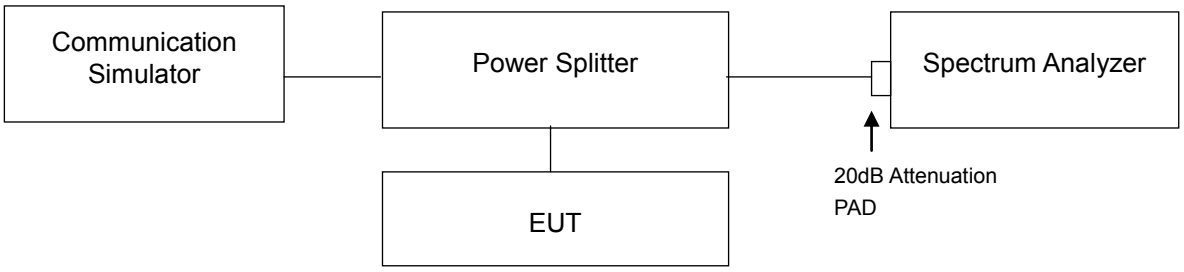
4.6 Conducted Spurious Emissions

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 log10(P) dB. The limit of emission is equal to -25 dBm.

4.6.2 Test Setup

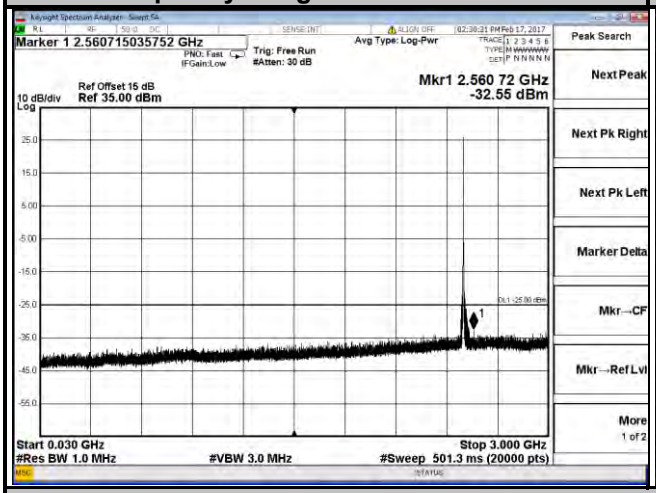
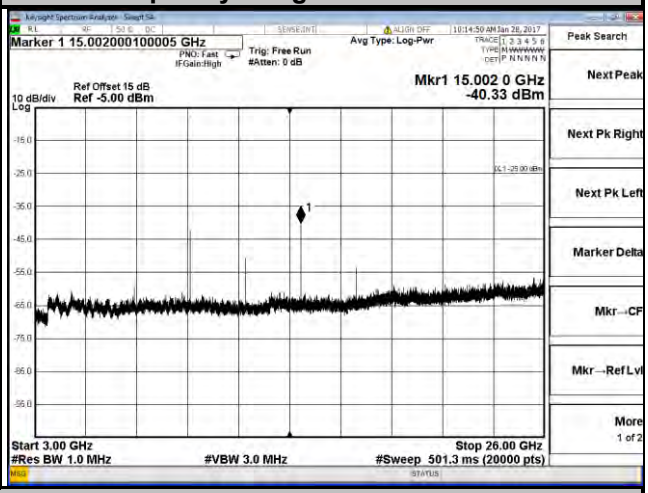
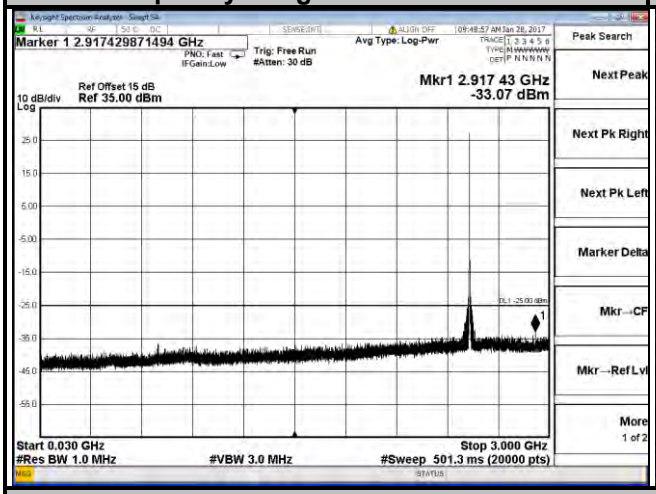
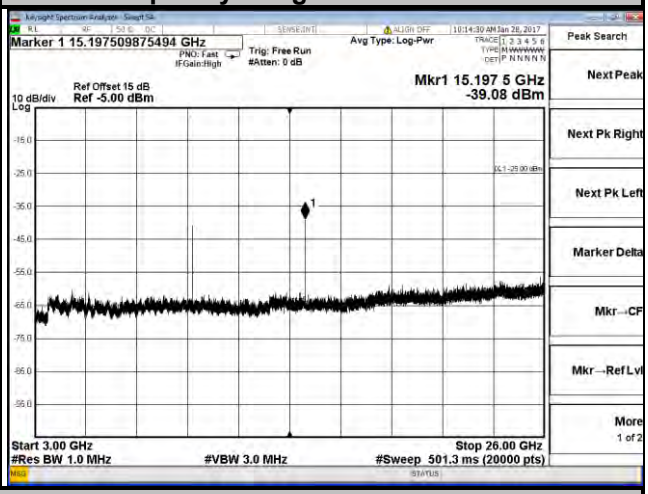
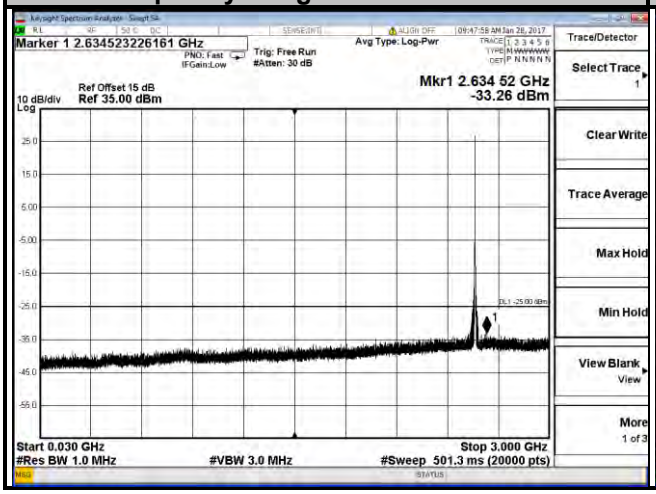
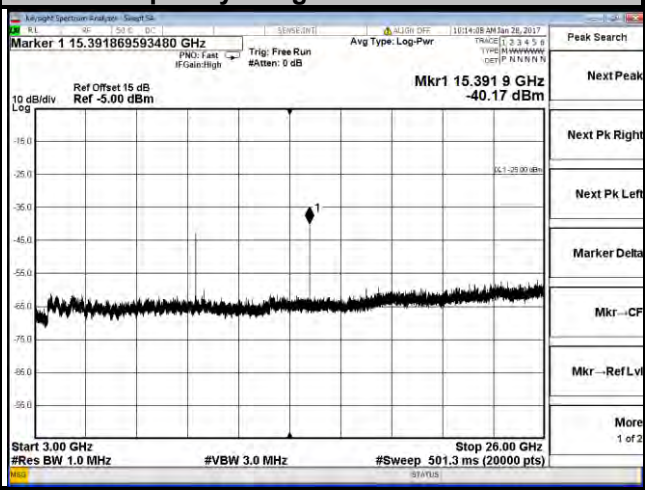


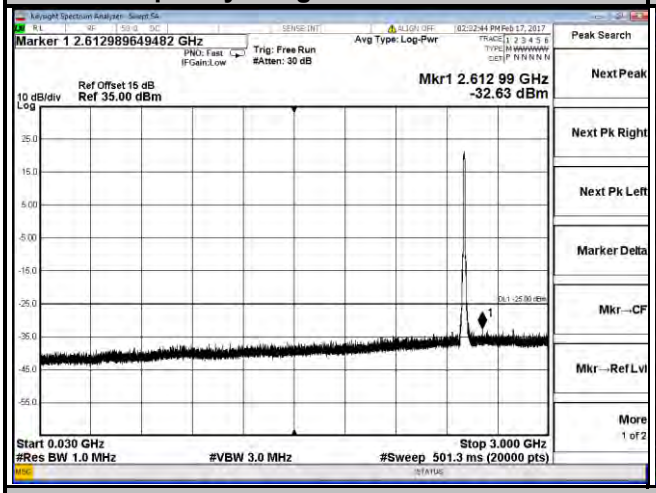
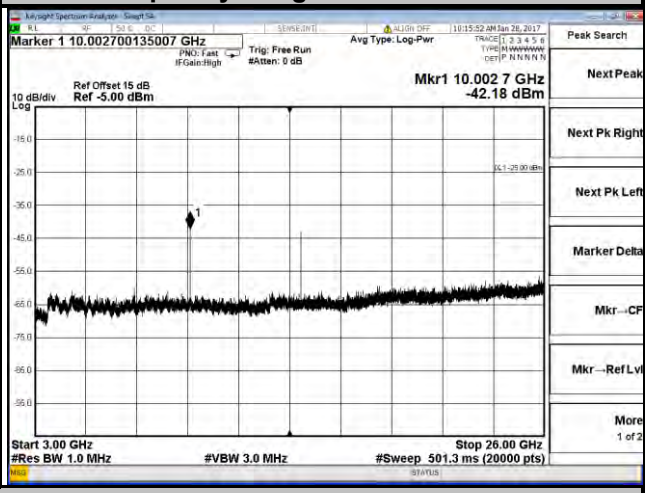
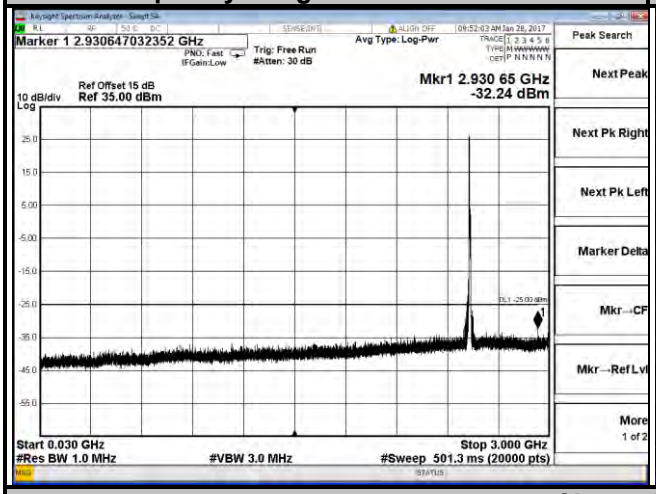
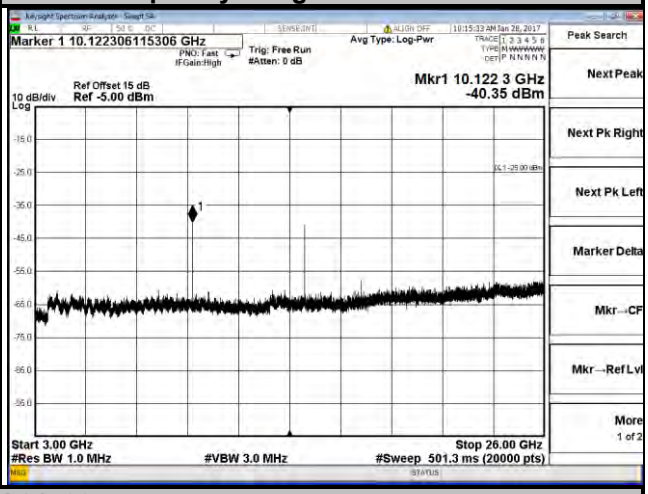
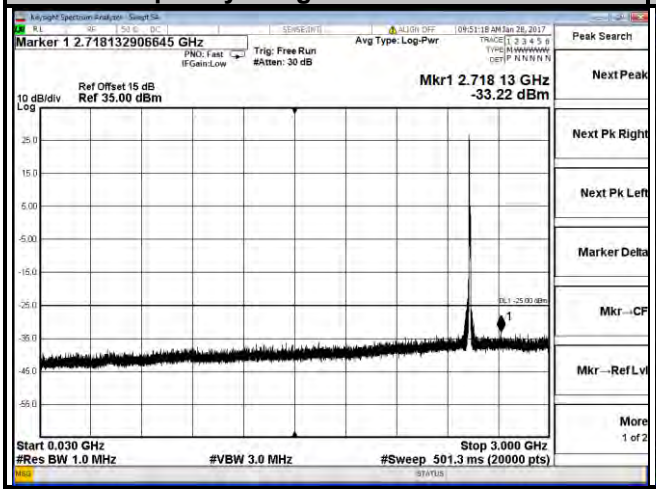
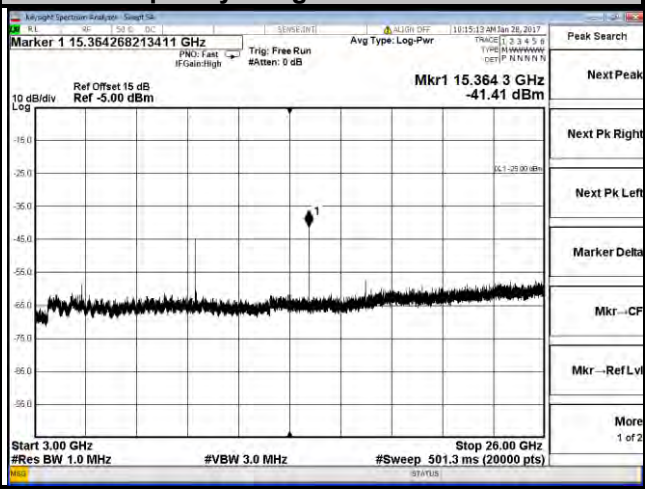
4.6.3 Test Procedure

