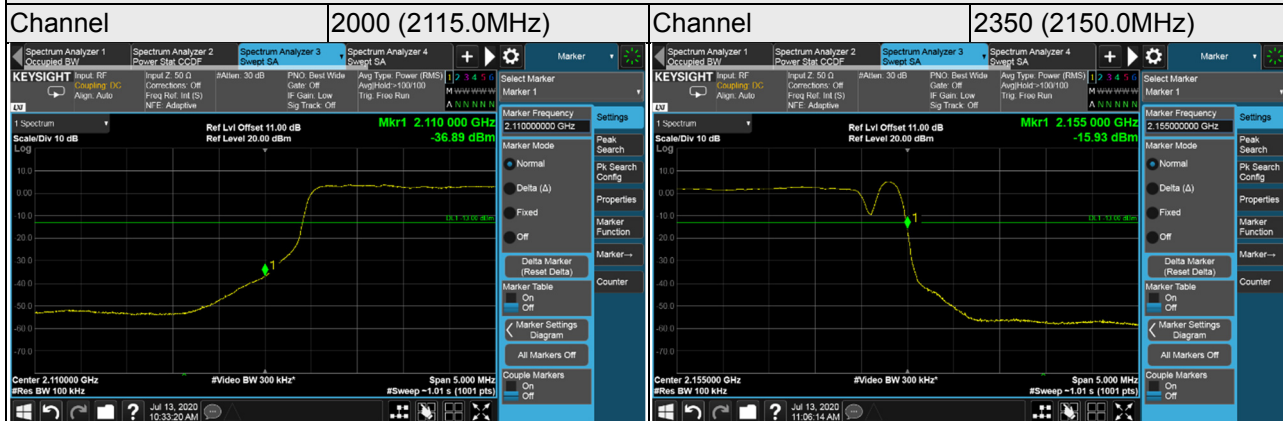
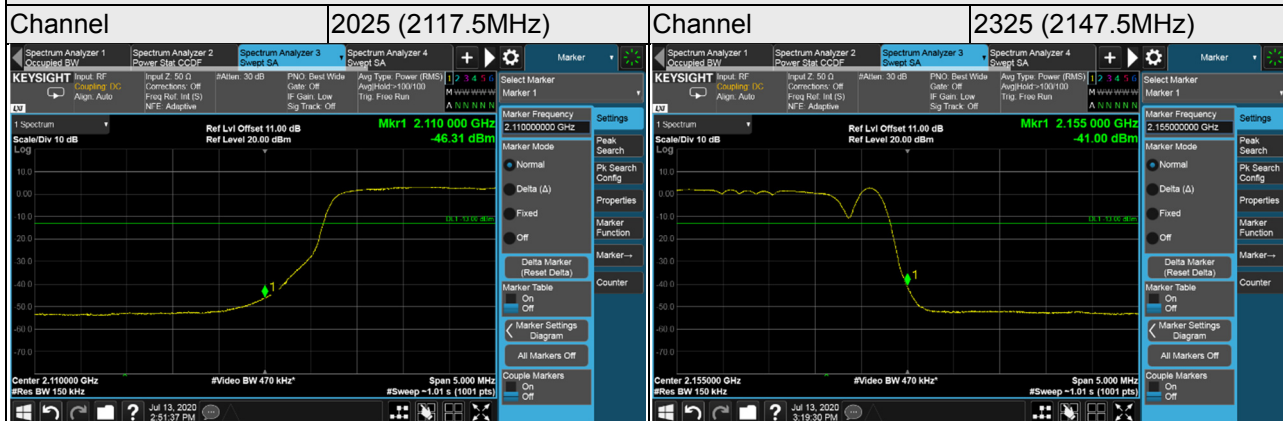


Signal at upper (Fixed on chain 0)

