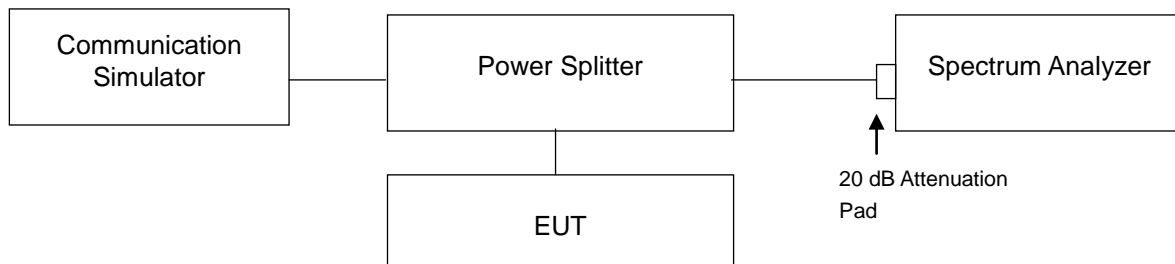


## 4.6 Conducted Spurious Emissions

### 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



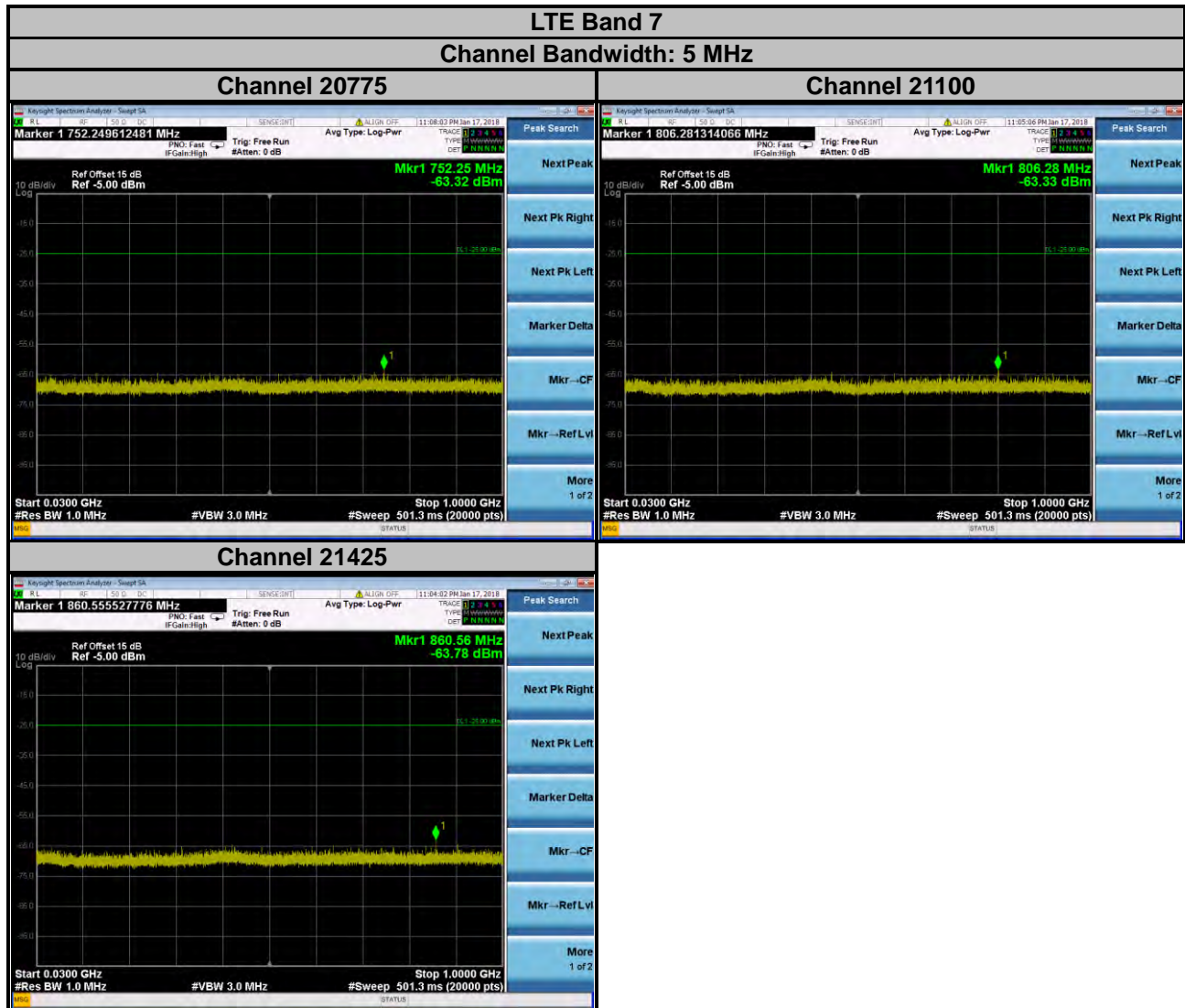
### 4.6.3 Test Procedure

- 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

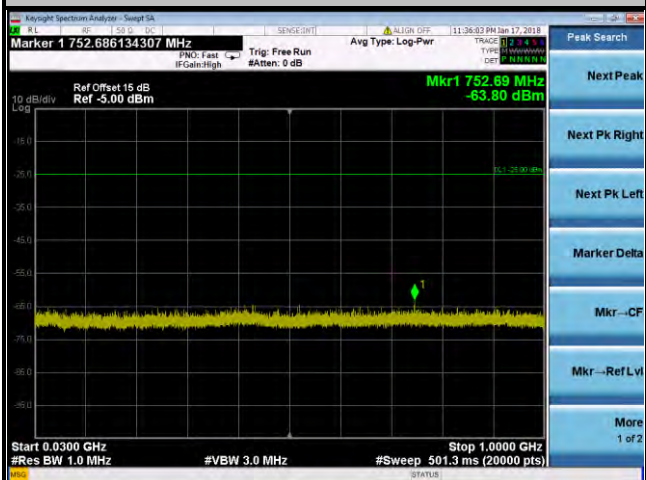
30MHz ~ 1GHz



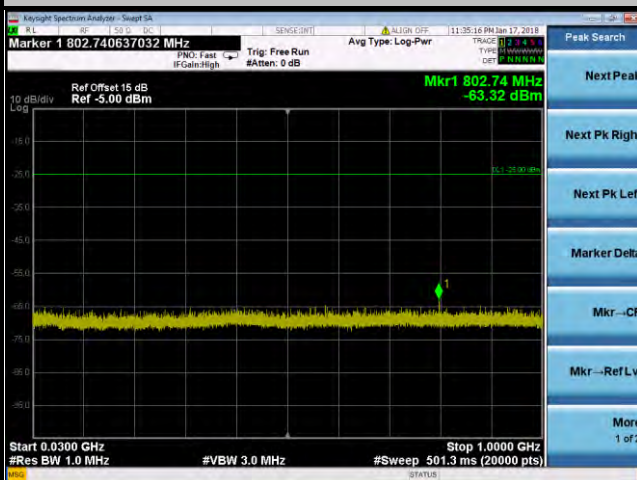
## LTE Band 7

Channel Bandwidth: 10 MHz

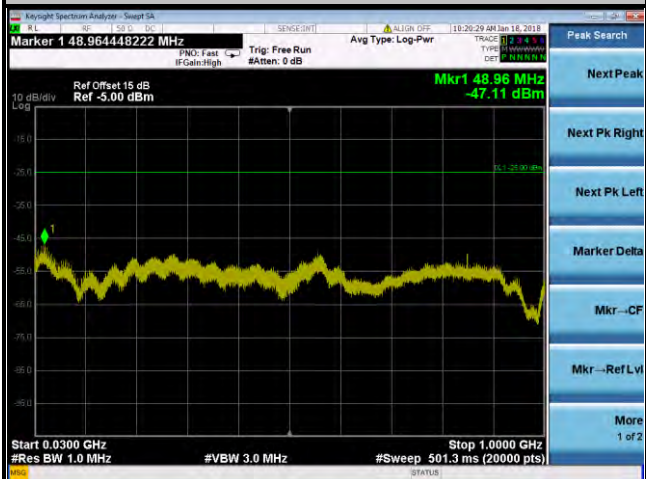
### Channel 20800



### Channel 21100



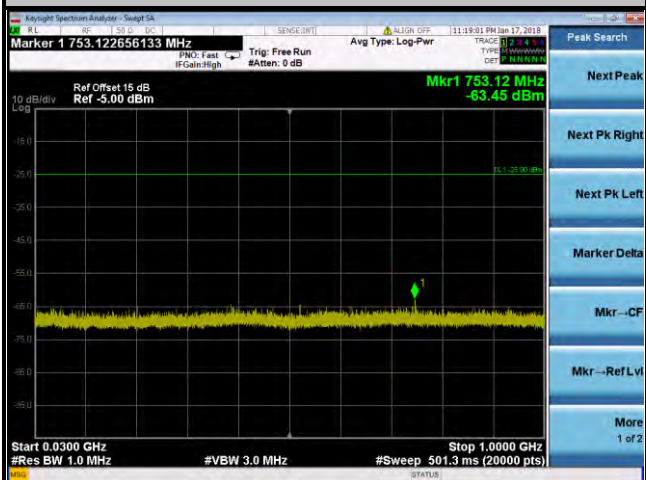
### Channel 21400



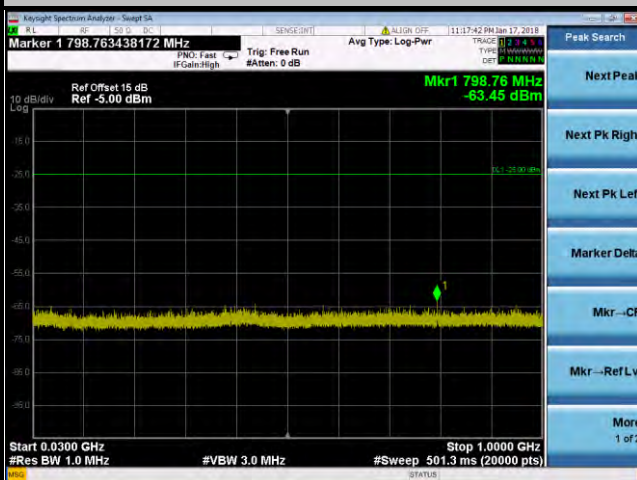
## LTE Band 7

Channel Bandwidth: 15 MHz

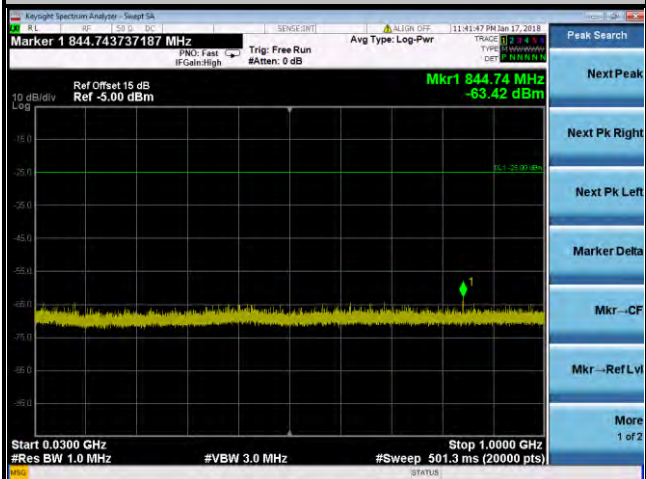
### Channel 20825



### Channel 21100



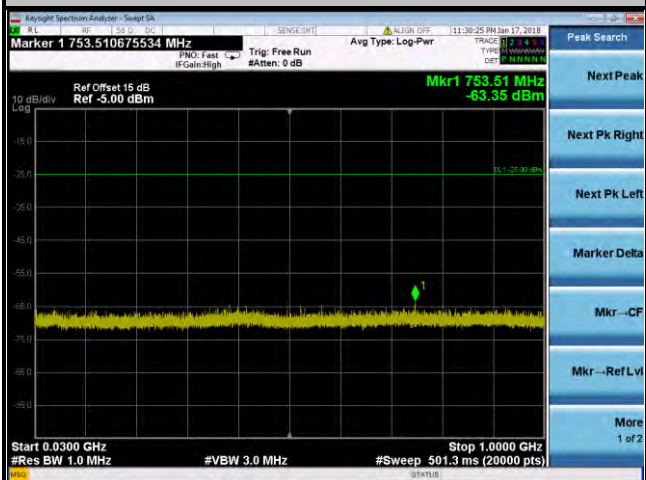
### Channel 21375



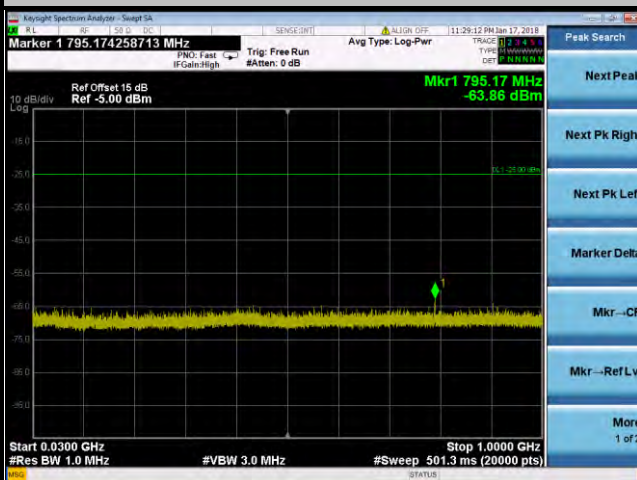
## LTE Band 7

Channel Bandwidth: 20 MHz

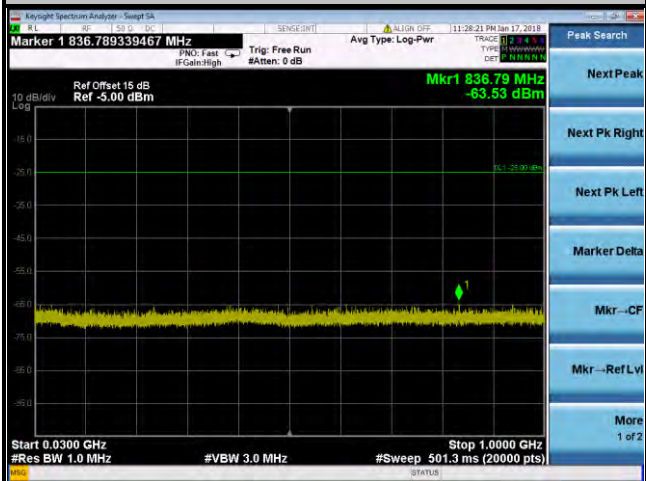
### Channel 20850



### Channel 21100



### Channel 21350



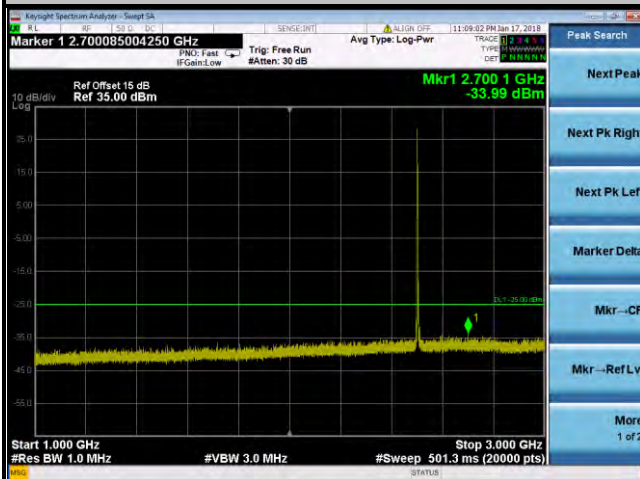


1GHz ~ 3GHz

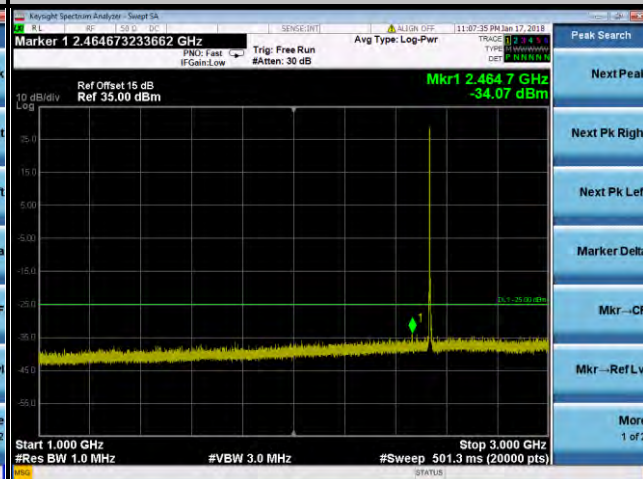
LTE Band 7

Channel Bandwidth: 5 MHz

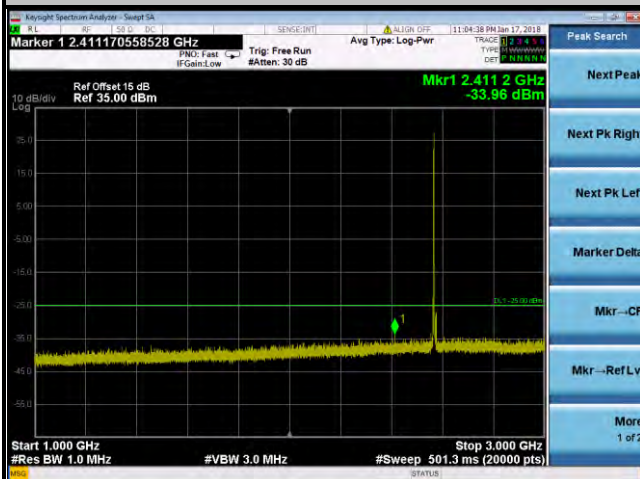
Channel 20775



Channel 21100



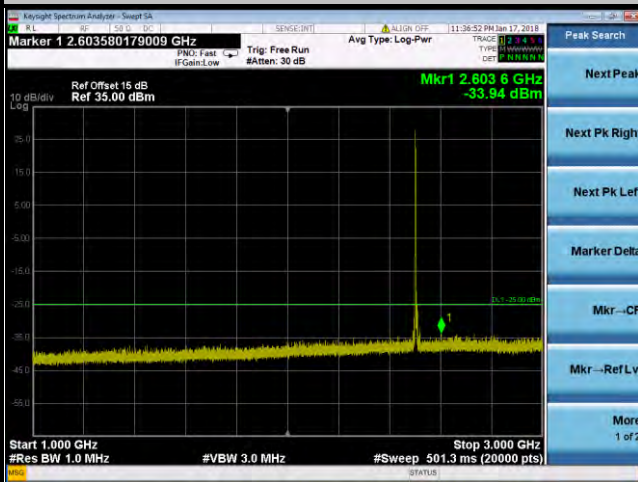
Channel 21425



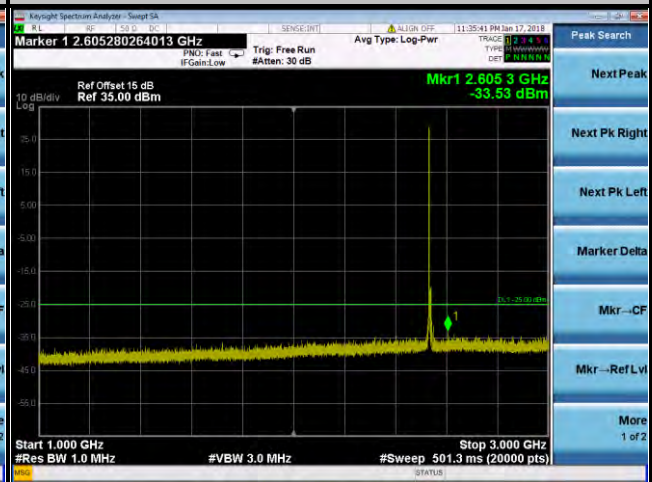
