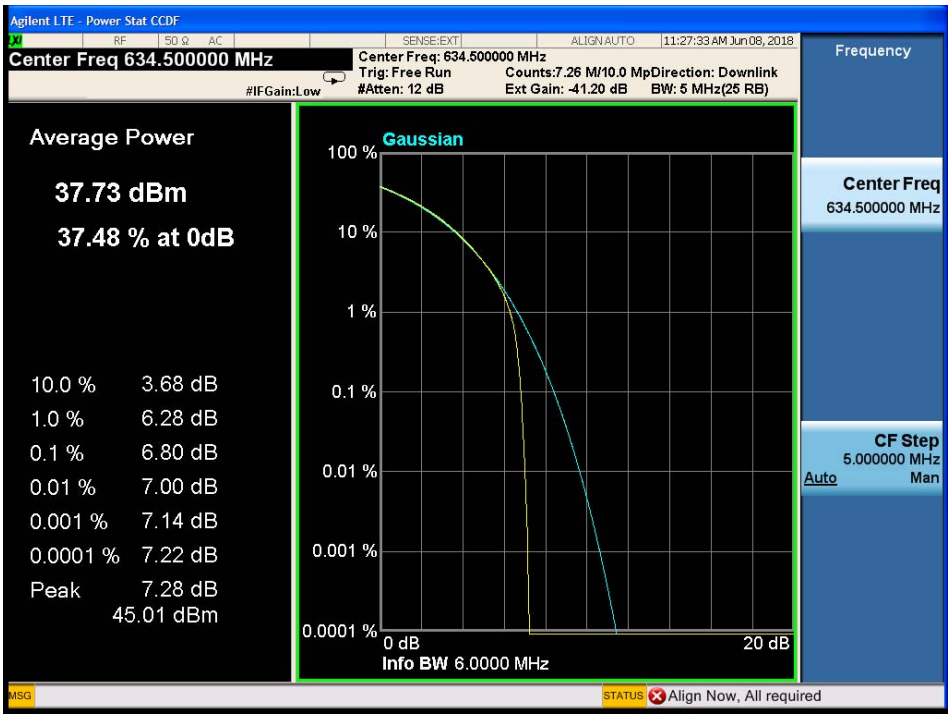
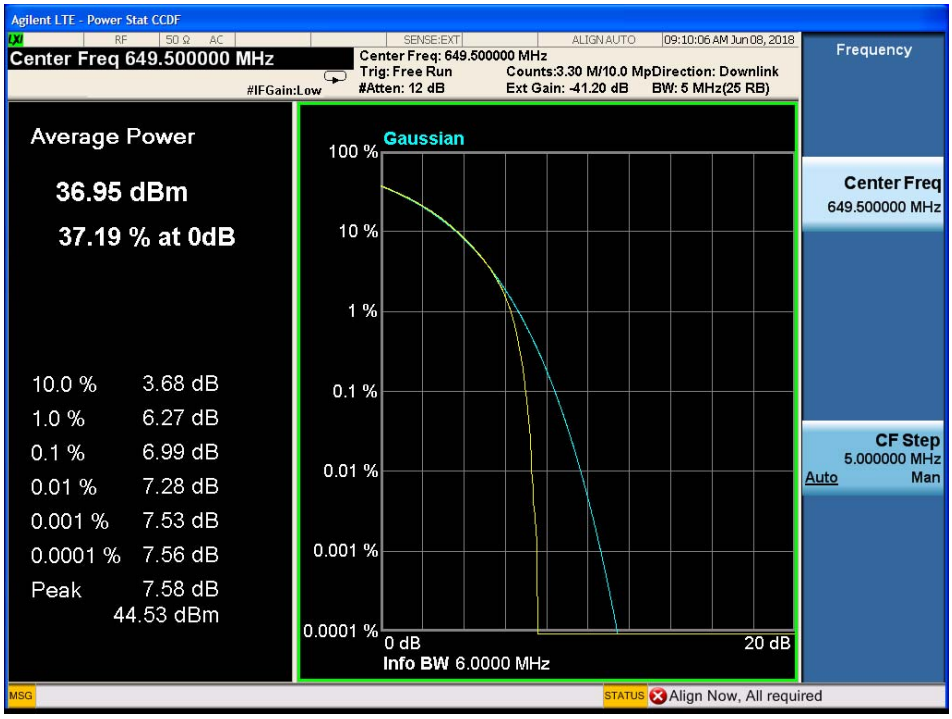
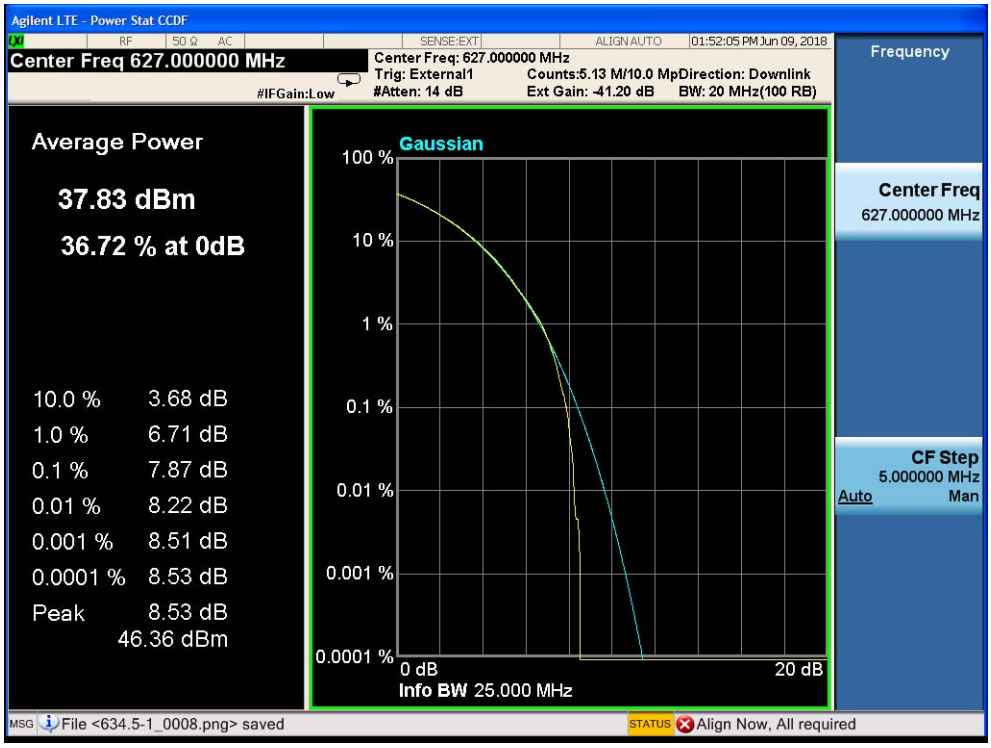


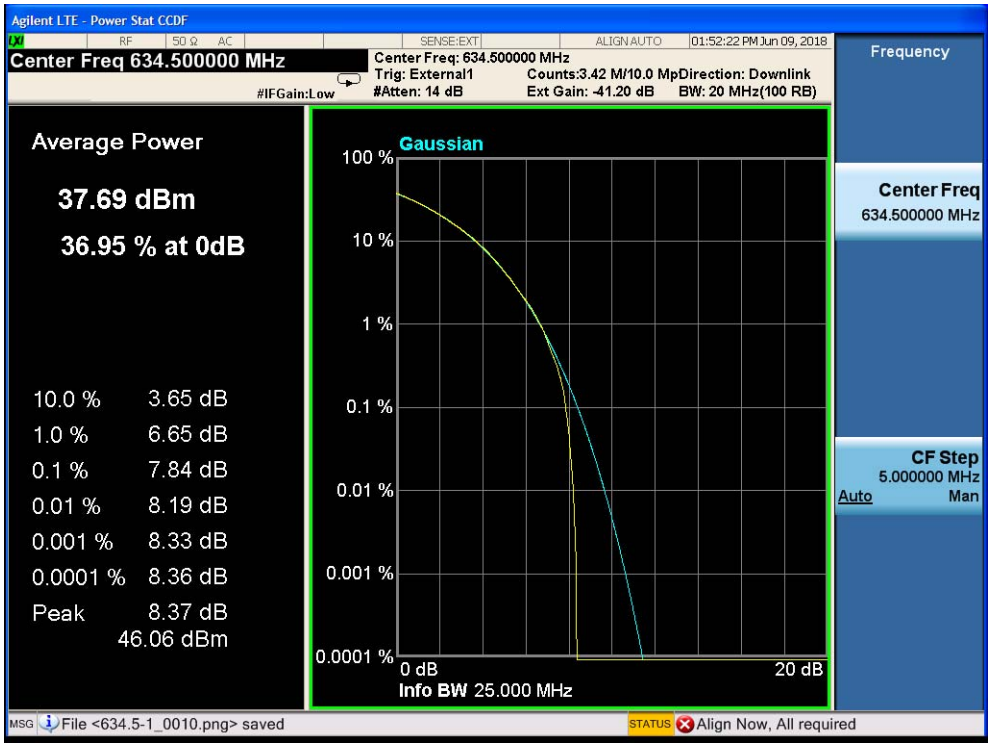
1.3 highest frequency



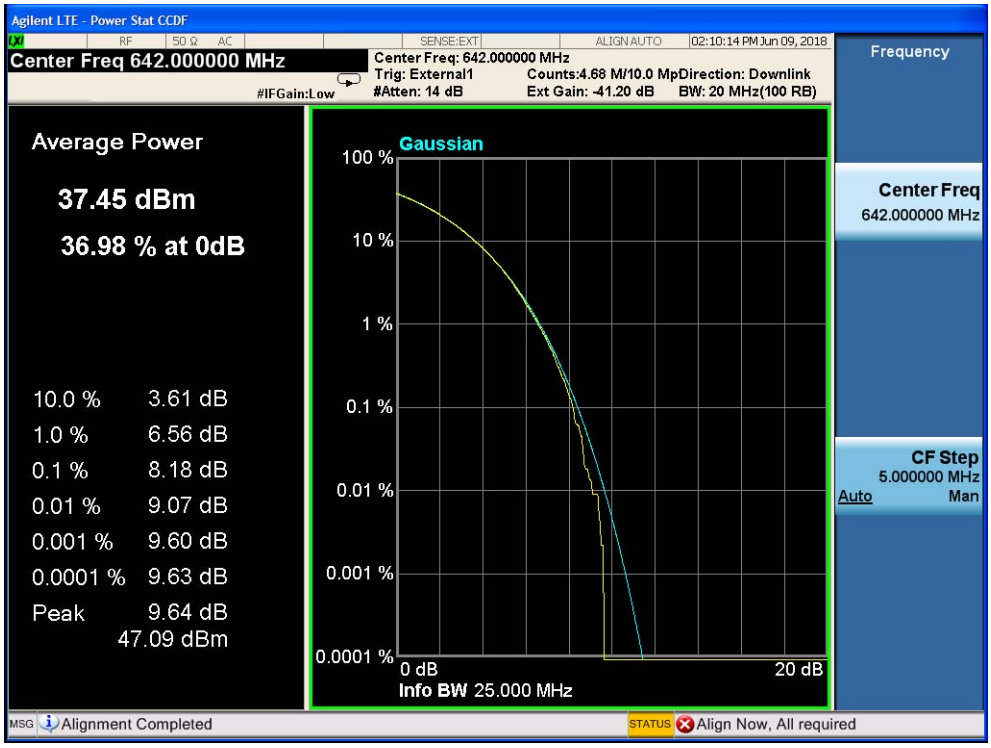
1.4 lowest frequency (20M Modulation)



