870 |
| | | 30 | | 3.9956 |
| | | 15 | 634.5 | 4.5307 |
| | | 30 | | 3.9958 |
| | | 15 | 649.5 | 4.4784 |
| | | 30 | | 3.9898 |
| | 10 | 15 | 622.0 | 9.3140 |
| | | 30 | | 8.6236 |
| | | 15 | 634.5 | 9.3159 |
| | | 30 | | 8.6274 |
| | | 15 | 647.0 | 9.3028 |
| | | 30 | | 8.6178 |
| | 15 | 15 | 624.5 | 14.117 |
| | | 30 | | 13.622 |
| | | 15 | 634.5 | 14.126 |
| | | 30 | | 13.634 |
| | | 15 | 644.5 | 14.101 |
| | | 30 | | 13.620 |
| | 20 | 15 | 627.0 | 18.956 |
| | | 30 | | 18.282 |
| | | 15 | 634.5 | 18.939 |
| | | 30 | | 18.306 |
| | | 15 | 642.0 | 18.894 |
| | | 30 | | 18.274 |

Table 21 Occupied Bandwidth 256QAM Output



| Modulation | Bandwidth | Sub Carrier | Operation Frequency | Reading |
|------------|-----------|-------------|---------------------|---------|
| | (MHz) | (kHz) | (MHz) | (MHz) |
| 256QAM | 5 | 15 | 619.5 | 4.4864 |
| | | 30 | | 4.0184 |
| | | 15 | 634.5 | 4.4894 |
| | | 30 | | 4.0224 |
| | | 15 | 649.5 | 4.4778 |
| | | 30 | | 4.0158 |
| | 10 | 15 | 622.0 | 9.3012 |
| | | 30 | | 8.6305 |
| | | 15 | 634.5 | 9.3040 |
| | | 30 | | 8.6290 |
| | | 15 | 647.0 | 9.2905 |
| | | 30 | | 8.6227 |
| | 15 | 15 | 624.5 | 14.112 |
| | | 30 | | 13.562 |
| | | 15 | 634.5 | 14.131 |
| | | 30 | | 13.587 |
| | | 15 | 644.5 | 14.117 |
| | | 30 | | 13.575 |
| | 20 | 15 | 627.0 | 18.914 |
| | | 30 | | 18.232 |
| | | 15 | 634.5 | 18.930 |
| | | 30 | | 18.241 |
| | | 15 | 642.0 | 18.893 |
| | | 30 | | 18.223 |

Table 22 Occupied Bandwidth QPSK Input



| Modulation | Bandwidth | Sub Carrier | Operation Frequency | Reading |
|------------|-----------|-------------|---------------------|---------|
| | (MHz) | (kHz) | (MHz) | (MHz) |
| QPSK | 5 | 15 | 619.5 | 4.5153 |
| | | 30 | | 4.1068 |
| | | 15 | 634.5 | 4.5209 |
| | | 30 | | 4.1083 |
| | | 15 | 649.5 | 4.5038 |
| | | 30 | | 4.0976 |
| | 10 | 15 | 622.0 | 9.1310 |
| | | 30 | | 8.4996 |
| | | 15 | 634.5 | 9.1406 |
| | | 30 | | 8.4966 |
| | | 15 | 647.0 | 9.0951 |
| | | 30 | | 8.4653 |
| | 15 | 15 | 624.5 | 14.165 |
| | | 30 | | 13.348 |
| | | 15 | 634.5 | 14.173 |
| | | 30 | | 13.370 |
| | | 15 | 644.5 | 14.156 |
| | | 30 | | 13.271 |
| | 20 | 15 | 627.0 | 19.015 |
| | | 30 | | 18.466 |
| | | 15 | 634.5 | 19.033 |
| | | 30 | | 18.474 |
| | | 15 | 642.0 | 18.995 |
| | | 30 | | 18.436 |

