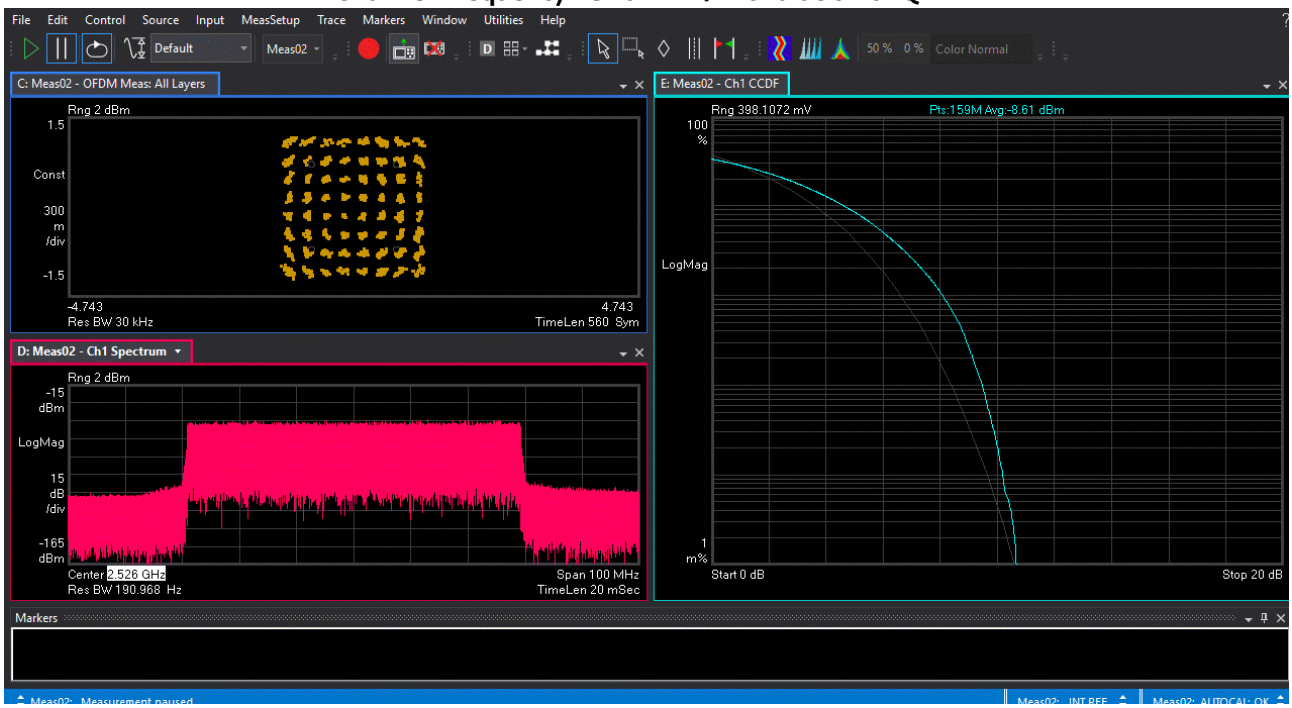
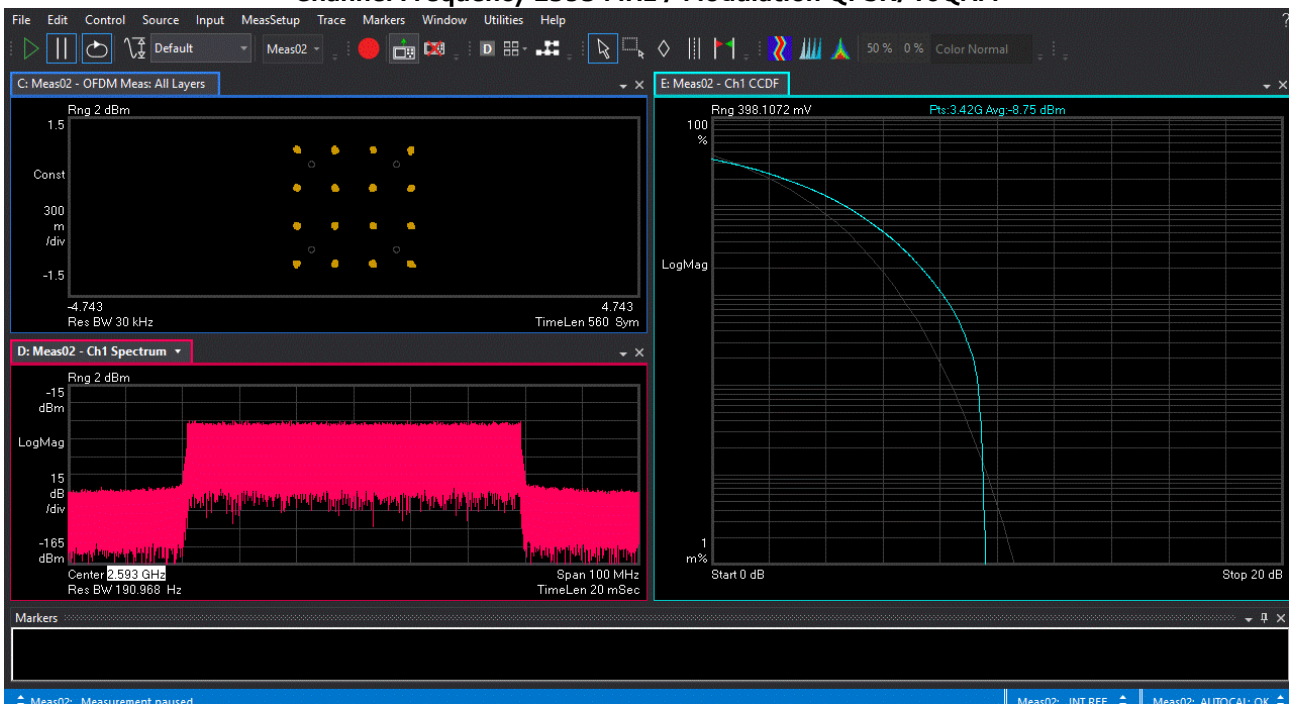
5G 60MHz Data

