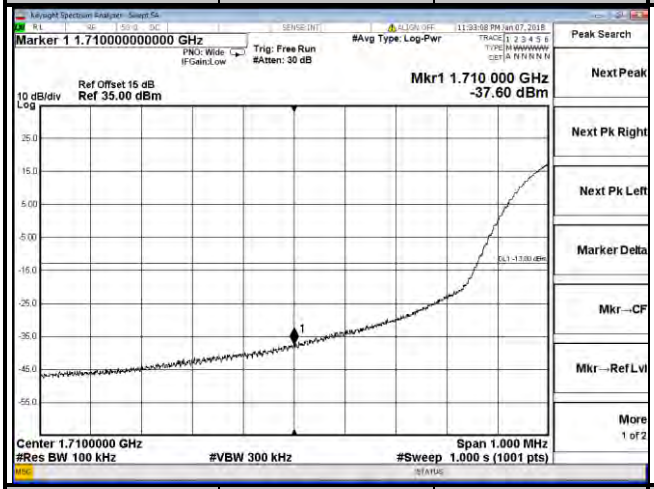
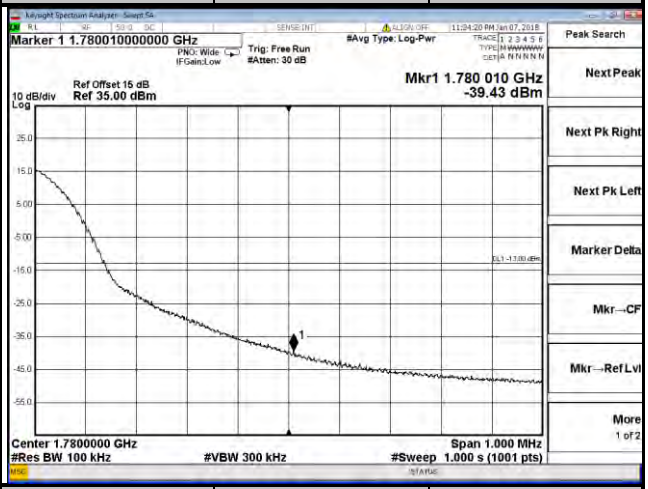
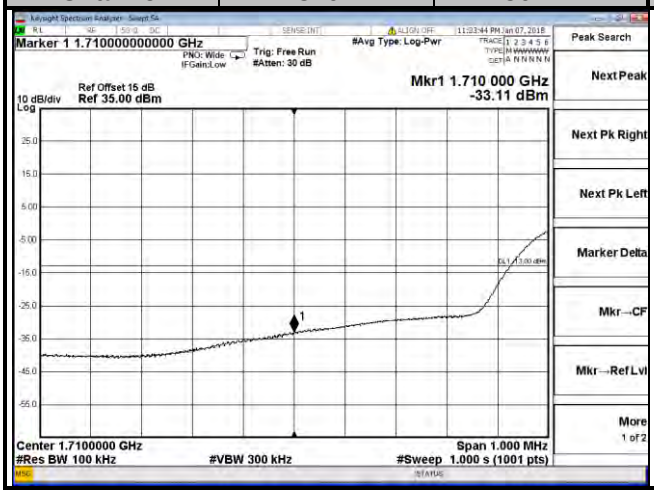
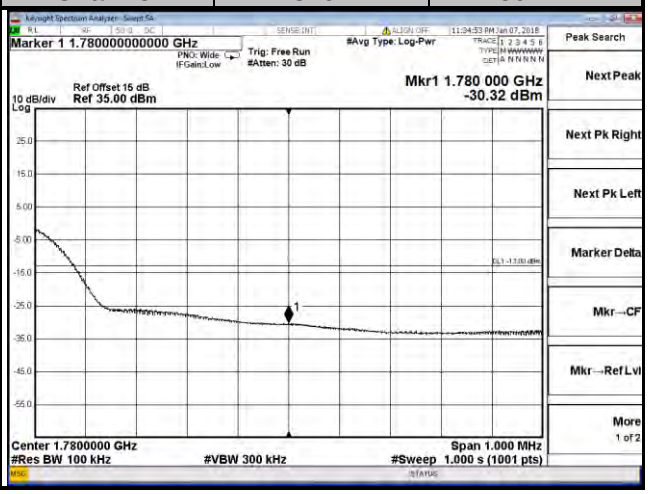
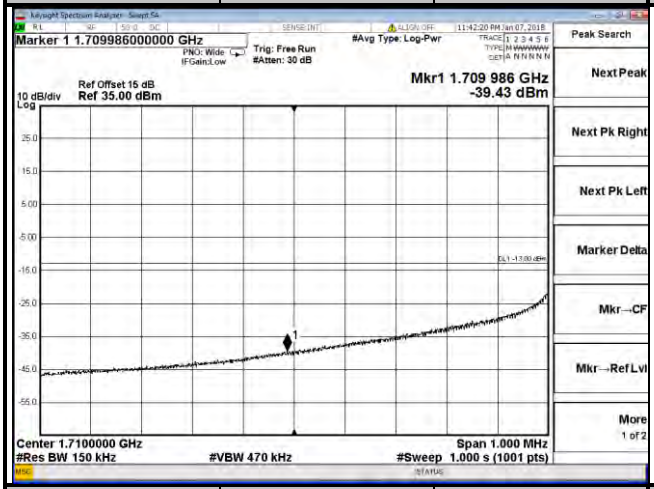
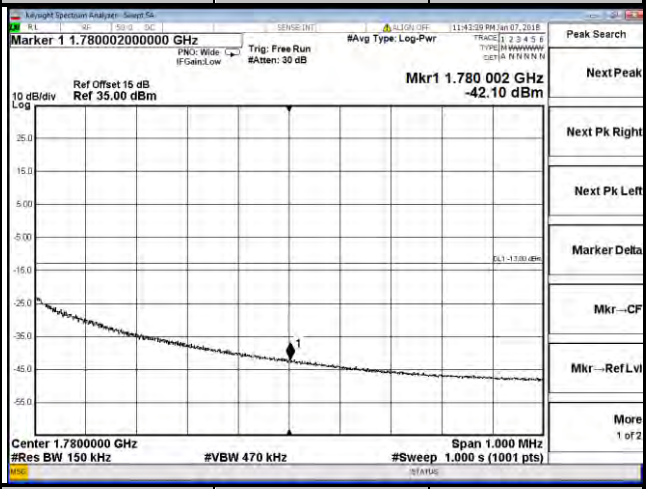
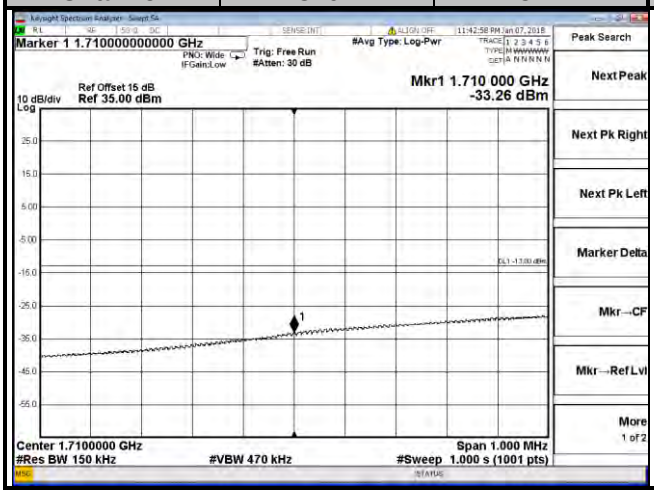
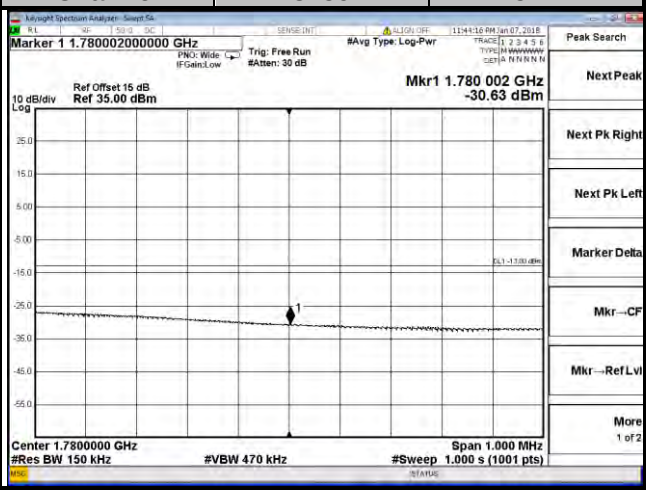
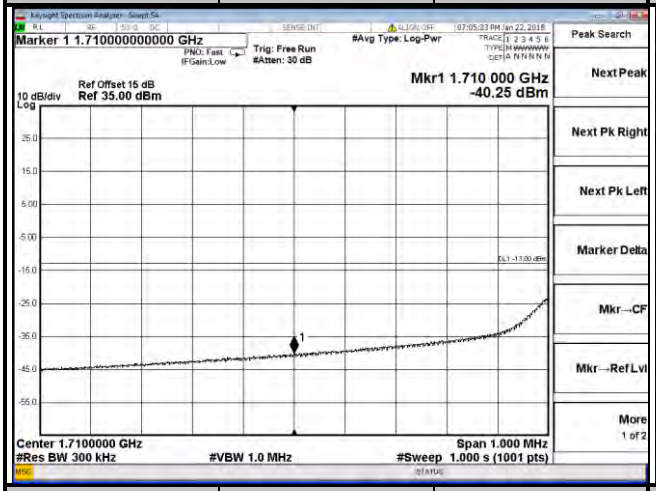
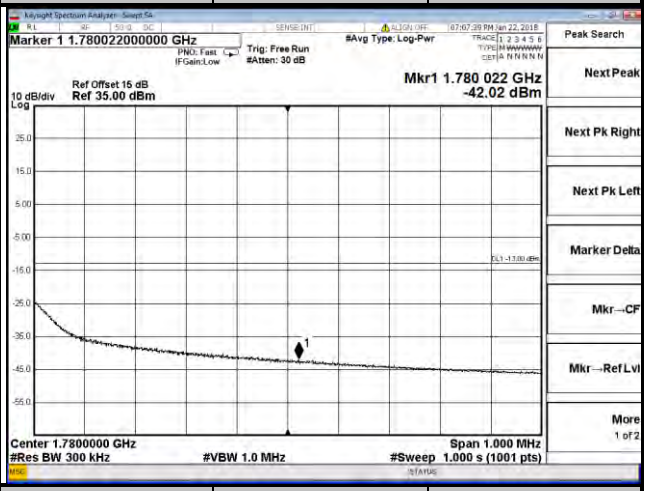
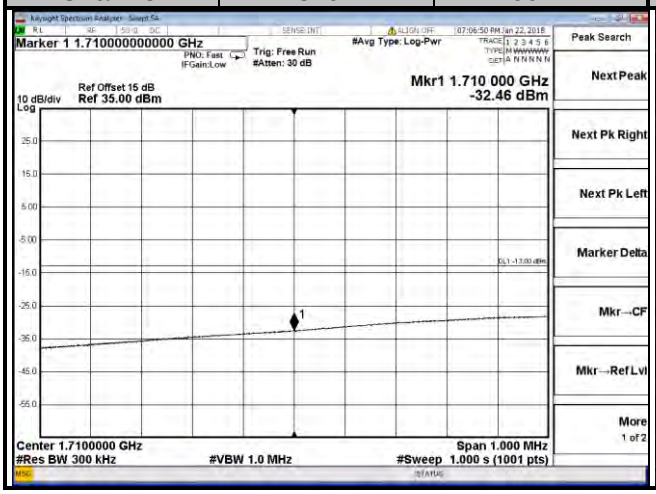
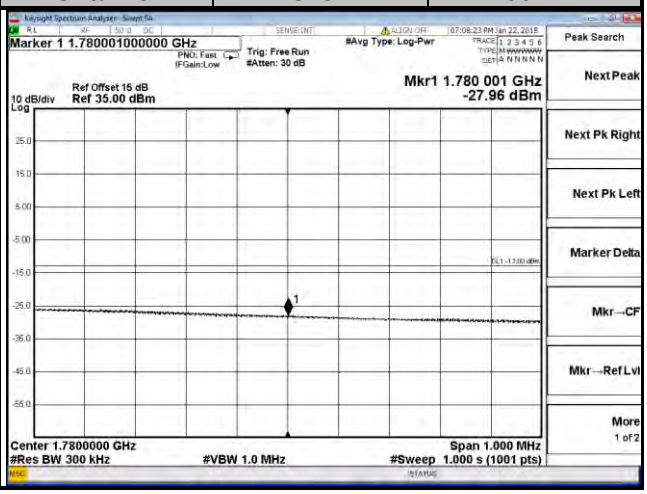
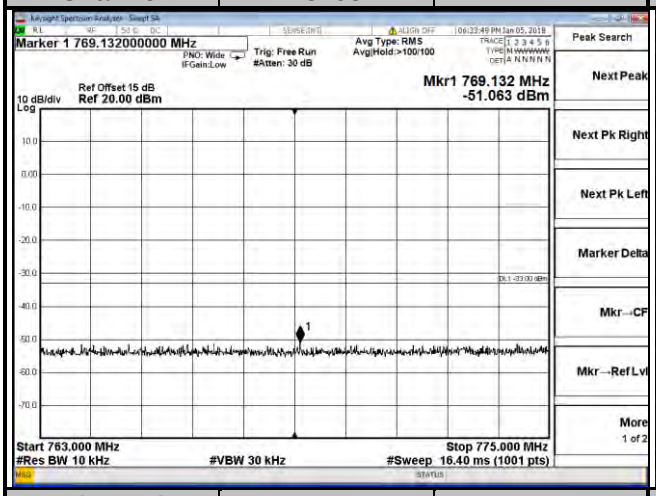
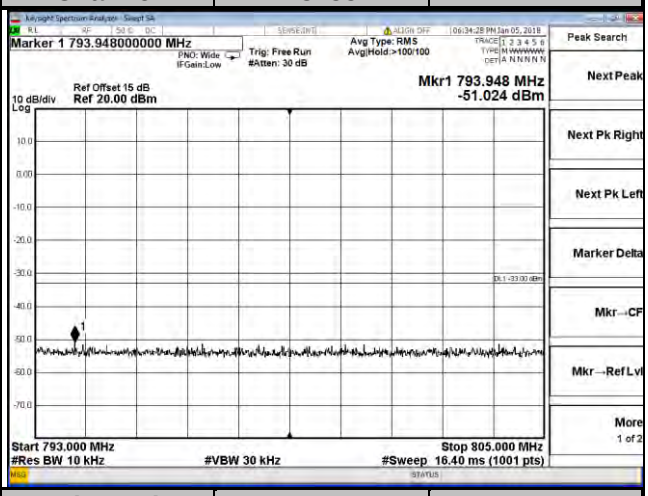
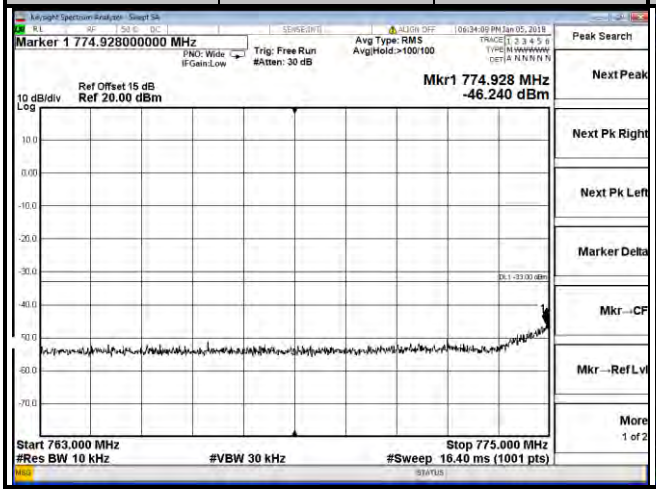
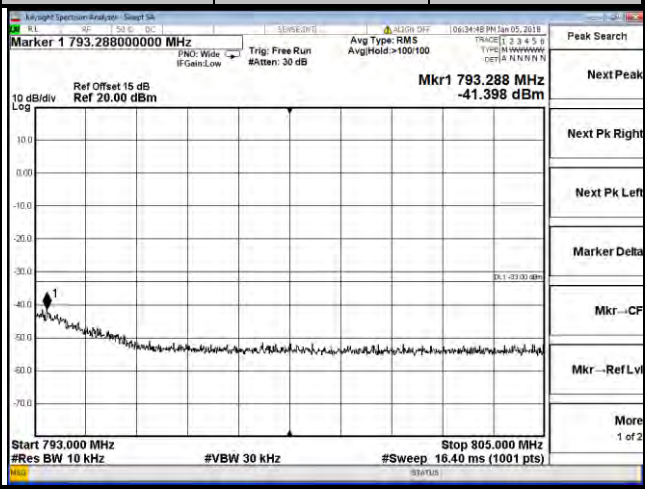
LTE Band 66					
Channel Bandwidth: 10 MHz					
Channel	132022	1 RB	Channel	132622	1 RB
					
Channel	132022	50 RB	Channel	132622	50 RB
					

LTE Band 66					
Channel Bandwidth: 15 MHz					
Channel	132047	1 RB	Channel	132597	1 RB
					
Channel	132047	75 RB	Channel	132597	75 RB
					

LTE Band 66					
Channel Bandwidth: 20 MHz					
Channel	132072	1 RB	Channel	132572	1 RB
					
Channel	132072	100 RB	Channel	132572	100 RB
					

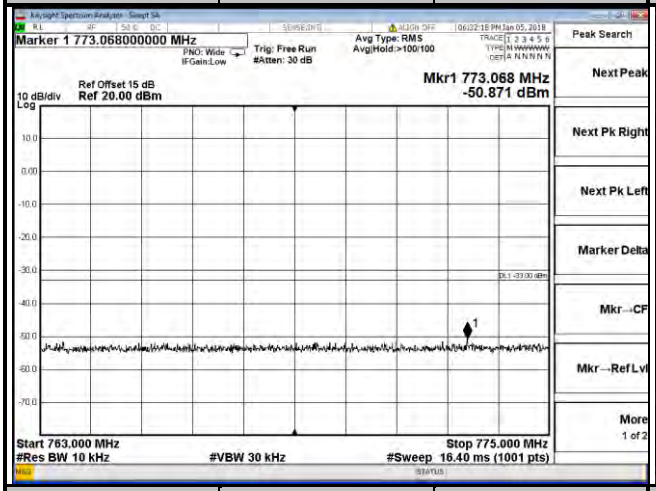
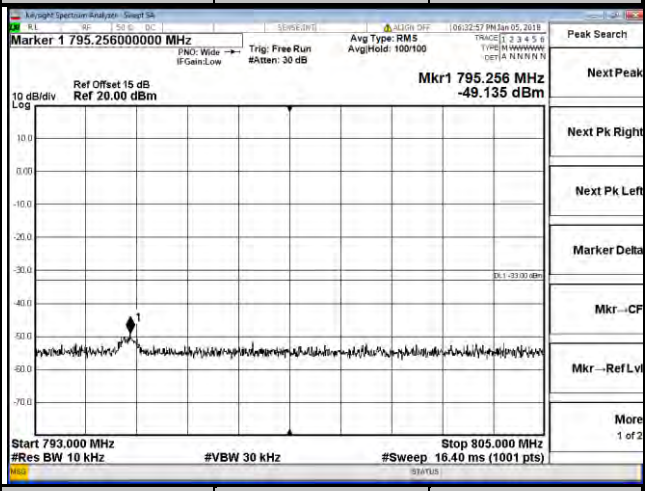
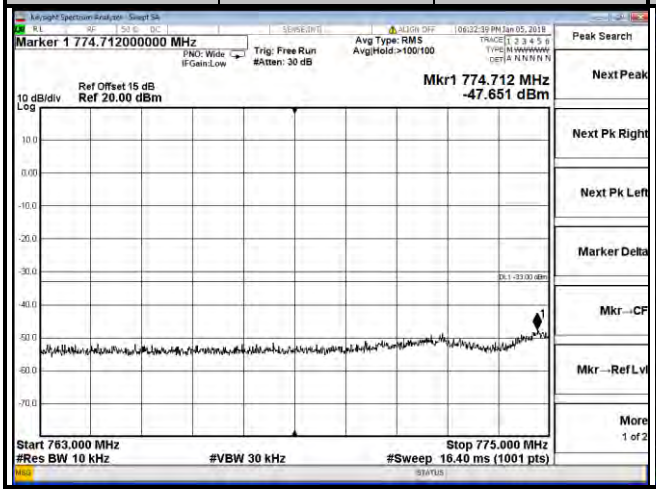
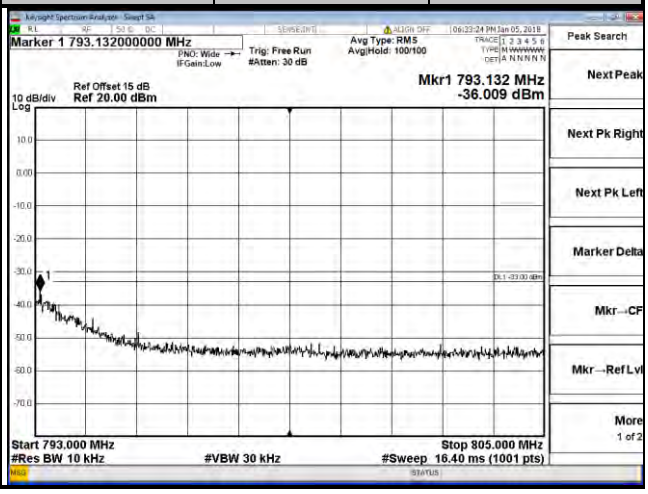
Emission Mask

LTE Band 13					
Channel Bandwidth: 5 MHz					
Channel	23205	1 RB	Channel	23255	1 RB
					
Channel	23205	25 RB	Channel	23255	25 RB
					

For the 763 - 775 MHz and 793 - 805 MHz band, the FCC limit is 65+10log(P[watt]) in a 6.25 kHz bandwidth. Since it was not possible to set the resolution bandwidth to 6.25 kHz with the available equipment, a bandwidth of 10 kHz was used instead to show compliance. By using a 10 kHz bandwidth on the spectrum analyzer.

10log(10kHz/6.25kHz) = 2.04 dB

Limit line = -35 dBm + 2.04 dB = -32.96 dBm

LTE Band 13					
Channel Bandwidth: 10 MHz					
Channel	23230	1 RB	Channel	23230	1 RB
					
Channel	23230	50 RB	Channel	23230	50 RB
					

For the 763 - 775 MHz and 793 - 805 MHz band, the FCC limit is 65+10log(P[watt]) in a 6.25 kHz bandwidth. Since it was not possible to set the resolution bandwidth to 6.25 kHz with the available equipment, a bandwidth of 10 kHz was used instead to show compliance. By using a 10 kHz bandwidth on the spectrum analyzer.

10log(10kHz/6.25kHz) = 2.04 dB

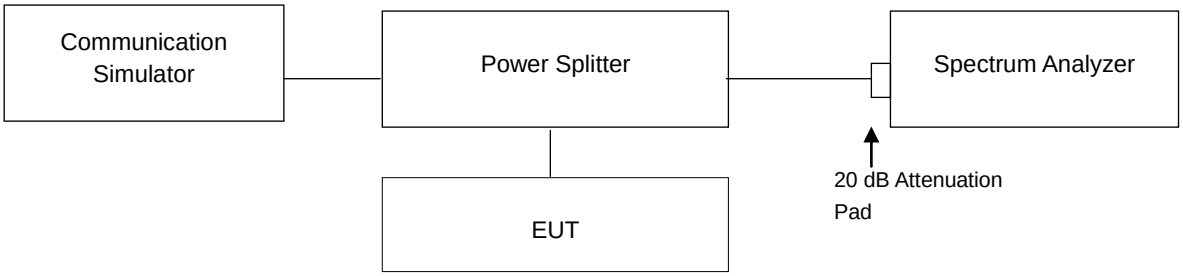
Limit line = -35 dBm + 2.04 dB =-32.96 dBm

4.5 Peak to Average Ratio

4.5.1 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.

4.5.2 Test Setup



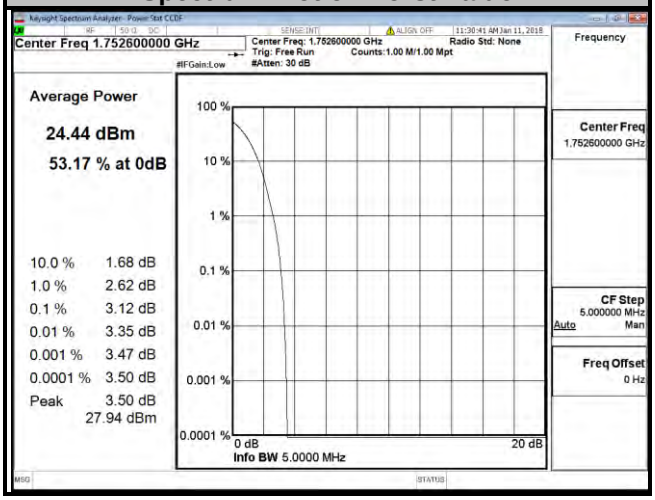
4.5.3 Test Procedures

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

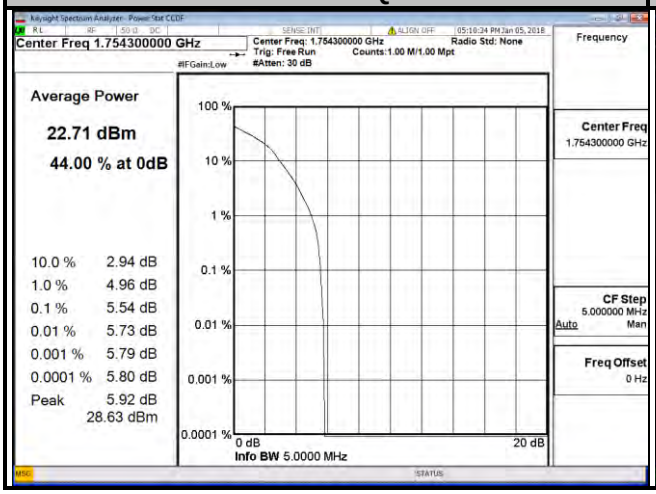
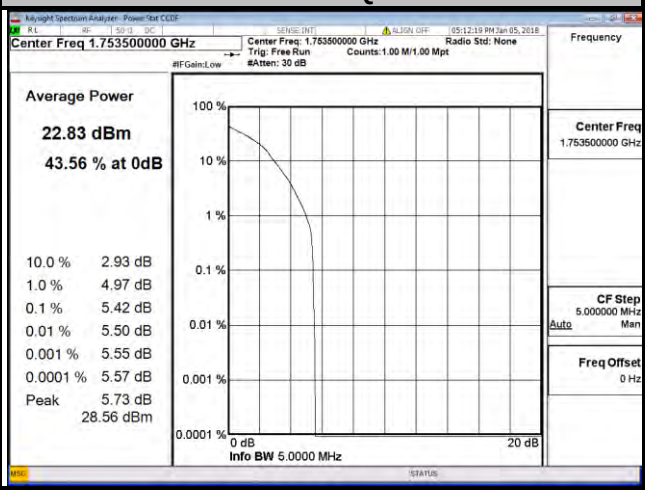
4.5.4 Test Results

WCDMA		
Channel	**Frequency (MHz)**	**Peak to Average Ratio (dB)**
1312	1712.4	3.07
1413	1732.6	3.10
1513	1752.6	3.12

Spectrum Plot of Worst Value

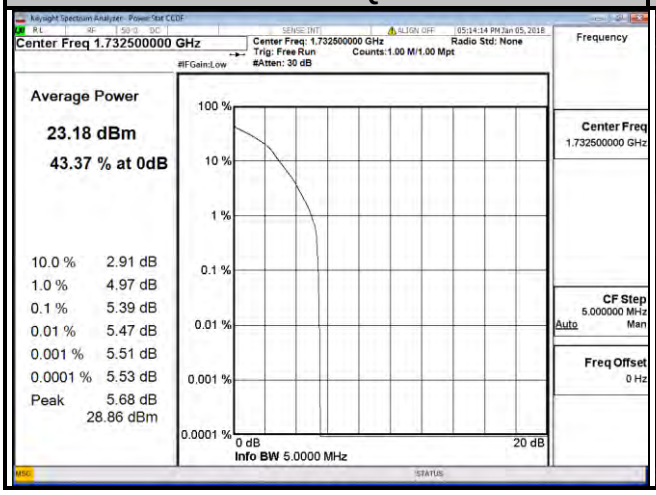


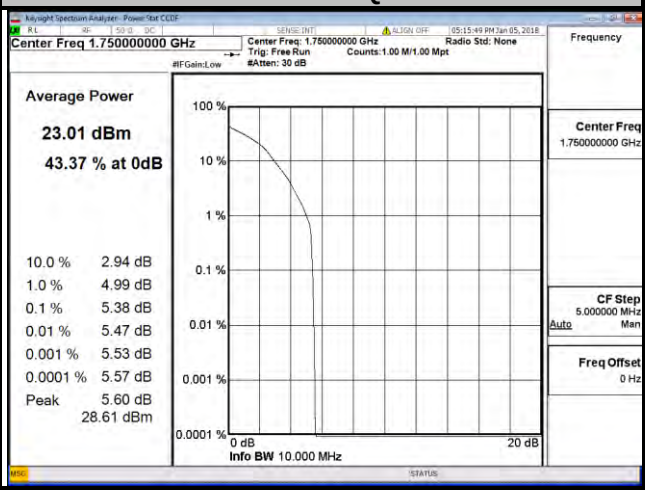
LTE Band 4									
Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
19957	1710.7	3.80	5.47	4.88	19965	1711.5	3.58	5.34	4.81
20175	1732.5	3.79	5.52	5.51	20175	1732.5	3.60	5.28	5.39
20393	1754.3	3.79	5.45	5.54	20385	1753.5	3.58	5.33	5.42

Spectrum Plot of Worst Value	
1.4 MHz / 64QAM	3 MHz / 64QAM
	

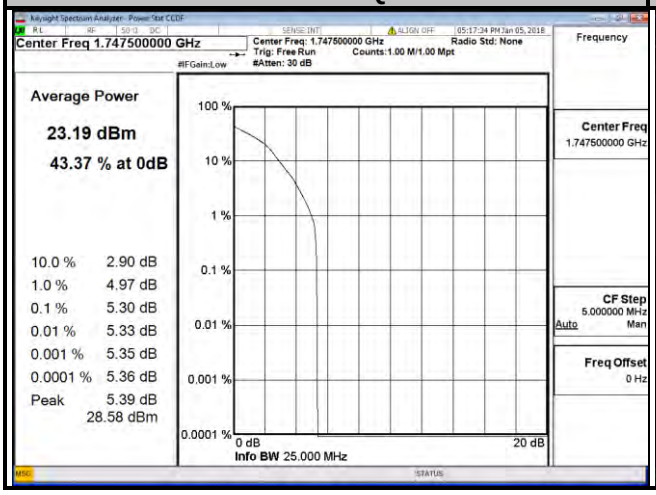
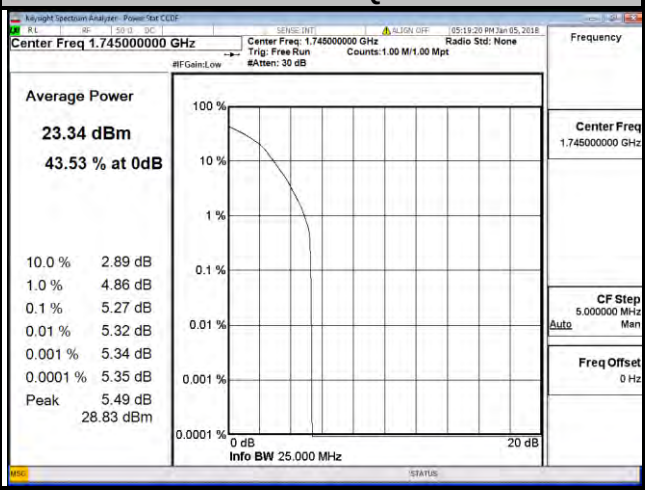
LTE Band 4									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
19975	1712.5	3.59	5.35	4.77	20000	1715.0	3.51	5.23	4.77
20175	1732.5	3.59	5.32	5.39	20175	1732.5	3.54	5.24	5.35
20375	1752.5	3.59	5.28	5.40	20350	1750.0	3.53	5.20	5.38

Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 64QAM

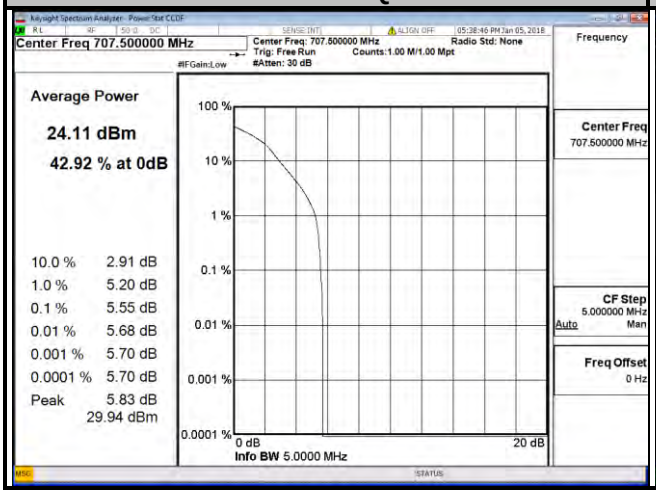
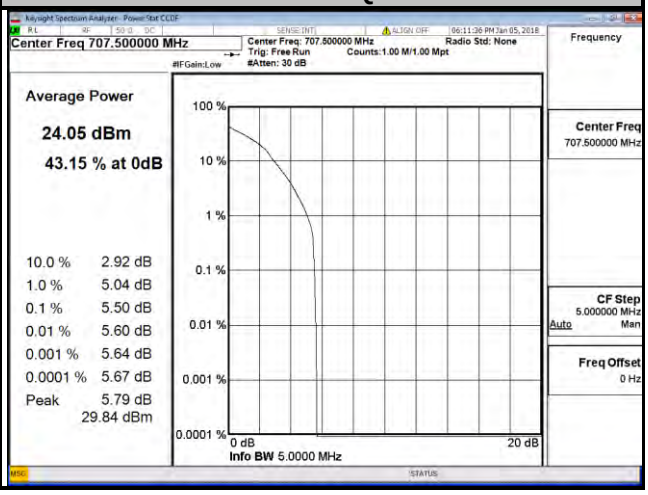




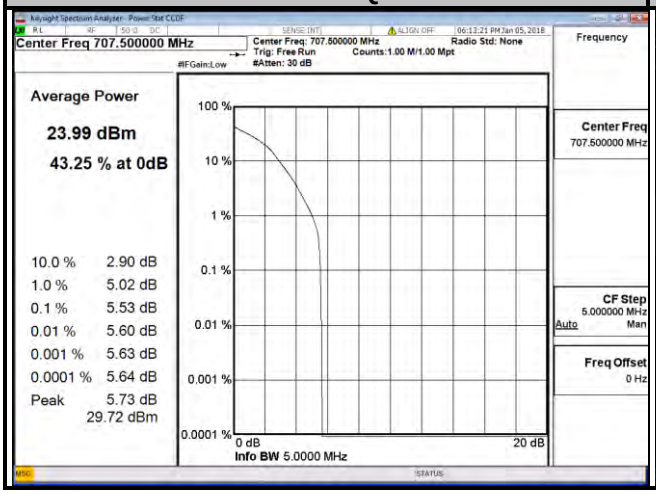
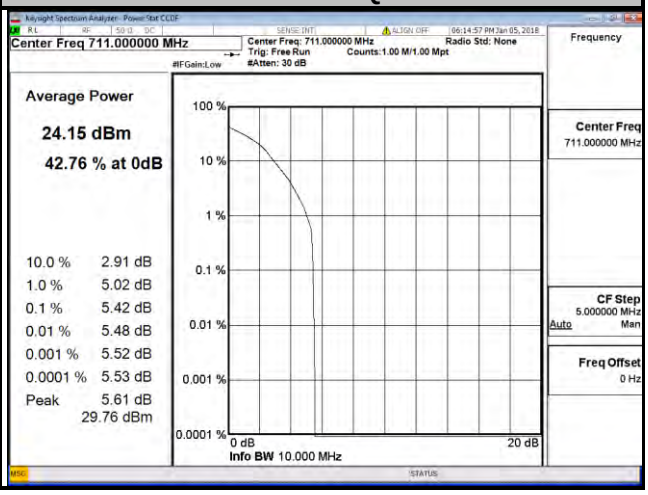
LTE Band 4									
Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
20025	1717.5	3.46	5.16	4.68	20050	1720.0	3.43	5.16	4.61
20175	1732.5	3.43	5.20	5.12	20175	1732.5	3.41	5.24	5.01
20325	1747.5	3.44	5.12	5.30	20300	1745.0	3.45	5.20	5.27

Spectrum Plot of Worst Value	
15 MHz / 64QAM	20 MHz / 64QAM
	

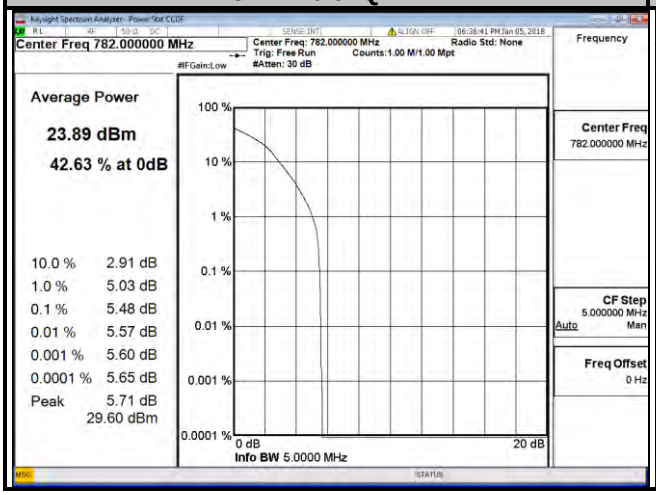
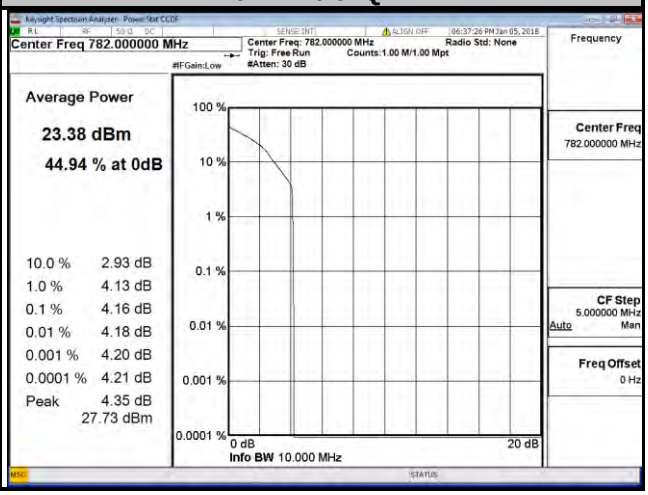
LTE Band 12									
Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23017	699.7	3.72	4.47	4.63	23025	700.5	3.61	4.47	4.56
23095	707.5	3.86	5.55	5.54	23095	707.5	3.63	5.48	5.50
23173	715.3	3.85	5.29	5.36	23165	714.5	3.64	4.92	5.06

