Spectrum Report (LTE)

FCC ID:	
Applicant:	Positioning Universal Inc
Address of Applicant:	4660 La Jolla Village Drive Suite 1100, San Diego, California 92122, United States
ISED:	
Applicant:	Positioning Universal
Address of Applicant:	4660 La Jolla Village Dr., Suite 1100 SAN DIEGO CA 92122 United States Of America
Manufacturer:	Positioning Universal Inc
Address of Manufacturer:	4660 La Jolla Village Drive Suite 1100, San Diego, California 92122, United States

Equipment Under Test (EUT)

Product Name:	Vehicle LTE CAT 1 Radio Telecommunications Unit
Model No.:	VCM550, DCM550
FCC ID:	2AHRH-DCD710LA
IC:	24008-DCD710LA
Applicable standards:	FCC CFR Title 47 Part 2 FCC CFR Title 47 Part 24 FCC CFR Title 47 Part 27 RSS-130 Issue 1, October 2013 RSS-132 Issue 3, January 2013 RSS-133 Issue 6, January 2018 RSS-139 Issue 3, July 2015
Date of sample receipt:	November 01, 2018
Date of Test:	November 01-12, 2018
Date of report issued:	November 12, 2018
Test Result :	PASS *

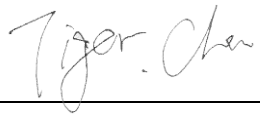
* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

1 Version

Version No.	Date	Description
00	*November 12, 2018*	*Original*

Prepared By:  ***Date:*** *November 12, 2018*

Project Engineer

Check By:  ***Date:*** *November 12, 2018*

Reviewer

2 Contents

Page

3 Test Summary

Test Item	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass* (Please refer to MPE 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.

Test Item	Section in RSS	Result
RF Exposure (SAR)	RSS-102	Pass* (Please refer to MPE Report)
Frequency Plan	RSS-130 Clause 4.2 RSS-133 Clause 6.1 RSS-139 Clause 6.1	Pass
Types of Modulation	RSS-130 Clause 4.2 RSS-133 Clause 6.1 RSS-139 Clause 6.1	Pass
Occupied Bandwidth	RSS-Gen Clause 6.6	Pass
Frequency Stability	RSS-130 Clause 4.2 RSS-133 Clause 6.1 RSS-139 Clause 6.1	Pass
Transmitter Output Power and Equivalent Isotropically Radiated Power	RSS-130 Clause 4.2 RSS-133 Clause 6.1 RSS-139 Clause 6.1	Pass
Peak-to-Average Power Ratio	RSS-130 Clause 4.2 RSS-133 Clause 6.1 RSS-139 Clause 6.1	Pass
Transmitter Unwanted Emissions	RSS-130 Clause 4.2 RSS-133 Clause 6.1 RSS-139 Clause 6.1	Pass
Field strength of spurious radiation measurement	RSS-Gen Clause 6.13	Pass

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

3.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

4 General Information

4.1 General Description of EUT

Product Name:	Vehicle LTE CAT 1 Radio Telecommunications Unit
Model No.:	VCM550, DCM550
Test Model No:	VCM550
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The only difference is the model name for commercial purpose.	
S/N:	0000064567
Tested Sample(s) ID:	GTS201811000009-01
Hardware Version:	DCD710-P2
Software Version:	6005.1.0.0
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 12V

4.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with Section Part 27 and Part 24 subpart E of the FCC CFR 47 Rules.
This submittal(s) (test report) is filing to comply with RSS-132, RSS-133, RSS-139, RSS-130, RSS-Gen of the IC Rules.

4.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA 603 and ANSI C63.4, FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

4.4 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 fully 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.

4.5 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

5 Test Instruments list

Radiated Emission:						
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	9.2(L)*6.2(W)* 6.4(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. 27 2018	June. 26 2019
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 27 2018	June. 26 2019
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 27 2018	June. 26 2019
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 27 2018	June. 26 2019
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 27 2018	June. 26 2019
9	Coaxial Cable	GTS	N/A	GTS211	June. 27 2018	June. 26 2019
10	Coaxial cable	GTS	N/A	GTS210	June. 27 2018	June. 26 2019
11	Coaxial Cable	GTS	N/A	GTS212	June. 27 2018	June. 26 2019
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 27 2018	June. 26 2019
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 27 2018	June. 26 2019
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 27 2018	June. 26 2019
15	Band filter	Amindeon	82346	GTS219	June. 27 2018	June. 26 2019
16	Power Meter	Anritsu	ML2495A	GTS540	June. 27 2018	June. 26 2019
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 27 2018	June. 26 2019
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 27 2018	June. 26 2019
19	Splitter	Agilent	11636B	GTS237	June. 27 2018	June. 26 2019
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 27 2018	June. 26 2019

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

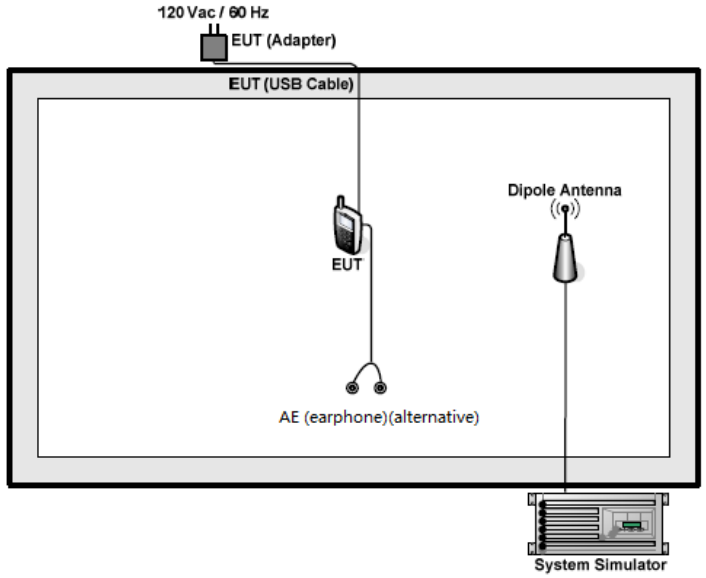
6 System test configuration

6.1 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

6.2 Configuration of Tested System



6.3 Frequency Plan

Frequency Plan for band 698MHz ~ 756MHz	
Frequency Plan (MHz)	**699-716**
Product Supported plan (Yes or No)	Y

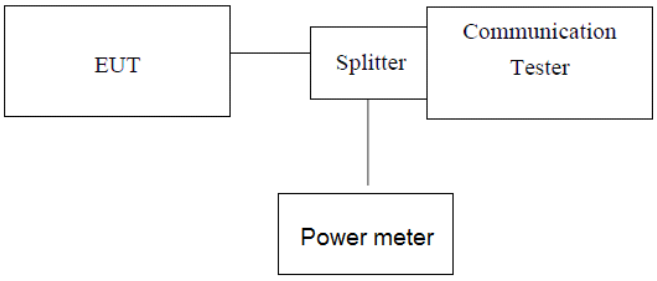
Frequency Plan for band 777MHz ~ 787MHz	
Frequency Plan (MHz)	**777-787**
Product Supported plan (Yes or No)	Y

Frequency Plan for band 824MHz ~ 849MHz				
Frequency Plan (MHz)	**824-835**	**835-845**	**845-846.5**	**846.5-849**
Product Supported plan (Yes or No)	Y	Y	Y	Y

Frequency Plan for band 1710MHz ~ 1755MHz			
Block	**Total Spectrum**	**Lower Sub-band**	**Product Supported plan (Yes or No)**
Block A	20 MHz	1710-1720 MHz	Y
Block B	20 MHz	1720-1730 MHz	Y
Block C	10 MHz	1730-1735 MHz	Y
Block D	10 MHz	1735-1740 MHz	Y
Block E	10 MHz	1740-1745 MHz	Y
Block F	20 MHz	1745-1755 MHz	Y
Block G	10 MHz	1755-1760 MHz	N
Block H	10 MHz	1760-1765 MHz	N
Block I	10 MHz	1765-1775 MHz	N
Block J1	10 MHz	1770-1775 MHz	N
Block J2	10 MHz	1775-1780 MHz	N

Frequency Plan for band 1850MHz ~ 1915MHz			
Block	**Total Spectrum**	**Lower Sub-band**	**Product Supported plan (Yes or No)**
Block A	30 MHz	1850-1865 MHz	Y
Block D*	10 MHz	1865-1870 MHz	Y
Block B1	10 MHz	1870-1875 MHz	Y
Block B2*	10 MHz	1875-1880 MHz	Y
Block B3*	10 MHz	1880-1885 MHz	Y
Block E*	10 MHz	1885-1890 MHz	Y
Block F	10 MHz	1890-1895 MHz	Y
Block C1*	10 MHz	1895-1900 MHz	Y
Block C2*	10 MHz	1900-1905 MHz	Y
Block C3*	10 MHz	1905-1910 MHz	Y
Block G	10 MHz	1910-1915 MHz	N
Note: * The usage of these blocks in certain geographic areas is under policies listed in SRSP-510 sections 3.1.3, 3.1.4, 3.1.5 and 3.1.15.			

6.4 Conducted Average Output Power

Test Requirement for FCC:	Part 24.232 (c); Part 27.50(c)(10)/(d)(4)
Test Requirement for IC:	RSS-130 Clause 4.4, RSS-132 Clause 5.4, RSS-133 Clause 6.4, RSS-139 Clause 6.5
Limit for FCC:	LTE Band 2: 2W LTE Band 4: 1W LTE Band 5: 7W LTE Band 12: 3W LTE Band 13: 3W
Limit for IC:	LTE Band 2: 2W LTE Band 4: 1W LTE Band 5: 11.5W LTE Band 12: 5W LTE Band 13: 5W
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 5.0 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	21.47	21.16	22.44
		1	2	21.22	22.87	22.23
		1	5	21.96	21.98	22.81
		3	0	22.81	22.06	21.64
		3	1	22.09	**22.92**	22.71
		3	2	22.92	21.87	21.12
		6	0	21.14	21.18	21.84
	16QAM	1	0	21.05	22.36	22.84
		1	2	22.13	22.75	21.36
		1	5	22.80	22.23	22.65
		3	0	22.68	21.18	22.55
		3	1	22.19	22.69	22.42
		3	2	21.60	21.46	21.99
		6	0	21.75	21.21	21.12
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	21.72	22.09	21.63
		1	8	21.49	22.78	21.38
		1	14	22.46	21.28	22.21
		8	0	22.90	22.79	22.90
		8	4	21.22	21.69	21.81
		8	7	21.00	22.64	21.25
		15	0	22.16	21.96	21.79
	16QAM	1	0	22.23	21.38	22.89
		1	8	22.80	21.61	22.06
		1	14	21.51	21.79	22.81
		8	0	22.05	21.42	21.17
		8	4	22.75	22.41	22.61
		8	7	21.29	21.40	22.29
		15	0	22.02	**22.94**	22.35

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	21.37	22.23	21.94
		1	13	21.94	22.71	21.22
		1	24	**22.98**	22.11	22.23
		12	0	21.28	21.45	22.35
		12	6	21.49	21.41	22.91
		12	13	22.35	22.97	22.24
		25	0	22.90	22.74	22.34
	16QAM	1	0	21.02	22.48	21.54
		1	13	21.84	22.20	22.06
		1	24	22.47	22.48	22.83
		12	0	21.35	21.83	22.06
		12	6	22.73	21.62	22.33
		12	13	21.50	21.55	21.11
		25	0	22.76	21.92	21.08
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	22.63	22.67	21.66
		1	25	21.52	22.77	22.27
		1	49	22.81	22.13	21.81
		25	0	21.61	22.01	22.60
		25	13	22.46	22.52	22.26
		25	25	22.20	22.21	21.74
		50	0	22.63	22.21	22.67
	16QAM	1	0	21.21	22.14	22.75
		1	25	21.89	22.24	22.86
		1	49	21.55	21.92	21.08
		25	0	**22.93**	21.17	22.42
		25	13	22.14	21.69	22.22
		25	25	22.66	21.41	22.50
		50	0	22.11	21.82	22.32

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	22.86	21.59	21.21
		1	38	22.65	22.88	22.58
		1	74	22.57	21.21	21.51
		36	0	21.32	21.71	21.03
		36	18	21.88	21.21	21.11
		36	39	22.67	21.15	21.58
		75	0	22.29	22.79	22.65
	16QAM	1	0	**23.00**	22.87	21.21
		1	38	21.42	21.17	22.35
		1	74	22.99	21.77	21.72
		36	0	21.46	21.19	22.09
		36	18	22.95	22.53	22.95
		36	39	21.41	21.05	21.44
		75	0	22.13	22.74	22.05
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	21.96	22.08	22.03
		1	50	22.57	22.21	21.00
		1	99	22.38	21.92	21.30
		50	0	21.87	21.34	21.30
		50	25	22.57	**22.99**	21.11
		50	50	21.96	22.28	22.79
		100	0	22.54	22.23	21.15
	16QAM	1	0	21.96	22.93	21.16
		1	50	21.17	22.47	21.13
		1	99	21.43	21.93	22.69
		50	0	21.13	21.42	21.78
		50	25	21.39	21.54	21.02
		50	50	22.82	21.88	22.29
		100	0	21.71	22.81	21.89

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	22.84	21.47	22.69
		1	2	22.64	22.21	21.14
		1	5	21.58	22.40	21.93
		3	0	21.23	21.21	22.40
		3	1	22.07	22.64	21.36
		3	2	21.35	22.39	22.72
		6	0	21.19	22.64	22.29
	16QAM	1	0	21.60	22.81	21.10
		1	2	22.73	22.94	21.57
		1	5	22.76	22.07	22.11
		3	0	22.17	22.43	22.41
		3	1	21.58	22.43	21.99
		3	2	22.92	22.40	**22.98**
		6	0	21.01	22.73	22.23
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	21.22	21.60	22.78
		1	8	22.22	21.27	21.28
		1	14	22.31	22.69	21.43
		8	0	21.71	21.53	21.70
		8	4	22.27	21.66	21.39
		8	7	21.72	22.29	21.67
		15	0	22.44	22.22	21.39
	16QAM	1	0	21.28	22.78	21.62
		1	8	21.56	21.96	22.33
		1	14	22.70	21.64	22.06
		8	0	21.94	22.18	22.09
		8	4	22.34	22.24	22.80
		8	7	21.11	**22.99**	21.03
		15	0	22.10	22.79	21.76

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	22.83	22.62	21.16
		1	13	21.42	22.66	21.81
		1	24	22.15	22.08	21.55
		12	0	21.64	21.07	22.12
		12	6	21.04	22.11	22.59
		12	13	21.03	21.04	22.78
		25	0	21.73	22.32	21.15
	16QAM	1	0	21.58	22.12	22.18
		1	13	21.33	22.70	21.67
		1	24	21.35	21.55	**22.96**
		12	0	22.78	22.63	21.59
		12	6	22.83	21.72	22.68
		12	13	21.13	22.65	21.78
		25	0	22.17	22.39	21.39
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	22.53	21.71	22.91
		1	25	22.57	22.12	21.53
		1	49	22.84	22.32	21.52
		25	0	22.61	22.57	21.46
		25	13	22.35	22.03	21.93
		25	25	22.56	22.03	22.83
		50	0	21.51	22.39	21.57
	16QAM	1	0	22.50	22.64	21.95
		1	25	22.78	22.93	21.97
		1	49	21.73	**22.94**	21.67
		25	0	21.40	22.82	22.08
		25	13	22.07	22.21	22.67
		25	25	21.24	22.34	22.37
		50	0	22.02	22.67	21.24

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	21.85	21.70	21.27
		1	38	22.18	21.59	22.90
		1	74	22.84	22.32	22.43
		36	0	22.52	21.18	21.07
		36	18	22.11	21.76	21.14
		36	39	21.19	22.22	21.52
		75	0	**22.93**	21.17	21.41
	16QAM	1	0	22.30	21.17	22.29
		1	38	22.48	22.66	22.07
		1	74	22.11	22.11	21.81
		36	0	22.01	21.48	22.67
		36	18	21.04	21.13	22.59
		36	39	22.53	22.66	21.54
		75	0	22.80	21.32	21.64
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	21.49	22.25	21.17
		1	50	22.33	22.03	21.21
		1	99	**22.96**	22.74	22.45
		50	0	21.77	22.76	21.57
		50	25	21.45	22.42	21.61
		50	50	21.26	21.98	21.21
		100	0	22.95	21.16	22.16
	16QAM	1	0	21.30	21.30	21.32
		1	50	21.44	22.54	22.60
		1	99	22.14	21.98	21.11
		50	0	21.43	22.65	21.69
		50	25	22.70	21.08	21.44
		50	50	21.72	21.72	21.77
		100	0	21.05	21.63	21.41

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	22.34	22.51	22.81
		1	13	21.31	22.30	21.93
		1	24	22.00	22.74	22.14
		12	0	**22.94**	22.19	21.54
		12	6	22.38	21.73	21.17
		12	13	22.55	21.67	21.07
		25	0	21.97	21.18	21.00
	16QAM	1	0	21.32	21.31	21.57
		1	13	21.92	21.78	22.46
		1	24	22.62	21.75	21.88
		12	0	22.80	21.03	22.26
		12	6	21.59	22.01	21.25
		12	13	22.94	22.20	22.48
		25	0	21.26	21.56	22.40
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	21.87	21.13	22.47
		1	25	21.58	22.41	21.48
		1	49	22.59	21.60	22.63
		25	0	21.20	22.78	22.43
		25	13	22.89	21.57	22.23
		25	25	22.73	21.21	22.22
		50	0	21.17	22.43	21.22
	16QAM	1	0	21.29	22.56	21.09
		1	25	22.29	22.06	21.69
		1	49	22.21	22.51	22.17
		25	0	22.59	**22.96**	21.01
		25	13	22.96	22.62	22.00
		25	25	21.92	21.67	22.37
		50	0	21.57	22.09	21.71

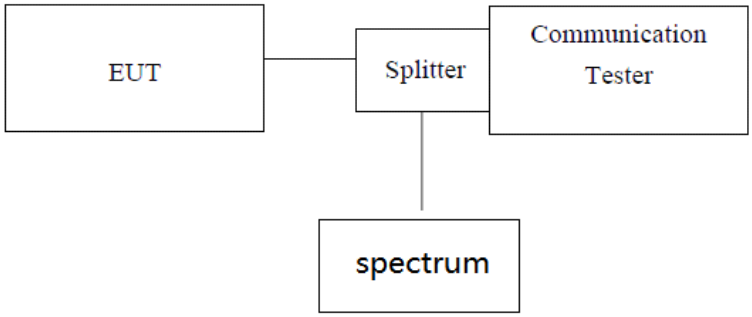
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20425 826.5MHz	Channel 20525 836.5MHz	Channel 20625 846.5MHz
5MHz	QPSK	1	0	21.70	**22.94**	22.34
		1	38	22.06	22.88	21.40
		1	74	22.61	22.11	21.35
		36	0	22.55	22.23	22.22
		36	18	22.21	22.70	22.45
		36	39	22.63	22.25	22.21
		75	0	21.34	21.44	21.33
	16QAM	1	0	21.57	22.00	21.93
		1	38	22.89	21.09	21.15
		1	74	22.39	21.45	22.53
		36	0	22.15	22.49	21.04
		36	18	22.85	22.54	21.57
		36	39	21.77	22.47	21.69
		75	0	22.17	21.58	22.90
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20450 829MHz	Channel 20525 836.5MHz	Channel 20600 844MHz
10MHz	QPSK	1	0	21.01	21.28	22.75
		1	50	21.54	21.64	21.86
		1	99	21.49	22.47	22.58
		50	0	**22.97**	21.06	22.24
		50	25	21.76	21.99	22.06
		50	50	22.72	22.92	21.84
		100	0	21.41	21.45	22.90
	16QAM	1	0	22.12	22.13	21.77
		1	50	21.42	21.16	22.54
		1	99	21.28	22.90	21.64
		50	0	22.54	22.66	21.94
		50	25	22.18	21.65	22.74
		50	50	21.99	21.50	22.30
		100	0	22.95	22.62	21.38

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	22.85	21.92	21.30
		1	2	22.93	21.09	21.25
		1	5	21.27	21.83	21.42
		3	0	21.02	22.49	21.18
		3	1	21.57	21.94	22.32
		3	2	22.20	**22.96**	22.22
		6	0	21.83	22.67	22.64
	16QAM	1	0	21.53	21.22	22.18
		1	2	21.63	21.02	22.22
		1	5	22.24	21.93	22.06
		3	0	21.61	21.15	22.73
		3	1	21.74	22.73	22.12
		3	2	21.73	21.94	21.51
		6	0	21.84	22.13	21.41
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	21.98	22.04	22.72
		1	8	21.36	**22.97**	22.06
		1	14	21.59	22.73	22.41
		8	0	21.35	22.84	22.11
		8	4	21.66	21.97	22.21
		8	7	21.04	21.34	21.67
		15	0	21.96	21.14	22.79
	16QAM	1	0	22.94	21.79	22.15
		1	8	21.11	21.51	21.13
		1	15	21.64	22.69	21.60
		8	0	21.30	21.59	22.31
		8	4	22.50	22.81	21.00
		8	7	22.32	22.82	22.24
		15	0	22.30	22.04	21.90

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	21.86	22.63	21.80
		1	13	21.12	21.68	22.82
		1	24	21.29	21.74	21.53
		12	0	21.91	22.80	21.33
		12	6	22.78	21.91	21.01
		12	13	22.02	22.46	21.65
		25	0	21.38	22.35	22.27
	16QAM	1	0	21.34	21.07	21.09
		1	13	22.82	21.95	22.65
		1	24	22.84	22.21	**22.89**
		12	0	21.62	21.29	22.50
		12	6	21.00	21.86	21.17
		12	13	21.06	22.37	21.09
		25	0	22.88	22.48	22.07
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	21.86	22.56	21.49
		1	25	22.62	21.87	21.51
		1	49	22.37	22.78	21.53
		25	0	21.09	21.50	**22.94**
		25	13	21.57	21.99	22.62
		25	25	22.57	22.88	22.27
		50	0	21.19	22.35	21.15
	16QAM	1	0	21.93	21.27	21.56
		1	25	22.34	22.67	22.14
		1	49	22.86	22.27	21.59
		25	0	22.57	21.94	22.88
		25	13	22.51	22.18	21.03
		25	25	22.80	22.88	22.77
		50	0	21.56	22.06	21.14

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	21.94	21.39	22.23
		1	13	21.37	22.49	22.61
		1	24	21.11	21.23	21.32
		12	0	21.13	21.06	21.07
		12	6	22.17	21.29	21.39
		12	13	21.02	22.55	22.53
		25	0	22.20	21.63	21.80
	16QAM	1	0	22.50	22.69	22.29
		1	13	21.57	22.12	21.47
		1	24	21.80	21.10	21.79
		12	0	21.15	22.57	21.10
		12	6	**22.87**	21.73	22.46
		12	13	22.59	22.12	22.41
		25	0	21.56	21.13	22.32
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
					Channel 23230 782.0MHz	
10MHz	QPSK	1	0		22.56	
		1	25		22.36	
		1	49		**22.98**	
		25	0		21.43	
		25	13		21.30	
		25	25		21.92	
		50	0		21.54	
	16QAM	1	0		22.90	
		1	25		22.04	
		1	49		21.38	
		25	0		22.22	
		25	13		21.19	
		25	25		21.57	
		50	0		22.60	

6.5 Peak-to-Average Ratio

Test Requirement for FCC:	FCC part24.232(d) & FCC Part 27.50
Test Requirement for IC:	RSS-130 Clause 4.4, RSS-132 Clause 5.4 RSS-133 Clause 6.4, RSS-139 Clause 6.5
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 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

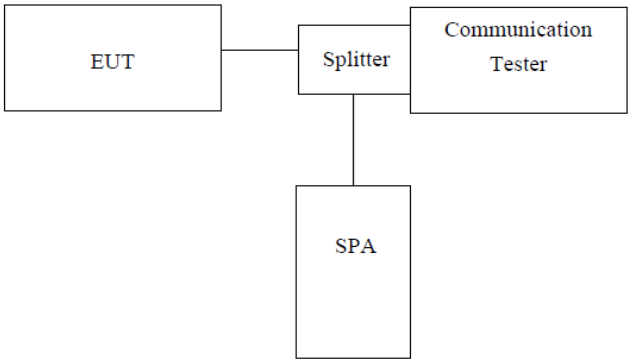
Measurement data:
QPSK mode:

Test Band	Bandwidth	Peak to Average Ratio（dB）			Limit（dB）	Result
		Low Ch.	Middle Ch.	High Ch.		
LTE Band 2	1.4MHz	2.10	2.52	2.84	13	PASS
	3MHz	3.17	3.62	3.68	13	PASS
	5MHz	4.07	4.78	4.25	13	PASS
	10MHz	5.76	5.94	5.18	13	PASS
	15MHz	5.43	5.31	5.65	13	PASS
	20MHz	6.86	6.85	6.19	13	PASS
LTE Band 4	1.4MHz	2.97	2.78	2.69	13	PASS
	3MHz	3.47	3.51	3.04	13	PASS
	5MHz	4.47	4.71	4.26	13	PASS
	10MHz	5.94	5.94	5.19	13	PASS
	15MHz	5.69	5.73	5.25	13	PASS
	20MHz	6.73	6.86	6.44	13	PASS
LTE Band 5	1.4MHz	2.46	2.21	2.69	13	PASS
	3MHz	3.50	3.53	3.33	13	PASS
	5MHz	4.42	4.21	4.45	13	PASS
	10MHz	5.31	5.21	5.51	13	PASS
LTE Band 12	1.4MHz	2.76	2.55	2.47	13	PASS
	3MHz	3.31	3.73	3.96	13	PASS
	5MHz	4.12	4.23	4.24	13	PASS
	10MHz	5.28	5.21	5.60	13	PASS
LTE Band 13	5MHz	5.31	5.75	5.70	13	PASS
	10MHz	--	6.76	--	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	2.98	2.34	2.09	13	PASS
	3MHz	3.01	3.21	3.30	13	PASS
	5MHz	4.77	4.97	4.74	13	PASS
	10MHz	5.55	5.23	5.81	13	PASS
	15MHz	5.32	5.36	5.99	13	PASS
	20MHz	6.79	6.28	6.15	13	PASS
LTE Band 4	1.4MHz	2.83	2.77	2.33	13	PASS
	3MHz	3.82	3.61	3.41	13	PASS
	5MHz	4.89	4.66	4.63	13	PASS
	10MHz	5.51	5.65	5.46	13	PASS
	15MHz	5.35	5.90	5.38	13	PASS
	20MHz	6.71	6.51	6.12	13	PASS
LTE Band 5	1.4MHz	2.69	2.33	2.42	13	PASS
	3MHz	3.69	3.53	3.75	13	PASS
	5MHz	4.33	4.10	4.57	13	PASS
	10MHz	5.00	5.01	5.08	13	PASS
LTE Band 12	1.4MHz	2.93	2.12	2.58	13	PASS
	3MHz	3.50	3.57	3.21	13	PASS
	5MHz	4.70	4.18	4.47	13	PASS
	10MHz	5.96	5.10	5.15	13	PASS
LTE Band 13	5MHz	5.15	5.22	5.02	13	PASS
	10MHz	---	6.44	---	13	PASS

6.6 Occupy Bandwidth

Test Requirement for FCC:	Part 24.238; FCC Part 27.53(h)/(g)
Test Requirement for IC:	RSS-Gen Clause 6.6
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 5.0 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	1108.3	1360
		Mid range	6	0	1111.1	1312
		High range	6	0	1097.6	1415
	3MHz	Low range	15	0	2692.3	2975
		Mid range	15	0	2685.0	2970
		High range	15	0	2683.6	2974
	5MHz	Low range	25	0	4508.8	5198
		Mid range	25	0	4503.5	5082
		High range	25	0	4533.5	5183
	10MHz	Low range	50	0	8947.8	9980
		Mid range	50	0	8949.5	10002
		High range	50	0	8963.3	10040
	15MHz	Low range	75	0	13457.3	15503
		Mid range	75	0	13421.2	15552
		High range	75	0	13447.9	15359
	20MHz	Low range	100	0	17871.9	19616
		Mid range	100	0	17896.3	19879
		High range	100	0	17812.4	19589

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	1112.2	1318
		Mid range	6	0	1098.8	1435
		High range	6	0	1106.1	1342
	3MHz	Low range	15	0	2692.2	2975
		Mid range	15	0	2687.4	2991
		High range	15	0	2678.3	2931
	5MHz	Low range	25	0	4512.1	5111
		Mid range	25	0	4516.5	5038
		High range	25	0	4508.1	5060
	10MHz	Low range	50	0	8976.8	10012
		Mid range	50	0	8942.2	9861
		High range	50	0	8957.7	9889
	15MHz	Low range	75	0	13467.5	15633
		Mid range	75	0	13373.7	15188
		High range	75	0	13420.2	15179
	20MHz	Low range	100	0	17892.1	20009
		Mid range	100	0	17775.9	19318
		High range	100	0	17918.4	19783

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	1089.9	1314
		Mid range	6	0	1110.6	1322
		High range	6	0	1099.6	1316
	3MHz	Low range	15	0	2683.3	2970
		Mid range	15	0	2687.1	2935
		High range	15	0	2677.8	2947
	5MHz	Low range	25	0	4517.1	5058
		Mid range	25	0	4512.0	4986
		High range	25	0	4486.8	5093
	10MHz	Low range	50	0	8926.9	9774
		Mid range	50	0	8942.3	9962
		High range	50	0	8956.3	9960

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	1116.0	1363
		Mid range	6	0	1097.8	1380
		High range	6	0	1103.7	1333
	3MHz	Low range	15	0	2688.6	2950
		Mid range	15	0	2678.9	2945
		High range	15	0	2677.6	2949
	5MHz	Low range	25	0	4504.9	5100
		Mid range	25	0	4497.7	5057
		High range	25	0	4529.8	5046
	10MHz	Low range	50	0	8929.5	9843
		Mid range	50	0	8894.2	9679
		High range	50	0	8976.4	9969

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	4514.9	5061
		Mid range	25	0	4501.9	5034
		High range	25	0	4506.0	5064
	10MHz	Mid range	50	0	8958.8	9924

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	1102.0	1335
		Mid range	6	0	1096.2	1326
		High range	6	0	1101.0	1370
	3MHz	Low range	15	0	2681.2	2956
		Mid range	15	0	2684.6	2980
		High range	15	0	2683.9	2984
	5MHz	Low range	25	0	4518.9	5155
		Mid range	25	0	4504.6	5047
		High range	25	0	4548.8	5065
	10MHz	Low range	50	0	8960.8	9978
		Mid range	50	0	8969.8	9853
		High range	50	0	8956.1	9963
	15MHz	Low range	75	0	13472.5	15056
		Mid range	75	0	13440.9	15356
		High range	75	0	13444.7	15080
	20MHz	Low range	100	0	17832.8	19453
		Mid range	100	0	17878.5	19704
		High range	100	0	17828.0	19735

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	1114.5	1333
		Mid range	6	0	1108.0	1450
		High range	6	0	1104.6	1363
	3MHz	Low range	15	0	2692.5	2965
		Mid range	15	0	2686.4	2984
		High range	15	0	2681.5	2938
	5MHz	Low range	25	0	4505.7	5093
		Mid range	25	0	4526.5	5065
		High range	25	0	4512.2	5038
	10MHz	Low range	50	0	8963.8	10101
		Mid range	50	0	8937.8	10157
		High range	50	0	8953.0	10003
	15MHz	Low range	75	0	13513.0	15181
		Mid range	75	0	13403.8	15171
		High range	75	0	13411.9	14972
	20MHz	Low range	100	0	17807.9	19468
		Mid range	100	0	17805.6	19388
		High range	100	0	17899.1	20146

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	1093.6	1332
		Mid range	6	0	1113.8	1328
		High range	6	0	1094.5	1320
	3MHz	Low range	15	0	2679.2	2959
		Mid range	15	0	2693.4	2968
		High range	15	0	2680.7	2932
	5MHz	Low range	25	0	4507.0	5033
		Mid range	25	0	4520.5	5054
		High range	25	0	4503.5	5085
	10MHz	Low range	50	0	8920.5	9646
		Mid range	50	0	8956.1	9928
		High range	50	0	8956.7	9831

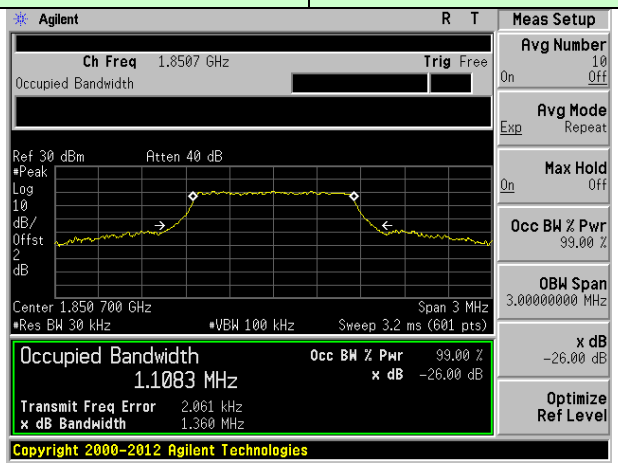
EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 12	1.4MHz	Low range	6	0	1113.0	1314
		Mid range	6	0	1090.3	1401
		High range	6	0	1097.0	1334
	3MHz	Low range	15	0	2689.0	2966
		Mid range	15	0	2681.0	2966
		High range	15	0	2689.3	2946
	5MHz	Low range	25	0	4526.3	5091
		Mid range	25	0	4501.4	4959
		High range	25	0	4526.9	5123
	10MHz	Low range	50	0	8914.9	9809
		Mid range	50	0	8891.5	9520
		High range	50	0	8984.5	9850

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	4514.7	5117
		Mid range	25	0	4508.5	5042
		High range	25	0	4514.1	4992
	10MHz	Mid range	50	0	8957.4	9924

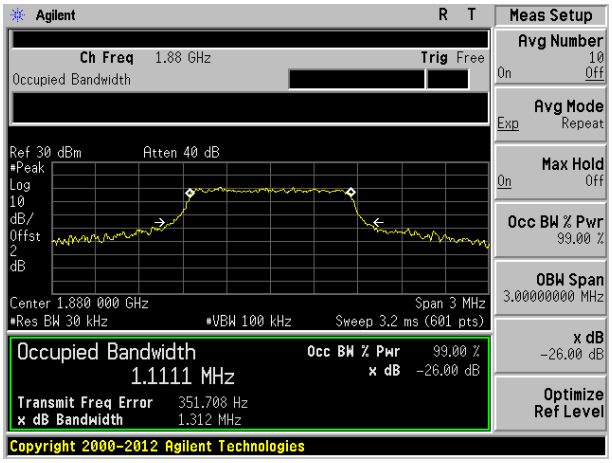
Test plot as follows:

