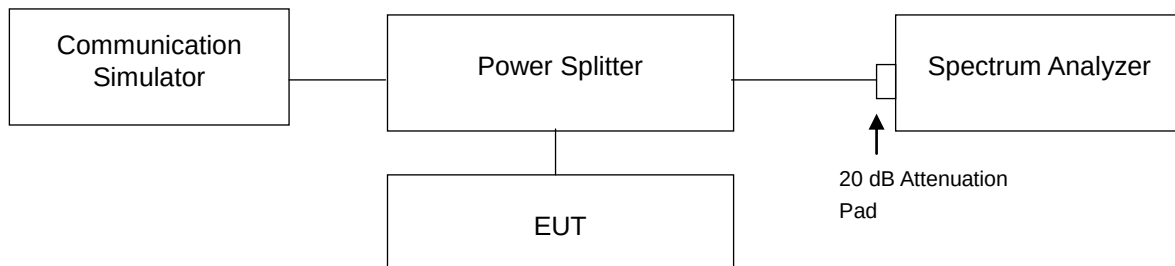


4.6 Conducted Spurious Emissions

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



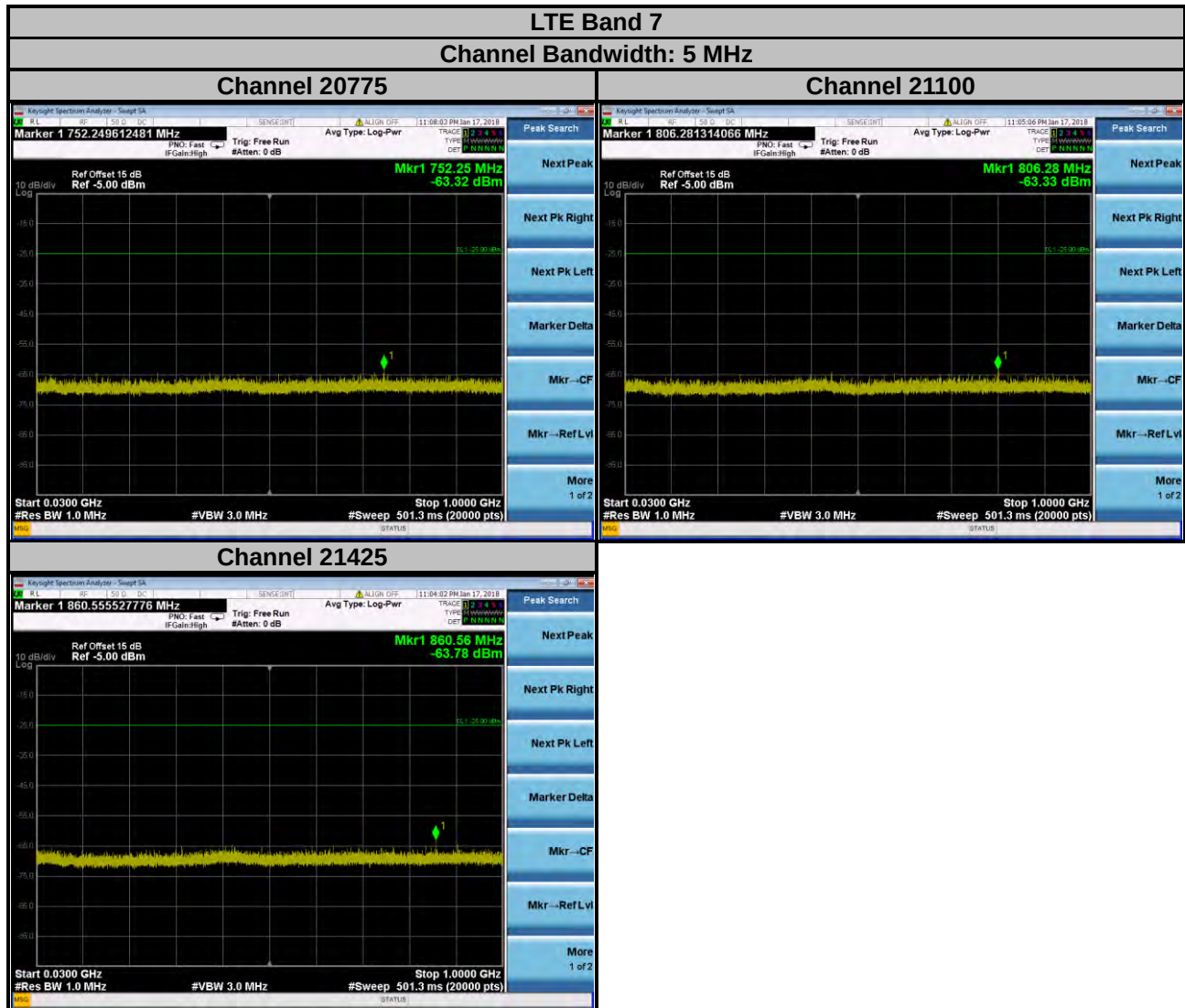
4.6.3 Test Procedure

- 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 30MHz to 1 GHz, 1 GHz to 3GHz, and 3 GHz to 26GHz for LTE Band 7, and 30MHz to 1 GHz, 1 GHz to 3GHz, and 3 GHz to 27GHz for LTE Band 38/41. 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