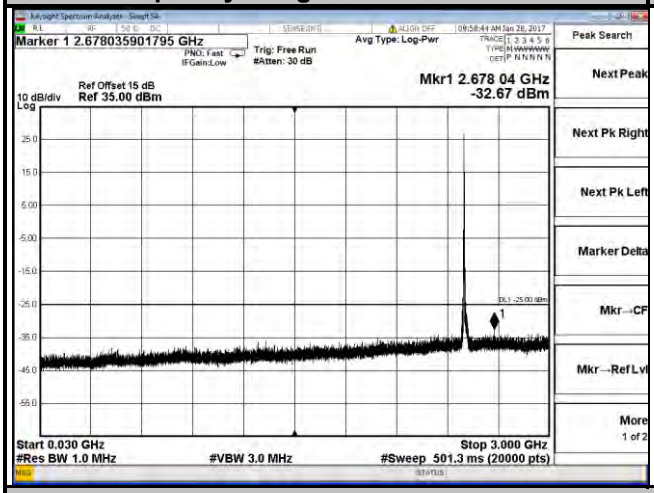
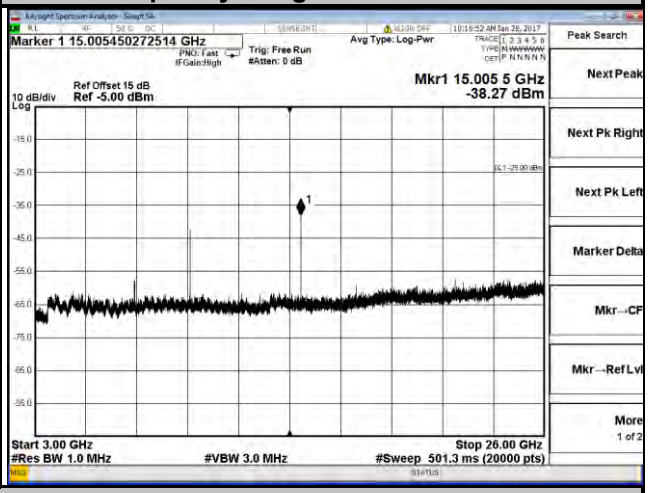
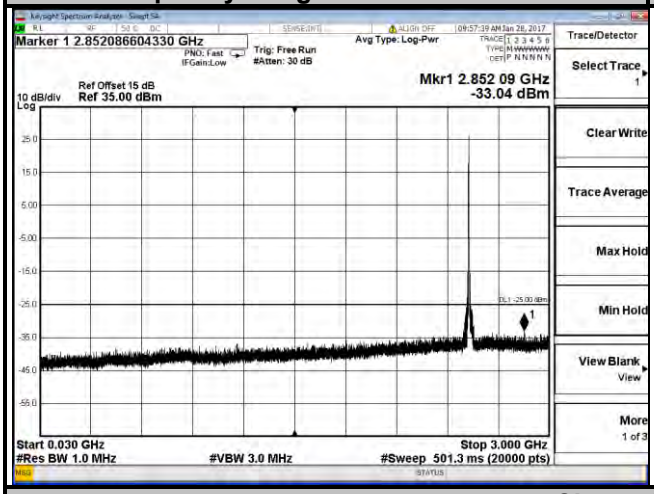
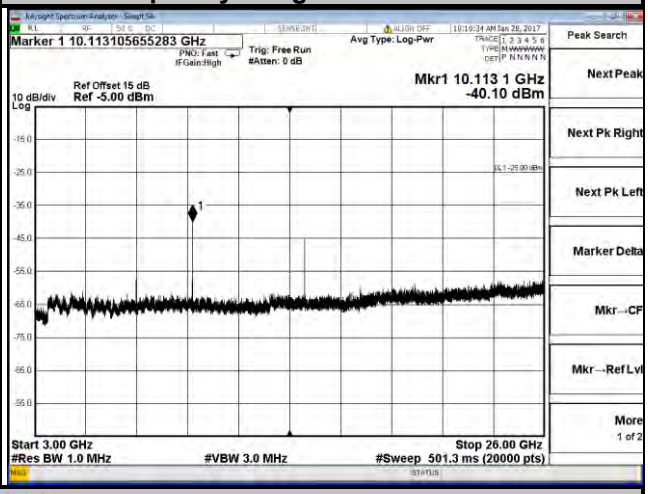
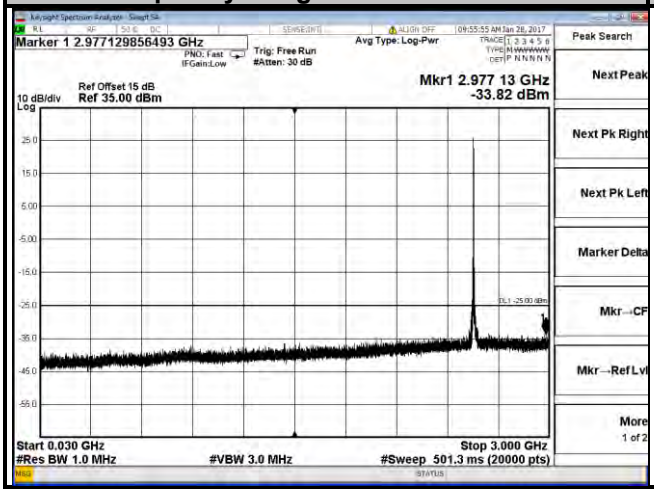
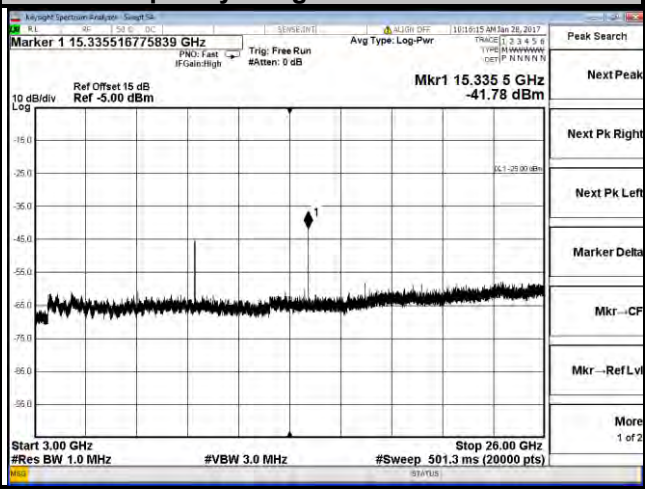
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

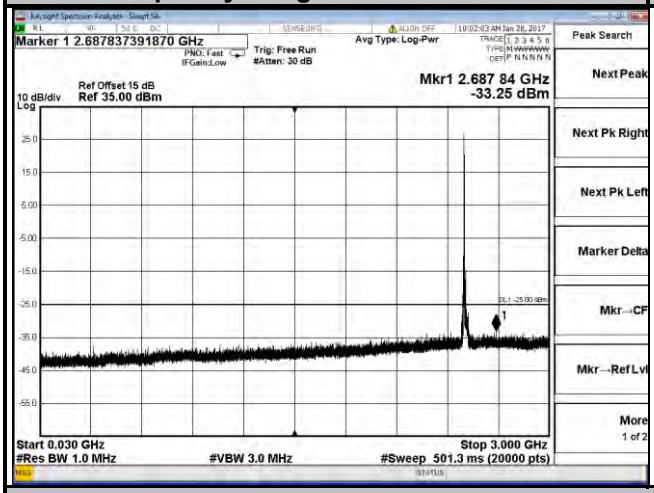
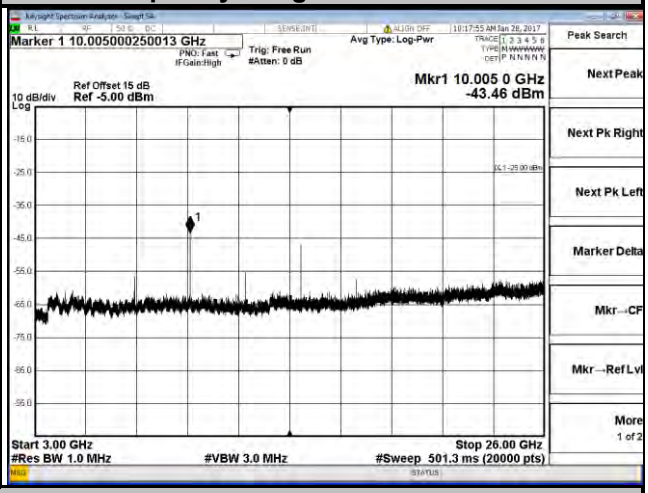
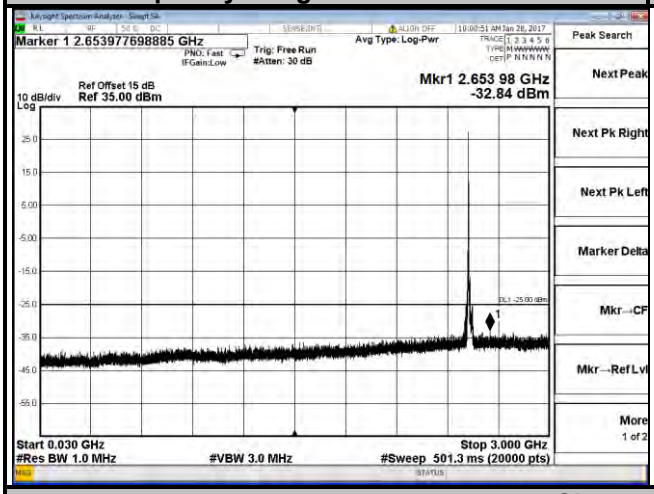
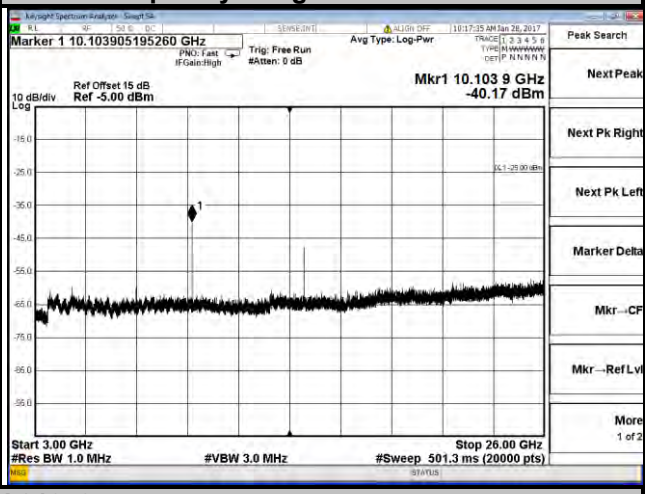
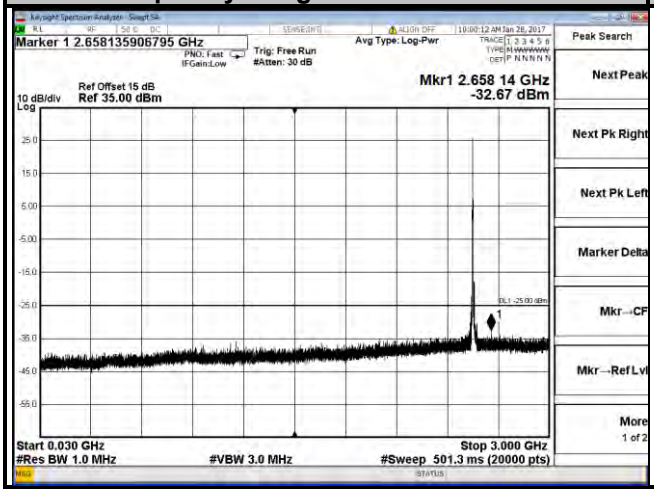
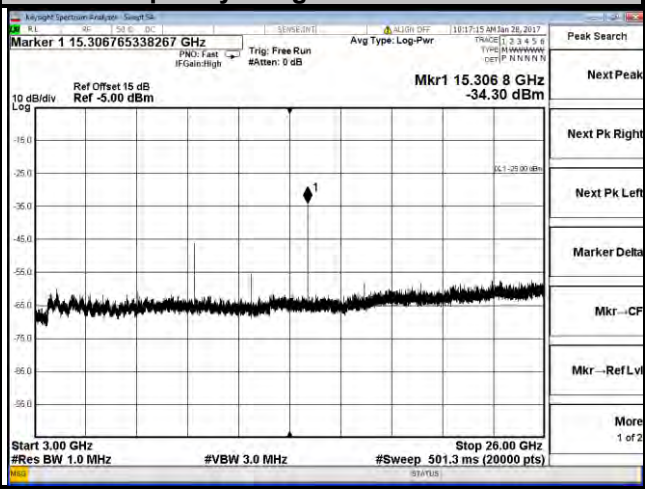
b. Measuring frequency range is from 30 MHz to 26 GHz for LTE Band 7 and from 30 MHz to 27 GHz for LTE Band 41. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

