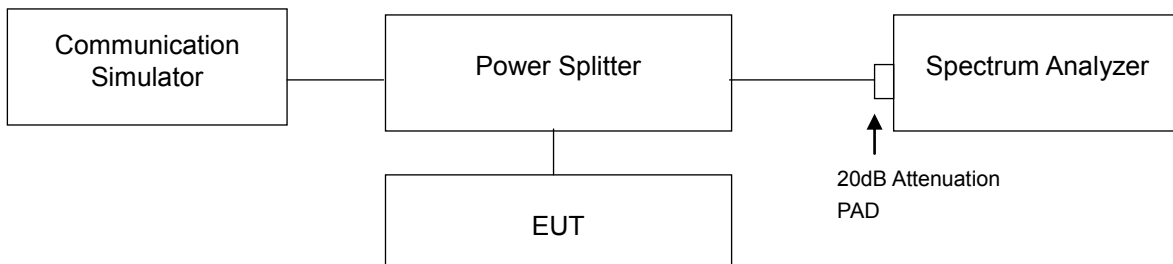


## 4.6 Conducted Spurious Emissions

### 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.

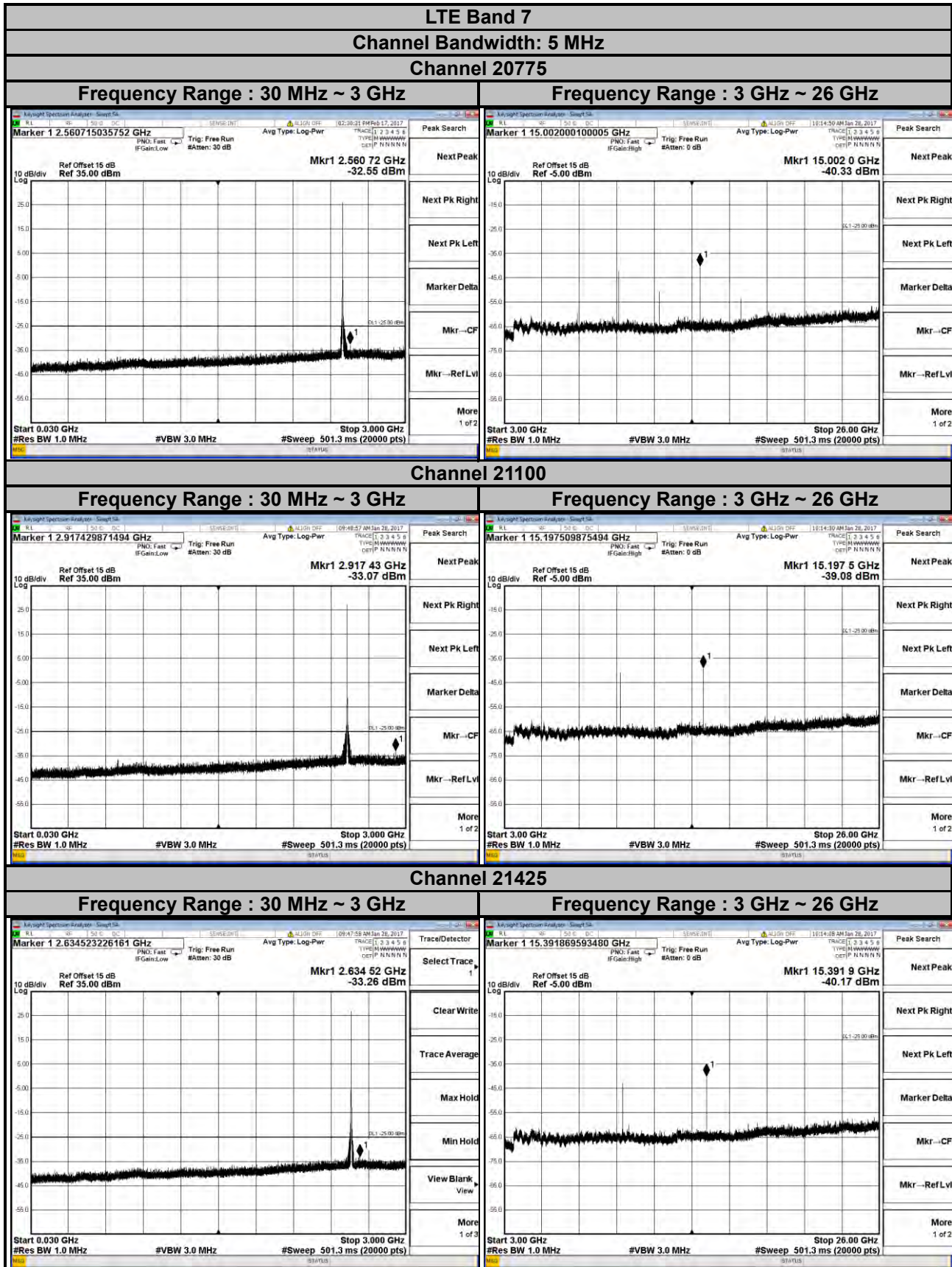
### 4.6.2 Test Setup



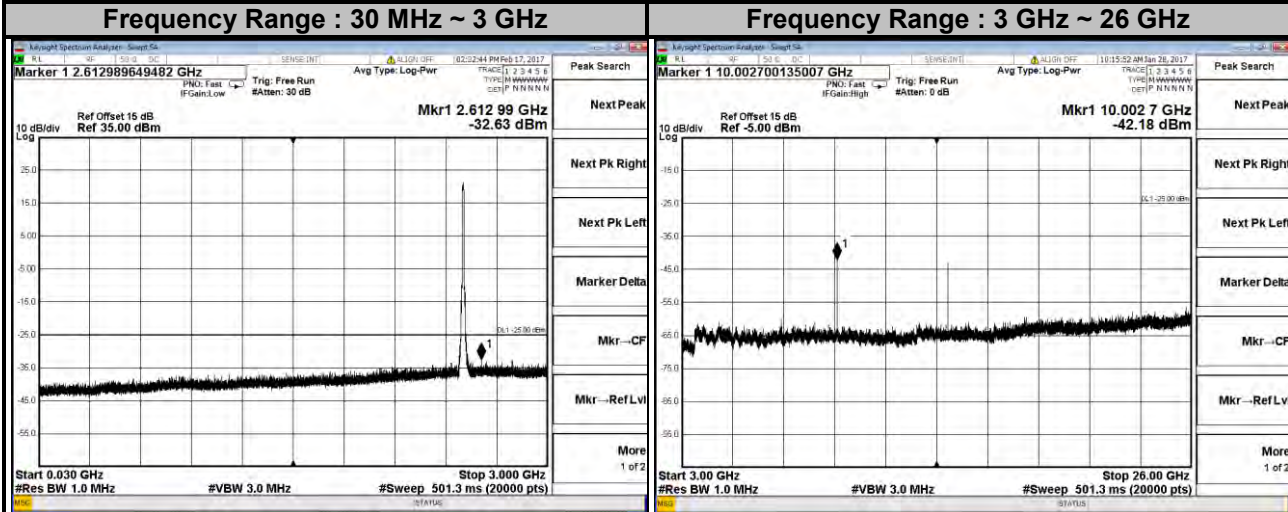
### 4.6.3 Test Procedure

- 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. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

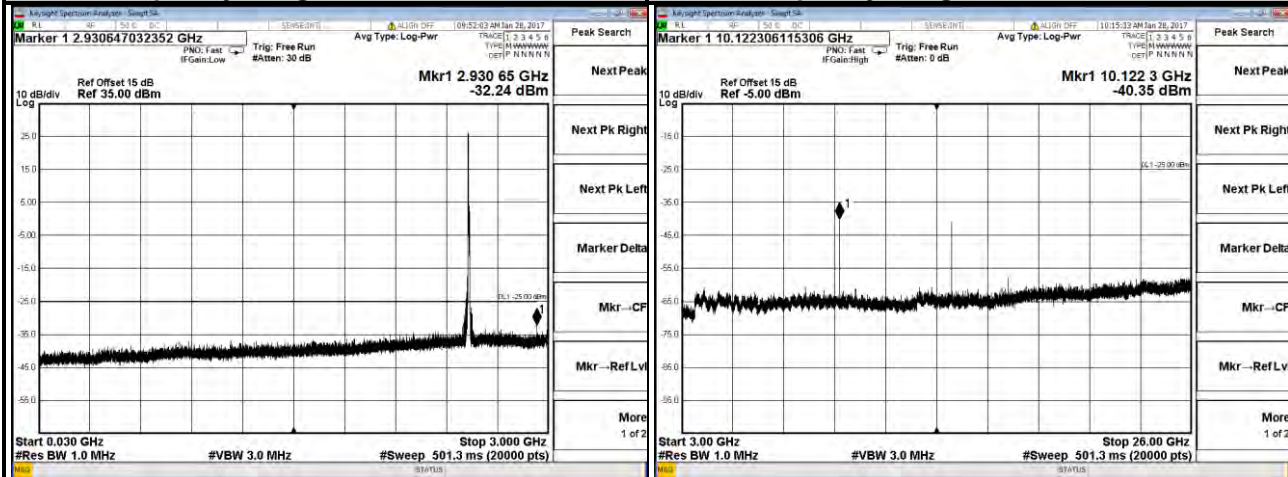
4.6.4 Test Results



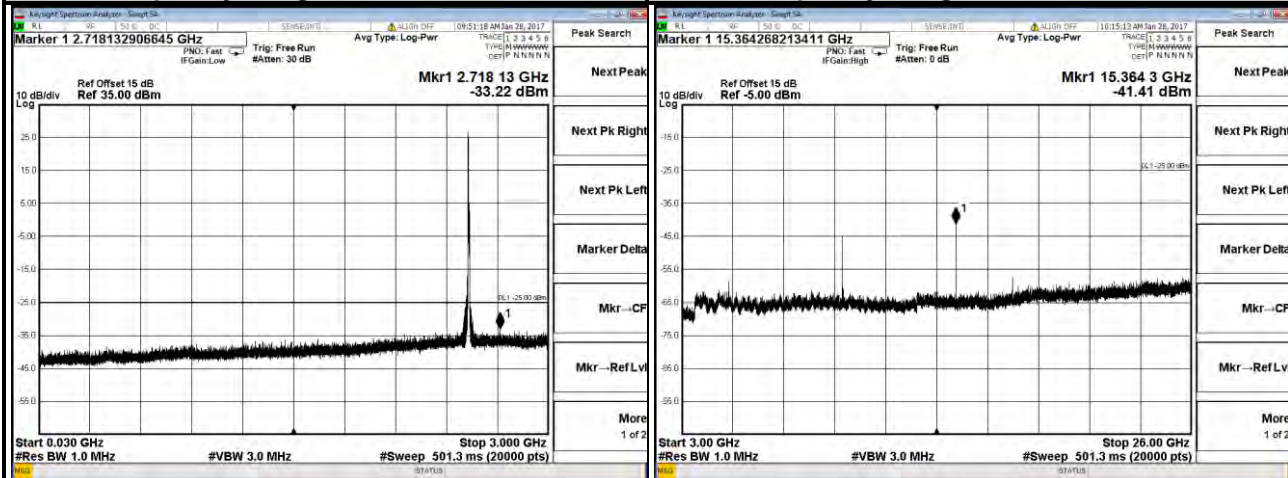
**LTE Band 7**  
**Channel Bandwidth: 10 MHz**  
**Channel 20800**