QPSK mode:

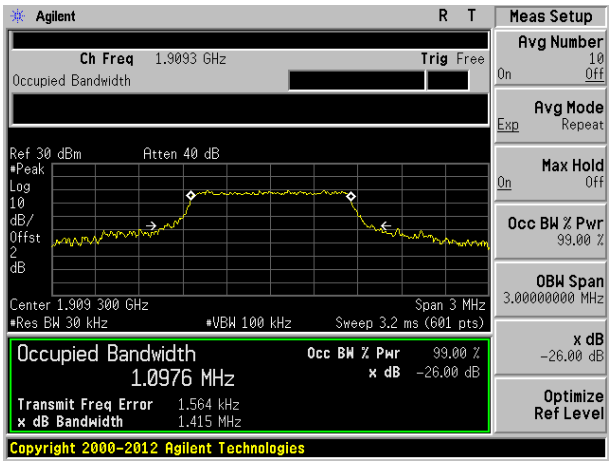
Test band: LTE Band 2	Channel Bandwidth: 1.4MHz



Lowest channel

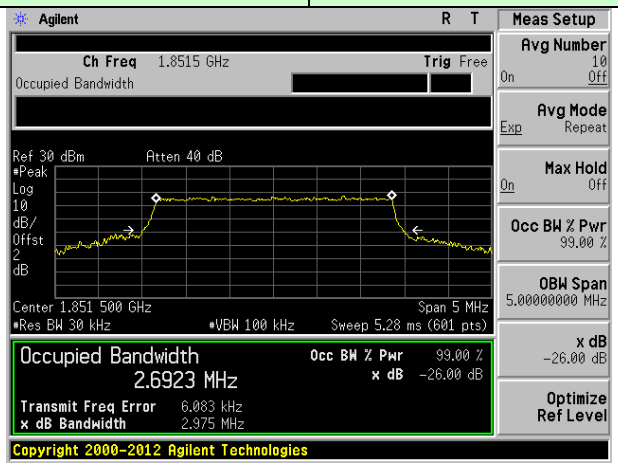


Middle channel

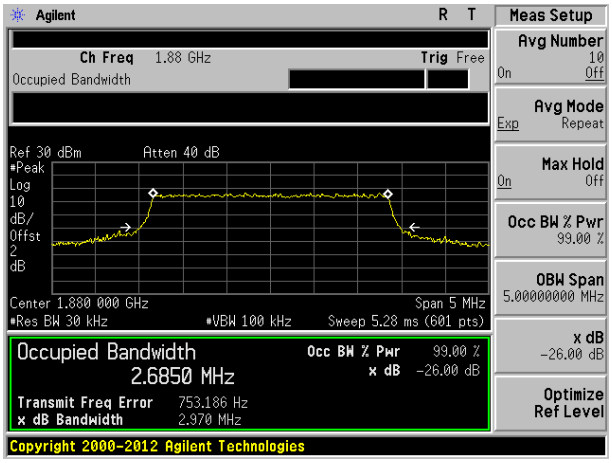


Highest channel

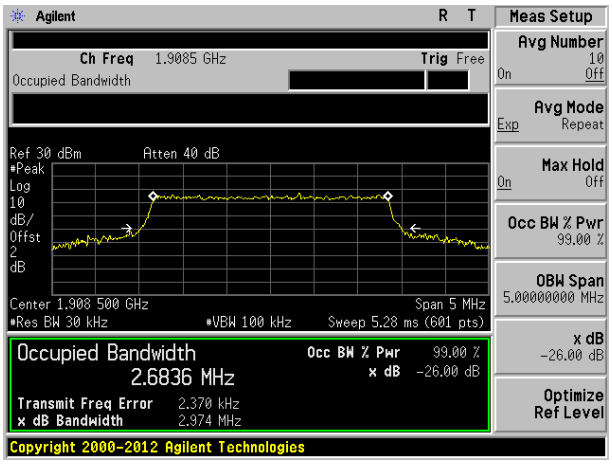
Test band: LTE Band 2	Channel Bandwidth:3MHz



Lowest channel

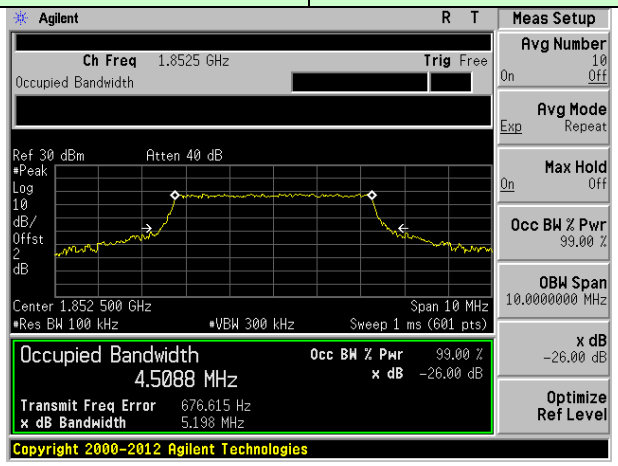


Middle channel

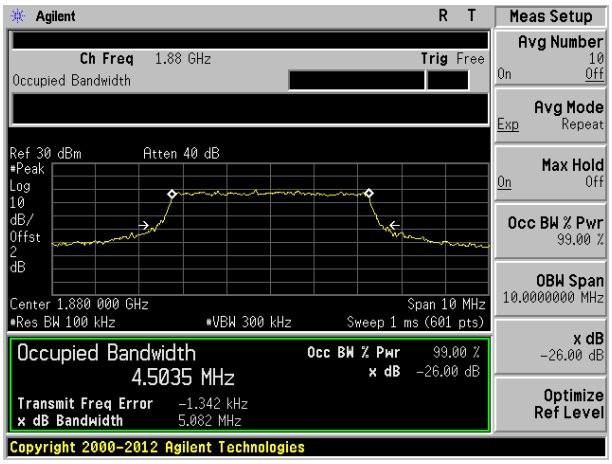


Highest channel

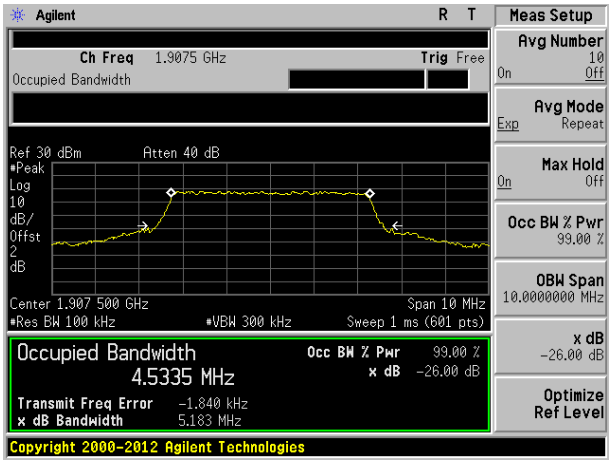
Test band: LTE Band 2	Channel Bandwidth: 5MHz



Lowest channel

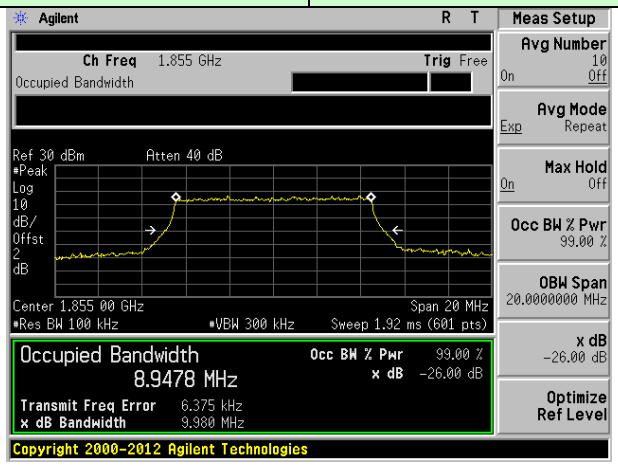


Middle channel

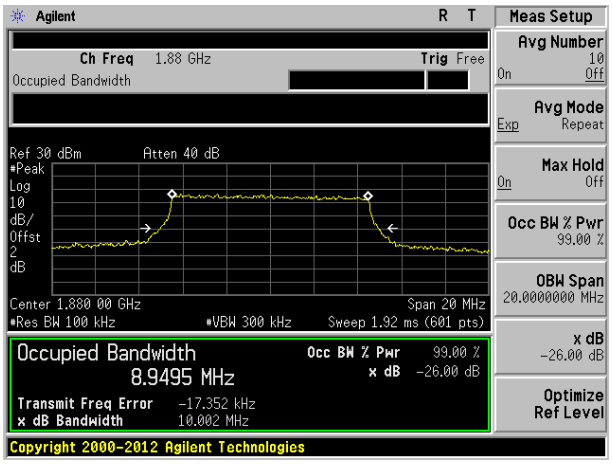


Highest channel

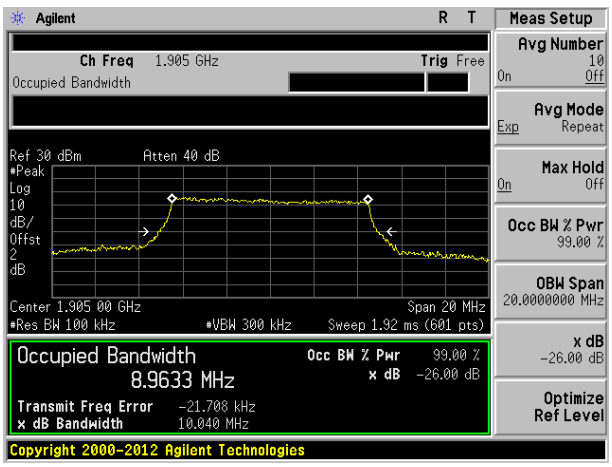
Test band: LTE Band 2	Channel Bandwidth:10MHz



Lowest channel

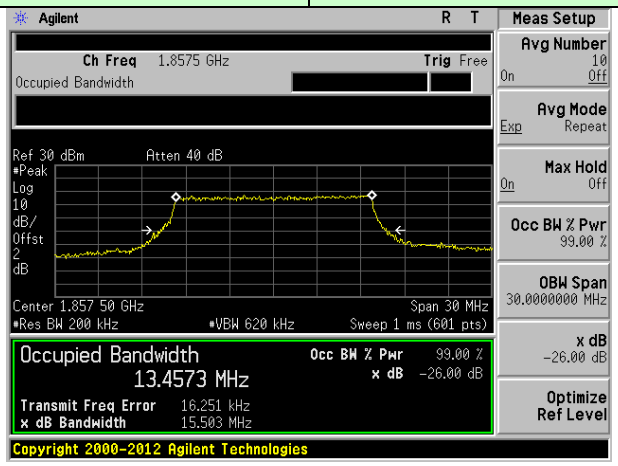


Middle channel

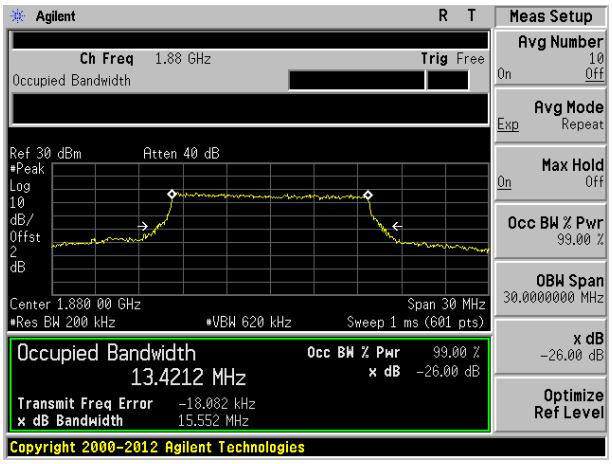


Highest channel

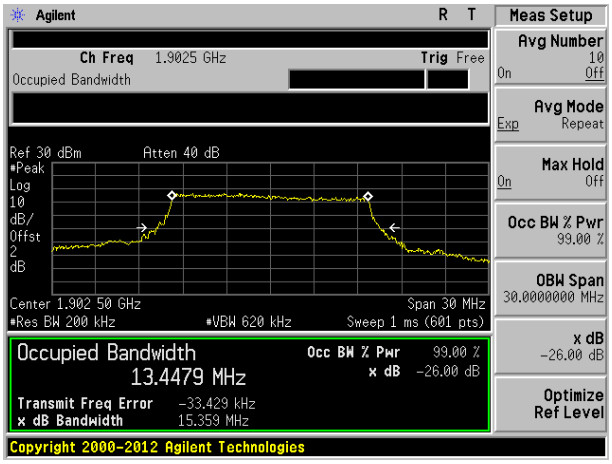
Test band: LTE Band 2	Channel Bandwidth:15MHz



Lowest channel

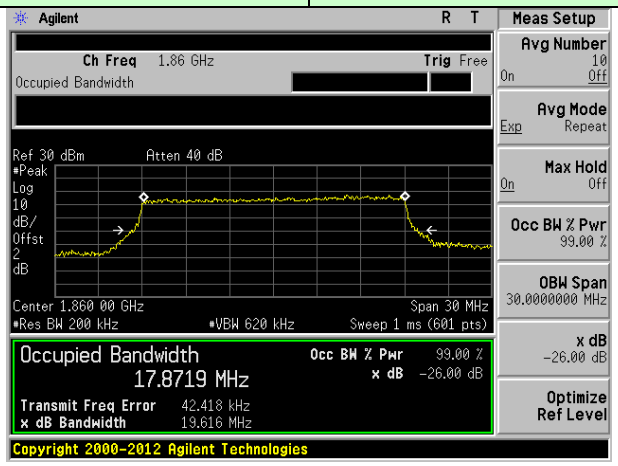


Middle channel

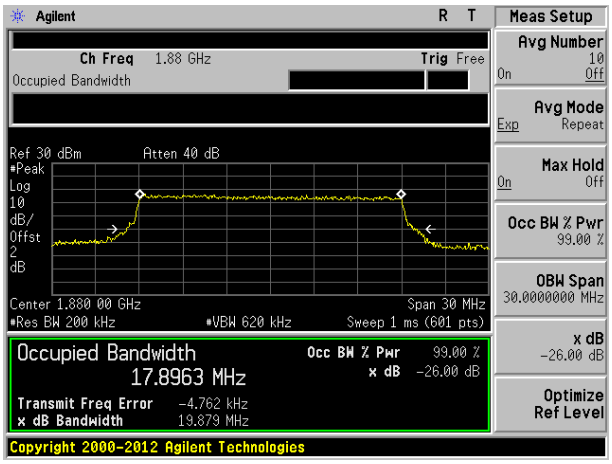


Highest channel

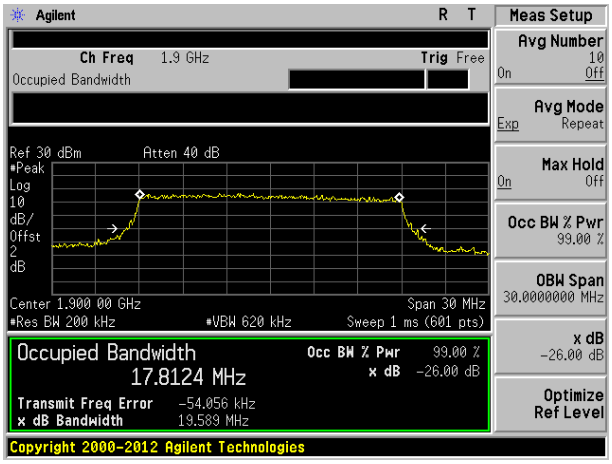
Test band: LTE Band 2	Channel Bandwidth:20MHz



Lowest channel

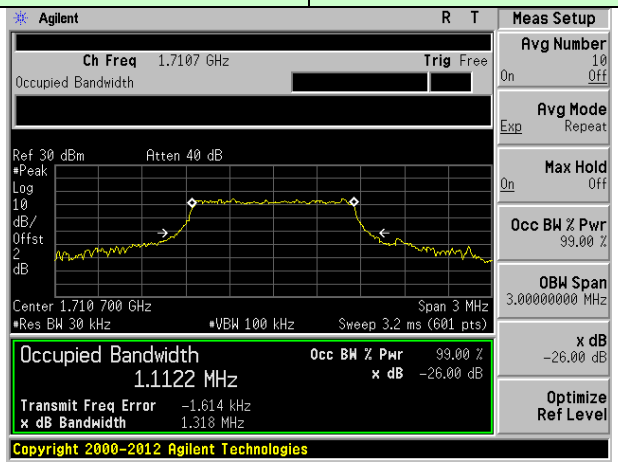


Middle channel

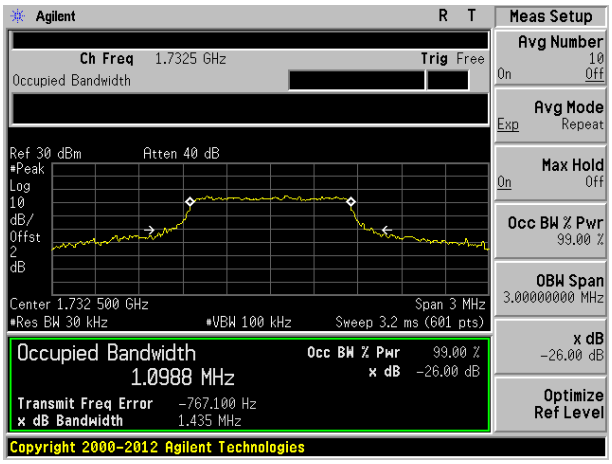


Highest channel

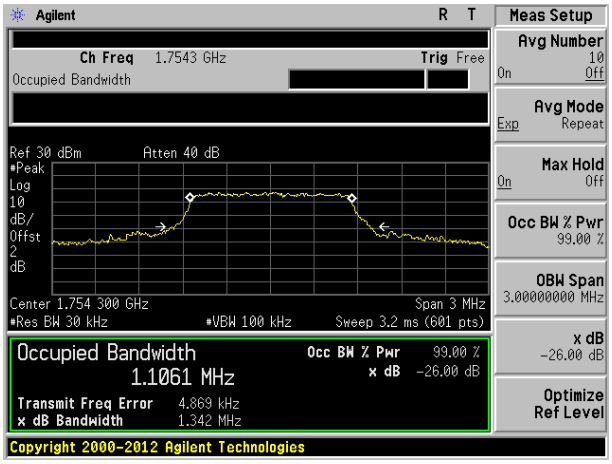
Test band: LTE Band 4	Channel Bandwidth: 1.4MHz



Lowest channel

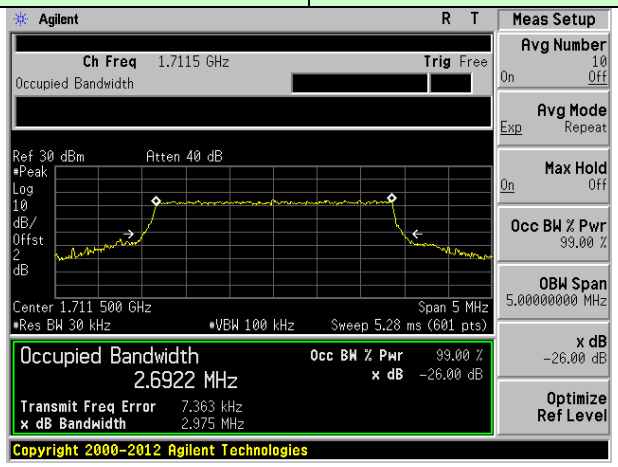


Middle channel

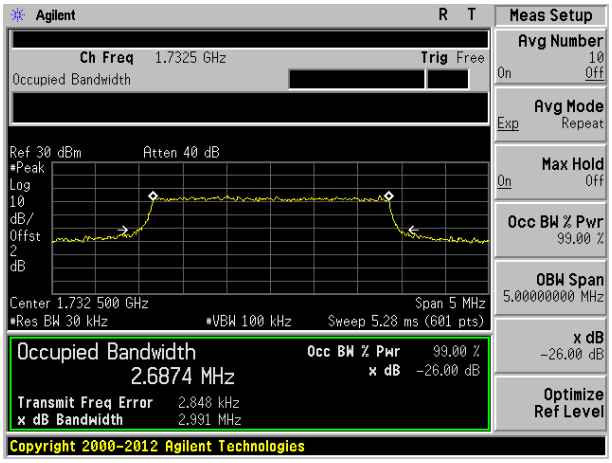


Highest channel

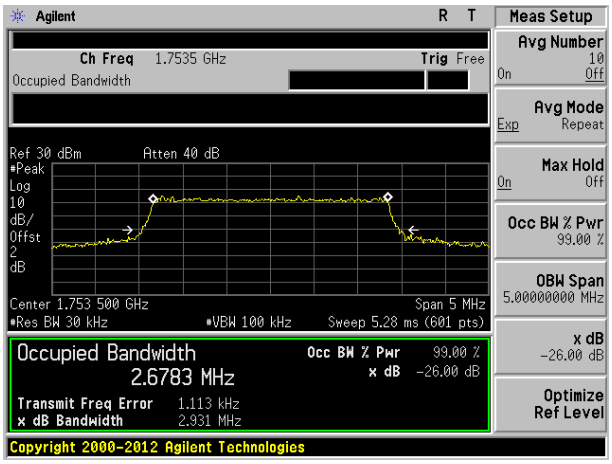
Test band: LTE Band 4	Channel Bandwidth: 3MHz



Lowest channel

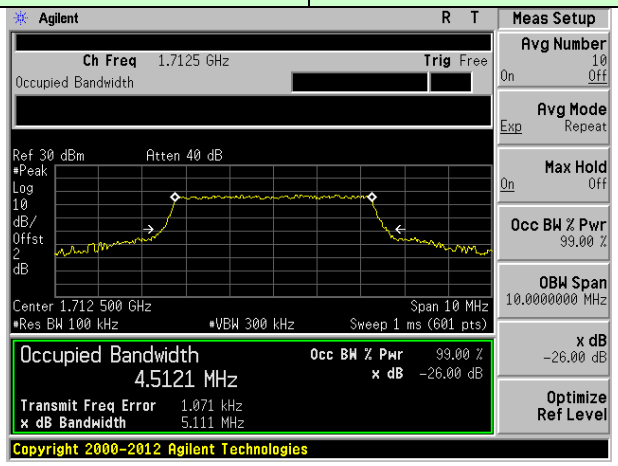


Middle channel

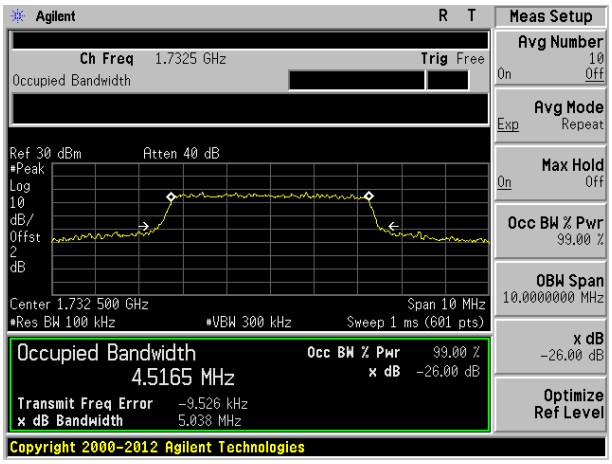


Highest channel

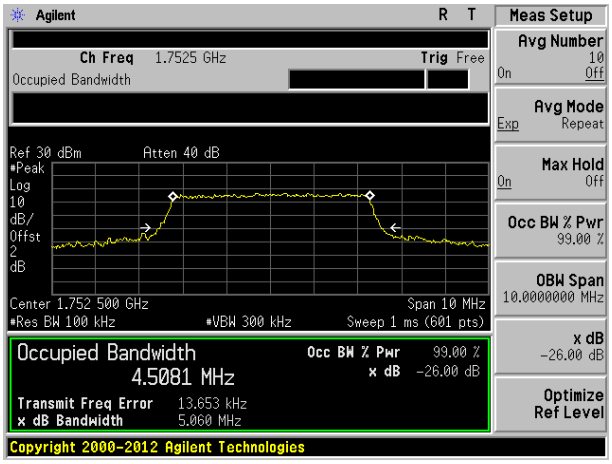
Test band: LTE Band 4	Channel Bandwidth: 5MHz



Lowest channel

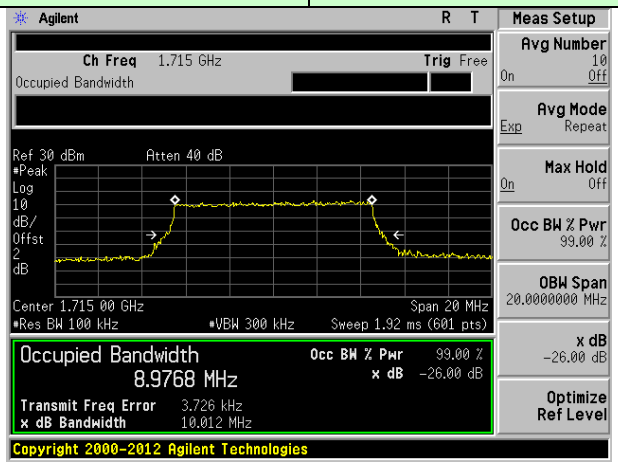


Middle channel

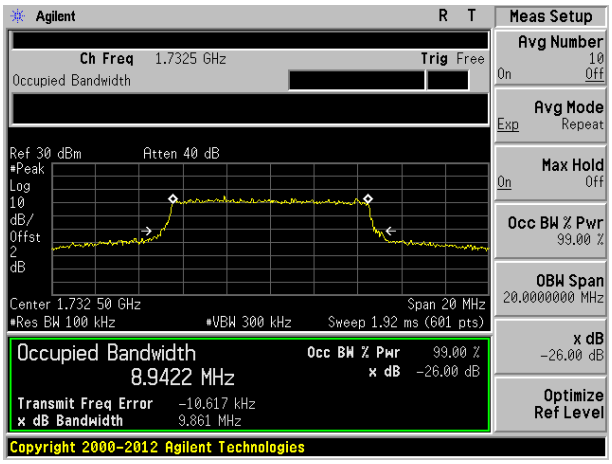


Highest channel

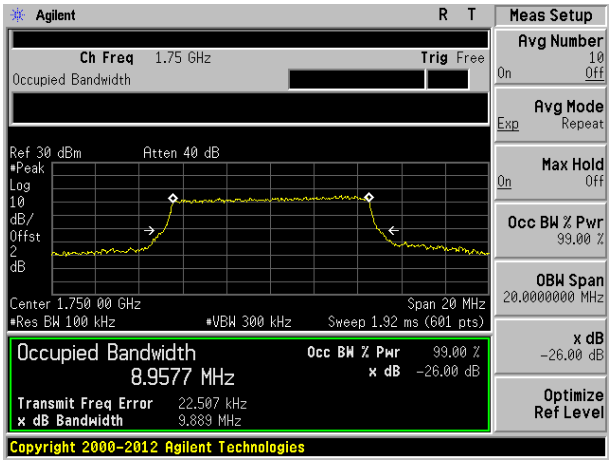
Test band: LTE Band 4	Channel Bandwidth: 10MHz



Lowest channel

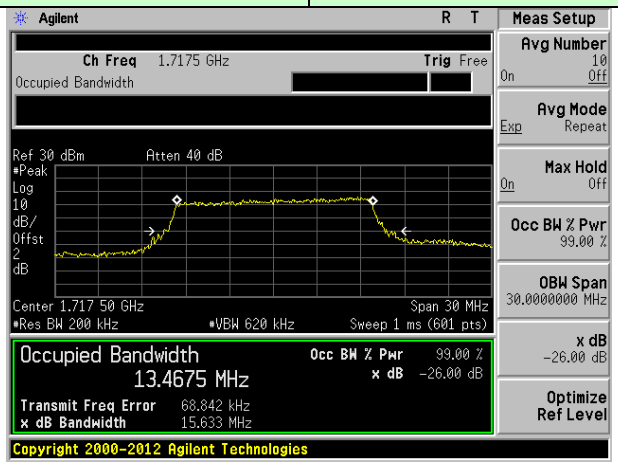


Middle channel

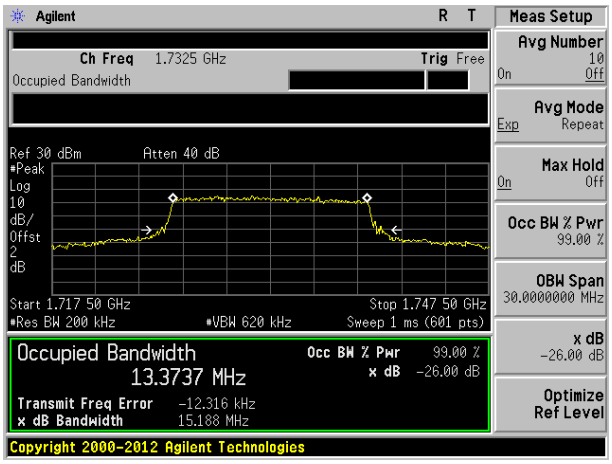


Highest channel

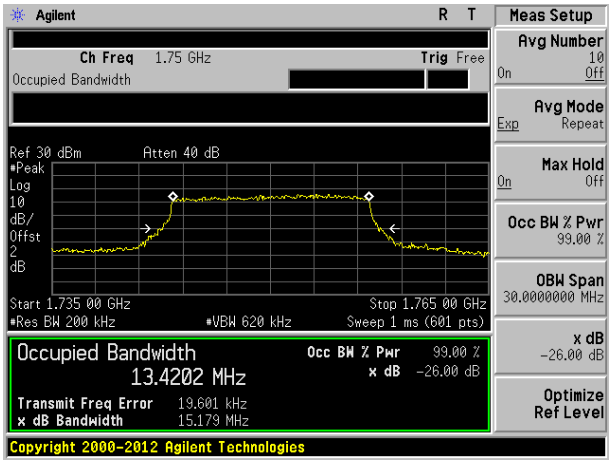
Test band: LTE Band 4	Channel Bandwidth: 15MHz



Lowest channel

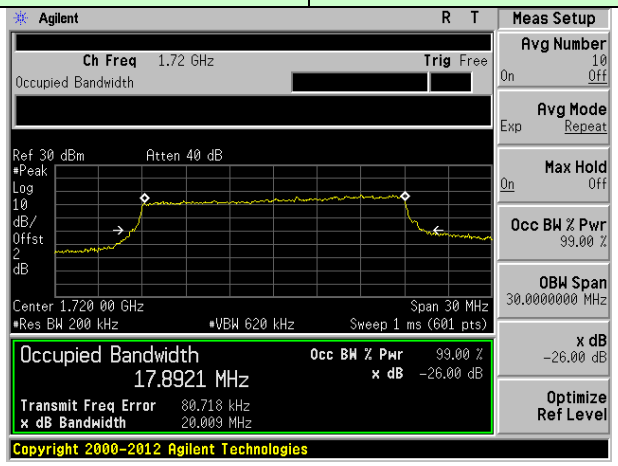


Middle channel

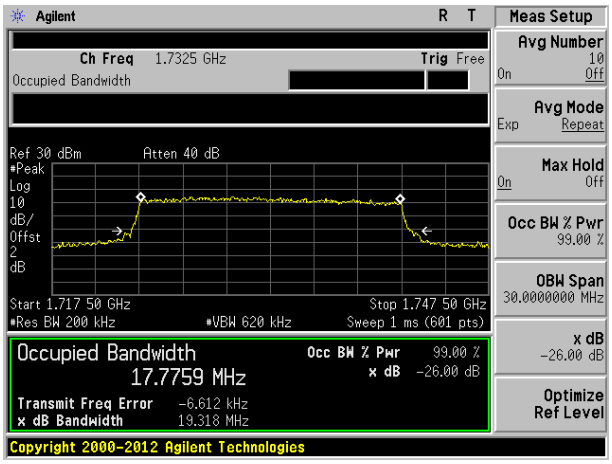


Highest channel

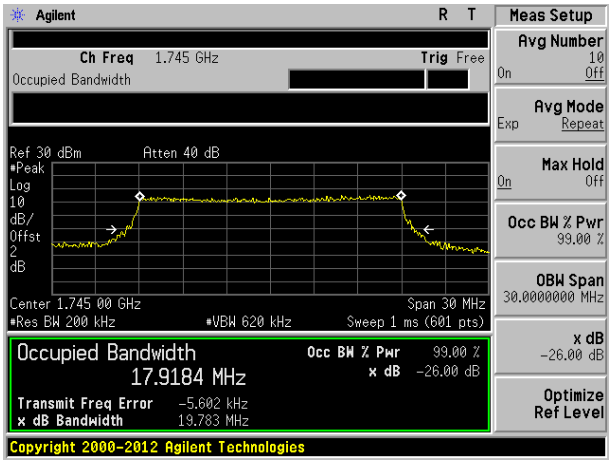
Test band: LTE Band 4	Channel Bandwidth: 20MHz



Lowest channel

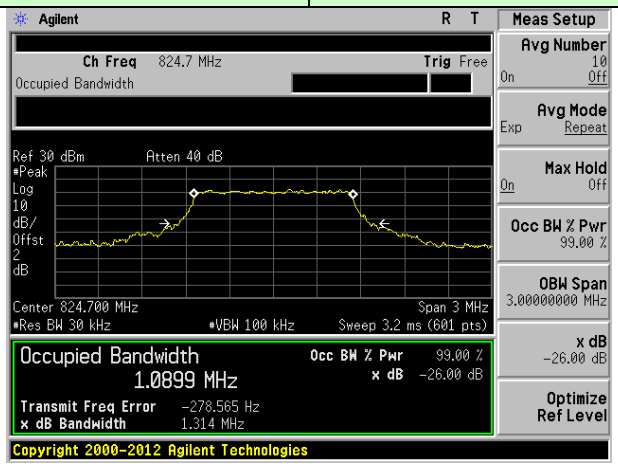


Middle channel

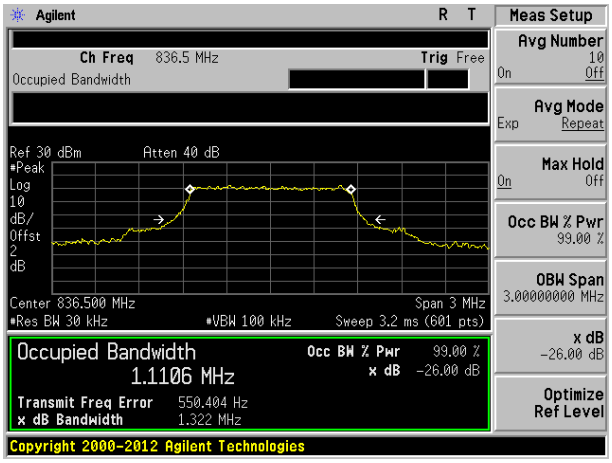


Highest channel

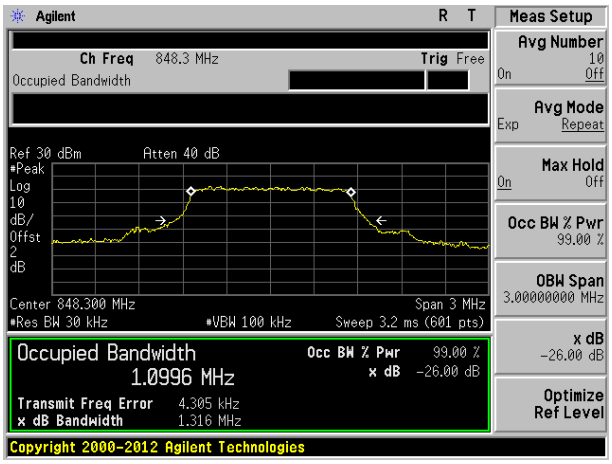
Test band: LTE Band 5	Channel Bandwidth: 1.4MHz



