FCC Report (LTE)

Applicant:	Juniper Systems, Inc.
Address of Applicant:	1132 W 1700 N, Logan Utahc 84321, United States
Manufacturer:	Juniper Systems, Inc.
Address of Manufacturer:	1132 W 1700 N, Logan Utahc 84321, United States

Equipment Under Test (EUT)

Product Name:	AGM X2 4G LTE Cellular Phone and Data Collector
Model No.:	AGM X2 Cedar CP3
Trade mark:	Cedar CP3
FCC ID:	VSFCP3
Applicable standards:	FCC CFR Title 47 Part 2 FCC CFR Title 47 Part 24 FCC CFR Title 47 Part 27
Date of sample receipt:	July 12, 2018
Date of Test:	July 13, 2018-August 16, 2018
Date of report issued:	August 17, 2018
Test Result :	PASS *

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

Authorized Signature:

Robinson Lo
Laboratory Manager

2 Version

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

Prepared By: Bill. Yuan ***Date:*** *August 17, 2018*

Project Engineer

Check By: Andy. Wu ***Date:*** *August 17, 2018*

Reviewer

3 Contents

Page

1 COVER PAGE 1

2 VERSION 2

3 CONTENTS 3

4 TEST SUMMARY 4

5 GENERAL INFORMATION 5

5.1 GENERAL DESCRIPTION OF EUT 5
5.2 RELATED SUBMITTAL(S) / GRANT (S) 8
5.3 TEST METHODOLOGY 8
5.4 TEST FACILITY 8
5.5 TEST LOCATION 8

6 TEST INSTRUMENTS LIST 9

7 SYSTEM TEST CONFIGURATION 11

7.1 TEST MODE 11
7.2 CONFIGURATION OF TESTED SYSTEM 11
7.3 CONDUCTED PEAK OUTPUT POWER 12
7.4 PEAK-TO-AVERAGE RATIO 26
7.5 OCCUPY BANDWIDTH 29
7.6 MODULATION CHARACTERISTIC 90
7.7 OUT OF BAND EMISSION AT ANTENNA TERMINALS 90
7.8 ERP, EIRP MEASUREMENT 165
7.9 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT 193
7.10 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT 201
7.11 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT 206

8 TEST SETUP PHOTO 209

9 EUT CONSTRUCTIONAL DETAILS 209

4 Test Summary

Test Item	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass* (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 22.913 (a) 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

Remarks:

1. *Pass: The EUT complies with the essential requirements in the standard.*
2. *N/A: Not applicable.*

5 General Information

5.1 General Description of EUT

Product Name:	AGM X2 4G LTE Cellular Phone and Data Collector
Model No.:	AGM X2 Cedar CP3
Serial No.:	477cc6f
Tested Sample(s) ID:	GTS201807000146-1
Hardware Version:	LA862T_MB_V1.00
Software Version:	L1372.6.01.03.EU00
Support Networks:	LTE
Support Bands:	LTE Band 2, LTE Band 4, LTE Band 5, LTE Band 7, LTE Band 12, Band 17
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 7: 5MHz; 10MHz; 15MHz; 20MHz LTE Band 12: 1.4MHz; 3MHz; 5MHz; 10MHz LTE Band 17: 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 7: 2502.50MHz-2567.50MHz LTE Band 12: 699.70MHz-715.30MHz LTE Band 17: 706.5MHz-713.5MHz
Modulation type:	LTE Band 2/4/5/7/12/17: QPSK, 16QAM
Antenna type:	PIFA antenna
Antenna gain:	Band 2/7: -0.80dBi(Max) Band 4: -0.30dBi(Max) Band 5: -2.30dBi(Max) Band 12/17: -3.50dBi(Max)
Power supply:	Adapter : Model:ES019-U120150XYF Input: AC100-240V, 50/60Hz, 0.6A Output: DC 5V, 2A or DC 9.0V, 2A or DC 12V, 1.5A (Note: DC 5V, 2A/ DC 9V,2A/ DC 12V,1.5A has a test, The test report reflects only DC 5V, 2A worst test data.) Battery: DC 3.8V , 6000mAh, 22.8Wh

Test Frequency

Test Mode	Channel Bandwidth	RF Channel		
		Lowest channel	Middle channel	Highest channel
LTE Band 2	1.4M	Channel 18607	Channel 18900	Channel 19193
		1850.7 MHz	1880 MHz	1909.3 MHz
	3M	Channel 18615	Channel 18900	Channel 19185
		1851.5 MHz	1880 MHz	1908.5 MHz
	5M	Channel 18625	Channel 18900	Channel 19175
		1852.5 MHz	1880 MHz	1907.5 MHz
	10M	Channel 18650	Channel 18900	Channel 19150
		1855 MHz	1880 MHz	1905 MHz
	15M	Channel 18675	Channel 18900	Channel 19125
		1857.5 MHz	1880 MHz	1902.5 MHz
	20M	Channel 18700	Channel 18900	Channel 19100
		1860 MHz	1880 MHz	1900 MHz

Test Mode	Channel Bandwidth	RF Channel		
		Lowest channel	Middle channel	Highest channel
LTE Band 4	1.4M	Channel 19957	Channel 20175	Channel 20393
		1710.7 MHz	1732.5 MHz	1754.3 MHz
	3M	Channel 19965	Channel 20175	Channel 20385
		1711.5 MHz	1732.5 MHz	1753.5 MHz
	5M	Channel 19975	Channel 20175	Channel 20375
		1712.5 MHz	1732.5 MHz	1752.5 MHz
	10M	Channel 20000	Channel 20175	Channel 20350
		1715 MHz	1732.5 MHz	1750 MHz
	15M	Channel 20025	Channel 20175	Channel 20325
		1717.5 MHz	1732.5 MHz	1747.5 MHz
	20M	Channel 20050	Channel 20175	Channel 20300
		1720 MHz	1732.5 MHz	1745 MHz

Test Mode	Channel Bandwidth	RF Channel		
		Lowest channel	Middle channel	Highest channel
LTE Band 5	1.4M	Channel 20407	Channel 20525	Channel 20643
		824.7 MHz	836.5 MHz	848.3 MHz
	3M	Channel 20415	Channel 20525	Channel 20635
		825.5 MHz	836.5 MHz	847.5 MHz
	5M	Channel 20425	Channel 20525	Channel 20625
		826.5 MHz	836.5 MHz	846.5 MHz
	10M	Channel 20450	Channel 20525	Channel 20600
		829 MHz	836.5 MHz	844 MHz

Test Mode	Channel Bandwidth	RF Channel		
		Lowest channel	Middle channel	Highest channel
LTE Band 7	5M	Channel 20775	Channel 21100	Channel 21425
		2502.5 MHz	2535 MHz	2567.5 MHz
	10M	Channel 20800	Channel 21100	Channel 21400
		2505 MHz	2535 MHz	2565 MHz
	15M	Channel 20825	Channel 21100	Channel 21375
		2507.5 MHz	2535 MHz	2562.5 MHz
	20M	Channel 20850	Channel 21100	Channel 21350
		2510 MHz	2535 MHz	2560 MHz

Test Mode	Channel Bandwidth	RF Channel		
		Lowest channel	Middle channel	Highest channel
LTE Band 12	1.4M	Channel 23017	Channel 23095	Channel 23173
		699.7MHz	707.5MHz	715.3MHz
	3M	Channel 23025	Channel 23095	Channel 23165
		700.5MHz	707.5MHz	714.5MHz
	5M	Channel 23035	Channel 23095	Channel 23155
		701.5MHz	707.5MHz	713.5MHz
	10M	Channel 23060	Channel 23095	Channel 23130
		704.0MHz	707.5MHz	711.0MHz

Test Mode	Channel Bandwidth	RF Channel		
		Lowest channel	Middle channel	Highest channel
LTE Band 17	5M	Channel 23755	Channel 23790	Channel 23825
		706.5 MHz	710 MHz	713.5 MHz
	10M	Channel 23780	Channel 23790	Channel 23800
		709 MHz	710 MHz	711 MHz

5.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with Section Part 22/24/27 of the FCC CFR 47 Rules.

5.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on ANSI C63.26:2015 and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

5.4 Test Facility

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

● **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and 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.

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

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

Tel: 0755-27798480

Fax: 0755-27798960

6 Test Instruments list

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

RF Conducted Test:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 27 2018	June. 26 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 27 2018	June. 26 2019
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 27 2018	June. 26 2019
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 27 2018	June. 26 2019
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 27 2018	June. 26 2019
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 27 2018	June. 26 2019
8	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019
9	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	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

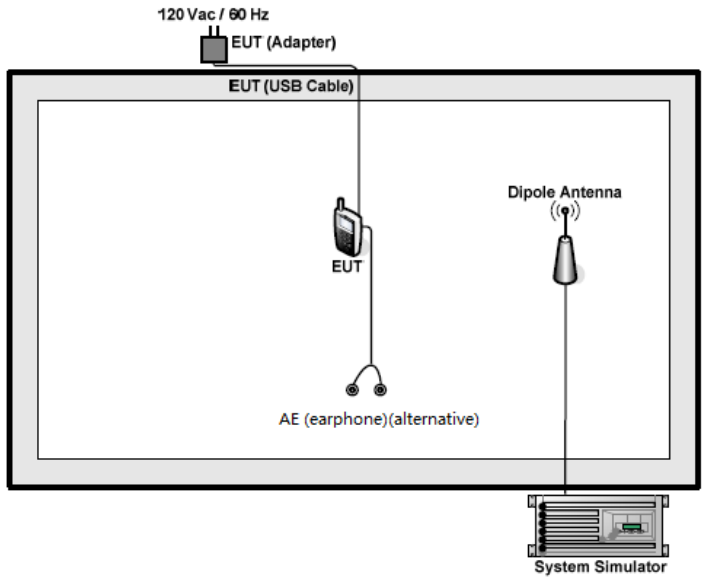
7 System test configuration

7.1 Test mode

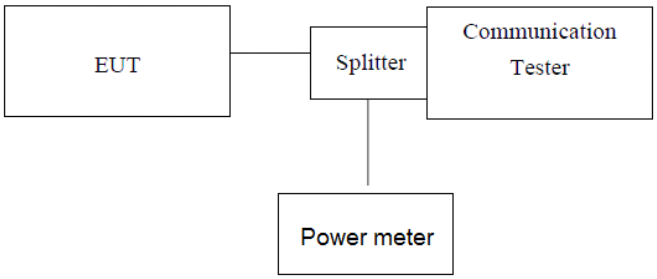
During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Test modes		
Band	Radiated	Conducted
LTE Band 2	■ QPSK and 16QAM link	■ QPSK and 16QAM link
LTE Band 4	■ QPSK and 16QAM link	■ QPSK and 16QAM link
LTE Band 5	■ QPSK and 16QAM link	■ QPSK and 16QAM link
LTE Band 7	■ QPSK and 16QAM link	■ QPSK and 16QAM link
LTE Band 12	■ QPSK and 16QAM link	■ QPSK and 16QAM link
LTE Band 17	■ QPSK and 16QAM link	■ QPSK and 16QAM link

7.2 Configuration of Tested System



7.3 Conducted Peak Output Power

Test Requirement:	FCC part 22.913(a), Part 24.232 (c); Part 27.50(c)(10)/(d)(4)
Test Method:	FCC part2.1046
Limit:	LTE Band 2: 2W LTE Band 4: 1W LTE Band 5: 7W LTE Band7: 2W LTE Band 12: 3W LTE Band 17: 3W
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1. The transmitter output port was connected to base station. 2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement. 3. Set EUT at maximum power through base station. 4. Select lowest, middle, and highest channels for each band and different modulation. 5. Measure the maximum burst average power.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 6.1 for details
Test results:	Pass

Measurement Data

Band 2						
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18607 1850.7MHz	Channel 18900 1880.0MHz	Channel 19193 1909.3MHz
1.4MHz	QPSK	1.00	0.00	22.75	22.68	22.73
		1.00	2.00	22.46	22.31	22.42
		1.00	5.00	22.62	22.58	22.63
		3.00	0.00	22.41	22.26	22.39
		3.00	1.00	22.23	22.11	22.33
		3.00	2.00	21.75	21.90	22.20
		6.00	0.00	22.51	22.75	22.48
	16QAM	1.00	0.00	22.03	21.90	22.09
		1.00	2.00	21.68	21.51	21.74
		1.00	5.00	22.45	22.37	22.27
		3.00	0.00	22.38	22.25	22.30
		3.00	1.00	22.21	22.26	22.14
		3.00	2.00	22.38	22.45	22.72
		6.00	0.00	22.00	22.01	21.84
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18615 1851.5MHz	Channel 18900 1880.0MHz	Channel 19185 1908.5MHz
3MHz	QPSK	1.00	0.00	22.73	22.67	22.35
		1.00	8.00	21.50	21.61	22.16
		1.00	14.00	22.35	21.51	21.85
		8.00	0.00	21.84	21.63	21.52
		8.00	4.00	21.98	22.10	22.21
		8.00	7.00	21.75	22.04	21.27
		15.00	0.00	21.69	21.99	21.70
	16QAM	1.00	0.00	21.93	21.71	22.04
		1.00	8.00	22.23	21.98	21.74
		1.00	14.00	22.50	22.42	22.43
		8.00	0.00	22.25	22.04	21.74
		8.00	4.00	21.81	21.33	21.49
		8.00	7.00	21.72	21.94	22.10
		15.00	0.00	22.45	22.43	22.55

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18625 1852.5MHz	Channel 18900 1880.0MHz	Channel 19175 1907.5MHz
5MHz	QPSK	1.00	0.00	22.22	22.14	22.02
		1.00	13.00	22.15	21.71	22.02
		1.00	24.00	22.19	21.83	22.28
		12.00	0.00	21.64	21.96	21.93
		12.00	6.00	21.83	21.99	21.50
		12.00	13.00	22.07	21.92	22.04
		25.00	0.00	22.05	21.91	22.15
	16QAM	1.00	0.00	21.44	22.09	21.26
		1.00	13.00	21.45	22.02	22.13
		1.00	24.00	21.81	22.45	22.48
		12.00	0.00	21.47	21.41	21.62
		12.00	6.00	21.63	21.83	22.11
		12.00	13.00	22.01	22.22	21.38
		25.00	0.00	22.25	22.26	22.38
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18650 1855.0MHz	Channel 18900 1880.0MHz	Channel 19150 1905.0MHz
10MHz	QPSK	1.00	0.00	22.44	22.37	22.42
		1.00	25.00	22.17	22.07	22.32
		1.00	49.00	22.23	22.06	22.19
		25.00	0.00	21.56	22.46	21.59
		25.00	13.00	22.45	22.32	22.52
		25.00	25.00	22.38	22.33	22.54
		50.00	0.00	22.58	22.32	22.59
	16QAM	1.00	0.00	21.39	21.79	21.81
		1.00	25.00	21.88	21.85	21.37
		1.00	49.00	21.94	22.37	21.70
		25.00	0.00	21.81	22.24	21.72
		25.00	13.00	22.13	21.91	22.04
		25.00	25.00	22.12	21.89	21.98
		50.00	0.00	22.14	21.99	22.01

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18675 1857.5MHz	Channel 18900 1880.0MHz	Channel 19125 1902.5MHz
15MHz	QPSK	1.00	0.00	22.72	22.66	22.71
		1.00	38.00	22.45	22.30	22.52
		1.00	74.00	22.15	21.83	22.21
		36.00	0.00	21.57	21.42	21.74
		36.00	18.00	22.30	22.16	21.61
		36.00	39.00	22.21	22.24	21.62
		75.00	0.00	21.42	22.31	21.61
	16QAM	1.00	0.00	21.74	22.06	22.15
		1.00	38.00	22.25	21.62	21.84
		1.00	74.00	22.29	21.70	21.77
		36.00	0.00	21.43	21.41	21.75
		36.00	18.00	21.37	22.14	21.60
		36.00	39.00	22.30	22.13	21.92
		75.00	0.00	22.23	22.04	21.65
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18700 1860.0MHz	Channel 18900 1880.0MHz	Channel 19100 1900.0MHz
20MHz	QPSK	1.00	0.00	22.56	22.34	22.60
		1.00	50.00	22.25	21.96	22.26
		1.00	99.00	21.90	22.10	22.36
		50.00	0.00	21.77	22.53	21.75
		50.00	25.00	22.49	22.34	22.47
		50.00	50.00	21.94	22.07	21.90
		100.00	0.00	22.36	22.16	21.42
	16QAM	1.00	0.00	22.77	22.40	22.59
		1.00	50.00	21.99	22.00	22.28
		1.00	99.00	22.04	22.26	22.11
		50.00	0.00	21.57	21.56	21.79
		50.00	25.00	22.42	22.26	22.35
		50.00	50.00	22.14	22.31	22.26
		100.00	0.00	21.40	22.20	22.38

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	1.00	0.00	22.27	22.57	22.12
		1.00	2.00	22.23	22.15	22.27
		1.00	5.00	22.13	22.14	22.53
		3.00	0.00	21.91	21.72	22.13
		3.00	1.00	22.24	22.01	22.18
		3.00	2.00	22.22	21.90	21.96
		6.00	0.00	22.32	22.46	22.10
	16QAM	1.00	0.00	22.34	22.21	22.11
		1.00	2.00	22.17	22.31	22.24
		1.00	5.00	21.96	22.05	22.12
		3.00	0.00	21.90	21.89	21.91
		3.00	1.00	21.98	21.99	21.81
		3.00	2.00	21.93	22.04	21.63
		6.00	0.00	22.19	22.14	21.95
Bandwidth	Mode	RB Size	RB Offset	Actual output po2wer(dBm)		
				Channel 19965 1711.5MHz	Channel 20175 1732.5MHz	Channel 20385 753.5MHz
3MHz	QPSK	1.00	0.00	22.24	22.12	22.18
		1.00	8.00	22.04	21.86	21.71
		1.00	14.00	22.13	21.94	21.93
		8.00	0.00	22.24	22.09	21.75
		8.00	4.00	22.08	22.03	21.86
		8.00	7.00	22.14	21.86	21.78
		15.00	0.00	22.22	22.26	22.03
	16QAM	1.00	0.00	22.03	21.77	21.37
		1.00	8.00	22.04	21.81	21.82
		1.00	14.00	21.67	21.80	21.84
		8.00	0.00	21.75	21.83	21.75
		8.00	4.00	21.90	22.10	21.66
		8.00	7.00	21.95	21.90	21.93
		15.00	0.00	22.12	21.86	21.78

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 19975 1712.5MHz	Channel 20175 1732.5MHz	Channel 20375 1752.5MHz
5MHz	QPSK	1.00	0.00	22.11	22.01	22.30
		1.00	13.00	22.30	21.94	22.01
		1.00	24.00	21.77	21.62	22.01
		12.00	0.00	22.14	21.78	21.94
		12.00	6.00	22.19	21.83	21.88
		12.00	13.00	22.08	21.75	21.74
		25.00	0.00	22.18	21.82	21.91
	16QAM	1.00	0.00	22.20	22.03	21.92
		1.00	13.00	21.76	22.17	21.64
		1.00	24.00	21.22	22.20	21.25
		12.00	0.00	22.07	21.94	21.06
		12.00	6.00	21.79	21.72	21.79
		12.00	13.00	22.27	22.21	22.24
		25.00	0.00	22.02	21.82	22.00
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20000 1715.0MHz	Channel 20175 1732.5MHz	Channel 20350 1750.0MHz
10MHz	QPSK	1.00	0.00	22.08	22.03	22.28
		1.00	25.00	21.57	22.04	21.94
		1.00	49.00	21.41	22.12	21.35
		25.00	0.00	21.24	21.93	22.11
		25.00	13.00	21.65	21.70	21.89
		25.00	25.00	22.18	21.92	22.09
		50.00	0.00	22.03	21.69	21.86
	16QAM	1.00	0.00	21.58	21.58	22.00
		1.00	25.00	22.05	21.52	22.05
		1.00	49.00	21.27	21.99	21.62
		25.00	0.00	21.56	21.83	21.90
		25.00	13.00	22.14	21.68	22.10
		25.00	25.00	21.04	21.99	21.36
		50.00	0.00	21.89	21.88	21.70

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20025 1717.5MHz	Channel 20175 1732.5MHz	Channel 20325 1747.5MHz
15MHz	QPSK	1.00	0.00	22.15	22.00	22.24
		1.00	38.00	22.04	21.72	21.96
		1.00	74.00	21.87	21.67	21.40
		36.00	0.00	21.56	22.40	22.13
		36.00	18.00	21.41	21.61	21.87
		36.00	39.00	22.02	22.43	22.01
		75.00	0.00	22.04	21.87	21.34
	16QAM	1.00	0.00	22.10	21.98	22.05
		1.00	38.00	21.38	22.19	21.69
		1.00	74.00	21.68	22.29	21.96
		36.00	0.00	22.31	22.22	22.12
		36.00	18.00	21.73	21.36	21.85
		36.00	39.00	21.92	22.09	22.18
		75.00	0.00	22.05	22.18	21.12
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20050 1720.0MHz	Channel 20175 1732.5MHz	Channel 20300 1745.0MHz
20MHz	QPSK	1.00	0.00	22.31	22.26	22.39
		1.00	50.00	22.10	21.82	21.74
		1.00	99.00	22.18	21.99	22.37
		50.00	0.00	21.95	22.23	22.30
		50.00	25.00	21.57	22.00	22.03
		50.00	50.00	21.97	21.83	22.06
		100.00	0.00	21.95	21.99	21.72
	16QAM	1.00	0.00	22.14	22.18	22.26
		1.00	50.00	21.99	22.03	22.18
		1.00	99.00	22.30	22.20	22.34
		50.00	0.00	21.84	21.96	21.87
		50.00	25.00	22.10	22.25	22.19
		50.00	50.00	22.29	22.12	21.54
		100.00	0.00	22.28	22.13	21.86

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	1.00	0.00	21.25	22.34	22.05
		1.00	3.00	21.36	21.89	21.85
		1.00	5.00	21.44	22.21	21.76
		3.00	0.00	21.56	22.30	21.60
		3.00	2.00	21.17	21.85	21.85
		3.00	3.00	21.67	22.34	21.61
		6.00	0.00	21.85	22.46	22.11
	16QAM	1.00	0.00	21.55	22.16	21.91
		1.00	3.00	21.77	22.54	21.69
		1.00	5.00	21.48	22.26	21.92
		3.00	0.00	21.17	21.87	21.59
		3.00	2.00	22.00	22.81	22.16
		3.00	3.00	21.70	22.68	21.88
		6.00	0.00	21.72	22.36	22.05
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20415 825.5MHz	Channel 20525 836.5MHz	Channel 20635 847.5MHz
3MHz	QPSK	1.00	0.00	21.27	21.97	21.57
		1.00	3.00	21.36	21.88	21.72
		1.00	5.00	21.56	21.91	21.74
		3.00	0.00	21.17	21.71	21.37
		3.00	2.00	21.36	21.76	21.47
		3.00	3.00	21.56	21.57	21.59
		6.00	0.00	21.86	21.95	21.69
	16QAM	1.00	0.00	21.45	21.57	21.83
		1.00	3.00	21.64	21.60	21.71
		1.00	5.00	21.14	21.79	21.56
		3.00	0.00	21.16	22.28	21.91
		3.00	2.00	21.37	21.89	21.69
		3.00	3.00	21.38	21.60	21.36
		6.00	0.00	21.48	21.80	21.92

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20425 826.5MHz	Channel 20525 836.5MHz	Channel 20625 846.5MHz
5MHz	QPSK	1.00	0.00	22.03	22.73	22.87
		1.00	13.00	21.70	22.26	22.21
		1.00	24.00	21.48	22.46	22.27
		12.00	0.00	21.89	22.74	22.64
		12.00	6.00	21.51	21.95	21.84
		12.00	13.00	21.48	22.03	21.96
		25.00	0.00	21.85	22.35	22.28
	16QAM	1.00	0.00	21.78	22.26	22.30
		1.00	13.00	21.71	22.30	22.31
		1.00	24.00	21.51	22.49	22.51
		12.00	0.00	21.86	22.45	22.32
		12.00	6.00	21.51	22.18	22.11
		12.00	13.00	21.48	22.26	22.21
		25.00	0.00	21.87	22.65	22.72
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20450 829MHz	Channel 20525 836.5MHz	Channel 20600 844MHz
10MHz	QPSK	1.00	0.00	21.61	22.04	21.75
		1.00	25.00	21.70	22.26	21.98
		1.00	49.00	21.99	22.62	22.25
		25.00	0.00	21.67	22.41	21.98
		25.00	13.00	21.87	22.42	21.93
		25.00	25.00	21.63	22.31	21.95
		50.00	0.00	21.14	21.99	21.51
	16QAM	1.00	0.00	21.59	22.32	21.89
		1.00	25.00	21.48	22.11	21.66
		1.00	49.00	21.40	21.92	21.48
		25.00	0.00	21.58	22.13	21.37
		25.00	13.00	21.64	22.25	21.88
		25.00	25.00	21.61	22.19	21.81
		50.00	0.00	21.62	22.19	21.72

Band 7						
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20775 2502.5MHz	Channel 21100 2535MHz	Channel 21425 2567.5MHz
5MHz	QPSK	1.00	0.00	22.41	22.22	22.52
		1.00	13.00	22.46	22.26	22.54
		1.00	24.00	22.07	22.40	22.46
		12.00	0.00	22.17	22.33	22.47
		12.00	6.00	22.33	22.57	22.55
		12.00	13.00	22.34	22.49	22.56
		25.00	0.00	22.17	22.33	22.57
	16QAM	1.00	0.00	21.99	22.47	22.43
		1.00	13.00	22.36	22.49	22.49
		1.00	24.00	22.34	22.29	22.46
		12.00	0.00	22.40	22.23	22.51
		12.00	6.00	22.06	22.22	22.46
		12.00	13.00	21.95	22.31	22.55
		25.00	0.00	21.97	22.22	22.56
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20800 2505.0MHz	Channel 21100 2535MHz	Channel 21400 2565.0MHz
10MHz	QPSK	1	0	1.00	0.00	22.32
		1	25	1.00	25.00	22.39
		1	49	1.00	49.00	22.50
		25	0	25.00	0.00	22.32
		25	13	25.00	13.00	22.12
		25	25	25.00	25.00	22.32
		50	0	50.00	0.00	22.22
	16QAM	1	0	1.00	0.00	22.03
		1	25	1.00	25.00	22.41
		1	49	1.00	49.00	22.50
		25	0	25.00	0.00	22.32
		25	13	25.00	13.00	22.54
		25	25	25.00	25.00	22.51
		50	0	50.00	0.00	22.42

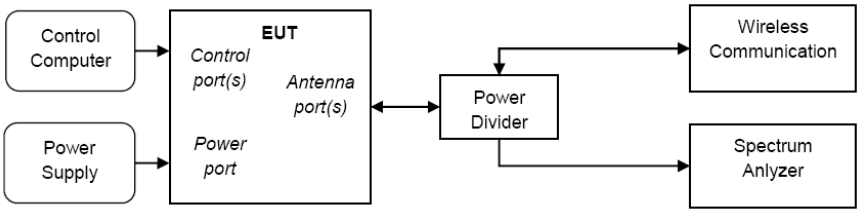
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20825 2507.5MHz	Channel 21100 2535MHz	Channel 21375 2562.5MHz
15MHz	QPSK	1.00	0.00	22.46	22.49	22.48
		1.00	38.00	22.46	22.50	22.45
		1.00	74.00	22.31	22.23	22.49
		36.00	0.00	22.42	22.31	22.47
		36.00	18.00	22.32	22.41	22.45
		36.00	39.00	22.35	22.43	22.39
		75.00	0.00	22.41	22.28	22.30
	16QAM	1.00	0.00	22.29	22.39	22.42
		1.00	38.00	22.41	22.26	22.34
		1.00	74.00	22.32	22.34	22.45
		36.00	0.00	22.33	22.27	22.38
		36.00	18.00	22.45	22.39	22.43
		36.00	39.00	22.40	22.43	22.49
		75.00	0.00	22.33	22.26	22.37
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20850 2510.0MHz	Channel 21100 2535MHz	Channel 21350 2560.0MHz
20MHz	QPSK	1.00	0.00	22.11	22.22	22.63
		1.00	50.00	22.10	22.23	22.48
		1.00	99.00	21.95	22.38	22.35
		50.00	0.00	22.44	22.52	22.20
		50.00	25.00	22.28	22.36	22.36
		50.00	50.00	22.52	22.17	22.12
		100.00	0.00	22.33	22.51	22.45
	16QAM	1.00	0.00	22.10	22.42	22.46
		1.00	50.00	21.99	22.18	22.38
		1.00	99.00	22.10	22.57	22.23
		50.00	0.00	22.34	22.52	22.48
		50.00	25.00	22.19	22.59	22.47
		50.00	50.00	22.17	22.25	22.47
		100.00	0.00	21.97	22.36	22.48

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	1.00	0.00	22.38	22.44	22.56
		1.00	2.00	21.83	22.04	22.58
		1.00	5.00	21.75	21.99	22.48
		3.00	0.00	21.78	21.93	22.47
		3.00	1.00	21.77	21.88	22.45
		3.00	2.00	21.83	22.05	22.41
		6.00	0.00	21.91	22.03	22.49
	16QAM	1.00	0.00	21.74	21.97	22.35
		1.00	2.00	21.89	22.04	22.48
		1.00	5.00	21.82	22.00	22.34
		3.00	0.00	21.90	22.19	22.38
		3.00	1.00	22.14	22.08	22.35
		3.00	2.00	21.89	22.42	22.37
		6.00	0.00	21.76	21.89	22.33
Bandwidth	Mode	RB Size	RB Offset	Actual output po2wer(dBm)		
				Channel 23025 700.5MHz	Channel 23095 707.5MHz	Channel 23165 714.5MHz
3MHz	QPSK	1.00	0.00	22.48	22.23	22.58
		1.00	8.00	22.38	22.13	22.20
		1.00	14.00	21.66	21.92	22.30
		8.00	0.00	21.97	22.27	22.44
		8.00	4.00	21.58	21.86	22.43
		8.00	7.00	22.08	22.26	22.10
		15.00	0.00	22.02	22.31	22.07
	16QAM	1.00	0.00	22.31	22.14	21.99
		1.00	8.00	21.80	22.14	21.98
		1.00	15.00	21.89	22.13	22.51
		8.00	0.00	21.82	22.08	22.44
		8.00	4.00	22.25	22.11	22.25
		8.00	7.00	21.97	22.02	22.37
		15.00	0.00	21.98	22.33	22.41

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 23035 701.5MHz	Channel 23095 707.5MHz	Channel 23155 713.5MHz
5MHz	QPSK	1.00	0.00	22.18	22.30	22.39
		1.00	13.00	21.88	22.08	22.25
		1.00	24.00	21.79	21.92	22.19
		12.00	0.00	21.88	22.12	22.23
		12.00	6.00	22.14	22.09	21.95
		12.00	13.00	21.83	21.99	21.85
		25.00	0.00	21.99	22.22	21.86
	16QAM	1.00	0.00	21.80	21.82	21.89
		1.00	13.00	22.05	22.08	21.92
		1.00	24.00	21.83	21.98	21.88
		12.00	0.00	21.75	22.38	22.23
		12.00	6.00	21.74	21.79	21.96
		12.00	13.00	21.74	22.18	21.95
		25.00	0.00	21.85	22.20	21.83
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 23060 704.0MHz	Channel 23095 707.5MHz	Channel 23130 711.0MHz
10MHz	QPSK	1.00	0.00	22.28	22.14	22.45
		1.00	25.00	22.21	22.11	22.07
		1.00	49.00	21.83	21.65	21.44
		25.00	0.00	22.09	22.04	21.92
		25.00	13.00	21.78	21.94	21.79
		25.00	25.00	22.07	22.08	21.96
		50.00	0.00	21.76	21.96	21.61
	16QAM	1.00	0.00	22.07	22.13	22.00
		1.00	25.00	21.66	21.79	21.47
		1.00	49.00	21.98	22.14	21.99
		25.00	0.00	21.79	21.94	21.78
		25.00	13.00	22.23	22.07	22.03
		25.00	25.00	22.00	22.05	22.03
		50.00	0.00	21.89	22.11	21.87

Band 17						
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 23755 706.5MHz	Channel 23790 710MHz	Channel 23825 713.5MHz
5MHz	QPSK	1.00	0.00	22.17	21.53	22.06
		1.00	13.00	22.22	21.57	22.08
		1.00	24.00	21.84	21.89	21.99
		12.00	0.00	21.94	21.63	22.00
		12.00	6.00	22.10	21.86	22.09
		12.00	13.00	22.11	21.79	22.29
		25.00	0.00	21.94	21.63	22.40
	16QAM	1.00	0.00	21.76	21.86	22.50
		1.00	13.00	22.13	21.79	22.32
		1.00	24.00	22.11	21.59	22.41
		12.00	0.00	22.17	21.54	22.43
		12.00	6.00	21.83	21.53	22.29
		12.00	13.00	21.72	21.61	22.09
		25.00	0.00	21.74	21.53	22.10
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 23780 709MHz	Channel 23790 710MHz	Channel 23800 711MHz
10MHz	QPSK	1.00	0.00	21.76	22.07	22.29
		1.00	25.00	22.16	22.08	22.41
		1.00	49.00	22.26	22.05	22.02
		25.00	0.00	22.08	22.10	22.48
		25.00	13.00	21.88	21.94	22.37
		25.00	25.00	22.08	22.14	22.35
		50.00	0.00	21.99	21.94	22.32
	16QAM	1.00	0.00	21.80	22.02	22.40
		1.00	25.00	22.17	21.94	22.00
		1.00	49.00	22.26	22.01	21.97
		25.00	0.00	22.08	21.57	21.95
		25.00	13.00	22.40	21.66	21.96
		25.00	25.00	22.48	22.01	22.14
		1.00	0.00	21.76	22.07	22.29

7.4 Peak-to-Average Ratio

Test Requirement:	FCC part24.232(d) & FCC Part 27.50
Test Method:	FCC part2.1046
Limit:	13db
Test setup:	
Test Procedure:	A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. The traces are generated with the spectrum analyzer set to zero span mode. **Test Settings** 1. The signal analyzer's CCDF measurement profile enabled 2. Frequency= carrier center frequency 3. Measurement BW > EBW of signal 4. for continuous transmissions, set to 1ms Record the maximum PAPR level associated with a probability of 0.1%.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 7.1 for details
Test results:	Pass

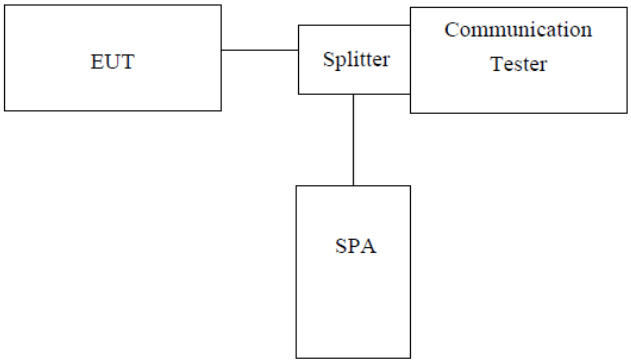
Remark: Both modulation modes have been tested, showing only the worst QPSK test data.