1.5 middle frequency



1.6 highest frequency



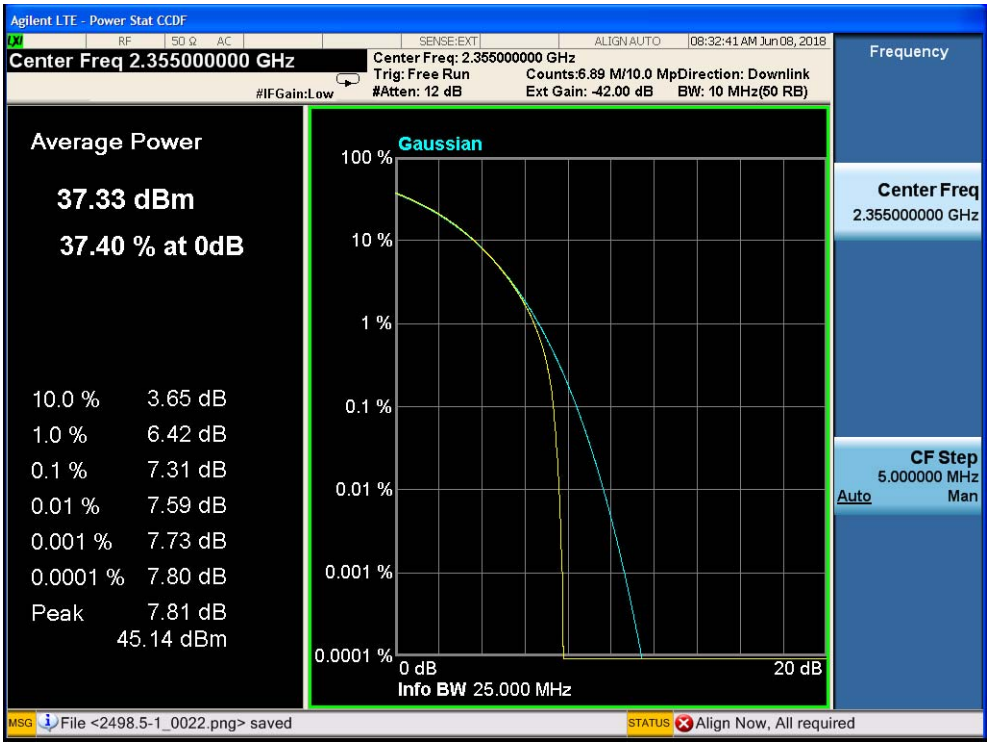
2.Downlink: 2350MHz to 2360MHz

2.1 Lowest frequency (5M Modulation)

2.2 middle frequency

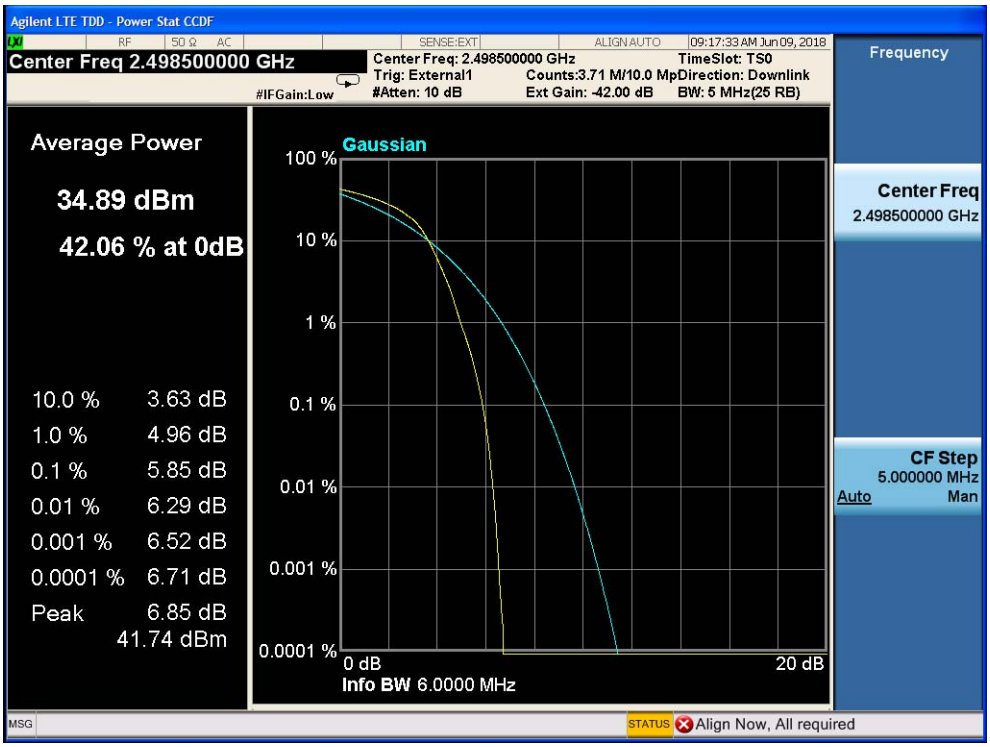
2.3 highest frequency

2.4 middle frequency – Input(10M Modulation)

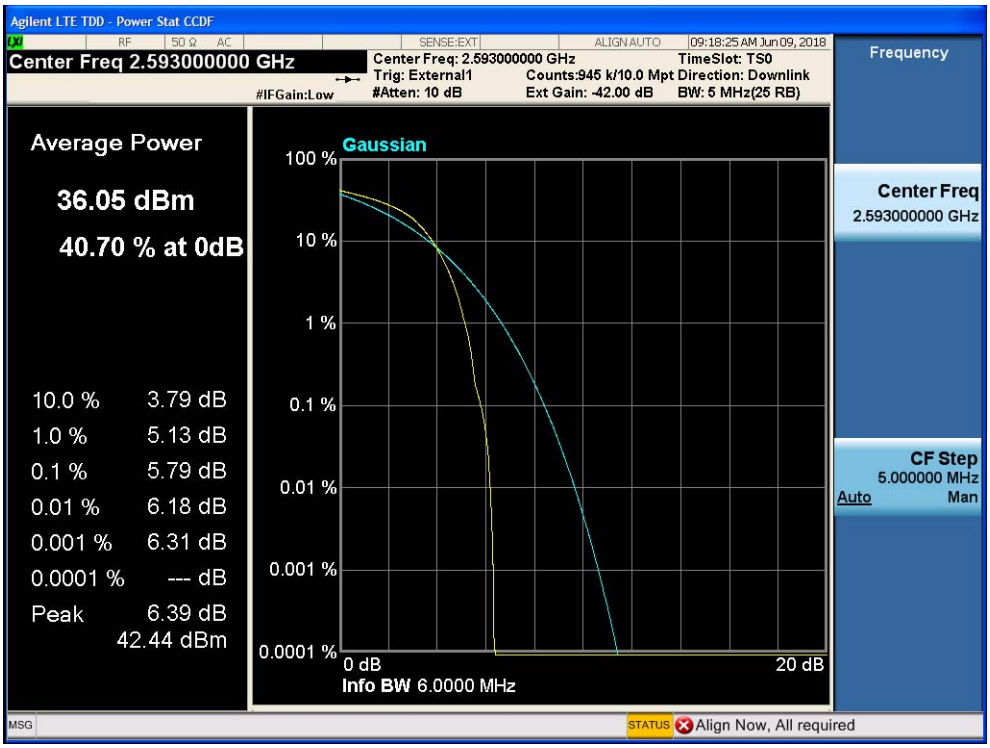


3.Downlink: 2496MHz to 2690MHz

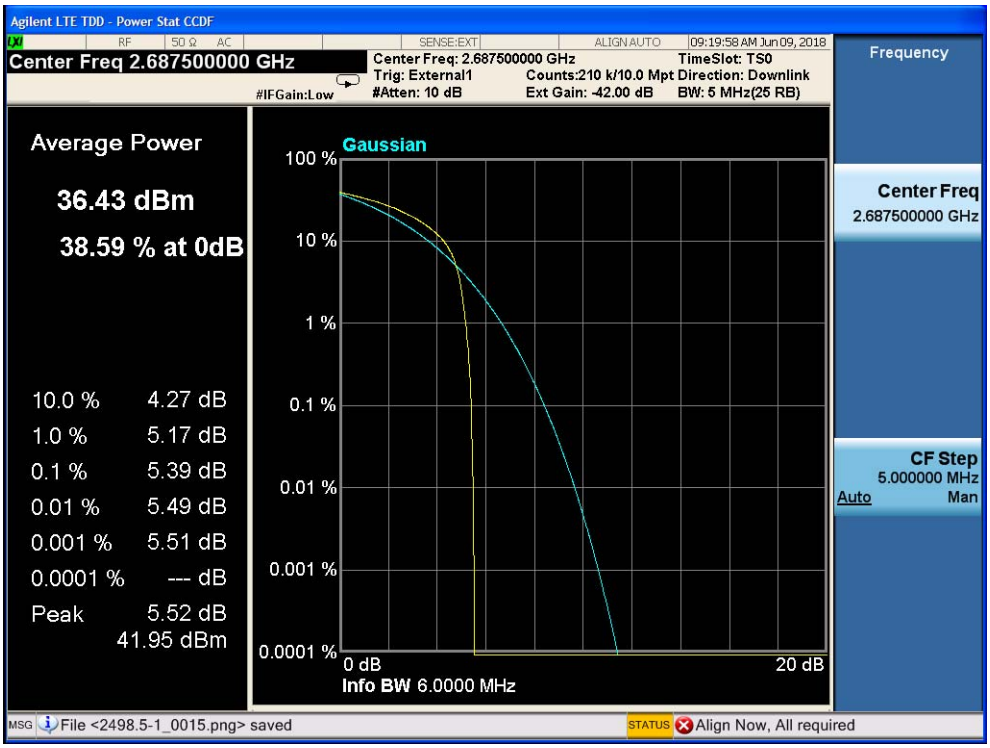
3. 1 lowest frequency (5M Modulation)