Lowest channel

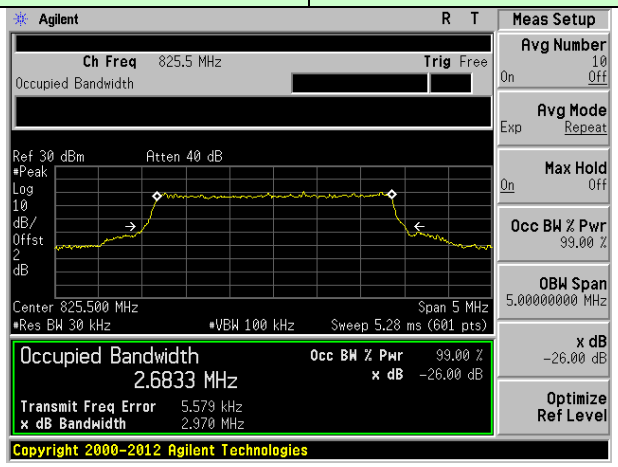


Middle channel

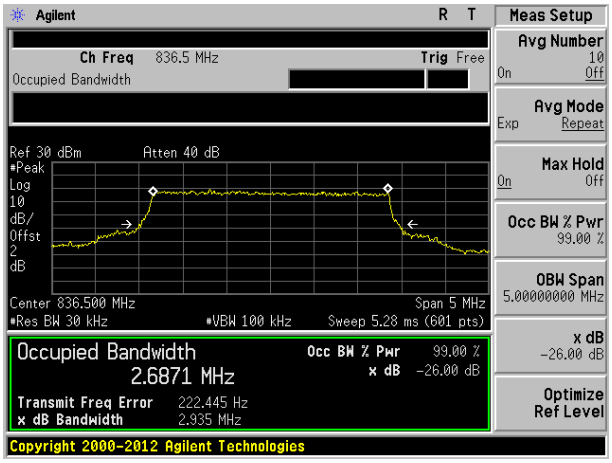


Highest channel

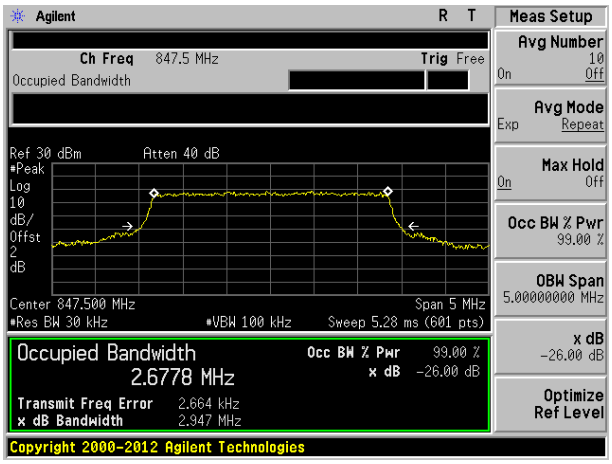
Test band: LTE Band 5	Channel Bandwidth: 3MHz



Lowest channel

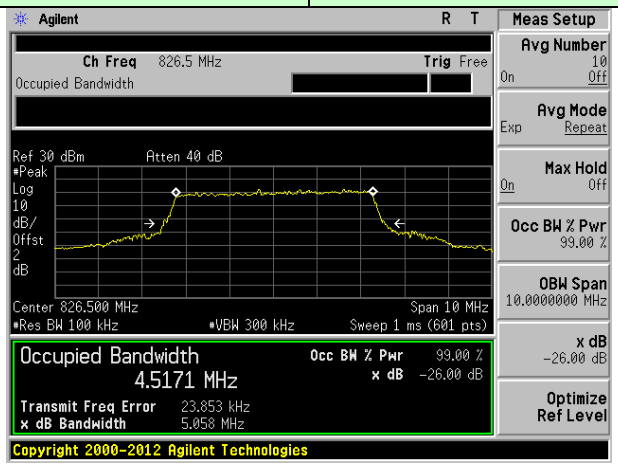


Middle channel

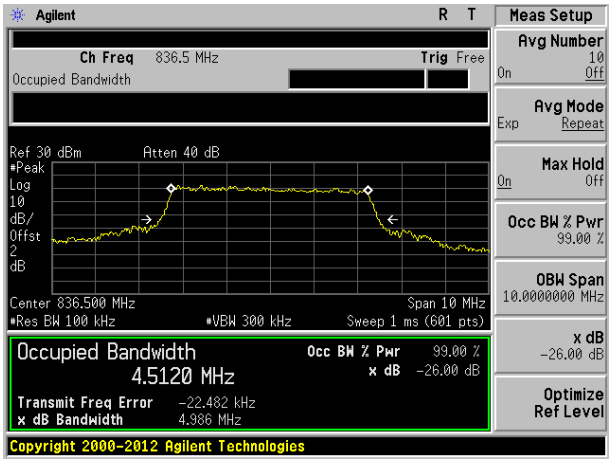


Highest channel

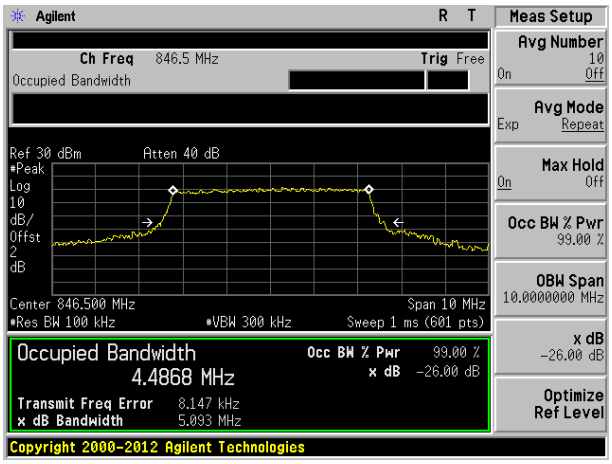
Test band: LTE Band 5	Channel Bandwidth: 5MHz



Lowest channel

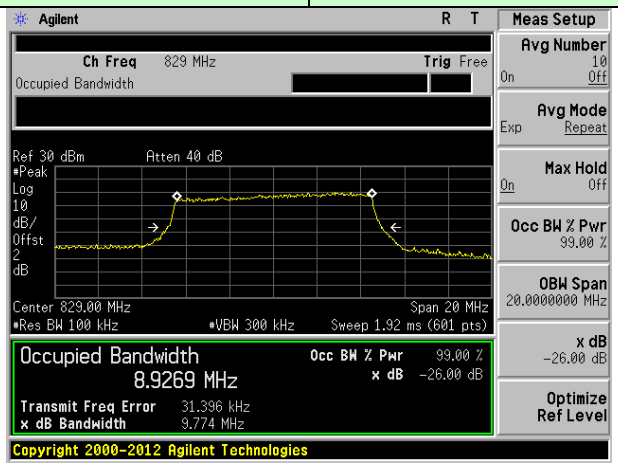


Middle channel

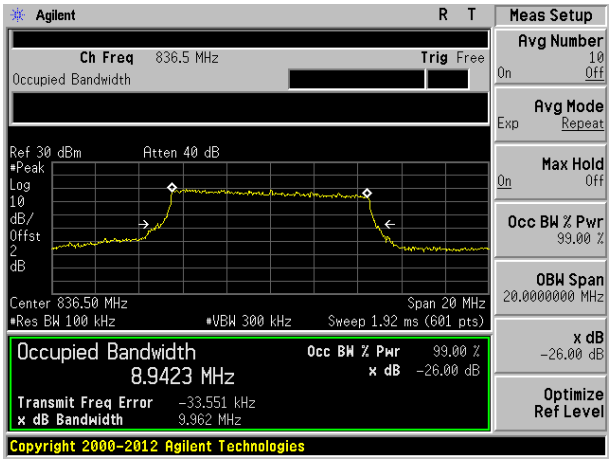


Highest channel

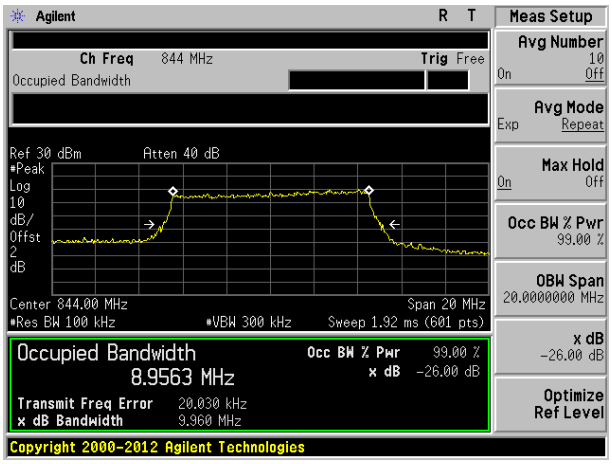
Test band: LTE Band 5	Channel Bandwidth: 10MHz



Lowest channel

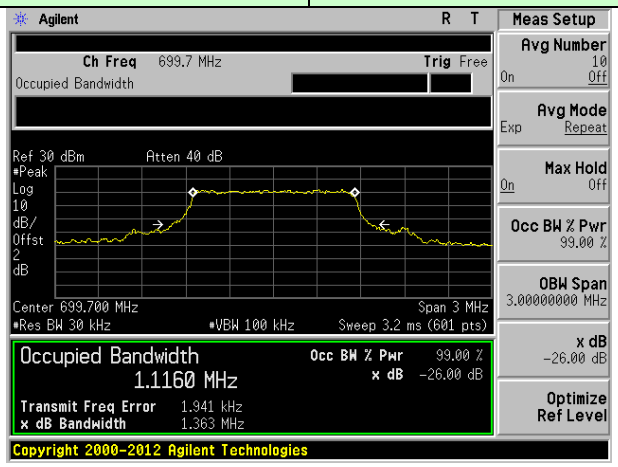


Middle channel

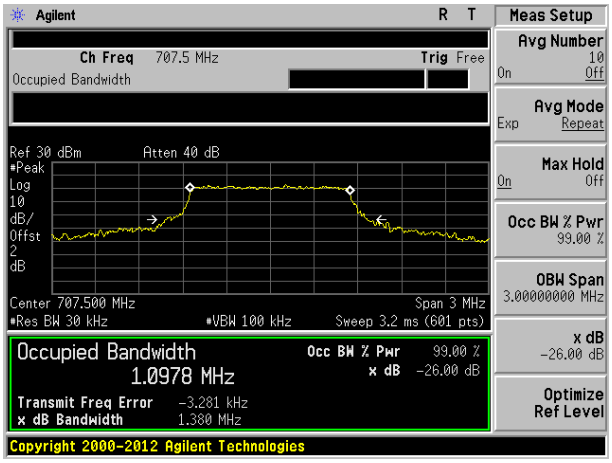


Highest channel

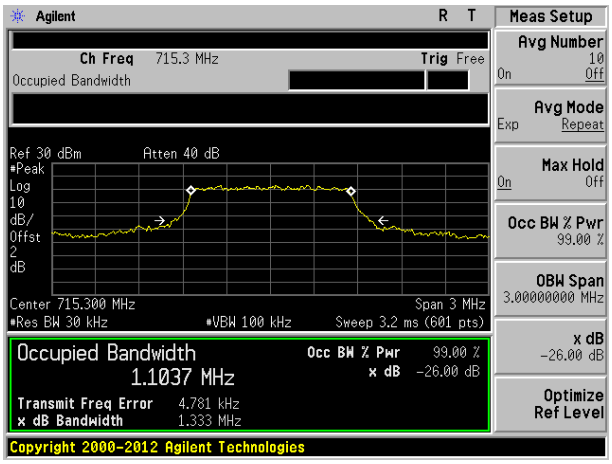
Test band: LTE Band 12	Channel Bandwidth: 1.4MHz



Lowest channel

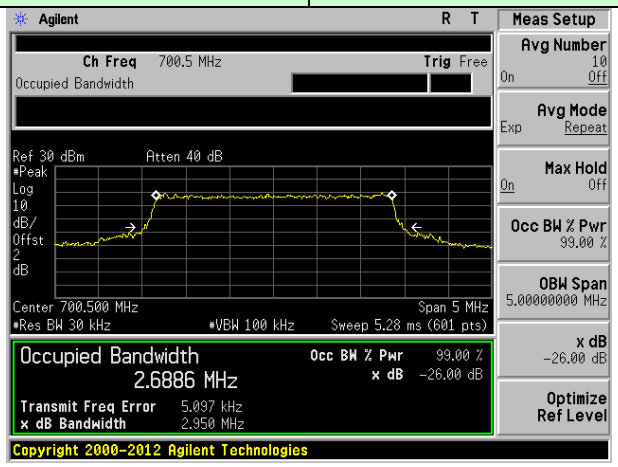


Middle channel

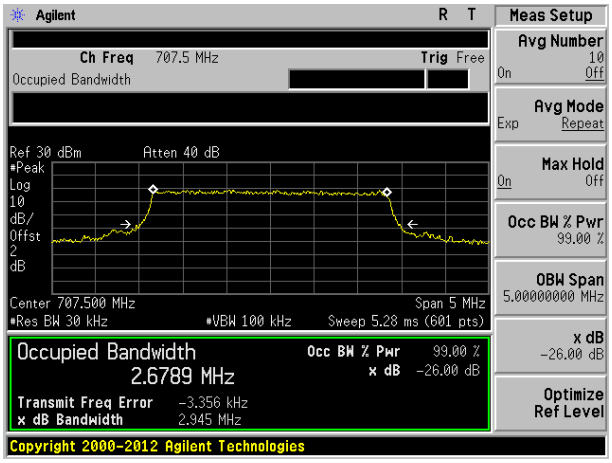


Highest channel

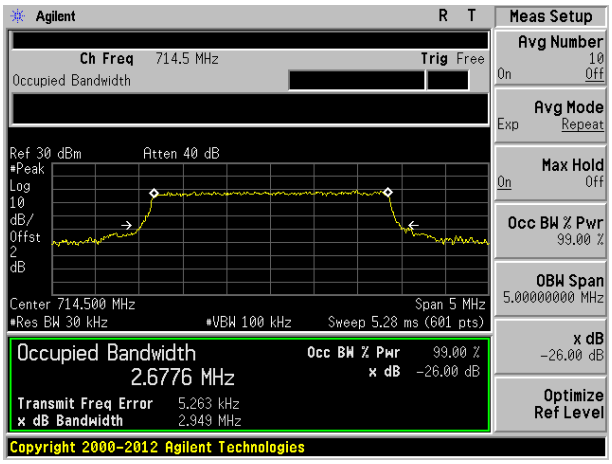
Test band: LTE Band 12	Channel Bandwidth: 3MHz



Lowest channel

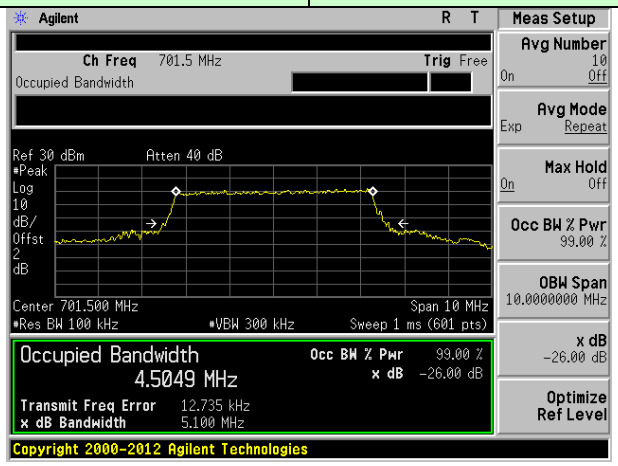


Middle channel

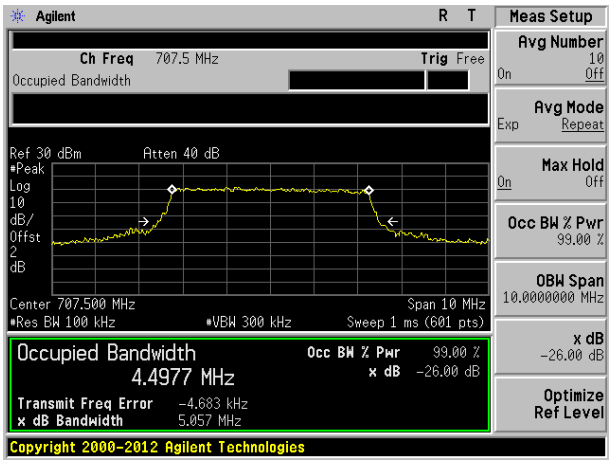


Highest channel

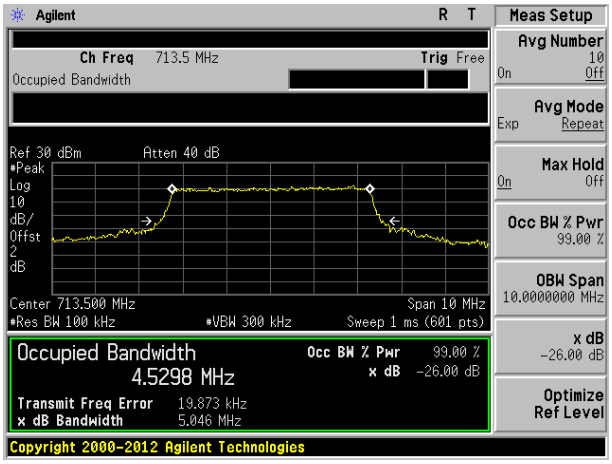
Test band: LTE Band 12	Channel Bandwidth: 5MHz



Lowest channel

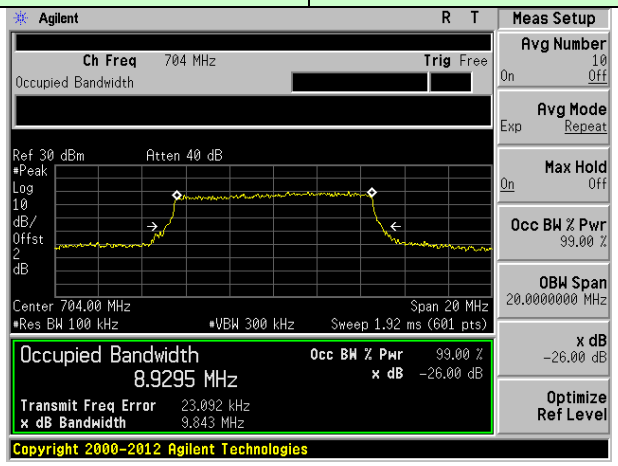


Middle channel

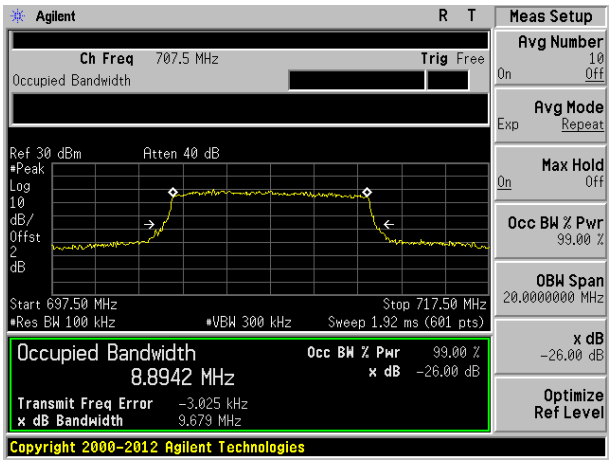


Highest channel

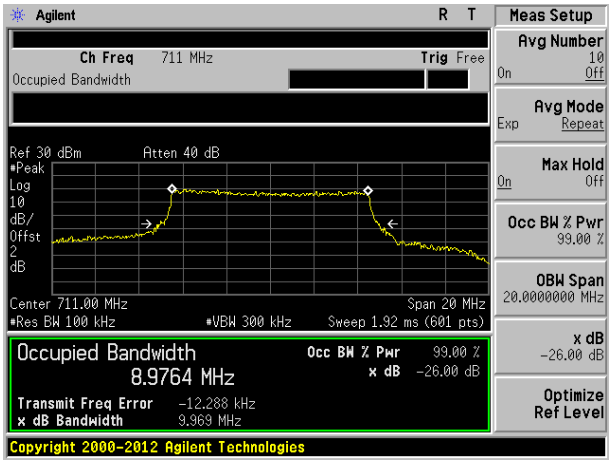
Test band: LTE Band 12	Channel Bandwidth: 10MHz



Lowest channel

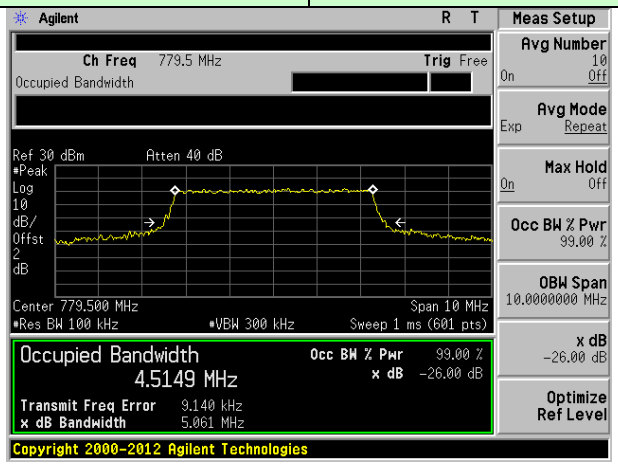


Middle channel

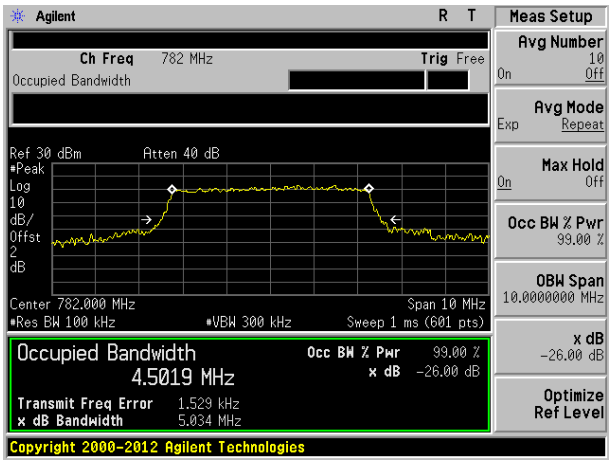


Highest channel

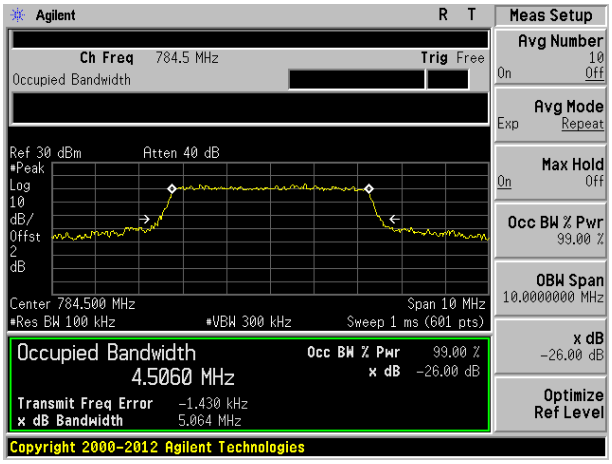
Test band: LTE Band 13	Channel Bandwidth: 5MHz



Lowest channel

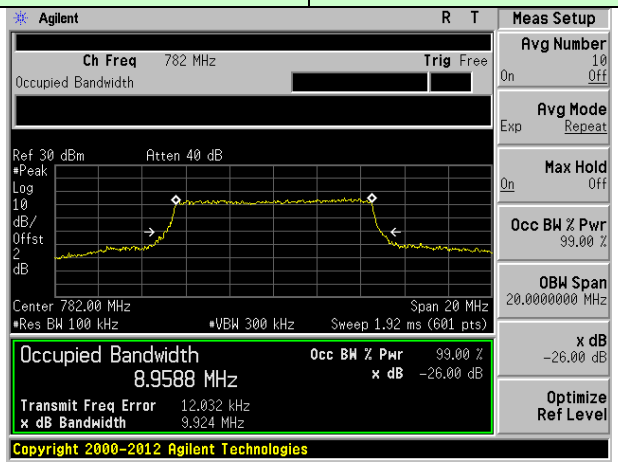


Middle channel



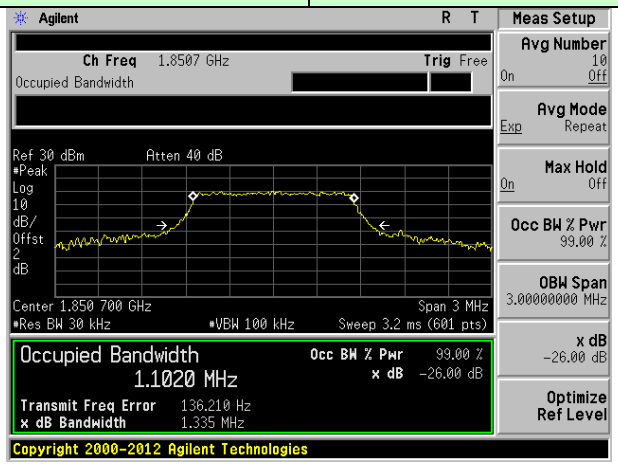
Highest channel

Test band: LTE Band 13	Channel Bandwidth: 10MHz

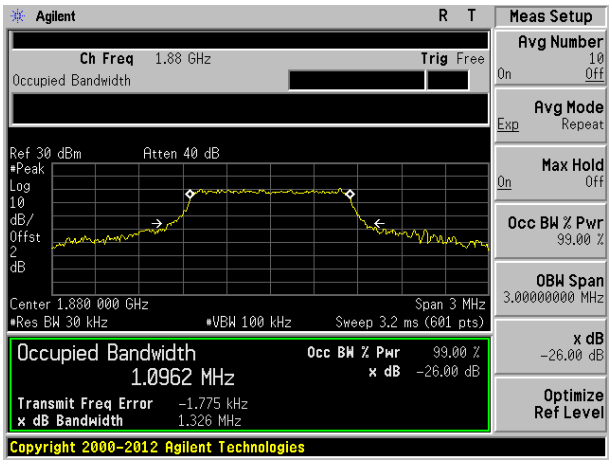


16QAM mode:

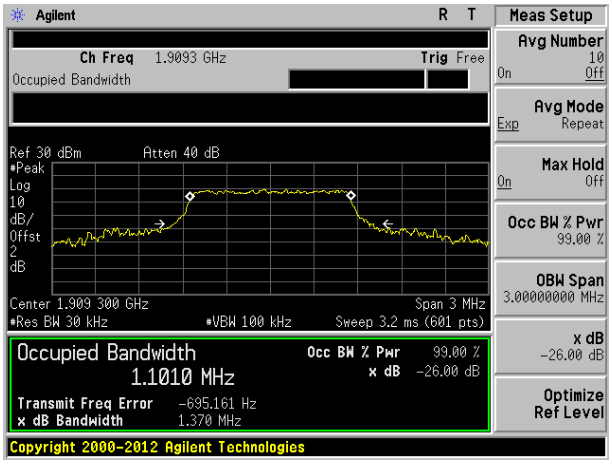
Test band: LTE Band 2	Channel Bandwidth: 1.4MHz



Lowest channel

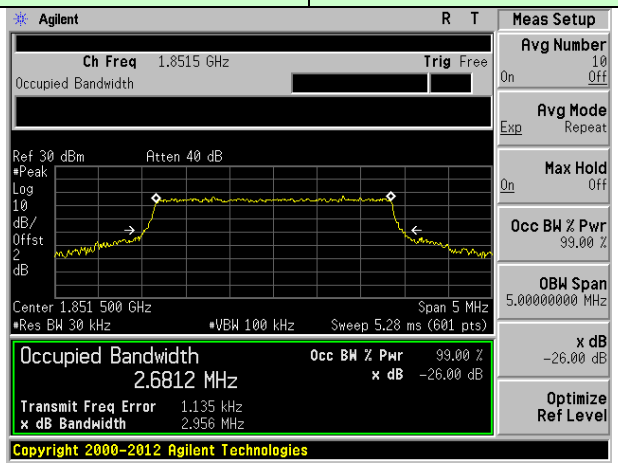


Middle channel

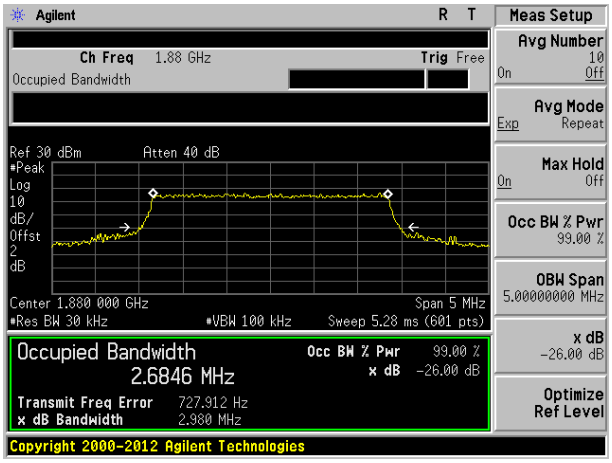


Highest channel

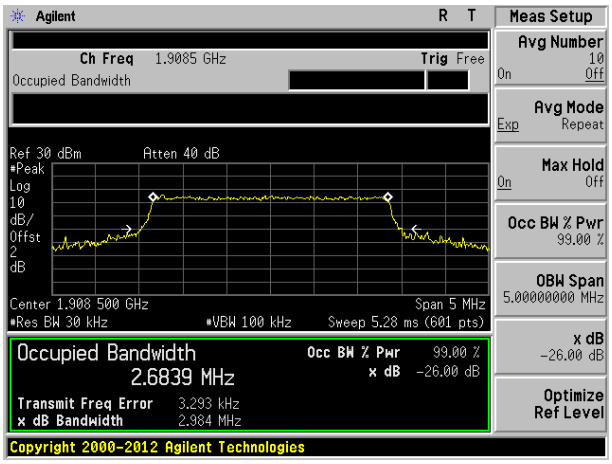
Test band: LTE Band 2	Channel Bandwidth:3MHz



Lowest channel

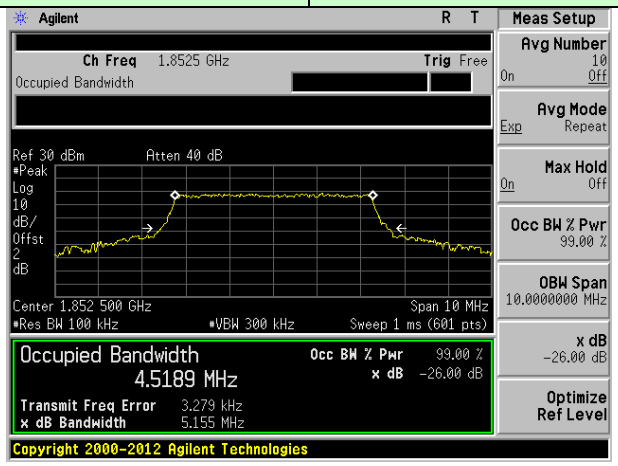


Middle channel

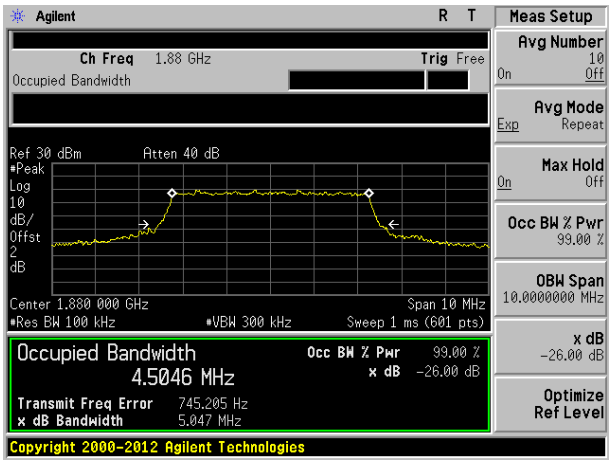


Highest channel

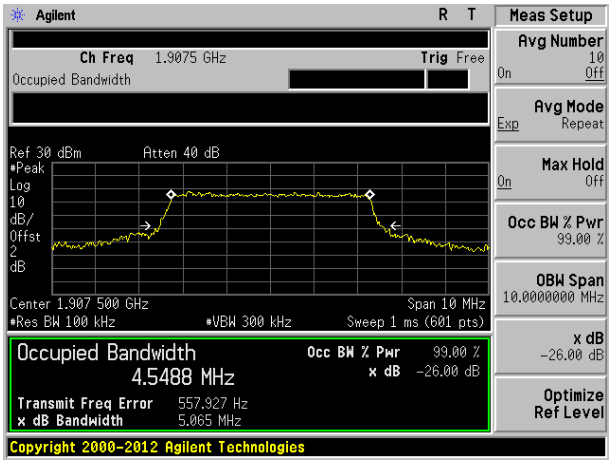
Test band: LTE Band 2	Channel Bandwidth: 5MHz