Measurement data:

Test Band	Test mode	Measured（dB）			Limit（dB）	Result
		Low Ch.	Middle Ch.	High Ch.		
LTE Band 2	LTE 1.4MHz Bandwidth	4.68	4.92	4.81	13.00	PASS
	LTE 3MHz Bandwidth	4.86	4.96	4.89	13.00	PASS
	LTE 5MHz Bandwidth	4.31	4.46	4.71	13.00	PASS
	LTE 10MHz Bandwidth	4.52	4.51	4.42	13.00	PASS
	LTE 15MHz Bandwidth	5.07	5.11	5.13	13.00	PASS
	LTE 20MHz Bandwidth	5.31	5.23	5.19	13.00	PASS
LTE Band 4	LTE 1.4MHz Bandwidth	4.79	4.85	5.01	13.00	PASS
	LTE 3MHz Bandwidth	4.82	4.96	5.05	13.00	PASS
	LTE 5MHz Bandwidth	5.12	5.06	4.89	13.00	PASS
	LTE 10MHz Bandwidth	4.97	4.63	5.05	13.00	PASS
	LTE 15MHz Bandwidth	5.11	5.23	5.07	13.00	PASS
	LTE 20MHz Bandwidth	5.25	5.32	5.62	13.00	PASS
LTE Band 12	LTE 1.4MHz Bandwidth	5.26	5.08	5.12	13.00	PASS
	LTE 3MHz Bandwidth	5.17	5.19	5.12	13.00	PASS
	LTE 5MHz Bandwidth	5.08	5.01	5.15	13.00	PASS
	LTE 10MHz Bandwidth	5.13	5.07	5.26	13.00	PASS

Test Band	Test mode	Peak to Average Ratio (dB)			Limit (dB)	Result
		Low Ch.	Middle Ch.	High Ch.		
LTE Band 5	LTE 1.4MHz Bandwidth	5.10	5.07	5.11	13.00	PASS
	LTE 3MHz Bandwidth	5.21	5.08	5.02	13.00	PASS
	LTE 5MHz Bandwidth	5.13	5.26	5.22	13.00	PASS
	LTE 10MHz Bandwidth	4.98	5.13	5.18	13.00	PASS
LTE Band 7	LTE 5MHz Bandwidth	5.02	5.07	5.13	13.00	PASS
	LTE 10MHz Bandwidth	5.25	5.19	5.42	13.00	PASS
	LTE 15MHz Bandwidth	5.28	5.12	5.05	13.00	PASS
	LTE 20MHz Bandwidth	5.10	5.04	5.52	13.00	PASS
LTE Band 17	LTE 5MHz Bandwidth	5.20	5.17	5.29	13.00	PASS
	LTE 10MHz Bandwidth	5.25	5.29	5.01	13.00	PASS

7.5 Occupy Bandwidth

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

Measurement Data

QPSK mode：

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 2	1.4MHz	Low range	6	0	1115.7	1331
		Mid range	6	0	1116.6	1296
		High range	6	0	1114.6	1340
	3MHz	Low range	15	0	2692.6	3808
		Mid range	15	0	2674.7	2923
		High range	15	0	2688.9	2926
	5MHz	Low range	25	0	4534.4	6791
		Mid range	25	0	4513.9	5029
		High range	25	0	4494.9	4949
	10MHz	Low range	50	0	8950.0	10131
		Mid range	50	0	8938.0	9690
		High range	50	0	8914.0	9532
	15MHz	Low range	75	0	13419.4	14636
		Mid range	75	0	13356.1	14535
		High range	75	0	13400.0	14635
	20MHz	Low range	100	0	17797.4	19361
		Mid range	100	0	17770.8	19060
		High range	100	0	17839.4	19139

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	1093.8	1299
		Mid range	6	0	1091.9	1305
		High range	6	0	1109.4	1320
	3MHz	Low range	15	0	2682.0	2927
		Mid range	15	0	2683.4	2953
		High range	15	0	2684.5	2956
	5MHz	Low range	25	0	4501.1	4929
		Mid range	25	0	4514.8	4990
		High range	25	0	4538.3	5051
	10MHz	Low range	50	0	8932.7	9850
		Mid range	50	0	8930.1	9630
		High range	50	0	8930.5	9652
	15MHz	Low range	75	0	13408.5	14516
		Mid range	75	0	13371.0	14245
		High range	75	0	13390.6	14686
	20MHz	Low range	100	0	17807.9	19072
		Mid range	100	0	17781.0	18792
		High range	100	0	17800.0	19121

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	1107.3	1957
		Mid range	6	0	1091.1	1310
		High range	6	0	1091.8	1295
	3MHz	Low range	15	0	2684.5	2949
		Mid range	15	0	2682.6	2931
		High range	15	0	2677.0	2938
	5MHz	Low range	25	0	4515.1	5021
		Mid range	25	0	4508.2	4979
		High range	25	0	4507.1	4971
	10MHz	Low range	50	0	8976.2	9875
		Mid range	50	0	8909.8	9635
		High range	50	0	8935.2	9681

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 7	5MHz	Low range	6	0	4518.1	5025
		Mid range	6	0	4504.6	4983
		High range	6	0	4508.6	4967
	10MHz	Low range	15	0	8954.4	9678
		Mid range	15	0	8917.6	9702
		High range	15	0	8927.0	9593
	15MHz	Low range	25	0	13381.9	14323
		Mid range	25	0	13338.6	14317
		High range	25	0	13300.6	14383
	20MHz	Low range	50	0	17879.0	19261
		Mid range	50	0	17812.4	19078
		High range	50	0	17801.4	19137

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	1093.6	1323
		Mid range	6	0	1105.8	1638
		High range	6	0	1102.2	1351
	3MHz	Low range	15	0	2680.0	2937
		Mid range	15	0	2683.3	2939
		High range	15	0	2685.8	2959
	5MHz	Low range	25	0	4317.5	4813
		Mid range	25	0	4514.9	5024
		High range	25	0	4497.2	4982
	10MHz	Low range	50	0	8951.0	10011
		Mid range	50	0	8973.9	9877
		High range	50	0	8945.0	9884

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 17	5MHz	Low range	25	0	4522.1	5744
		Mid range	25	0	4504.1	4999
		High range	25	0	4519.1	4936
	10MHz	Low range	50	0	8968.3	9899
		Mid range	50	0	8930.8	9649
		High range	50	0	8929.0	9647

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	1118.3	1346
		Mid range	6	0	1114.9	1295
		High range	6	0	1113.8	1330
	3MHz	Low range	15	0	2694.9	3791
		Mid range	15	0	2674.9	2894
		High range	15	0	2693.1	2911
	5MHz	Low range	25	0	4521.4	5854
		Mid range	25	0	4500.3	5007
		High range	25	0	4494.7	4953
	10MHz	Low range	50	0	8955.3	10410
		Mid range	50	0	8935.5	9704
		High range	50	0	8941.7	9599
	15MHz	Low range	75	0	13388.9	14372
		Mid range	75	0	13376.3	14558
		High range	75	0	13400.0	14578
	20MHz	Low range	100	0	17829.8	19168
		Mid range	100	0	17759.7	18950
		High range	100	0	17871.5	19001

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	1096.0	1288
		Mid range	6	0	1096.1	1311
		High range	6	0	1106.4	1300
	3MHz	Low range	15	0	2679.3	2946
		Mid range	15	0	2682.0	2912
		High range	15	0	2683.7	2947
	5MHz	Low range	25	0	4504.1	4997
		Mid range	25	0	4514.2	4976
		High range	25	0	4509.8	5007
	10MHz	Low range	50	0	8937.7	9617
		Mid range	50	0	8919.2	9649
		High range	50	0	8950.9	9823
	15MHz	Low range	75	0	13390.1	14432
		Mid range	75	0	13374.6	14538
		High range	75	0	13390.3	14513
	20MHz	Low range	100	0	17833.4	19168
		Mid range	100	0	17772.4	18923
		High range	100	0	17781.5	19111

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 5	1.4MHz	Low range	6	0	1106.6	1940
		Mid range	6	0	1096.6	1298
		High range	6	0	1091.1	1272
	3MHz	Low range	15	0	2682.0	2920
		Mid range	15	0	2683.7	2933
		High range	15	0	2678.5	2938
	5MHz	Low range	25	0	4507.2	4968
		Mid range	25	0	4495.6	4988
		High range	25	0	4509.9	5016
	10MHz	Low range	50	0	8974.6	9850
		Mid range	50	0	8912.0	9601
		High range	50	0	8956.8	9641

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 7	5MHz	Low range	6	0	4500.1	4971
		Mid range	6	0	4489.9	4955
		High range	6	0	4501.9	4952
	10MHz	Low range	15	0	8944.3	9613
		Mid range	15	0	8912.3	9606
		High range	15	0	8941.9	9763
	15MHz	Low range	25	0	13381.1	14544
		Mid range	25	0	13352.9	14416
		High range	25	0	13327.7	14188
	20MHz	Low range	50	0	17830.0	19159
		Mid range	50	0	17821.7	19023
		High range	50	0	17809.8	19208

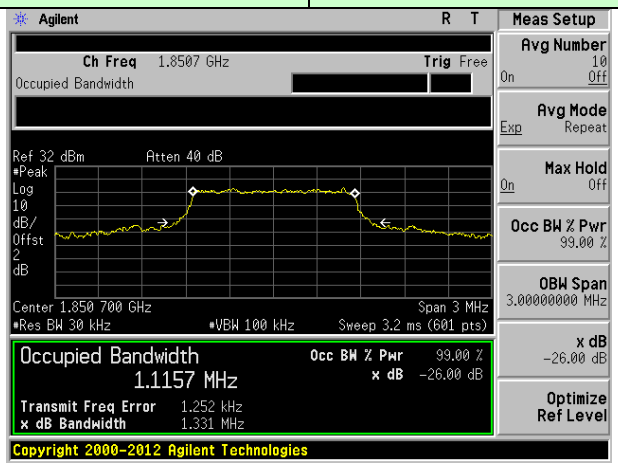
EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 12	1.4MHz	Low range	6	0	1093.9	1311
		Mid range	6	0	1105.5	1376
		High range	6	0	1109.5	1363
	3MHz	Low range	15	0	2645.5	2918
		Mid range	15	0	2690.0	2945
		High range	15	0	2689.0	3012
	5MHz	Low range	25	0	4315.7	4841
		Mid range	25	0	4527.2	4981
		High range	25	0	4485.6	4928
	10MHz	Low range	50	0	8951.0	9957
		Mid range	50	0	8969.3	10011
		High range	50	0	8940.2	9968

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 17	5MHz	Low range	25	0	4526.8	4961
		Mid range	25	0	4511.7	4859
		High range	25	0	4505.9	4994
	10MHz	Low range	50	0	8975.7	9634
		Mid range	50	0	8936.5	9654
		High range	50	0	8937.9	9688

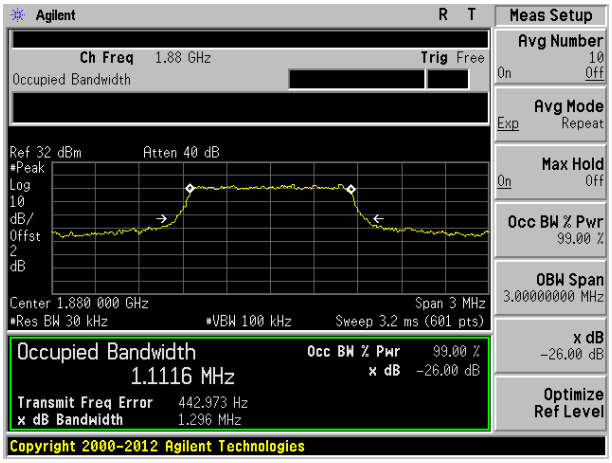
Test plot as follows:

QPSK mode:

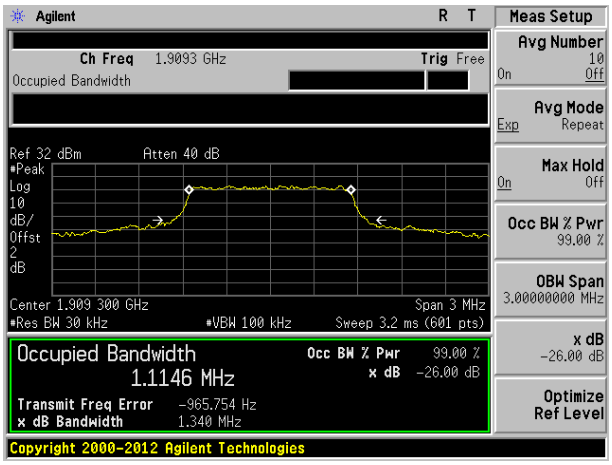
Test band: LTE Band 2	Channel Bandwidth: 1.4MHz



Lowest channel

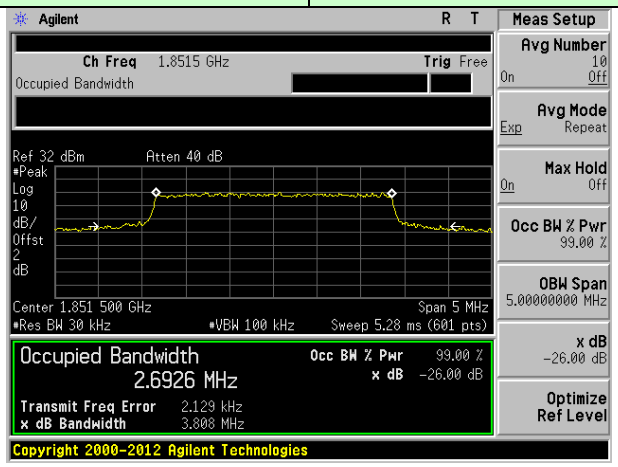


Middle channel

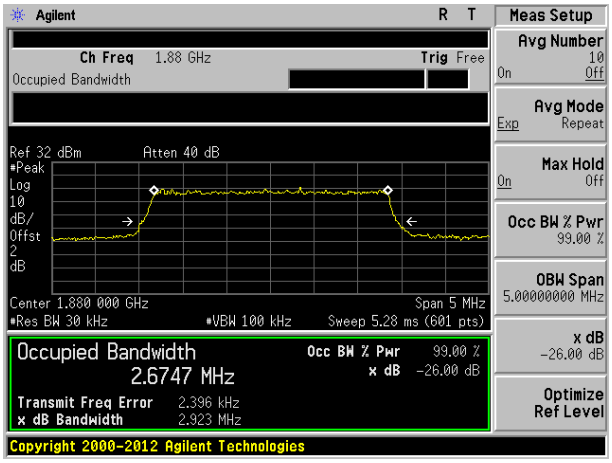


Highest channel

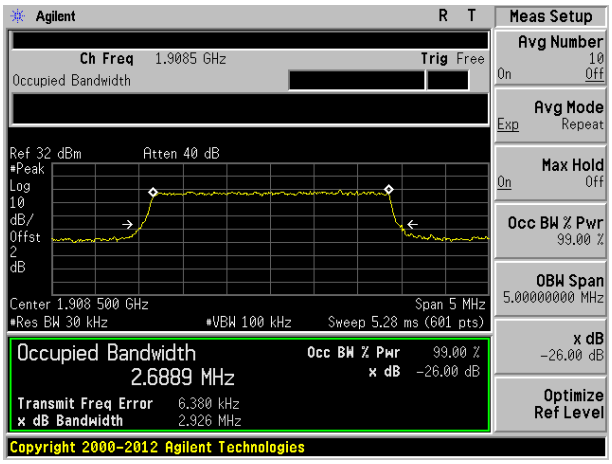
Test band: LTE Band 2	Channel Bandwidth:3MHz



Lowest channel

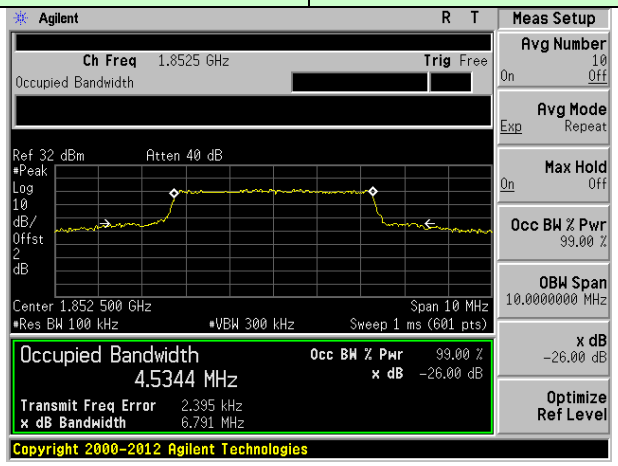


Middle channel

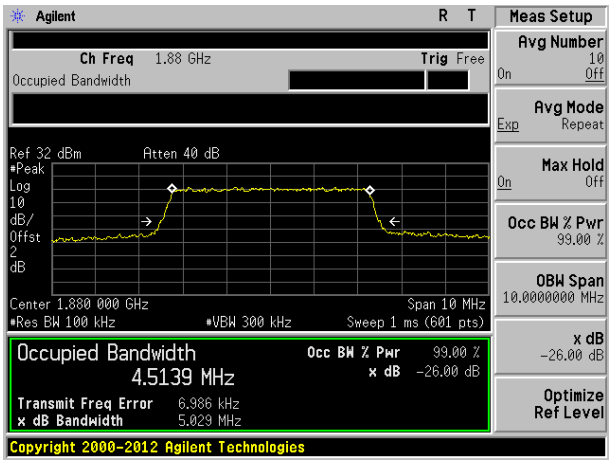


Highest channel

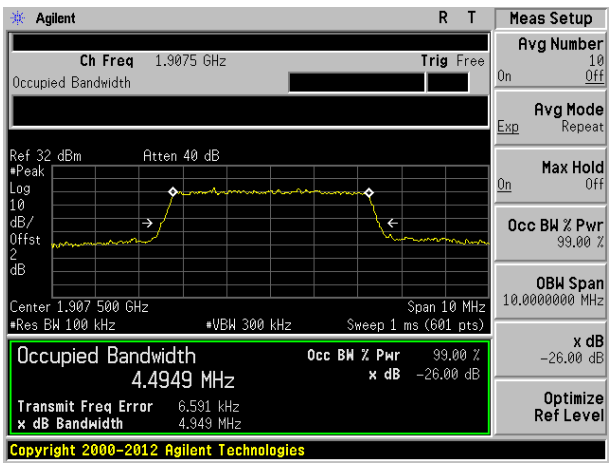
Test band: LTE Band 2	Channel Bandwidth: 5MHz



Lowest channel

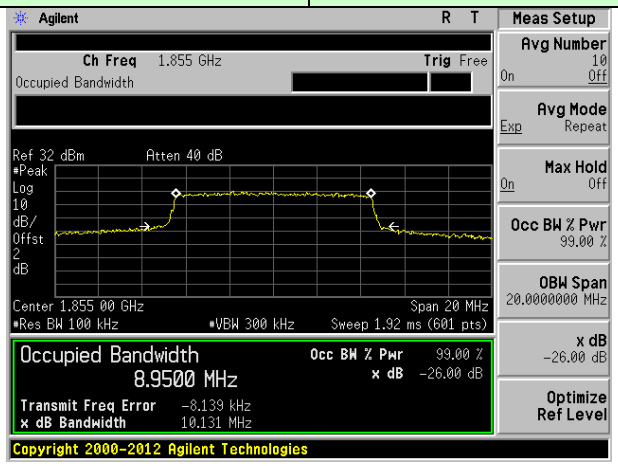


Middle channel

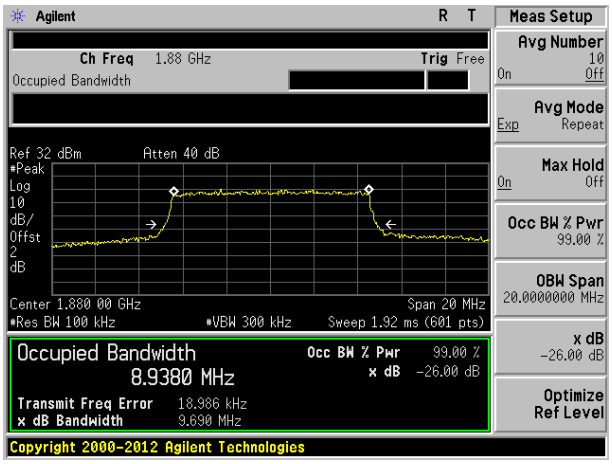


Highest channel

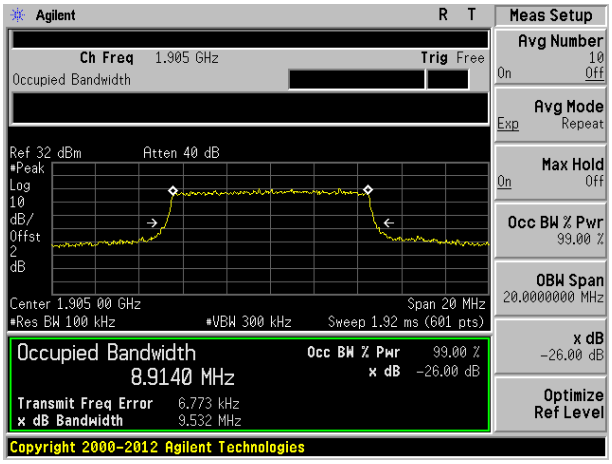
Test band: LTE Band 2	Channel Bandwidth:10MHz



Lowest channel

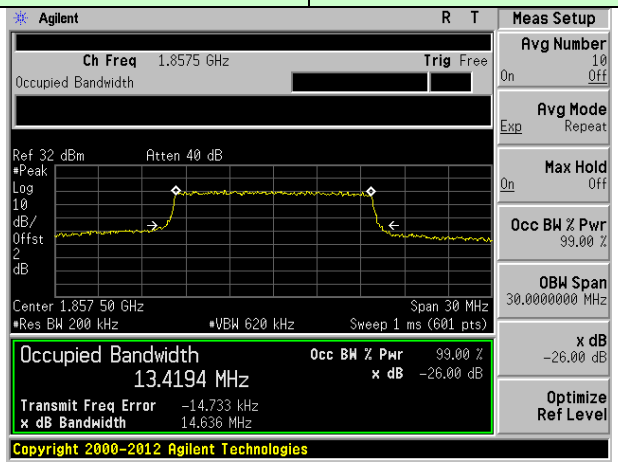


Middle channel

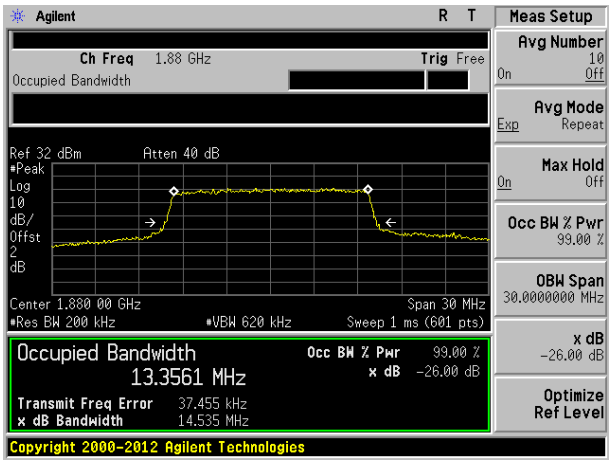


Highest channel

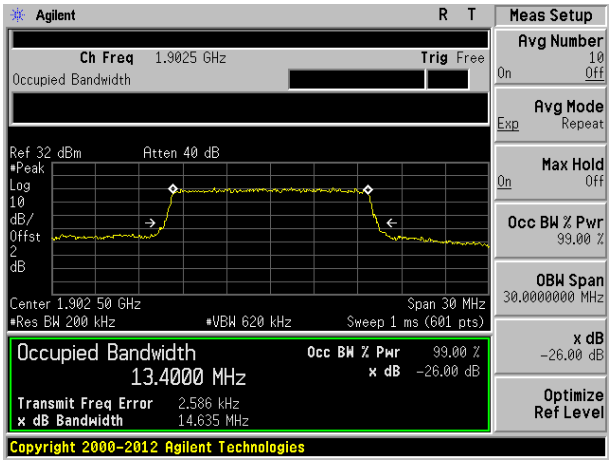
Test band: LTE Band 2	Channel Bandwidth:15MHz



Lowest channel

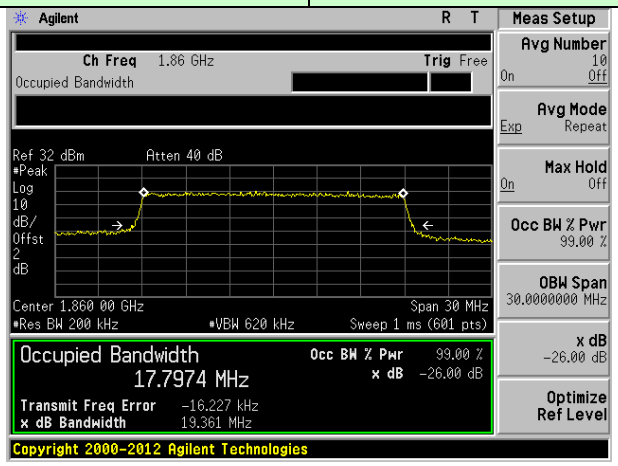


Middle channel

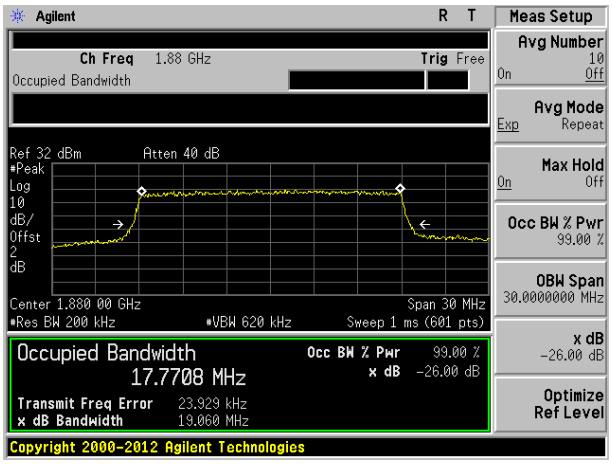


Highest channel

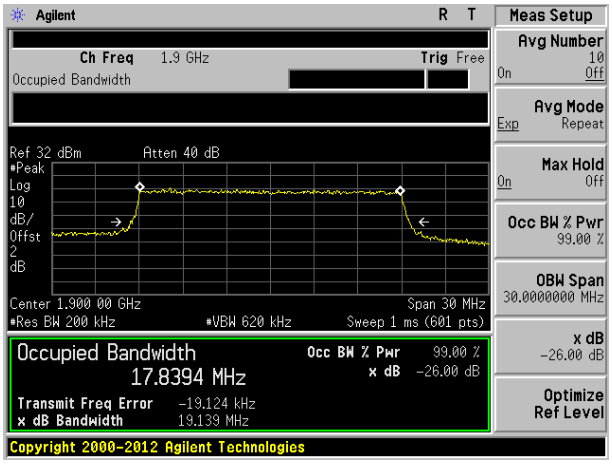
Test band: LTE Band 2	Channel Bandwidth:20MHz