Table 23 Occupied Bandwidth QPSK Output



Figure 264: 16QAM 5MHz B.W; 619.5MHz, 15kHz Input



Figure 265: 16QAM 5MHz B.W; 619.5MHz, 30kHz Input



Figure 266: 16QAM 5MHz B.W; 634.5MHz, 15kHz Input



Figure 267: 16QAM 5MHz B.W; 634.5MHz, 30kHz Input



Figure 268: 16QAM 5MHz B.W; 649.5MHz, 15kHz Input



Figure 269: 16QAM 5MHz B.W; 649.5MHz, 30kHz Input



Figure 270: 16QAM 10MHz B.W; 622.0MHz, 15kHz Input



Figure 271: 16QAM 10MHz B.W; 622.0MHz, 30kHz Input



Figure 272: 16QAM 10MHz B.W; 634.5MHz, 15kHz Input



Figure 273: 16QAM 10MHz B.W; 634.5MHz, 30kHz Input



Figure 274: 16QAM 10MHz B.W; 647.0MHz, 15kHz Input



Figure 275: 16QAM 10MHz B.W; 647.0MHz, 30kHz Input



Figure 276: 16QAM 15MHz B.W; 624.5MHz, 15kHz Input



Figure 277: 16QAM 15MHz B.W; 624.5MHz, 30kHz Input



Figure 278: 16QAM 15MHz B.W; 634.5MHz, 15kHz Input



Figure 279: 16QAM 15MHz B.W; 634.5MHz, 30kHz Input



Figure 280: 16QAM 15MHz B.W; 644.5MHz, 15kHz Input



Figure 281: 16QAM 15MHz B.W; 644.5MHz, 30kHz Input



Figure 282: 16QAM 20MHz B.W; 627.0MHz, 15kHz Input



Figure 283: 16QAM 20MHz B.W; 627.0MHz, 30kHz Input



Figure 284: 16QAM 20MHz B.W; 634.5MHz, 15kHz Input



Figure 285: 16QAM 20MHz B.W; 634.5MHz, 30kHz Input



Figure 286: 16QAM 20MHz B.W; 642.0MHz, 15kHz Input



Figure 287: 16QAM 20MHz B.W; 642.0MHz, 30kHz Input



Figure 288: 16QAM 5MHz B.W; 619.5MHz, 15kHz Input



Figure 289: 64QAM 5MHz B.W; 619.5MHz, 30kHz Input



Figure 290: 64QAM 5MHz B.W; 634.5MHz, 15kHz Input



Figure 291: 64QAM 5MHz B.W; 634.5MHz, 30kHz Input



Figure 292: 64QAM 5MHz B.W; 649.5MHz, 15kHz Input



Figure 293: 64QAM 5MHz B.W; 649.5MHz, 30kHz Input



Figure 294: 64QAM 5MHz B.W; 622.0MHz, 15kHz Input



Figure 295: 64QAM 10MHz B.W; 622.0MHz, 30kHz Input



Figure 296: 64QAM 10MHz B.W; 634.5MHz, 15kHz Input



Figure 297: 64QAM 10MHz B.W; 634.5MHz, 30kHz Input



Figure 298: 64QAM 10MHz B.W; 647.0MHz, 15kHz Input



Figure 299: 64QAM 10MHz B.W; 647.0MHz, 30kHz Input



Figure 300: 64QAM 15MHz B.W; 624.5MHz, 15kHz Input



Figure 301: 64QAM 15MHz B.W; 624.5MHz, 30kHz Input



Figure 302: 64QAM 15MHz B.W; 634.5MHz, 15kHz Input



Figure 303: 64QAM 15MHz B.W; 634.5MHz, 30kHz Input



Figure 304: 64QAM 15MHz B.W; 644.5MHz, 15kHz Input



Figure 305: 64QAM 15MHz B.W; 644.5MHz, 30kHz Input



Figure 306: 64QAM 20MHz B.W; 627.0MHz, 15kHz Input



Figure 307: 64QAM 20MHz B.W; 627.0MHz, 30kHz Input



Figure 308: 64QAM 20MHz B.W; 634.5MHz, 15kHz Input