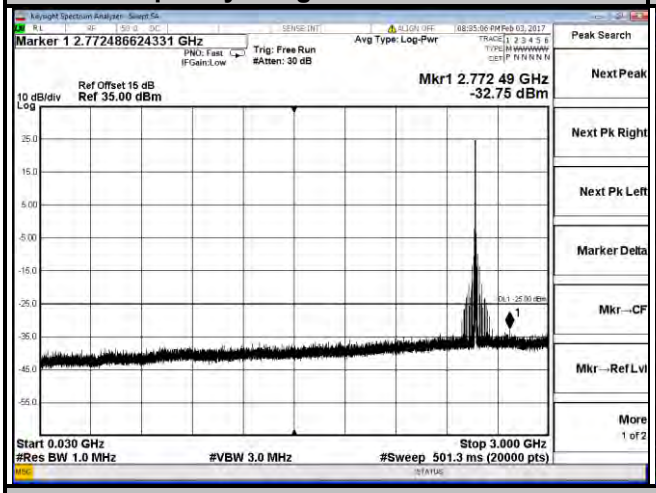
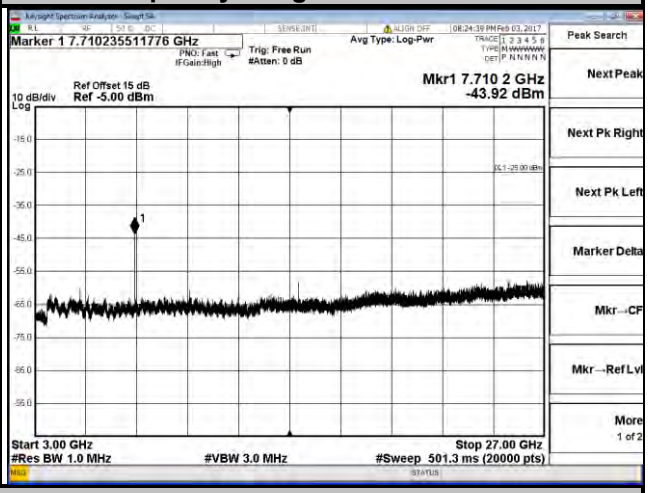
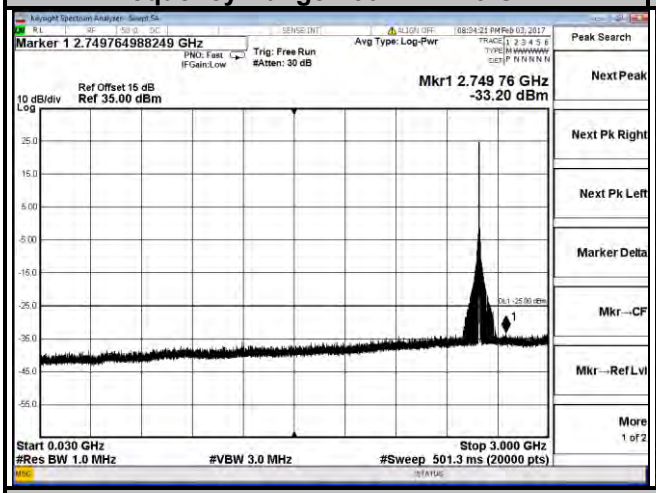
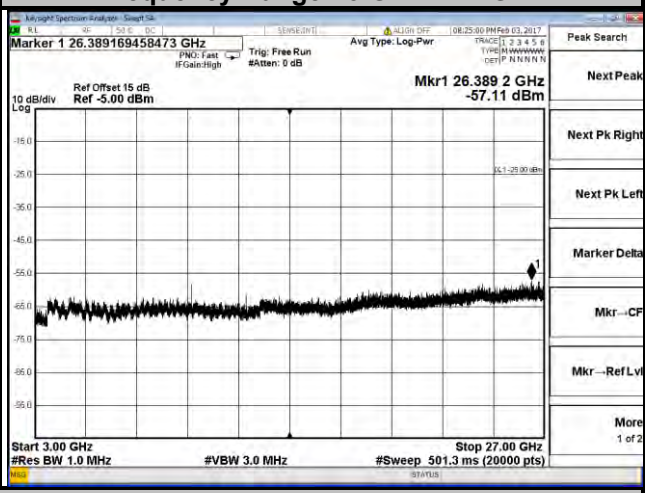
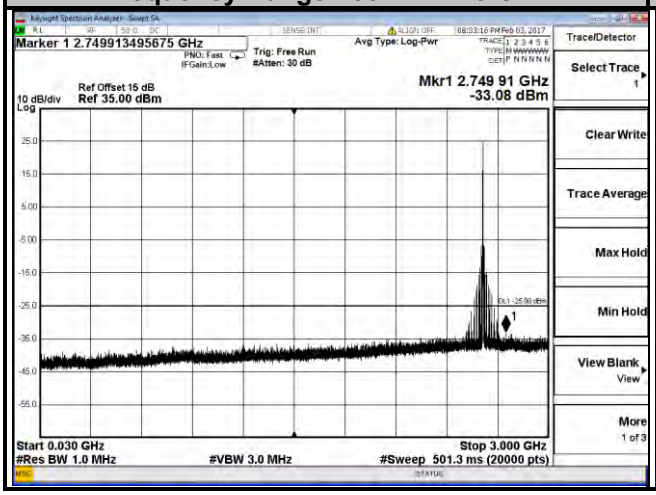
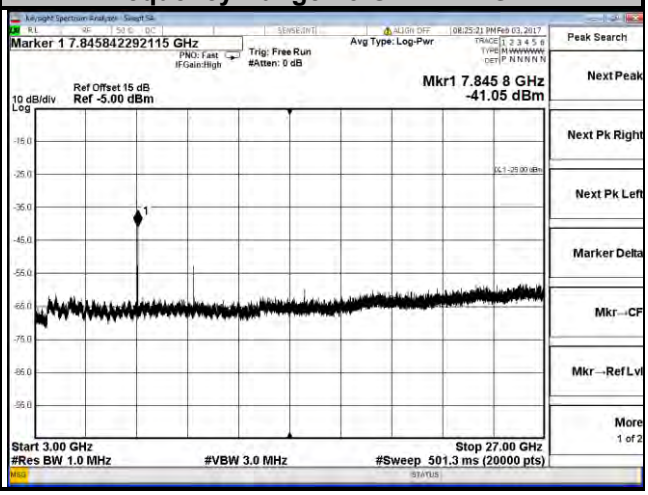
4.6.4 Test Results

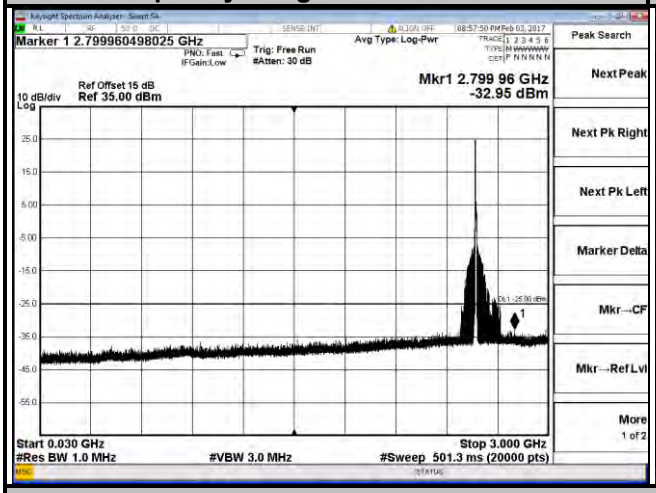
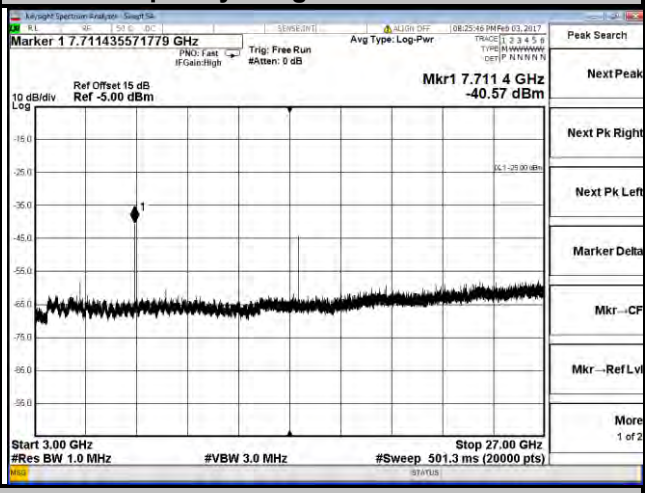
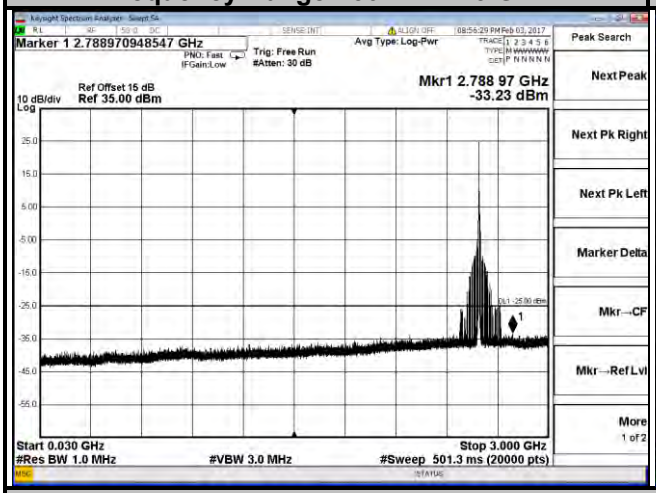
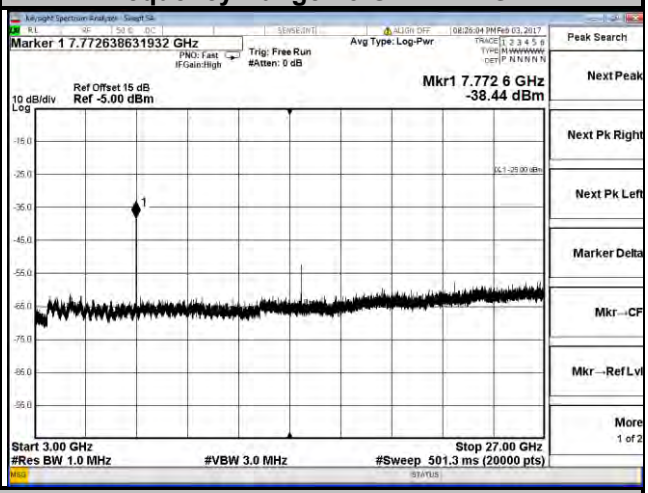
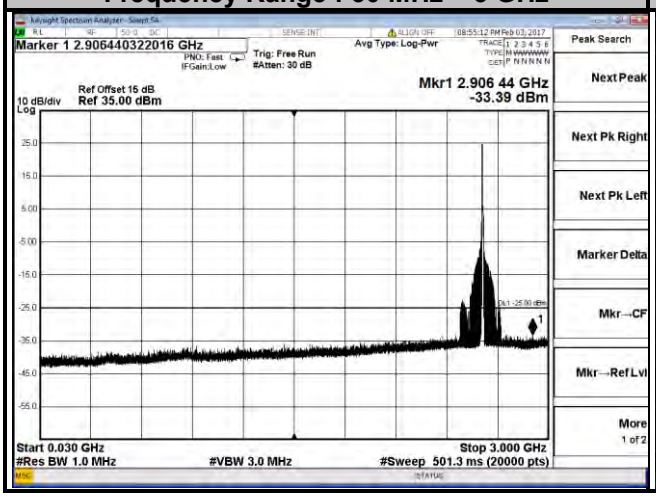
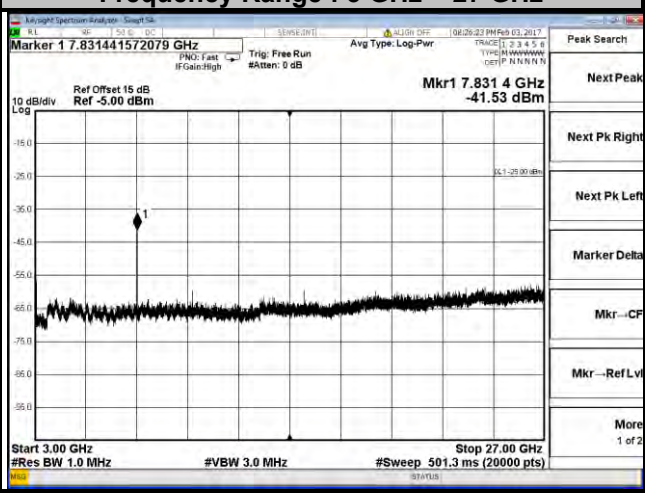
LTE Band 7	
Channel Bandwidth: 5 MHz	
Channel 20775	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21100	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21425	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	

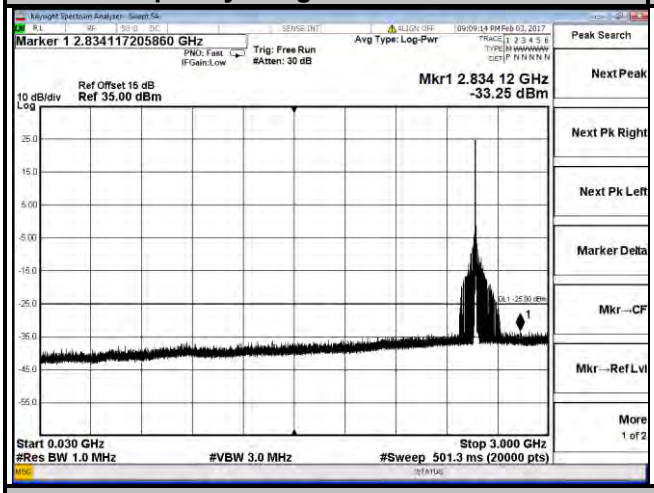
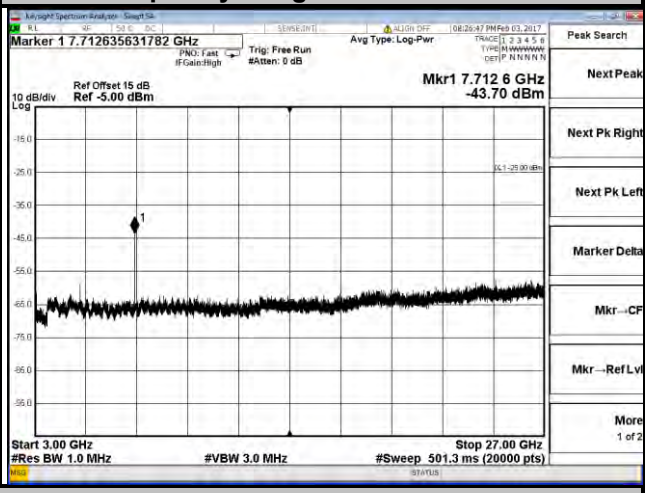
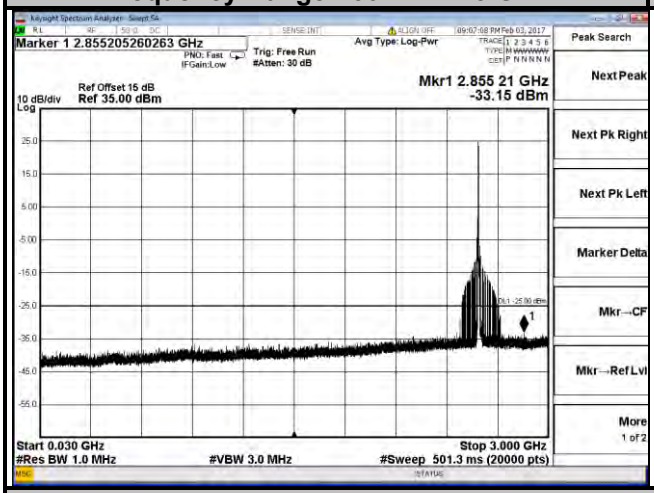
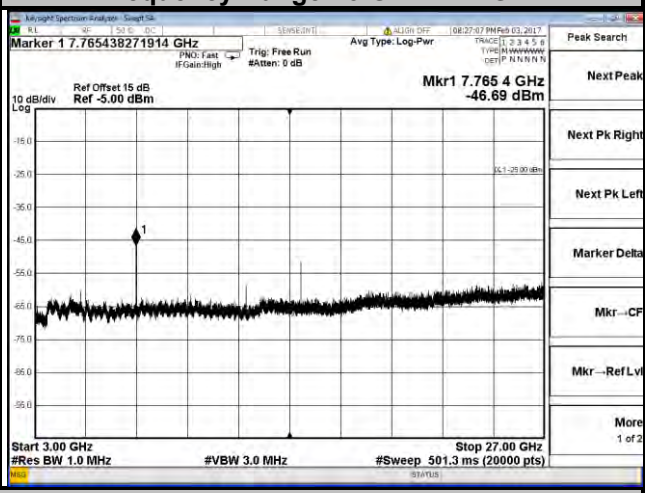
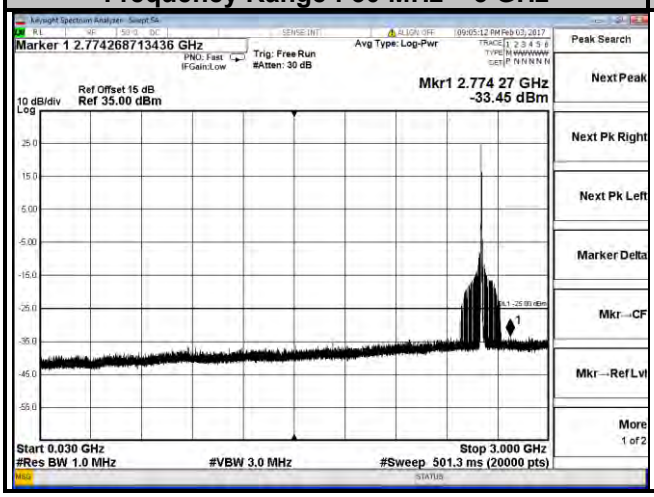
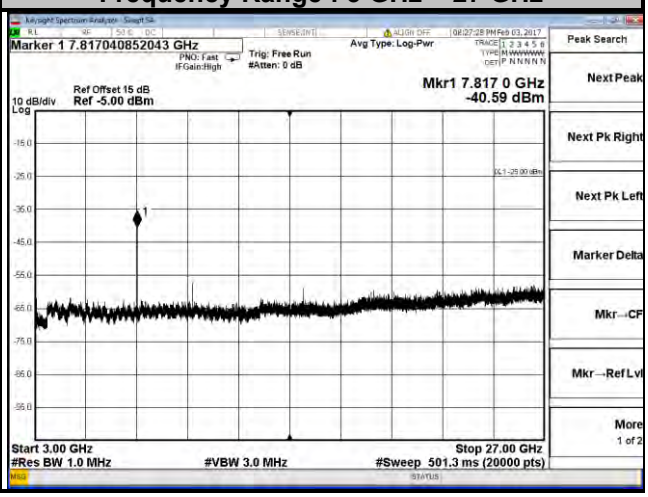
LTE Band 7	
Channel Bandwidth: 10 MHz	
Channel 20800	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21100	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21400	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	

