

LTE Band 7

Channel Bandwidth: 10 MHz / QPSK

<Adjacent Channel Band Edge>

Channel

20800

50 RB

Channel

20800

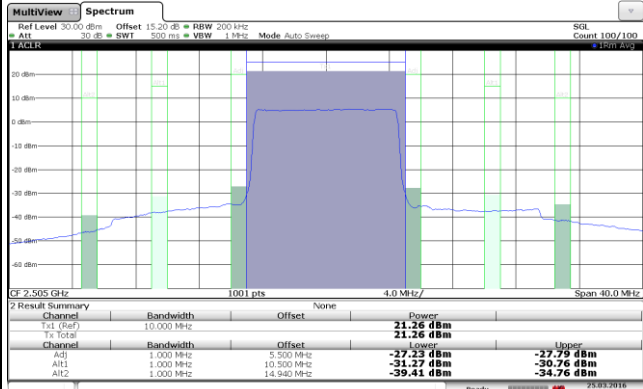
50 RB

Low

High



Date: 25 MAR 2016 14:44:04

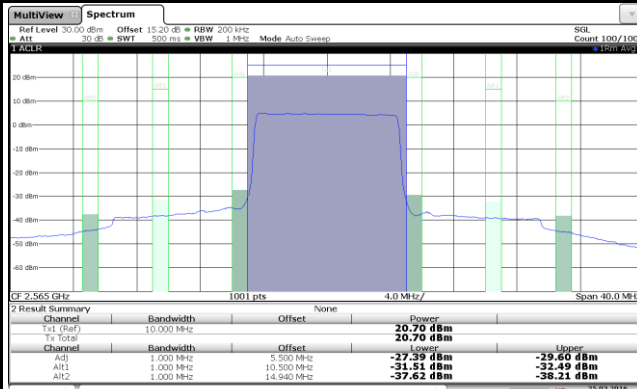


Date: 25 MAR 2016 14:38:54

Channel

21400

50 RB



Date: 25 MAR 2016 14:40:24

<Channel Band Edge>

Channel

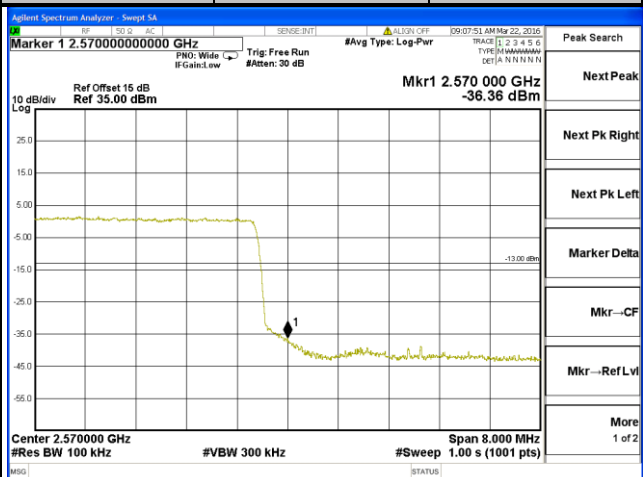
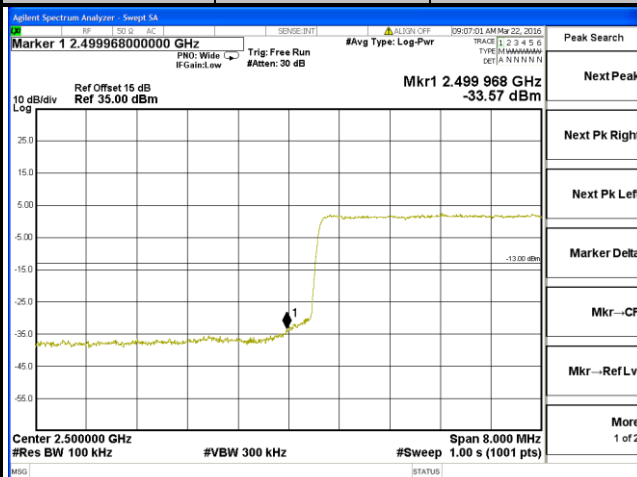
20800

50 RB

Channel

21400

50 RB



LTE Band 7

Channel Bandwidth: 10 MHz / 16QAM

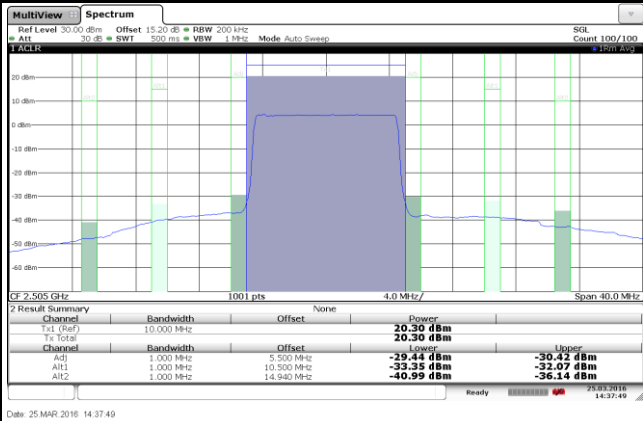
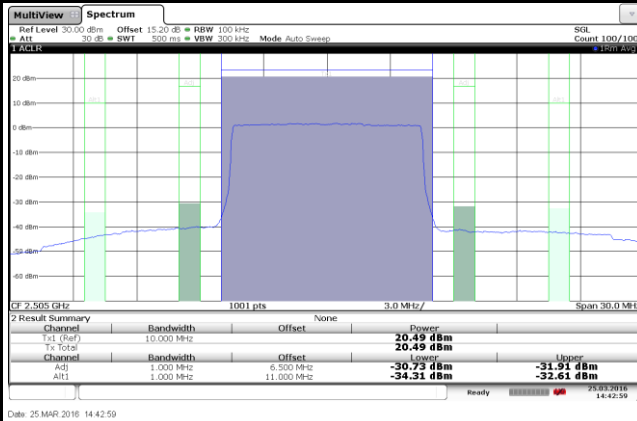
<Adjacent Channel Band Edge>

Channel 20800
Low

50 RB

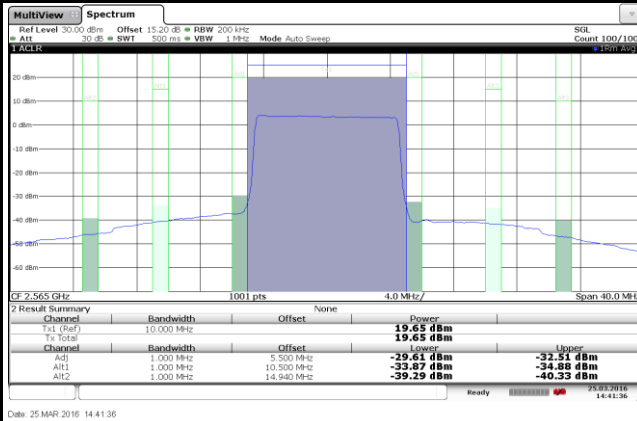
Channel 20800
High

50 RB



Channel 21400

50 RB



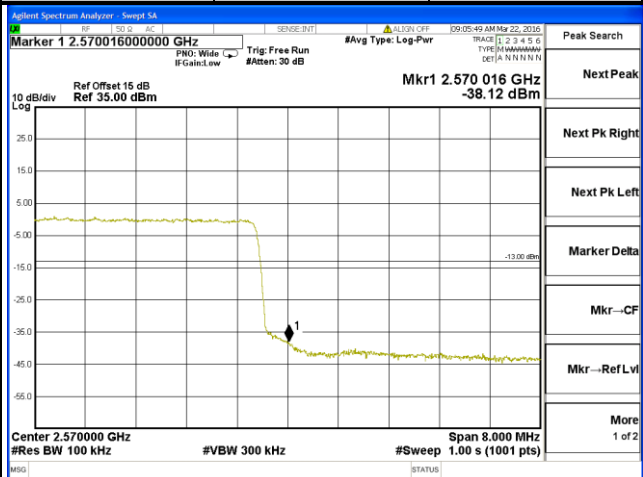
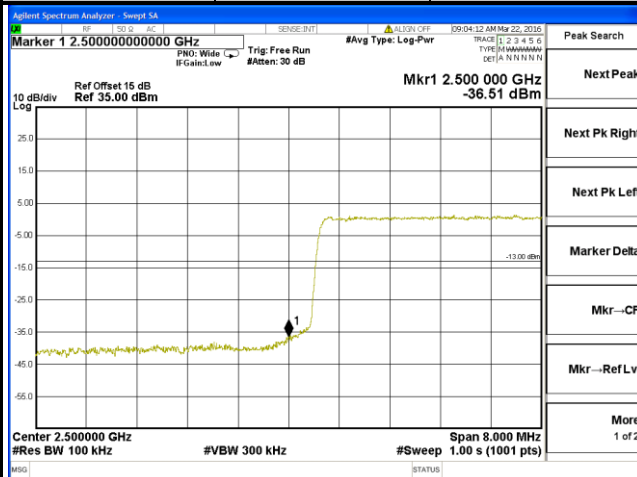
<Channel Band Edge>

Channel 20800

50 RB

Channel 21400

50 RB





A D T

LTE Band 7

Channel Bandwidth: 15 MHz / QPSK

<Adjacent Channel Band Edge>

Channel

20825

75 RB

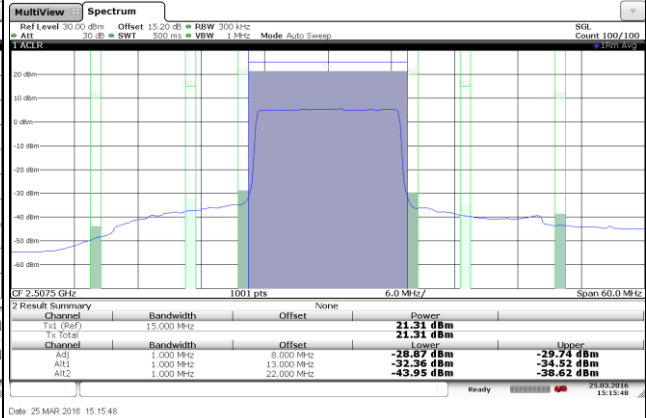
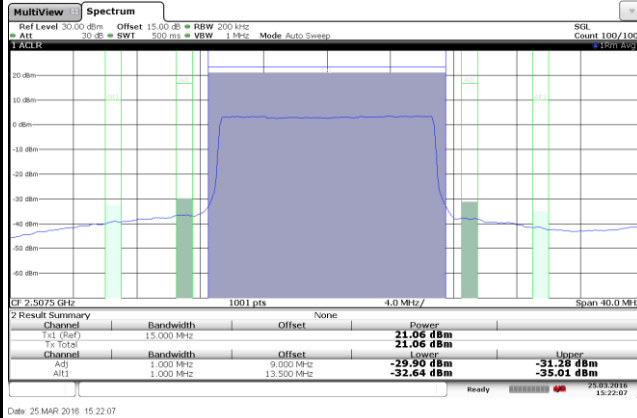
Channel

20825

75 RB

Low

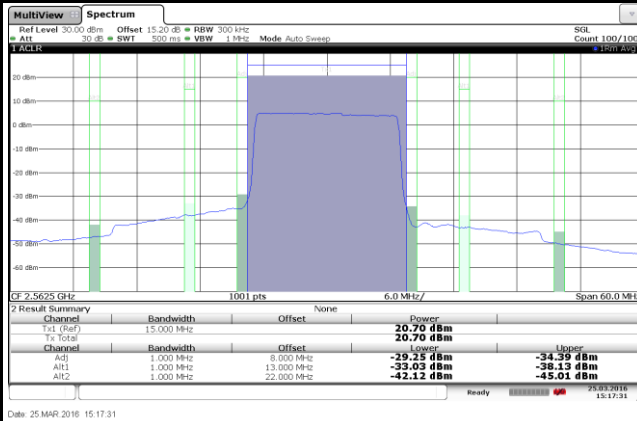
High



Channel

21375

75 RB



<Channel Band Edge>

Channel

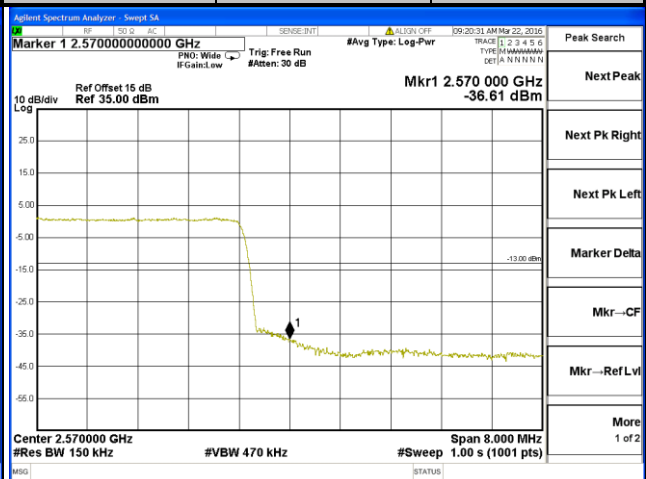
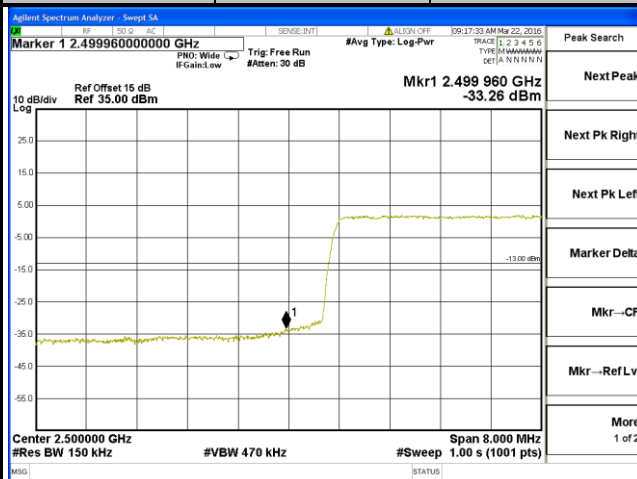
20825

