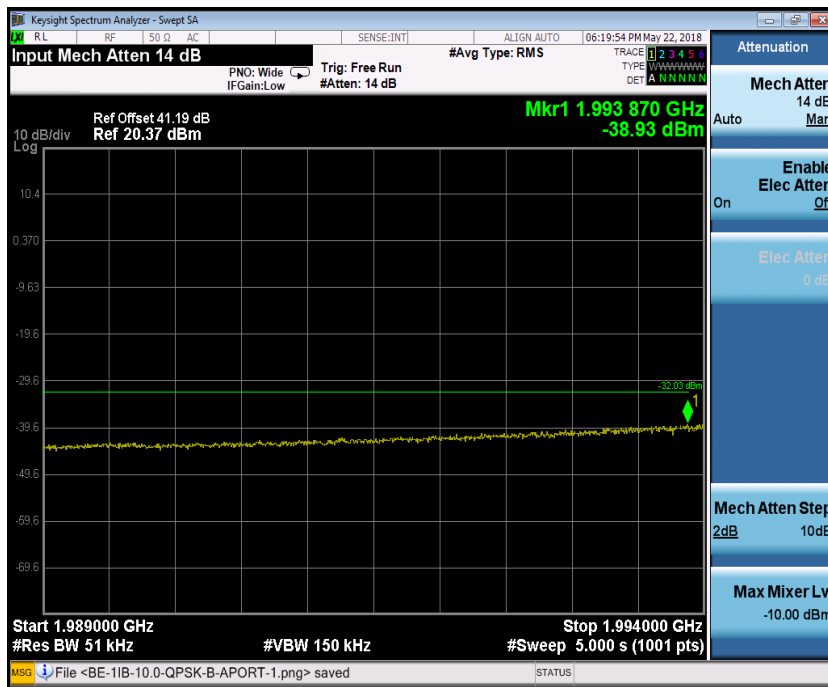




Port B, Channel Position B, 10.0MHz





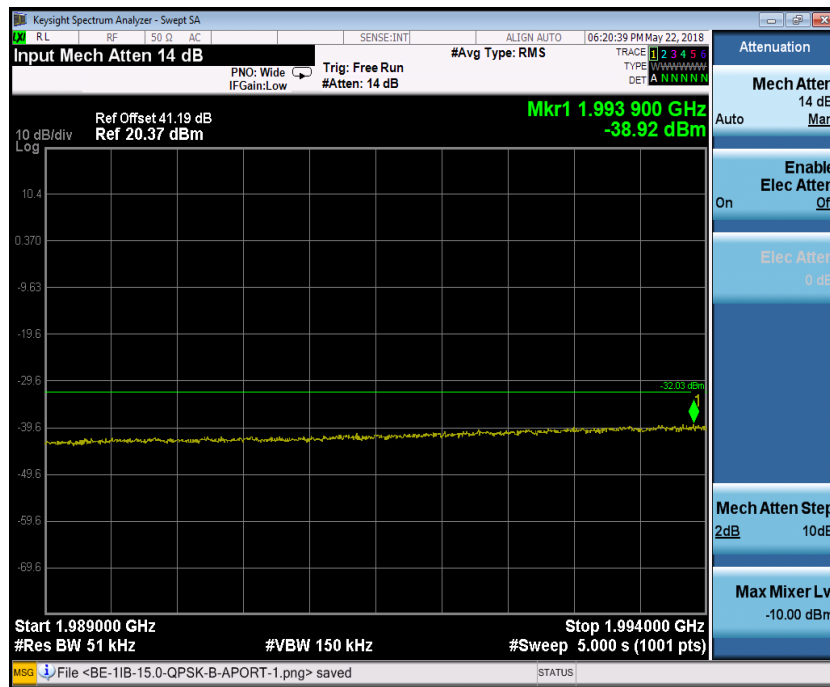
Port B, Channel Position T, 10.0MHz





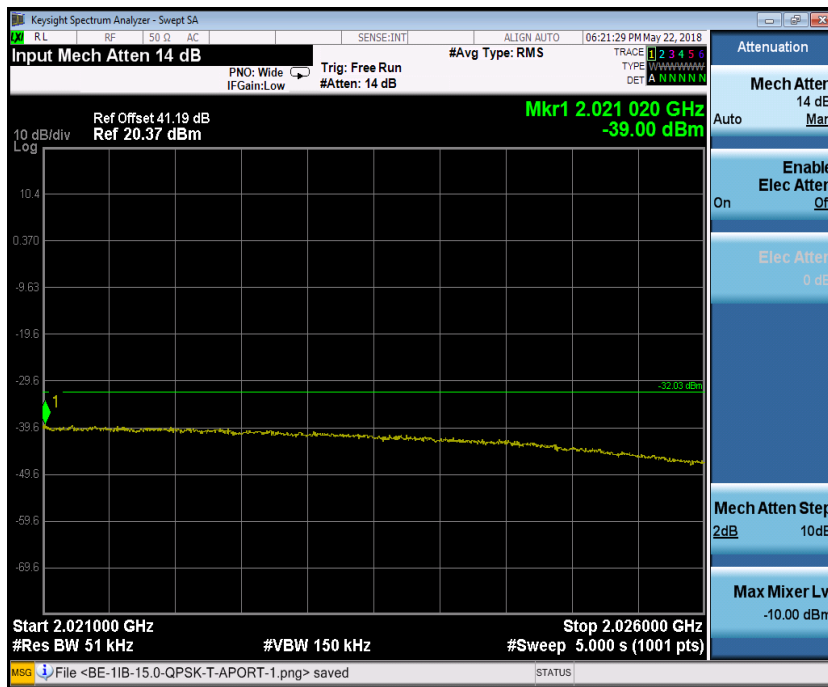
Port B, Channel Position B, 15.0MHz





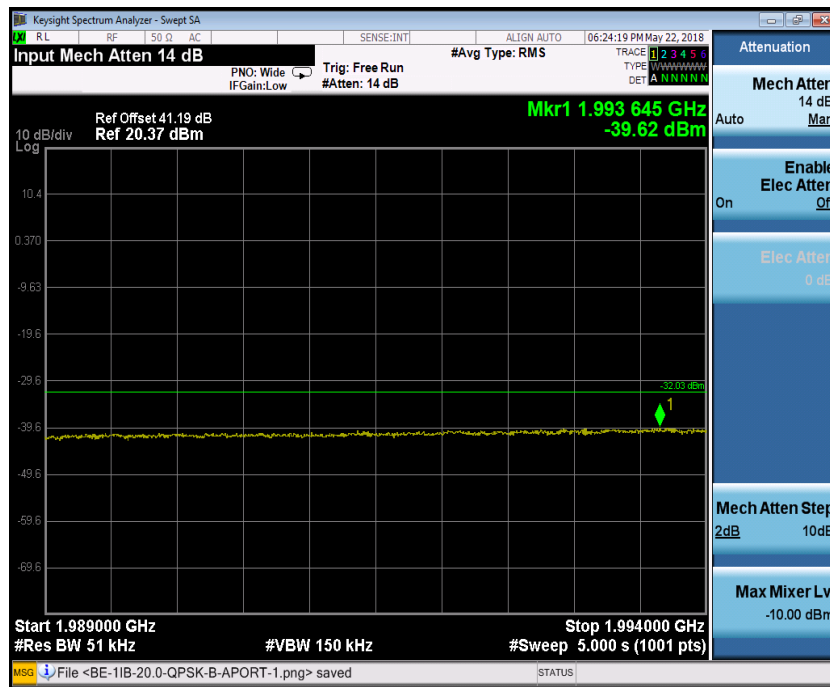
Port B, Channel Position T, 15.0MHz





Port B, Channel Position B, 20.0MHz





Port B, Channel Position T, 20.0MHz

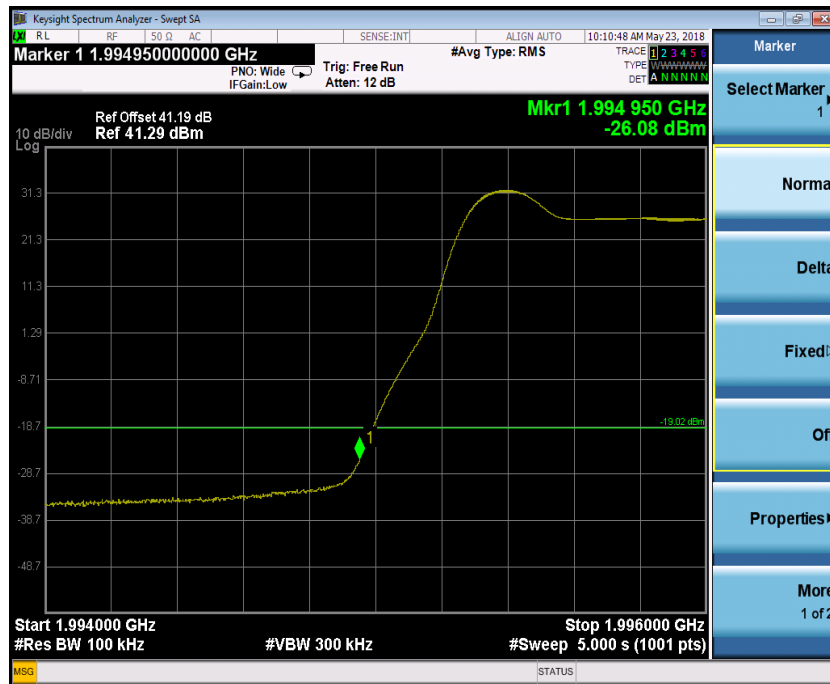




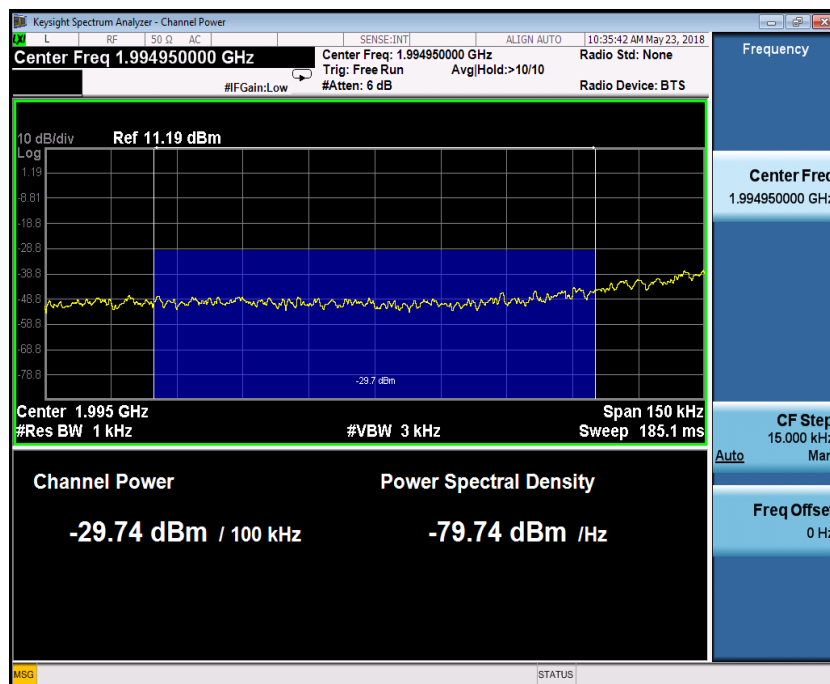
Configuration NB-IoT-GuardBand-1C, QPSK

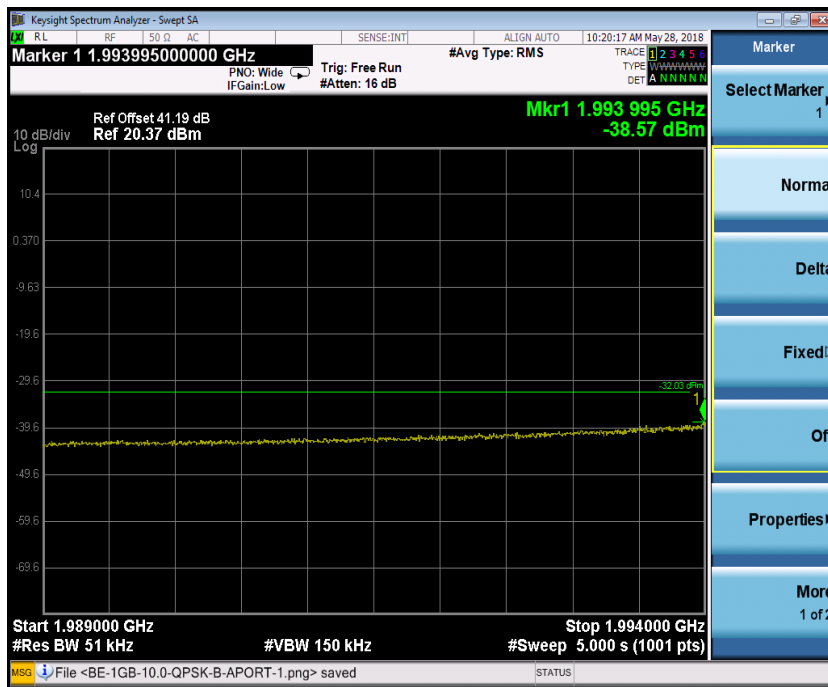
Band Edge Frequency	Channel Bandwidth	RBW(KHz)	Limit(dBm)
Channel Position B 1995.0MHz	10.0 MHz	100	-19.02
	15.0 MHz	150	-19.02
	20.0 MHz	200	-19.02
Channel Position T 2020.0MHz	10.0 MHz	100	-19.02
	15.0 MHz	150	-19.02
	20.0 MHz	200	-19.02

Port B, Channel Position B, 10.0MHz



The channel power of 100.0KHz for 1994.950MHz is -29.74dBm, which is within the limit of -19.02dBm.





