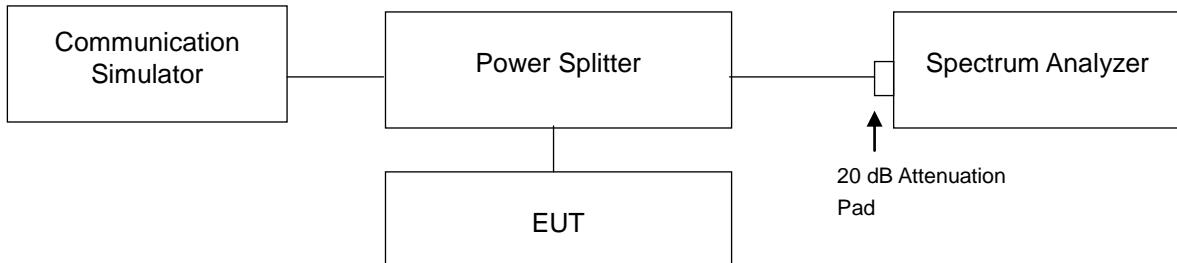


4.6 Conducted Spurious Emissions

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 $55 + 10 \log_{10}(P)$ dB. The limit of emission is equal to -25 dBm.

4.6.2 Test Setup



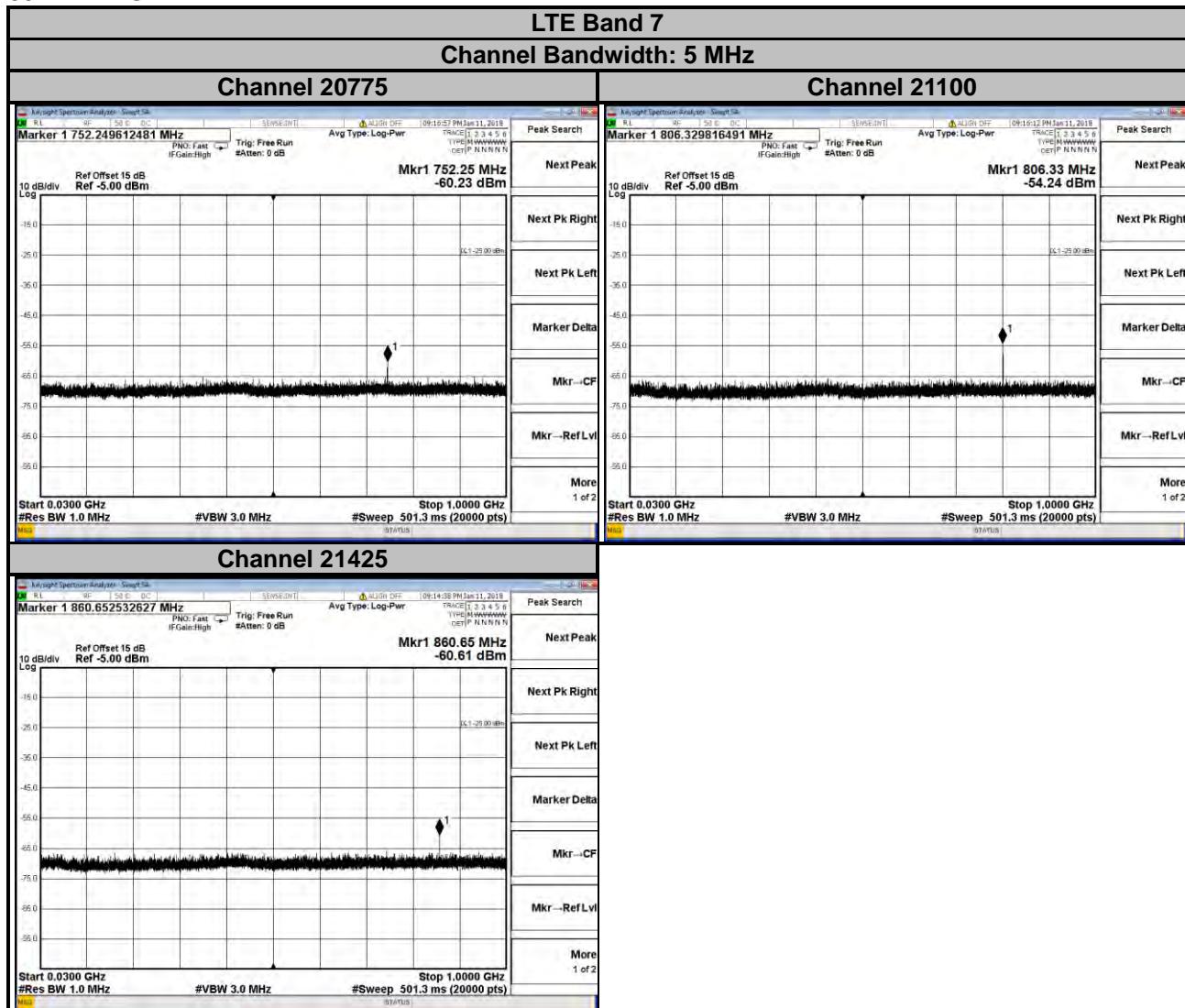
4.6.3 Test Procedure

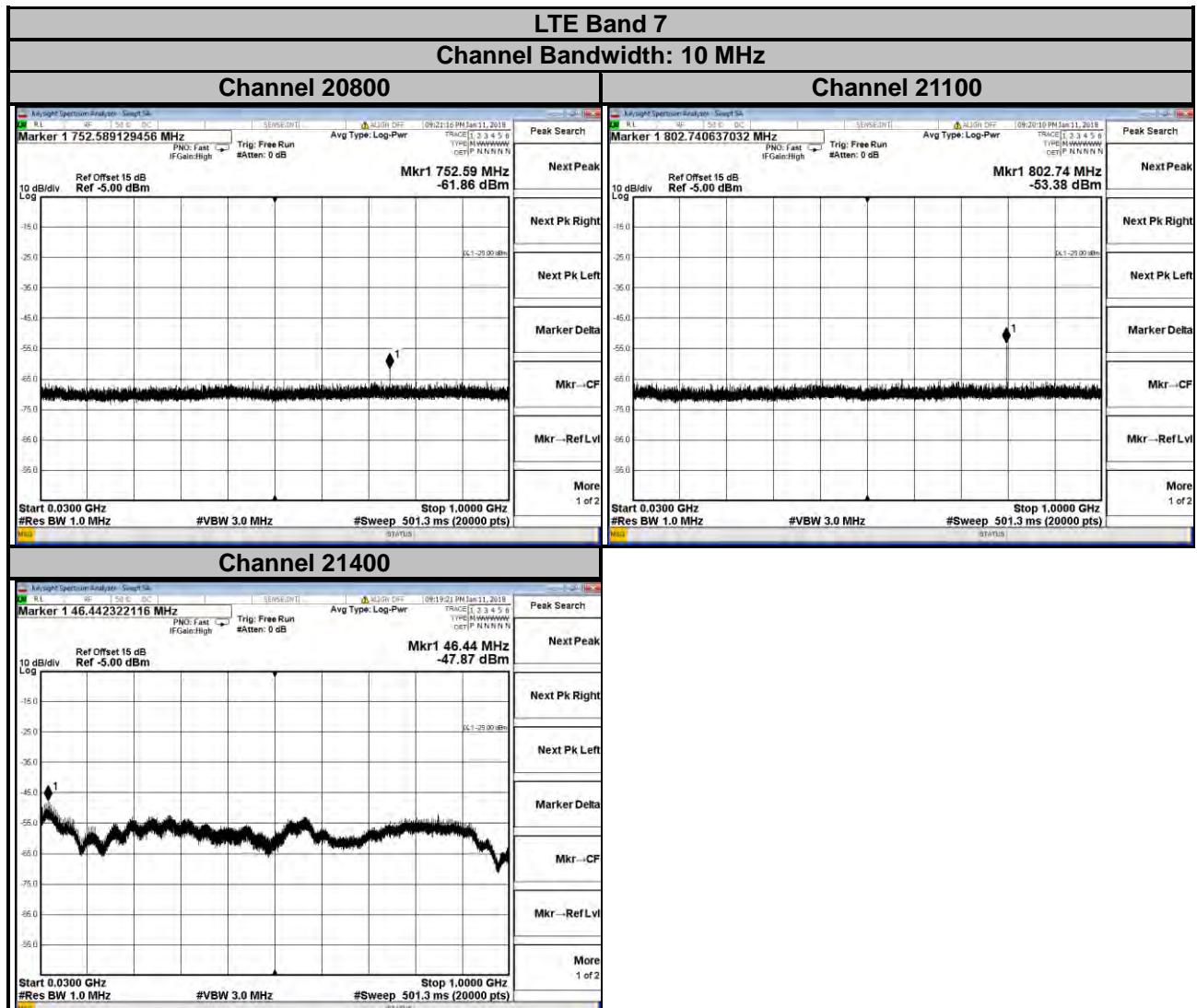
- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 30 MHz to 26 GHz for LTE Band 7 and from 30 MHz to 27 GHz for LTE Band 41. 10 dB attenuation pad is connected with spectrum. RBW = 100 kHz and VBW = 300 kHz are used for conducted emission measurement.

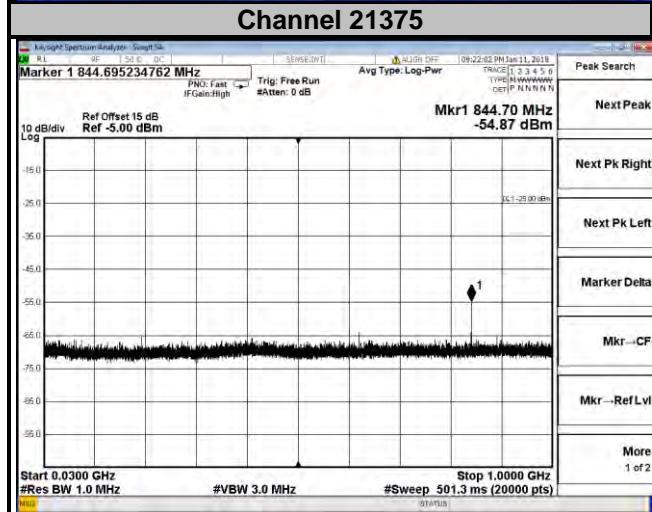
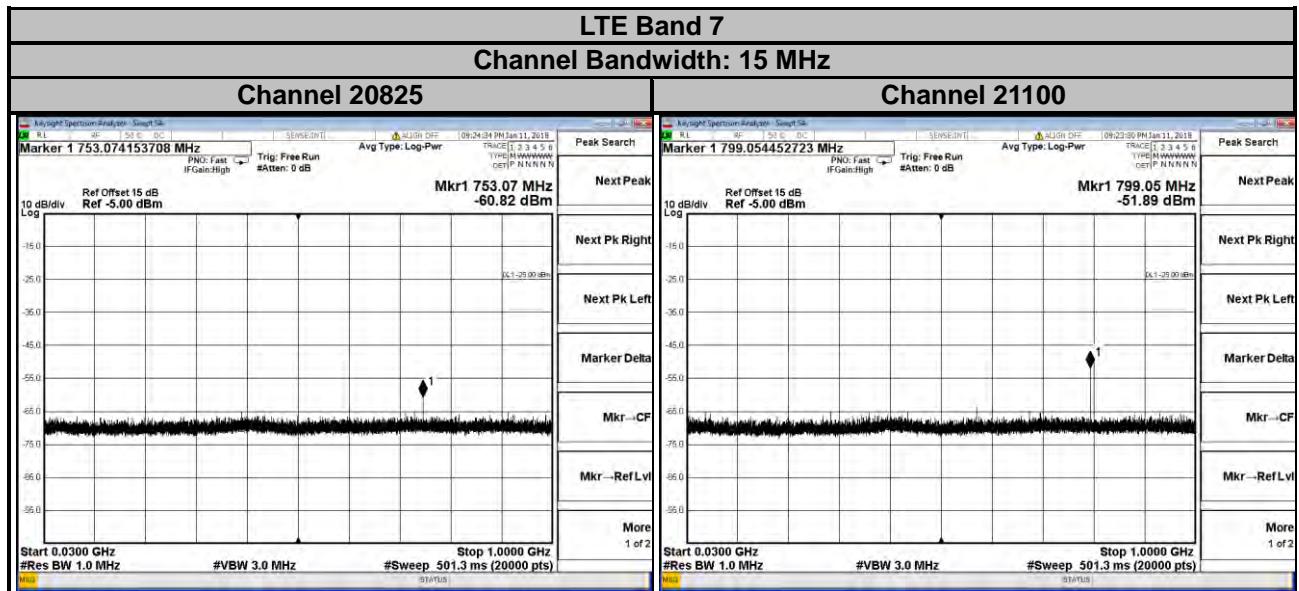
4.6.4 Test Results