75 RB

Channel

21375

75 RB





A D T

LTE Band 7

Channel Bandwidth: 15 MHz / 16QAM

<Adjacent Channel Band Edge>

Channel

20825

75 RB

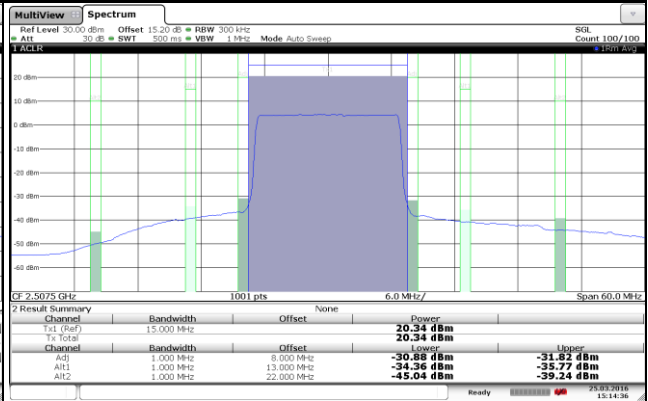
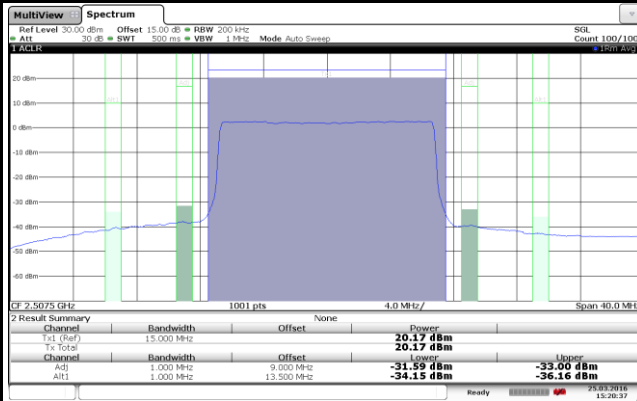
Channel

20825

75 RB

Low

High



Channel

21375

75 RB



<Channel Band Edge>

Channel

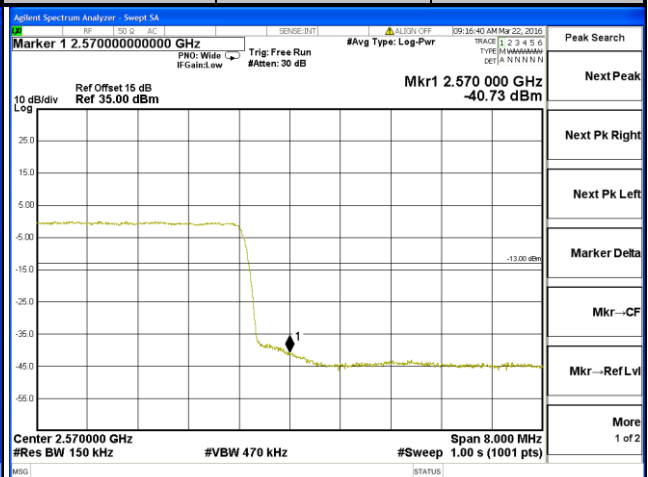
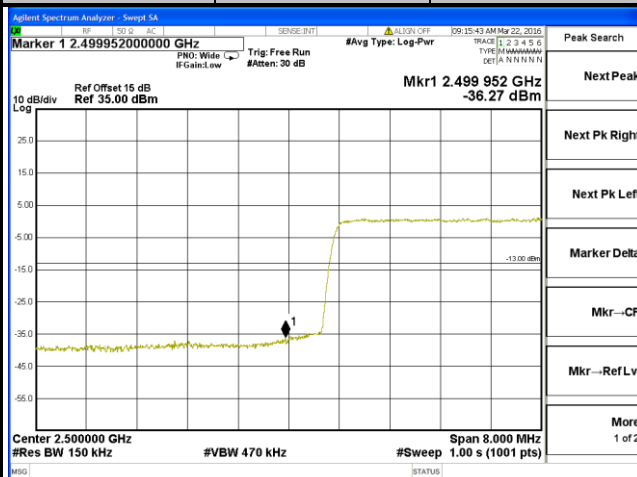
20825

75 RB

Channel

21375

75 RB



LTE Band 7

Channel Bandwidth: 20 MHz / QPSK

<Adjacent Channel Band Edge>

Channel

20850

100 RB

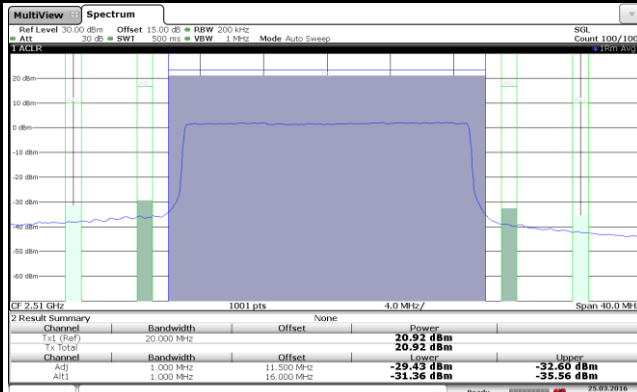
Channel

20850

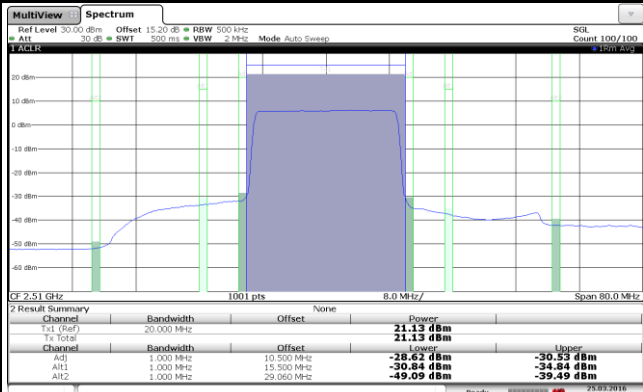
100 RB

Low

High



Date: 25 MAR 2016 15:32:23

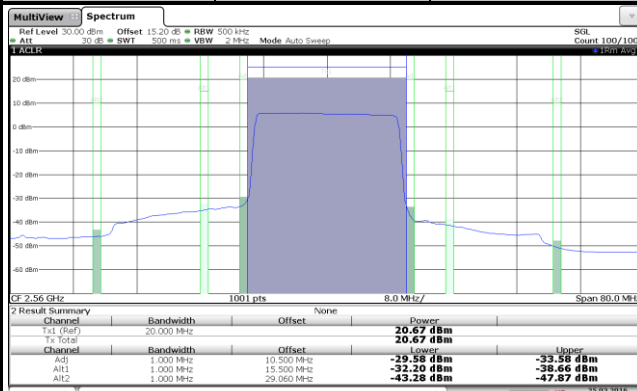


Date: 25 MAR 2016 15:26:47

Channel

21350

100 RB



Date: 25 MAR 2016 15:28:08

<Channel Band Edge>

Channel

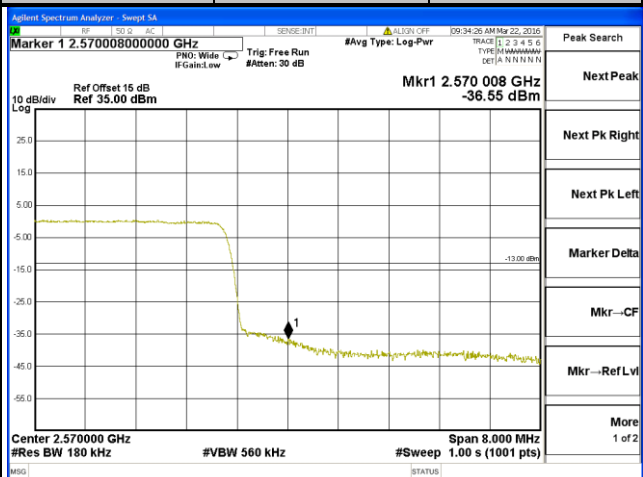
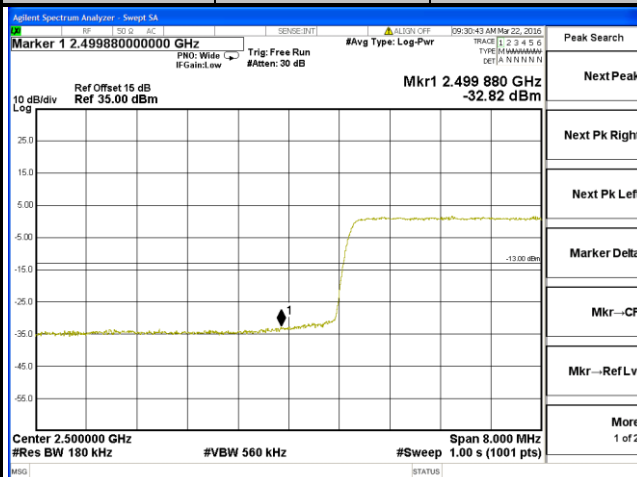
20850