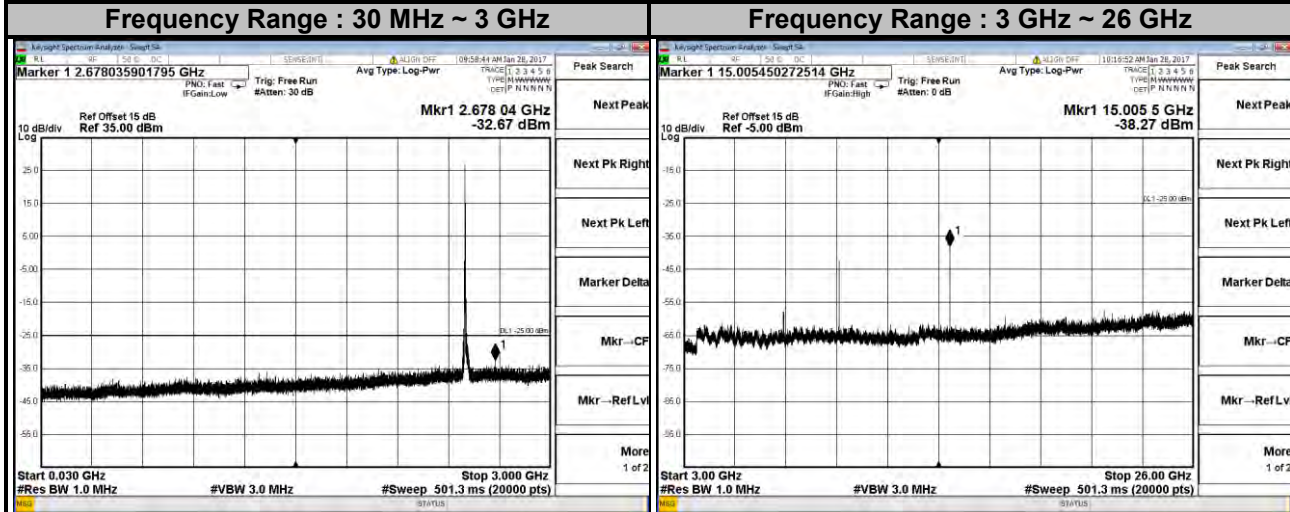
**Channel 21100**



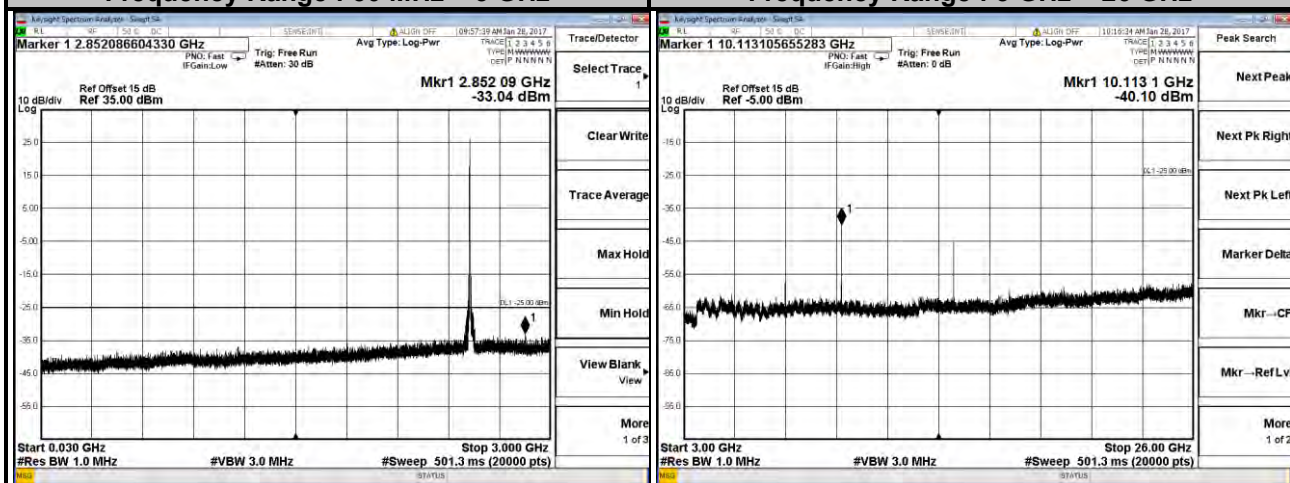
**Channel 21400**



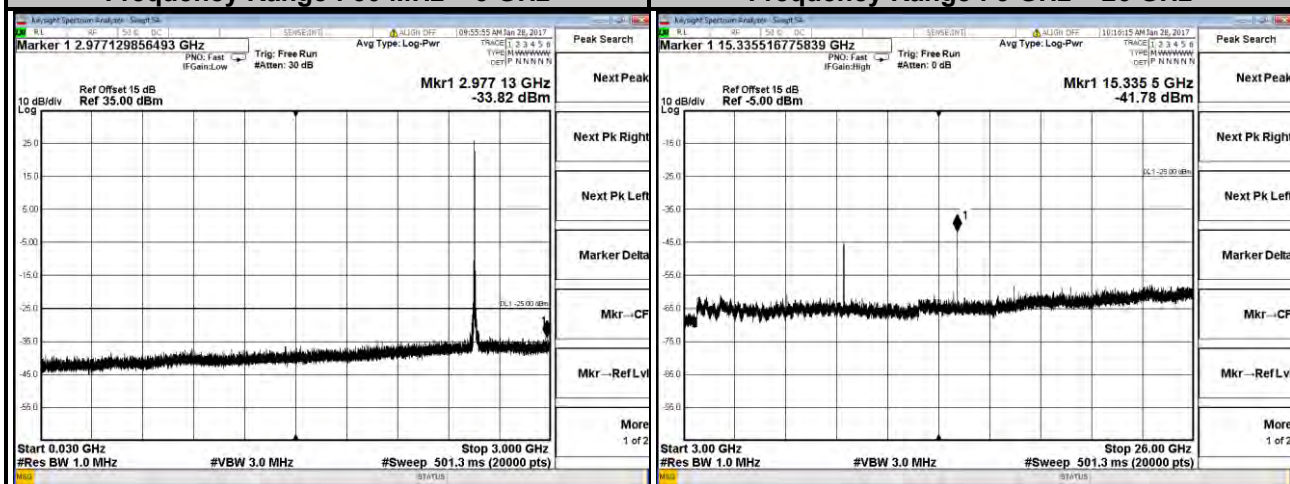
**LTE Band 7**  
**Channel Bandwidth: 15 MHz**  
**Channel 20825**



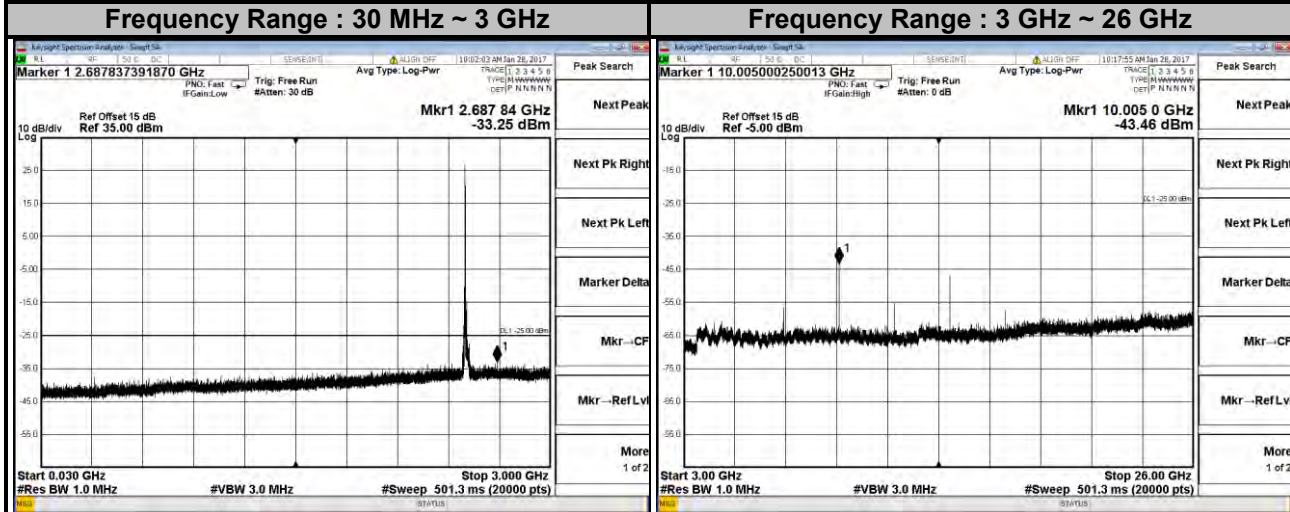
**Channel 21100**



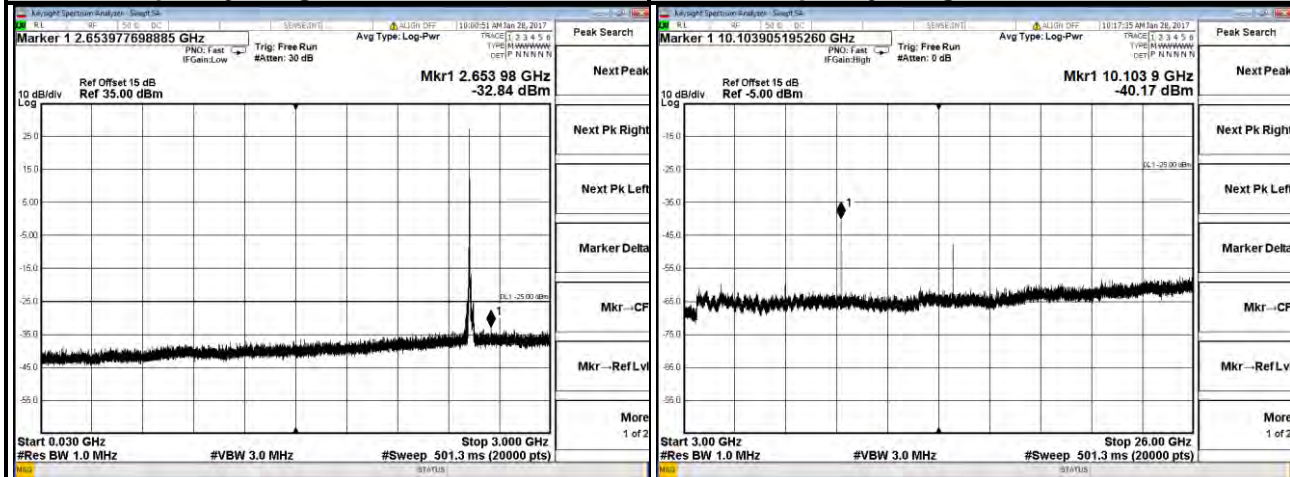
**Channel 21375**



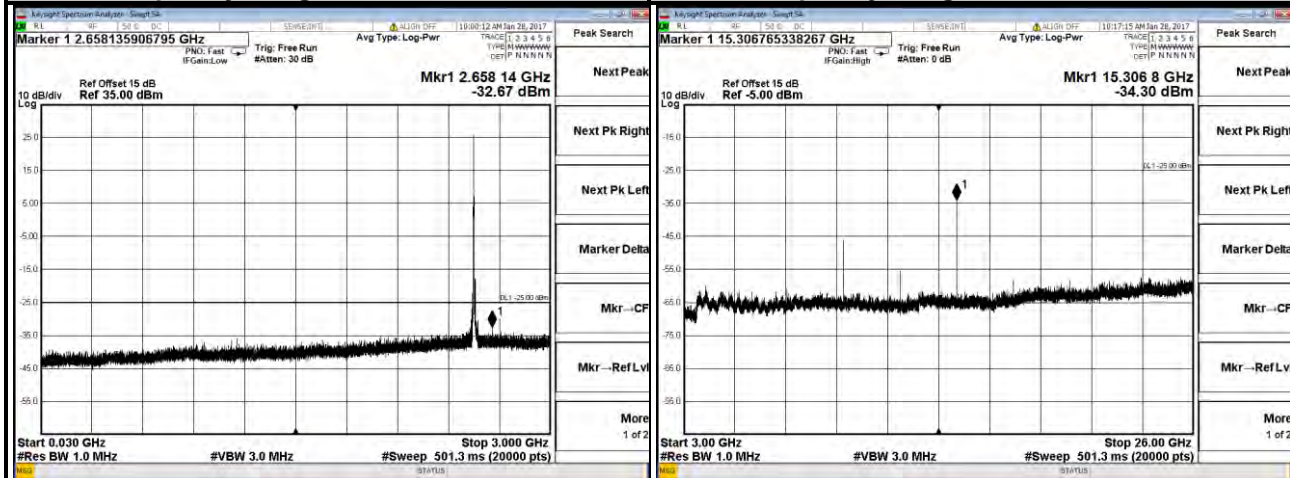
**LTE Band 7**  
**Channel Bandwidth: 20 MHz**  
**Channel 20850**



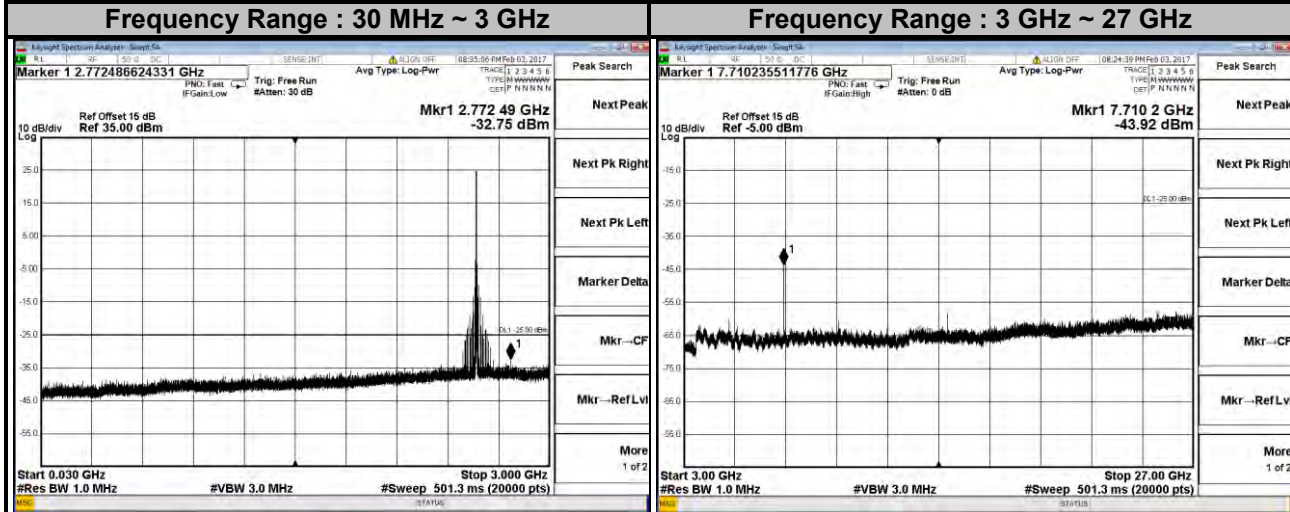
**Channel 21100**



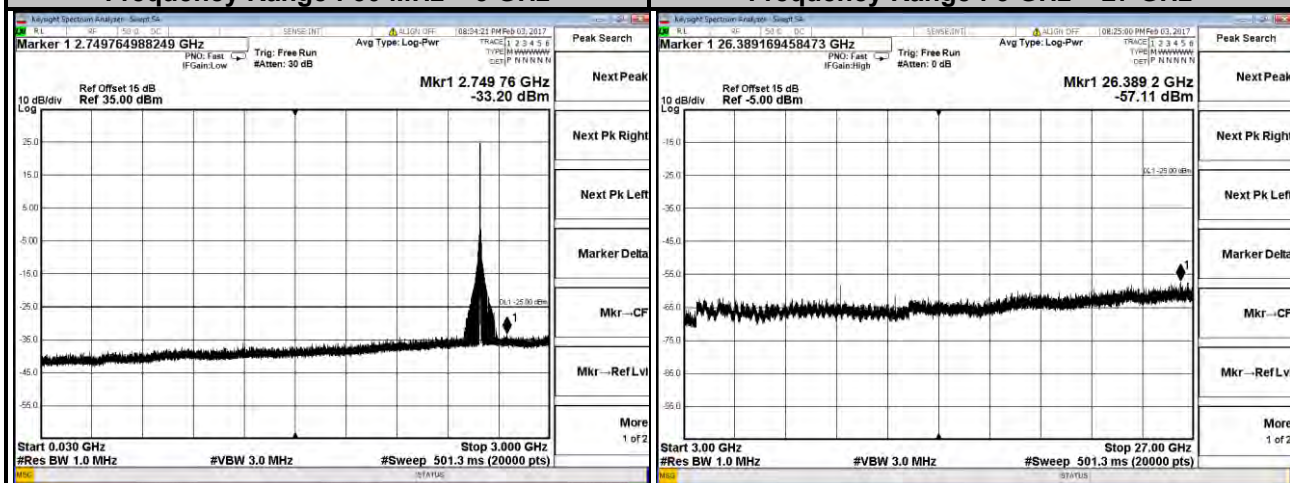
**Channel 21350**



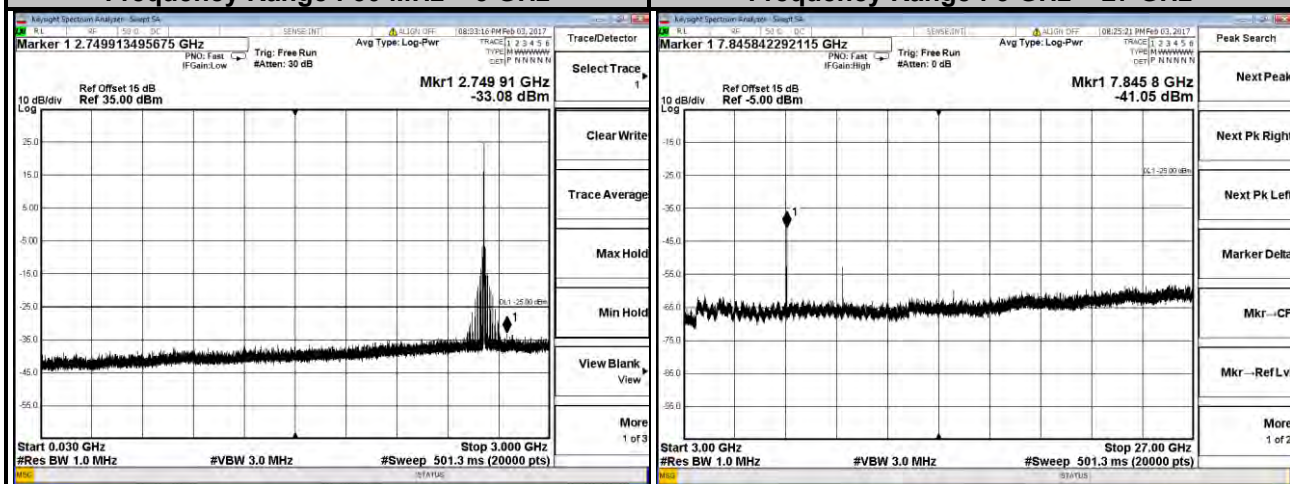
**LTE Band 38**  
**Channel Bandwidth: 5 MHz**  
**Channel 37775**



