FCC Report (LTE)

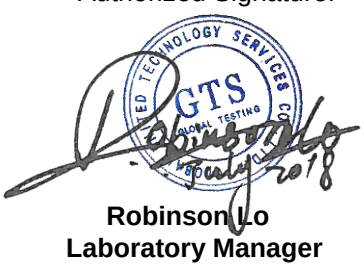
Applicant:	TR Controls Inc.
Address of Applicant:	955 Green Valley Road,London, Ontario, Canada, N6N 1E4
Manufacturer:	Positioning Universal Inc
Address of Manufacturer:	4660 La Jolla Village Drive, Suite 1100, San Diego, CA92122, United States

Equipment Under Test (EUT)

Product Name:	M7 LTE Vehicle Telematics Unit
Model No.:	M7L
FCC ID:	2AL9H-M7L
Applicable standards:	FCC CFR Title 47 Part 2 FCC CFR Title 47 Part 24 FCC CFR Title 47 Part 27
Date of sample receipt:	June 11, 2018
Date of Test:	June 12-July 16, 2018
Date of report issued:	July 17, 2018
Test Result :	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

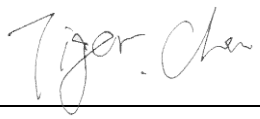
Authorized Signature:



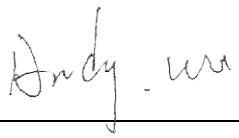
Robinson Lo
Laboratory Manager

2 Version

Version No.	Date	Description
00	*July 17, 2018*	*Original*

Prepared By:  ***Date:*** *July 17, 2018*

Project Engineer

Check By:  ***Date:*** *July 17, 2018*

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass* (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 24.232 (c) Part 27.50(c)(10)/(d)(4)	Pass
Peak-to-Average Ratio	FCC part24.232(d) FCC Part 27.50	Pass
Modulation Characteristics	Part 2.1047	N/A
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 24.238 Part 27.53(h)/(g)	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 24.238 (a) Part 27.53(h)/(g)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 24.238 (a) Part 27.53(h)/(g)	Pass
Out of band emission, Band Edge	Part 24.238 (a) Part 27.53(h)/(g)	Pass
Frequency stability vs. temperature	Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 2.1055(d)(1)(2)	Pass

Pass: The EUT complies with the essential requirements in the standard.

N/A: Not applicable.

5 General Information

5.1 General Description of EUT

Product Name:	M7 LTE Vehicle Telematics Unit
Model No.:	M7L
S/N:	N/A
Tested Sample(s) ID:	GTS201806000109-1
Hardware Version:	P2
Software Version:	20.00.524
Support Networks:	LTE
Support Bands:	LTE Band 2, LTE Band 4, LTE Band 5, LTE Band 12, LTE Band 13,
Channel Bandwidth:	LTE Band 2: 1.4MHz; 3MHz; 5MHz; 10MHz; 15MHz; 20MHz LTE Band 4: 1.4MHz; 3MHz; 5MHz; 10MHz; 15MHz; 20MHz LTE Band 5: 1.4MHz; 3MHz; 5MHz; 10MHz LTE Band 12: 1.4MHz; 3MHz; 5MHz; 10MHz LTE Band 13: 5MHz; 10MHz
TX Frequency:	LTE Band 2: 1850.70MHz-1909.30MHz LTE Band 4: 1710.70MHz-1754.30MHz LTE Band 5: 824.7MHz-848.3MHz LTE Band 12: 698.70MHz-715.30MHz LTE Band 13: 779.50MHz-784.50MHz
Modulation type:	LTE Band 2/4/5/12/13: QPSK, 16QAM
Antenna type:	Integral antenna
Antenna gain:	1.0dBi (declare by manufacturer)
Power supply:	DC 6-90V

5.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with Section Part 27 of the FCC CFR 47 Rules.

5.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA 603 and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

5.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383, January 08, 2018.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016.

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

6 Test Instruments list

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	GTS250	July 03 2015	July 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June 28 2017	June 27 2018
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June 28 2017	June 27 2018
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 28 2017	June 27 2018
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June 28 2017	June 27 2018
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June 28 2017	June 27 2018
9	Coaxial Cable	GTS	N/A	GTS211	June 28 2017	June 27 2018
10	Coaxial cable	GTS	N/A	GTS210	June 28 2017	June 27 2018
11	Coaxial Cable	GTS	N/A	GTS212	June 28 2017	June 27 2018
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June 28 2017	June 27 2018
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June 28 2017	June 27 2018
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 28 2017	June 27 2018
15	Band filter	Amindeon	82346	GTS219	June 28 2017	June 27 2018
16	Universal radio communication tester	Rohde & Schwarz	CMU200	GTS235	June 28 2017	June 27 2018
17	Signal Generator	Rohde & Schwarz	SML03	GTS236	June 28 2017	June 27 2018
18	Temp. Humidity/ Barometer	Oregon Scientific	BA-888	GTS248	June 28 2017	June 27 2018
19	D.C. Power Supply	Instek	PS-3030	GTS232	June 28 2017	June 27 2018
20	Splitter	Agilent	11636B	GTS237	June 28 2017	June 27 2018
21	Power meter	Anritsu	ML2495A	GTS540	June 28 2017	June 27 2018
22	Power Sensor	Anritsu	MA2411B	GTS541	June 28 2017	June 27 2018
23	Spectrum Analyzer	Agilent	E4440A	GTS533	June 28 2017	June 27 2018
24	Temp.&Humidity chamber	Chuang wei	GDS-225	GTS005-1	June 28 2017	June 27 2018
25	Highpass filter	Micro-Tronics	HPM50108	GTS549	June 28 2017	June 27 2018
26	Highpass filter	Micro-Tronics	HPM50111	GTS550	June 28 2017	June 27 2018

General used equipment:

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 27 2018	June. 26 2019
2	Barometer	ChangChun	DYM3	GTS255	June. 27 2018	June. 26 2019

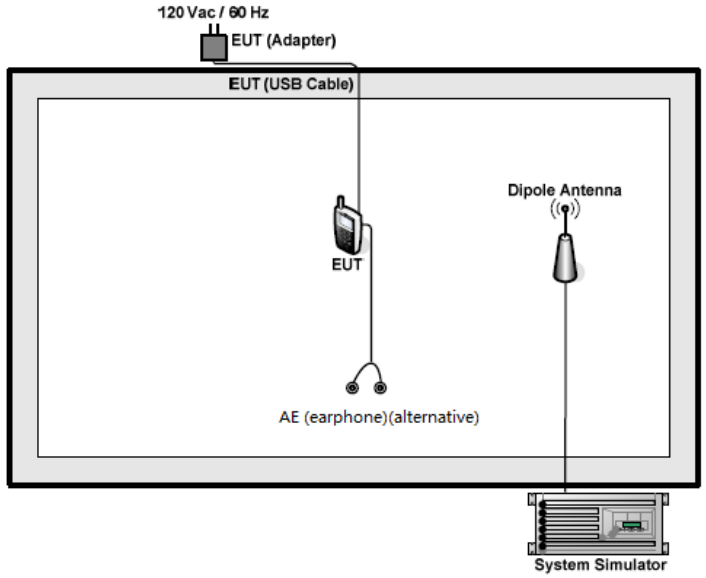
7 System test configuration

7.1 Test mode

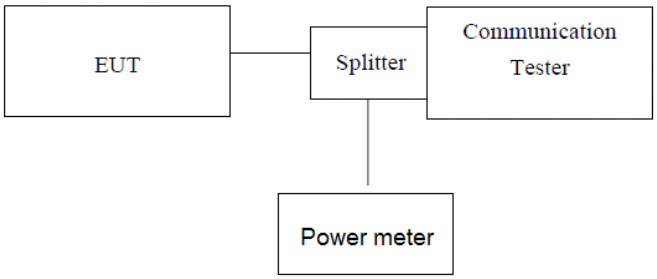
During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Test modes		
Band	Radiated	Conducted
LTE Band 2	■ QPSK and 16QAM link	■ QPSK and 16QAM link
LTE Band 4	■ QPSK and 16QAM link	■ QPSK and 16QAM link
LTE Band 5	■ QPSK and 16QAM link	■ QPSK and 16QAM link
LTE Band 12	■ QPSK and 16QAM link	■ QPSK and 16QAM link
LTE Band 13	■ QPSK and 16QAM link	■ QPSK and 16QAM link

7.2 Configuration of Tested System



7.3 Conducted Peak Output Power

Test Requirement:	Part 24.232 (c); Part 27.50(c)(10)/(d)(4)
Test Method:	FCC part2.1046
Limit:	LTE Band 2: 2W LTE Band 4: 1W LTE Band 5: 7W LTE Band 12: 3W LTE Band 13: 3W
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1. The transmitter output port was connected to base station. 2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement. 3. Set EUT at maximum power through base station. 4. Select lowest, middle, and highest channels for each band and different modulation. 5. Measure the maximum burst average power.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data

Band 2						
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18607 1850.7MHz	Channel 18900 1880.0MHz	Channel 19193 1909.3MHz
1.4MHz	QPSK	1	0	21.93	21.26	21.92
		1	2	21.07	**21.94**	21.26
		1	5	21.06	21.54	21.64
		3	0	21.08	21.70	21.55
		3	1	21.17	21.66	21.73
		3	2	21.71	21.44	21.71
		6	0	21.59	21.07	21.72
	16QAM	1	0	21.90	21.59	21.45
		1	2	21.78	21.36	21.19
		1	5	21.40	21.70	21.72
		3	0	21.36	21.72	21.58
		3	1	21.31	21.87	21.41
		3	2	21.31	21.70	21.69
		6	0	21.09	21.80	21.66
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18615 1851.5MHz	Channel 18900 1880.0MHz	Channel 19185 1908.5MHz
3MHz	QPSK	1	0	21.47	21.98	21.61
		1	8	21.08	21.20	21.82
		1	14	21.66	21.89	21.76
		8	0	21.43	21.97	21.07
		8	4	21.24	21.63	**21.99**
		8	7	21.87	21.73	21.02
		15	0	21.41	21.42	21.41
	16QAM	1	0	21.33	21.76	21.61
		1	8	21.98	21.87	21.29
		1	14	21.60	21.28	21.04
		8	0	21.20	21.11	21.85
		8	4	21.83	21.55	21.28
		8	7	21.29	21.04	21.99
		15	0	21.29	21.17	21.60

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18625 1852.5MHz	Channel 18900 1880.0MHz	Channel 19175 1907.5MHz
5MHz	QPSK	1	0	21.76	21.30	21.77
		1	13	21.45	21.66	21.81
		1	24	21.64	21.10	21.26
		12	0	21.24	**21.99**	21.86
		12	6	21.24	21.64	21.25
		12	13	21.65	21.25	21.03
		25	0	21.69	21.14	21.11
	16QAM	1	0	21.28	21.19	21.08
		1	13	21.11	21.41	21.49
		1	24	21.27	21.53	21.04
		12	0	21.24	21.56	21.66
		12	6	21.95	21.64	21.94
		12	13	21.90	21.60	21.31
		25	0	21.62	21.66	21.32
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18650 1855.0MHz	Channel 18900 1880.0MHz	Channel 19150 1905.0MHz
10MHz	QPSK	1	0	21.11	21.24	21.06
		1	25	21.31	21.04	21.46
		1	49	21.82	21.14	21.90
		25	0	21.77	21.19	21.16
		25	13	21.75	21.71	21.04
		25	25	**21.98**	21.66	21.03
		50	0	21.92	21.18	21.52
	16QAM	1	0	21.14	21.42	21.02
		1	25	21.47	21.46	21.74
		1	49	21.97	21.68	21.29
		25	0	21.35	21.13	21.80
		25	13	21.46	21.91	21.38
		25	25	21.33	21.75	21.95
		50	0	21.02	21.00	21.45

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18675 1857.5MHz	Channel 18900 1880.0MHz	Channel 19125 1902.5MHz
15MHz	QPSK	1	0	21.53	21.72	**21.99**
		1	38	21.90	21.34	21.47
		1	74	21.74	21.11	21.96
		36	0	21.33	21.98	21.73
		36	18	21.01	21.49	21.72
		36	39	21.34	21.16	21.30
		75	0	21.44	21.96	21.60
	16QAM	1	0	21.19	21.40	21.38
		1	38	21.72	21.12	21.35
		1	74	21.69	21.59	21.39
		36	0	21.86	21.56	21.38
		36	18	21.64	21.75	21.37
		36	39	21.71	21.85	21.12
		75	0	21.72	21.99	21.76
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18700 1860.0MHz	Channel 18900 1880.0MHz	Channel 19100 1900.0MHz
20MHz	QPSK	1	0	21.13	21.93	21.09
		1	50	21.94	21.02	21.81
		1	99	21.19	21.66	21.05
		50	0	21.25	21.57	21.29
		50	25	**21.99**	21.91	21.31
		50	50	21.46	21.21	21.89
		100	0	21.72	21.86	21.17
	16QAM	1	0	21.11	21.39	21.25
		1	50	21.31	21.82	21.25
		1	99	21.80	21.79	21.03
		50	0	21.93	21.26	21.87
		50	25	21.04	21.70	21.11
		50	50	21.79	21.33	21.13
		100	0	21.66	21.25	21.20

Band 4						
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 19957 1710.7MHz	Channel 20175 1732.5MHz	Channel 20393 1754.3MHz
1.4MHz	QPSK	1	0	21.59	21.24	21.20
		1	2	21.13	21.71	21.09
		1	5	21.10	21.22	21.70
		3	0	21.72	21.43	21.59
		3	1	21.28	21.63	21.78
		3	2	21.23	21.64	21.43
		6	0	21.79	21.46	21.30
	16QAM	1	0	21.81	21.90	21.65
		1	2	21.90	21.78	21.73
		1	5	21.82	21.44	21.05
		3	0	21.81	21.35	21.05
		3	1	21.74	21.19	**21.92**
		3	2	21.84	21.42	21.20
		6	0	21.77	21.72	21.30
Bandwidth	Mode	RB Size	RB Offset	Actual output po2wer(dBm)		
				Channel 19965 1711.5MHz	Channel 20175 1732.5MHz	Channel 20385 753.5MHz
3MHz	QPSK	1	0	21.70	21.29	21.19
		1	8	21.65	21.68	21.09
		1	14	21.65	21.56	21.43
		8	0	21.36	21.46	21.52
		8	4	21.32	21.27	**21.98**
		8	7	21.02	21.63	21.59
		15	0	21.77	21.60	21.86
	16QAM	1	0	21.23	21.14	21.89
		1	8	21.28	21.71	21.09
		1	14	21.98	21.71	21.31
		8	0	21.29	21.10	21.26
		8	4	21.33	21.72	21.54
		8	7	21.23	21.08	21.62
		15	0	21.95	21.82	21.07

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 19975 1712.5MHz	Channel 20175 1732.5MHz	Channel 20375 1752.5MHz
5MHz	QPSK	1	0	21.69	21.75	21.26
		1	13	21.51	21.70	21.92
		1	24	21.91	21.43	21.50
		12	0	21.12	21.01	21.42
		12	6	21.83	21.45	21.70
		12	13	21.81	21.90	21.17
		25	0	21.61	21.57	21.05
	16QAM	1	0	21.35	21.90	21.77
		1	13	21.27	**21.98**	21.13
		1	24	21.50	21.47	21.75
		12	0	21.40	21.60	21.65
		12	6	21.15	21.02	21.50
		12	13	21.55	21.87	21.43
		25	0	21.98	21.72	21.73
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20000 1715.0MHz	Channel 20175 1732.5MHz	Channel 20350 1750.0MHz
10MHz	QPSK	1	0	21.46	21.58	21.66
		1	25	21.77	21.83	21.44
		1	49	21.17	21.91	21.64
		25	0	21.95	21.93	21.49
		25	13	21.61	21.28	21.21
		25	25	21.89	21.17	**21.97**
		50	0	21.58	21.66	21.03
	16QAM	1	0	21.41	21.58	21.30
		1	25	21.58	21.22	21.27
		1	49	21.11	21.95	21.02
		25	0	21.52	21.80	21.37
		25	13	21.11	21.45	21.85
		25	25	21.65	21.35	21.81
		50	0	21.26	21.33	21.75

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20025 1717.5MHz	Channel 20175 1732.5MHz	Channel 20325 1747.5MHz
15MHz	QPSK	1	0	21.79	21.97	21.14
		1	38	21.87	21.39	21.16
		1	74	21.11	21.23	21.08
		36	0	21.57	21.53	21.22
		36	18	21.09	21.58	21.39
		36	39	21.40	21.02	21.15
		75	0	21.10	21.21	21.94
	16QAM	1	0	21.11	21.49	21.29
		1	38	21.97	21.77	21.36
		1	74	21.13	21.94	21.20
		36	0	21.36	21.80	21.79
		36	18	21.09	21.11	21.12
		36	39	21.12	21.68	21.44
		75	0	21.07	21.33	**21.98**
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20050 1720.0MHz	Channel 20175 1732.5MHz	Channel 20300 1745.0MHz
20MHz	QPSK	1	0	21.89	21.06	21.04
		1	50	21.53	21.11	21.25
		1	99	21.63	21.15	21.02
		50	0	21.33	21.20	21.82
		50	25	21.39	21.88	21.36
		50	50	21.92	21.18	21.38
		100	0	21.69	21.34	21.56
	16QAM	1	0	21.16	21.21	21.16
		1	50	21.54	21.82	21.35
		1	99	21.23	21.49	21.22
		50	0	21.68	**21.96**	21.76
		50	25	21.31	21.39	21.14
		50	50	21.15	21.08	21.37
		100	0	21.66	21.03	21.61

Band 5						
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20407 824.7MHz	Channel 20525 836.5MHz	Channel 20643 848.3MHz
1.4MHz	QPSK	1	0	21.26	21.48	21.22
		1	13	21.49	21.02	21.95
		1	24	21.43	21.45	21.22
		12	0	21.88	21.73	21.13
		12	6	21.83	21.53	21.00
		12	13	21.85	21.06	21.92
		25	0	21.85	21.69	21.68
	16QAM	1	0	21.68	21.04	21.50
		1	13	**21.97**	21.88	21.69
		1	24	21.85	21.51	21.52
		12	0	21.25	21.46	21.63
		12	6	21.60	21.04	21.62
		12	13	21.14	21.71	21.54
		25	0	21.36	21.40	21.07
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20415 825.5MHz	Channel 20525 836.5MHz	Channel 20635 847.5MHz
3MHz	QPSK	1	0	21.43	21.13	21.30
		1	25	21.48	21.46	21.43
		1	49	21.81	21.40	21.15
		25	0	21.32	21.95	21.06
		25	13	21.48	21.88	21.10
		25	25	21.54	21.14	21.71
		50	0	21.68	21.19	21.10
	16QAM	1	0	21.15	21.85	21.02
		1	25	21.18	21.88	21.36
		1	49	**22.00**	21.38	21.28
		25	0	21.57	21.87	21.18
		25	13	21.02	21.26	21.54
		25	25	21.03	21.68	21.42
		50	0	21.65	21.65	21.11

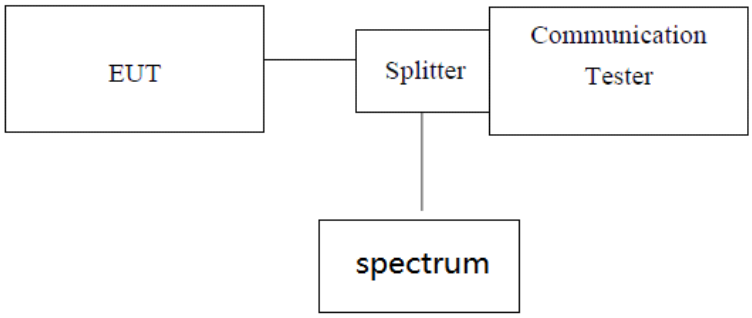
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20425 826.5MHz	Channel 20525 836.5MHz	Channel 20625 846.5MHz
5MHz	QPSK	1	0	21.93	21.74	21.22
		1	38	21.64	21.77	21.11
		1	74	21.37	21.19	21.47
		36	0	21.26	21.60	21.90
		36	18	21.59	21.59	21.34
		36	39	21.37	21.51	21.76
		75	0	21.11	21.59	21.36
	16QAM	1	0	21.74	21.64	21.74
		1	38	21.06	21.53	21.96
		1	74	21.39	21.17	21.61
		36	0	**21.99**	21.28	21.29
		36	18	21.88	21.43	21.46
		36	39	21.59	21.55	21.65
		75	0	21.93	21.43	21.43
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20450 829MHz	Channel 20525 836.5MHz	Channel 20600 844MHz
10MHz	QPSK	1	0	21.16	21.43	21.87
		1	50	21.67	21.68	21.85
		1	99	21.20	21.27	21.65
		50	0	21.64	21.92	21.68
		50	25	21.39	21.60	21.57
		50	50	21.04	21.68	21.28
		100	0	21.96	21.17	**21.98**
	16QAM	1	0	21.93	21.87	21.31
		1	50	21.16	21.63	21.11
		1	99	21.53	21.62	21.72
		50	0	21.62	21.37	21.90
		50	25	21.50	21.73	21.48
		50	50	21.97	21.29	21.43
		100	0	21.54	21.21	21.42

Band 12						
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 23017 699.7MHz	Channel 23095 707.5MHz	Channel 23173 715.3MHz
1.4MHz	QPSK	1	0	21.26	21.18	21.18
		1	2	21.90	21.20	21.39
		1	5	21.20	21.16	21.33
		3	0	**21.98**	21.61	21.71
		3	1	21.04	21.44	21.60
		3	2	21.38	21.05	21.09
		6	0	21.17	21.67	21.59
	16QAM	1	0	21.19	21.90	21.11
		1	2	21.71	21.16	21.74
		1	5	21.41	21.29	21.92
		3	0	21.77	21.28	21.04
		3	1	21.40	21.92	21.83
		3	2	21.09	21.83	21.27
		6	0	21.39	21.44	21.05
Bandwidth	Mode	RB Size	RB Offset	Actual output po2wer(dBm)		
				Channel 23025 700.5MHz	Channel 23095 707.5MHz	Channel 23165 714.5MHz
3MHz	QPSK	1	0	21.06	21.08	21.50
		1	8	21.63	21.83	21.69
		1	14	21.92	21.51	21.71
		8	0	21.11	21.42	21.02
		8	4	21.38	21.86	21.51
		8	7	21.80	21.83	**21.99**
		15	0	21.73	21.65	21.50
	16QAM	1	0	21.98	21.53	21.87
		1	8	21.13	21.31	21.60
		1	15	21.86	21.66	21.71
		8	0	21.10	21.27	21.46
		8	4	21.89	21.44	21.27
		8	7	21.35	21.46	21.29
		15	0	21.71	21.89	21.03

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 23035 701.5MHz	Channel 23095 707.5MHz	Channel 23155 713.5MHz
5MHz	QPSK	1	0	21.92	**21.98**	21.19
		1	13	21.17	21.85	21.10
		1	24	21.17	21.70	21.87
		12	0	21.34	21.80	21.57
		12	6	21.21	21.57	21.90
		12	13	21.63	21.25	21.09
		25	0	21.39	21.57	21.07
	16QAM	1	0	21.49	21.41	21.68
		1	13	21.40	21.42	21.93
		1	24	21.62	21.12	21.37
		12	0	21.25	21.00	21.80
		12	6	21.07	21.98	21.37
		12	13	21.04	21.35	21.78
		25	0	21.84	21.57	21.03
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 23060 704.0MHz	Channel 23095 707.5MHz	Channel 23130 711.0MHz
10MHz	QPSK	1	0	21.54	21.03	21.47
		1	25	21.91	21.08	21.45
		1	49	21.62	21.28	21.10
		25	0	21.35	21.63	21.29
		25	13	21.93	21.48	21.25
		25	25	21.04	21.39	21.22
		50	0	21.83	21.03	21.02
	16QAM	1	0	21.31	21.83	21.17
		1	25	21.47	21.83	21.83
		1	49	21.43	21.04	21.26
		25	0	**21.94**	21.57	21.87
		25	13	21.69	21.63	21.86
		25	25	21.83	21.09	21.47
		50	0	21.71	21.40	21.15

Band 13						
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 23205 779.5MHz	Channel 23230 782.0MHz	Channel 23255 784.5MHz
5MHz	QPSK	1	0	21.86	21.10	21.09
		1	13	**21.98**	21.79	21.35
		1	24	21.31	21.09	21.85
		12	0	21.49	21.71	21.17
		12	6	21.85	21.25	21.55
		12	13	21.24	21.43	21.39
		25	0	21.00	21.51	21.94
	16QAM	1	0	21.84	21.42	21.45
		1	13	21.27	21.75	21.18
		1	24	21.30	21.45	21.92
		12	0	21.02	21.94	21.97
		12	6	21.04	21.14	21.88
		12	13	21.61	21.29	21.94
		25	0	21.92	21.43	21.37
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
					Channel 23230 782.0MHz	
10MHz	QPSK	1	0		**21.97**	
		1	25		21.31	
		1	49		21.37	
		25	0		21.97	
		25	13		21.09	
		25	25		21.54	
		50	0		21.25	
	16QAM	1	0		21.29	
		1	25		21.84	
		1	49		21.75	
		25	0		21.21	
		25	13		21.26	
		25	25		21.75	
		50	0		21.25	

7.4 Peak-to-Average Ratio

Test Requirement:	FCC part24.232(d) & FCC Part 27.50
Test Method:	FCC part2.1046
Limit:	13db
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1. The transmitter output port was connected to base station. 2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement. 3. Set EUT at maximum power through base station. 4. Select lowest, middle, and highest channels for each band and different modulation. 5. Measure the maximum burst average power. 6. Record the maximum peak-to-average ratio value.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 7.1 for details
Test results:	Pass

Measurement data:

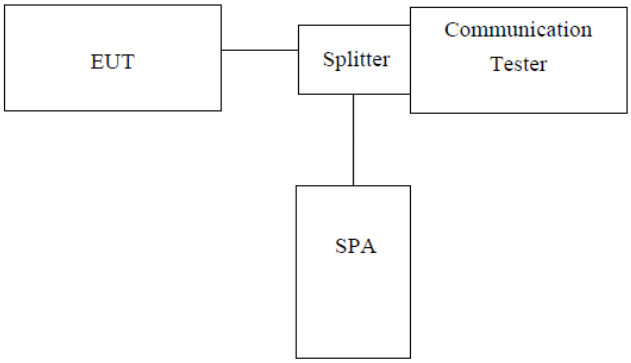
QPSK mode:

Test Band	Bandwidth	Peak to Average Ratio（dB）			Limit（dB）	Result
		Low Ch.	Middle Ch.	High Ch.		
LTE Band 2	1.4MHz	2.18	2.83	2.36	13	PASS
	3MHz	3.04	3.01	3.72	13	PASS
	5MHz	4.94	4.24	4.74	13	PASS
	10MHz	4.77	4.63	4.58	13	PASS
	15MHz	5.67	5.02	5.76	13	PASS
	20MHz	6.56	6.42	6.36	13	PASS
LTE Band 4	1.4MHz	2.08	2.40	2.99	13	PASS
	3MHz	3.79	3.02	3.30	13	PASS
	5MHz	4.08	4.47	4.15	13	PASS
	10MHz	4.55	4.82	4.63	13	PASS
	15MHz	5.68	5.45	5.85	13	PASS
	20MHz	6.67	6.12	6.82	13	PASS
LTE Band 5	1.4MHz	2.80	2.61	2.19	13	PASS
	3MHz	3.46	3.67	3.45	13	PASS
	5MHz	4.48	4.86	4.61	13	PASS
	10MHz	4.60	4.15	4.65	13	PASS
LTE Band 12	1.4MHz	2.23	2.77	2.03	13	PASS
	3MHz	3.29	3.63	3.56	13	PASS
	5MHz	4.10	4.88	4.11	13	PASS
	10MHz	5.00	4.38	4.48	13	PASS
LTE Band 13	5MHz	4.47	4.14	4.43	13	PASS
	10MHz	4.47	4.37	4.83	13	PASS

16QAM mode:

Test Band	Bandwidth	Peak to Average Ratio（dB）			Limit（dB）	Result
		Low Ch.	Middle Ch.	High Ch.		
LTE Band 2	1.4MHz	2.55	2.05	2.39	13	PASS
	3MHz	3.73	3.22	3.63	13	PASS
	5MHz	4.42	4.01	4.69	13	PASS
	10MHz	4.99	4.96	4.44	13	PASS
	15MHz	5.34	5.28	5.19	13	PASS
	20MHz	6.04	6.51	6.59	13	PASS
LTE Band 4	1.4MHz	2.80	2.17	2.14	13	PASS
	3MHz	3.70	3.37	3.55	13	PASS
	5MHz	4.17	4.34	4.78	13	PASS
	10MHz	4.94	4.24	4.74	13	PASS
	15MHz	5.38	5.20	5.08	13	PASS
	20MHz	6.21	6.85	6.62	13	PASS
LTE Band 5	1.4MHz	2.32	2.77	2.30	13	PASS
	3MHz	3.39	3.68	3.21	13	PASS
	5MHz	4.90	4.16	4.99	13	PASS
	10MHz	4.24	4.94	4.53	13	PASS
LTE Band 12	1.4MHz	2.80	2.64	2.43	13	PASS
	3MHz	3.26	3.51	3.06	13	PASS
	5MHz	4.26	4.65	4.33	13	PASS
	10MHz	4.64	4.90	4.29	13	PASS
LTE Band 13	5MHz	4.32	4.78	4.70	13	PASS
	10MHz	---	4.47	---	13	PASS

7.5 Occupy Bandwidth

Test Requirement:	Part 24.238; FCC Part 27.53(h)/(g)
Test Method:	FCC part2.1049
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. RBW was set to about 1% of emission BW, VBW= 3 times RBW. 3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data

QPSK mode：

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 2	1.4MHz	Low range	6	0	1102.00	1345.00
		Mid range	6	0	1101.20	1400.00
		High range	6	0	1105.30	1357.00
	3MHz	Low range	15	0	2684.80	2947.00
		Mid range	15	0	2688.40	2958.00
		High range	15	0	2686.50	2957.00
	5MHz	Low range	25	0	4522.30	5155.00
		Mid range	25	0	4516.60	5027.00
		High range	25	0	4521.00	518.00
	10MHz	Low range	50	0	8962.60	9992.00
		Mid range	50	0	8943.80	9928.00
		High range	50	0	8954.40	9837.00
	15MHz	Low range	75	0	13570.60	15744.00
		Mid range	75	0	13461.60	15567.00
		High range	75	0	13462.40	15393.00
	20MHz	Low range	100	0	17932.10	20174.00
		Mid range	100	0	17970.70	20203.00
		High range	100	0	17819.30	19862.00

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 4	1.4MHz	Low range	6	0	1138.80	1805.00
		Mid range	6	0	1164.60	1815.00
		High range	6	0	1146.50	1793.00
	3MHz	Low range	15	0	2676.70	2949.00
		Mid range	15	0	2684.00	2964.00
		High range	15	0	2687.60	2939.00
	5MHz	Low range	25	0	4517.80	5109.00
		Mid range	25	0	4516.50	5100.00
		High range	25	0	4525.60	5160.00
	10MHz	Low range	50	0	8945.20	10037.00
		Mid range	50	0	8984.40	10025.00
		High range	50	0	8945.90	10039.00
	15MHz	Low range	75	0	13479.20	15754.00
		Mid range	75	0	13544.90	16435.00
		High range	75	0	13430.70	15218.00
	20MHz	Low range	100	0	17900.20	19933.00
		Mid range	100	0	17938.60	19848.00
		High range	100	0	17862.80	19741.00

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 5	1.4MHz	Low range	6	0	1096.40	1330.00
		Mid range	6	0	1096.00	1329.00
		High range	6	0	1094.30	1385.00
	3MHz	Low range	15	0	2679.60	2965.00
		Mid range	15	0	2685.50	2941.00
		High range	15	0	2682.20	2940.00
	5MHz	Low range	25	0	4515.50	5049.00
		Mid range	25	0	4515.20	5119.00
		High range	25	0	4515.10	4999.00
	10MHz	Low range	50	0	8907.70	9825.00
		Mid range	50	0	8953.70	9979.00
		High range	50	0	8936.80	10006.00

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 12	1.4MHz	Low range	6	0	1094.10	1378.00
		Mid range	6	0	1094.60	1348.00
		High range	6	0	1101.20	1329.00
	3MHz	Low range	15	0	2684.80	2996.00
		Mid range	15	0	2688.30	2934.00
		High range	15	0	2683.50	2929.00
	5MHz	Low range	25	0	4531.10	5134.00
		Mid range	25	0	4527.90	5104.00
		High range	25	0	4503.20	5128.00
	10MHz	Low range	50	0	8958.90	10040.00
		Mid range	50	0	8964.60	10059.00
		High range	50	0	8945.60	10035.00

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 13	5MHz	Low range	25	0	4539.50	4851.00
		Mid range	25	0	4484.00	4783.00
		High range	25	0	4506.60	4813.00
	10MHz	Mid range	50	0	8930.60	9445.00

16QAM mode：

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 2	1.4MHz	Low range	6	0	1105.70	1359.00
		Mid range	6	0	1098.00	1343.00
		High range	6	0	1103.90	1367.00
	3MHz	Low range	15	0	2679.60	2936.00
		Mid range	15	0	2683.60	2956.00
		High range	15	0	2684.50	2959.00
	5MHz	Low range	25	0	4508.30	5139.00
		Mid range	25	0	4513.40	5119.00
		High range	25	0	4506.20	4993.00
	10MHz	Low range	50	0	8970.10	10106.00
		Mid range	50	0	8938.20	9773.00
		High range	50	0	8944.90	9936.00
	15MHz	Low range	75	0	13543.20	16004.00
		Mid range	75	0	13485.70	15718.00
		High range	75	0	13458.20	15527.00
	20MHz	Low range	100	0	17936.70	19826.00
		Mid range	100	0	17934.70	20332.00
		High range	100	0	17773.90	19635.00

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 4	1.4MHz	Low range	6	0	1133.40	1793.00
		Mid range	6	0	1149.30	1812.00
		High range	6	0	1144.70	1792.00
	3MHz	Low range	15	0	2680.00	2936.00
		Mid range	15	0	2681.00	2952.00
		High range	15	0	2684.40	2934.00
	5MHz	Low range	25	0	4505.60	5011.00
		Mid range	25	0	4505.40	5106.00
		High range	25	0	4524.90	5090.00
	10MHz	Low range	50	0	8947.00	9988.00
		Mid range	50	0	8964.00	9952.00
		High range	50	0	8950.60	9818.00
	15MHz	Low range	75	0	13478.40	15748.00
		Mid range	75	0	13542.10	16247.00
		High range	75	0	13438.50	15387.00
	20MHz	Low range	100	0	17849.70	20061.00
		Mid range	100	0	17917.70	20069.00
		High range	100	0	17839.00	19820.00

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 5	1.4MHz	Low range	6	0	1106.50	1359.00
		Mid range	6	0	1102.70	1317.00
		High range	6	0	1092.90	1375.00
	3MHz	Low range	15	0	2682.50	2967.00
		Mid range	15	0	2682.80	2951.00
		High range	15	0	2682.10	2937.00
	5MHz	Low range	25	0	4524.20	5066.00
		Mid range	25	0	4560.10	5145.00
		High range	25	0	4499.60	5026.00
	10MHz	Low range	50	0	8924.20	9943.00
		Mid range	50	0	8973.70	9866.00
		High range	50	0	8921.80	9950.00

