FCC PART 22H, 24E, & 27

TEST AND MEASUREMENT REPORT

For

Cellphone-Mate, Inc.

48820 Kato Rd. Suite 300B,
Fremont, CA 94538, USA

FCC ID: RSNCM-EHPRO

Report Type:	Product Type:
Original Report	Cellular Amplifier

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Report Number: R1206113-222427

Report Date: 2012-09-24

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1206113-222427	Original Report	2012-09-24

1 General Information

1.1 Product Description for Equipment under Test (EUT)

This test and measurement report was prepared on behalf of *Cellphone-Mate, Inc.* and their product *FCC ID: RSNCM-EHPRO*, model: *EHPRO-5* which will henceforth be referred to as the EUT (Equipment Under Test). The EUT is a wireless, mobile and fixed (in-building), five-band bi-directional amplifier for enhancing the range of cell phones. A 50 Ω n-type connector is used for connecting both outside and inside antenna to the amplifier. The uplink frequency bands are: 824-849 MHz, 1850-1910 MHz, 698-716 MHz, 776-787 MHz and 1710-1755 MHz. The downlink frequency bands are 869-894 MHz, 1930-1990 MHz, 728-746 MHz, 746-757 MHz, and 2110-2155 MHz. Modulation types are CDMA/EVDO, GSM, EDGE, WCDMA/HSPA, QPSK, 16QAM and 64QAM. The amplifier is contained in a metal case.

1.2 Mechanical Description

The EUT measures approximately 300 mm (L) x 230 mm (W) x 56 mm (H) and weighs 4450 g.

The test data gathered are from typical production sample, serial number: R1206113 assigned by BACL.

1.3 Objective

This type approval report is prepared on behalf of *Cellphone-Mate, Inc.* in accordance with Part 2, Subpart J, Part 22 Subpart H, Part 24 Subpart E and Part 27 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for RF output power, modulation characteristics, occupied bandwidth, spurious emissions at antenna terminal, field strength of spurious radiation, frequency stability, band edge, and conducted and radiated margin.

1.4 Related Submittal(s)/Grant(s)

No Related Submittals

1.5 Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 22 Subpart H - Public Mobile Services
Part 24 Subpart E – PCS
Part 27 - Miscellaneous Wireless Communications Services

Applicable Standards: TIA/EIA603-C, ANSI C63.4-2003.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR16-4-2:2003, The Treatment of Uncertainty in EMC Measurements, the values ranging from ±2.0 dB for Conducted Emissions tests and ±4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

1.7 Test Facility

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997, and Article 8 of the VCCI regulations on December 25, 1997. The test site also complies with the test methods and procedures set forth in CISPR 22:2008 §10.4 for measurements below 1 GHz and §10.6 for measurements above 1 GHz as well as ANSI C63.4-2003, ANSI C63.4-2009, TIA/EIA-603 & CISPR 24:2010.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: A-0027. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL Corp. is an American Association for Laboratory Accreditation (A2LA) accredited laboratory (Lab Code 3297-02). The current scope of accreditations can be found at

http://www.a2la.org/scopepdf/3297-02.pdf?CFID=1132286&CFTOKEN=e42a3240dac3f6ba-6DE17DCB-1851-9E57-477422F667031258&jsessionid=8430d44f1f47cf2996124343c704b367816b

2 System Test Configuration

2.1 Justification

The EUT was configured for testing according to TIA/EIA-603-C.

The final qualification test was performed with the EUT operating at normal mode.

2.2 EUT Exercise Software

NA, signal was sent through EUT using a signal generator, device was set to normal operating mode.

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 EUT Internal Configuration

Manufacturer	Description	Model	Serial Number
Cellphone-Mate, Inc	PCB Board	2Bands Amplifier V1.0	-
Cellphone-Mate, Inc.	PCB Board	3Bands Amplifier V1.0	-

2.5 Local Support Equipment List and Details

N/A

2.6 Power Supply and Line Filters

Manufacturer	Description	Model	Serial Number
ITE Power Supply	AC Adapter	S018BU1200150	T001U08D180023405

2.7 Interface Ports and Cabling

Cable Description	Length (m)	From	To
RF cable	<1	Signal Generator	Input/ EUT
RF cable	<1	Output/ EUT	Spectrum Analyzer

3 Summary of Test Results

FCC Rules	Description of Tests	Results
§2.1046, §22.913, §24.232, §27.50	RF Output Power	Compliant
§2.1047	Modulation Characteristics	N/A
§2.1049, §22.917, §24.238, §27.53	Occupied Bandwidth	Compliant
§2.1053, §22.917, §24.238, §27.53	Spurious Radiated Emissions	Compliant
§2.1051, §22.917, §24.238, §27.53	Spurious Emissions at Antenna Terminals	Compliant
§22.917, §24.238, §27.53	Band Edge	Compliant
§2.1055	Frequency Stability	N/A
§2.1091	RF Exposure	Compliant

Note: NA, the unit is amplifier only device.

4 FCC §2.1046, §22.913, §24.232 & §27.50 – RF Output Power

4.1 Applicable Standard

According to FCC §22.913 (a), the maximum effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts.

According to FCC §24.232 , Mobile/portable stations are limited to 2 watts EIRP peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

According to FCC §27.50, the maximum effective radiated power (ERP) of fixed and base station must not exceed 1000 Watts.

4.2 Test Procedure

Conducted:

The RF output of the transmitter was connected to the signal generator and the spectrum analyzer through sufficient attenuation.

4.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates	Calibration Interval
Agilent	Spectrum Analyzer	E4440A	US45303156	2010-08-09	2 years
Agilent	Signal Generator	E4438C	MY45091309	2012-05-03	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

4.4 Test Environmental Conditions

Temperature:	21 °C
Relative Humidity:	42 %
ATM Pressure:	101.4kPa

The testing was performed by Lionel Lara on 2012-06-19 in the RF Site.

4.5 Test Results

Maximum Output Power – Modulated Signal

GSM/GPRS

Mode		Channel	Frequency (MHz)	Input Power (dBm)	Output Power (dBm)
GSM/GPRS	850 MHz Uplink	Low	824.2	-30.1	25.23
		Middle	836.6	-33.1	25.05
		High	848.8	-30.1	24.59
	850 MHz Downlink	Low	869.2	-41.1	21.37
		Middle	881.6	-44.1	21.10
		High	893.8	-42.1	21.28
	1900 MHz Uplink	Low	1850.2	-28.53	24.23
		Middle	1880.0	-33.53	25.93
		High	1909.8	-26.53	23.12
	1900 MHz Downlink	Low	1930.2	-38.53	21.76
		Middle	1960.0	-41.53	22.64
		High	1989.8	-38.53	21.12

EDGE

Mode		Channel	Frequency (MHz)	Input Power (dBm)	Output Power (dBm)
EDGE	850 MHz Uplink	Low	824.2	-33.10	25.69
		Middle	836.6	-35.10	26.06
		High	848.8	-33.10	24.97
	850 MHz Downlink	Low	869.2	-42.10	23.57
		Middle	881.6	-45.10	23.35
		High	893.8	-43.10	23.50
	1900 MHz Uplink	Low	1850.2	-30.53	25.16
		Middle	1880.0	-35.53	26.86
		High	1909.8	-28.53	24.21
	1900 MHz Downlink	Low	1930.2	-40.53	22.83
		Middle	1960.0	-42.53	21.83
		High	1989.8	-40.53	22.30

CDMA/EVDO

Mode		Channel	Frequency (MHz)	Input Power (dBm)	Output Power (dBm)
CDMA/EVDO	850 MHz Uplink	Low	824.80	-35.10	20.66
		Middle	836.52	-37.10	20.57
		High	848.20	-34.10	20.65
	850 MHz Downlink	Low	869.80	.44.10	18.33
		Middle	881.52	-46.10	18.75
		High	893.20	-45.10	19.00
	1900 MHz Uplink	Low	1850.8	-33.53	19.87
		Middle	1880.0	-38.53	21.08
		High	1909.2	-30.53	19.87
	1900 MHz Downlink	Low	1930.8	-42.53	17.49
		Middle	1960.0	-43.53	19.87
		High	1989.2	-41.53	17.69

WCDMA/HSPA

Mode		Channel	Frequency (MHz)	Input Power (dBm)	Output Power (dBm)
WCDMA/HSPA	850 MHz Uplink	Low	826.4	-33.10	23.68
		Middle	836.4	-34.10	23.92
		High	846.6	-32.10	23.59
	850 MHz Downlink	Low	871.4	-43.10	20.25
		Middle	881.4	-44.10	20.90
		High	891.6	-43.10	20.51
	1900 MHz Uplink	Low	1852.4	-30.53	23.77
		Middle	1880.0	-35.53	24.03
		High	1907.6	-28.53	23.71
	1900 MHz Downlink	Low	1932.4	-39.53	20.64
		Middle	1960.0	-41.53	21.73
		High	1987.6	-39.53	20.34

Lower LTE Band – Downlink

Mode	Modulation	Frequency (MHz)	Input Power (dBm)	Output Power (dBm)
Downlink 728-746 MHz	QPSK (1.4 MHz)	729	-35	18.20
	QPSK (1.4 MHz)	737	-37	19.75
	QPSK (1.4 MHz)	745	-38	19.87
	16QAM (1.4 MHz)	729	-34	19.03
	16QAM (1.4 MHz)	737	-37	19.79
	16QAM (1.4 MHz)	745	-38	19.91
	64QAM (1.4 MHz)	729	-35	18.31
	64QAM (1.4 MHz)	737	-37	19.86
	64QAM (1.4 MHz)	745	-38	19.97
	QPSK (3 MHz)	730	-35	18.74
	QPSK (3 MHz)	737	-37	19.62
	QPSK (3 MHz)	744	-38	19.64
	16QAM (3 MHz)	730	-35	18.73
	16QAM (3 MHz)	737	-37	19.59
	16QAM (3 MHz)	744	-38	19.63
	64QAM (3 MHz)	730	-35	18.70
	64QAM (3 MHz)	737	-37	19.57
	64QAM (3 MHz)	744	-38	19.59
	QPSK (5 MHz)	731	-36	18.31
	QPSK (5 MHz)	737	-37	19.49
	QPSK (5 MHz)	743	-37	20.23
	16QAM (5 MHz)	731	-36	18.34
	16QAM (5 MHz)	737	-37	19.53
	16QAM (5 MHz)	743	-38	19.45
	64QAM (5 MHz)	731	-35	19.08
	64QAM (5 MHz)	737	-37	19.47
	64QAM (5 MHz)	743	-37	20.19
	QPSK (10 MHz)	733	-36	19.11
	QPSK (10 MHz)	741	-37	19.96
	16QAM (10 MHz)	733	-36	19.11
	16QAM (10 MHz)	741	-37	19.95
	64QAM (10 MHz)	733	-36	19.10
	64QAM (10 MHz)	741	-37	19.94

Lower LTE Band – Uplink

Mode	Modulation	Frequency (MHz)	Input Power (dBm)	Output Power (dBm)
Uplink 698-716 MHz	QPSK (1.4 MHz)	699	-37	20.34
	QPSK (1.4 MHz)	709	-37	22.52
	QPSK (1.4 MHz)	715	-33	21.14
	16QAM (1.4 MHz)	699	-37	20.21
	16QAM (1.4 MHz)	709	-37	22.46
	16QAM (1.4 MHz)	715	-33	21.10
	64QAM (1.4 MHz)	699	-37	20.21
	64QAM (1.4 MHz)	709	-37	22.45
	64QAM (1.4 MHz)	715	-33	21.10
	QPSK (3 MHz)	700	-37	21.08
	QPSK (3 MHz)	709	-37	22.53
	QPSK (3 MHz)	714	-35	21.12
	16QAM (3 MHz)	700	-37	20.99
	16QAM (3 MHz)	709	-36	23.05
	16QAM (3 MHz)	714	-35	21.06
	64QAM (3 MHz)	700	-37	20.95
	64QAM (3 MHz)	709	-37	22.42
	64QAM (3 MHz)	714	-35	21.01
	QPSK (5 MHz)	701	-37	21.61
	QPSK (5 MHz)	709	-37	22.48
	QPSK (5 MHz)	713	-35	22.00
	16QAM (5 MHz)	701	-37	21.50
	16QAM (5 MHz)	709	-37	22.41
	16QAM (5 MHz)	713	-35	21.89
	64QAM (5 MHz)	701	-37	21.45
	64QAM (5 MHz)	709	-37	22.38
	64QAM (5 MHz)	713	-35	21.86
	QPSK (10 MHz)	703	-37	21.83
	QPSK (10 MHz)	711	-36	22.31
	16QAM (10 MHz)	703	-37	21.74
	16QAM (10 MHz)	711	-36	22.24
	64QAM (10 MHz)	703	-37	21.71
	64QAM (10 MHz)	711	-36	22.11

Upper LTE Band – Downlink

Mode	Modulation	Frequency (MHz)	Input Power (dBm)	Output Power (dBm)
Downlink 746-757 MHz	QPSK (1.4 MHz)	747	-38	19.73
	QPSK (1.4 MHz)	752	-36	19.65
	QPSK (1.4 MHz)	756	-35	19.28
	16QAM (1.4 MHz)	747	-39	18.96
	16QAM (1.4 MHz)	752	-36	19.71
	16QAM (1.4 MHz)	756	-35	19.33
	64QAM (1.4 MHz)	747	-38	19.85
	64QAM (1.4 MHz)	752	-36	19.78
	64QAM (1.4 MHz)	756	-35	19.41
	QPSK (3 MHz)	748	-38	19.33
	QPSK (3 MHz)	752	-36	19.59
	QPSK (3 MHz)	755	-35	19.74
	16QAM (3 MHz)	748	-38	19.35
	16QAM (3 MHz)	752	-36	19.61
	16QAM (3 MHz)	755	-35	19.75
	64QAM (3 MHz)	748	-38	19.31
	64QAM (3 MHz)	752	-36	19.56
	64QAM (3 MHz)	755	-35	19.72
	QPSK (5 MHz)	749	-37	19.74
	QPSK (5 MHz)	754	-35	19.88
	16QAM (5 MHz)	749	-37	19.77
	16QAM (5 MHz)	754	-35	19.90
	64QAM (5 MHz)	749	-37	19.69
	64QAM (5 MHz)	754	-35	19.83
	QPSK (10 MHz)	752	-36	19.57
	16QAM (10 MHz)	752	-36	19.56
	64QAM (10 MHz)	752	-36	19.56

Upper LTE Band – Uplink

Mode	Modulation	Frequency (MHz)	Input Power (dBm)	Output Power (dBm)
Uplink 776-787 MHz	QPSK (1.4 MHz)	777	-37	23.88
	QPSK (1.4 MHz)	782	-39	23.55
	QPSK (1.4 MHz)	786	-38	23.42
	16QAM (1.4 MHz)	777	-37	23.56
	16QAM (1.4 MHz)	782	-39	23.40
	16QAM (1.4 MHz)	786	-38	23.09
	64QAM (1.4 MHz)	777	-37	23.53
	64QAM (1.4 MHz)	782	-39	23.37
	64QAM (1.4 MHz)	786	-38	23.04
	QPSK (3 MHz)	778	-38	23.75
	QPSK (3 MHz)	782	-39	23.55
	QPSK (3 MHz)	785	-38	23.63
	16QAM (3 MHz)	778	-38	23.61
	16QAM (3 MHz)	782	-39	23.42
	16QAM (3 MHz)	785	-38	23.31
	64QAM (3 MHz)	778	-38	23.57
	64QAM (3 MHz)	782	-39	23.38
	64QAM (3 MHz)	785	-38	23.25
	QPSK (5 MHz)	779	-38	24.11
	QPSK (5 MHz)	784	-38	23.90
	16QAM (5 MHz)	779	-38	23.91
	16QAM (5 MHz)	784	-38	23.58
	64QAM (5 MHz)	779	-38	23.87
	64QAM (5 MHz)	784	-38	23.54
	QPSK (10 MHz)	782	-38	24.10
	16QAM (10 MHz)	782	-39	23.26
	64QAM (10 MHz)	782	-39	23.24

AWS Band

Mode		Channel	Frequency (MHz)	Input Power (dBm)	Output Power (dBm)
WCDMA/HSPA	1710-1755 MHz Uplink	Low	1712.4	-36.53	22.03
		Middle	1732.4	-34.53	23.40
		High	1752.6	-33.53	22.96
	2110-2155 MHz Downlink	Low	2112.4	-39.53	22.02
		Middle	2132.4	-38.53	21.77
		High	2152.6	-39.53	21.98

5 FCC §2.1049, §22.917, §24.238 & §27.53 - Occupied Bandwidth

5.1 Applicable Standard

Requirements: FCC §2.1049, §22.917, §24.238 and §27.53.

5.2 Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set to at least 1% of the BW and the 26 dB & 99% bandwidth was recorded.

5.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates	Calibration Interval
Agilent	Spectrum Analyzer	E4440A	US45303156	2010-08-09	2 years
Agilent	Signal Generator	E4438C	MY45091309	2012-05-03	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

5.4 Test Environmental Conditions

Temperature:	20-21 °C
Relative Humidity:	41-42 %
ATM Pressure:	101-102kPa

The testing was performed by Jeffrey Wu from 2012-06-22 to 2012-06-25 in the RF Site.

5.5 Test Results

Please refer to the following tables and plots.

Mode		Channel	Frequency (MHz)	Emission Bandwidth Input (kHz)	Emission Bandwidth Output (kHz)
GSM	850 MHz Uplink	Middle	836.6	249.81	245.28
	850 MHz Downlink	Middle	881.6	245.67	245.57
	1900 MHz Uplink	Middle	1880.0	242.70	249.54
	1900 MHz Downlink	Middle	1960.0	245.62	246.41

Mode		Channel	Frequency (MHz)	Emission Bandwidth Input (kHz)	Emission Bandwidth Output (kHz)
EDGE	850 MHz Uplink	Middle	836.6	245.17	241.64
	850 MHz Downlink	Middle	881.6	245.03	241.97
	1900 MHz Uplink	Middle	1880.0	244.98	264.13
	1900 MHz Downlink	Middle	1960.0	245.02	243.84

Mode		Channel	Frequency (MHz)	Emission Bandwidth Input (MHz)	Emission Bandwidth Output (MHz)
CDMA	850 MHz Uplink	Middle	836.52	1.2603	1.2545
	850 MHz Downlink	Middle	881.52	1.2619	1.2565
	1900 MHz Uplink	Middle	1880.0	1.2548	1.2624
	1900 MHz Downlink	Middle	1960.0	1.2611	1.2584

Mode		Channel	Frequency (MHz)	Emission Bandwidth Input (MHz)	Emission Bandwidth Output (MHz)
WCDMA	850 MHz Uplink	Middle	836.4	4.1607	4.1663
	850 MHz Downlink	Middle	881.4	4.1666	4.1654
	1900 MHz Uplink	Middle	1880.0	4.1609	4.1711
	1900 MHz Downlink	Middle	1960.0	4.1624	4.1574

Lower LTE Band – Downlink

Mode	Modulation	Frequency (MHz)	Emission Bandwidth Input (MHz)	Emission Bandwidth Output (MHz)
Downlink 728-746 MHz	QPSK (1.4 MHz)	737	1.0887	1.0915
	16QAM (1.4 MHz)	737	1.0890	1.0904
	64QAM (1.4 MHz)	737	1.0894	1.0916
	QPSK (3 MHz)	737	2.6876	2.6917
	16QAM (3 MHz)	737	2.6880	2.6937
	64QAM (3 MHz)	737	2.6884	2.6906
	QPSK (5 MHz)	737	4.4712	4.4706
	16QAM (5 MHz)	737	4.4725	4.4732
	64QAM (5 MHz)	737	4.4717	4.4708
	QPSK (10 MHz)	733	8.9228	8.8968
	16QAM (10 MHz)	733	8.9204	8.8985
	64QAM (10 MHz)	733	8.9215	8.8957

Lower LTE Band – Uplink

Mode	Modulation	Frequency (MHz)	Emission Bandwidth Input (MHz)	Emission Bandwidth Output (MHz)
Uplink 698-716 MHz	QPSK (1.4 MHz)	709	1.0734	1.0745
	16QAM (1.4 MHz)	709	1.0735	1.0748
	64QAM (1.4 MHz)	709	1.0738	1.0769
	QPSK (3 MHz)	709	2.6741	2.6743
	16QAM (3 MHz)	709	2.6749	2.6783
	64QAM (3 MHz)	709	2.6723	2.6760
	QPSK (5 MHz)	709	4.4521	4.4505
	16QAM (5 MHz)	709	4.4590	4.4578
	64QAM (5 MHz)	709	4.4534	4.4555
	QPSK (10 MHz)	703	8.9050	8.8989
	16QAM (10 MHz)	703	8.9033	8.9066
	64QAM (10 MHz)	703	8.9133	8.9111

Upper LTE Band – Downlink

Mode	Modulation	Frequency (MHz)	Emission Bandwidth Input (MHz)	Emission Bandwidth Output (MHz)
Downlink 746-757 MHz	QPSK (1.4 MHz)	752	1.0888	1.0950
	16QAM (1.4 MHz)	752	1.0890	1.0949
	64QAM (1.4 MHz)	752	1.0894	1.0972
	QPSK (3 MHz)	752	2.6884	2.7004
	16QAM (3 MHz)	752	2.6882	2.7017
	64QAM (3 MHz)	752	2.6889	2.7002
	QPSK (5 MHz)	749	4.4711	4.4736
	16QAM (5 MHz)	749	4.4740	4.4760
	64QAM (5 MHz)	749	4.4719	4.4742
	QPSK (10 MHz)	752	8.9219	8.9143
	16QAM (10 MHz)	752	8.9231	8.9134
	64QAM (10 MHz)	752	8.9216	8.9142

Upper LTE Band – Uplink

Mode	Modulation	Frequency (MHz)	Emission Bandwidth Input (MHz)	Emission Bandwidth Output (MHz)
Uplink 776-787 MHz	QPSK (1.4 MHz)	782	1.0738	1.0779
	16QAM (1.4 MHz)	782	1.0733	1.0780
	64QAM (1.4 MHz)	782	1.0731	1.0801
	QPSK (3 MHz)	782	2.6788	2.6820
	16QAM (3 MHz)	782	2.6752	2.6801
	64QAM (3 MHz)	782	2.6732	2.6783
	QPSK (5 MHz)	779	4.4524	4.4468
	16QAM (5 MHz)	779	4.4627	4.4565
	64QAM (5 MHz)	779	4.4539	4.4477
	QPSK (10 MHz)	782	8.9054	8.8843
	16QAM (10 MHz)	782	8.9083	8.8924
	64QAM (10 MHz)	782	8.9120	8.8986

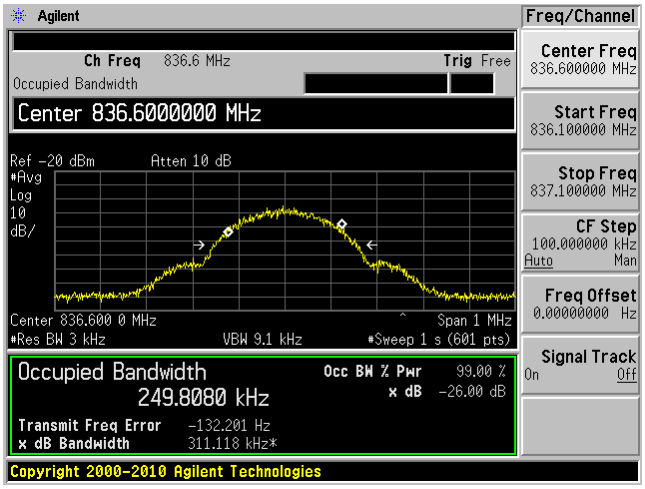
AWS Band

Mode		Channel	Frequency (MHz)	Emission Bandwidth Input (MHz)	Emission Bandwidth Output (MHz)
WCDMA	1710-1755 MHz Uplink	Middle	1732.4	4.1615	4.1732
	2110-2155 MHz Downlink	Middle	2132.4	4.1620	4.1742

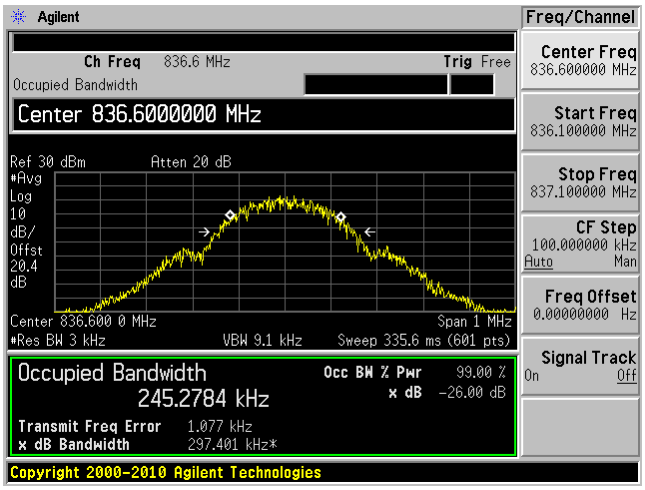
Cell Band, Uplink:

GSM/GPRS (Middle Channel)

Input

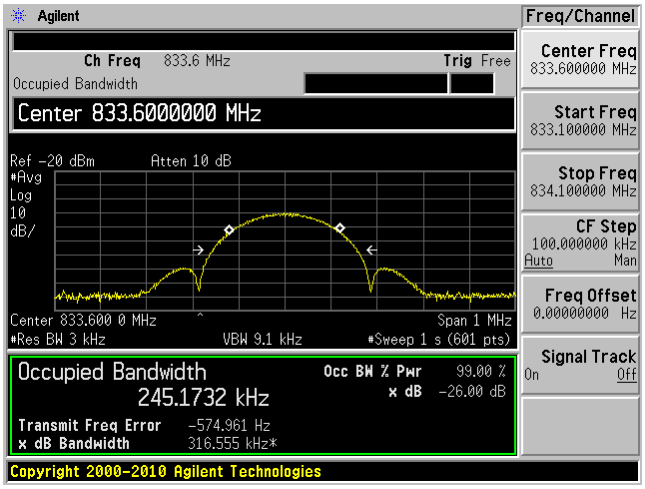


Output

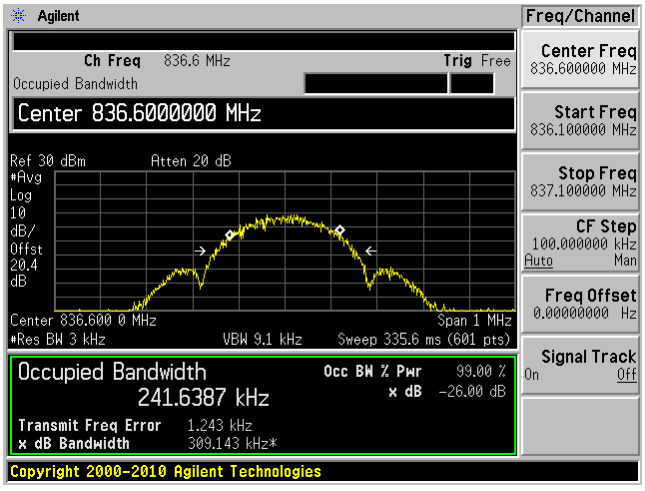


EDGE (Middle Channel)

Input

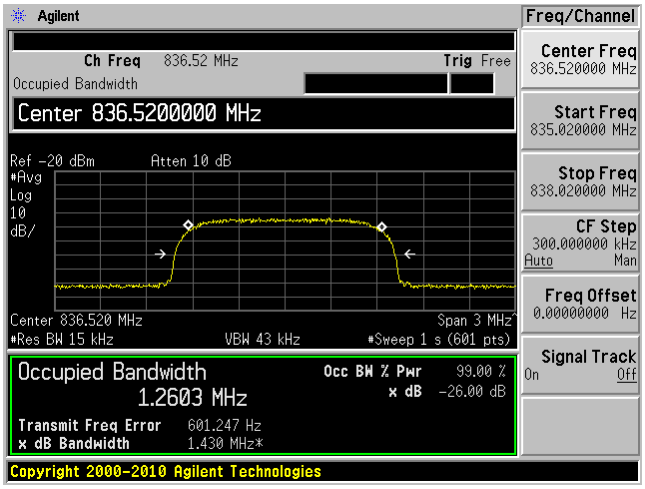


Output

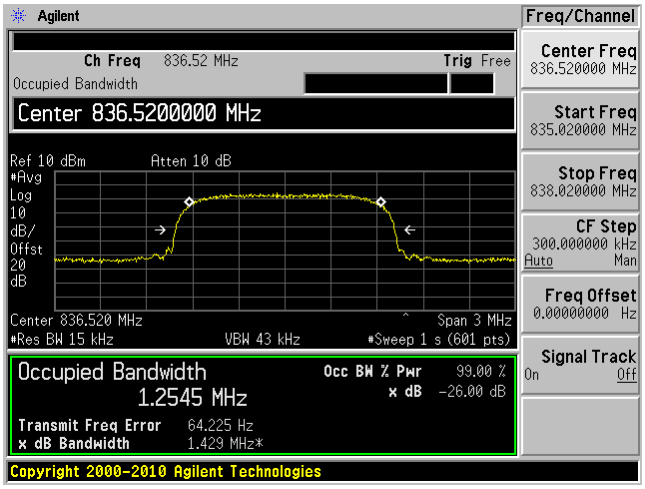


CDMA/EVDO (Middle Channel)

Input

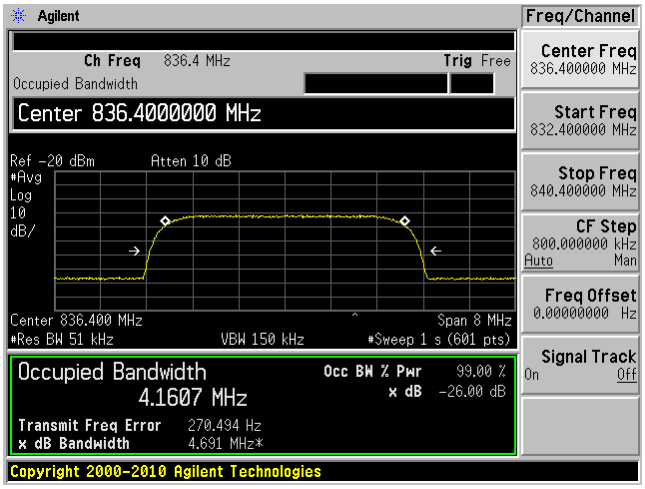


Output

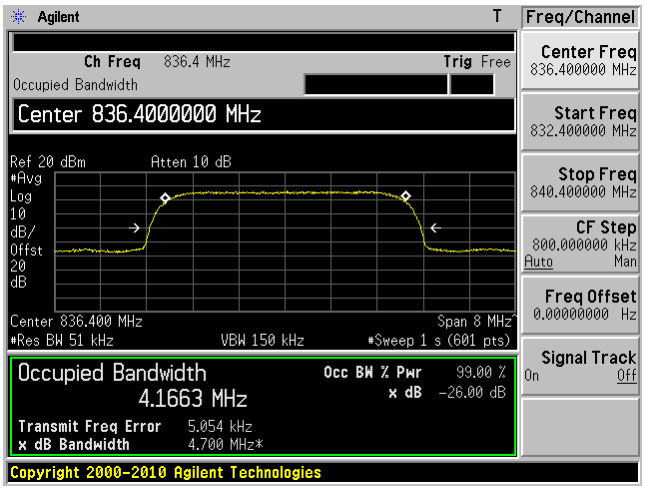


WCDMA/HSPA (Middle Channel)

Input



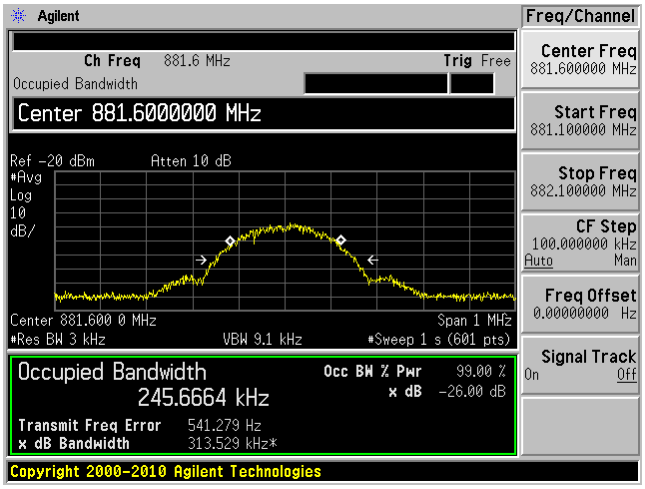
Output



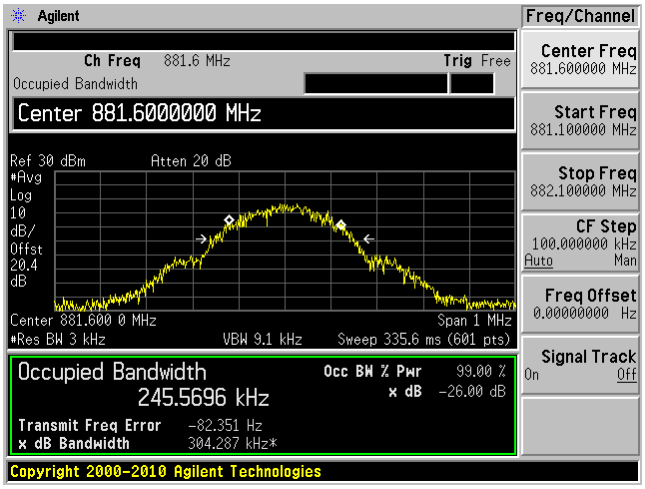
Cell Band, Downlink:

GSM/GPRS (Middle Channel)

Input

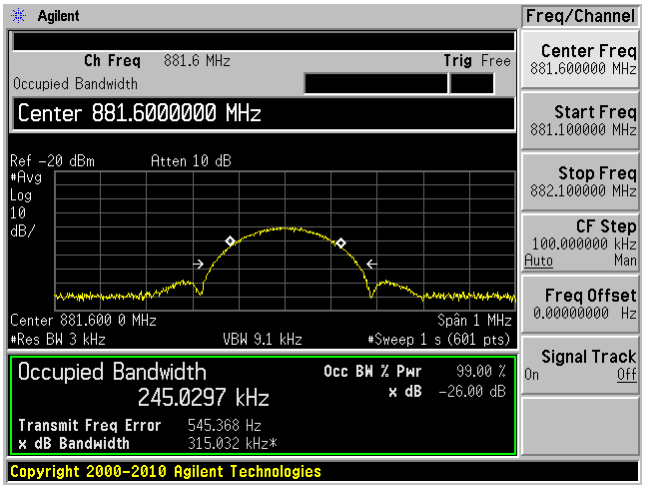


Output

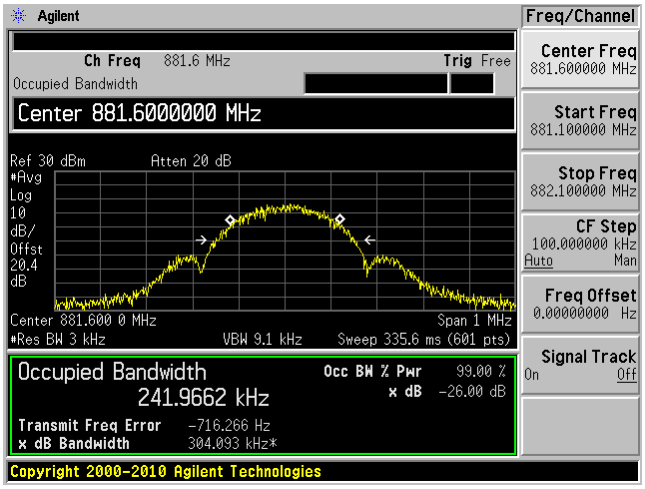


EDGE (Middle Channel)

Input

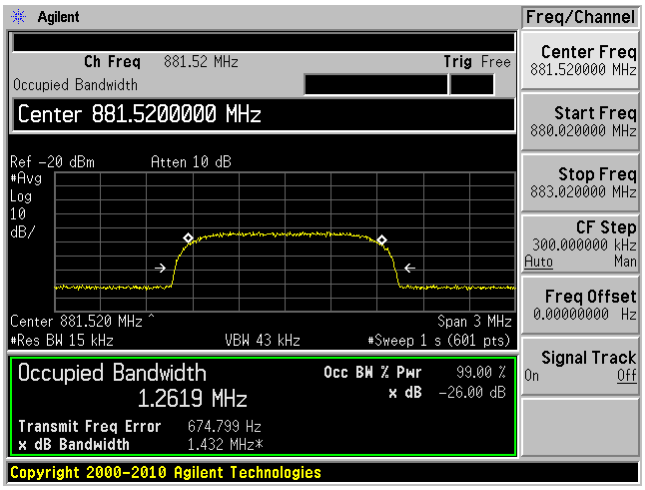


Output

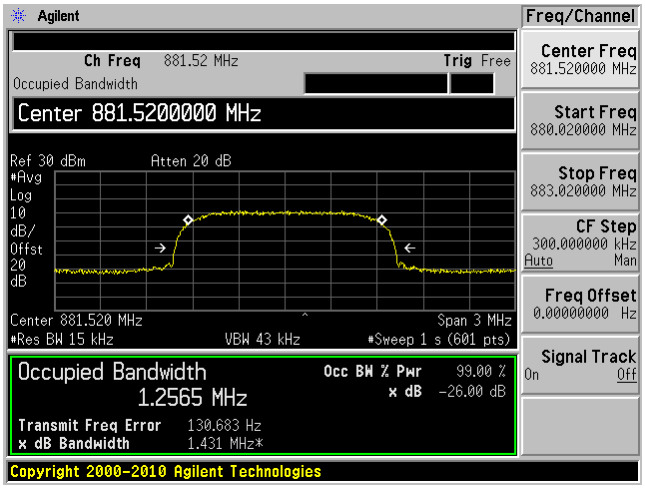


CDMA/EVDO (Middle Channel)

Input

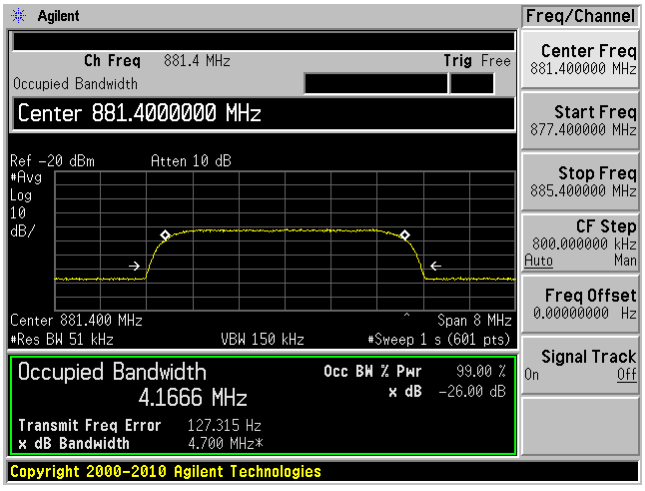


Output

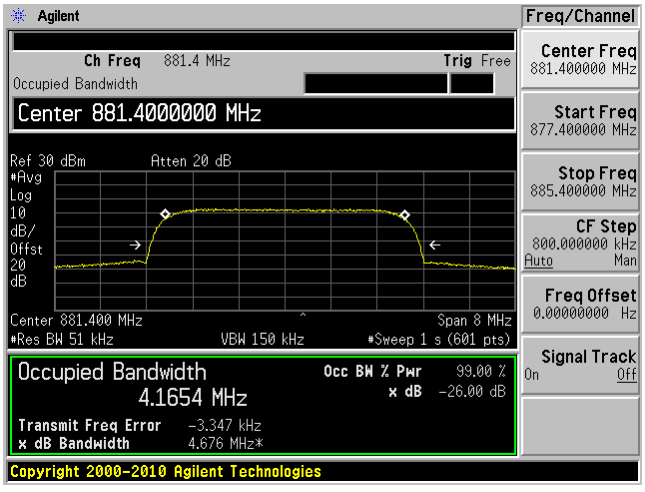


WCDMA/HSPA (Middle Channel)

Input



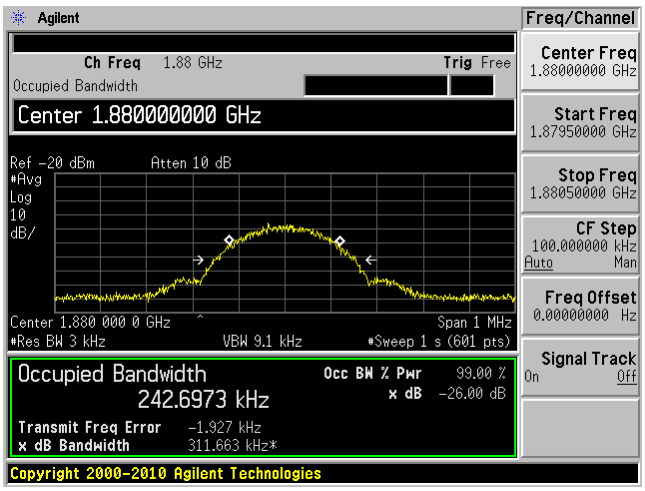
Output



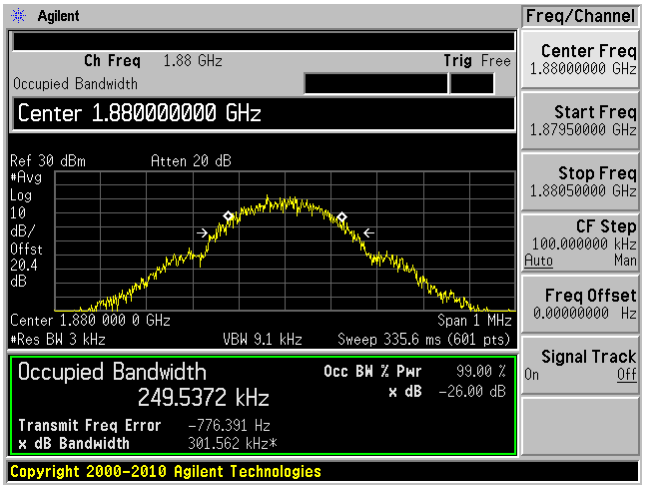
PCS Band, Uplink:

GSM/GPRS (Middle Channel)

Input

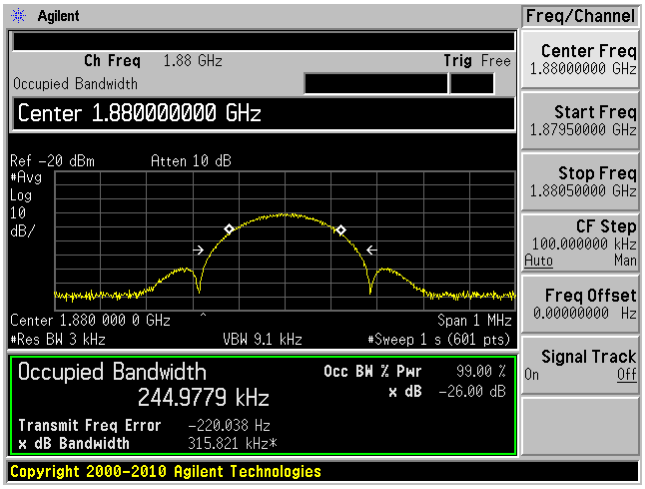


Output

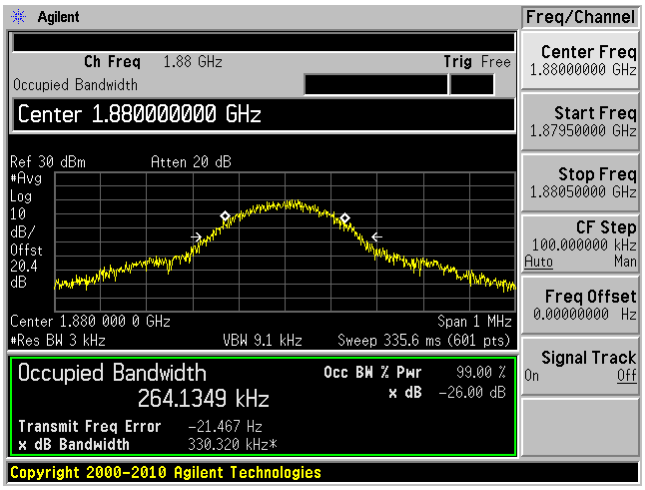


EDGE (Middle Channel)

Input

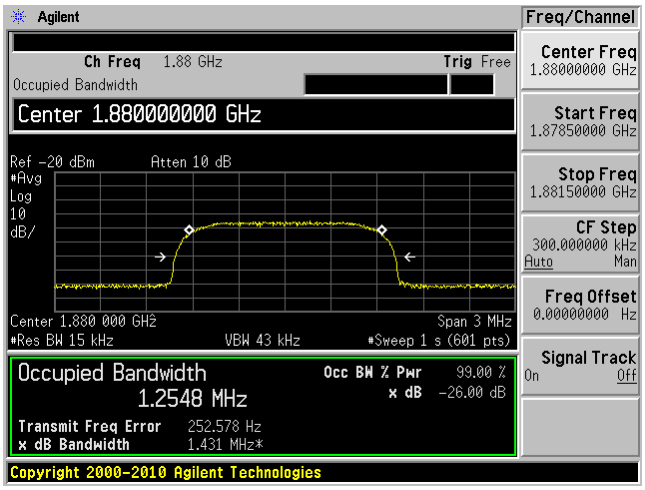


Output

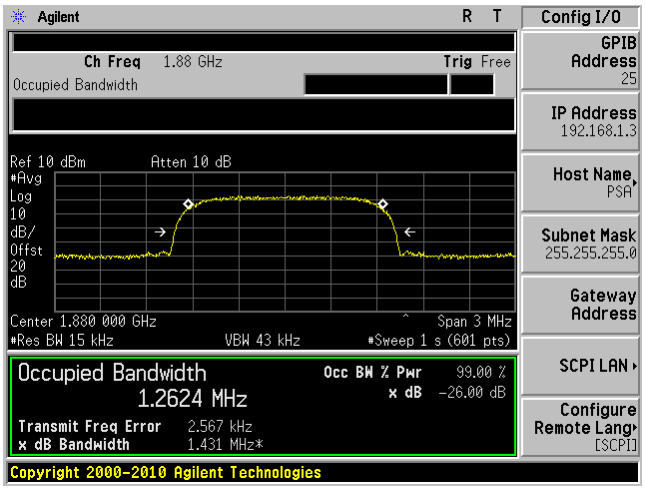


CDMA/EVDO (Middle Channel)