Figure 309: 64QAM 20MHz B.W; 634.5MHz, 30kHz Input



Figure 310: 64QAM 20MHz B.W; 642.0MHz, 15kHz Input



Figure 311: 64QAM 20MHz B.W; 642.0MHz, 30kHz Input



Figure 312: 256QAM 5MHz B.W; 619.5MHz, 15kHz Input



Figure 313: 256QAM 5MHz B.W; 619.5MHz, 30kHz Input



Figure 314: 256QAM 5MHz B.W; 634.5MHz, 15kHz Input



Figure 315: 256QAM 5MHz B.W; 634.5MHz, 30kHz Input



Figure 316: 256QAM 5MHz B.W; 649.5MHz, 15kHz Input



Figure 317: 256QAM 5MHz B.W; 649.5MHz, 30kHz Input



Figure 318: 256QAM 10MHz B.W; 622.0MHz, 15kHz Input



Figure 319: 256QAM 10MHz B.W; 622.0MHz, 30kHz Input



Figure 320: 256QAM 10MHz B.W; 634.5MHz, 15kHz Input



Figure 321: 256QAM 10MHz B.W; 634.5MHz, 30kHz Input



Figure 322: 256QAM 10MHz B.W; 647.0MHz, 15kHz Input

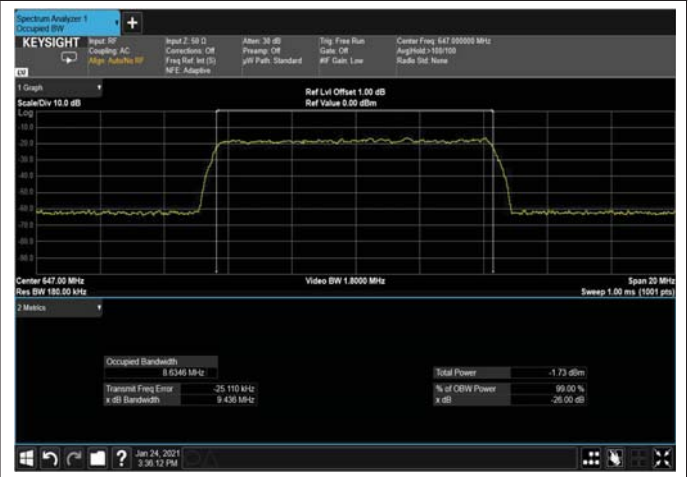


Figure 323: 256QAM 10MHz B.W; 647.0MHz, 30kHz Input



Figure 324: 256QAM 10MHz B.W; 624.5MHz, 15kHz Input



Figure 325: 256QAM 15MHz B.W; 624.5MHz, 30kHz Input



Figure 326: 256QAM 15MHz B.W; 634.5MHz, 15kHz Input



Figure 327: 256QAM 15MHz B.W; 634.5MHz, 30kHz Input



Figure 328: 256QAM 15MHz B.W; 644.5MHz, 15kHz Input



Figure 329: 256QAM 15MHz B.W; 644.5MHz, 30kHz Input



Figure 330: 256QAM 20MHz B.W; 627.0MHz, 15kHz Input



Figure 331: 256QAM 20MHz B.W; 627.0MHz, 30kHz Input



Figure 332: 256QAM 20MHz B.W; 634.5MHz, 15kHz Input



Figure 333: 256QAM 20MHz B.W; 634.5MHz, 30kHz Input

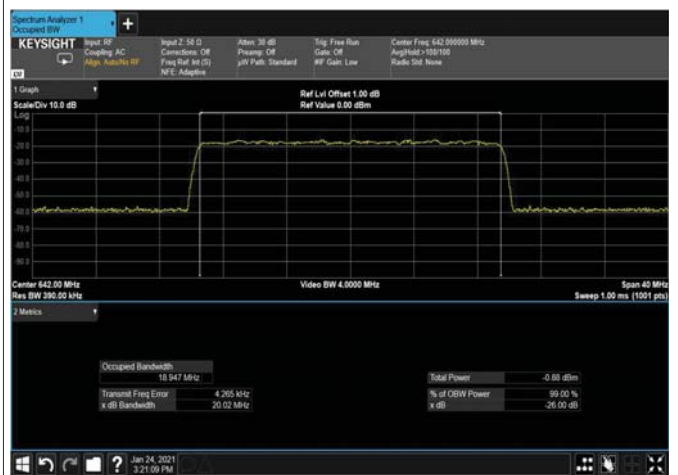


Figure 334: 256QAM 20MHz B.W; 642.0MHz, 15kHz Input



Figure 335: 256QAM 20MHz B.W; 642.0MHz, 30kHz Input



Figure 336: QPSK 5MHz B.W; 619.5MHz, 15kHz Input



Figure 337: QPSK 5MHz B.W; 619.5MHz, 30kHz Input



Figure 338: QPSK 5MHz B.W; 634.5MHz, 15kHz Input



Figure 339: QPSK 5MHz B.W; 634.5MHz, 30kHz Input



Figure 340: QPSK 5MHz B.W; 649.5MHz, 15kHz Input



Figure 341: QPSK 5MHz B.W; 649.5MHz, 30kHz Input



Figure 342: QPSK 10MHz B.W; 622.0MHz, 15kHz Input



Figure 343: QPSK 10MHz B.W; 622.0MHz, 30kHz Input



Figure 344: QPSK 10MHz B.W; 634.5MHz, 15kHz Input



Figure 345: QPSK 10MHz B.W; 634.5MHz, 30kHz Input



Figure 346: QPSK 10MHz B.W; 647.0MHz, 15kHz Input



Figure 347: QPSK 10MHz B.W; 647.0MHz, 30kHz Input



Figure 348: QPSK 15MHz B.W; 624.5MHz, 15kHz Input



Figure 349: QPSK 15MHz B.W; 624.5MHz, 30kHz Input



Figure 350: QPSK 15MHz B.W; 634.5MHz, 15kHz Input



Figure 351: QPSK 15MHz B.W; 634.5MHz, 30kHz Input



Figure 352: QPSK 15MHz B.W; 644.5MHz, 15kHz Input



Figure 353: QPSK 15MHz B.W; 644.5MHz, 30kHz Input