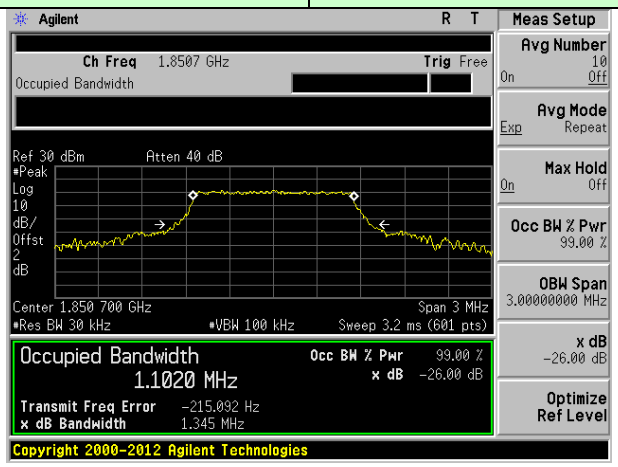
EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 12	1.4MHz	Low range	6	0	1100.60	1370.00
		Mid range	6	0	1104.20	1334.00
		High range	6	0	1107.00	1345.00
	3MHz	Low range	15	0	2684.90	2985.00
		Mid range	15	0	2688.80	2920.00
		High range	15	0	2682.70	2945.00
	5MHz	Low range	25	0	4508.90	5083.00
		Mid range	25	0	4512.40	5136.00
		High range	25	0	4501.60	5150.00
	10MHz	Low range	50	0	8944.90	10068.00
		Mid range	50	0	8941.60	9866.00
		High range	50	0	8943.90	9904.00

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 13	5MHz	Low range	25	0	4534.10	4909.00
		Mid range	25	0	4488.10	4797.00
		High range	25	0	4504.20	4792.00
	10MHz	Mid range	50	0	8915.40	9370.00

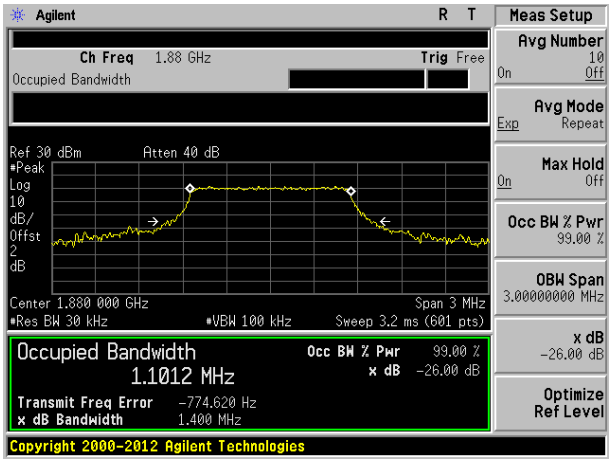
Test plot as follows:

QPSK mode:

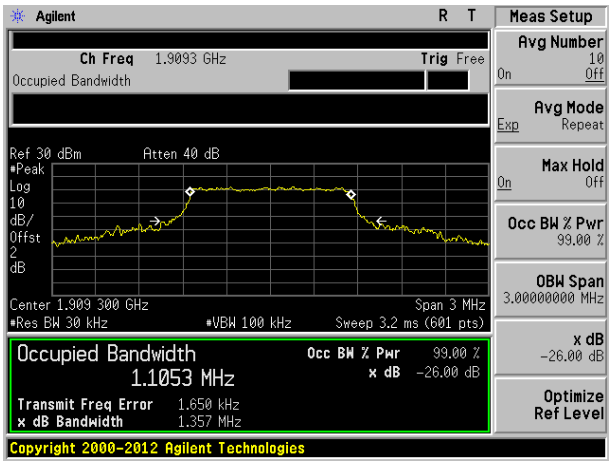
Test band: LTE Band 2	Channel Bandwidth: 1.4MHz



Lowest channel

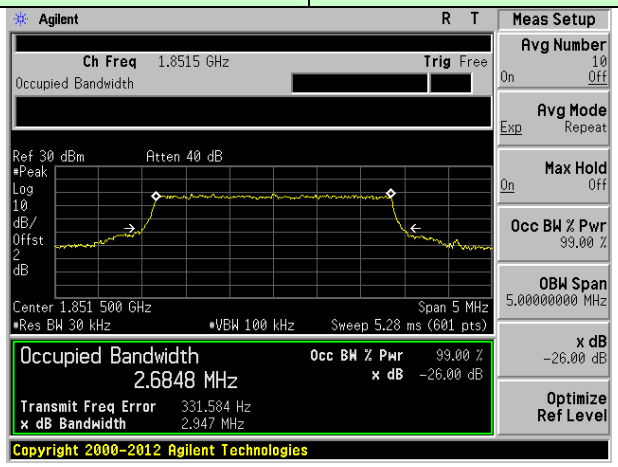


Middle channel

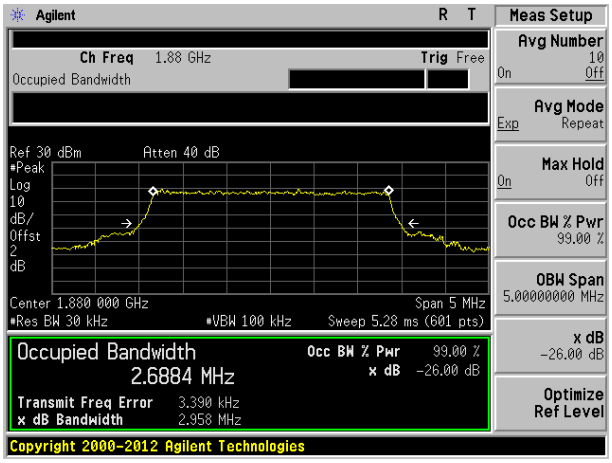


Highest channel

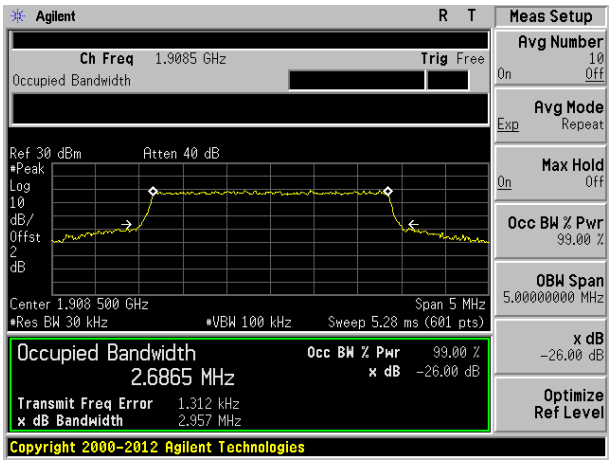
Test band: LTE Band 2	Channel Bandwidth:3MHz



Lowest channel

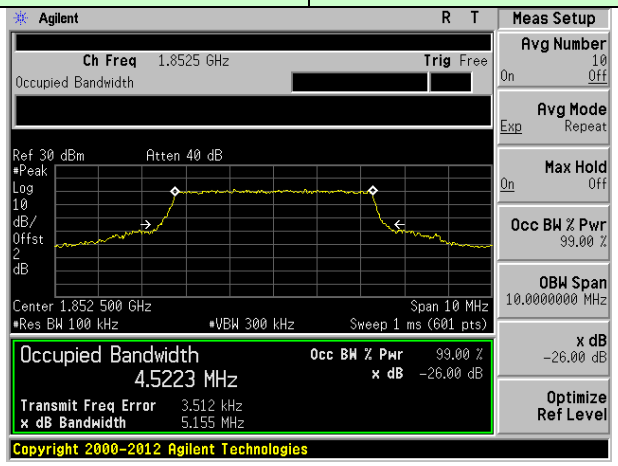


Middle channel

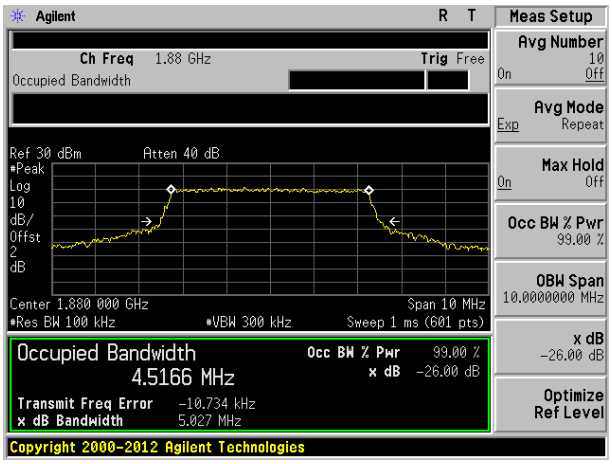


Highest channel

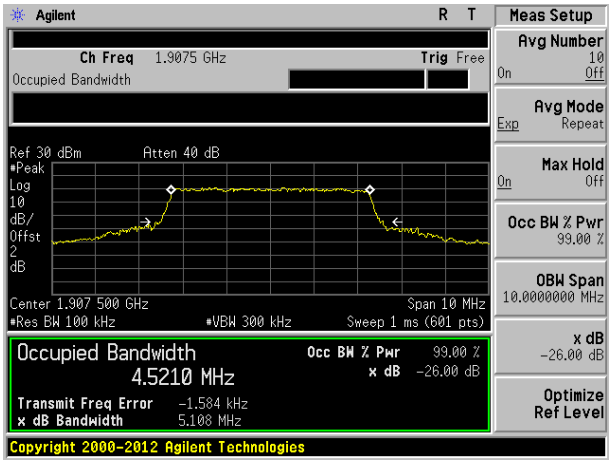
Test band: LTE Band 2	Channel Bandwidth: 5MHz



Lowest channel

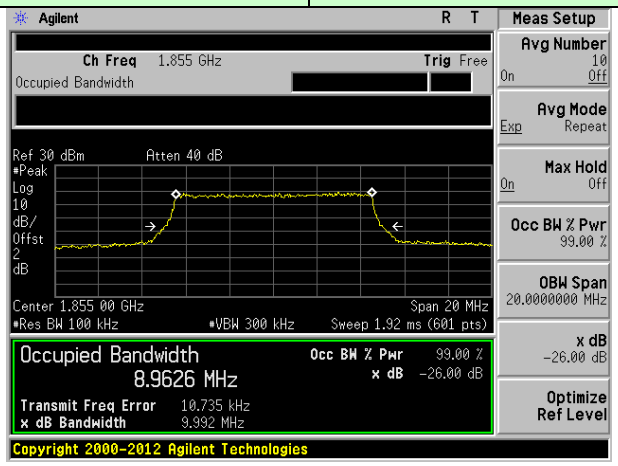


Middle channel

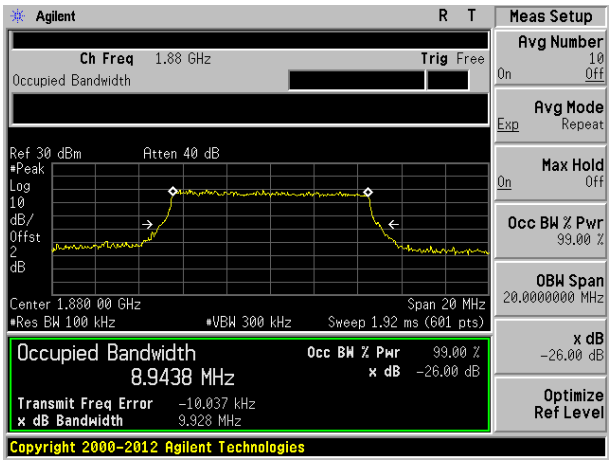


Highest channel

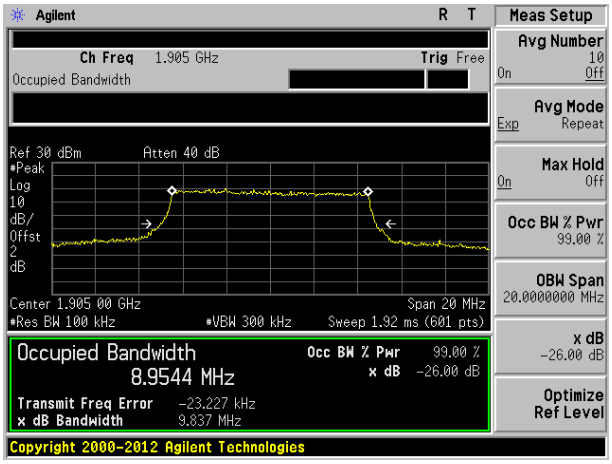
Test band: LTE Band 2	Channel Bandwidth:10MHz



Lowest channel

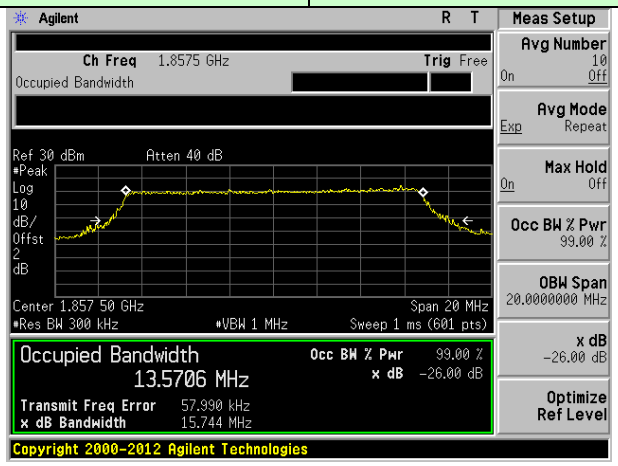


Middle channel

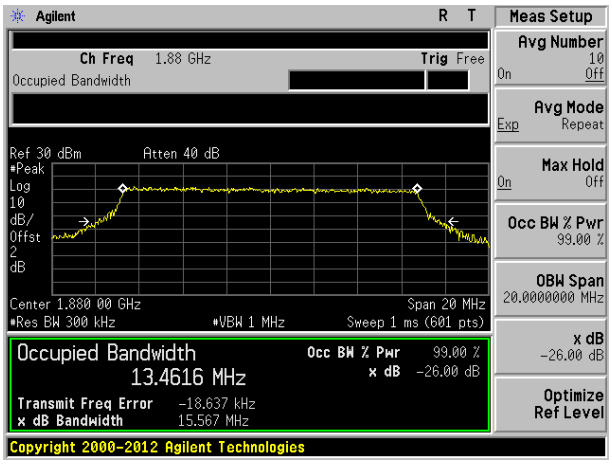


Highest channel

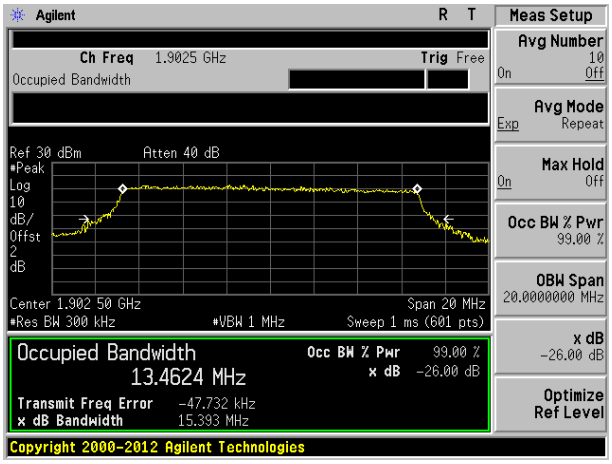
Test band: LTE Band 2	Channel Bandwidth:15MHz



Lowest channel

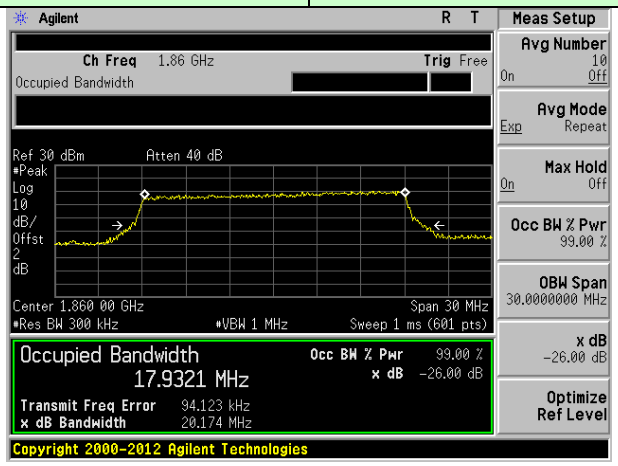


Middle channel

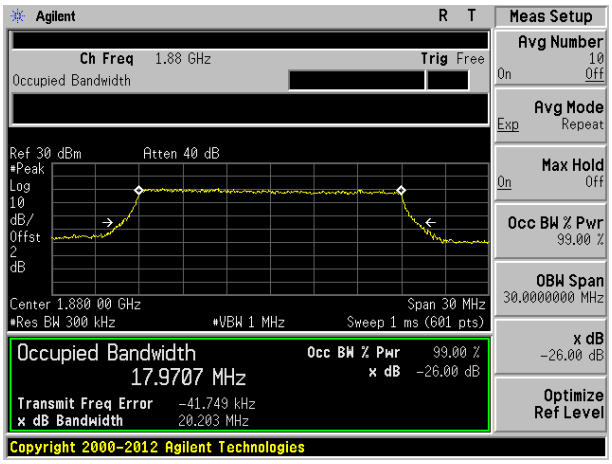


Highest channel

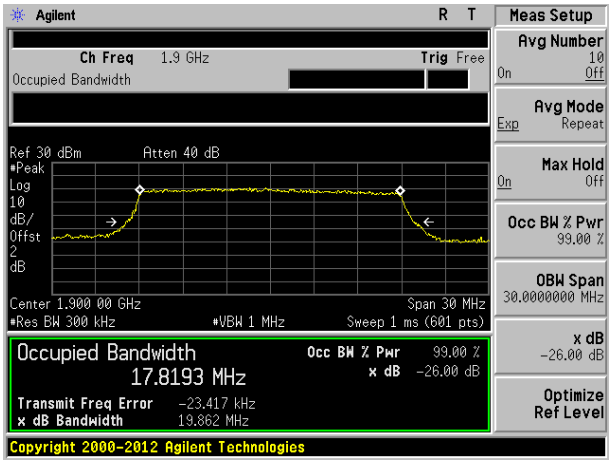
Test band: LTE Band 2	Channel Bandwidth:20MHz



Lowest channel

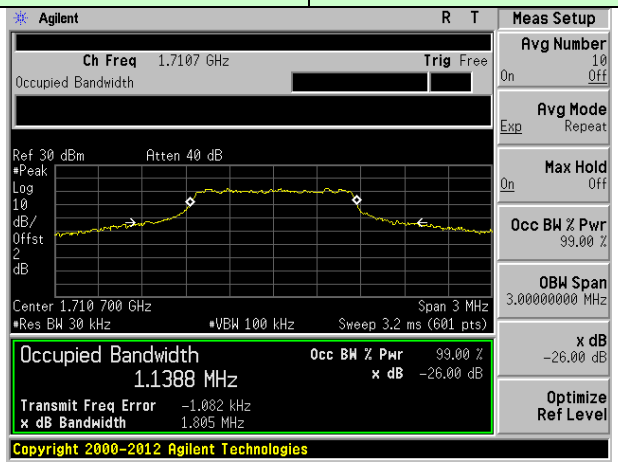


Middle channel

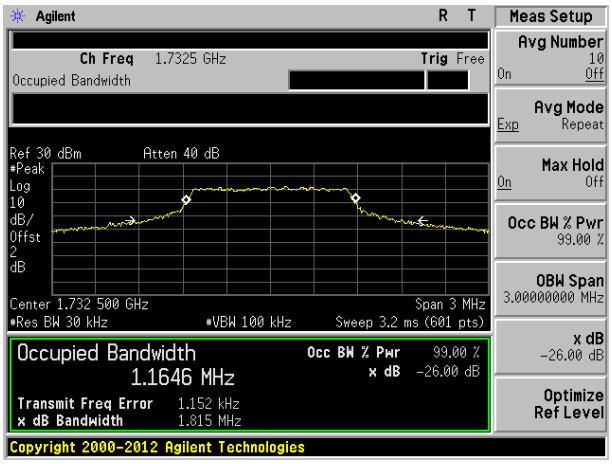


Highest channel

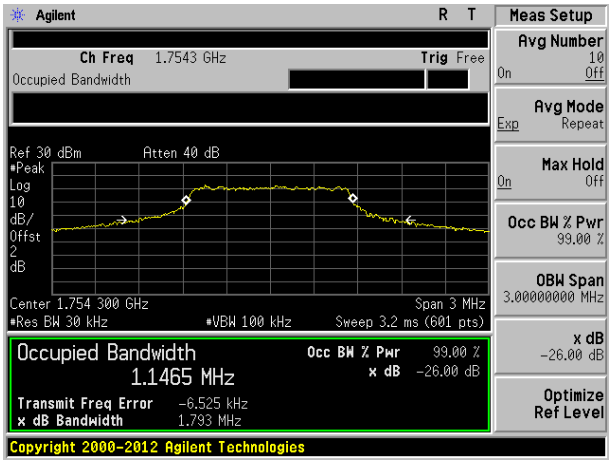
Test band: LTE Band 4	Channel Bandwidth: 1.4MHz



Lowest channel

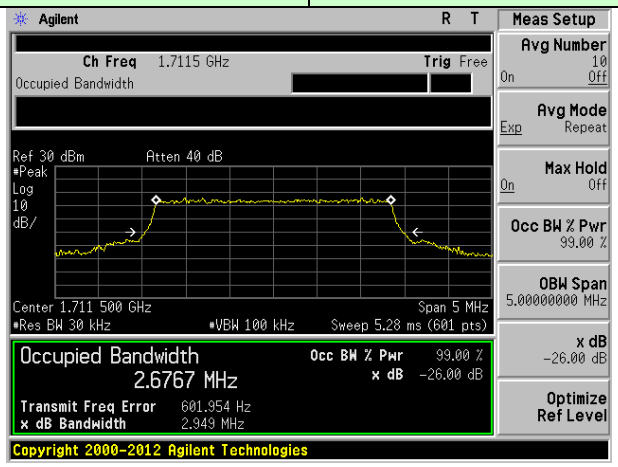


Middle channel

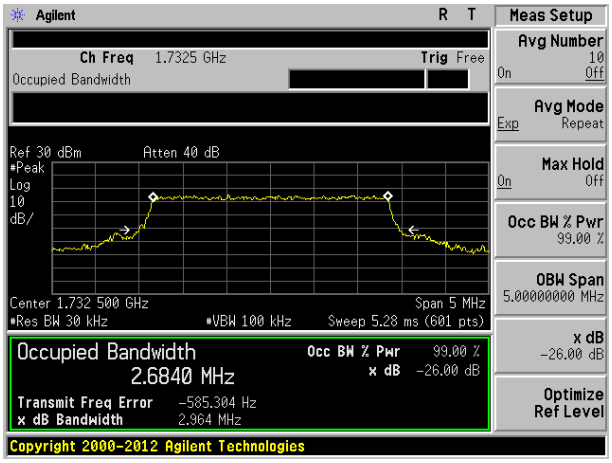


Highest channel

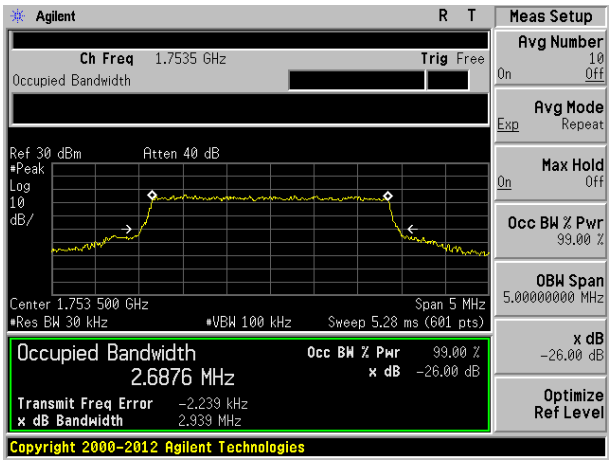
Test band: LTE Band 4	Channel Bandwidth: 3MHz



Lowest channel

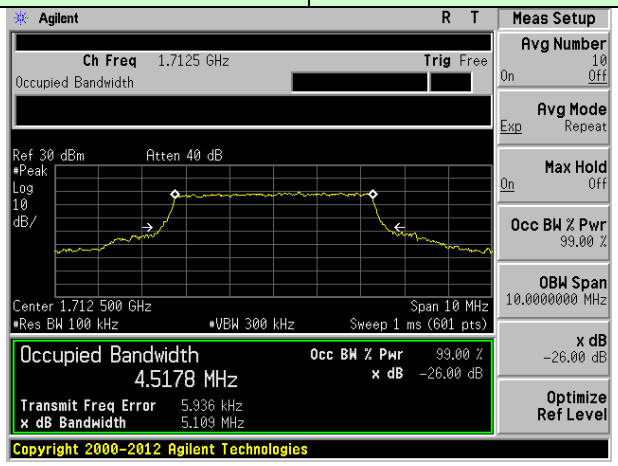


Middle channel

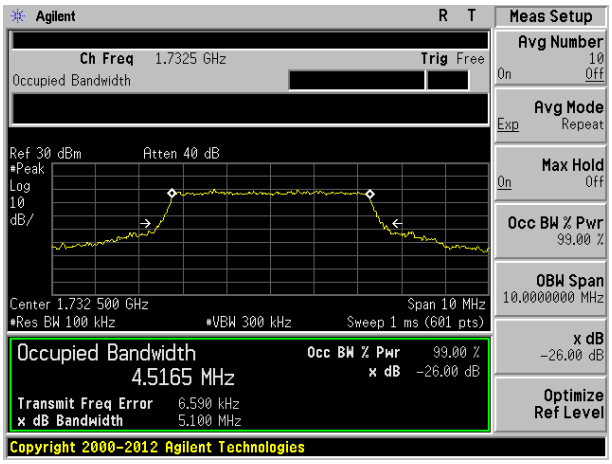


Highest channel

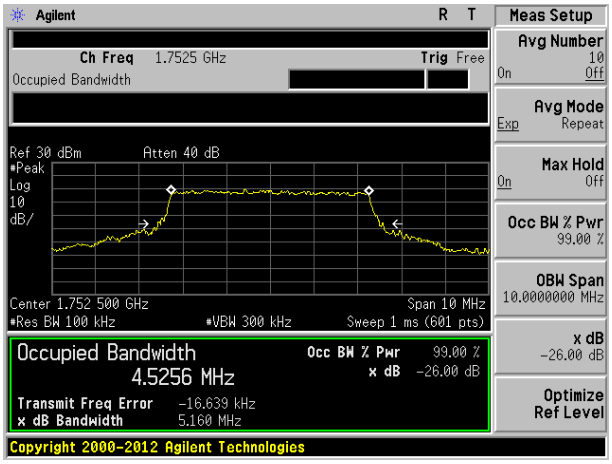
Test band: LTE Band 4	Channel Bandwidth: 5MHz



Lowest channel

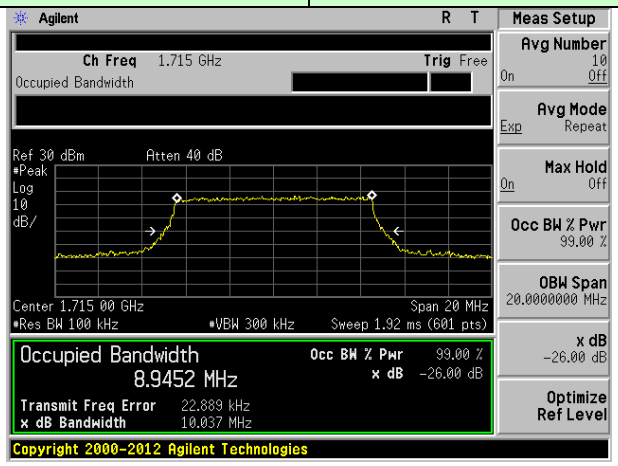


Middle channel

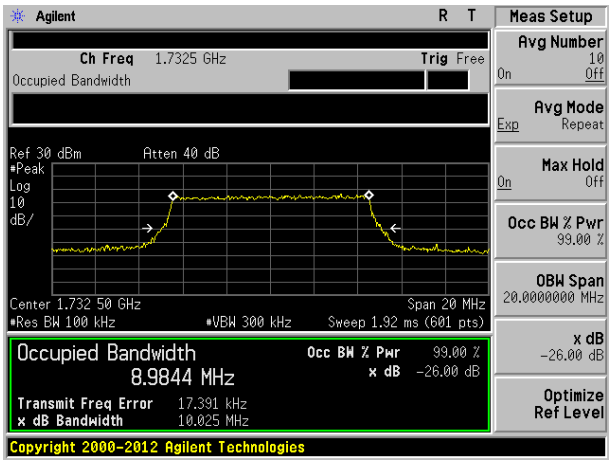


Highest channel

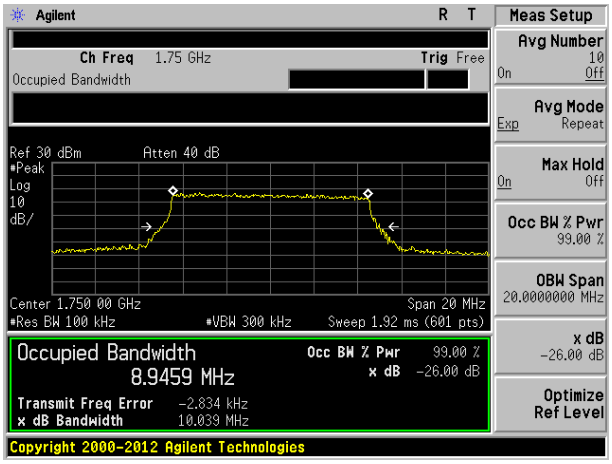
Test band: LTE Band 4	Channel Bandwidth: 10MHz



Lowest channel

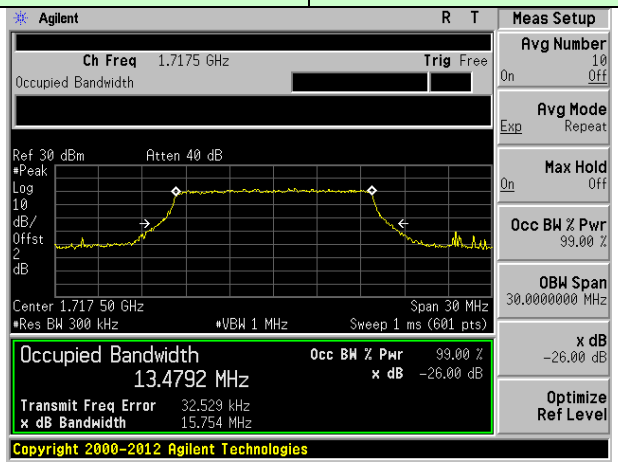


Middle channel

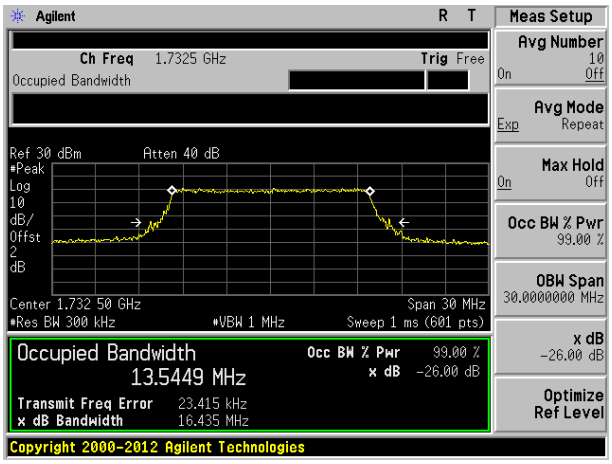


Highest channel

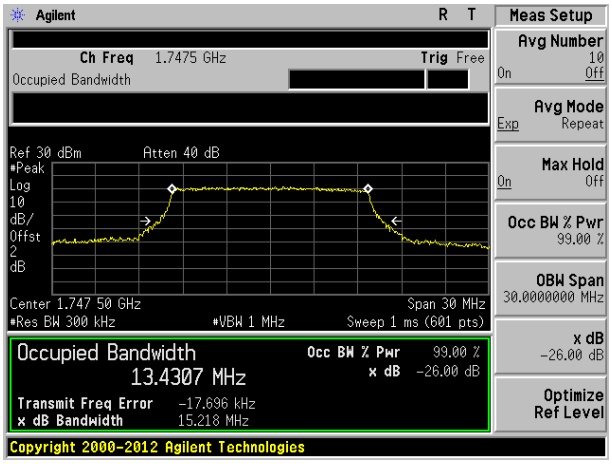
Test band: LTE Band 4	Channel Bandwidth: 15MHz



Lowest channel

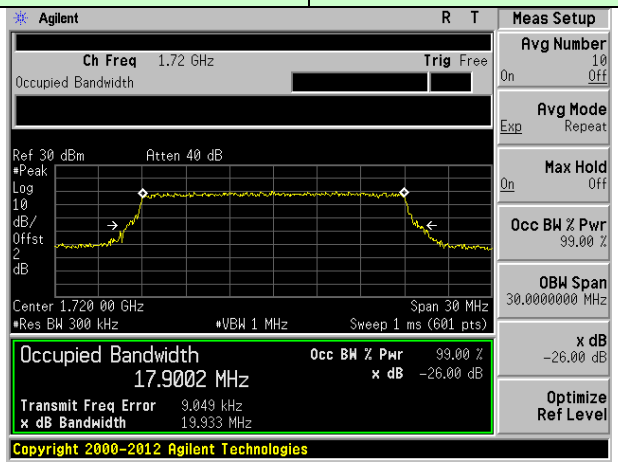


Middle channel

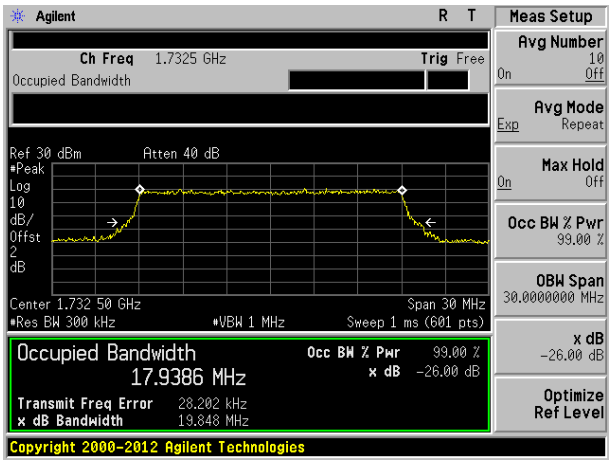


Highest channel

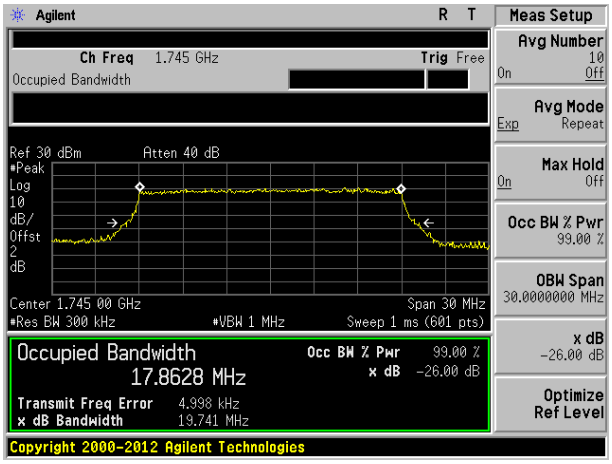
Test band: LTE Band 4	Channel Bandwidth: 20MHz