Channel Frequency 2526 MHz / Modulation 64QAM

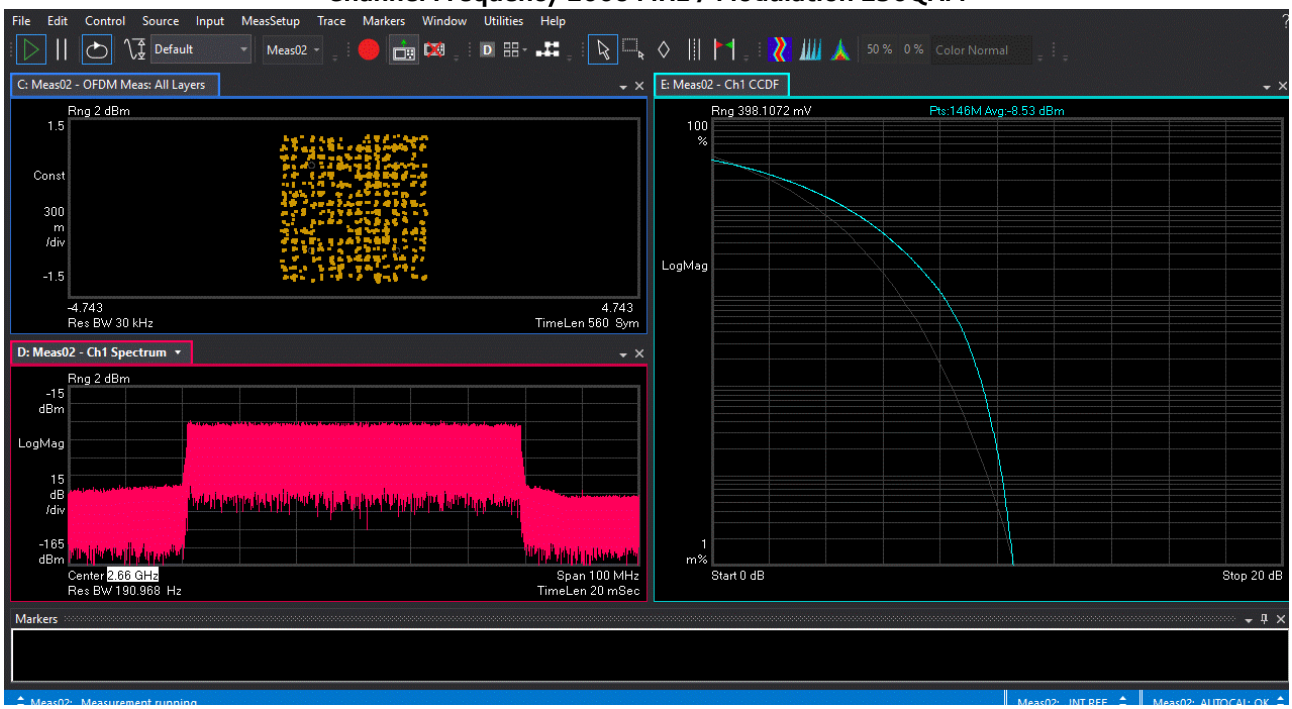


Channel Frequency 2593 MHz / Modulation QPSK/16QAM



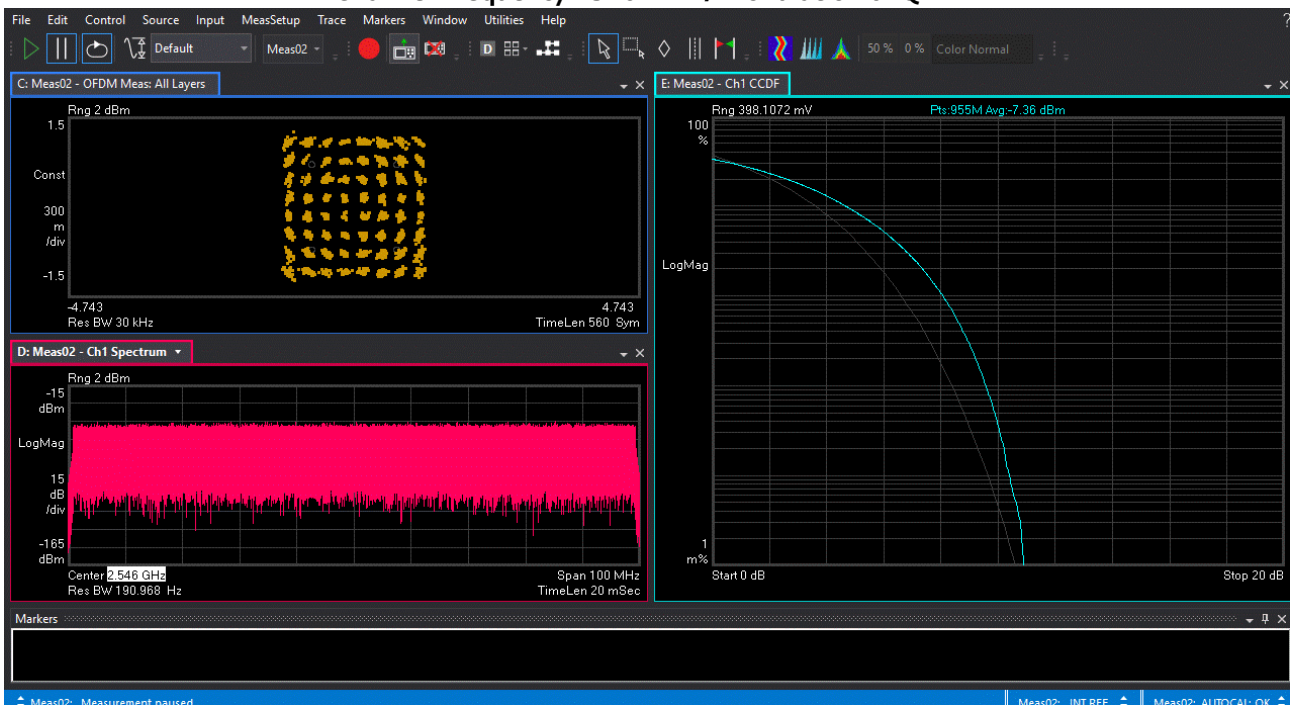
5G 60MHz Data

Channel Frequency 2660 MHz / Modulation 256QAM

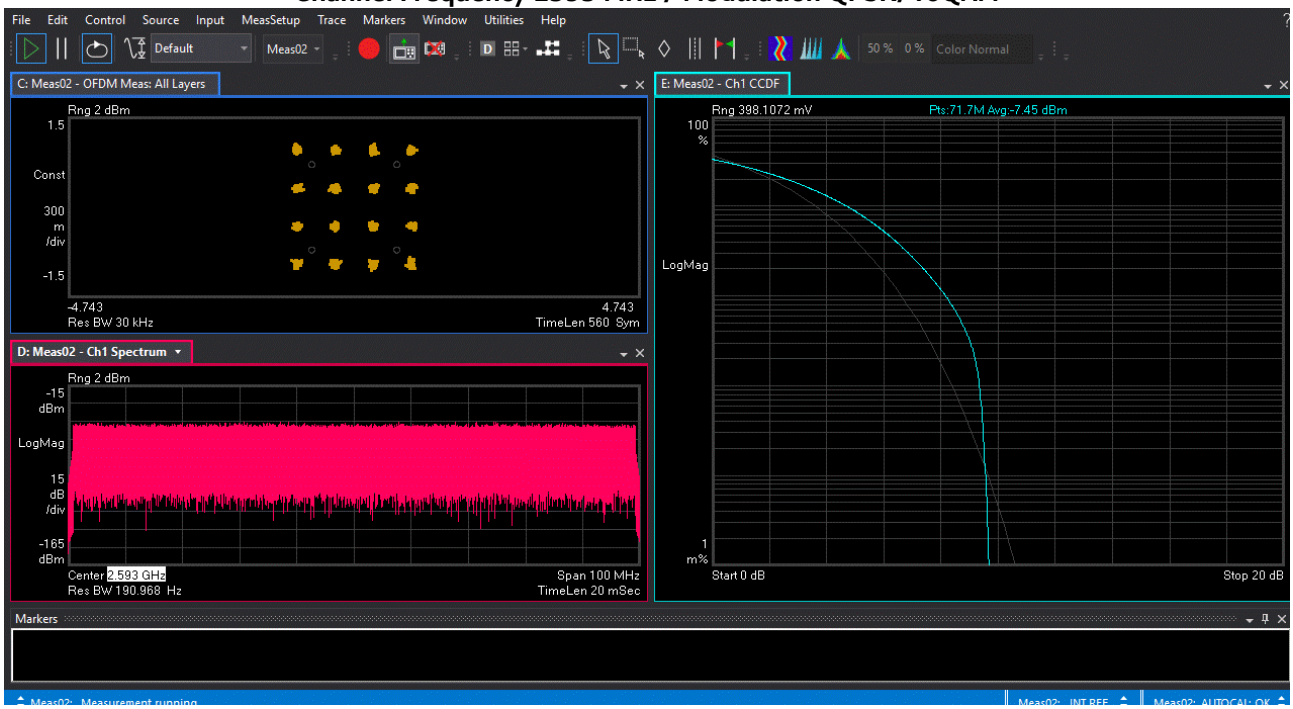


5G 100MHz Data

Channel Frequency 2546 MHz / Modulation 64QAM

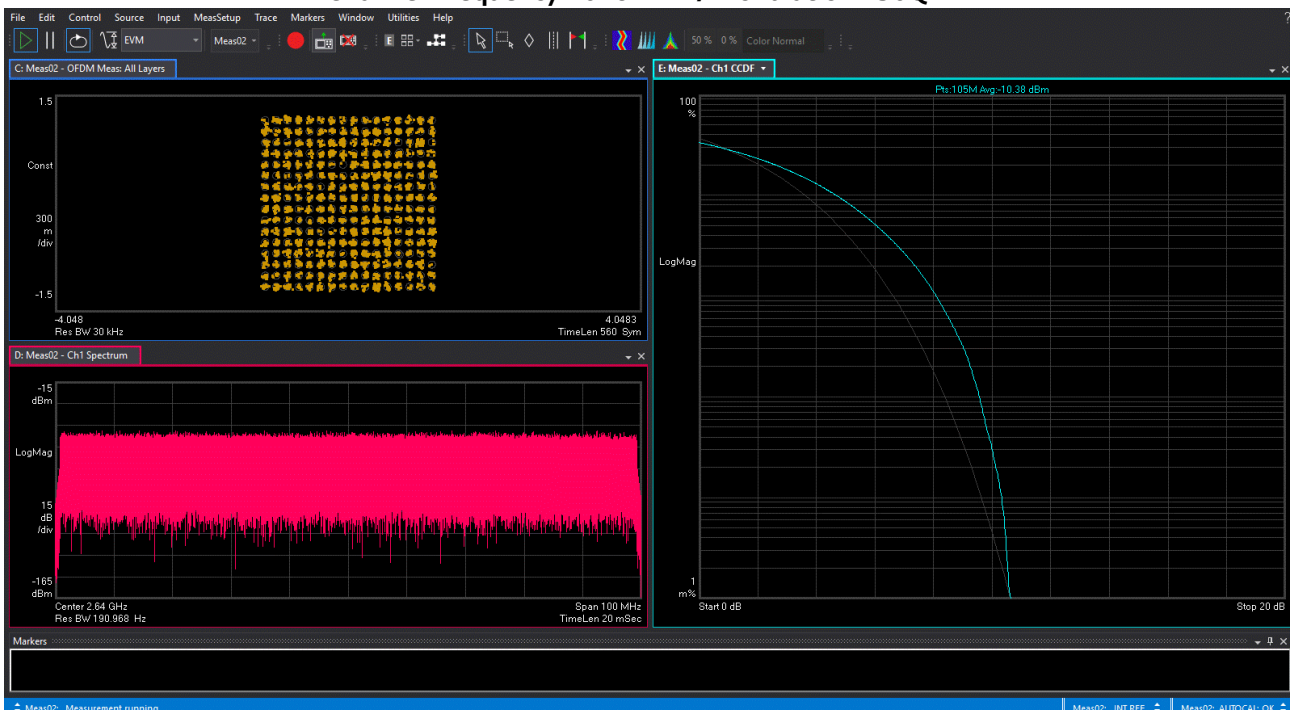


Channel Frequency 2593 MHz / Modulation QPSK/16QAM



5G 100MHz

Channel Frequency 2640 MHz / Modulation 256QAM



4. FCC Section 2.1049 – Occupied Bandwidth/Edge of Band Emissions

4.1 Occupied Bandwidth

In 47CFR 2.1049 the FCC requires:

"The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable."