100 RB

Channel

21350

100 RB



LTE Band 7

Channel Bandwidth: 20 MHz / 16QAM

<Adjacent Channel Band Edge>

Channel

20850

100 RB

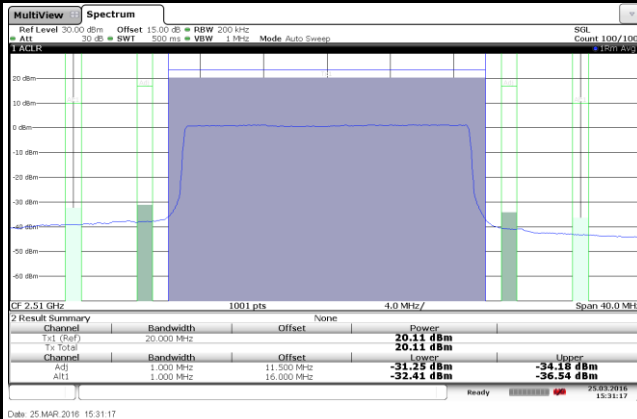
Channel

20850

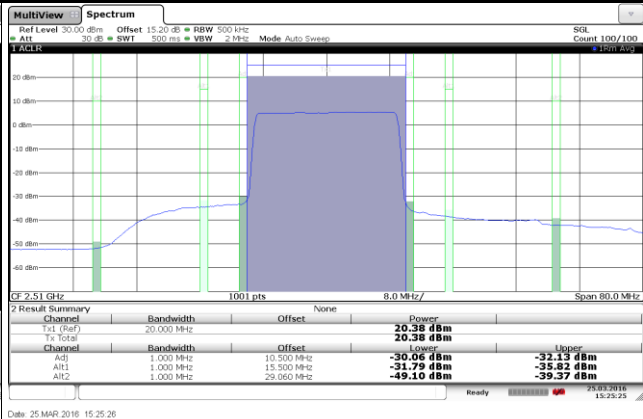
100 RB

Low

High



Date: 25 MAR 2016 15:31:17

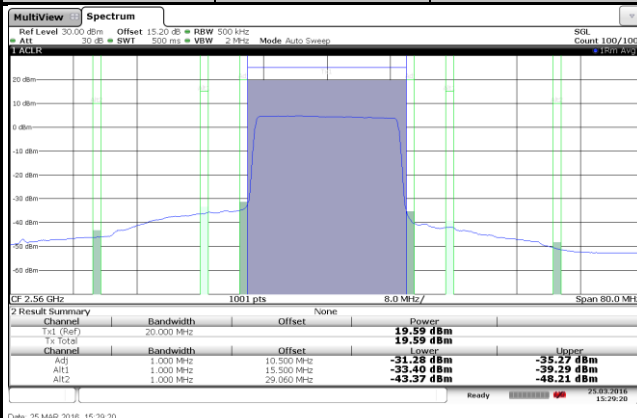


Date: 25 MAR 2016 15:25:26

Channel

21350

100 RB



Date: 25 MAR 2016 15:29:20

<Channel Band Edge>

Channel

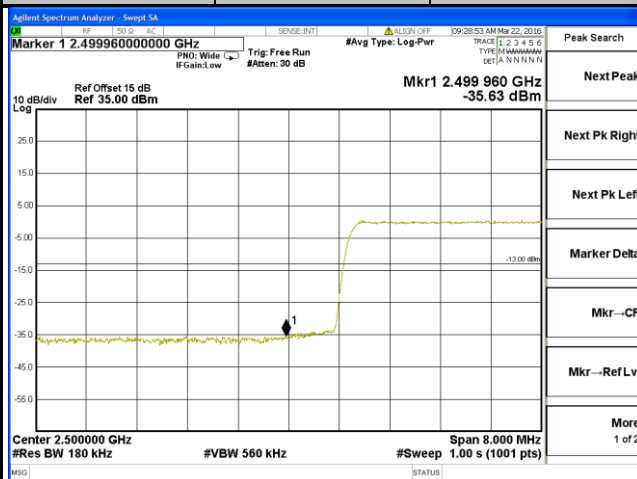
20850

100 RB

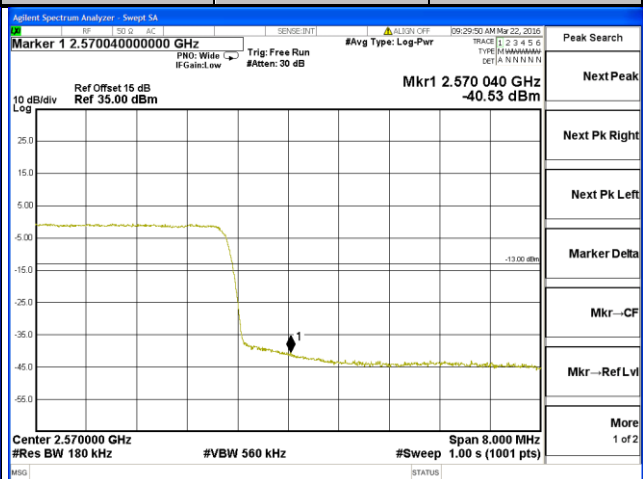
Channel

21350

100 RB



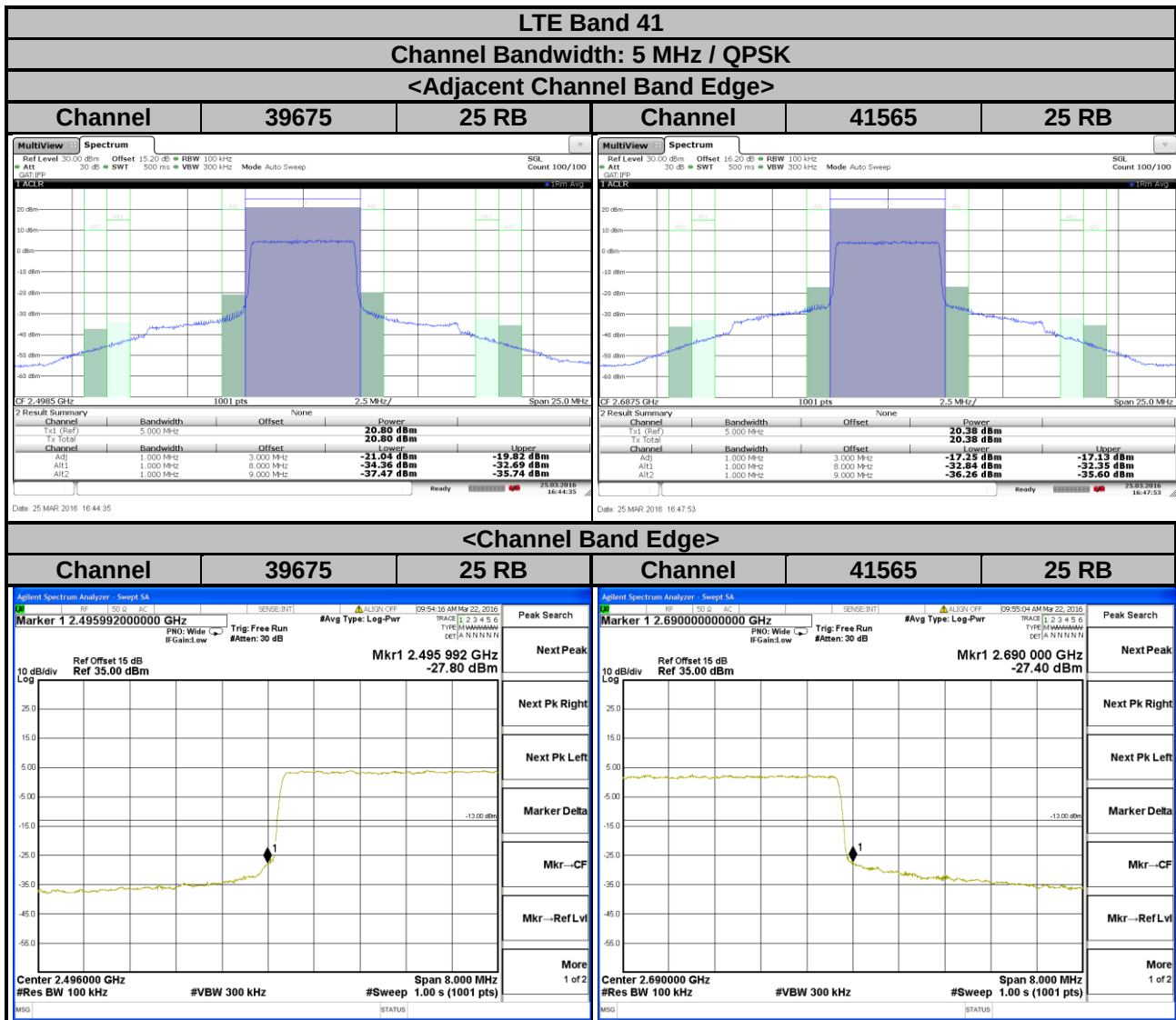
Date: 25 MAR 2016 15:29:20



Date: 25 MAR 2016 15:25:26

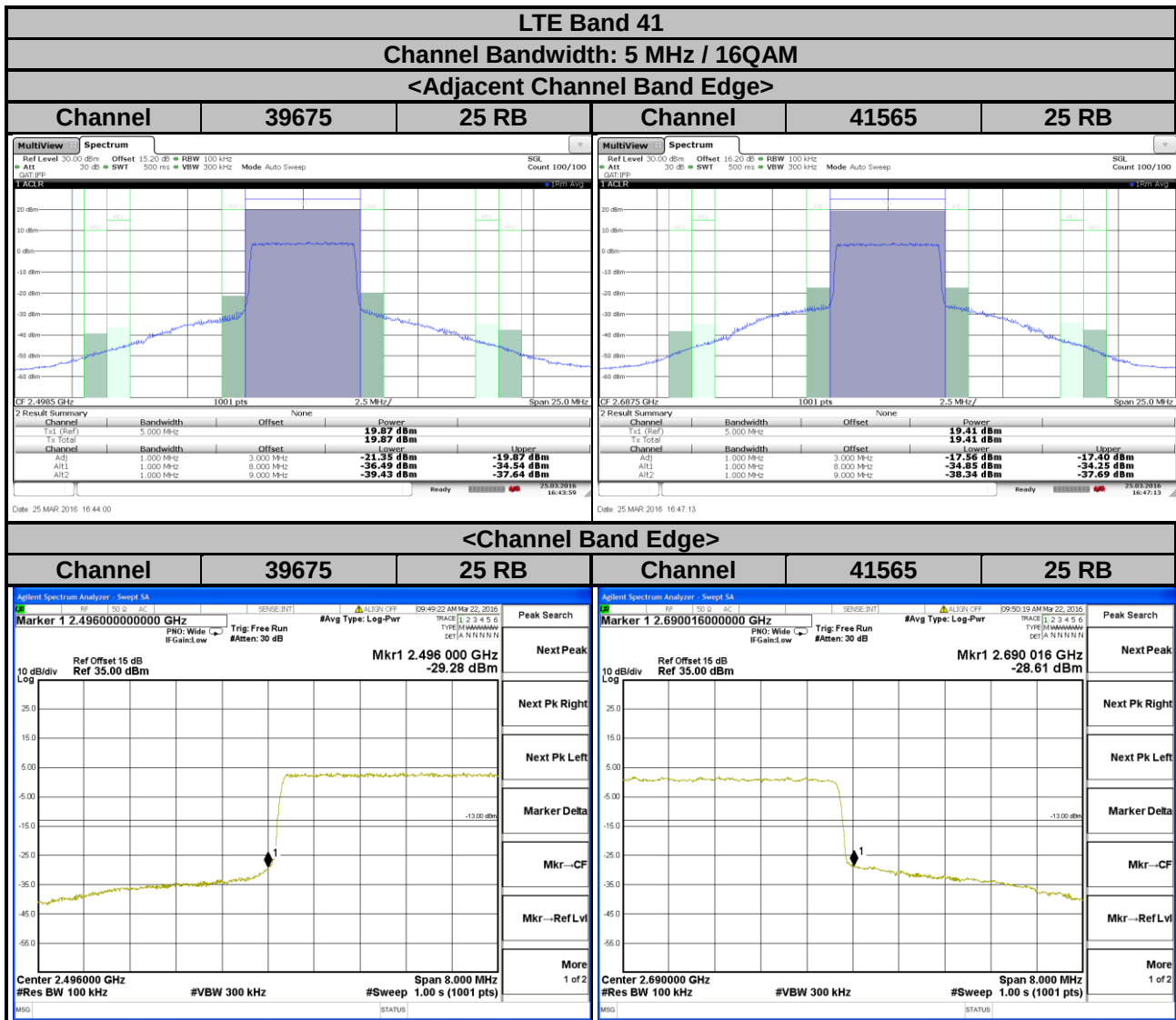


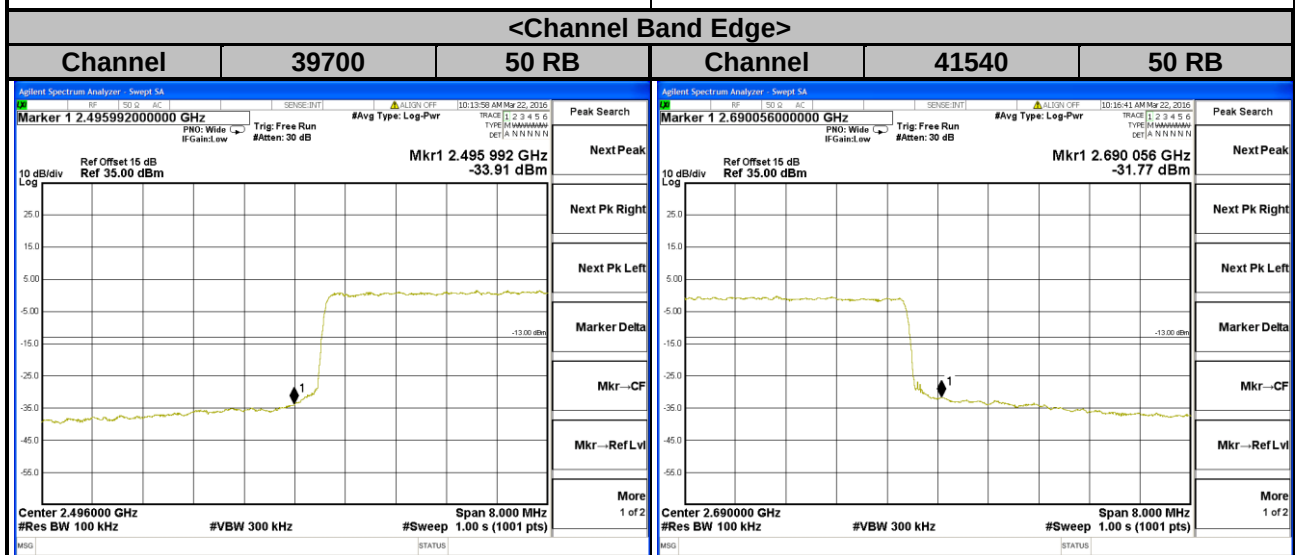
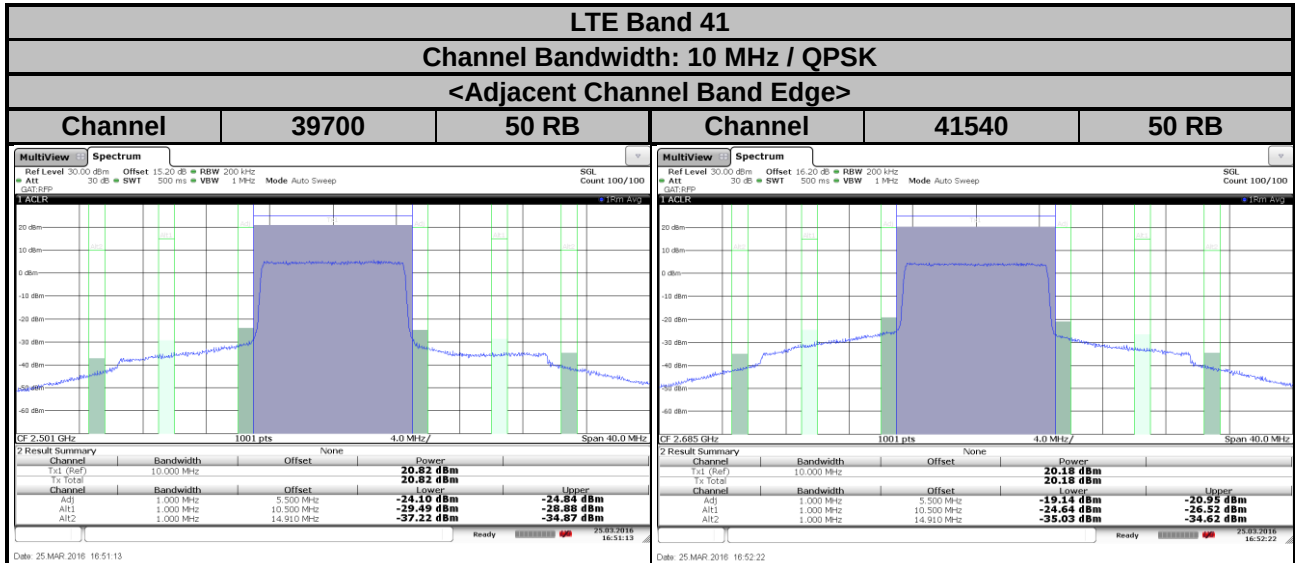
A D T