## LTE Band 7

Channel Bandwidth: 10 MHz

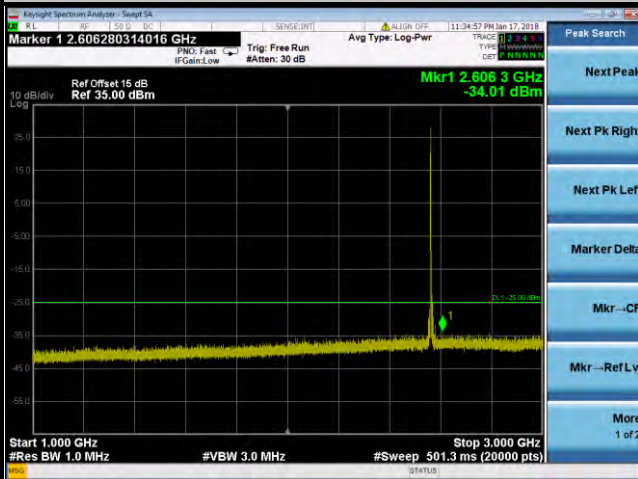
### Channel 20800



### Channel 21100



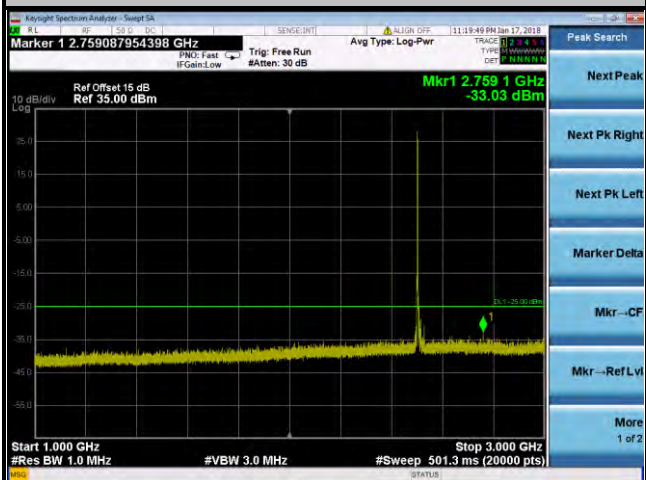
### Channel 21400



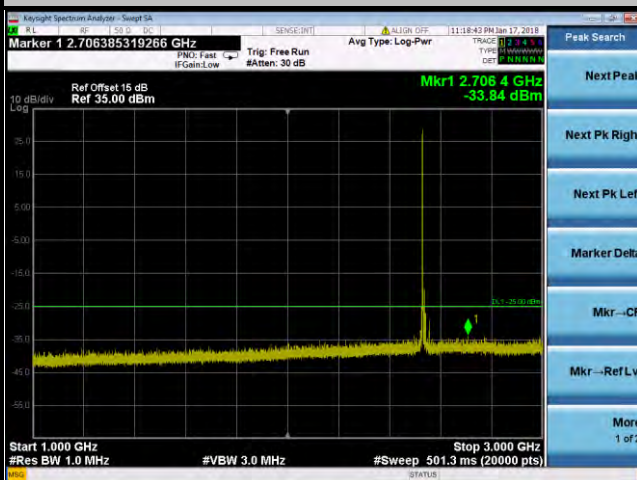
## LTE Band 7

Channel Bandwidth: 15 MHz

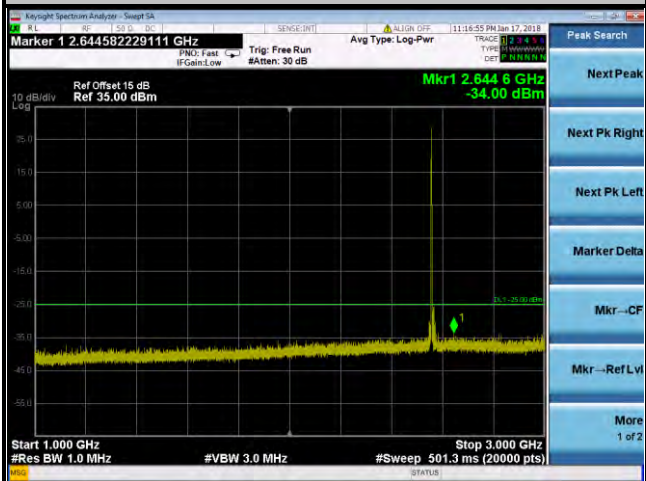
### Channel 20825



### Channel 21100



### Channel 21375

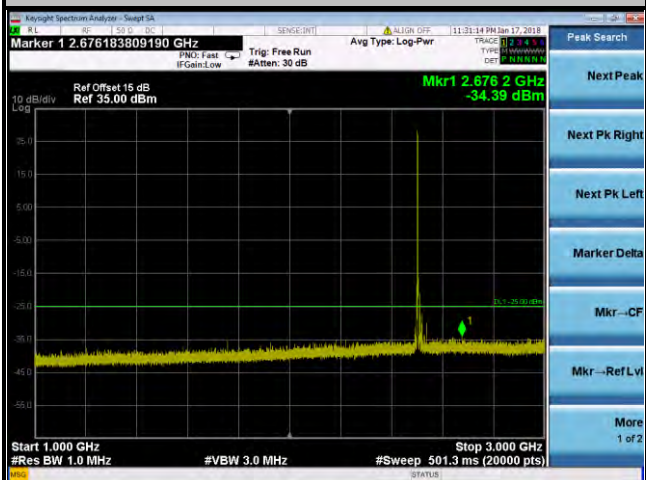




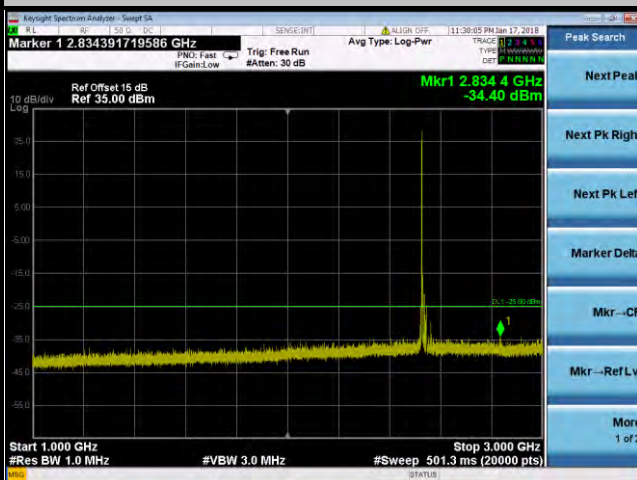
## LTE Band 7

Channel Bandwidth: 20 MHz

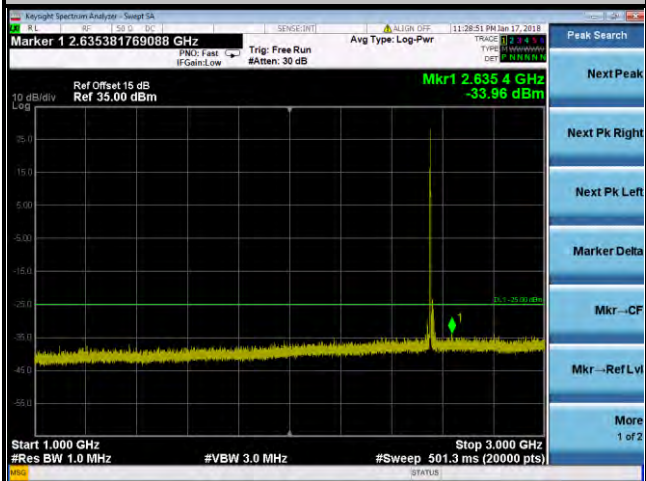
### Channel 20850



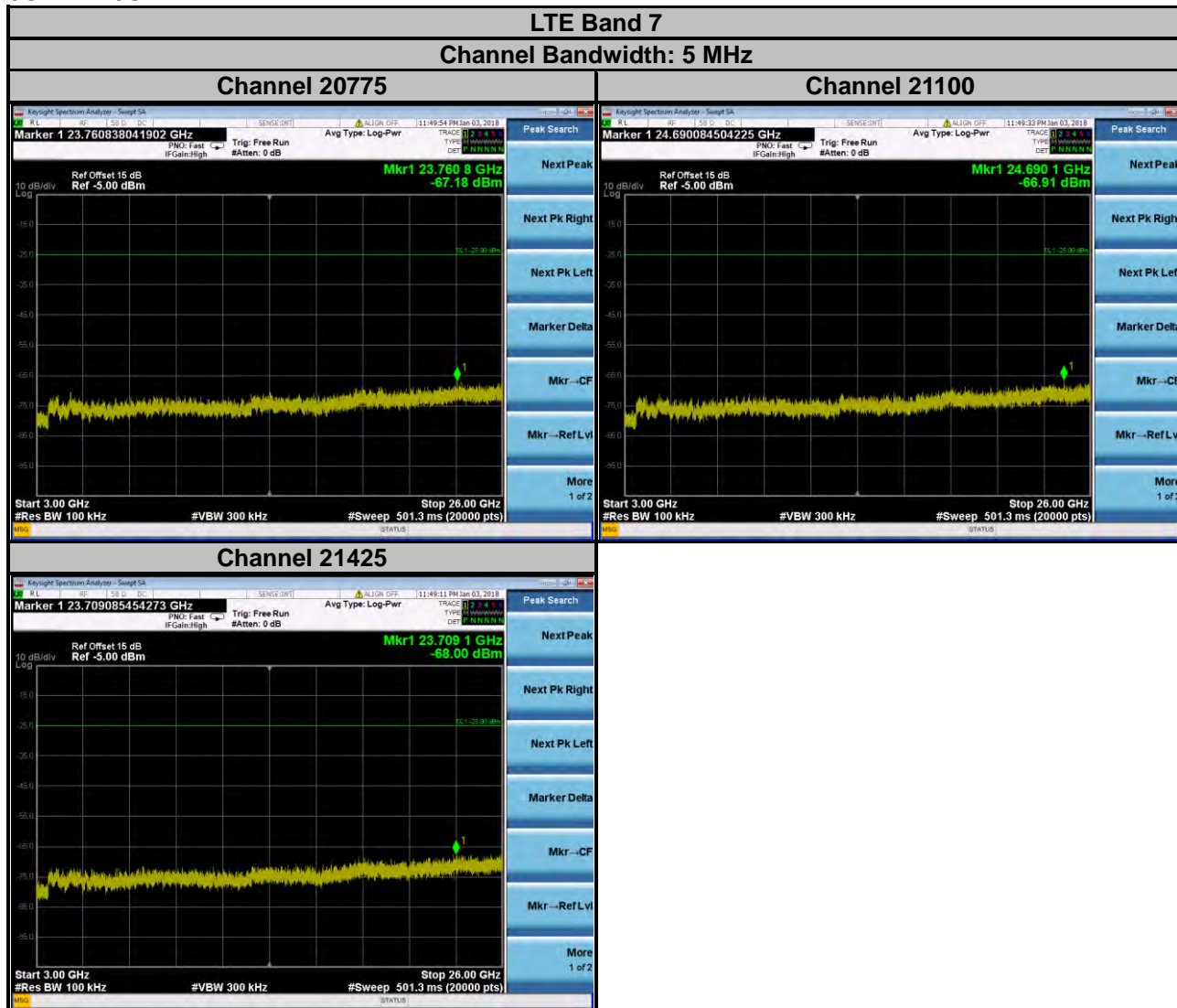
### Channel 21100



### Channel 21350



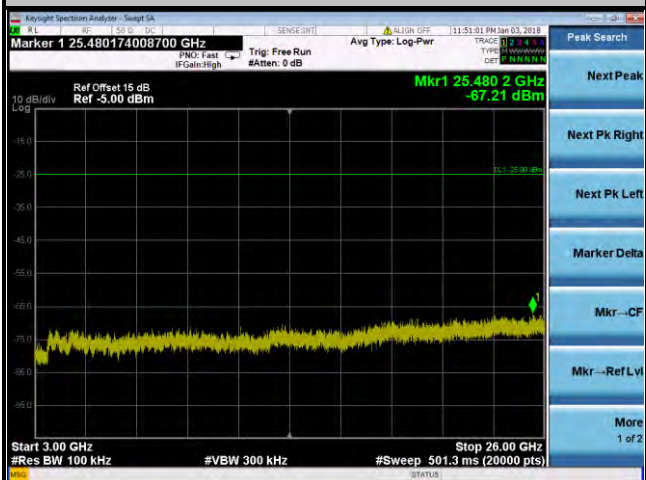
3GHz ~ 26GHz



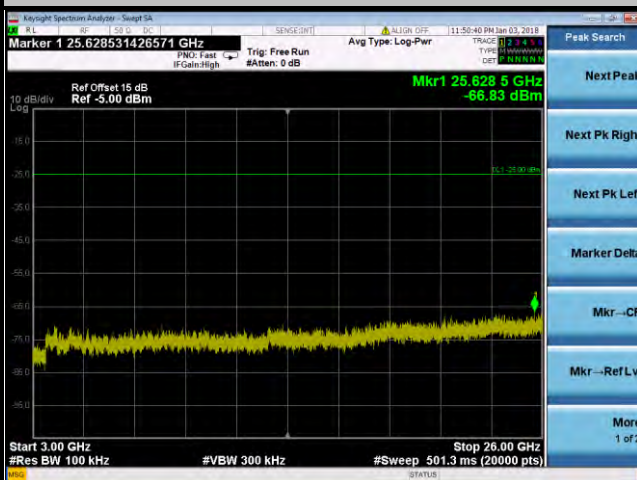
## LTE Band 7

Channel Bandwidth: 10 MHz

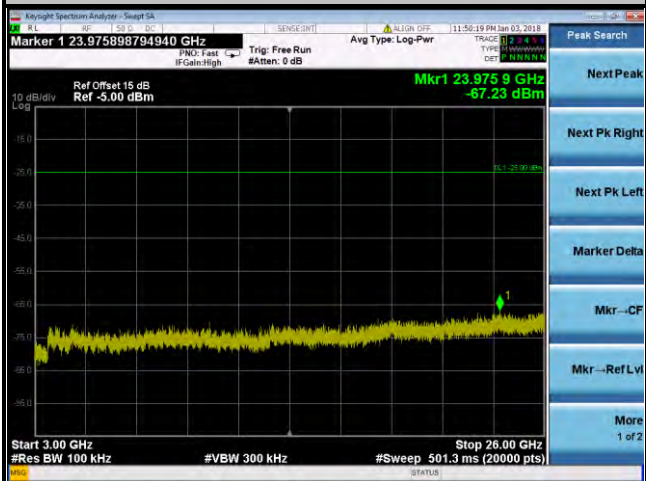
### Channel 20800



### Channel 21100



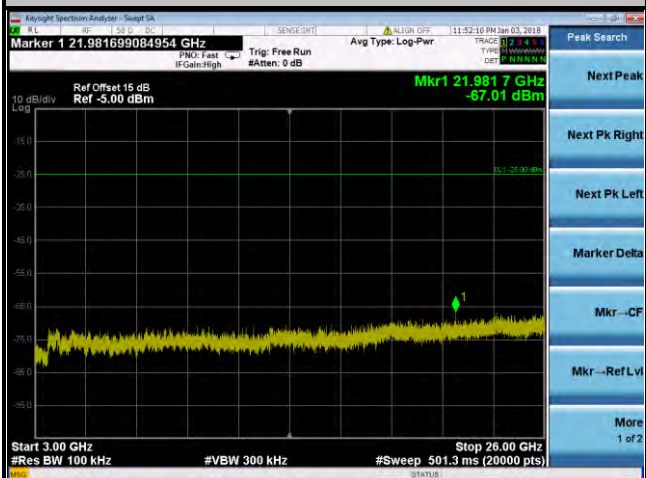
### Channel 21400



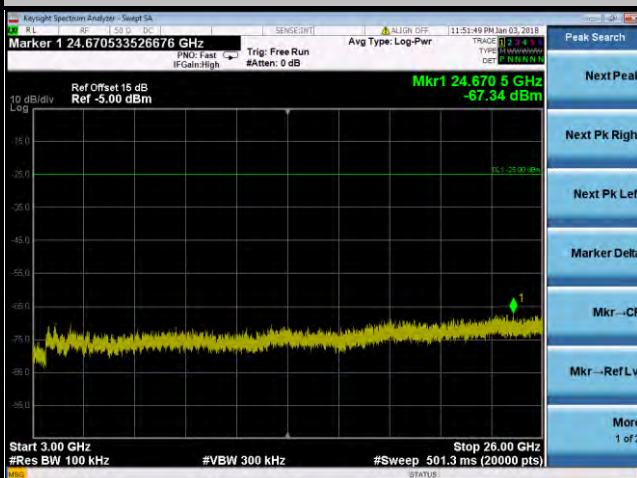
## LTE Band 7

Channel Bandwidth: 15 MHz

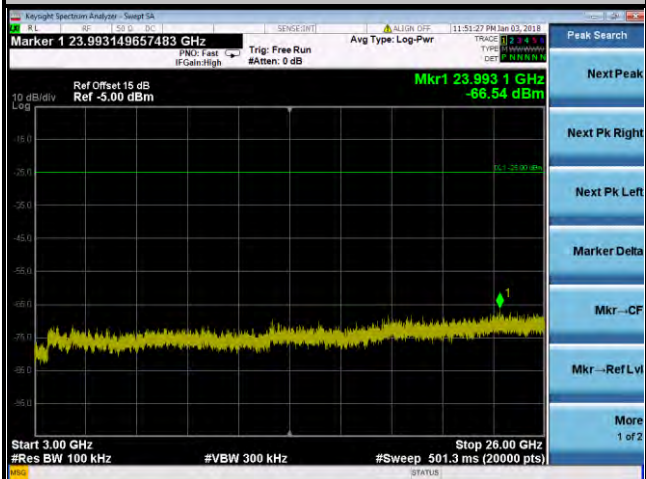
### Channel 20825



### Channel 21100



### Channel 21375

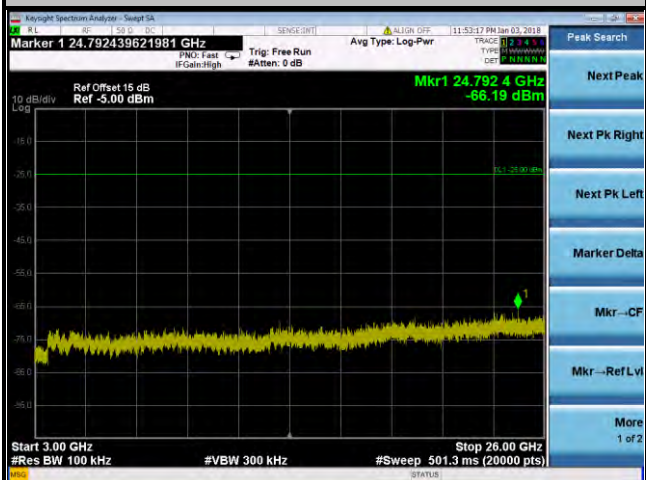




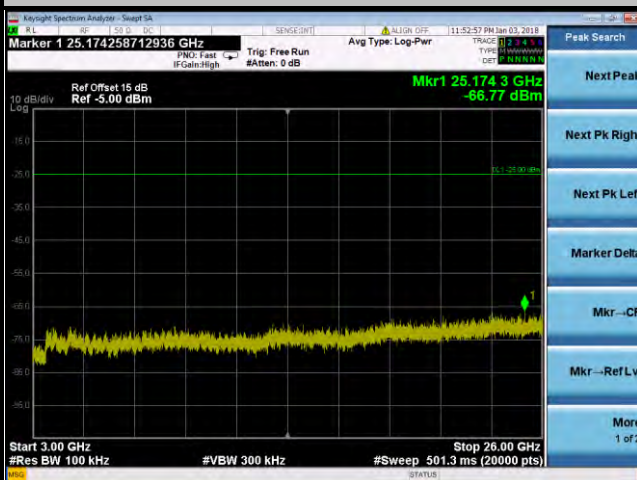
## LTE Band 7

Channel Bandwidth: 20 MHz

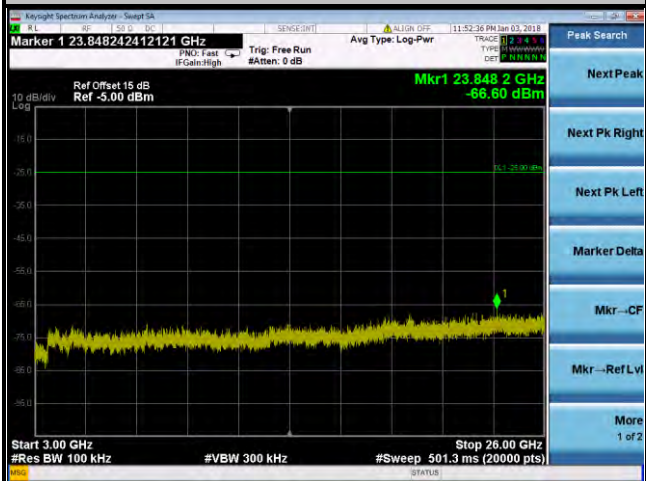