This required measurement is the 99% Occupied Bandwidth, also called the designated signal bandwidth and needs to be within the parameters of the products specified emissions designator. During these measurements it is customary to evaluate the Edge of Band emissions at block/band edges.

The transmitted signal occupied bandwidth was measured using a Keysight MXA Signal Analyzer. All emissions were within the parameters as required.

Tabular Data – LTE Occupied Bandwidth

Carrier	TM	TX Port	Channel Frequency MHz	Signal BW MHz	Modulation	Occupied BW MHz
1	3.1a	6	2506	20	256QAM	17.810
	1.1	6	2593	20	QPSK	17.729
	3.1	6	2680	20	64QAM	17.621
2	3.1	6	2506+2526	20	64QAM	37.658
	3.1a	6	2660+2680	20	256QAM	37.573
3	3.1a	6	2506+2526+2546	20	256QAM	57.699
	1.1	6	2640+2660+2680	20	QPSK	57.197

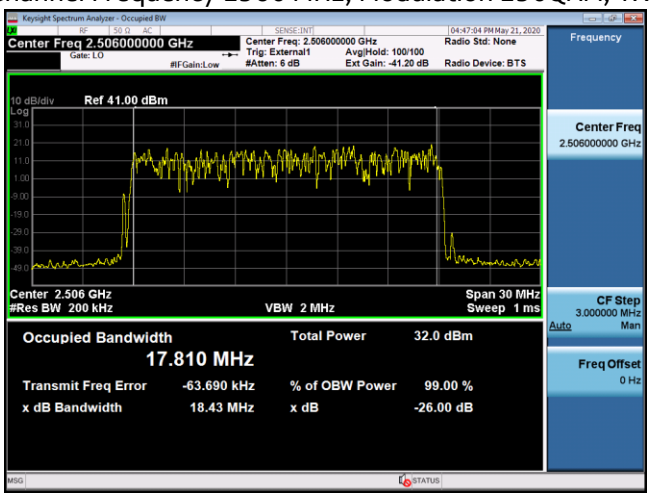
Tabular Data – 5G Occupied Bandwidth

	TM	TX Port	Channel Frequency MHz	Signal BW MHz	Modulation	Occupied BW MHz
40MHz	3.1a	6	2516	40	256QAM	37.770
	3.1	6	2593	40	64QAM	37.842
	3.2	6	2670	40	QPSK/16QAM	37.953
60MHz	3.1	6	2546	60	64QAM	57.573
	3.2	6	2593	60	QPSK/16QAM	57.659
	3.1a	6	2660	60	256QAM	57.676
100MHz	3.1	1	2546	100	64QAM	97.146
	3.2	1	2593	100	QPSK/16QAM	97.139
	3.1a	2	2640	100	256QAM	97.105
	3.1	17	2546	100	64QAM	97.142
	3.2	17	2593	100	QPSK/16QAM	97.139
	3.1a	17	2640	100	256QAM	97.103
	3.1	33	2546	100	64QAM	97.152
	3.2	33	2593	100	QPSK/16QAM	97.140
	3.1a	33	2640	100	256QAM	97.092
	3.1	49	2546	100	64QAM	97.149
	3.2	49	2593	100	QPSK/16QAM	97.148
	3.1a	49	2640	100	256QAM	97.099

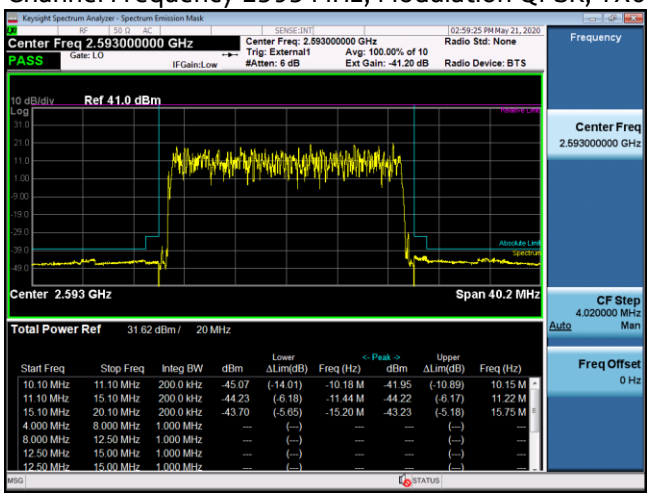
4.1.1 Occupied Bandwidth – Plots

LTE 1C Data

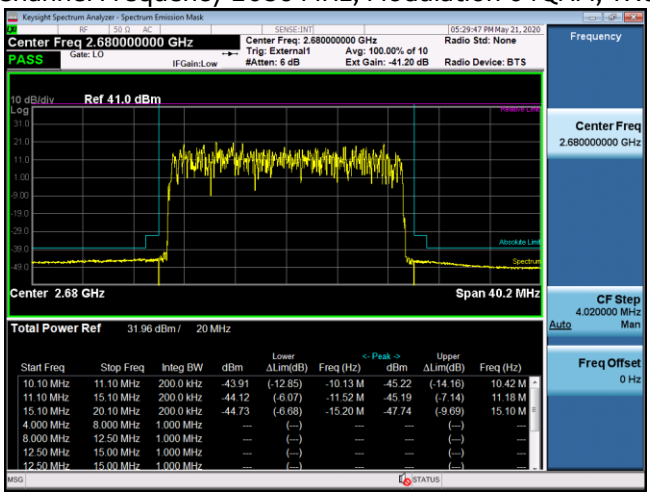
Channel Frequency 2506 MHz, Modulation 256QAM, TX6



