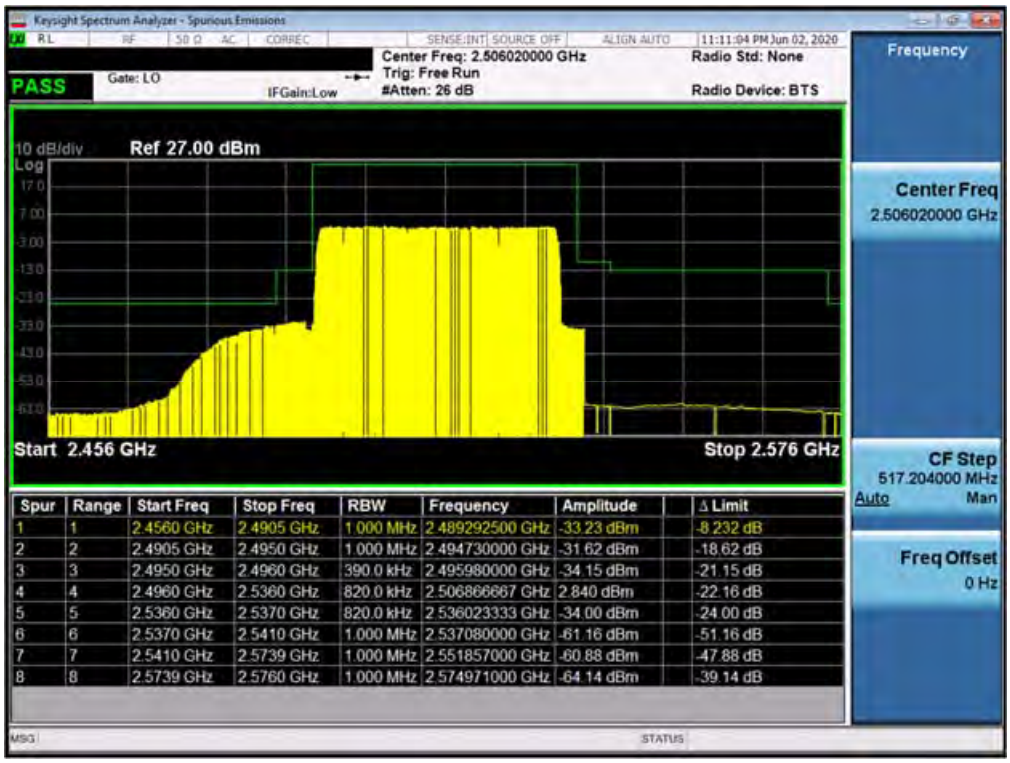
NR Band n41

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4760 GHz	2.4905 GHz	1.000 MHz	2.488228333 GHz	-29.50 dBm	-4.496 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494977500 GHz	-28.68 dBm	-15.68 dB
3	3	2.4950 GHz	2.4960 GHz	200.0 kHz	2.495998333 GHz	-32.00 dBm	-19.00 dB
4	4	2.4960 GHz	2.5160 GHz	390.0 kHz	2.503800000 GHz	2.986 dBm	-22.01 dB
5	5	2.5160 GHz	2.5170 GHz	390.0 kHz	2.516006667 GHz	-27.93 dBm	-17.93 dB
6	6	2.5170 GHz	2.5210 GHz	1.000 MHz	2.519120000 GHz	-31.19 dBm	-21.19 dB
7	7	2.5210 GHz	2.5343 GHz	1.000 MHz	2.523394000 GHz	-24.47 dBm	-11.47 dB
8	8	2.5343 GHz	2.5360 GHz	1.000 MHz	2.535966000 GHz	-43.21 dBm	-18.21 dB

Plot 7-543. Lower ACP Plot at 2496 MHz (n41 - 20.0MHz DFT-s-OFDM-QPSK - Full RB Configuration)

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6500 GHz	2.6517 GHz	1.000 MHz	2.651258000 GHz	-43.62 dBm	-18.62 dB
2	2	2.6517 GHz	2.6650 GHz	1.000 MHz	2.663005000 GHz	-24.45 dBm	-11.45 dB
3	3	2.6650 GHz	2.6690 GHz	220.0 kHz	2.668993333 GHz	-31.98 dBm	-21.98 dB
4	4	2.6690 GHz	2.6700 GHz	390.0 kHz	2.669996667 GHz	-27.47 dBm	-17.47 dB
5	5	2.6700 GHz	2.6900 GHz	390.0 kHz	2.673600000 GHz	5.763 dBm	-19.24 dB
6	6	2.6900 GHz	2.6910 GHz	390.0 kHz	2.690080000 GHz	-24.46 dBm	-14.46 dB
7	7	2.6910 GHz	2.6950 GHz	1.000 MHz	2.692600000 GHz	-26.67 dBm	-16.67 dB
8	8	2.6950 GHz	2.7083 GHz	1.000 MHz	2.698059000 GHz	-23.16 dBm	-10.16 dB
9	9	2.7083 GHz	2.7100 GHz	1.000 MHz	2.708351000 GHz	-44.05 dBm	-19.05 dB

Plot 7-544. Upper ACP Plot (Band 41 - 20.0MHz DFT-s-OFDM-QPSK - Full RB Configuration)

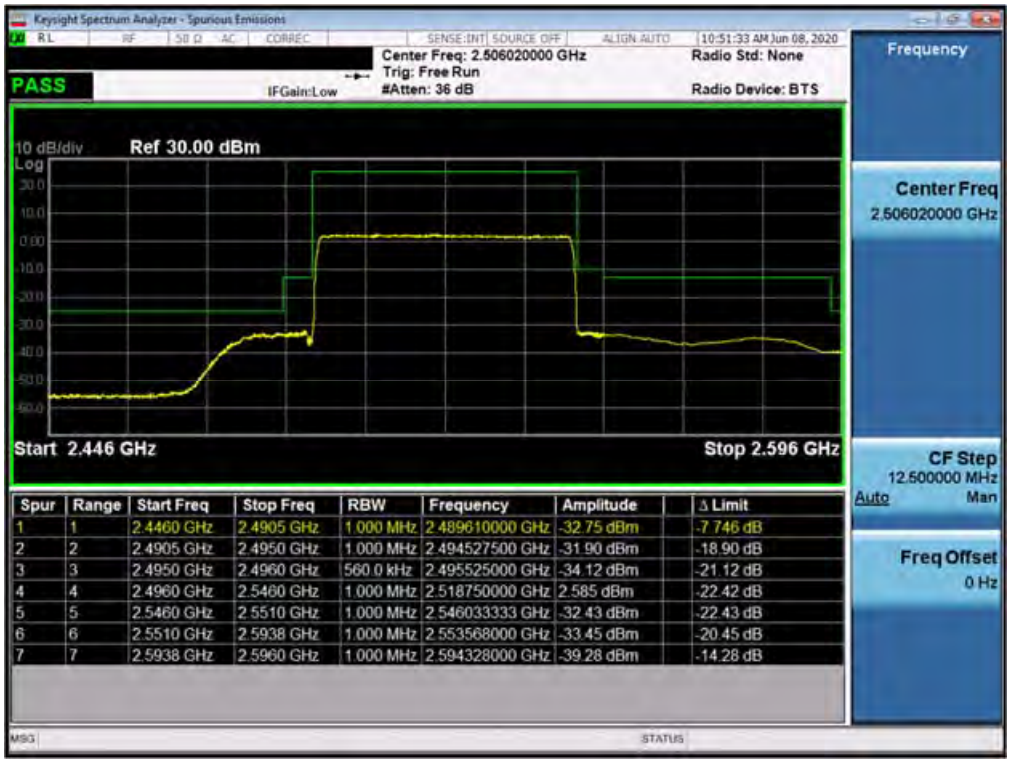


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4560 GHz	2.4905 GHz	1.000 MHz	2.489292500 GHz	-33.23 dBm	-8.232 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494730000 GHz	-31.62 dBm	-18.62 dB
3	3	2.4950 GHz	2.4960 GHz	390.0 kHz	2.495980000 GHz	-34.15 dBm	-21.15 dB
4	4	2.4960 GHz	2.5360 GHz	820.0 kHz	2.506866667 GHz	2.840 dBm	-22.16 dB
5	5	2.5360 GHz	2.5370 GHz	820.0 kHz	2.536023333 GHz	-34.00 dBm	-24.00 dB
6	6	2.5370 GHz	2.5410 GHz	1.000 MHz	2.537080000 GHz	-61.16 dBm	-51.16 dB
7	7	2.5410 GHz	2.5739 GHz	1.000 MHz	2.551857000 GHz	-60.88 dBm	-47.88 dB
8	8	2.5739 GHz	2.5760 GHz	1.000 MHz	2.574971000 GHz	-64.14 dBm	-39.14 dB

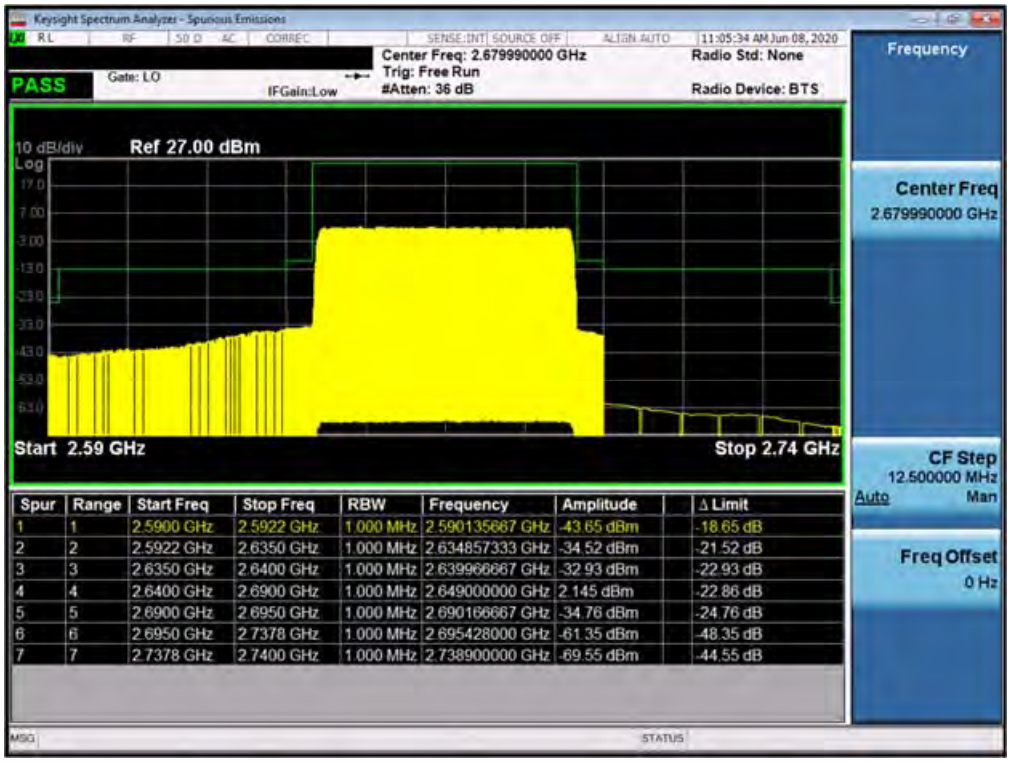
Plot 7-545. Lower ACP Plot at 2496 MHz (n41 - 40.0MHz DFT-s-OFDM-QPSK - Full RB Configuration)

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6100 GHz	2.6121 GHz	1.000 MHz	2.610220500 GHz	-50.86 dBm	-25.86 dB
2	2	2.6121 GHz	2.6450 GHz	1.000 MHz	2.635568667 GHz	-28.88 dBm	-15.88 dB
3	3	2.6450 GHz	2.6490 GHz	1.000 MHz	2.648980000 GHz	-26.92 dBm	-16.92 dB
4	4	2.6490 GHz	2.6500 GHz	820.0 kHz	2.649998333 GHz	-27.51 dBm	-17.51 dB
5	5	2.6500 GHz	2.6900 GHz	820.0 kHz	2.662666667 GHz	1.736 dBm	-23.26 dB
6	6	2.6900 GHz	2.6910 GHz	820.0 kHz	2.690420000 GHz	-24.01 dBm	-14.01 dB
7	7	2.6910 GHz	2.6950 GHz	1.000 MHz	2.692160000 GHz	-24.74 dBm	-14.74 dB
8	8	2.6950 GHz	2.7279 GHz	1.000 MHz	2.706515000 GHz	-26.51 dBm	-13.51 dB
9	9	2.7279 GHz	2.7300 GHz	1.000 MHz	2.727942000 GHz	-56.13 dBm	-31.13 dB

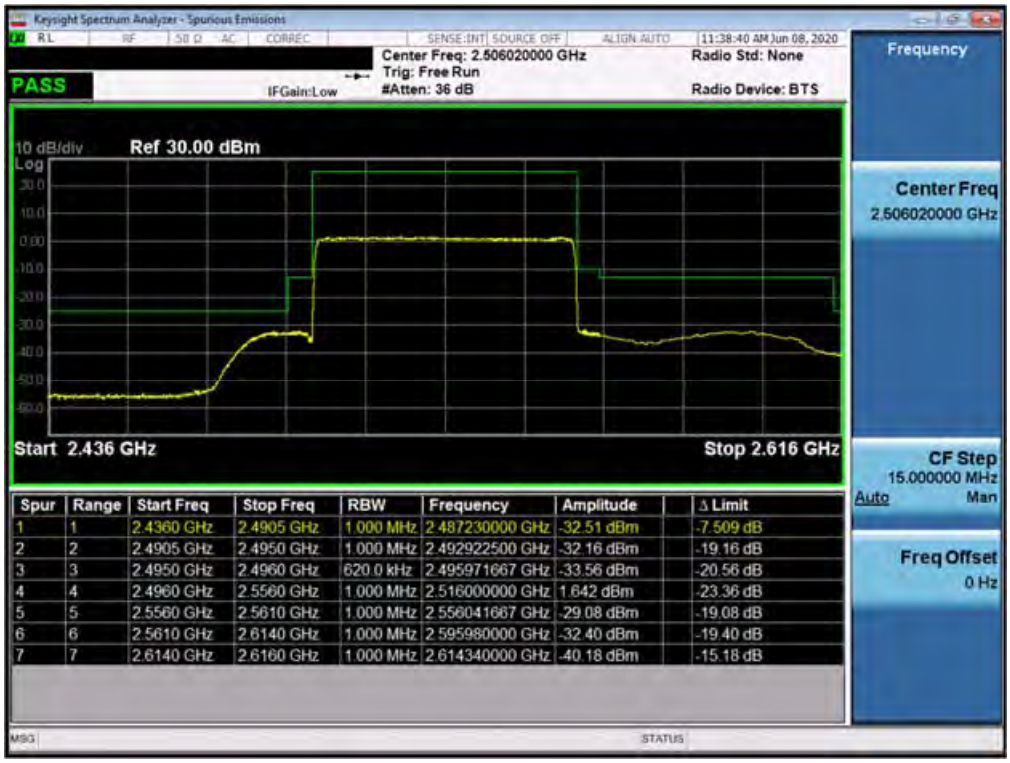
Plot 7-546. Upper ACP Plot (Band 41 - 40.0MHz DFT-s-OFDM-QPSK - Full RB Configuration)



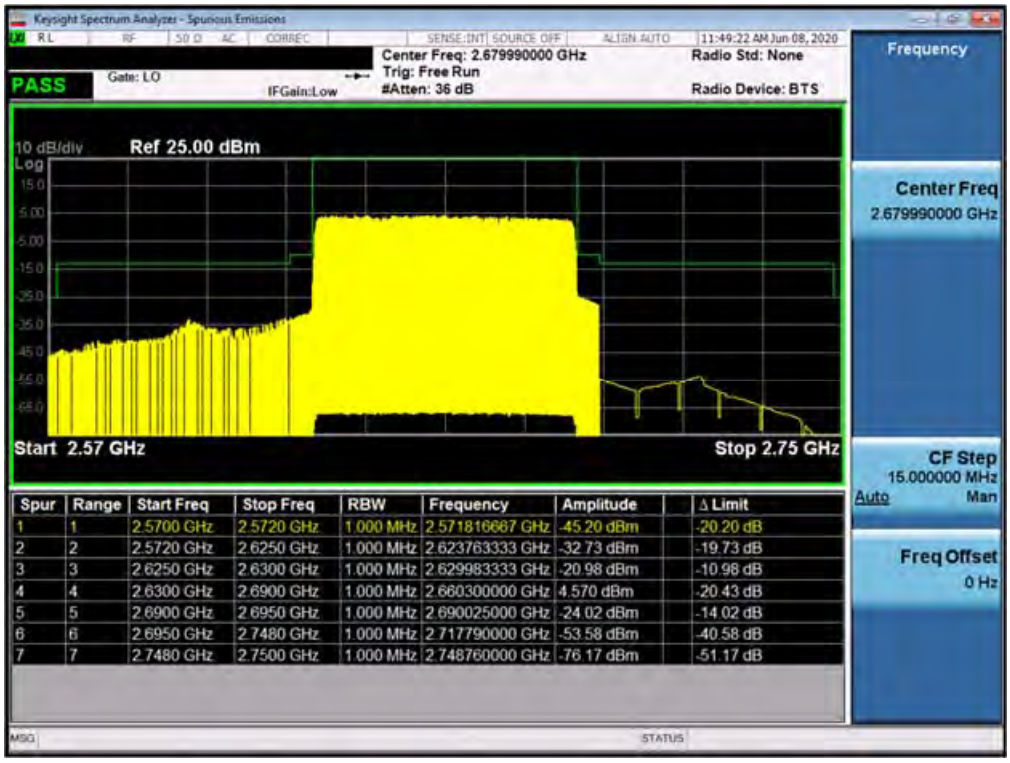
Plot 7-547. Lower ACP Plot at 2496 MHz (n41 - 50.0MHz DFT-s-OFDM-QPSK - Full RB Configuration)



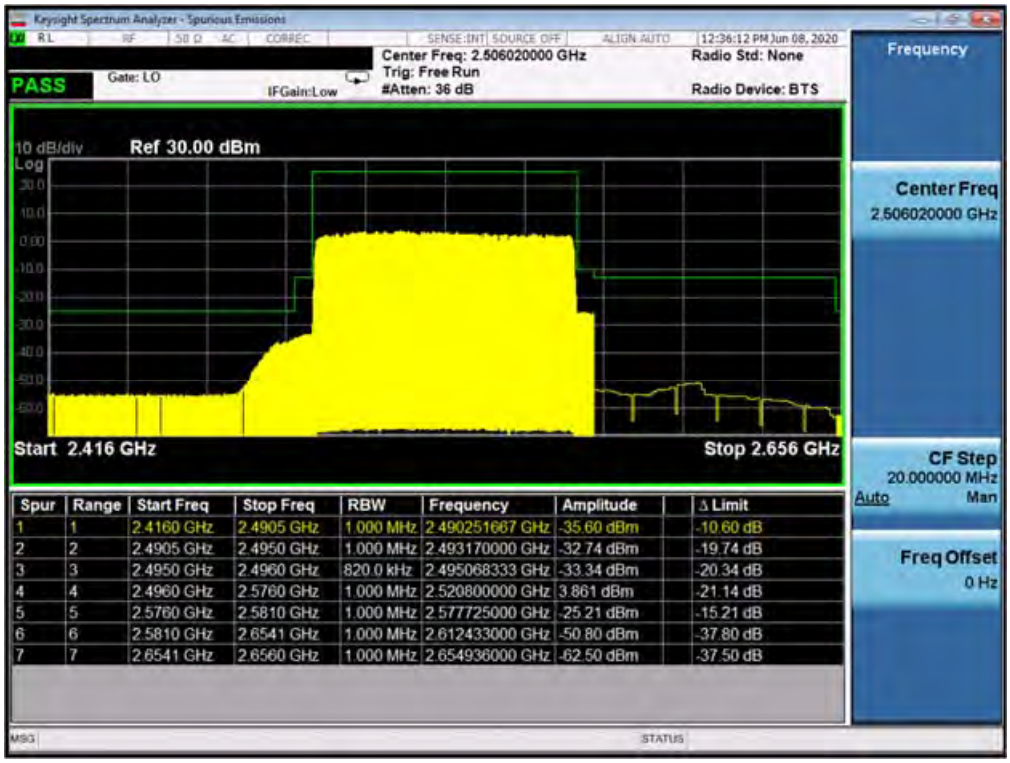
Plot 7-548. Upper ACP Plot (Band 41 - 50.0MHz DFT-s-OFDM-QPSK - Full RB Configuration)



Plot 7-549. Lower ACP Plot at 2496 MHz (n41 - 60.0MHz DFT-s-OFDM-QPSK - Full RB Configuration)



Plot 7-550. Upper ACP Plot (Band 41 - 60.0MHz DFT-s-OFDM-QPSK - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4160 GHz	2.4905 GHz	1.000 MHz	2.490251667 GHz	-35.60 dBm	-10.60 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.493170000 GHz	-32.74 dBm	-19.74 dB
3	3	2.4950 GHz	2.4960 GHz	820.0 kHz	2.495068333 GHz	-33.34 dBm	-20.34 dB
4	4	2.4960 GHz	2.5760 GHz	1.000 MHz	2.520800000 GHz	3.861 dBm	-21.14 dB
5	5	2.5760 GHz	2.5810 GHz	1.000 MHz	2.577725000 GHz	-25.21 dBm	-15.21 dB
6	6	2.5810 GHz	2.6541 GHz	1.000 MHz	2.612433000 GHz	-50.80 dBm	-37.80 dB
7	7	2.6541 GHz	2.6560 GHz	1.000 MHz	2.654936000 GHz	-62.50 dBm	-37.50 dB

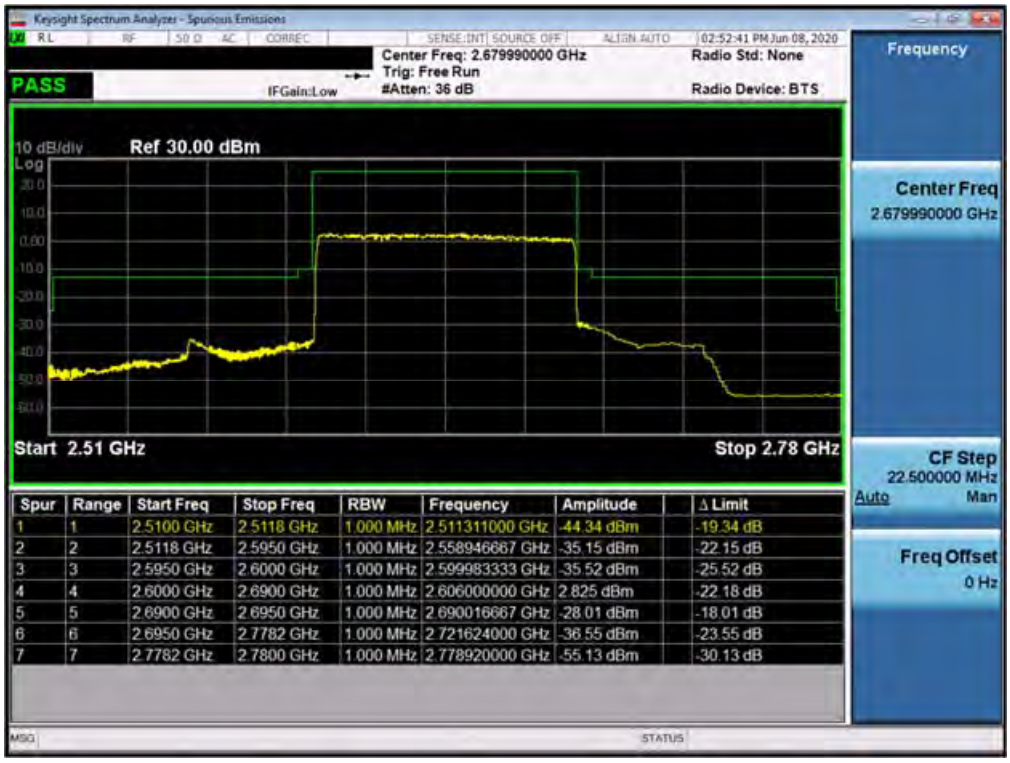
Plot 7-551. Lower ACP Plot at 2496 MHz (n41 - 80.0MHz DFT-s-OFDM-QPSK - Full RB Configuration)

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5300 GHz	2.5319 GHz	1.000 MHz	2.530889833 GHz	-46.86 dBm	-21.86 dB
2	2	2.5319 GHz	2.6050 GHz	1.000 MHz	2.573810667 GHz	-34.35 dBm	-21.35 dB
3	3	2.6050 GHz	2.6100 GHz	1.000 MHz	2.608766667 GHz	-34.69 dBm	-24.69 dB
4	4	2.6100 GHz	2.6900 GHz	1.000 MHz	2.637333333 GHz	3.527 dBm	-21.47 dB
5	5	2.6900 GHz	2.6950 GHz	1.000 MHz	2.690025000 GHz	-29.35 dBm	-19.35 dB
6	6	2.6950 GHz	2.7681 GHz	1.000 MHz	2.721316000 GHz	-35.21 dBm	-22.21 dB
7	7	2.7681 GHz	2.7700 GHz	1.000 MHz	2.768708000 GHz	-55.22 dBm	-30.22 dB

Plot 7-552. Upper ACP Plot (Band 41 - 80.0MHz DFT-s-OFDM-QPSK - Full RB Configuration)

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4060 GHz	2.4905 GHz	1.000 MHz	2.489936667 GHz	-33.96 dBm	-8.956 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494977500 GHz	-31.02 dBm	-18.02 dB
3	3	2.4950 GHz	2.4960 GHz	910.0 kHz	2.495995000 GHz	-28.37 dBm	-15.37 dB
4	4	2.4960 GHz	2.5860 GHz	1.000 MHz	2.515800000 GHz	1.238 dBm	-23.76 dB
5	5	2.5860 GHz	2.5910 GHz	1.000 MHz	2.586725000 GHz	-24.21 dBm	-14.21 dB
6	6	2.5910 GHz	2.6742 GHz	1.000 MHz	2.627608000 GHz	-23.86 dBm	-10.86 dB
7	7	2.6742 GHz	2.6760 GHz	1.000 MHz	2.675982000 GHz	-40.26 dBm	-15.26 dB

Plot 7-553. Lower ACP Plot at 2496 MHz (n41 - 90.0MHz DFT-s-OFDM-QPSK - Full RB Configuration)

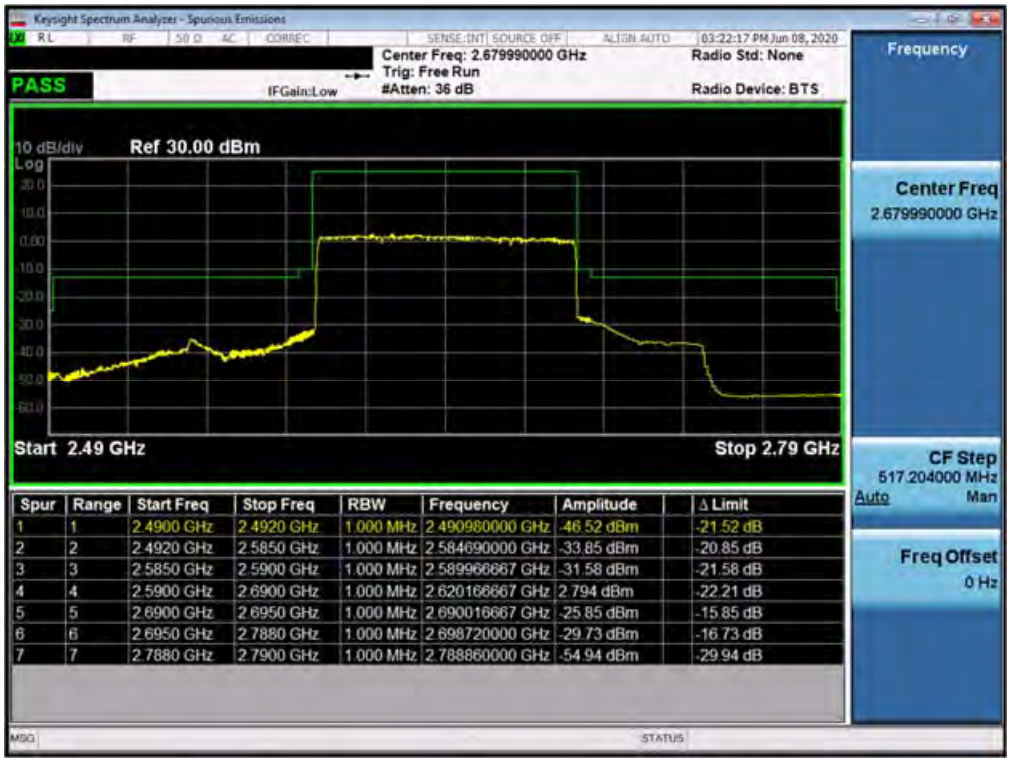


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5100 GHz	2.5118 GHz	1.000 MHz	2.511311000 GHz	-44.34 dBm	-19.34 dB
2	2	2.5118 GHz	2.5950 GHz	1.000 MHz	2.558946667 GHz	-35.15 dBm	-22.15 dB
3	3	2.5950 GHz	2.6000 GHz	1.000 MHz	2.599983333 GHz	-35.52 dBm	-25.52 dB
4	4	2.6000 GHz	2.6900 GHz	1.000 MHz	2.606000000 GHz	2.825 dBm	-22.18 dB
5	5	2.6900 GHz	2.6950 GHz	1.000 MHz	2.690016667 GHz	-28.01 dBm	-18.01 dB
6	6	2.6950 GHz	2.7782 GHz	1.000 MHz	2.721624000 GHz	-36.55 dBm	-23.55 dB
7	7	2.7782 GHz	2.7800 GHz	1.000 MHz	2.778920000 GHz	-55.13 dBm	-30.13 dB

Plot 7-554. Upper ACP Plot (Band 41 - 90.0MHz DFT-s-OFDM-QPSK - Full RB Configuration)

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.3960 GHz	2.4905 GHz	1.000 MHz	2.490342500 GHz	-31.72 dBm	-6.717 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494970000 GHz	-31.27 dBm	-18.27 dB
3	3	2.4950 GHz	2.4960 GHz	1.000 MHz	2.495995000 GHz	-28.73 dBm	-15.73 dB
4	4	2.4960 GHz	2.5960 GHz	1.000 MHz	2.527166667 GHz	-0.634 dBm	-25.63 dB
5	5	2.5960 GHz	2.6010 GHz	1.000 MHz	2.598983333 GHz	-25.12 dBm	-15.12 dB
6	6	2.6010 GHz	2.6940 GHz	1.000 MHz	2.641920000 GHz	-25.79 dBm	-12.79 dB
7	7	2.6940 GHz	2.6960 GHz	1.000 MHz	2.694360000 GHz	-41.34 dBm	-16.34 dB

Plot 7-555. Lower ACP Plot at 2496 MHz (n41 - 100.0MHz DFT-s-OFDM-QPSK - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4900 GHz	2.4920 GHz	1.000 MHz	2.490980000 GHz	-46.52 dBm	-21.52 dB
2	2	2.4920 GHz	2.5850 GHz	1.000 MHz	2.584690000 GHz	-33.85 dBm	-20.85 dB
3	3	2.5850 GHz	2.5900 GHz	1.000 MHz	2.589966667 GHz	-31.58 dBm	-21.58 dB
4	4	2.5900 GHz	2.6900 GHz	1.000 MHz	2.620166667 GHz	2.794 dBm	-22.21 dB
5	5	2.6900 GHz	2.6950 GHz	1.000 MHz	2.690016667 GHz	-25.85 dBm	-15.85 dB
6	6	2.6950 GHz	2.7880 GHz	1.000 MHz	2.698720000 GHz	-29.73 dBm	-16.73 dB
7	7	2.7880 GHz	2.7900 GHz	1.000 MHz	2.788860000 GHz	-54.94 dBm	-29.94 dB

Plot 7-556. Upper ACP Plot (Band n41 - 100.0MHz DFT-s-OFDM-QPSK - Full RB Configuration)

7.5 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

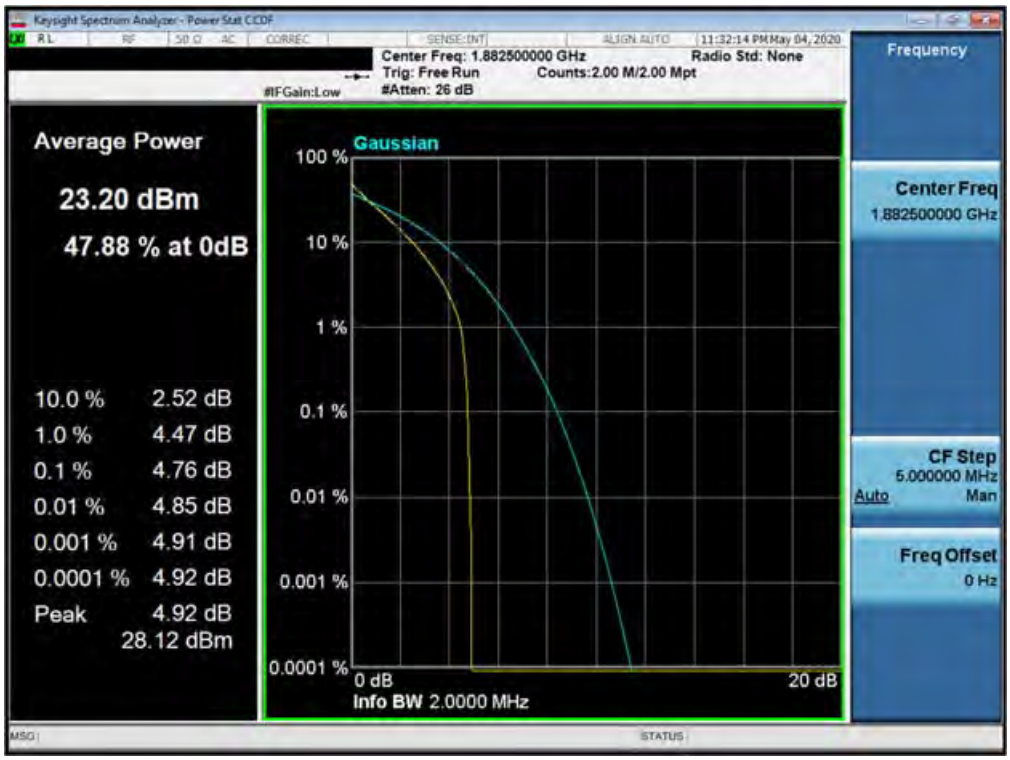
The EUT and measurement equipment were set up as shown in the diagram below.

Figure 7-4. Test Instrument & Measurement Setup

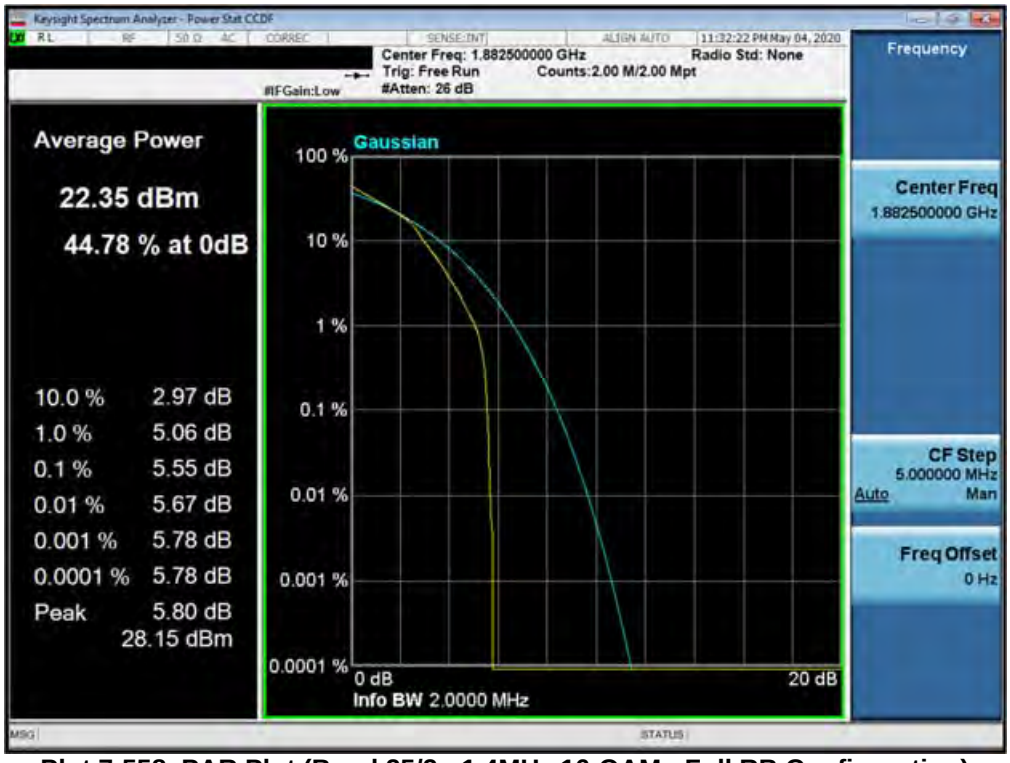
Test Notes

None.

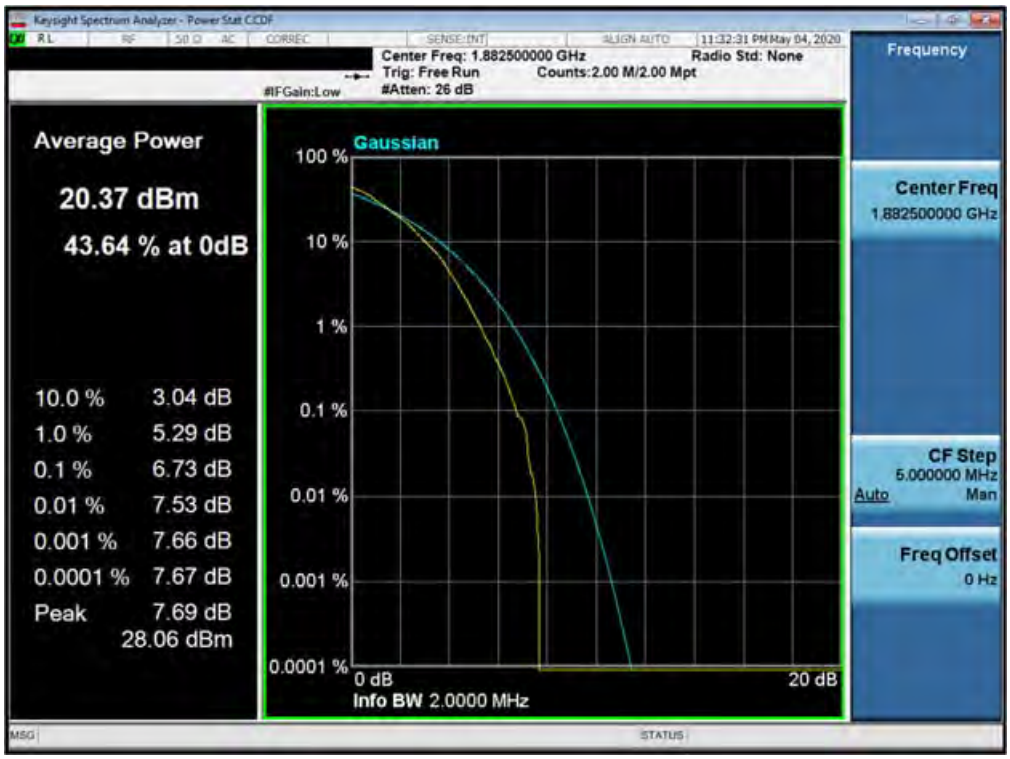
Band 25/2



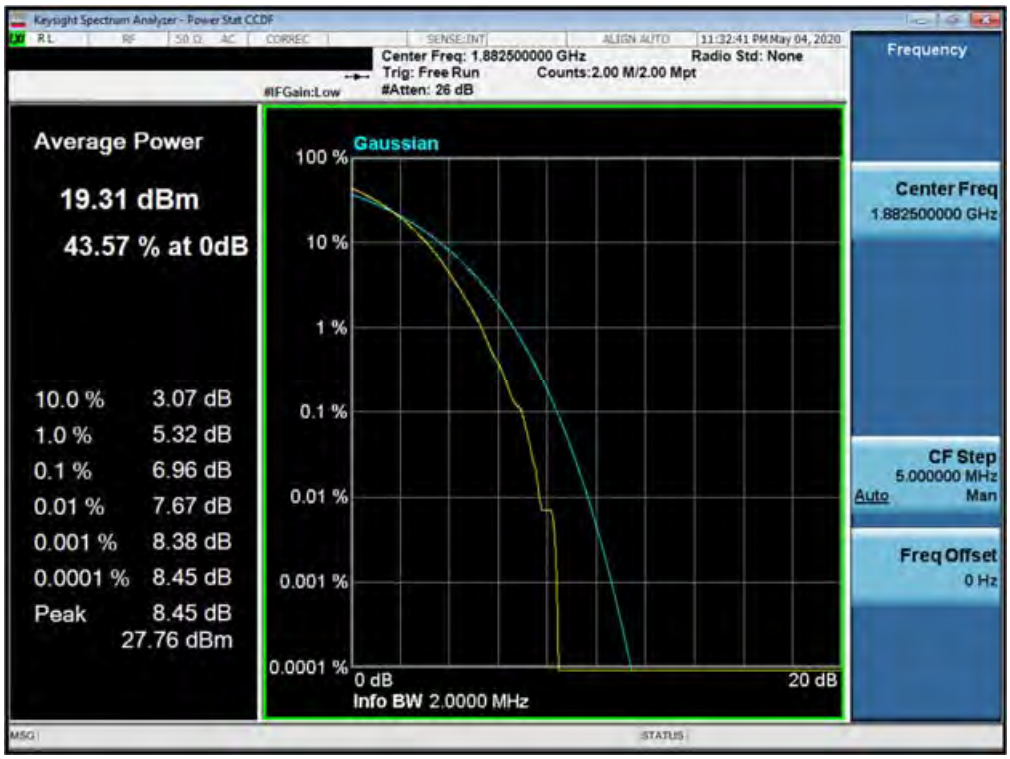
Plot 7-557. PAR Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



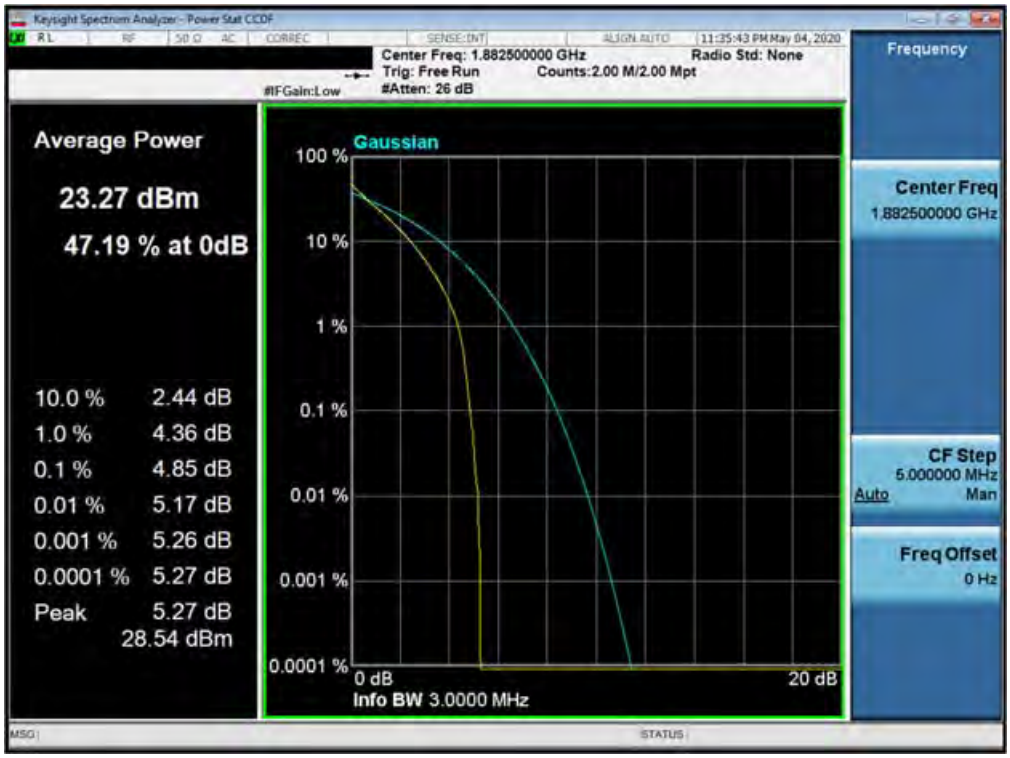
Plot 7-558. PAR Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)



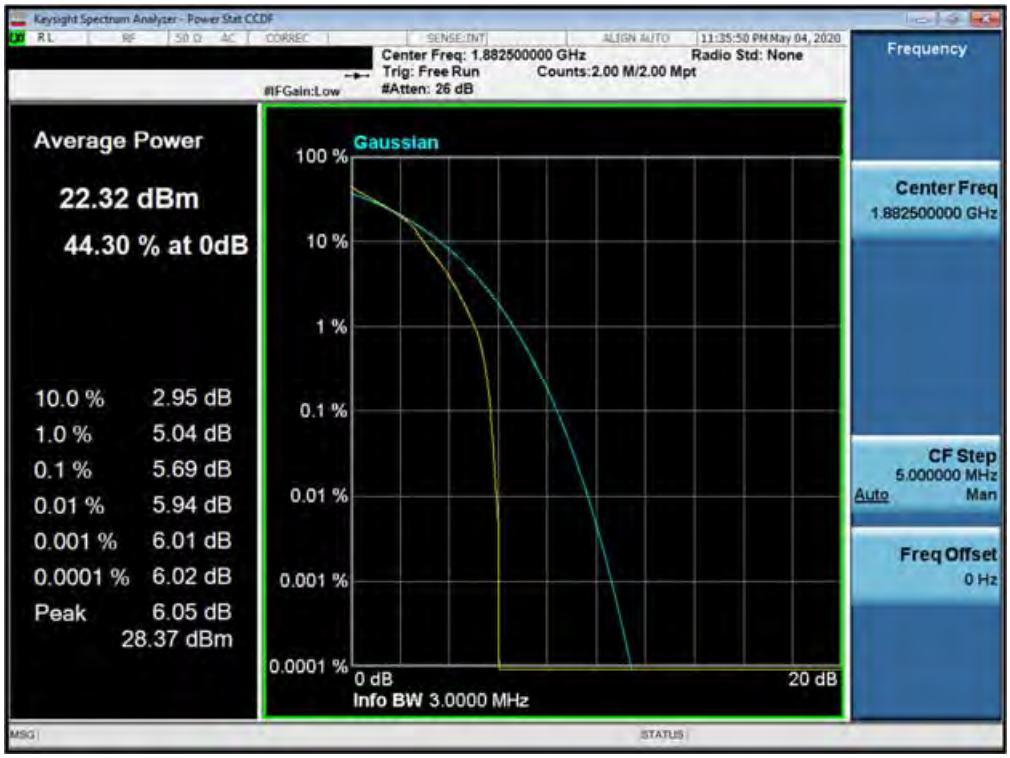
Plot 7-559. PAR Plot (Band 25/2 - 1.4MHz 64-QAM - Full RB Configuration)



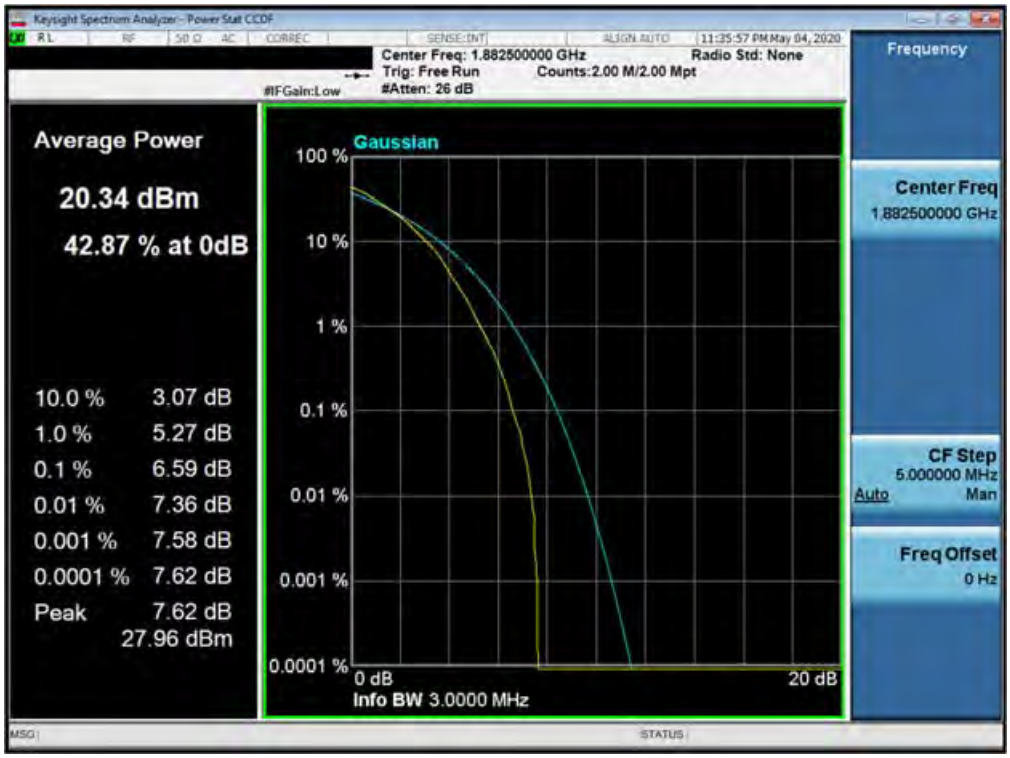
Plot 7-560. PAR Plot (Band 25/2 - 1.4MHz 256-QAM - Full RB Configuration)



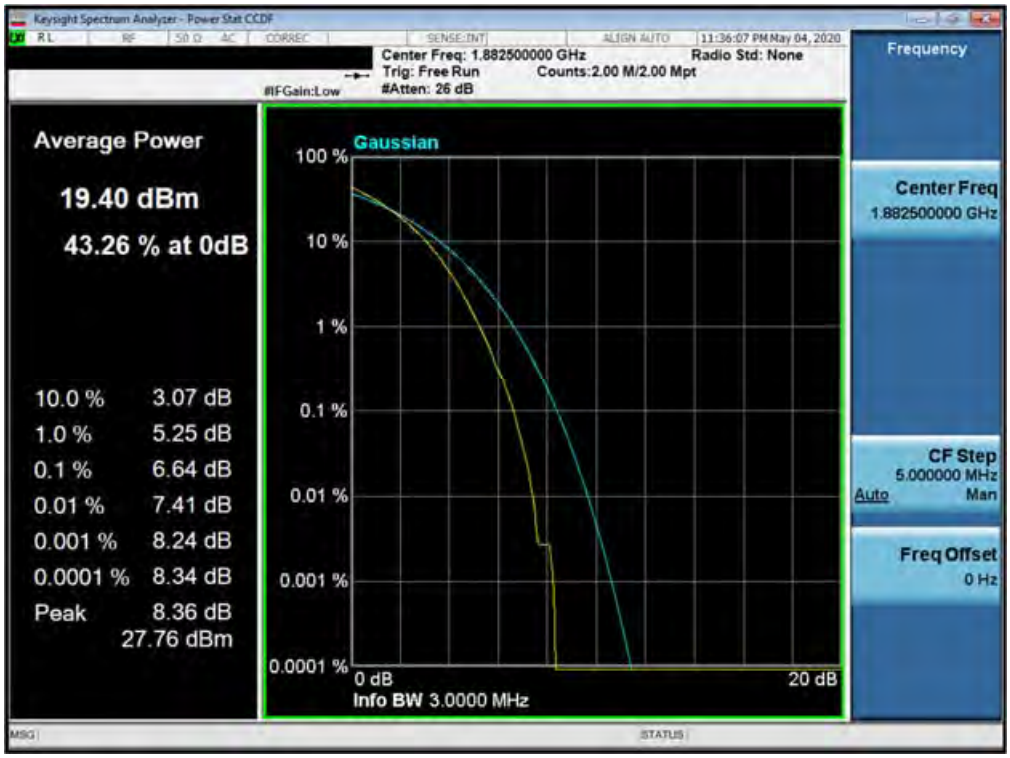
Plot 7-561. PAR Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



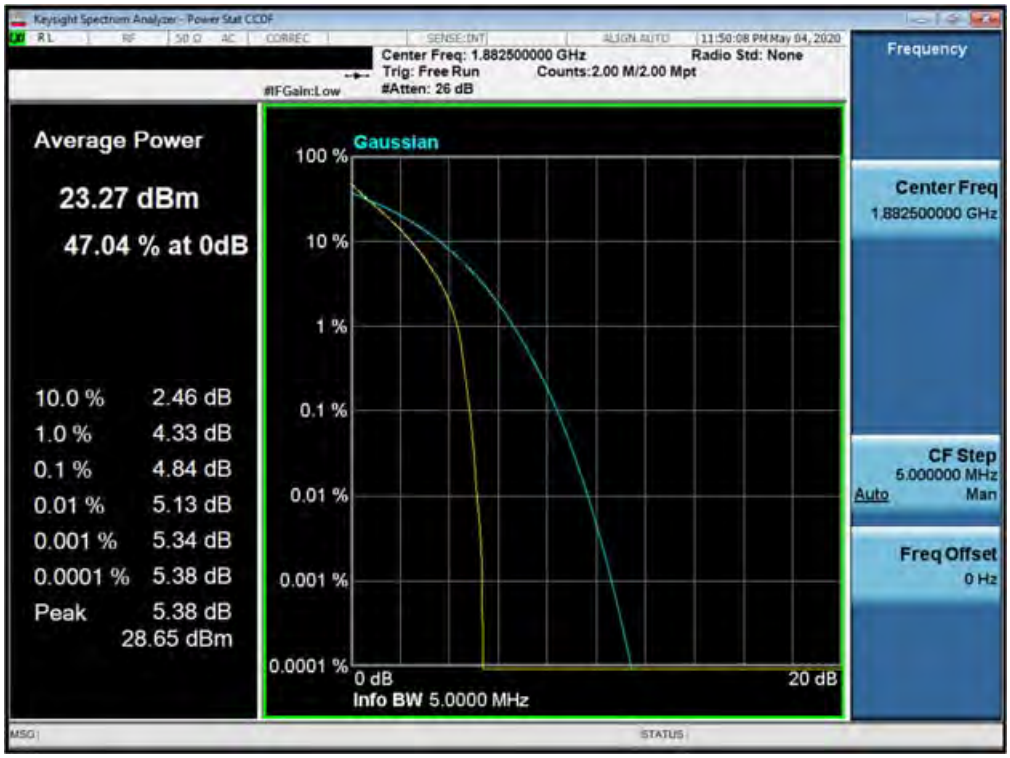
Plot 7-562. PAR Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)



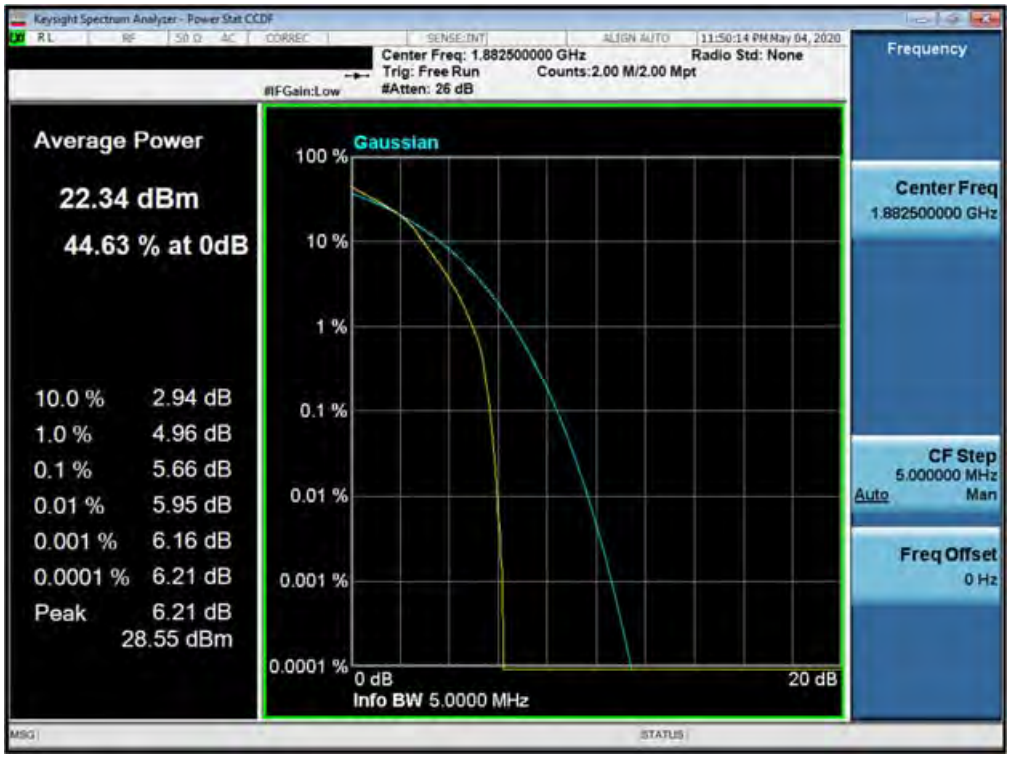
Plot 7-563. PAR Plot (Band 25/2 - 3.0MHz 64-QAM - Full RB Configuration)



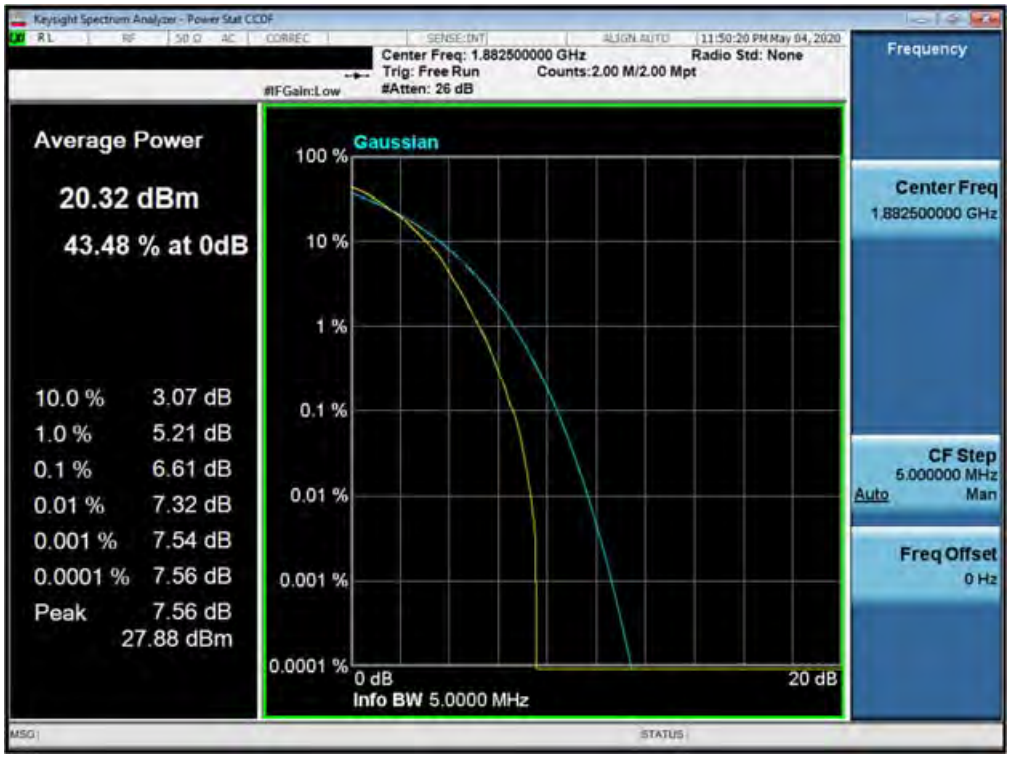
Plot 7-564. PAR Plot (Band 25/2 - 3.0MHz 256-QAM - Full RB Configuration)



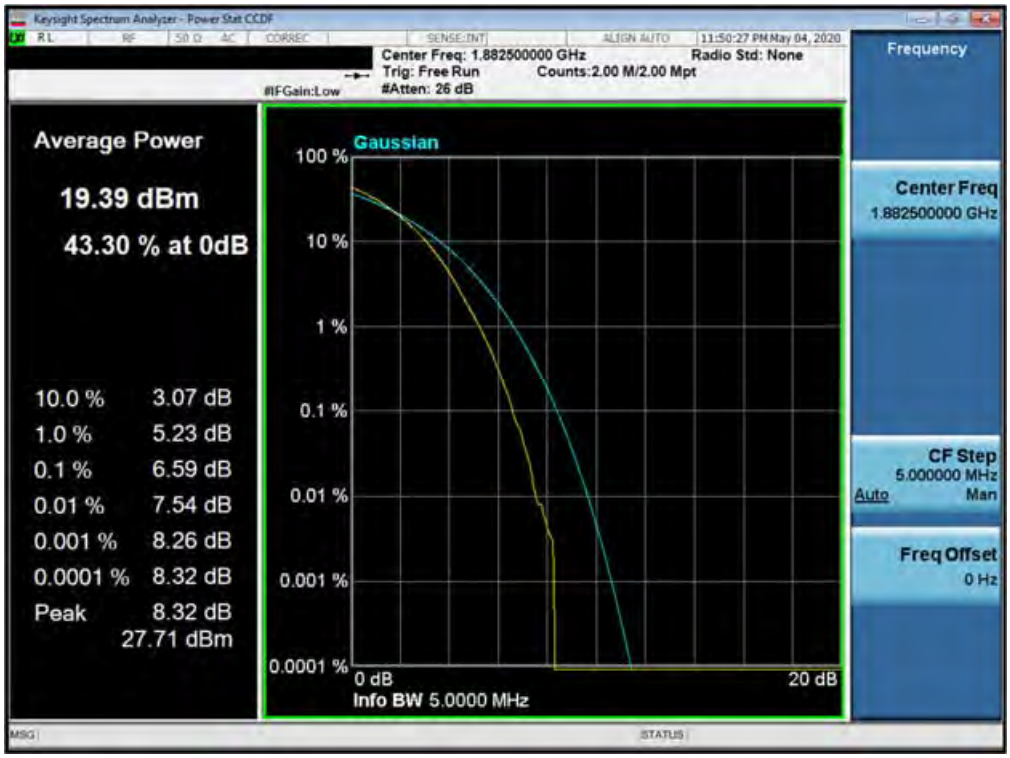
Plot 7-565. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