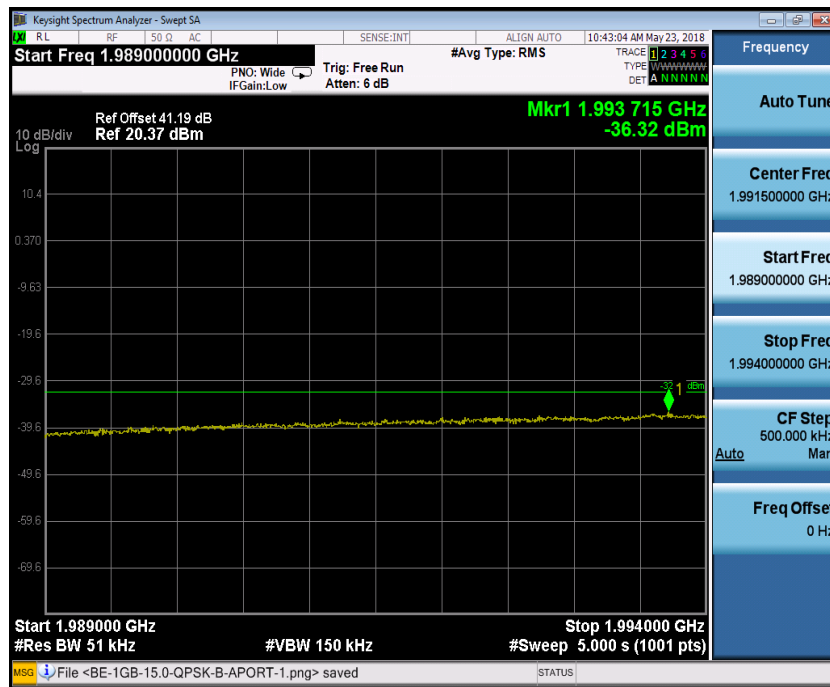
Port B, Channel Position T, 10.0MHz





Port B, Channel Position B, 15.0MHz





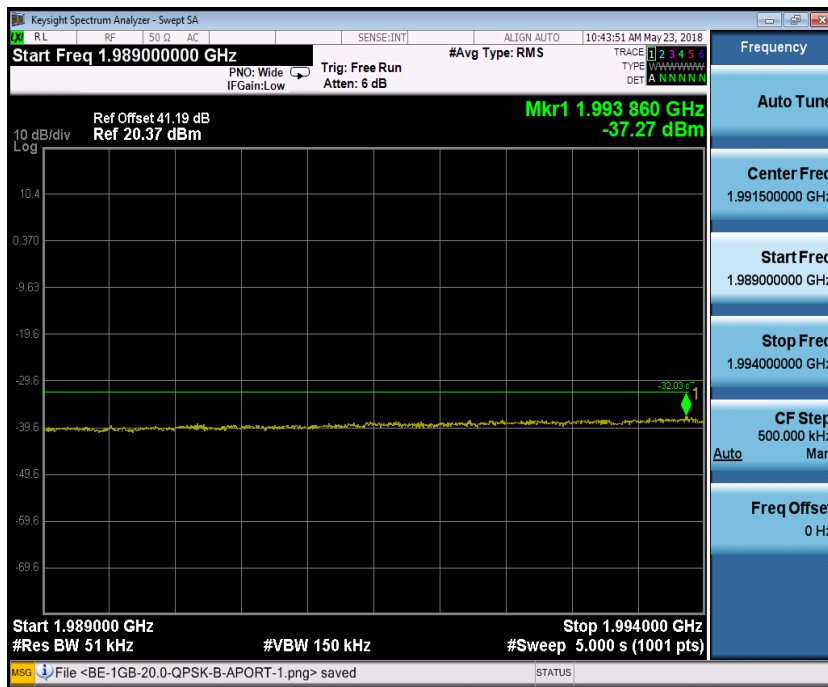
Port B, Channel Position T, 15.0MHz





Port B, Channel Position B, 20.0MHz





Port B, Channel Position T, 20.0MHz

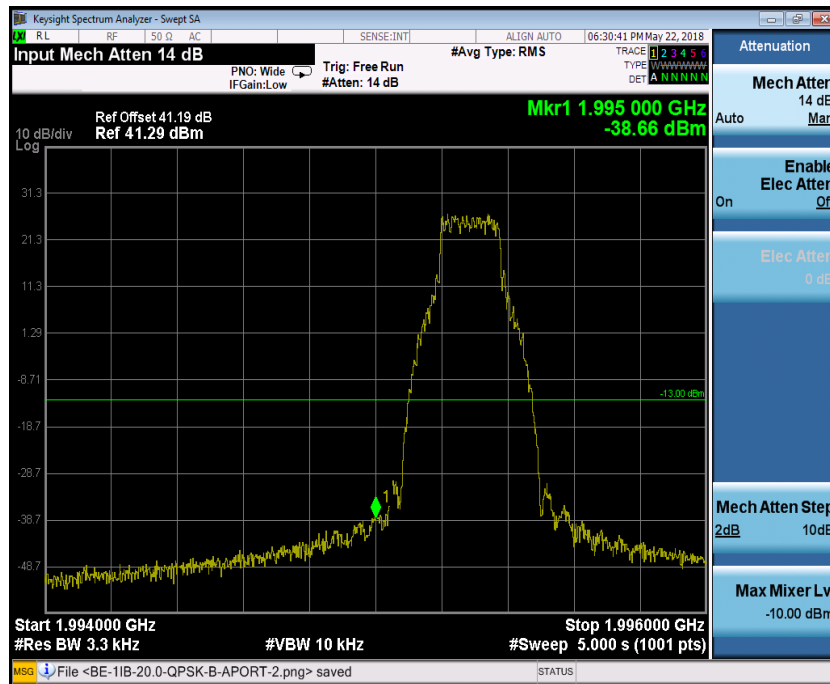




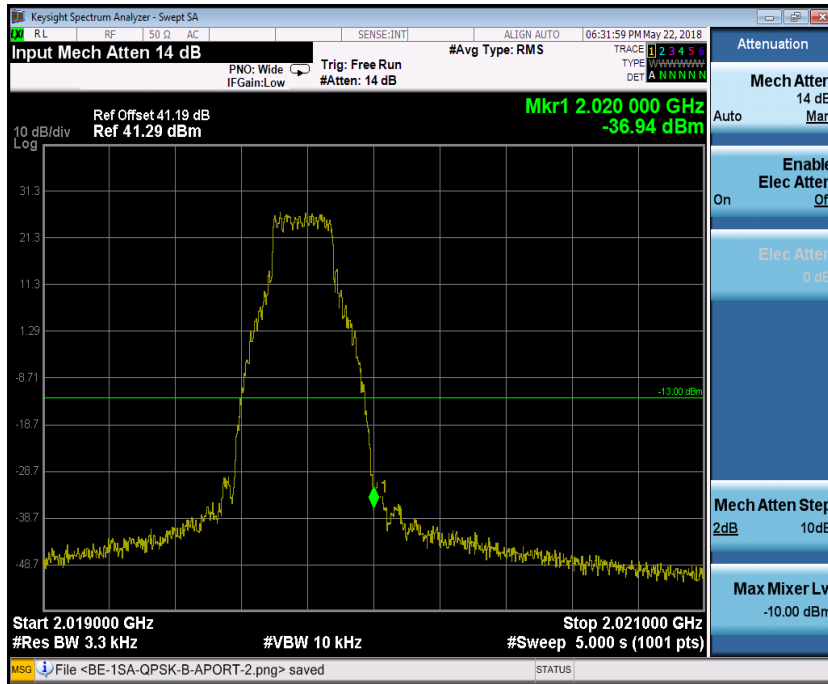
Configuration NB-IoT-StandAlone-1C, QPSK

Band Edge Frequency	Channel Bandwidth	RBW (KHz)	Limit (dBm)
Channel Position B 1995.0MHz	250KHz	3.3	-13.00
Channel Position T 2020.0MHz	250KHz	3.3	-13.00

Port B, Channel Position B



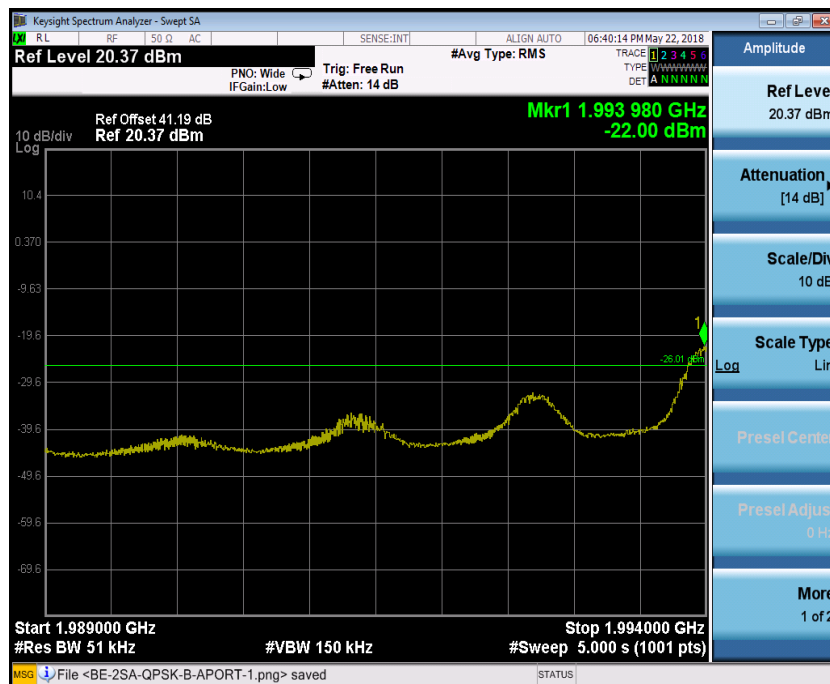
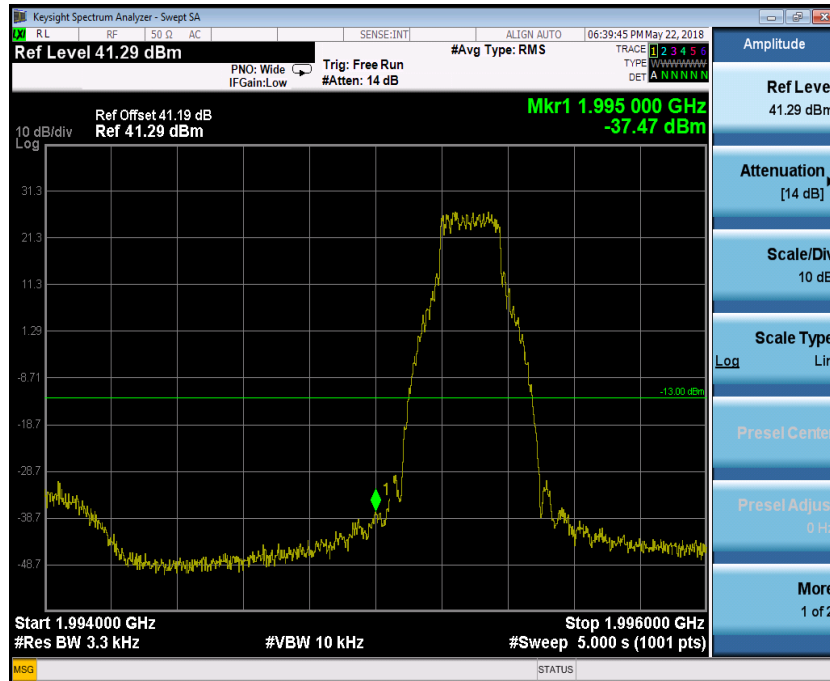
Port B, Channel Position T



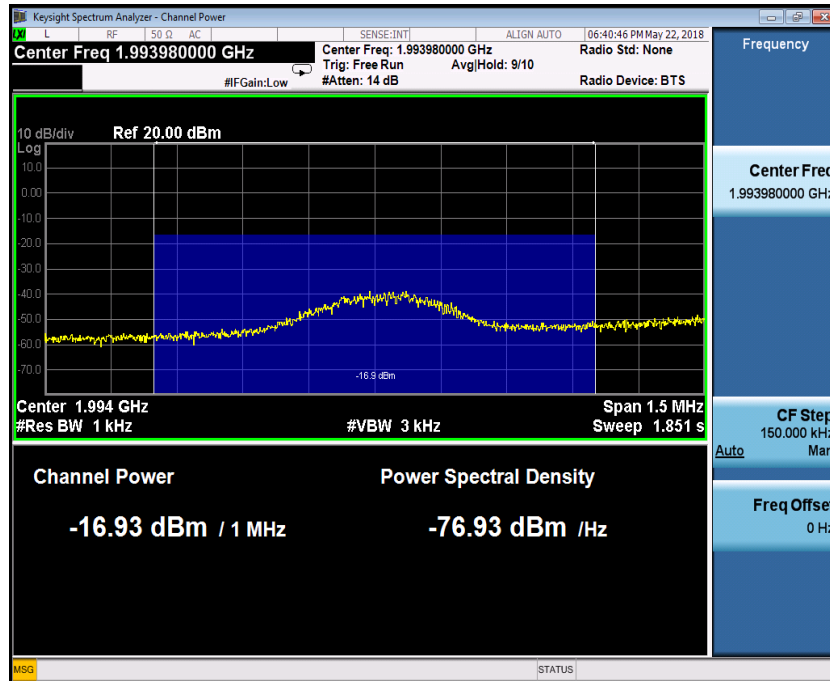
Configuration NB-IoT-StandAlone-2C, QPSK

Band Edge Frequency	Channel Bandwidth	RBW (KHz)	Limit (dBm)
Channel Position B 1995.0MHz	250KHz	3.3	-13.00
Channel Position T 2020.0MHz	250KHz	3.3	-13.00

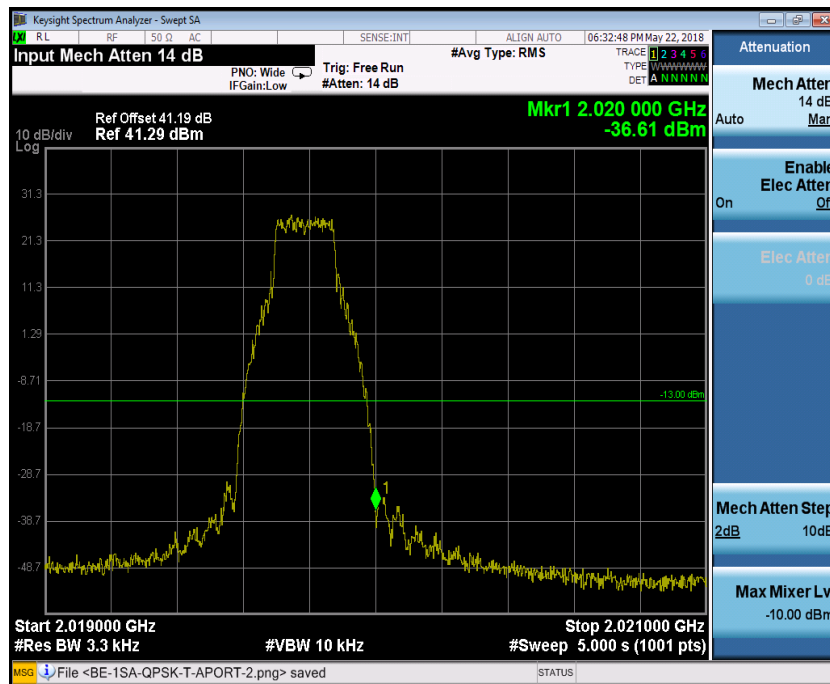
Port B, Channel Position B



The channel power of 1MHz for 1993.980MHz is -16.93dBm, which is within the limit of -13.00dBm.

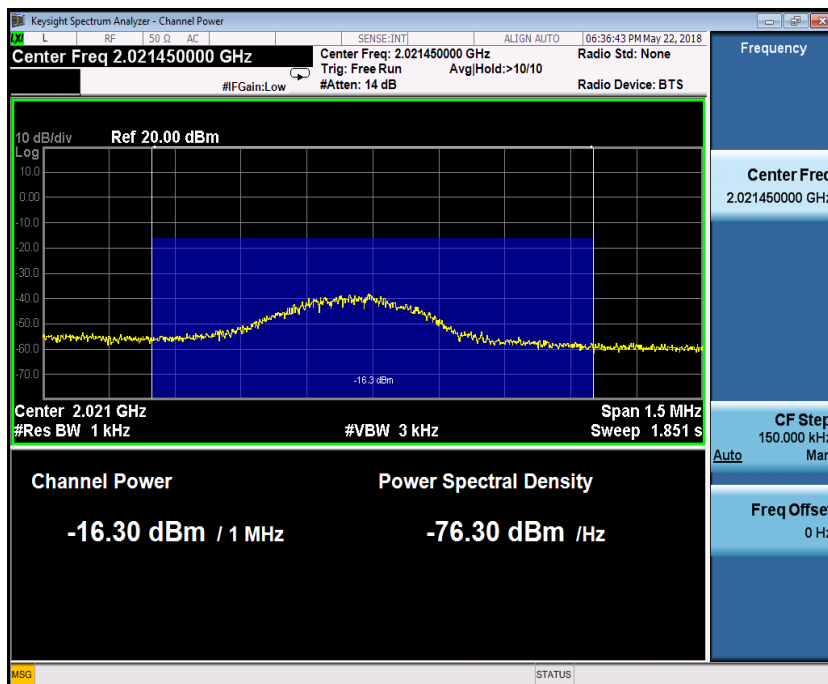


Port B, Channel Position T





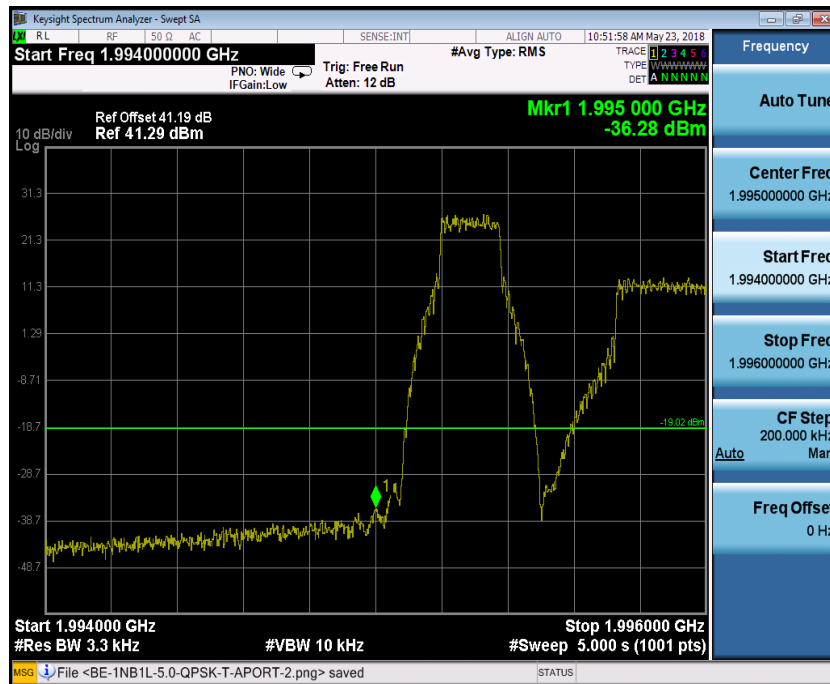
The channel power of 1MHz for 2021.450MHz is -16.30dBm, which is within the limit of -13.00dBm.