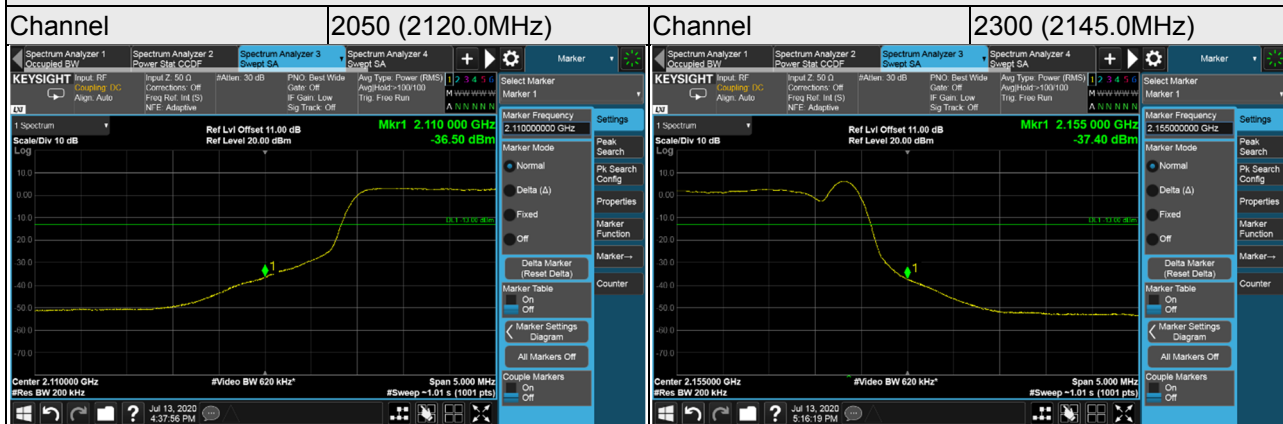
Channel Bandwidth: 10MHz



Channel Bandwidth: 15MHz



Channel Bandwidth: 20MHz

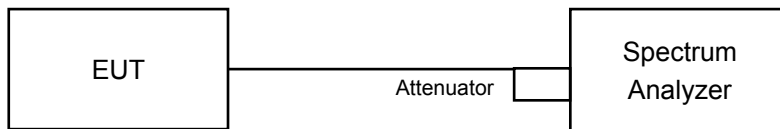


4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

4.6.2 Test Setup



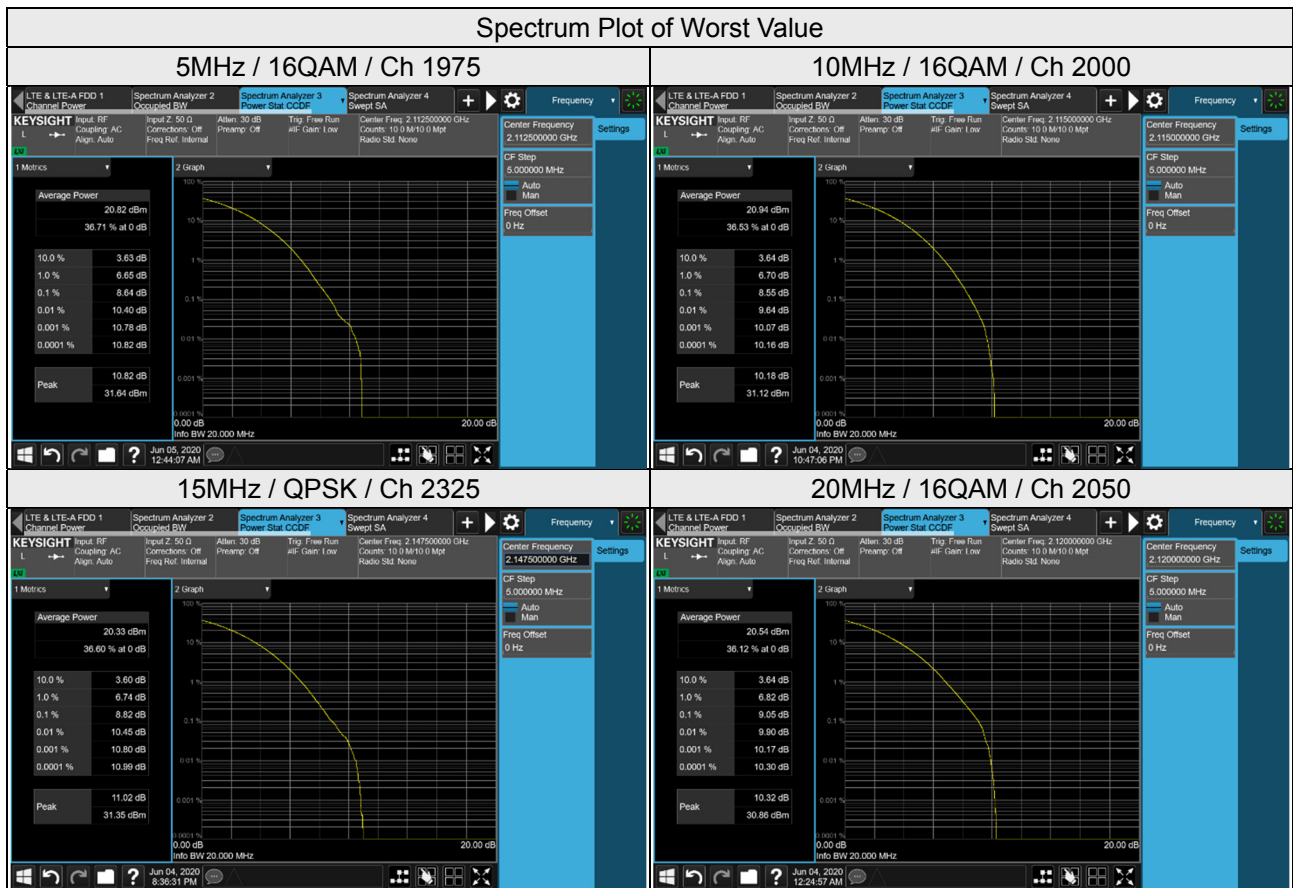
4.6.3 Test Procedures

- a. Set resolution/measurement bandwidth \geq signal's occupied bandwidth;
- b. Set the number of counts to a value that stabilizes the measured CCDF curve;
- c. Record the maximum PAPR level associated with a probability of 0.1%.