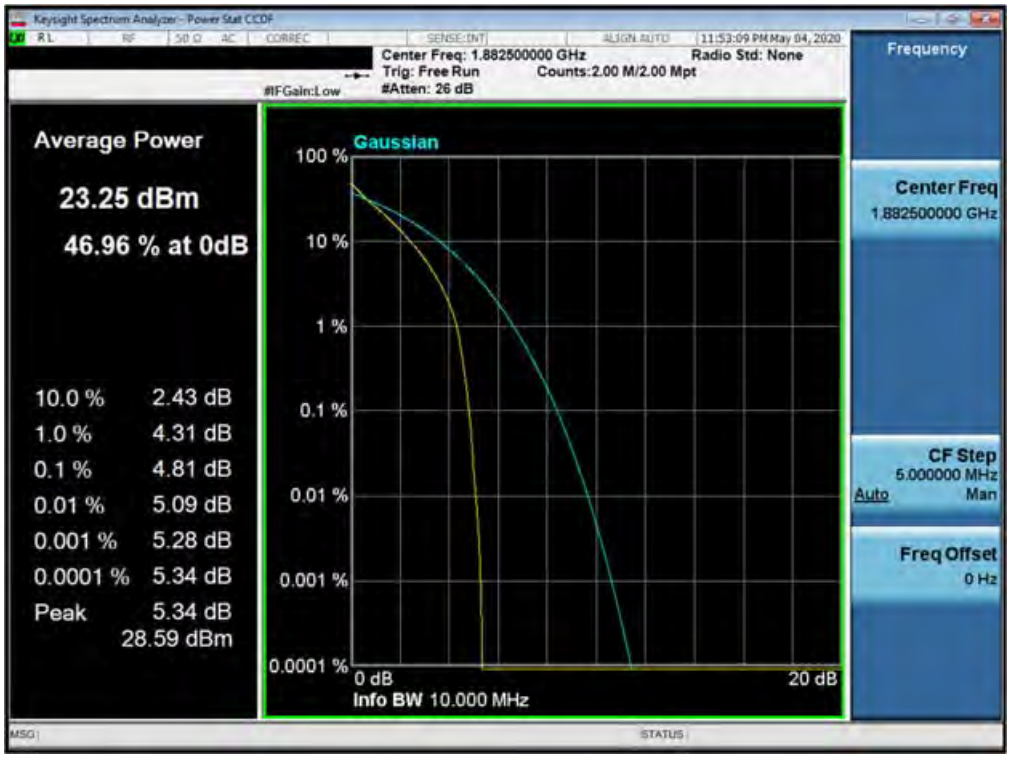
Plot 7-566. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)



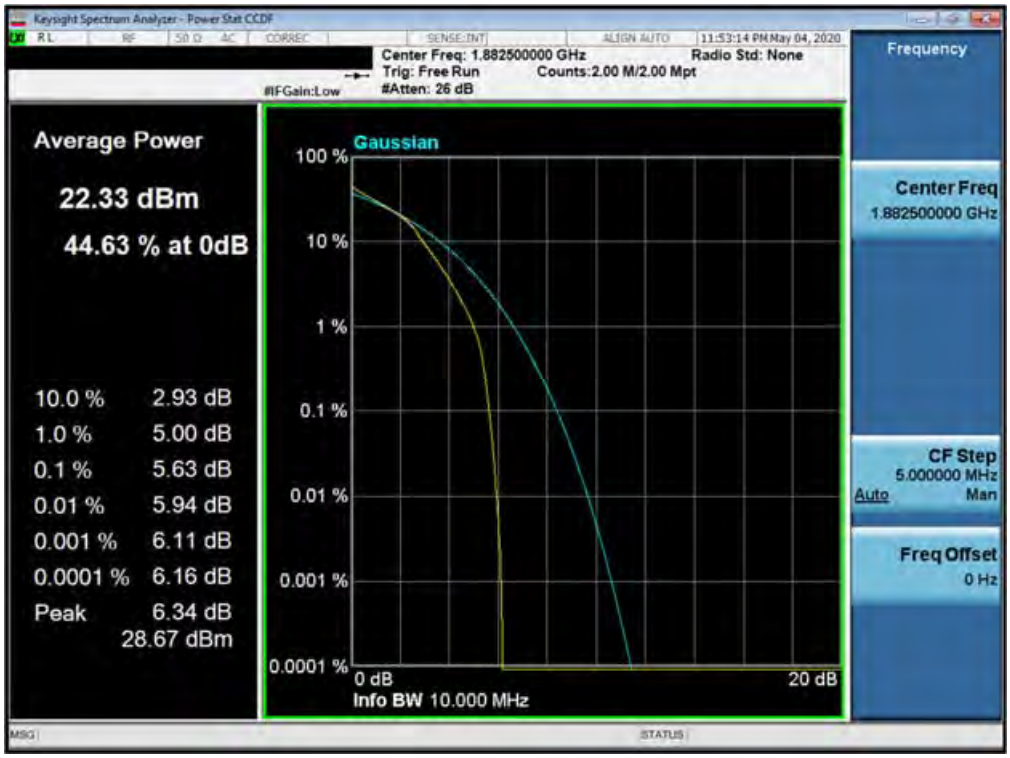
Plot 7-567. PAR Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)



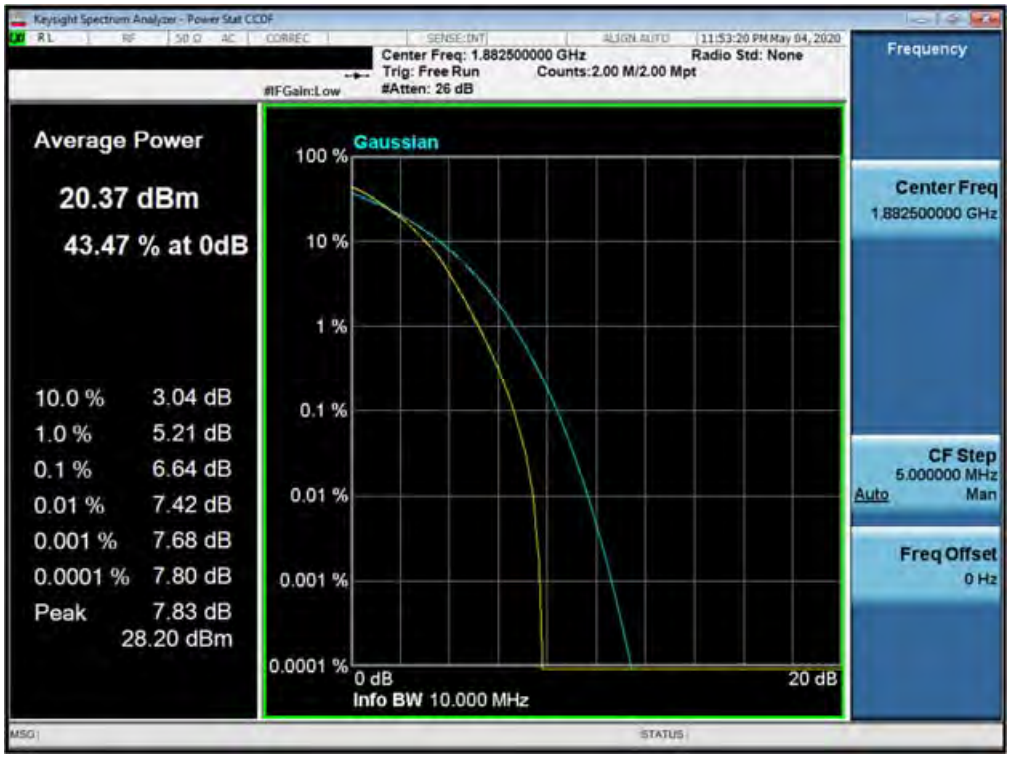
Plot 7-568. PAR Plot (Band 25/2 - 5.0MHz 256-QAM - Full RB Configuration)



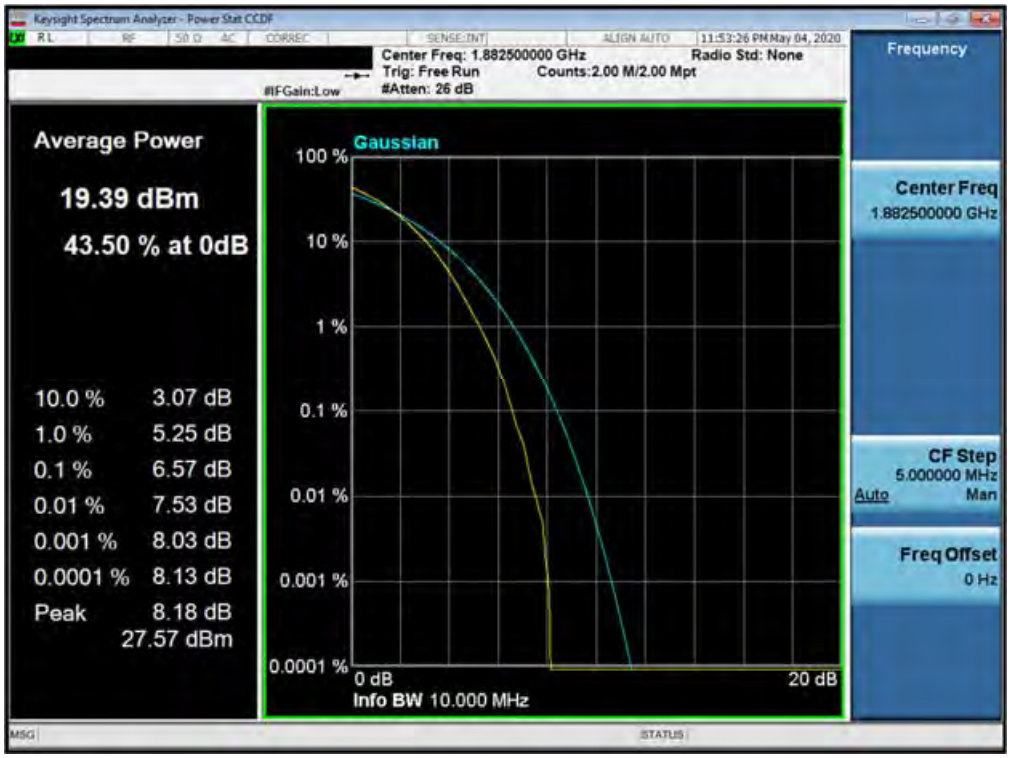
Plot 7-569. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



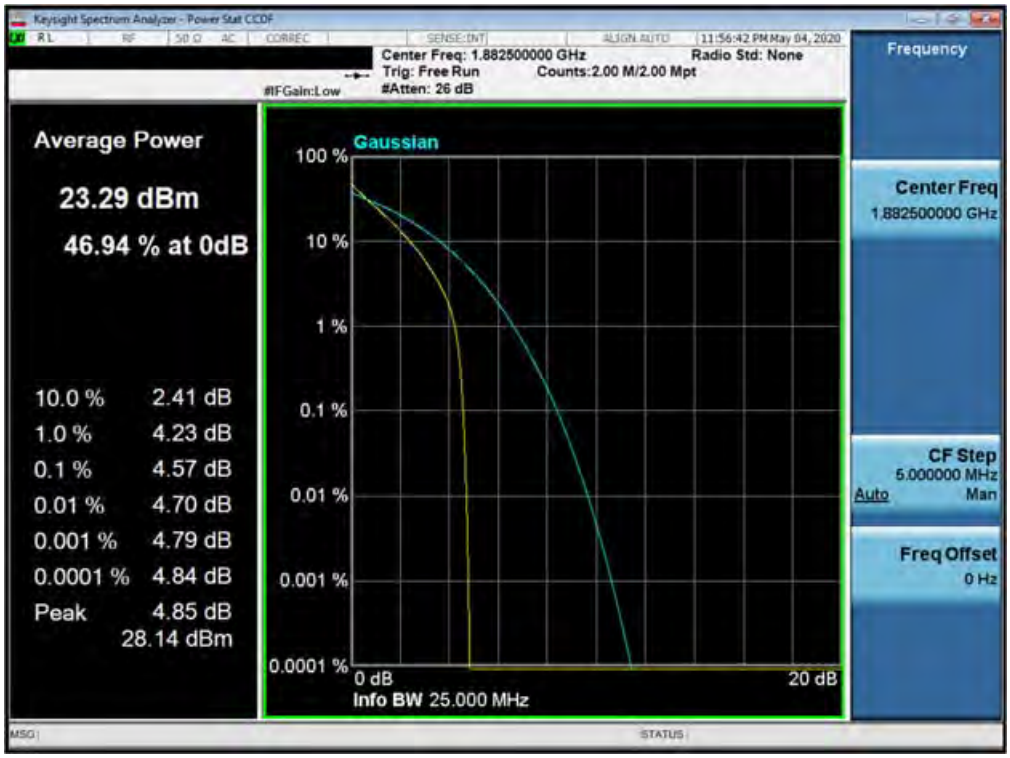
Plot 7-570. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)



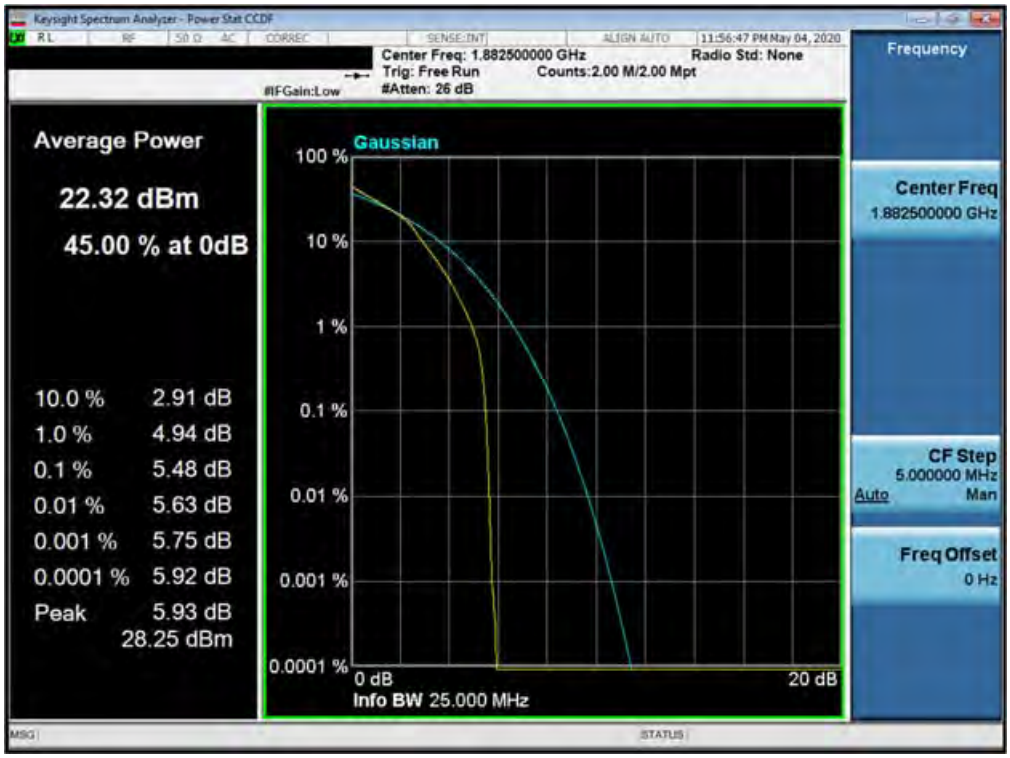
Plot 7-571. PAR Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)



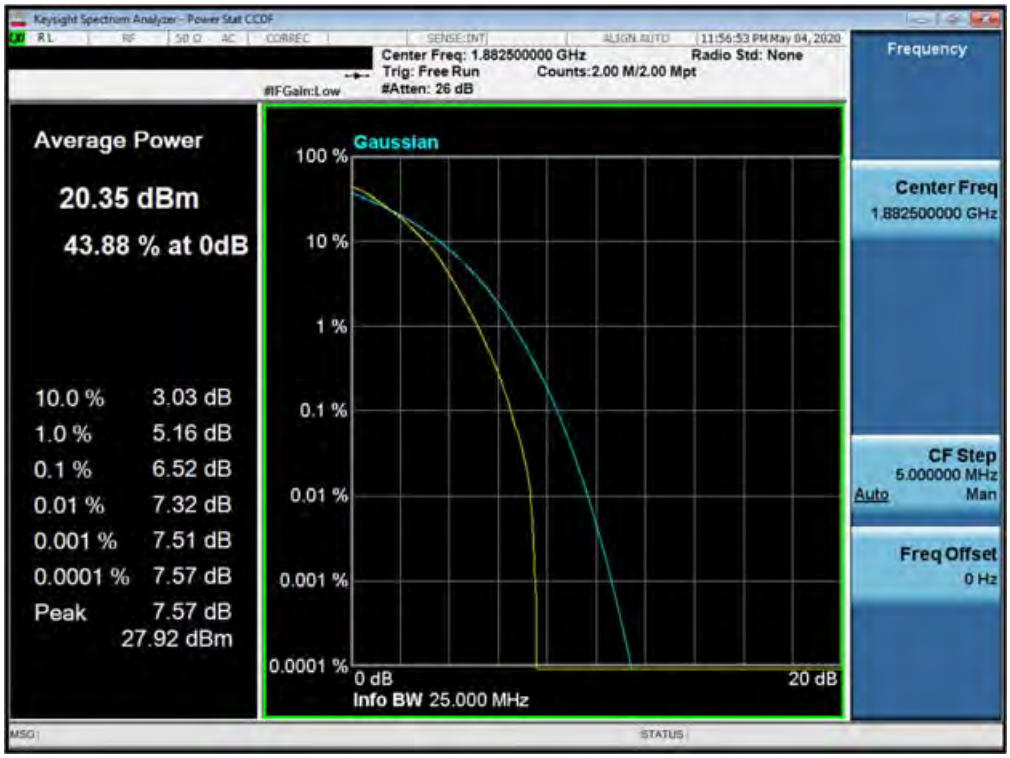
Plot 7-572. PAR Plot (Band 25/2 - 10.0MHz 256-QAM - Full RB Configuration)



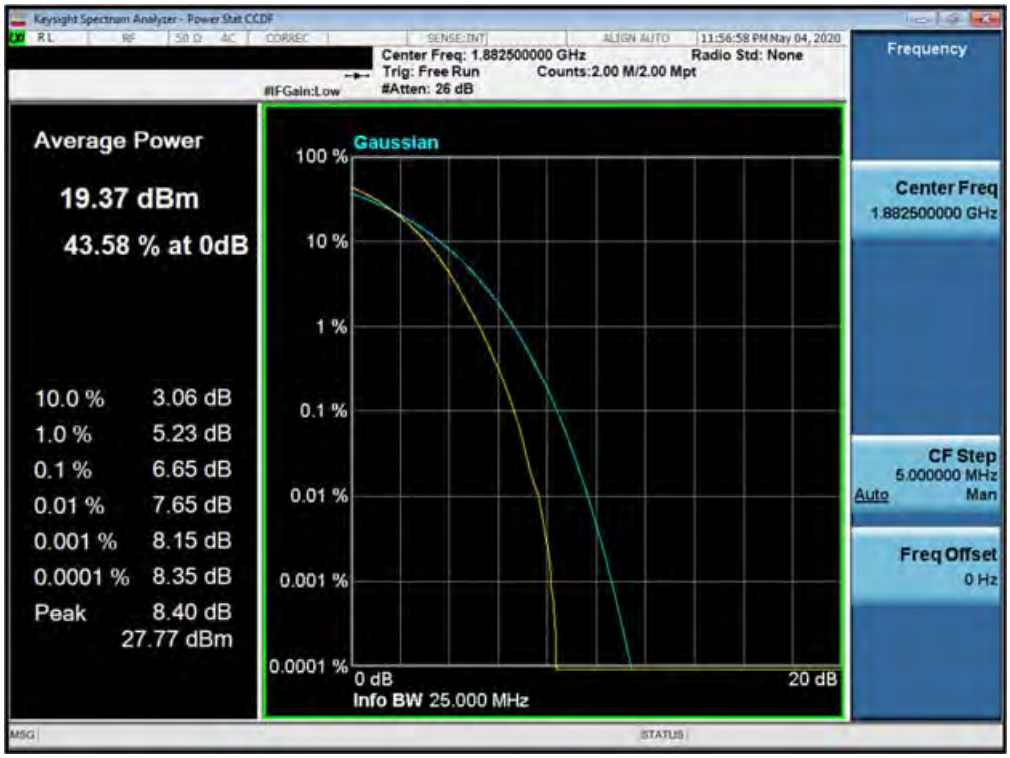
Plot 7-573. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



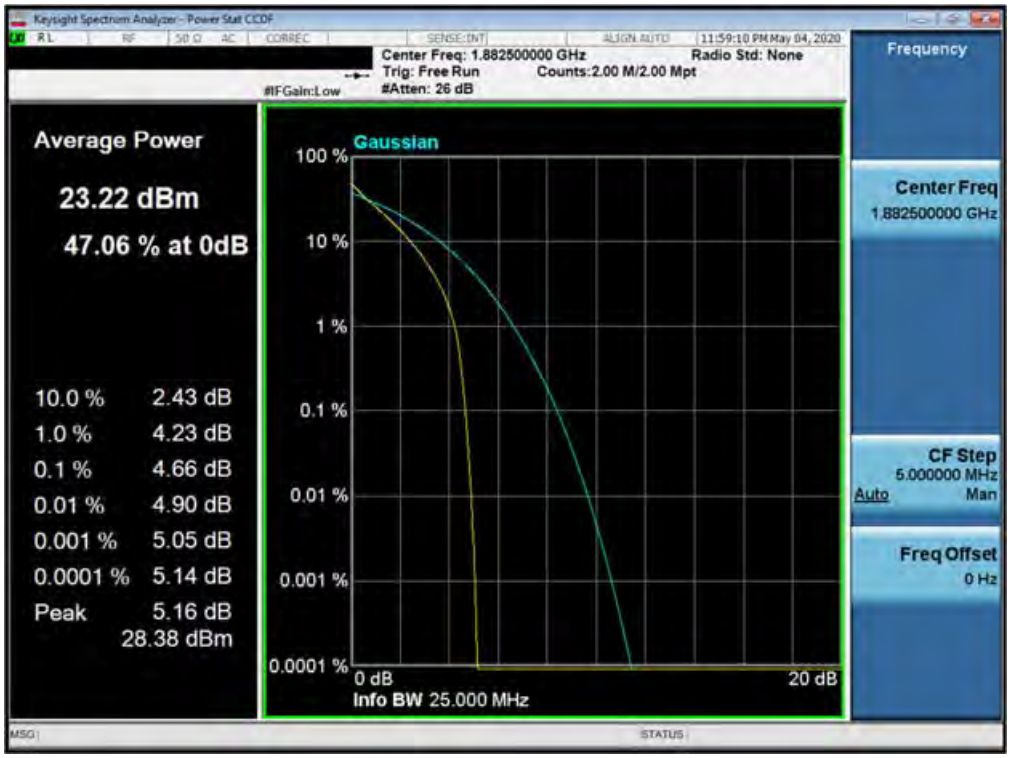
Plot 7-574. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)



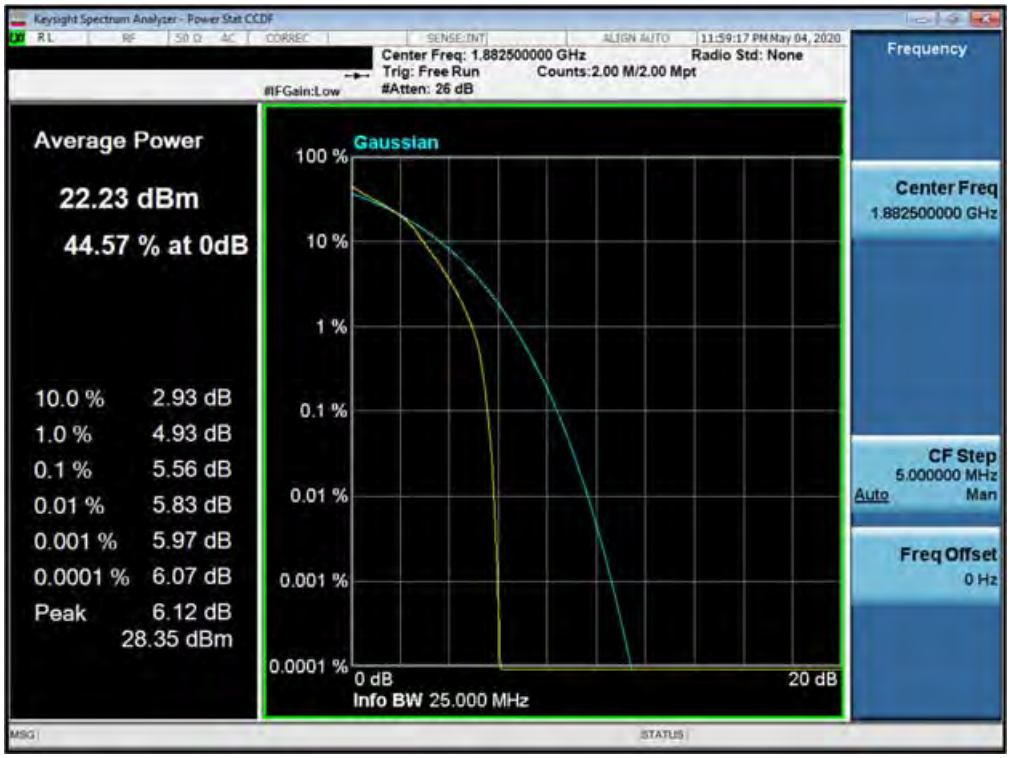
Plot 7-575. PAR Plot (Band 25/2 - 15.0MHz 64-QAM - Full RB Configuration)



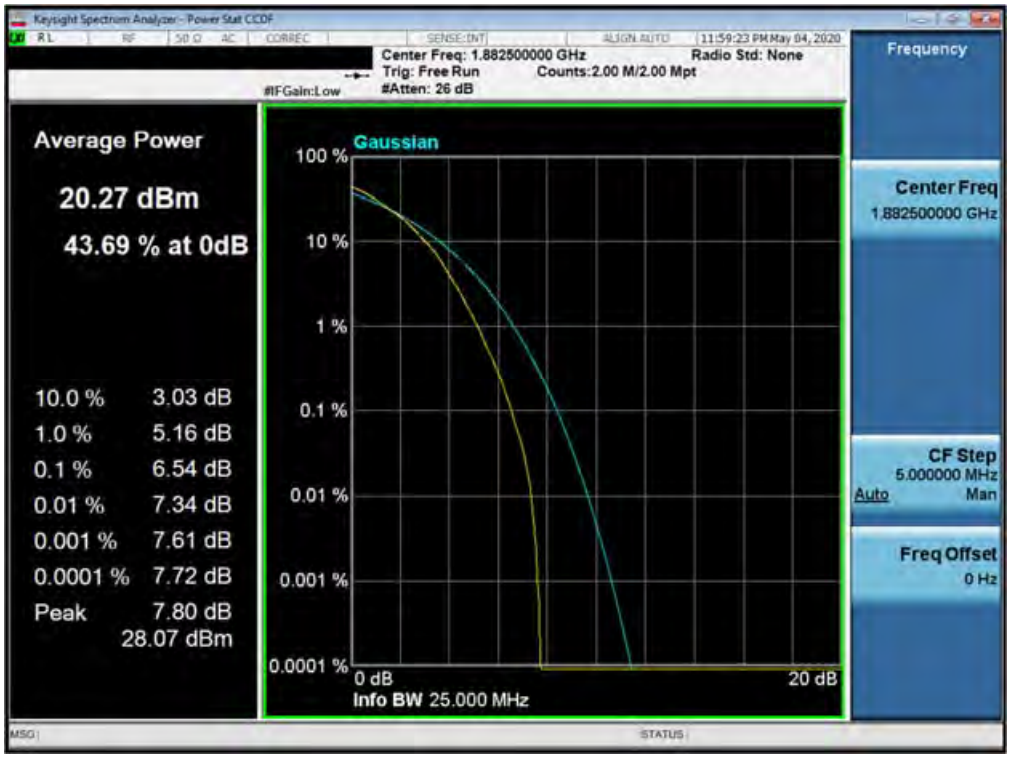
Plot 7-576. PAR Plot (Band 25/2 - 15.0MHz 256-QAM - Full RB Configuration)



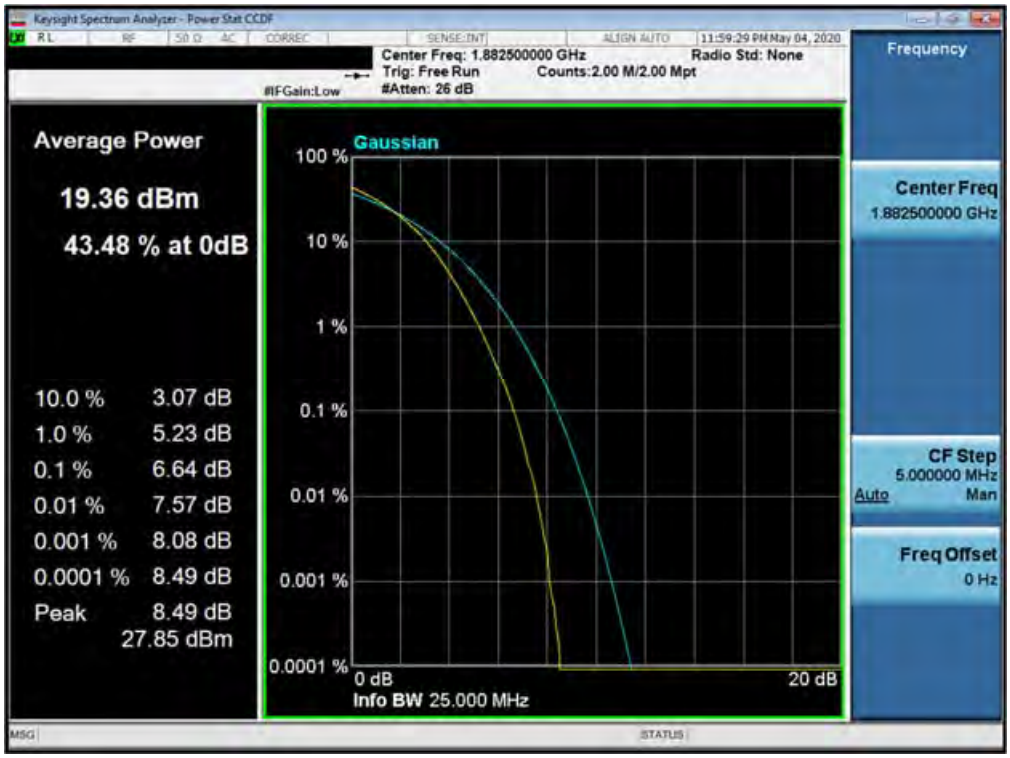
Plot 7-577. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-578. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)

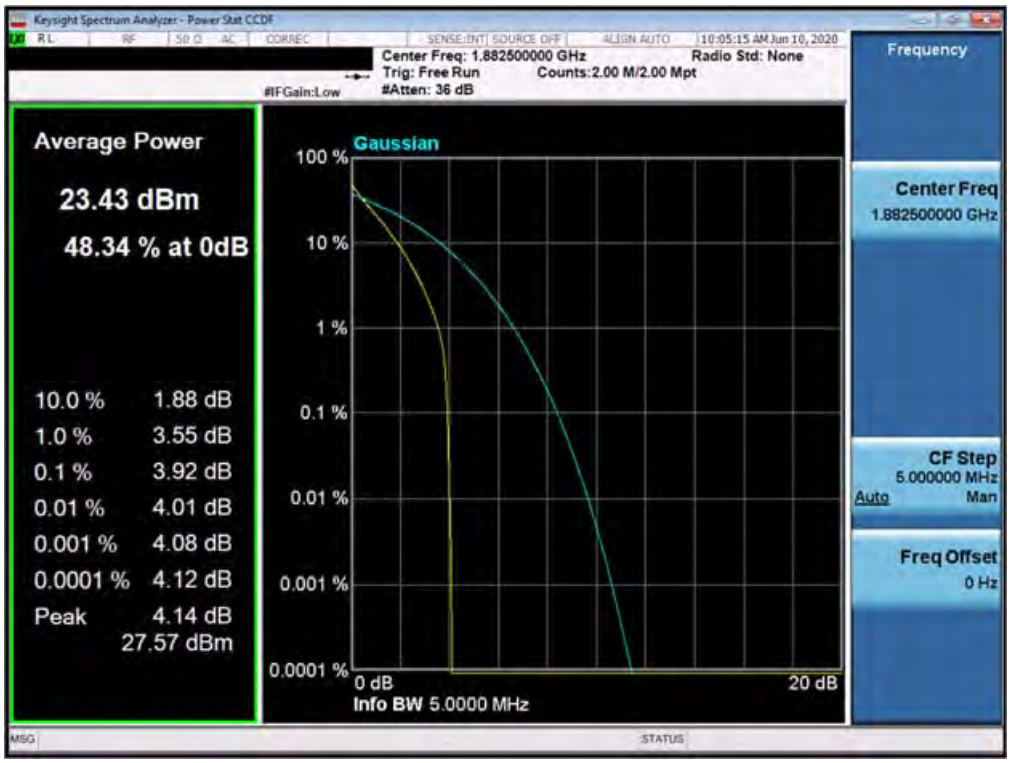


Plot 7-579. PAR Plot (Band 25/2 - 20.0MHz 64-QAM - Full RB Configuration)

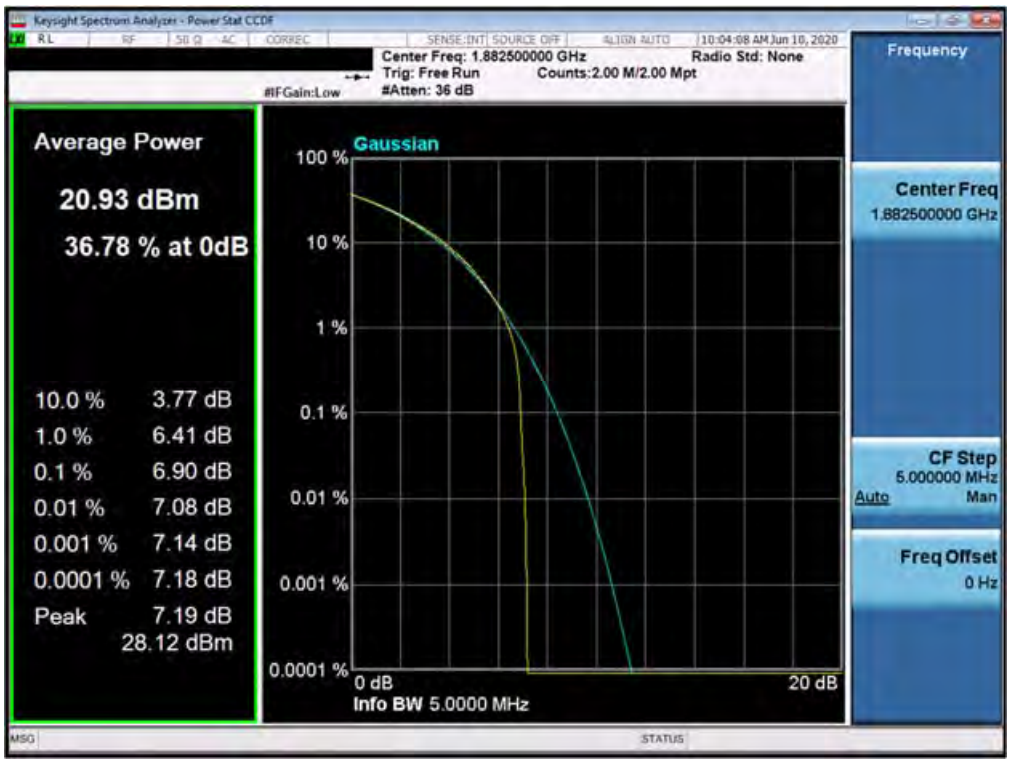


Plot 7-580. PAR Plot (Band 25/2 - 20.0MHz 256-QAM - Full RB Configuration)

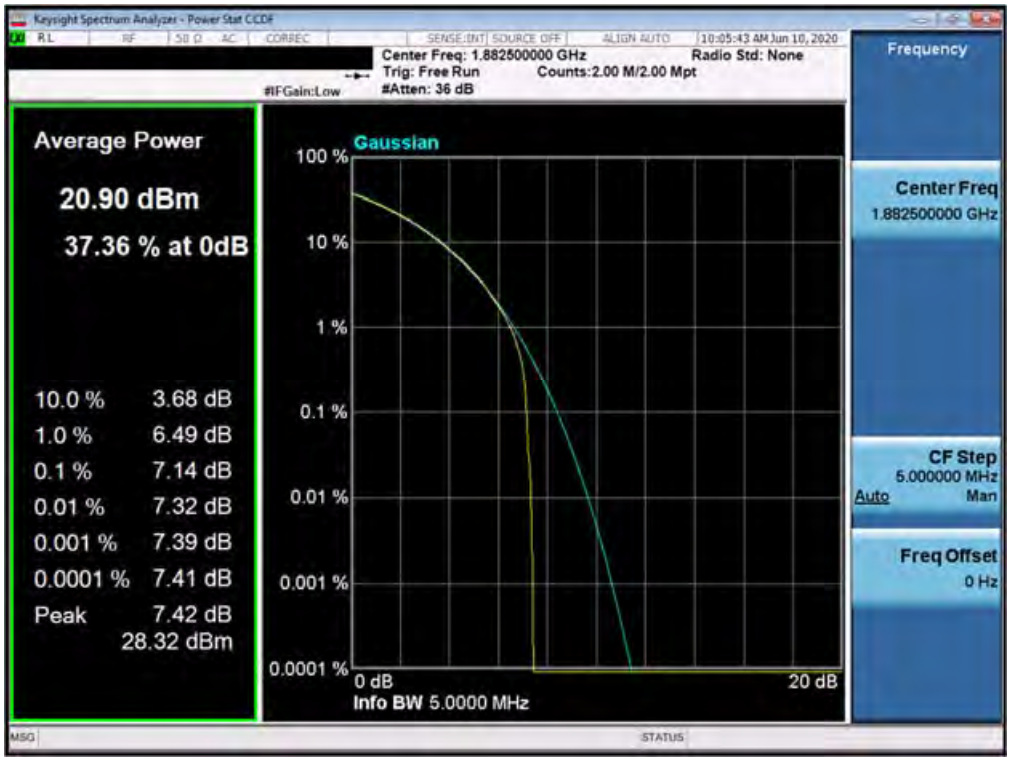
NR Band n25/2



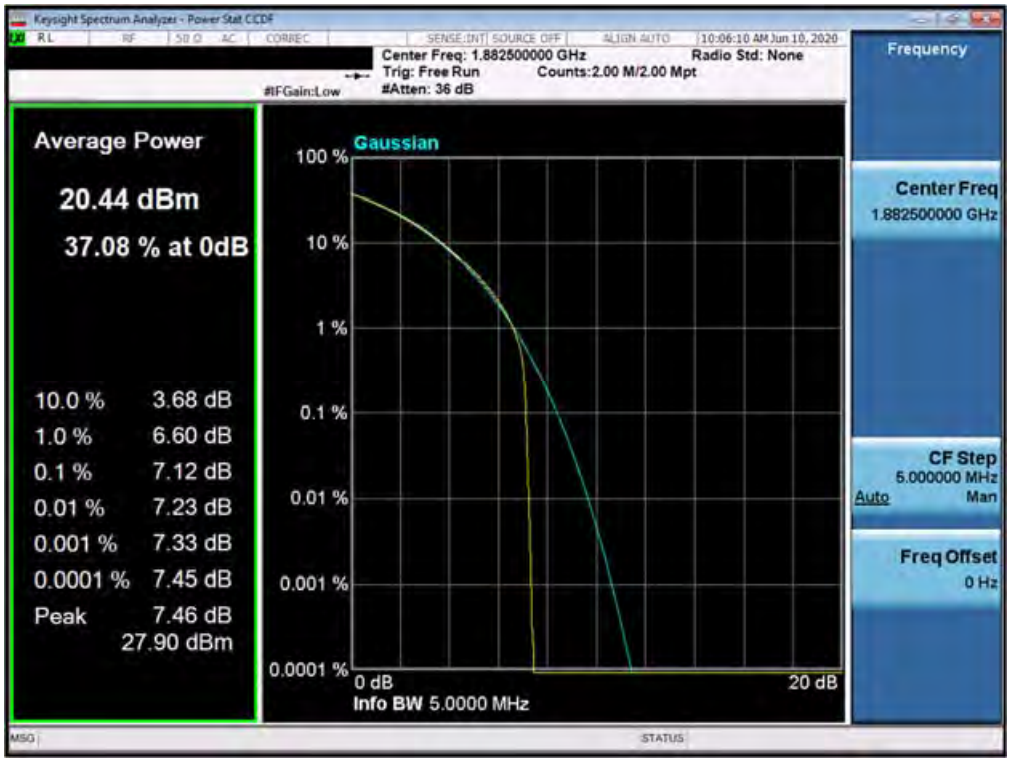
Plot 7-581. PAR Plot (Band n25/2 - 5.0MHz DFT-s-OFDM BPSK - Full RB Configuration)



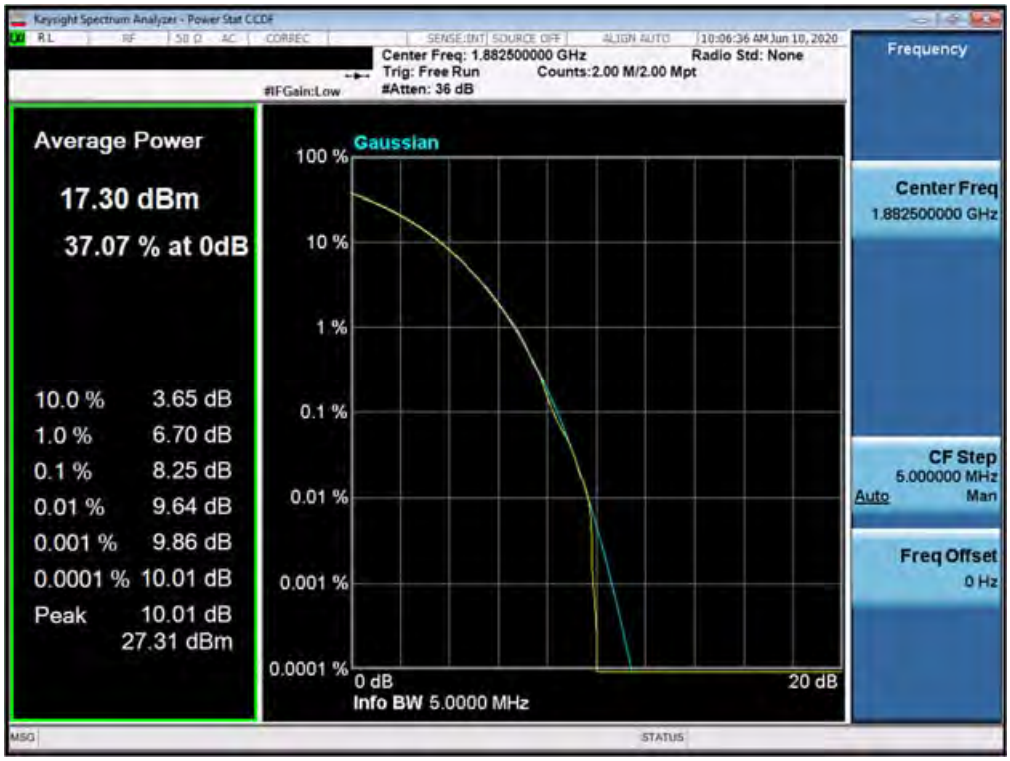
Plot 7-582. PAR Plot (Band n25/2 - 5.0MHz QPSK - Full RB Configuration)



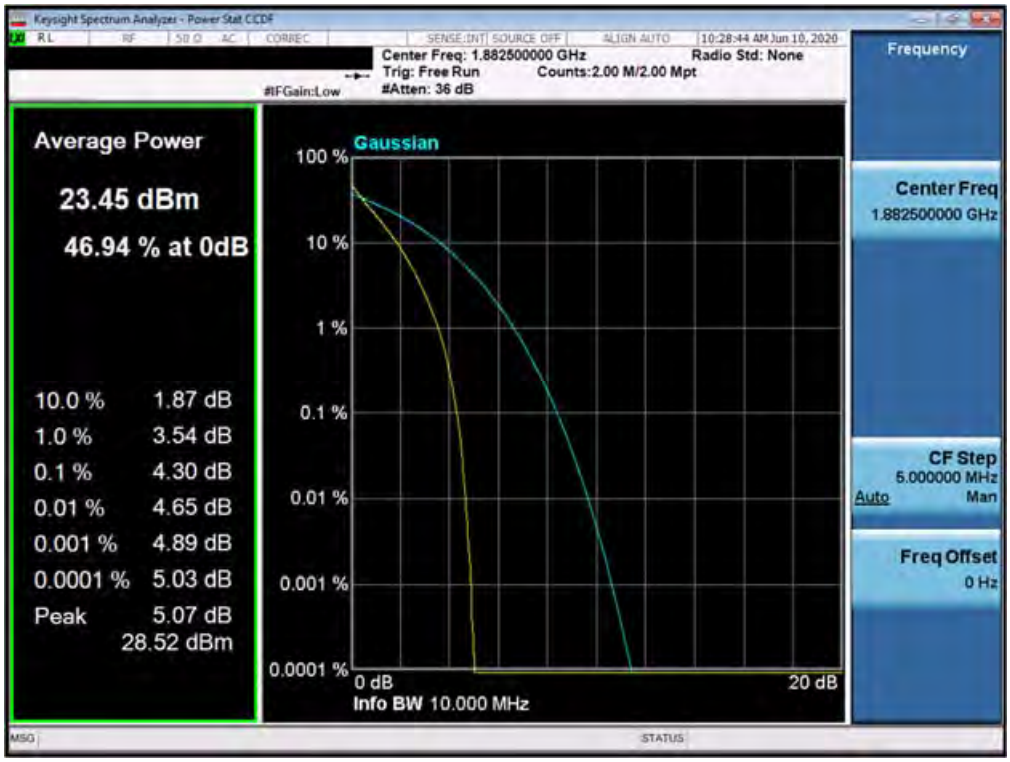
Plot 7-583. PAR Plot (Band n25/2 - 5.0MHz 16-QAM - Full RB Configuration)



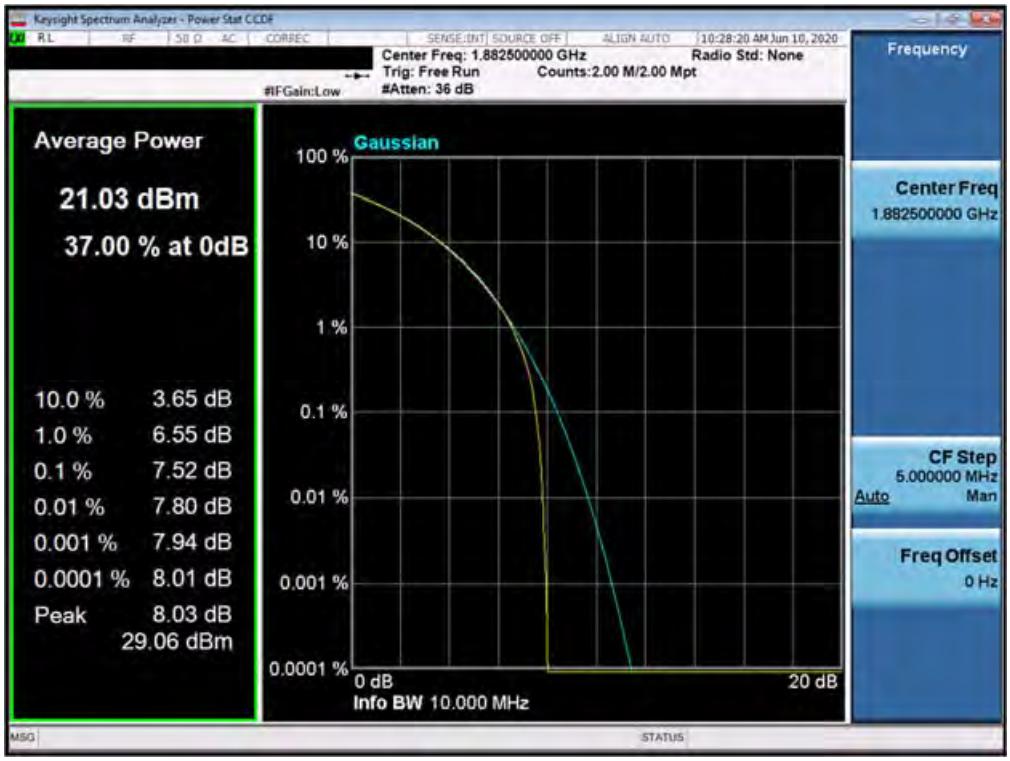
Plot 7-584. PAR Plot (Band n25/2 - 5.0MHz 64-QAM - Full RB Configuration)



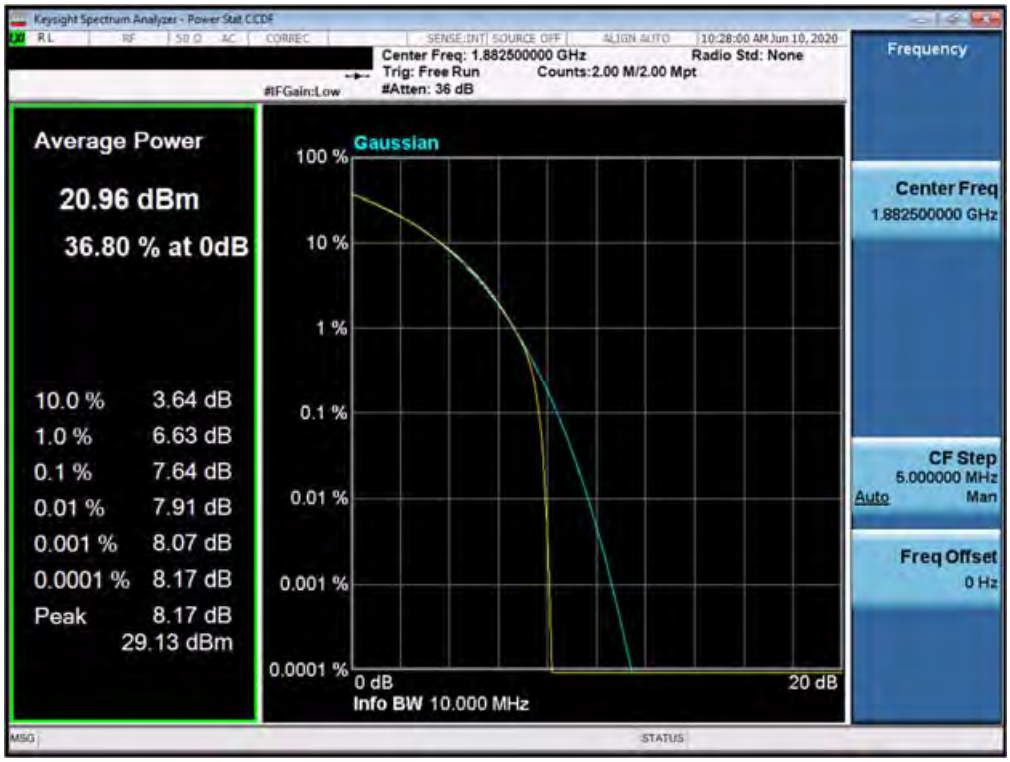
Plot 7-585. PAR Plot (Band n25/2 - 5.0MHz 256-QAM - Full RB Configuration)



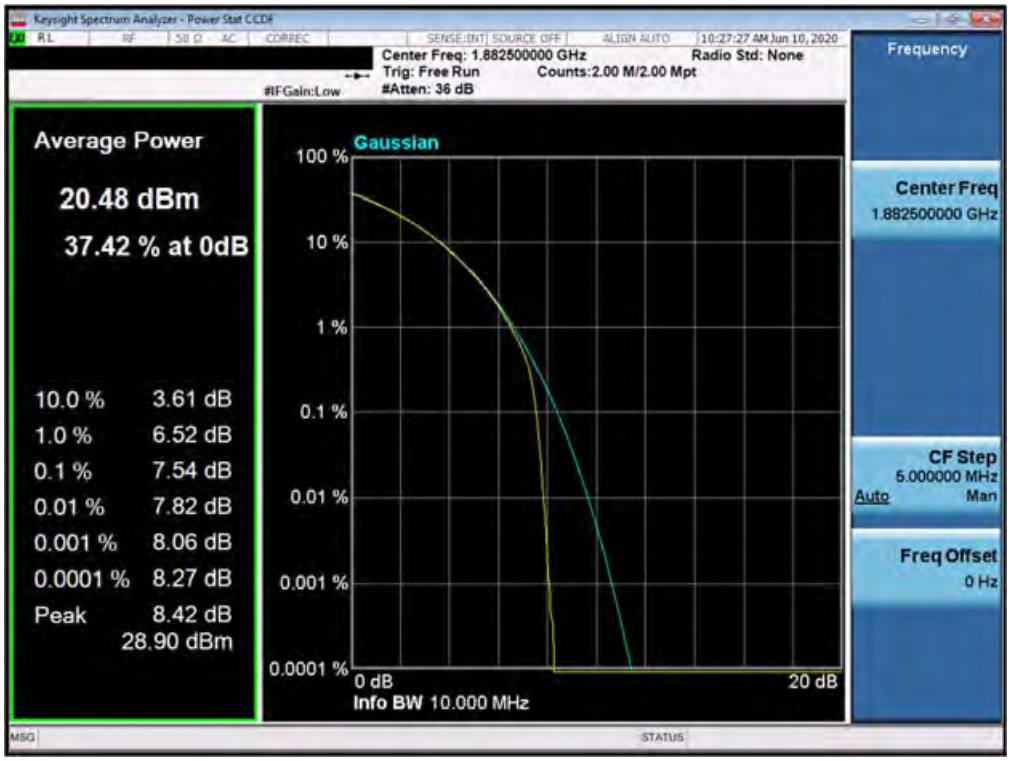
Plot 7-586. PAR Plot (Band n25/2 - 10.0MHz DFT-s-OFDM BPSK - Full RB Configuration)



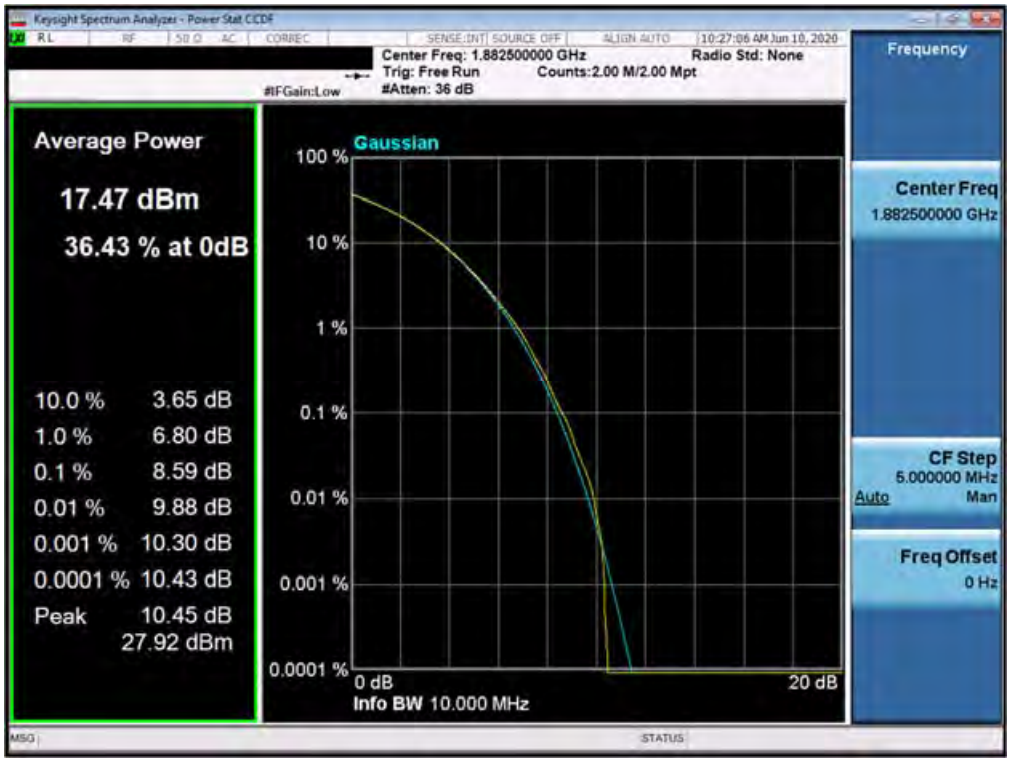
Plot 7-587. PAR Plot (Band n25/2 - 10.0MHz QPSK - Full RB Configuration)



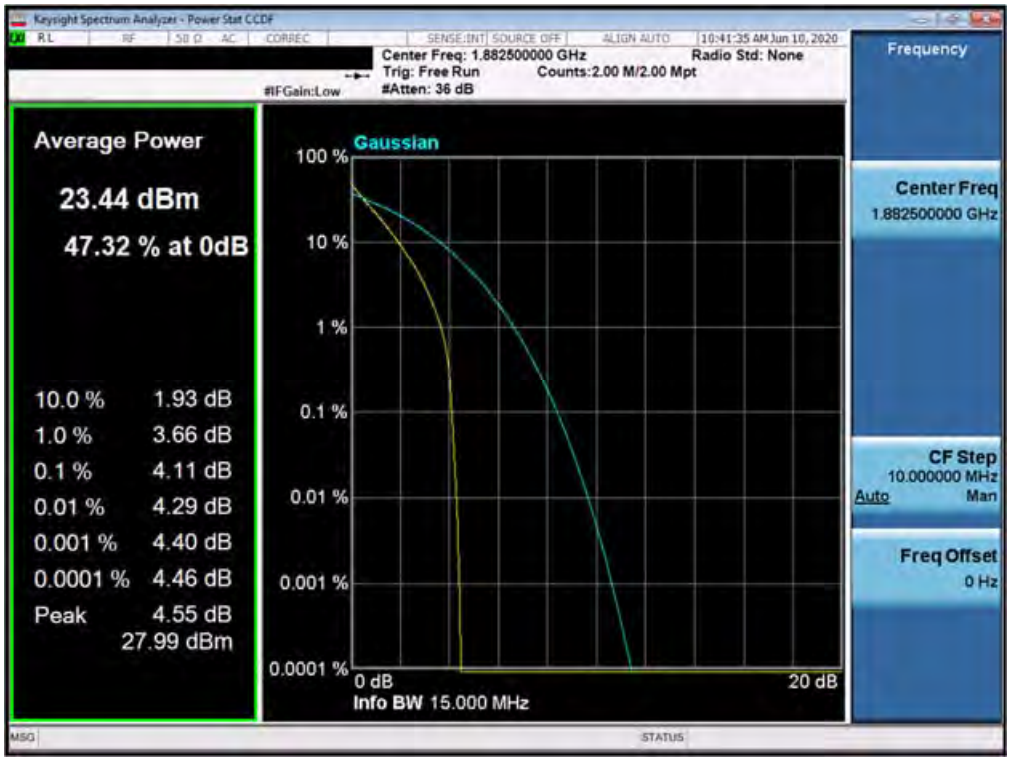
Plot 7-588. PAR Plot (Band n25/2 - 10.0MHz 16-QAM - Full RB Configuration)



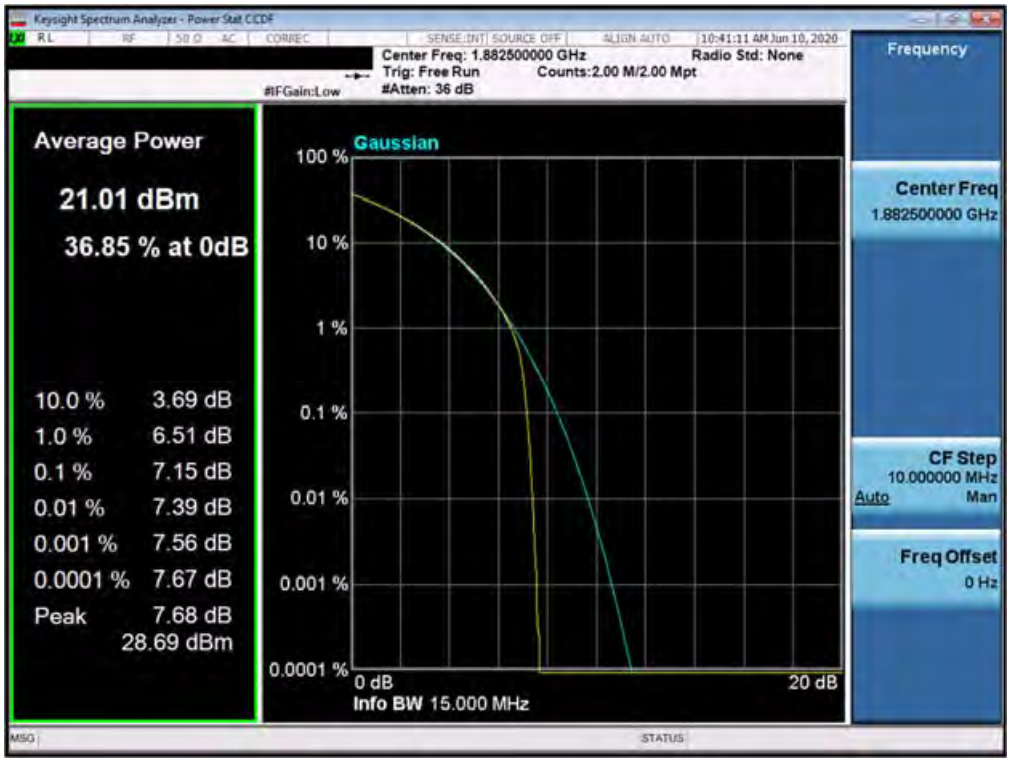
Plot 7-589. PAR Plot (Band n25/2 - 10.0MHz 64-QAM - Full RB Configuration)



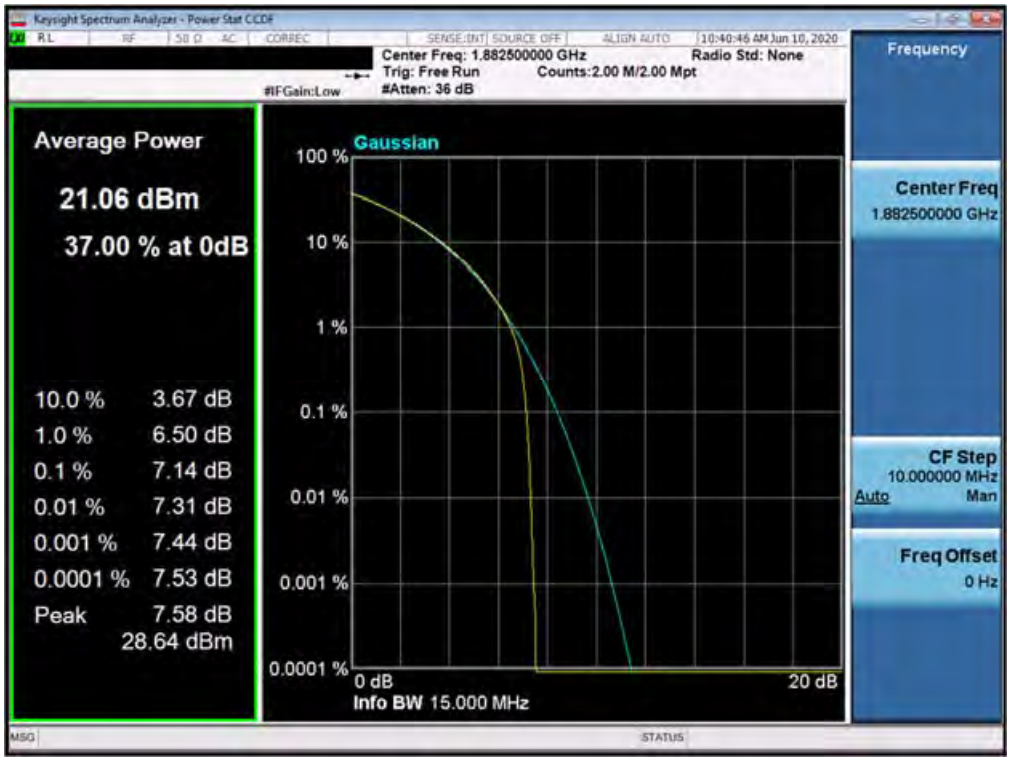
Plot 7-590. PAR Plot (Band n25/2 - 10.0MHz 256-QAM - Full RB Configuration)



