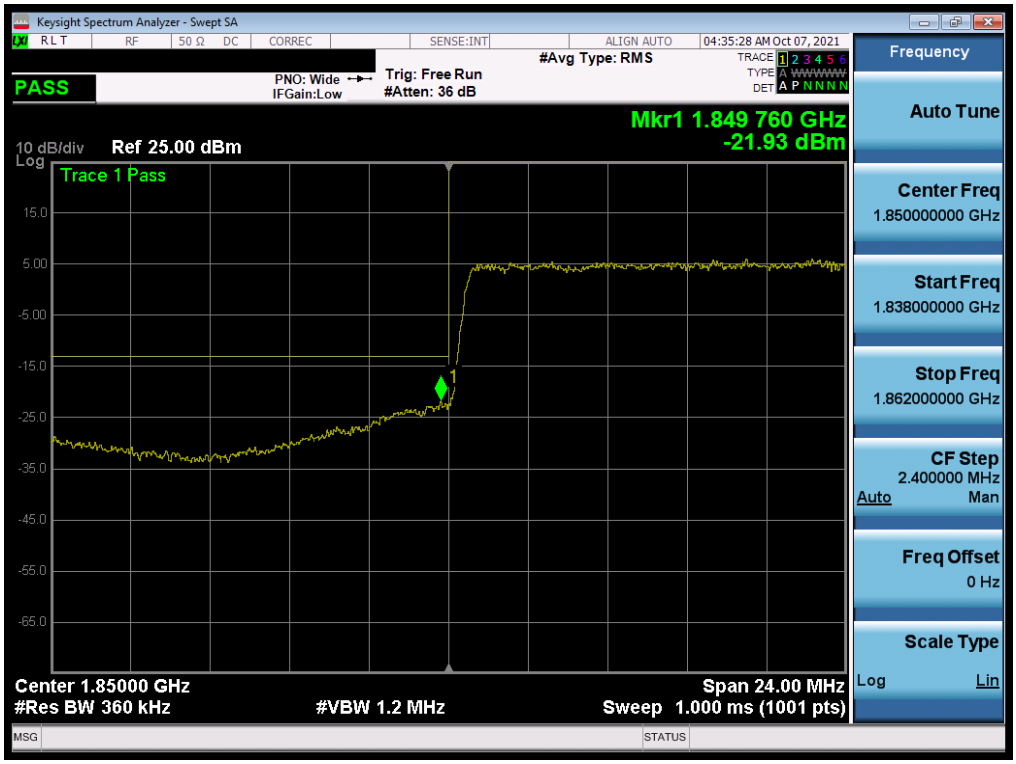
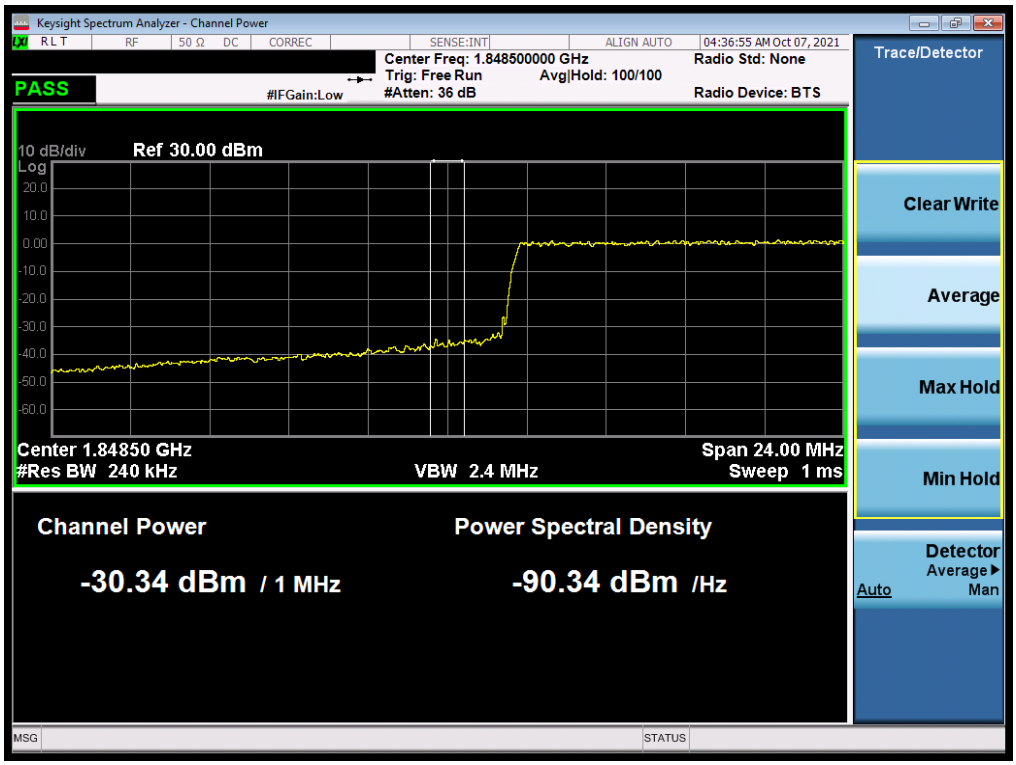
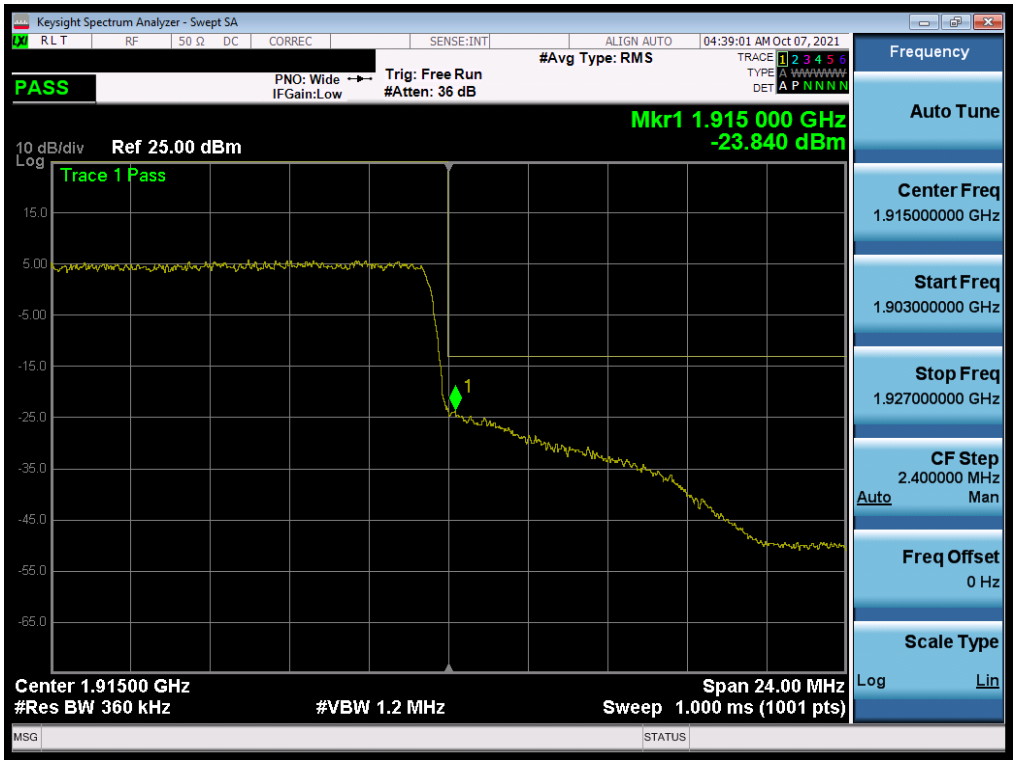


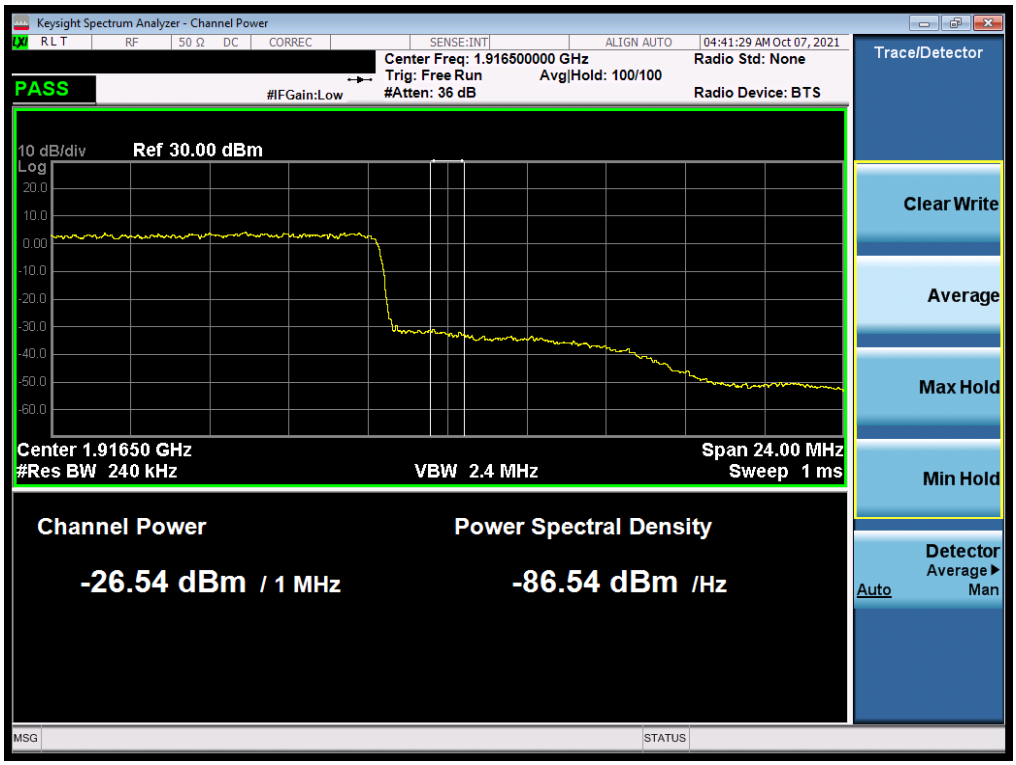
Plot 7-179. Lower Band Edge Plot (NR Band n25 - 30MHz QPSK – Full RB)



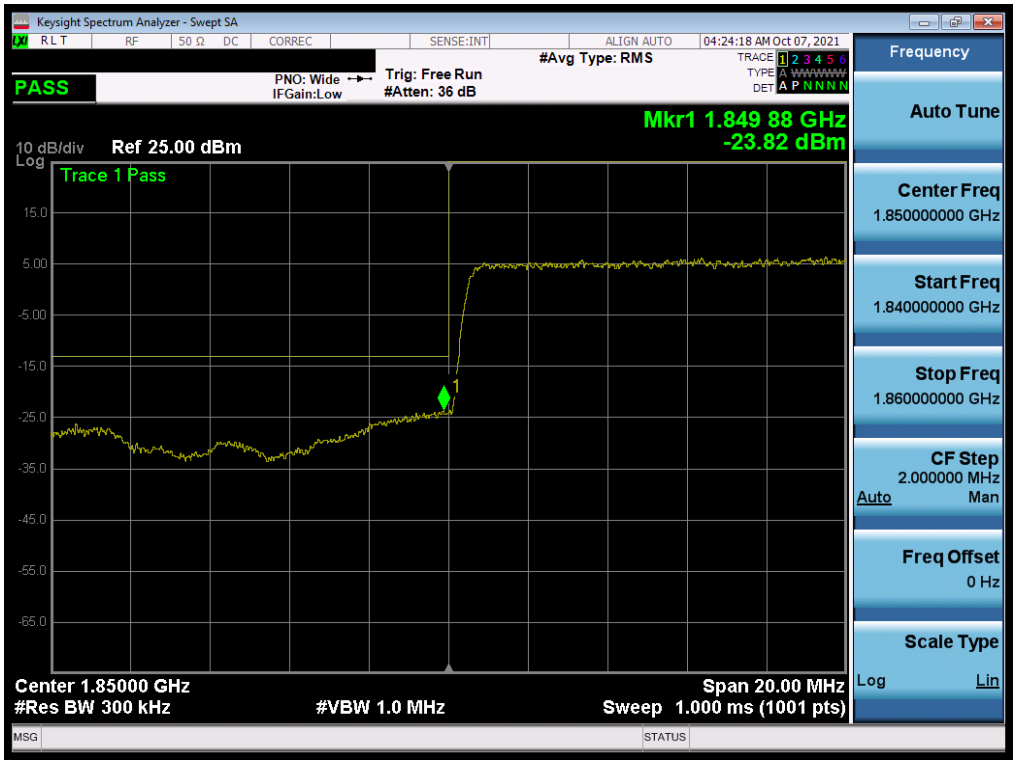
Plot 7-180. Extended Lower Band Edge Plot (NR Band n25 - 30MHz QPSK – Full RB)



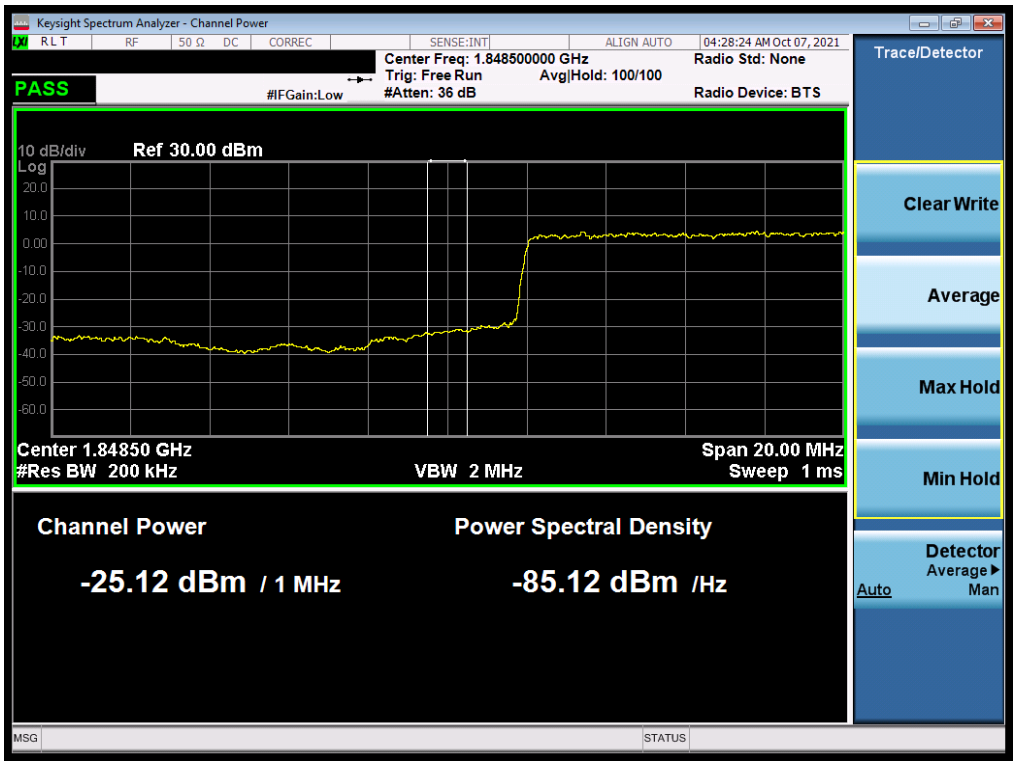
Plot 7-181. Upper Band Edge Plot (NR Band n25 - 30MHz QPSK – Full RB)



Plot 7-182. Extended Upper Band Edge Plot (NR Band n25 - 30MHz QPSK – Full RB)

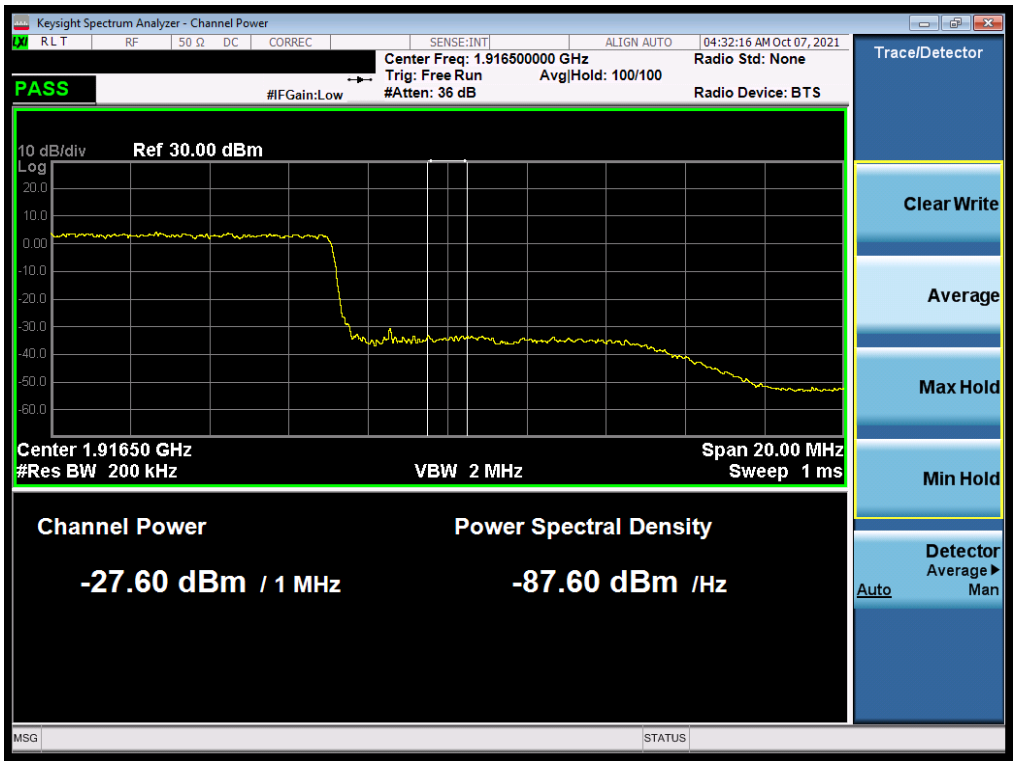


Plot 7-183. Lower Band Edge Plot (NR Band n25 - 25MHz QPSK – Full RB)

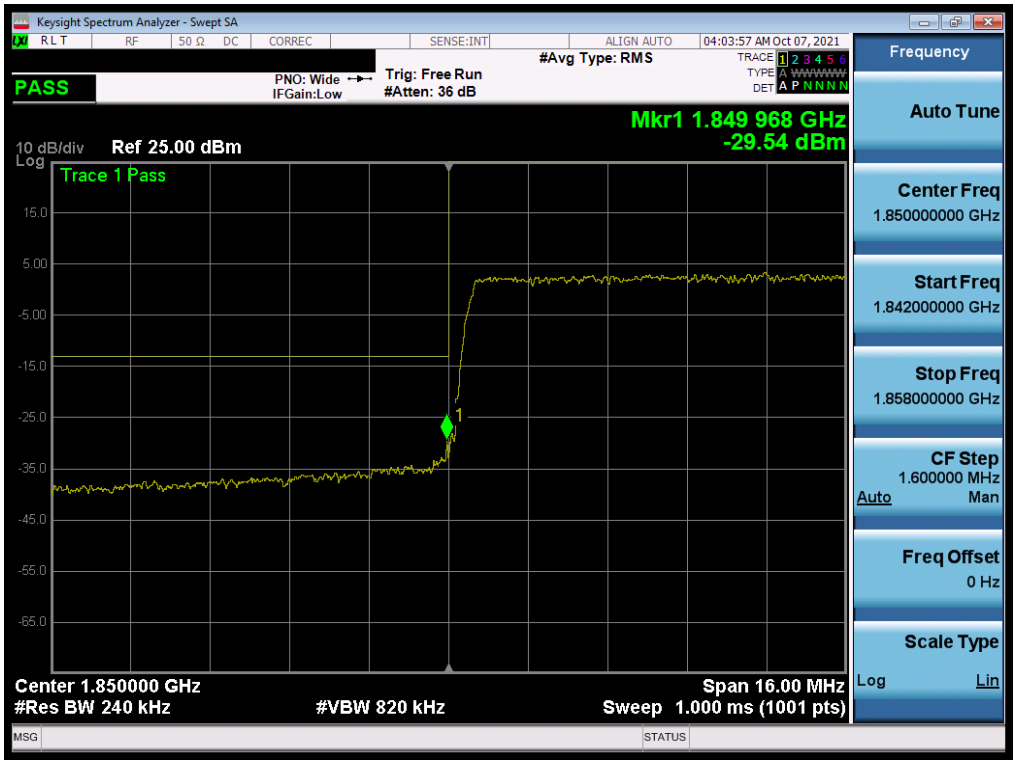


Plot 7-184. Extended Lower Band Edge Plot (NR Band n25 - 25MHz QPSK – Full RB)