LTE Band 7

30MHz ~ 1GHz



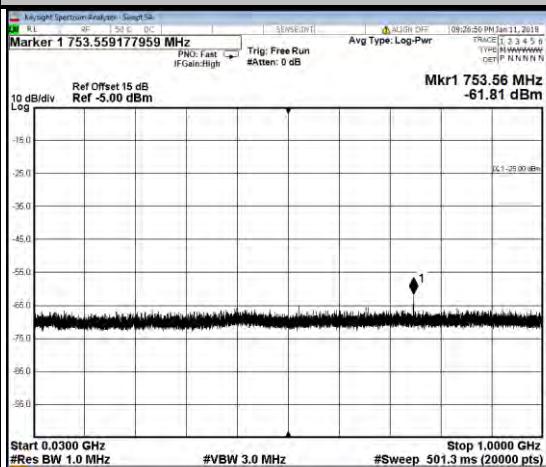




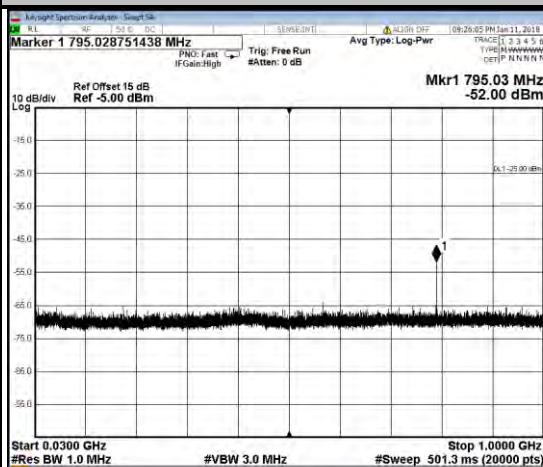
LTE Band 7

Channel Bandwidth: 20 MHz

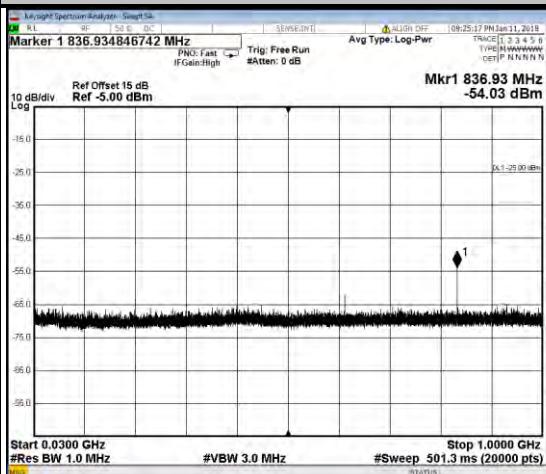
Channel 20850



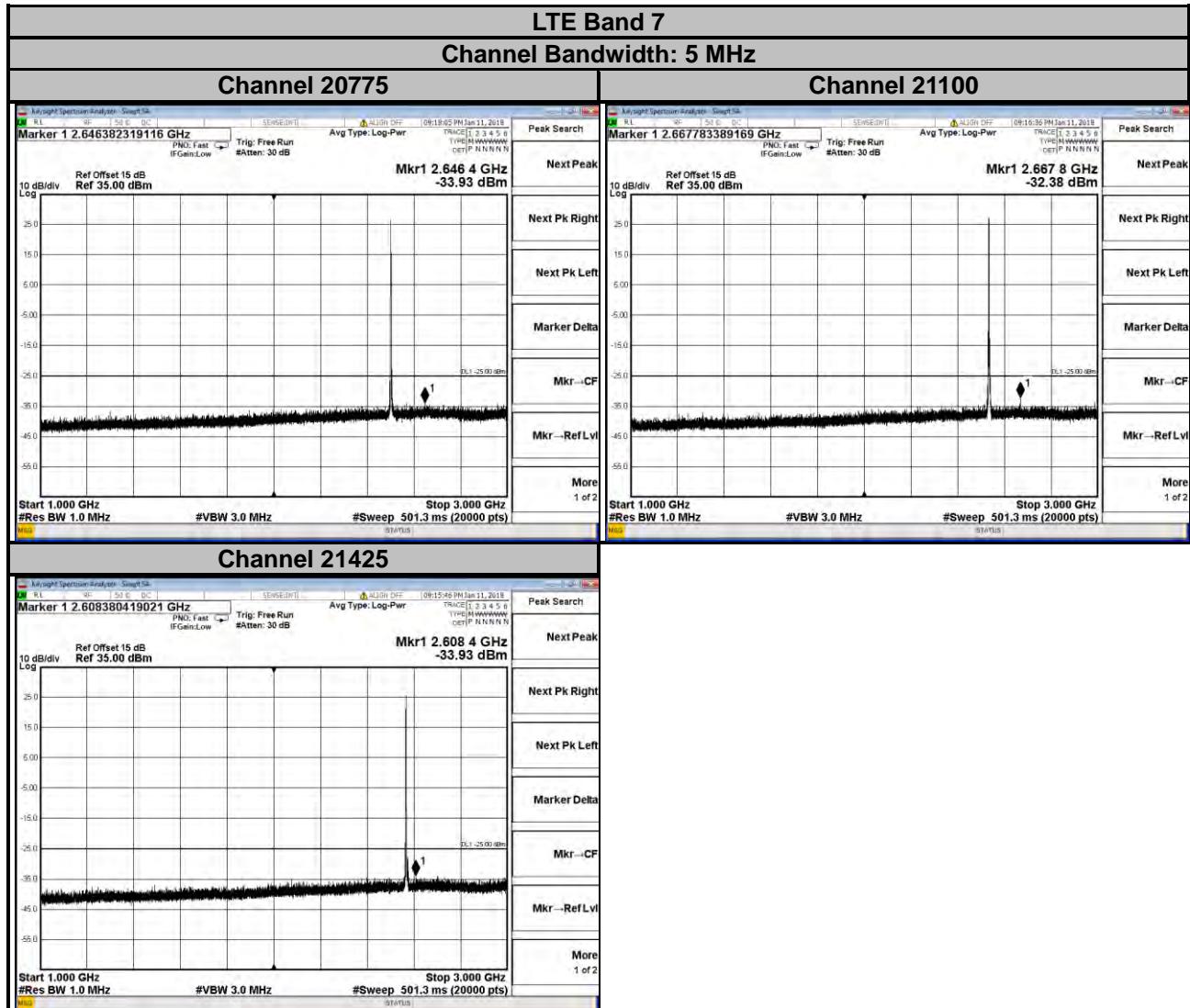
Channel 21100



Channel 21350



1GHz ~ 3GHz



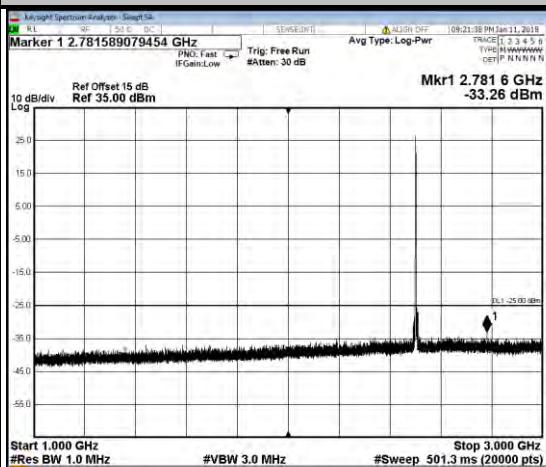


BUREAU
VERITAS

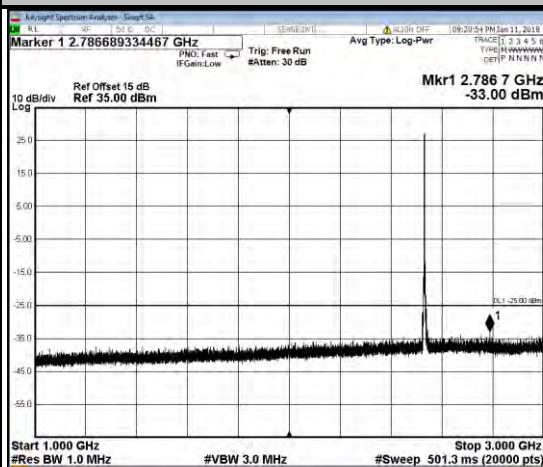
LTE Band 7

Channel Bandwidth: 10 MHz

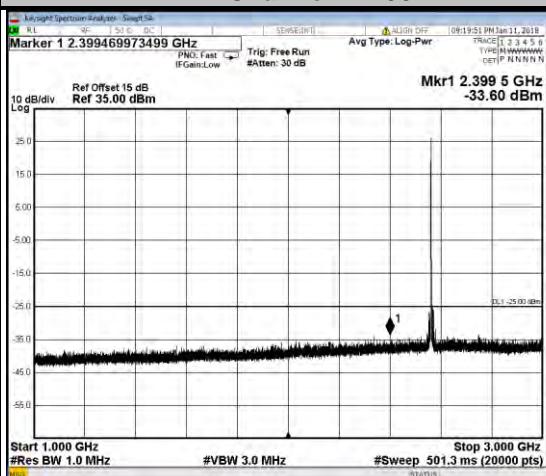
Channel 20800

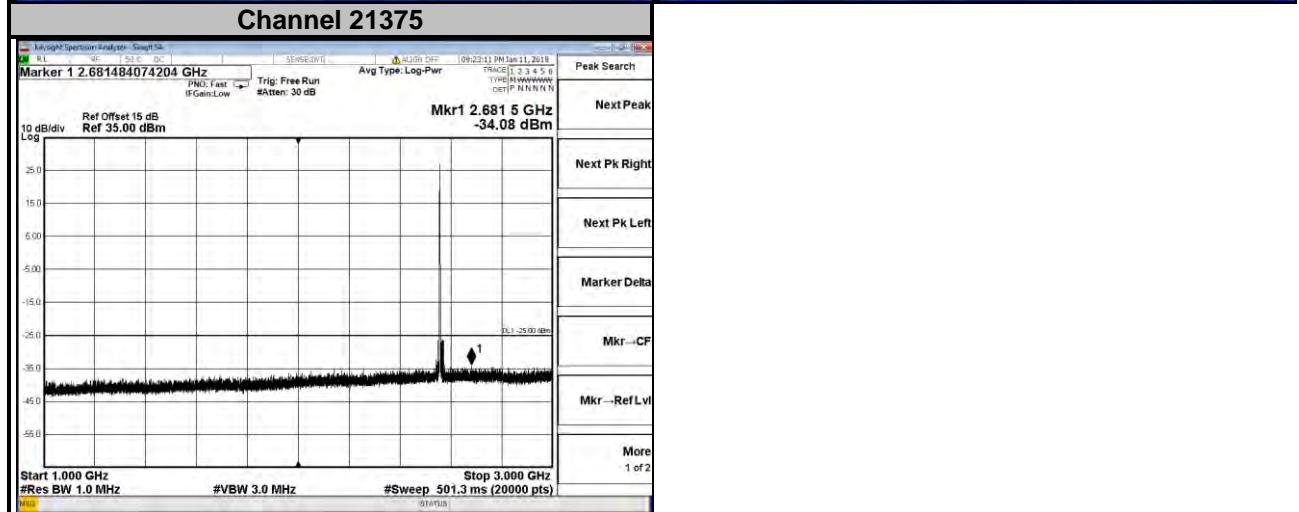
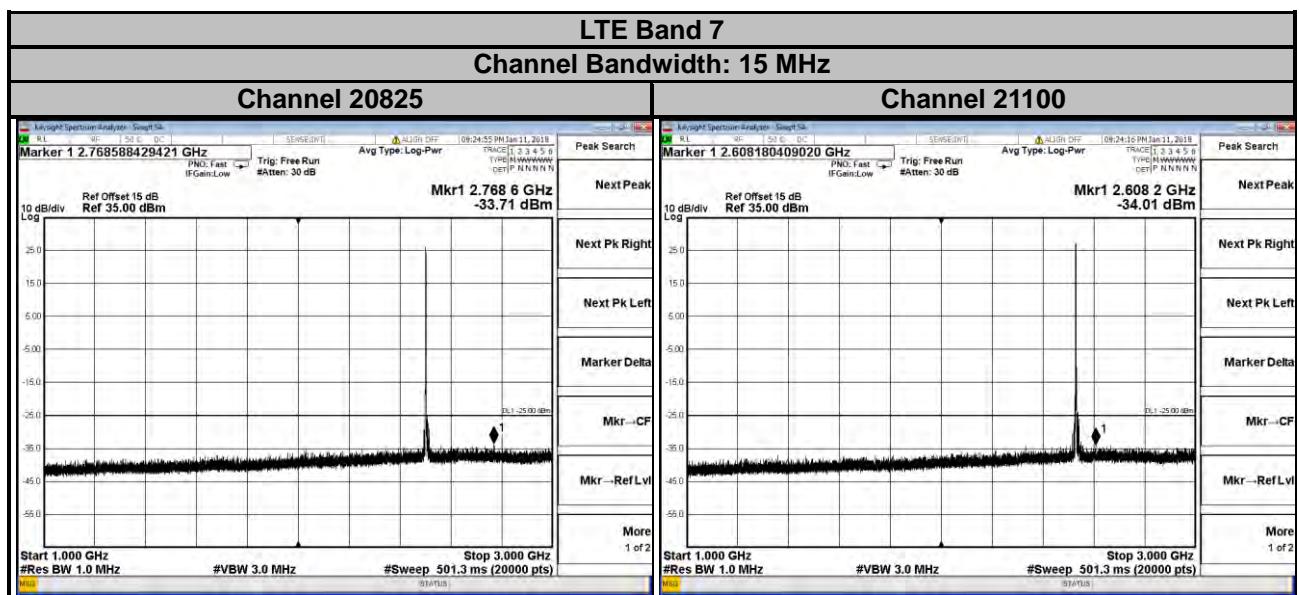


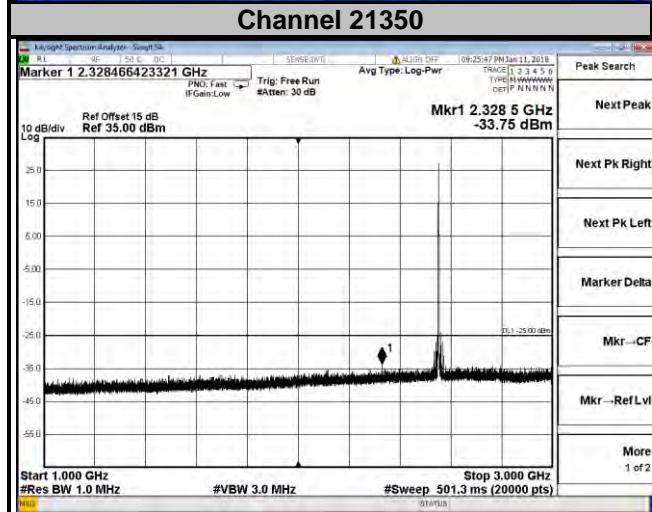
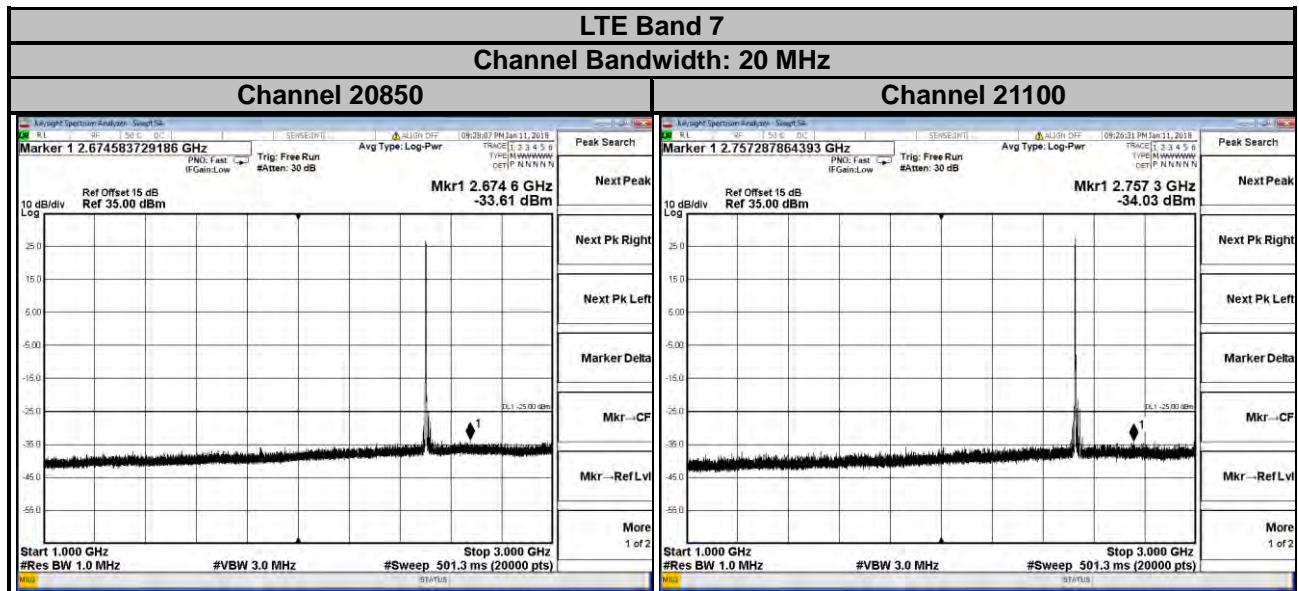
Channel 21100