Spectrum Plot of Worst Value	
1.4 MHz / 16QAM	3 MHz / 64QAM
	

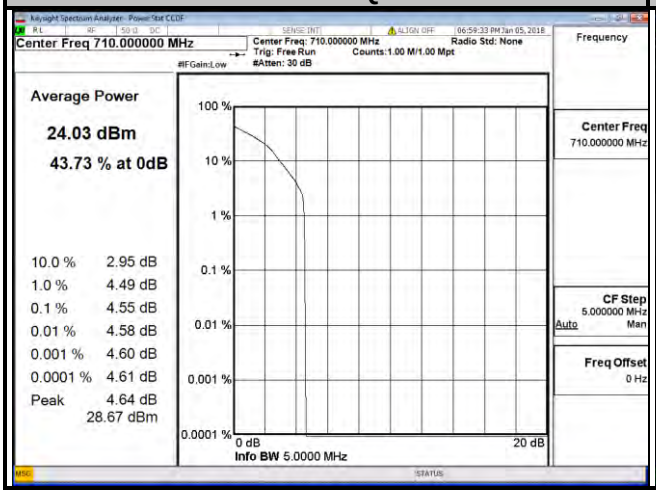
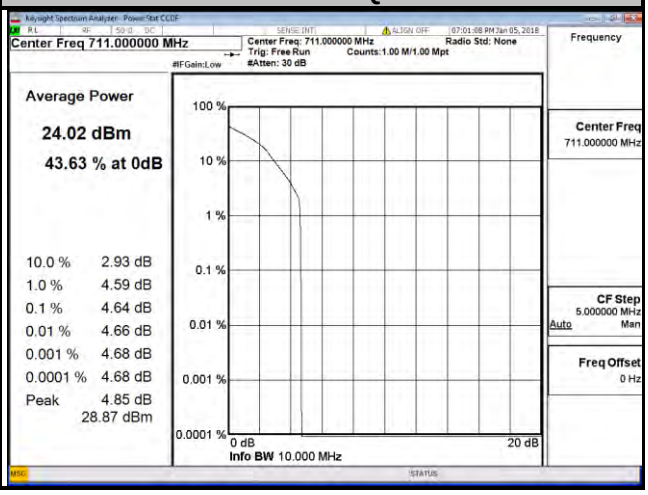
LTE Band 12									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23035	701.5	3.60	4.43	4.49	23060	704.0	3.51	4.12	4.39
23095	707.5	3.63	5.46	5.53	23095	707.5	3.55	5.05	5.01
23155	713.5	3.62	5.16	5.22	23130	711.0	3.55	5.34	5.42

Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 64QAM
	

LTE Band 13									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23205	779.5	3.38	4.08	4.21	23230	782.0	3.32	4.12	4.16
23230	782.0	3.62	5.37	5.48					
23255	784.5	3.60	5.38	5.42					

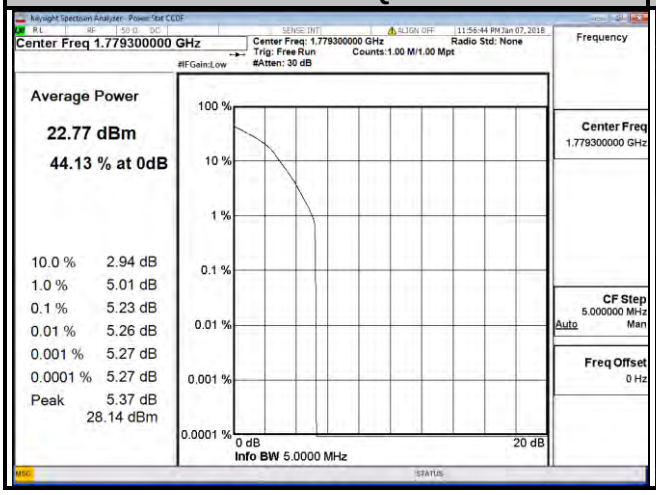
Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 64QAM
	

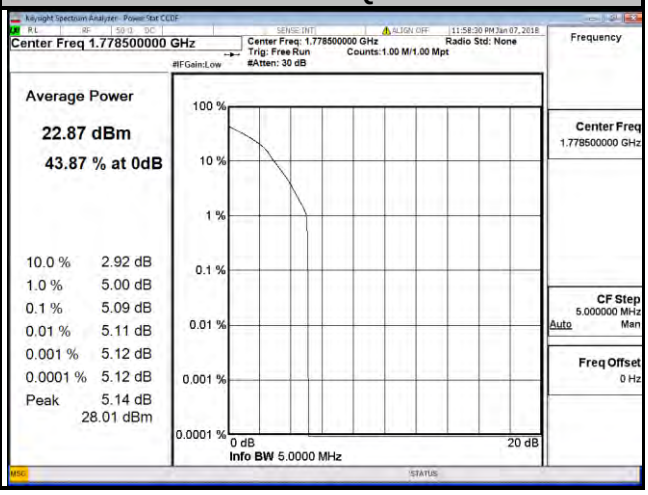
LTE Band 17									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23755	706.5	3.44	4.20	4.28	23780	709.0	3.39	4.16	4.27
23790	710.0	3.62	4.45	4.55	23790	710.0	3.59	4.35	4.44
23825	713.5	3.51	4.27	4.34	23800	711.0	3.57	4.42	4.64

Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 64QAM
	

LTE Band 66									
Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
131979	1710.7	3.43	4.23	4.26	131987	1711.5	3.36	4.12	4.22
132322	1745	3.83	4.91	5.04	132322	1745	3.63	4.67	4.87
132665	1779.3	3.81	5.01	5.23	132657	1778.5	3.56	4.90	5.09

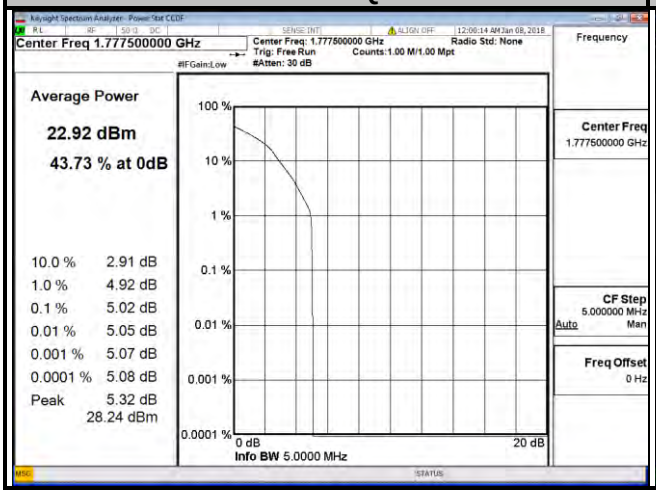
Spectrum Plot of Worst Value	
1.4 MHz / 64QAM	3 MHz / 64QAM

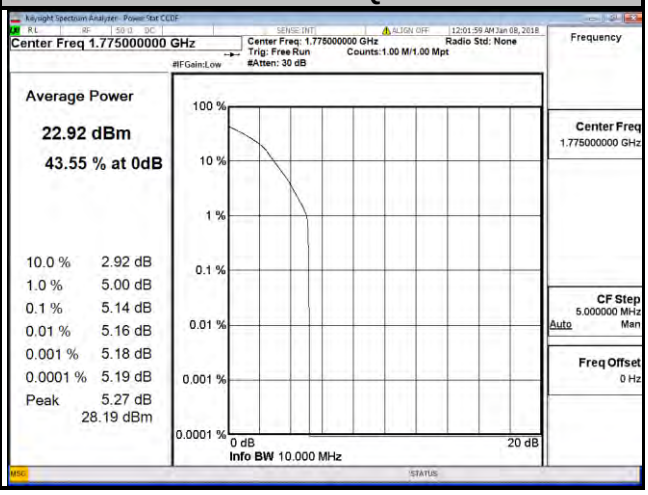




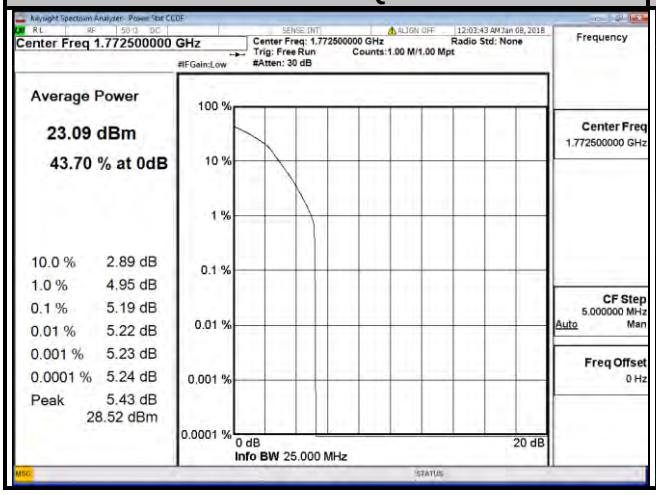
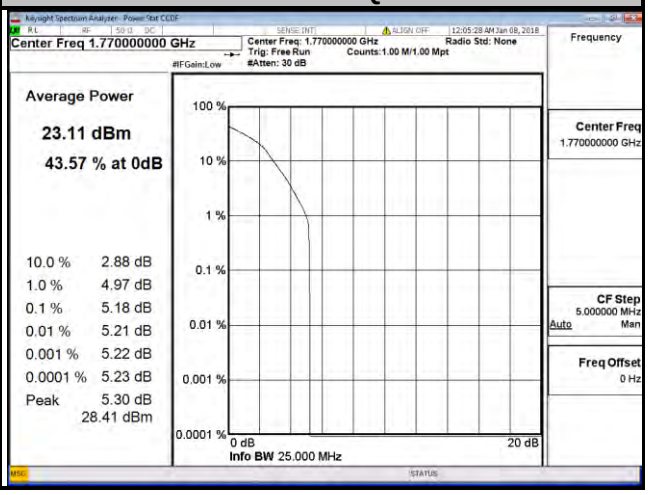
LTE Band 66									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
131997	1712.5	3.42	4.18	4.28	132022	1715	3.38	4.15	4.21
132322	1745	3.60	4.72	4.73	132322	1745	3.52	4.56	4.62
132647	1777.5	3.58	4.96	5.02	132622	1775	3.52	5.00	5.14

Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 64QAM





LTE Band 66									
Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
132047	1717.5	3.30	4.08	4.22	132072	1720	3.34	4.11	4.27
132322	1745	3.47	4.48	4.61	132322	1745	3.48	4.56	4.62
132597	1772.5	3.43	5.01	5.19	132572	1770	3.40	5.12	5.18

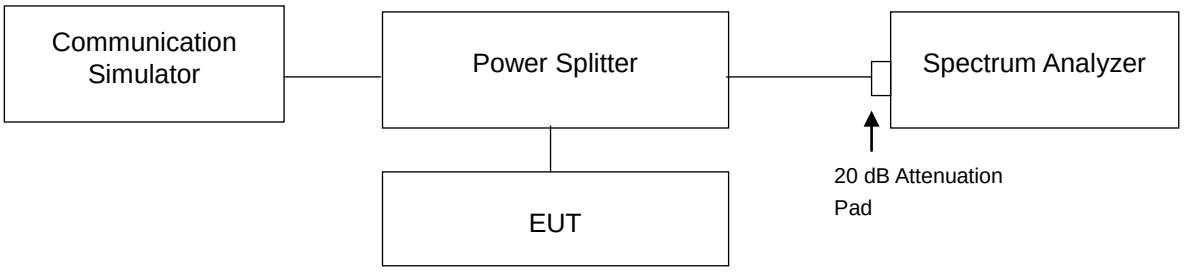
Spectrum Plot of Worst Value	
15 MHz / 64QAM	20 MHz / 64QAM
	

4.6 Conducted Spurious Emissions

4.6.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10(P) dB. The limit of emission is equal to -13 dBm.

4.6.2 Test Setup

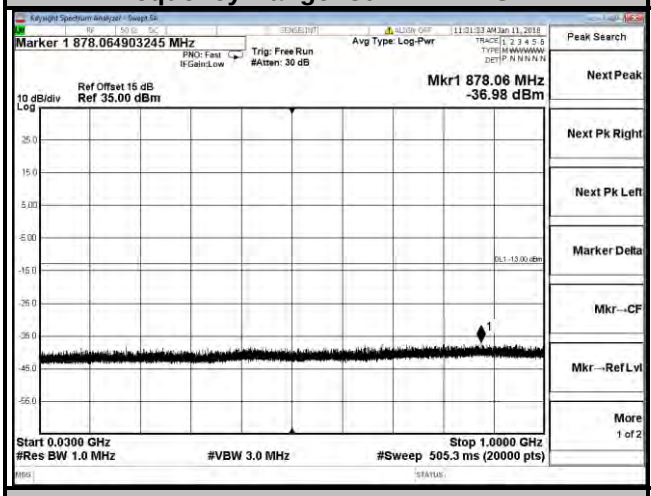
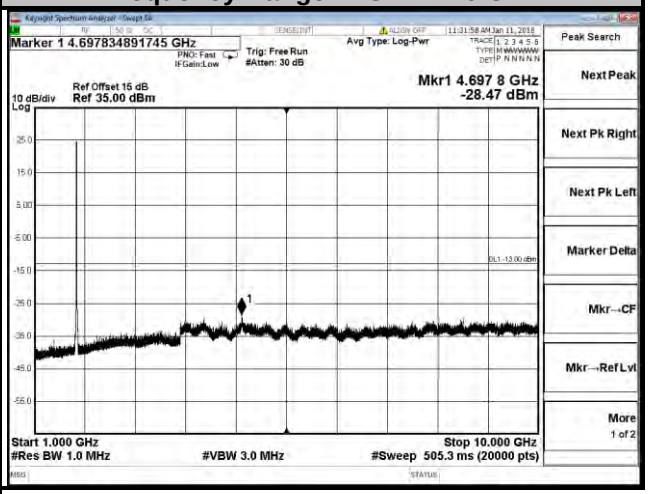
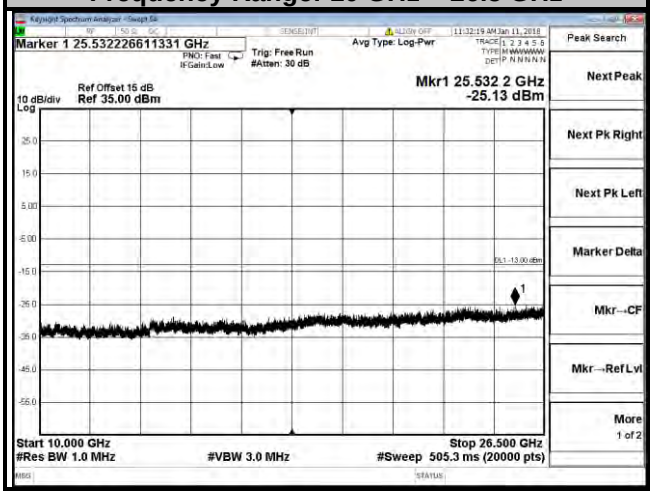


4.6.3 Test Procedure

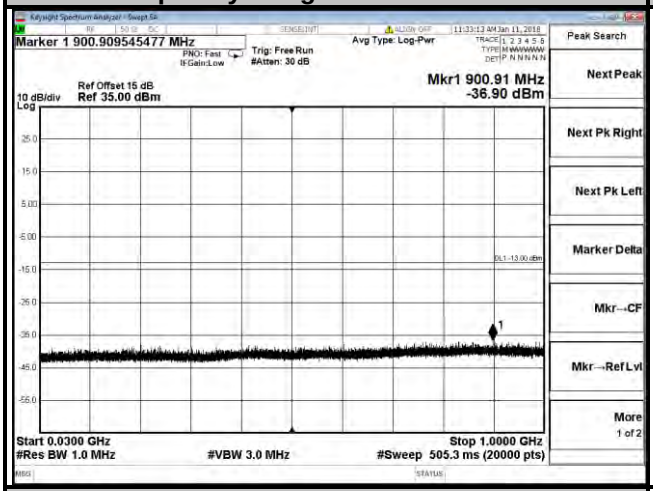
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

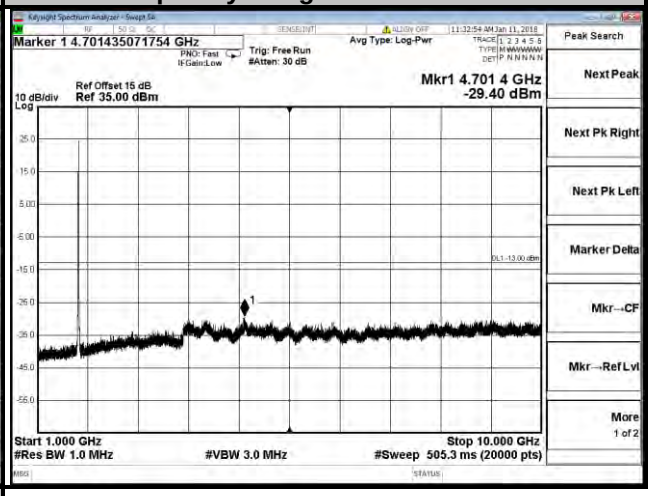
b. Measuring frequency range is from 30 MHz to 10 GHz for LTE Band 12/13/17 and from 30 MHz to 26.5 GHz for WCDMA/LTE Band 4/66. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz are used for conducted spurious emission measurement.

4.6.4 Test Results

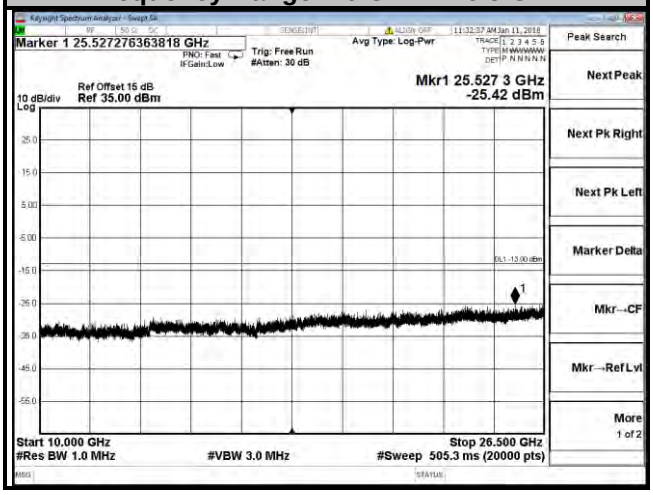
WCDMA	
Channel 1312	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 26.5 GHz	
	

WCDMA	
Channel 1413	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz

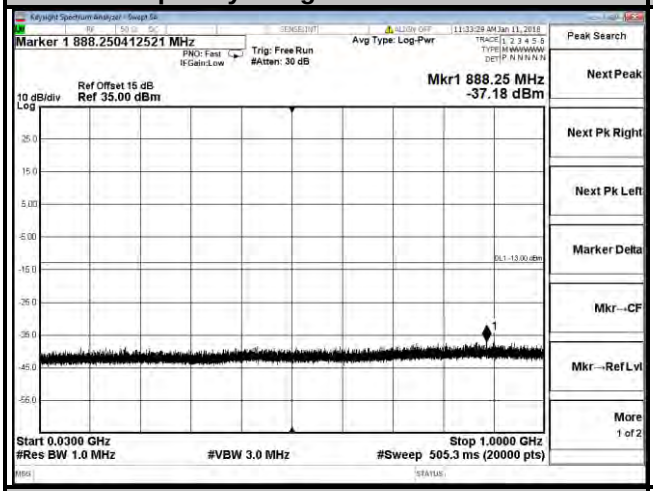


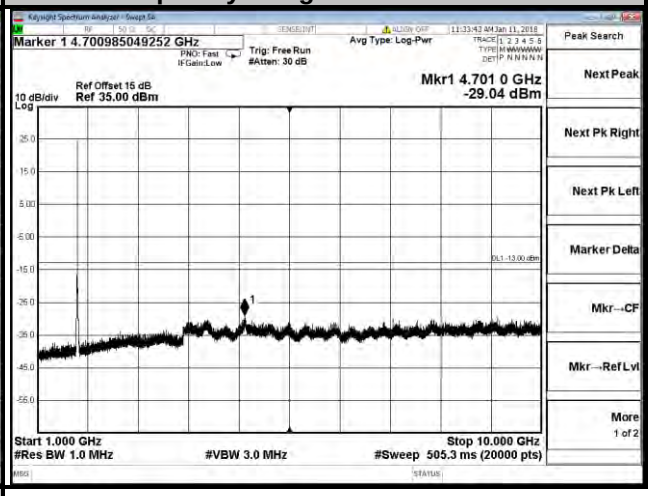


Frequency Range: 10 GHz ~ 26.5 GHz

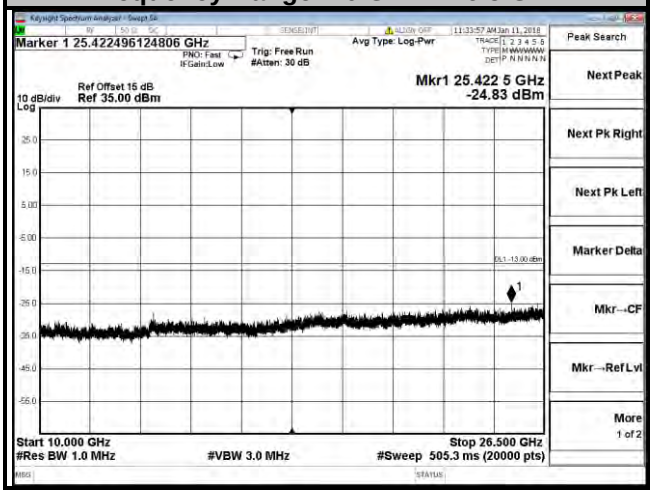


WCDMA	
Channel 1513	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz



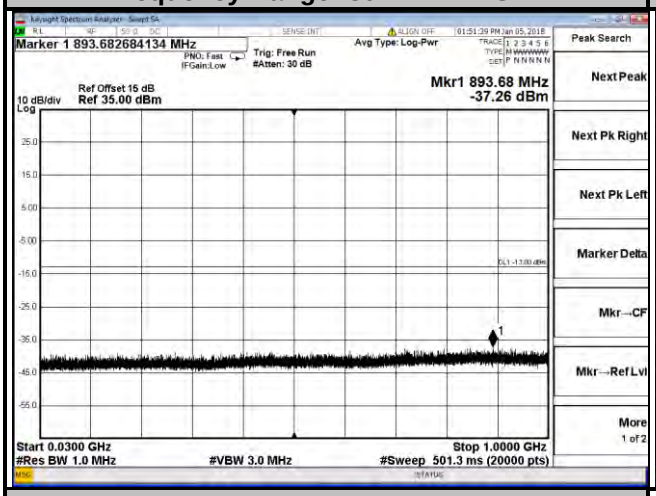


Frequency Range: 10 GHz ~ 26.5 GHz

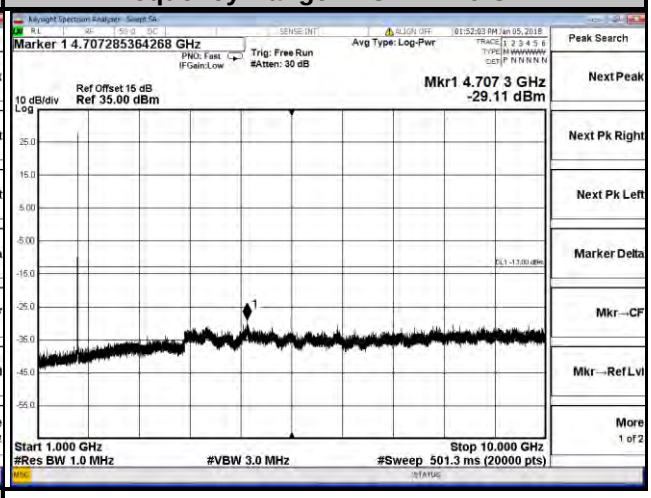


LTE Band 4
Channel Bandwidth: 1.4 MHz
Channel 19957

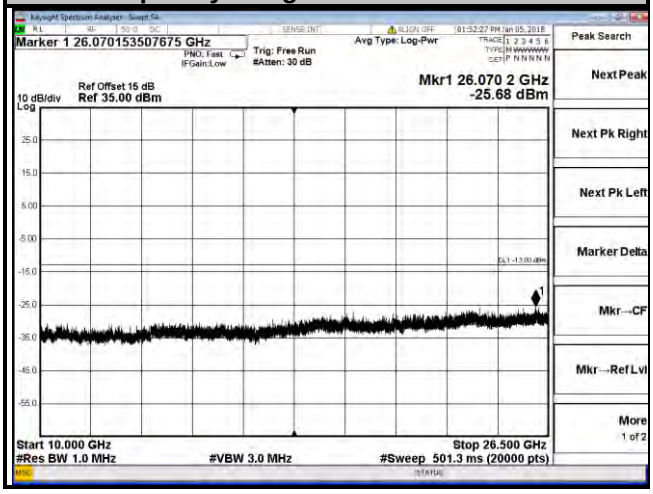
Frequency Range: 30 MHz ~ 1 GHz



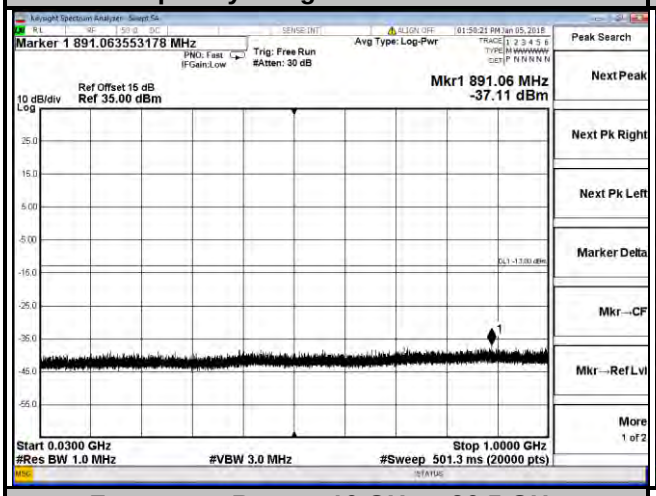
Frequency Range: 1 GHz ~ 10 GHz

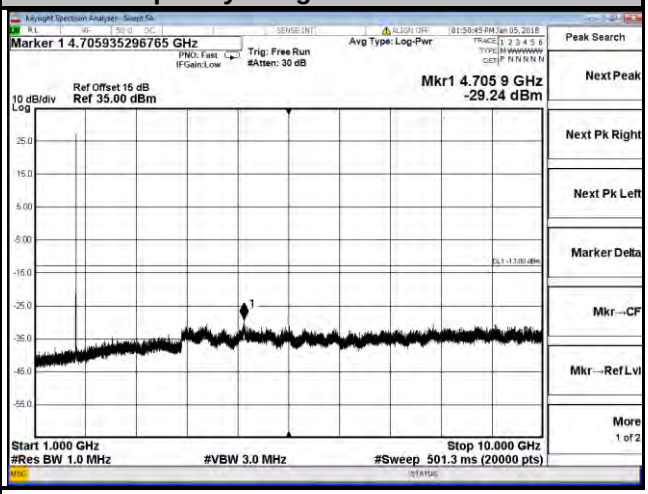


Frequency Range: 10 GHz ~ 26.5 GHz

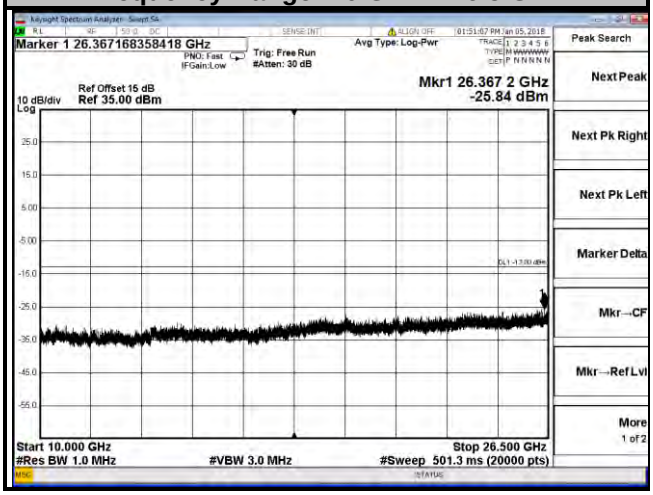


LTE Band 4	
Channel Bandwidth: 1.4 MHz	
Channel 20175	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz

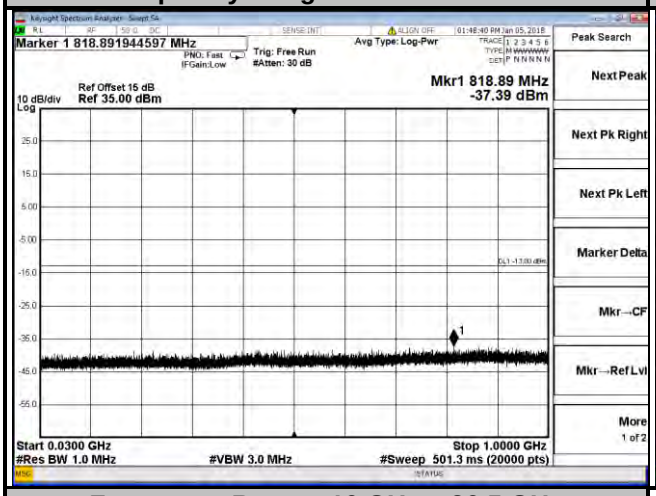


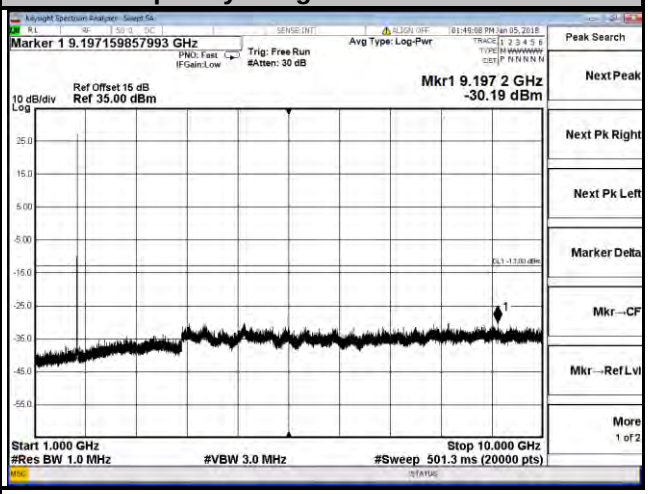


Frequency Range: 10 GHz ~ 26.5 GHz

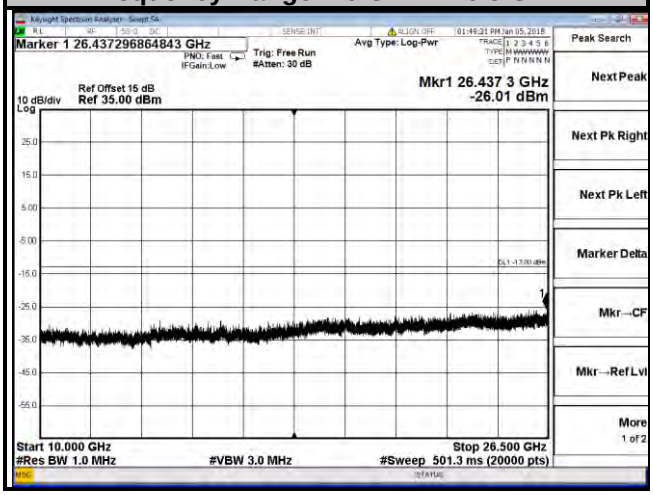


LTE Band 4	
Channel Bandwidth: 1.4 MHz	
Channel 20393	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz



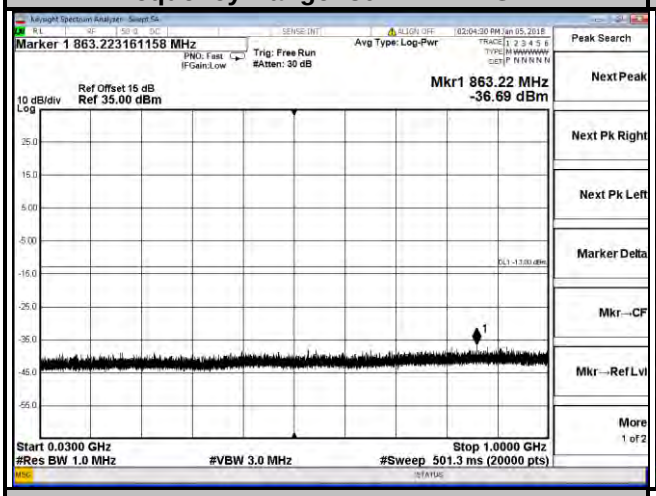


Frequency Range: 10 GHz ~ 26.5 GHz

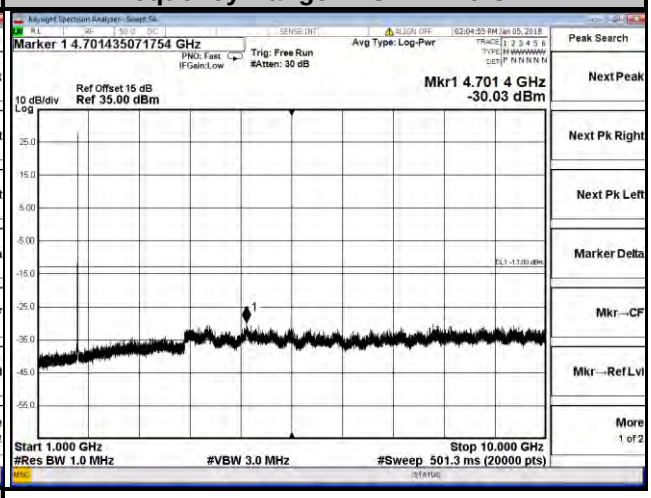


LTE Band 4
Channel Bandwidth: 3 MHz
Channel 19965

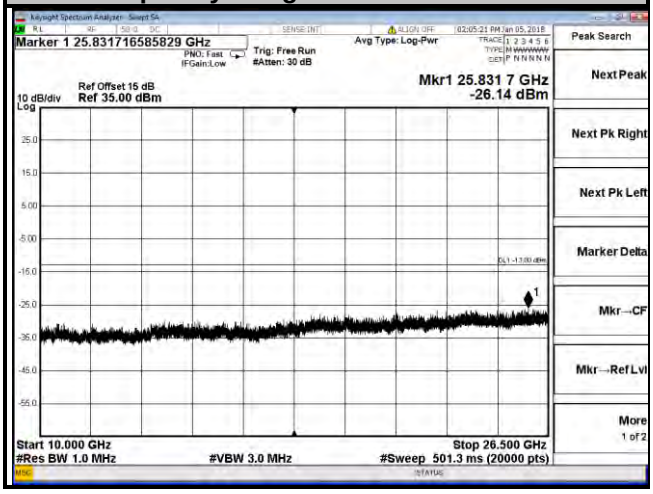
Frequency Range: 30 MHz ~ 1 GHz



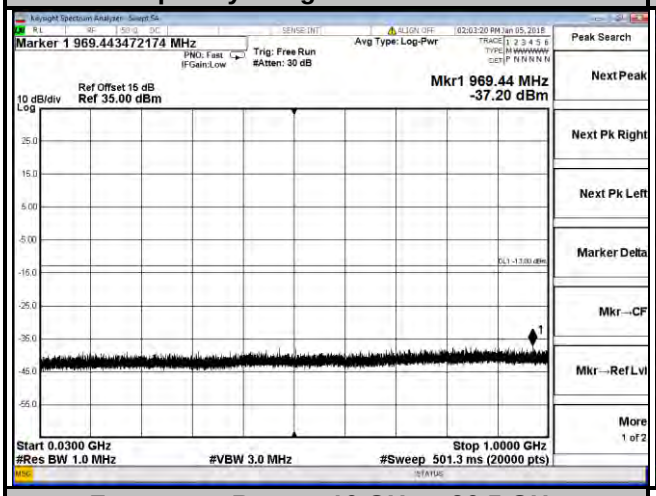
Frequency Range: 1 GHz ~ 10 GHz

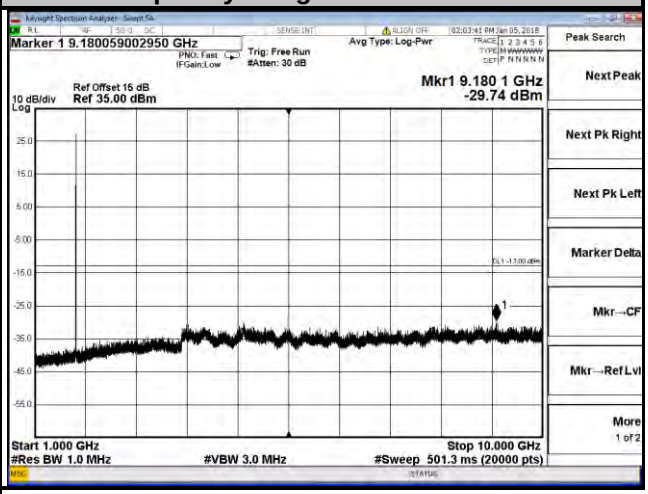


Frequency Range: 10 GHz ~ 26.5 GHz

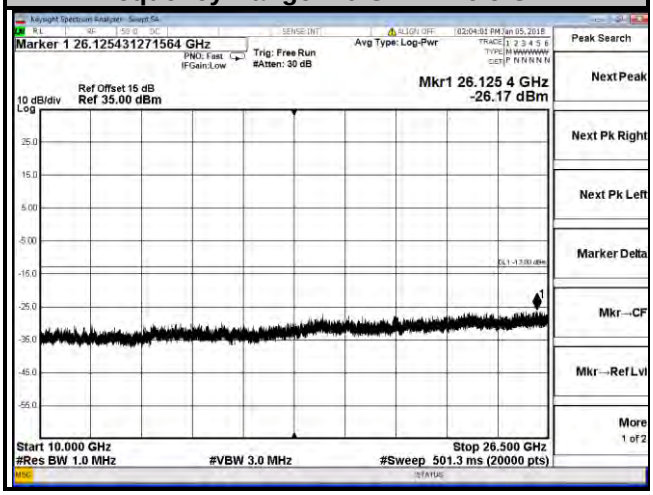


LTE Band 4	
Channel Bandwidth: 3 MHz	
Channel 20175	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz

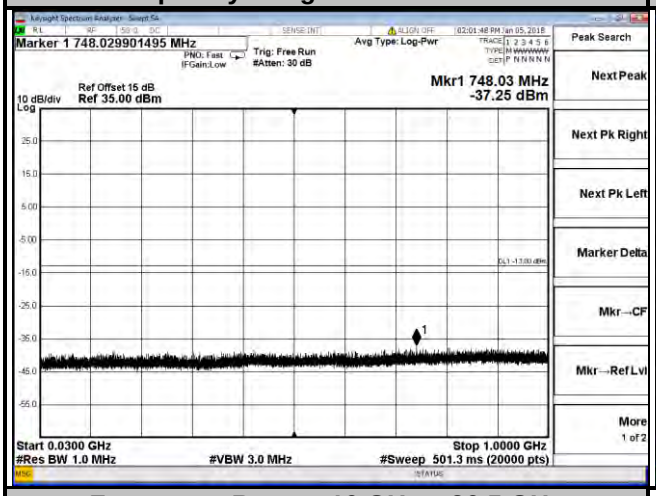


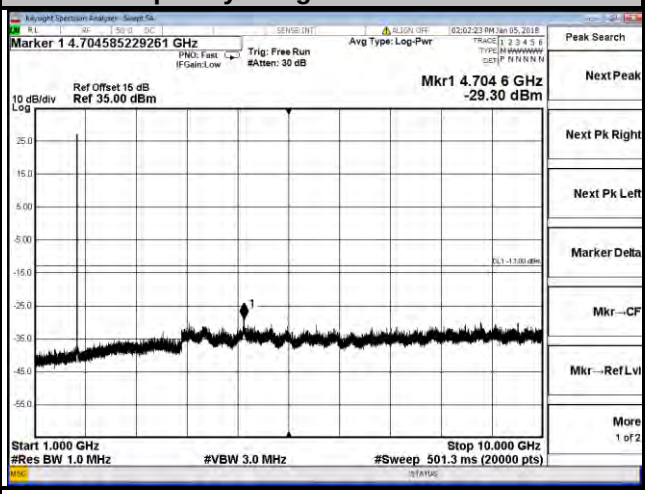


Frequency Range: 10 GHz ~ 26.5 GHz

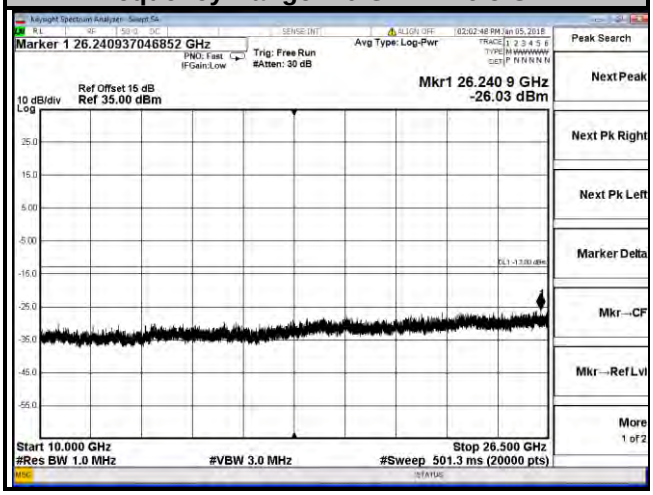


LTE Band 4	
Channel Bandwidth: 3 MHz	
Channel 20385	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz



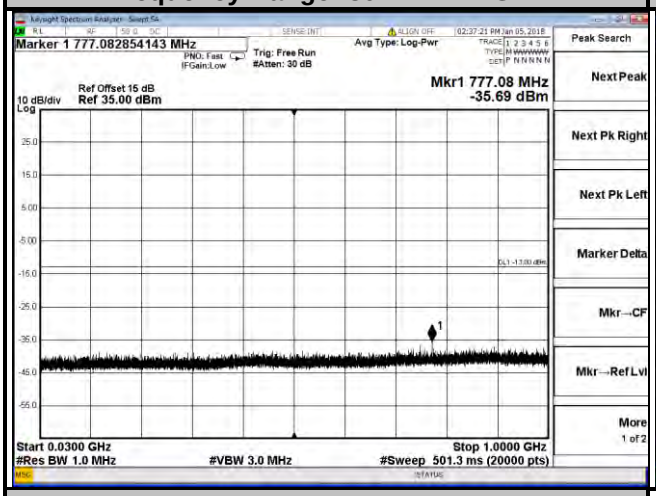


Frequency Range: 10 GHz ~ 26.5 GHz

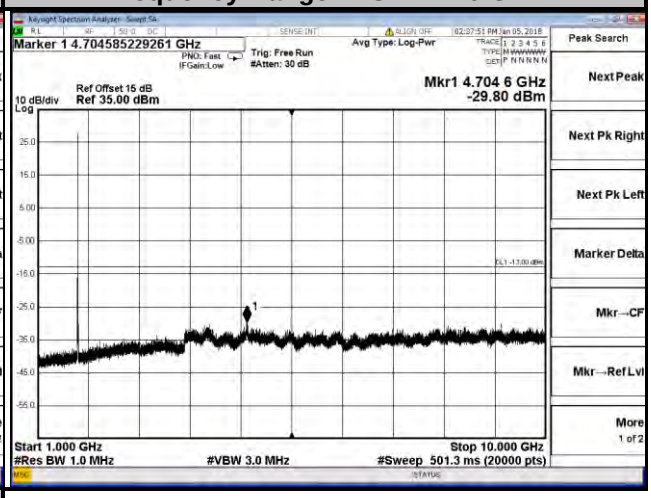


LTE Band 4
Channel Bandwidth: 5 MHz
Channel 19975

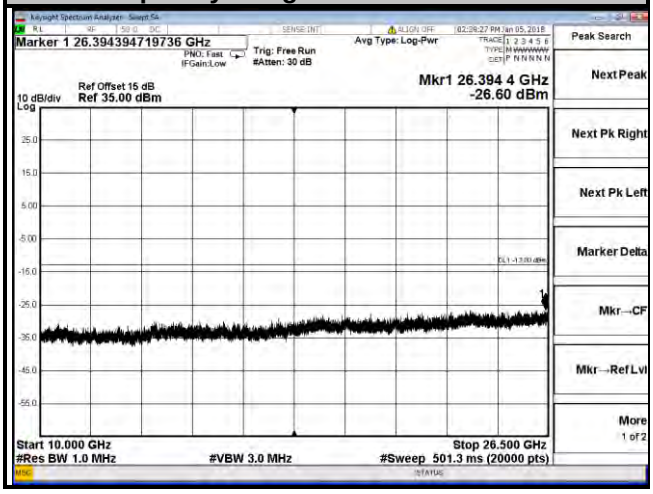
Frequency Range: 30 MHz ~ 1 GHz



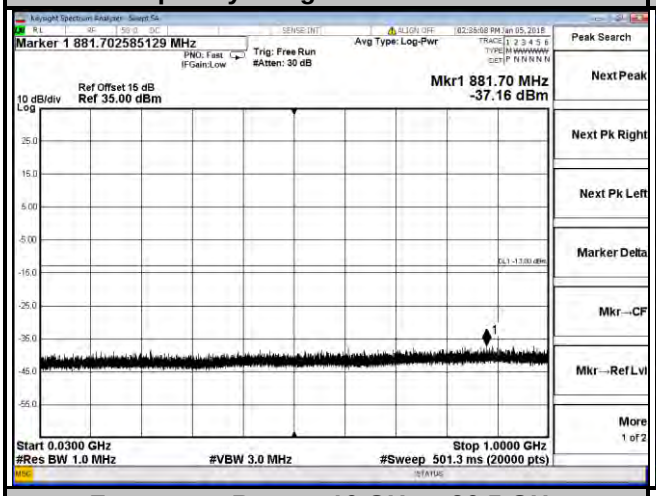
Frequency Range: 1 GHz ~ 10 GHz

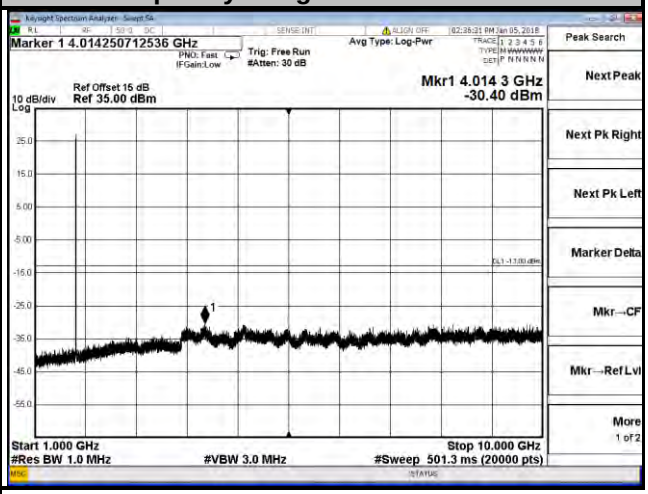


Frequency Range: 10 GHz ~ 26.5 GHz

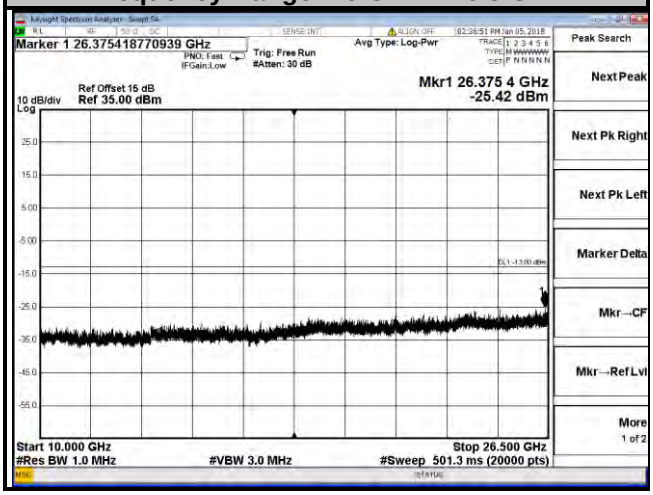


LTE Band 4	
Channel Bandwidth: 5 MHz	
Channel 20175	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz

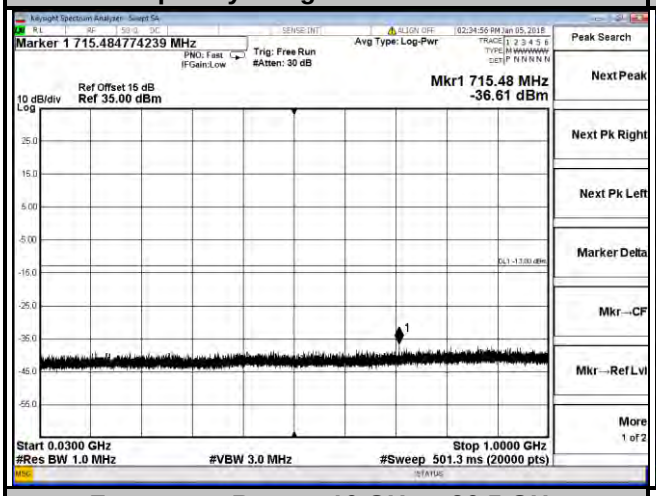


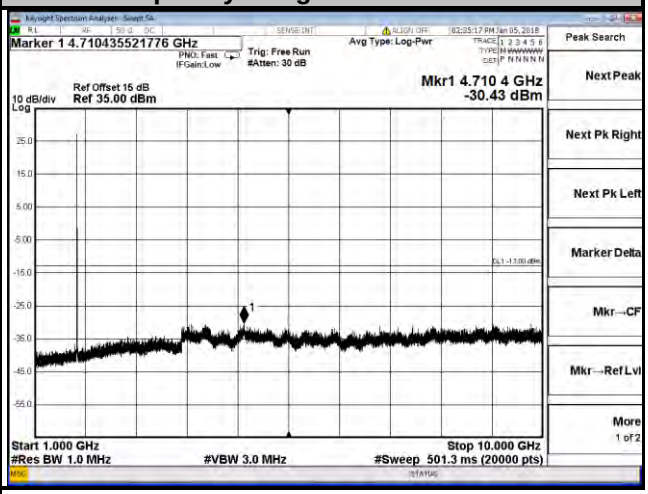


Frequency Range: 10 GHz ~ 26.5 GHz

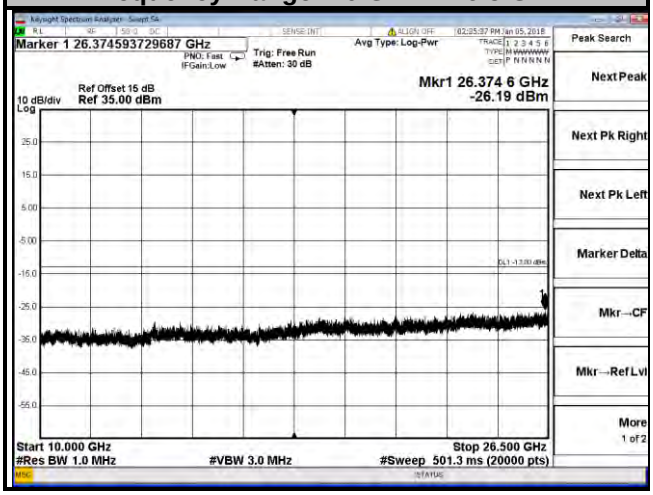


LTE Band 4	
Channel Bandwidth: 5 MHz	
Channel 20375	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz



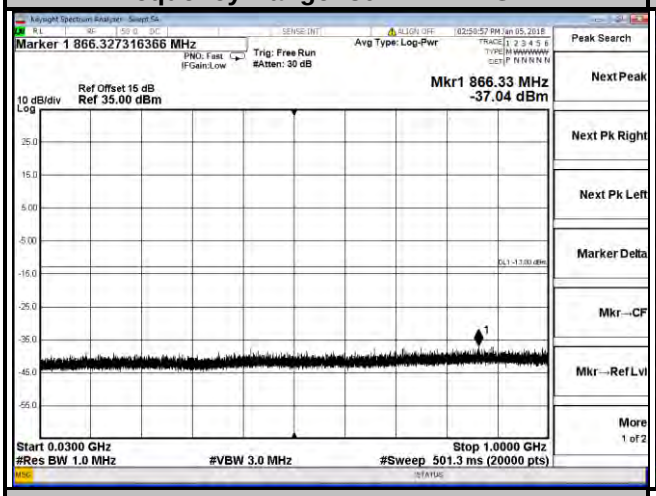


Frequency Range: 10 GHz ~ 26.5 GHz

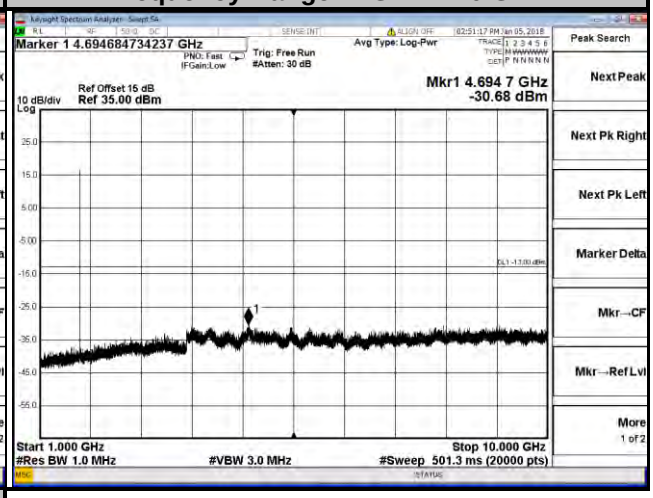


LTE Band 4
Channel Bandwidth: 10 MHz
Channel 20000

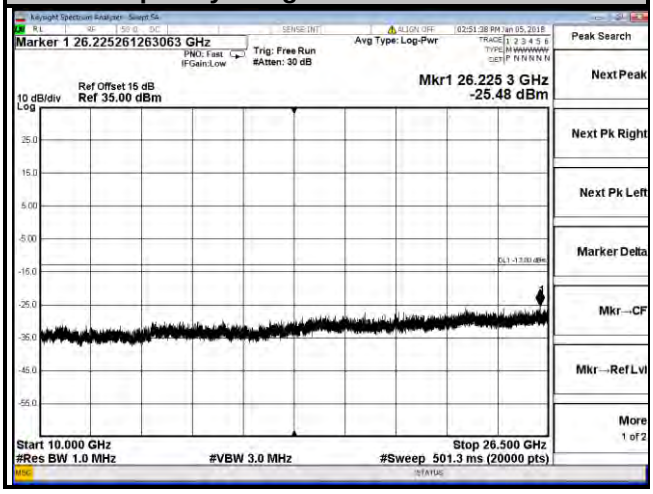
Frequency Range: 30 MHz ~ 1 GHz



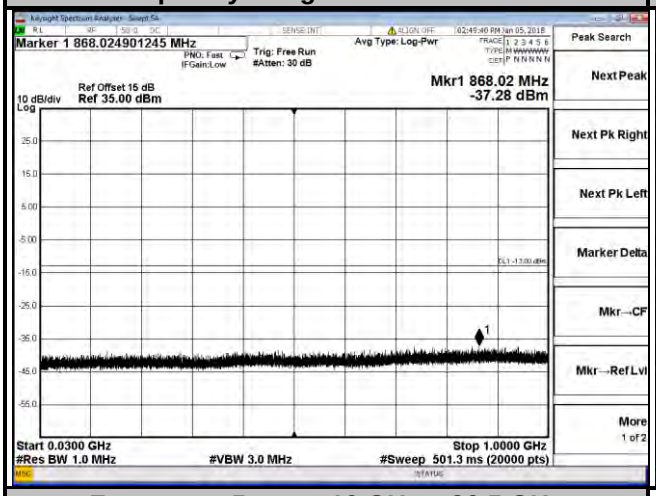
Frequency Range: 1 GHz ~ 10 GHz

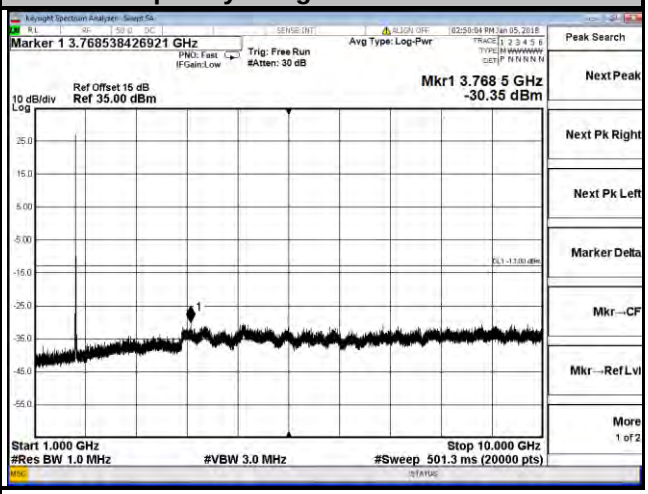


Frequency Range: 10 GHz ~ 26.5 GHz

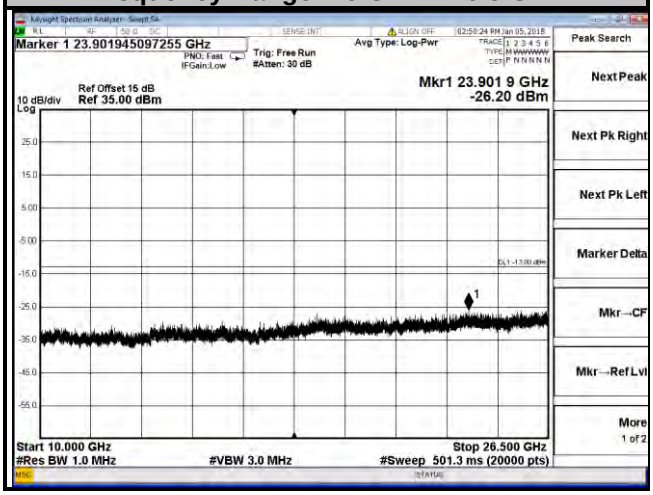


LTE Band 4	
Channel Bandwidth: 10 MHz	
Channel 20175	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz

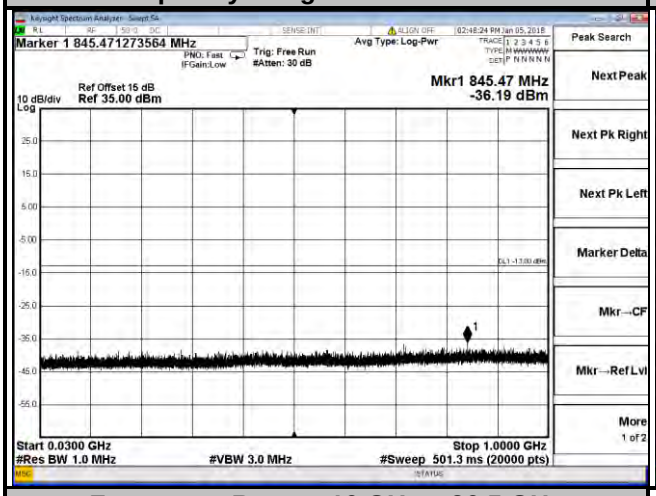


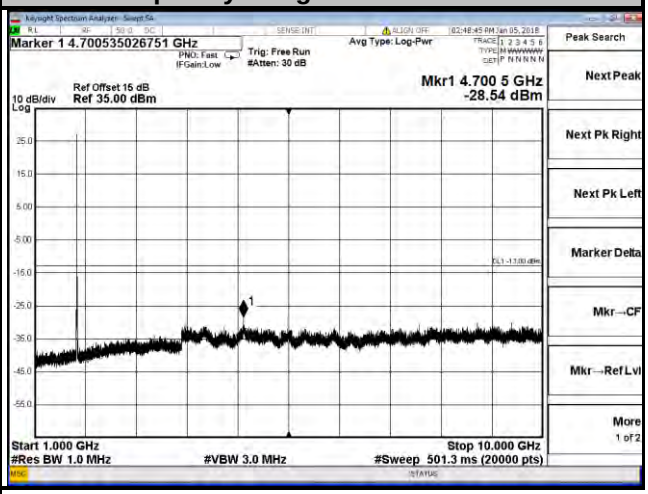


Frequency Range: 10 GHz ~ 26.5 GHz

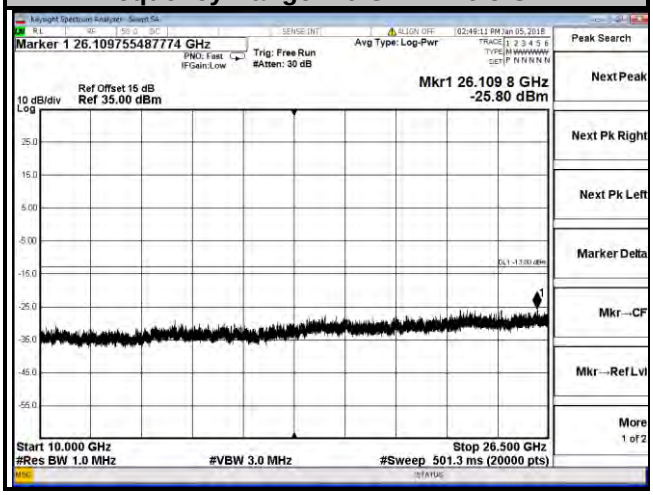


LTE Band 4	
Channel Bandwidth: 10 MHz	
Channel 20350	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz



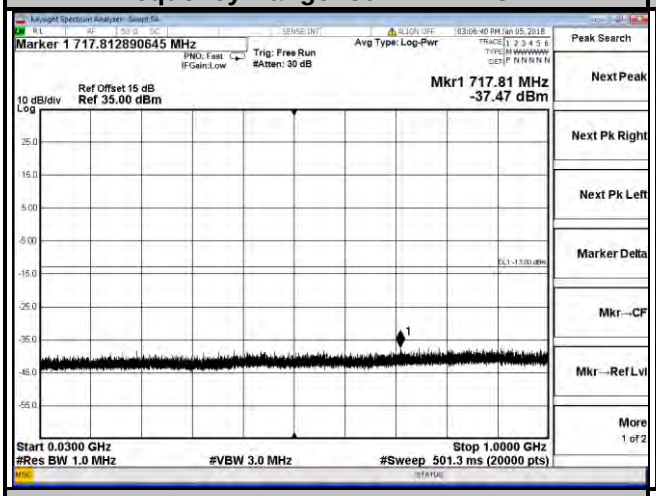


Frequency Range: 10 GHz ~ 26.5 GHz

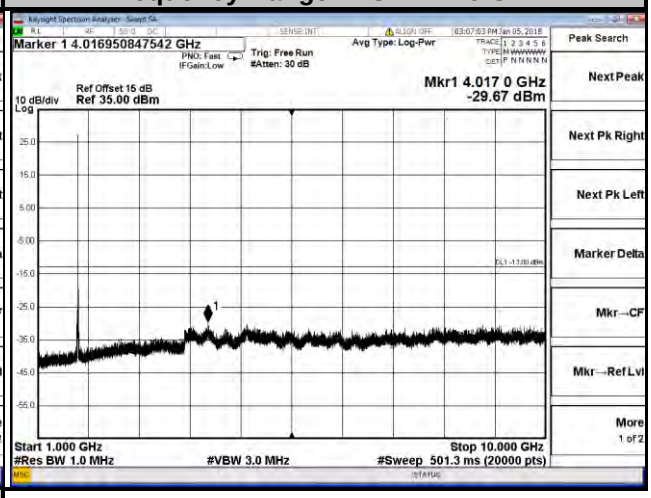


LTE Band 4
Channel Bandwidth: 15 MHz
Channel 20025

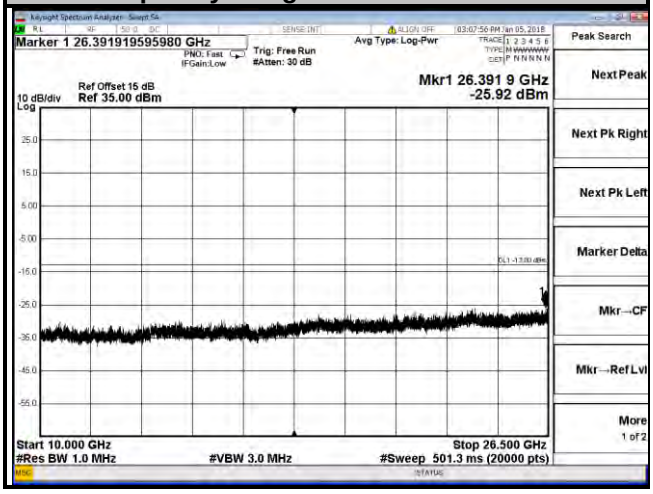
Frequency Range: 30 MHz ~ 1 GHz



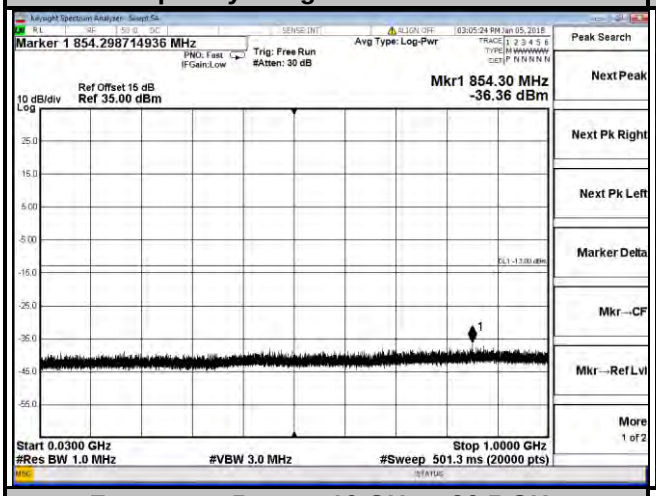
Frequency Range: 1 GHz ~ 10 GHz

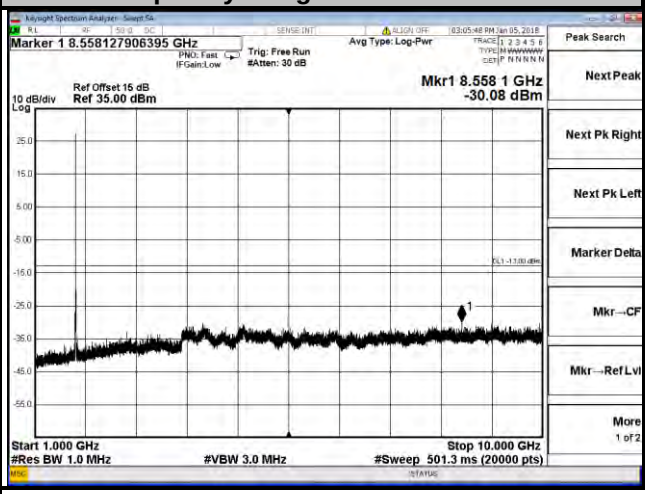


Frequency Range: 10 GHz ~ 26.5 GHz

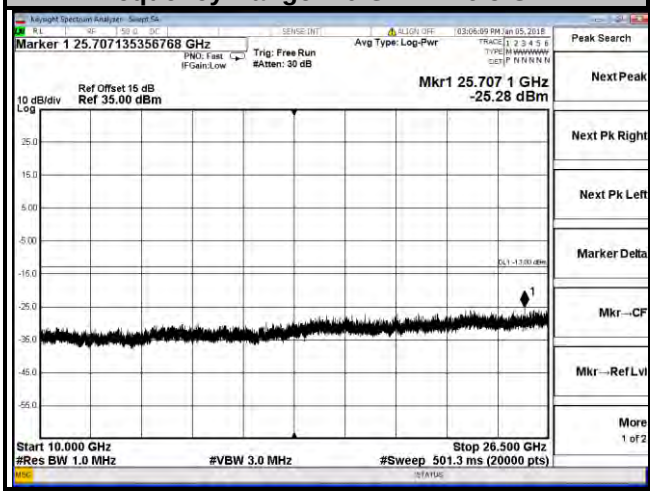


LTE Band 4	
Channel Bandwidth: 15 MHz	
Channel 20175	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz

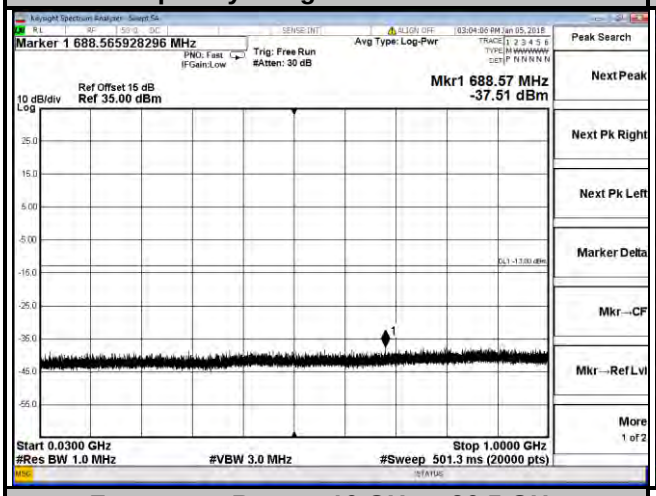


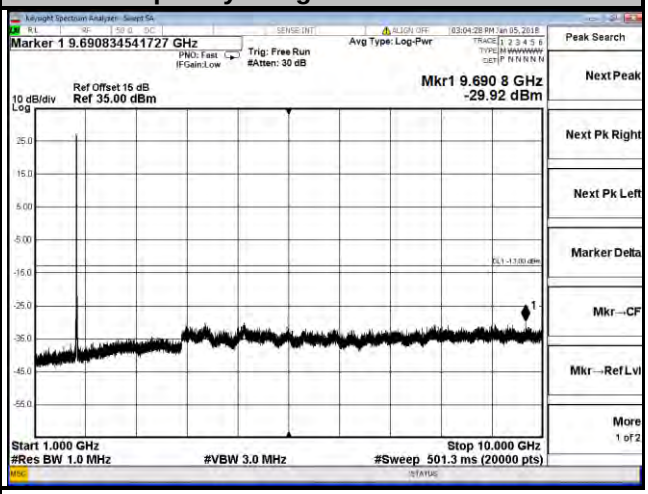


Frequency Range: 10 GHz ~ 26.5 GHz

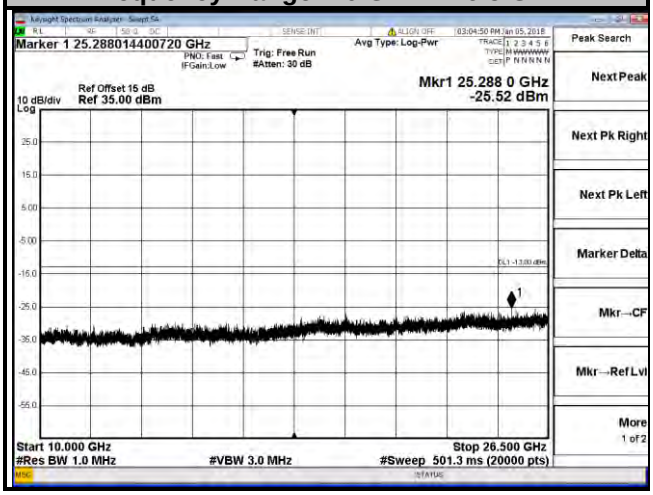


LTE Band 4	
Channel Bandwidth: 15 MHz	
Channel 20325	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz



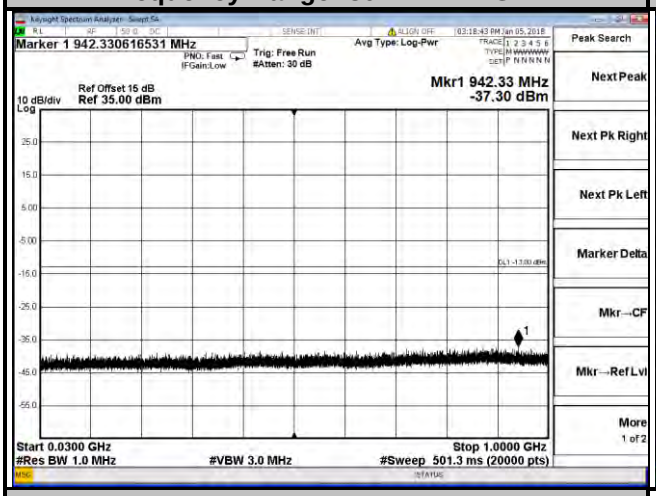


Frequency Range: 10 GHz ~ 26.5 GHz

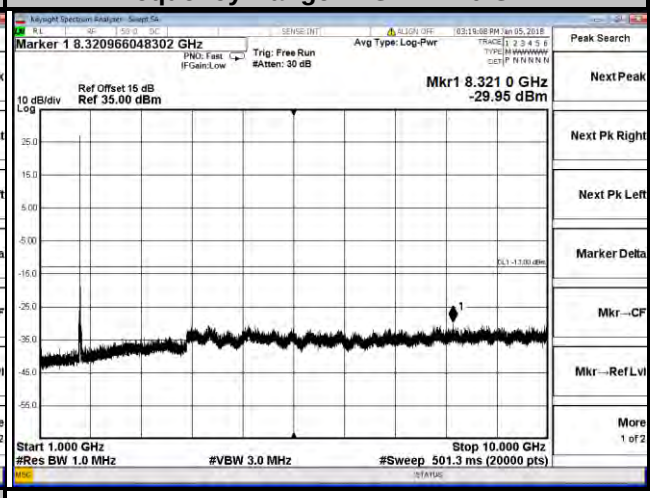


LTE Band 4
Channel Bandwidth: 20 MHz
Channel 20050

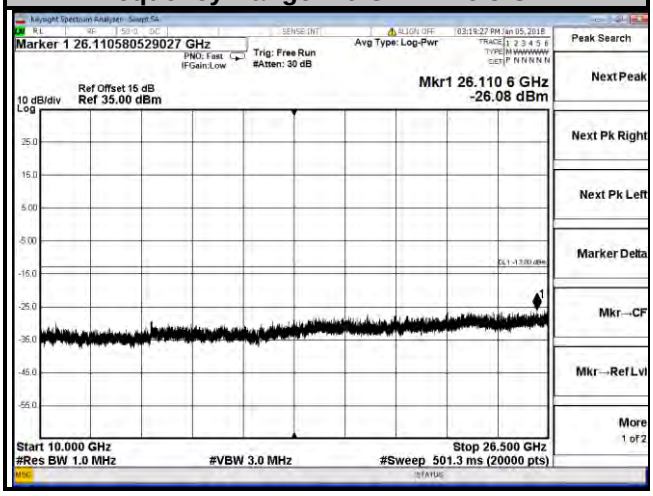
Frequency Range: 30 MHz ~ 1 GHz



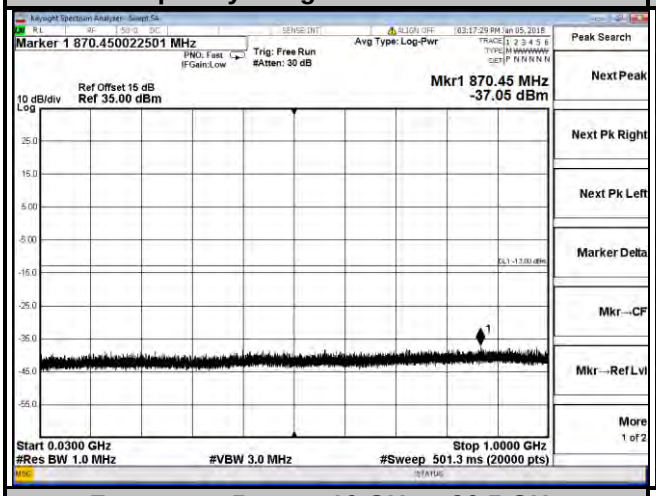
Frequency Range: 1 GHz ~ 10 GHz

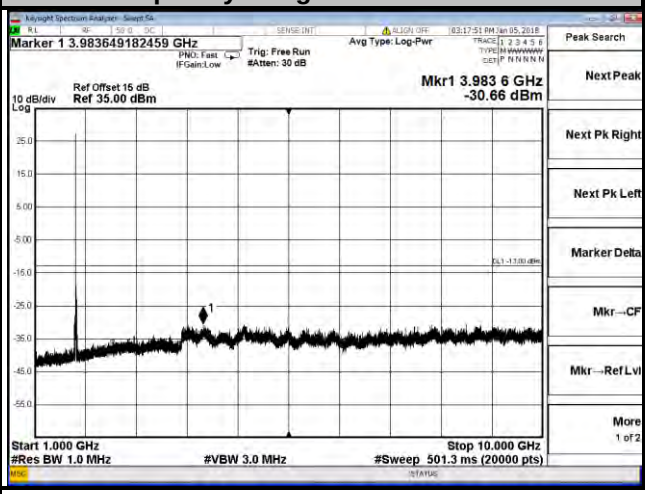


Frequency Range: 10 GHz ~ 26.5 GHz

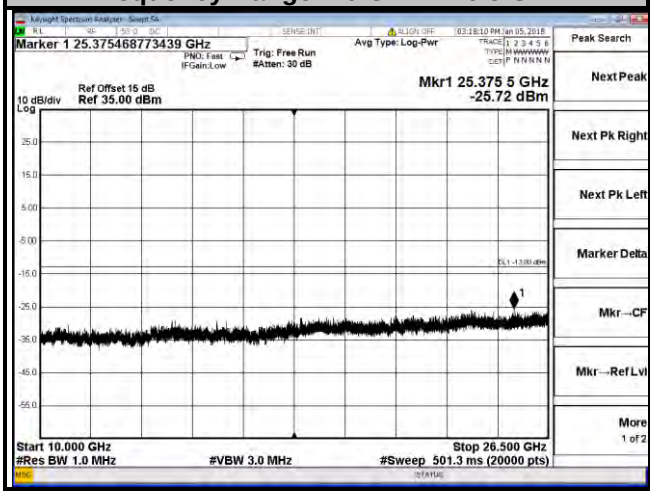


LTE Band 4	
Channel Bandwidth: 20 MHz	
Channel 20175	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz



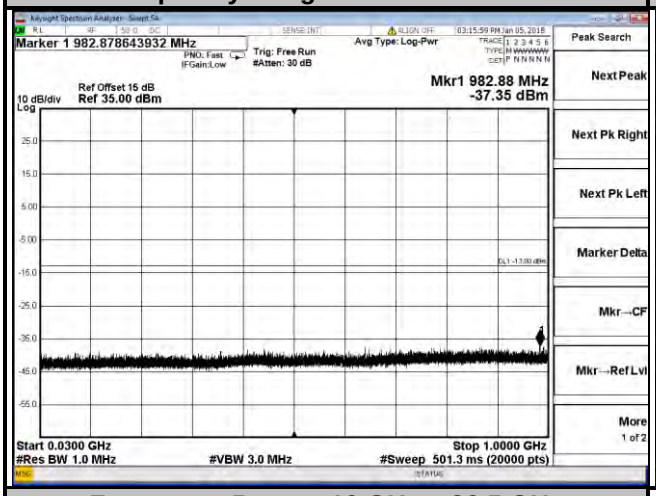


Frequency Range: 10 GHz ~ 26.5 GHz

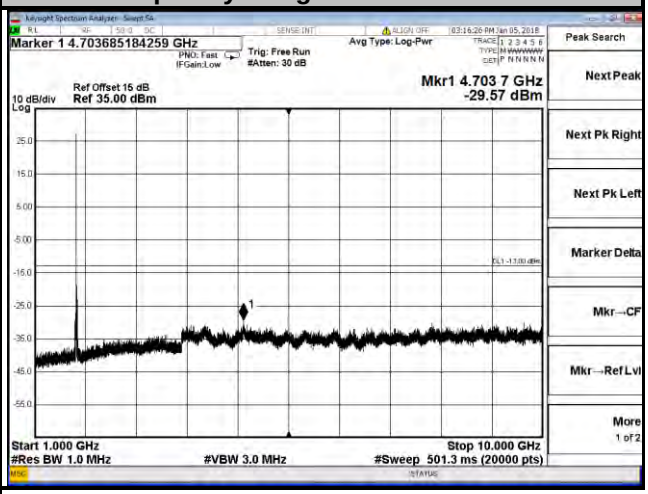


LTE Band 4
Channel Bandwidth: 20 MHz
Channel 20300

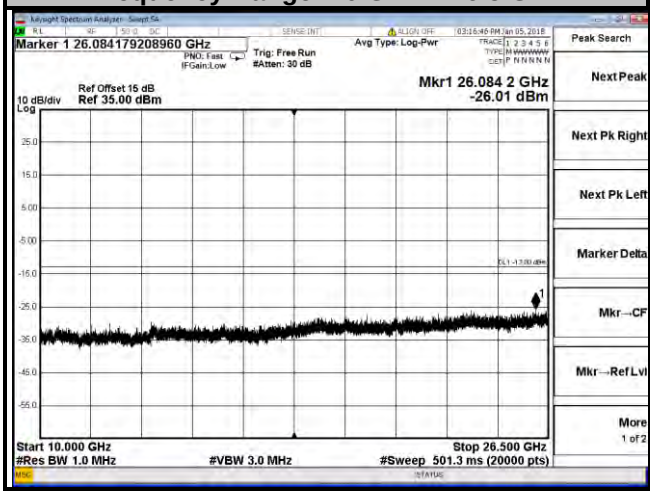
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz



Frequency Range: 10 GHz ~ 26.5 GHz

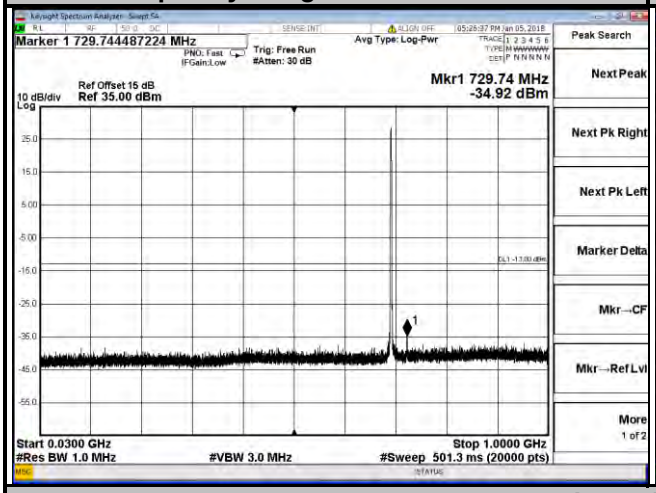


LTE Band 12

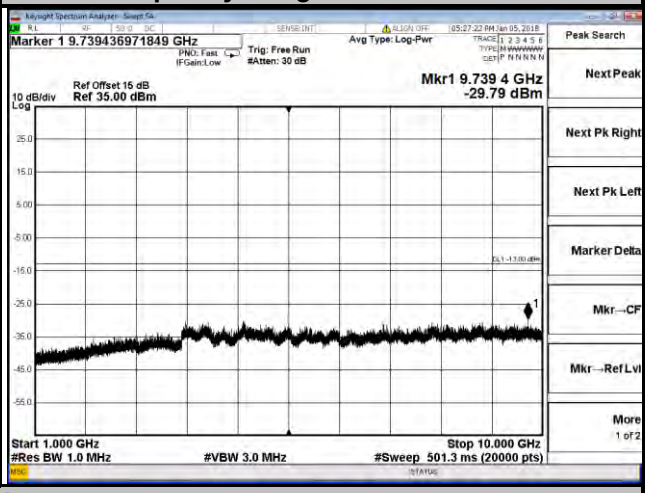
Channel Bandwidth: 1.4 MHz

Channel 23017

Frequency Range: 30 MHz ~ 1 GHz

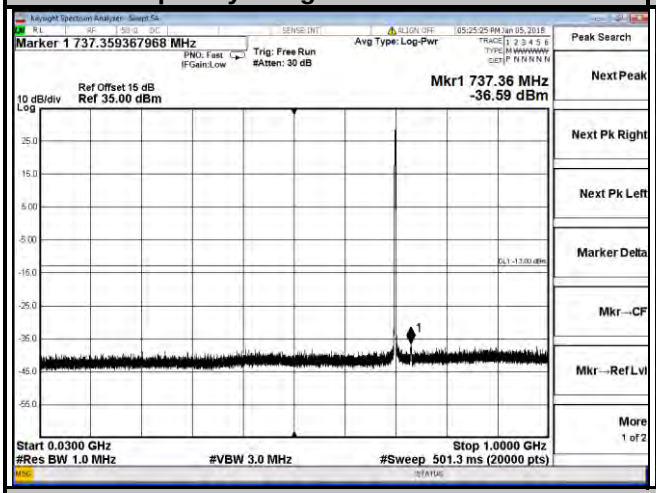


Frequency Range: 1 GHz ~ 10 GHz

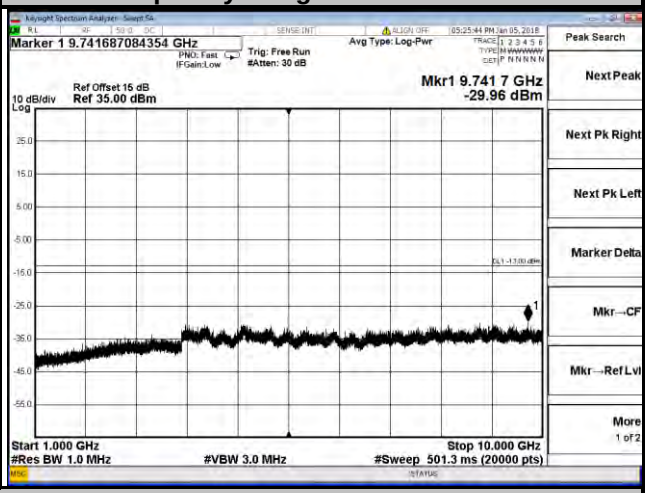


Channel 23095

Frequency Range: 30 MHz ~ 1 GHz

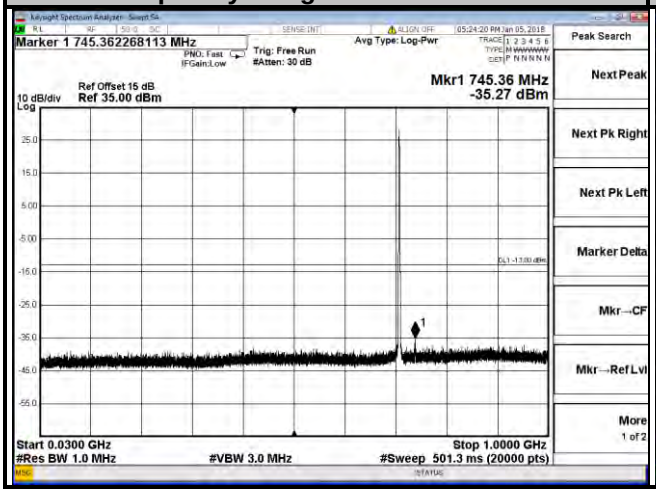


Frequency Range: 1 GHz ~ 10 GHz

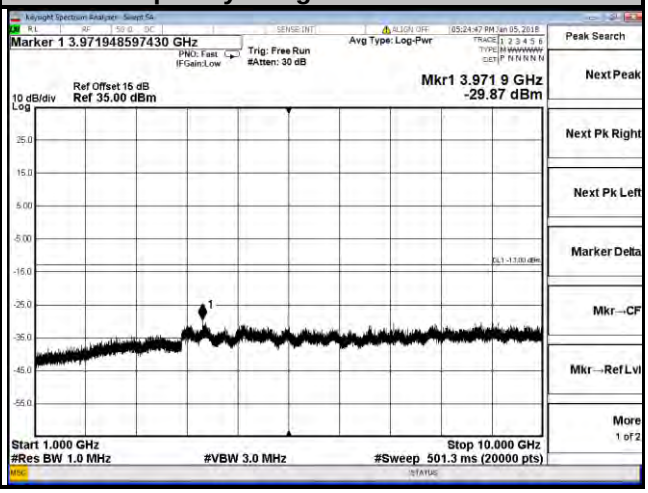


Channel 23173

Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz

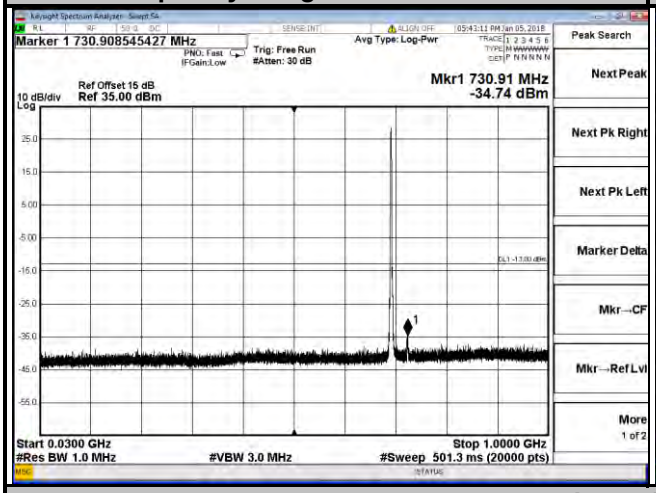


LTE Band 12

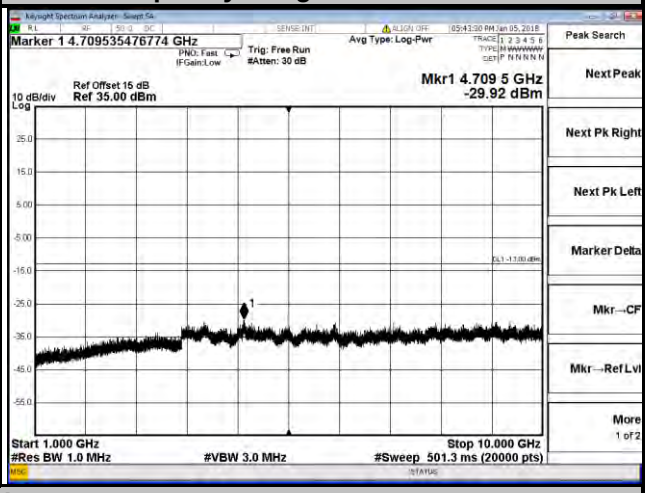
Channel Bandwidth: 3 MHz

Channel 23025

Frequency Range: 30 MHz ~ 1 GHz

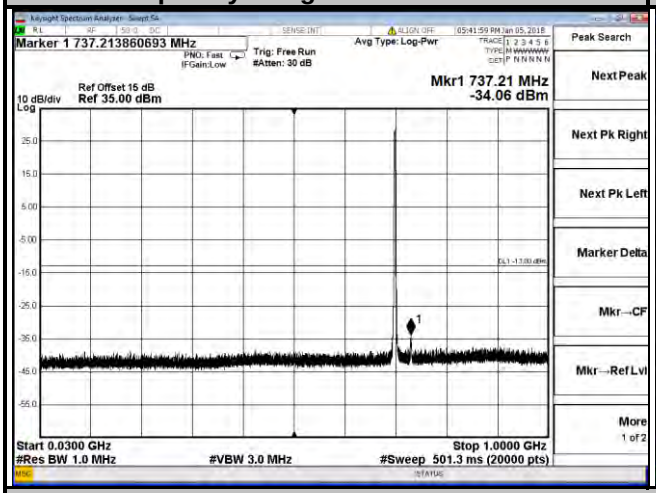


Frequency Range: 1 GHz ~ 10 GHz

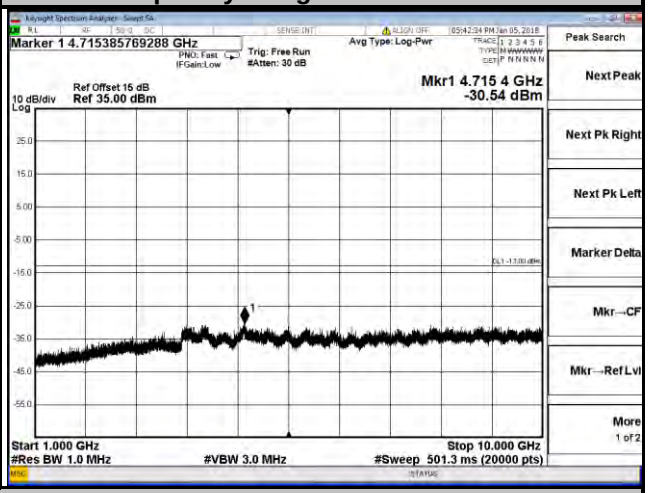


Channel 23095

Frequency Range: 30 MHz ~ 1 GHz

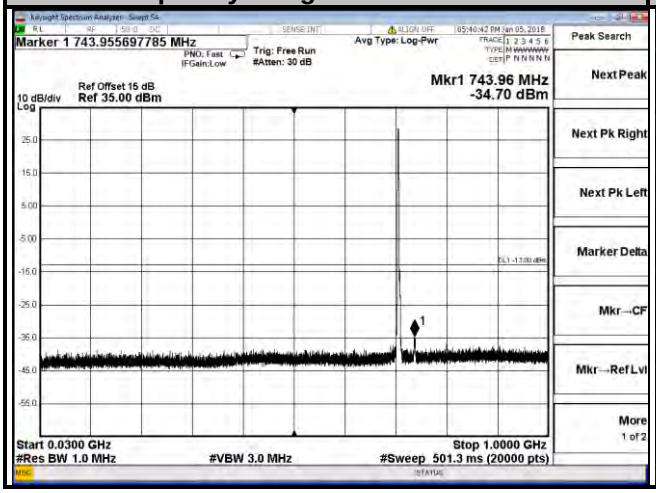


Frequency Range: 1 GHz ~ 10 GHz

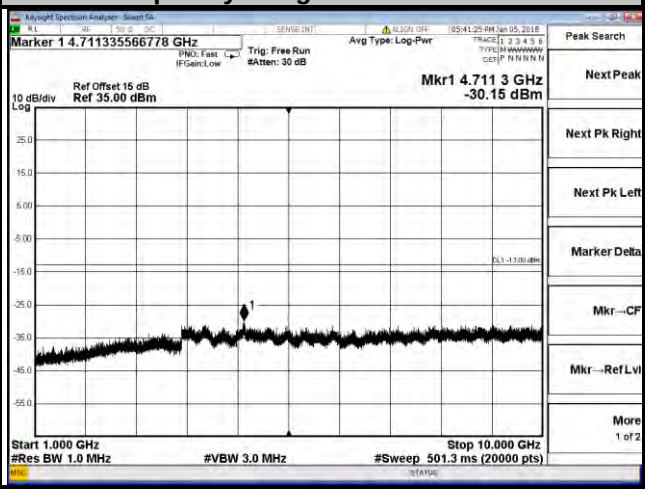


Channel 23165

Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz

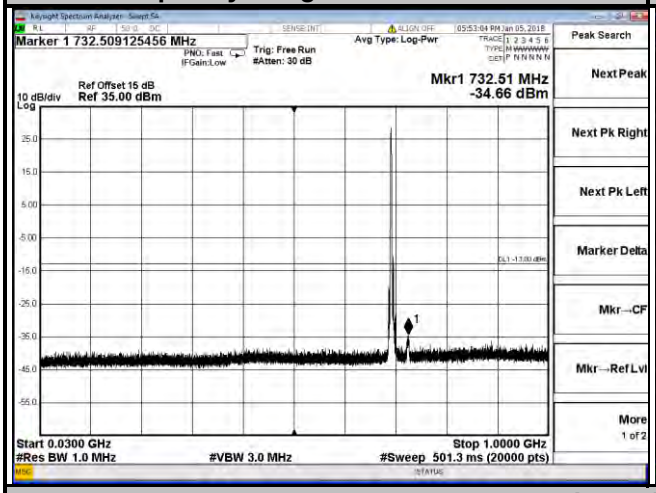


LTE Band 12

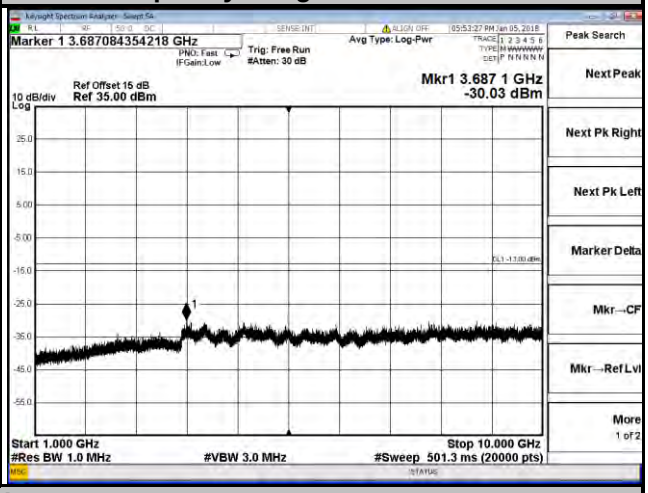
Channel Bandwidth: 5 MHz

Channel 23035

Frequency Range: 30 MHz ~ 1 GHz

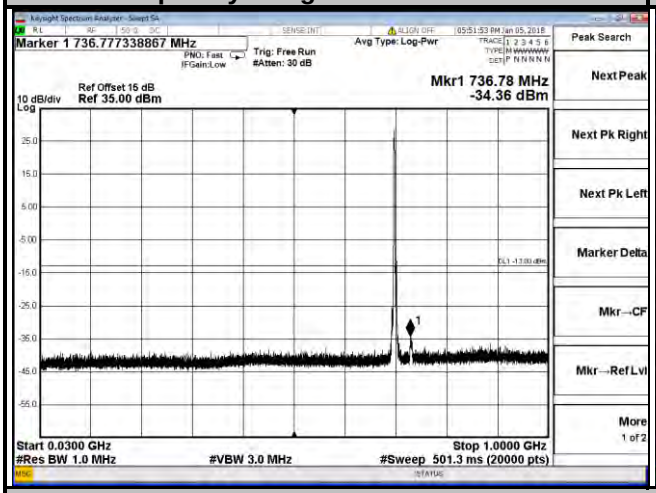


Frequency Range: 1 GHz ~ 10 GHz

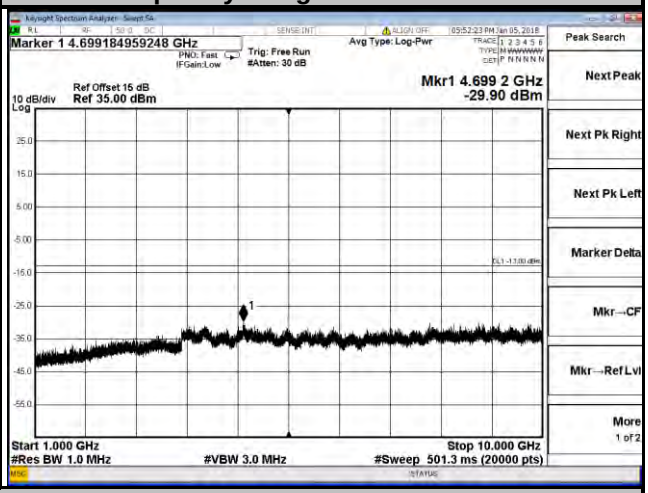


Channel 23095

Frequency Range: 30 MHz ~ 1 GHz

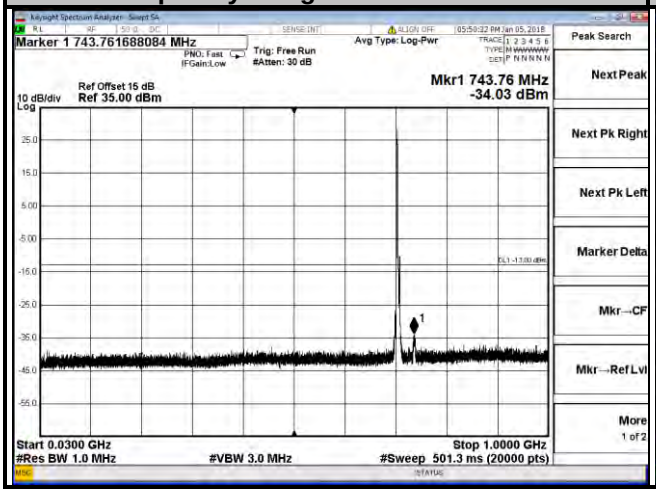


Frequency Range: 1 GHz ~ 10 GHz

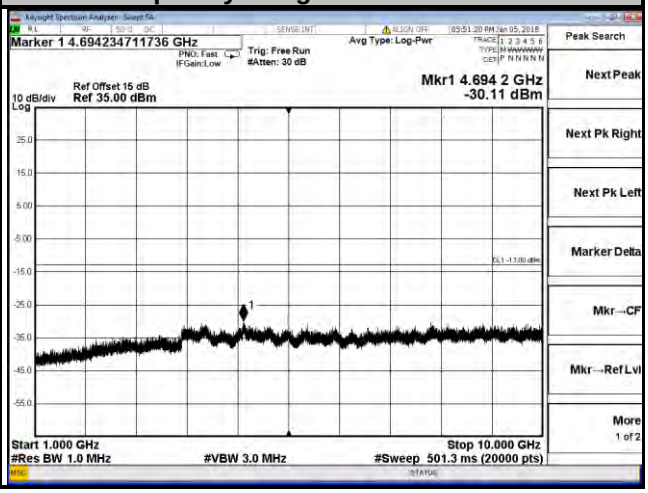


Channel 23155

Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz

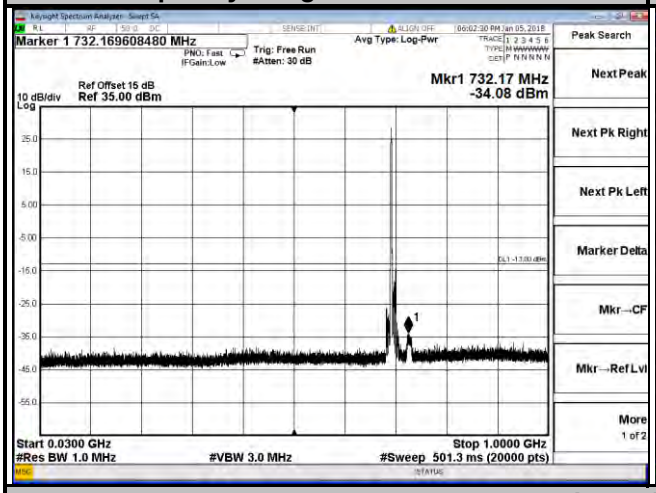


LTE Band 12

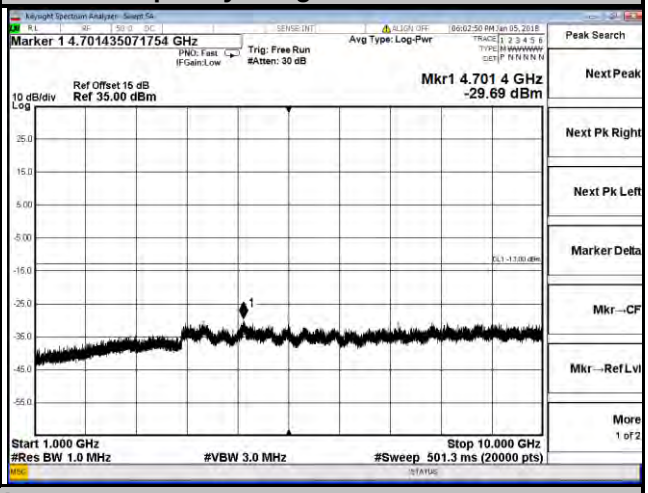
Channel Bandwidth: 10 MHz

Channel 23060

Frequency Range: 30 MHz ~ 1 GHz

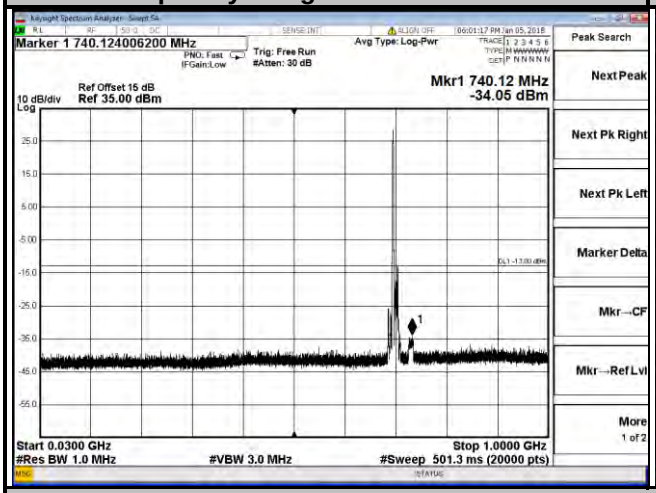


Frequency Range: 1 GHz ~ 10 GHz

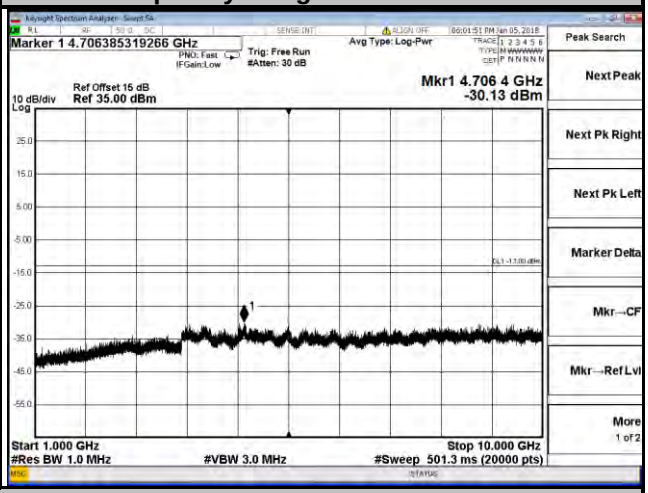


Channel 23095

Frequency Range: 30 MHz ~ 1 GHz

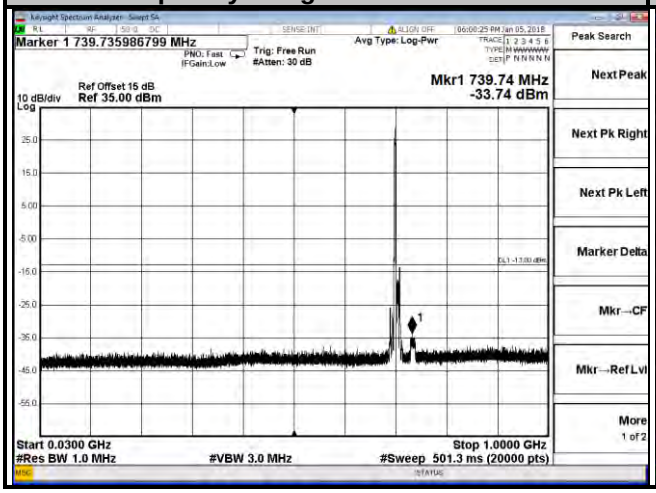


Frequency Range: 1 GHz ~ 10 GHz

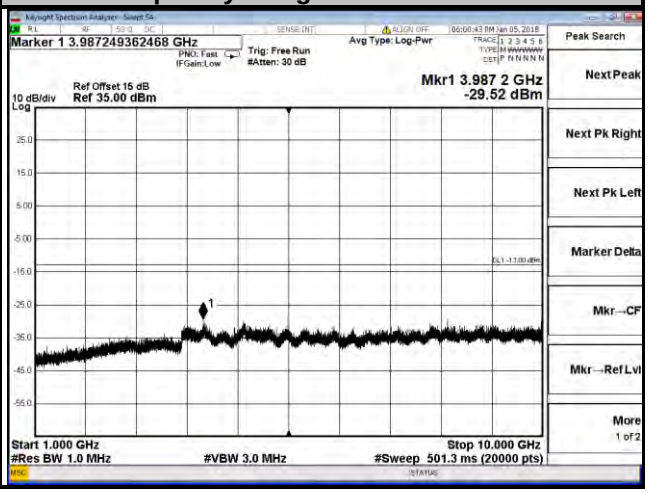


Channel 23130

Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz

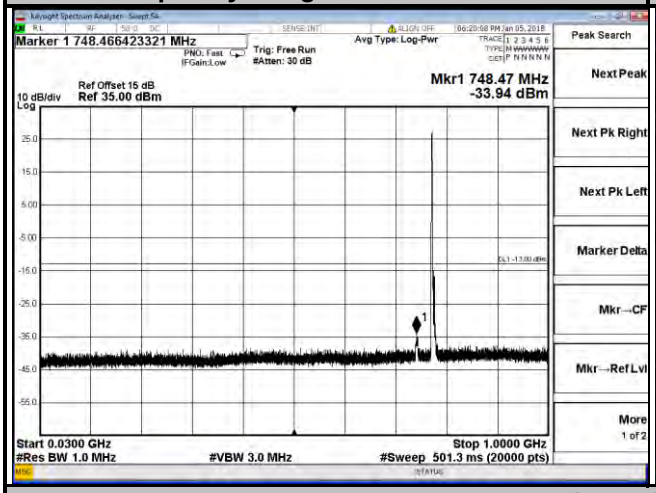


LTE Band 13

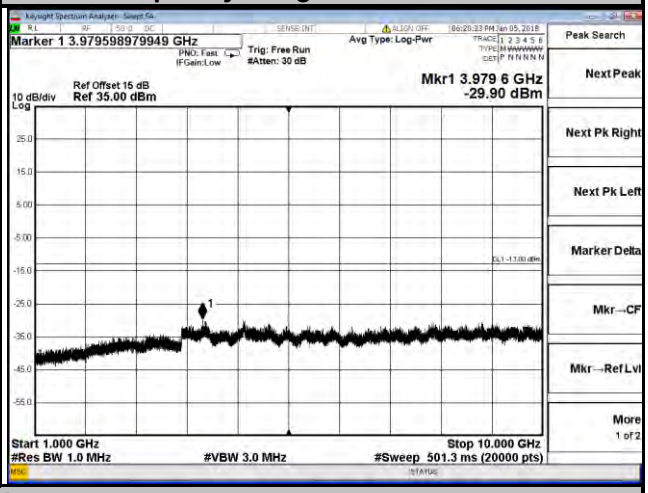
Channel Bandwidth: 5 MHz

Channel 23205

Frequency Range: 30 MHz ~ 1 GHz

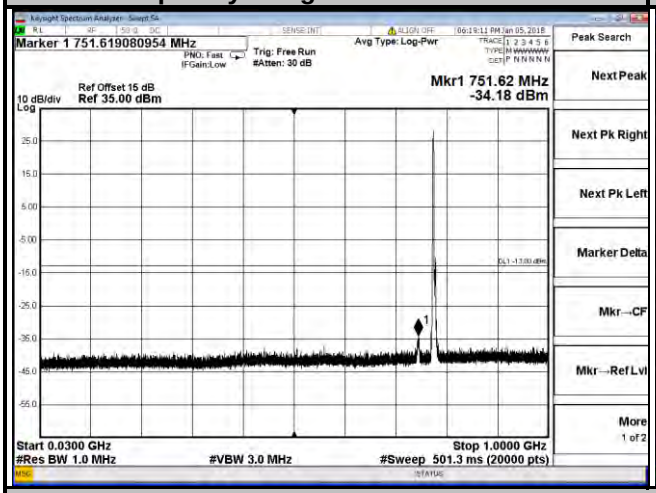


Frequency Range: 1 GHz ~ 10 GHz

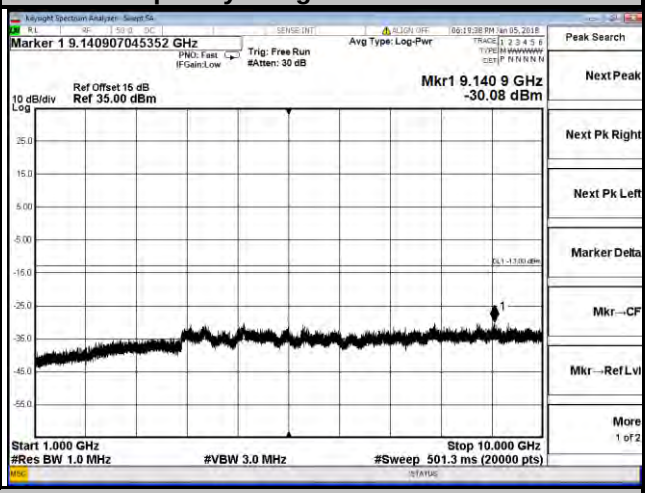


Channel 23230

Frequency Range: 30 MHz ~ 1 GHz

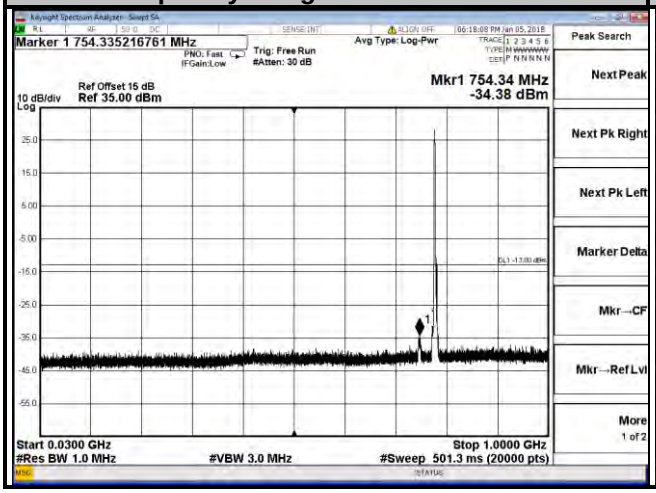


Frequency Range: 1 GHz ~ 10 GHz

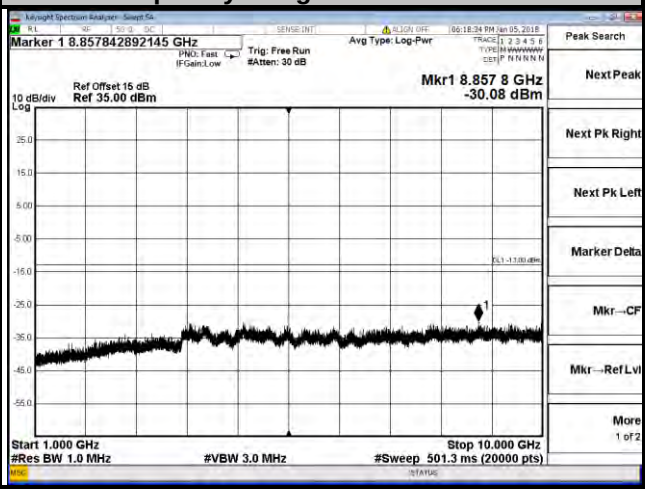


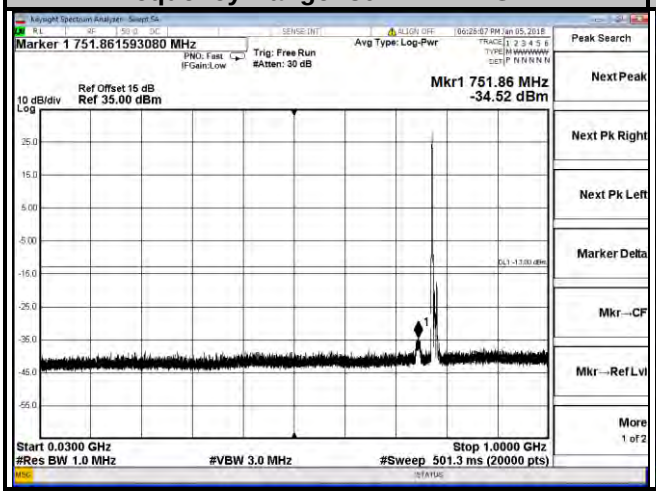
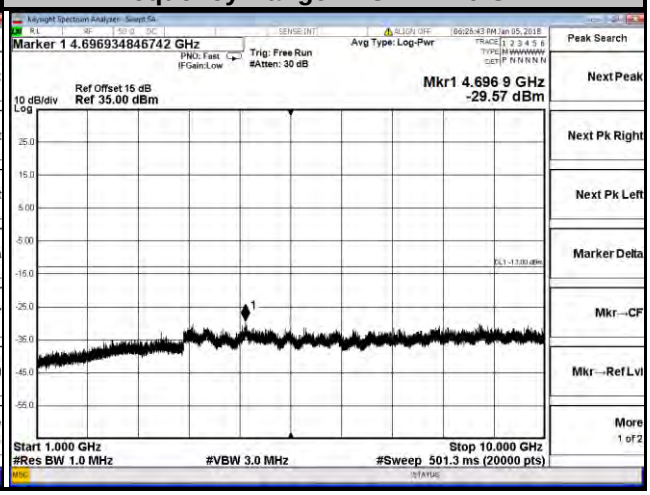
Channel 23255

Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz



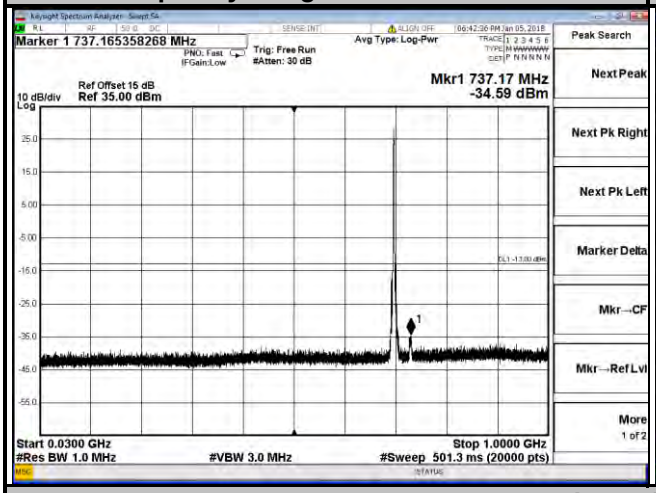
LTE Band 13	
Channel Bandwidth: 10 MHz	
Channel 23230	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	