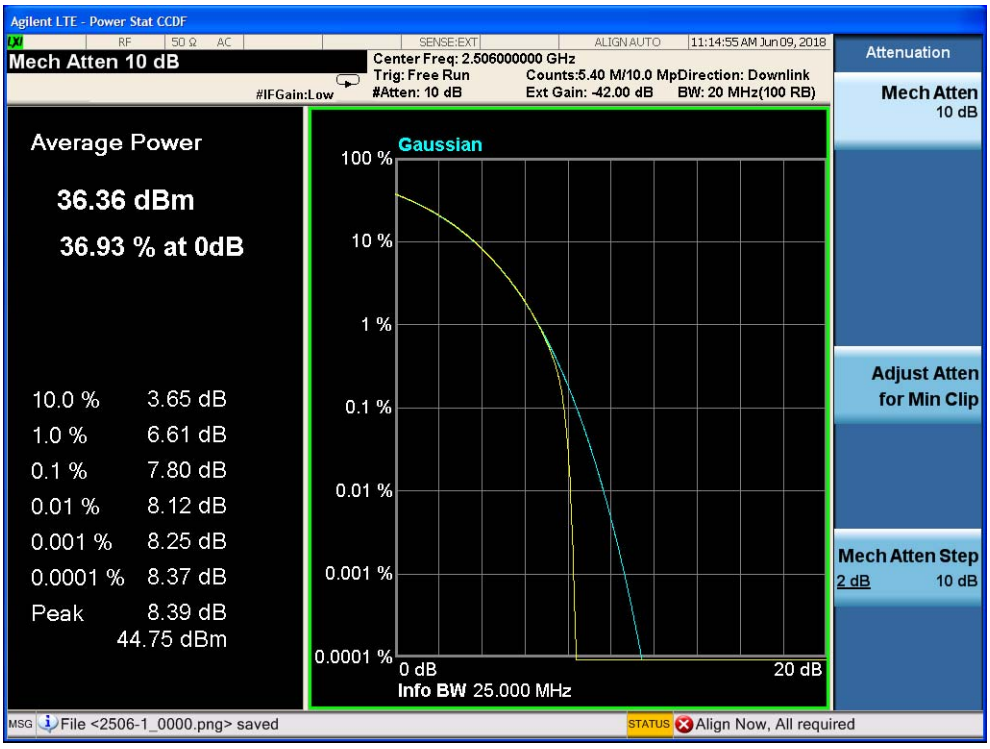
3.2 middle frequency



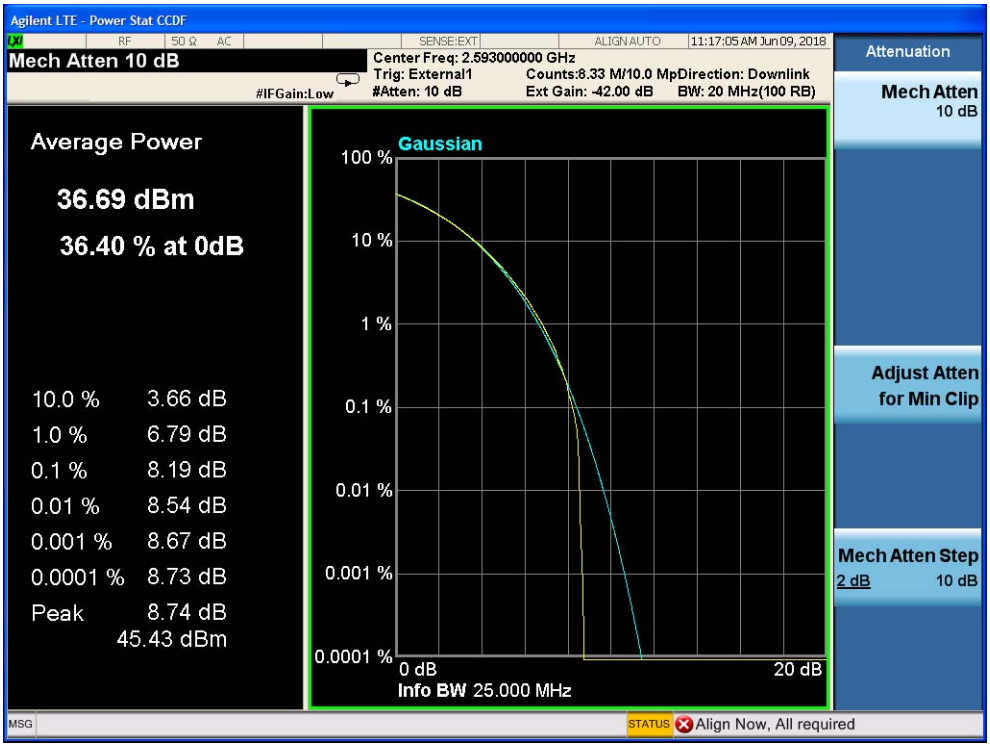
3.3 highest frequency



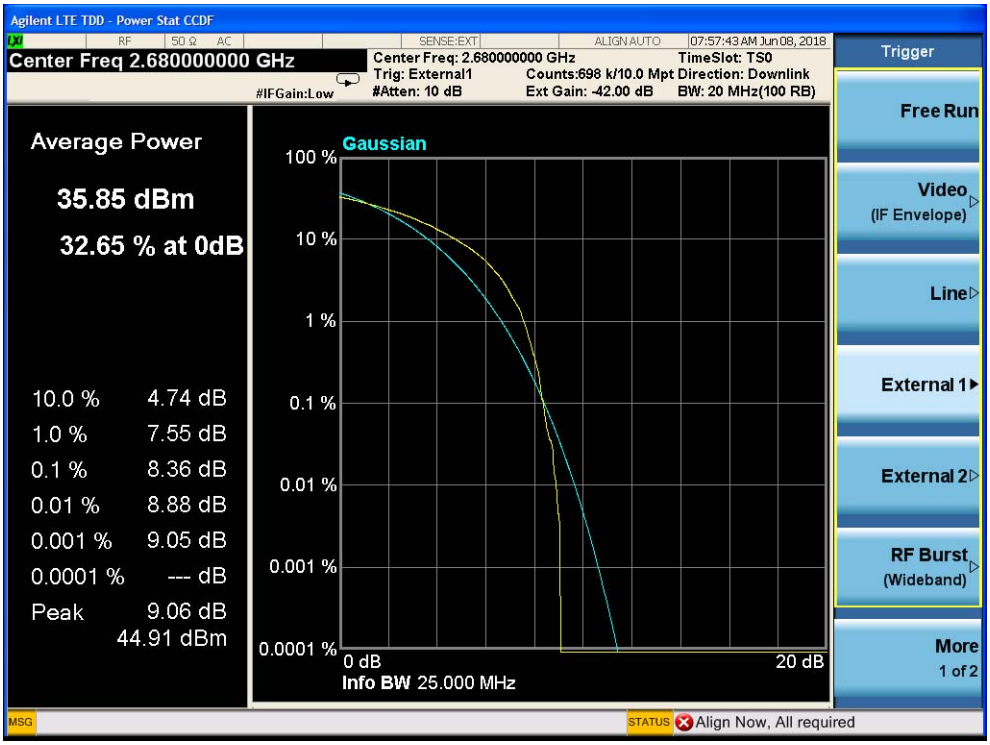
3.4 lowest frequency (20M Modulation)



3.5 middle frequency



3.6 highest frequency



7.2.5 Band Edge & Intermodulation

Test Requirement: FCC part 27.53(a) **&** FCC part 27.53(m) (v) and (g)
WCS:2350-2360MHz: 600MHz: 617-652MHz

§27.53 Emission limits.

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

(a) For operations in the 2305-2320 MHz band and the 2345-2360 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in watts, by the following amounts:
(1) For base and fixed stations' operations in the 2305-2320 MHz band and the 2345-2360 MHz band:
(i) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, and not less than 75 + 10 log (P) dB on all frequencies between 2320 and 2345 MHz;
(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 70 + 10 log (P) dB on all frequencies between 2287.5 and 2300 MHz, 72 + 10 log (P) dB on all frequencies between 2285 and 2287.5 MHz, and 75 + 10 log (P) dB below 2285 MHz; .

(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2362.5 MHz, 55 + 10 log (P) dB on all frequencies between 2362.5 and 2365 MHz, 70 + 10 log (P) dB on all frequencies between 2365 and 2367.5 MHz, 72 + 10 log (P) dB on all frequencies between 2367.5 and 2370 MHz, and 75 + 10 log (P) dB above 2370 MHz.

(2) For fixed customer premises equipment (CPE) stations operating in the 2305-2320 MHz band and the 2345-2360 MHz band transmitting with more than 2 watts per 5 megahertz average EIRP:
(i) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, and not less than 75 + 10 log (P) dB on all frequencies between 2320 and 2345 MHz;

(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 70 + 10 log (P) dB on all frequencies between 2287.5 and 2300 MHz, 72 + 10 log (P) dB on all frequencies between 2285 and 2287.5 MHz, and 75 + 10 log (P) dB below 2285 MHz;
(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2362.5 MHz, 55 + 10 log (P) dB on all frequencies between 2362.5 and 2365 MHz, 70 + 10 log (P) dB on all frequencies between 2365 and 2367.5

MHz, 72 + 10 log (P) dB on all frequencies between 2367.5 and 2370 MHz, and 75 + 10 log (P) dB above 2370 MHz.

BRS and EBS: 2496-2690MHz

(m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.

(v) For all fixed digital user stations, the attenuation factor shall be not less than 43 + 10 log (P) dB at the channel edge.

Test Method: FCC part 2.1051

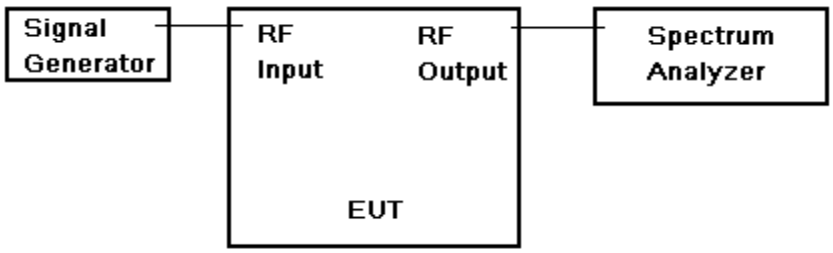
EUT Operation:

Status: Drive the EUT to maximum output power.

Conditions: Normal conditions

Application: Cellular Band RF output ports

Test Configuration:



Band edge and Intermodulation test configuration

Test Procedure: Conducted Emissions test procedure:

a) Connect the equipment as illustrated, with the notch filter by-passed, when the output power is over the max value of the Spectrum Analyzer, add the attenuator to avoid destroying the facility.

b) Set the center frequency of the spectrum analyzer to the assigned transmitter frequency, key the transmitter, and set the level of the carrier to the full scale reference line.

c) do not apply any tone to modulate the EUT.

d) Adjust the spectrum analyzer for the following settings:

1) Resolution Bandwidth,(base the standard, apply the different set),here is 100KHz for frequency band less than 1GHz, 1MHz for frequency over 1GHz;

2) Video Bandwidth refer to standard requirement.

e) Adjust the center frequency of the spectrum analyzer for incremental coverage of the range from:

1) the lowest radio frequency generated in the equipment, it can be 9KHz base the test method, here select 30MHz as lowest frequency start point;

2) the highest radion frequency shall higher than 10 times of carrier frequency;

f) Record the frequencies and levels of spurious emissions from step e)

Remark:

The notch filter is used for avoid the EUT fundamental carrier output power making the spectrum overload and the harmonic spurious brought by it.

When the EUT fundamental carrier is not enough to make the status, the notch filter could be not used.

Intermodulation Test Procedure:

1. Connect the equipment as illustrated;

2. Test the background noise level with all the test facilities;

3. Keep one transmitting path, all other connectors shall be connected by normal power or RF leads;

4. Select the attenuator to avoid the test receiver or spectrum analyzer being destroied;

5. Keep the EUT continuously transmitting in max power;

6. Keep two signals are same in modulation type and level;

7. Measure the 3 order intermodulated product by the EUT(the sum of the two unwanted signal should be rated power);

8. Correct for all losses in the RF path;

9. Read the conducted spurious emissioins of the EUT antenna port.

Remark:

CW signal rather than typical signal is acceptable (for FM).