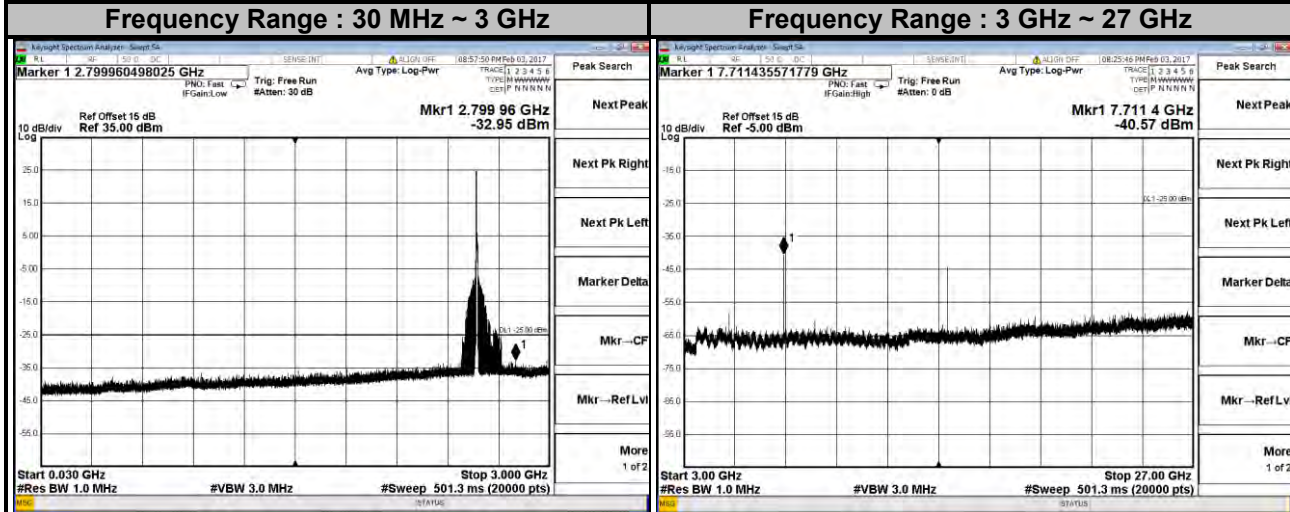
**Channel 38000**



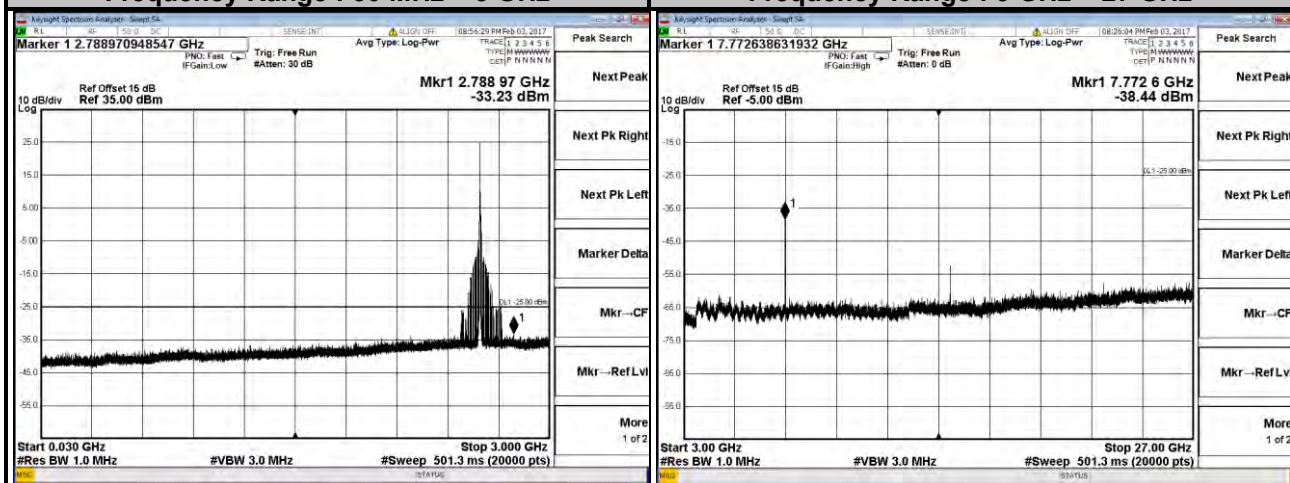
**Channel 38225**



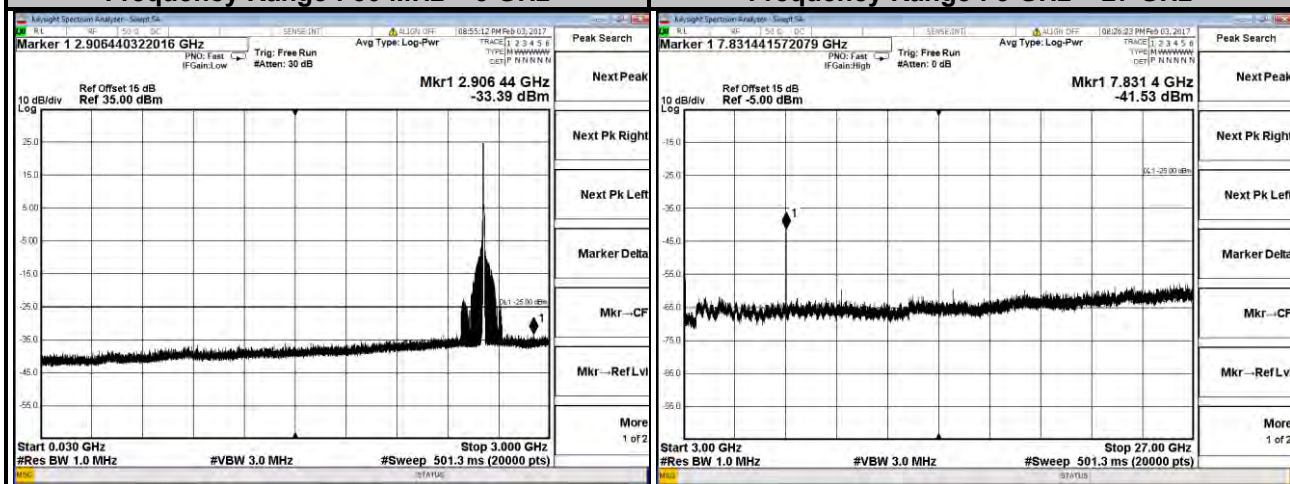
**LTE Band 38**  
**Channel Bandwidth: 10 MHz**  
**Channel 37800**



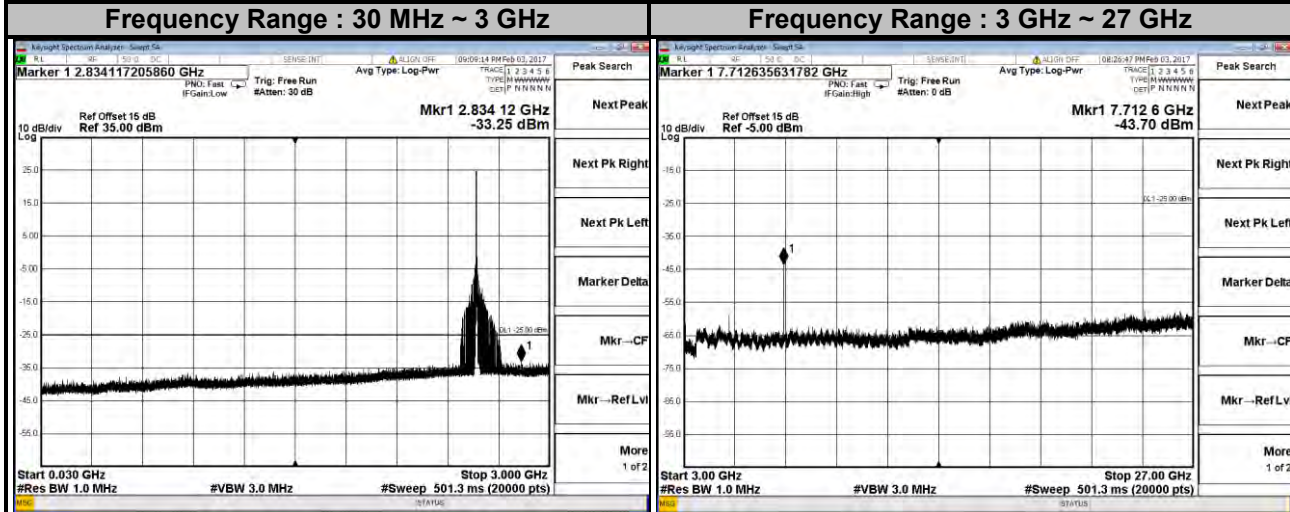
**Channel 38000**



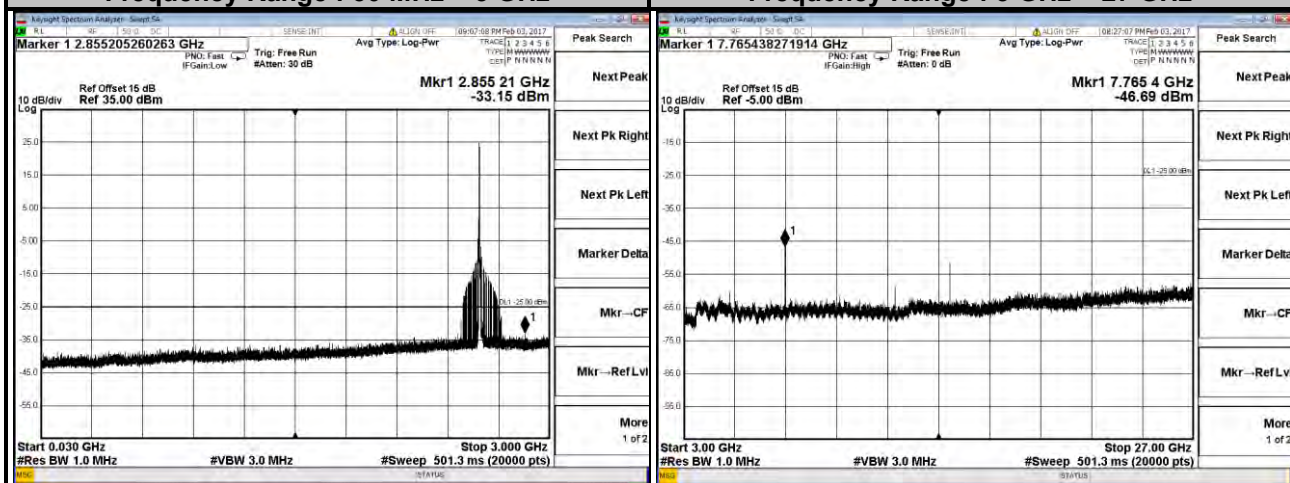
**Channel 38200**



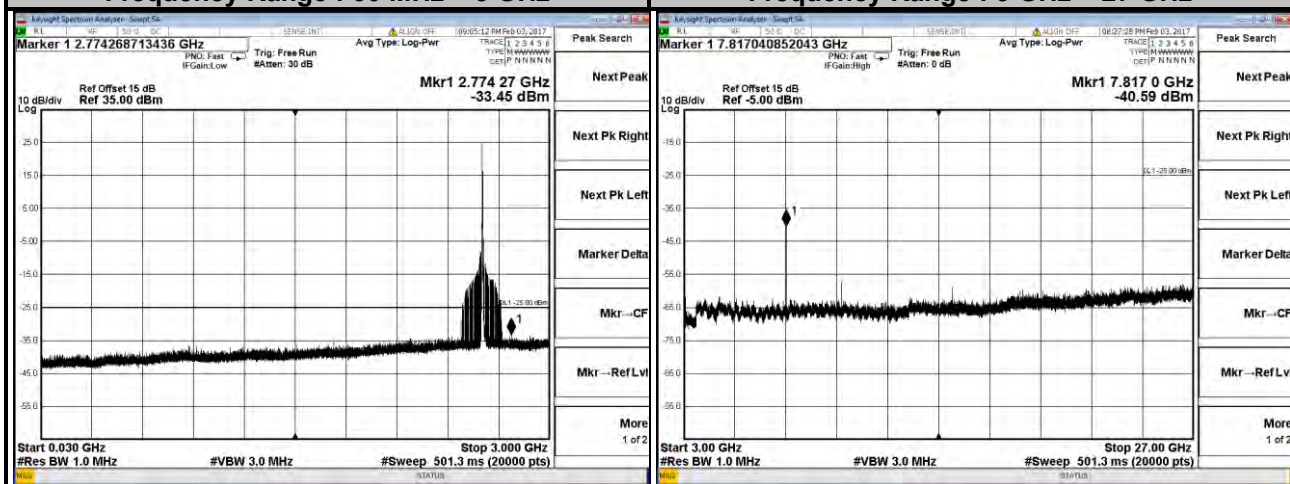
**LTE Band 38**  
**Channel Bandwidth: 15 MHz**  
**Channel 37825**