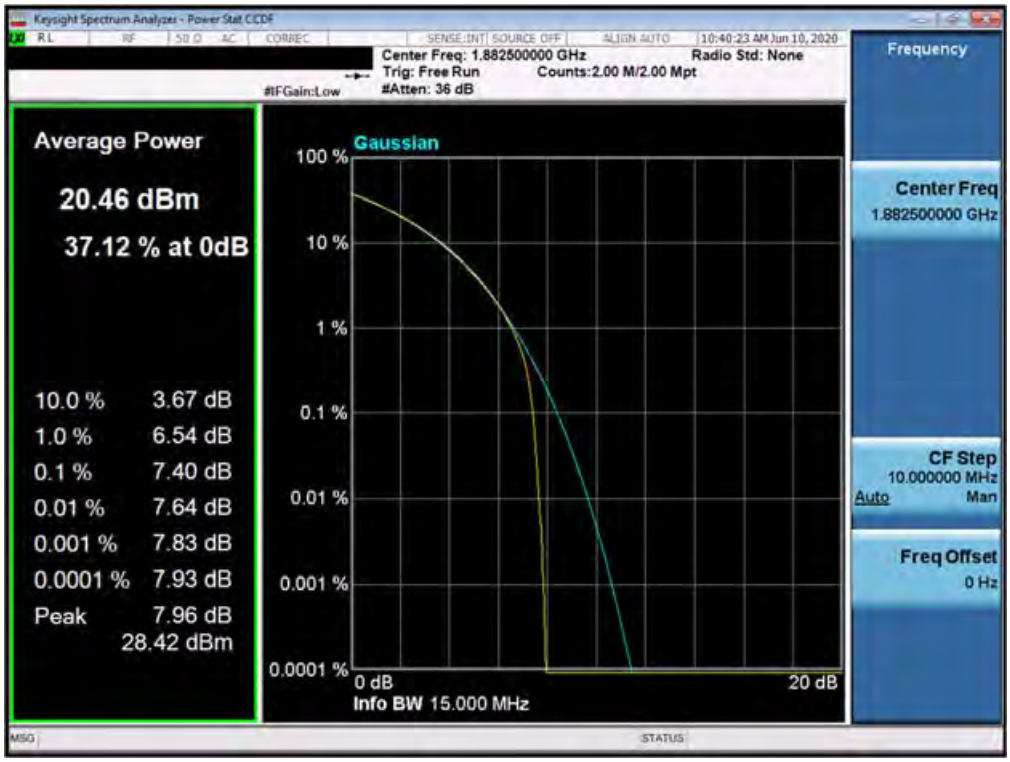
Plot 7-591. PAR Plot (Band n25/2 - 15.0MHz DFT-s-OFDM BPSK - Full RB Configuration)



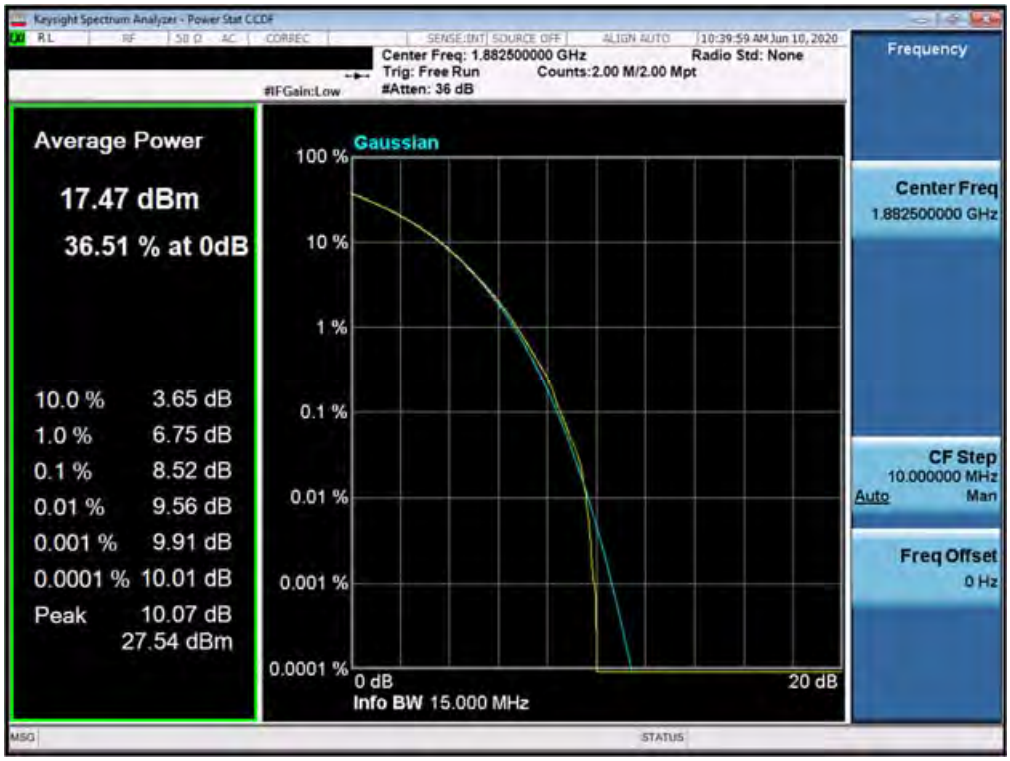
Plot 7-592. PAR Plot (Band n25/2 - 15.0MHz QPSK - Full RB Configuration)



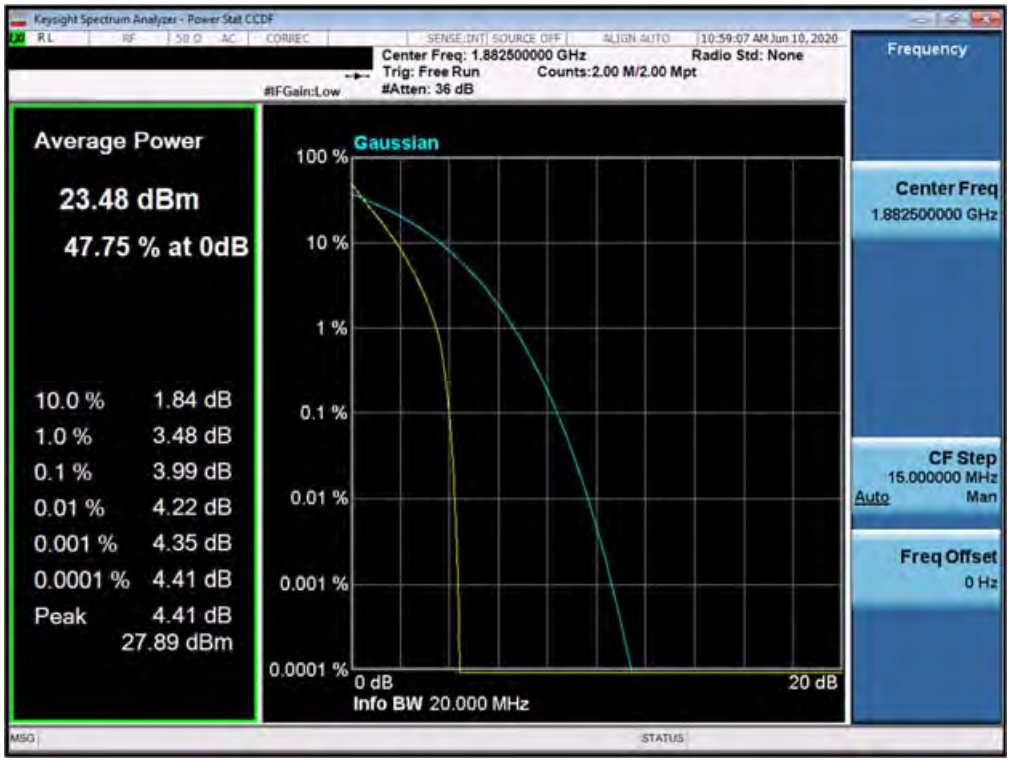
Plot 7-593. PAR Plot (Band n25/2 - 15.0MHz 16-QAM - Full RB Configuration)



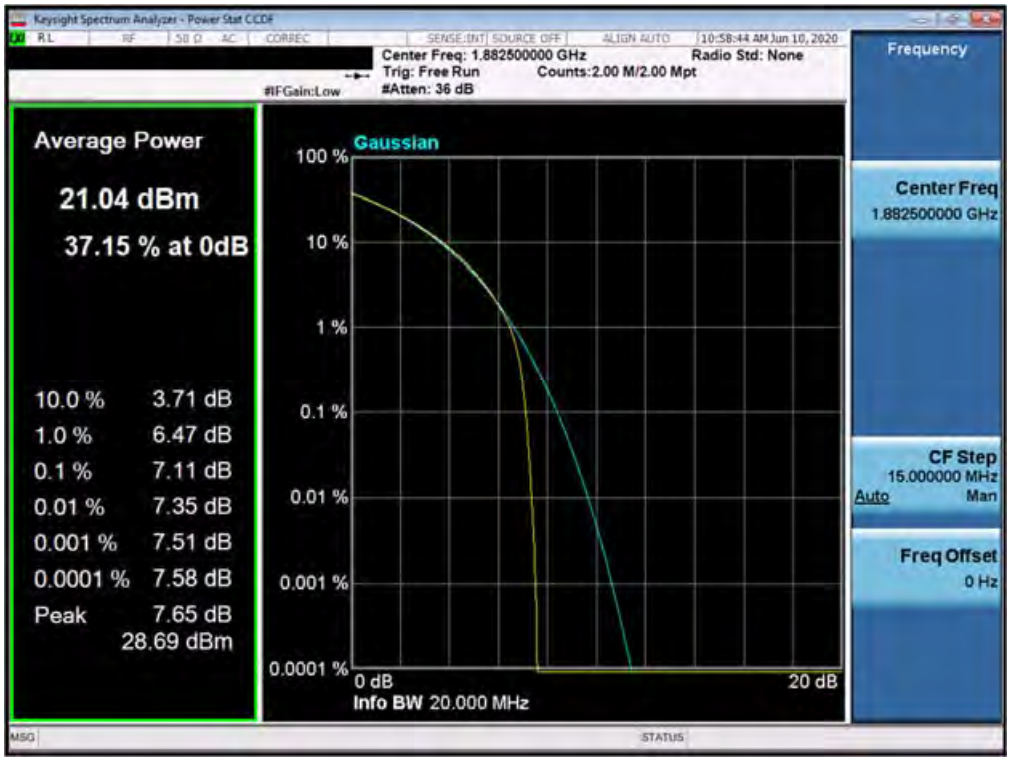
Plot 7-594. PAR Plot (Band n25/2 - 15.0MHz 64-QAM - Full RB Configuration)



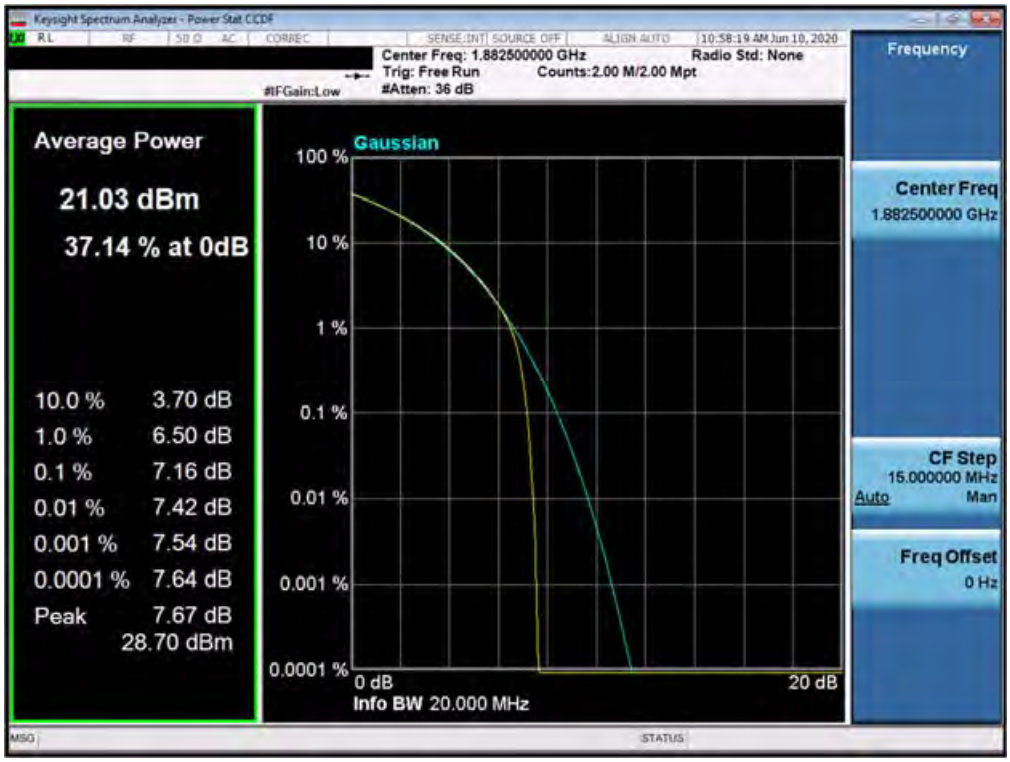
Plot 7-595. PAR Plot (Band n25/2 - 15.0MHz 256-QAM - Full RB Configuration)



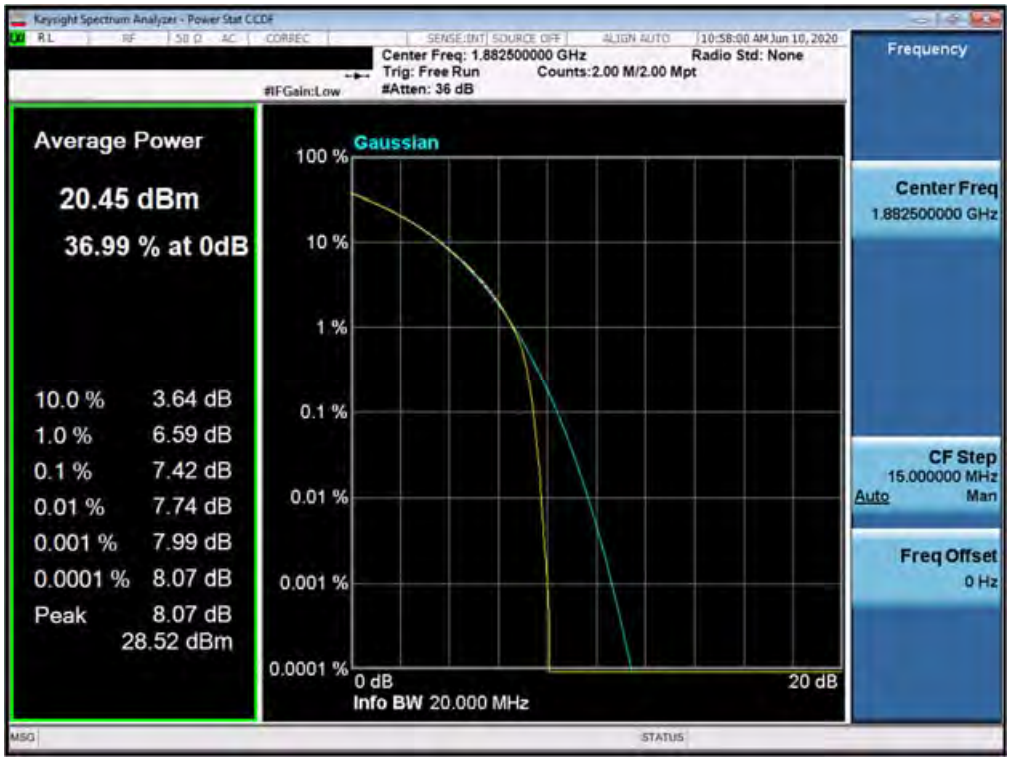
Plot 7-596. PAR Plot (Band n25/2 - 20.0MHz DFT-s-OFDM BPSK - Full RB Configuration)



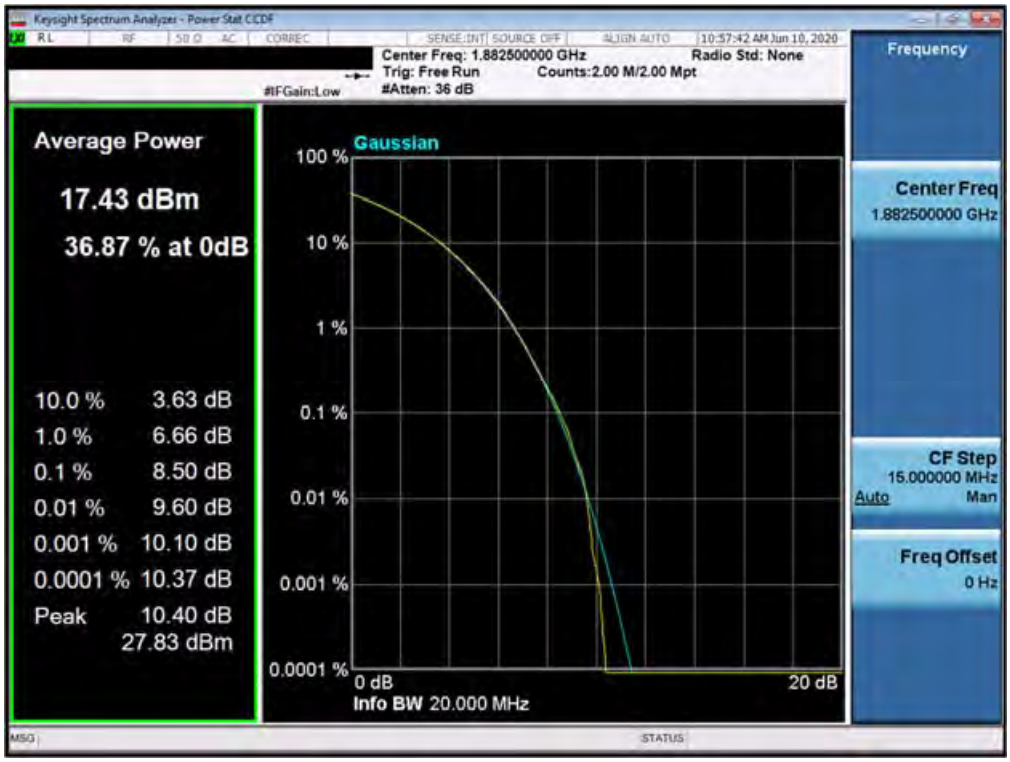
Plot 7-597. PAR Plot (Band n25/2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-598. PAR Plot (Band n25/2 - 20.0MHz 16-QAM - Full RB Configuration)

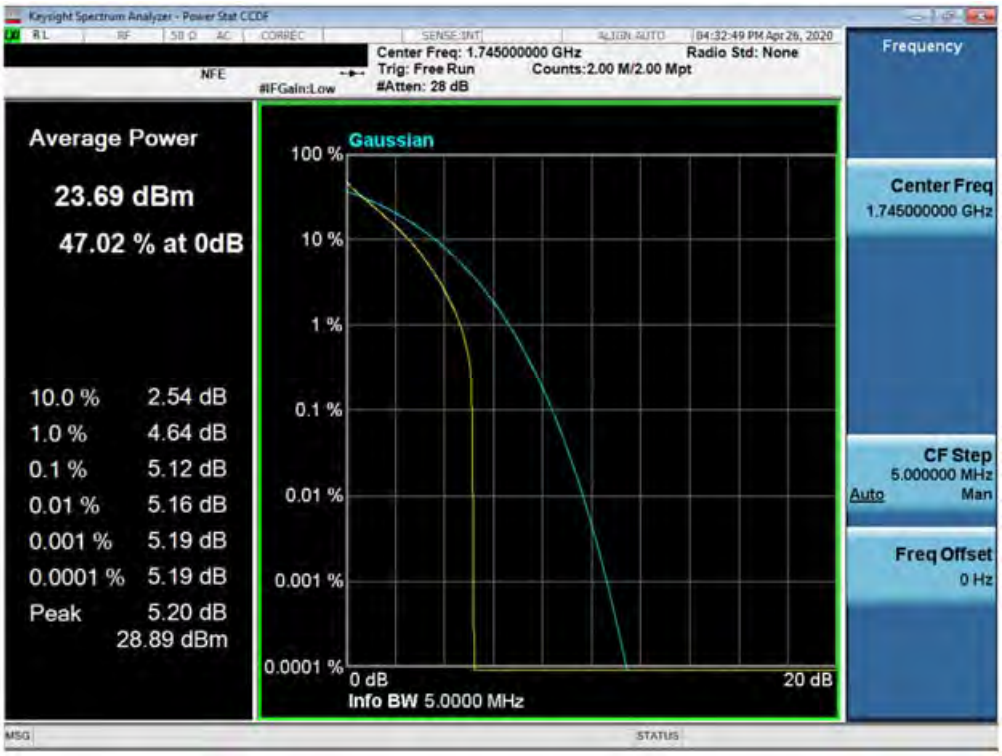


Plot 7-599. PAR Plot (Band n25/2 - 20.0MHz 64-QAM - Full RB Configuration)

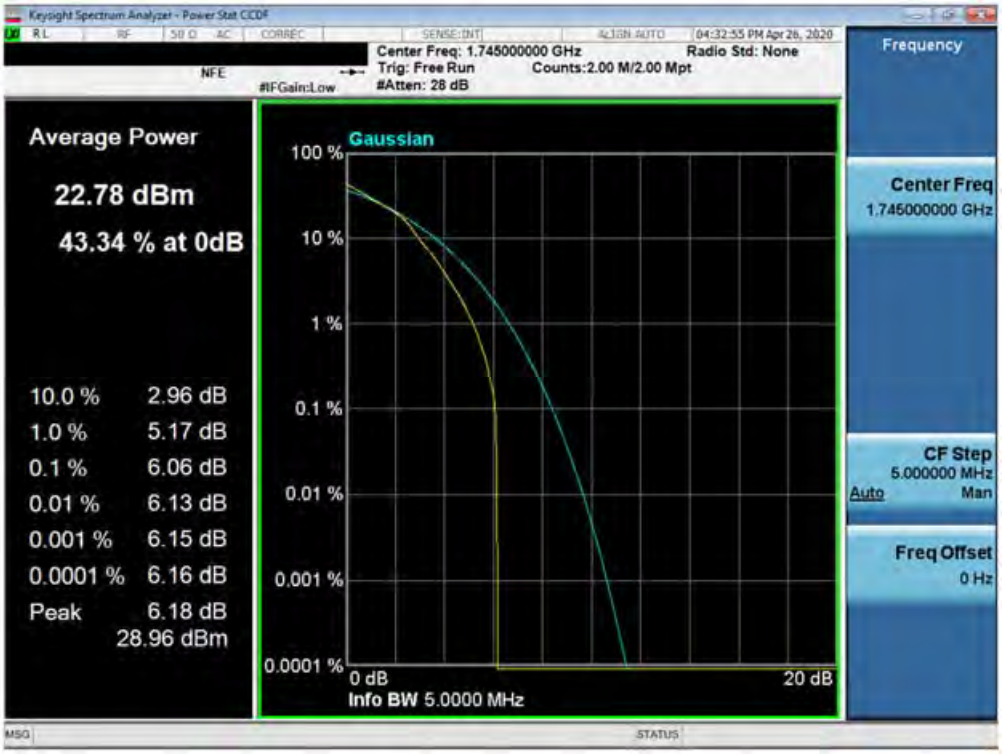


Plot 7-600. PAR Plot (Band n25/2 - 20.0MHz 256-QAM - Full RB Configuration)

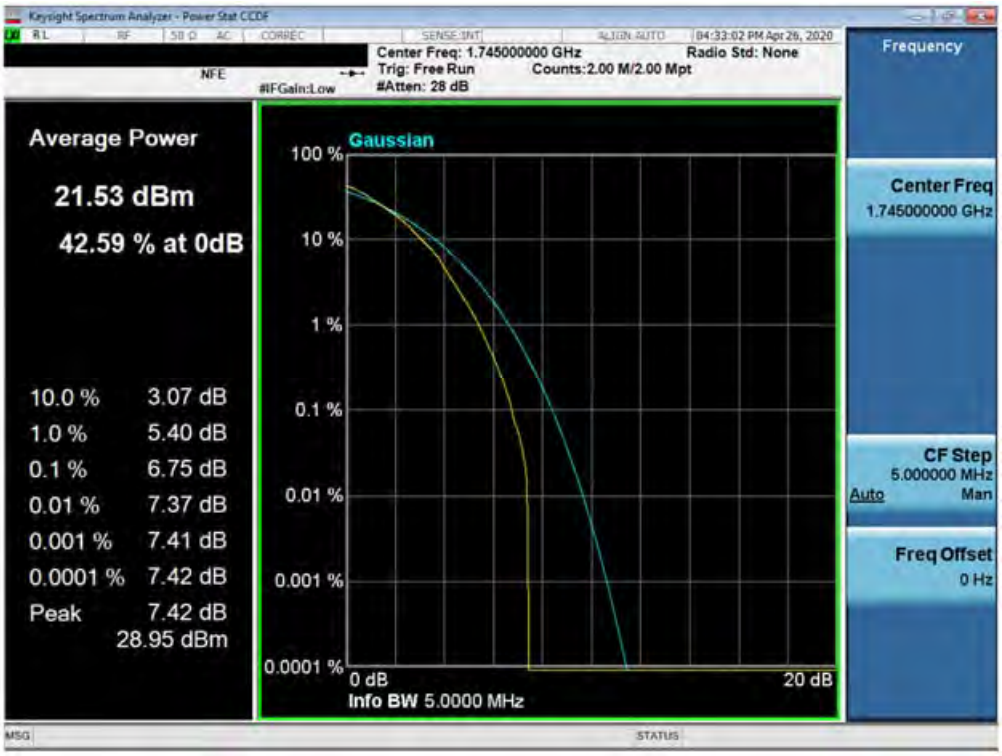
Band 66/4



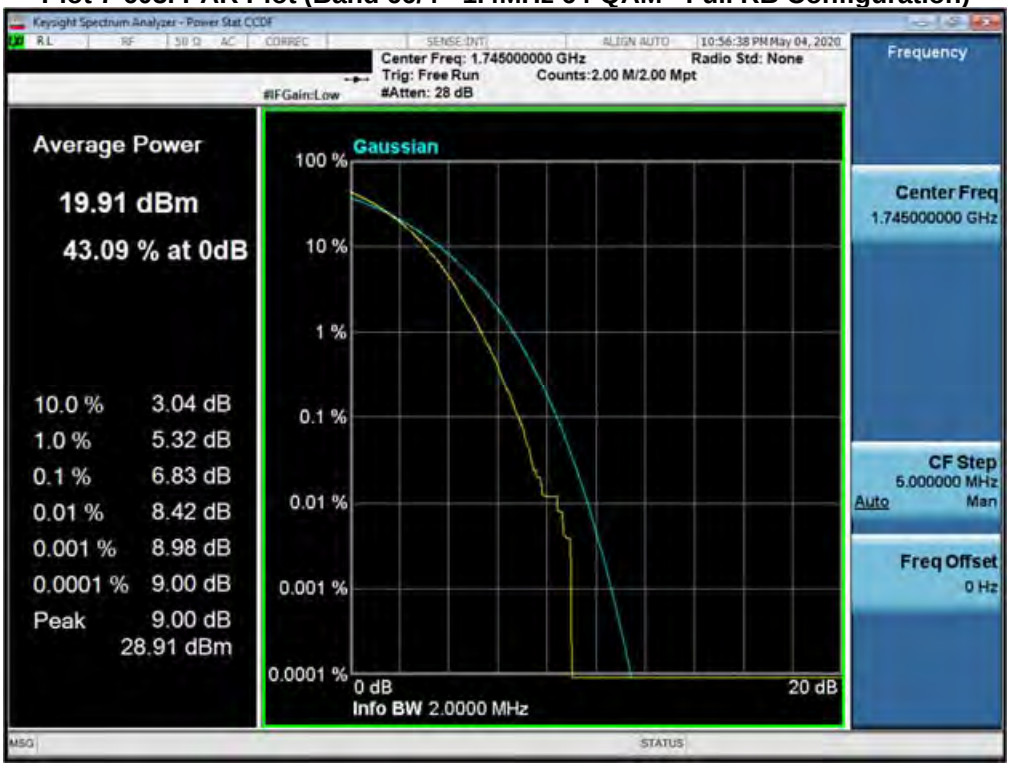
Plot 7-601. PAR Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)



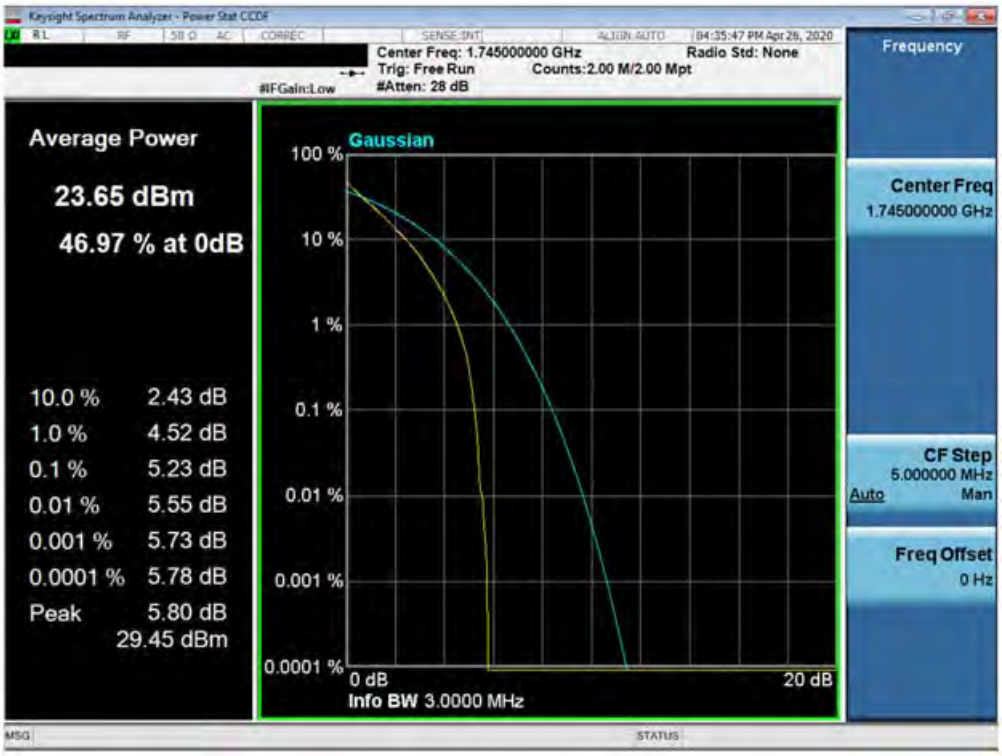
Plot 7-602. PAR Plot (Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)



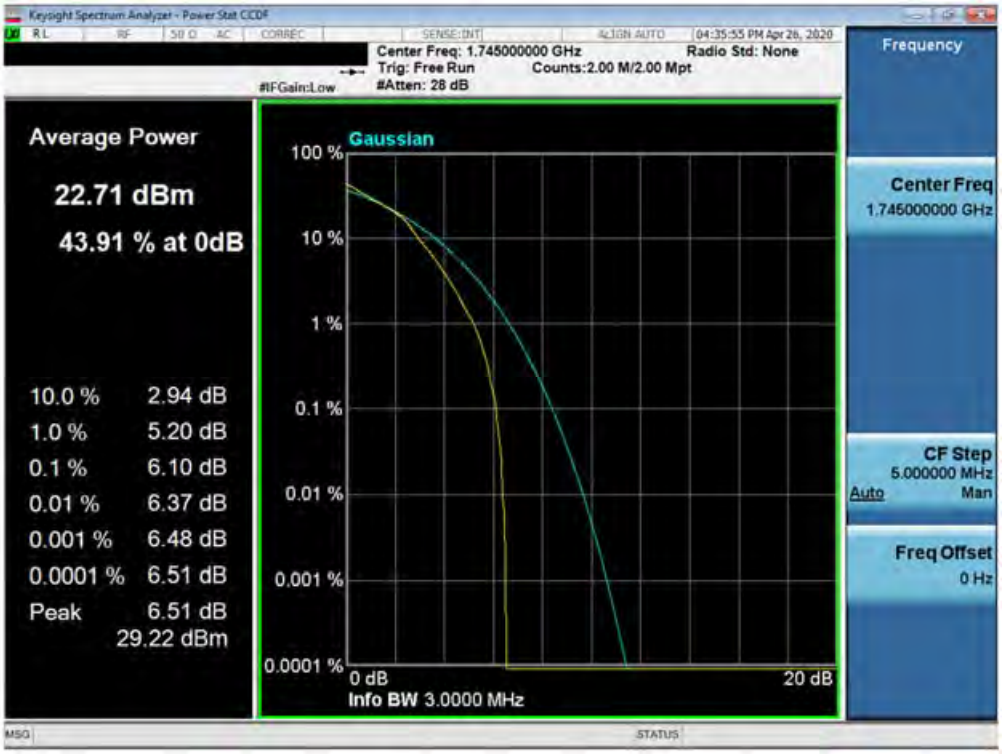
Plot 7-603. PAR Plot (Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration)



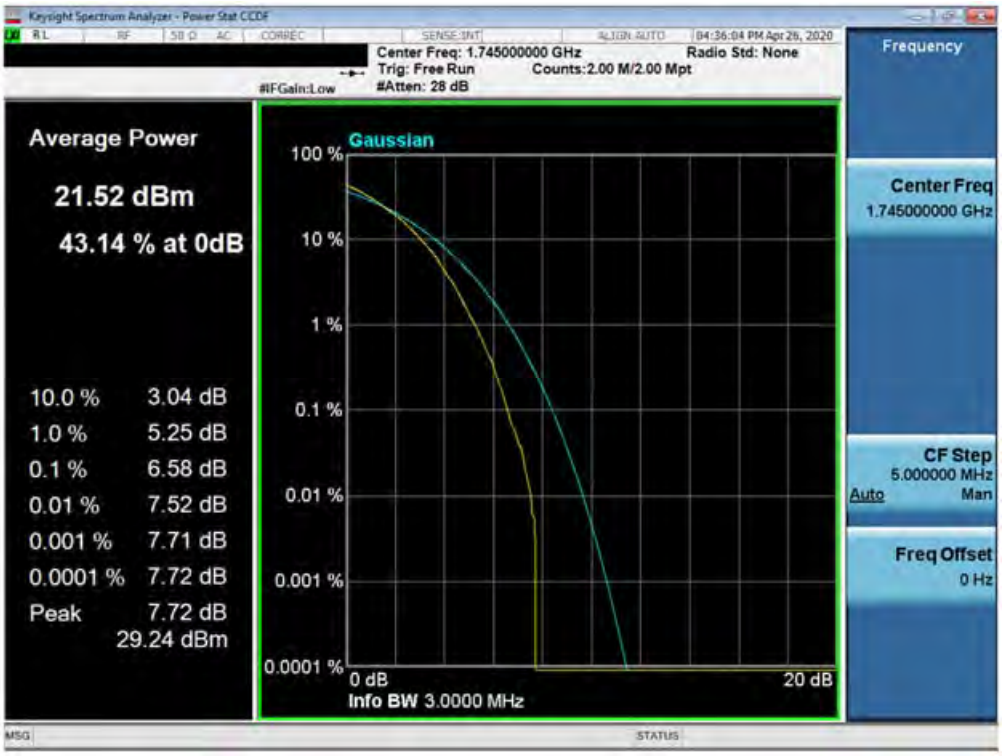
Plot 7-604. PAR Plot (Band 66/4 - 1.4MHz 256-QAM - Full RB Configuration)



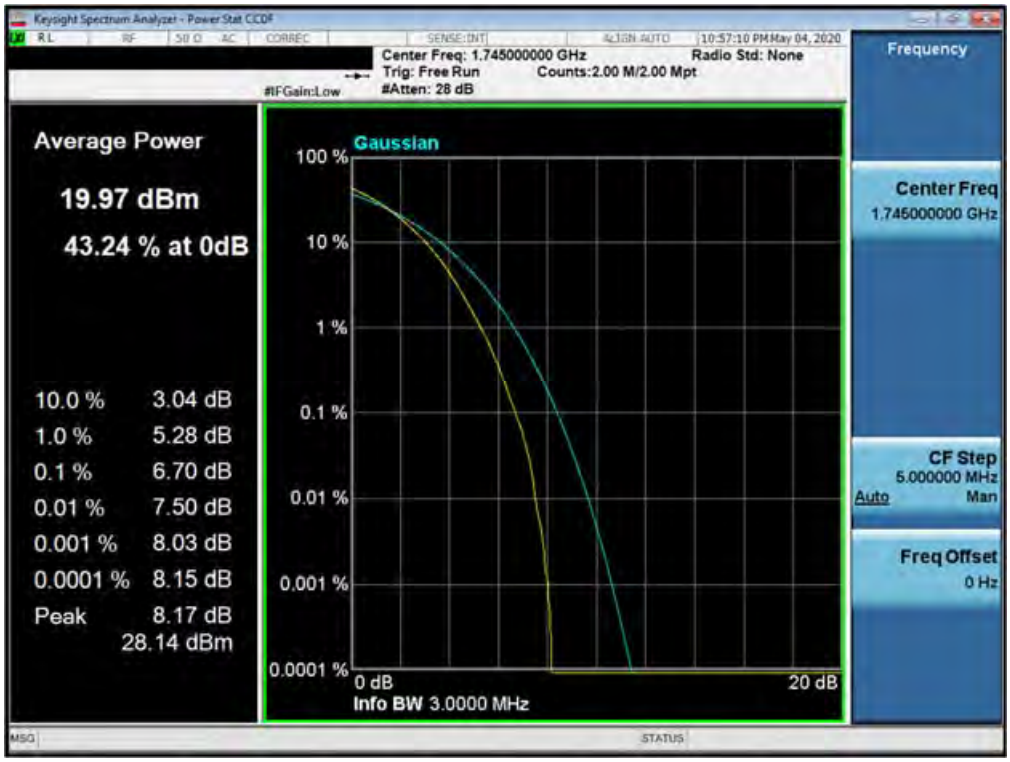
Plot 7-605. PAR Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)



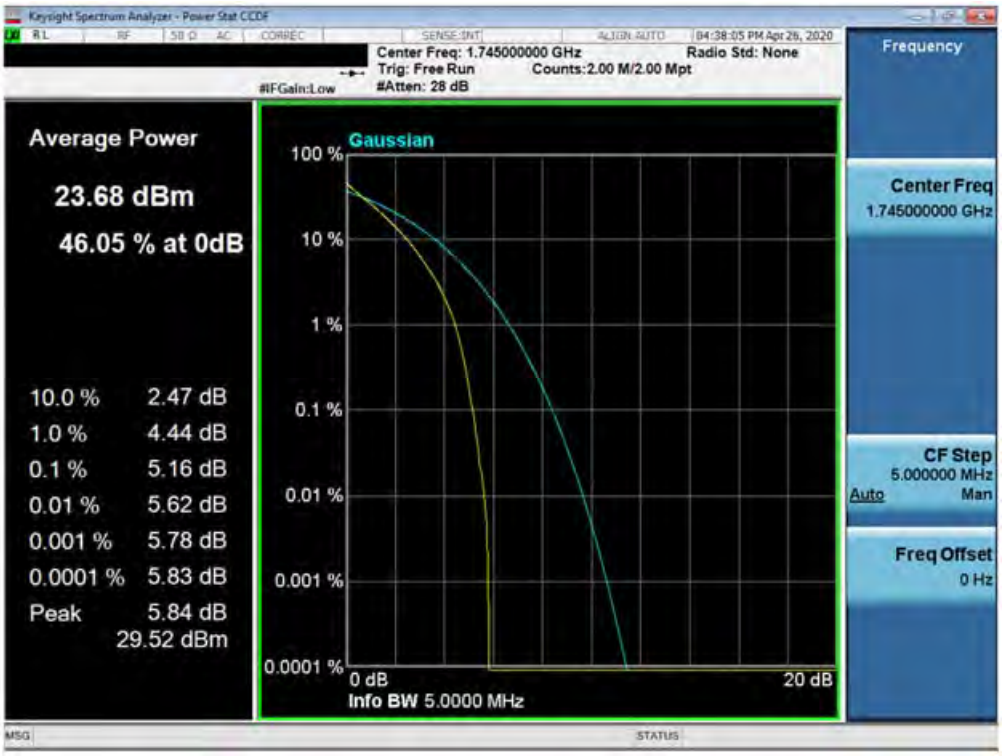
Plot 7-606. PAR Plot (Band 66/4 - 3.0MHz 16-QAM - Full RB Configuration)



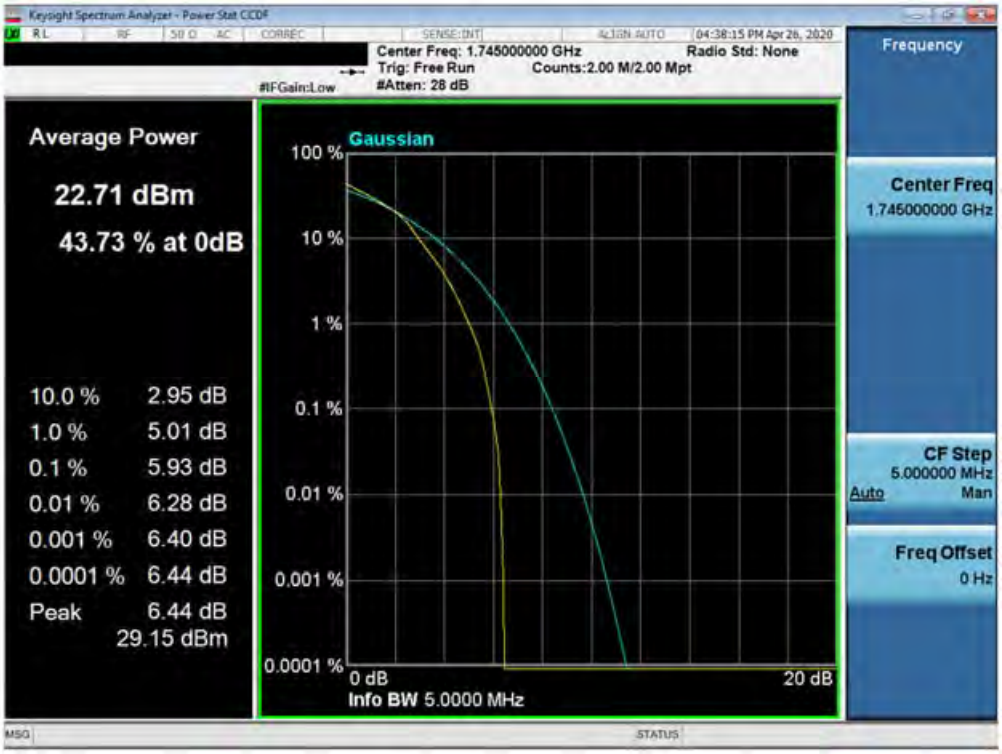
Plot 7-607. PAR Plot (Band 66/4 - 3.0MHz 64-QAM - Full RB Configuration)



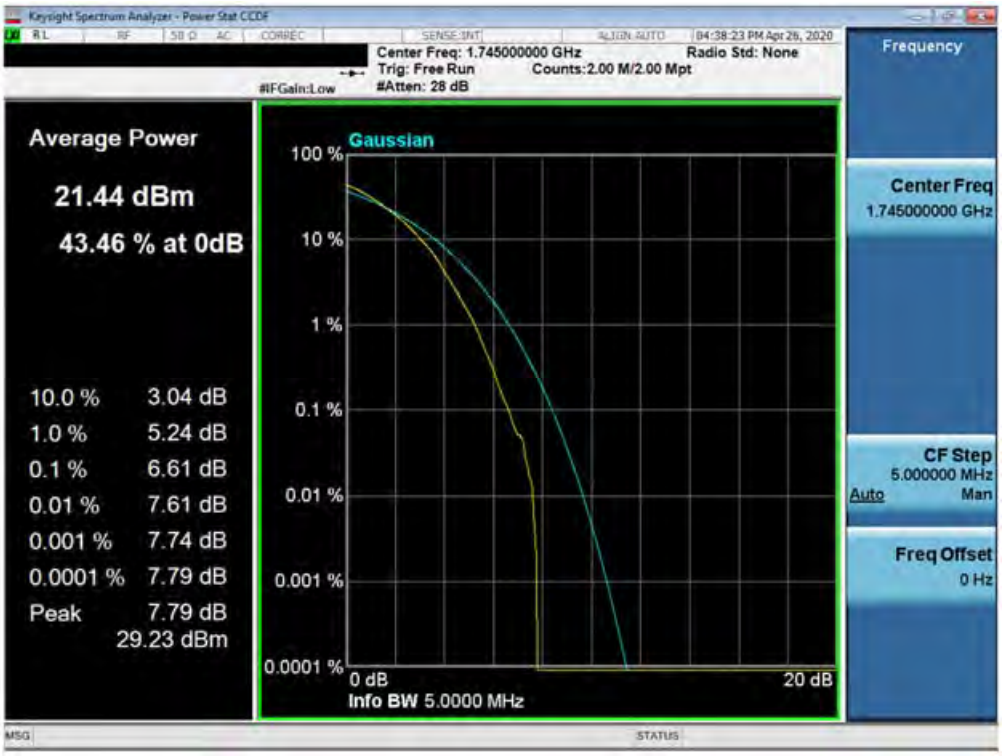
Plot 7-608. PAR Plot (Band 66/4 - 3.0MHz 256-QAM - Full RB Configuration)



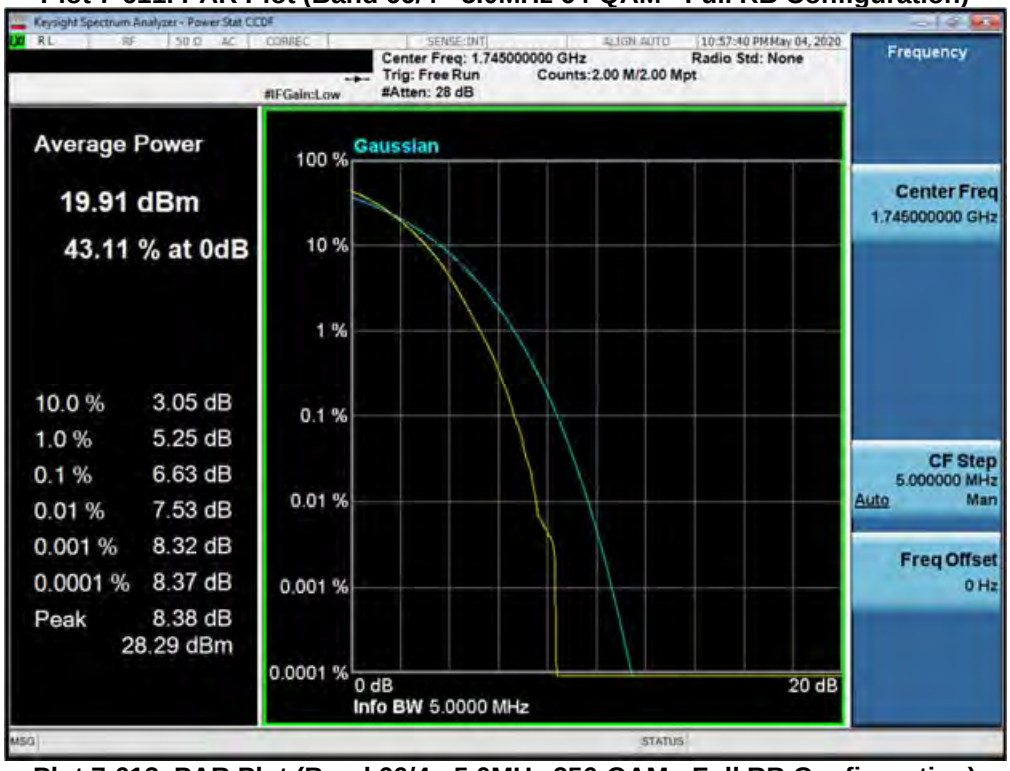
Plot 7-609. PAR Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)



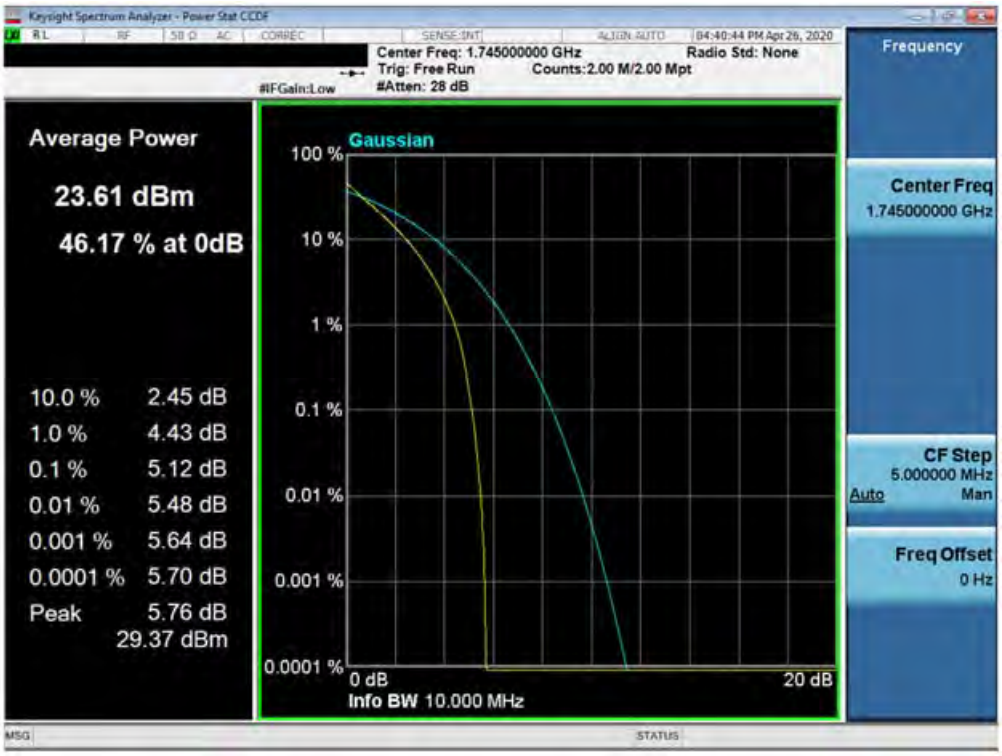
Plot 7-610. PAR Plot (Band 66/4 - 5.0MHz 16-QAM - Full RB Configuration)



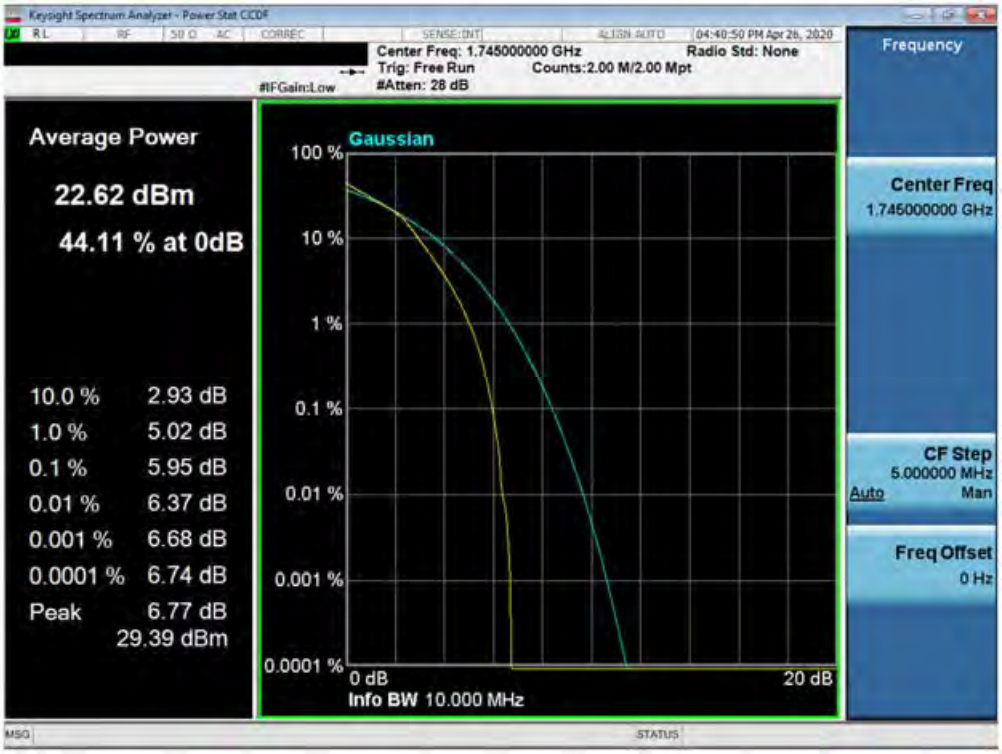
Plot 7-611. PAR Plot (Band 66/4 - 5.0MHz 64-QAM - Full RB Configuration)



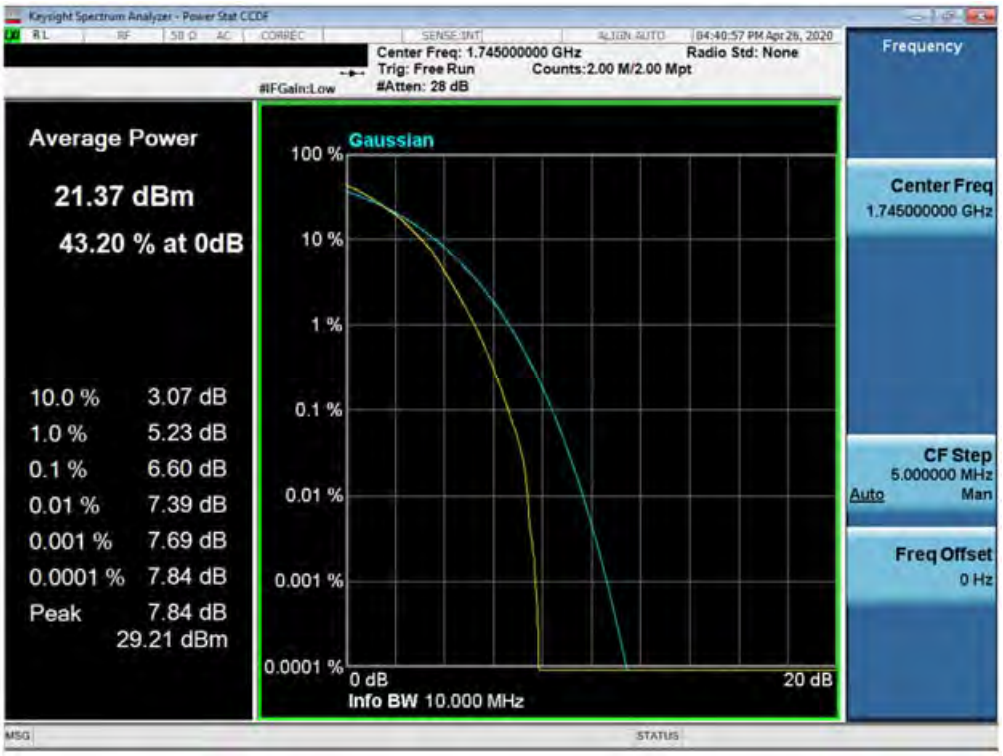
Plot 7-612. PAR Plot (Band 66/4 - 5.0MHz 256-QAM - Full RB Configuration)



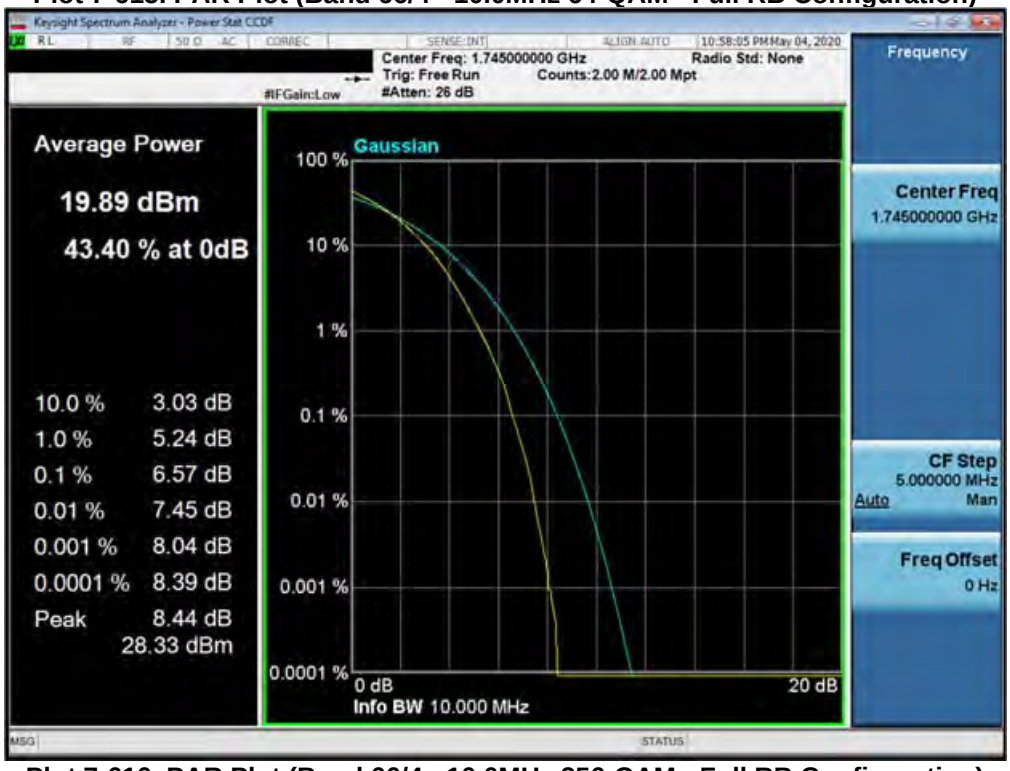
Plot 7-613. PAR Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)



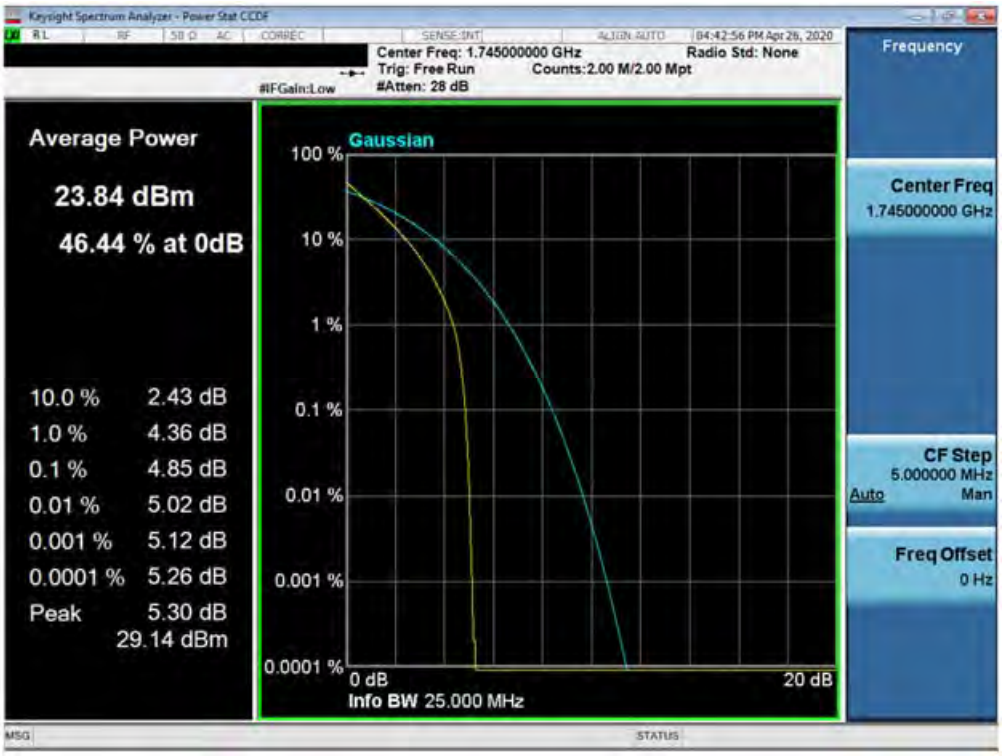
Plot 7-614. PAR Plot (Band 66/4 - 10.0MHz 16-QAM - Full RB Configuration)



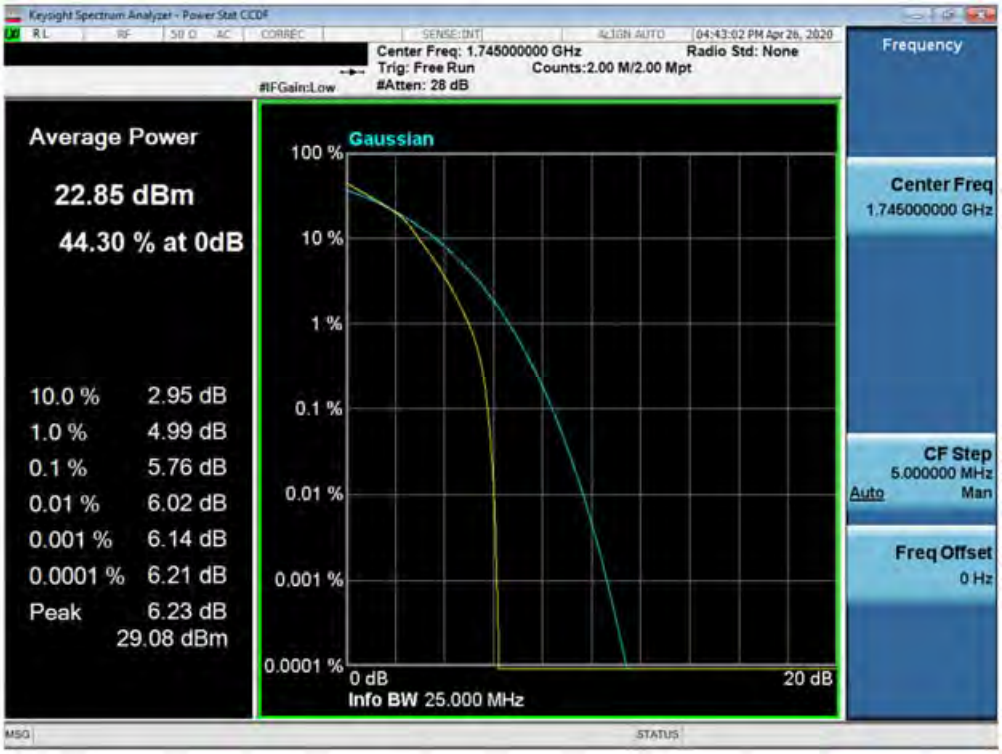
Plot 7-615. PAR Plot (Band 66/4 - 10.0MHz 64-QAM - Full RB Configuration)



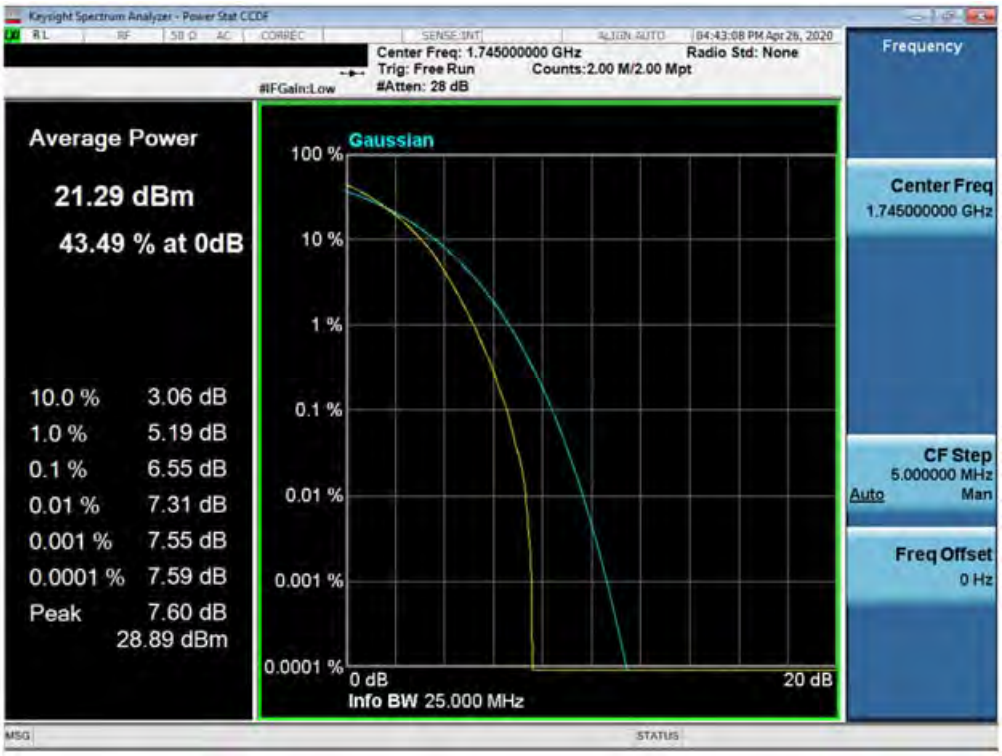
Plot 7-616. PAR Plot (Band 66/4 - 10.0MHz 256-QAM - Full RB Configuration)