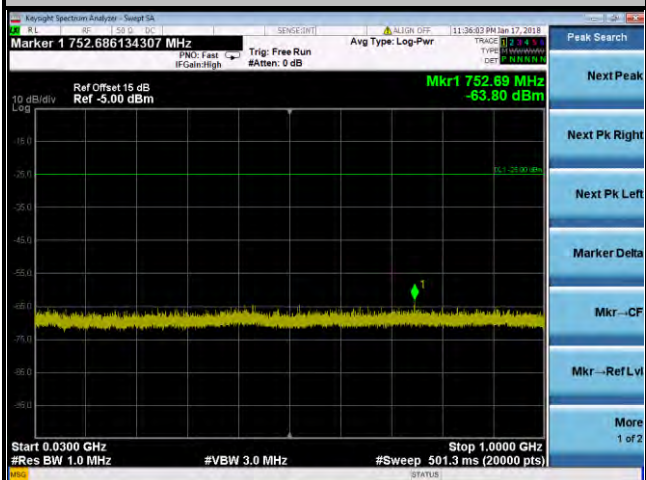
30MHz ~ 1GHz



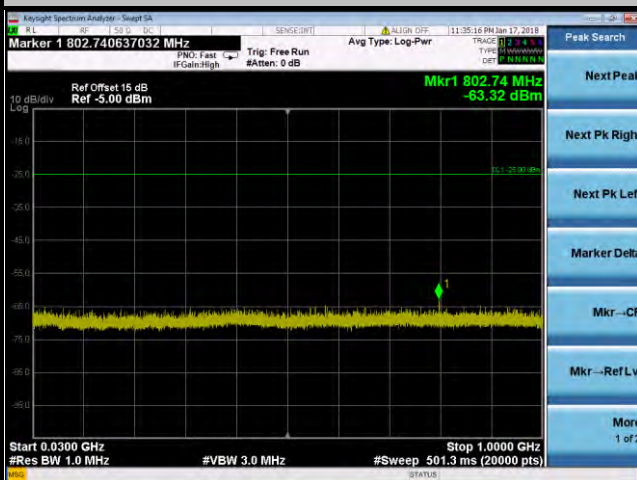
LTE Band 7

Channel Bandwidth: 10 MHz

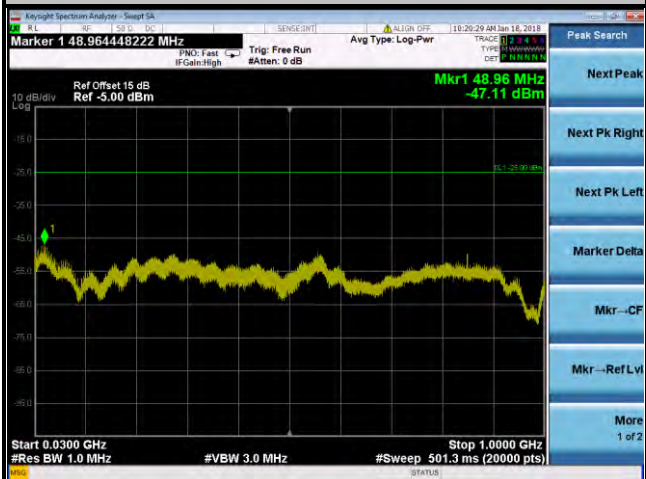
Channel 20800



Channel 21100



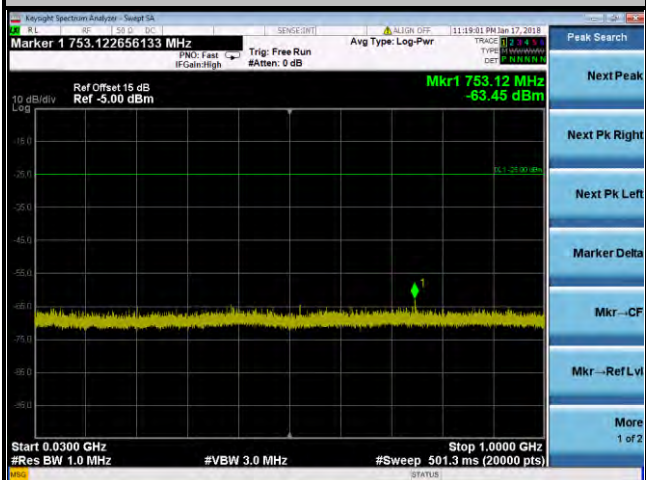
Channel 21400



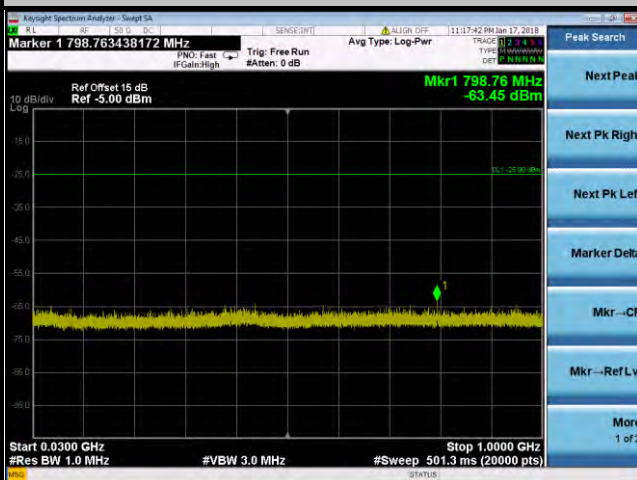
LTE Band 7

Channel Bandwidth: 15 MHz

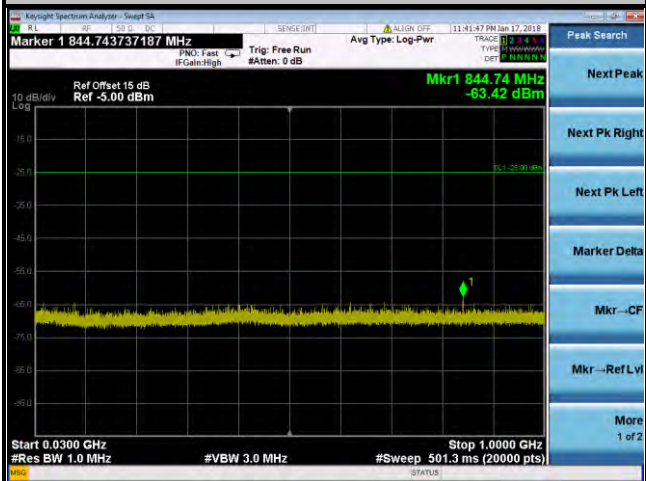
Channel 20825



Channel 21100



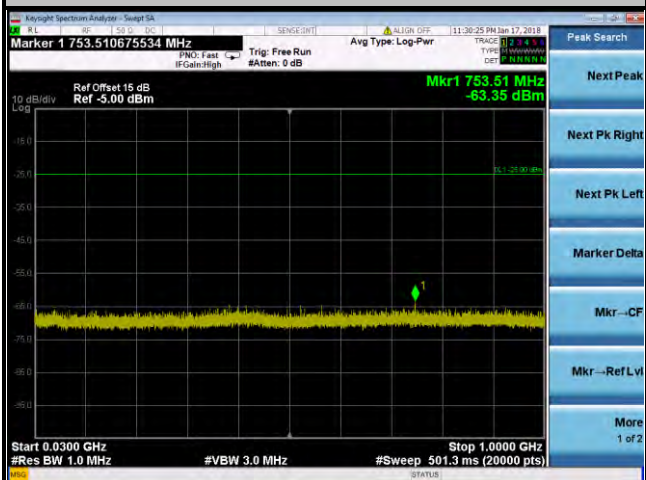
Channel 21375



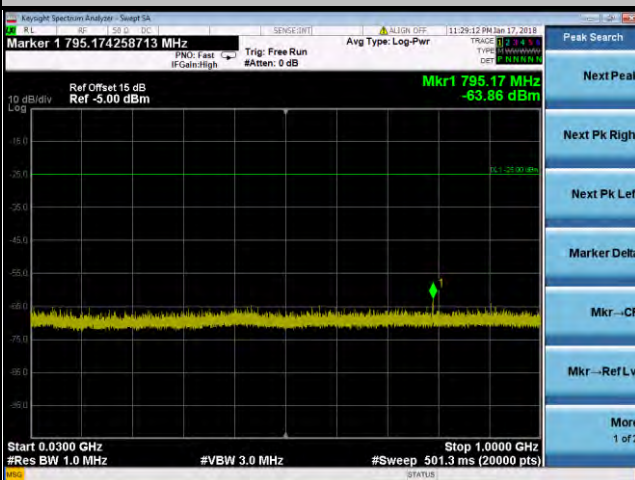
LTE Band 7

Channel Bandwidth: 20 MHz

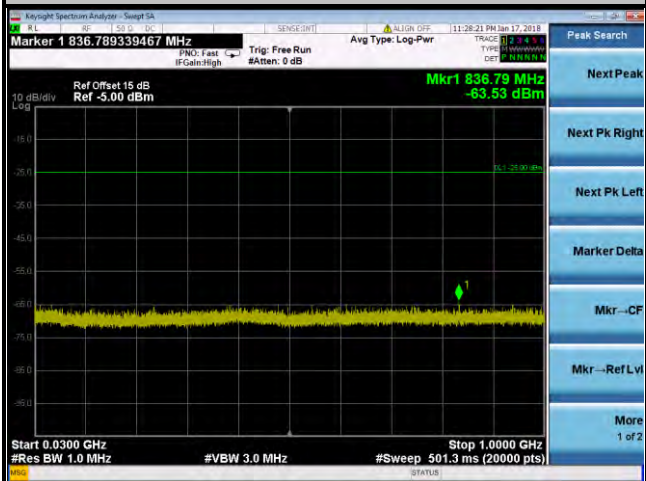
Channel 20850



Channel 21100



Channel 21350

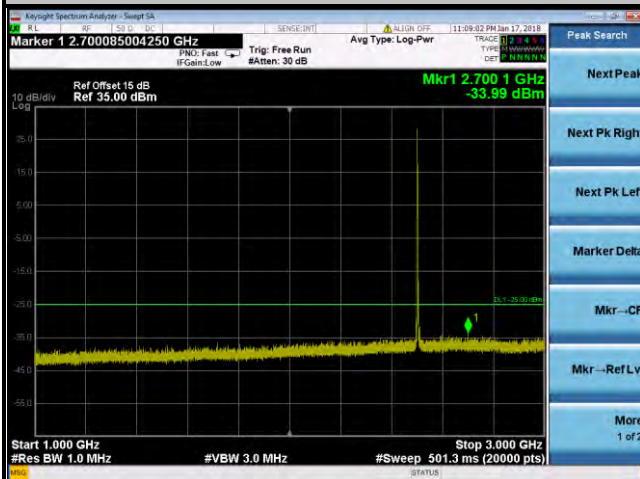


1GHz ~ 3GHz

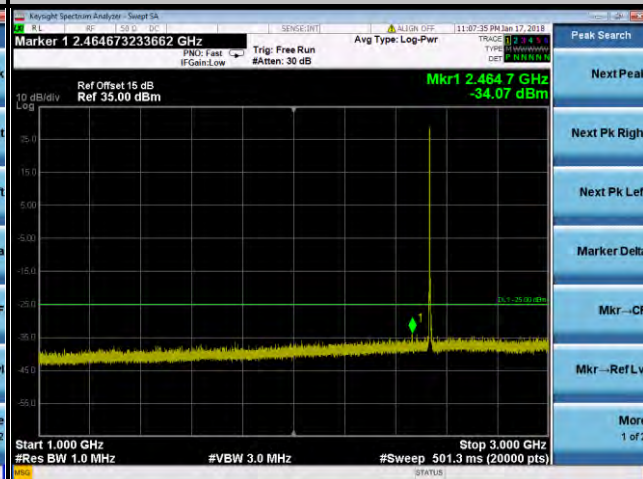
LTE Band 7

Channel Bandwidth: 5 MHz

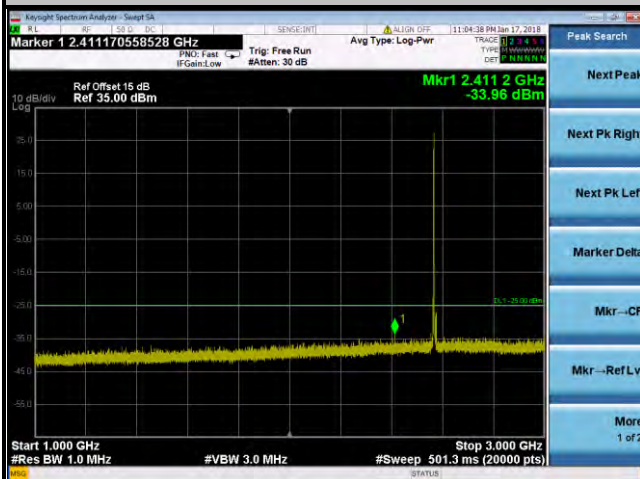
Channel 20775



Channel 21100



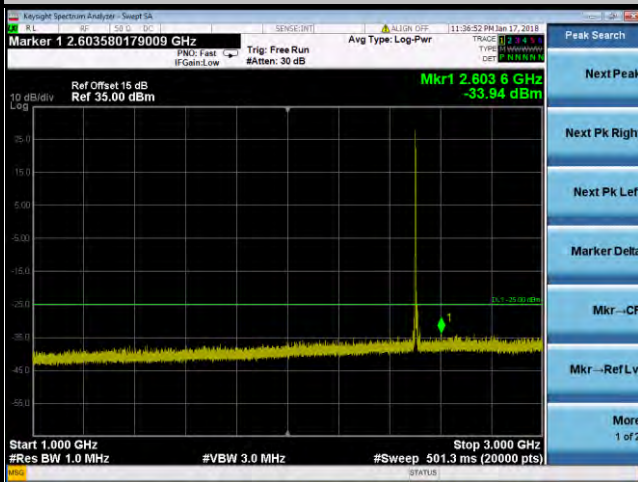
Channel 21425



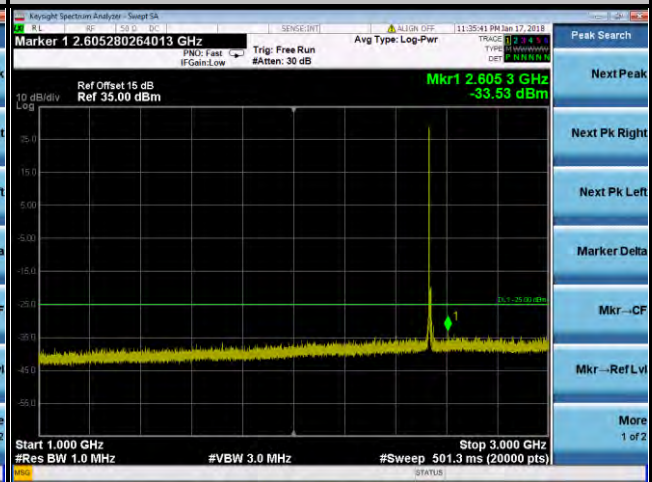
LTE Band 7

Channel Bandwidth: 10 MHz

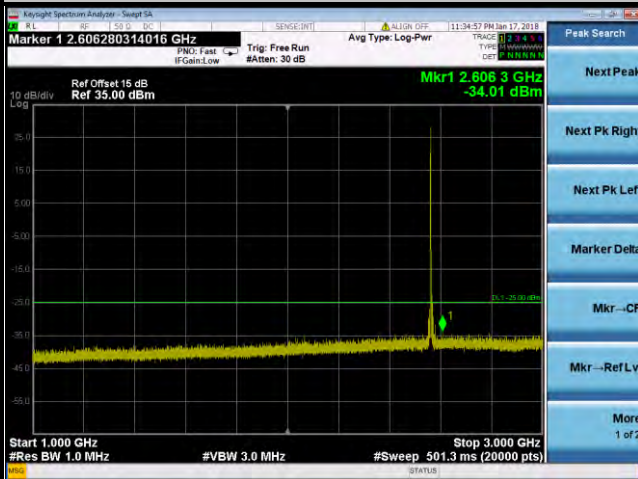
Channel 20800



Channel 21100



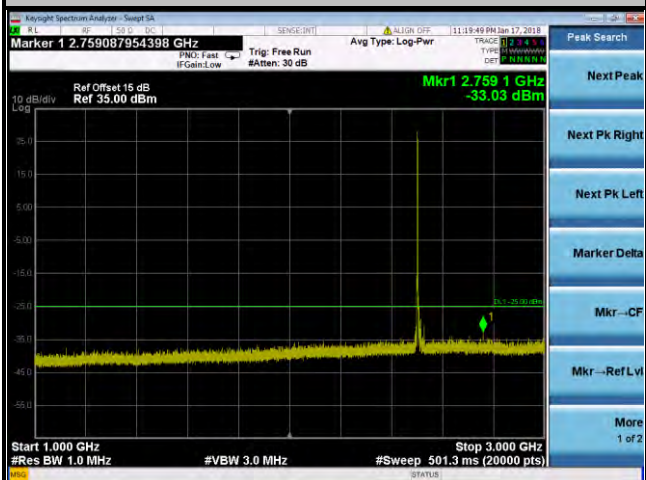
Channel 21400



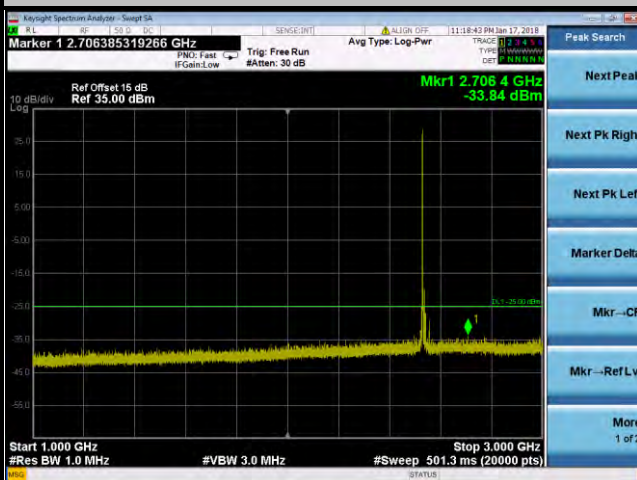
LTE Band 7

Channel Bandwidth: 15 MHz

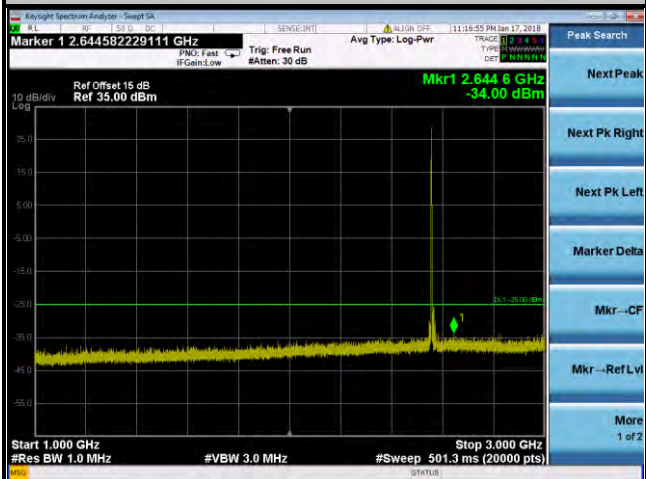
Channel 20825



Channel 21100



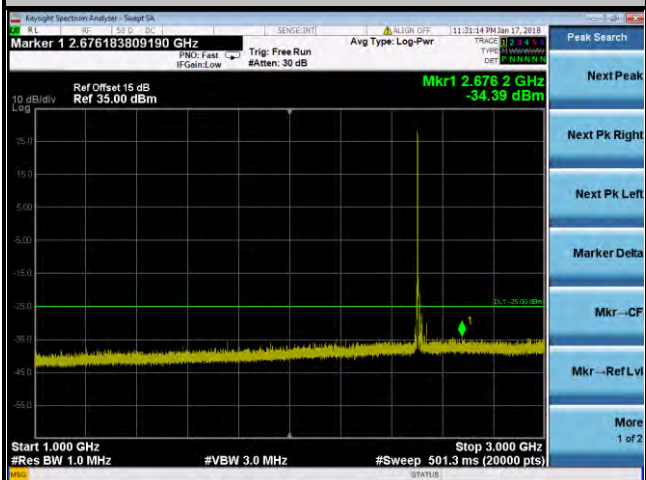
Channel 21375



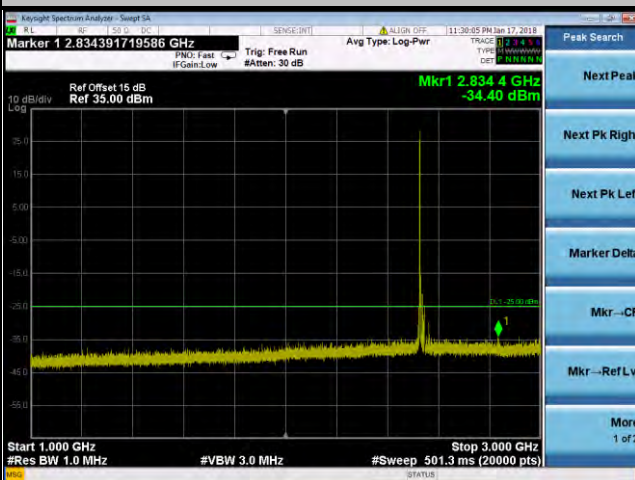
LTE Band 7

Channel Bandwidth: 20 MHz

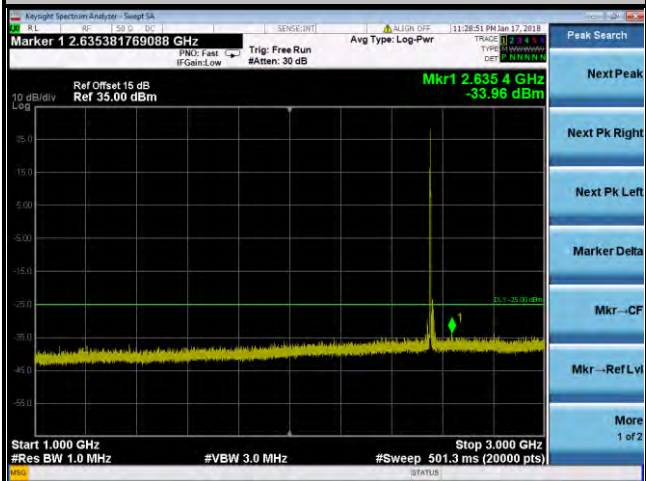