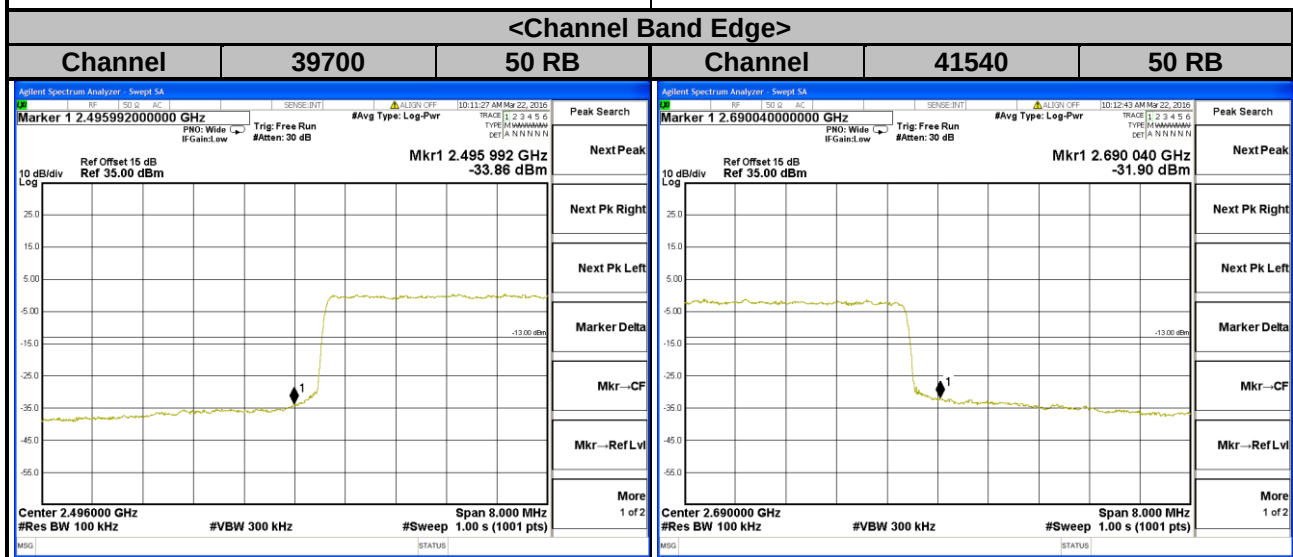
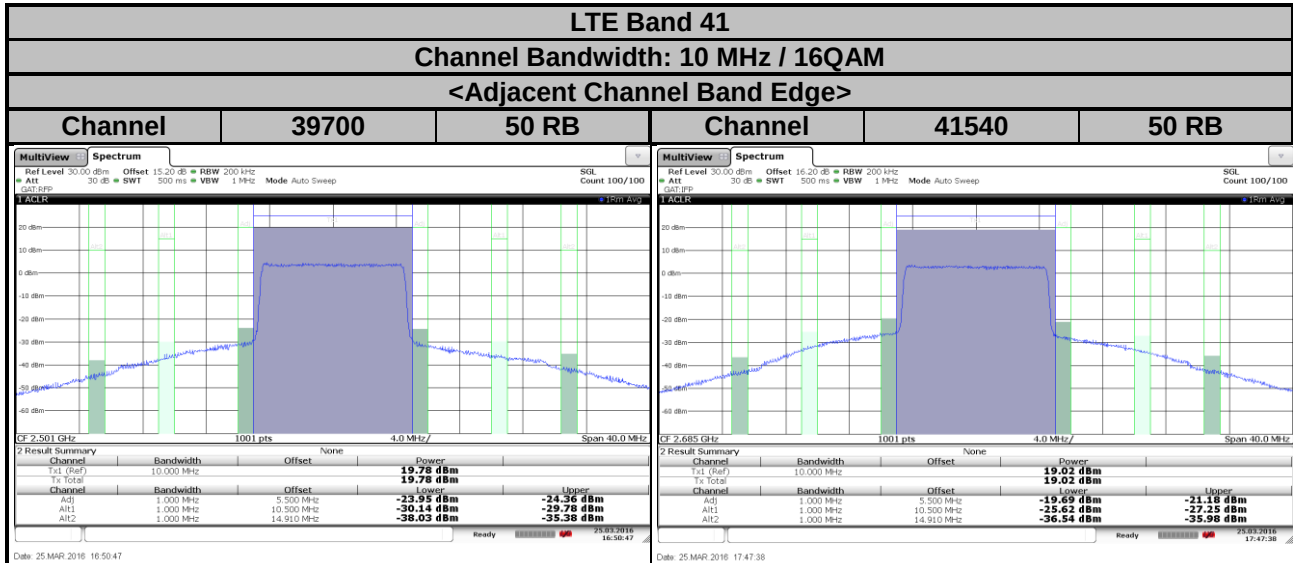
A D T

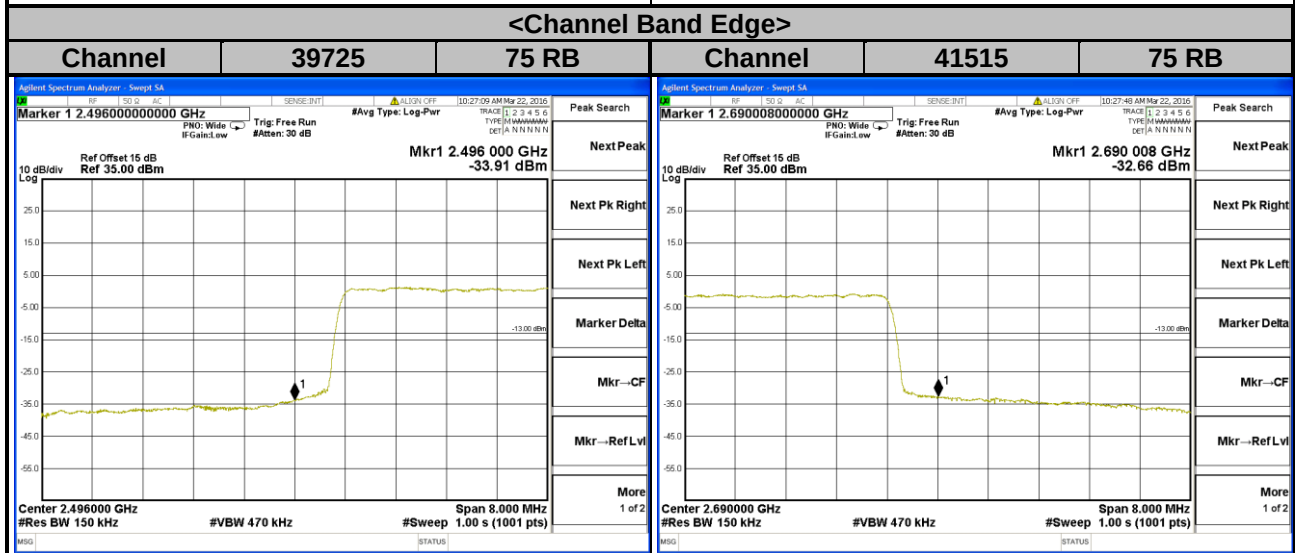
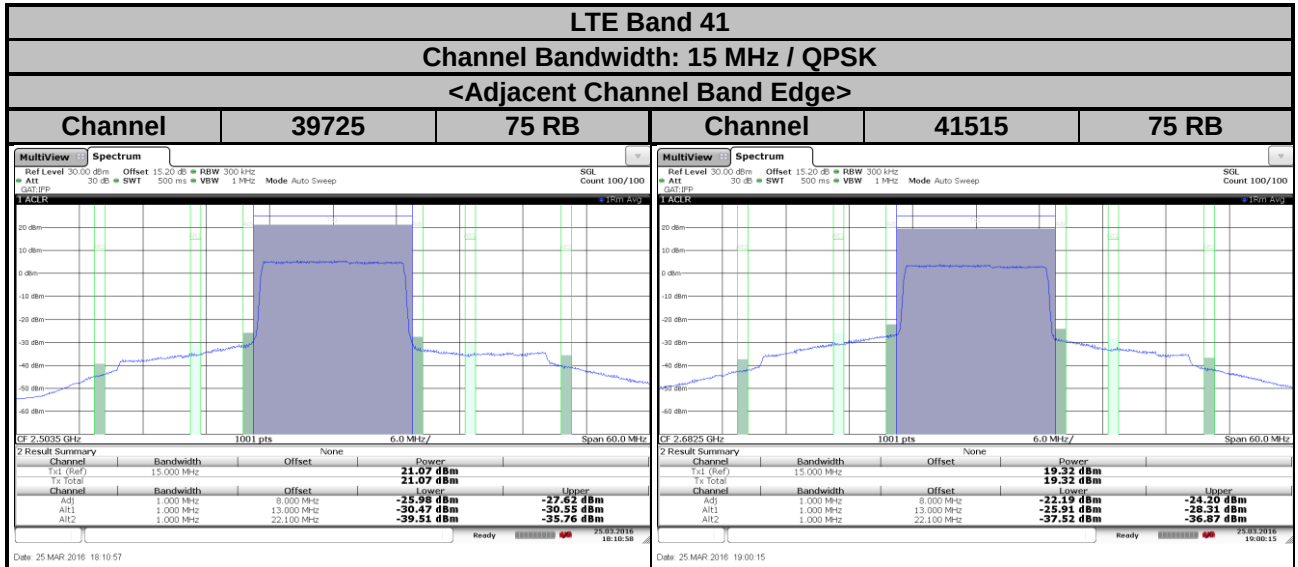


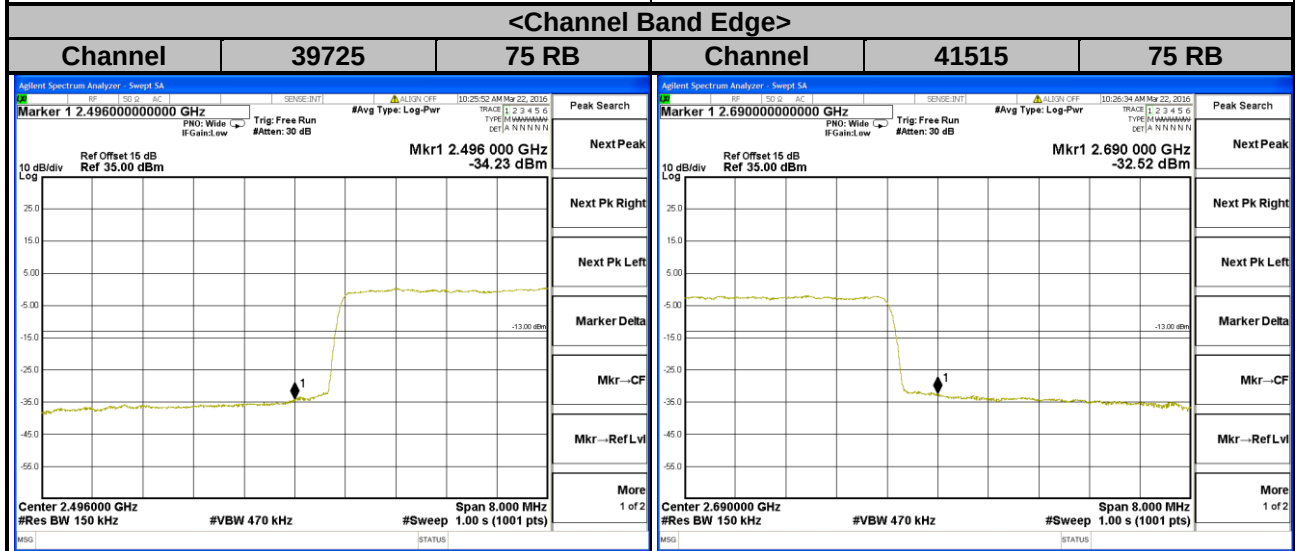
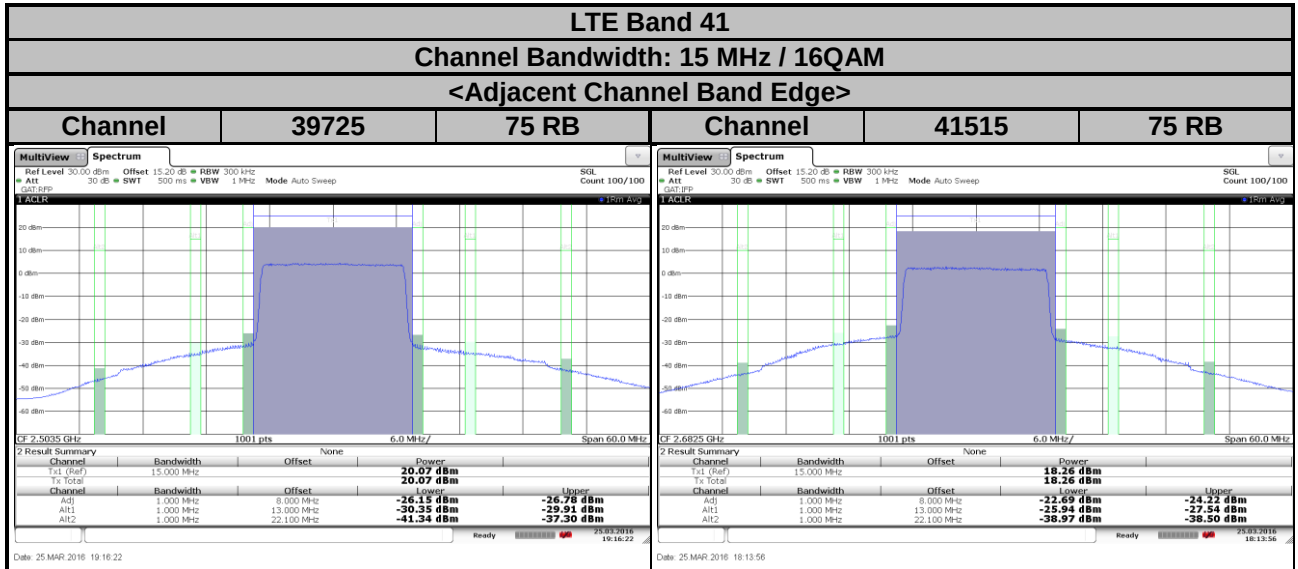