Input

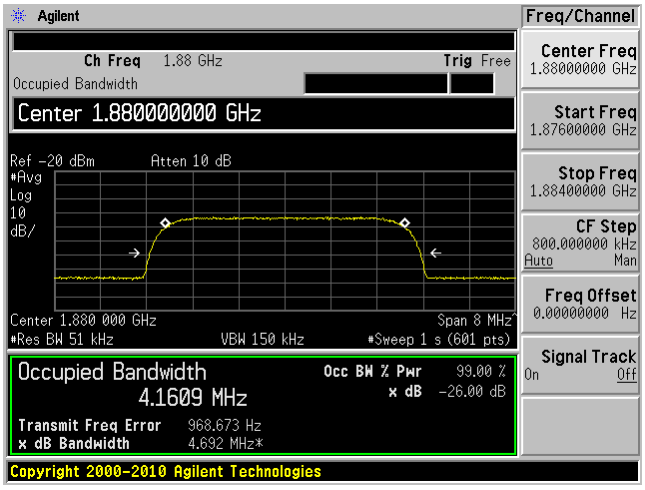


Output

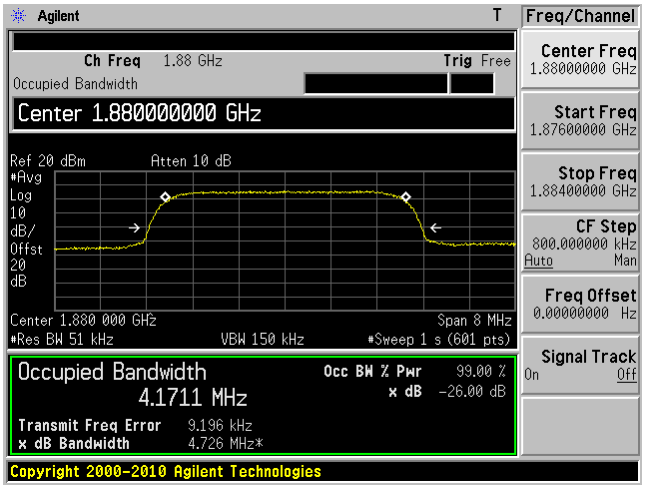


WCDMA/HSPA (Middle Channel)

Input



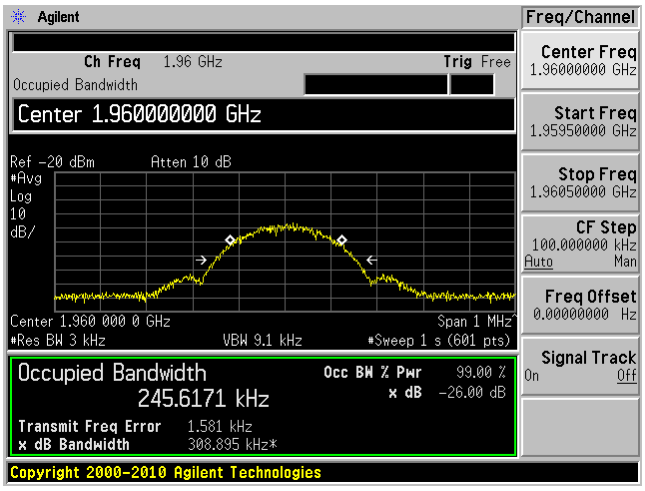
Output



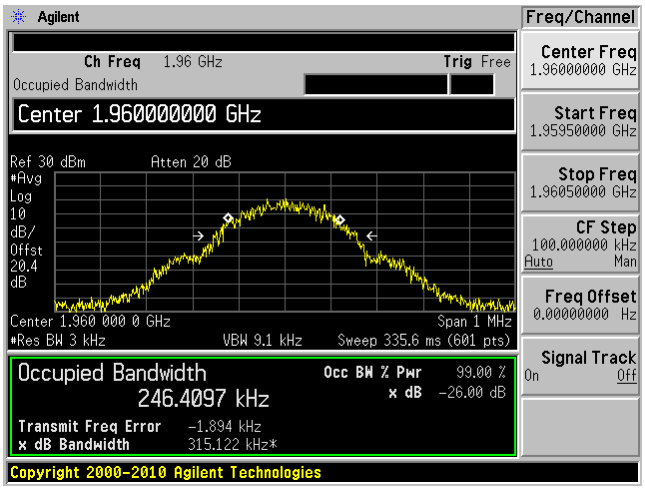
PCS Band, Downlink:

GSM/GPRS (Middle Channel)

Input

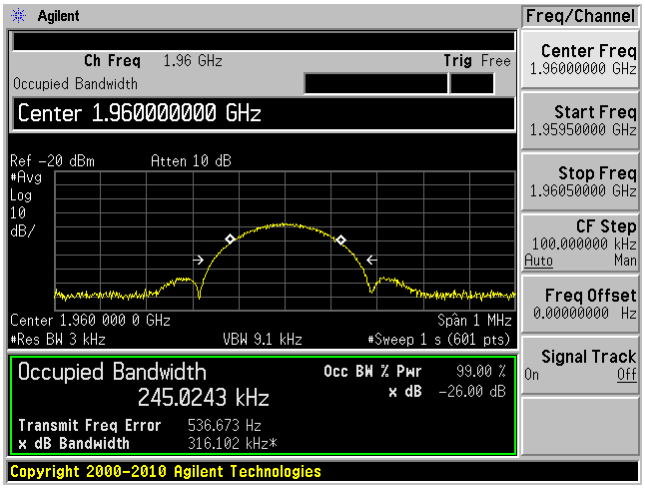


Output

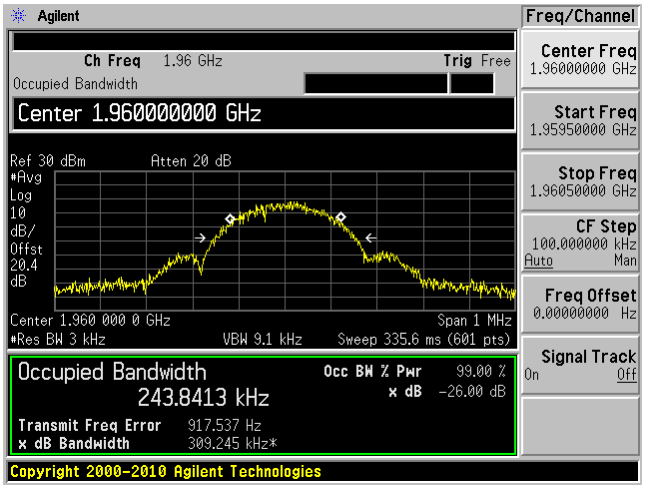


EDGE (Middle Channel)

Input

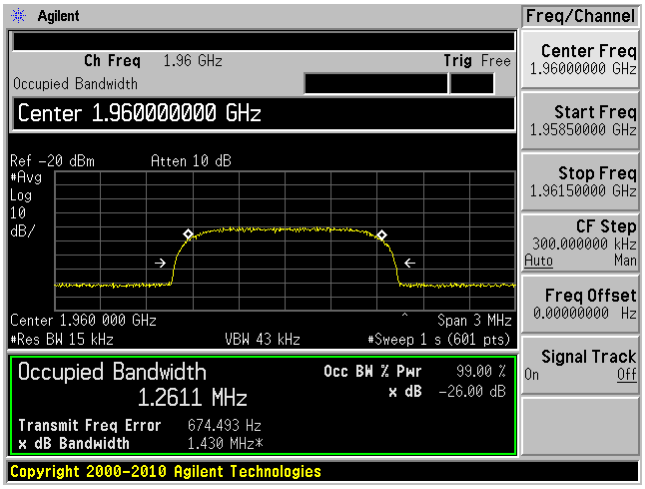


Output

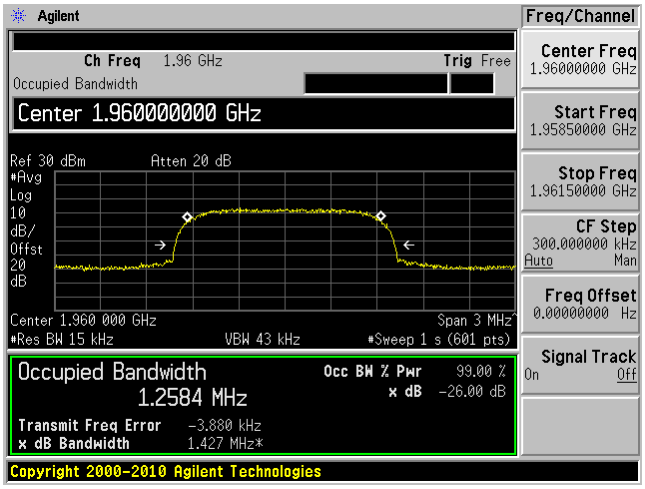


CDMA/EVDO (Middle Channel)

Input

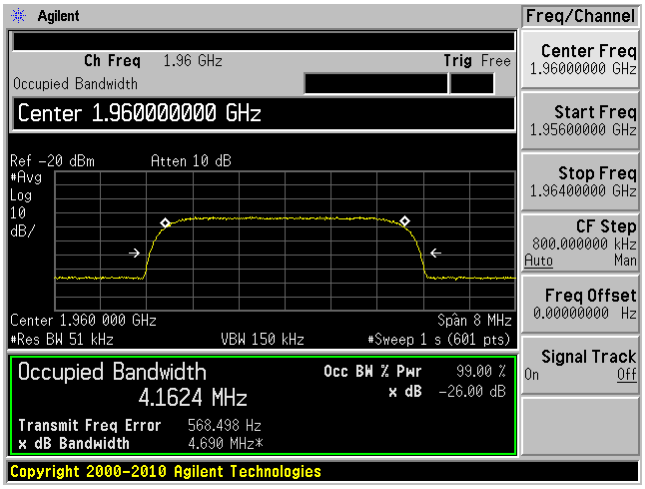


Output

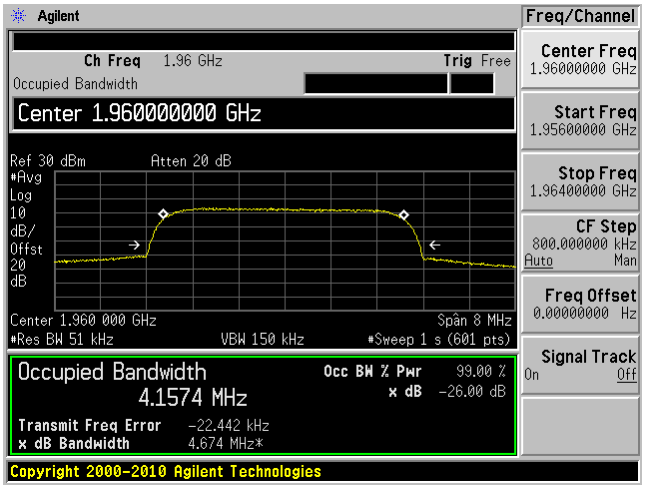


WCDMA/HSPA (Middle Channel)

Input



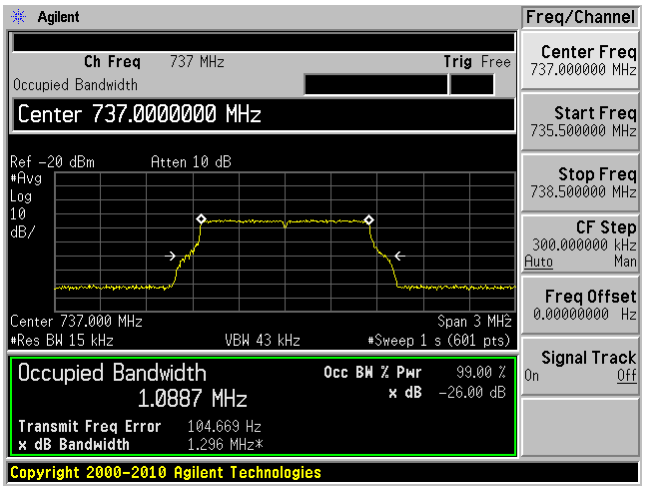
Output



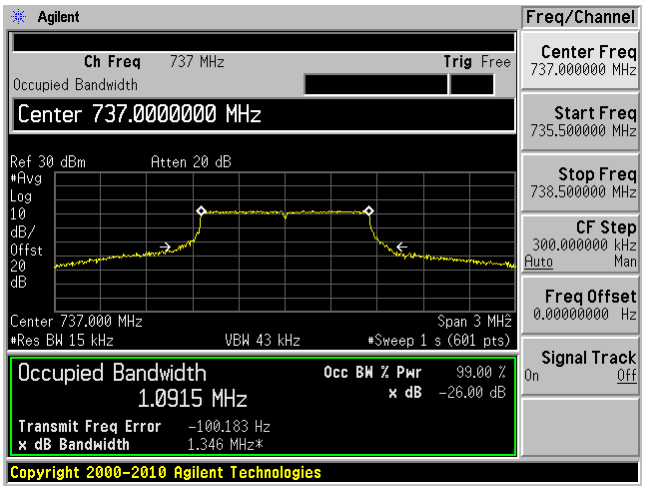
Lower LTE Band; DL: 728-746 MHz

QPSK (1.4 MHz), (Middle Channel)

Input

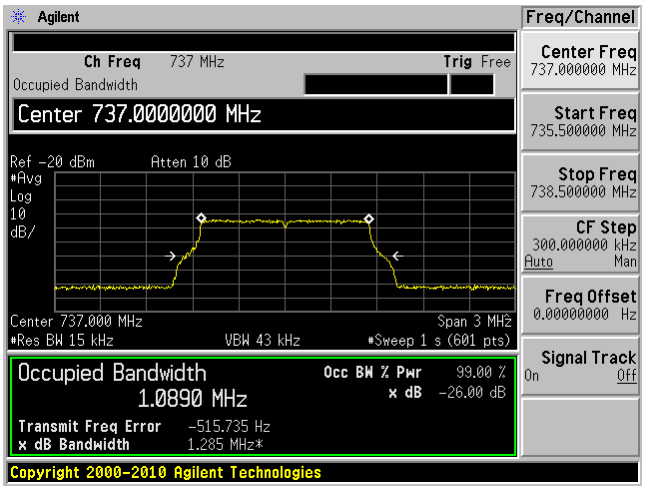


Output

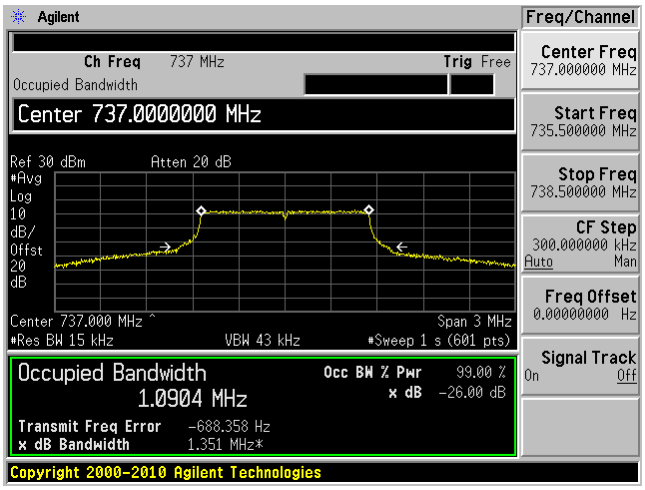


16QAM (1.4 MHz), (Middle Channel)

Input

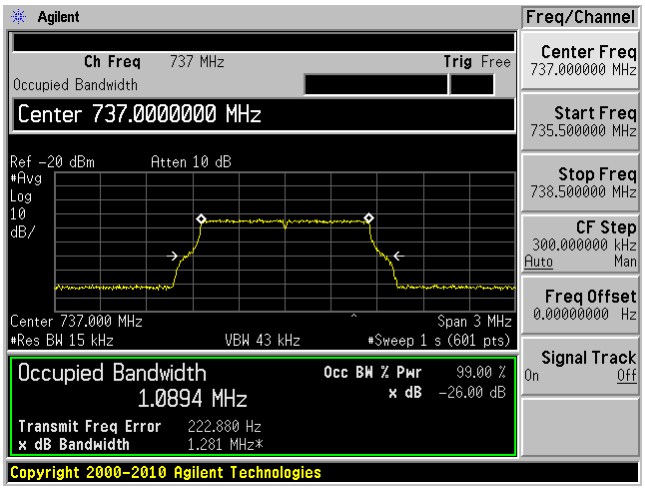


Output

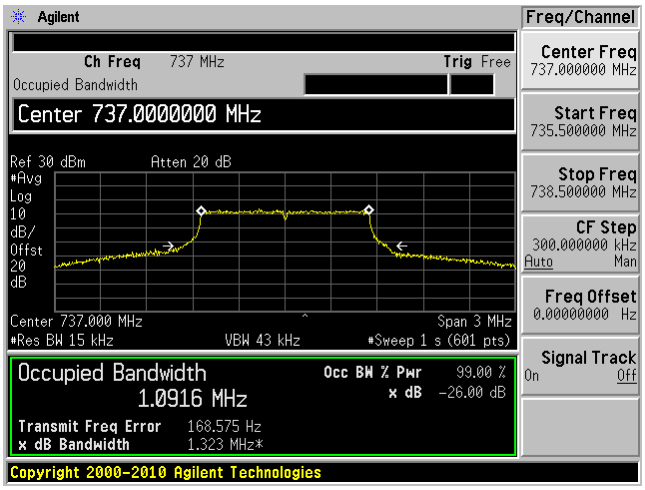


64QAM (1.4 MHz), (Middle Channel)

Input

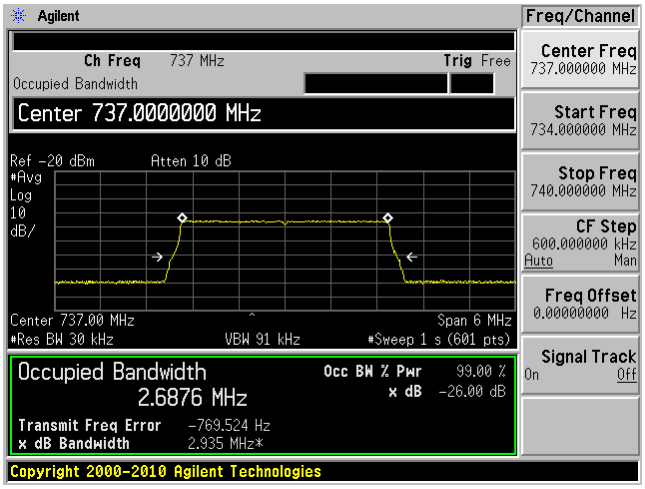


Output

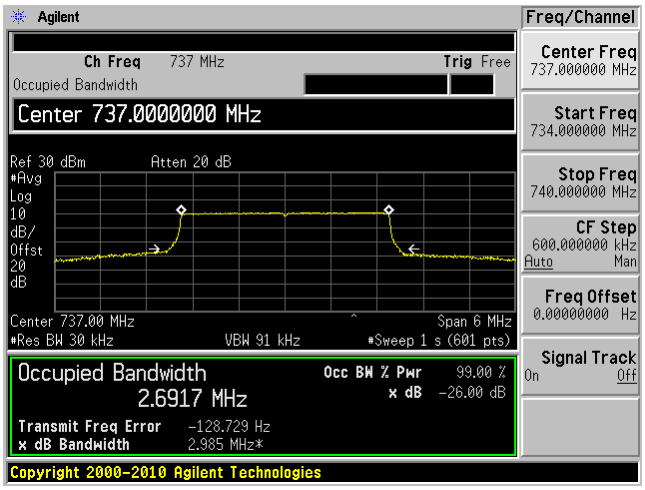


QPSK (3 MHz), (Middle Channel)

Input

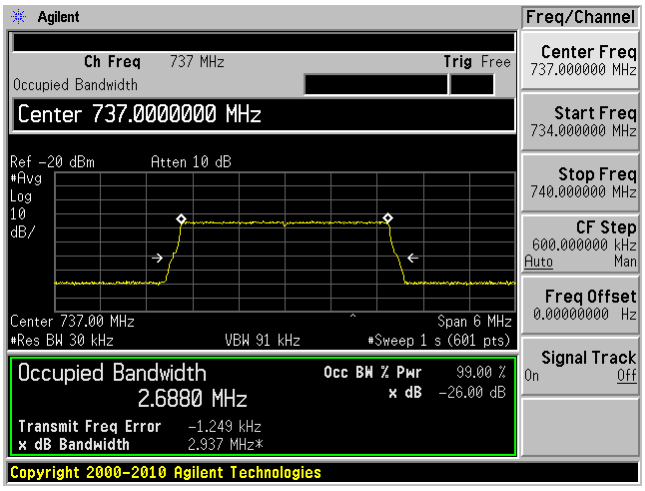


Output

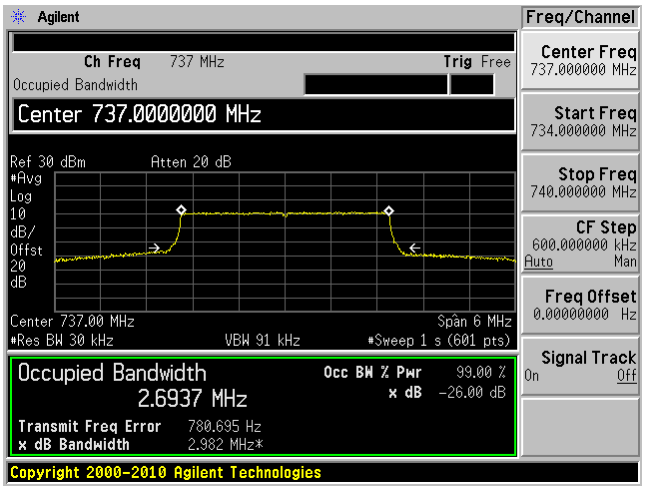


16QAM (3 MHz), (Middle Channel)

Input

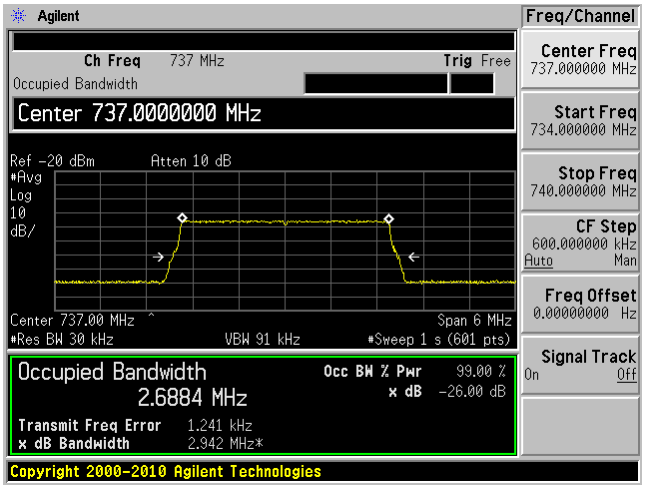


Output

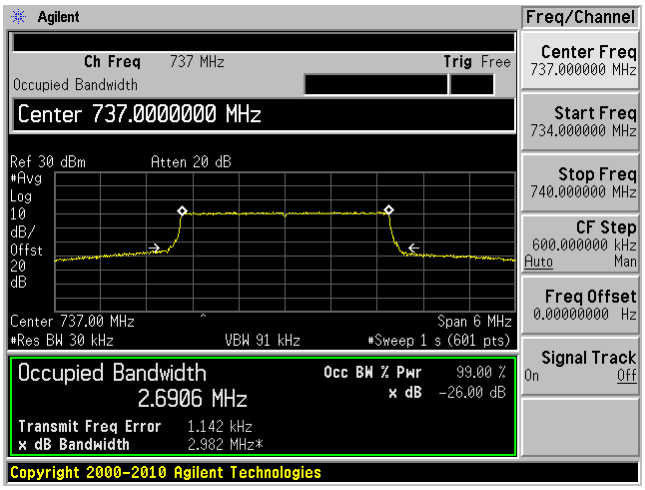


64QAM (3 MHz), (Middle Channel)

Input

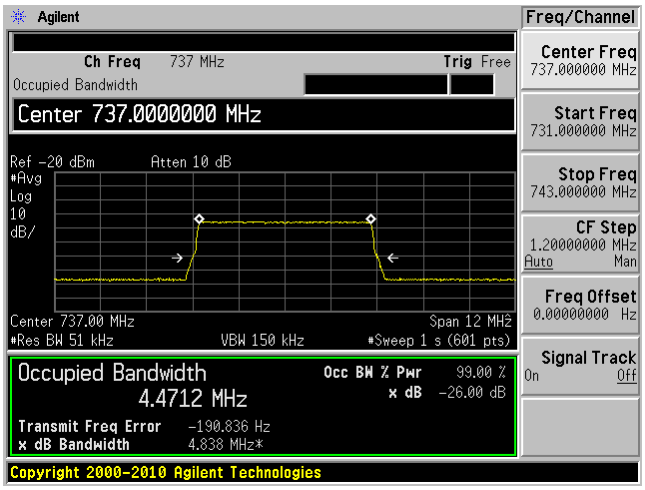


Output

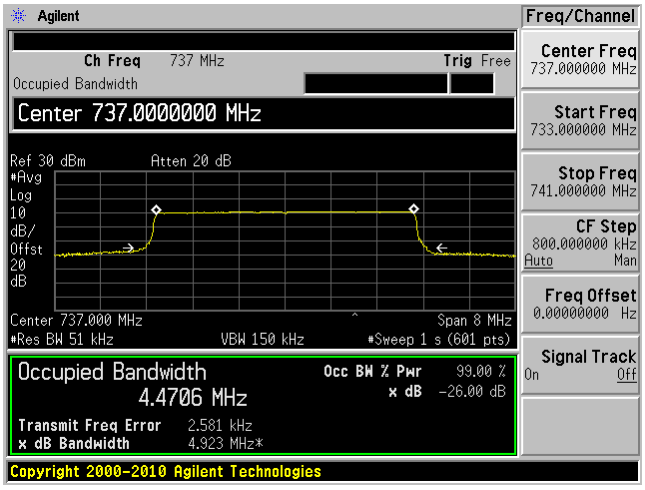


QPSK (5 MHz), (Middle Channel)

Input

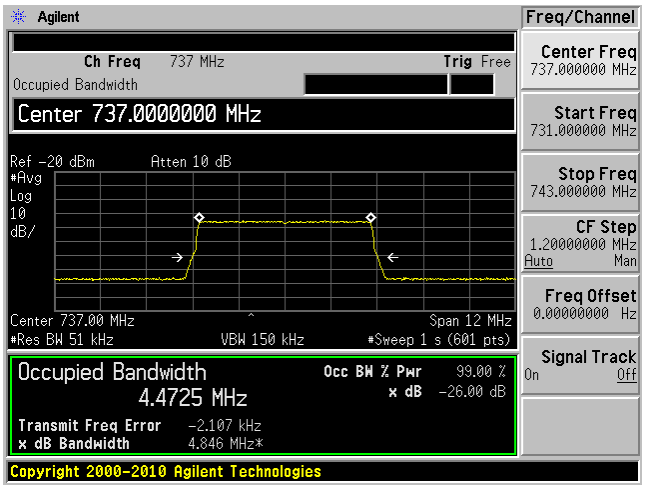


Output

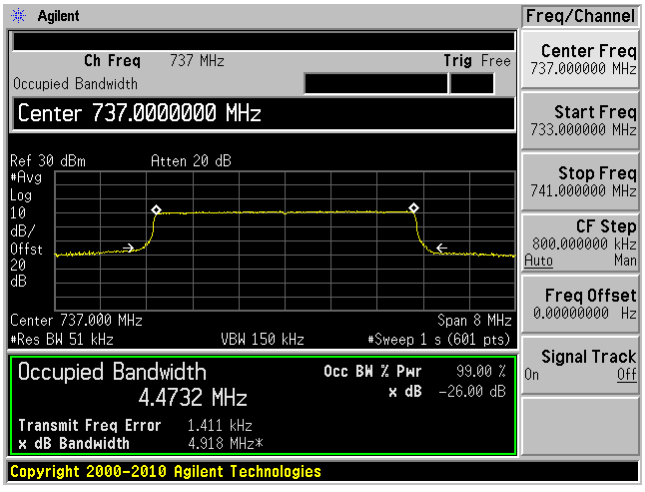


16QAM (5 MHz), (Middle Channel)

Input

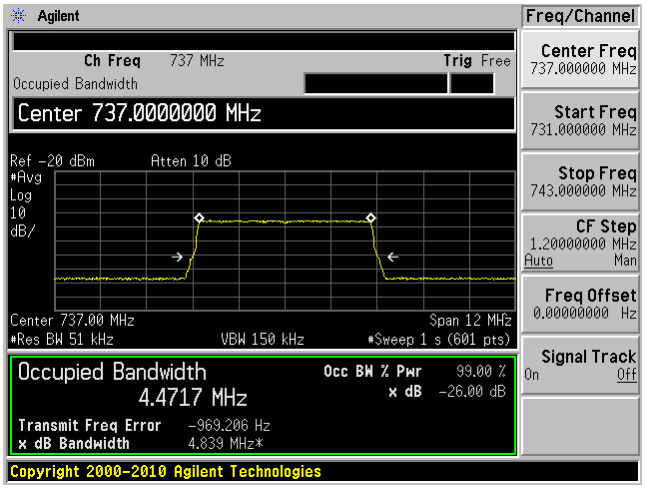


Output

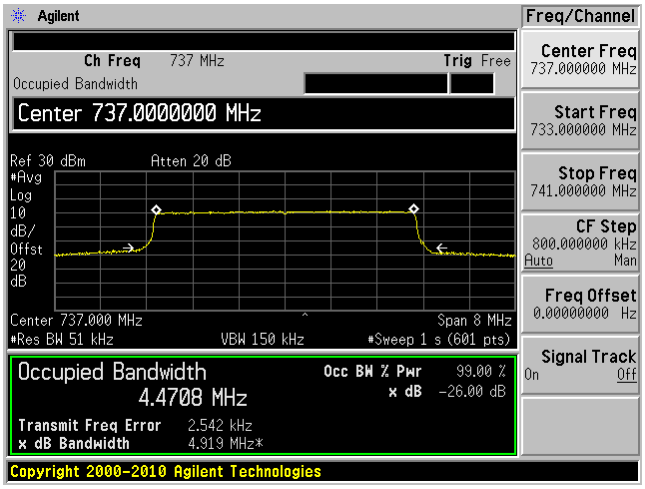


64QAM (5 MHz), (Middle Channel)

Input

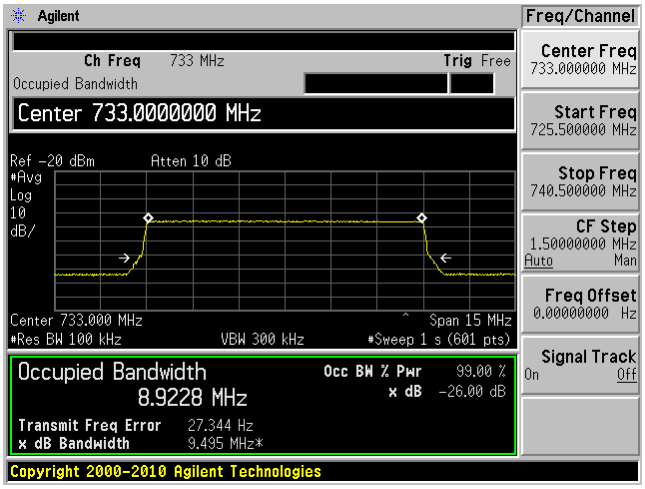


Output

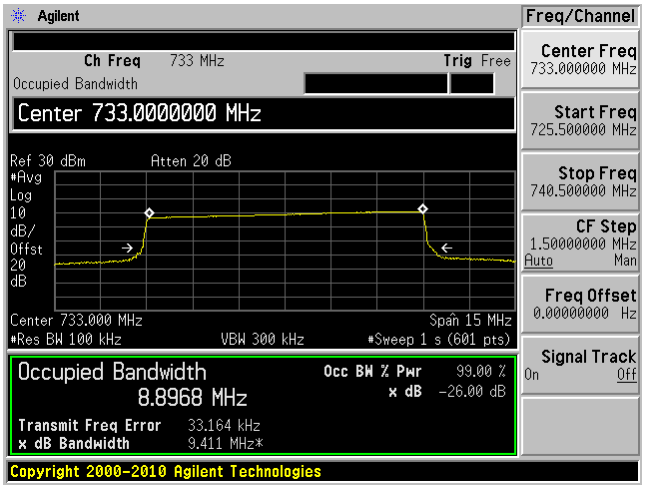


QPSK (10 MHz), (Low Channel)

Input

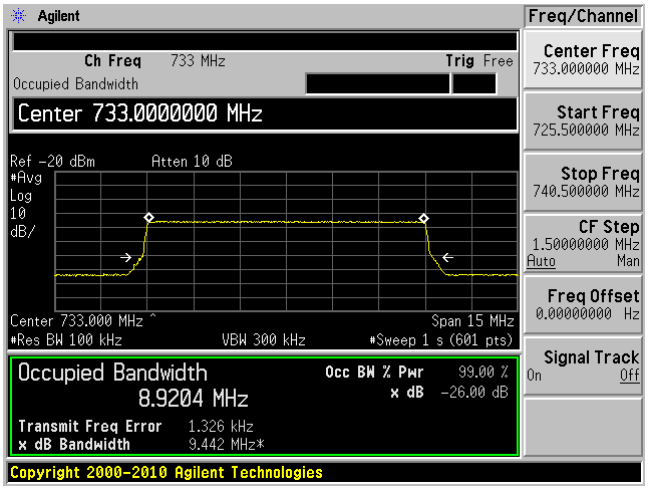


Output

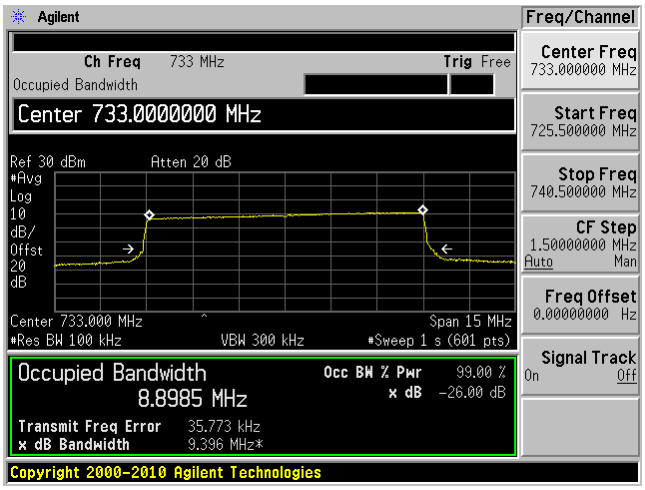


16QAM (10 MHz), (Low Channel)

Input

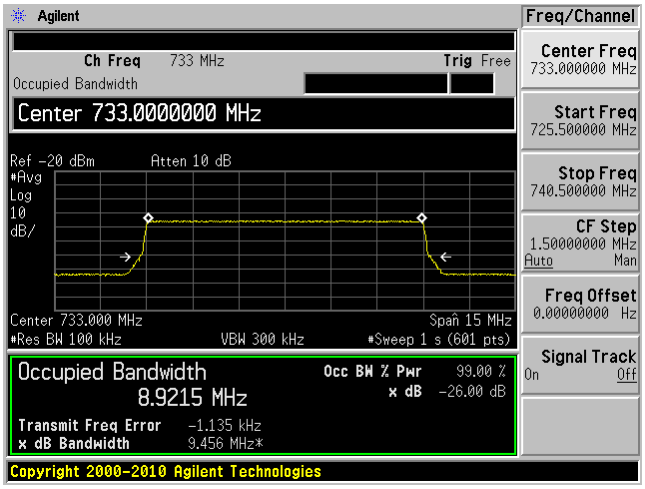


Output

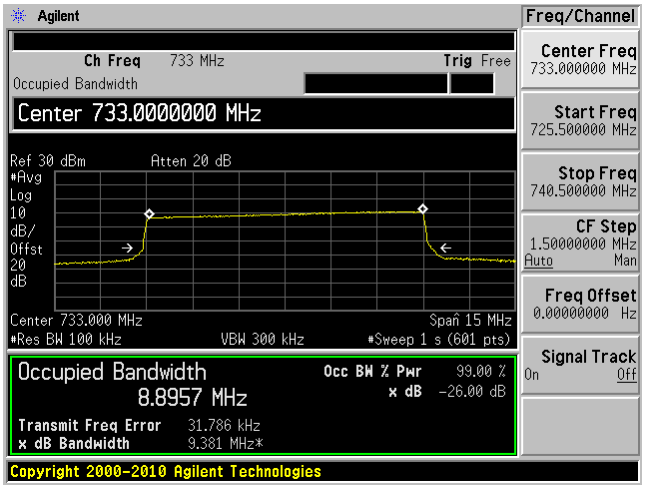


64QAM (10 MHz), (Low Channel)

Input



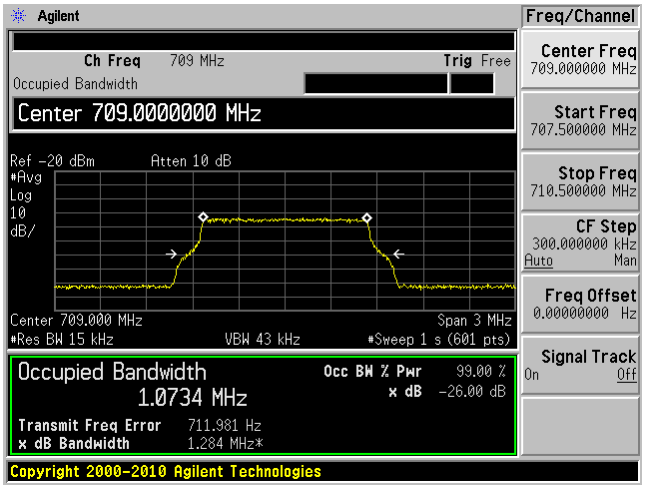
Output



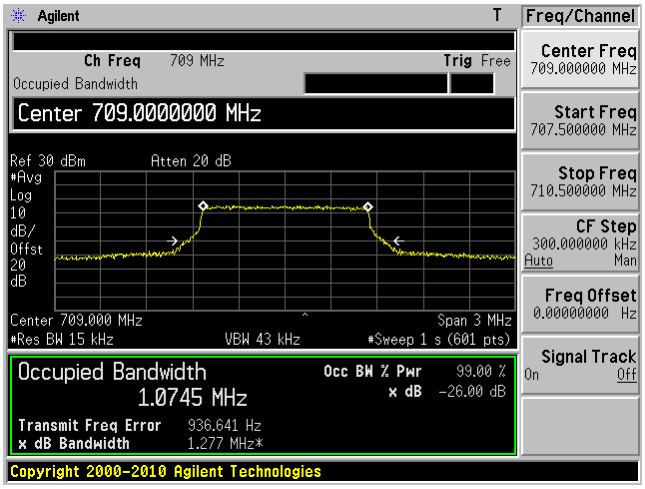
Lower LTE Band; UL: 698-716 MHz

QPSK (1.4 MHz), (Middle Channel)

Input

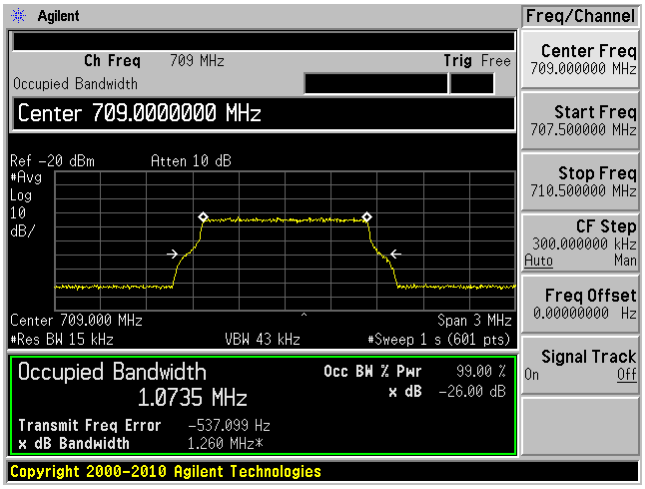


Output

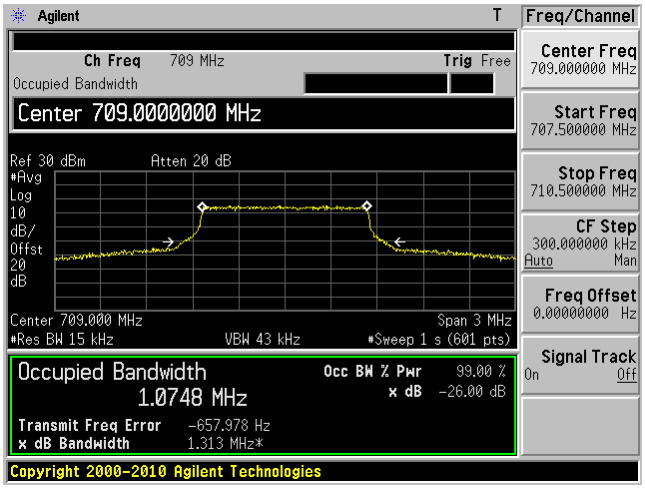


16QAM (1.4 MHz), (Middle Channel)

Input

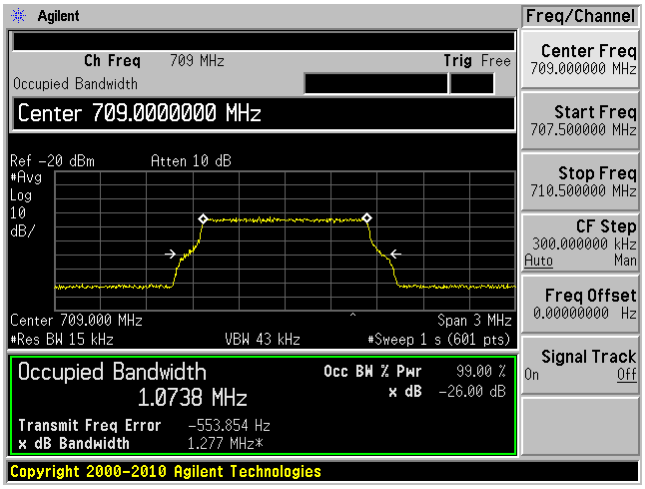


Output

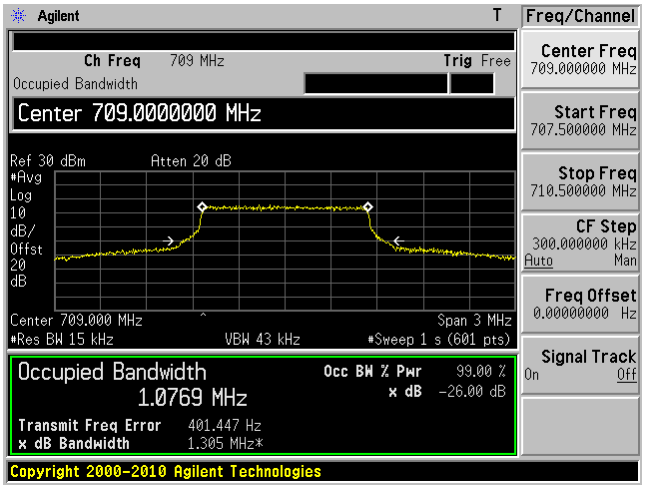


64QAM (1.4 MHz), (Middle Channel)

Input

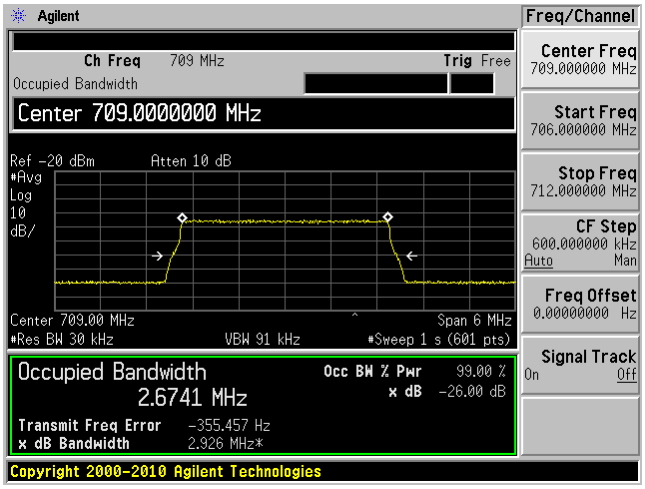


Output

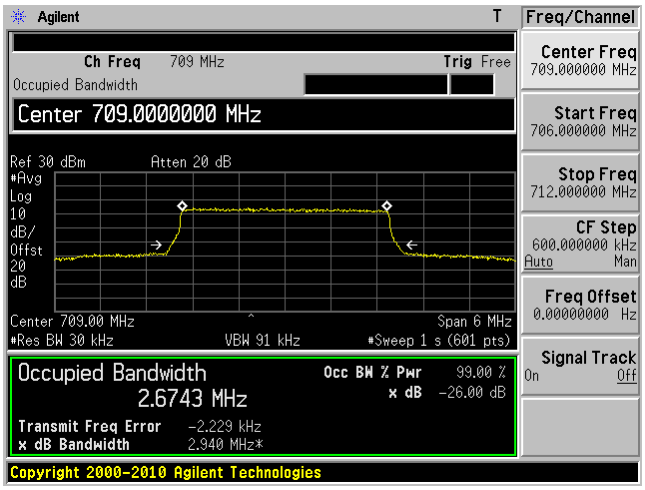


QPSK (3 MHz), (Middle Channel)