### Channel 20850



### Channel 21100



### Channel 21350





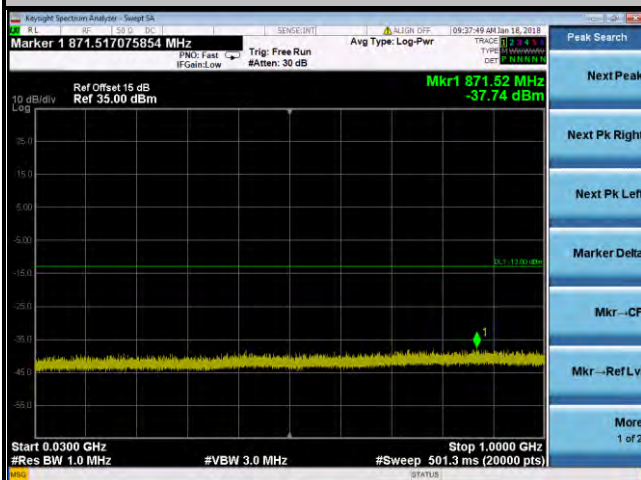
**LTE Band 38**  
**30MHz ~ 1GHz**



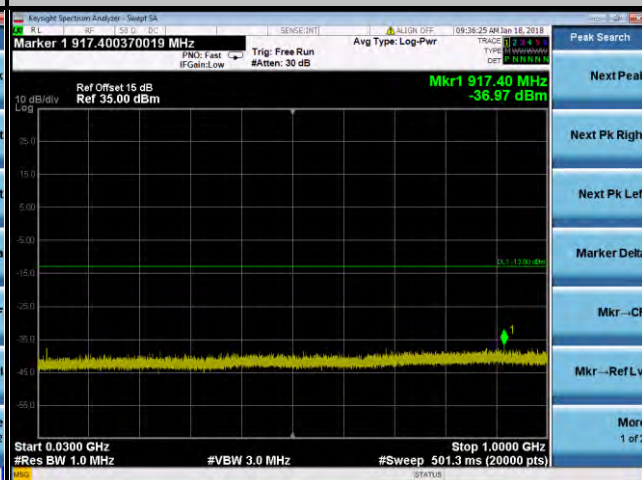
# LTE Band 38

Channel Bandwidth: 10 MHz

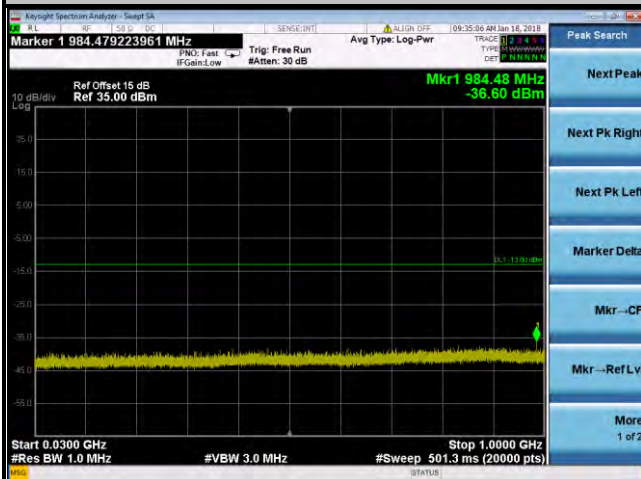
## Channel 37800



## Channel 38000



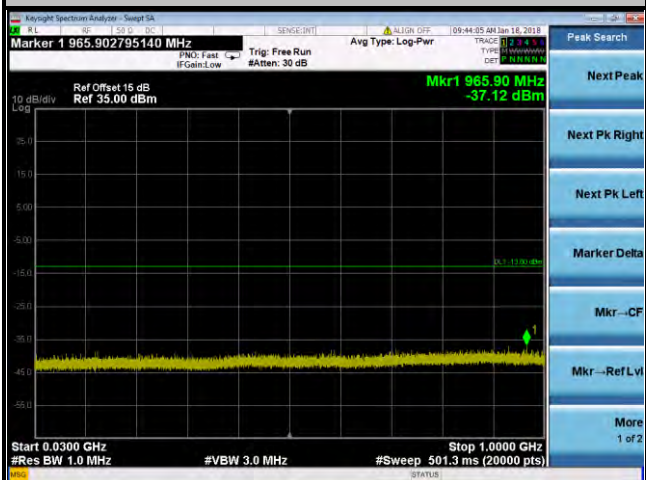
## Channel 38200



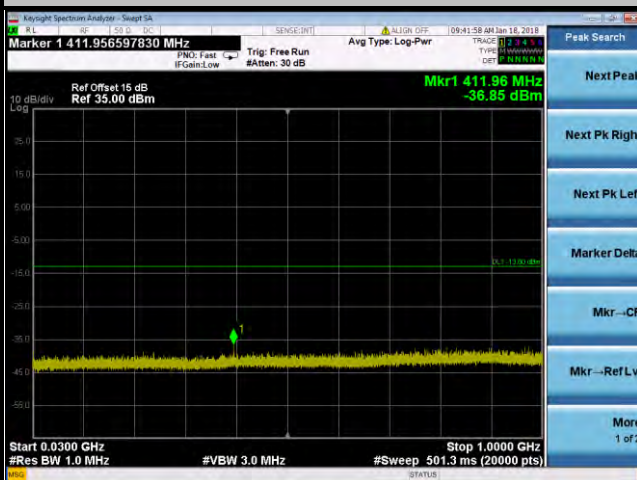
## LTE Band 38

Channel Bandwidth: 15 MHz

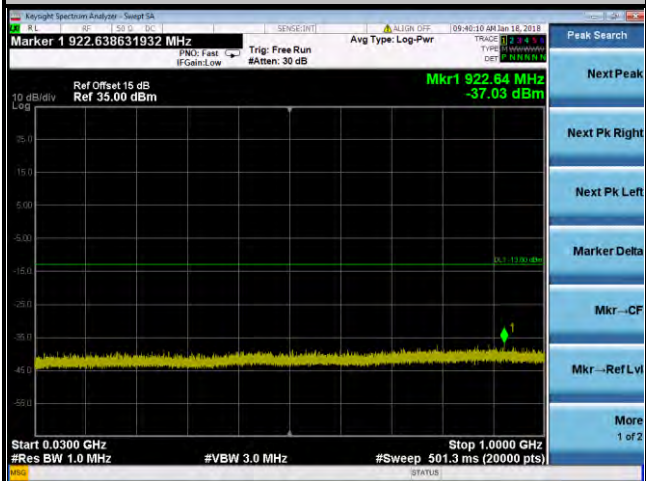
### Channel 37825



### Channel 38000



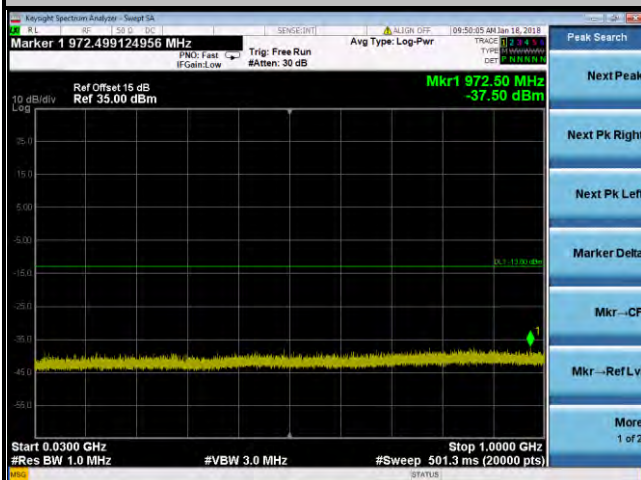
### Channel 38175



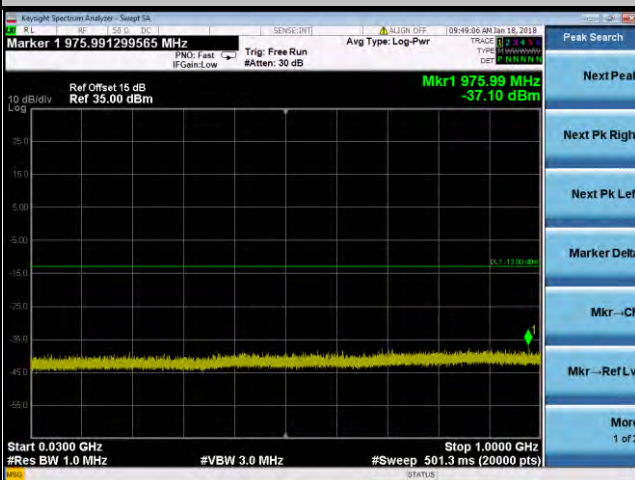
# LTE Band 38

Channel Bandwidth: 20 MHz

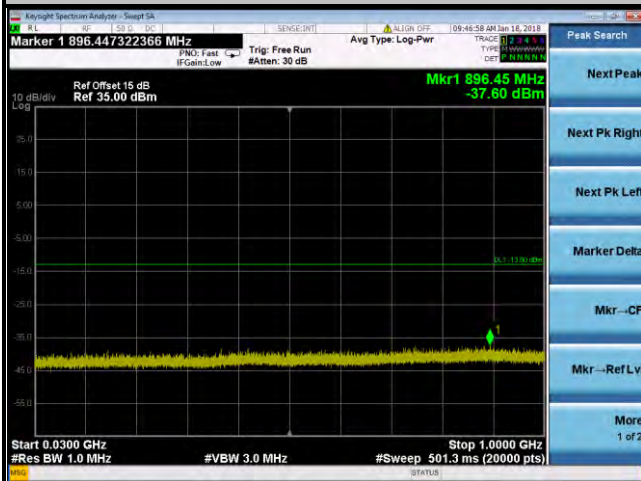
## Channel 37850



## Channel 38000



## Channel 38150



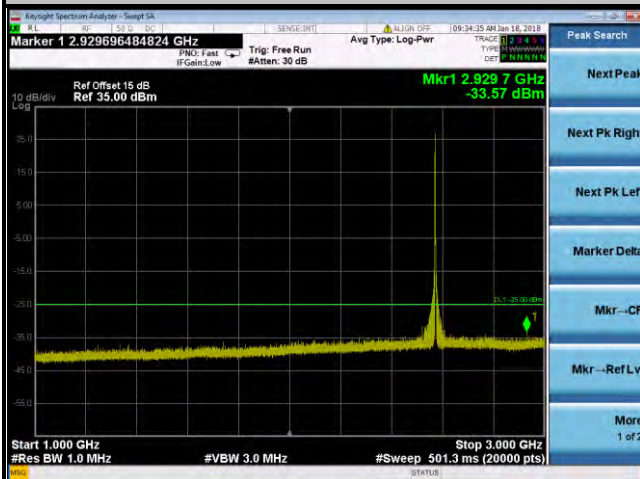


1GHz ~ 3GHz

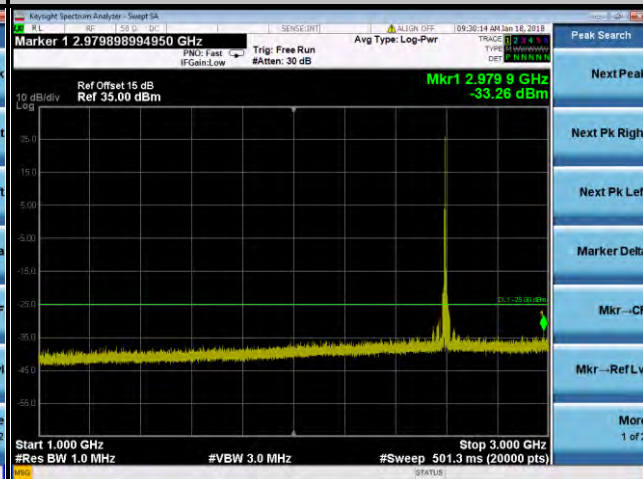
LTE Band 38

Channel Bandwidth: 5 MHz

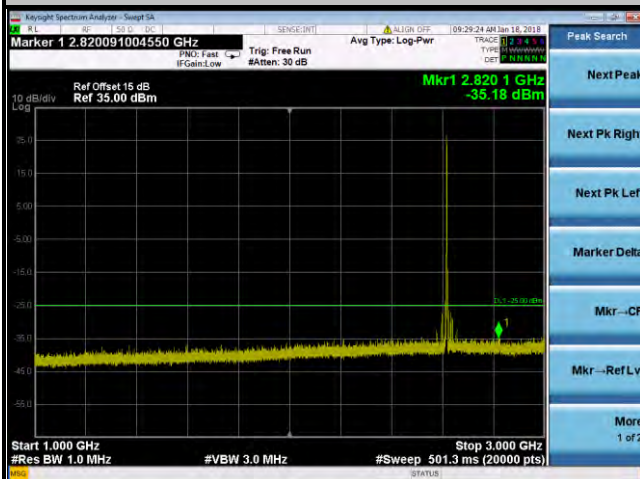
Channel 37775



Channel 38000



Channel 38225

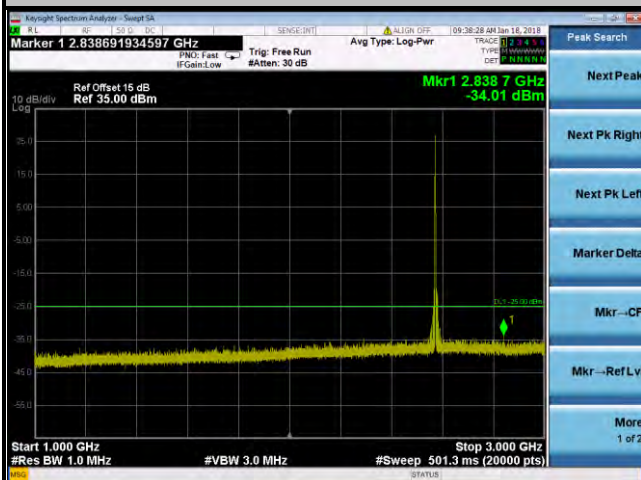




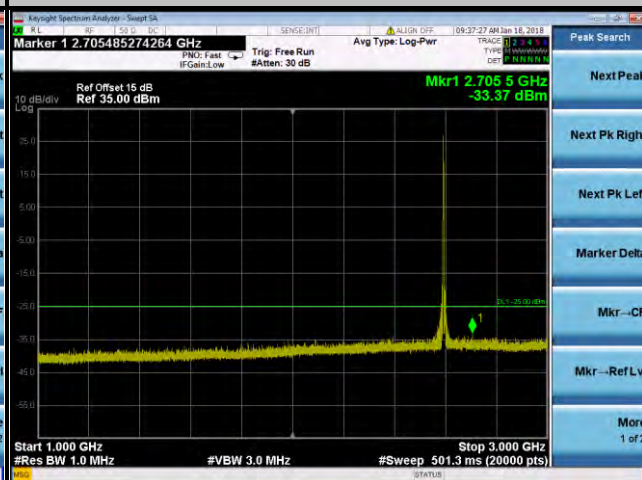
# LTE Band 38

Channel Bandwidth: 10 MHz

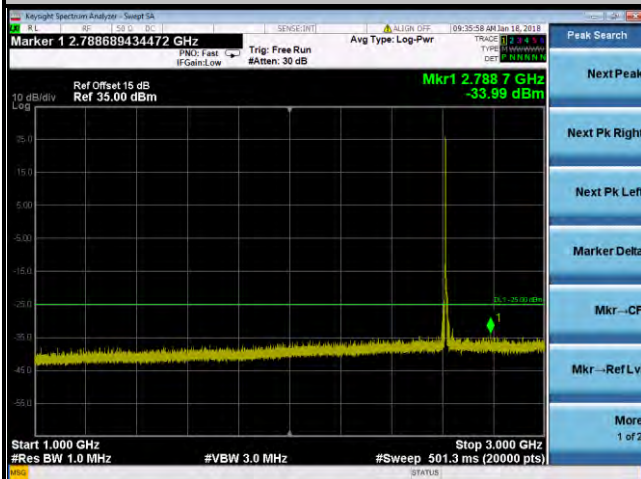
## Channel 37800



## Channel 38000



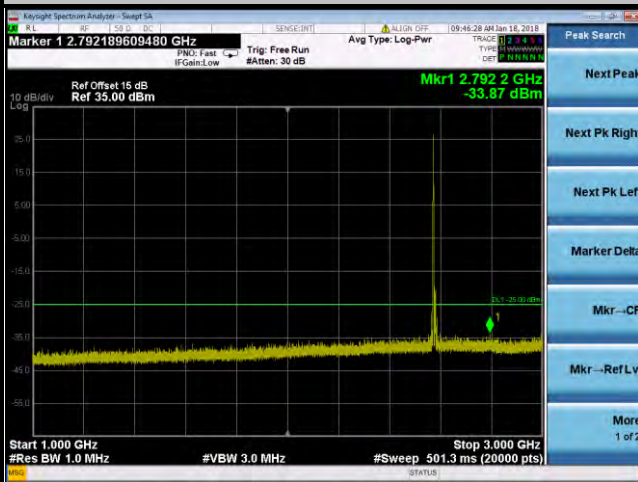