Lowest channel

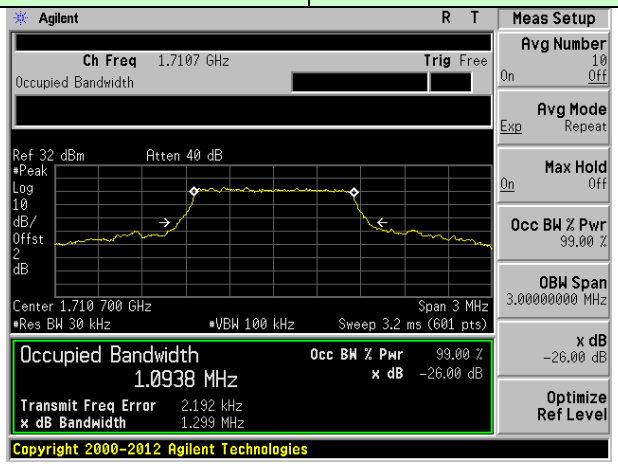


Middle channel

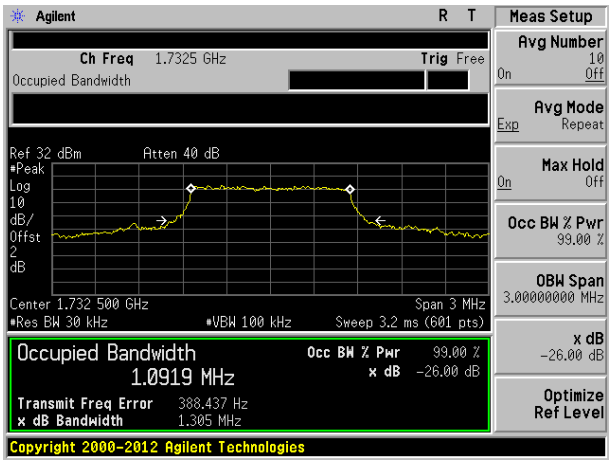


Highest channel

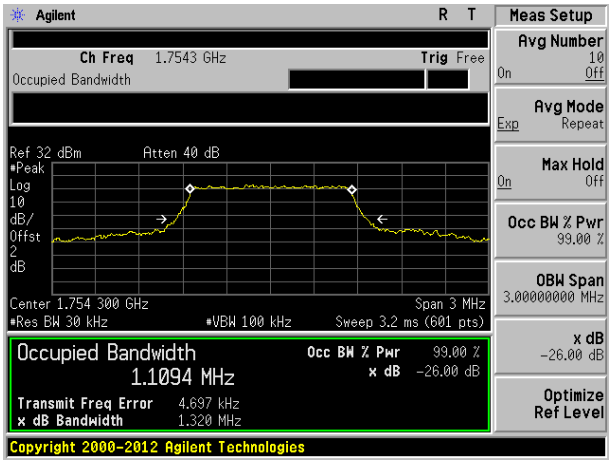
Test band: LTE Band 4	Channel Bandwidth: 1.4MHz



Lowest channel

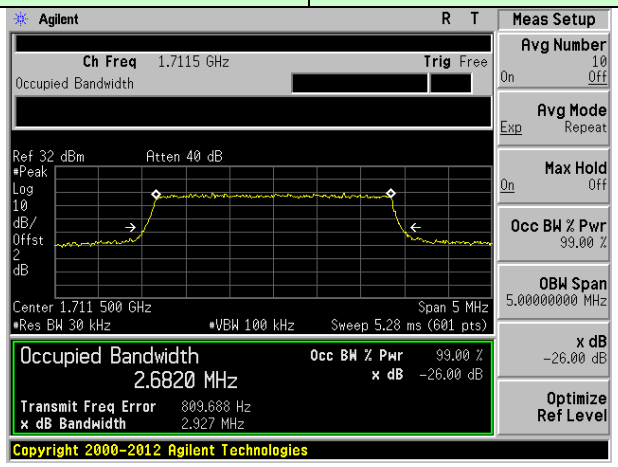


Middle channel

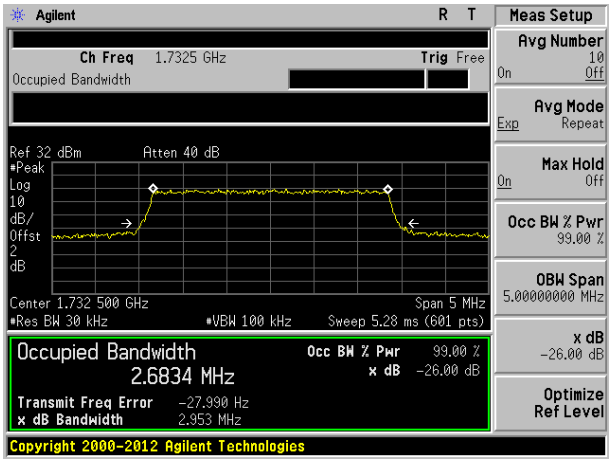


Highest channel

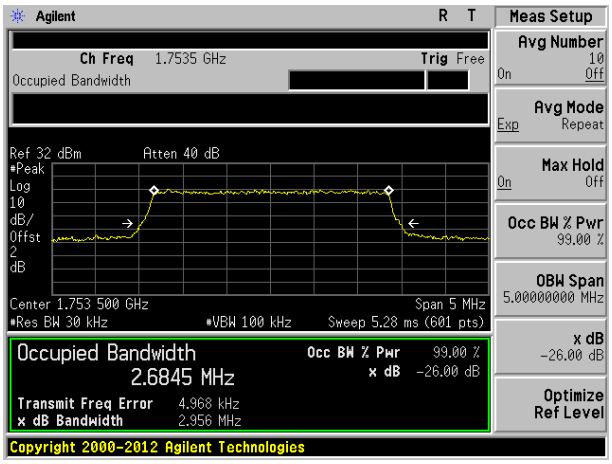
Test band: LTE Band 4	Channel Bandwidth: 3MHz



Lowest channel

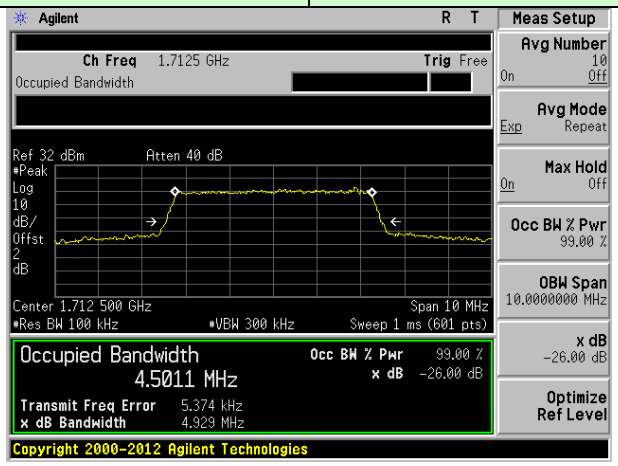


Middle channel

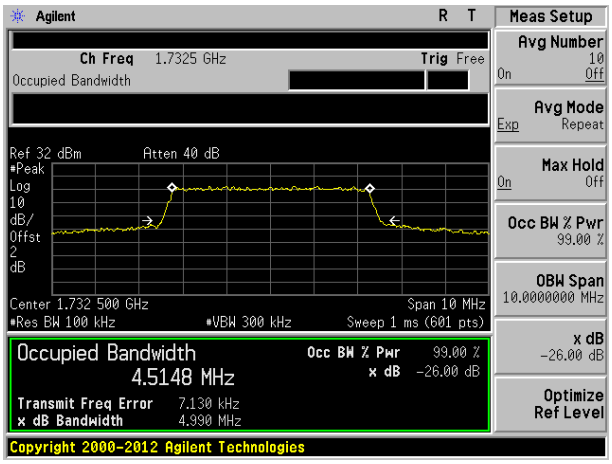


Highest channel

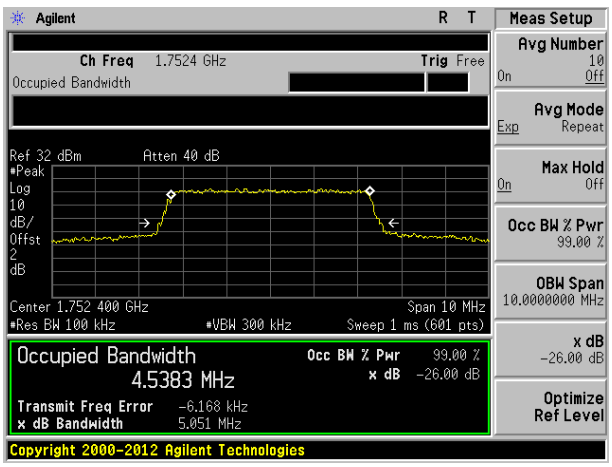
Test band: LTE Band 4	Channel Bandwidth: 5MHz



Lowest channel

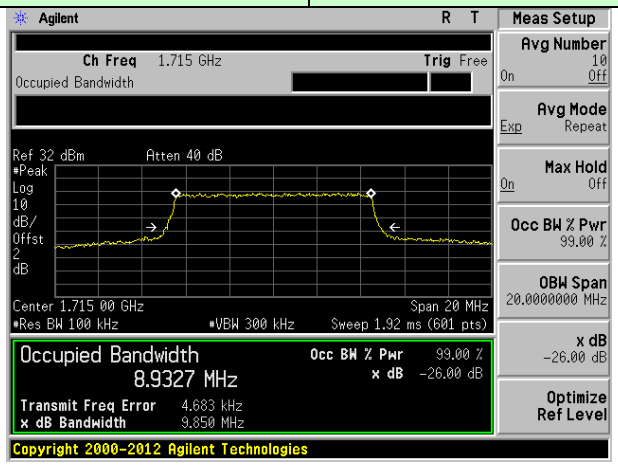


Middle channel

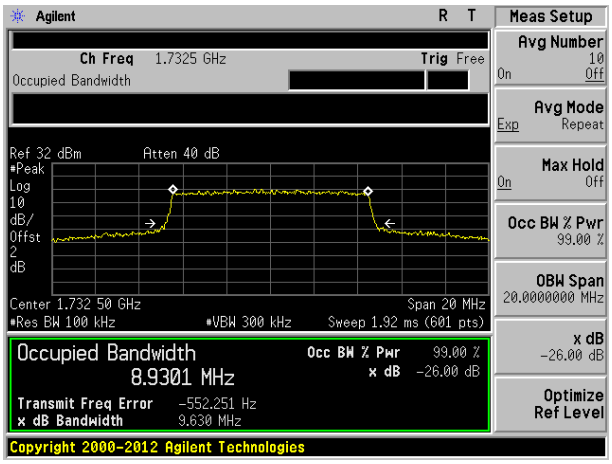


Highest channel

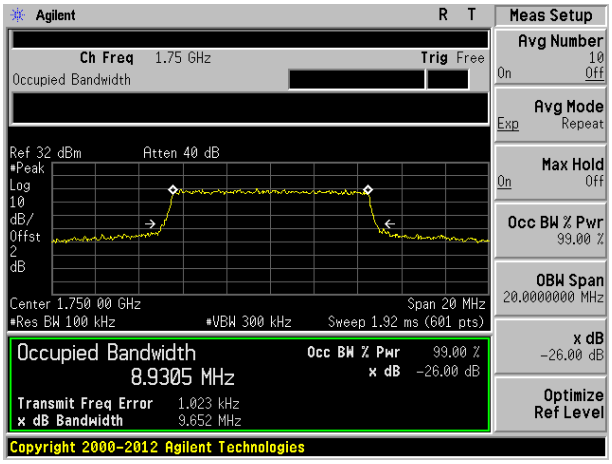
Test band: LTE Band 4	Channel Bandwidth: 10MHz



Lowest channel

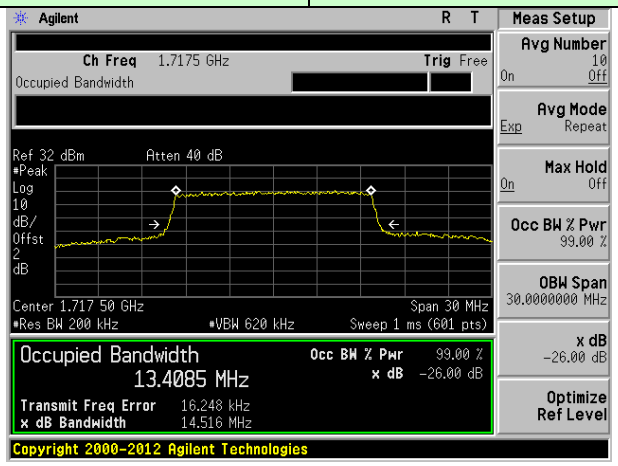


Middle channel

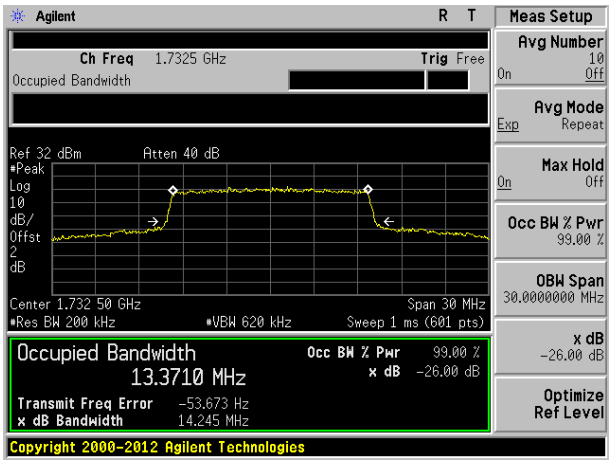


Highest channel

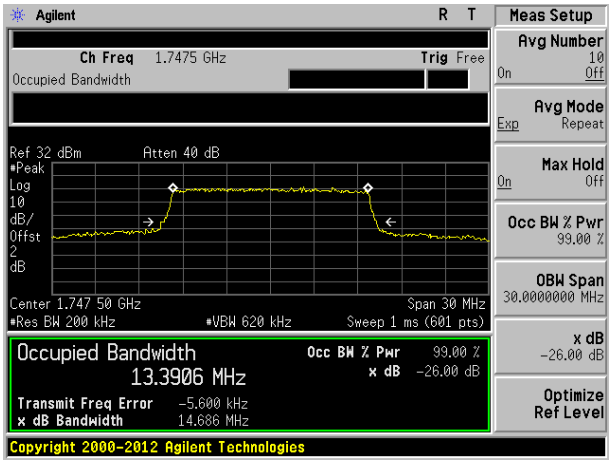
Test band: LTE Band 4	Channel Bandwidth: 15MHz



Lowest channel

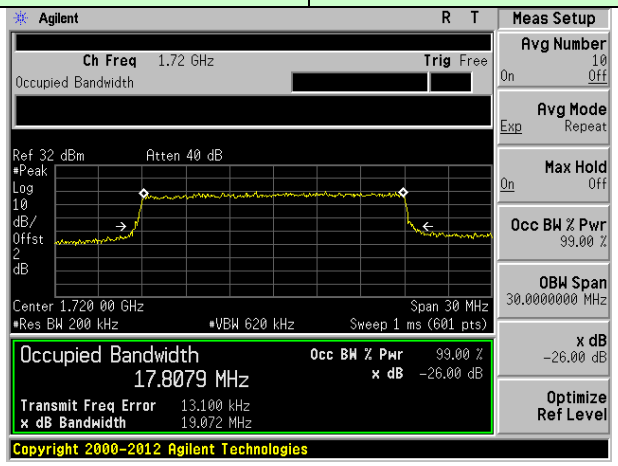


Middle channel

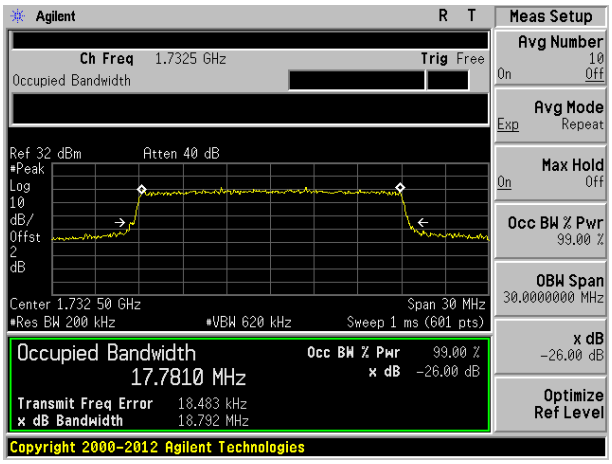


Highest channel

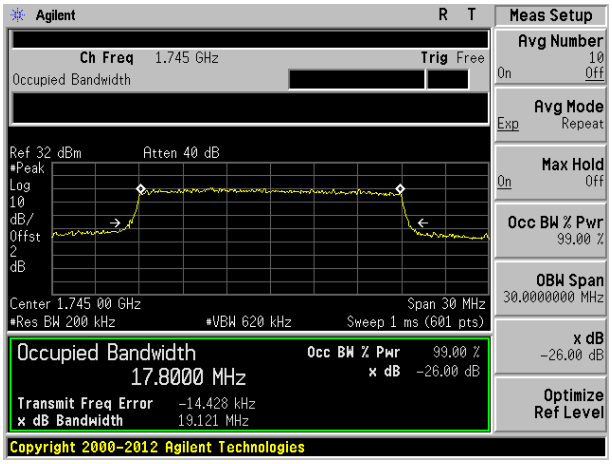
Test band: LTE Band 4	Channel Bandwidth: 20MHz



Lowest channel

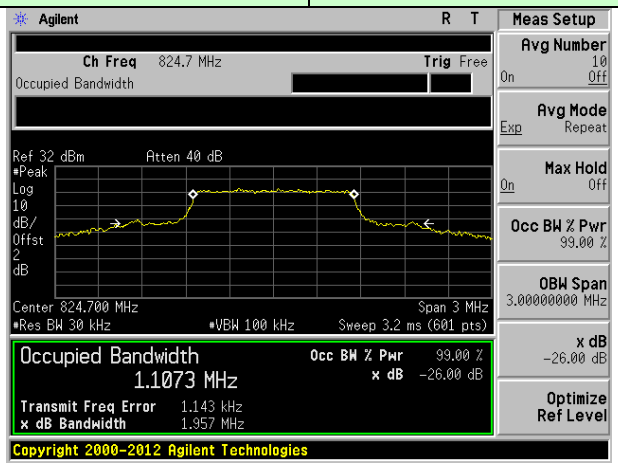


Middle channel

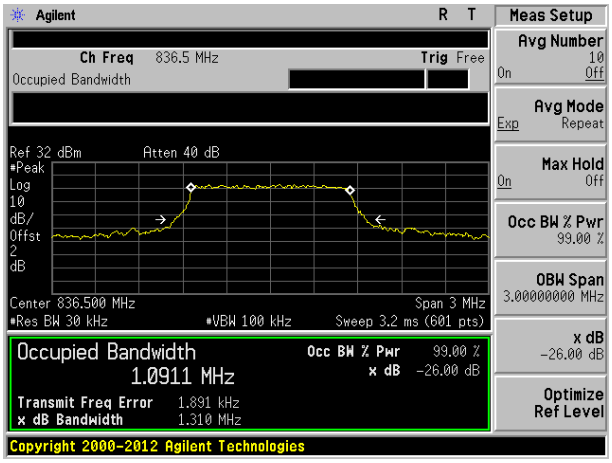


Highest channel

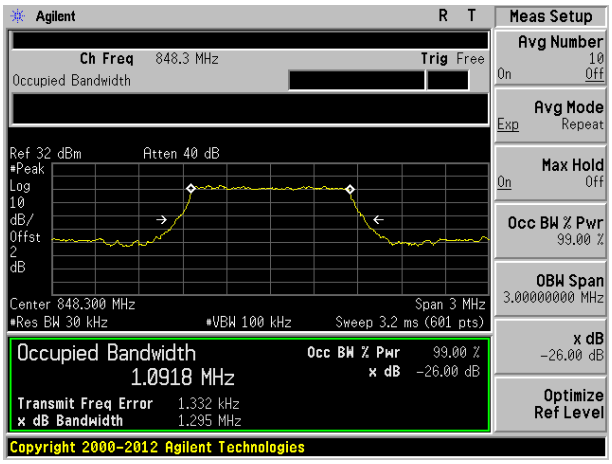
Test band: LTE Band 5	Channel Bandwidth: 1.4MHz



Lowest channel

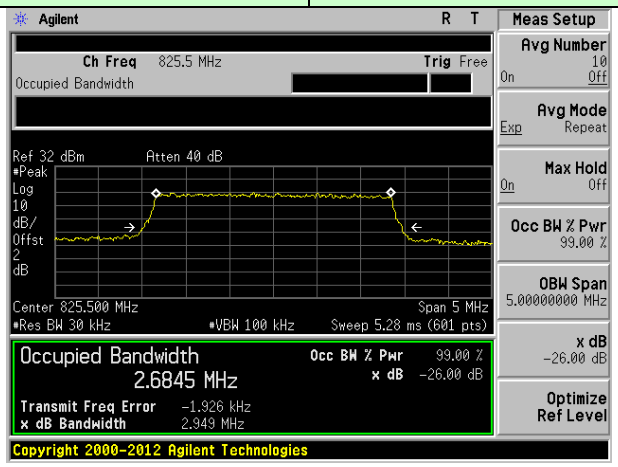


Middle channel

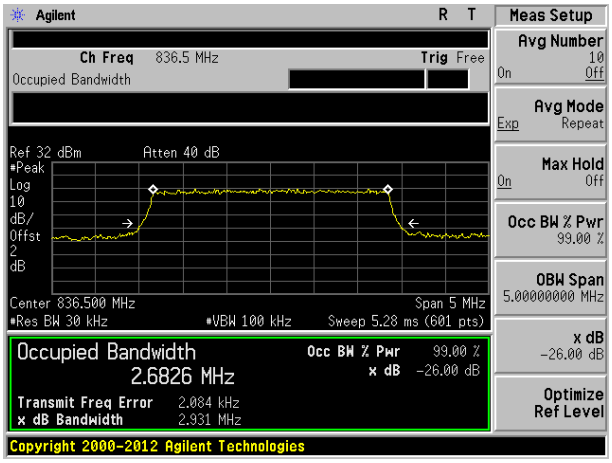


Highest channel

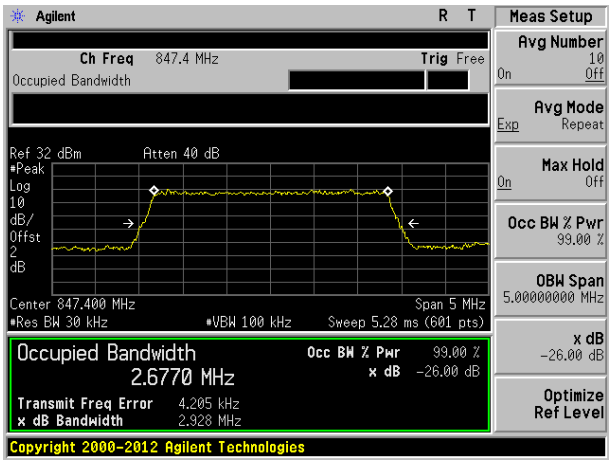
Test band: LTE Band 5	Channel Bandwidth: 3MHz



Lowest channel

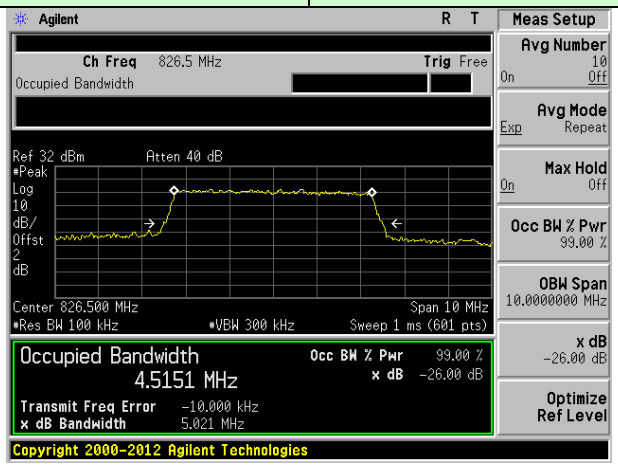


Middle channel

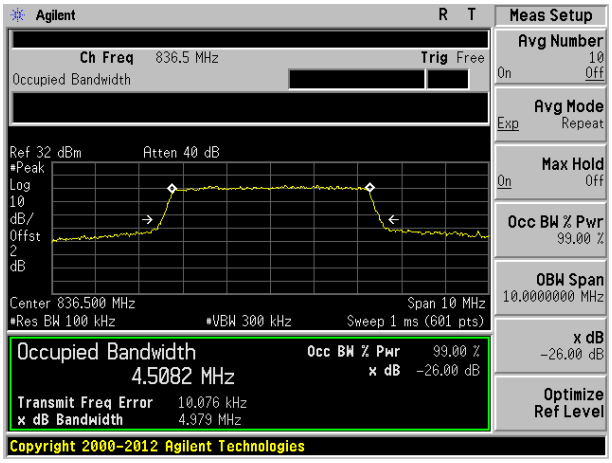


Highest channel

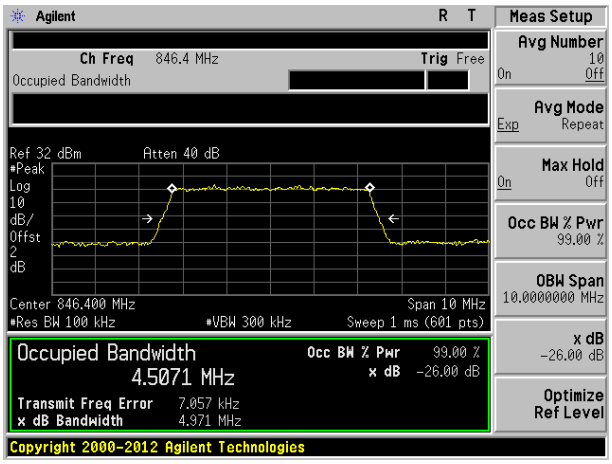
Test band: LTE Band 5	Channel Bandwidth: 5MHz



Lowest channel

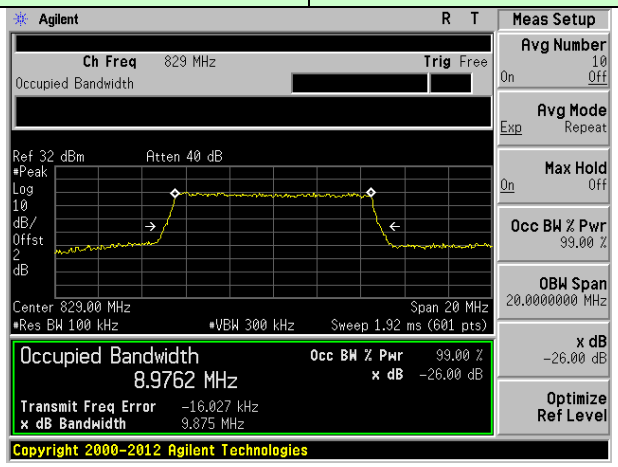


Middle channel

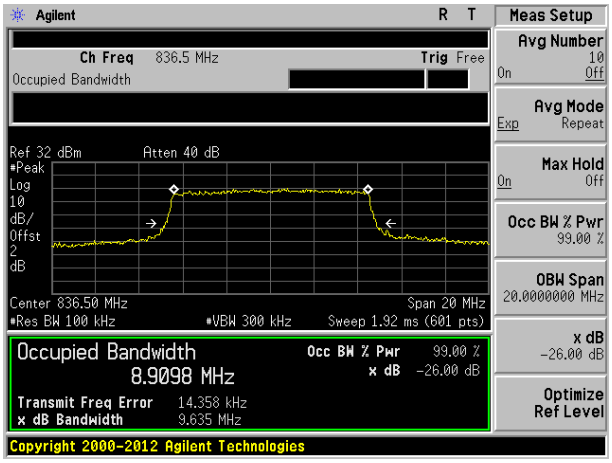


Highest channel

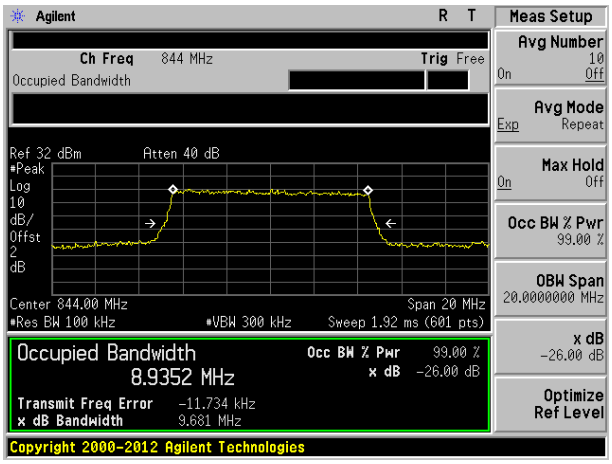
Test band: LTE Band 5	Channel Bandwidth: 10MHz



Lowest channel

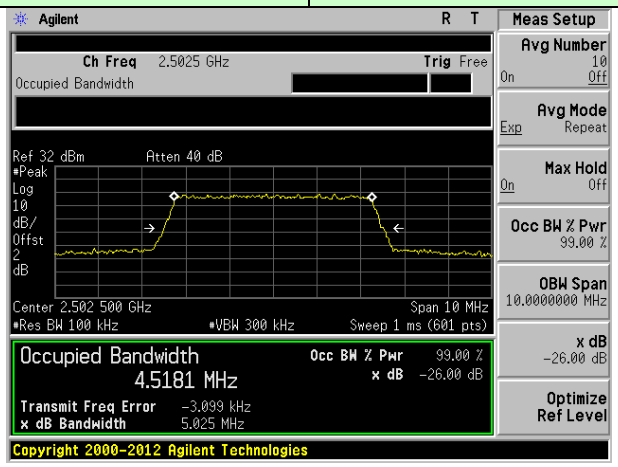


Middle channel

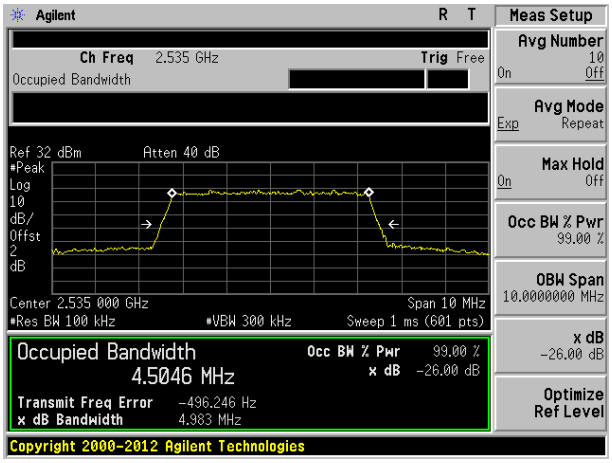


Highest channel

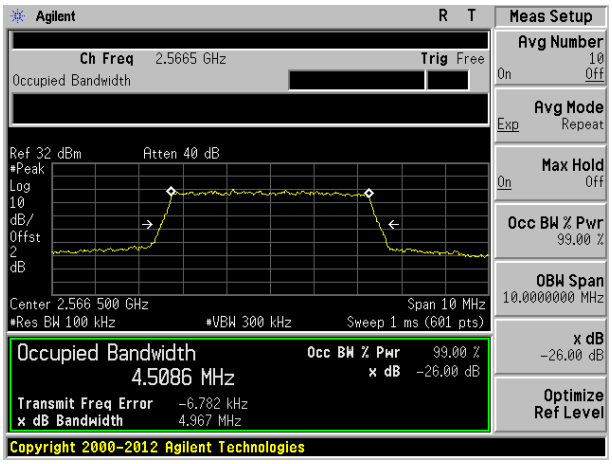
Test band: LTE Band 7	Channel Bandwidth: 5MHz