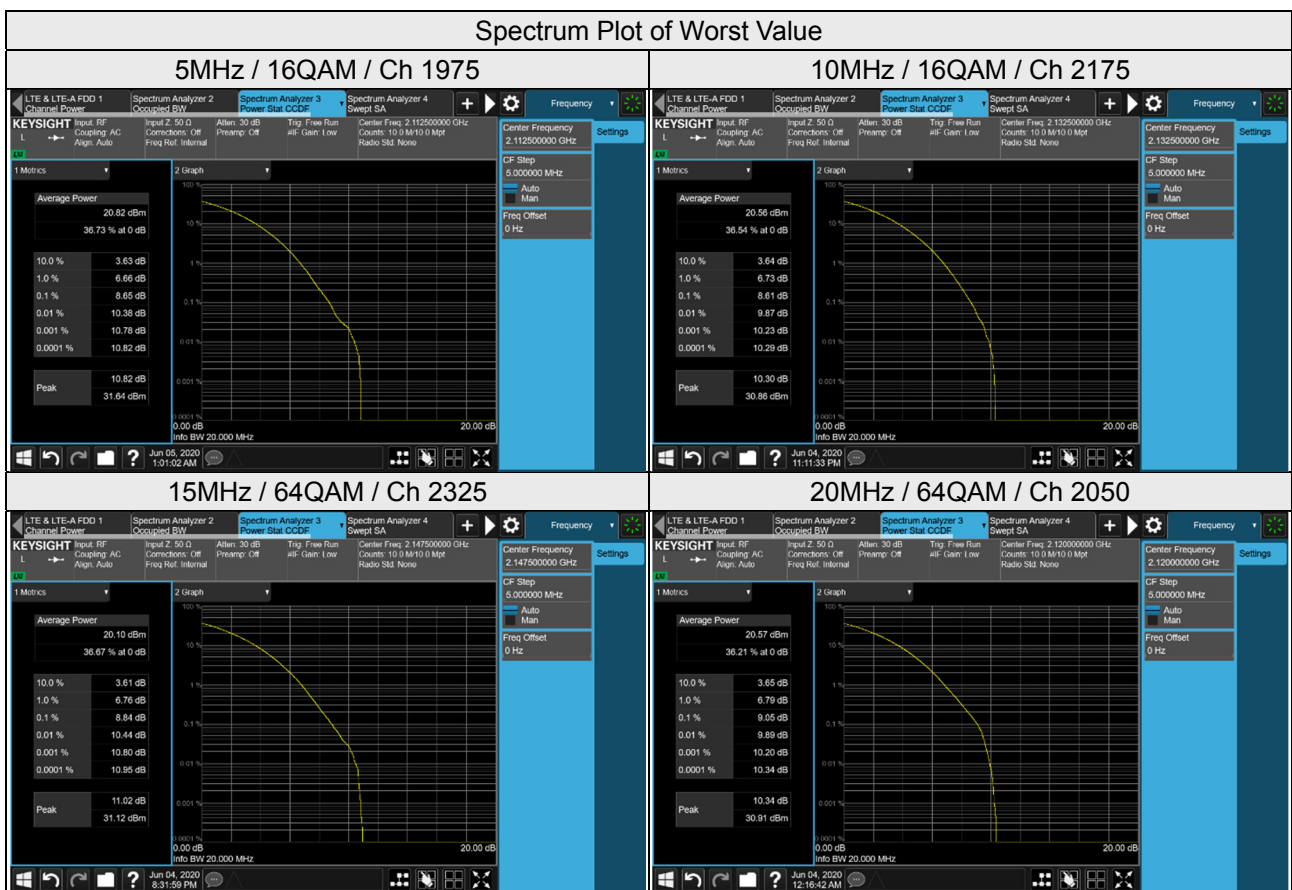
4.6.4 Test Results

LTE Band 4

LTE Band 4 / Chain 0									
Channel Bandwidth 5MHz					Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)			Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
1975	2112.5	8.63	8.64	8.64	2000	2115.0	8.50	8.55	8.51
2175	2132.5	8.48	8.49	8.48	2175	2132.5	8.49	8.49	8.51
2375	2152.5	8.48	8.47	8.47	2350	2150.0	8.39	8.42	8.38
Channel Bandwidth 15MHz					Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)			Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
2025	2117.5	8.75	8.74	8.77	2050	2120.0	8.98	9.05	8.98
2175	2175.0	8.54	8.55	8.75	2175	2132.5	9.02	9.01	9.00
2325	2147.5	8.82	8.80	8.78	2300	2145.0	8.96	8.95	8.88



LTE Band 4 / Chain 1									
Channel Bandwidth 5MHz					Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)			Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
1975	2112.5	8.64	8.65	8.63	2000	2115.0	8.54	8.54	8.54
2175	2132.5	8.45	8.45	8.44	2175	2132.5	8.60	8.61	8.60
2375	2152.5	8.47	8.47	8.46	2350	2150.0	8.43	8.41	8.41
Channel Bandwidth 15MHz					Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)			Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
2025	2117.5	8.81	8.77	8.78	2050	2120.0	8.97	9.00	9.05
2175	2175.0	8.57	8.57	8.59	2175	2132.5	9.03	9.04	9.03
2325	2147.5	8.81	8.81	8.84	2300	2145.0	8.86	8.86	8.86