**Channel 38000**

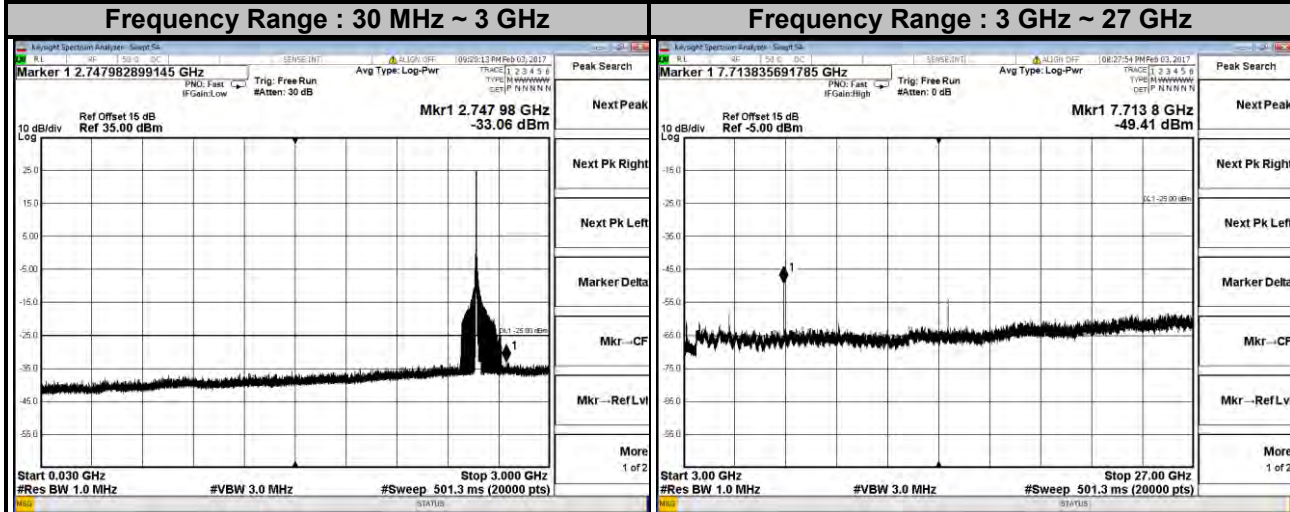


**Channel 38175**

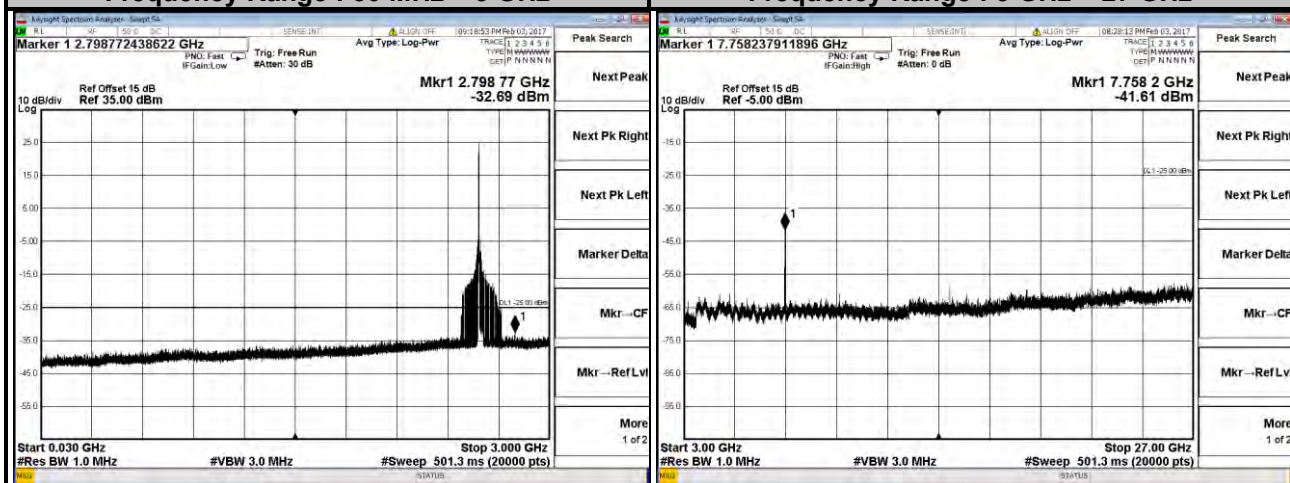




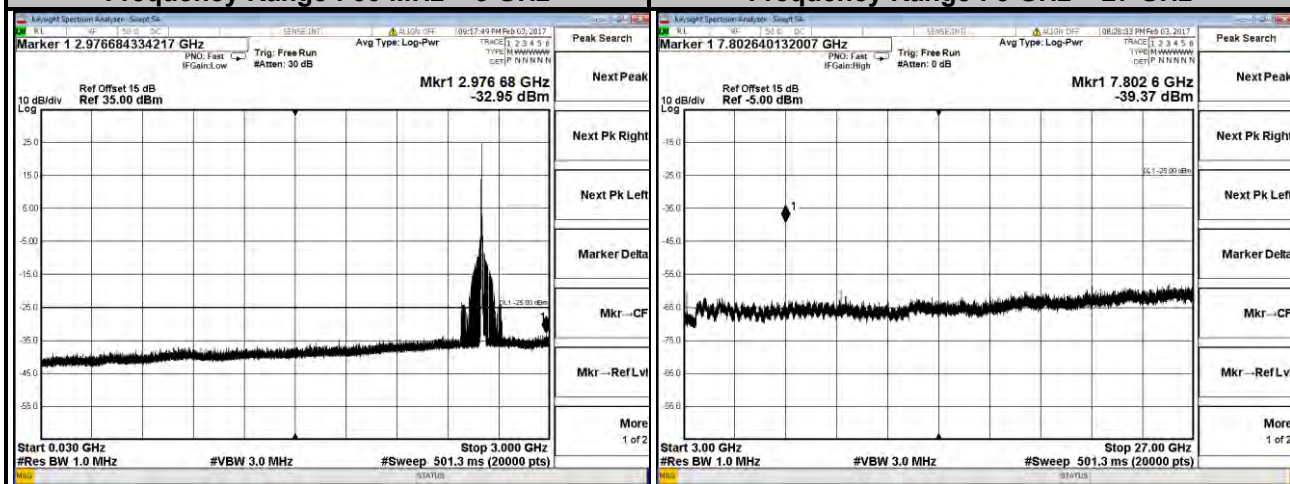
**LTE Band 38**  
**Channel Bandwidth: 20 MHz**  
**Channel 37850**



**Channel 38000**



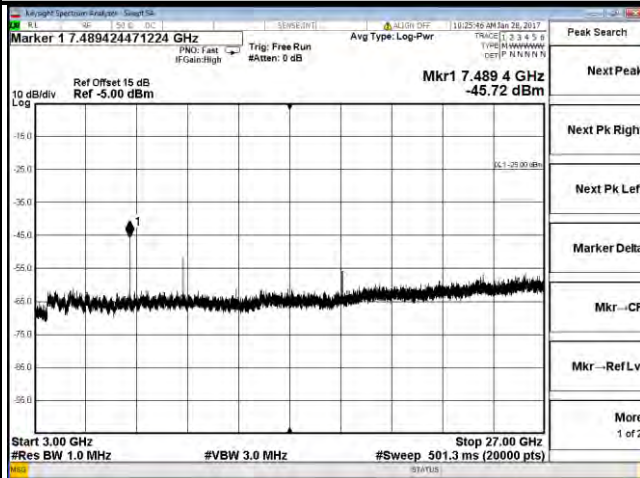
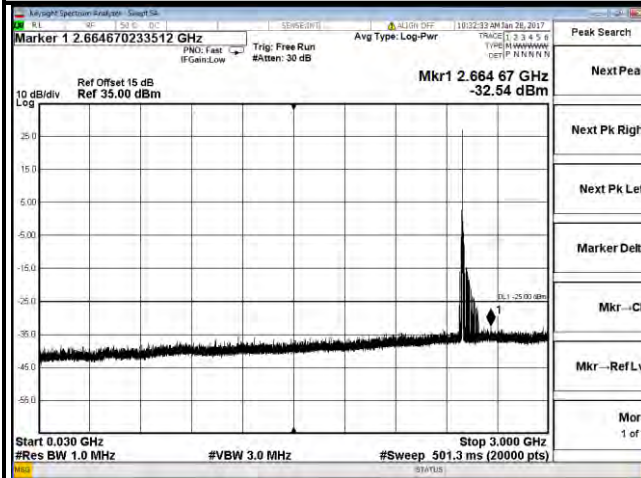
**Channel 38150**



**LTE Band 41**  
**Channel Bandwidth: 5 MHz**  
**Channel 39675**

**Frequency Range : 30 MHz ~ 3 GHz**

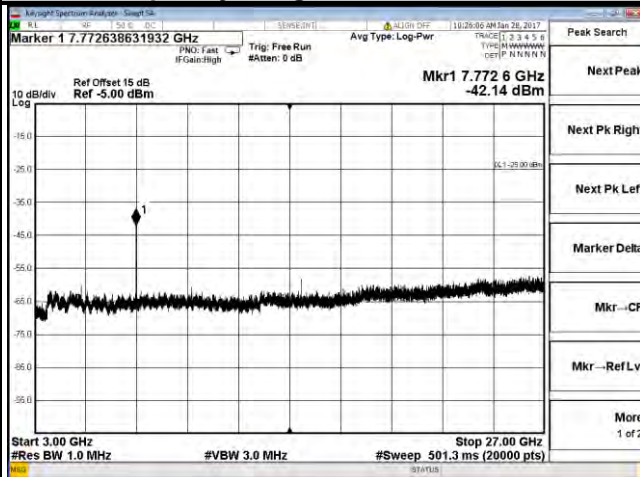
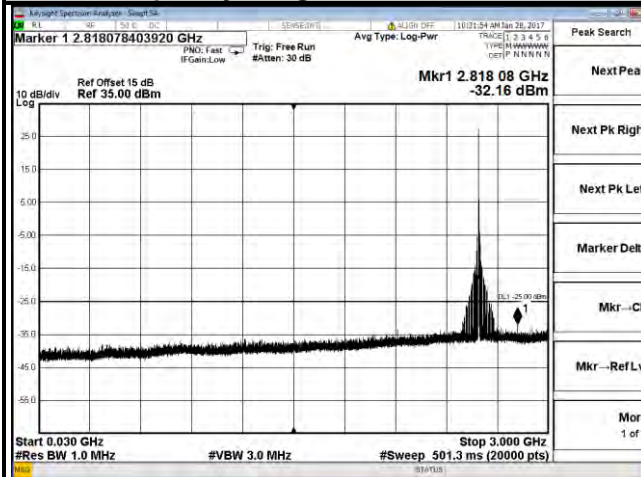
**Frequency Range : 3 GHz ~ 27 GHz**



**Channel 40620**

**Frequency Range : 30 MHz ~ 3 GHz**

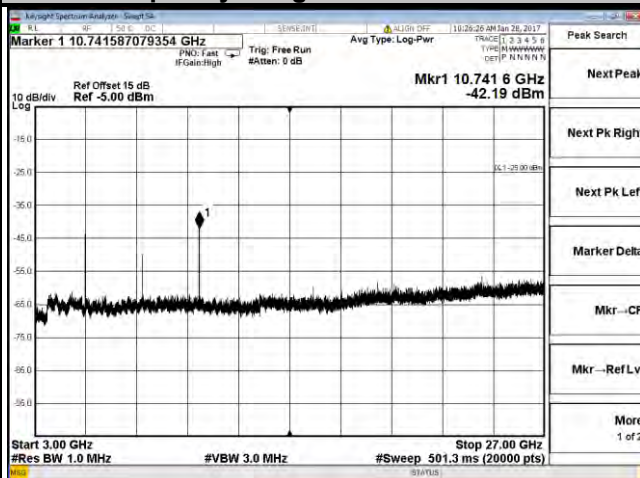
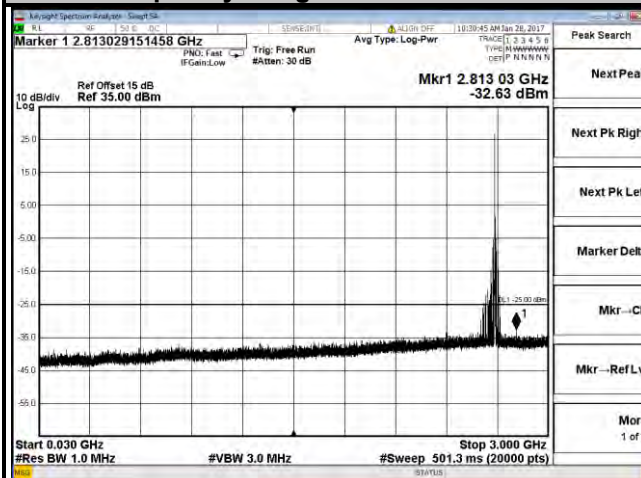
**Frequency Range : 3 GHz ~ 27 GHz**