Channel 20850



Channel 21100



Channel 21350

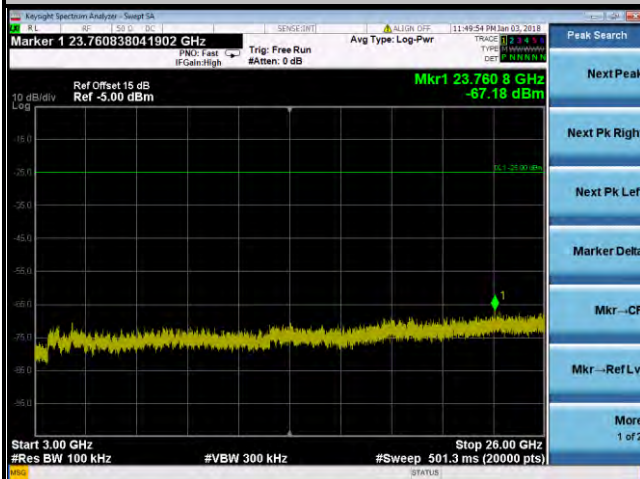


3GHz ~ 26GHz

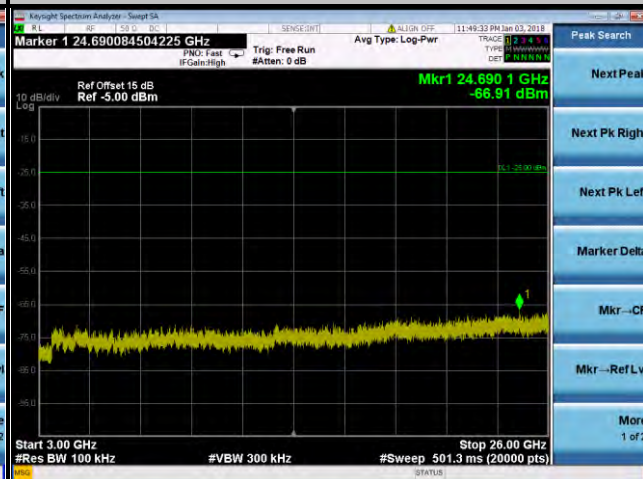
LTE Band 7

Channel Bandwidth: 5 MHz

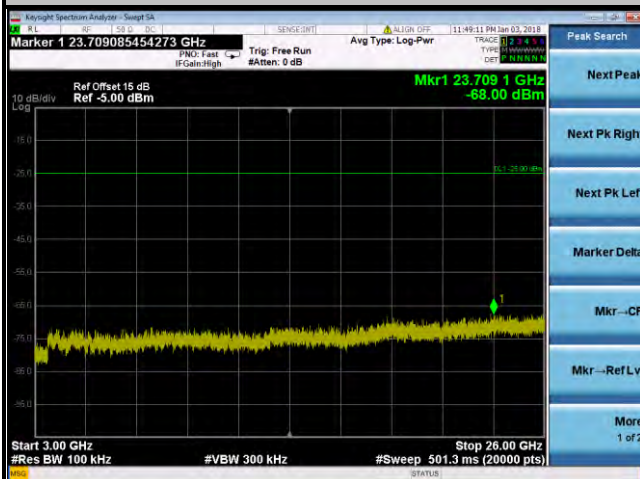
Channel 20775



Channel 21100



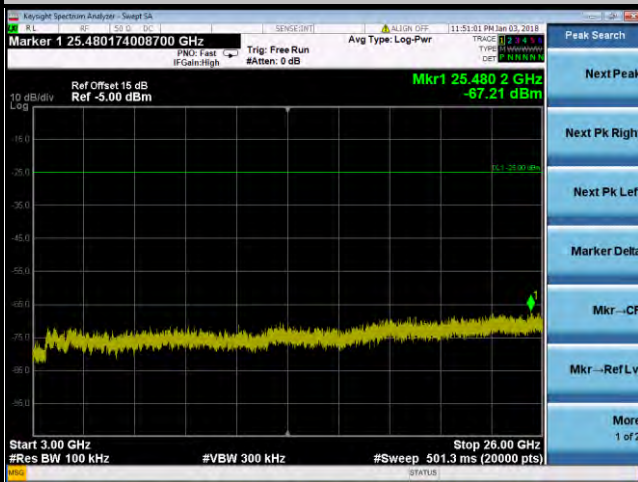
Channel 21425



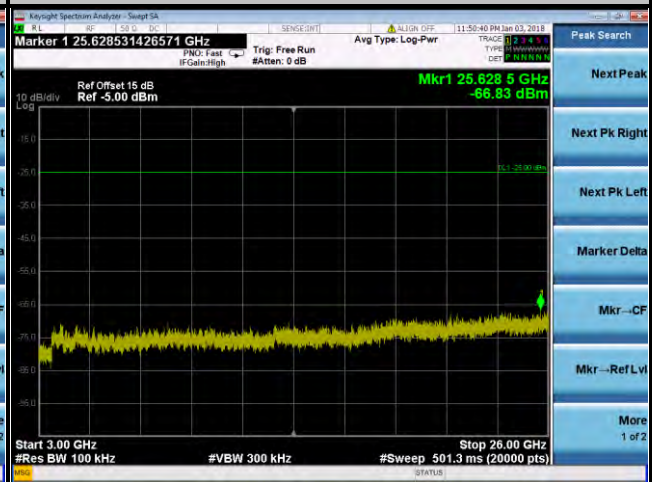
LTE Band 7

Channel Bandwidth: 10 MHz

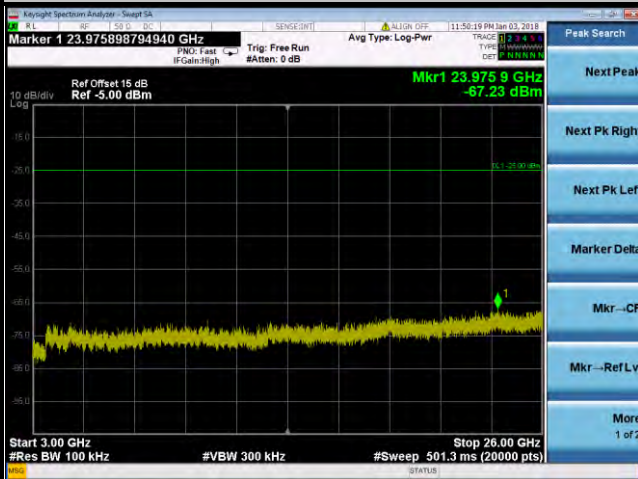
Channel 20800



Channel 21100



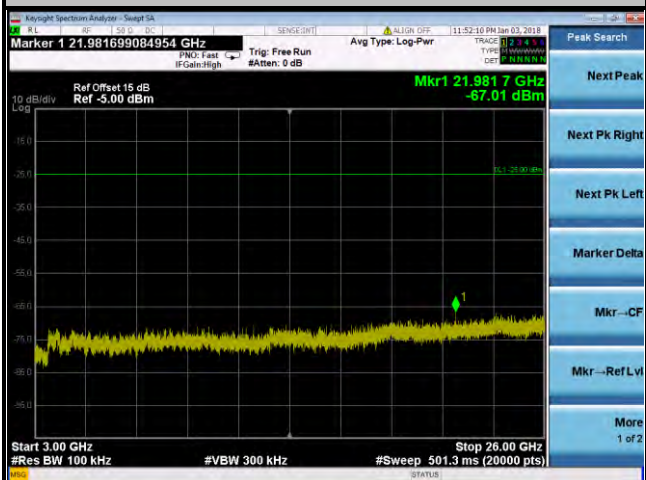
Channel 21400



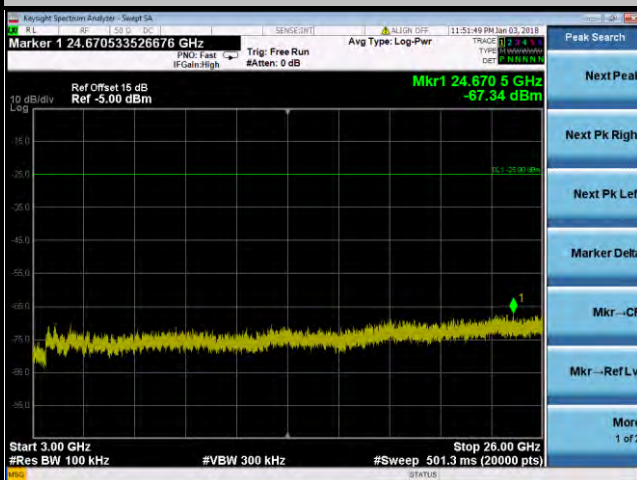
LTE Band 7

Channel Bandwidth: 15 MHz

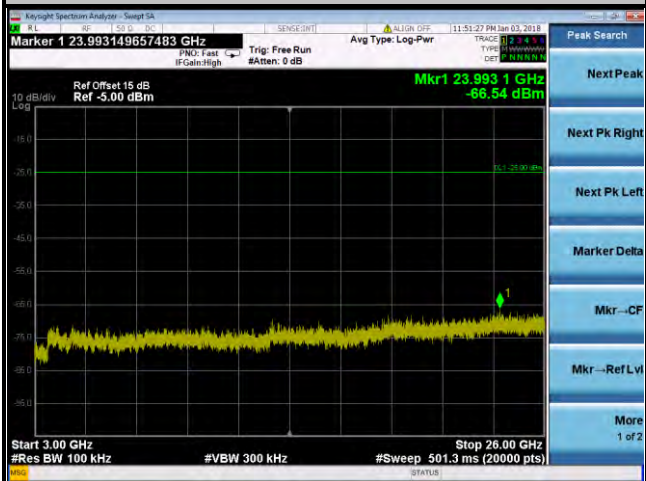
Channel 20825



Channel 21100



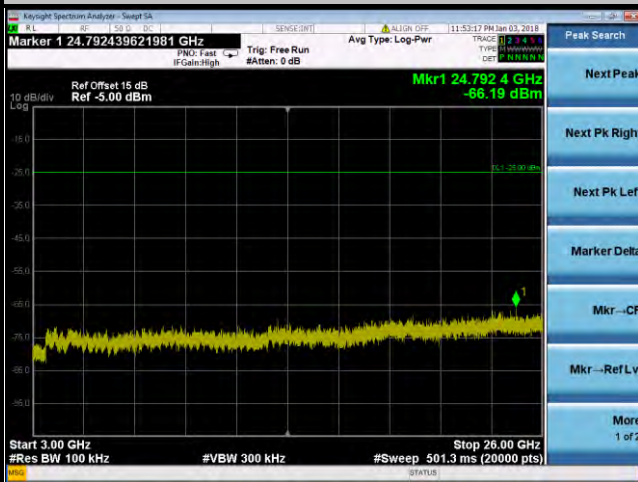
Channel 21375



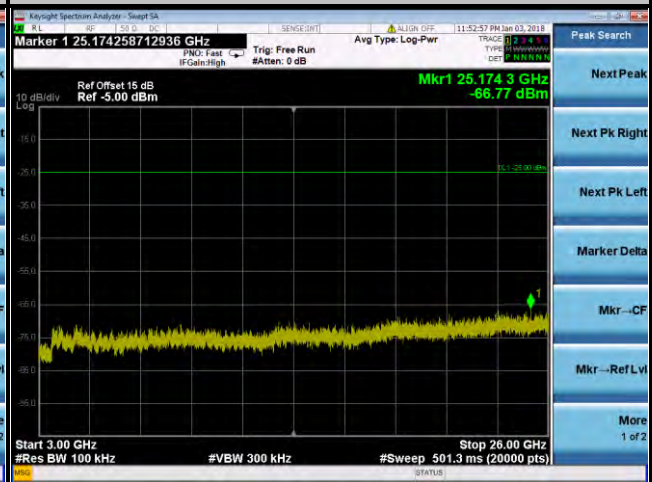
LTE Band 7

Channel Bandwidth: 20 MHz

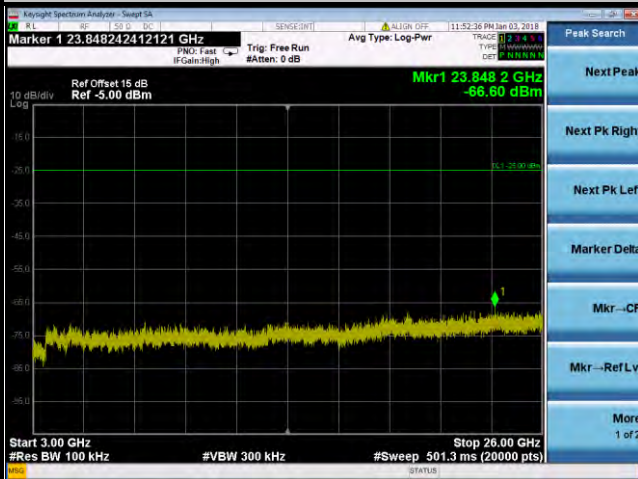
Channel 20850



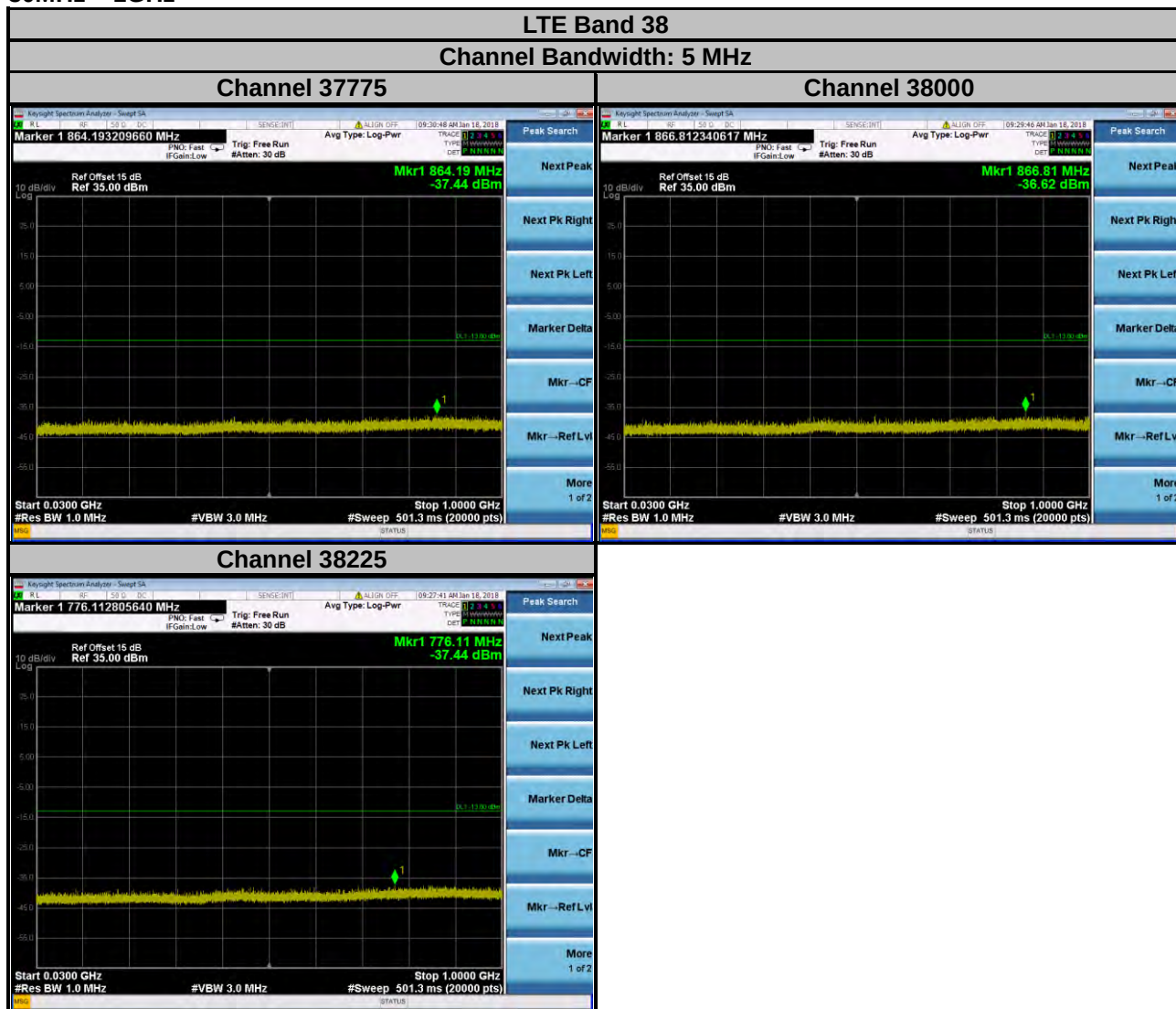
Channel 21100



Channel 21350



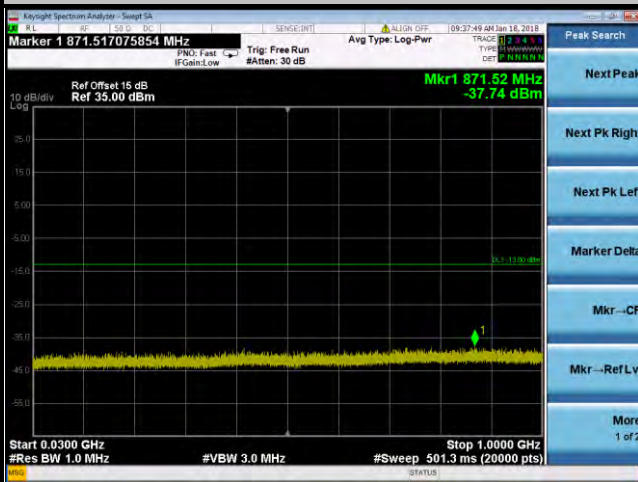
LTE Band 38
30MHz ~ 1GHz



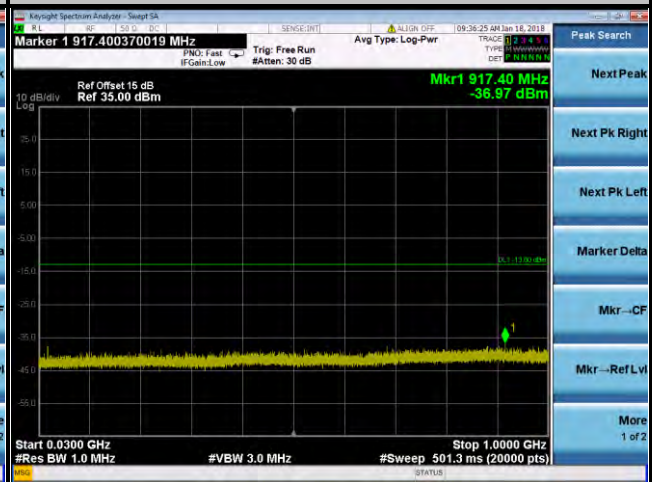
LTE Band 38

Channel Bandwidth: 10 MHz

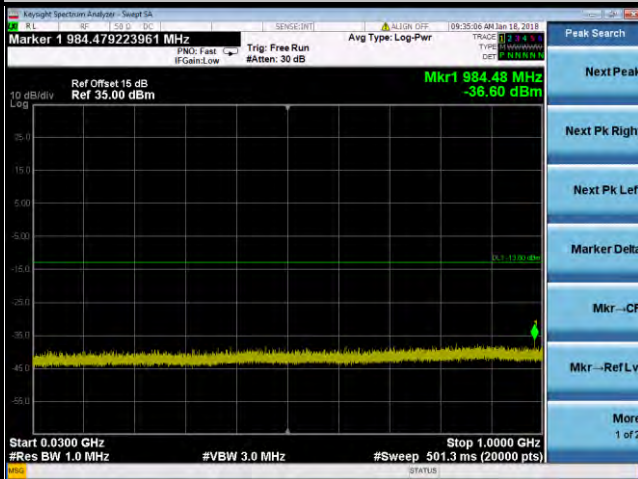
Channel 37800



Channel 38000



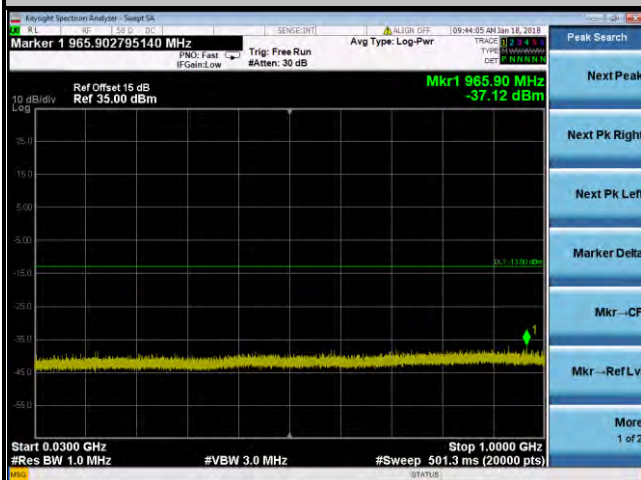
Channel 38200



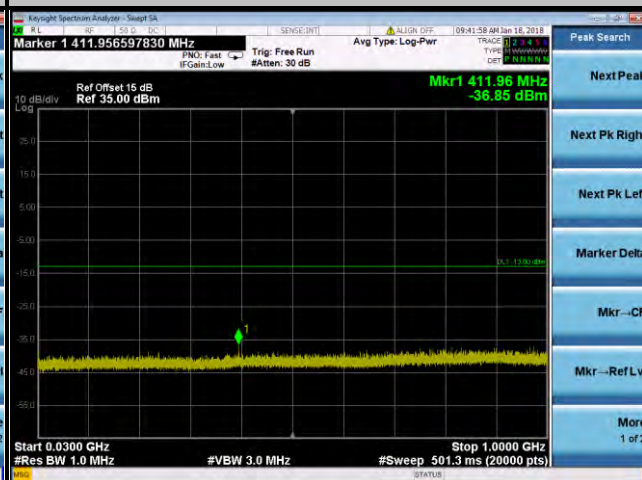
LTE Band 38

Channel Bandwidth: 15 MHz

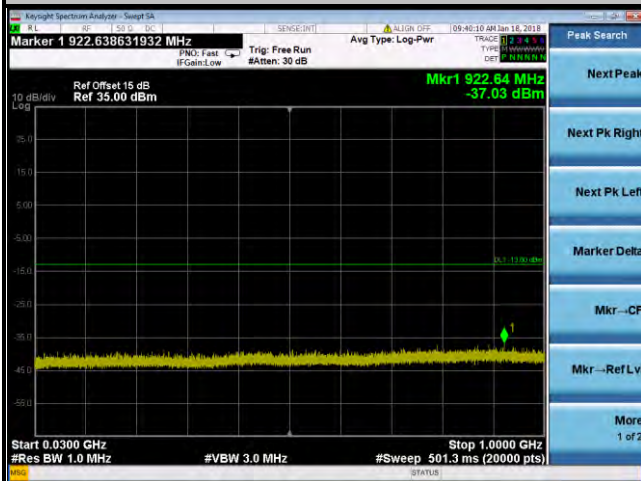
Channel 37825



Channel 38000



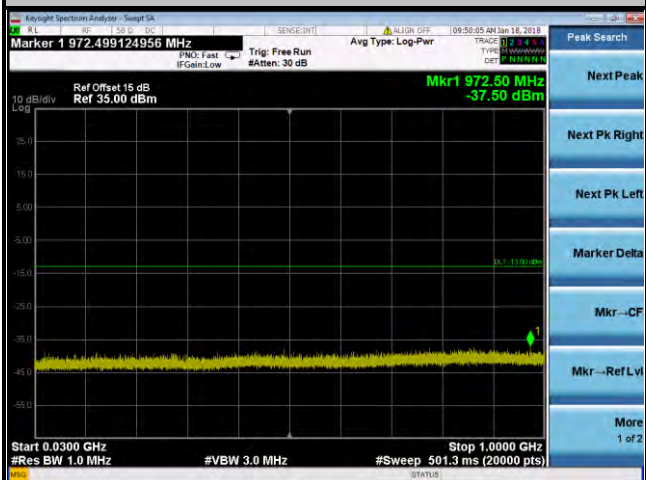