Channel Frequency 2593 MHz, Modulation QPSK, TX6

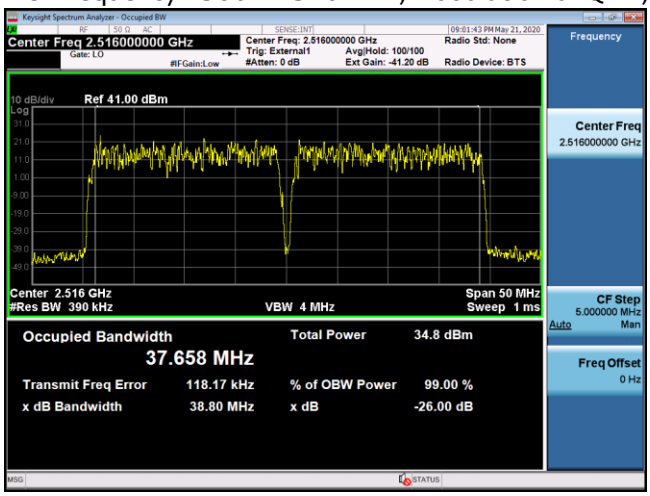


Channel Frequency 2680 MHz, Modulation 64QAM, TX6

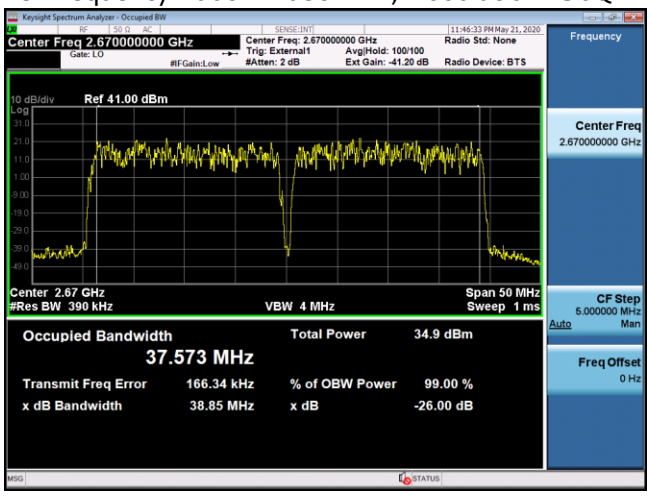


LTE 2C Data

Channel Frequency 2506 + 2526 MHz, Modulation 64QAM, TX6

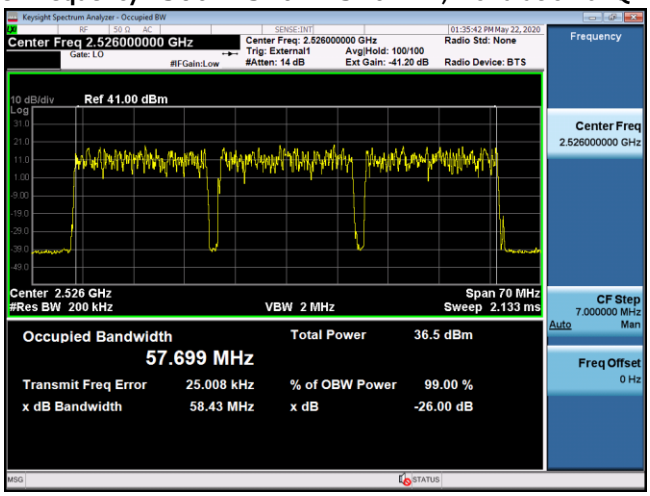


Channel Frequency 2660 + 2680 MHz, Modulation 256QAM, TX6

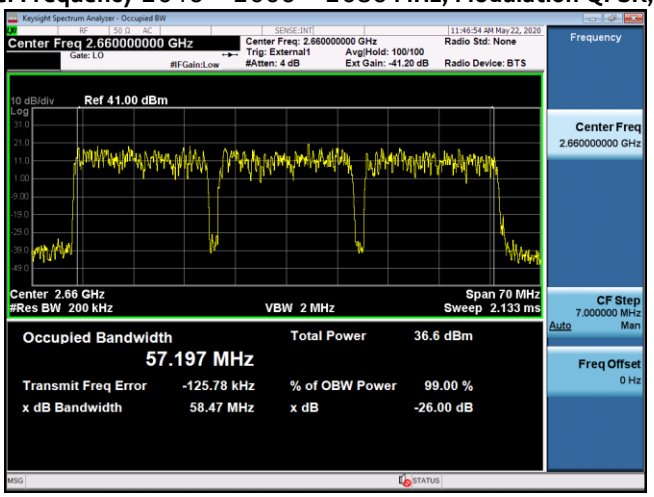


LTE 3C Data

Channel Frequency 2506+ 2526 + 2546 **MHz, Modulation 64QAM, TX6**

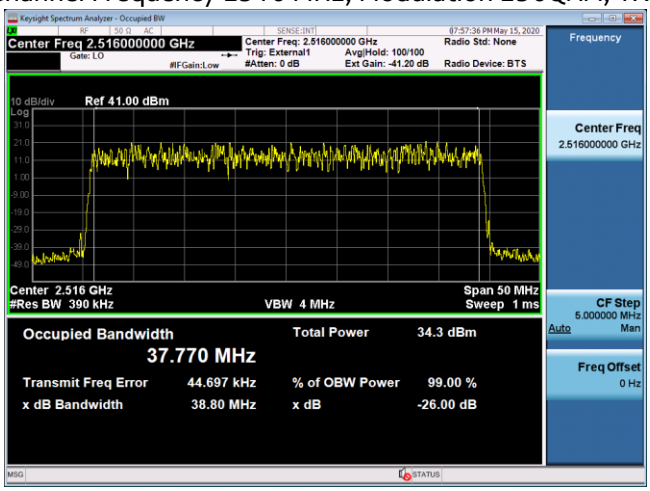


Channel Frequency 2640 + 2660 + 2680 **MHz, Modulation QPSK, TX6**

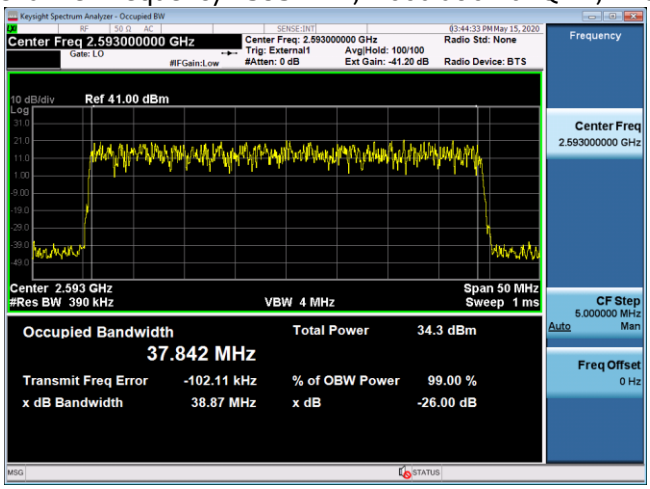


5G 40MHz

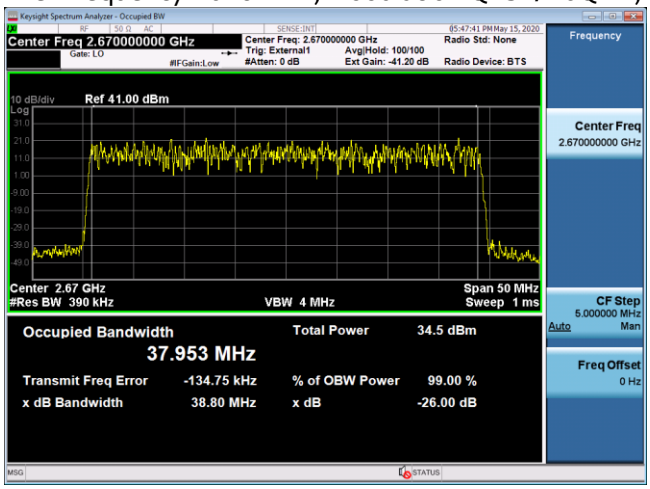
Channel Frequency 2516 MHz, Modulation 256QAM, TX6



Channel Frequency 2593 MHz, Modulation 64QAM, TX6

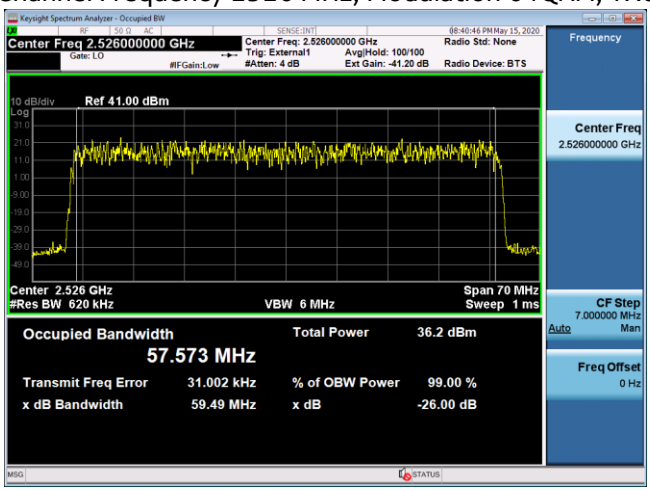


Channel Frequency 2670 MHz, Modulation QPSK/16QAM, TX6

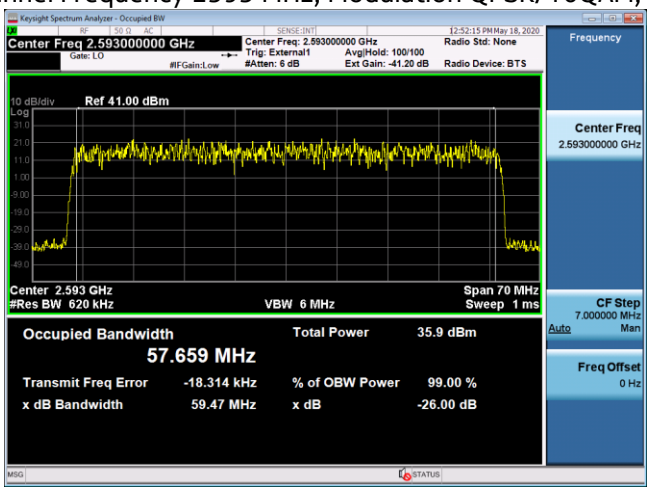


5G 60MHz

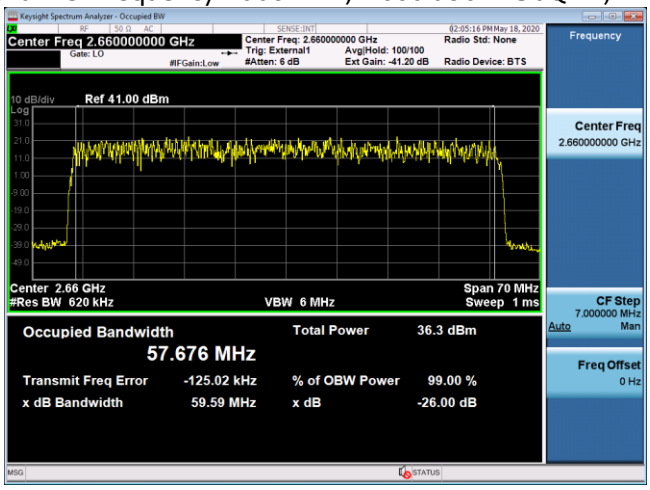
Channel Frequency 2526 MHz, Modulation 64QAM, TX6