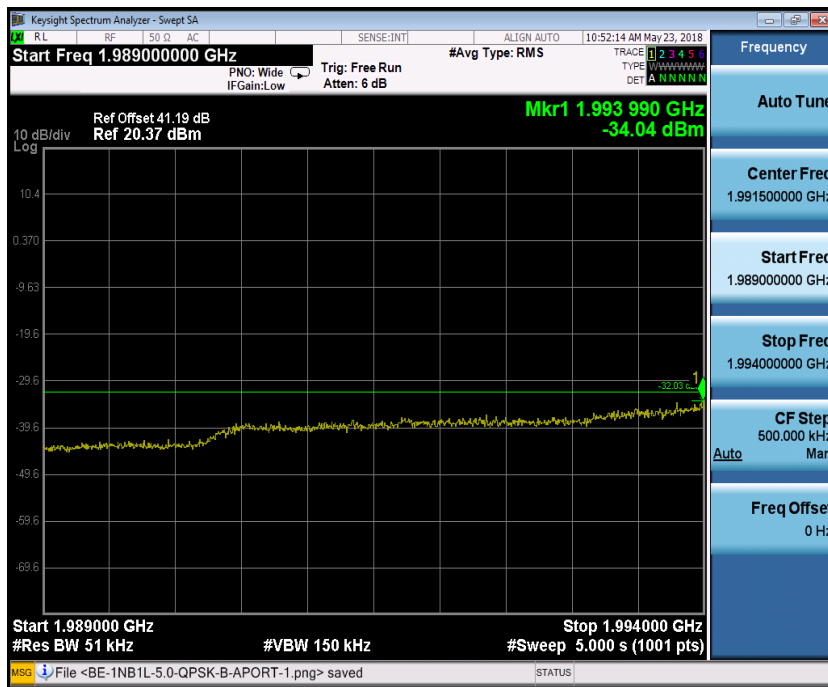


Configuration NB-IoT+LTE-MIMO-MC-1-BE, (1NB, QPSK +1LTE, QPSK)

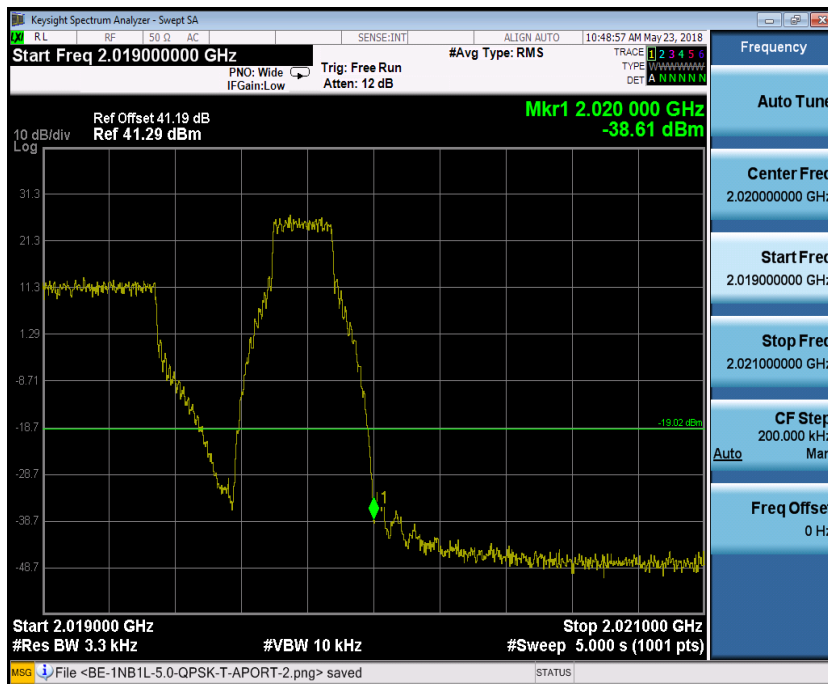
Band Edge Frequency	Channel Bandwidth	RBW (KHz)	Limit (dBm)
Channel Position B 1995.0MHz	(NB) 250KHz, (L) 5.0MHz	3.3	-19.02
	(NB) 250KHz, (L) 10.0MHz	3.3	-19.02
	(NB) 250KHz, (L) 15.0MHz	3.3	-19.02
	(NB) 250KHz, (L) 20.0MHz	3.3	-19.02
Channel Position T 2020.0MHz	(NB) 250KHz, (L) 5.0MHz	3.3	-19.02
	(NB) 250KHz, (L) 10.0MHz	3.3	-19.02
	(NB) 250KHz, (L) 15.0MHz	3.3	-19.02
	(NB) 250KHz, (L) 20.0MHz	3.3	-19.02

