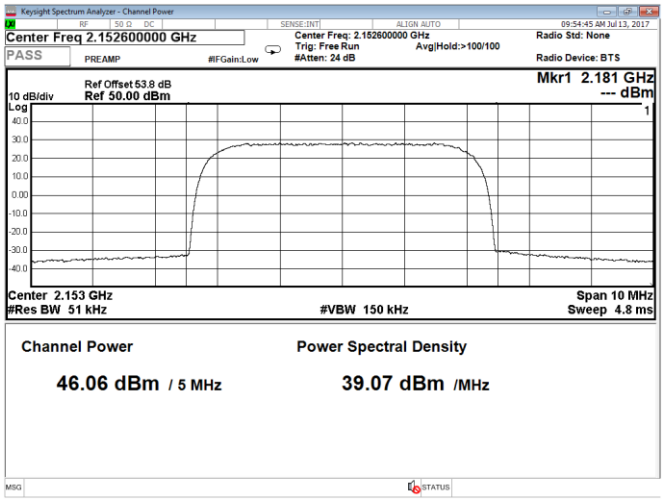

Figure 8.1-77: *Output power at high channel, QPSK, 5 MHz, WCDMA, Port A*

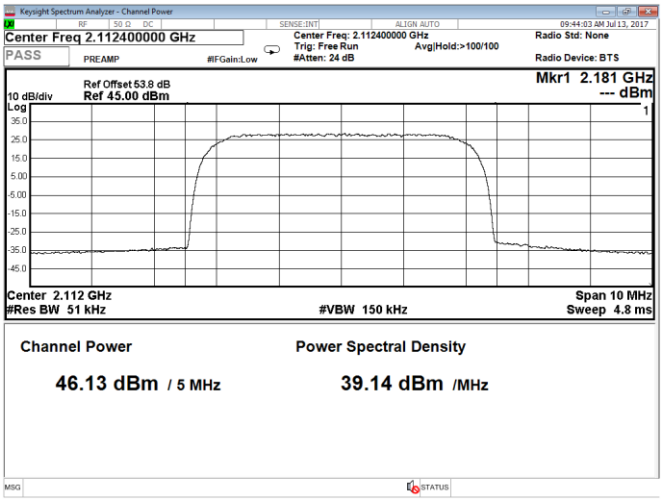

Figure 8.1-78: *Output power at low channel, 16QAM, 5 MHz, WCDMA, Port A*

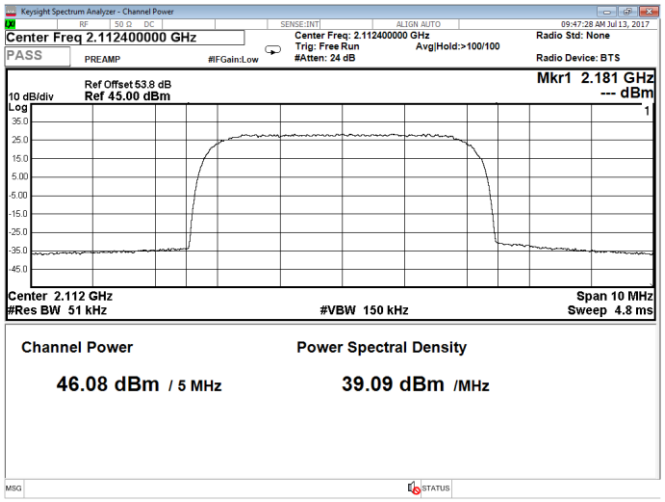

Figure 8.1-79: *Output power at low channel, 64QAM, 5 MHz, WCDMA, Port A*

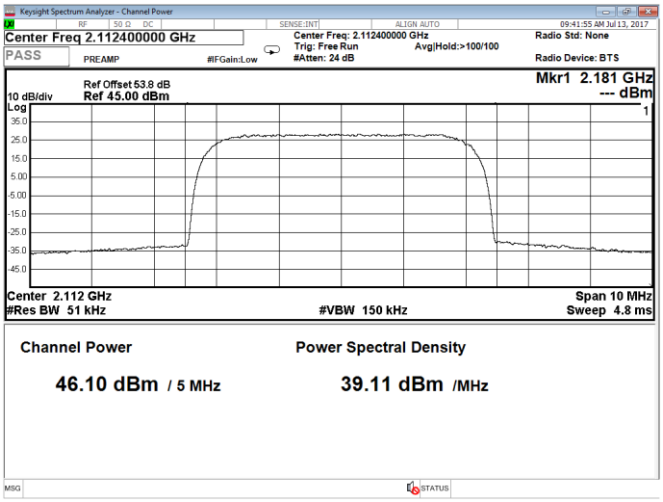

Figure 8.1-80: *Output power at low channel, QPSK, 5 MHz, WCDMA, Port B*

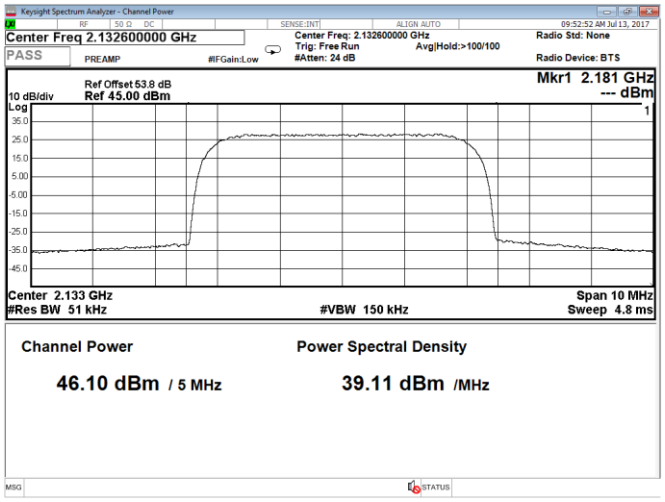

Figure 8.1-81: *Output power at mid channel, QPSK, 5 MHz, WCDMA, Port B*

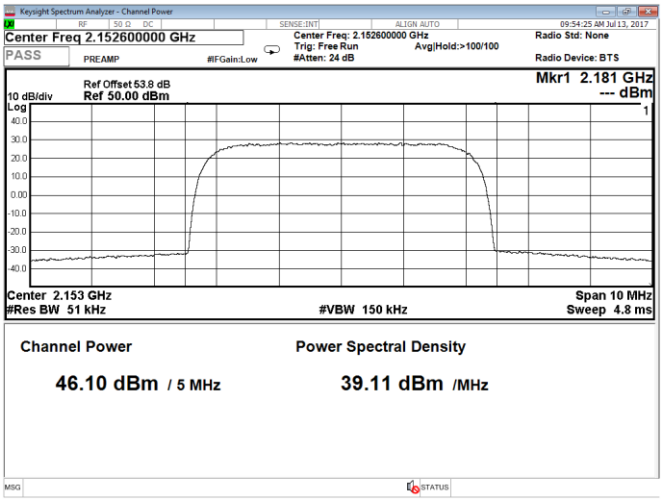

Figure 8.1-82: *Output power at high channel, QPSK, 5 MHz, WCDMA, Port B*

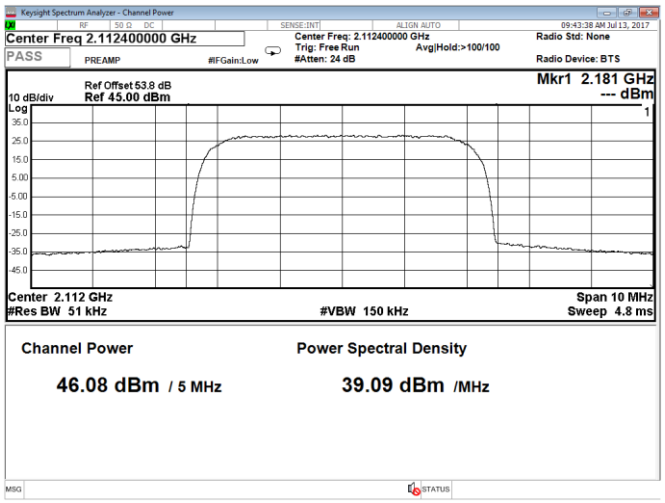

Figure 8.1-83: *Output power at low channel, 16QAM, 5 MHz, WCDMA, Port B*

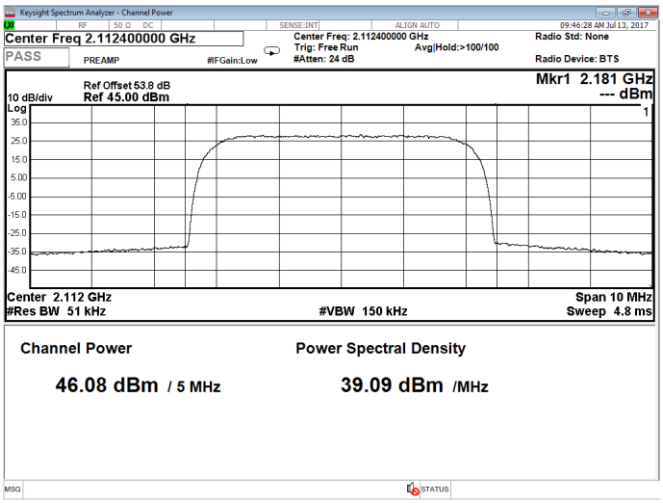

Figure 8.1-84: *Output power at low channel, 64QAM, 5 MHz, WCDMA, Port B*

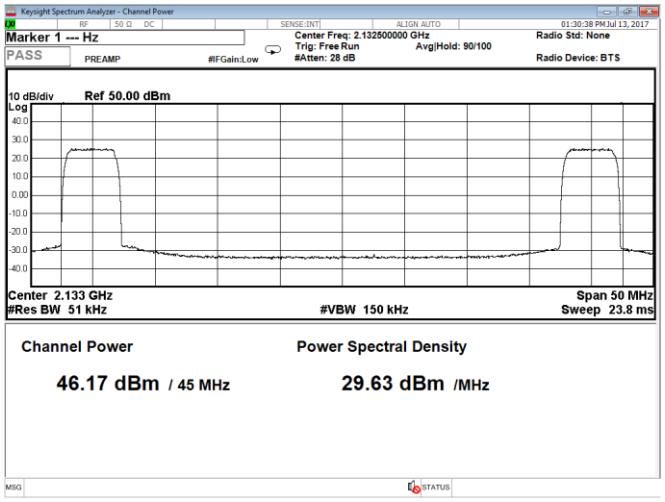

Figure 8.1-85: *Output power 2 carriers, QPSK, carrier 1: 5 MHz, carrier 2: 5 MHz, WCDMA, Port A*

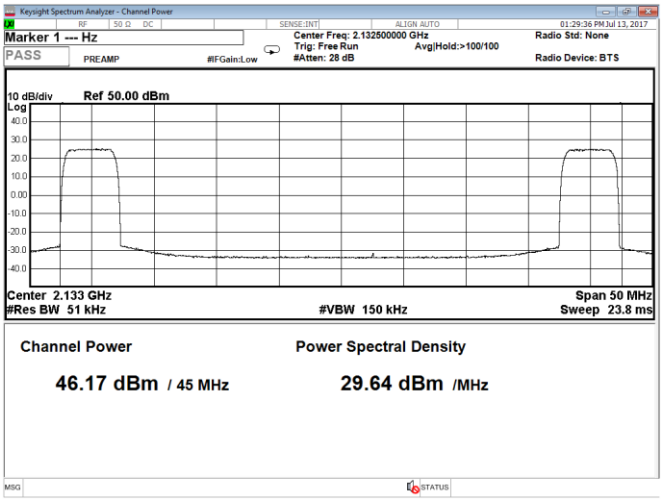

Figure 8.1-86: *Output power 2 carriers, QPSK, carrier 1: 5 MHz, carrier 2: 5 MHz, WCDMA, Port B*

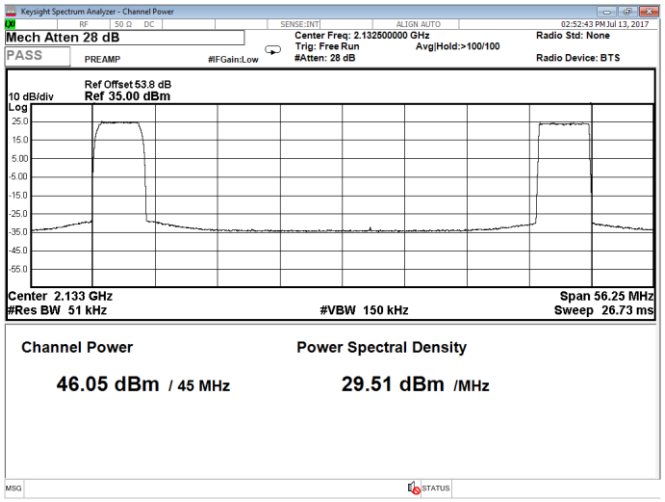

Figure 8.1-87: *Output power Mix mode, 2 carriers; carrier 1: WCDMA 5 MHz, carrier 2: LTE 5 MHz, Port A*