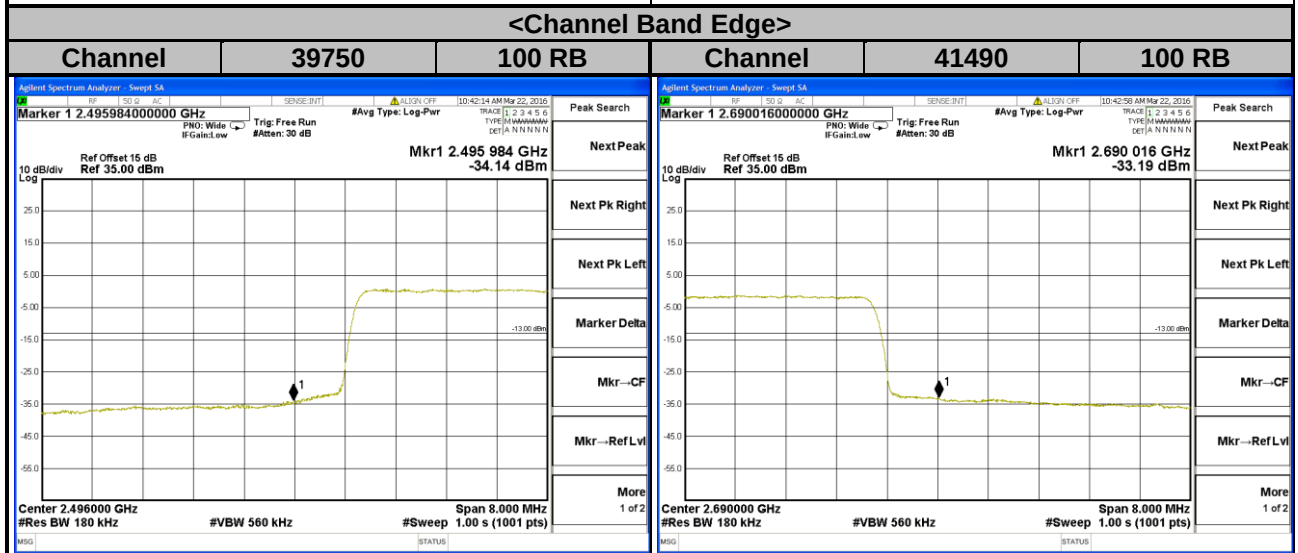
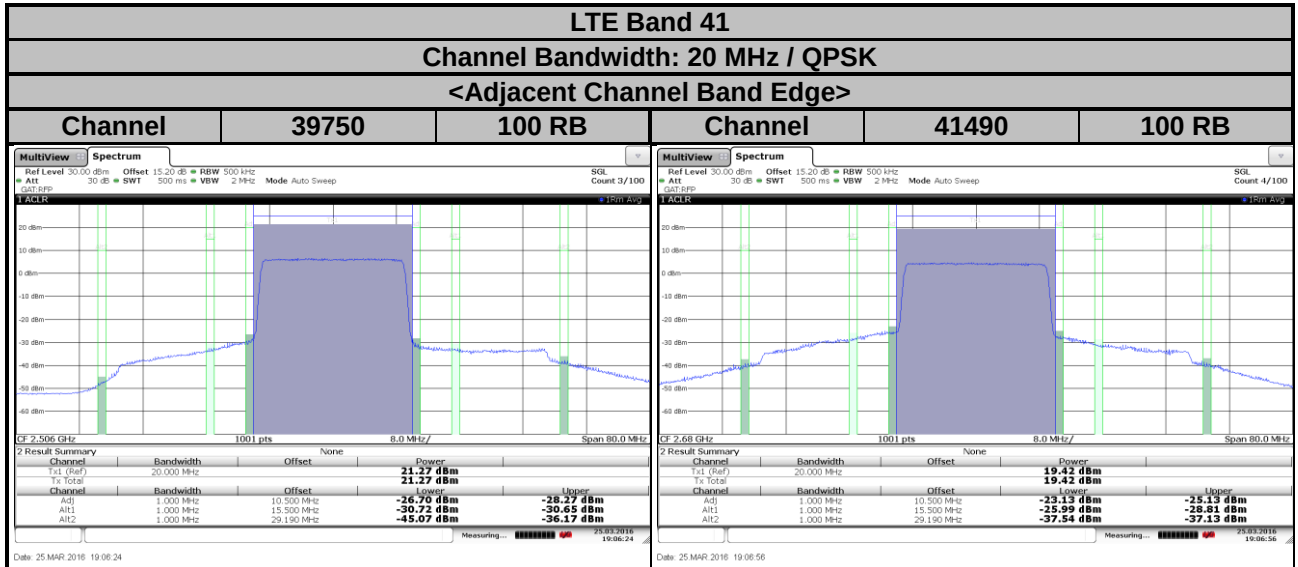


A D T











A D T

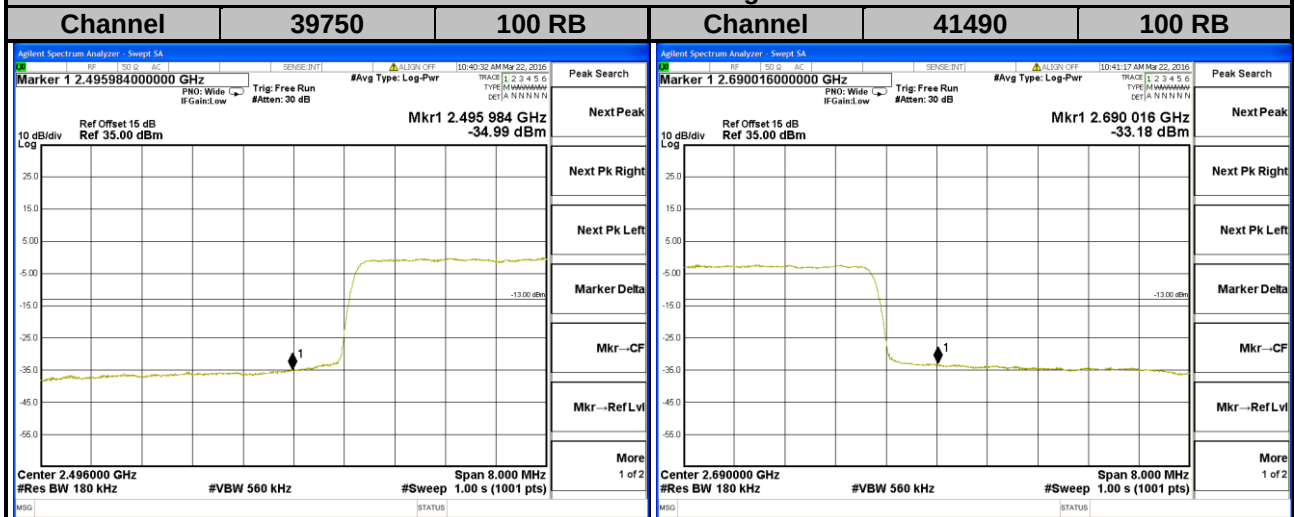
LTE Band 41

Channel Bandwidth: 20 MHz / 16QAM

<Adjacent Channel Band Edge>



<Channel Band Edge>

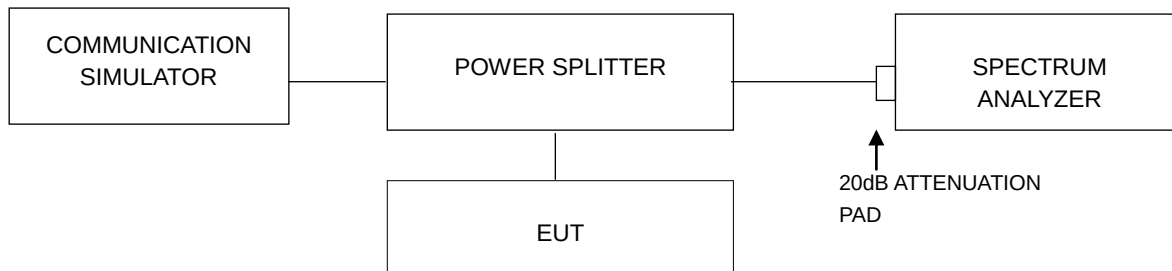


4.5 Peak to Average Ratio

4.5.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

4.5.2 Test Setup

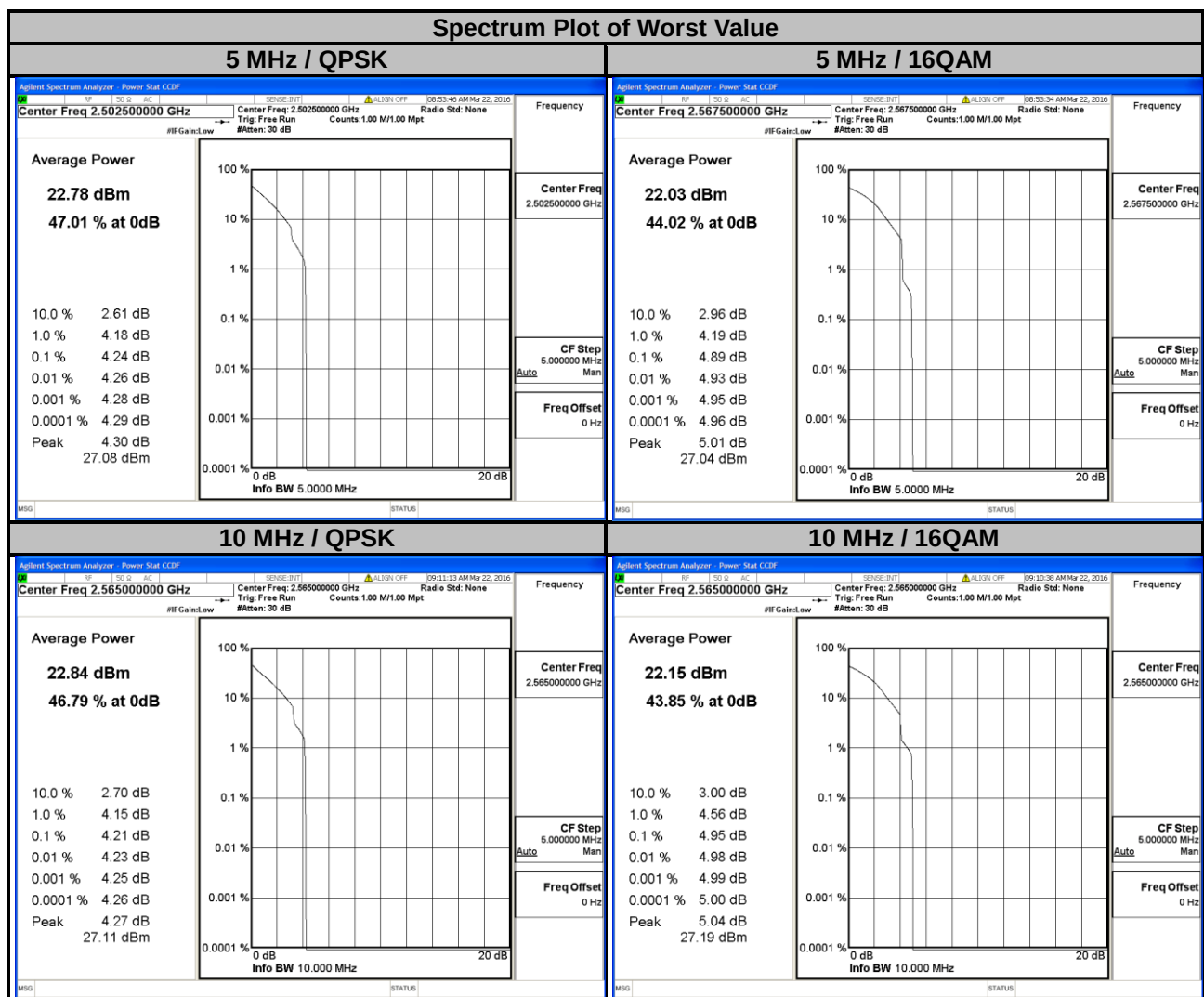


4.5.3 Test Procedures

1. 6HWUHVROXWLRQPHDVXUHPHQWEDQGZLGWKVLJQDOYRFFXSLHGEDQGZLGWK
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.5.4 Test Results

LTE Band 7							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20775	2502.5	4.24	4.49	20800	2505.0	3.96	4.23
21100	2535.0	3.47	4.15	21100	2535.0	3.49	4.13
21425	2567.5	4.02	4.89	21400	2565.0	4.21	4.95



LTE Band 7

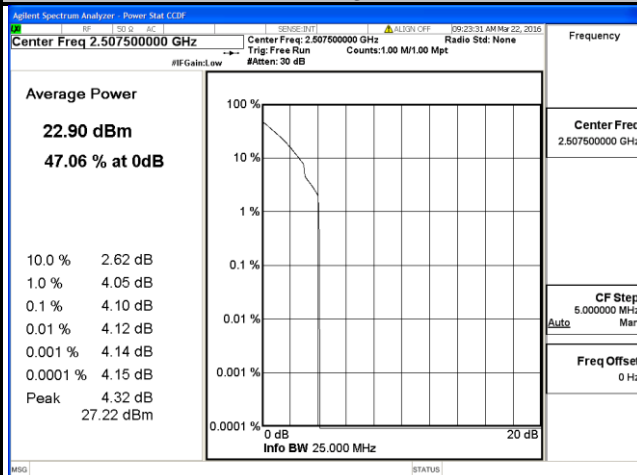
Channel Bandwidth: 15 MHz

Channel Bandwidth: 20 MHz

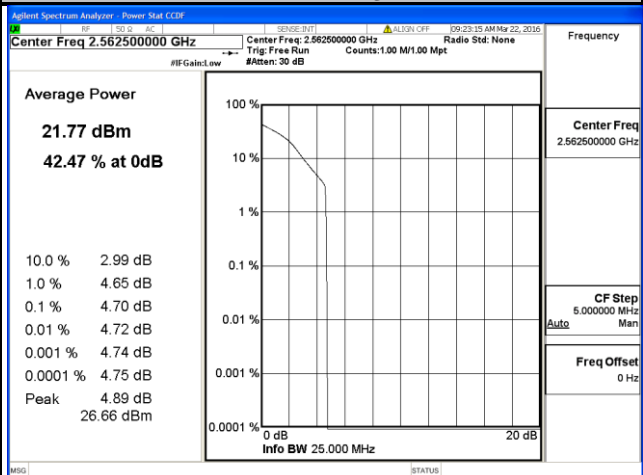
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20825	2507.5	4.10	4.46	20850	2510.0	4.02	4.25
21100	2535.0	3.89	4.34	21100	2535.0	4.07	4.82
21375	2562.5	3.83	4.70	21350	2560.0	4.15	5.01