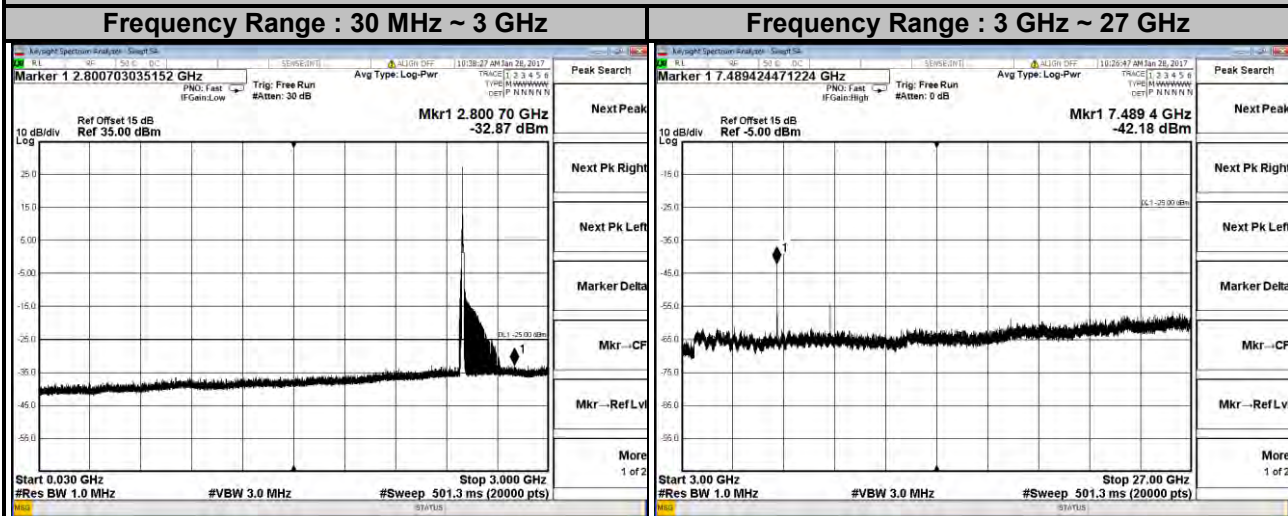
**Channel 41565**

**Frequency Range : 30 MHz ~ 3 GHz**

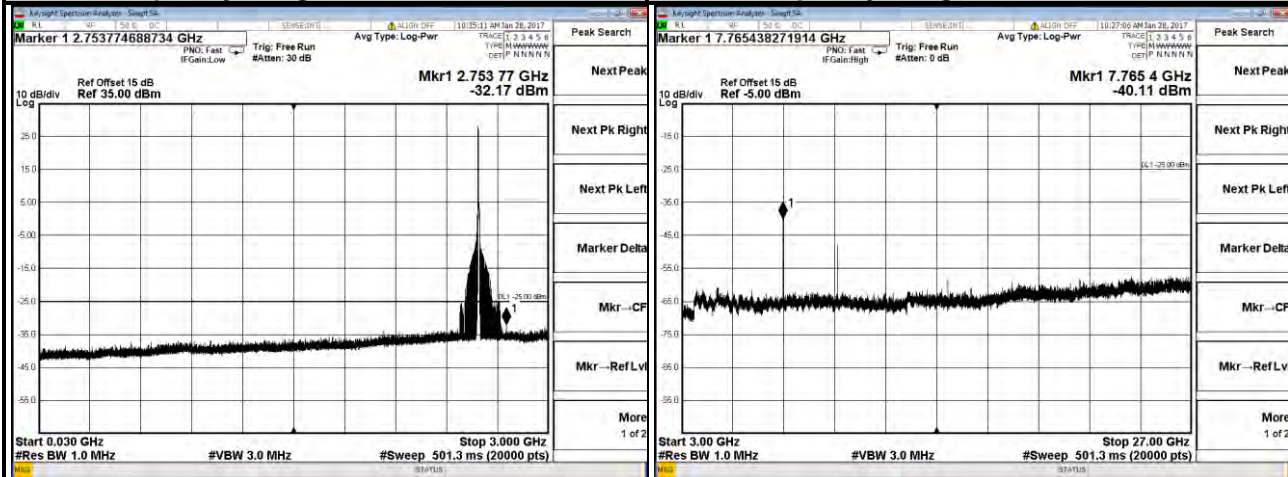
**Frequency Range : 3 GHz ~ 27 GHz**



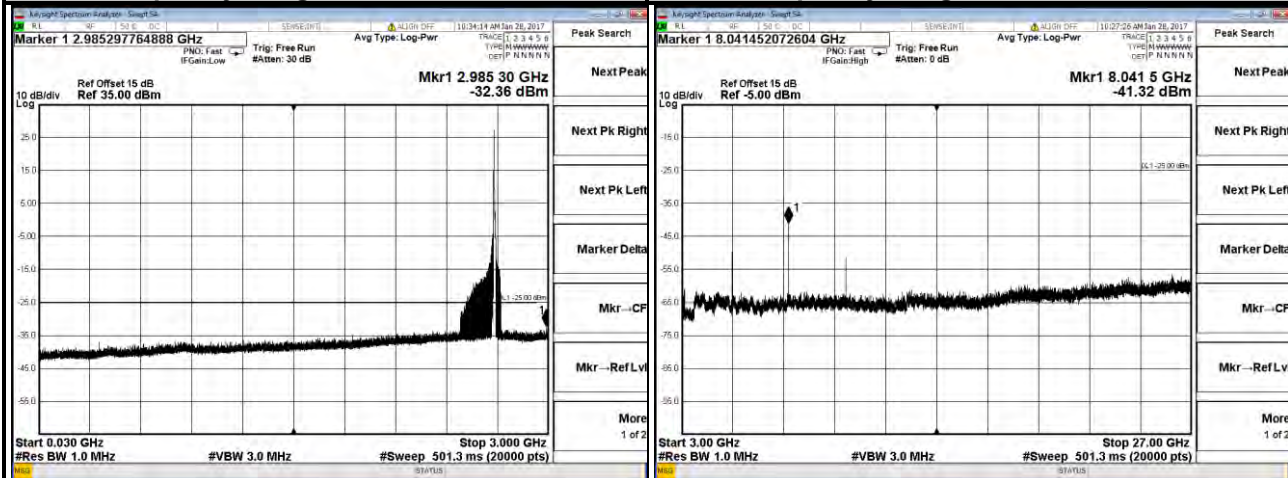
**LTE Band 41**  
**Channel Bandwidth: 10 MHz**  
**Channel 39700**



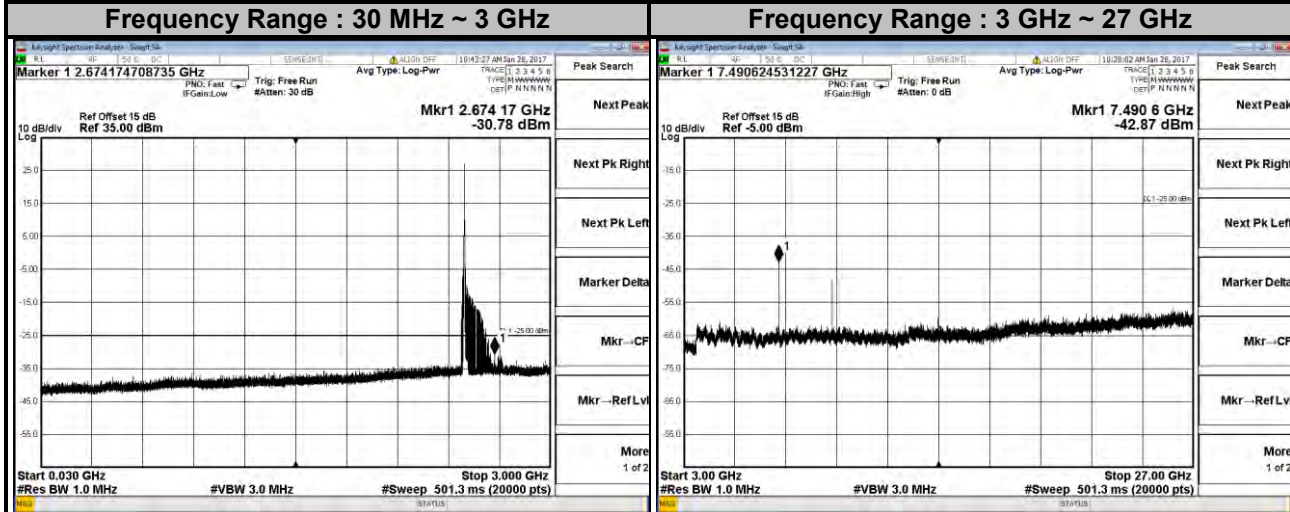
**Channel 40620**



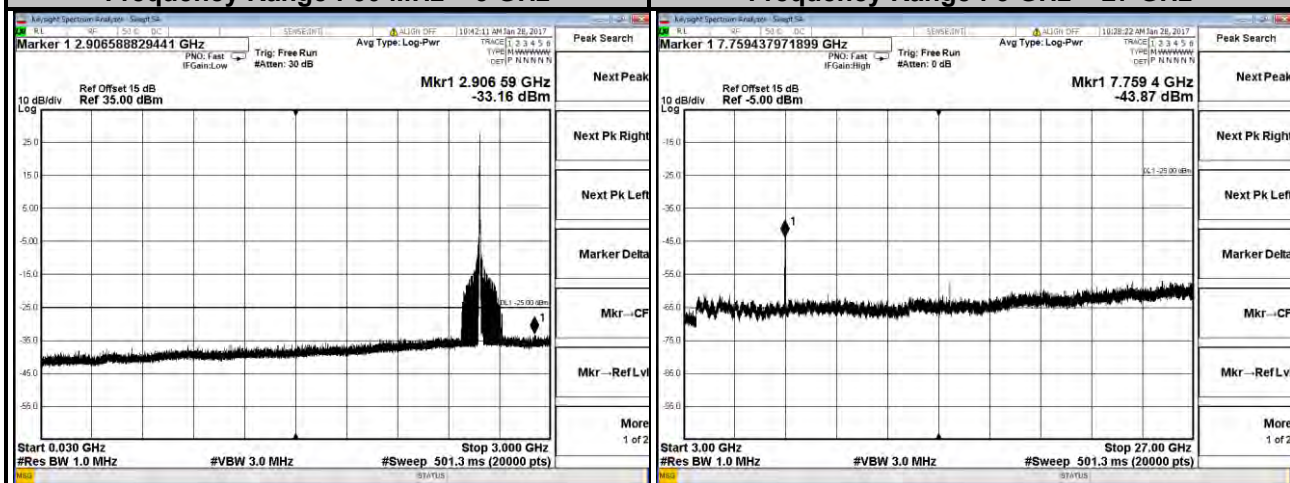
**Channel 41540**



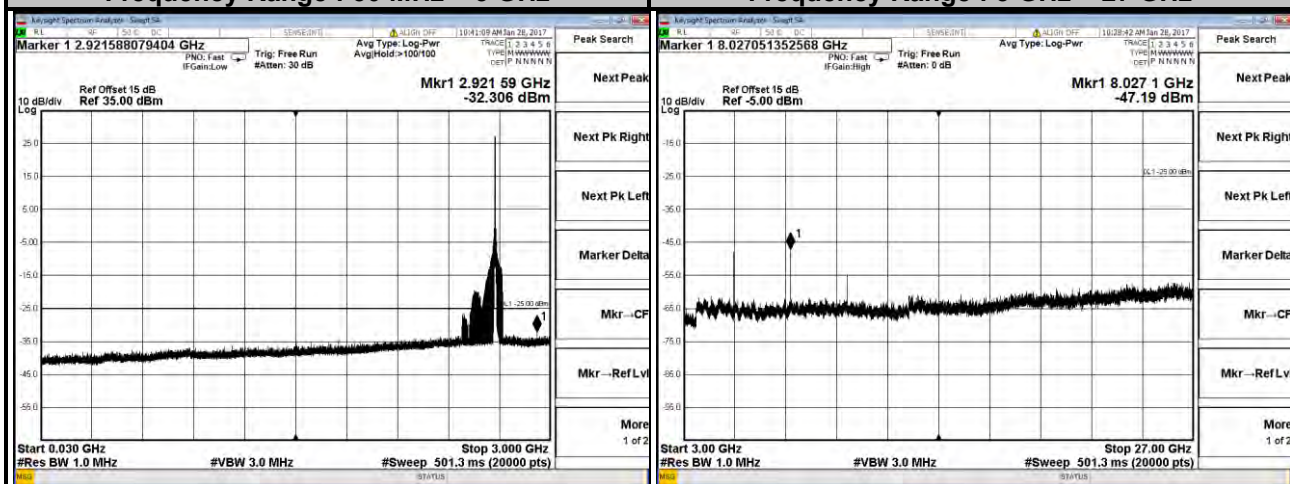
**LTE Band 41**  
**Channel Bandwidth: 15 MHz**  
**Channel 39725**



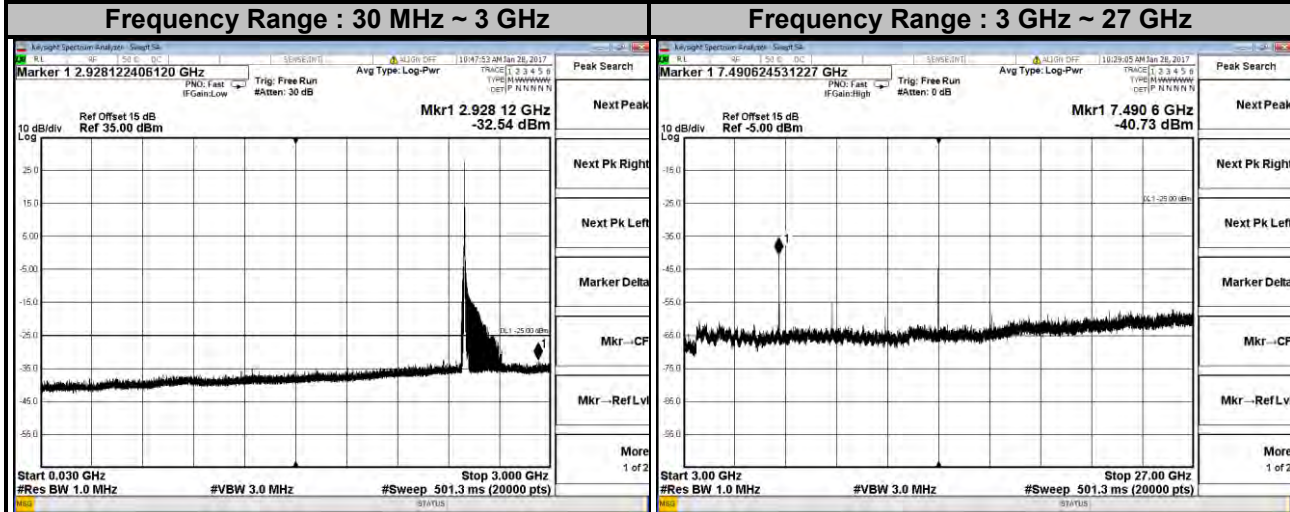
**Channel 40620**



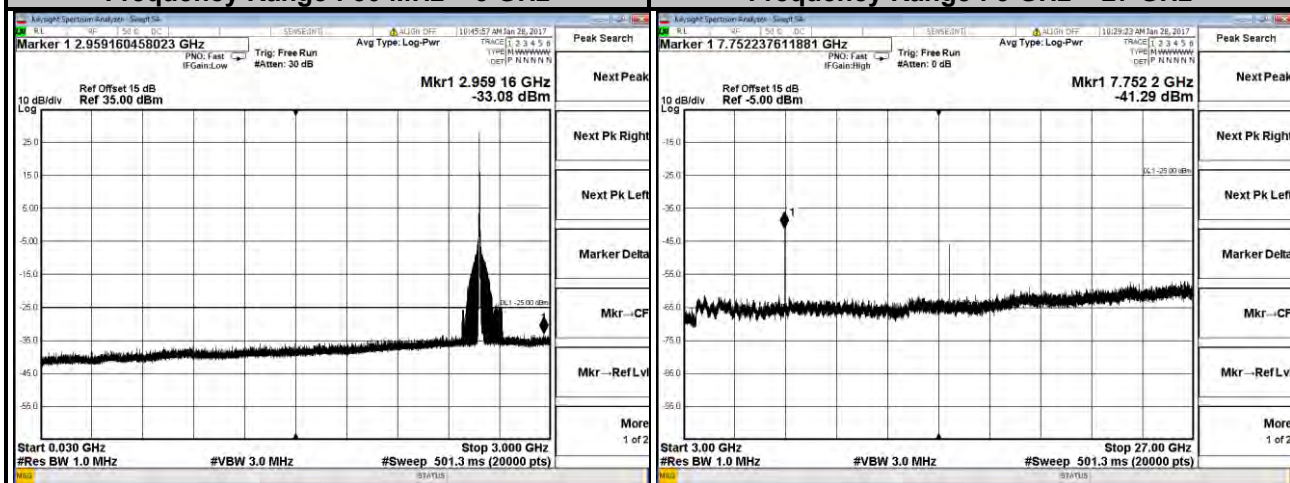
**Channel 41515**



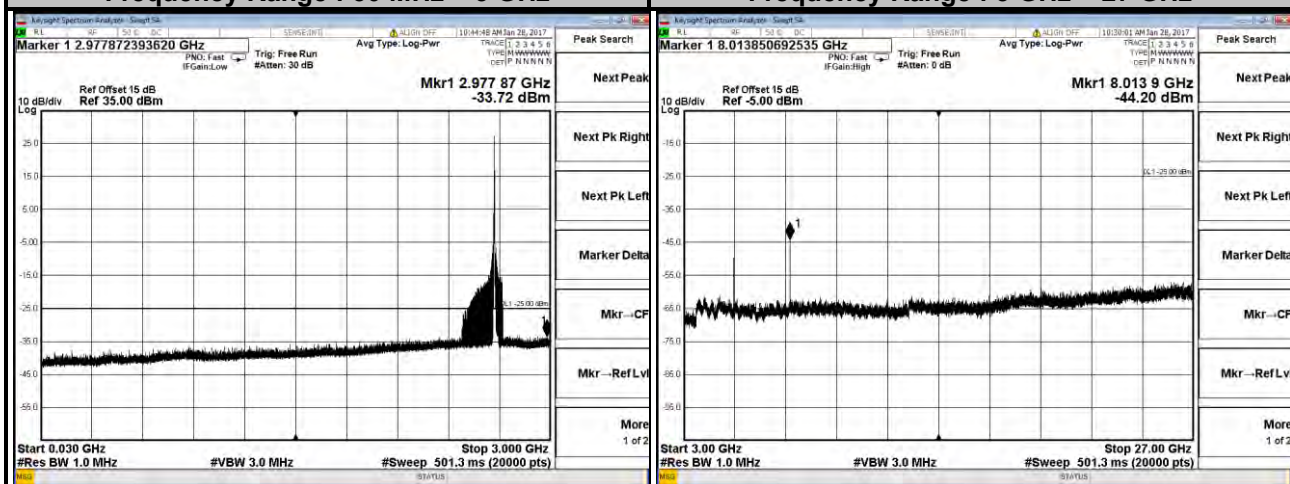
**LTE Band 41**  
**Channel Bandwidth: 20 MHz**  
**Channel 39750**