## Channel 38200



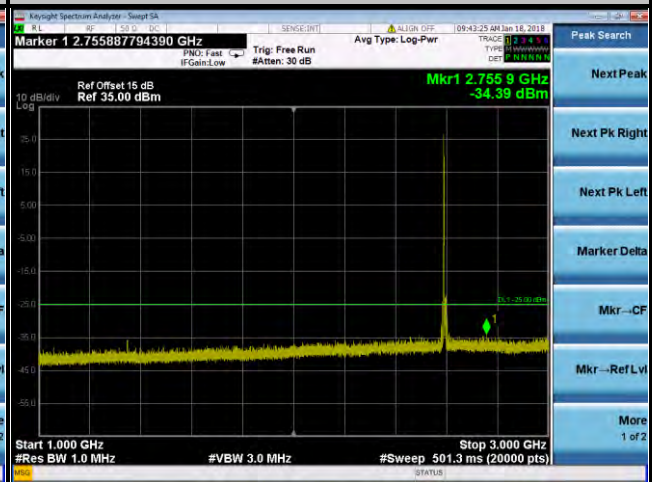
## LTE Band 38

Channel Bandwidth: 15 MHz

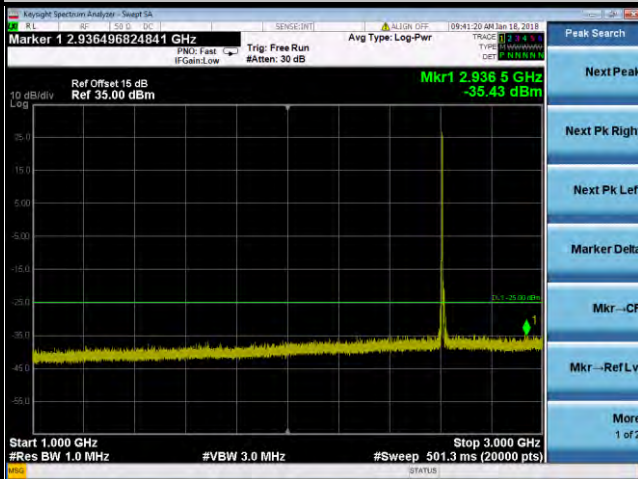
### Channel 37825



### Channel 38000



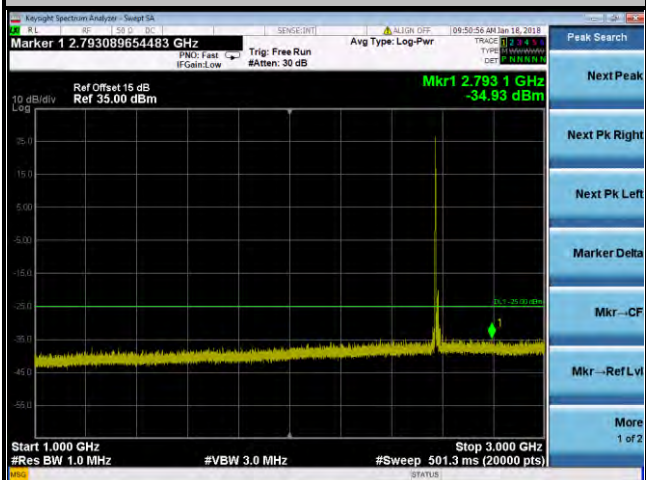
### Channel 38175



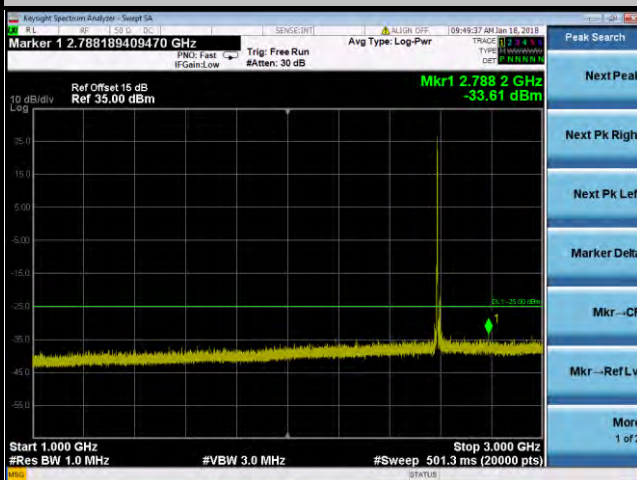
## LTE Band 38

Channel Bandwidth: 20 MHz

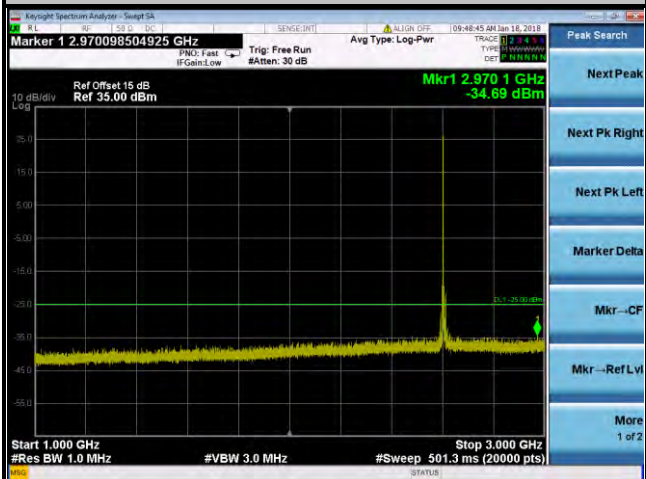
### Channel 37850



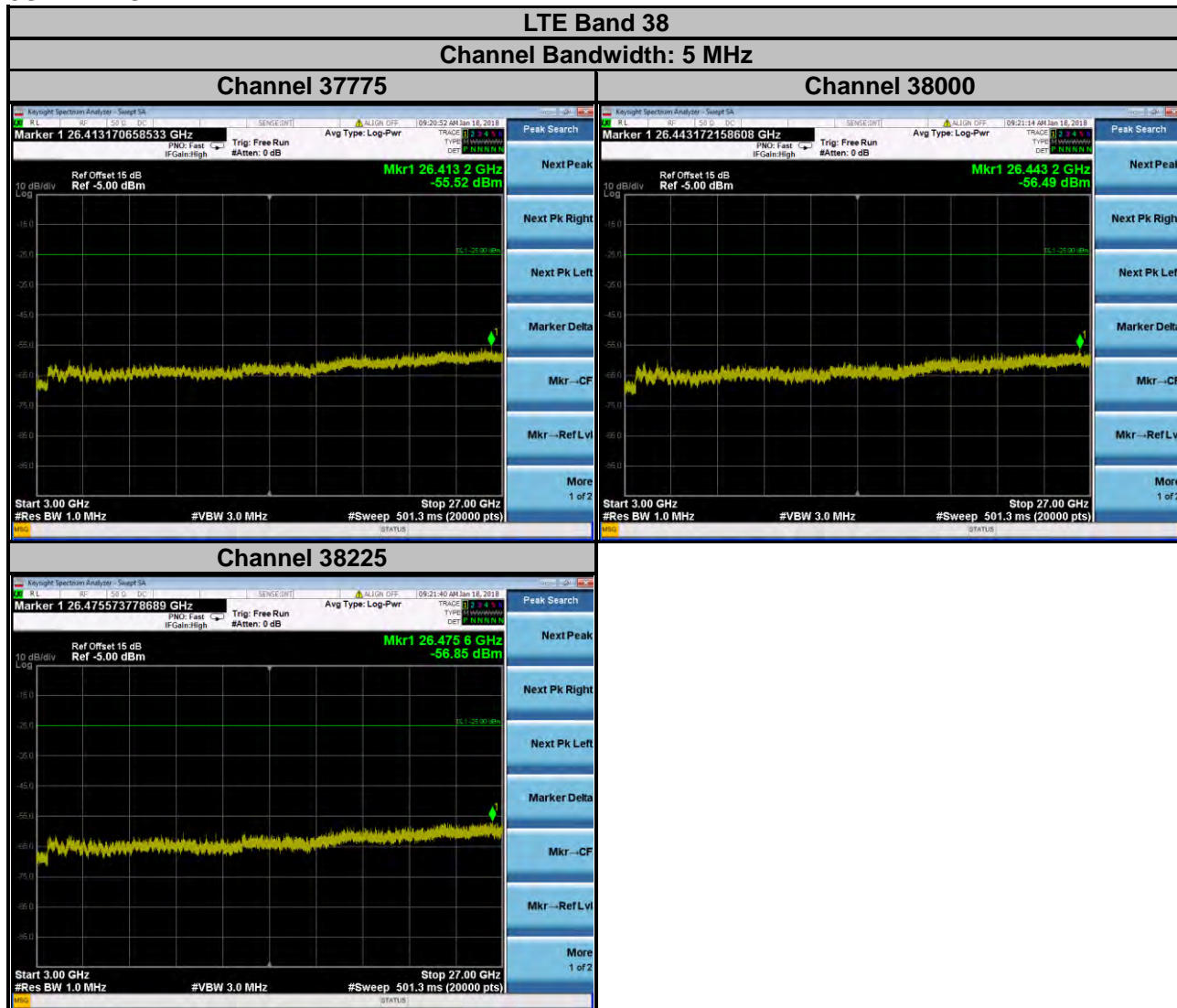
### Channel 38000



### Channel 38150



3GHz ~ 27GHz

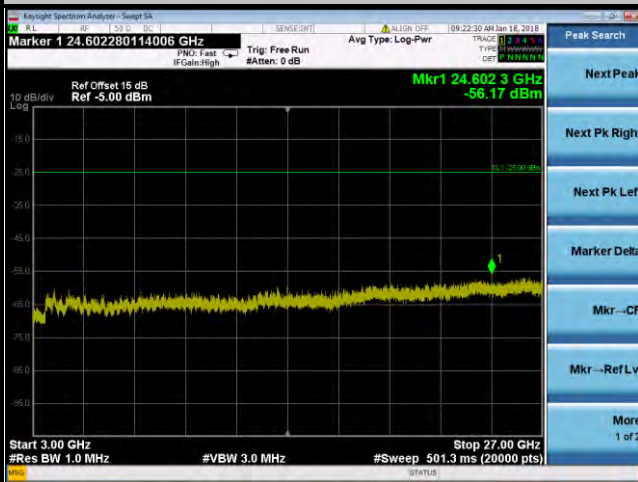




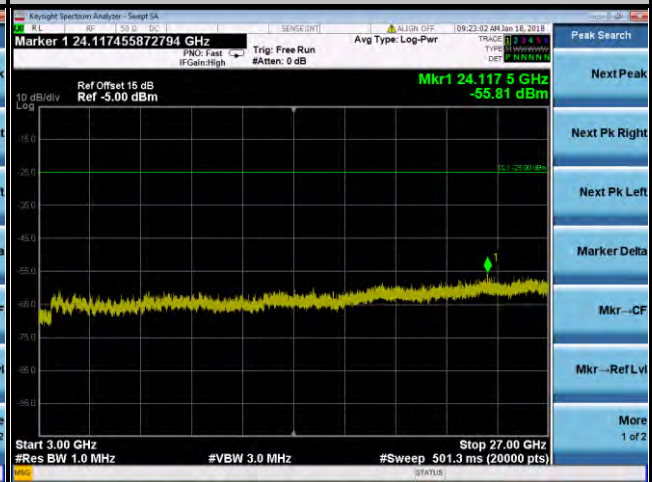
## LTE Band 38

Channel Bandwidth: 10 MHz

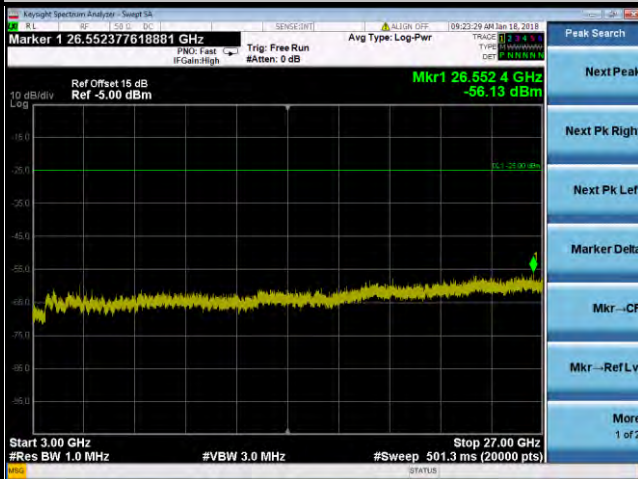
### Channel 37800



### Channel 38000



### Channel 38200

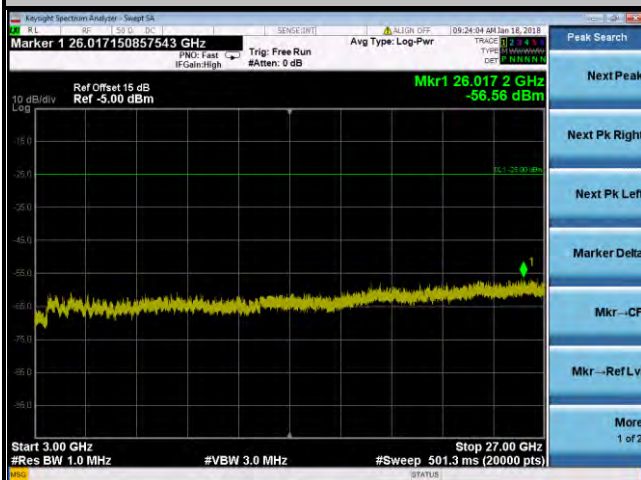




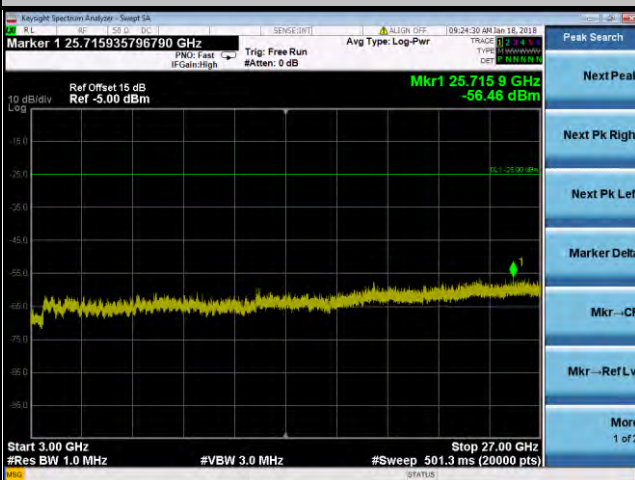
# LTE Band 38

Channel Bandwidth: 15 MHz

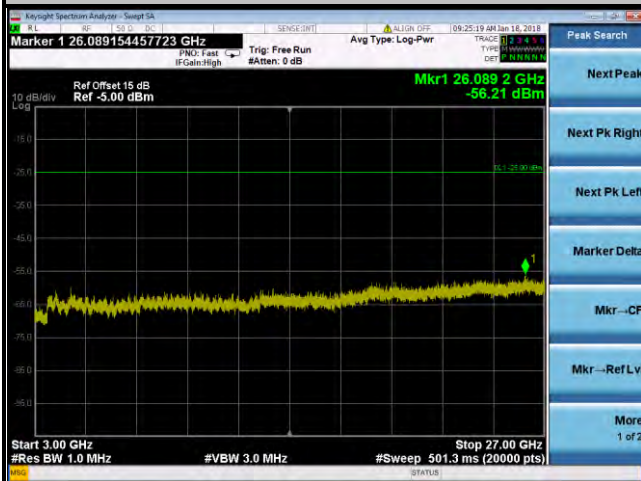
## Channel 37825



## Channel 38000



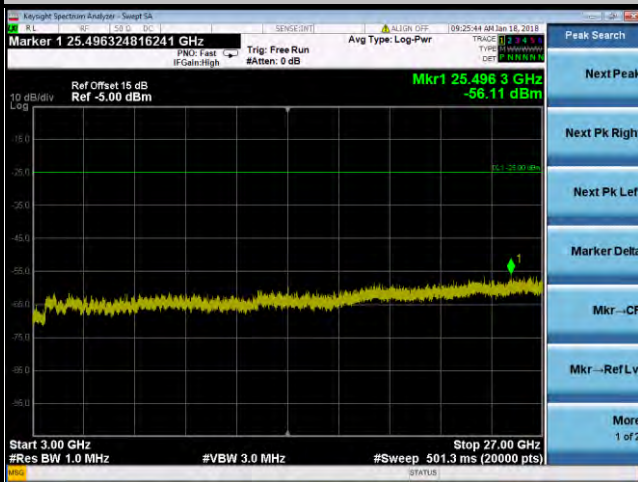
## Channel 38175



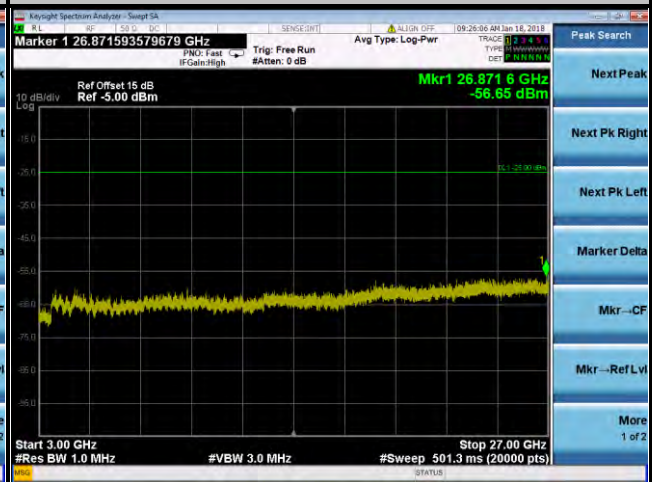
## LTE Band 38

Channel Bandwidth: 20 MHz

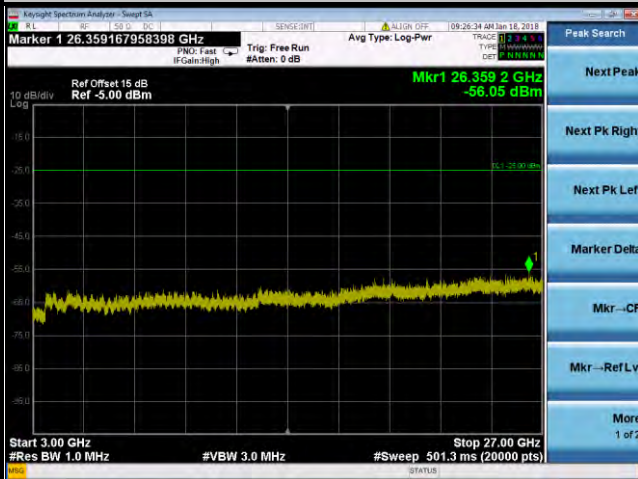
### Channel 37850



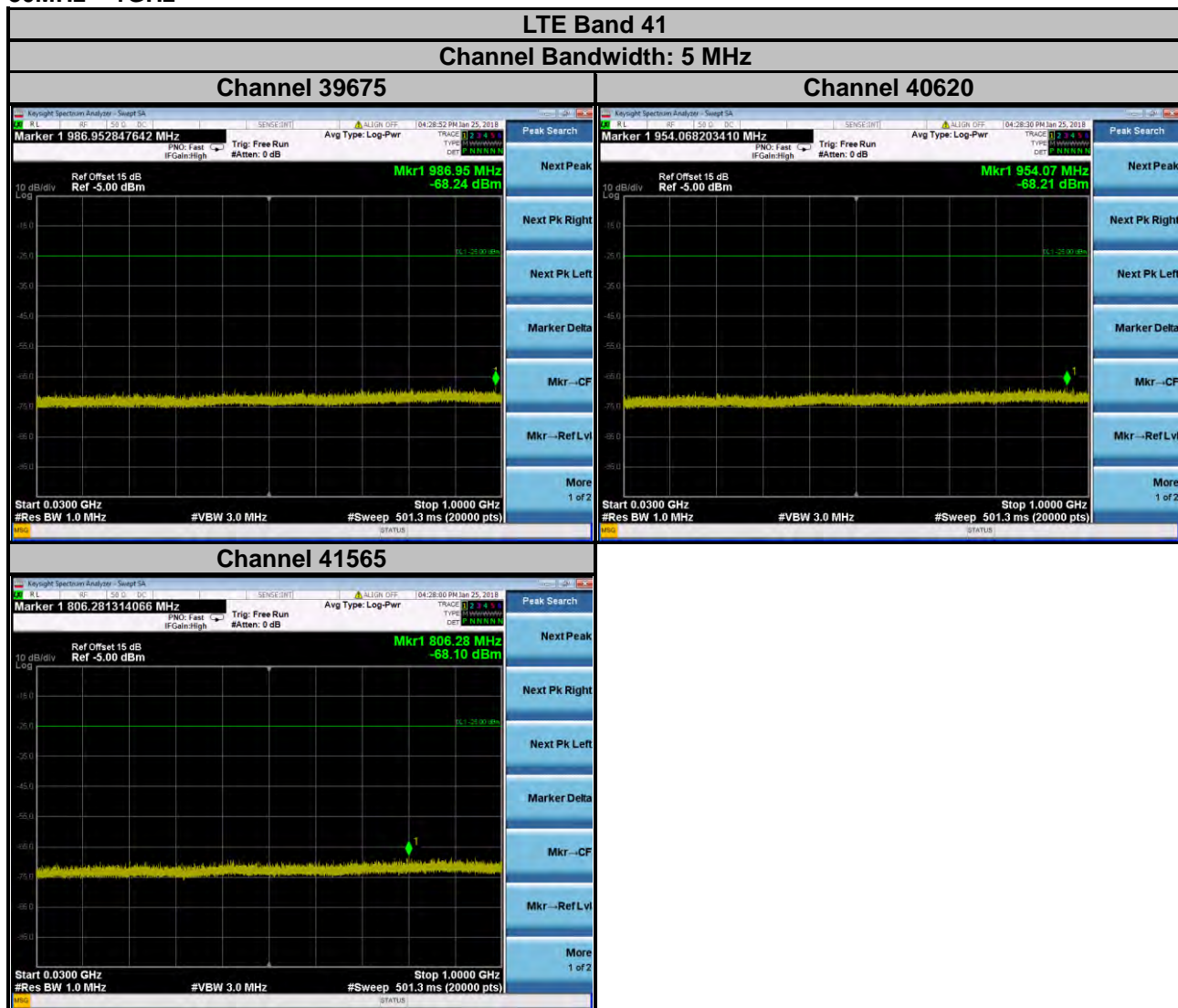
### Channel 38000



### Channel 38150



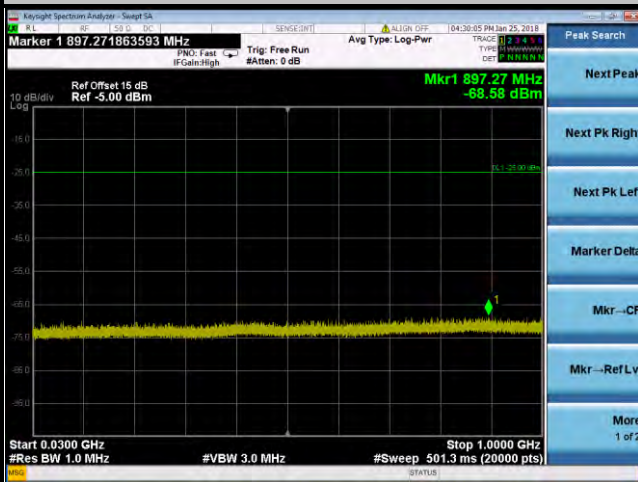