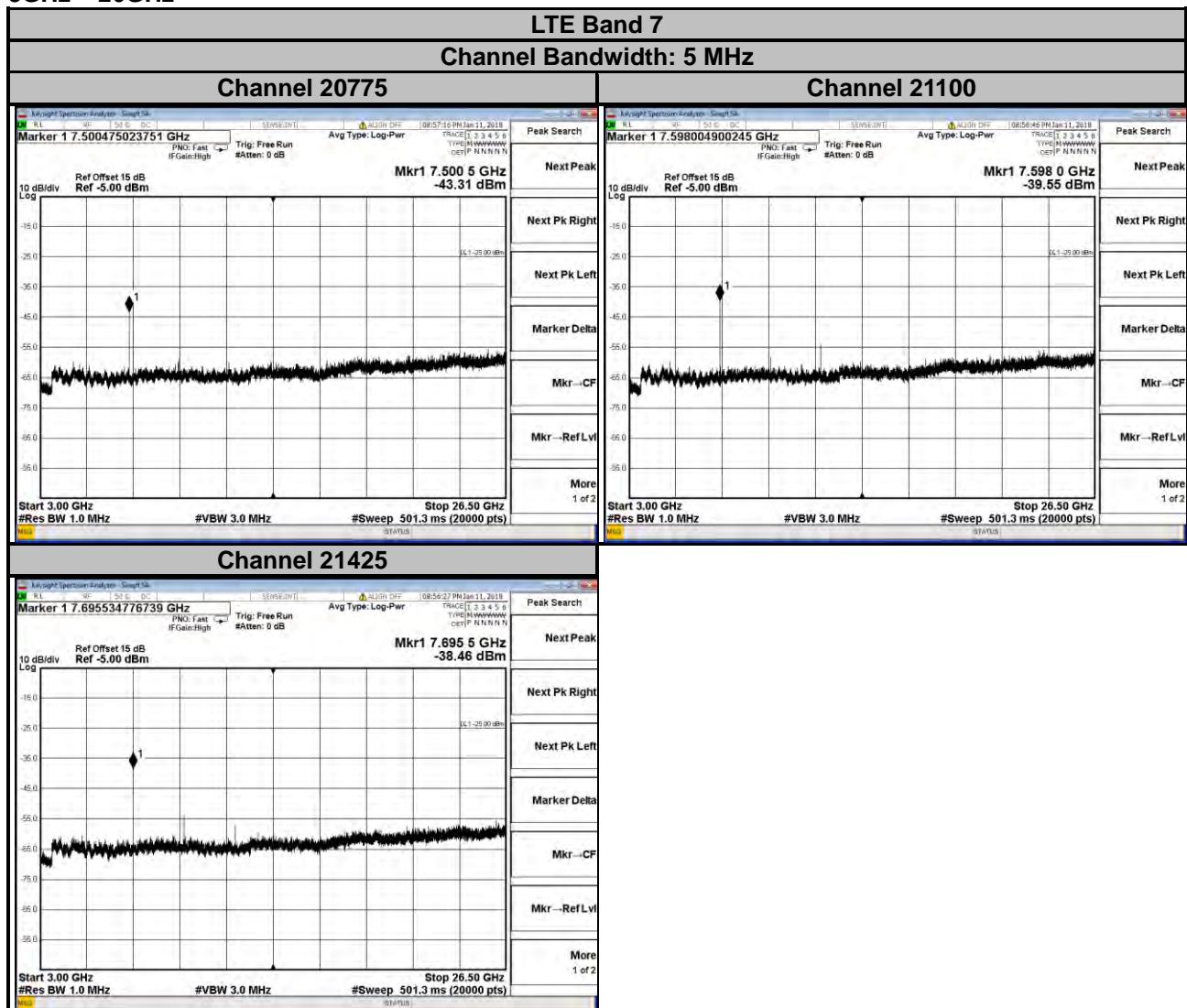
Channel 21400

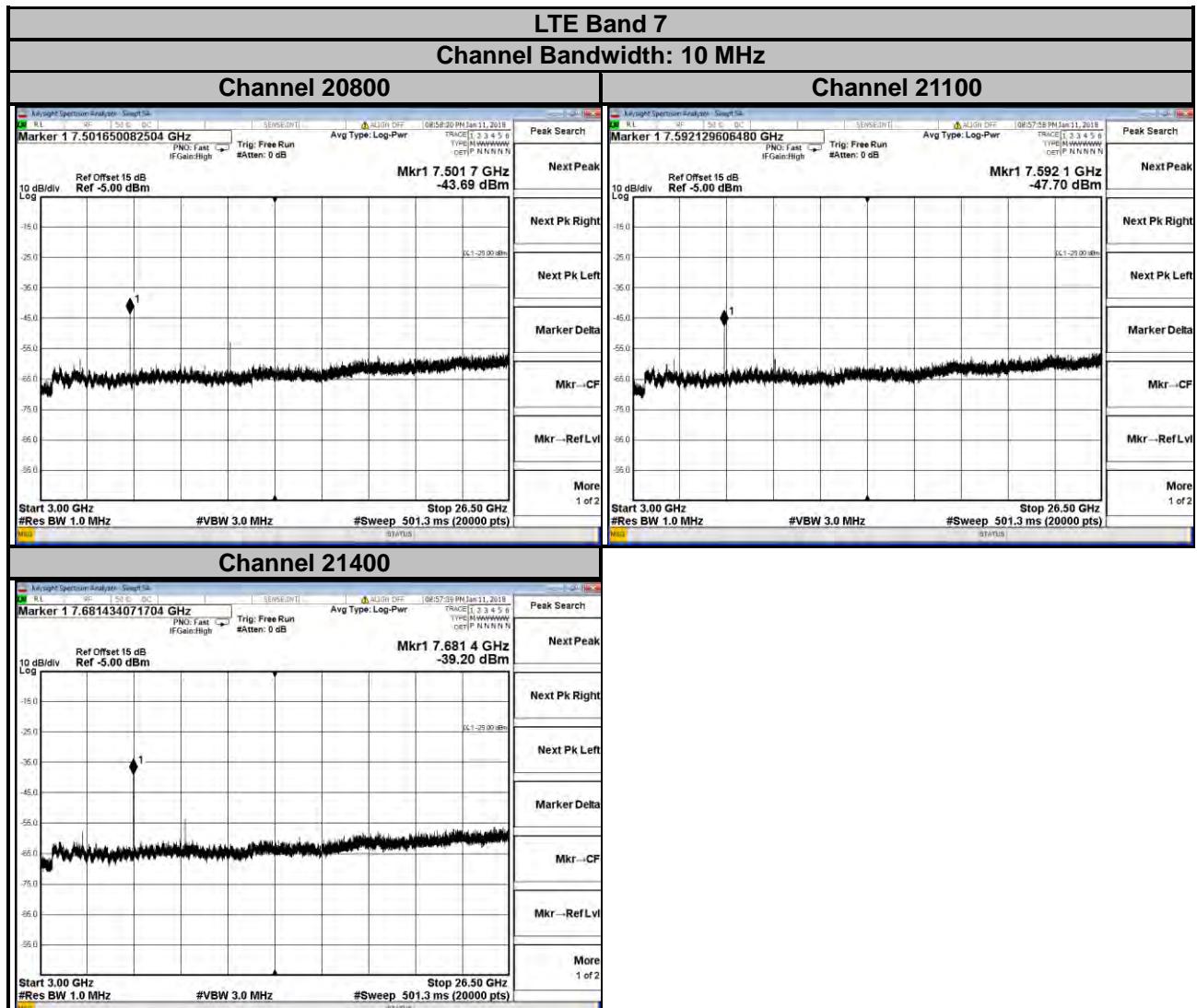






3GHz ~ 26GHz

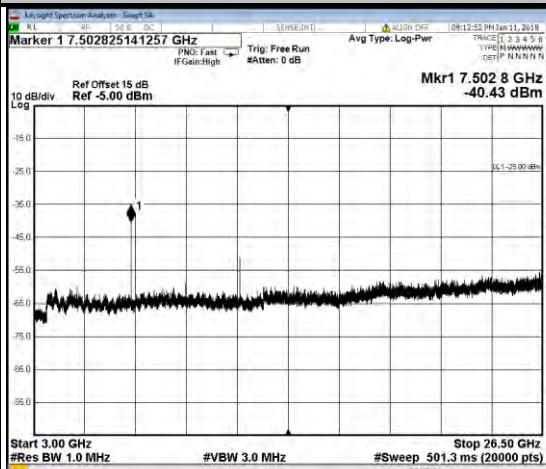




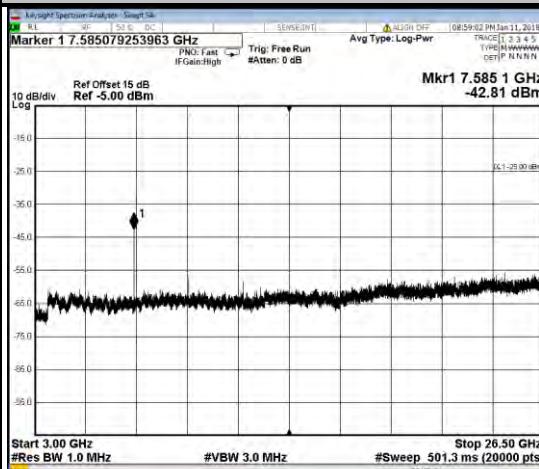
LTE Band 7

Channel Bandwidth: 15 MHz

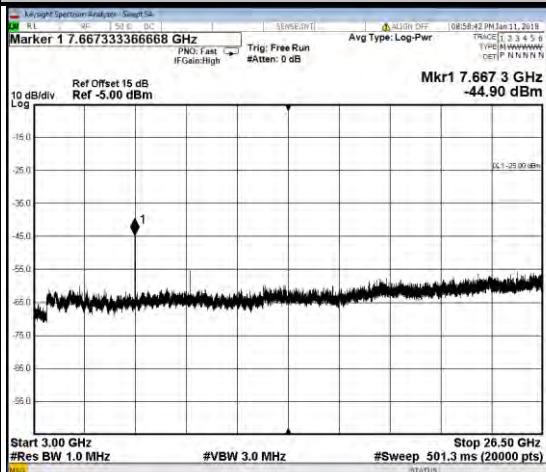
Channel 20825



Channel 21100



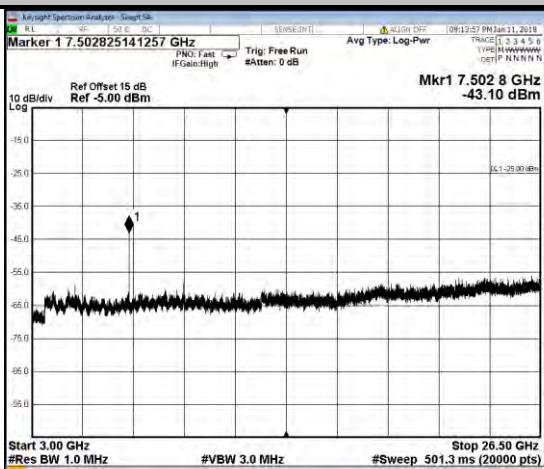
Channel 21375



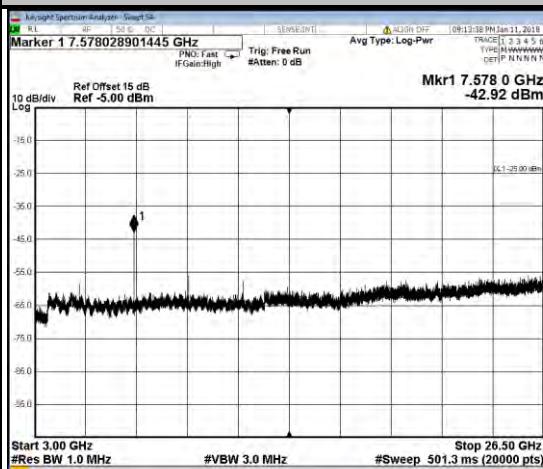
LTE Band 7

Channel Bandwidth: 20 MHz

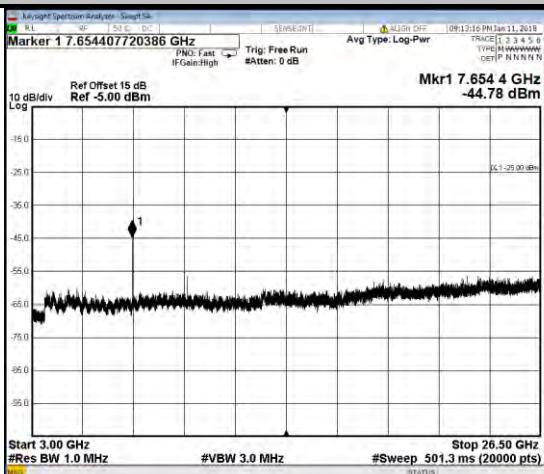
Channel 20850



Channel 21100

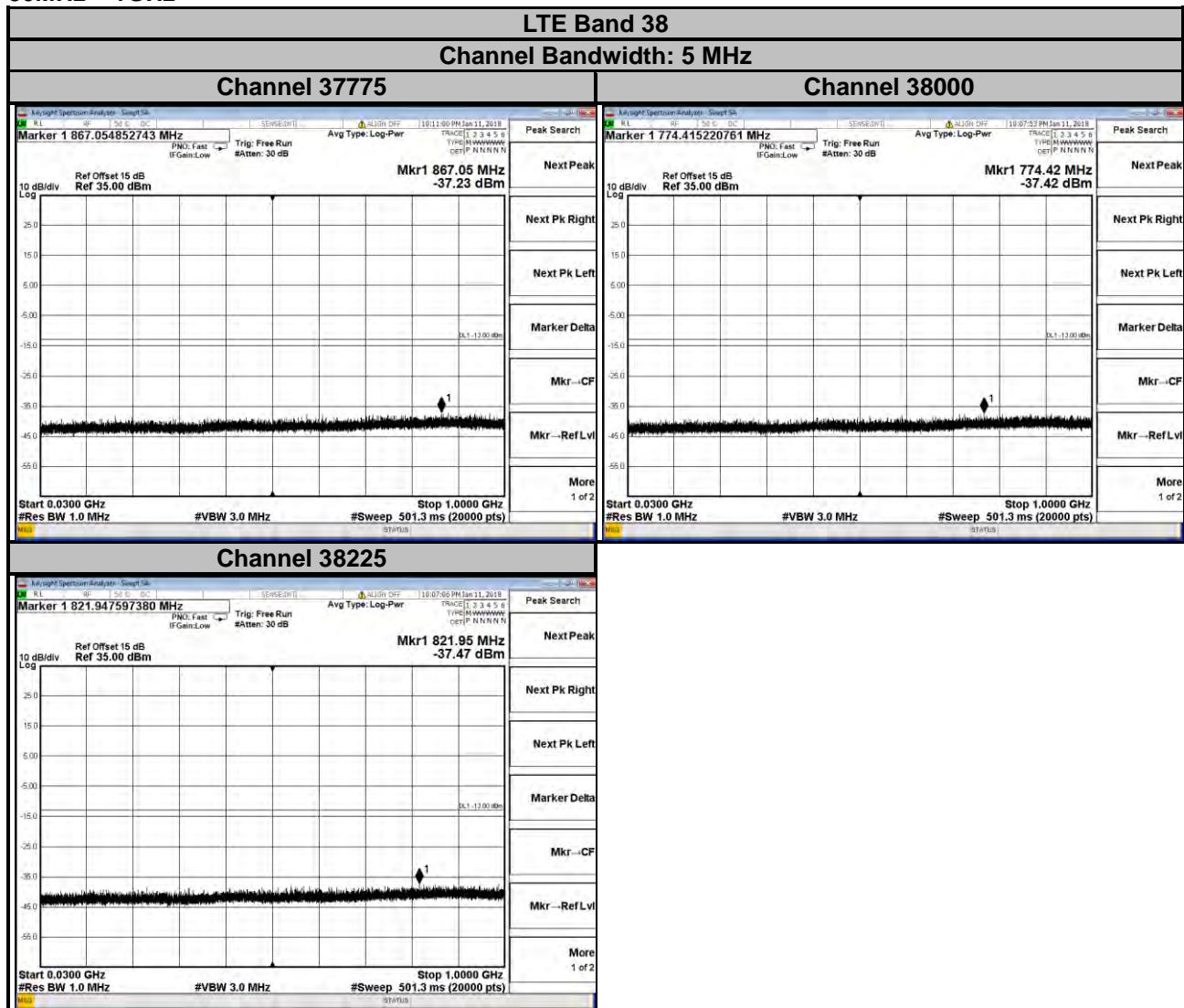


Channel 21350



LTE Band 38

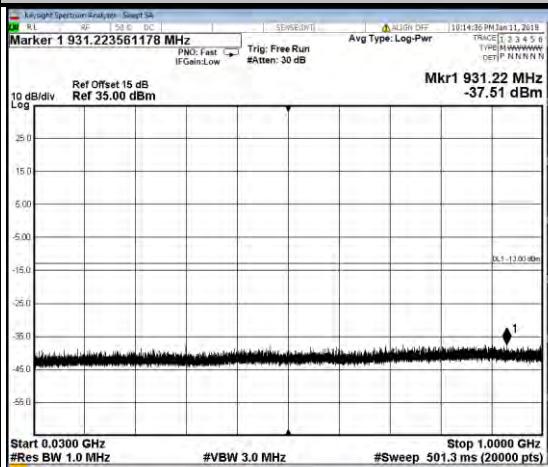
30MHz ~ 1GHz



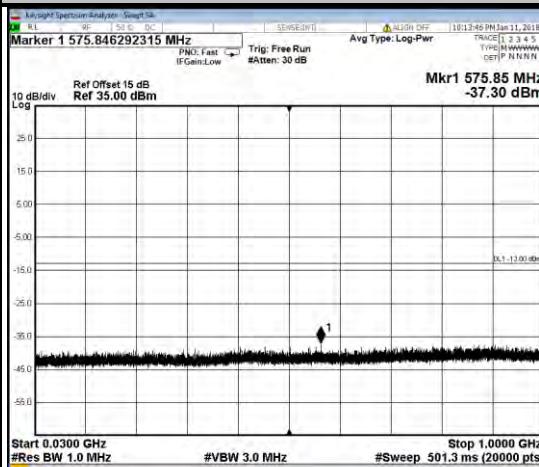
LTE Band 38

Channel Bandwidth: 10 MHz

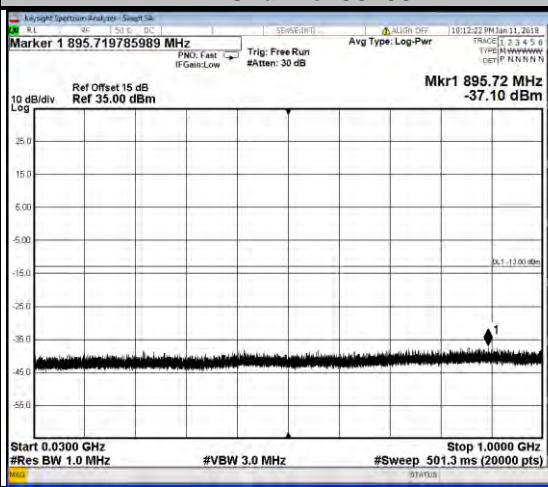
Channel 37800



Channel 38000



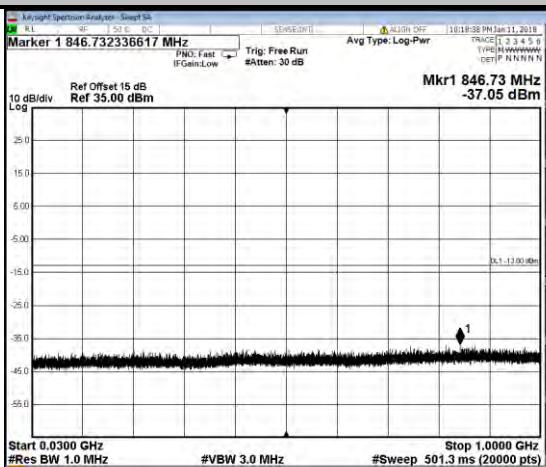
Channel 38200



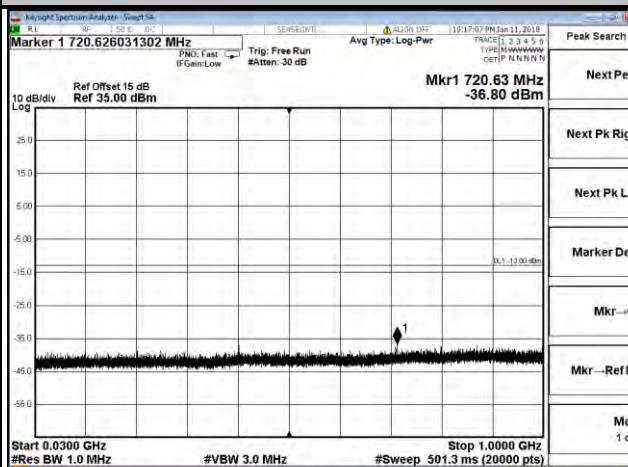
LTE Band 38

Channel Bandwidth: 15 MHz

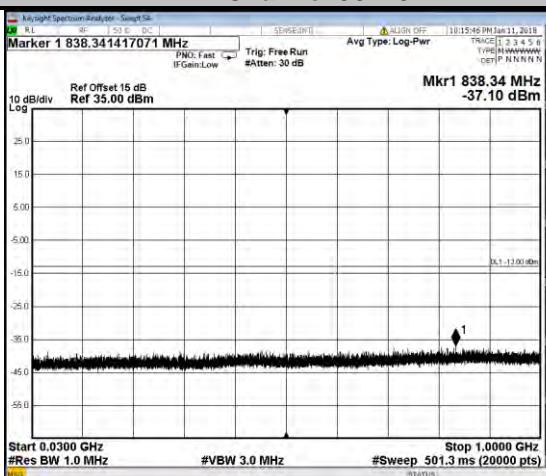
Channel 37825



Channel 38000



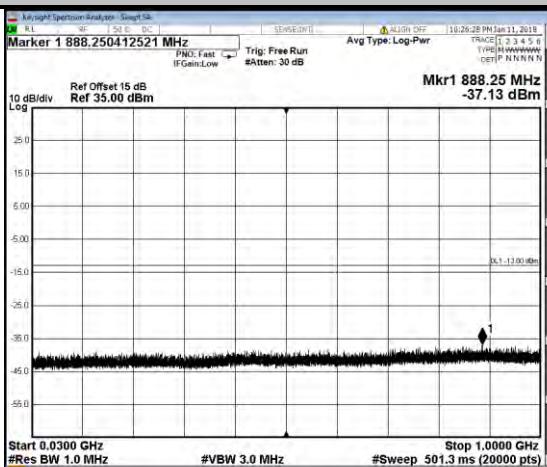
Channel 38175



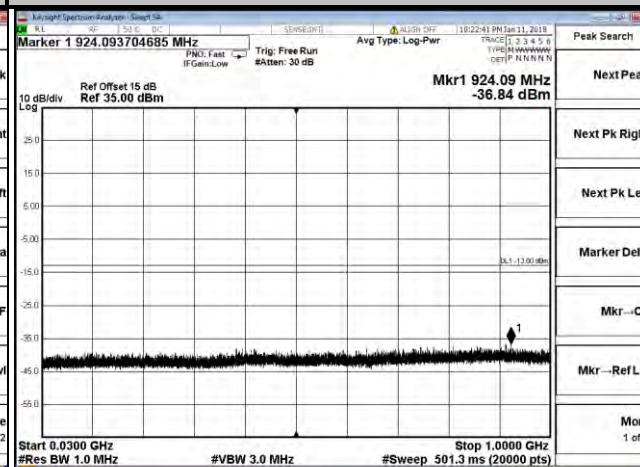
LTE Band 38

Channel Bandwidth: 20 MHz

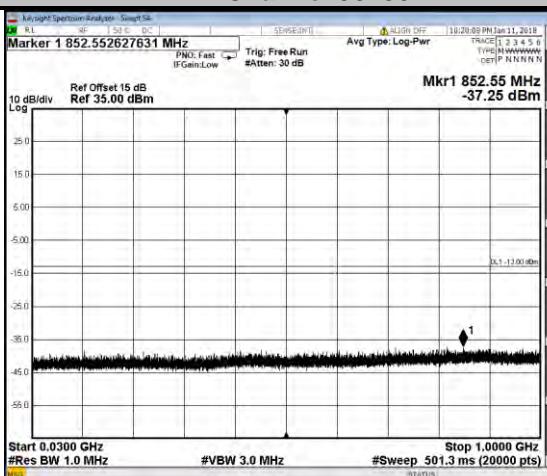
Channel 37850



Channel 38000



Channel 38150

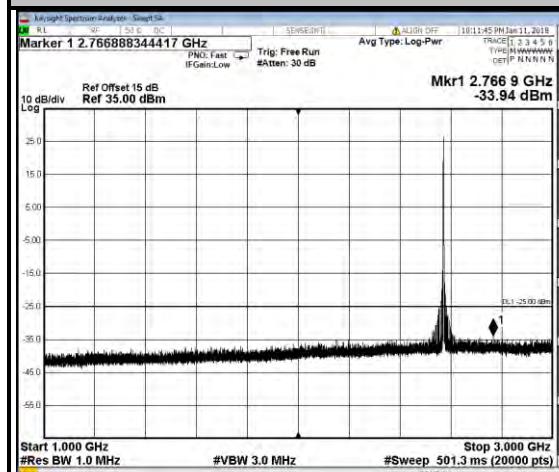


1GHz ~ 3GHz

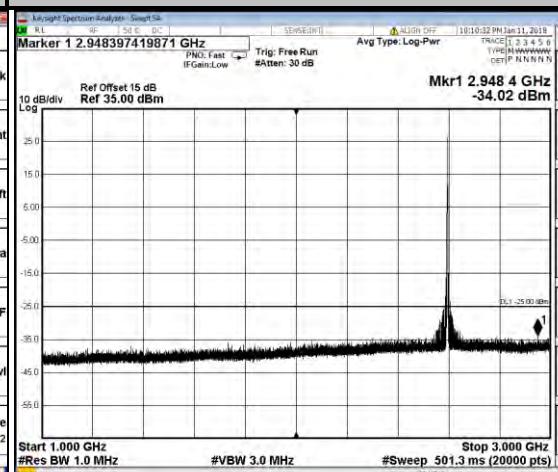
LTE Band 38

Channel Bandwidth: 5 MHz

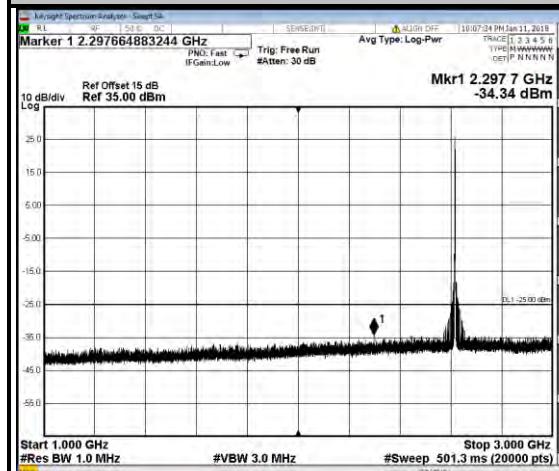
Channel 37775



Channel 38000



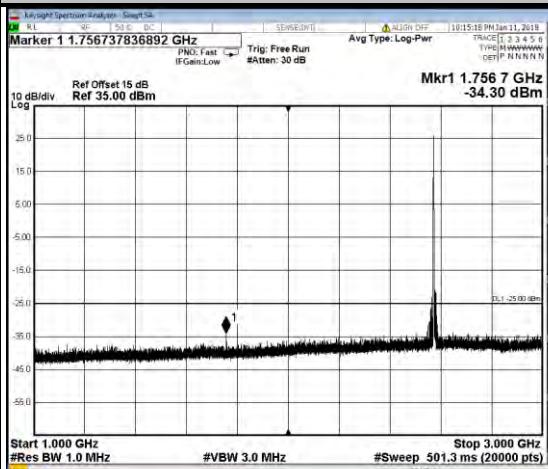
Channel 38225



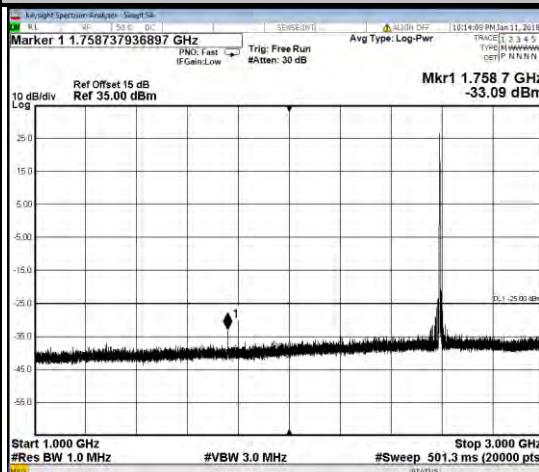
LTE Band 38

Channel Bandwidth: 10 MHz

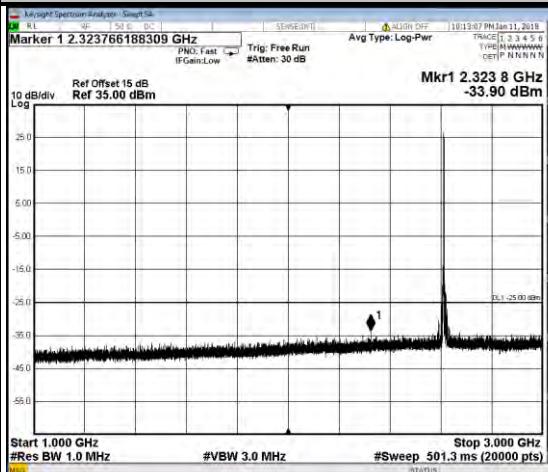
Channel 37800

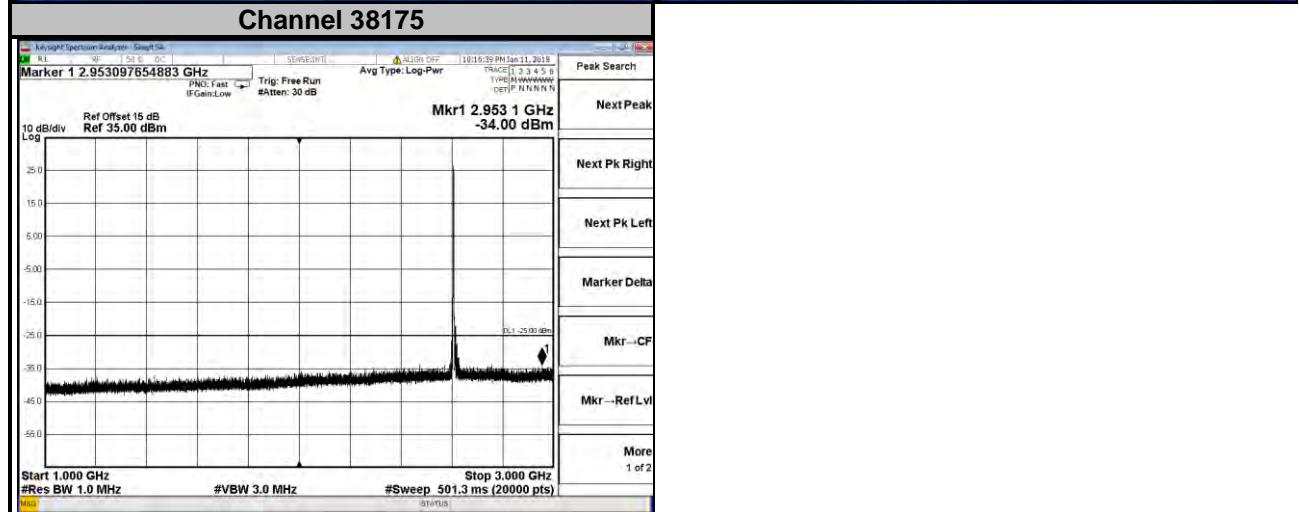
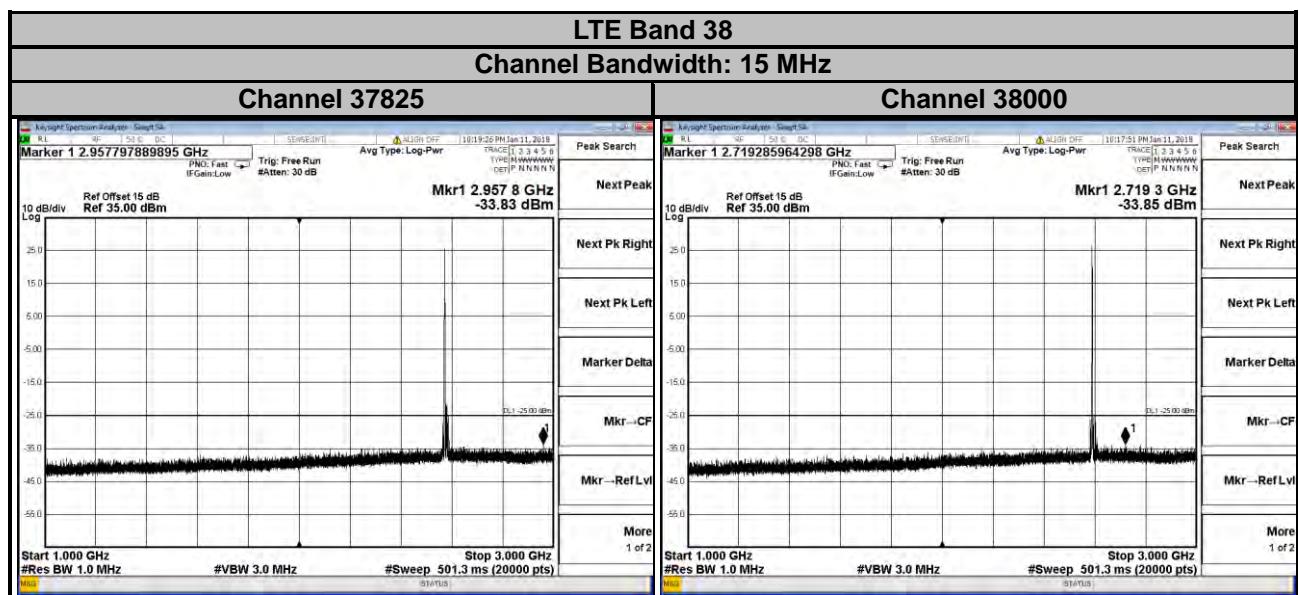