**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

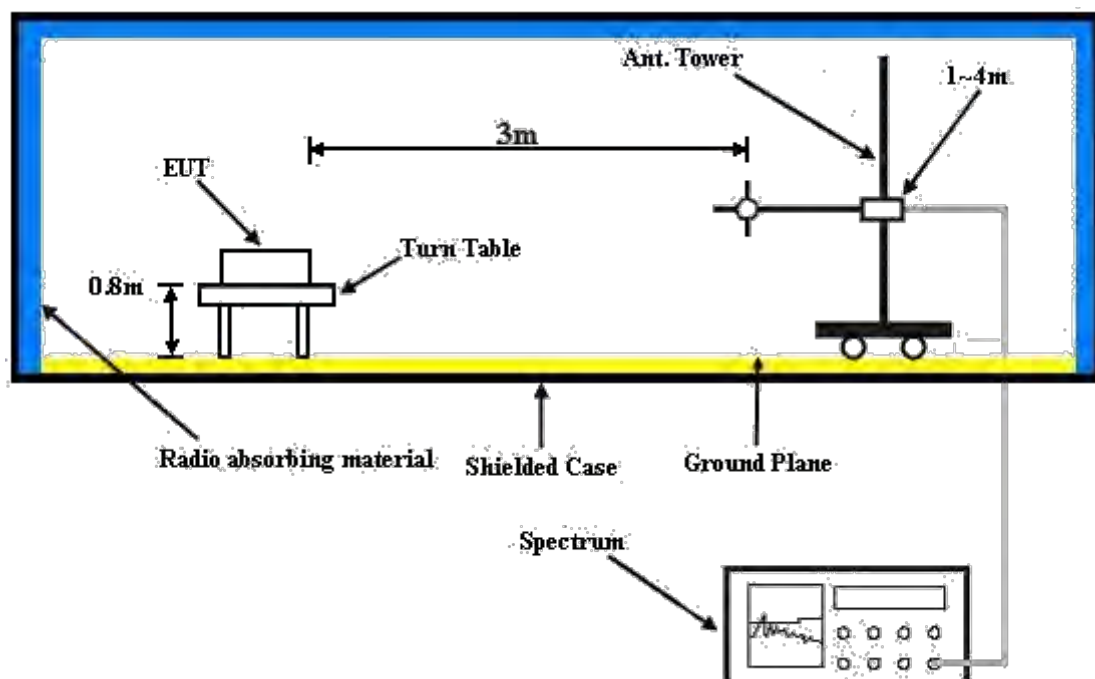
- Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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



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

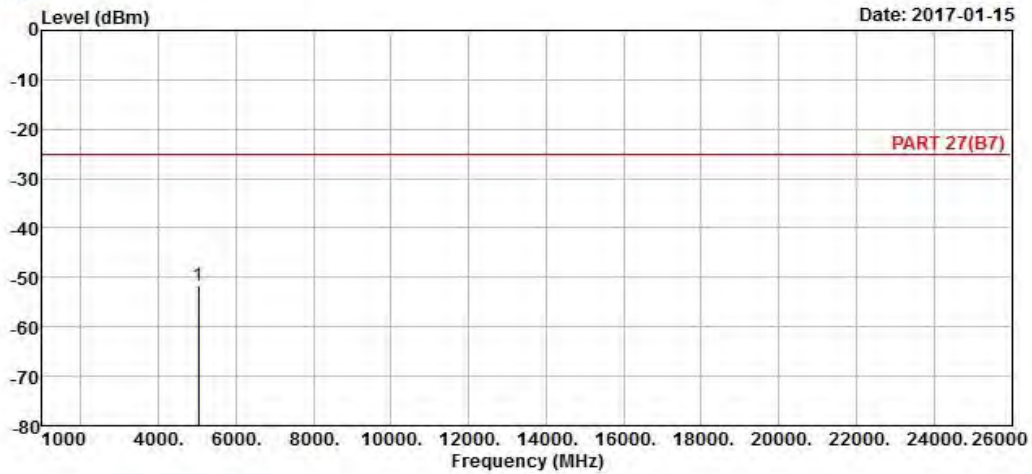
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 Chamber 5  
 Condition: PART 27(B7) HORIZONTAL  
 Remak : LTE Band 7 QPSK\_20M\_L-CH Link  
 Tested by: Gavin Wu

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5020.00	-51.76	-48.53	-25.00	-26.76	-3.23	Peak

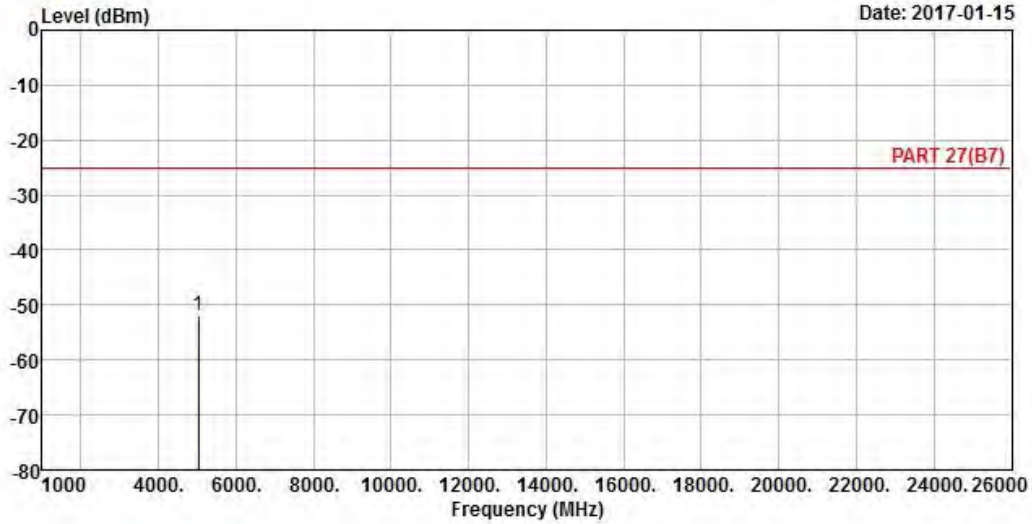


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A D T

Data: 6

Date: 2017-01-15



Site : 966 Chamber 5  
 Condition: PART 27(B7) VERTICAL  
 Remak : LTE Band 7 QPSK\_20M\_L-CH Link  
 Tested by: Gavin Wu

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5020.00	-51.96	-48.73	-25.00	-26.96	-3.23	Peak



Middle Channel

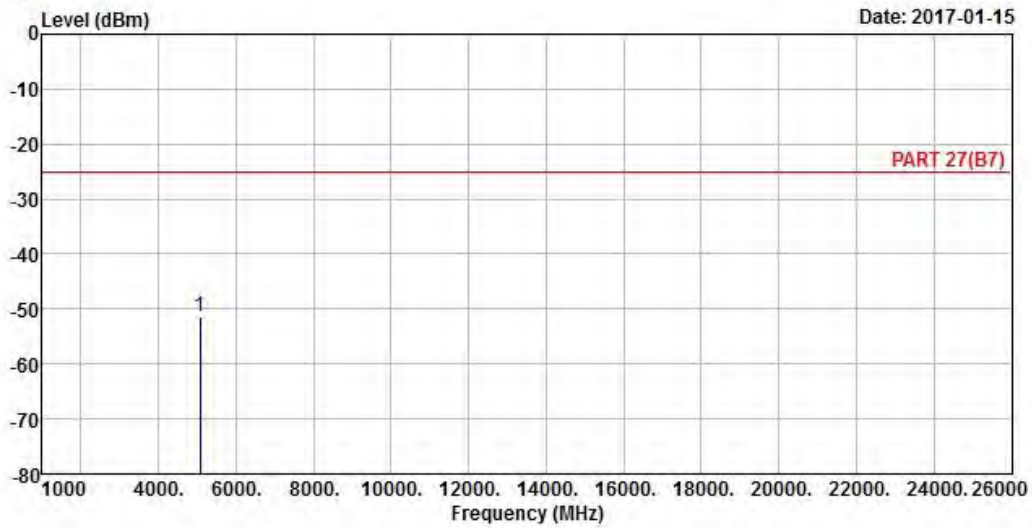


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A D T

Data: 5

Date: 2017-01-15



Site : 966 Chamber 5  
 Condition: PART 27(B7) HORIZONTAL  
 Remak : LTE Band 7 QPSK\_20M\_M-CH Link  
 Tested by: Gavin Wu

Freq	Level	Read Level	Limit	Over	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5070.00	-51.28	-48.16	-25.00	-26.28	-3.12	Peak

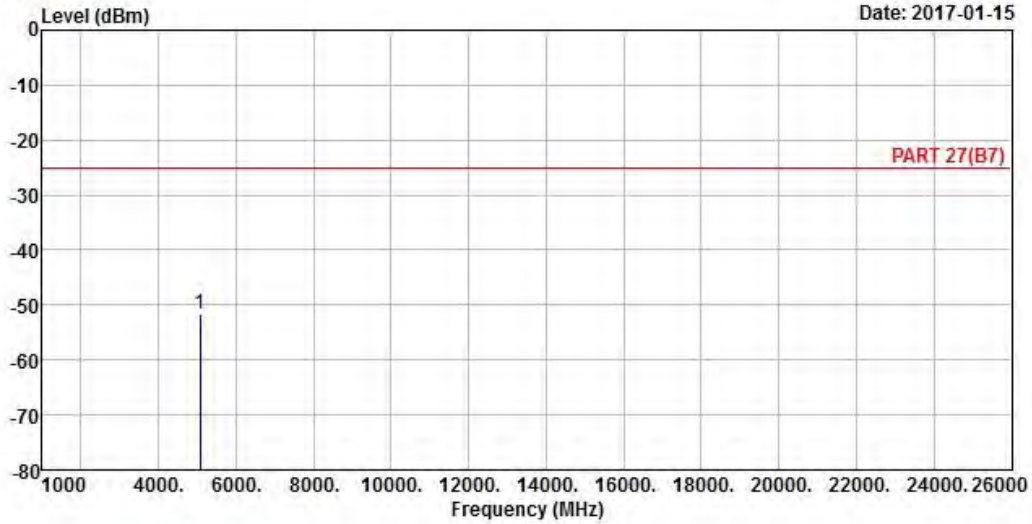


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A D T

Data: 6

Date: 2017-01-15



Site : 966 Chamber 5  
 Condition: PART 27(B7) VERTICAL  
 Remak : LTE Band 7 QPSK\_20M\_M-CH Link  
 Tested by: Gavin Wu

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5070.00	-51.61	-48.49	-25.00	-26.61	-3.12	Peak

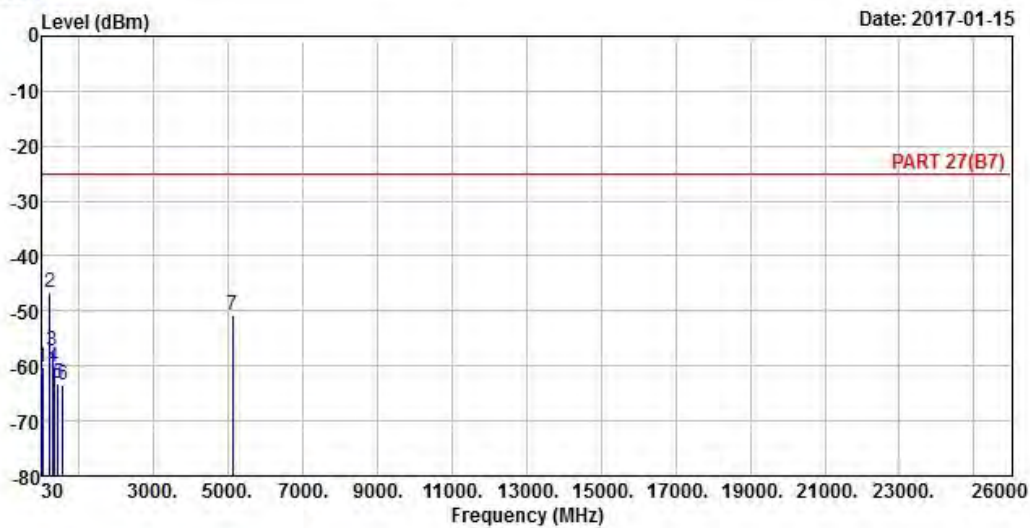
# High Channel



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A D T

Data: 7



Site : 966 Chamber 5  
 Condition: PART 27(B7) HORIZONTAL  
 Remak : LTE Band 7 QPSK\_20M\_H-CH Link  
 Tested by: Gavin Wu

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	42.61	-60.13	-59.19	-25.00	-35.13	-0.94	Peak
2 pp	235.64	-46.61	-40.03	-25.00	-21.61	-6.58	Peak
3	300.63	-57.33	-50.33	-25.00	-32.33	-7.00	Peak
4	338.46	-60.20	-53.78	-25.00	-35.20	-6.42	Peak
5	448.07	-63.26	-57.69	-25.00	-38.26	-5.57	Peak
6	576.11	-63.32	-61.56	-25.00	-38.32	-1.76	Peak
7	5120.00	-50.68	-47.67	-25.00	-25.68	-3.01	Peak