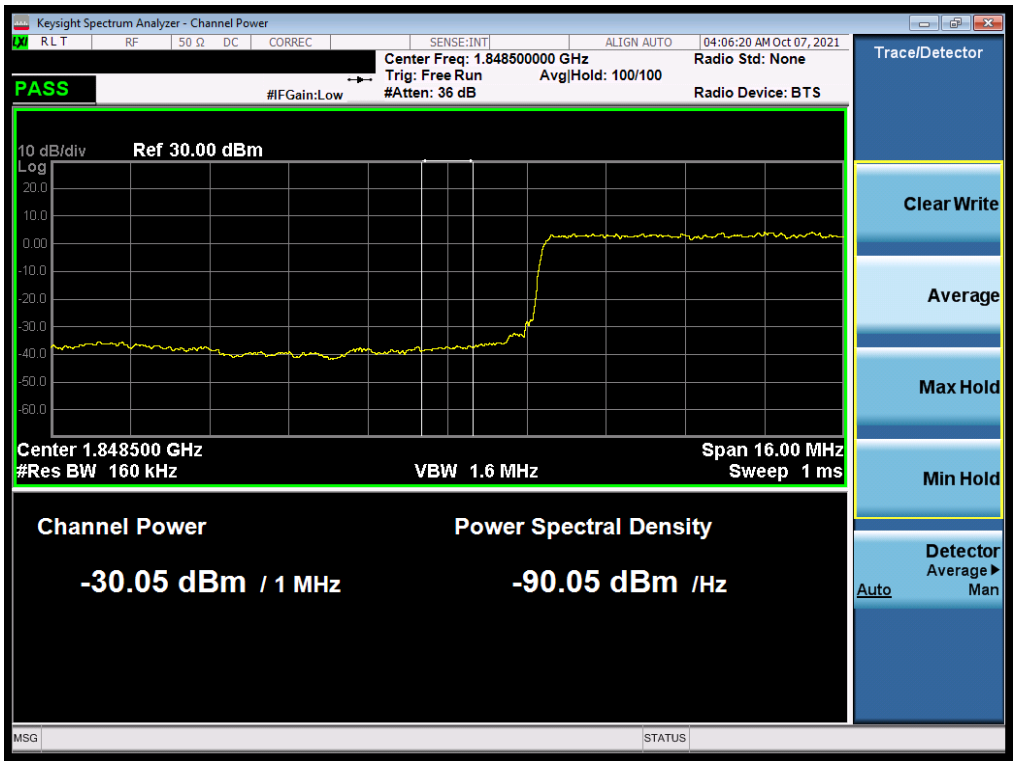
Plot 7-185. Upper Band Edge Plot (NR Band n25 - 25MHz QPSK – Full RB)



Plot 7-186. Extended Upper Band Edge Plot (NR Band n25 - 25MHz QPSK – Full RB)

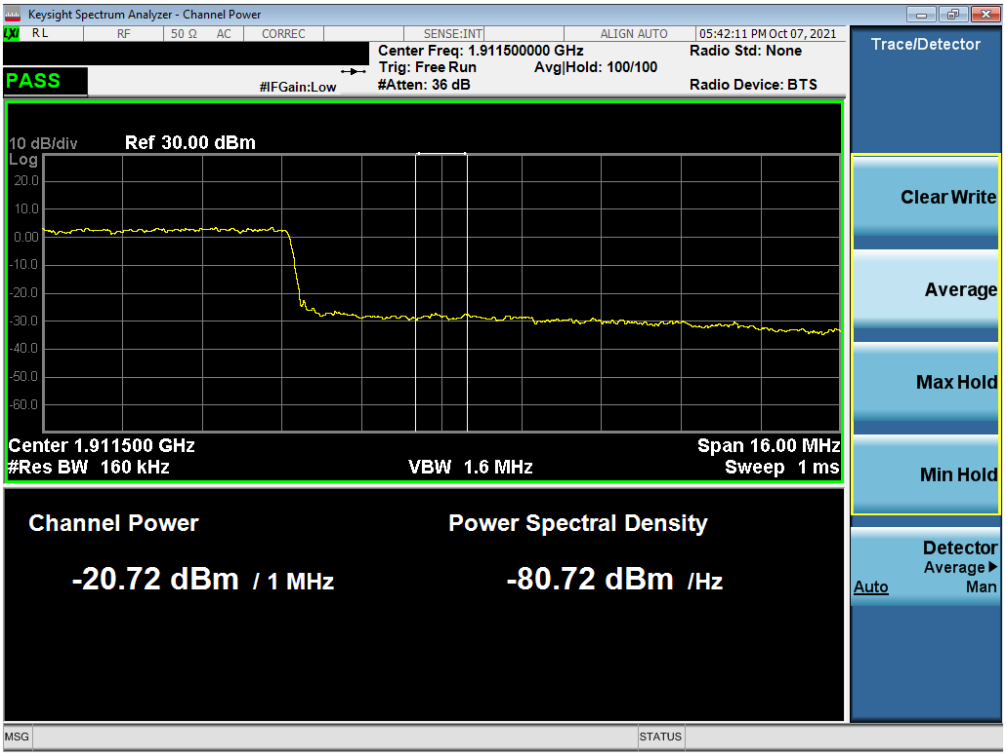


Plot 7-187. Lower Band Edge Plot (NR Band n25/2 - 20MHz QPSK – Full RB)

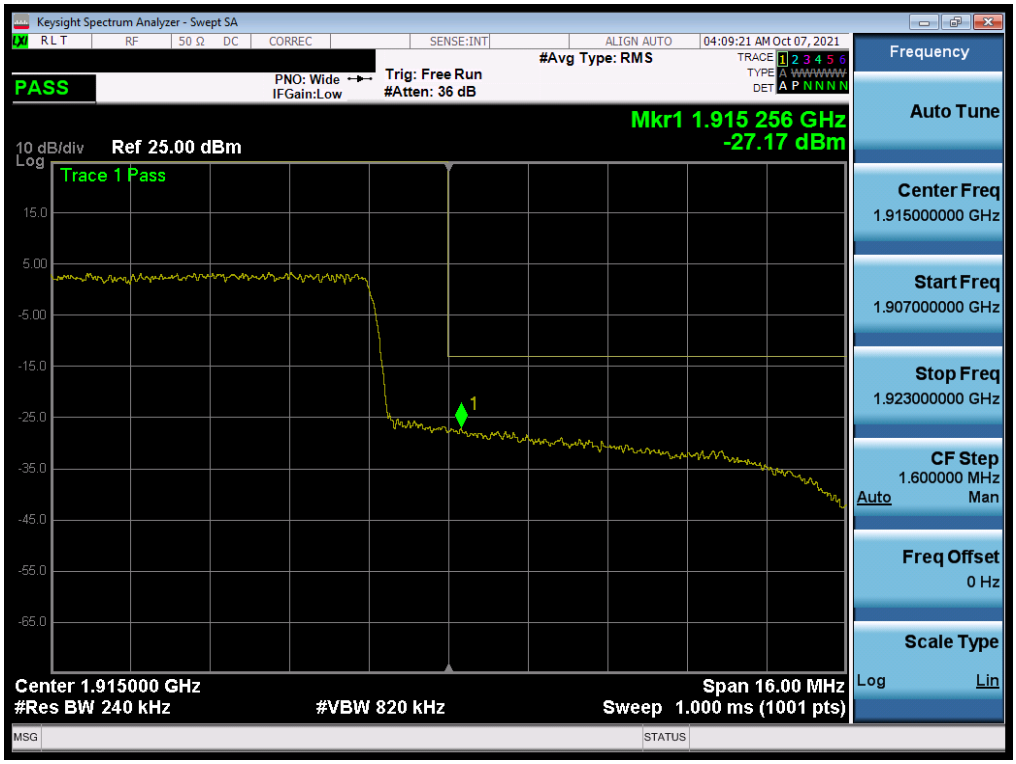


Plot 7-188. Extended Lower Band Edge Plot (NR Band n25/2 - 20MHz QPSK – Full RB)

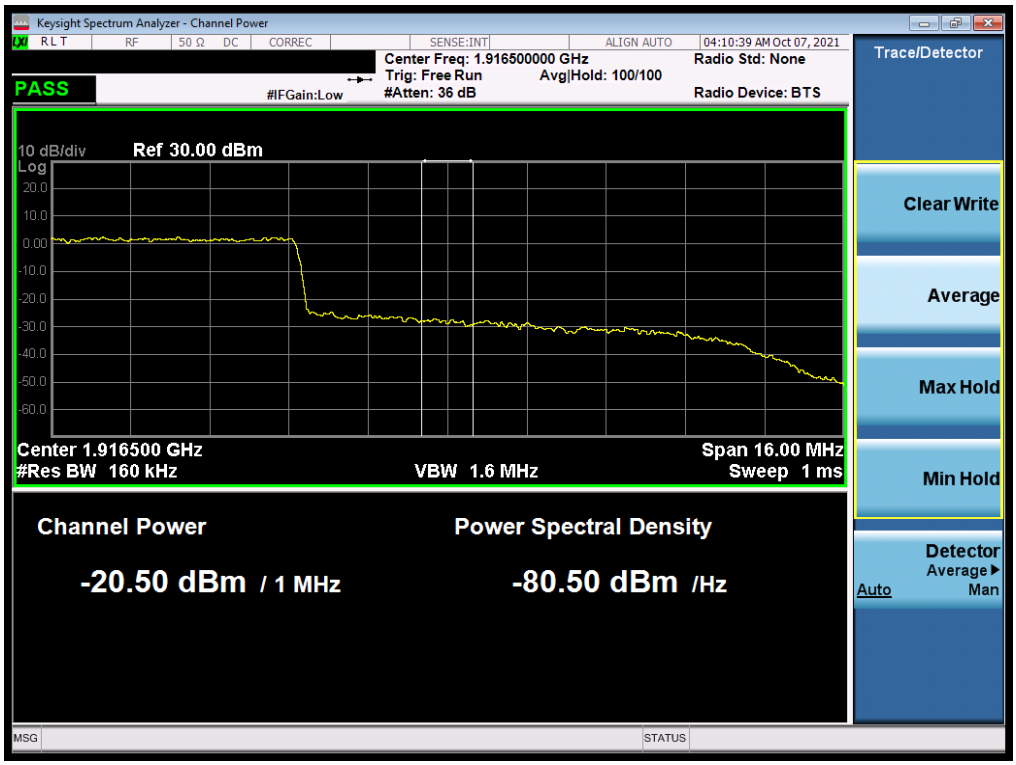
Plot 7-189. Upper Band Edge Plot (NR Band n2 - 20MHz QPSK – Full RB)



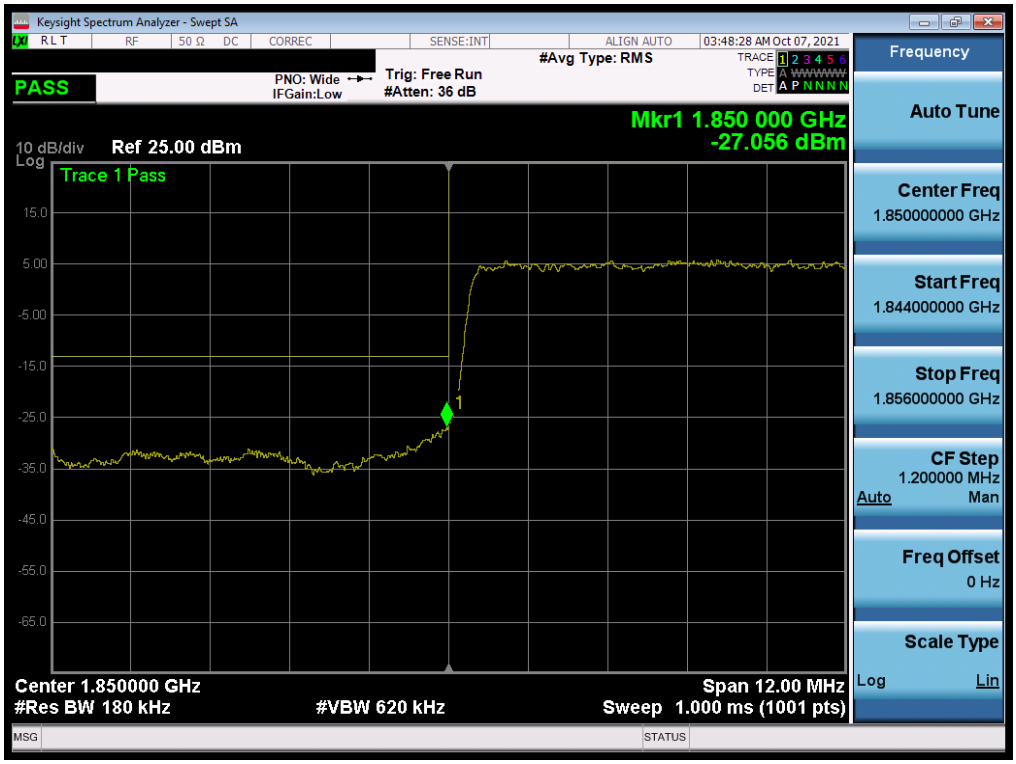
Plot 7-190. Extended Upper Band Edge Plot (NR Band n2 - 20MHz QPSK – Full RB)



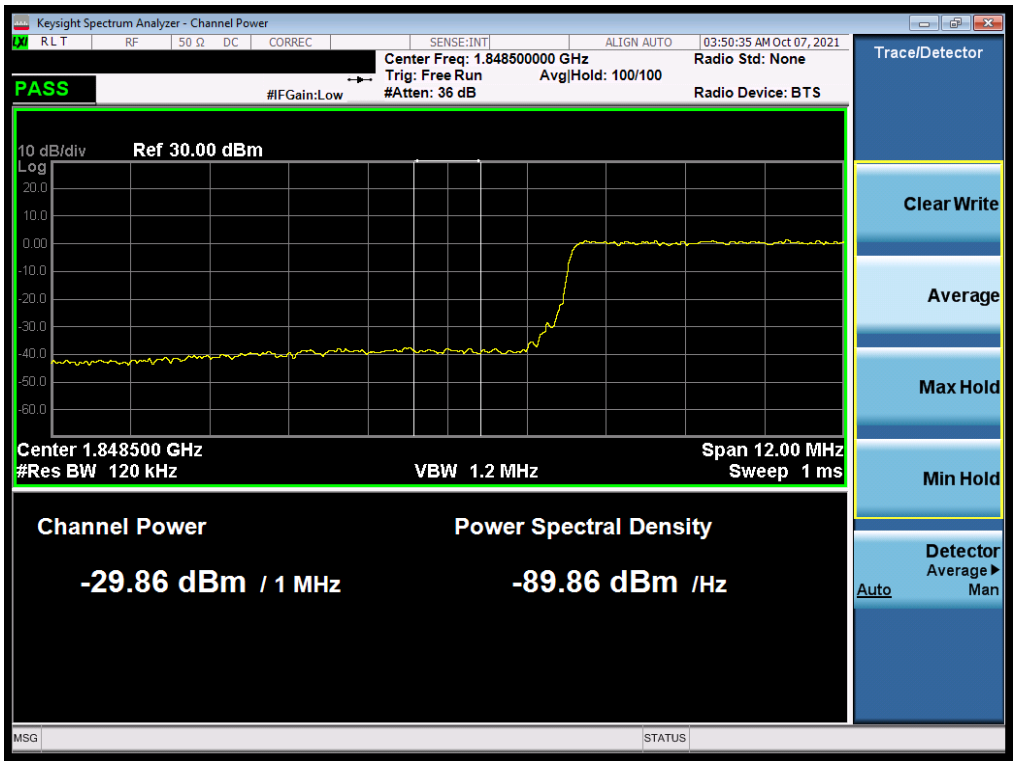
Plot 7-191. Upper Band Edge Plot (NR Band n25 - 20MHz QPSK – Full RB)



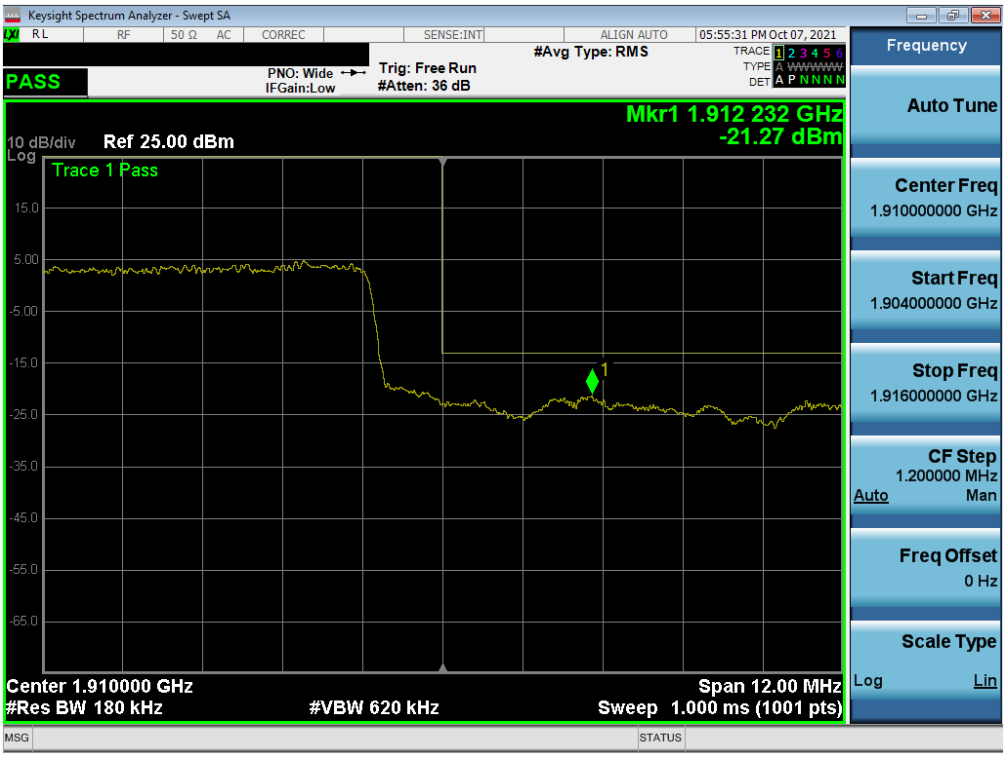
Plot 7-192. Extended Upper Band Edge Plot (NR Band n25 - 20MHz QPSK – Full RB)



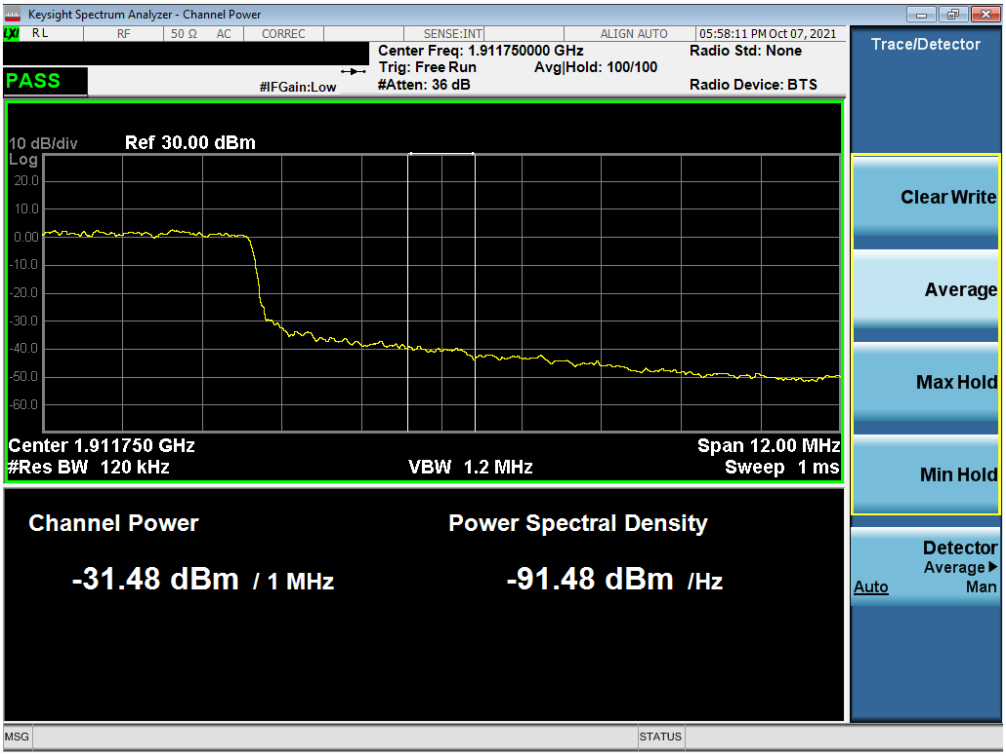
Plot 7-193. Lower Band Edge Plot (NR Band n25/2 - 15MHz QPSK – Full RB)