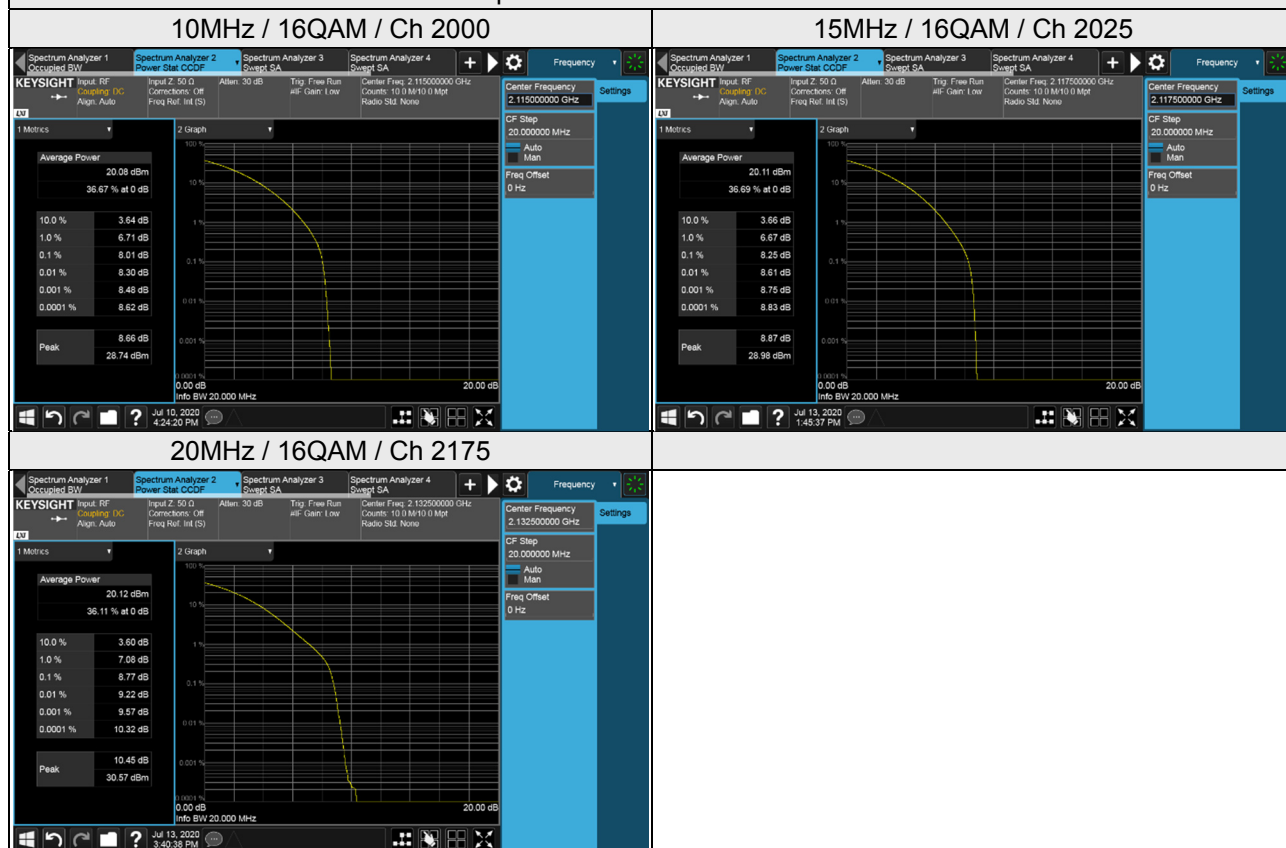


LTE Band 4 NB-IoT Guard band

Signal at lower

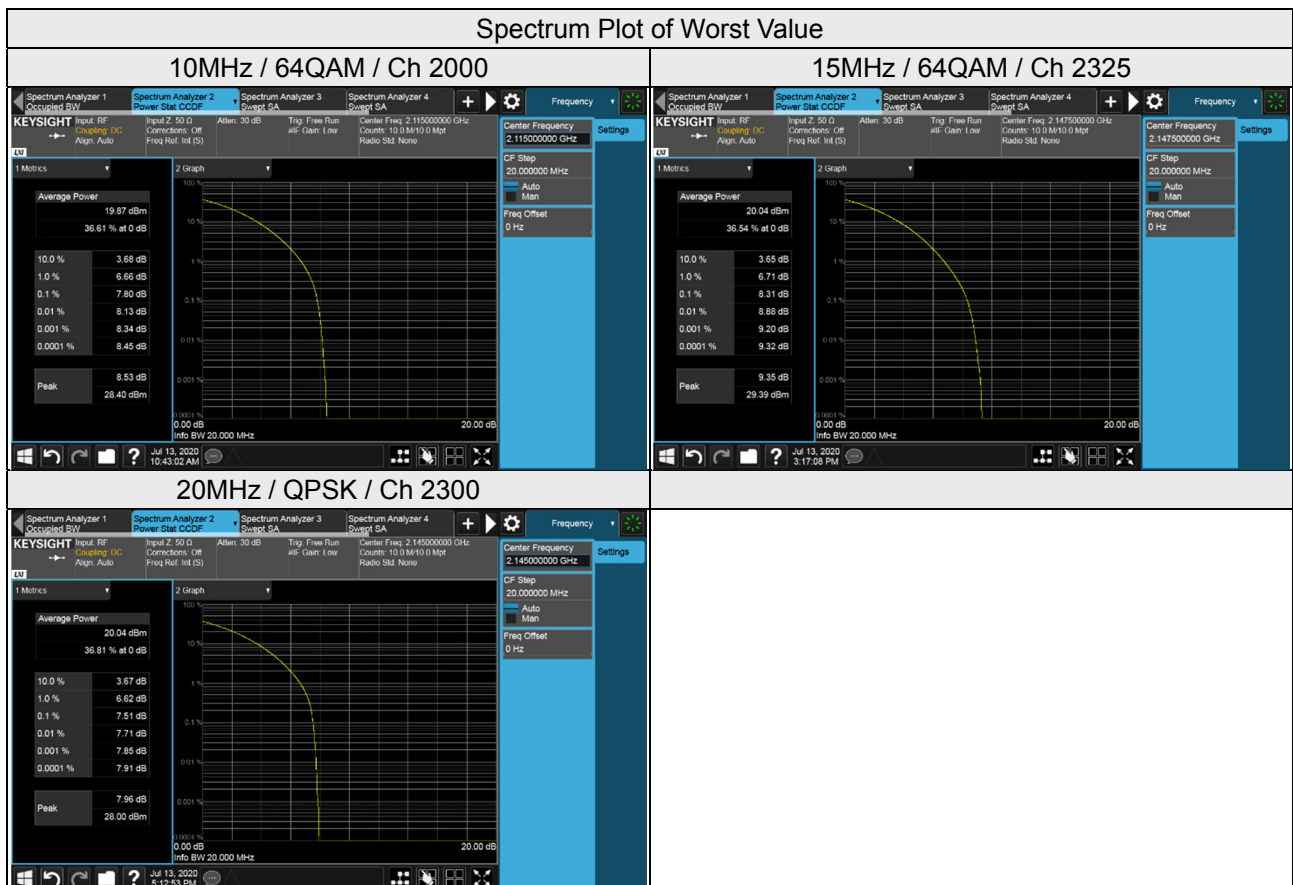
LTE Band 4 NB-IoT Guard band									
Channel Bandwidth 10MHz					Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)			Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
2000	2115.0	7.60	8.01	7.89	2025	2117.5	8.24	8.25	8.23
2175	2132.5	7.19	7.82	6.45	2175	2175.0	8.23	8.22	8.22
2350	2150.0	7.73	7.78	7.92	2325	2147.5	8.22	8.23	8.24
Channel Bandwidth 20MHz									
Channel	Frequency (MHz)	Peak To Average Ratio (dB)							
		QPSK	16QAM	64QAM					
2050	2120.0	7.53	7.52	7.52					
2175	2132.5	7.18	8.77	8.76					
2300	2145.0	7.56	7.56	7.57					