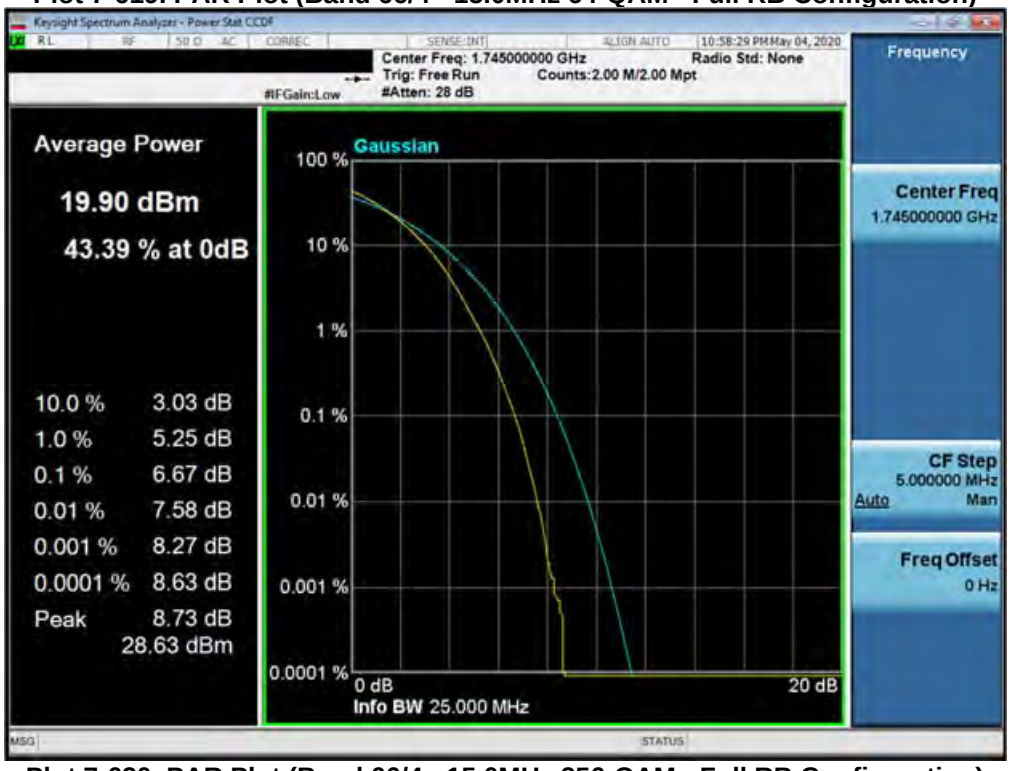
Plot 7-617. PAR Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)



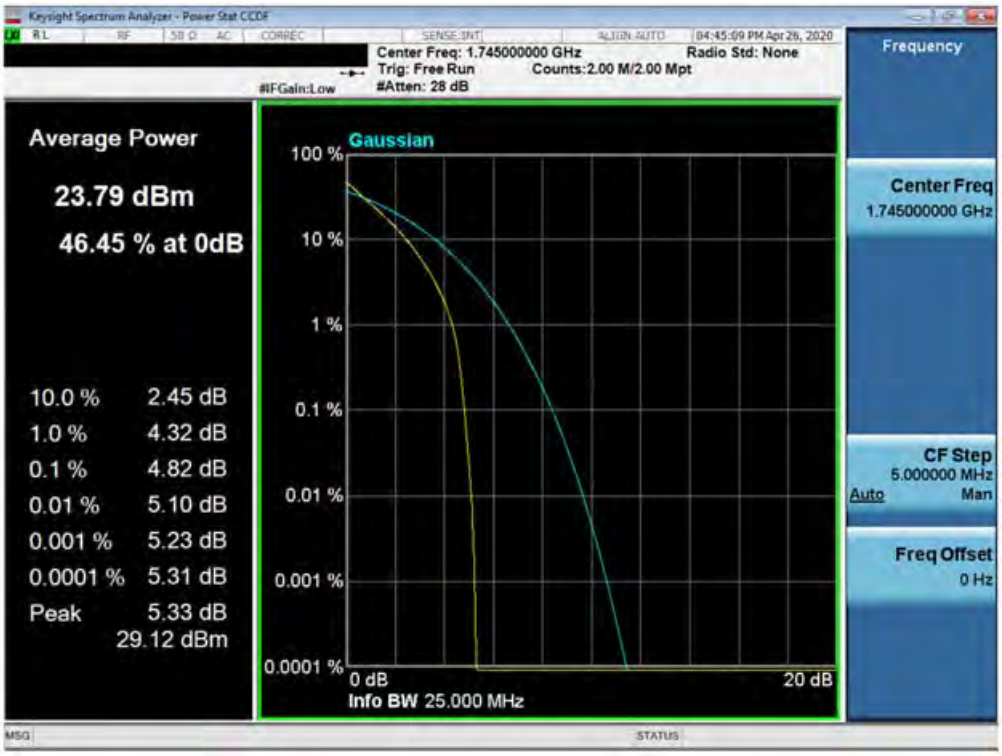
Plot 7-618. PAR Plot (Band 66/4 - 15.0MHz 16-QAM - Full RB Configuration)



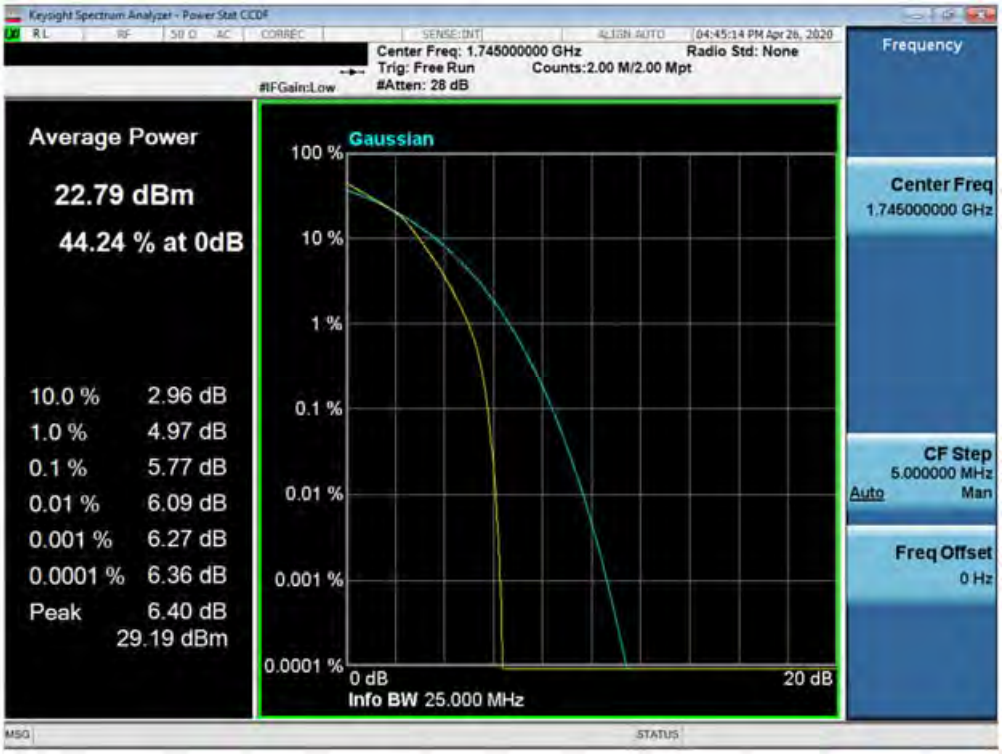
Plot 7-619. PAR Plot (Band 66/4 - 15.0MHz 64-QAM - Full RB Configuration)



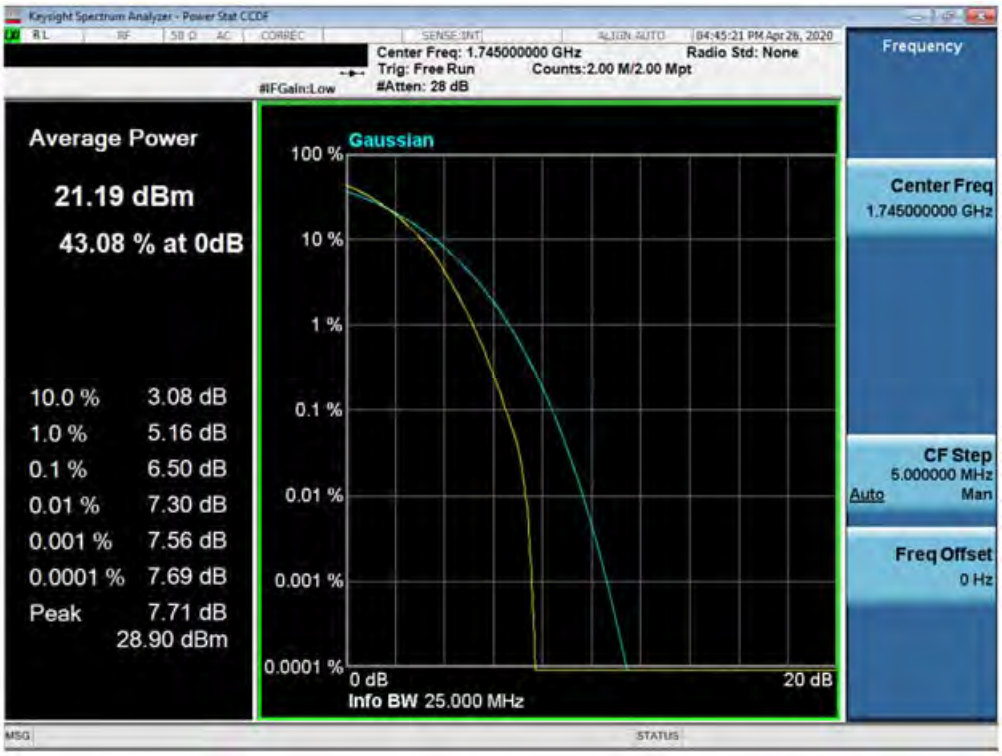
Plot 7-620. PAR Plot (Band 66/4 - 15.0MHz 256-QAM - Full RB Configuration)



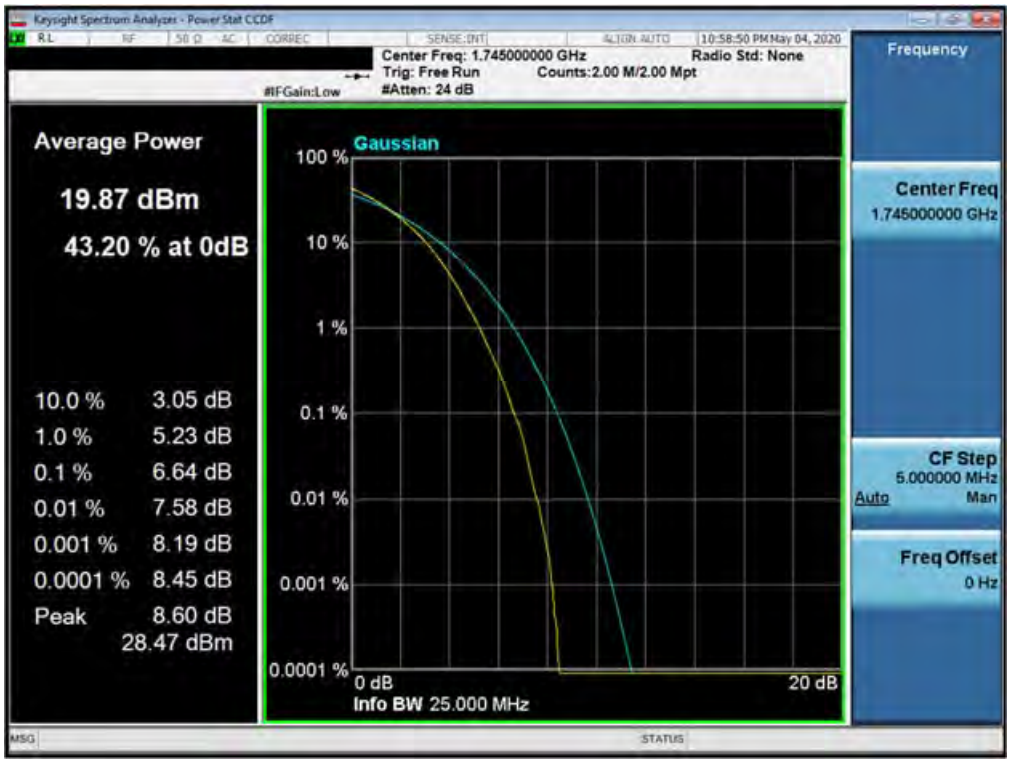
Plot 7-621. PAR Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-622. PAR Plot (Band 66/4 - 20.0MHz 16-QAM - Full RB Configuration)

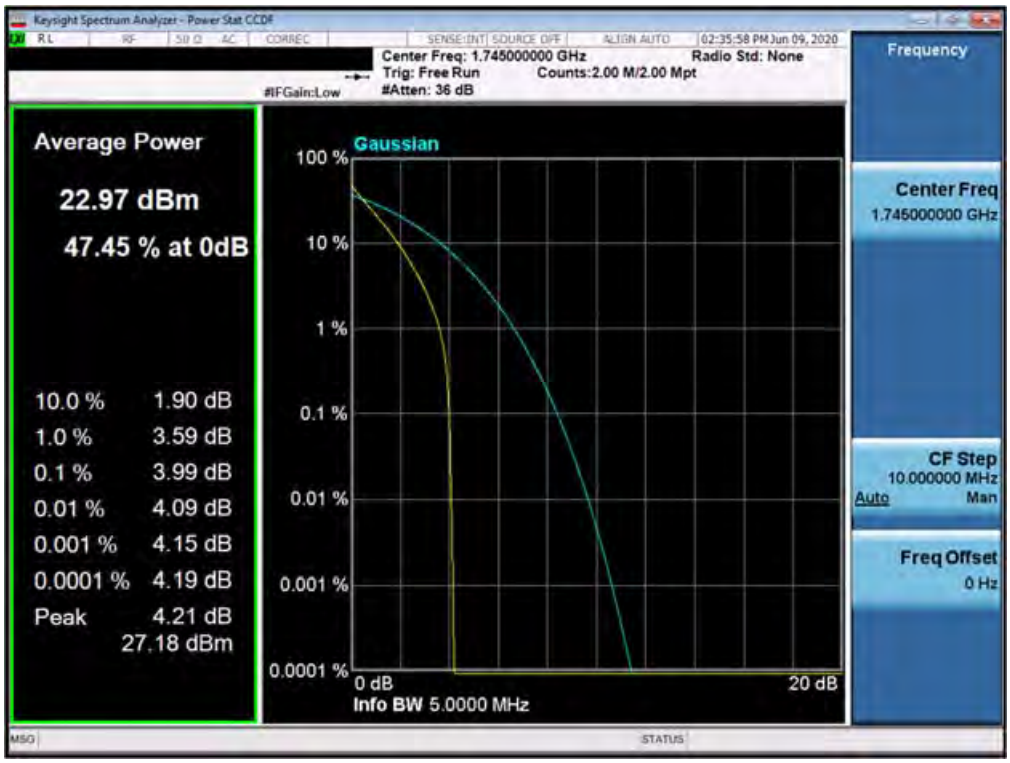


Plot 7-623. PAR Plot (Band 66/4 - 20.0MHz 64-QAM - Full RB Configuration)

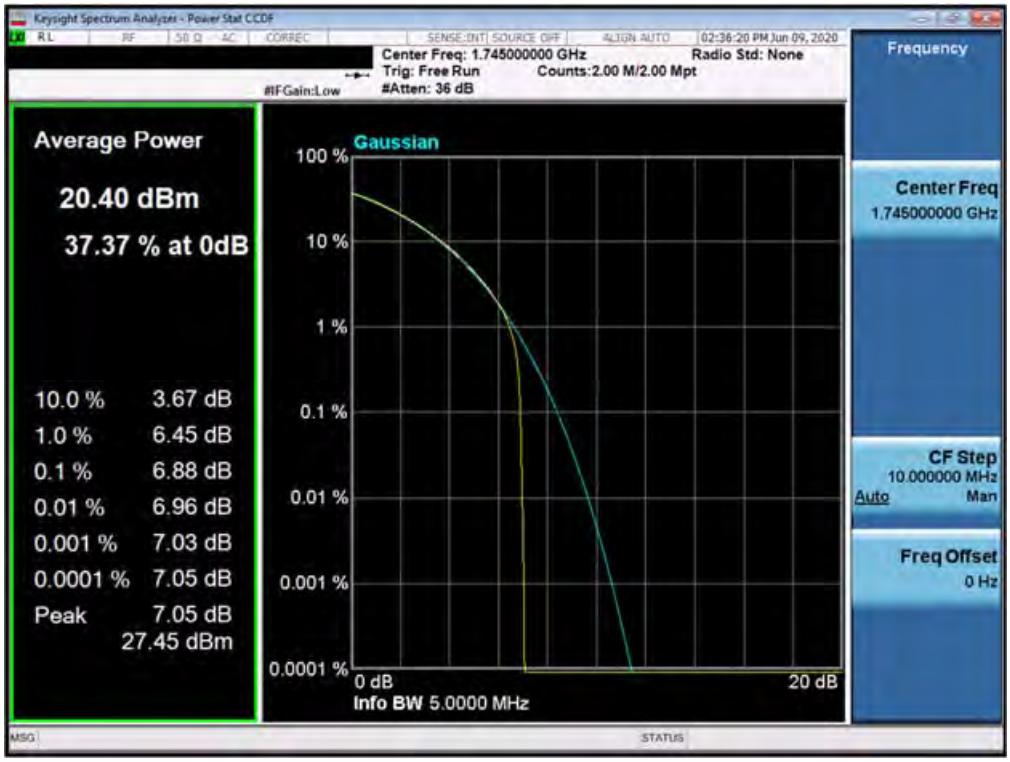


Plot 7-624. PAR Plot (Band 66/4 - 20.0MHz 256-QAM - Full RB Configuration)

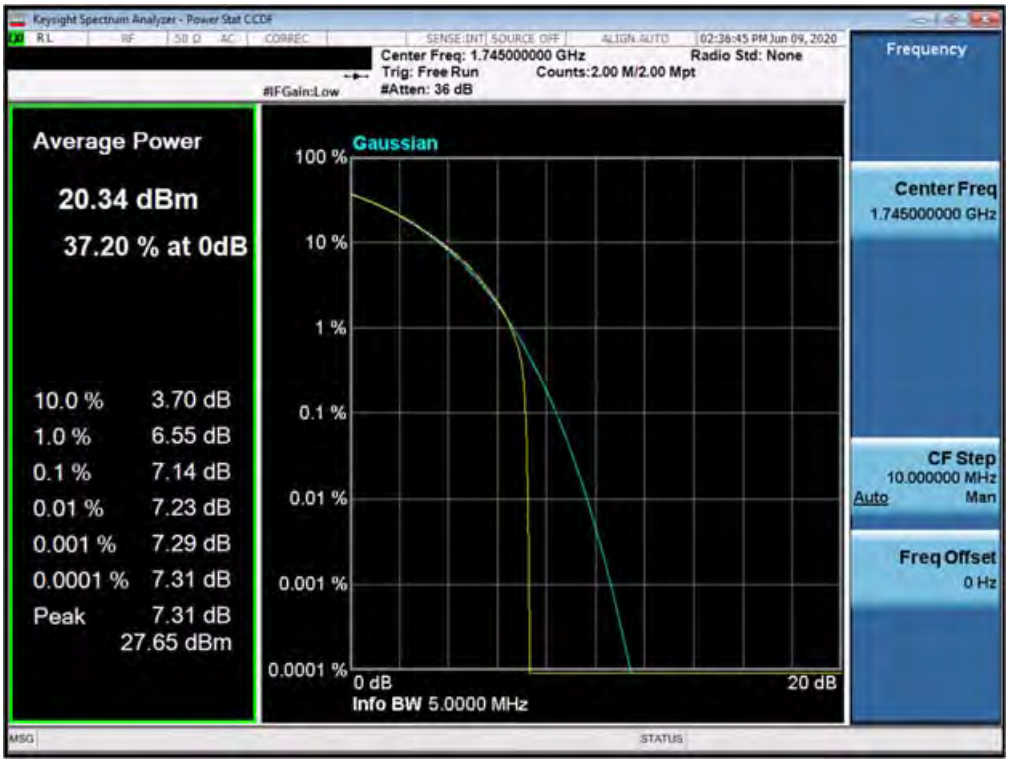
NR Band n66



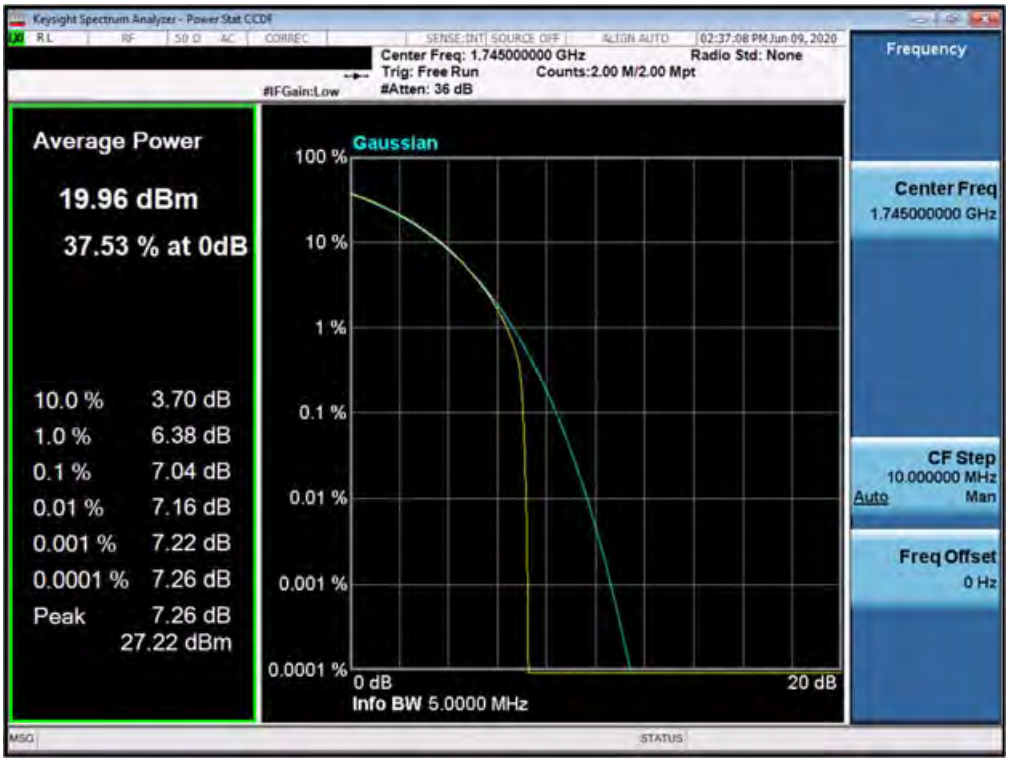
Plot 7-625. PAR Plot (n66 - 5.0MHz DFT-s-OFDM BPSK - Full RB Configuration)



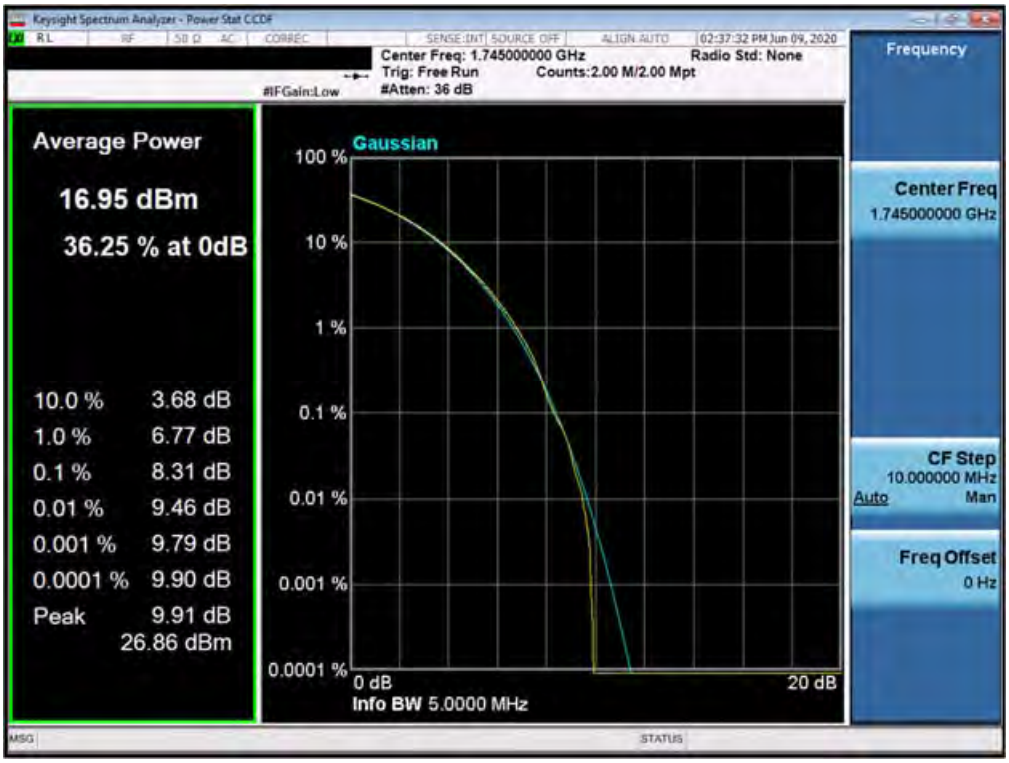
Plot 7-626. PAR Plot (n66 - 5.0MHz CP-OFDM-QPSK - Full RB Configuration)



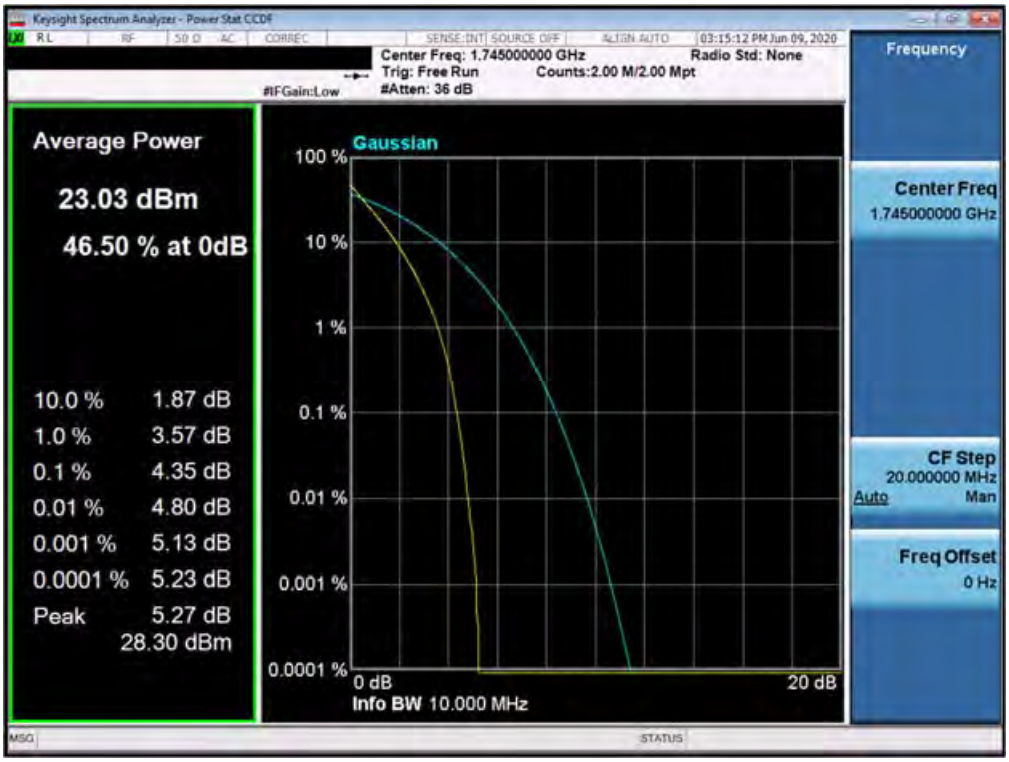
Plot 7-627. PAR Plot (n66 - 5.0MHz CP-OFDM-16-QAM - Full RB Configuration)



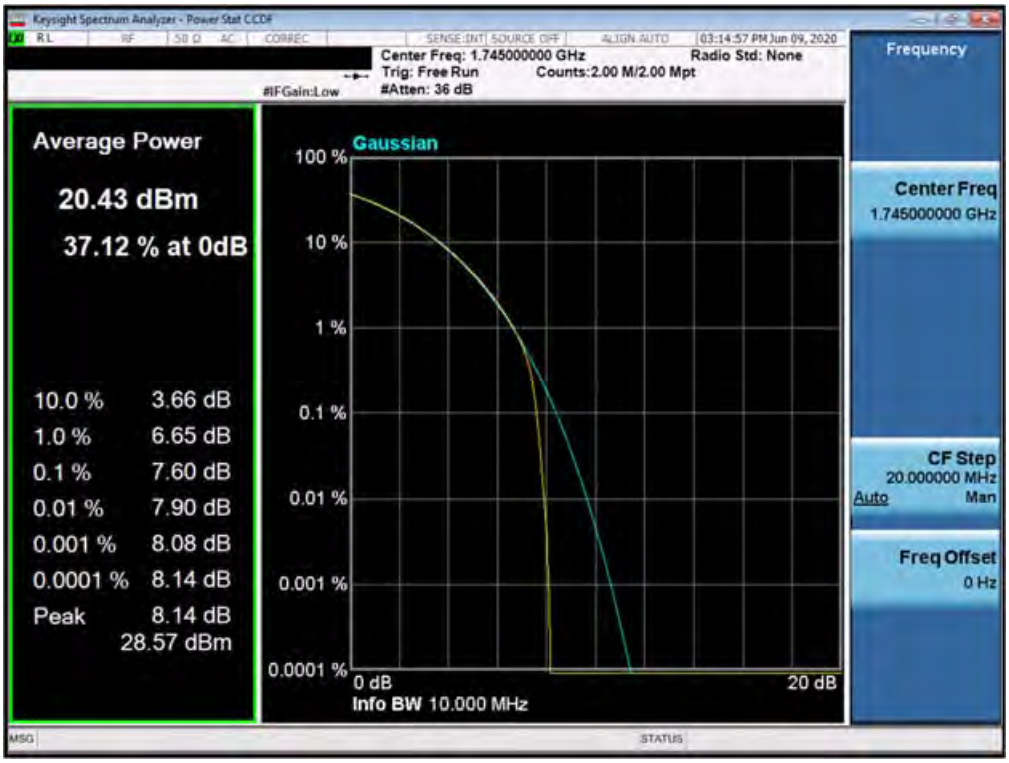
Plot 7-628. PAR Plot (n66 - 5.0MHz CP-OFDM-64-QAM - Full RB Configuration)



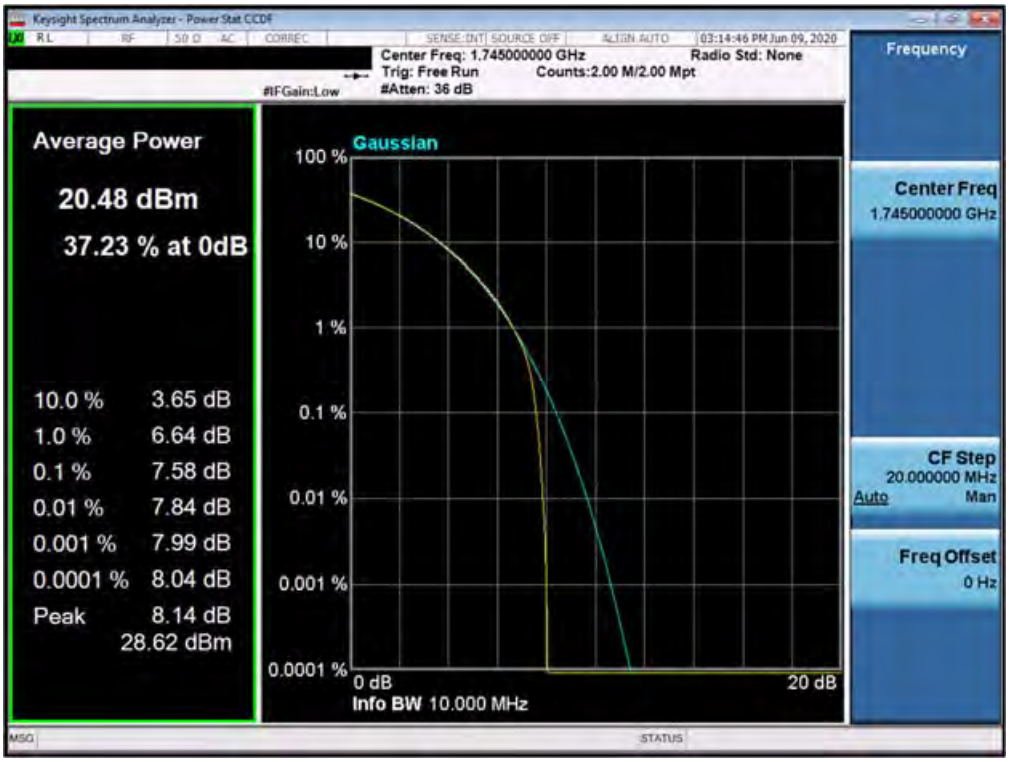
Plot 7-629. PAR Plot (n66 - 5.0MHz CP-OFDM-256-QAM - Full RB Configuration)



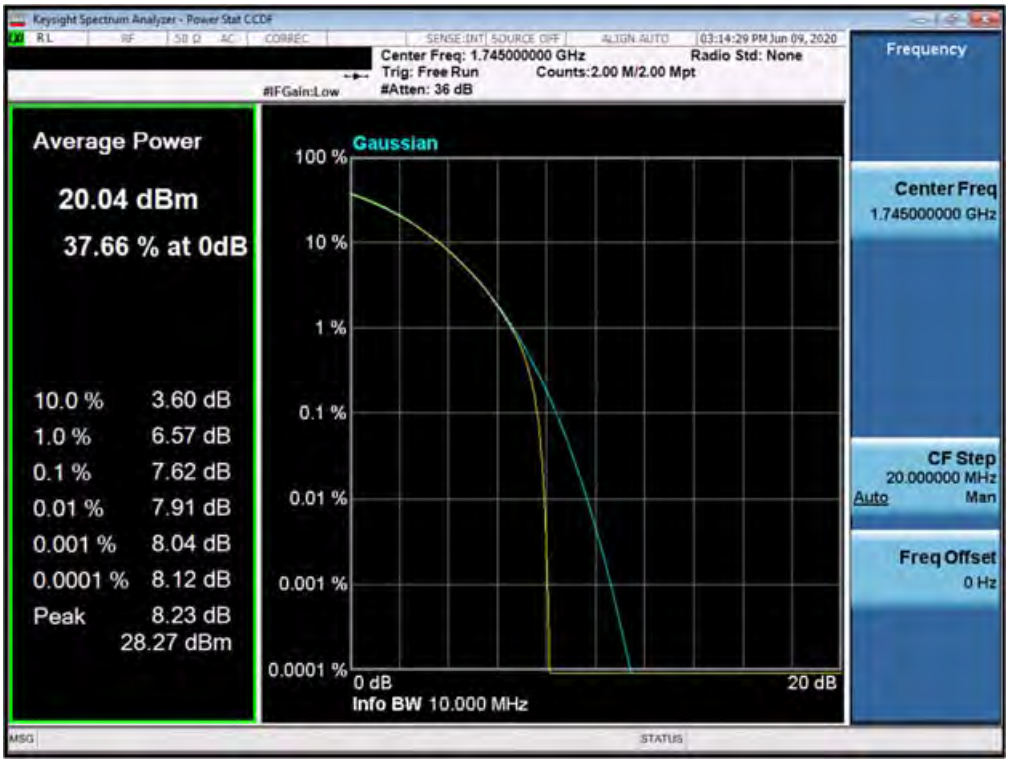
Plot 7-630. PAR Plot (n66 - 10.0MHz DFT-s-OFDM BPSK - Full RB Configuration)



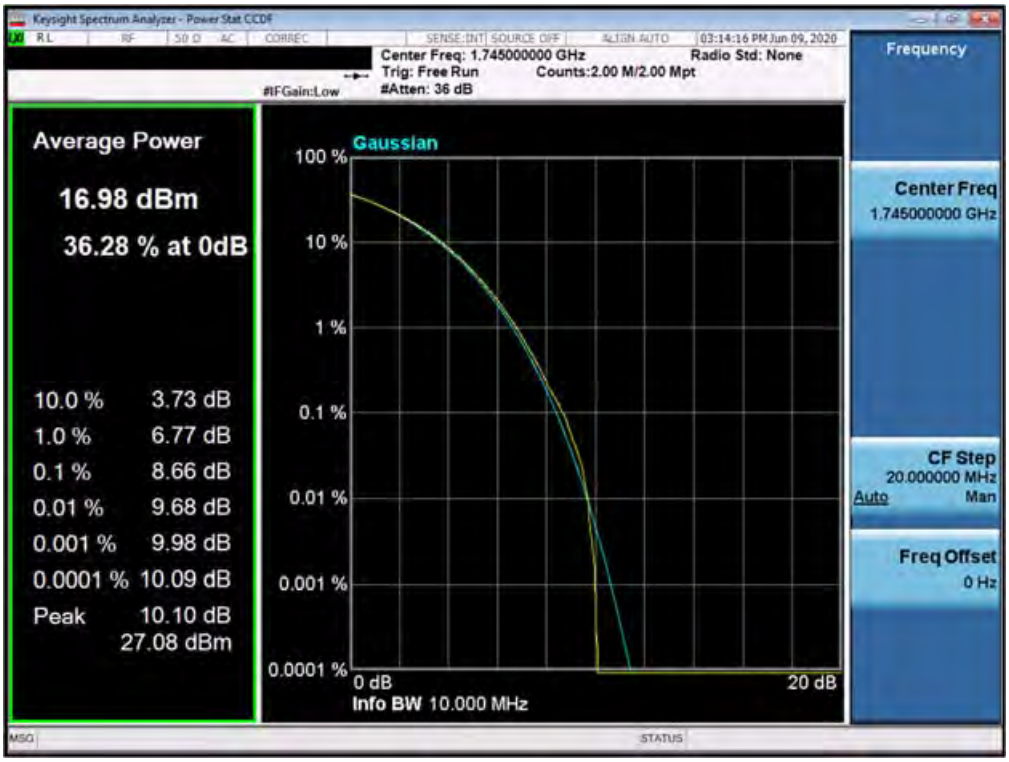
Plot 7-631. PAR Plot (n66 - 10.0MHz CP-OFDM-QPSK - Full RB Configuration)



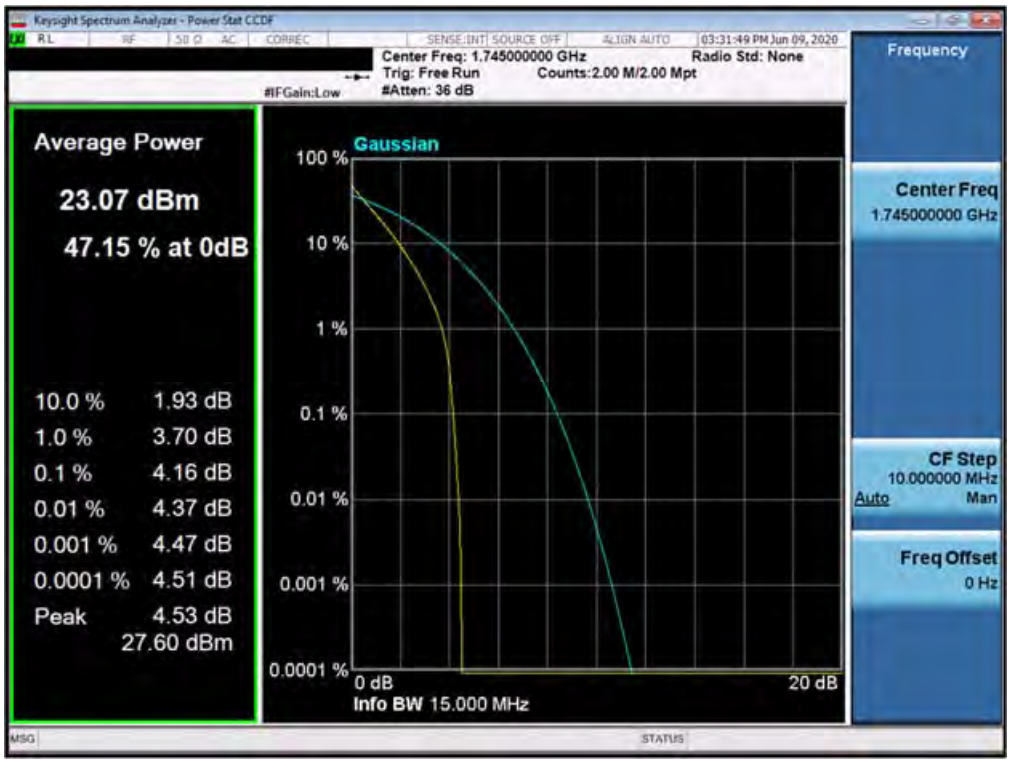
Plot 7-632. PAR Plot (n66 - 10.0MHz CP-OFDM-16-QAM - Full RB Configuration)



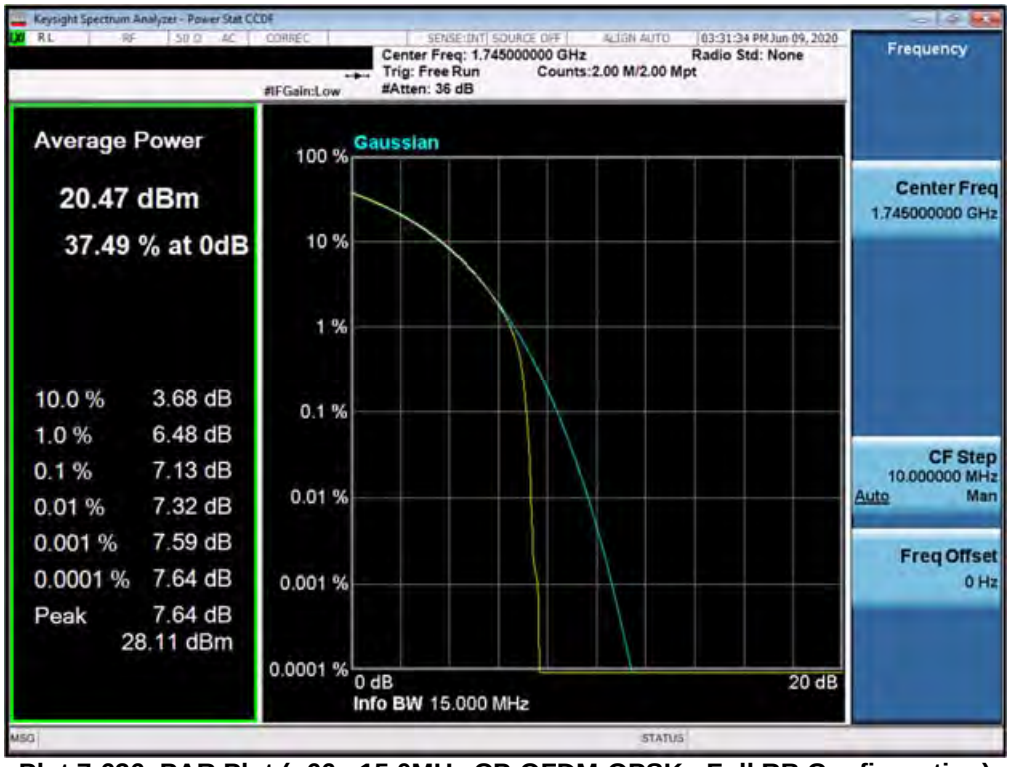
Plot 7-633. PAR Plot (n66 - 10.0MHz CP-OFDM-64-QAM - Full RB Configuration)



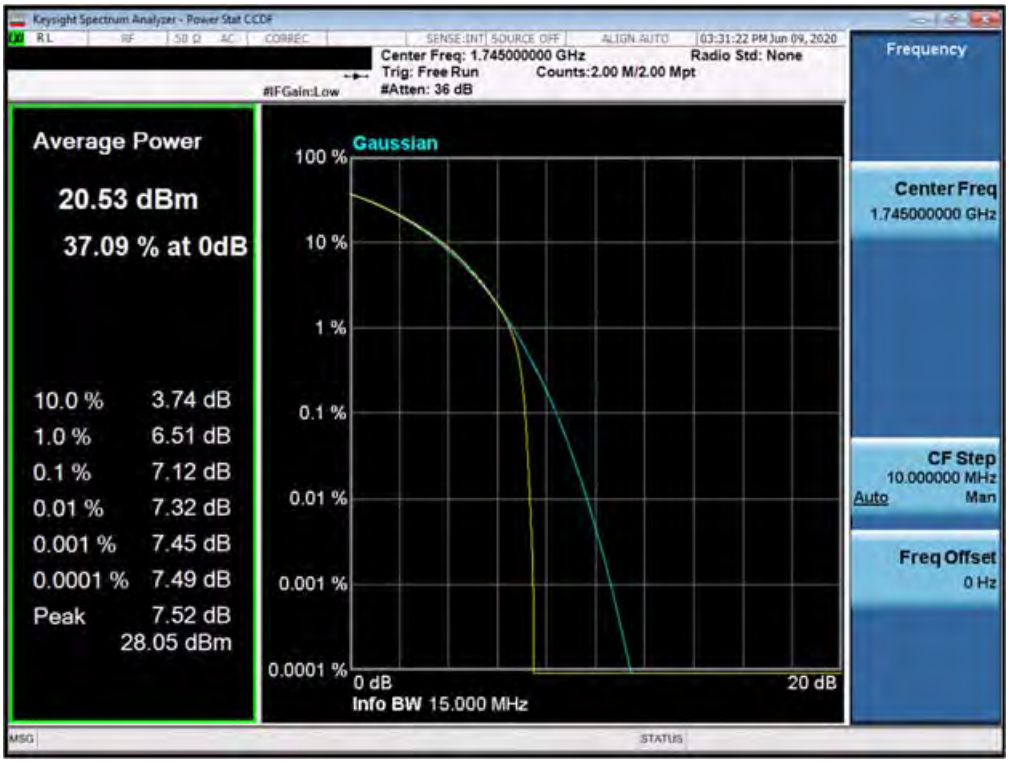
Plot 7-634. PAR Plot (n66 - 10.0MHz CP-OFDM-256-QAM - Full RB Configuration)



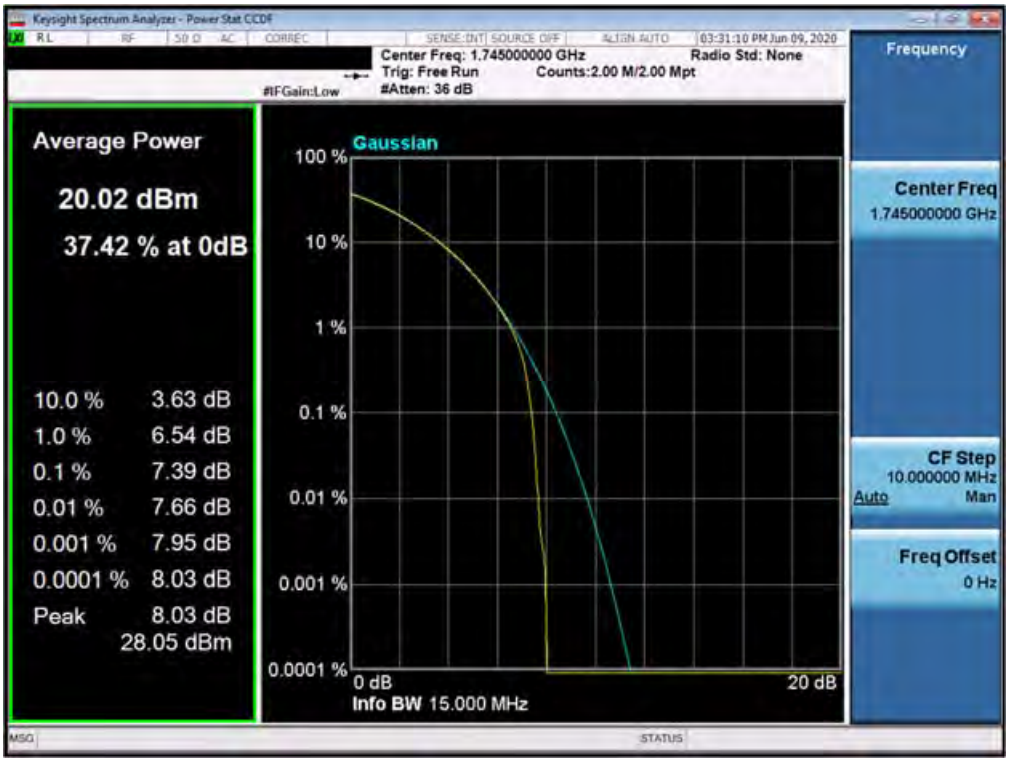
Plot 7-635. PAR Plot (n66 - 15.0MHz DFT-s-OFDM BPSK - Full RB Configuration)



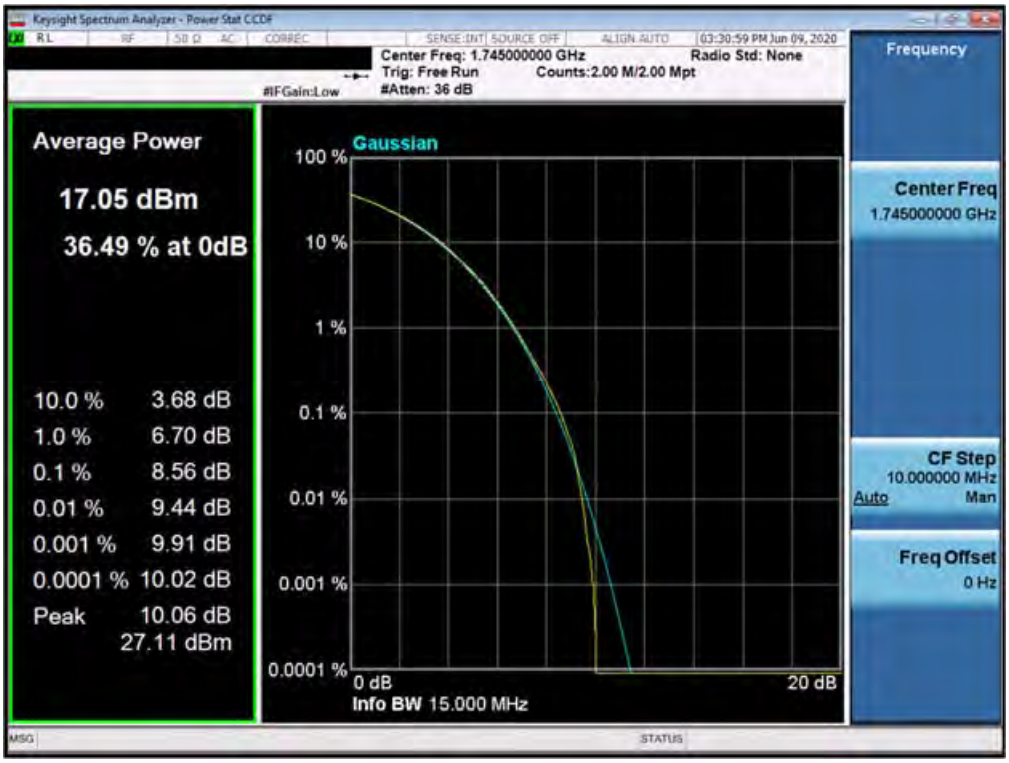
Plot 7-636. PAR Plot (n66 - 15.0MHz CP-OFDM-QPSK - Full RB Configuration)



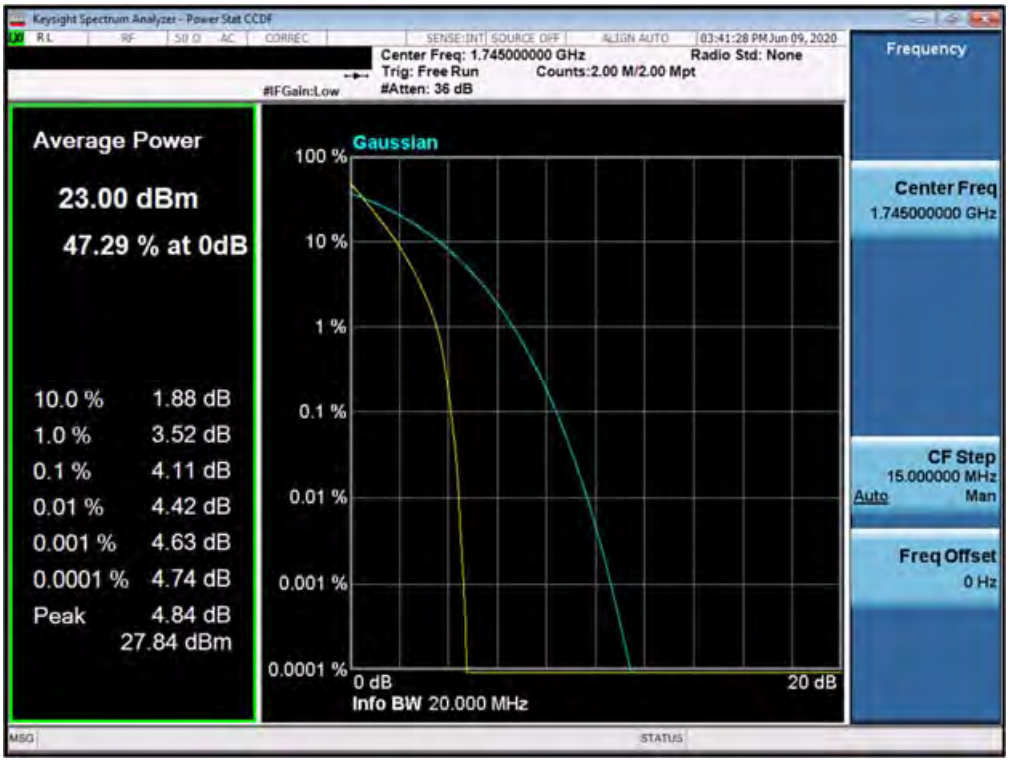
Plot 7-637. PAR Plot (n66 - 15.0MHz CP-OFDM-16-QAM - Full RB Configuration)



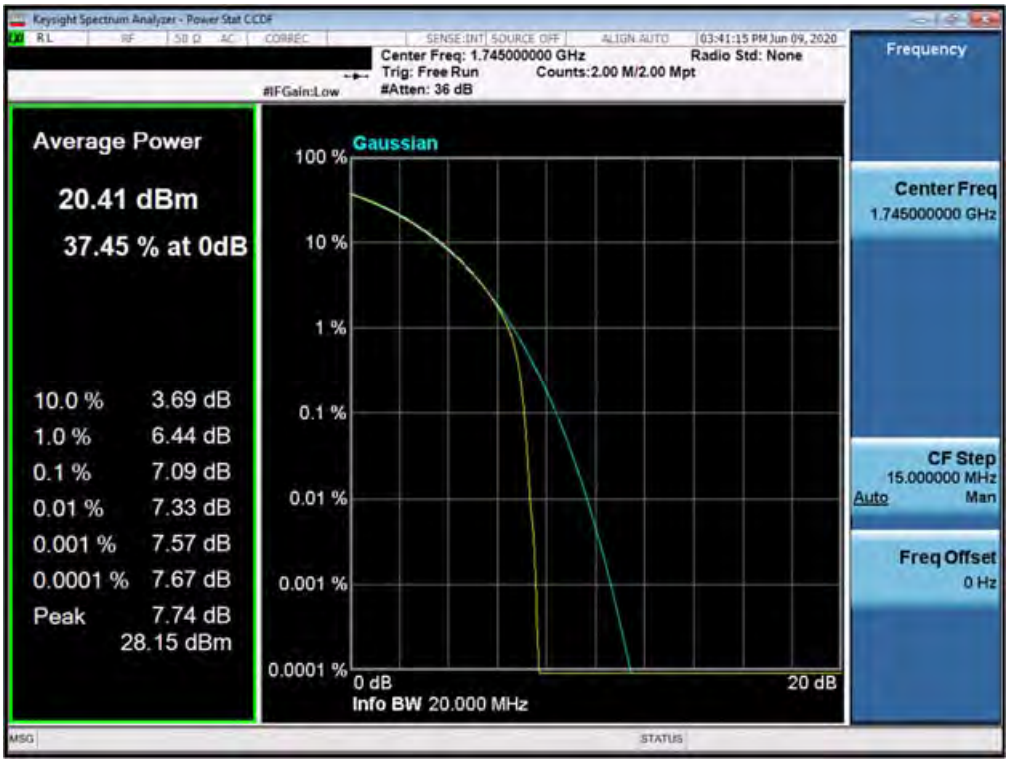
Plot 7-638. PAR Plot (n66 - 15.0MHz CP-OFDM-64-QAM - Full RB Configuration)



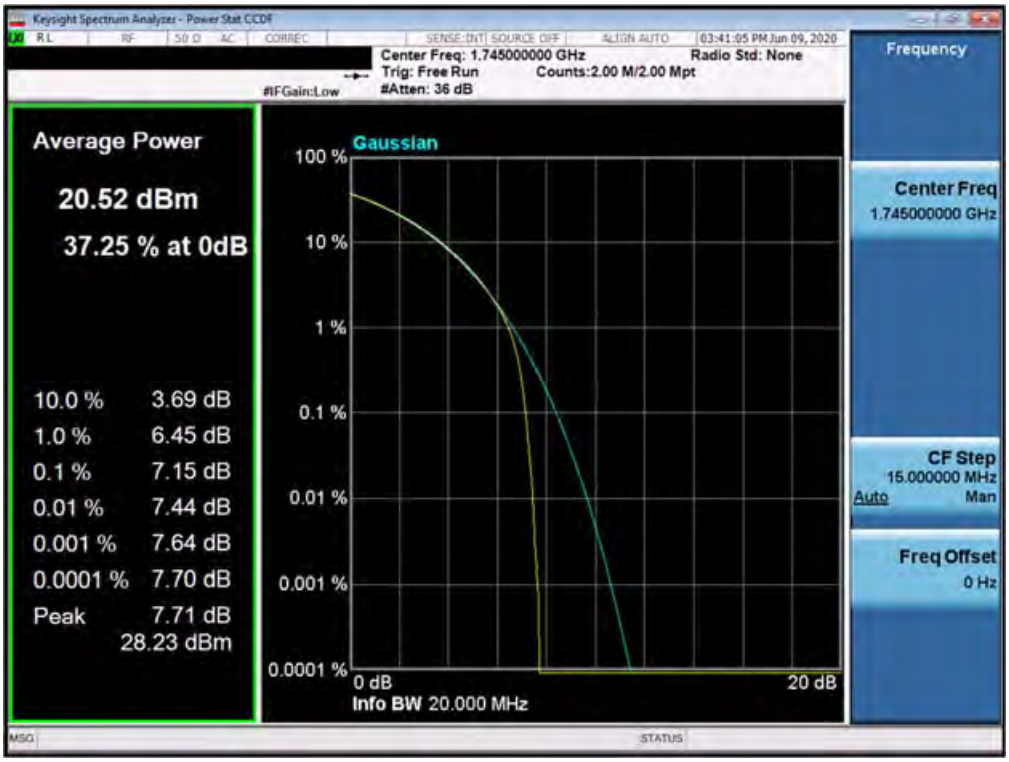
Plot 7-639. PAR Plot (n66 - 15.0MHz CP-OFDM-256-QAM - Full RB Configuration)



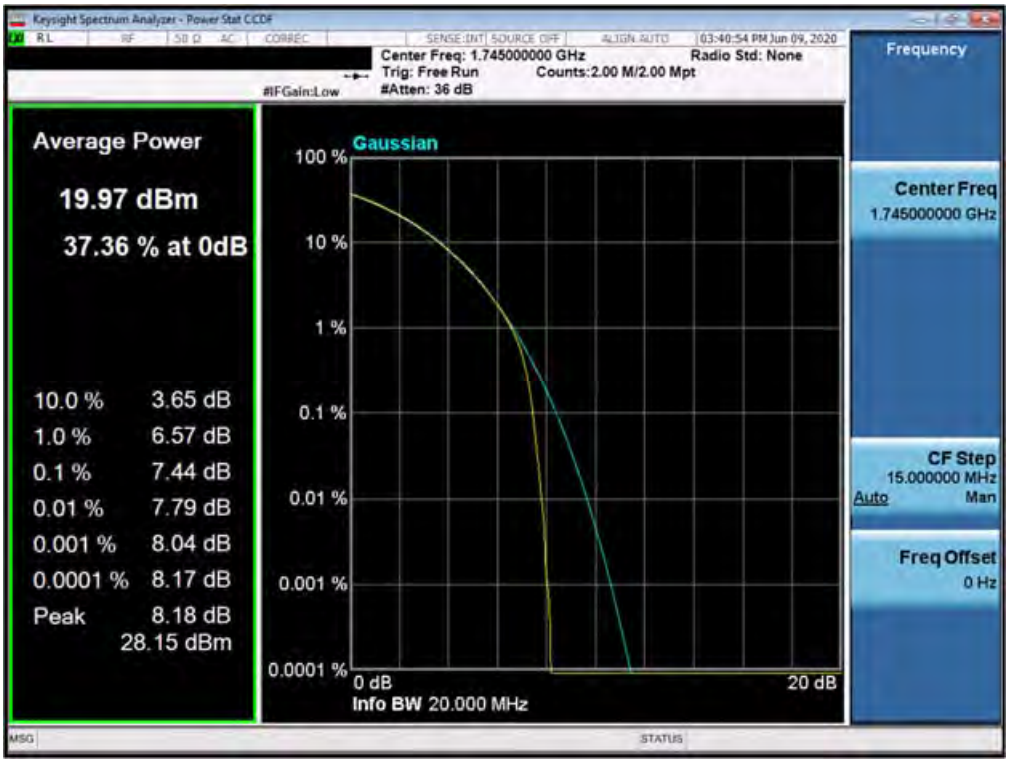
Plot 7-640. PAR Plot (n66 - 20.0MHz DFT-s-OFDM BPSK - Full RB Configuration)



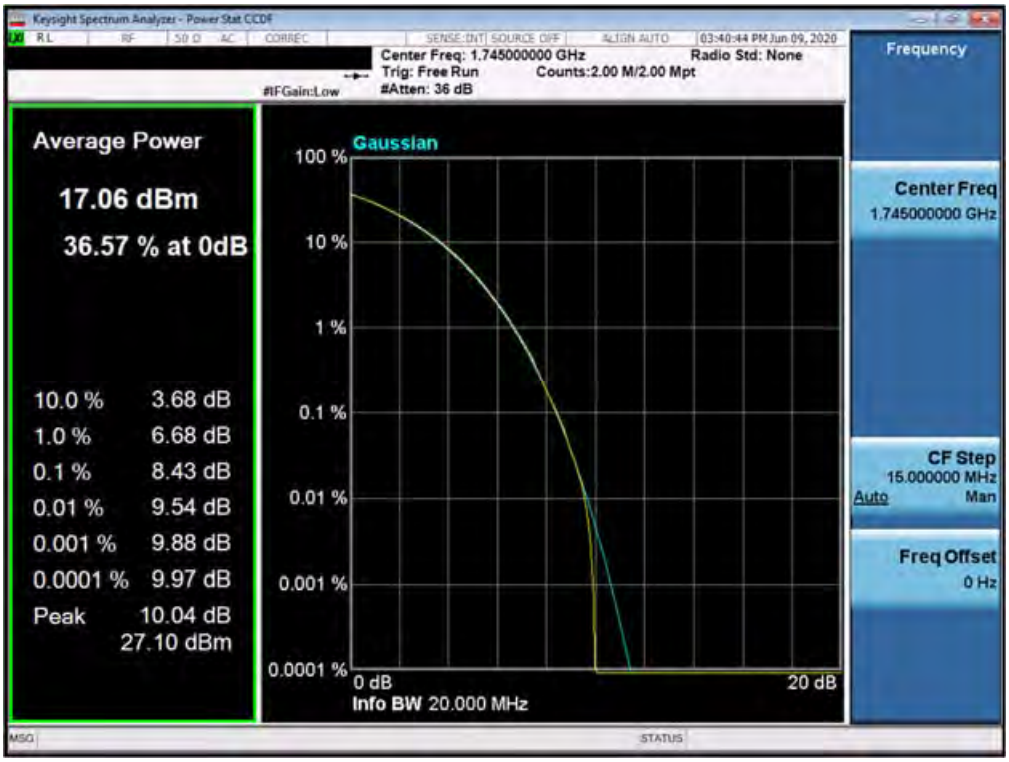
Plot 7-641. PAR Plot (n66 - 20.0MHz CP-OFDM-QPSK - Full RB Configuration)



Plot 7-642. PAR Plot (n66 - 20.0MHz CP-OFDM-16-QAM - Full RB Configuration)



Plot 7-643. PAR Plot (n66 - 20.0MHz CP-OFDM-64-QAM - Full RB Configuration)



Plot 7-644. PAR Plot (n66 - 20.0MHz CP-OFDM-256-QAM - Full RB Configuration)

7.6 Uplink Carrier Aggregation

§27.53(m)

Test Overview

The EUT is set up to transmit two contiguous LTE channels. The power level of both carriers and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

For Band 38/41, the minimum permissible attenuation level of any spurious emission is 55 + 10 $log_{10}(P_{[Watts]})$.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

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

1. For LTE Band 41, Uplink carrier aggregation is only supported in this EUT while operating in Power Class 3.

2. Conducted power and spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device. The worst case (highest) powers were found while operating with QPSK modulation, as shown in the tables below, with both carriers set to transmit using 1RB.

3. Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

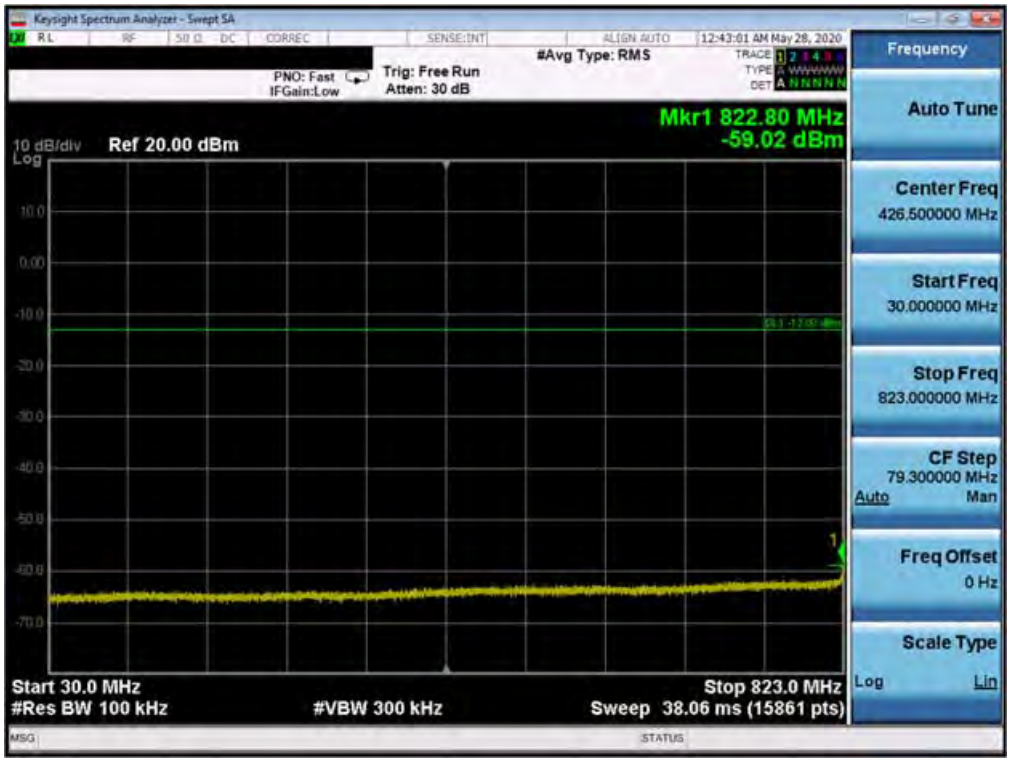
Uplink CA Configuration 5B

Power State	PCC							SCC							Power
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)
Max	LTE B5	10	20450	829	QPSK	1	49	LTE B5	10	20549	838.9	QPSK	1	0	24.41
Max	LTE B5	10	20600	844	QPSK	1	0	LTE B5	10	20501	834.1	QPSK	1	49	24.52

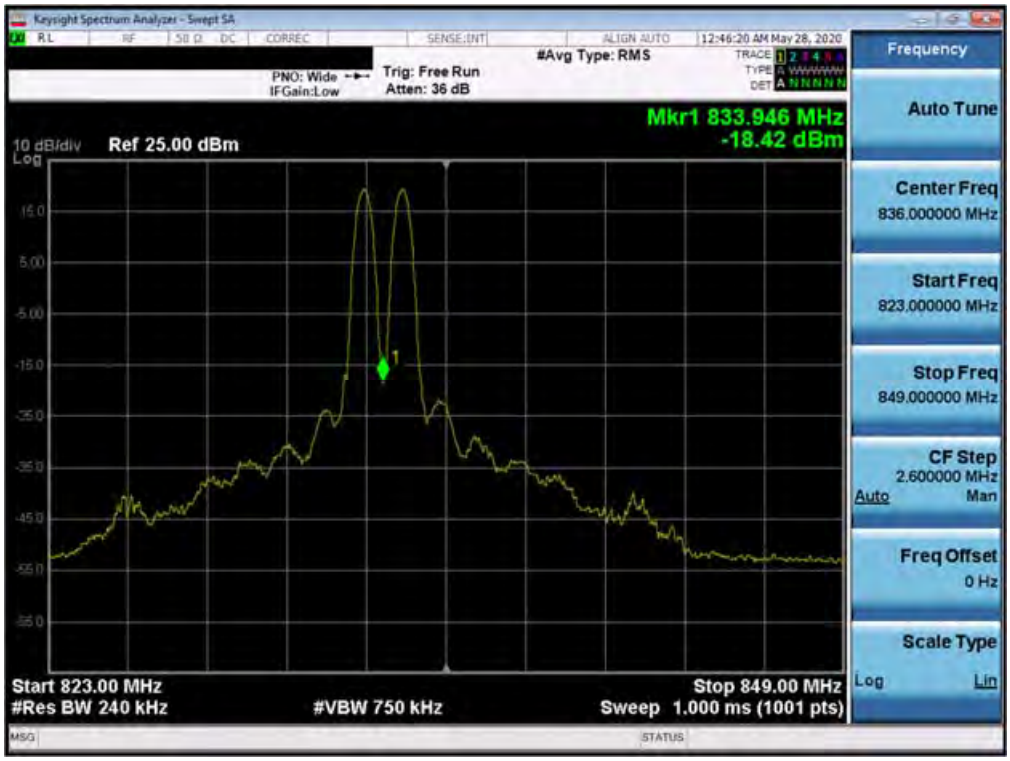
Table 7-3. Conducted Powers (B5 – PCC/SCC: RB Size 1)

Power State	PCC							SCC							Power
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)
Max	LTE B5	10	20600	844	QPSK	50	0	LTE B5	10	20699	853.9	QPSK	50	0	23.27
Max	LTE B5	10	20600	844	16-QAM	50	0	LTE B5	10	20699	853.9	16-QAM	50	0	22.44
Max	LTE B5	10	20600	844	64-QAM	50	0	LTE B5	10	20699	853.9	64-QAM	50	0	22.20
Max	LTE B5	10	20600	844	256-QAM	50	0	LTE B5	10	20699	853.9	256-QAM	50	0	20.23

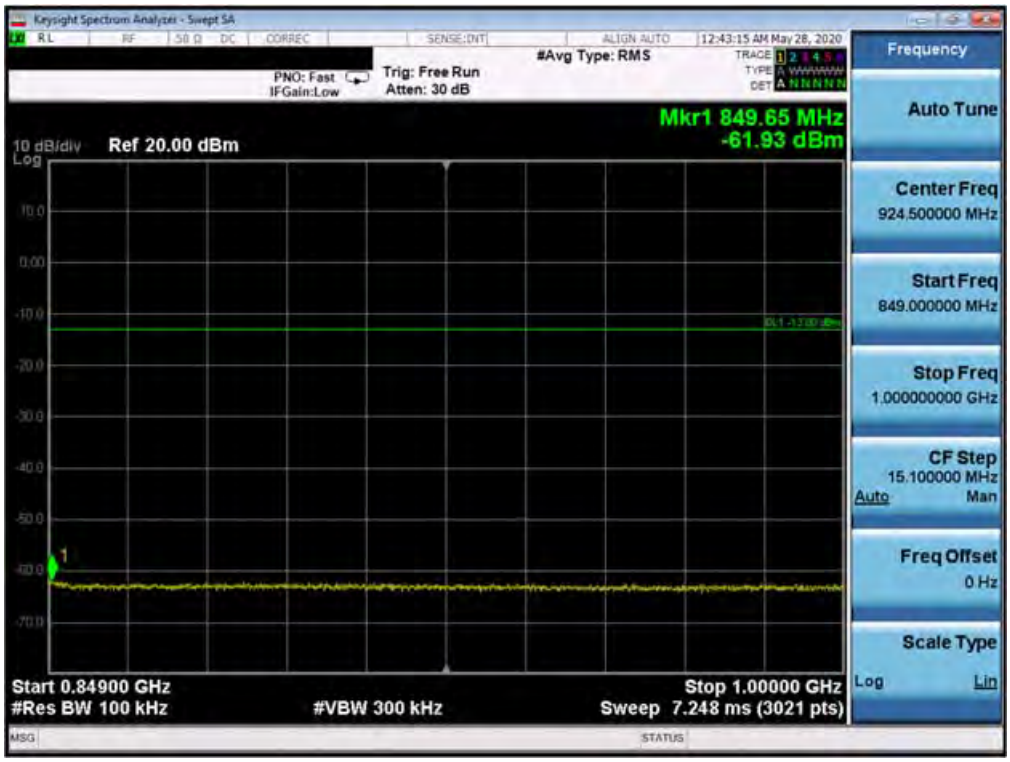
Table 7-4. Conducted Powers (B5 with Various Modulations for 10MHz Channel Bandwidth)



Plot 7-645. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/49 SCC 1/0 – Low Channel)

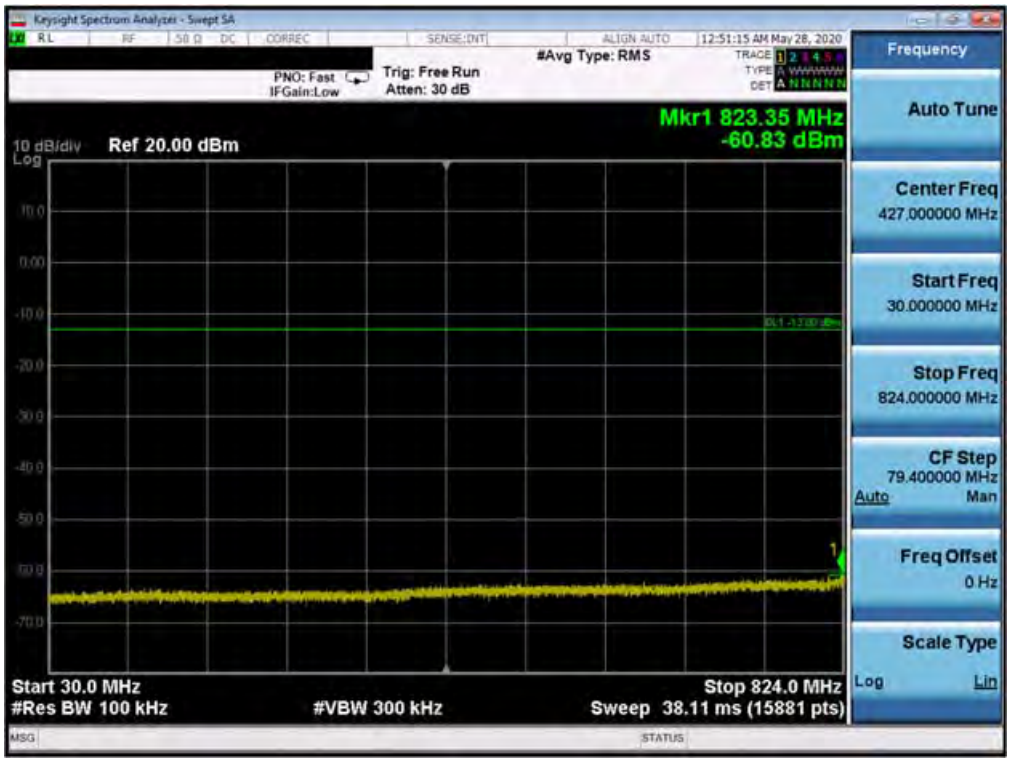


Plot 7-646. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/49 SCC 1/0 – Low Channel)



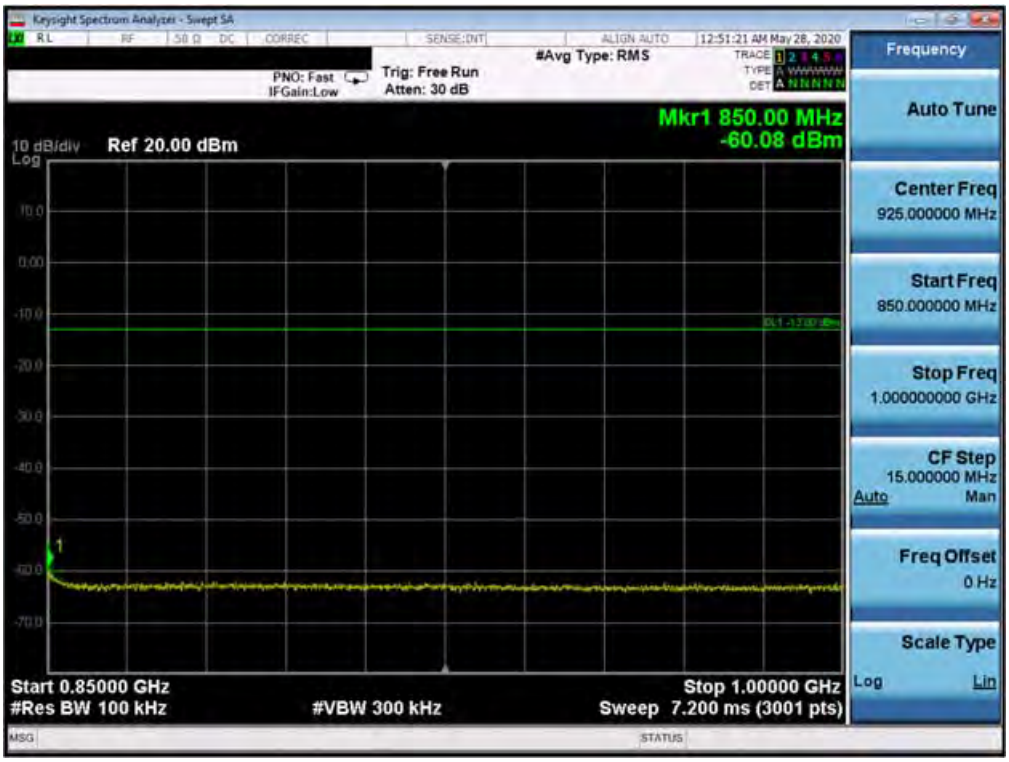
Plot 7-647. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/49 SCC 1/0 – Low Channel)

Plot 7-648. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/49 SCC 1/0 – Low Channel)



Plot 7-649. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/0 SCC 1/49 – High Channel)

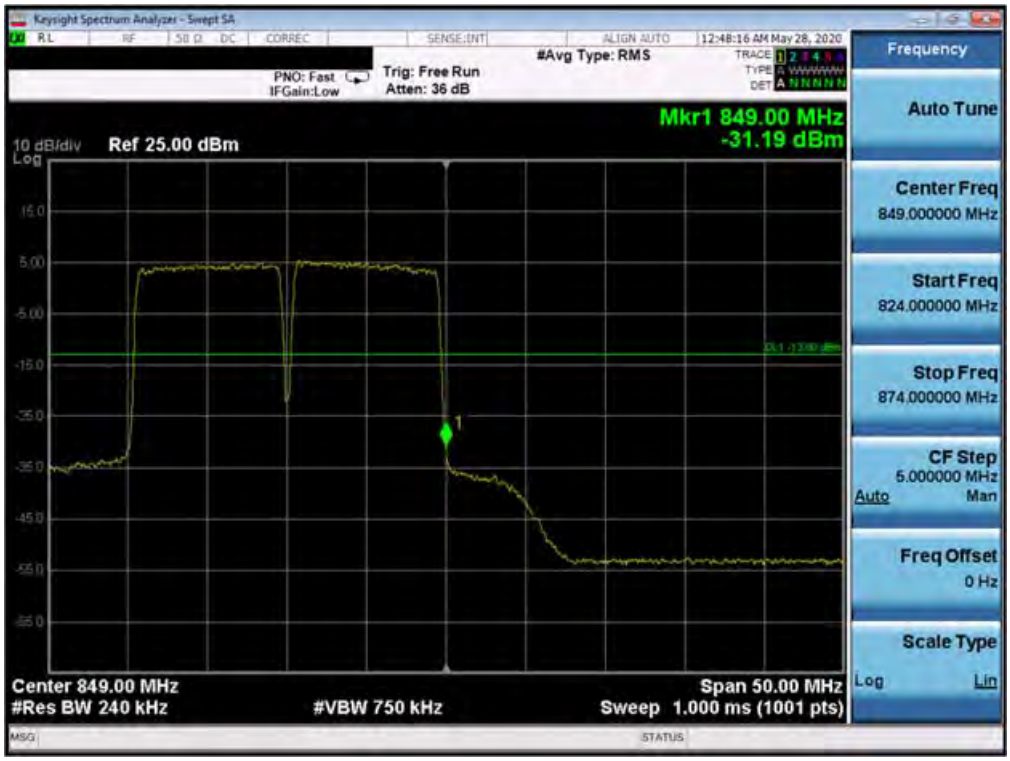
Plot 7-650. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/0 SCC 1/49 – High Channel)



Plot 7-651. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/0 SCC 1/49 – High Channel)

Plot 7-652. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/0 SCC 1/49 – High Channel)

Plot 7-653. Lower Band Edge Plot (Band 5 QPSK – PCC:10 MHz SCC:10 MHz – Full RB)



Plot 7-654. Upper Band Edge Plot (Band 5 QPSK – PCC:10 MHz SCC:10 MHz – Full RB)

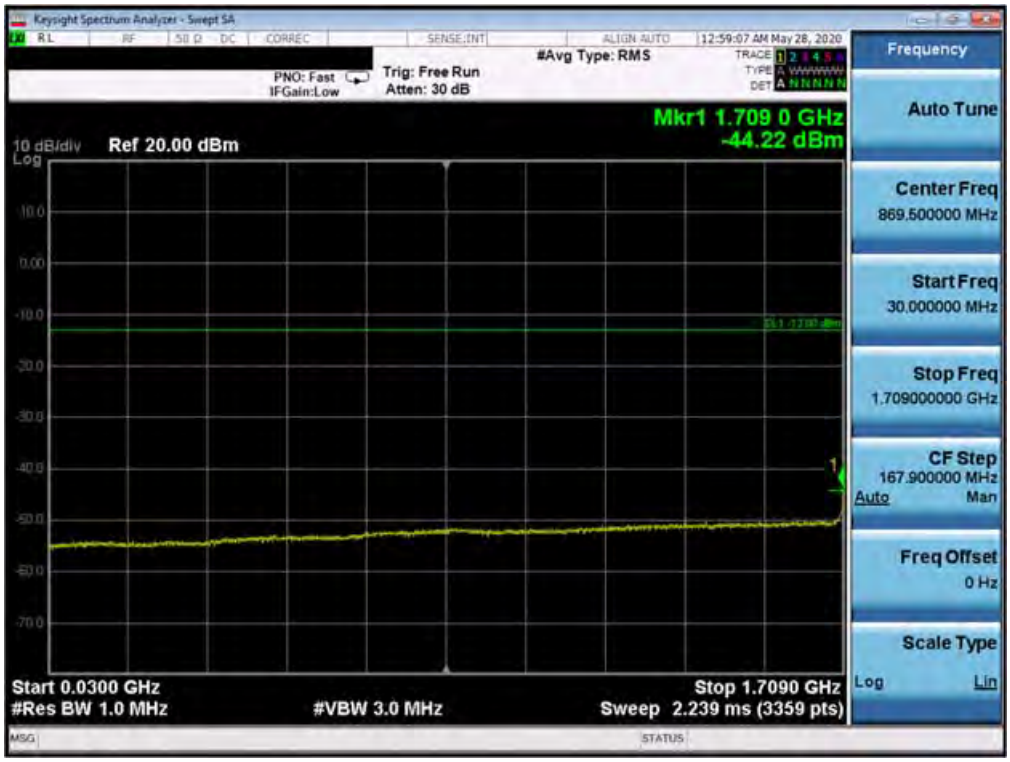
Uplink CA Configuration 66B/C

Power State	PCC							SCC							Power
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)
Max	LTE B66	20	132072	1720	QPSK	1	99	LTE B66	20	132270	1739.8	QPSK	1	0	24.92
Max	LTE B66	20	132322	1745	QPSK	1	99	LTE B66	20	132520	1764.8	QPSK	1	0	24.62
Max	LTE B66	20	132572	1770	QPSK	1	0	LTE B66	20	132374	1750.2	QPSK	1	99	24.52

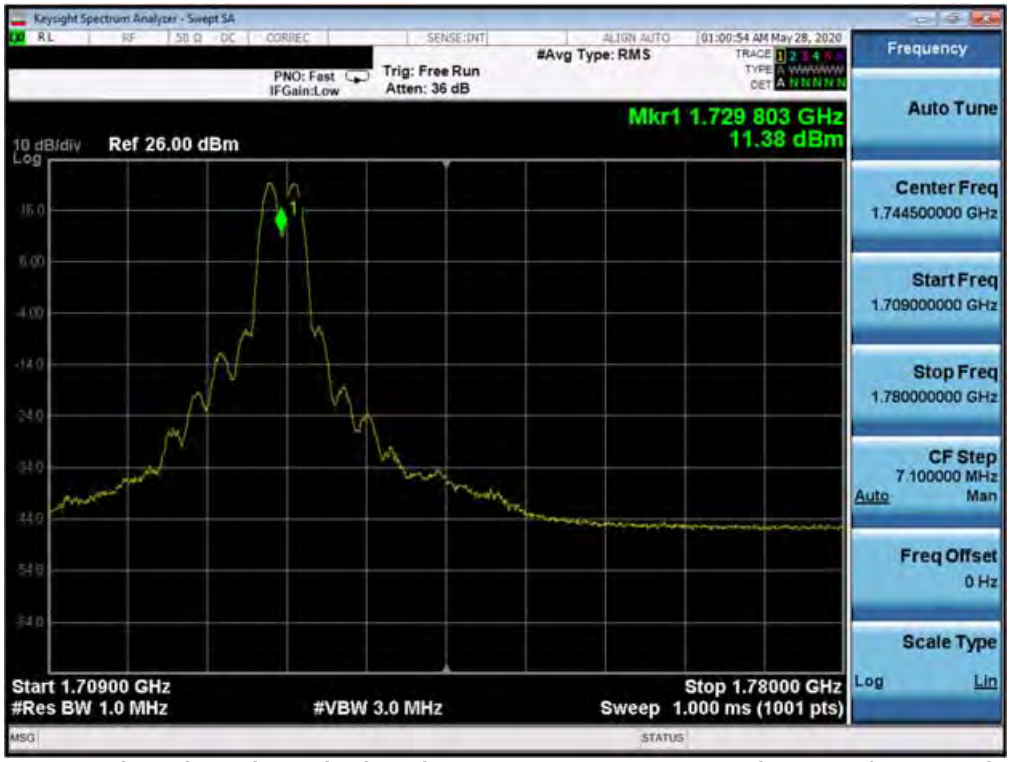
Table 7-5. Conducted Powers (B66 – 20MHz + 20MHz Channel Bandwidth – PCC/SCC: RB Size 1)

Power State	PCC							SCC							Power
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)
Max	LTE B66	20	132072	1720	QPSK	100	0	LTE B66	20	132270	1739.8	QPSK	100	0	23.44
Max	LTE B66	20	132072	1720	16-QAM	100	0	LTE B66	20	132270	1739.8	16-QAM	100	0	22.46
Max	LTE B66	20	132072	1720	64-QAM	100	0	LTE B66	20	132270	1739.8	64-QAM	100	0	22.26
Max	LTE B66	20	132072	1720	256-QAM	100	0	LTE B66	20	132270	1739.8	256-QAM	100	0	20.42

Table 7-6. Conducted Powers (B66 with Various Combinations for 20MHz + 20MHz Channel Bandwidth)

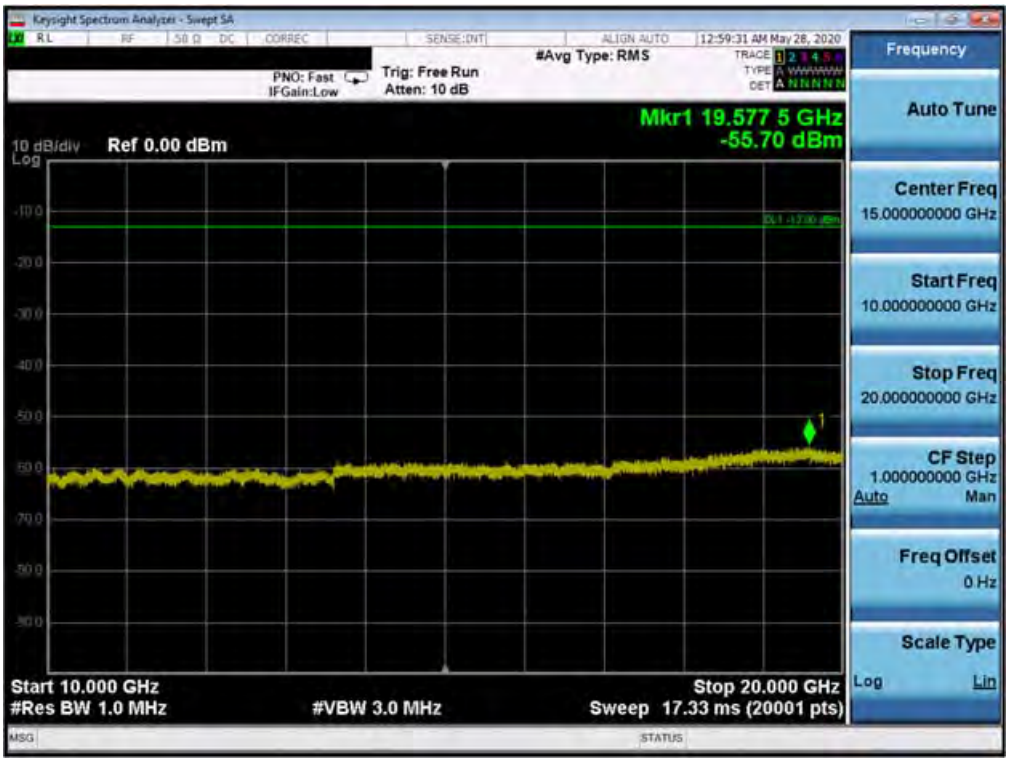


Plot 7-655. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Low Channel)

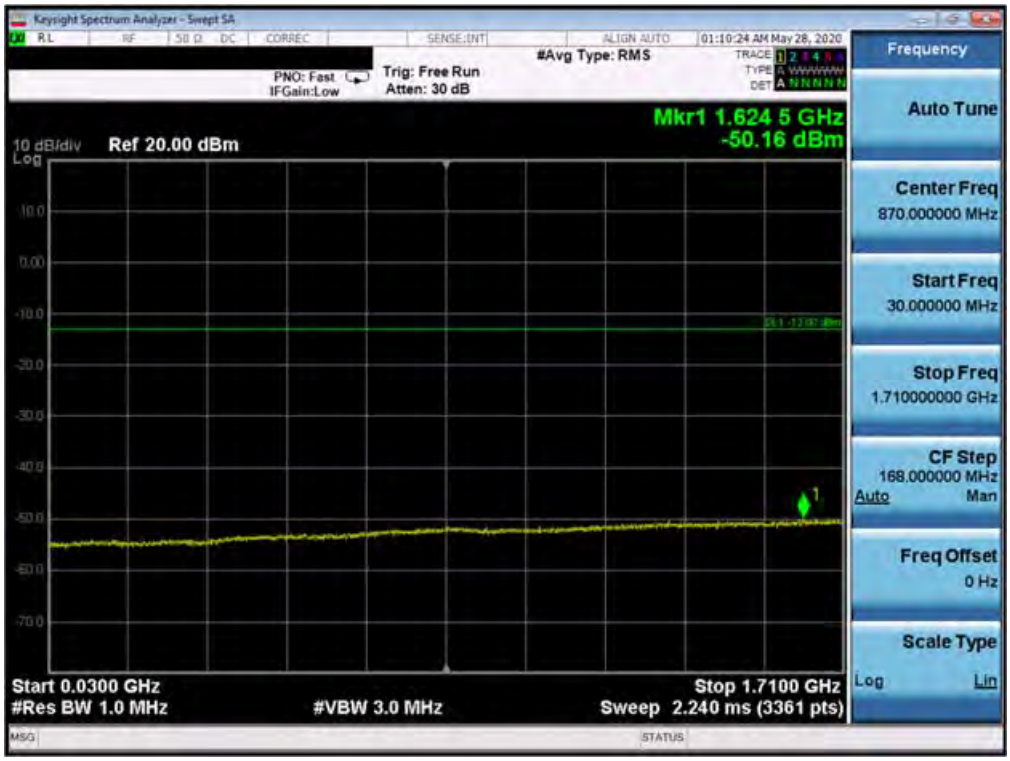


Plot 7-656. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Low Channel)

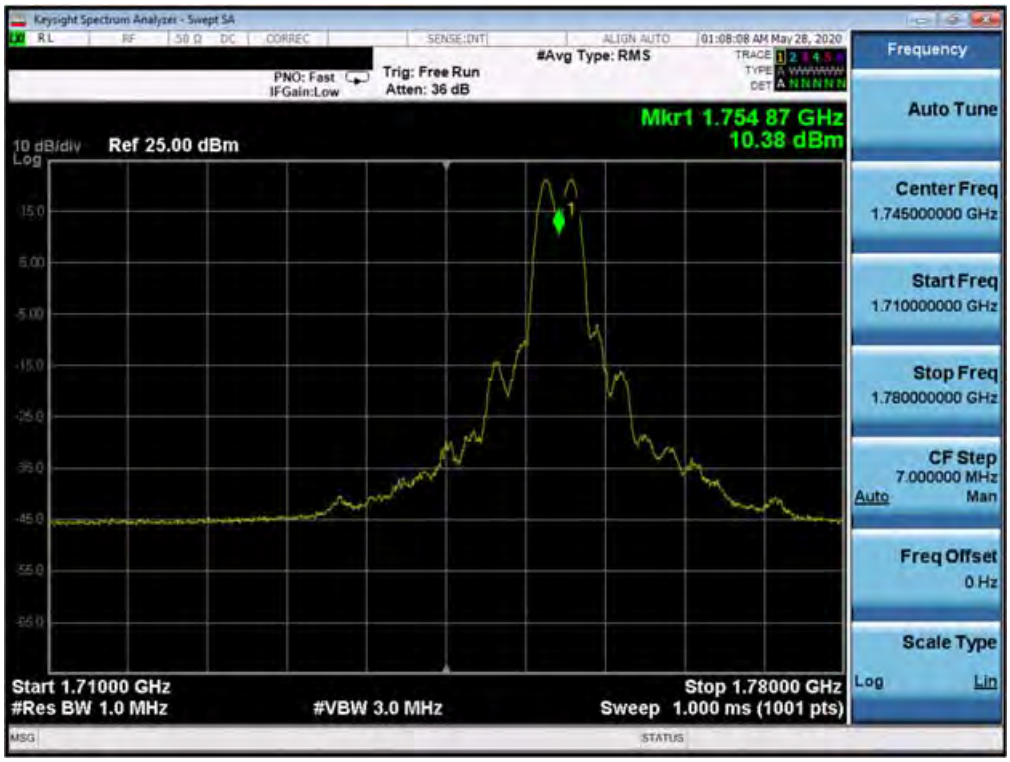
Plot 7-657. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Low Channel)



Plot 7-658. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Low Channel)

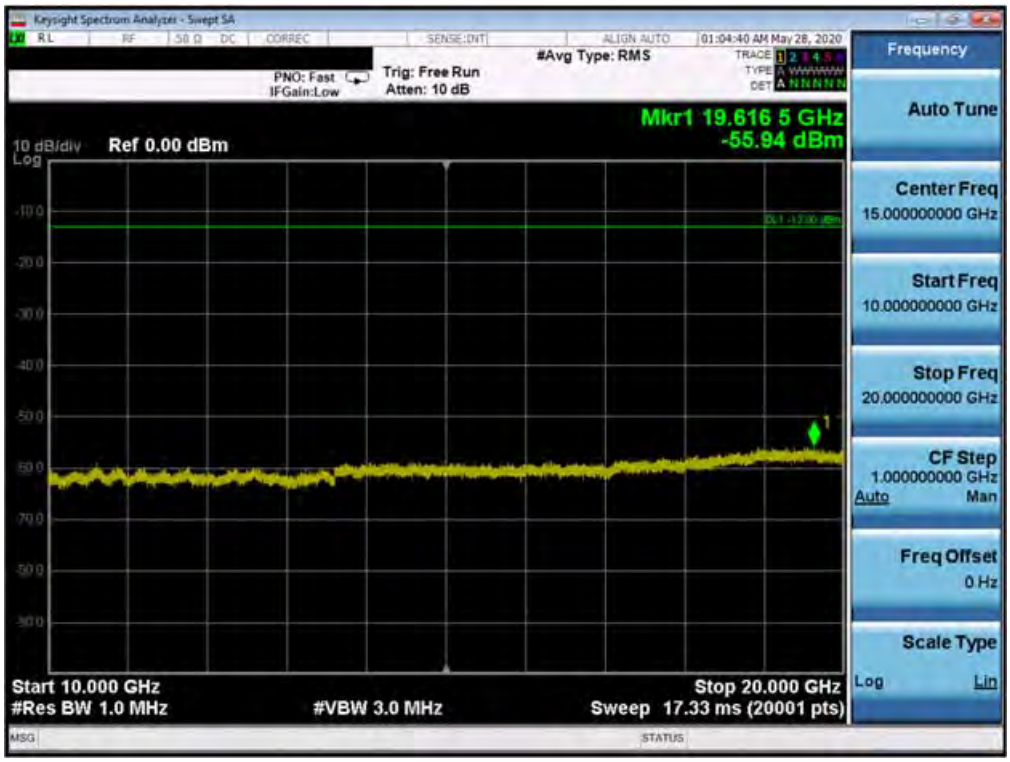


Plot 7-659. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

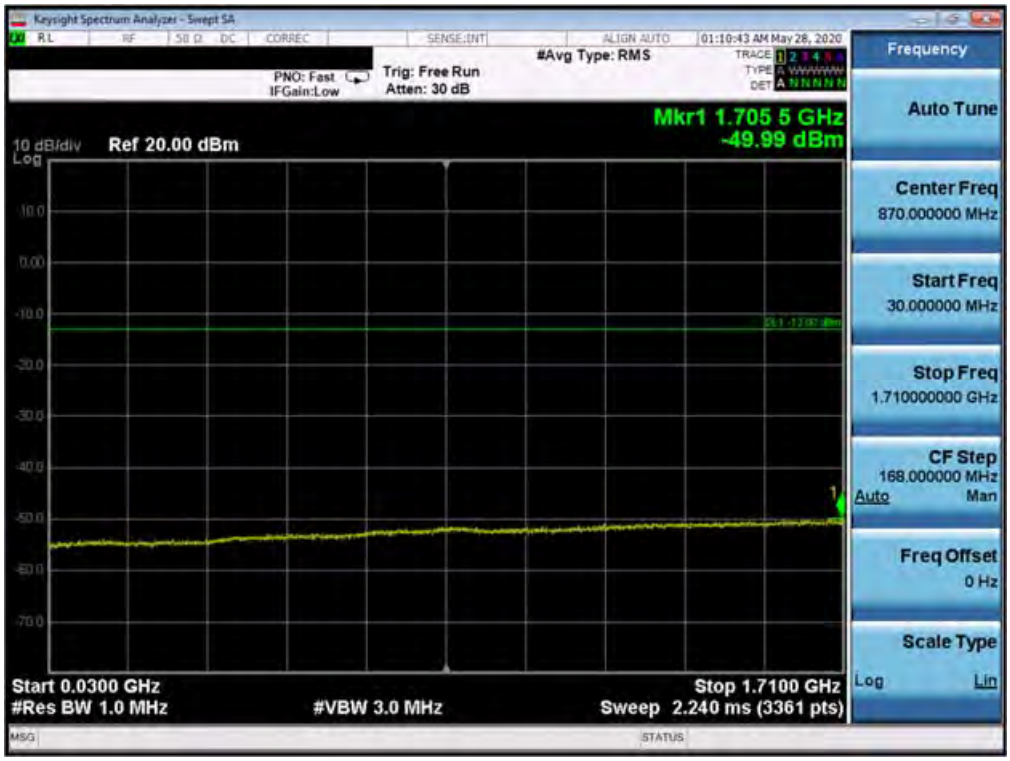


Plot 7-660. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

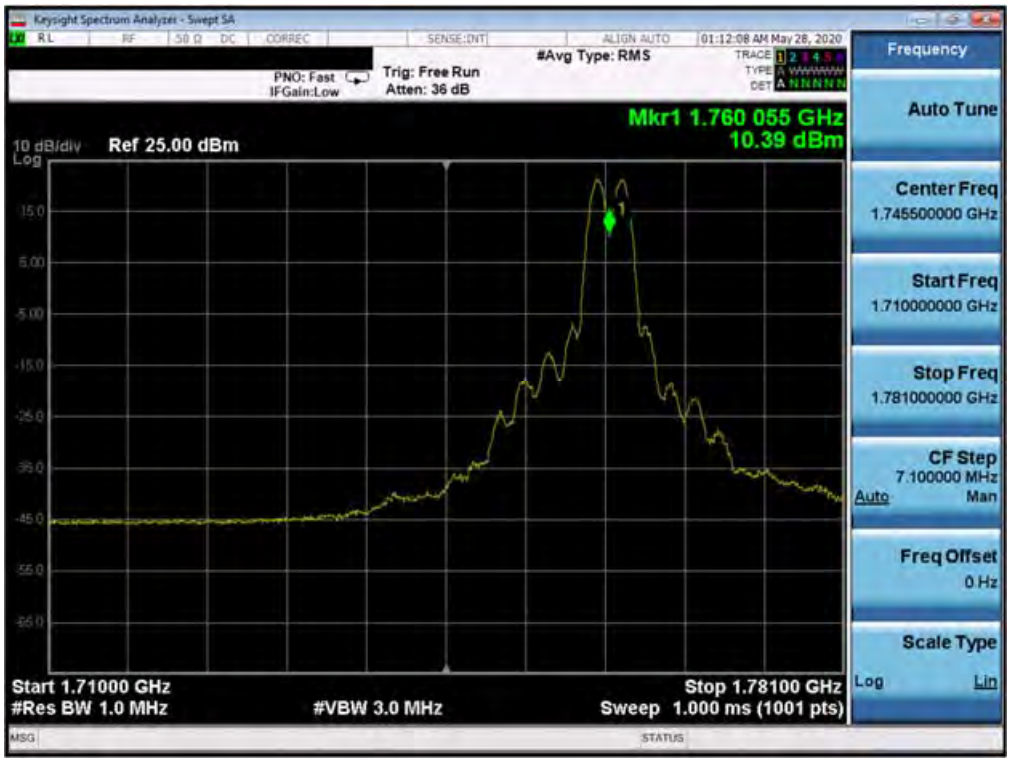
Plot 7-661. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)



Plot 7-662. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

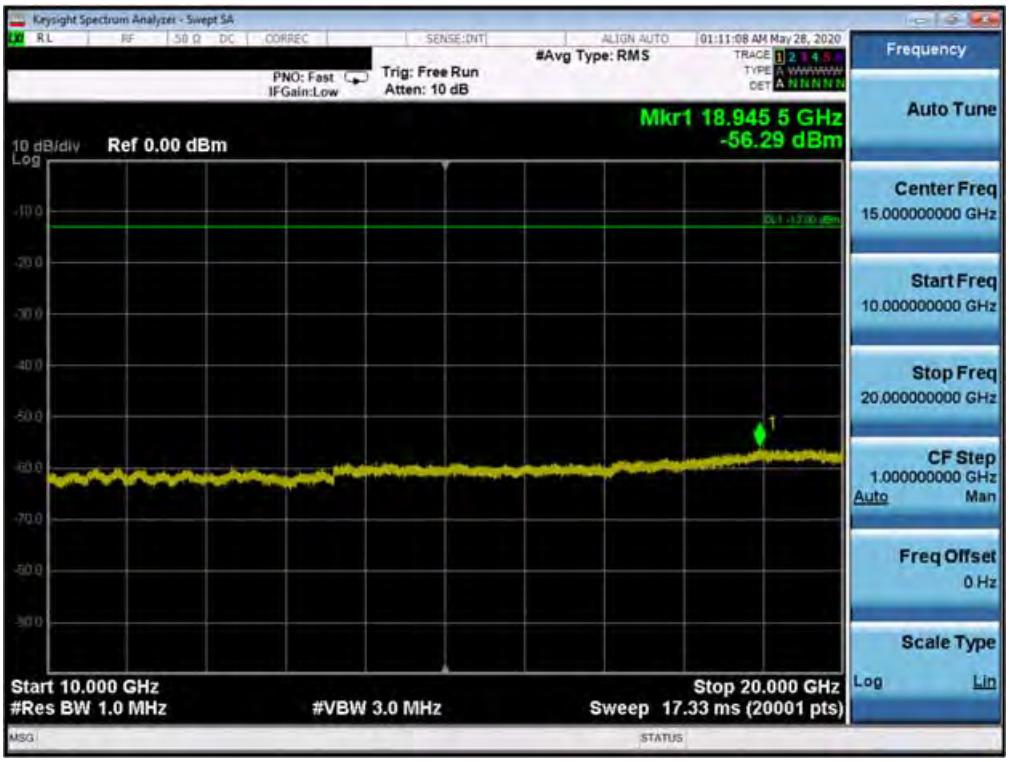


Plot 7-663. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/0 SCC 1/99 – High Channel)



Plot 7-664. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/0 SCC 1/99 – High Channel)

Plot 7-665. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/0 SCC 1/99 – High Channel)



Plot 7-666. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/0 SCC 1/99 – High Channel)

Plot 7-667. Lower Band Edge Plot (Band 66 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

Plot 7-668. Extended Lower Band Edge Plot (Band 66 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

Plot 7-669. Upper Band Edge Plot (Band 66 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

Plot 7-670. Extended Upper Band Edge Plot (Band 66 QPSK – PCC:20 MHz SCC:20 MHz – Full RB

Uplink CA Configuration 41C

Power State	PCC							SCC							Power
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	25.22
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	0	**25.43**
Max	LTE B41	20	41490	2680	QPSK	1	0	LTE B41	20	41292	2660.2	QPSK	1	99	24.70

Table 7-7. Conducted Powers (B41 – Left Carrier: RB Size 1 Offset Max Right Carrier: RB Size 1 Offset 0)

Power State	PCC							SCC							Power
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)
Max	LTE B41	20	40620	2593	QPSK	100	0	LTE B41	20	40818	2612.8	QPSK	100	0	21.82
Max	LTE B41	20	40620	2593	16-QAM	100	0	LTE B41	20	40818	2612.8	16-QAM	100	0	21.08
Max	LTE B41	20	40620	2593	64-QAM	100	0	LTE B41	20	40818	2612.8	64-QAM	100	0	21.12
Max	LTE B41	20	40620	2593	256-QAM	100	0	LTE B41	20	40818	2612.8	256-QAM	100	0	20.02

Table 7-8. Conducted Powers (B41 with Various Combinations for 20MHz Channel Bandwidth)

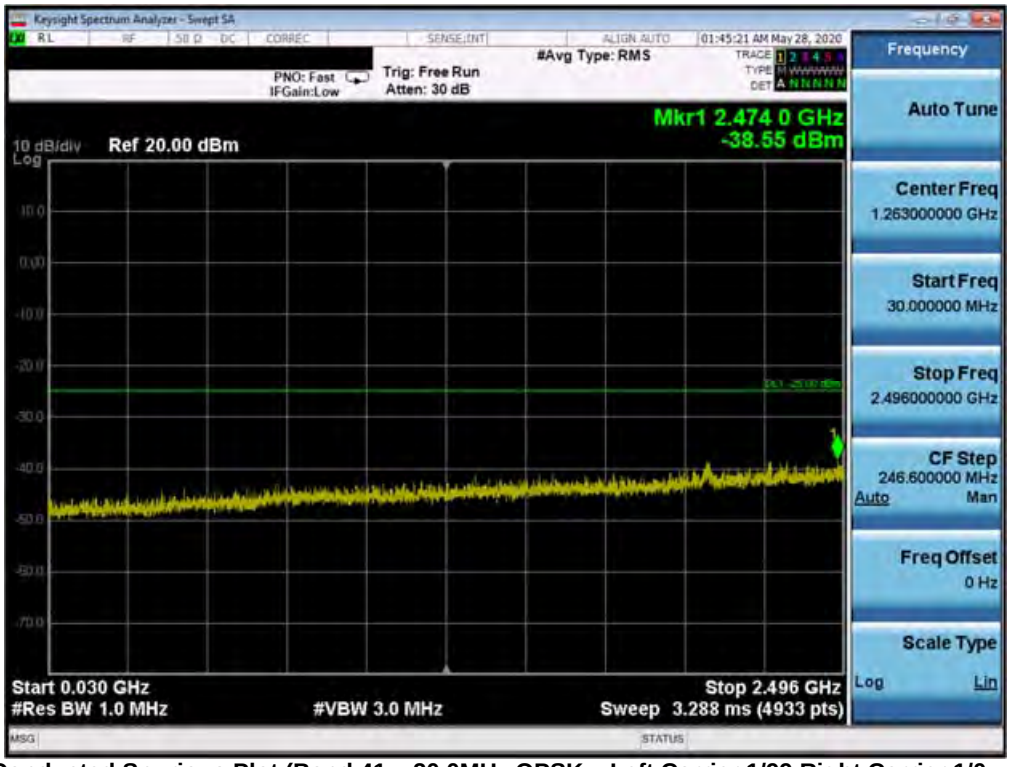


Table 7-671. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Mid Channel)

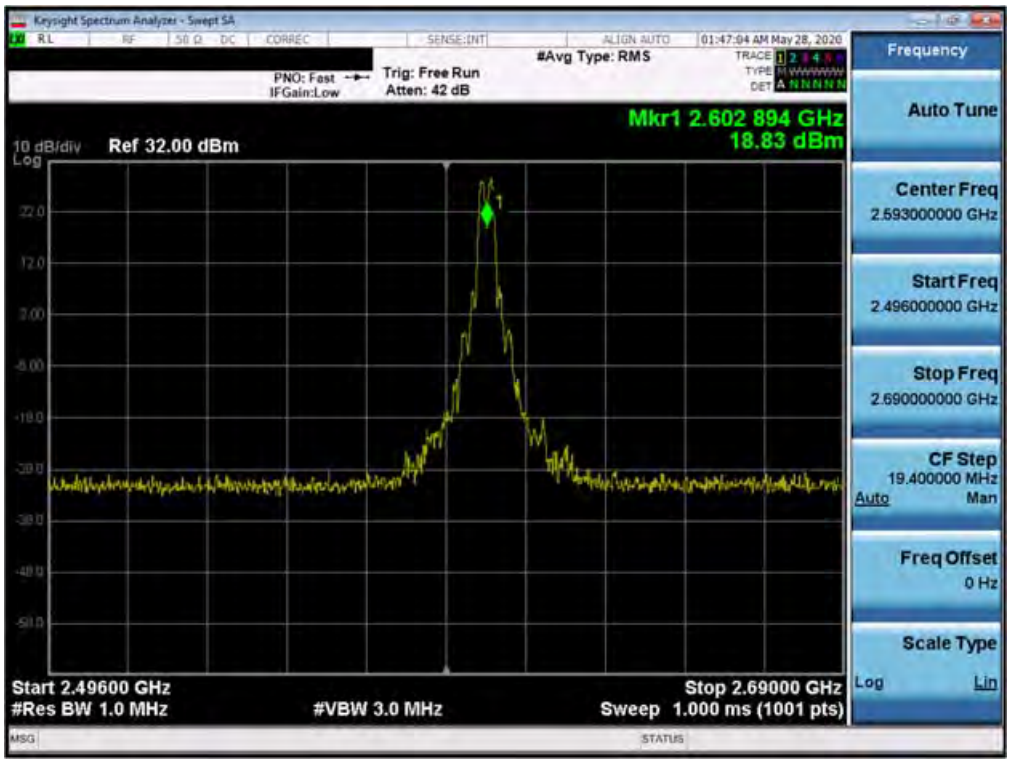


Table 7-672. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Mid Channel)

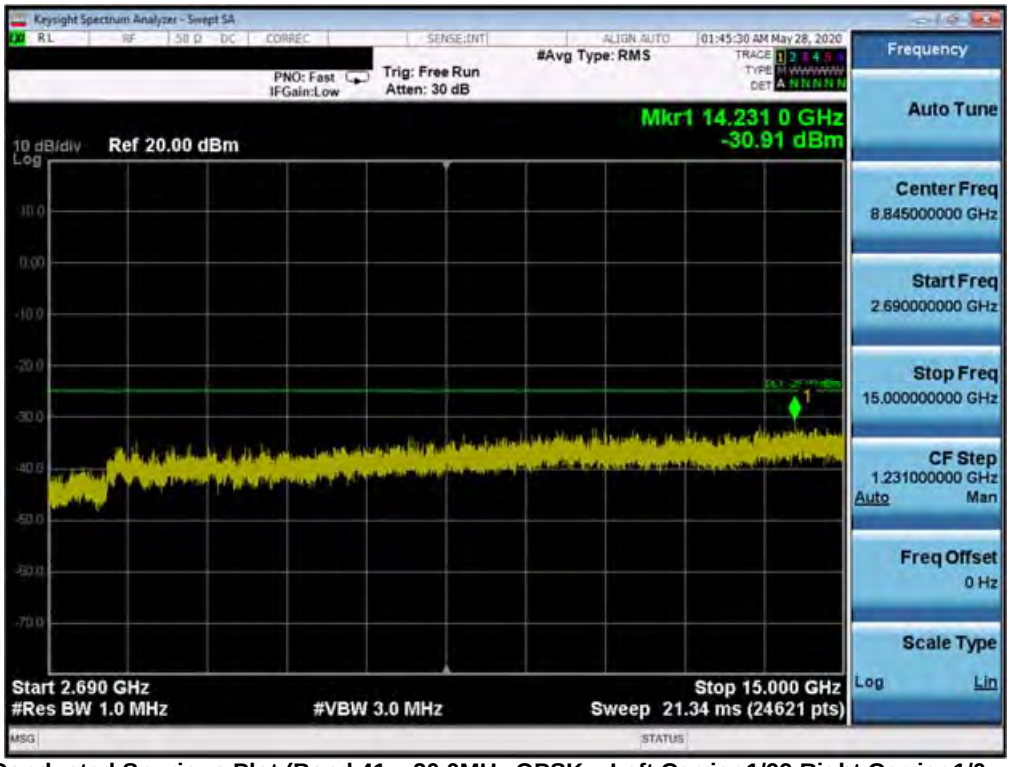


Table 7-673. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Mid Channel)

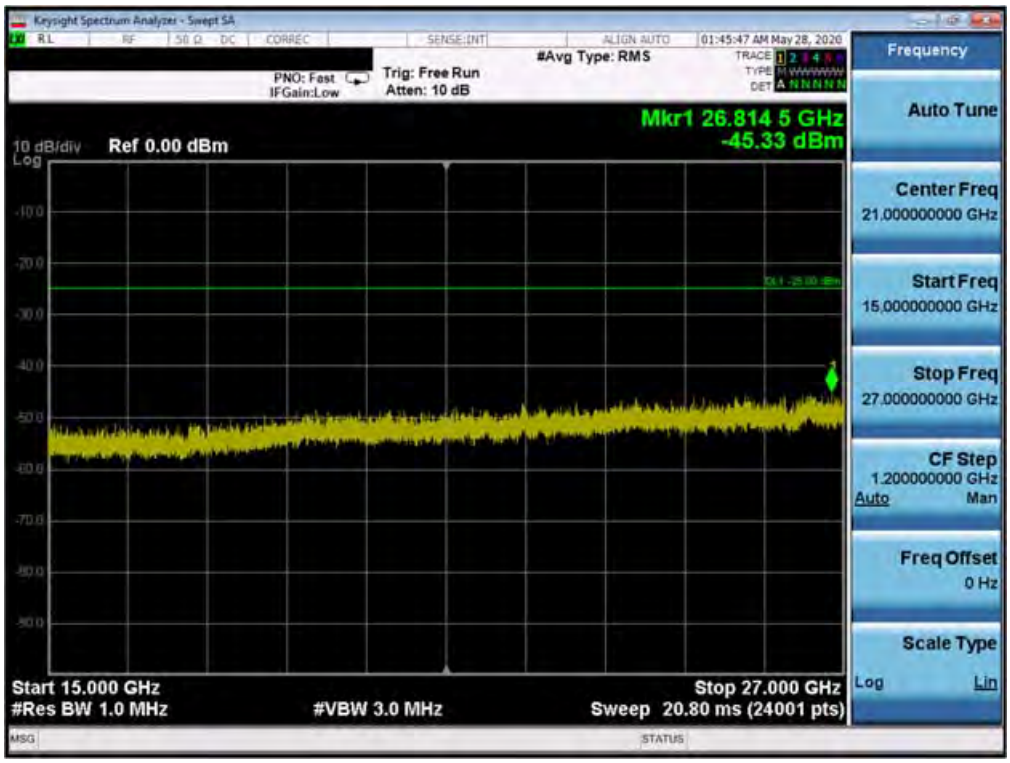


Table 7-674. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Mid Channel)

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.489182500 GHz	-26.14 dBm	-1.138 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494977500 GHz	-24.82 dBm	-11.82 dB
3	3	2.4950 GHz	2.4960 GHz	820.0 kHz	2.495975000 GHz	-25.26 dBm	-12.26 dB
4	4	2.4960 GHz	2.5400 GHz	820.0 kHz	2.512793333 GHz	7.696 dBm	-17.30 dB

Table 7-675. Lower ACP Plot (Band 41 QPSK – Left Carrier:20 MHz Right Carrier:20 MHz – Full RB)

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6450 GHz	2.6900 GHz	820.0 kHz	2.667575000 GHz	7.877 dBm	-17.12 dB
2	2	2.6900 GHz	2.6910 GHz	820.0 kHz	2.690285000 GHz	-24.08 dBm	-14.08 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.692680000 GHz	-23.88 dBm	-13.88 dB
4	4	2.6950 GHz	2.7320 GHz	1.000 MHz	2.700550000 GHz	-24.19 dBm	-11.19 dB

Table 7-676. Upper ACP Plot (Band 41 QPSK – Left Carrier:20 MHz Right Carrier:20 MHz – Full RB)

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 its maximum duty cycle, 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.

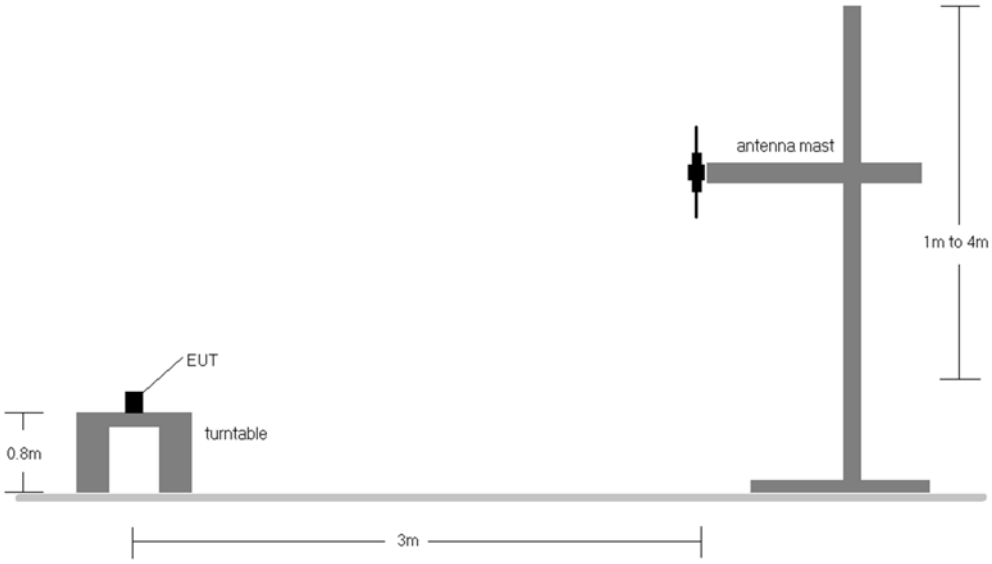


Figure 7-6. Radiated Test Setup <1GHz

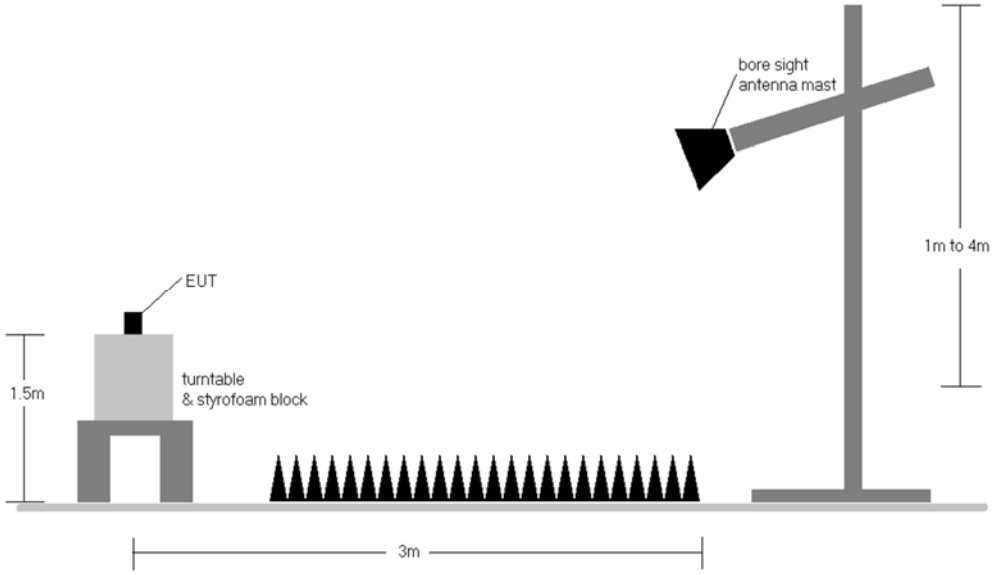


Figure 7-7. Radiated Test Setup >1GHz

Test Notes

1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.

2) This unit was tested with its standard battery.