Channel 38000



Channel 38200

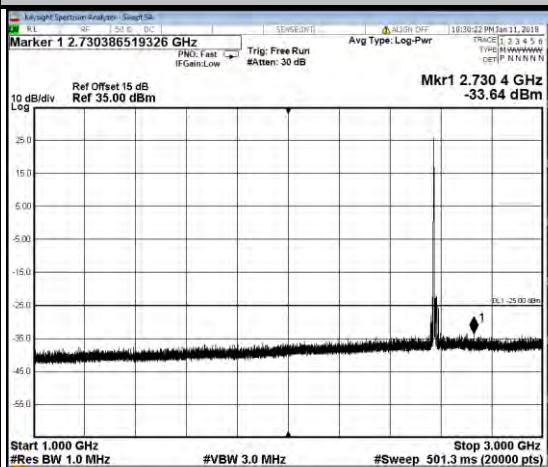




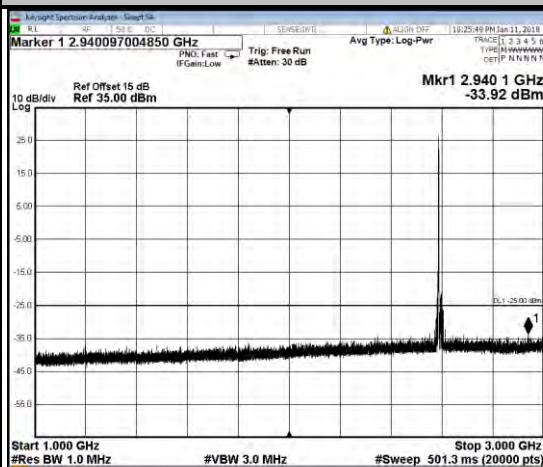
LTE Band 38

Channel Bandwidth: 20 MHz

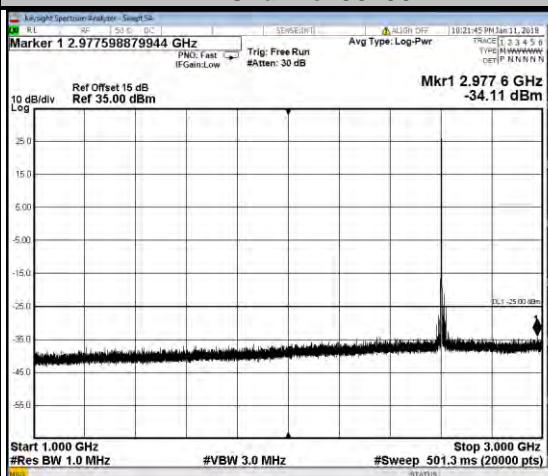
Channel 37850



Channel 38000



Channel 38150

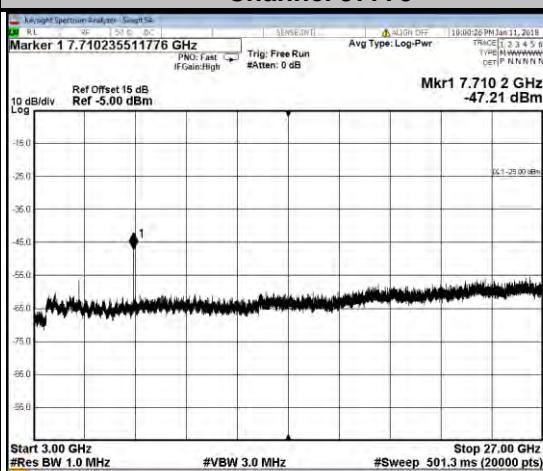


3GHz ~ 27GHz

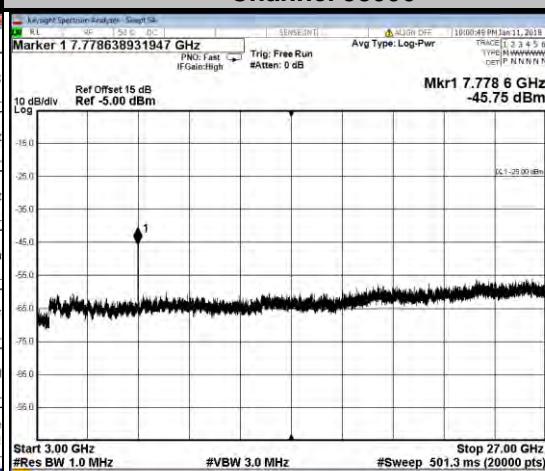
LTE Band 38

Channel Bandwidth: 5 MHz

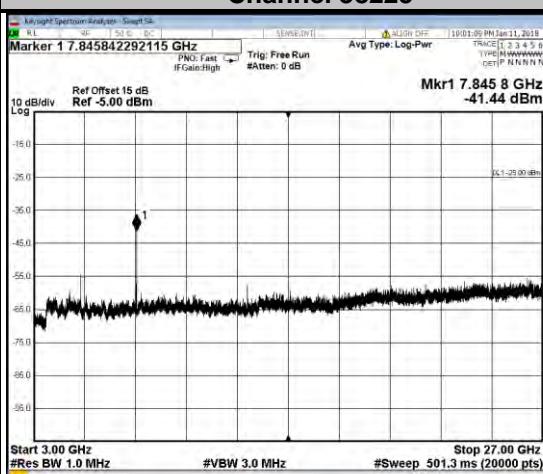
Channel 37775



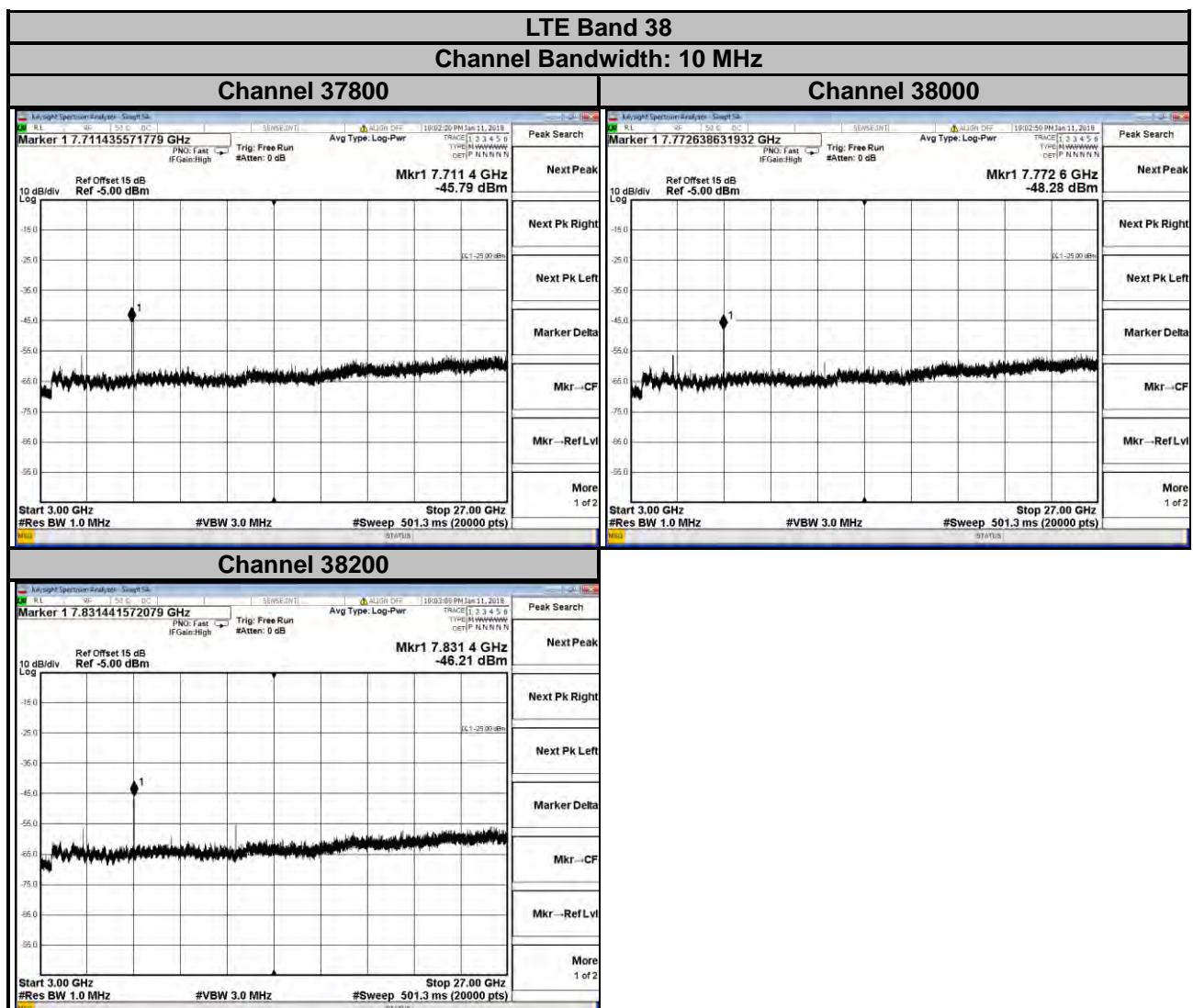
Channel 38000



Channel 38225



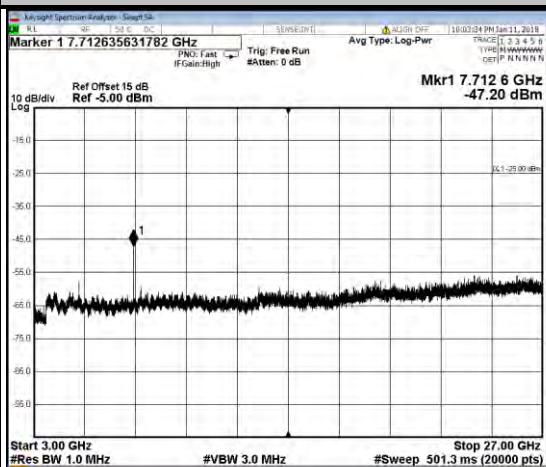
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr--CF
Mkr--Ref Lvl
More 1 of 2