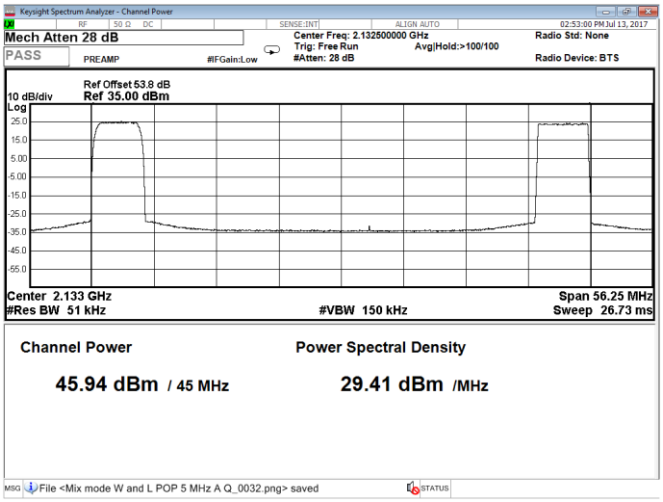

Figure 8.1-88: *Output power Mix mode, 2 carriers; carrier 1: WCDMA 5 MHz, carrier 2: LTE 5 MHz, Port B*

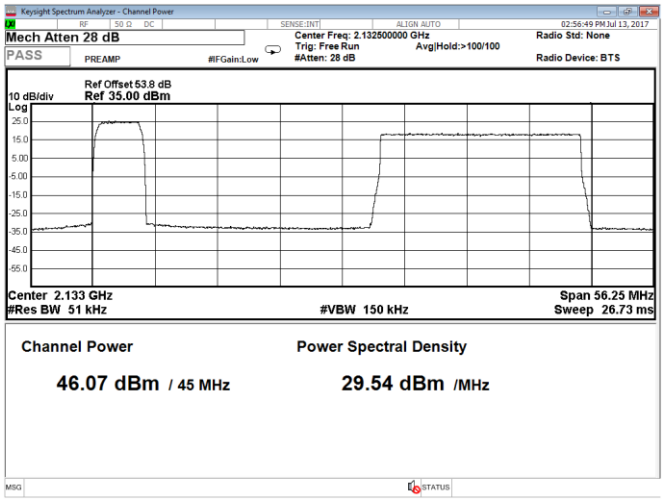

Figure 8.1-89: *Output power Mix mode, 2 carriers; carrier 1: WCDMA 5 MHz, carrier 2: LTE 20 MHz, Port A*

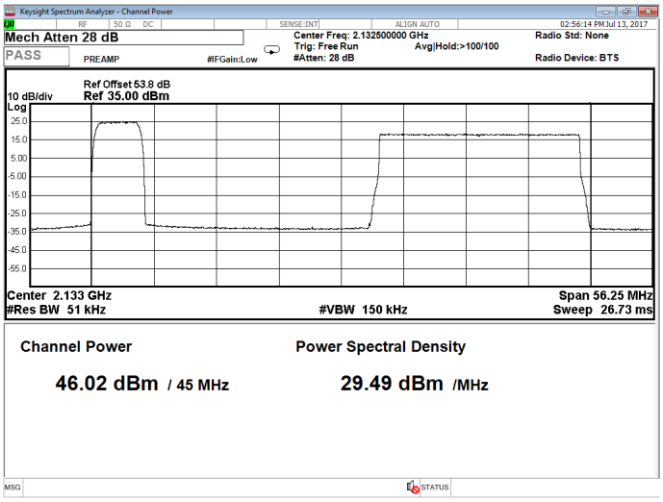

Figure 8.1-90: *Output power Mix mode, 2 carriers; carrier 1: WCDMA 5 MHz, carrier 2: LTE 20 MHz, Port B*

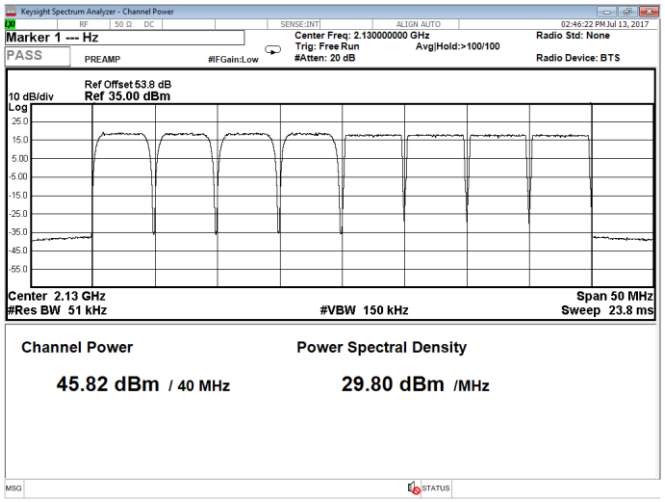

Figure 8.1-91: *Output power Mix mode, 8 carriers;*
carriers 1–4: WCDMA 5 MHz,
carriers 5–8: LTE 5 MHz, Port A

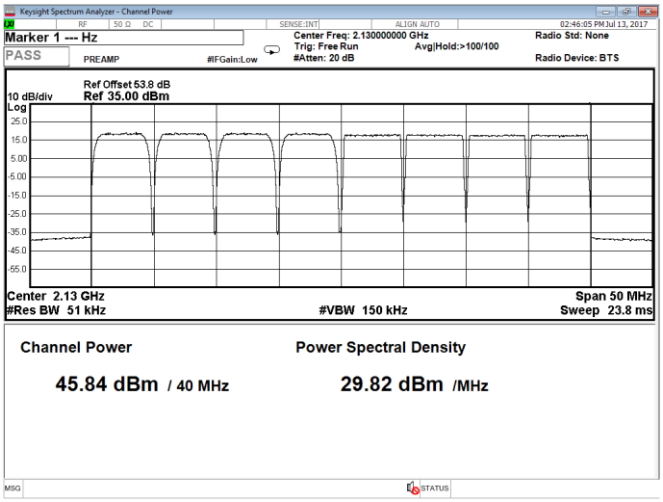

Figure 8.1-92: *Output power Mix mode, 8 carriers;*
carriers 1–4: WCDMA 5 MHz,
carriers 5–8: LTE 5 MHz, Port B

Table 8.1-12: *Complementary Cumulative Distribution Function (CCDF) of the PAPR reduction measurement results for LTE*

Remarks	Frequency, MHz	0.1% CCDF, dB	PAPR reduction limit, dB	Margin, dB
QPSK, 5 MHz, Ant A	2112.5	7.09	13.00	5.91
QPSK, 5 MHz, Ant A	2145.0	7.10	13.00	5.90
QPSK, 5 MHz, Ant A	2177.5	7.09	13.00	5.91
QPSK, 5 MHz, Ant B	2112.5	7.09	13.00	5.91
QPSK, 5 MHz, Ant B	2145.0	7.12	13.00	5.88
QPSK, 5 MHz, Ant B	2177.5	7.12	13.00	5.88
QPSK, 10 MHz, Ant A	2115.0	7.11	13.00	5.89
QPSK, 10 MHz, Ant A	2145.0	7.11	13.00	5.89
QPSK, 10 MHz, Ant A	2175.0	7.12	13.00	5.88
QPSK, 10 MHz, Ant B	2115.0	7.12	13.00	5.88
QPSK, 10 MHz, Ant B	2145.0	7.12	13.00	5.88
QPSK, 10 MHz, Ant B	2175.0	7.14	13.00	5.86
QPSK, 15 MHz, Ant A	2117.5	7.13	13.00	5.87
QPSK, 15 MHz, Ant A	2145.0	7.11	13.00	5.89
QPSK, 15 MHz, Ant A	2172.5	7.16	13.00	5.84
QPSK, 15 MHz, Ant B	2117.5	7.15	13.00	5.85
QPSK, 15 MHz, Ant B	2145.0	7.13	13.00	5.87
QPSK, 15 MHz, Ant B	2172.5	7.20	13.00	5.80
QPSK, 20 MHz, Ant A	2120.0	7.15	13.00	5.85
QPSK, 20 MHz, Ant A	2145.0	7.10	13.00	5.90
QPSK, 20 MHz, Ant A	2170.0	7.20	13.00	5.80
QPSK, 20 MHz, Ant B	2120.0	7.15	13.00	5.85
QPSK, 20 MHz, Ant B	2145.0	7.12	13.00	5.88
QPSK, 20 MHz, Ant B	2170.0	7.22	13.00	5.78

Table 8.1-13: *Complementary Cumulative Distribution Function (CCDF) of the PAPR reduction measurement results for WCDMA*

Remarks	Frequency, MHz	0.1% CCDF, dB	PAPR reduction limit, dB	Margin, dB
QPSK, 5 MHz, Ant A	2112.5	7.20	13.00	5.80
QPSK, 5 MHz, Ant A	2132.5	7.21	13.00	5.79
QPSK, 5 MHz, Ant A	2152.5	7.22	13.00	5.78
QPSK, 5 MHz, Ant B	2112.5	7.21	13.00	5.79
QPSK, 5 MHz, Ant B	2132.5	7.20	13.00	5.80
QPSK, 5 MHz, Ant B	2152.5	7.22	13.00	5.78