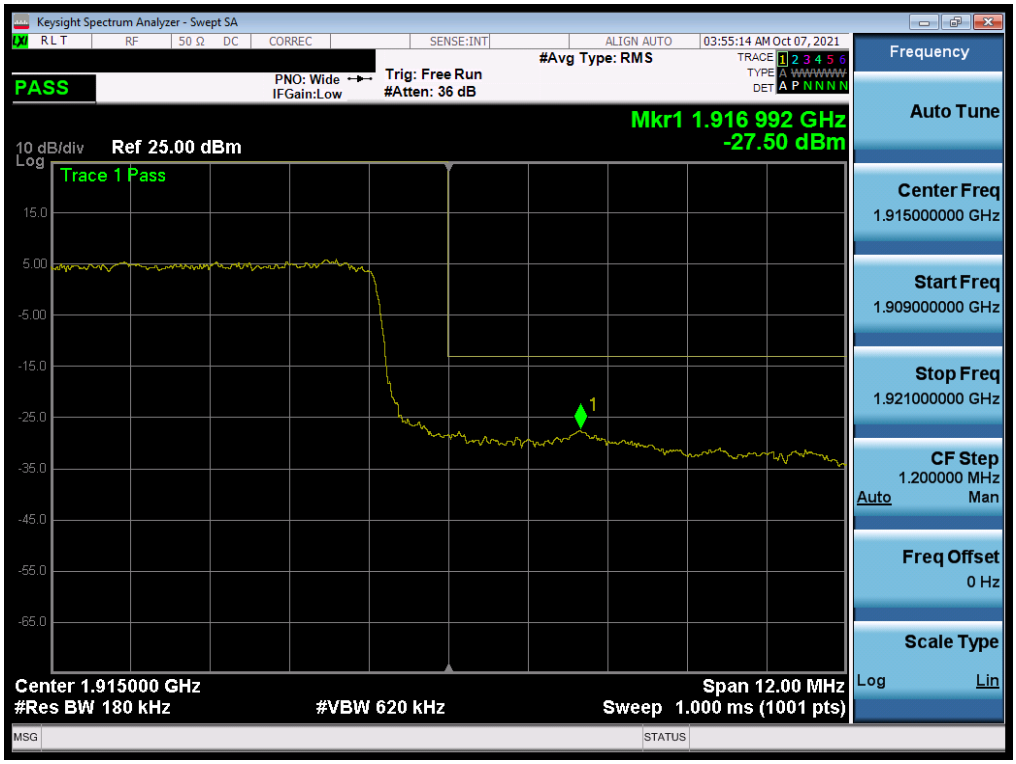
Plot 7-194. Extended Lower Band Edge Plot (NR Band n25/2 - 15MHz QPSK – Full RB)



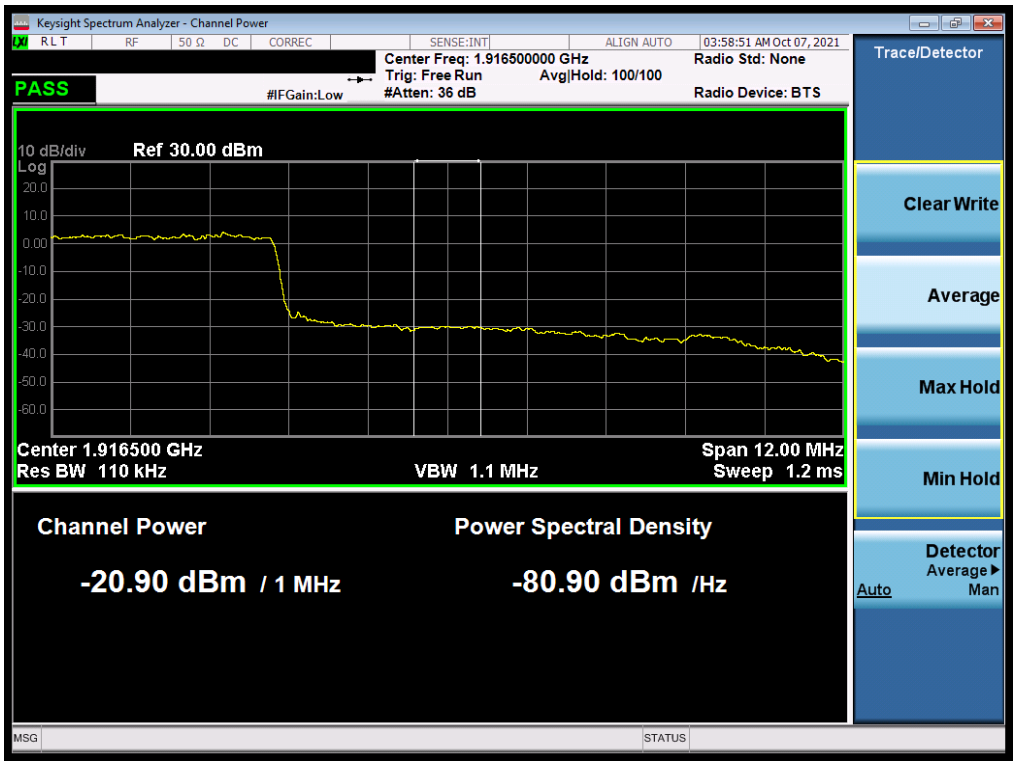
Plot 7-195. Upper Band Edge Plot (NR Band n2 - 15MHz QPSK – Full RB)



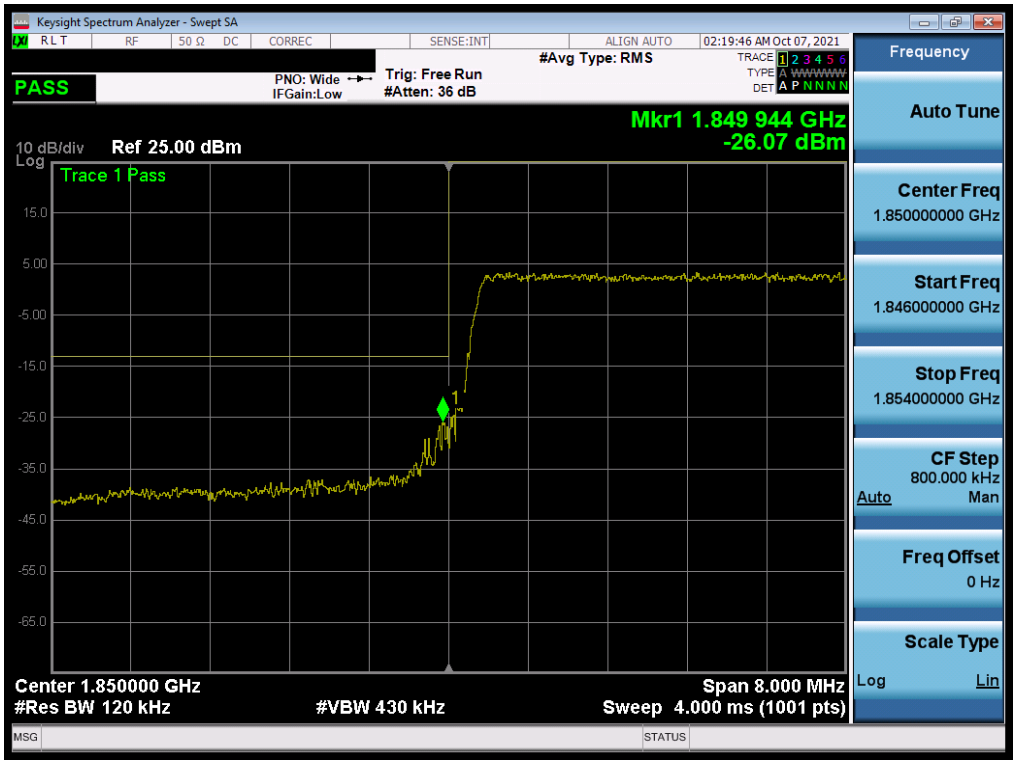
Plot 7-196. Extended Upper Band Edge Plot (NR Band n2 - 15MHz QPSK – Full RB)



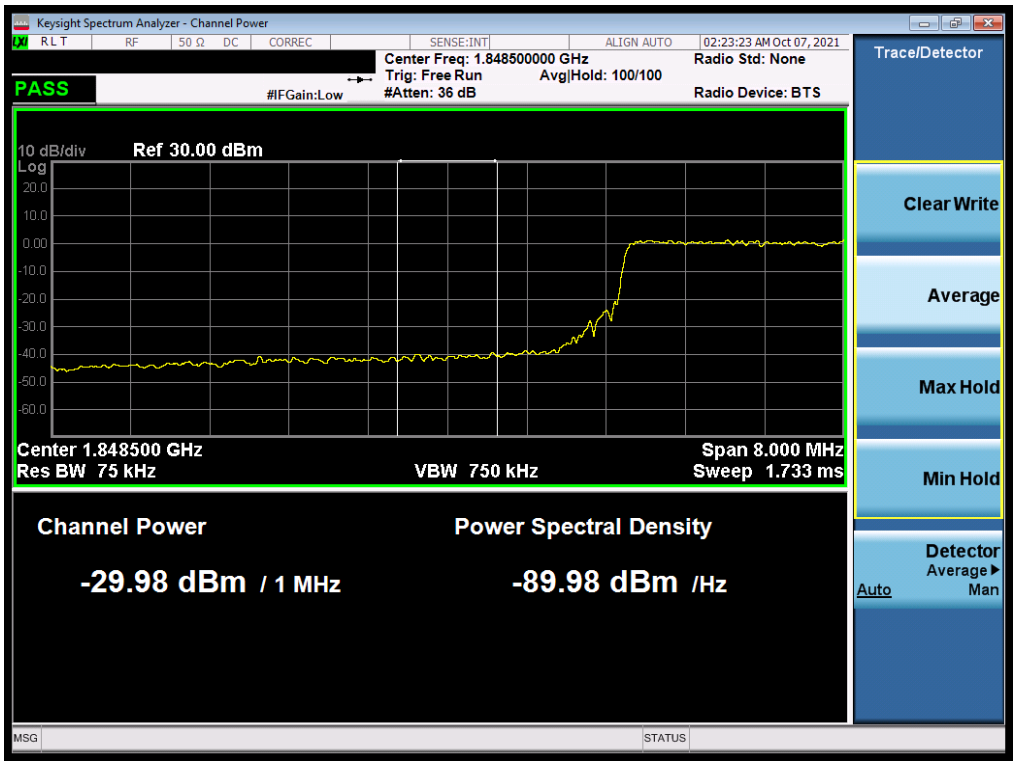
Plot 7-197. Upper Band Edge Plot (NR Band n25 - 15MHz QPSK – Full RB)



Plot 7-198. Extended Upper Band Edge Plot (NR Band n25 - 15MHz QPSK – Full RB)

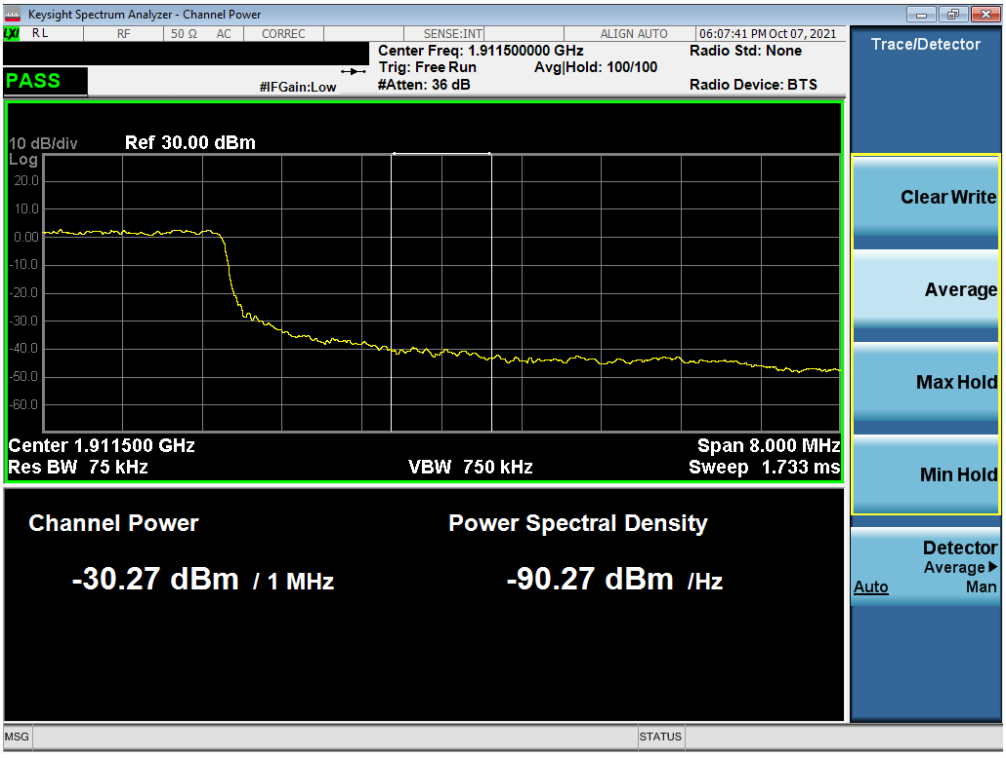


Plot 7-199. Lower Band Edge Plot (NR Band n25/2 - 10MHz QPSK – Full RB)



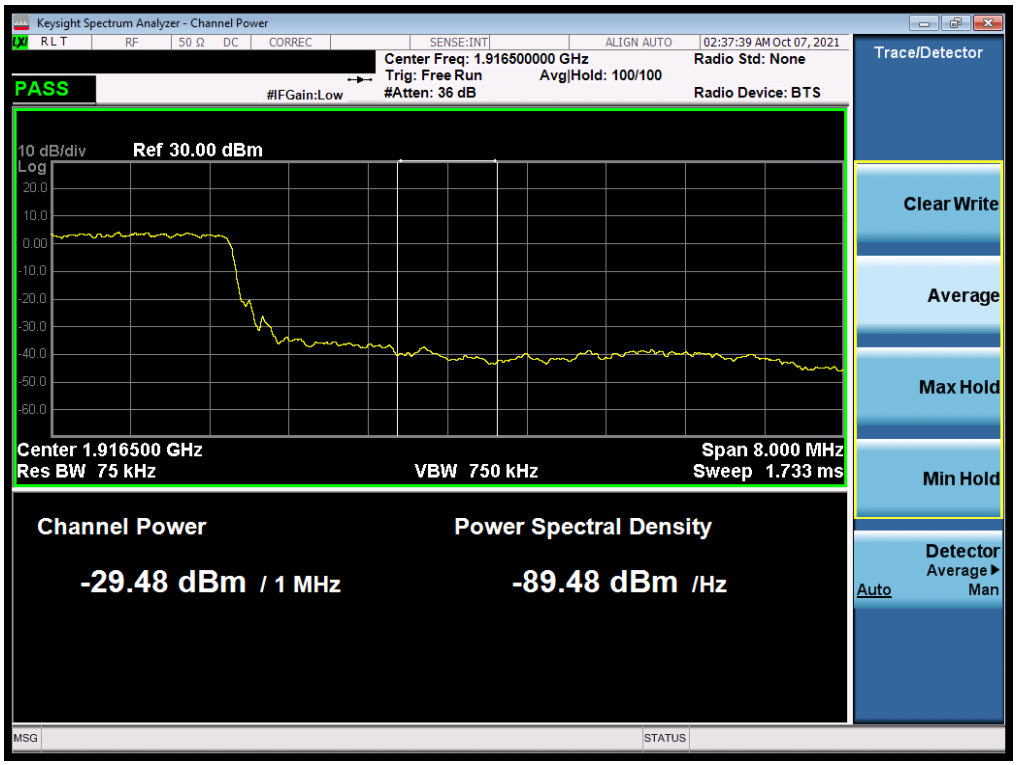
Plot 7-200. Extended Lower Band Edge Plot (NR Band n25/2 - 10MHz QPSK – Full RB)

Plot 7-201. Upper Band Edge Plot (NR Band n2 - 10MHz QPSK – Full RB)

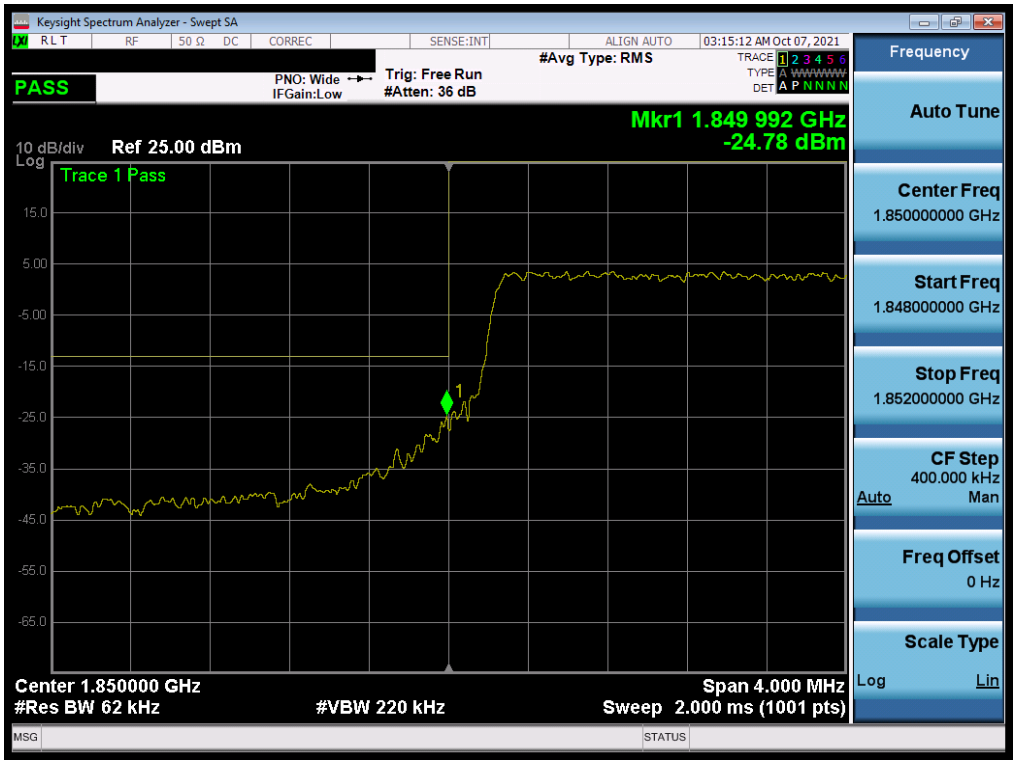


Plot 7-202. Extended Upper Band Edge Plot (NR Band n2 - 10MHz QPSK – Full RB)

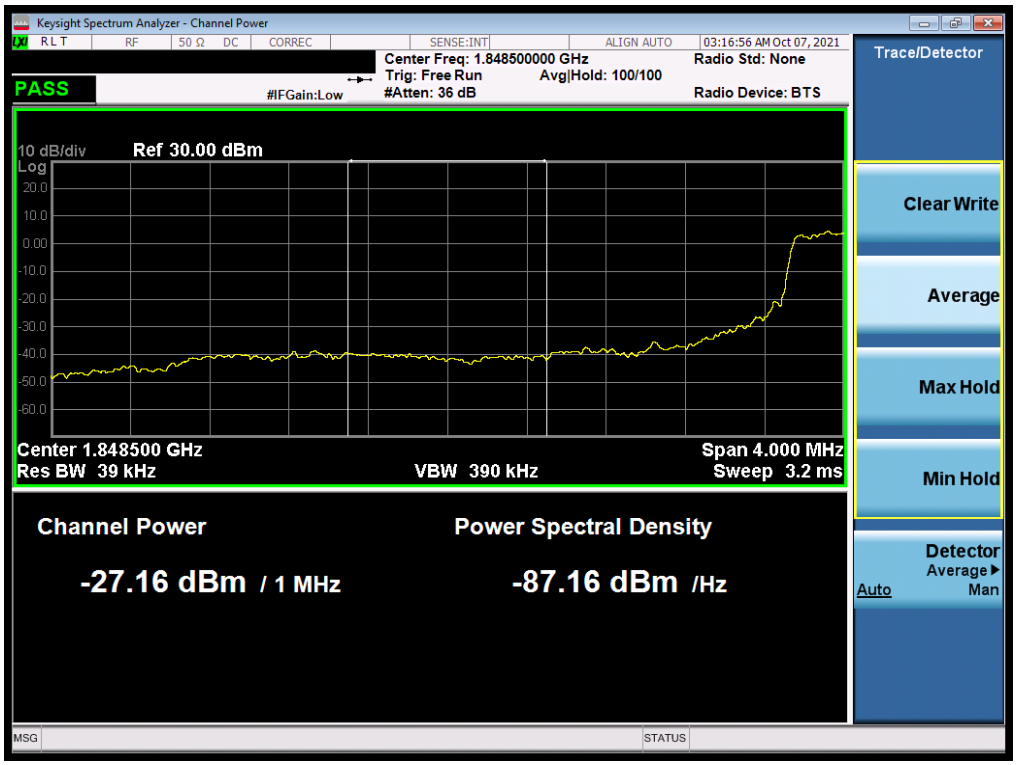
Plot 7-203. Upper Band Edge Plot (NR Band n25 - 10MHz QPSK – Full RB)



Plot 7-204. Extended Upper Band Edge Plot (NR Band n25 - 10MHz QPSK – Full RB)