Spectrum Plot of Worst Value



Signal at upper

LTE Band 4 NB-IoT Guard band									
Channel Bandwidth 10MHz					Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)			Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
2000	2115.0	7.61	7.75	7.80	2025	2117.5	8.22	8.23	8.24
2175	2132.5	7.64	7.62	7.63	2175	2175.0	8.27	8.27	8.30
2350	2150.0	7.70	7.69	7.71	2325	2147.5	8.30	8.30	8.31
Channel Bandwidth 20MHz									
Channel	Frequency (MHz)	Peak To Average Ratio (dB)							
		QPSK	16QAM	64QAM					
2050	2120.0	7.44	7.44	7.45					
2175	2132.5	7.41	7.40	7.40					
2300	2145.0	7.51	7.50	7.49					



4.7 Conducted Spurious Emissions

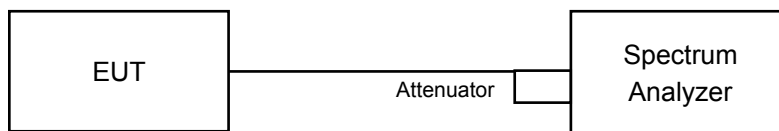
4.7.1 Limits of Conducted Spurious Emissions Measurement

In the FCC 27.53(h), On any frequency outside a licensee's frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB, the emission limit equal to -13dBm .

Note:

This device can be implemented MIMO function, so the limit of spurious emissions needs to be reduced by $10\log(\text{Numbers}_{\text{Ant}})$ according to FCC KDB 662911 D01 guidance.

4.7.2 Test Setup



4.7.3 Test Procedure

- a. All measurements were done at 3 channels: low, middle and high operational frequency range.
- b. When the spectrum scanned from 9kHz to 26.5GHz, it shall be connected to the attenuator with the carried frequency.

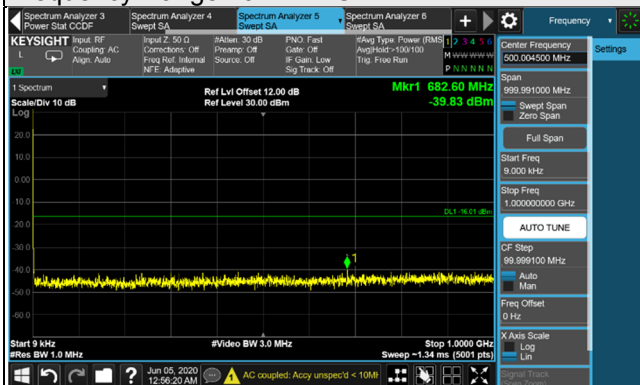
4.7.4 Test Results

LTE Band 4

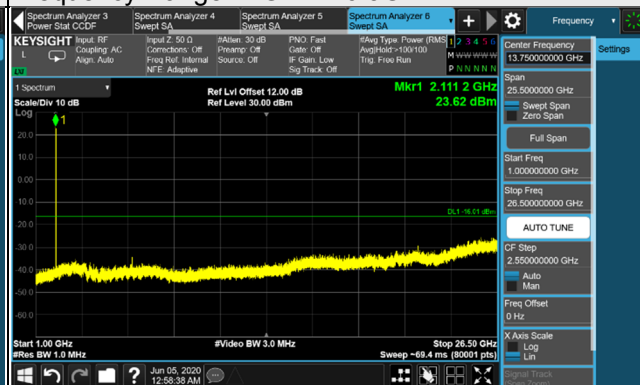
LTE Band 4 / Chain 0 / Channel Bandwidth: 5MHz