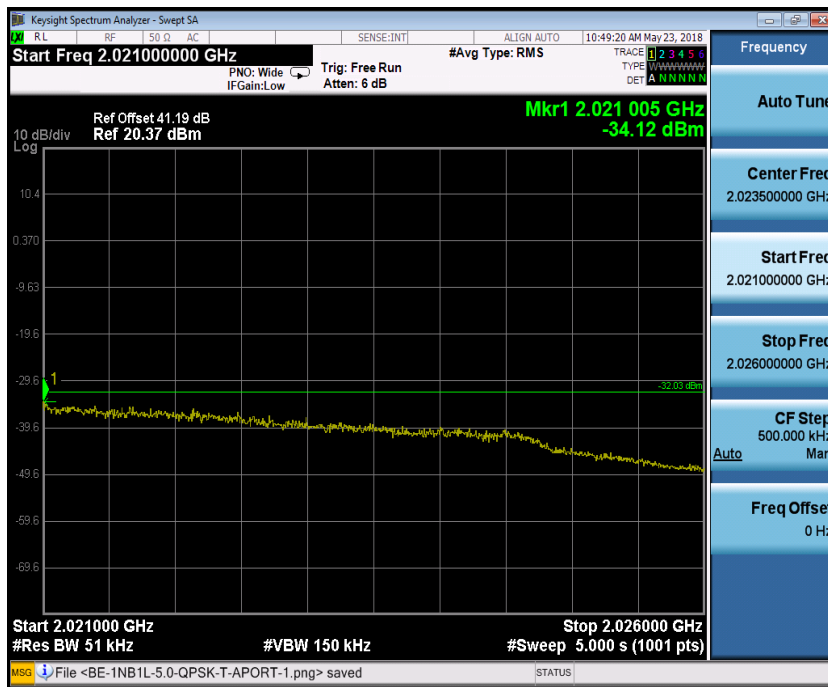
Port B, Channel Position B, LTE 5.0MHz



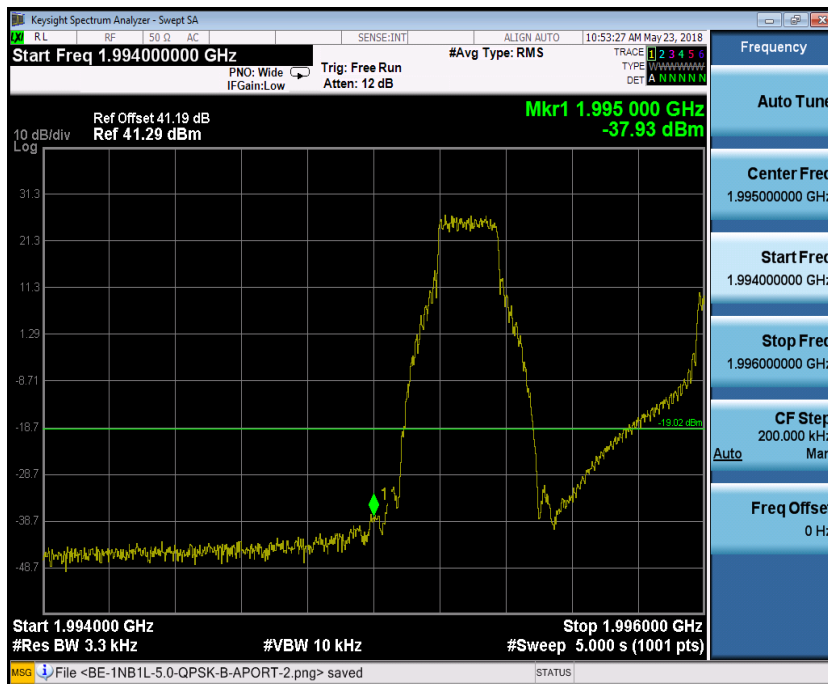


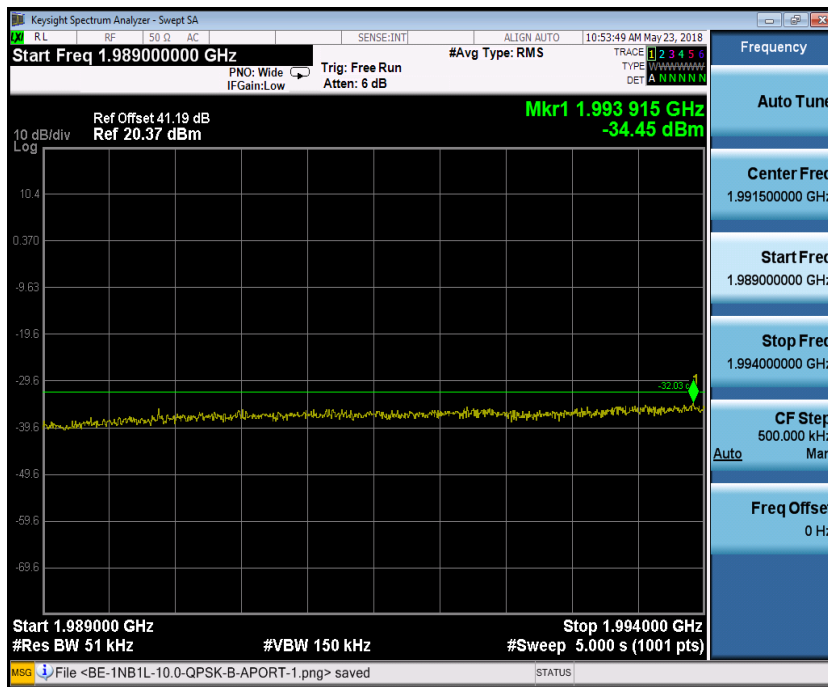
Port B, Channel Position T, LTE 5.0MHz



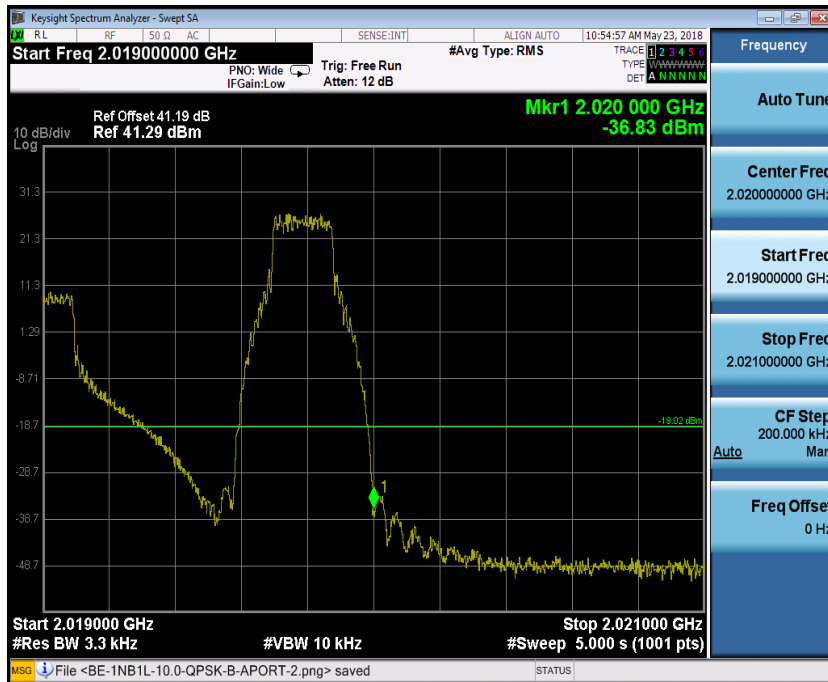


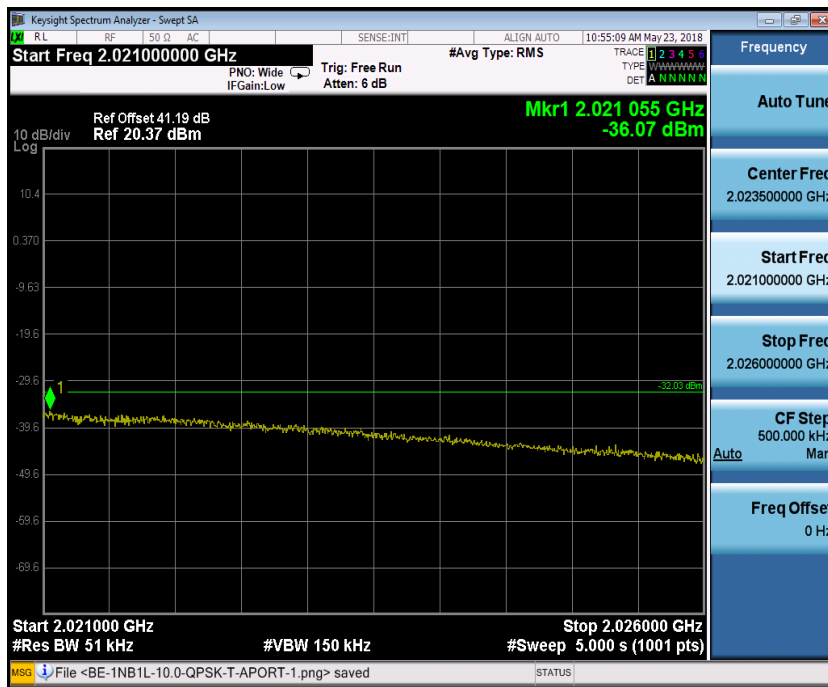
Port B, Channel Position B, LTE 10.0MHz



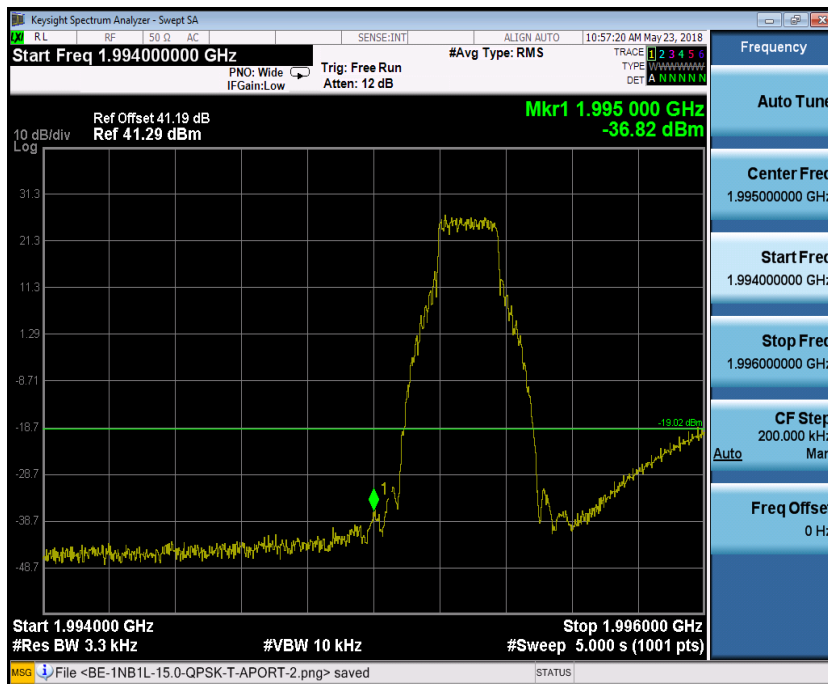


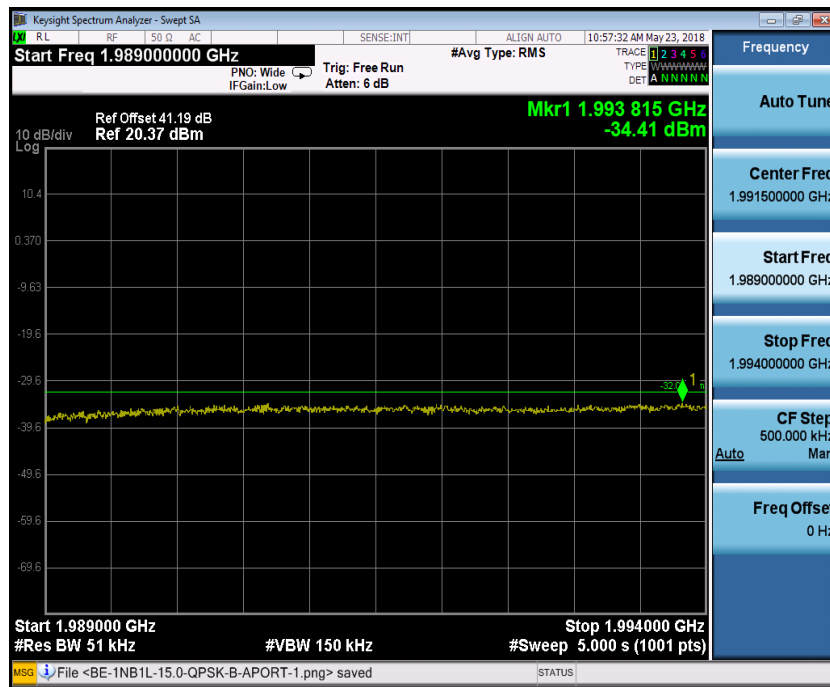
Port B, Channel Position T, LTE 10.0MHz



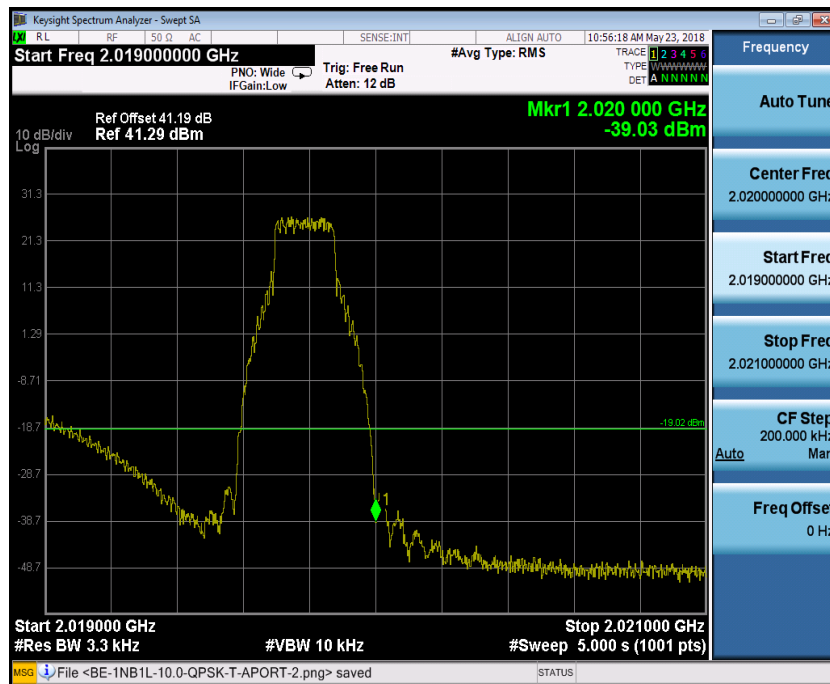


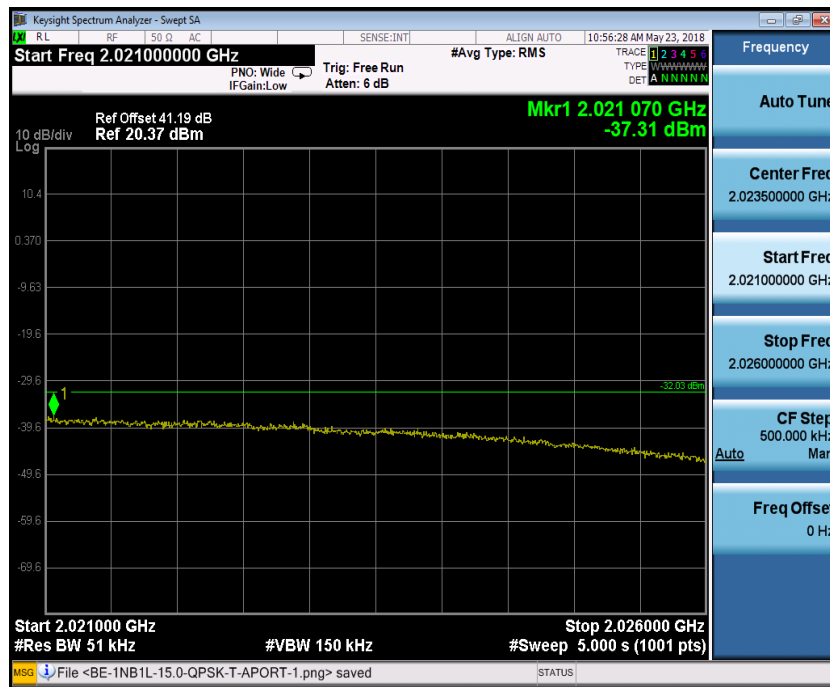
Port B, Channel Position B, LTE 15.0MHz



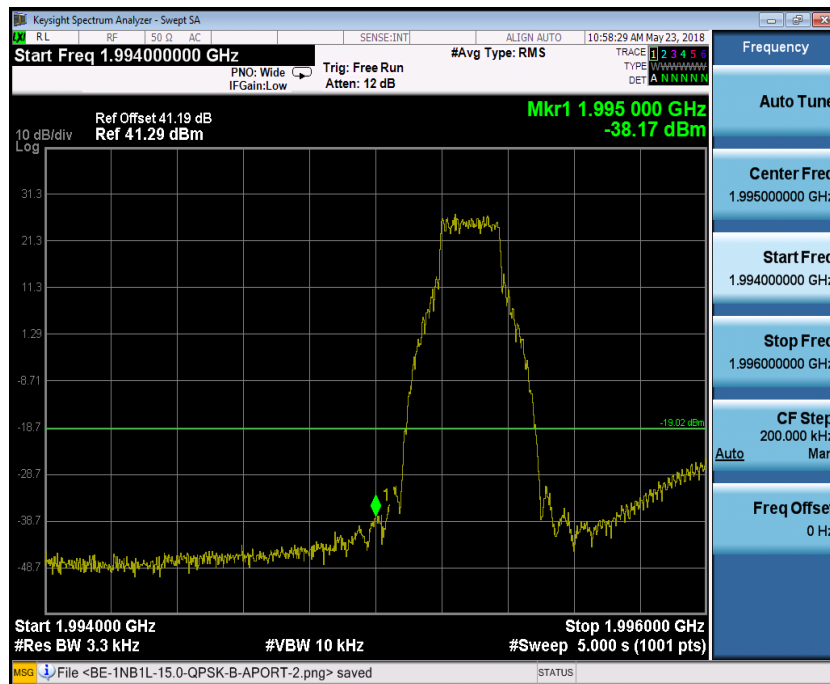


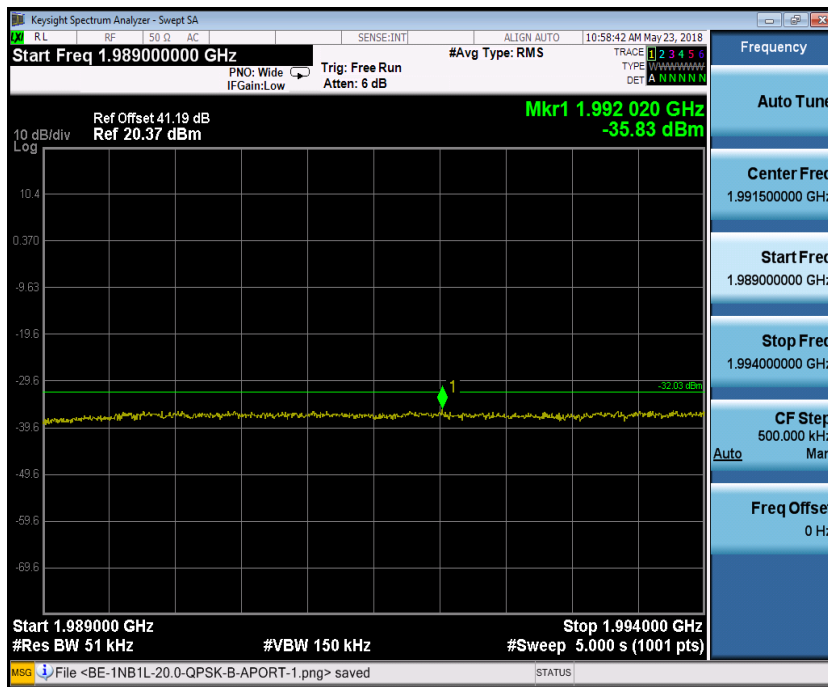
Port B, Channel Position T, LTE 15.0MHz



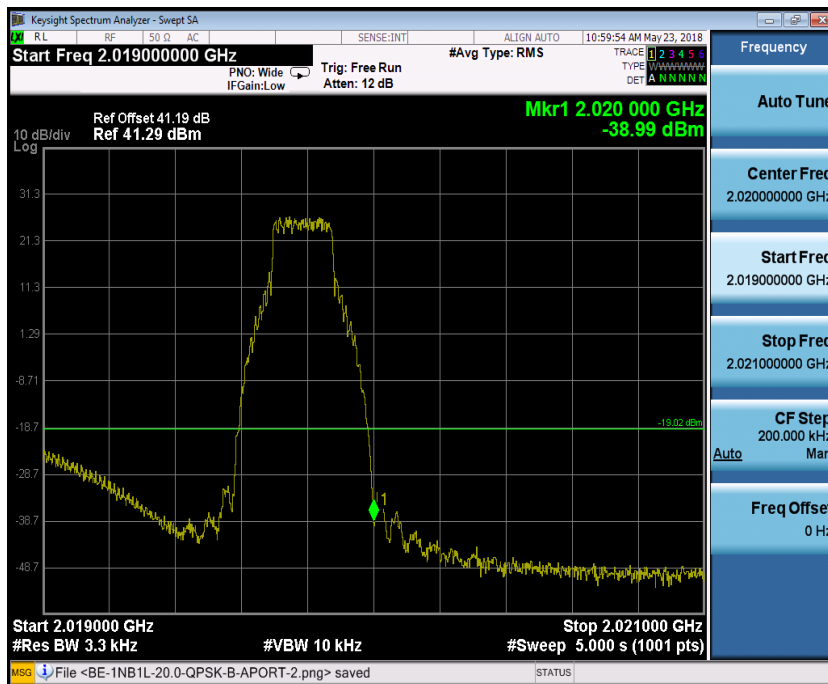


Port B, Channel Position B, LTE 20.0MHz





Port B, Channel Position T, LTE 20.0MHz

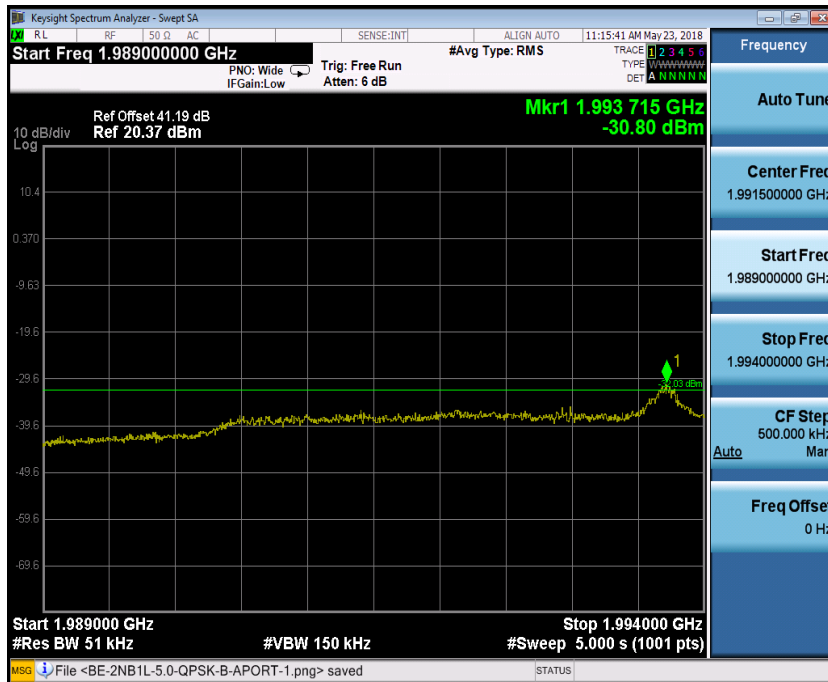
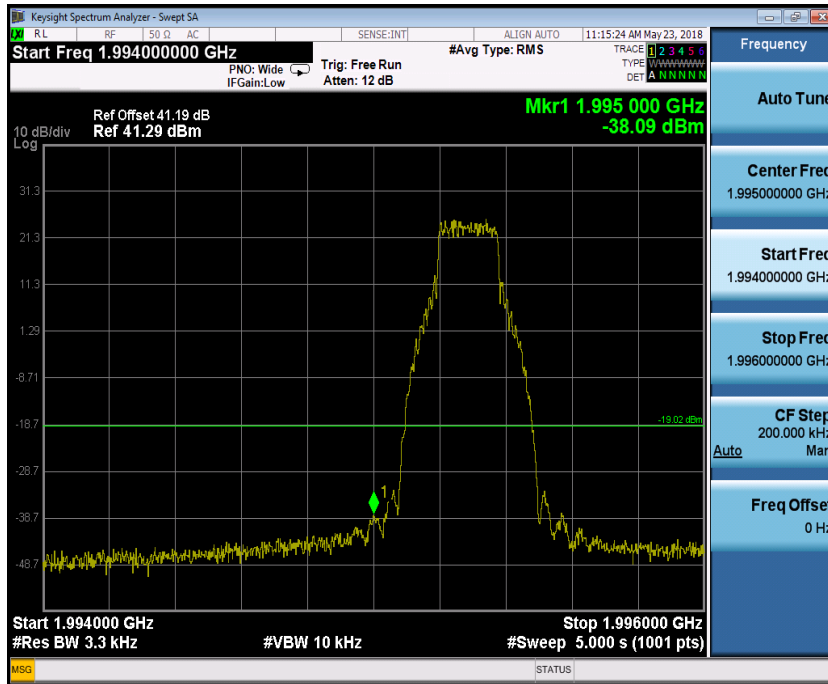




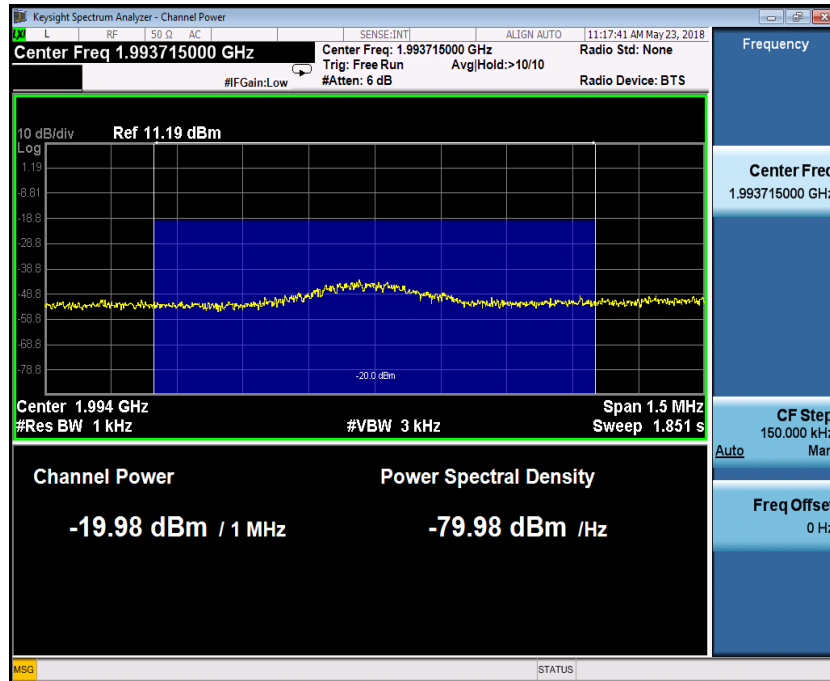
Configuration NB-IoT+LTE-MIMO-MC-2-BE, (2NB, QPSK +1LTE, QPSK)

Band Edge Frequency	Channel Bandwidth	RBW (KHz)	Limit (dBm)
Channel Position B 1995.0MHz	(NB) 250KHz, (L) 5.0MHz	3.3	-19.02
	(NB) 250KHz, (L) 10.0MHz	3.3	-19.02
	(NB) 250KHz, (L) 15.0MHz	3.3	-19.02
	(NB) 250KHz, (L) 20.0MHz	3.3	-19.02
Channel Position T 2020.0MHz	(NB) 250KHz, (L) 5.0MHz	3.3	-19.02
	(NB) 250KHz, (L) 10.0MHz	3.3	-19.02
	(NB) 250KHz, (L) 15.0MHz	3.3	-19.02
	(NB) 250KHz, (L) 20.0MHz	3.3	-19.02

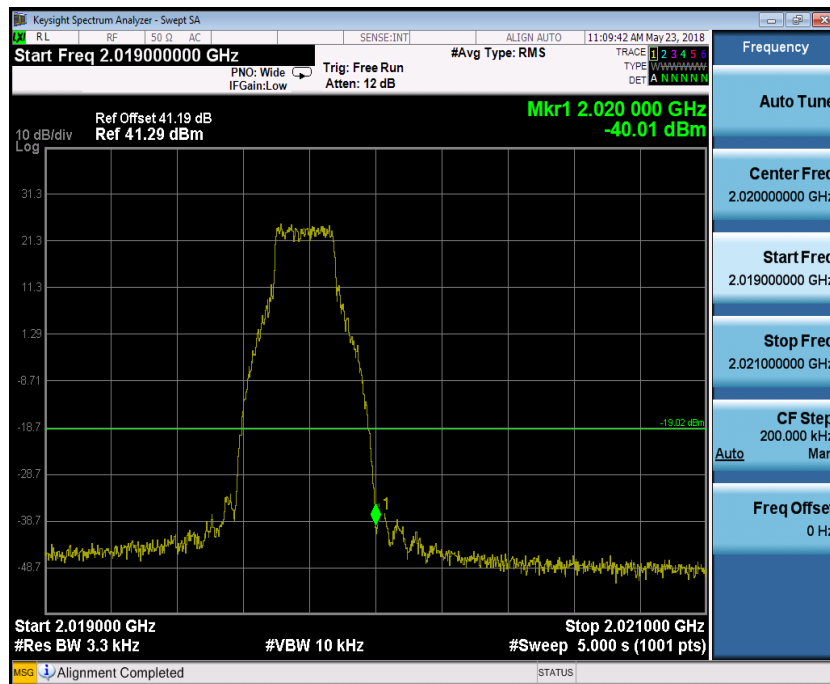
Port B, Channel Position B, LTE 5.0MHz

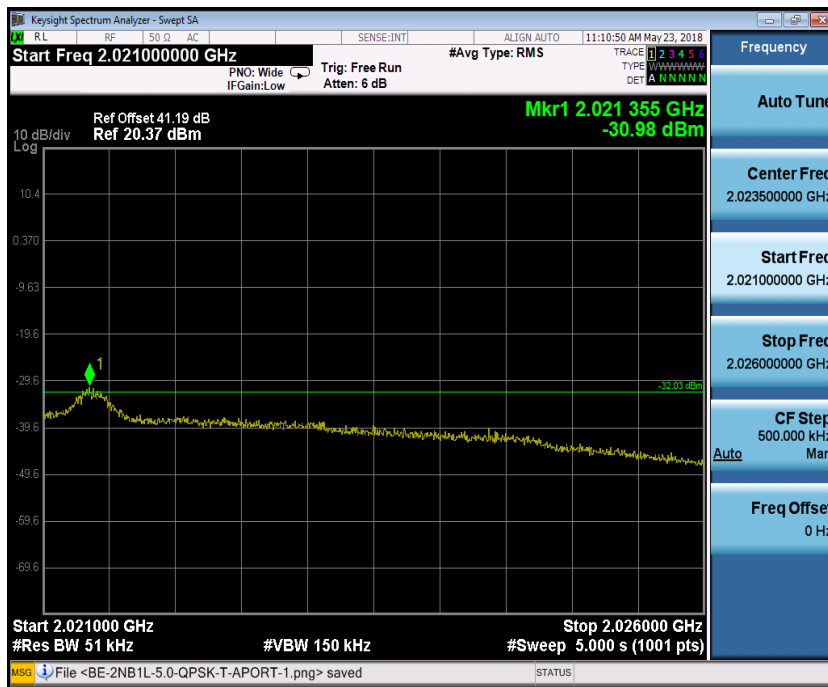


The channel power of 1MHz for 1993.715MHz is -19.98dBm, which is within the limit of -19.02dBm.