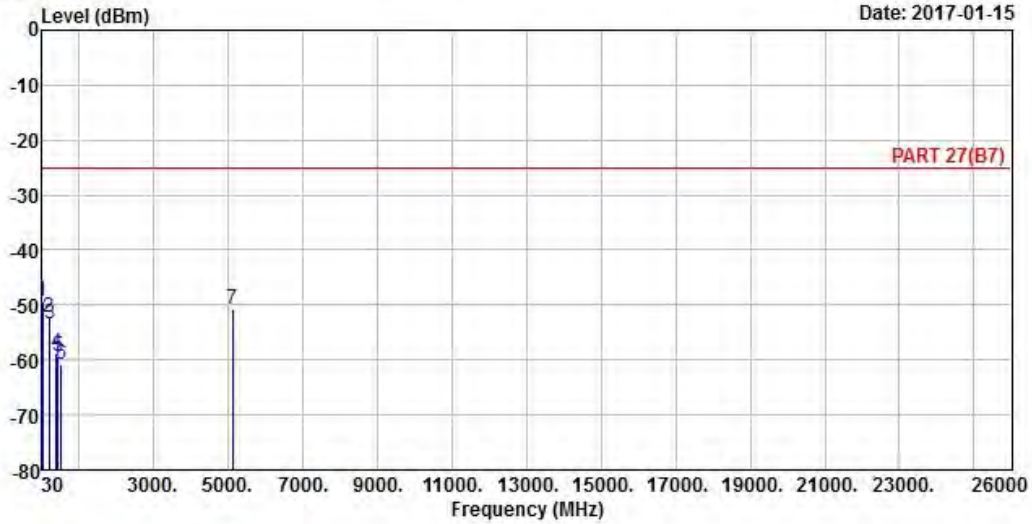


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A D T

Data: 8

Date: 2017-01-15



Site : 966 Chamber 5  
 Condition: PART 27(B7) VERTICAL  
 Remak : LTE Band 7 QPSK\_20M\_H-CH Link  
 Tested by: Gavin Wu

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	41.64	-49.29	-48.88	-25.00	-24.29	-0.41	Peak
2	207.51	-52.18	-44.47	-25.00	-27.18	-7.71	Peak
3	232.73	-53.43	-46.73	-25.00	-28.43	-6.70	Peak
4	402.48	-58.65	-52.72	-25.00	-33.65	-5.93	Peak
5	460.68	-59.43	-54.08	-25.00	-34.43	-5.35	Peak
6	546.04	-60.76	-57.77	-25.00	-35.76	-2.99	Peak
7	5120.00	-50.63	-47.62	-25.00	-25.63	-3.01	Peak

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

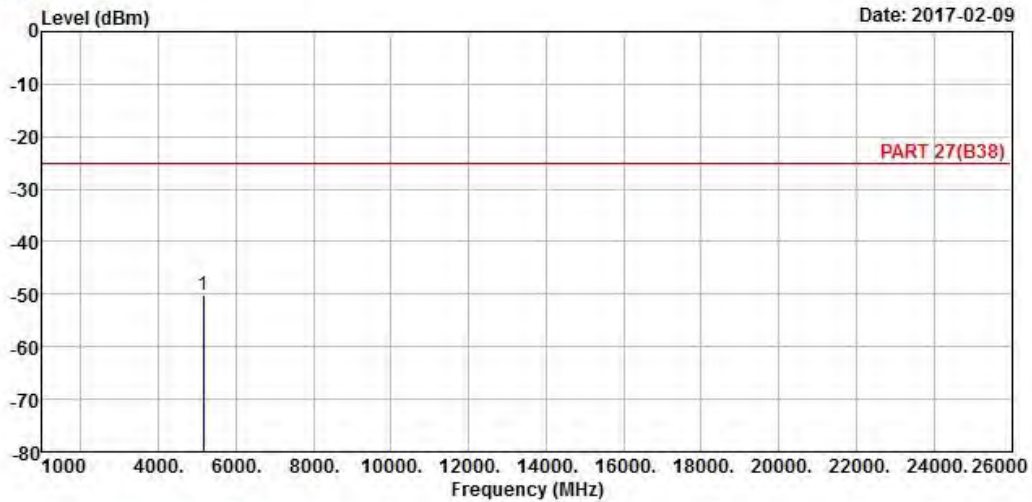


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5

Date: 2017-02-09



Site : 966 Chamber 5  
 Condition: PART 27(B38) HORIZONTAL  
 Remak : LTE Band 38 QPSK\_20M\_L-CH Link  
 Tested by: Getaz Yang

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5160.00	-50.11	-47.18	-25.00	-25.11	-2.93	Peak

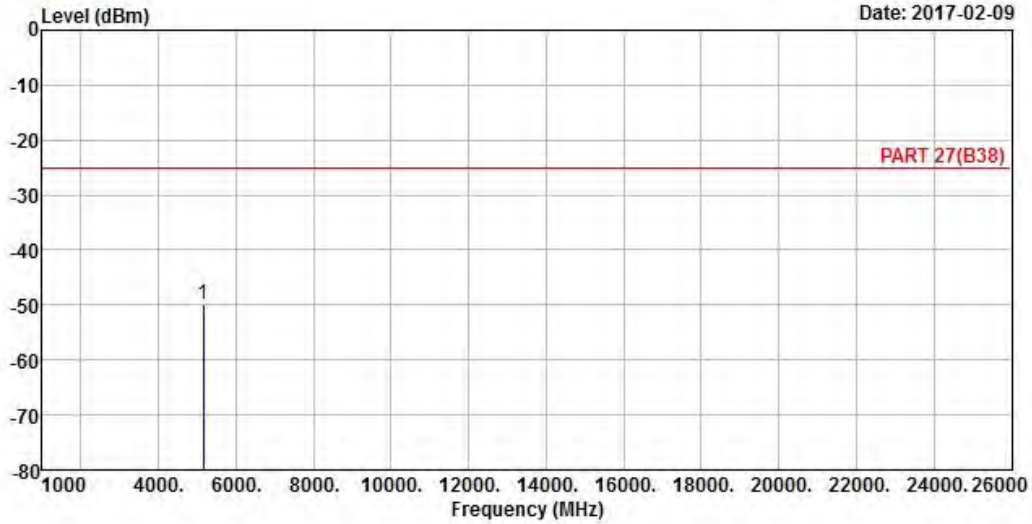


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6

Date: 2017-02-09



Site : 966 Chamber 5  
 Condition: PART 27(B38) VERTICAL  
 Remark : LTE Band 38 QPSK\_20M\_L-CH Link  
 Tested by: Getaz Yang

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5160.00	-49.87	-46.94	-25.00	-24.87	-2.93	Peak

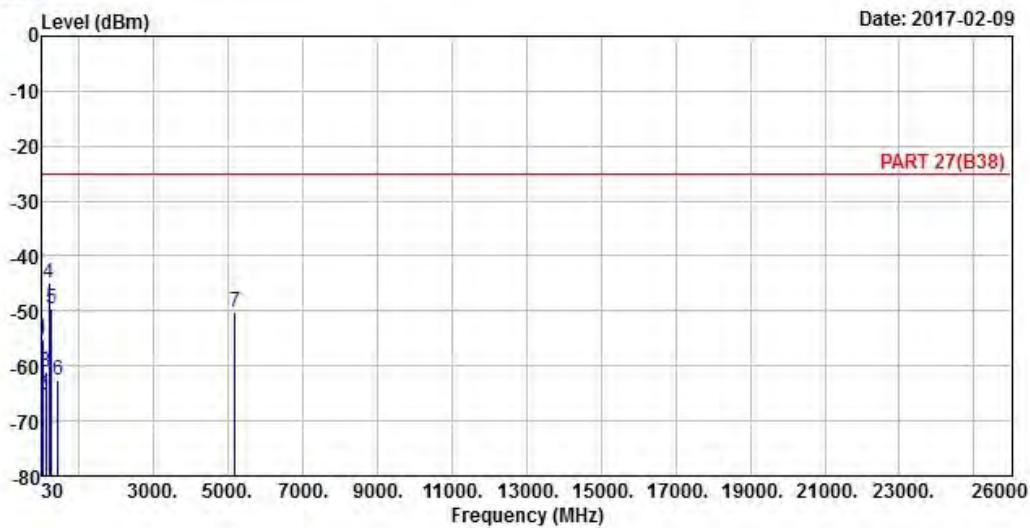
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 7



Site : 966 Chamber 5  
 Condition: PART 27(B38) HORIZONTAL  
 Remak : LTE Band 38 QPSK\_20M\_M-CH Link  
 Tested by: Getaz Yang

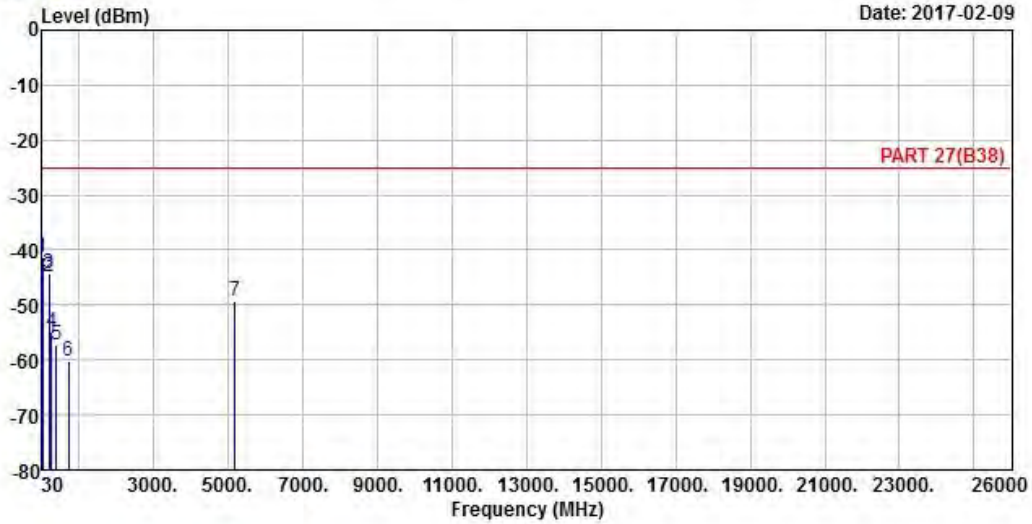
	Freq	Level	Read Level	Limit	Over	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	41.64	-55.33	-54.92	-13.00	-42.33	-0.41	Peak
2	46.49	-65.31	-62.31	-13.00	-52.31	-3.00	Peak
3	114.39	-61.02	-50.91	-13.00	-48.02	-10.11	Peak
4	221.09	-45.01	-37.85	-13.00	-32.01	-7.16	Peak
5	269.59	-49.60	-43.21	-13.00	-36.60	-6.39	Peak
6	444.19	-62.55	-56.95	-13.00	-49.55	-5.60	Peak
7 pp	5190.00	-50.22	-47.36	-25.00	-25.22	-2.86	Peak



A D T

Data: 8

Date: 2017-02-09



Site : 966 Chamber 5  
 Condition: PART 27(B38) VERTICAL  
 Remak : LTE Band 38 QPSK\_20M\_M-CH Link  
 Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	46.49	-41.41	-38.41	-13.00	-28.41	-3.00	Peak
2	206.54	-44.74	-36.99	-13.00	-31.74	-7.75	Peak
3	215.27	-44.38	-36.98	-13.00	-31.38	-7.40	Peak
4	271.53	-54.99	-48.56	-13.00	-41.99	-6.43	Peak
5	402.48	-57.27	-51.34	-13.00	-44.27	-5.93	Peak
6	733.25	-60.36	-60.91	-13.00	-47.36	0.55	Peak
7 pp	5190.00	-49.43	-46.57	-25.00	-24.43	-2.86	Peak



High Channel

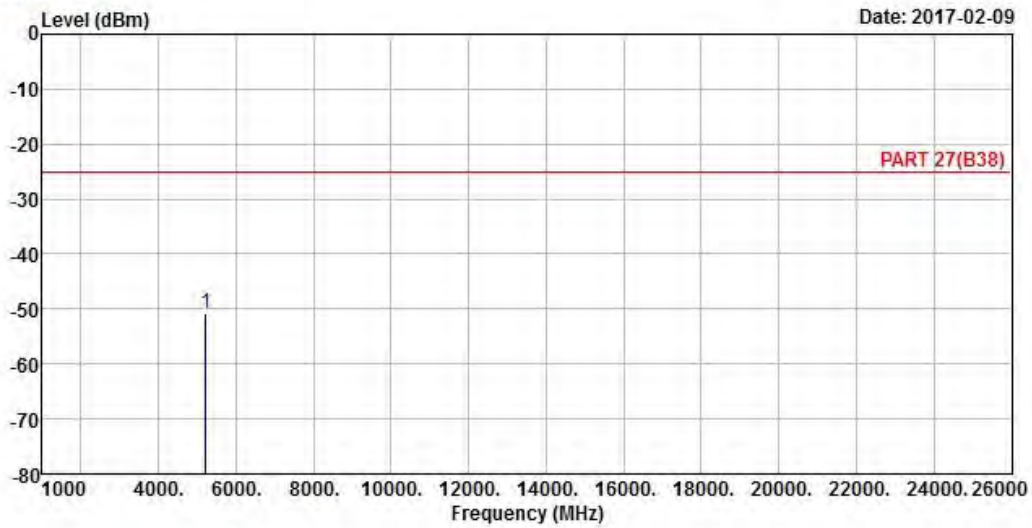


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A D T

Data: 5

Date: 2017-02-09



Site : 966 Chamber 5  
 Condition: PART 27(B38) HORIZONTAL  
 Remak : LTE Band 38 QPSK\_20M\_H-CH Link  
 Tested by: Getaz Yang

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5220.00	-50.76	-48.00	-25.00	-25.76	-2.76	Peak

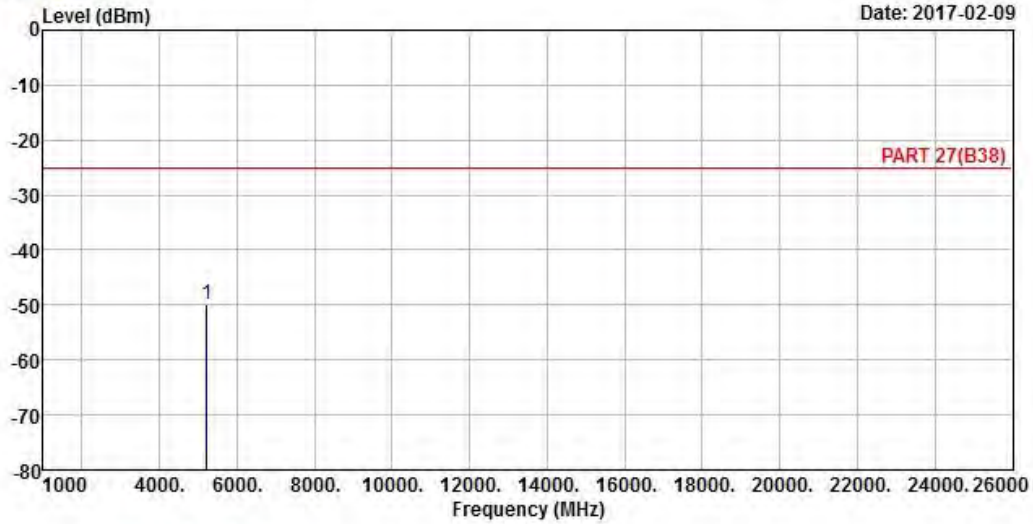


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6

Date: 2017-02-09



Site : 966 Chamber 5  
 Condition: PART 27(B38) VERTICAL  
 Remak : LTE Band 38 QPSK\_20M\_H-CH Link  
 Tested by: Getaz Yang