Lowest channel

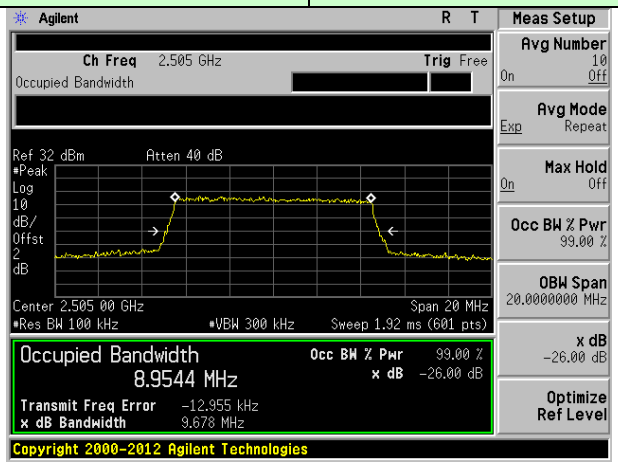


Middle channel

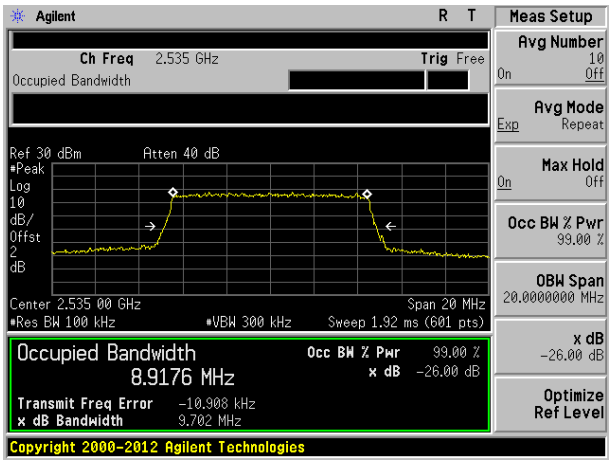


Highest channel

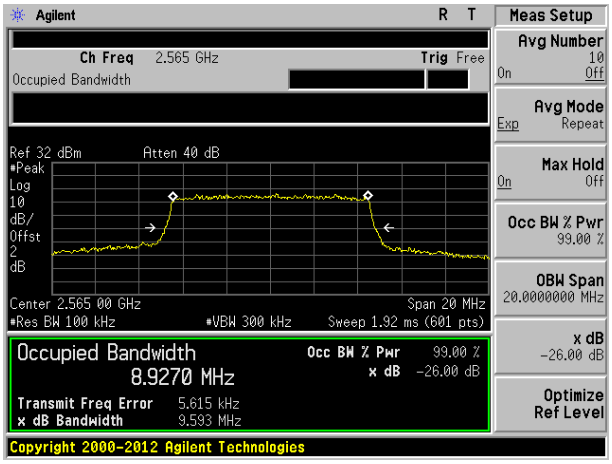
Test band: LTE Band 7	Channel Bandwidth: 10MHz



Lowest channel

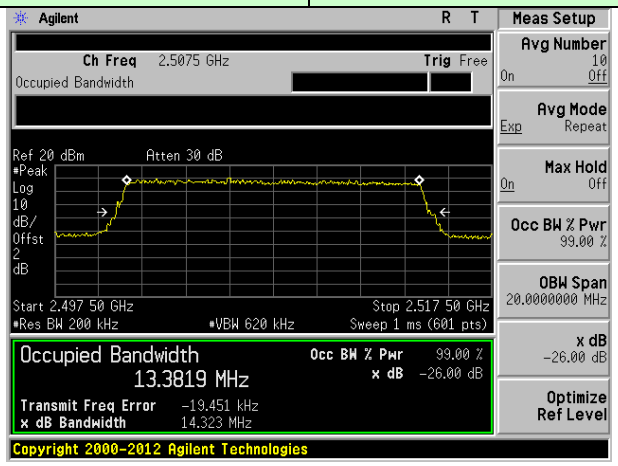


Middle channel

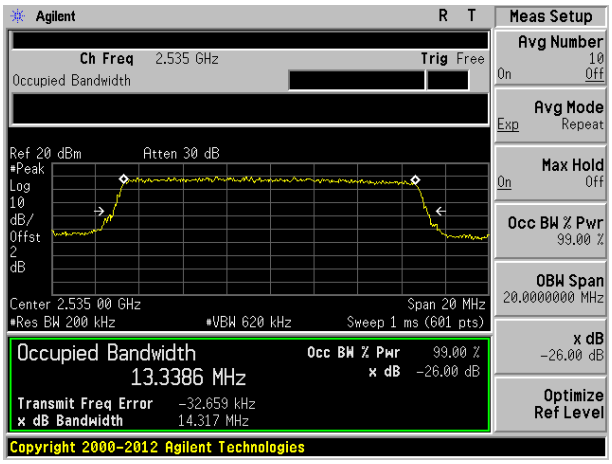


Highest channel

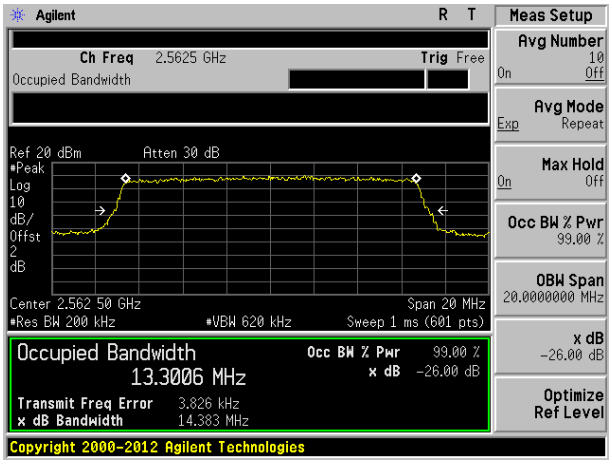
Test band: LTE Band 7	Channel Bandwidth: 15MHz



Lowest channel

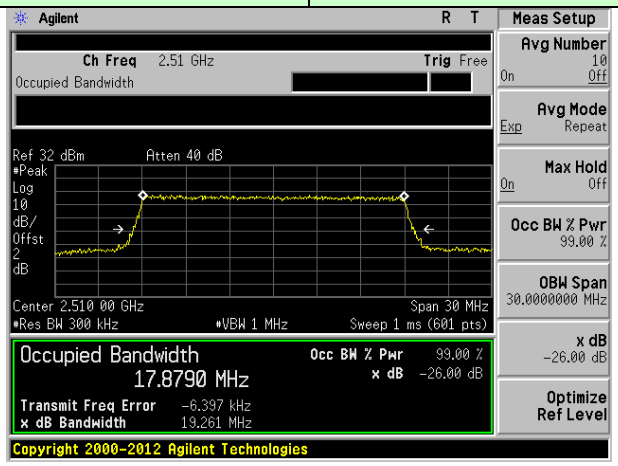


Middle channel

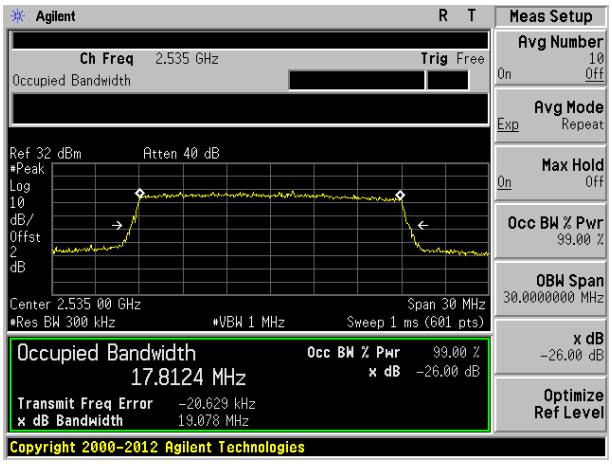


Highest channel

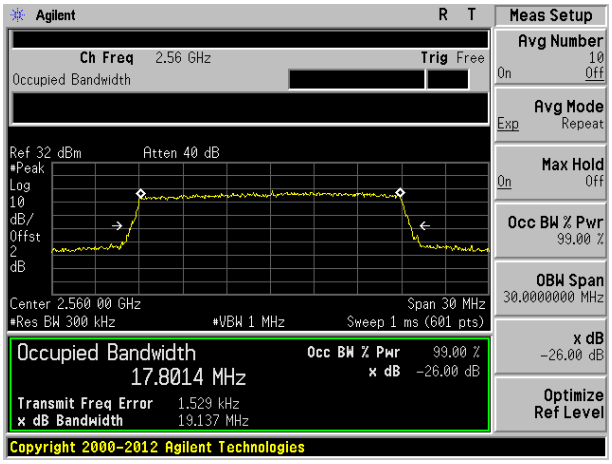
Test band: LTE Band 7	Channel Bandwidth: 20MHz



Lowest channel

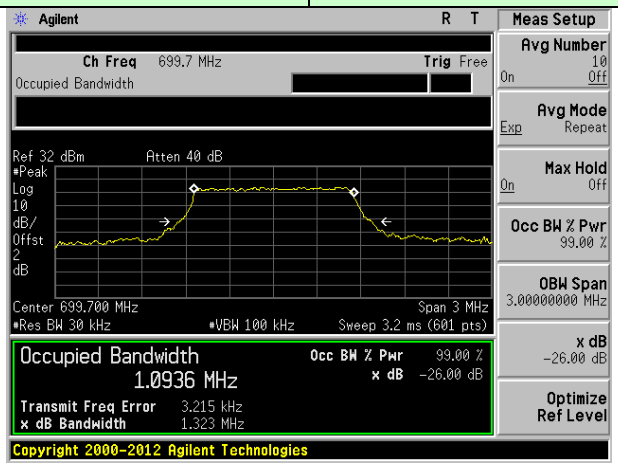


Middle channel

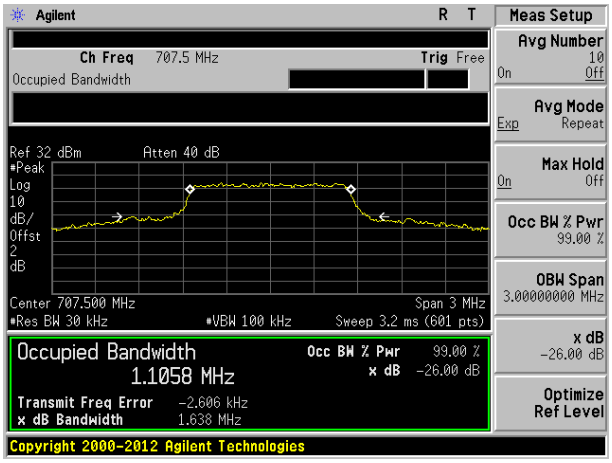


Highest channel

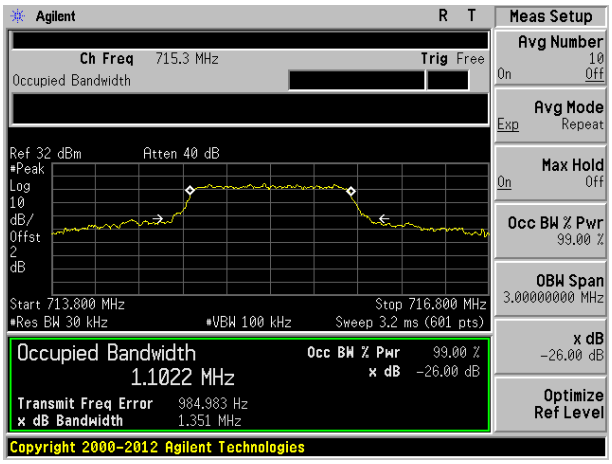
Test band: LTE Band 12	Channel Bandwidth: 1.4MHz



Lowest channel

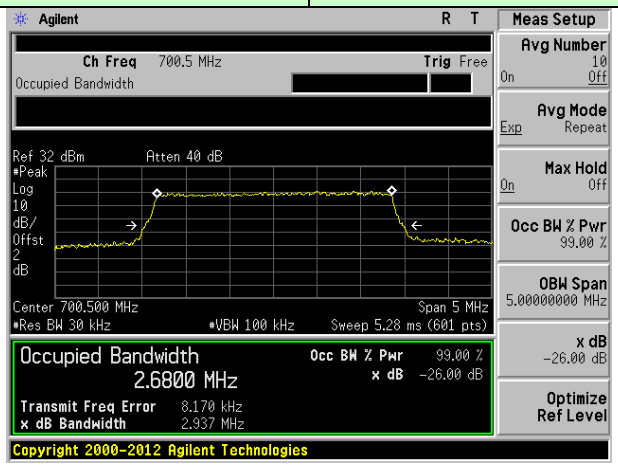


Middle channel

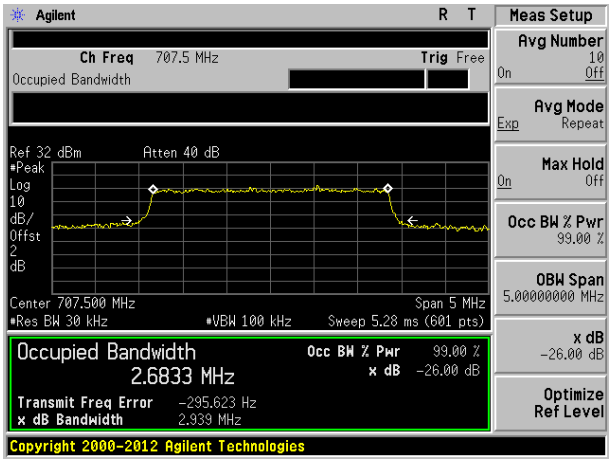


Highest channel

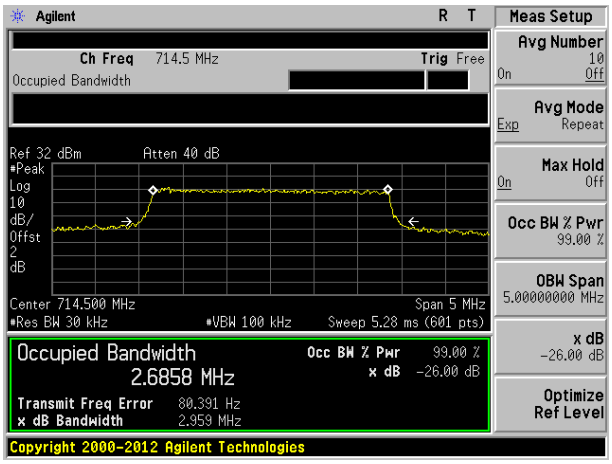
Test band: LTE Band 12	Channel Bandwidth: 3MHz



Lowest channel

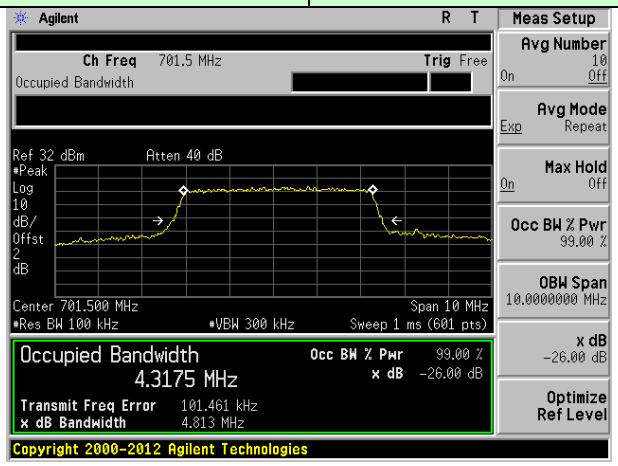


Middle channel

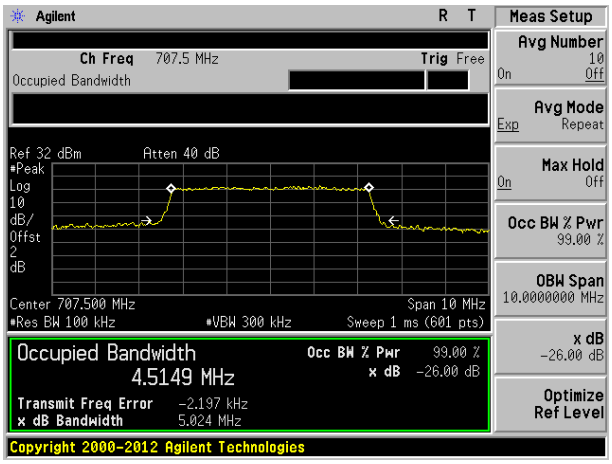


Highest channel

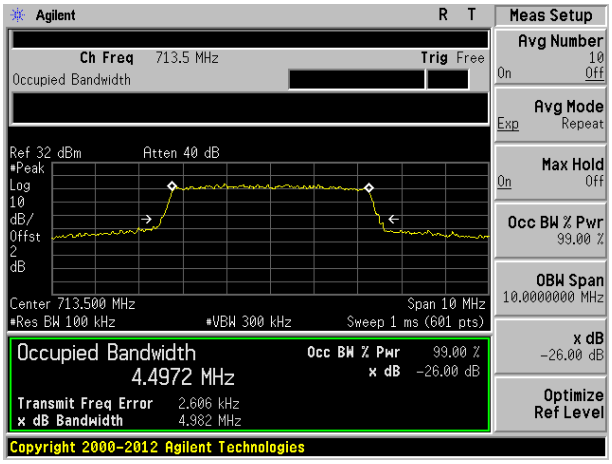
Test band: LTE Band 12	Channel Bandwidth: 5MHz



Lowest channel

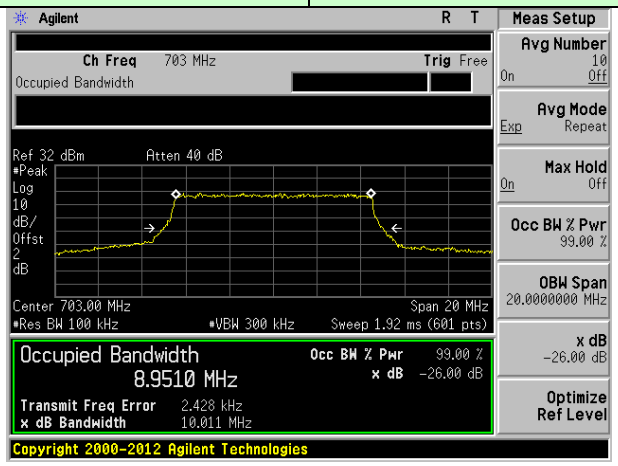


Middle channel

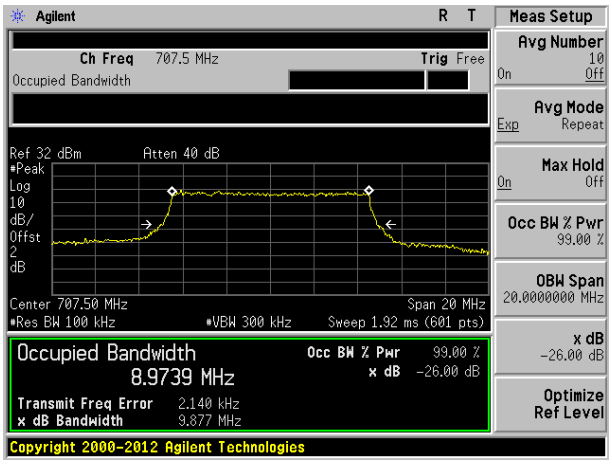


Highest channel

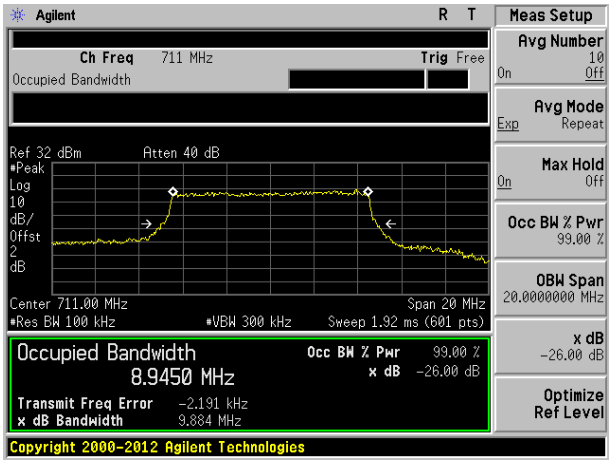
Test band: LTE Band 12	Channel Bandwidth: 10MHz



Lowest channel

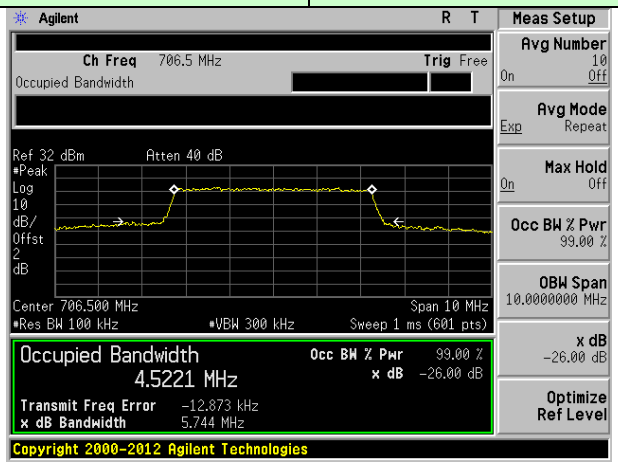


Middle channel

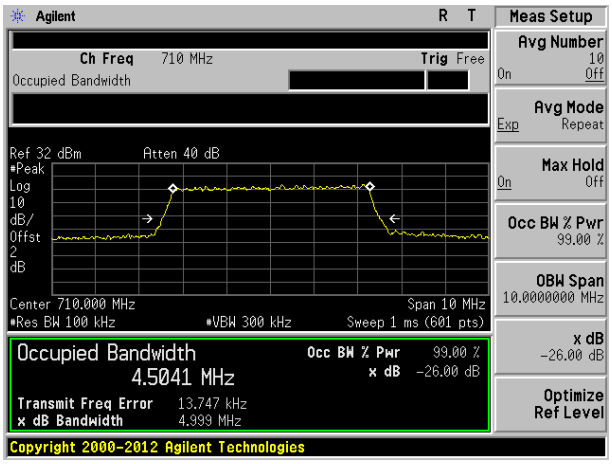


Highest channel

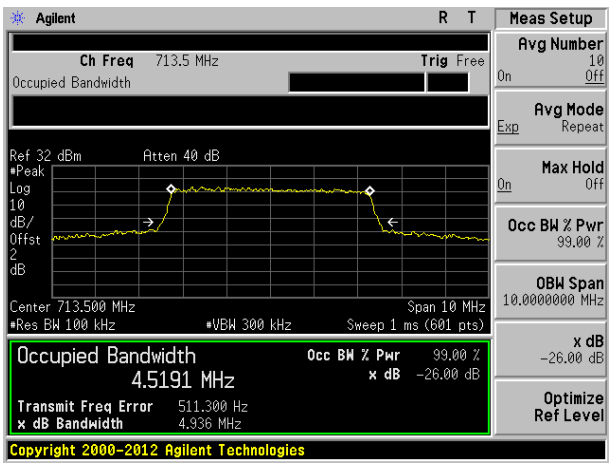
Test band: LTE Band 17	Channel Bandwidth: 5MHz



Lowest channel

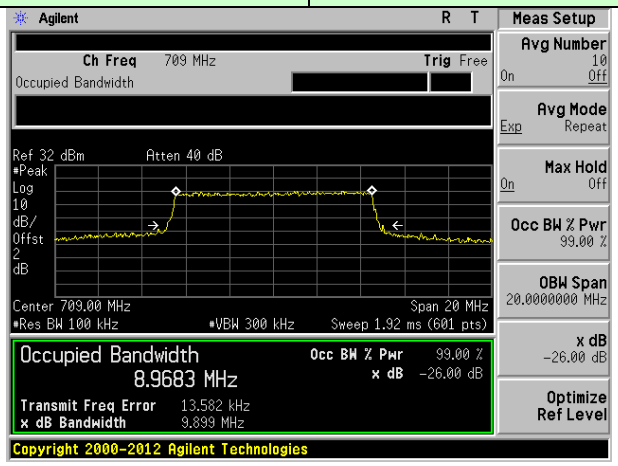


Middle channel

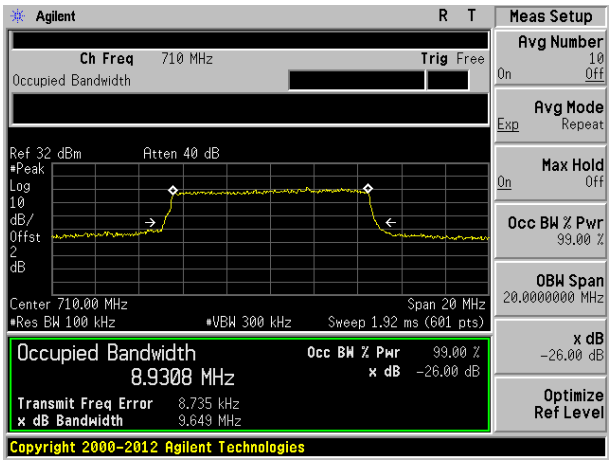


Highest channel

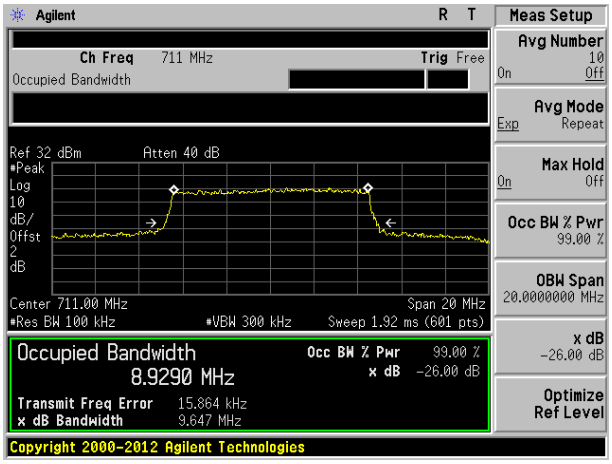
Test band: LTE Band 17	Channel Bandwidth: 10MHz



Lowest channel



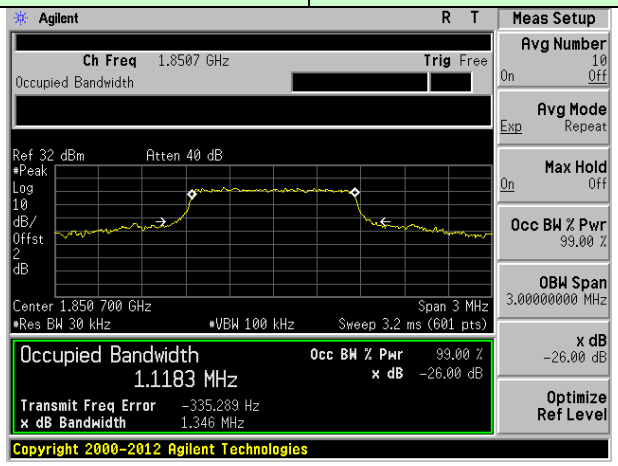
Middle channel



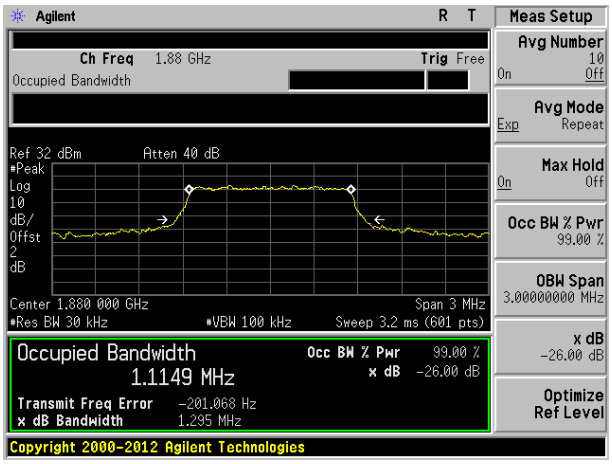
Highest channel

16QAM mode:

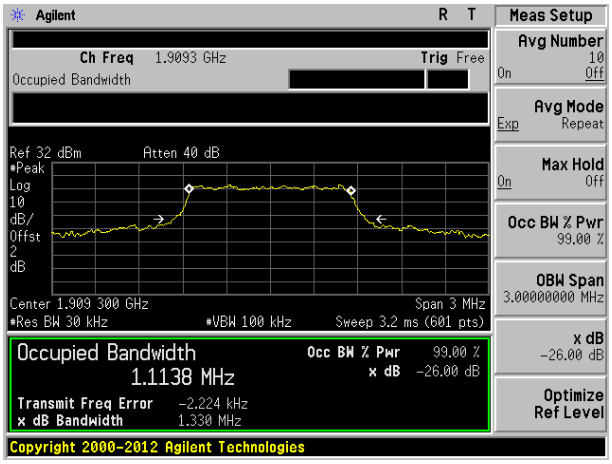
Test band: LTE Band 2	Channel Bandwidth: 1.4MHz



Lowest channel

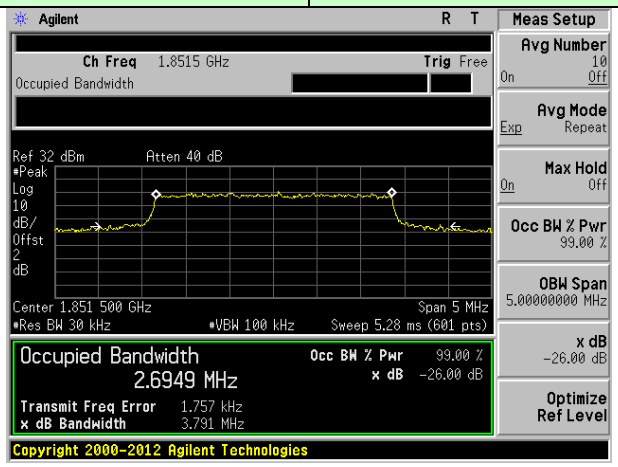


Middle channel

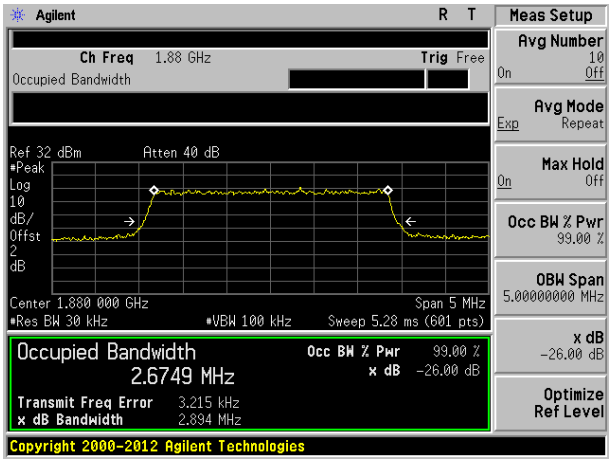


Highest channel

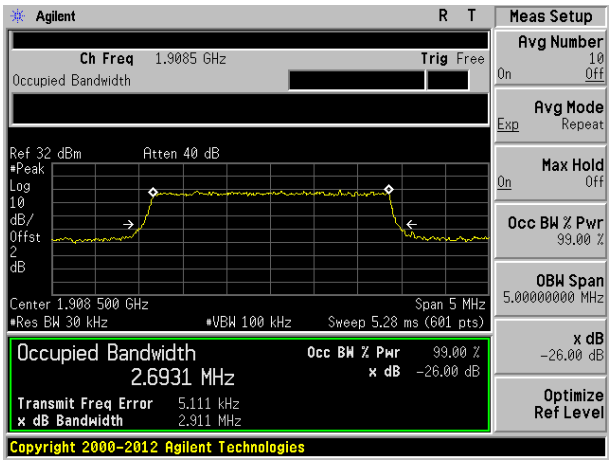
Test band: LTE Band 2	Channel Bandwidth:3MHz