**LTE Band 41**  
**30MHz ~ 1GHz**



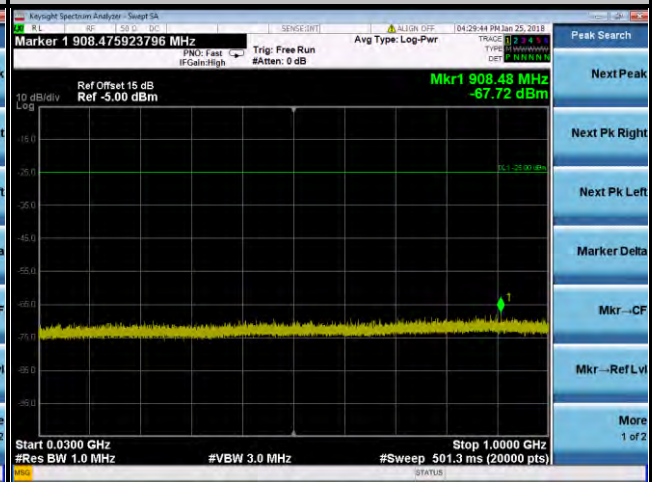
## LTE Band 41

Channel Bandwidth: 10 MHz

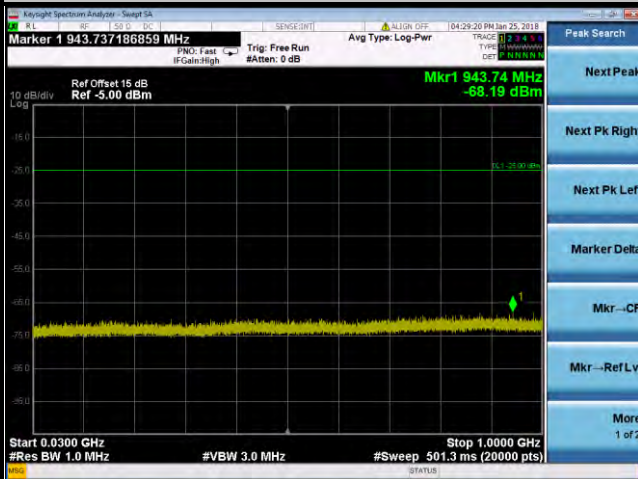
### Channel 39700



### Channel 40620



### Channel 41540

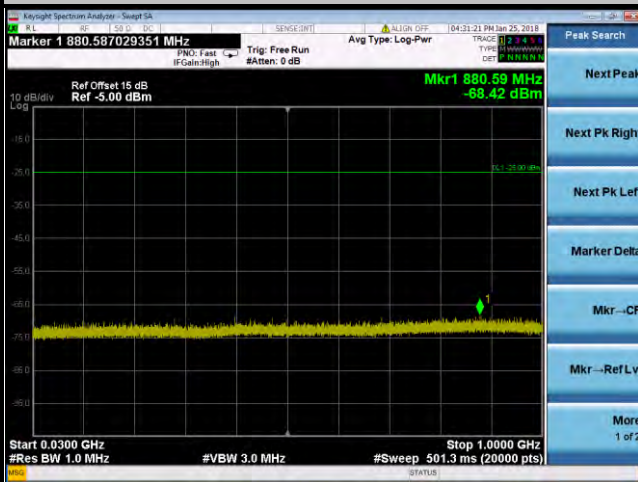




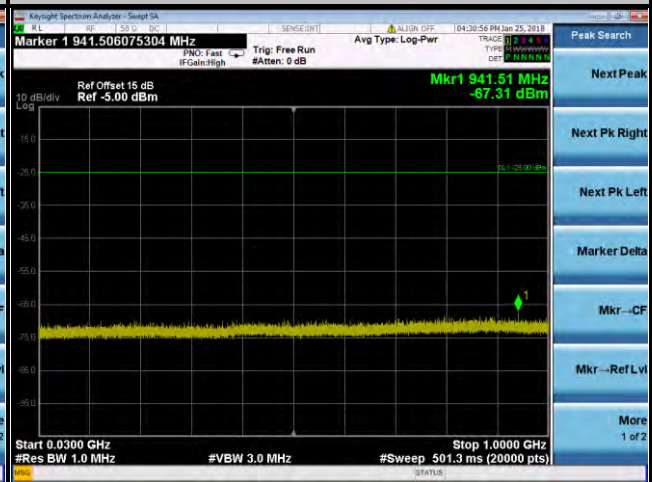
## LTE Band 41

Channel Bandwidth: 15 MHz

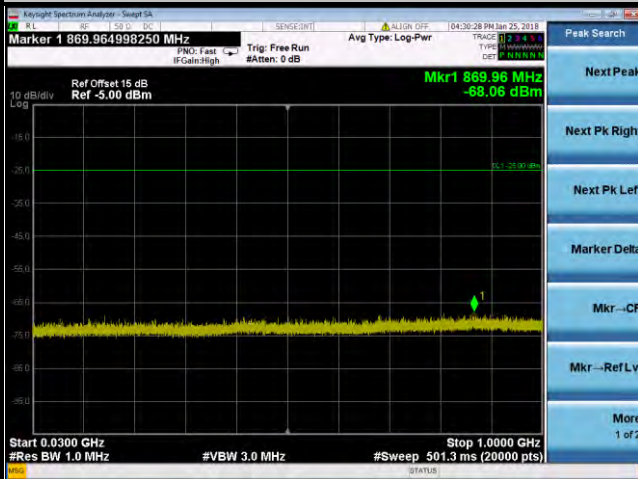
### Channel 39725



### Channel 40620



### Channel 41515

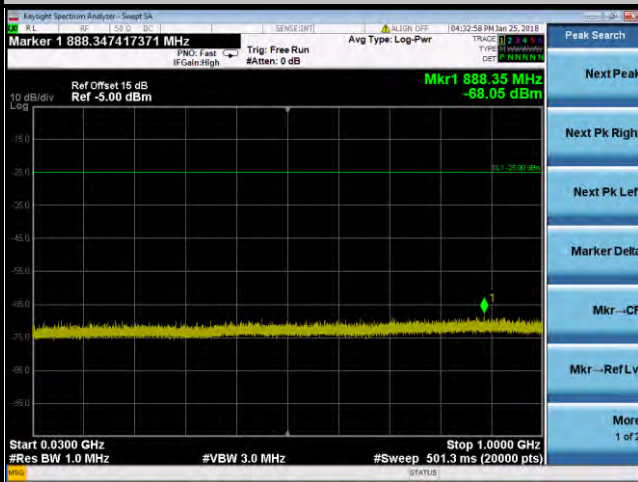




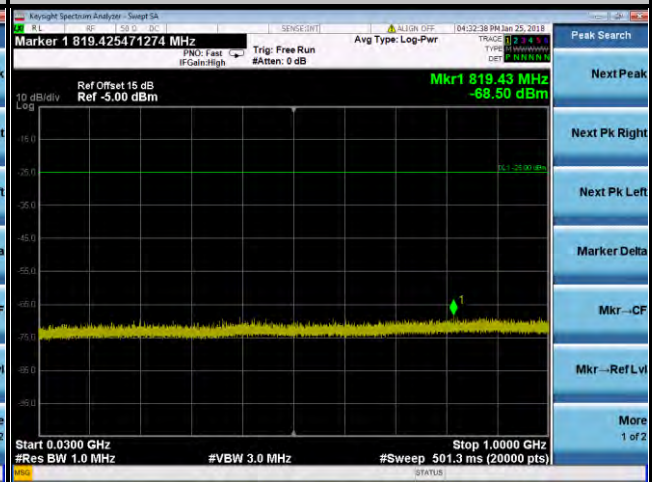
## LTE Band 41

Channel Bandwidth: 20 MHz

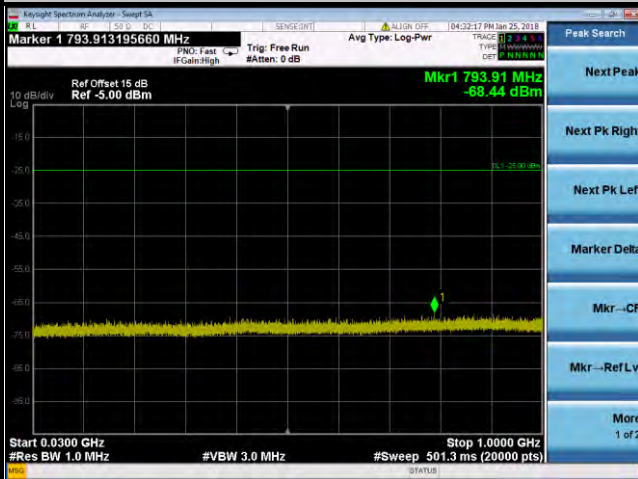
### Channel 39750



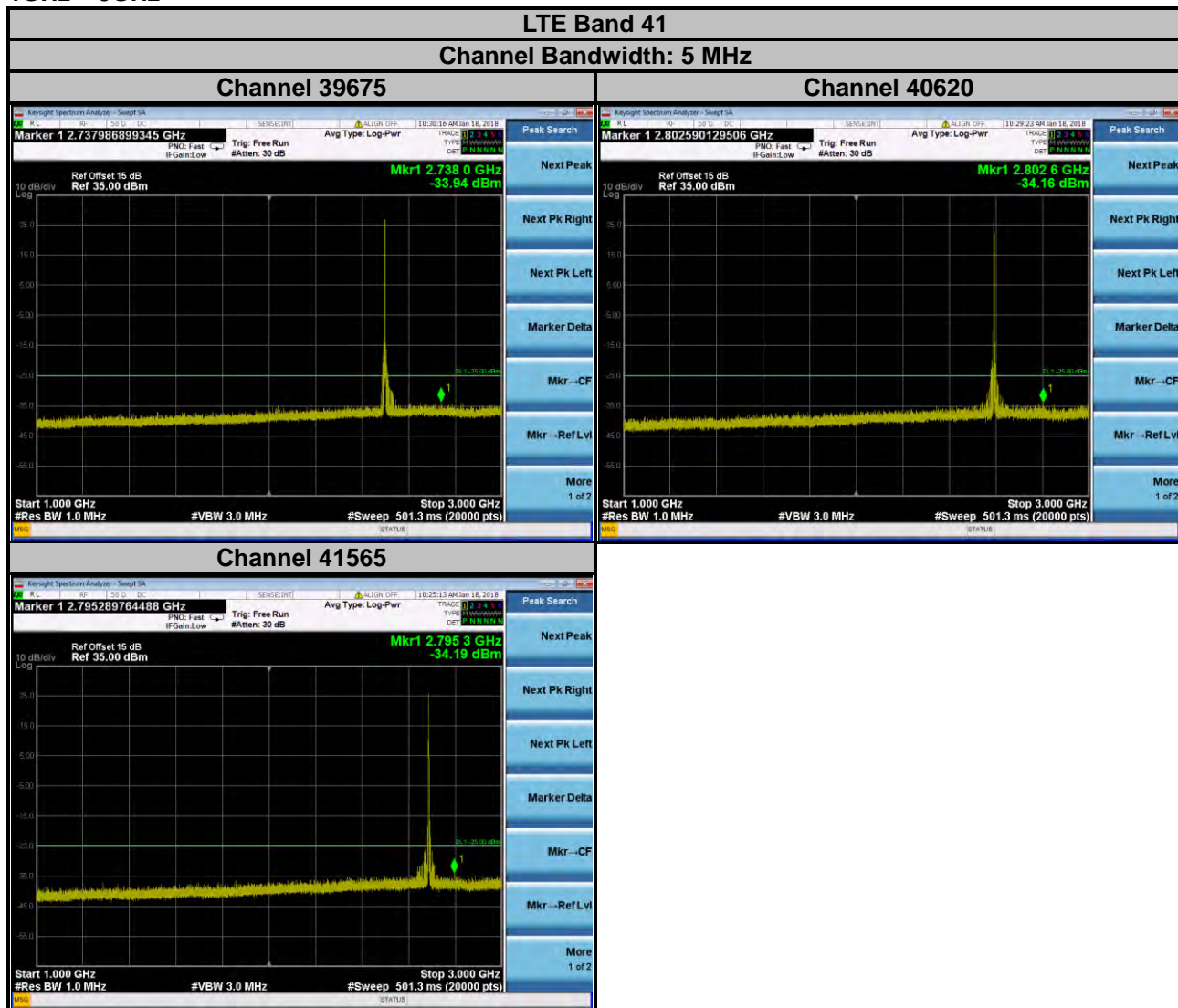
### Channel 40620



### Channel 41490



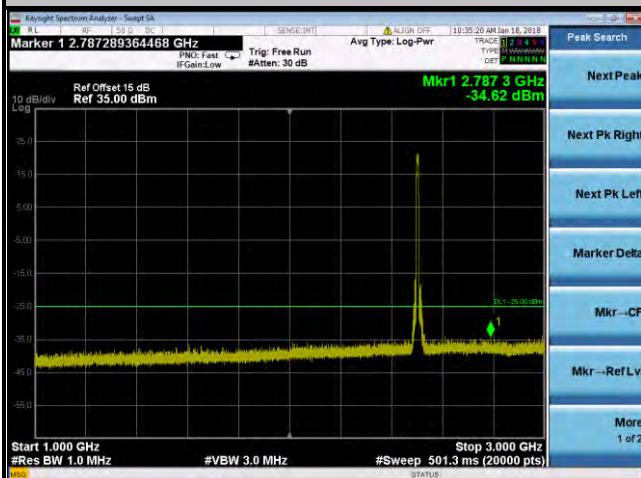
1GHz ~ 3GHz



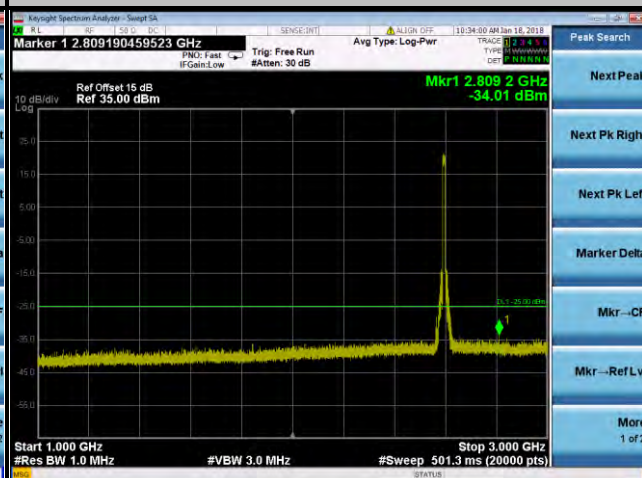
# LTE Band 41

Channel Bandwidth: 10 MHz

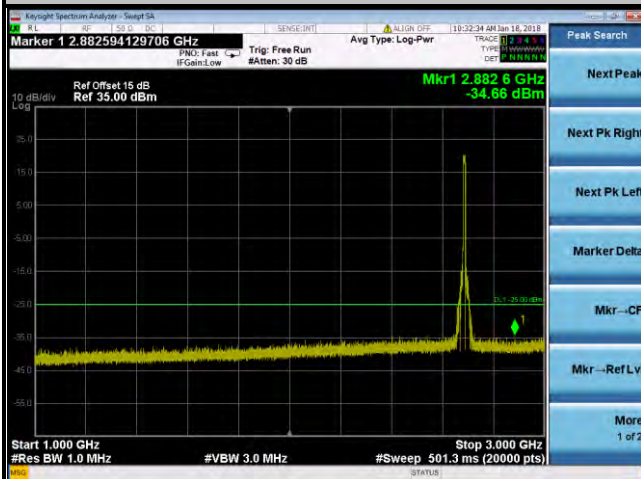
## Channel 39700



## Channel 40620



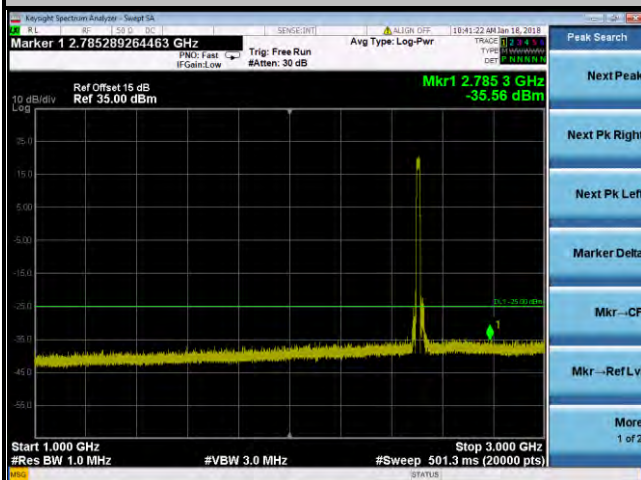
## Channel 41540



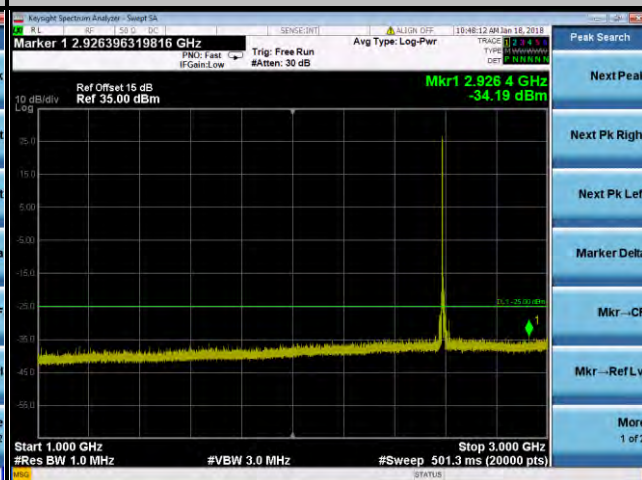
# LTE Band 41

Channel Bandwidth: 15 MHz

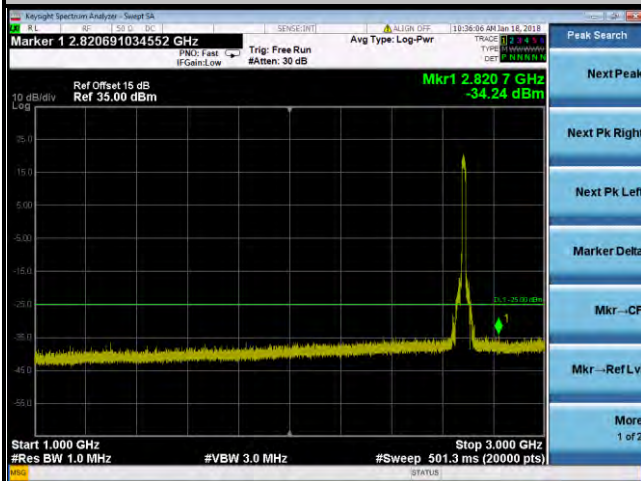
## Channel 39725



## Channel 40620



## Channel 41515

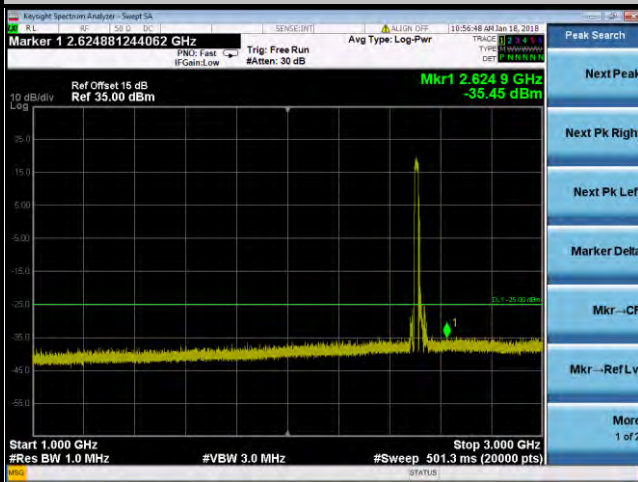




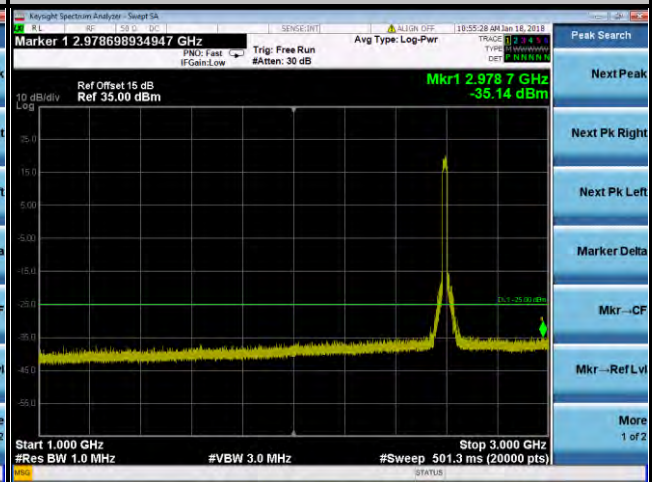