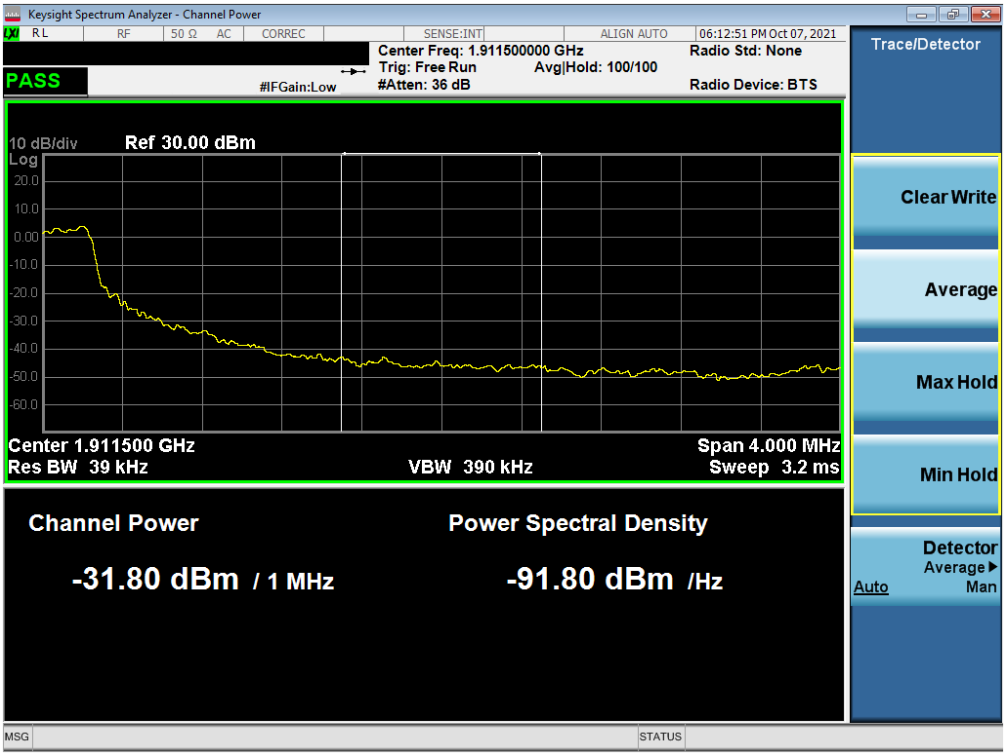


Plot 7-205. Lower Band Edge Plot (NR Band n25/2 – 5MHz QPSK – Full RB)

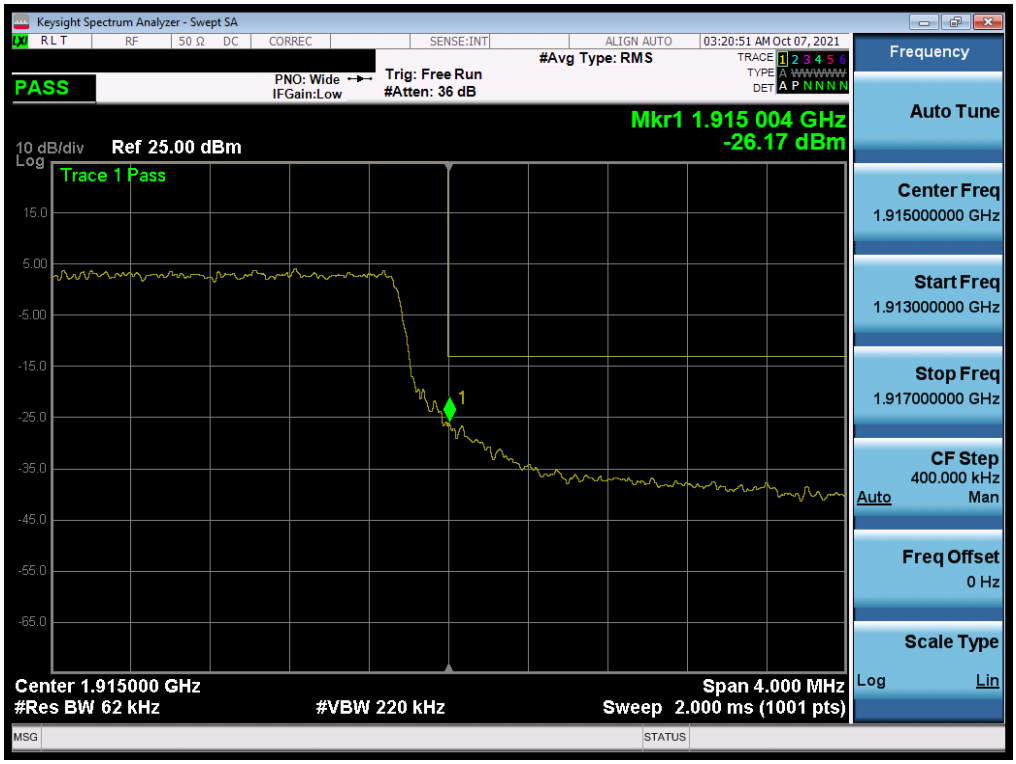


Plot 7-206. Extended Lower Band Edge Plot (NR Band n25/2 – 5MHz QPSK – Full RB)

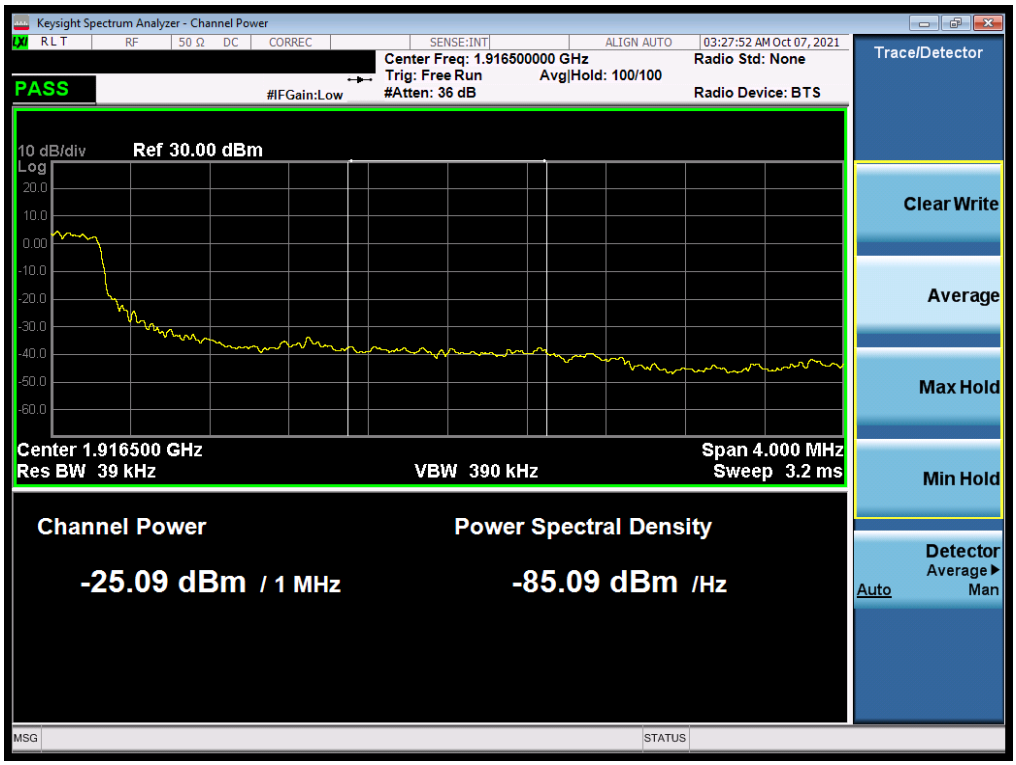
Plot 7-207. Upper Band Edge Plot (NR Band n2 – 5MHz QPSK – Full RB)



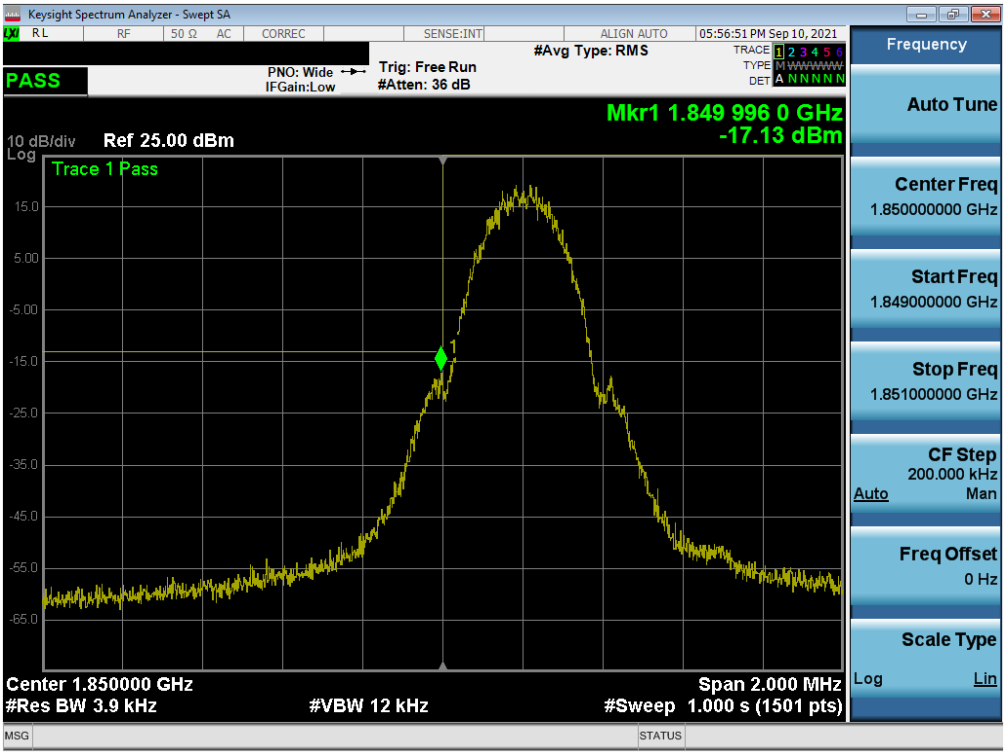
Plot 7-208. Extended Upper Band Edge Plot (NR Band n2 – 5MHz QPSK – Full RB)



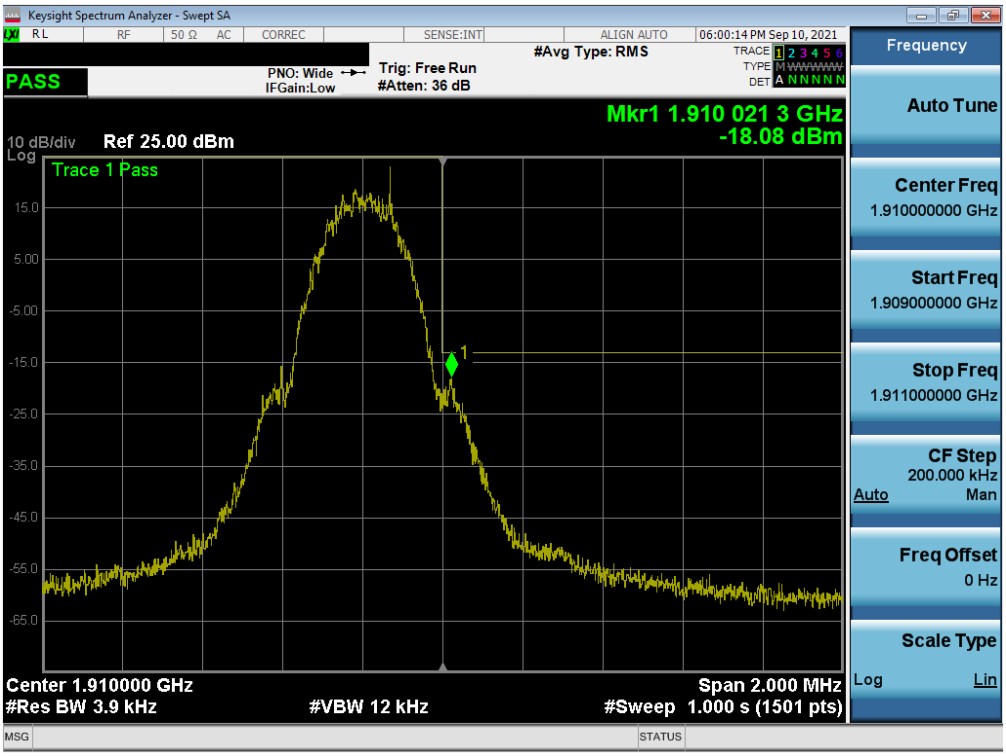
Plot 7-209. Upper Band Edge Plot (NR Band n25 – 5MHz QPSK – Full RB)



Plot 7-210. Extended Upper Band Edge Plot (NR Band n25 – 5MHz QPSK – Full RB)

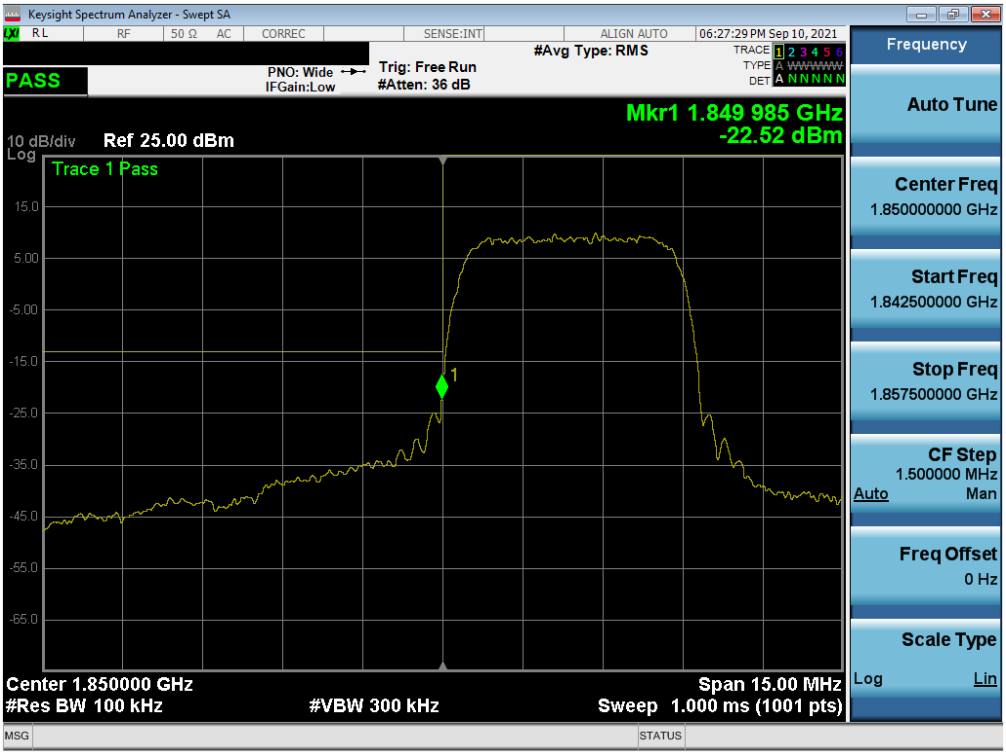


Plot 7-211. Lower Band Edge Plot (GPRS PCS – Ch. 512)

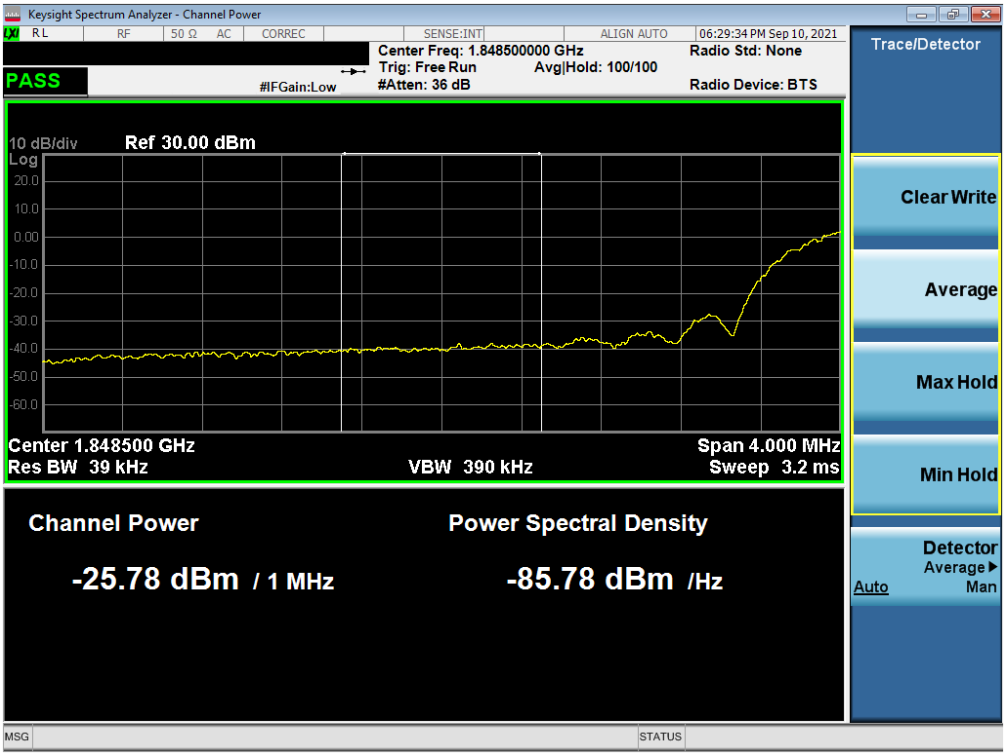


Plot 7-212. Upper Band Edge Plot (GPRS PCS – Ch. 810)

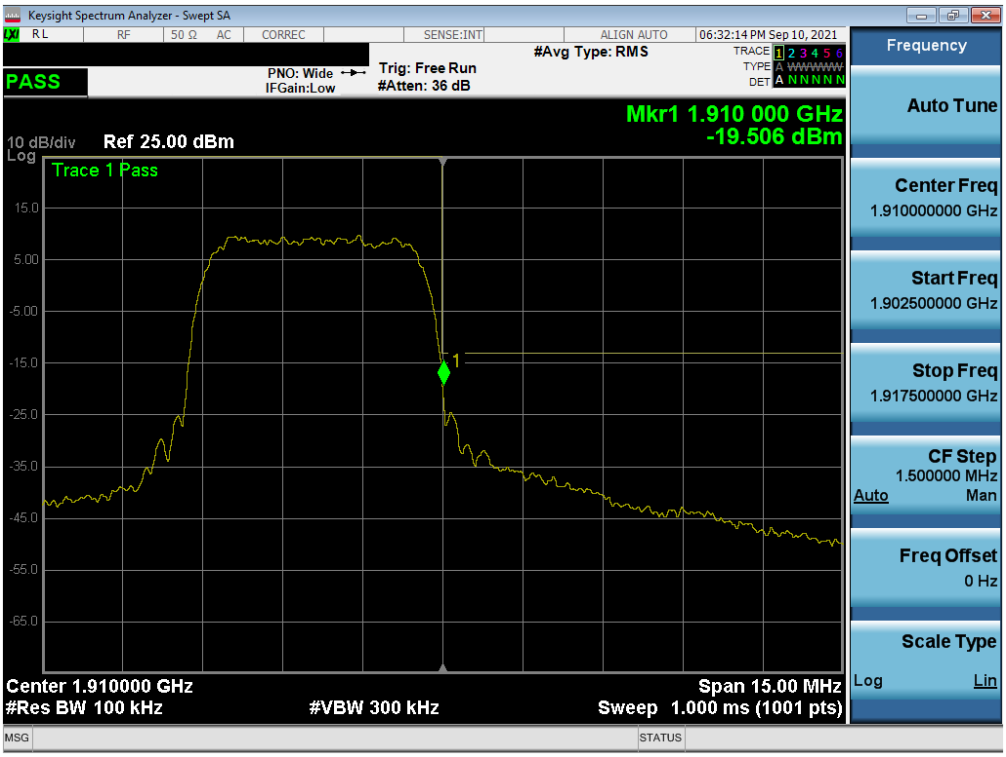
WCDMA PCS



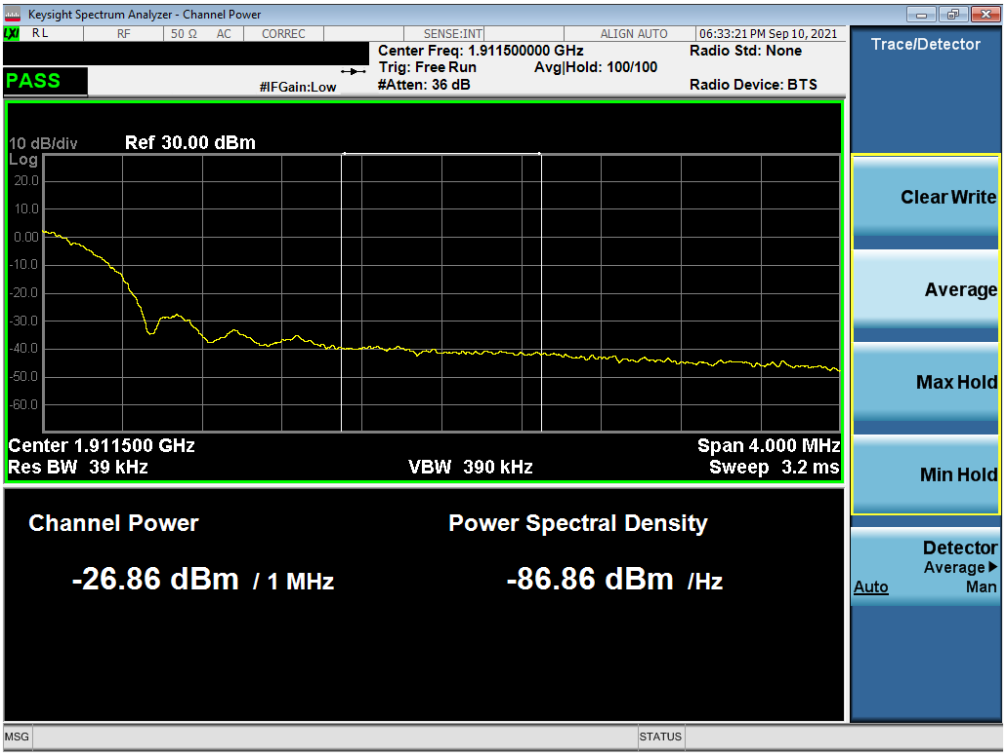
Plot 7-213. Lower Band Edge Plot (WCDMA PCS – Ch. 9262)