Channel Frequency 2593 MHz, Modulation QPSK/16QAM, TX6

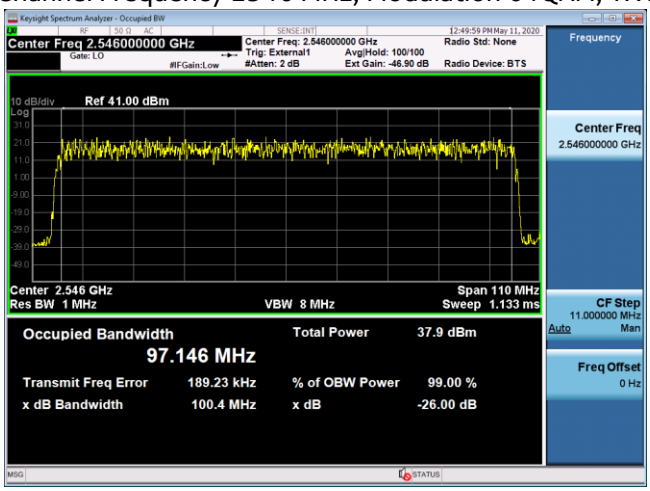


Channel Frequency 2660 MHz, Modulation 256QAM, TX6

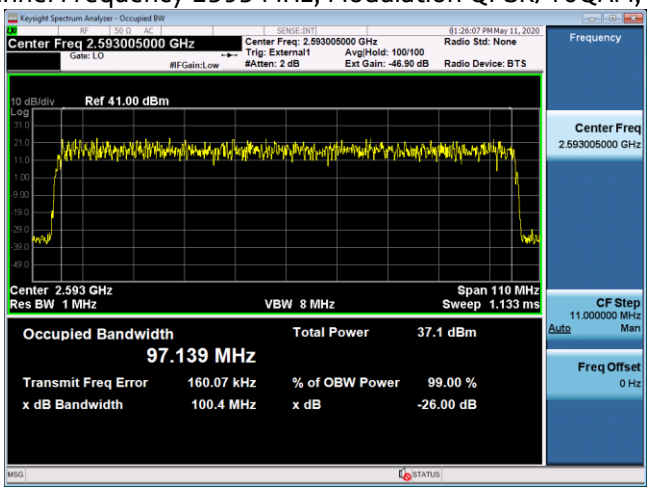


5G 100MHz

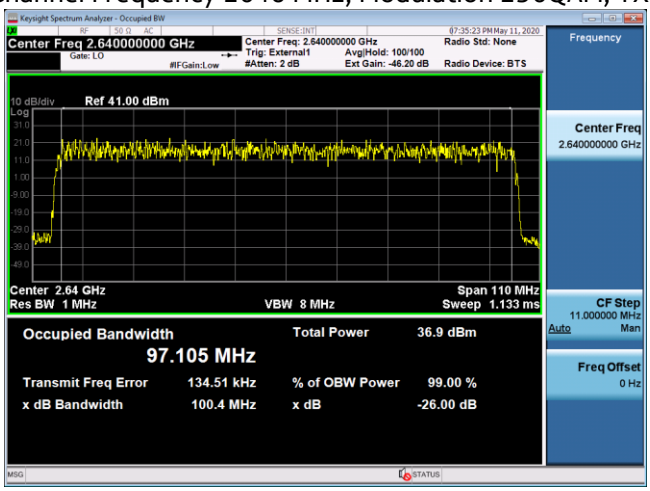
Channel Frequency 2546 MHz, Modulation 64QAM, TX1



Channel Frequency 2593 MHz, Modulation QPSK/16QAM, TX1

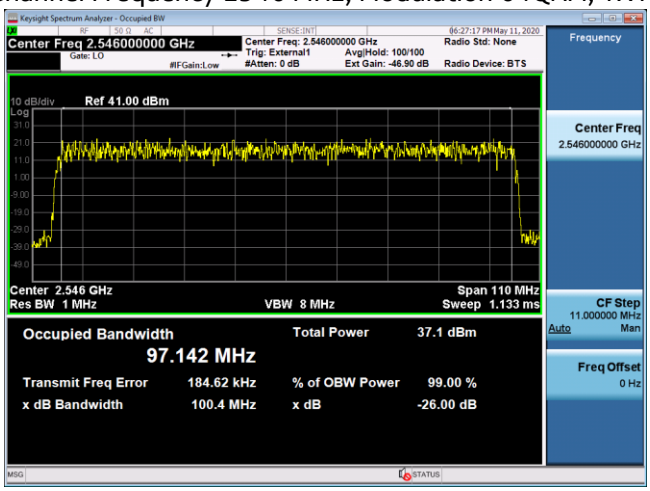


Channel Frequency 2640 MHz, Modulation 256QAM, TX2

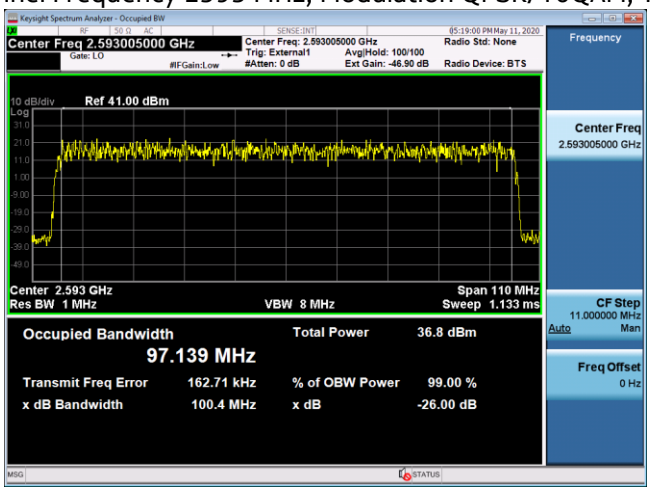


5G 100MHz

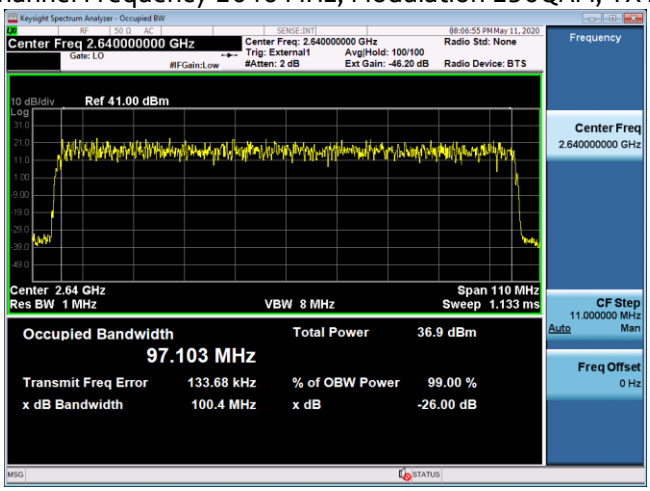
Channel Frequency 2546 MHz, Modulation 64QAM, TX17