LTE Band 7	
Channel Bandwidth: 15 MHz	
Channel 20825	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21100	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21375	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	

LTE Band 7	
Channel Bandwidth: 20 MHz	
Channel 20850	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21100	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	
Channel 21350	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 26 GHz
	

LTE Band 38	
Channel Bandwidth: 5 MHz	
Channel 37775	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	
Channel 38000	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	
Channel 38225	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	

LTE Band 38	
Channel Bandwidth: 10 MHz	
Channel 37800	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	
Channel 38000	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	
Channel 38200	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	

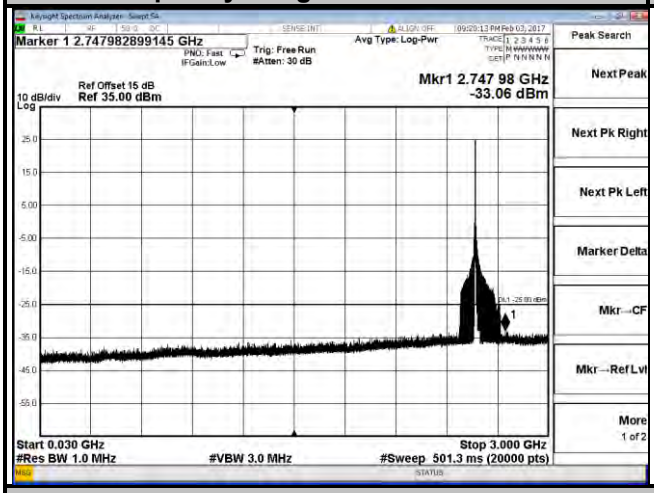
LTE Band 38	
Channel Bandwidth: 15 MHz	
Channel 37825	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	
Channel 38000	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	
Channel 38175	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	

LTE Band 38

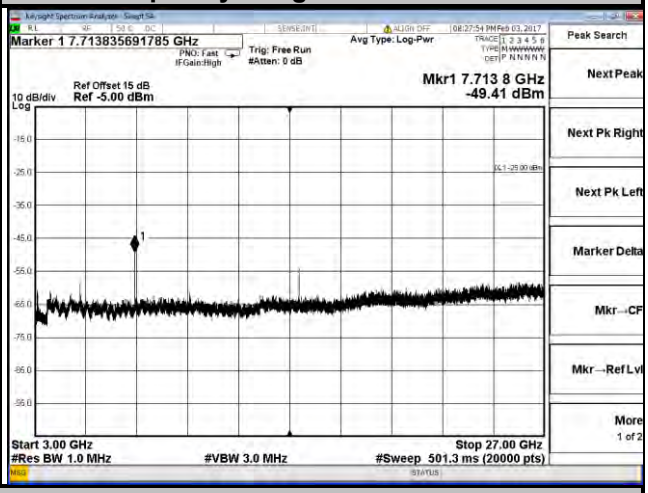
Channel Bandwidth: 20 MHz

Channel 37850

Frequency Range : 30 MHz ~ 3 GHz

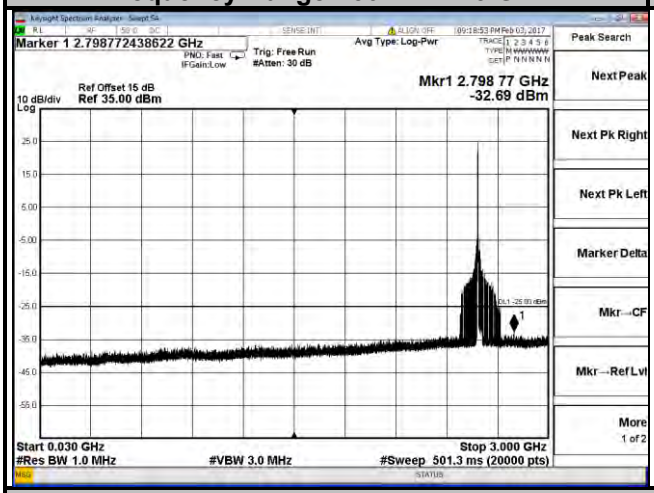


Frequency Range : 3 GHz ~ 27 GHz

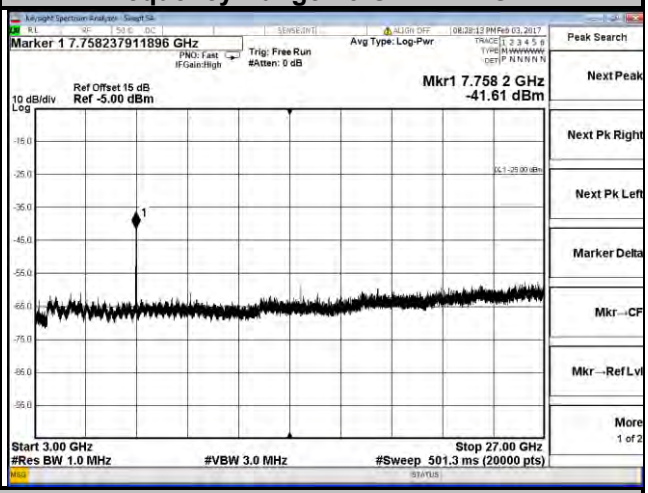


Channel 38000

Frequency Range : 30 MHz ~ 3 GHz

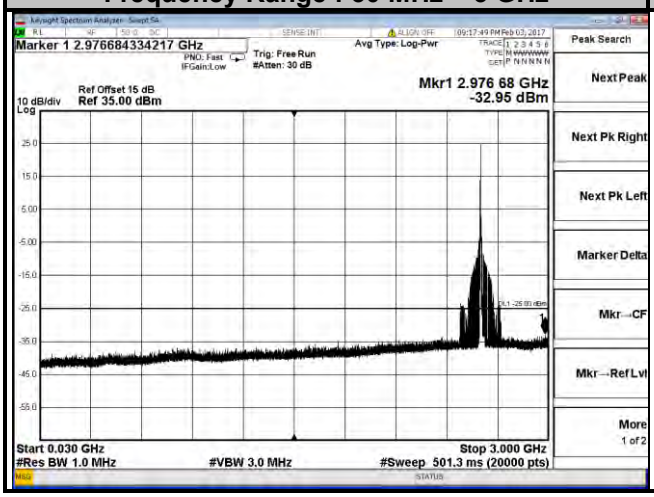


Frequency Range : 3 GHz ~ 27 GHz

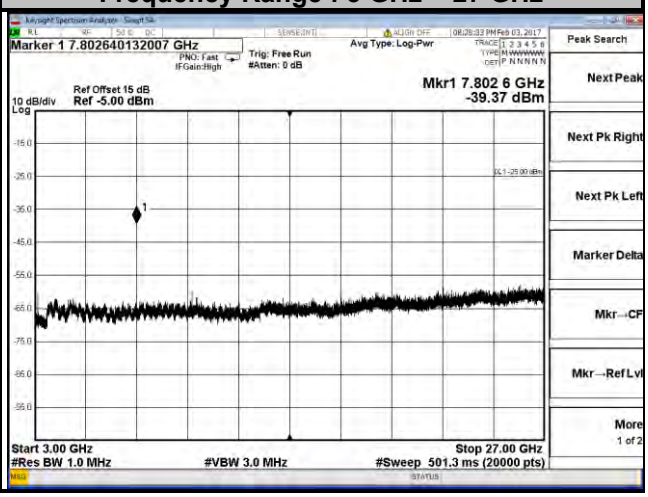


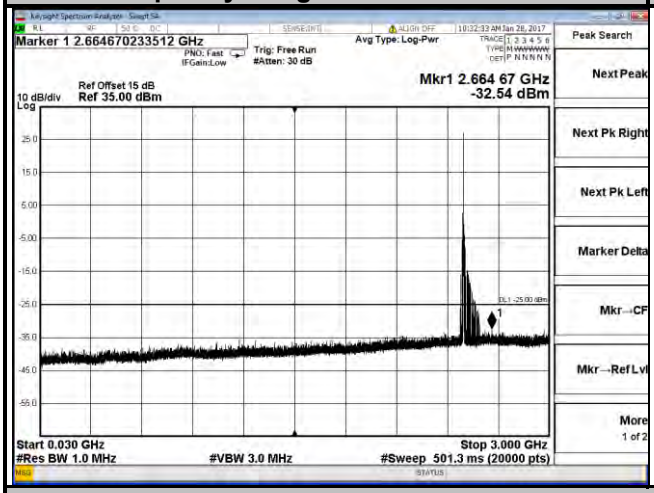
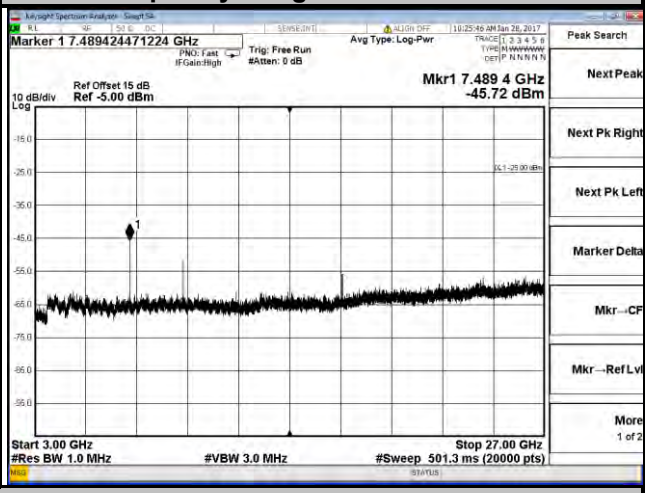
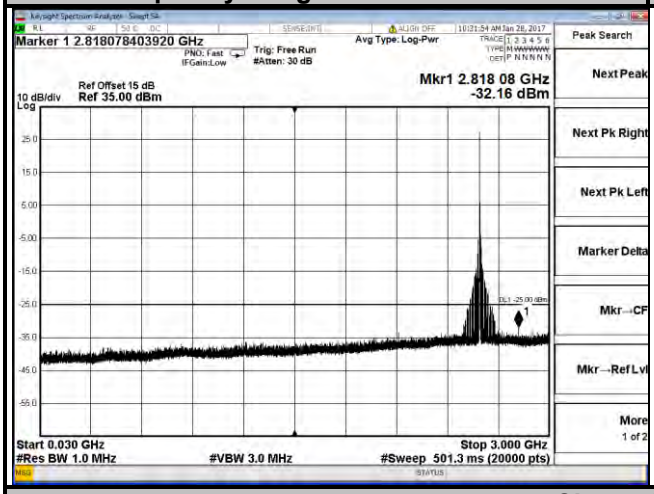
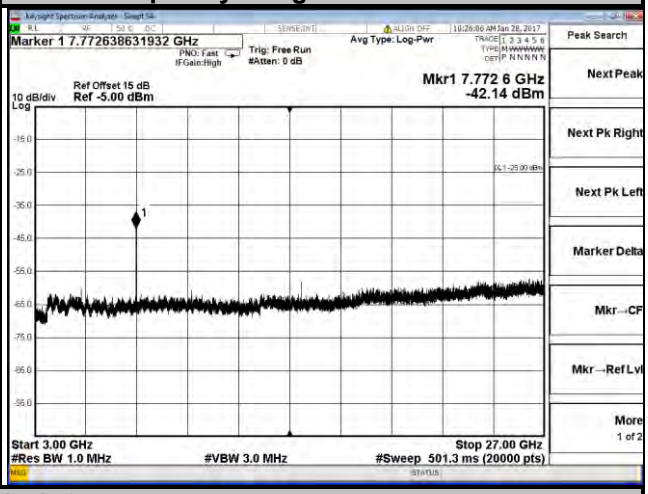
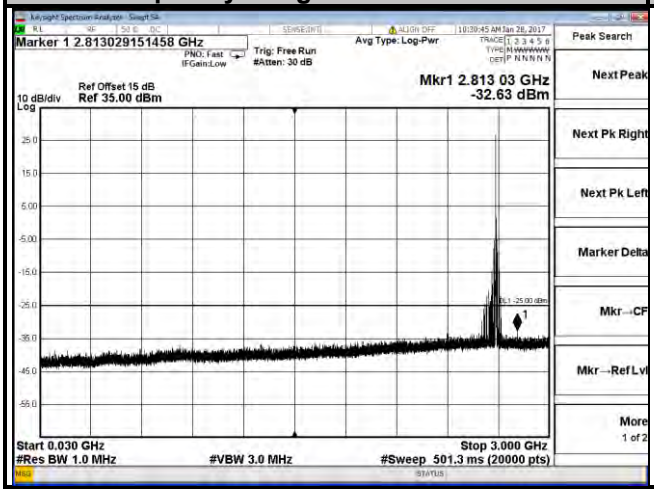
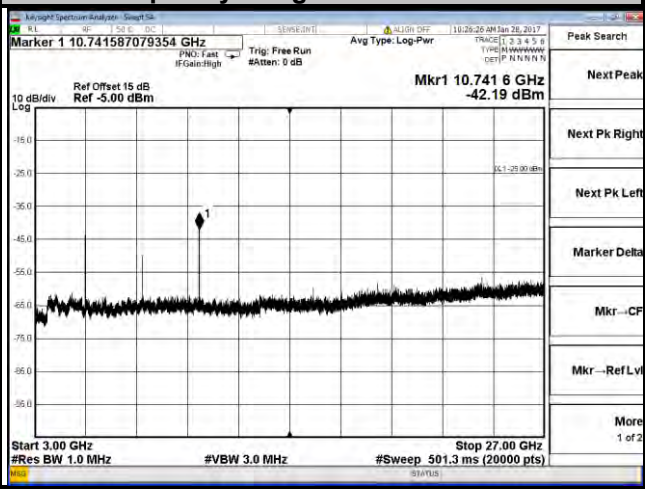
Channel 38150