Channel 38175



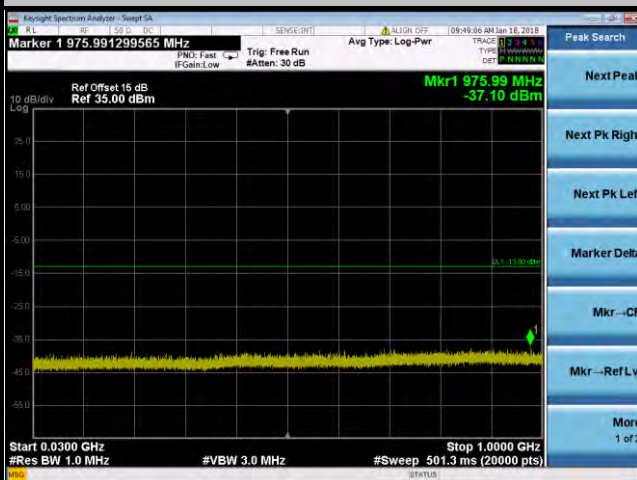
LTE Band 38

Channel Bandwidth: 20 MHz

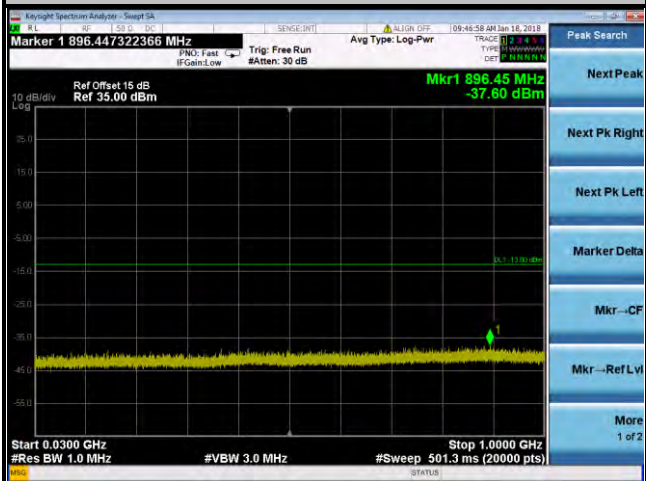
Channel 37850



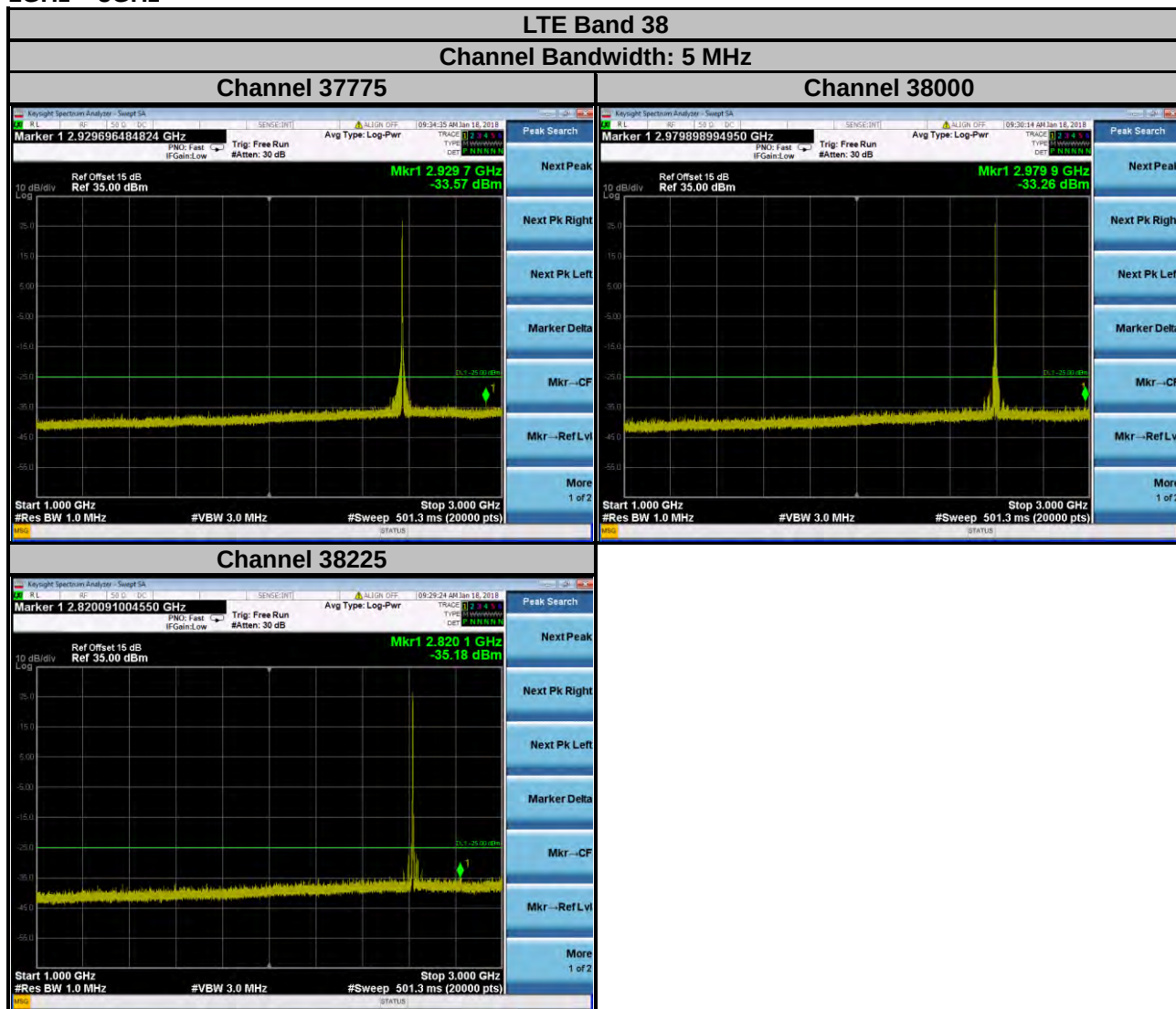
Channel 38000



Channel 38150



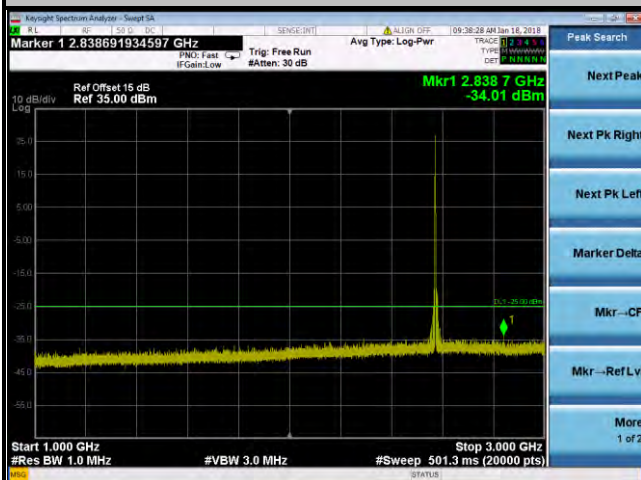
1GHz ~ 3GHz



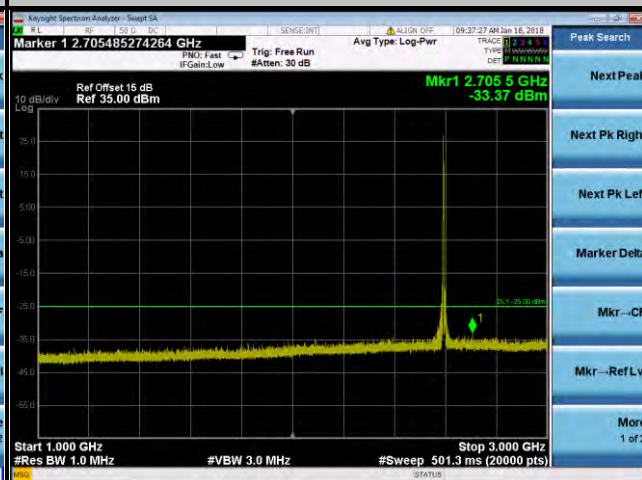
LTE Band 38

Channel Bandwidth: 10 MHz

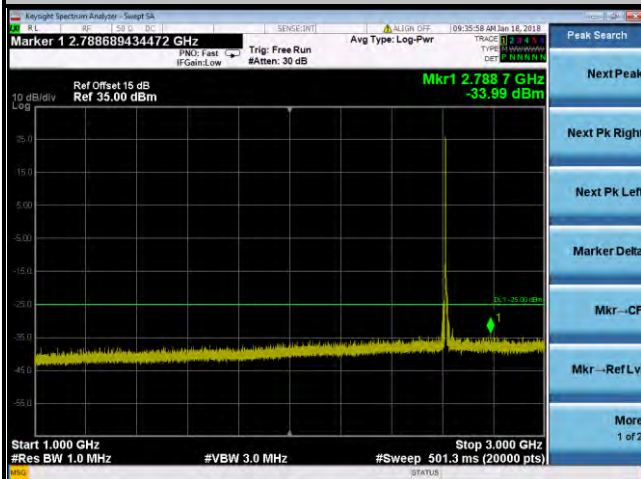
Channel 37800



Channel 38000



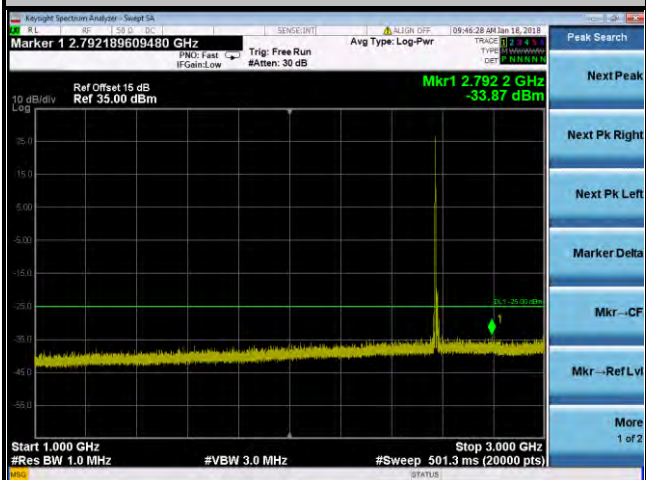
Channel 38200



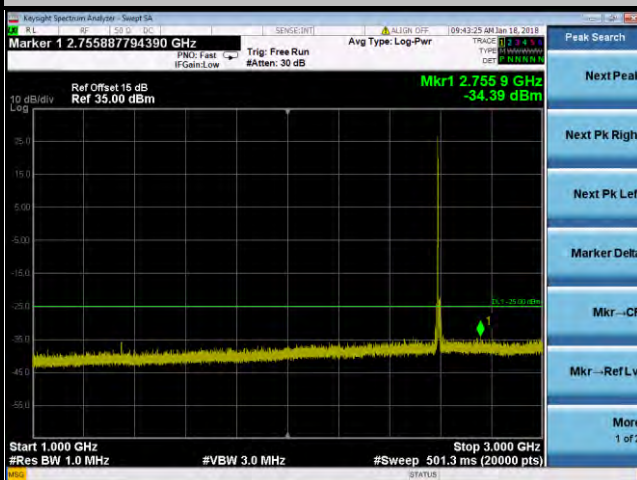
LTE Band 38

Channel Bandwidth: 15 MHz

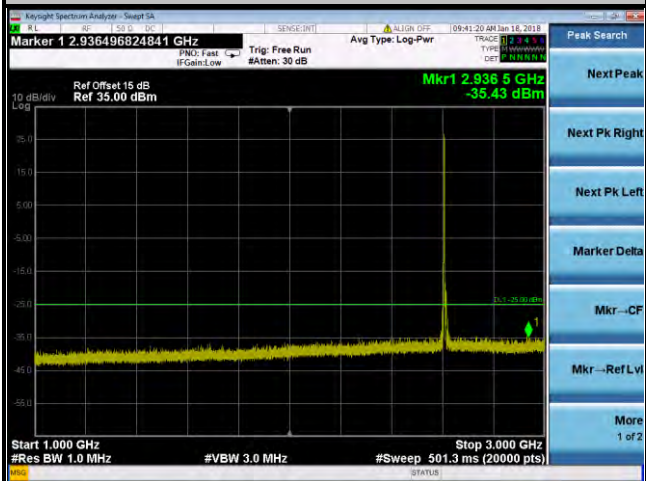
Channel 37825



Channel 38000



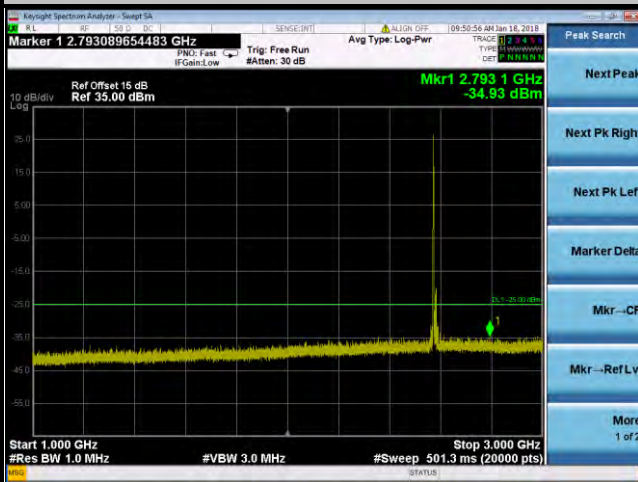
Channel 38175



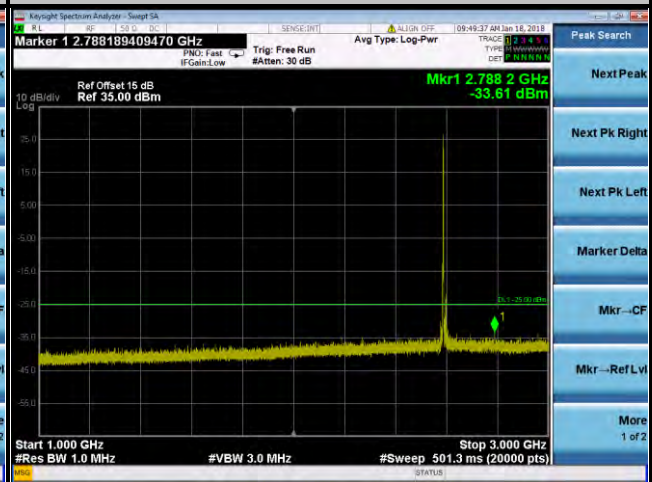
LTE Band 38

Channel Bandwidth: 20 MHz

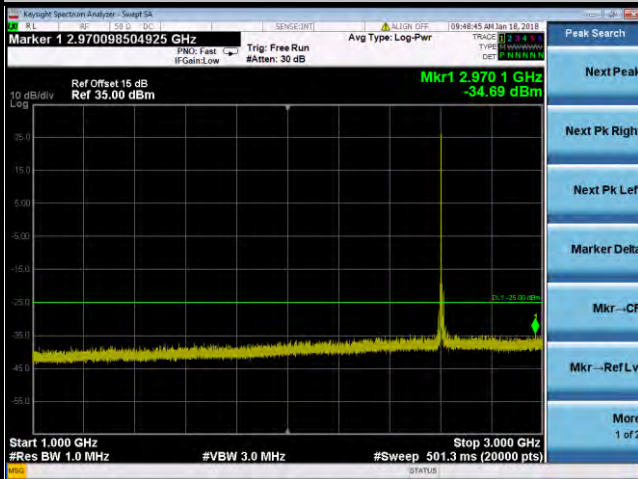
Channel 37850



Channel 38000



Channel 38150

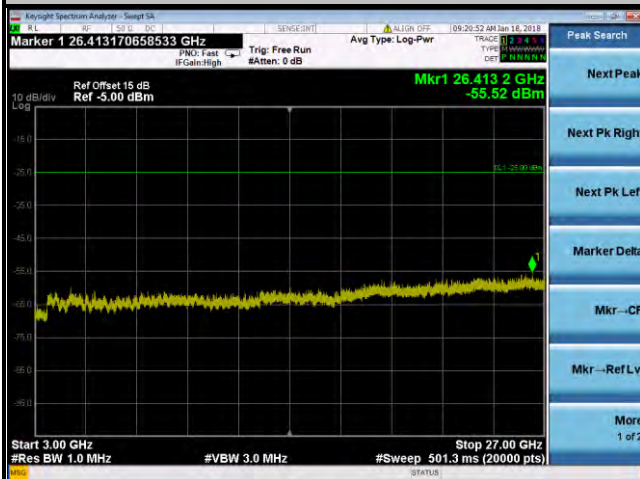


3GHz ~ 27GHz

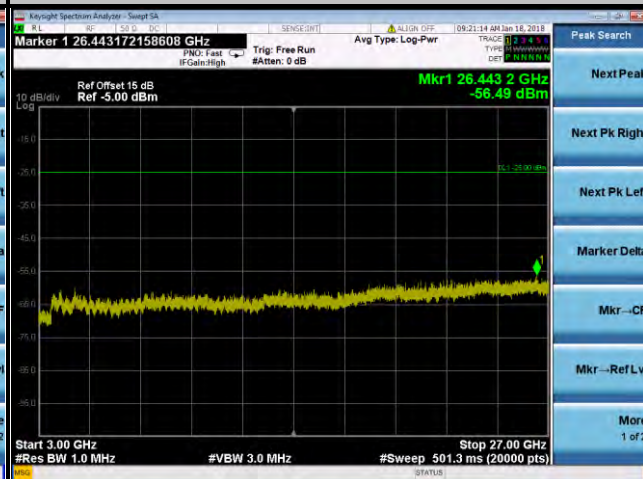
LTE Band 38

Channel Bandwidth: 5 MHz

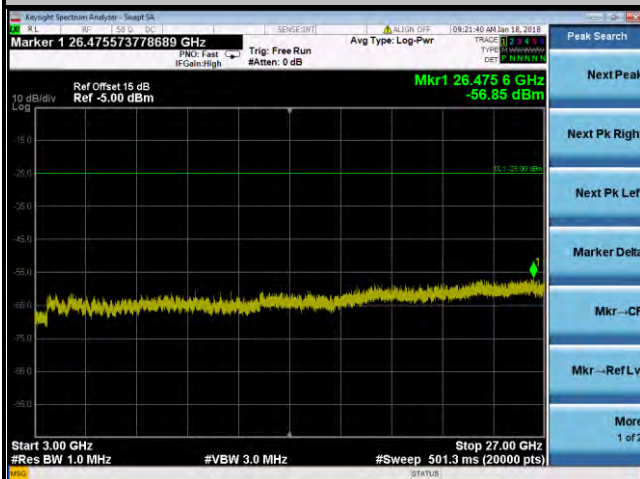
Channel 37775



Channel 38000



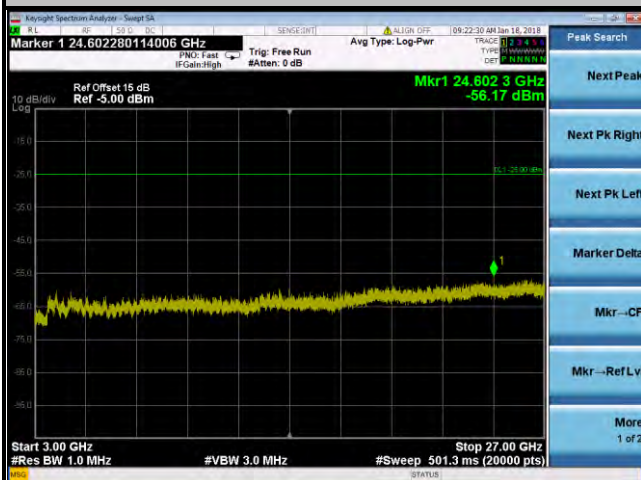
Channel 38225



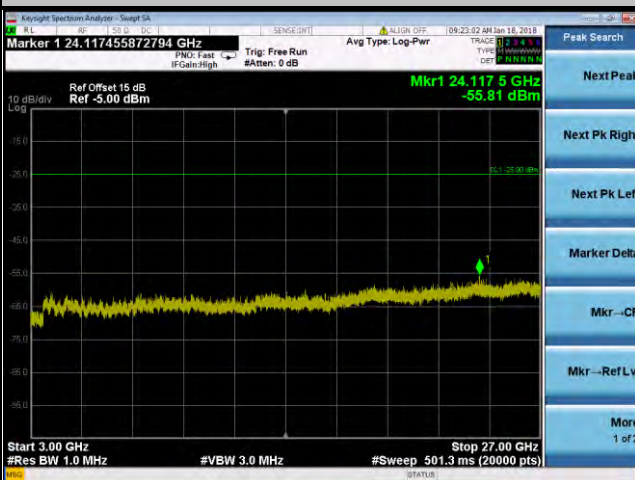
LTE Band 38

Channel Bandwidth: 10 MHz

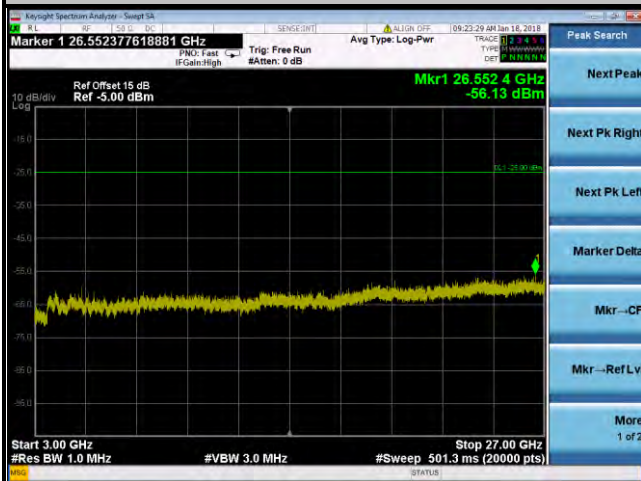
Channel 37800



Channel 38000



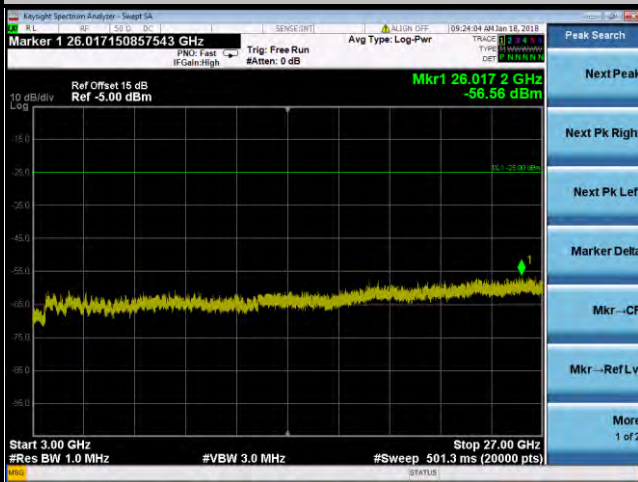
Channel 38200



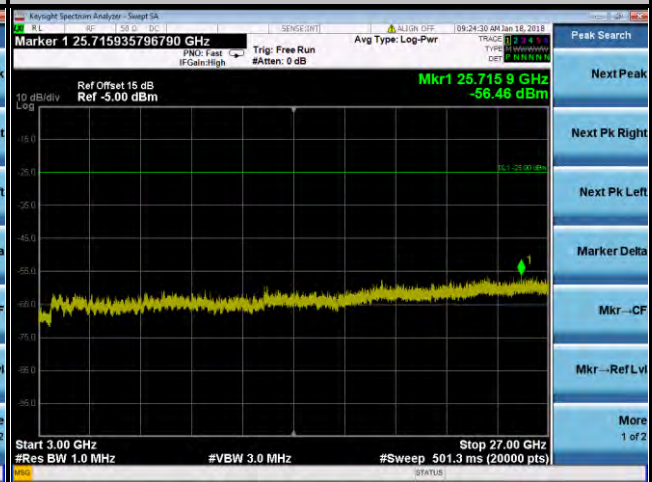
LTE Band 38

Channel Bandwidth: 15 MHz