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5220.00	-49.88	-47.12	-25.00	-24.88	-2.76	Peak

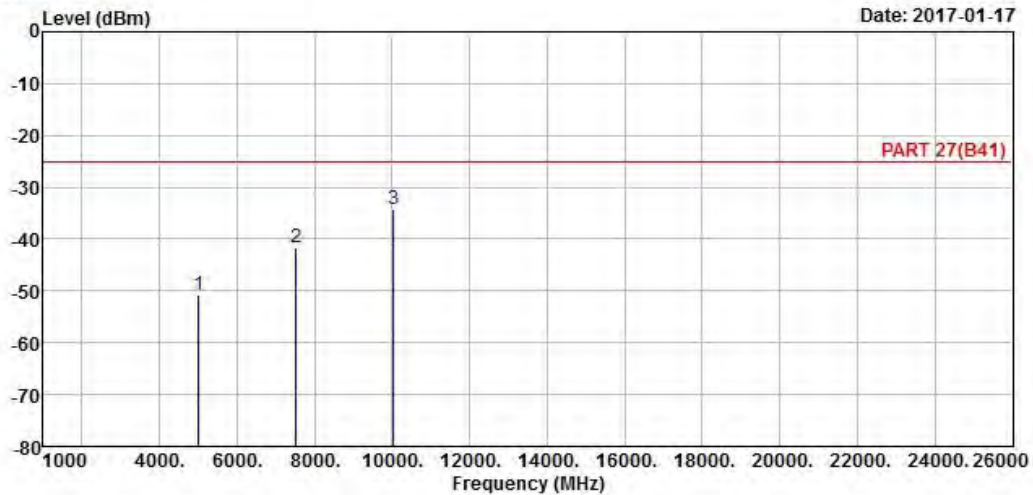
LTE Band 41  
Channel Bandwidth: 20 MHz / QPSK  
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 Chamber 5  
Condition: PART 27(B41) HORIZONTAL  
Remak : LTE Band 41 QPSK\_20M\_L-CH Link  
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5012.00	-50.71	-47.48	-25.00	-25.71	-3.23	Peak
2	7518.00	-41.73	-47.32	-25.00	-16.73	5.59	Peak
3	pp 10024.00	-34.20	-43.13	-25.00	-9.20	8.93	Peak

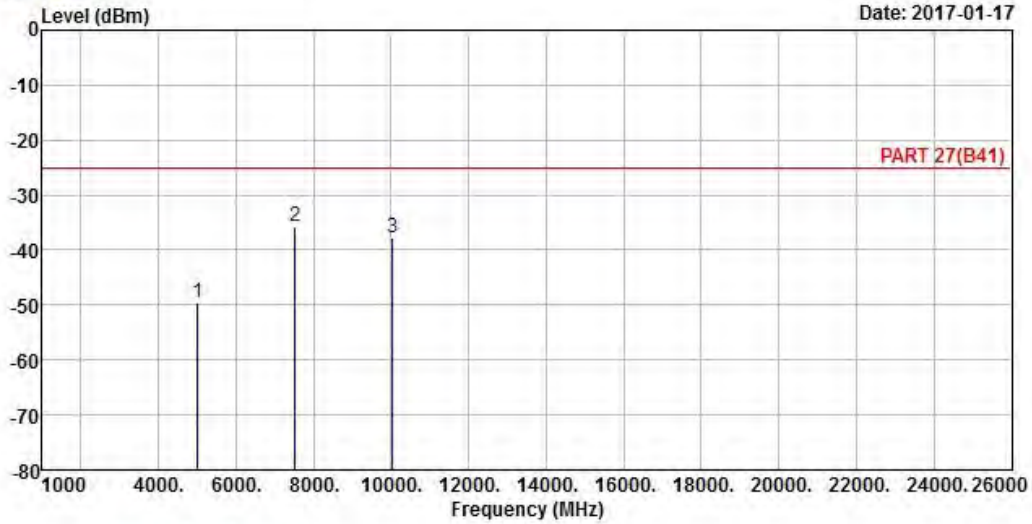


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6

Date: 2017-01-17



Site : 966 Chamber 5  
 Condition: PART 27(B41) VERTICAL  
 Remak : LTE Band 41 QPSK\_20M\_L-CH Link  
 Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5012.00	-49.47	-46.24	-25.00	-24.47	-3.23	Peak
2	pp 7518.00	-35.84	-41.43	-25.00	-10.84	5.59	Peak
3	10024.00	-37.77	-46.70	-25.00	-12.77	8.93	Peak

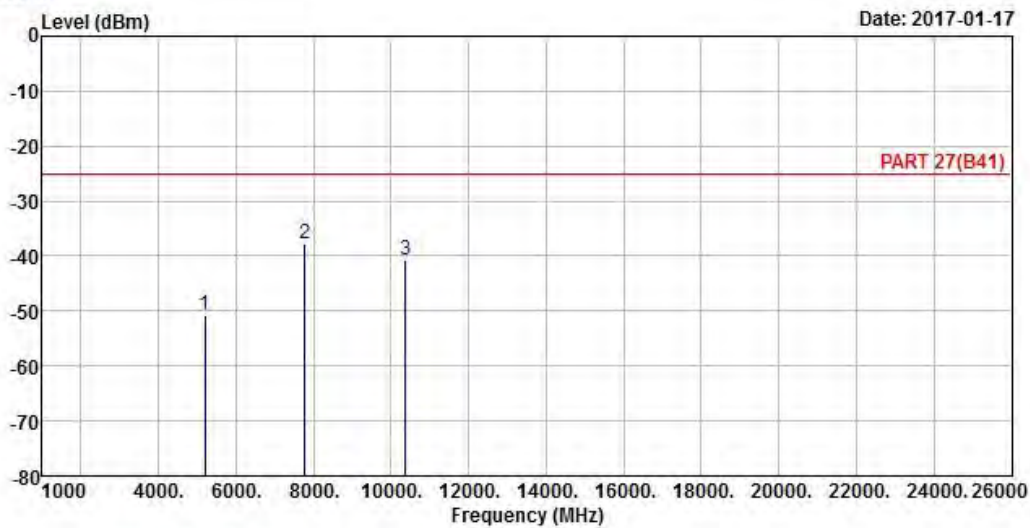
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 Chamber 5  
 Condition: PART 27(B41) HORIZONTAL  
 Remak : LTE Band 41 QPSK\_20M\_M-CH Link  
 Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5186.00	-50.79	-47.93	-25.00	-25.79	-2.86	Peak
2 pp	7779.00	-37.82	-42.94	-25.00	-12.82	5.12	Peak
3	10372.00	-40.84	-49.17	-25.00	-15.84	8.33	Peak

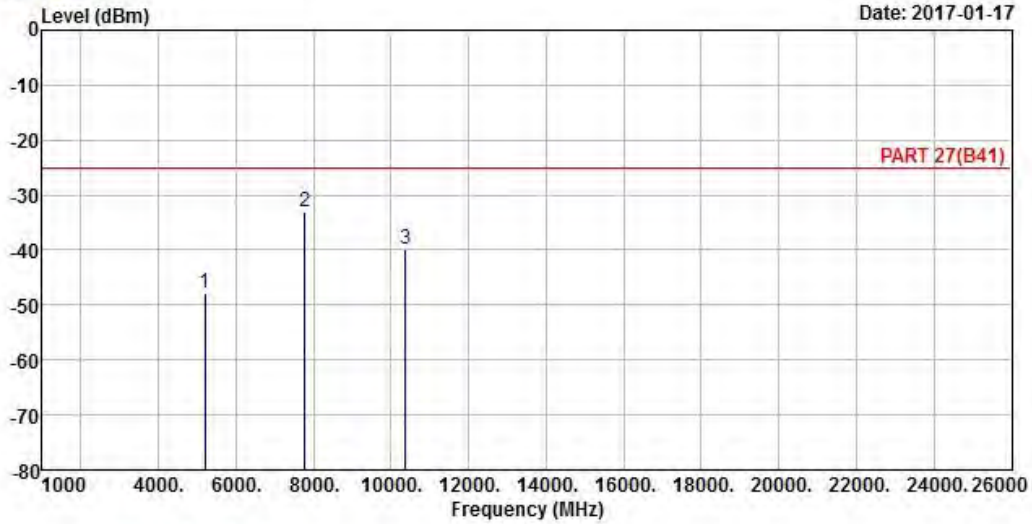


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6

Date: 2017-01-17



Site : 966 Chamber 5  
 Condition: PART 27(B41) VERTICAL  
 Remak : LTE Band 41 QPSK\_20M\_M-CH Link  
 Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5186.00	-47.95	-45.09	-25.00	-22.95	-2.86	Peak
2	pp 7779.00	-33.08	-38.20	-25.00	-8.08	5.12	Peak
3	10372.00	-39.99	-48.32	-25.00	-14.99	8.33	Peak

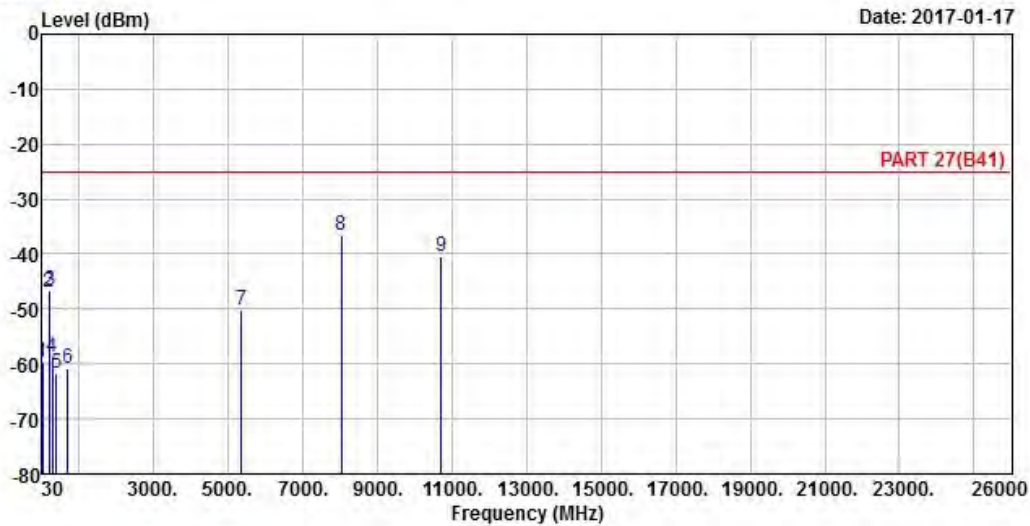
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 Chamber 5  
 Condition: PART 27(B41) HORIZONTAL  
 Remak : LTE Band 41 QPSK\_20M\_H-CH Link  
 Tested by: Getaz Yang

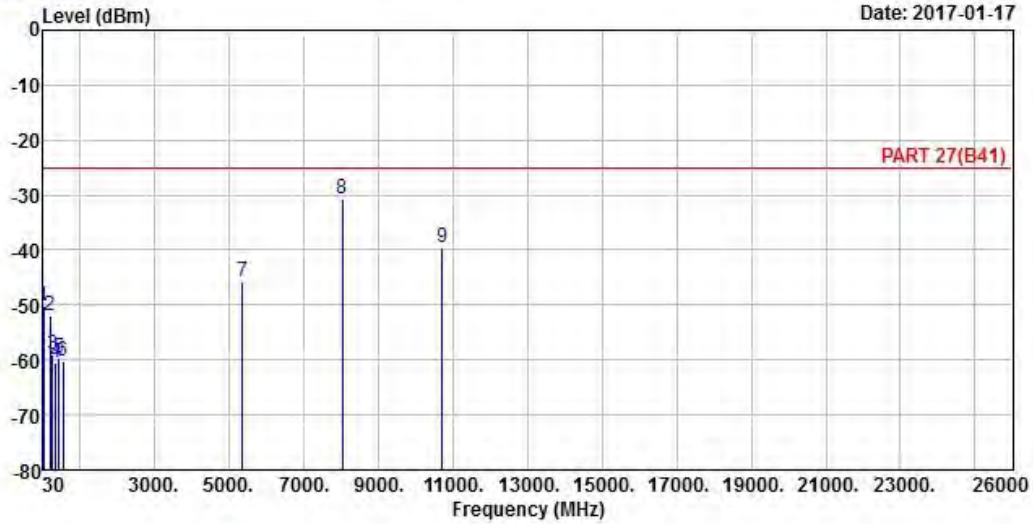
	Freq	Level	Read Level	Limit	Over	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	40.80	-59.65	-59.77	-25.00	-34.65	0.12	Peak
2	206.58	-46.97	-39.22	-25.00	-21.97	-7.75	Peak
3	234.12	-46.55	-39.89	-25.00	-21.55	-6.66	Peak
4	304.20	-58.73	-51.79	-25.00	-33.73	-6.94	Peak
5	400.10	-61.78	-55.84	-25.00	-36.78	-5.94	Peak
6	707.40	-60.96	-61.00	-25.00	-35.96	0.04	Peak
7	5360.00	-50.19	-48.19	-25.00	-25.19	-2.00	Peak
8 pp	8040.00	-36.46	-42.36	-25.00	-11.46	5.90	Peak
9	10720.00	-40.46	-48.64	-25.00	-15.46	8.18	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10



Site : 966 Chamber 5  
 Condition: PART 27(B41) VERTICAL  
 Remak : LTE Band 41 QPSK\_20M\_H-CH Link  
 Tested by: Getaz Yang

	Read	Limit	Over				
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1	41.34	-50.10	-49.69	-25.00	-25.10	-0.41	Peak
2	206.85	-51.92	-44.17	-25.00	-26.92	-7.75	Peak
3	265.44	-59.07	-52.76	-25.00	-34.07	-6.31	Peak
4	365.80	-60.40	-54.25	-25.00	-35.40	-6.15	Peak
5	455.40	-59.63	-54.19	-25.00	-34.63	-5.44	Peak
6	554.80	-60.30	-57.65	-25.00	-35.30	-2.65	Peak
7	5360.00	-45.88	-43.88	-25.00	-20.88	-2.00	Peak
8 pp	8040.00	-30.68	-36.58	-25.00	-5.68	5.90	Peak
9	10720.00	-39.56	-47.74	-25.00	-14.56	8.18	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 accredited and approved according to ISO/IEC 17025.

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

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**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.

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