· At maximum drive level, for each modulation: one test with three tones, or two tests (high-, low-band edge) with two tones

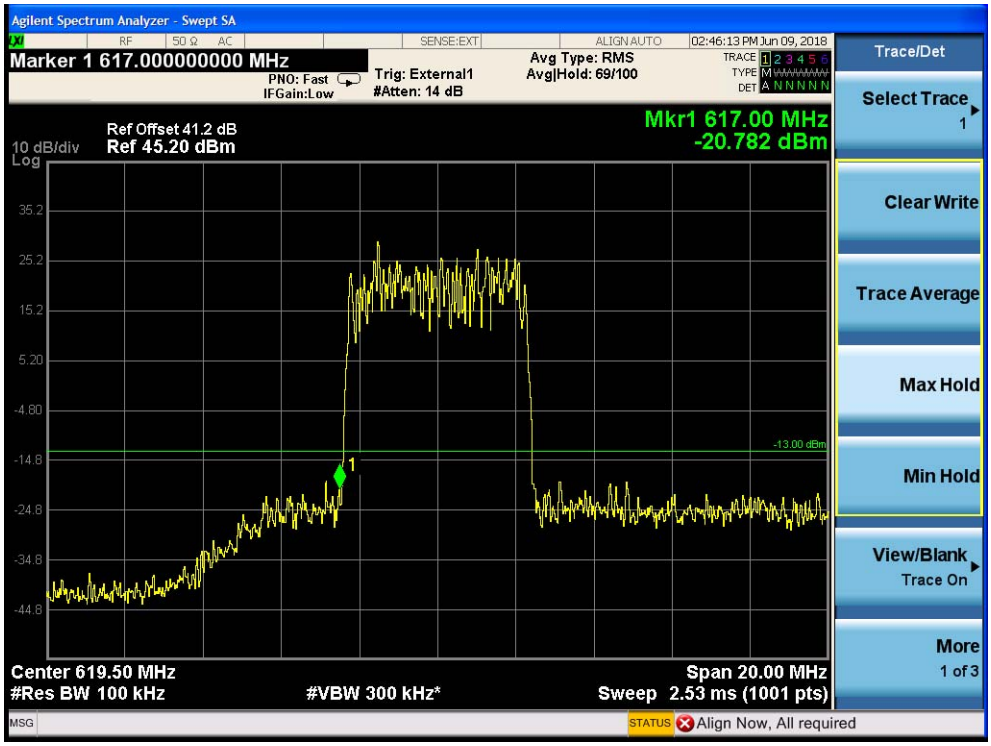
· Limit usually is -13dBm conducted.

· Not needed for Single Channel systems.

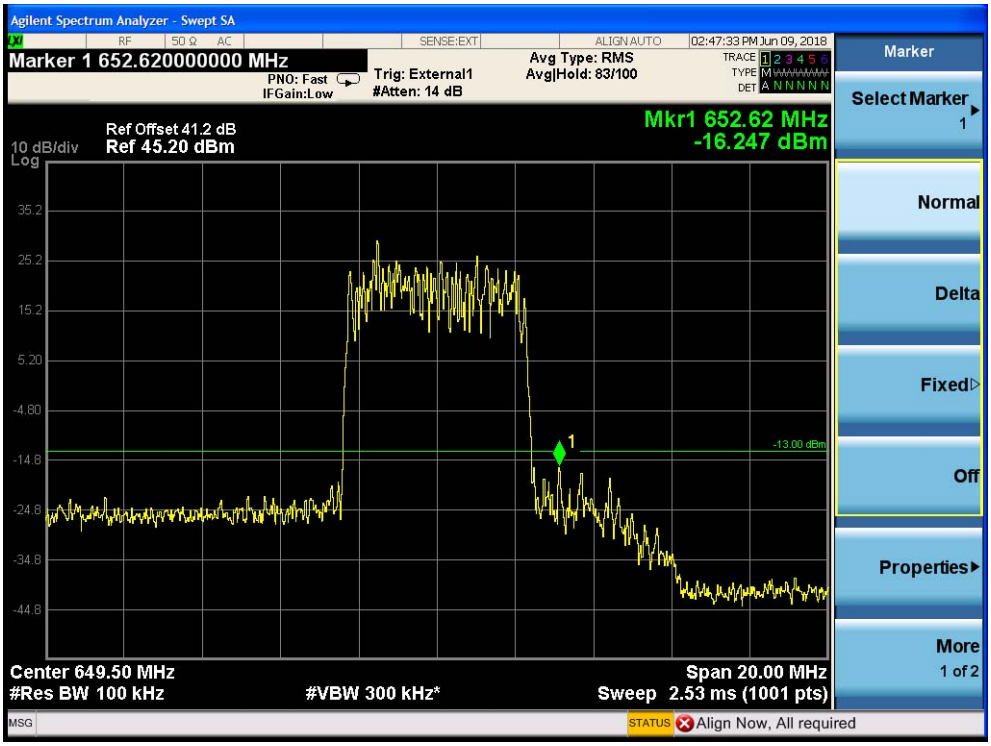
7.2.5.1 Measurement Record:

1)Downlink: 617MHz to 652MHz(5M Modulation)