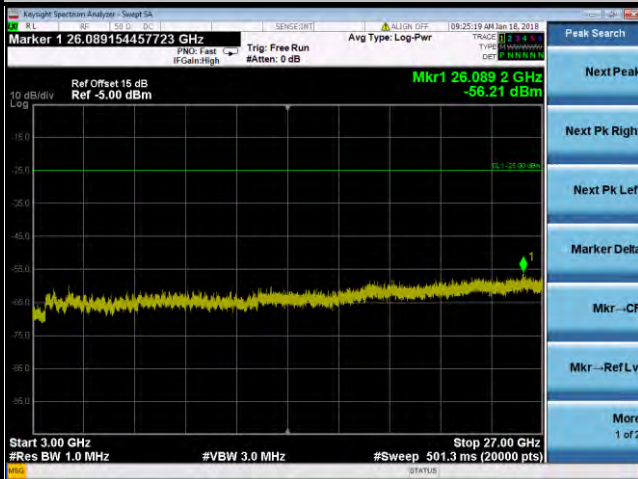
Channel 37825



Channel 38000



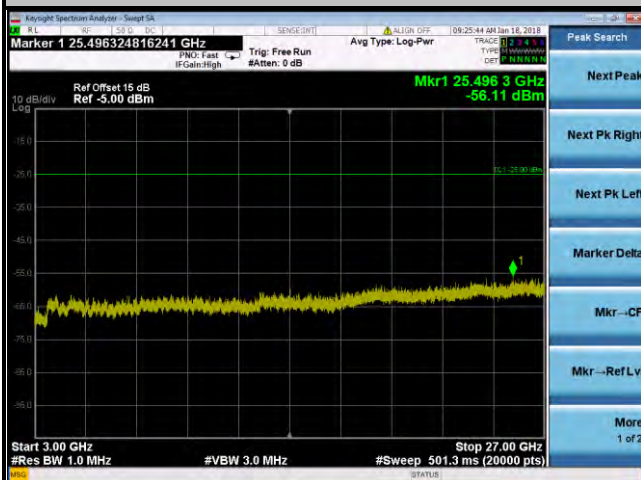
Channel 38175



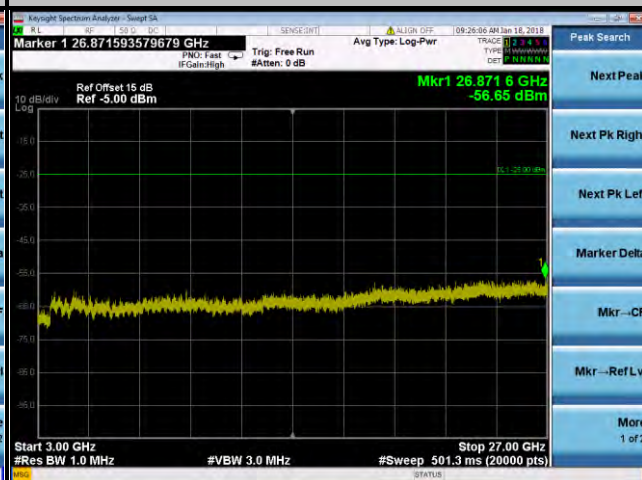
LTE Band 38

Channel Bandwidth: 20 MHz

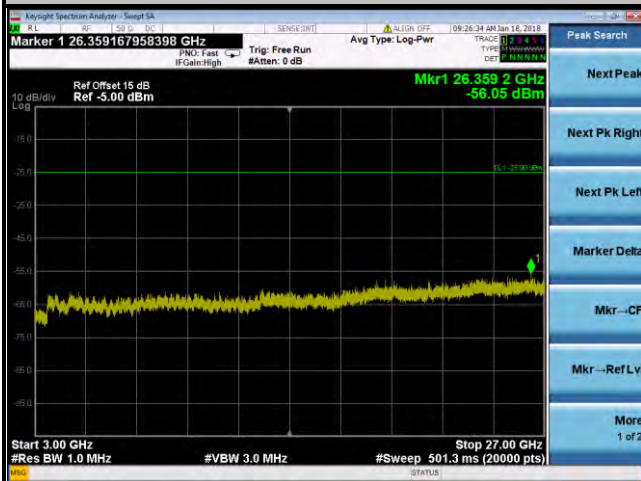
Channel 37850



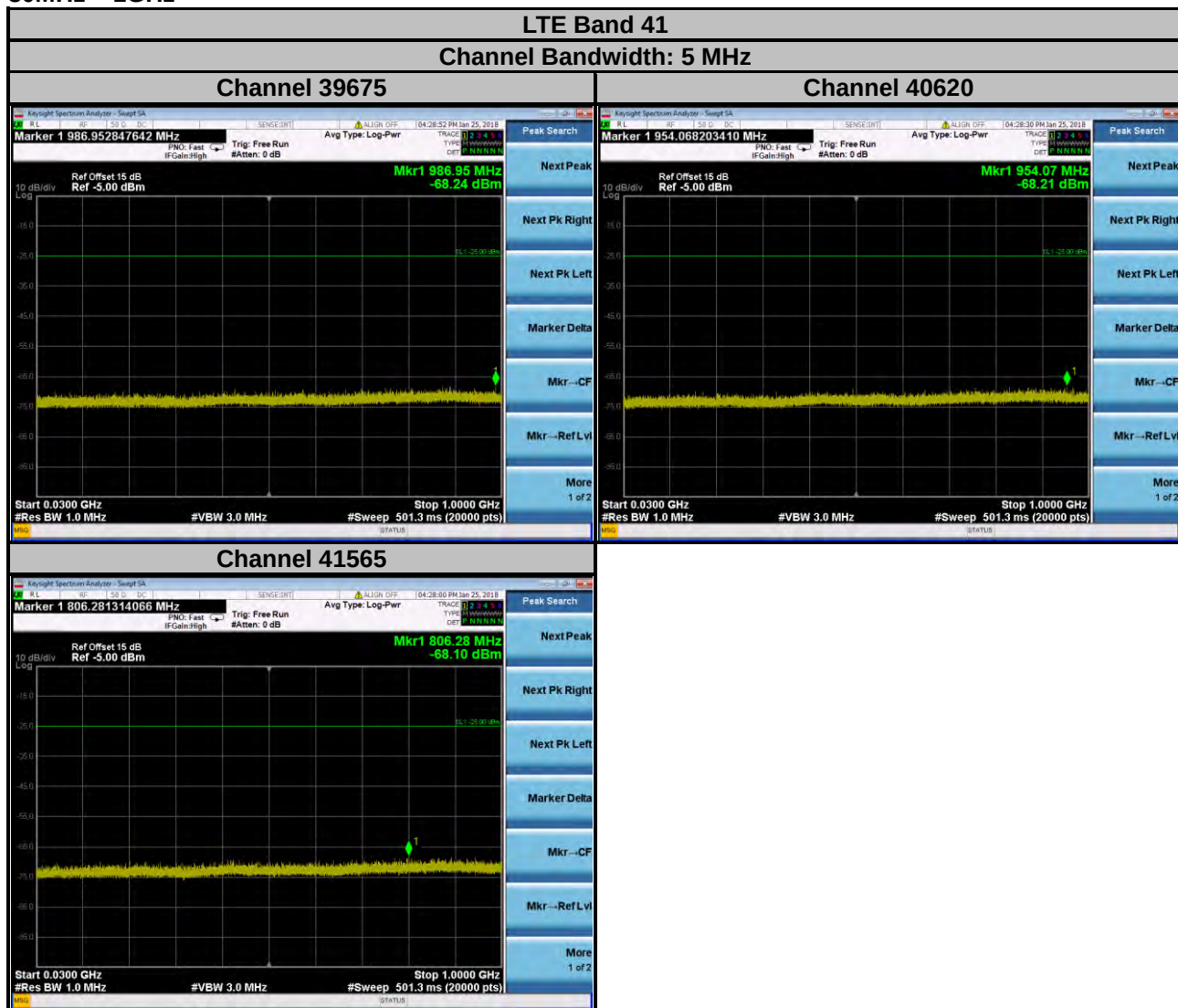
Channel 38000



Channel 38150



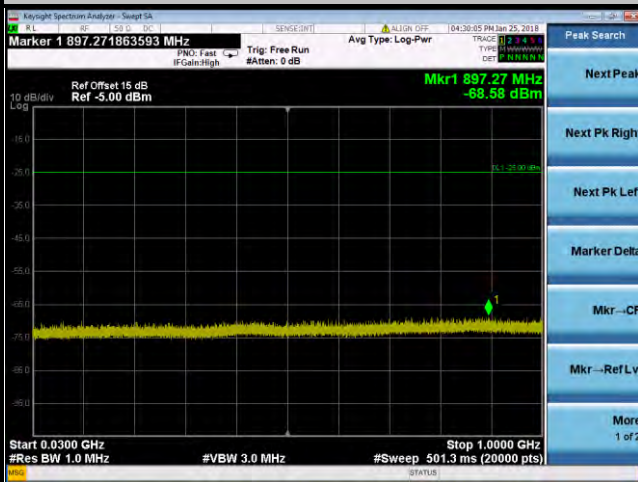
LTE Band 41
30MHz ~ 1GHz



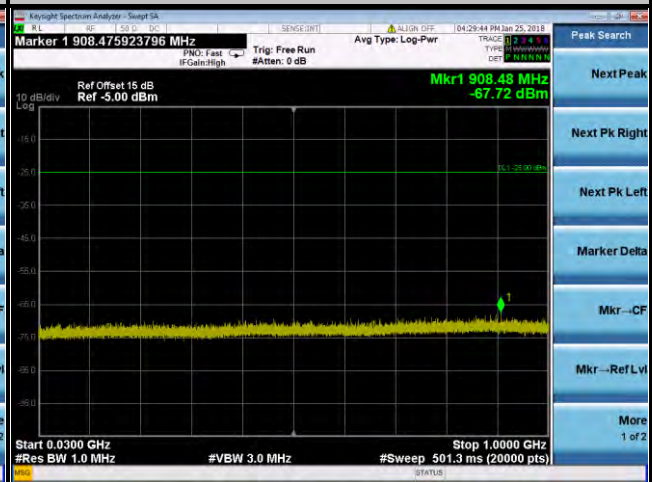
LTE Band 41

Channel Bandwidth: 10 MHz

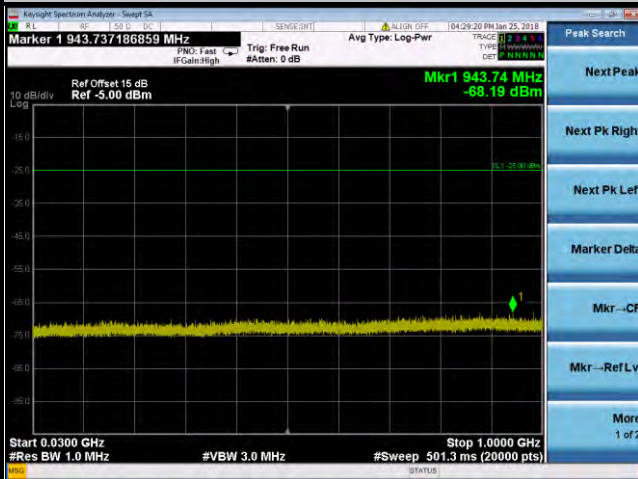
Channel 39700



Channel 40620



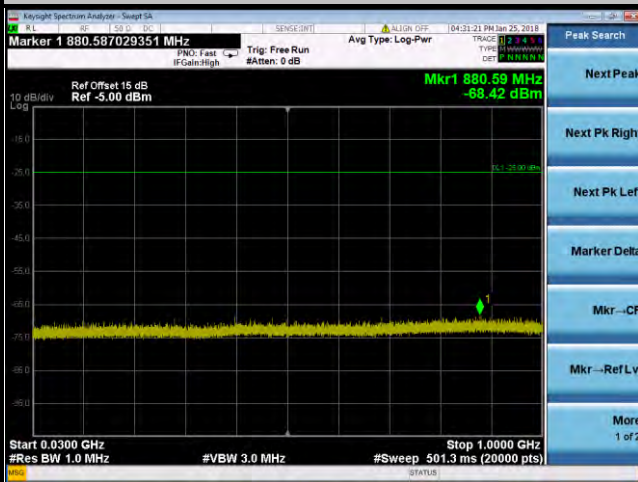
Channel 41540



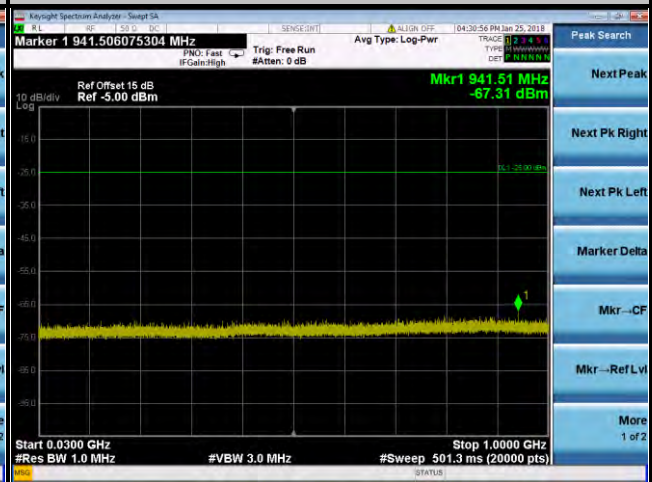
LTE Band 41

Channel Bandwidth: 15 MHz

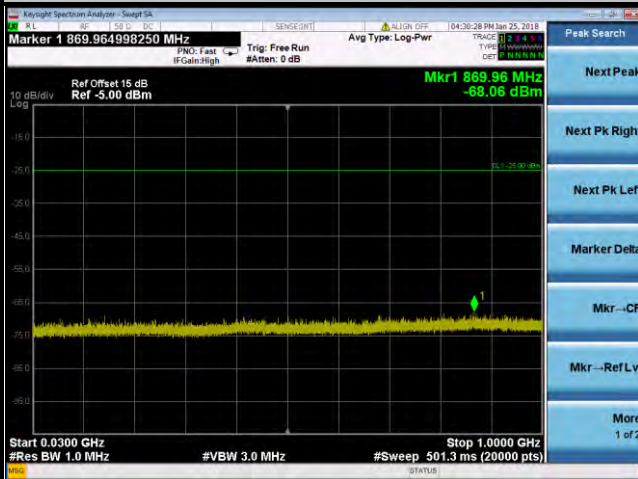
Channel 39725



Channel 40620



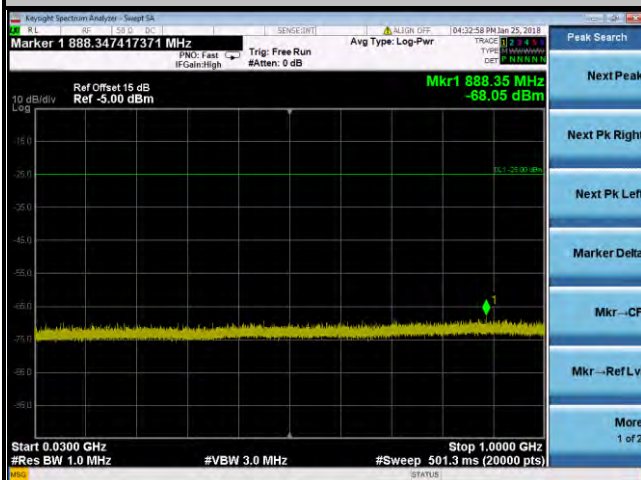
Channel 41515



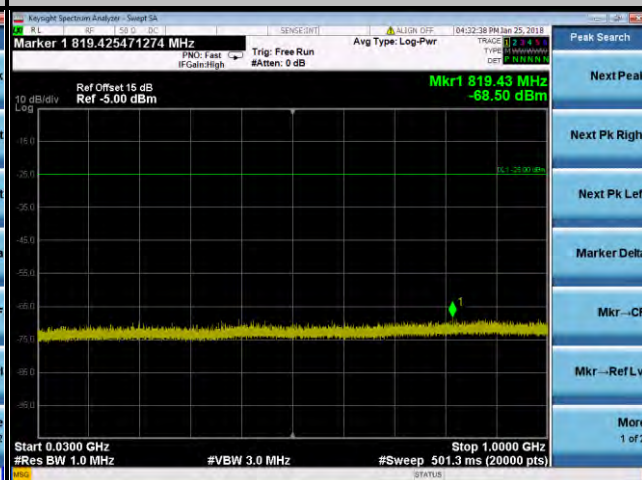
LTE Band 41

Channel Bandwidth: 20 MHz

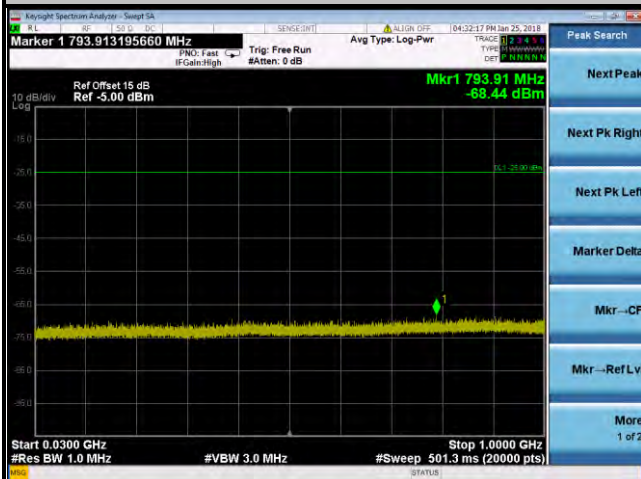
Channel 39750



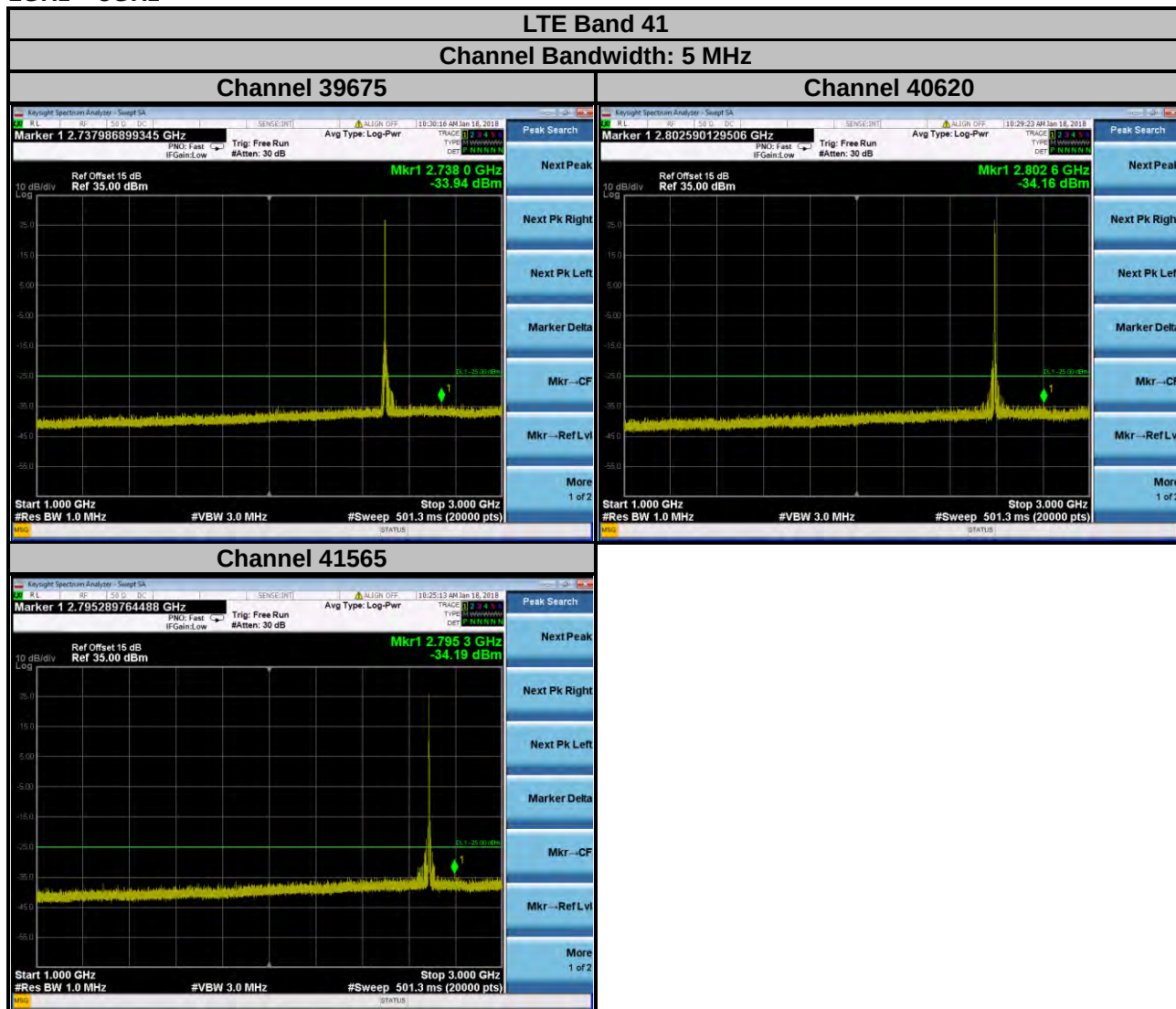
Channel 40620



Channel 41490



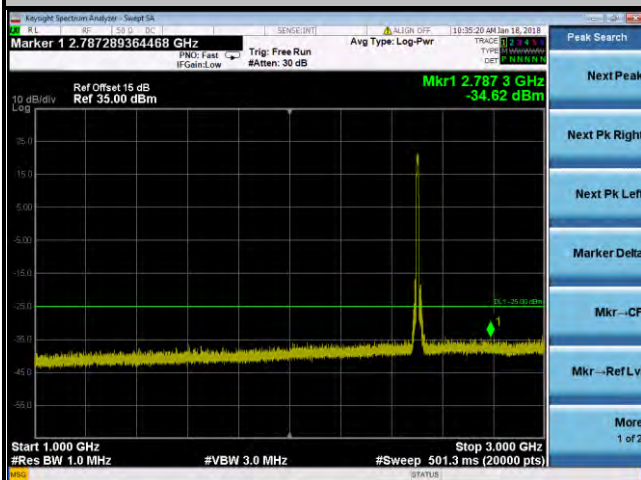
1GHz ~ 3GHz



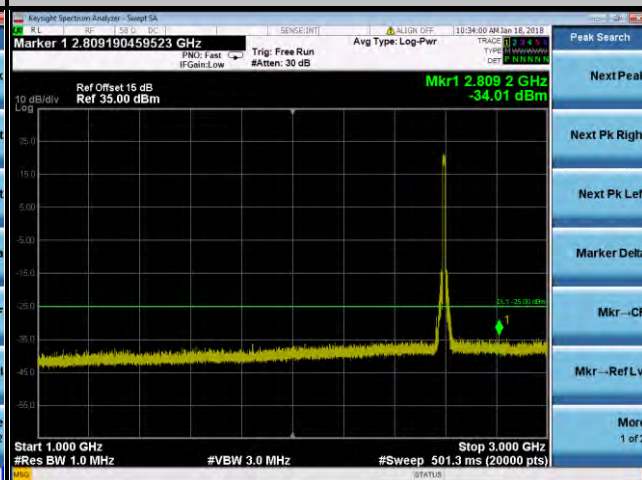
LTE Band 41

Channel Bandwidth: 10 MHz

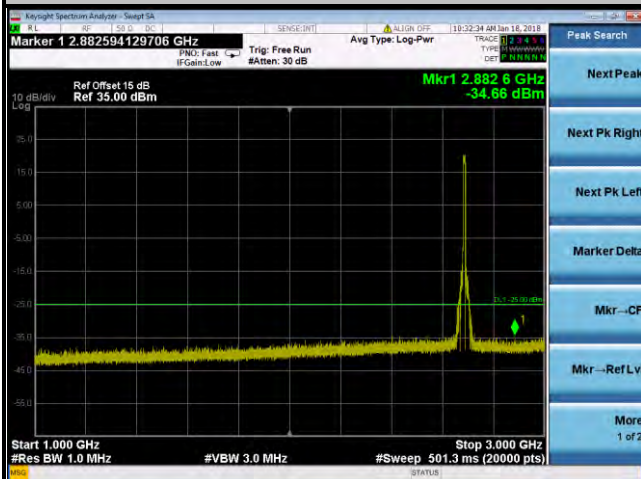
Channel 39700



Channel 40620



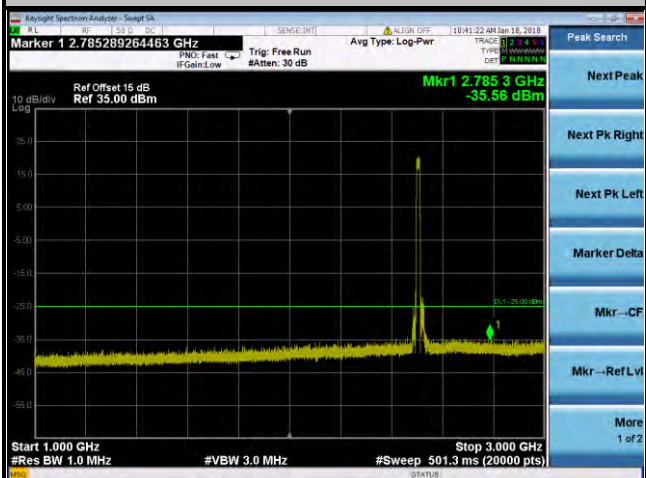
Channel 41540



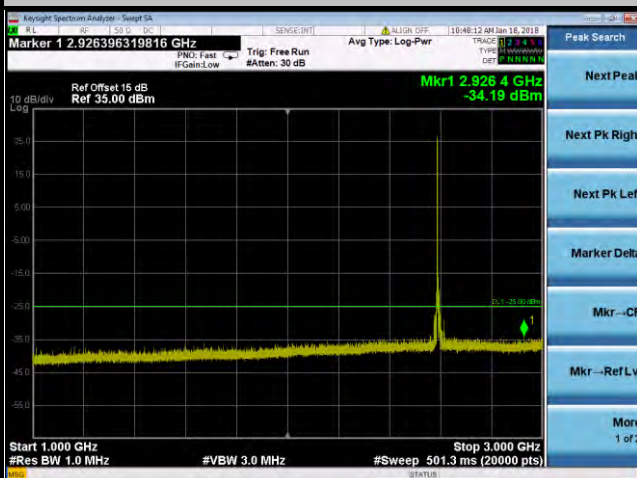
LTE Band 41

Channel Bandwidth: 15 MHz

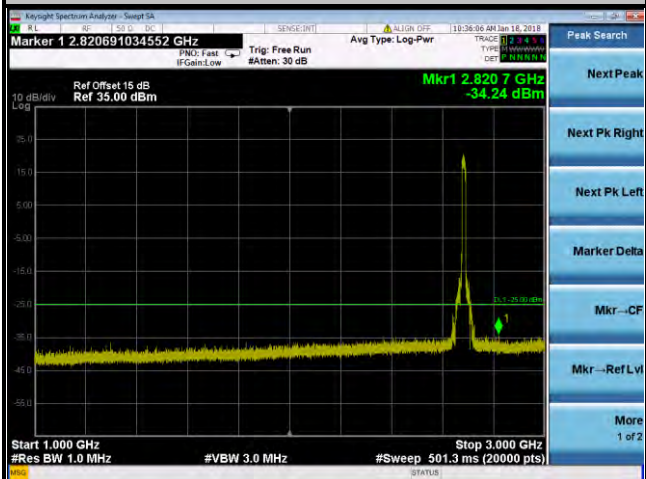