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
665.50	5	QPSK	V	160	110	1 / 0	16.91	3.79	18.55	0.072	34.77	-16.22
680.50	5	QPSK	V	158	115	1 / 0	17.02	4.24	**19.11**	0.081	34.77	-15.67
695.50	5	QPSK	V	153	127	1 / 0	16.45	4.58	18.88	0.077	34.77	-15.90
680.50	5	16-QAM	V	158	115	1 / 0	16.19	4.24	**18.28**	0.067	34.77	-16.50
680.50	5	64-QAM	V	158	115	1 / 0	14.51	4.24	**16.60**	0.046	34.77	-18.18
680.50	5	256-QAM	V	153	115	1 / 0	11.66	4.24	13.75	0.02	34.77	-21.03
668.00	10	QPSK	V	166	107	1 / 0	17.10	3.82	18.77	0.075	34.77	-16.00
680.50	10	QPSK	V	155	118	1 / 0	17.10	4.24	**19.19**	0.083	34.77	-15.59
693.00	10	QPSK	V	158	122	1 / 0	16.35	4.44	18.64	0.073	34.77	-16.13
680.50	10	16-QAM	V	155	118	1 / 0	16.33	4.24	**18.42**	0.069	34.77	-16.36
680.50	10	64-QAM	V	155	118	1 / 0	14.88	4.24	**16.97**	0.050	34.77	-17.81
680.50	10	256-QAM	V	155	118	1 / 0	12.00	4.24	**14.09**	**0.026**	34.77	-20.69
670.50	15	QPSK	V	147	109	1 / 0	16.93	3.96	18.74	0.075	34.77	-16.03
680.50	15	QPSK	V	150	120	1 / 0	17.07	4.24	**19.16**	0.082	34.77	-15.62
690.50	15	QPSK	V	155	109	1 / 0	16.35	4.41	18.61	0.073	34.77	-16.16
680.50	15	16-QAM	V	150	120	1 / 0	16.29	4.24	**18.38**	0.069	34.77	-16.40
680.50	15	64-QAM	V	150	120	1 / 0	14.53	4.24	**16.62**	0.046	34.77	-18.16
680.50	15	256-QAM	V	150	120	1 / 0	12.19	4.24	**14.28**	**0.027**	34.77	-20.50
673.00	20	QPSK	V	159	114	1 / 0	16.90	4.09	18.84	0.077	34.77	-15.93
680.50	20	QPSK	V	155	114	1 / 0	17.27	4.24	**19.36**	**0.086**	34.77	-15.42
688.00	20	QPSK	V	150	113	1 / 0	16.66	4.48	18.99	0.079	34.77	-15.78
680.50	20	16-QAM	V	155	114	1 / 0	16.48	4.24	**18.57**	0.072	34.77	-16.21
680.50	20	64-QAM	V	155	114	1 / 0	14.63	4.24	**16.72**	0.047	34.77	-18.06
680.50	20	256-QAM	V	155	114	1 / 0	12.25	4.24	**14.34**	**0.027**	34.77	-20.44
680.50	20	QPSK	H	377	352	1 / 0	14.93	3.19	15.97	0.040	34.77	-18.80

Table 7-9. ERP Data (Band 71)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
20 MHz	π/2 BPSK	673.0	V	156.0	74.0	4.09	1 / 1	16.72	18.66	0.073	34.77	-16.11
		680.5	V	158.0	70.0	4.24	1 / 1	16.86	**18.95**	0.078	34.77	-15.83
		688.0	V	158.0	88.0	4.48	1 / 1	16.41	18.74	0.075	34.77	-16.03
	QPSK	673.0	V	156.0	74.0	4.09	1 / 1	16.41	18.35	0.068	34.77	-16.42
		680.5	V	158.0	70.0	4.24	1 / 1	16.90	**18.99**	0.079	34.77	-15.79
		688.0	V	158.0	88.0	4.48	1 / 1	16.40	18.73	0.075	34.77	-16.04
	16-QAM	680.5	V	158.0	70.0	4.24	1 / 1	15.64	**17.73**	0.059	34.77	-17.05
	64-QAM	680.5	V	158.0	70.0	4.24	1 / 1	14.41	**16.50**	0.045	34.77	-18.28
	256-QAM	680.5	V	158.0	70.0	4.24	1 / 1	12.36	**14.45**	0.028	34.77	-20.33
15 MHz	π/2 BPSK	670.5	V	156.0	74.0	3.96	1 / 1	17.16	18.97	0.079	34.77	-15.80
		680.5	V	158.0	70.0	4.24	1 / 1	17.15	**19.24**	0.084	34.77	-15.54
		690.5	V	158.0	88.0	4.41	1 / 1	16.50	18.76	0.075	34.77	-16.01
	QPSK	670.5	V	156.0	74.0	3.96	1 / 1	17.16	18.97	0.079	34.77	-15.80
		680.5	V	158.0	70.0	4.24	1 / 1	17.22	**19.31**	0.085	34.77	-15.47
		690.5	V	158.0	88.0	4.41	1 / 1	16.50	18.76	0.075	34.77	-16.01
	16-QAM	680.5	V	158.0	70.0	4.24	1 / 1	16.06	**18.15**	0.065	34.77	-16.63
	64-QAM	680.5	V	158.0	70.0	4.24	1 / 1	14.74	**16.83**	0.048	34.77	-17.95
	256-QAM	680.5	V	158.0	70.0	4.24	1 / 1	12.99	**15.08**	0.032	34.77	-19.70
10 MHz	π/2 BPSK	668.0	V	156.0	74.0	3.82	1 / 26	17.51	**19.18**	0.083	34.77	-15.59
		680.5	V	158.0	70.0	4.24	1 / 1	16.83	18.92	0.078	34.77	-15.86
		693.0	V	158.0	88.0	4.44	1 / 1	16.47	18.76	0.075	34.77	-16.01
	QPSK	668.0	V	156.0	74.0	3.82	1 / 26	17.45	**19.12**	0.082	34.77	-15.65
		680.5	V	158.0	70.0	4.24	1 / 1	16.97	19.06	0.080	34.77	-15.72
		693.0	V	158.0	88.0	4.44	1 / 1	16.52	18.81	0.076	34.77	-15.96
	16-QAM	668.0	V	156.0	74.0	3.82	1 / 26	16.26	**17.93**	0.062	34.77	-16.84
	64-QAM	668.0	V	156.0	74.0	3.82	1 / 26	14.82	16.49	0.045	34.77	-18.28
	256-QAM	668.0	V	156.0	74.0	3.82	1 / 26	13.23	**14.90**	0.031	34.77	-19.87
5 MHz	π/2 BPSK	665.5	V	156.0	74.0	3.79	1 / 13	17.53	**19.17**	0.083	34.77	-15.60
		680.5	V	158.0	70.0	4.24	1 / 1	16.85	18.94	0.078	34.77	-15.84
		695.5	V	158.0	88.0	4.58	1 / 1	16.56	18.99	0.079	34.77	-15.79
	QPSK	665.5	V	156.0	74.0	3.79	1 / 13	17.25	18.89	0.077	34.77	-15.88
		680.5	V	158.0	70.0	4.24	1 / 1	17.06	**19.15**	0.082	34.77	-15.63
		695.5	V	158.0	88.0	4.58	1 / 1	16.51	18.94	0.078	34.77	-15.84
	16-QAM	680.5	V	158.0	70.0	4.24	1 / 1	16.05	**18.14**	0.065	34.77	-16.64
	64-QAM	680.5	V	158.0	70.0	4.24	1 / 1	15.02	**17.11**	0.051	34.77	-17.67
	256-QAM	680.5	V	158.0	70.0	4.24	1 / 1	13.21	**15.30**	0.034	34.77	-19.48
	QPSK (CP-OFDM)	680.5	V	163.0	70.0	4.24	1 / 1	15.90	**17.99**	0.063	34.77	-16.79
	QPSK (Opposite Pol.)	680.5	H	100.0	355.0	3.19	1 / 1	14.08	15.12	0.033	34.77	-19.65

Table 7-10. ERP Data (Band n71)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	V	172	117	1 / 0	16.37	4.56	**18.78**	0.075	34.77	-15.99	**20.93**	0.124	36.99	-16.06
707.50	1.4	QPSK	V	164	108	1 / 0	15.91	4.62	18.38	0.069	34.77	-16.39	20.53	0.113	36.99	-16.46
715.30	1.4	QPSK	V	151	112	1 / 0	15.61	4.72	18.18	0.066	34.77	-16.59	20.33	0.108	36.99	-16.66
699.70	1.4	16-QAM	V	172	117	1 / 0	15.46	4.56	**17.87**	0.061	34.77	-16.90	**20.02**	0.100	36.99	-16.97
699.70	1.4	64-QAM	V	172	117	1 / 0	14.44	4.56	**16.85**	0.048	34.77	-17.92	**19.00**	0.079	36.99	-17.99
699.70	1.4	256-QAM	V	172	117	1 / 0	11.00	4.56	**13.41**	**0.022**	34.77	-21.36	**15.56**	**0.036**	36.99	-21.43
700.50	3	QPSK	V	169	110	1 / 0	16.47	4.59	**18.91**	**0.078**	34.77	-15.86	**21.06**	**0.128**	36.99	-15.93
707.50	3	QPSK	V	161	104	1 / 0	16.05	4.62	18.52	0.071	34.77	-16.25	20.67	0.117	36.99	-16.32
714.50	3	QPSK	V	154	122	1 / 0	16.05	4.71	18.61	0.073	34.77	-16.16	20.76	0.119	36.99	-16.23
700.50	3	16-QAM	V	169	110	1 / 0	15.63	4.59	**18.07**	0.064	34.77	-16.70	**20.22**	0.105	36.99	-16.77
700.50	3	64-QAM	V	169	110	1 / 0	14.60	4.59	**17.04**	0.051	34.77	-17.73	**19.19**	0.083	36.99	-17.80
700.50	3	256-QAM	V	169	110	1 / 0	11.11	4.59	**13.55**	**0.023**	34.77	-21.22	**15.70**	**0.037**	36.99	-21.29
701.50	5	QPSK	V	164	111	1 / 0	16.45	4.60	**18.90**	0.078	34.77	-15.87	**21.05**	0.127	36.99	-15.94
707.50	5	QPSK	V	167	110	1 / 0	15.99	4.62	18.46	0.070	34.77	-16.31	20.61	0.115	36.99	-16.38
713.50	5	QPSK	V	152	117	1 / 0	15.66	4.70	18.21	0.066	34.77	-16.56	20.36	0.109	36.99	-16.63
701.50	5	16-QAM	V	164	111	1 / 0	15.60	4.60	**18.05**	0.064	34.77	-16.72	**20.20**	0.105	36.99	-16.79
701.50	5	64-QAM	V	164	111	1 / 0	14.63	4.60	**17.08**	0.051	34.77	-17.69	**19.23**	0.084	36.99	-17.76
701.50	5	256-QAM	V	164	111	1 / 0	11.61	4.60	**14.06**	**0.025**	34.77	-20.71	**16.21**	**0.042**	36.99	-20.78
704.00	10	QPSK	V	158	115	1 / 0	16.44	4.58	**18.87**	0.077	34.77	-15.90	**21.02**	0.126	36.99	-15.97
707.50	10	QPSK	V	164	123	1 / 0	16.13	4.62	18.60	0.073	34.77	-16.17	20.75	0.119	36.99	-16.24
711.00	10	QPSK	V	161	114	1 / 0	15.82	4.67	18.34	0.068	34.77	-16.43	20.49	0.112	36.99	-16.50
704.00	10	16-QAM	V	158	115	1 / 0	15.66	4.58	**18.09**	0.064	34.77	-16.68	**20.24**	0.106	36.99	-16.75
704.00	10	64-QAM	V	158	115	1 / 0	14.60	4.58	**17.03**	0.050	34.77	-17.74	**19.18**	0.083	36.99	-17.81
704.00	10	256-QAM	V	158	115	1 / 0	11.25	4.58	**13.68**	**0.023**	34.77	-21.09	**15.83**	**0.038**	36.99	-21.16
700.50	3	QPSK	H	352	186	1 / 0	15.99	3.45	17.29	0.054	34.77	-17.48	19.44	0.088	36.99	-17.55

Table 7-11. ERP Data (Band 12)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
779.50	5	QPSK	V	134	140	1 / 24	15.29	5.77	18.91	0.078	34.77	-15.87	21.06	0.128	36.99	-15.93
782.00	5	QPSK	V	137	141	1 / 24	15.43	5.79	19.07	0.081	34.77	-15.70	21.22	0.133	36.99	-15.77
784.50	5	QPSK	V	134	144	1 / 24	15.55	5.82	**19.22**	0.084	34.77	-15.55	**21.37**	0.137	36.99	-15.62
784.50	5	16-QAM	V	134	144	1 / 24	14.75	5.82	**18.42**	0.070	34.77	-16.35	**20.57**	0.114	36.99	-16.42
782.00	5	64-QAM	V	137	141	1 / 24	13.60	5.79	**17.24**	0.053	34.77	-17.53	**19.39**	0.087	36.99	-17.60
782.00	5	256-QAM	V	137	141	1 / 24	10.78	5.79	**14.42**	**0.028**	34.77	-20.35	**16.57**	**0.045**	36.99	-20.42
782.00	10	QPSK	V	139	141	1 / 49	15.60	5.79	**19.24**	**0.084**	34.77	-15.53	**21.39**	**0.138**	36.99	-15.60
782.00	10	16-QAM	V	139	141	1 / 49	14.89	5.79	**18.53**	0.071	34.77	-16.24	**20.68**	0.117	36.99	-16.31
782.00	10	64-QAM	V	139	141	1 / 49	13.72	5.79	**17.36**	0.054	34.77	-17.41	**19.51**	0.089	36.99	-17.48
782.00	10	256-QAM	V	139	141	1 / 49	10.61	5.79	**14.25**	**0.027**	34.77	-20.52	**16.40**	**0.044**	36.99	-20.59
782.00	10	QPSK	H	101	359	1 / 49	14.46	5.89	18.20	0.066	34.77	-16.57	20.35	0.108	36.99	-16.64

Table 7-12. ERP Data (Band 13)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	V	157	66	1 / 0	14.53	6.36	**18.74**	0.075	38.45	-19.72	**20.89**	0.123	40.61	-19.72
836.50	1.4	QPSK	V	141	42	1 / 0	13.98	6.38	18.21	0.066	38.45	-20.24	20.36	0.109	40.61	-20.25
848.30	1.4	QPSK	V	135	50	3 / 2	12.64	6.50	16.99	0.050	38.45	-21.46	19.14	0.082	40.61	-21.47
824.70	1.4	16-QAM	V	157	66	1 / 0	13.63	6.36	**17.84**	0.061	38.45	-20.62	**19.99**	0.100	40.61	-20.62
824.70	1.4	64-QAM	V	157	66	1 / 0	12.56	6.36	**16.77**	0.047	38.45	-21.69	**18.92**	0.078	40.61	-21.69
824.70	1.4	256-QAM	V	157	66	1 / 0	9.78	6.36	**13.99**	**0.025**	38.45	-24.47	**16.14**	**0.041**	40.61	-24.47
825.50	3	QPSK	V	152	71	1 / 0	14.74	6.36	**18.95**	0.079	38.45	-19.50	**21.10**	0.129	40.61	-19.50
836.50	3	QPSK	V	144	40	1 / 0	14.11	6.38	18.34	0.068	38.45	-20.11	20.49	0.112	40.61	-20.12
847.50	3	QPSK	V	130	53	8 / 4	12.56	6.49	16.90	0.049	38.45	-21.55	19.05	0.080	40.61	-21.55
825.50	3	16-QAM	V	152	71	1 / 0	13.67	6.36	**17.88**	0.061	38.45	-20.57	**20.03**	0.101	40.61	-20.57
825.50	3	64-QAM	V	152	71	1 / 0	12.72	6.36	**16.93**	0.049	38.45	-21.52	**19.08**	0.081	40.61	-21.52
825.50	3	256-QAM	V	152	71	1 / 0	9.97	6.36	**14.18**	**0.026**	38.45	-24.27	**16.33**	**0.043**	40.61	-24.27
826.50	5	QPSK	V	150	61	1 / 0	14.62	6.37	**18.84**	0.077	38.45	-19.61	**20.99**	0.126	40.61	-19.61
836.50	5	QPSK	V	147	49	1 / 0	14.10	6.38	18.33	0.068	38.45	-20.12	20.48	0.112	40.61	-20.13
846.50	5	QPSK	V	137	55	12 / 6	12.74	6.48	17.07	0.051	38.45	-21.38	19.22	0.084	40.61	-21.39
826.50	5	16-QAM	V	150	61	1 / 0	13.72	6.37	**17.94**	0.062	38.45	-20.51	**20.09**	0.102	40.61	-20.51
826.50	5	64-QAM	V	150	61	1 / 0	12.83	6.37	**17.05**	0.051	38.45	-21.40	**19.20**	0.083	40.61	-21.40
826.50	5	256-QAM	V	150	61	1 / 0	9.69	6.37	**13.91**	**0.025**	38.45	-24.54	**16.06**	**0.040**	40.61	-24.54
829.00	10	QPSK	V	142	54	1 / 0	14.72	6.40	**18.97**	**0.079**	38.45	-19.48	**21.12**	**0.129**	40.61	-19.49
836.50	10	QPSK	V	142	43	1 / 0	14.25	6.38	18.48	0.070	38.45	-19.97	20.63	0.116	40.61	-19.98
844.00	10	QPSK	V	134	50	1 / 25	12.52	6.46	16.83	0.048	38.45	-21.62	18.98	0.079	40.61	-21.63
829.00	10	16-QAM	V	142	54	1 / 0	13.98	6.40	**18.23**	0.067	38.45	-20.22	**20.38**	0.109	40.61	-20.23
829.00	10	64-QAM	V	142	54	1 / 0	12.62	6.40	**16.87**	0.049	38.45	-21.58	**19.02**	0.080	40.61	-21.59
829.00	10	256-QAM	V	142	54	1 / 0	9.57	6.40	**13.82**	**0.024**	38.45	-24.63	**15.97**	**0.040**	40.61	-24.64
831.50	15	QPSK	V	137	51	1 / 0	14.59	6.43	**18.87**	0.077	38.45	-19.58	**21.02**	0.126	40.61	-19.59
836.50	15	QPSK	V	137	47	1 / 0	14.28	6.38	18.51	0.071	38.45	-19.94	20.66	0.116	40.61	-19.95
841.50	15	QPSK	V	142	48	1 / 0	12.83	6.43	17.11	0.051	38.45	-21.34	19.26	0.084	40.61	-21.35
831.50	15	16-QAM	V	137	51	1 / 0	13.88	6.43	**18.16**	0.065	38.45	-20.29	**20.31**	0.107	40.61	-20.30
831.50	15	64-QAM	V	137	51	1 / 0	12.25	6.43	**16.53**	0.045	38.45	-21.92	**18.68**	0.074	40.61	-21.93
831.50	15	256-QAM	V	137	51	1 / 0	9.53	6.43	**13.81**	**0.024**	38.45	-24.64	**15.96**	**0.039**	40.61	-24.65
829.00	10	QPSK	H	204	15	1 / 0	13.38	6.80	18.03	0.064	38.45	-20.42	20.18	0.104	40.61	-20.43

Table 7-13. ERP Data (Band 26/5)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	π/2 BPSK	834.0	V	142.0	133.0	6.35	1 / 53	16.09	**20.29**	0.107	38.45	-18.16	**22.44**	0.175	40.61	-18.16
		836.5	V	134.0	131.0	6.38	1 / 53	15.88	20.11	0.103	38.45	-18.34	22.26	0.168	40.61	-18.35
		839.0	V	136.0	134.0	6.40	1 / 1	15.80	20.05	0.101	38.45	-18.40	22.20	0.166	40.61	-18.40
	QPSK	834.0	V	142.0	133.0	6.35	1 / 53	15.91	**20.11**	0.103	38.45	-18.34	**22.26**	0.168	40.61	-18.34
		836.5	V	134.0	131.0	6.38	1 / 1	15.73	19.96	0.099	38.45	-18.49	22.11	0.163	40.61	-18.50
		839.0	V	136.0	134.0	6.40	1 / 1	15.82	20.07	0.102	38.45	-18.38	22.22	0.167	40.61	-18.38
	16-QAM	834.0	V	142.0	133.0	6.35	1 / 53	14.86	**19.06**	0.081	38.45	-19.39	**21.21**	0.132	40.61	-19.39
	64-QAM	834.0	V	142.0	133.0	6.35	1 / 53	13.47	**17.67**	0.059	38.45	-20.78	**19.82**	0.096	40.61	-20.78
	256-QAM	834.0	V	142.0	133.0	6.35	1 / 53	11.65	**15.85**	0.038	38.45	-22.60	**18.00**	0.063	40.61	-22.60
15 MHz	π/2 BPSK	831.5	V	142.0	133.0	6.43	1 / 40	15.82	**20.10**	0.102	38.45	-18.35	**22.25**	0.168	40.61	-18.36
		836.5	V	134.0	131.0	6.38	1 / 1	15.86	20.09	0.102	38.45	-18.36	22.24	0.167	40.61	-18.37
		841.5	V	136.0	134.0	6.43	1 / 1	15.59	19.87	0.097	38.45	-18.58	22.02	0.159	40.61	-18.59
	QPSK	831.5	V	142.0	133.0	6.43	1 / 40	15.77	20.05	0.101	38.45	-18.40	22.20	0.166	40.61	-18.41
		836.5	V	134.0	131.0	6.38	1 / 1	15.96	**20.19**	0.104	38.45	-18.26	**22.34**	0.171	40.61	-18.27
		841.5	V	136.0	134.0	6.43	1 / 1	15.73	20.01	0.100	38.45	-18.44	22.16	0.164	40.61	-18.45
	16-QAM	836.5	V	134.0	131.0	6.38	1 / 1	14.67	**18.90**	0.078	38.45	-19.55	**21.05**	0.127	40.61	-19.56
	64-QAM	836.5	V	134.0	131.0	6.38	1 / 1	13.30	**17.53**	0.057	38.45	-20.92	**19.68**	0.093	40.61	-20.93
	256-QAM	836.5	V	134.0	131.0	6.38	1 / 1	11.62	**15.85**	0.038	38.45	-22.60	**18.00**	0.063	40.61	-22.61
10 MHz	π/2 BPSK	829.0	V	142.0	133.0	6.40	1 / 26	16.17	**20.42**	0.110	38.45	-18.03	**22.57**	0.181	40.61	-18.04
		836.5	V	134.0	131.0	6.38	1 / 26	15.99	20.22	0.105	38.45	-18.23	22.37	0.173	40.61	-18.24
		844.0	V	136.0	134.0	6.46	1 / 1	15.51	19.82	0.096	38.45	-18.63	21.97	0.157	40.61	-18.64
	QPSK	829.0	V	142.0	133.0	6.40	1 / 26	16.06	**20.31**	0.107	38.45	-18.14	**22.46**	0.176	40.61	-18.15
		836.5	V	134.0	131.0	6.38	1 / 1	15.98	20.21	0.105	38.45	-18.24	22.36	0.172	40.61	-18.25
		844.0	V	136.0	134.0	6.46	1 / 1	15.58	19.89	0.097	38.45	-18.56	22.04	0.160	40.61	-18.57
	16-QAM	829.0	V	142.0	133.0	6.40	1 / 26	14.96	**19.21**	0.083	38.45	-19.24	**21.36**	0.137	40.61	-19.25
	64-QAM	829.0	V	142.0	133.0	6.40	1 / 26	13.45	**17.70**	0.059	38.45	-20.75	**19.85**	0.097	40.61	-20.76
	256-QAM	829.0	V	142.0	133.0	6.40	1 / 26	11.73	**15.98**	0.040	38.45	-22.47	**18.13**	0.065	40.61	-22.48
5 MHz	π/2 BPSK	829.0	V	142.0	133.0	6.37	1 / 13	15.61	19.83	0.096	38.45	-18.62	21.98	0.158	40.61	-18.62
		836.5	V	134.0	131.0	6.38	1 / 0	15.87	**20.10**	0.102	38.45	-18.35	**22.25**	0.168	40.61	-18.36
		844.0	V	136.0	134.0	6.48	1 / 0	14.93	19.26	0.084	38.45	-19.19	21.41	0.138	40.61	-19.20
	QPSK	829.0	V	142.0	133.0	6.37	1 / 13	15.71	19.93	0.098	38.45	-18.52	22.08	0.162	40.61	-18.52
		836.5	V	134.0	131.0	6.38	1 / 0	15.85	**20.08**	0.102	38.45	-18.37	**22.23**	0.167	40.61	-18.38
		844.0	V	136.0	134.0	6.48	1 / 0	15.02	19.35	0.086	38.45	-19.10	21.50	0.141	40.61	-19.11
	16-QAM	836.5	V	134.0	131.0	6.38	1 / 0	14.82	**19.05**	0.080	38.45	-19.40	**21.20**	0.132	40.61	-19.41
	64-QAM	836.5	V	134.0	131.0	6.38	1 / 0	13.41	**17.64**	0.058	38.45	-20.81	**19.79**	0.095	40.61	-20.82
	256-QAM	836.5	V	134.0	131.0	6.38	1 / 0	11.62	**15.85**	0.038	38.45	-22.60	18.00	0.063	40.61	-22.61
	QPSK (CP-OFDM)	829.0	V	144.0	135.0	6.40	1 / 26	12.35	**18.75**	0.075	38.45	-19.70	**20.90**	0.123	40.61	-19.71
	QPSK (Opposite Pol.)	829.0	H	186.0	352.0	6.80	1 / 26	12.59	19.39	0.087	38.45	-19.06	21.54	0.143	40.61	-19.07

Table 7-14. ERP Data (Band n5)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	V	210	121	1 / 2	13.99	9.38	**23.37**	0.217	30.00	-6.63
1745.00	1.4	QPSK	V	228	129	1 / 2	13.95	9.14	23.09	0.204	30.00	-6.91
1779.30	1.4	QPSK	V	124	104	1 / 2	13.46	9.20	22.66	0.184	30.00	-7.34
1710.70	1.4	16-QAM	V	210	121	1 / 2	13.04	9.38	22.42	0.175	30.00	-7.58
1710.70	1.4	64-QAM	V	210	121	1 / 2	11.00	9.38	20.38	0.109	30.00	-9.62
1710.70	1.4	256-QAM	V	210	121	1 / 2	10.49	9.38	**19.87**	**0.097**	30.00	-10.13
1711.50	3	QPSK	V	203	115	1 / 8	14.46	9.37	**23.83**	0.242	30.00	-6.17
1745.00	3	QPSK	V	233	133	1 / 8	14.02	9.14	23.16	0.207	30.00	-6.84
1778.50	3	QPSK	V	120	108	1 / 8	13.62	9.20	22.82	0.191	30.00	-7.18
1711.50	3	16-QAM	V	203	115	1 / 8	13.35	9.37	**22.72**	0.187	30.00	-7.28
1711.50	3	64-QAM	V	203	115	1 / 8	11.14	9.37	20.51	0.113	30.00	-9.49
1711.50	3	256-QAM	V	203	115	1 / 8	10.53	9.37	**19.90**	**0.098**	30.00	-10.10
1712.50	5	QPSK	V	210	110	1 / 12	14.47	9.37	**23.84**	**0.242**	30.00	-6.16
1745.00	5	QPSK	V	238	131	1 / 12	13.98	9.14	23.12	0.205	30.00	-6.88
1777.50	5	QPSK	V	122	101	1 / 12	13.53	9.19	22.72	0.187	30.00	-7.28
1712.50	5	16-QAM	V	210	110	1 / 12	13.23	9.37	**22.60**	0.182	30.00	-7.40
1712.50	5	64-QAM	V	210	110	1 / 12	11.23	9.37	20.60	0.115	30.00	-9.40
1712.50	5	256-QAM	V	210	110	1 / 12	10.59	9.37	**19.96**	**0.099**	30.00	-10.04
1715.00	10	QPSK	V	208	101	1 / 25	14.45	9.35	**23.80**	0.240	30.00	-6.20
1745.00	10	QPSK	V	233	138	1 / 25	14.46	9.14	23.60	0.229	30.00	-6.40
1775.00	10	QPSK	V	125	105	1 / 25	13.99	9.18	23.17	0.208	30.00	-6.83
1715.00	10	16-QAM	V	208	101	1 / 25	12.96	9.35	**22.31**	0.170	30.00	-7.69
1715.00	10	64-QAM	V	208	101	1 / 25	10.89	9.35	20.24	0.106	30.00	-9.76
1715.00	10	256-QAM	V	208	101	1 / 25	10.29	9.35	**19.64**	**0.092**	30.00	-10.36
1717.50	15	QPSK	V	214	95	1 / 36	14.17	9.33	**23.50**	0.224	30.00	-6.50
1745.00	15	QPSK	V	243	140	1 / 36	13.87	9.14	23.01	0.200	30.00	-6.99
1772.50	15	QPSK	V	122	102	1 / 36	13.60	9.18	22.78	0.190	30.00	-7.22
1717.50	15	16-QAM	V	214	95	1 / 36	12.96	9.33	**22.29**	0.169	30.00	-7.71
1717.50	15	64-QAM	V	214	95	1 / 36	11.17	9.33	20.50	0.112	30.00	-9.50
1717.50	15	256-QAM	V	214	95	1 / 36	10.45	9.33	**19.78**	**0.095**	30.00	-10.22
1720.00	20	QPSK	V	210	93	1 / 50	14.29	9.31	23.60	0.229	30.00	-6.40
1745.00	20	QPSK	V	240	136	1 / 50	14.44	9.14	23.58	0.228	30.00	-6.42
1770.00	20	QPSK	V	118	97	1 / 50	14.50	9.17	**23.67**	0.233	30.00	-6.33
1770.00	20	16-QAM	V	118	97	1 / 50	13.94	9.17	**23.11**	0.205	30.00	-6.89
1770.00	20	64-QAM	V	118	97	1 / 50	12.88	9.17	**22.05**	0.160	30.00	-7.95
1770.00	20	256-QAM	V	118	97	1 / 50	10.77	9.17	**19.94**	**0.099**	30.00	-10.06
1712.50	5	QPSK	H	158	338	1 / 12	13.10	9.27	22.37	0.173	30.00	-7.63

Table 7-15. EIRP Data (Band 66/4)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	π/2 BPSK	1720.0	V	160.0	114.0	9.31	1 / 1	15.10	24.41	0.276	30.00	-5.59
		1745.0	V	151.0	127.0	9.14	1 / 1	15.54	**24.68**	0.294	30.00	-5.32
		1770.0	V	184.0	106.0	9.17	1 / 53	14.95	24.12	0.258	30.00	-5.88
	QPSK	1720.0	V	160.0	114.0	9.31	1 / 1	14.90	24.21	0.264	30.00	-5.79
		1745.0	V	151.0	127.0	9.14	1 / 1	15.61	**24.75**	0.298	30.00	-5.25
		1770.0	V	184.0	106.0	9.17	1 / 53	14.59	23.76	0.238	30.00	-6.24
	16-QAM	1745.0	V	151.0	127.0	9.14	1 / 1	14.57	**23.71**	0.235	30.00	-6.29
	64-QAM	1745.0	V	151.0	127.0	9.14	1 / 1	12.93	**22.07**	0.161	30.00	-7.93
	256-QAM	1745.0	V	151.0	127.0	9.14	1 / 1	11.20	**20.34**	0.108	30.00	-9.66
15 MHz	π/2 BPSK	1717.5	V	160.0	114.0	9.33	1 / 1	14.81	24.14	0.259	30.00	-5.86
		1745.0	V	151.0	127.0	9.14	1 / 1	15.68	**24.82**	0.303	30.00	-5.18
		1772.5	V	184.0	106.0	9.18	1 / 40	14.35	23.53	0.225	30.00	-6.47
	QPSK	1717.5	V	160.0	114.0	9.33	1 / 1	14.92	24.25	0.266	30.00	-5.75
		1745.0	V	151.0	127.0	9.14	1 / 1	15.49	**24.63**	0.290	30.00	-5.37
		1772.5	V	184.0	106.0	9.18	1 / 40	14.24	23.42	0.220	30.00	-6.58
	16-QAM	1745.0	V	151.0	127.0	9.14	1 / 1	14.45	**23.59**	0.228	30.00	-6.41
	64-QAM	1745.0	V	151.0	127.0	9.14	1 / 1	12.97	**22.11**	0.162	30.00	-7.89
	256-QAM	1745.0	V	151.0	127.0	9.14	1 / 1	11.26	**20.40**	0.110	30.00	-9.60
10 MHz	π/2 BPSK	1715.0	V	160.0	114.0	9.35	1 / 1	14.79	24.14	0.259	30.00	-5.86
		1745.0	V	151.0	127.0	9.14	1 / 1	15.35	**24.49**	0.281	30.00	-5.51
		1775.0	V	184.0	106.0	9.18	1 / 26	14.58	23.76	0.238	30.00	-6.24
	QPSK	1715.0	V	160.0	114.0	9.35	1 / 1	15.02	24.37	0.273	30.00	-5.63
		1745.0	V	151.0	127.0	9.14	1 / 1	15.53	**24.67**	0.293	30.00	-5.33
		1775.0	V	184.0	106.0	9.18	1 / 26	14.50	23.68	0.234	30.00	-6.32
	16-QAM	1745.0	V	151.0	127.0	9.14	1 / 1	14.49	**23.63**	0.231	30.00	-6.37
	64-QAM	1745.0	V	151.0	127.0	9.14	1 / 1	13.11	**22.25**	0.168	30.00	-7.75
	256-QAM	1745.0	V	151.0	127.0	9.14	1 / 1	11.43	**20.57**	0.114	30.00	-9.43
5 MHz	π/2 BPSK	1712.5	V	160.0	114.0	9.37	1 / 0	14.73	24.10	0.257	30.00	-5.90
		1745.0	V	151.0	127.0	9.14	1 / 0	15.25	**24.39**	0.275	30.00	-5.61
		1777.5	V	184.0	106.0	9.19	1 / 13	14.34	23.53	0.226	30.00	-6.47
	QPSK	1712.5	V	160.0	114.0	9.37	1 / 0	14.91	24.28	0.268	30.00	-5.72
		1745.0	V	151.0	127.0	9.14	1 / 0	15.45	**24.59**	0.288	30.00	-5.41
		1777.5	V	184.0	106.0	9.19	1 / 13	14.24	23.43	0.220	30.00	-6.57
	16-QAM	1745.0	V	151.0	127.0	9.14	1 / 0	14.41	**23.55**	0.226	30.00	-6.45
	64-QAM	1745.0	V	151.0	127.0	9.14	1 / 0	13.03	**22.17**	0.165	30.00	-7.83
	256-QAM	1745.0	V	151.0	127.0	9.14	1 / 0	11.37	**20.51**	0.112	30.00	-9.49
	QPSK (CP-OFDM)	1745.0	V	149.0	123.0	9.14	1 / 1	13.87	**23.01**	0.200	30.00	-6.99
	QPSK (Opposite Pol.)	1745.0	H	346.0	157.0	9.26	1 / 1	13.40	22.66	0.185	30.00	-7.34

Table 7-16. EIRP Data (Band n66)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	V	261	88	1 / 2	12.43	9.91	22.34	0.171	33.01	-10.67
1882.50	1.4	QPSK	V	255	93	1 / 2	13.04	10.15	23.19	0.209	33.01	-9.82
1914.30	1.4	QPSK	V	264	90	1 / 0	13.25	10.37	**23.62**	0.230	33.01	-9.40
1914.30	1.4	16-QAM	V	264	90	1 / 0	11.88	10.37	22.25	0.168	33.01	-10.77
1914.30	1.4	64-QAM	V	264	90	1 / 0	10.39	10.37	20.76	0.119	33.01	-12.26
1914.30	1.4	256-QAM	V	264	90	1 / 0	8.55	10.37	**18.92**	**0.078**	33.01	-14.10
1851.50	3	QPSK	V	256	94	1 / 7	12.46	9.91	22.37	0.173	33.01	-10.64
1882.50	3	QPSK	V	251	88	1 / 7	13.08	10.15	23.23	0.211	33.01	-9.78
1913.50	3	QPSK	V	261	91	1 / 0	13.21	10.36	**23.57**	0.228	33.01	-9.44
1913.50	3	16-QAM	V	261	91	1 / 0	12.71	10.36	**23.07**	0.203	33.01	-9.94
1913.50	3	64-QAM	V	261	91	1 / 0	10.36	10.36	20.72	0.118	33.01	-12.29
1913.50	3	256-QAM	V	261	91	1 / 0	8.34	10.36	**18.70**	**0.074**	33.01	-14.31
1852.50	5	QPSK	V	250	90	1 / 12	12.47	9.92	22.39	0.173	33.01	-10.62
1882.50	5	QPSK	V	256	84	1 / 12	13.03	10.15	23.18	0.208	33.01	-9.83
1912.50	5	QPSK	V	251	89	1 / 0	13.35	10.36	**23.71**	0.235	33.01	-9.31
1912.50	5	16-QAM	V	251	89	1 / 0	12.69	10.36	**23.05**	0.202	33.01	-9.97
1912.50	5	64-QAM	V	251	89	1 / 0	10.37	10.36	20.73	0.118	33.01	-12.29
1912.50	5	256-QAM	V	251	89	1 / 0	8.71	10.36	**19.07**	**0.081**	33.01	-13.95
1855.00	10	QPSK	V	253	85	1 / 25	12.66	9.94	22.60	0.182	33.01	-10.41
1882.50	10	QPSK	V	251	91	1 / 25	13.07	10.15	23.22	0.210	33.01	-9.79
1910.00	10	QPSK	V	260	94	1 / 0	13.45	10.34	**23.79**	**0.239**	33.01	-9.22
1910.00	10	16-QAM	V	260	94	1 / 0	12.71	10.34	**23.05**	0.202	33.01	-9.96
1910.00	10	64-QAM	V	260	94	1 / 0	10.75	10.34	21.09	0.129	33.01	-11.92
1910.00	10	256-QAM	V	260	94	1 / 0	8.50	10.34	**18.84**	**0.077**	33.01	-14.17
1857.50	15	QPSK	V	244	82	1 / 36	12.80	9.96	22.76	0.189	33.01	-10.25
1882.50	15	QPSK	V	257	97	1 / 36	13.30	10.15	23.45	0.221	33.01	-9.56
1907.50	15	QPSK	V	255	90	1 / 0	13.33	10.33	**23.66**	0.232	33.01	-9.35
1907.50	15	16-QAM	V	255	90	1 / 0	12.60	10.33	**22.93**	0.196	33.01	-10.08
1907.50	15	64-QAM	V	255	90	1 / 0	10.80	10.33	21.13	0.130	33.01	-11.88
1907.50	15	256-QAM	V	255	90	1 / 0	8.34	10.33	**18.67**	**0.074**	33.01	-14.34
1860.00	20	QPSK	V	250	80	1 / 50	12.58	9.98	22.56	0.180	33.01	-10.45
1882.50	20	QPSK	V	261	94	1 / 50	13.06	10.15	23.21	0.210	33.01	-9.80
1905.00	20	QPSK	V	252	87	1 / 0	13.41	10.31	**23.72**	0.236	33.01	-9.29
1905.00	20	16-QAM	V	252	87	1 / 0	12.66	10.31	**22.97**	0.198	33.01	-10.04
1905.00	20	64-QAM	V	252	87	1 / 0	10.71	10.31	21.02	0.127	33.01	-11.99
1905.00	20	256-QAM	V	252	87	1 / 0	8.34	10.31	**18.65**	**0.073**	33.01	-14.36
1910.00	10	QPSK	H	101	343	1 / 0	12.81	10.24	23.05	0.202	33.01	-9.96

Table 7-17. EIRP Data (Band 25/2)

Bandwidth	Modulation	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
20 MHz	π/2 BPSK	1860.0	V	103	75	9.98	1 / 53	14.51	24.49	33.01	-8.52
		1880.0	V	100	70	10.13	1 / 1	14.51	24.64	33.01	-8.37
		1905.0	V	116	92	10.29	1 / 1	14.88	25.17	33.01	-7.84
	QPSK	1860.0	V	103	75	9.98	1 / 53	14.23	24.21	33.01	-8.80
		1880.0	V	100	70	10.13	1 / 1	14.45	24.58	33.01	-8.43
		1905.0	V	116	92	10.29	1 / 1	14.89	**25.18**	33.01	-7.83
	16-QAM	1905.0	V	116	92	10.29	1 / 1	13.74	**24.03**	33.01	-8.98
	64-QAM	1905.0	V	116	92	10.29	1 / 1	12.53	**22.82**	33.01	-10.19
	256-QAM	1905.0	V	116	92	10.29	1 / 1	10.61	**20.90**	33.01	-12.11
15 MHz	π/2 BPSK	1857.5	V	110	81	9.96	1 / 40	14.49	24.45	33.01	-8.56
		1880.0	V	104	74	10.13	1 / 0	14.42	24.55	33.01	-8.46
		1907.5	V	121	88	10.30	1 / 0	14.93	**25.23**	33.01	-7.78
	QPSK	1857.5	V	110	81	9.96	1 / 40	14.25	24.21	33.01	-8.80
		1880.0	V	104	74	10.13	1 / 1	14.44	24.57	33.01	-8.44
		1907.5	V	121	88	10.30	1 / 1	15.03	**25.33**	33.01	-7.68
	16-QAM	1907.5	V	121	88	10.30	1 / 1	14.20	**24.50**	33.01	-8.51
	64-QAM	1907.5	V	121	88	10.30	1 / 1	12.51	**22.81**	33.01	-10.20
	256-QAM	1907.5	V	121	88	10.30	1 / 1	10.54	**20.84**	33.01	-12.17
10 MHz	π/2 BPSK	1855.0	V	115	77	9.94	1 / 26	14.34	24.28	33.01	-8.73
		1880.0	V	107	71	10.13	1 / 1	14.42	24.55	33.01	-8.46
		1910.0	V	114	94	10.31	1 / 1	15.30	**25.61**	33.01	-7.40
	QPSK	1855.0	V	115	77	9.94	1 / 26	14.36	24.30	33.01	-8.71
		1880.0	V	107	71	10.13	1 / 1	14.33	24.46	33.01	-8.55
		1910.0	V	114	94	10.31	1 / 1	14.75	**25.06**	33.01	-7.95
	16-QAM	1910.0	V	114	94	10.31	1 / 1	13.82	**24.13**	33.01	-8.88
	64-QAM	1910.0	V	114	94	10.31	1 / 1	12.60	**22.91**	33.01	-10.10
	256-QAM	1910.0	V	114	94	10.31	1 / 1	10.61	**20.92**	33.01	-12.09
5 MHz	π/2 BPSK	1852.5	V	120	74	9.92	1 / 13	14.46	24.38	33.01	-8.63
		1880.0	V	102	75	10.13	1 / 1	14.46	24.59	33.01	-8.42
		1912.5	V	111	89	10.33	1 / 1	14.90	**25.23**	33.01	-7.78
	QPSK	1852.5	V	120	74	9.92	1 / 13	14.09	24.01	33.01	-9.00
		1880.0	V	102	75	10.13	1 / 1	14.48	24.61	33.01	-8.40
		1912.5	V	111	89	10.33	1 / 1	14.73	**25.06**	33.01	-7.95
	16-QAM	1912.5	V	111	89	10.33	1 / 1	13.60	**23.93**	33.01	-9.08
	64-QAM	1912.5	V	111	89	10.33	1 / 1	12.51	**22.84**	33.01	-10.17
	256-QAM	1912.5	V	111	89	10.33	1 / 1	10.54	20.87	33.01	-12.14
	QPSK (CP-OFDM)	1910.0	V	116	92	10.31	1 / 1	13.35	**23.66**	33.01	-9.35
	QPSK (Opposite Pol.)	1910.0	H	220	15	10.20	1 / 1	14.75	24.95	33.01	-8.06

Table 7-18. EIRP Data (Band n25/2)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2502.50	5	QPSK	H	182	352	1 / 0	11.41	9.46	20.87	0.122	33.01	-12.14
2535.00	5	QPSK	H	161	6	1 / 12	11.51	9.42	20.93	0.124	33.01	-12.08
2567.50	5	QPSK	H	107	9	1 / 12	11.55	9.48	**21.03**	0.127	33.01	-11.98
2567.50	5	16-QAM	H	107	9	1 / 12	10.67	9.48	20.15	0.104	33.01	-12.86
2567.50	5	64-QAM	H	107	9	1 / 12	9.92	9.48	19.40	0.087	33.01	-13.61
2567.50	5	256-QAM	H	107	9	1 / 12	6.74	9.48	**16.22**	**0.042**	33.01	-16.79
2505.00	10	QPSK	H	180	349	1 / 0	11.39	9.45	20.84	0.121	33.01	-12.17
2535.00	10	QPSK	H	164	2	1 / 25	11.41	9.42	20.83	0.121	33.01	-12.18
2565.00	10	QPSK	H	104	5	1 / 25	11.57	9.47	**21.04**	0.127	33.01	-11.97
2565.00	10	16-QAM	H	104	5	1 / 25	11.09	9.47	**20.56**	0.114	33.01	-12.45
2565.00	10	64-QAM	H	104	5	1 / 25	9.80	9.47	19.27	0.085	33.01	-13.74
2565.00	10	256-QAM	H	104	5	1 / 25	7.14	9.47	**16.61**	**0.046**	33.01	-16.40
2507.50	15	QPSK	H	176	352	1 / 0	11.60	9.45	**21.05**	0.127	33.01	-11.96
2535.00	15	QPSK	H	161	5	1 / 36	11.52	9.42	20.94	0.124	33.01	-12.07
2562.50	15	QPSK	H	107	2	1 / 36	11.59	9.46	21.05	0.127	33.01	-11.96
2562.50	15	16-QAM	H	107	2	1 / 36	11.16	9.46	**20.62**	0.115	33.01	-12.39
2562.50	15	64-QAM	H	107	2	1 / 36	9.90	9.46	19.36	0.086	33.01	-13.65
2562.50	15	256-QAM	H	107	2	1 / 36	7.17	9.46	**16.63**	**0.046**	33.01	-16.38
2510.00	20	QPSK	H	172	358	1 / 0	10.93	9.45	20.38	0.109	33.01	-12.63
2535.00	20	QPSK	H	163	1	1 / 50	11.52	9.42	20.94	0.124	33.01	-12.07
2560.00	20	QPSK	H	102	3	1 / 50	11.76	9.45	**21.21**	**0.132**	33.01	-11.80
2560.00	20	16-QAM	H	102	3	1 / 50	11.08	9.45	**20.53**	0.113	33.01	-12.48
2560.00	20	64-QAM	H	102	3	1 / 50	9.96	9.45	**19.41**	0.087	33.01	-13.60
2560.00	20	256-QAM	H	102	3	1 / 50	6.88	9.45	**16.33**	**0.043**	33.01	-16.68
2560.00	20	QPSK	V	130	164	1 / 50	7.93	9.45	17.38	0.055	33.01	-15.63

Table 7-19. EIRP Data (Band 7)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2498.50	5	QPSK	V	364	161	1 / 0	17.15	9.43	26.58	0.455	33.01	-6.43
2593.00	5	QPSK	V	361	158	1 / 12	17.11	9.59	**26.70**	0.467	33.01	-6.31
2687.50	5	QPSK	V	384	167	1 / 0	14.14	9.71	23.85	0.243	33.01	-9.16
2593.00	5	16-QAM	V	361	158	1 / 12	15.78	9.59	25.37	0.344	33.01	-7.64
2593.00	5	64-QAM	V	361	158	1 / 12	14.47	9.59	**24.06**	0.255	33.01	-8.95
2593.00	5	256-QAM	V	361	158	1 / 12	12.01	9.59	21.60	0.144	33.01	-11.41
2501.00	10	QPSK	V	359	151	1 / 0	17.24	9.42	26.66	0.464	33.01	-6.35
2593.00	10	QPSK	V	368	164	1 / 25	17.16	9.59	**26.75**	**0.473**	33.01	-6.26
2685.00	10	QPSK	V	391	162	1 / 0	14.10	9.71	23.81	0.241	33.01	-9.20
2593.00	10	16-QAM	V	368	164	1 / 25	15.67	9.59	25.26	0.336	33.01	-7.75
2593.00	10	64-QAM	V	368	164	1 / 25	14.15	9.59	23.74	0.236	33.01	-9.27
2593.00	10	256-QAM	V	368	164	1 / 25	11.52	9.59	21.11	0.129	33.01	-11.90
2503.50	15	QPSK	V	350	154	1 / 0	17.19	9.42	26.61	0.459	33.01	-6.40
2593.00	15	QPSK	V	375	160	1 / 36	17.07	9.59	**26.66**	0.463	33.01	-6.35
2682.50	15	QPSK	V	388	158	1 / 0	13.82	9.71	23.53	0.226	33.01	-9.48
2593.00	15	16-QAM	V	375	160	1 / 36	15.47	9.59	25.06	0.320	33.01	-7.95
2593.00	15	64-QAM	V	375	160	1 / 36	14.35	9.59	23.94	0.248	33.01	-9.07
2593.00	15	256-QAM	V	375	160	1 / 36	11.60	9.59	21.19	0.131	33.01	-11.82
2506.00	20	QPSK	V	354	151	1 / 0	17.26	9.42	**26.68**	0.466	33.01	-6.33
2593.00	20	QPSK	V	379	164	1 / 50	16.79	9.59	26.38	0.434	33.01	-6.63
2680.00	20	QPSK	V	395	160	1 / 0	13.79	9.71	23.50	0.224	33.01	-9.51
2506.00	20	16-QAM	V	354	151	1 / 0	17.19	9.42	**26.61**	0.458	33.01	-6.40
2506.00	20	64-QAM	V	354	151	1 / 0	14.86	9.42	**24.28**	0.268	33.01	-8.73
2506.00	20	256-QAM	V	354	151	1 / 0	12.40	9.42	**21.82**	**0.152**	33.01	-11.19
2593.00	10	QPSK	H	203	20	1 / 25	17.12	9.45	26.57	0.454	33.01	-6.44

Table 7-20. EIRP Data (Band 41 – PC2)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
100 MHz	π/2 BPSK	2546.0	V	399.0	167.0	9.41	1 / 137	14.97	24.38	0.274	33.01	-8.63
		2593.0	V	387.0	169.0	9.59	1 / 137	15.60	**25.19**	0.330	33.01	-7.82
		2640.0	V	372.0	167.0	9.68	1 / 137	15.31	24.99	0.315	33.01	-8.02
	QPSK	2546.0	V	399.0	167.0	9.41	1 / 137	15.13	24.54	0.284	33.01	-8.47
		2593.0	V	387.0	169.0	9.59	1 / 137	15.69	**25.28**	0.337	33.01	-7.73
		2640.0	V	372.0	167.0	9.68	1 / 137	15.38	25.06	0.321	33.01	-7.95
	16-QAM	2593.0	V	387.0	169.0	9.59	1 / 137	14.32	**23.91**	0.246	33.01	-9.10
	64-QAM	2593.0	V	387.0	169.0	9.59	1 / 137	13.15	**22.74**	0.188	33.01	-10.27
	256-QAM	2593.0	V	387.0	169.0	9.59	1 / 137	11.29	**20.88**	0.122	33.01	-12.13
90 MHz	π/2 BPSK	2541.0	V	399.0	167.0	9.41	1 / 123	15.08	24.49	0.281	33.01	-8.52
		2593.0	V	387.0	169.0	9.59	1 / 123	15.20	**24.79**	0.301	33.01	-8.22
		2645.0	V	372.0	167.0	9.69	1 / 123	15.04	24.73	0.297	33.01	-8.28
	QPSK	2541.0	V	399.0	167.0	9.41	1 / 123	14.74	24.15	0.260	33.01	-8.86
		2593.0	V	387.0	169.0	9.59	1 / 123	15.16	**24.75**	0.298	33.01	-8.26
		2645.0	V	372.0	167.0	9.69	1 / 123	14.84	24.53	0.284	33.01	-8.48
	16-QAM	2593.0	V	387.0	169.0	9.59	1 / 123	13.92	**23.51**	0.224	33.01	-9.50
	64-QAM	2593.0	V	387.0	169.0	9.59	1 / 123	12.84	**22.43**	0.175	33.01	-10.58
	256-QAM	2593.0	V	387.0	169.0	9.59	1 / 123	10.91	**20.50**	0.112	33.01	-12.51
80 MHz	π/2 BPSK	2536.0	V	399.0	167.0	9.41	1 / 108	15.20	24.61	0.289	33.01	-8.40
		2593.0	V	387.0	169.0	9.59	1 / 108	15.97	**25.56**	0.360	33.01	-7.45
		2650.0	V	372.0	167.0	9.69	1 / 108	15.00	24.69	0.295	33.01	-8.32
	QPSK	2536.0	V	399.0	167.0	9.41	1 / 108	15.41	24.82	0.304	33.01	-8.19
		2593.0	V	387.0	169.0	9.59	1 / 108	16.24	**25.83**	0.383	33.01	-7.18
		2650.0	V	372.0	167.0	9.69	1 / 108	15.33	25.02	0.318	33.01	-7.99
	16-QAM	2593.0	V	387.0	169.0	9.59	1 / 108	14.29	**23.88**	0.244	33.01	-9.13
	64-QAM	2593.0	V	387.0	169.0	9.59	1 / 108	13.10	**22.69**	0.186	33.01	-10.32
	256-QAM	2593.0	V	387.0	169.0	9.59	1 / 108	11.27	**20.86**	0.122	33.01	-12.15
60 MHz	π/2 BPSK	2526.0	V	399.0	167.0	9.42	1 / 81	15.24	24.66	0.292	33.01	-8.35
		2593.0	V	387.0	169.0	9.59	1 / 81	15.71	**25.30**	0.339	33.01	-7.71
		2660.0	V	372.0	167.0	9.70	1 / 81	15.42	25.12	0.325	33.01	-7.89
	QPSK	2526.0	V	399.0	167.0	9.42	1 / 81	15.24	24.66	0.292	33.01	-8.35
		2593.0	V	387.0	169.0	9.59	1 / 81	16.01	**25.60**	0.363	33.01	-7.41
		2660.0	V	372.0	167.0	9.70	1 / 81	15.44	25.14	0.327	33.01	-7.87
	16-QAM	2593.0	V	387.0	169.0	9.59	1 / 81	14.64	**24.23**	0.265	33.01	-8.78
	64-QAM	2593.0	V	387.0	169.0	9.59	1 / 81	13.45	**23.04**	0.201	33.01	-9.97
	256-QAM	2593.0	V	387.0	169.0	9.59	1 / 81	11.62	**21.21**	0.132	33.01	-11.80
50 MHz	π/2 BPSK	2521.0	V	399.0	167.0	9.42	1 / 66	15.22	24.64	0.291	33.01	-8.37
		2593.0	V	387.0	169.0	9.59	1 / 66	15.76	**25.35**	0.343	33.01	-7.66
		2665.0	V	372.0	167.0	9.70	1 / 66	15.57	25.27	0.337	33.01	-7.74
	QPSK	2521.0	V	399.0	167.0	9.42	1 / 66	15.46	24.88	0.307	33.01	-8.13
		2593.0	V	387.0	169.0	9.59	1 / 66	16.05	**25.64**	0.366	33.01	-7.37
		2665.0	V	372.0	167.0	9.70	1 / 66	15.77	25.47	0.353	33.01	-7.54
	16-QAM	2593.0	V	387.0	169.0	9.59	1 / 66	14.66	**24.25**	0.266	33.01	-8.76
	64-QAM	2593.0	V	387.0	169.0	9.59	1 / 66	13.52	**23.11**	0.205	33.01	-9.90
	256-QAM	2593.0	V	387.0	169.0	9.59	1 / 66	11.71	**21.30**	0.135	33.01	-11.71
40 MHz	π/2 BPSK	2516.0	V	399.0	167.0	9.42	1 / 53	15.43	24.85	0.305	33.01	-8.16
		2593.0	V	387.0	169.0	9.59	1 / 53	16.08	**25.67**	0.369	33.01	-7.34
		2670.0	V	372.0	167.0	9.71	1 / 53	15.70	25.41	0.347	33.01	-7.61
	QPSK	2516.0	V	399.0	167.0	9.42	1 / 53	15.72	25.14	0.327	33.01	-7.87
		2593.0	V	387.0	169.0	9.59	1 / 53	16.19	**25.78**	0.378	33.01	-7.23
		2670.0	V	372.0	167.0	9.71	1 / 53	15.85	25.56	0.359	33.01	-7.46
	16-QAM	2593.0	V	387.0	169.0	9.59	1 / 53	13.96	**23.55**	0.226	33.01	-9.46
	64-QAM	2593.0	V	387.0	169.0	9.59	1 / 53	13.74	**23.33**	0.215	33.01	-9.68
	256-QAM	2593.0	V	387.0	169.0	9.59	1 / 53	11.86	**21.45**	0.140	33.01	-11.56
20 MHz	π/2 BPSK	2506.0	V	399.0	167.0	9.42	1 / 26	15.37	24.79	0.302	33.01	-8.22
		2593.0	V	387.0	169.0	9.59	1 / 26	15.80	**25.39**	0.346	33.01	-7.62
		2680.0	V	372.0	167.0	9.71	1 / 26	15.41	25.12	0.325	33.01	-7.89
	QPSK	2506.0	V	399.0	167.0	9.42	1 / 26	15.73	25.15	0.328	33.01	-7.86
		2593.0	V	387.0	169.0	9.59	1 / 26	15.93	**25.52**	0.356	33.01	-7.49
		2680.0	V	372.0	167.0	9.71	1 / 26	15.73	25.44	0.350	33.01	-7.57
	16-QAM	2593.0	V	387.0	169.0	9.59	1 / 26	13.84	**23.43**	0.220	33.01	-9.58
	64-QAM	2593.0	V	387.0	169.0	9.59	1 / 26	13.56	**23.15**	0.206	33.01	-9.86
	256-QAM	2593.0	V	387.0	169.0	9.59	1 / 26	11.53	**21.12**	0.129	33.01	-11.89
	QPSK (CP-OFDM)	2593.0	V	387.0	169.0	9.59	1 / 108	14.33	23.92	0.246	33.01	-9.09
	QPSK (Opposite Pol.)	2593.0	H	117.0	221.0	9.58	1 / 108	12.83	22.41	0.174	33.01	-10.60

Table 7-21. EIRP Data (Band n41)

7.8 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions 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.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points ≥ 2 x span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

Test Setup

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

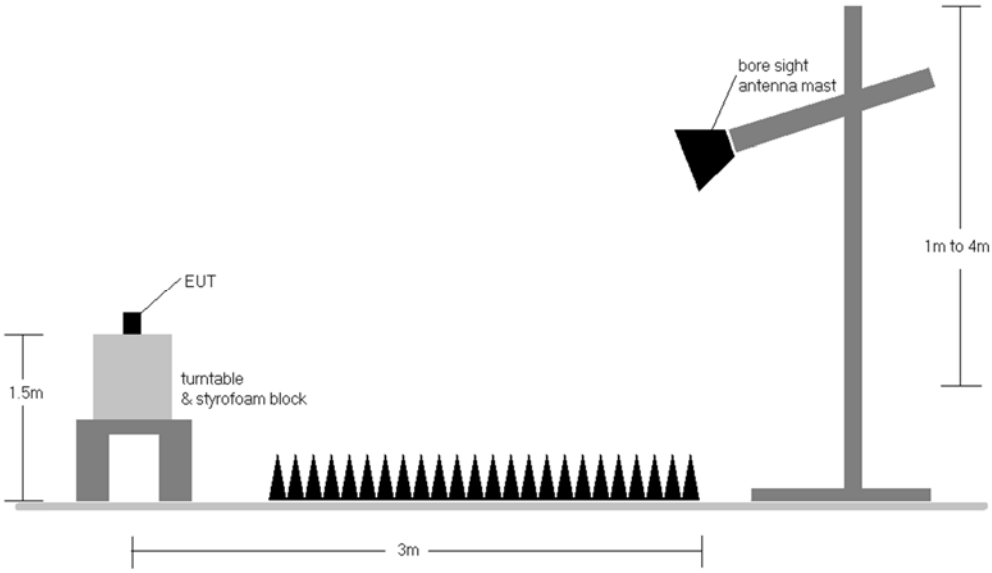


Figure 7-8. Test Instrument & Measurement Setup

Test Notes

1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.

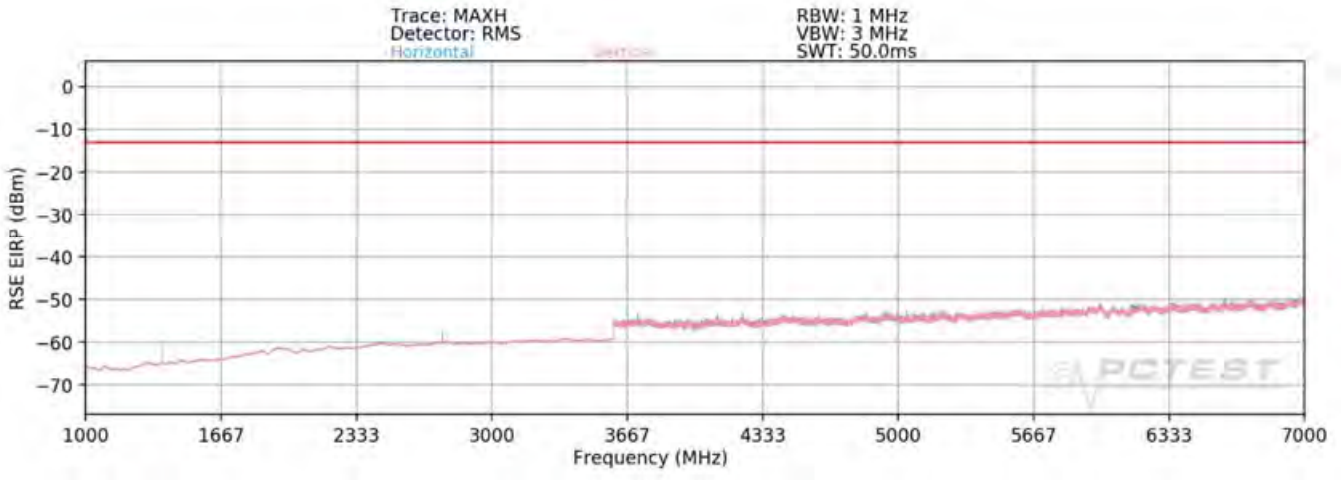
2) This unit was tested with its standard battery.