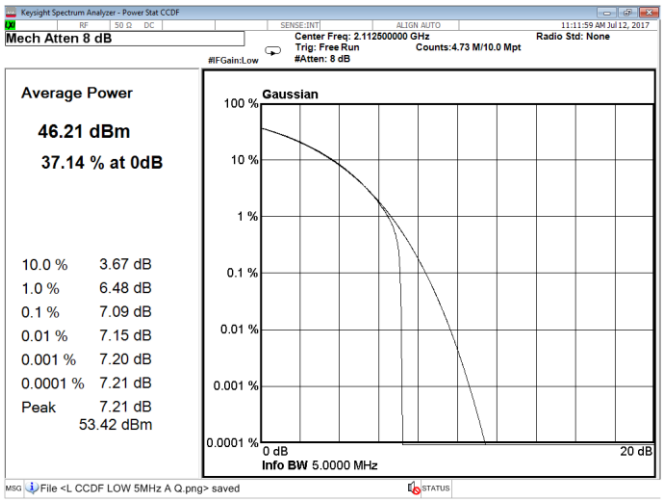

Figure 8.1-93: *CCDF, QPSK, 5 MHz, LTE, Port A, Low channel*

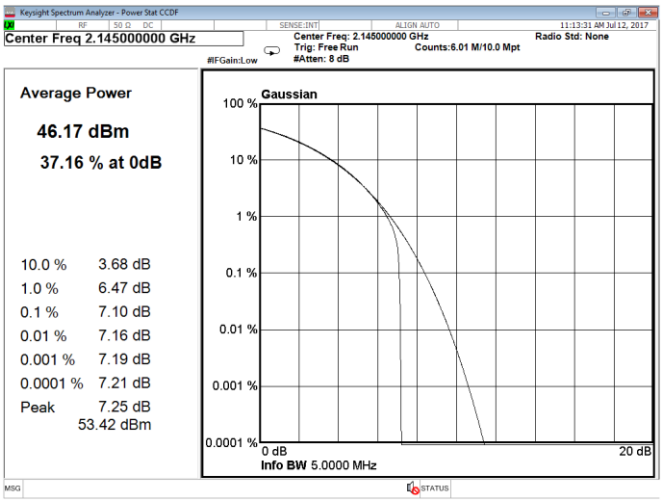

Figure 8.1-94: *CCDF, QPSK, 5 MHz, LTE, Port A, Mid channel*

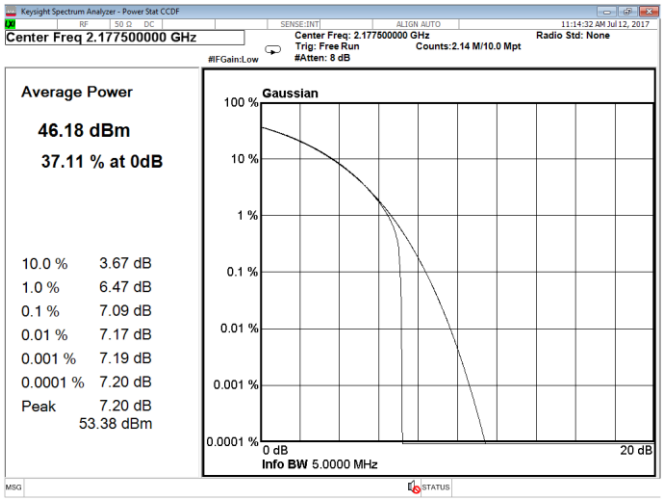

Figure 8.1-95: *CCDF, QPSK, 5 MHz, LTE, Port A, High channel*

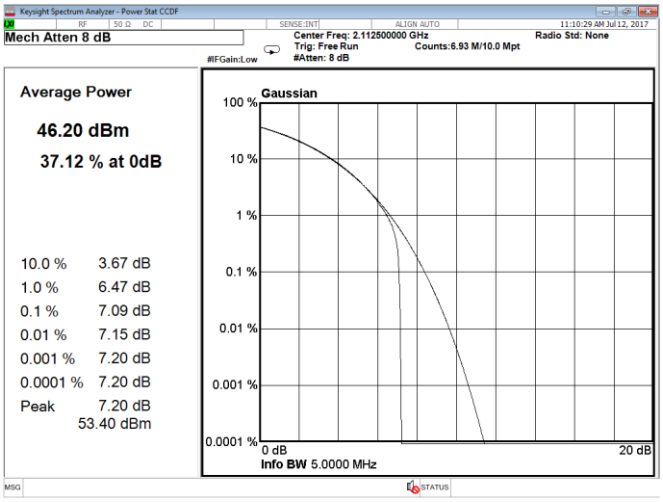

Figure 8.1-96: *CCDF, QPSK, 5 MHz, LTE, Port B, Low channel*

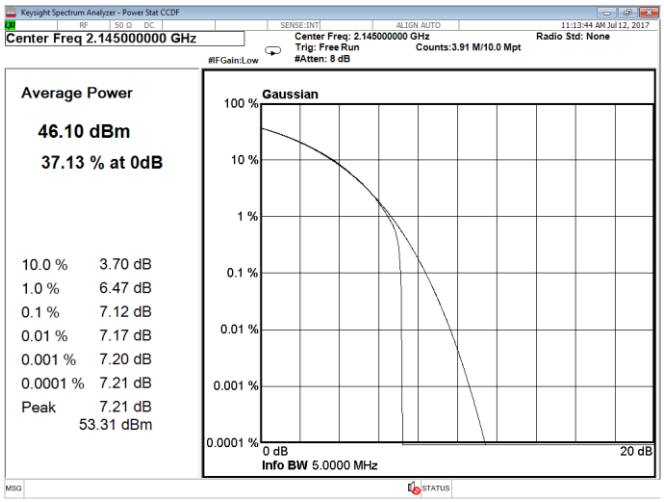

Figure 8.1-97: *CCDF, QPSK, 5 MHz, LTE, Port B, Mid channel*

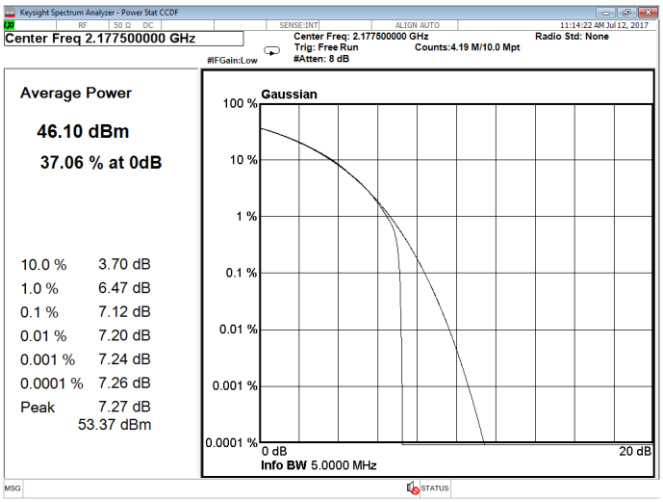

Figure 8.1-98: *CCDF, QPSK, 5 MHz, LTE, Port B, High channel*

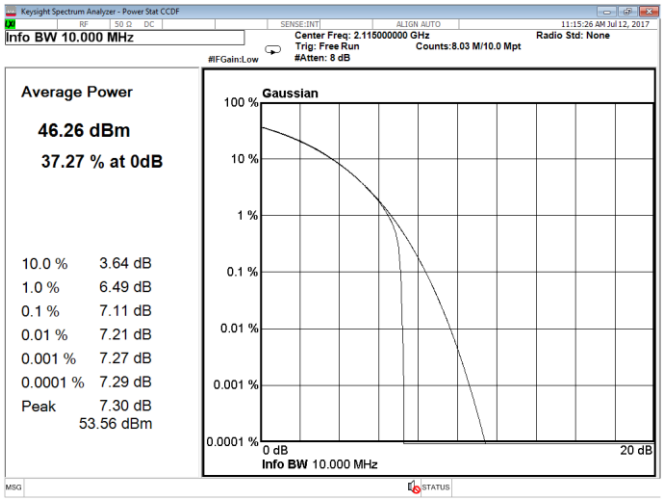

Figure 8.1-99: *CCDF, QPSK, 10 MHz, LTE, Port A, Low channel*

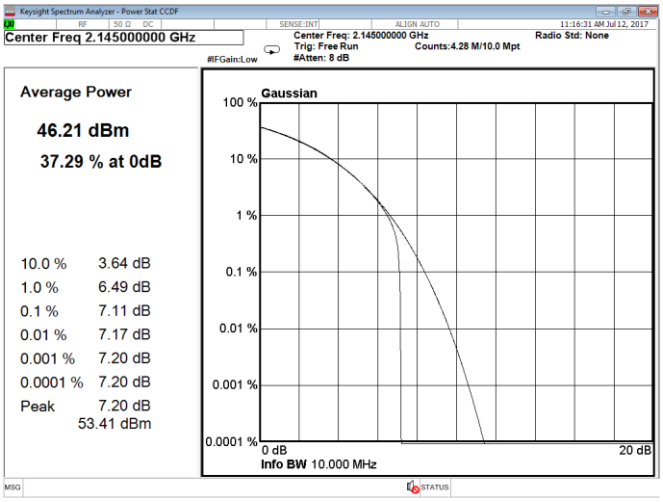

Figure 8.1-100: *CCDF, QPSK, 10 MHz, LTE, Port A, Mid channel*

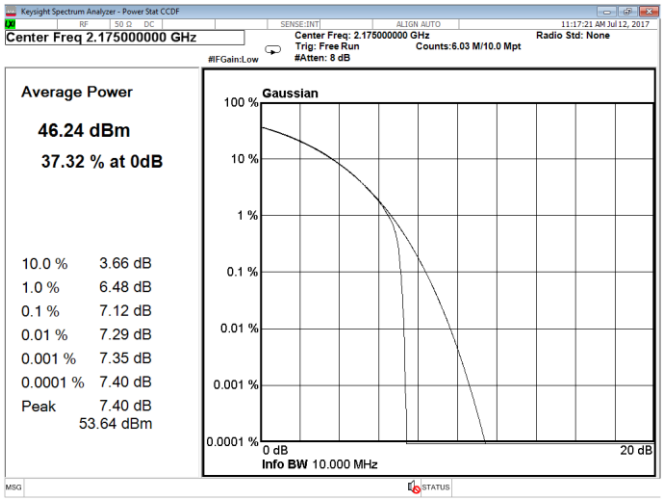

Figure 8.1-101: *CCDF, QPSK, 10 MHz, LTE, Port A, High channel*

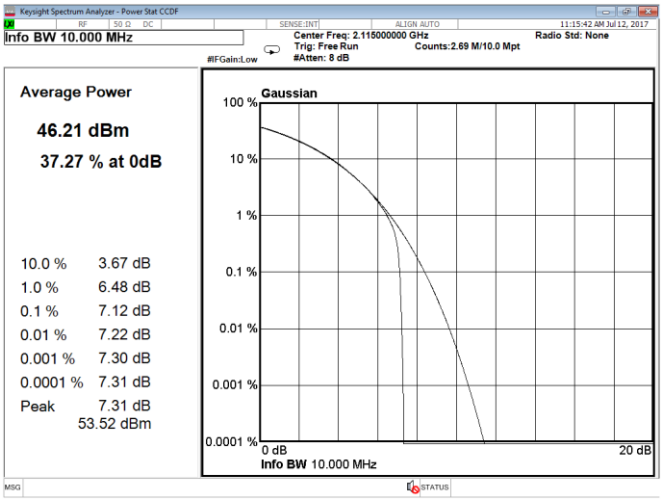

Figure 8.1-102: *CCDF, QPSK, 10 MHz, LTE, Port B, Low channel*

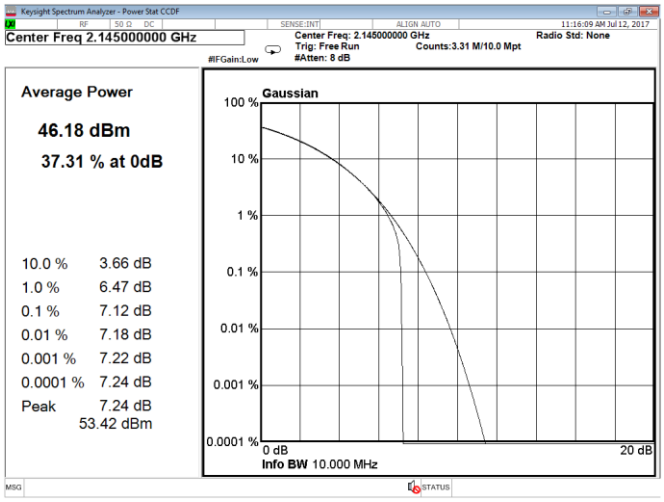

Figure 8.1-103: *CCDF, QPSK, 10 MHz, LTE, Port B, Mid channel*

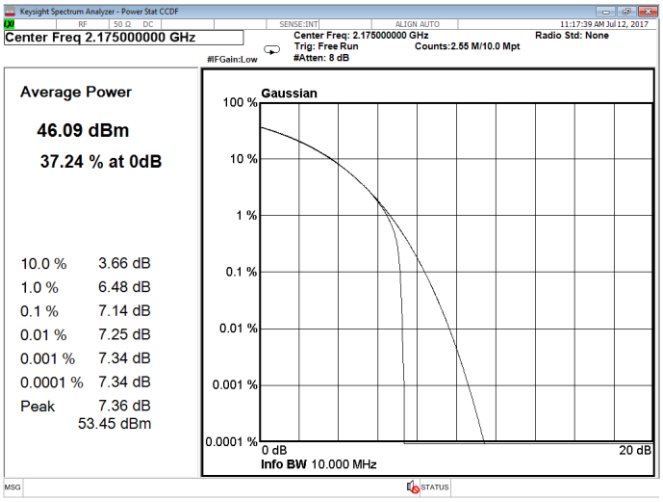

Figure 8.1-104: *CCDF, QPSK, 10 MHz, LTE, Port B, High channel*

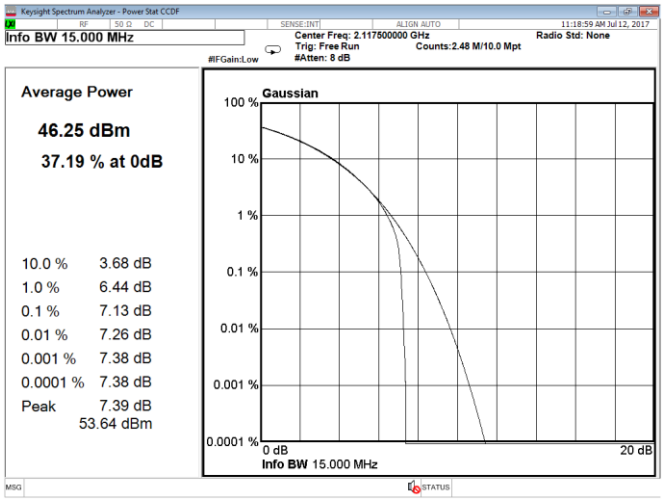

Figure 8.1-105: *CCDF, QPSK, 15 MHz, Port A, Low channel*

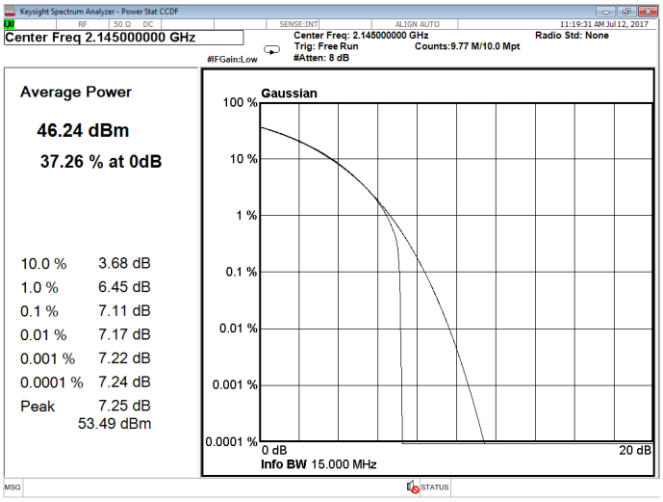

Figure 8.1-106: *CCDF, QPSK, 15 MHz, LTE, Port A, Mid channel*

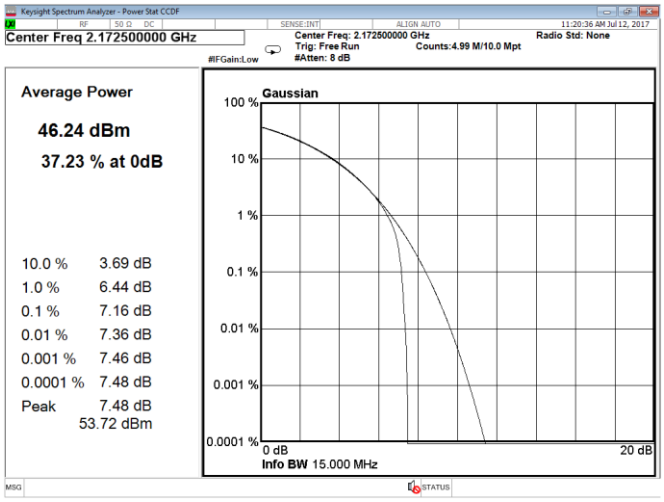

Figure 8.1-107: *CCDF, QPSK, 15 MHz, LTE, Port A, High channel*

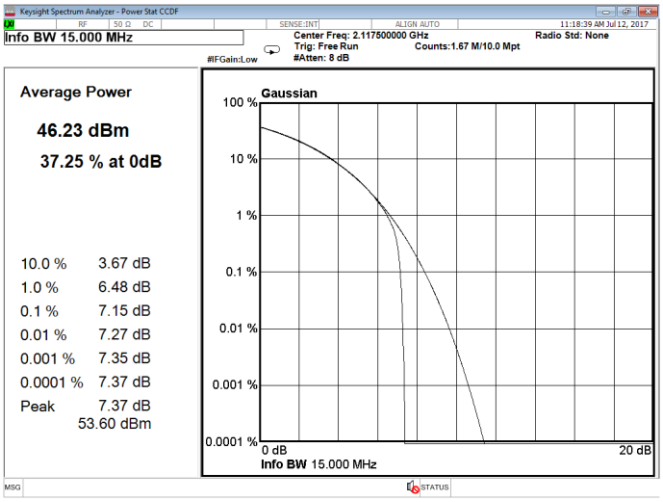

Figure 8.1-108: *CCDF, QPSK, 15 MHz, LTE, Port B, Low channel*

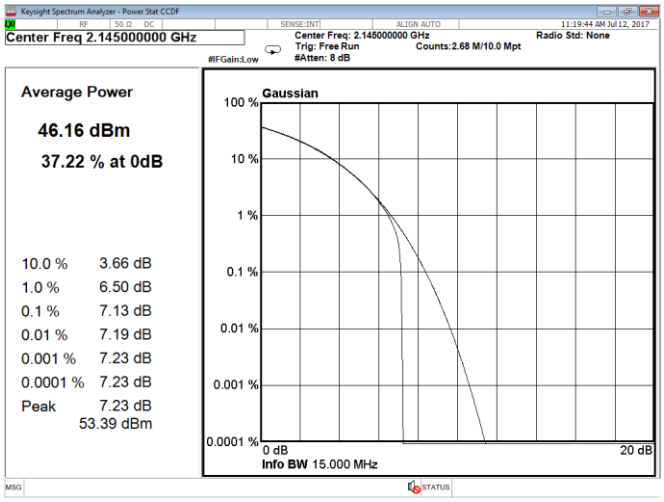

Figure 8.1-109: *CCDF, QPSK, 15 MHz, LTE, Port B, Mid channel*

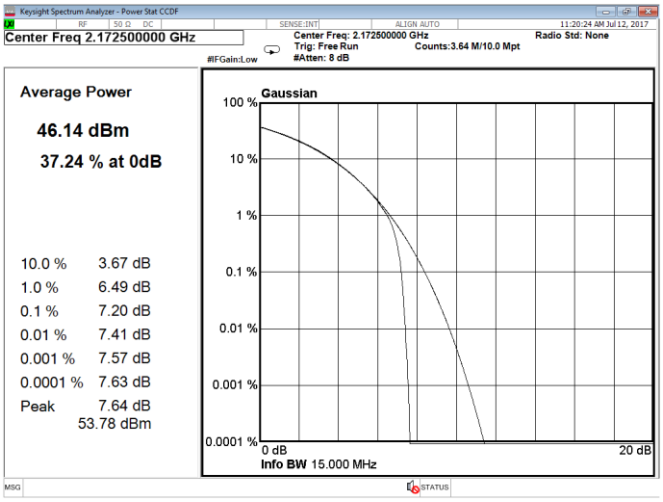