Spectrum Plot of Worst Value

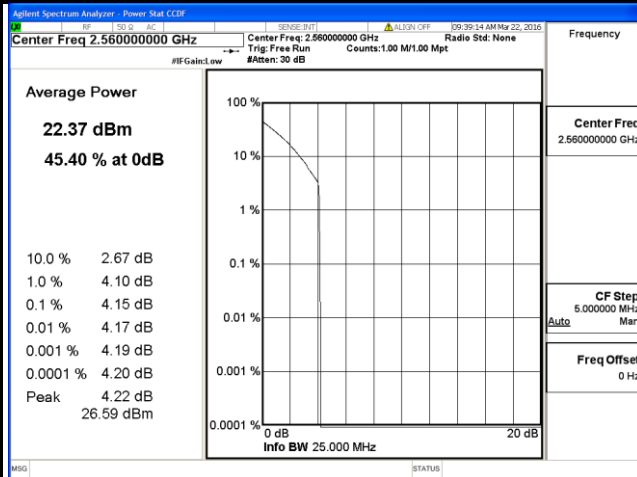
15 MHz / QPSK



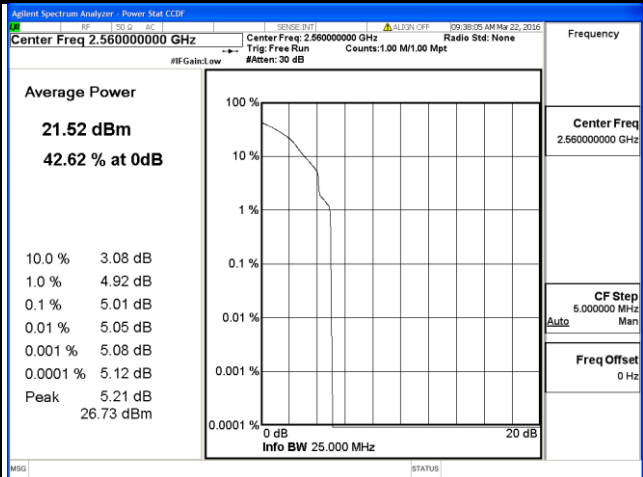
15 MHz / 16QAM



20 MHz / QPSK



20 MHz / 16QAM



LTE Band 41

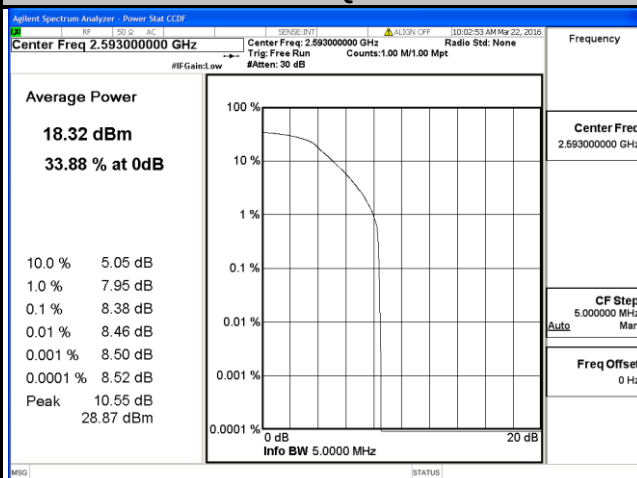
Channel Bandwidth: 5 MHz

Channel Bandwidth: 10 MHz

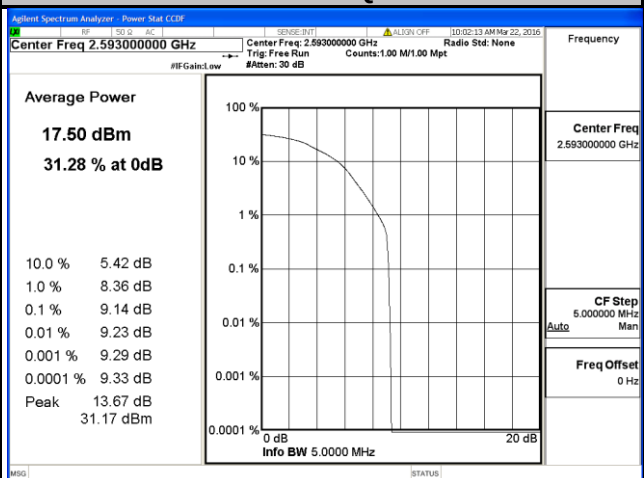
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
39675	2498.5	7.39	8.88	39700	2501.0	6.77	9.28
40620	2593.0	8.38	9.14	40620	2593.0	6.84	9.84
41565	2687.5	8.21	8.85	41540	2685.0	8.33	10.41

Spectrum Plot of Worst Value

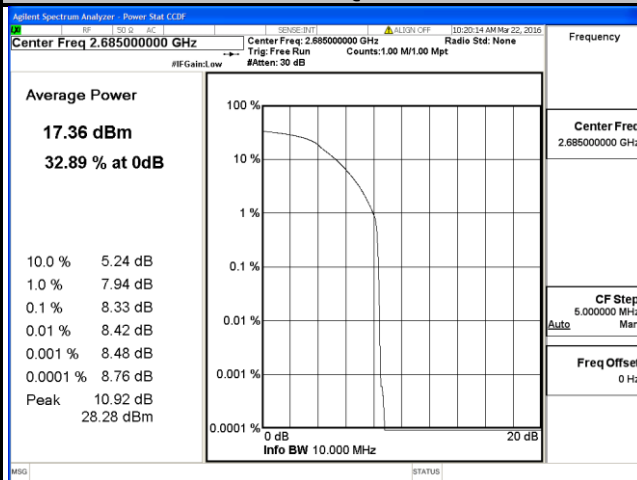
5 MHz / QPSK



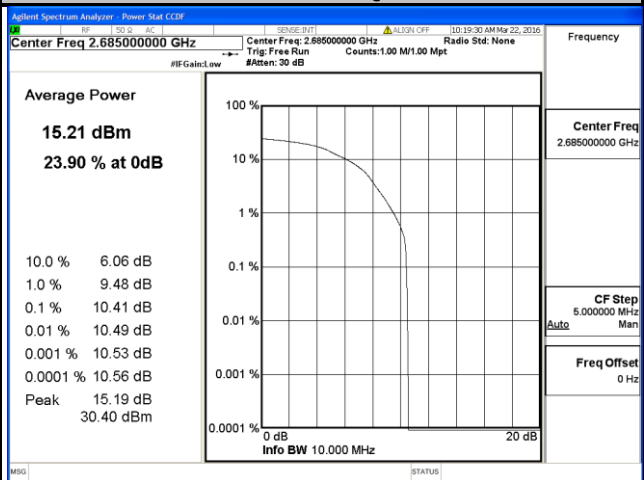
5 MHz / 16QAM



10 MHz / QPSK



10 MHz / 16QAM



LTE Band 41

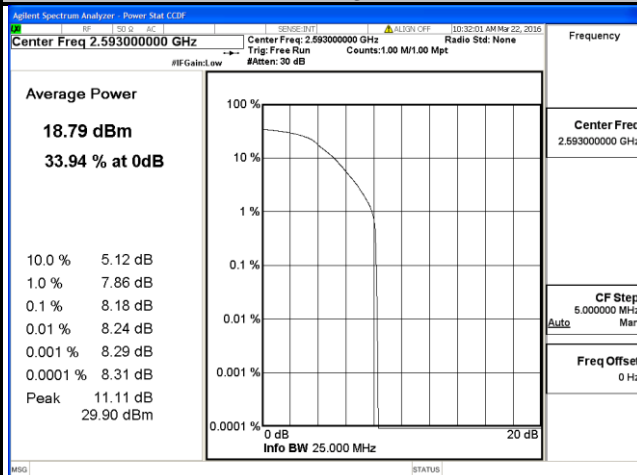
Channel Bandwidth: 15 MHz

Channel Bandwidth: 20 MHz

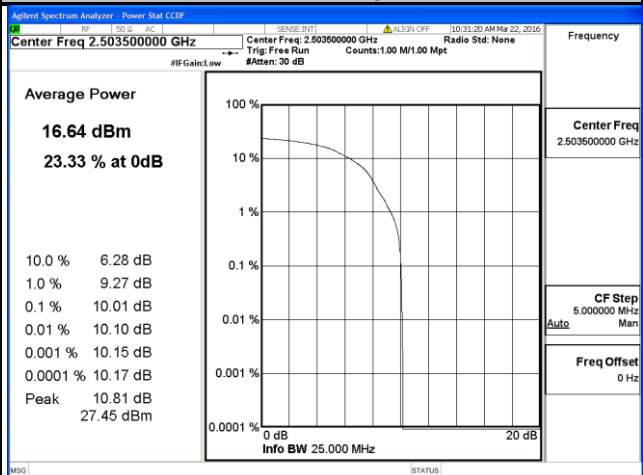
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
39725	2503.5	6.57	10.01	39750	2506.0	6.52	9.55
40620	2593.0	8.18	9.82	40620	2593.0	8.41	9.88
41515	2682.5	7.81	8.85	41490	2680.0	7.40	10.09

Spectrum Plot of Worst Value

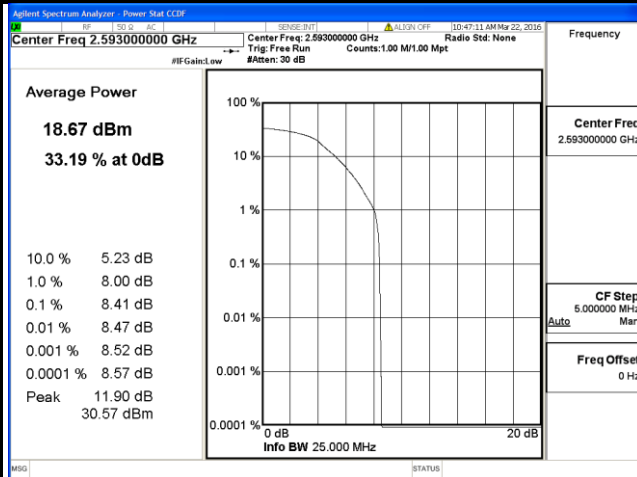
15 MHz / QPSK



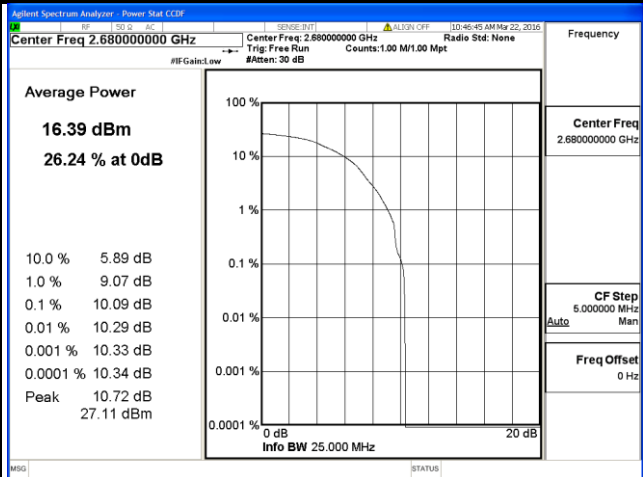
15 MHz / 16QAM



20 MHz / QPSK



20 MHz / 16QAM

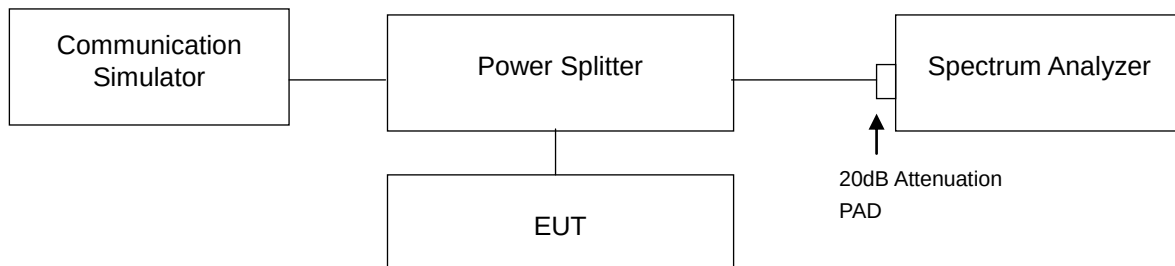


4.6 Conducted Spurious Emissions

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.