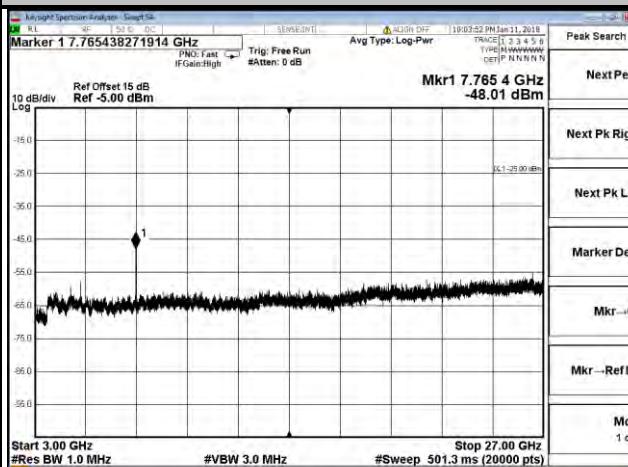
LTE Band 38

Channel Bandwidth: 15 MHz

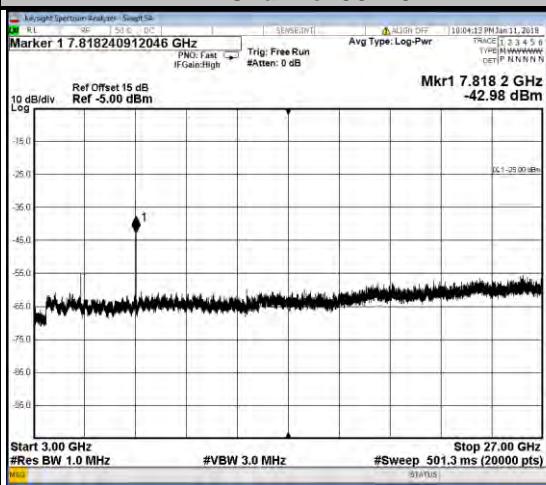
Channel 37825

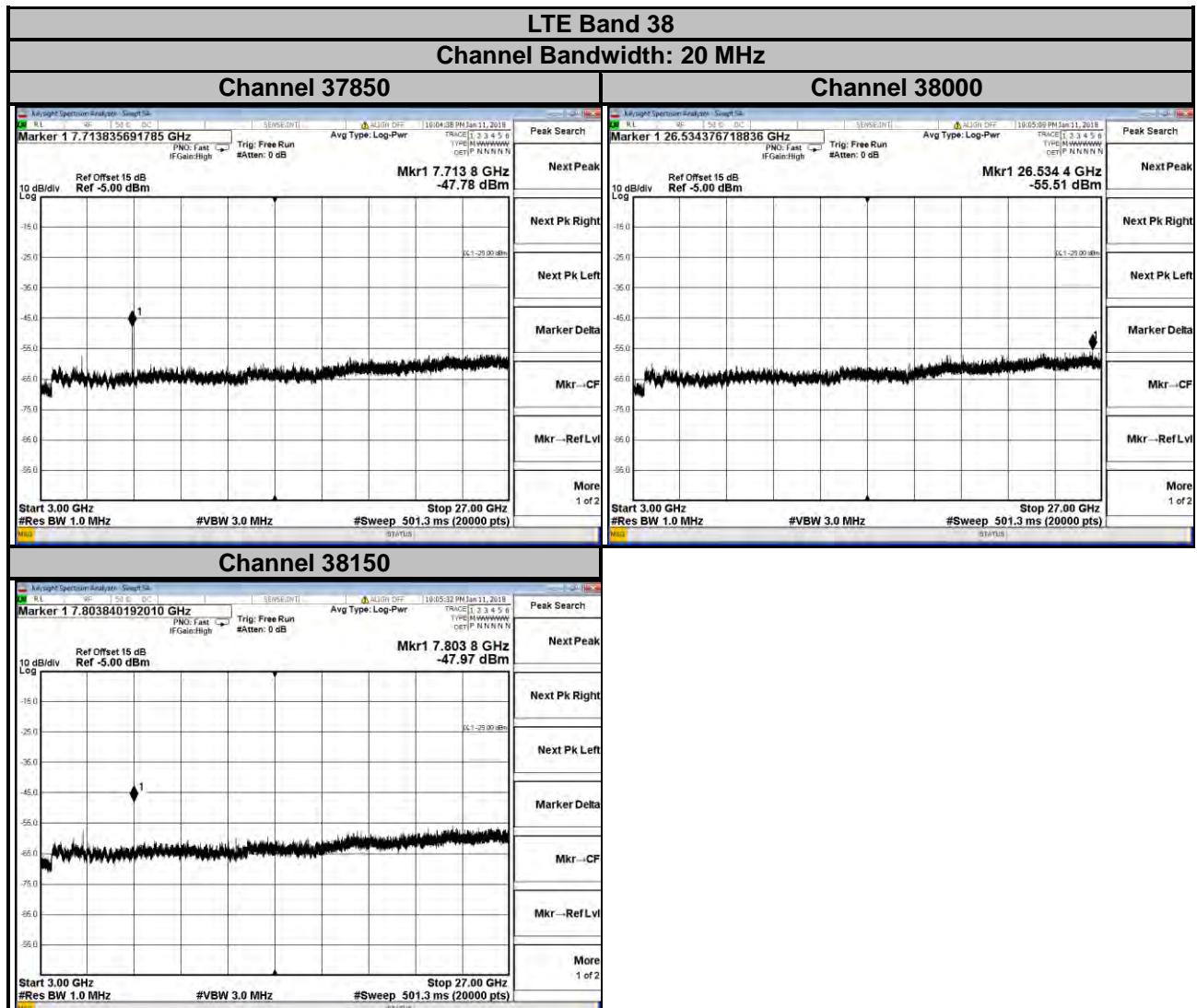


Channel 38000



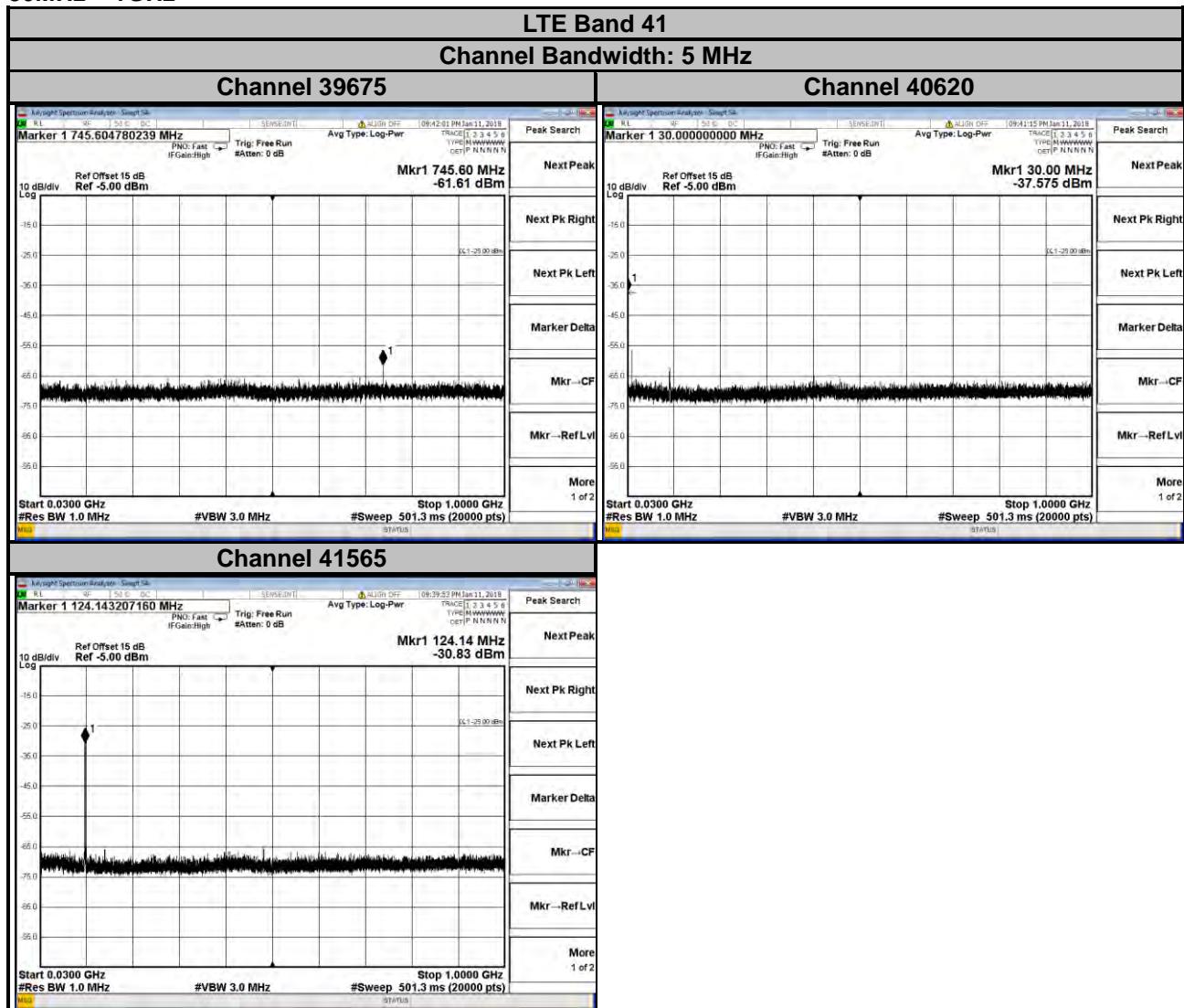
Channel 38175

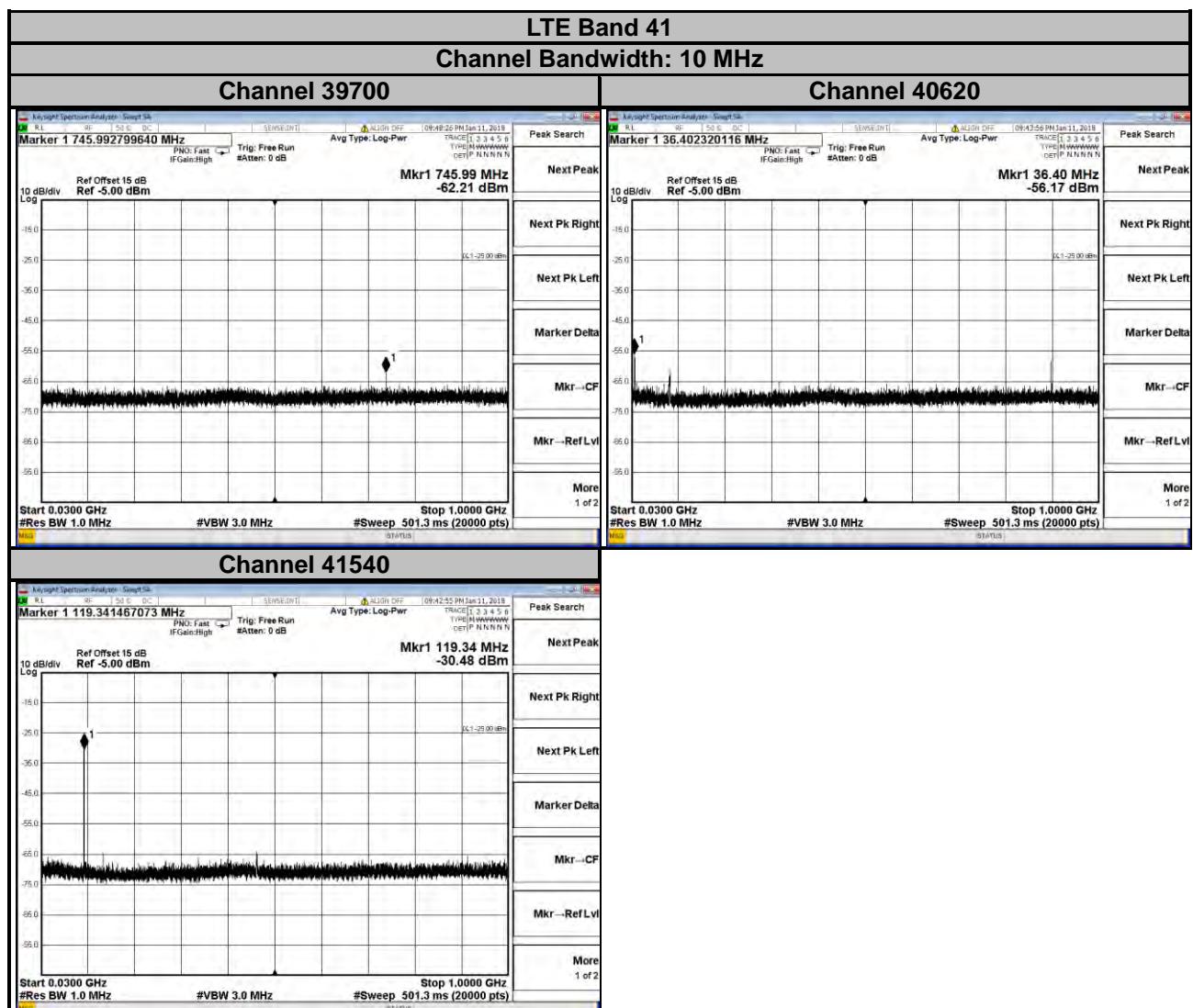


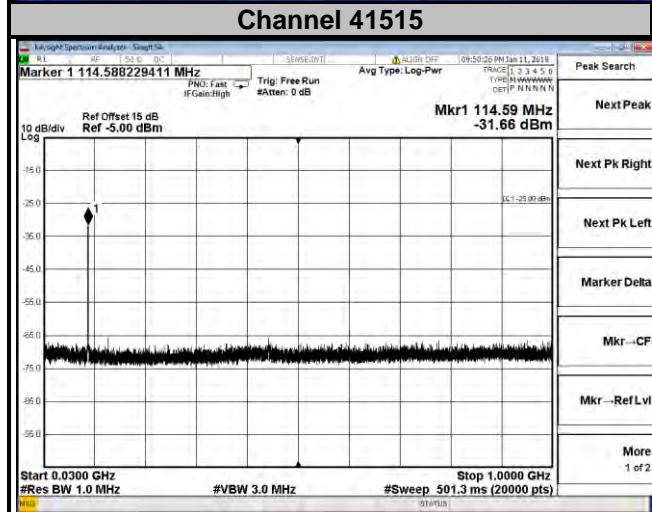
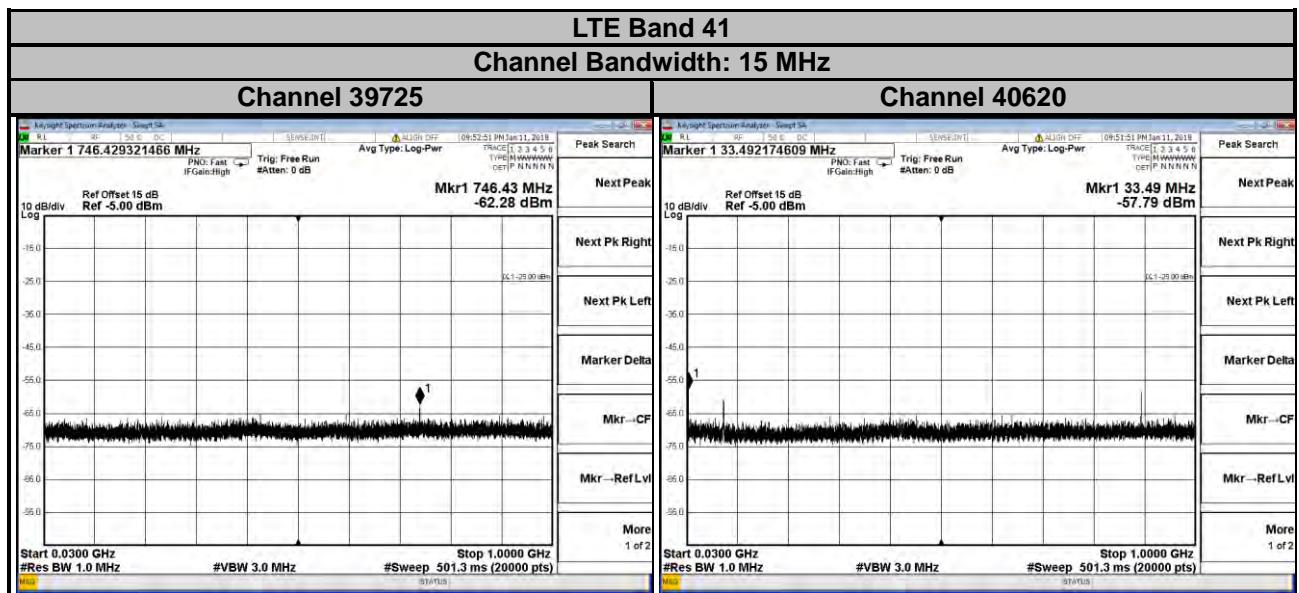


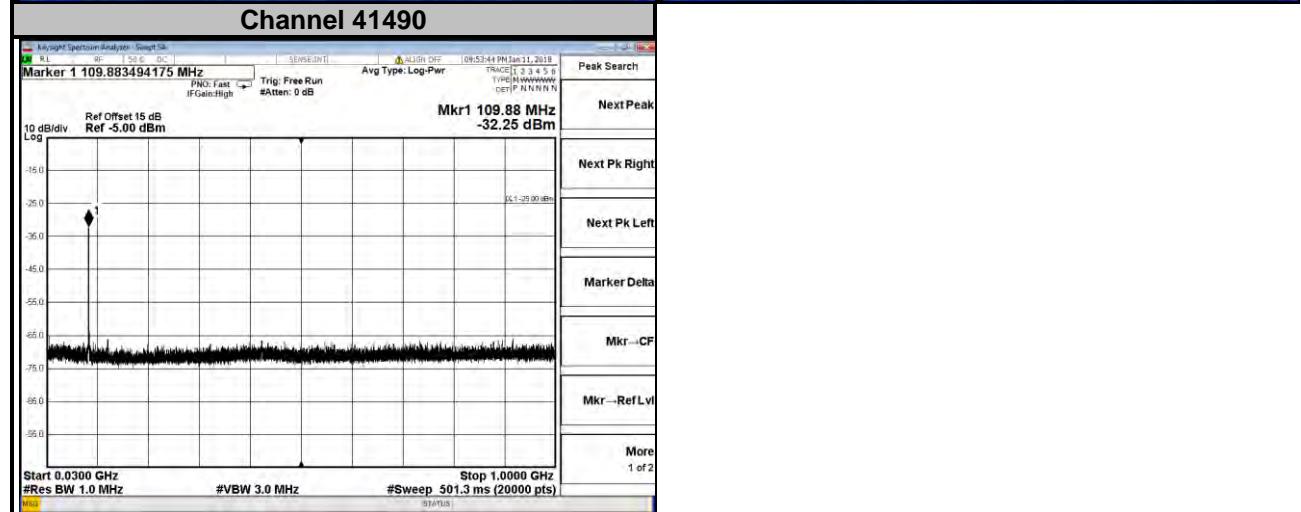
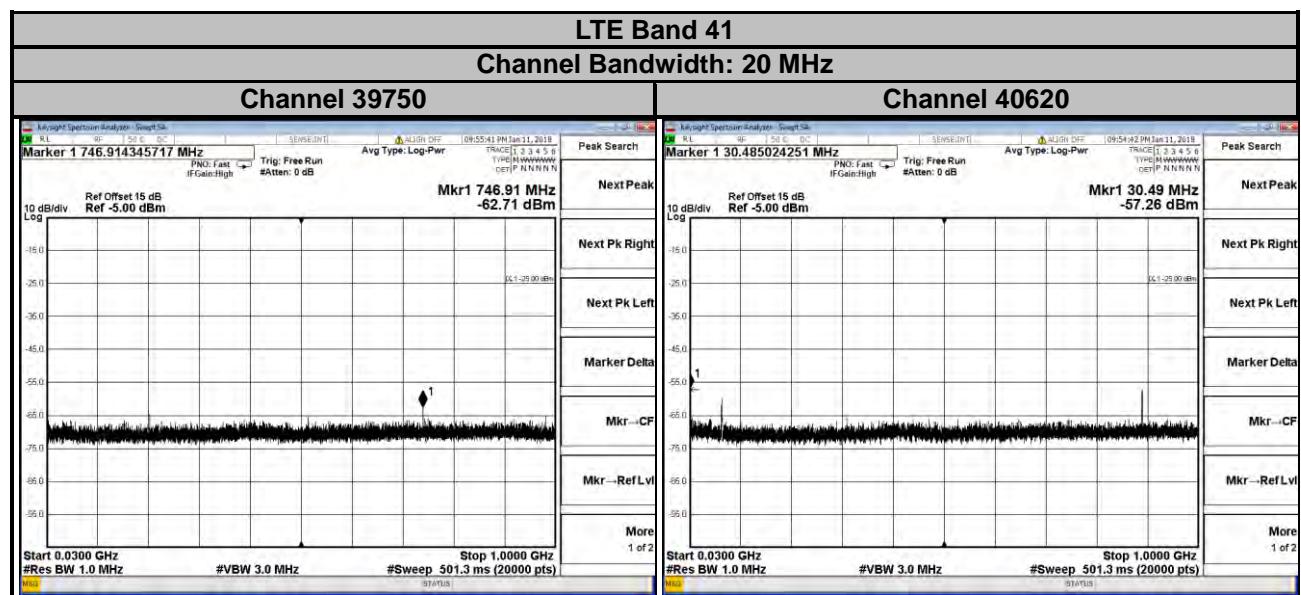
LTE Band 41

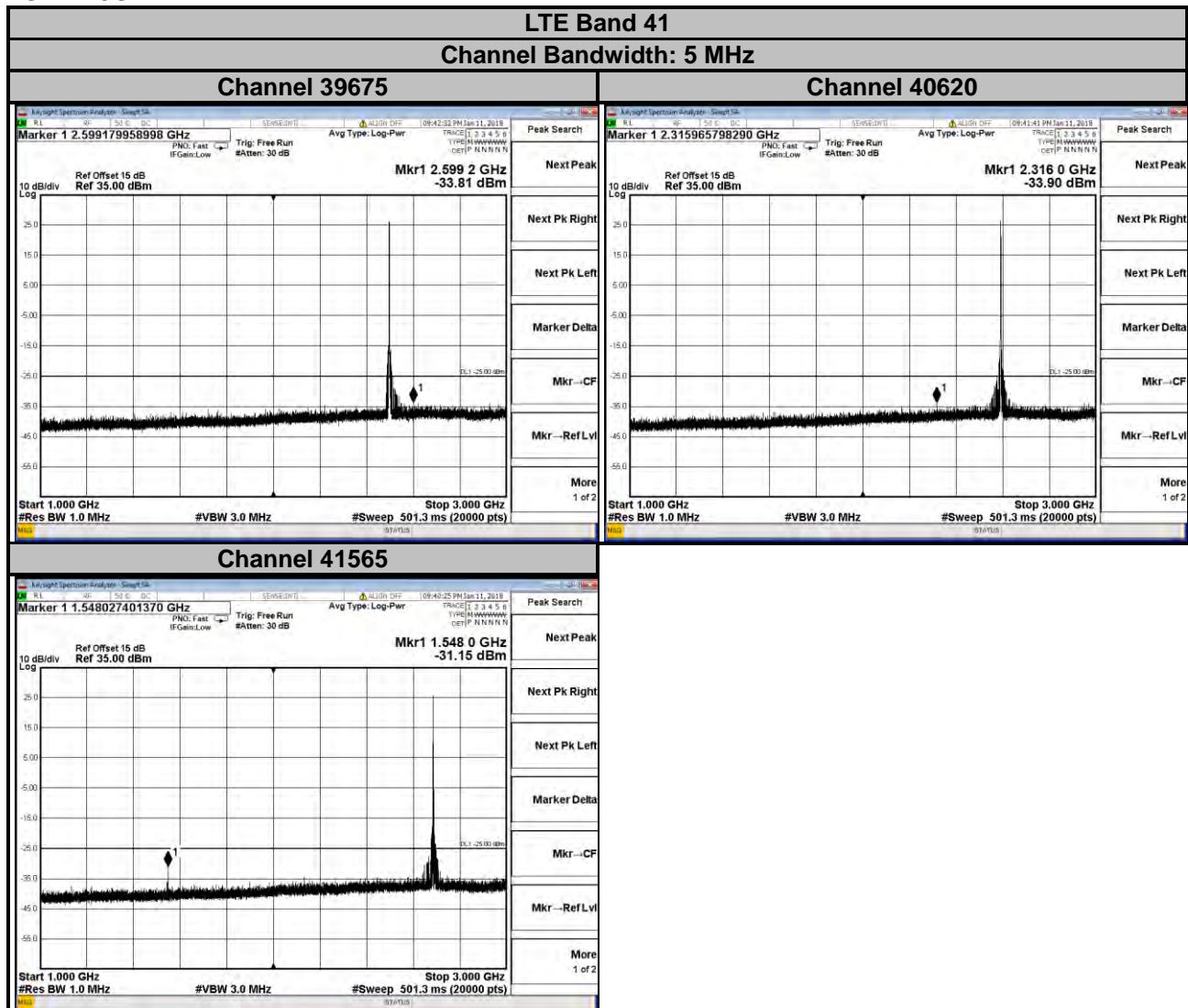
30MHz ~ 1GHz

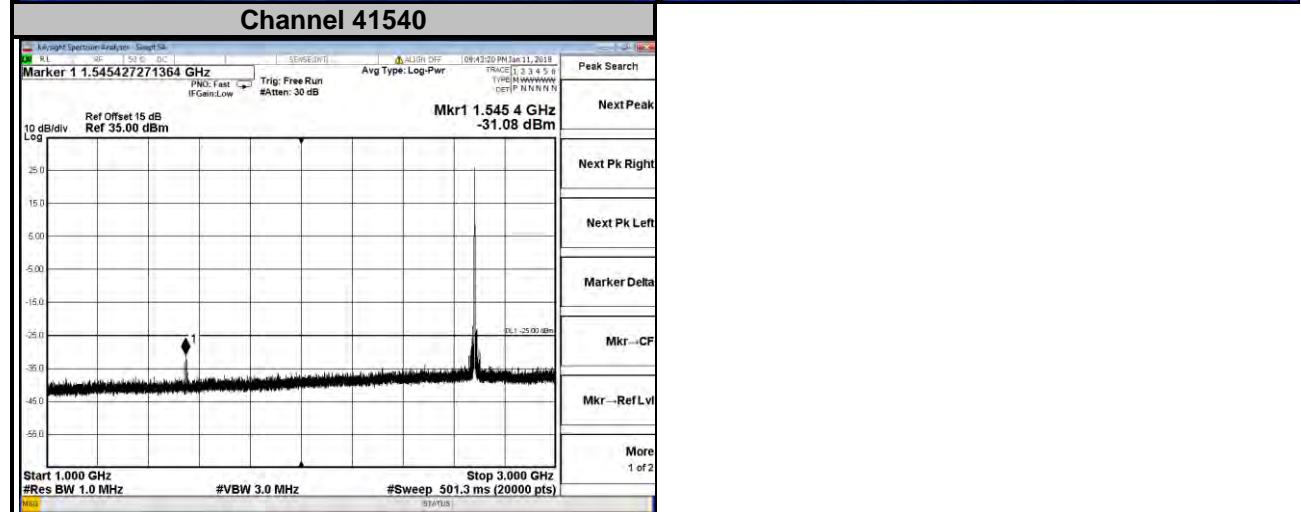
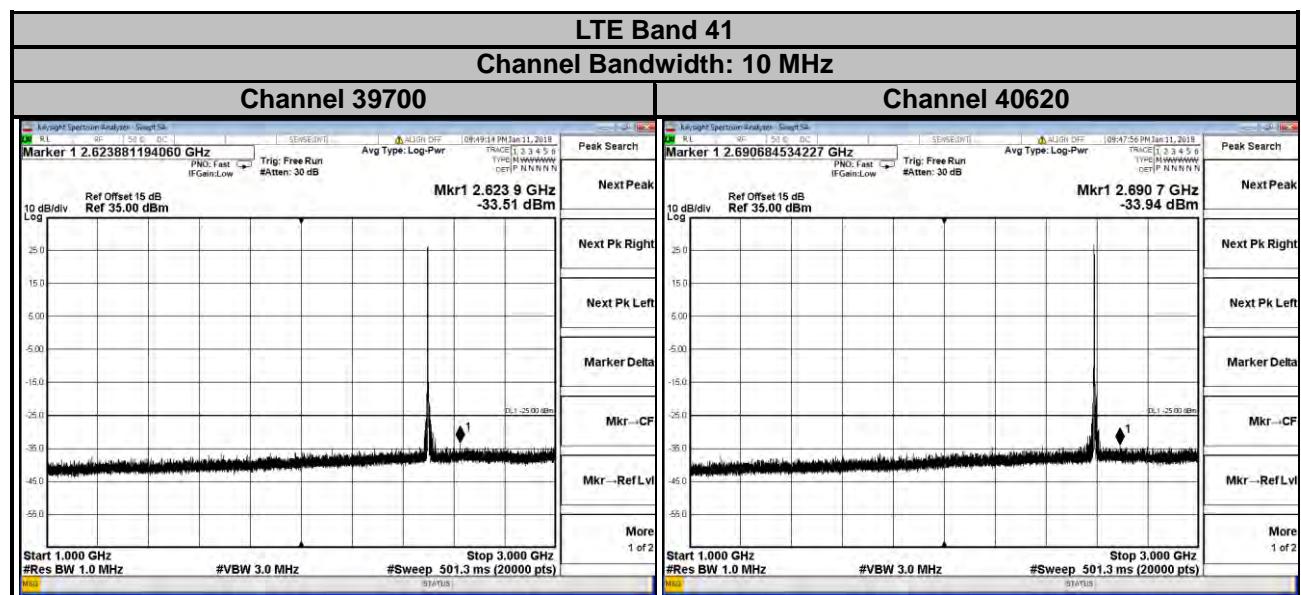