Lowest channel

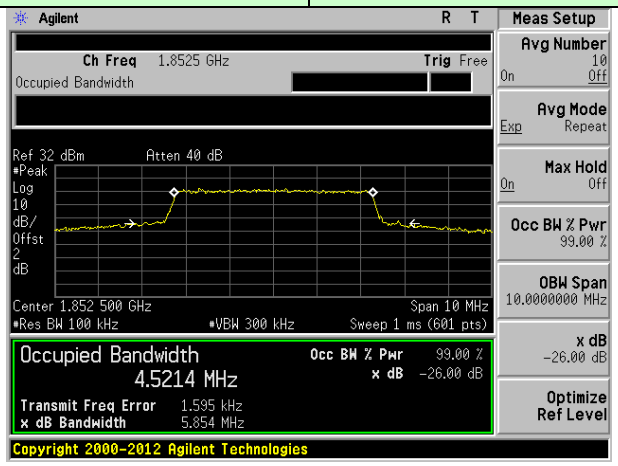


Middle channel

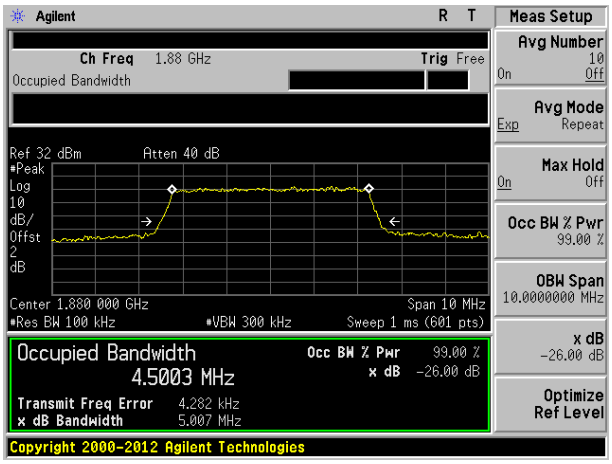


Highest channel

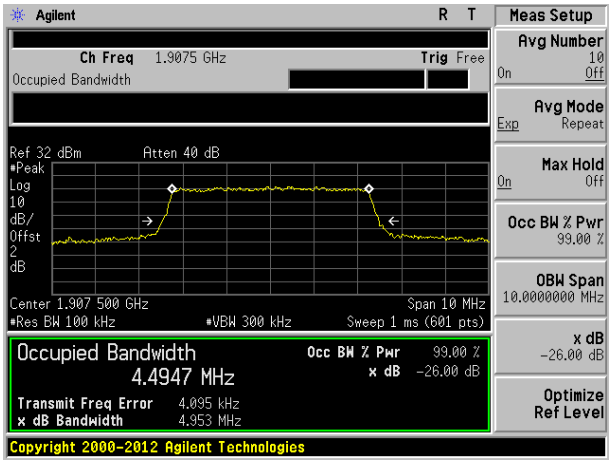
Test band: LTE Band 2	Channel Bandwidth: 5MHz



Lowest channel

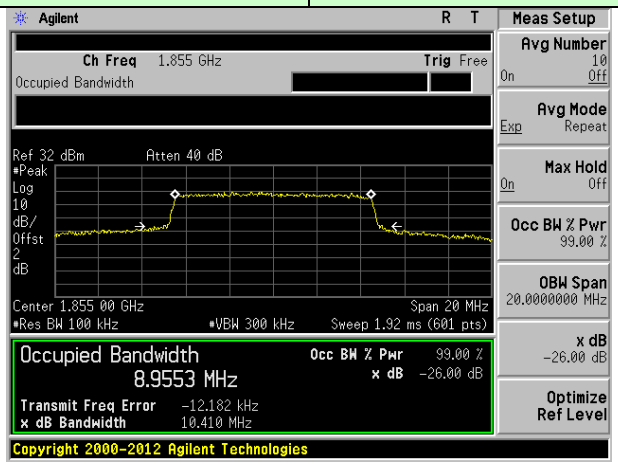


Middle channel

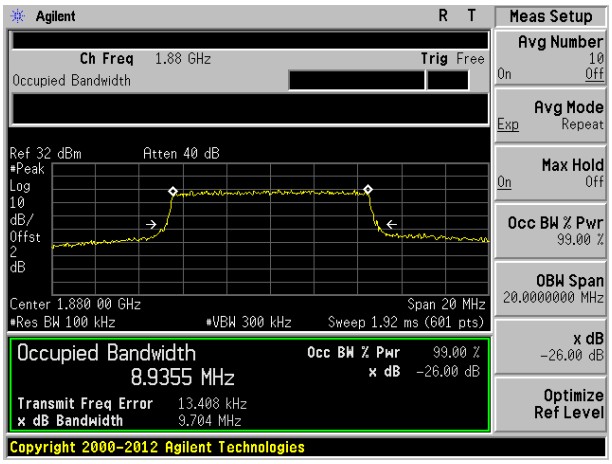


Highest channel

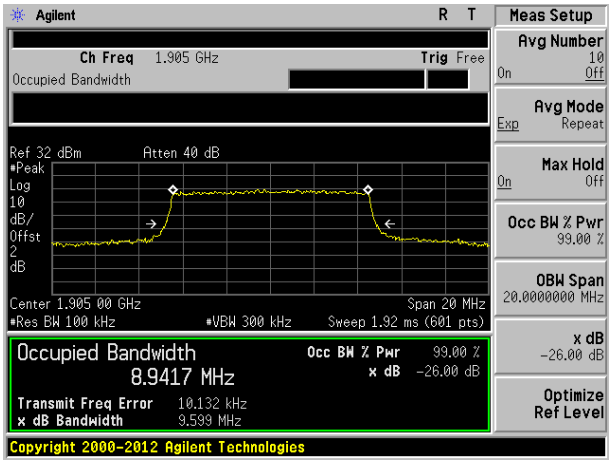
Test band: LTE Band 2	Channel Bandwidth:10MHz



Lowest channel

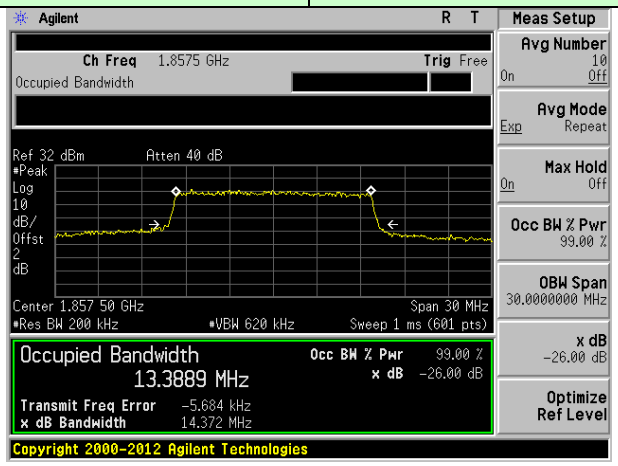


Middle channel

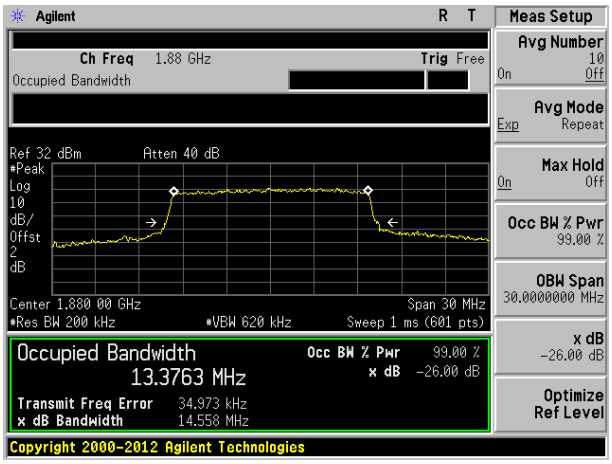


Highest channel

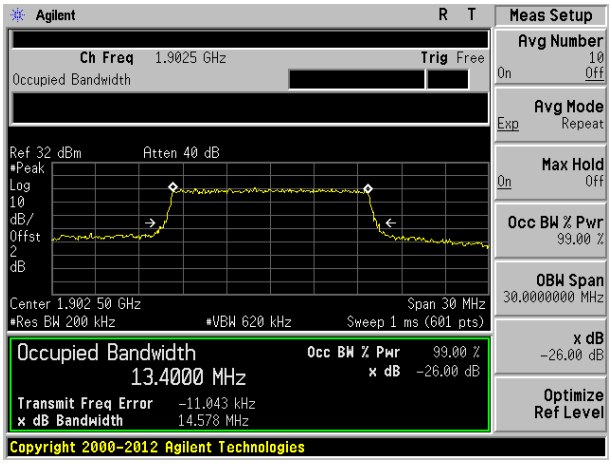
Test band: LTE Band 2	Channel Bandwidth:15MHz



Lowest channel

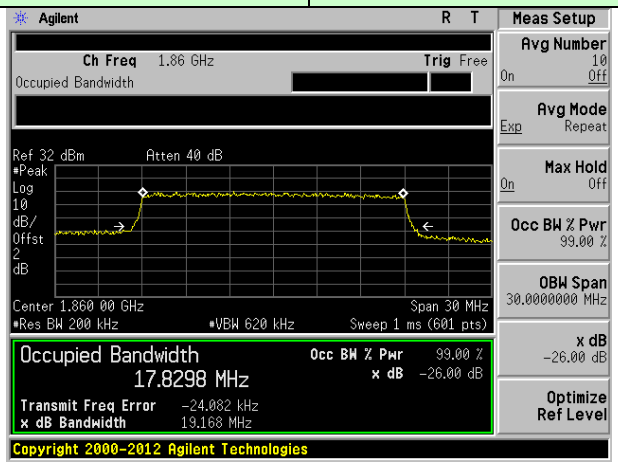


Middle channel

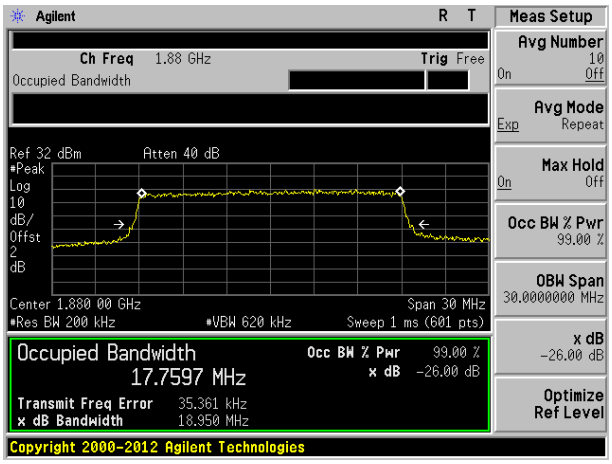


Highest channel

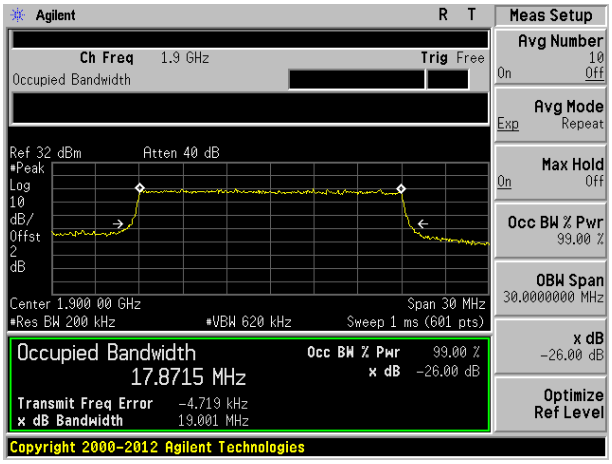
Test band: LTE Band 2	Channel Bandwidth:20MHz



Lowest channel

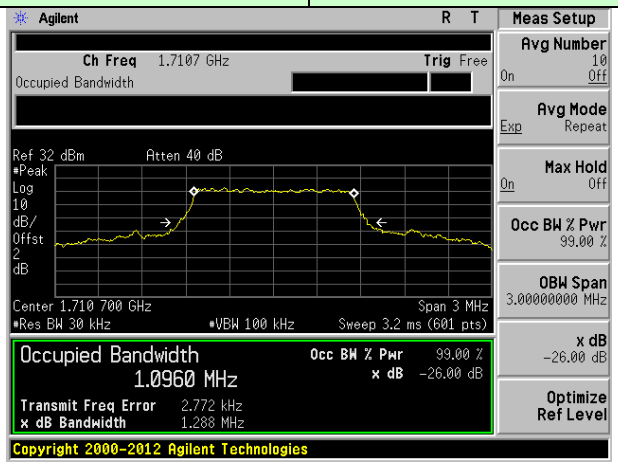


Middle channel

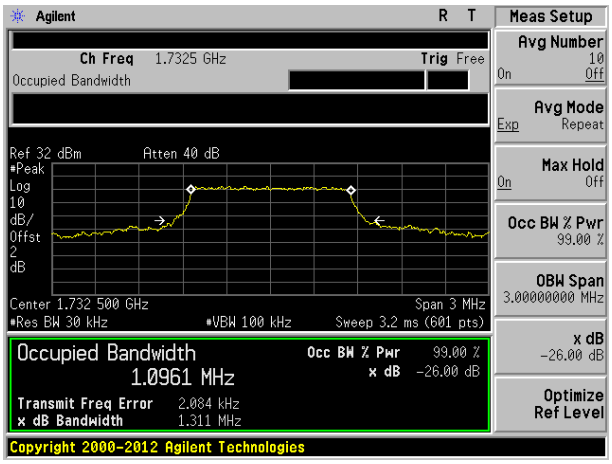


Highest channel

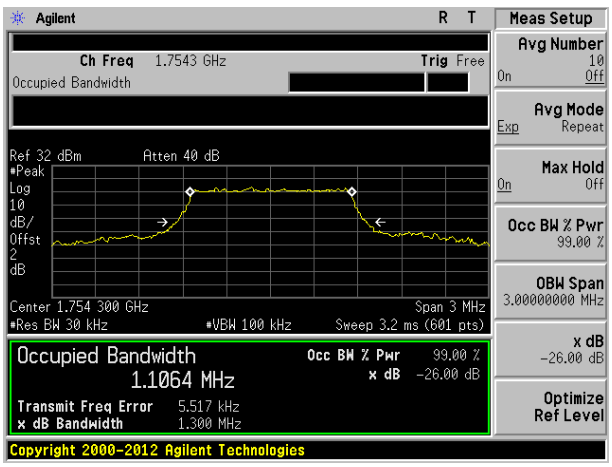
Test band: LTE Band 4	Channel Bandwidth: 1.4MHz



Lowest channel

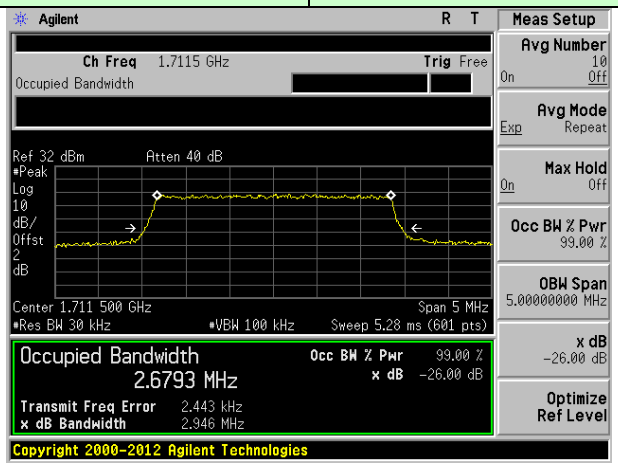


Middle channel

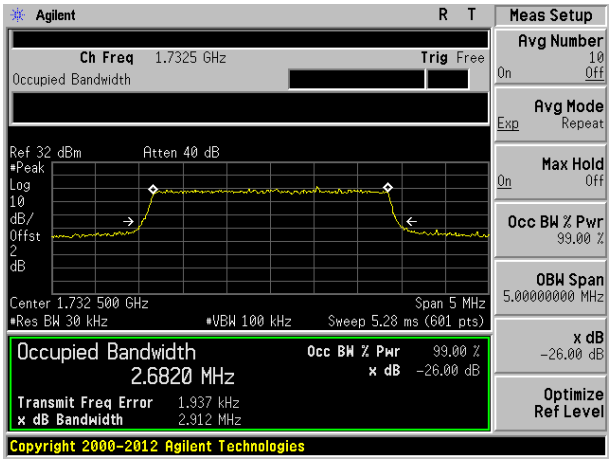


Highest channel

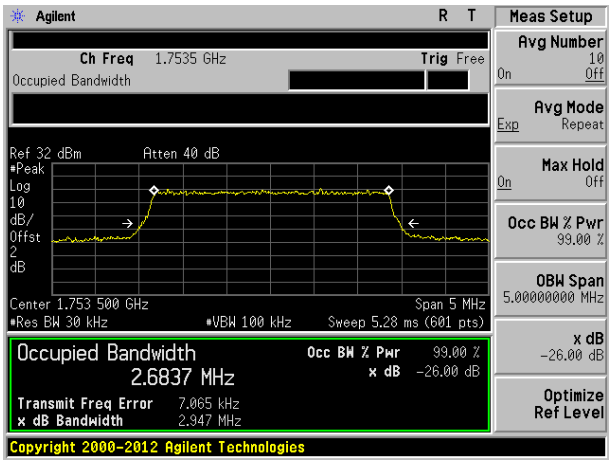
Test band: LTE Band 4	Channel Bandwidth: 3MHz



Lowest channel

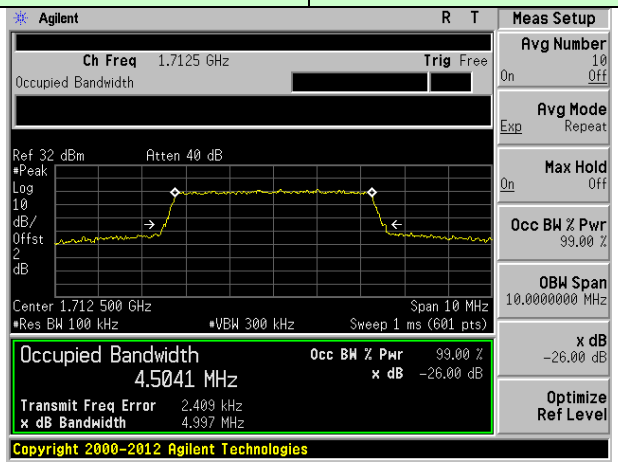


Middle channel

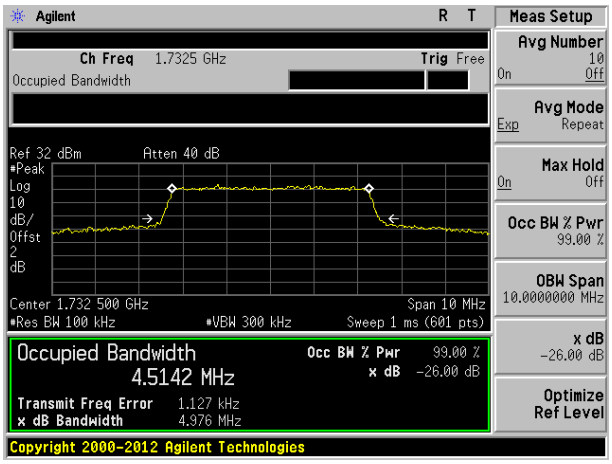


Highest channel

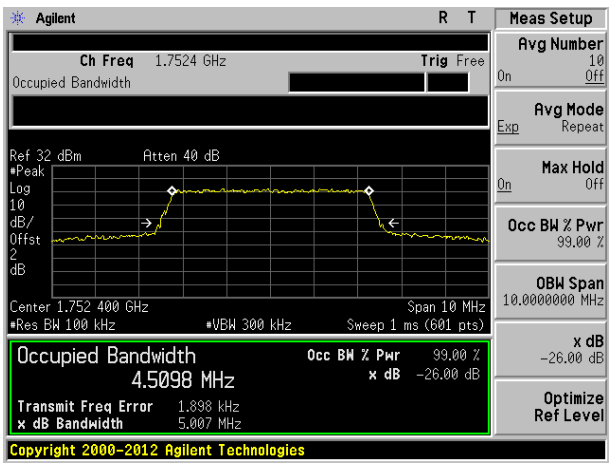
Test band: LTE Band 4	Channel Bandwidth: 5MHz



Lowest channel

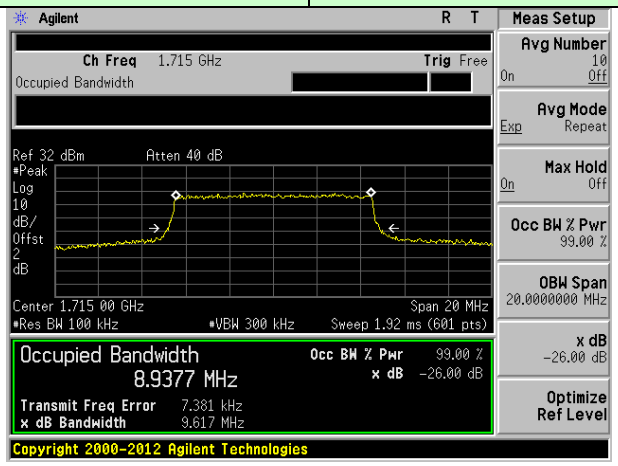


Middle channel

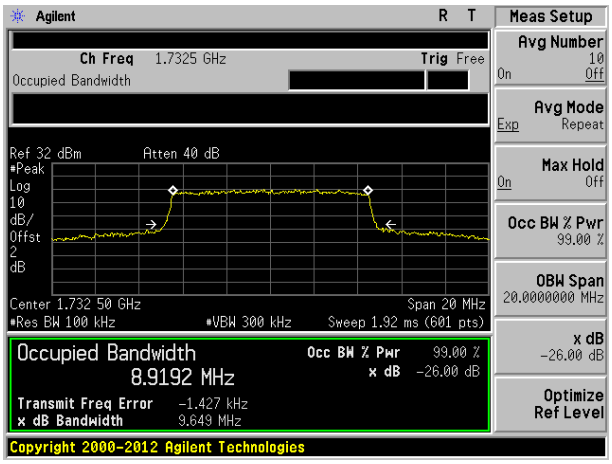


Highest channel

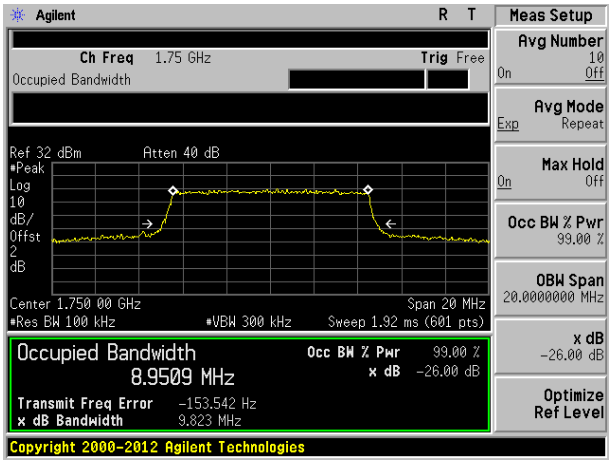
Test band: LTE Band 4	Channel Bandwidth: 10MHz



Lowest channel

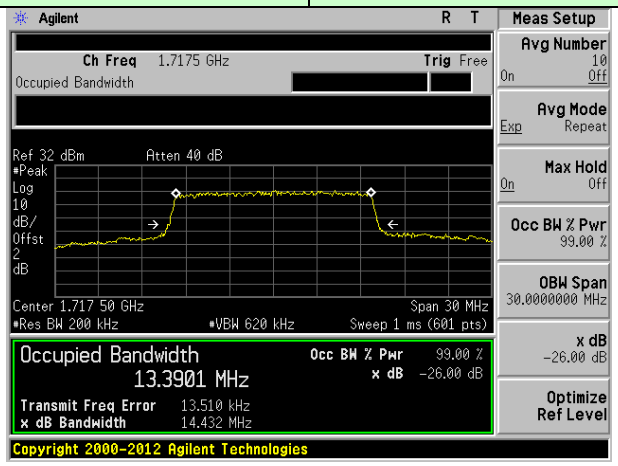


Middle channel

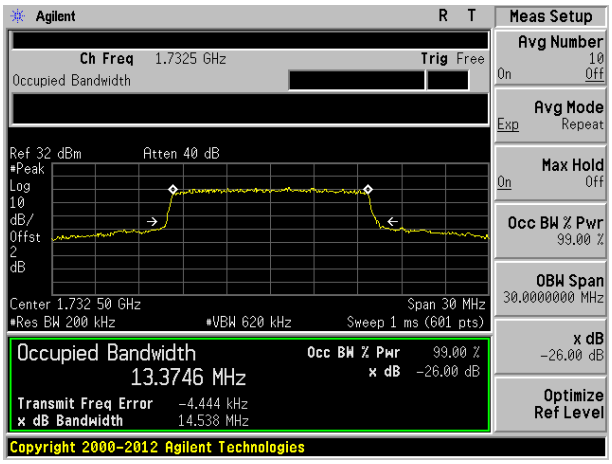


Highest channel

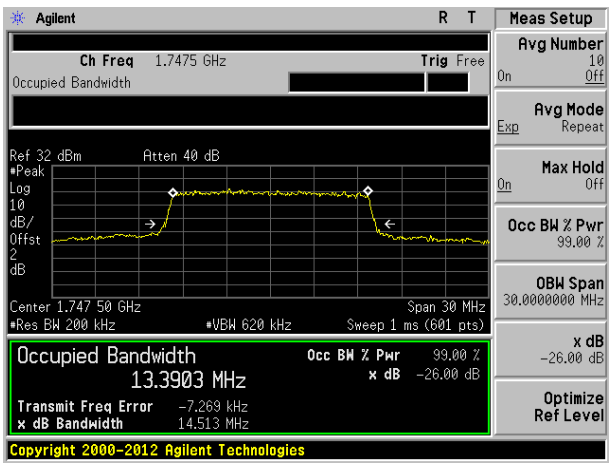
Test band: LTE Band 4	Channel Bandwidth: 15MHz



Lowest channel

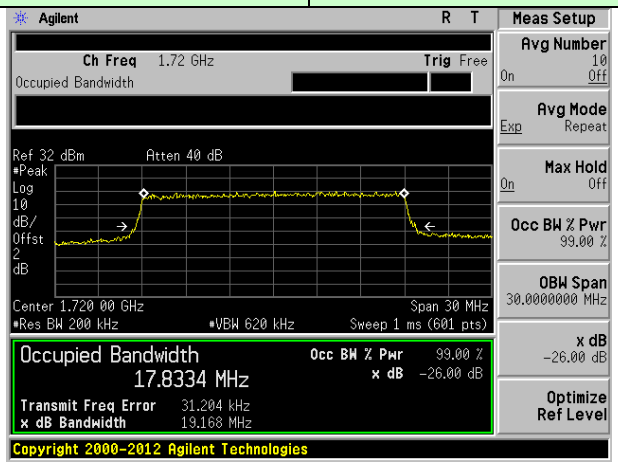


Middle channel

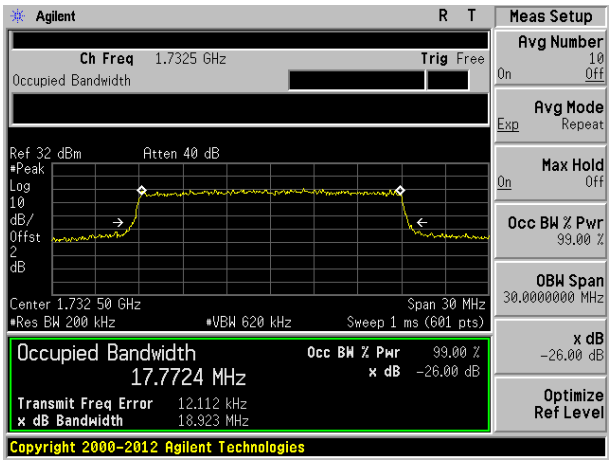


Highest channel

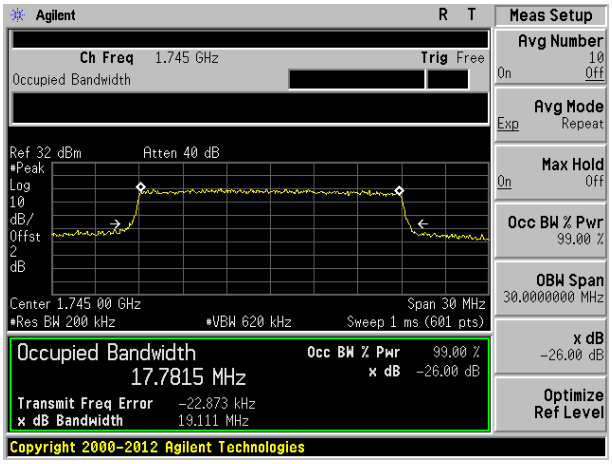
Test band: LTE Band 4	Channel Bandwidth: 20MHz



Lowest channel

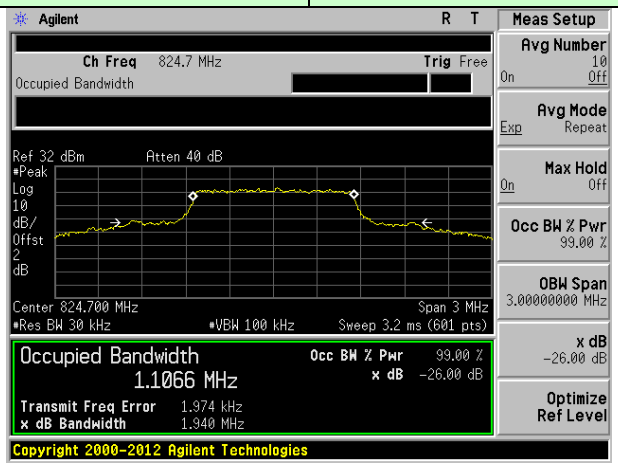


Middle channel

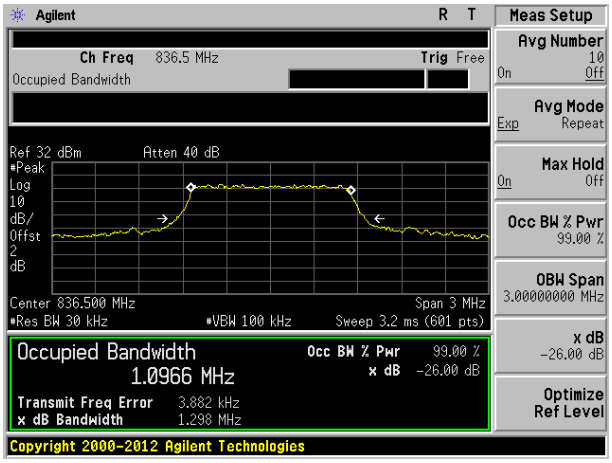


Highest channel

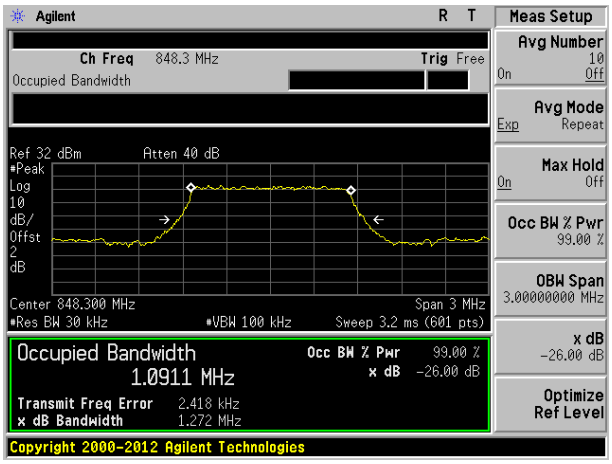
Test band: LTE Band 5	Channel Bandwidth: 1.4MHz