Channel Frequency 2593 MHz, Modulation QPSK/16QAM, TX17

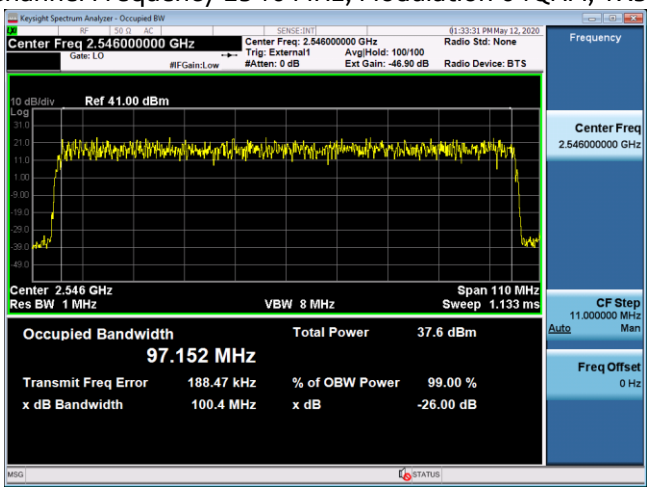


Channel Frequency 2640 MHz, Modulation 256QAM, TX17

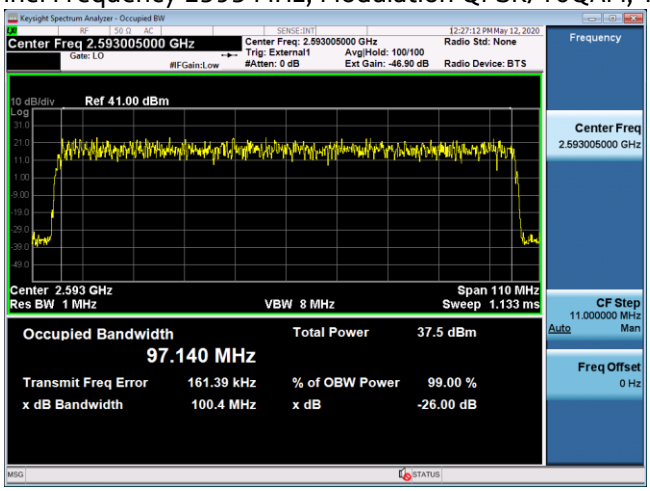


5G 100MHz

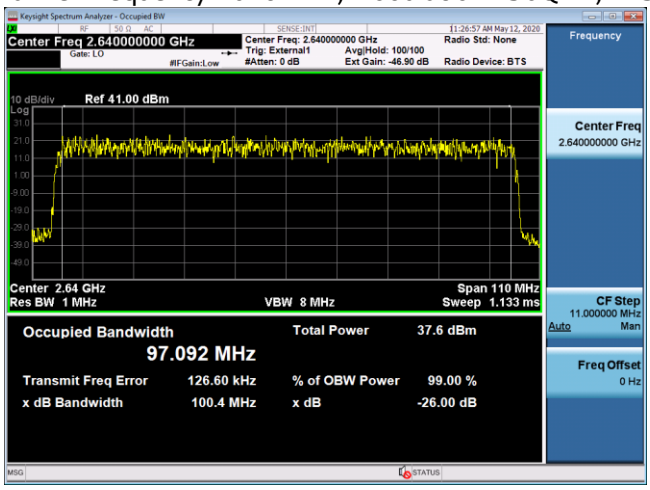
Channel Frequency 2546 MHz, Modulation 64QAM, TX33



Channel Frequency 2593 MHz, Modulation QPSK/16QAM, TX33

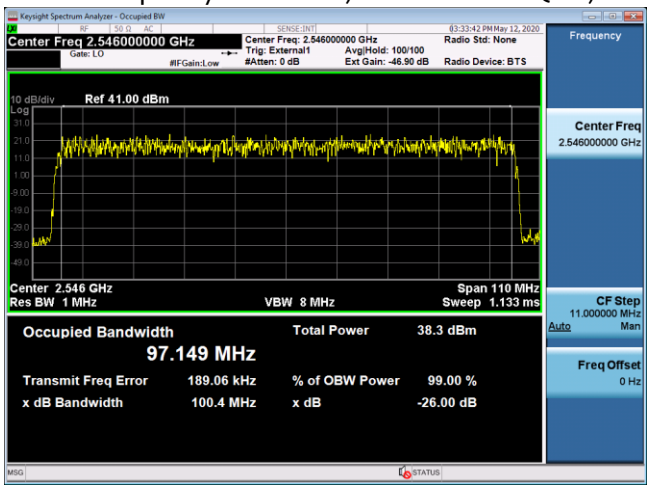


Channel Frequency 2640 MHz, Modulation 256QAM, TX33

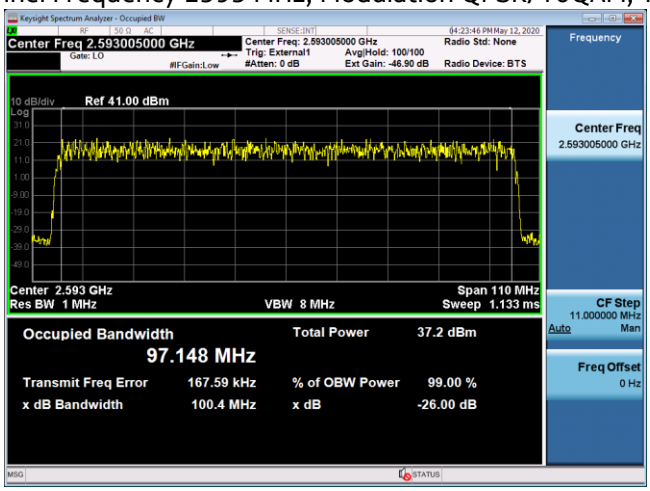


5G 100MHz

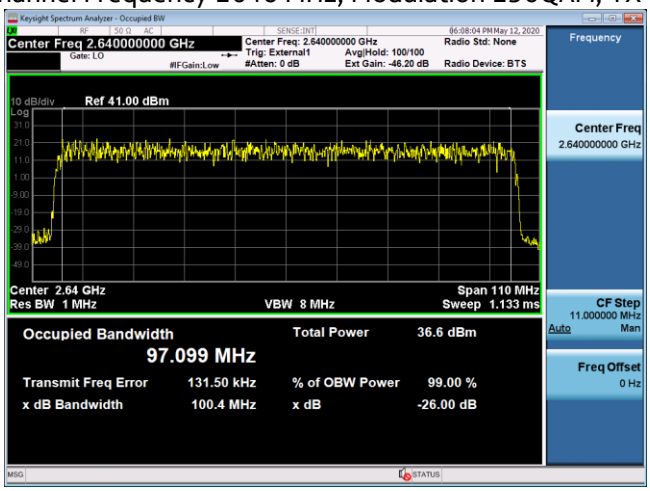
Channel Frequency 2546 MHz, Modulation 64QAM, TX49



Channel Frequency 2593 MHz, Modulation QPSK/16QAM, TX49



Channel Frequency 2640 MHz, Modulation 256QAM, TX49



4.2 Edge of band Emissions

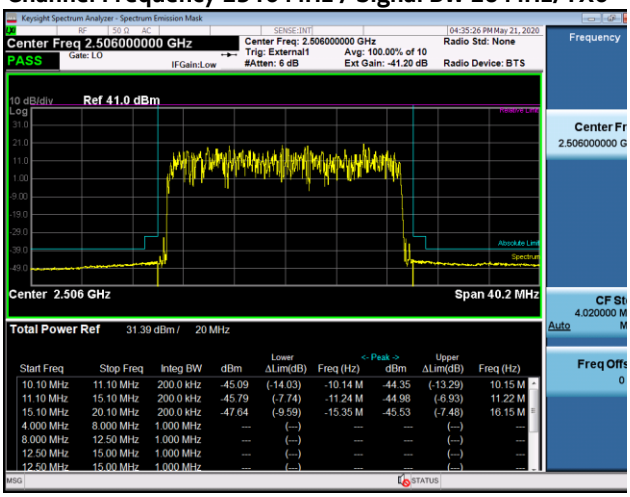
The Edge of Band emissions of the EUT at the external antenna connector (EAC) were measured using a Keysight MXA Signal Analyzer. The RF power level was continuously measured using a RF broadband power meter. The RF output from the EAC port to signal analyzer was reduced (to an amplitude usable by the signal analyzer) by using a calibrated attenuator and test coupler. The path attenuation was offset on the display and the signal for the carrier was adjusted to the corrected RF power level for the resolution bandwidth used for the transmit signal. All mask values were adjusted based upon the designated signal bandwidth and measurement bandwidths. The Top of Mask corresponds to the set rated power level as confirmed by the RF power meter.

4.2.1 Edge of Band Emissions - Plots.

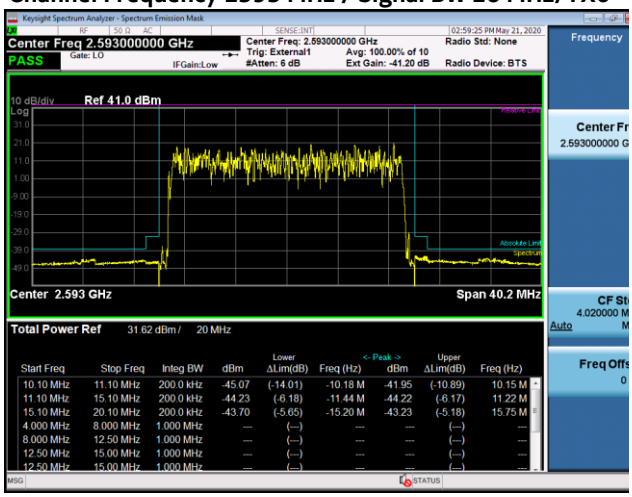
All of the measurements met the requirements of Part 27.53 when measured per Part 2.1049. The limit is derived using the 10 Log (n) rule for limits with n=64