LTE Band 17

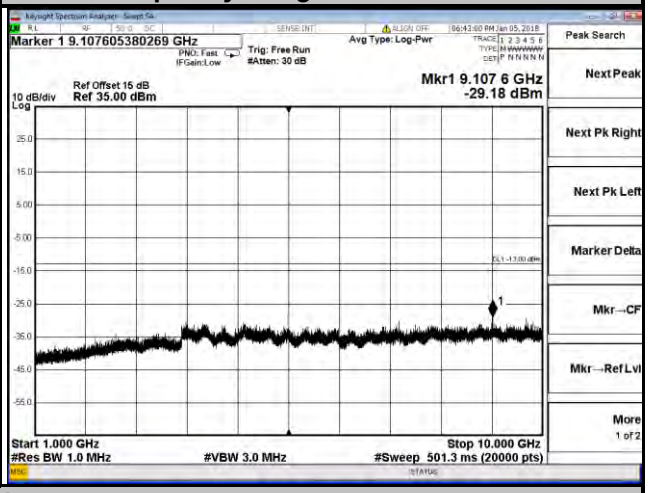
Channel Bandwidth: 5 MHz

Channel 23755

Frequency Range: 30 MHz ~ 1 GHz

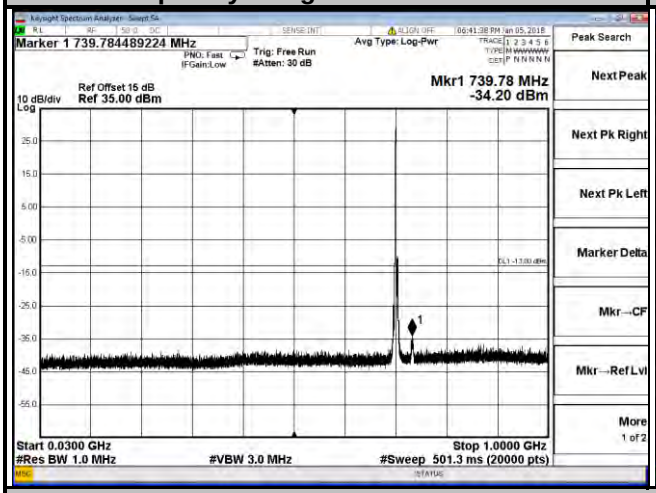


Frequency Range: 1 GHz ~ 10 GHz

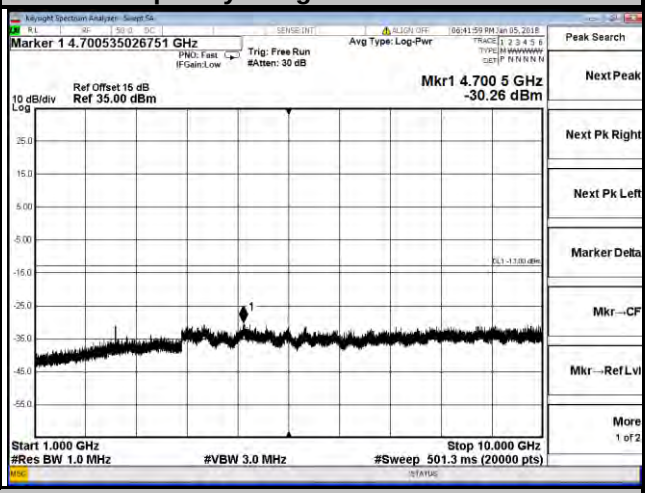


Channel 23790

Frequency Range: 30 MHz ~ 1 GHz

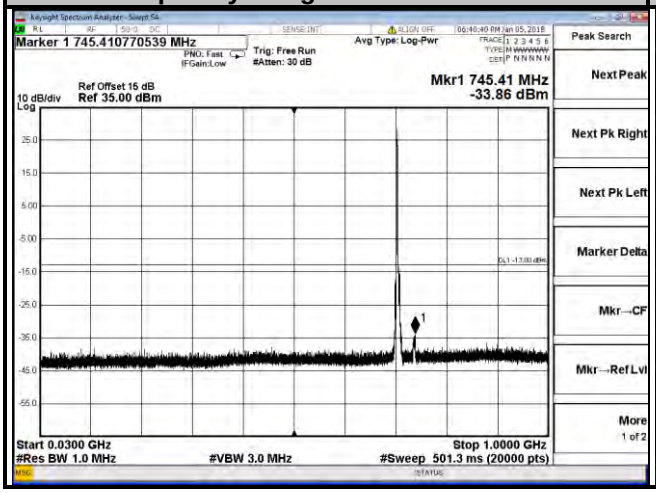


Frequency Range: 1 GHz ~ 10 GHz

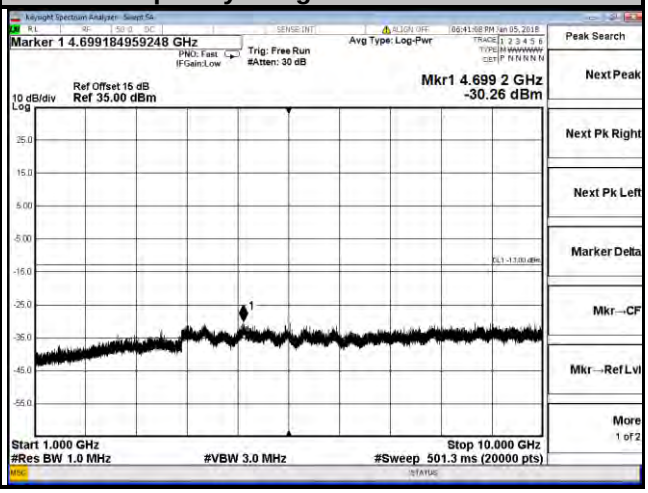


Channel 23825

Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz

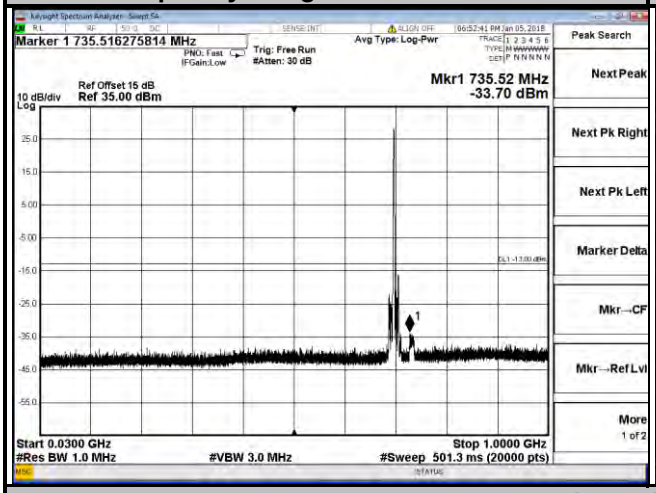


LTE Band 17

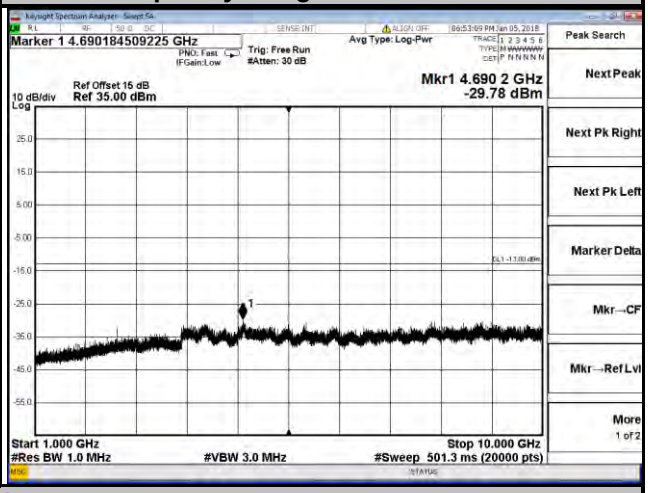
Channel Bandwidth: 10 MHz

Channel 23780

Frequency Range: 30 MHz ~ 1 GHz

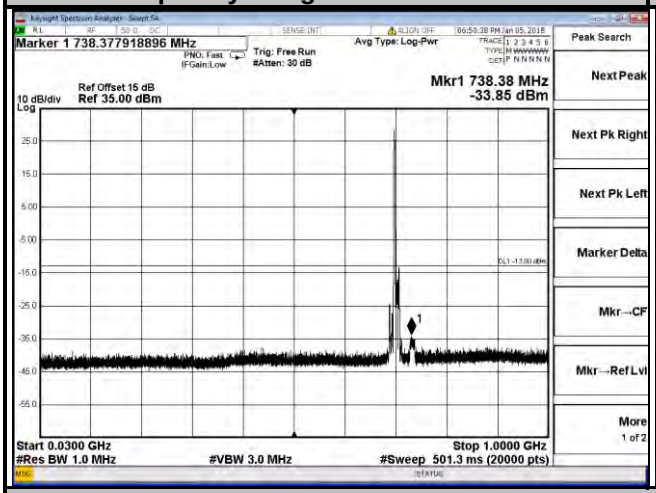


Frequency Range: 1 GHz ~ 10 GHz

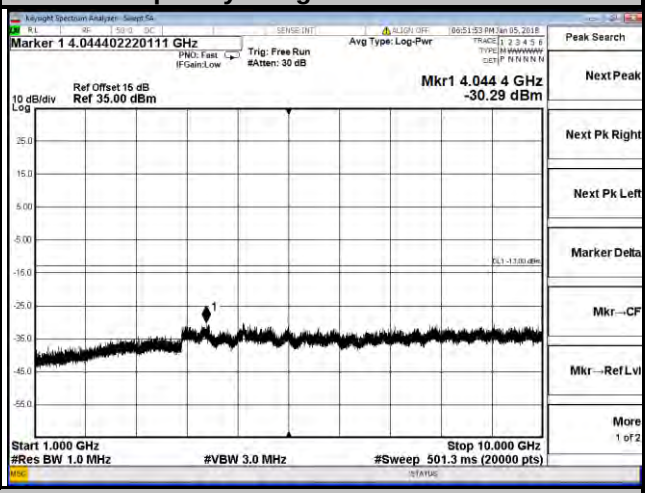


Channel 23790

Frequency Range: 30 MHz ~ 1 GHz

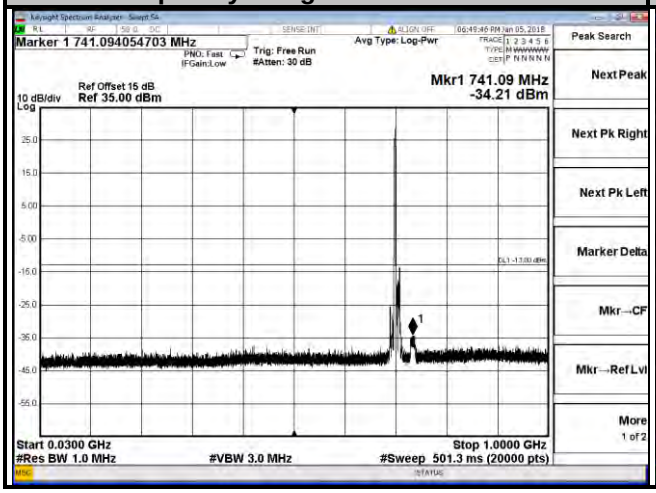


Frequency Range: 1 GHz ~ 10 GHz

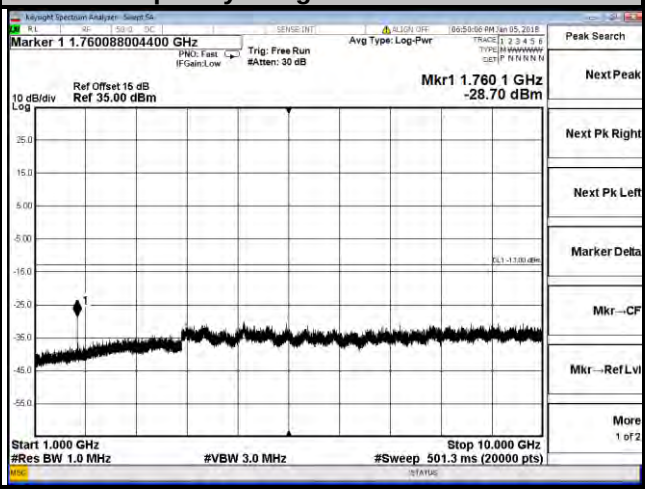


Channel 23800

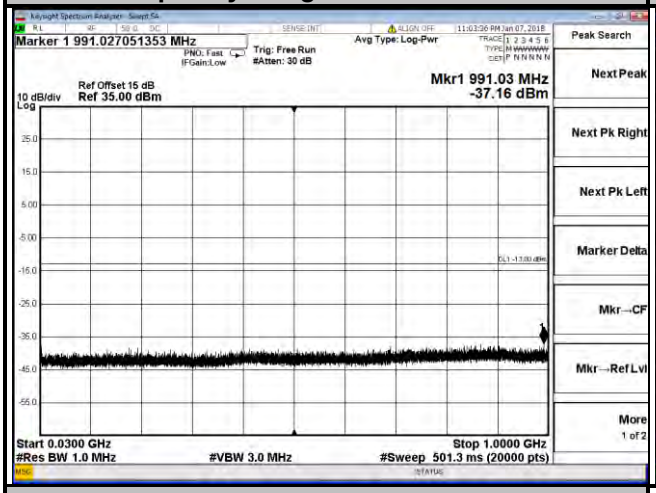
Frequency Range: 30 MHz ~ 1 GHz

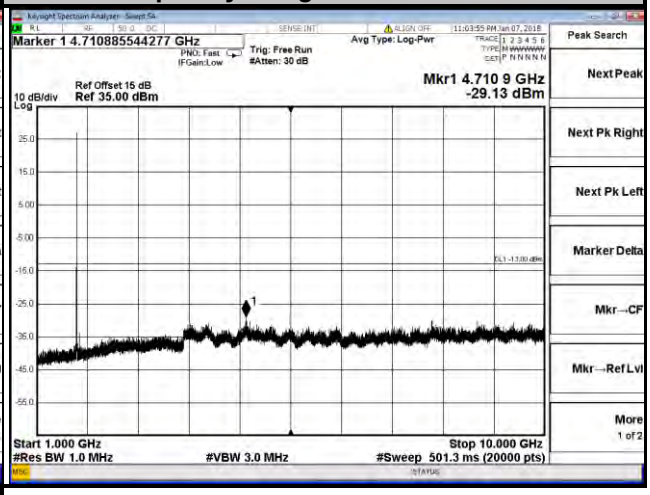


Frequency Range: 1 GHz ~ 10 GHz

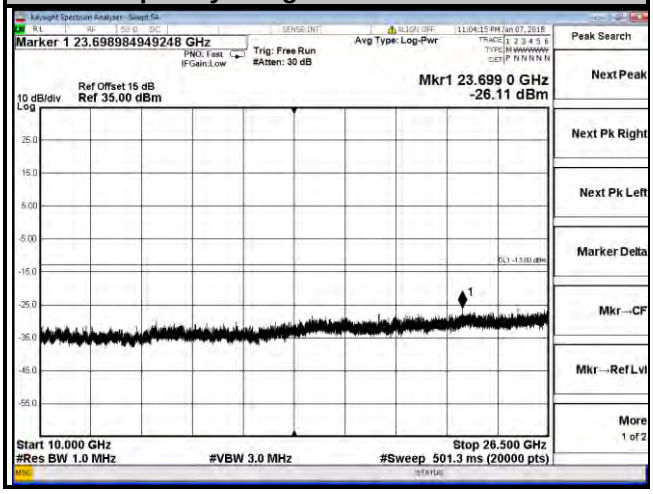


LTE Band 66	
Channel Bandwidth: 1.4 MHz	
Channel 131979	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz

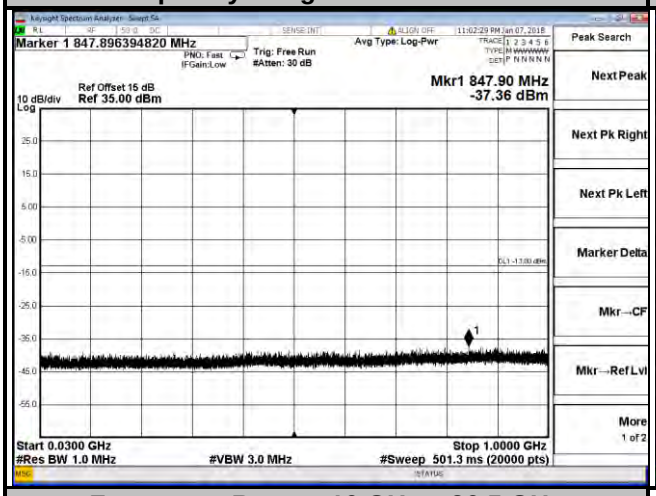


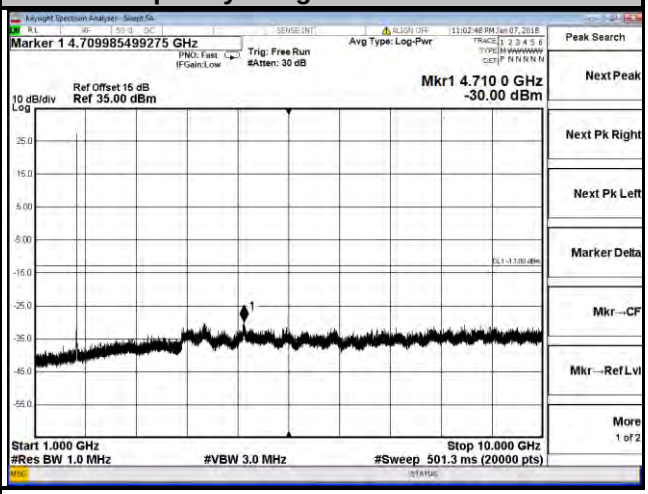


Frequency Range: 10 GHz ~ 26.5 GHz

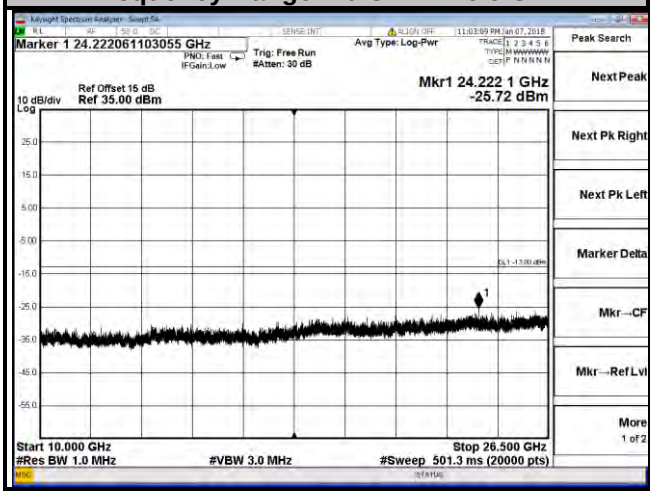


LTE Band 66	
Channel Bandwidth: 1.4 MHz	
Channel 132322	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz



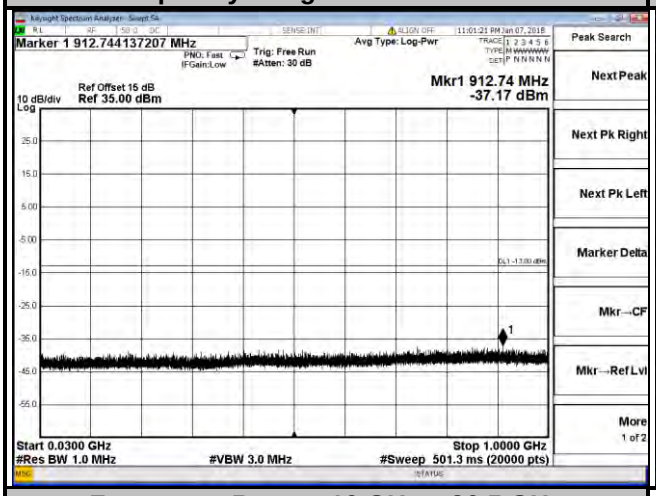


Frequency Range: 10 GHz ~ 26.5 GHz

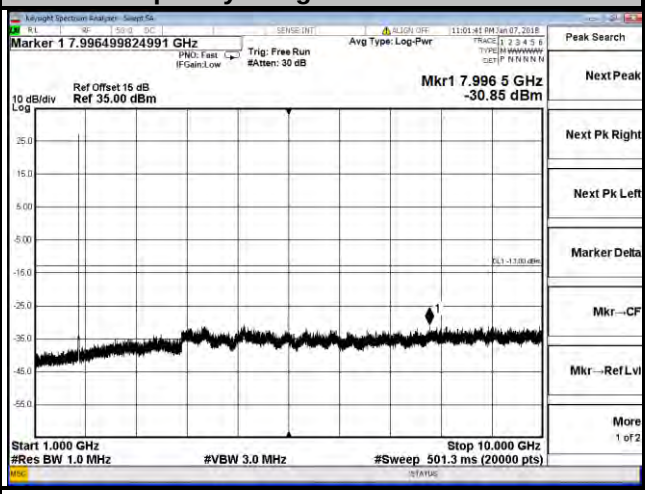


LTE Band 66
Channel Bandwidth: 1.4 MHz
Channel 132655

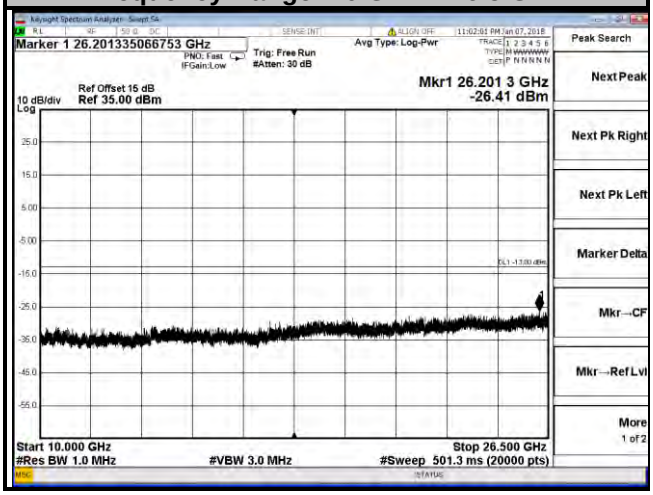
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz

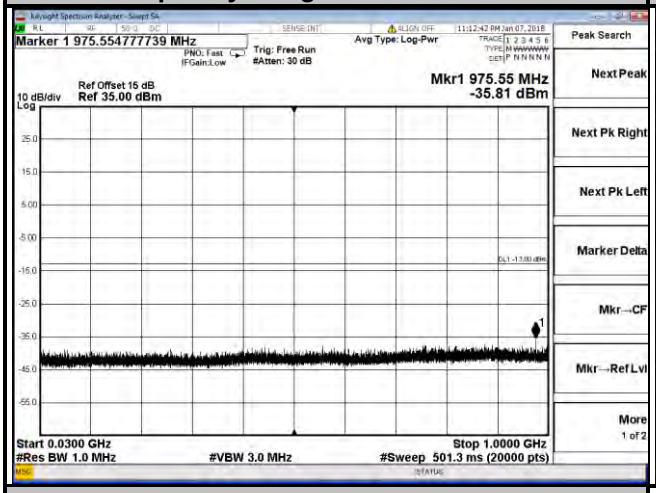


Frequency Range: 10 GHz ~ 26.5 GHz

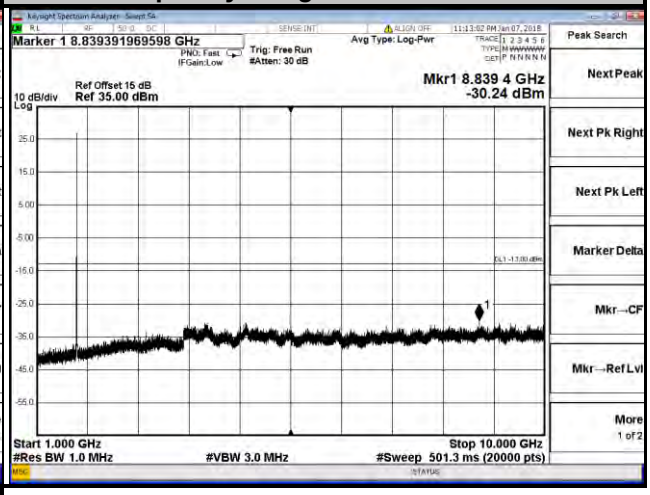


LTE Band 66
Channel Bandwidth: 3 MHz
Channel 131987

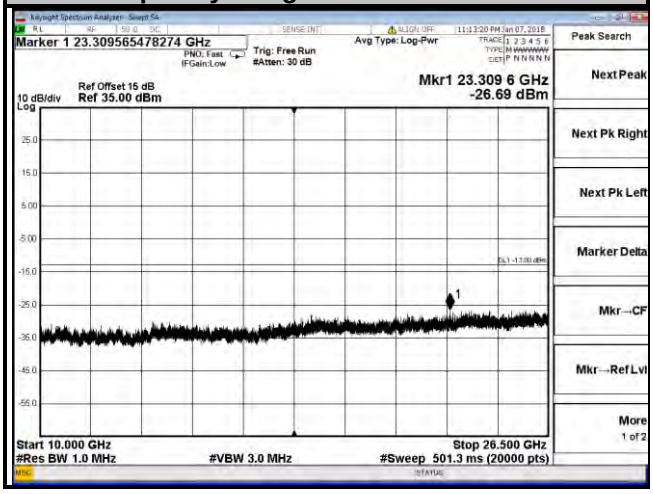
Frequency Range: 30 MHz ~ 1 GHz



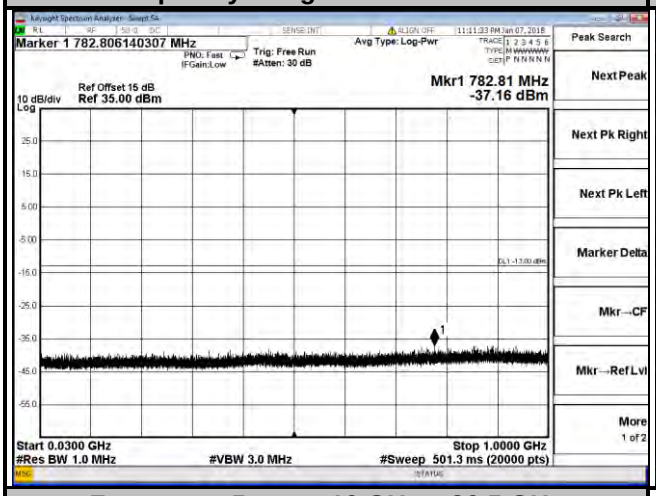
Frequency Range: 1 GHz ~ 10 GHz

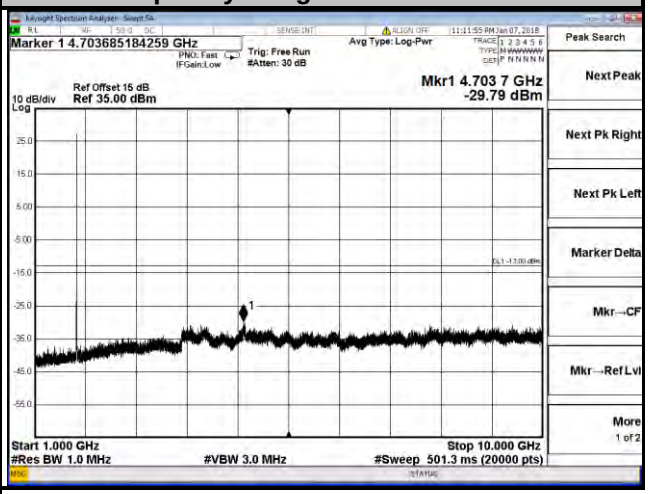


Frequency Range: 10 GHz ~ 26.5 GHz

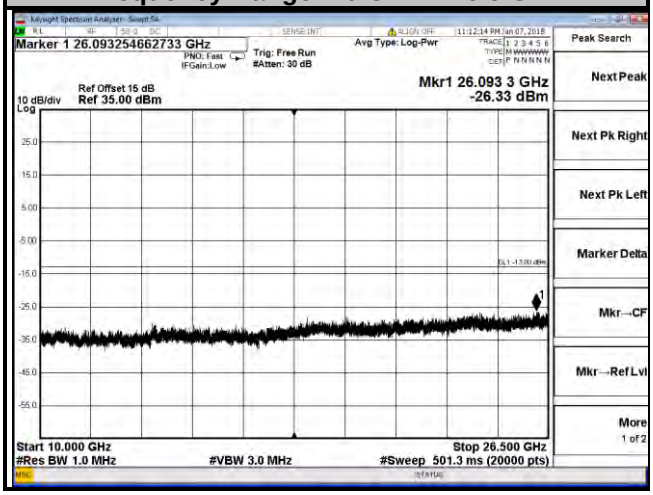


LTE Band 66	
Channel Bandwidth: 3 MHz	
Channel 132322	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz

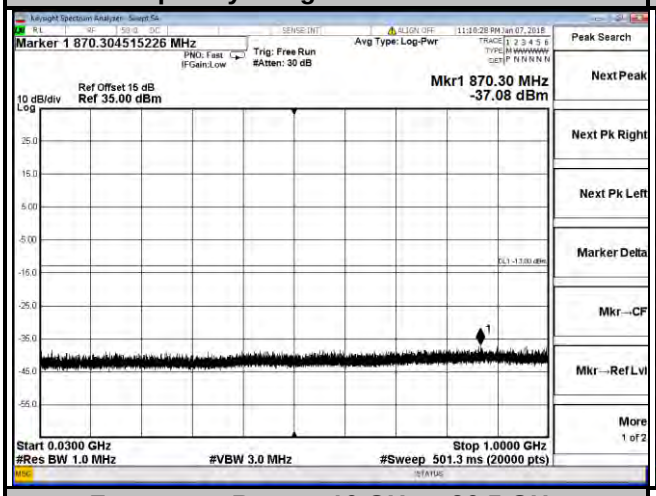


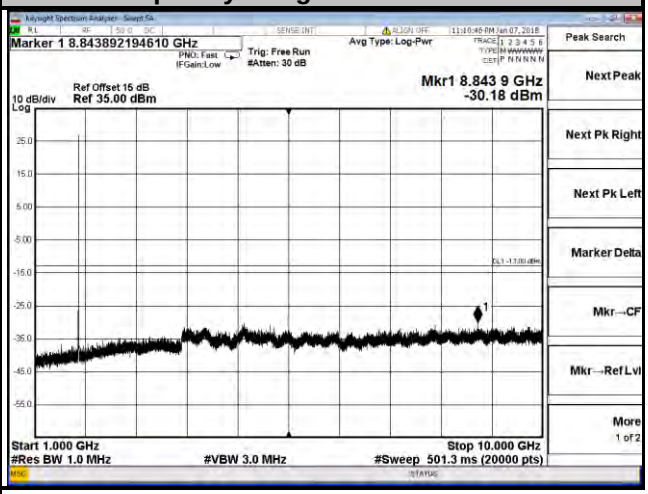


Frequency Range: 10 GHz ~ 26.5 GHz

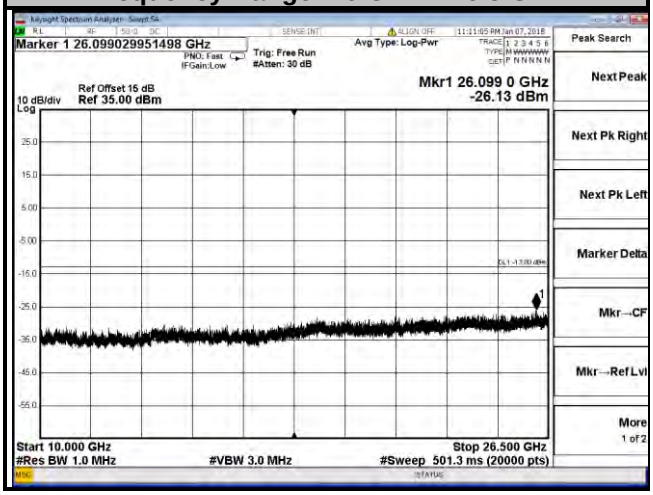


LTE Band 66	
Channel Bandwidth: 3 MHz	
Channel 132657	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz



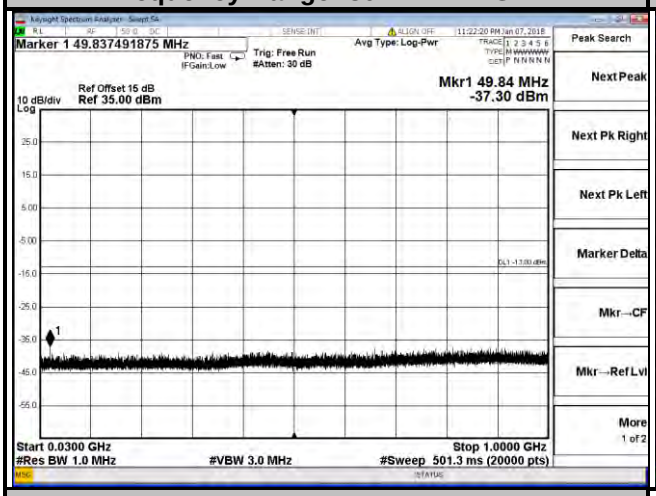


Frequency Range: 10 GHz ~ 26.5 GHz

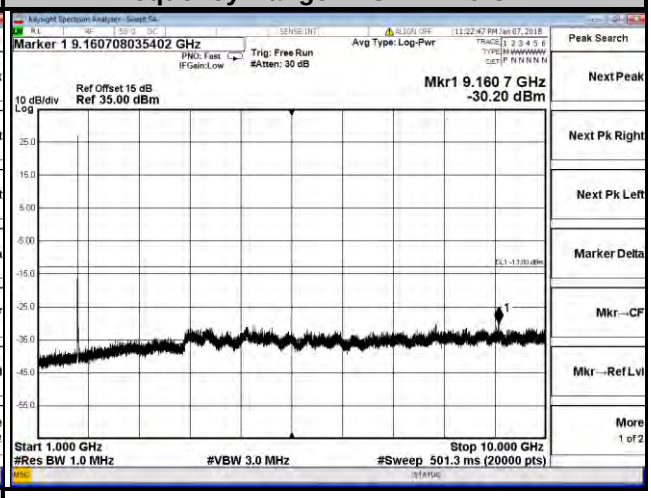


LTE Band 66
Channel Bandwidth: 5 MHz
Channel 131997

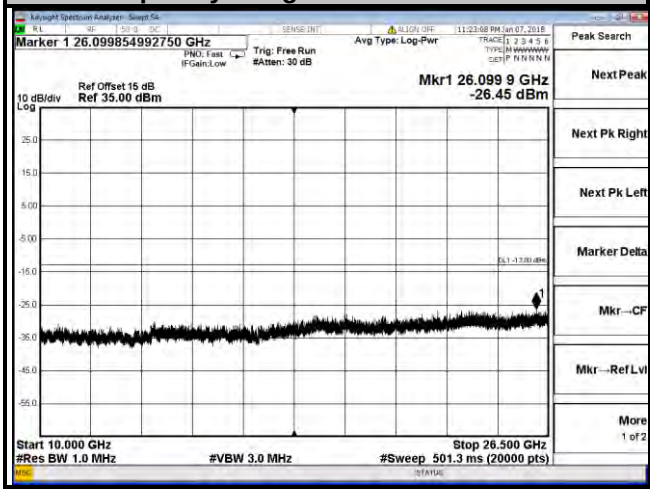
Frequency Range: 30 MHz ~ 1 GHz



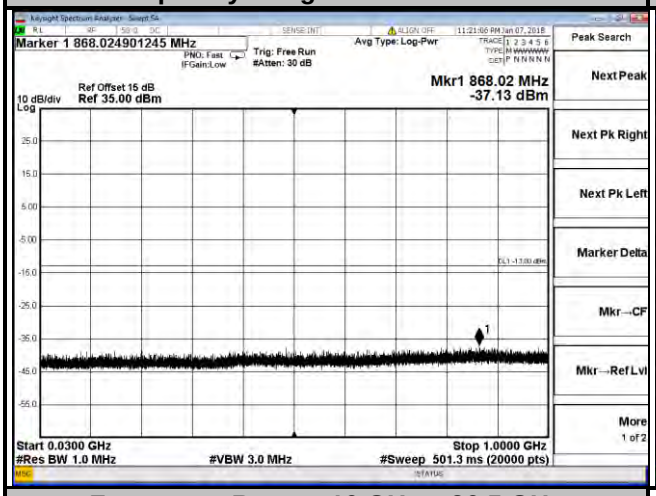
Frequency Range: 1 GHz ~ 10 GHz

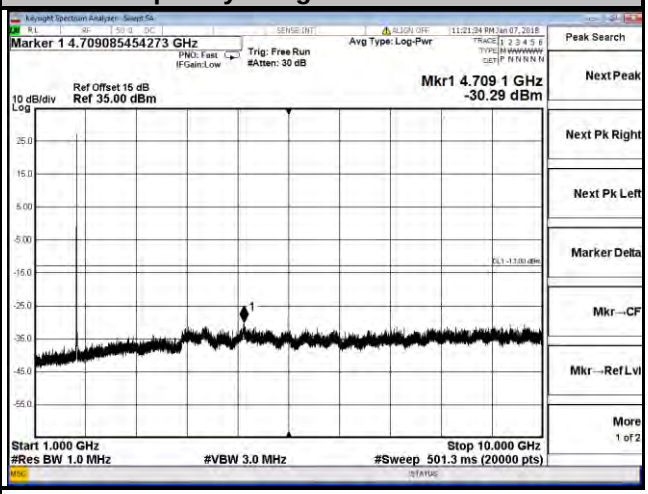


Frequency Range: 10 GHz ~ 26.5 GHz

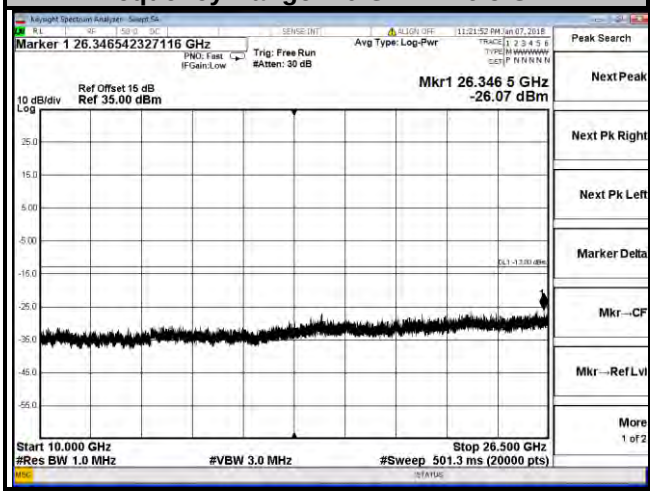


LTE Band 66	
Channel Bandwidth: 5 MHz	
Channel 132322	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz

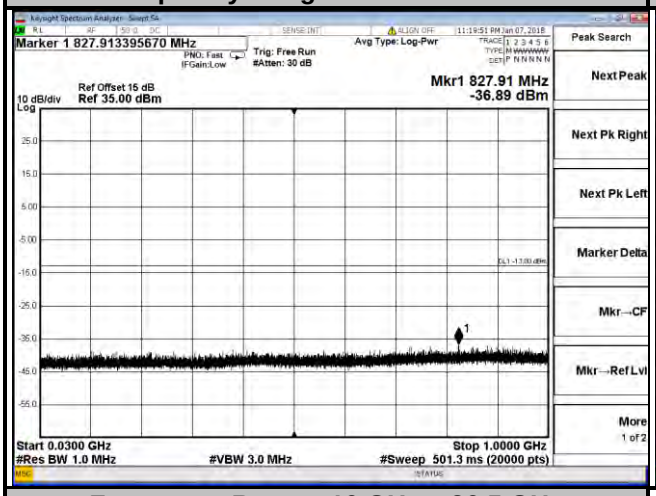


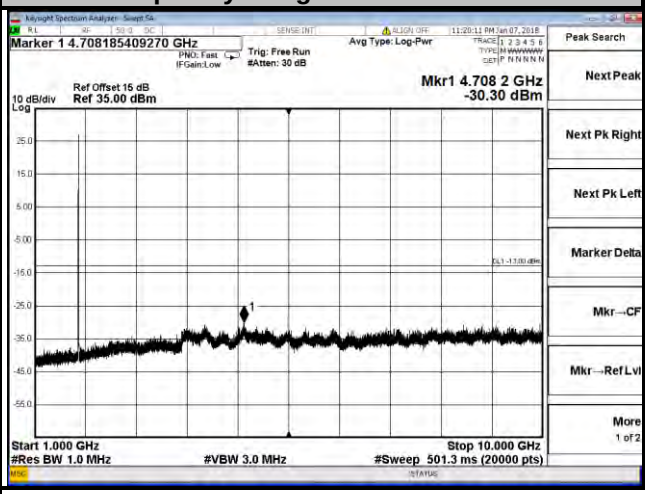


Frequency Range: 10 GHz ~ 26.5 GHz

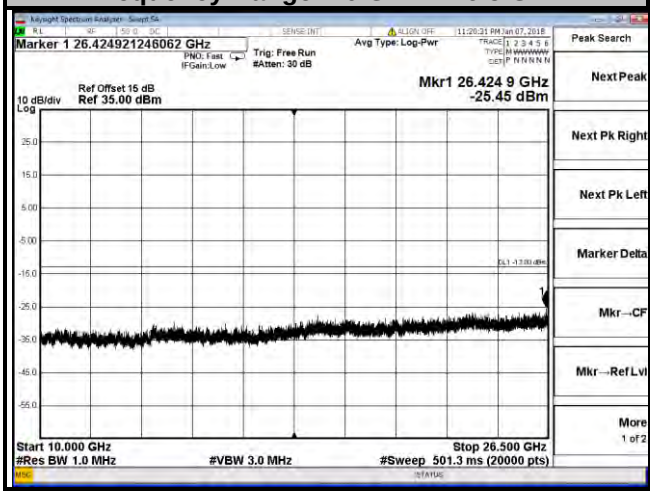


LTE Band 66	
Channel Bandwidth: 5 MHz	
Channel 132647	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz



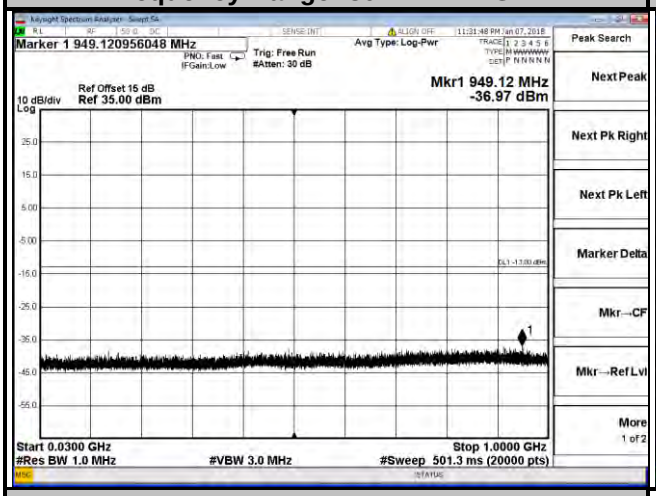


Frequency Range: 10 GHz ~ 26.5 GHz

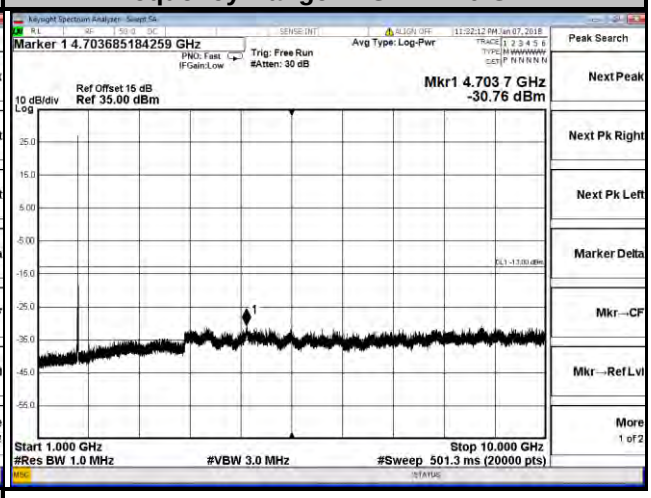


LTE Band 66
Channel Bandwidth: 10 MHz
Channel 132022

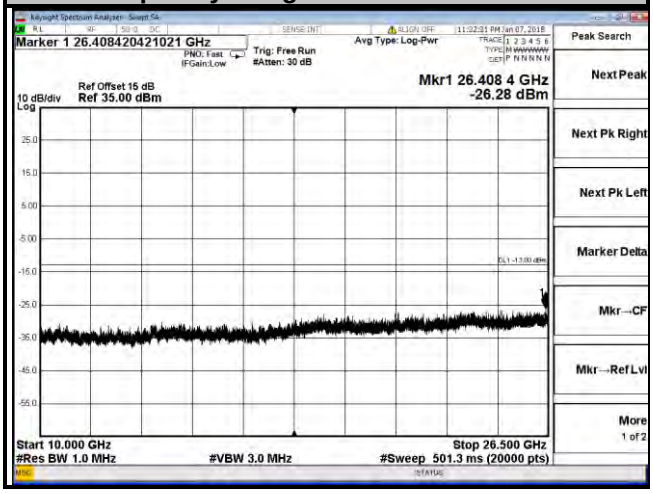
Frequency Range: 30 MHz ~ 1 GHz



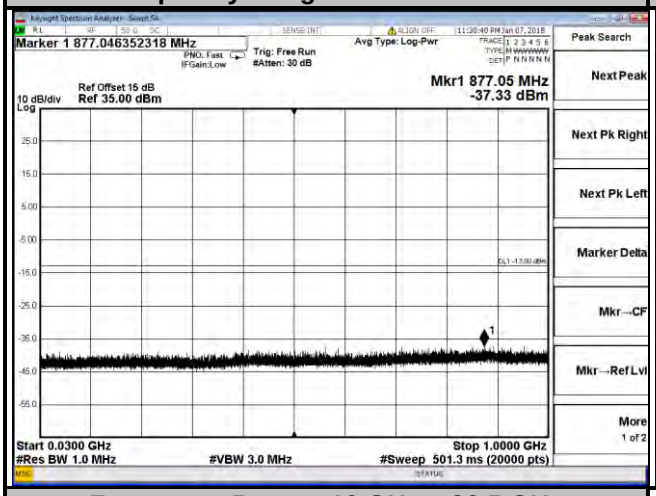
Frequency Range: 1 GHz ~ 10 GHz

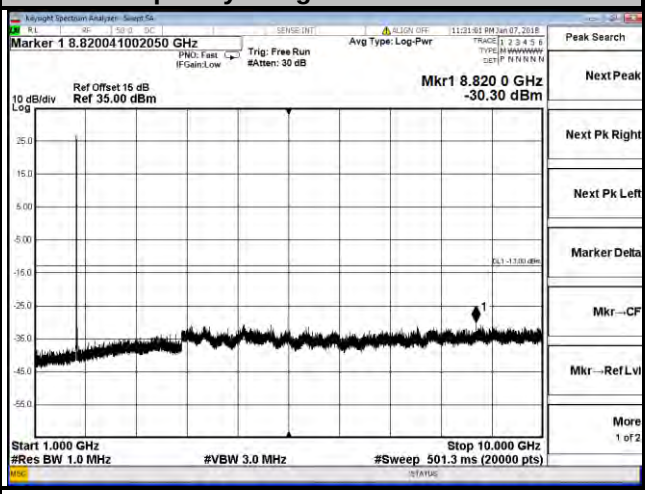


Frequency Range: 10 GHz ~ 26.5 GHz

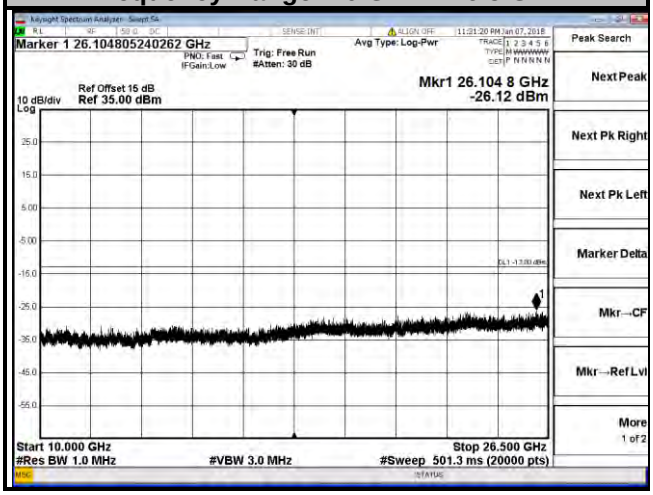


LTE Band 66	
Channel Bandwidth: 10 MHz	
Channel 132322	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz

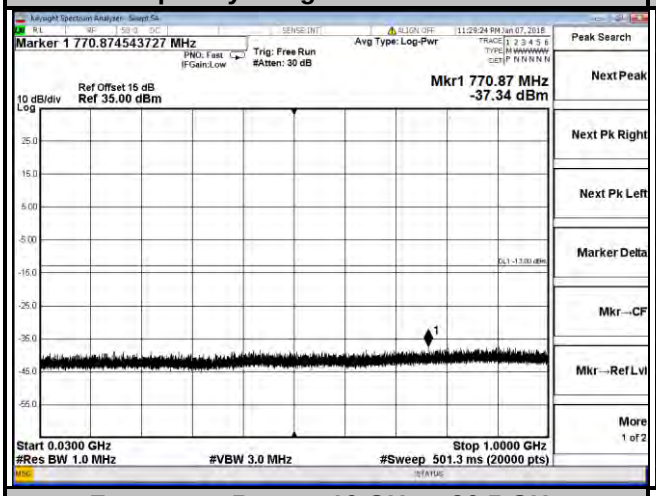


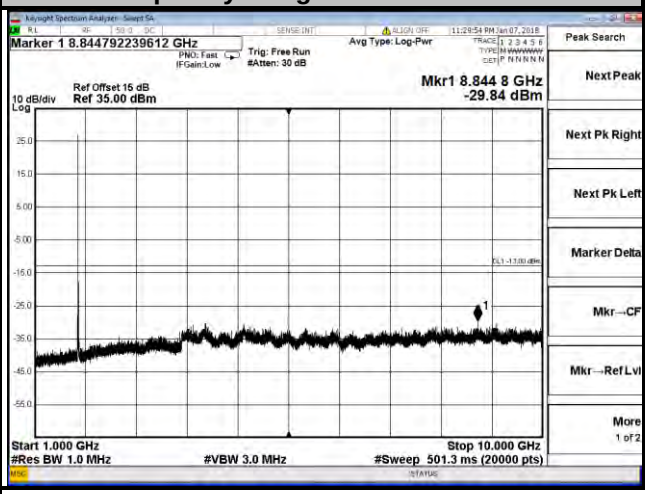


Frequency Range: 10 GHz ~ 26.5 GHz

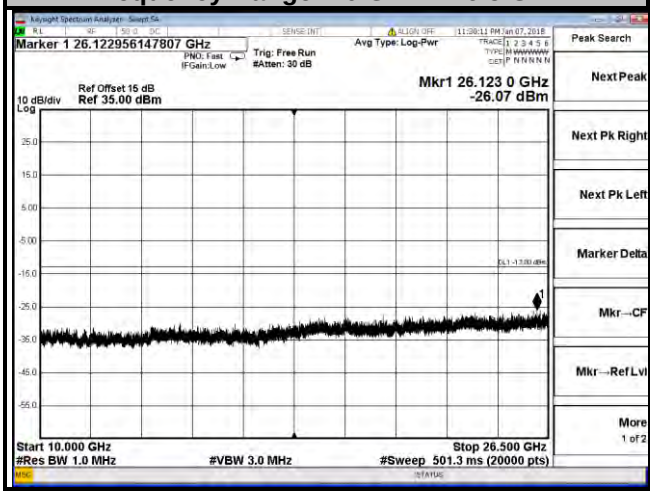


LTE Band 66	
Channel Bandwidth: 10 MHz	
Channel 132622	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz



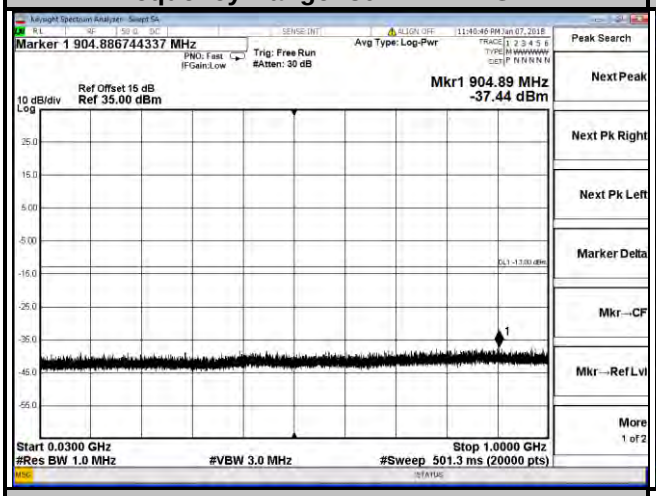


Frequency Range: 10 GHz ~ 26.5 GHz

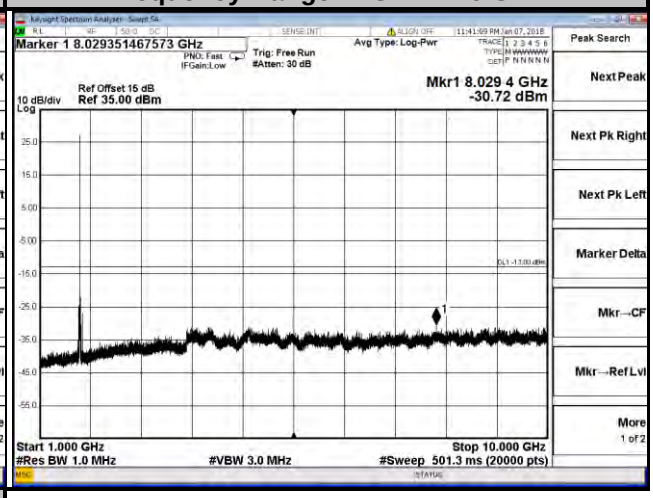


LTE Band 66
Channel Bandwidth: 15 MHz
Channel 132047

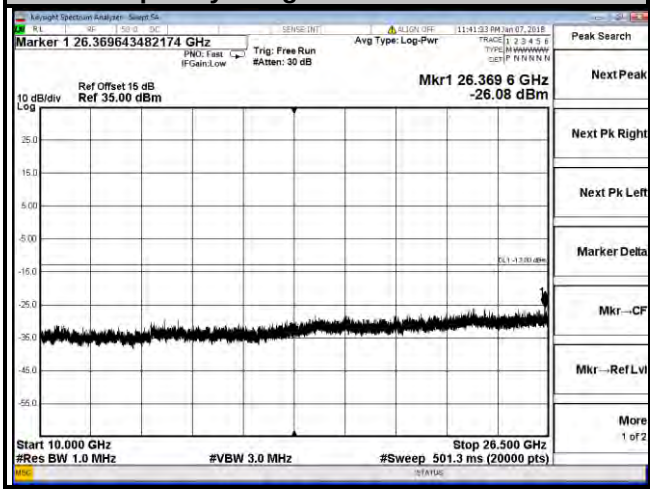
Frequency Range: 30 MHz ~ 1 GHz



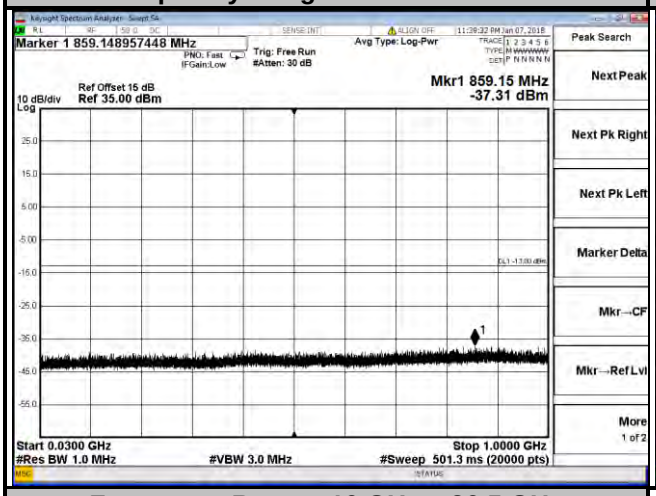
Frequency Range: 1 GHz ~ 10 GHz

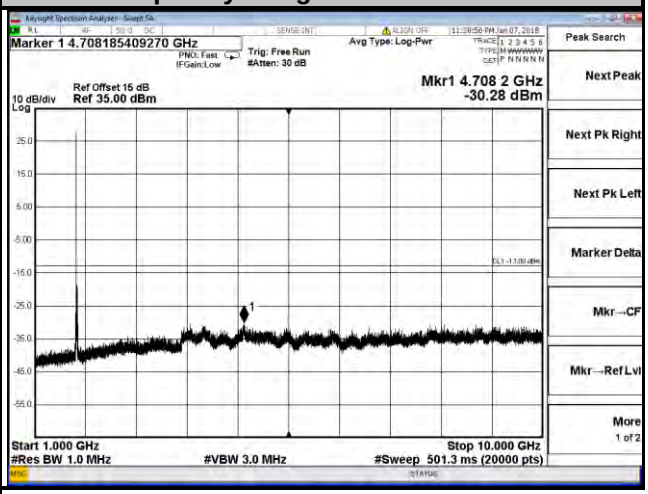


Frequency Range: 10 GHz ~ 26.5 GHz

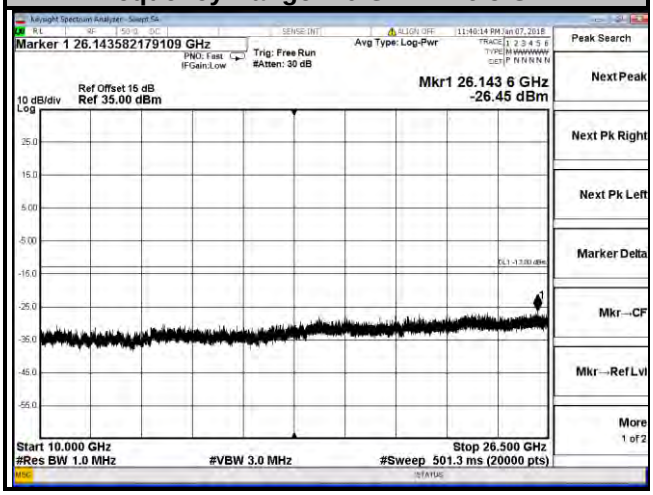


LTE Band 66	
Channel Bandwidth: 15 MHz	
Channel 132322	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz

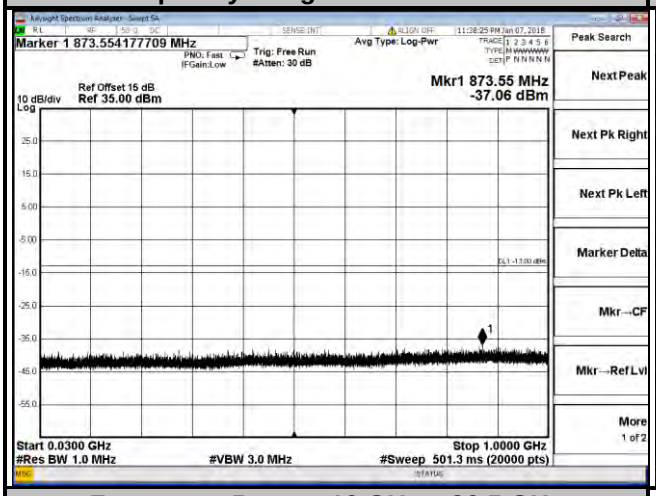


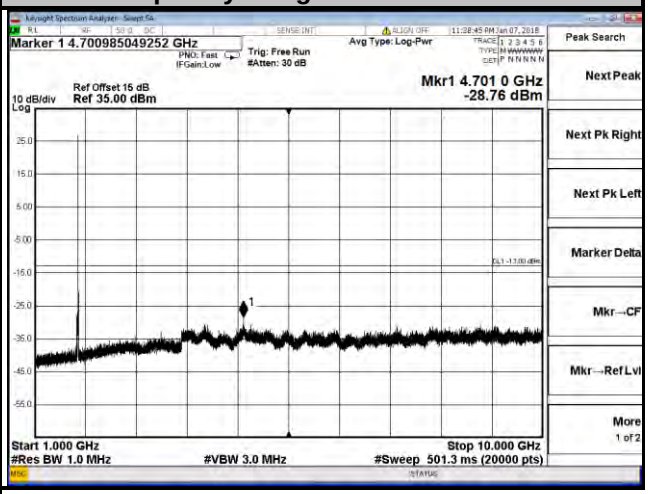


Frequency Range: 10 GHz ~ 26.5 GHz

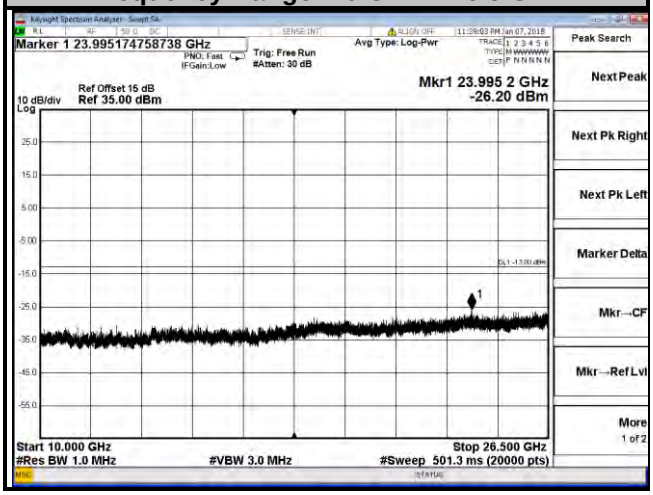


LTE Band 66	
Channel Bandwidth: 15 MHz	
Channel 132597	
Frequency Range: 30 MHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz



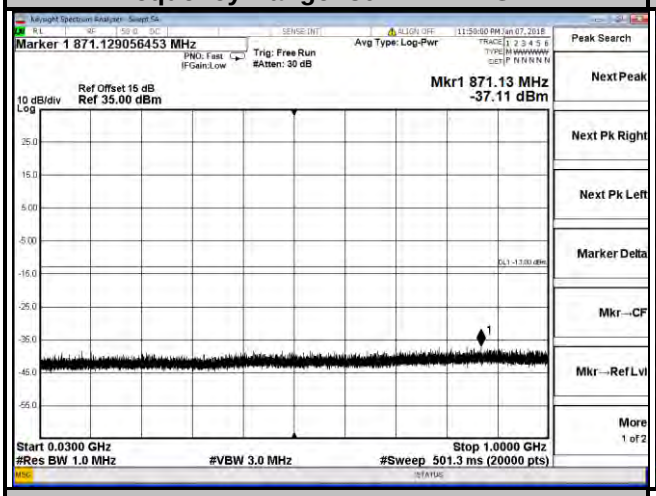


Frequency Range: 10 GHz ~ 26.5 GHz

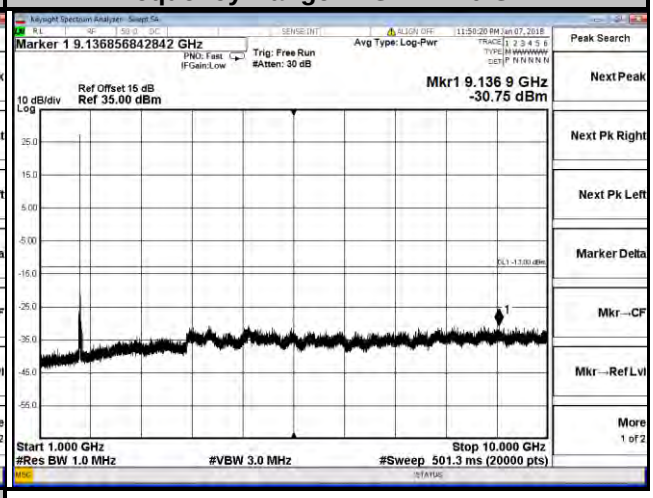


LTE Band 66
Channel Bandwidth: 20 MHz
Channel 132072

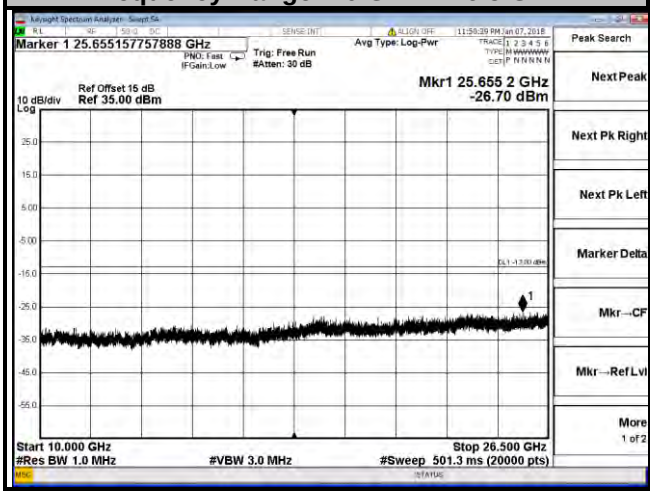
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz

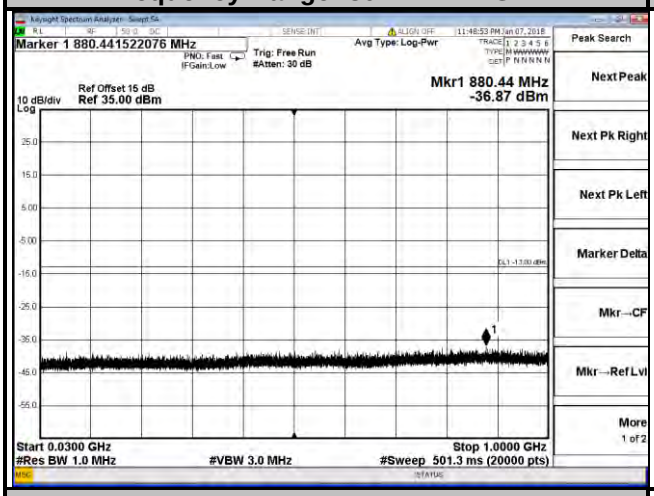


Frequency Range: 10 GHz ~ 26.5 GHz

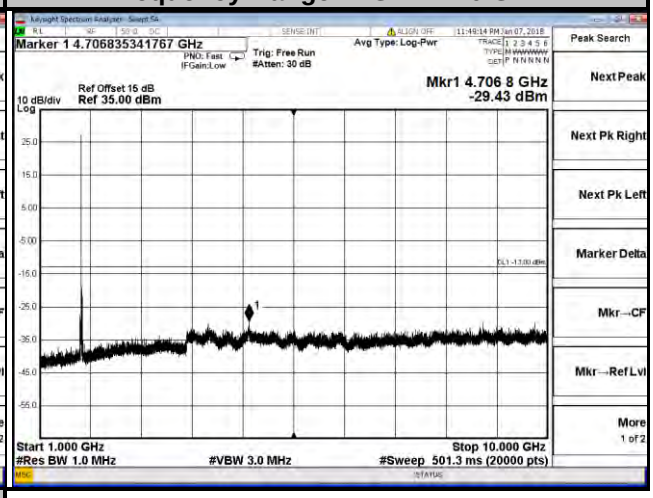


LTE Band 66
Channel Bandwidth: 20 MHz
Channel 132322

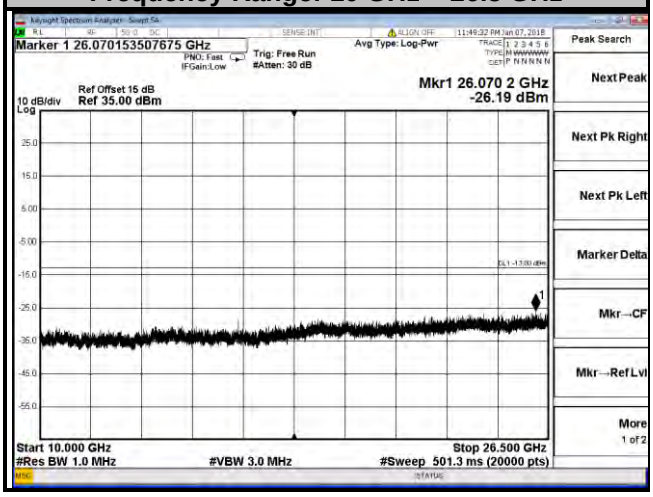
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz

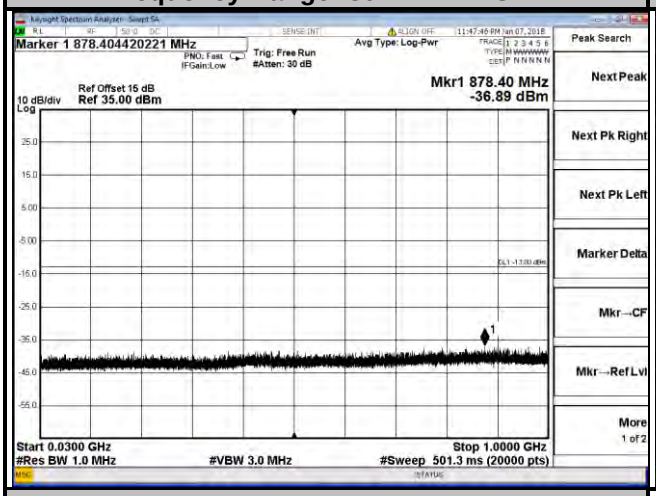


Frequency Range: 10 GHz ~ 26.5 GHz

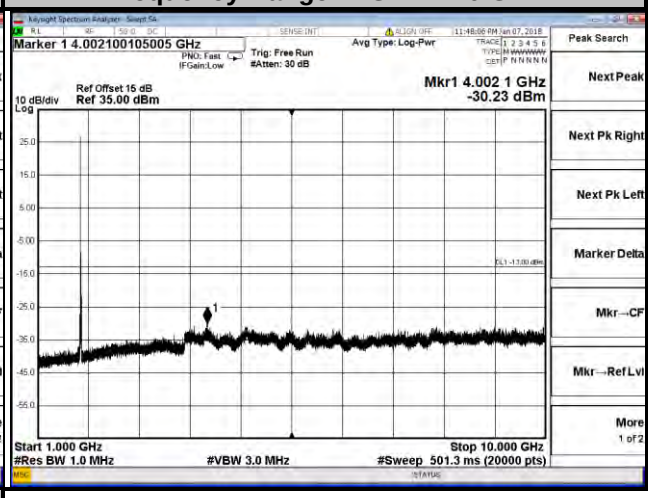


LTE Band 66
Channel Bandwidth: 20 MHz
Channel 132572

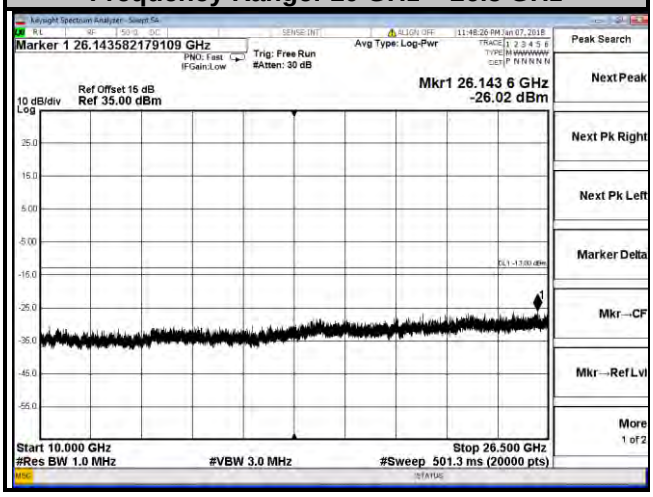
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz



Frequency Range: 10 GHz ~ 26.5 GHz



4.7 Radiated Emission Measurement

4.7.1 Limits of Radiated Emission Measurement

a. The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10(P) dB. The limit of emission is equal to -13 dBm.
b. For operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz. The limit of emissions is equal to -40 dBm.

4.7.2 Test Procedure

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G.
c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15 dBi.

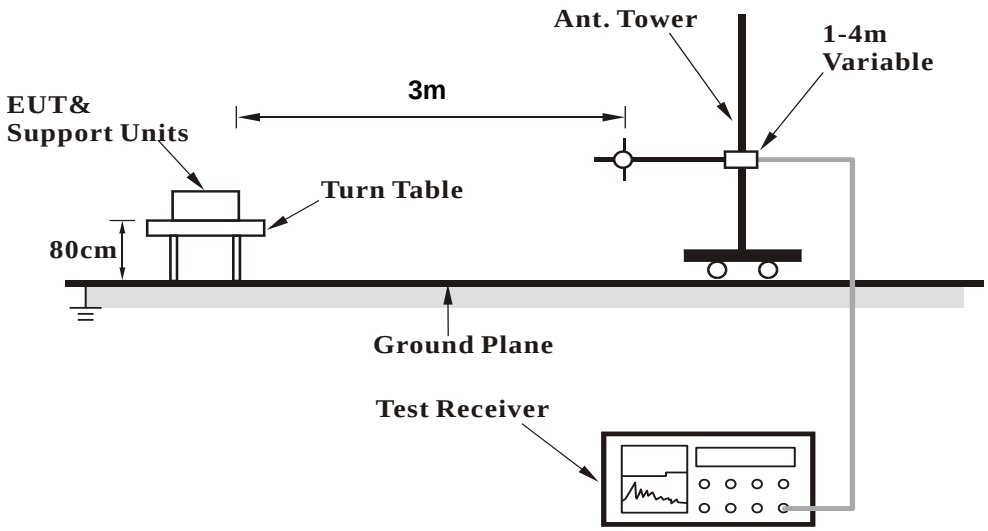
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.7.3 Deviation from Test Standard

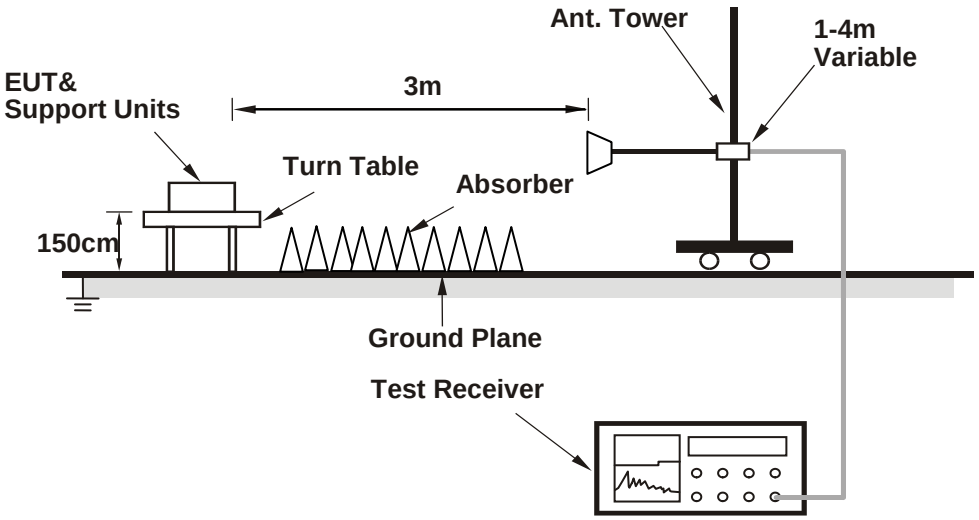
No deviation.

4.7.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



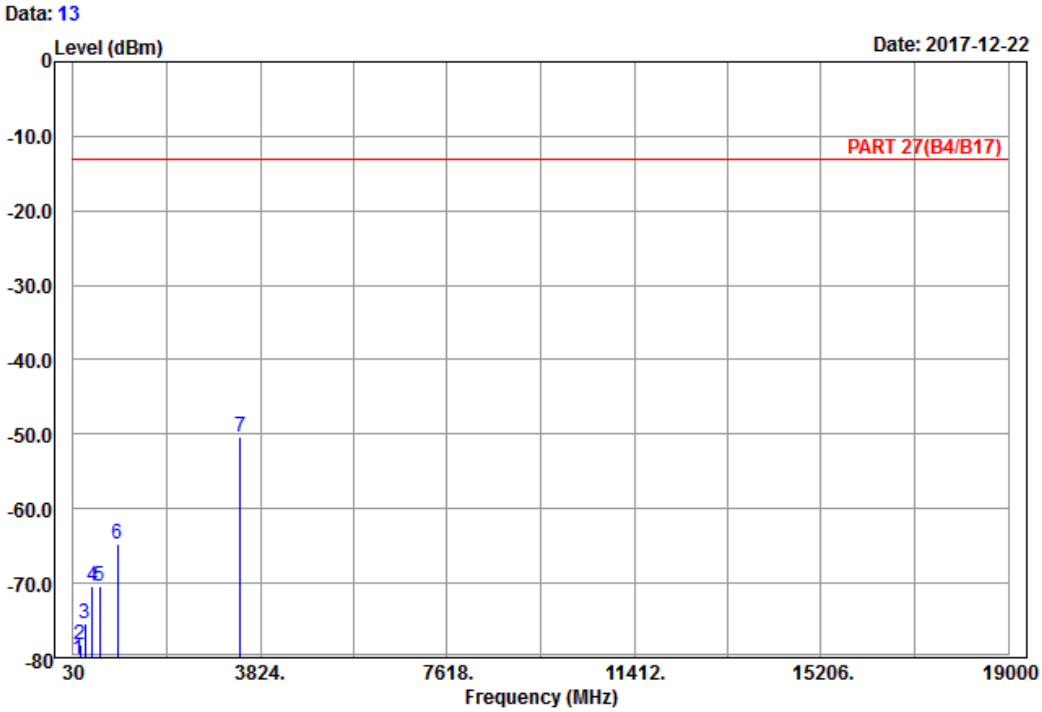
For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.7.5 Test Results

WCDMA:

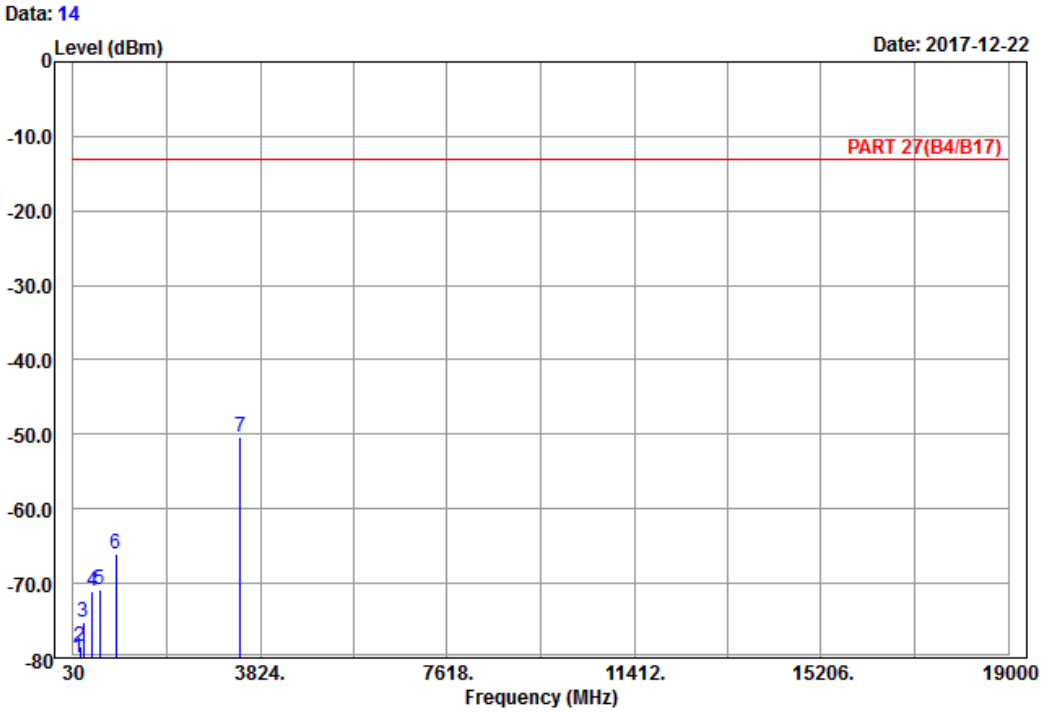
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : Band IV_Link_CH1312
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	128.55	-80.21	-72.50	-13.00	-67.21	-7.71	Peak
2	168.78	-78.25	-71.45	-13.00	-65.25	-6.80	Peak
3	268.14	-75.34	-69.66	-13.00	-62.34	-5.68	Peak
4	422.50	-70.32	-67.07	-13.00	-57.32	-3.25	Peak
5	562.50	-70.32	-69.18	-13.00	-57.32	-1.14	Peak
6	928.60	-64.70	-68.85	-13.00	-51.70	4.15	Peak
7 pp	3424.80	-50.27	-64.64	-13.00	-37.27	14.37	Peak