Lowest channel

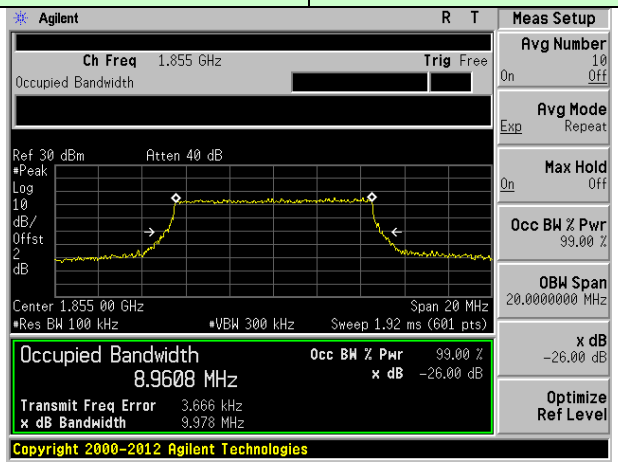


Middle channel

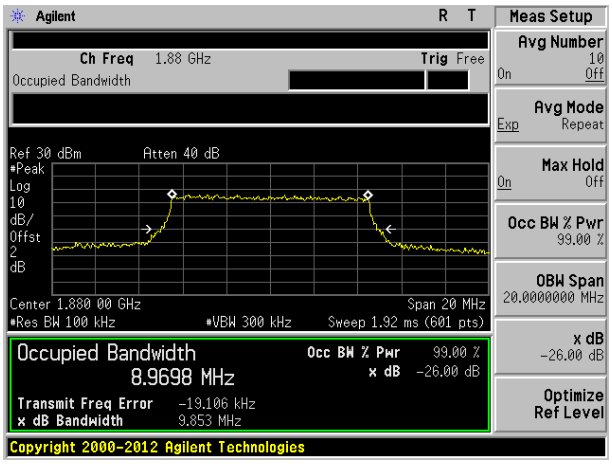


Highest channel

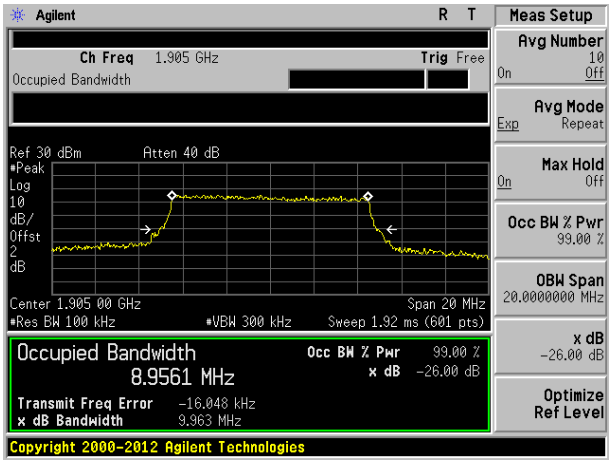
Test band: LTE Band 2	Channel Bandwidth:10MHz



Lowest channel

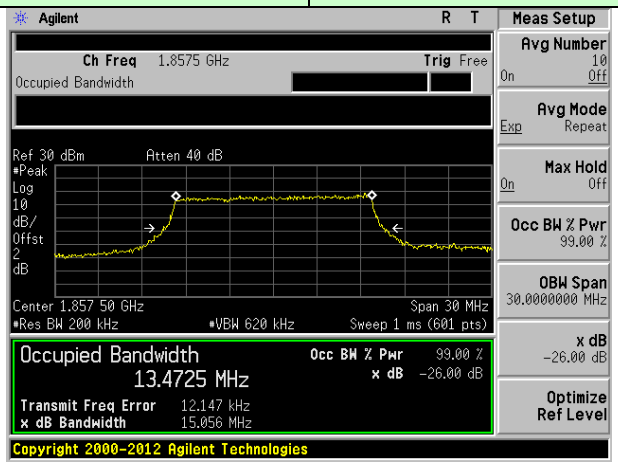


Middle channel

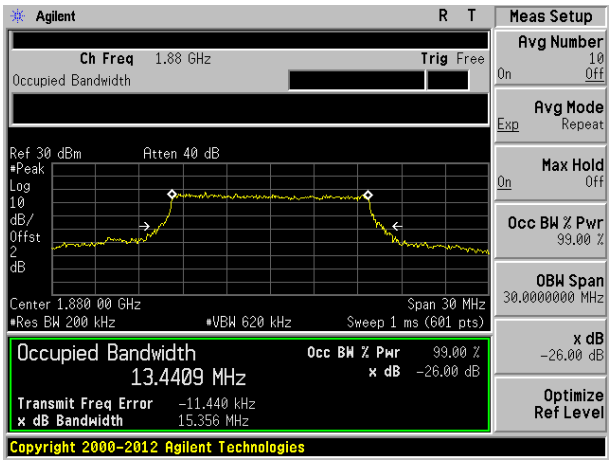


Highest channel

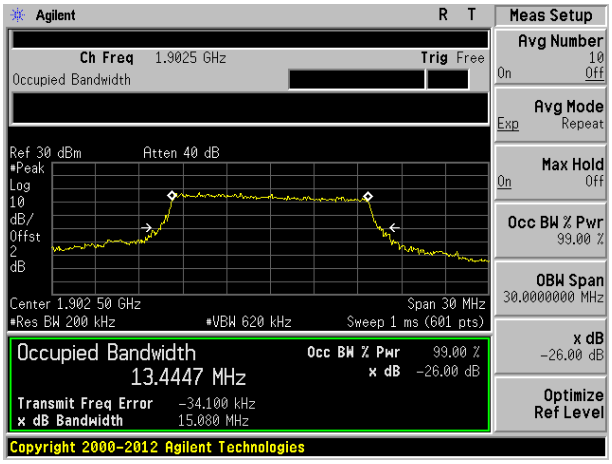
Test band: LTE Band 2	Channel Bandwidth:15MHz



Lowest channel

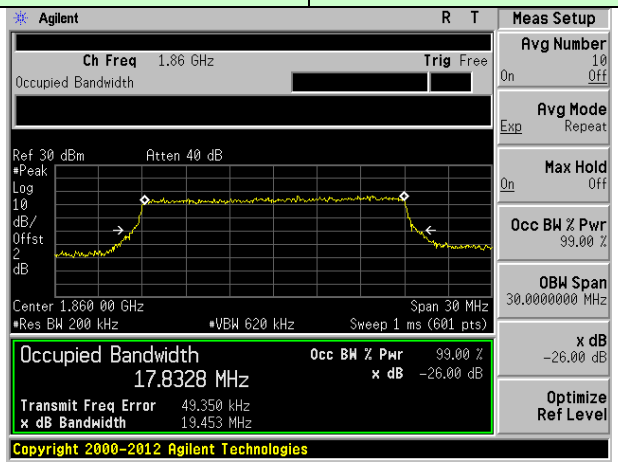


Middle channel

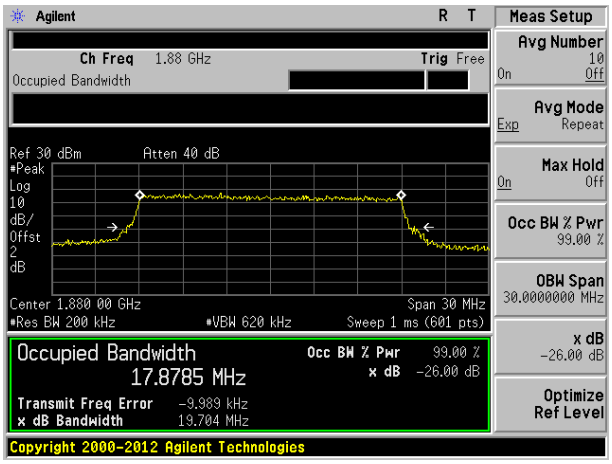


Highest channel

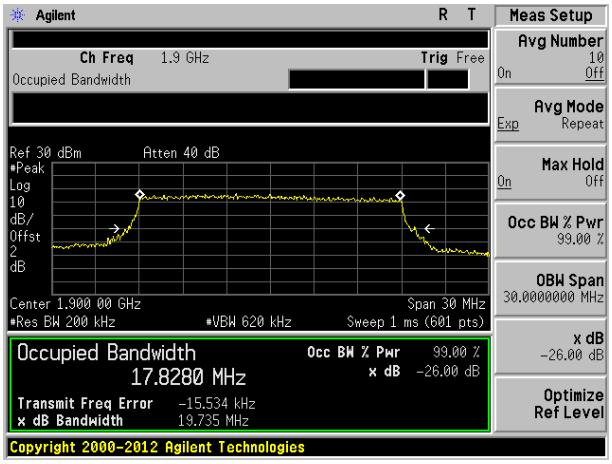
Test band: LTE Band 2	Channel Bandwidth:20MHz



Lowest channel

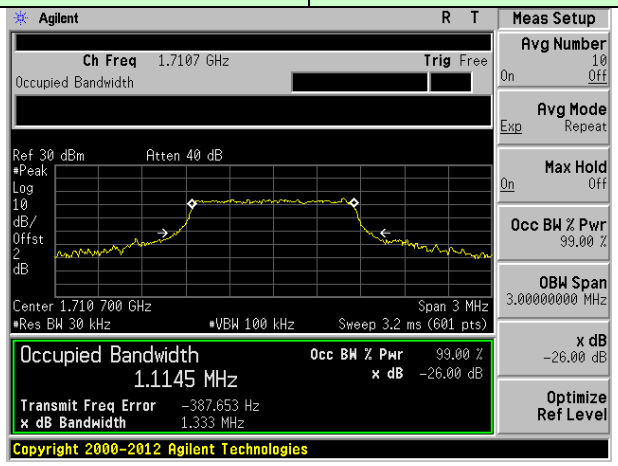


Middle channel

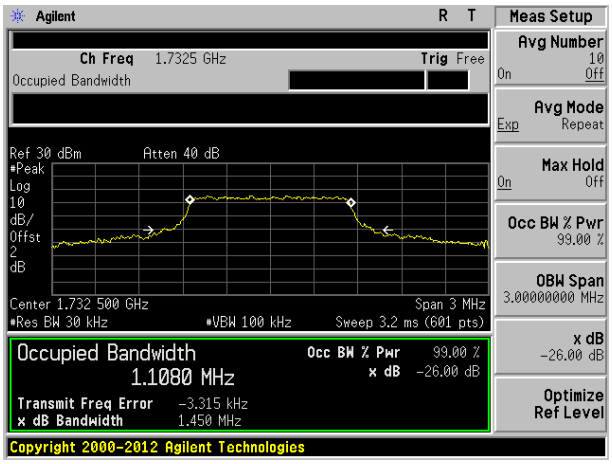


Highest channel

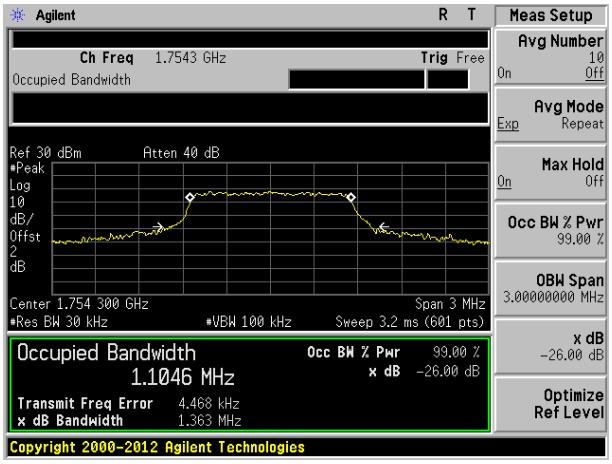
Test band: LTE Band 4	Channel Bandwidth: 1.4MHz



Lowest channel

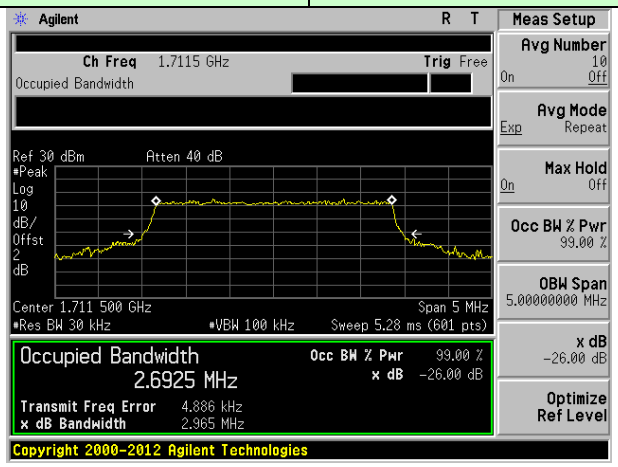


Middle channel

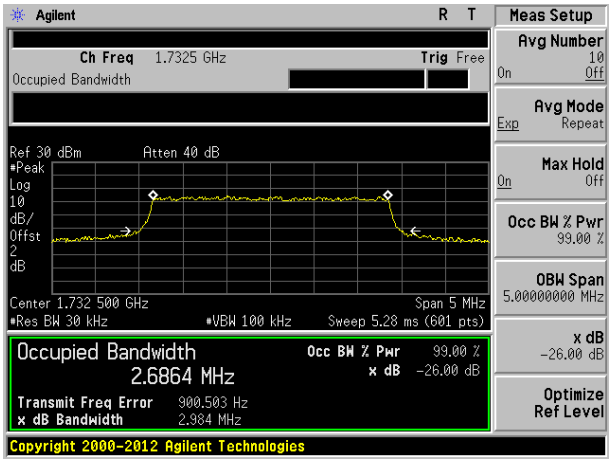


Highest channel

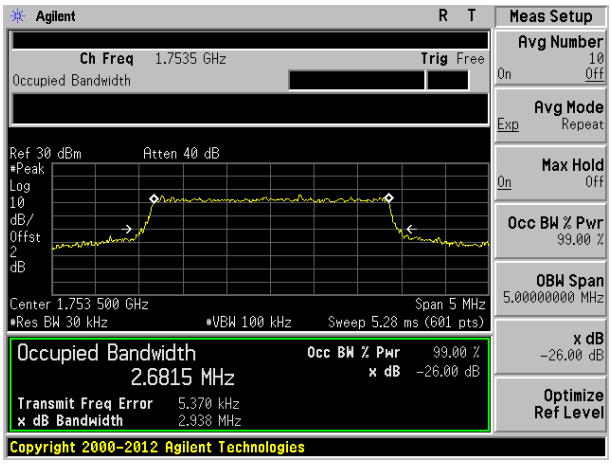
Test band: LTE Band 4	Channel Bandwidth: 3MHz



Lowest channel

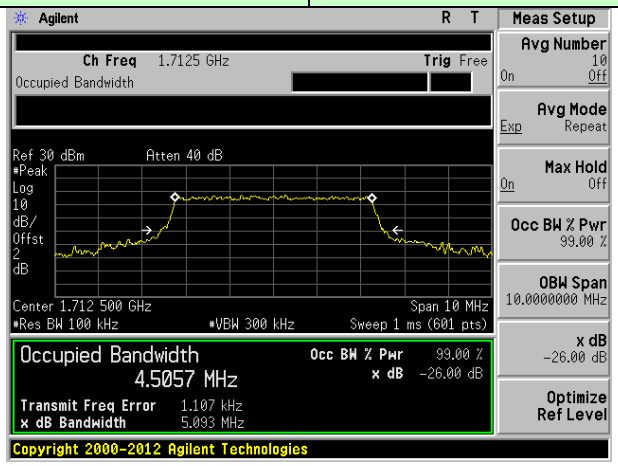


Middle channel

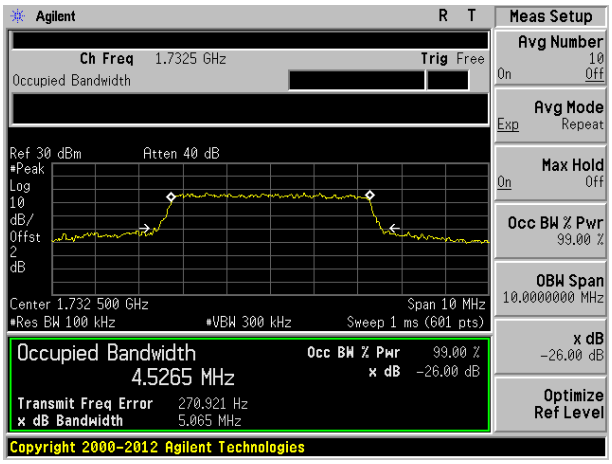


Highest channel

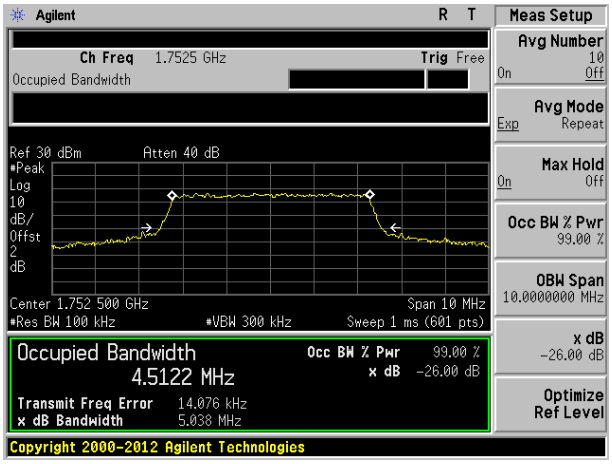
Test band: LTE Band 4	Channel Bandwidth: 5MHz



Lowest channel

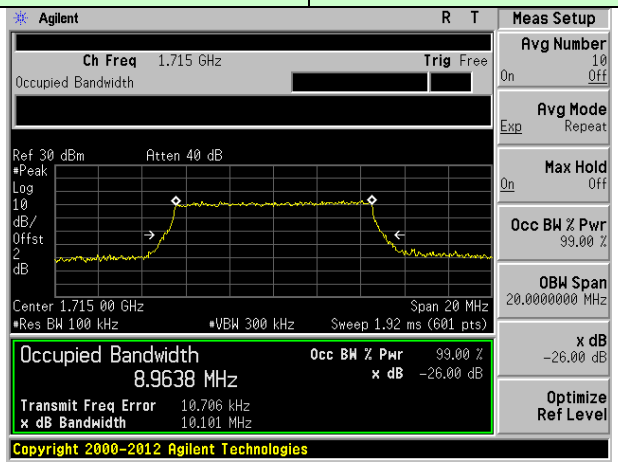


Middle channel

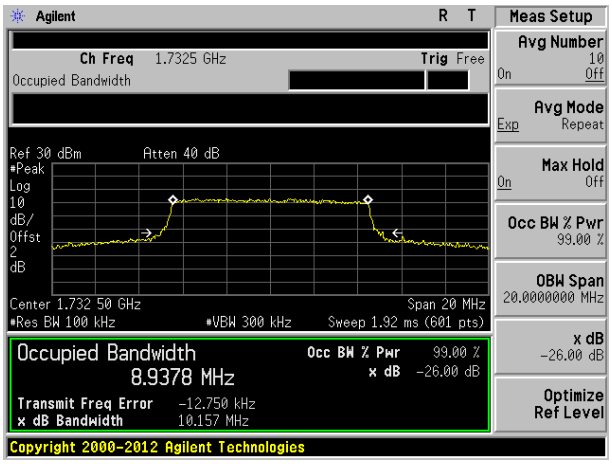


Highest channel

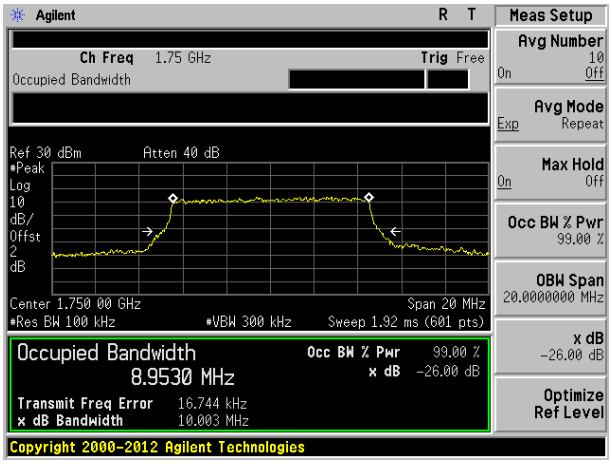
Test band: LTE Band 4	Channel Bandwidth: 10MHz



Lowest channel

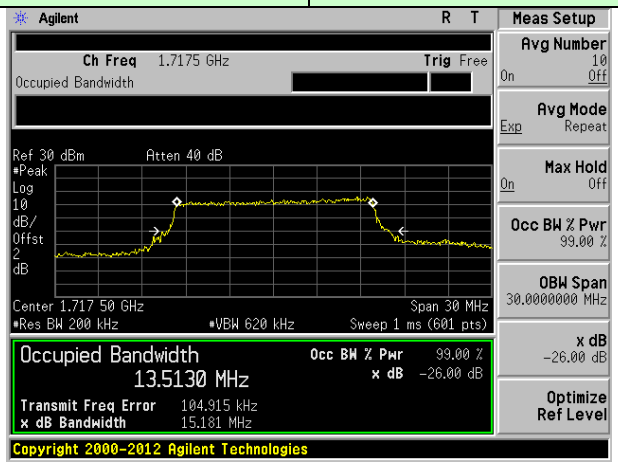


Middle channel

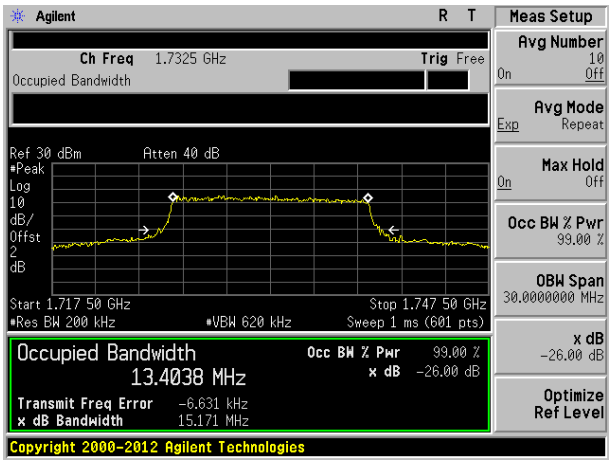


Highest channel

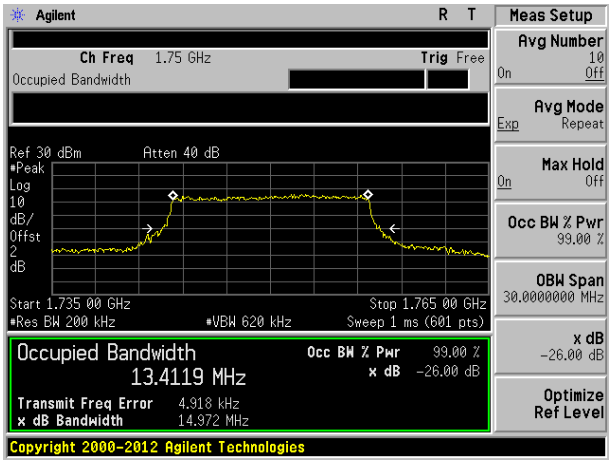
Test band: LTE Band 4	Channel Bandwidth: 15MHz



Lowest channel

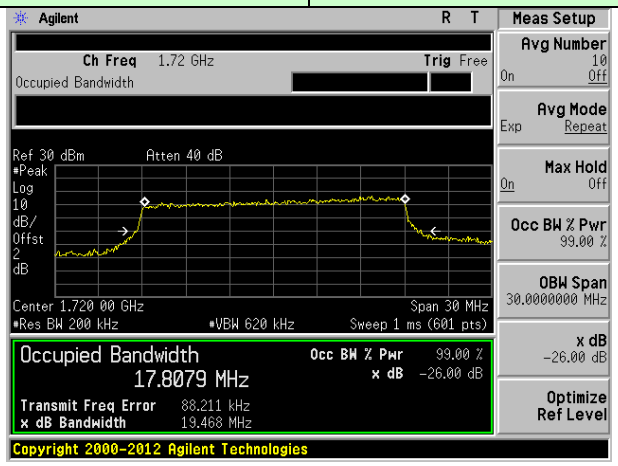


Middle channel

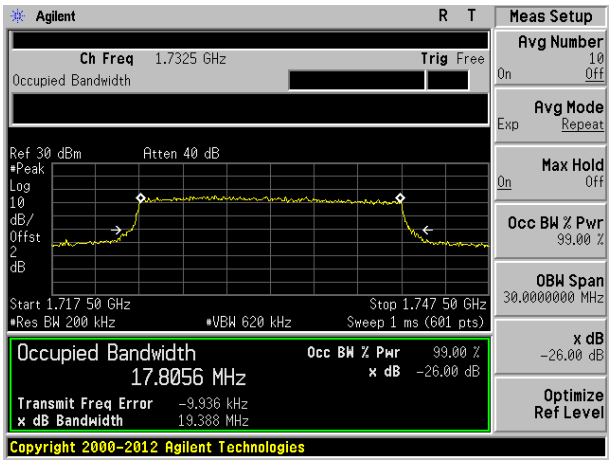


Highest channel

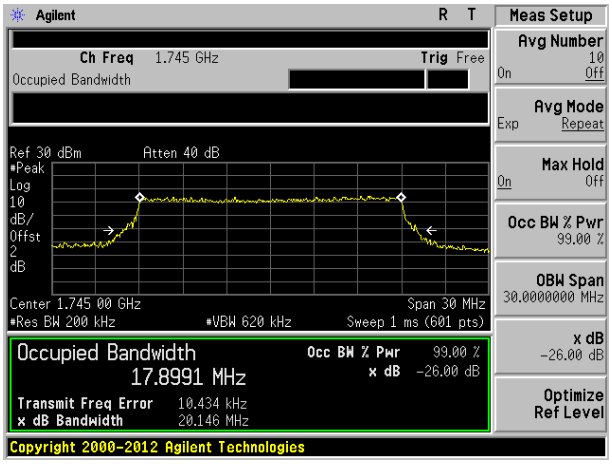
Test band: LTE Band 4	Channel Bandwidth: 20MHz



Lowest channel

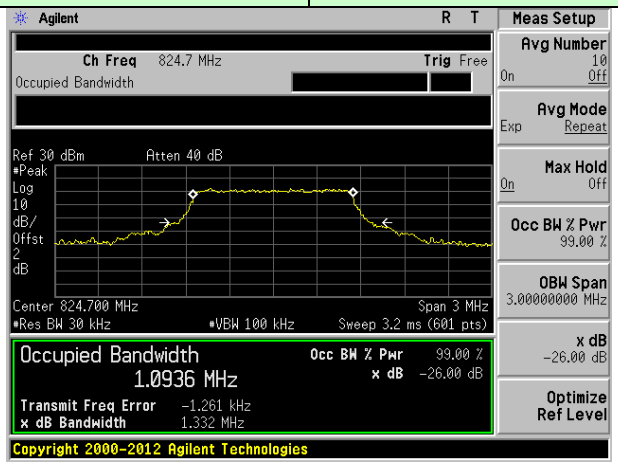


Middle channel

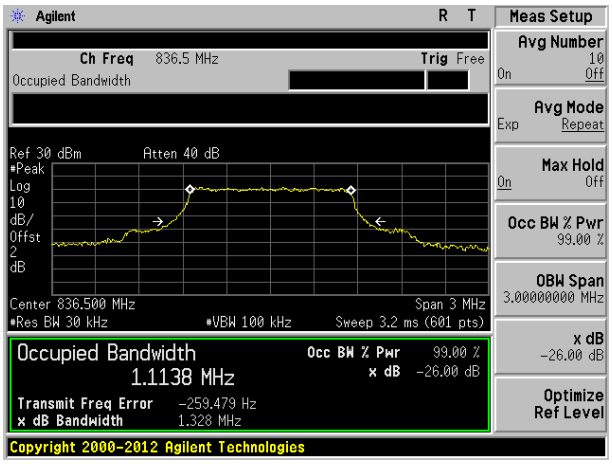


Highest channel

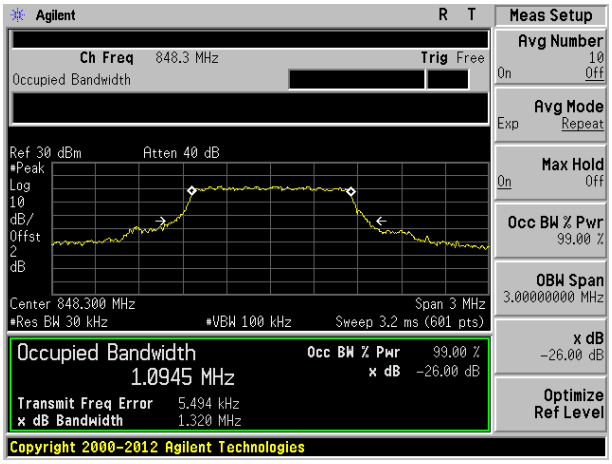
Test band: LTE Band 5	Channel Bandwidth: 1.4MHz



Lowest channel

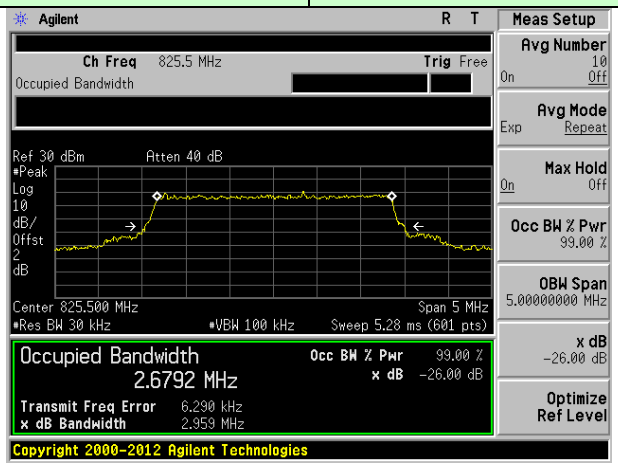


Middle channel

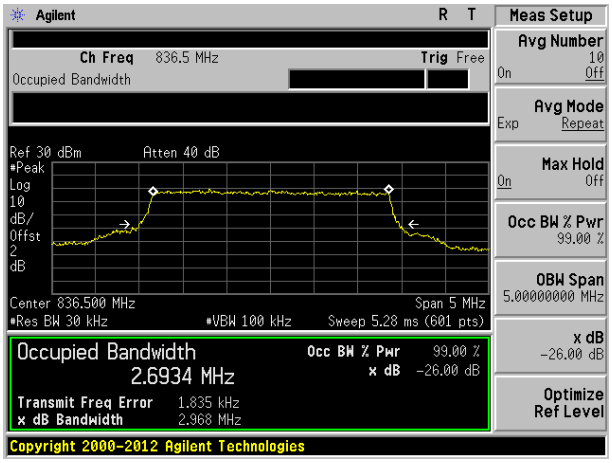


Highest channel

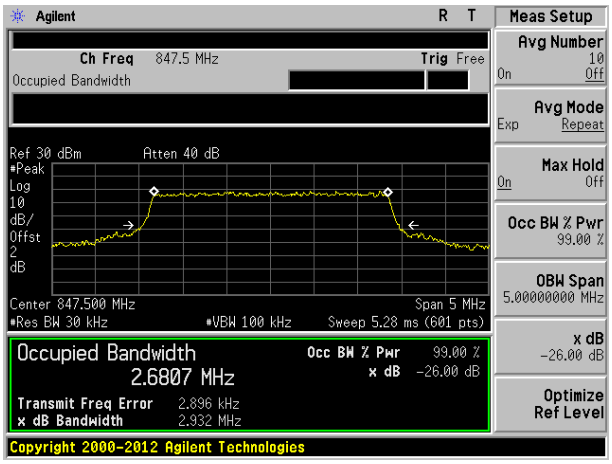
Test band: LTE Band 5	Channel Bandwidth: 3MHz



Lowest channel

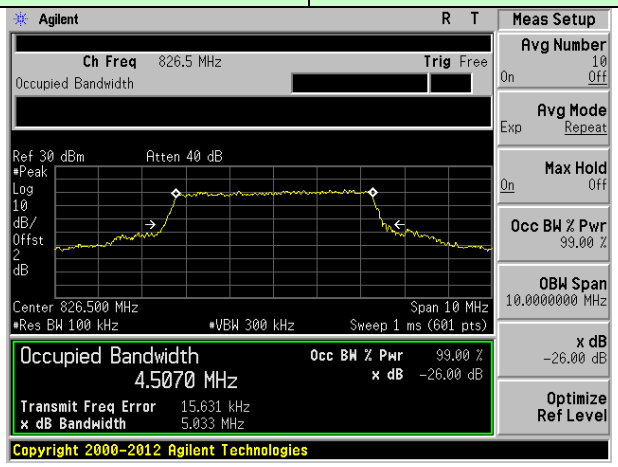


Middle channel

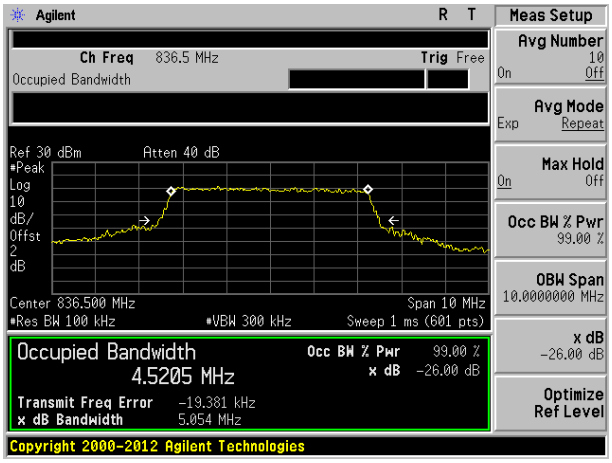


Highest channel

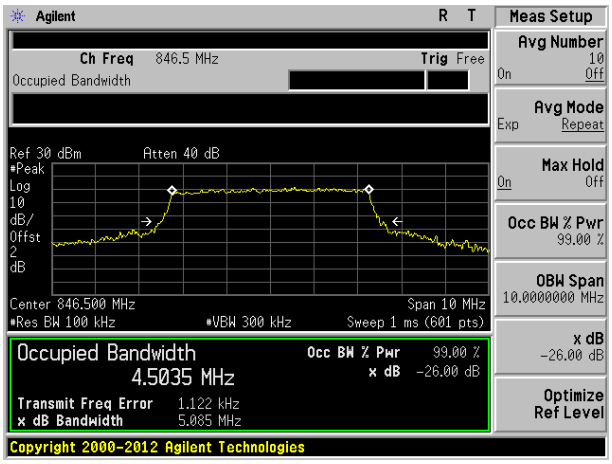
Test band: LTE Band 5	Channel Bandwidth: 5MHz