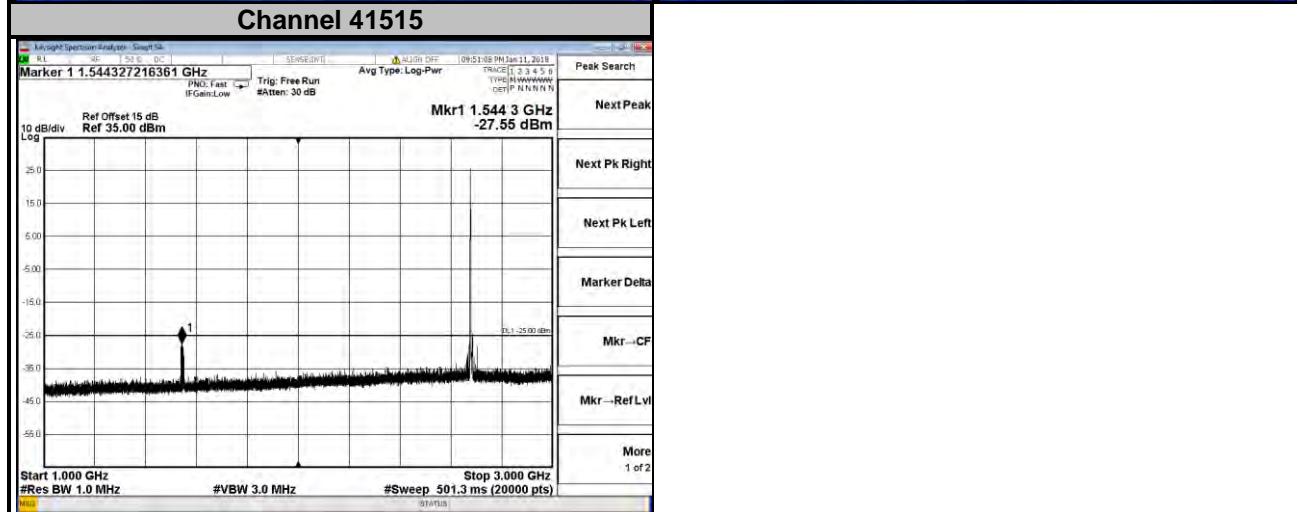
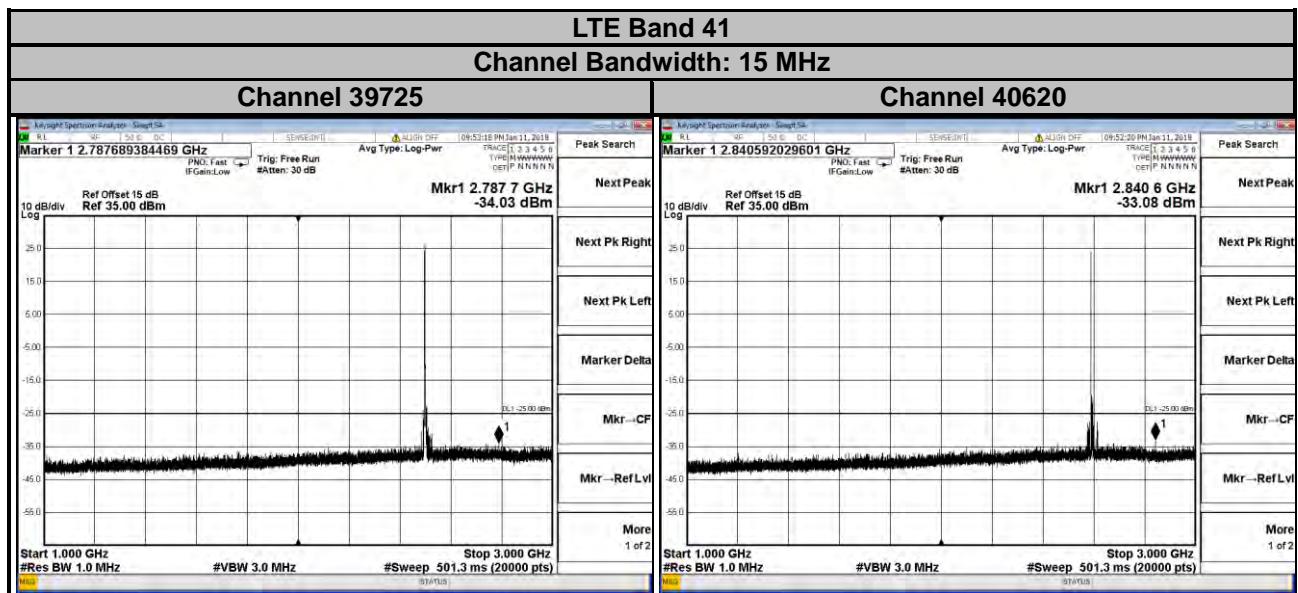


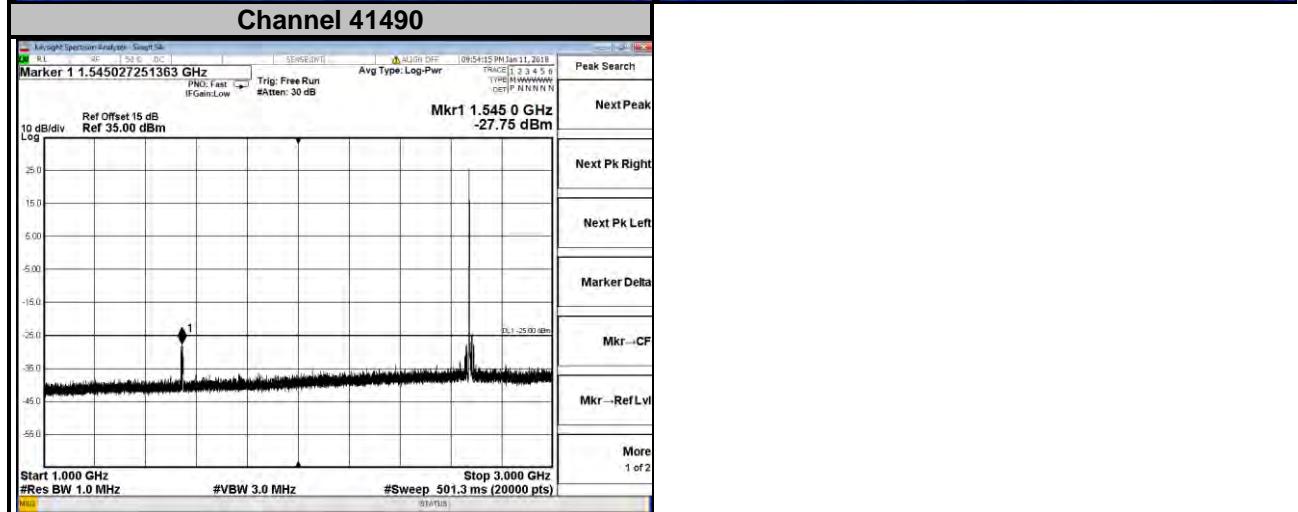
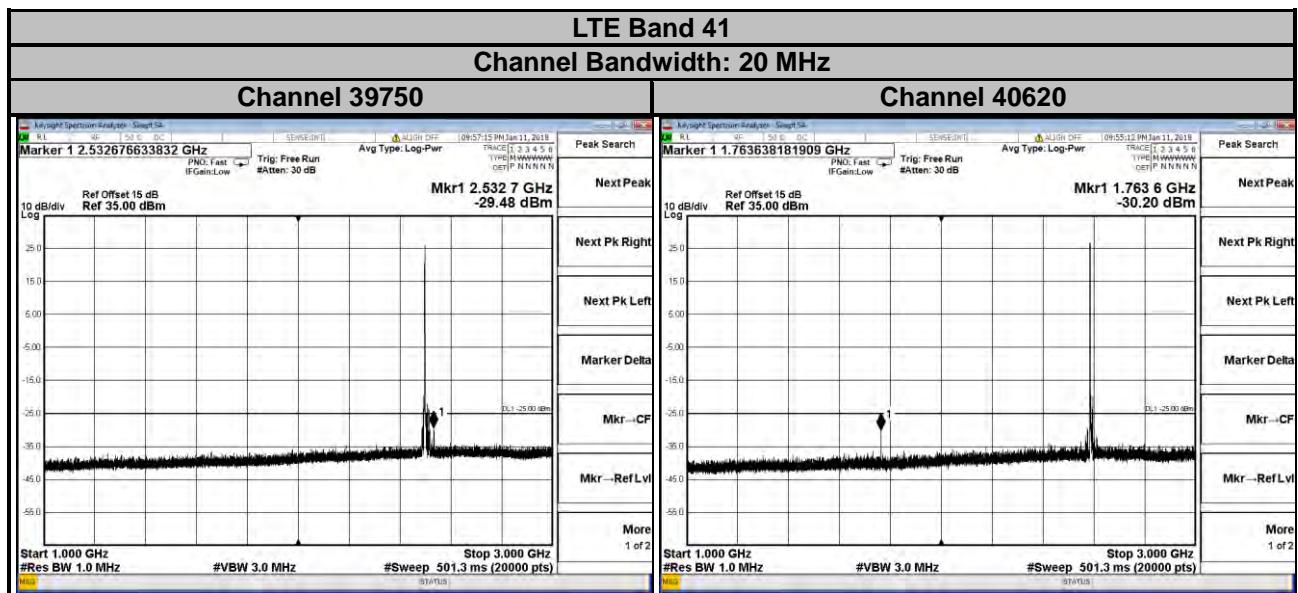




1GHz ~ 3GHz






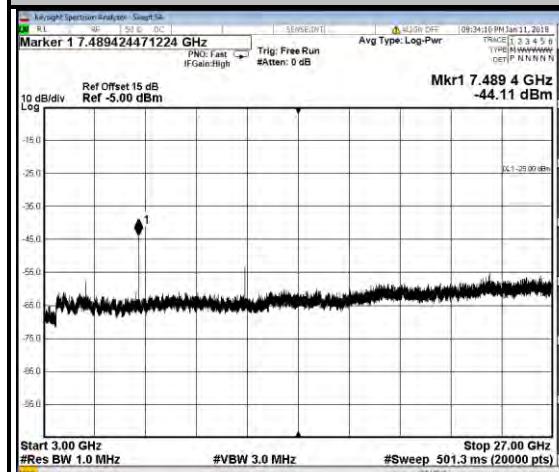


3GHz ~ 27GHz

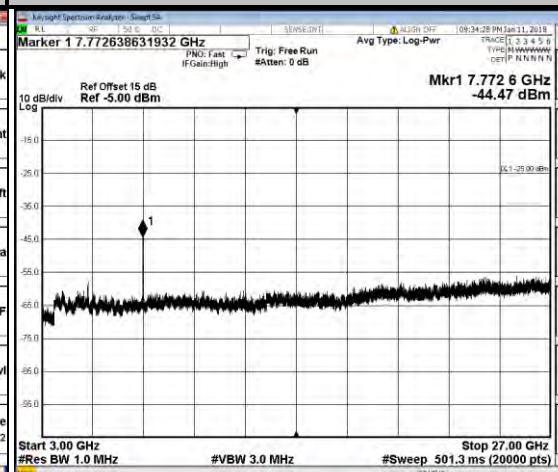
LTE Band 41

Channel Bandwidth: 5 MHz

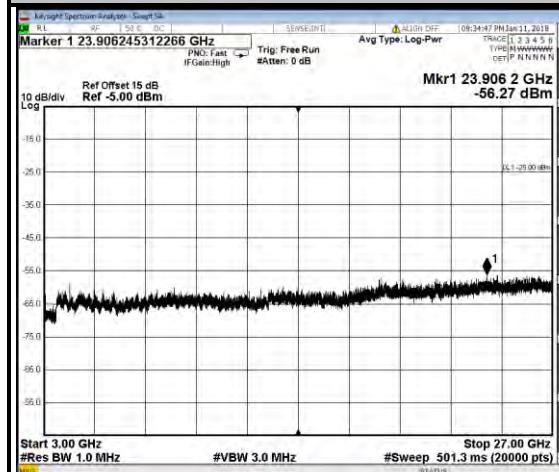
Channel 39675



Channel 40620



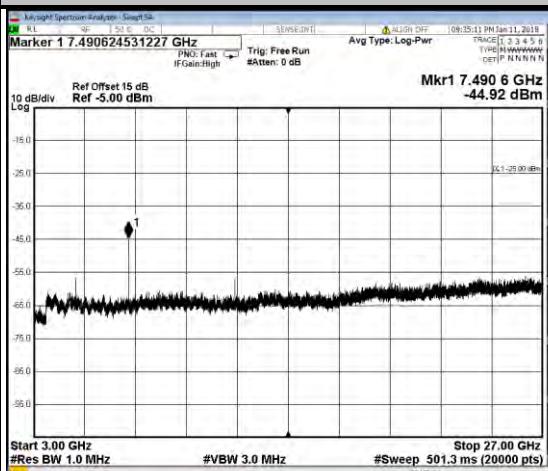
Channel 41565



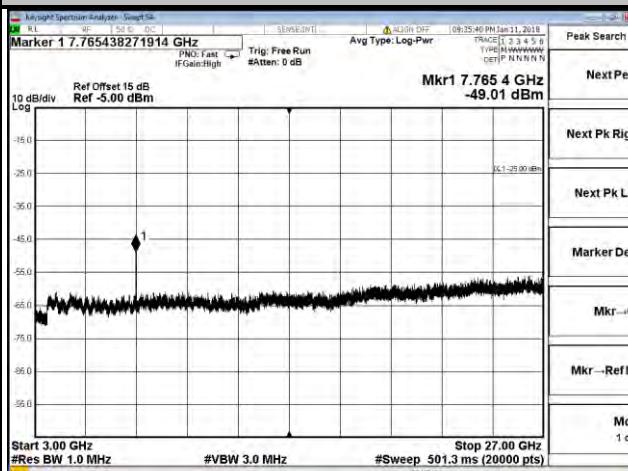
LTE Band 41

Channel Bandwidth: 10 MHz

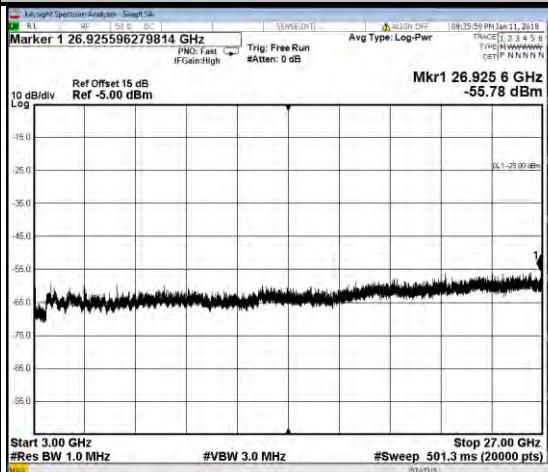
Channel 39700



Channel 40620



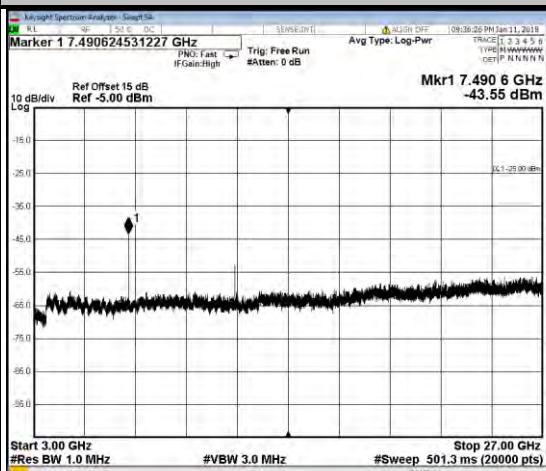
Channel 41540



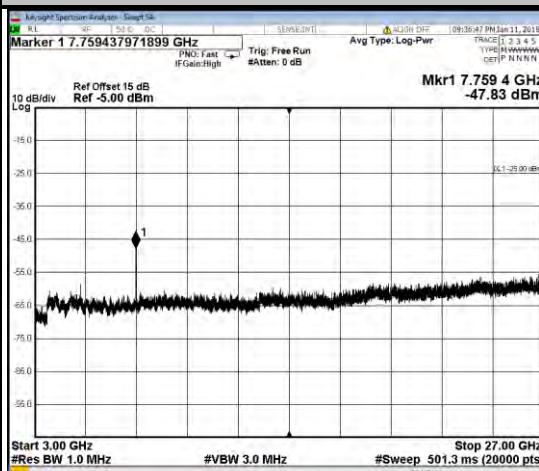
LTE Band 41

Channel Bandwidth: 15 MHz

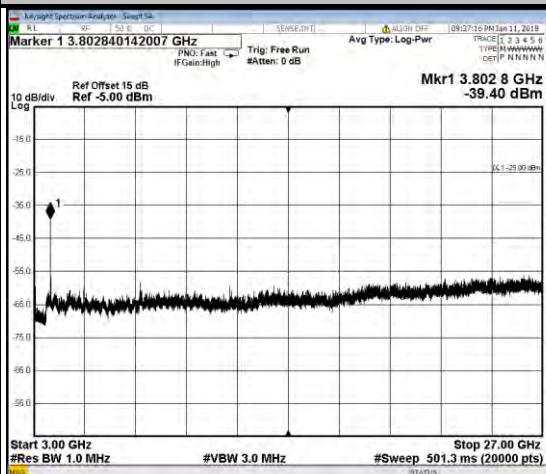
Channel 39725

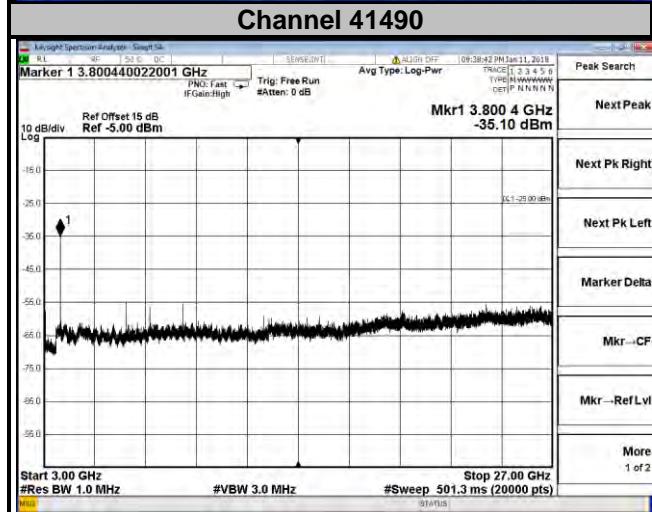
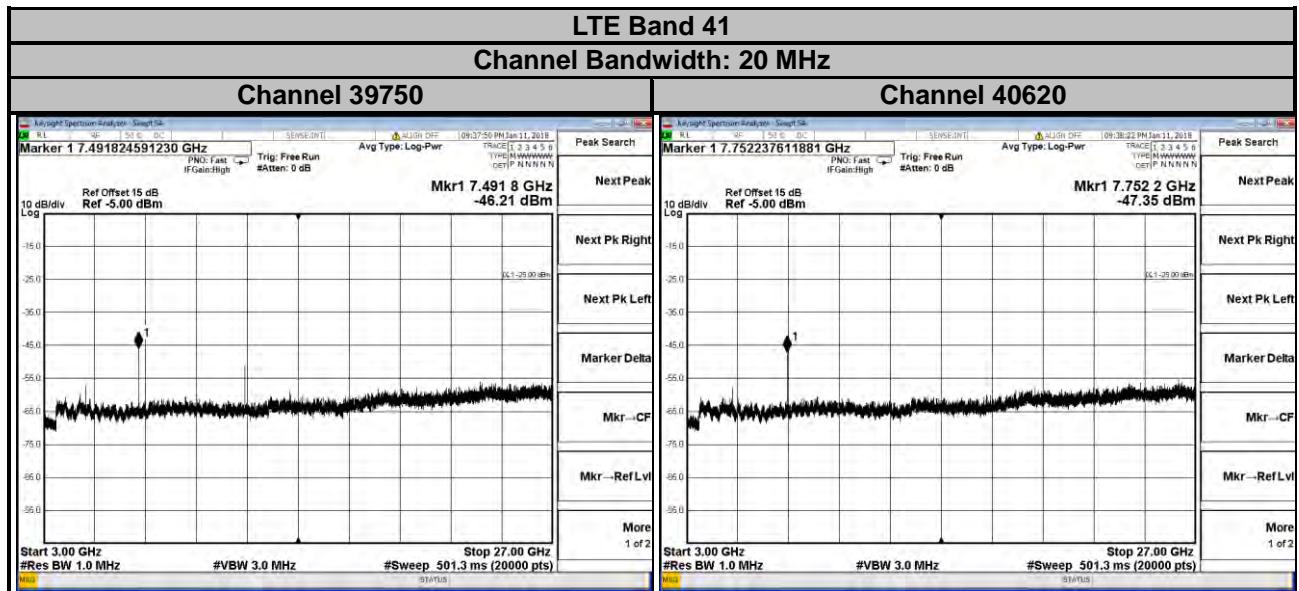


Channel 40620



Channel 41515





4.7 Radiated Emission Measurement

4.7.1 Limits of Radiated Emission Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $55 + 10 \log_{10}(P)$ dB. The limit of emission is equal to -25 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 from E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15 dBi.

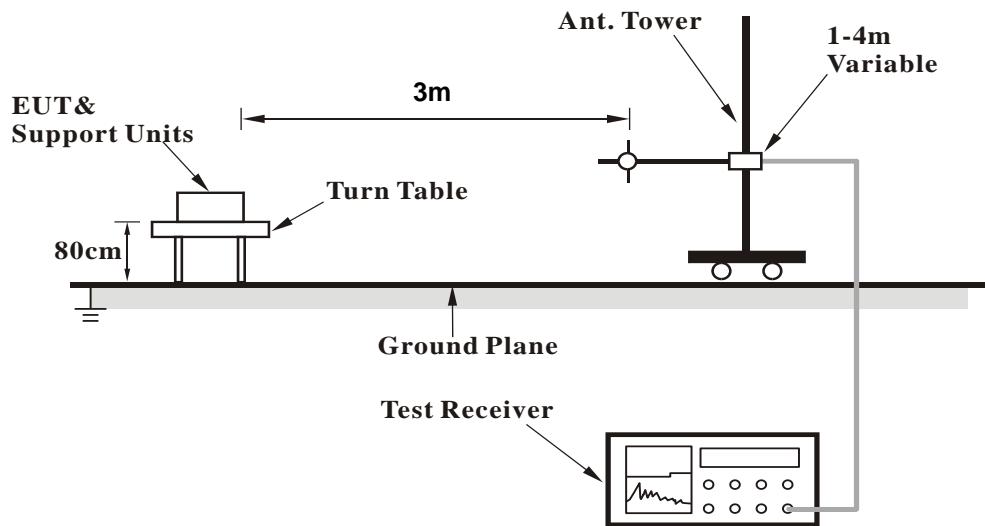
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.7.3 Deviation from Test Standard

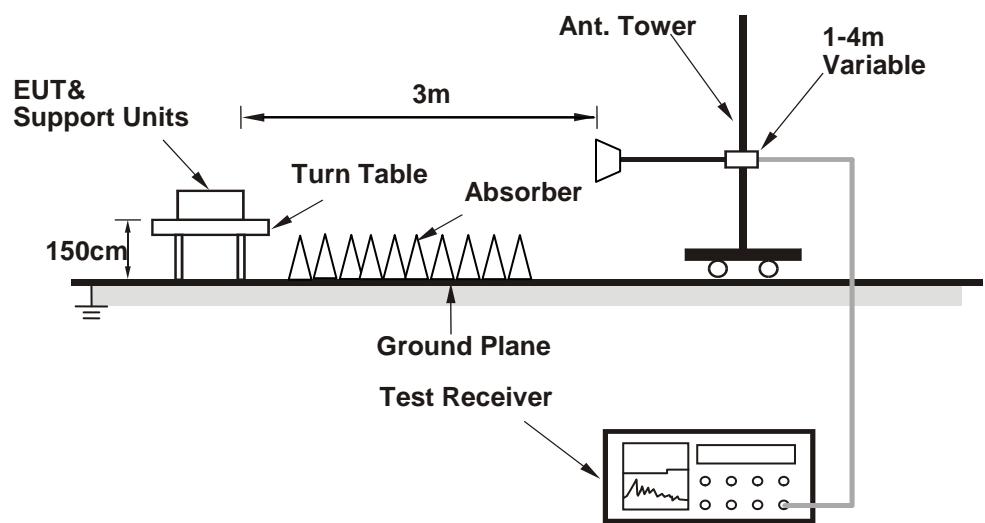
No deviation.