Plot 7-214. Extended Lower Band Edge Plot (WCDMA PCS – Ch. 9262)



Plot 7-215. Upper Band Edge Plot (WCDMA PCS – Ch. 9538)



Plot 7-216. Extended Upper Band Edge Plot (WCDMA PCS – Ch. 9538)

7.6 Peak-Average Ratio

Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.7.1

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW ≥ OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

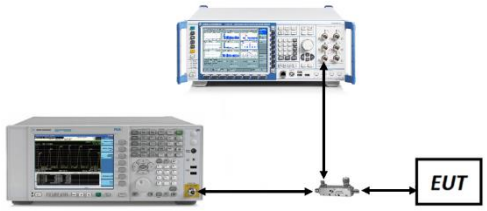
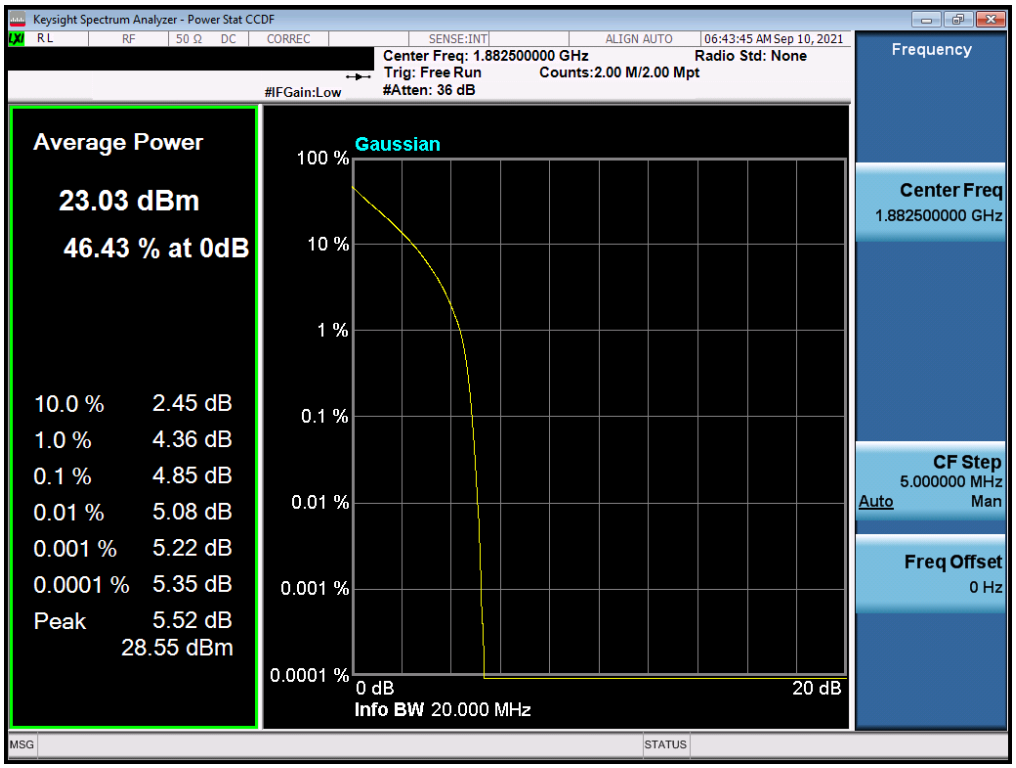


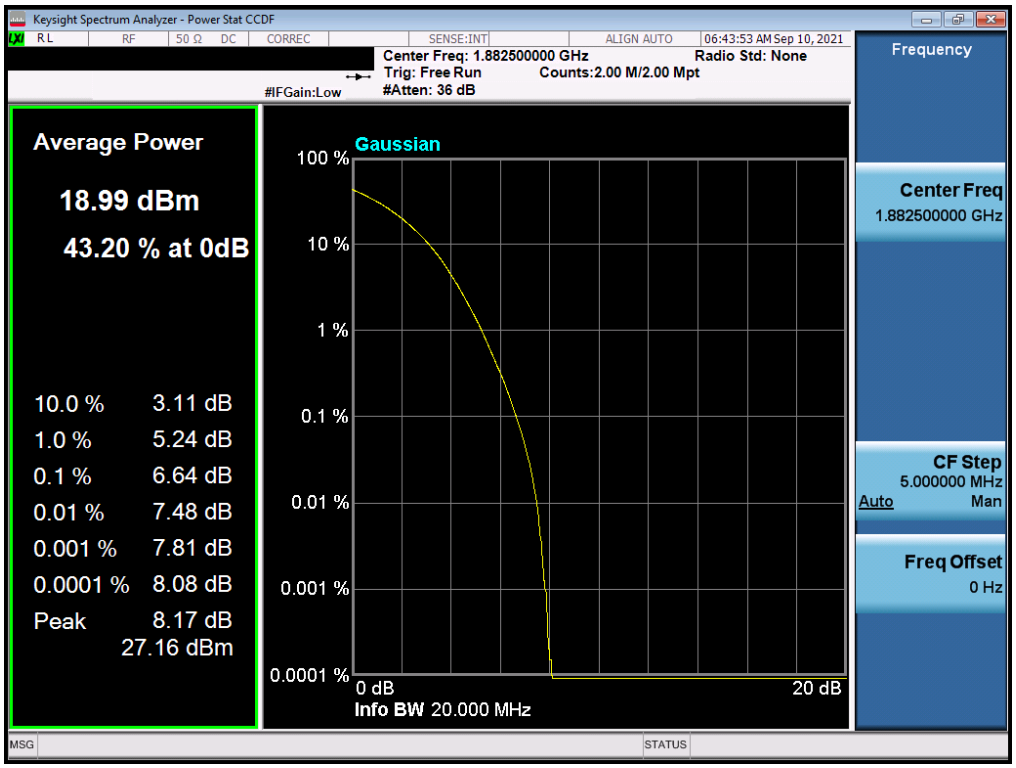
Figure 7-5. Test Instrument & Measurement Setup

Test Notes

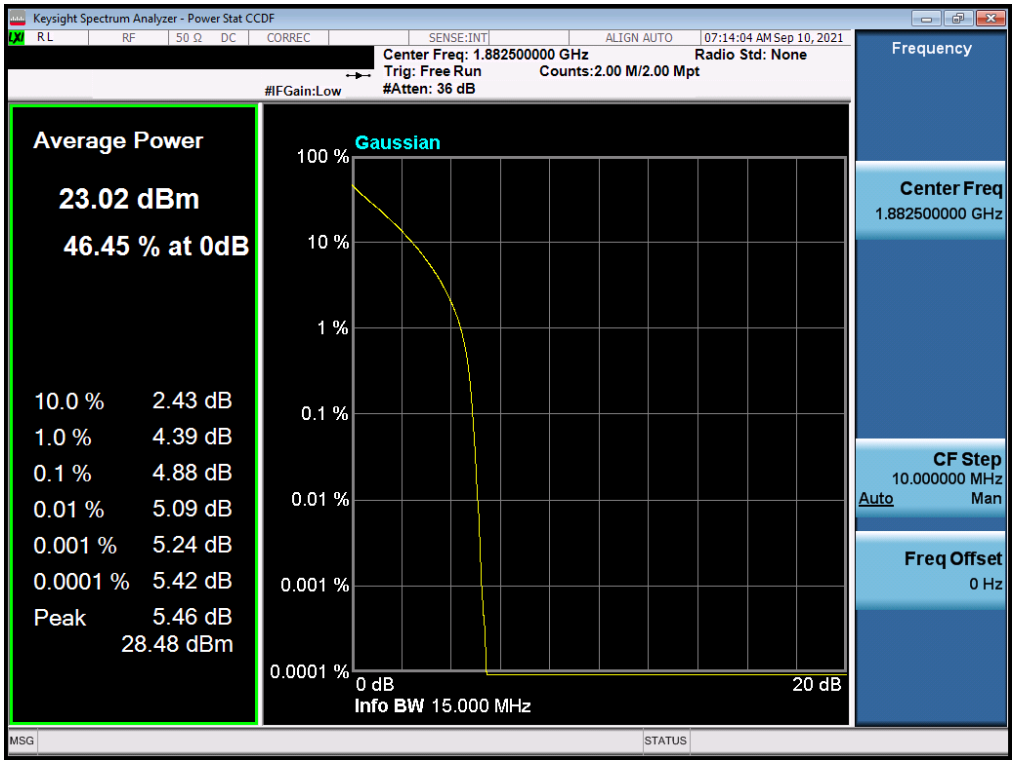
Among the PAR measurements for 16QAM, 64QAM, and 256QAM, it was determined that 256QAM exhibited the highest PAR.



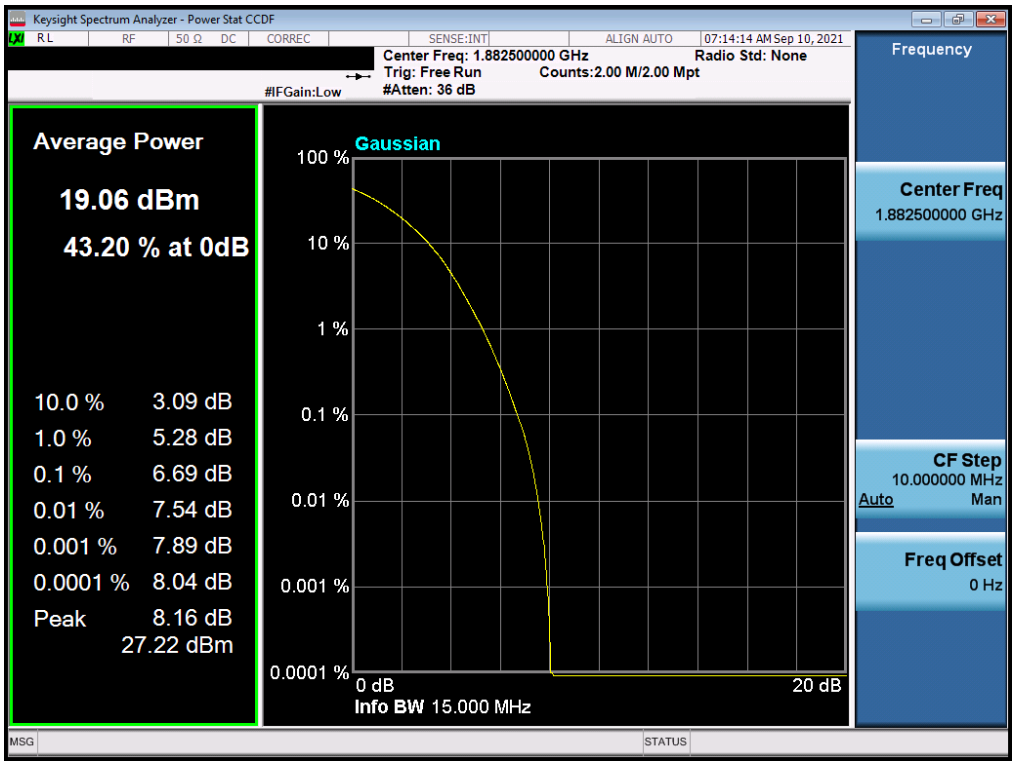
Plot 7-217. PAR Plot (LTE Band 25/2 - 20MHz QPSK - Full RB)



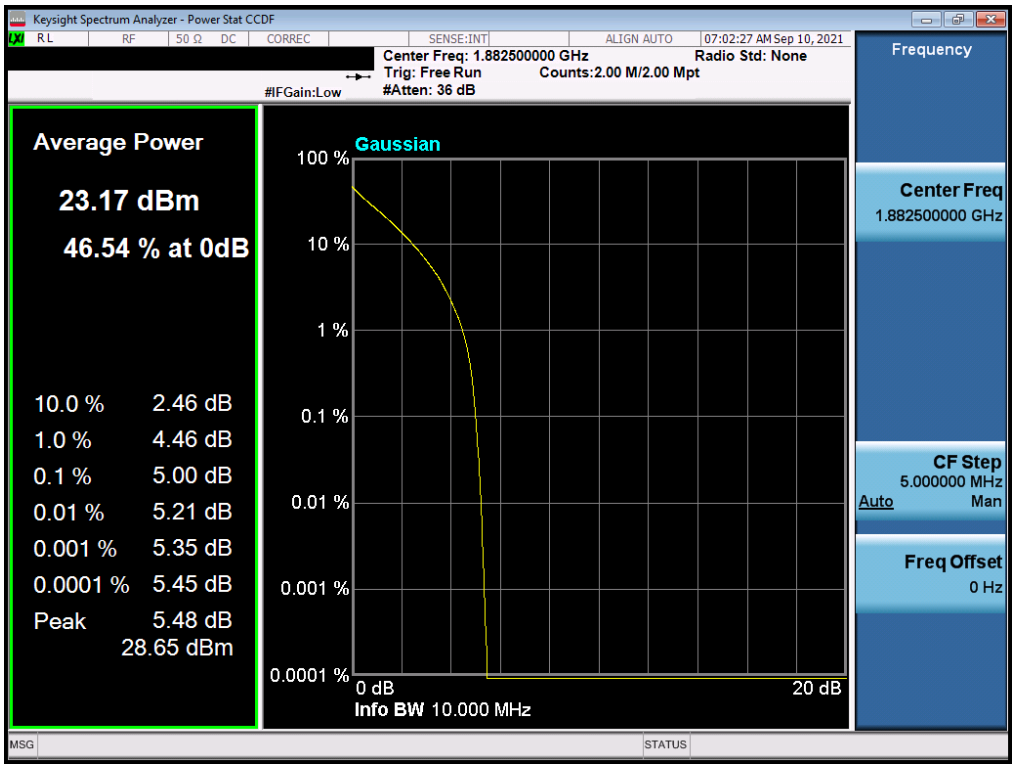
Plot 7-218. PAR Plot (LTE Band 25/2 - 20MHz 256-QAM - Full RB)



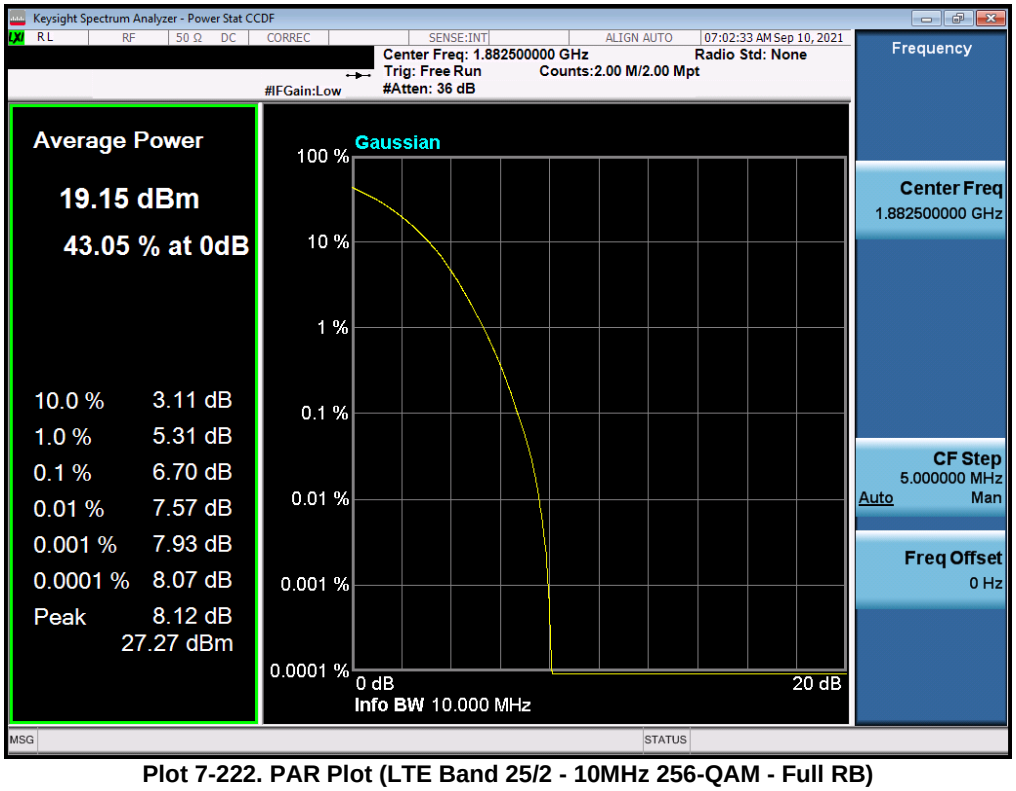
Plot 7-219. PAR Plot (LTE Band 25/2 - 15MHz QPSK - Full RB)



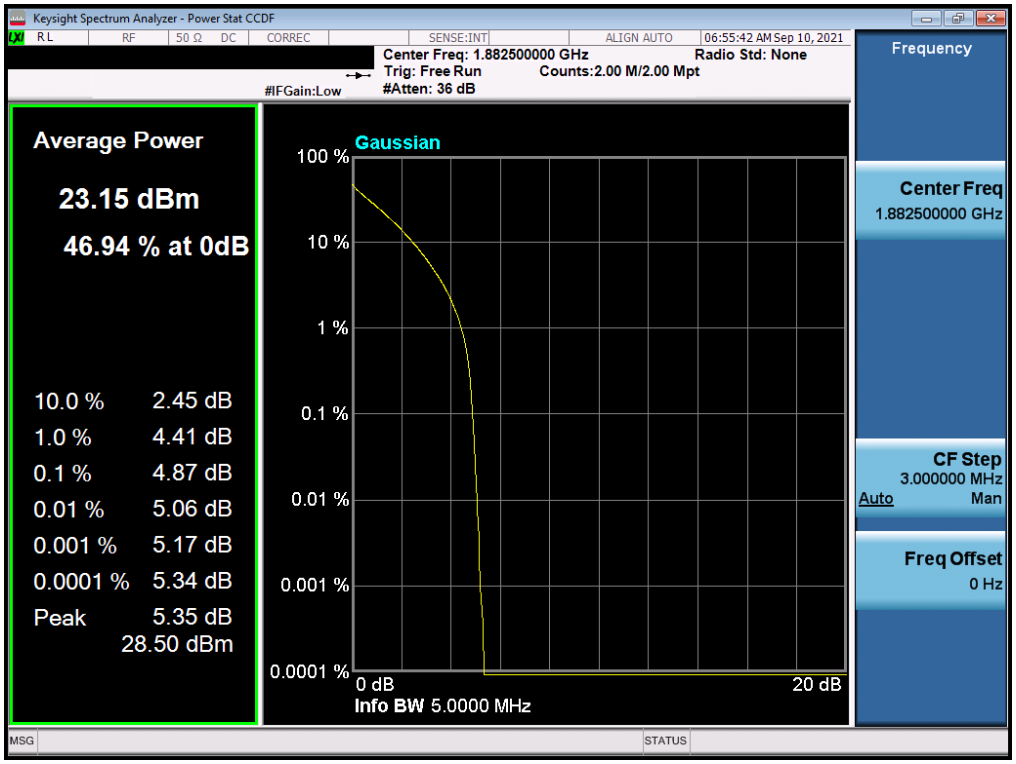
Plot 7-220. PAR Plot (LTE Band 25/2 - 15MHz 256-QAM - Full RB)



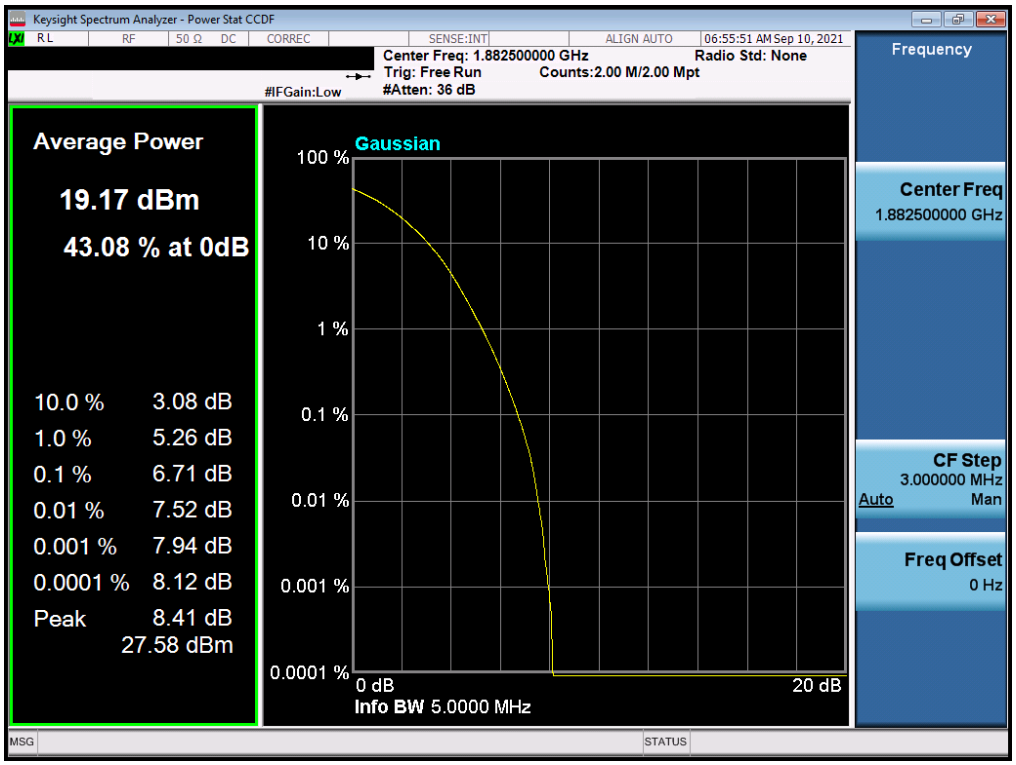
Plot 7-221. PAR Plot (LTE Band 25/2 - 10MHz QPSK - Full RB)