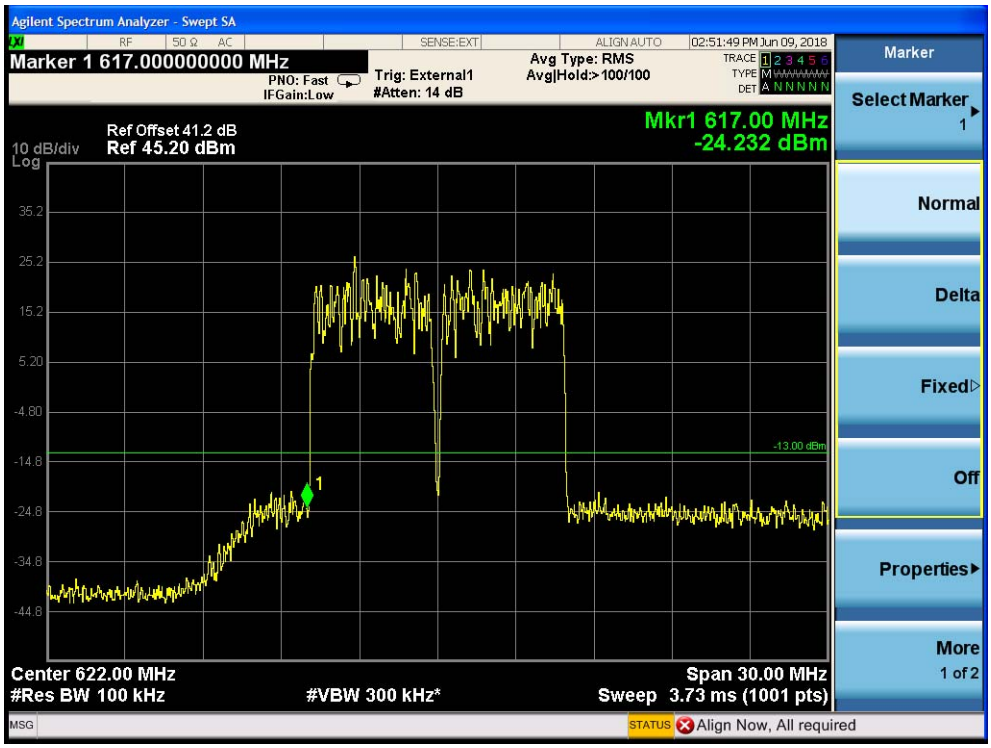
1.1 one signal input —Lower Edge



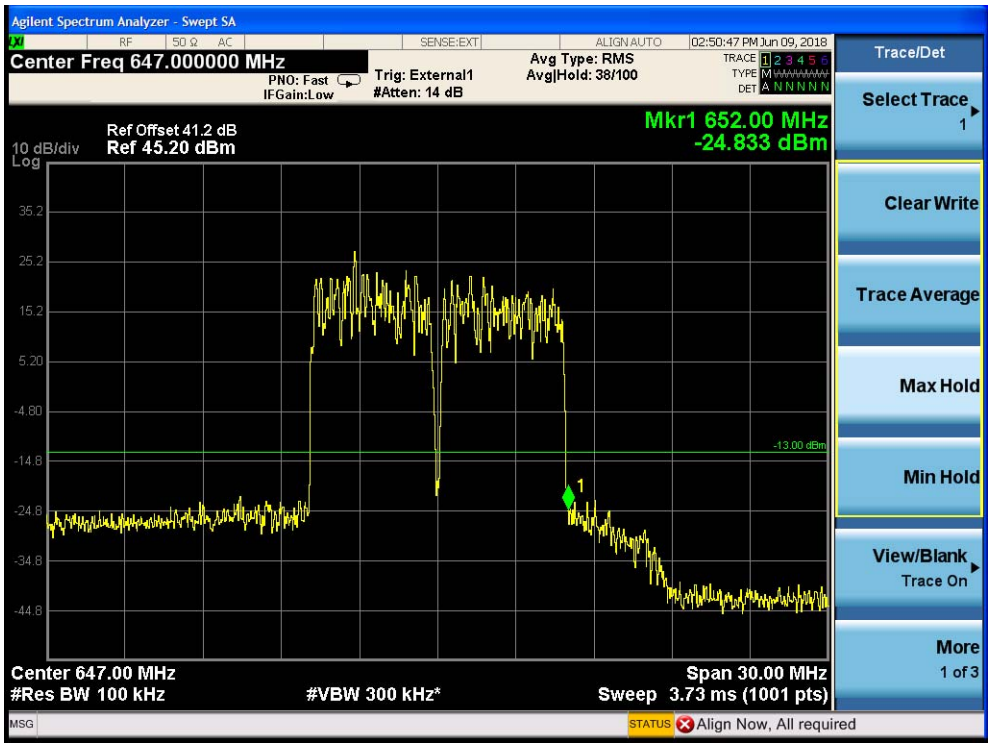
1.2 one signal input —Upper Edge



1.3 two signal input —Lower Edge

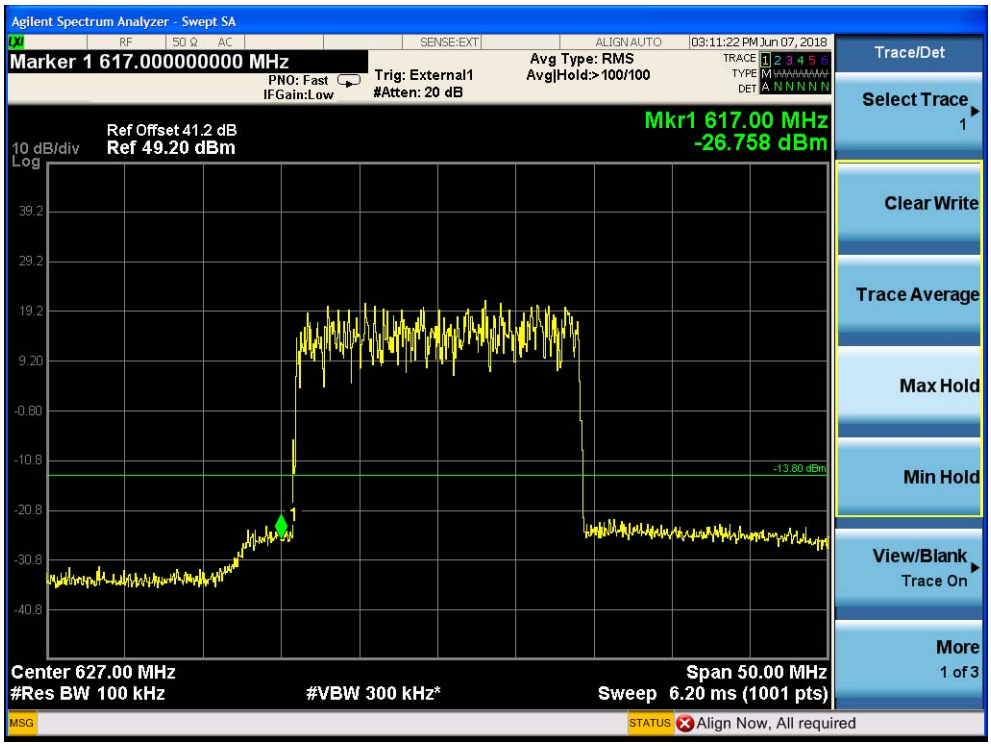


1.4 one signal input —Upper Edge

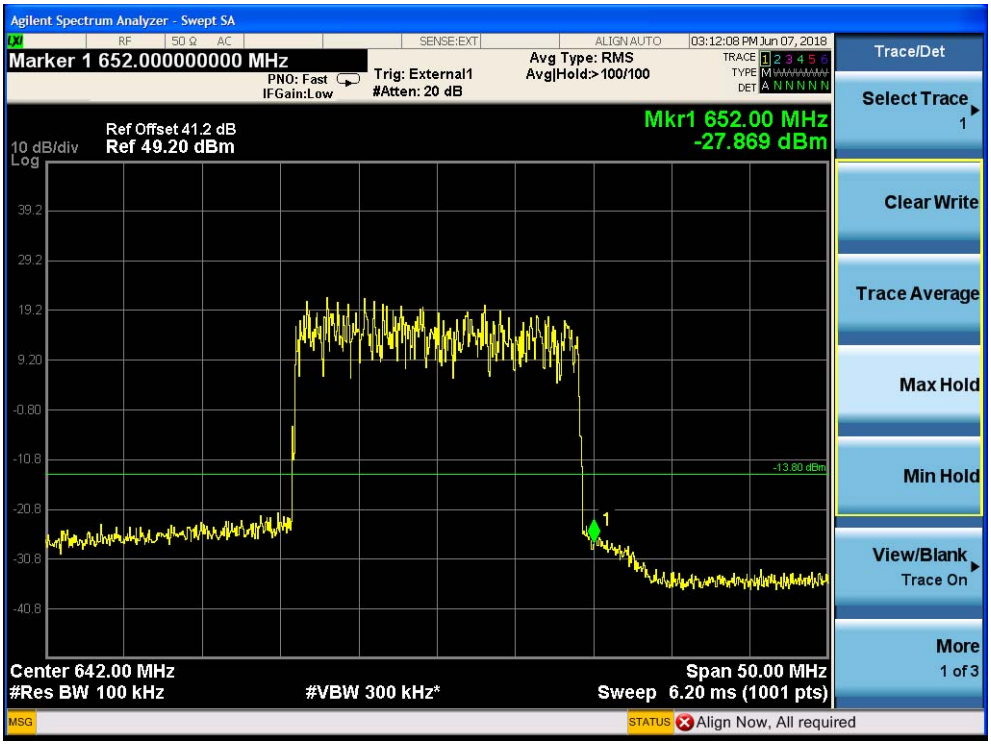


2)617MHz to 652MHz(20M Modulation)

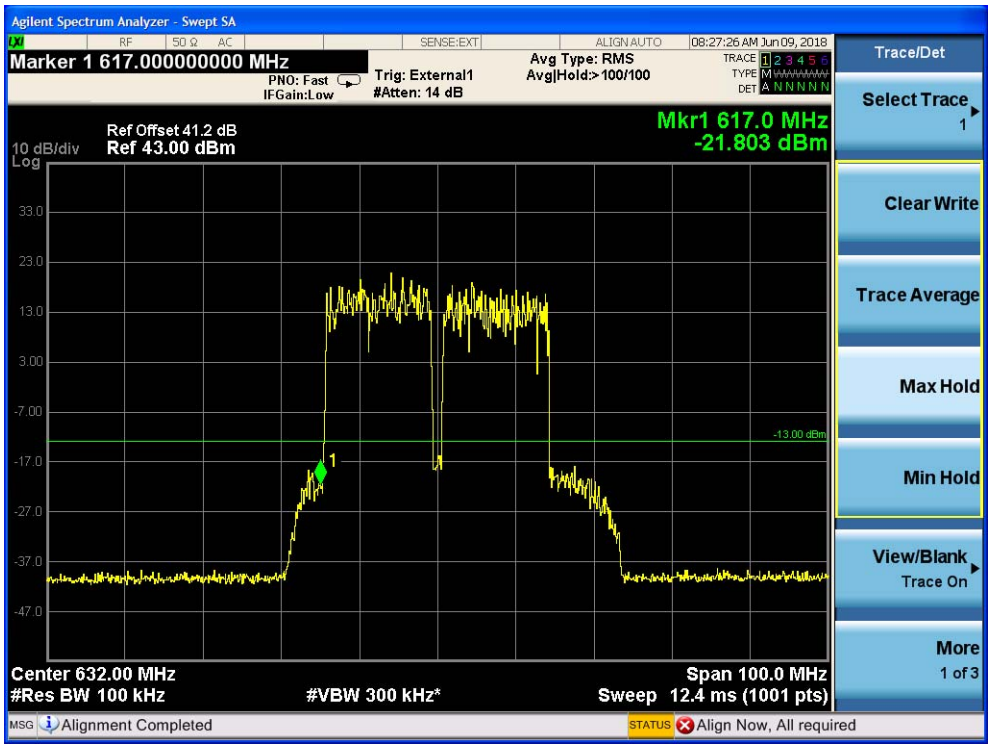
1.1 one signal input —Lower Edge



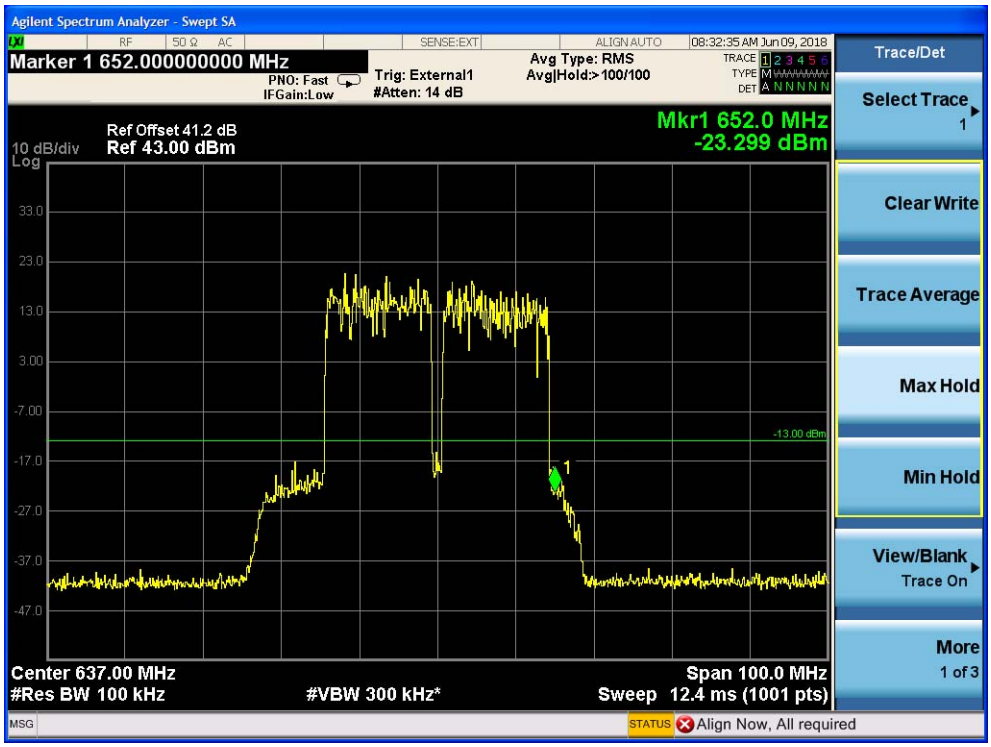
1.2 one signal input —Upper Edge



1.3 two signal input —Lower Edge



1.4 one signal input —Upper Edge



1.5intermodulation spurious emissioins

For LTE mode:

1.5.1 Input frequency:

1)in lower edge test:f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency

f1=619.5MHz,f2=624.5MHz

2)in higher edge test:f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency

f1=644.5MHz,f2=649.5MHz

base the 3rd product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,

a) in lower edge test, F1=2f1-(f1+△f)=f1-△f=lower edge frequency;
b) in higher edge test, F2=2f2-(f2-△f)=f2+△f=higher edge frequency.

F1=614.5MHz,F2=627.5MHz

base the 5rd product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,

a) in lower edge test, F1=3f1-2(f1+△f)=f1-2△f=lower edge frequency;
b) in higher edge test, F2=3f2-2(f2-△f)=f2+2△f=higher edge frequency.

F1=609.5MHz,F2=632.5MHz

base the 7rd product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above,

a) in lower edge test, F1=4f1-3(f1+△f)=f1-3△f=lower edge frequency;
b) in higher edge test, F2=4f2-3(f2-△f)=f2+3△f=higher edge frequency.