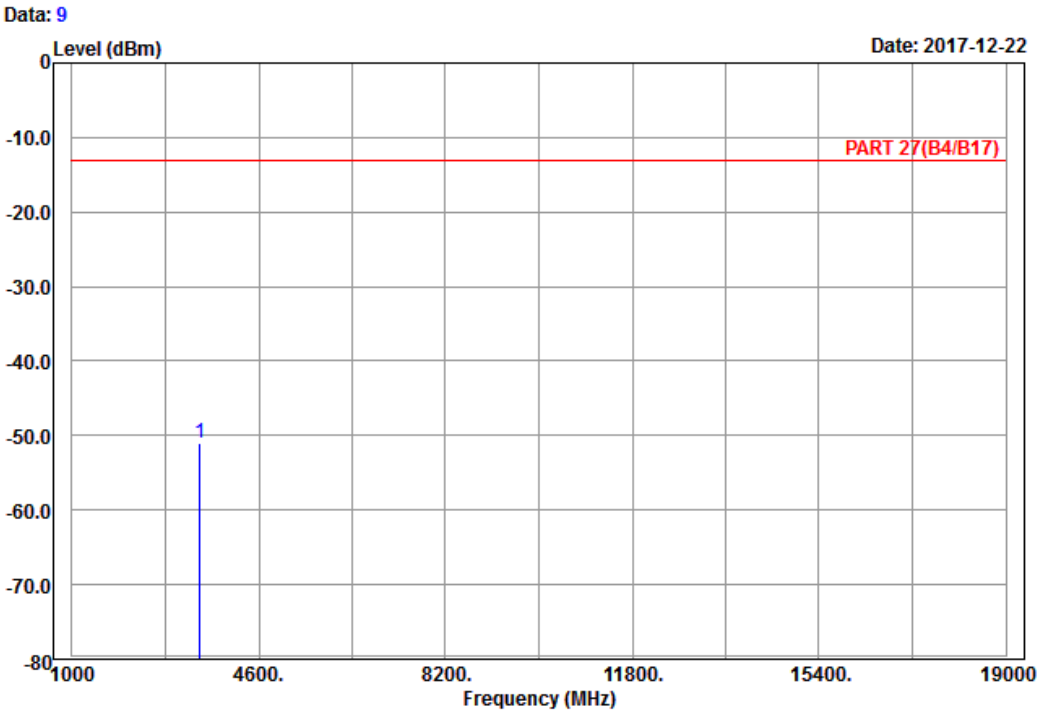


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : Band IV_Link_CH1312
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	128.55	-79.96	-72.25	-13.00	-66.96	-7.71	Peak
2	168.51	-78.43	-71.63	-13.00	-65.43	-6.80	Peak
3	236.82	-75.30	-69.61	-13.00	-62.30	-5.69	Peak
4	422.50	-71.00	-67.75	-13.00	-58.00	-3.25	Peak
5	563.90	-70.91	-69.81	-13.00	-57.91	-1.10	Peak
6	892.90	-66.02	-68.71	-13.00	-53.02	2.69	Peak
7 pp	3424.80	-50.26	-64.63	-13.00	-37.26	14.37	Peak

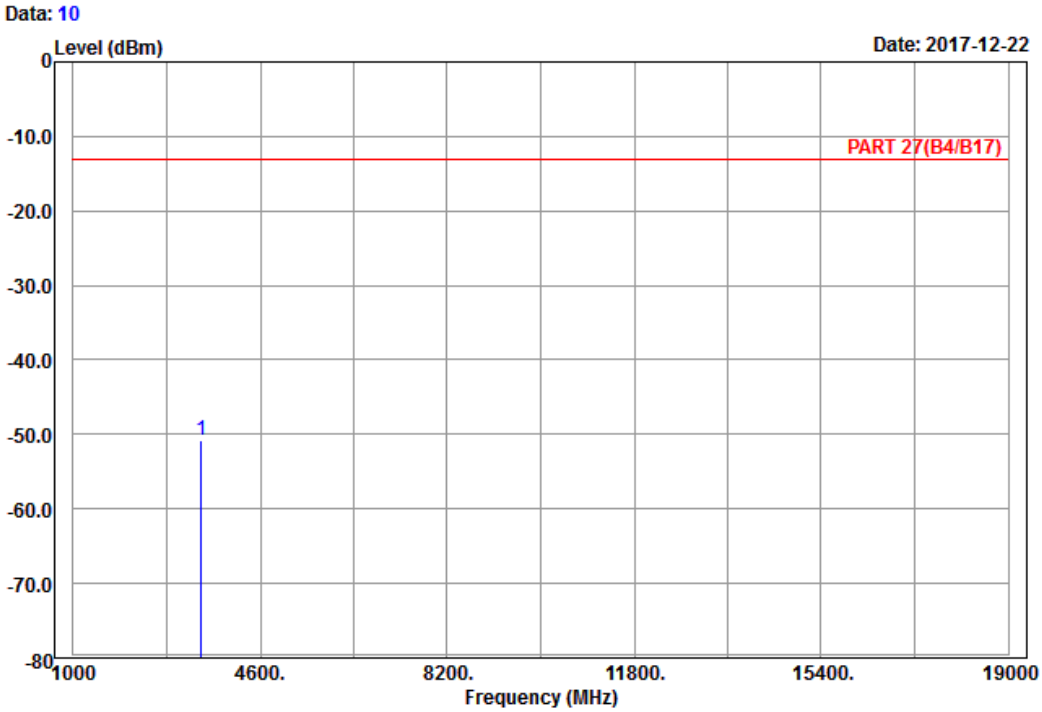
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : Band IV_Link_CH1413
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3465.20	-51.10	-65.44	-13.00	-38.10	14.34	Peak

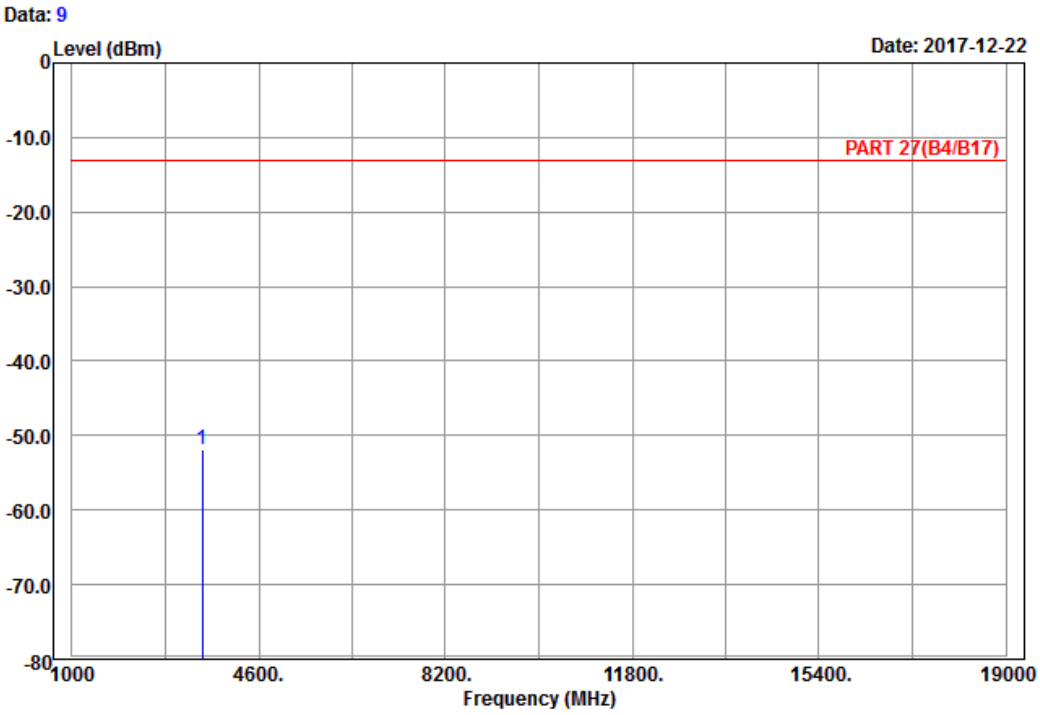


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : Band IV_Link_CH1413
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3465.20	-50.88	-65.22	-13.00	-37.88	14.34	Peak

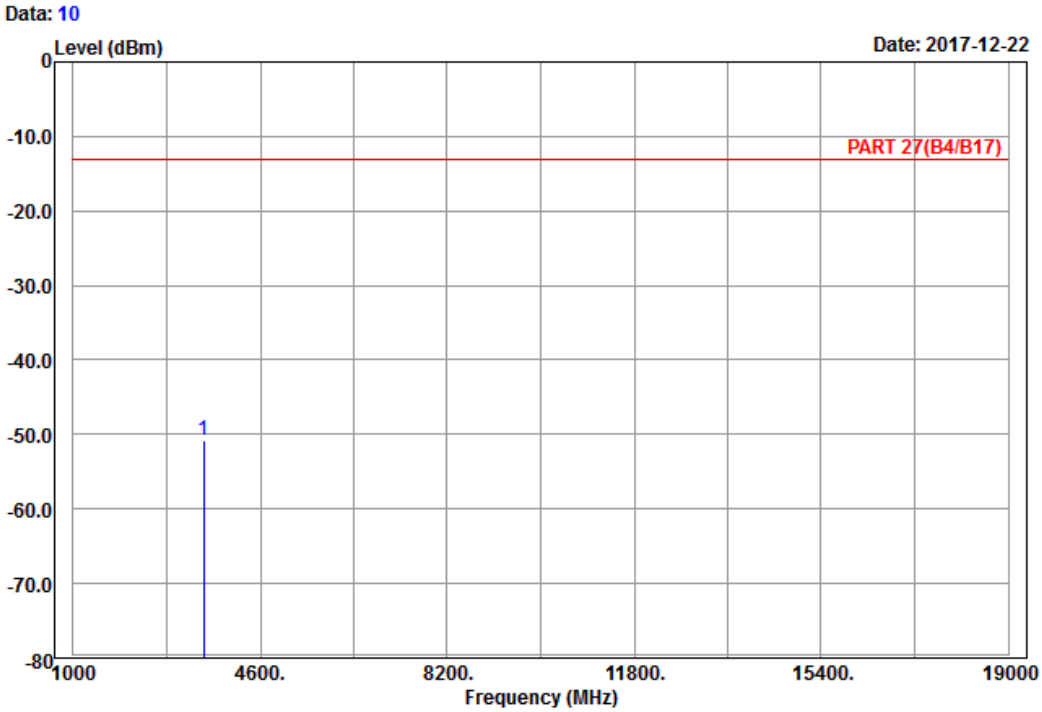
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : Band IV_Link_CH1513
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3505.20	-51.96	-66.24	-13.00	-38.96	14.28	Peak



Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : Band IV_Link_CH1513
Tested by: Charles Hsiao

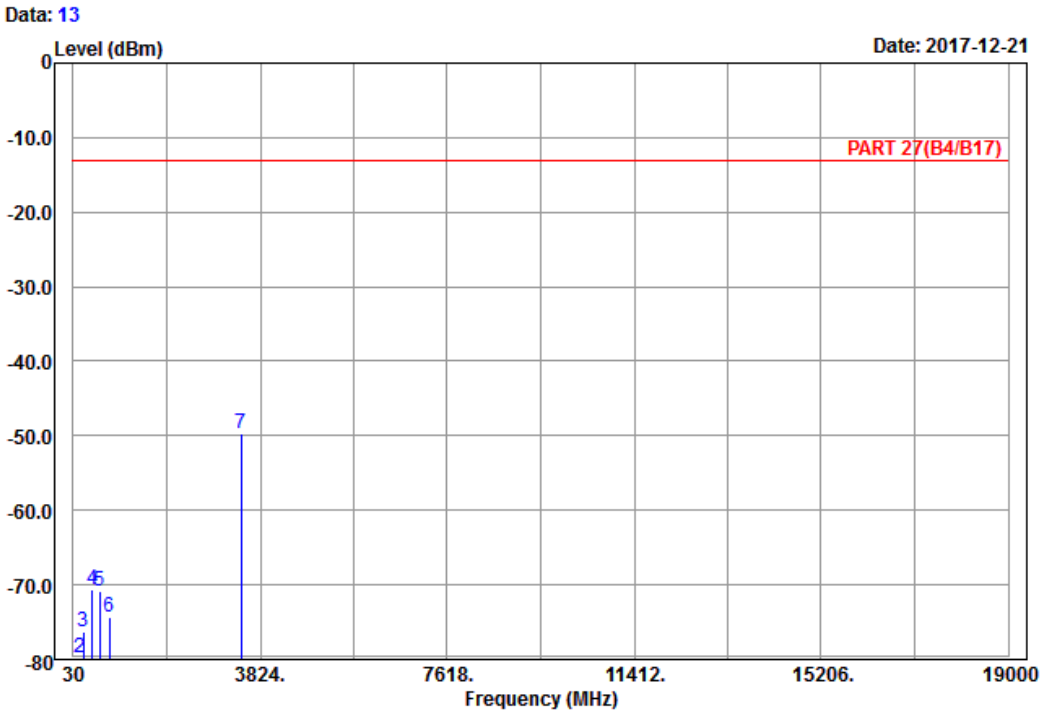
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3505.20	-50.81	-65.09	-13.00	-37.81	14.28	Peak

LTE Band 4

Channel Bandwidth: 20 MHz / QPSK

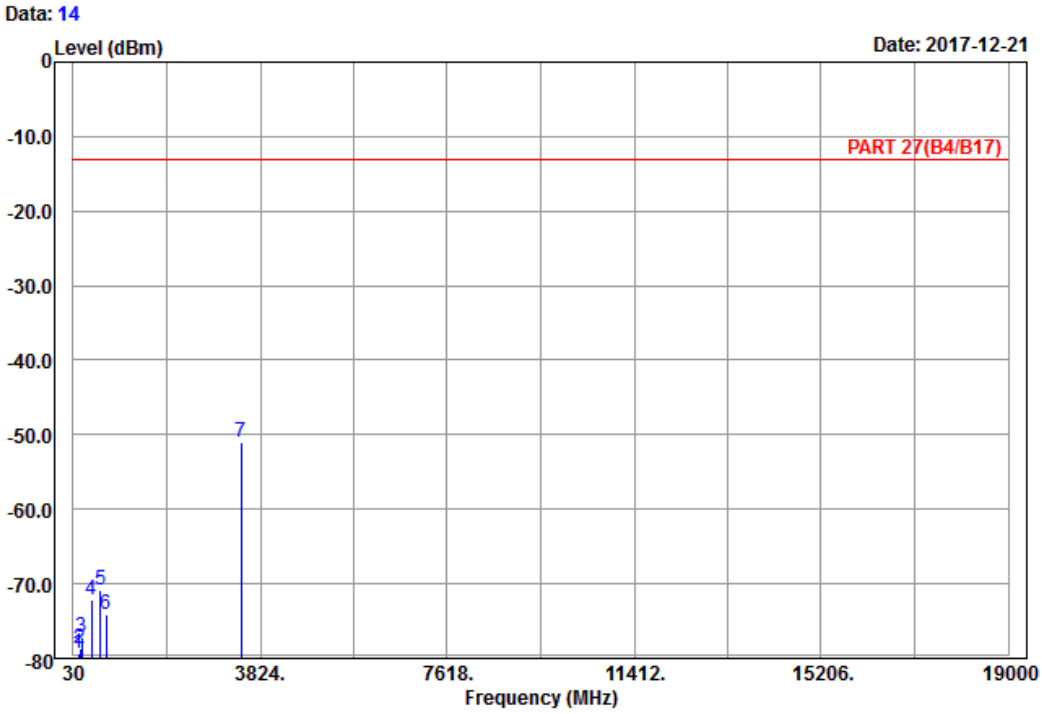
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20050
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	87.51	-83.57	-72.57	-13.00	-70.57	-11.00	Peak
2	160.14	-79.68	-72.01	-13.00	-66.68	-7.67	Peak
3	236.01	-76.23	-70.53	-13.00	-63.23	-5.70	Peak
4	416.20	-70.67	-67.57	-13.00	-57.67	-3.10	Peak
5	563.20	-70.76	-69.66	-13.00	-57.76	-1.10	Peak
6	760.60	-74.41	-73.80	-13.00	-61.41	-0.61	Peak
7 pp	3440.00	-49.73	-64.08	-13.00	-36.73	14.35	Peak

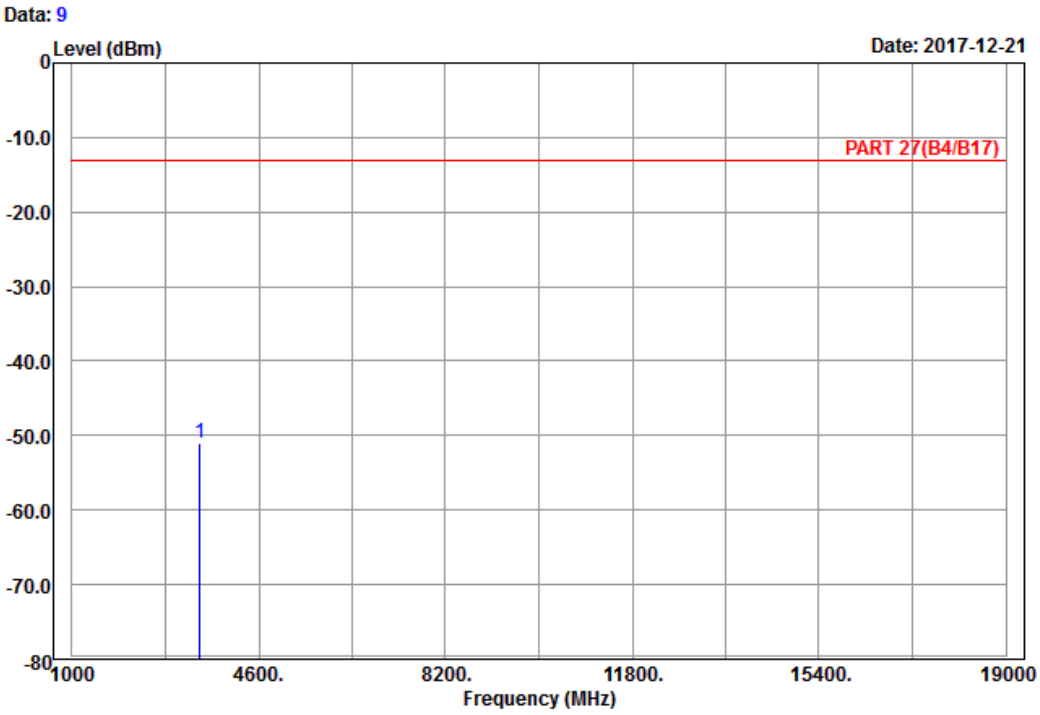


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20050
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	131.25	-79.37	-71.72	-13.00	-66.37	-7.65	Peak
2	168.78	-78.70	-71.90	-13.00	-65.70	-6.80	Peak
3	201.99	-77.24	-71.08	-13.00	-64.24	-6.16	Peak
4	402.90	-72.18	-69.38	-13.00	-59.18	-2.80	Peak
5	576.50	-70.90	-70.32	-13.00	-57.90	-0.58	Peak
6	705.30	-74.22	-73.75	-13.00	-61.22	-0.47	Peak
7 pp	3440.00	-51.11	-65.46	-13.00	-38.11	14.35	Peak

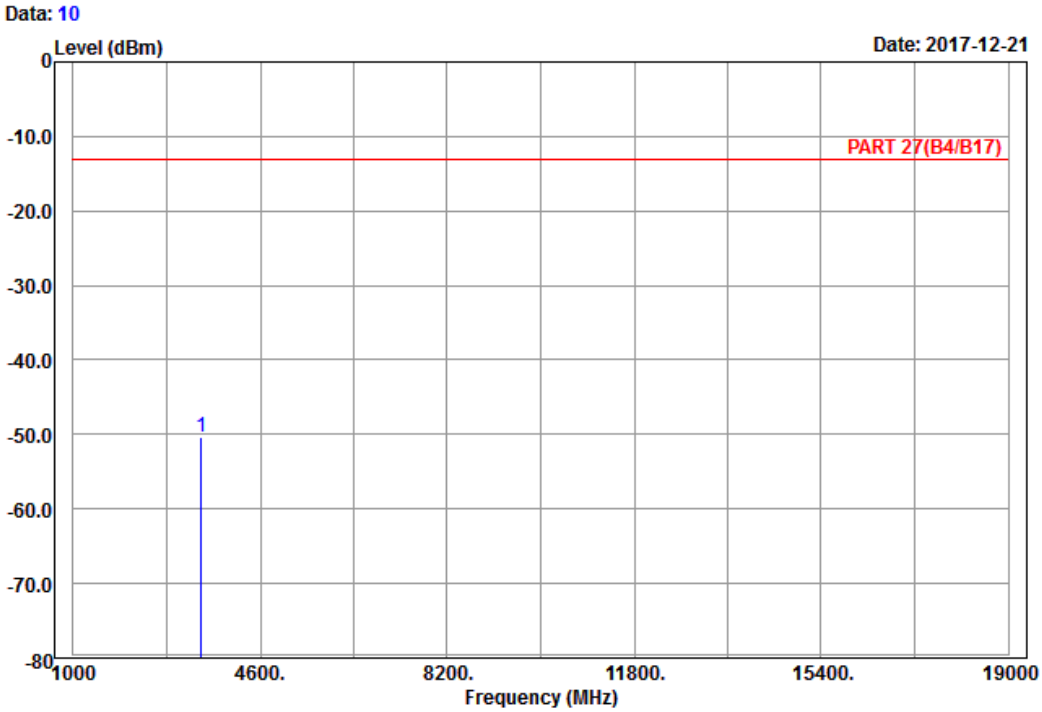
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20175
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3465.00	-51.00	-65.34	-13.00	-38.00	14.34	Peak

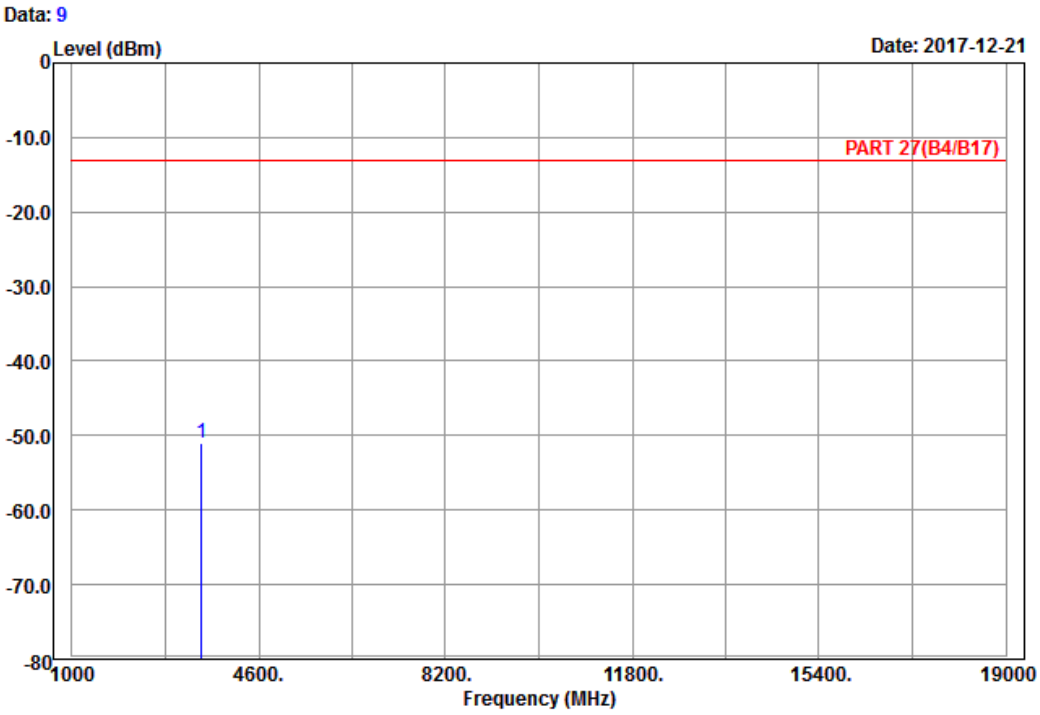


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20175
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3465.00	-50.32	-64.66	-13.00	-37.32	14.34	Peak

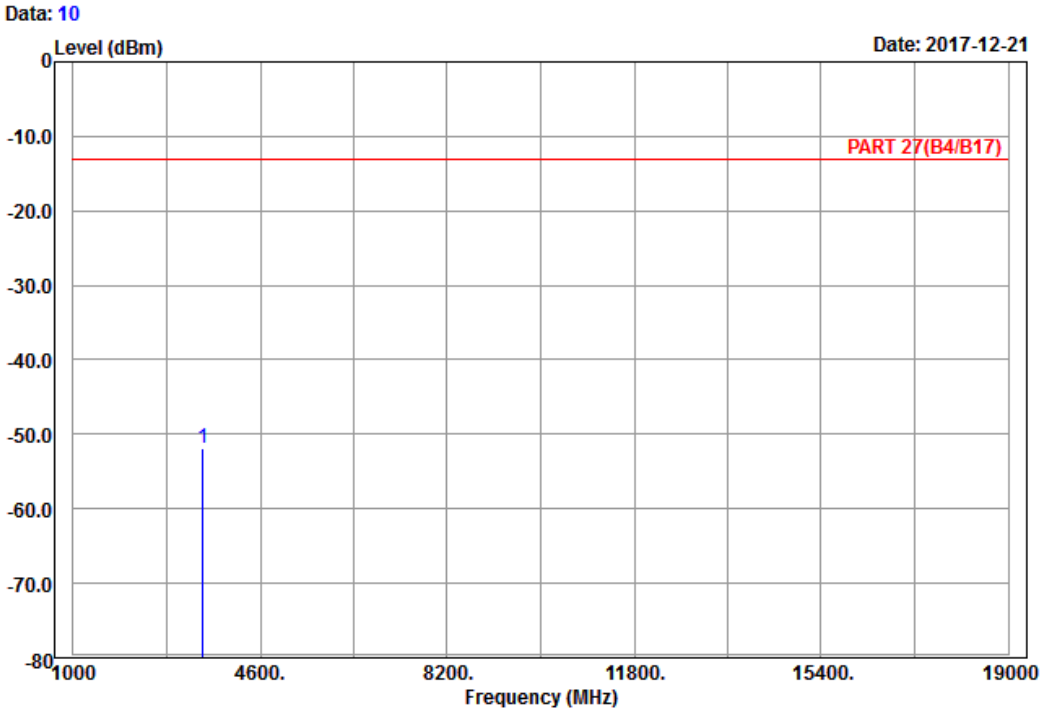
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20300
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3490.00	-51.07	-65.38	-13.00	-38.07	14.31	Peak



Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20300
Tested by: Charles Hsiao

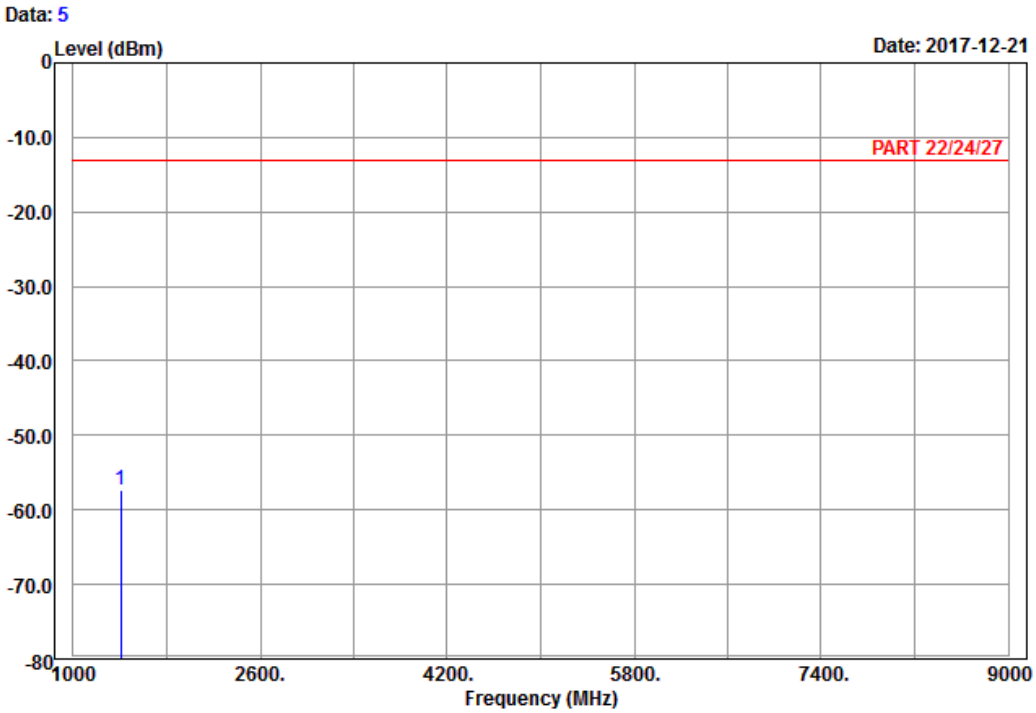
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3490.00	-51.79	-66.10	-13.00	-38.79	14.31	Peak

LTE Band 12

Channel Bandwidth: 10 MHz / QPSK

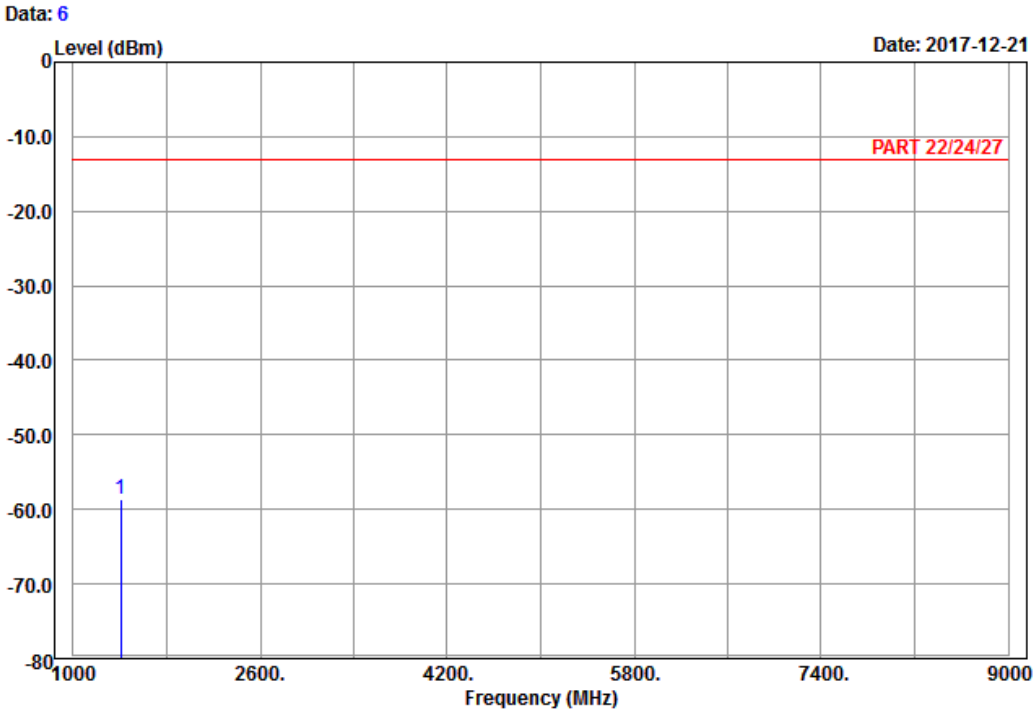
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




```
Site      : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark    : LTE_Band 12_Link_CH23060
Tested by: Charles Hsiao
                        Read  Limit   Over
          Freq  Level  Level   Line  Limit Factor Remark
        _______ ______ ______ ______ ______ ______ _______
            MHz    dBm    dBm    dBm     dB     dB

  1 pp  1408.00 -57.36 -63.72 -13.00 -44.36   6.36 Peak
```

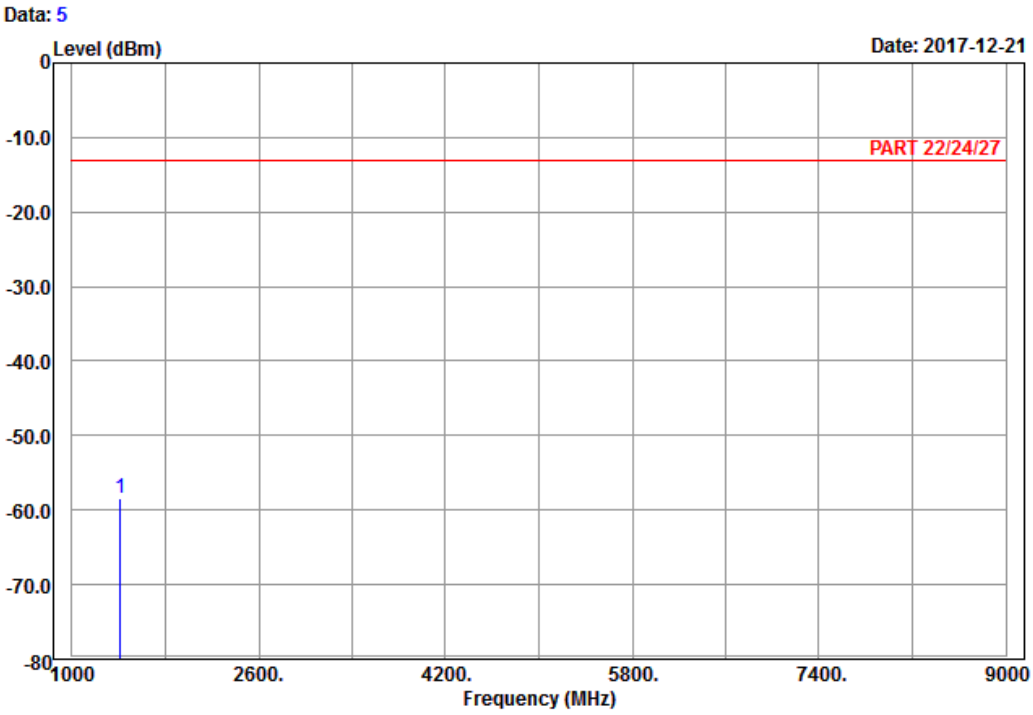


Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 12_Link_CH23060
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1408.00	-58.61	-64.97	-13.00	-45.61	6.36	Peak

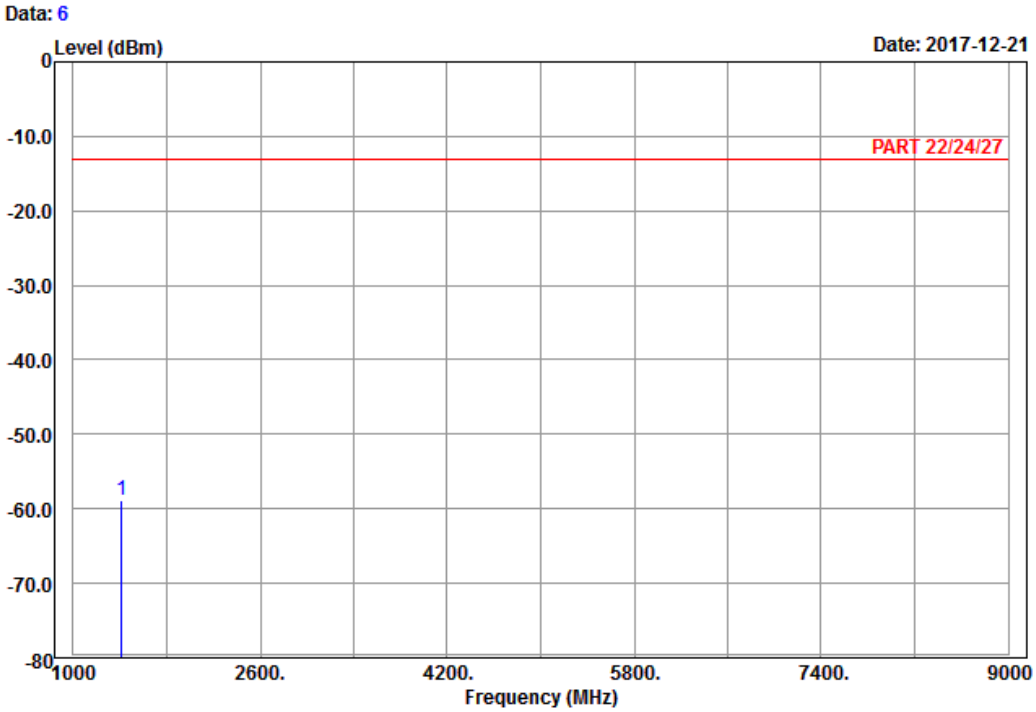
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark : LTE_Band 12_Link_CH23095
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-58.46	-64.82	-13.00	-45.46	6.36	Peak

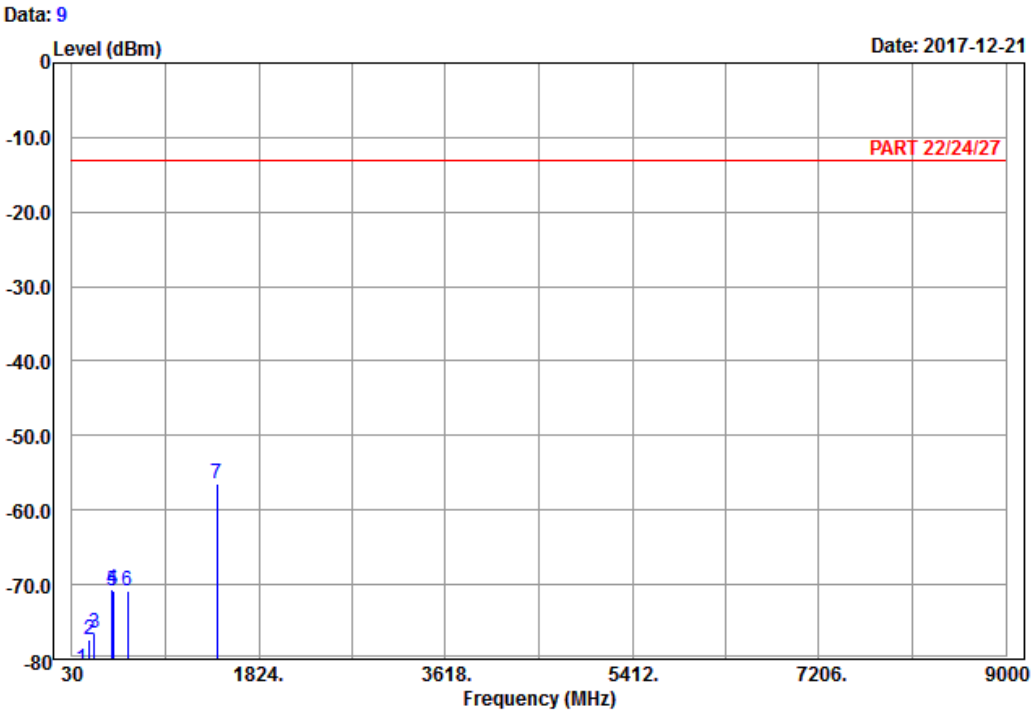


Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 12_Link_CH23095
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-58.86	-65.22	-13.00	-45.86	6.36	Peak

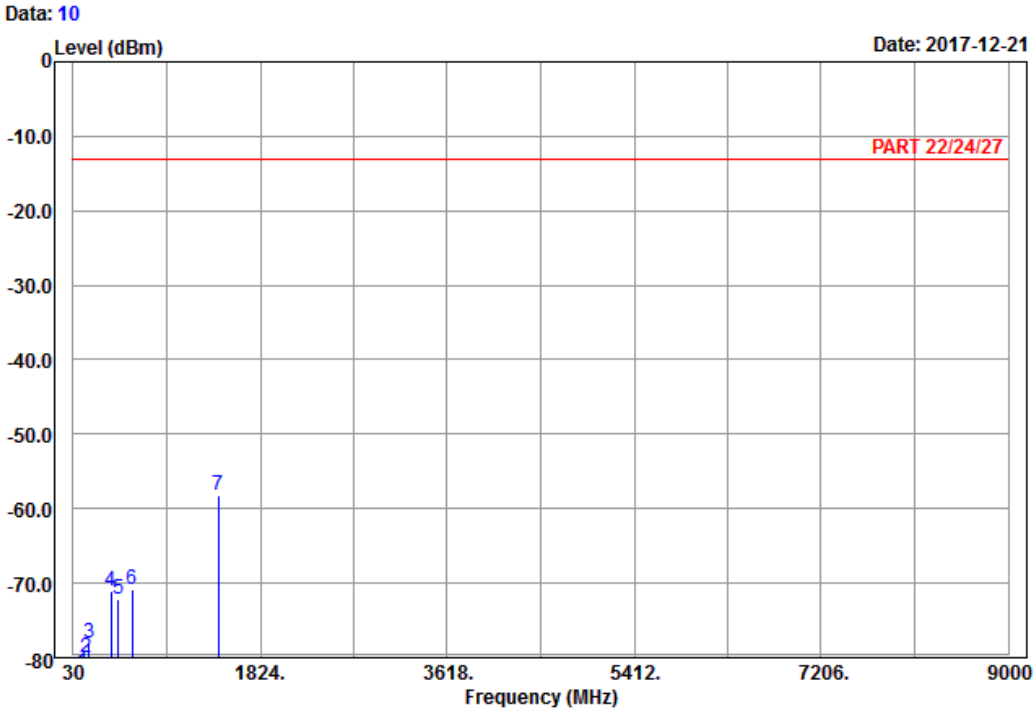
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark : LTE_Band 12_Link_CH23130
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	120.99	-81.30	-73.11	-13.00	-68.30	-8.19	Peak
2	196.59	-77.31	-71.26	-13.00	-64.31	-6.05	Peak
3	241.41	-76.42	-70.80	-13.00	-63.42	-5.62	Peak
4	413.40	-70.74	-67.70	-13.00	-57.74	-3.04	Peak
5	426.00	-70.77	-67.46	-13.00	-57.77	-3.31	Peak
6	565.30	-70.83	-69.81	-13.00	-57.83	-1.02	Peak
7 pp	1422.00	-56.56	-62.92	-13.00	-43.56	6.36	Peak