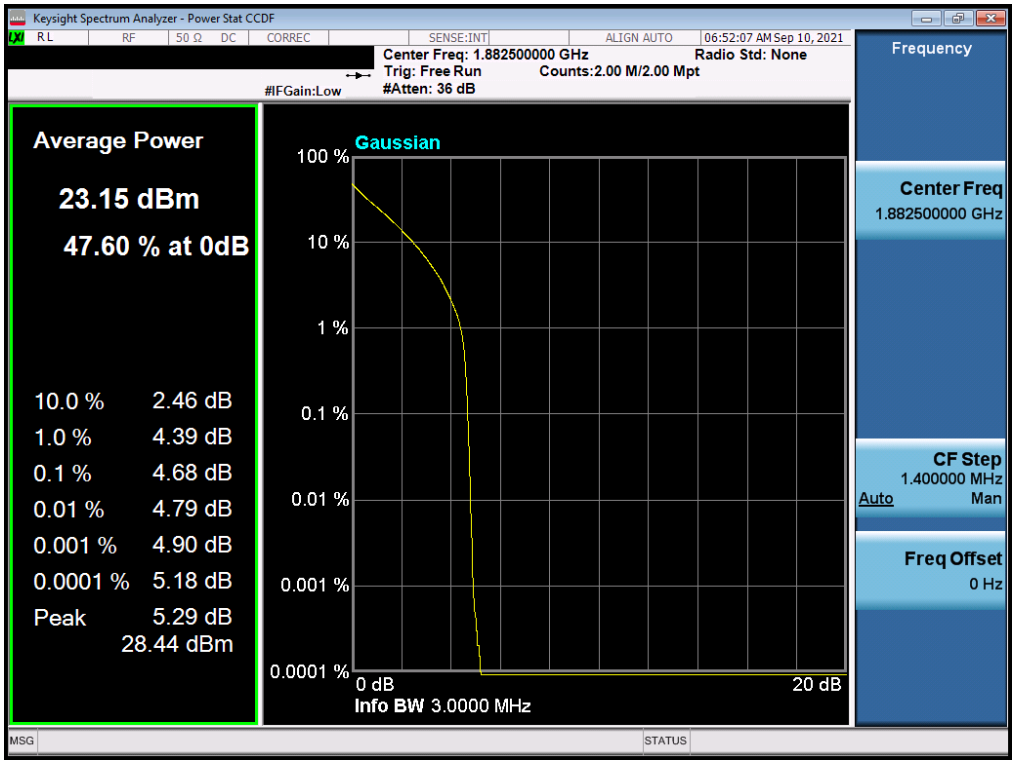
Plot 7-222. PAR Plot (LTE Band 25/2 - 10MHz 256-QAM - Full RB)



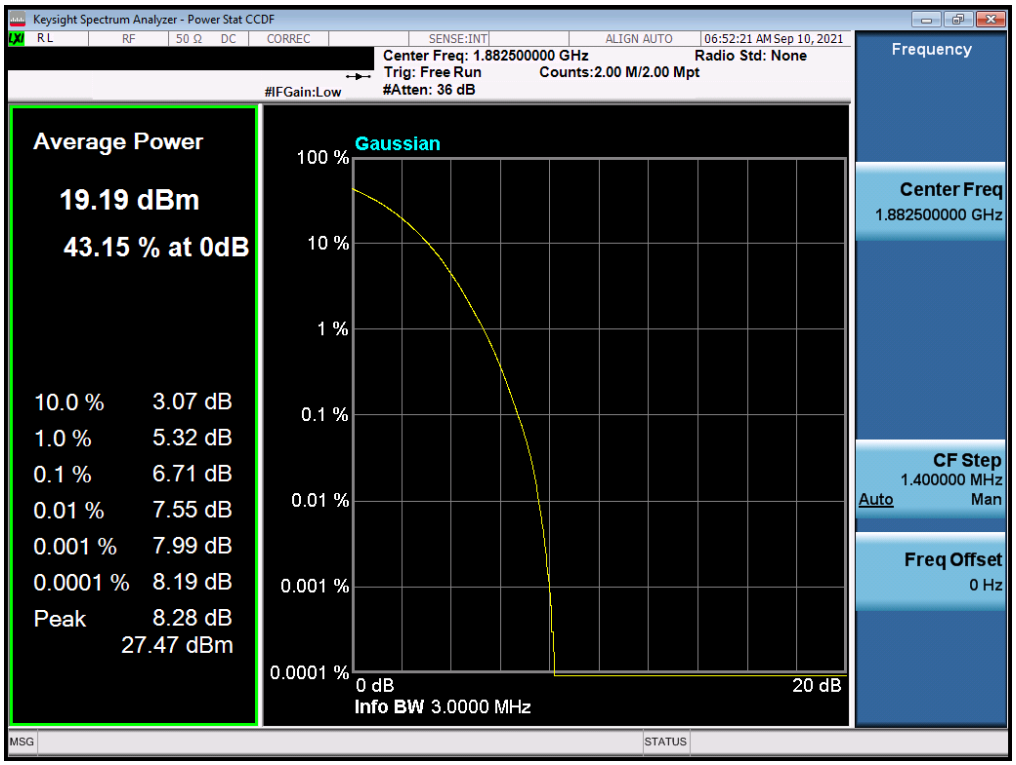
Plot 7-223. PAR Plot (LTE Band 25/2 - 5MHz QPSK - Full RB)



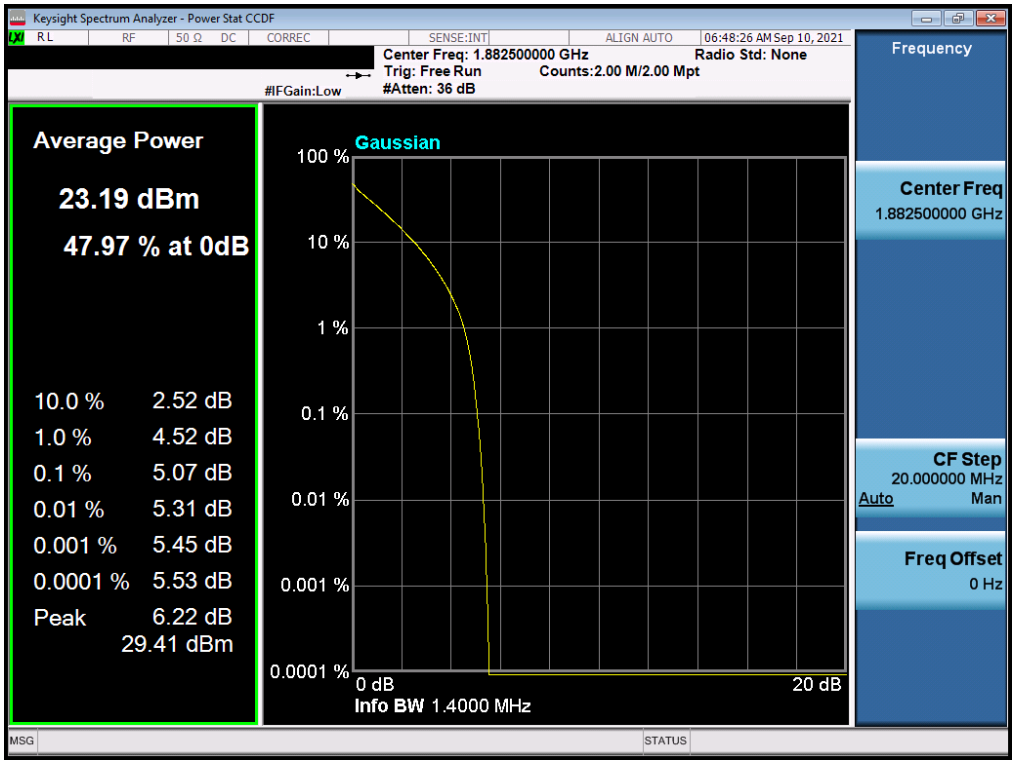
Plot 7-224. PAR Plot (LTE Band 25/2 - 5MHz 256-QAM - Full RB)



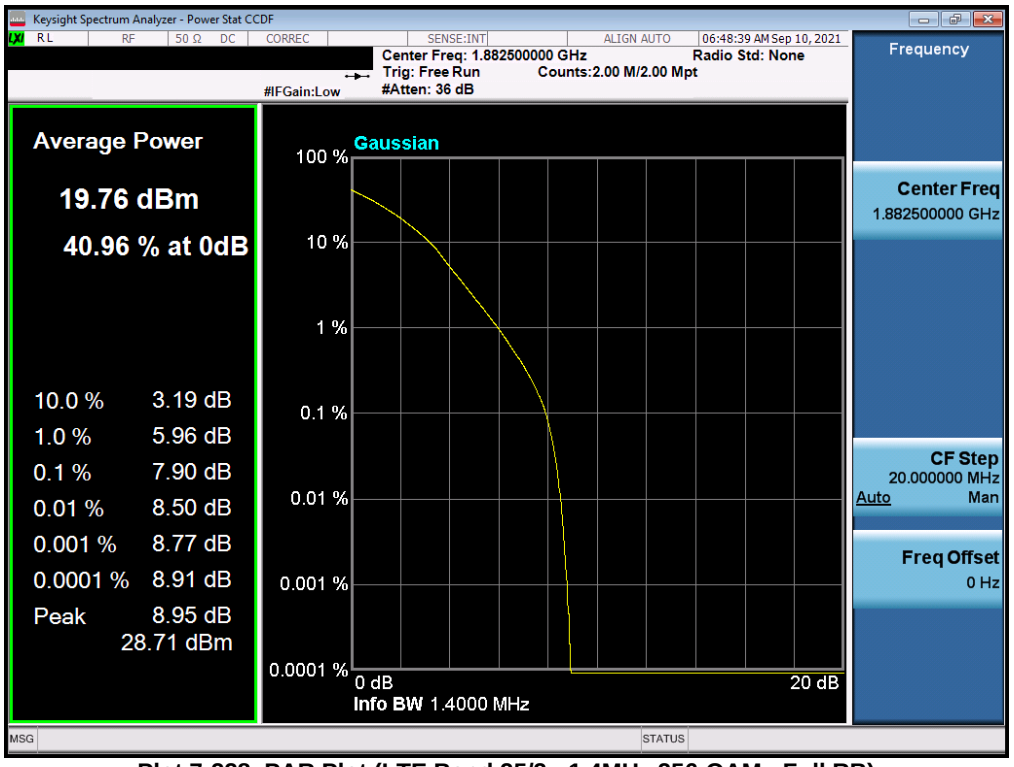
Plot 7-225. PAR Plot (LTE Band 25/2 - 3MHz QPSK - Full RB)



Plot 7-226. PAR Plot (LTE Band 25/2 - 3MHz 256-QAM - Full RB)



Plot 7-227. PAR Plot (LTE Band 25/2 - 1.4MHz QPSK - Full RB)



Plot 7-228. PAR Plot (LTE Band 25/2 - 1.4MHz 256-QAM - Full RB)

NR Band n25/2 – Ant A

Plot 7-229. PAR Plot (NR Band n25 - 40.0MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-230. PAR Plot (NR Band n25 - 40.0MHz CP-OFDM QPSK - Full RB)

Plot 7-231. PAR Plot (NR Band n25 - 40.0MHz CP-OFDM 256-QAM - Full RB)

Plot 7-232. PAR Plot (NR Band n25 - 30.0MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-233. PAR Plot (NR Band n25 - 30.0MHz CP-OFDM QPSK - Full RB)

Plot 7-234. PAR Plot (NR Band n25 - 30.0MHz CP-OFDM 256-QAM - Full RB)

Plot 7-235. PAR Plot (NR Band n25 - 25.0MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-236. PAR Plot (NR Band n25 - 25.0MHz CP-OFDM QPSK - Full RB)

Plot 7-237. PAR Plot (NR Band n25 - 25MHz CP-OFDM 256-QAM - Full RB)

Plot 7-238. PAR Plot (NR Band n25/2 - 20.0MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-239. PAR Plot (NR Band n25/2 - 20.0MHz CP-OFDM QPSK - Full RB)

Plot 7-240. PAR Plot (NR Band n25/2 - 20.0MHz CP-OFDM 256-QAM - Full RB)

Plot 7-241. PAR Plot (NR Band n25/2 - 15.0MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-242. PAR Plot (NR Band n25/2 - 15.0MHz CP-OFDM QPSK - Full RB)

Plot 7-243. PAR Plot (NR Band n25/2 - 15.0MHz CP-OFDM 256-QAM - Full RB)

Plot 7-244. PAR Plot (NR Band n25/2 - 10.0MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-245. PAR Plot (NR Band n25/2 - 10.0MHz CP-OFDM QPSK - Full RB)

Plot 7-246. PAR Plot (NR Band n25/2 - 10.0MHz CP-OFDM 256-QAM - Full RB)

Plot 7-247. PAR Plot (NR Band n25/2 - 5.0MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-248. PAR Plot (NR Band n25/2 - 5.0MHz CP-OFDM QPSK - Full RB)

Plot 7-249. PAR Plot (NR Band n25/2 - 5.0MHz CP-OFDM 256-QAM - Full RB)

NR Band n25/2 – Ant I

Plot 7-250. PAR Plot (NR Band n25 - 40.0MHz DFT-s-OFDM BPSK - Full RB)

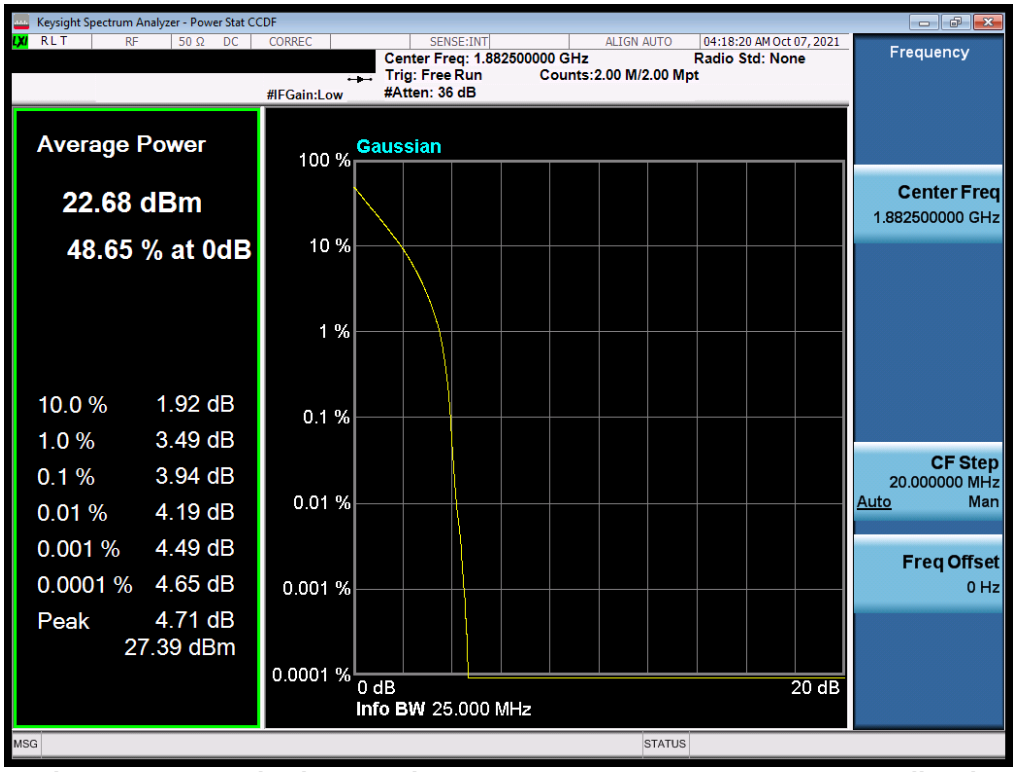
Plot 7-251. PAR Plot (NR Band n25 - 40.0MHz CP-OFDM QPSK - Full RB)

Plot 7-252. PAR Plot (NR Band n25 - 40.0MHz CP-OFDM 256-QAM - Full RB)

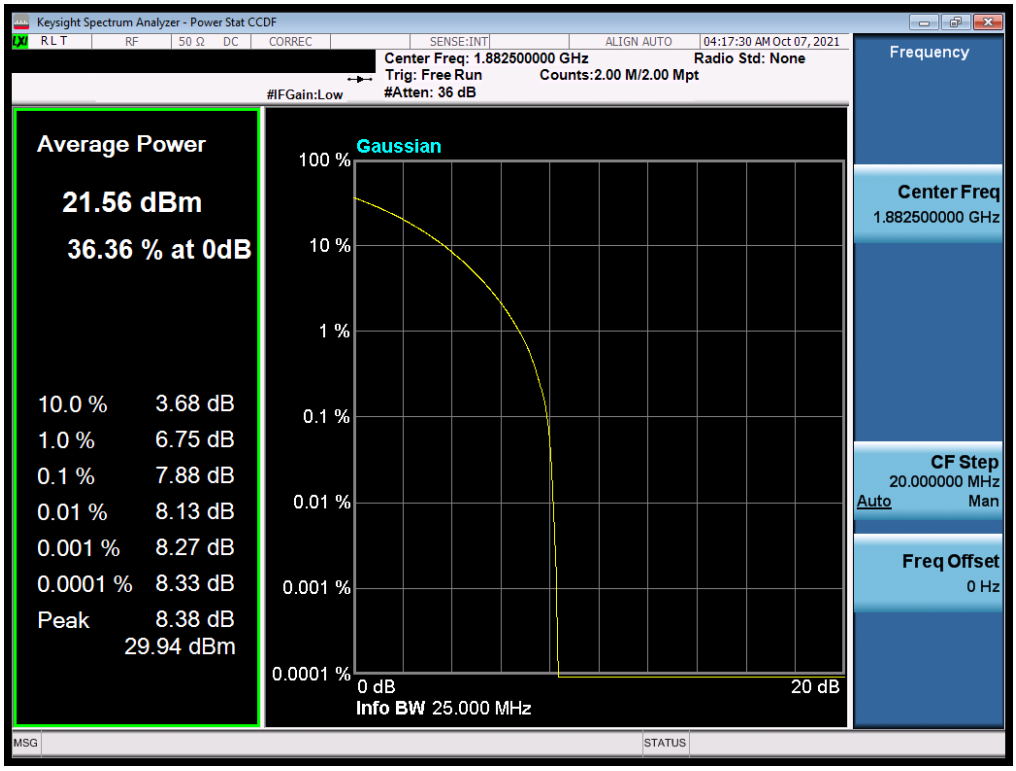
Plot 7-253. PAR Plot (NR Band n25 - 30.0MHz DFT-s-OFDM BPSK - Full RB)

Plot 7-254. PAR Plot (NR Band n25 - 30.0MHz CP-OFDM QPSK - Full RB)

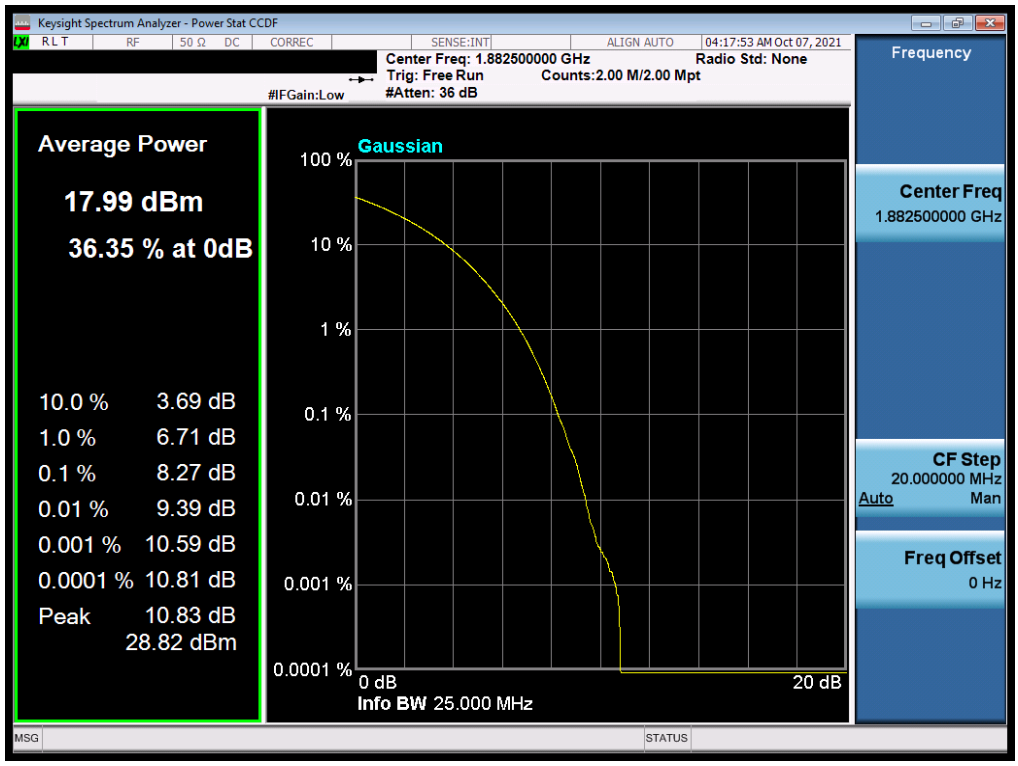
Plot 7-255. PAR Plot (NR Band n25 - 30.0MHz CP-OFDM 256-QAM - Full RB)