Channel 39725



Channel 40620



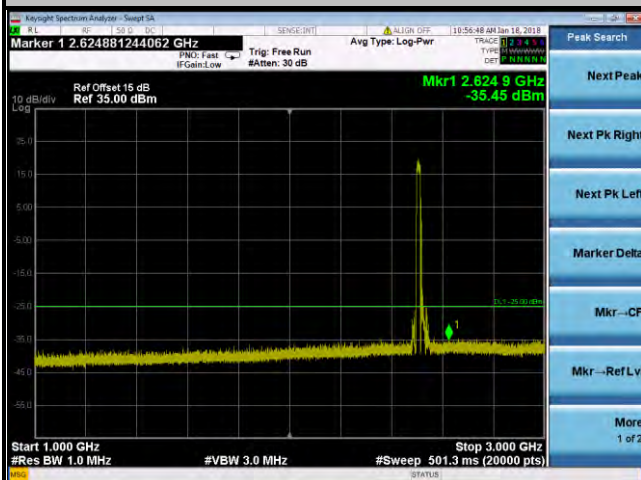
Channel 41515



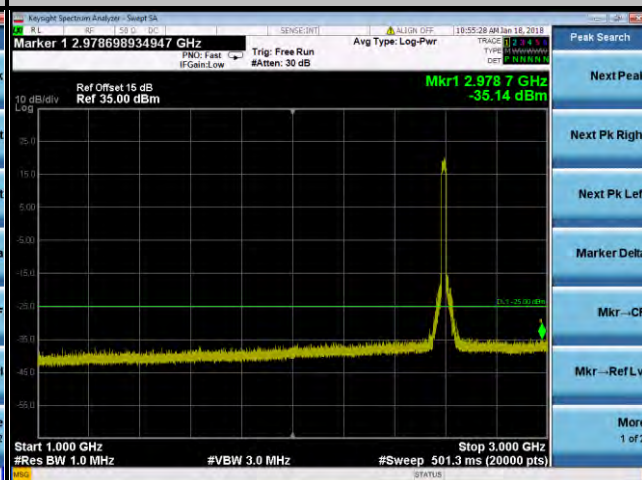
LTE Band 41

Channel Bandwidth: 20 MHz

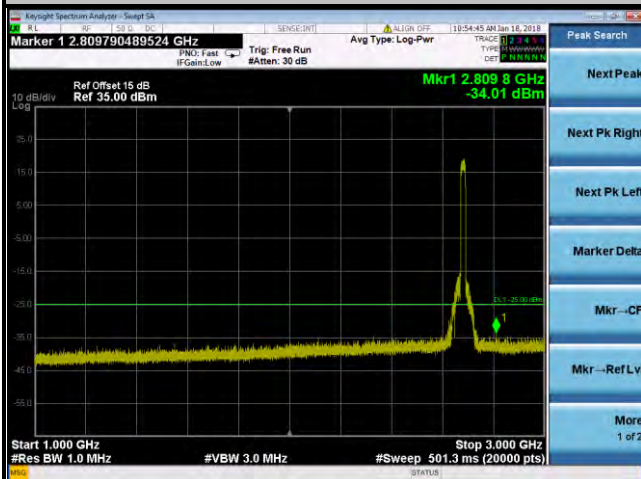
Channel 39750



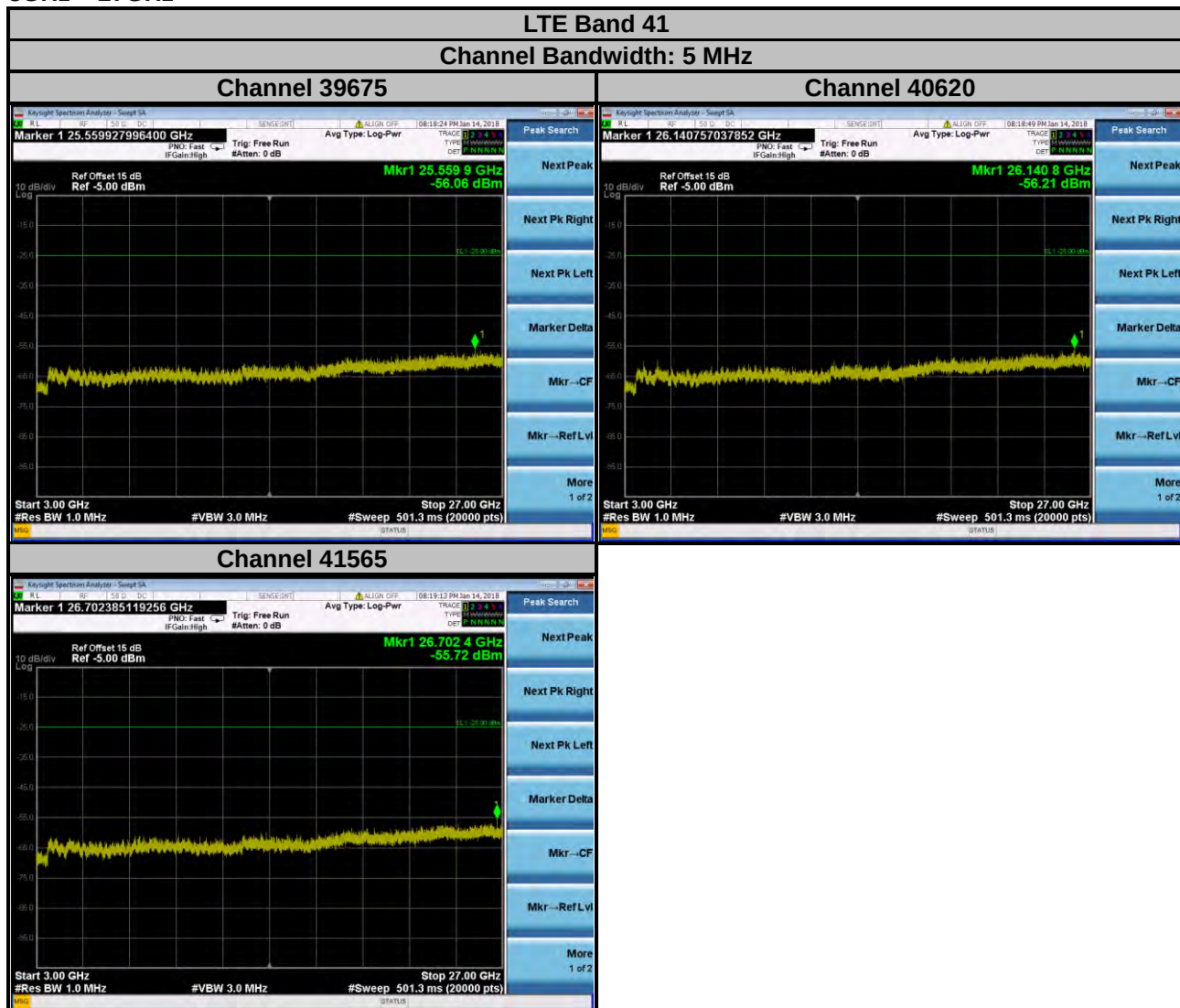
Channel 40620



Channel 41490



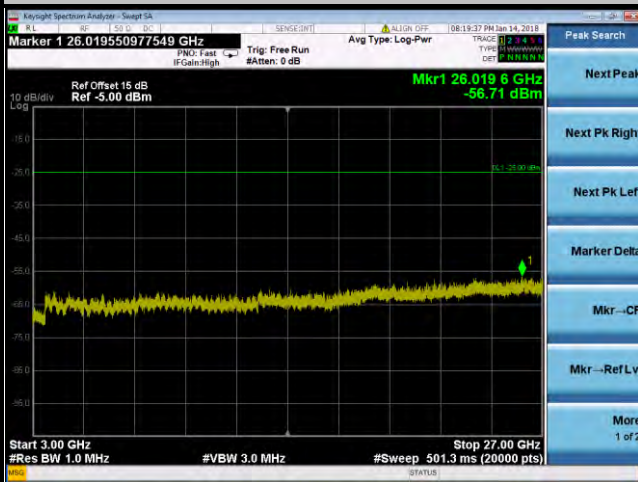
3GHz ~ 27GHz



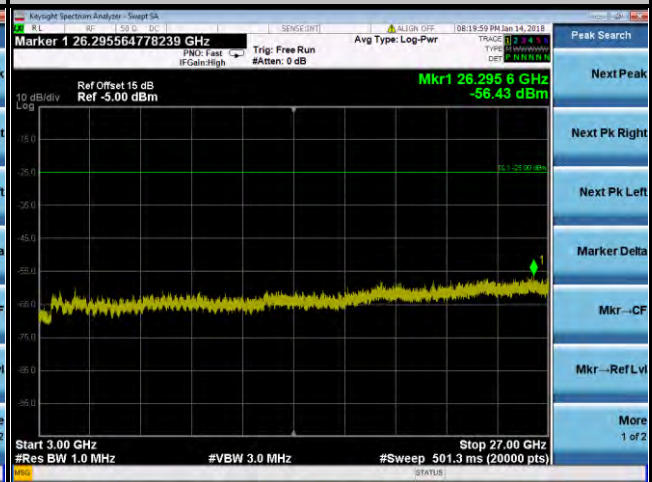
LTE Band 41

Channel Bandwidth: 10 MHz

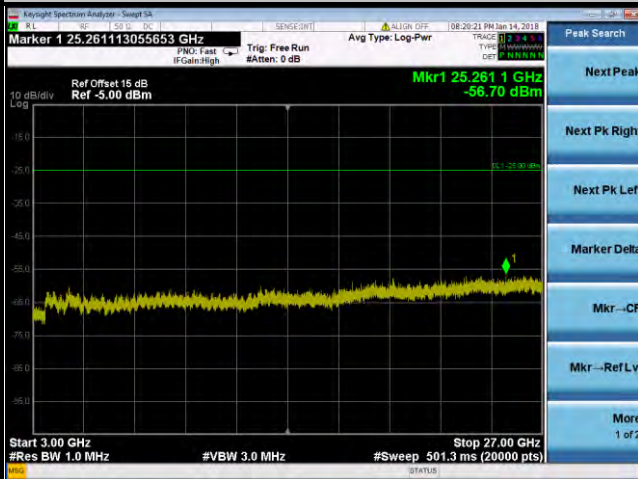
Channel 39700



Channel 40620



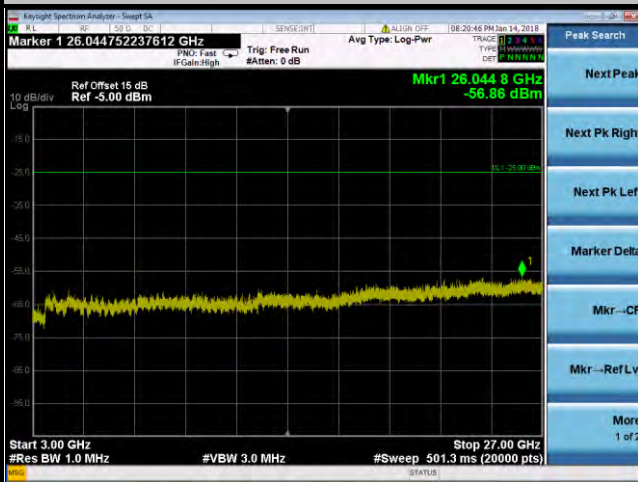
Channel 41540



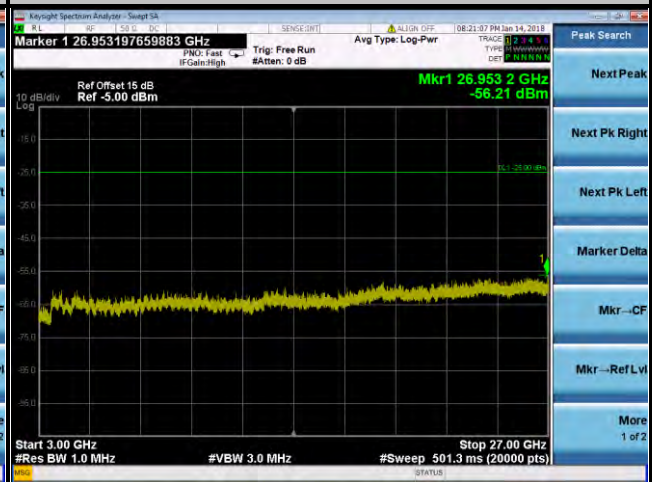
LTE Band 41

Channel Bandwidth: 15 MHz

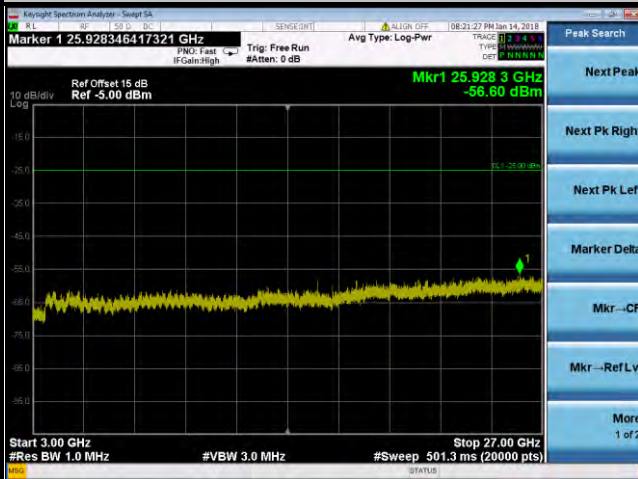
Channel 39725



Channel 40620



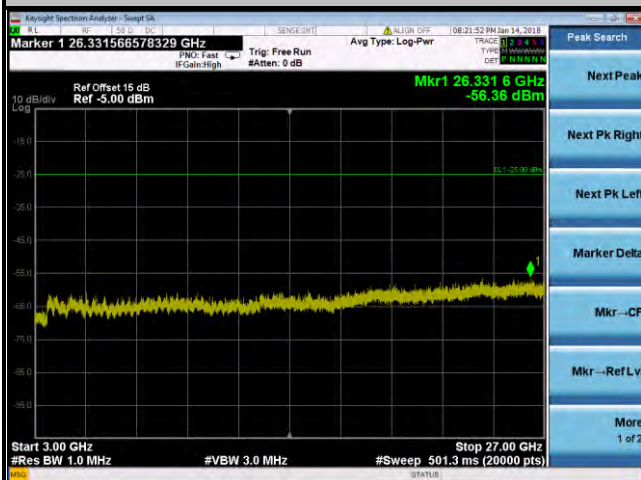
Channel 41515



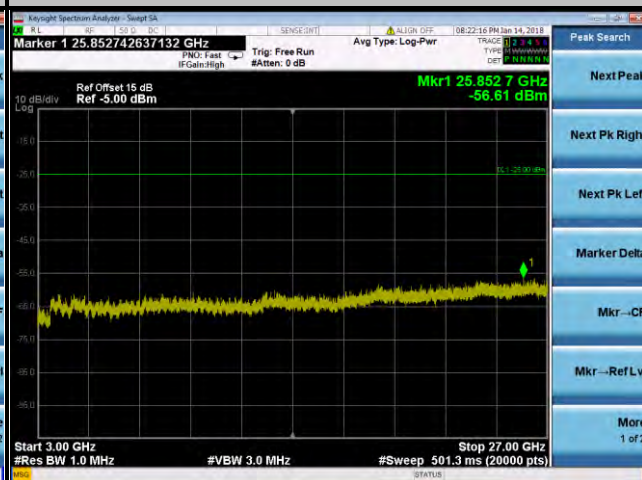
LTE Band 41

Channel Bandwidth: 20 MHz

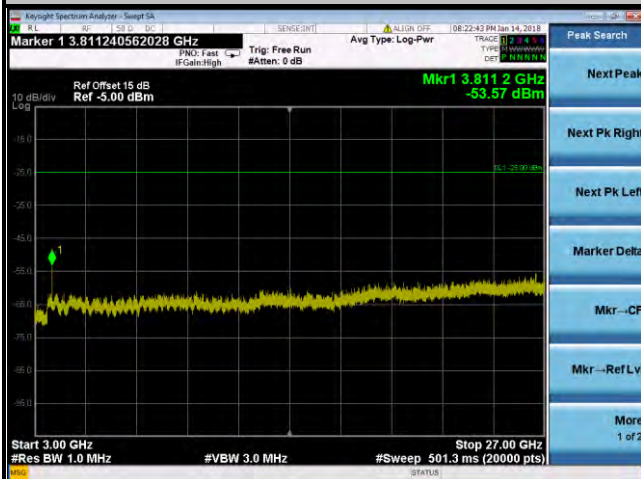
Channel 39750



Channel 40620



Channel 41490



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

- 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.
- 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.
- $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$
- E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dBi}.$

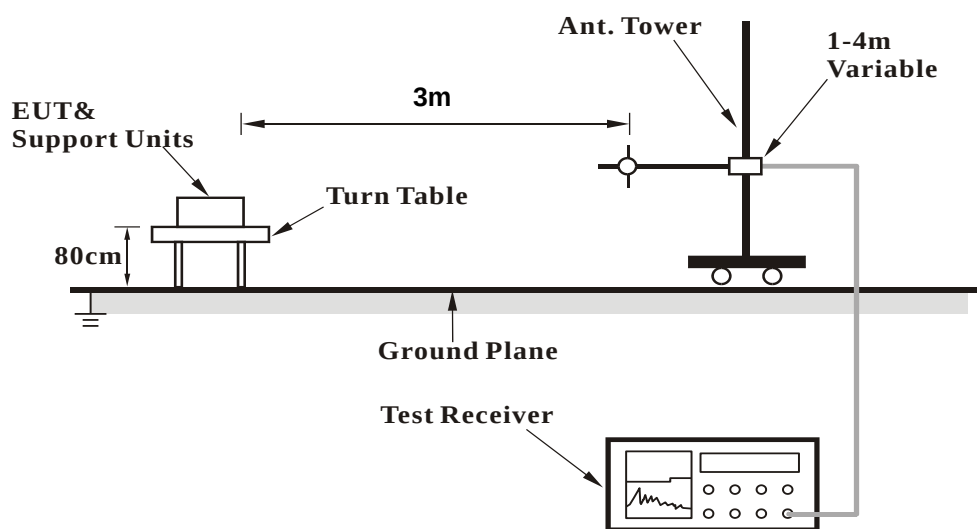
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.7.3 Deviation from Test Standard

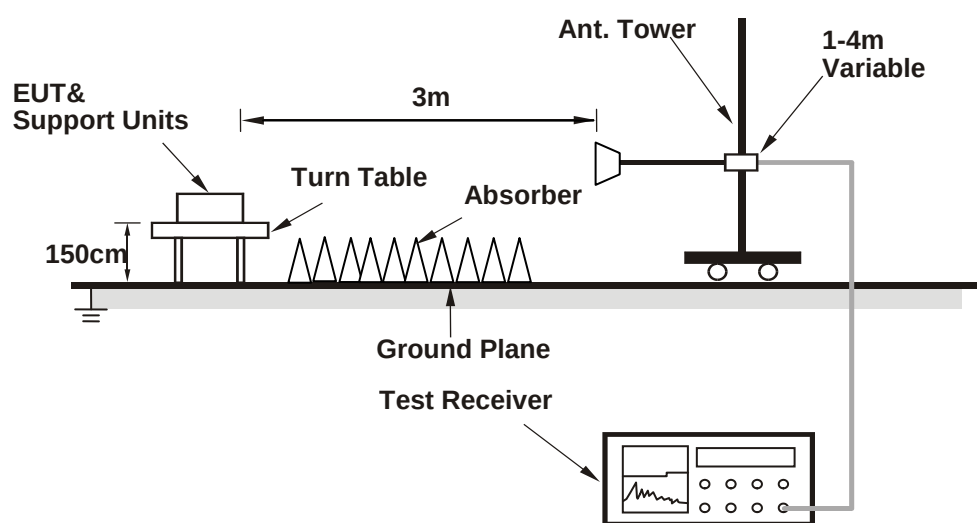
No deviation.