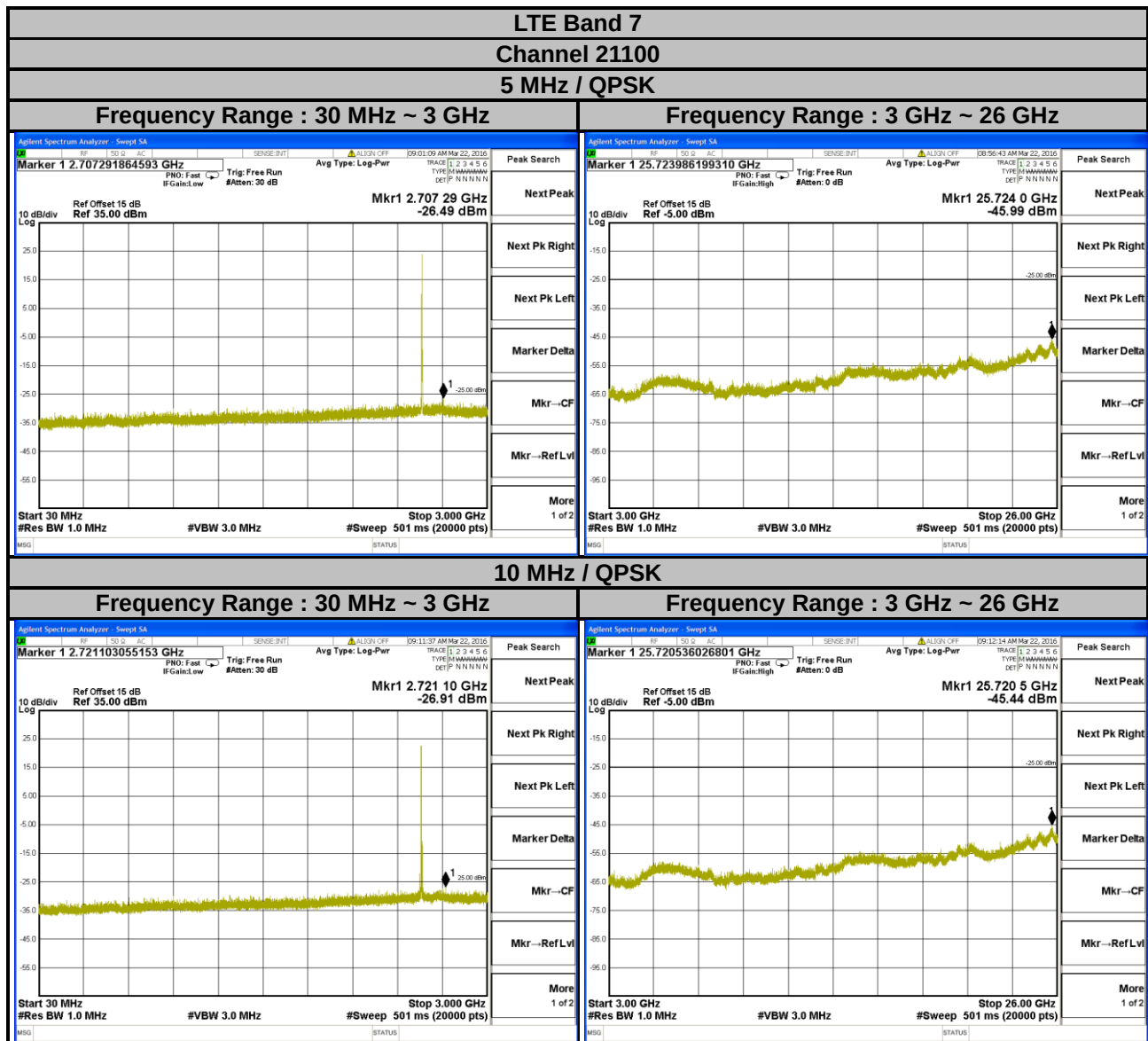
4.6.2 Test Setup



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

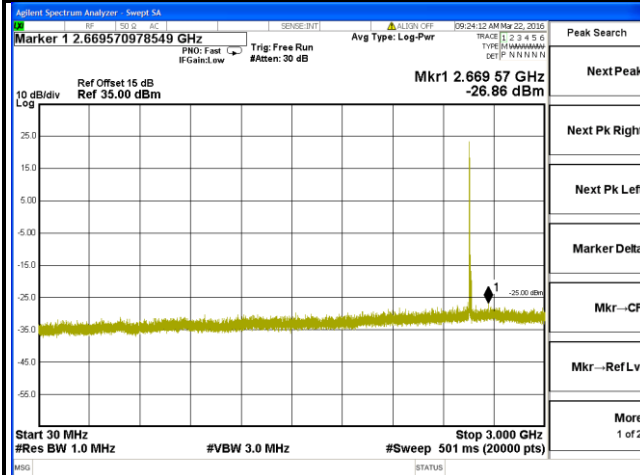




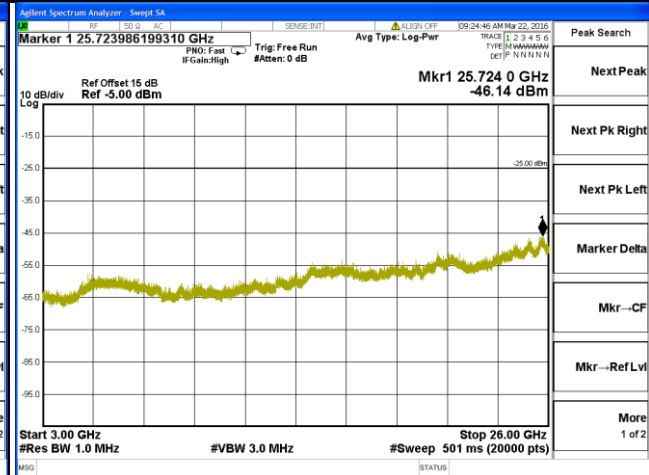
A D T

LTE Band 7
Channel 21100
15 MHz / QPSK

Frequency Range : 30 MHz ~ 3 GHz

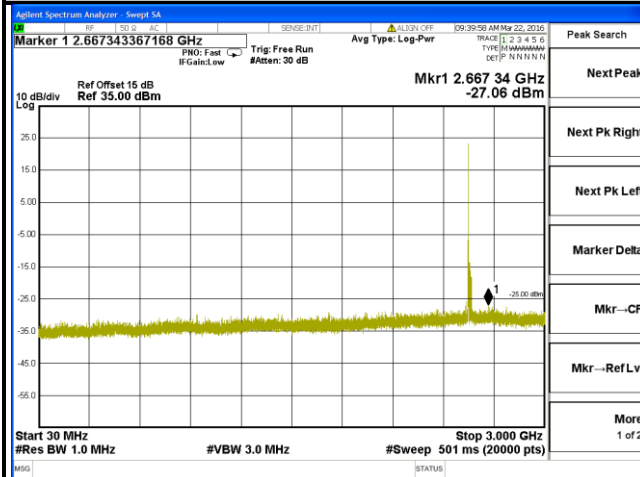


Frequency Range : 3 GHz ~ 26 GHz

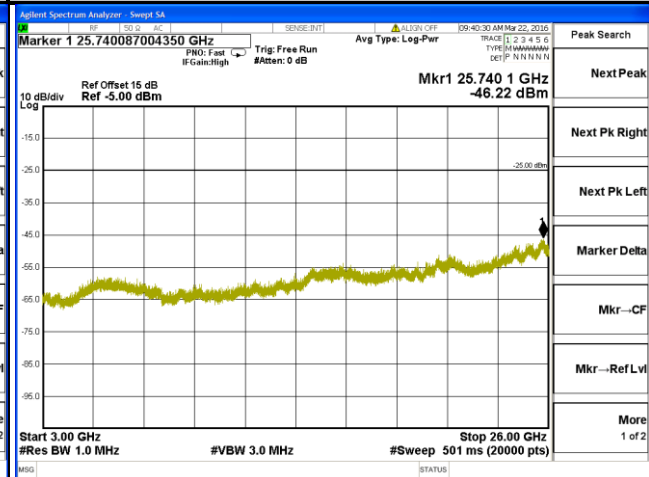


20 MHz / QPSK

Frequency Range : 30 MHz ~ 3 GHz



Frequency Range : 3 GHz ~ 26 GHz

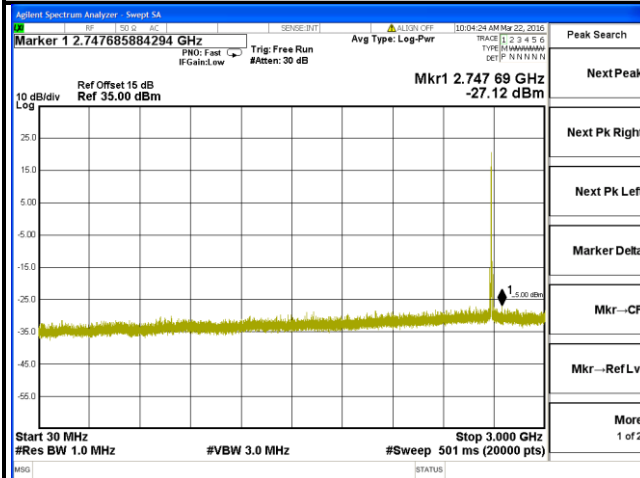


LTE Band 41

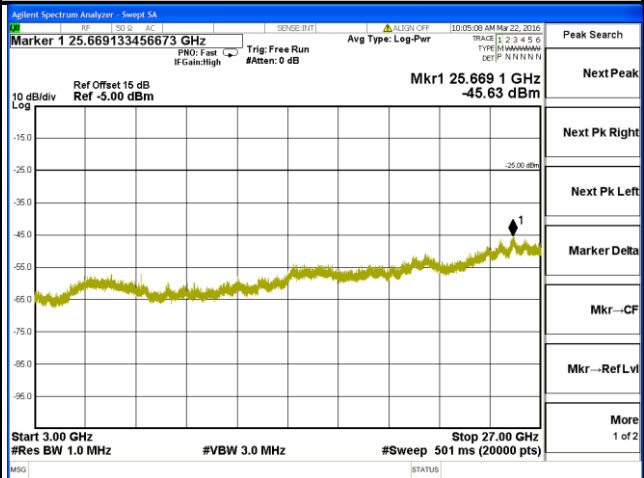
Channel 40620

5 MHz / QPSK

Frequency Range : 30 MHz ~ 3 GHz

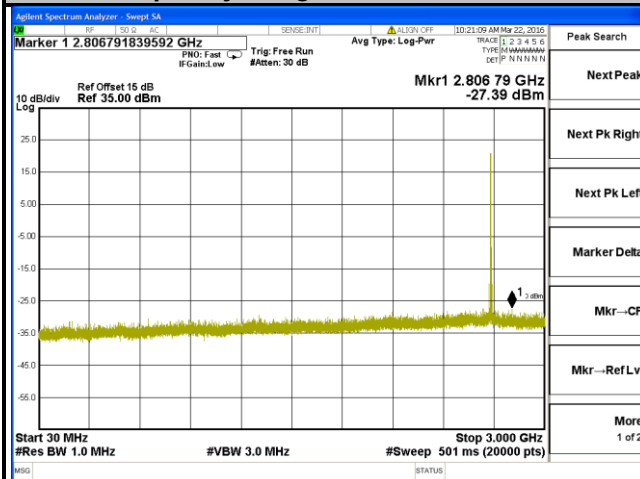


Frequency Range : 3 GHz ~ 27 GHz

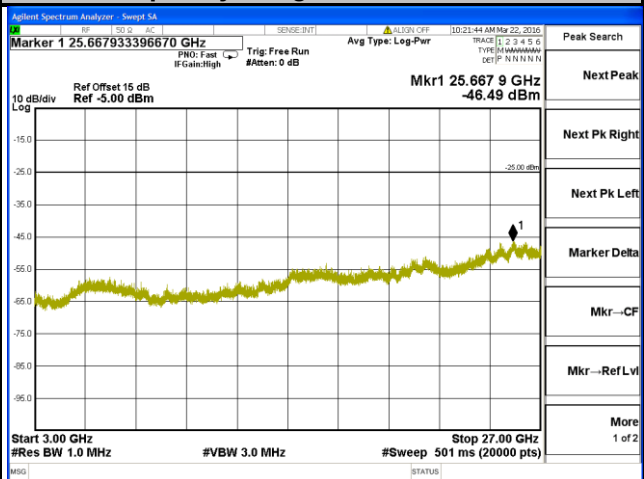


10 MHz / QPSK

Frequency Range : 30 MHz ~ 3 GHz



Frequency Range : 3 GHz ~ 27 GHz

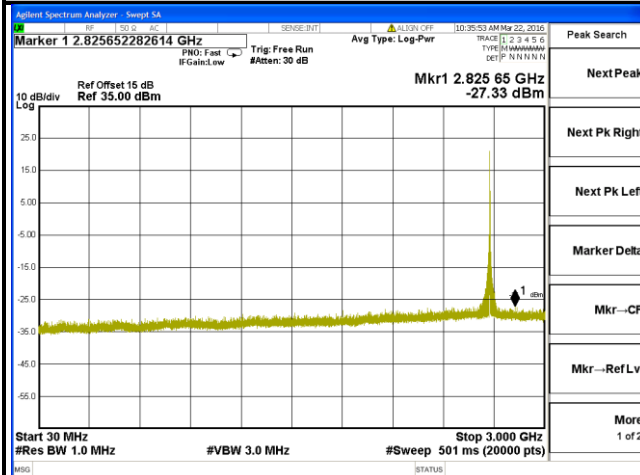


LTE Band 41

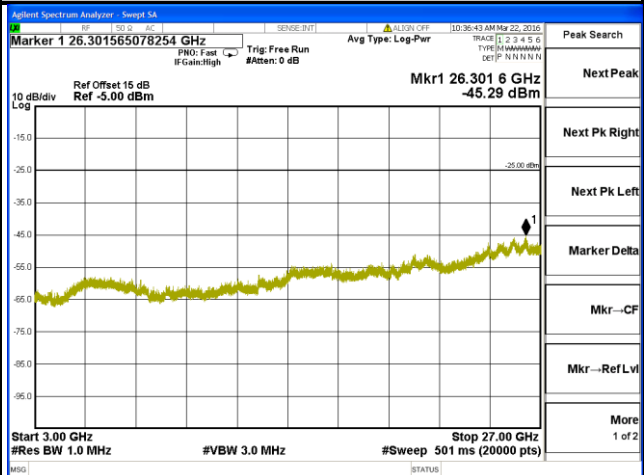
Channel 40620

15 MHz / QPSK

Frequency Range : 30 MHz ~ 3 GHz

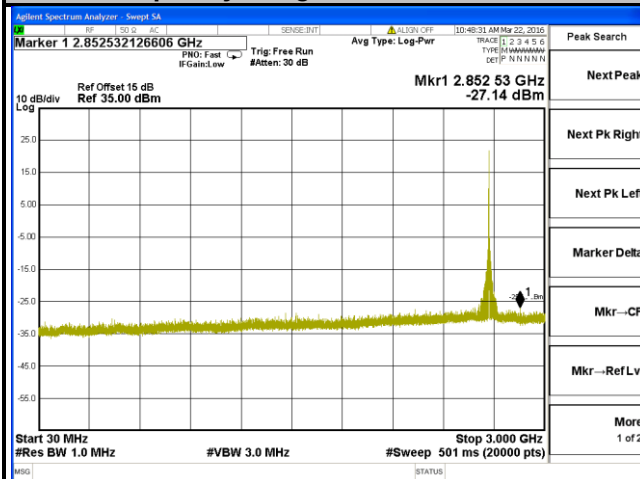


Frequency Range : 3 GHz ~ 27 GHz

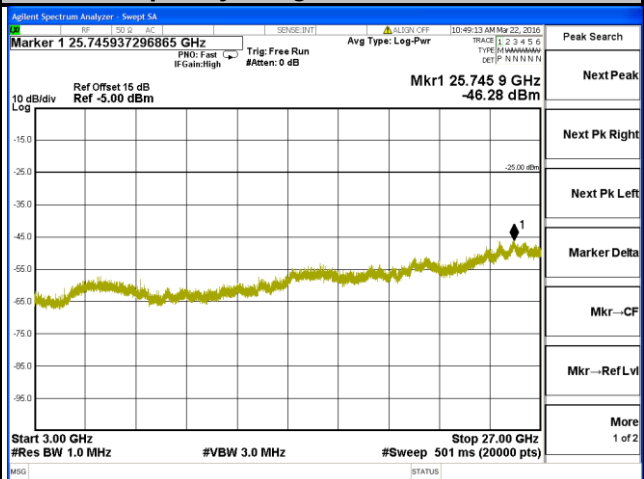


20 MHz / QPSK

Frequency Range : 30 MHz ~ 3 GHz



Frequency Range : 3 GHz ~ 27 GHz



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

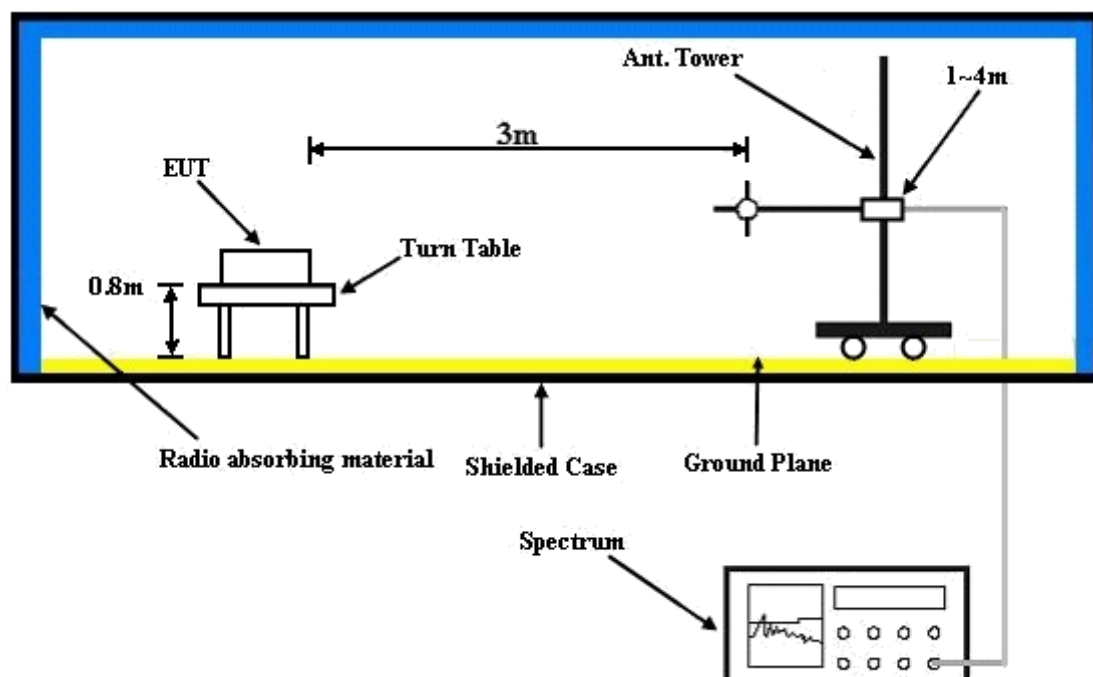
- Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum SRODUUDGLDWHGSRZHU7KH5HDG9DOXH1LVWKHVSHFWUXPUHDGLQJWKHPD[P. 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 VSHFWUXPUHDGLQJHTXDOWR5HDG9DOXH. Record the power level of S.G.
- EIRP = Output power level of S.G $\pm$ TX cable loss + 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 power = E.I.P.R power - 2.15 dBi.