LTE 1C

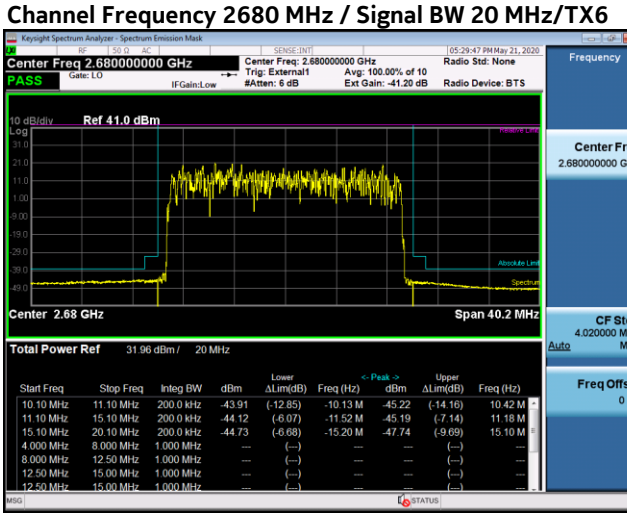
Channel Frequency 2516 MHz / Signal BW 20 MHz/TX6



Channel Frequency 2593 MHz / Signal BW 20 MHz/TX6

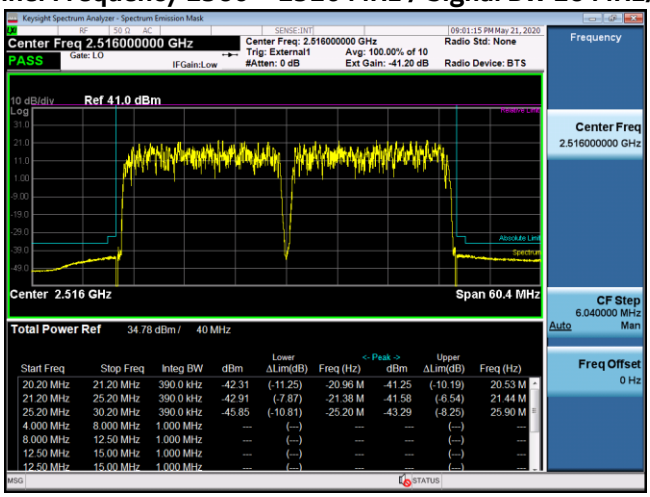


Channel Frequency 2680 MHz / Signal BW 20 MHz/TX6

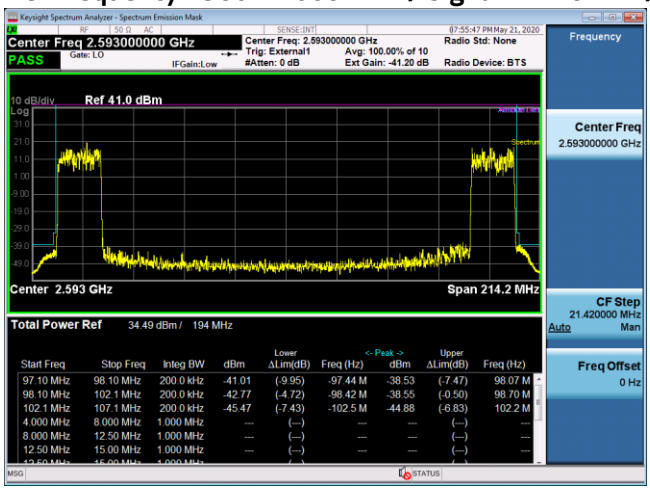


LTE 2C

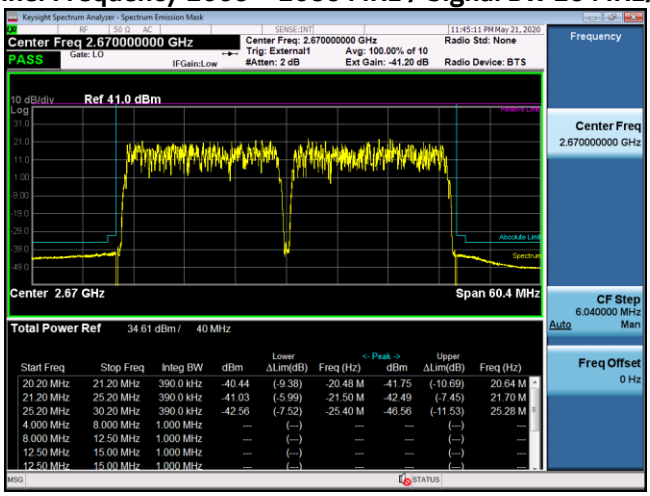
Channel Frequency 2506 + 2526 MHz / Signal BW 20 MHz/TX6



Channel Frequency 2506 + 2680 MHz / Signal BW 20 MHz/TX6

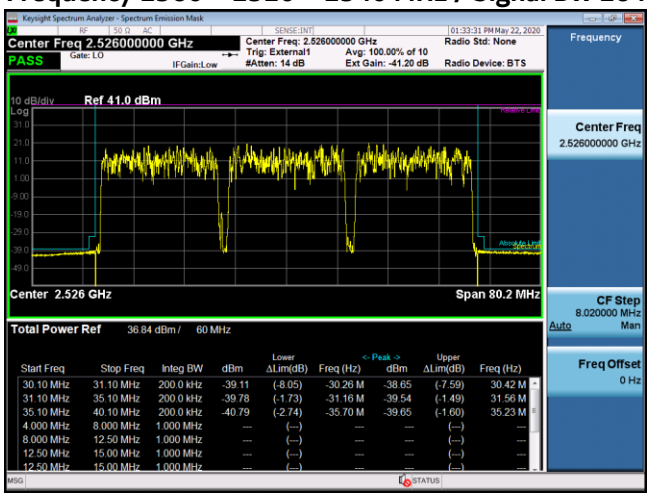


Channel Frequency 2660 + 2680 MHz / Signal BW 20 MHz/TX6

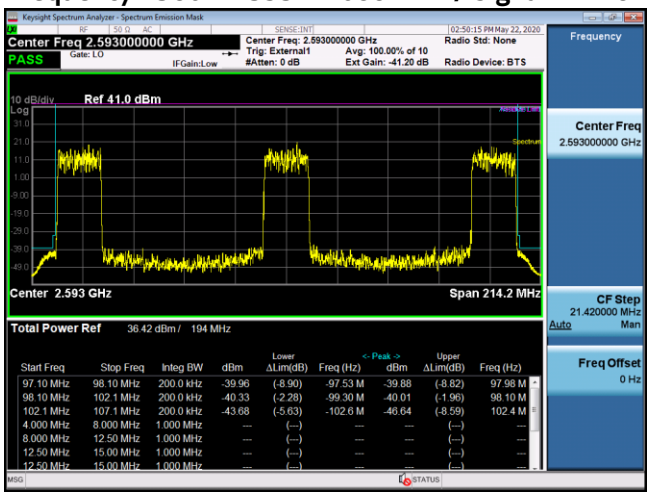


LTE 3C

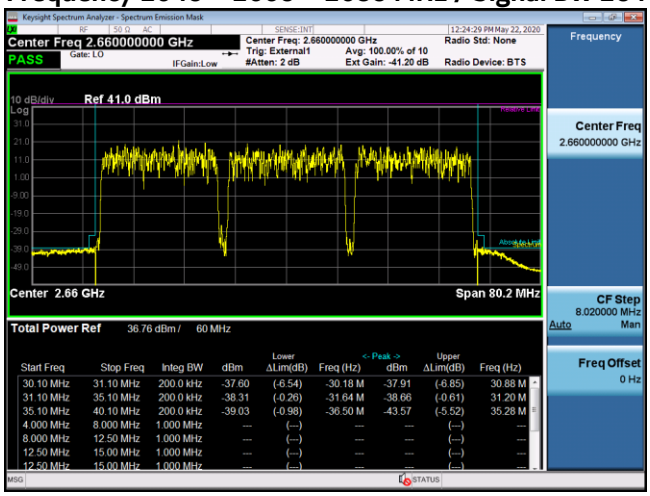
Channel Frequency 2506 + 2526 + 2546 MHz / Signal BW 20 MHz/TX6