Channel 1975

Frequency Range : 9kHz~1GHz

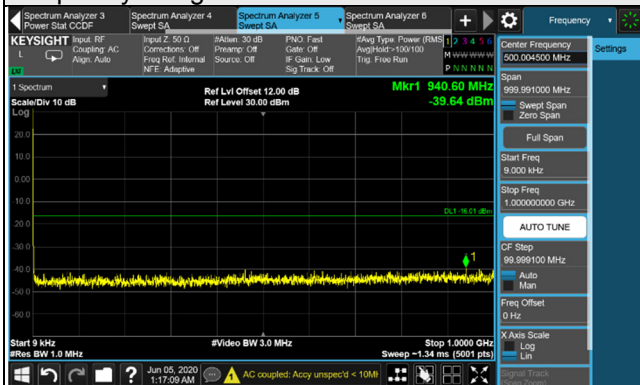


Frequency Range : 1GHz~26.5GHz

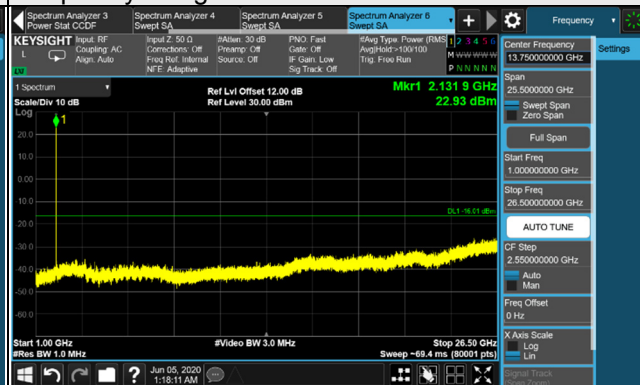


Channel 2175

Frequency Range : 9kHz~1GHz

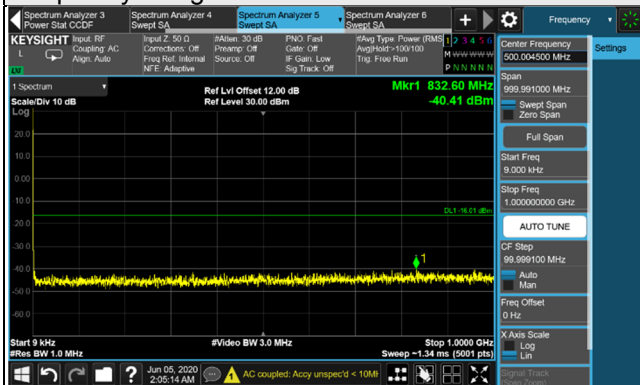


Frequency Range : 1GHz~26.5GHz

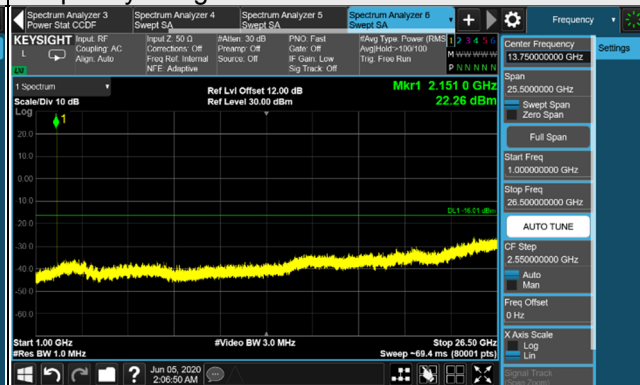


Channel 2375

Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~26.5GHz

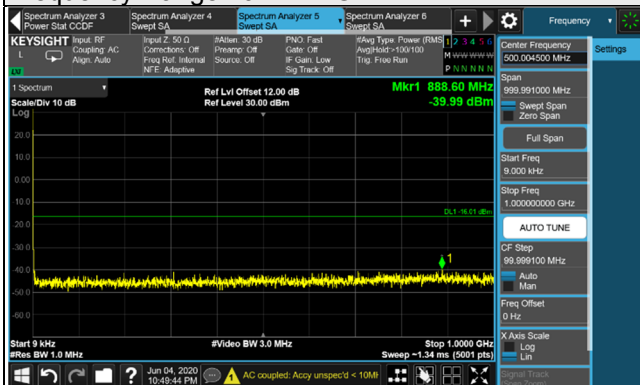


*The 9kHz signal over the limit is from Spectrum.