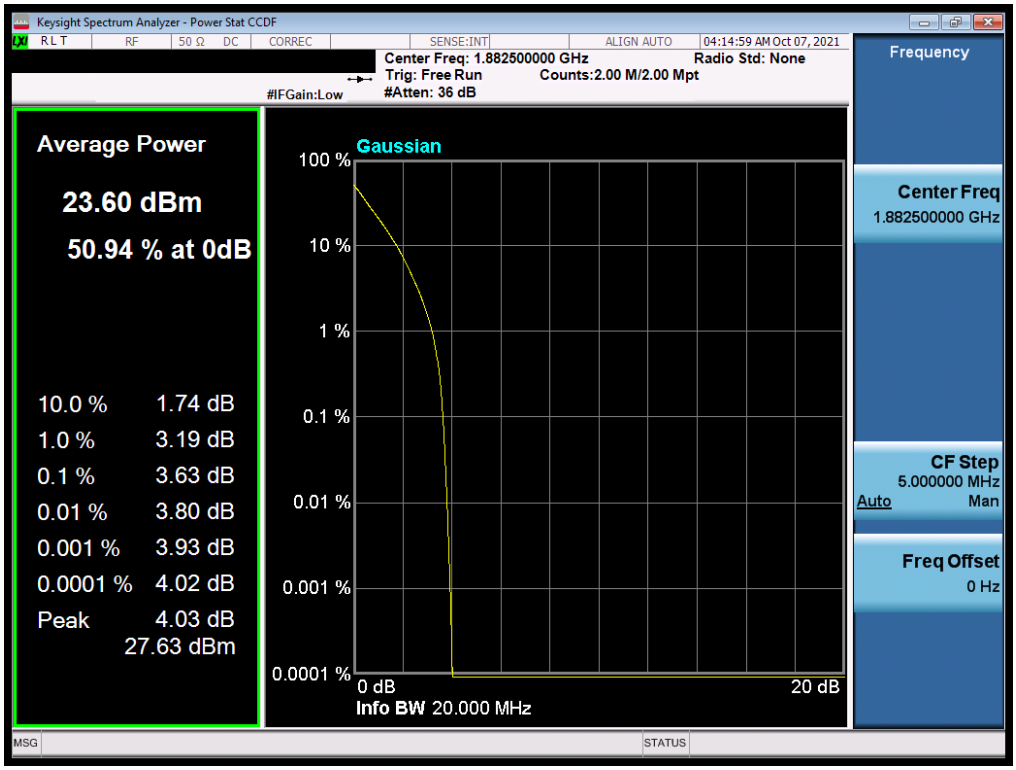
Plot 7-256. PAR Plot (NR Band n25 - 25.0MHz DFT-s-OFDM BPSK - Full RB)



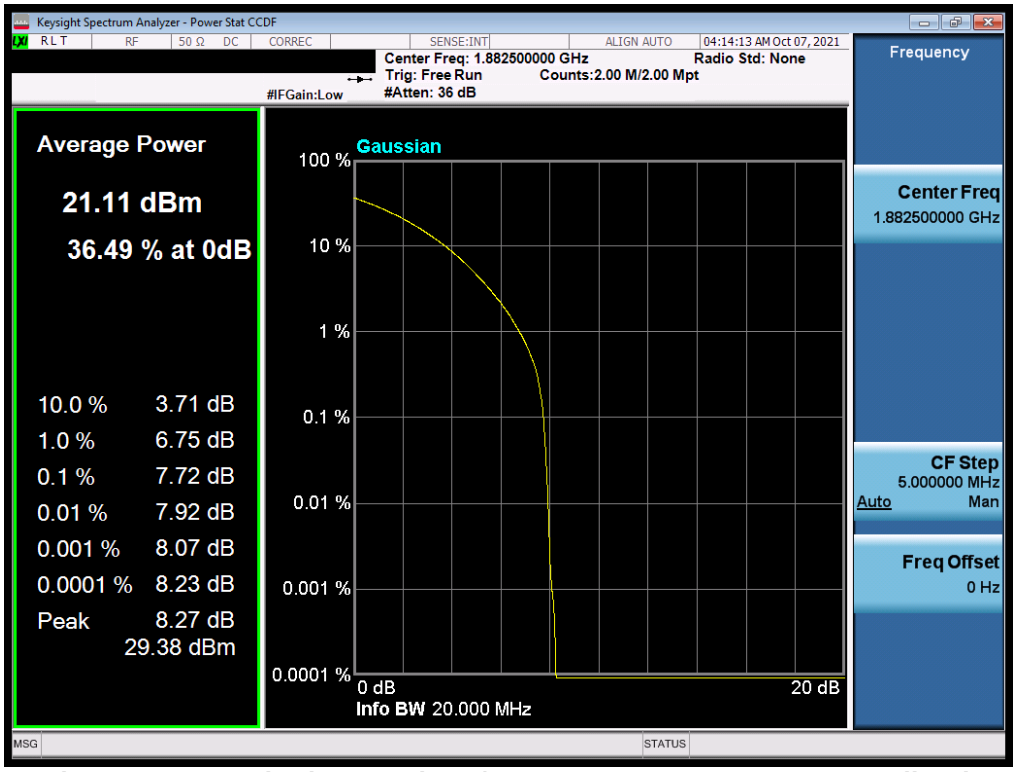
Plot 7-257. PAR Plot (NR Band n25 - 25.0MHz CP-OFDM QPSK - Full RB)



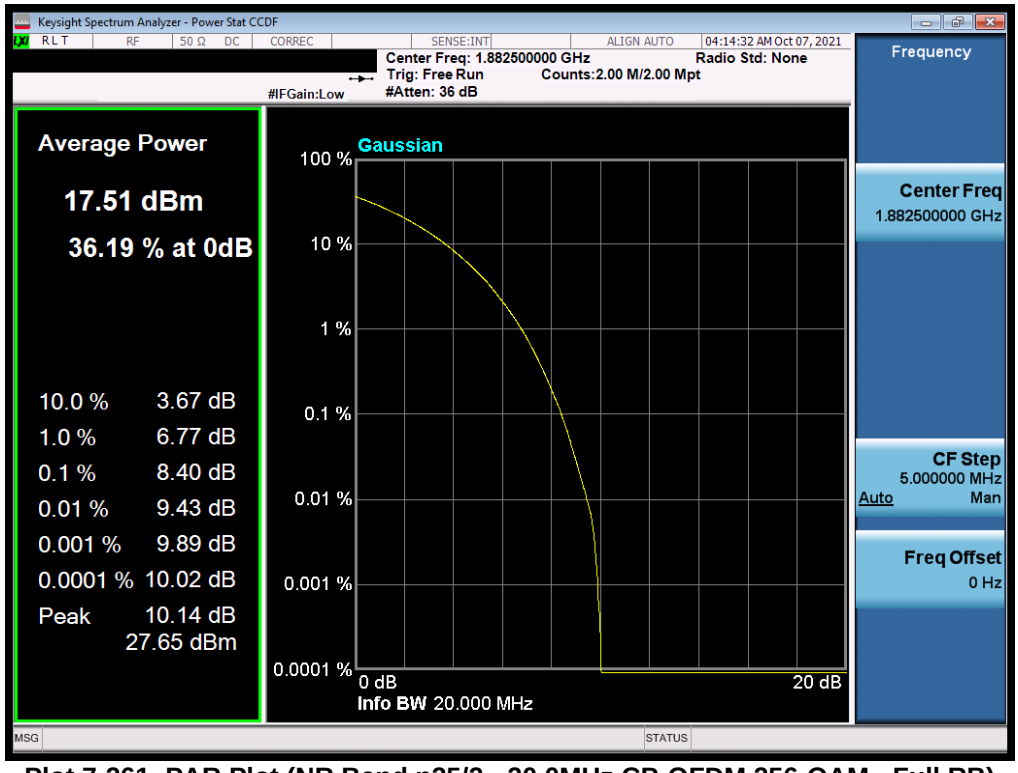
Plot 7-258. PAR Plot (NR Band n25 - 25MHz CP-OFDM 256-QAM - Full RB)



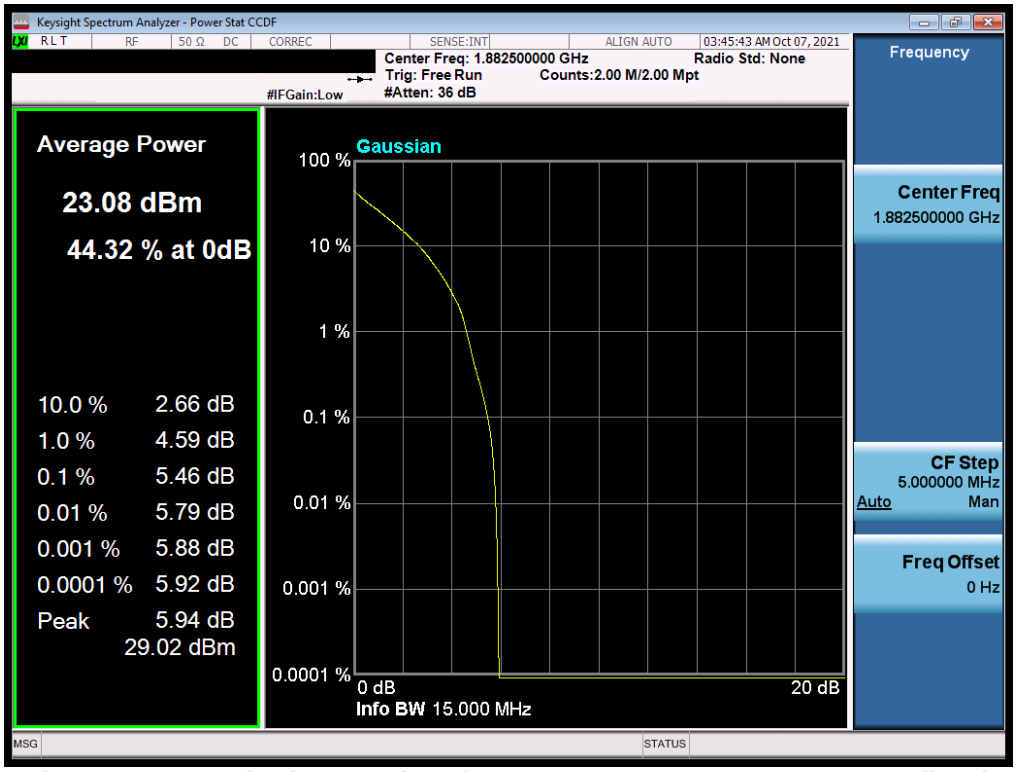
Plot 7-259. PAR Plot (NR Band n25/2 - 20.0MHz DFT-s-OFDM BPSK - Full RB)



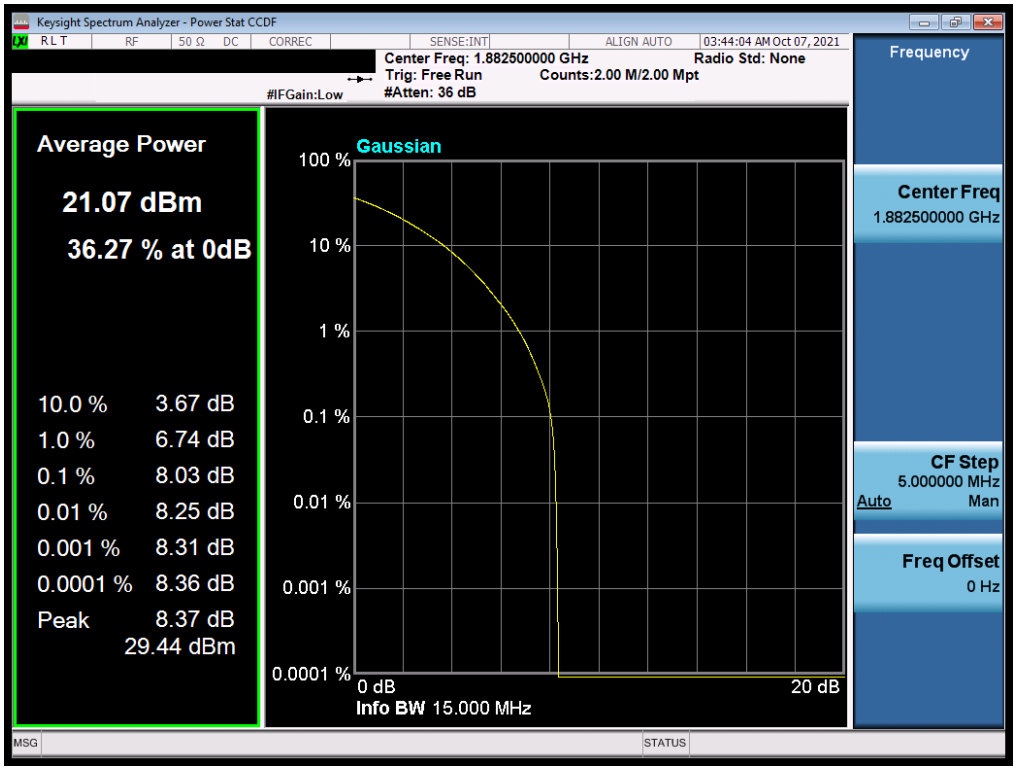
Plot 7-260. PAR Plot (NR Band n25/2 - 20.0MHz CP-OFDM QPSK - Full RB)



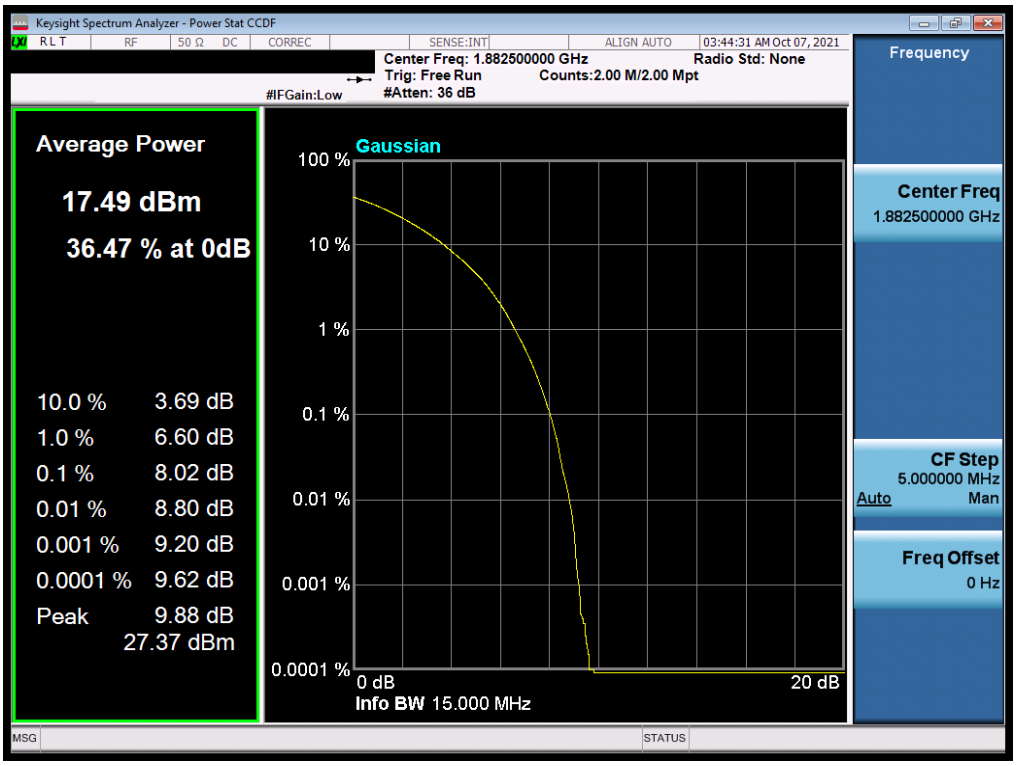
Plot 7-261. PAR Plot (NR Band n25/2 - 20.0MHz CP-OFDM 256-QAM - Full RB)



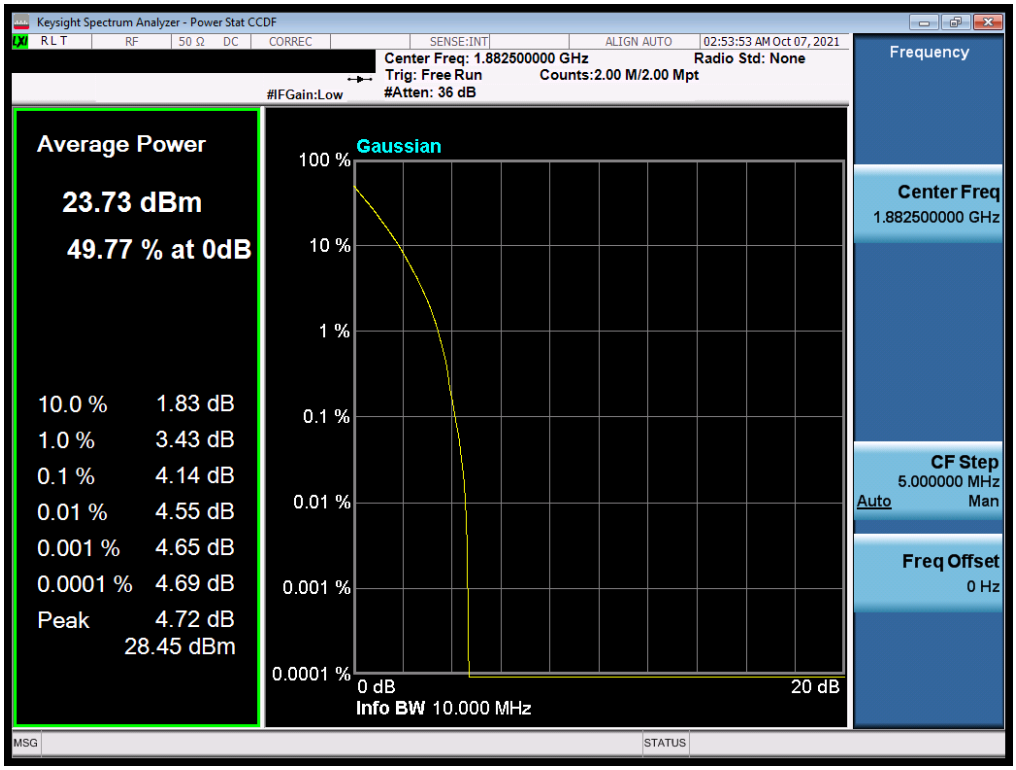
Plot 7-262. PAR Plot (NR Band n25/2 - 15.0MHz DFT-s-OFDM BPSK - Full RB)



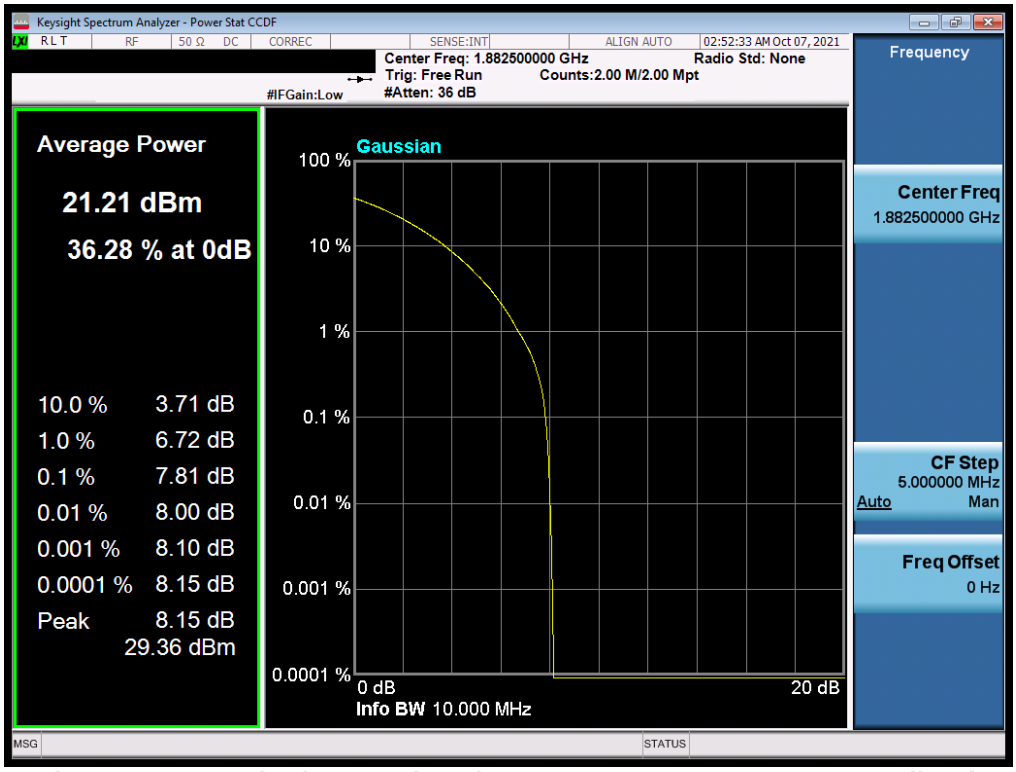
Plot 7-263. PAR Plot (NR Band n25/2 - 15.0MHz CP-OFDM QPSK - Full RB)