Lowest channel

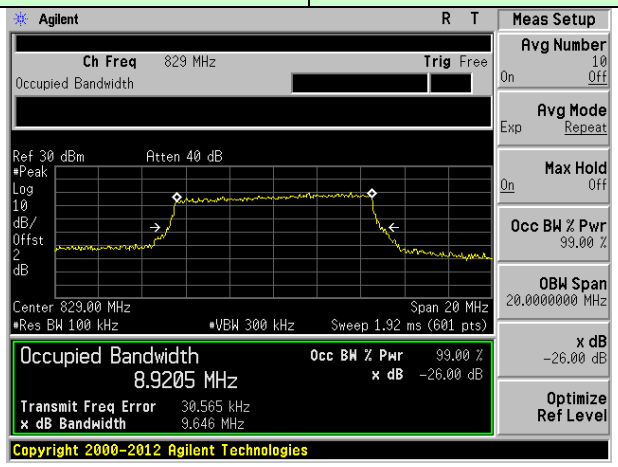


Middle channel

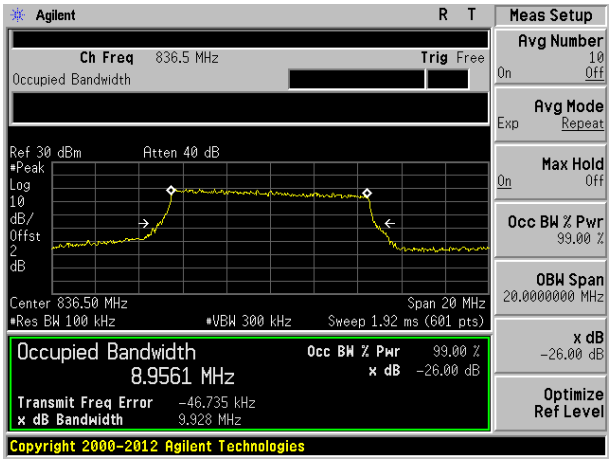


Highest channel

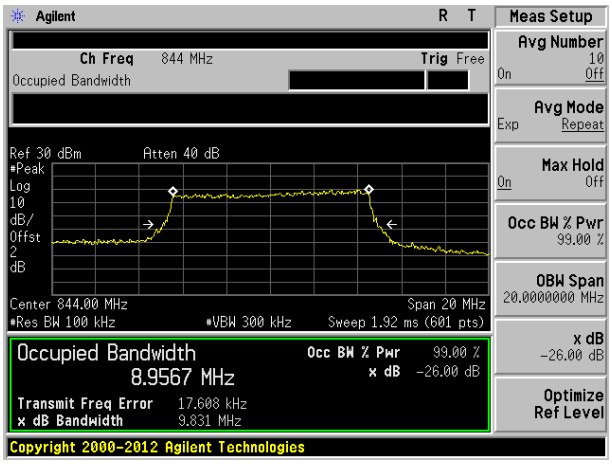
Test band: LTE Band 5	Channel Bandwidth: 10MHz



Lowest channel

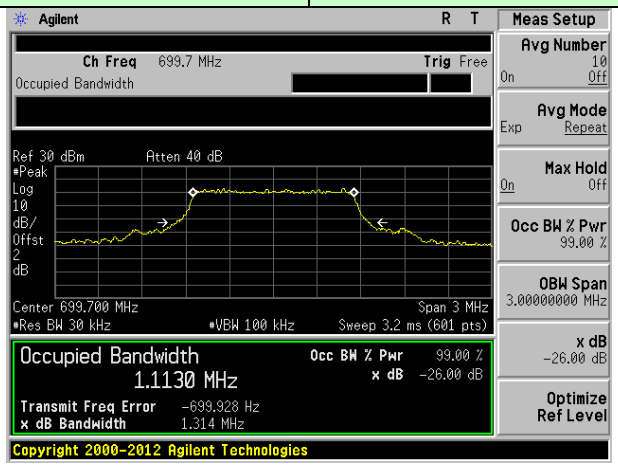


Middle channel

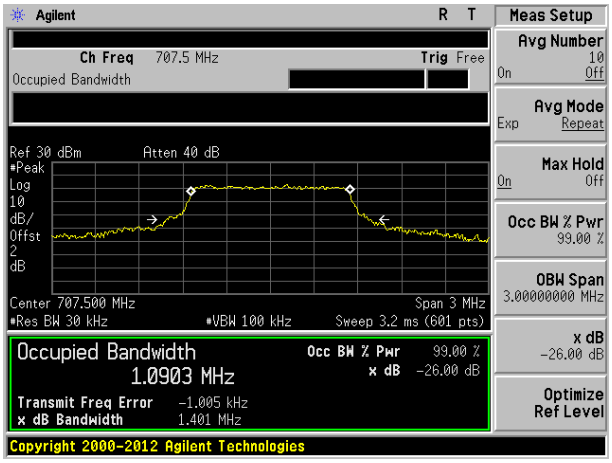


Highest channel

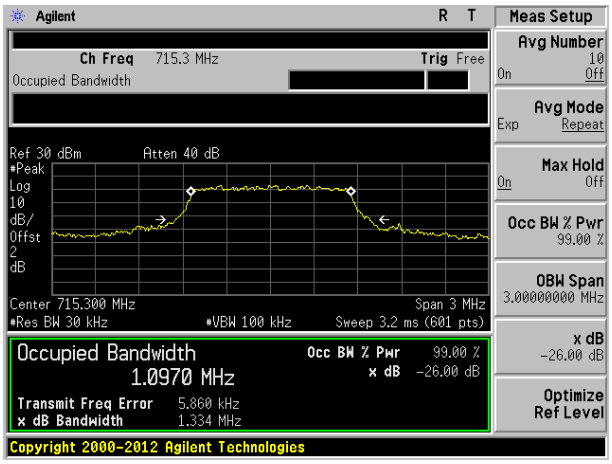
Test band: LTE Band 12	Channel Bandwidth: 1.4MHz



Lowest channel

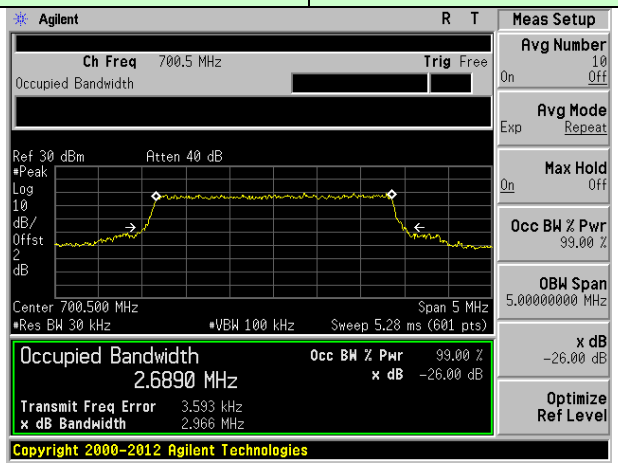


Middle channel

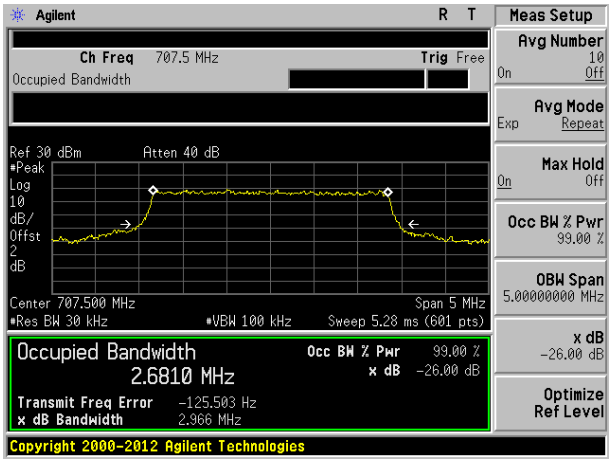


Highest channel

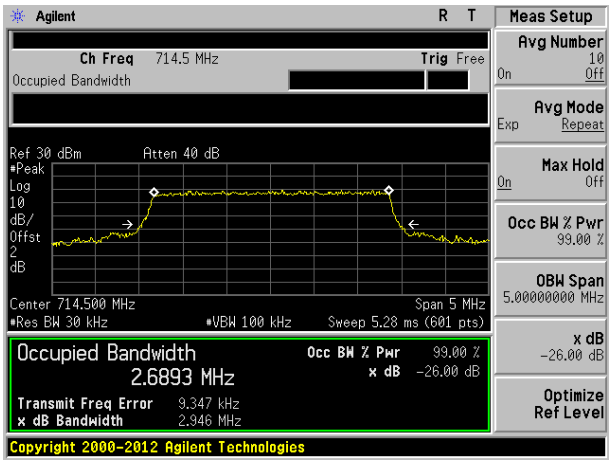
Test band: LTE Band 12	Channel Bandwidth: 3MHz



Lowest channel

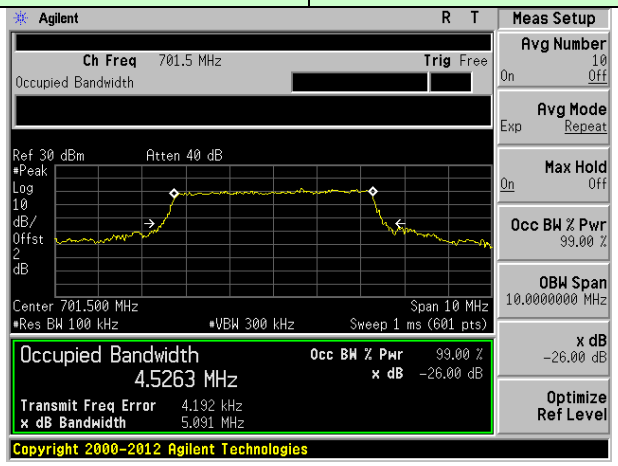


Middle channel

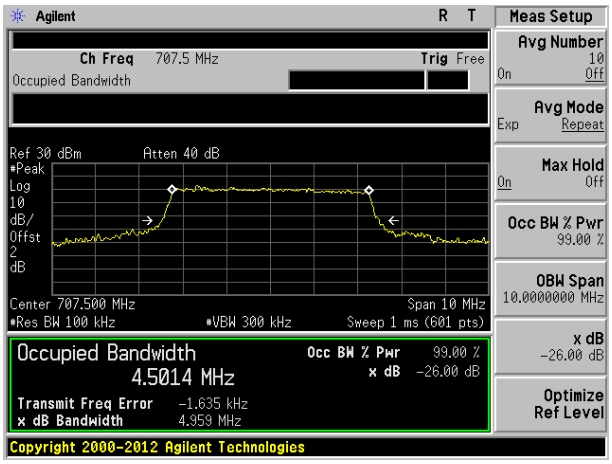


Highest channel

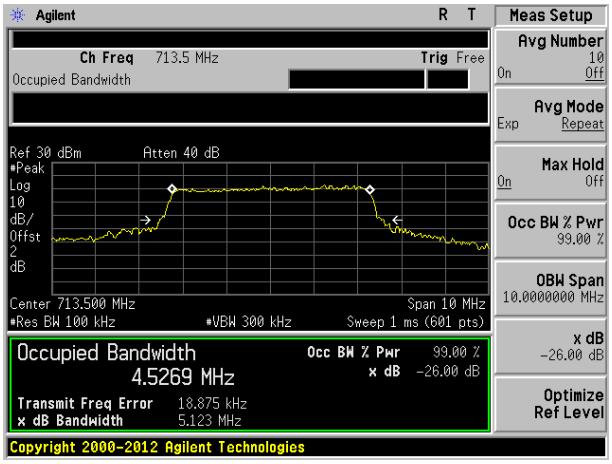
Test band: LTE Band 12	Channel Bandwidth: 5MHz



Lowest channel

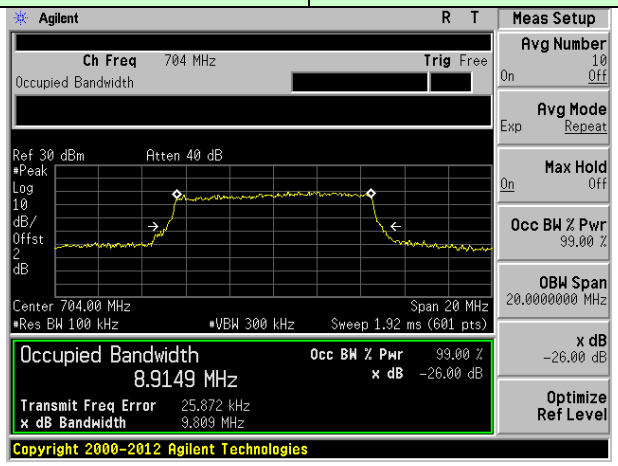


Middle channel

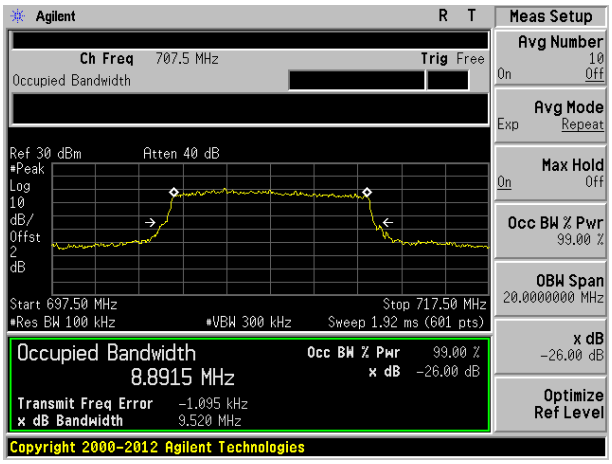


Highest channel

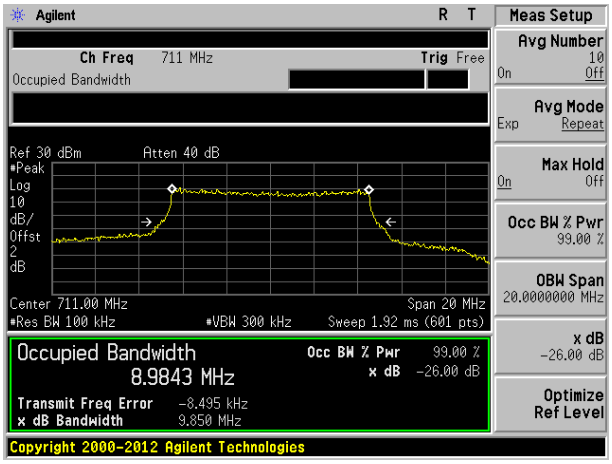
Test band: LTE Band 12	Channel Bandwidth: 10MHz



Lowest channel

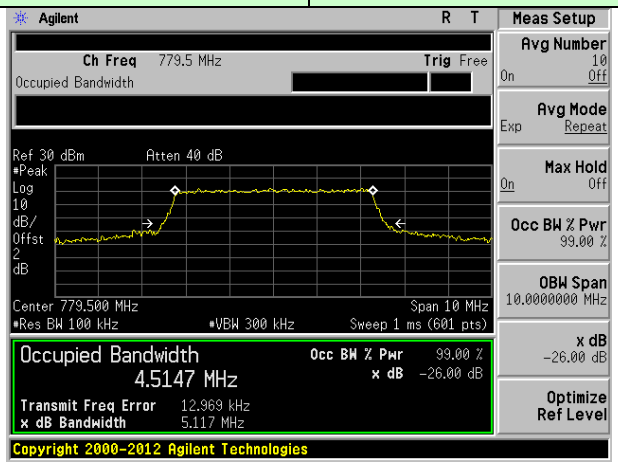


Middle channel

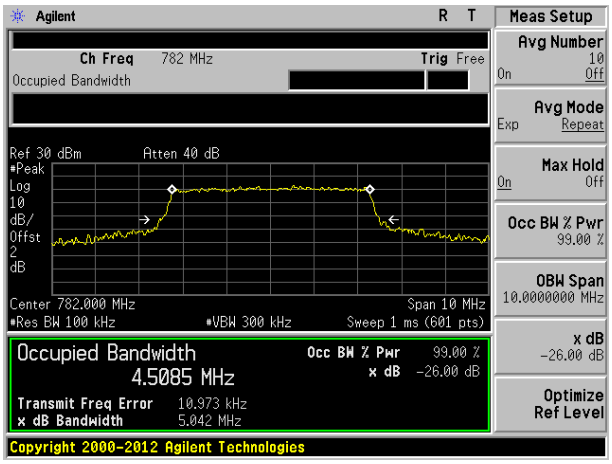


Highest channel

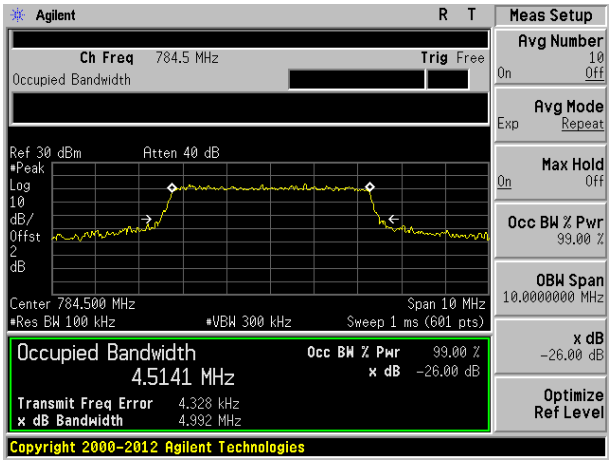
Test band: LTE Band 13	Channel Bandwidth: 5MHz



Lowest channel

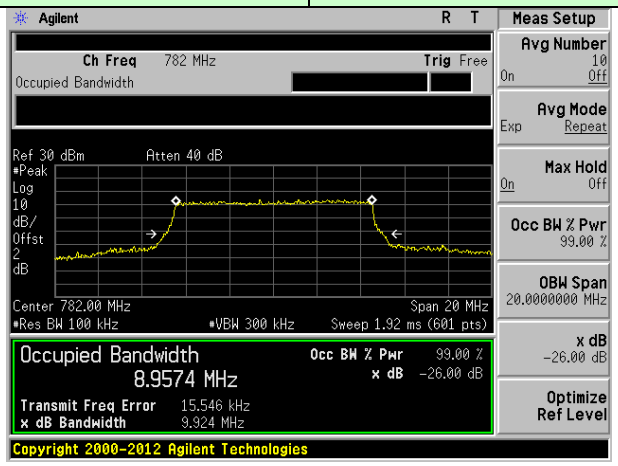


Middle channel



Highest channel

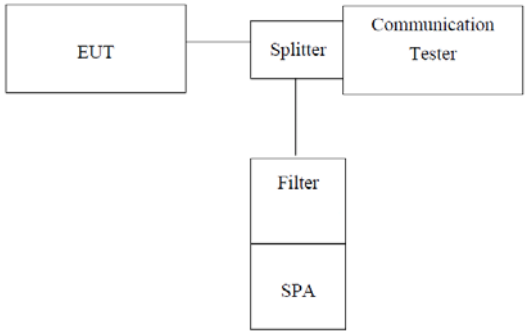
Test band: LTE Band 13	Channel Bandwidth: 10MHz



6.7 MODULATION CHARACTERISTIC

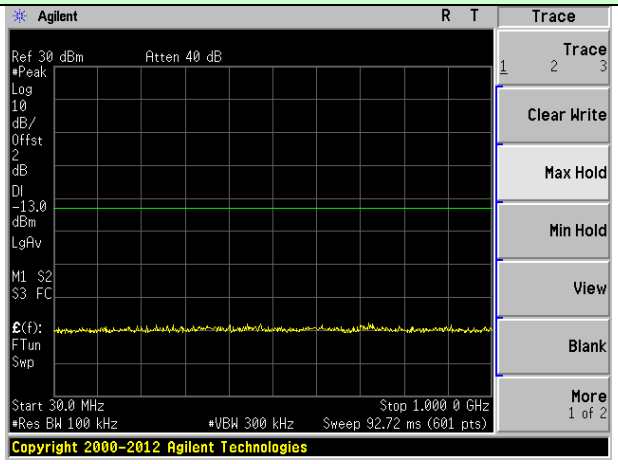
According to FCC § 2.1047(d), Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

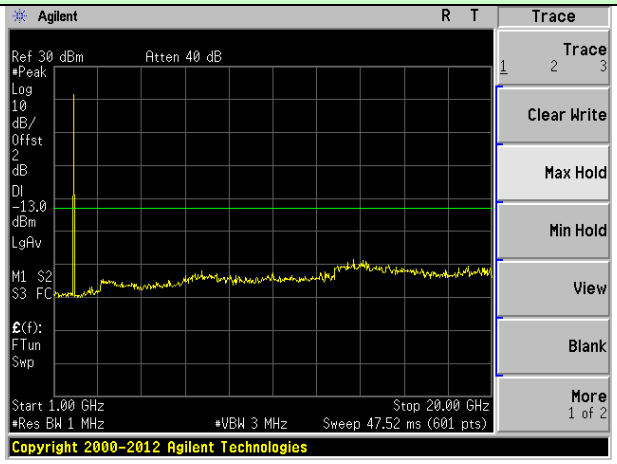
6.8 Out of band emission at antenna terminals

Test Requirement for FCC:	Part 24.238 (a); FCC Part 27.53(h)/(g)
Test Requirement for IC:	RSS-130 Clause 4.6, RSS-132 Clause 5.4, RSS-139 Clause 6.6, RSS-133 Clause 6.5
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 5.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

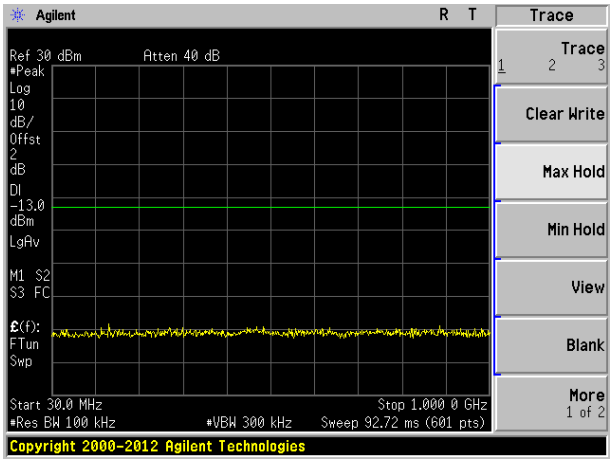
Test plot as follows:

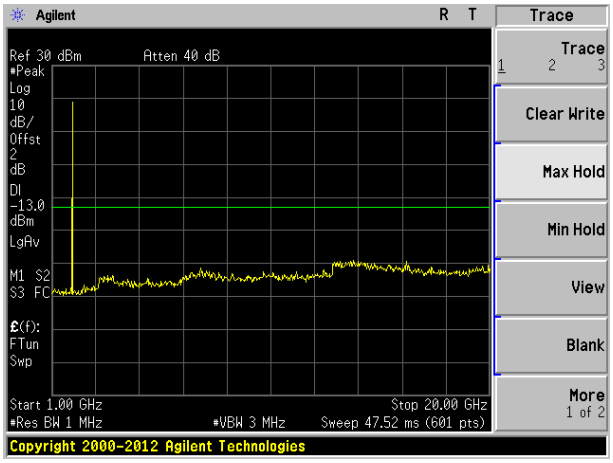
Test Mode: LTE Band 2	Channel Bandwidth: 1.4MHz



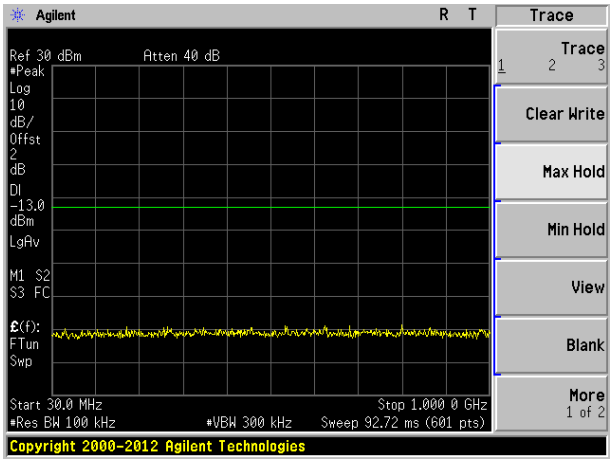


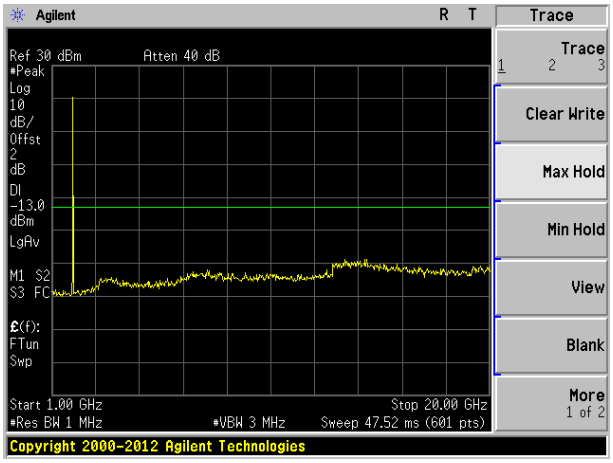
Lowest channel





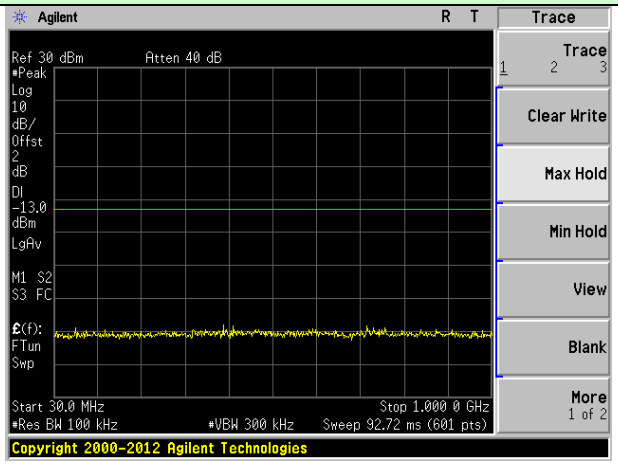
Middle channel

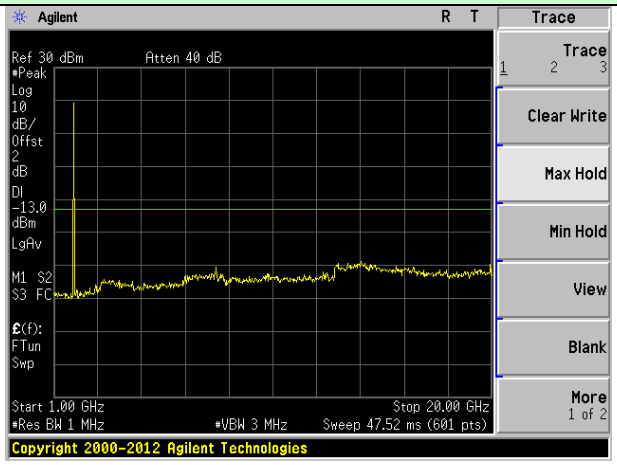




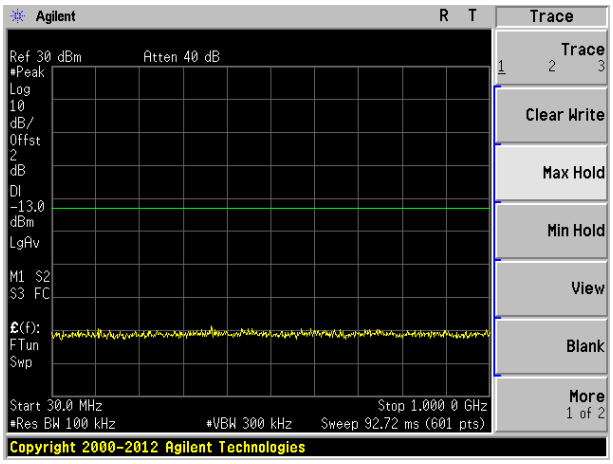
Highest channel

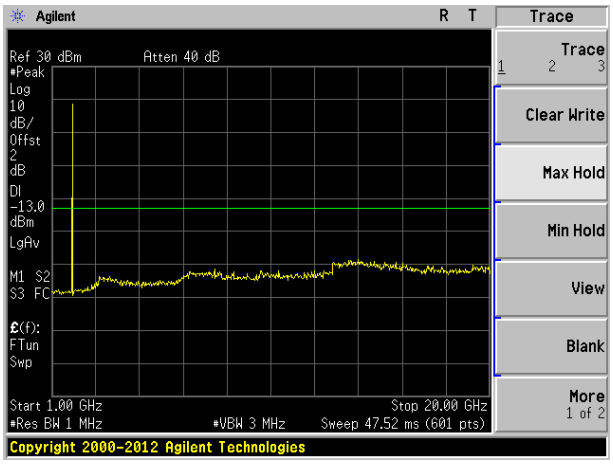
Test Mode: LTE Band 2	Channel Bandwidth: 3MHz



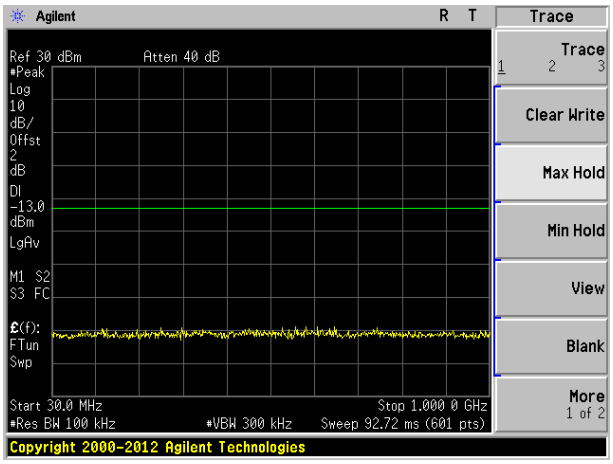


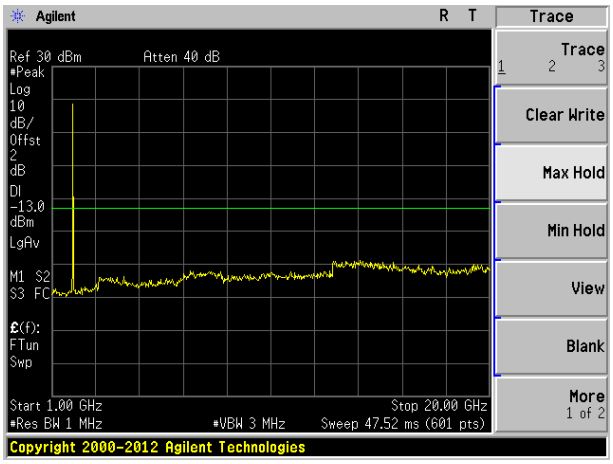
Lowest channel





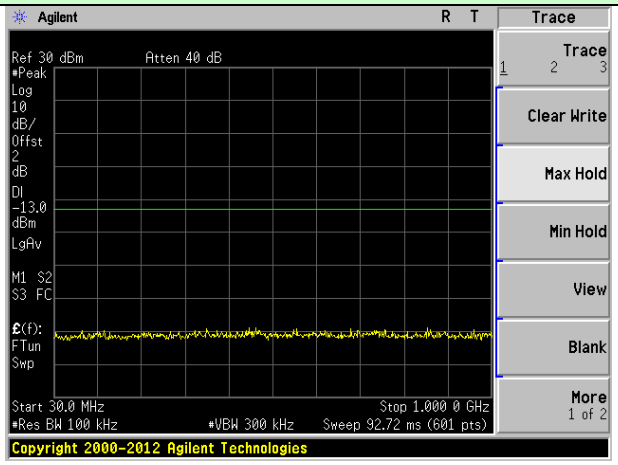
Middle channel

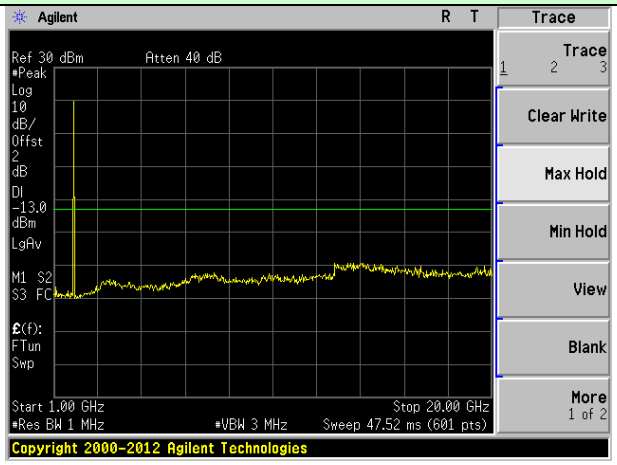




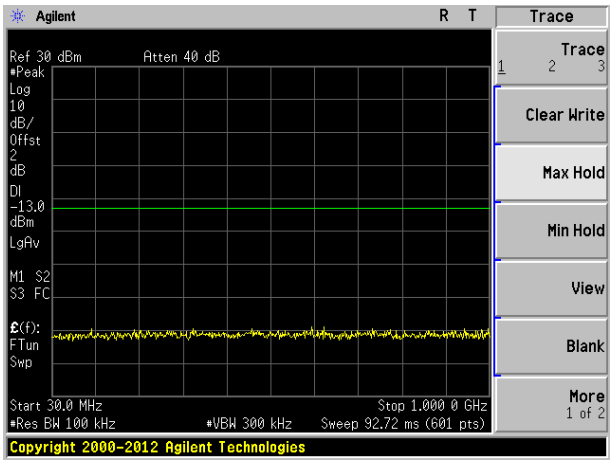
Highest channel

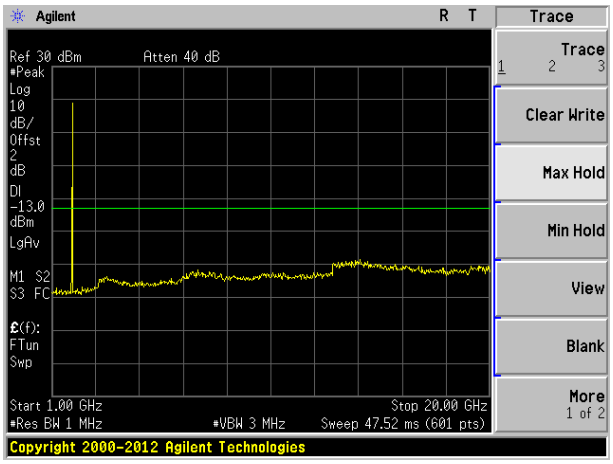
Test Mode: LTE Band 2	Channel Bandwidth: 5MHz