Lowest channel

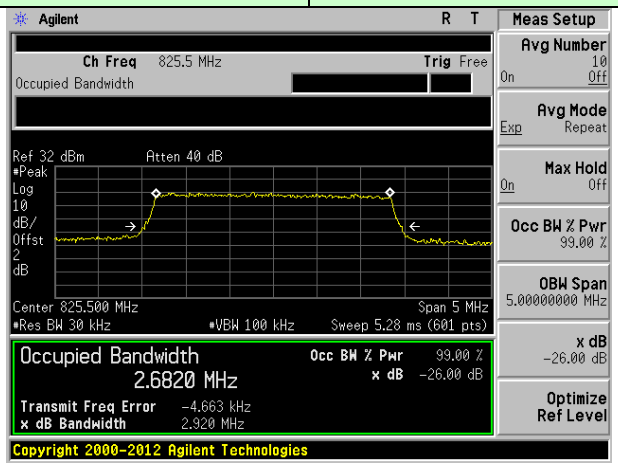


Middle channel

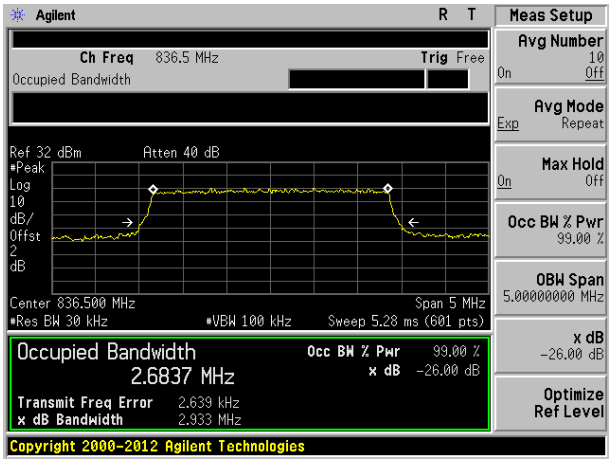


Highest channel

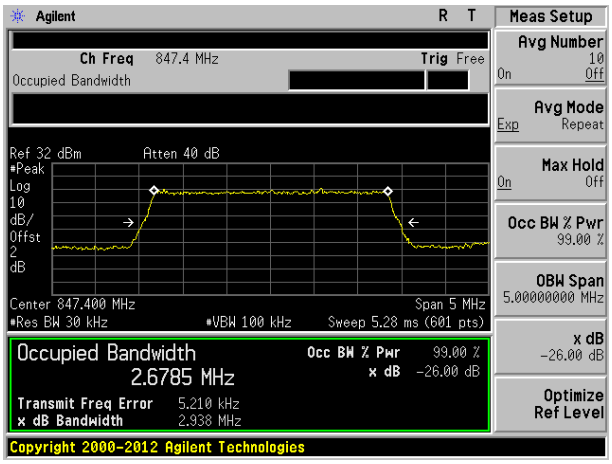
Test band: LTE Band 5	Channel Bandwidth: 3MHz



Lowest channel

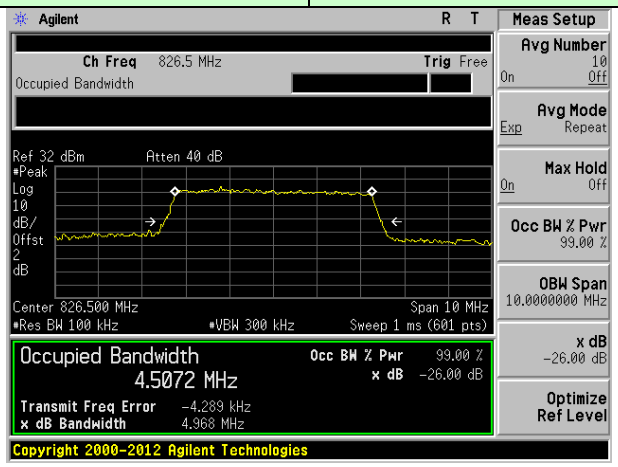


Middle channel

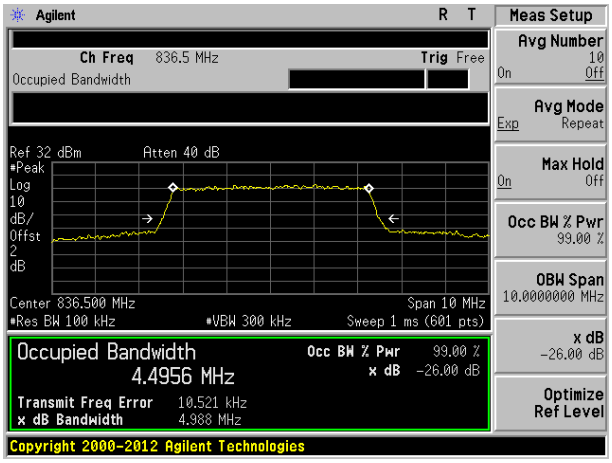


Highest channel

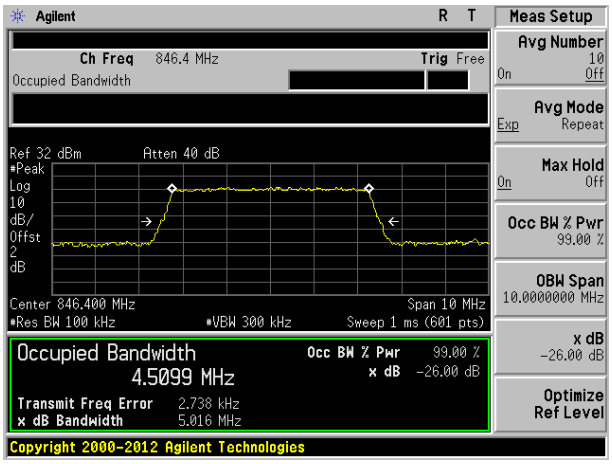
Test band: LTE Band 5	Channel Bandwidth: 5MHz



Lowest channel

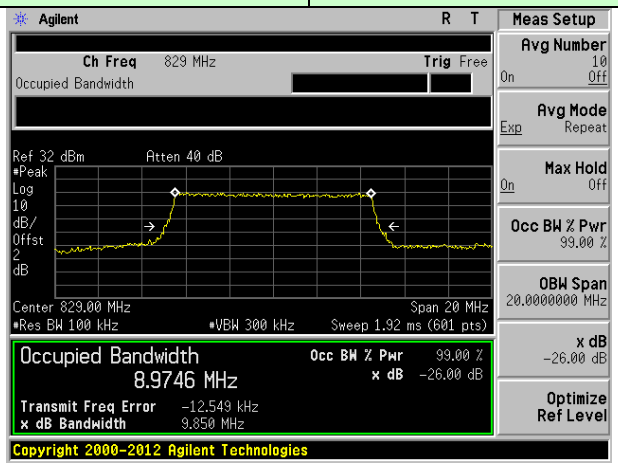


Middle channel

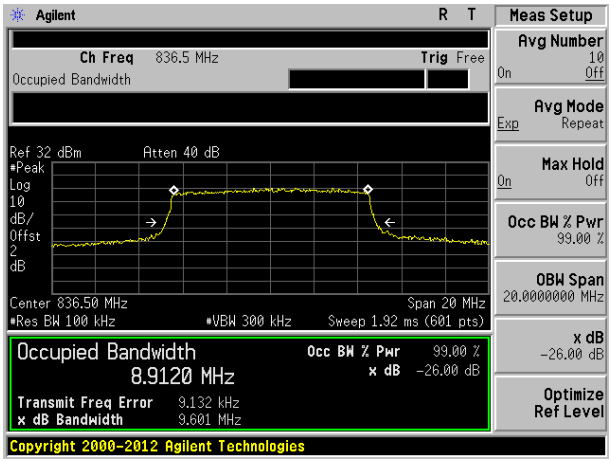


Highest channel

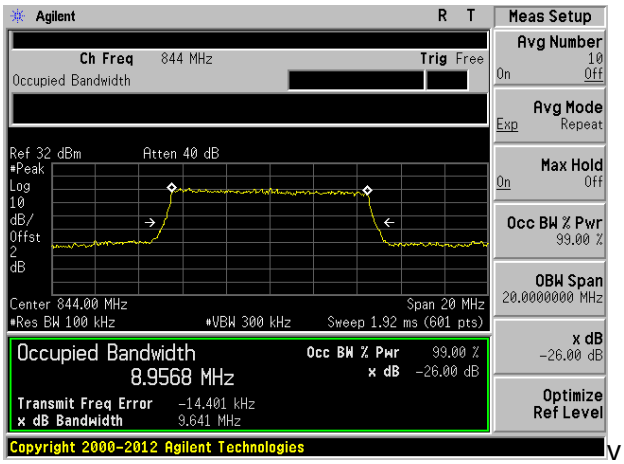
Test band: LTE Band 5	Channel Bandwidth: 10MHz



Lowest channel

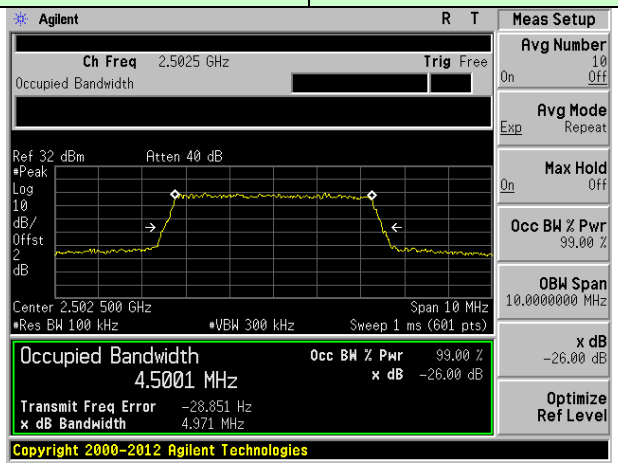


Middle channel

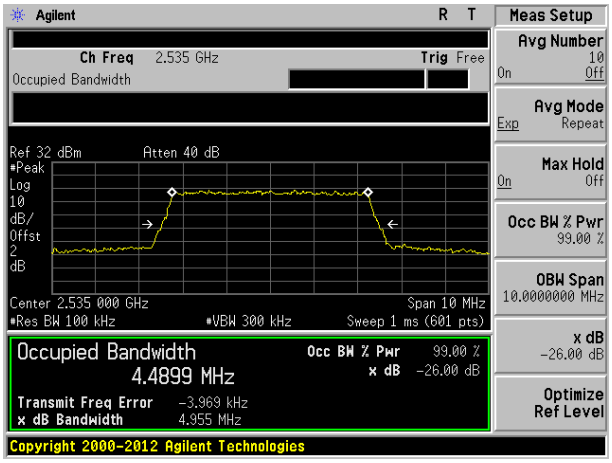


Highest channel

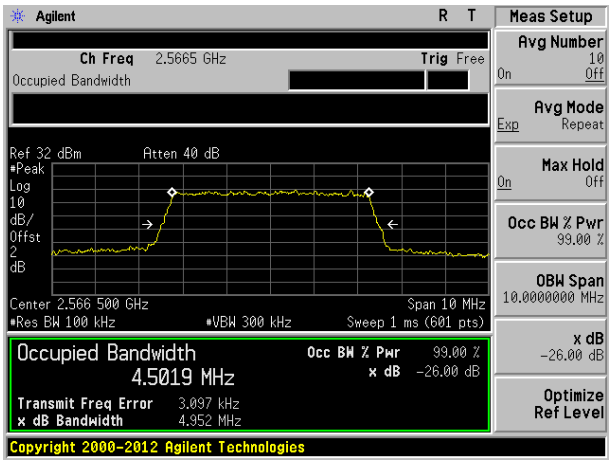
Test band: LTE Band 7	Channel Bandwidth: 5MHz



Lowest channel

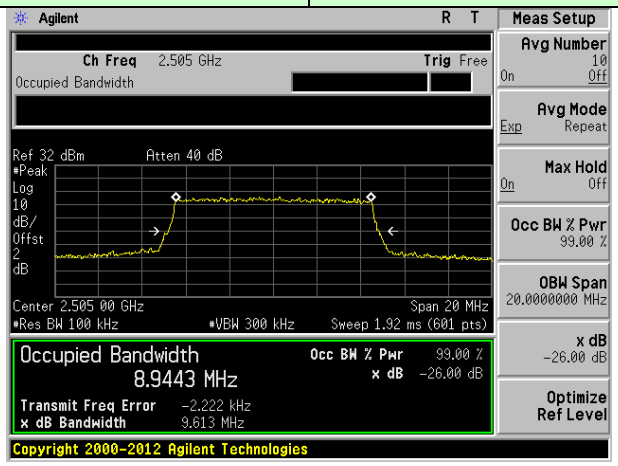


Middle channel

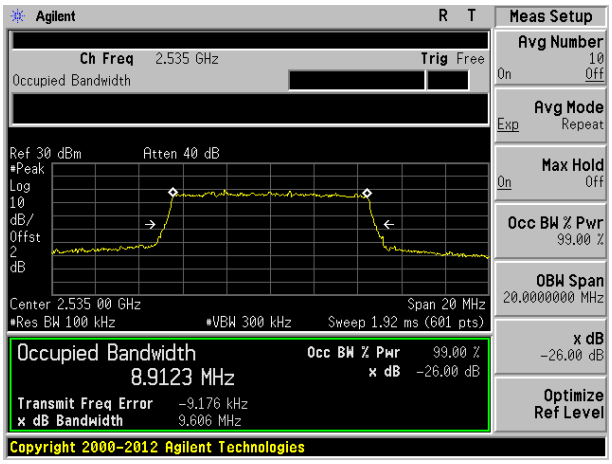


Highest channel

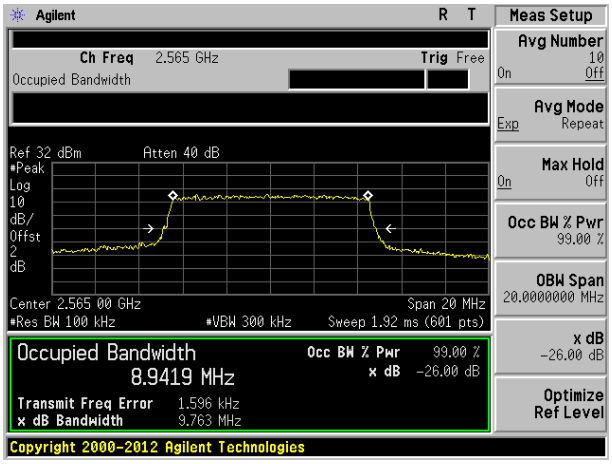
Test band: LTE Band 7	Channel Bandwidth: 10MHz



Lowest channel

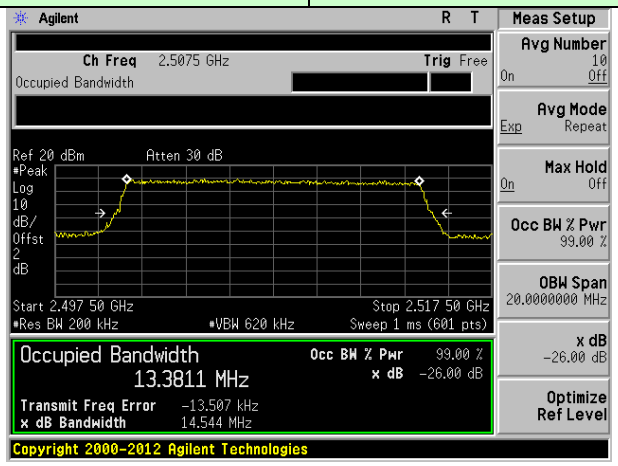


Middle channel

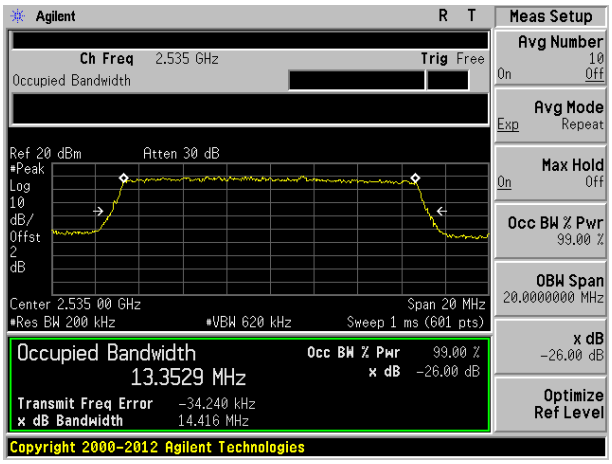


Highest channel

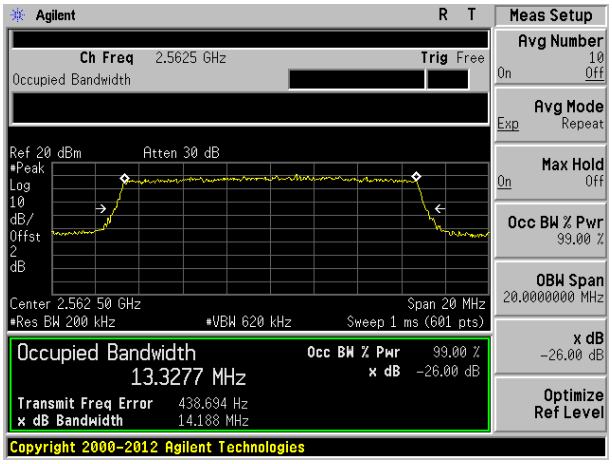
Test band: LTE Band 7	Channel Bandwidth: 15MHz



Lowest channel

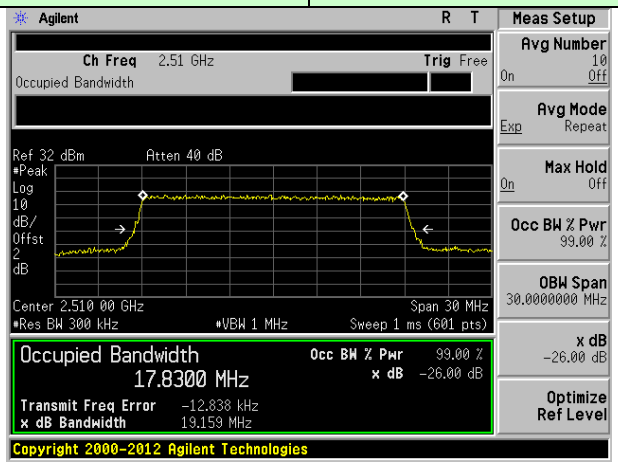


Middle channel

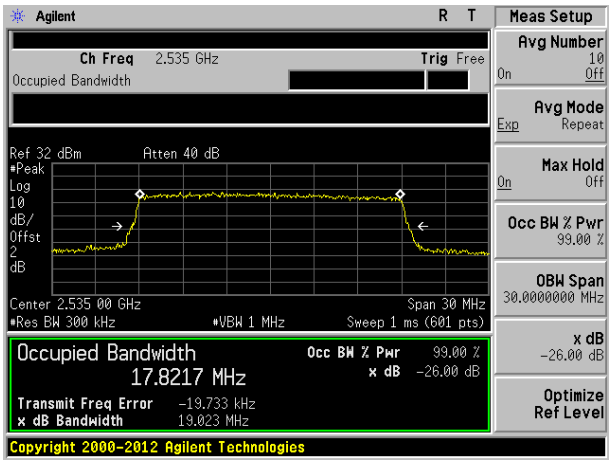


Highest channel

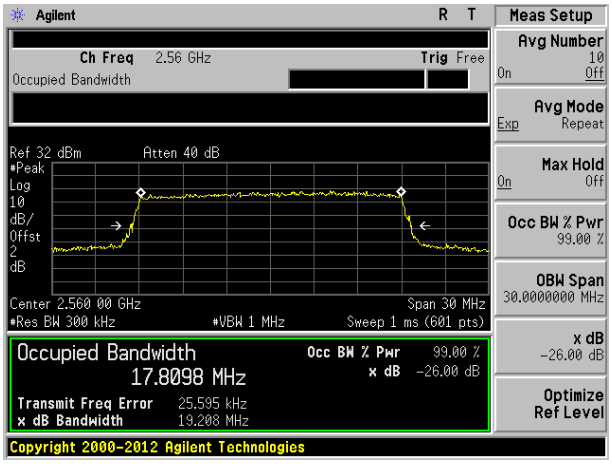
Test band: LTE Band 7	Channel Bandwidth: 20MHz



Lowest channel

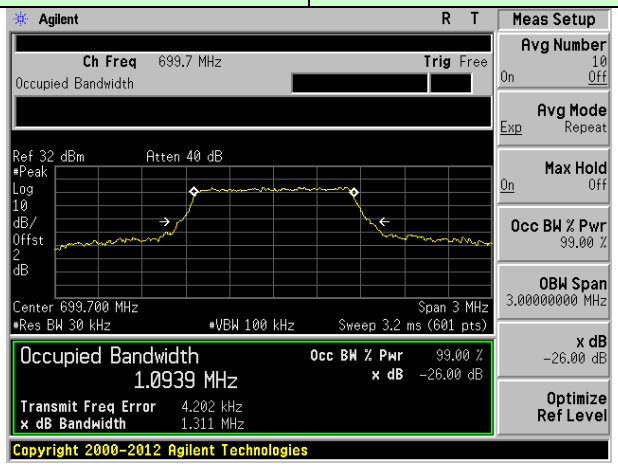


Middle channel

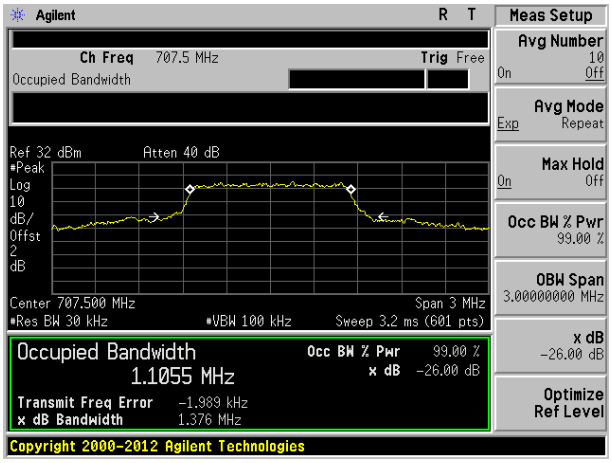


Highest channel

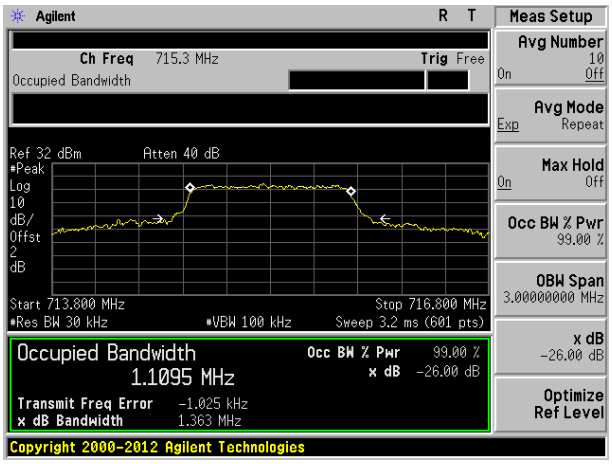
Test band: LTE Band 12	Channel Bandwidth: 1.4MHz



Lowest channel

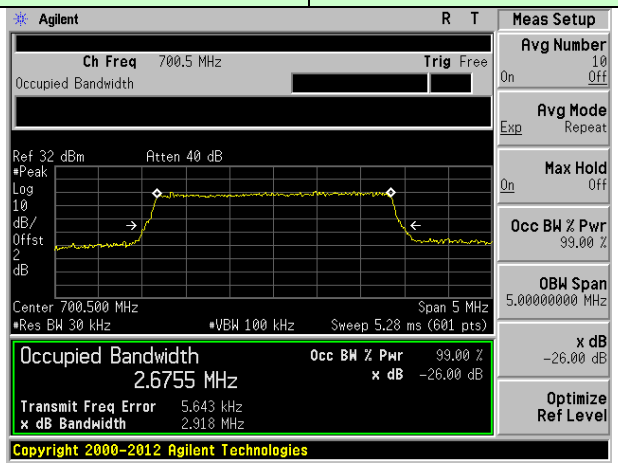


Middle channel

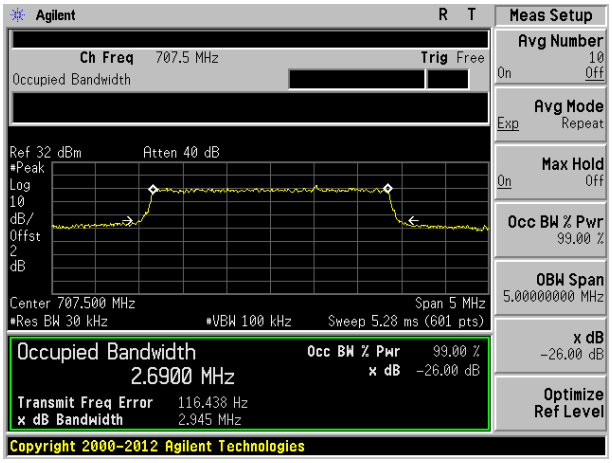


Highest channel

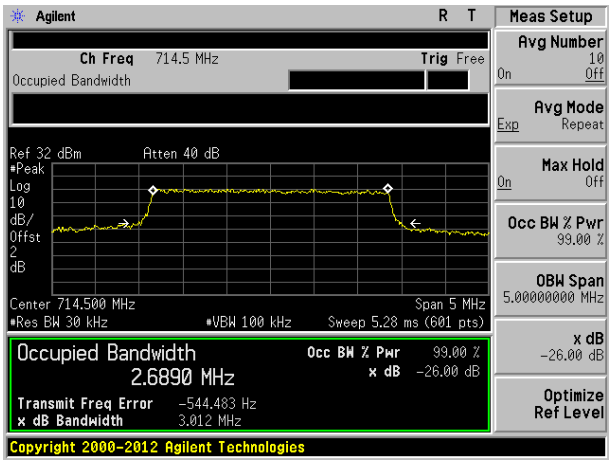
Test band: LTE Band 12	Channel Bandwidth: 3MHz



Lowest channel

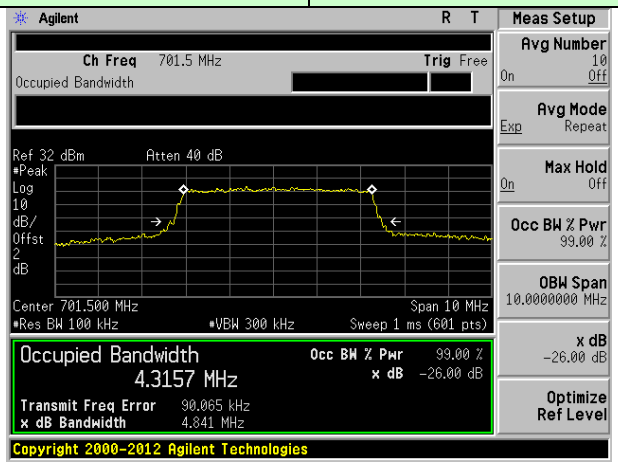


Middle channel

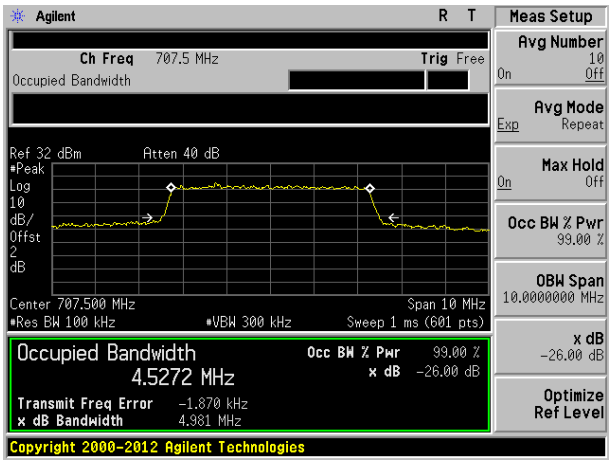


Highest channel

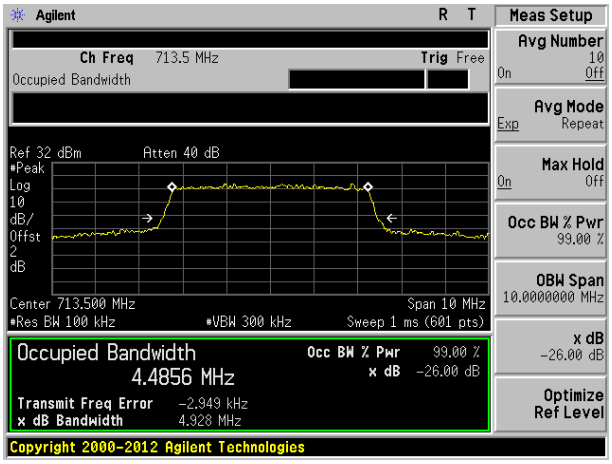
Test band: LTE Band 12	Channel Bandwidth: 5MHz



Lowest channel

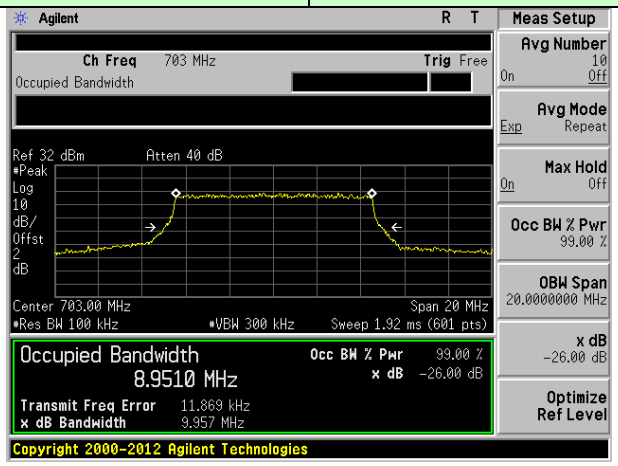


Middle channel

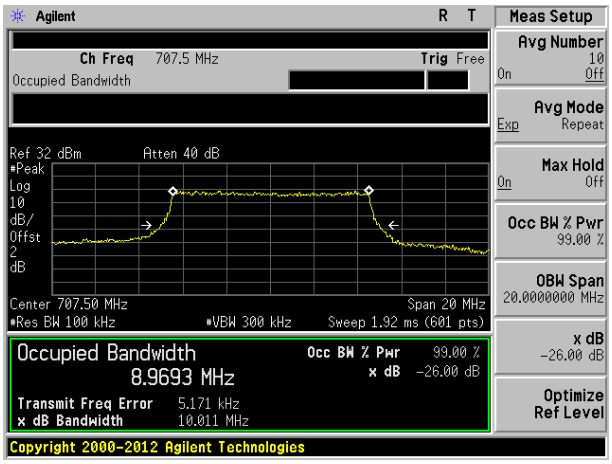


Highest channel

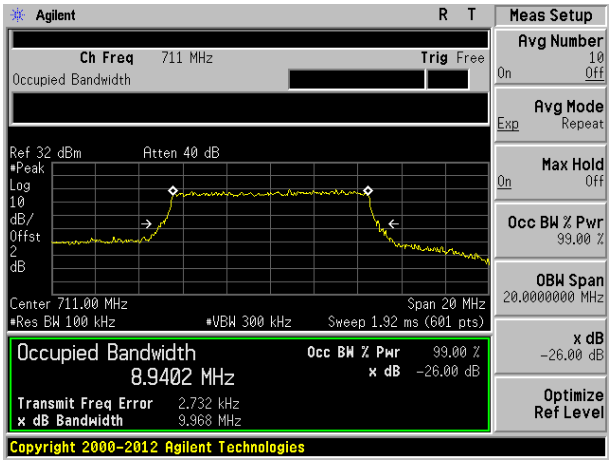
Test band: LTE Band 12	Channel Bandwidth: 10MHz