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

LTE Band 7

Channel Bandwidth: 20 MHz / QPSK

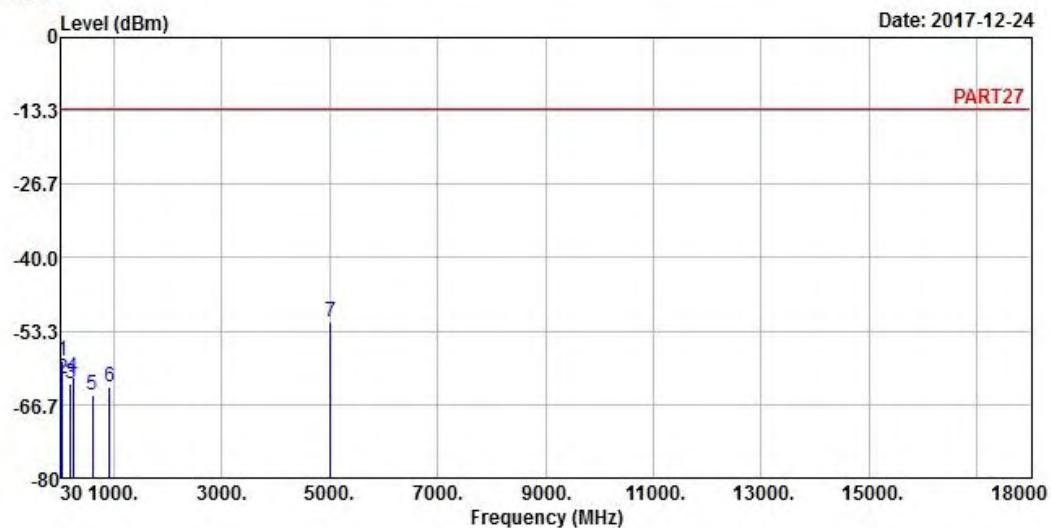
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 7



Site : 966 Chamber 5

Condition: PART27 HORIZONTAL

Remak : LTE Band 7 QPSK_20M Link-L

Tested by: Jisyong Wang

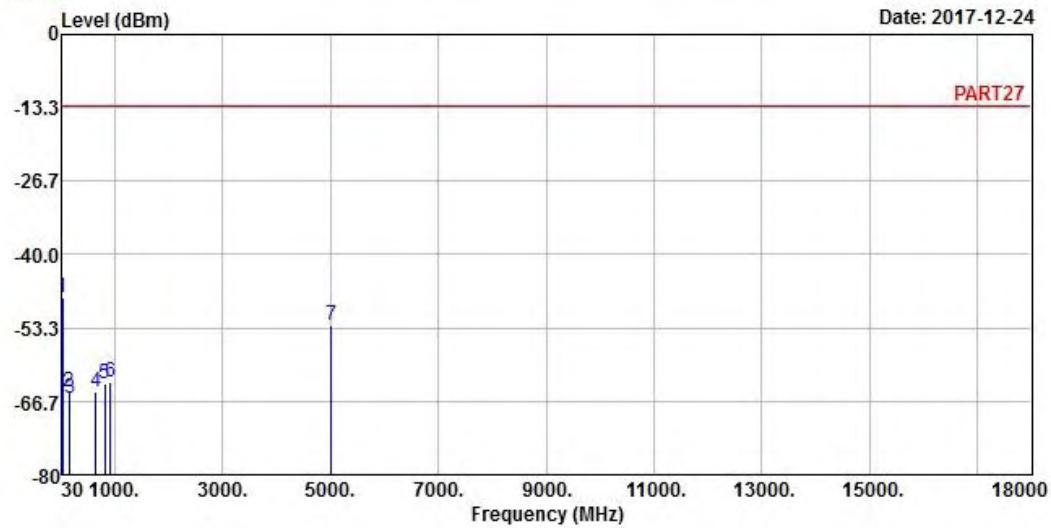
	Freq	Read Level	Limit Level	Over Line	Limit Factor	Remark
	MHz	dBm	dBm	dBm	dB	
1	42.61	-58.60	-57.66	-13.00	-45.60	-0.94 Peak
2	53.28	-62.08	-56.27	-13.00	-49.08	-5.81 Peak
3	195.87	-62.99	-55.34	-13.00	-49.99	-7.65 Peak
4	247.28	-61.77	-55.66	-13.00	-48.77	-6.11 Peak
5	600.36	-64.89	-64.14	-13.00	-51.89	-0.75 Peak
6	927.25	-63.40	-64.65	-13.00	-50.40	1.25 Peak
7 pp	5020.00	-51.75	-48.52	-25.00	-26.75	-3.23 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 8



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 7 QPSK_20M Link-L

Tested by: Jisyong Wang

		Read	Limit	Over	
	Freq	Level	Level	Line	Limit Factor Remark
	MHz	dBm	dBm	dBm	dB
1	41.64	-47.82	-47.41	-13.00	-34.82 -0.41 Peak
2	161.92	-64.88	-59.90	-13.00	-51.88 -4.98 Peak
3	167.74	-66.05	-60.66	-13.00	-53.05 -5.39 Peak
4	644.98	-65.06	-64.19	-13.00	-52.06 -0.87 Peak
5	821.52	-63.55	-64.09	-13.00	-50.55 0.54 Peak
6	930.16	-63.30	-64.62	-13.00	-50.30 1.32 Peak
7 pp	5020.00	-52.84	-49.61	-25.00	-27.84 -3.23 Peak

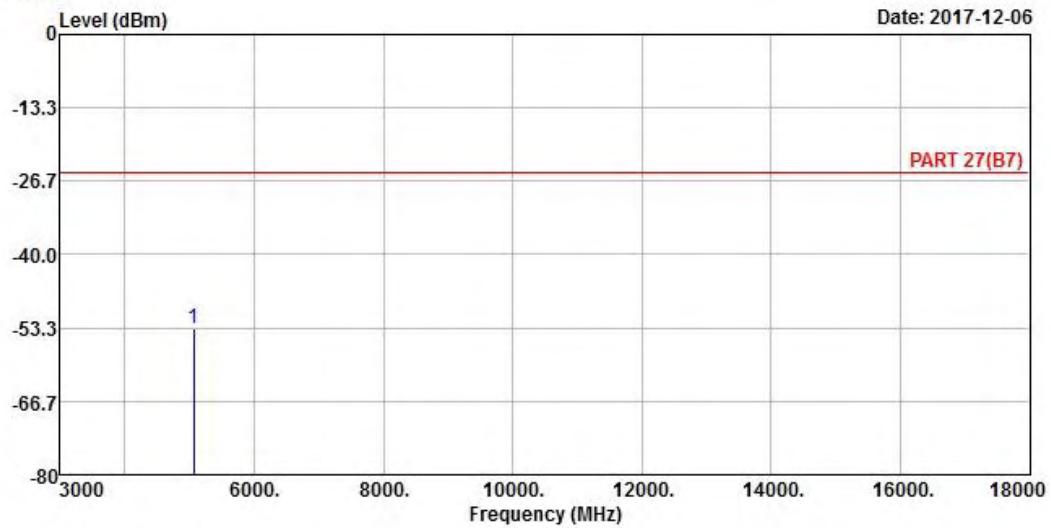
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 Chamber 5

Condition: PART 27(B7) HORIZONTAL

Remak : LTE Band 7 QPSK_20M Link-M

Tested by: Jisyong Wang

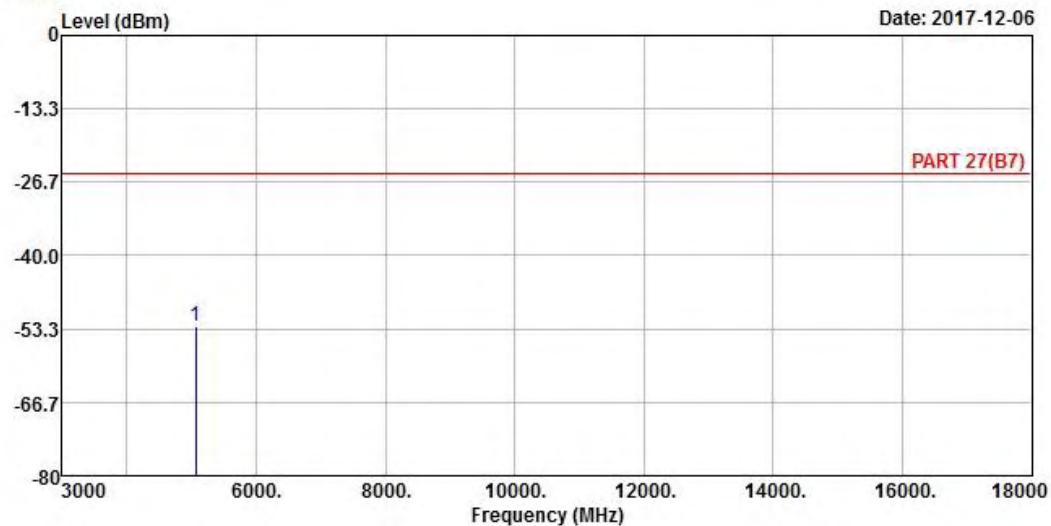
Freq	Level	Read	Limit	Over	Factor	Remark
		MHz	dBm	dBm	Line	Limit
1 pp	5070.00	-53.35	-50.23	-25.00	-28.35	-3.12 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 Chamber 5

Condition: PART 27(B7) VERTICAL

Remak : LTE Band 7 QPSK_20M Link-M

Tested by: Jisyong Wang

Freq MHz	Read Level dBm		Limit Level dBm	Over Line dB	Limit Factor	Remark
	pp	pp	pp	pp	pp	
1 pp	5070.00	-52.70	-49.58	-25.00	-27.70	-3.12 Peak

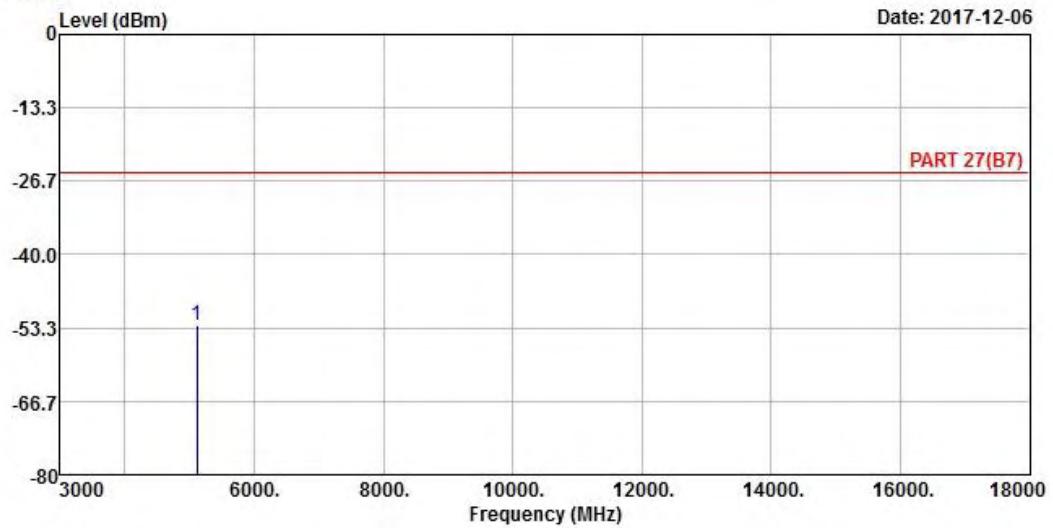
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 Chamber 5

Condition: PART 27(B7) HORIZONTAL

Remak : LTE Band 7 QPSK_20M Link-H

Tested by: Jisyong Wang

Freq	Read Level	Limit Level	Over Line	Limit Factor	Remark
MHz	dBm	dBm	dBm	dB	

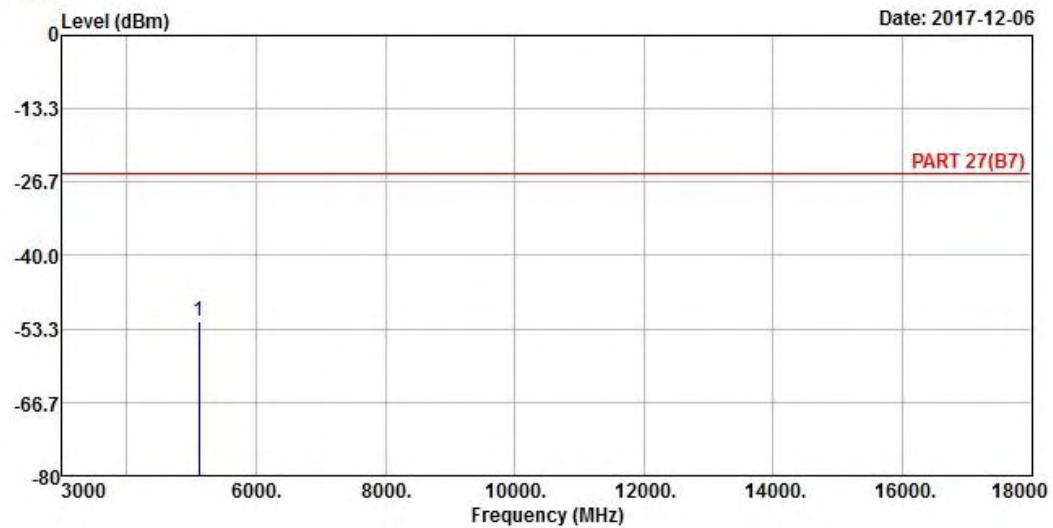
1 pp 5120.00 -52.76 -49.75 -25.00 -27.76 -3.01 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 Chamber 5

Condition: PART 27(B7) VERTICAL

Remak : LTE Band 7 QPSK_20M Link-H

Tested by: Jisyong Wang

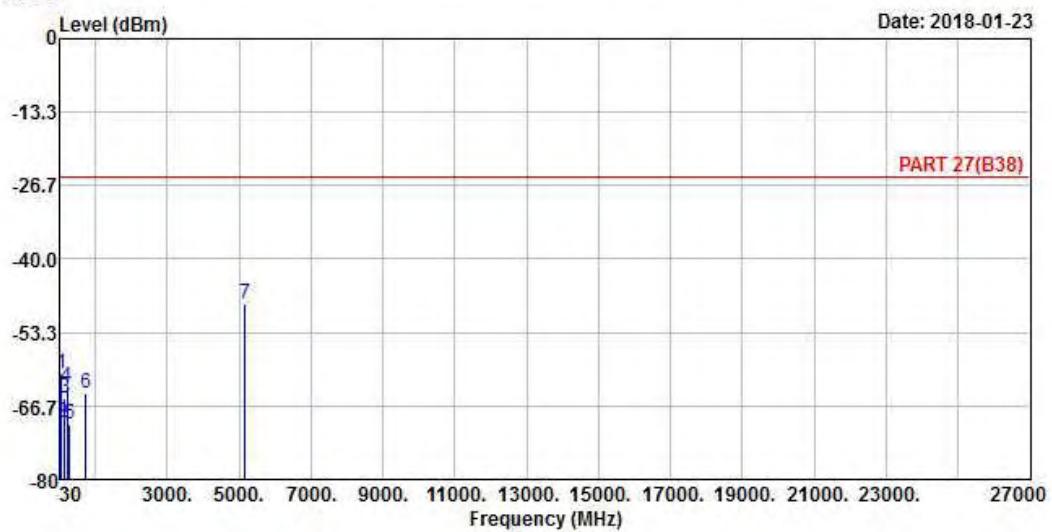
Freq MHz	Level dBm	Read Level dBm	Limit Line dBm	Over Limit dB	Factor	Remark
			dBm	dB		
1 pp	5120.00	-51.90	-48.89	-25.00	-26.90	-3.01 Peak

LTE Band 38
Channel Bandwidth: 20 MHz / QPSK
Low Channel


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 Chamber 5

Condition: PART 27(B38) HORIZONTAL

Remak : LTE Band 38 QPSK_20M Link_L-CH

Tested by: Getaz Yang

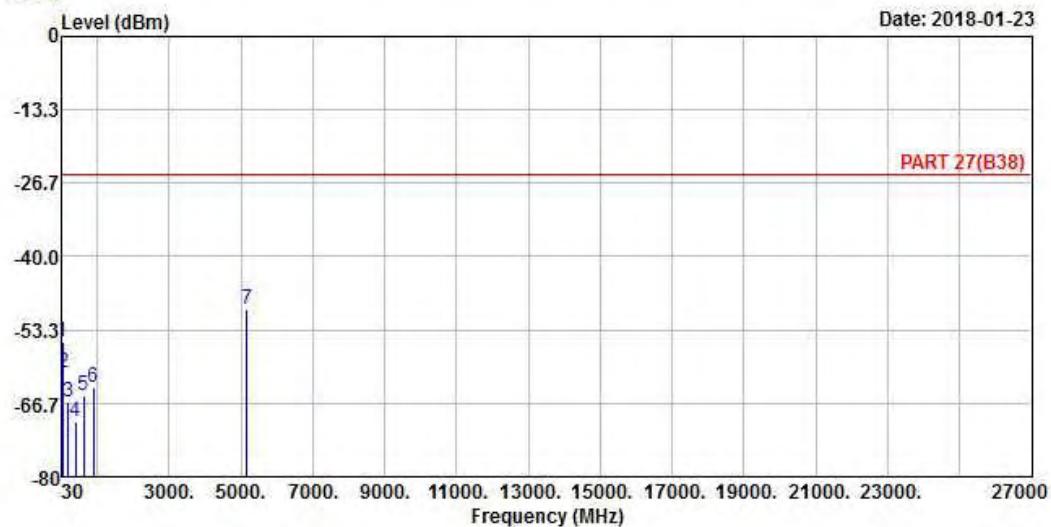
Freq	Level	Read	Limit	Over	Factor	Remark	
		MHz	dBm	dBm	Line	Limit	
1	53.28	-60.93	-55.12	-13.00	-47.93	-5.81	Peak
2	56.19	-69.60	-63.00	-13.00	-56.60	-6.60	Peak
3	154.16	-65.37	-58.89	-13.00	-52.37	-6.48	Peak
4	227.88	-63.04	-56.15	-13.00	-50.04	-6.89	Peak
5	282.20	-70.08	-63.43	-13.00	-57.08	-6.65	Peak
6	727.43	-64.29	-64.73	-13.00	-51.29	0.44	Peak
7 pp	5160.00	-48.25	-45.32	-25.00	-23.25	-2.93	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 Chamber 5

Condition: PART 27(B38) VERTICAL

Remak : LTE Band 38 QPSK_20M Link_L-CH

Tested by: Getaz Yang

Freq	MHz	Read	Limit	Over	Factor	Remark
		Level	Level	Line		
1	46.49	-55.37	-52.37	-13.00	-42.37	-3.00 Peak
2	64.92	-61.17	-53.14	-13.00	-48.17	-8.03 Peak
3	199.75	-66.27	-58.25	-13.00	-53.27	-8.02 Peak
4	389.87	-70.06	-64.06	-13.00	-57.06	-6.00 Peak
5	613.94	-65.20	-64.41	-13.00	-52.20	-0.79 Peak
6	892.33	-63.90	-64.43	-13.00	-50.90	0.53 Peak
7 pp	5160.00	-49.55	-46.62	-25.00	-24.55	-2.93 Peak

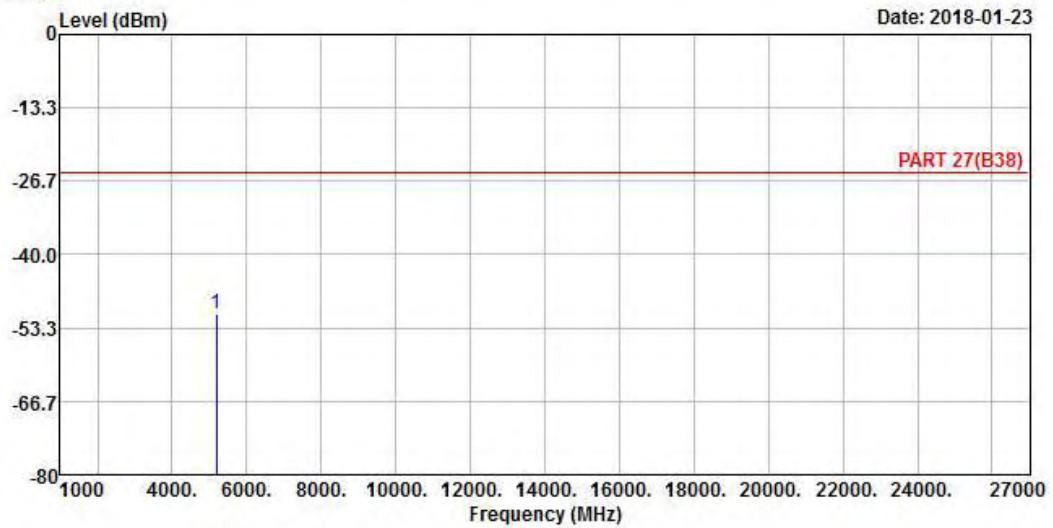
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5