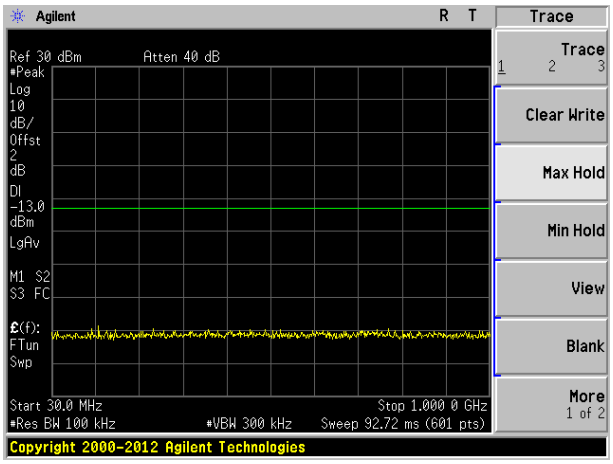


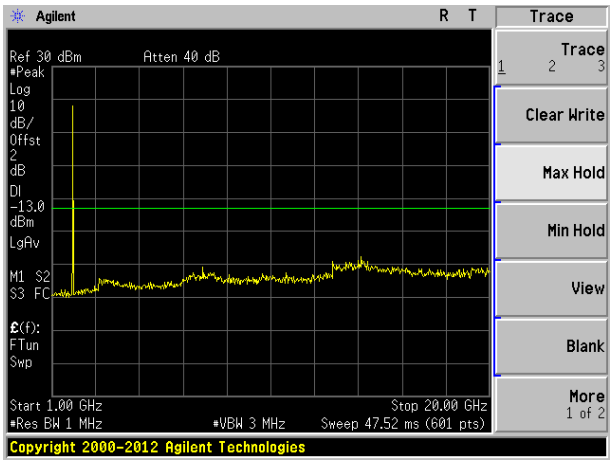
Lowest channel





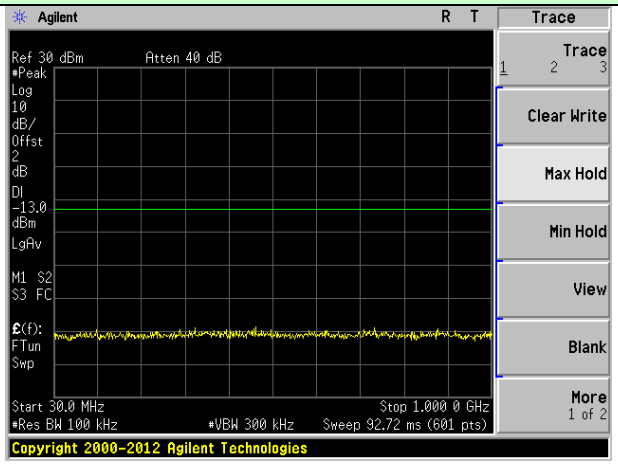
Middle channel

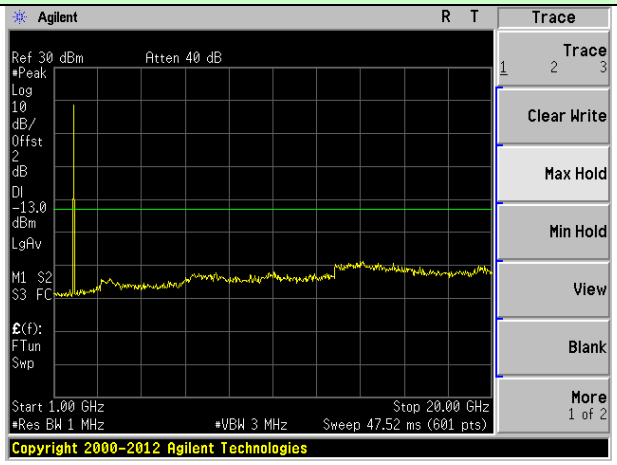




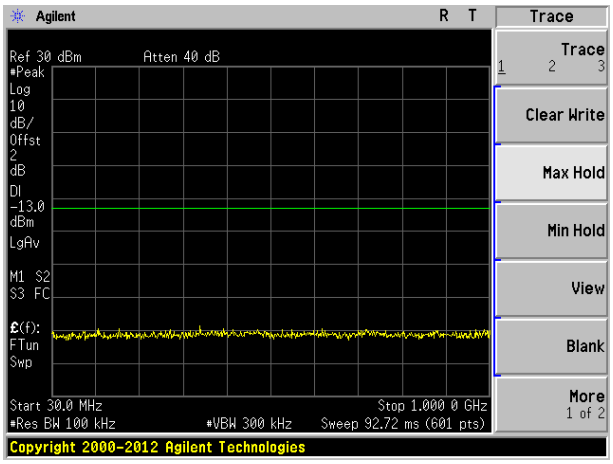
Highest channel

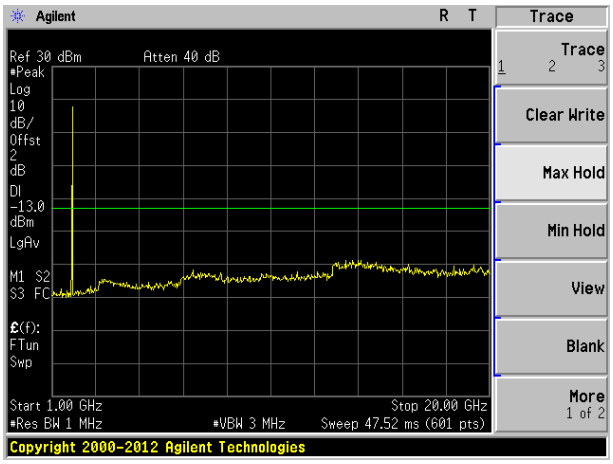
Test Mode: LTE Band 2	Channel Bandwidth: 10MHz



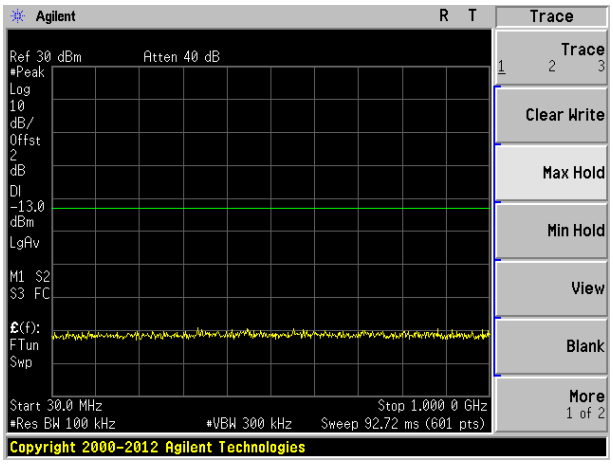


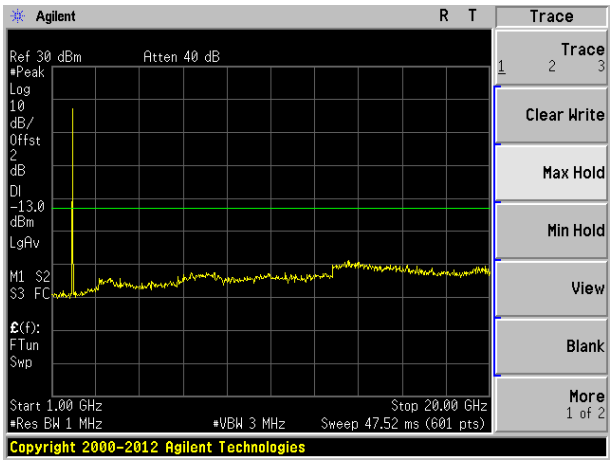
Lowest channel





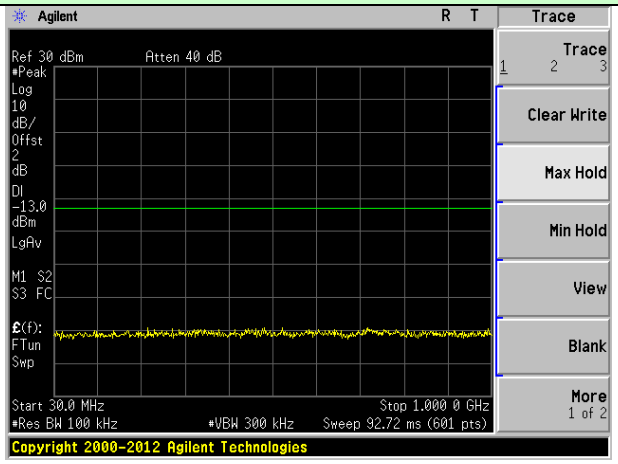
Middle channel

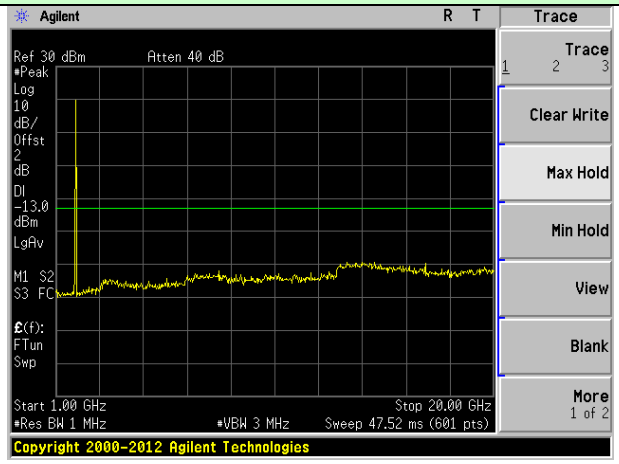




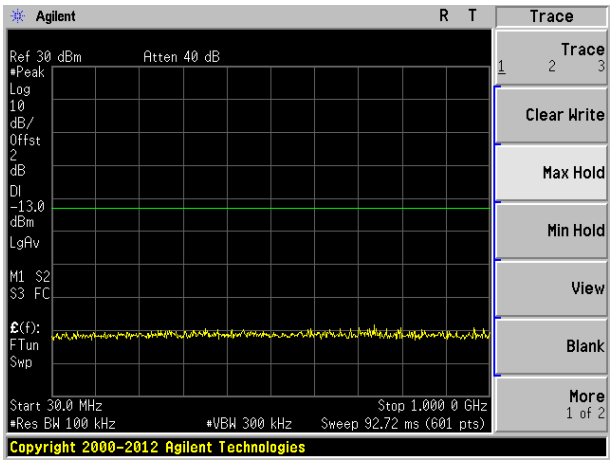
Highest channel

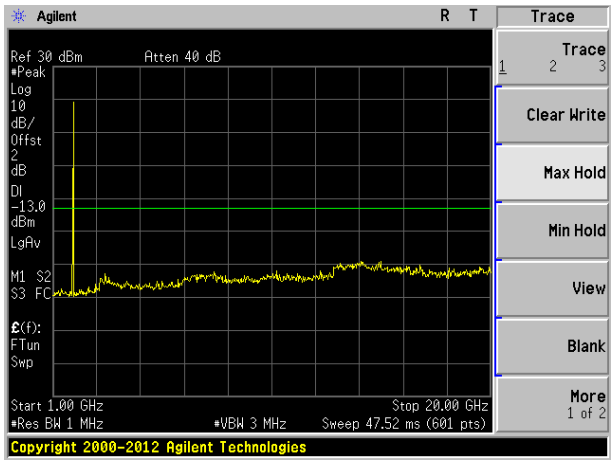
Test Mode: LTE Band 2	Channel Bandwidth: 15MHz



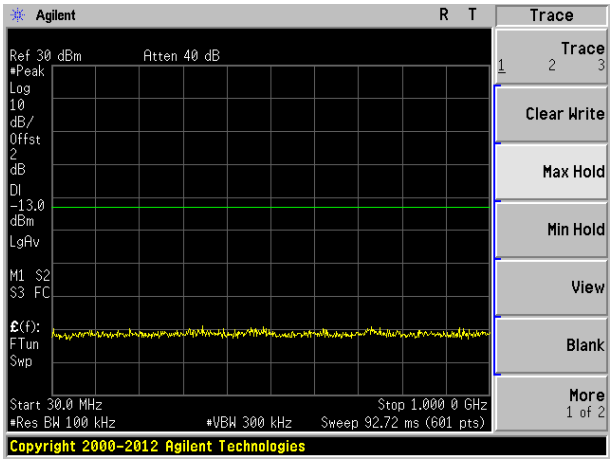


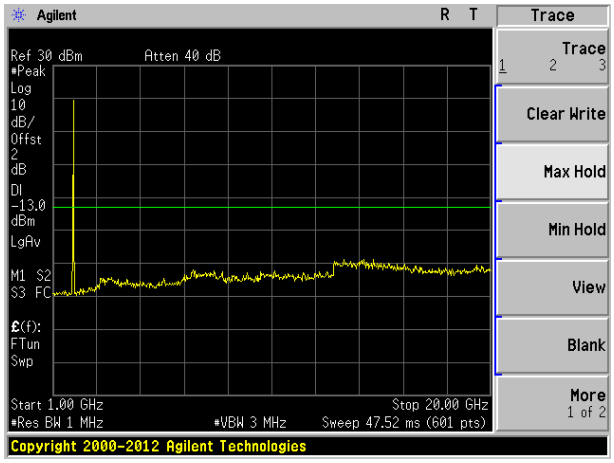
Lowest channel





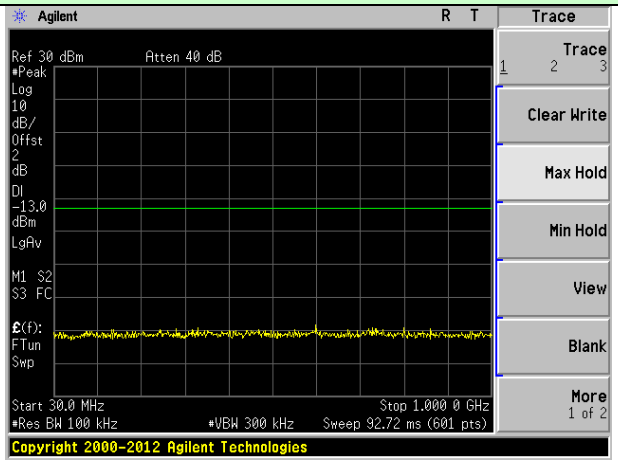
Middle channel

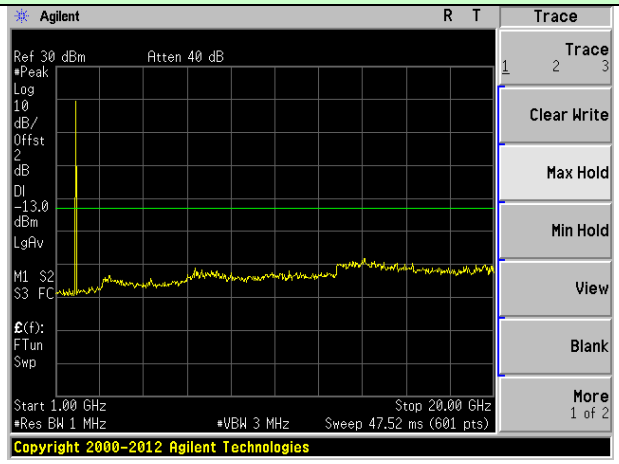




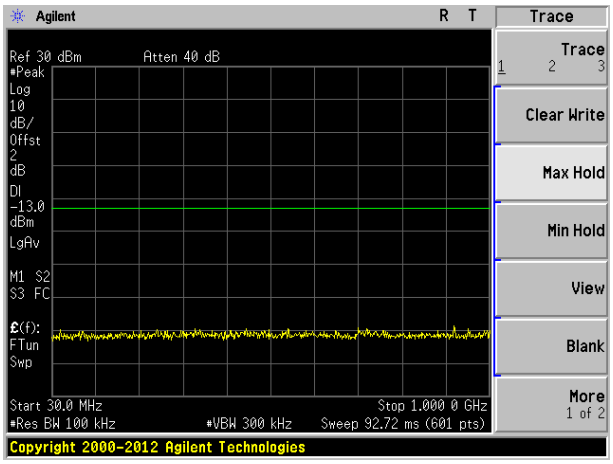
Highest channel

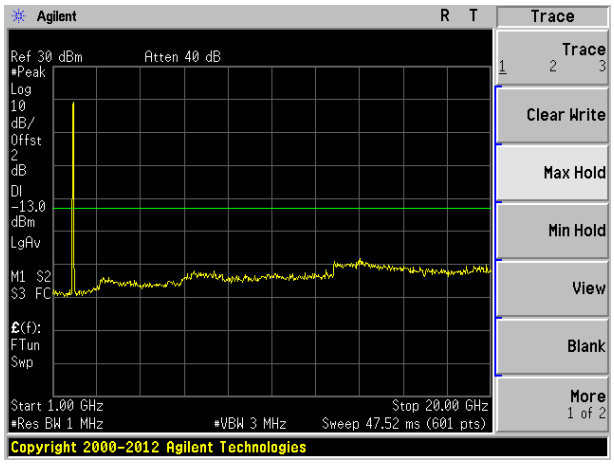
Test Mode: LTE Band 2	Channel Bandwidth: 20MHz



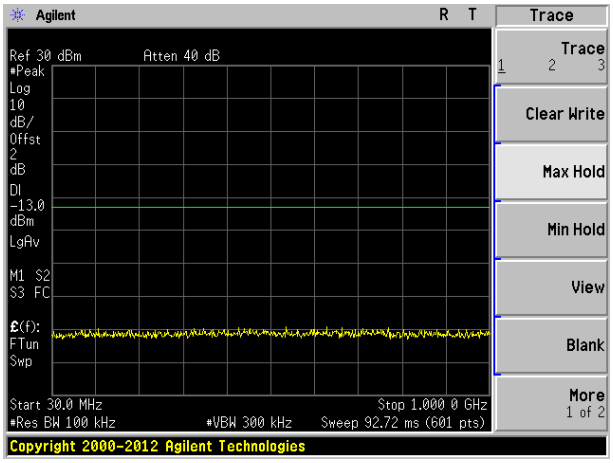


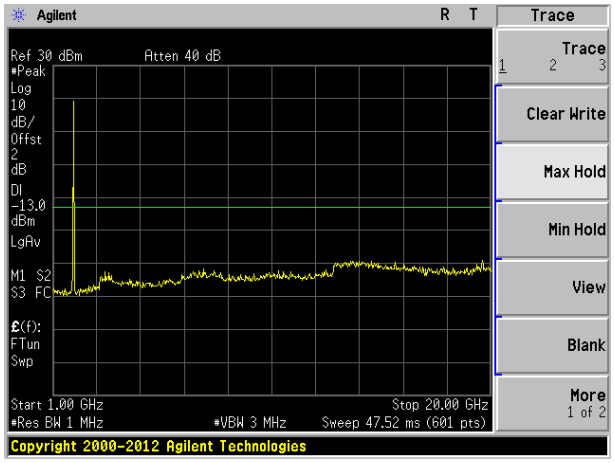
Lowest channel





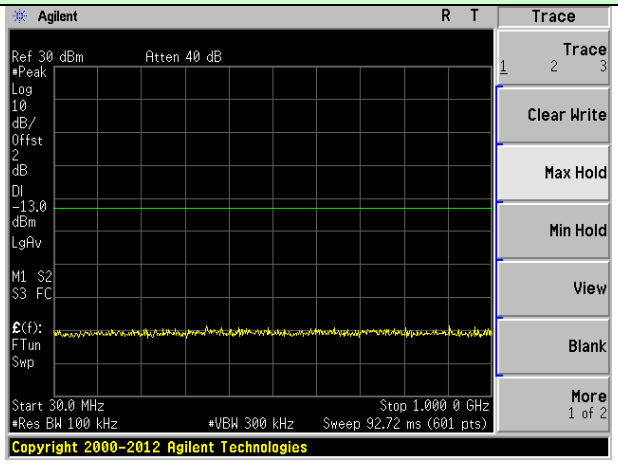
Middle channel

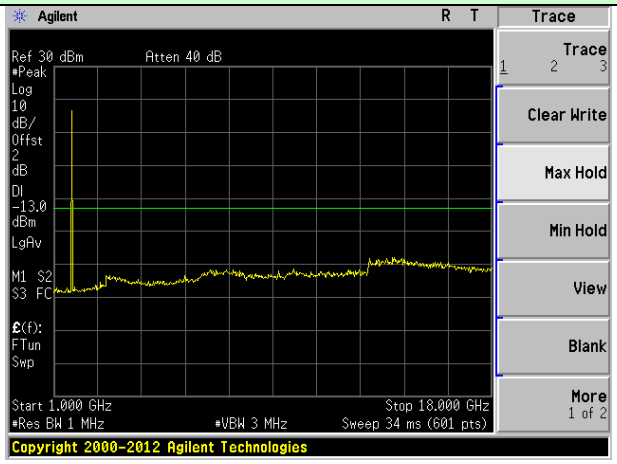




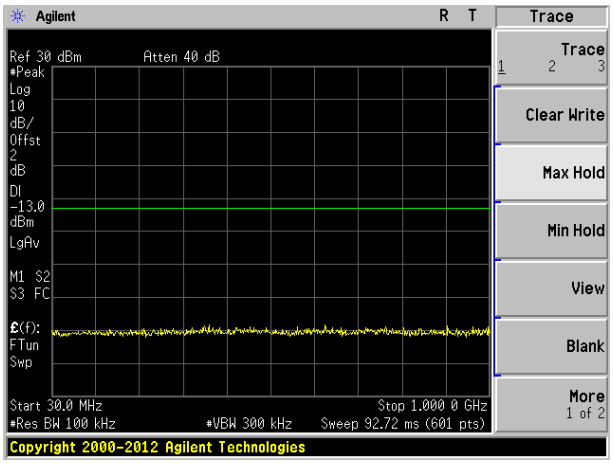
Highest channel

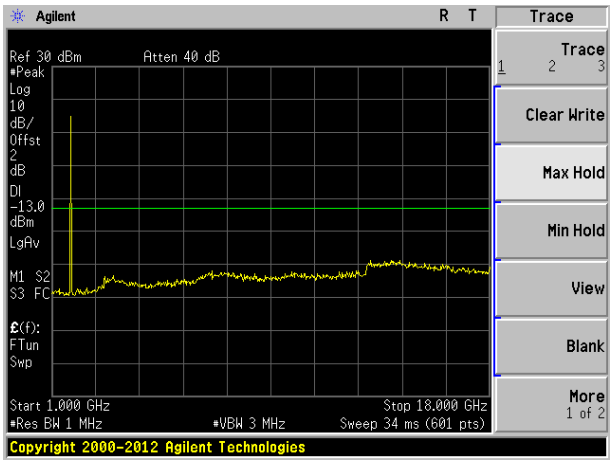
Test Mode: LTE Band 4	Channel Bandwidth: 1.4MHz



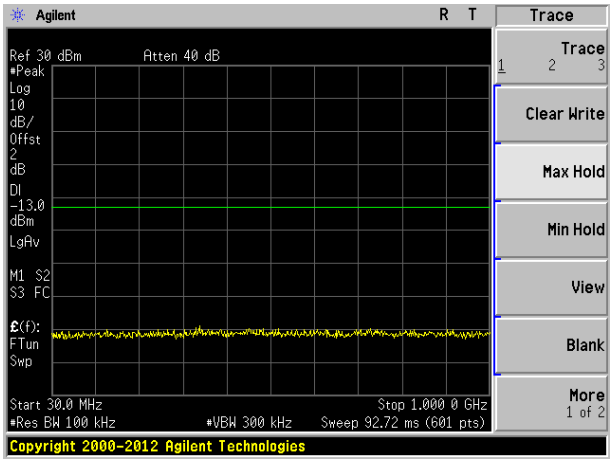


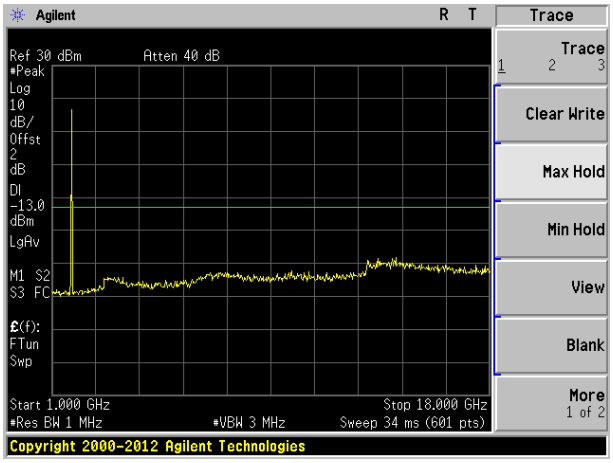
Lowest channel





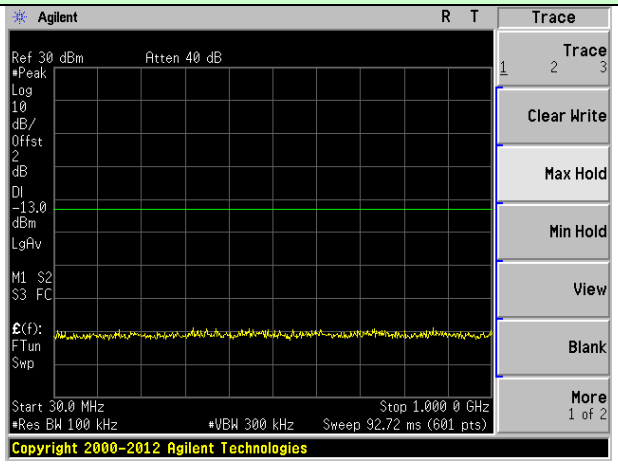
Middle channel

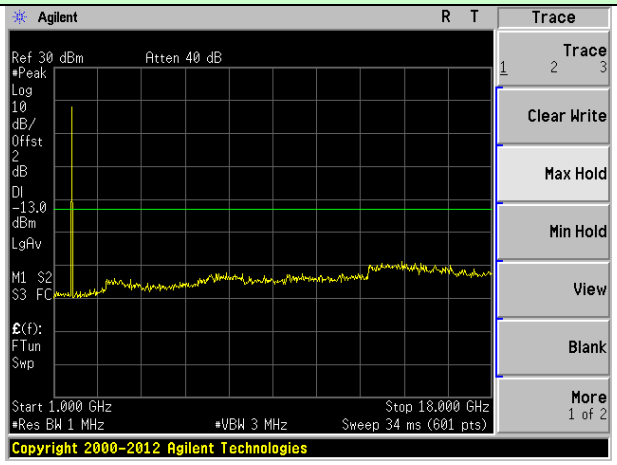




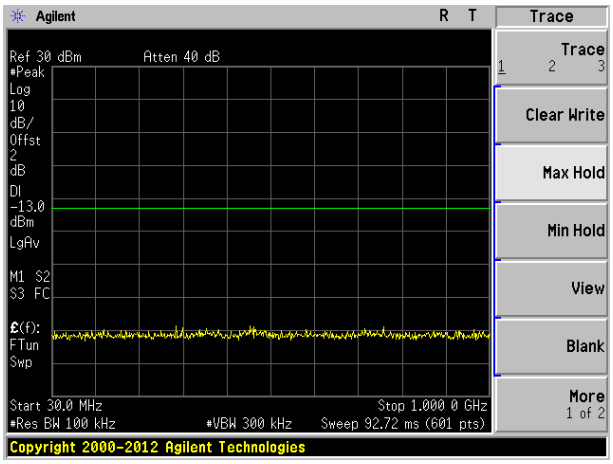
Highest channel

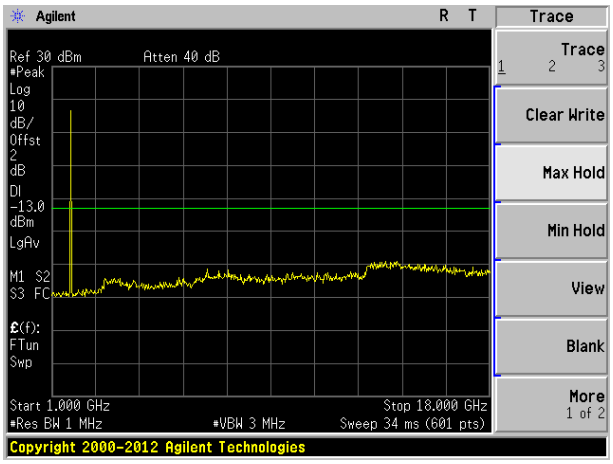
Test Mode: LTE Band 4	Channel Bandwidth: 3MHz



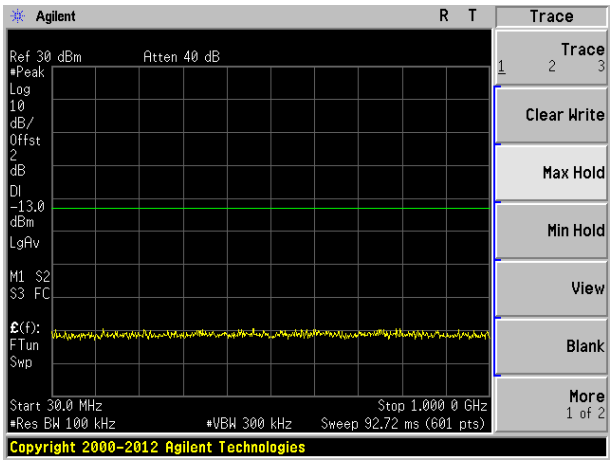


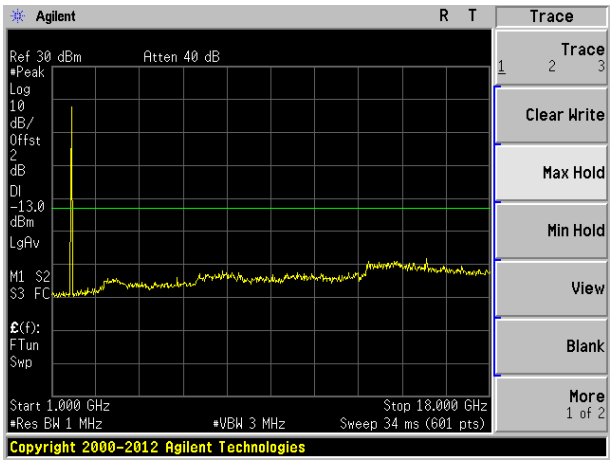
Lowest channel





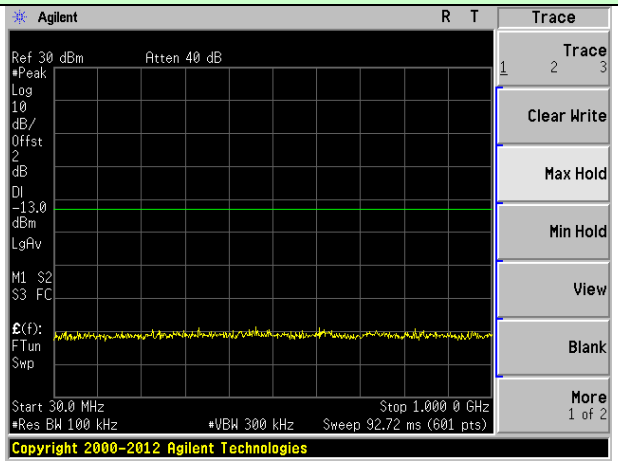
Middle channel

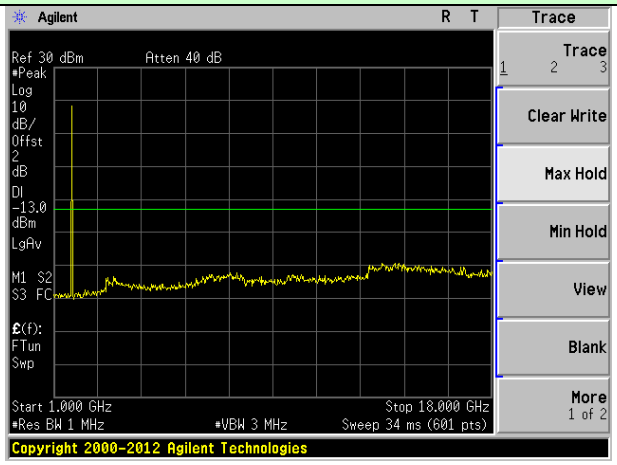




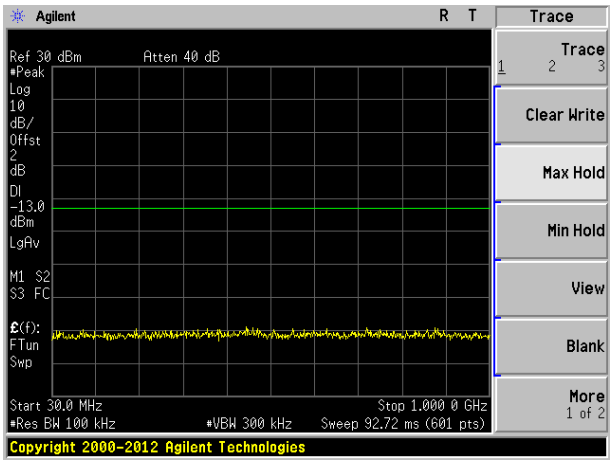
Highest channel

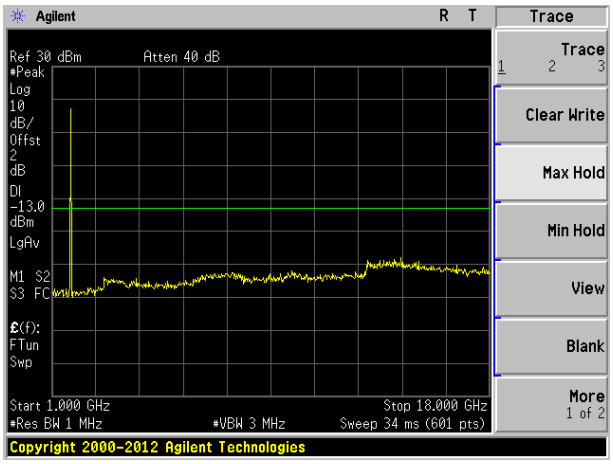
Test Mode: LTE Band 4	Channel Bandwidth: 5MHz