## LTE Band 41

Channel Bandwidth: 20 MHz

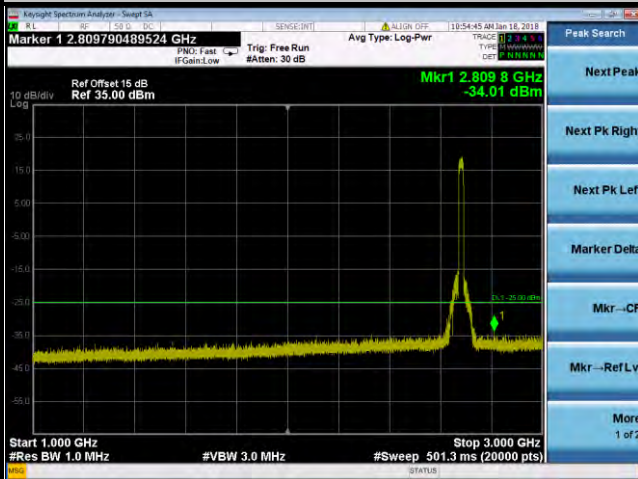
### Channel 39750



### Channel 40620

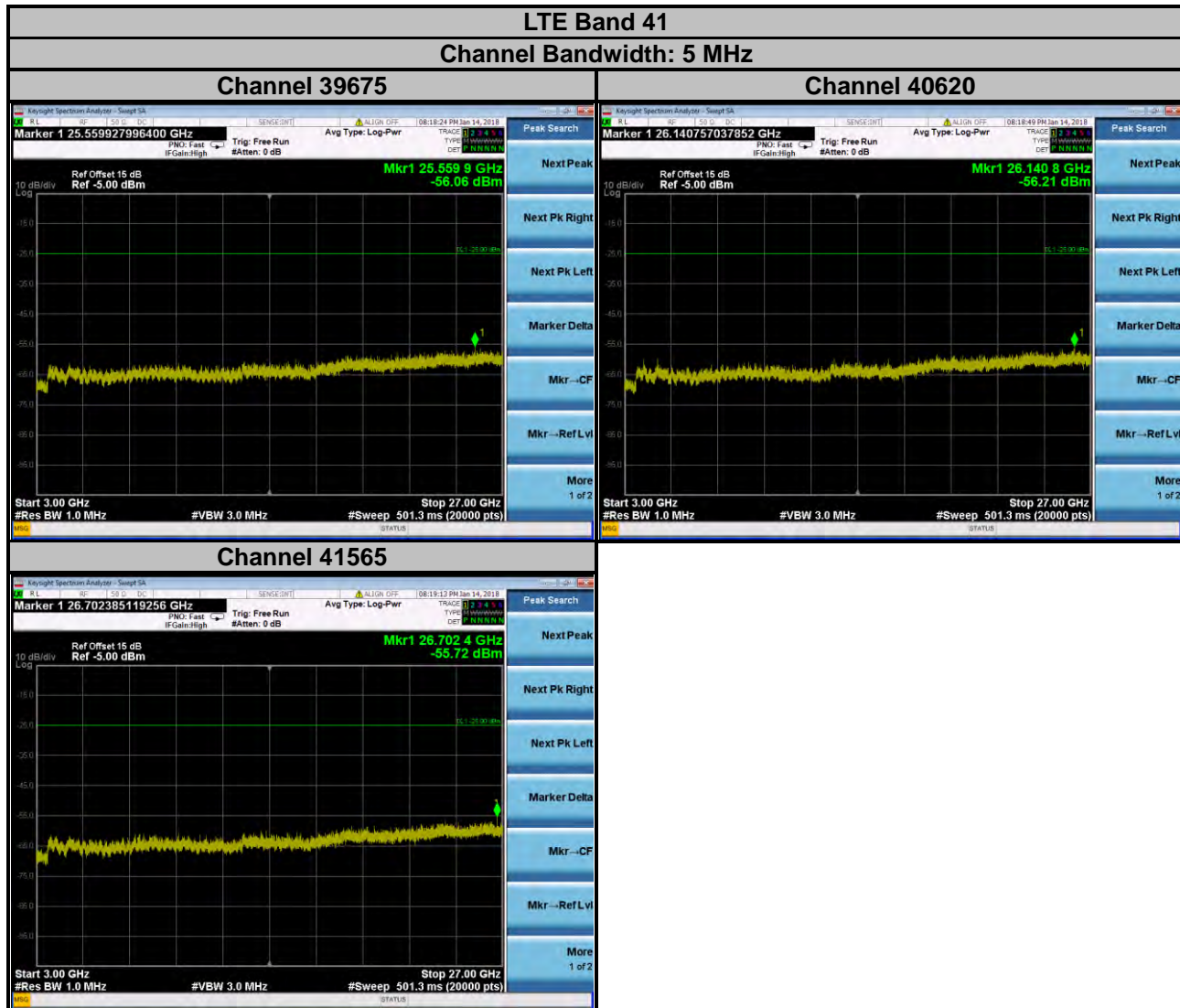


### Channel 41490





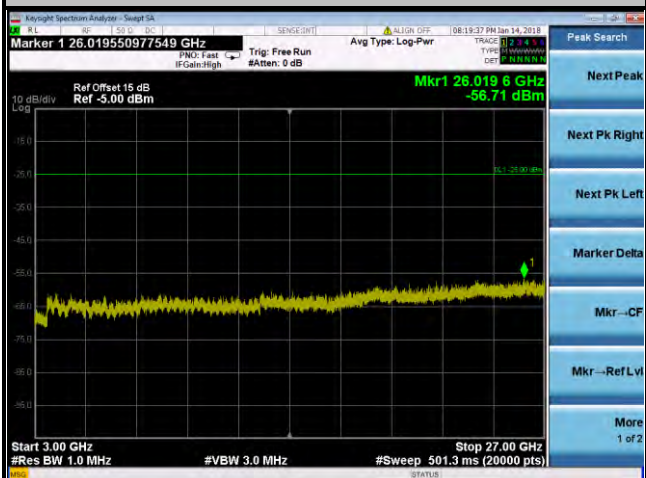
3GHz ~ 27GHz



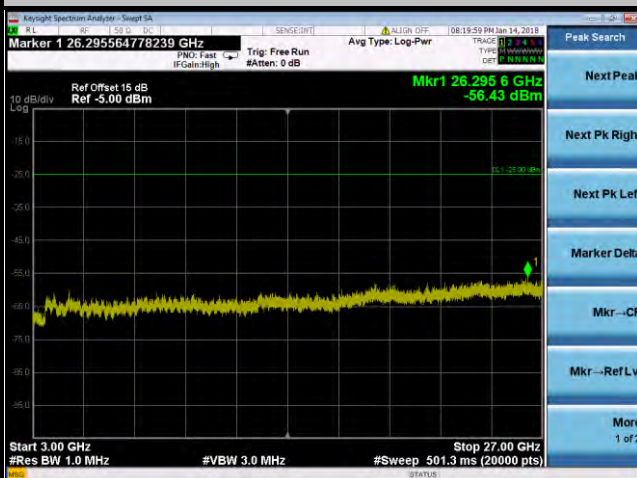
## LTE Band 41

Channel Bandwidth: 10 MHz

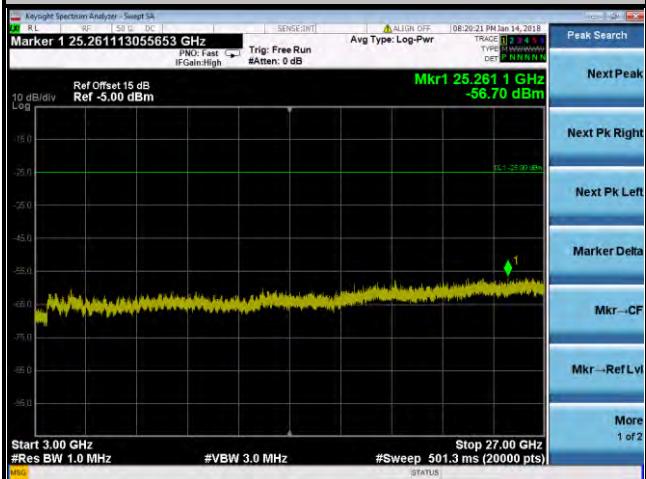
### Channel 39700



### Channel 40620



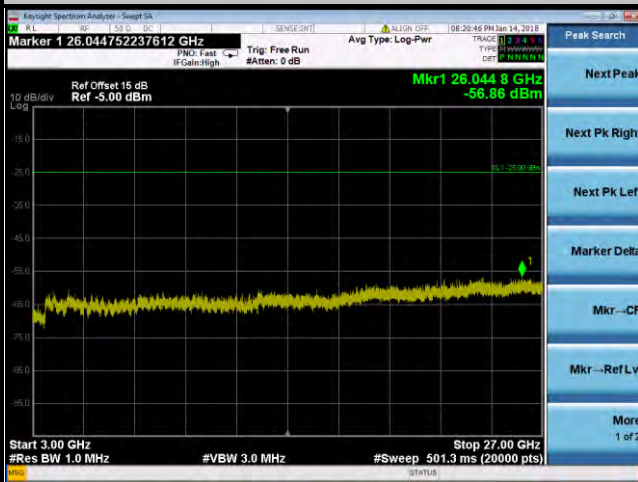
### Channel 41540



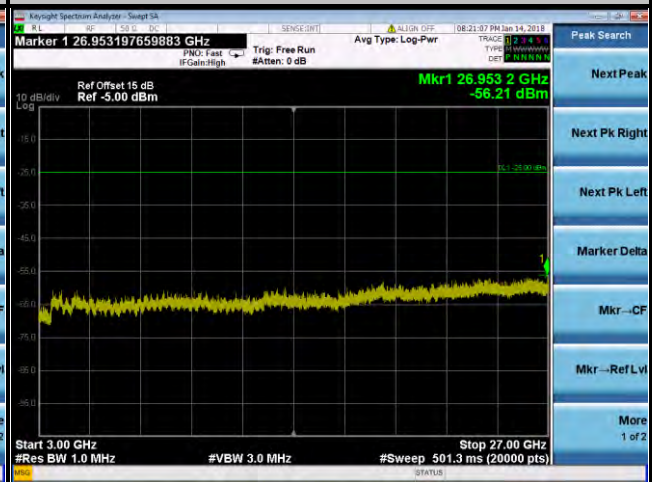
## LTE Band 41

Channel Bandwidth: 15 MHz

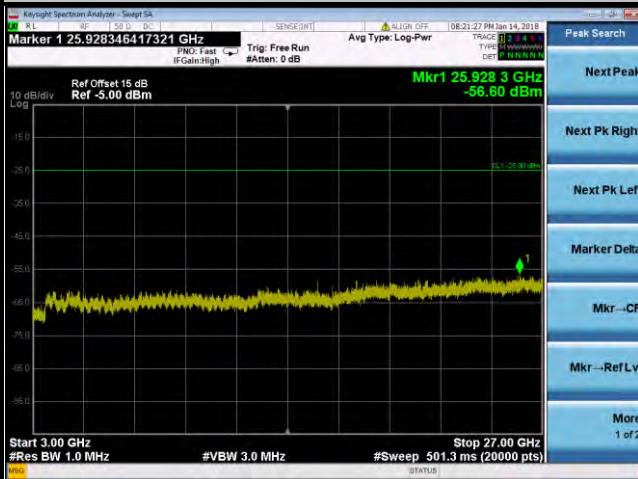
### Channel 39725



### Channel 40620



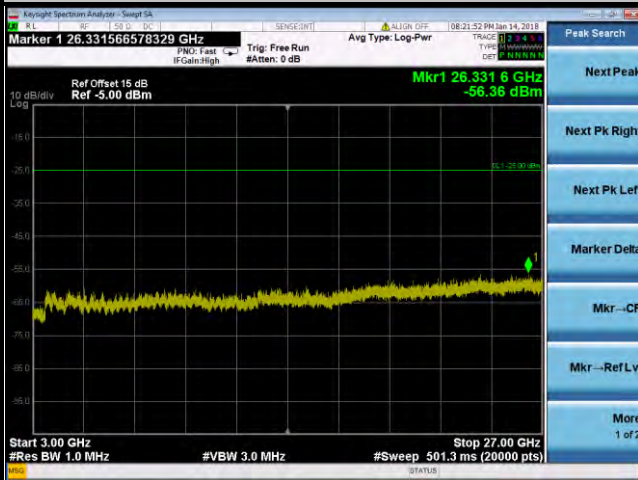
### Channel 41515



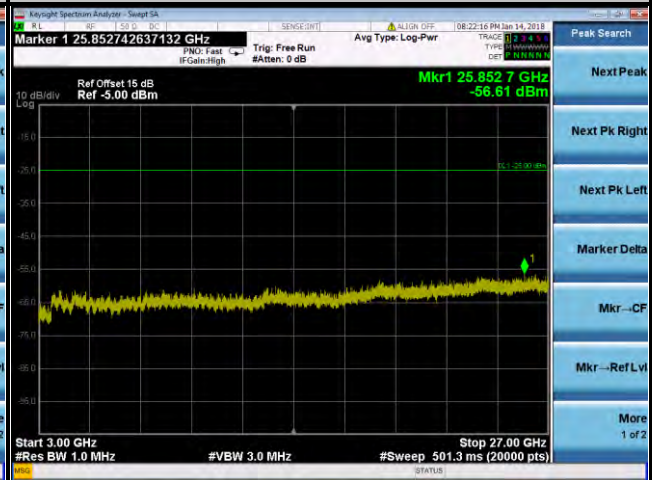
## LTE Band 41

Channel Bandwidth: 20 MHz

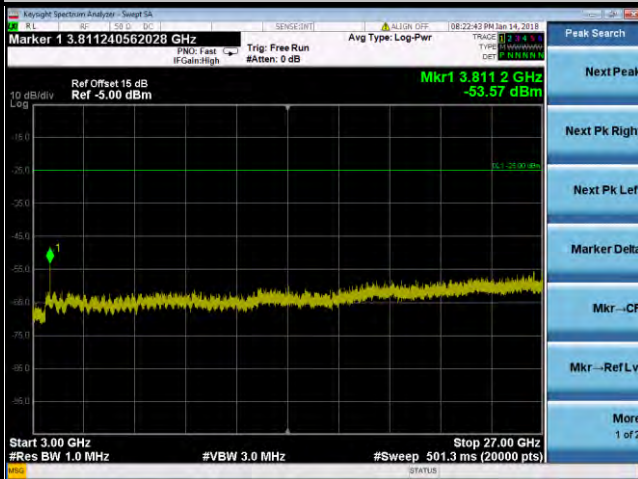
### Channel 39750



### 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,  $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dBi}.$

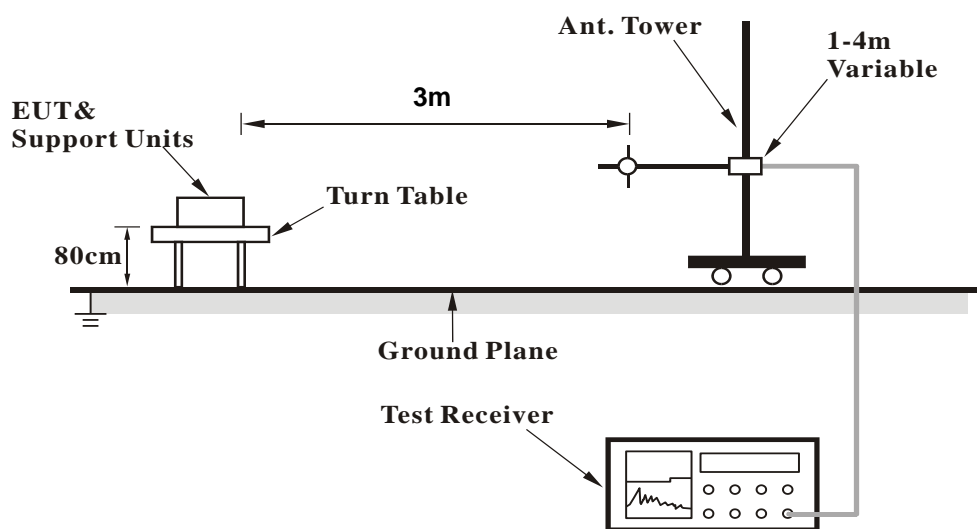
**NOTE:** The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

### 4.7.3 Deviation from Test Standard

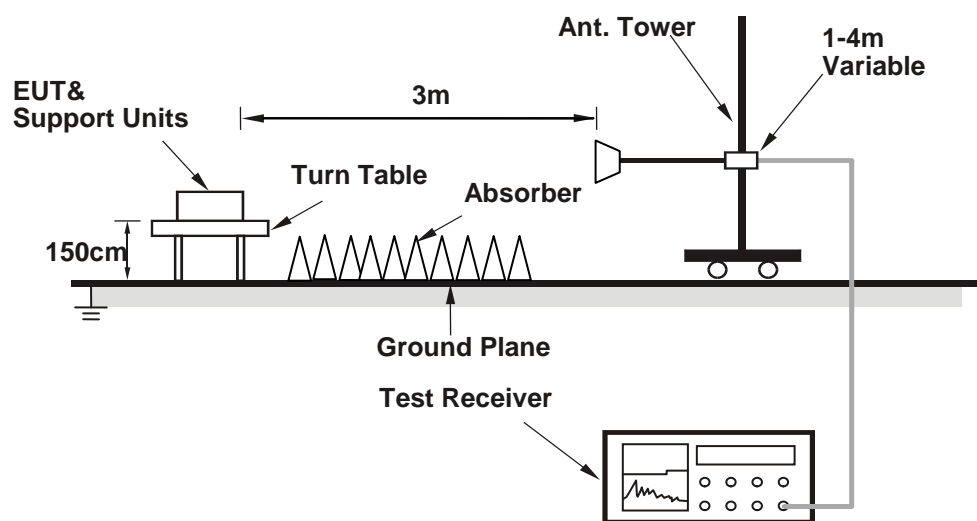
No deviation.

#### 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

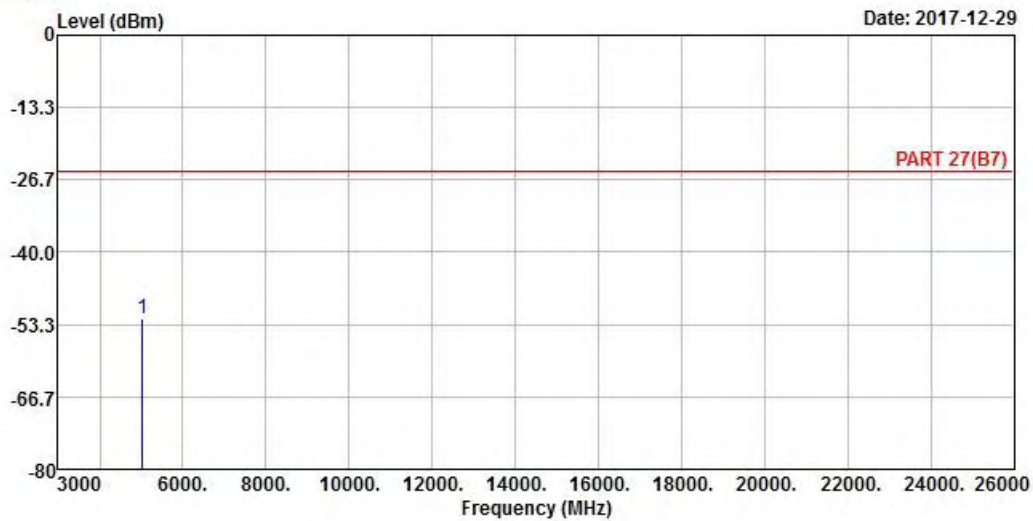
##### Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



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	

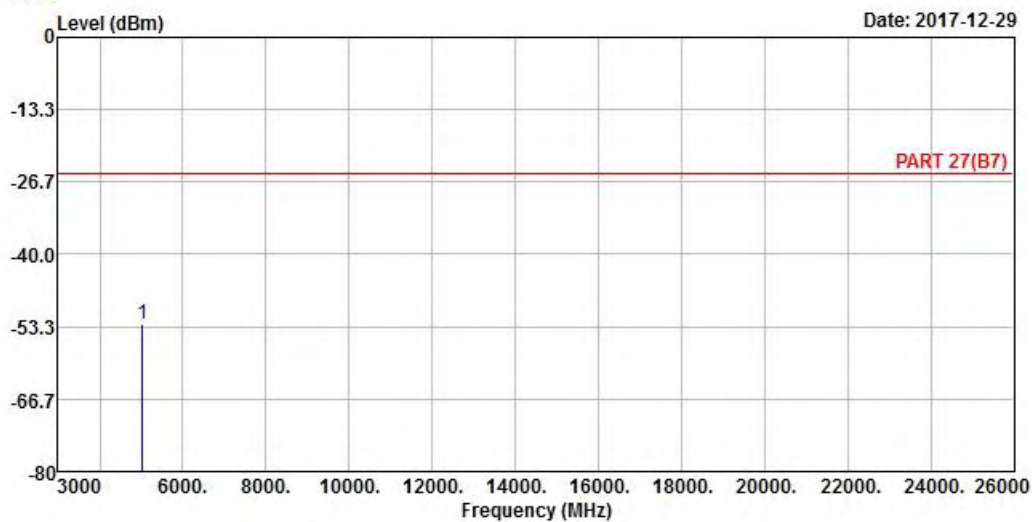
1 pp 5020.00 -52.34 -49.11 -25.00 -27.34 -3.23 Peak



# 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



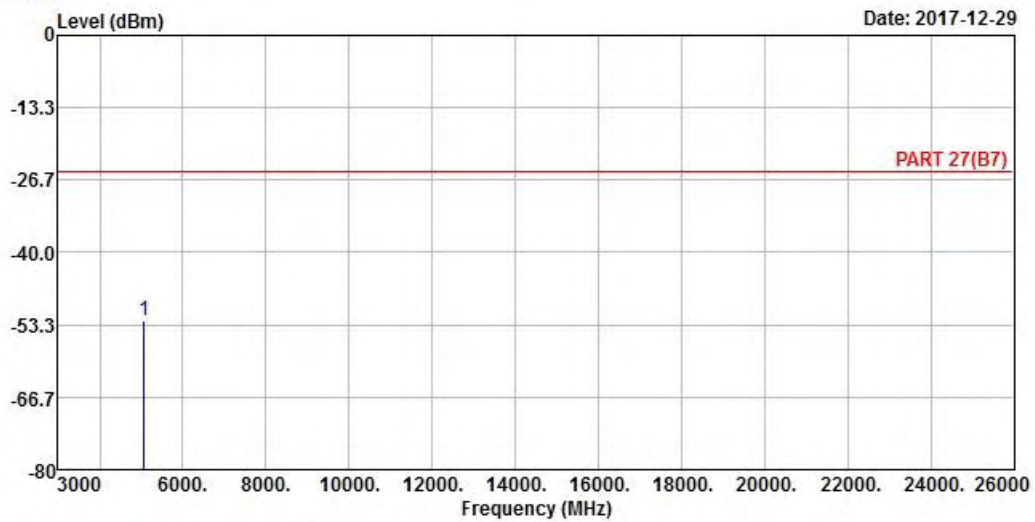
## Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5

Condition: PART 27(B7) HORIZONTAL

Remak : LTE Band 7 QPSK\_20M Link\_M-CH

Tested by: Jisyong Wang

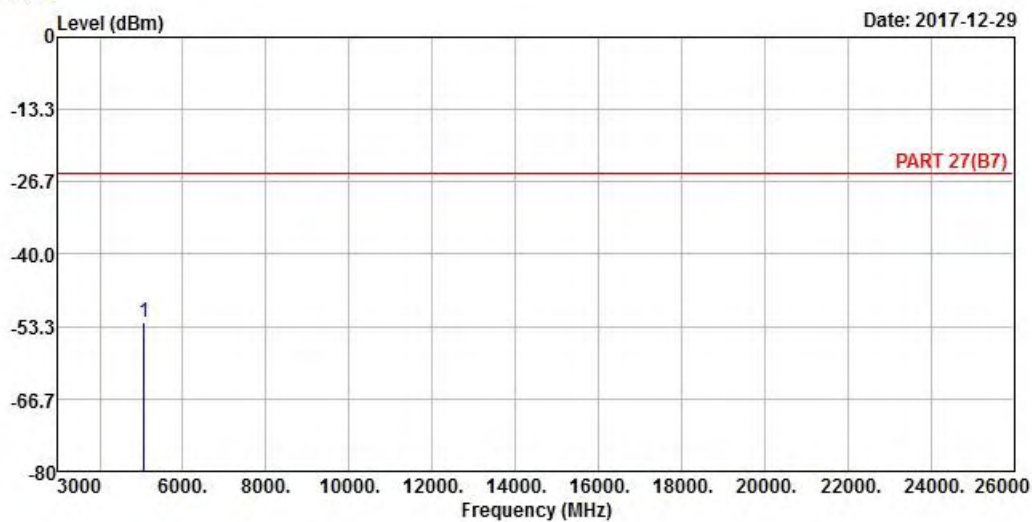
Freq	Level	Read	Limit	Over	Factor	Remark
		Level	Line	Limit		
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5070.00	-52.41	-49.29	-25.00	-27.41	-3.12	Peak



# 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

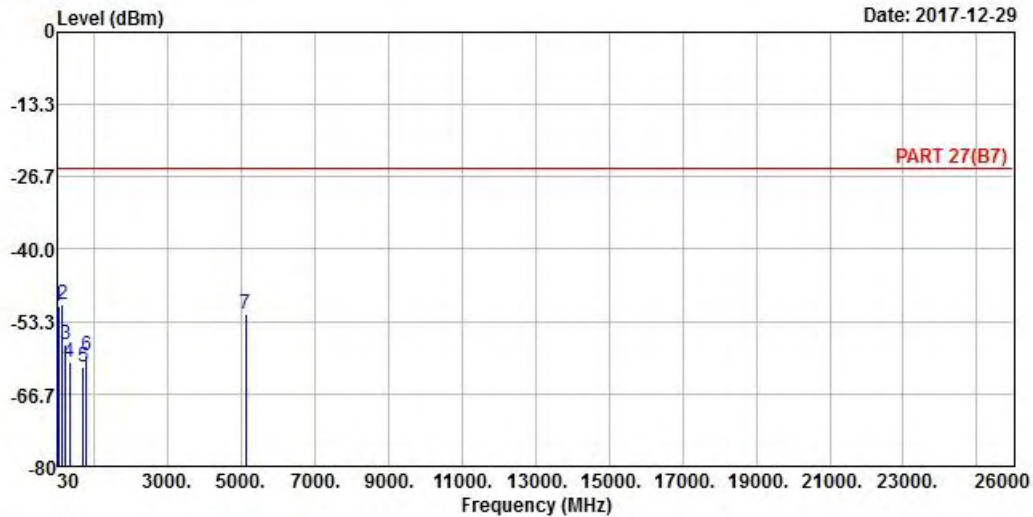


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

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

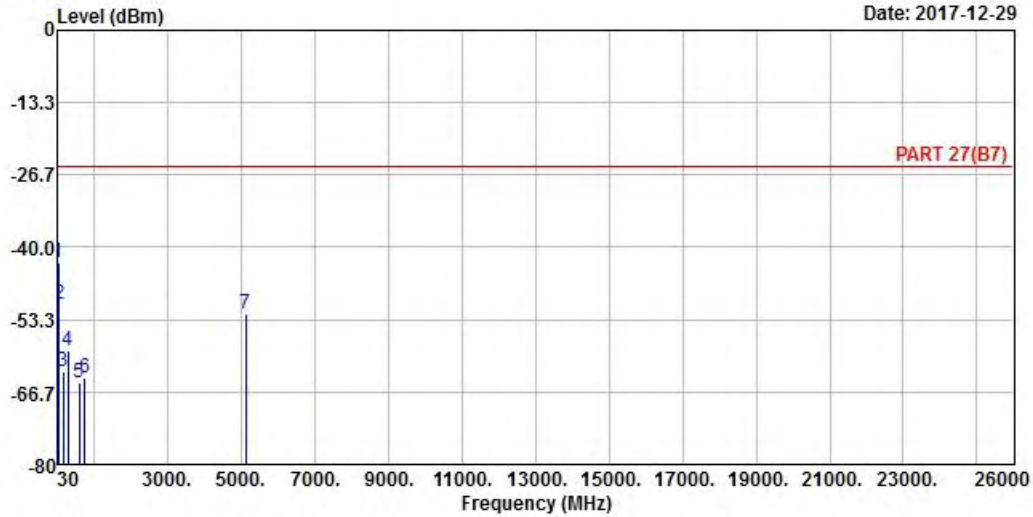


# Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 8

Date: 2017-12-29



Site : 966 Chamber 5

Condition: PART 27(B7) VERTICAL

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 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



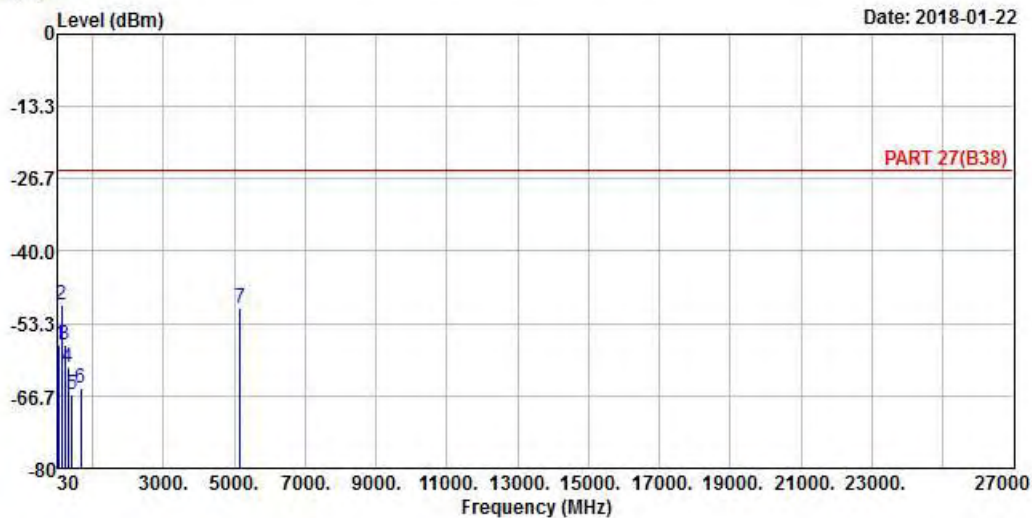
LTE Band 38  
Channel Bandwidth: 20 MHz / QPSK  
Low Channel