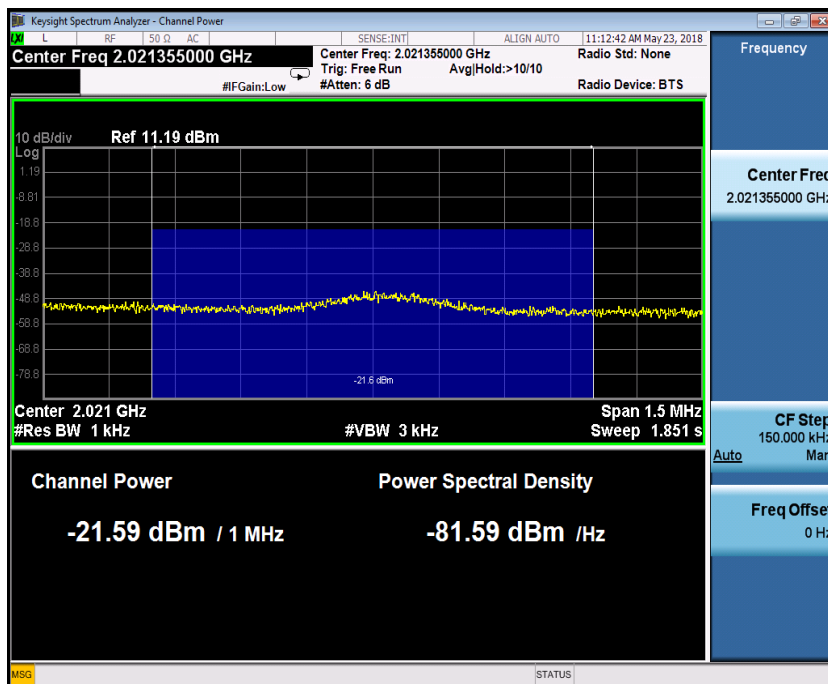


Port B, Channel Position T, LTE 5.0MHz

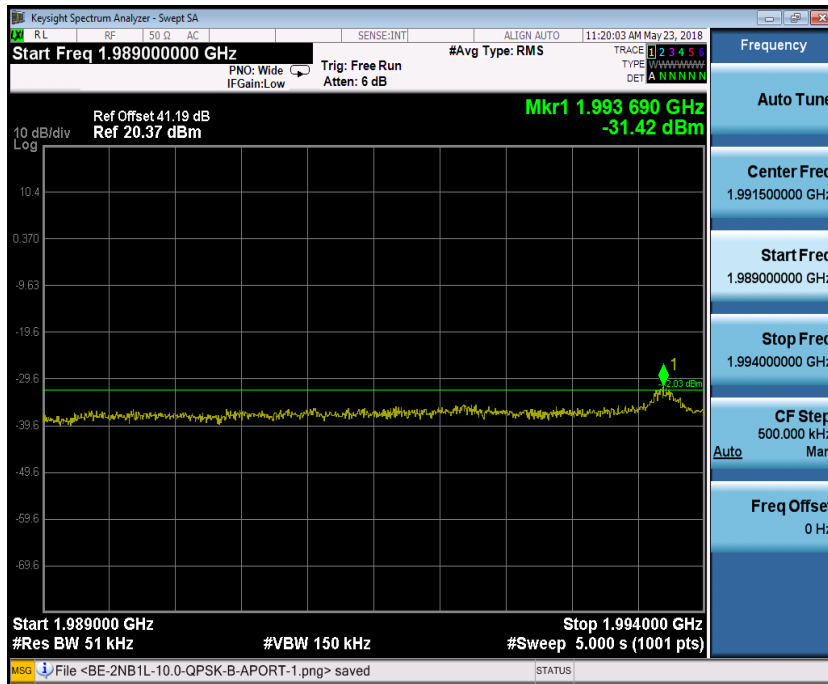
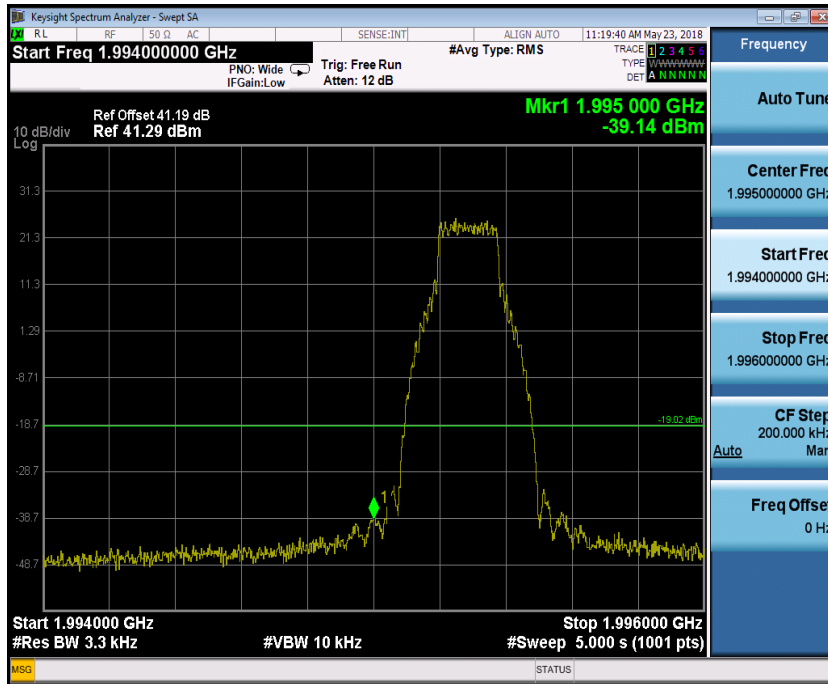




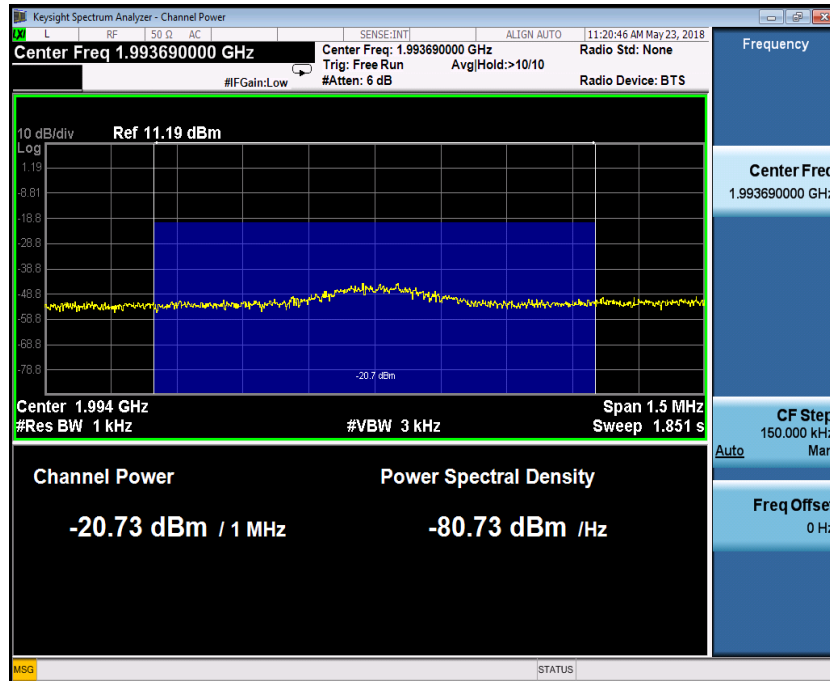
The channel power of 1MHz for 2021.335MHz is -21.59dBm, which is within the limit of -19.02dBm.



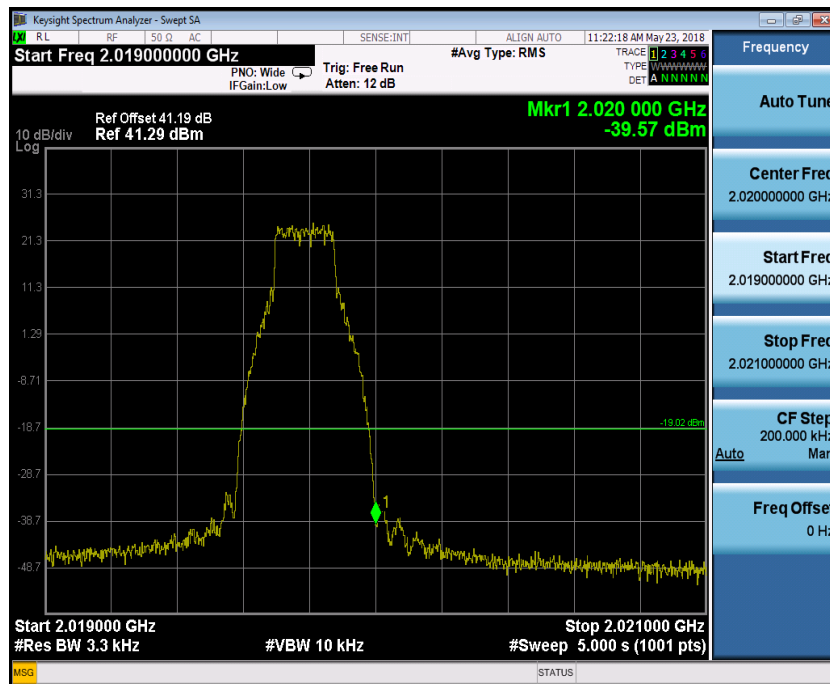
Port B, Channel Position B, LTE 10.0MHz

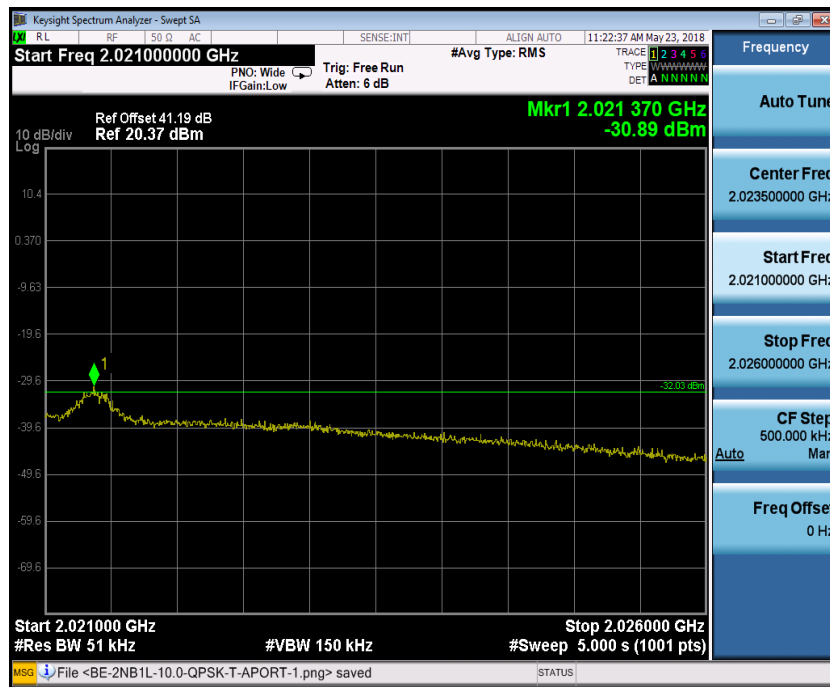


The channel power of 1MHz for 1993.690MHz is -20.73dBm, which is within the limit of -19.02dBm.

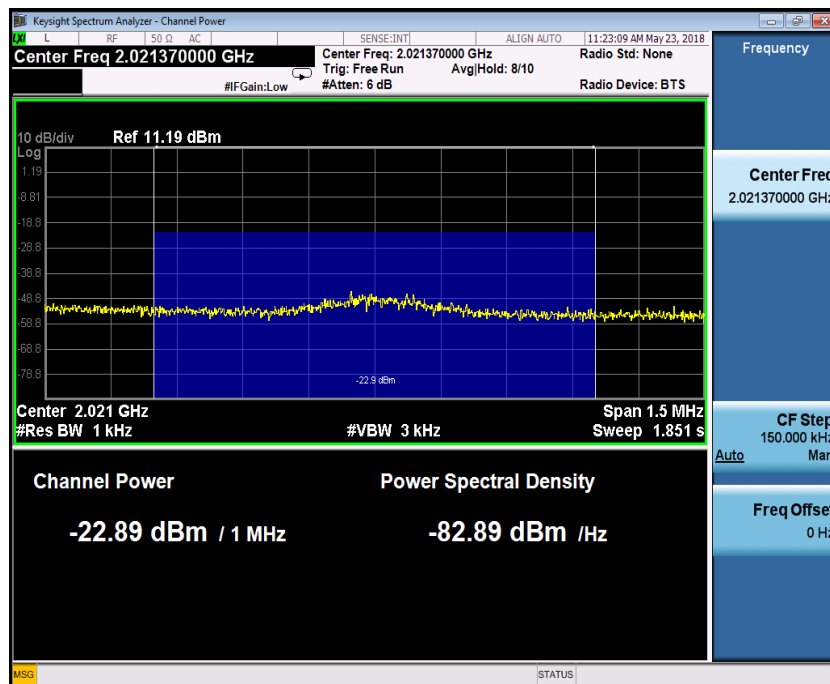


Port B, Channel Position T, LTE 10.0MHz

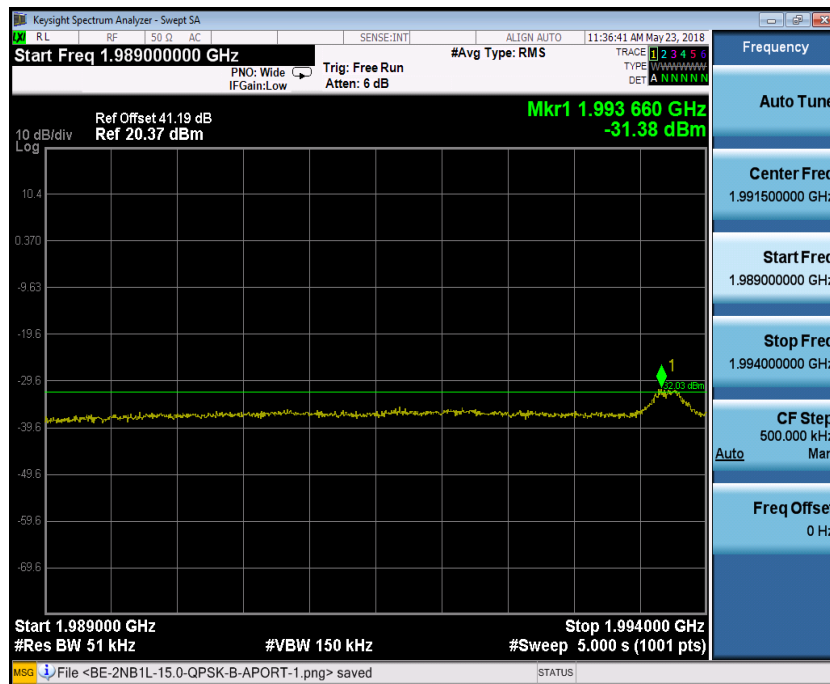
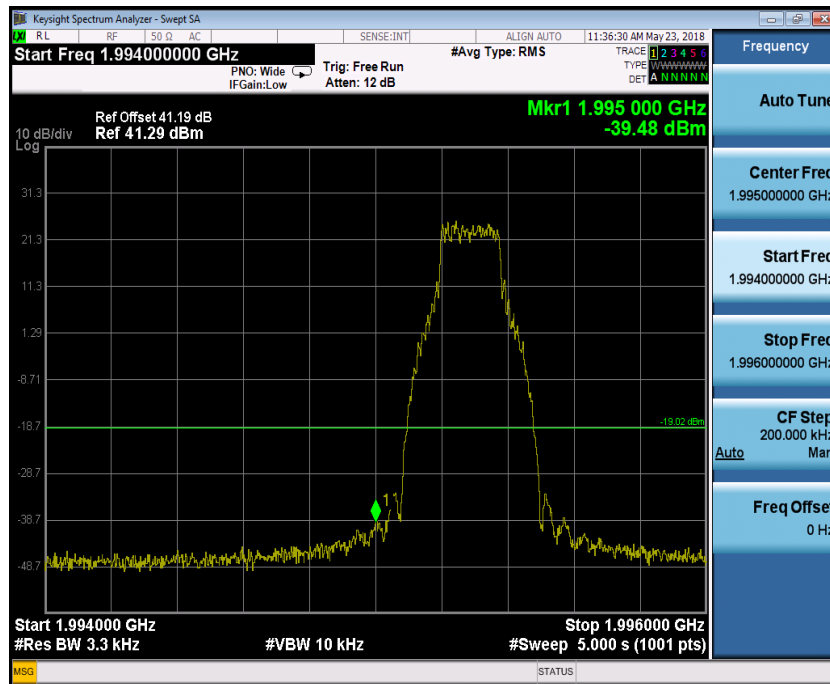