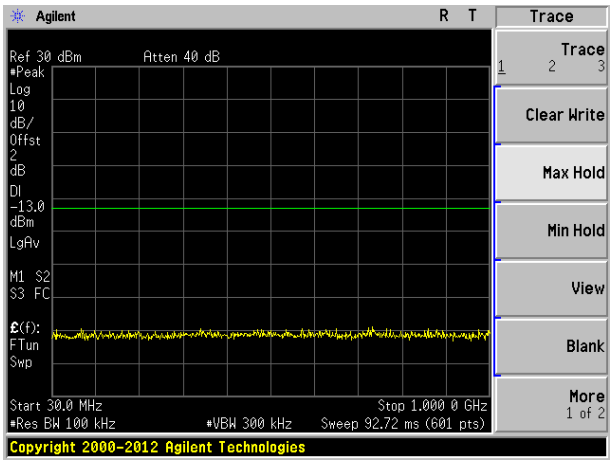


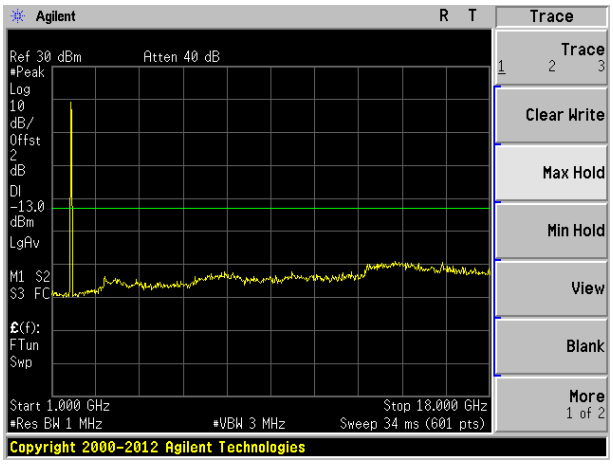
Lowest channel





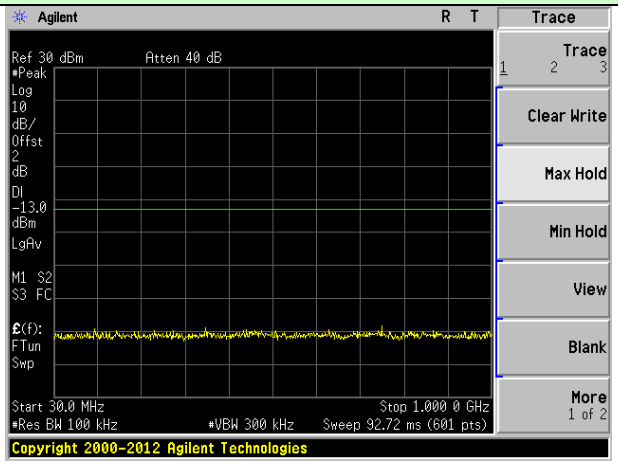
Middle channel

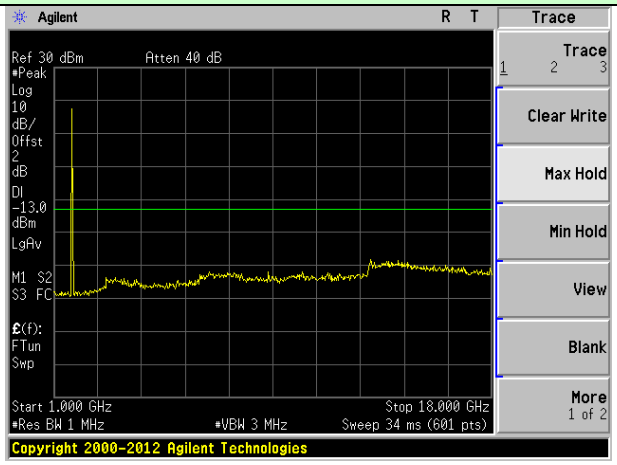




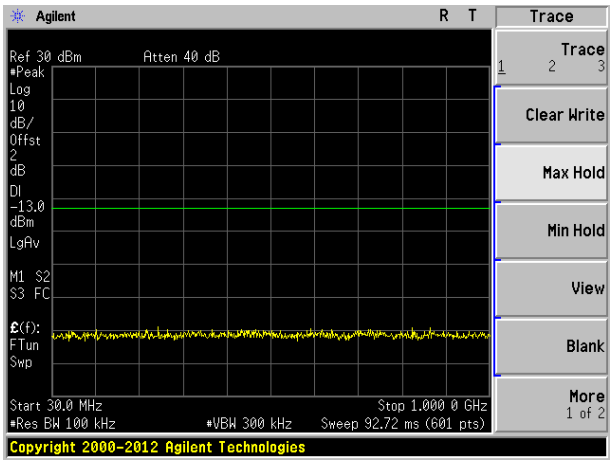
Highest channel

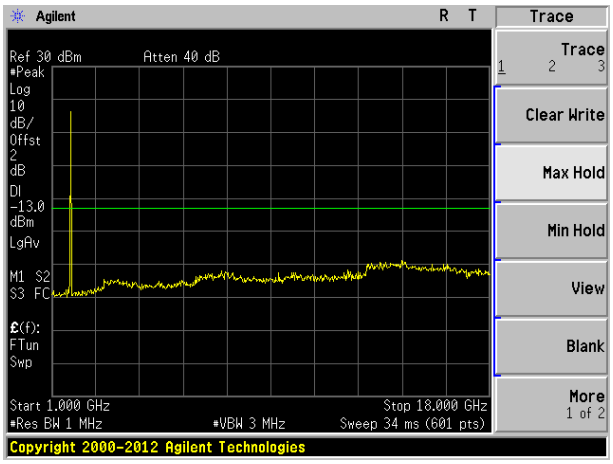
Test Mode: LTE Band 4	Channel Bandwidth: 10MHz



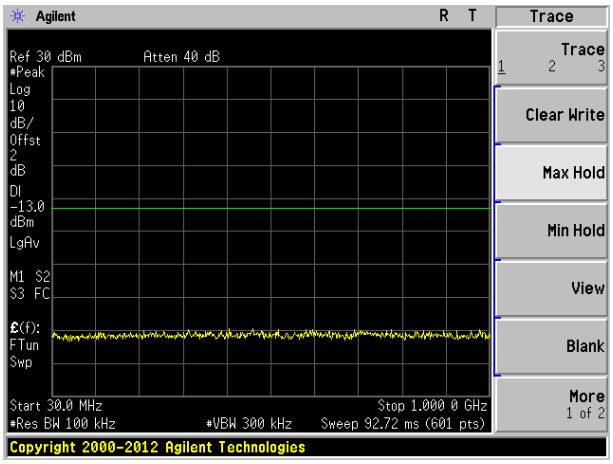


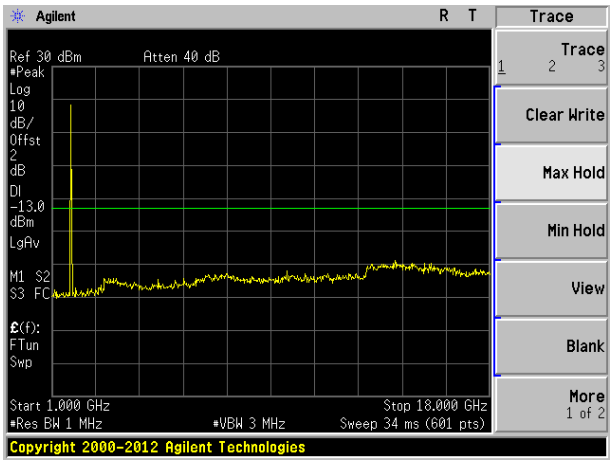
Lowest channel





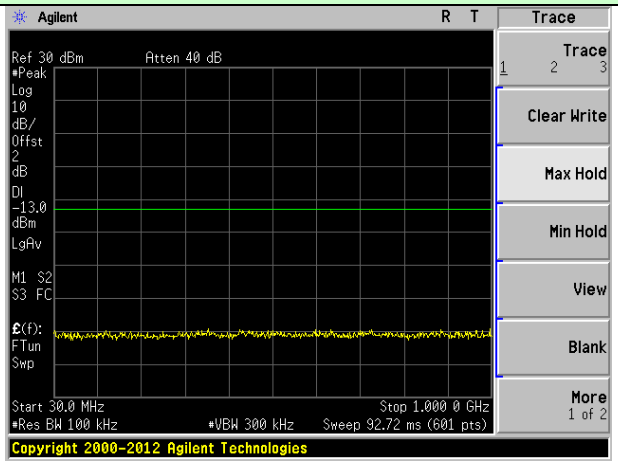
Middle channel

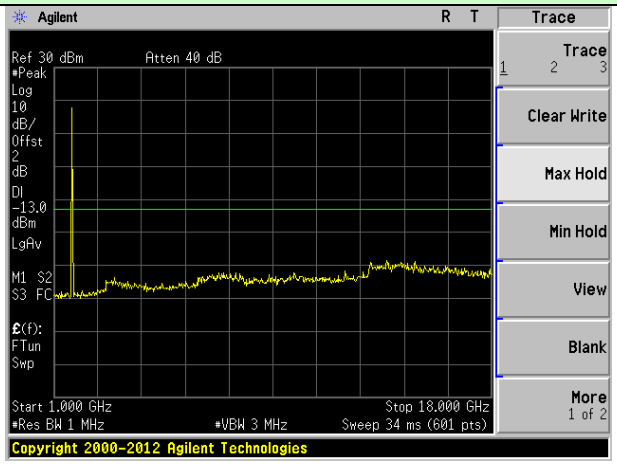




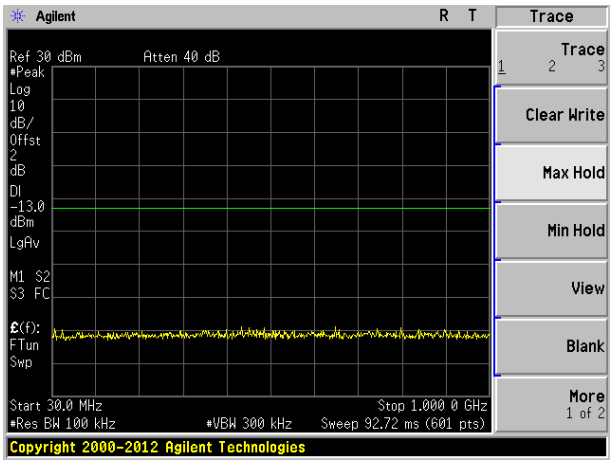
Highest channel

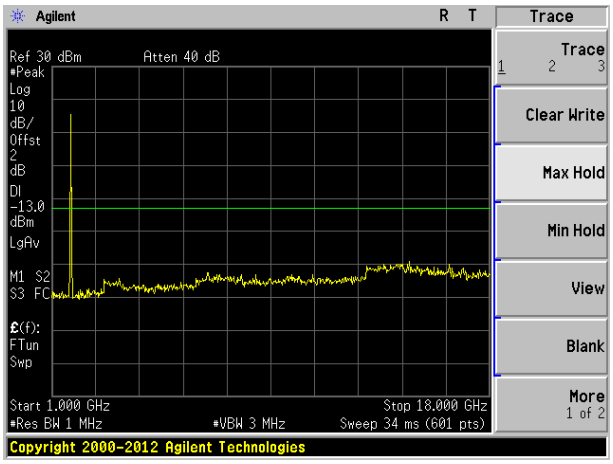
Test Mode: LTE Band 4	Channel Bandwidth: 15MHz



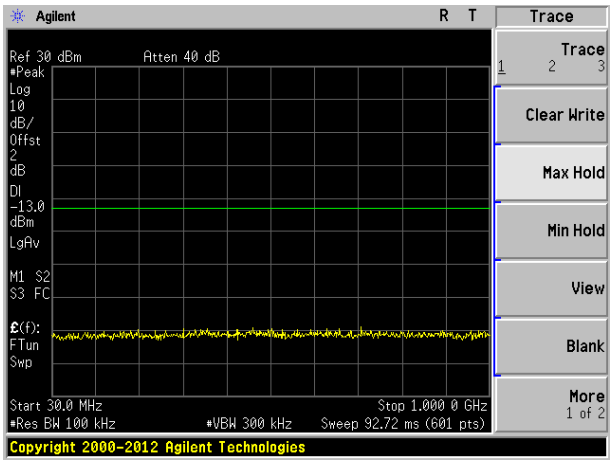


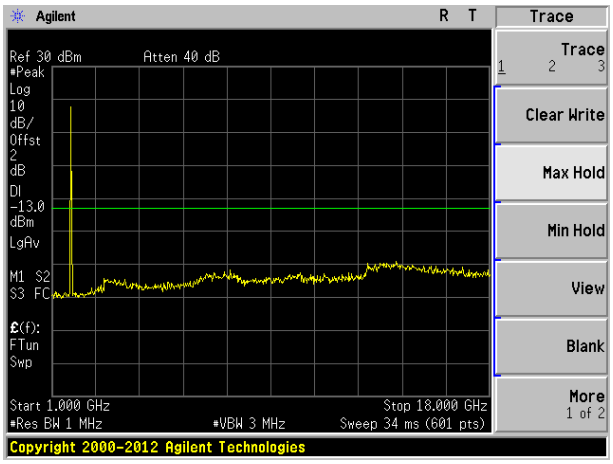
Lowest channel





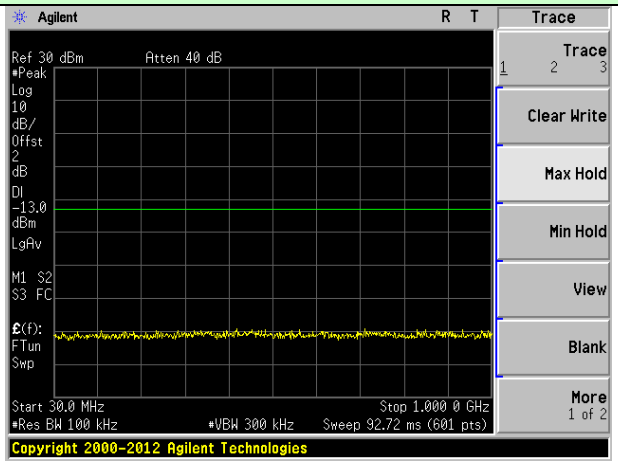
Middle channel

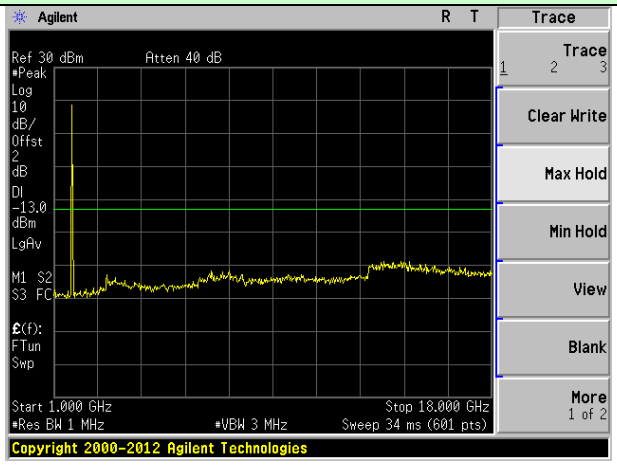




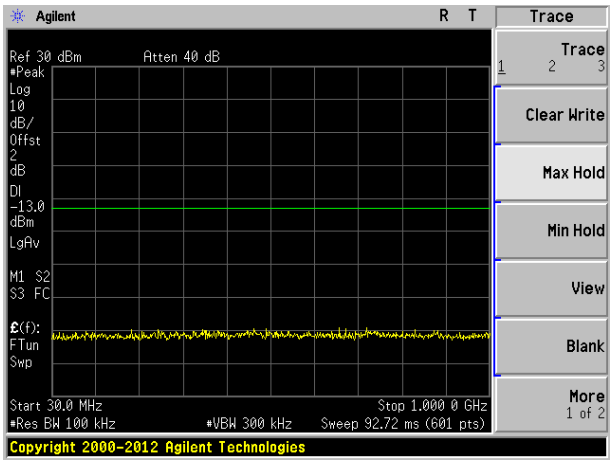
Highest channel

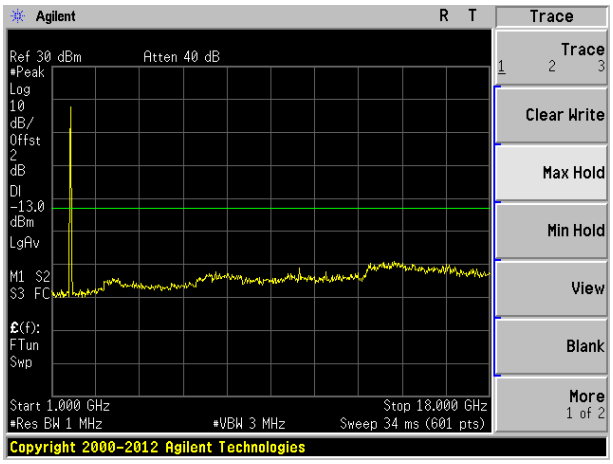
Test Mode: LTE Band 4	Channel Bandwidth: 20MHz



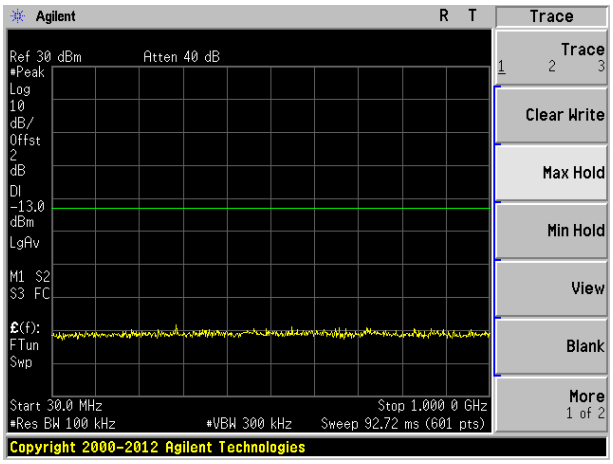


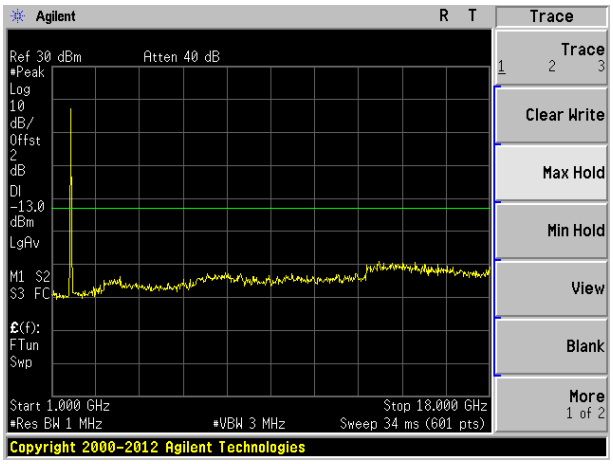
Lowest channel





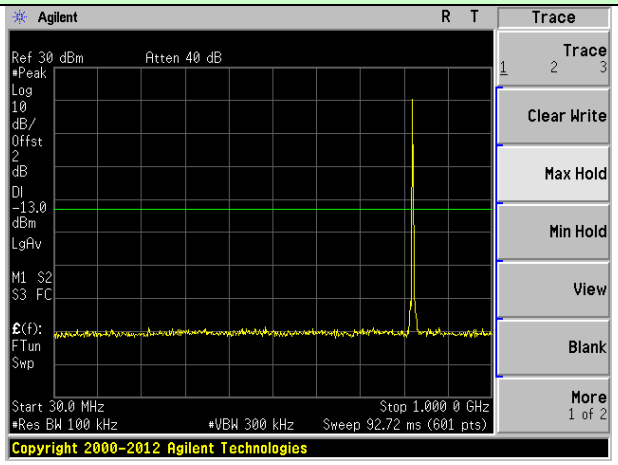
Middle channel

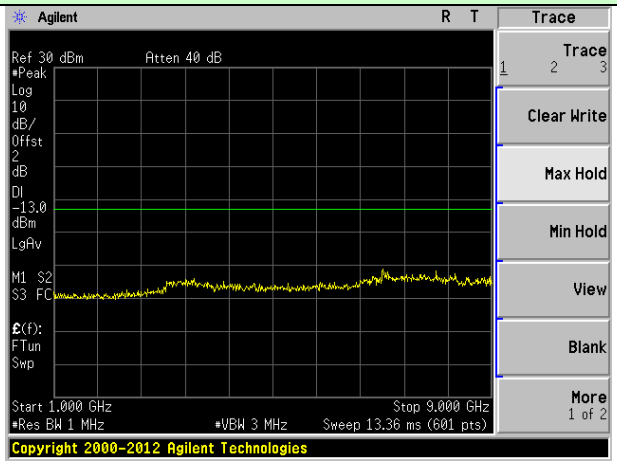




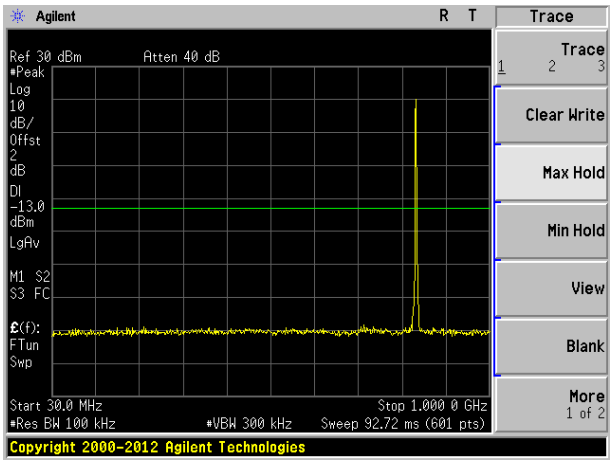
Highest channel

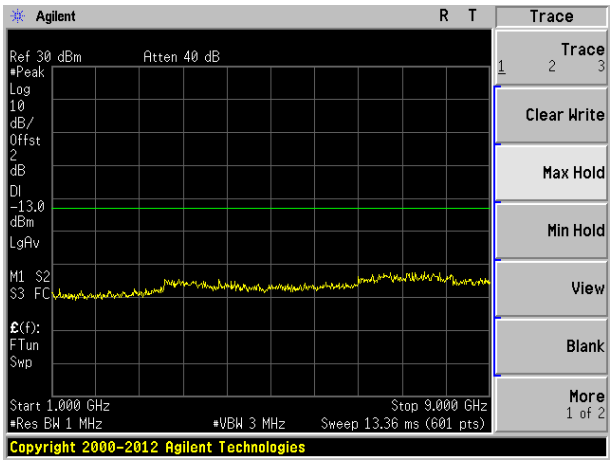
Test Mode: LTE Band 5	Channel Bandwidth: 1.4MHz



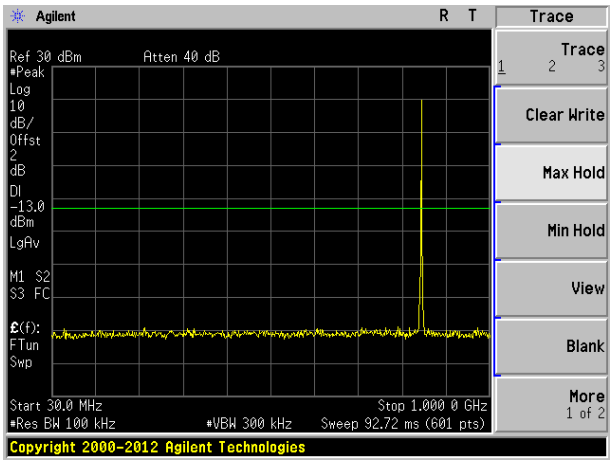


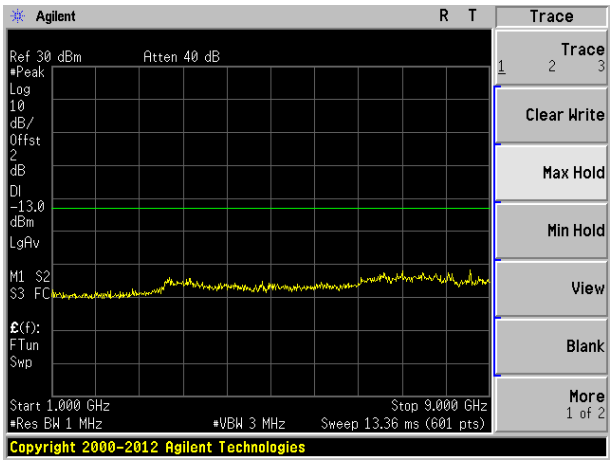
Lowest channel





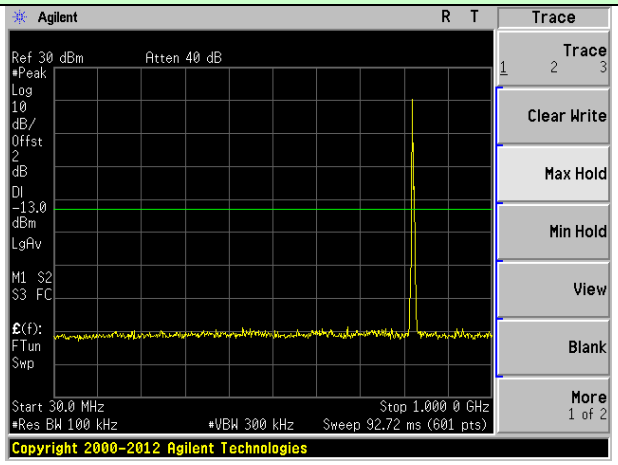
Middle channel

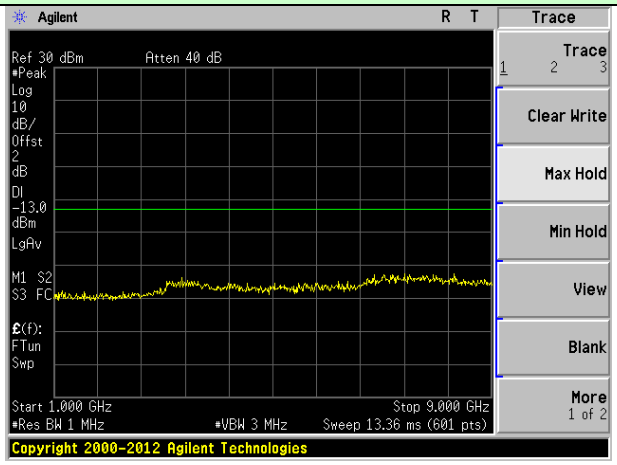




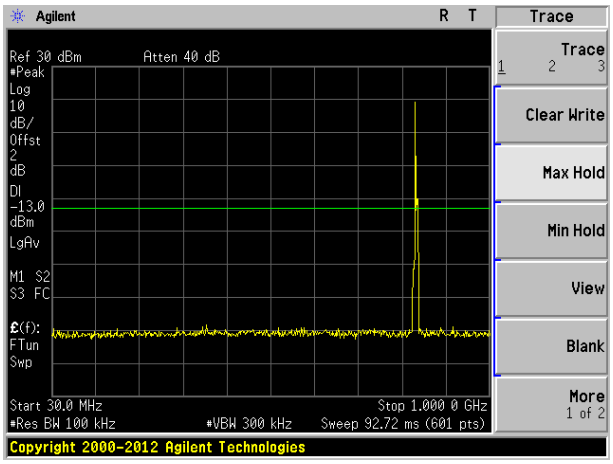
Highest channel

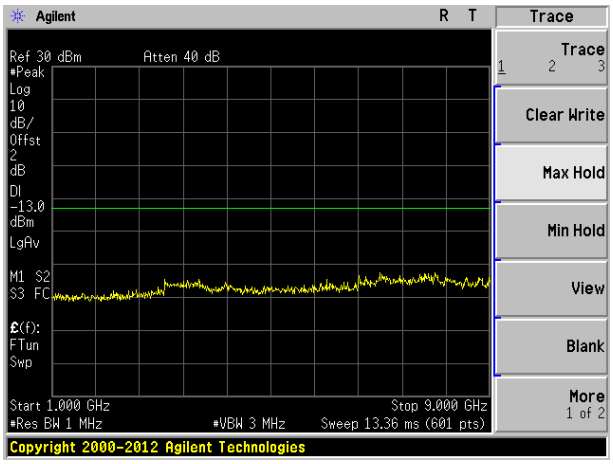
Test Mode: LTE Band 5	Channel Bandwidth: 3MHz



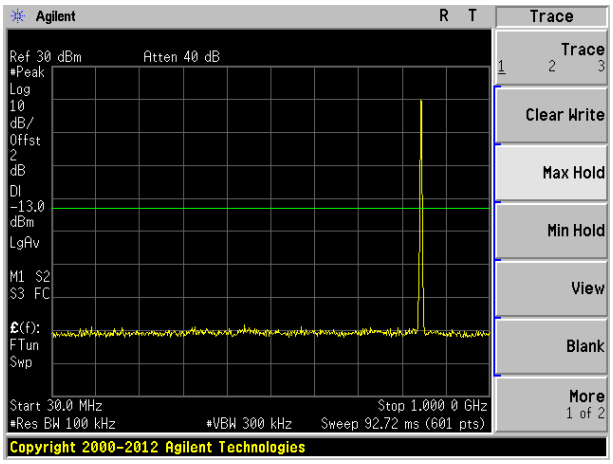


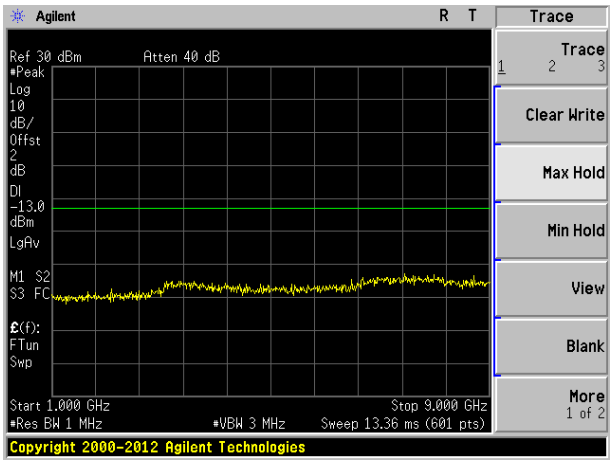
Lowest channel





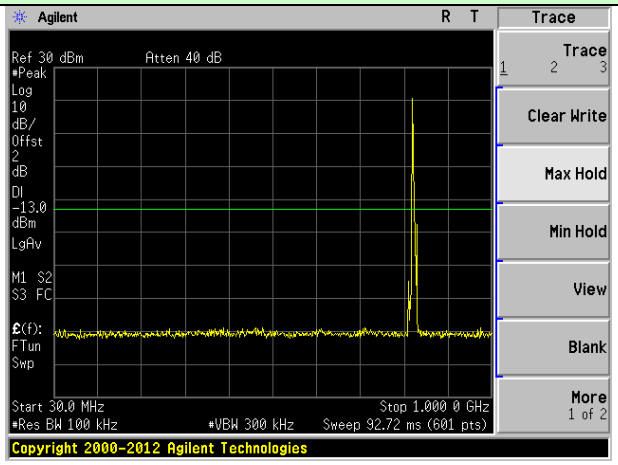
Middle channel

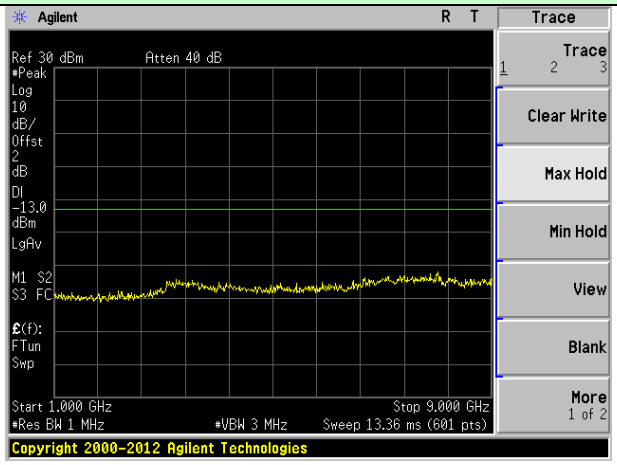




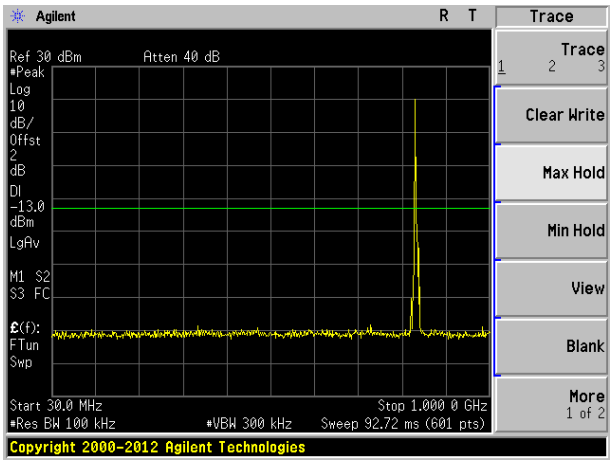
Highest channel

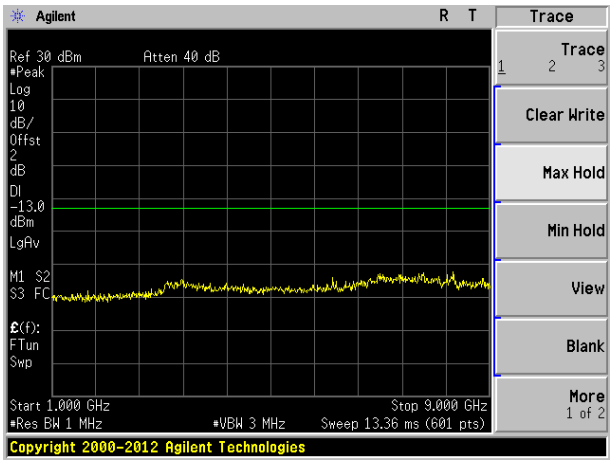
Test Mode: LTE Band 5	Channel Bandwidth: 5MHz