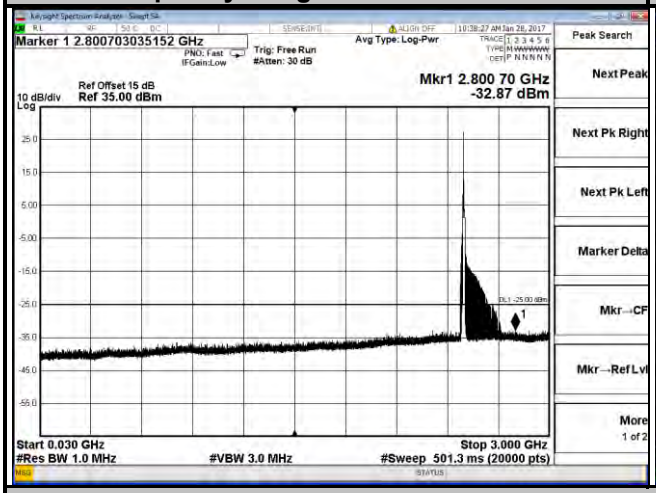
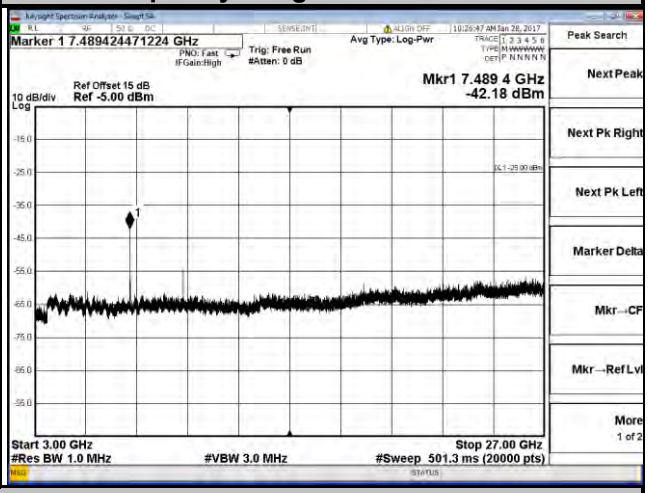
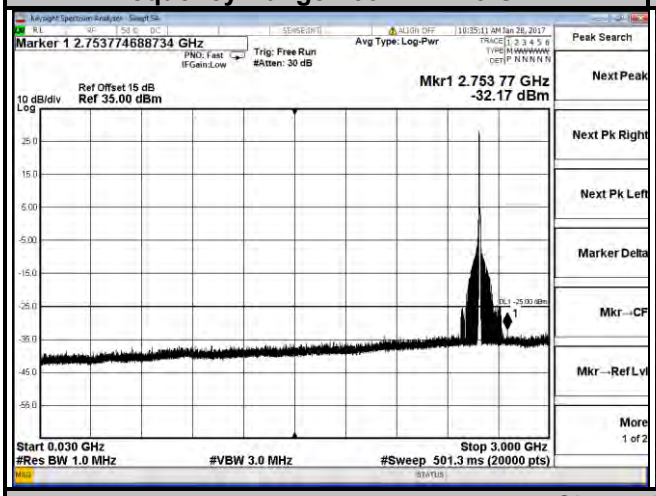
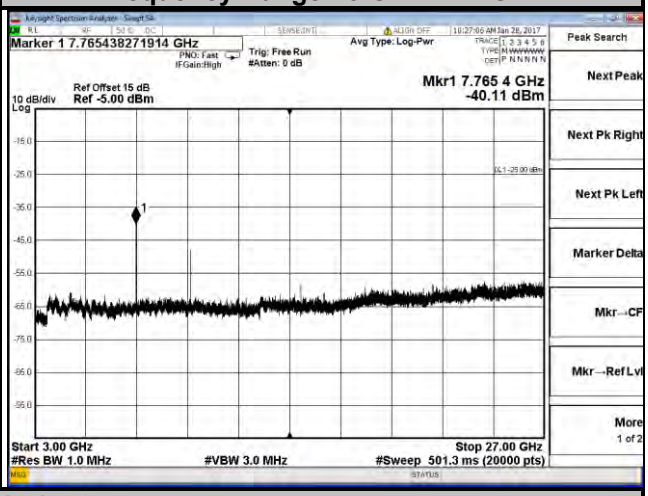
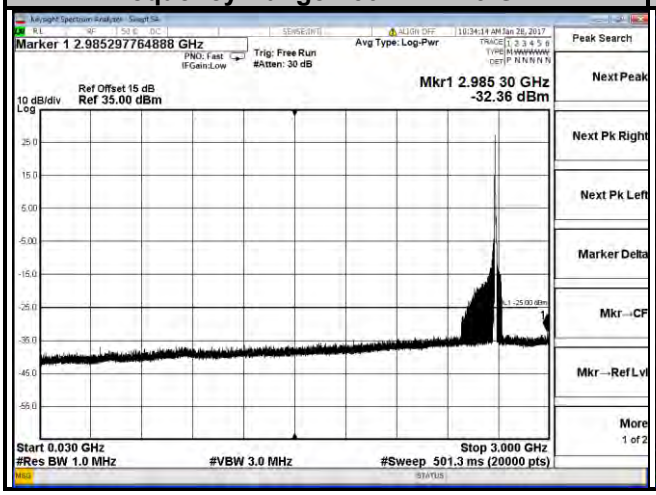
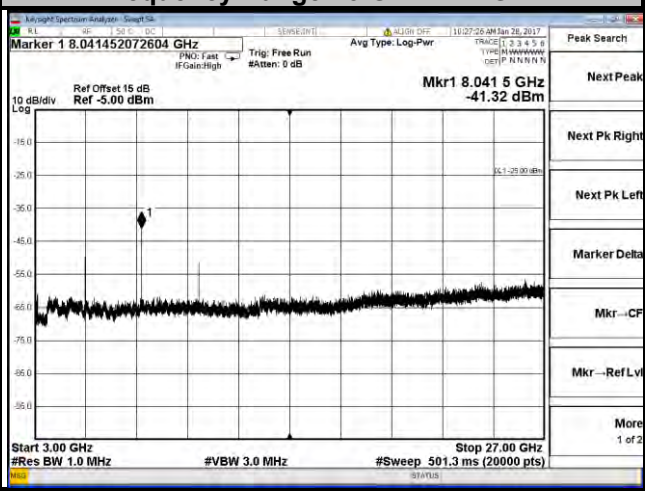
Frequency Range : 30 MHz ~ 3 GHz

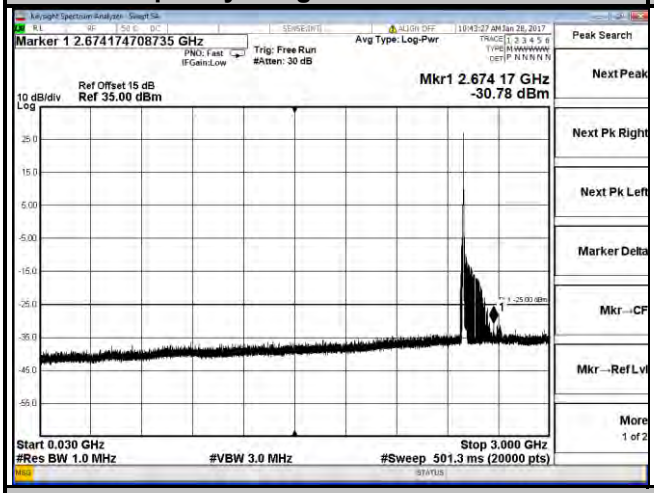
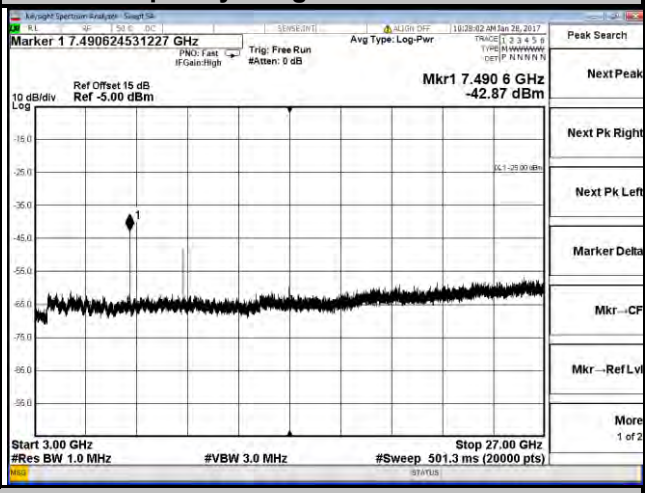
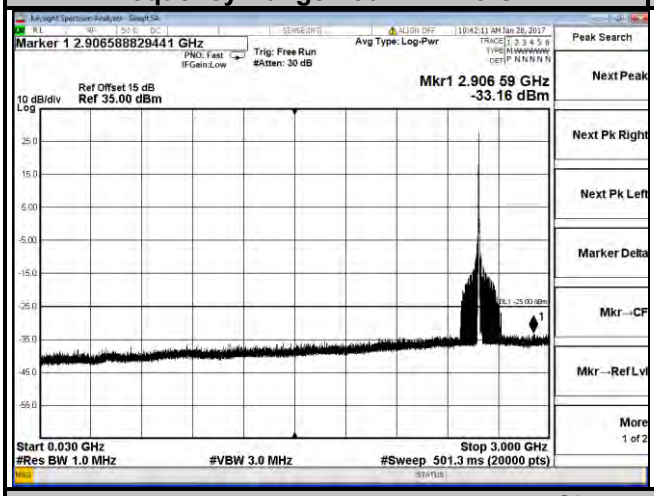
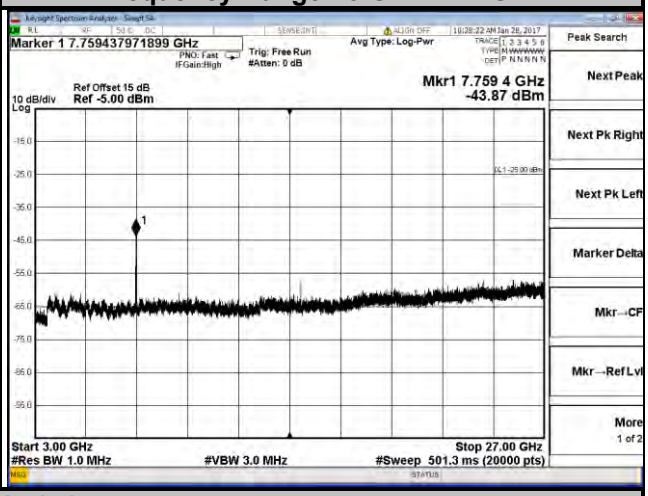
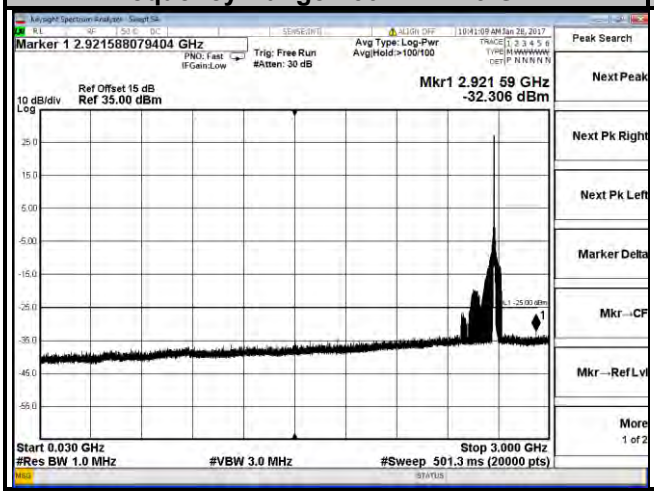
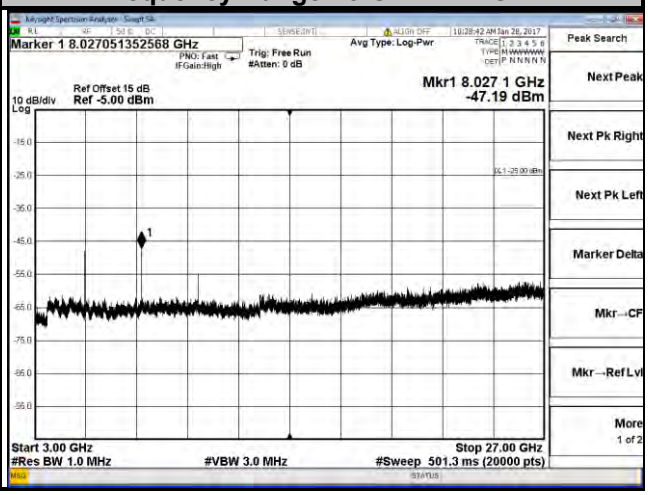