3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

4) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

Band 71



Plot 7-677. Radiated Spurious Plot above 1GHz (Band 71)

OPERATING FREQUENCY:	673.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1346.00	H	149	343	-67.31	3.15	-64.16	-51.2
2019.00	H	319	5	-66.96	3.52	-63.44	-50.4
2692.00	H	150	315	-64.78	4.77	-60.01	-47.0
3365.00	H	-	-	-67.31	6.00	-61.31	-48.3
4038.00	H	-	-	-69.02	7.43	-61.59	-48.6

Table 7-22. Radiated Spurious Data (Band 71 – Low Channel)

OPERATING FREQUENCY:	680.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1361.00	H	149	1	-60.76	3.04	-57.72	-44.7
2041.50	H	144	37	-66.79	3.49	-63.30	-50.3
2722.00	H	170	308	-62.94	4.83	-58.11	-45.1
3402.50	H	123	303	-67.30	6.16	-61.14	-48.1
4083.00	H	-	-	-68.85	7.51	-61.34	-48.3
4763.50	H	-	-	-69.99	8.48	-61.51	-48.5

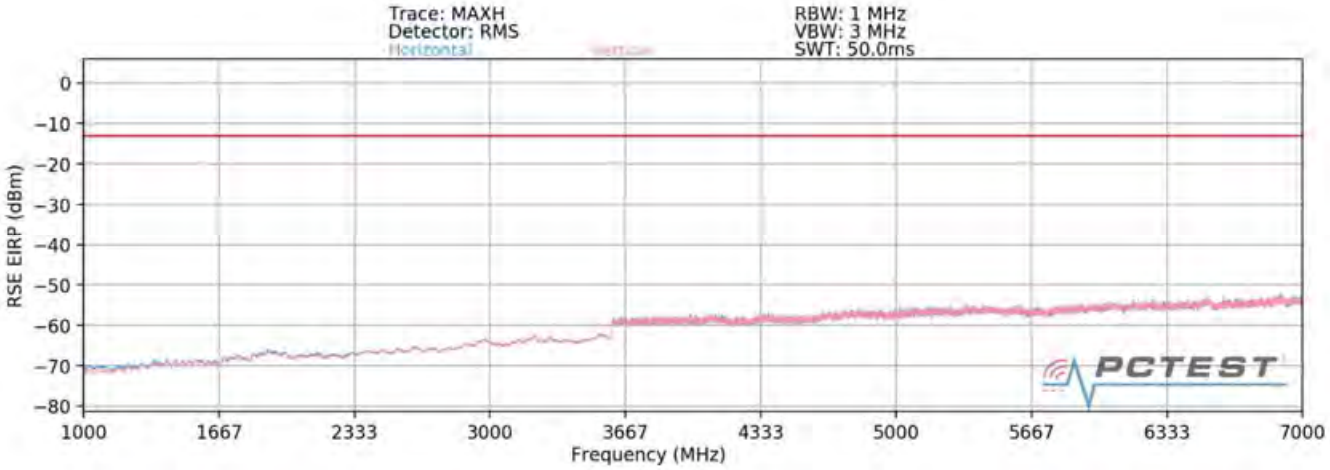
Table 7-23. Radiated Spurious Data (Band 71 – Mid Channel)

OPERATING FREQUENCY:	688.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

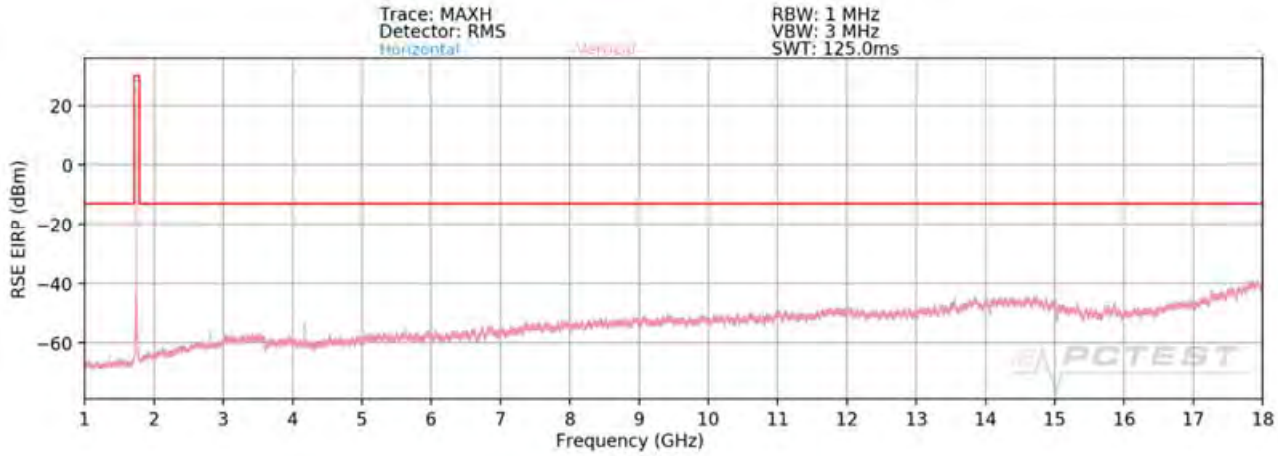
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1376.00	H	155	20	-60.40	2.88	-57.52	-44.5
2064.00	H	254	23	-67.23	3.50	-63.73	-50.7
2752.00	H	136	308	-61.64	4.88	-56.76	-43.8
3440.00	H	-	-	-68.30	6.22	-62.08	-49.1
4128.00	H	-	-	-68.36	7.61	-60.74	-47.7

Table 7-24. Radiated Spurious Data (Band 71 – High Channel)

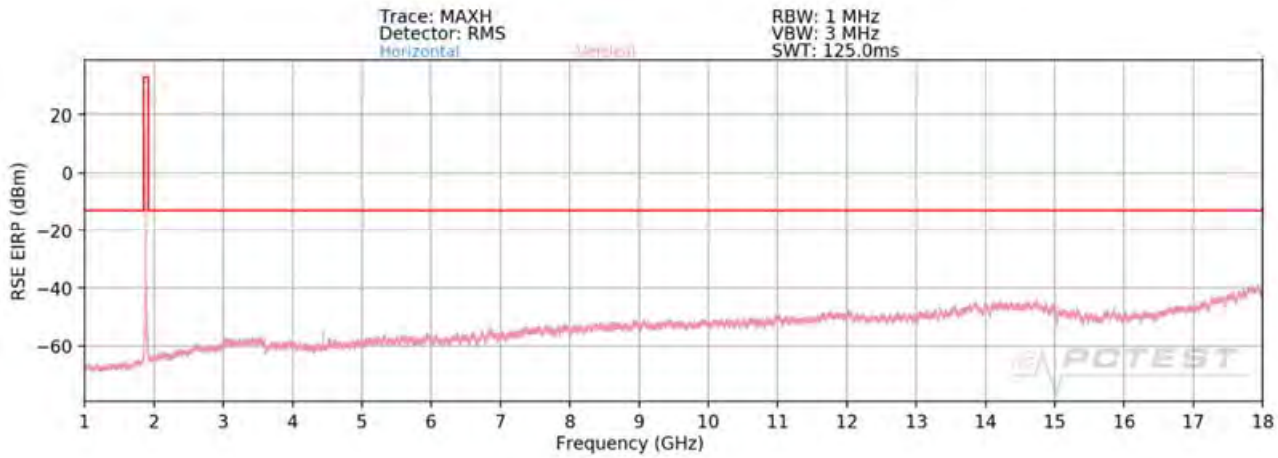
Band n71 (66/2 Anchors)



Plot 7-678. Radiated Spurious Plot above 1GHz (n71 Standalone)



Plot 7-679. Radiated Spurious Plot above 1GHz (n71 + Anchor B66 EN-DC)



Plot 7-680. Radiated Spurious Plot above 1GHz (n71 + Anchor B2 EN-DC)

Sample #:	04097
Bandwidth (MHz):	20
Frequency (MHz):	673.0
RB / Offset:	1 / 53
Anchor Band:	LTE Band 66

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1346.0	H	400	191	-75.76	-6.42	24.82	-70.44	-13.00	-57.44
2019.0	H	397	194	-75.50	-3.90	27.60	-67.66	-13.00	-54.66
2692.0	H	-	-	-76.91	-1.74	28.35	-66.91	-13.00	-53.91
3365.0	H	-	-	-77.02	0.76	30.74	-64.52	-13.00	-51.52

Table 7-25. Radiated Spurious Data (n71 Anchor B66 EN-DC – Low Channel)

Sample #:	04097
Bandwidth (MHz):	20
Frequency (MHz):	680.5
RB / Offset:	1 / 53
Anchor Band:	LTE Band 66

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1361.0	H	359	326	-74.61	-6.38	26.01	-69.25	-13.00	-56.25
2041.5	H	389	330	-76.03	-3.65	27.32	-67.94	-13.00	-54.94
2722.0	H	-	-	-76.29	-1.61	29.10	-66.16	-13.00	-53.16
3402.5	H	-	-	-76.75	0.75	31.00	-64.25	-13.00	-51.25

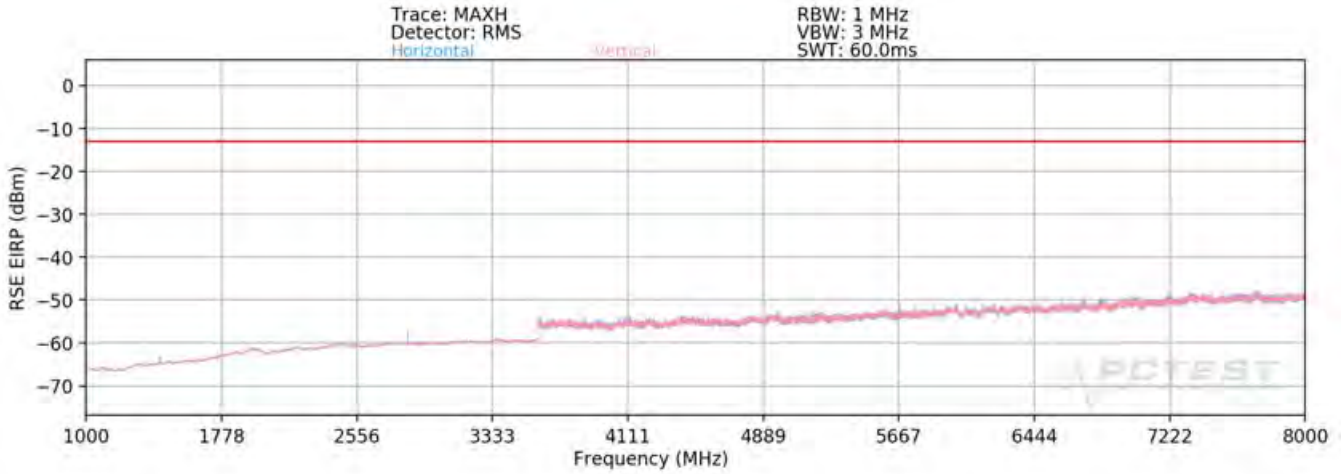
Table 7-26. Radiated Spurious Data (n71 Anchor B66 EN-DC – Mid Channel)

Sample #:	04097
Bandwidth (MHz):	20
Frequency (MHz):	688.0
RB / Offset:	1 / 53
Anchor Band:	LTE Band 66

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1376.0	H	157	327	-67.66	-6.23	33.11	-62.14	-13.00	-49.14
2064.0	H	400	331	-76.04	-3.60	27.36	-67.89	-13.00	-54.89
2752.0	H	356	318	-76.07	-2.23	28.70	-66.55	-13.00	-53.55
3440.0	H	-	-	-76.80	0.05	30.25	-65.01	-13.00	-52.01
4128.0	H	-	-	-77.65	2.31	31.66	-63.59	-13.00	-50.59

Table 7-27. Radiated Spurious Data (n71 Anchor B66 EN-DC – High Channel)

Band 12



Plot 7-681. Radiated Spurious Plot above 1GHz (Band 12)

OPERATING FREQUENCY:	701.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1403.00	H	133	15	-64.80	2.65	-62.14	-49.1
2104.50	H	117	360	-66.87	3.56	-63.31	-50.3
2806.00	H	150	319	-61.63	4.94	-56.69	-43.7
3507.50	H	-	-	-68.01	6.34	-61.67	-48.7
4209.00	H	-	-	-68.83	7.72	-61.10	-48.1

Table 7-28. Radiated Spurious Data (Band 12 – Low Channel)

OPERATING FREQUENCY:	707.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1415.00	H	220	148	-67.10	2.80	-64.30	-51.3
2122.50	H	215	359	-66.37	3.57	-62.79	-49.8
2830.00	H	118	318	-61.87	5.02	-56.85	-43.8
3537.50	H	-	-	-68.11	6.31	-61.80	-48.8
4245.00	H	-	-	-68.28	7.80	-60.48	-47.5

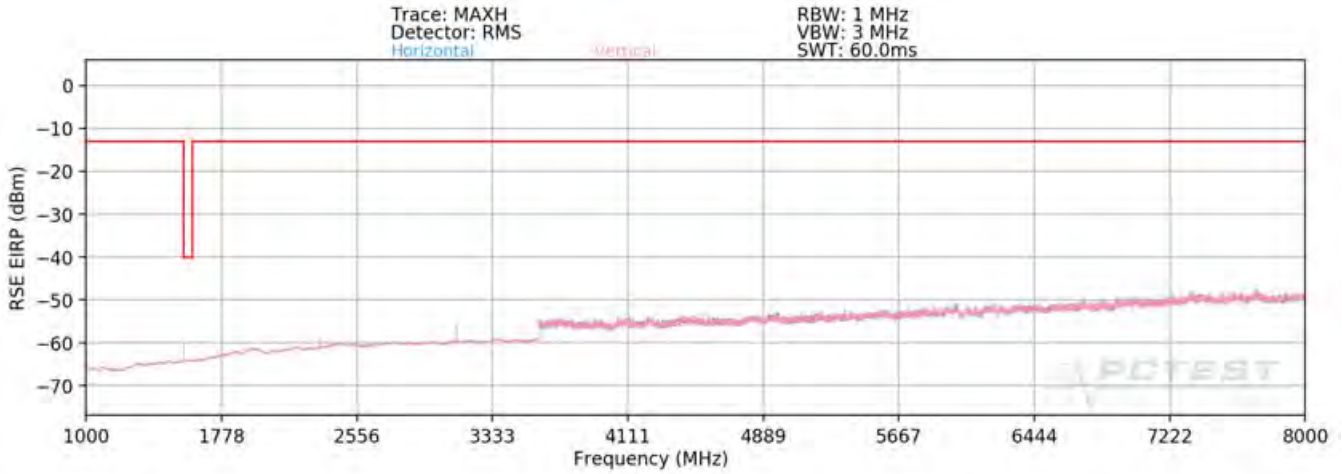
Table 7-29. Radiated Spurious Data (Band 12 – Mid Channel)

OPERATING FREQUENCY:	713.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1427.00	H	115	141	-66.24	2.94	-63.29	-50.3
2140.50	H	148	14	-66.38	3.59	-62.79	-49.8
2854.00	H	107	308	-62.45	5.10	-57.35	-44.3
3567.50	H	-	-	-68.19	6.35	-61.85	-48.8
4281.00	H	-	-	-68.86	7.88	-60.99	-48.0

Table 7-30. Radiated Spurious Data (Band 12 – High Channel)

Band 13



Plot 7-682. Radiated Spurious Plot above 1GHz (Band 13)

OPERATING FREQUENCY:	782.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	H	149	143	-62.29	4.00	-58.29	-45.3
3128.00	H	102	226	-61.48	5.38	-56.10	-43.1
3910.00	H	-	-	-68.68	7.09	-61.59	-48.6
4692.00	H	-	-	-69.03	8.37	-60.67	-47.7

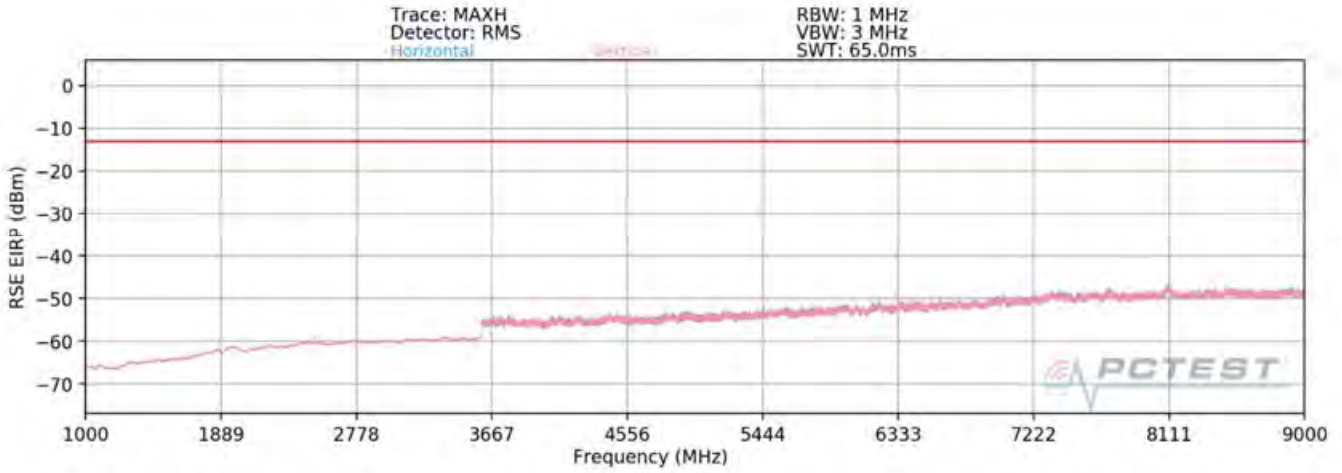
Table 7-31. Radiated Spurious Data (Band 13 – Mid Channel)

MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.00	MHz
DISTANCE:	3	meters
NARROWBAND EMISSION LIMIT:	-50	dBm
WIDEBAND EMISSION LIMIT:	-40	dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	H	136	29	-59.96	3.53	-56.43	-16.4

Table 7-32. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

Band 26/5



Plot 7-683. Radiated Spurious Plot above 1GHz (Band 26/5)

OPERATING FREQUENCY:	829.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1658.00	H	150	335	-63.07	3.61	-59.46	-46.5
2487.00	H	199	156	-60.01	4.25	-55.76	-42.8
3316.00	H	175	218	-65.87	5.83	-60.04	-47.0
4145.00	H	-	-	-68.76	7.66	-61.09	-48.1
4974.00	H	-	-	-69.04	8.56	-60.47	-47.5

Table 7-33. Radiated Spurious Data (Band 26/5 – Low Channel)

OPERATING FREQUENCY:	836.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	115	38	-66.23	3.62	-62.61	-49.6
2509.50	H	164	155	-62.00	4.33	-57.66	-44.7
3346.00	H	157	215	-66.85	5.92	-60.93	-47.9
4182.50	H	-	-	-68.94	7.69	-61.24	-48.2
5019.00	H	-	-	-69.02	8.56	-60.46	-47.5

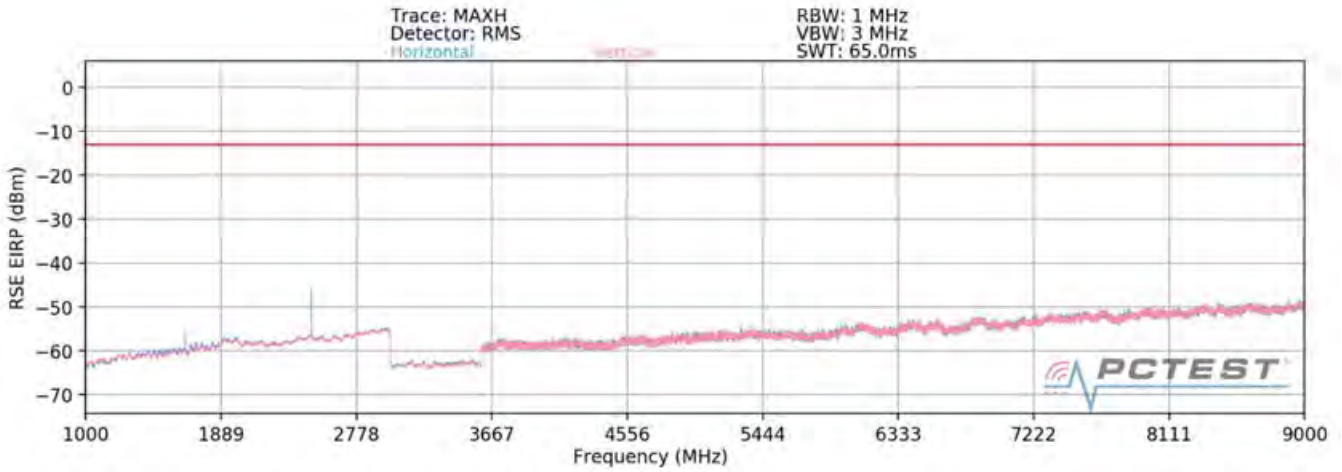
Table 7-34. Radiated Spurious Data (Band 26/5 – Mid Channel)

OPERATING FREQUENCY:	844.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

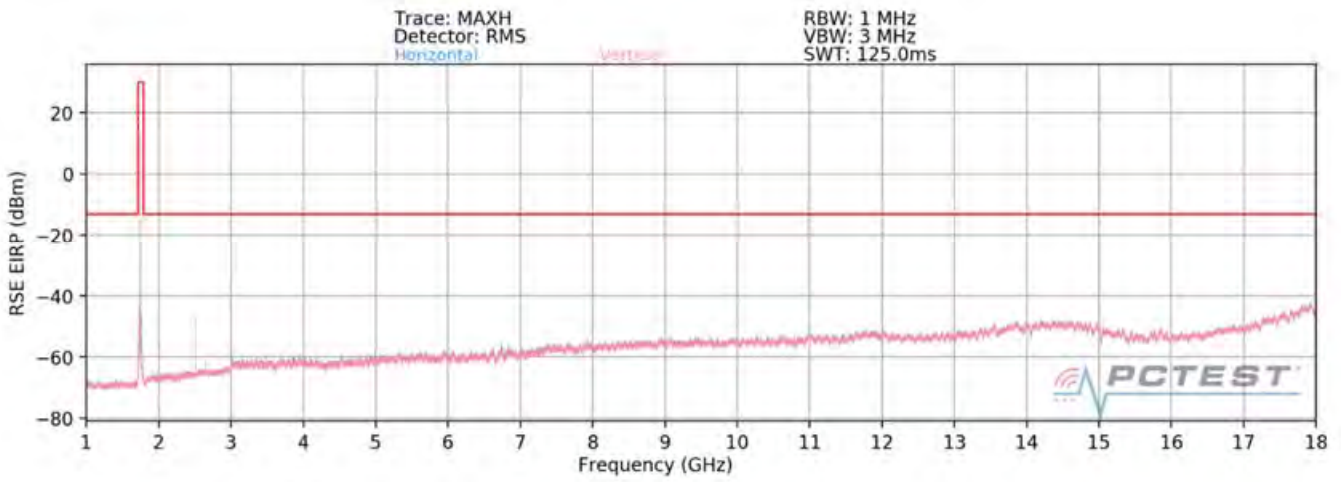
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1688.00	H	147	44	-65.69	3.63	-62.06	-49.1
2532.00	H	148	155	-60.99	4.47	-56.52	-43.5
3376.00	H	169	208	-66.94	6.05	-60.89	-47.9
4220.00	H	-	-	-68.64	7.75	-60.89	-47.9
5064.00	H	-	-	-69.11	8.59	-60.52	-47.5

Table 7-35. Radiated Spurious Data (Band 26/5 – High Channel)

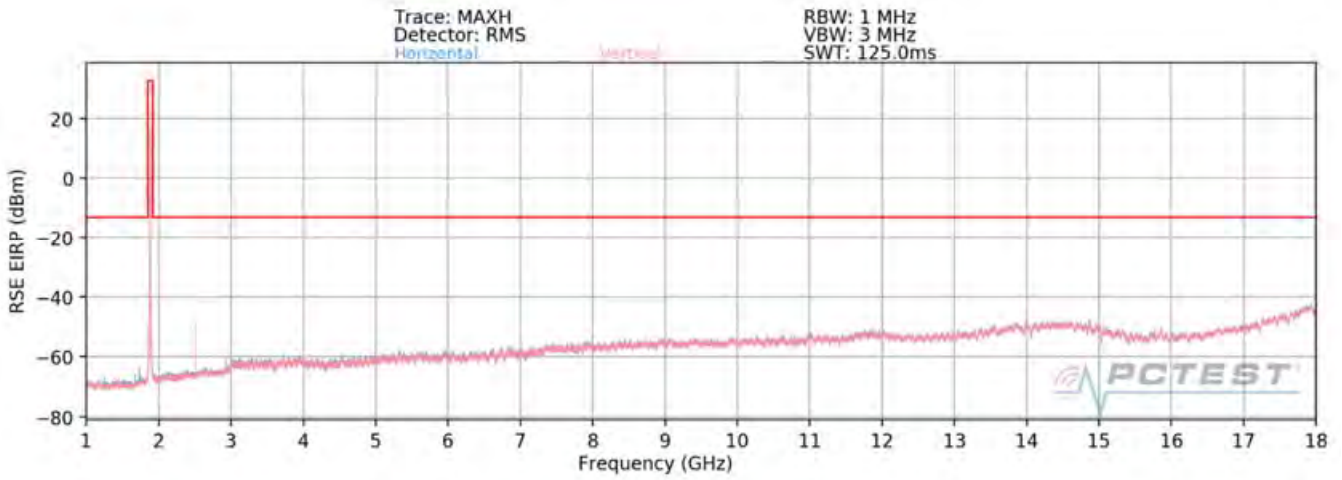
Band n5 (66/2 Anchors)



Plot 7-684. Radiated Spurious Plot above 1GHz (Band n5)



Plot 7-685. Radiated Spurious Plot above 1GHz (EN-DC Band n5 + B66)



Plot 7-686. Radiated Spurious Plot above 1GHz (EN-DC Band n5 + B2)

Bandwidth (MHz):	20
Frequency (MHz):	834.0
RB / Offset:	1 / 53
Mode:	EN-DC
Anchor Band:	LTE Band 2

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1668.0	V	385	214	-73.91	-6.21	26.88	-68.38	-13.00	-55.38
2502.0	V	387	179	-63.83	-2.83	40.34	-54.92	-13.00	-41.92
3336.0	V	-	-	-76.83	0.66	30.83	-64.42	-13.00	-51.42
4170.0	V	398	28	-77.20	2.40	32.20	-63.06	-13.00	-50.06
5004.0	V	-	-	-78.48	3.95	32.47	-62.79	-13.00	-49.79
5838.0	V	400	197	-76.19	5.70	36.51	-58.75	-13.00	-45.75
6672.0	V	-	-	-78.42	5.12	33.70	-61.55	-13.00	-48.55
7506.0	V	-	-	-79.10	9.02	36.92	-58.33	-13.00	-45.33

Table 7-36. Radiated Spurious Data (Band n5 Anchor B66 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	836.5
RB / Offset:	1 / 50
Mode:	EN-DC
Anchor Band:	LTE Band 2

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1673.0	V	384	216	-73.95	-6.21	26.84	-68.41	-13.00	-55.41
2509.5	V	383	180	-62.72	-2.57	41.71	-53.54	-13.00	-40.54
3346.0	V	-	-	-76.95	0.79	30.84	-64.42	-13.00	-51.42
4182.5	V	398	197	-77.00	2.47	32.47	-62.79	-13.00	-49.79
5019.0	V	-	-	-78.46	3.86	32.40	-62.86	-13.00	-49.86
5855.5	V	400	200	-75.34	4.95	36.61	-58.65	-13.00	-45.65
6692.0	V	-	-	-78.65	6.71	35.06	-60.20	-13.00	-47.20
7528.5	V	-	-	-78.72	8.92	37.20	-58.06	-13.00	-45.06

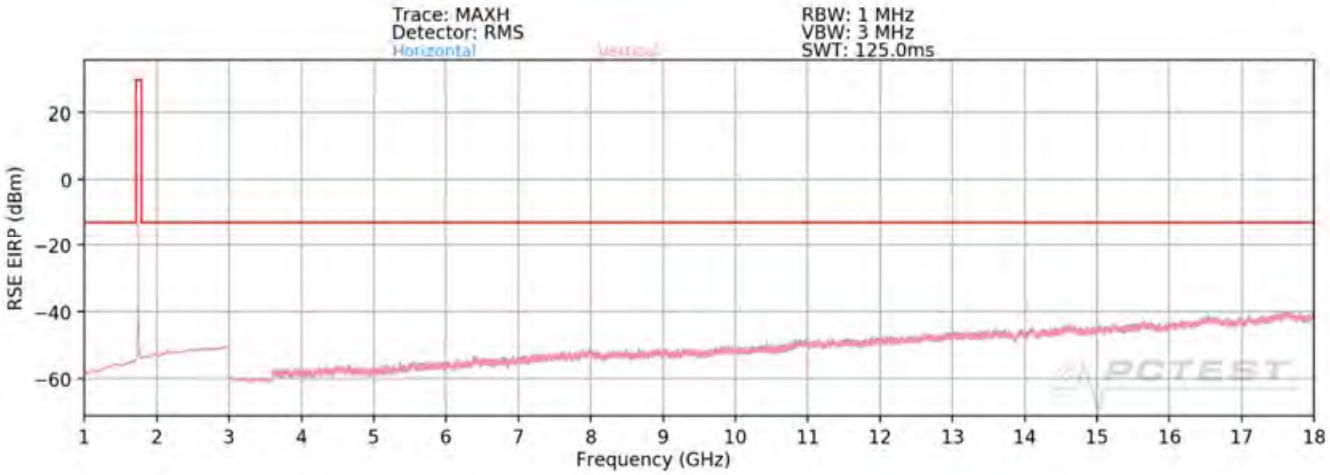
Table 7-37. Radiated Spurious Data (Band n5 Anchor B66 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	839.0
RB / Offset:	1 / 50
Mode:	EN-DC
Anchor Band:	LTE Band 2

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1678.0	V	391	214	-74.63	-6.20	26.17	-69.09	-13.00	-56.09
2517.0	V	383	181	-62.48	-2.31	42.21	-53.04	-13.00	-40.04
3356.0	V	-	-	-77.19	0.90	30.71	-64.55	-13.00	-51.55
4195.0	V	400	184	-77.56	2.45	31.89	-63.37	-13.00	-50.37
5034.0	V	-	-	-78.21	4.13	32.92	-62.34	-13.00	-49.34
5873.0	V	400	203	-75.36	5.61	37.25	-58.01	-13.00	-45.01
6712.0	V	-	-	-78.60	7.54	35.94	-59.32	-13.00	-46.32
7551.0	V	-	-	-78.97	9.67	37.70	-57.56	-13.00	-44.56

Table 7-38. Radiated Spurious Data (Band n5 Anchor B66 – High Channel)

Band 66/4



Plot 7-687. Radiated Spurious Plot above 1GHz (Band 66/4)

OPERATING FREQUENCY:	1720.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3440.00	H	157	177	-66.49	6.22	-60.27	-47.3
5160.00	H	-	-	-68.38	8.68	-59.70	-46.7
6880.00	H	-	-	-65.61	8.76	-56.86	-43.9

Table 7-39. Radiated Spurious Data (Band 66/4 – Low Channel)

OPERATING FREQUENCY:	1745.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3490.00	H	258	208	-66.15	6.32	-59.83	-46.8
5235.00	H	-	-	-68.72	8.71	-60.01	-47.0
6980.00	H	-	-	-65.56	8.74	-56.82	-43.8

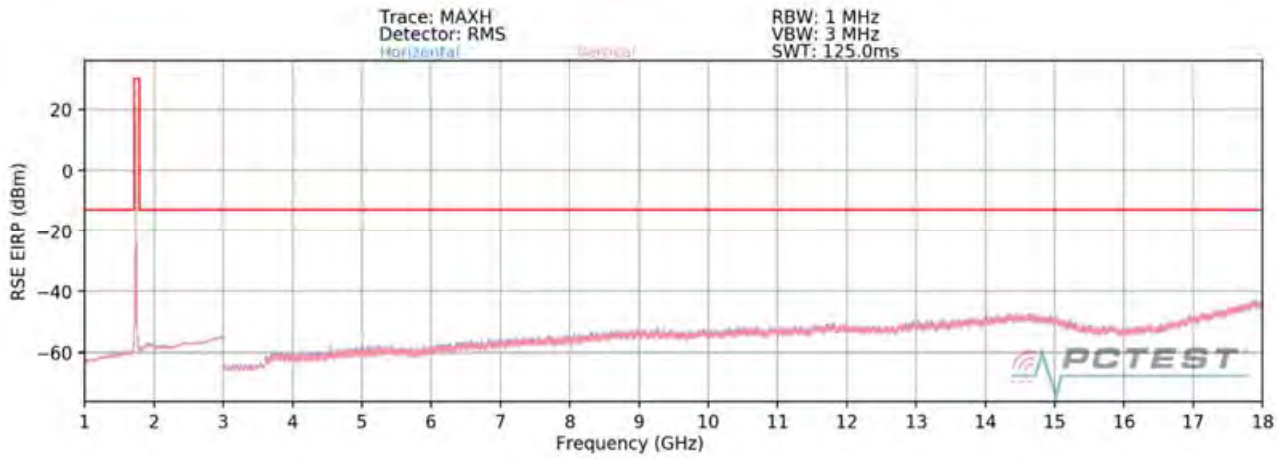
Table 7-40. Radiated Spurious Data (Band 66/4 – Mid Channel)

OPERATING FREQUENCY:	1770.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

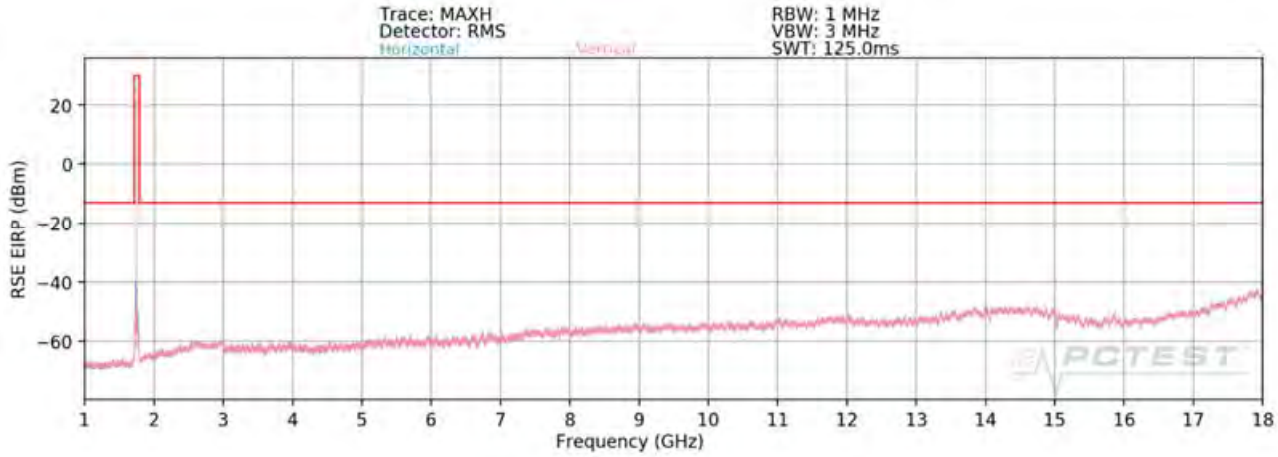
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3540.00	H	112	157	-66.65	6.31	-60.34	-47.3
5310.00	H	-	-	-69.01	8.74	-60.27	-47.3
7080.00	H	-	-	-65.58	8.66	-56.92	-43.9

Table 7-41. Radiated Spurious Data (Band 66/4 – High Channel)

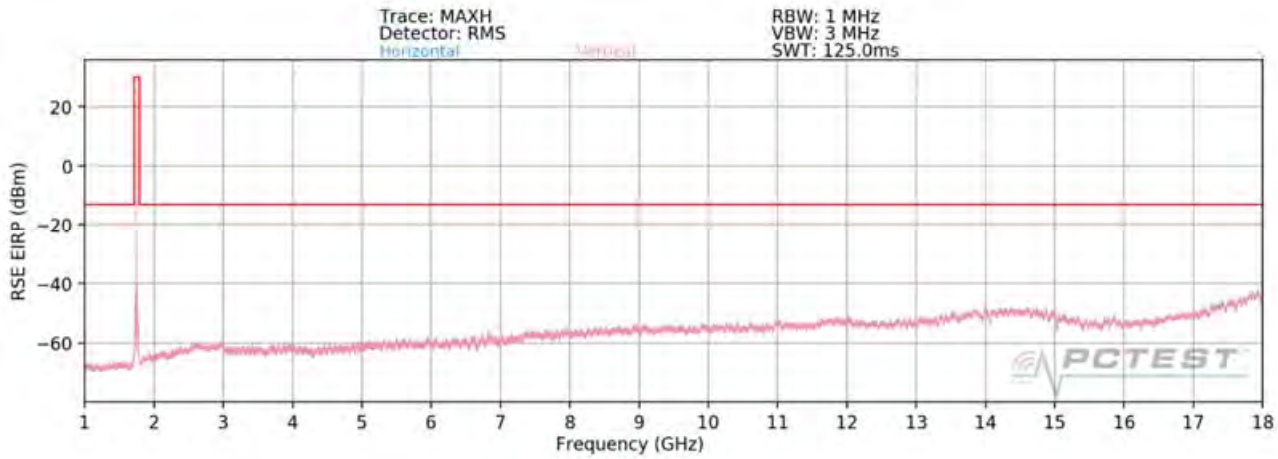
NR Band n66 (12/13/5 Anchors)



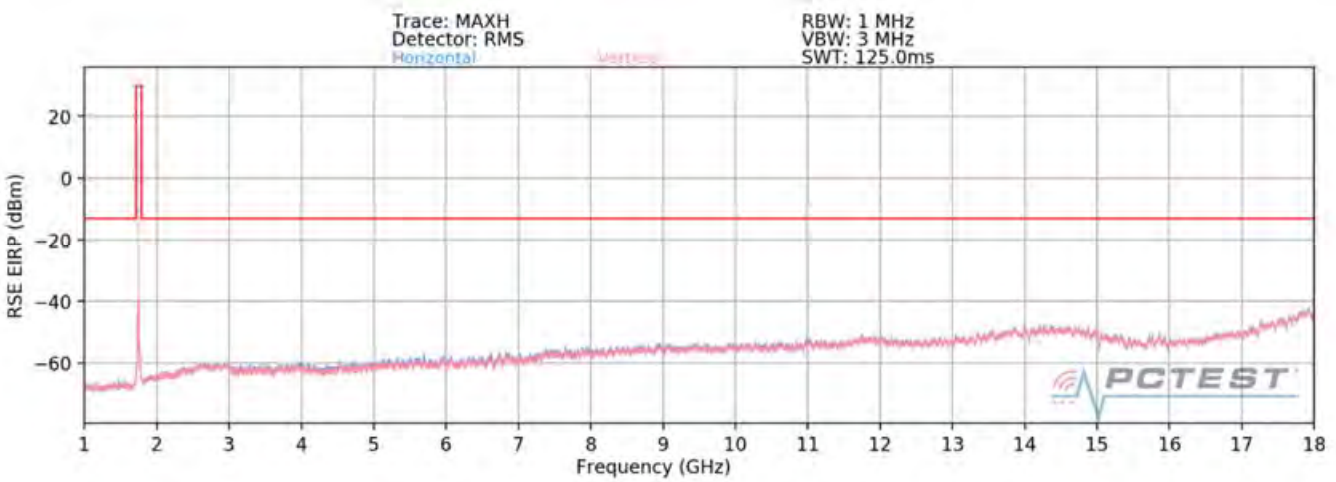
Plot 7-688. Radiated Spurious Plot above 1GHz (n66 Standalone)



Plot 7-689. Radiated Spurious Plot above 1GHz (n66 Anchor B12 EN-DC)



Plot 7-690. Radiated Spurious Plot above 1GHz (n66 Anchor B12 EN-DC)



Plot 7-691. Radiated Spurious Plot above 1GHz (n66 Anchor B5 EN-DC)

Bandwidth (MHz):	20
Frequency (MHz):	1860.0
RB / Offset:	1 / 50
Mode:	EN-DC
Anchor Band:	LTE Band 5

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
2509.5	H	262	312	-71.45	-2.56	32.99	-62.27	-13.00	-49.27
3440.0	V	397	164	-75.99	1.29	32.30	-62.96	-13.00	-49.96
5160.0	V	-	-	-77.87	4.50	33.63	-61.62	-13.00	-48.62
6880.0	V	-	-	-78.45	7.76	36.31	-58.95	-13.00	-45.95

Table 7-42. Radiated Spurious Data (n66 Anchor B5 EN-DC – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1880.0
RB / Offset:	1 / 50
Mode:	EN-DC
Anchor Band:	LTE Band 5

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
2509.5	H	112	305	-67.44	-2.56	37.00	-58.26	-13.00	-45.26
3490.0	V	400	171	-75.26	1.11	32.85	-62.41	-13.00	-49.41
5235.0	V	-	-	-77.89	4.96	34.07	-61.19	-13.00	-48.19
6980.0	V	-	-	-78.05	6.31	35.26	-60.00	-13.00	-47.00

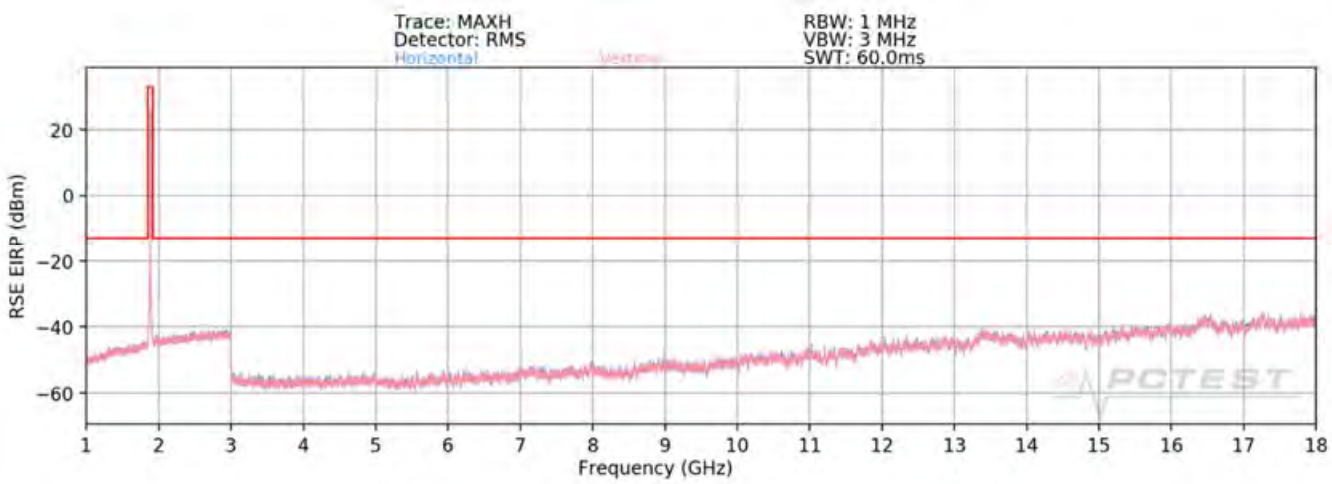
Table 7-43. Radiated Spurious Data (n66 Anchor B5 EN-DC – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1900.0
RB / Offset:	1 / 50
Mode:	EN-DC
Anchor Band:	LTE Band 5

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
2509.5	H	113	311	-71.44	-2.56	33.00	-62.26	-13.00	-49.26
3540.0	V	131	145	-75.16	1.42	33.26	-61.99	-13.00	-48.99
5310.0	V	-	-	-77.42	4.99	34.57	-60.68	-13.00	-47.68
7080.0	V	-	-	-78.36	6.30	34.94	-60.31	-13.00	-47.31

Table 7-44. Radiated Spurious Data (n66 Anchor B5 EN-DC – High Channel)

Band 25/2



Plot 7-692. Radiated Spurious Plot above 1GHz (Band 25/2)

OPERATING FREQUENCY:	1860.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3720.00	H	141	151	-68.80	6.58	-62.22	-49.2
5580.00	H	-	-	-71.52	8.74	-62.78	-49.8
7440.00	H	-	-	-67.83	8.41	-59.42	-46.4
9300.00	H	-	-	-67.04	9.33	-57.71	-44.7

Table 7-45. Radiated Spurious Data (Band 25/2 – Low Channel)

OPERATING FREQUENCY:	1882.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3765.00	H	126	232	-66.09	6.70	-59.40	-46.4
5647.50	H	-	-	-70.80	8.83	-61.97	-49.0
7530.00	H	-	-	-67.32	8.46	-58.86	-45.9
9412.50	H	-	-	-67.69	9.32	-58.37	-45.4

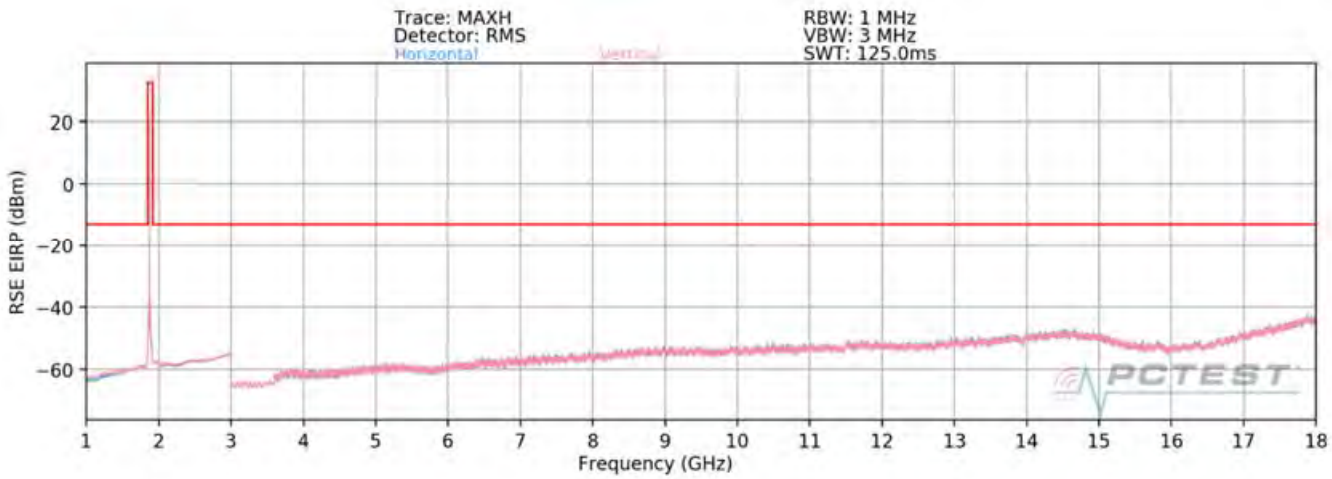
Table 7-46. Radiated Spurious Data (Band 25/2 – Mid Channel)

OPERATING FREQUENCY:	1905.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

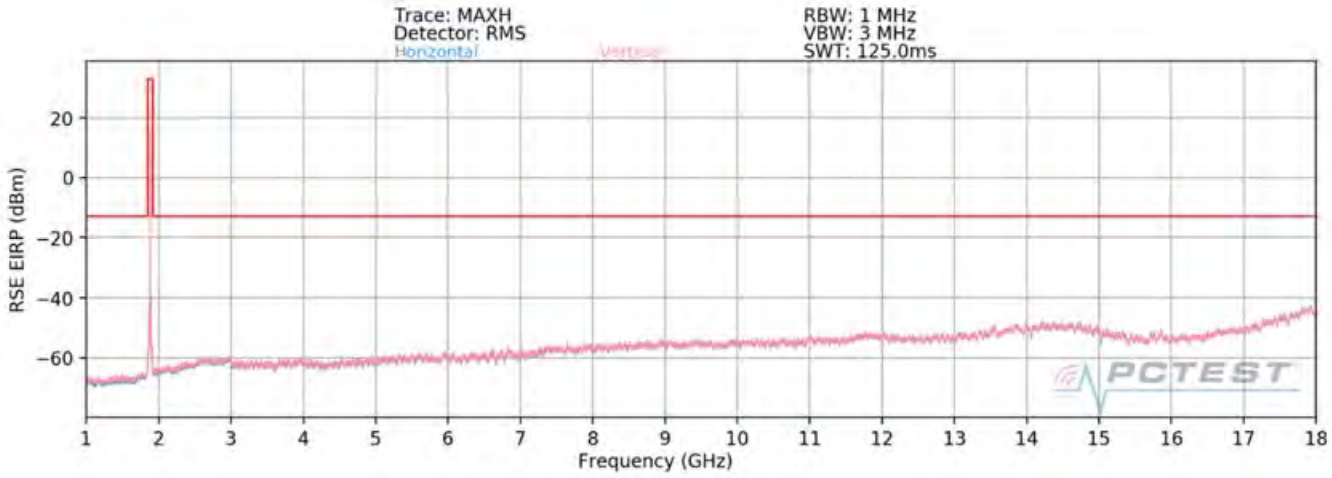
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3810.00	H	129	152	-68.72	6.94	-61.79	-48.8
5715.00	H	-	-	-70.73	8.77	-61.96	-49.0
7620.00	H	-	-	-67.56	8.51	-59.05	-46.1
9525.00	H	-	-	-67.43	9.40	-58.03	-45.0

Table 7-47. Radiated Spurious Data (Band 25/2 – High Channel)

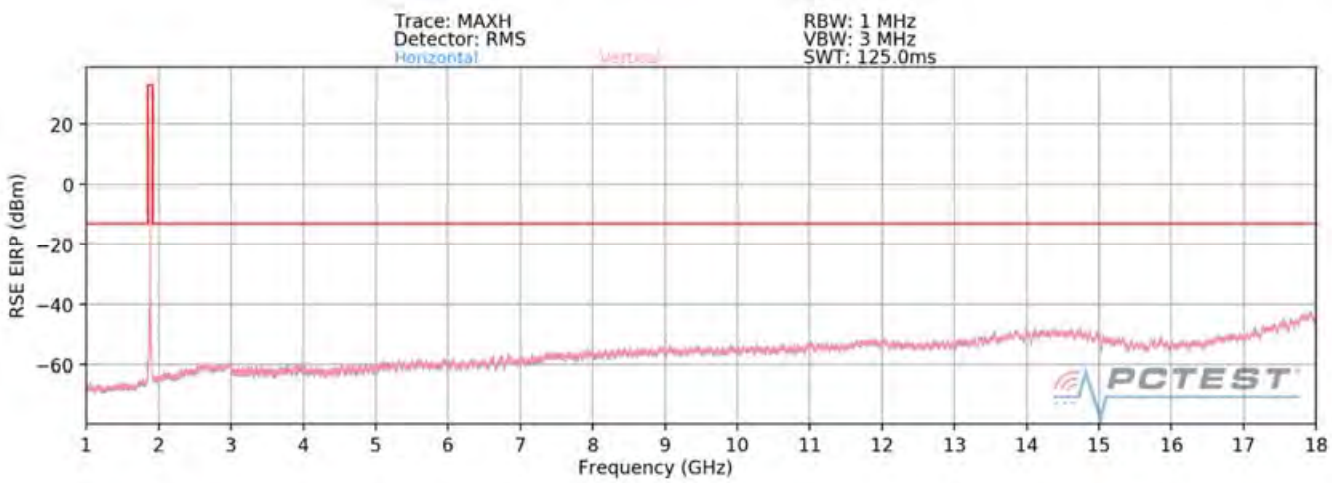
NR Band n25/2 (5/12/13 Anchors)



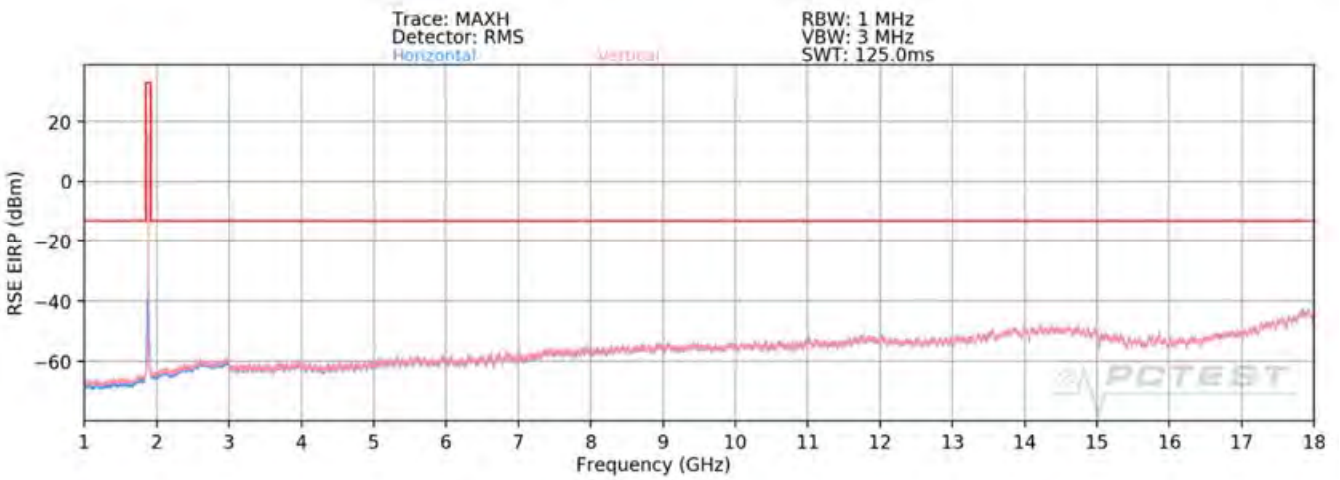
Plot 7-693. Radiated Spurious Plot above 1GHz (n25/2 Standalone)



Plot 7-694. Radiated Spurious Plot above 1GHz (n25/2 Anchor B12 EN-DC)



Plot 7-695. Radiated Spurious Plot above 1GHz (n25/2 Anchor B13 EN-DC)



Plot 7-696. Radiated Spurious Plot above 1GHz (n25/2 Anchor B5 EN-DC)

Bandwidth (MHz):	20
Frequency (MHz):	1860.0
RB / Offset:	1 / 50
Mode:	EN-DC
Anchor Band:	LTE Band 13

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3720.0	V	400	267	-76.64	3.20	33.56	-61.69	-13.00	-48.69
5580.0	V	-	-	-78.01	5.57	34.56	-60.69	-13.00	-47.69
7440.0	V	-	-	-78.54	8.58	37.04	-58.22	-13.00	-45.22

Table 7-48. Radiated Spurious Data (n25/2 Anchor B13 EN-DC – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1880.0
RB / Offset:	1 / 50
Mode:	EN-DC
Anchor Band:	LTE Band 13

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3760.0	V	397	356	-74.98	2.16	34.18	-61.08	-13.00	-48.08
5640.0	V	-	-	-78.33	5.42	34.09	-61.16	-13.00	-48.16
7520.0	V	-	-	-78.53	8.87	37.34	-57.92	-13.00	-44.92

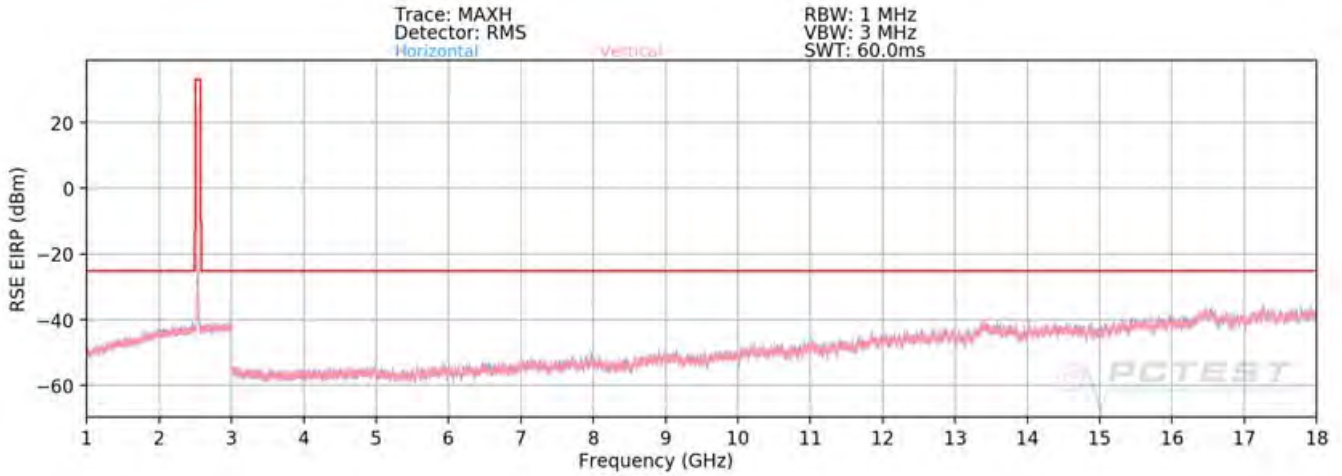
Table 7-49. Radiated Spurious Data (n25/2 Anchor B13 EN-DC – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1900.0
RB / Offset:	1 / 50
Mode:	EN-DC
Anchor Band:	LTE Band 13

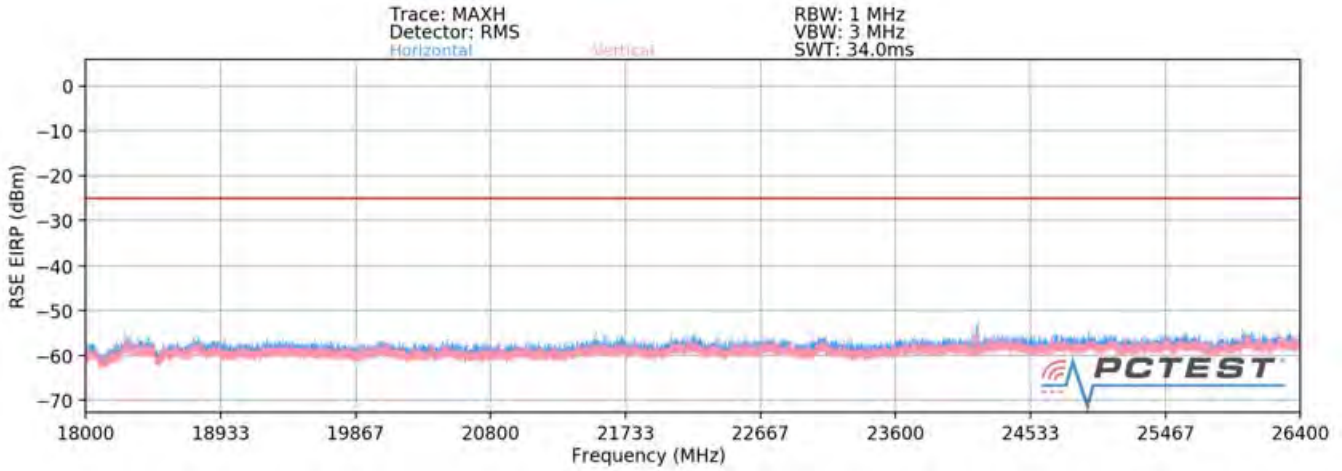
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3800.0	V	393	265	-74.92	2.91	34.99	-60.26	-13.00	-47.26
5700.0	V	-	-	-78.13	5.81	34.68	-60.58	-13.00	-47.58
7600.0	V	-	-	-78.65	8.23	36.58	-58.68	-13.00	-45.68

Table 7-50. Radiated Spurious Data (n25/2 Anchor B13 EN-DC – High Channel)

Band 7



Plot 7-697. Radiated Spurious Plot 1GHz - 18GHz (Band 7)



Plot 7-698. Radiated Spurious Plot 18GHz – 26.5GHz (Band 7)

OPERATING FREQUENCY:	2510.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5020.00	H	170	155	-68.20	8.56	-59.64	-34.6
7530.00	H	114	245	-68.13	8.46	-59.67	-34.7
10040.00	H	-	-	-65.21	9.85	-55.36	-30.4
12550.00	H	-	-	-60.66	9.06	-51.60	-26.6

Table 7-51. Radiated Spurious Data (Band 7 – Low Channel)

OPERATING FREQUENCY:	2535.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5070.00	H	111	222	-68.26	8.60	-59.66	-34.7
7605.00	H	-	-	-68.13	8.48	-59.65	-34.6
10140.00	H	-	-	-66.58	9.78	-56.80	-31.8
12675.00	H	-	-	-60.22	9.08	-51.15	-26.1

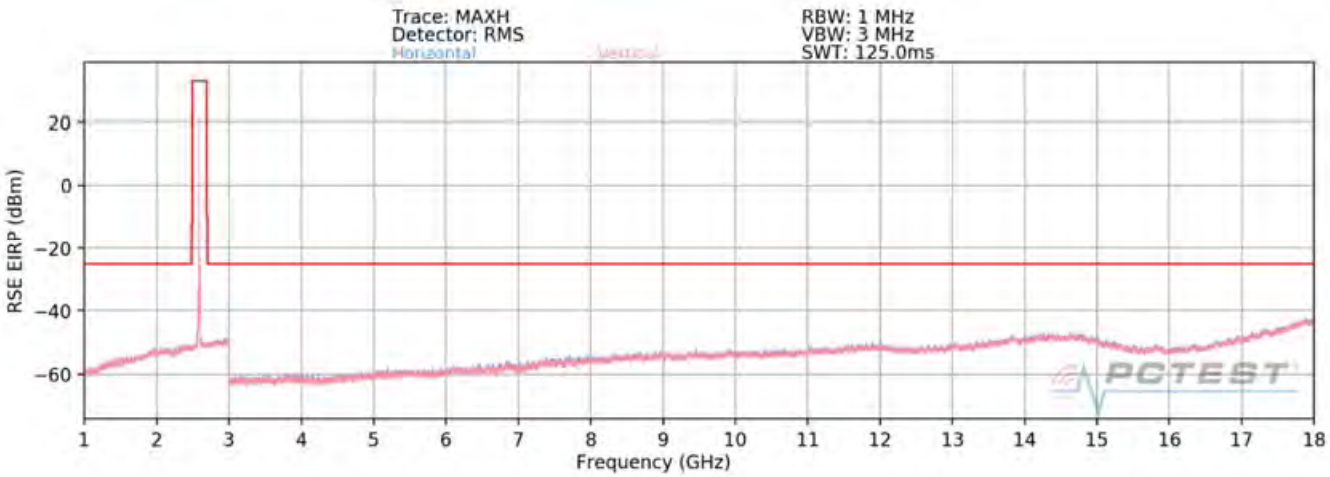
Table 7-52. Radiated Spurious Data (Band 7 – Mid Channel)

OPERATING FREQUENCY:	2560.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

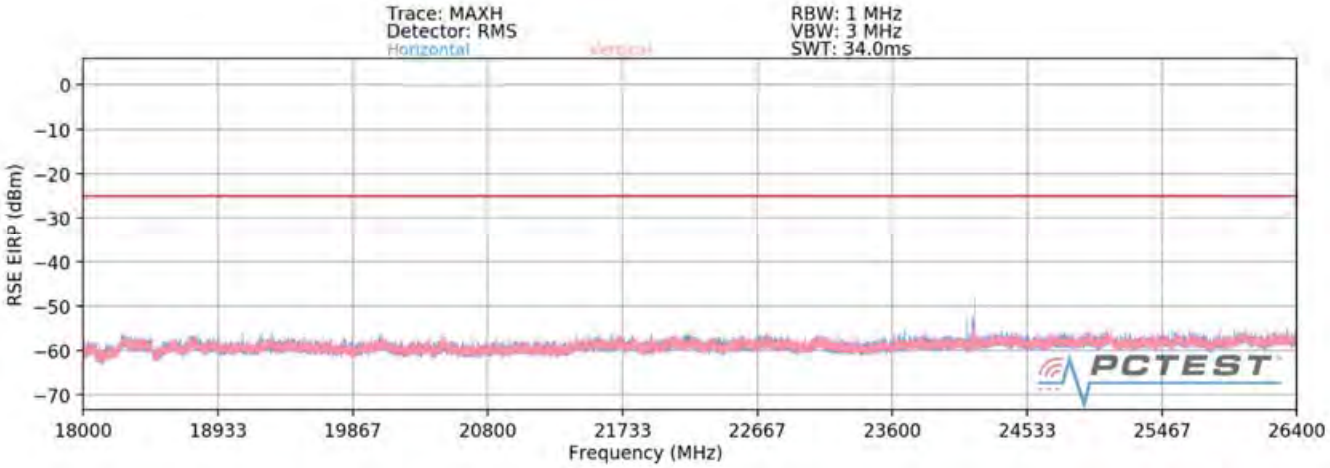
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5120.00	H	218	152	-68.72	8.66	-60.06	-35.1
7680.00	H	-	-	-67.74	8.58	-59.16	-34.2
10240.00	H	-	-	-65.63	9.65	-55.98	-31.0
12800.00	H	-	-	-60.79	9.07	-51.72	-26.7

Table 7-53. Radiated Spurious Data (Band 7 – High Channel)

Band 41 PC2



Plot 7-699. Radiated Spurious Plot 1GHz - 18GHz (Band 41 PC2)



Plot 7-700. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41 PC2)

OPERATING FREQUENCY:	2501.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5002.00	V	120	157	-60.16	8.78	-51.37	-26.4
7503.00	V	253	191	-55.99	9.31	-46.68	-21.7
10004.00	V	101	180	-56.18	9.78	-46.40	-21.4
12505.00	V	-	-	-51.81	8.80	-43.01	-18.0
15006.00	V	-	-	-49.64	8.89	-40.76	-15.8

Table 7-54. Radiated Spurious Data (Band 41 – Low Channel)

OPERATING FREQUENCY:	2593.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5186.00	V	-	-	-62.14	9.03	-53.12	-28.1
7779.00	V	-	-	-60.38	9.29	-51.09	-26.1
10372.00	V	-	-	-56.80	9.50	-47.30	-22.3

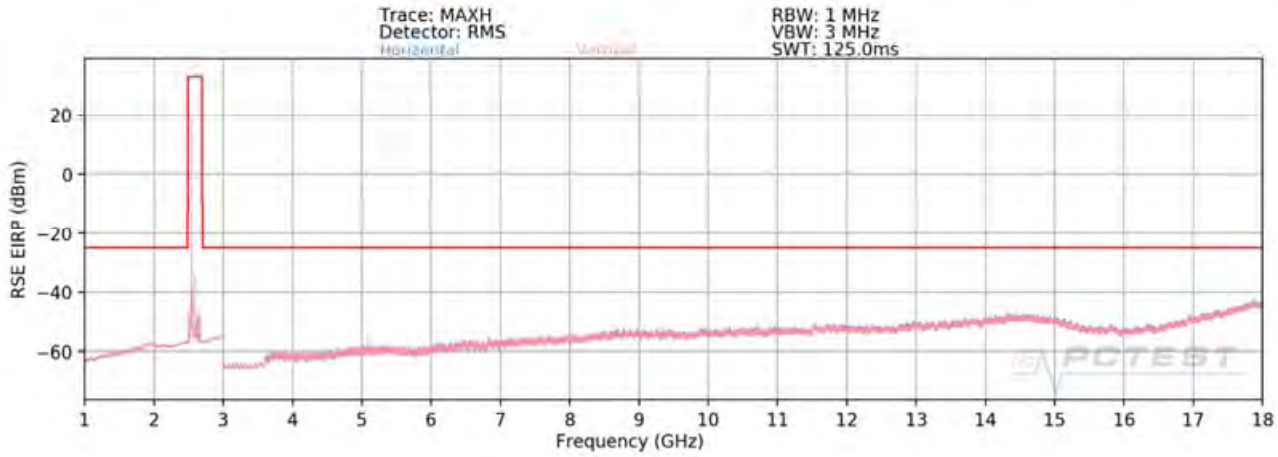
Table 7-55. Radiated Spurious Data (Band 41 – Mid Channel)

OPERATING FREQUENCY:	2685.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

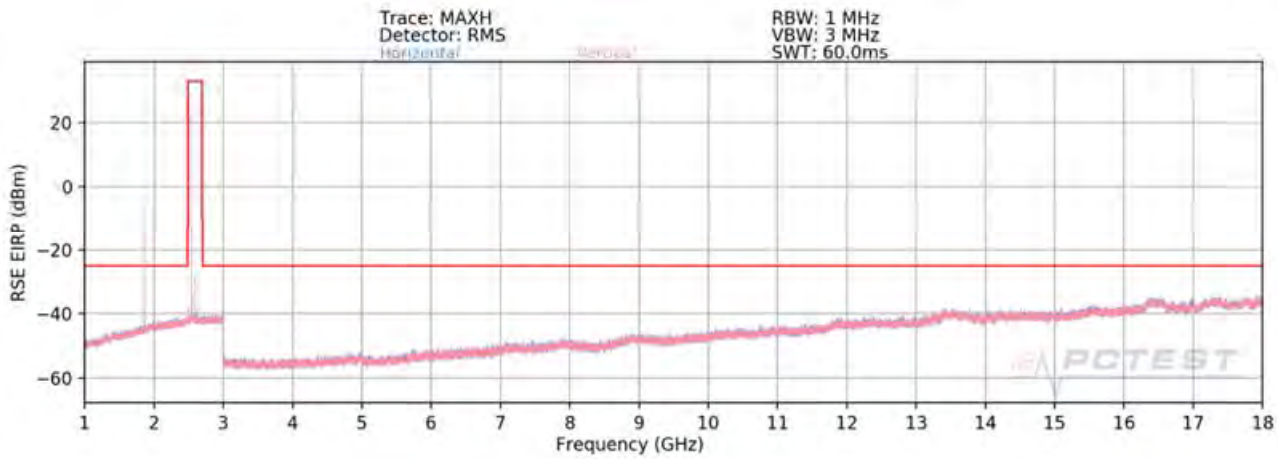
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5370.00	V	114	221	-51.56	8.99	-42.57	-17.6
8055.00	V	245	186	-53.58	9.35	-44.22	-19.2
10740.00	V	-	-	-57.72	9.39	-48.33	-23.3
13425.00	V	-	-	-49.96	8.67	-41.29	-16.3
16110.00	V	-	-	-46.73	8.46	-38.27	-13.3

Table 7-56. Radiated Spurious Data (Band 41 – High Channel)

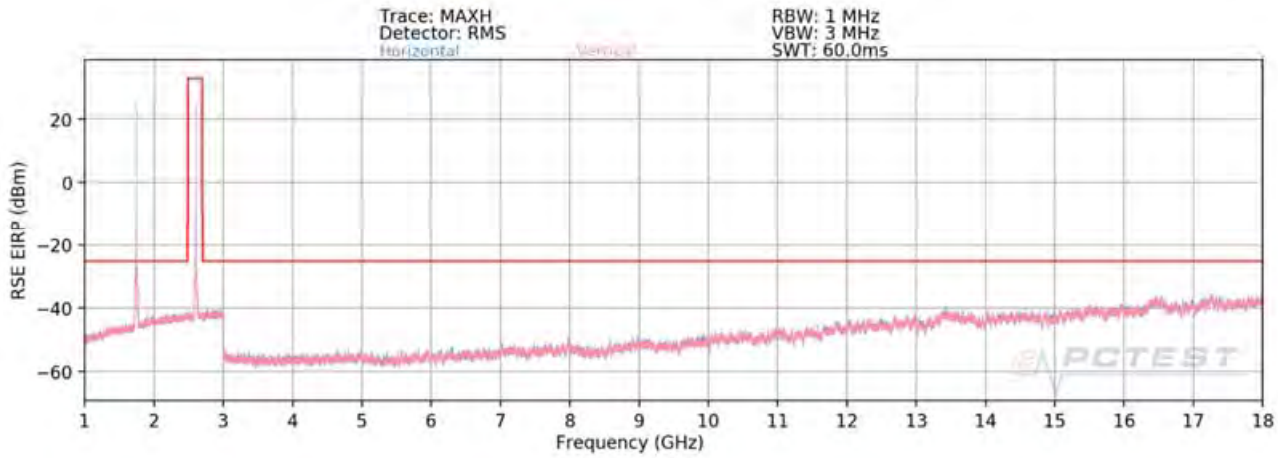
NR Band n41(25/66 Anchors)



Plot 7-701. Radiated Spurious Plot above 1GHz (n41 Standalone)



Plot 7-702. Radiated Spurious Plot above 1GHz (n41 + Anchor B25 EN-DC)



Plot 7-703. Radiated Spurious Plot above 1GHz (n41 + Anchor B66 EN-DC)

Bandwidth (MHz):	100
Frequency (MHz):	2546.0
RB / Offset:	1 / 0
Mode:	EN-DC
Anchor Band:	LTE Band 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1327.0	V	143	160	-53.65	2.07	55.42	-49.38	-25.00	-24.38
5092.0	V	400	226	-75.76	5.18	36.42	-68.38	-25.00	-43.38
7638.0	V	-	-	-77.20	9.45	39.25	-65.55	-25.00	-40.55
10184.0	V	-	-	-77.89	12.22	41.33	-63.47	-25.00	-38.47

Table 7-57. Radiated Spurious Data (Band n41 Anchor B25 – Low Channel)

Bandwidth (MHz):	100
Frequency (MHz):	2593.0
RB / Offset:	1 / 0
Mode:	EN-DC
Anchor Band:	LTE Band 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1440.9	V	184	105	-48.31	2.66	61.35	-43.45	-25.00	-18.45
5186.0	V	245	180	-75.26	4.87	36.61	-68.19	-25.00	-43.19
7779.0	V	-	-	-77.01	8.43	38.42	-66.38	-25.00	-41.38
10372.0	V	-	-	-77.99	11.45	40.46	-64.34	-25.00	-39.34

Table 7-58. Radiated Spurious Data (Band n41 Anchor B25 – Mid Channel)

Bandwidth (MHz):	100
Frequency (MHz):	2640.0
RB / Offset:	1 / 0
Mode:	EN-DC
Anchor Band:	LTE Band 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1514.5	V	134	97	-48.65	3.06	61.41	-43.39	-25.00	-18.39
5280.0	V	367	212	-76.30	3.92	34.62	-70.18	-25.00	-45.18
7920.0	V	-	-	-78.25	10.36	39.11	-65.69	-25.00	-40.69
10560.0	V	-	-	-78.48	11.30	39.82	-64.98	-25.00	-39.98

Table 7-59. Radiated Spurious Data (Band n41 Anchor B25– High Channel)

7.9 Uplink Carrier Aggregation Radiated Measurements

§2.1053, §27.53(m)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 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 peak measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW ≥ 3 x RBW
3. No. of sweep points ≥ 2 x span / RBW
4. Detector = RMS
5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
6. The trace was allowed to stabilize

Test Setup

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

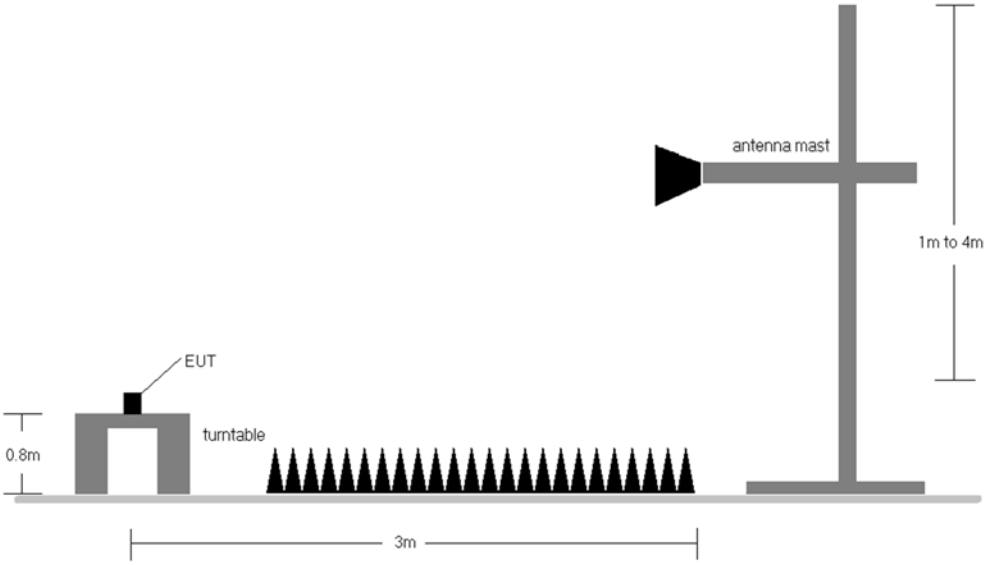


Figure 7-9. Test Instrument & Measurement Setup

Test Notes

1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.