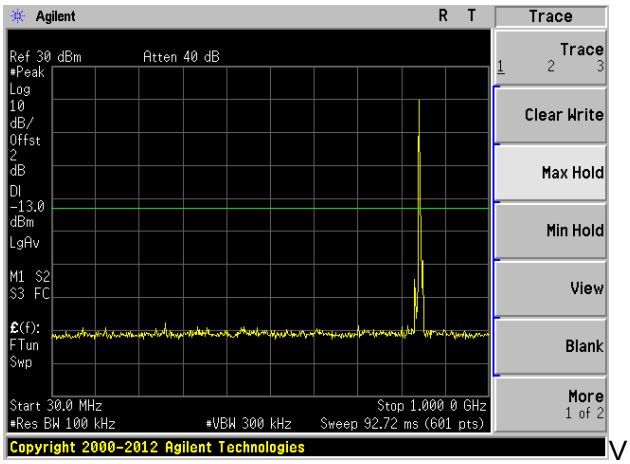


Lowest channel

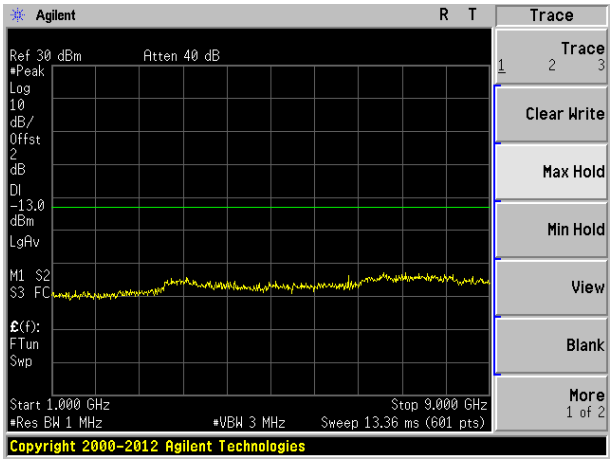




Middle channel

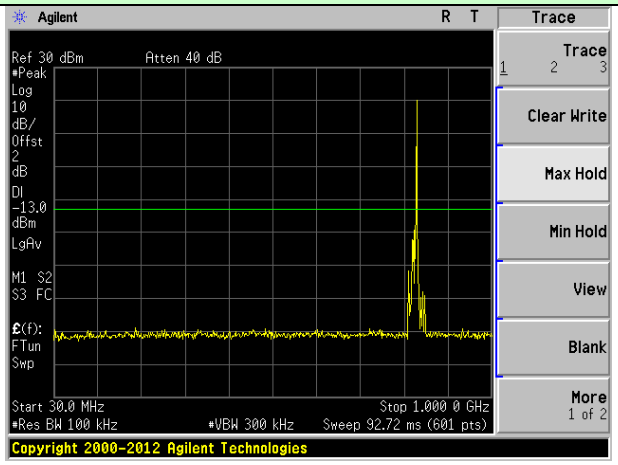


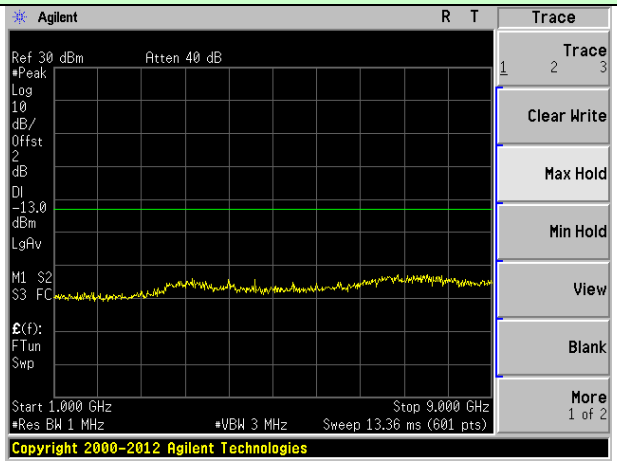
V



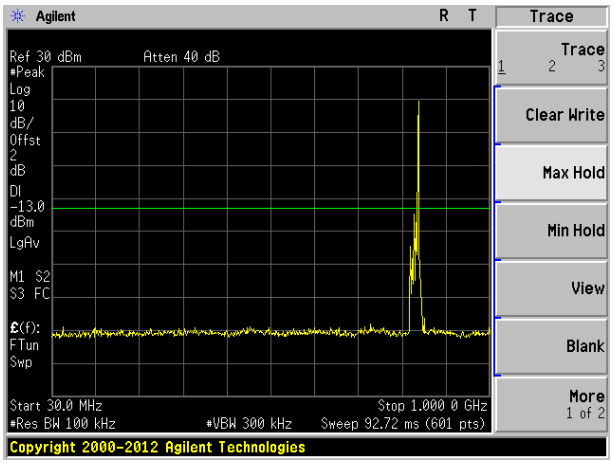
Highest channel

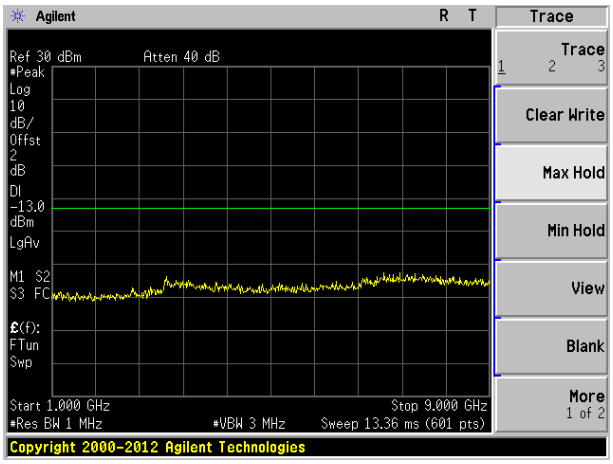
Test Mode: LTE Band 5	Channel Bandwidth: 10MHz



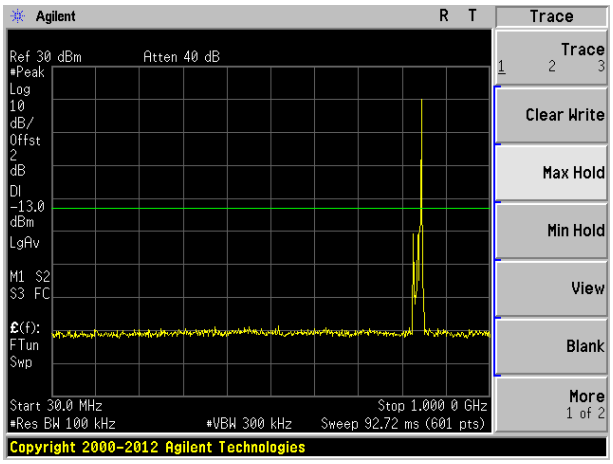


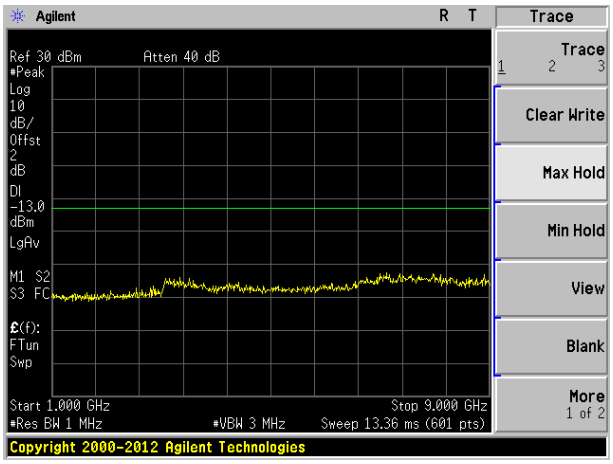
Lowest channel





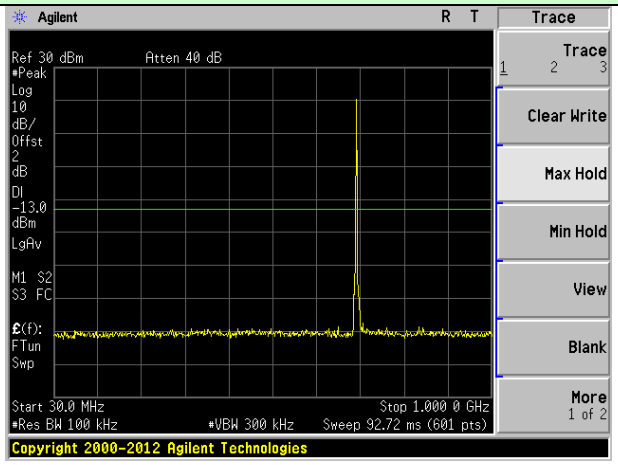
Middle channel

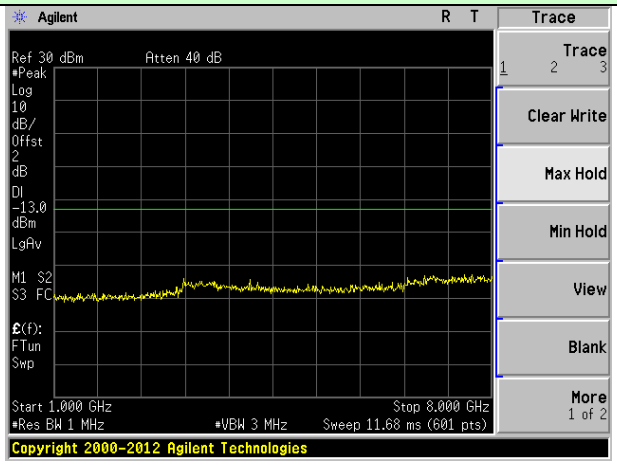




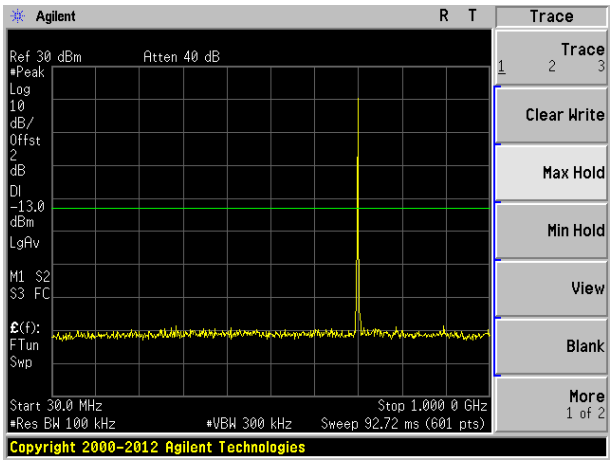
Highest channel

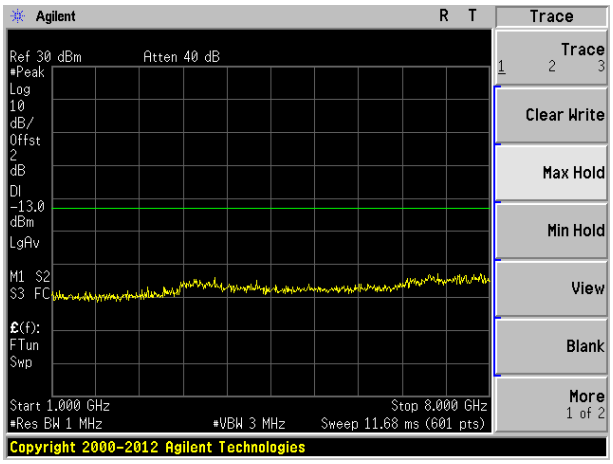
Test Mode: LTE Band 12	Channel Bandwidth: 1.4MHz



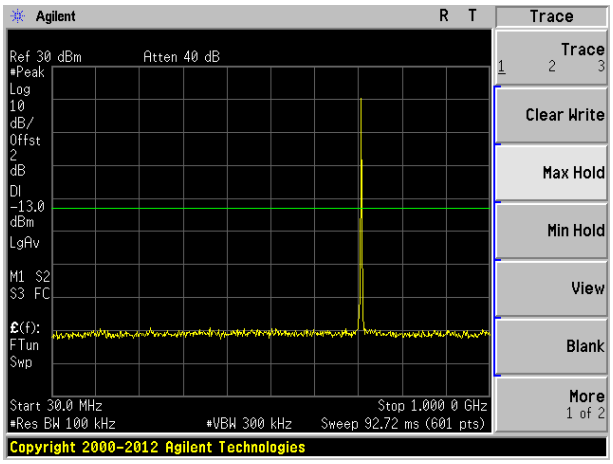


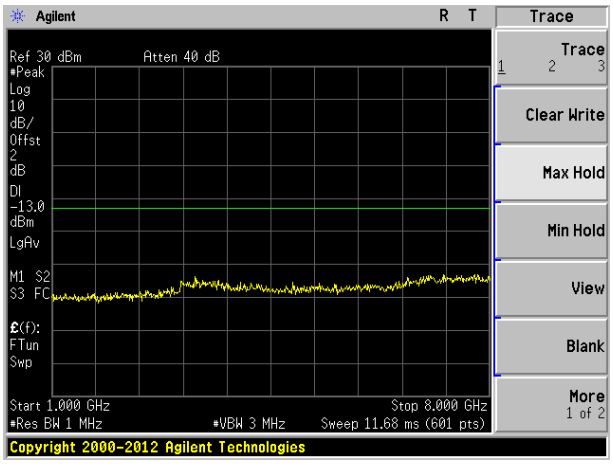
Lowest channel





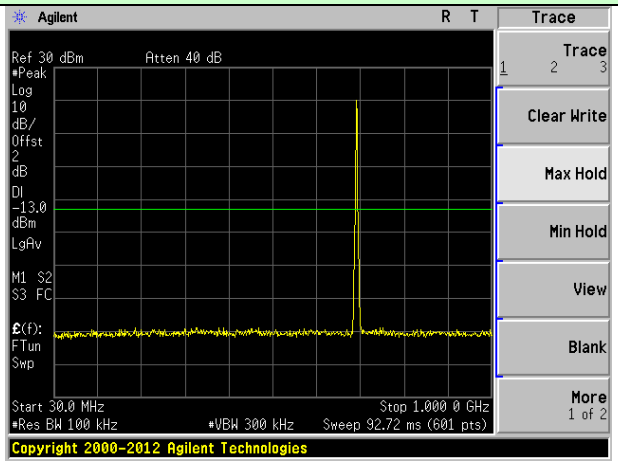
Middle channel

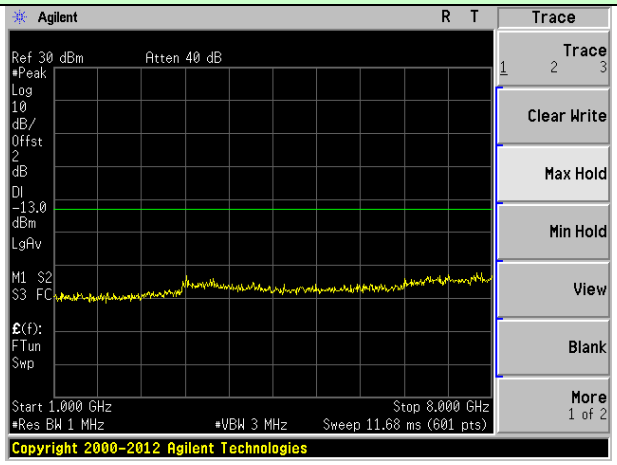




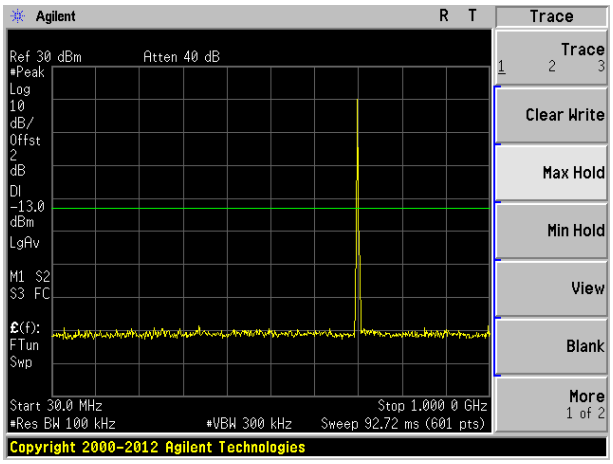
Highest channel

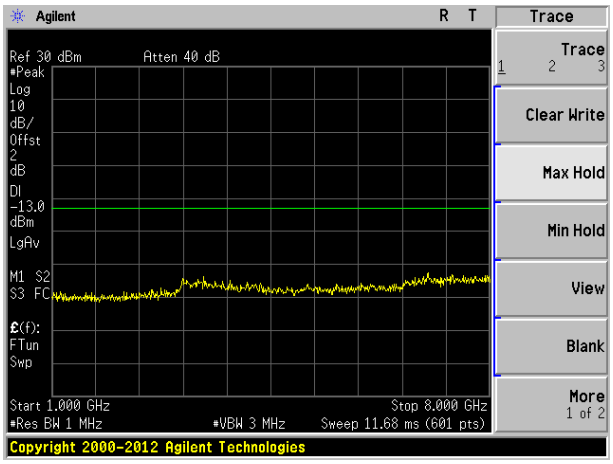
Test Mode: LTE Band 12	Channel Bandwidth: 3MHz



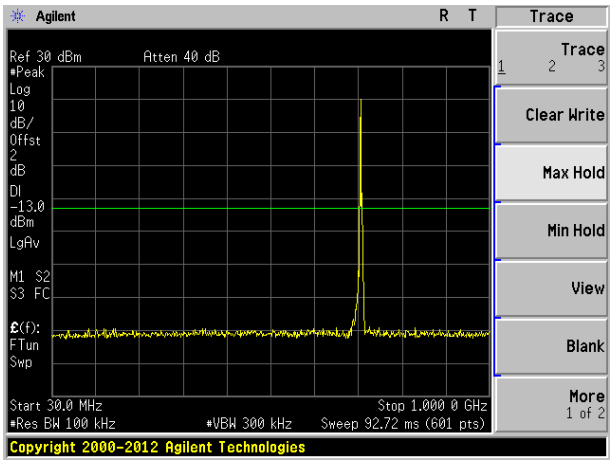


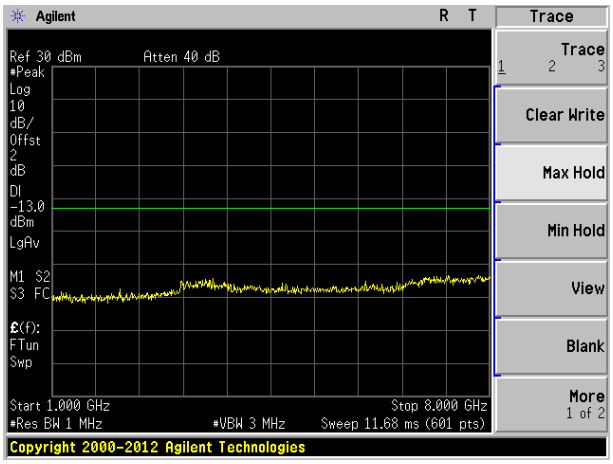
Lowest channel





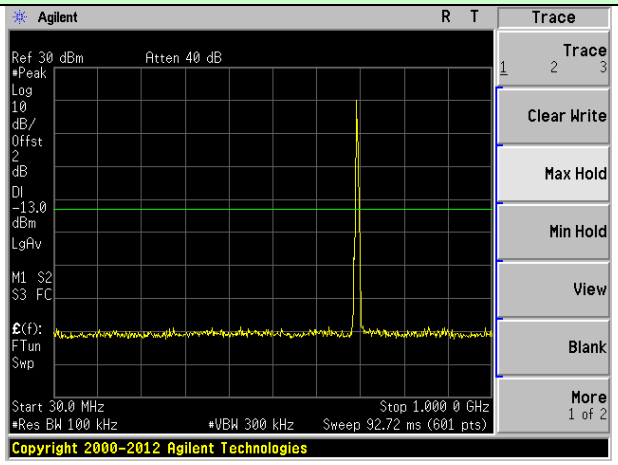
Middle channel

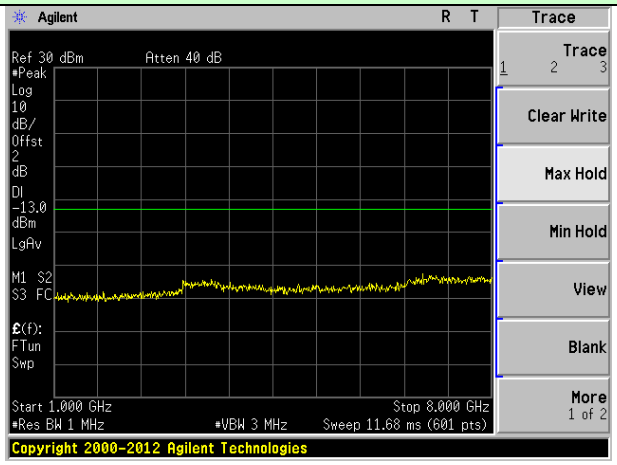




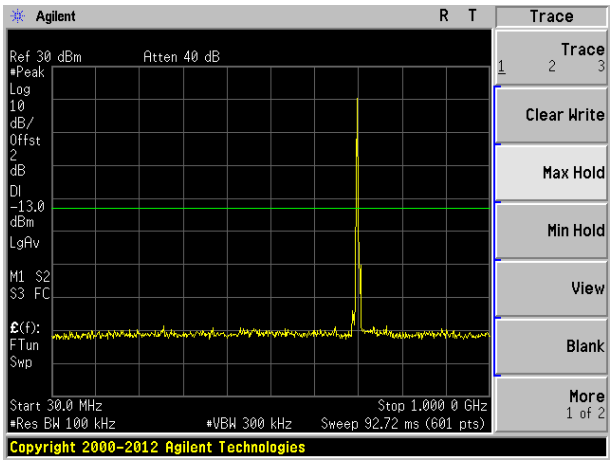
Highest channel

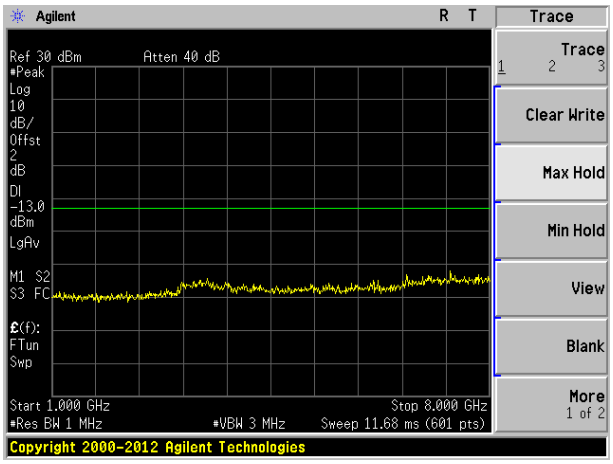
Test Mode: LTE Band 12	Channel Bandwidth: 5MHz



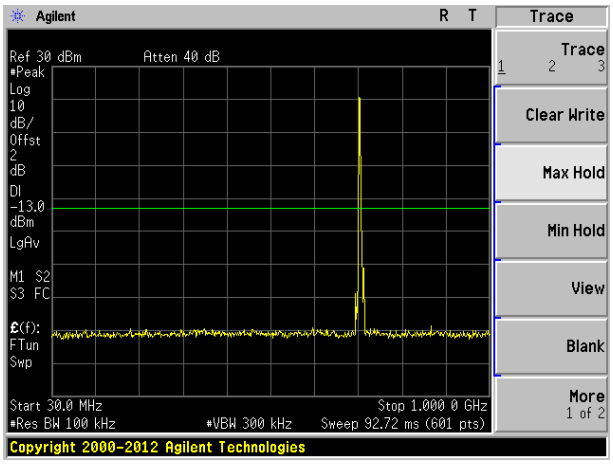


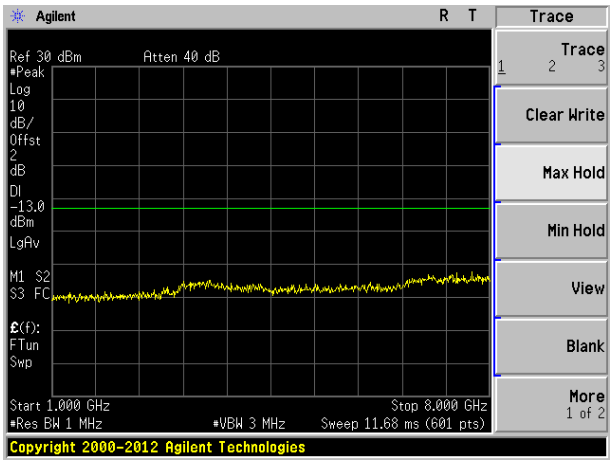
Lowest channel





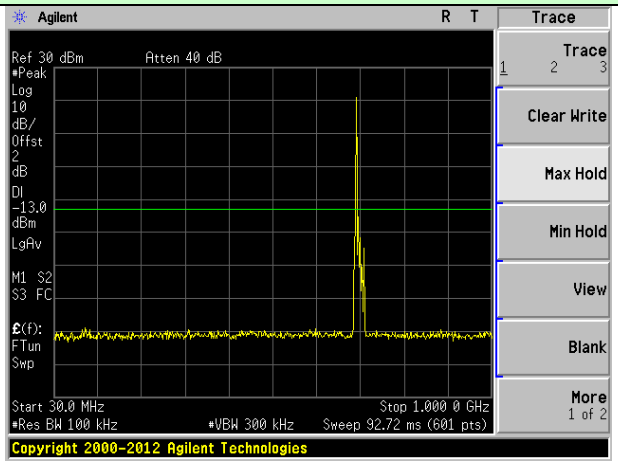
Middle channel

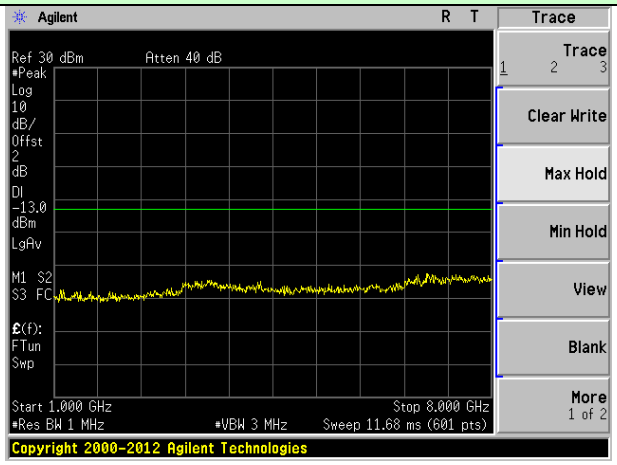




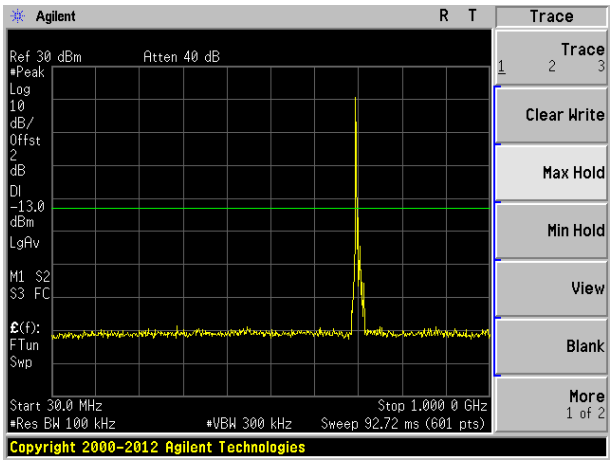
Highest channel

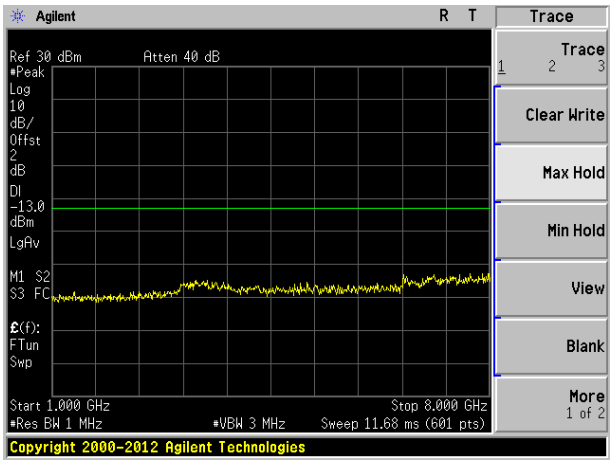
Test Mode: LTE Band 12	Channel Bandwidth: 10MHz



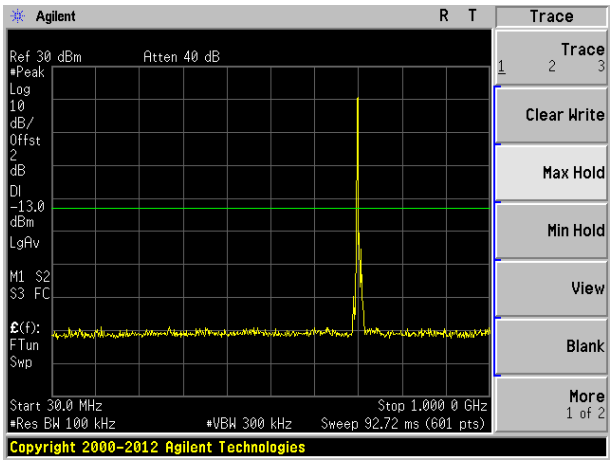


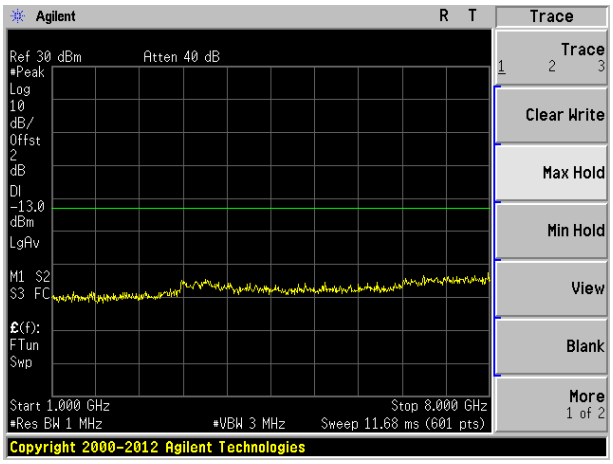
Lowest channel





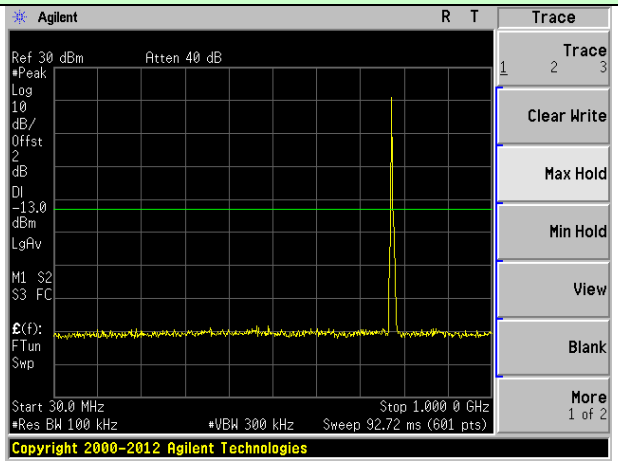
Middle channel

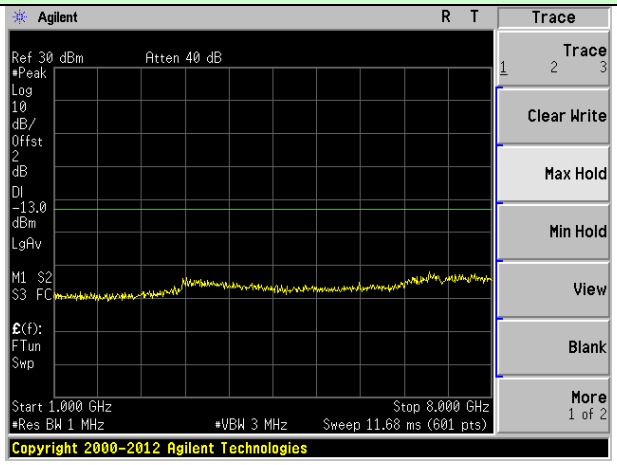




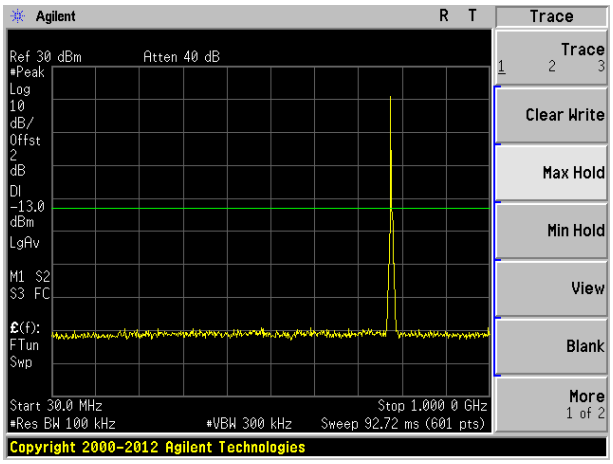
Highest channel

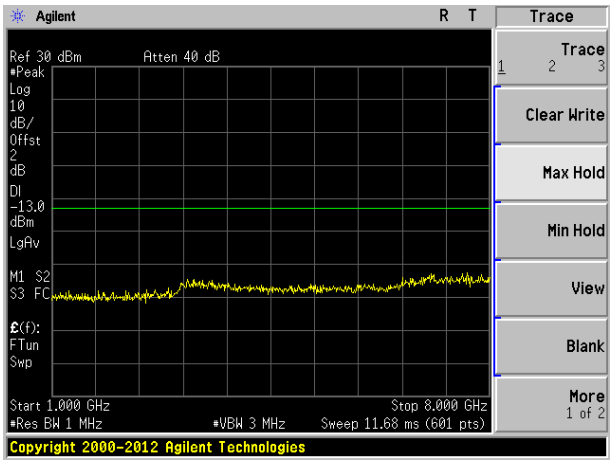
Test Mode: LTE Band 13	Channel Bandwidth: 5MHz



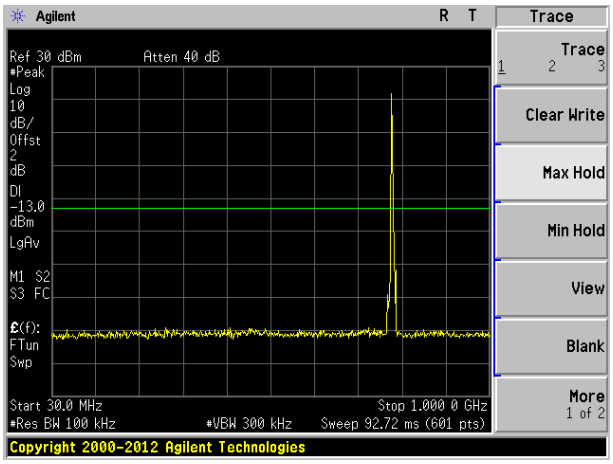


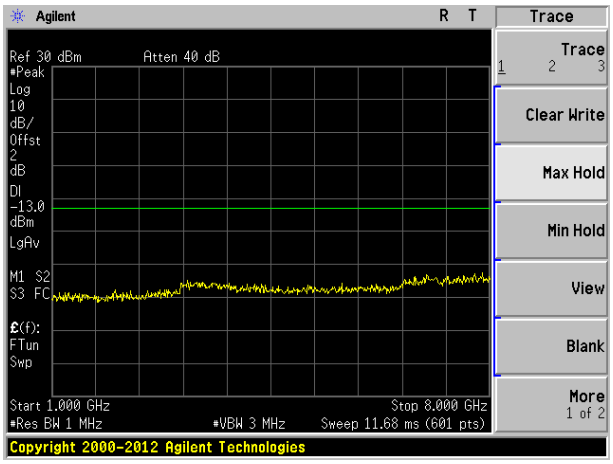
Lowest channel





Middle channel





Highest channel

Test Mode: LTE Band 13	Channel Bandwidth: 10MHz