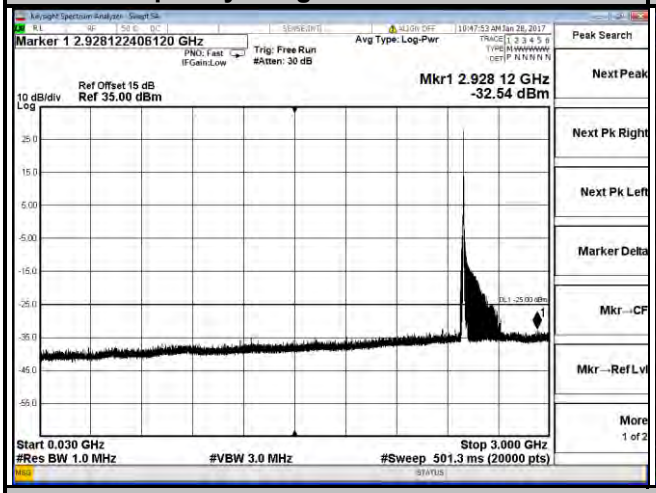
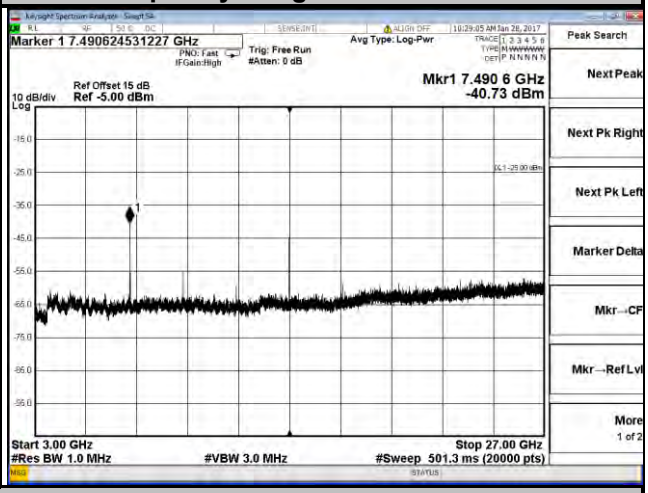
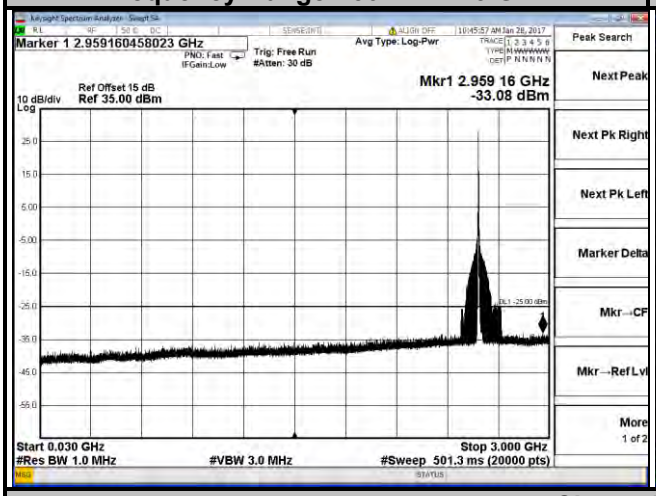
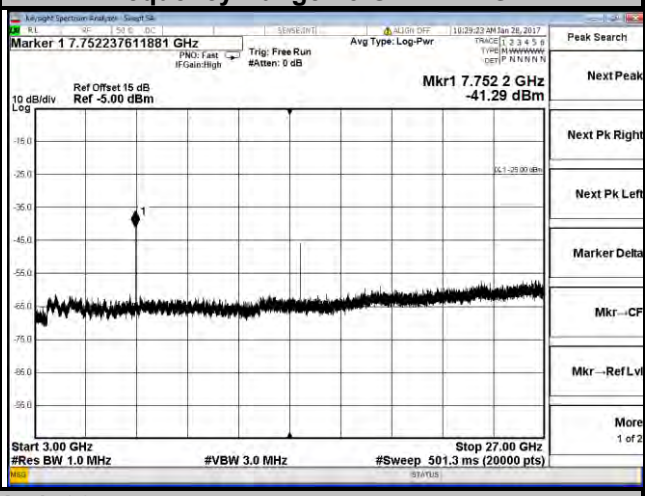
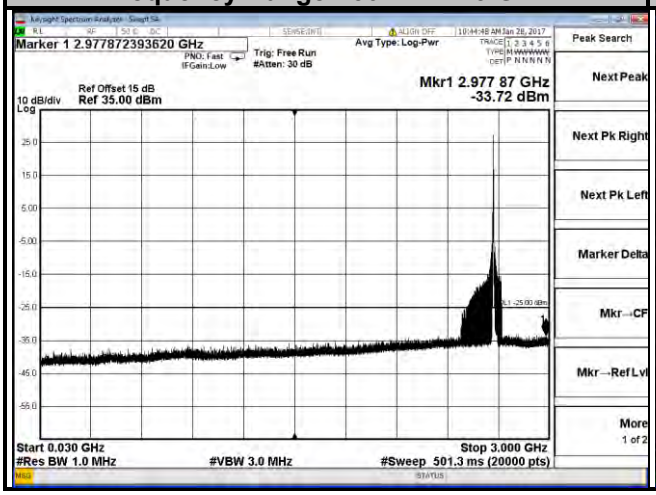
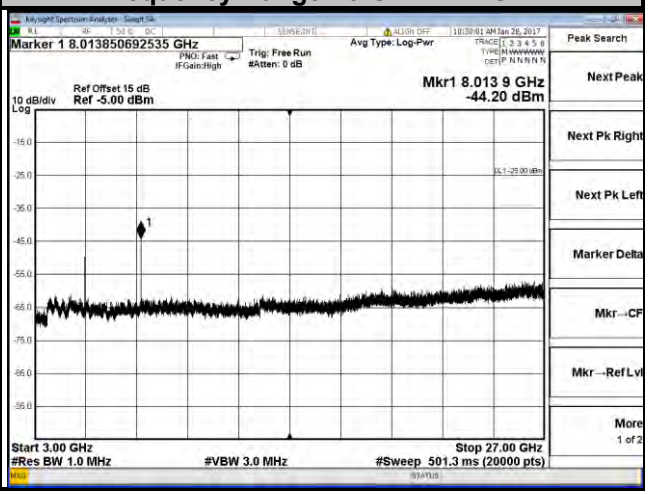
Frequency Range : 3 GHz ~ 27 GHz



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	
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 41540	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	

LTE Band 41	
Channel Bandwidth: 15 MHz	
Channel 39725	
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 41515	
Frequency Range : 30 MHz ~ 3 GHz	Frequency Range : 3 GHz ~ 27 GHz
	

LTE Band 41	
Channel Bandwidth: 20 MHz	
Channel 39750	
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 41490	
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 log10(P) dB. The limit of emission is equal to -25 dBm.

4.7.2 Test Procedure

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G.

c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

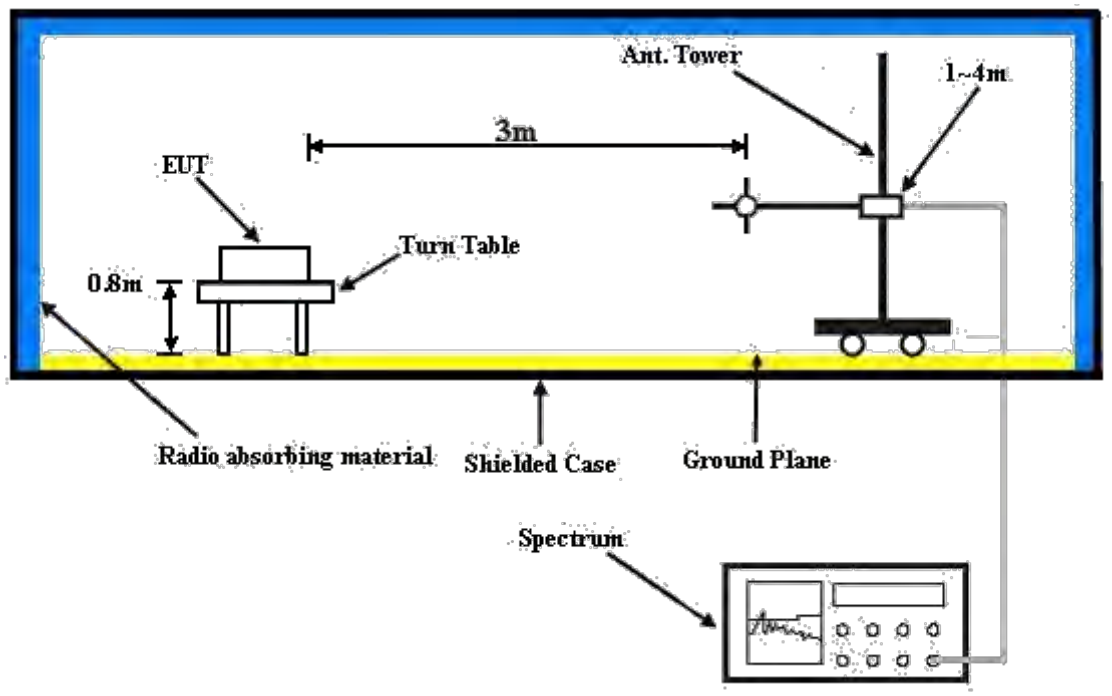
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15 dBi.

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



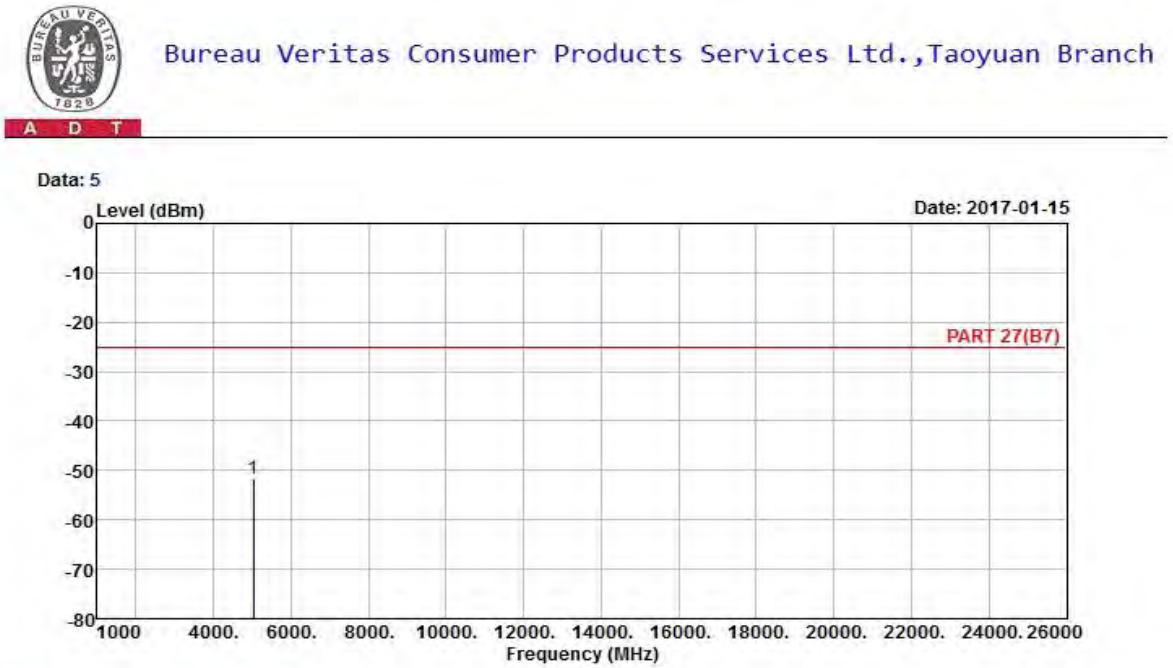
For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.7.5 Test Results

LTE Band 7

Channel Bandwidth: 20 MHz / QPSK

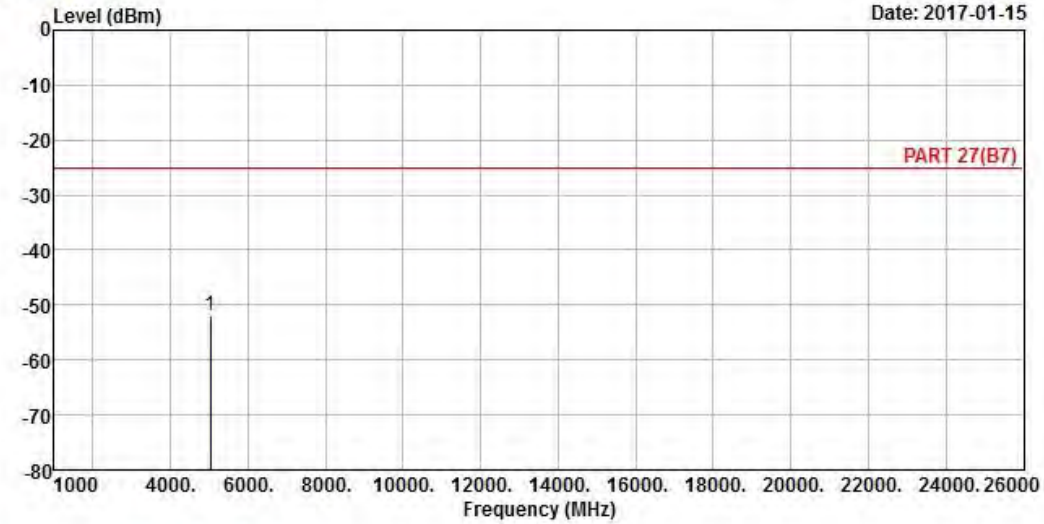
Low Channel



Site : 966 Chamber 5
Condition: PART 27(B7) HORIZONTAL
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	-51.76	-48.53	-25.00	-26.76	-3.23	Peak