Figure 8.1-110: *CCDF, QPSK, 15 MHz, LTE, Port B, High channel*

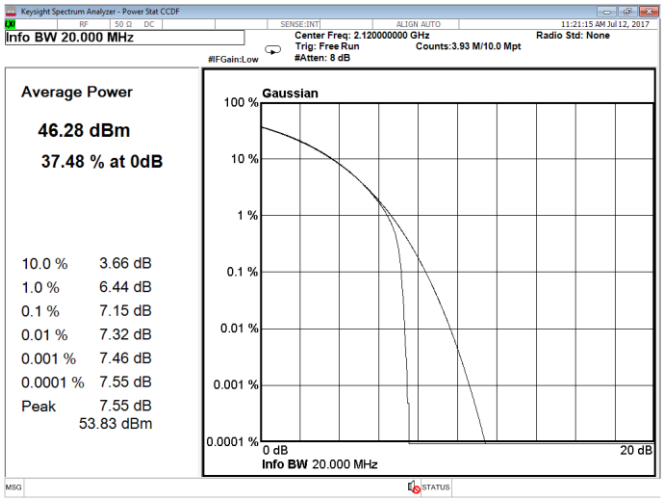

Figure 8.1-111: *CCDF, QPSK, 20 MHz, LTE, Port A, Low channel*

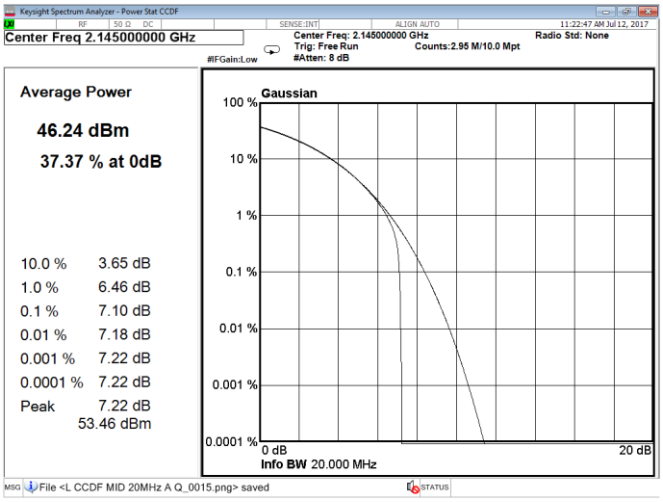

Figure 8.1-112: *CCDF, QPSK, 20 MHz, LTE, Port A, Mid channel*

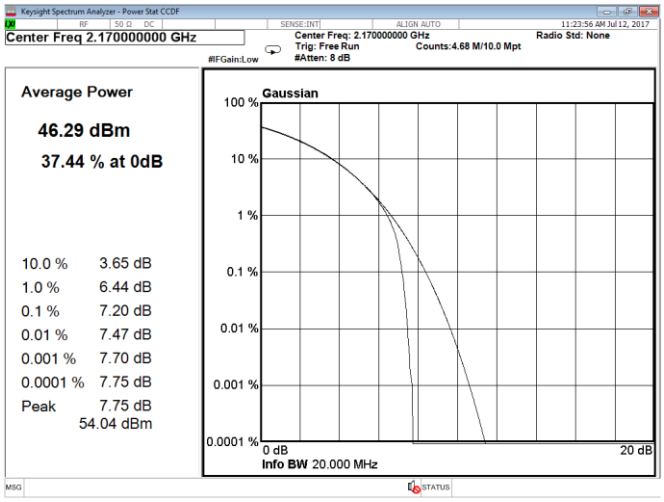

Figure 8.1-113: *CCDF, QPSK, 20 MHz, LTE, Port A, High channel*

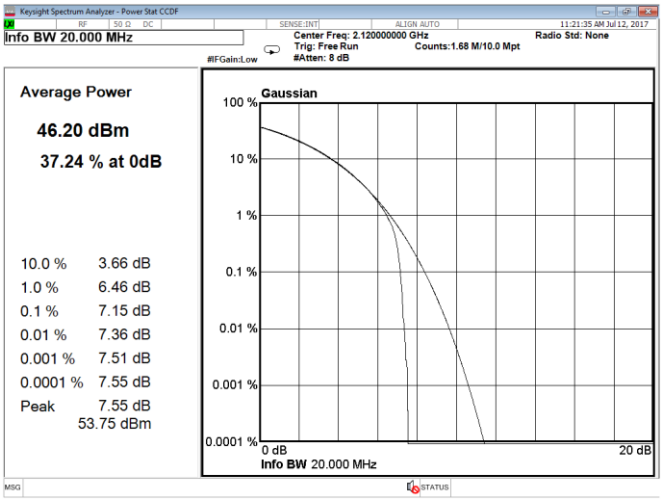

Figure 8.1-114: *CCDF, QPSK, 20 MHz, LTE, Port B, Low channel*

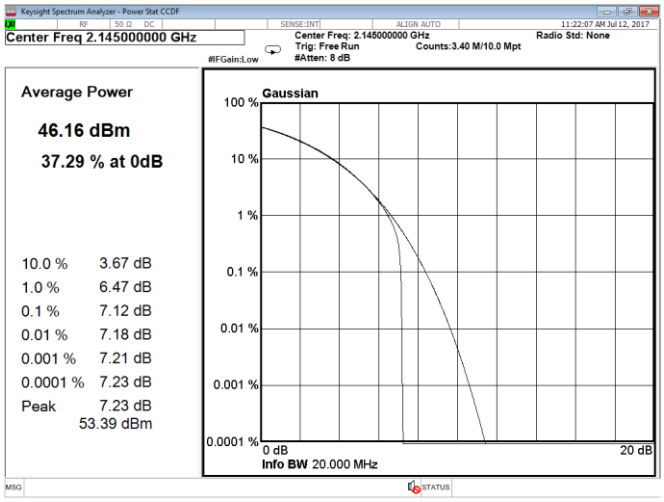

Figure 8.1-115: *CCDF, QPSK, 20 MHz, LTE, Port B, Mid channel*

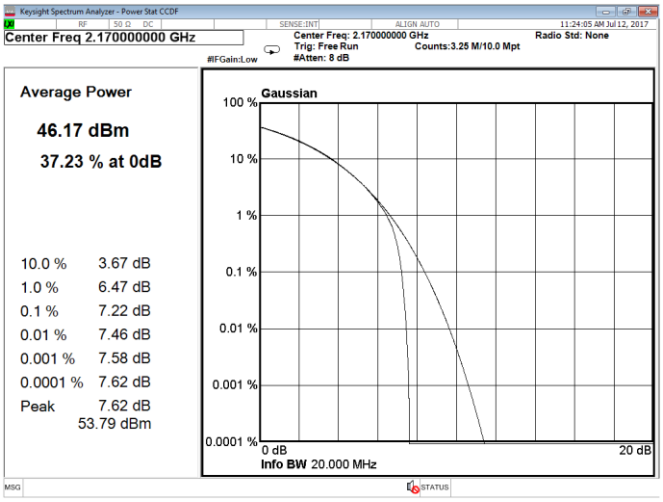

Figure 8.1-116: *CCDF, QPSK, 20 MHz, LTE, Port B, High channel*

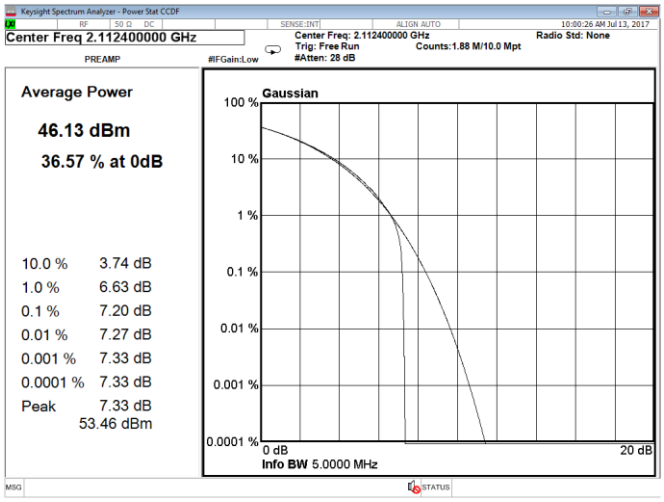

Figure 8.1-117: *CCDF, QPSK, 5 MHz, WCDMA, Port A, Low channel*

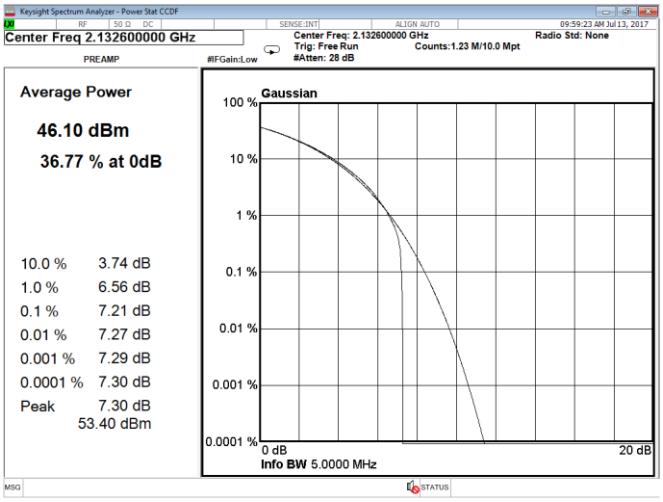

Figure 8.1-118: *CCDF, QPSK, 5 MHz, WCDMA, Port A, Mid channel*

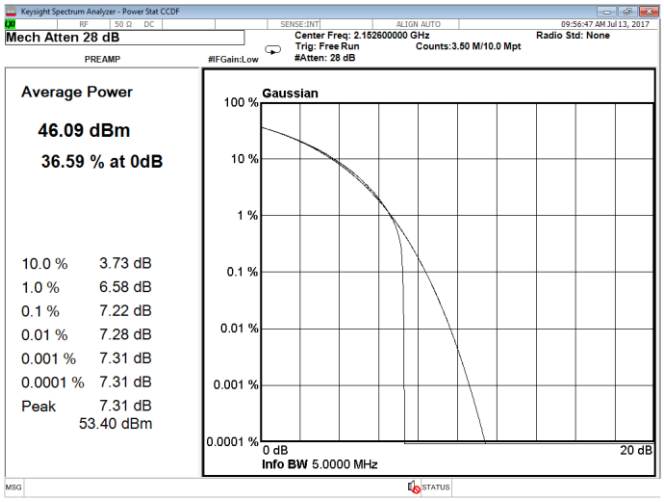

Figure 8.1-119: *CCDF, QPSK, 5 MHz, WCDMA, Port A, High channel*

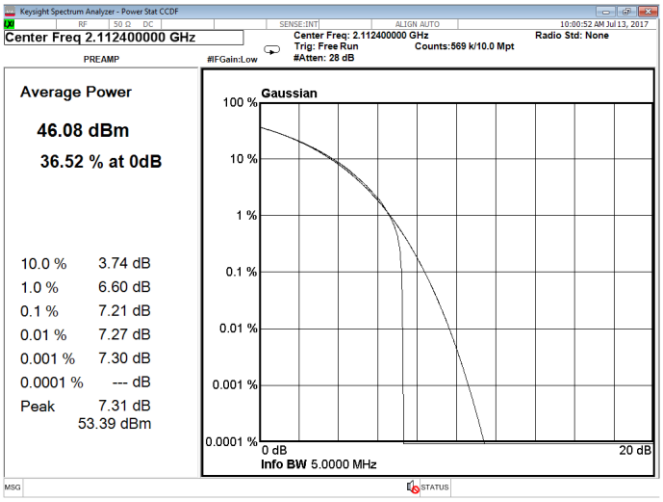

Figure 8.1-120: *CCDF, QPSK, 5 MHz, WCDMA, Port B, Low channel*

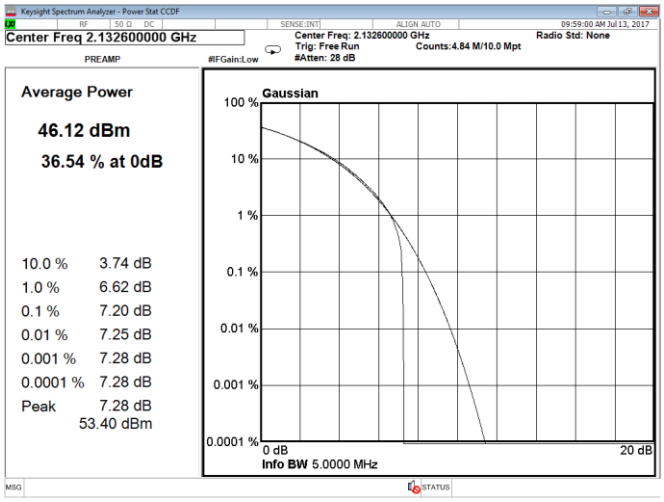

Figure 8.1-121: *CCDF, QPSK, 5 MHz, WCDMA, Port B, Mid channel*

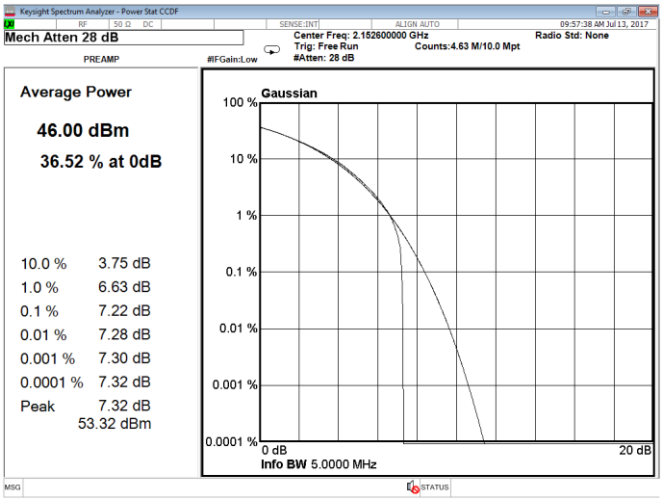

Figure 8.1-122: *CCDF, QPSK, 5 MHz, WCDMA, Port B, High channel*

8.2 FCC 27.53 and RSS-139, 4.2 Spurious emissions at RF antenna connector

8.2.1 Definitions and limits

FCC:
(h) AWS emission limits
(1) General protection levels. Except as otherwise specified below, for operations in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz, and 2180–2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}$ (P) dB.

(3) Measurement procedure.

(i) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