Input

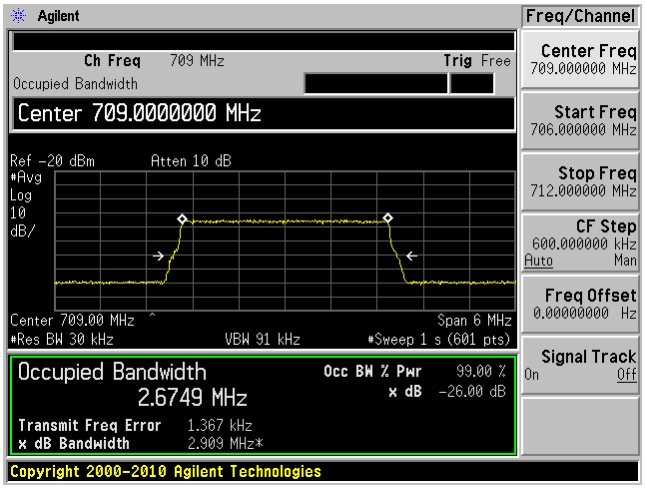


Output

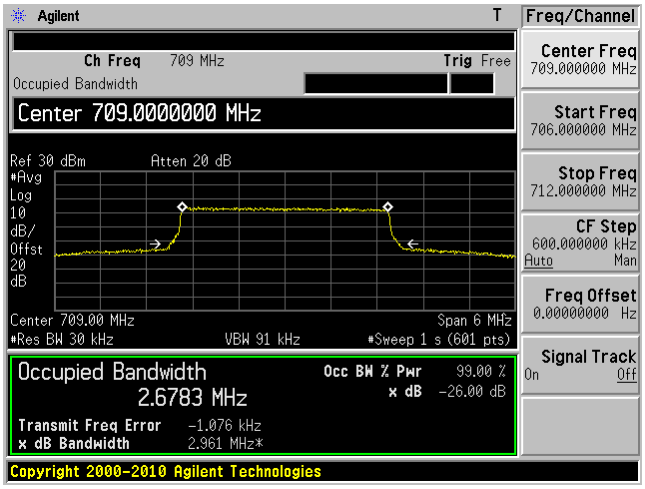


16QAM (3 MHz), (Middle Channel)

Input

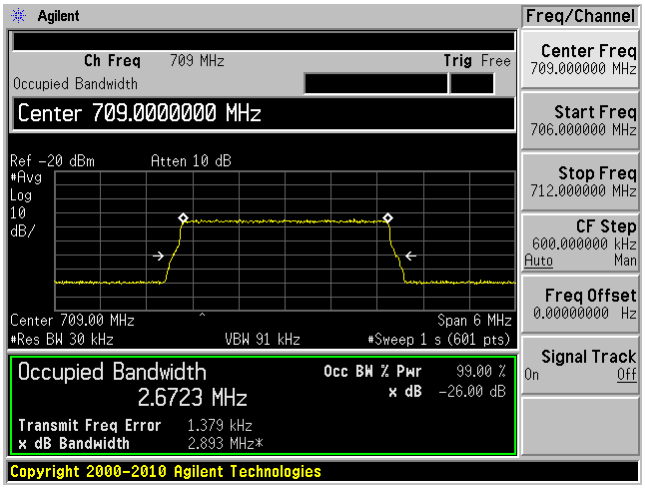


Output

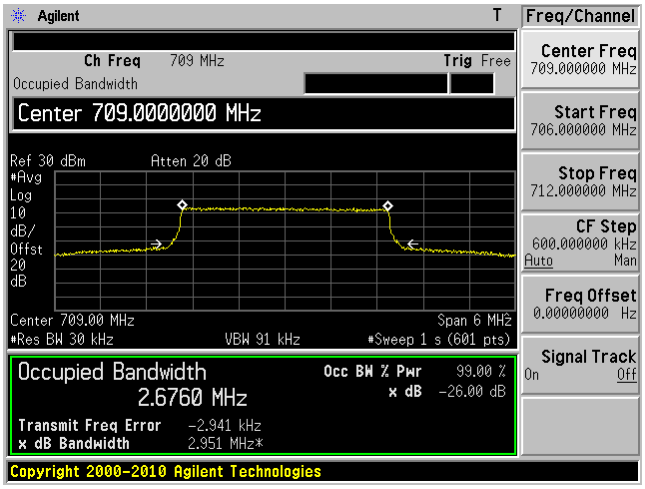


64QAM (3 MHz), (Middle Channel)

Input

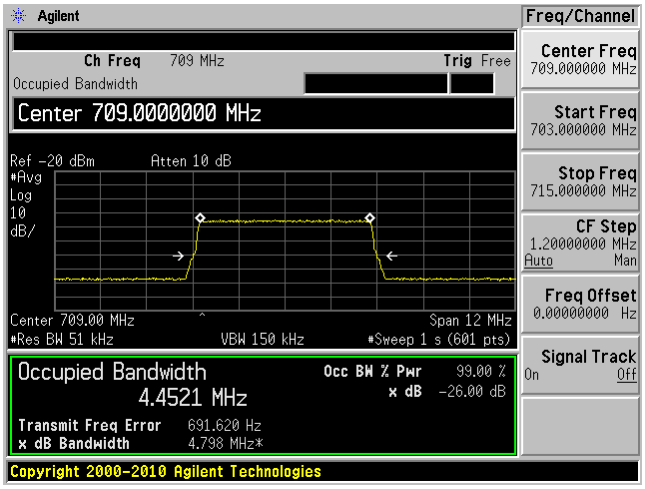


Output

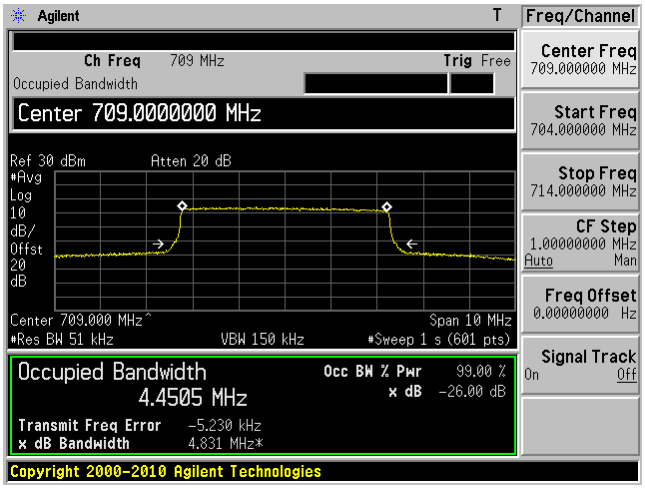


QPSK (5 MHz), (Middle Channel)

Input

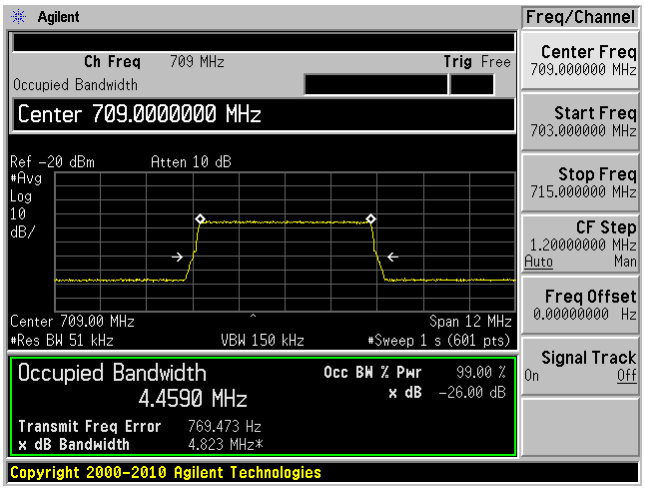


Output

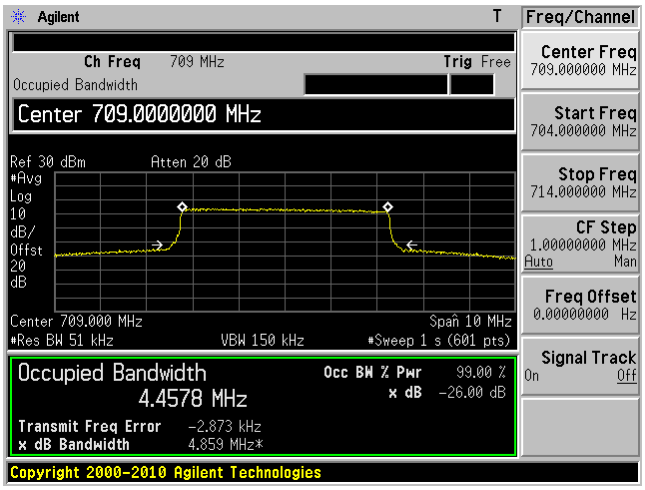


16QAM (5 MHz), (Middle Channel)

Input

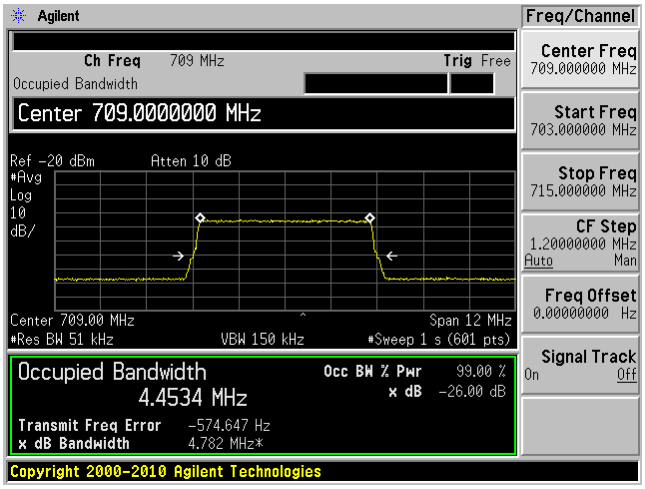


Output

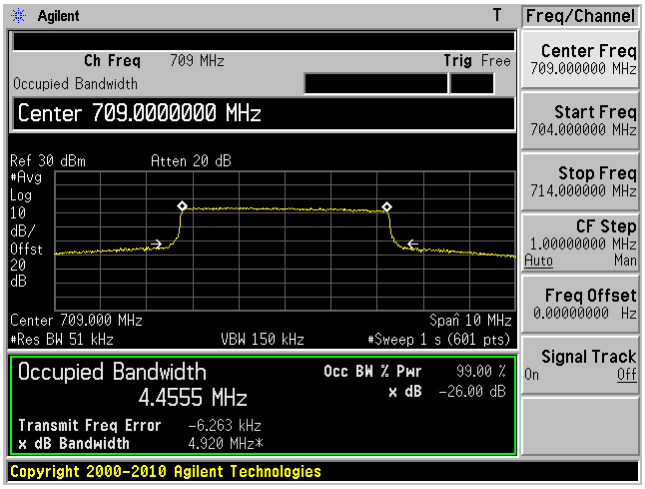


64QAM (5 MHz), (Middle Channel)

Input

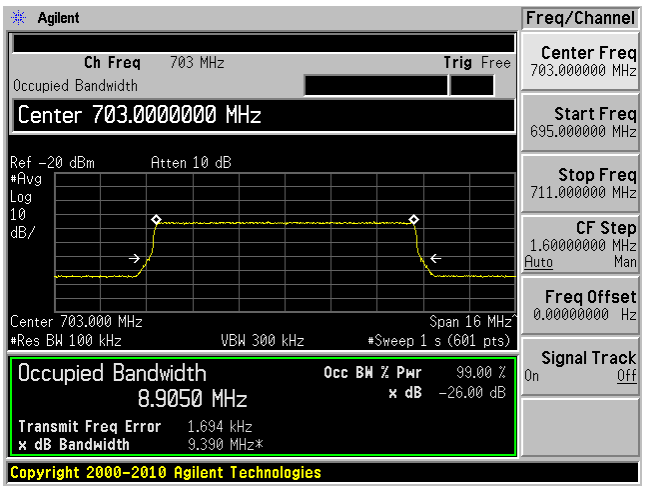


Output

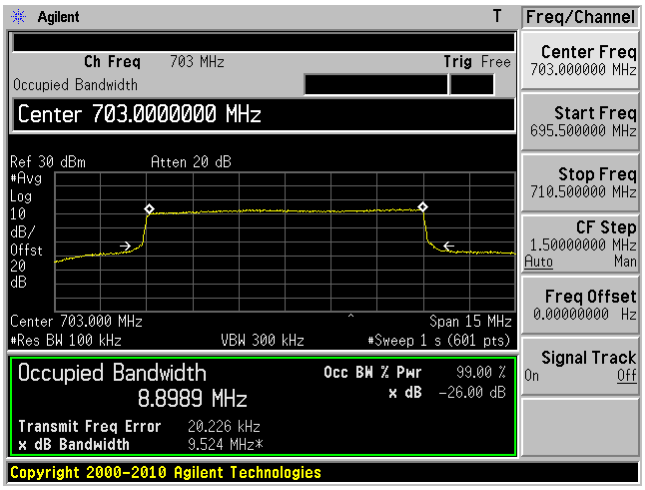


QPSK (10 MHz), (Low Channel)

Input

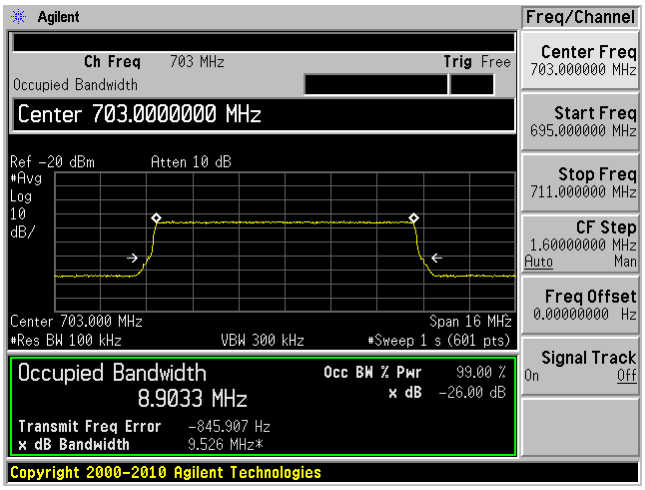


Output

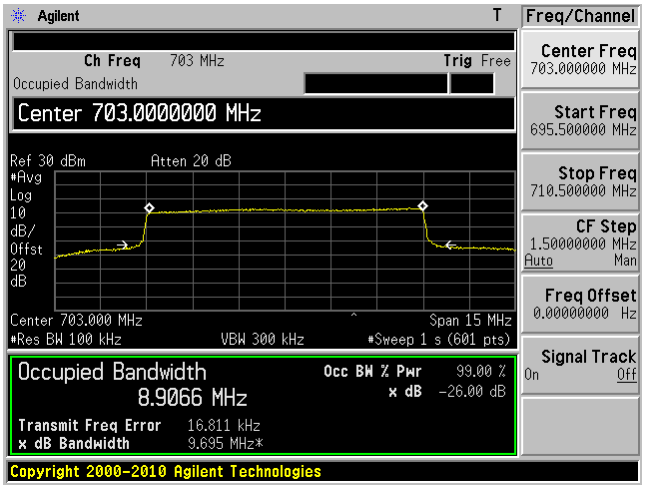


16QAM (10 MHz), (Low Channel)

Input

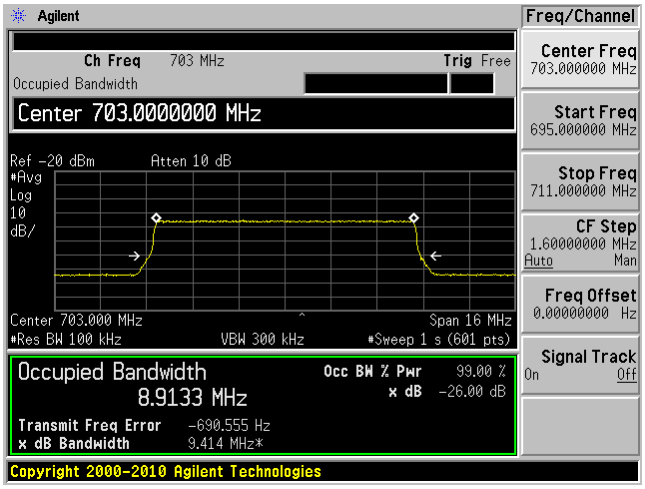


Output

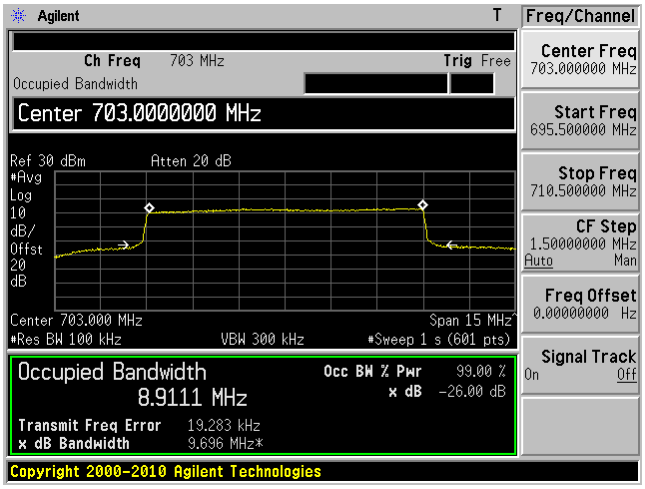


64QAM (10 MHz), (Low Channel)

Input



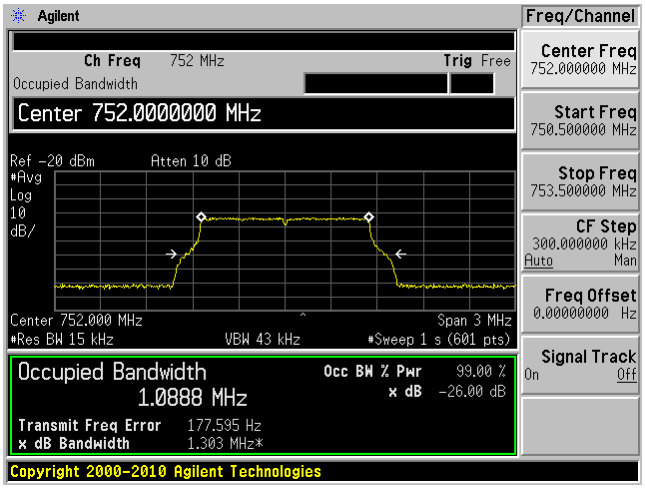
Output



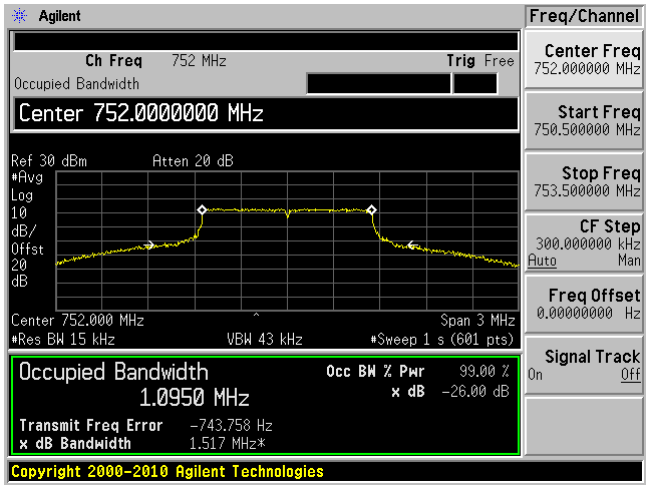
Upper LTE Band; DL: 746-757 MHz

QPSK (1.4 MHz), (Middle Channel)

Input

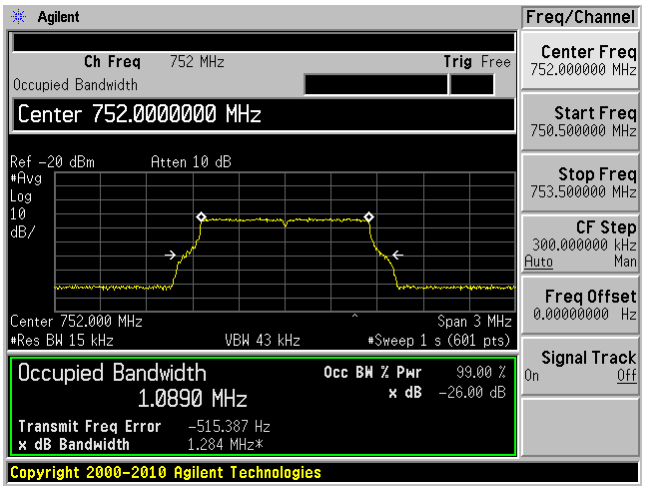


Output

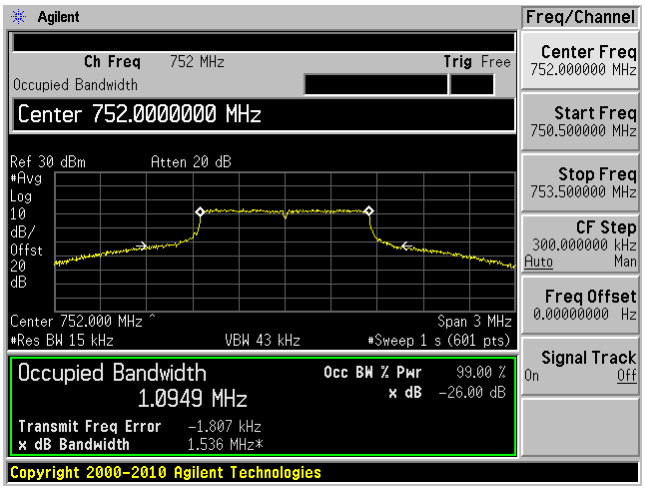


16QAM (1.4 MHz), (Middle Channel)

Input

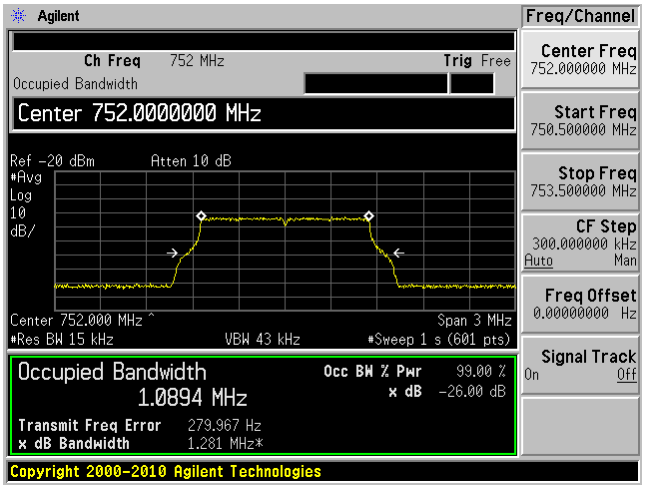


Output

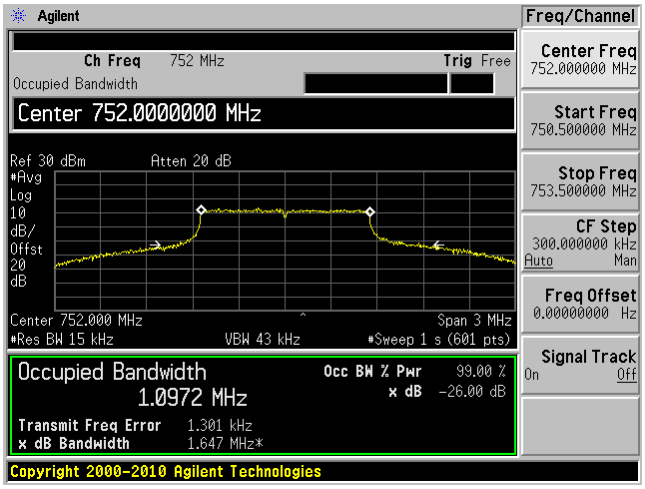


64QAM (1.4 MHz), (Middle Channel)

Input

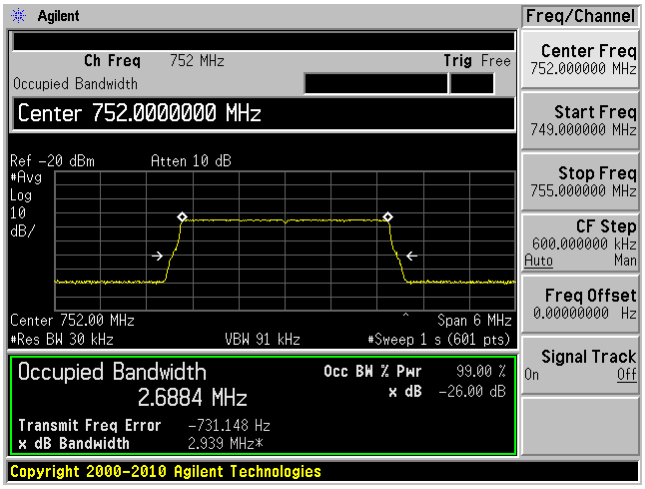


Output

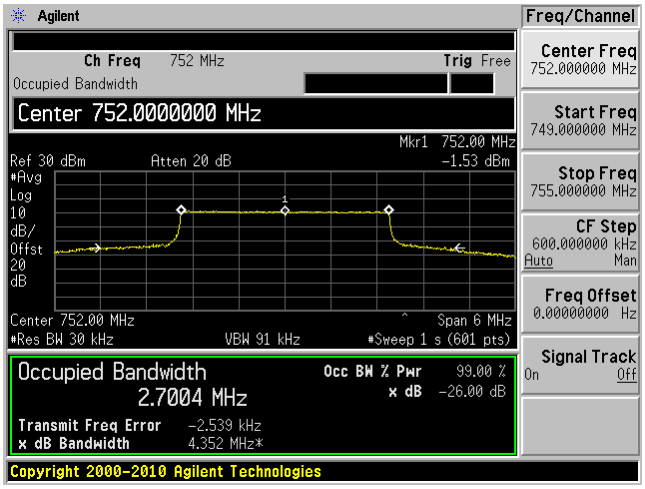


QPSK (3 MHz), (Middle Channel)

Input

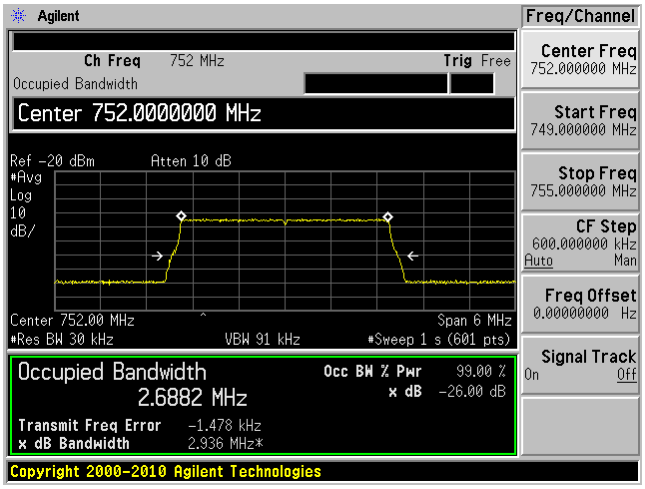


Output

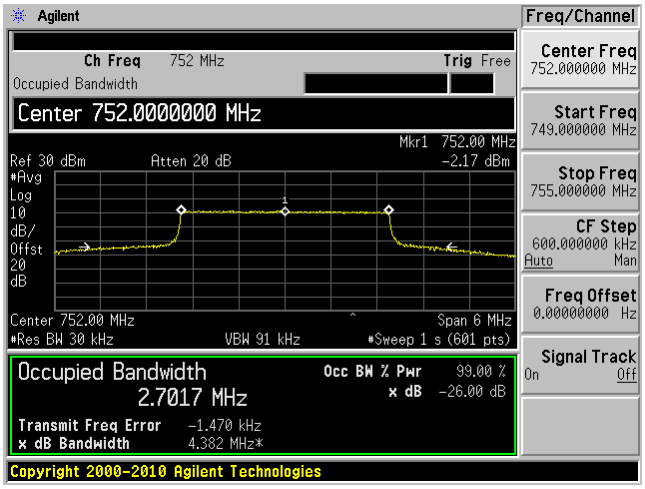


16QAM (3 MHz), (Middle Channel)

Input

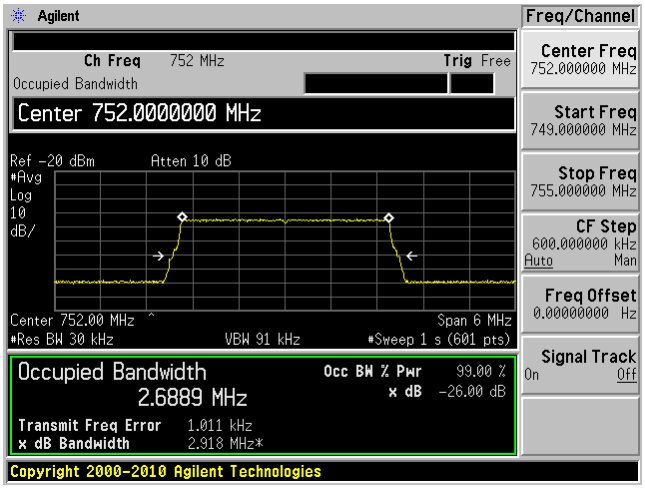


Output

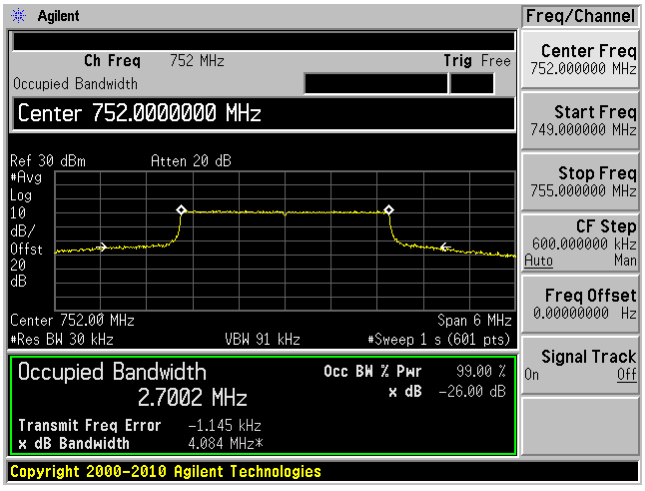


64QAM (3 MHz), (Middle Channel)

Input

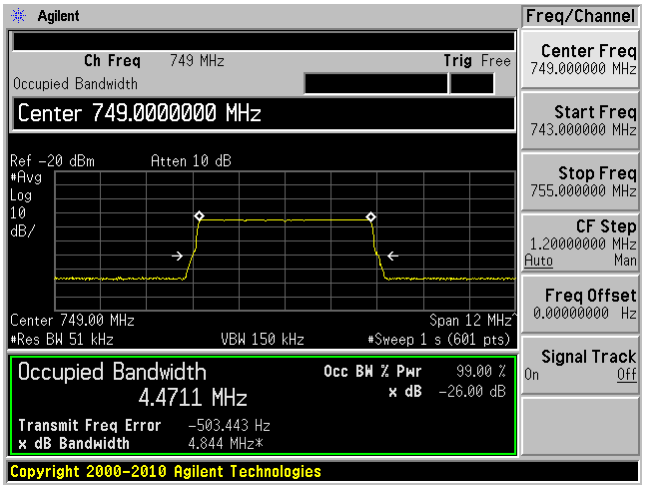


Output

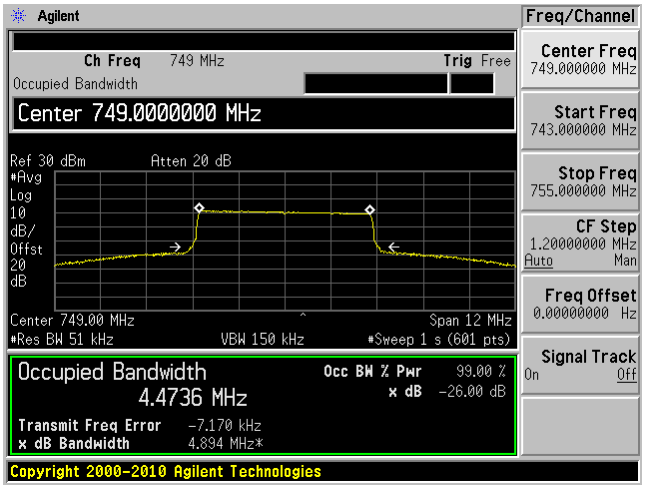


QPSK (5 MHz), (Low Channel)

Input

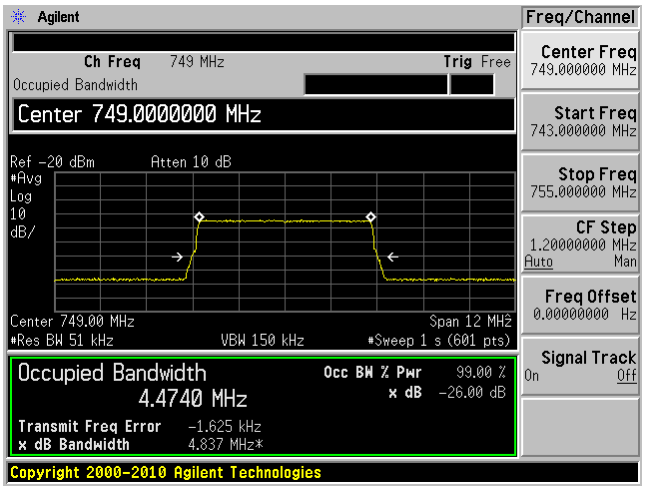


Output

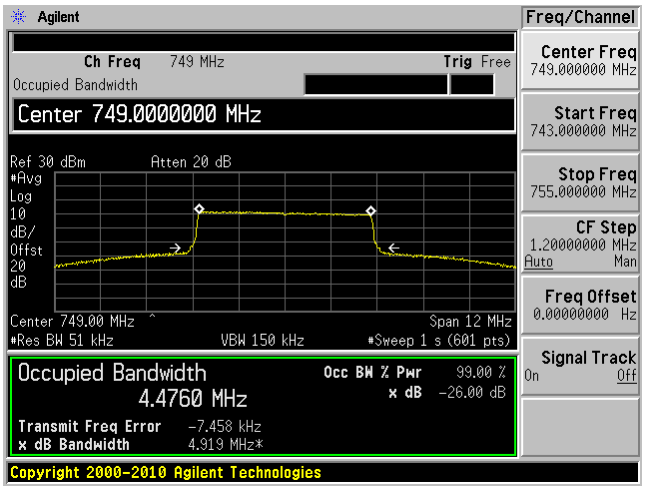


16QAM (5 MHz), (Low Channel)

Input

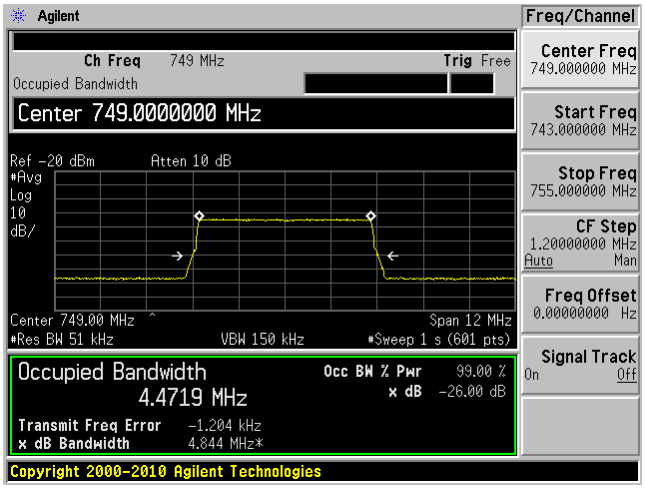


Output

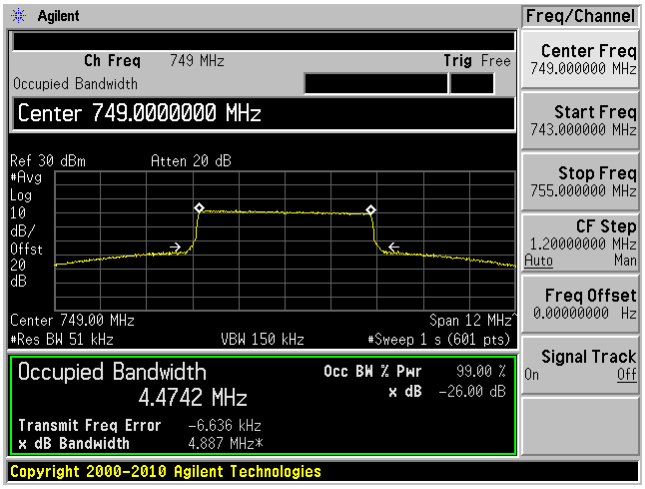


64QAM (5 MHz), (Low Channel)

Input

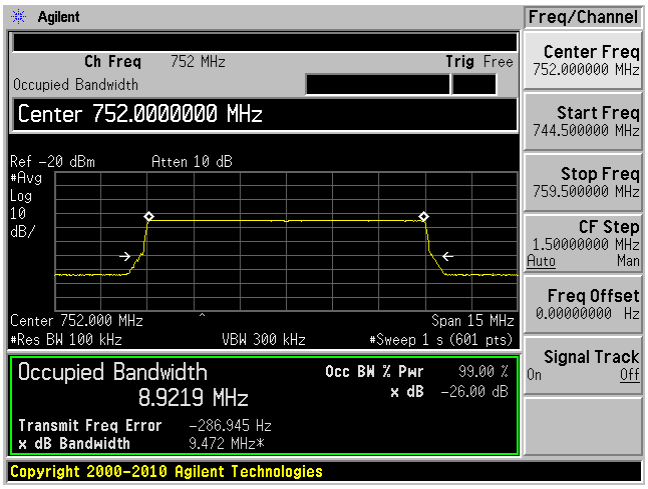


Output

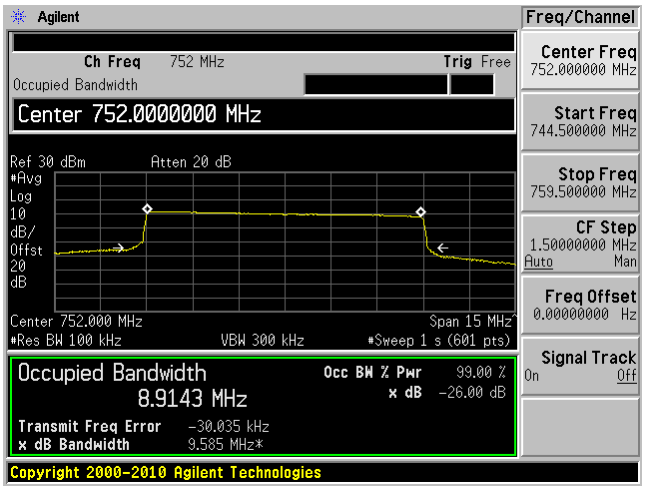


QPSK (10 MHz), (Middle Channel)

Input

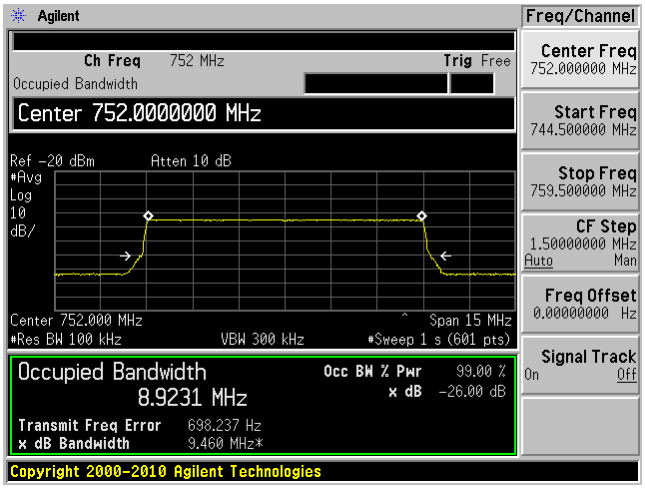


Output

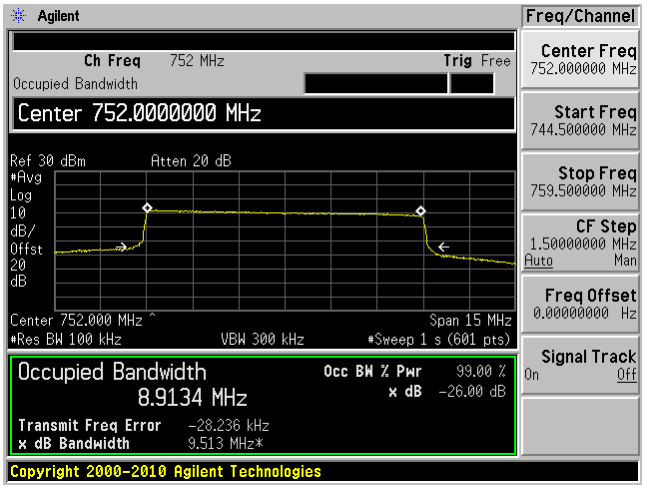


16QAM (10 MHz), (Middle Channel)

Input

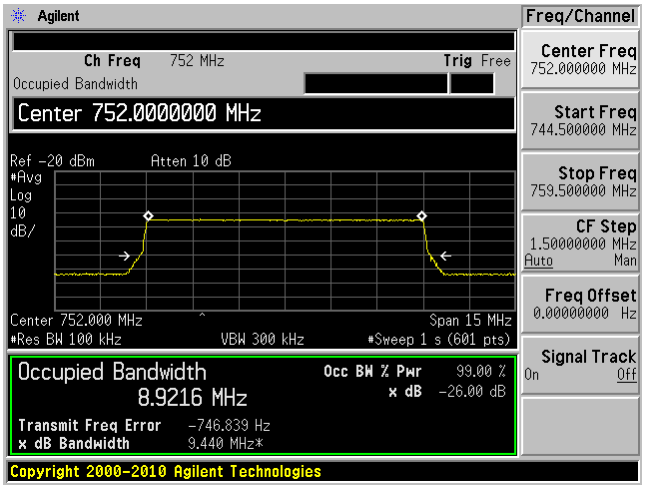


Output

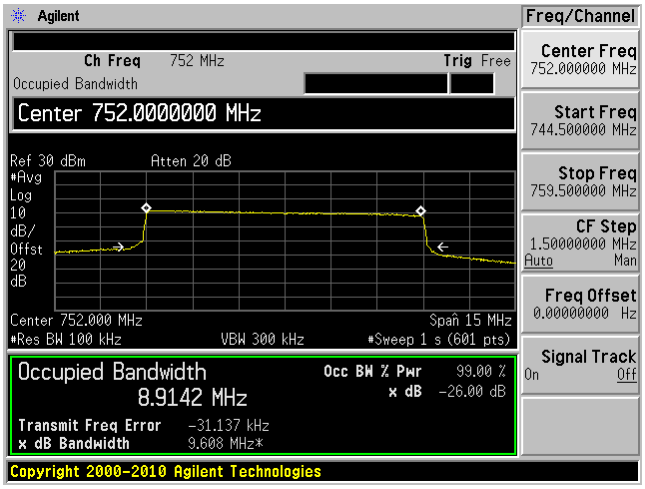


64QAM (10 MHz), (Middle Channel)

Input



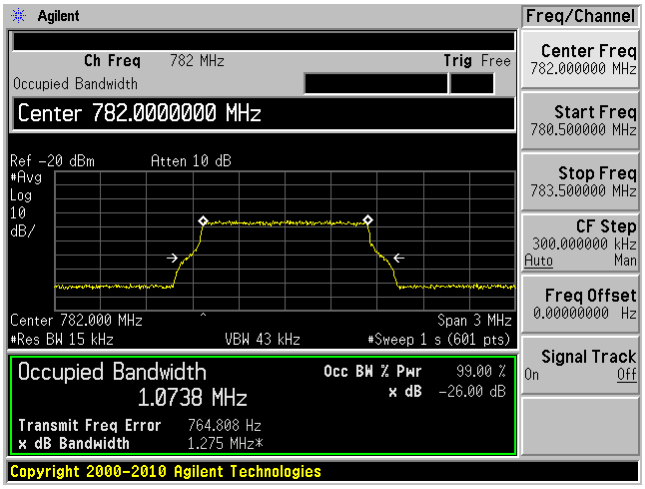
Output



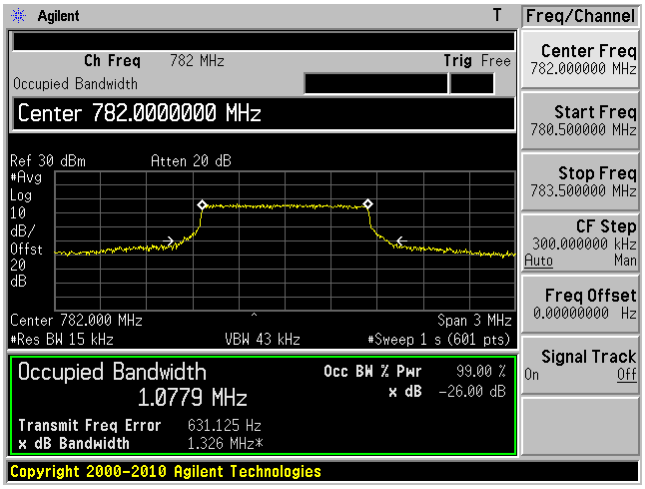
Upper LTE Band; UL: 776-787 MHz

QPSK (1.4 MHz), (Middle Channel)

Input

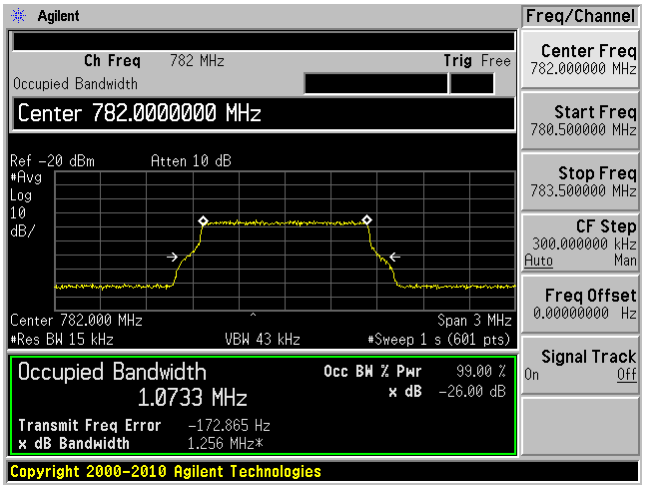


Output

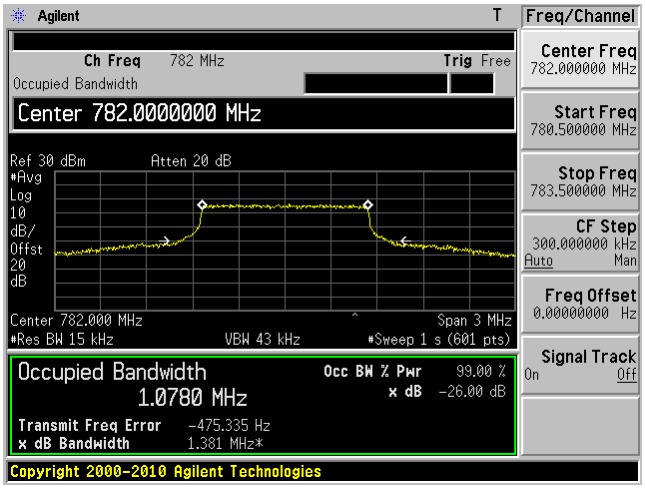


16QAM (1.4 MHz), (Middle Channel)