Lowest channel

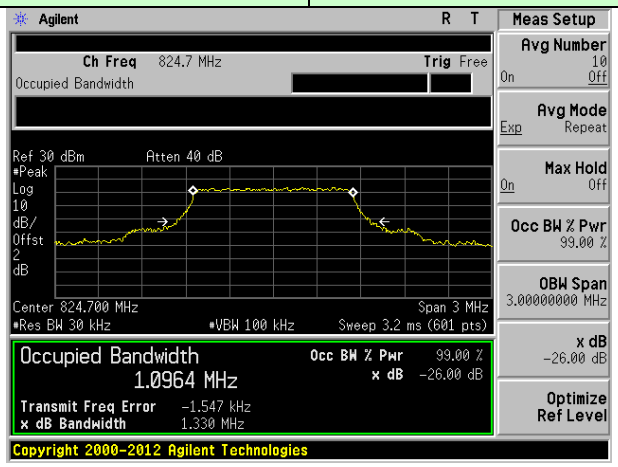


Middle channel

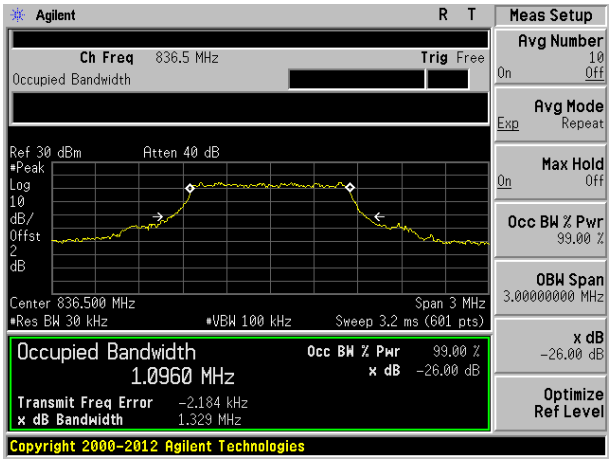


Highest channel

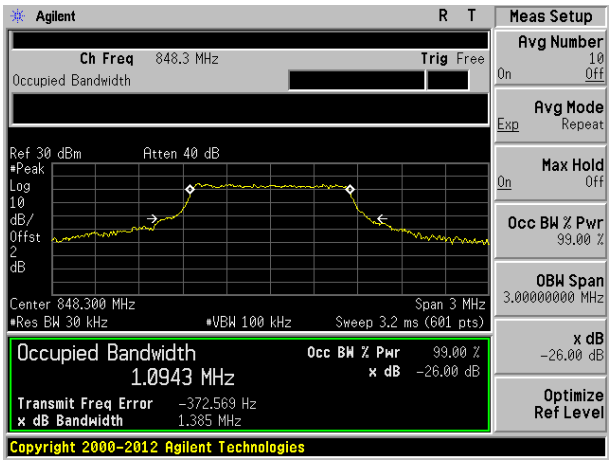
Test band: LTE Band 5	Channel Bandwidth: 1.4MHz



Lowest channel

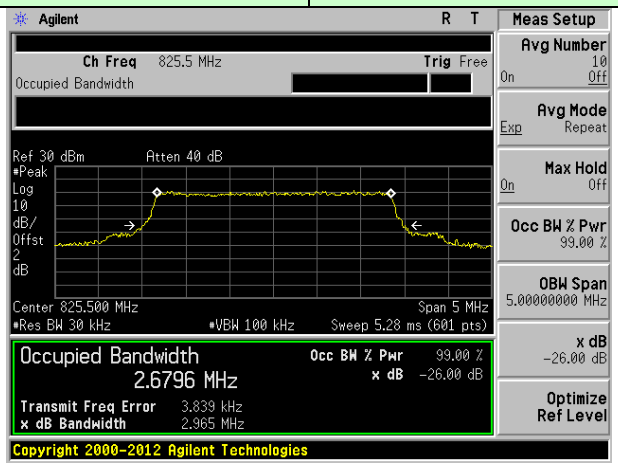


Middle channel

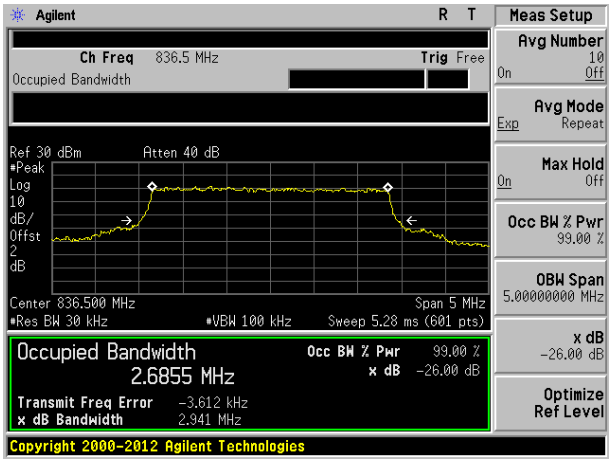


Highest channel

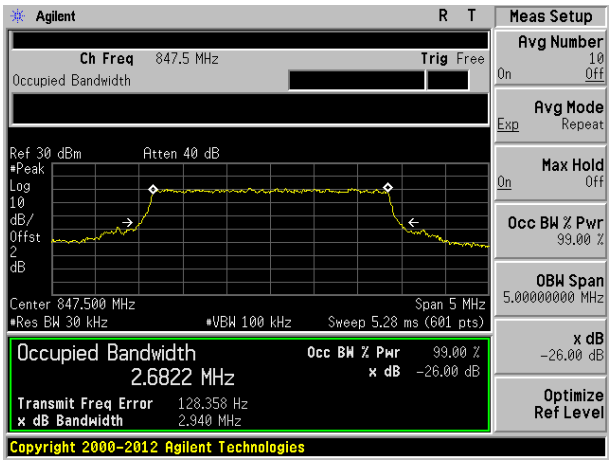
Test band: LTE Band 5	Channel Bandwidth: 3MHz



Lowest channel

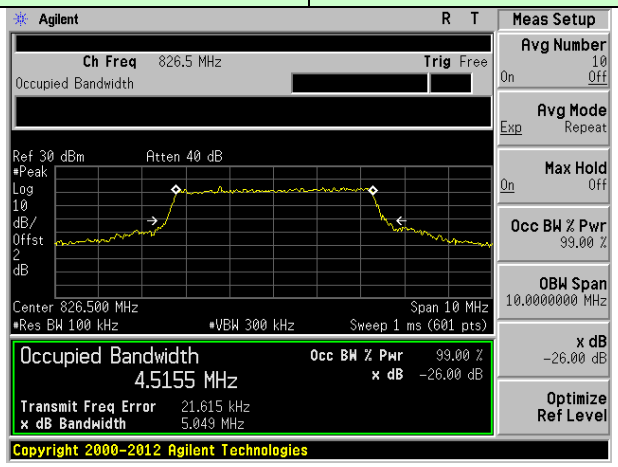


Middle channel

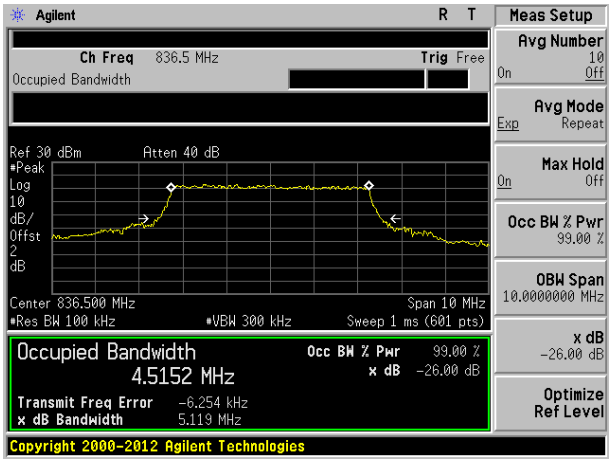


Highest channel

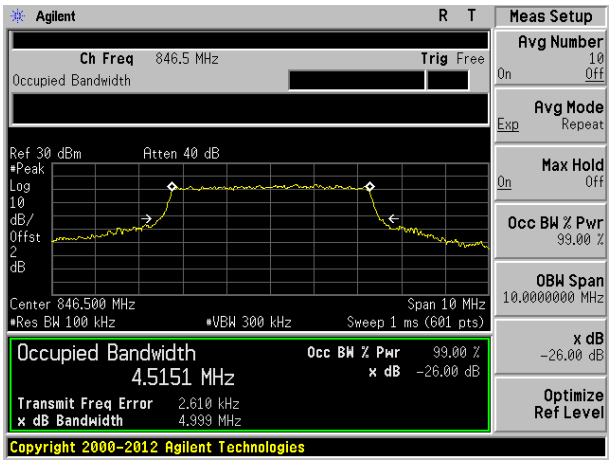
Test band: LTE Band 5	Channel Bandwidth: 5MHz



Lowest channel

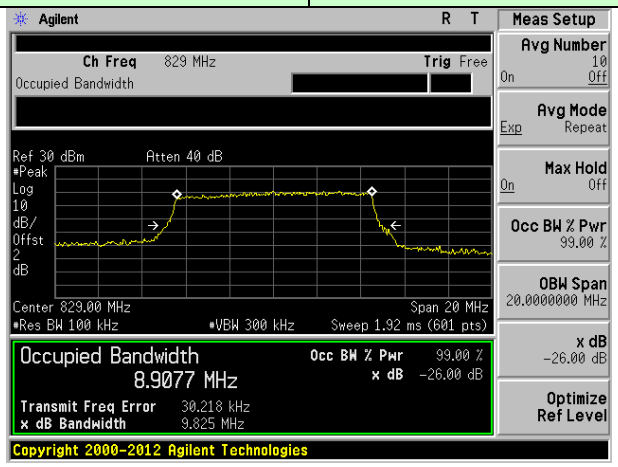


Middle channel

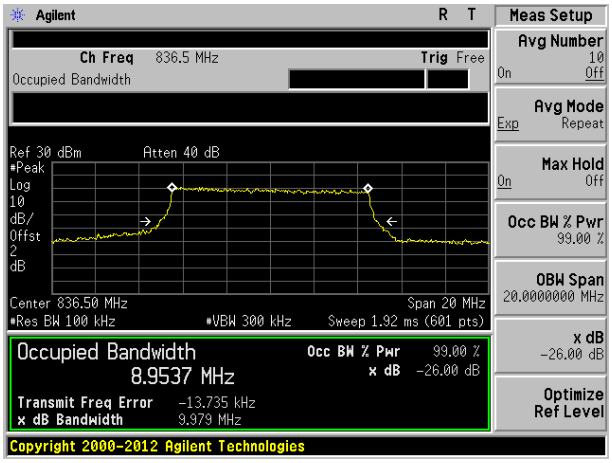


Highest channel

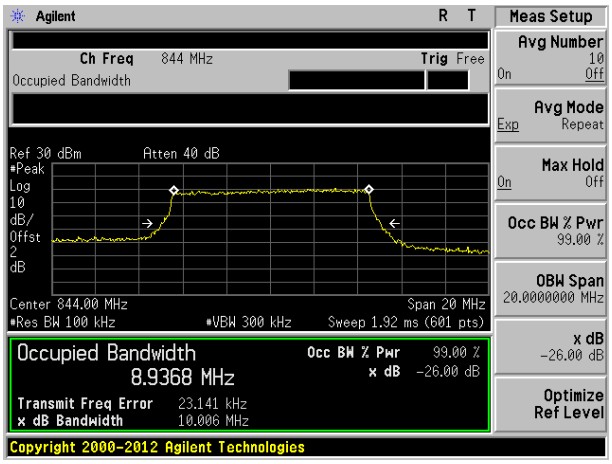
Test band: LTE Band 5	Channel Bandwidth: 10MHz



Lowest channel

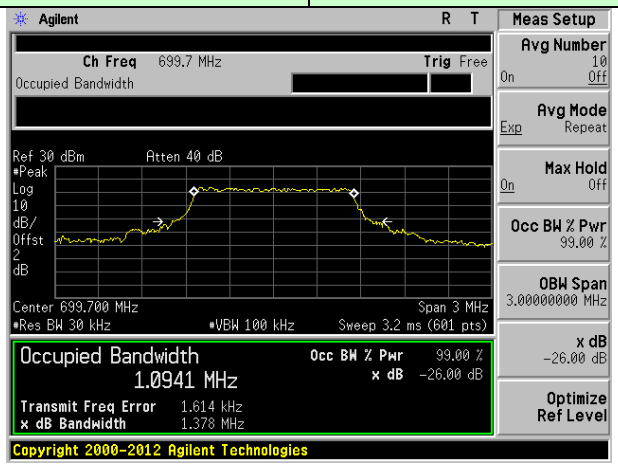


Middle channel

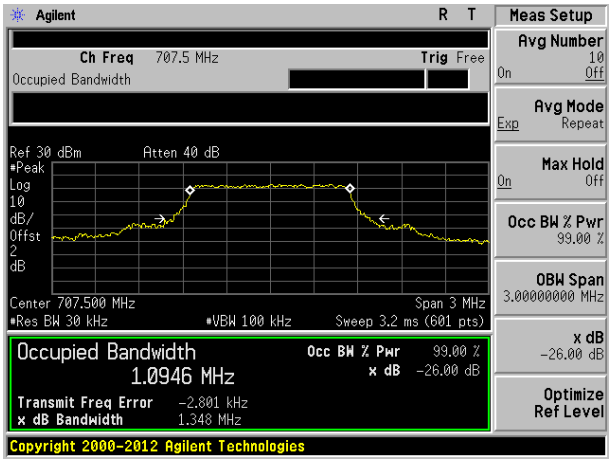


Highest channel

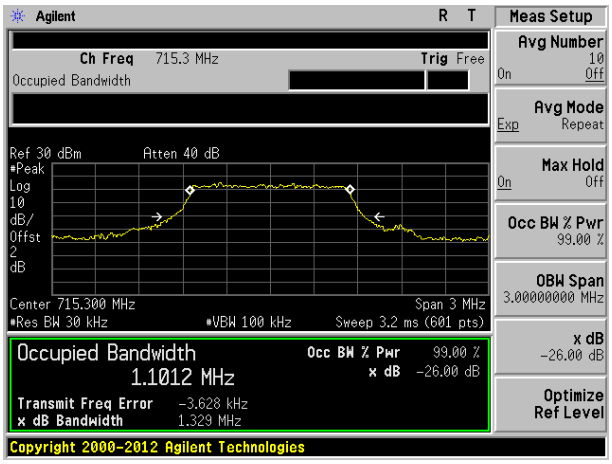
Test band: LTE Band 12	Channel Bandwidth: 1.4MHz



Lowest channel

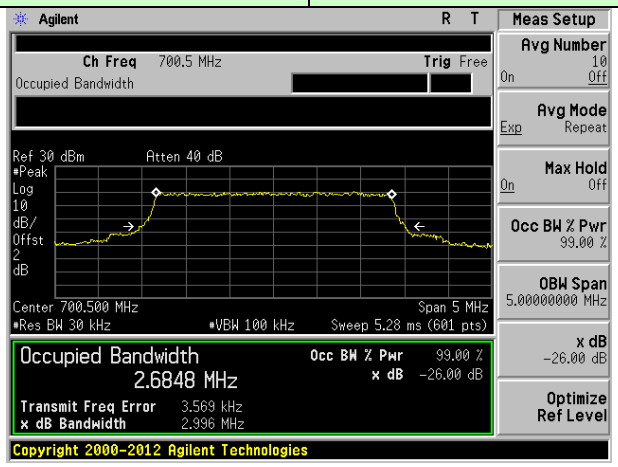


Middle channel

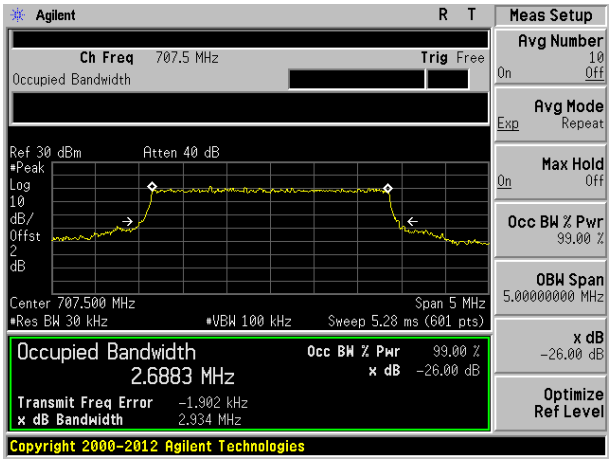


Highest channel

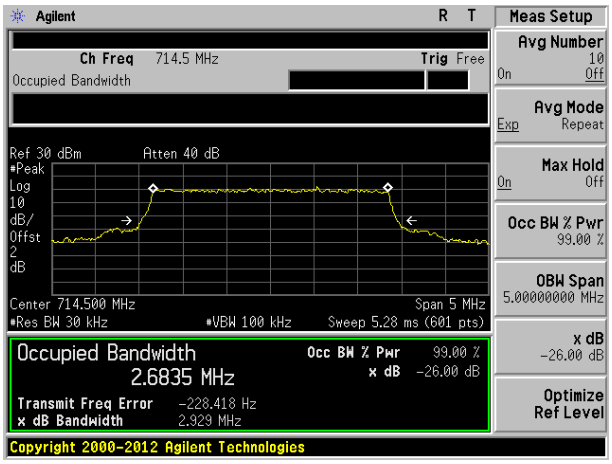
Test band: LTE Band 12	Channel Bandwidth: 3MHz



Lowest channel

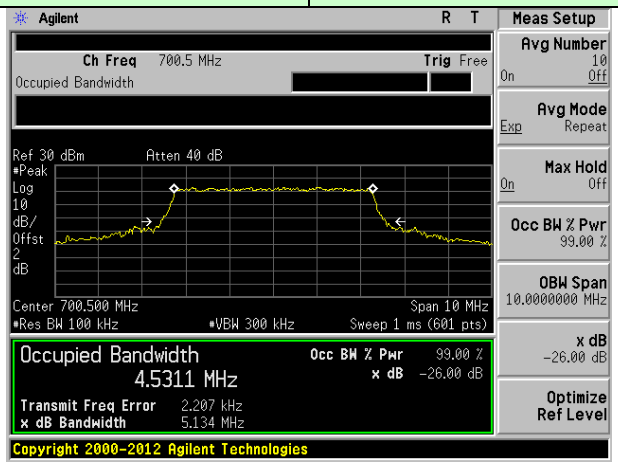


Middle channel

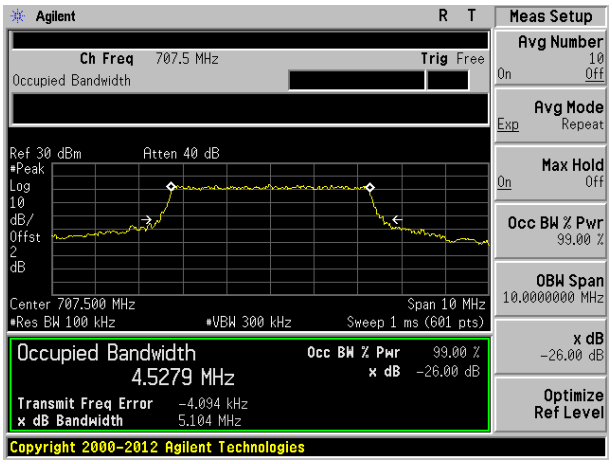


Highest channel

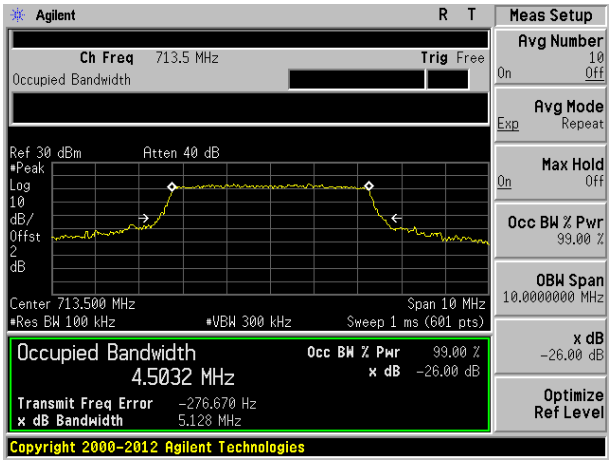
Test band: LTE Band 12	Channel Bandwidth: 5MHz



Lowest channel

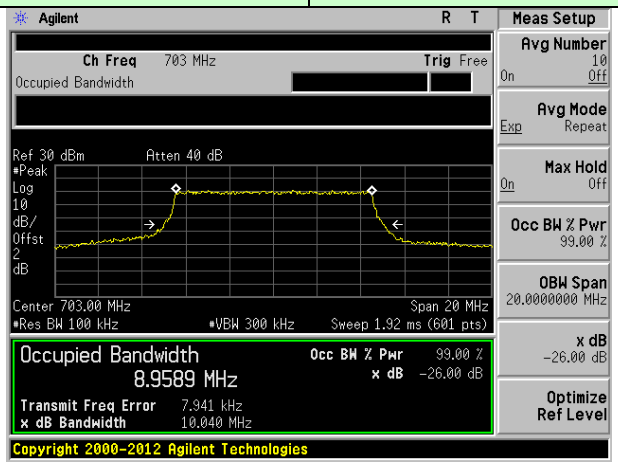


Middle channel

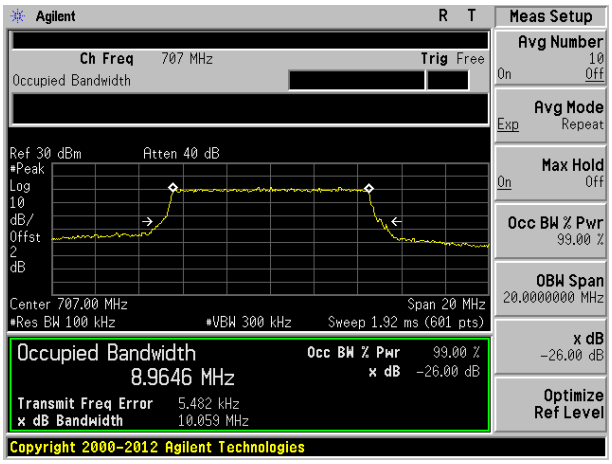


Highest channel

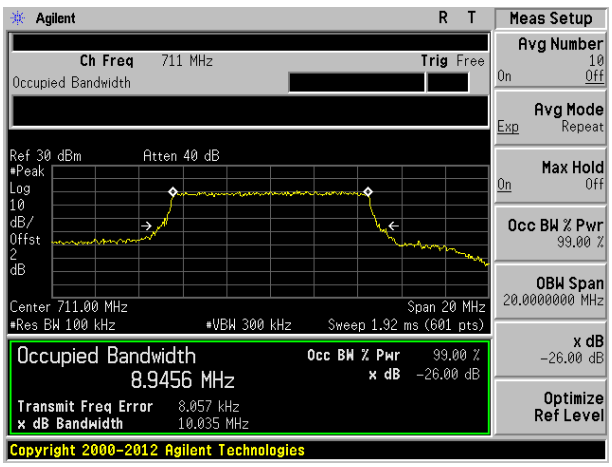
Test band: LTE Band 12	Channel Bandwidth: 10MHz



Lowest channel

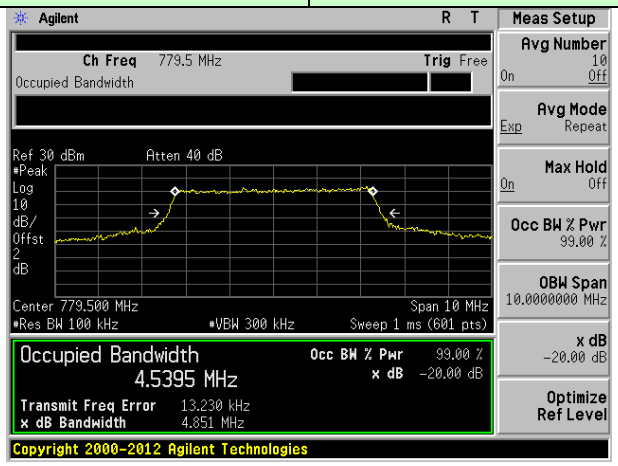


Middle channel

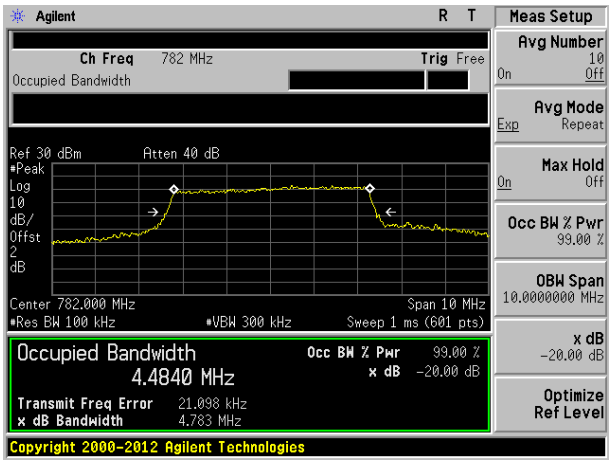


Highest channel

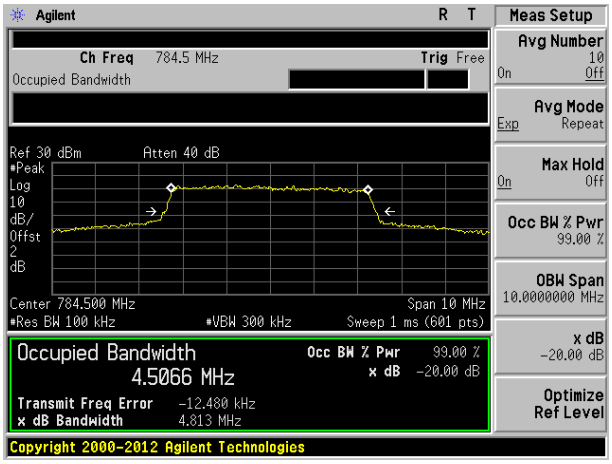
Test band: LTE Band 13	Channel Bandwidth: 5MHz



Lowest channel

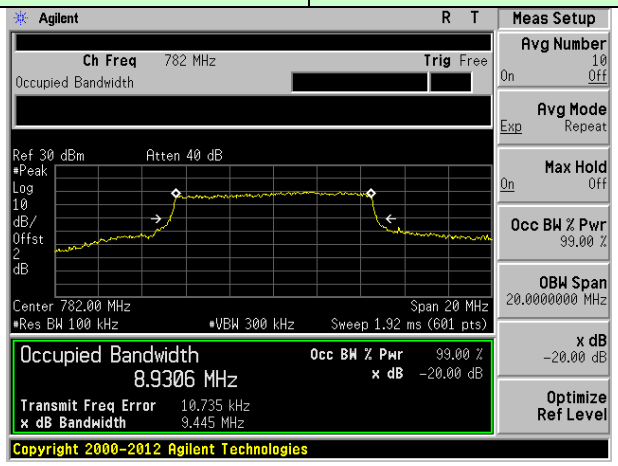


Middle channel



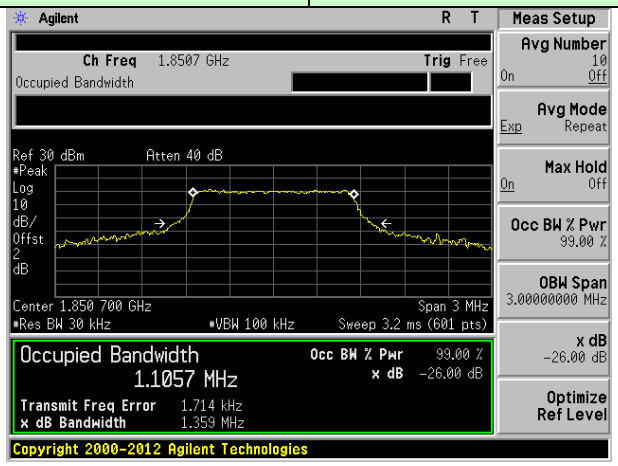
Highest channel

Test band: LTE Band 13	Channel Bandwidth: 10MHz

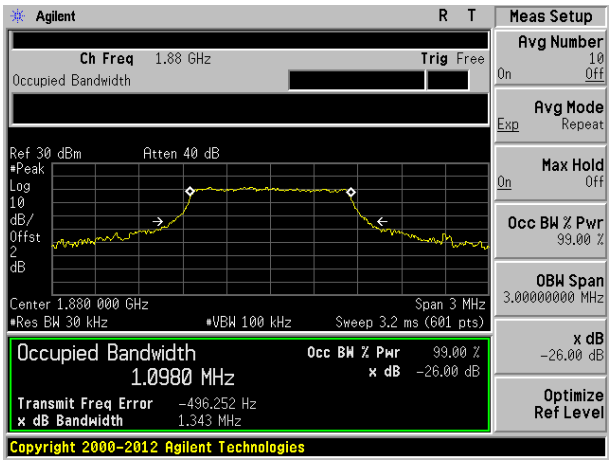


16QAM mode:

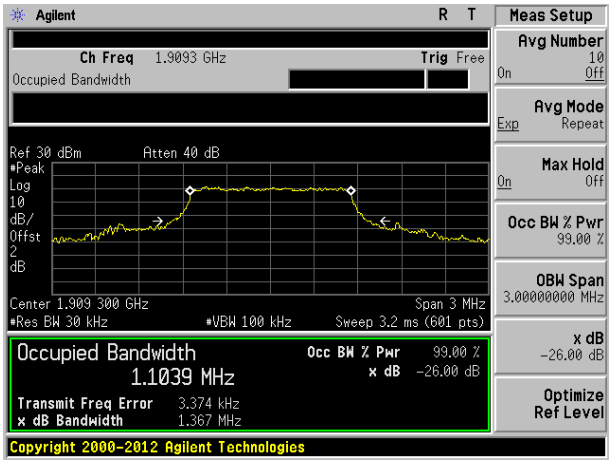
Test band: LTE Band 2	Channel Bandwidth: 1.4MHz



Lowest channel

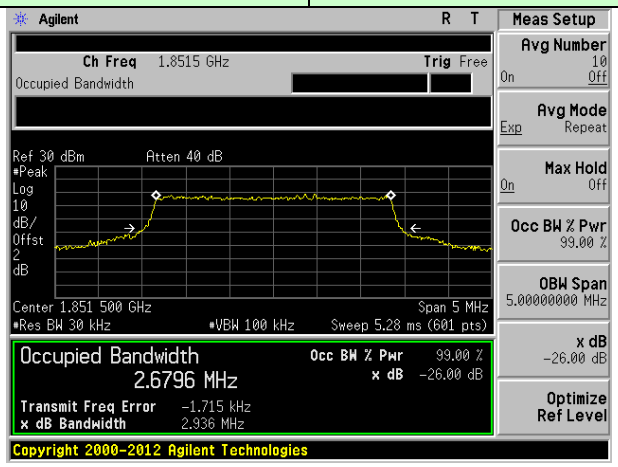


Middle channel

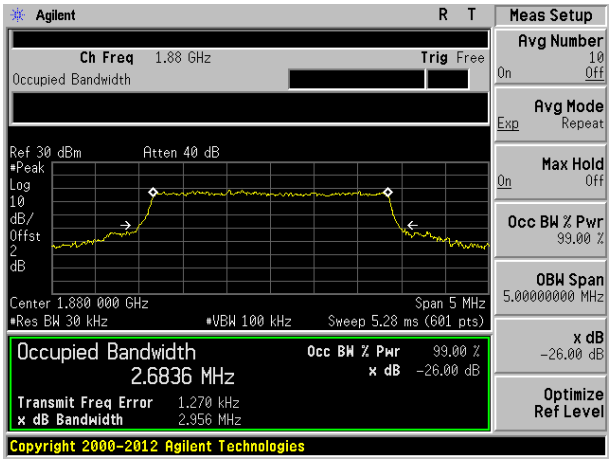


Highest channel

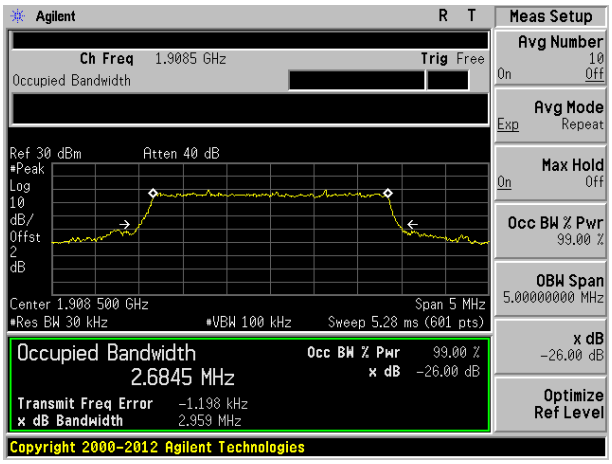
Test band: LTE Band 2	Channel Bandwidth:3MHz



Lowest channel

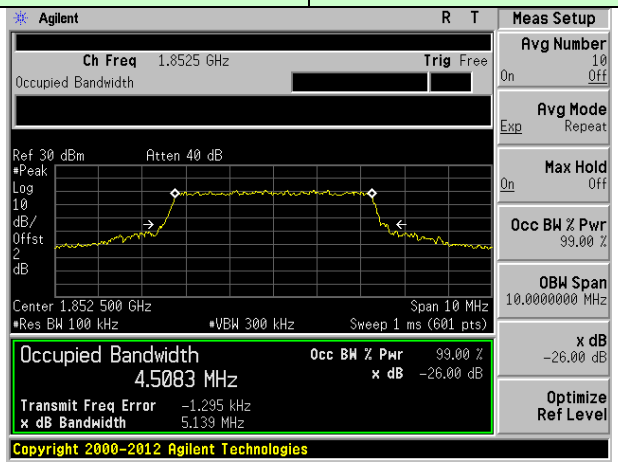


Middle channel

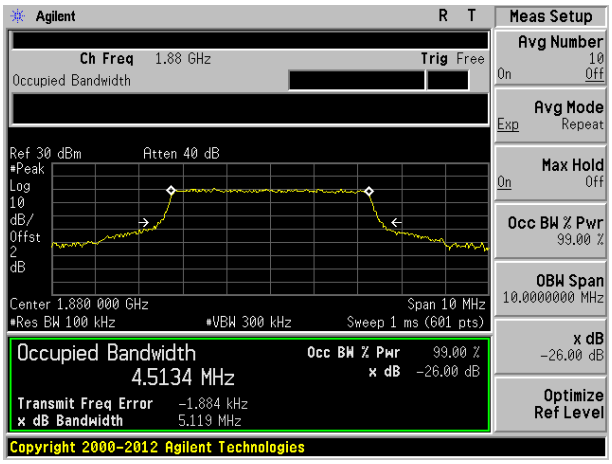


Highest channel

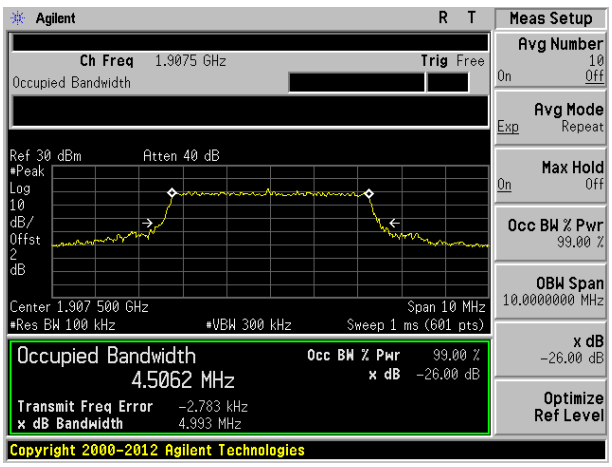
Test band: LTE Band 2	Channel Bandwidth: 5MHz