F1=2342.5MHz,F2=2367.5MHz

1.5.2 Input power:+10dBm

measure frequency		product Value (dBm)	Limit (dBm)	Magin (dB)
3rd	Lower:617MHz	-17.33	-13dBm	-4.33
	Higher:652MHz	-18.53		-5.53
5rd	Lower:612MHz	-21.37	-13dBm	-8.37
	Higher:657MHz	-22.72		-9.72
7rd	Lower:607MHz	-23.57	-13dBm	-10.57
	Higher:617MHz	-24.29		-11.29

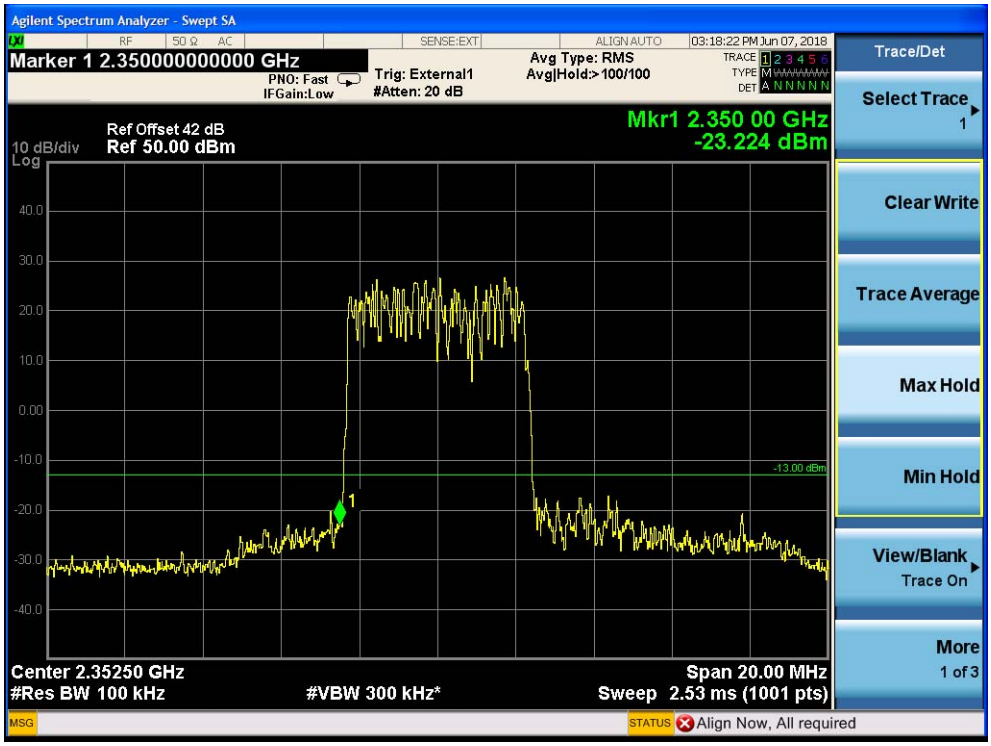
Remark:

No other intermodulation spurious emissioins of above 7rd have been found,so only record the test data about the 3rd, 5rdand 7rd

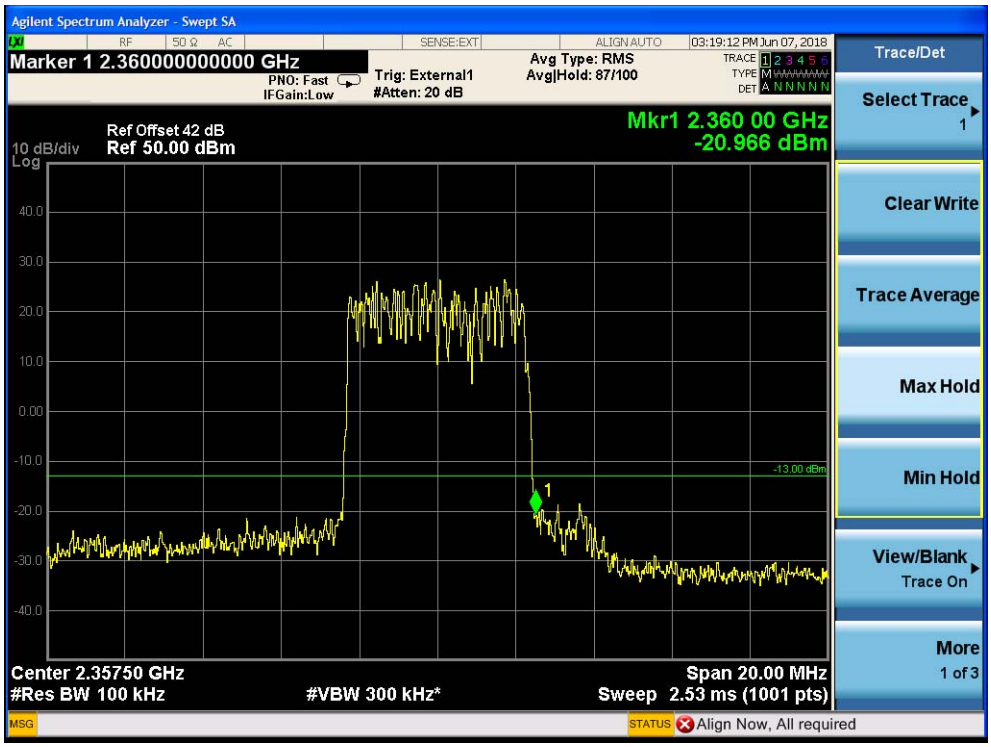
7.2.5.2 Measurement Record:

2) Downlink: 2350MHz to 2360MHz(LTE)

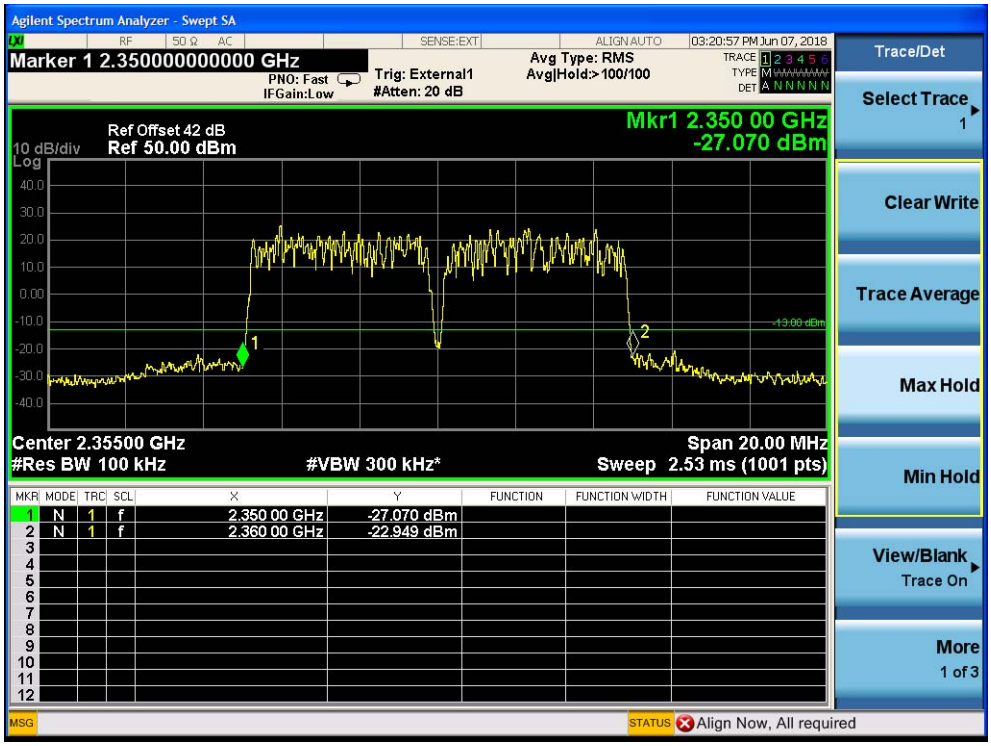
1.1 one signal input —Lower Edge



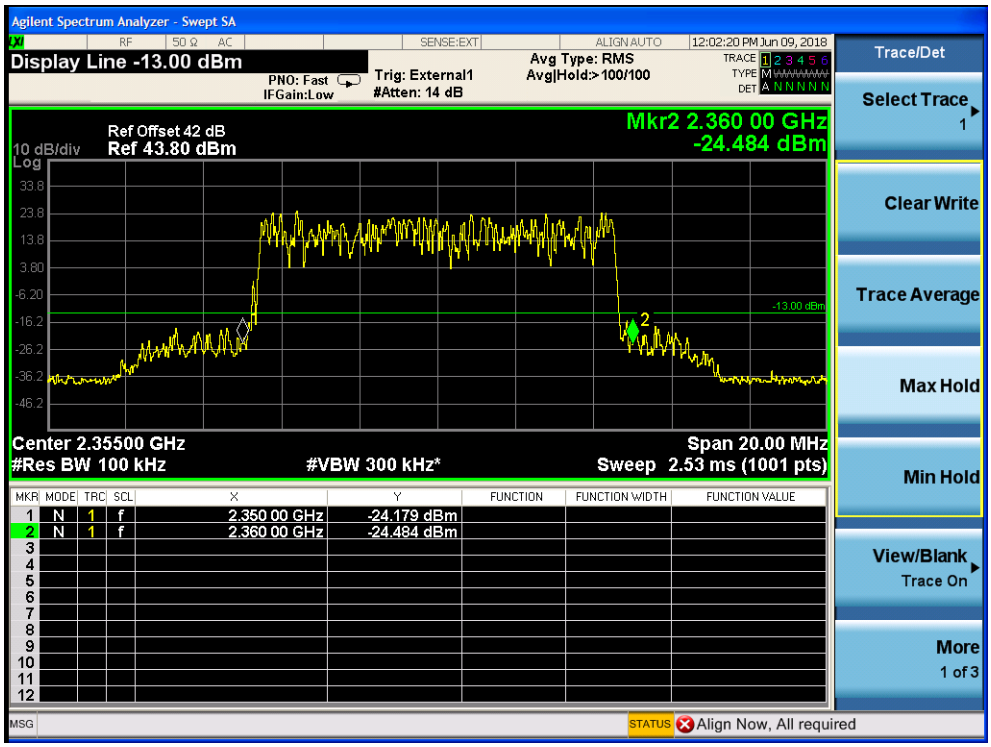
1.2 one signal input — Upper Edge



1.3 two signal input —Lower and Upper Edge



1.4 one signal input —Lower and Upper Edge(10M Modulation)



1.5intermodulation spurious emissioins

For LTE mode:

1.5.1 Input frequency:

1)in lower edge test:f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency

f1=2352.5MHz,f2=2357.5MHz

2)in higher edge test:f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency

f1=2352.5MHz,f2=2357.5MHz

base the 3rd product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,

c) in lower edge test, F1=2f1-(f1+△f)=f1-△f=lower edge frequency;

d) in higher edge test, F2=2f2-(f2-△f)=f2+△f=higher edge frequency.

F1=2350MHz,F2=2360MHz

base the 5rd product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,

c) in lower edge test, F1=3f1-2(f1+△f)=f1-2△f=lower edge frequency;

d) in higher edge test, F2=3f2-2(f2-△f)=f2+2△f=higher edge frequency.

F1=2347.5MHz,F2=2362.5MHz

base the 7rd product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above,

c) in lower edge test, F1=4f1-3(f1+△f)=f1-3△f=lower edge frequency;

d) in higher edge test, F2=4f2-3(f2-△f)=f2+3△f=higher edge frequency.