Channel Frequency 2506 + 2593 + 2680 MHz / Signal BW 20 MHz/TX6

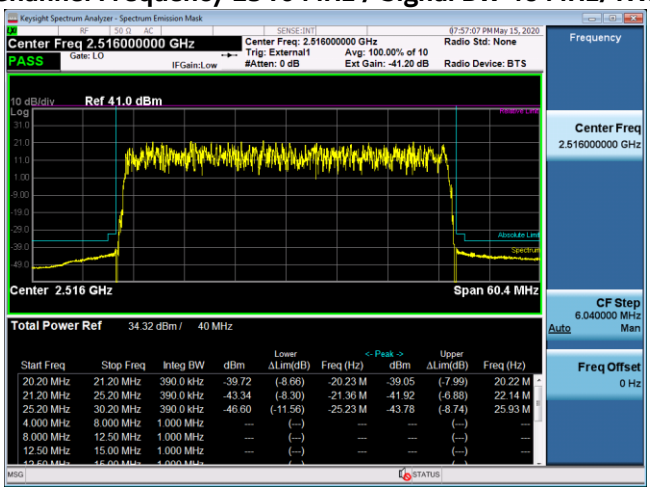


Channel Frequency 2640 + 2660 + 2680 MHz / Signal BW 20 MHz/TX6



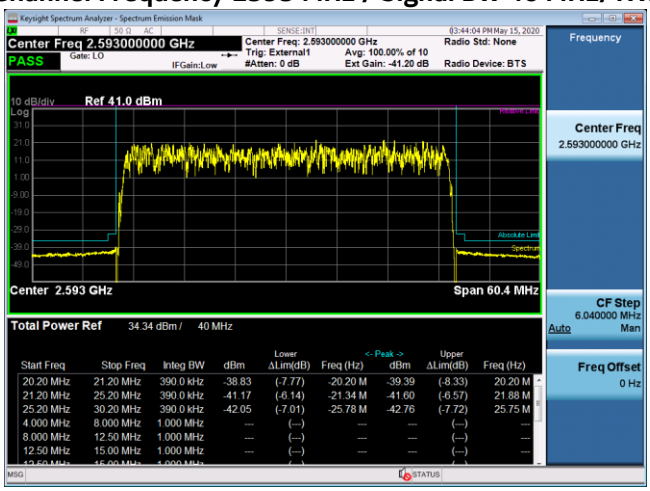
5G 40MHz Data

Channel Frequency 2516 MHz / Signal BW 40 MHz/TX6



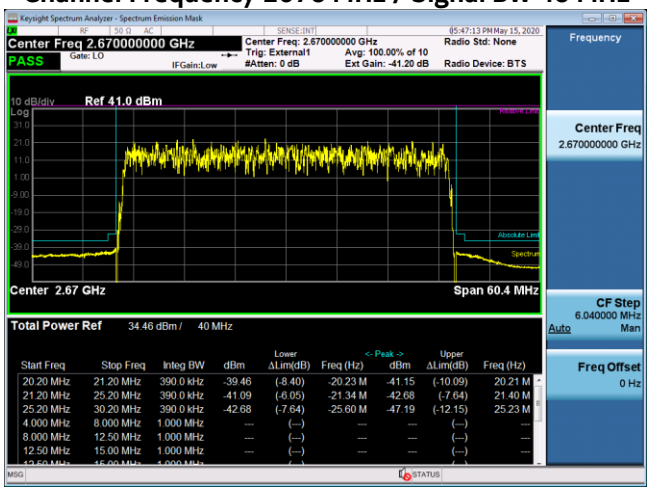
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
20.20 MHz	21.20 MHz	390.0 kHz	-39.72	(-8.66)	-20.23 M	-39.05	(-7.99)	20.22 M
21.20 MHz	25.20 MHz	390.0 kHz	-43.34	(-8.30)	-21.36 M	-41.92	(-6.88)	22.14 M
25.20 MHz	30.20 MHz	390.0 kHz	-46.60	(-11.56)	-25.23 M	-43.78	(-8.74)	25.93 M
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

Channel Frequency 2593 MHz / Signal BW 40 MHz/TX6



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
20.20 MHz	21.20 MHz	390.0 kHz	-38.83	(-7.77)	-20.20 M	-39.39	(-8.33)	20.20 M
21.20 MHz	25.20 MHz	390.0 kHz	-41.17	(-6.14)	-21.34 M	-41.60	(-6.57)	21.88 M
25.20 MHz	30.20 MHz	390.0 kHz	-42.05	(-7.01)	-25.78 M	-42.76	(-7.72)	25.75 M
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

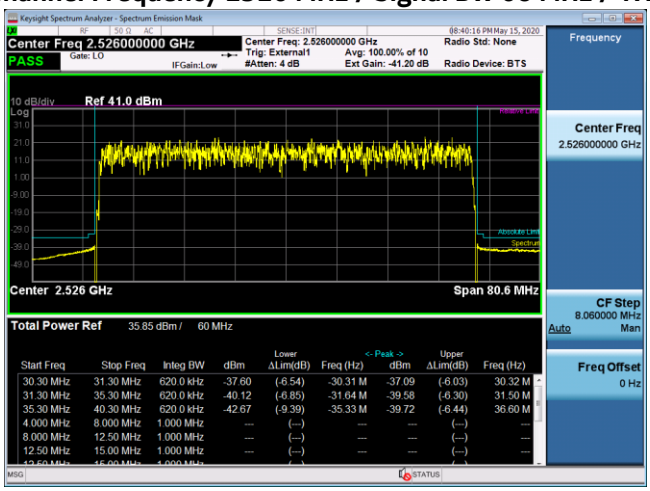
Channel Frequency 2670 MHz / Signal BW 40 MHz



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
20.20 MHz	21.20 MHz	390.0 kHz	-39.46	(-8.40)	-20.23 M	-41.15	(-10.09)	20.21 M
21.20 MHz	25.20 MHz	390.0 kHz	-41.09	(-6.05)	-21.34 M	-42.68	(-7.64)	21.40 M
25.20 MHz	30.20 MHz	390.0 kHz	-42.68	(-7.64)	-25.60 M	-47.19	(-12.15)	25.23 M
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

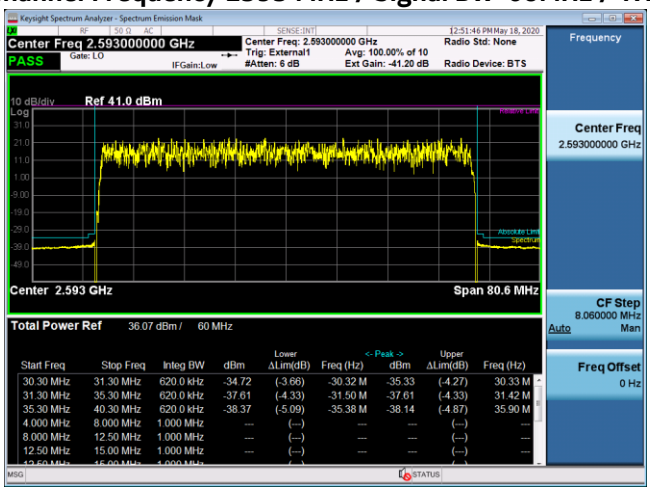
5G 60MHz Data

Channel Frequency 2526 MHz / Signal BW 60 MHz / TX6



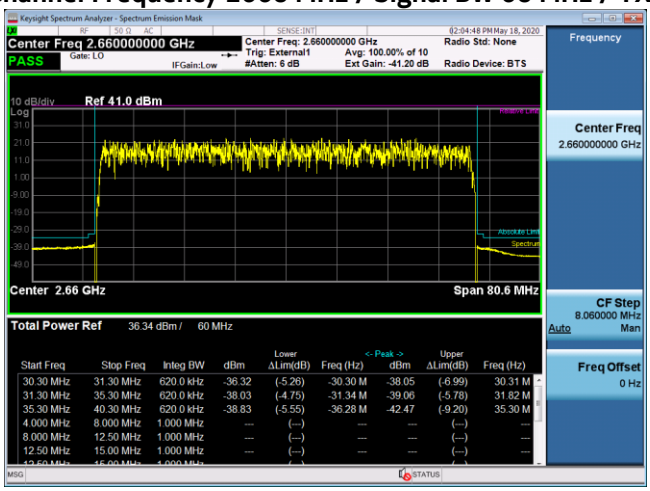
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Freq (Hz)
30.30 MHz	31.30 MHz	620.0 kHz	-37.60	(-6.54)	-30.31 M	-37.09	(-6.03)	30.32 M
31.30 MHz	35.30 MHz	620.0 kHz	-40.12	(-6.85)	-31.64 M	-39.58	(-6.30)	31.50 M
35.30 MHz	40.30 MHz	620.0 kHz	-42.67	(-9.39)	-35.33 M	-39.72	(-6.44)	36.60 M
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

Channel Frequency 2593 MHz / Signal BW 60MHz / TX6



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Freq (Hz)
30.30 MHz	31.30 MHz	620.0 kHz	-34.72	(-3.66)	-30.32 M	-35.33	(-4.27)	30.33 M
31.30 MHz	35.30 MHz	620.0 kHz	-37.61	(-4.33)	-31.50 M	-37.61	(-4.33)	31.42 M
35.30 MHz	40.30 MHz	620.0 kHz	-38.37	(-5.09)	-35.38 M	-38.14	(-4.87)	35.90 M
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

Channel Frequency 2660 MHz / Signal BW 60 MHz / TX6



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Freq (Hz)
30.30 MHz	31.30 MHz	620.0 kHz	-36.32	(-5.26)	-30.30 M	-38.05	(-6.99)	30.31 M
31.30 MHz	35.30 MHz	620.0 kHz	-38.03	(-4.75)	-31.34 M	-39.06	(-5.78)	31.82 M
35.30 MHz	40.30 MHz	620.0 kHz	-38.83	(-5.55)	-36.28 M	-42.47	(-9.20)	35.30 M
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---