Lowest channel

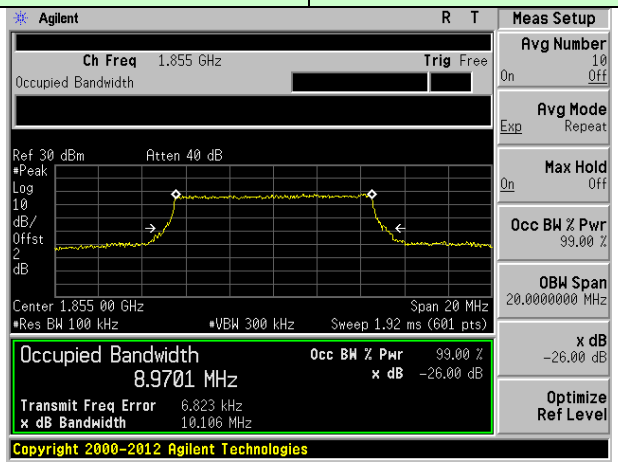


Middle channel

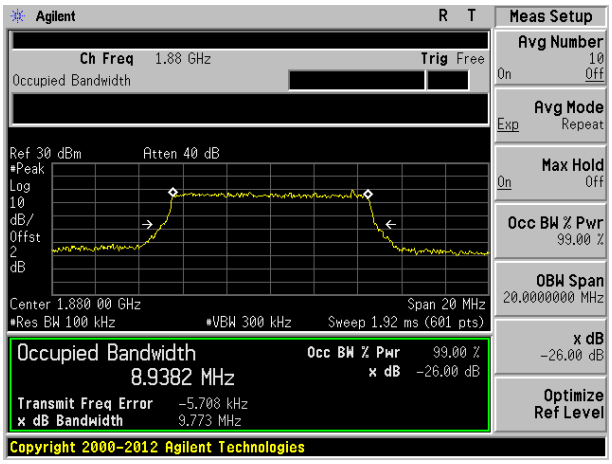


Highest channel

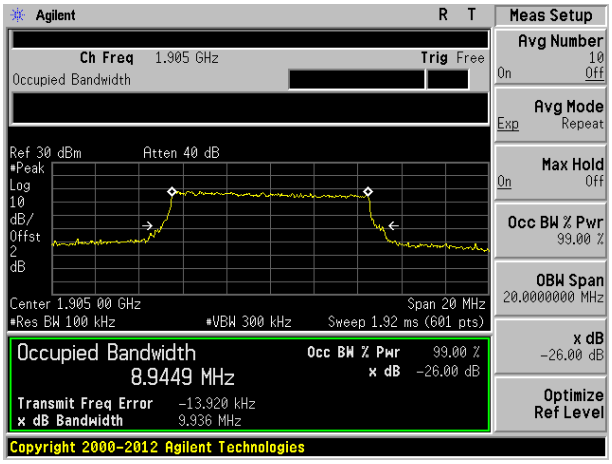
Test band: LTE Band 2	Channel Bandwidth:10MHz



Lowest channel

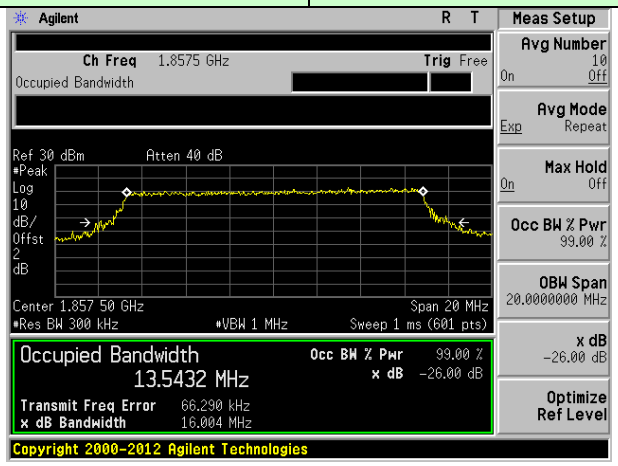


Middle channel

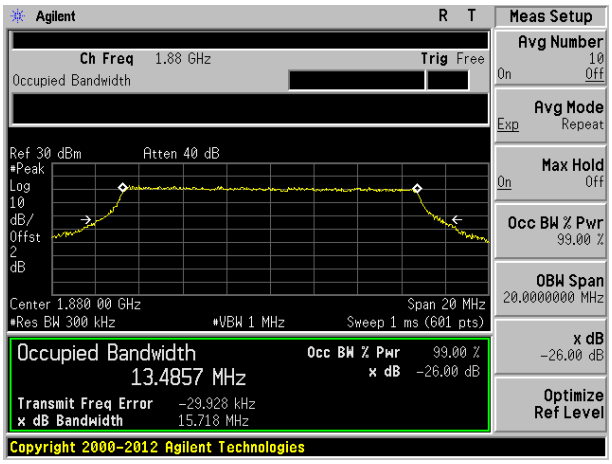


Highest channel

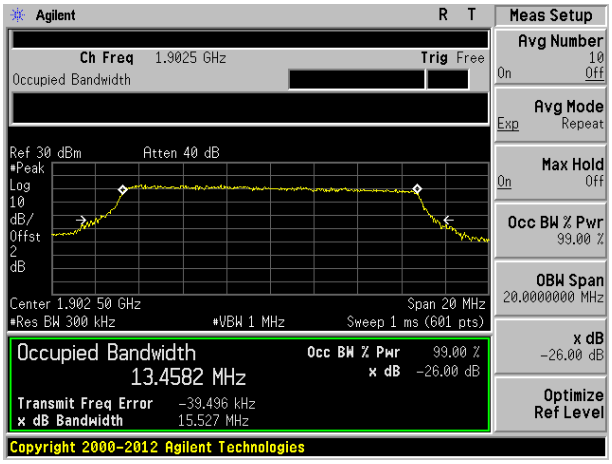
Test band: LTE Band 2	Channel Bandwidth:15MHz



Lowest channel

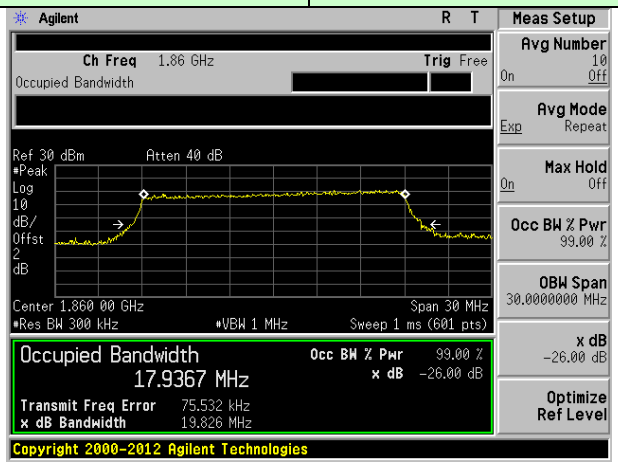


Middle channel

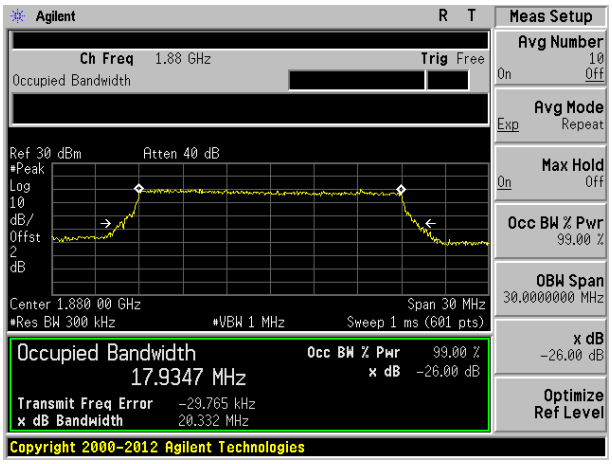


Highest channel

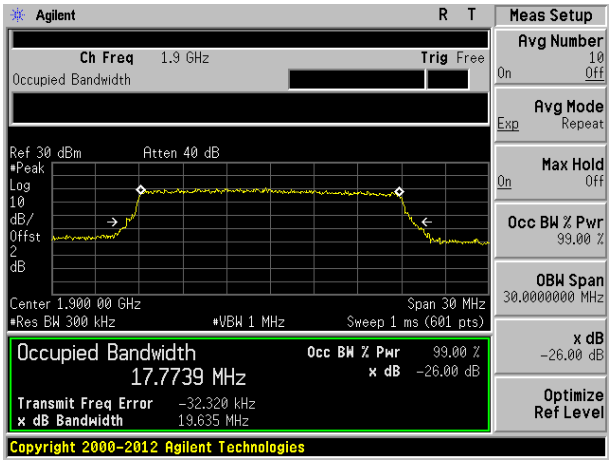
Test band: LTE Band 2	Channel Bandwidth:20MHz



Lowest channel

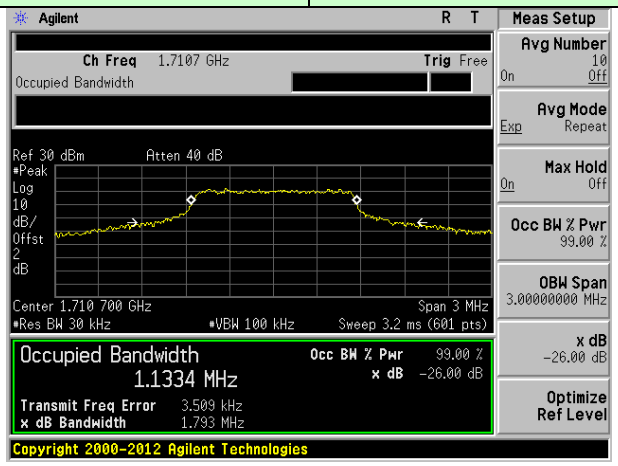


Middle channel

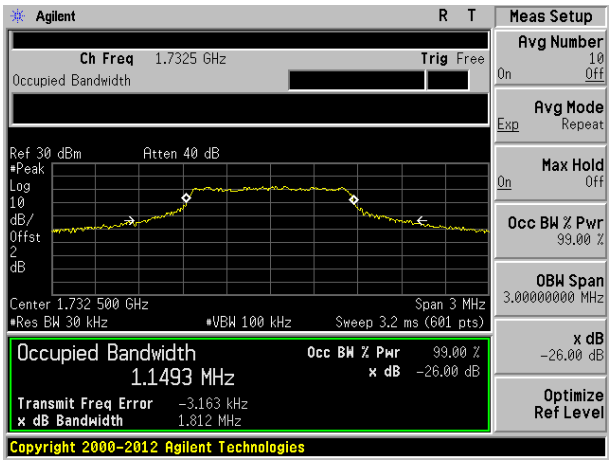


Highest channel

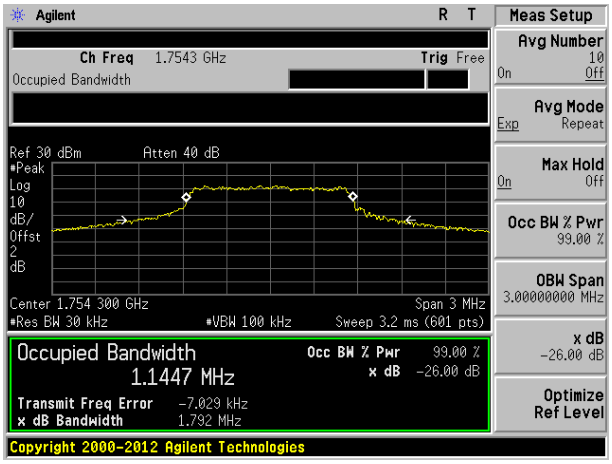
Test band: LTE Band 4	Channel Bandwidth: 1.4MHz



Lowest channel

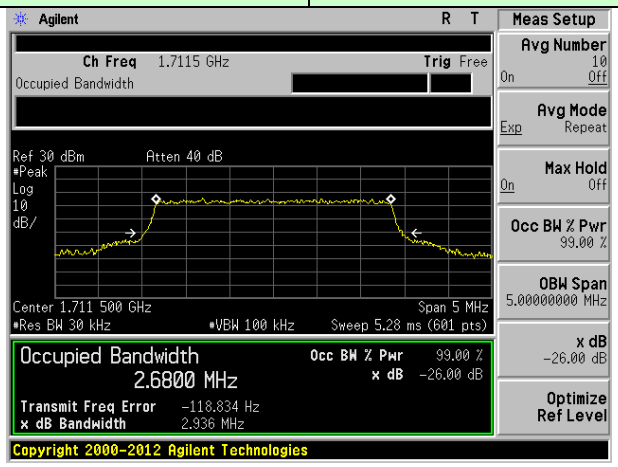


Middle channel

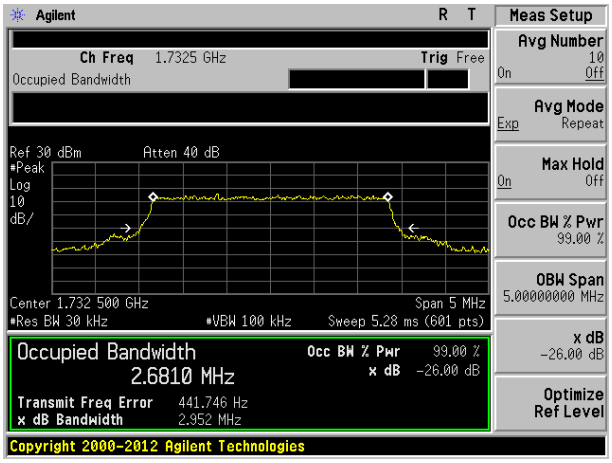


Highest channel

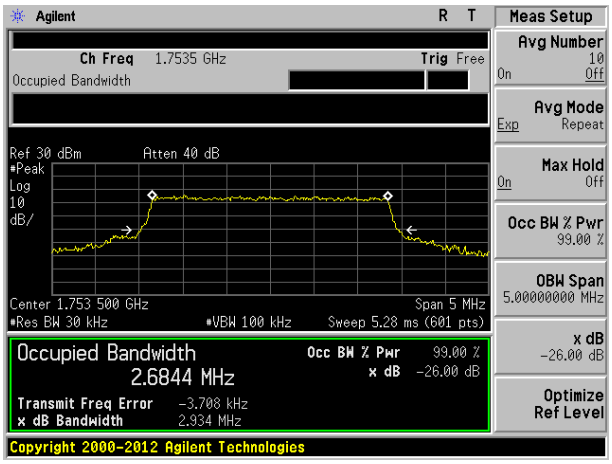
Test band: LTE Band 4	Channel Bandwidth: 3MHz



Lowest channel

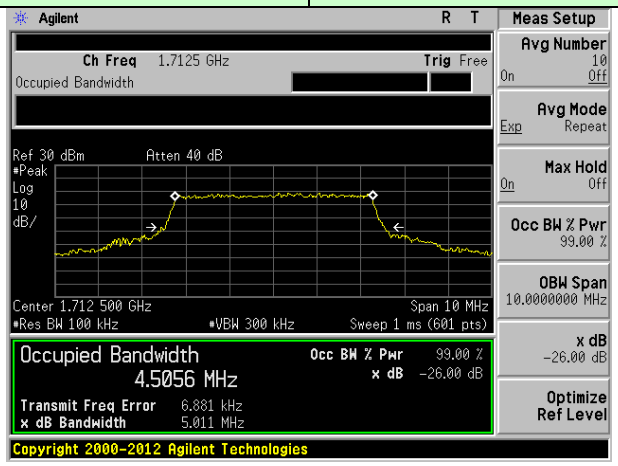


Middle channel

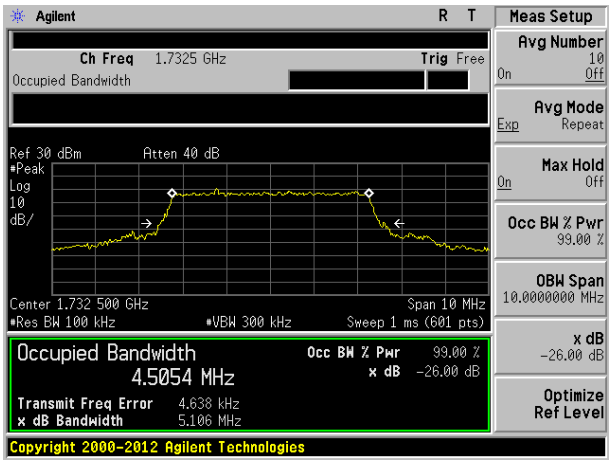


Highest channel

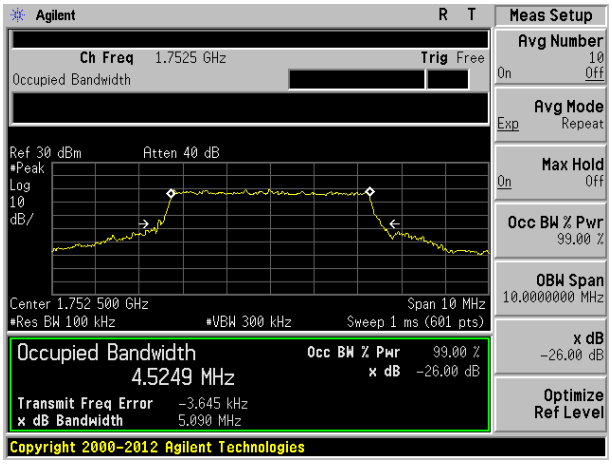
Test band: LTE Band 4	Channel Bandwidth: 5MHz



Lowest channel

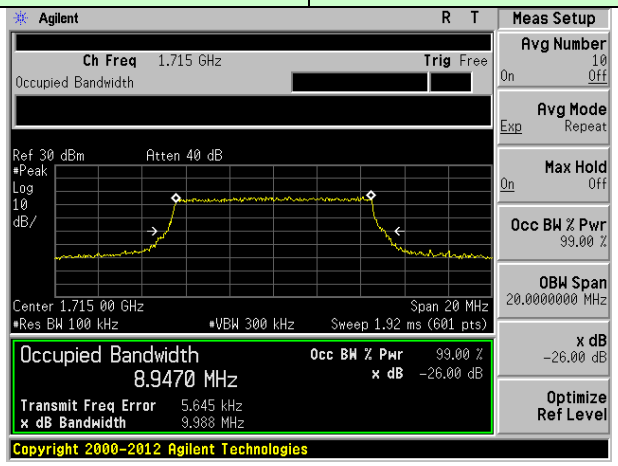


Middle channel

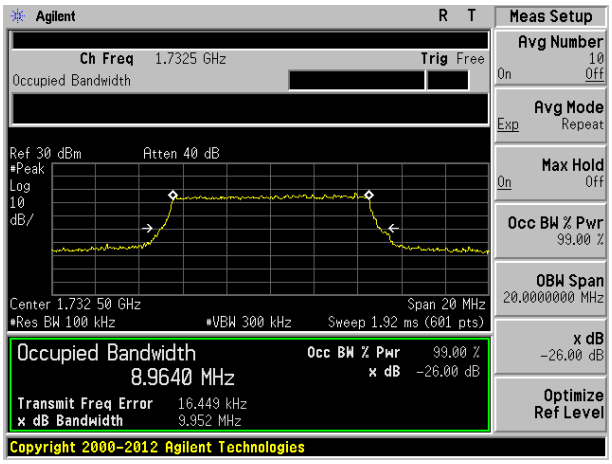


Highest channel

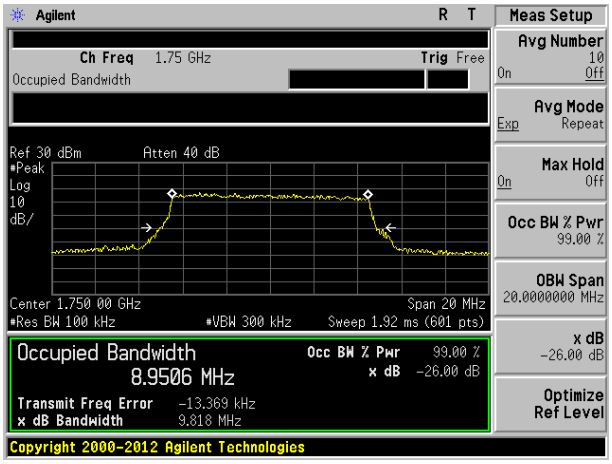
Test band: LTE Band 4	Channel Bandwidth: 10MHz



Lowest channel

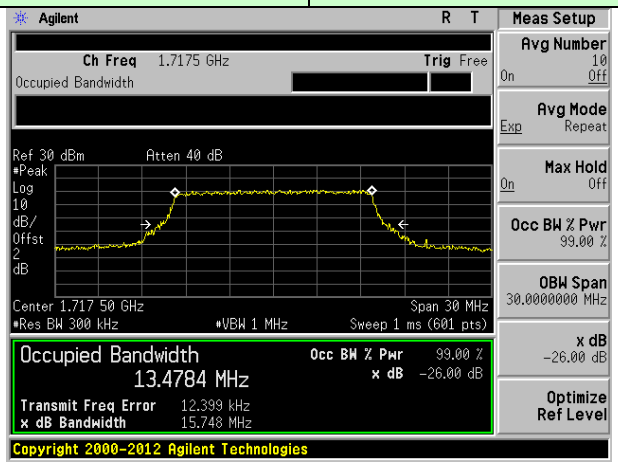


Middle channel

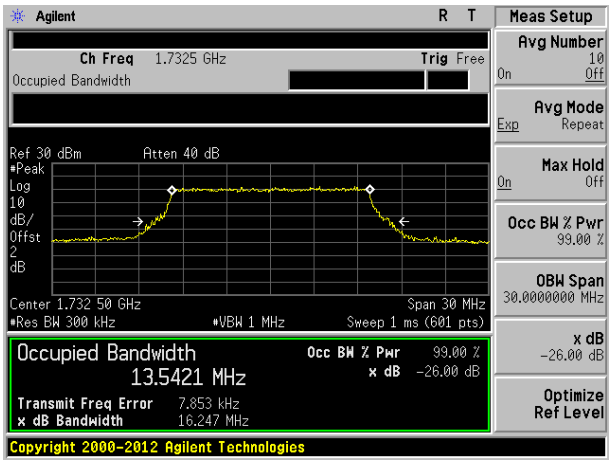


Highest channel

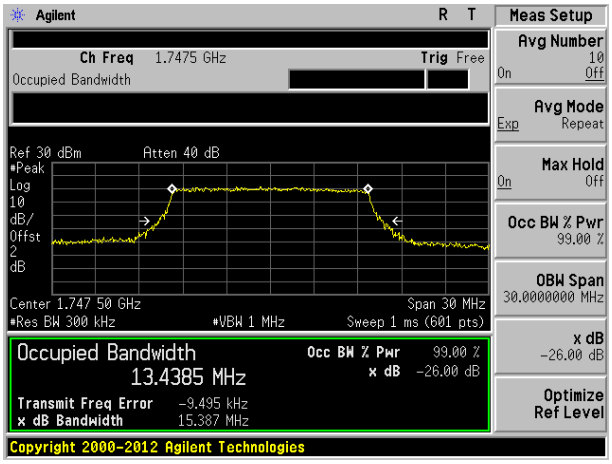
Test band: LTE Band 4	Channel Bandwidth: 15MHz



Lowest channel

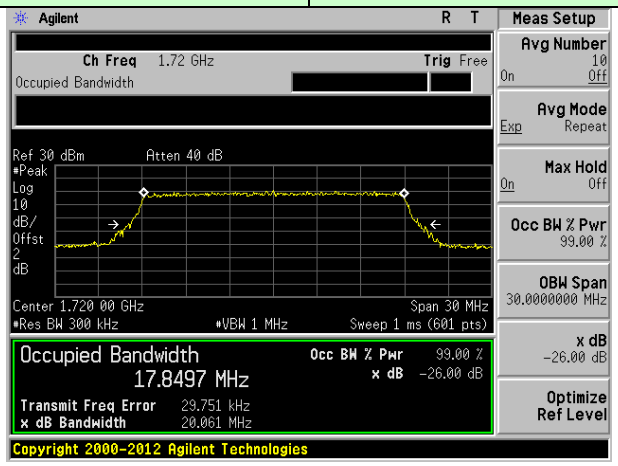


Middle channel

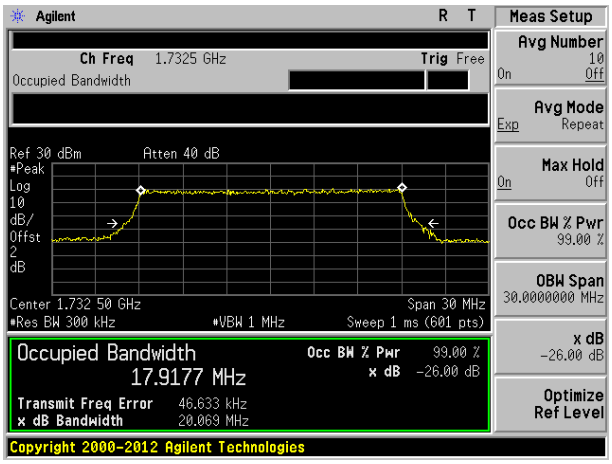


Highest channel

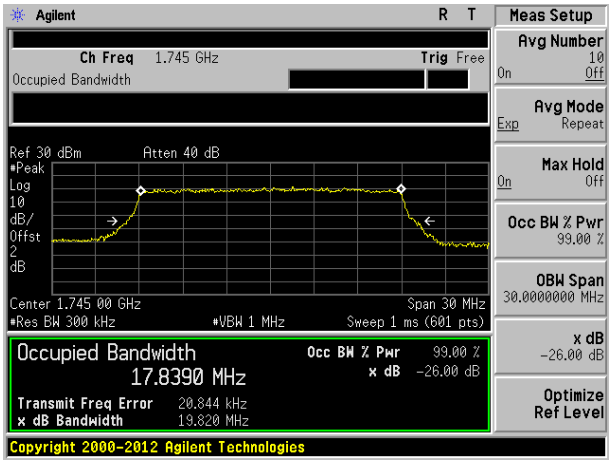
Test band: LTE Band 4	Channel Bandwidth: 20MHz



Lowest channel

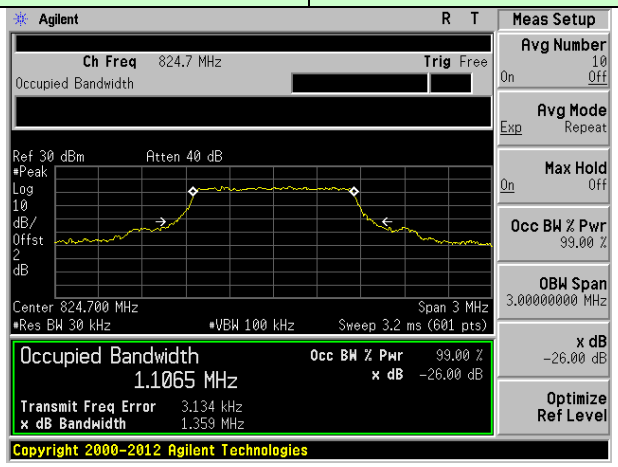


Middle channel

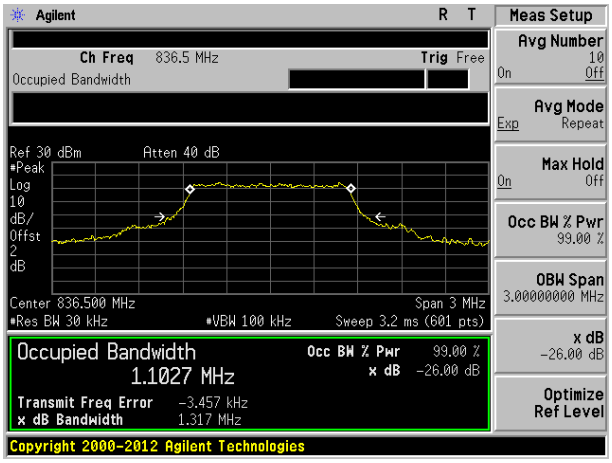


Highest channel

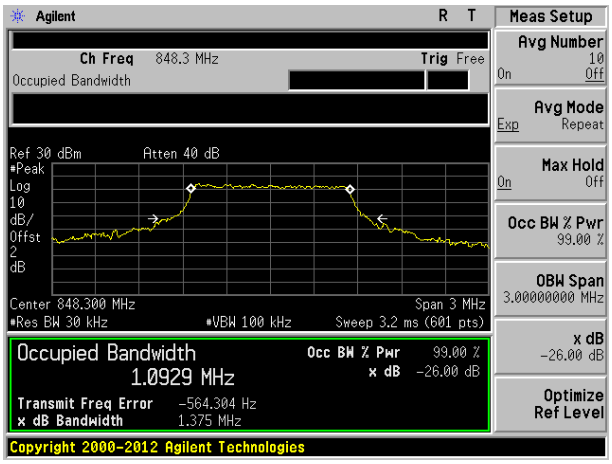
Test band: LTE Band 5	Channel Bandwidth: 1.4MHz



Lowest channel

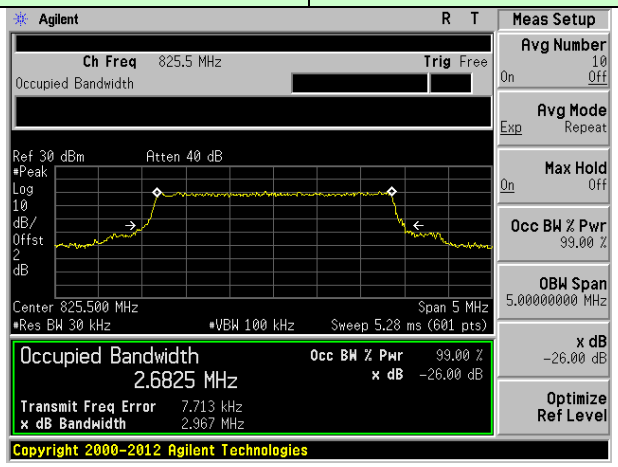


Middle channel

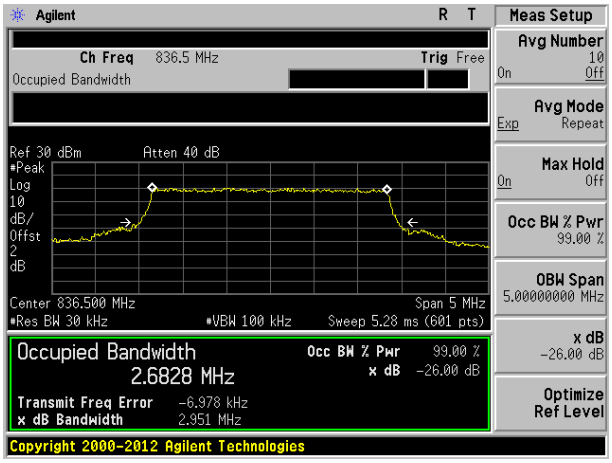


Highest channel

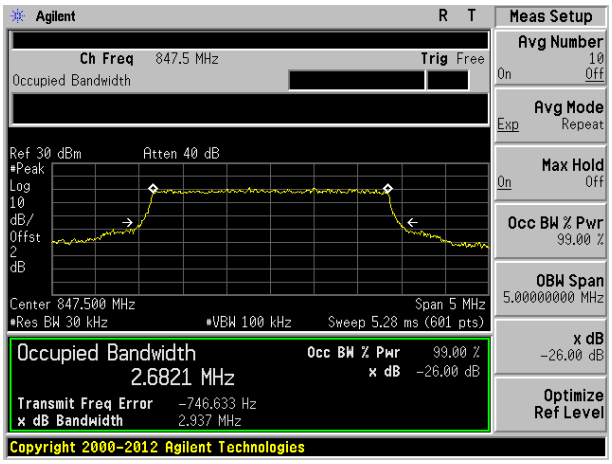
Test band: LTE Band 5	Channel Bandwidth: 3MHz



Lowest channel

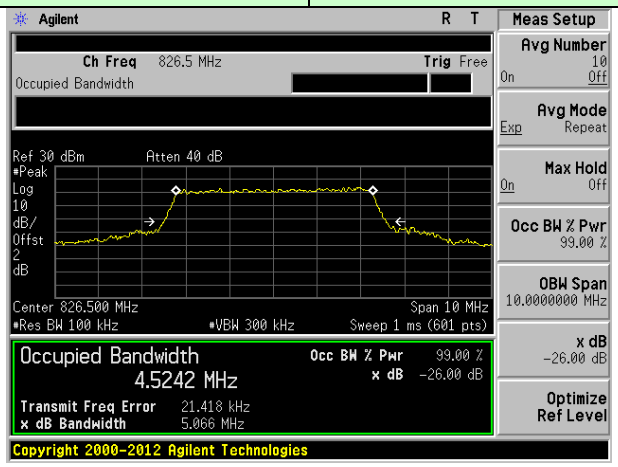


Middle channel

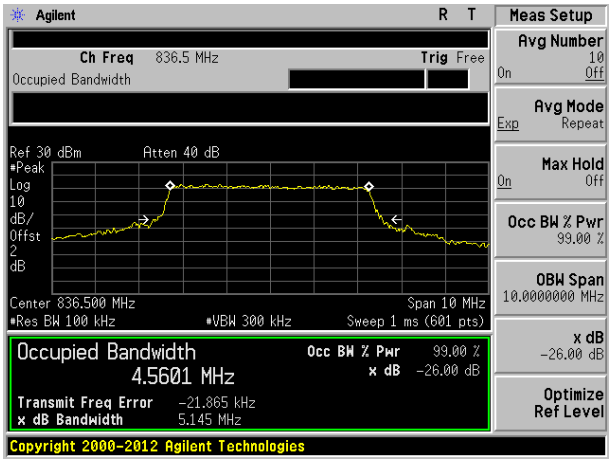


Highest channel

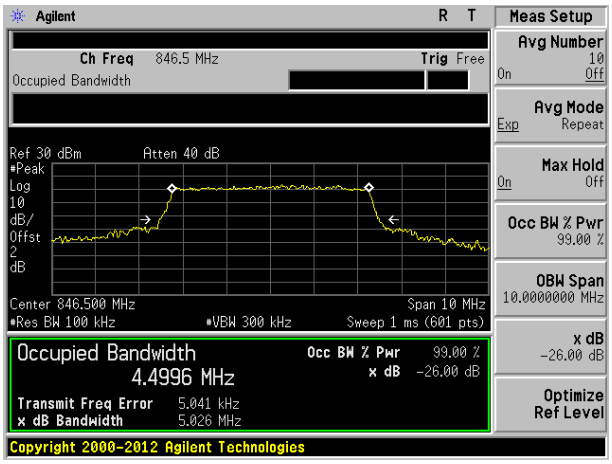
Test band: LTE Band 5	Channel Bandwidth: 5MHz



Lowest channel

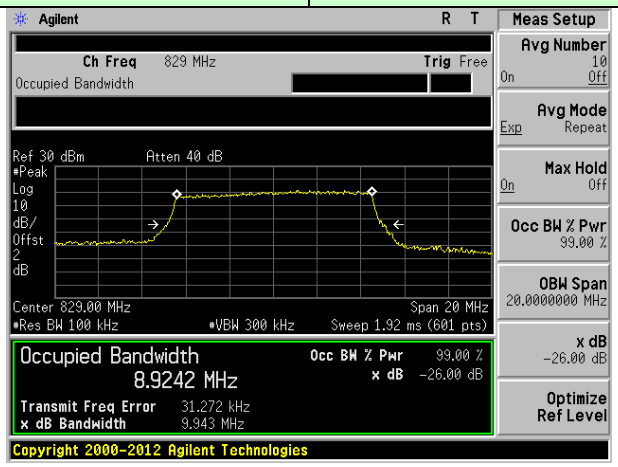


Middle channel

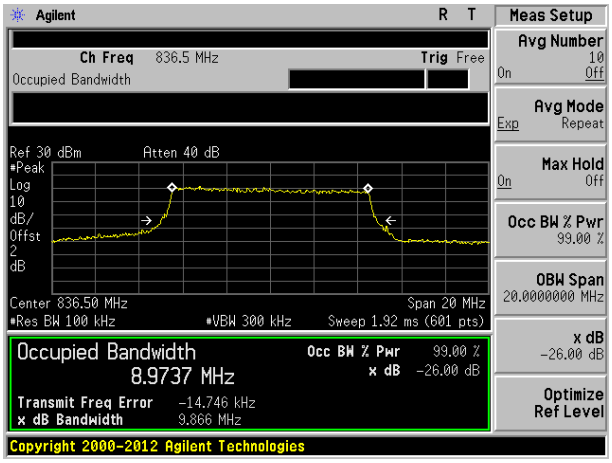


Highest channel

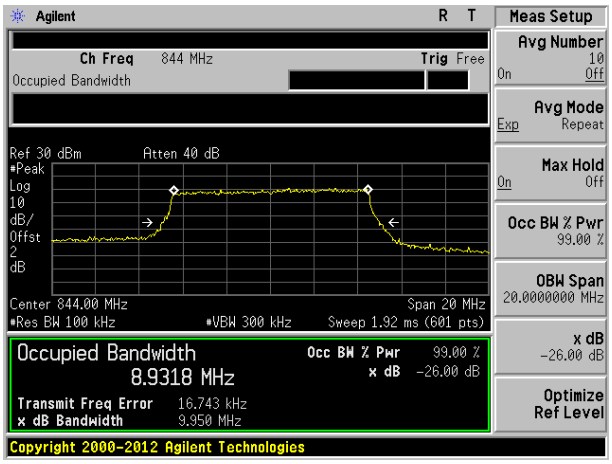
Test band: LTE Band 5	Channel Bandwidth: 10MHz