F1=2342.5MHz,F2=2367.5MHz

1.5.2 Input power:+10dBm

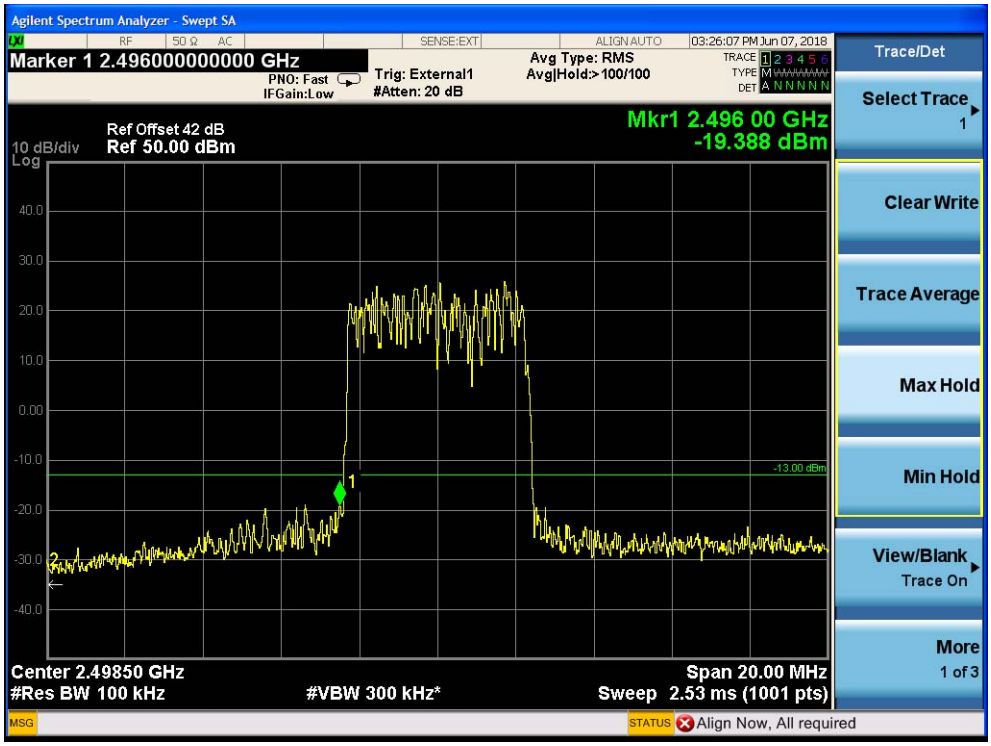
measure frequency		product Value (dBm)	Limit (dBm)	Magin (dB)
3rd	Lower:2350MHz	-20.64	-13dBm	-7.64
	Higher:2360MHz	-20.20		-7.20
5rd	Lower:2345MHz	-21.83	-13dBm	-8.83
	Higher:2365MHz	-22.07		-9.07
7rd	Lower:2340MHz	-23.76	-13dBm	-10.76
	Higher:2370MHz	-24.73		-11.73

Remark:

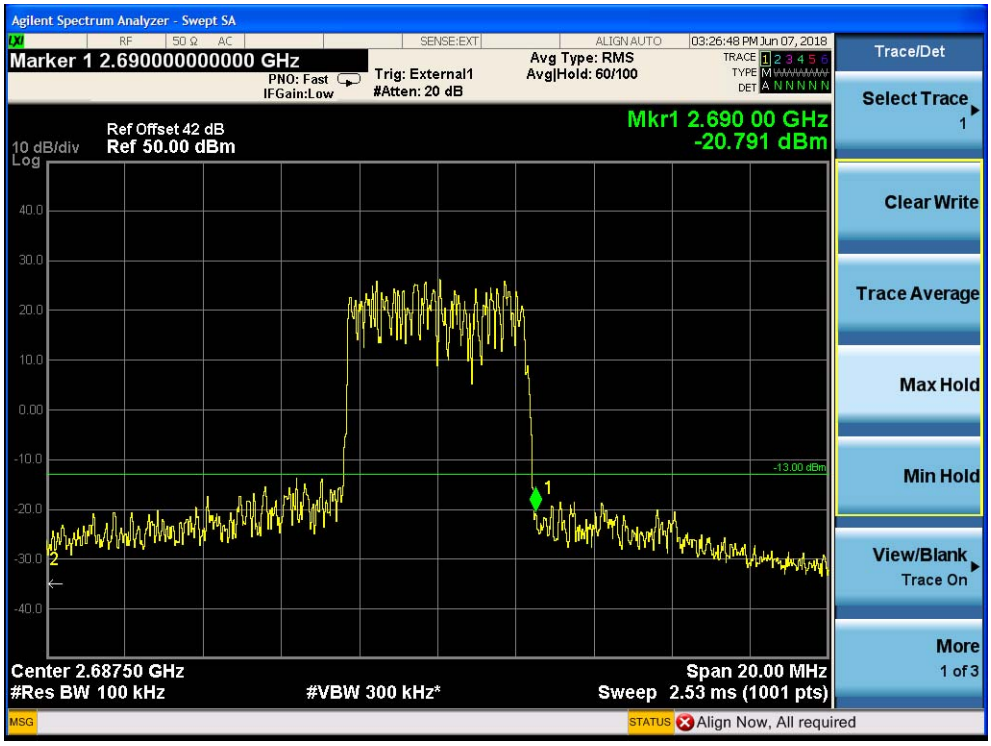
No other intermodulation spurious emissioins of above 7rd have been found,so only record the test data about the 3rd, 5rdand 7rd

3) Downlink: 2496MHz to 2690MHz(5M Modulation)