(ii) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.
(iii) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

RSS-139, Section 6.6:
i. In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10}$ p (watts) dB.
ii. After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10}$ p (watts) dB.

8.2.2 Test summary

Test date	July 12, 2017	Temperature	22 °C
Test engineer	Andrey Adelberg	Air pressure	1009 mbar
Verdict	Pass	Relative humidity	33 %

8.2.3 Observations, settings and special notes

The spectrum was searched from 30 MHz to the 10th harmonic.
All measurements were performed using an average detector.
Limit line was adjusted for MIMO 2×2 operation by 3 dB (for *2* ports: $10 \times \text{Log}_{10}(2)$): −13 dBm – 3 dB = −16 dBm
RBW 1 MHz, VBW was wider than RBW.

8.2.4 Test data

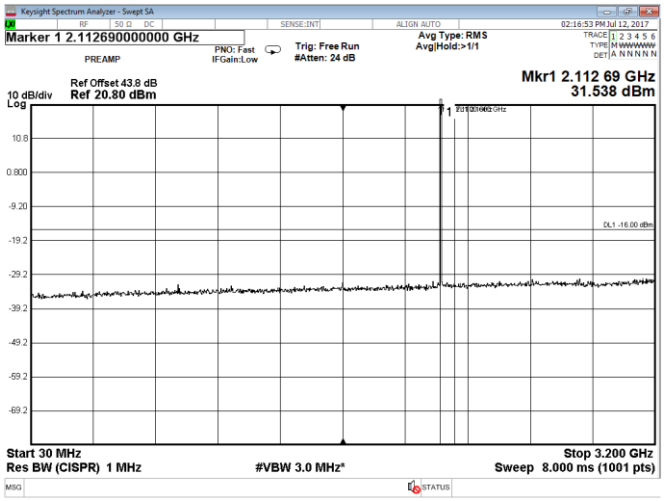

Figure 8.2-1: *Conducted spurious emissions within 30–3200 MHz, Port A, LTE, 5 MHz low channel, QPSK*

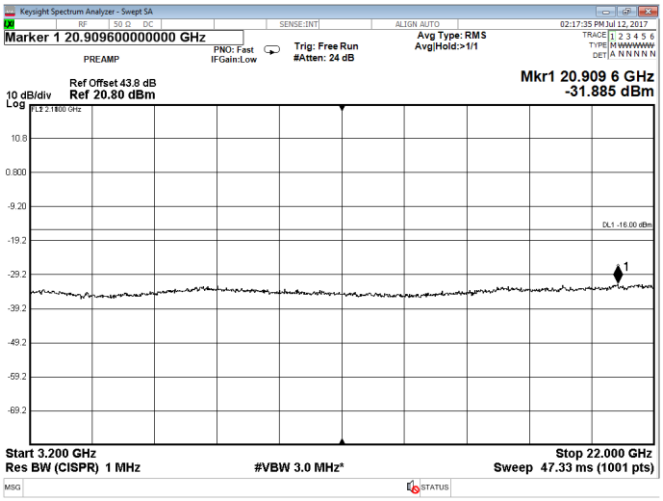

Figure 8.2-2: *Conducted spurious emissions within 3200–22000 MHz, Port A, LTE, 5 MHz low channel, QPSK*

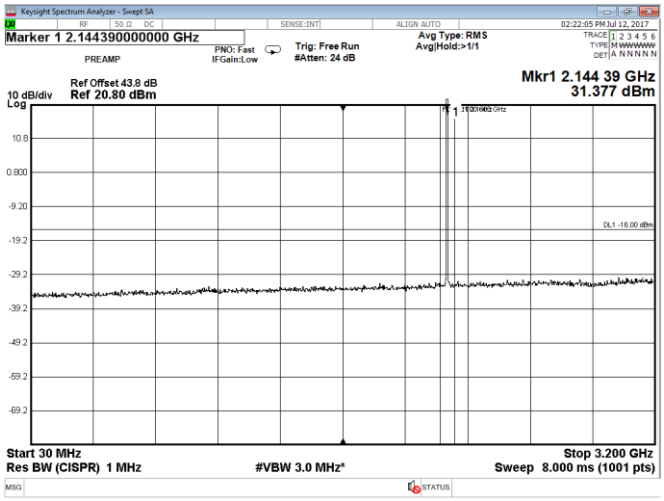

Figure 8.2-3: *Conducted spurious emissions within 30–3200 MHz, Port A, LTE, 5 MHz mid channel, QPSK*

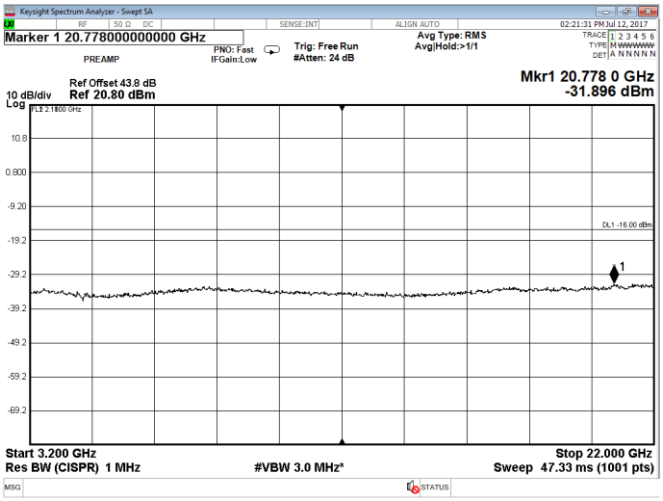

Figure 8.2-4: *Conducted spurious emissions within 3200–22000 MHz, Port A, LTE, 5 MHz mid channel, QPSK*

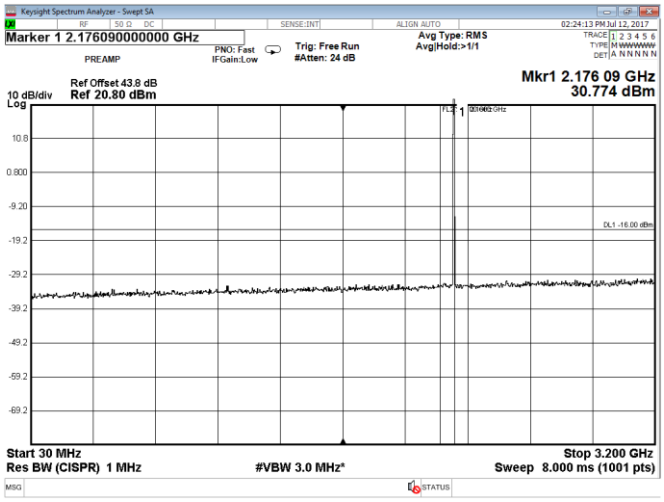

Figure 8.2-5: *Conducted spurious emissions within 30–3200 MHz, Port A, LTE, 5 MHz high channel, QPSK*

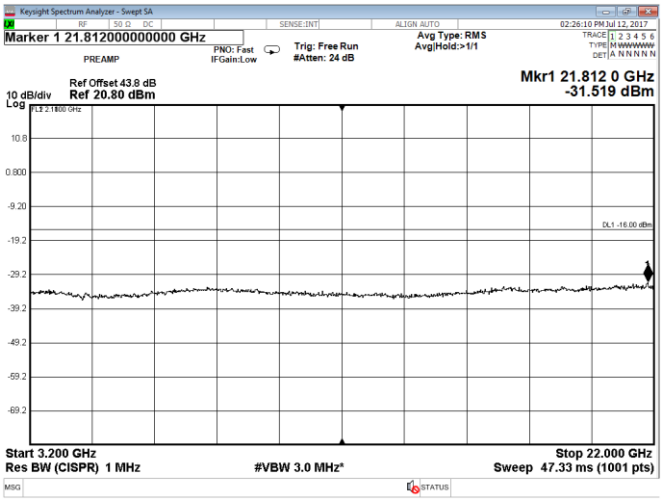

Figure 8.2-6: *Conducted spurious emissions within 3200–22000 MHz, Port A, LTE, 5 MHz high channel, QPSK*

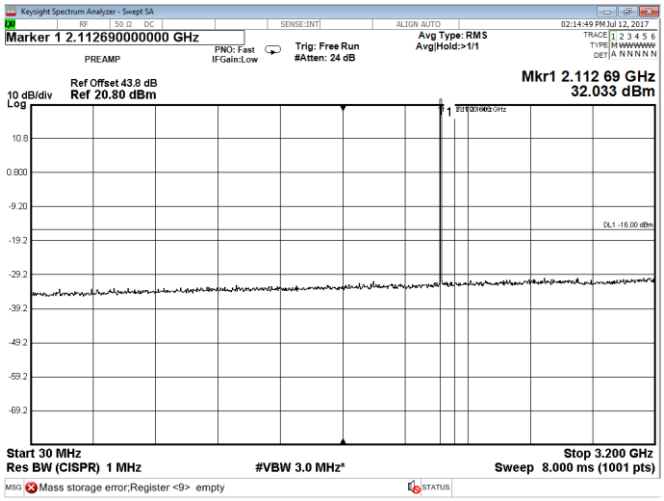

Figure 8.2-7: *Conducted spurious emissions within 30–3200 MHz, Port B, LTE, 5 MHz low channel, QPSK*