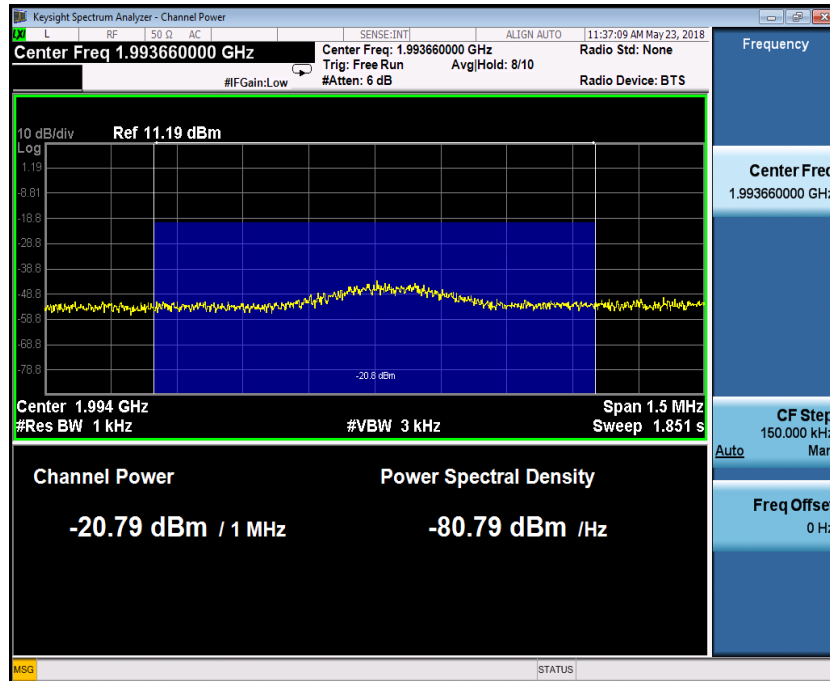
The channel power of 1MHz for 2021.370MHz is -22.89dBm, which is within the limit of -19.02dBm.



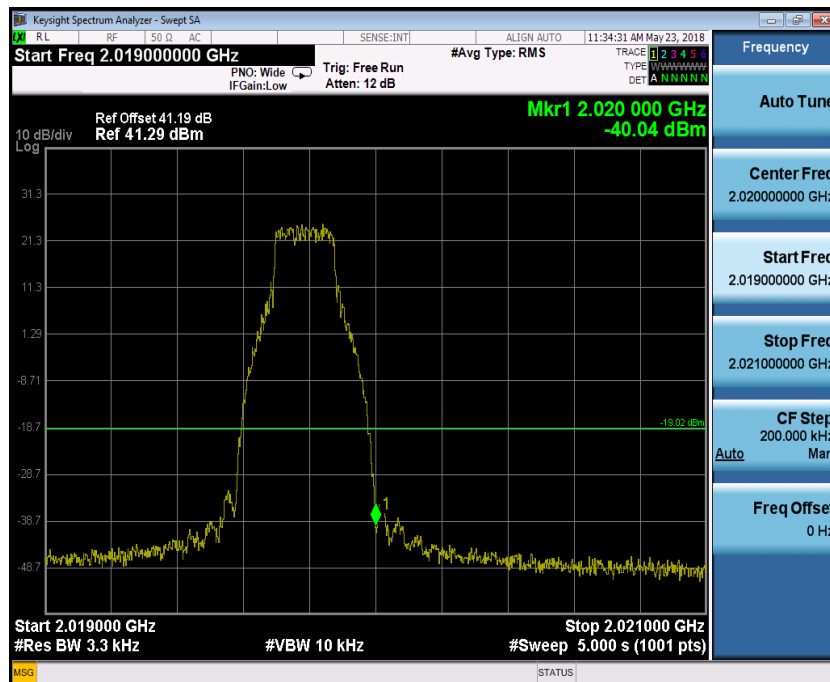
Port B, Channel Position B, LTE 15.0MHz

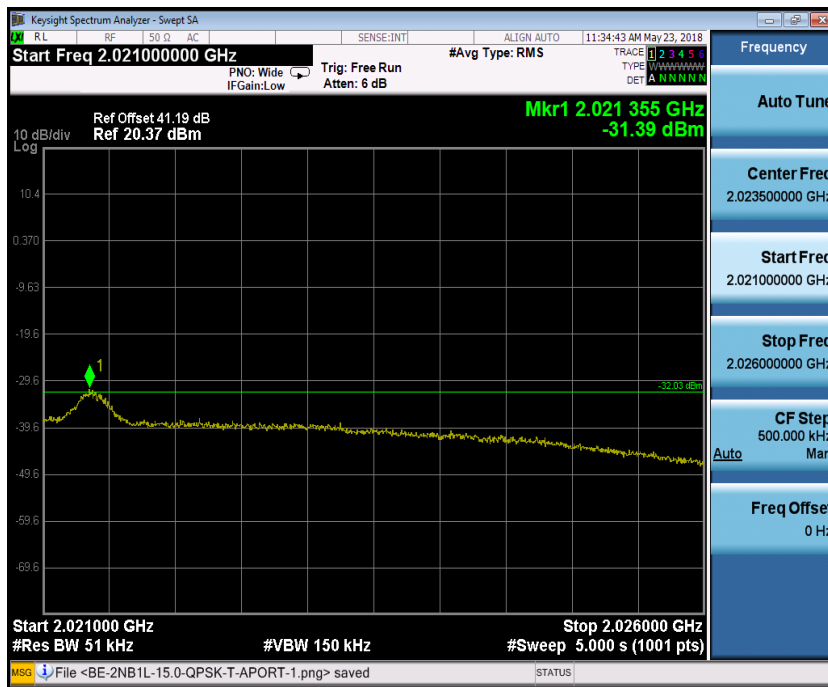


The channel power of 1MHz for 1993.660MHz is -20.79dBm, which is within the limit of -19.02dBm.

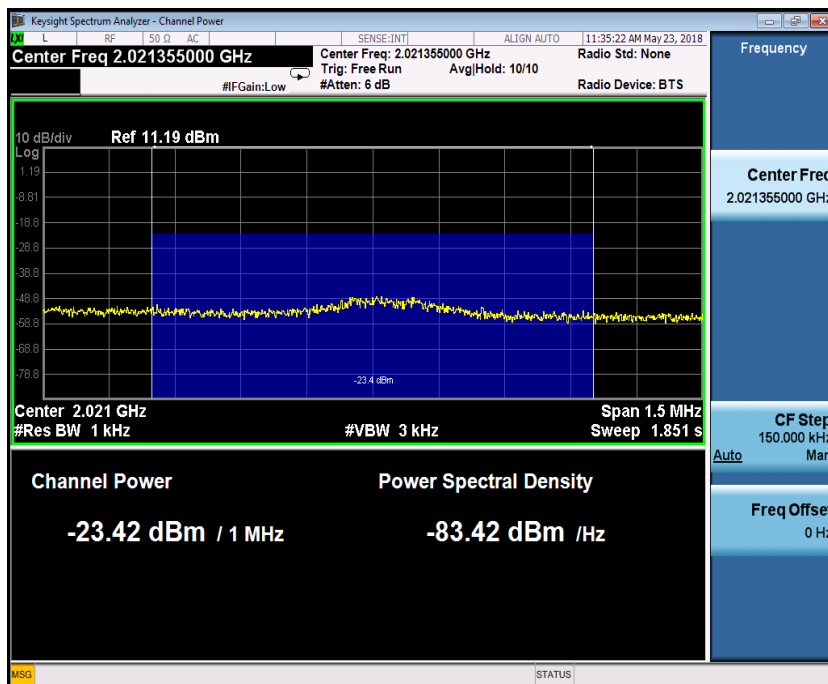


Port B, Channel Position T, LTE 15.0MHz

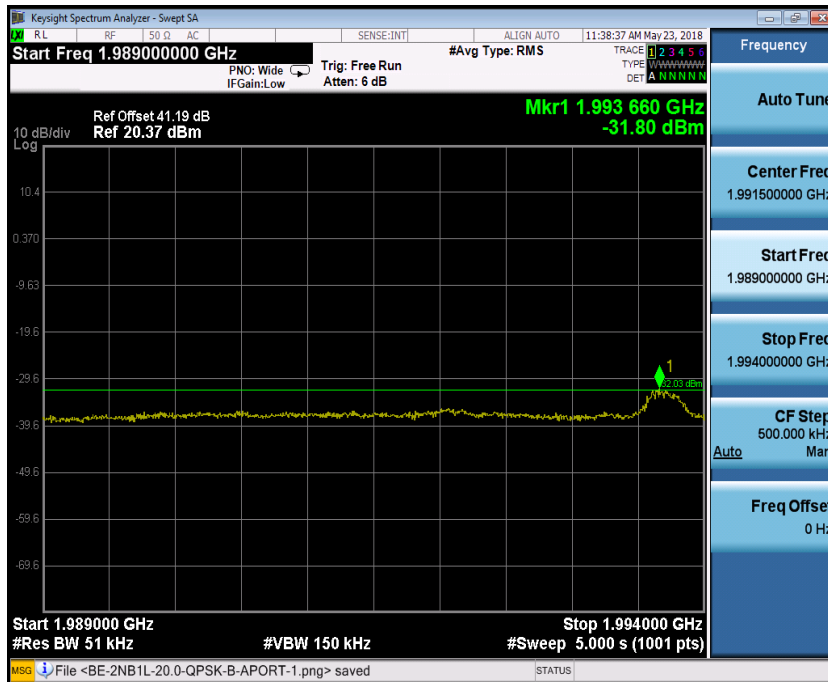
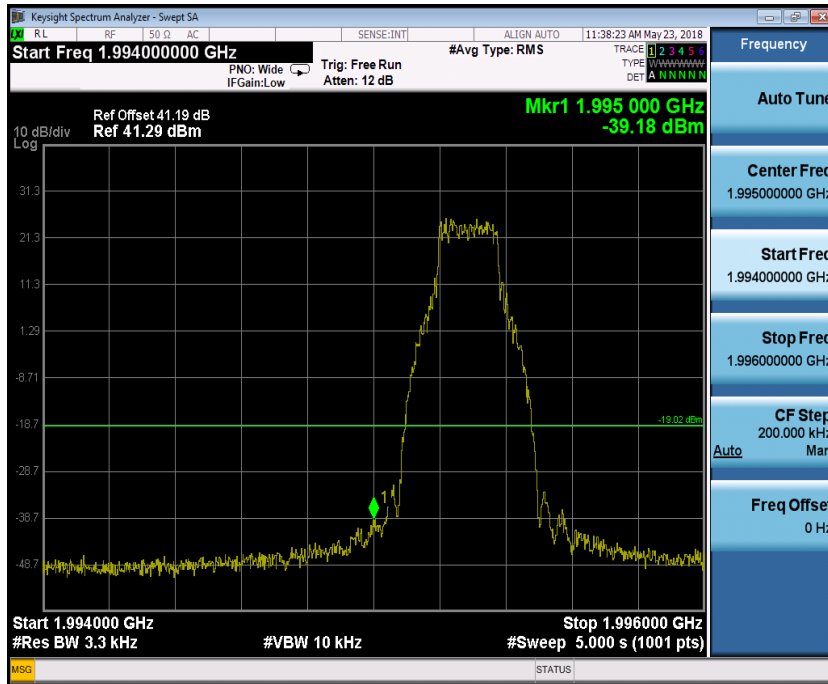




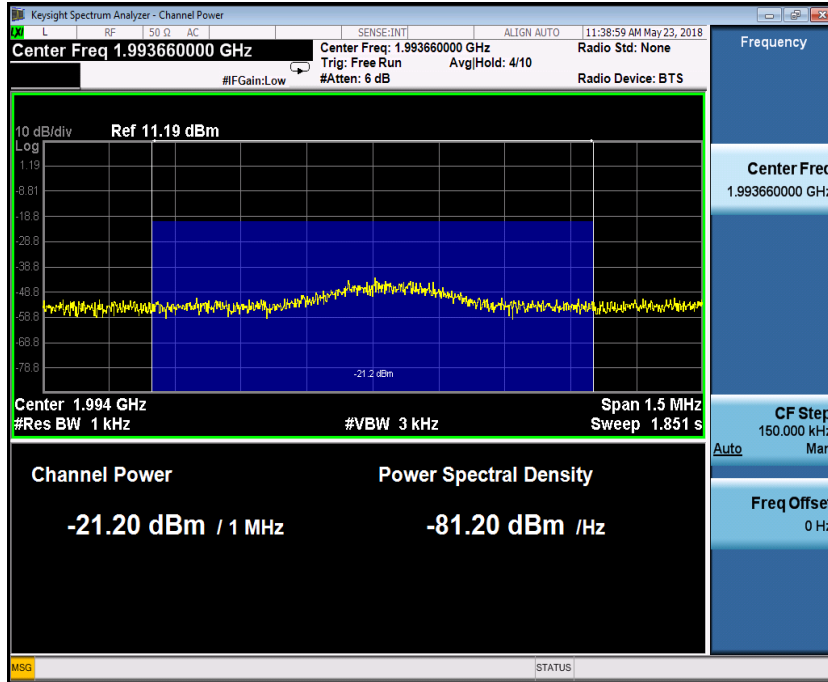
The channel power of 1MHz for 2021.355MHz is -23.42dBm, which is within the limit of -19.02dBm.