2) This unit was tested with its standard battery.

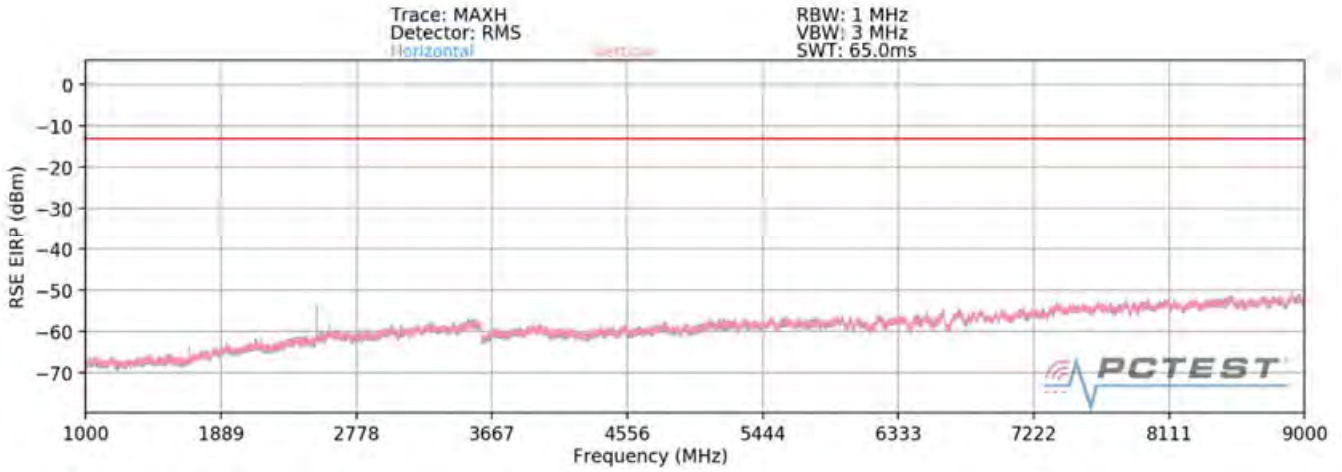
3) Radiated spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. The worst case (highest) emissions were found while operating with QPSK modulation with both carriers set to transmit using 1RB.

4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

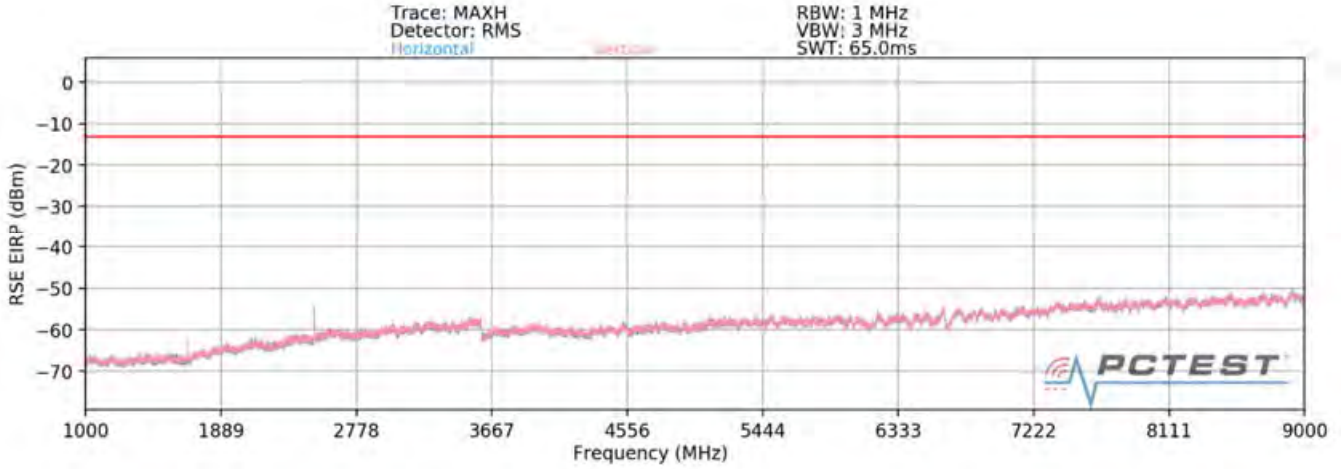
5) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

6) No significant emissions were found as a result of two uplink carriers operating contiguously.

Band 5 ULCA



Plot 7-60. Radiated Spurious Plot 1GHz – 18GHz (ULCA Band 5 Low Channel – PCC/SCC: 1RB)



Plot 7-61. Radiated Spurious Plot 1GHz – 18GHz (ULCA Band 5 High Channel – PCC/SCC: 1RB)

OPERATING FREQUENCY (PCC):	829.00	MHz
OPERATING FREQUENCY (SCC):	838.90	MHz
CHANNEL (PCC):	20450	
CHANNEL (SCC):	20549	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1658.00	H	145	45	-74.30	8.98	-65.32	-52.3
2487.00	H	333	53	-66.29	9.73	-56.56	-43.6
3316.00	H	398	237	-73.20	9.62	-63.58	-50.6
4145.00	H	398	46	-71.31	10.24	-61.06	-48.1
4974.00	H	-	-	-73.50	10.95	-62.55	-49.5
5803.00	H	-	-	-72.28	11.53	-60.75	-47.7

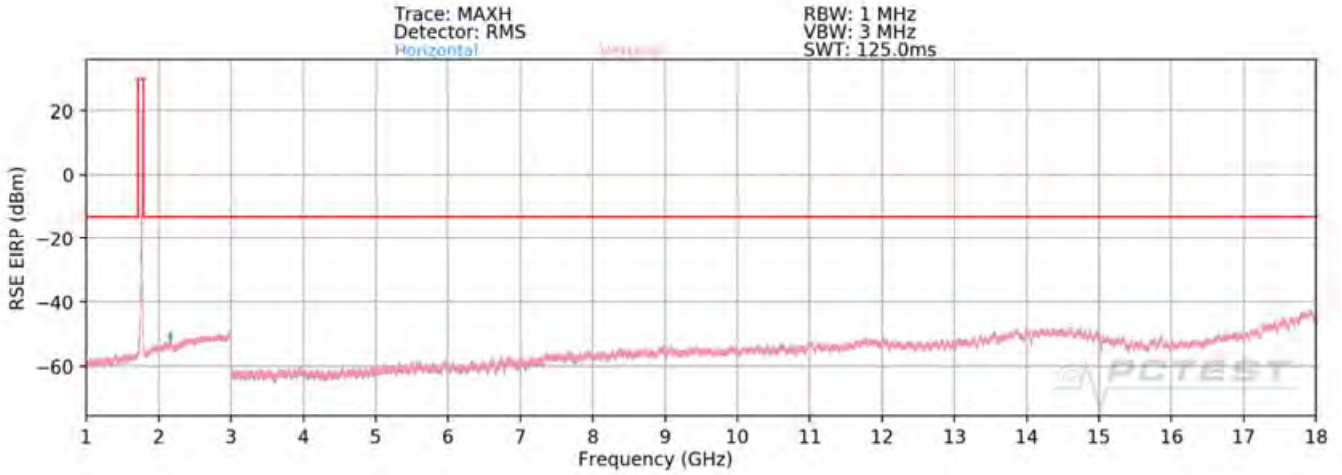
Plot 7-62. Radiated Spurious Data (ULCA B5 Left Carrier: RB 1 Offset 99, Right Carrier: RB 1 Offset 0)

OPERATING FREQUENCY (PCC):	844.00	MHz
OPERATING FREQUENCY (SCC):	834.10	MHz
CHANNEL (PCC):	20600	
CHANNEL (SCC):	20501	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

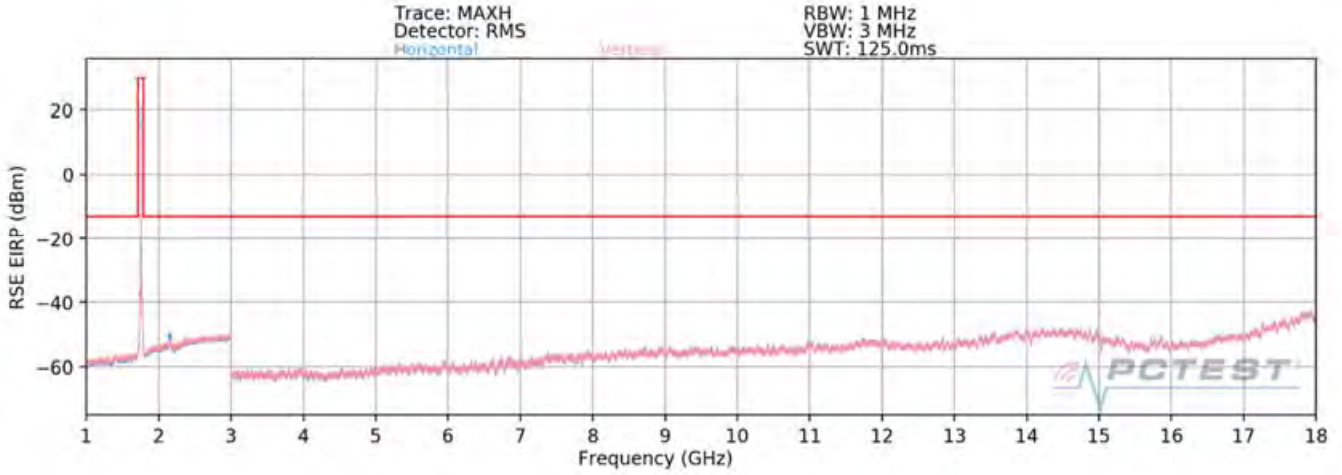
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1688.00	H	139	337	-73.88	8.98	-64.89	-51.9
2532.00	H	114	49	-64.89	9.78	-55.11	-42.1
3376.00	H	-	-	-73.86	9.74	-64.13	-51.1
4220.00	H	400	219	-73.28	10.51	-62.76	-49.8
5064.00	H	-	-	-72.82	10.79	-62.03	-49.0
5908.00	H	-	-	-72.31	11.48	-60.83	-47.8

Plot 7-63. Radiated Spurious Data (ULCA B5 Left Carrier: RB 1 Offset 0, Right Carrier: RB 1 Offset 99)

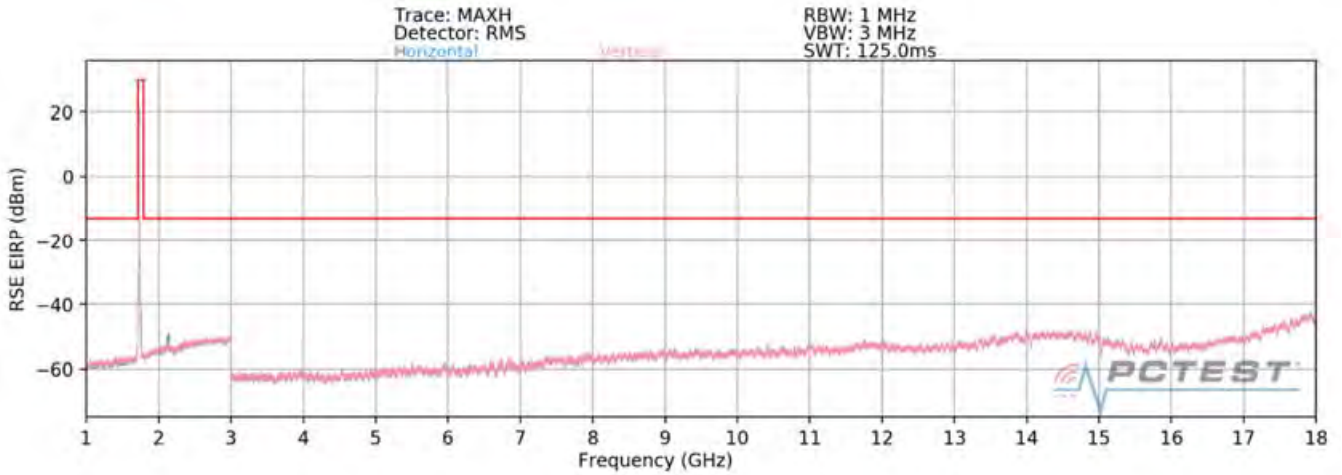
Band 66 ULCA



Plot 7-64. Radiated Spurious Plot 1GHz – 18GHz (ULCA Band 66 Low Channel – PCC/SCC: 1RB)



Plot 7-65. Radiated Spurious Plot 1GHz – 18GHz (ULCA Band 66 Mid Channel – PCC/SCC: 1RB))



Plot 7-66. Radiated Spurious Plot 1GHz – 18GHz (ULCA Band 66 High Channel – PCC/SCC: 1RB)

OPERATING FREQUENCY (PCC):	1720.00	MHz
OPERATING FREQUENCY (SCC):	1739.80	MHz
CHANNEL (PCC):	132072	
CHANNEL (SCC):	132270	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3440.00	H	175	177	-73.46	9.87	-63.59	-50.6
5160.00	H	-	-	-72.69	10.74	-61.95	-49.0
6880.00	H	-	-	-70.93	11.71	-59.22	-46.2
8600.00	H	-	-	-67.79	11.11	-56.68	-43.7

Plot 7-67. Radiated Spurious Data (ULCA B 66 Left Carrier: RB 1 Offset 99, Right Carrier: RB 1 Offset 0)

OPERATING FREQUENCY (PCC):	1745.00	MHz
OPERATING FREQUENCY (SCC):	1764.80	MHz
CHANNEL (PCC):	132322	
CHANNEL (SCC):	132520	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3490.00	H	181	172	-72.00	9.94	-62.06	-49.1
5235.00	H	-	-	-72.10	10.76	-61.34	-48.3
6980.00	H	-	-	-72.11	11.85	-60.25	-47.3
8725.00	H	-	-	-66.95	11.03	-55.92	-42.9

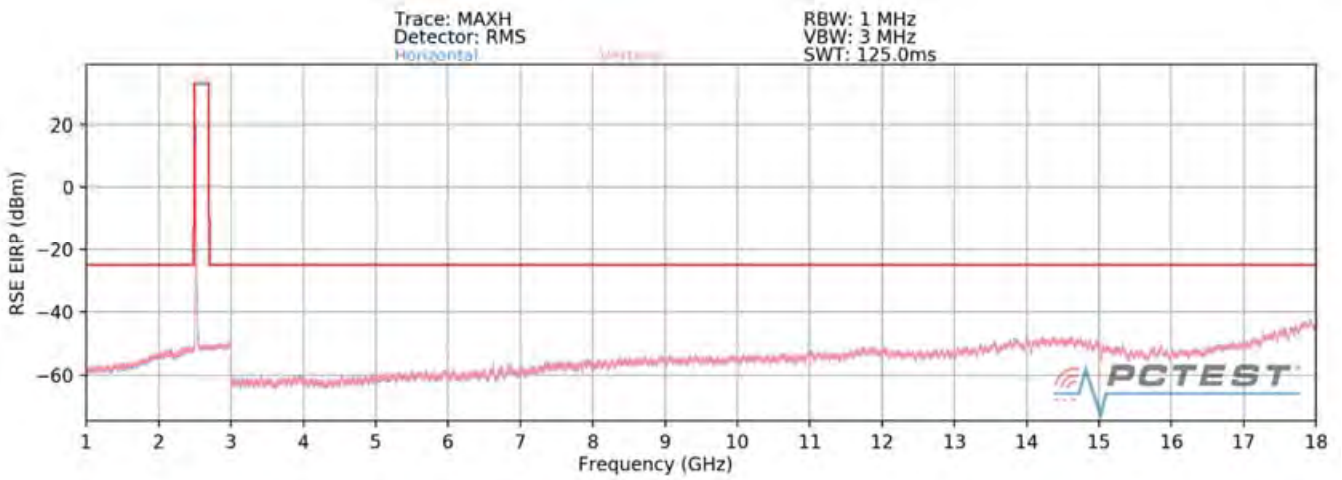
Plot 7-68. Radiated Spurious Data (ULCA B 66 Left Carrier: RB 1 Offset 99, Right Carrier: RB 1 Offset 0)

OPERATING FREQUENCY (PCC):	1770.00	MHz
OPERATING FREQUENCY (SCC):	1750.20	MHz
CHANNEL (PCC):	132572	
CHANNEL (SCC):	132374	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

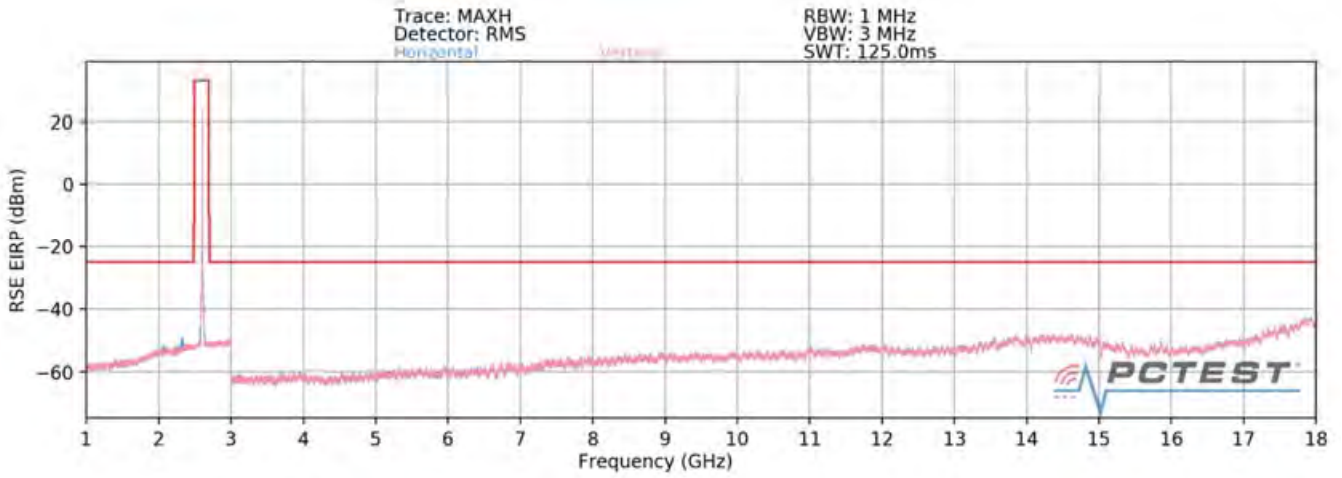
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3540.00	H	398	227	-72.08	9.92	-62.15	-49.2
5310.00	H	-	-	-72.13	10.72	-61.42	-48.4
7080.00	H	-	-	-72.03	11.82	-60.21	-47.2
8850.00	H	-	-	-67.47	11.02	-56.44	-43.4

Plot 7-69. Radiated Spurious Data (ULCA B 66 Left Carrier: RB 1 Offset 0, Right Carrier: RB 1 Offset 99)

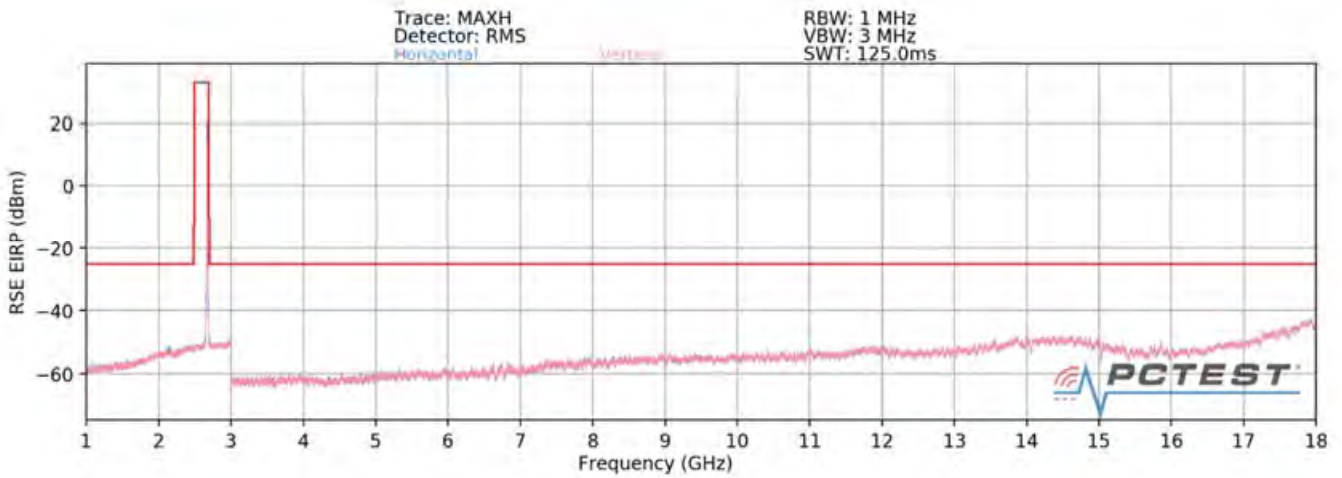
Band 41 ULCA



Plot 7-70. Radiated Spurious Plot 1GHz – 18GHz (ULCA Band 41 Low Channel – PCC/SCC: 1RB)



Plot 7-71. Radiated Spurious Plot 1GHz – 18GHz (ULCA Band 41 Mid Channel – PCC/SCC: 1RB))



Plot 7-72. Radiated Spurious Plot 1GHz – 18GHz (ULCA Band 41 High Channel – PCC/SCC: 1RB)

OPERATING FREQUENCY (PCC):	2506.00	MHz
OPERATING FREQUENCY (SCC):	2525.80	MHz
CHANNEL (PCC):	39750	
CHANNEL (SCC):	39948	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5012.00	V	400	214	-70.53	10.93	-59.60	-34.6
7518.00	V	-	-	-67.73	11.14	-56.59	-31.6
10024.00	V	-	-	-67.10	12.03	-55.07	-30.1
12530.00	V	-	-	-66.21	13.60	-52.61	-27.6

Plot 7-73. Radiated Spurious Data (ULCA B41 Left Carrier: RB 1 Offset 99, Right Carrier: RB 1 Offset 0)

OPERATING FREQUENCY (PCC):	2593.00	MHz
OPERATING FREQUENCY (SCC):	2612.80	MHz
CHANNEL (PCC):	40620	
CHANNEL (SCC):	40818	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5186.00	V	400	111	-67.49	10.77	-56.71	-31.7
7779.00	V	-	-	-68.15	11.47	-56.68	-31.7
10372.00	V	-	-	-67.25	12.48	-54.77	-29.8
12965.00	V	-	-	-65.74	13.34	-52.39	-27.4

Plot 7-74. Radiated Spurious Data (ULCA B41 Left Carrier: RB 1 Offset 99, Right Carrier: RB 1 Offset 0)

OPERATING FREQUENCY (PCC):	2680.00	MHz
OPERATING FREQUENCY (SCC):	2660.20	MHz
CHANNEL (PCC):	41490	
CHANNEL (SCC):	41292	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5360.00	V	395	112	-70.08	10.73	-59.36	-34.4
8040.00	V	-	-	-67.08	11.19	-55.89	-30.9
10720.00	V	-	-	-66.07	12.63	-53.44	-28.4
13400.00	V	-	-	-64.36	12.62	-51.74	-26.7

Plot 7-75. Radiated Spurious Data (ULCA B41 Left Carrier: RB 1 Offset 0, Right Carrier: RB 1 Offset 99)

7.10 Frequency Stability / Temperature Variation

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24, Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

Test Notes

None

Band 71 Frequency Stability Measurements

OPERATING FREQUENCY:	707,500,000	Hz
CHANNEL:	23790	
REFERENCE VOLTAGE:	4.33	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	707,500,046	46	0.0000065
100 %		- 20	707,499,941	-59	-0.0000083
100 %		- 10	707,500,136	136	0.0000192
100 %		0	707,500,049	49	0.0000069
100 %		+ 10	707,499,791	-209	-0.0000295
100 %		+ 20	707,500,021	21	0.0000030
100 %		+ 30	707,499,740	-260	-0.0000367
100 %		+ 40	707,500,109	109	0.0000154
100 %		+ 50	707,500,113	113	0.0000160
BATT. ENDPOINT	3.38	+ 20	707,499,956	-44	-0.0000062

Table 7-76. Frequency Stability Data (Band 71)

Band 71 Frequency Stability Measurements

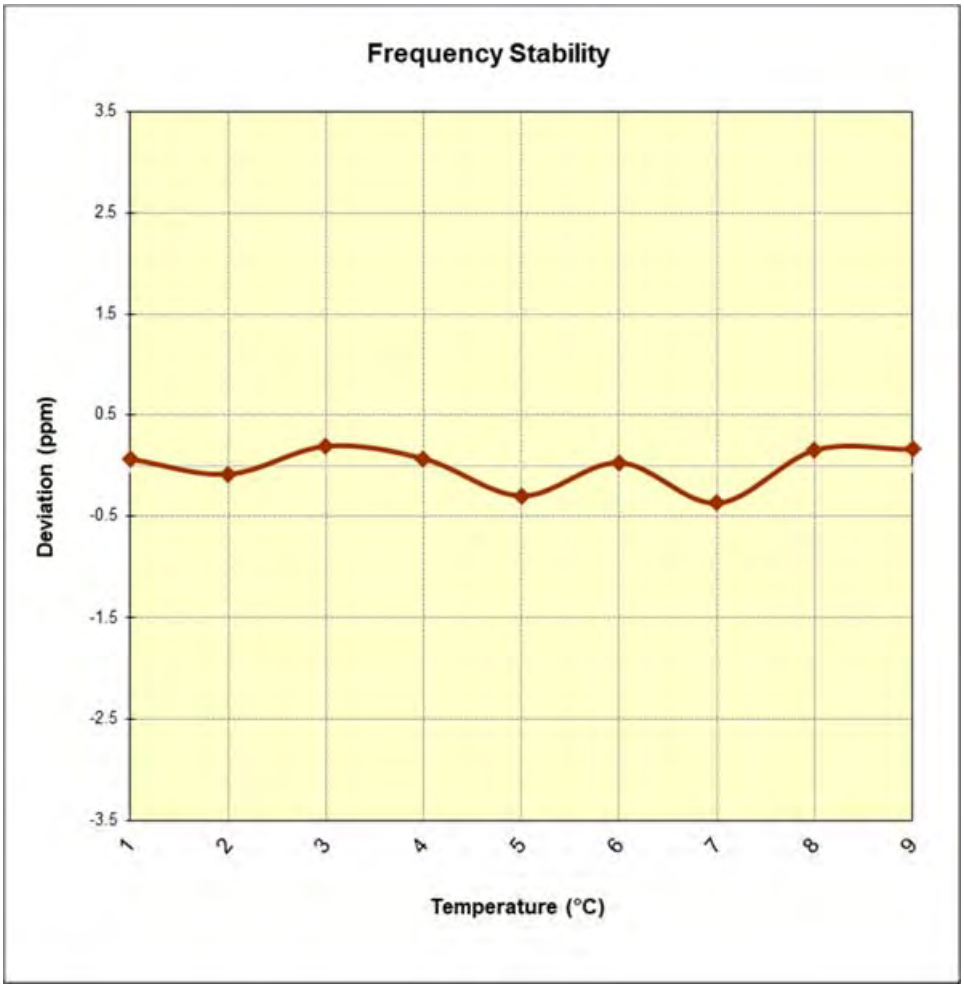


Figure 7-10. Frequency Stability Graph (Band 71)

Band 12 Frequency Stability Measurements

OPERATING FREQUENCY:	707,500,000	Hz
CHANNEL:	23790	
REFERENCE VOLTAGE:	4.33	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	707,499,577	-423	-0.0000598
100 %		- 20	707,499,976	-24	-0.0000034
100 %		- 10	707,499,803	-197	-0.0000278
100 %		0	707,499,603	-397	-0.0000561
100 %		+ 10	707,500,005	5	0.0000007
100 %		+ 20	707,499,930	-70	-0.0000099
100 %		+ 30	707,499,873	-127	-0.0000180
100 %		+ 40	707,500,218	218	0.0000308
100 %		+ 50	707,499,933	-67	-0.0000095
BATT. ENDPOINT	3.38	+ 20	707,499,655	-345	-0.0000488

Table 7-77. Frequency Stability Data (Band 12)

Band 12 Frequency Stability Measurements

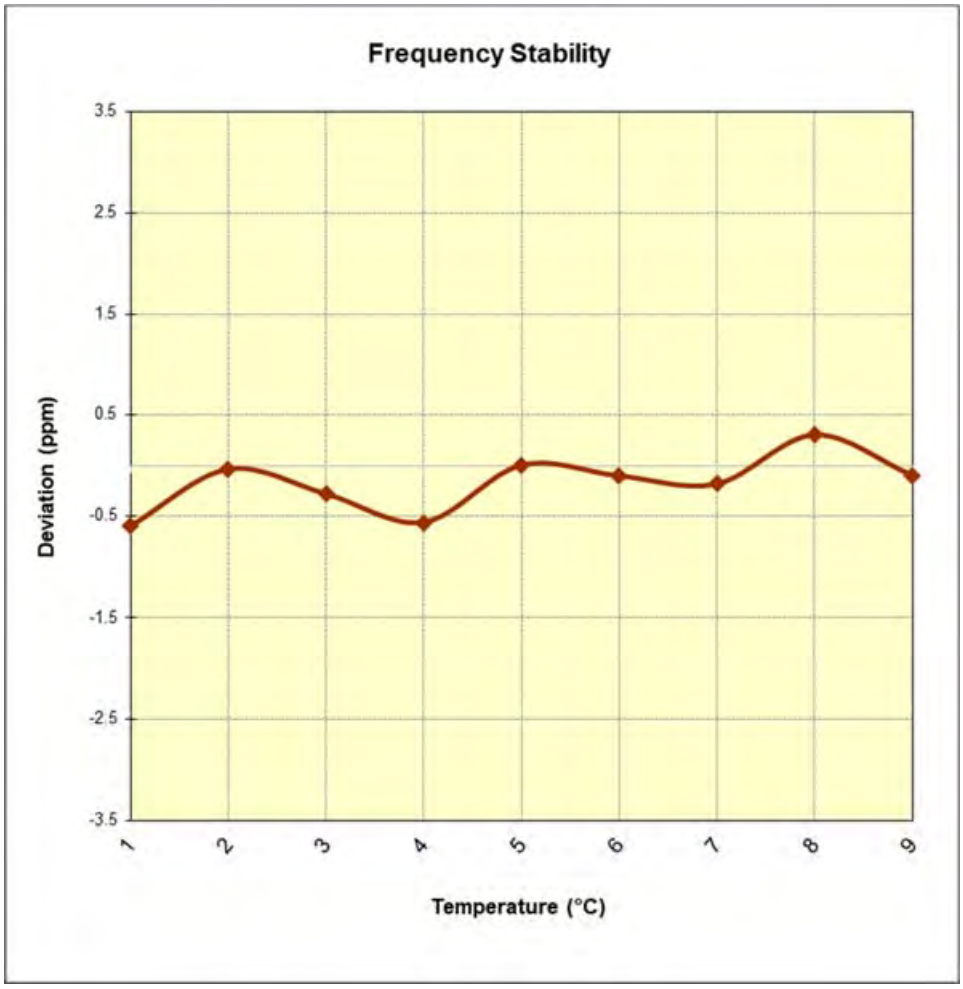


Figure 7-11. Frequency Stability Graph (Band 12)

Band 13 Frequency Stability Measurements

OPERATING FREQUENCY:	782,000,000	Hz
CHANNEL:	23230	
REFERENCE VOLTAGE:	4.33	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	781,999,671	-329	-0.0000421
100 %		- 20	782,000,176	176	0.0000225
100 %		- 10	782,000,187	187	0.0000239
100 %		0	782,000,104	104	0.0000133
100 %		+ 10	781,999,894	-106	-0.0000136
100 %		+ 20	782,000,302	302	0.0000386
100 %		+ 30	782,000,102	102	0.0000130
100 %		+ 40	781,999,940	-60	-0.0000077
100 %		+ 50	782,000,263	263	0.0000336
BATT. ENDPOINT	3.38	+ 20	781,999,685	-315	-0.0000403

Table 7-78. Frequency Stability Data (Band 13)

Band 13 Frequency Stability Measurements

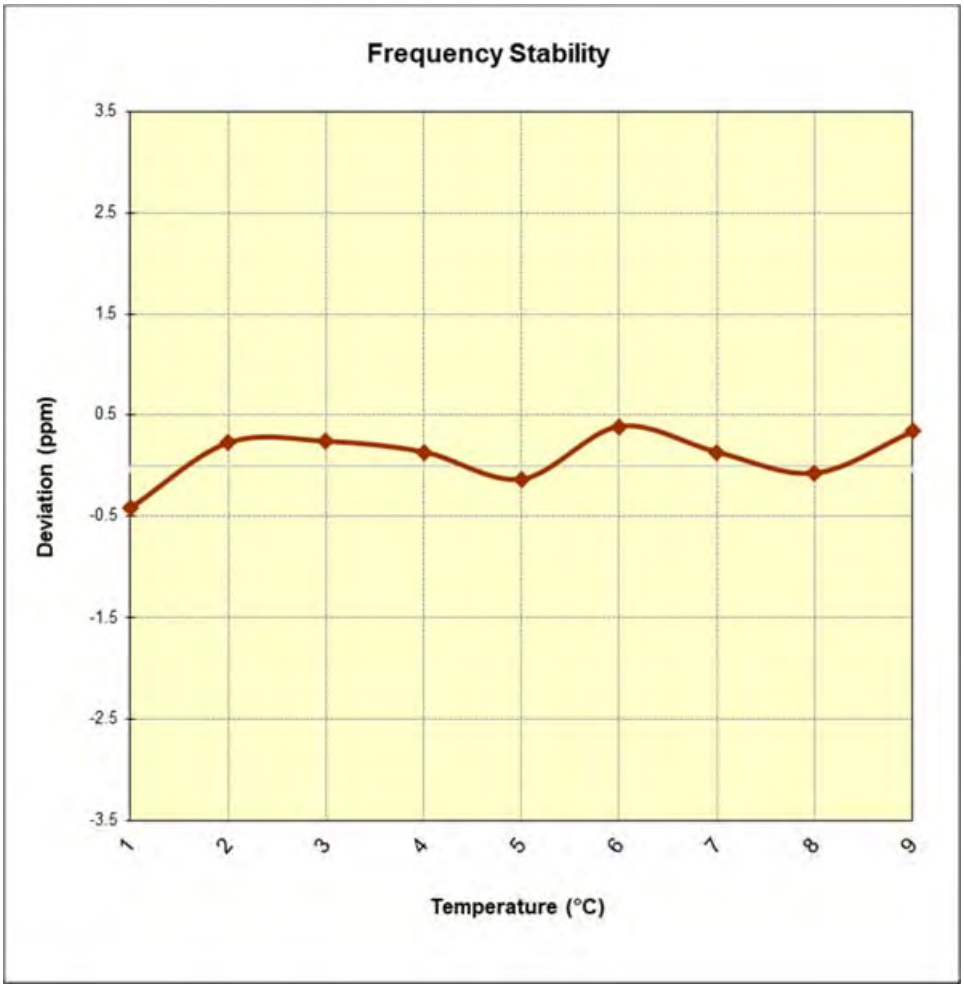


Figure 7-12. Frequency Stability Graph (Band 13)

Band 26/5 Frequency Stability Measurements

OPERATING FREQUENCY:	831,500,000	Hz
CHANNEL:	26865	
REFERENCE VOLTAGE:	4.33	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	831,500,041	41	0.0000049
100 %		- 20	831,499,895	-105	-0.0000126
100 %		- 10	831,499,624	-376	-0.0000452
100 %		0	831,499,957	-43	-0.0000052
100 %		+ 10	831,499,803	-197	-0.0000237
100 %		+ 20	831,500,371	371	0.0000446
100 %		+ 30	831,500,038	38	0.0000046
100 %		+ 40	831,500,141	141	0.0000170
100 %		+ 50	831,499,966	-34	-0.0000041
BATT. ENDPOINT	3.38	+ 20	831,499,923	-77	-0.0000093

Table 7-79. Frequency Stability Data (Band 26/5)

Band 26/5 Frequency Stability Measurements

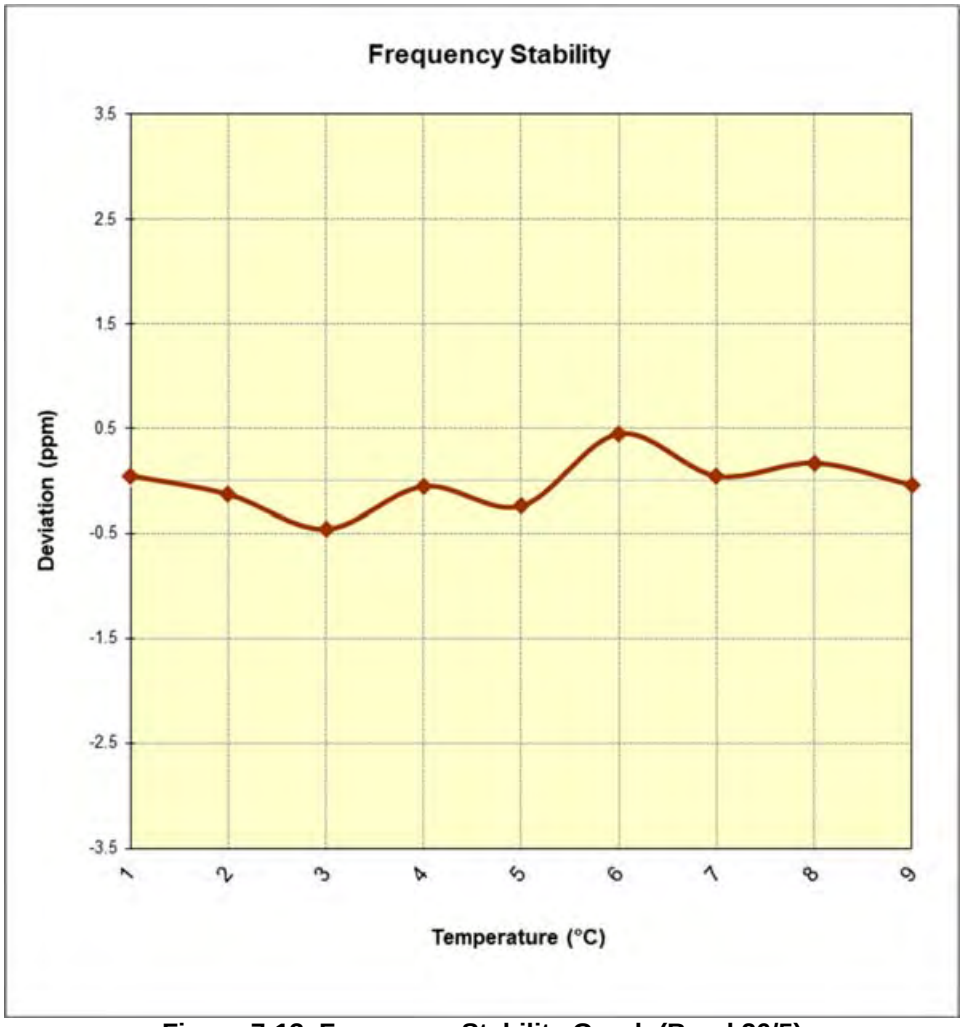


Figure 7-13. Frequency Stability Graph (Band 26/5)

Band 66/4 Frequency Stability Measurements

OPERATING FREQUENCY:	1,745,000,000	Hz
CHANNEL:	132322	
REFERENCE VOLTAGE:	4.33	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	1,744,999,542	-458	-0.0000262
100 %		- 20	1,745,000,233	233	0.0000134
100 %		- 10	1,745,000,176	176	0.0000101
100 %		0	1,744,999,916	-84	-0.0000048
100 %		+ 10	1,745,000,216	216	0.0000124
100 %		+ 20	1,745,000,298	298	0.0000171
100 %		+ 30	1,744,999,925	-75	-0.0000043
100 %		+ 40	1,745,000,067	67	0.0000038
100 %		+ 50	1,744,999,904	-96	-0.0000055
BATT. ENDPOINT	3.38	+ 20	1,744,999,912	-88	-0.0000050

Table 7-80. Frequency Stability Data (Band 66/4)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Band 66/4 Frequency Stability Measurements

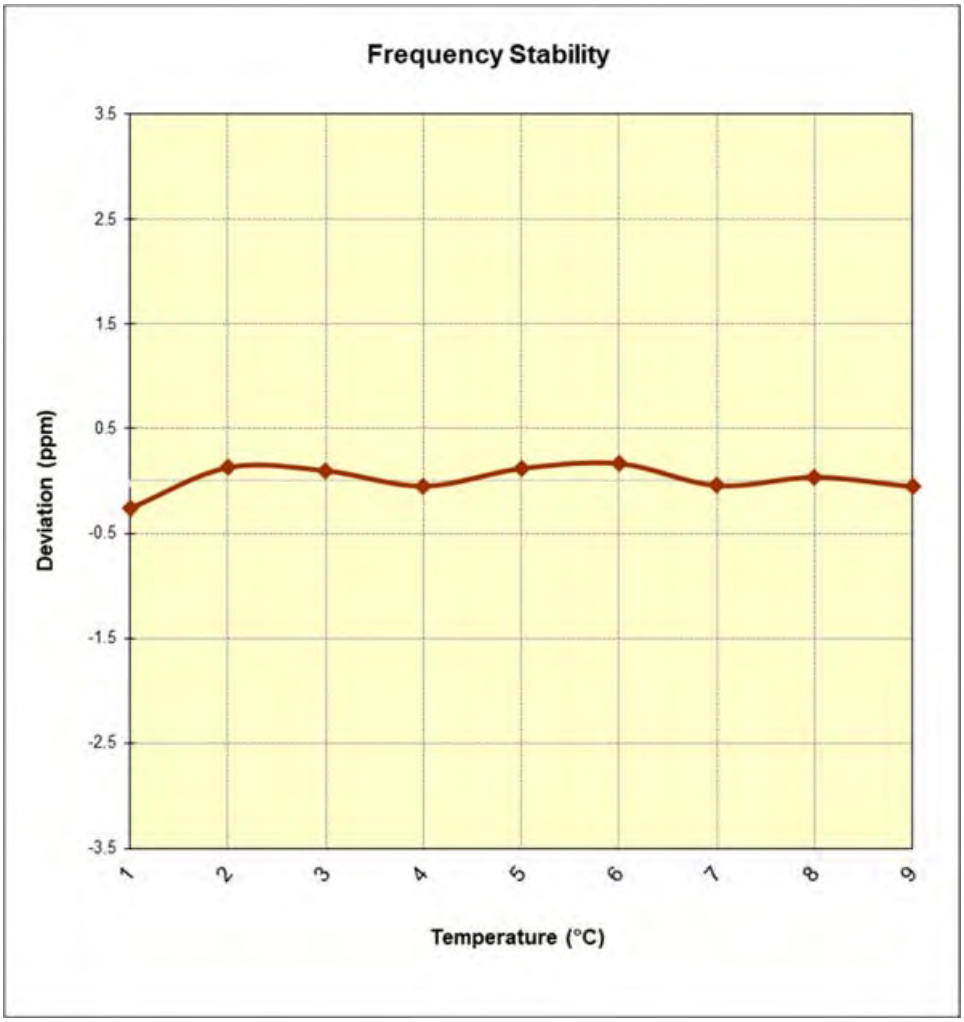


Figure 7-14. Frequency Stability Graph (Band 66/4)

Band 25/2 Frequency Stability Measurements

OPERATING FREQUENCY:	1,882,500,000	Hz
CHANNEL:	26365	
REFERENCE VOLTAGE:	4.33	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	1,882,499,993	-7	-0.0000004
100 %		- 20	1,882,499,725	-275	-0.0000146
100 %		- 10	1,882,499,858	-142	-0.0000075
100 %		0	1,882,499,738	-262	-0.0000139
100 %		+ 10	1,882,499,996	-4	-0.0000002
100 %		+ 20	1,882,500,173	173	0.0000092
100 %		+ 30	1,882,500,119	119	0.0000063
100 %		+ 40	1,882,499,910	-90	-0.0000048
100 %		+ 50	1,882,500,024	24	0.0000013
BATT. ENDPOINT	3.38	+ 20	1,882,500,120	120	0.0000064

Table 7-81. Frequency Stability Data (Band 25/2)

Band 25/2 Frequency Stability Measurements

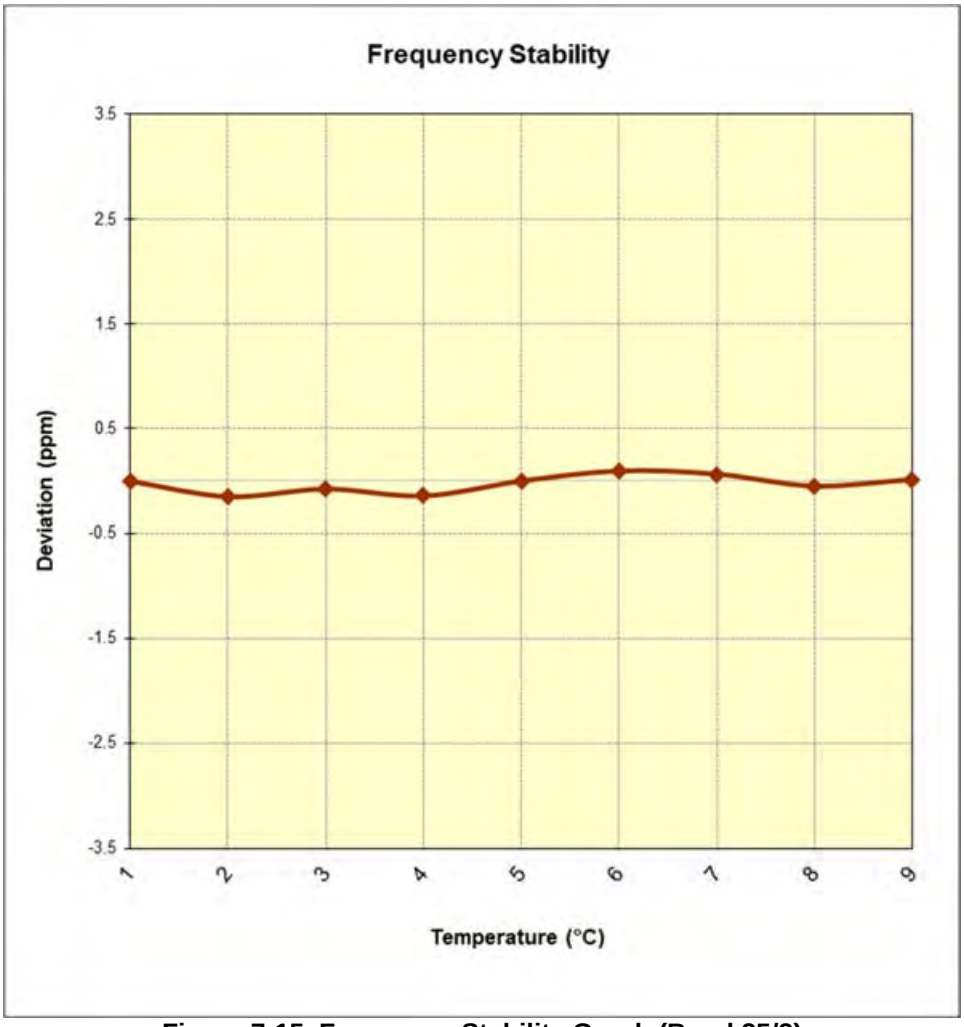


Figure 7-15. Frequency Stability Graph (Band 25/2)

Band 7 Frequency Stability Measurements

OPERATING FREQUENCY:	2,535,000,000	Hz
CHANNEL:	21100	
REFERENCE VOLTAGE:	4.33	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	2,535,000,334	334	0.0000132
100 %		- 20	2,535,000,004	4	0.0000002
100 %		- 10	2,534,999,997	-3	-0.0000001
100 %		0	2,534,999,974	-26	-0.0000010
100 %		+ 10	2,535,000,316	316	0.0000125
100 %		+ 20	2,535,000,112	112	0.0000044
100 %		+ 30	2,535,000,138	138	0.0000054
100 %		+ 40	2,534,999,761	-239	-0.0000094
100 %		+ 50	2,534,999,843	-157	-0.0000062
BATT. ENDPOINT	3.38	+ 20	2,534,999,976	-24	-0.0000009

Table 7-82. Frequency Stability Data (Band 7)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Band 7 Frequency Stability Measurements

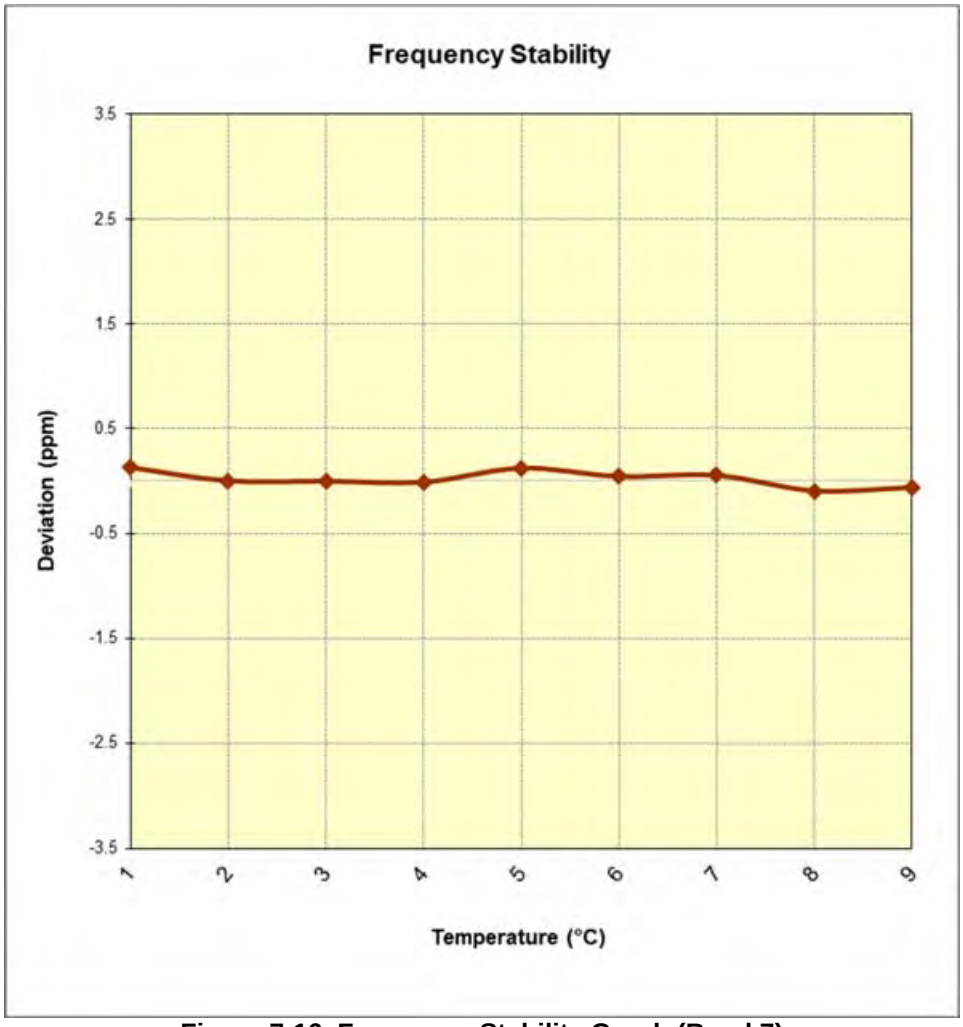


Figure 7-16. Frequency Stability Graph (Band 7)

Band 41 Frequency Stability Measurements

OPERATING FREQUENCY:	2,593,000,000	Hz
CHANNEL:	40620	
REFERENCE VOLTAGE:	4.33	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	2,592,999,912	-88	-0.0000034
100 %		- 20	2,592,999,850	-150	-0.0000058
100 %		- 10	2,592,999,810	-190	-0.0000073
100 %		0	2,593,000,188	188	0.0000073
100 %		+ 10	2,593,000,054	54	0.0000021
100 %		+ 20	2,593,000,034	34	0.0000013
100 %		+ 30	2,592,999,727	-273	-0.0000105
100 %		+ 40	2,592,999,970	-30	-0.0000012
100 %		+ 50	2,592,999,897	-103	-0.0000040
BATT. ENDPOINT	3.38	+ 20	2,593,000,345	345	0.0000133

Table 7-83. Frequency Stability Data (Band 41)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Band 41 Frequency Stability Measurements

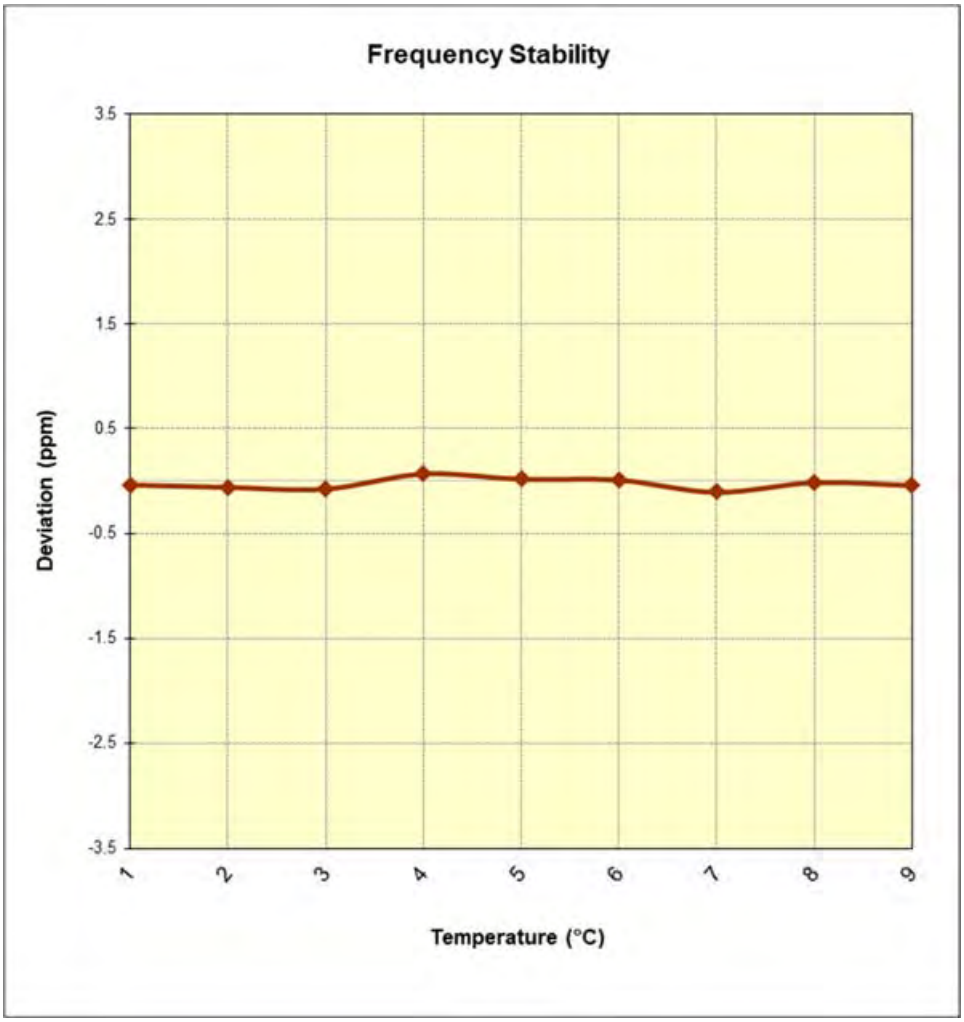


Figure 7-17. Frequency Stability Graph (Band 41)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Tablet FCC ID: A3LSMT978U** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE and Sub 6GHz NR operation only.