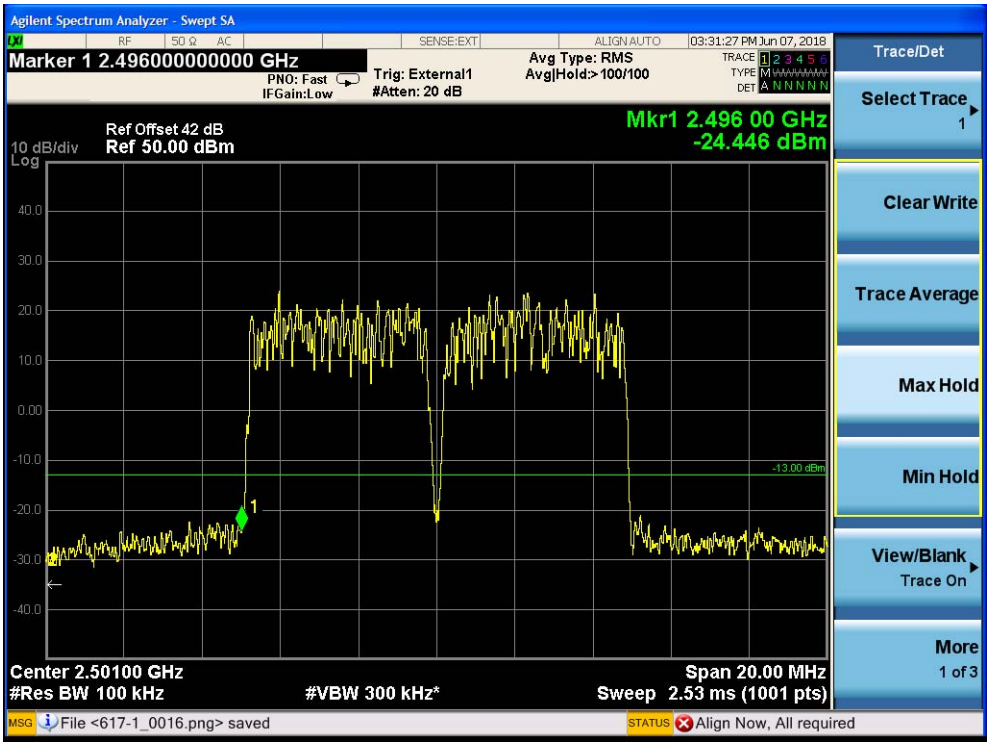
1.1 one signal input —Lower Edge



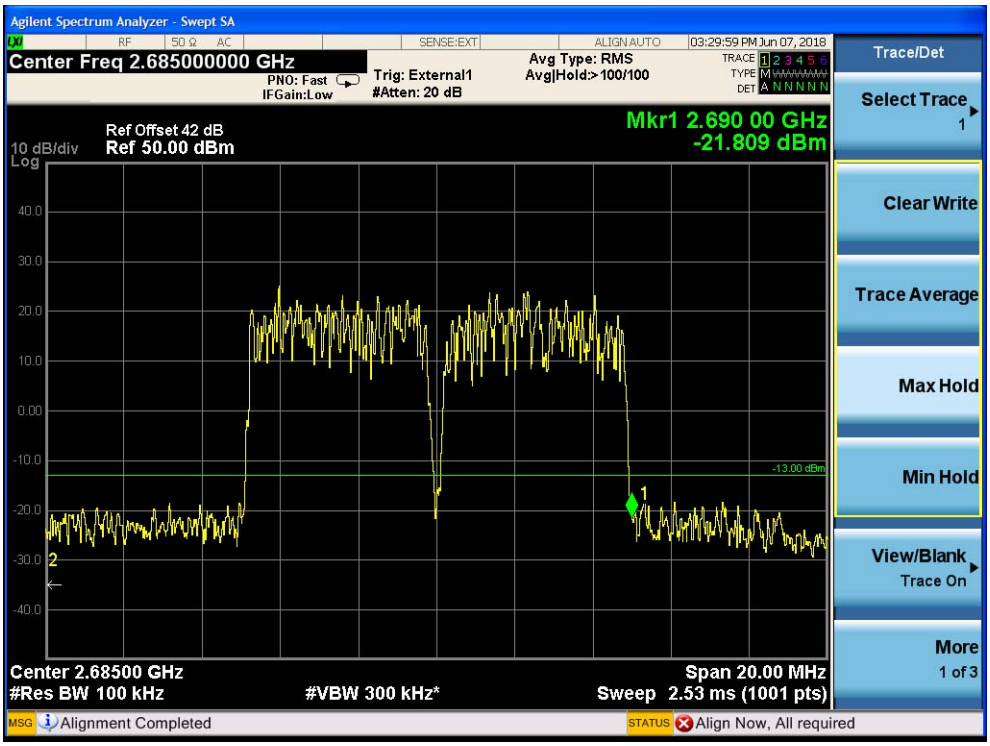
1.2 one signal input — Upper Edge



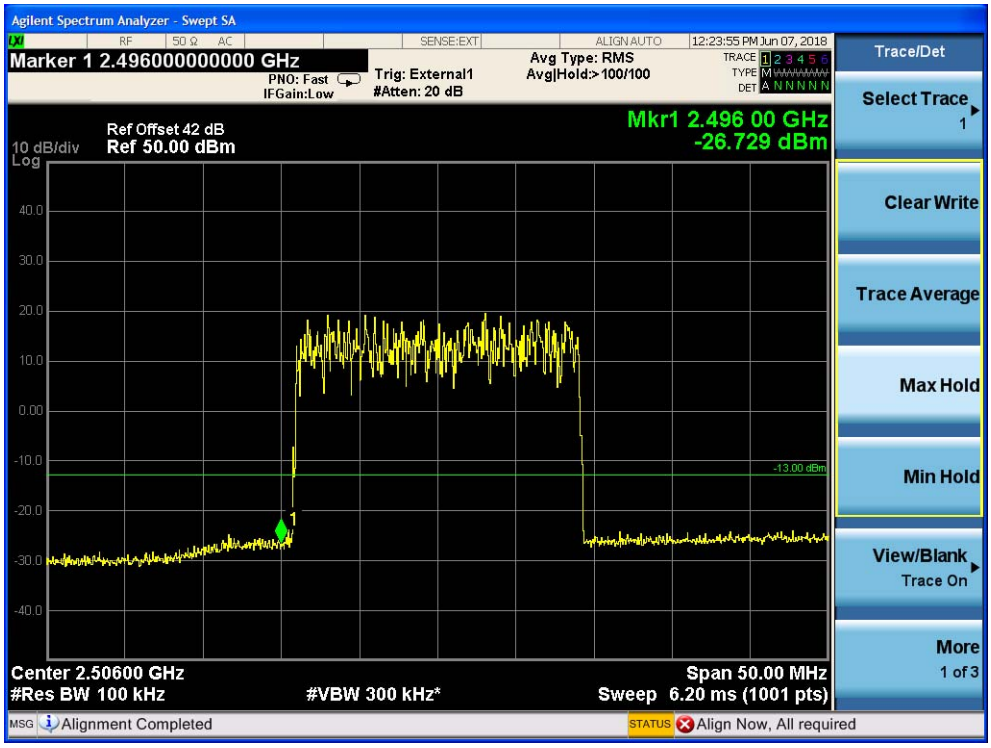
1.3 two signal input —Lower Edge



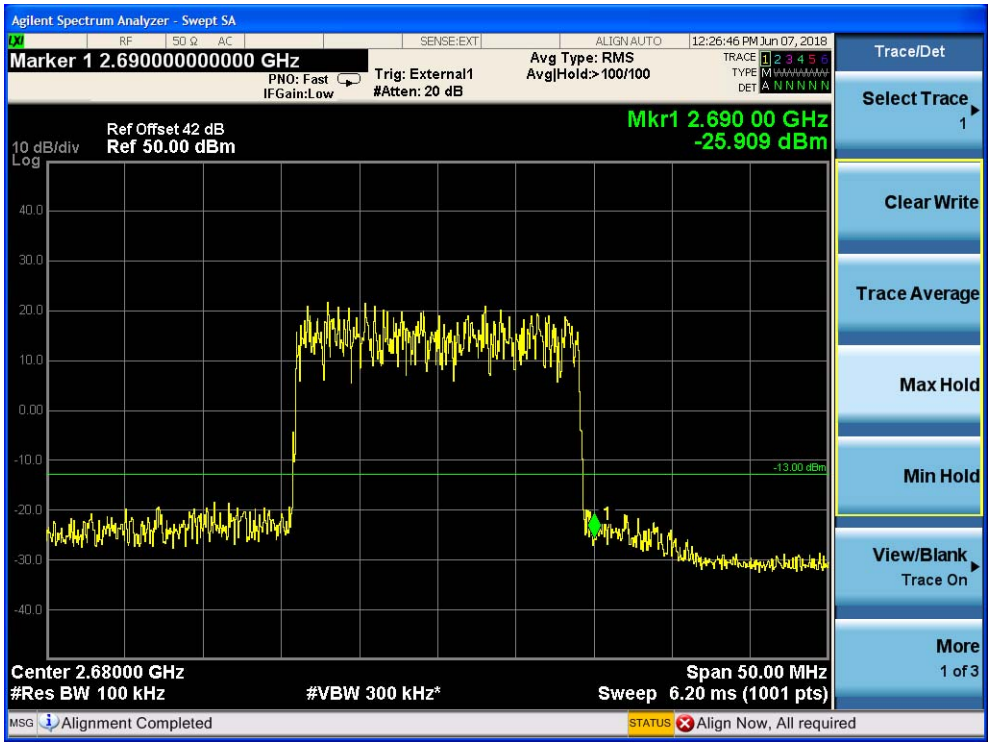
1.4 two signal input —Upper Edge



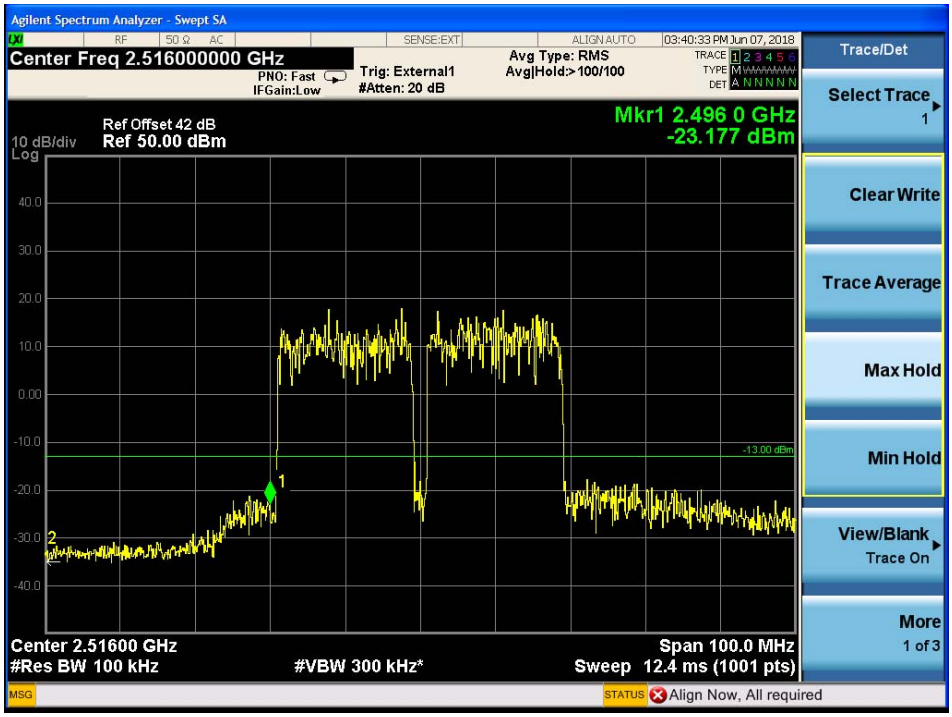
1.5 one signal input —Lower Edge(20M Modulation)



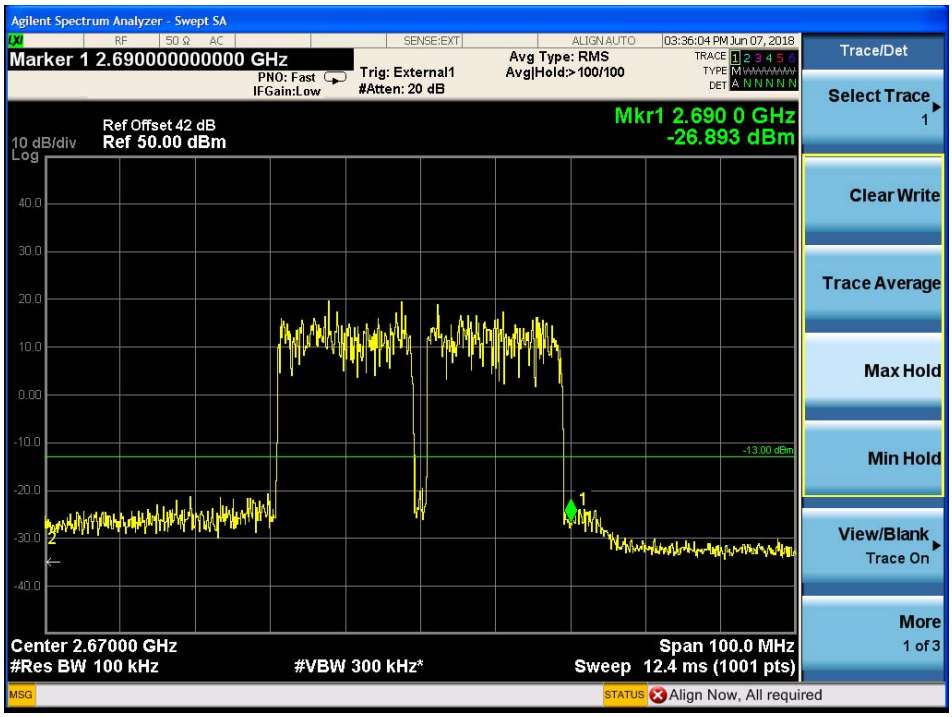
1.6 one signal input — Upper Edge



1.7 two signal input —Lower Edge



1.8 two signal input —Upper Edge



1.9 intermodulation spurious emissioins

For LTE mode:

1.9.1 Input frequency:

1)in lower edge test:f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency

f1=2498.5MHz,f2=2503.5MHz

2)in higher edge test:f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency

f1=2682.5MHz,f2=2687.5MHz

base the 3rd product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,

e) in lower edge test, F1=2f1-(f1+△f)=f1-△f=lower edge frequency;

f) in higher edge test, F2=2f2-(f2-△f)=f2+△f=higher edge frequency.

F1=2496MHz,F2=2690MHz

base the 5rd product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,

e) in lower edge test, F1=3f1-2(f1+△f)=f1-2△f=lower edge frequency;

f) in higher edge test, F2=3f2-2(f2-△f)=f2+2△f=higher edge frequency.

F1=2491MHz,F2=2695MHz

base the 7rd product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above,

e) in lower edge test, F1=4f1-3(f1+△f)=f1-3△f=lower edge frequency;

f) in higher edge test, F2=4f2-3(f2-△f)=f2+3△f=higher edge frequency.

F1=2486MHz,F2=2700MHz

1.9.2 Input power:+10dBm

measure frequency		product Value (dBm)	Limit (dBm)	Magin (dB)
3rd	Lower:2496MHz	-17.26	-13dBm	-4.26
	Higher:2690MHz	-15.56		-5.56
5rd	Lower:2491MHz	-23.21	-13dBm	-10.21
	Higher: 2695MHz	-22.75		-9.75
7rd	Lower: 2486MHz	-25.21	-13dBm	-12.21
	Higher: 2700MHz	-24.39		-11.39

Remark:

No other intermodulation spurious emissioins of above 7rd have been found,so only record the test data about the 3rd, 5rdand 7rd

7.2.6 Conducted Spurious Emissions

Test Requirement: FCC part 27.53(a) and 27.53(m) **&** FCC part 27.53(g)
600MHz: 617-652MHz
WCS:2350-2360MHz

§27.53 Emission limits.

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

(a) For operations in the 2305-2320 MHz band and the 2345-2360 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in watts, by the following amounts:
(1) For base and fixed stations' operations in the 2305-2320 MHz band and the 2345-2360 MHz band:
(i) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, and not less than 75 + 10 log (P) dB on all frequencies between 2320 and 2345 MHz;
(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 70 + 10 log (P) dB on all frequencies between 2287.5 and 2300 MHz, 72 + 10 log (P) dB on all frequencies between 2285 and 2287.5 MHz, and 75 + 10 log (P) dB below 2285 MHz; .

(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2362.5 MHz, 55 + 10 log (P) dB on all frequencies between 2362.5 and 2365 MHz, 70 + 10 log (P) dB on all frequencies between 2365 and 2367.5 MHz, 72 + 10 log (P) dB on all frequencies between 2367.5 and 2370 MHz, and 75 + 10 log (P) dB above 2370 MHz.

(2) For fixed customer premises equipment (CPE) stations operating in the 2305-2320 MHz band and the 2345-2360 MHz band transmitting with more than 2 watts per 5 megahertz average EIRP:
(i) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, and not less than 75 + 10 log (P) dB on all frequencies between 2320 and 2345 MHz;

(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 70 + 10 log (P) dB on all frequencies between 2287.5 and 2300 MHz, 72 + 10 log (P) dB on all frequencies between 2285 and 2287.5 MHz, and 75 + 10 log (P) dB below 2285 MHz;
(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between