Input

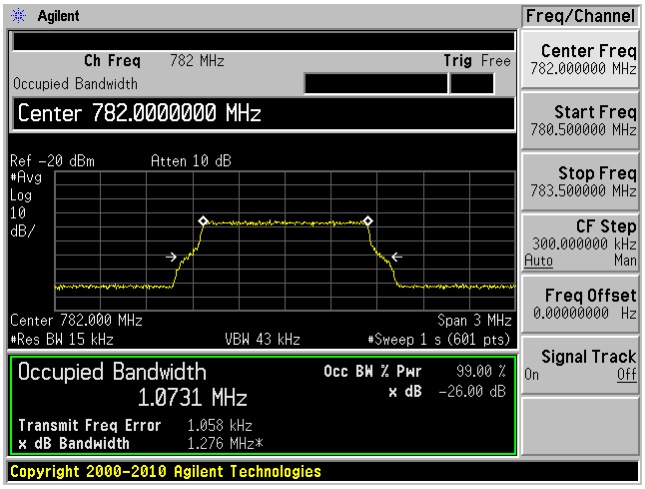


Output

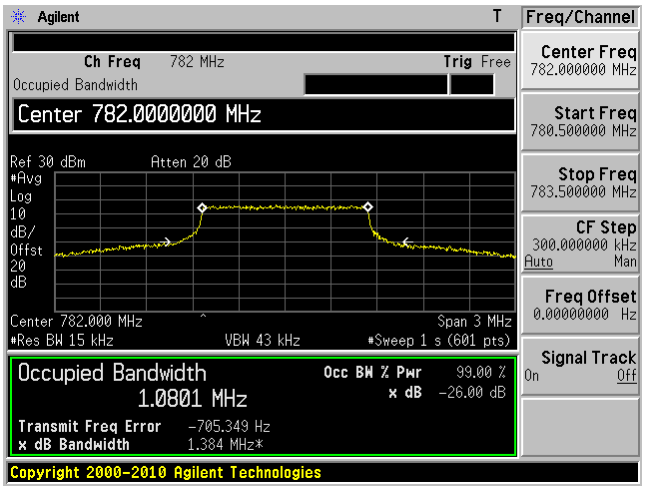


64QAM (1.4 MHz), (Middle Channel)

Input

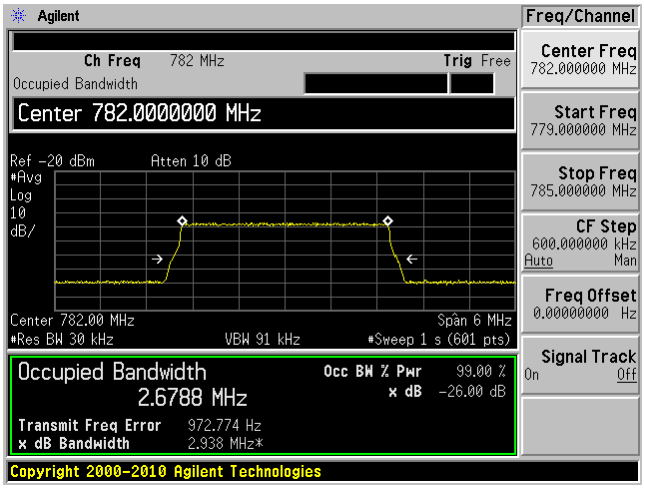


Output

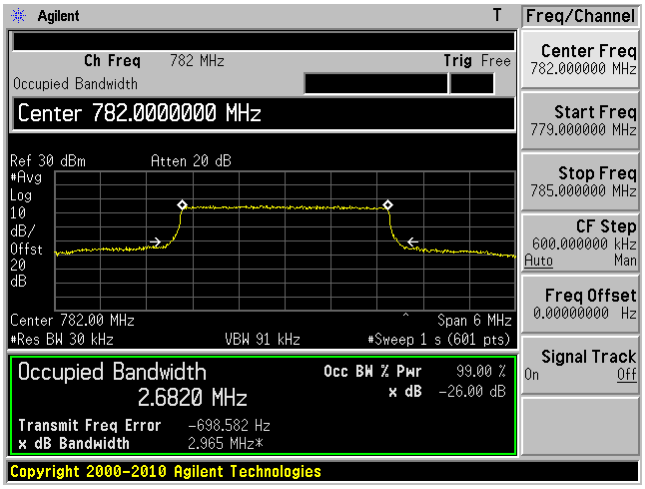


QPSK (3 MHz), (Middle Channel)

Input

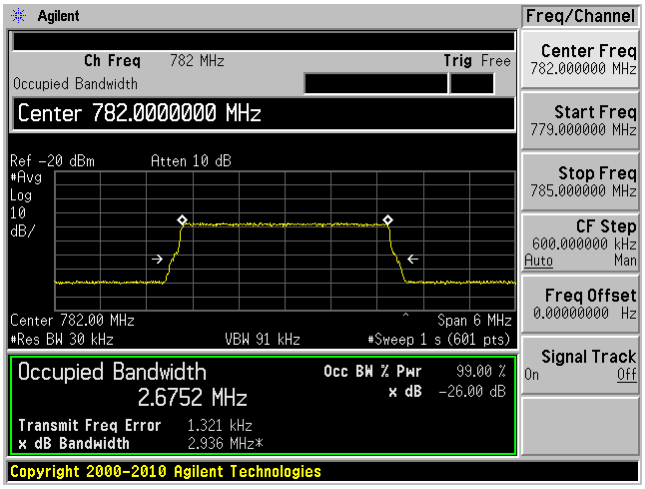


Output

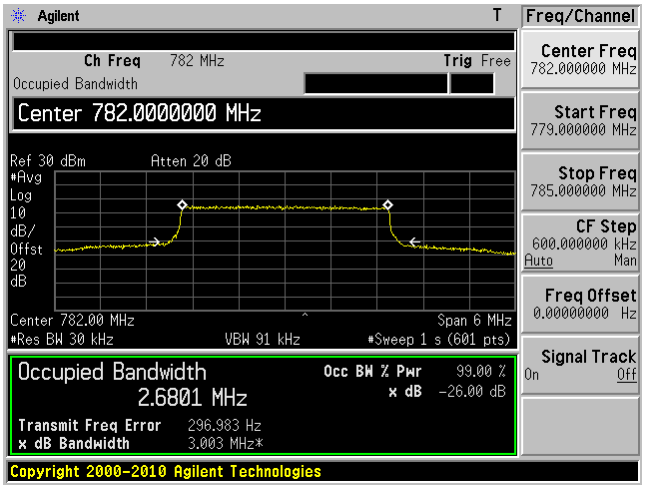


16QAM (3 MHz), (Middle Channel)

Input

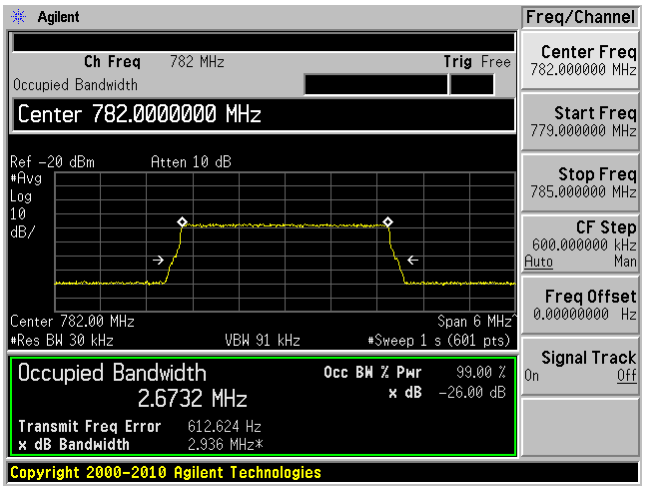


Output

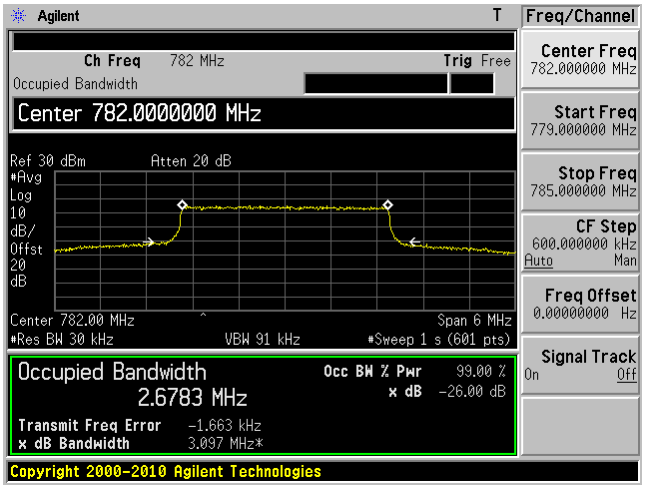


64QAM (3 MHz), (Middle Channel)

Input

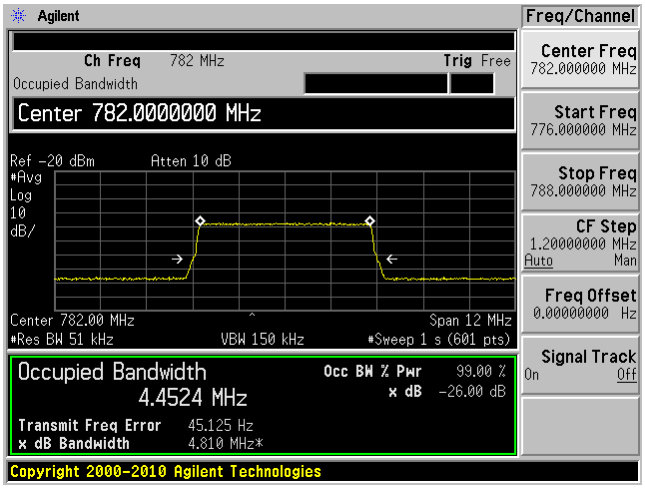


Output

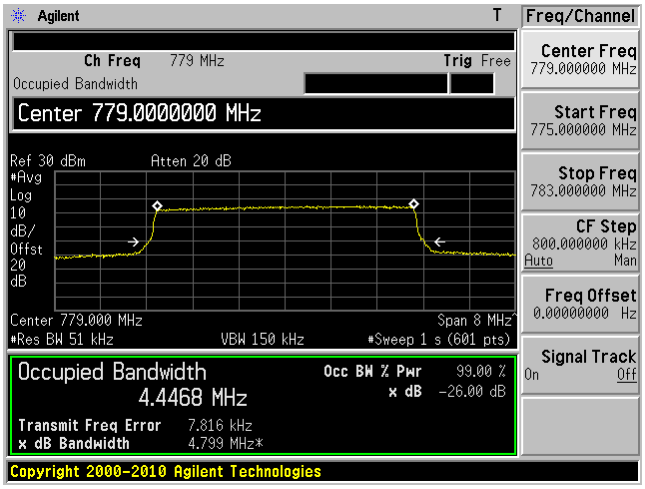


QPSK (5 MHz), (Low Channel)

Input

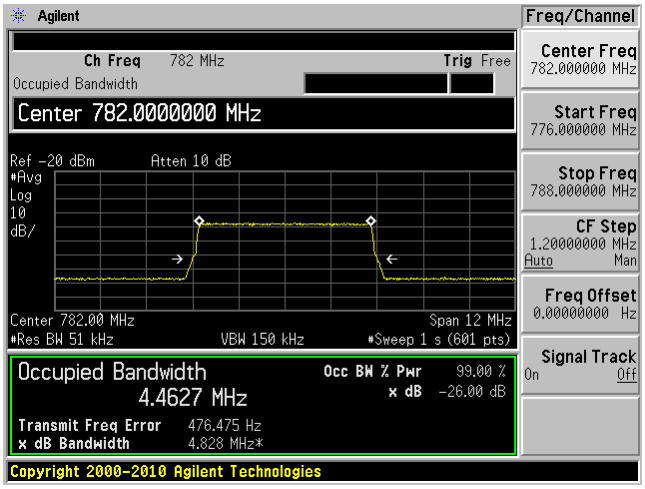


Output

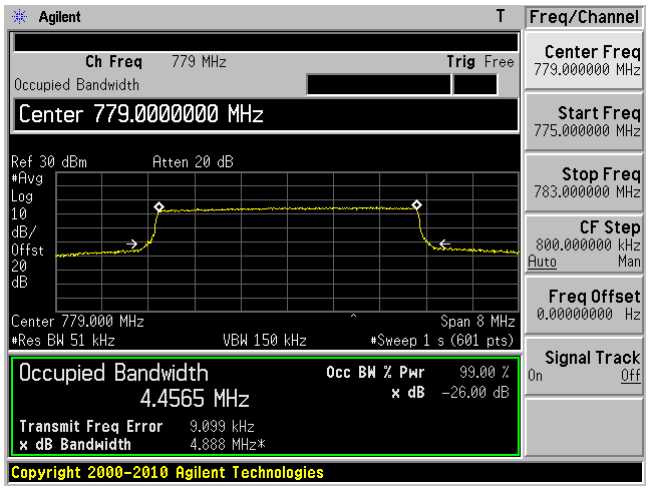


16QAM (5 MHz), (Low Channel)

Input

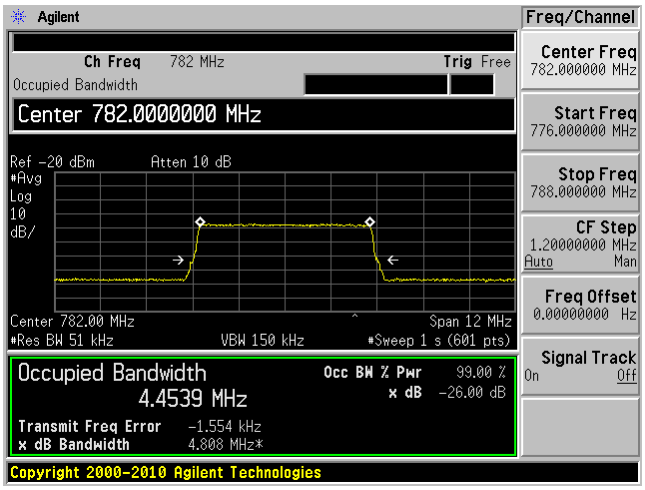


Output

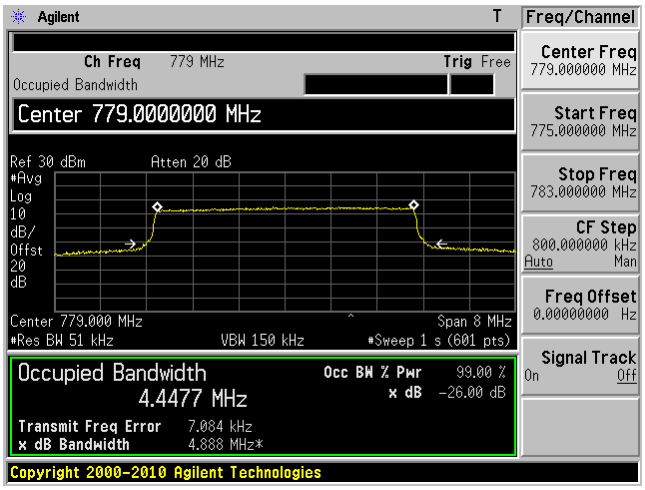


64QAM (5 MHz), (Low Channel)

Input

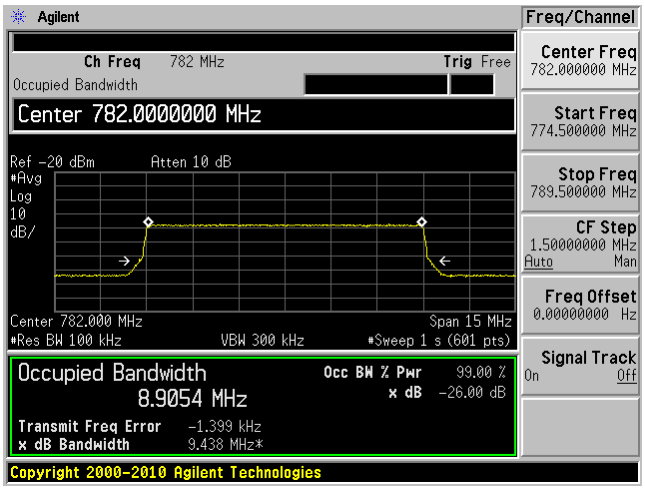


Output

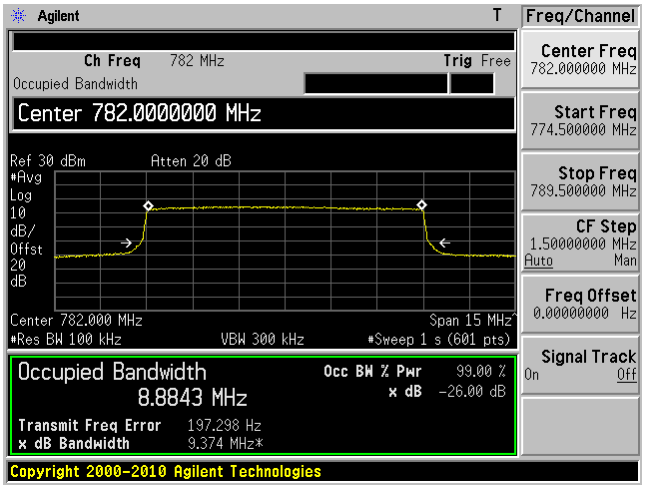


QPSK (10 MHz), (Middle Channel)

Input

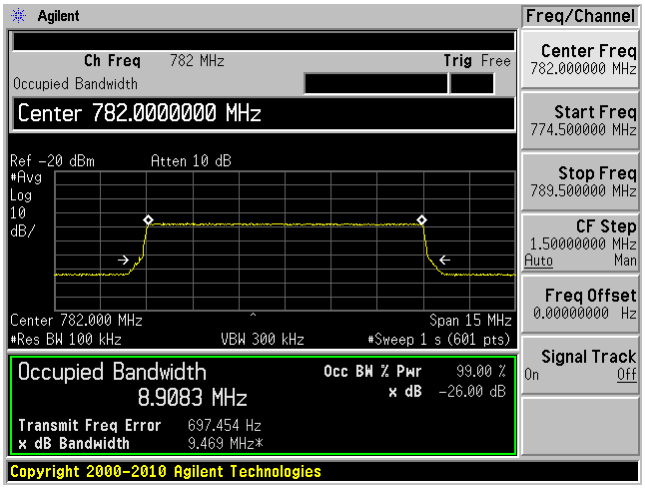


Output

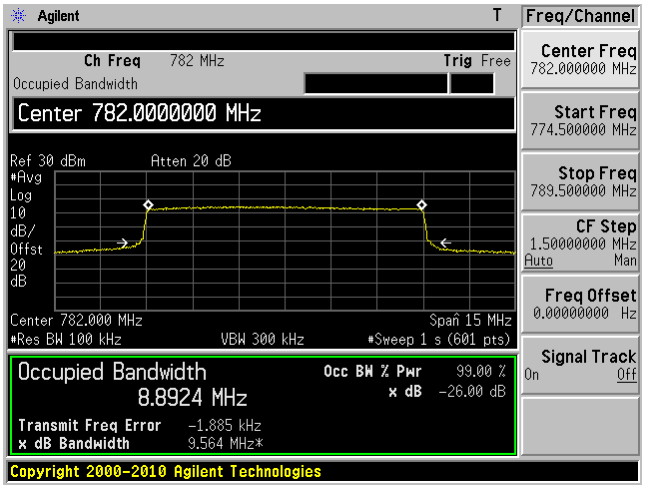


16QAM (10 MHz), (Middle Channel)

Input

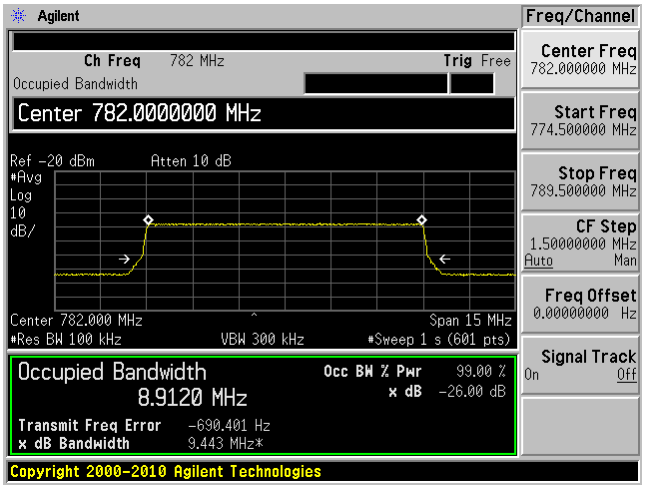


Output

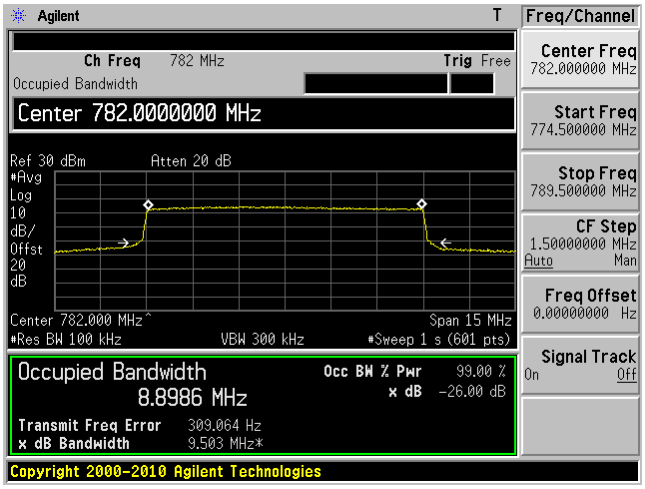


64QAM (10 MHz), (Middle Channel)

Input



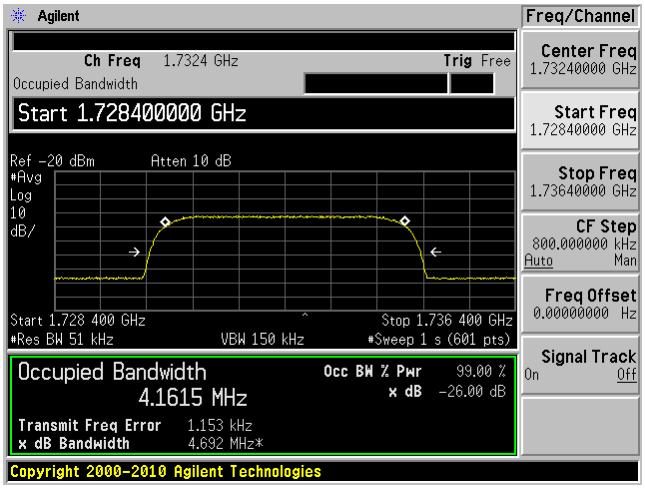
Output



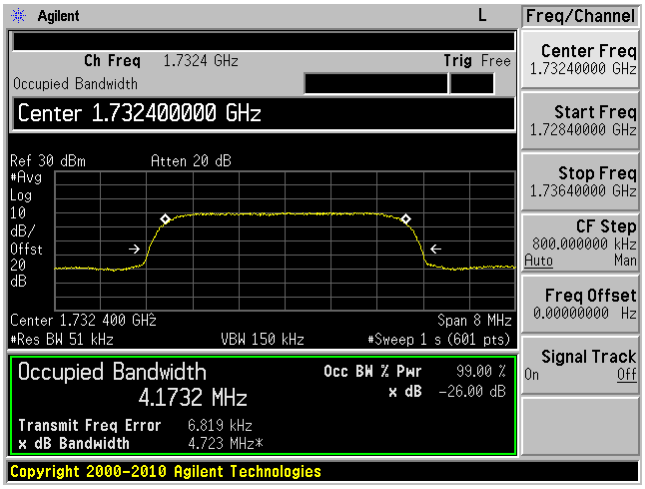
AWS Band, Uplink:

WCDMA/HSPA (Middle Channel)

Input



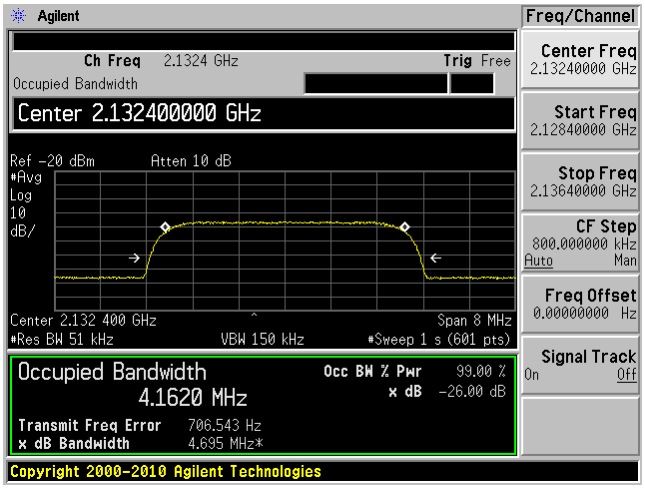
Output



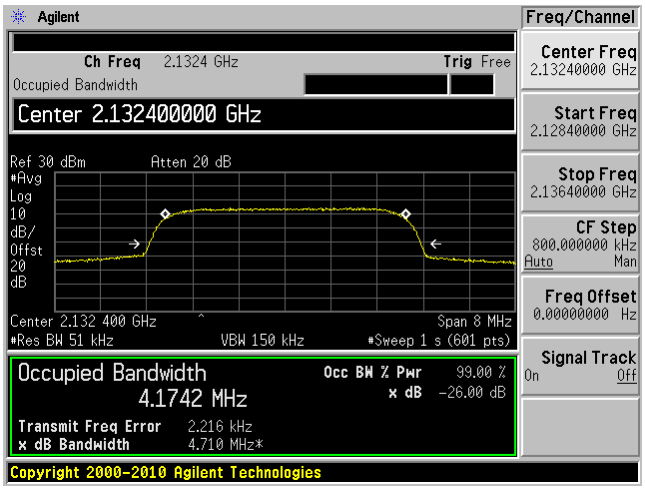
AWS Band, Downlink:

WCDMA/HSPA (Middle Channel)

Input



Output



6 FCC §2.1053, §22.917, §24.238 & §27.53 - Spurious Radiated Emissions

6.1 Applicable Standard

According to FCC §22.917, §24.238 and §27.53, the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

6.2 Test Procedure

The transmitter was placed on the turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 log (TX Power in Watts/0.001) – the absolute level
Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

6.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates	Calibration Interval
Agilent	Spectrum Analyzer	E4440A	US45303156	2010-08-09	2 years
Sunol Science Corp	System Controller	SC99V	122303-1	N/A	-
Sunol Science Corp	Combination Antenna	JB3	A020106-2	2011-08-10	1 year
Hewlett Packard	Pre amplifier	8447D	2944A06639	2012-06-09	1 year
ARA	Horn antenna	DRG-118/A	1132	2012-01-04	1 year
A.H. Systems	Horn antenna	SAS-200/571	261	2012-01-18	1 year
Mini-Circuits	Pre Amplifier	ZVA-183-S	667400960	2011-08-10	1 year
HP	Signal Generator	8648C	3426A00417	2011-08-18	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

6.4 Test Environmental Conditions

Temperature:	20-21 °C
Relative Humidity:	47-49 %
ATM Pressure:	101.4-101.6kPa

The testing was performed by Jeffrey Wu from 2012-06-28 to 2012-07-03 in 5 Meter Chamber 3.

6.5 Test Results

Cell Band:

Uplink (Input frequency = 836.6 MHz)

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)		
142.5	49.22	16	185	H	142.5	-58.11	0	0.6	-58.71	-13	-45.71
142.5	43.59	0	253	V	142.5	-63.74	0	0.6	-64.34	-13	-51.34
6236.6	42.89	63	100	H	6236.6	-47.77	11.04	2	-38.73	-13	-25.73
6236.6	43.82	125	100	V	6236.6	-46.84	11.04	2	-37.8	-13	-24.8

Downlink (Input frequency = 869.2 MHz)

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)		
151.1	49.65	36	193	H	151.1	-57.6	0	0.6	-58.2	-13	-45.2
151.1	45.24	272	221	V	151.1	-62.01	0	0.6	-62.61	-13	-49.61
-	-	-	-	H	-	-	-	-	-	-13	Note
-	-	-	-	V	-	-	-	-	-	-13	Note

PCS Band:

Uplink (Input frequency = 1880 MHz)

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)		
144	49.44	32	198	H	144	-58.89	0	0.6	-59.49	144	49.44
144	45.36	271	235	V	144	-62.97	0	0.6	-63.57	144	45.36
-	-	-	-	H	-	-	-	-	-	-	Note
-	-	-	-	V	-	-	-	-	-	-	Note

Downlink (Input frequency = 1930.2 MHz)

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)		
152	48.77	206	159	H	152	-58.6	0	0.6	-59.2	-13	-46.2
152	44.44	250	246	V	152	-62.93	0	0.6	-63.53	-13	-50.53
-	-	-	-	H	-	-	-	-	-	-	Note
-	-	-	-	V	-	-	-	-	-	-	Note

Lower LTE Band:

Uplink (Input frequency = 709 MHz)

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)		
144.4	44.45	264	254	H	144.4	-63.81	0	0.6	-64.41	-13	-51.41
144.4	44.55	250	218	V	144.4	-63.71	0	0.6	-64.31	-13	-51.31
2127	55.61	199	108	H	2127	-44.09	8.63	1.3	-36.76	-13	-23.76
2127	56.5	210	156	V	2127	-43.2	8.63	1.3	-35.87	-13	-22.87

Downlink (Input frequency = 743 MHz)

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)		
152.2	49.09	208	182	H	152.2	-58.48	0	0.6	-59.08	-13	-46.08
152.2	40.44	0	234	V	152.2	-67.13	0	0.6	-67.73	-13	-54.73
-	-	-	-	H	-	-	-	-	-	-	Note
-	-	-		V	-	-	-	-	-	-	Note

Upper LTE Band:

Uplink (Input frequency = 779 MHz)

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)		
144.7	48.86	38	198	H	144.7	-59.4	0	0.6	-60	-13	-47
144.7	44.34	244	217	V	144.7	-63.92	0	0.6	-64.52	-13	-51.52
6178.9	42.42	106	100	H	6178.9	-48.43	11.4	2	-39.03	-13	-26.03
6178.9	43.17	156	100	V	6178.9	-47.68	11.04	2	-38.64	-13	-25.64

Downlink (Input frequency = 754 MHz)

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)		
152.3	48.66	212	150	H	152.3	-58.91	0	0.6	-59.51	-13	-46.51
152.3	40.72	0	226	V	152.3	-66.85	0	0.6	-67.45	-13	-54.45
-	-	-	-	H	-	-	-	-	-	-	Note
-	-	-	-	V	-	-	-	-	-	-	Note

AWS Band:

Uplink (Input frequency = 1732.4 MHz)

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)		
142.7	50.56	20	180	H	142.7	-57.25	0	0.6	-57.85	-13	-44.85
142.7	45.71	247	221	V	142.7	-62.1	0	0.6	-62.7	-13	-49.7
-	-	-	-	H	-	-	-	-	-	-	Note
-	-	-	-	V	-	-	-	-	-	-	Note

Downlink (Input frequency = 2112.4 MHz)

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)		
152	48.66	203	177	H	152	-58.91	0	0.6	-59.51	-13	-46.51
152	44.48	274	227	V	152	-63.09	0	0.6	-63.69	-13	-50.69
-	-	-	-	H	-	-	-	-	-	-	Note
-	-	-	-	V	-	-	-	-	-	-	Note

Note: - All emissions are on/under noise floor level.

7 FCC §2.1051, §22.917, §24.238 & §27.53 - Spurious Emissions at Antenna Terminals

7.1 Applicable Standard

According to FCC §22.917, §24.238 and §27.53 the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

7.2 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

7.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates	Calibration Interval
Agilent	Spectrum Analyzer	E4440A	US45303156	2010-08-09	2 years
Agilent	Signal Generator	E4438C	MY45091309	2012-05-03	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

7.4 Test Environmental Conditions

Temperature:	20-22 °C
Relative Humidity:	40-42 %
ATM Pressure:	101.1-101.3 kPa

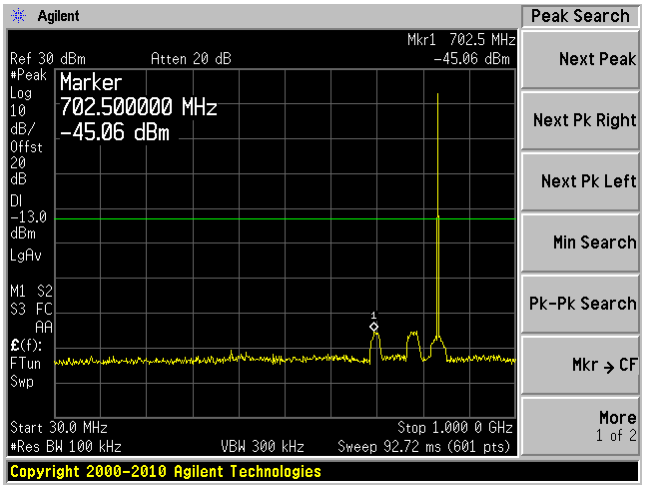
The testing was performed by Jeffrey Wu from 2012-06-27 to 2012-07-02 in the RF Site.

7.5 Test Results

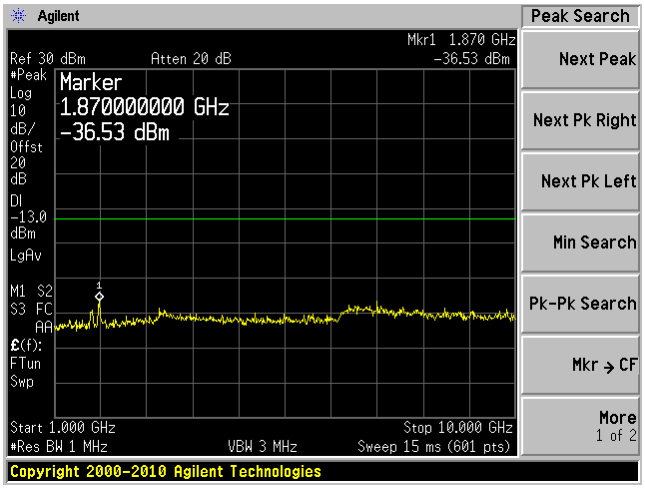
Please refer to the following plots.

Cellular Band Uplink, Middle Channel: 836.6 MHz:

Plot 1: 30 MHz to 1 GHz

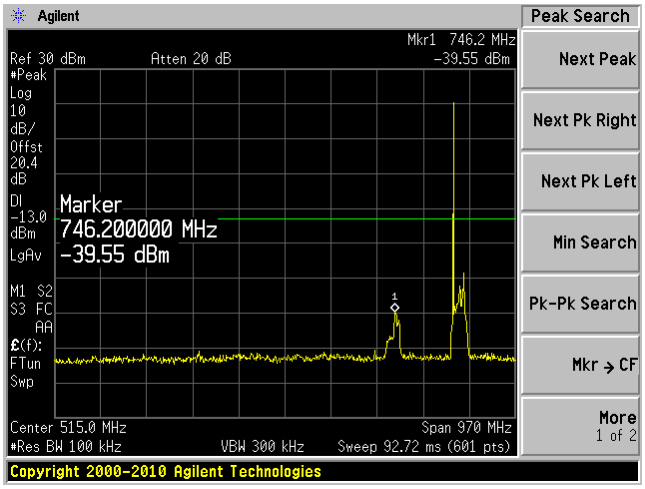


Plot 2: Above 1 GHz

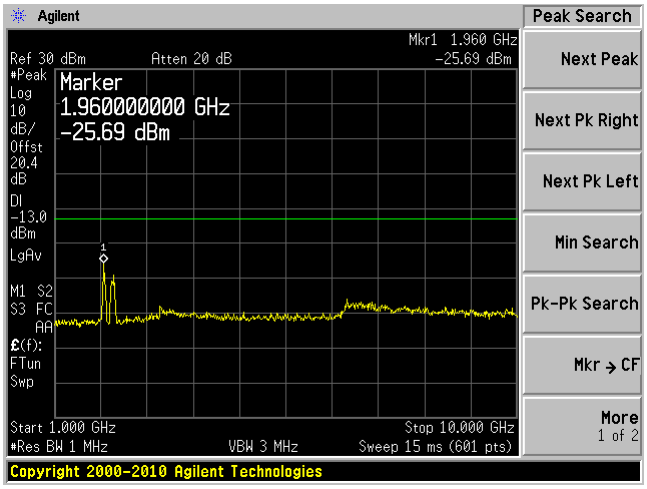


Cellular Band Downlink, Middle Channel: 881.6 MHz:

Plot 1: 30 MHz to 1 GHz

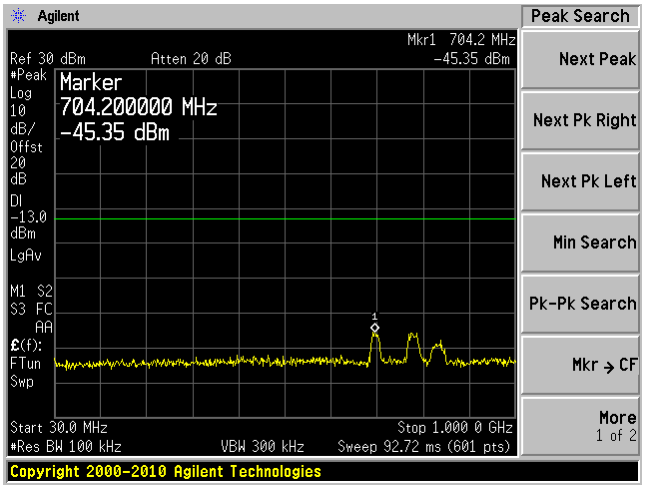


Plot 2: Above 1 GHz

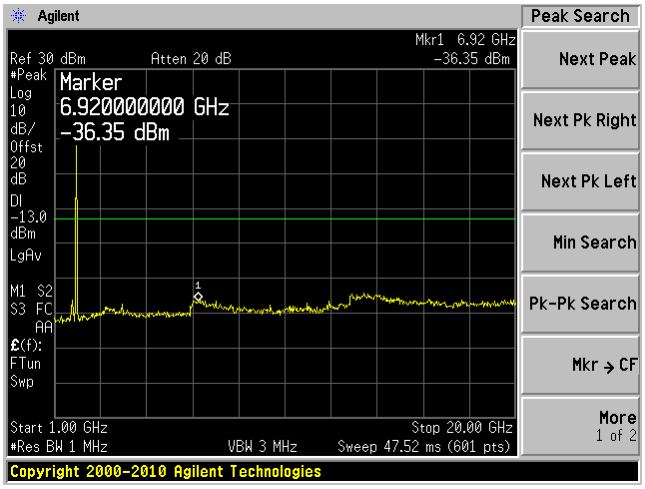


PCS Band Uplink, Middle Channel: 1880 MHz:

Plot 1: 30 MHz to 1 GHz

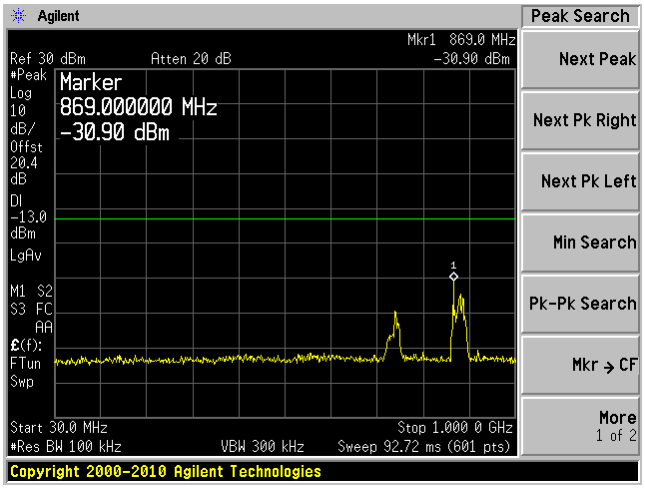


Plot 2: Above 1 GHz

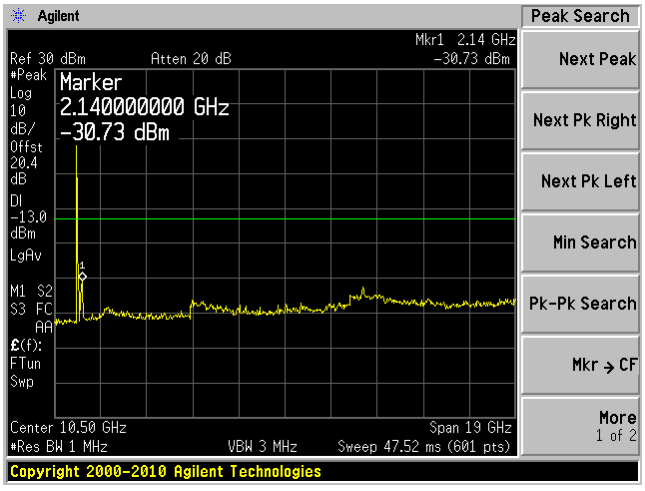


PCS Band Downlink, Middle Channel: 1960 MHz:

Plot 1: 30 MHz to 1 GHz

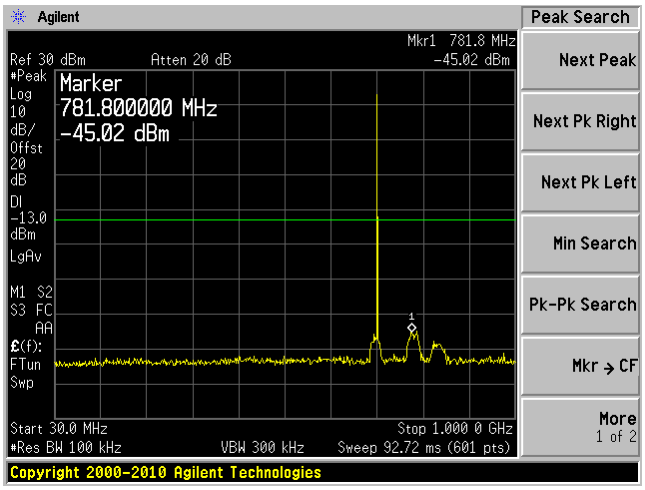


Plot 2: Above 1 GHz

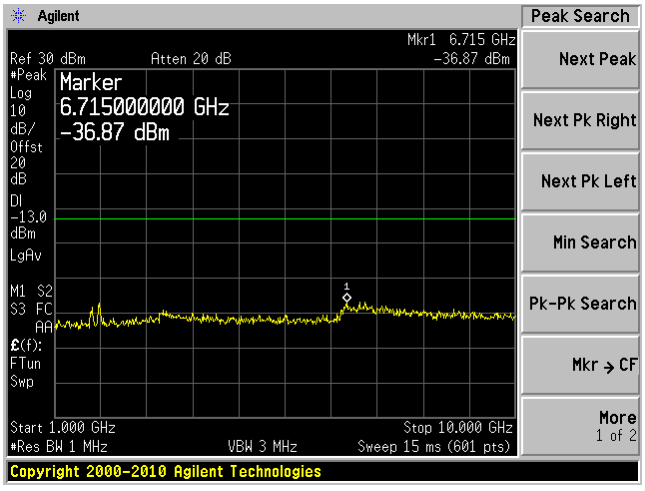


Lower LTE Band Uplink, Middle Channel: 709 MHz:

Plot 1: 30 MHz to 1 GHz

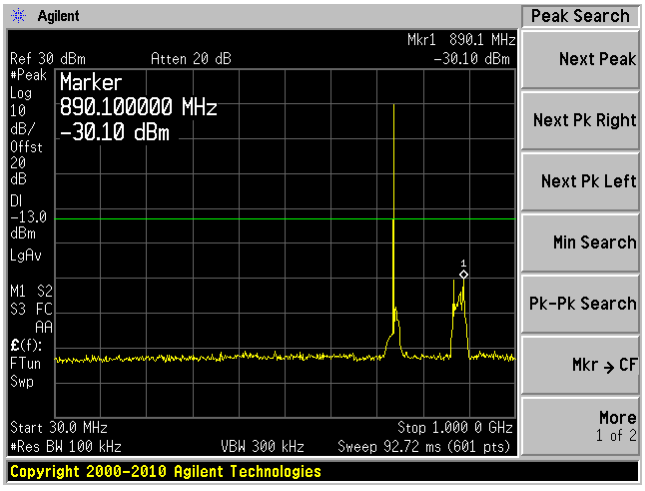


Plot 2: Above 1 GHz

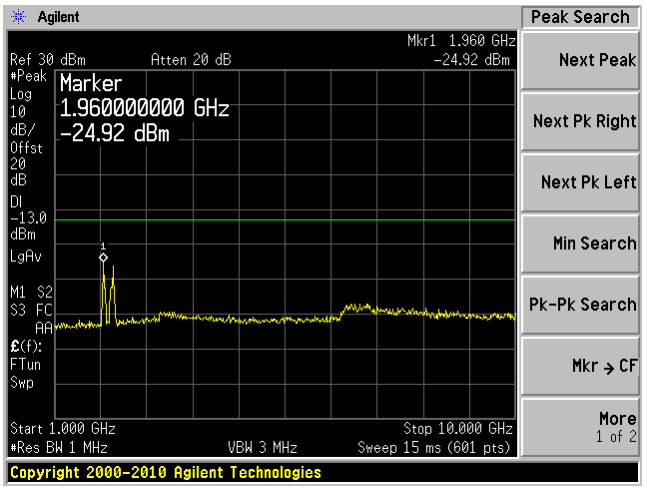


Lower LTE Band Downlink, High Channel: 743 MHz:

Plot 1: 30 MHz to 1 GHz

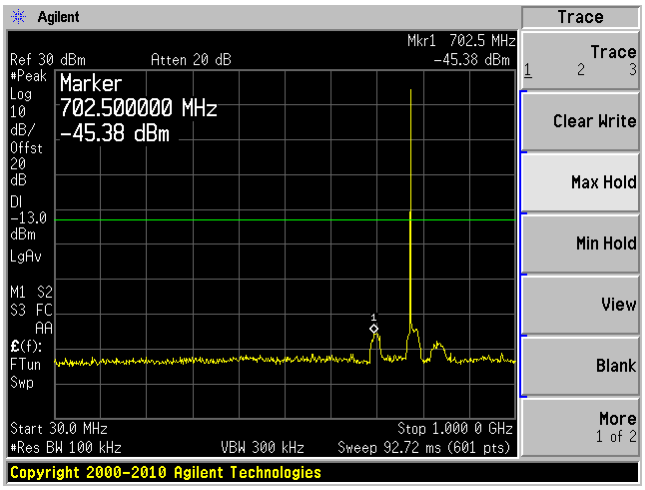


Plot 2: Above 1 GHz

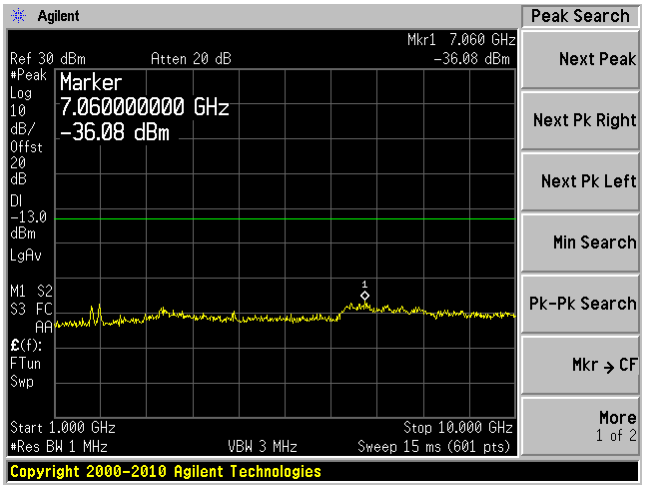


Upper LTE Band Uplink, Low Channel: 779 MHz:

Plot 1: 30 MHz to 1 GHz

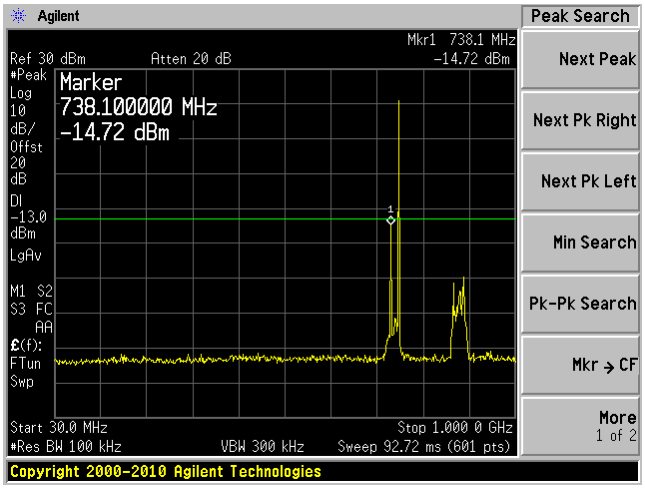


Plot 2: Above 1 GHz

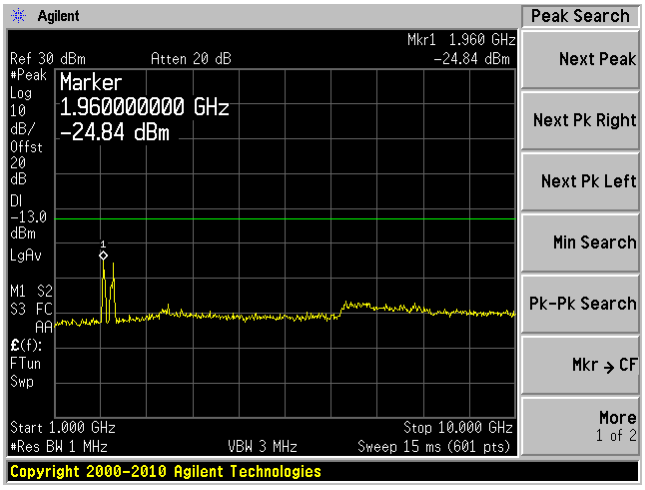


Upper LTE Band Downlink, High Channel: 754 MHz:

Plot 1: 30 MHz to 1 GHz

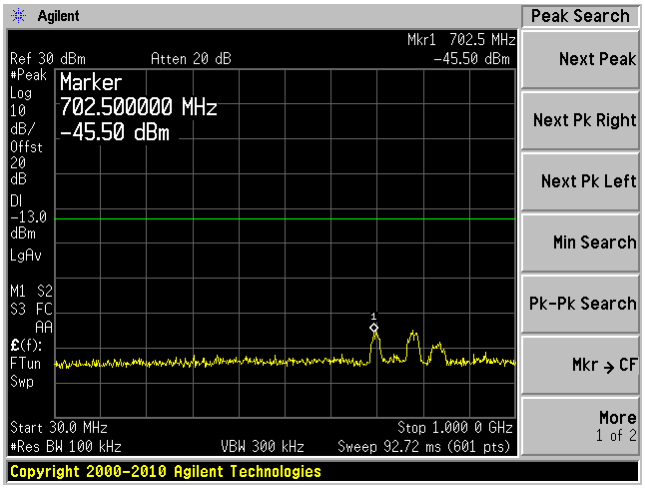


Plot 2: Above 1 GHz

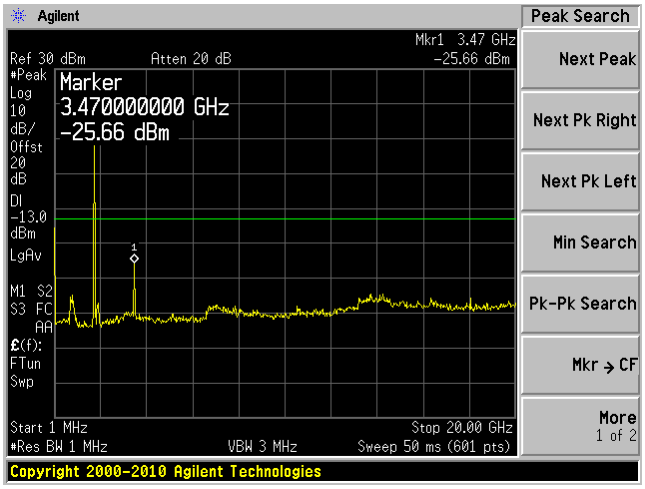


AWS Band Uplink, Middle Channel: 1732.4 MHz:

Plot 1: 30 MHz to 1 GHz

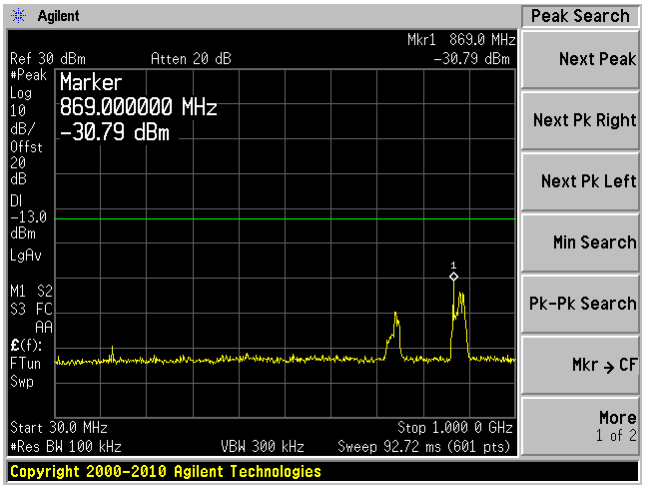


Plot 2: Above 1 GHz

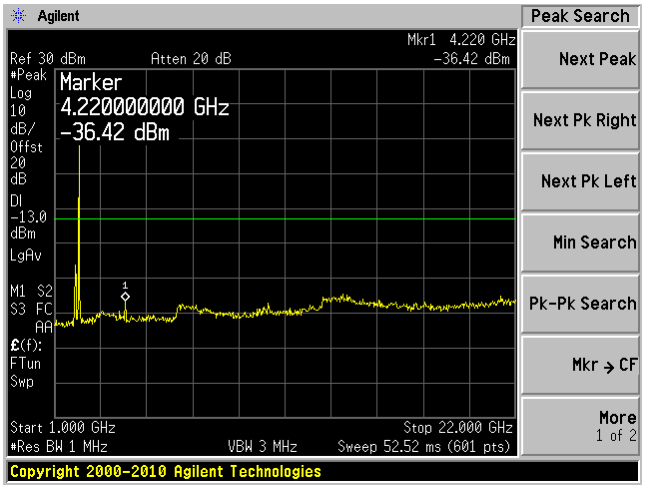


AWS Band Downlink, Middle Channel: 2132.4 MHz:

Plot 1: 30 MHz to 1 GHz



Plot 2: Above 1 GHz

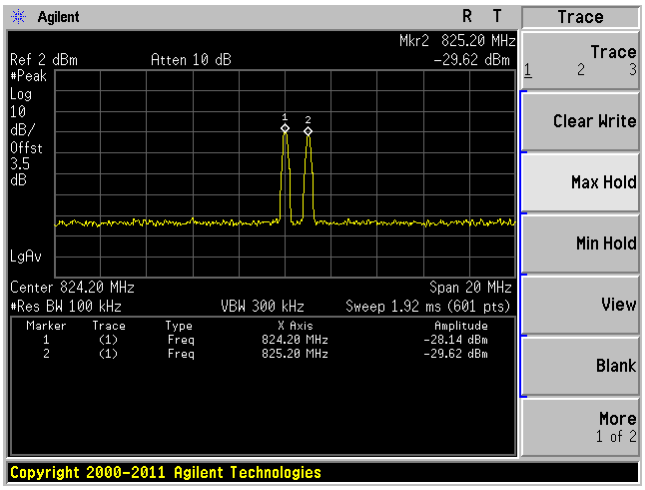


Inter-modulation

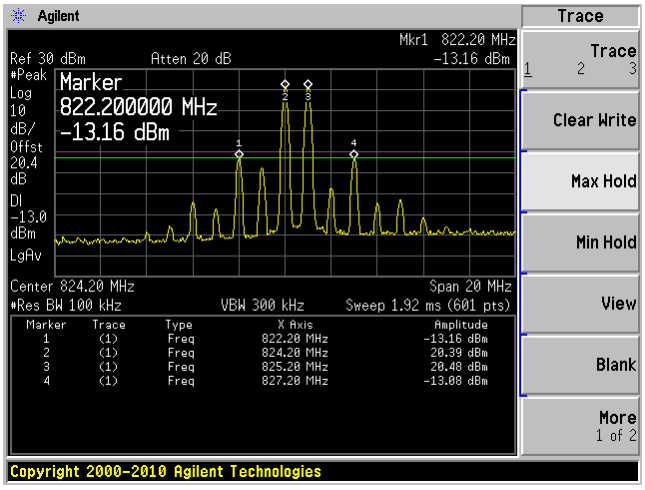
Cellular Band Uplink:

CW: GSM/EDGE

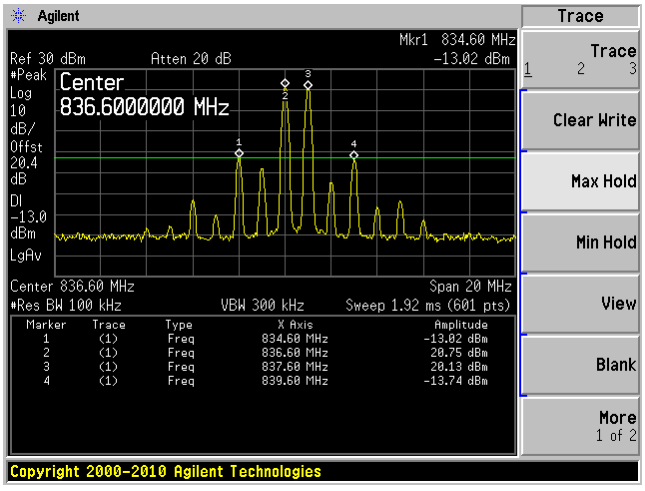
Low Channel, Input



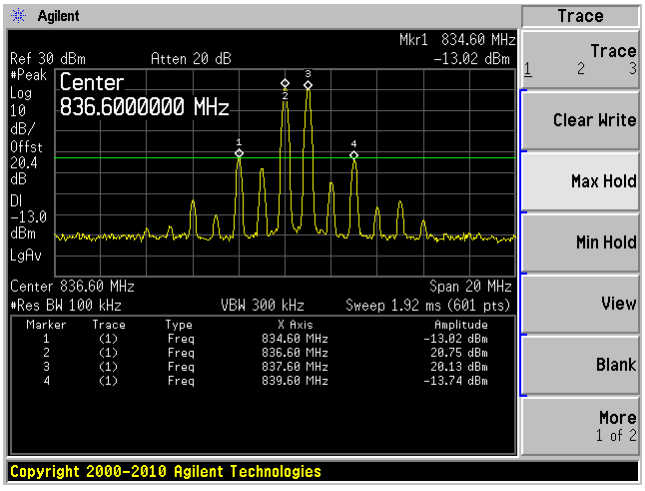
Low Channel, Output



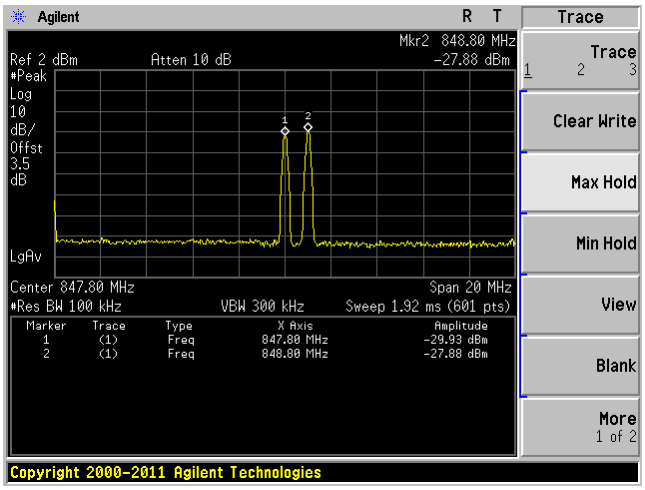
Middle Channel, Input



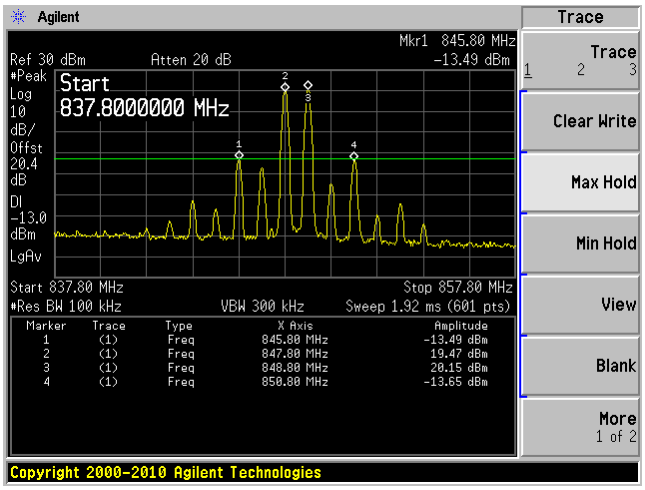
Middle Channel, Output



High Channel, Input

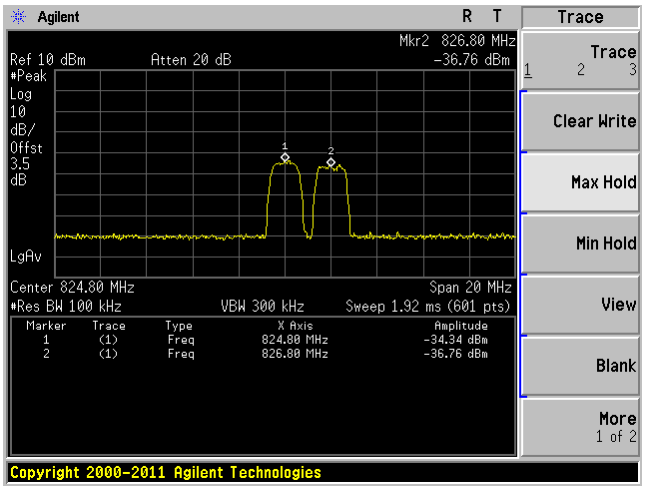


High Channel, Output

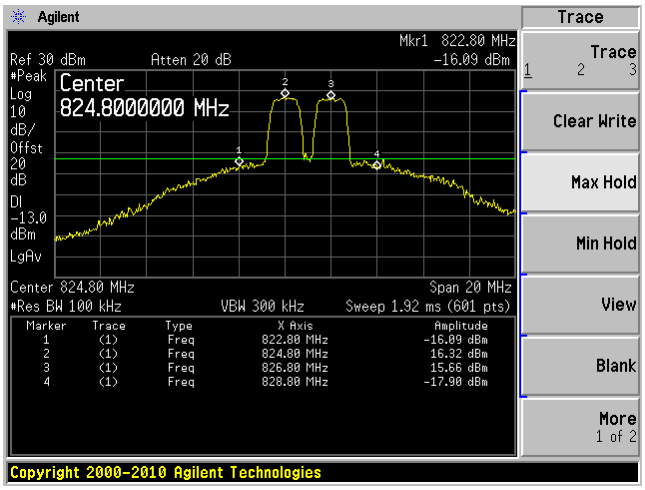


Modulation: CDMA

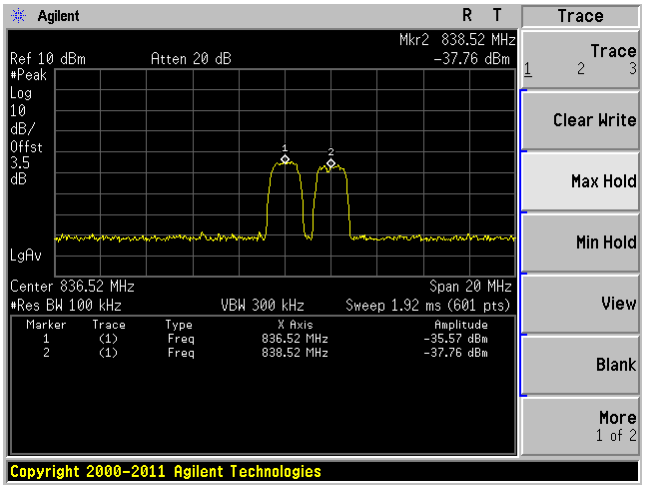
Low Channel, Input



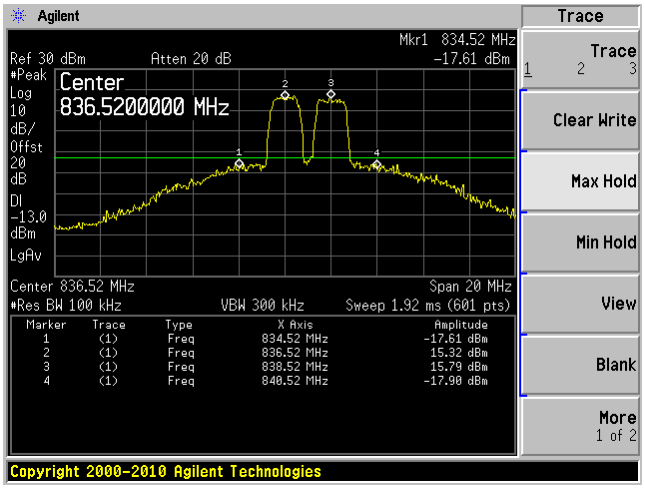
Low Channel, Output



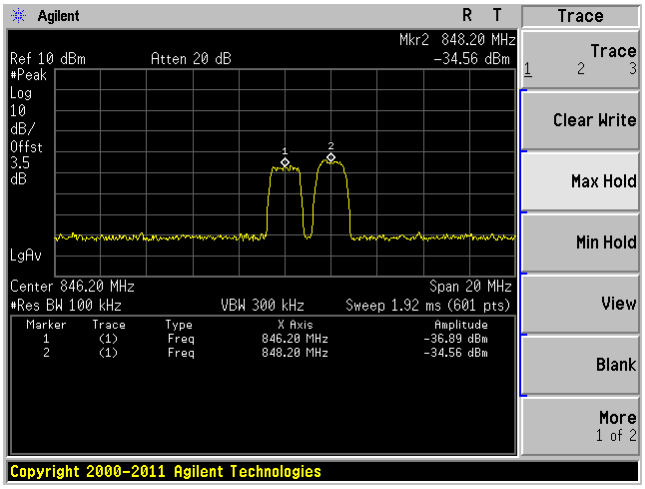
Middle Channel, Input



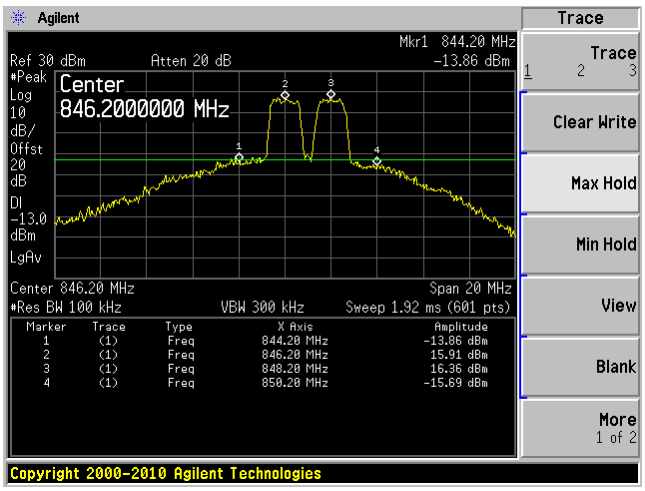
Middle Channel, Output



High Channel, Input

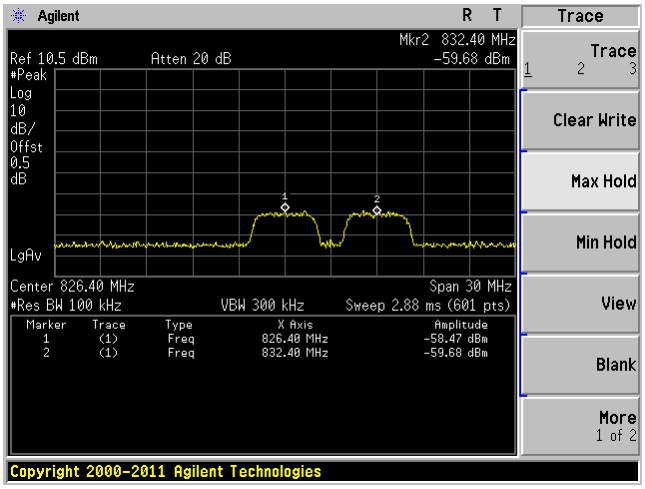


High Channel, Output

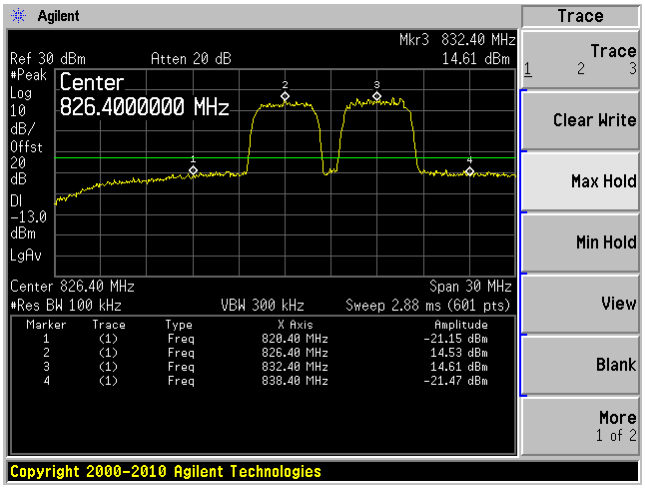


Modulation: WCDMA

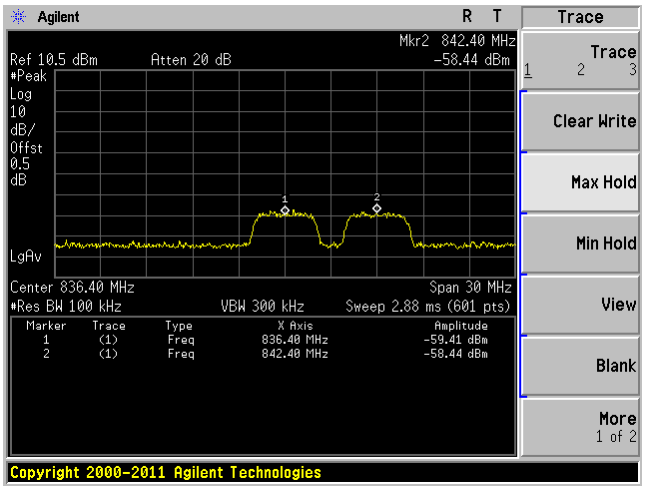
Low Channel, Input



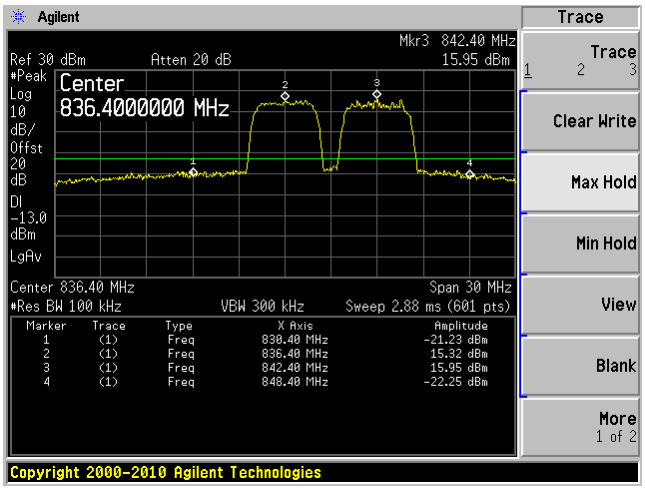
Low Channel, Output



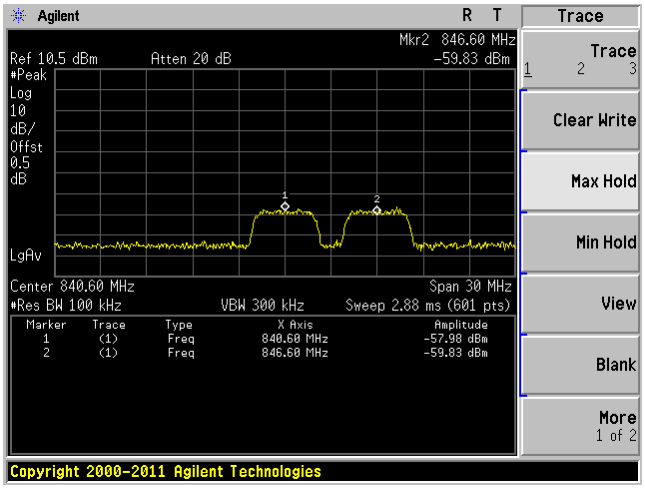
Middle Channel, Input



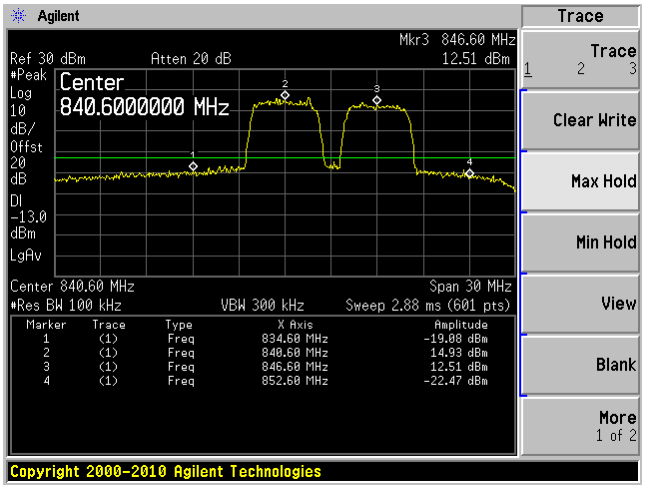
Middle Channel, Output



High Channel, Input



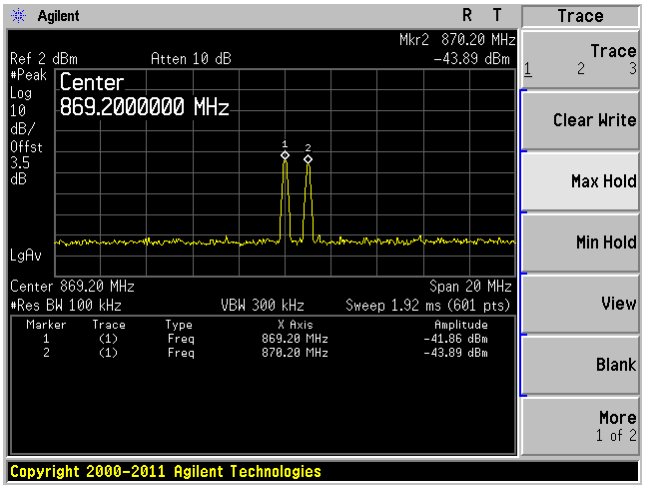
High Channel, Output



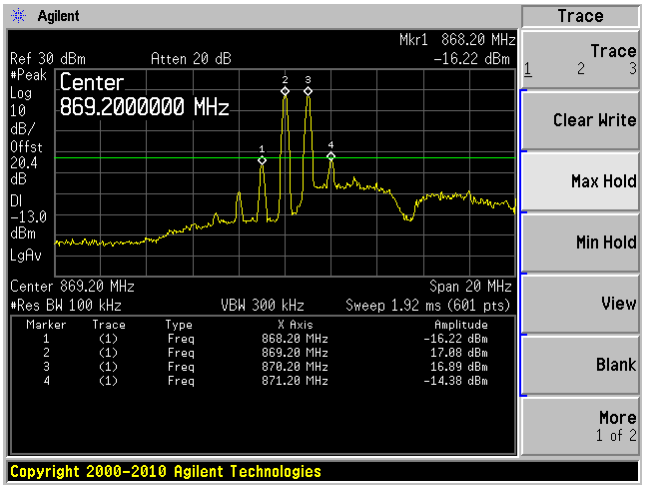
Cellular Band Downlink:

CW: GSM/EDGE

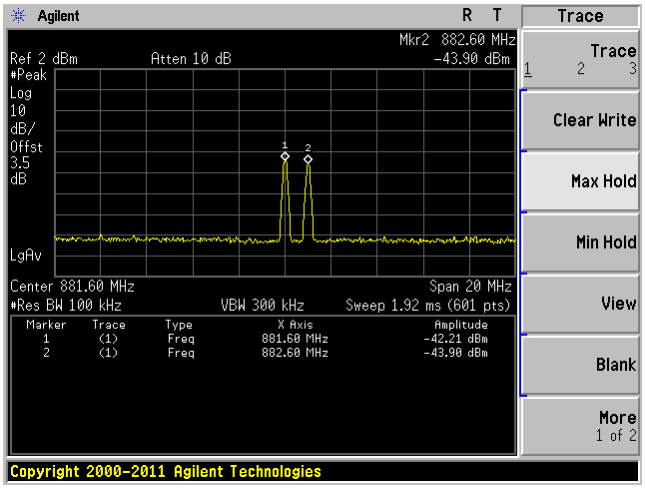
Low Channel, Input



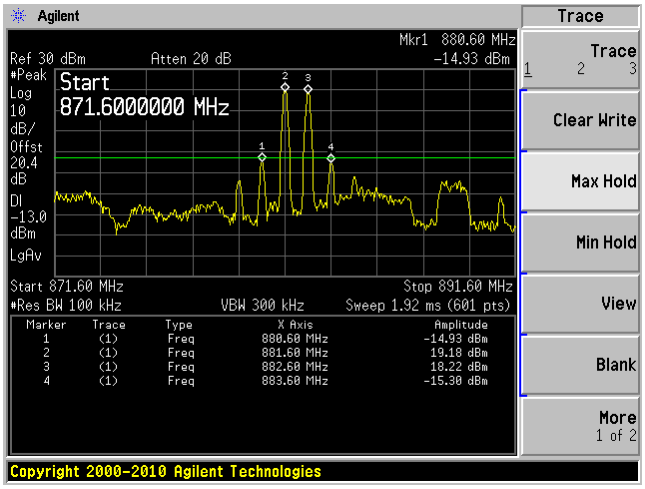
Low Channel, Output



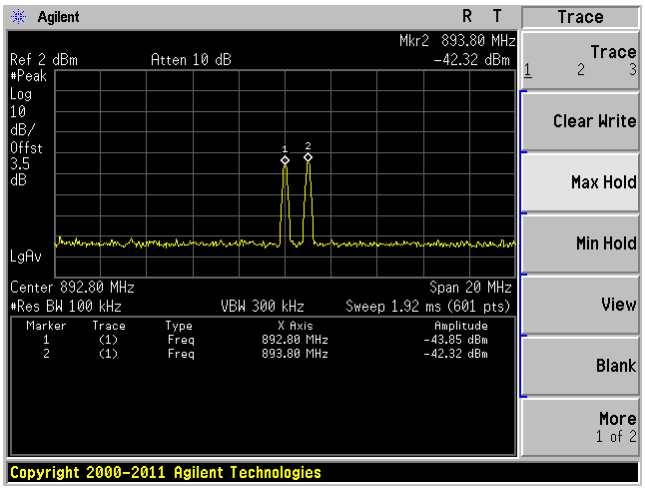
Middle Channel, Input



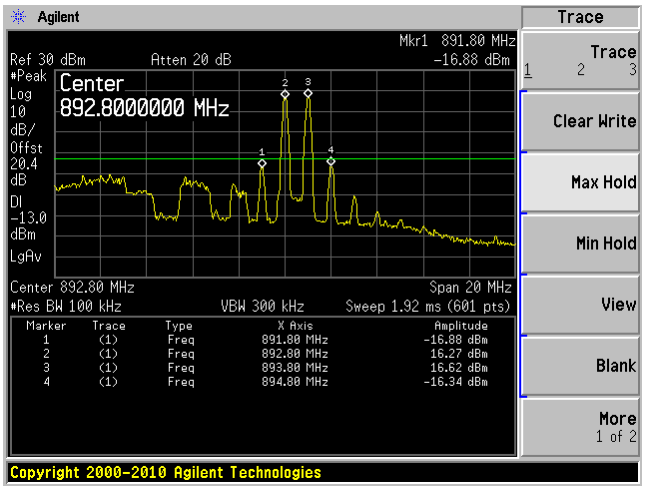
Middle Channel, Output



High Channel, Input

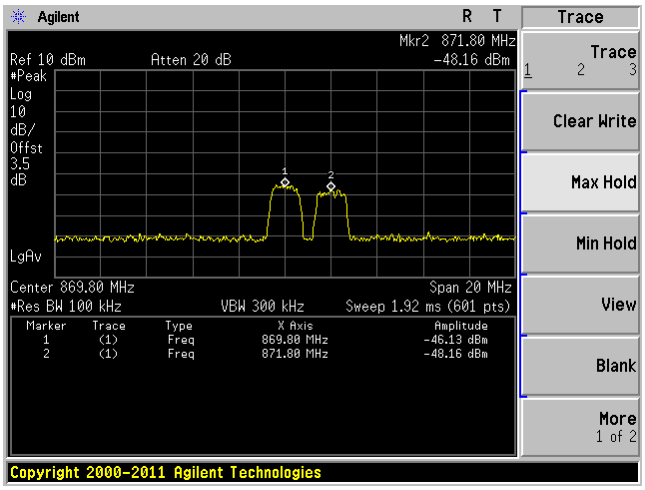


High Channel, Output

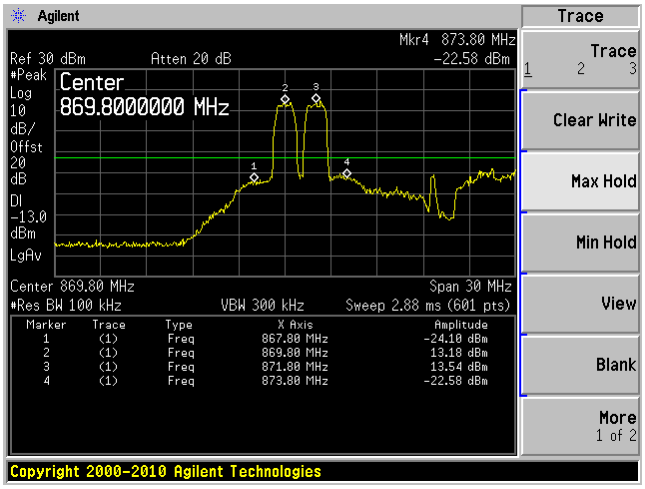


Modulation: CDMA

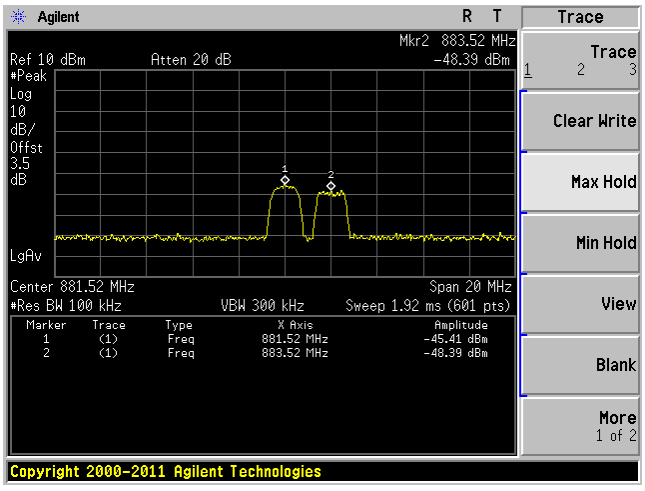
Low Channel, Input



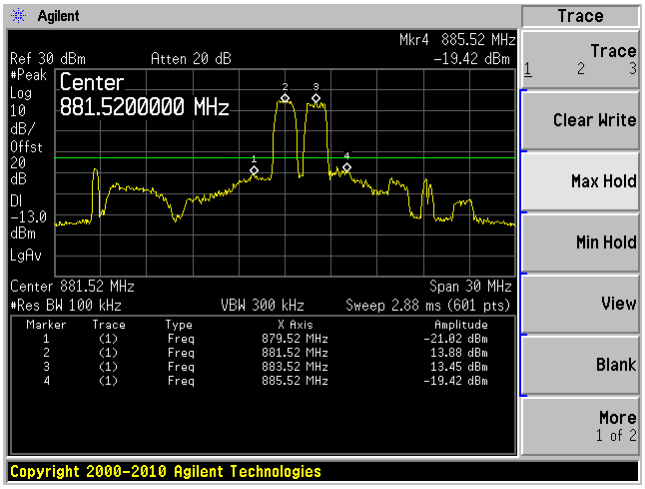
Low Channel, Output



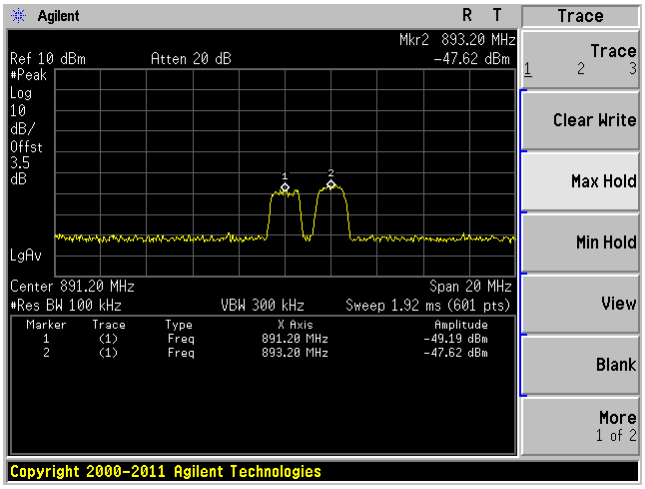
Middle Channel, Input



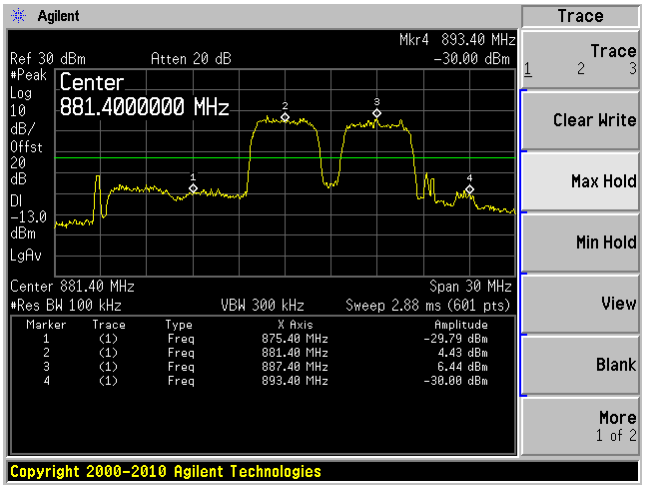
Middle Channel, Output



High Channel, Input

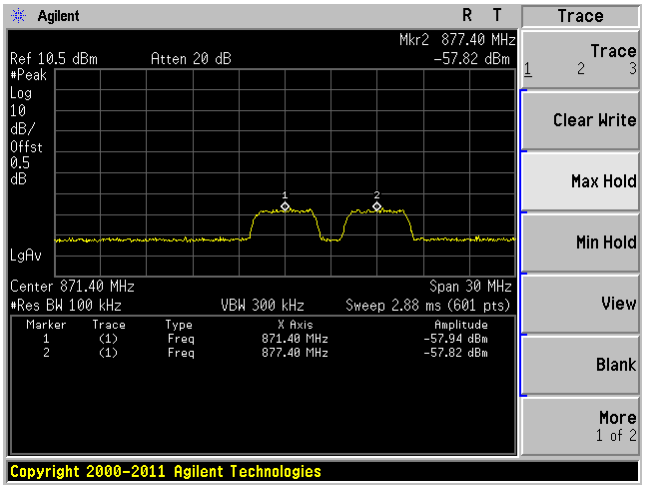


High Channel, Output

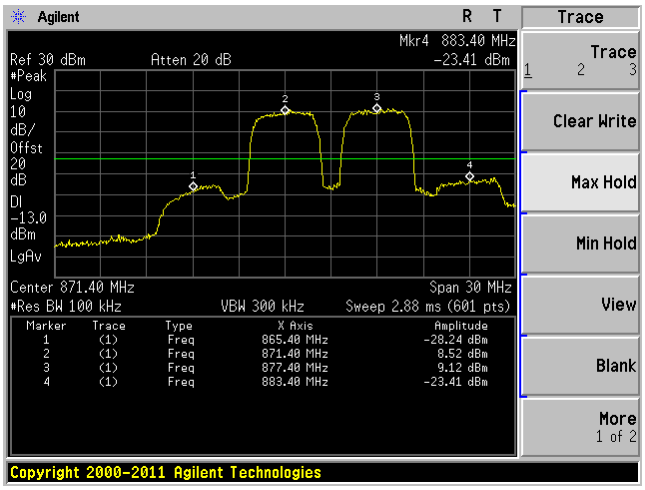


Modulation: WCDMA

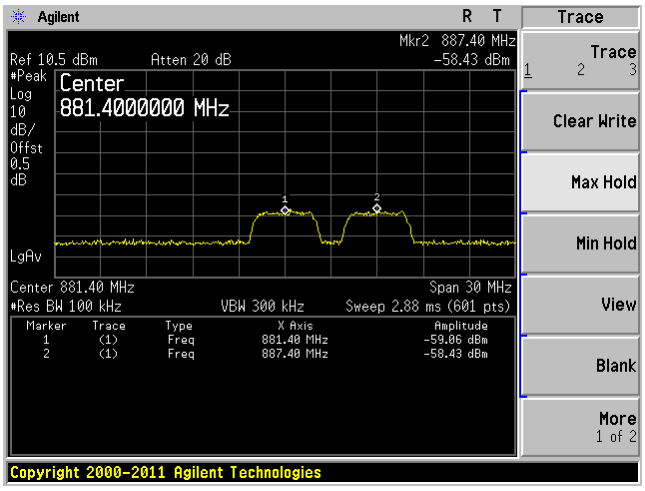
Low Channel, Input



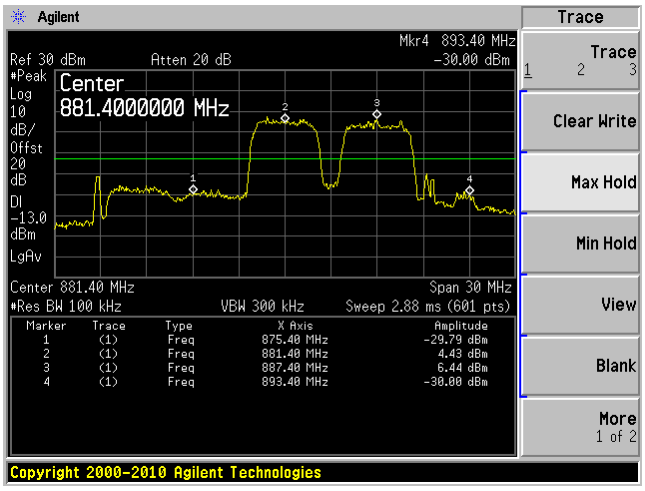
Low Channel, Output



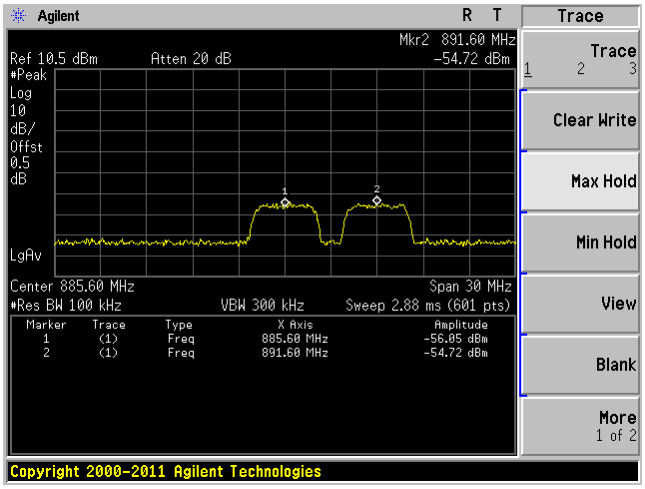
Middle Channel, Input



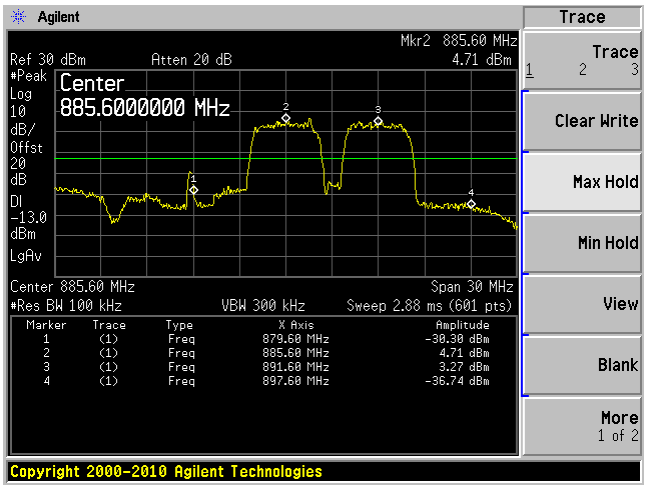
Middle Channel, Output



High Channel, Input



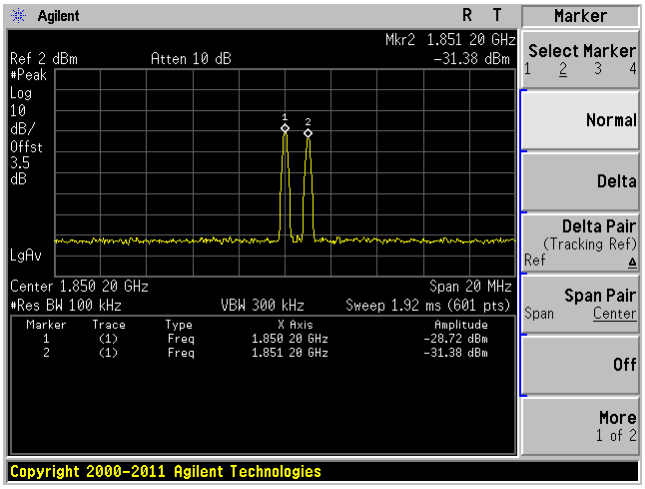
High Channel, Output



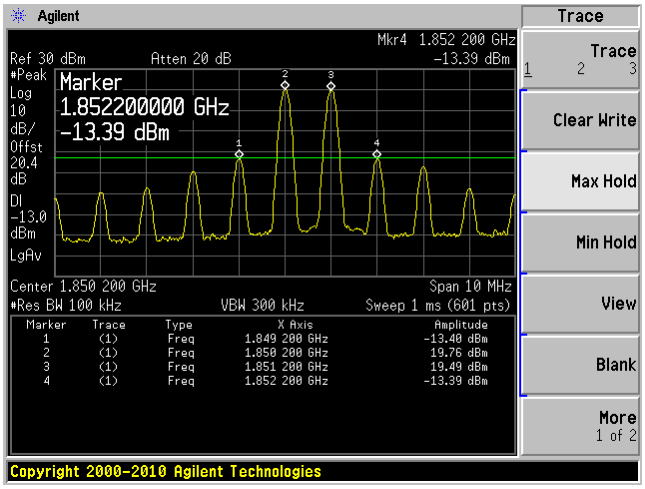
PCS Band Uplink:

CW: GSM/EDGE

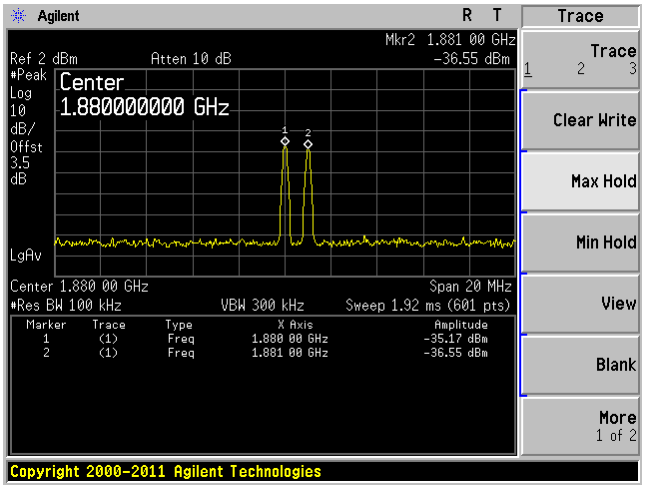
Low Channel, Input



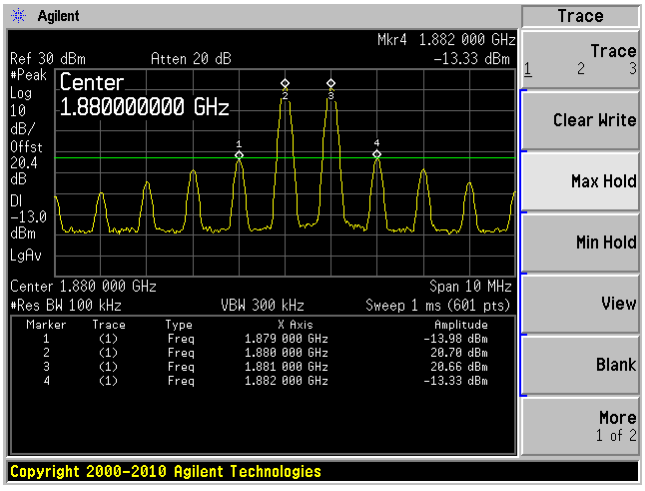
Low Channel, Output



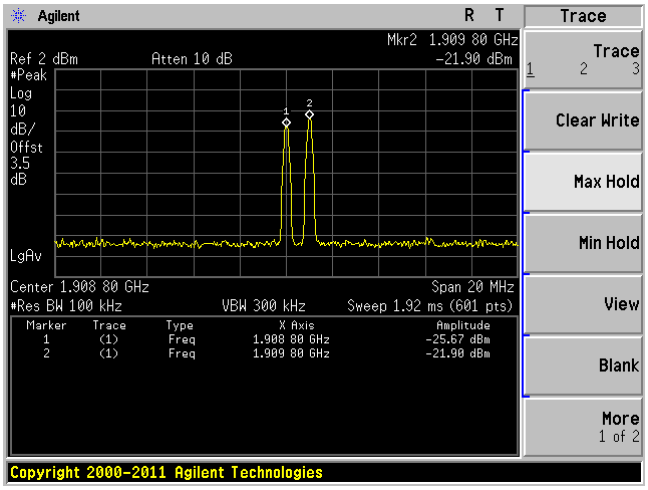
Middle Channel, Input



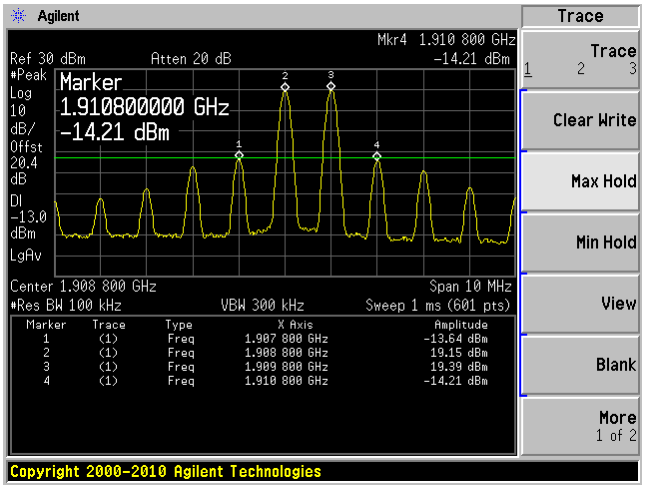
Middle Channel, Output



High Channel, Input

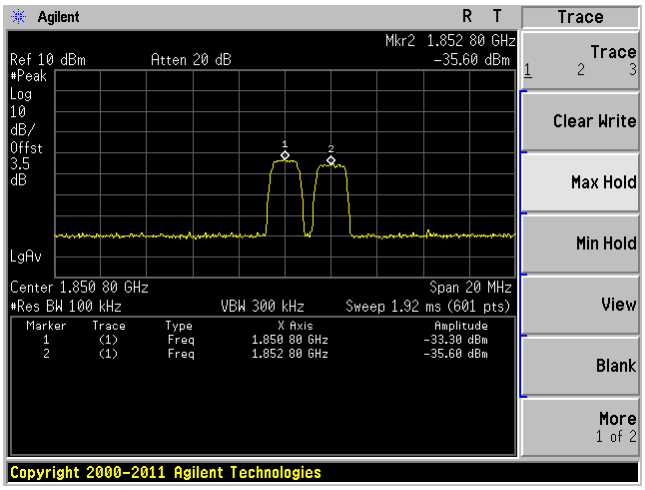


High Channel, Output

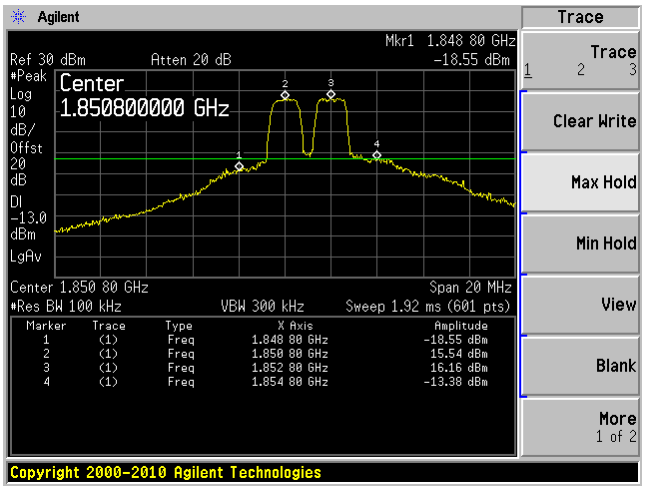


Modulation: CDMA

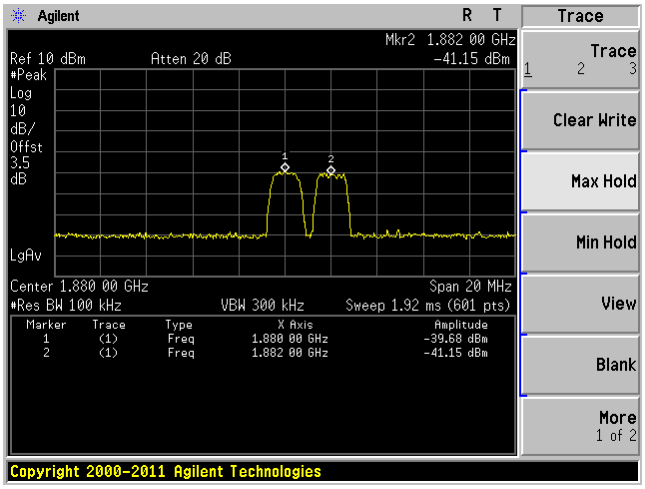
Low Channel, Input



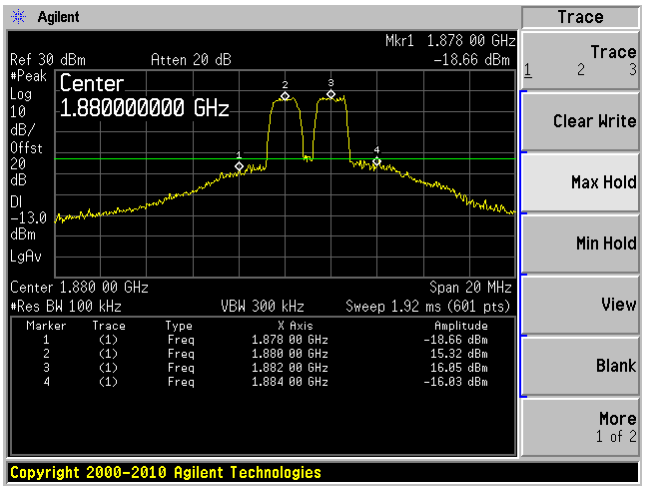
Low Channel, Output



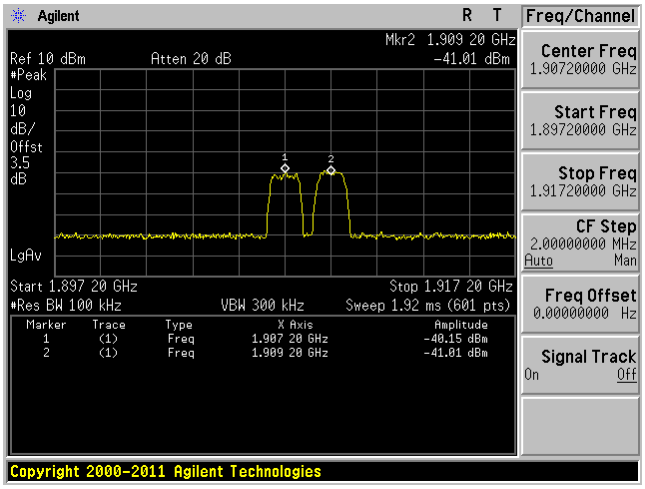
Middle Channel, Input



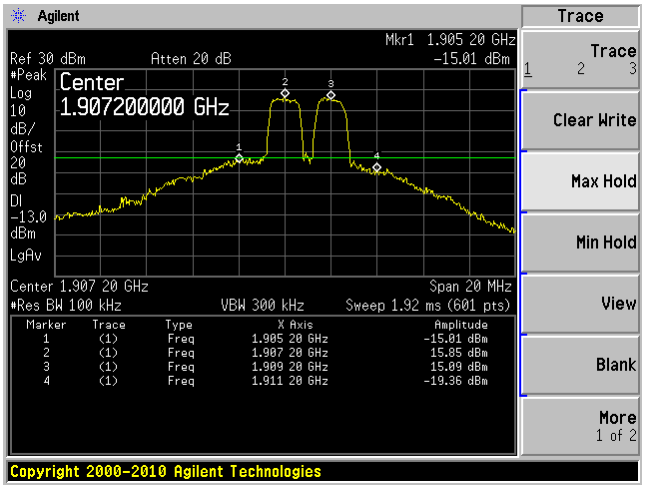
Middle Channel, Output



High Channel, Input

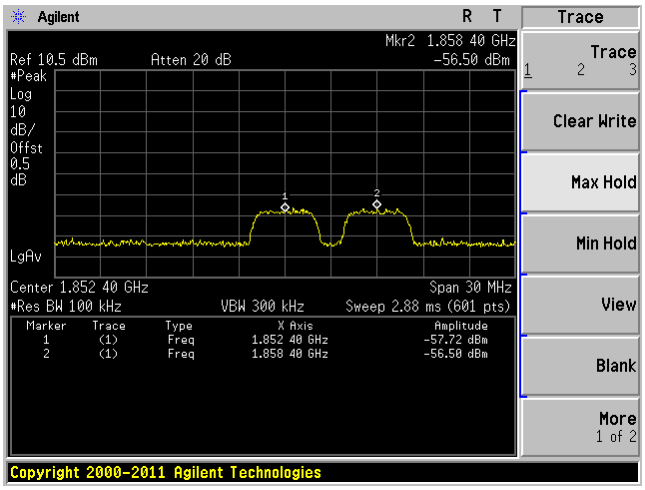


High Channel, Output

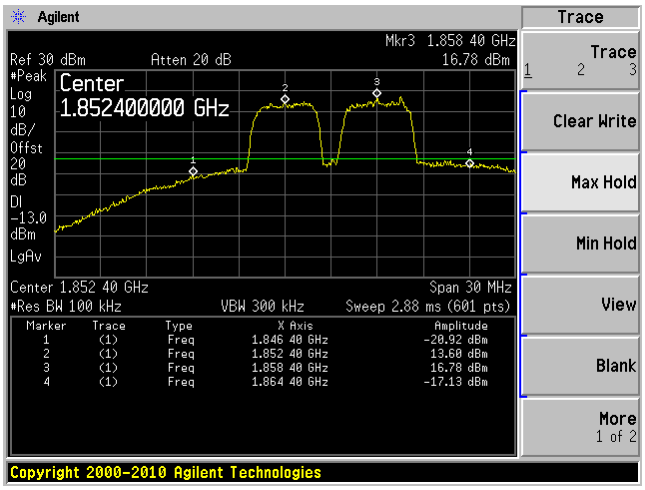


Modulation: WCDMA

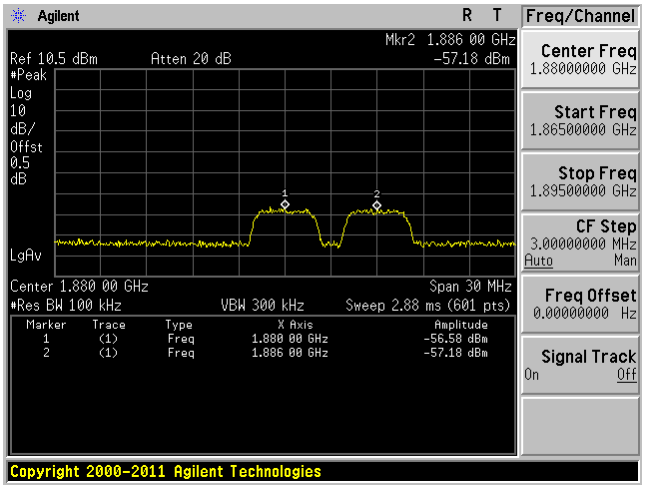
Low Channel, Input



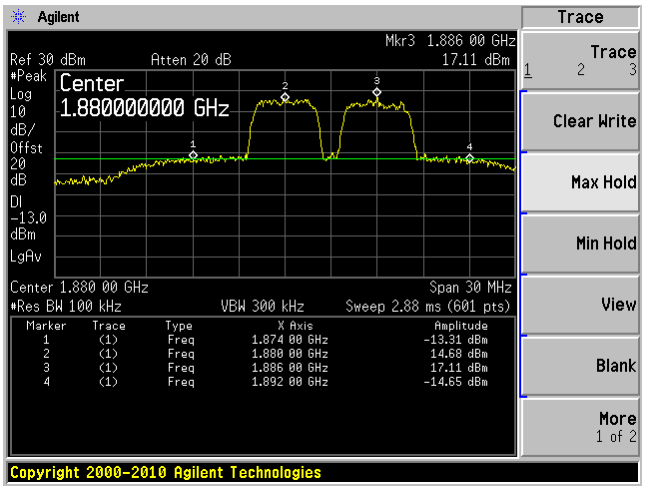
Low Channel, Output



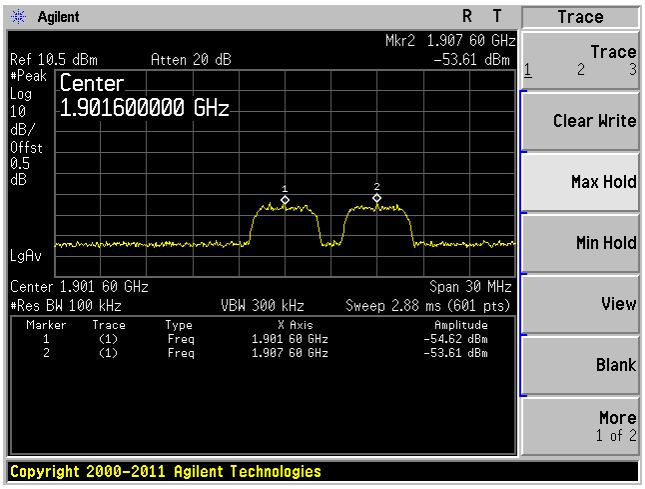
Middle Channel, Input



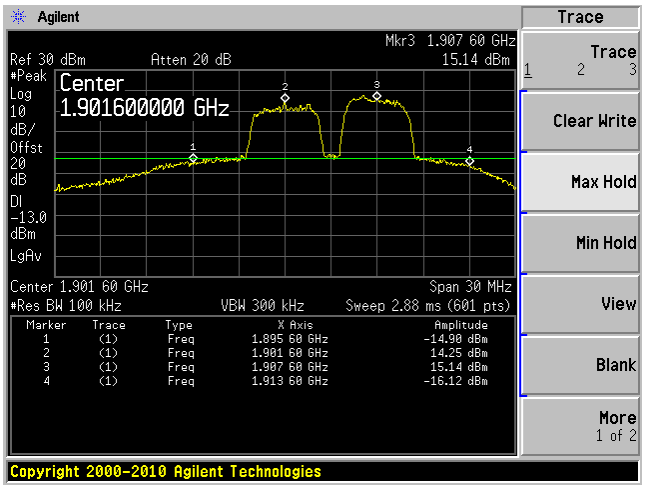
Middle Channel, Output



High Channel, Input



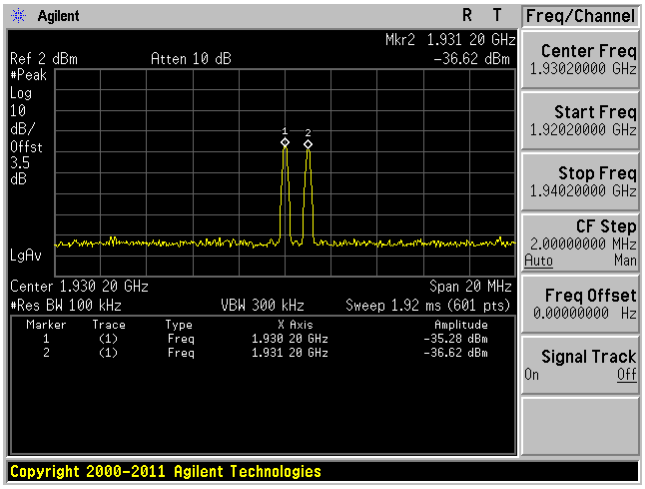
High Channel, Output



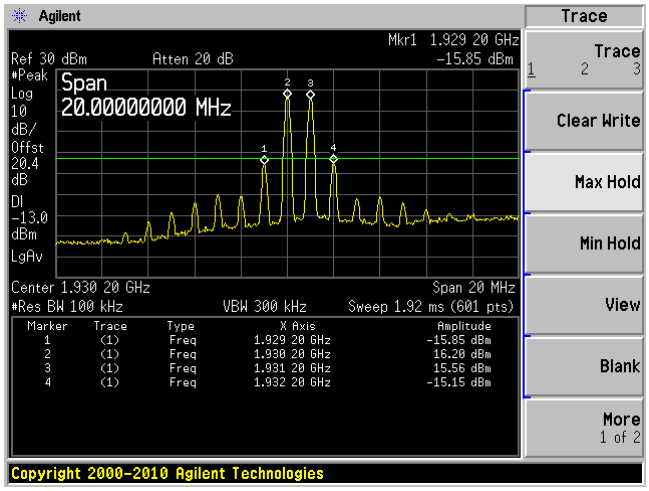
PCS Band Downlink:

CW: GSM/EDGE

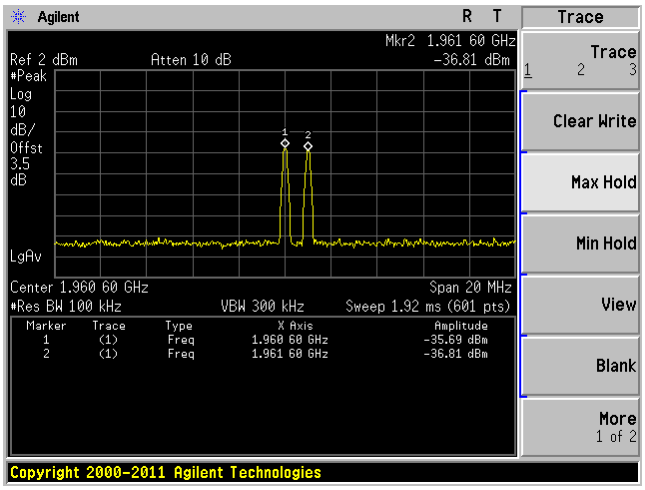
Low Channel, Input



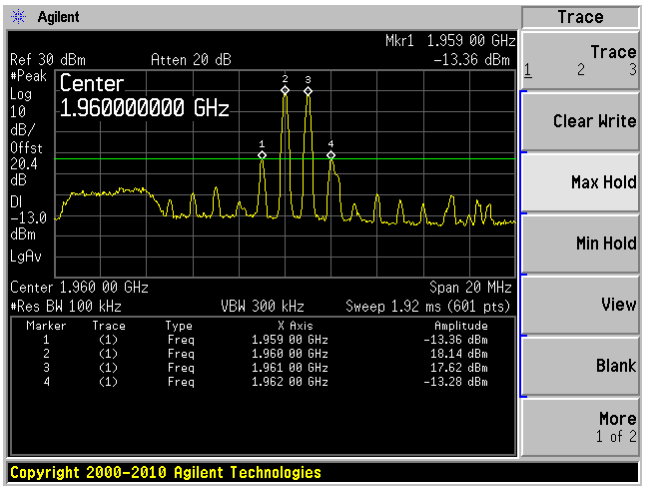
Low Channel, Output



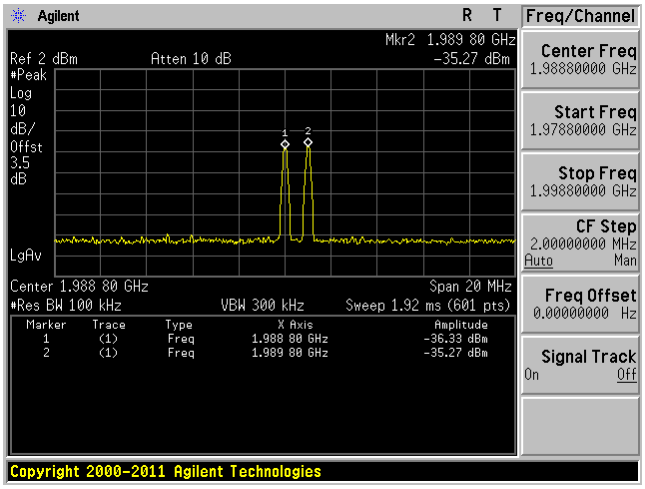
Middle Channel, Input



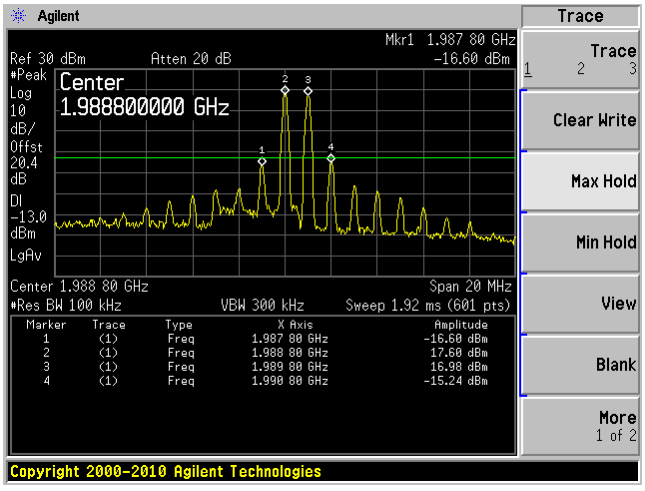
Middle Channel, Output



High Channel, Input

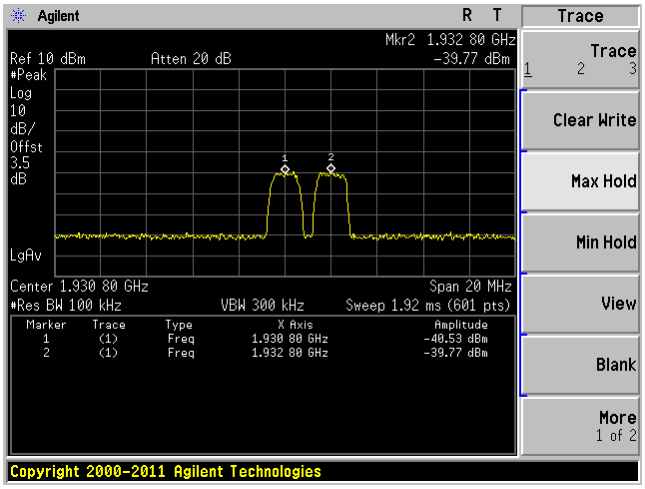


High Channel, Output

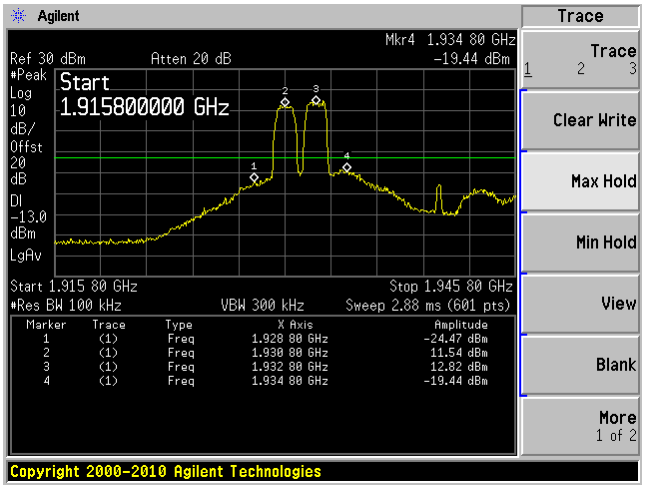


Modulation: CDMA

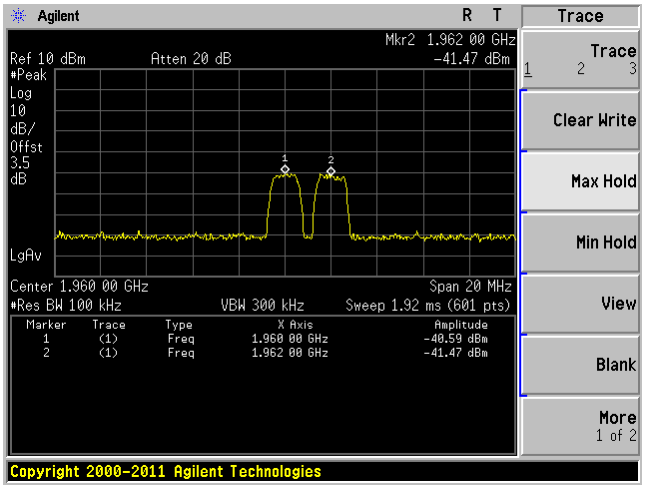
Low Channel, Input



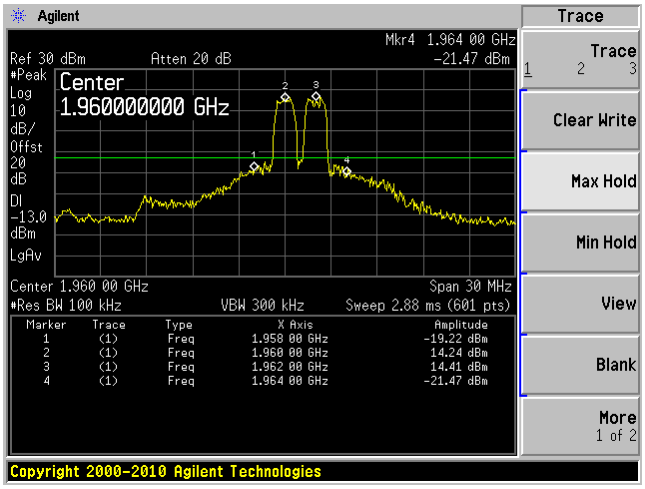
Low Channel, Output



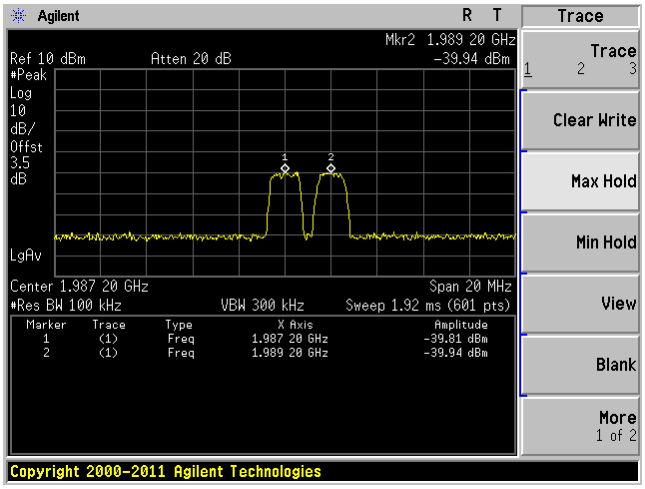
Middle Channel, Input



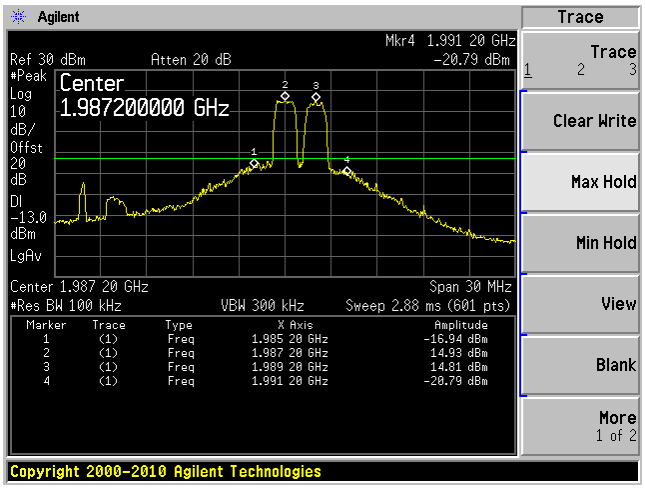
Middle Channel, Output



High Channel, Input

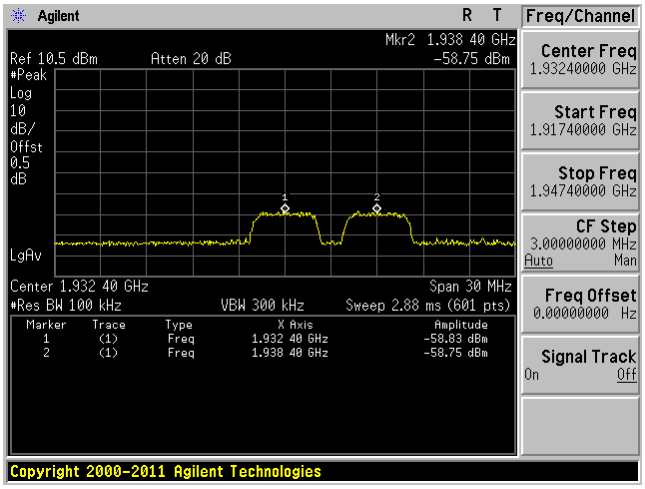


High Channel, Output

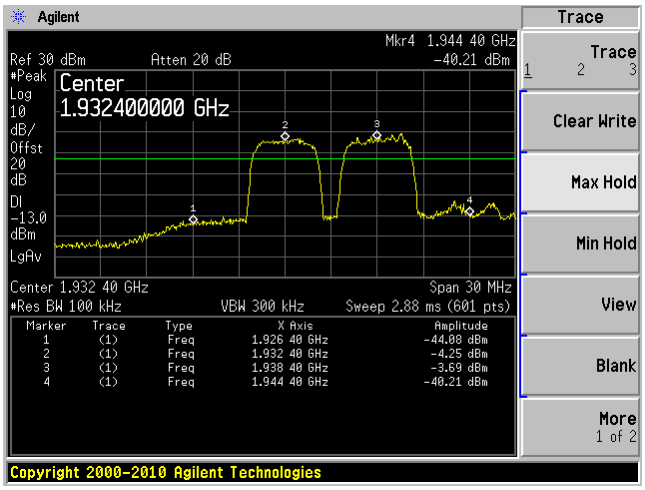


Modulation: WCDMA

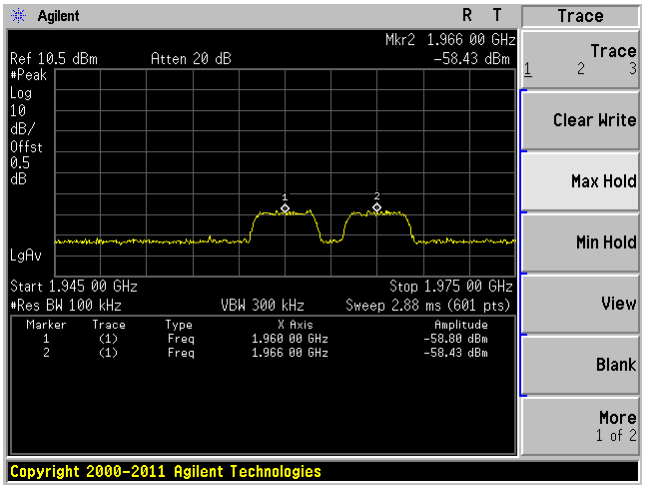
Low Channel, Input



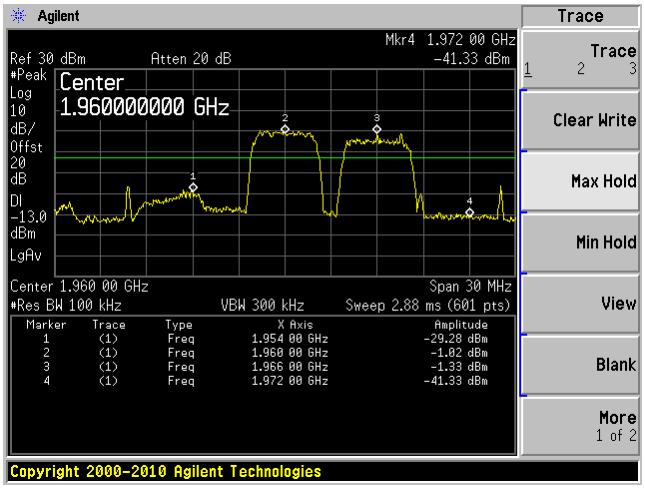
Low Channel, Output



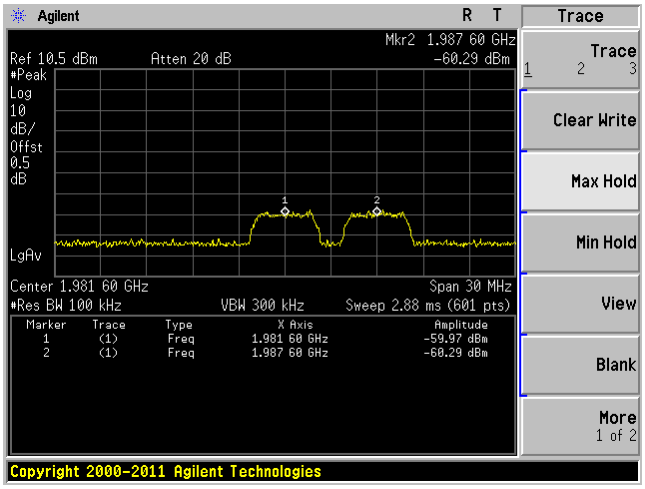
Middle Channel, Input



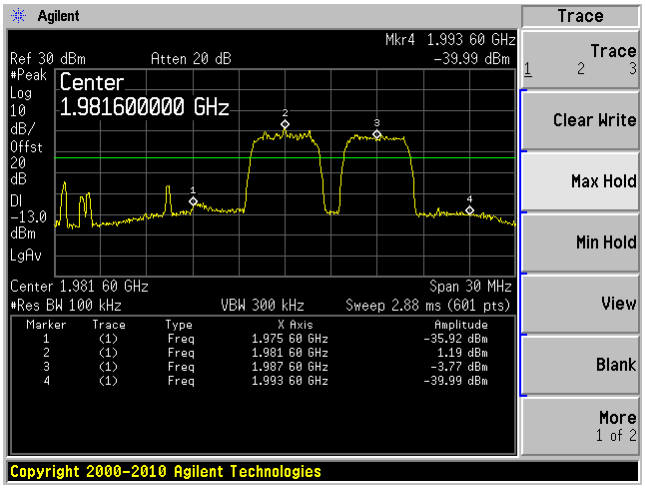
Middle Channel, Output



High Channel, Input



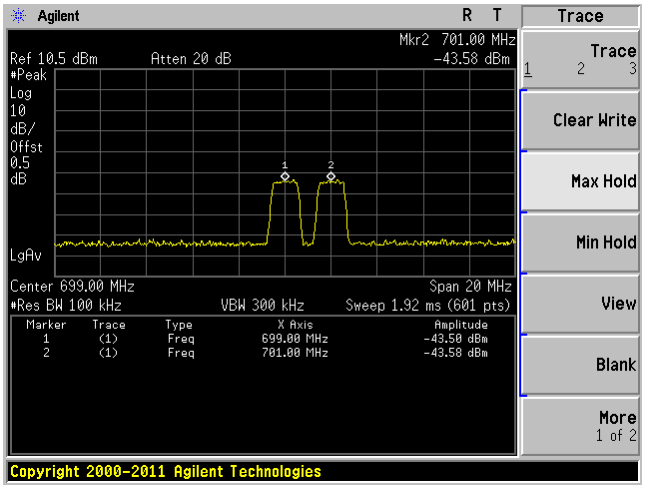
High Channel, Output



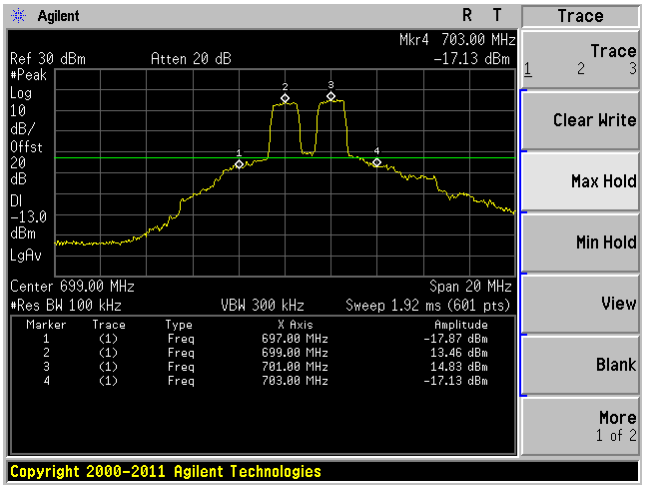
Lower LTE Band Uplink:

Modulation: QPSK (1.4 MHz)

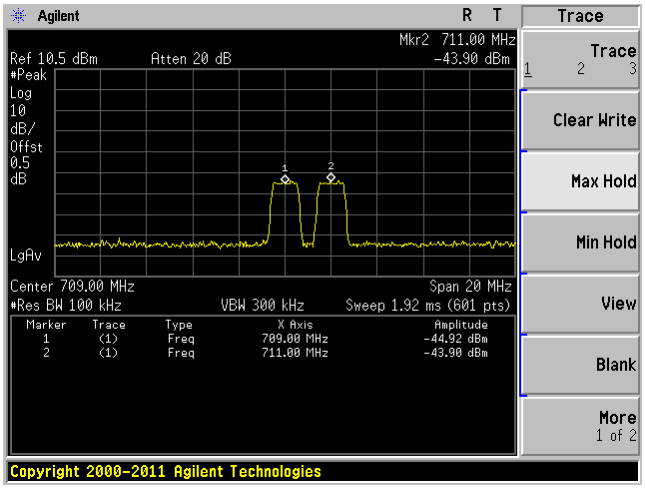
Low Channel, Input



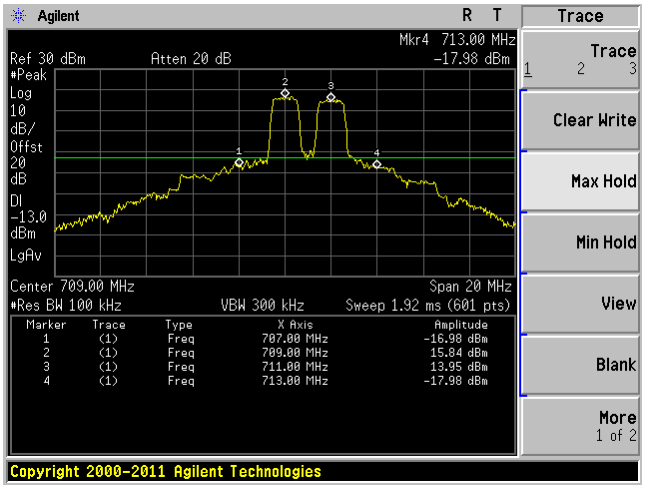
Low Channel, Output



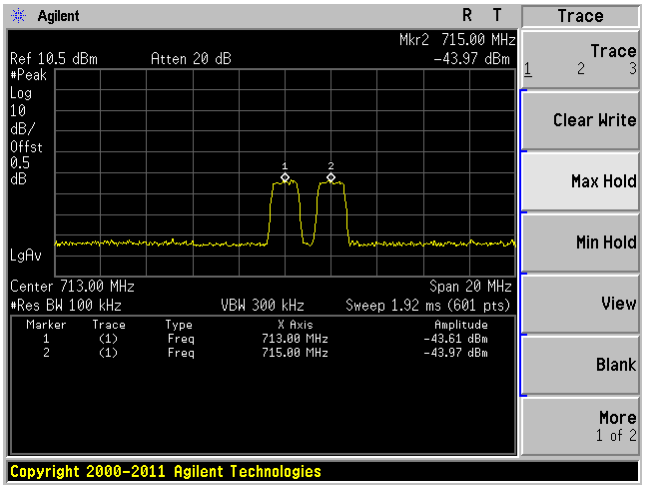
Middle Channel, Input



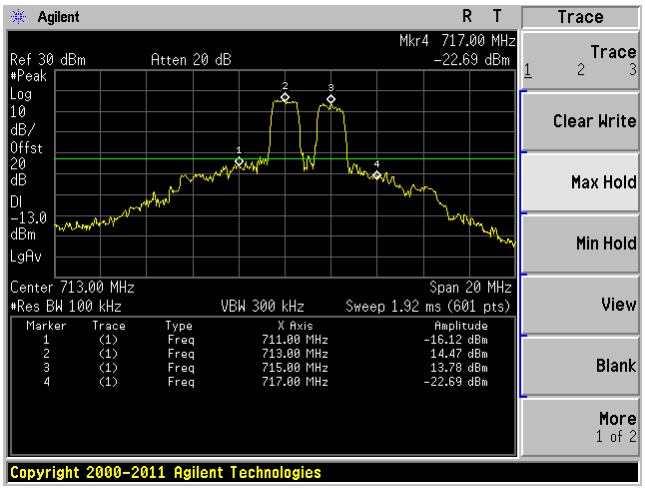
Middle Channel, Output



High Channel, Input

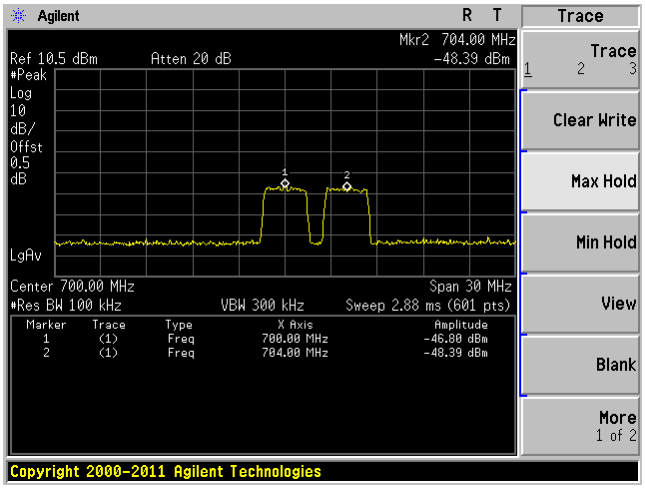


High Channel, Output

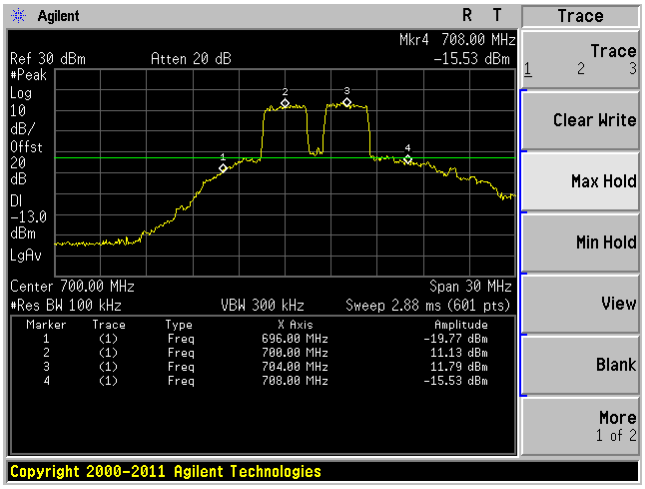


Modulation: QPSK (3 MHz)