Condition: PART 27(B38) HORIZONTAL

Remak : LTE Band 38 QPSK_20M Link_M-CH

Tested by: Getaz Yang

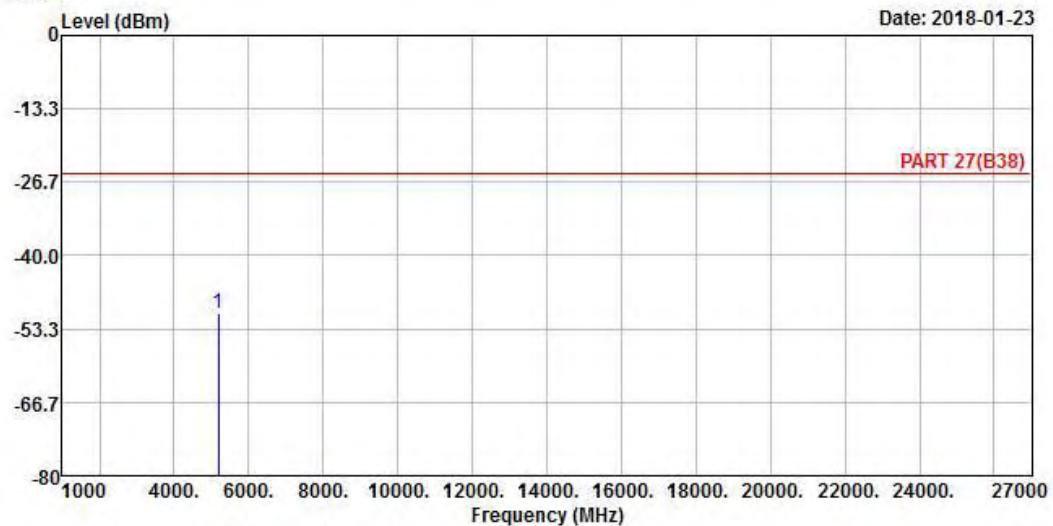
Freq	Level	Read	Limit	Over	Factor	Remark
		MHz	dBm	dBm	Line	Limit
1 pp	5190.00	-50.75	-47.89	-25.00	-25.75	-2.86 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4



Site : 966 Chamber 5

Condition: PART 27(B38) VERTICAL

Remak : LTE Band 38 QPSK_20M Link_M-CH

Tested by: Getaz Yang

Freq	Read		Limit	Over	Factor	Remark
	Level	Level	Line	Limit		
MHz	dBm	dBm	dBm	dB	dB	
1 pp	5190.00	-50.62	-47.76	-25.00	-25.62	-2.86 Peak

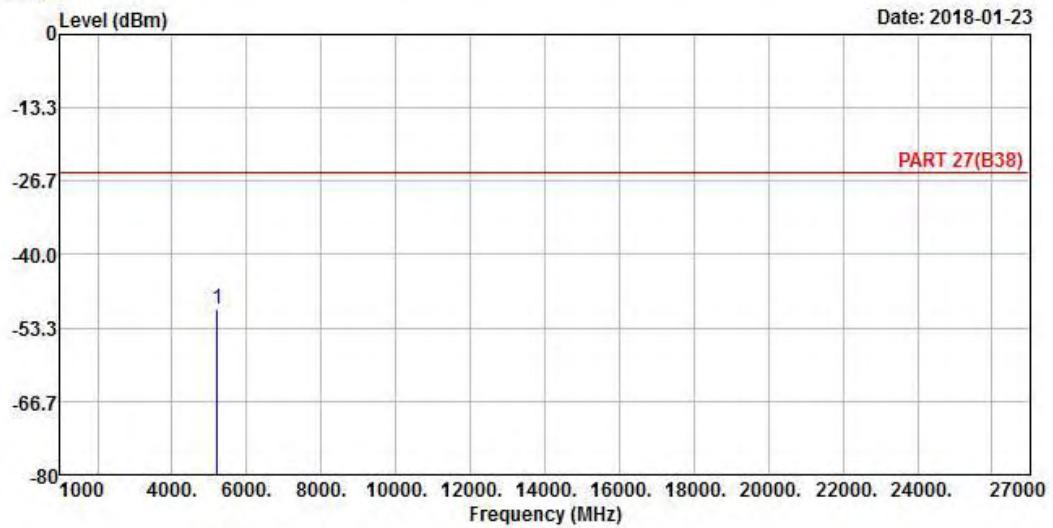
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5

Condition: PART 27(B38) HORIZONTAL

Remak : LTE Band 38 QPSK_20M Link_H-CH

Tested by: Getaz Yang

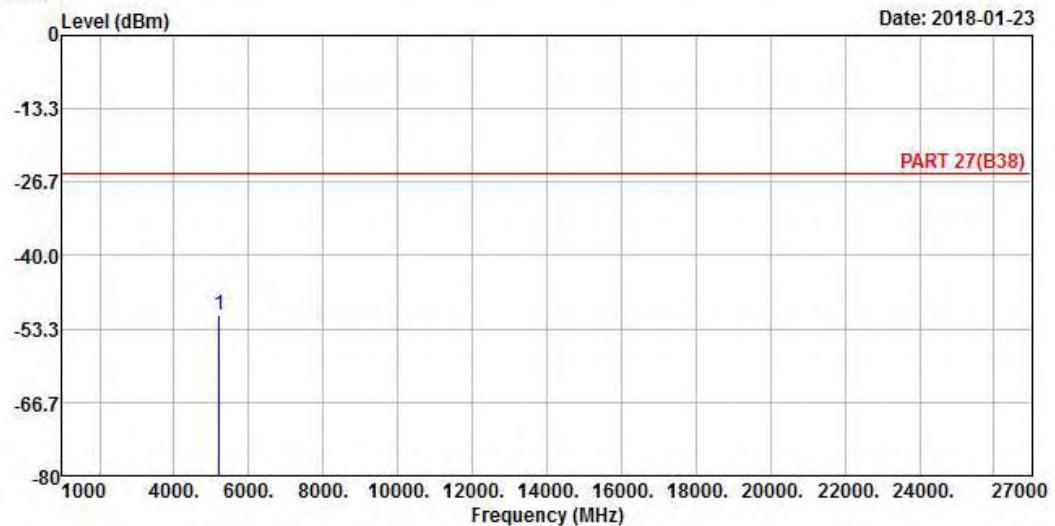
Freq	Level	Read	Limit	Over	Factor	Remark
		MHz	dBm	dBm	Line	Limit
1 pp	5220.00	-49.79	-47.03	-25.00	-24.79	-2.76 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4



Site : 966 Chamber 5

Condition: PART 27(B38) VERTICAL

Remak : LTE Band 38 QPSK_20M Link_H-CH

Tested by: Getaz Yang

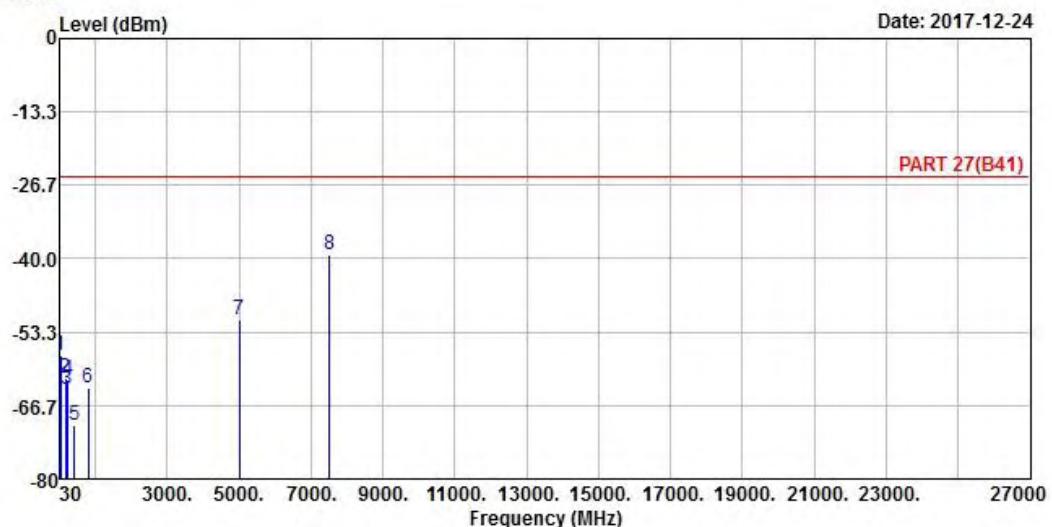
Freq	Read		Limit	Over	Factor	Remark
	Level	Level	Line	Limit		
MHz	dBm	dBm	dBm	dB	dB	
1 pp	5220.00	-50.86	-48.10	-25.00	-25.86	-2.76 Peak

LTE Band 41
Channel Bandwidth: 20 MHz / QPSK
Low Channel


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 7



Site : 966 Chamber 5

Condition: PART 27(B41) HORIZONTAL

Remak : LTE Band 41 QPSK_20M _L-CH

Tested by: Jisyong Wang

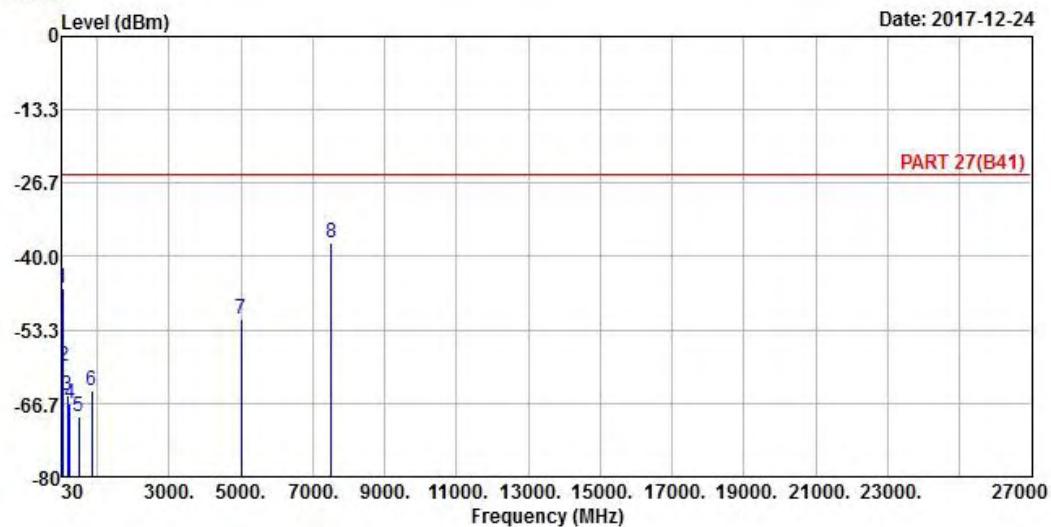
Freq	Level	Read	Limit	Over	Factor	Remark	
		MHz	dBm	dBm	Line	Limit	
1	42.42	-57.58	-56.64	-25.00	-32.58	-0.94	Peak
2	170.13	-61.59	-56.06	-25.00	-36.59	-5.53	Peak
3	207.12	-63.77	-56.06	-25.00	-38.77	-7.71	Peak
4	247.89	-62.06	-55.99	-25.00	-37.06	-6.07	Peak
5	426.70	-70.30	-64.57	-25.00	-45.30	-5.73	Peak
6	797.70	-63.43	-64.17	-25.00	-38.43	0.74	Peak
7	5012.00	-51.10	-47.87	-25.00	-26.10	-3.23	Peak
8 pp	7518.00	-39.28	-44.87	-25.00	-14.28	5.59	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 8



Site : 966 Chamber 5

Condition: PART 27(B41) VERTICAL

Remak : LTE Band 41 QPSK_20M _L-CH

Tested by: Jisyong Wang

Freq	Read		Limit	Over	Factor	Remark
	MHz	dBm	dBm	dBm		
1	41.34	-45.66	-45.25	-25.00	-20.66	-0.41 Peak
2	67.80	-60.02	-51.77	-25.00	-35.02	-8.25 Peak
3	161.22	-65.20	-60.29	-25.00	-40.20	-4.91 Peak
4	237.63	-66.65	-60.15	-25.00	-41.65	-6.50 Peak
5	499.50	-69.04	-64.41	-25.00	-44.04	-4.63 Peak
6	843.90	-64.21	-64.55	-25.00	-39.21	0.34 Peak
7	5012.00	-51.25	-48.02	-25.00	-26.25	-3.23 Peak
8 pp	7518.00	-37.37	-42.96	-25.00	-12.37	5.59 Peak

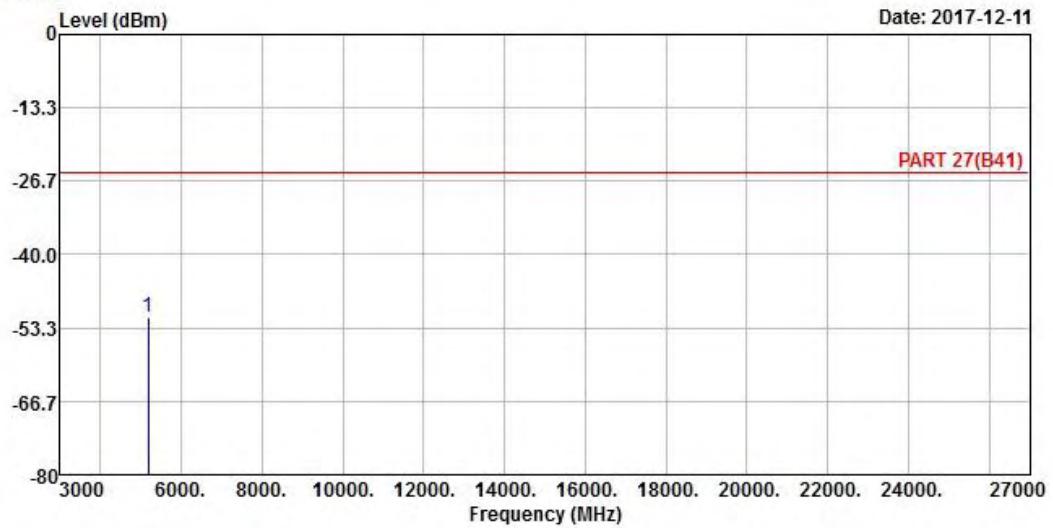
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5

Condition: PART 27(B41) HORIZONTAL

Remak : LTE Band 41 QPSK_20M _M-CH

Tested by: Jisyong Wang

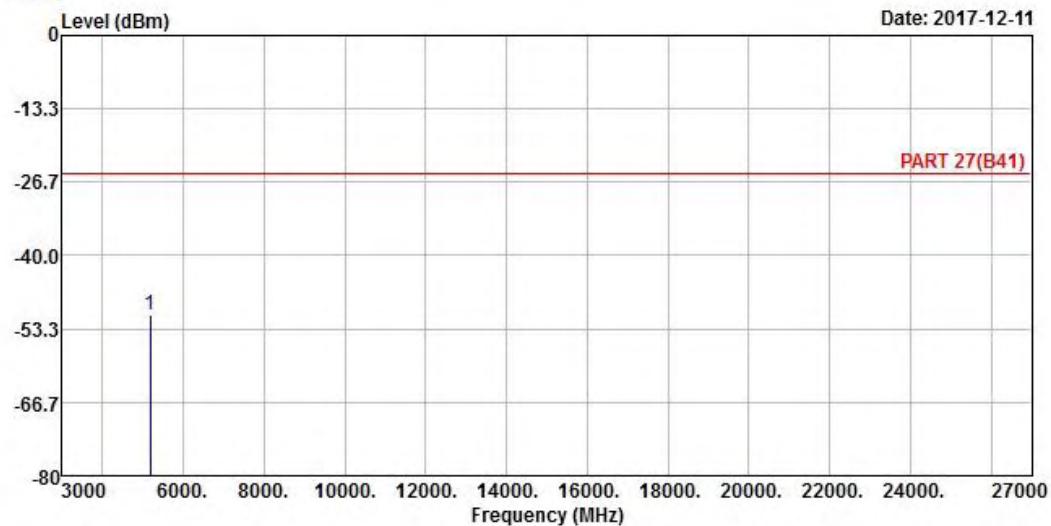
Freq	Read	Limit	Over	Factor	Remark
	Level	Level	Line		
MHz	dBm	dBm	dBm	dB	
1 pp	5186.00	-51.27	-48.41	-25.00	-26.27 -2.86 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4



Site : 966 Chamber 5

Condition: PART 27(B41) VERTICAL

Remak : LTE Band 41 QPSK_20M _M-CH

Tested by: Jisyong Wang

Freq	Read		Limit	Over	Factor	Remark
	Level	Level				
MHz	dBm	dBm	dBm	dB	dB	
1 pp	5186.00	-50.86	-48.00	-25.00	-25.86	-2.86 Peak

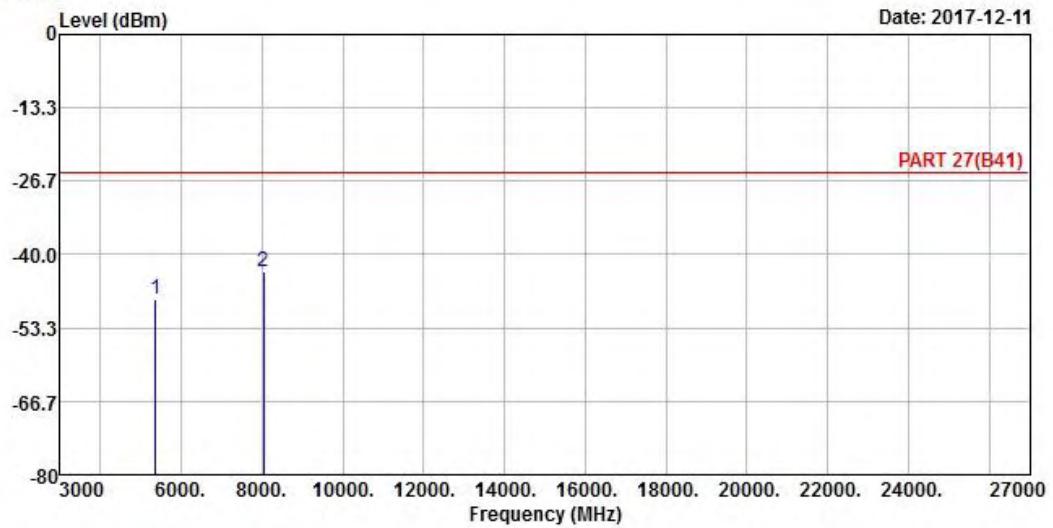
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5

Condition: PART 27(B41) HORIZONTAL

Remak : LTE Band 41 QPSK_20M _H-CH

Tested by: Jisyong Wang

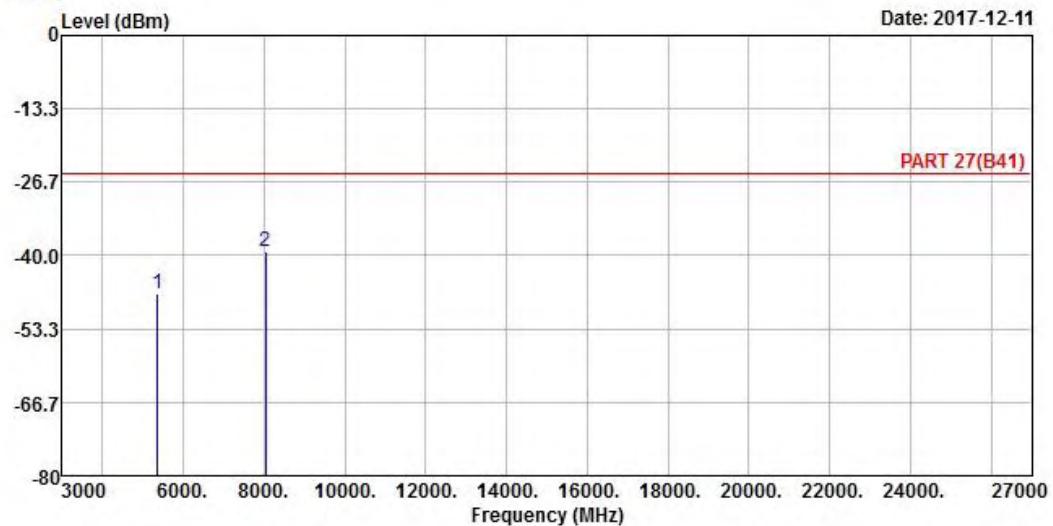
	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	
1	5360.00	-48.16	-46.16	-25.00	-23.16	-2.00 Peak
2 pp	8040.00	-43.06	-48.96	-25.00	-18.06	5.90 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4



Site : 966 Chamber 5

Condition: PART 27(B41) VERTICAL

Remak : LTE Band 41 QPSK_20M _H-CH

Tested by: Jisyong Wang

	Freq	Read Level	Limit Level	Over Line	Limit	Over Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5360.00	-46.98	-44.98	-25.00	-21.98	-2.00	Peak
2 pp	8040.00	-39.22	-45.12	-25.00	-14.22	5.90	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

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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.

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