Lowest channel

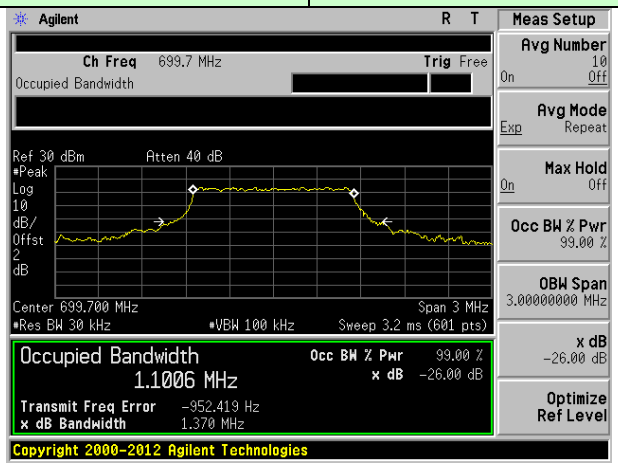


Middle channel

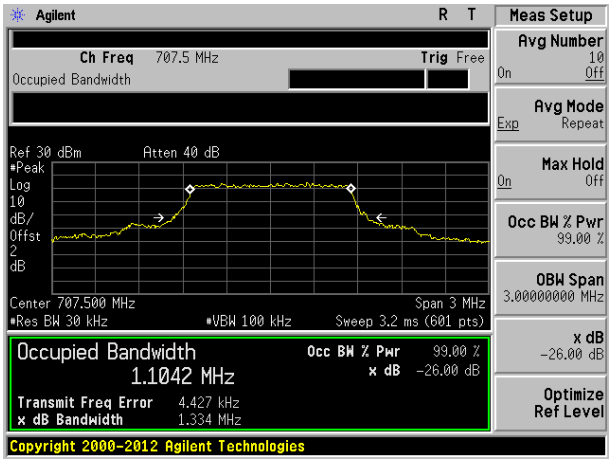


Highest channel

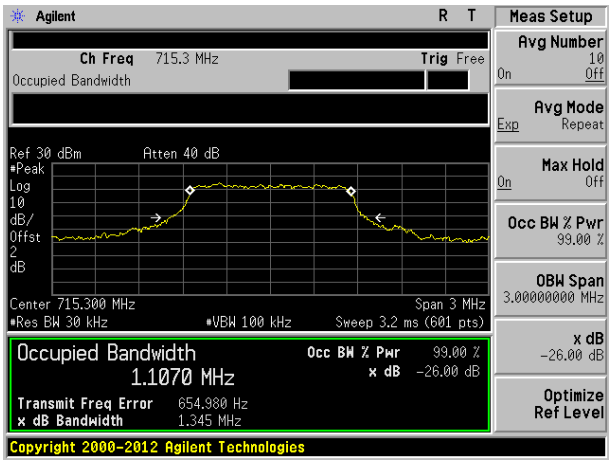
Test band: LTE Band 12	Channel Bandwidth: 1.4MHz



Lowest channel

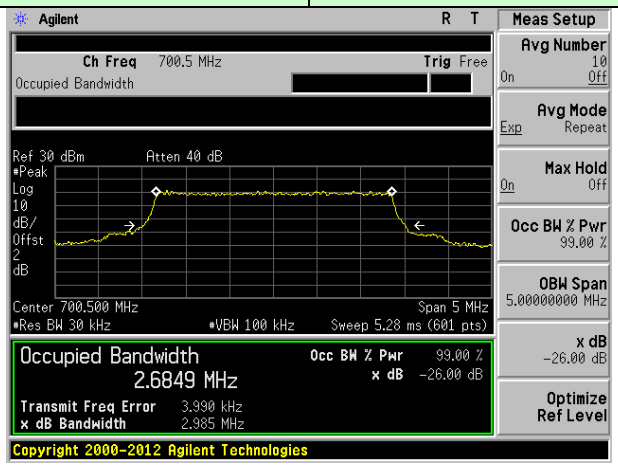


Middle channel

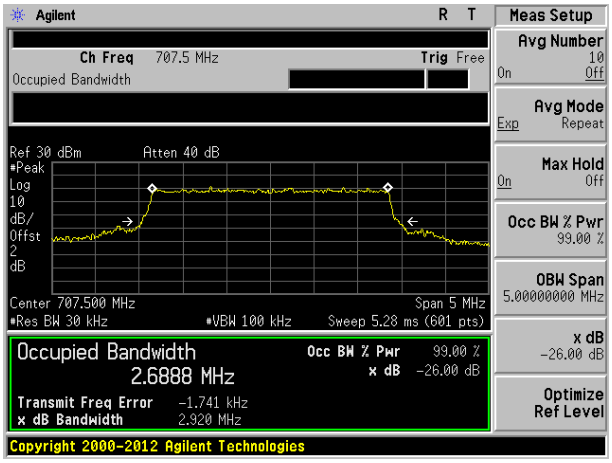


Highest channel

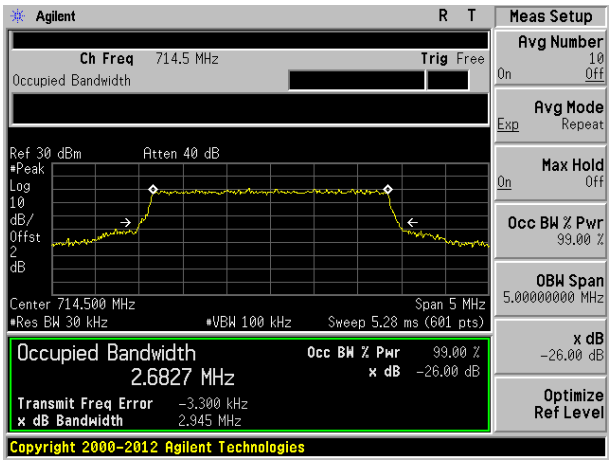
Test band: LTE Band 12	Channel Bandwidth: 3MHz



Lowest channel

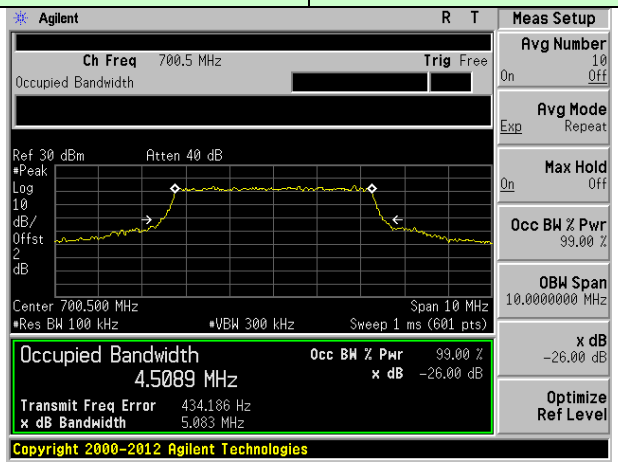


Middle channel

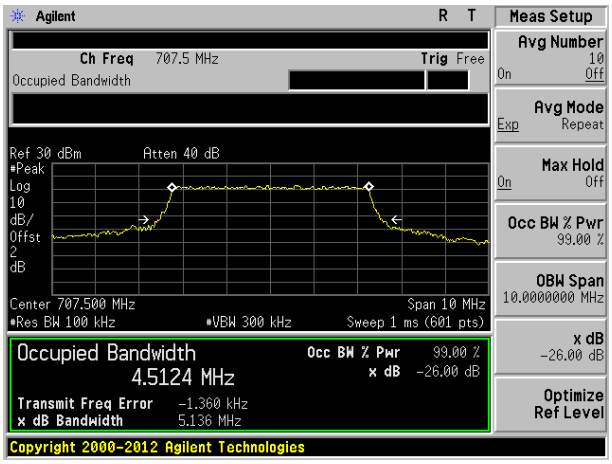


Highest channel

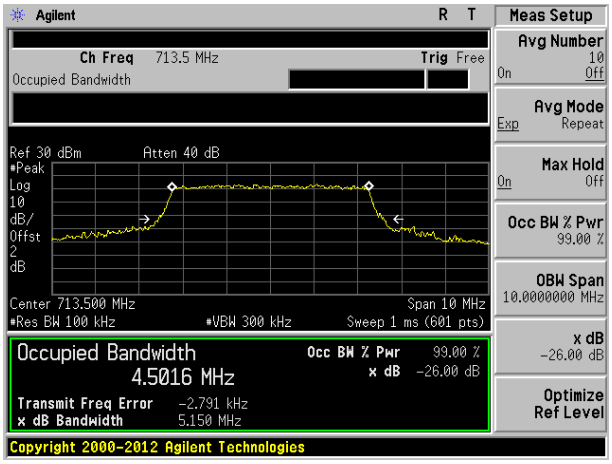
Test band: LTE Band 12	Channel Bandwidth: 5MHz



Lowest channel

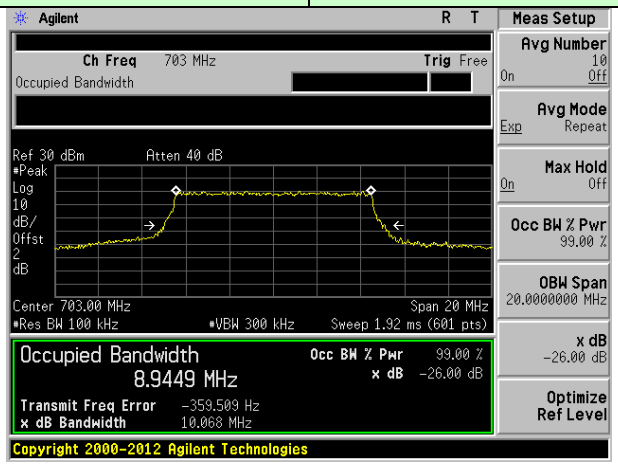


Middle channel

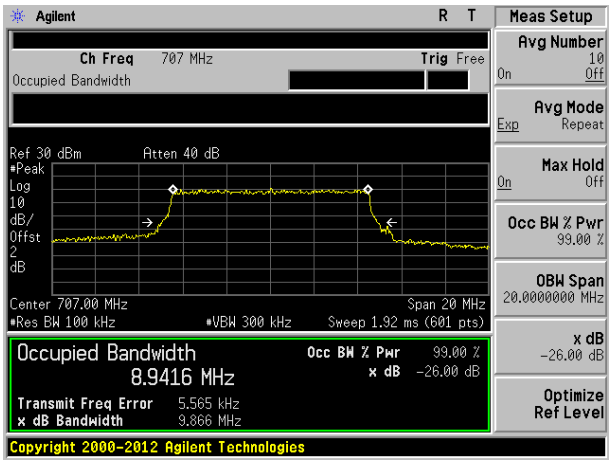


Highest channel

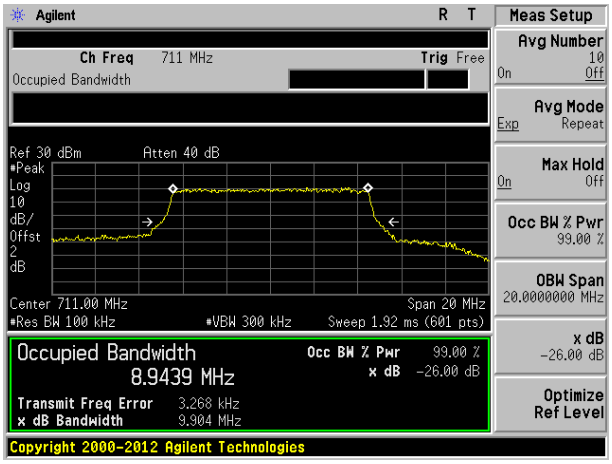
Test band: LTE Band 12	Channel Bandwidth: 10MHz



Lowest channel

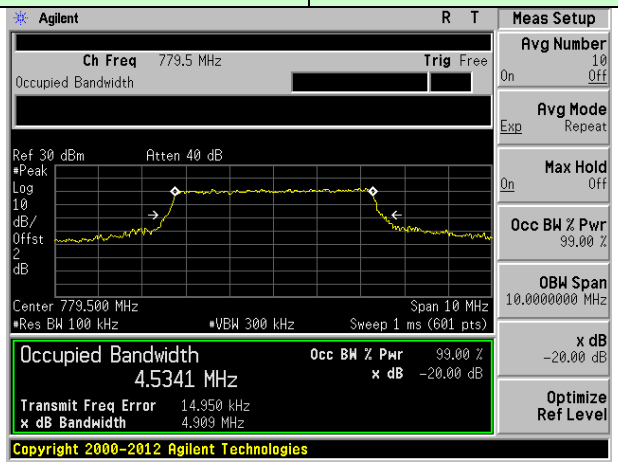


Middle channel

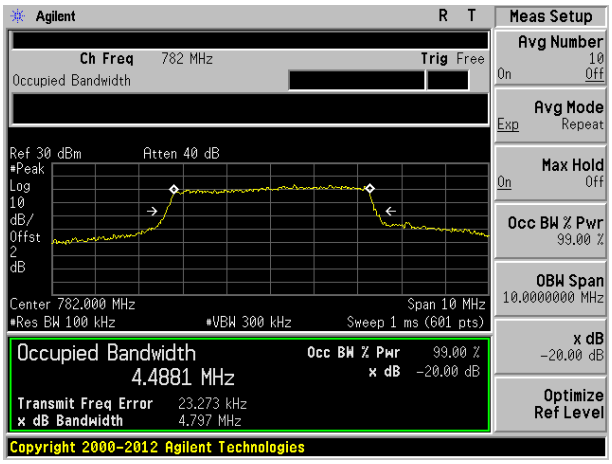


Highest channel

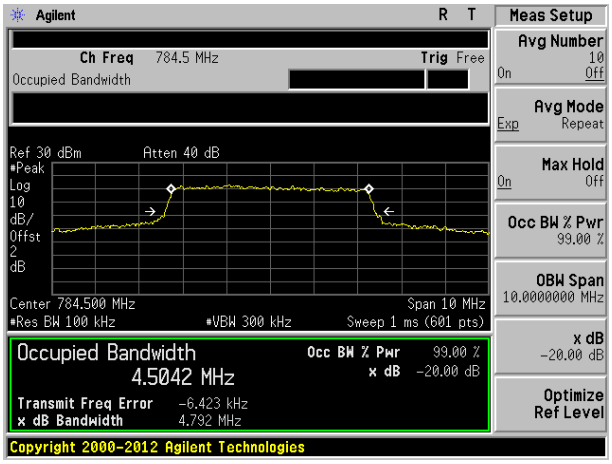
Test band: LTE Band 13	Channel Bandwidth: 5MHz



Lowest channel

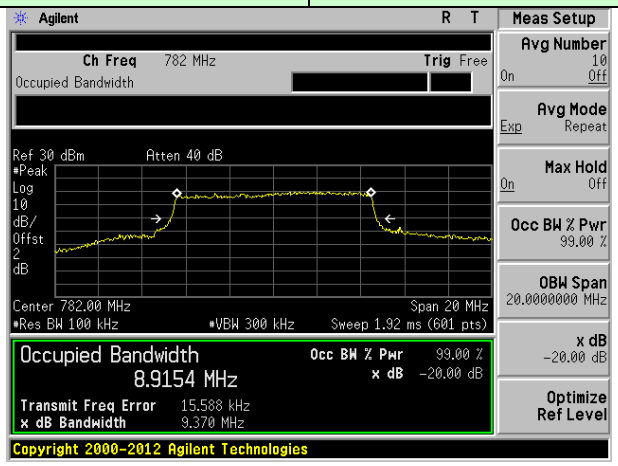


Middle channel



Highest channel

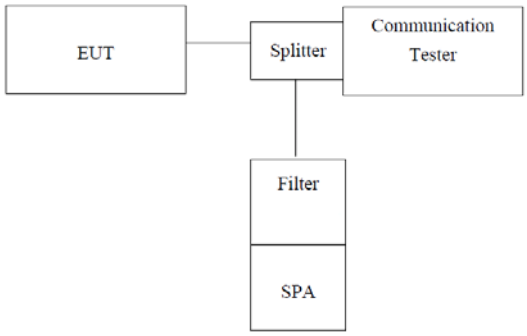
Test band: LTE Band 13	Channel Bandwidth: 10MHz



7.6 MODULATION CHARACTERISTIC

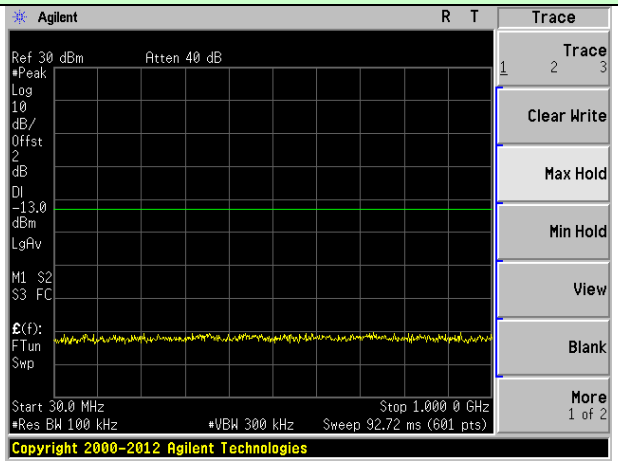
According to FCC § 2.1047(d), Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

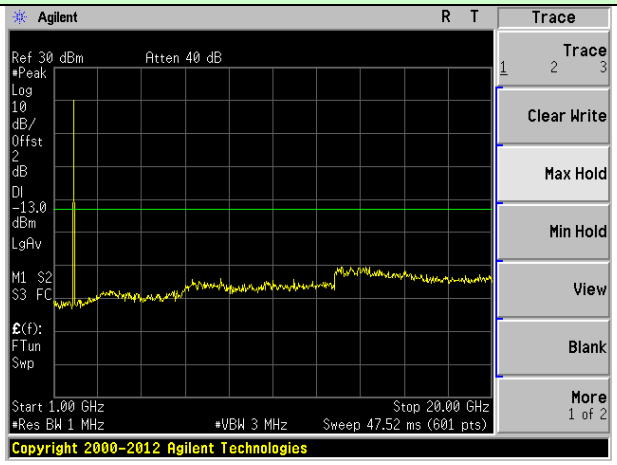
7.7 Out of band emission at antenna terminals

Test Requirement:	Part 24.238 (a); FCC Part 27.53(h)/(g)
Test Method:	FCC part2.1051
Limit:	-13dBm
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic. 3 For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10th harmonic. 4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

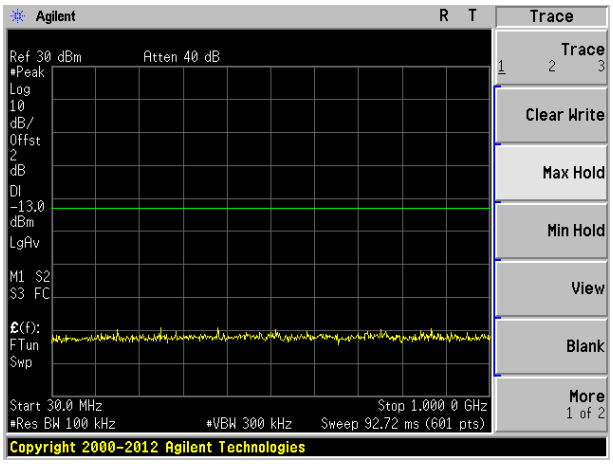
Test plot as follows:

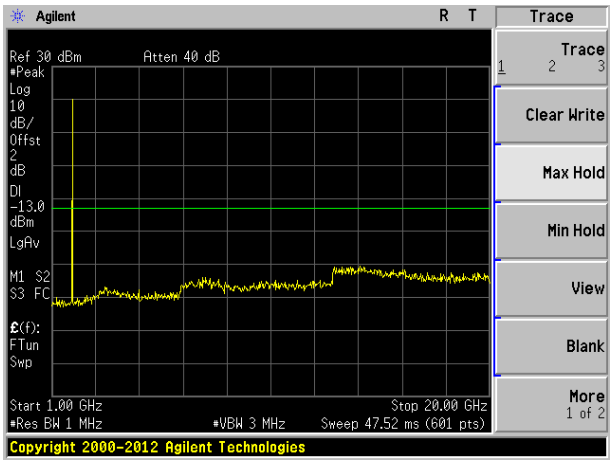
Test Mode: LTE Band 2	Channel Bandwidth: 1.4MHz



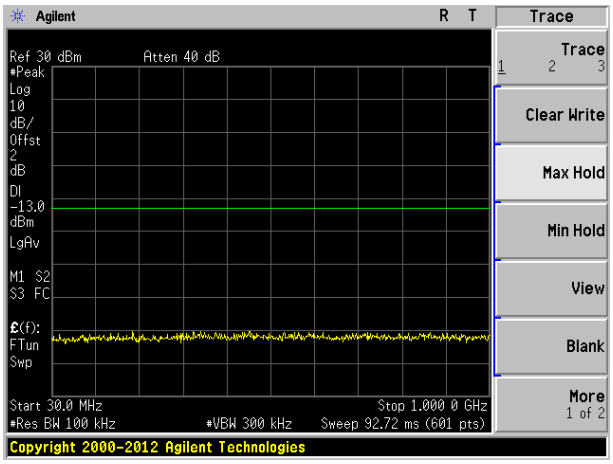


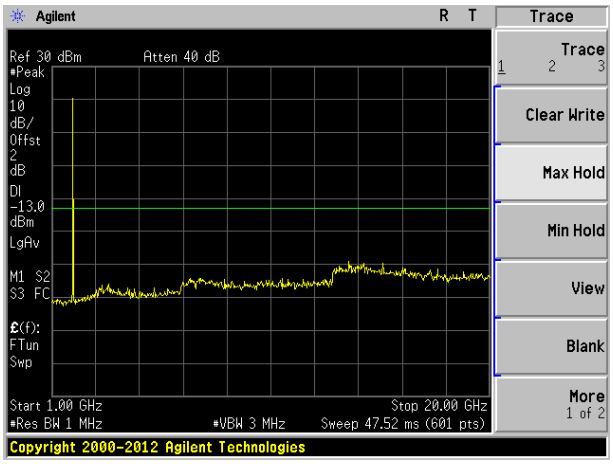
Lowest channel





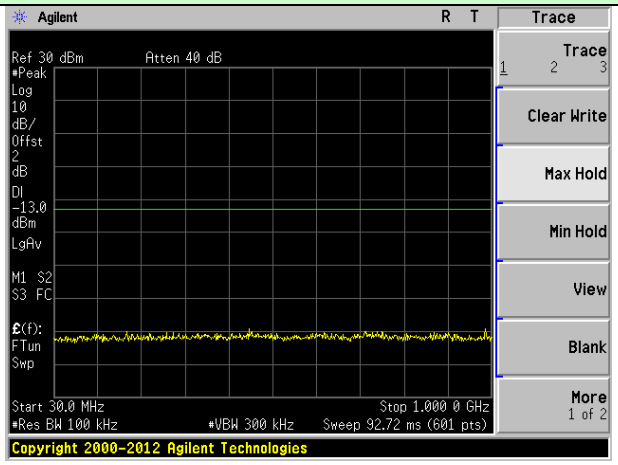
Middle channel

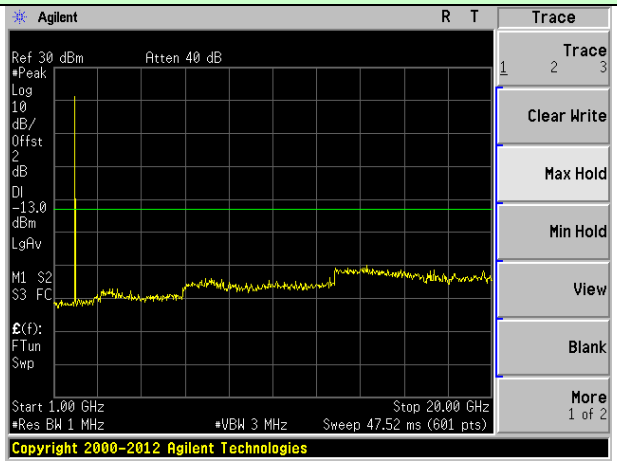




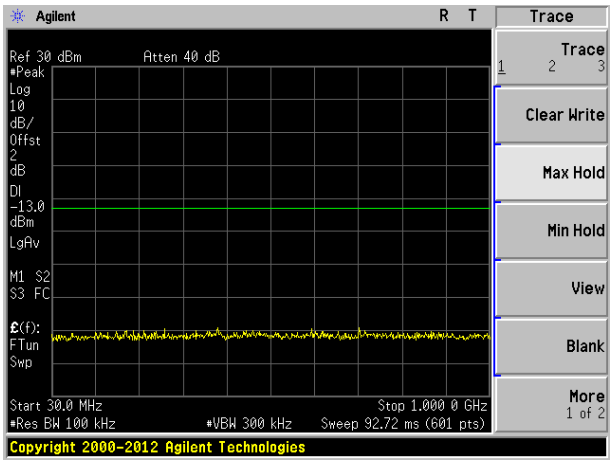
Highest channel

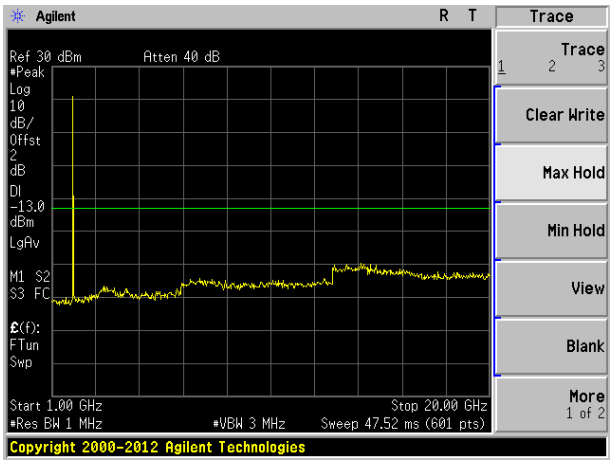
Test Mode: LTE Band 2	Channel Bandwidth: 3MHz



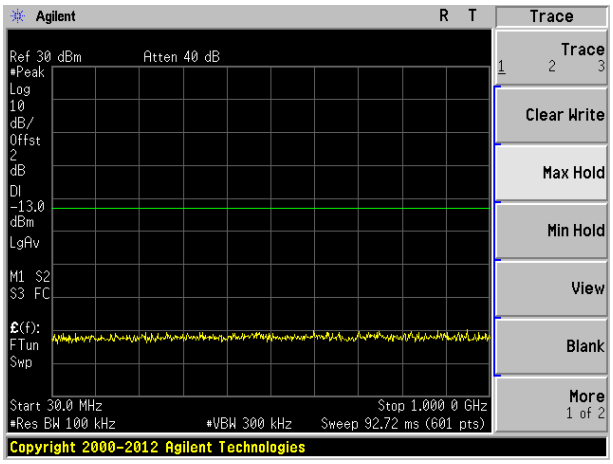


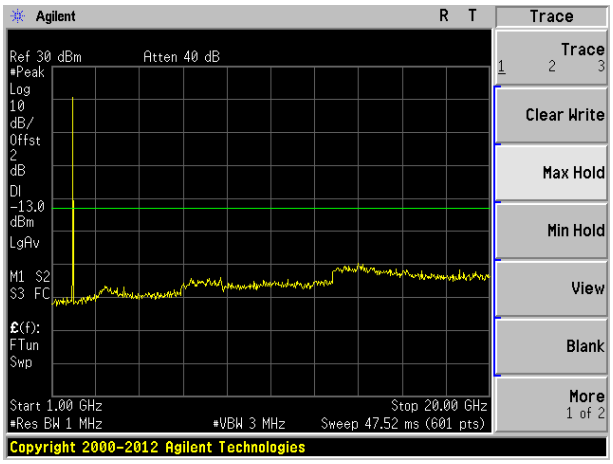
Lowest channel





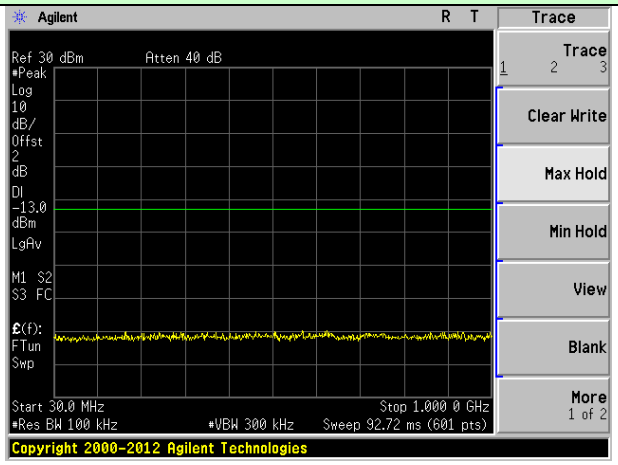
Middle channel

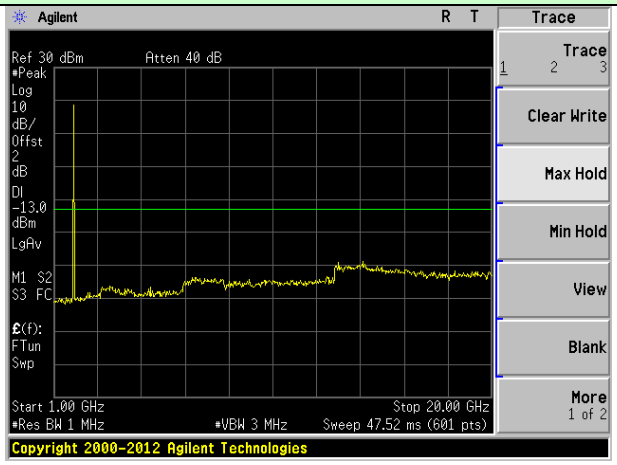




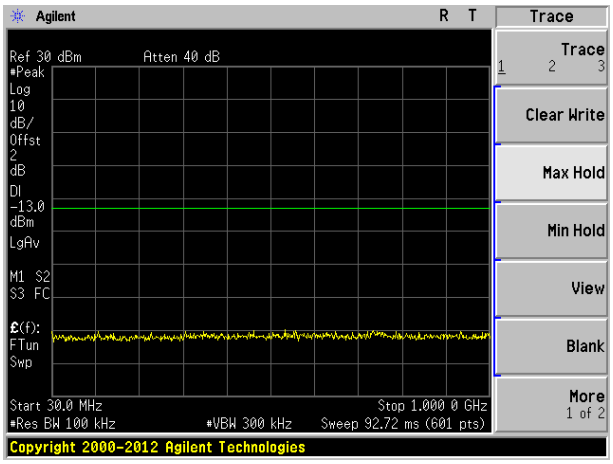
Highest channel

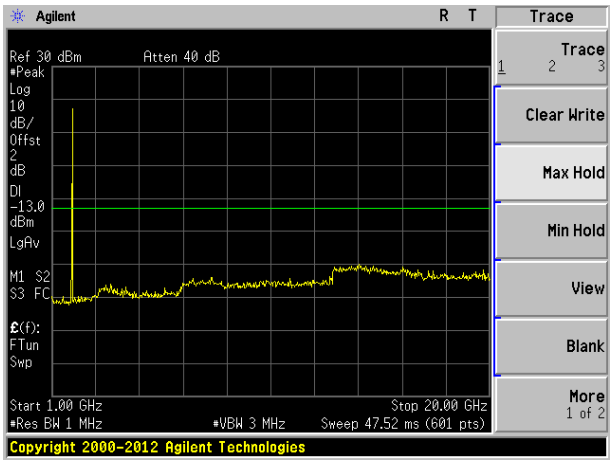
Test Mode: LTE Band 2	Channel Bandwidth: 5MHz



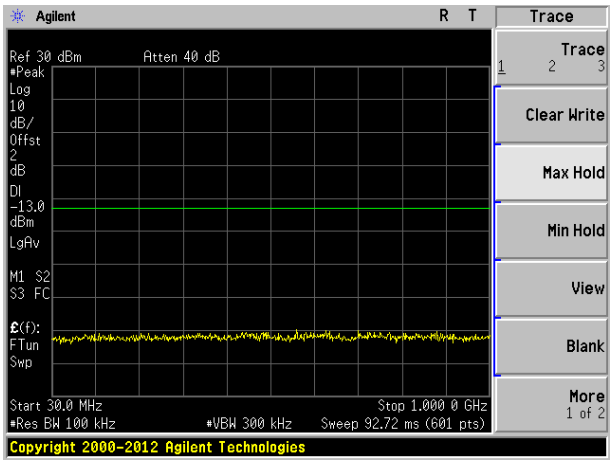


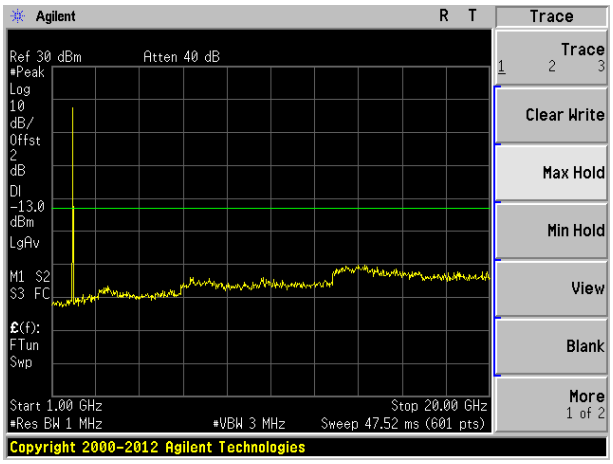
Lowest channel





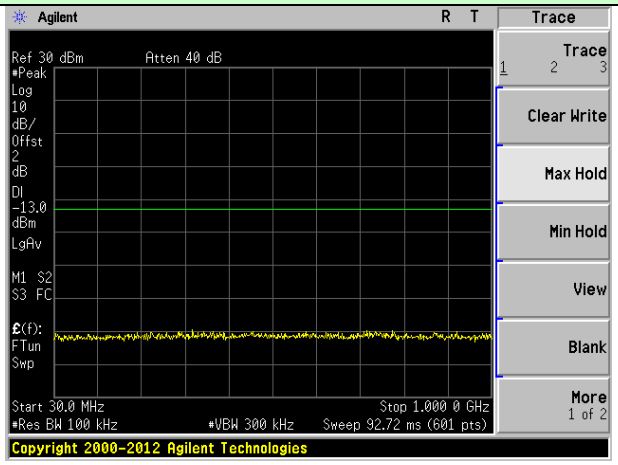
Middle channel

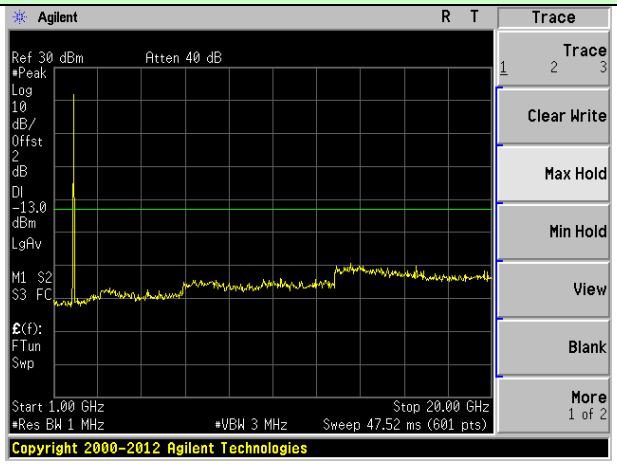




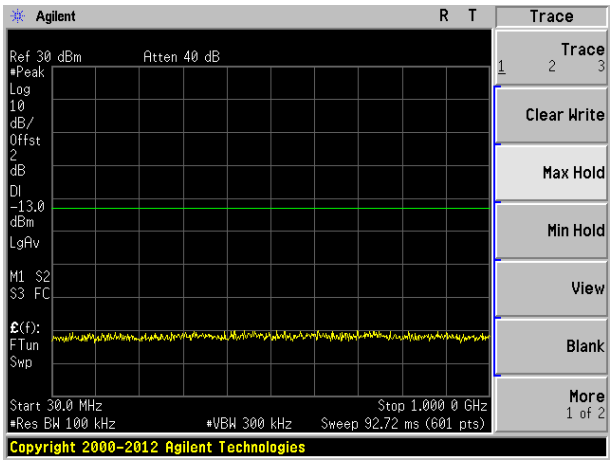
Highest channel

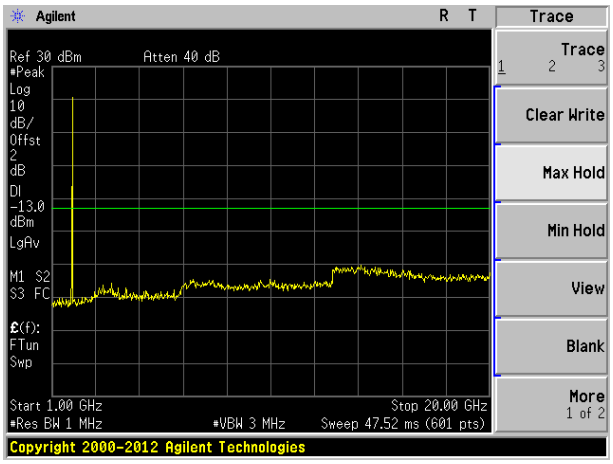
Test Mode: LTE Band 2	Channel Bandwidth: 10MHz