Data: 6



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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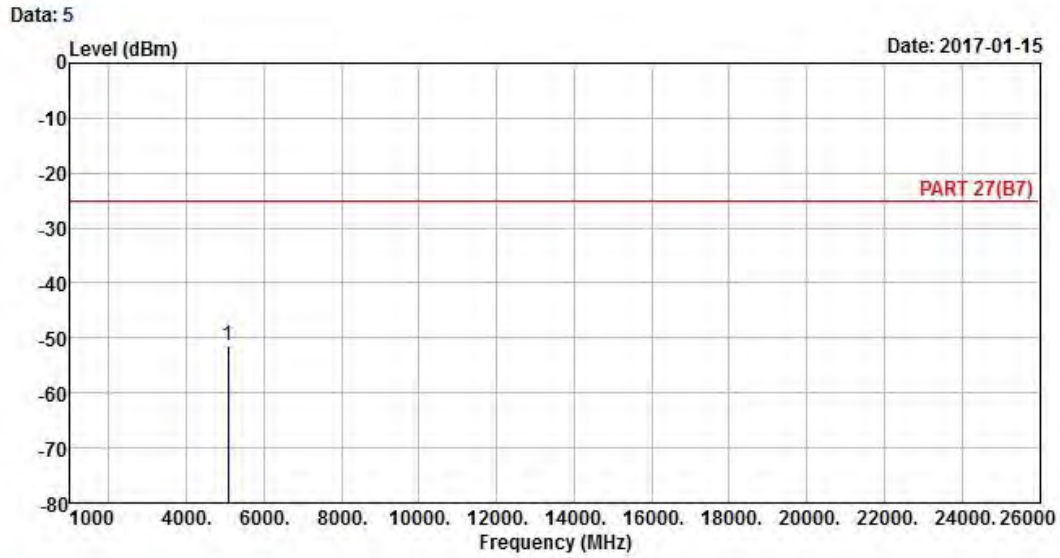
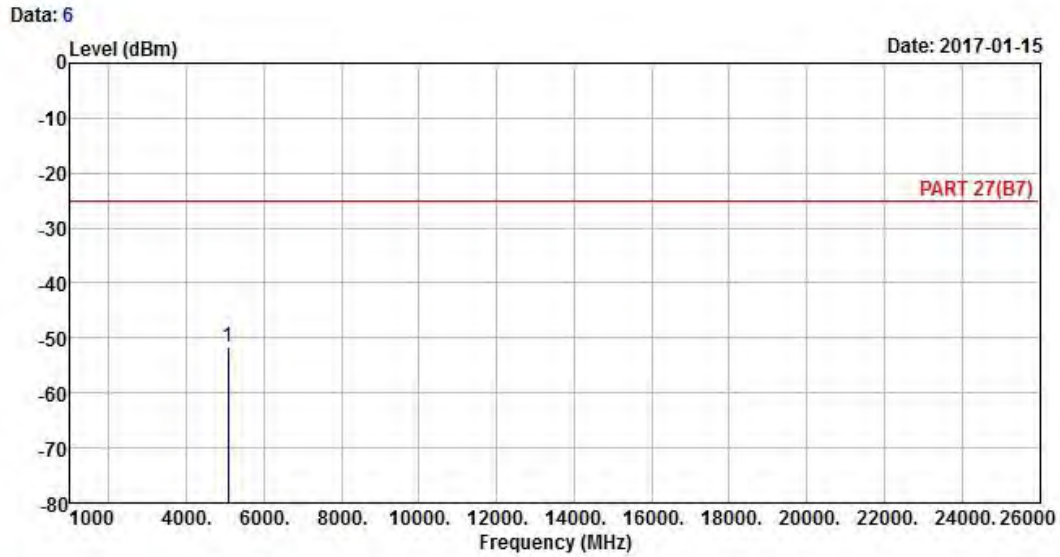


Site : 966 Chamber 5
Condition: PART 27(B7) HORIZONTAL
Remak : LTE Band 7 QPSK_20M_M-CH Link
Tested by: Gavin Wu

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



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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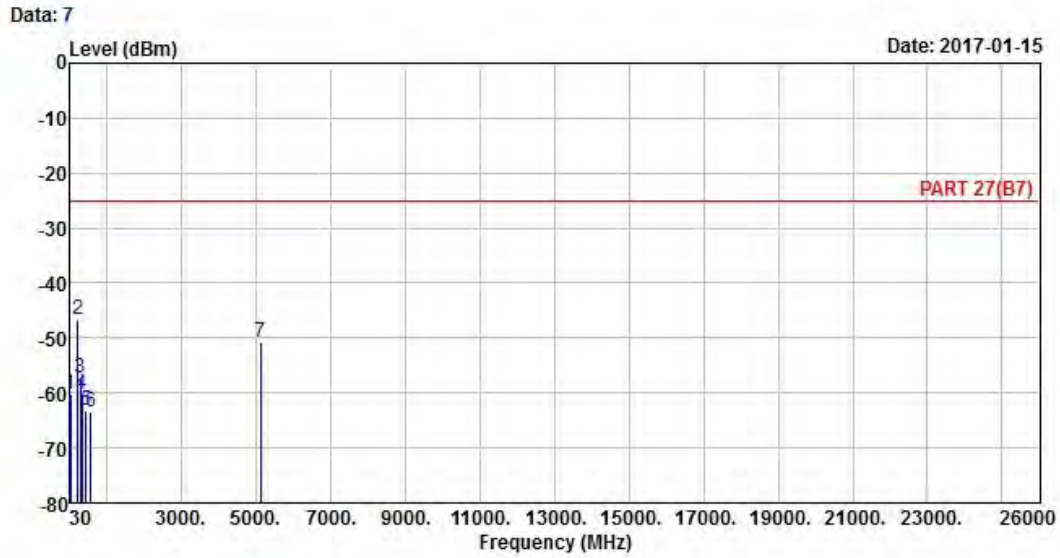
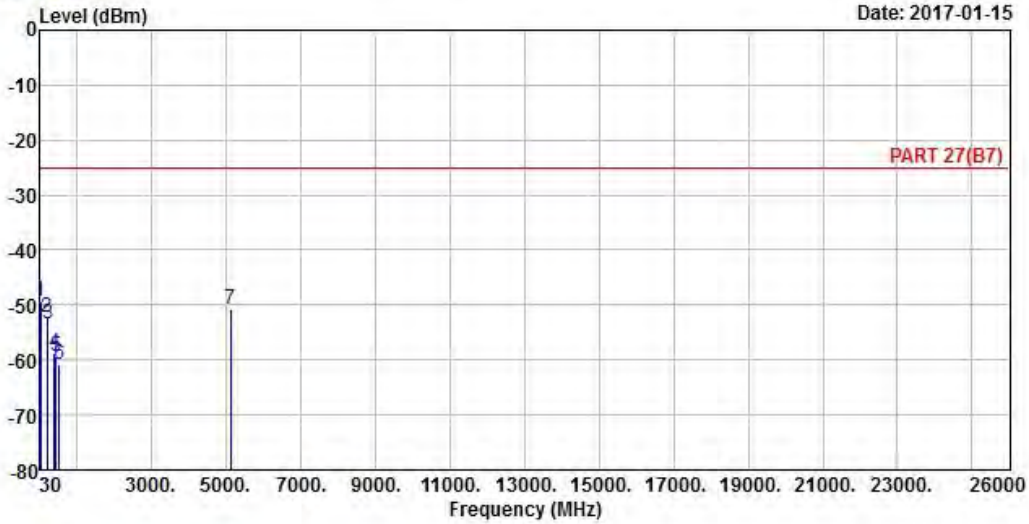


Site : 966 Chamber 5
Condition: PART 27(B7) HORIZONTAL
Remak : LTE Band 7 QPSK_20M_H-CH Link
Tested by: Gavin Wu

	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

Data: 8



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

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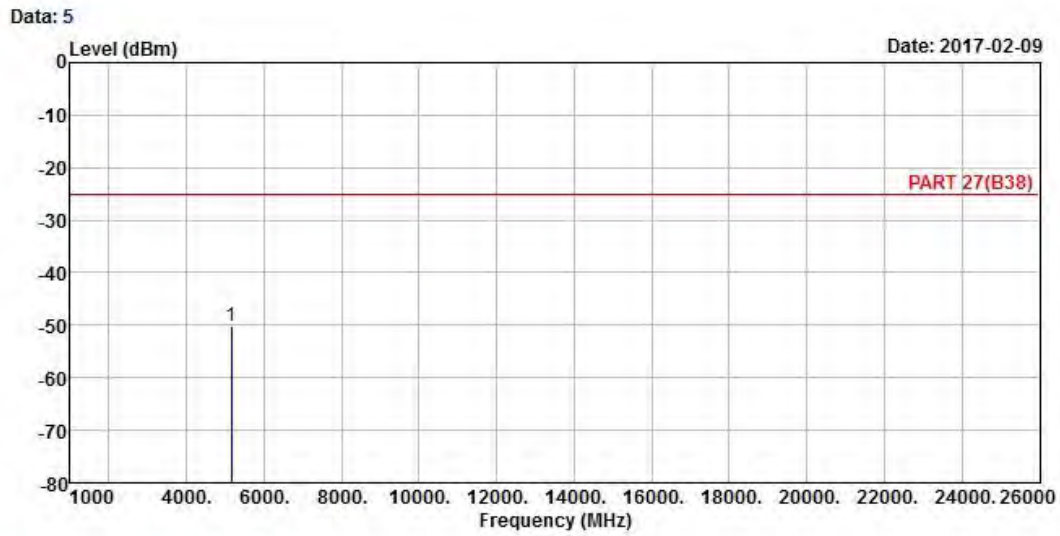
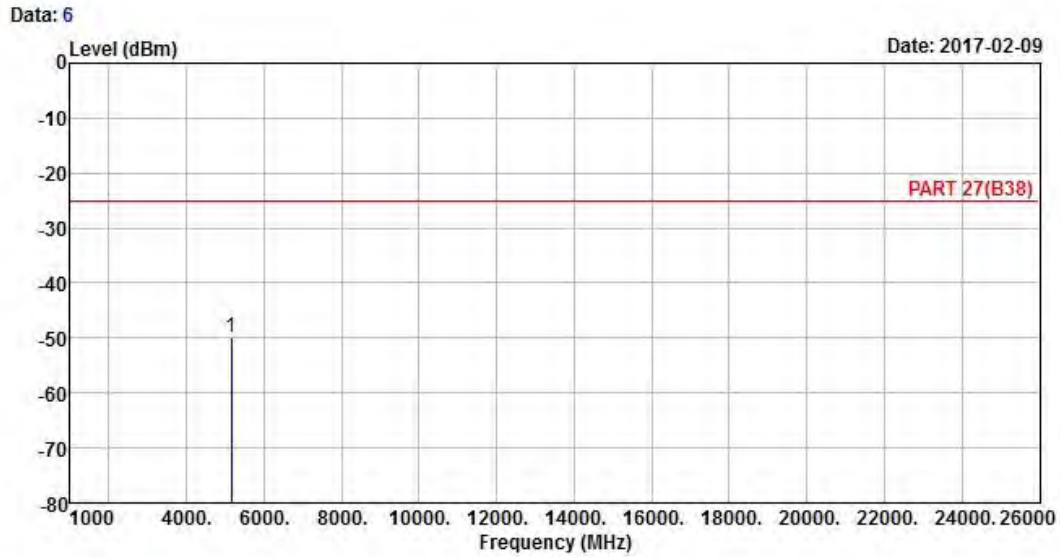


Site : 966 Chamber 5
Condition: PART 27(B38) HORIZONTAL
Remak : LTE Band 38 QPSK_20M_L-CH Link
Tested by: Getaz Yang

	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



Site : 966 Chamber 5
Condition: PART 27(B38) VERTICAL
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	-49.87	-46.94	-25.00	-24.87	-2.93	Peak

Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

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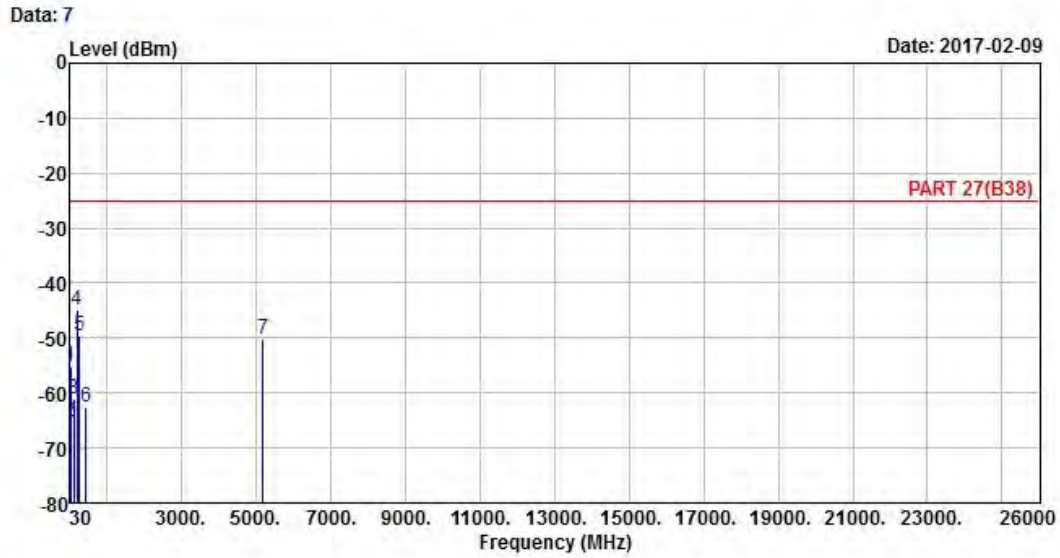
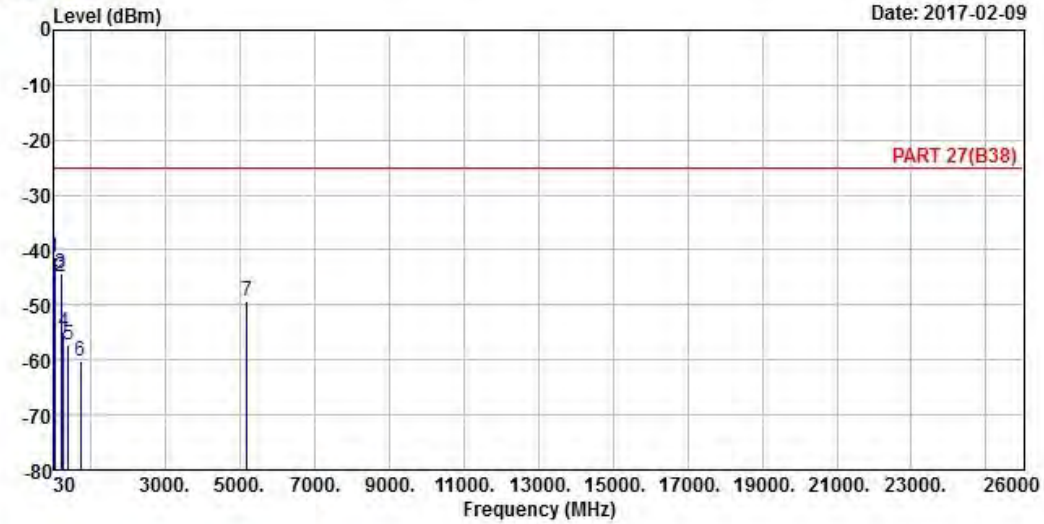


Site : 966 Chamber 5
Condition: PART 27(B38) HORIZONTAL
Remak : LTE Band 38 QPSK_20M_M-CH Link
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Over Limit	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