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

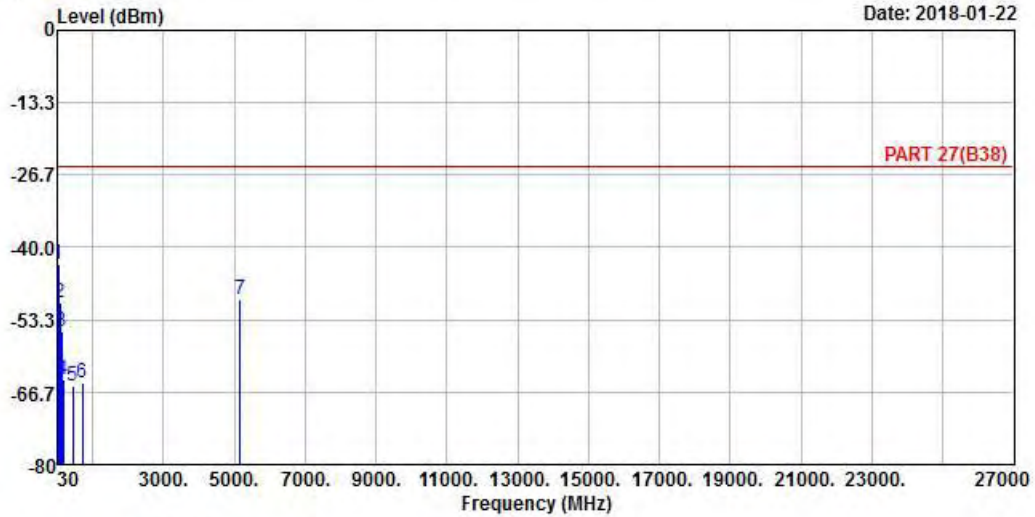
	Freq	Level	Read	Limit	Over	
	MHz	dBm	Level	Line	Limit	Factor Remark
			dBm	dBm	dB	dB
1	52.31	-57.18	442.82	-25.00	-32.18	-500.00 Peak
2 pp	137.67	-49.81	450.19	-25.00	-24.81	-500.00 Peak
3	224.97	-57.29	442.71	-25.00	-32.29	-500.00 Peak
4	302.57	-61.49	438.51	-25.00	-36.49	-500.00 Peak
5	421.88	-66.39	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	pp	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

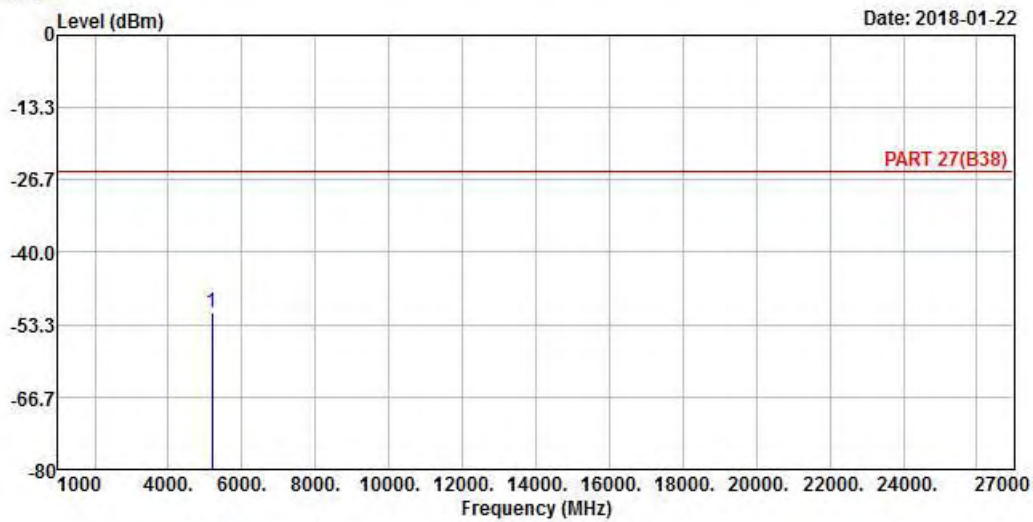
## Middle Channel



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

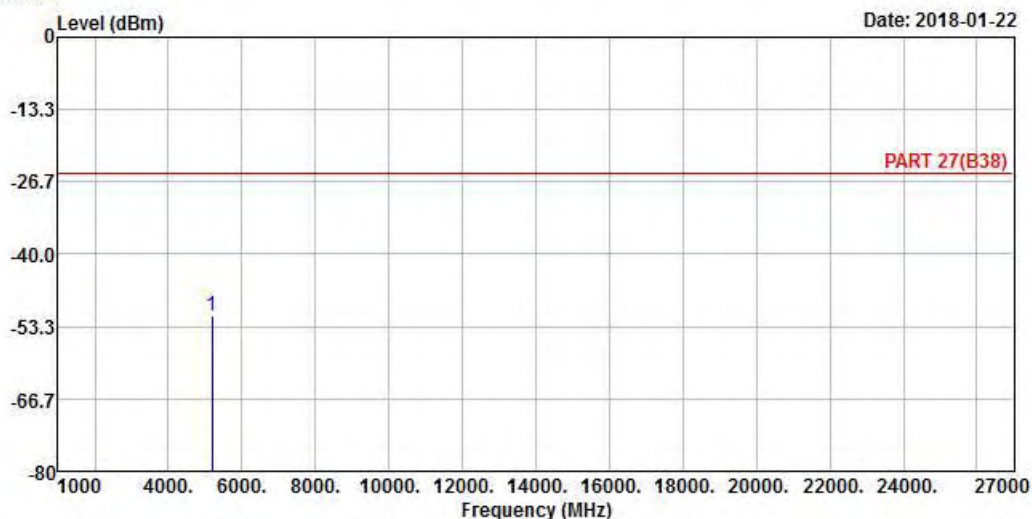
		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5190.00	-51.18	-48.32	-25.00	-26.18	-2.86	Peak



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

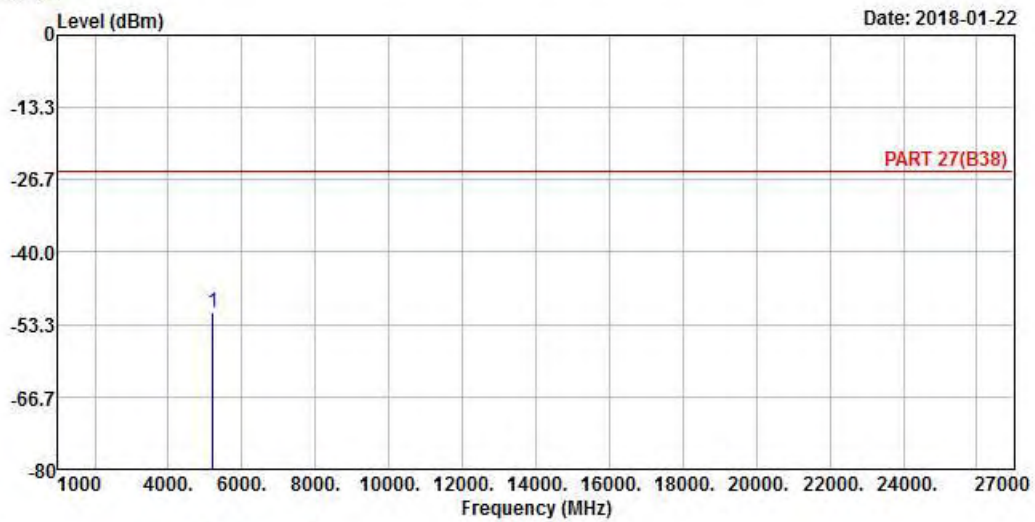
## High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



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

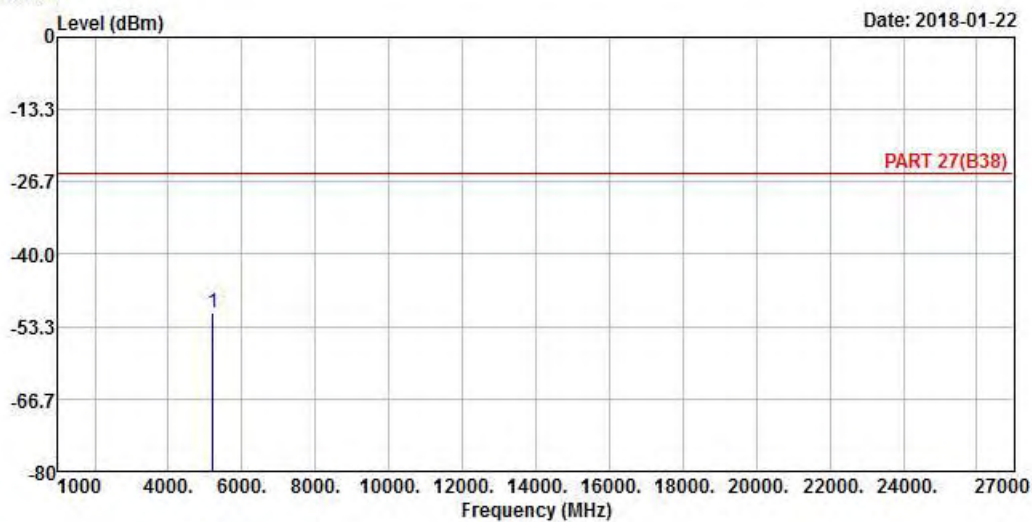




# Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

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

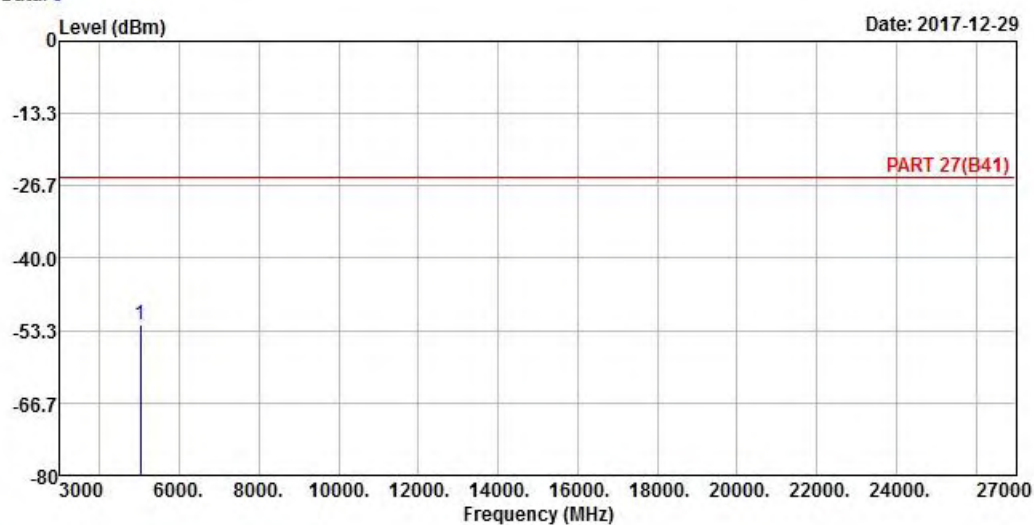
LTE Band 41  
Channel Bandwidth: 20 MHz / QPSK  
Low Channel



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	

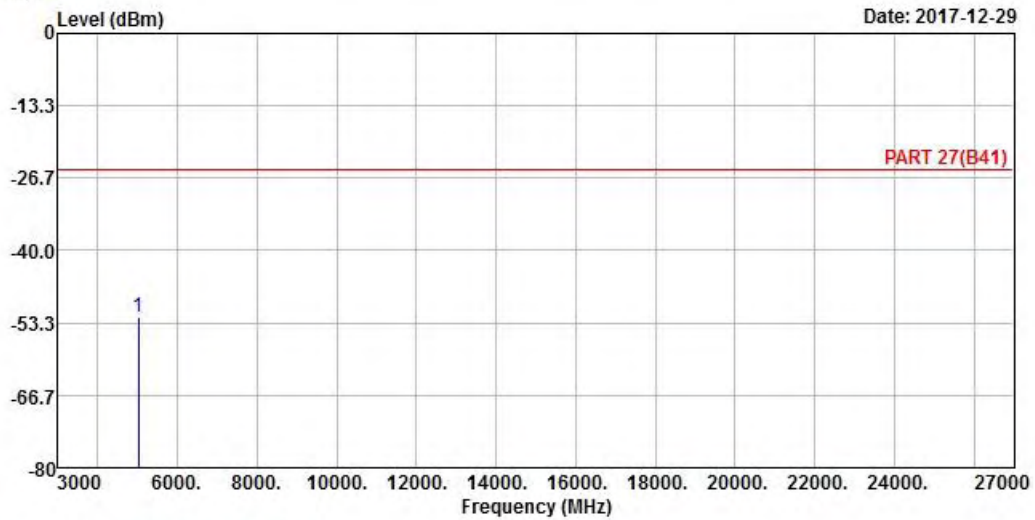
1 pp 5012.00 -52.35 -49.12 -25.00 -27.35 -3.23 Peak



# 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

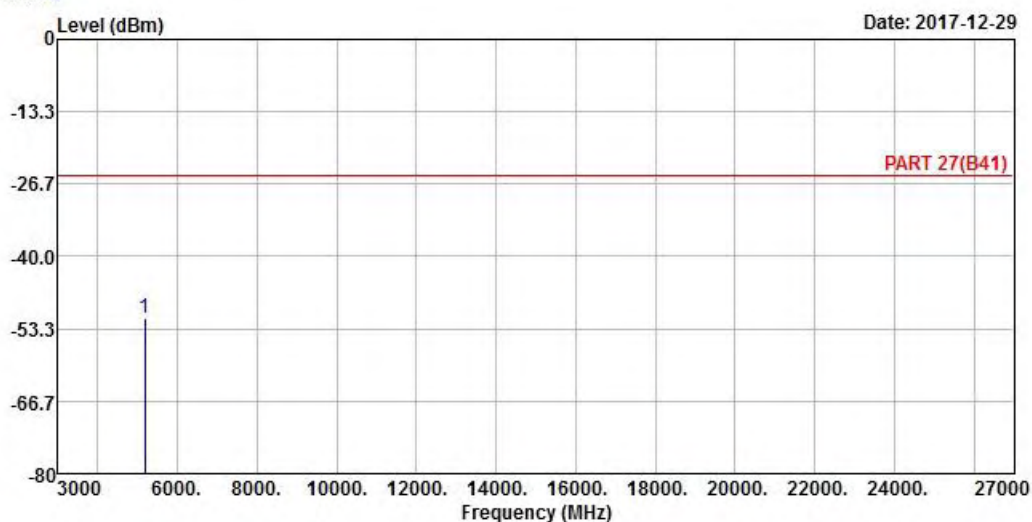
## Middle Channel



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

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

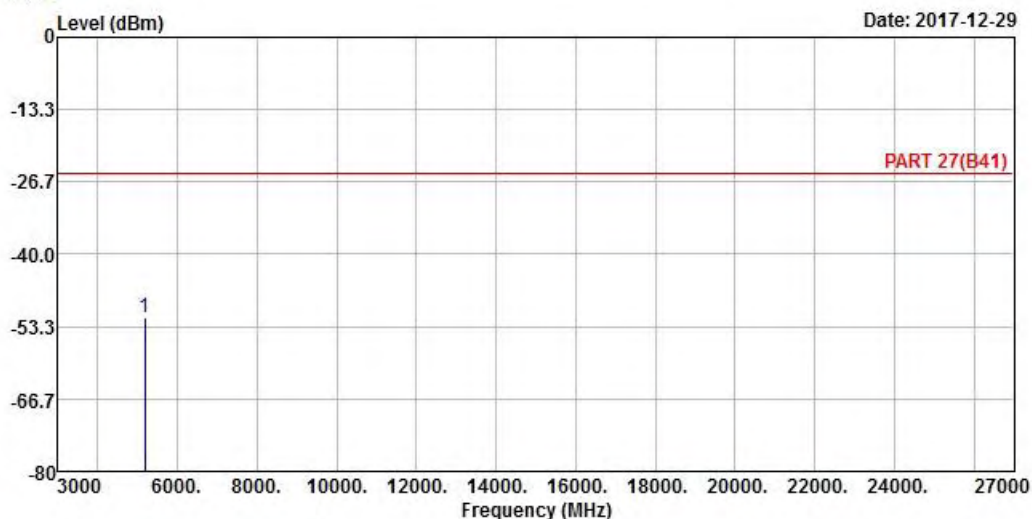
1 pp 5186.00 -51.30 -48.44 -25.00 -26.30 -2.86 Peak



# 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

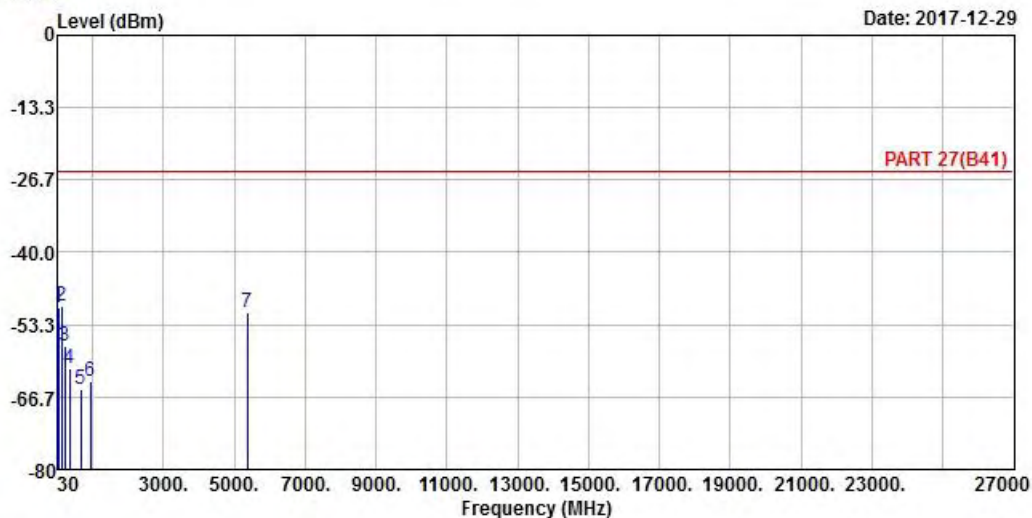


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

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

	Freq	Level	Read Level	Limit Line	Over 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

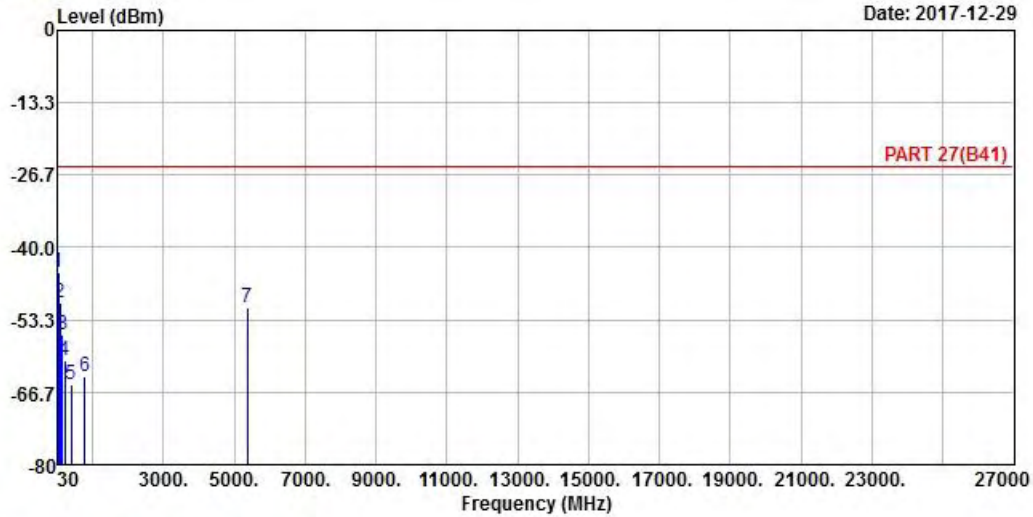


# Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

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

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Tel: 886-3-3183232

Fax: 886-3-3270892

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

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

--- END ---