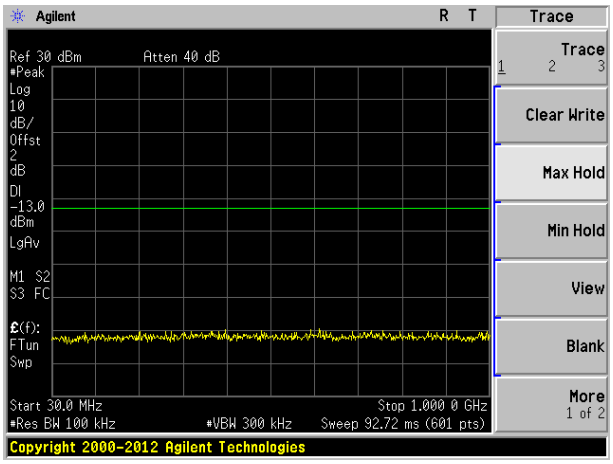


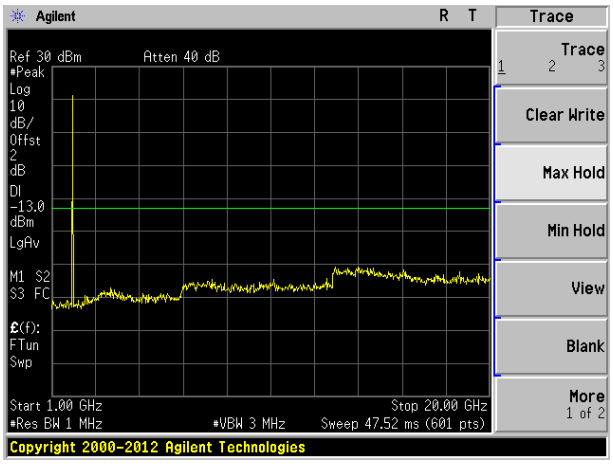
Lowest channel





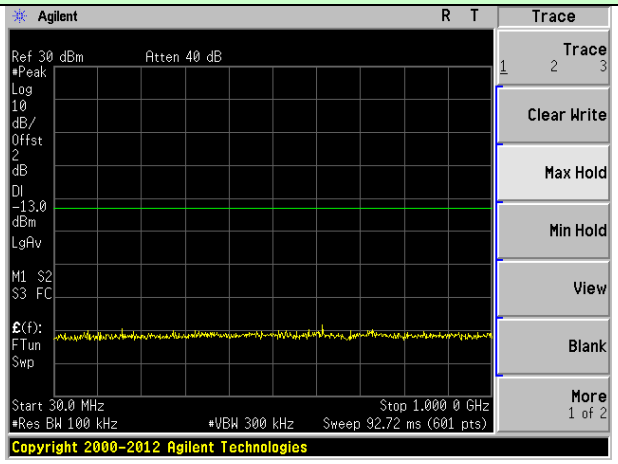
Middle channel

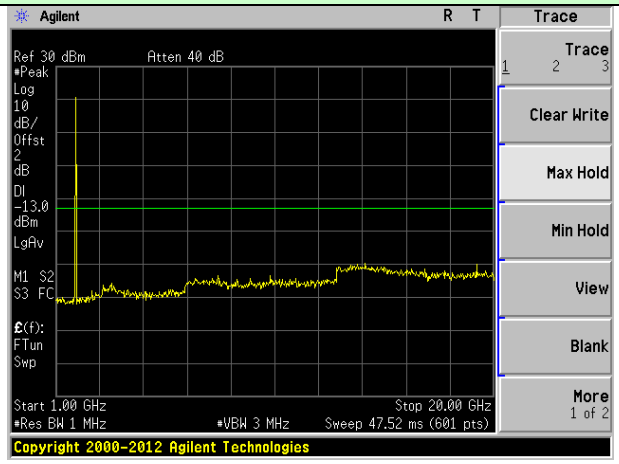




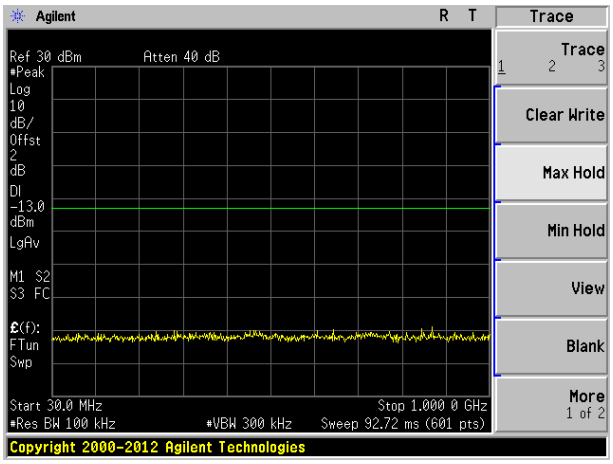
Highest channel

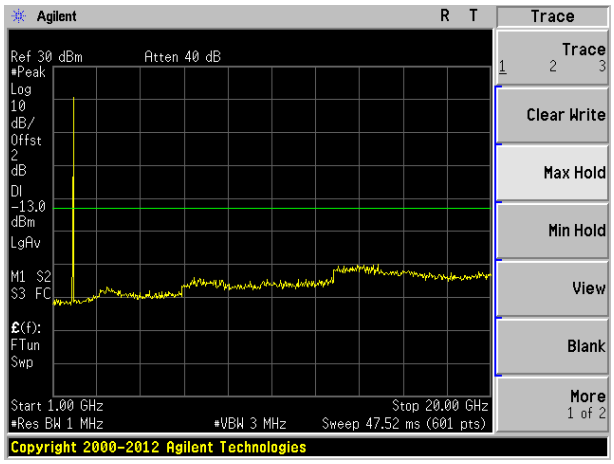
Test Mode: LTE Band 2	Channel Bandwidth: 15MHz



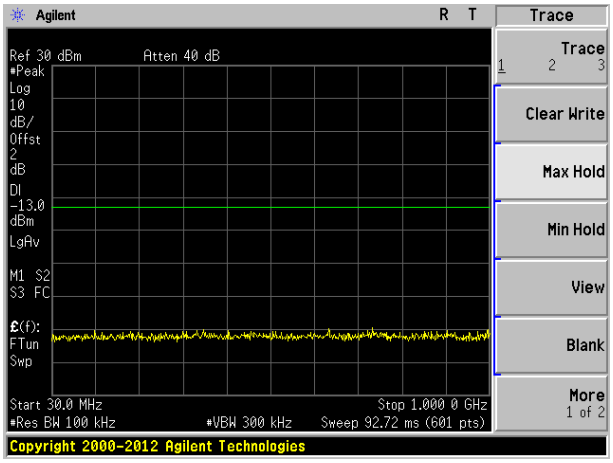


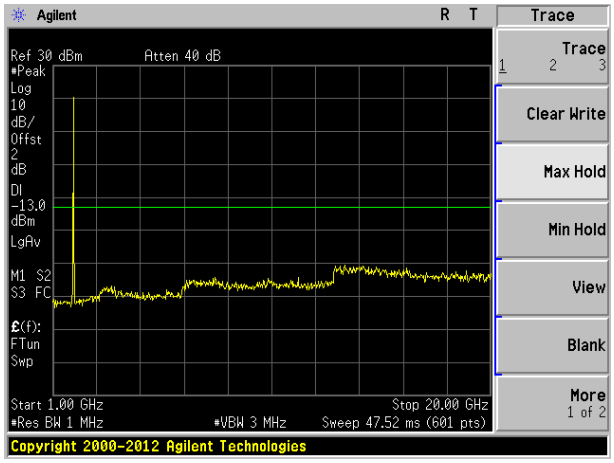
Lowest channel





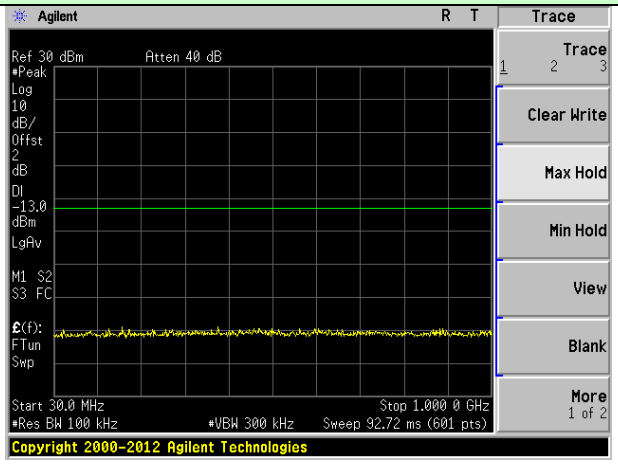
Middle channel

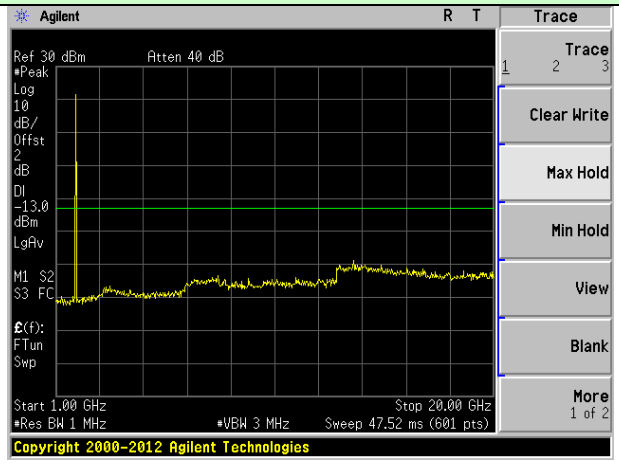




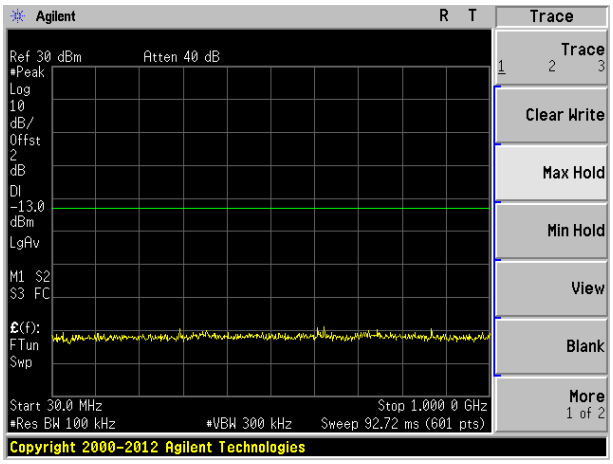
Highest channel

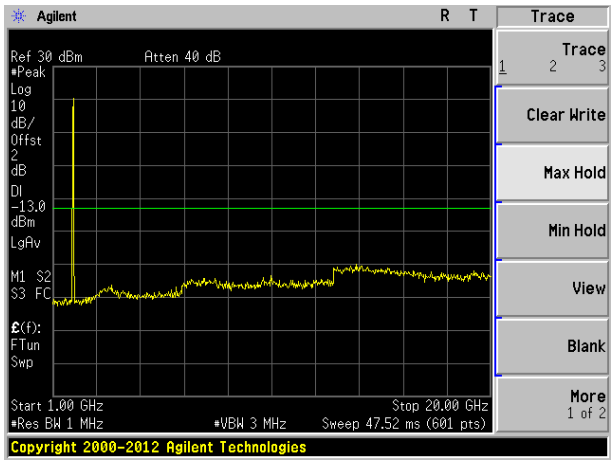
Test Mode: LTE Band 2	Channel Bandwidth: 20MHz



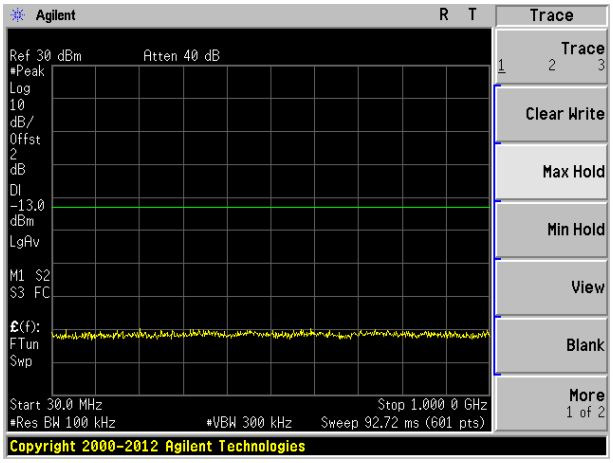


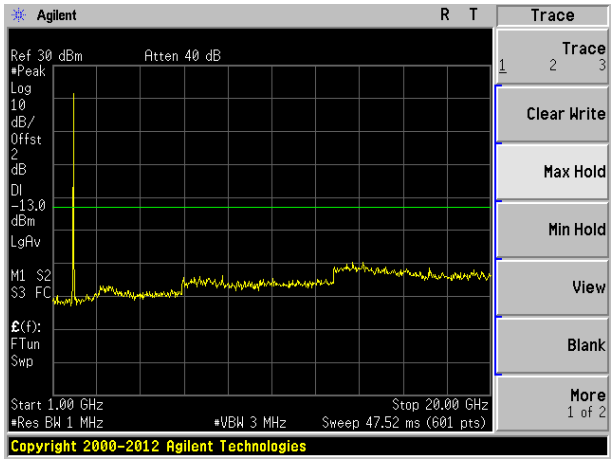
Lowest channel





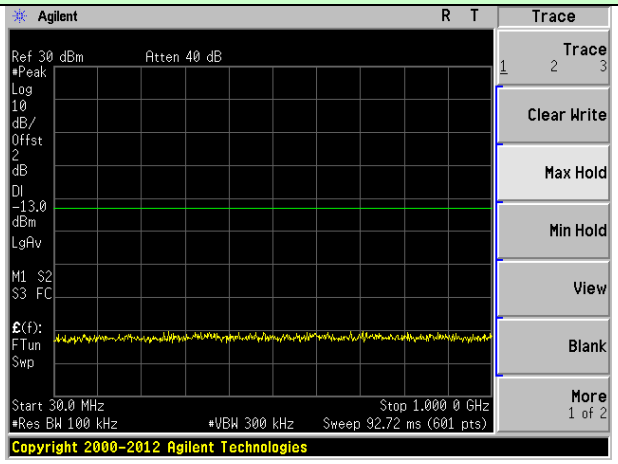
Middle channel

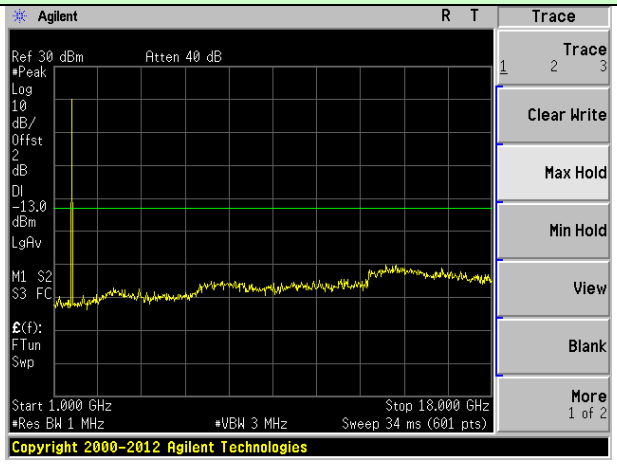




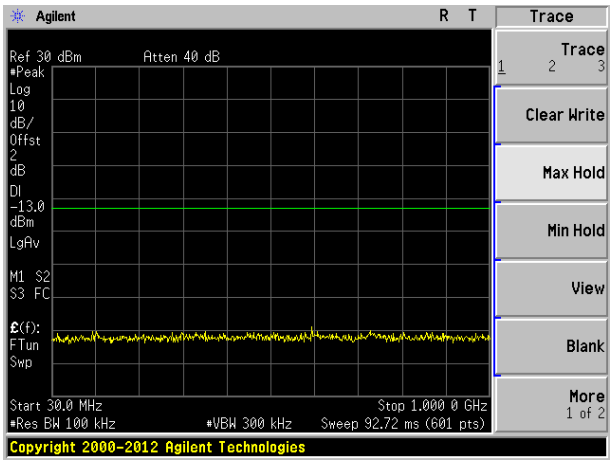
Highest channel

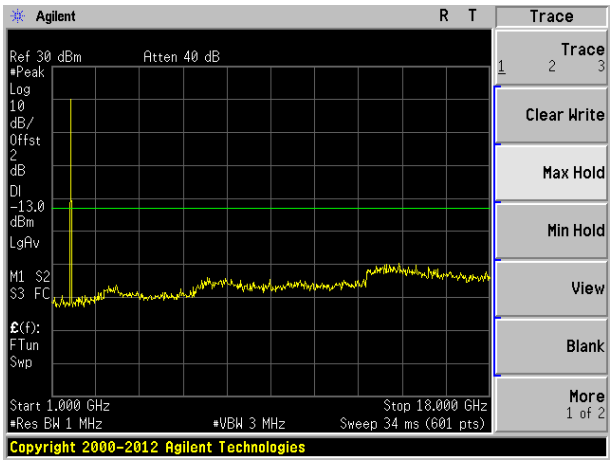
Test Mode: LTE Band 4	Channel Bandwidth: 1.4MHz



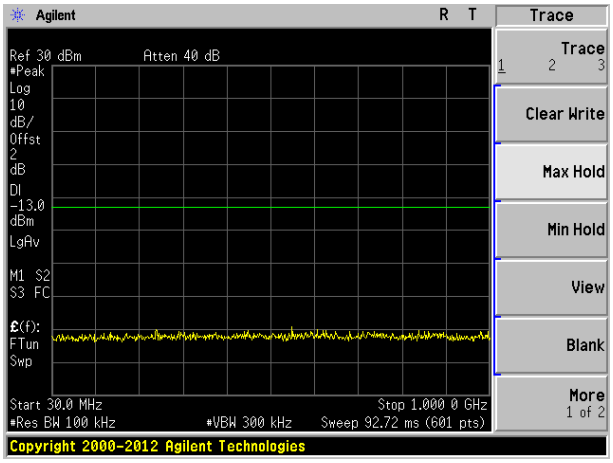


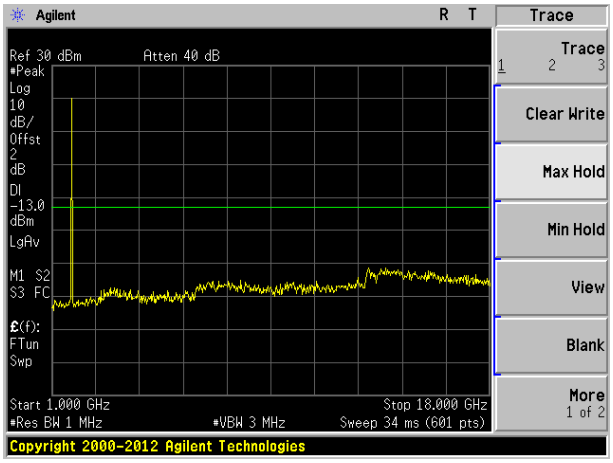
Lowest channel





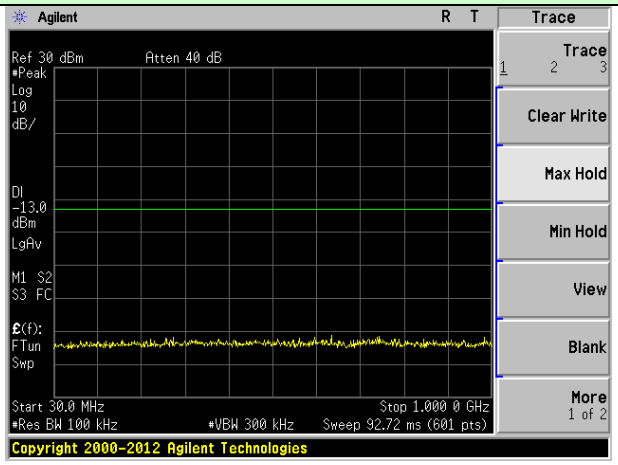
Middle channel

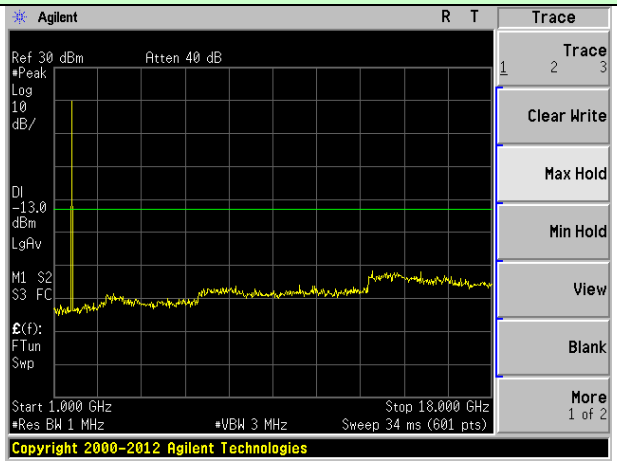




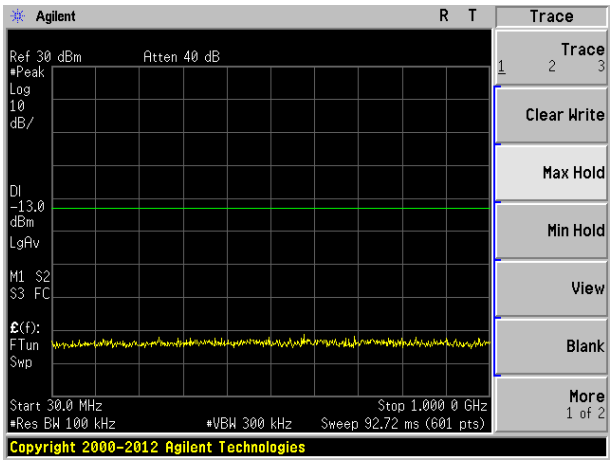
Highest channel

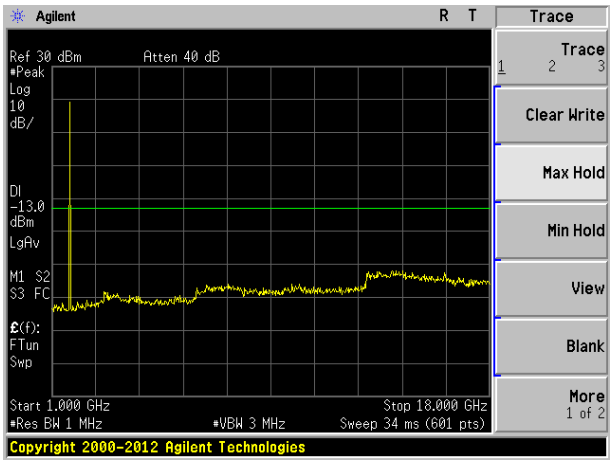
Test Mode: LTE Band 4	Channel Bandwidth: 3MHz



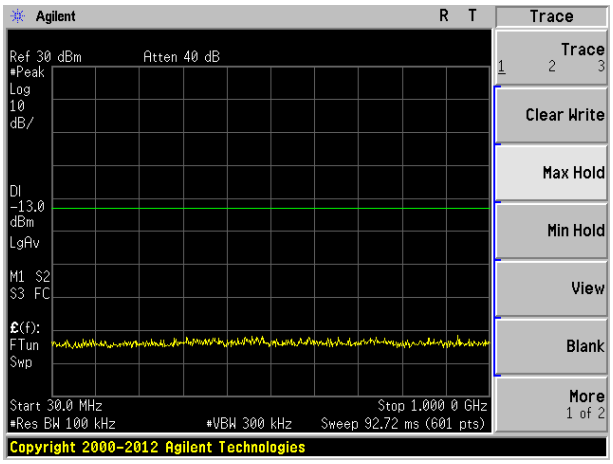


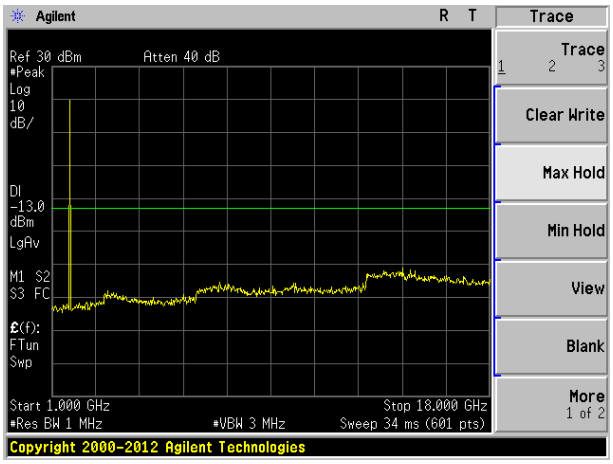
Lowest channel





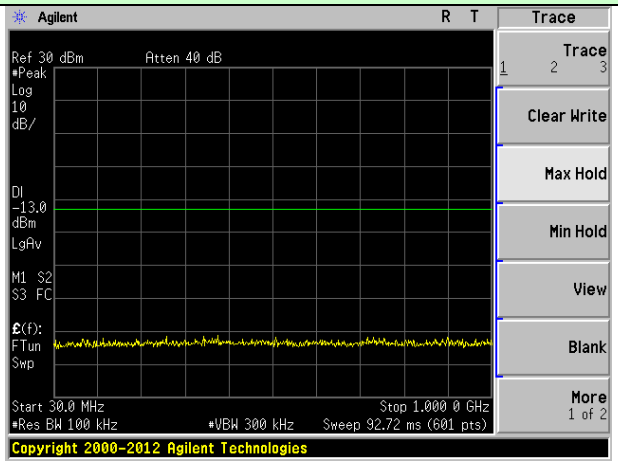
Middle channel

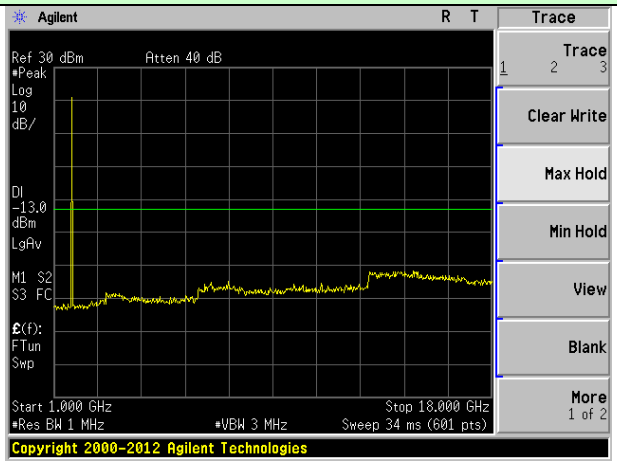




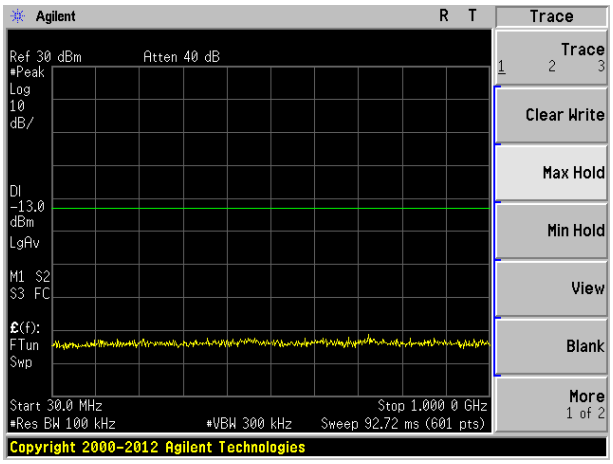
Highest channel

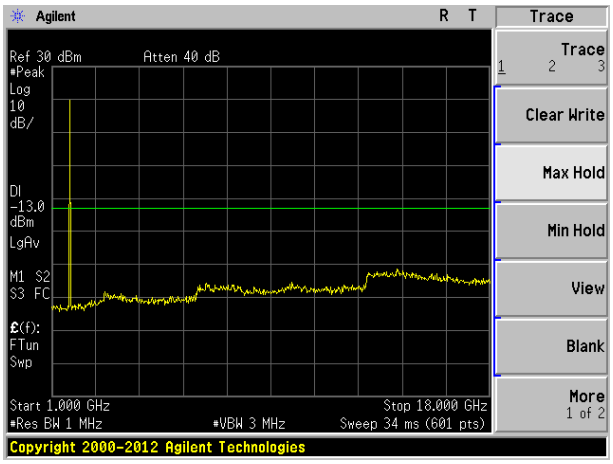
Test Mode: LTE Band 4	Channel Bandwidth: 5MHz



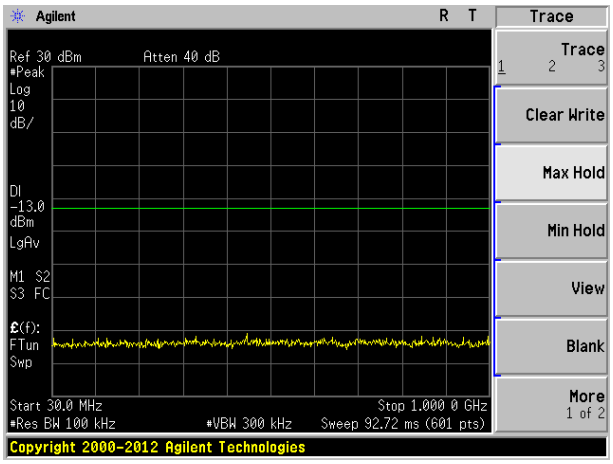


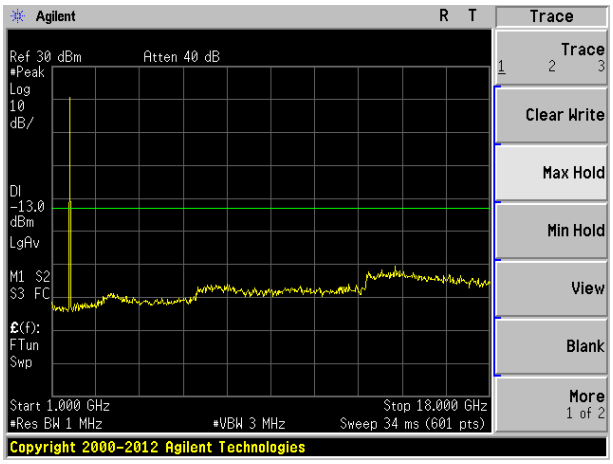
Lowest channel





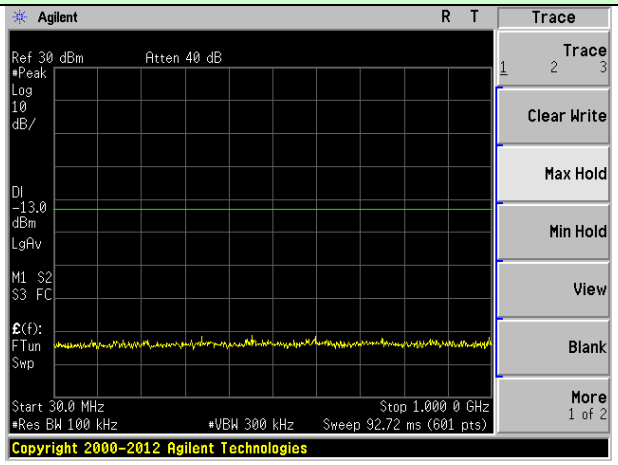
Middle channel

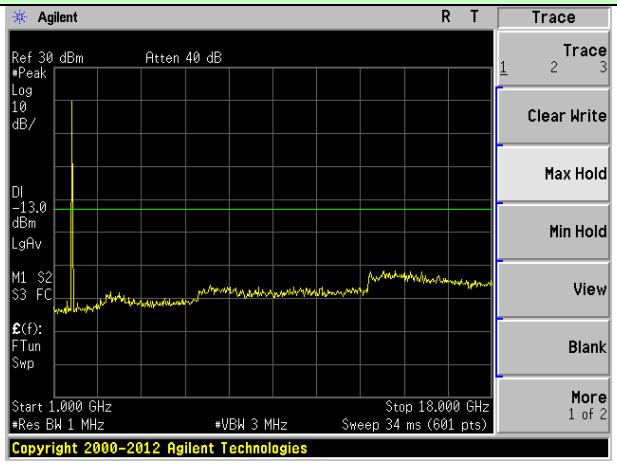




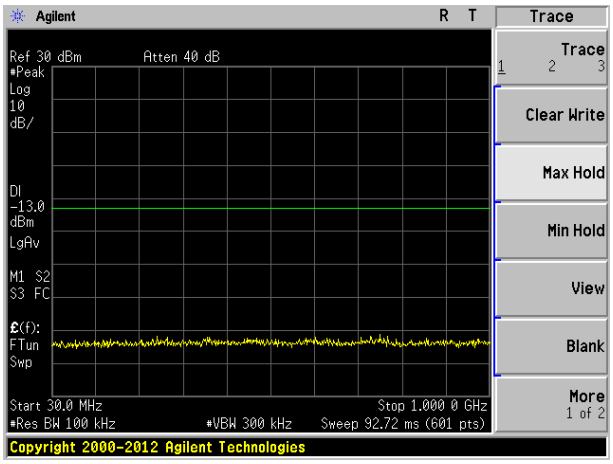
Highest channel

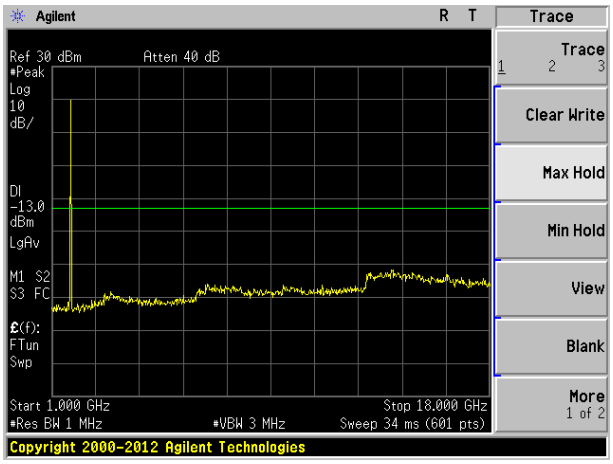
Test Mode: LTE Band 4	Channel Bandwidth: 10MHz