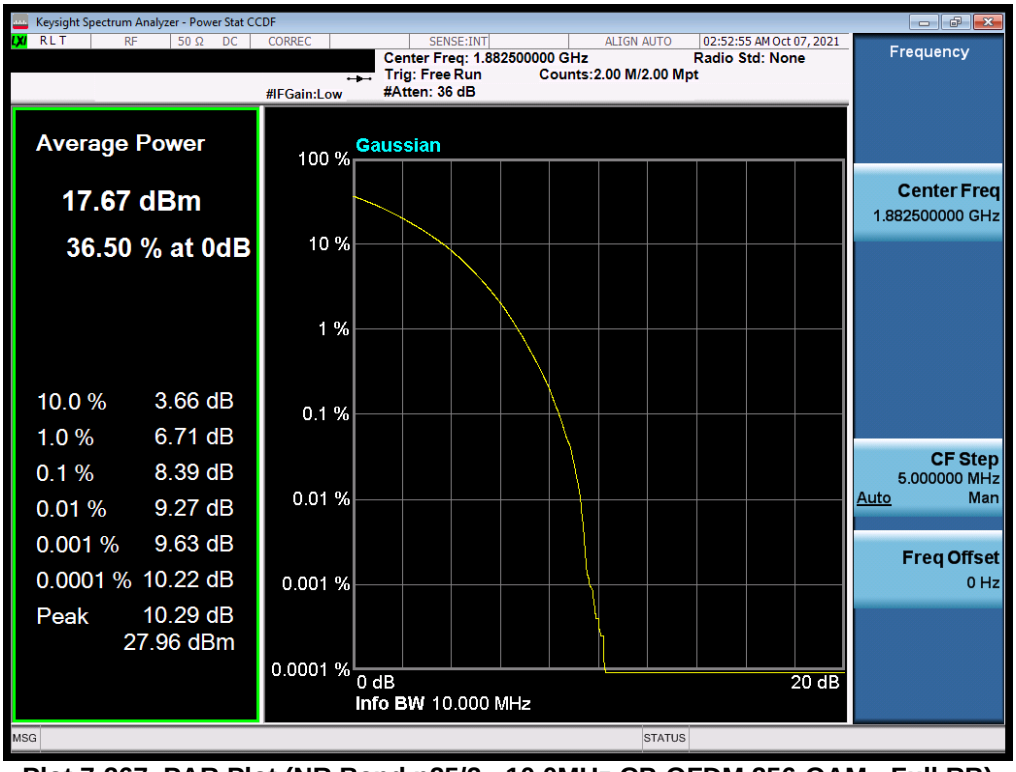
Plot 7-264. PAR Plot (NR Band n25/2 – 15.0MHz CP-OFDM 256-QAM – Full RB)



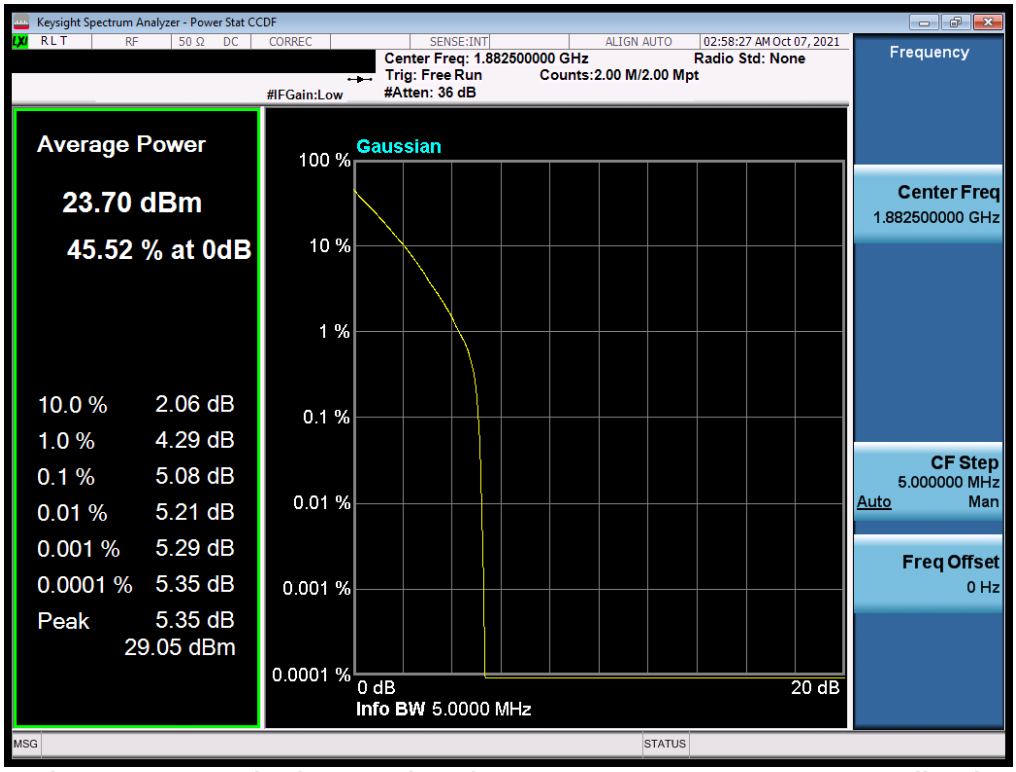
Plot 7-265. PAR Plot (NR Band n25/2 – 10.0MHz DFT-s-OFDM BPSK – Full RB)



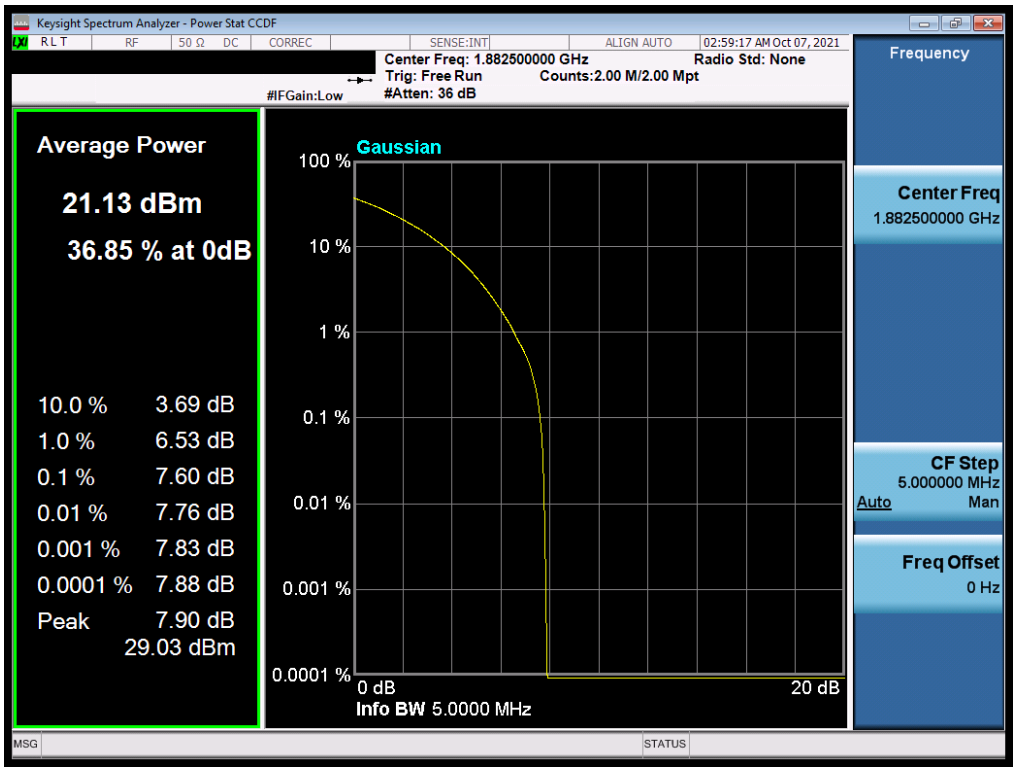
Plot 7-266. PAR Plot (NR Band n25/2 – 10.0MHz CP-OFDM QPSK – Full RB)



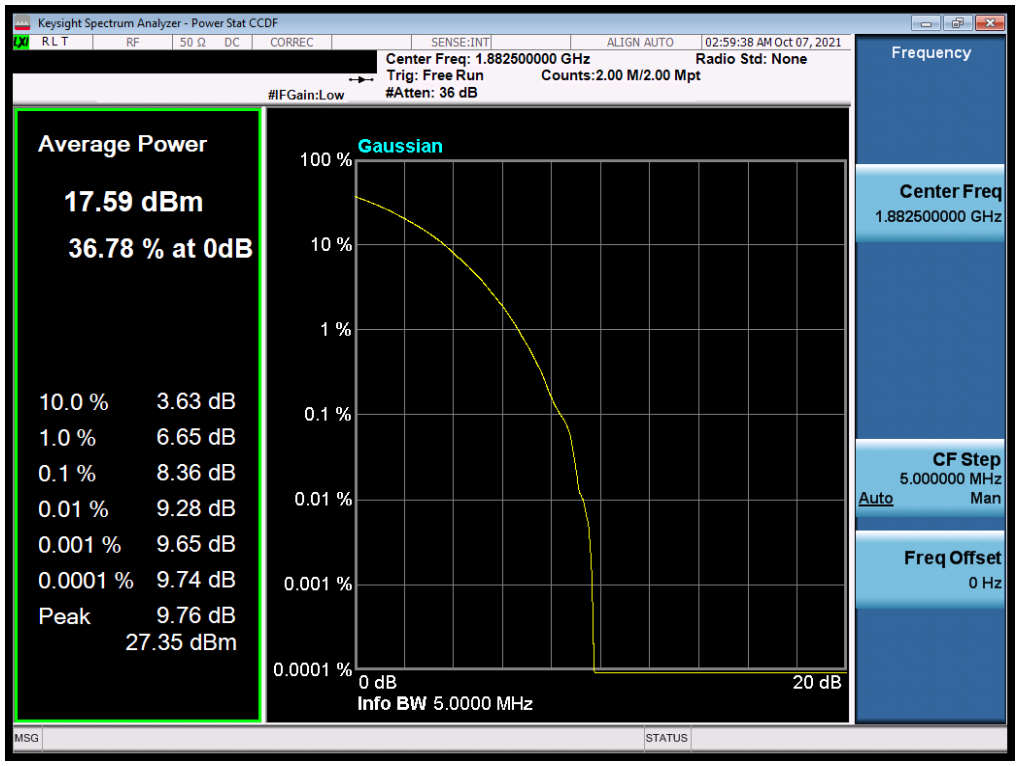
Plot 7-267. PAR Plot (NR Band n25/2 - 10.0MHz CP-OFDM 256-QAM - Full RB)



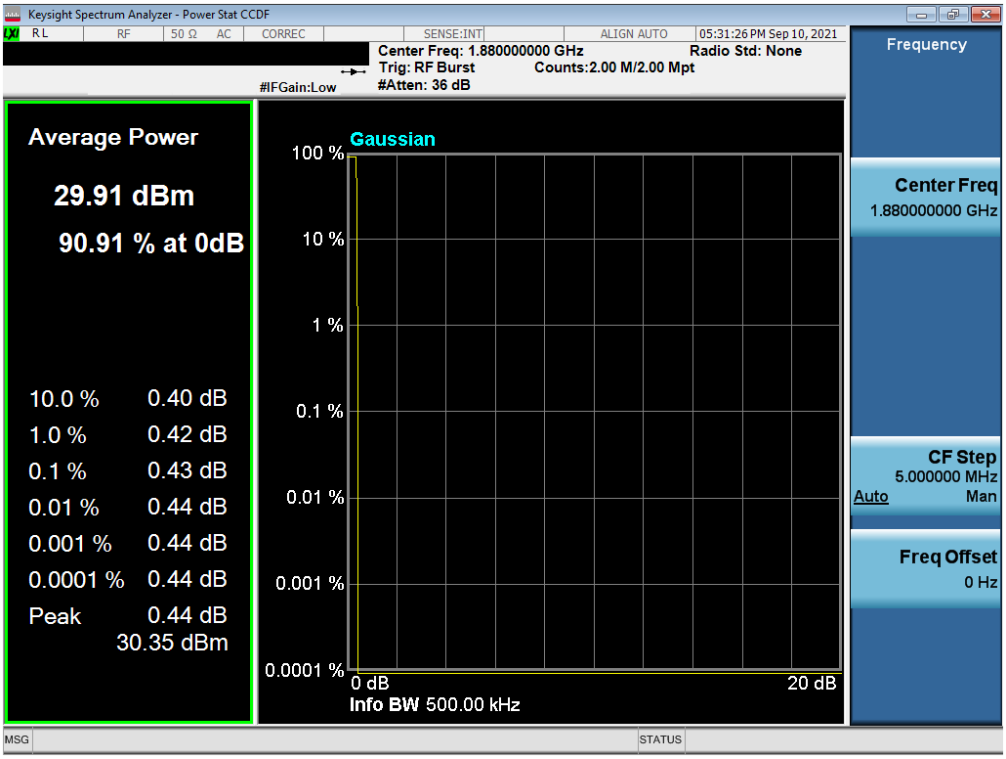
Plot 7-268. PAR Plot (NR Band n25/2 - 5.0MHz DFT-s-OFDM BPSK - Full RB)



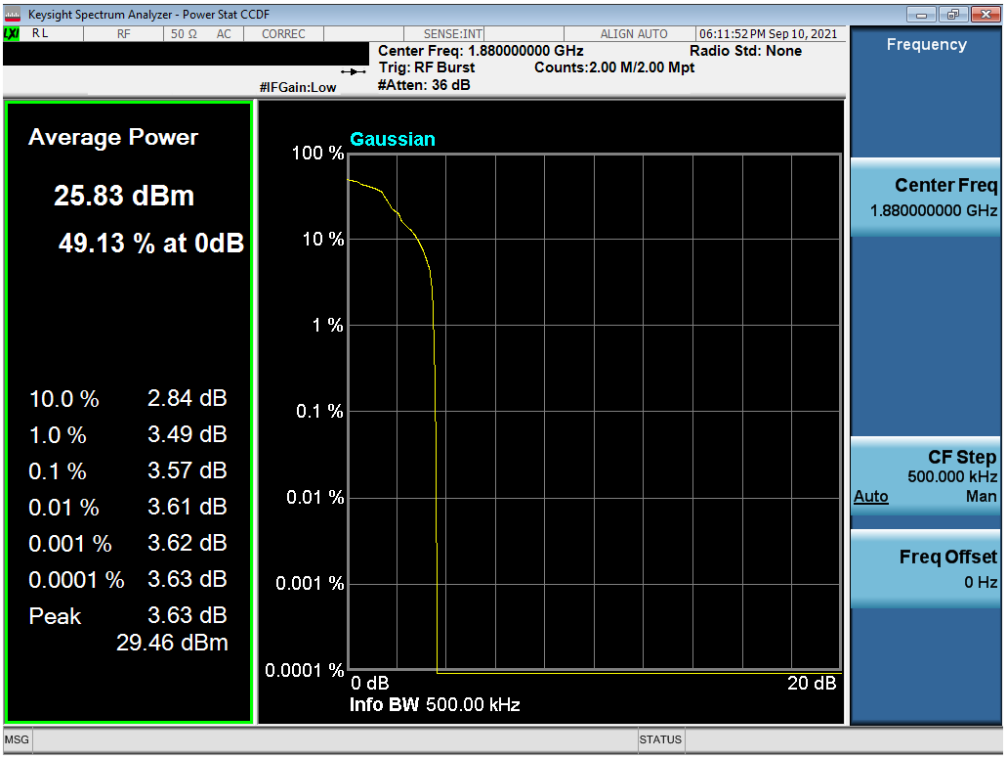
Plot 7-269. PAR Plot (NR Band n25/2 - 5.0MHz CP-OFDM QPSK - Full RB)



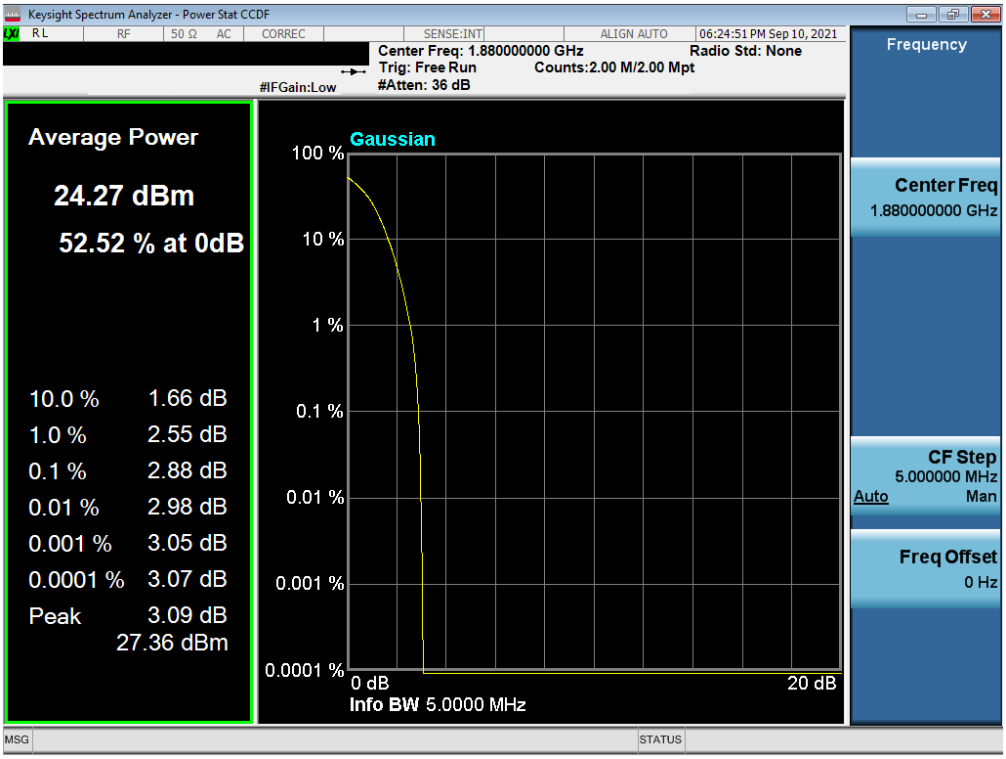
Plot 7-270. PAR Plot (NR Band n25/2 - 5.0MHz CP-OFDM 256-QAM - Full RB)



Plot 7-271. PAR Plot (GPRS, Ch. 661)



Plot 7-272. PAR Plot (EDGE, Ch. 661)



Plot 7-273. PAR Plot (WCDMA, Ch. 9400)

7.7 Radiated Power (ERP/EIRP)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points ≥ 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

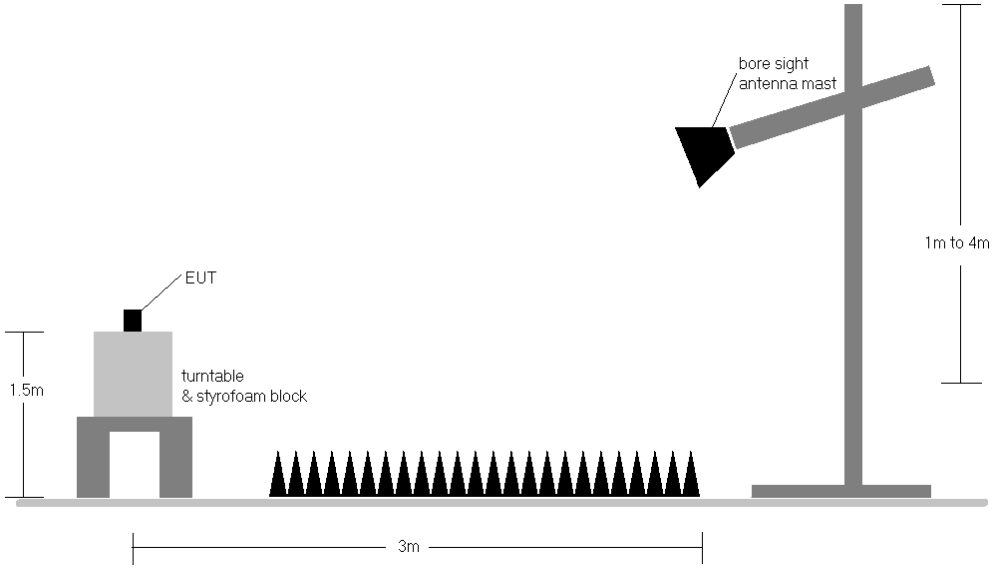


Figure 7-6. Radiated Test Setup >1GHz