Data: 8



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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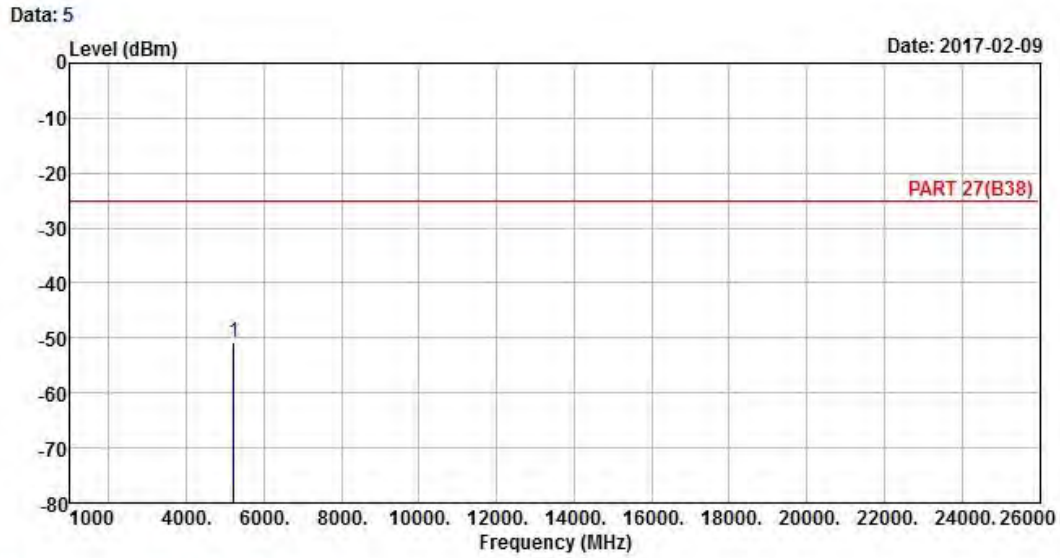
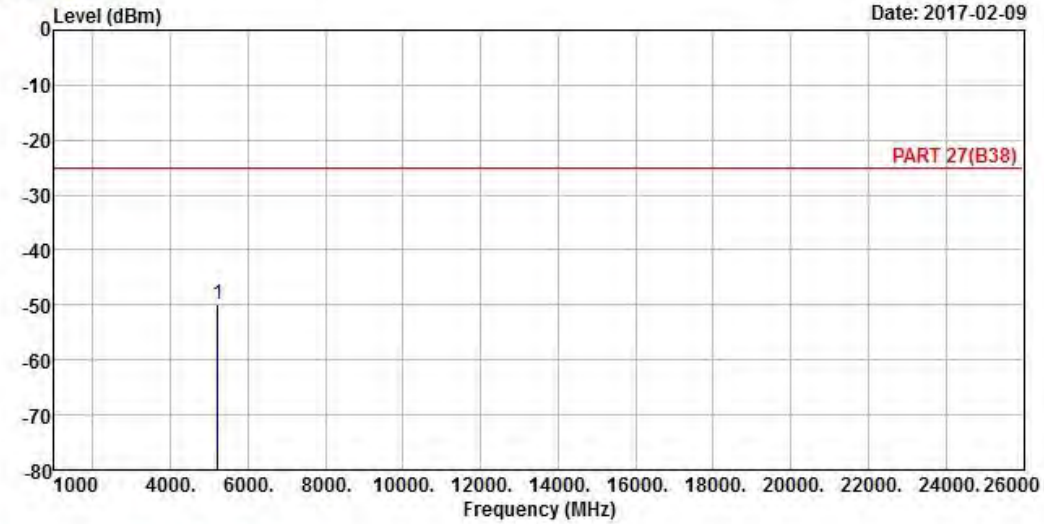


Site : 966 Chamber 5
Condition: PART 27(B38) HORIZONTAL
Remak : LTE Band 38 QPSK_20M_H-CH Link
Tested by: Getaz Yang

	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

Data: 6

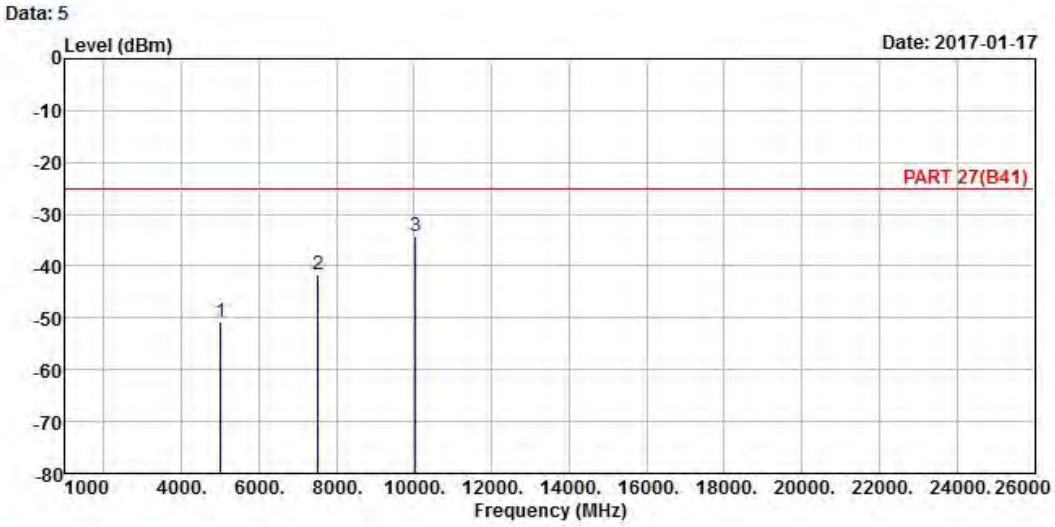


Site : 966 Chamber 5
Condition: PART 27(B38) VERTICAL
Remak : LTE Band 38 QPSK_20M_H-CH Link
Tested by: Getaz Yang

	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

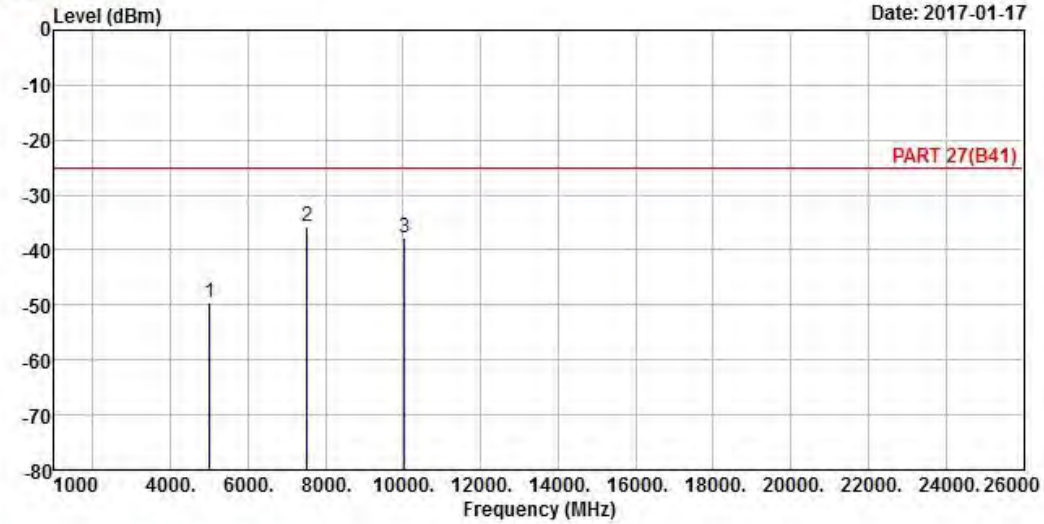
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

Data: 6



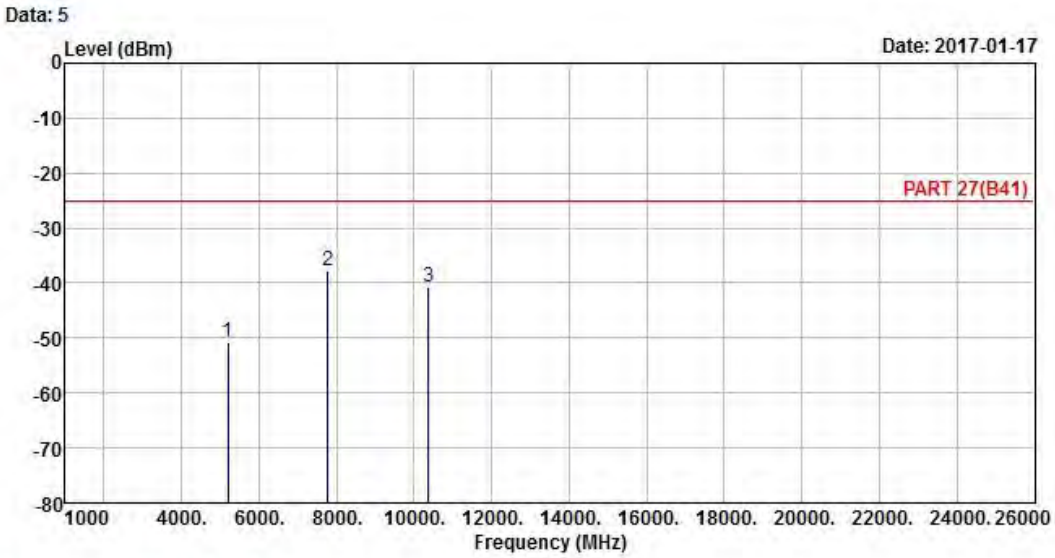
Site : 966 Chamber 5
Condition: PART 27(B41) VERTICAL
Remak : LTE Band 41 QPSK_20M_L-CH Link
Tested by: Getaz Yang

	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

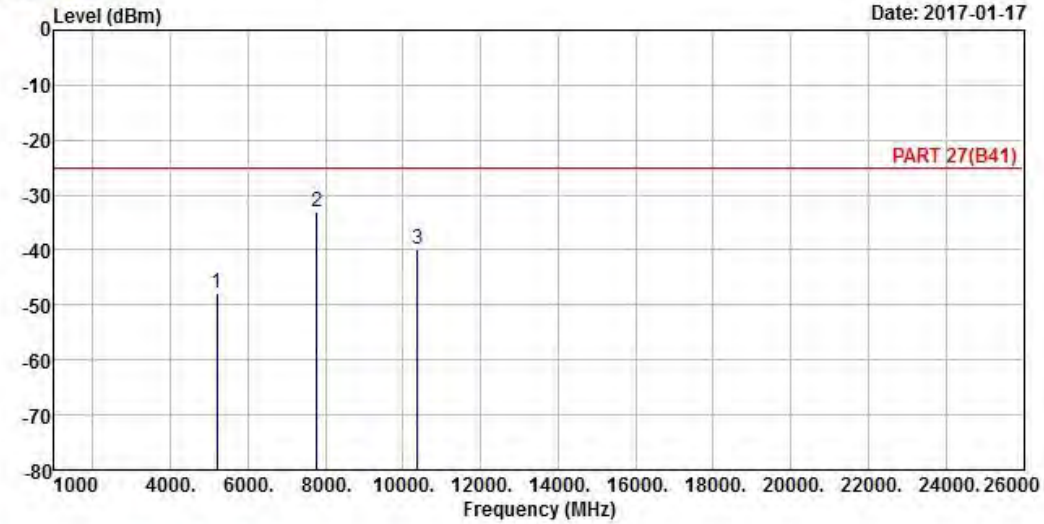
A D T



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

Data: 6



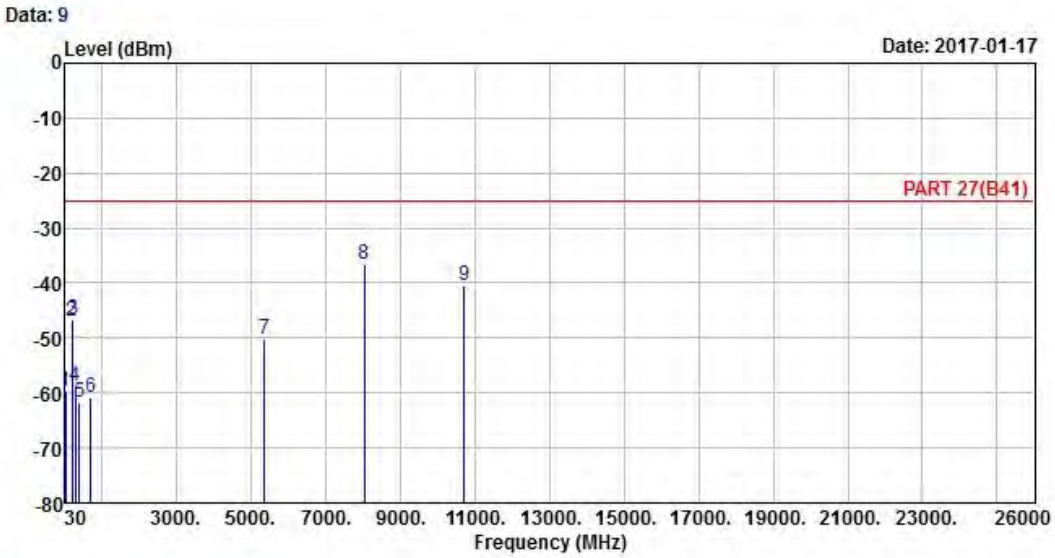
Site : 966 Chamber 5
Condition: PART 27(B41) VERTICAL
Remak : LTE Band 41 QPSK_20M_M-CH Link
Tested by: Getaz Yang

	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

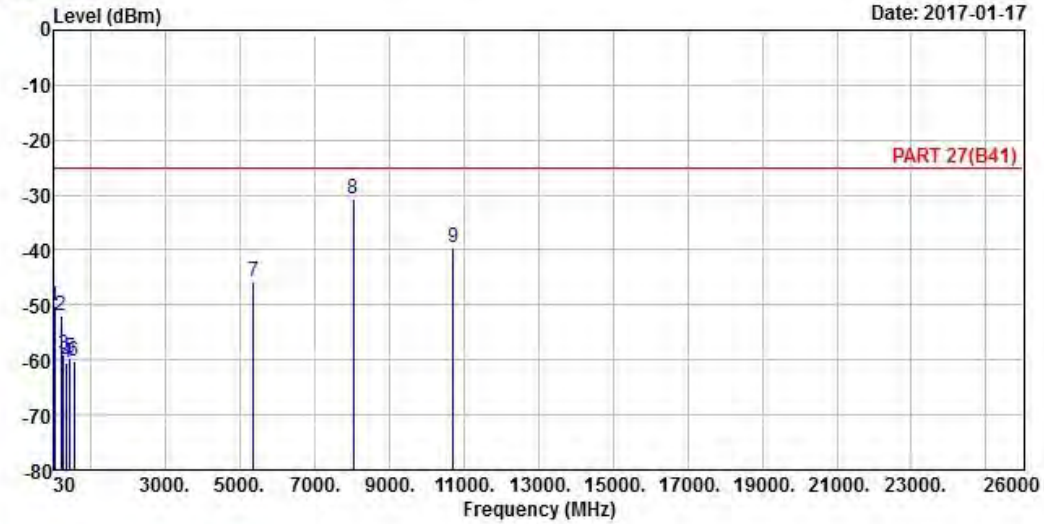
A D T



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 Line	Over Limit	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

Data: 10



Site : 966 Chamber 5
Condition: PART 27(B41) VERTICAL
Remak : LTE Band 41 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	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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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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