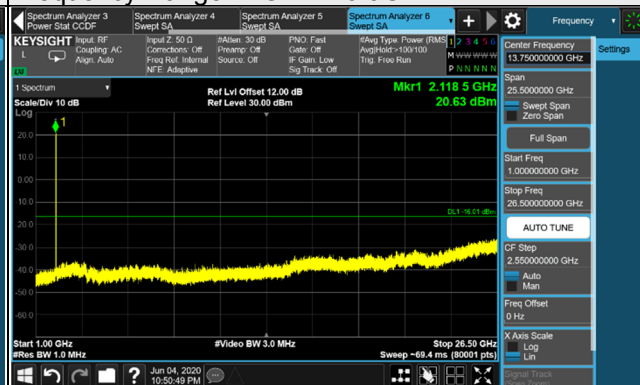
LTE Band 4 / Chain 0 / Channel Bandwidth: 10MHz

Channel 2000

Frequency Range : 9kHz~1GHz

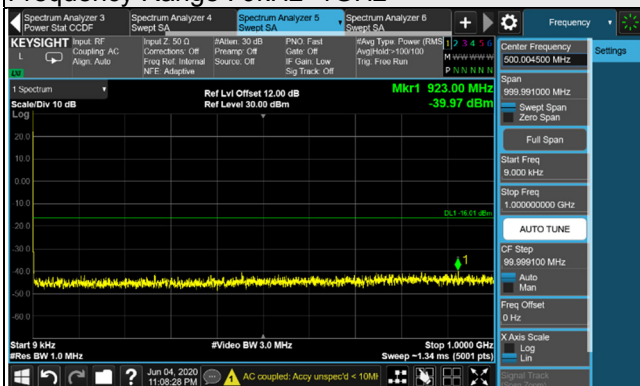


Frequency Range : 1GHz~26.5GHz

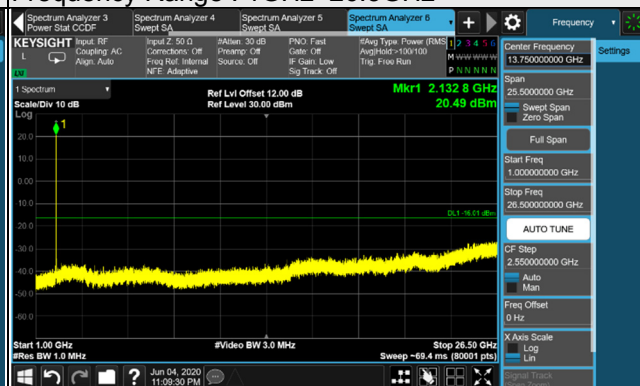


Channel 2175

Frequency Range : 9kHz~1GHz

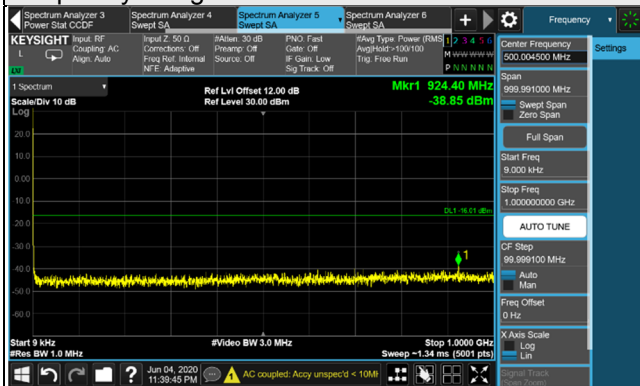


Frequency Range : 1GHz~26.5GHz

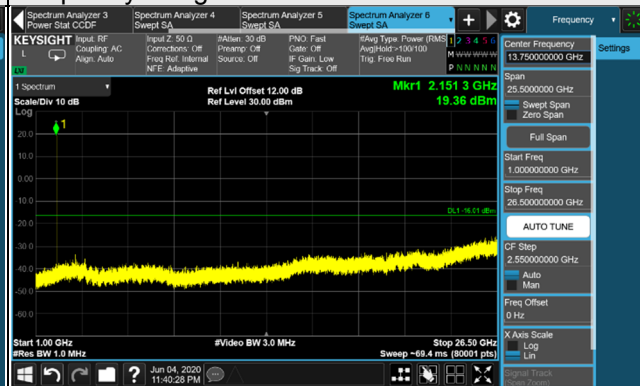


Channel 2350

Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~26.5GHz



*The 9kHz signal over the limit is from Spectrum.