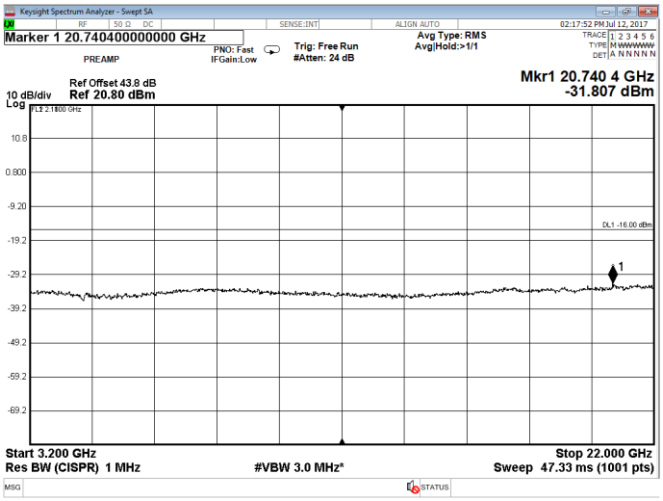

Figure 8.2-8: *Conducted spurious emissions within 3200–22000 MHz, Port B, LTE, 5 MHz low channel, QPSK*

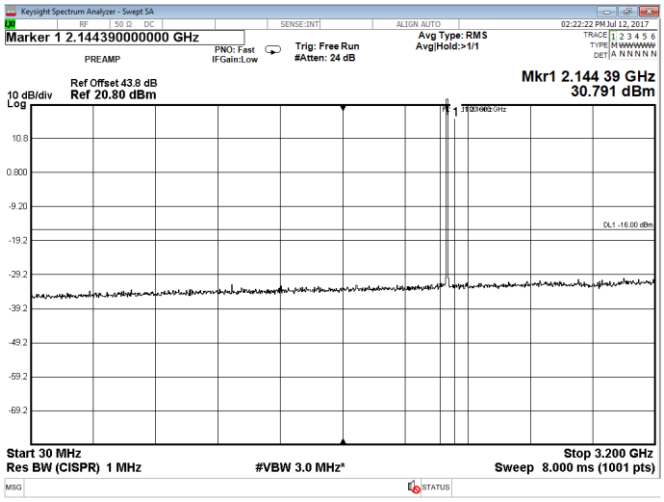

Figure 8.2-9: *Conducted spurious emissions within 30–3200 MHz, Port B, LTE, 5 MHz mid channel, QPSK*

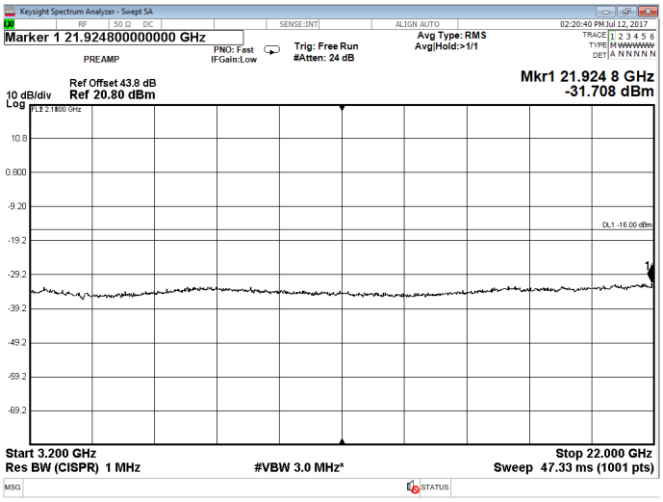

Figure 8.2-10: *Conducted spurious emissions within 3200–22000 MHz, Port B, LTE, 5 MHz mid channel, QPSK*

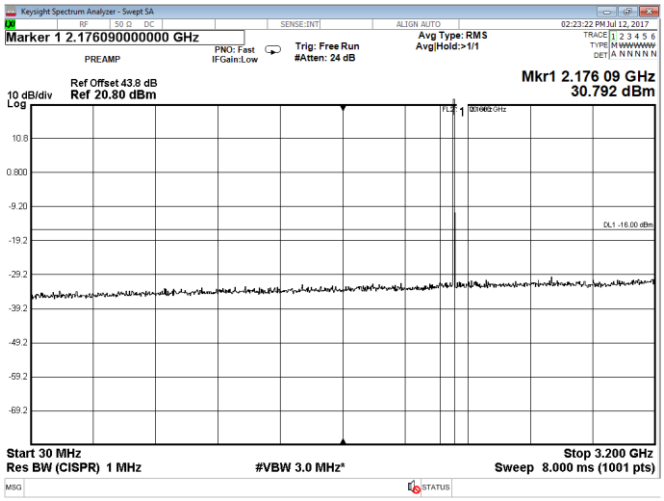

Figure 8.2-11: *Conducted spurious emissions within 30–3200 MHz, Port B, LTE, 5 MHz high channel, QPSK*

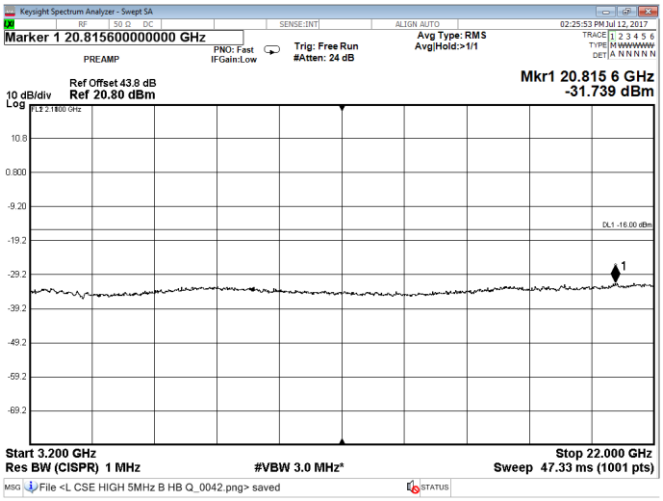

Figure 8.2-12: *Conducted spurious emissions within 3200–22000 MHz, Port B, LTE, 5 MHz high channel, QPSK*

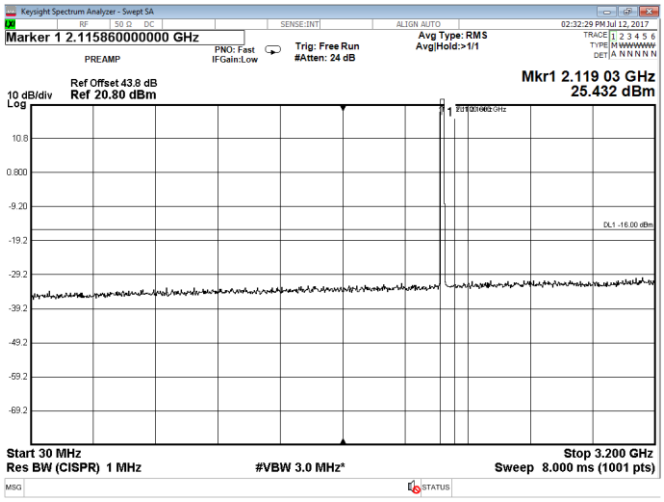

Figure 8.2-13: *Conducted spurious emissions within 30–3200 MHz, Port A, LTE, 20 MHz low channel, QPSK*

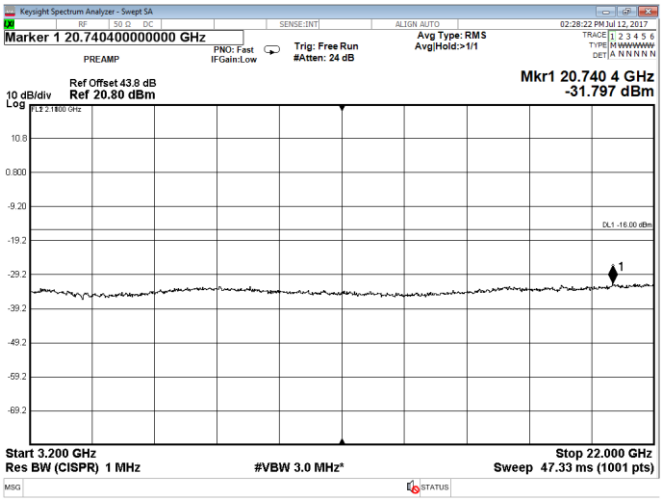

Figure 8.2-14: *Conducted spurious emissions within 3200–22000 MHz, Port A, LTE, 20 MHz low channel, QPSK*

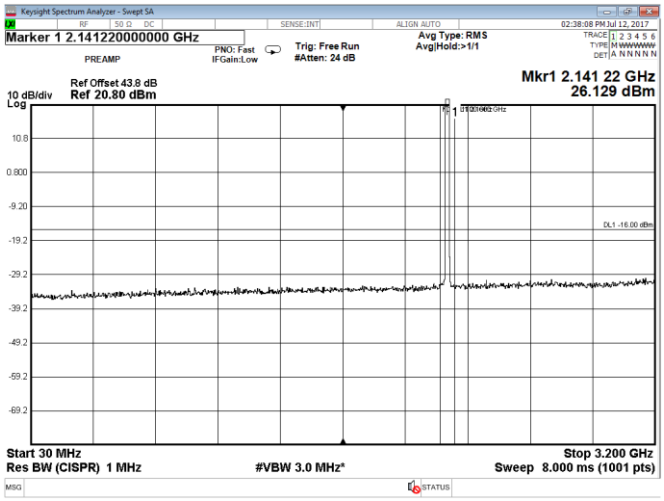

Figure 8.2-15: *Conducted spurious emissions within 30–3200 MHz, Port A, LTE, 20 MHz mid channel, QPSK*

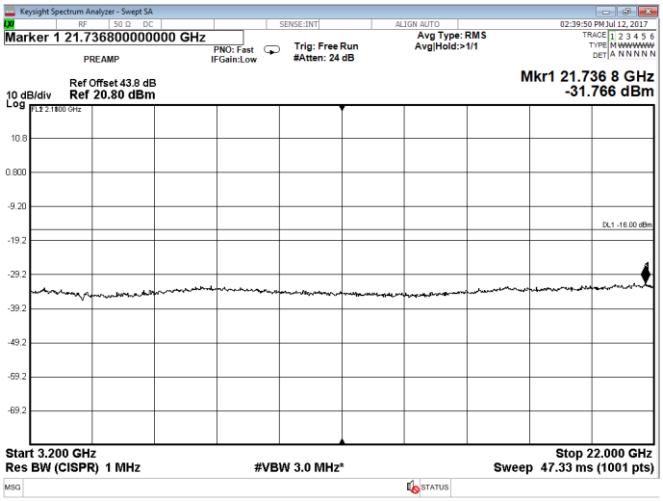

Figure 8.2-16: *Conducted spurious emissions within 3200–22000 MHz, Port A, LTE, 20 MHz mid channel, QPSK*

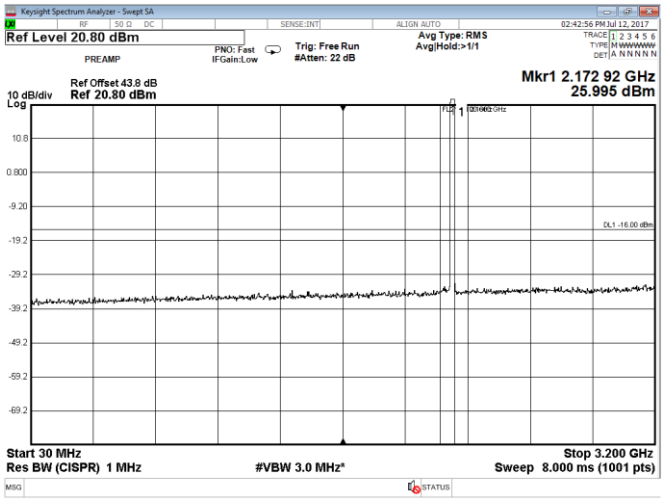

Figure 8.2-17: *Conducted spurious emissions within 30–3200 MHz, Port A, LTE, 20 MHz high channel, QPSK*

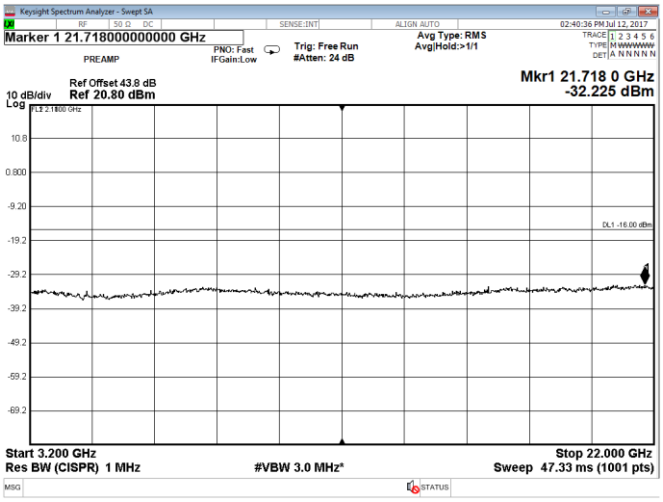

Figure 8.2-18: *Conducted spurious emissions within 3200–22000 MHz, Port A, LTE, 20 MHz high channel, QPSK*