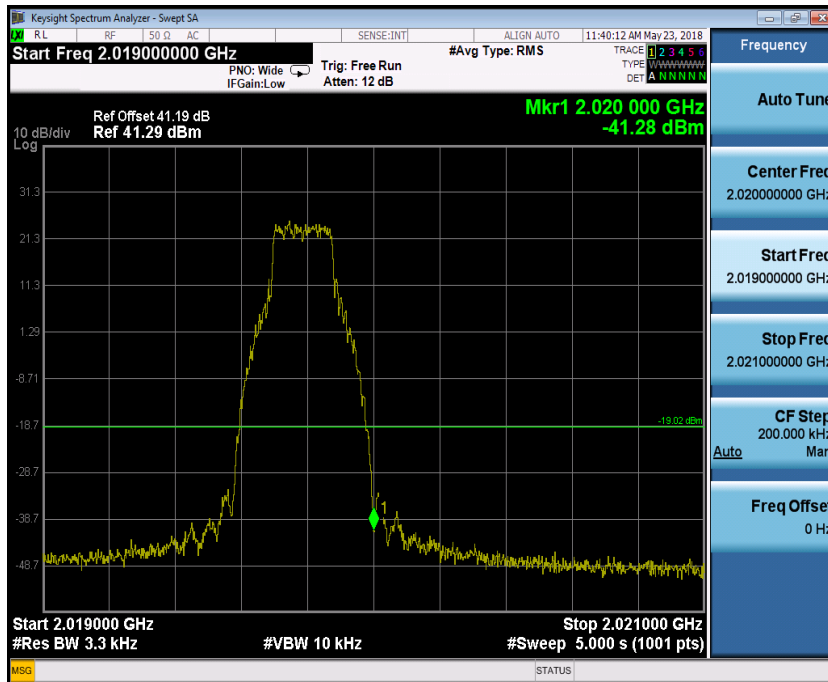
Port B, Channel Position B, LTE 20.0MHz

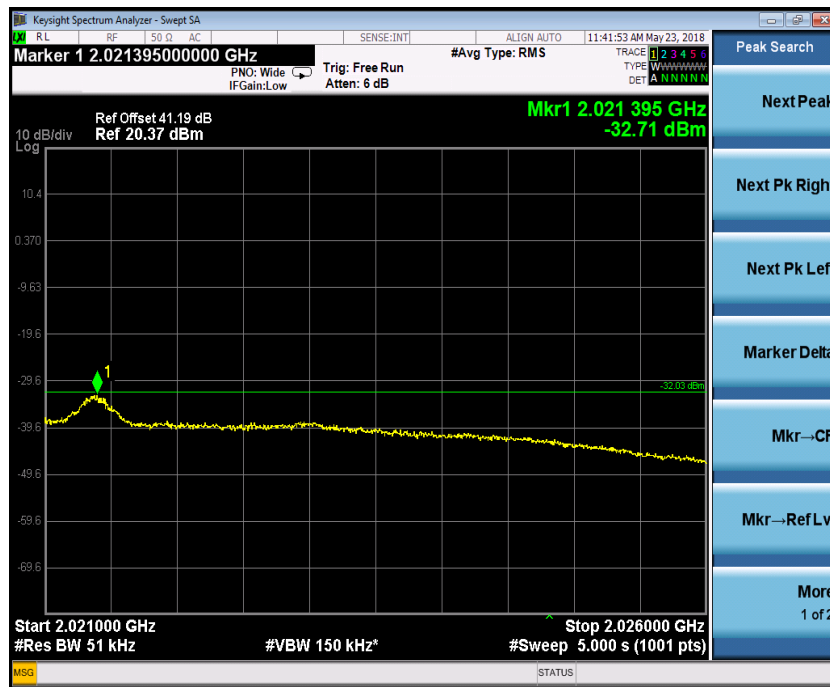


The channel power of 1MHz for 1993.660MHz is -21.20dBm, which is within the limit of -19.02dBm.



Port B, Channel Position T, LTE 20.0MHz





A.4 Conducted Spurious Emission

A.4.1 Reference

FCC CFR 47 Part 27, Clause 27.53 (h)

A.4.2 Method of measurement

In accordance with FCC CFR 47 Part 24, Clause 24.238, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

The spurious emissions from the antenna terminal were measured. The transmitter output power was attenuated using an attenuator and the frequency spectrum investigated from 3KHz to 21GHz. The resolution bandwidth of 1MHz was employed for frequency band 3KHz to 21GHz. The spectrum analyzer detector was set to RMS.

For MIMO mode configurations, the limit was adjusted with a correction of -6.02dB [10Log4] by using the Measure and Add 10Log(N) dB technique according to FCC KDB 662911 D01 Multiple Transmitter Output accounting for simultaneous transmission from antenna ports RF A,B,C and D. Then the limit was adjust to -19.02dBm.

A.4.3 Measurement limit

(1) General protection levels. Except as otherwise specified below, for operations in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180MHz, 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.

(2) Additional protection levels. Notwithstanding the foregoing paragraph (h) (1) of this section:

(ii) For operations in the 2000–2020MHz band, the power of any emissions below 2000 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.

(iv) For operations in the 1995–2000MHz band, the power of any emission between 2005–2020 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.

(4) Private agreements. (i) For AWS operations in the 2000–2020 MHz and 2180–2200 MHz bands, to the extent a licensee establishes unified operations across the AWS blocks, that licensee may choose not to observe the emission limit specified in paragraph (h)(1), above, strictly between its adjacent block licenses in a geographic area, so long as it complies with other Commission rules and is not adversely affecting the operations of other parties by virtue of exceeding the emission limit. (ii) For AWS operations in the 2000–2020 MHz band, a licensee may enter into private agreements with all licensees operating between 1995 and 2000 MHz to allow the $70 + 10 \log_{10}(P)$ dB limit to be exceeded within the 1995–2000 MHz band.

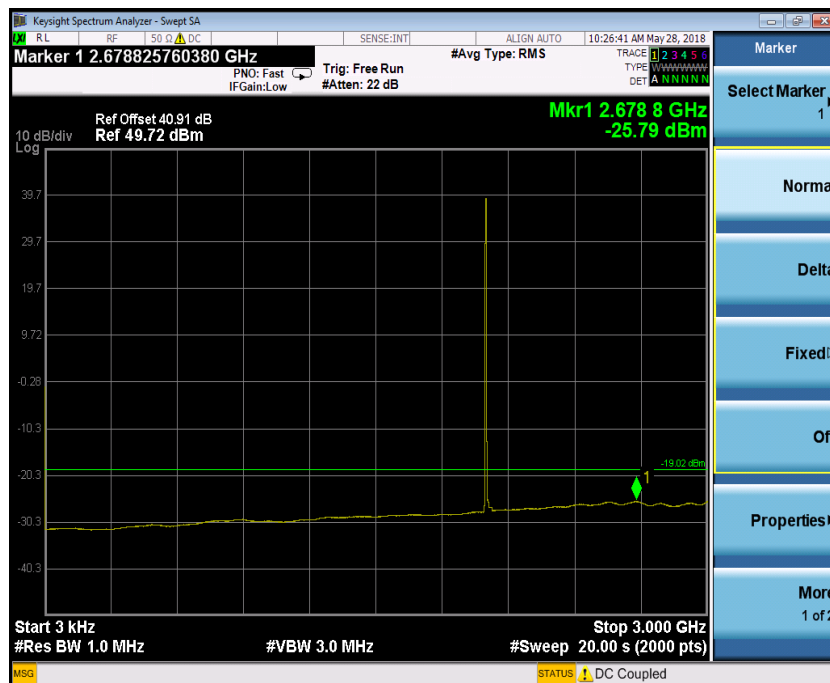
Based on discussion in docket on.DA 13-2409(para. 25 and 47) for operations in 2000-2020MHz in downlink, only 27.53(h)(1) and 27.53(h)(3) apply. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

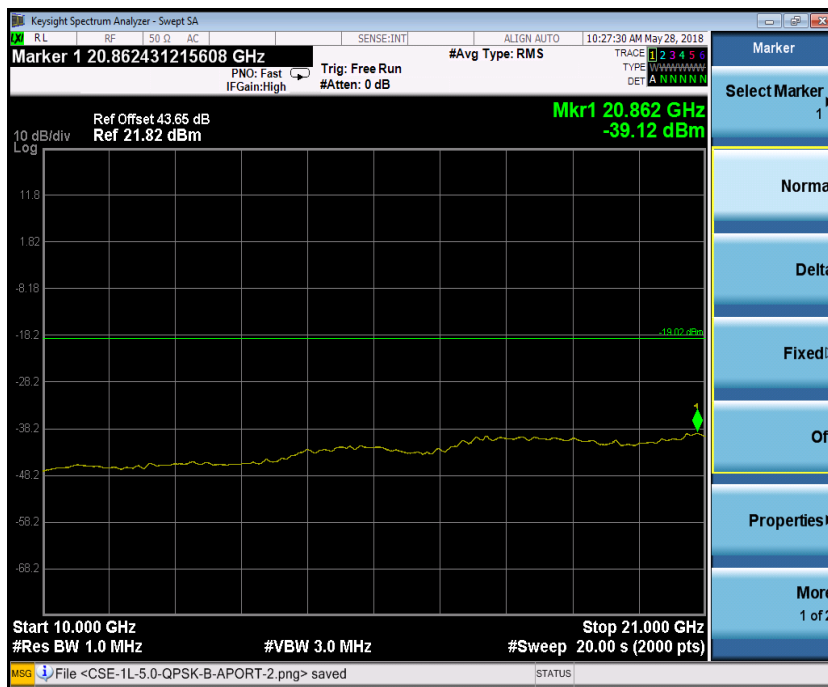
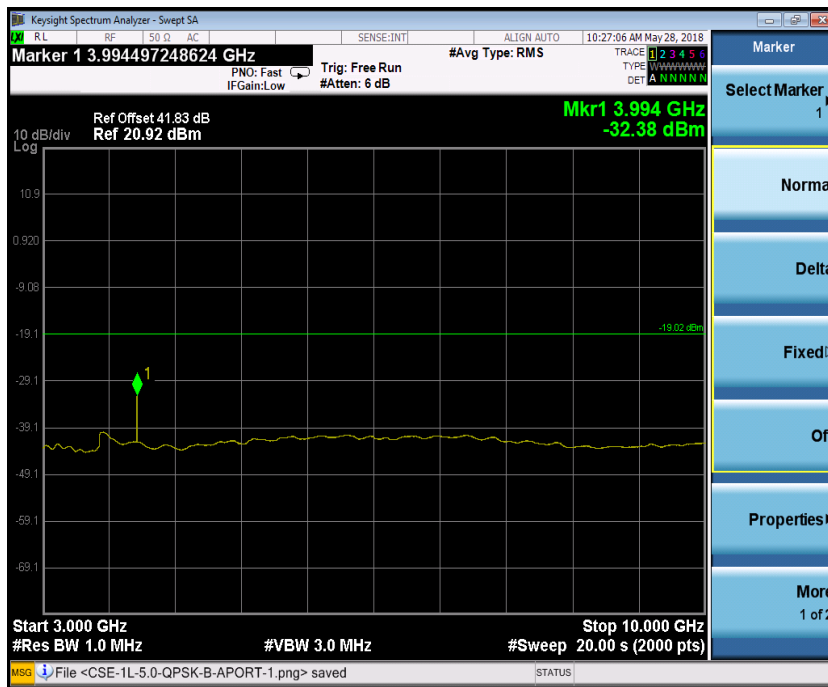
A.4.4 Measurement results

Configuration LTE-MIMO-1C QPSK

Channel Bandwidth	RBW (MHz)	Limit (dBm)
5.0 MHz	1.0	-19.02
10.0 MHz	1.0	-19.02
15.0 MHz	1.0	-19.02
20.0 MHz	1.0	-19.02

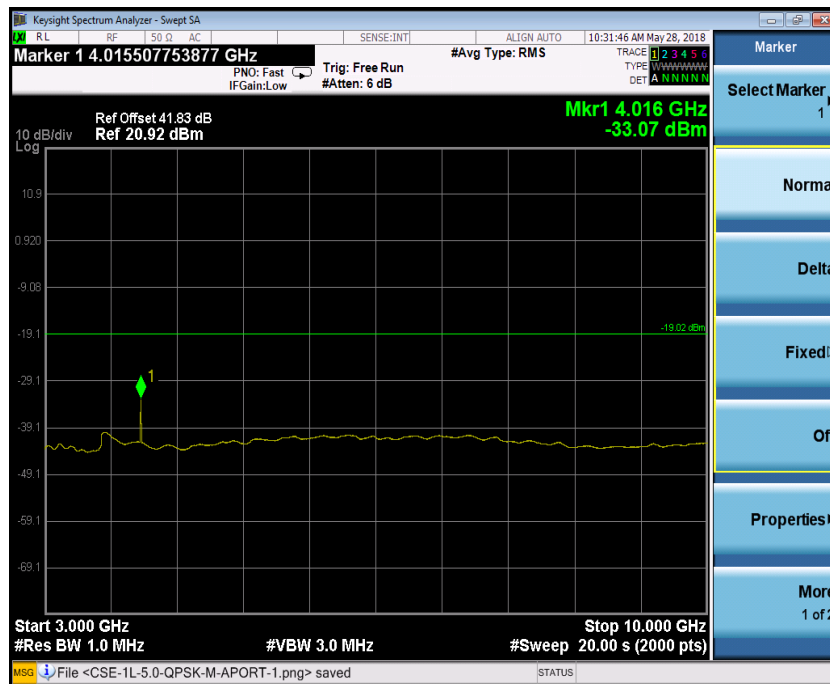
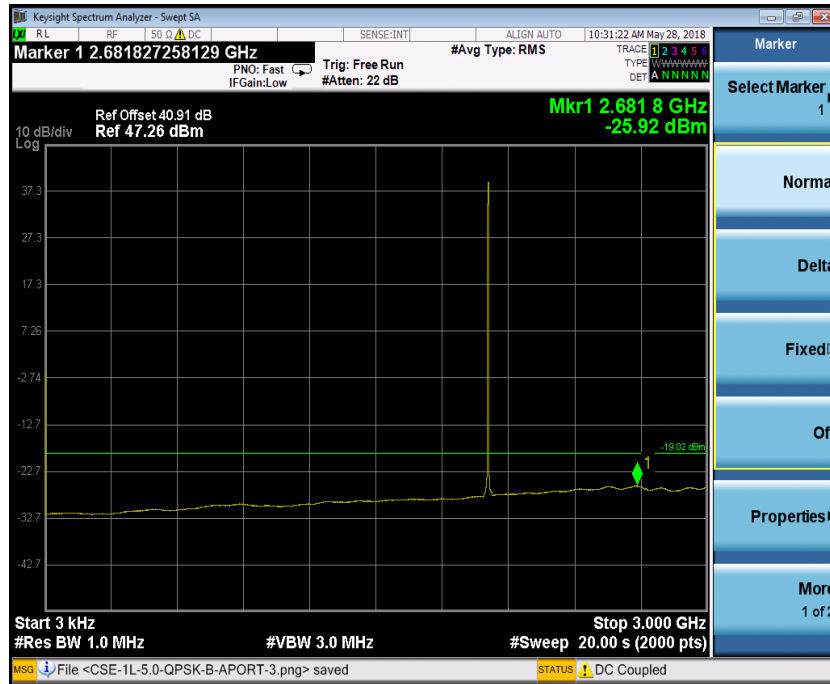
Port B, Channel Position B 5.0 MHz