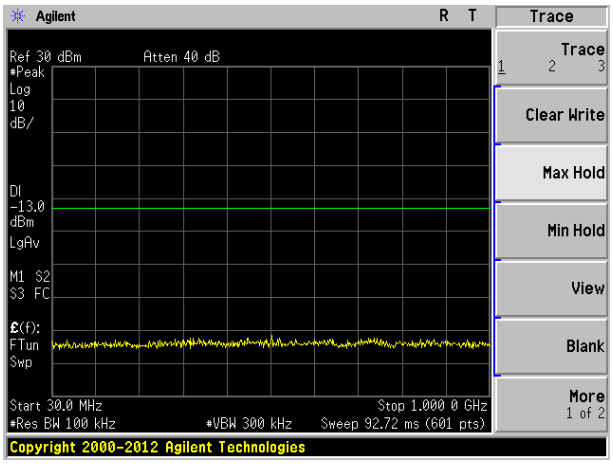


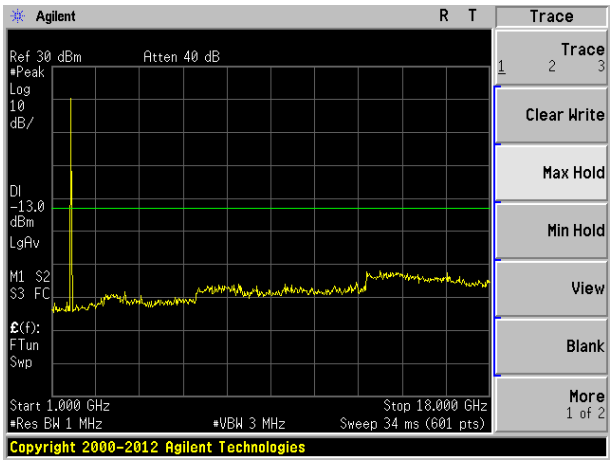
Lowest channel





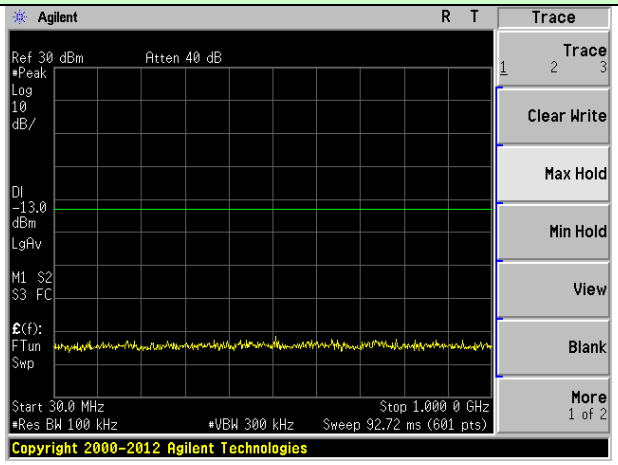
Middle channel

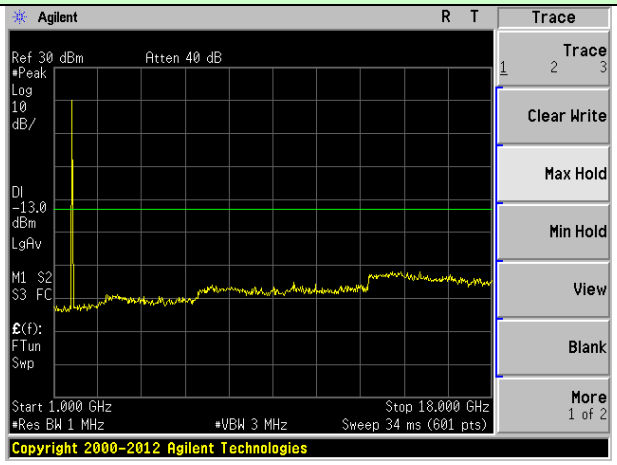




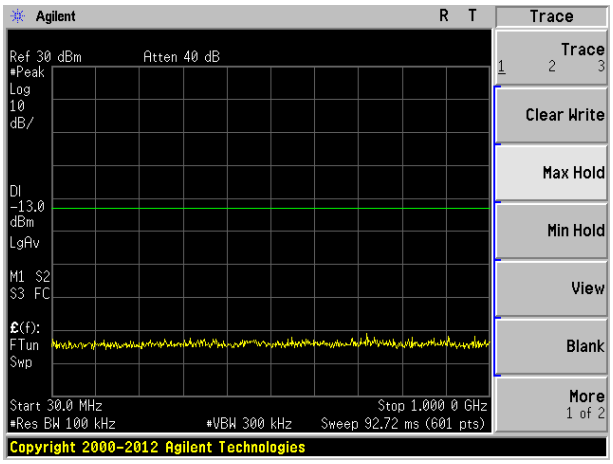
Highest channel

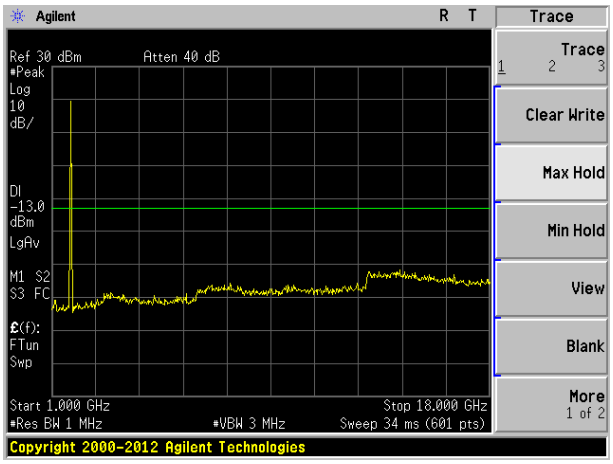
Test Mode: LTE Band 4	Channel Bandwidth: 15MHz



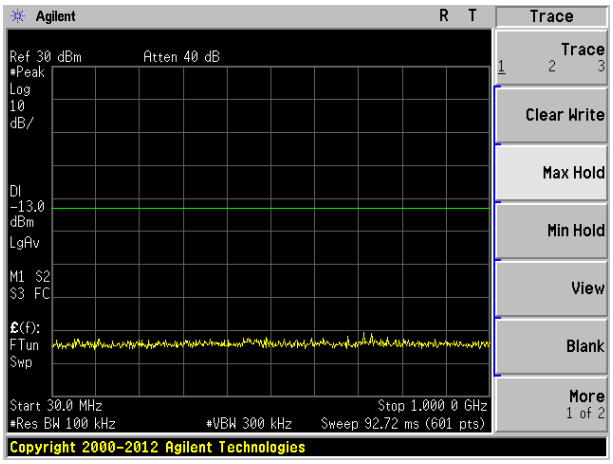


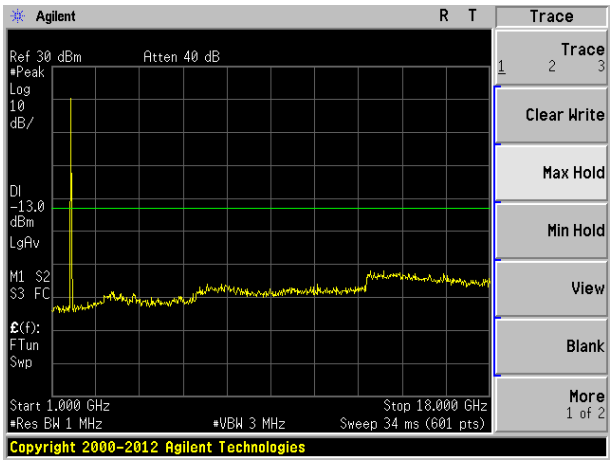
Lowest channel





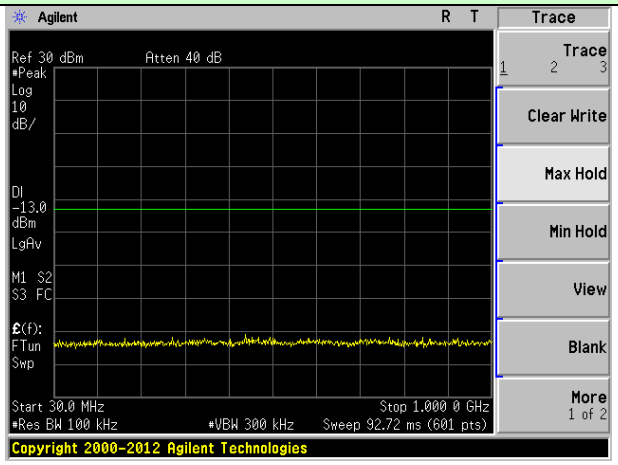
Middle channel

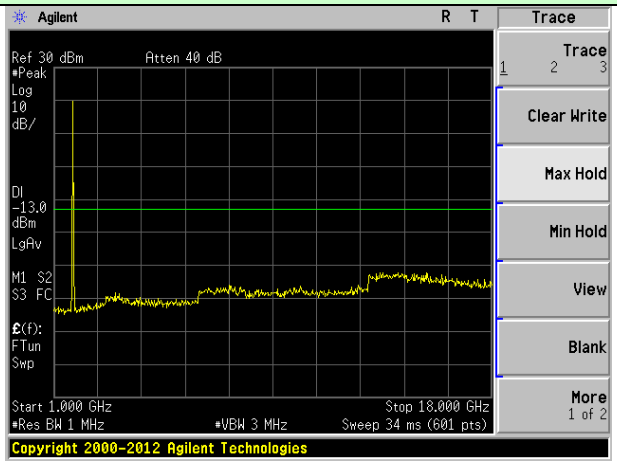




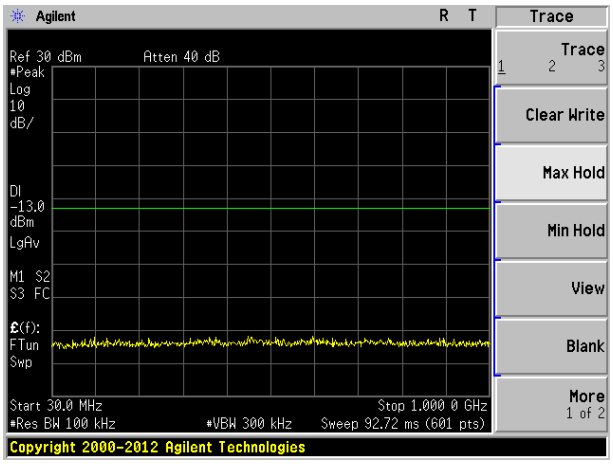
Highest channel

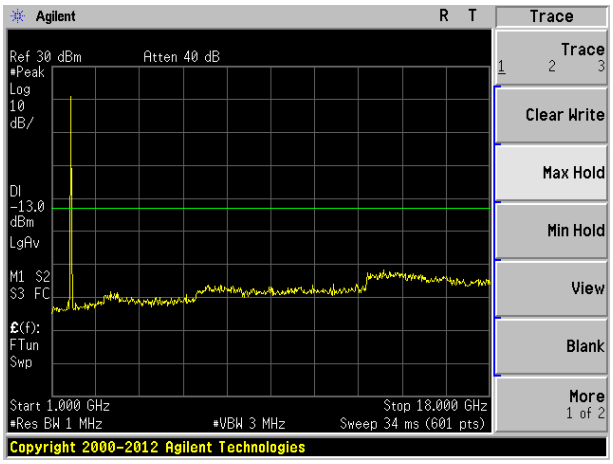
Test Mode: LTE Band 4	Channel Bandwidth: 20MHz



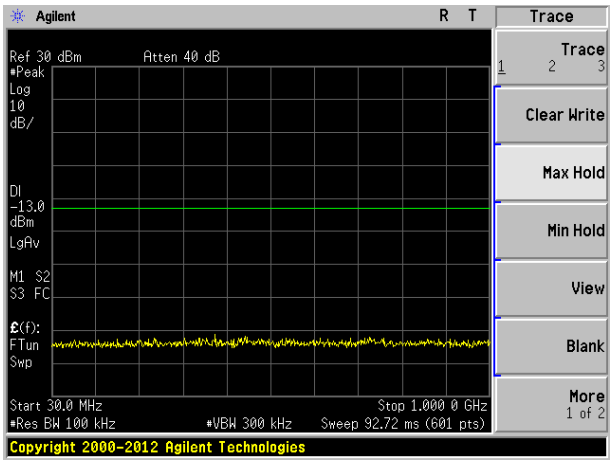


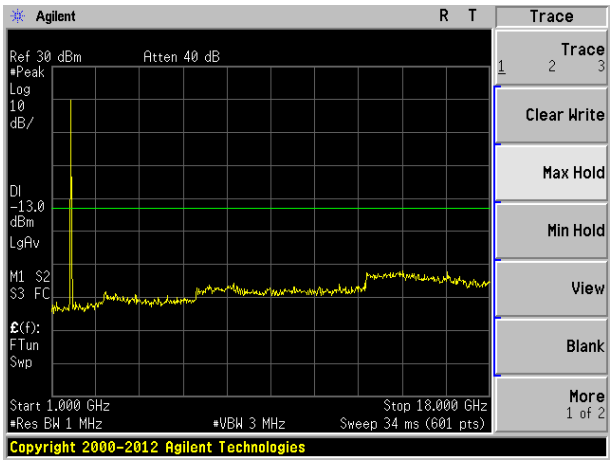
Lowest channel





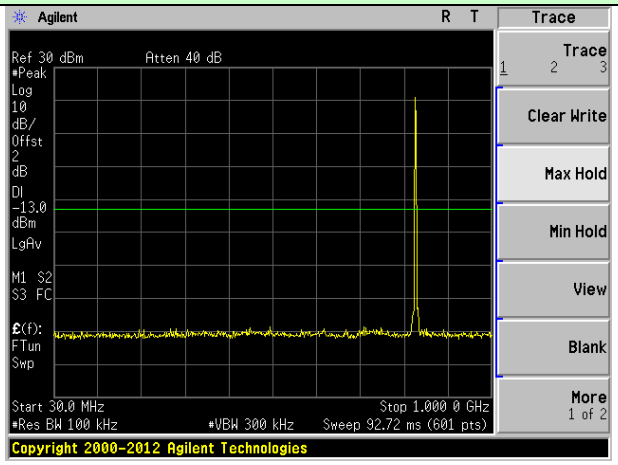
Middle channel

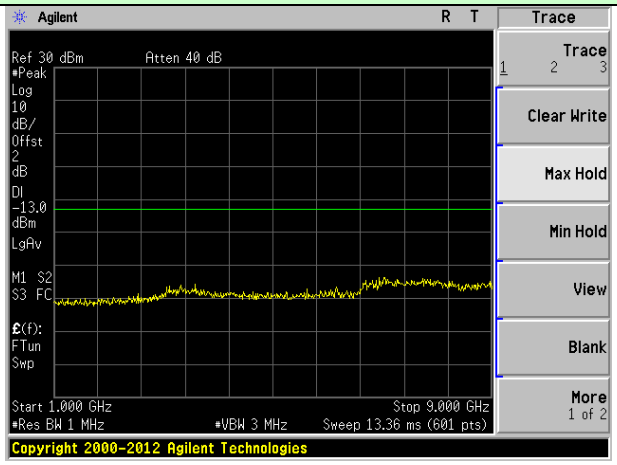




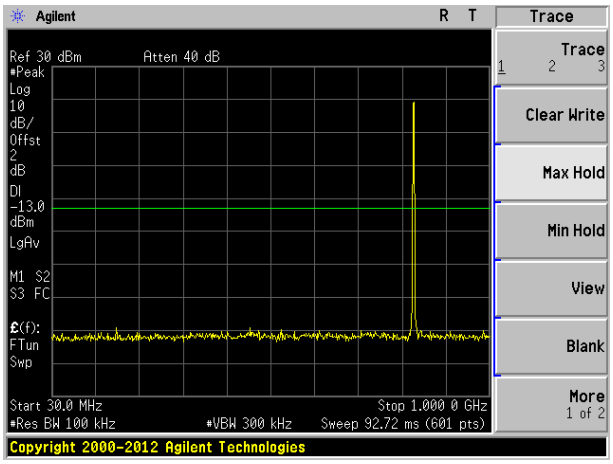
Highest channel

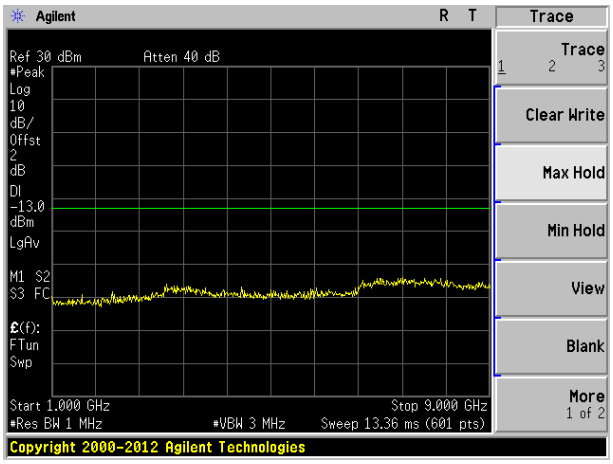
Test Mode: LTE Band 5	Channel Bandwidth: 1.4MHz



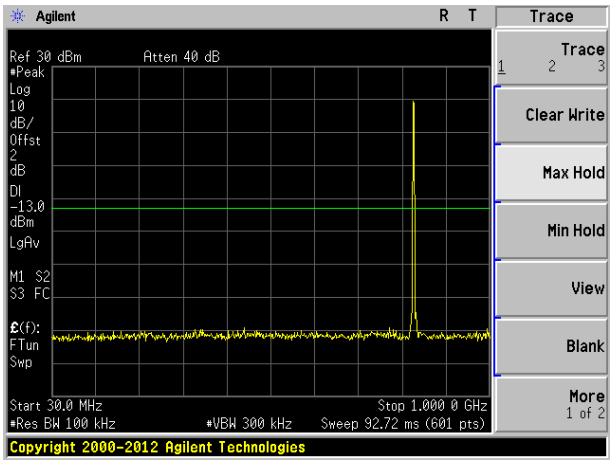


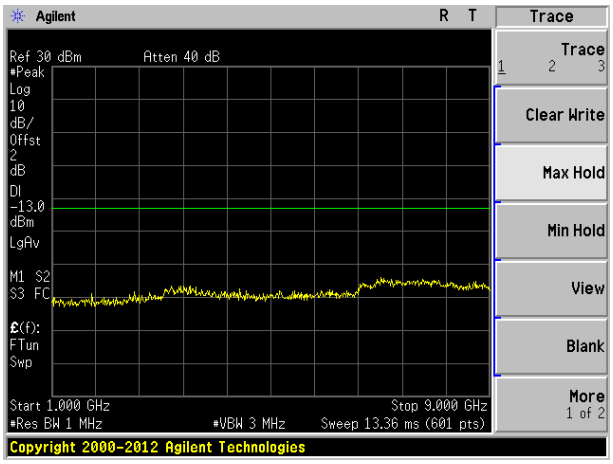
Lowest channel





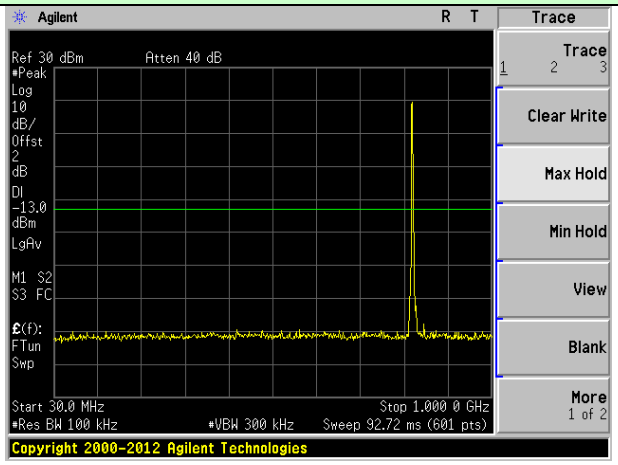
Middle channel

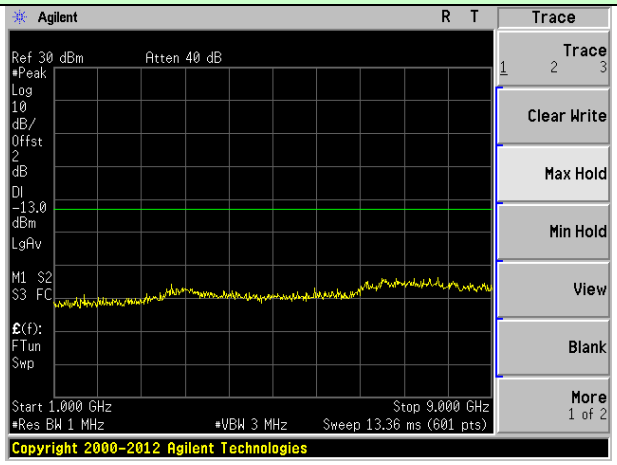




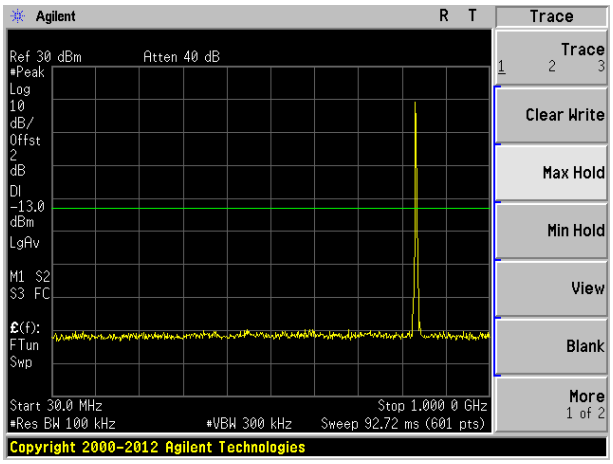
Highest channel

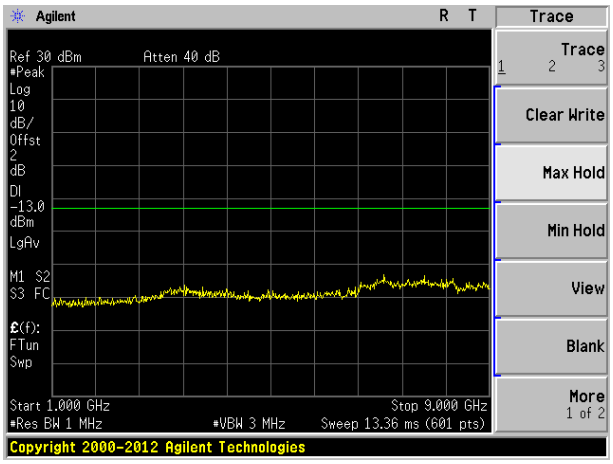
Test Mode: LTE Band 5	Channel Bandwidth: 3MHz



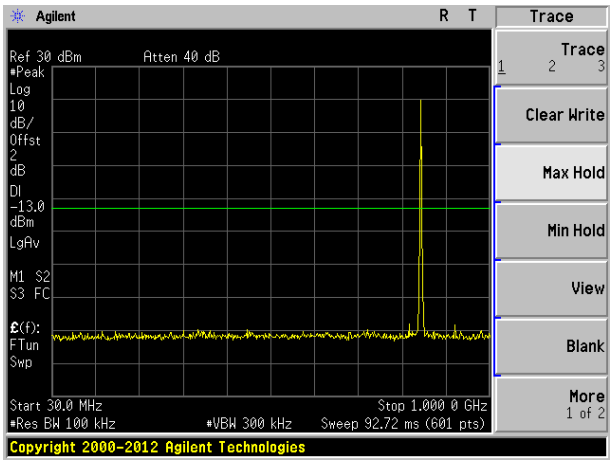


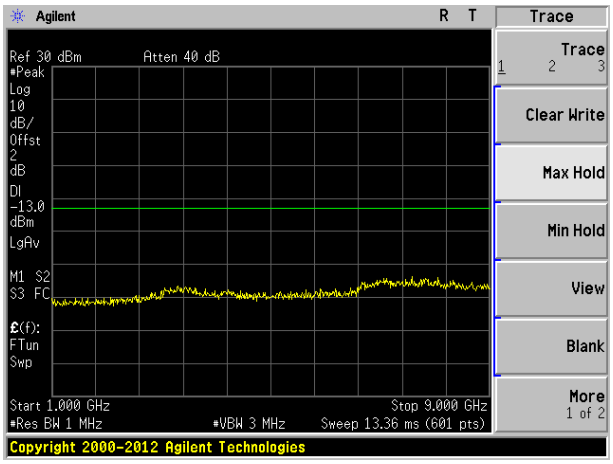
Lowest channel





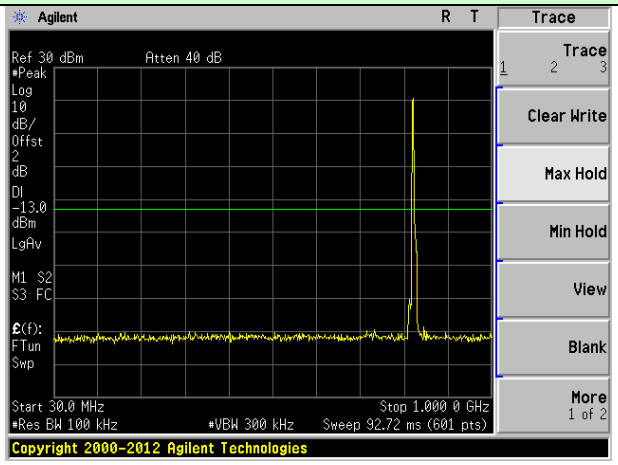
Middle channel

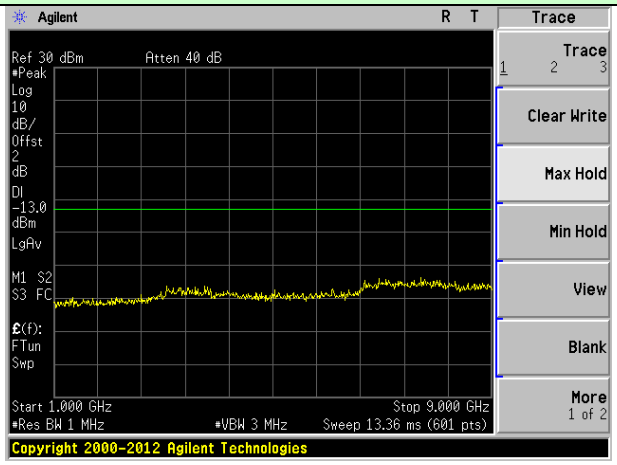




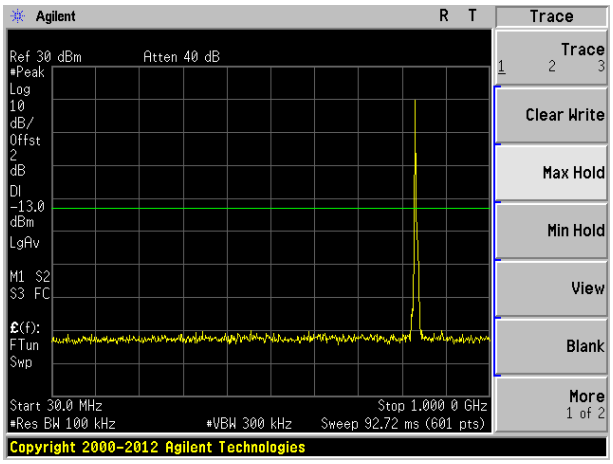
Highest channel

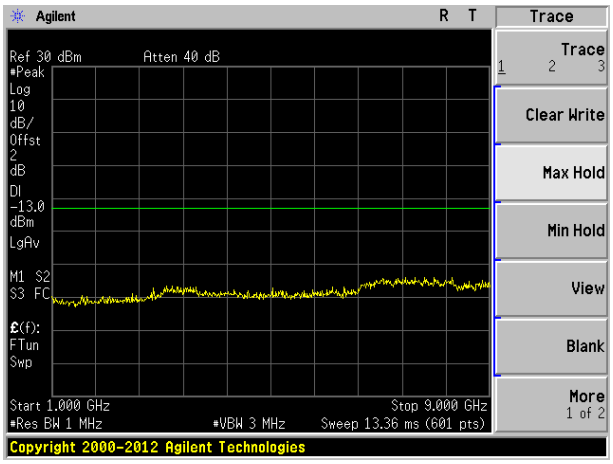
Test Mode: LTE Band 5	Channel Bandwidth: 5MHz



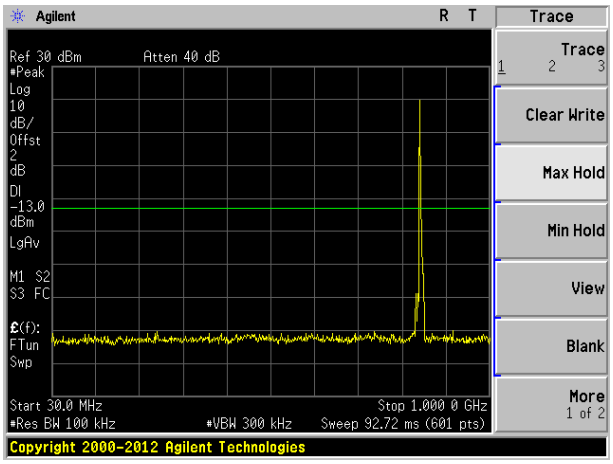


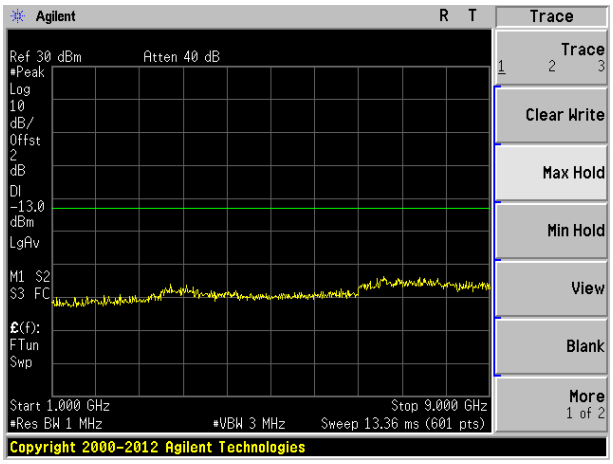
Lowest channel





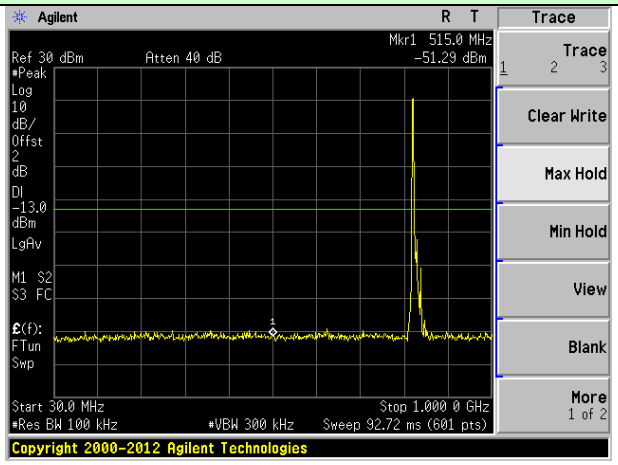
Middle channel

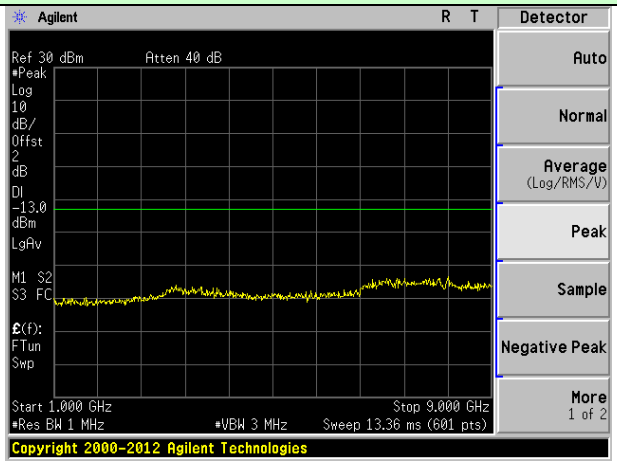




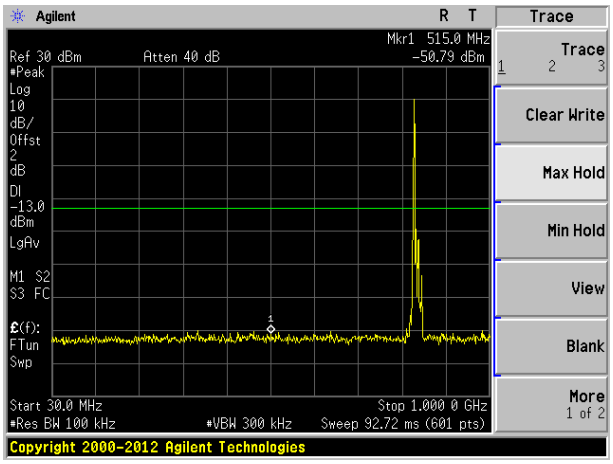
Highest channel

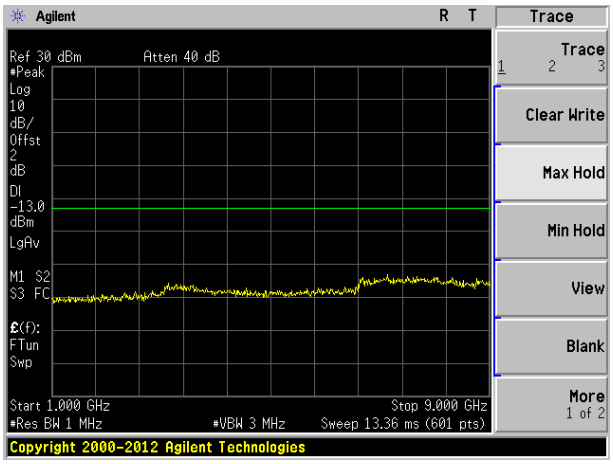
Test Mode: LTE Band 5	Channel Bandwidth: 10MHz