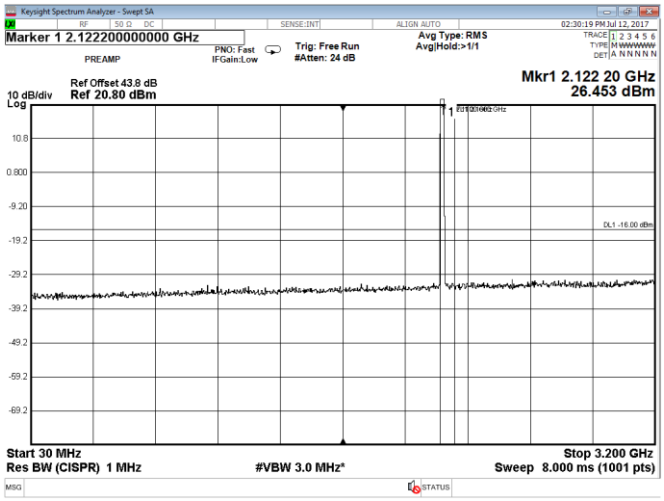

Figure 8.2-19: *Conducted spurious emissions within 30–3200 MHz, Port B, LTE, 20 MHz low channel, QPSK*

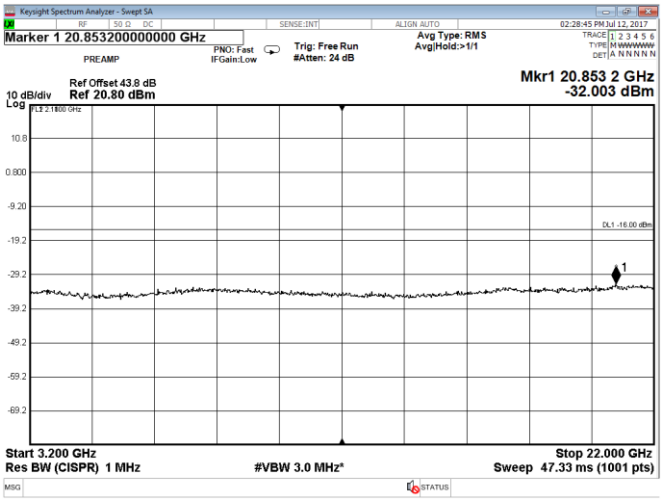

Figure 8.2-20: *Conducted spurious emissions within 3200–22000 MHz, Port B, LTE, 20 MHz low channel, QPSK*

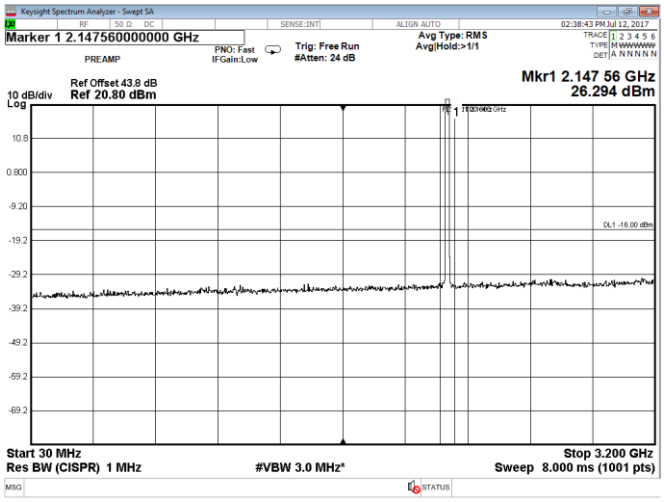

Figure 8.2-21: *Conducted spurious emissions within 30–3200 MHz, Port B, LTE, 20 MHz mid channel, QPSK*

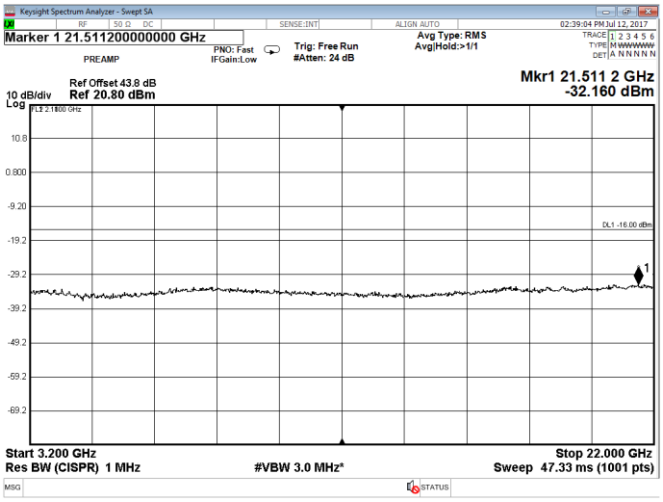

Figure 8.2-22: *Conducted spurious emissions within 3200–22000 MHz, Port B, LTE, 20 MHz mid channel, QPSK*

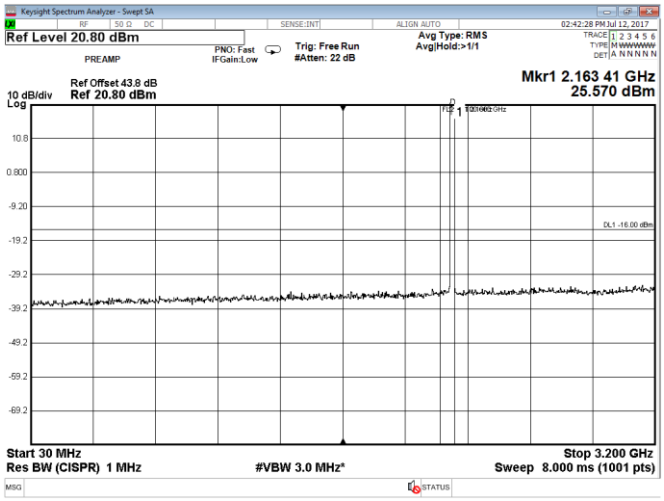

Figure 8.2-23: *Conducted spurious emissions within 30–3200 MHz, Port B, LTE, 20 MHz high channel, QPSK*

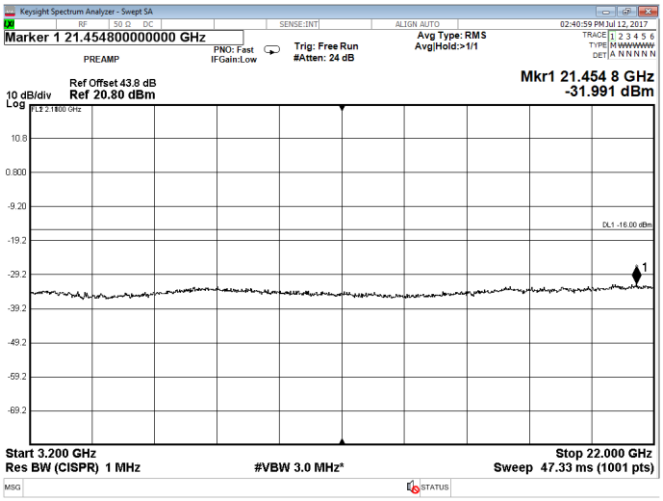

Figure 8.2-24: *Conducted spurious emissions within 3200–22000 MHz, Port B, LTE, 20 MHz high channel, QPSK*

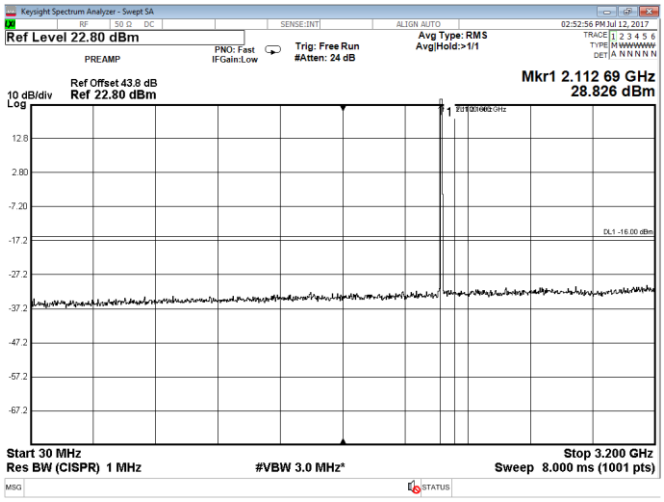

Figure 8.2-25: *Conducted spurious emissions within 30–3200 MHz, Port A, LTE, 2 carriers: 5 MHz each at the bottom of the band, QPSK*

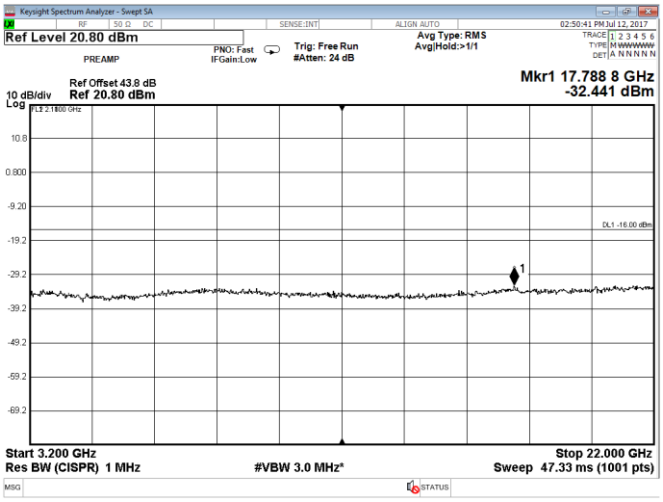

Figure 8.2-26: *Conducted spurious emissions within 3200–22000 MHz, Port A, LTE, 2 carriers: 5 MHz each at the bottom of the band, QPSK*

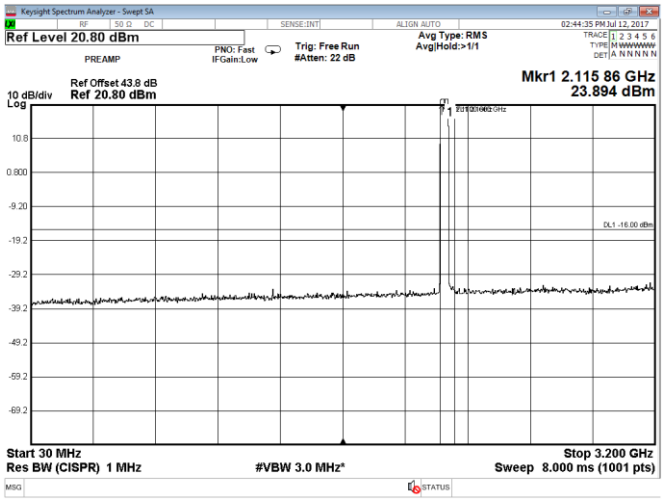

Figure 8.2-27: *Conducted spurious emissions within 30–3200 MHz, Port A, LTE, 2 carriers: 20 MHz each at the bottom of the band, QPSK*

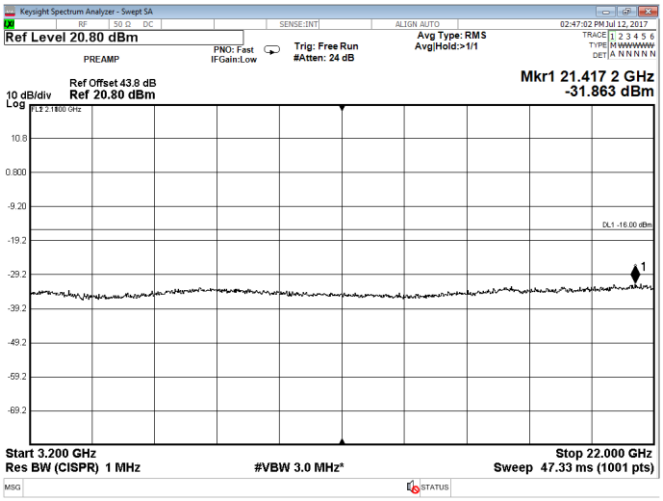

Figure 8.2-28: *Conducted spurious emissions within 3200–22000 MHz, Port A, LTE, 2 carriers: 20 MHz each at the bottom of the band, QPSK*

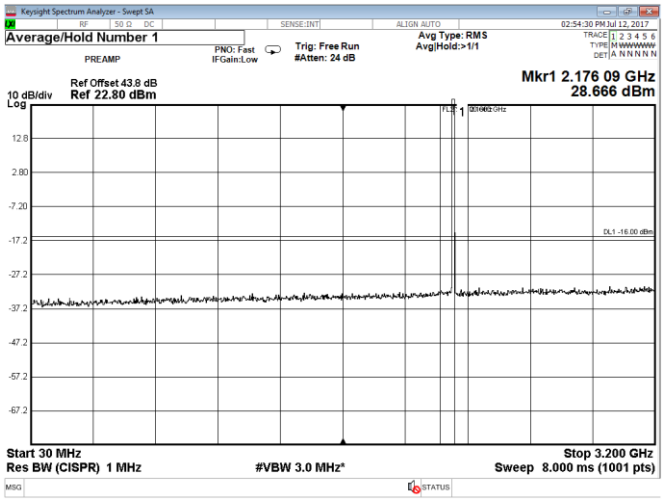

Figure 8.2-29: *Conducted spurious emissions within 30–3200 MHz, Port A, LTE, 2 carriers: 5 MHz each at the top of the band, QPSK*