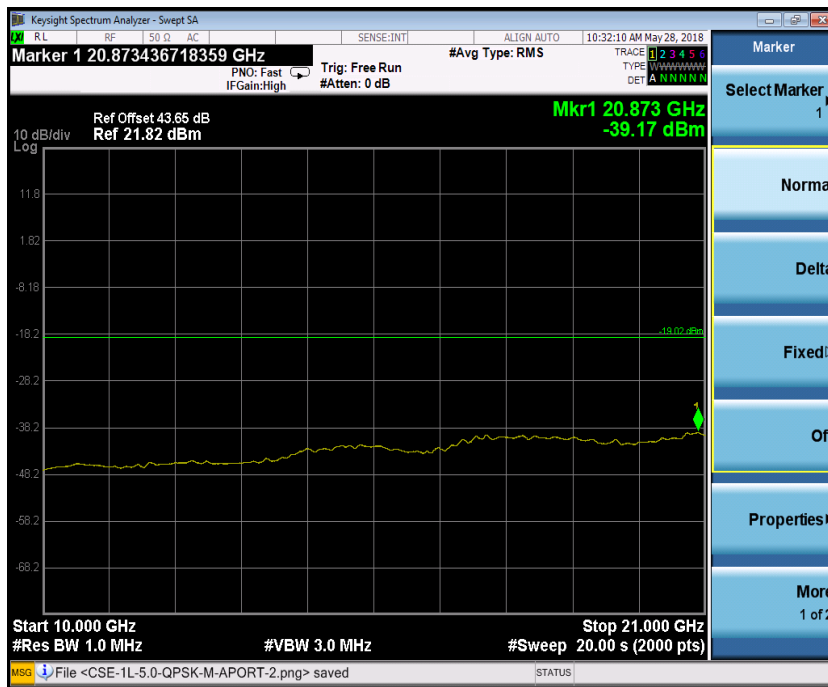






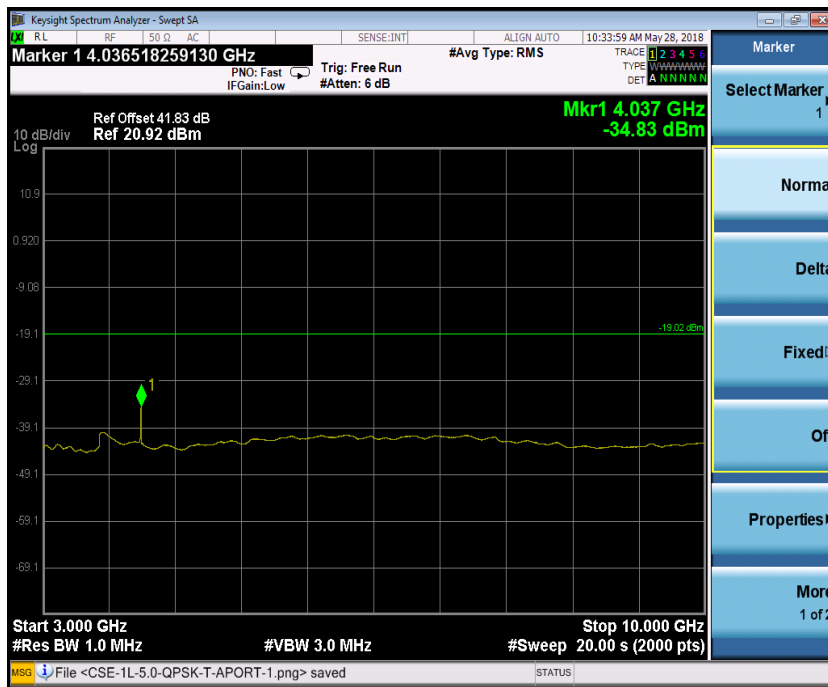
Port B, Channel Position M 5.0 MHz



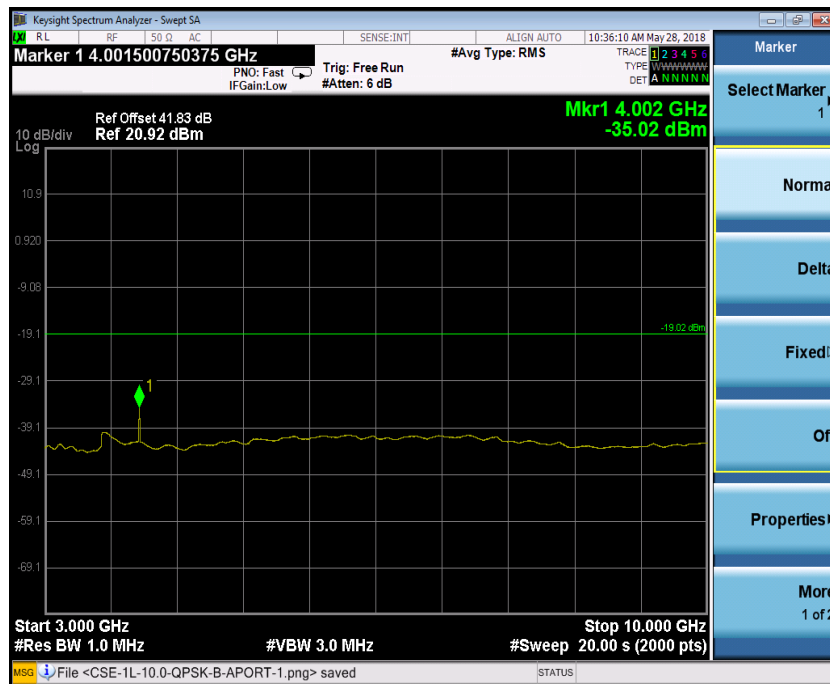
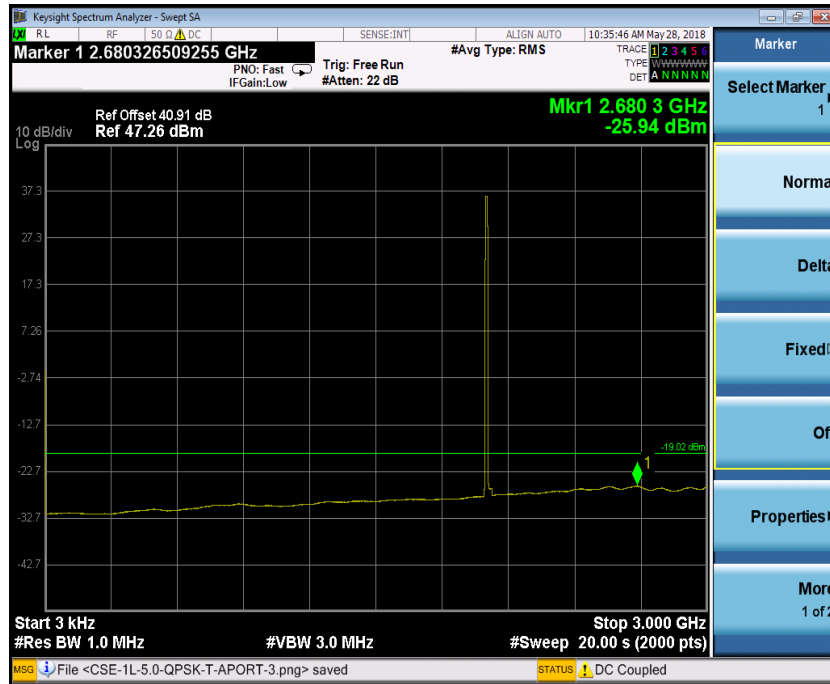


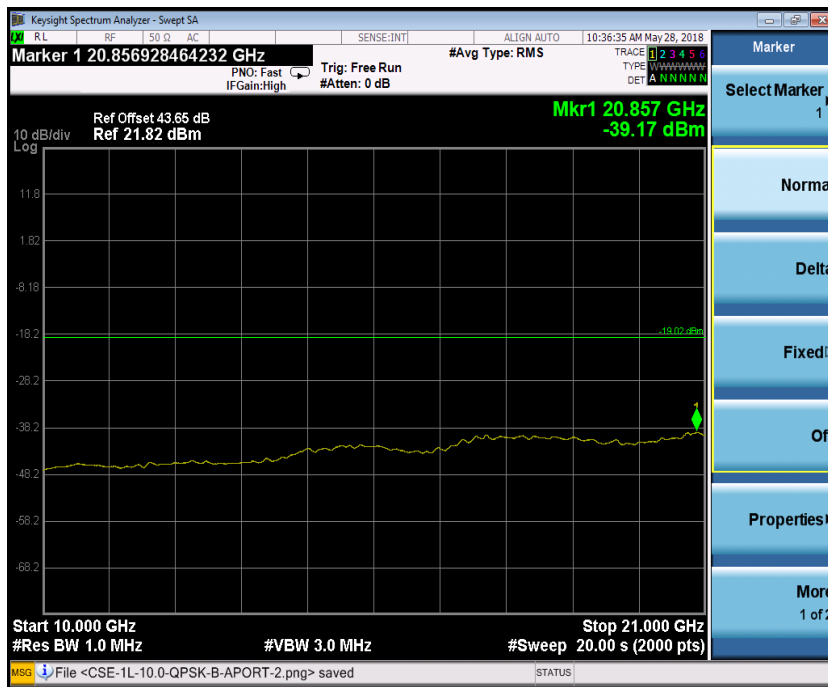
Port B, Channel Position T 5.0 MHz



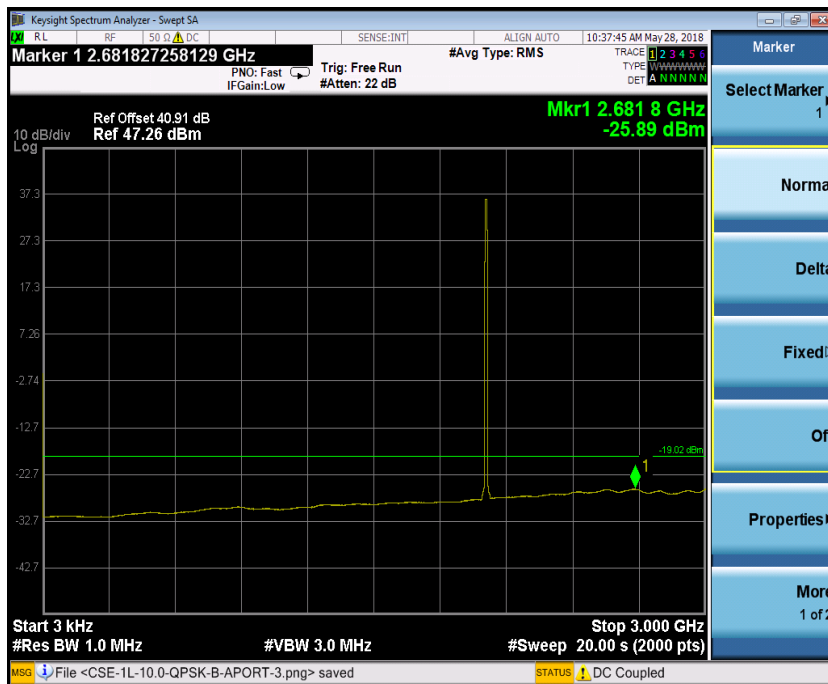


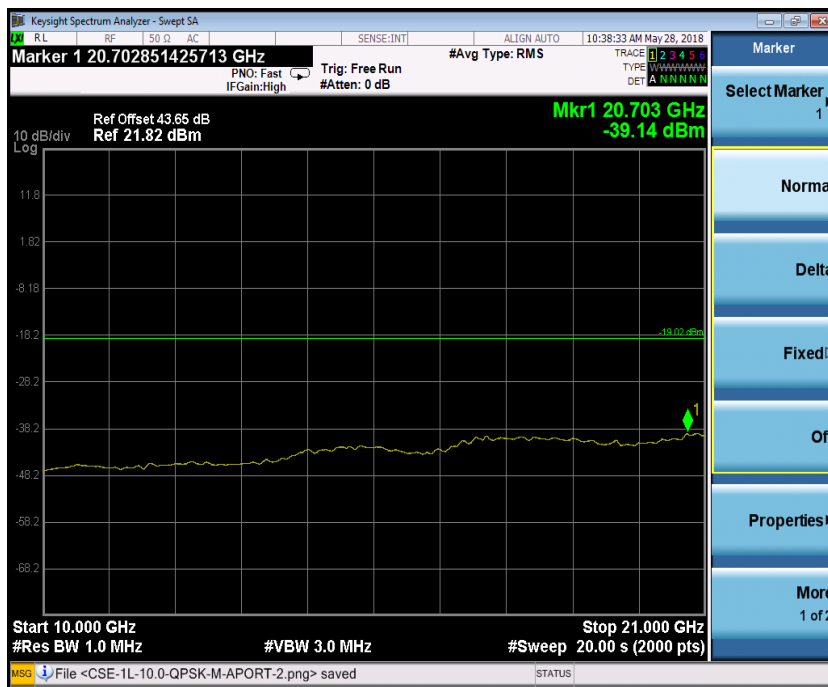
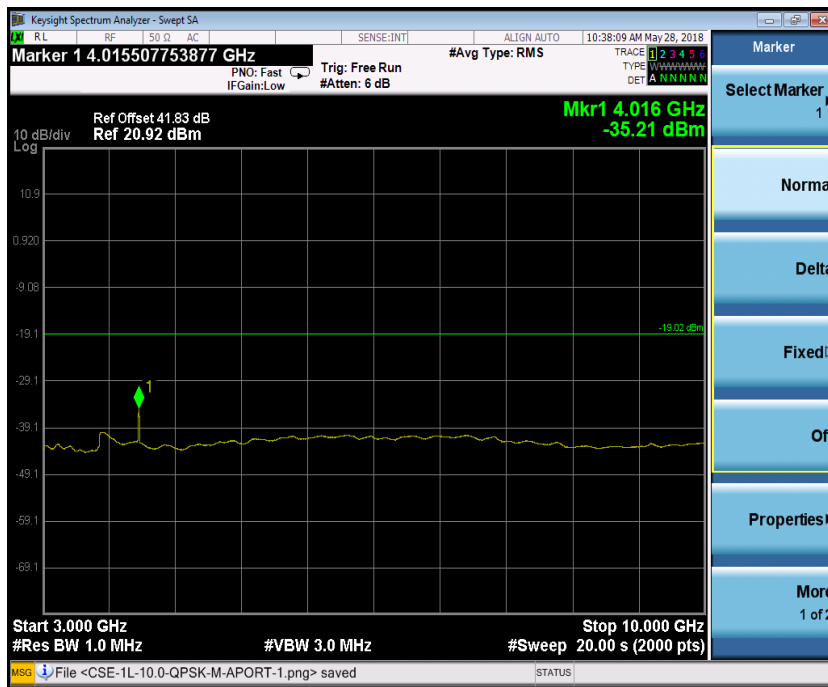
Port B, Channel Position B 10.0 MHz



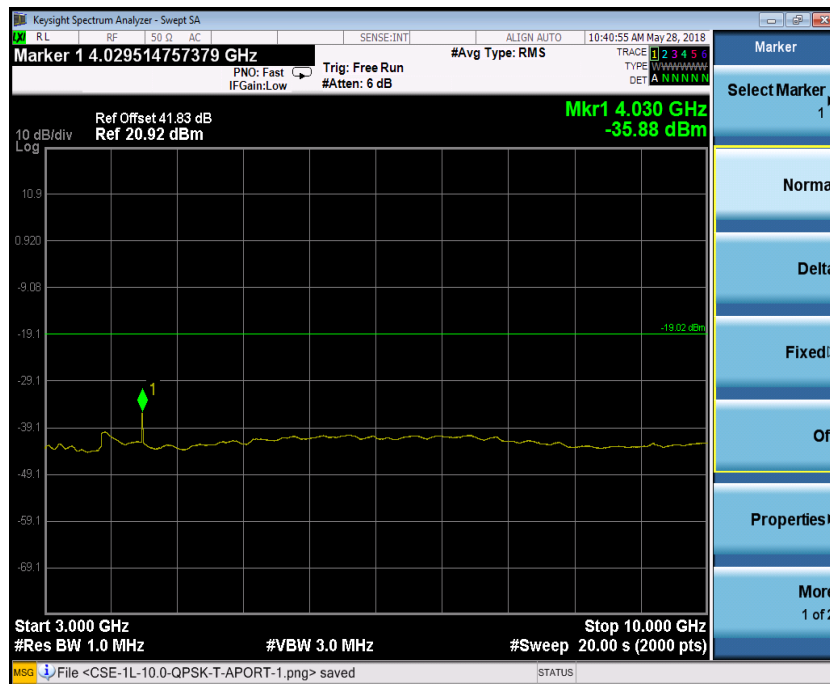
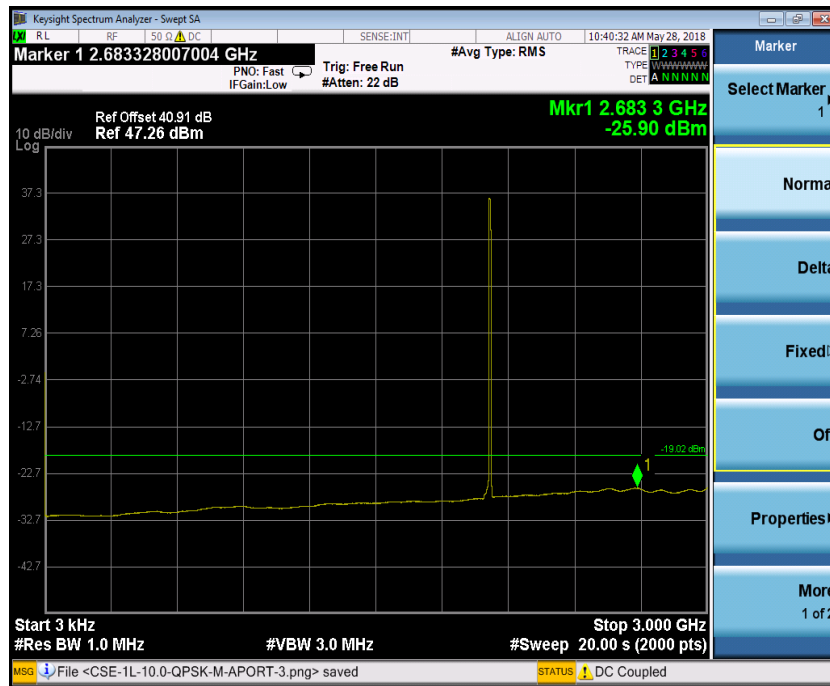


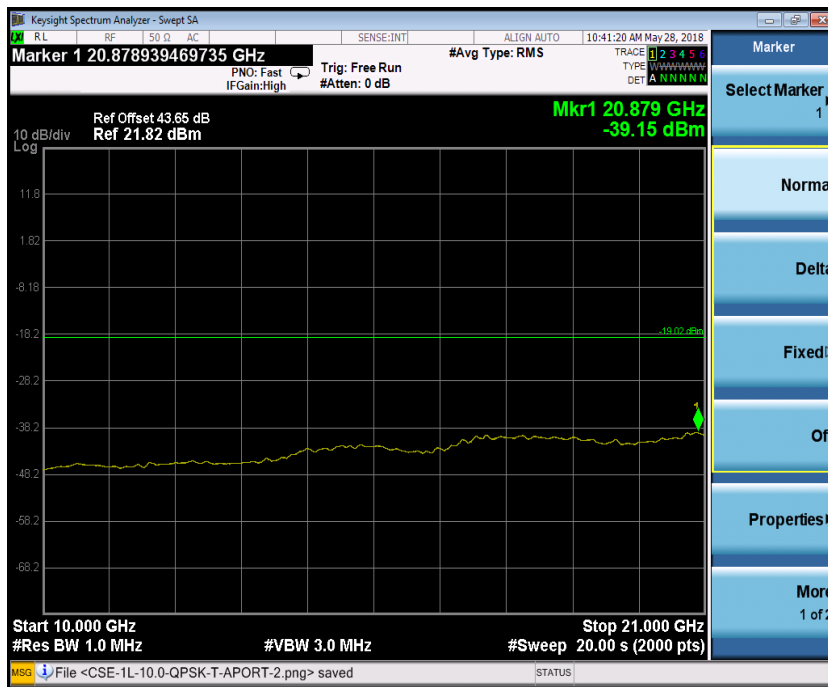
Port B, Channel Position M 10.0 MHz





Port B, Channel Position T 10.0 MHz





Port B, Channel Position B 15.0 MHz