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

4.7.3 Deviation from Test Standard

No deviation.

4.7.4 Test Setup



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

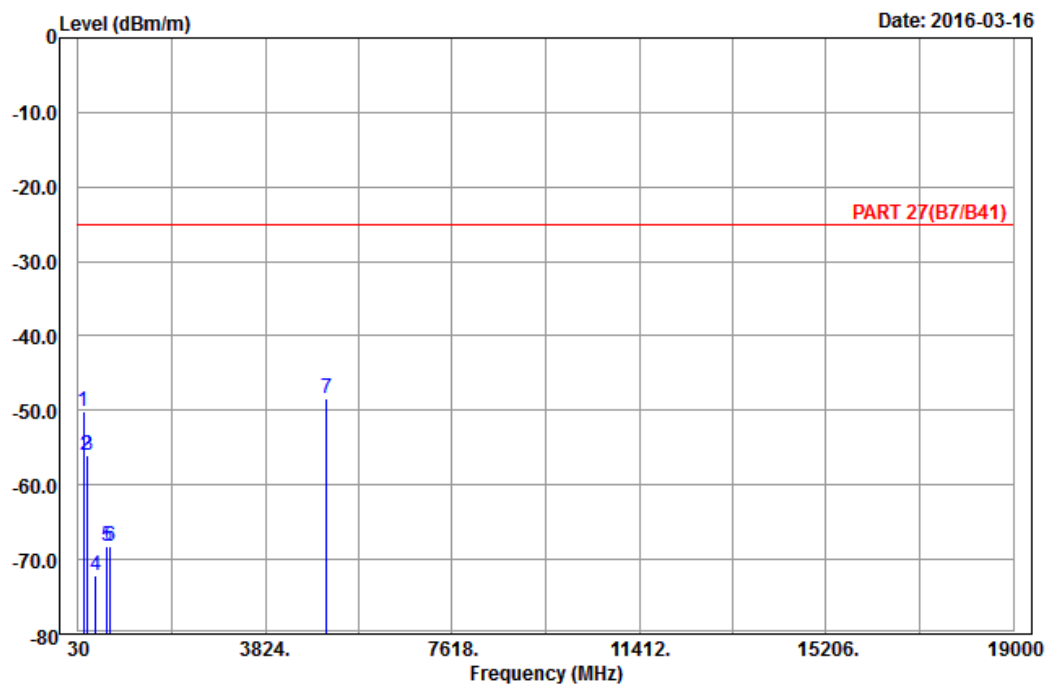


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13

Date: 2016-03-16



Site : 966 chamber 1

Condition: PART 27(B7/B41) 3m Horizontal

Remark : LTE_Band 7_Link_CH21100

Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	139.89	-50.20	-42.51	-25.00	-25.20	-7.69	Peak
2	197.13	-56.02	-49.97	-25.00	-31.02	-6.05	Peak
3	211.71	-56.07	-50.04	-25.00	-31.07	-6.03	Peak
4	391.00	-72.11	-68.90	-25.00	-47.11	-3.21	Peak
5	613.60	-68.31	-68.58	-25.00	-43.31	0.27	Peak
6	686.40	-68.19	-67.88	-25.00	-43.19	-0.31	Peak
7 pp	5070.00	-48.46	-67.85	-25.00	-23.46	19.39	Peak

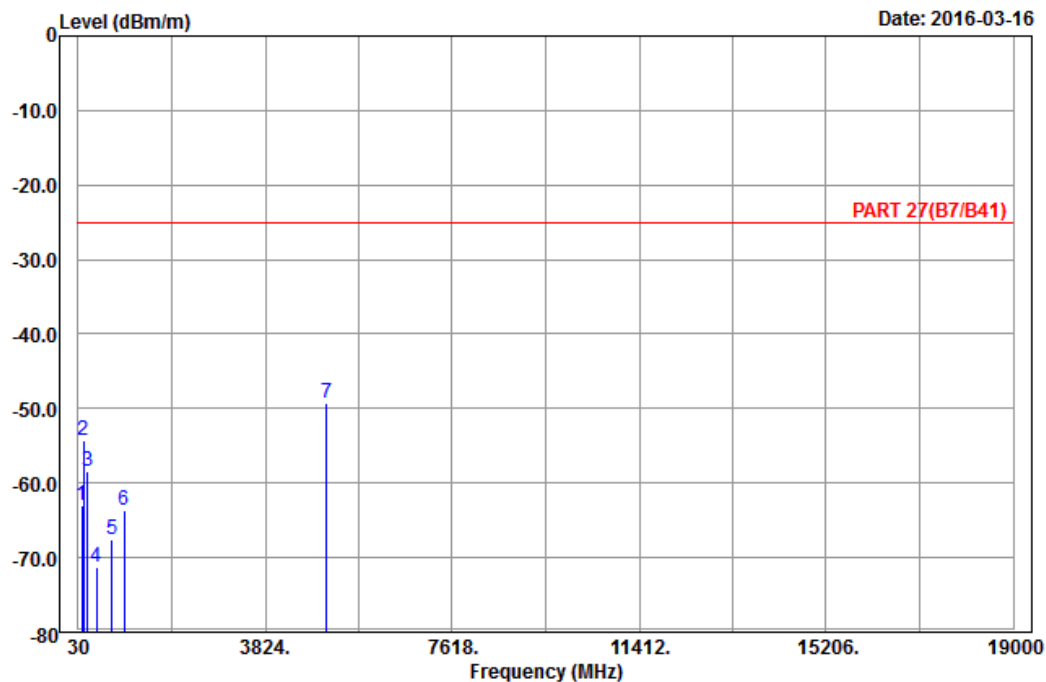


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2016-03-16



Site : 966 chamber 1

Condition: PART 27(B7/B41) 3m Vertical

Remark : LTE_Band 7_Link_CH21100

Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	105.33	-62.92	-53.50	-25.00	-37.92	-9.42	Peak
2	143.94	-54.35	-46.56	-25.00	-29.35	-7.79	Peak
3	212.25	-58.34	-52.33	-25.00	-33.34	-6.01	Peak
4	401.50	-71.32	-68.54	-25.00	-46.32	-2.78	Peak
5	707.40	-67.54	-67.03	-25.00	-42.54	-0.51	Peak
6	959.40	-63.55	-68.69	-25.00	-38.55	5.14	Peak
7 pp	5070.00	-49.36	-68.75	-25.00	-24.36	19.39	Peak

LTE Band 41

Channel Bandwidth: 20 MHz / QPSK

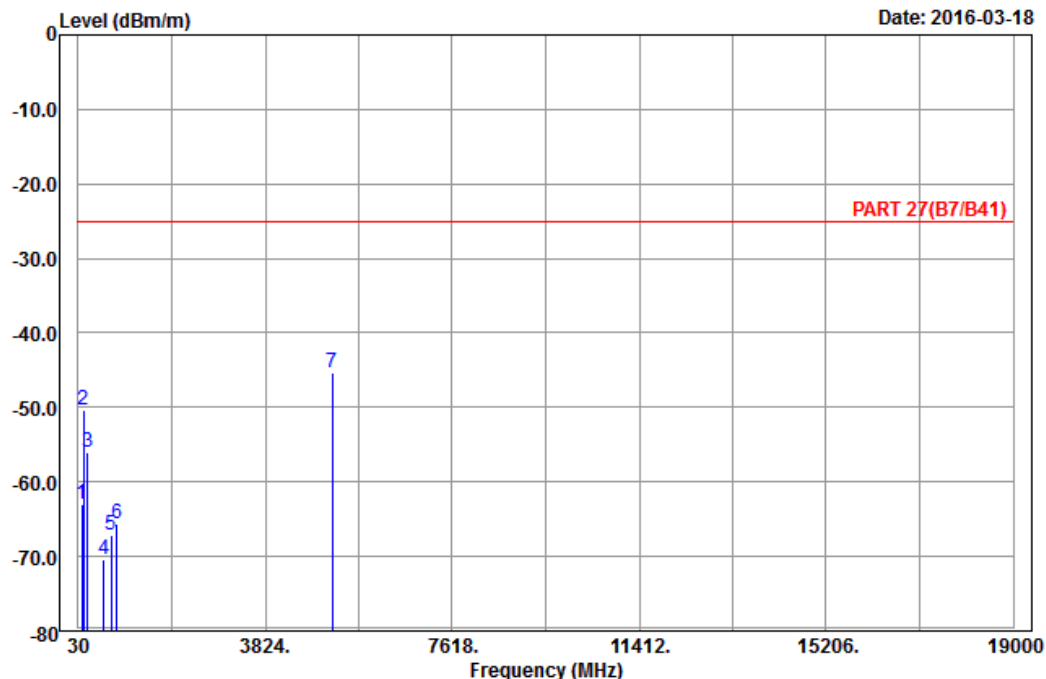


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13

Date: 2016-03-18



Site : 966 chamber 1

Condition: PART 27(B7/B41) 3m Horizontal

Remark : LTE_Band 41_Link_CH40620

Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	105.33	-63.03	-53.61	-25.00	-38.03	-9.42	Peak
2	140.43	-50.40	-42.68	-25.00	-25.40	-7.72	Peak
3	213.33	-56.06	-50.06	-25.00	-31.06	-6.00	Peak
4	554.80	-70.32	-68.86	-25.00	-45.32	-1.46	Peak
5	693.40	-67.11	-66.76	-25.00	-42.11	-0.35	Peak
6	806.10	-65.59	-67.53	-25.00	-40.59	1.94	Peak
7 pp	5186.00	-45.28	-65.40	-25.00	-20.28	20.12	Peak

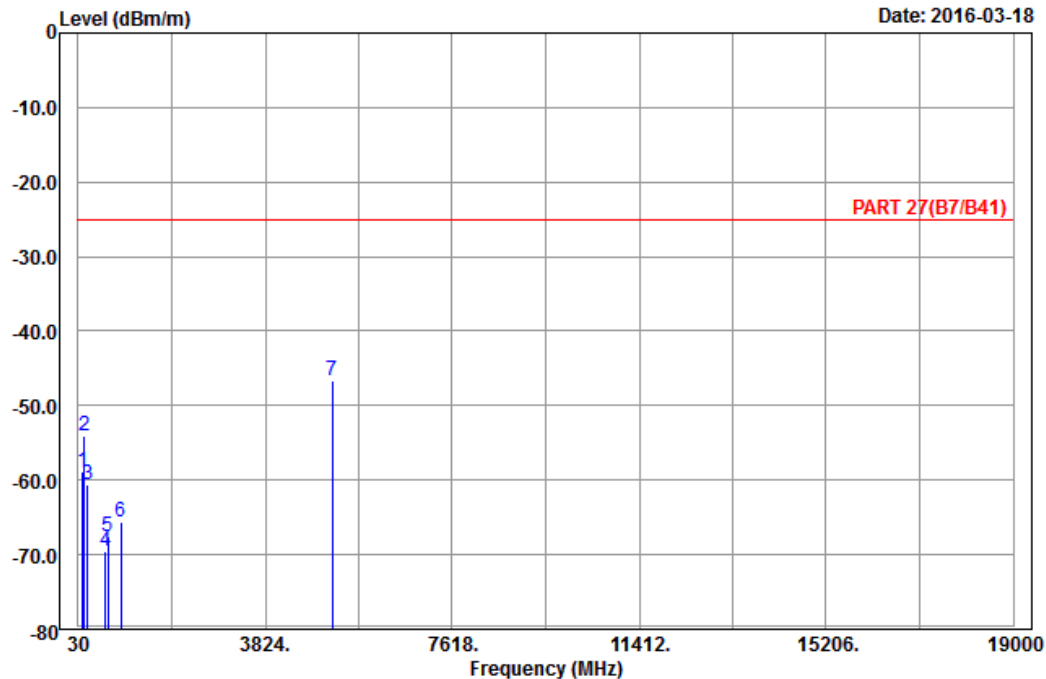


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2016-03-18



Site : 966 chamber 1

Condition: PART 27(B7/B41) 3m Vertical

Remark : LTE_Band 41_Link_CH40620

Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	126.93	-58.76	-50.93	-25.00	-33.76	-7.83	Peak
2	145.83	-54.15	-46.32	-25.00	-29.15	-7.83	Peak
3	217.92	-60.70	-54.76	-25.00	-35.70	-5.94	Peak
4	577.20	-69.52	-68.98	-25.00	-44.52	-0.54	Peak
5	626.20	-67.60	-67.73	-25.00	-42.60	0.13	Peak
6	892.20	-65.69	-68.36	-25.00	-40.69	2.67	Peak
7 pp	5186.00	-46.60	-66.72	-25.00	-21.60	20.12	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:

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 ---