Lowest channel

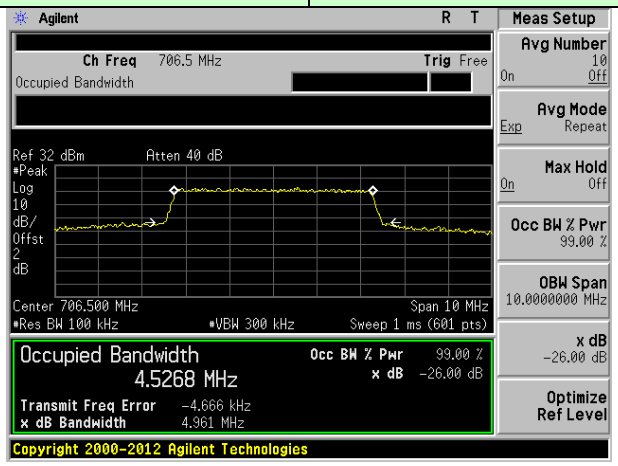


Middle channel

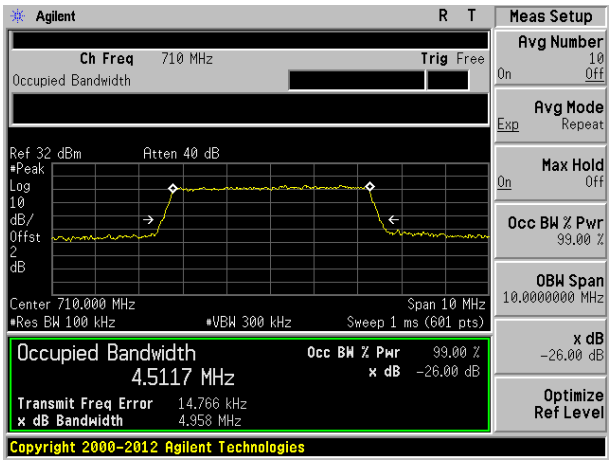


Highest channel

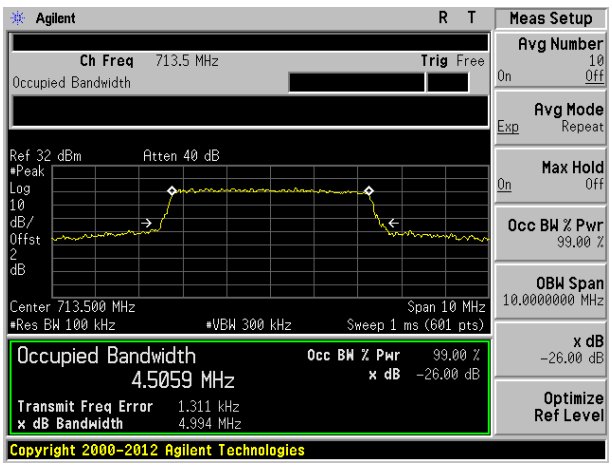
Test band: LTE Band 17	Channel Bandwidth: 5MHz



Lowest channel

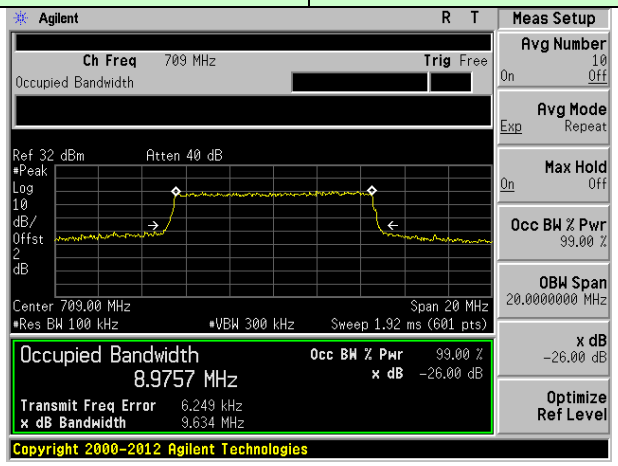


Middle channel

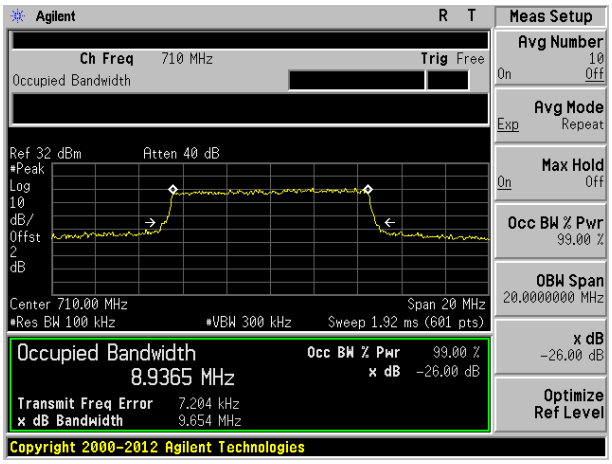


Highest channel

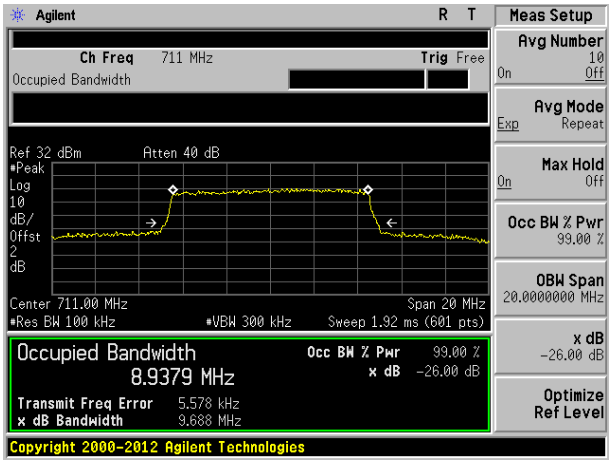
Test band: LTE Band 17	Channel Bandwidth: 10MHz



Lowest channel



Middle channel

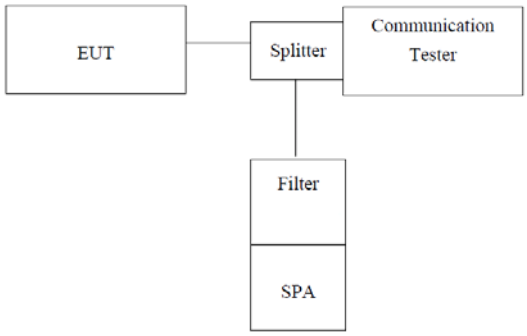


Highest channel

7.6 MODULATION CHARACTERISTIC

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

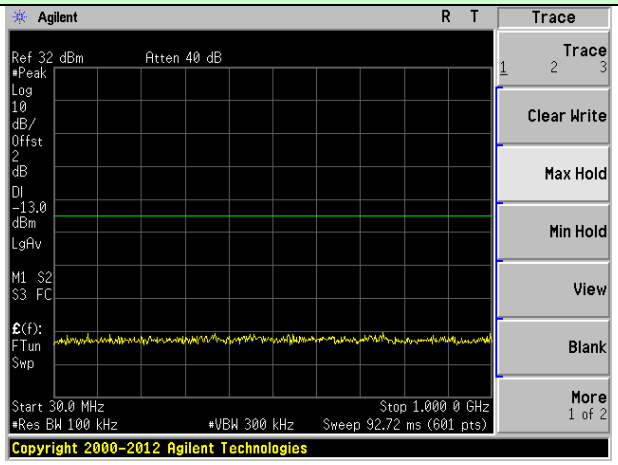
7.7 Out of band emission at antenna terminals

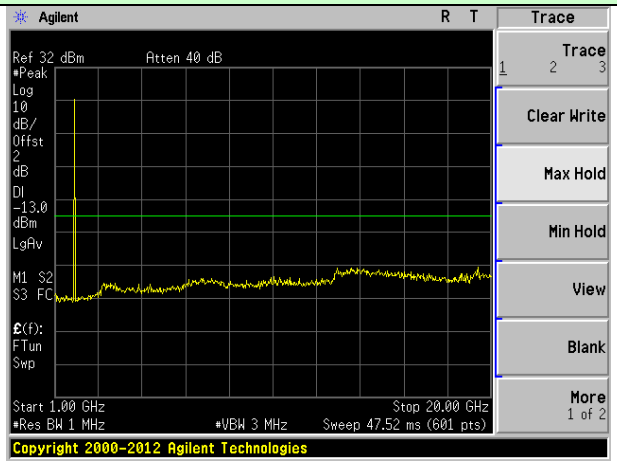
Test Requirement:	Part 24.238 (a); FCC Part 27.53(h)/(g)
Test Method:	FCC part2.1051
Limit:	-13dBm
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 The resolution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

Remark: Both modulation modes have been tested, showing only the worst QPSK test data.

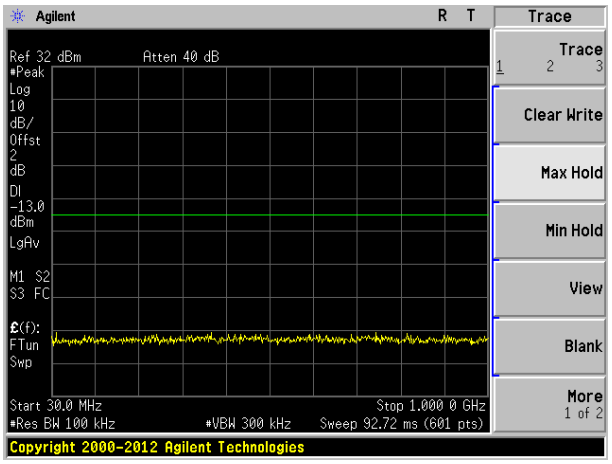
Test plot as follows:

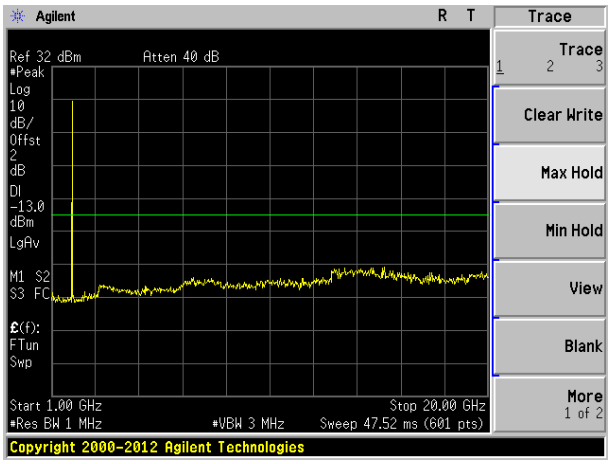
Test Mode: LTE Band 2	Channel Bandwidth: 1.4MHz



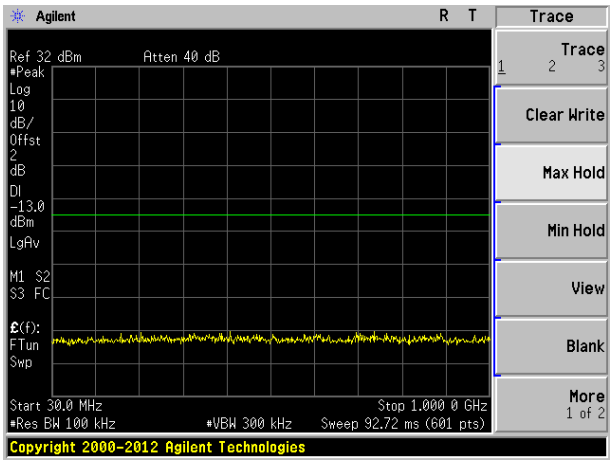


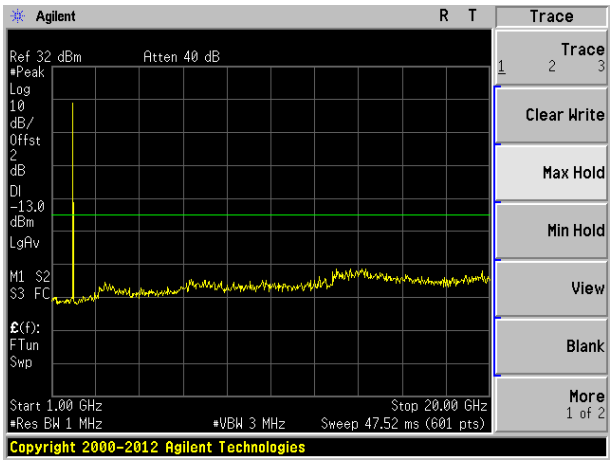
Lowest channel





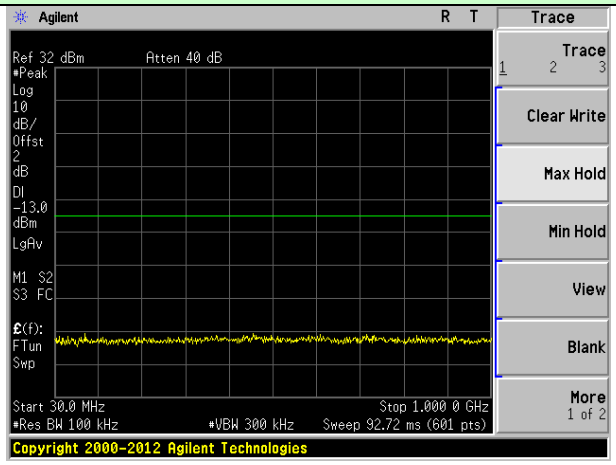
Middle channel

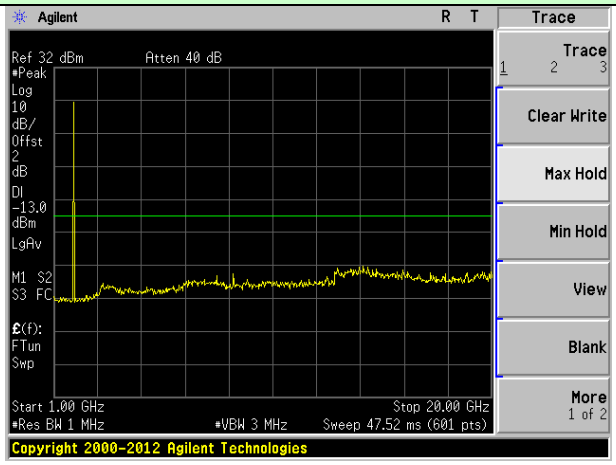




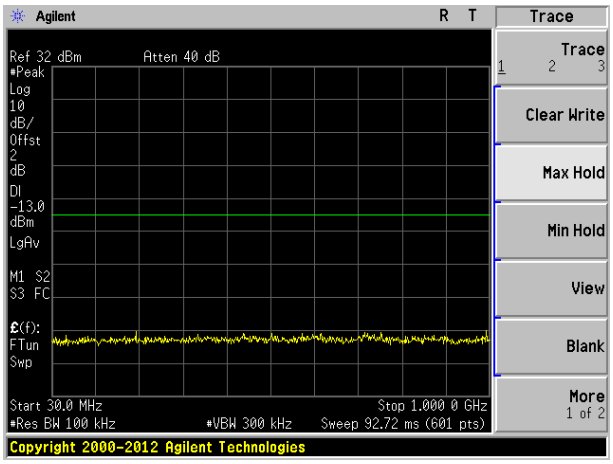
Highest channel

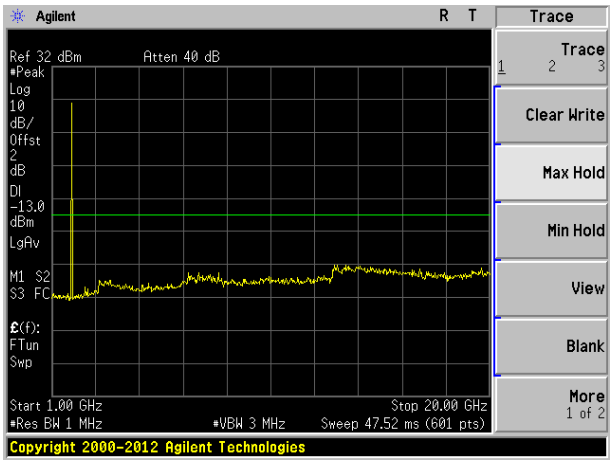
Test Mode: LTE Band 2	Channel Bandwidth: 3MHz



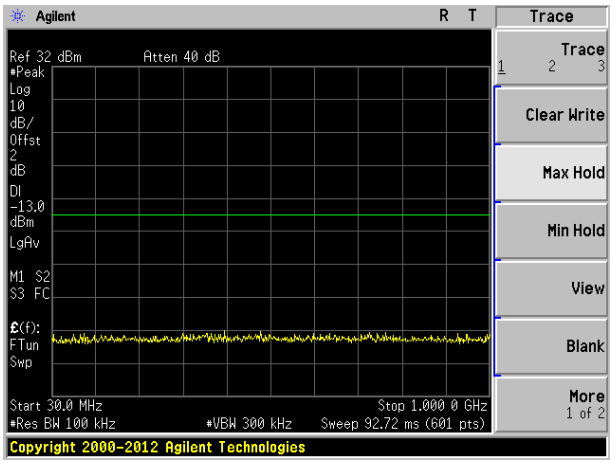


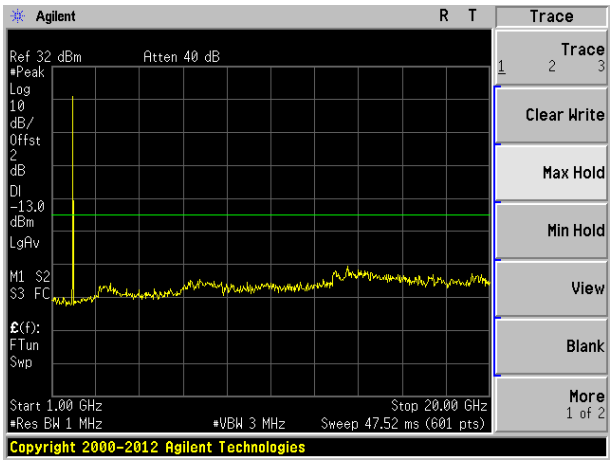
Lowest channel





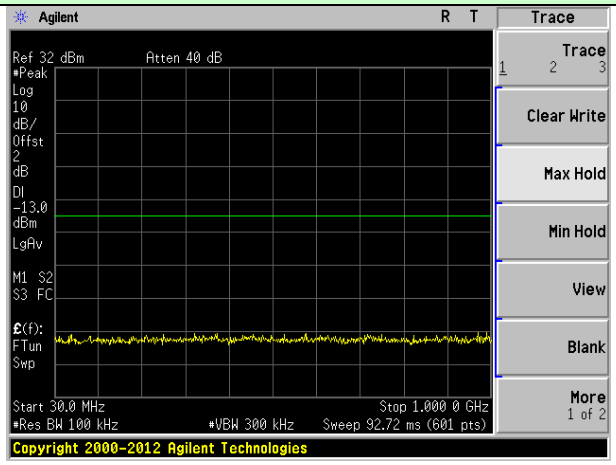
Middle channel

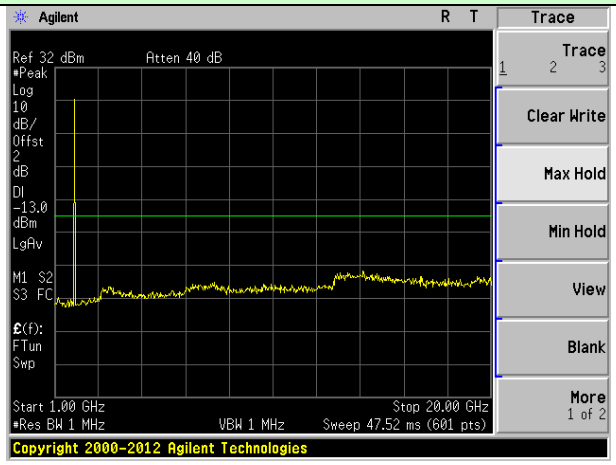




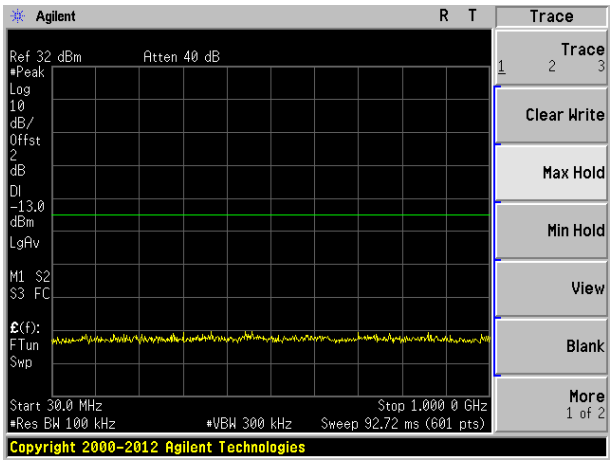
Highest channel

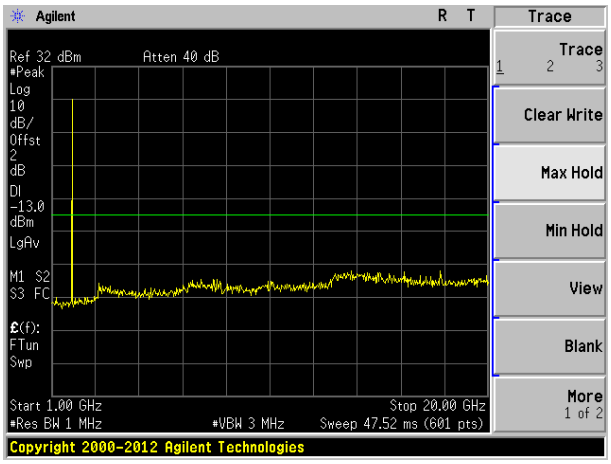
Test Mode: LTE Band 2	Channel Bandwidth: 5MHz



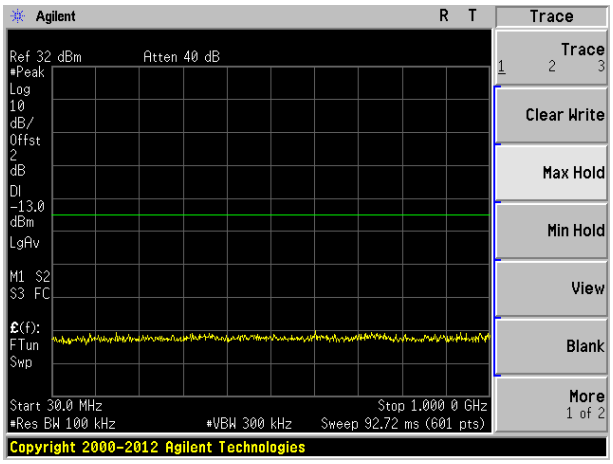


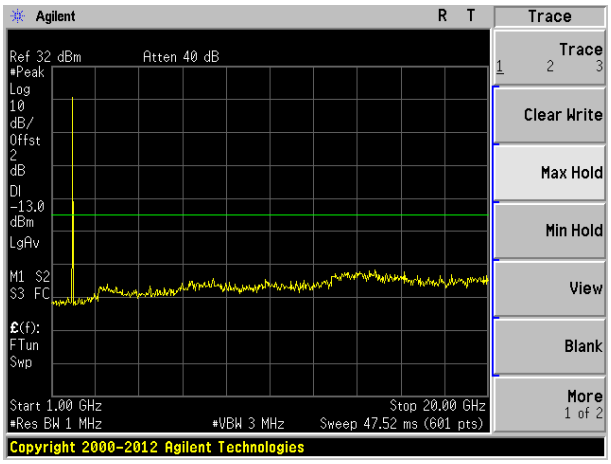
Lowest channel





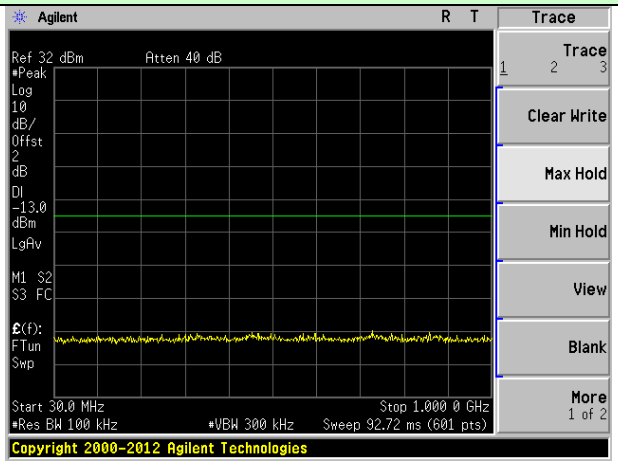
Middle channel

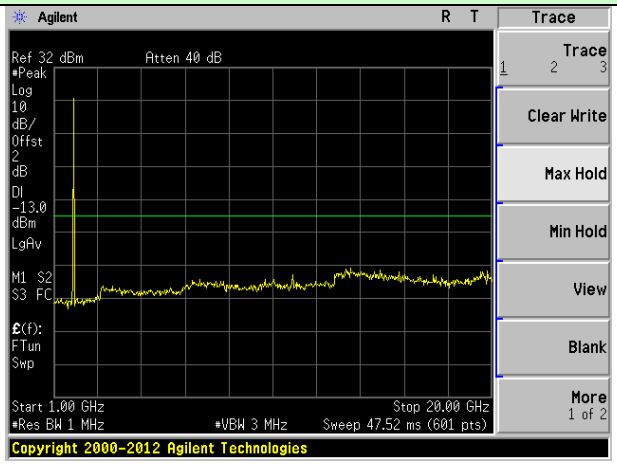




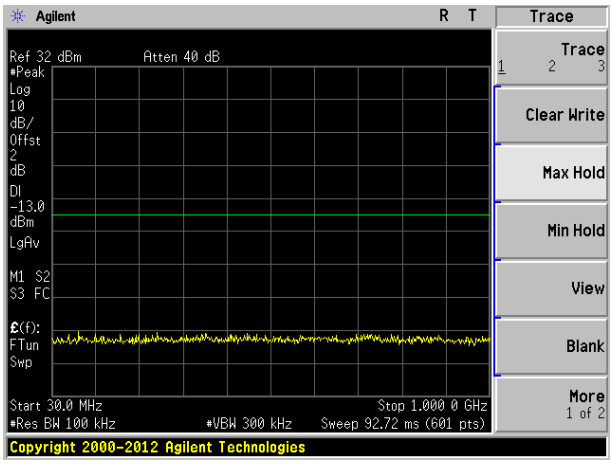
Highest channel

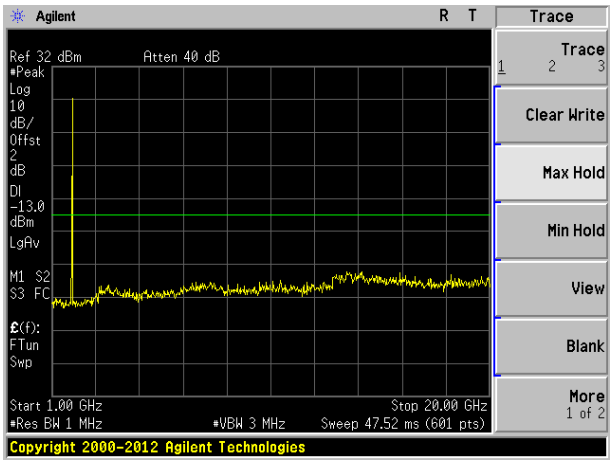
Test Mode: LTE Band 2	Channel Bandwidth: 10MHz



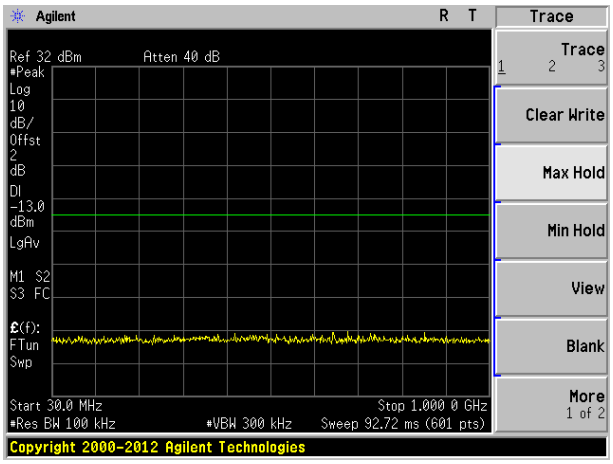


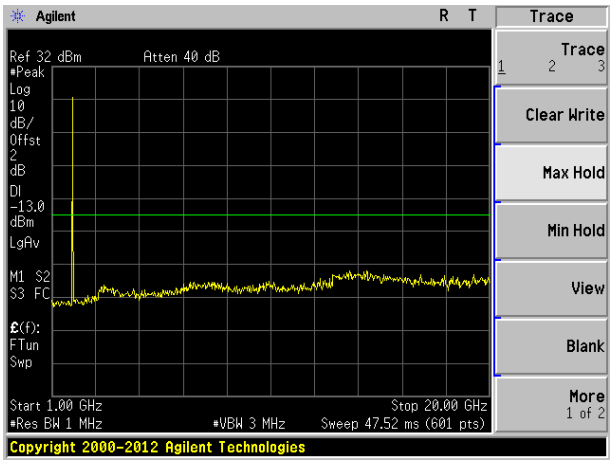
Lowest channel





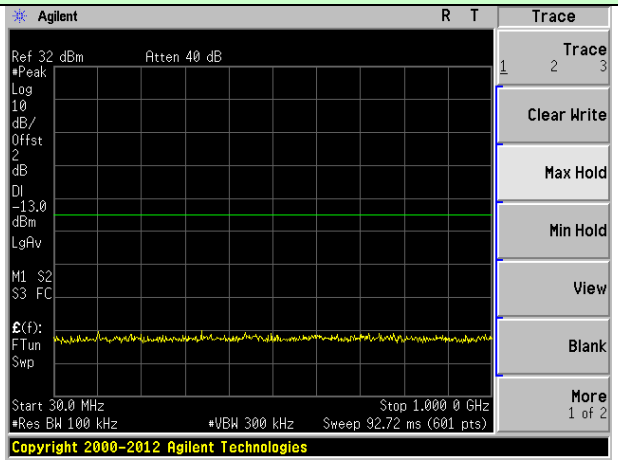
Middle channel

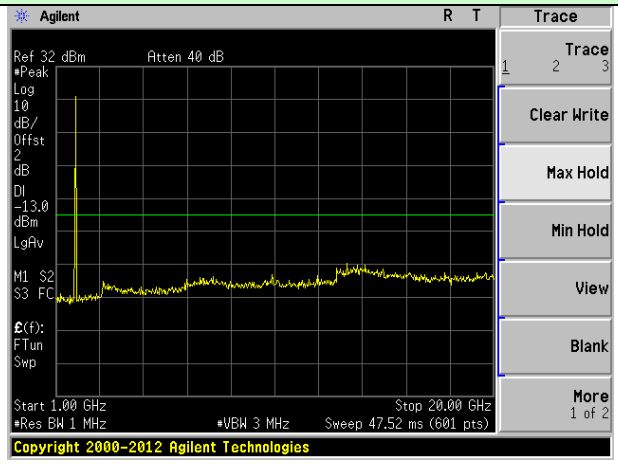




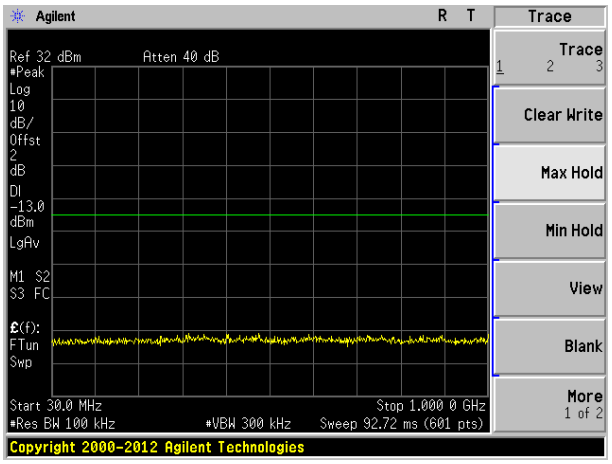
Highest channel

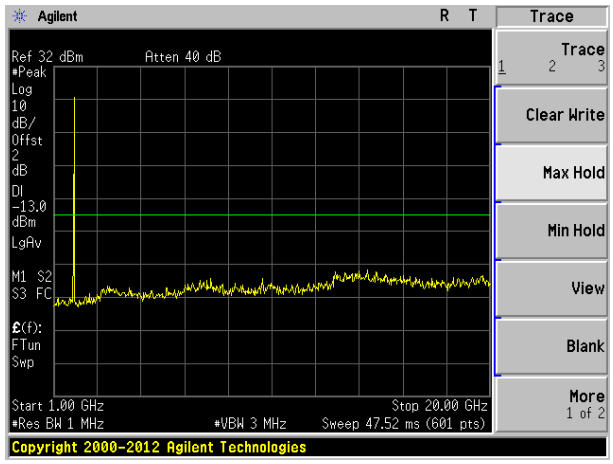
Test Mode: LTE Band 2	Channel Bandwidth: 15MHz