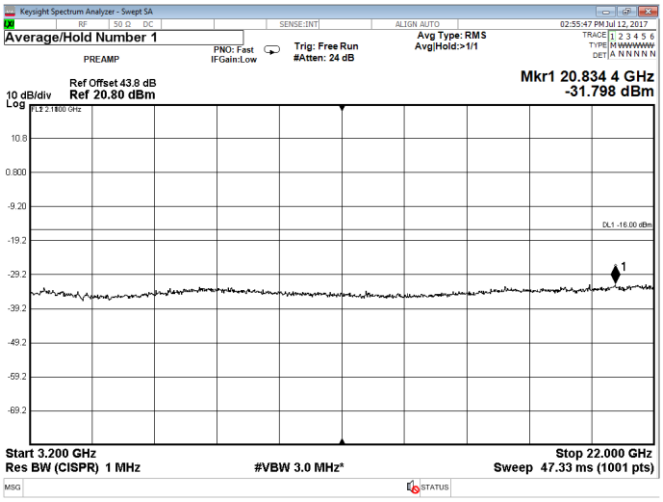

Figure 8.2-30: *Conducted spurious emissions within 3200–22000 MHz, Port A, LTE, 2 carriers: 5 MHz each at the top of the band, QPSK*

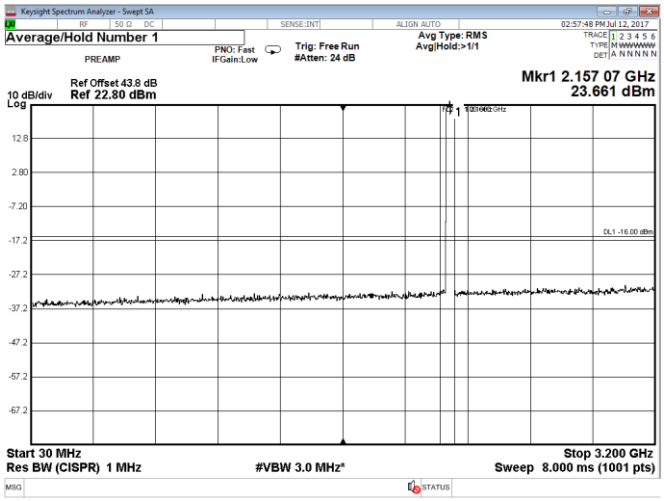

Figure 8.2-31: *Conducted spurious emissions within 30–3200 MHz, Port A, LTE, 2 carriers: 20 MHz each at the top of the band, QPSK*

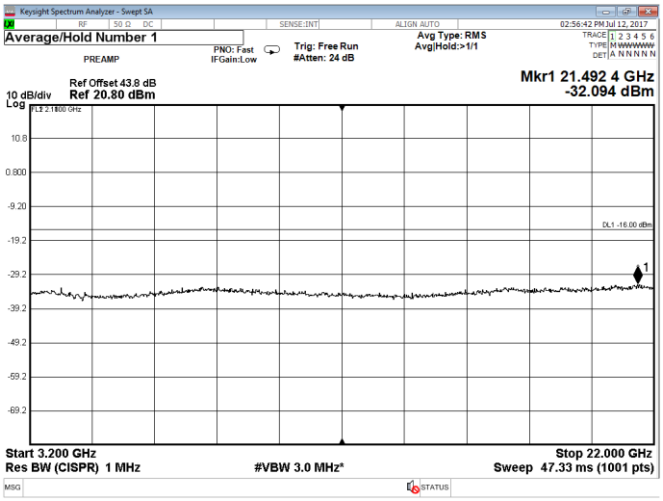

Figure 8.2-32: *Conducted spurious emissions within 3200–22000 MHz, Port A, LTE, 2 carriers: 20 MHz each at the top of the band, QPSK*

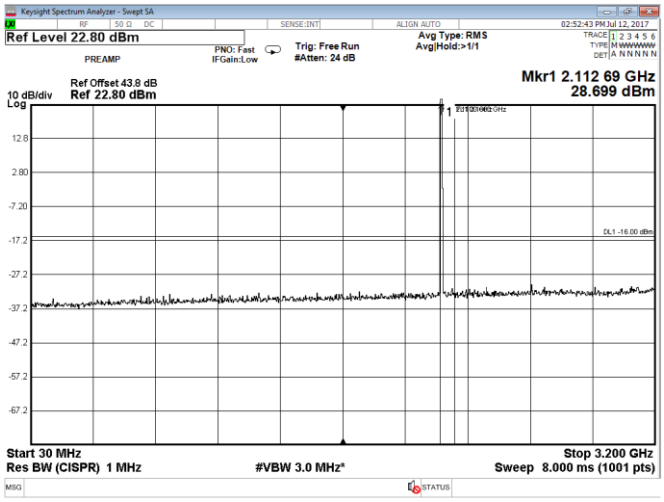

Figure 8.2-33: *Conducted spurious emissions within 30–3200 MHz, Port B, LTE, 2 carriers: 5 MHz each at the bottom of the band, QPSK*

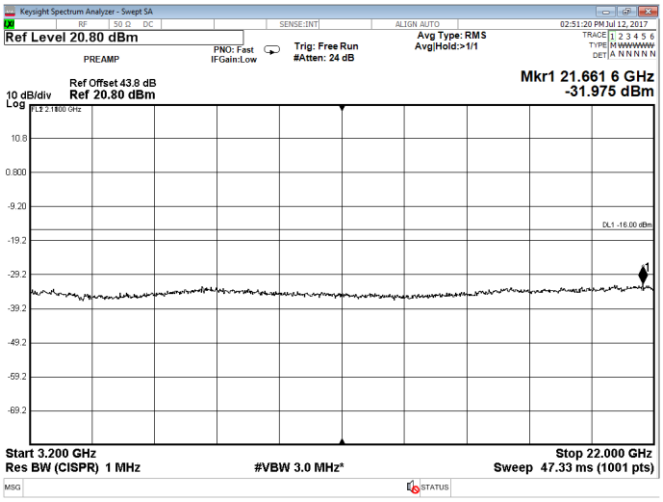

Figure 8.2-34: *Conducted spurious emissions within 3200–22000 MHz, Port B, LTE, 2 carriers: 5 MHz each at the bottom of the band, QPSK*

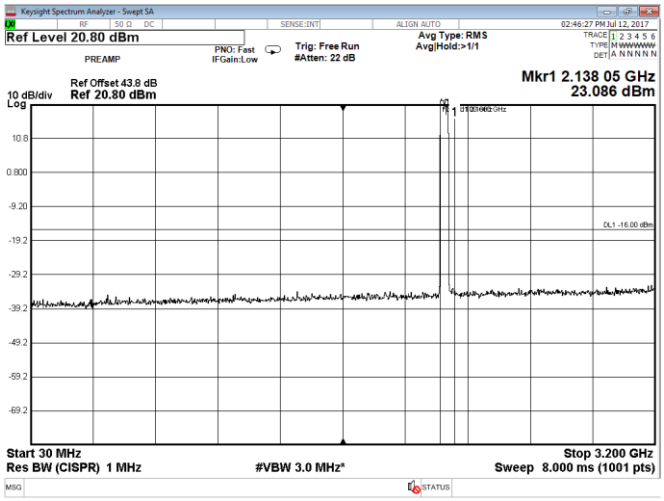

Figure 8.2-35: *Conducted spurious emissions within 30–3200 MHz, Port B, LTE, 2 carriers: 20 MHz each at the bottom of the band, QPSK*

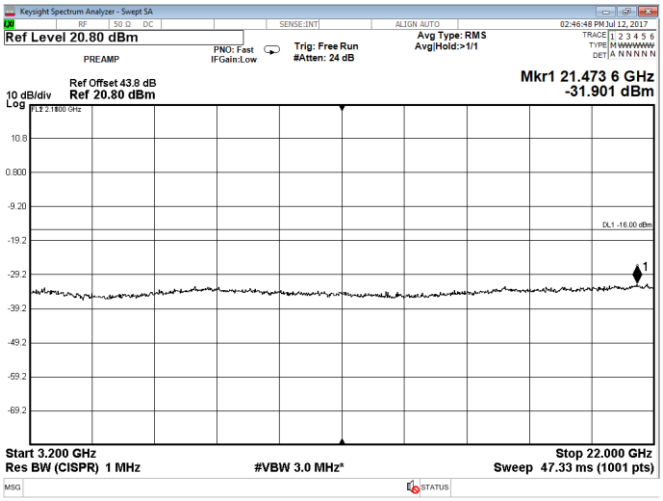

Figure 8.2-36: *Conducted spurious emissions within 3200–22000 MHz, Port B, LTE, 2 carriers: 20 MHz each at the bottom of the band, QPSK*

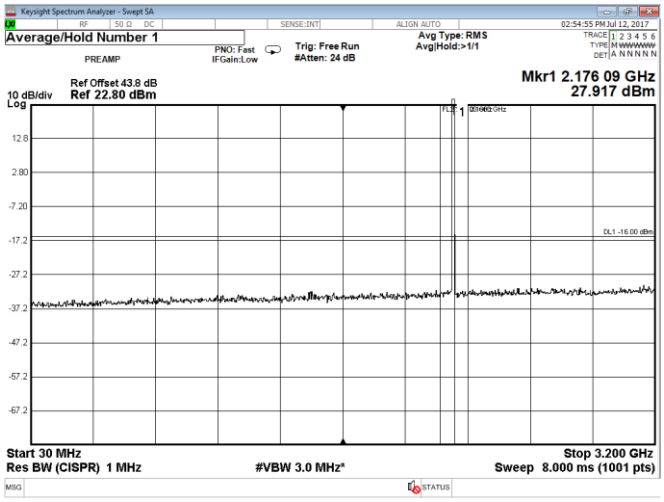

Figure 8.2-37: *Conducted spurious emissions within 30–3200 MHz, Port B, LTE, 2 carriers: 5 MHz each at the top of the band, QPSK*

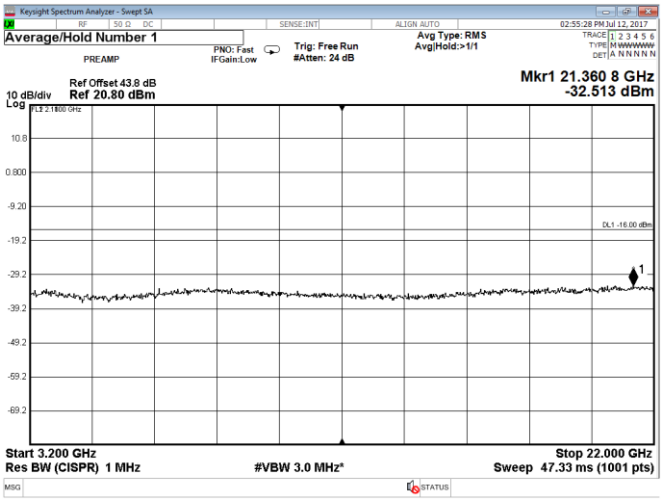

Figure 8.2-38: *Conducted spurious emissions within 3200–22000 MHz, Port B, LTE, 2 carriers: 5 MHz each at the top of the band, QPSK*

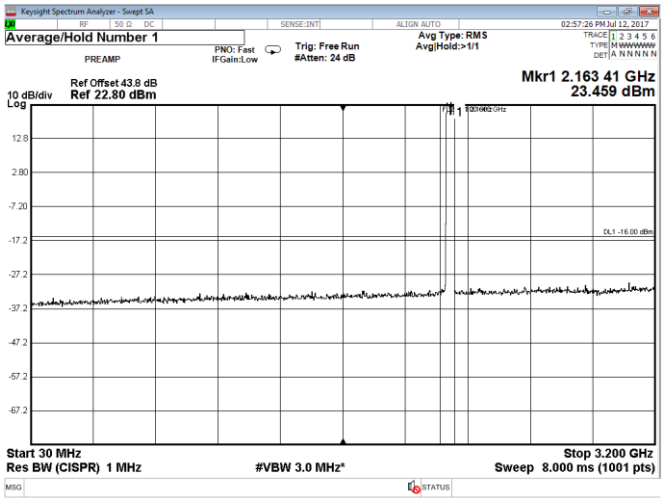

Figure 8.2-39: *Conducted spurious emissions within 30–3200 MHz, Port B, LTE, 2 carriers: 20 MHz each at the top of the band, QPSK*

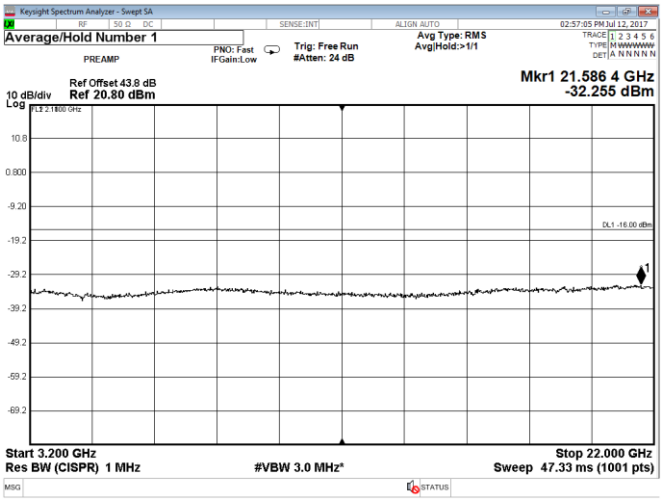

Figure 8.2-40: *Conducted spurious emissions within 3200–22000 MHz, Port B, LTE, 2 carriers: 20 MHz each at the top of the band, QPSK*