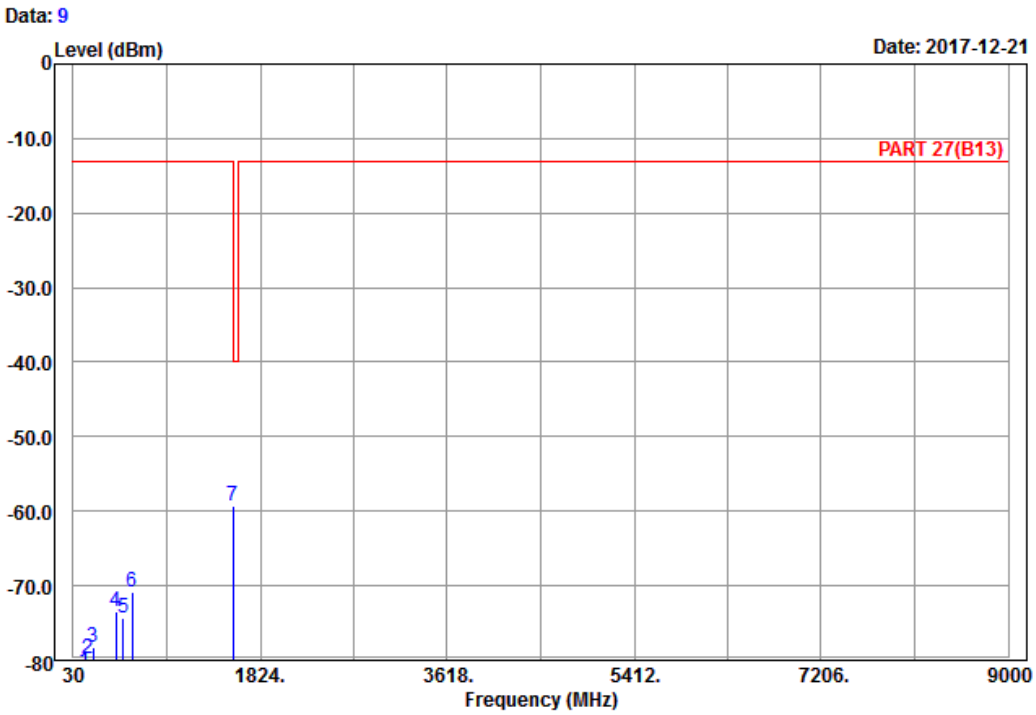


Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 12_Link_CH23130
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	116.67	-81.98	-73.47	-13.00	-68.98	-8.51	Peak
2	154.74	-80.04	-72.23	-13.00	-67.04	-7.81	Peak
3	185.25	-77.99	-72.34	-13.00	-64.99	-5.65	Peak
4	393.80	-71.01	-67.96	-13.00	-58.01	-3.05	Peak
5	459.60	-72.25	-68.13	-13.00	-59.25	-4.12	Peak
6	598.90	-70.83	-71.18	-13.00	-57.83	0.35	Peak
7 pp	1422.00	-58.28	-64.64	-13.00	-45.28	6.36	Peak

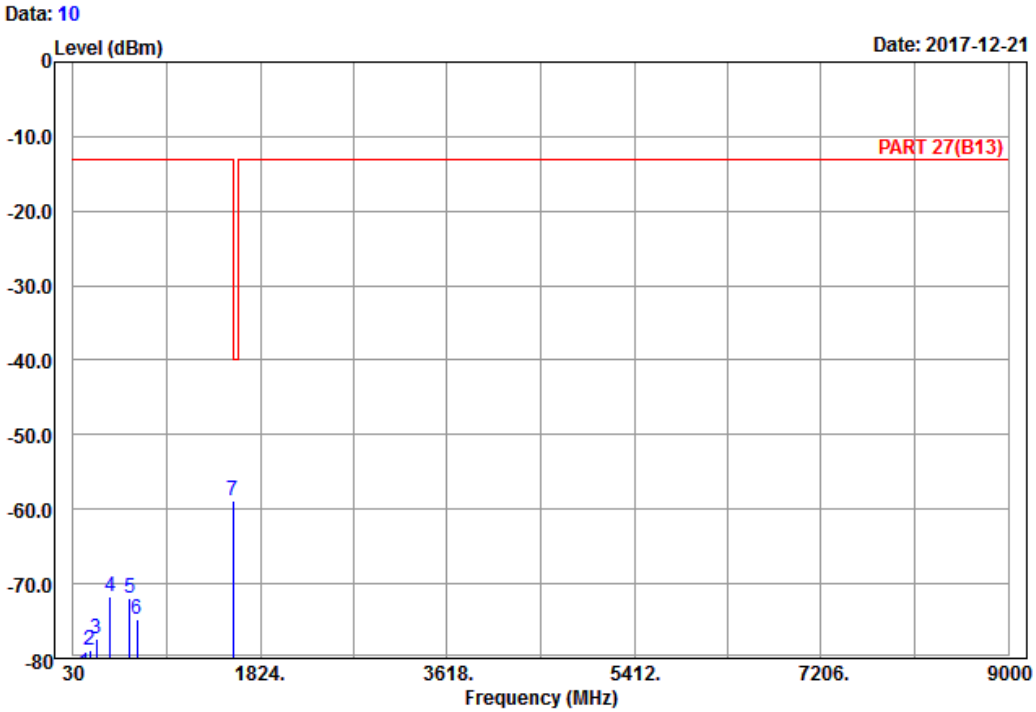
LTE Band 13
Channel Bandwidth: 10 MHz / QPSK

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B13) Horizontal
Remark : LTE_Band 13_Link_CH23230
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	132.87	-81.47	-73.81	-13.00	-68.47	-7.66	Peak
2	177.15	-79.84	-73.96	-13.00	-66.84	-5.88	Peak
3	224.13	-78.25	-72.39	-13.00	-65.25	-5.86	Peak
4	439.30	-73.46	-69.85	-13.00	-60.46	-3.61	Peak
5	505.80	-74.30	-69.44	-13.00	-61.30	-4.86	Peak
6	598.20	-70.88	-71.23	-13.00	-57.88	0.35	Peak
7 pp	1564.00	-59.24	-66.10	-40.00	-19.24	6.86	Peak



Site : 966 chamber 1
Condition: PART 27(B13) Vertical
Remark : LTE_Band 13_Link_CH23230
Tested by: Charles Hsiao

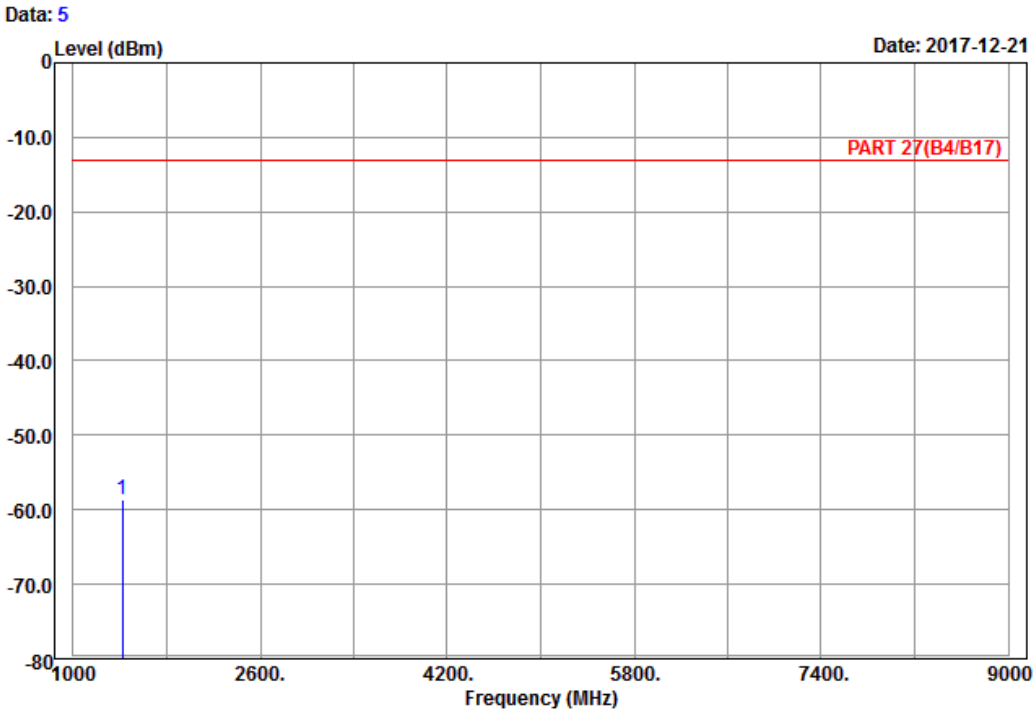
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	141.78	-81.95	-74.21	-13.00	-68.95	-7.74	Peak
2	186.06	-78.98	-73.31	-13.00	-65.98	-5.67	Peak
3	255.18	-77.45	-71.90	-13.00	-64.45	-5.55	Peak
4	381.20	-71.80	-68.08	-13.00	-58.80	-3.72	Peak
5	570.20	-71.83	-71.01	-13.00	-58.83	-0.82	Peak
6	640.20	-74.75	-74.73	-13.00	-61.75	-0.02	Peak
7 pp	1564.00	-58.83	-65.69	-40.00	-18.83	6.86	Peak

LTE Band 17

Channel Bandwidth: 10 MHz / QPSK

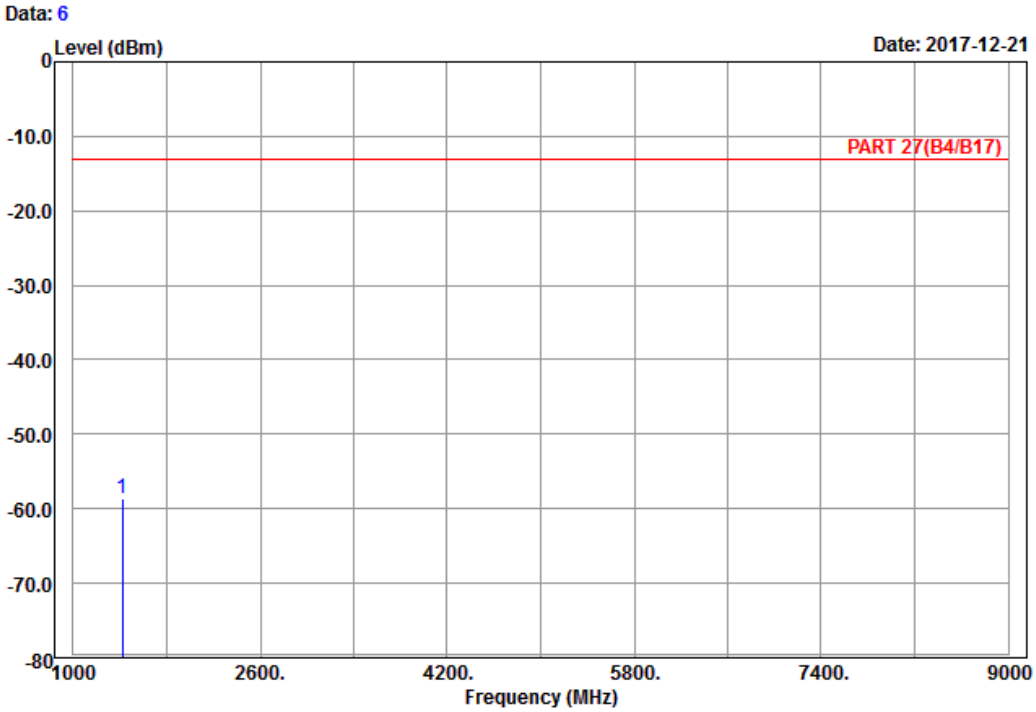
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 17_Link_CH23780
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1418.00	-58.61	-64.97	-13.00	-45.61	6.36	Peak

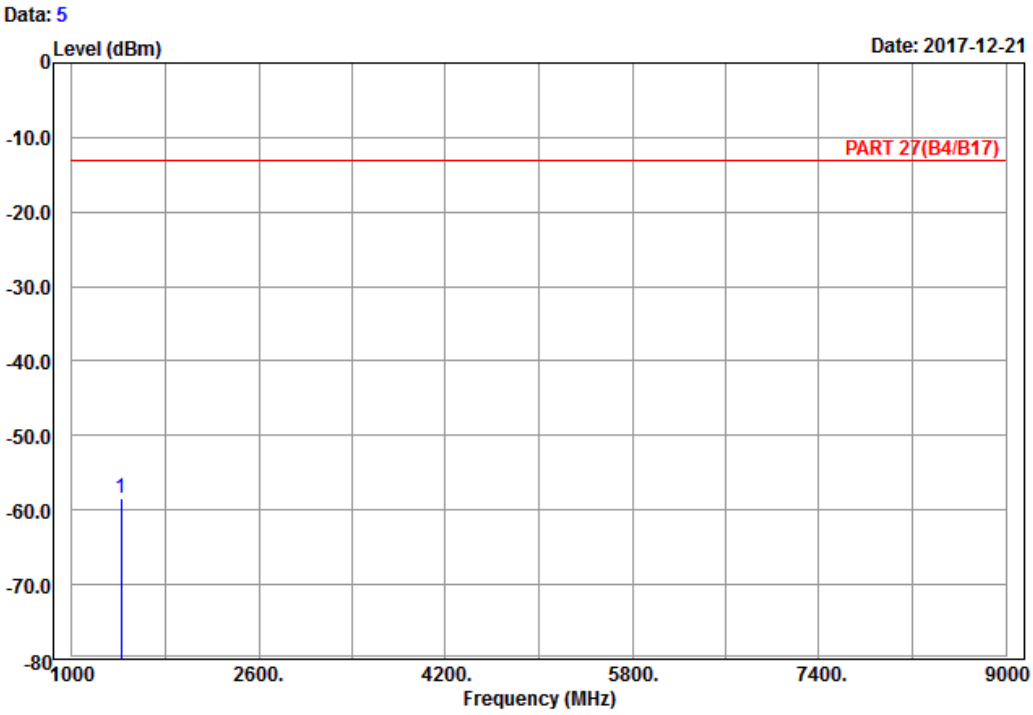


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 17_Link_CH23780
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1418.00	-58.57	-64.93	-13.00	-45.57	6.36	Peak

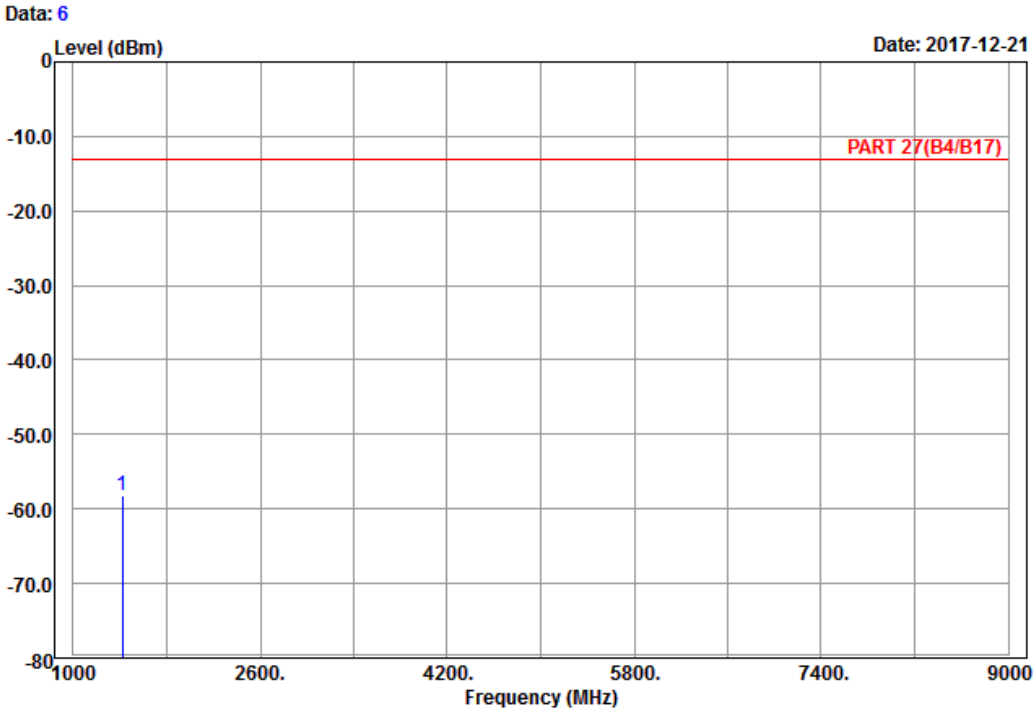
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 17_Link_CH23790
Tested by: Harry Hsueh

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1420.00	-58.46	-64.82	-13.00	-45.46	6.36	Peak

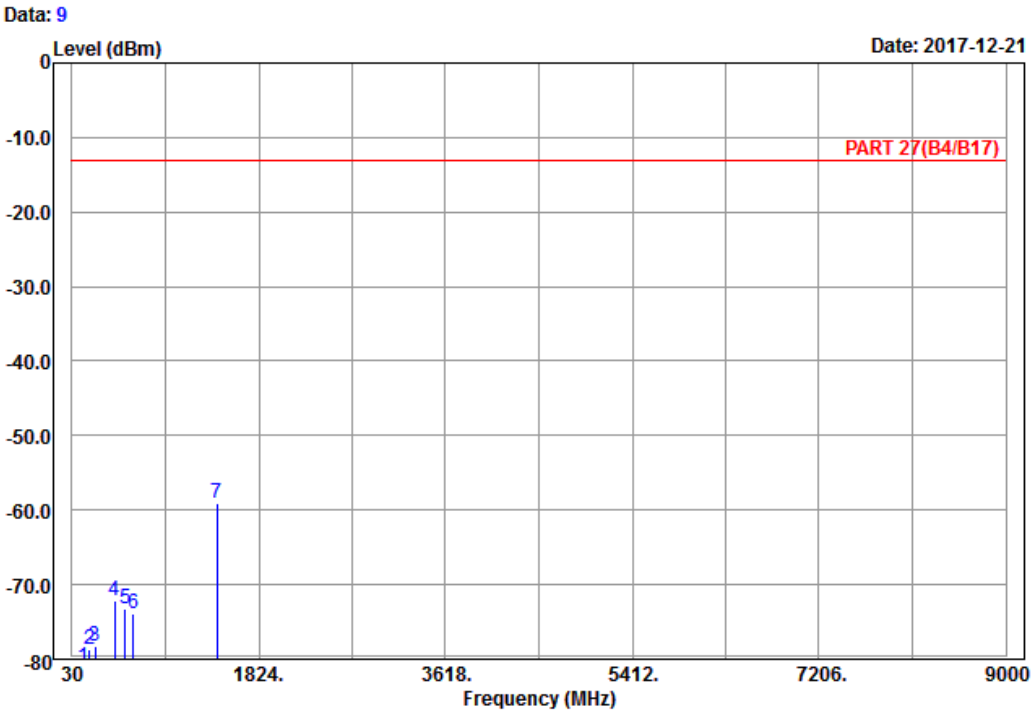


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 17_Link_CH23790
Tested by: Harry Hsueh

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1420.00	-58.20	-64.56	-13.00	-45.20	6.36	Peak

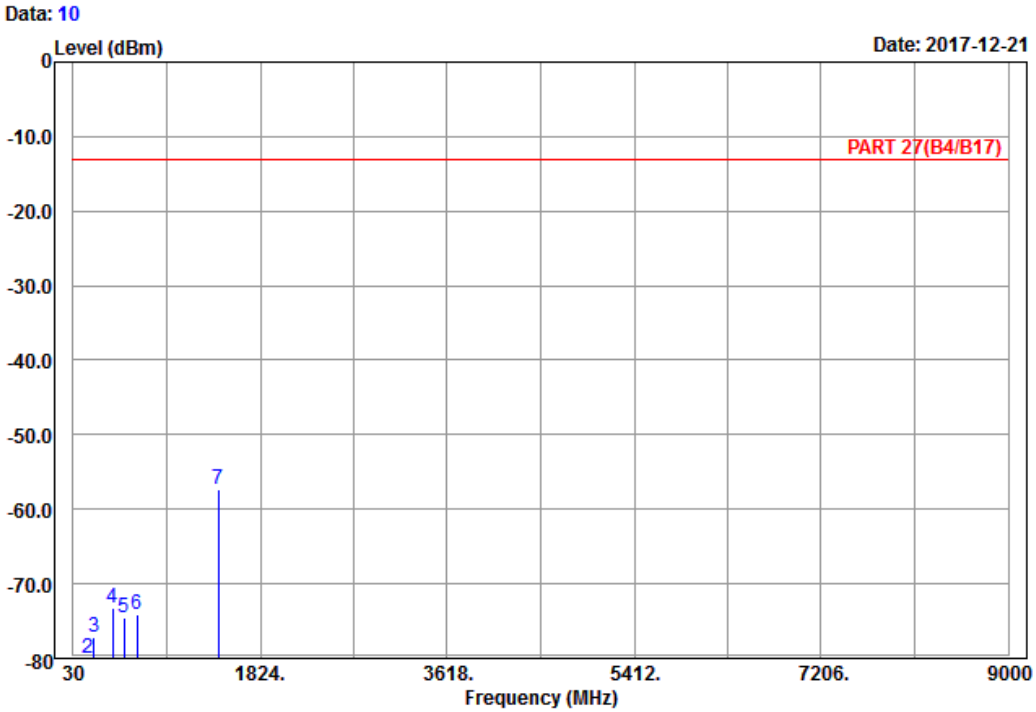
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 17_Link_CH23800
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	131.52	-81.16	-73.50	-13.00	-68.16	-7.66	Peak
2	196.86	-78.58	-72.53	-13.00	-65.58	-6.05	Peak
3	250.32	-78.27	-72.76	-13.00	-65.27	-5.51	Peak
4	442.80	-72.25	-68.55	-13.00	-59.25	-3.70	Peak
5	538.00	-73.16	-70.65	-13.00	-60.16	-2.51	Peak
6	622.70	-73.94	-74.11	-13.00	-60.94	0.17	Peak
7 pp	1422.00	-59.07	-65.43	-13.00	-46.07	6.36	Peak

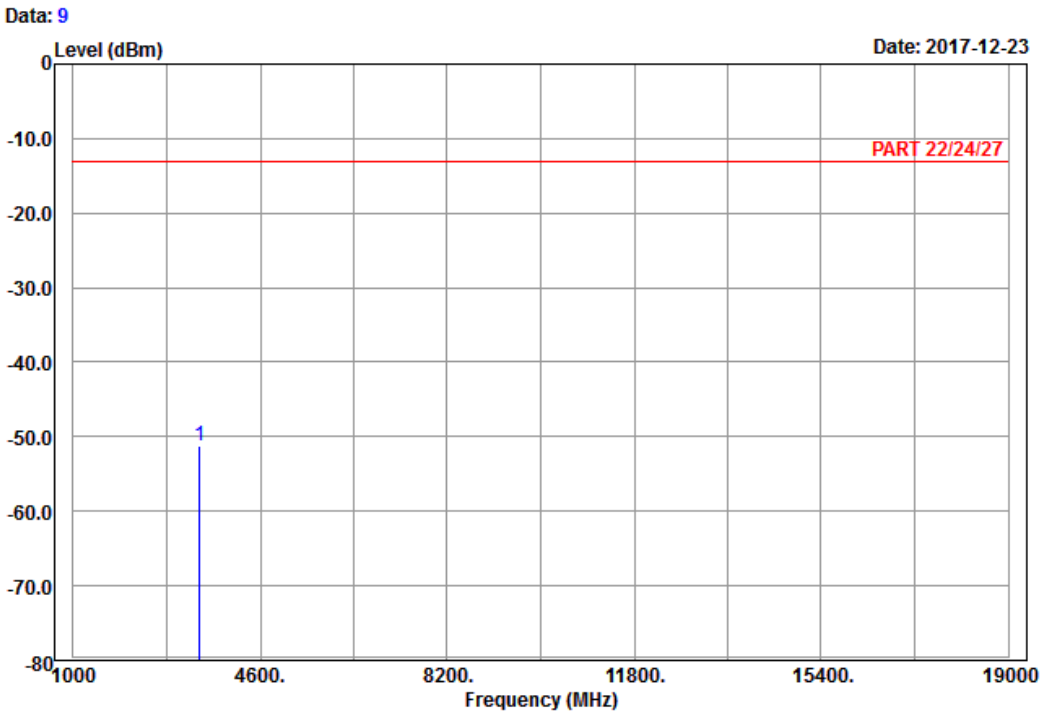


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 17_Link_CH23800
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	96.15	-84.38	-74.04	-13.00	-71.38	-10.34	Peak
2	169.86	-79.91	-73.20	-13.00	-66.91	-6.71	Peak
3	230.61	-77.23	-71.46	-13.00	-64.23	-5.77	Peak
4	405.00	-73.15	-70.28	-13.00	-60.15	-2.87	Peak
5	514.20	-74.64	-70.35	-13.00	-61.64	-4.29	Peak
6	640.20	-74.22	-74.20	-13.00	-61.22	-0.02	Peak
7 pp	1422.00	-57.38	-63.74	-13.00	-44.38	6.36	Peak

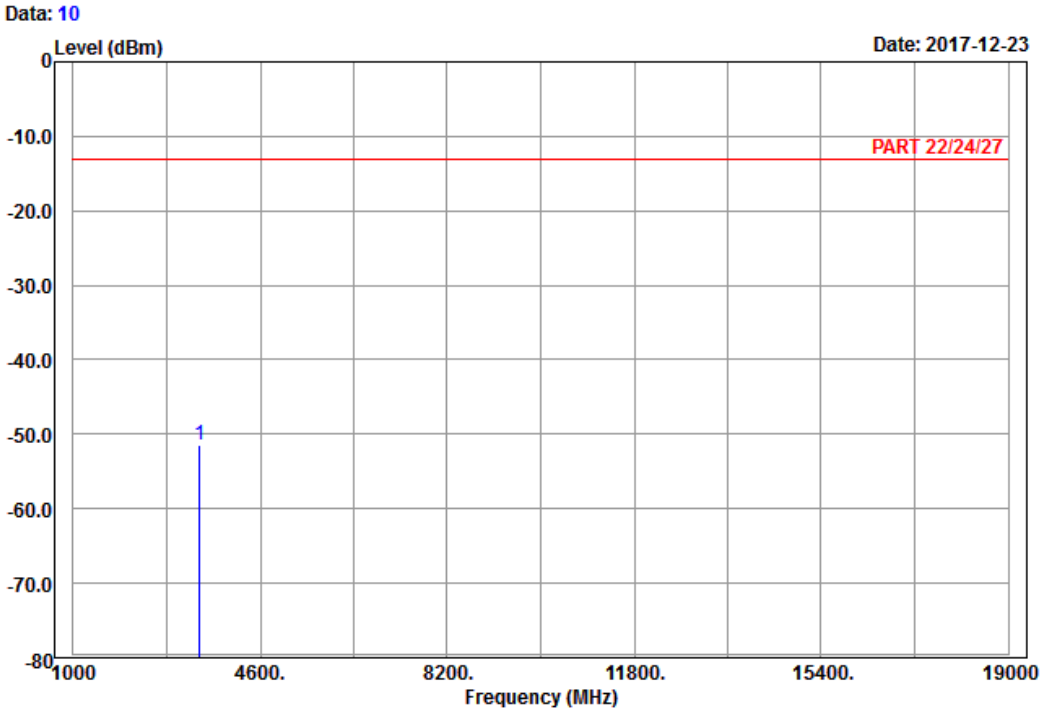
LTE Band 66:
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




```
Site      : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark    : LTE_Band 66_Link_CH132072
Tested by: Charles Hsiao
                        Read  Limit   Over
          Freq  Level  Level   Line  Limit Factor Remark
      ________ ______ ______ ______ ______ ______ __________
           MHz    dBm    dBm    dBm     dB     dB

  1 pp  3440.00 -51.21 -65.56 -13.00 -38.21  14.35 Peak
```

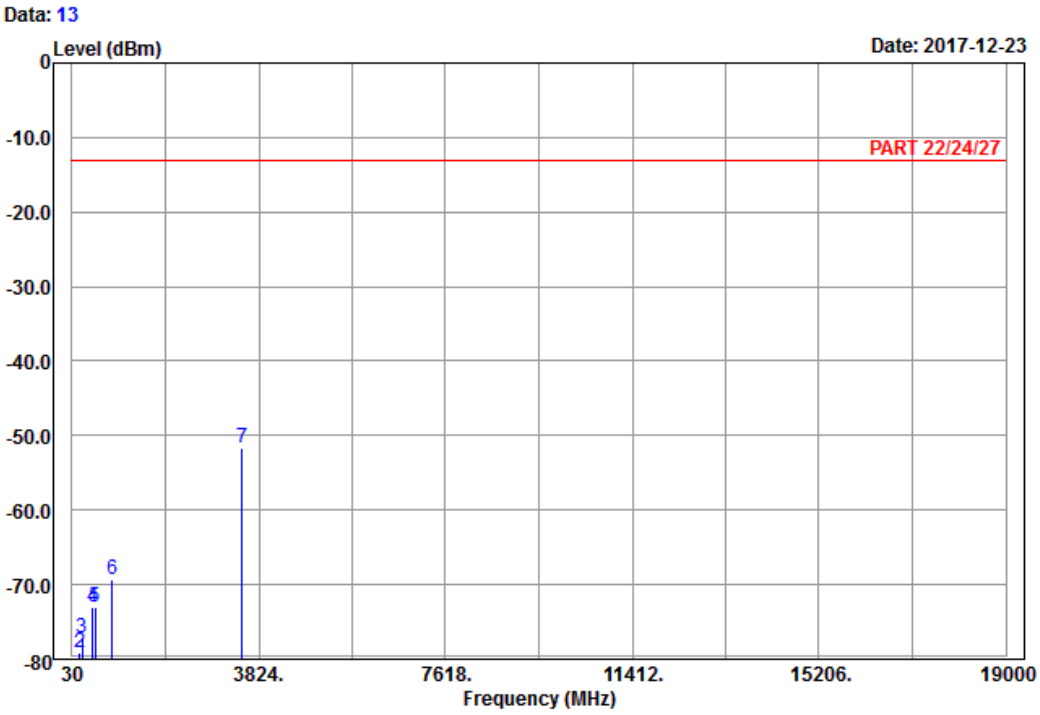


Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 66_Link_CH132072
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3440.00	-51.46	-65.81	-13.00	-38.46	14.35	Peak

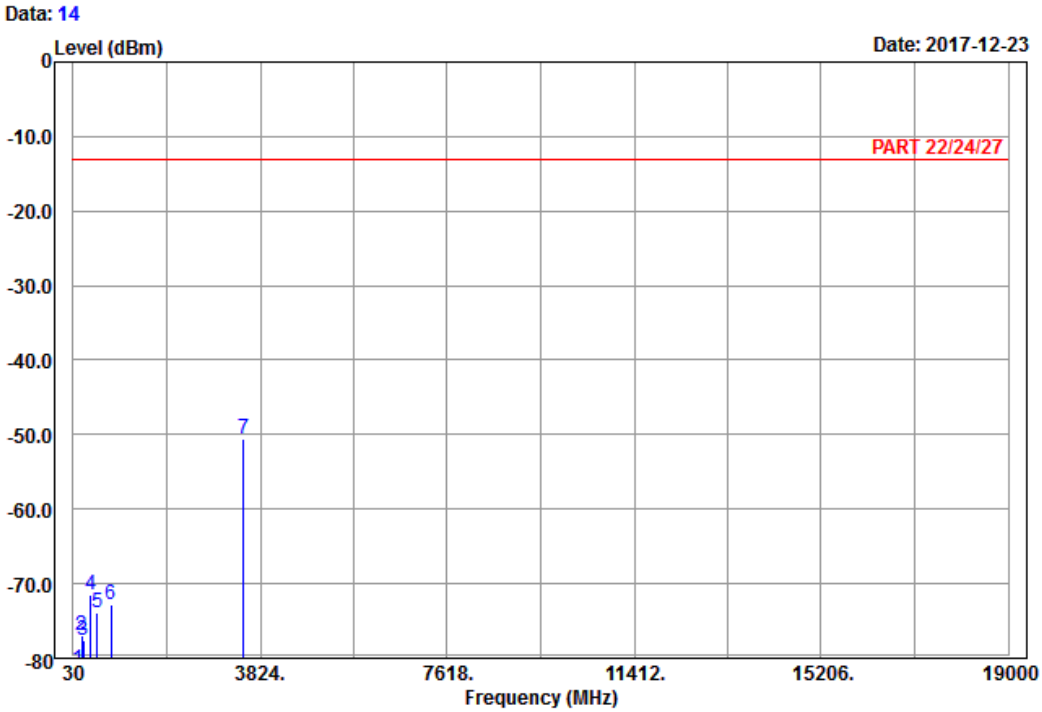
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark : LTE_Band 66_Link_CH132322
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	106.95	-83.94	-74.64	-13.00	-70.94	-9.30	Peak
2	184.98	-79.16	-73.51	-13.00	-66.16	-5.65	Peak
3	243.03	-77.20	-71.60	-13.00	-64.20	-5.60	Peak
4	454.00	-72.97	-69.01	-13.00	-59.97	-3.96	Peak
5	504.40	-72.93	-67.93	-13.00	-59.93	-5.00	Peak
6	853.70	-69.40	-70.96	-13.00	-56.40	1.56	Peak
7 pp	3490.00	-51.75	-66.06	-13.00	-38.75	14.31	Peak

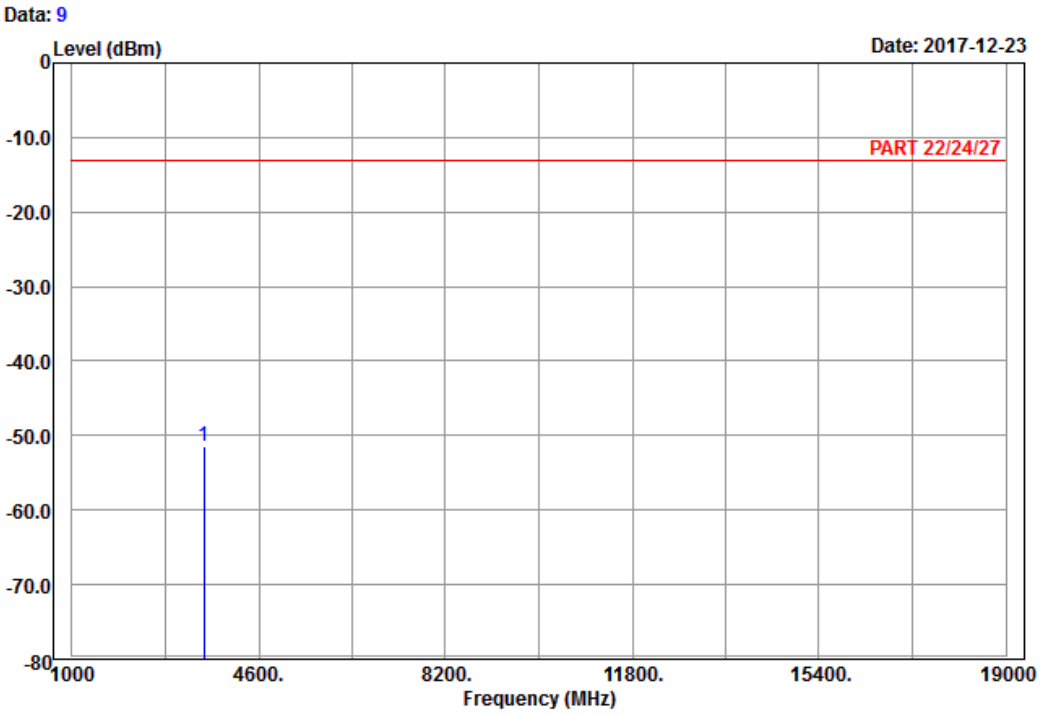


Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 66_Link_CH132322
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	116.67	-81.50	-72.99	-13.00	-68.50	-8.51	Peak
2	196.32	-77.03	-71.03	-13.00	-64.03	-6.00	Peak
3	242.76	-77.50	-71.89	-13.00	-64.50	-5.61	Peak
4	387.50	-71.54	-68.18	-13.00	-58.54	-3.36	Peak
5	508.60	-73.91	-69.20	-13.00	-60.91	-4.71	Peak
6	795.60	-72.78	-74.47	-13.00	-59.78	1.69	Peak
7 pp	3490.00	-50.57	-64.88	-13.00	-37.57	14.31	Peak

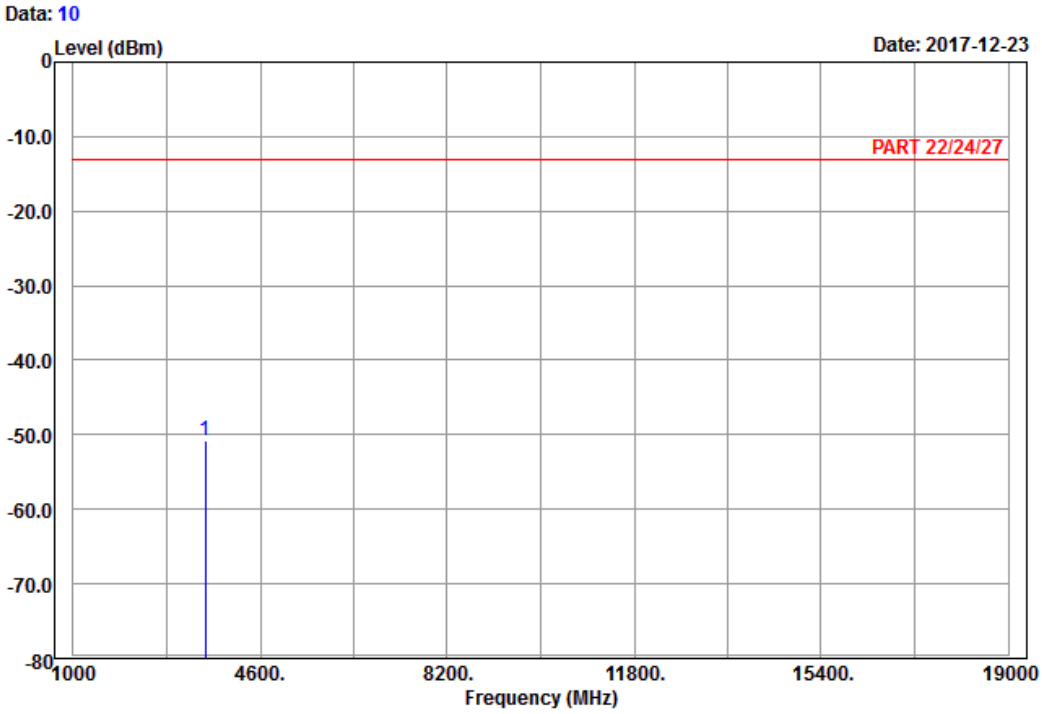
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark : LTE_Band 66_Link_CH132572
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3540.00	-51.39	-66.28	-13.00	-38.39	14.89	Peak



Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 66_Link_CH132572
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3540.00	-50.77	-65.66	-13.00	-37.77	14.89	Peak

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

--- END ---