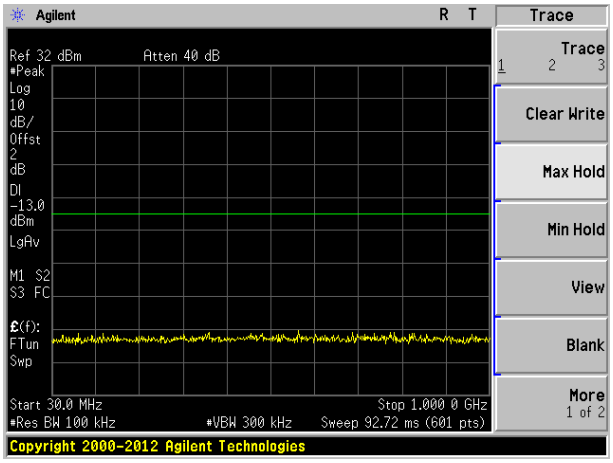


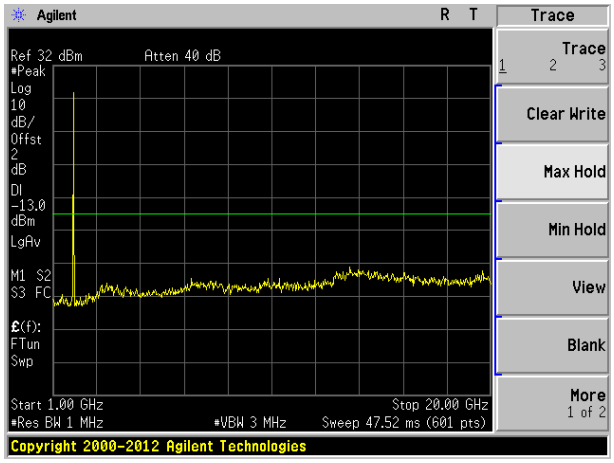
Lowest channel





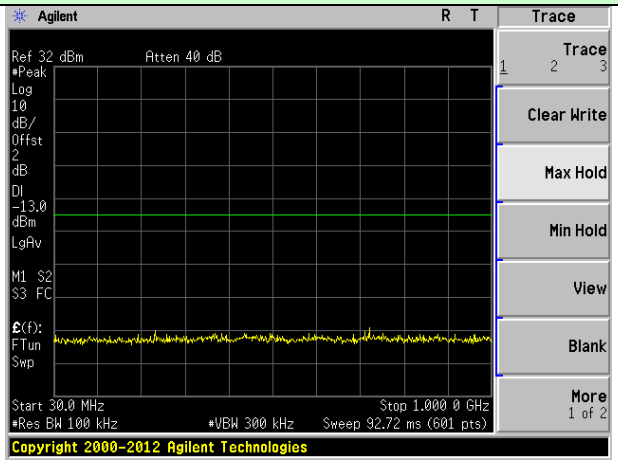
Middle channel

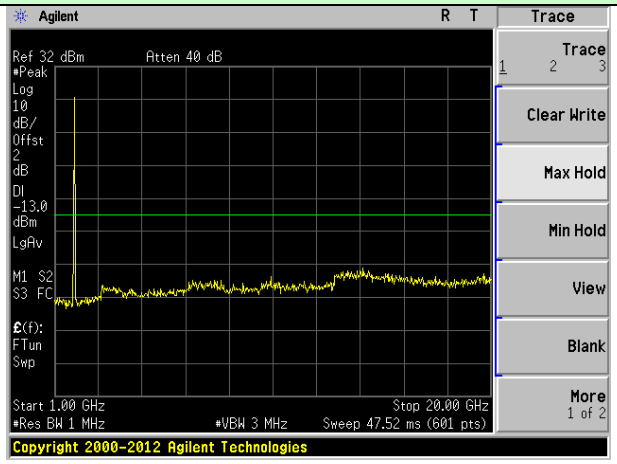




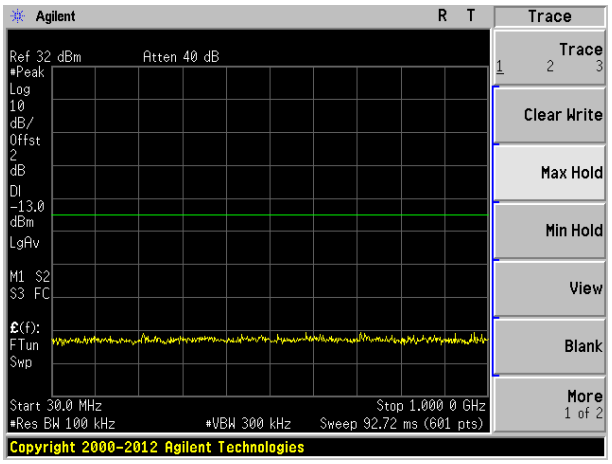
Highest channel

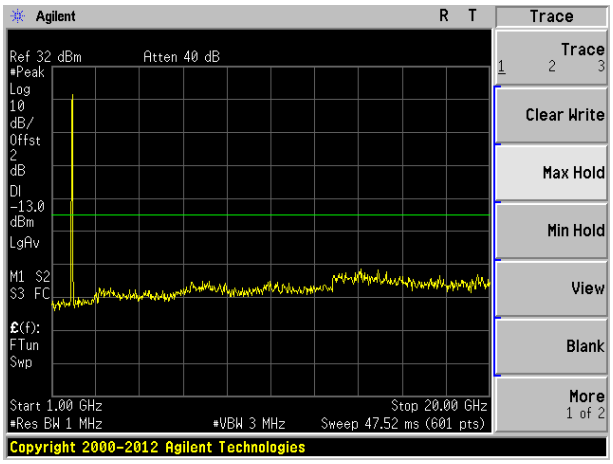
Test Mode: LTE Band 2	Channel Bandwidth: 20MHz



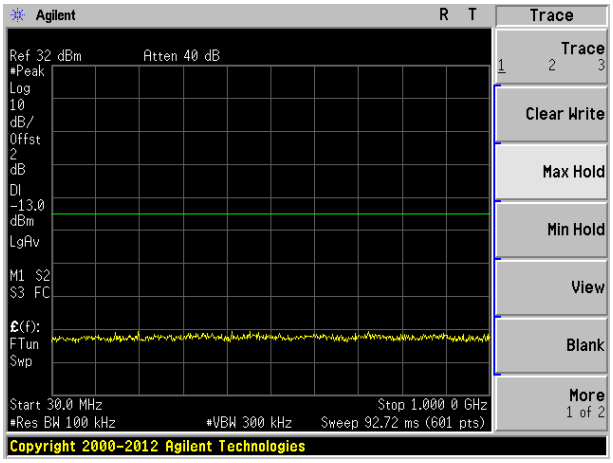


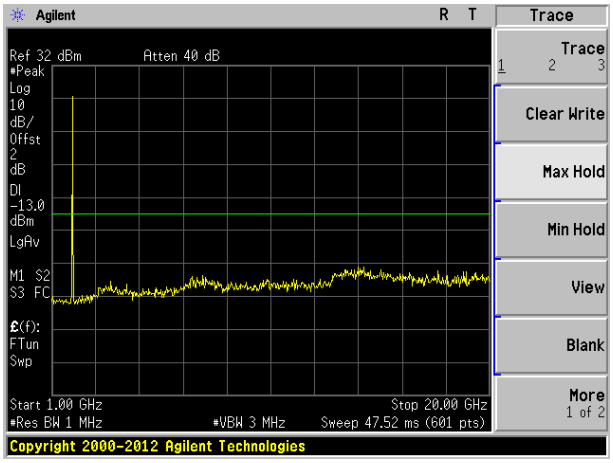
Lowest channel





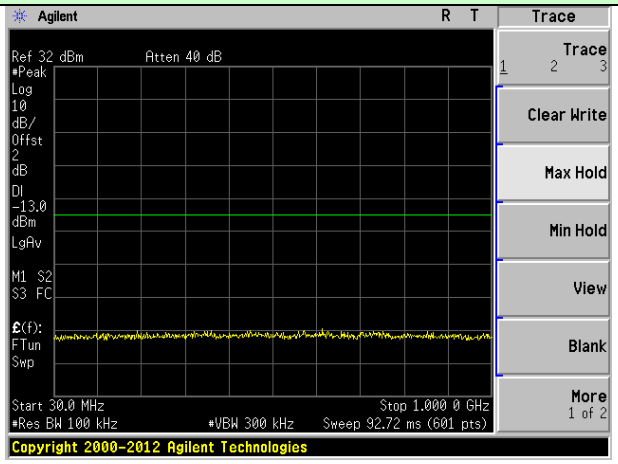
Middle channel

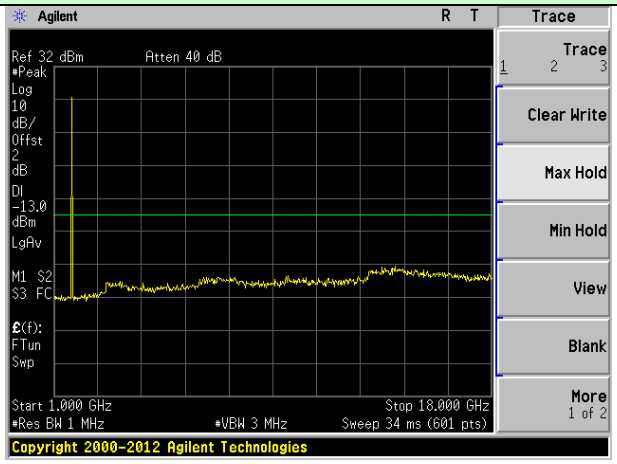




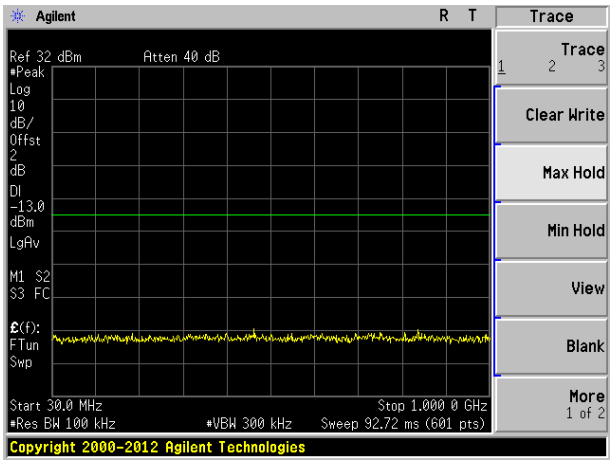
Highest channel

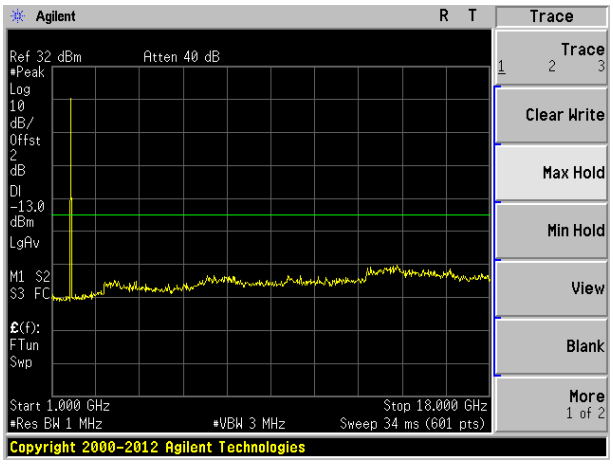
Test Mode: LTE Band 4	Channel Bandwidth: 1.4MHz



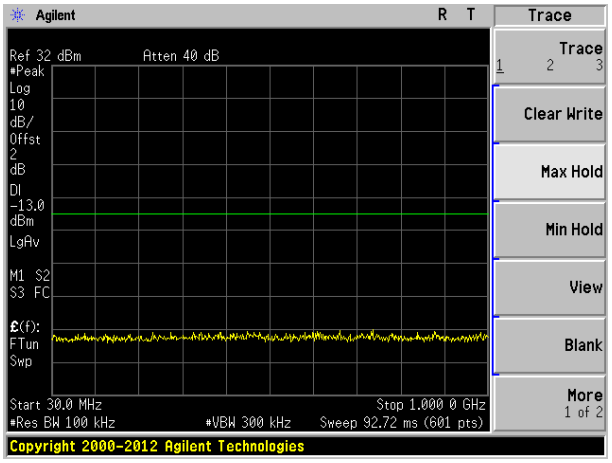


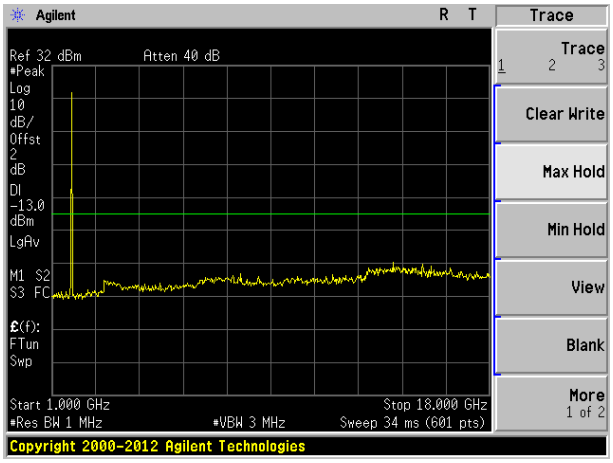
Lowest channel





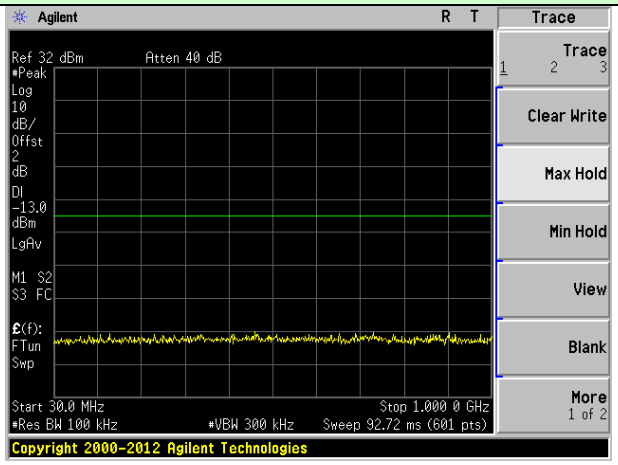
Middle channel

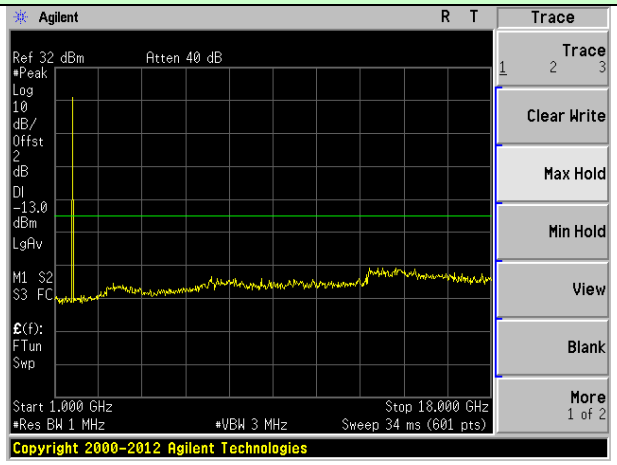




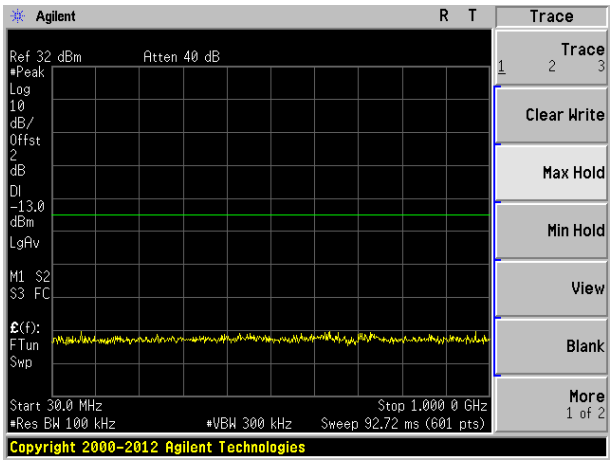
Highest channel

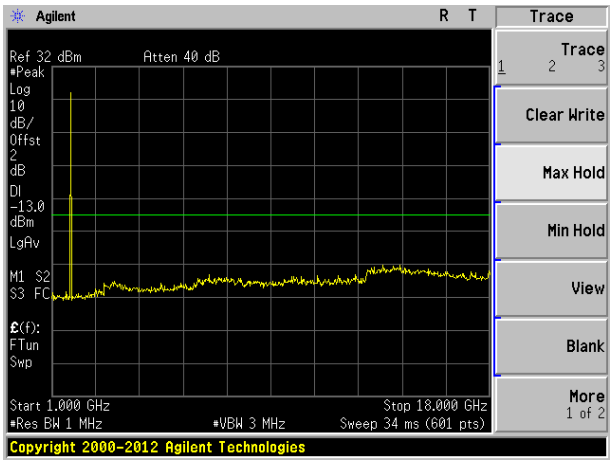
Test Mode: LTE Band 4	Channel Bandwidth: 3MHz



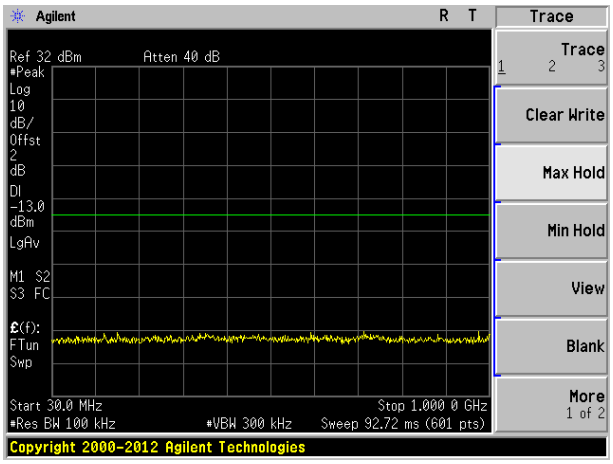


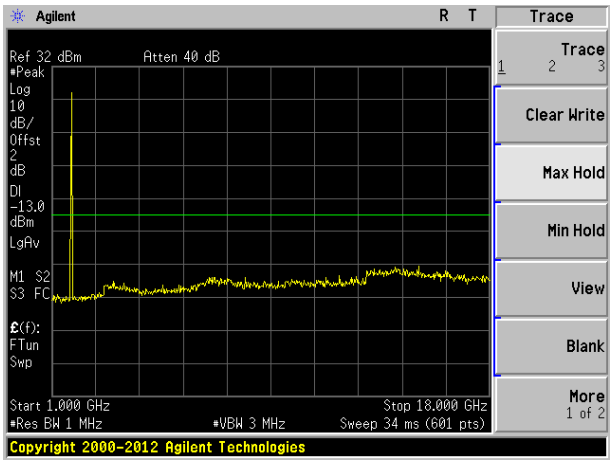
Lowest channel





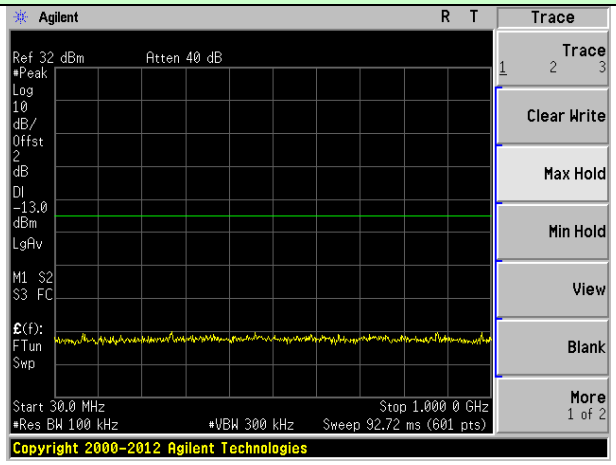
Middle channel

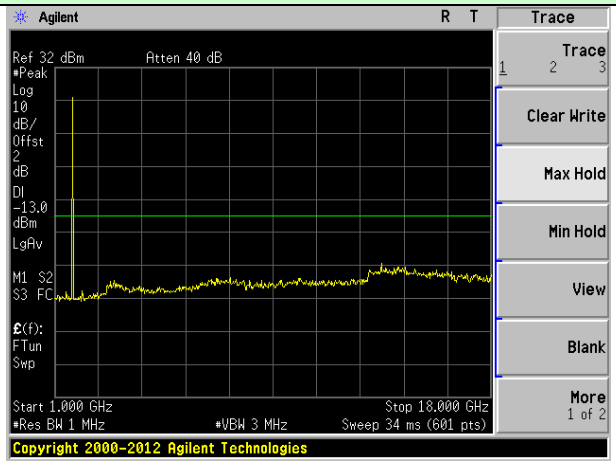




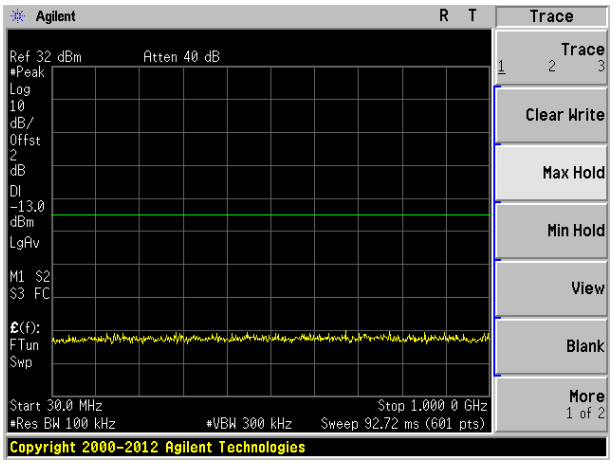
Highest channel

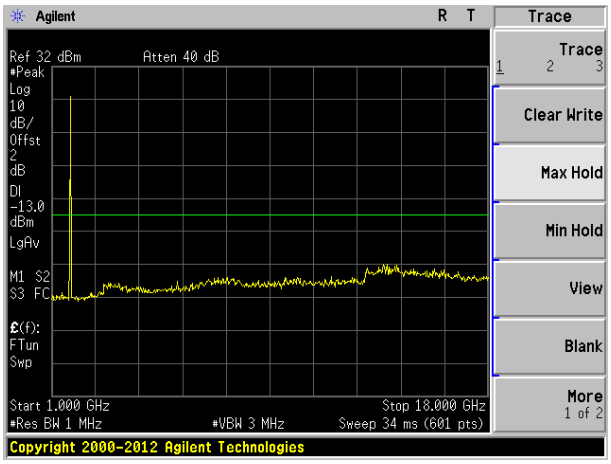
Test Mode: LTE Band 4	Channel Bandwidth: 5MHz



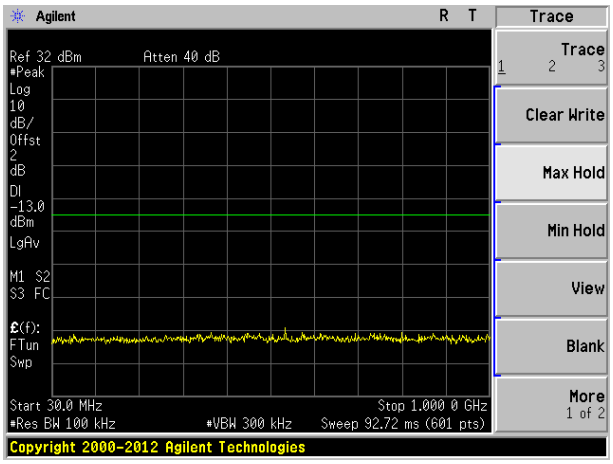


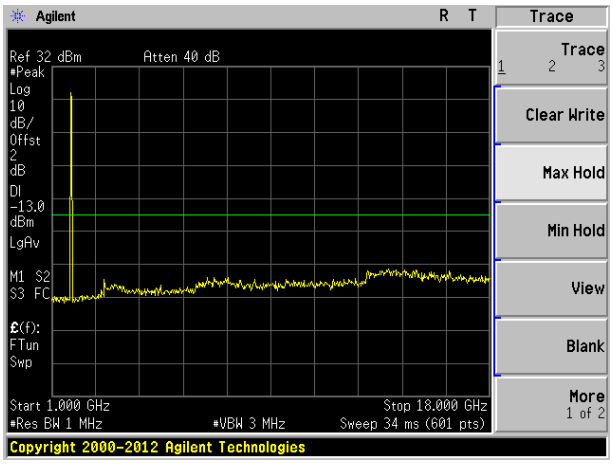
Lowest channel





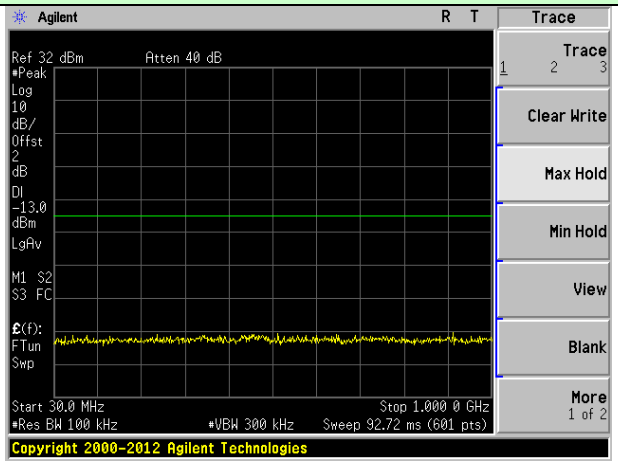
Middle channel

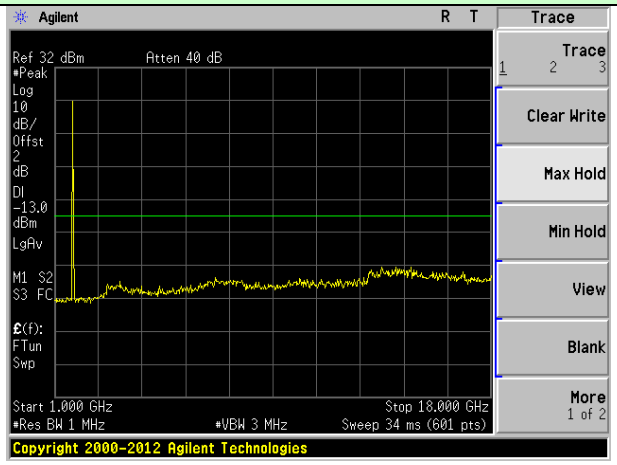




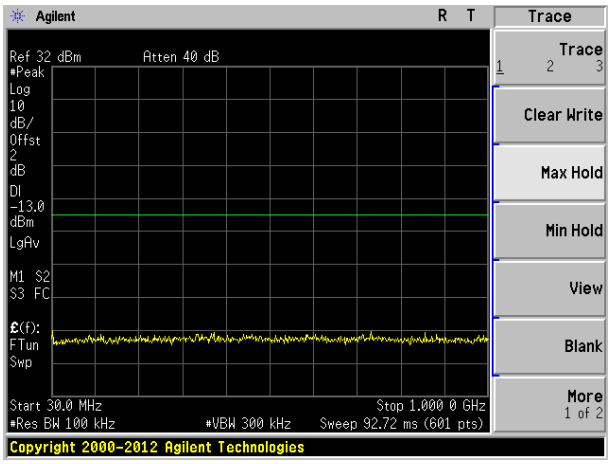
Highest channel

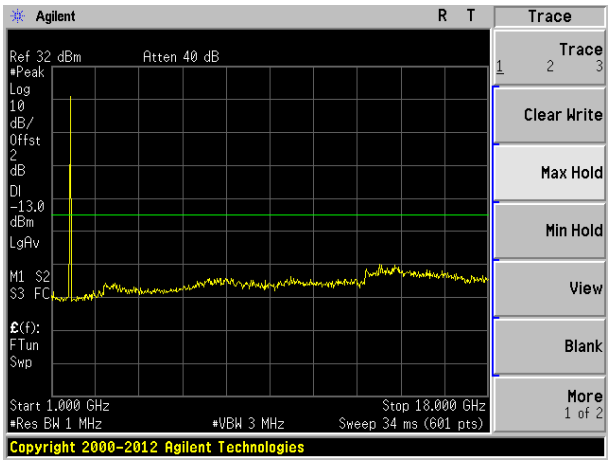
Test Mode: LTE Band 4	Channel Bandwidth: 10MHz



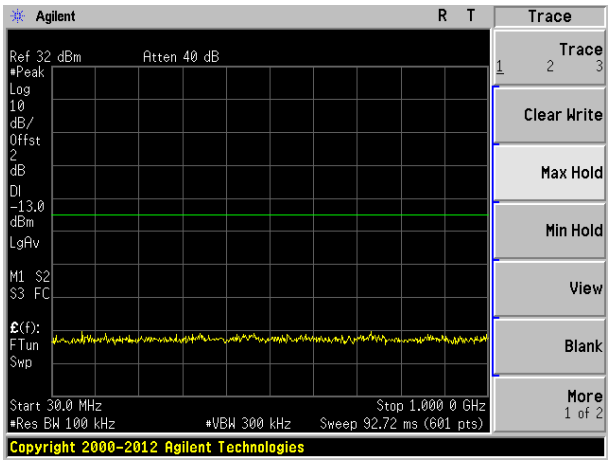


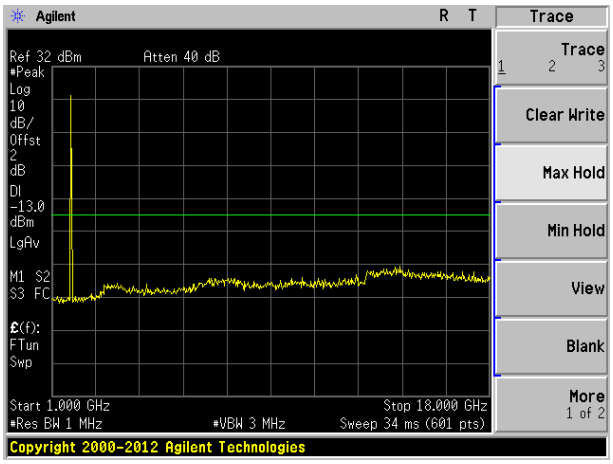
Lowest channel





Middle channel





Highest channel