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

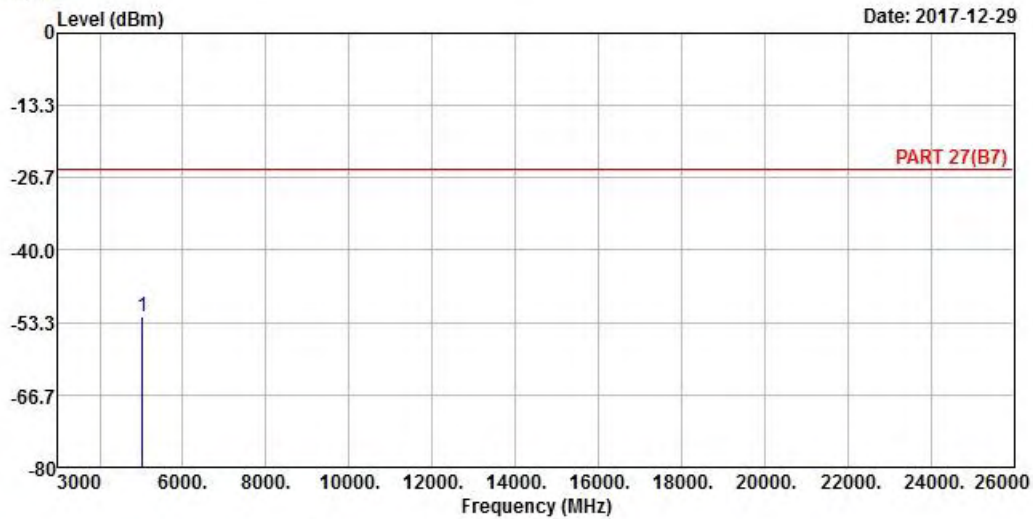


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 2017-12-29



Site : 966 Chamber 5

Condition: PART 27(B7) HORIZONTAL

Remak : LTE Band 7 QPSK_20M Link_L-CH

Tested by: Jisyong Wang

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

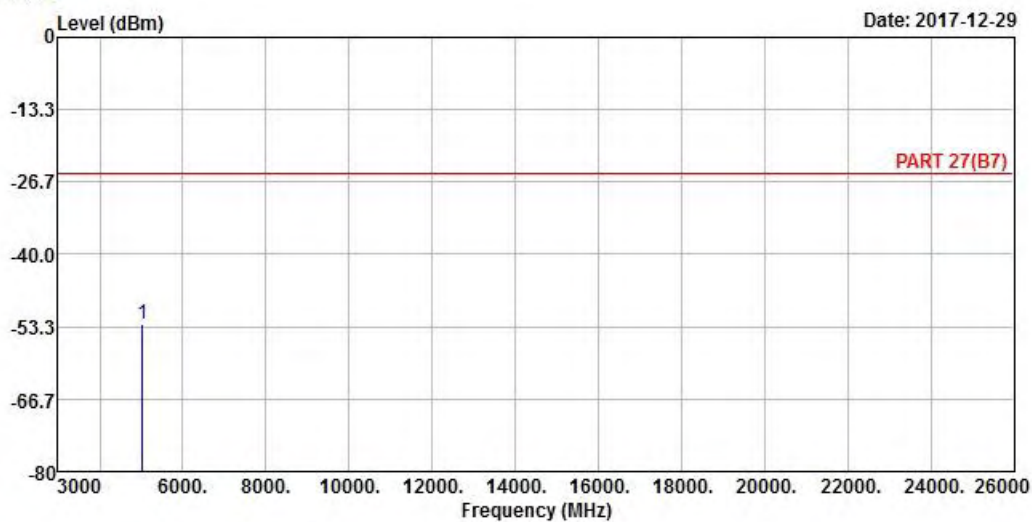
1 pp 5020.00 -52.34 -49.11 -25.00 -27.34 -3.23 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4



Site : 966 Chamber 5

Condition: PART 27(B7) VERTICAL

Remak : LTE Band 7 QPSK_20M Link_L-CH

Tested by: Jisyong Wang

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

1 pp 5020.00 -52.97 -49.74 -25.00 -27.97 -3.23 Peak

Middle Channel

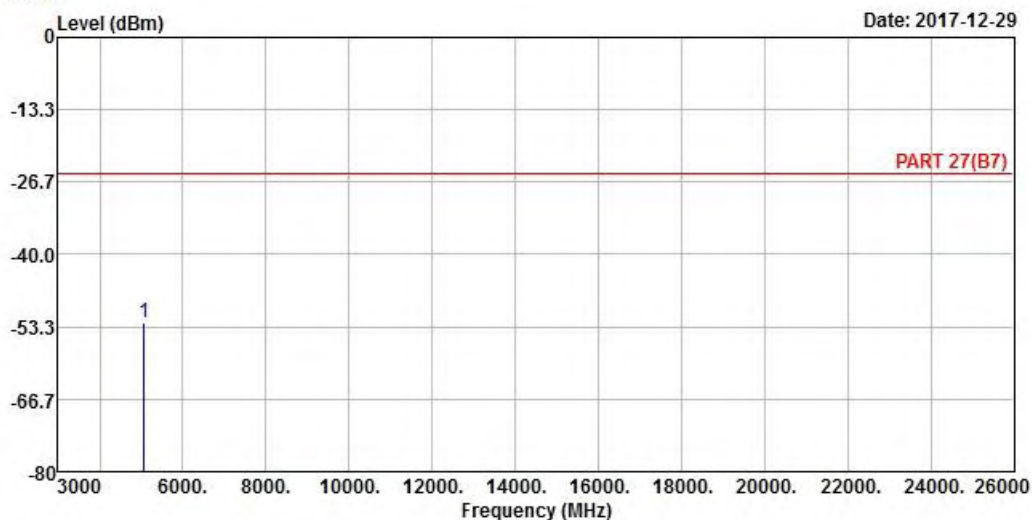


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 2017-12-29



Site : 966 Chamber 5

Condition: PART 27(B7) HORIZONTAL

Remak : LTE Band 7 QPSK_20M Link_M-CH

Tested by: Jisyong Wang

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

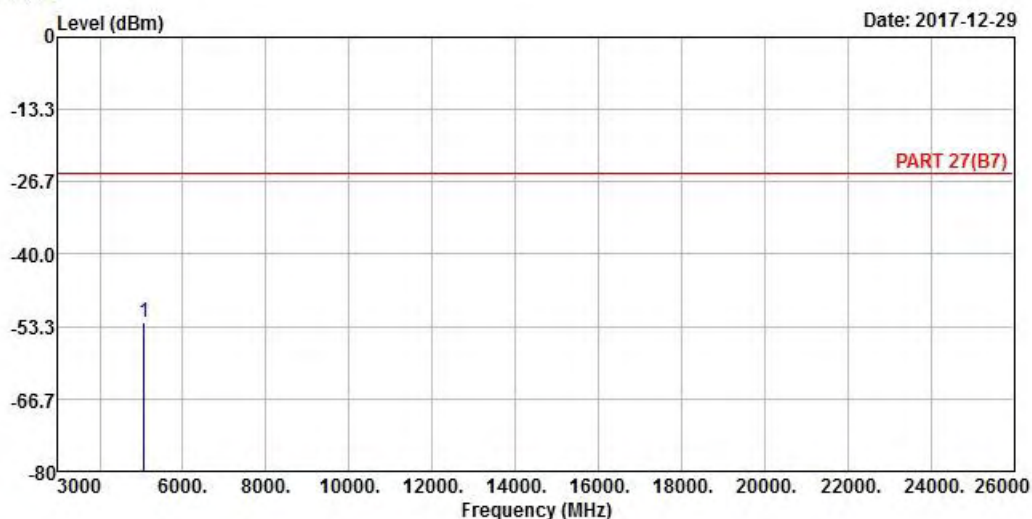
1 pp 5070.00 -52.41 -49.29 -25.00 -27.41 -3.12 Peak



Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 4



Site : 966 Chamber 5

Condition: PART 27(B7) VERTICAL

Remak : LTE Band 7 QPSK_20M Link_M-CH

Tested by: Jisyong Wang

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

1 pp 5070.00 -52.45 -49.33 -25.00 -27.45 -3.12 Peak

High Channel

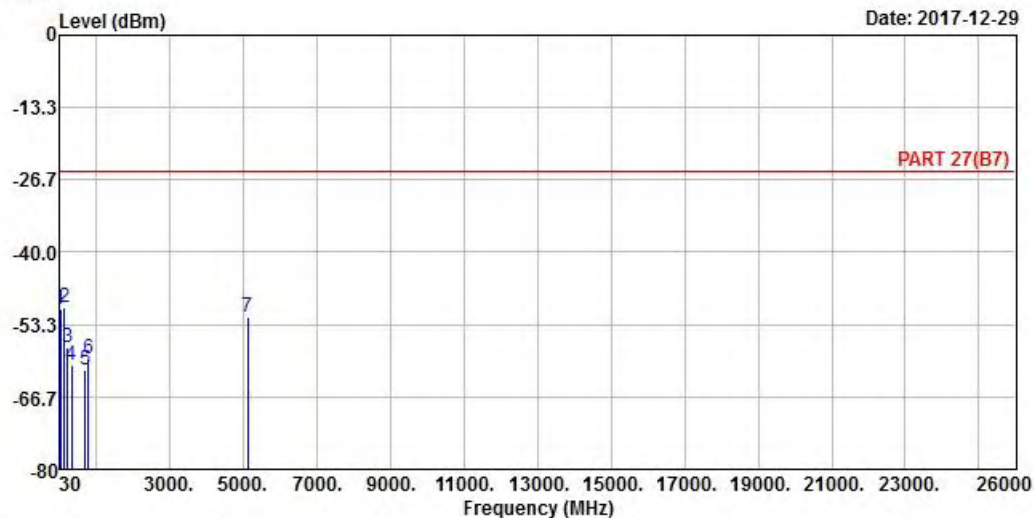


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 7

Date: 2017-12-29



Site : 966 Chamber 5

Condition: PART 27(B7) HORIZONTAL

Remak : LTE Band 7 QPSK_20M Link_H-CH

Tested by: Jisyong Wang

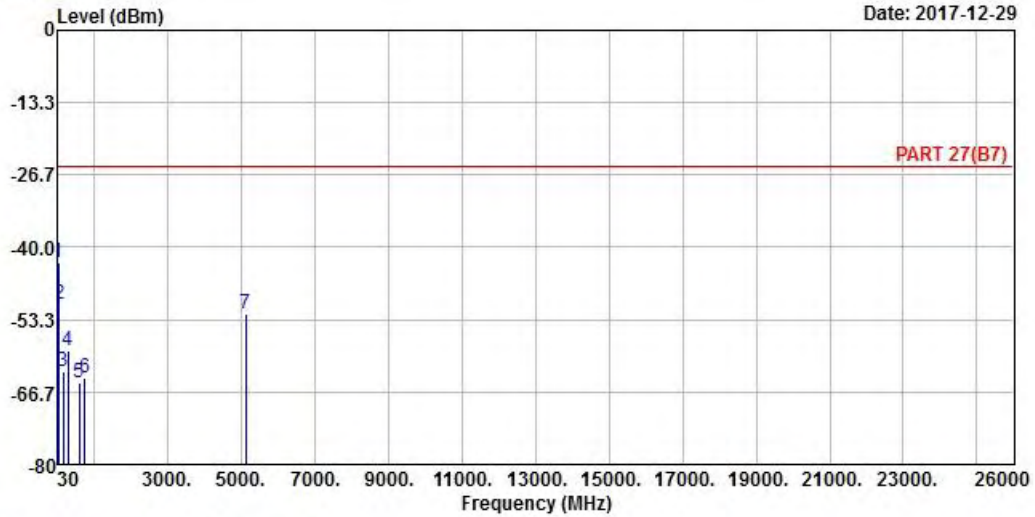
			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	42.69	-50.49	-49.55	-25.00	-25.49	-0.94	Peak
2 pp	138.81	-50.18	-41.52	-25.00	-25.18	-8.66	Peak
3	224.40	-57.55	-50.50	-25.00	-32.55	-7.05	Peak
4	350.40	-60.78	-54.54	-25.00	-35.78	-6.24	Peak
5	716.50	-61.70	-61.93	-25.00	-36.70	0.23	Peak
6	800.50	-59.56	-60.30	-25.00	-34.56	0.74	Peak
7	5120.00	-51.96	-48.95	-25.00	-26.96	-3.01	Peak



Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 8



Site : 966 Chamber 5

Condition: PART 27(B7) VERTICAL

Remak : LTE Band 7 QPSK_20M Link_H-CH

Tested by: Jisyong Wang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	42.96	-42.88	-41.94	-25.00	-17.88	-0.94	Peak
2	60.51	-50.60	-42.94	-25.00	-25.60	-7.66	Peak
3	169.59	-62.91	-57.38	-25.00	-37.91	-5.53	Peak
4	300.00	-59.02	-52.01	-25.00	-34.02	-7.01	Peak
5	610.10	-64.86	-64.08	-25.00	-39.86	-0.78	Peak
6	750.10	-64.20	-65.08	-25.00	-39.20	0.88	Peak
7	5120.00	-52.14	-49.13	-25.00	-27.14	-3.01	Peak

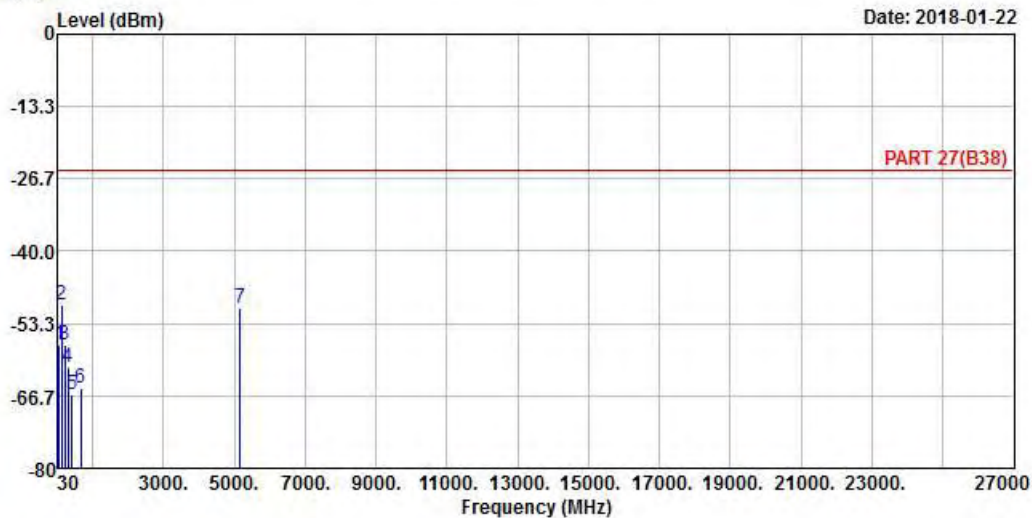
LTE Band 38
Channel Bandwidth: 20 MHz / QPSK
Low Channel



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 _L-CH
Tested by: Getaz Yang

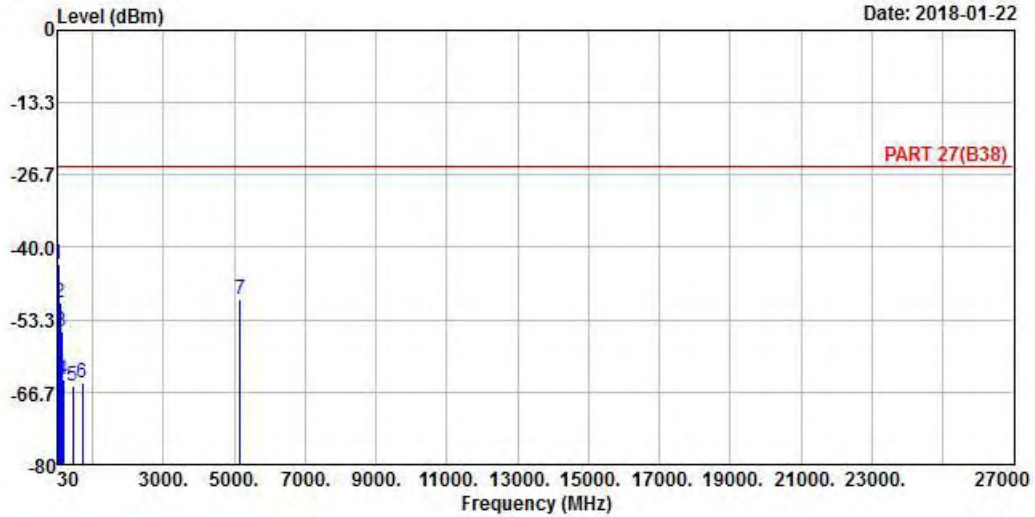
	Freq	Level	Read	Limit	Over	
	MHz	dBm	Level	Line	Limit	Factor Remark
	MHz	dBm	dBm	dBm	dB	dB
1	52.31	-57.18	442.82	-25.00	-32.18	-500.00 Peak
2 pp	137.67	-49.81	450.19	-25.00	-24.81	-500.00 Peak
3	224.97	-57.29	442.71	-25.00	-32.29	-500.00 Peak
4	302.57	-61.49	438.51	-25.00	-36.49	-500.00 Peak
5	421.88	-66.39	433.61	-25.00	-41.39	-500.00 Peak
6	680.87	-65.10	434.90	-25.00	-40.10	-500.00 Peak
7	5160.00	-50.60	447.67	-25.00	-25.60	-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 _L-CH

Tested by: Getaz Yang

	Freq	Level	Read	Limit	Over		
	MHz	dBm	Level	Line	Limit	Factor	Remark
1	34.85	-42.96	457.04	-25.00	-17.96	-500.00	Peak
2	79.47	-50.31	449.69	-25.00	-25.31	-500.00	Peak
3	137.67	-55.56	444.44	-25.00	-30.56	-500.00	Peak
4	170.65	-64.37	435.63	-25.00	-39.37	-500.00	Peak
5	440.31	-65.50	434.50	-25.00	-40.50	-500.00	Peak
6	710.94	-64.93	435.07	-25.00	-39.93	-500.00	Peak
7	5160.00	-49.65	-46.72	-25.00	-24.65	-2.93	Peak