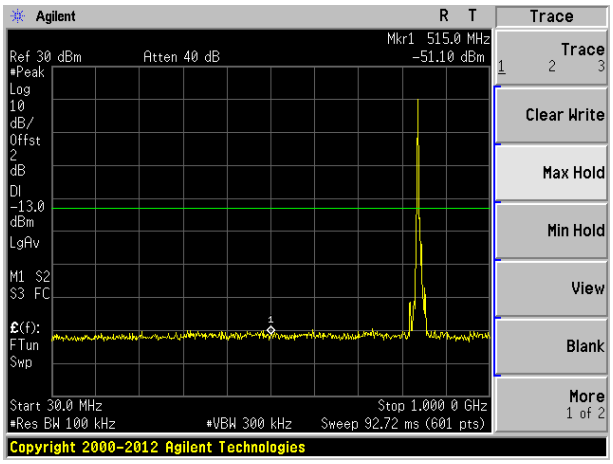


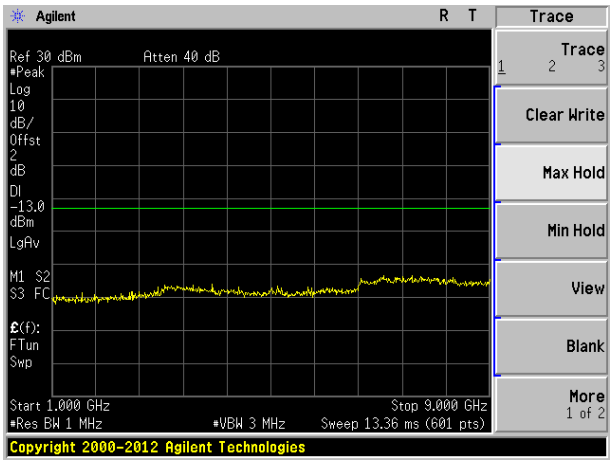
Lowest channel





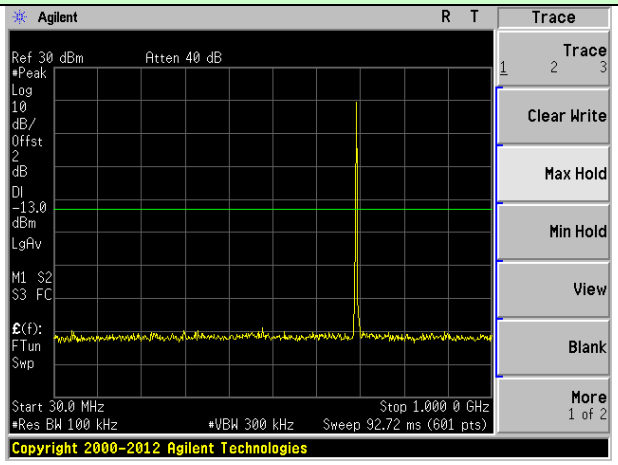
Middle channel

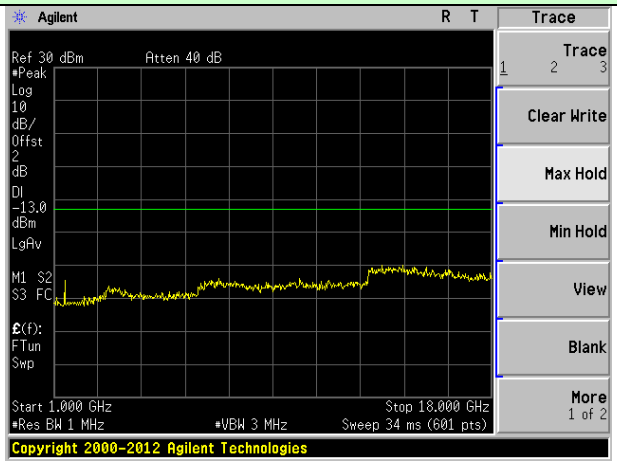




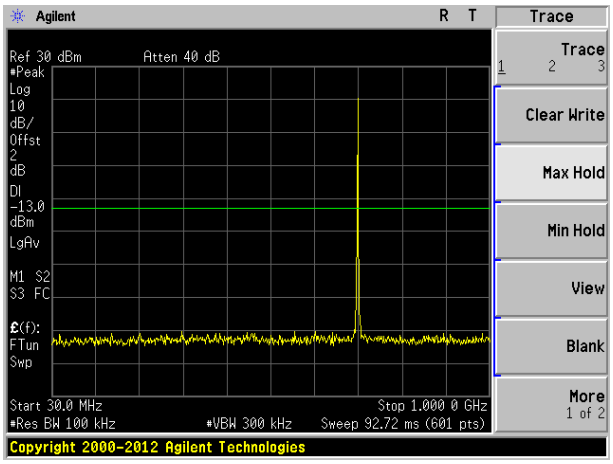
Highest channel

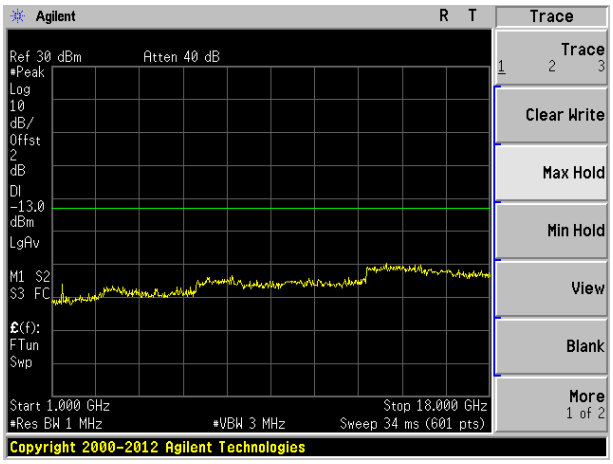
Test Mode: LTE Band 12	Channel Bandwidth: 1.4MHz



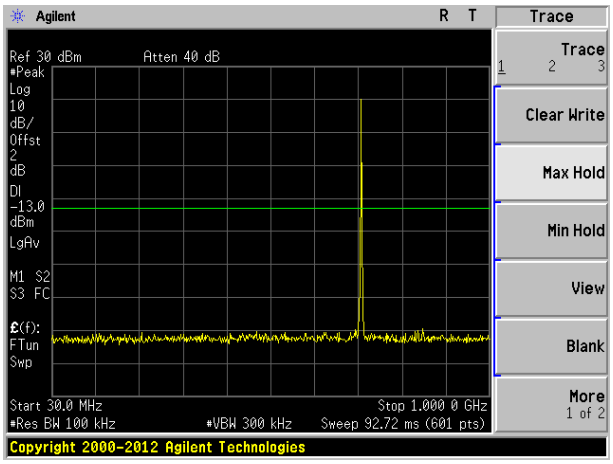


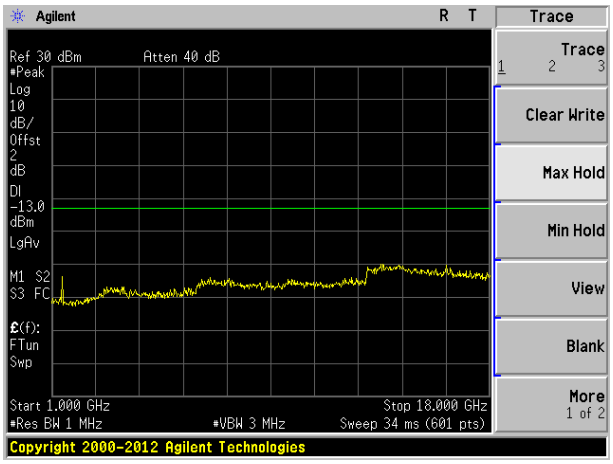
Lowest channel





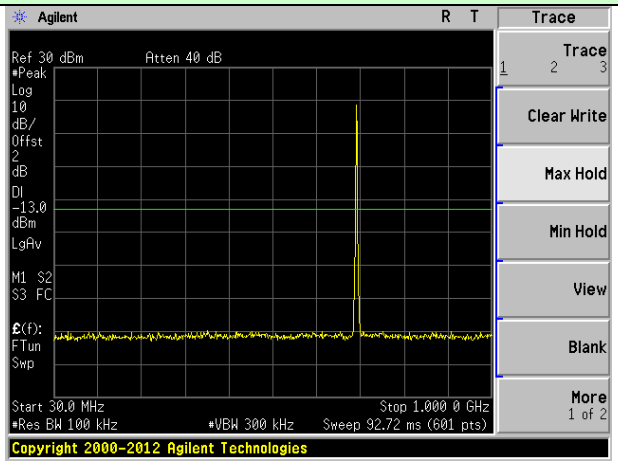
Middle channel

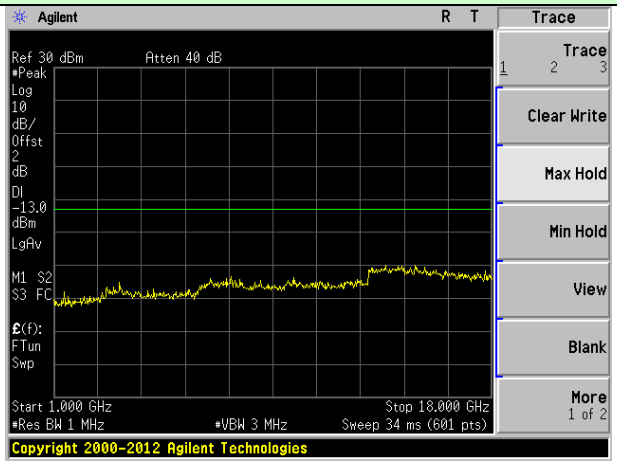




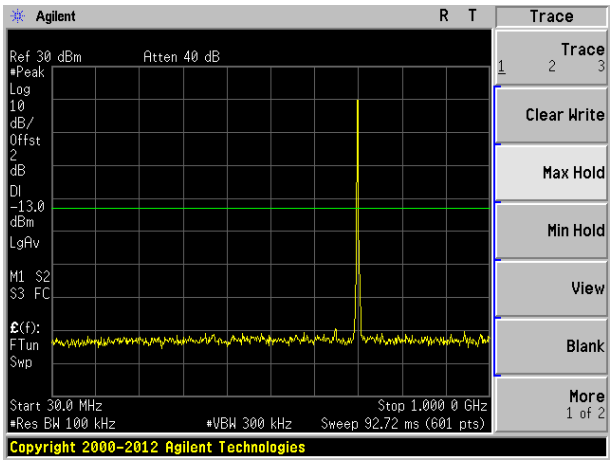
Highest channel

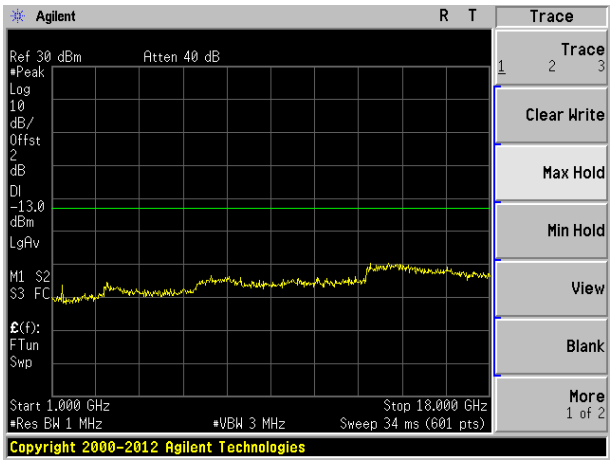
Test Mode: LTE Band 12	Channel Bandwidth: 3MHz



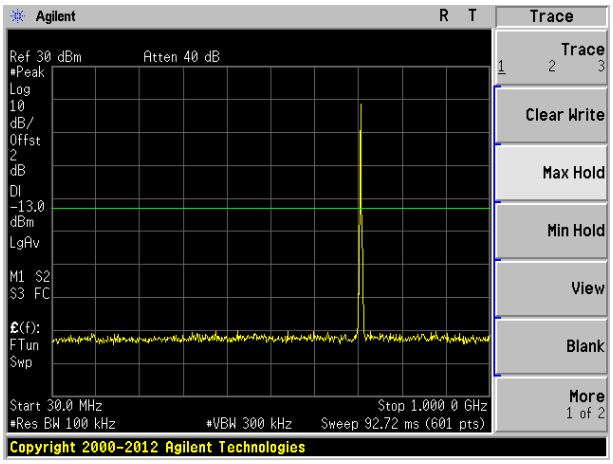


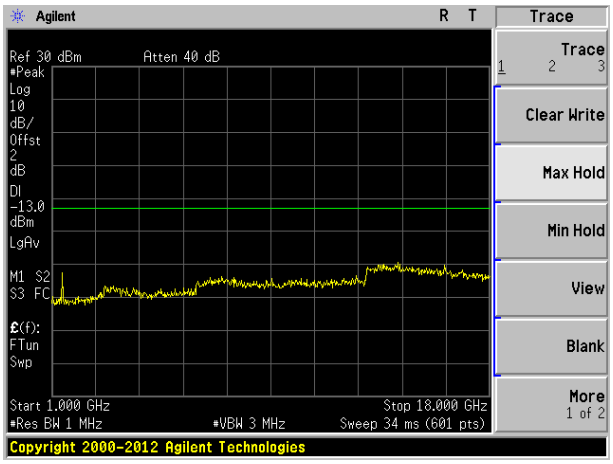
Lowest channel





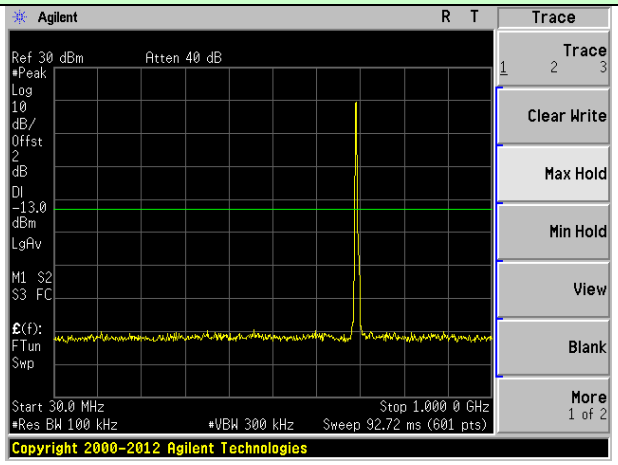
Middle channel

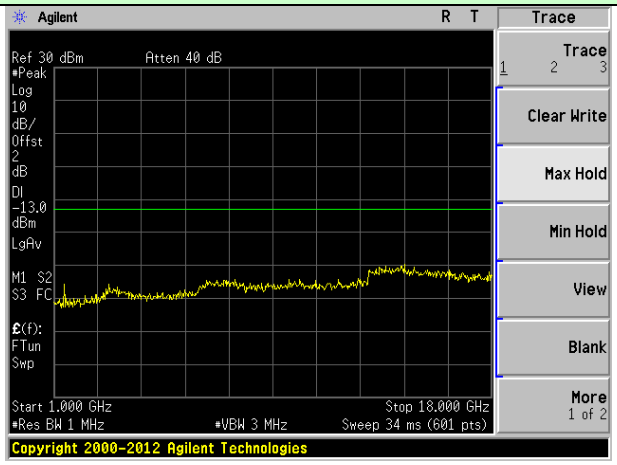




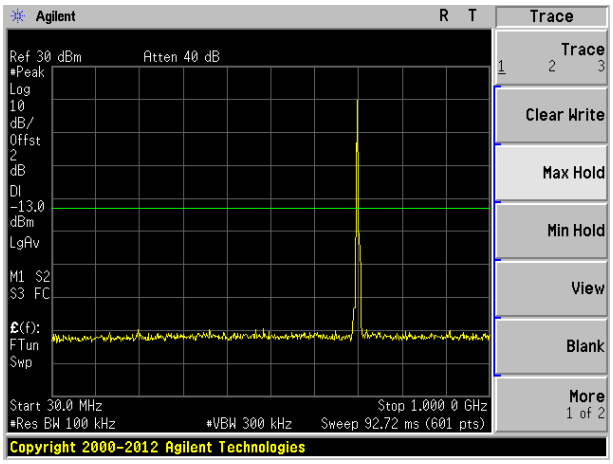
Highest channel

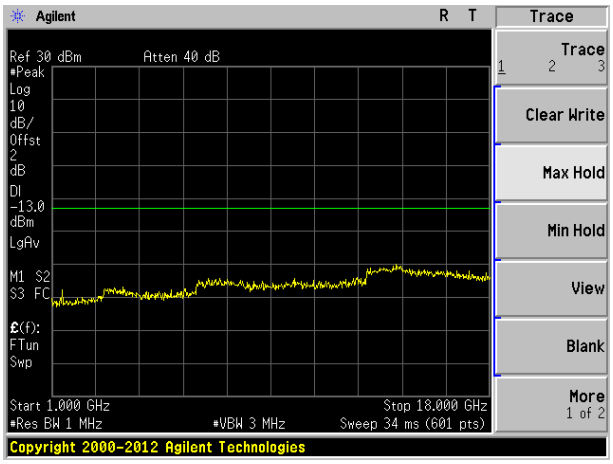
Test Mode: LTE Band 12	Channel Bandwidth: 5MHz



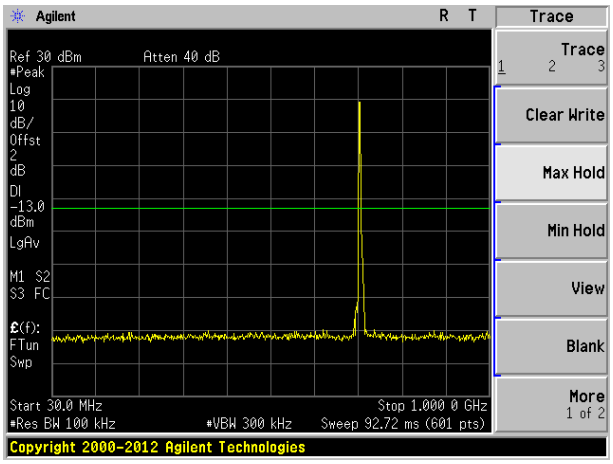


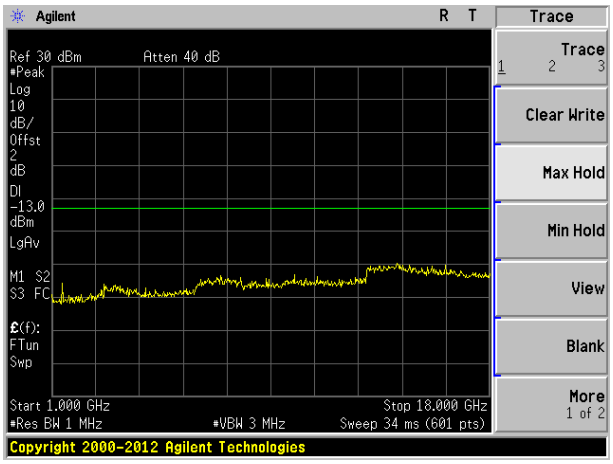
Lowest channel





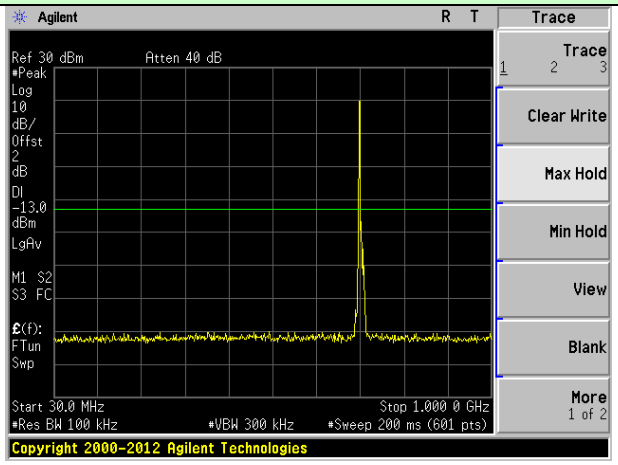
Middle channel

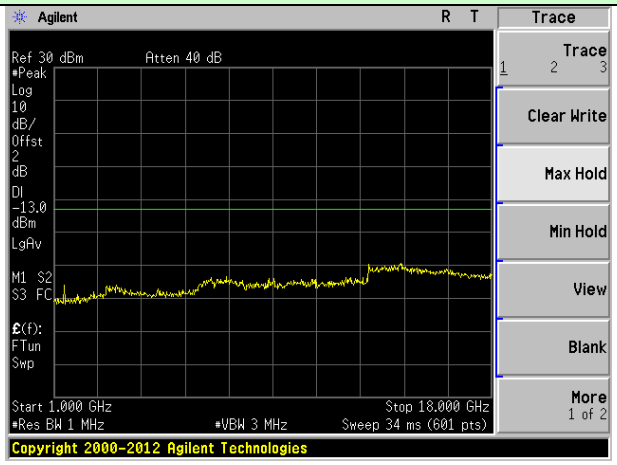




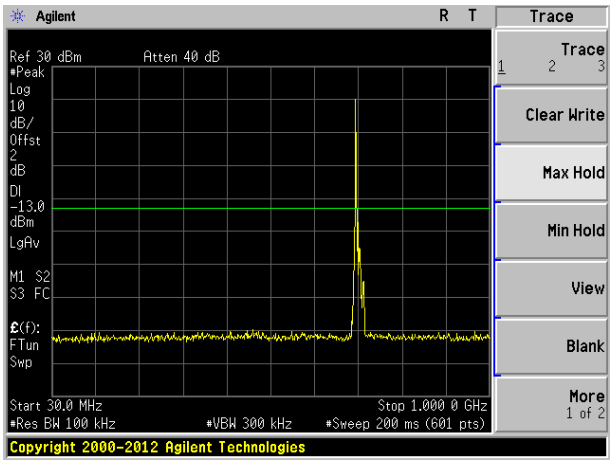
Highest channel

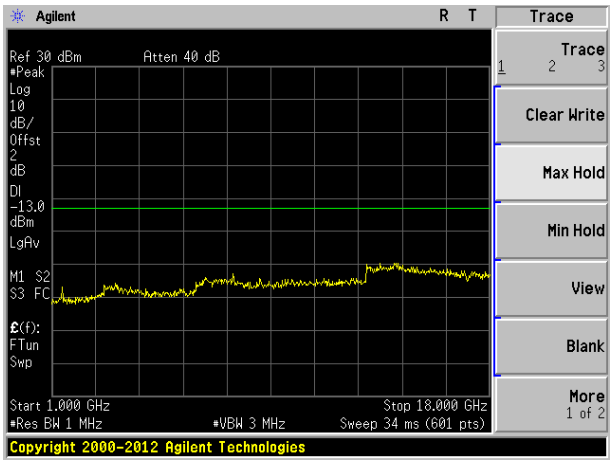
Test Mode: LTE Band 12	Channel Bandwidth: 10MHz



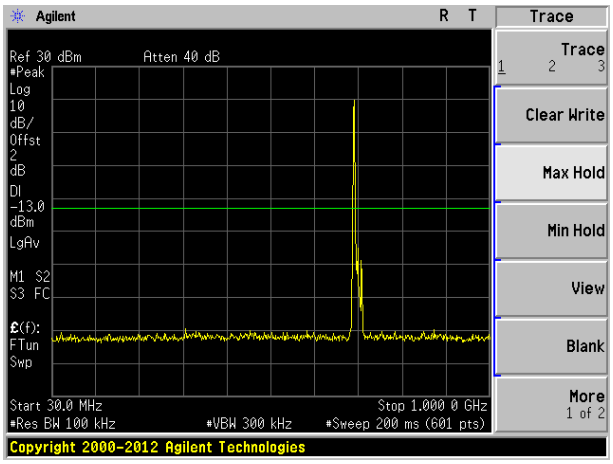


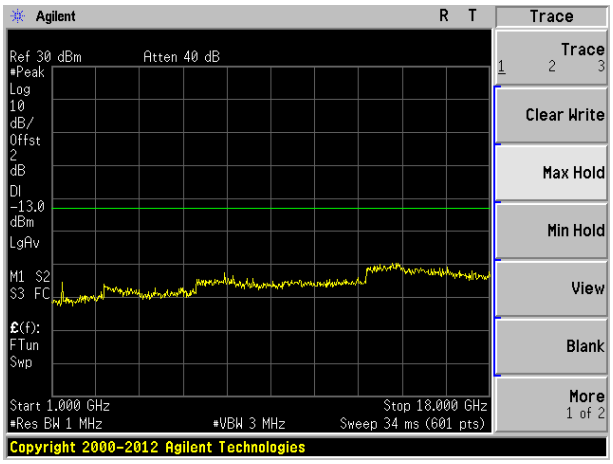
Lowest channel





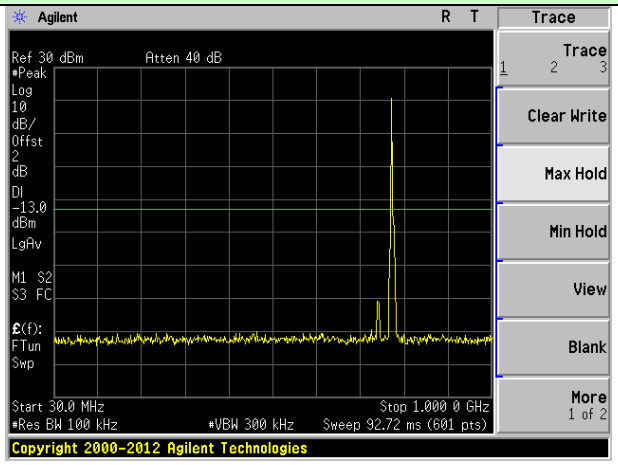
Middle channel

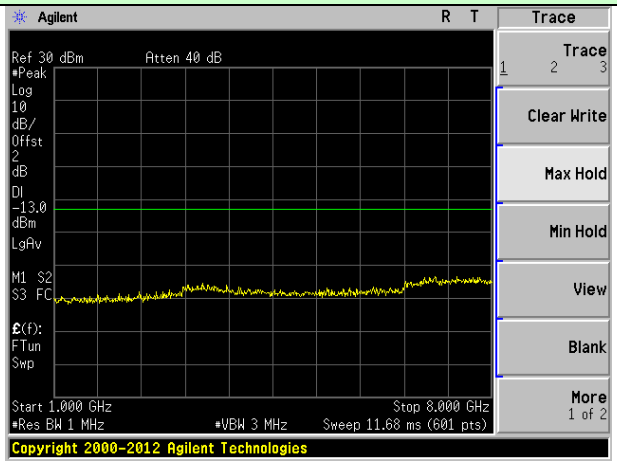




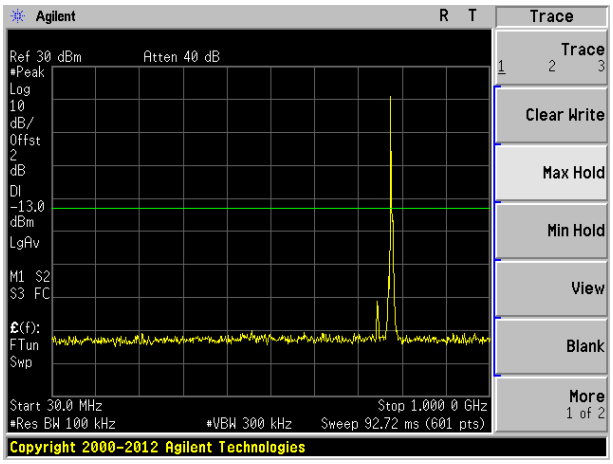
Highest channel

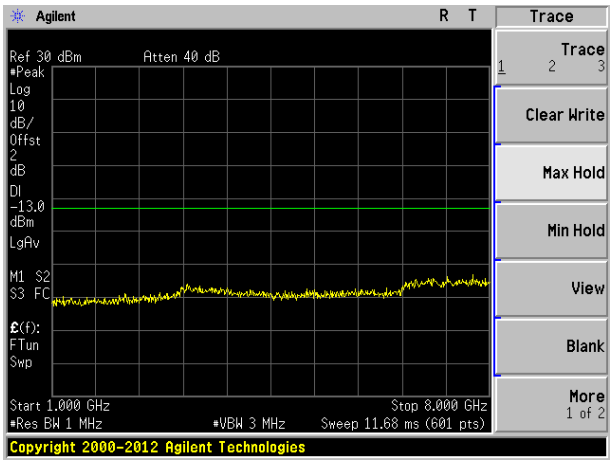
Test Mode: LTE Band 13	Channel Bandwidth: 5MHz



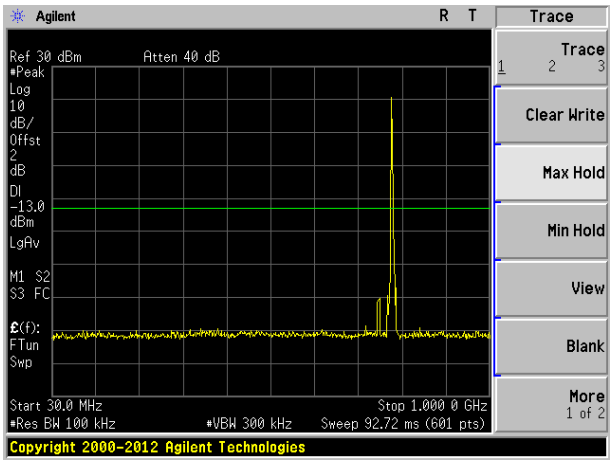


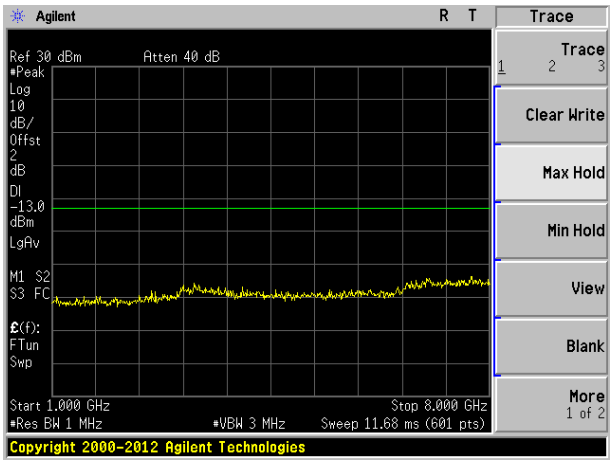
Lowest channel





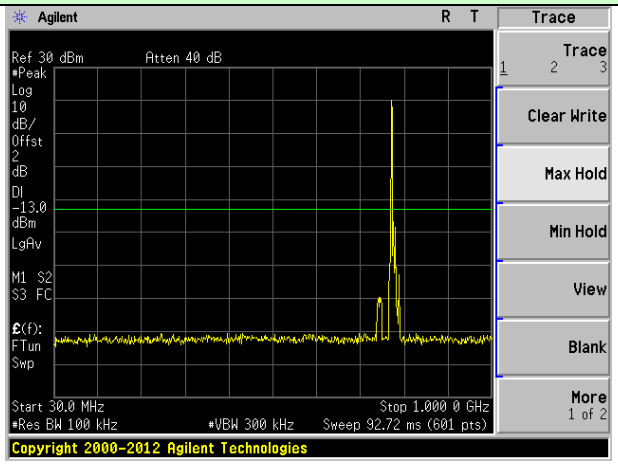
Middle channel

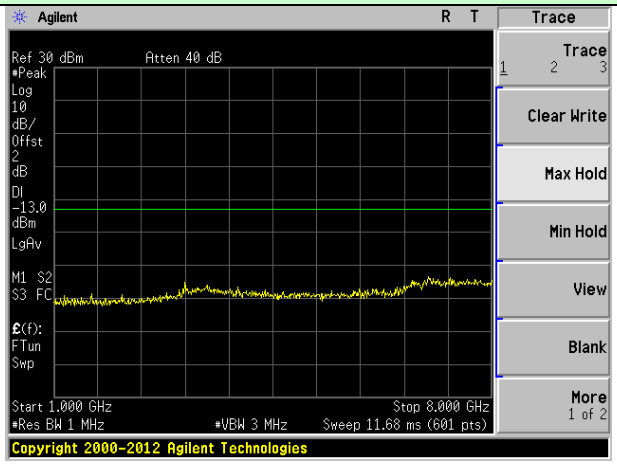




Highest channel

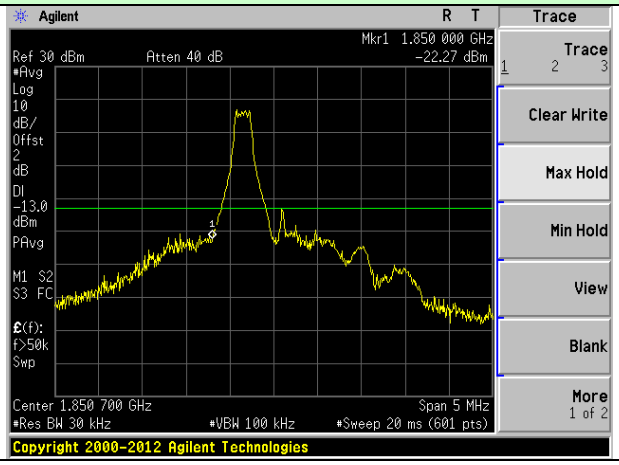
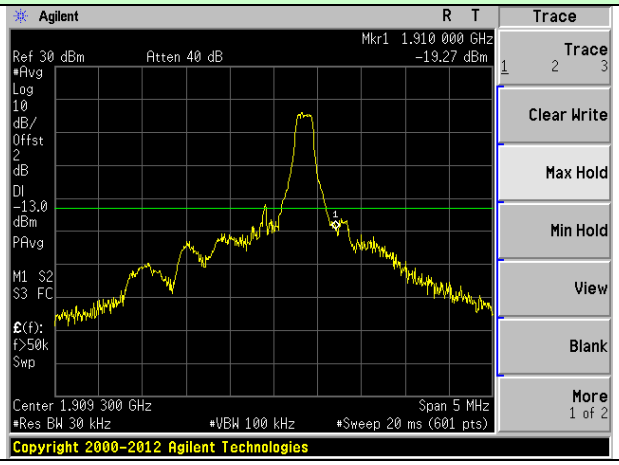
Test Mode: LTE Band 13	Channel Bandwidth: 10MHz

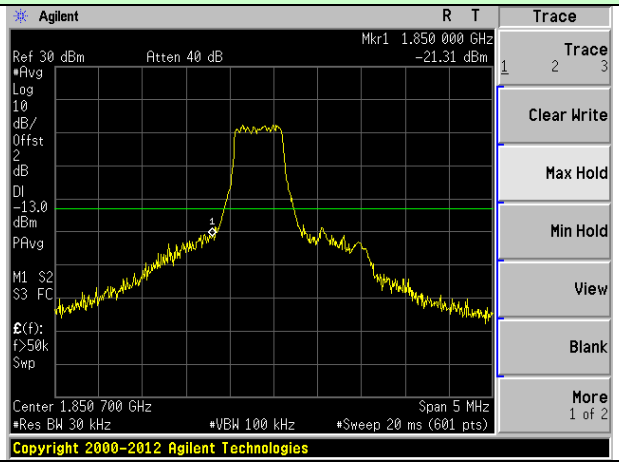
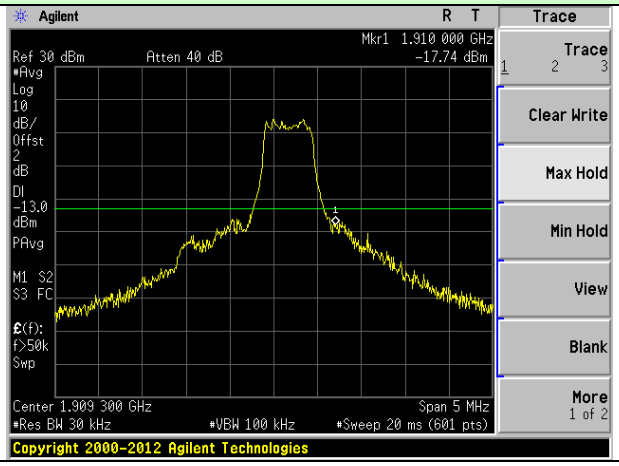


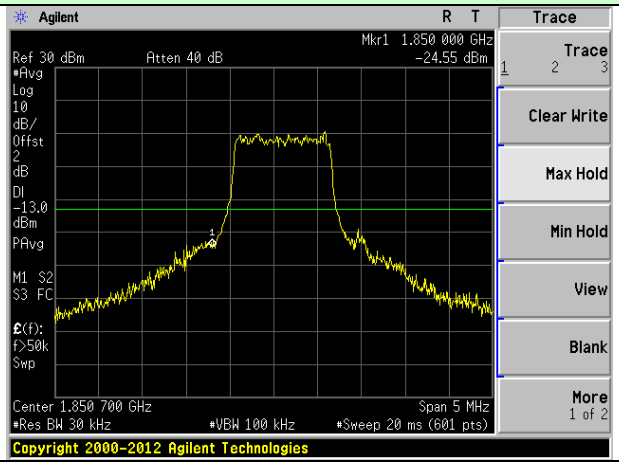
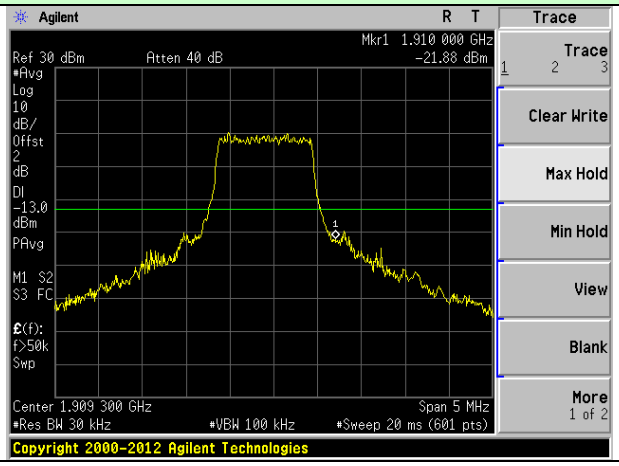


Band Edge:

QPSK mode:

1.4MHz Bandwidth (RB size:1# RB offset:0#)	1.4MHz Bandwidth (RB size:1# RB offset:5#)
	
Lowest channel	Highest channel

1.4MHz Bandwidth (RB size:3# RB offset:0#)	1.4MHz Bandwidth (RB size:3# RB offset:2#)
	
Lowest channel	Highest channel

1.4MHz Bandwidth (RB size:6# RB offset:0#)	1.4MHz Bandwidth (RB size:6# RB offset:0#)
	
Lowest channel	Highest channel