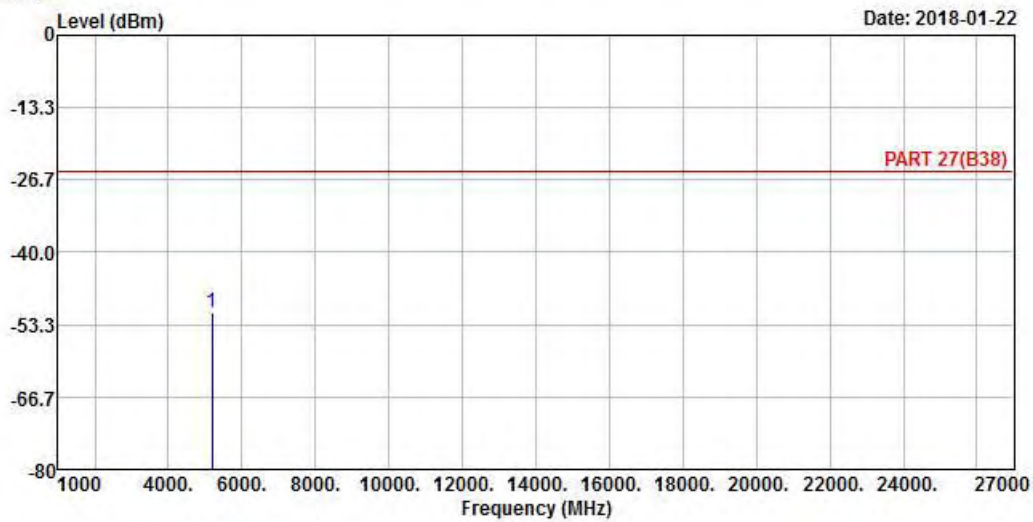
Middle Channel



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_M-CH

Tested by: Getaz Yang

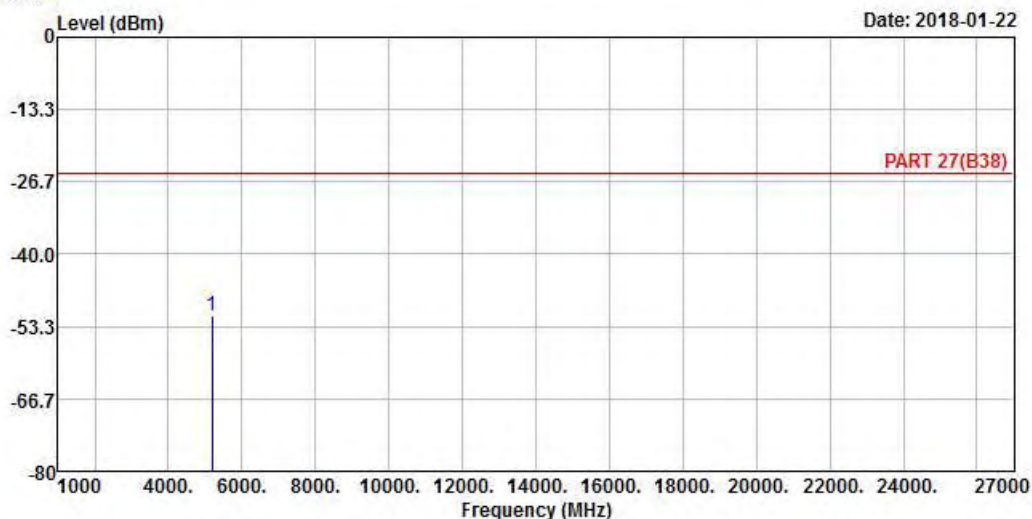
		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5190.00	-51.18	-48.32	-25.00	-26.18	-2.86	Peak



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_M-CH
Tested by: Getaz Yang

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5190.00	-51.32	-48.46	-25.00	-26.32	-2.86	Peak

High Channel

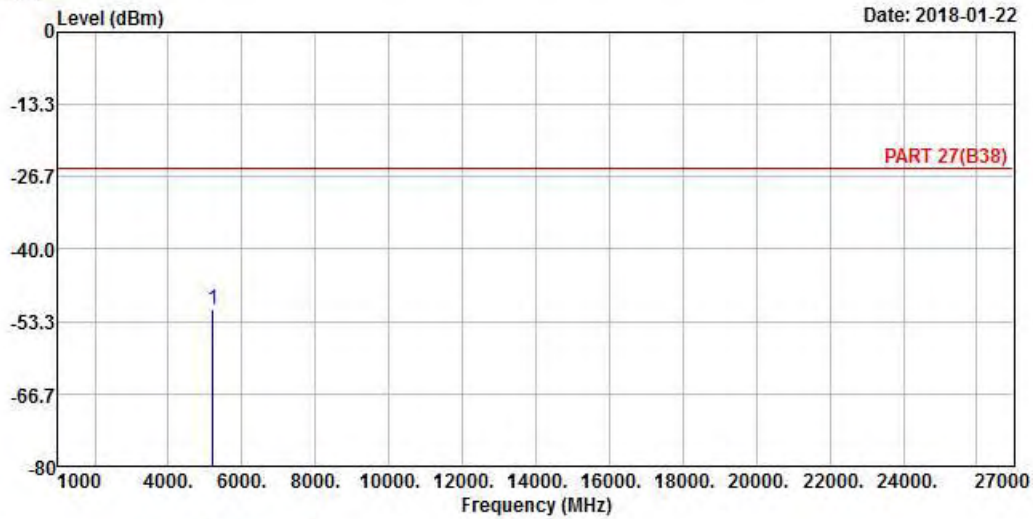


Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 3

Date: 2018-01-22



Site : 966 Chamber 5

Condition: PART 27(B38) HORIZONTAL

Remak : LTE Band 38 QPSK_20M_H-CH

Tested by: Getaz Yang

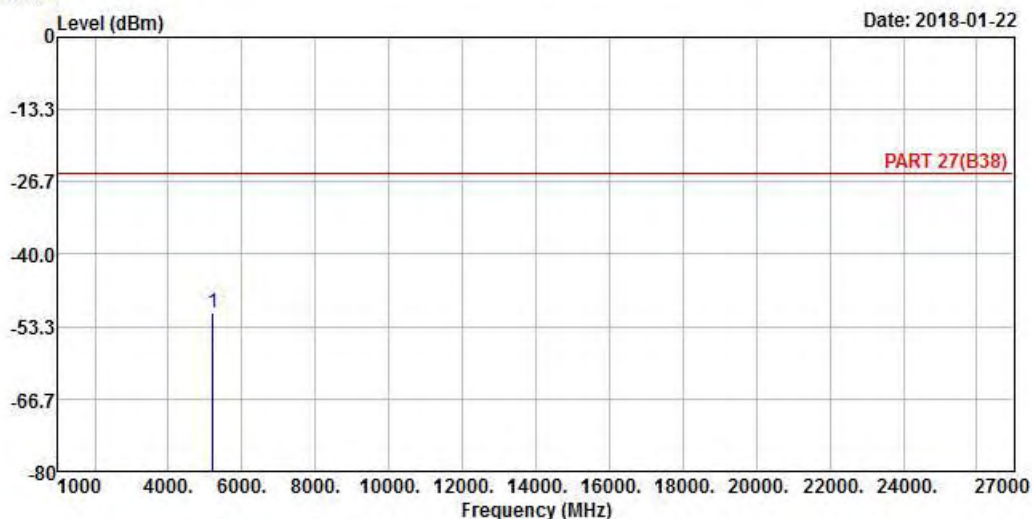
		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5220.00	-51.16	-48.40	-25.00	-26.16	-2.76	Peak



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_H-CH
 Tested by: Getaz Yang

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5220.00	-50.85	-48.09	-25.00	-25.85	-2.76	Peak

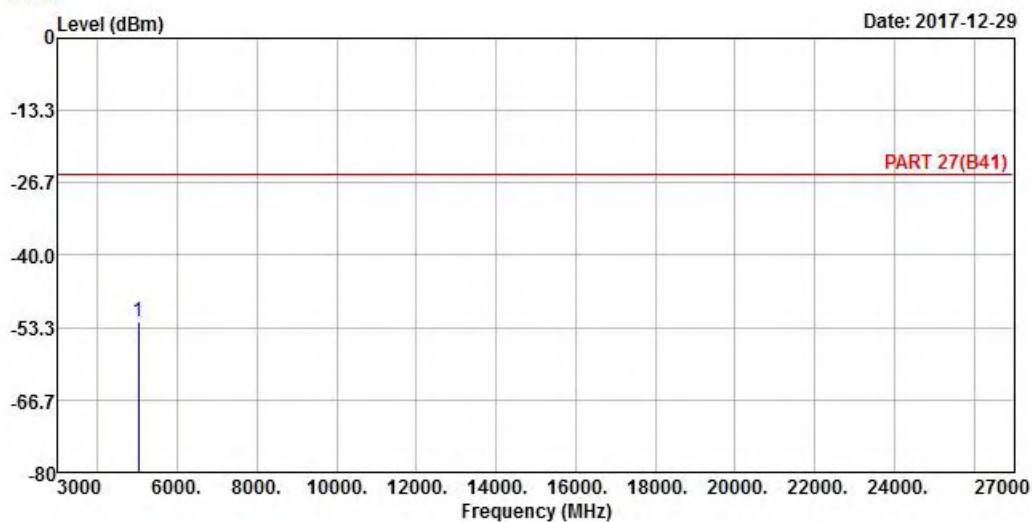
LTE Band 41
Channel Bandwidth: 20 MHz / QPSK
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5
Condition: PART 27(B41) HORIZONTAL
Remak : LTE Band 41 QPSK_20M _L-CH
Tested by: Jisyong Wang

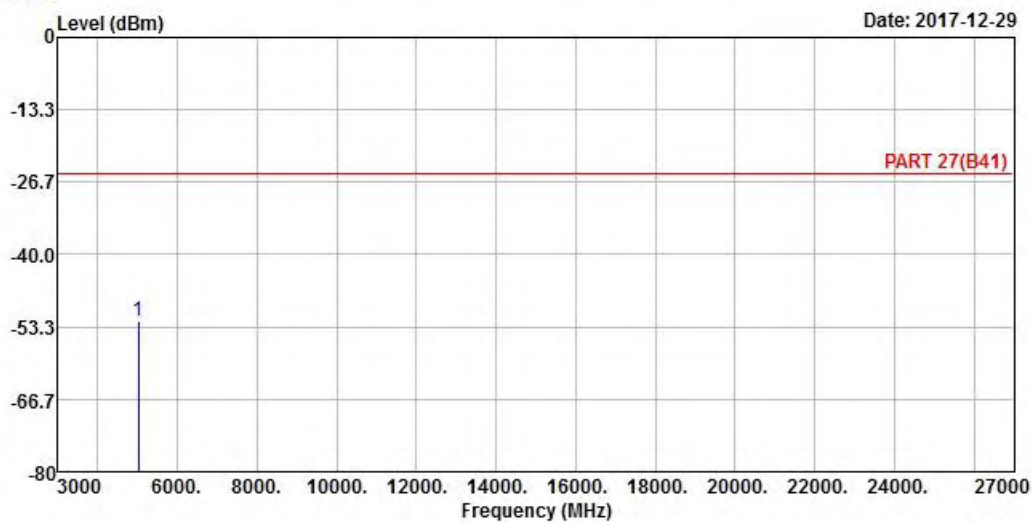
Freq	Level	Read Limit		Over		Factor	Remark
		Level	Line	Limit	Limit		
MHz	dBm	dBm	dBm	dB	dB	dB	
1 pp 5012.00	-52.35	-49.12	-25.00	-27.35	-3.23	Peak	



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 _L-CH

Tested by: Jisyong Wang

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5012.00	-52.15	-48.92	-25.00	-27.15	-3.23	Peak

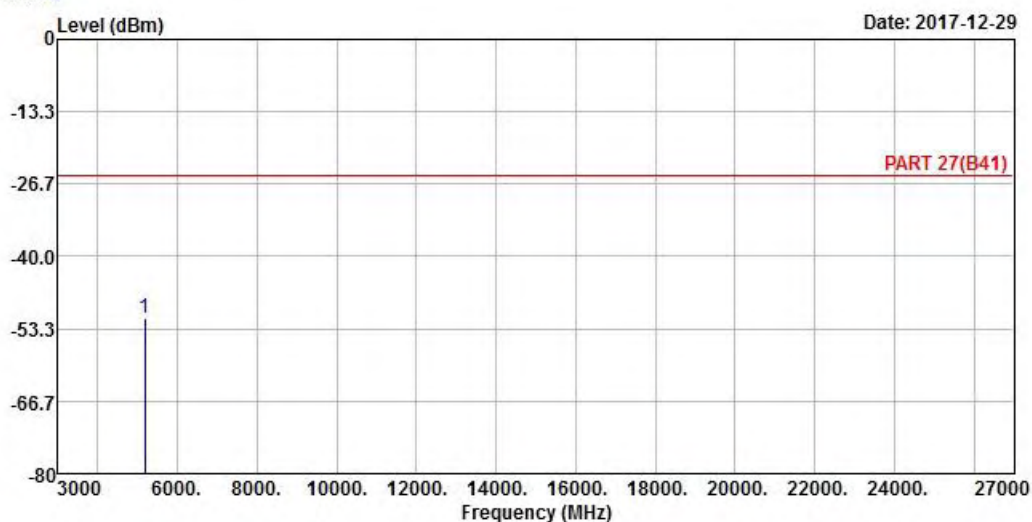
Middle Channel



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

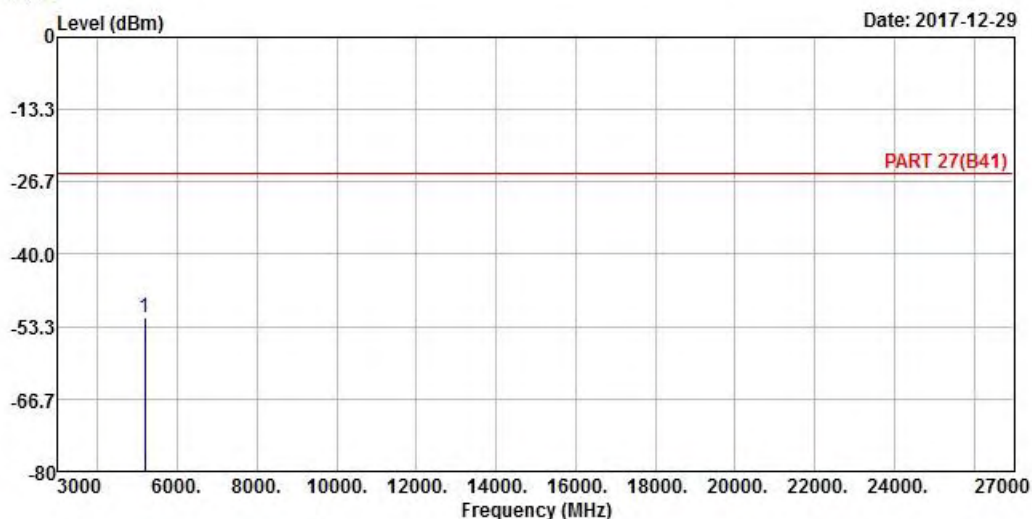
Freq	Level	Read	Limit	Over	Factor	Remark
		Level	Line	Limit		
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5186.00	-51.30	-48.44	-25.00	-26.30	-2.86	Peak



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

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

1 pp 5186.00 -51.57 -48.71 -25.00 -26.57 -2.86 Peak

High Channel

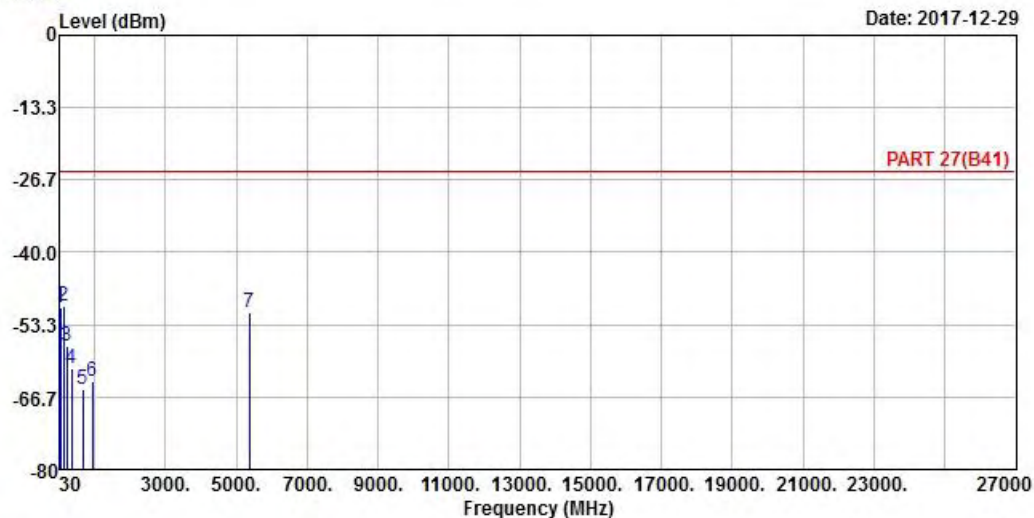


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5

Date: 2017-12-29



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	dB		
1	42.61	-50.18	-49.24	-13.00	-37.18	-0.94	Peak
2	137.67	-49.81	-41.15	-13.00	-36.81	-8.66	Peak
3	224.97	-57.29	-50.28	-13.00	-44.29	-7.01	Peak
4	350.10	-61.54	-55.30	-13.00	-48.54	-6.24	Peak
5	680.87	-65.10	-64.70	-13.00	-52.10	-0.40	Peak
6	936.95	-63.78	-65.27	-13.00	-50.78	1.49	Peak
7 pp	5360.00	-50.95	-48.95	-25.00	-25.95	-2.00	Peak

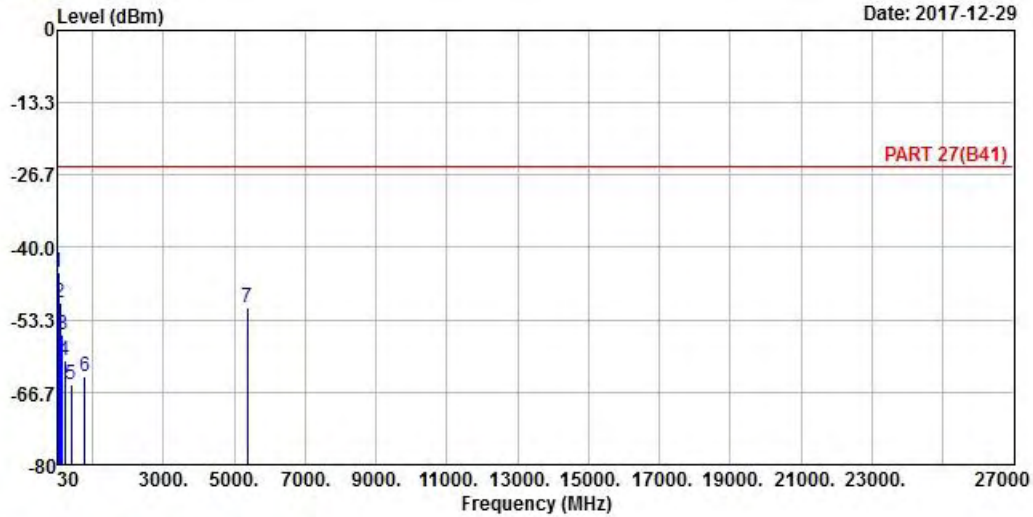


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A D T

Data: 6

Date: 2017-12-29



Site : 966 Chamber 5

Condition: PART 27(B41) VERTICAL

Remak : LTE Band 41 QPSK_20M _H-CH

Tested by: Jisyong Wang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	42.61	-44.47	-43.53	-13.00	-31.47	-0.94	Peak
2	79.47	-50.31	-39.65	-13.00	-37.31	-10.66	Peak
3	139.61	-55.94	-47.29	-13.00	-42.94	-8.65	Peak
4	226.91	-60.77	-53.84	-13.00	-47.77	-6.93	Peak
5	400.54	-65.38	-59.44	-13.00	-52.38	-5.94	Peak
6	787.57	-63.74	-64.51	-13.00	-50.74	0.77	Peak
7 pp	5360.00	-51.13	-49.13	-25.00	-26.13	-2.00	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 ---