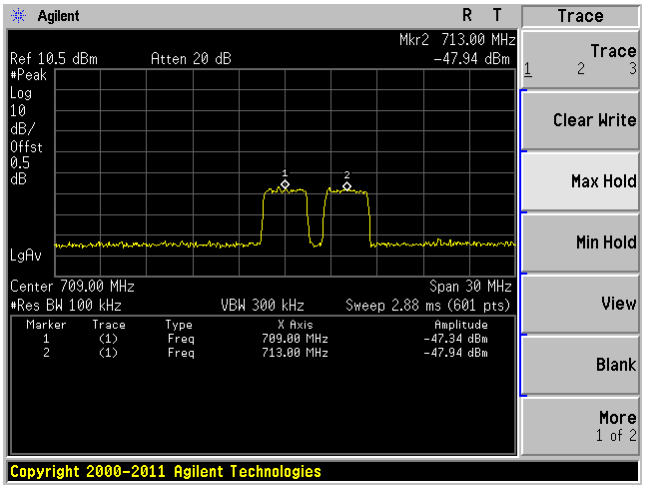
Low Channel, Input



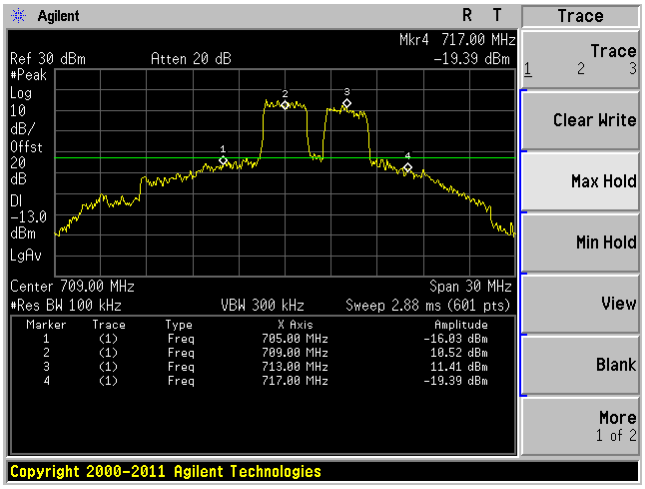
Low Channel, Output



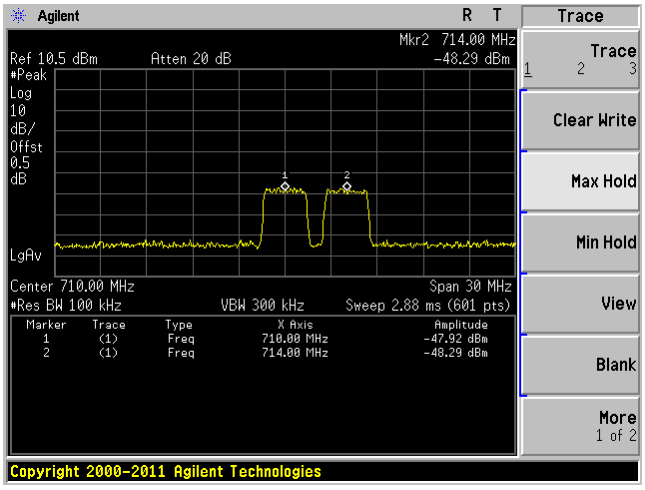
Middle Channel, Input



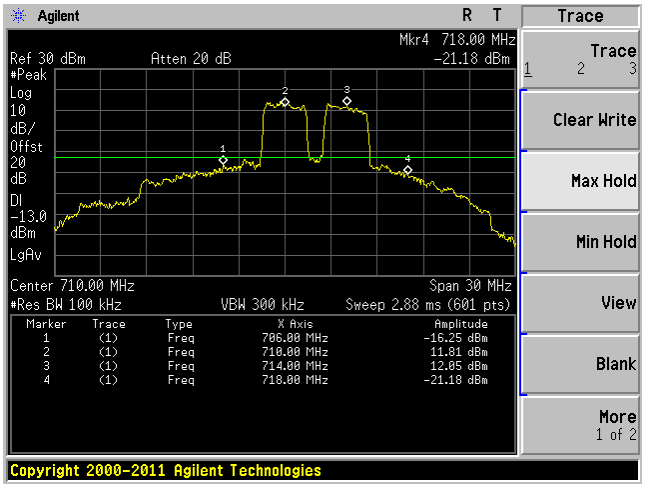
Middle Channel, Output



High Channel, Input

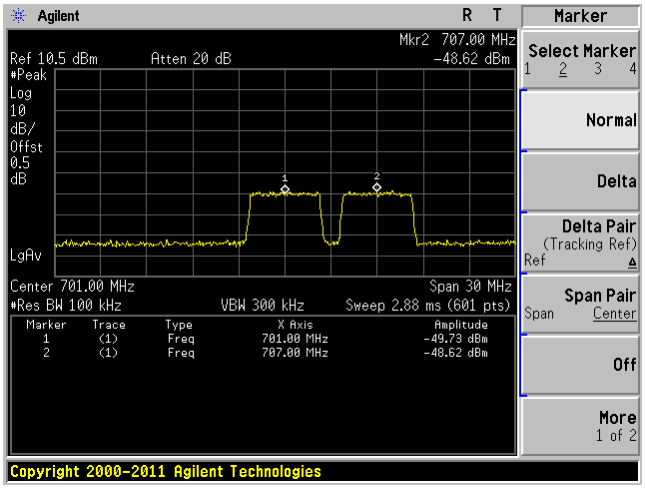


High Channel, Output

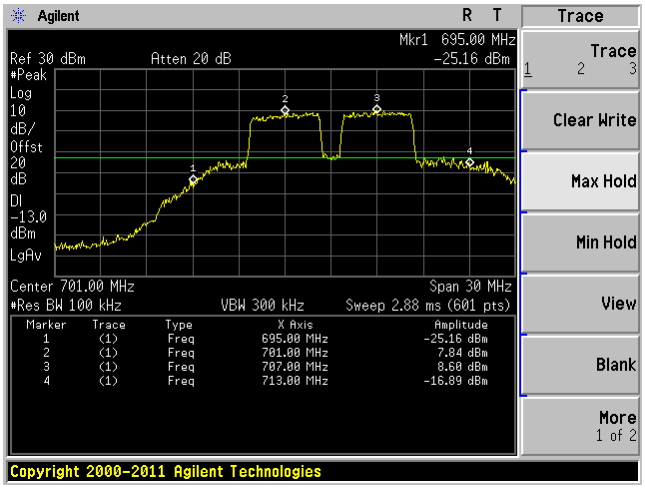


Modulation: QPSK (5 MHz)

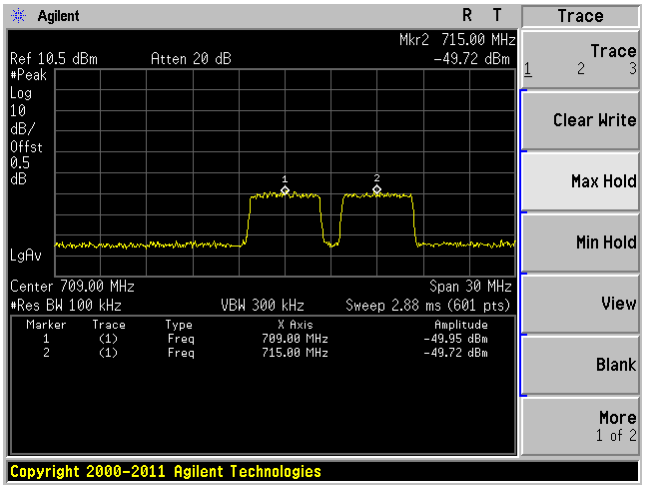
Low Channel, Input



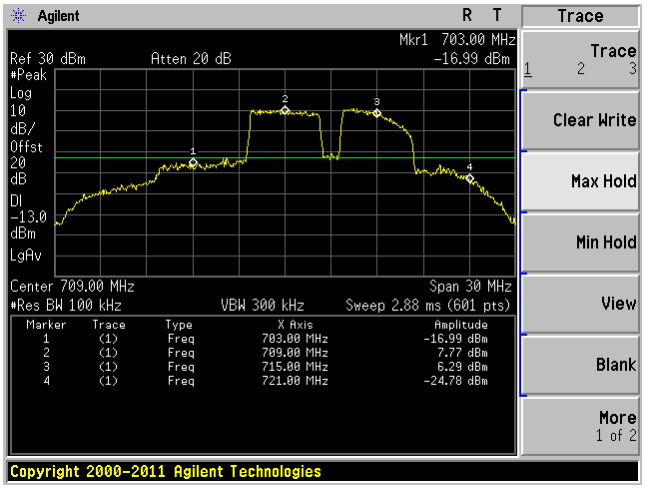
Low Channel, Output



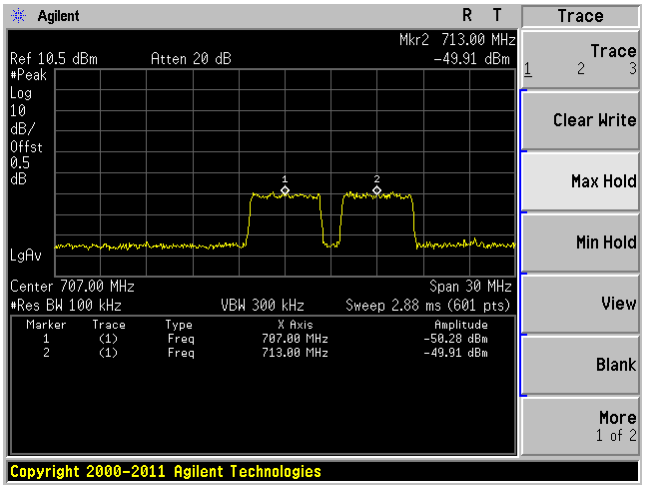
Middle Channel, Input



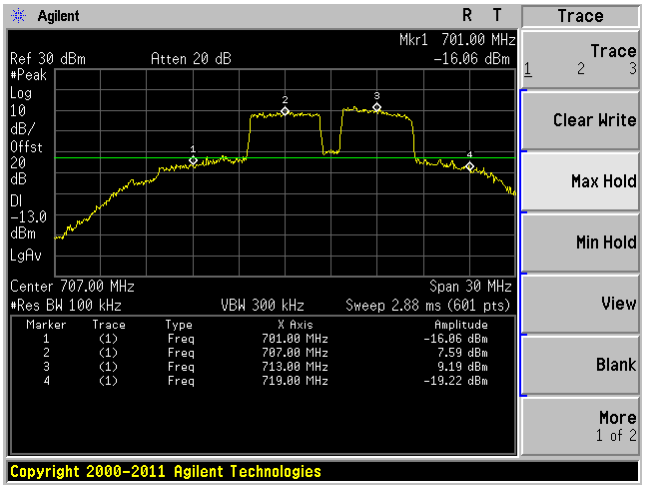
Middle Channel, Output



High Channel, Input



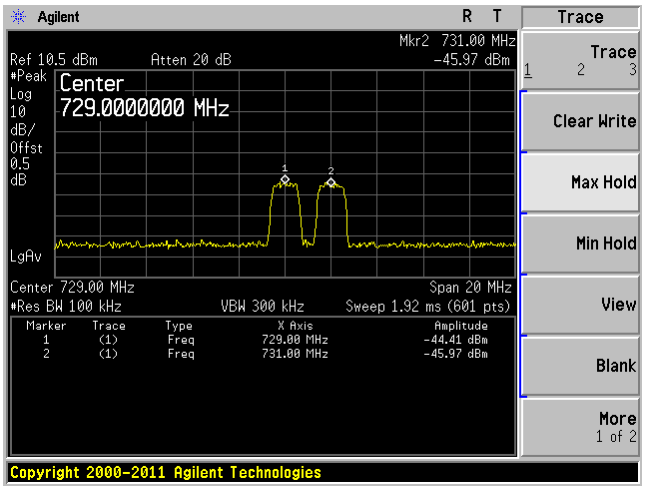
High Channel, Output



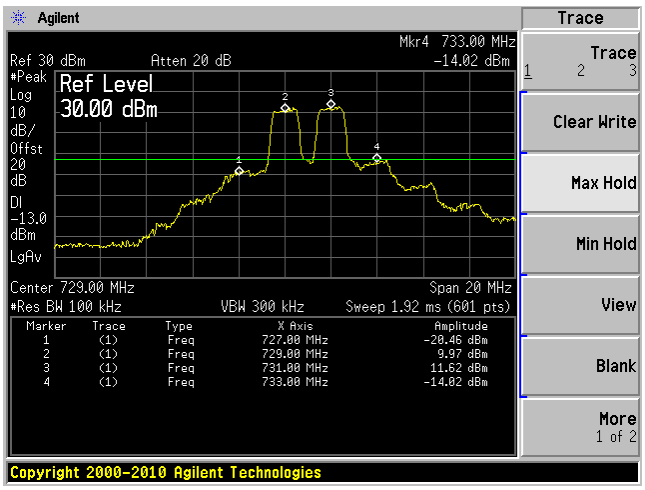
Lower LTE Band Downlink:

Modulation: QPSK (1.4 MHz)

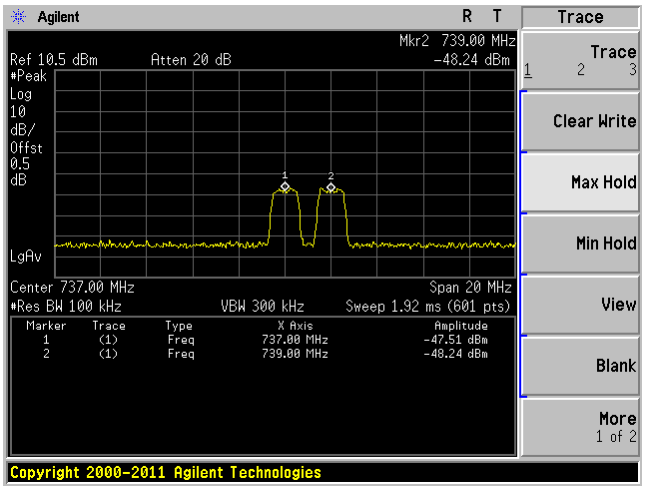
Low Channel, Input



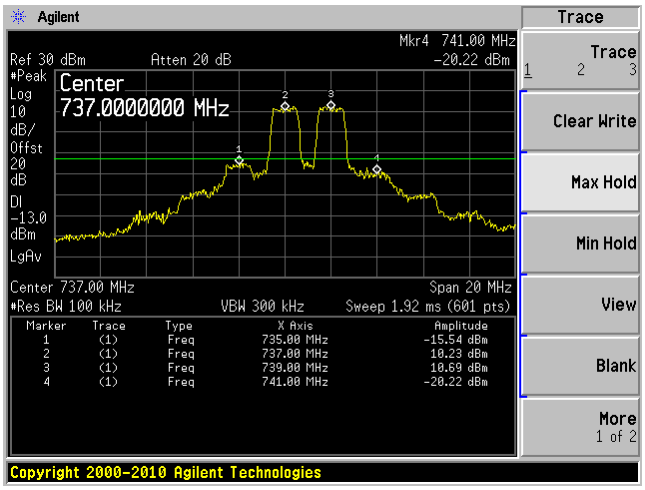
Low Channel, Output



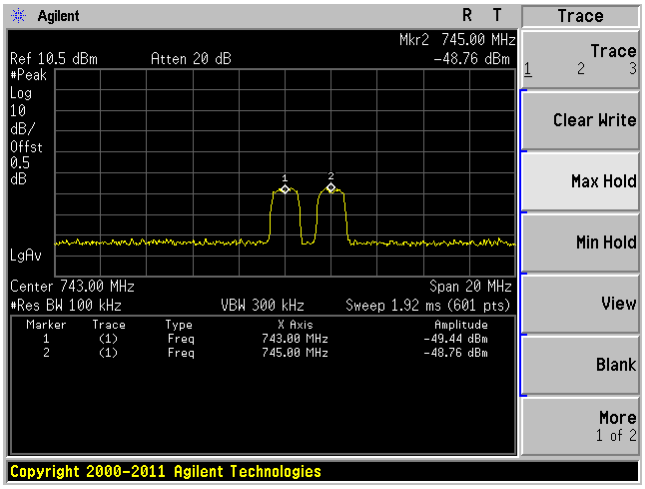
Middle Channel, Input



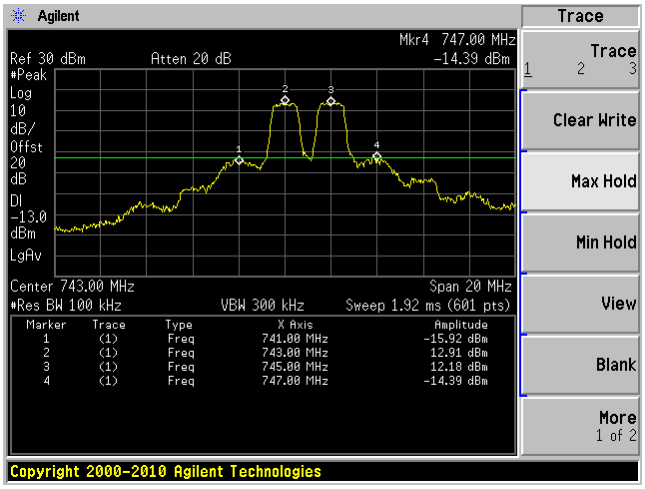
Middle Channel, Output



High Channel, Input

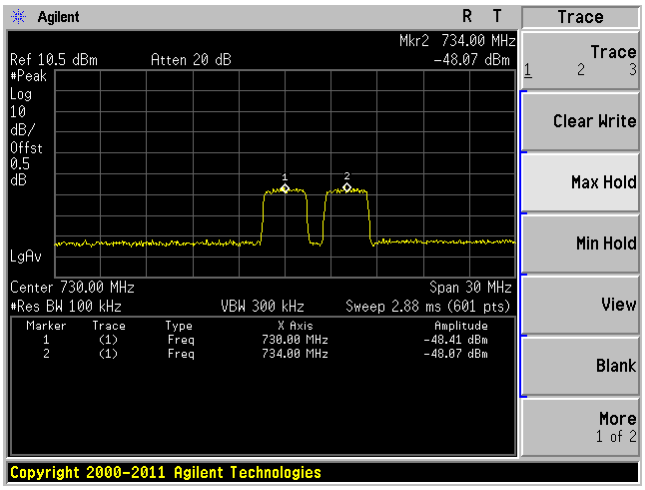


High Channel, Output

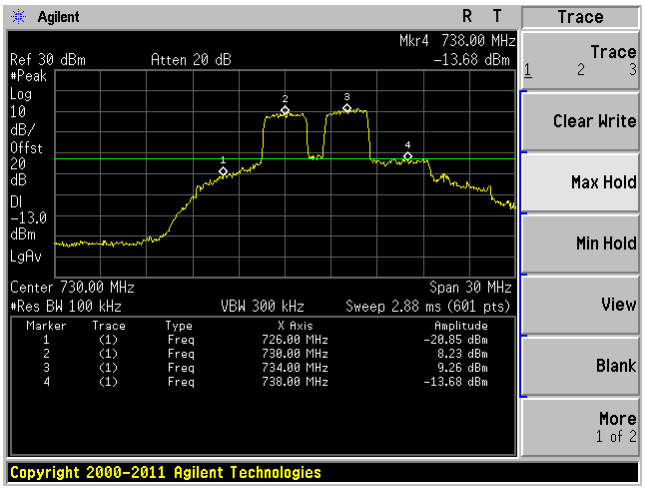


Modulation: QPSK (3 MHz)

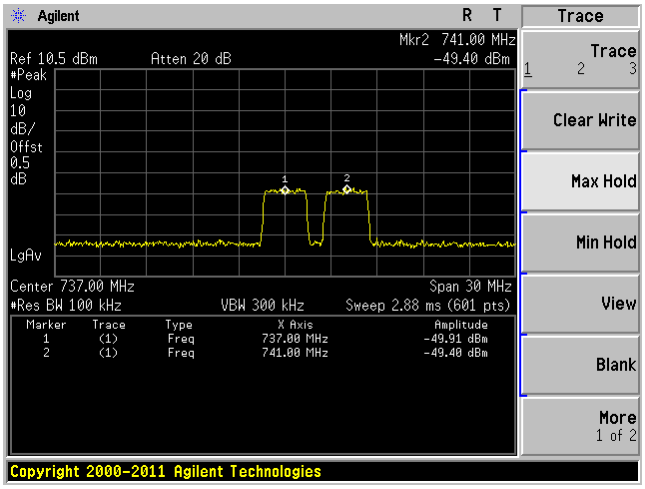
Low Channel, Input



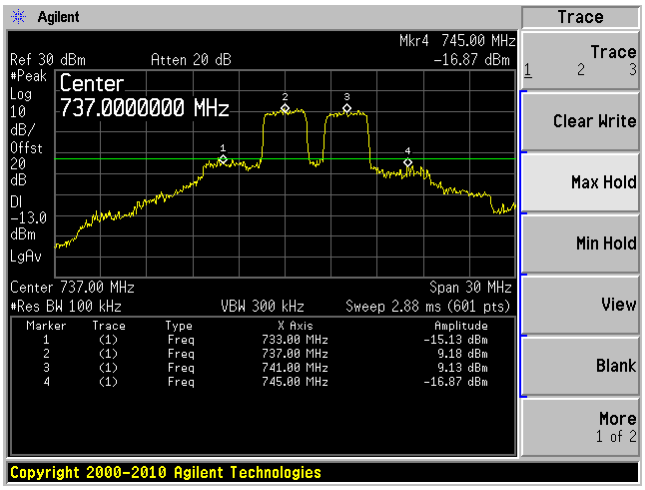
Low Channel, Output



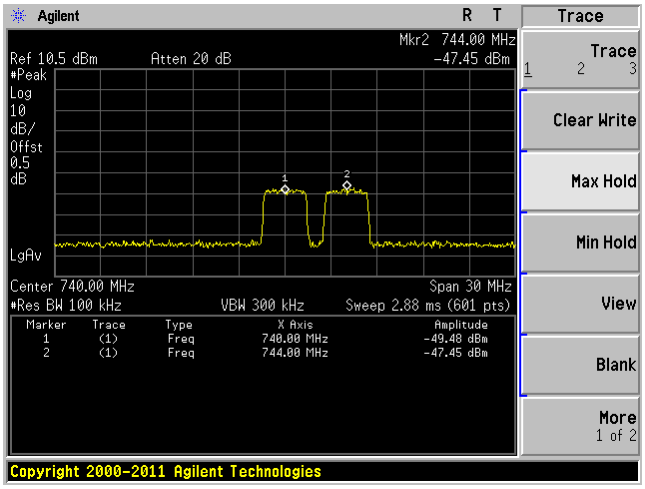
Middle Channel, Input



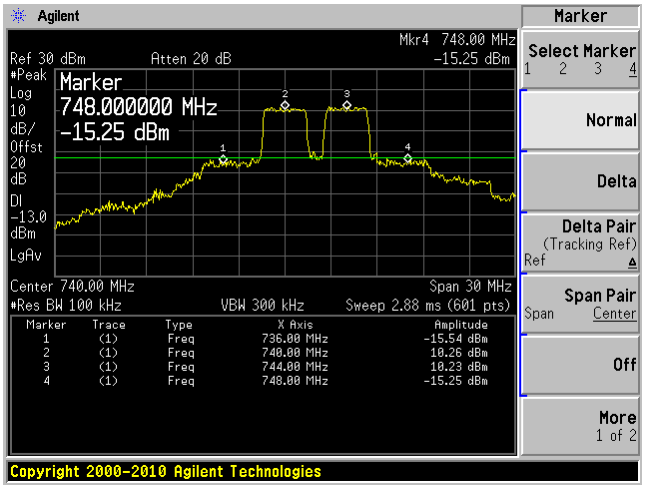
Middle Channel, Output



High Channel, Input

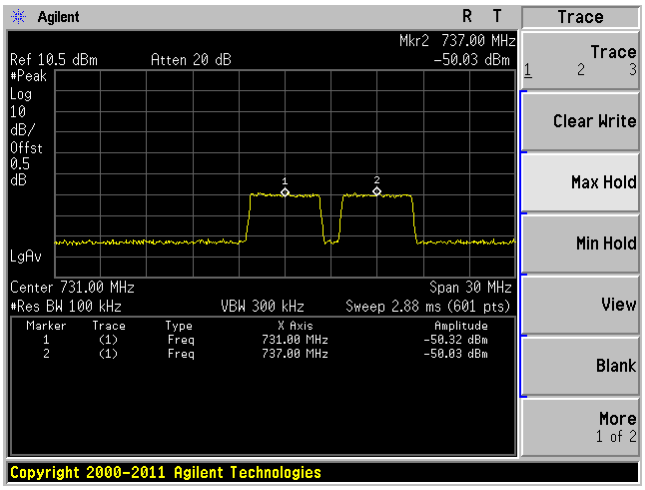


High Channel, Output

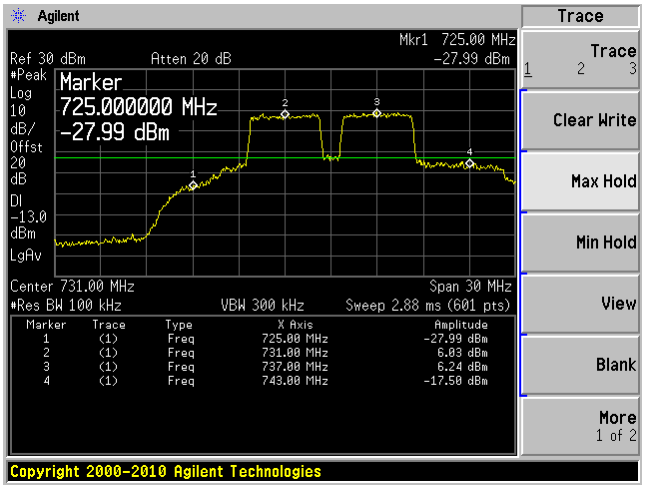


Modulation: QPSK (5 MHz)

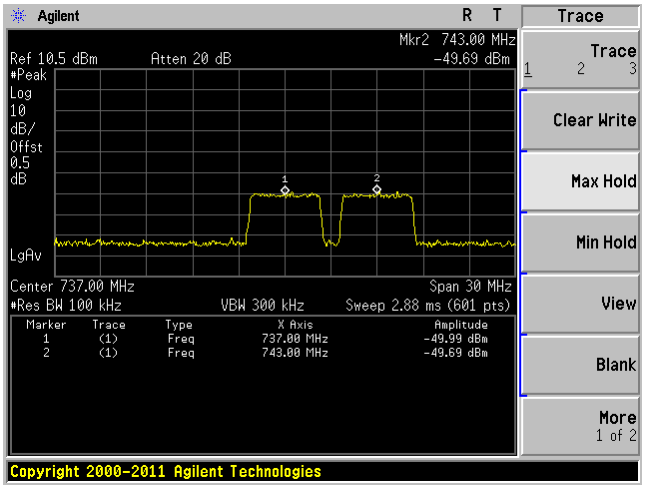
Low Channel, Input



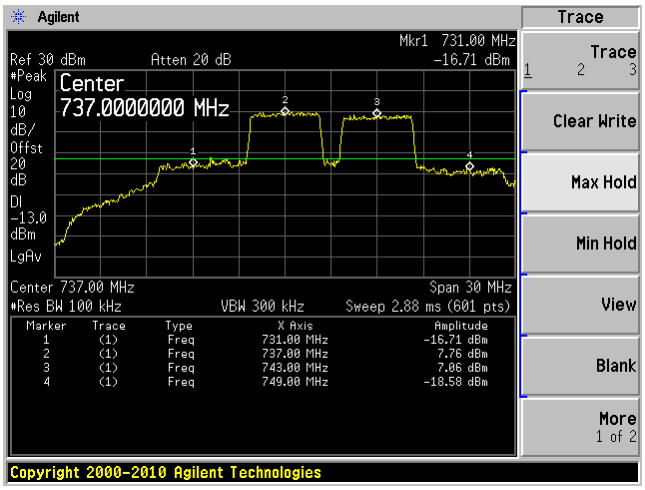
Low Channel, Output



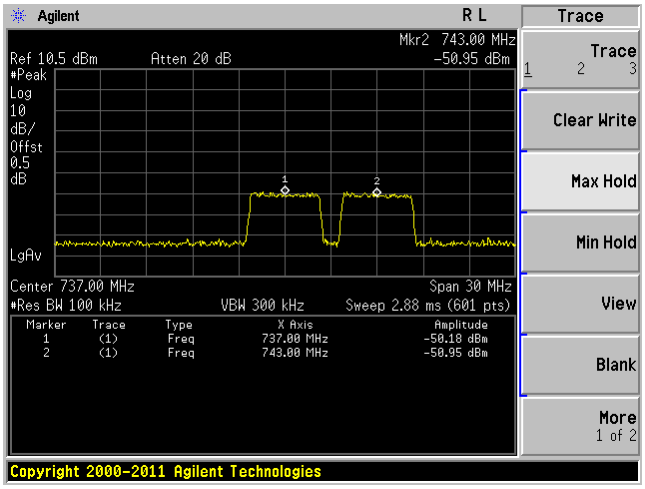
Middle Channel, Input



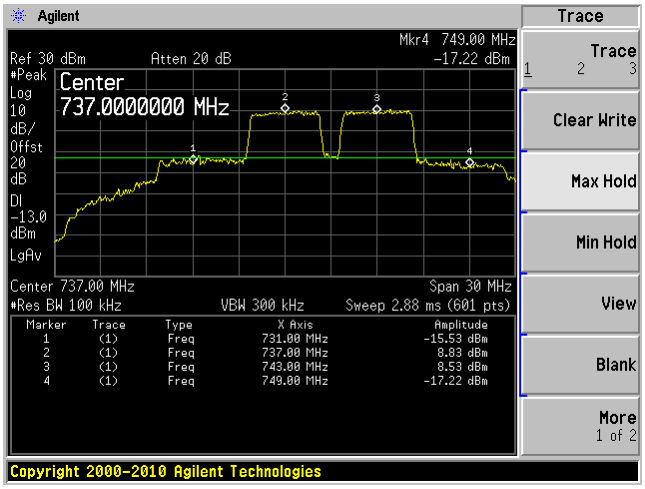
Middle Channel, Output



High Channel, Input



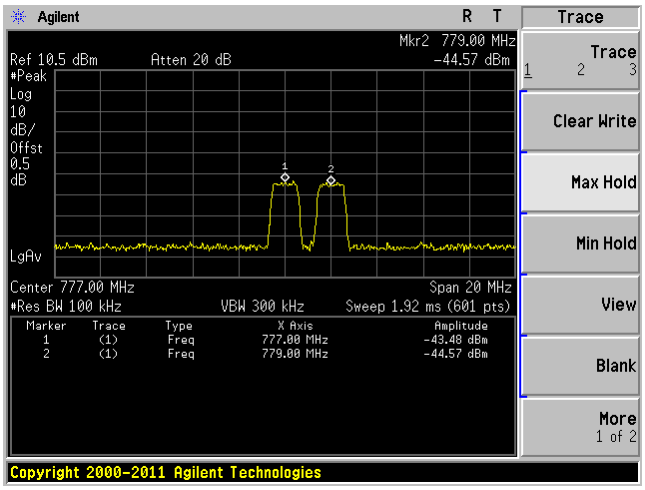
High Channel, Output



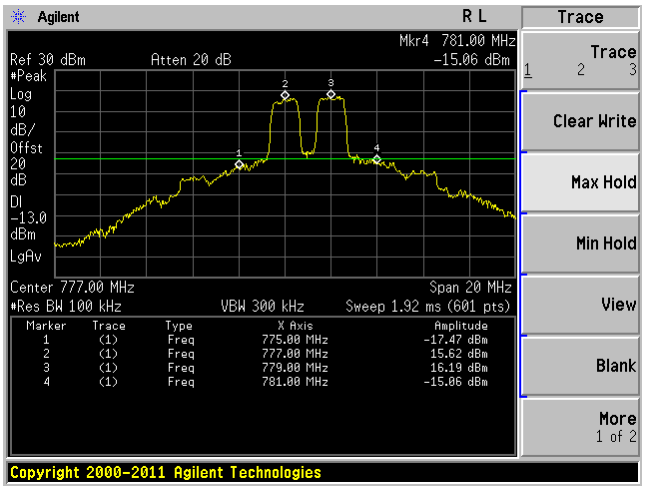
Upper LTE Band Uplink:

Modulation: QPSK (1.4 MHz)

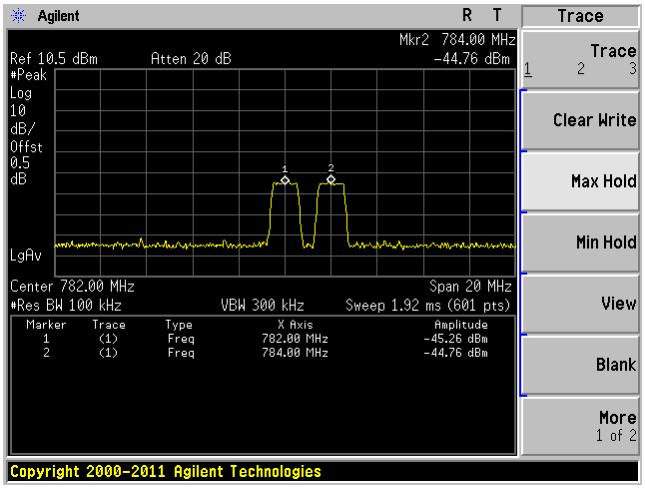
Low Channel, Input



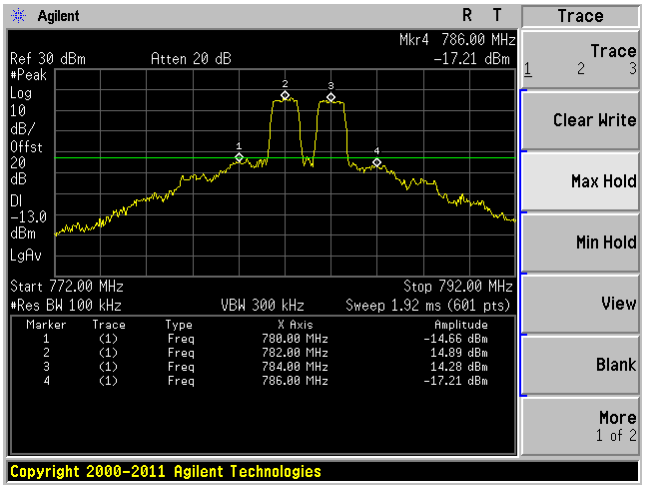
Low Channel, Output



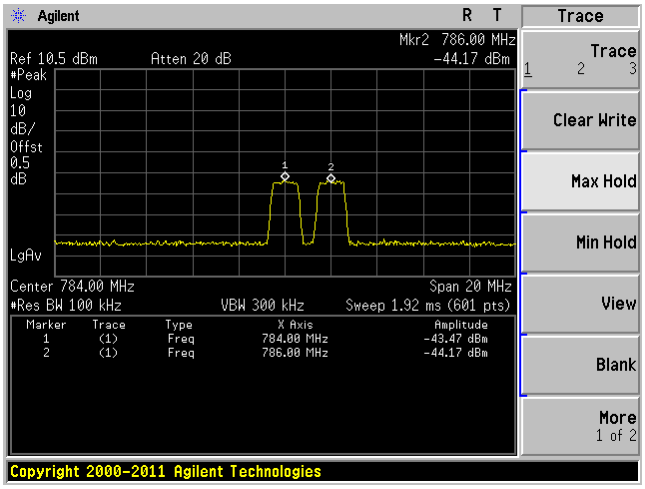
Middle Channel, Input



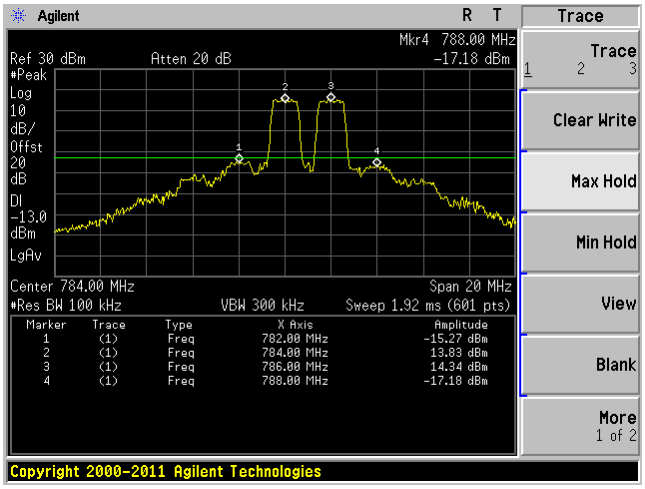
Middle Channel, Output



High Channel, Input

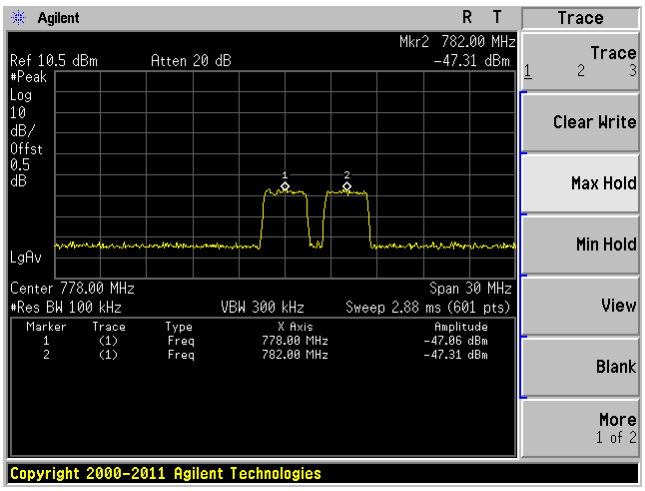


High Channel, Output

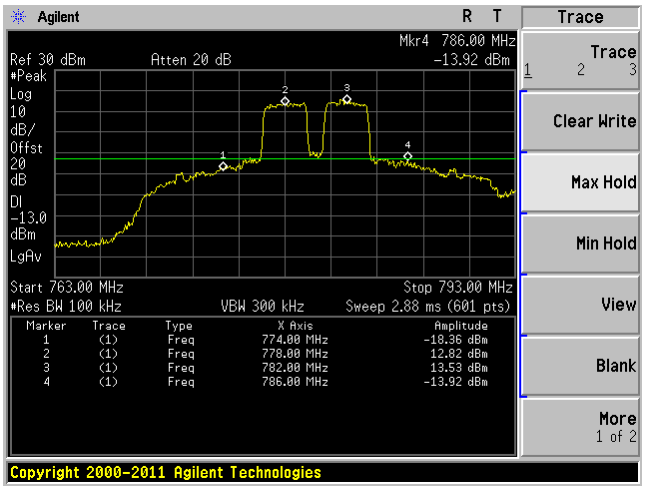


Modulation: QPSK (3 MHz)

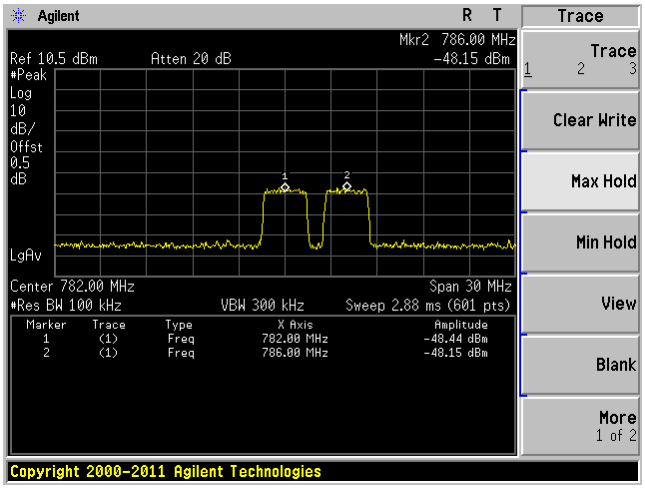
Low Channel, Input



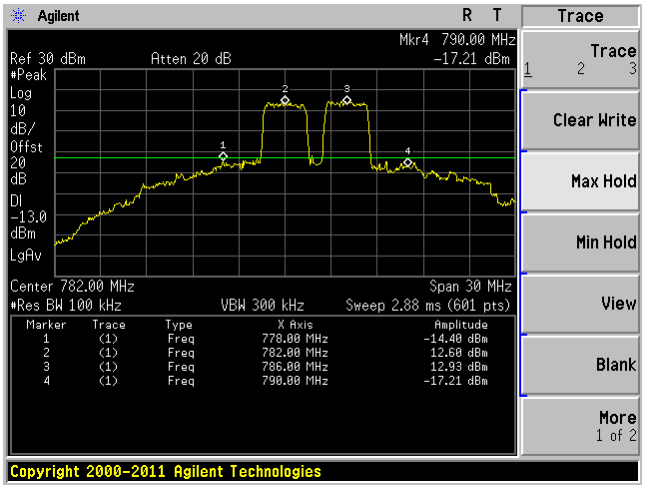
Low Channel, Output



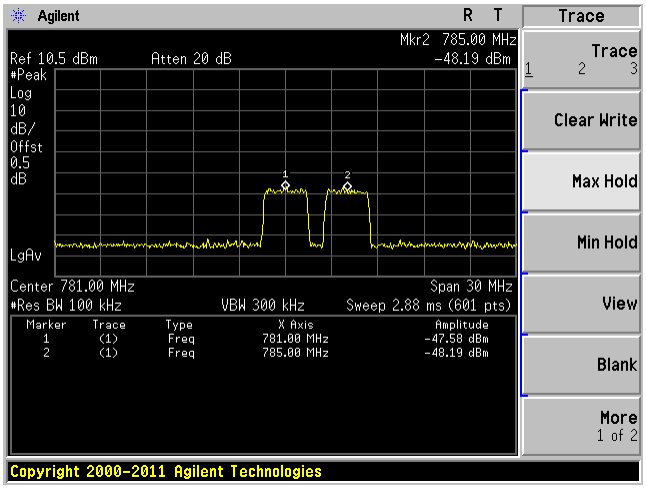
Middle Channel, Input



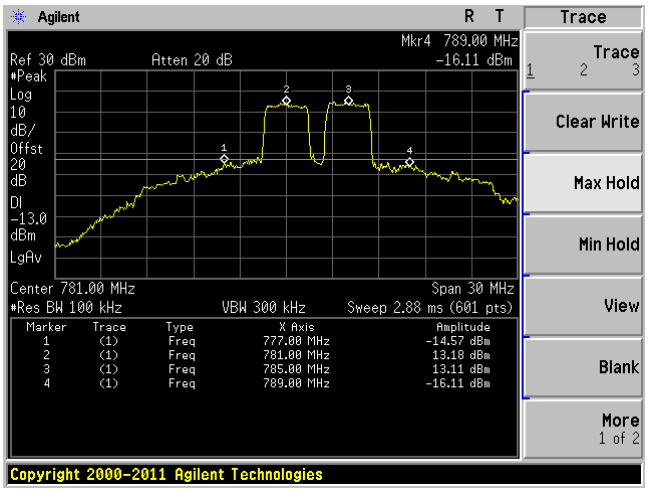
Middle Channel, Output



High Channel, Input



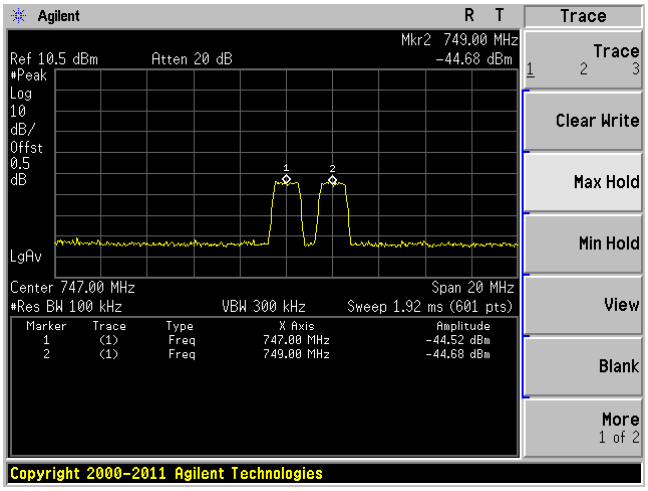
High Channel, Output



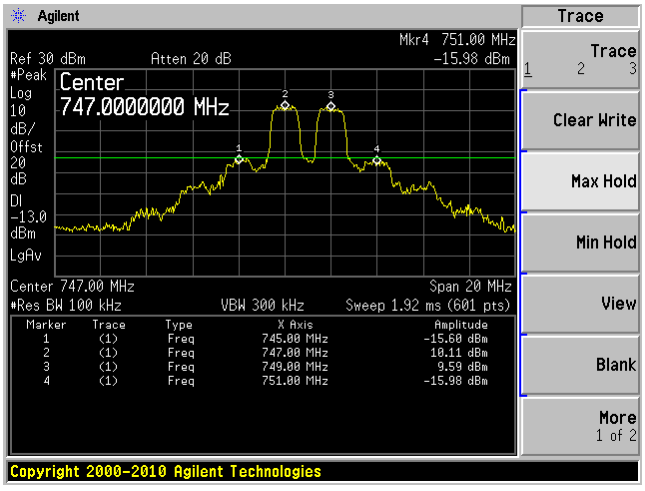
Upper LTE Band Downlink:

Modulation: QPSK (1.4 MHz)

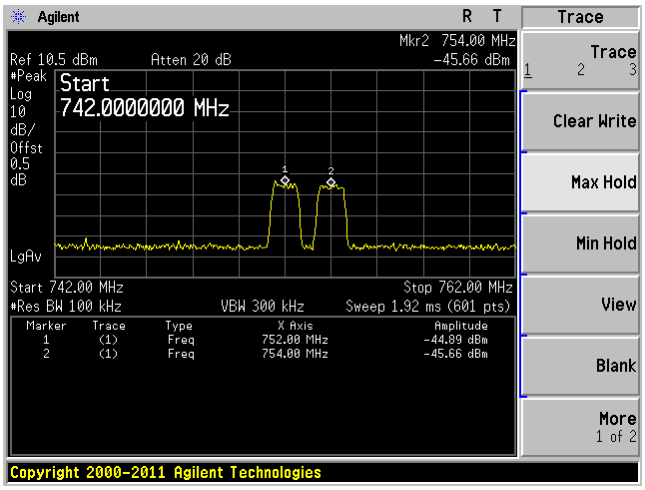
Low Channel, Input



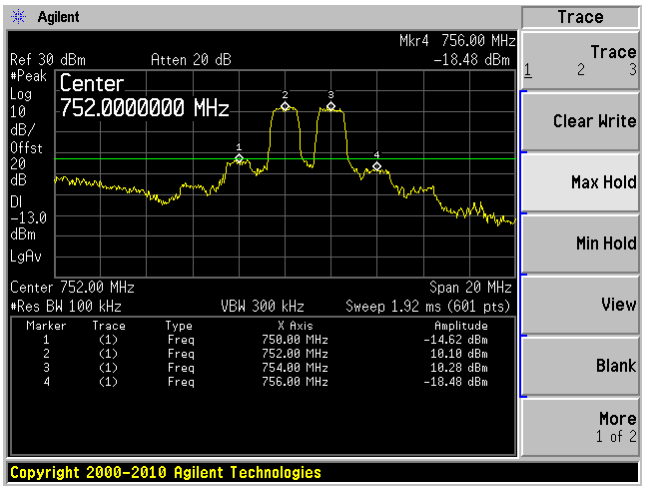
Low Channel, Output



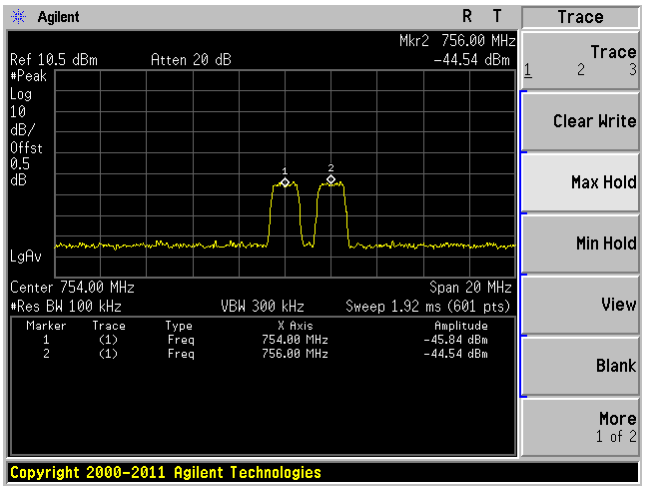
Middle Channel, Input



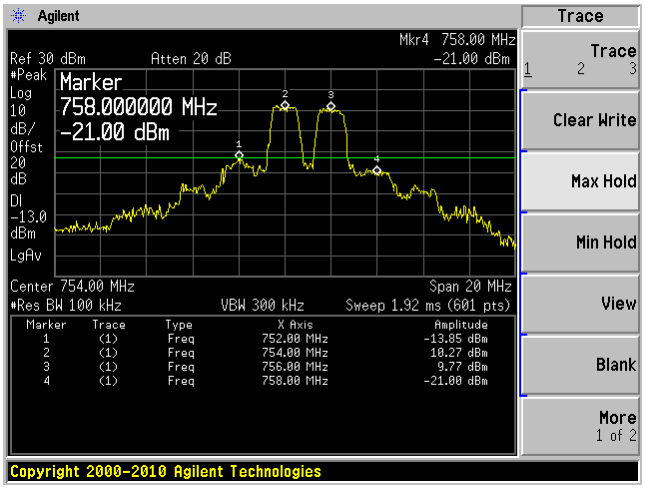
Middle Channel, Output



High Channel, Input

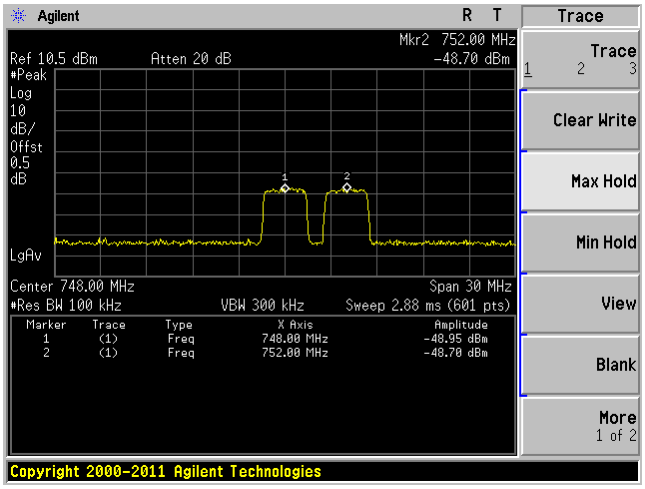


High Channel, Output

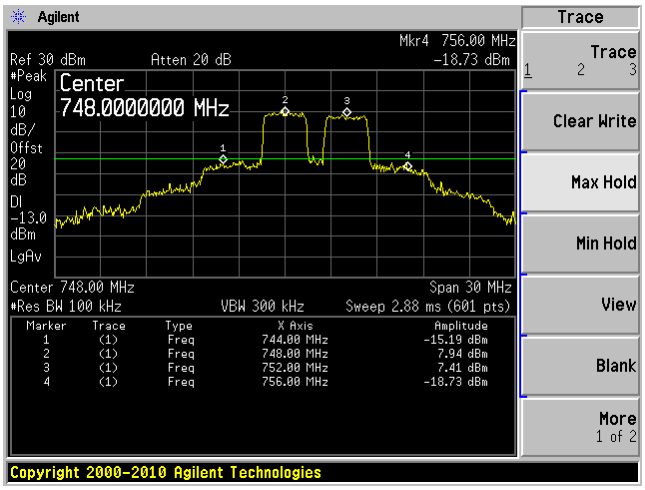


Modulation: QPSK (3 MHz)

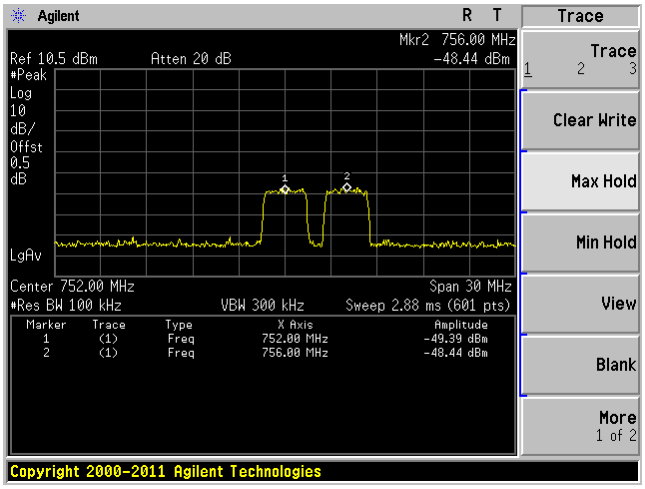
Low Channel, Input



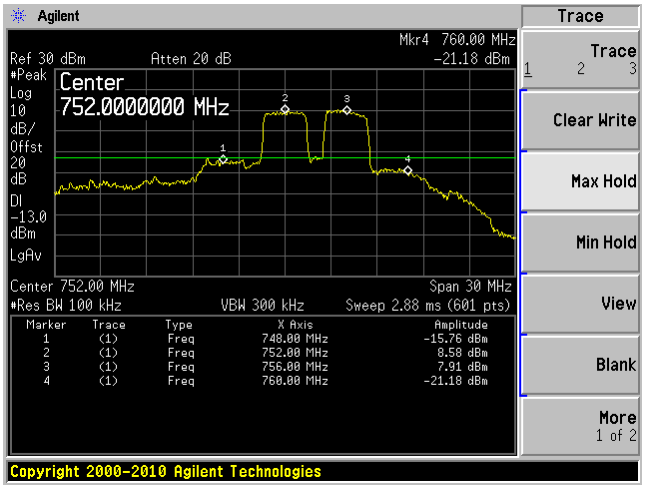
Low Channel, Output



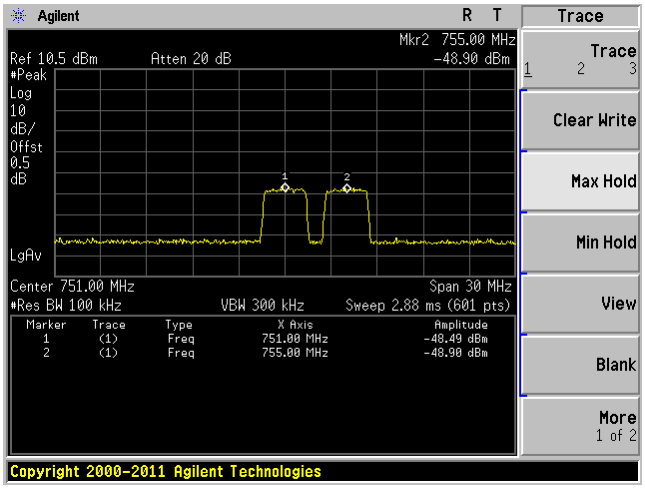
Middle Channel, Input



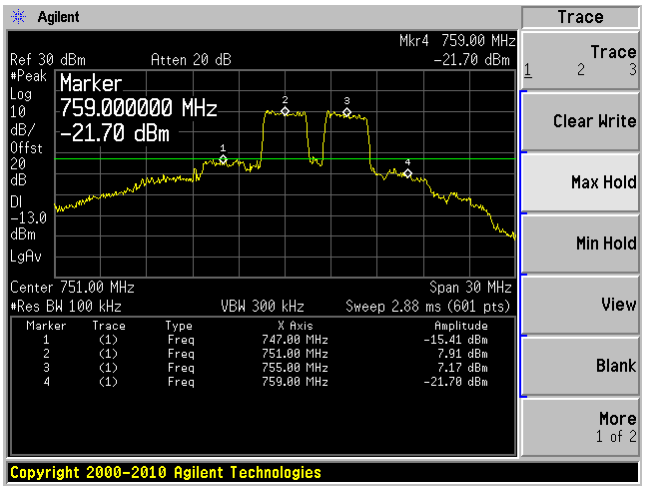
Middle Channel, Output



High Channel, Input

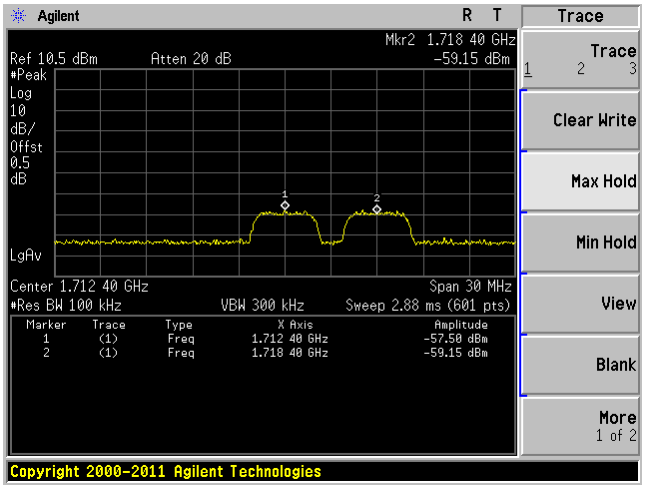


High Channel, Output

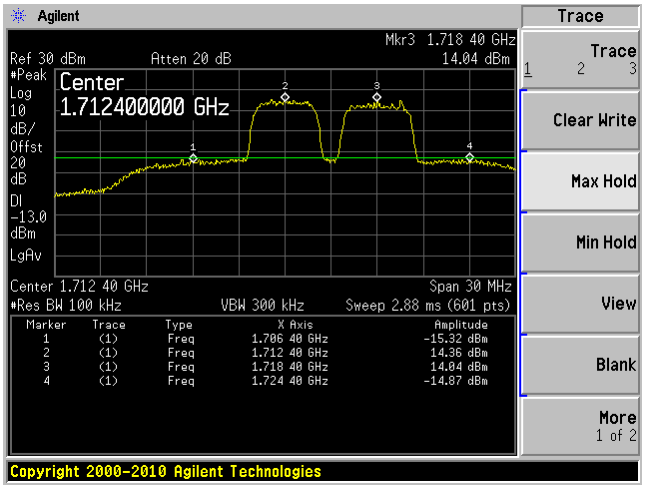


AWS Band Uplink:

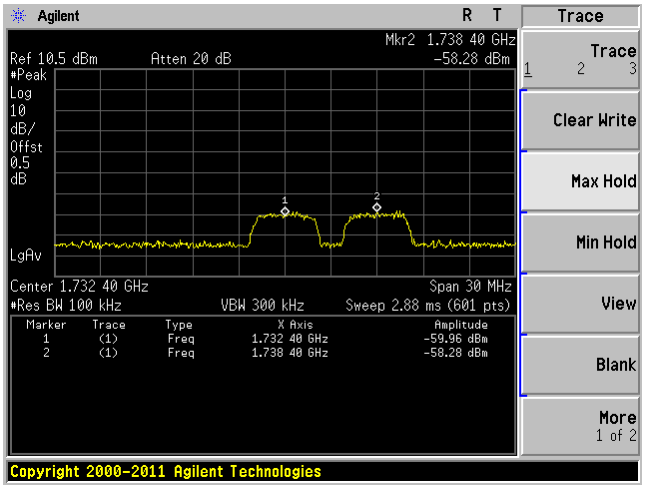
Low Channel, Input



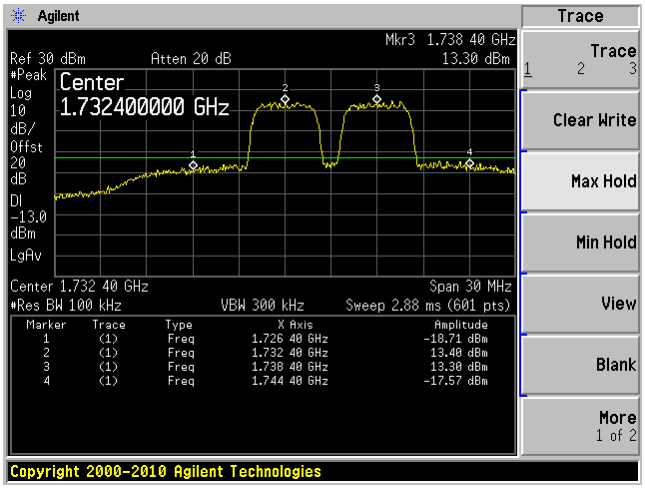
Low Channel, Output



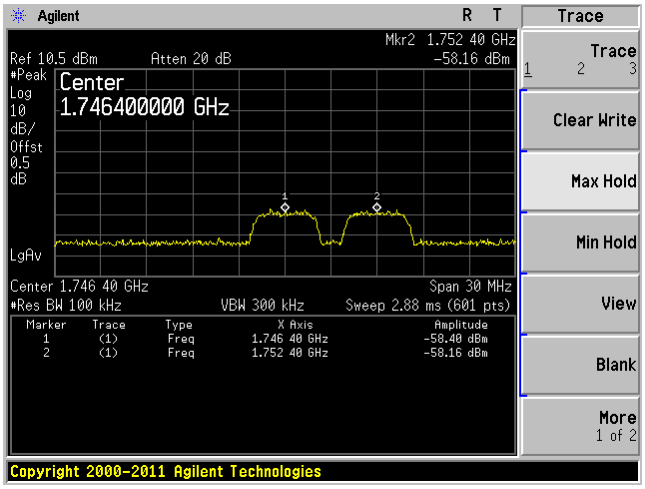
Middle Channel, Input



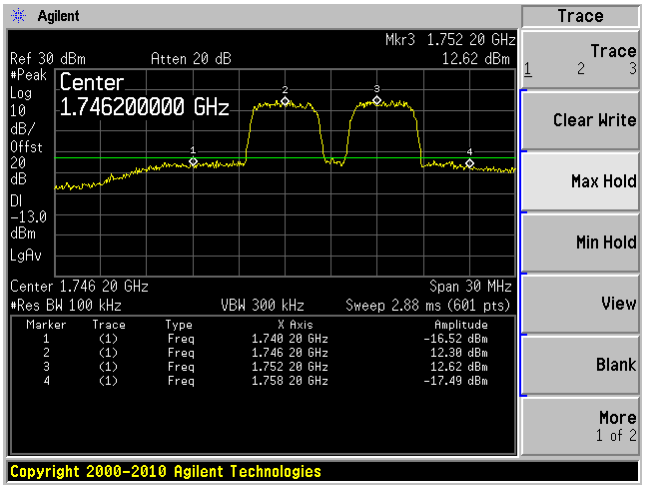
Middle Channel, Output



High Channel, Input

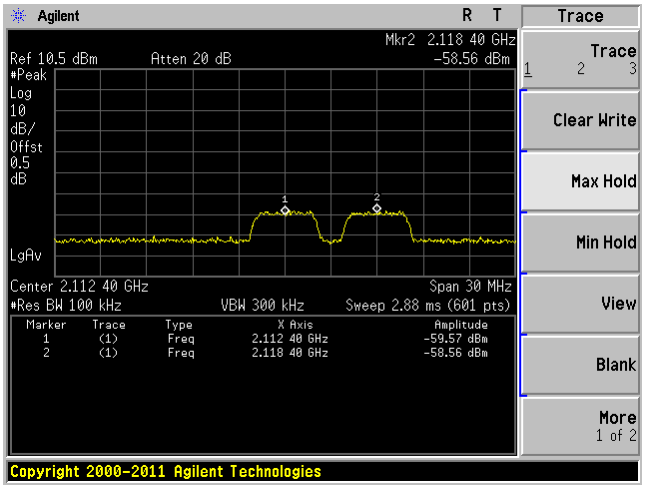


High Channel, Output

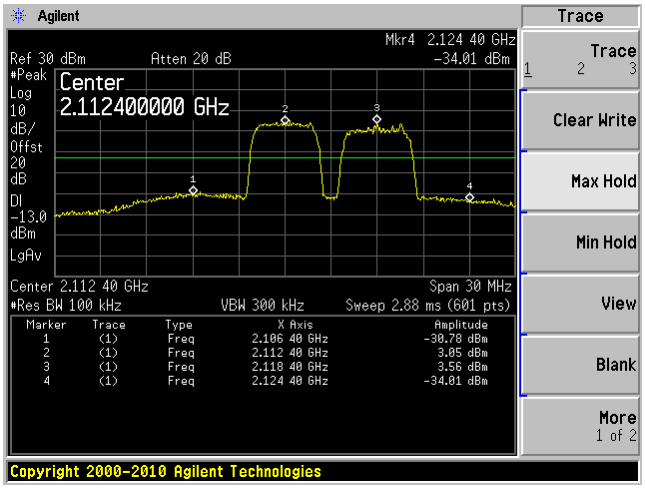


AWS Band Downlink:

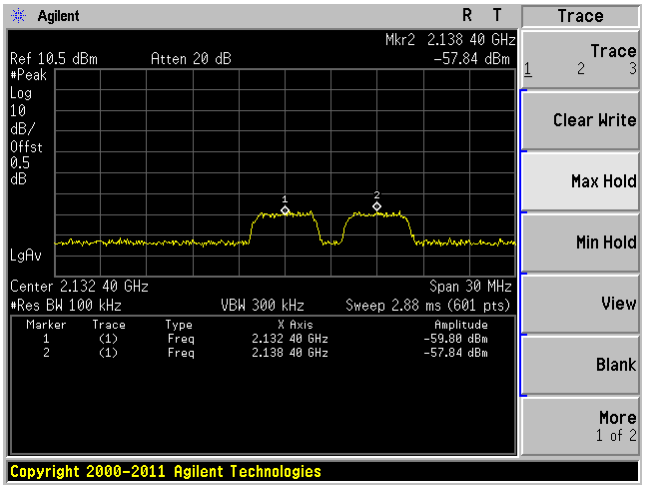
Low Channel, Input



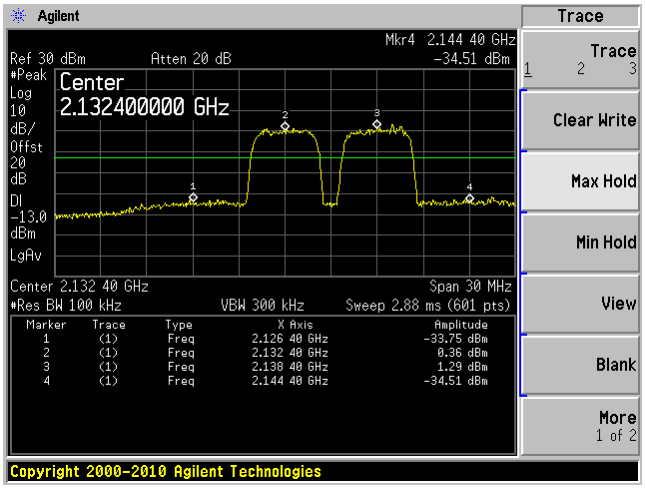
Low Channel, Output



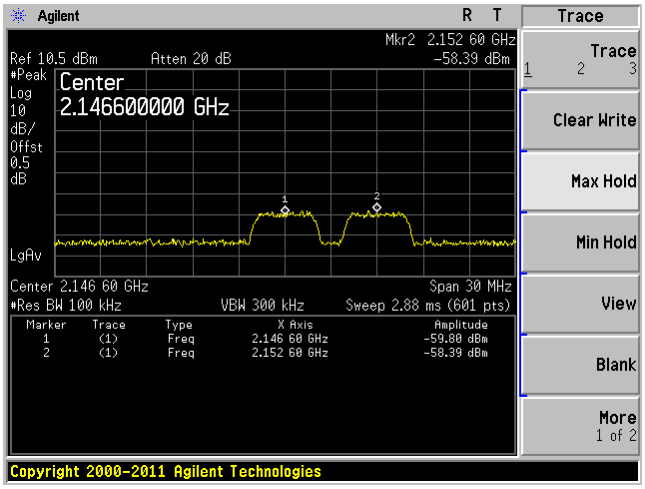
Middle Channel, Input



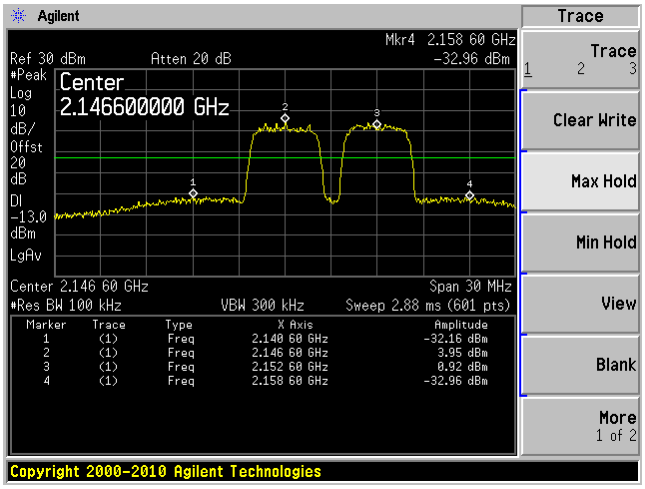
Middle Channel, Output



High Channel, Input



High Channel, Output



8 FCC §22.917 & §24.238, & §27.53 – Band Edge

8.1 Applicable Standard

According to FCC §22.917, §24.238, and §27.53, the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

8.2 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency.

8.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates	Calibration Interval
Agilent	Spectrum Analyzer	E4440A	US45303156	2010-08-09	2 years
Agilent	Signal Generator	E4438C	MY45091309	2012-05-03	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

8.4 Test Environmental Conditions

Temperature:	21 °C
Relative Humidity:	42 %
ATM Pressure:	101kPa

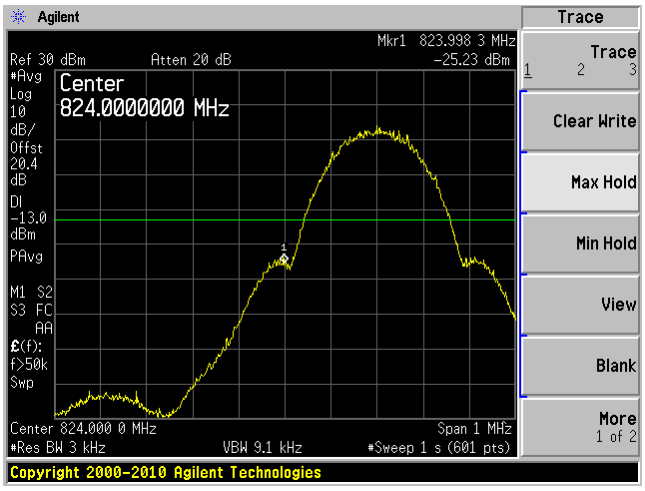
The testing was performed by Jeffrey Wu on 2012-06-26 in the RF Site.

8.5 Test Results

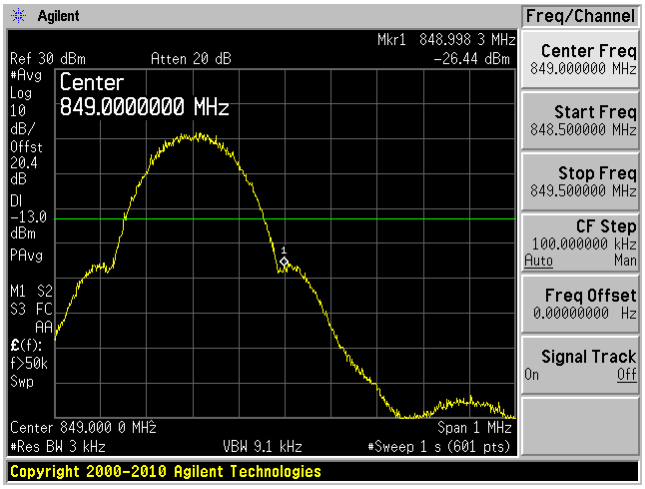
Please refer to the following plots.

Cell Band Uplink:

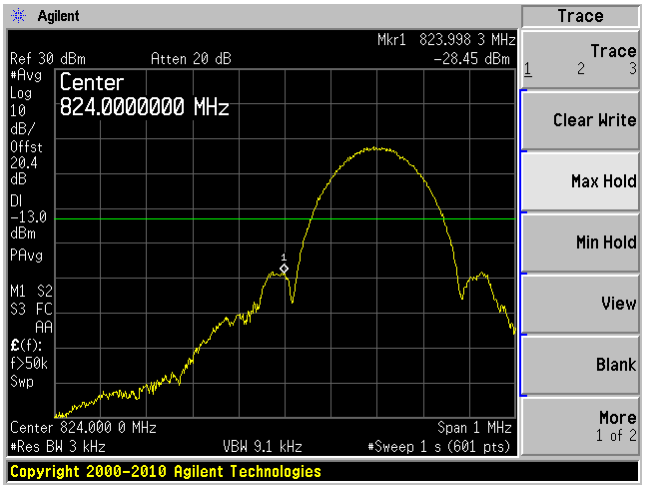
GSM - Low Channel



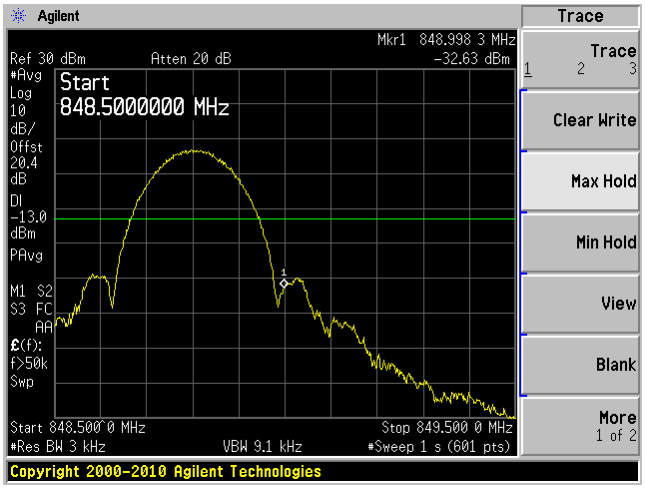
GSM - High Channel



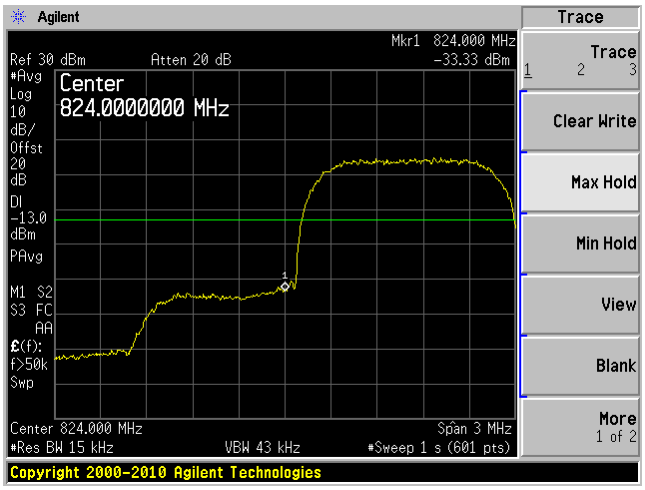
EDGE - Low Channel



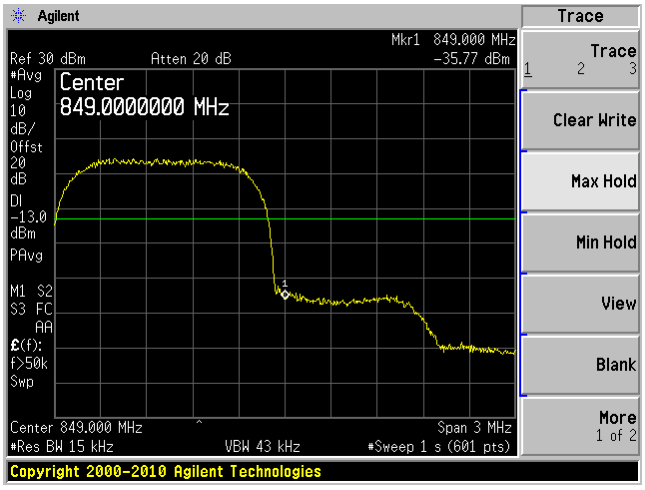
EDGE - High Channel



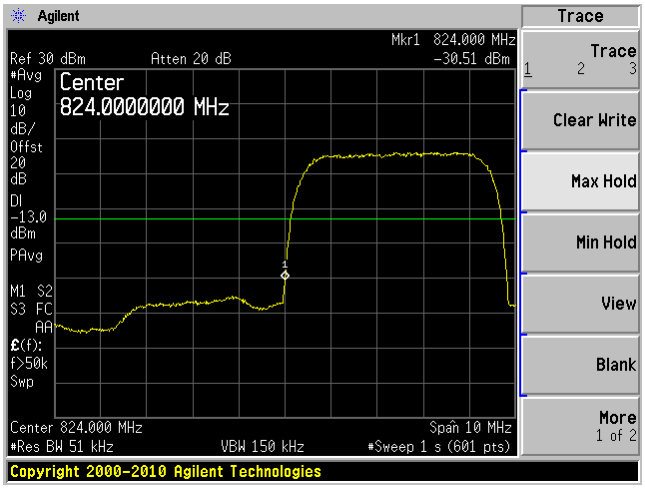
CDMA - Low Channel



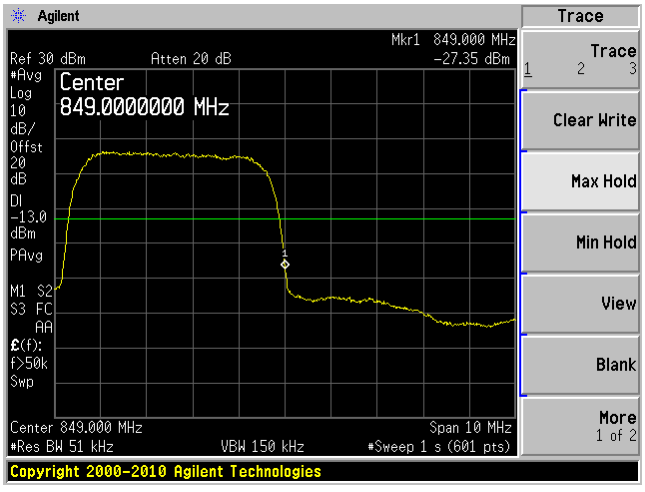
CDMA - High Channel



WCDMA - Low Channel

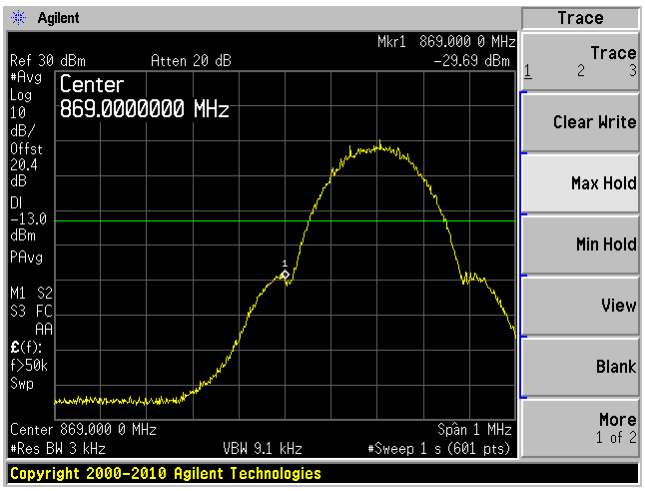


WCDMA - High Channel

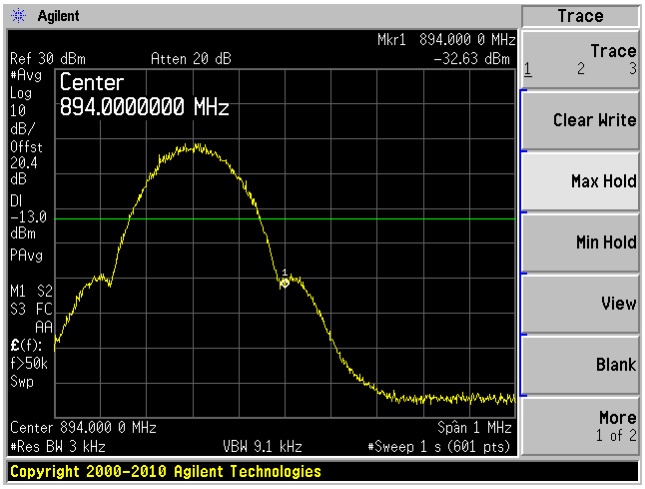


Cell Band Downlink:

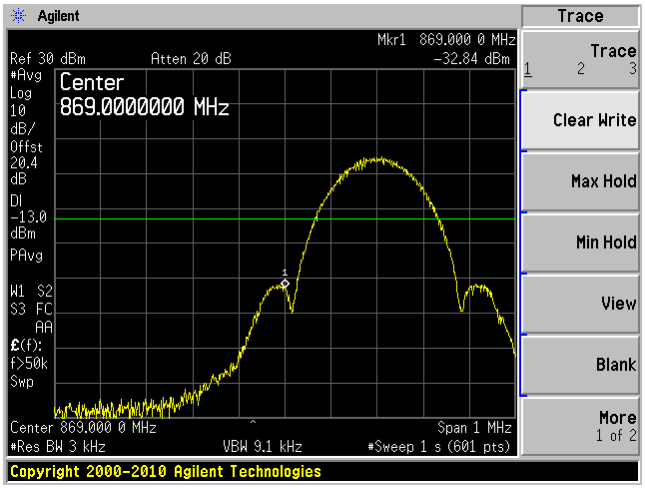
GSM - Low Channel



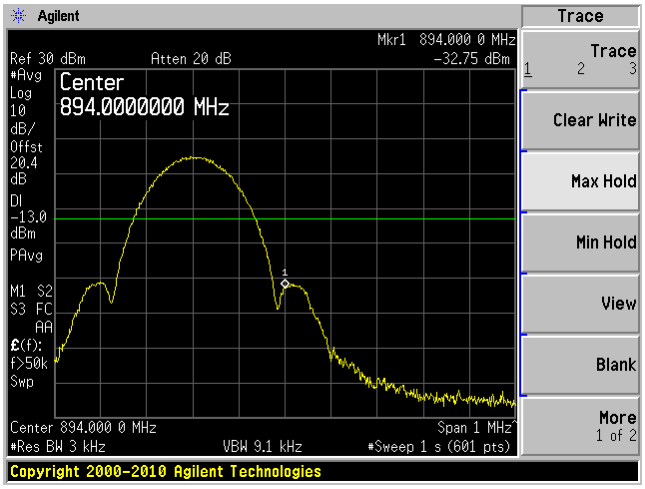
GSM - High Channel



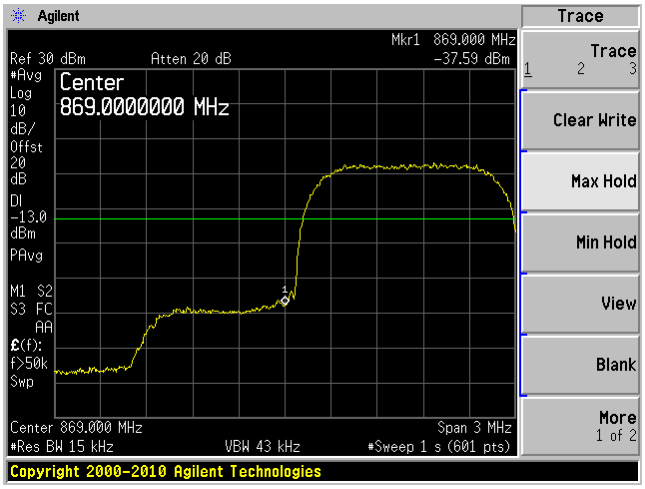
EDGE - Low Channel



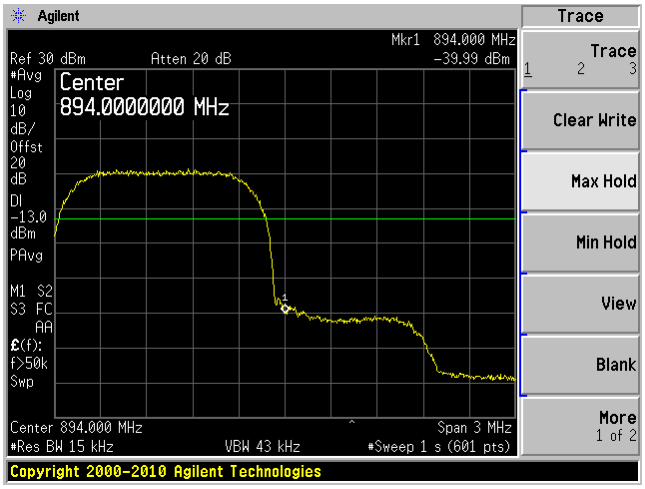
EDGE - High Channel



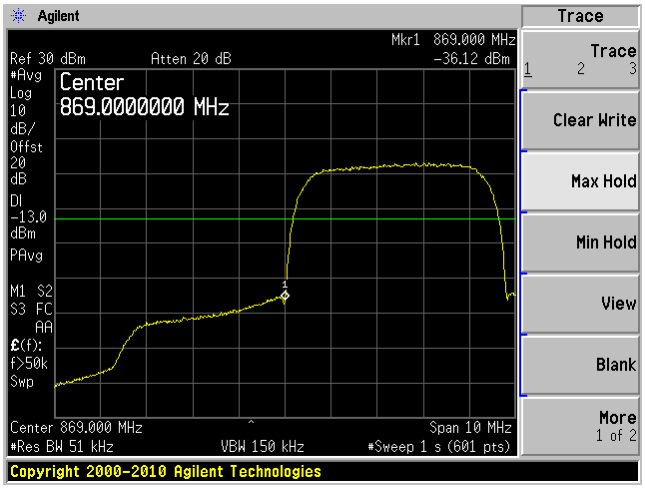
CDMA - Low Channel



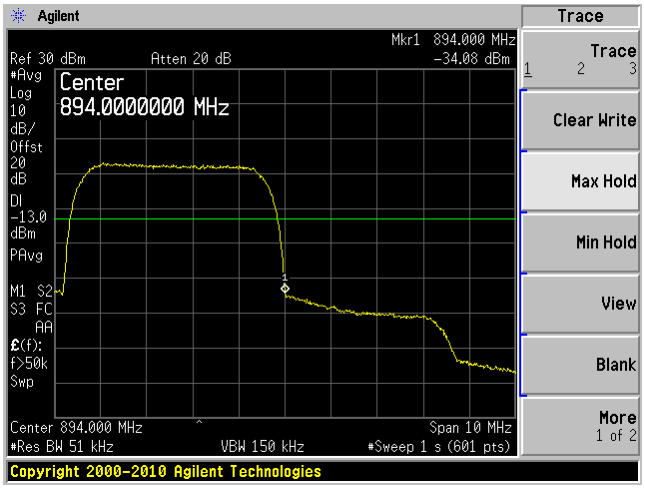
CDMA - High Channel



WCDMA - Low Channel

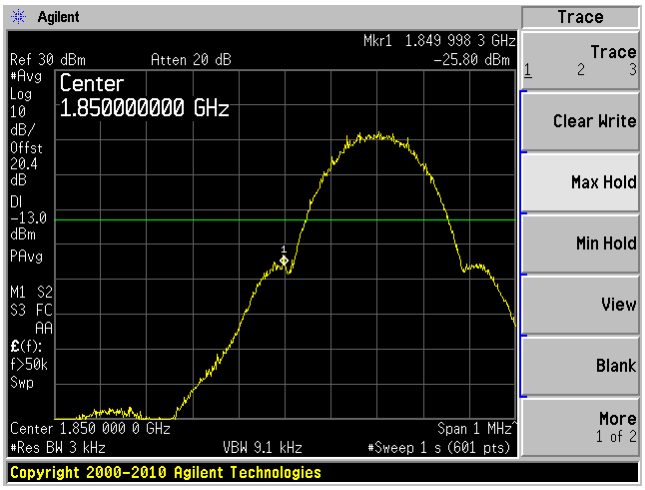


WCDMA - High Channel

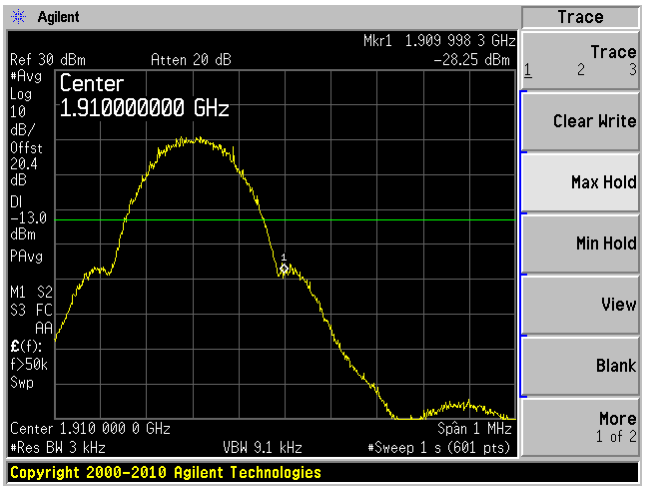


PCS Band Uplink:

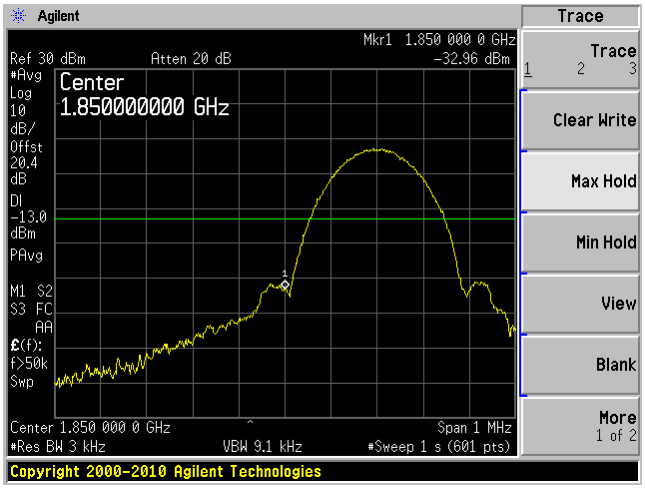
GSM - Low Channel



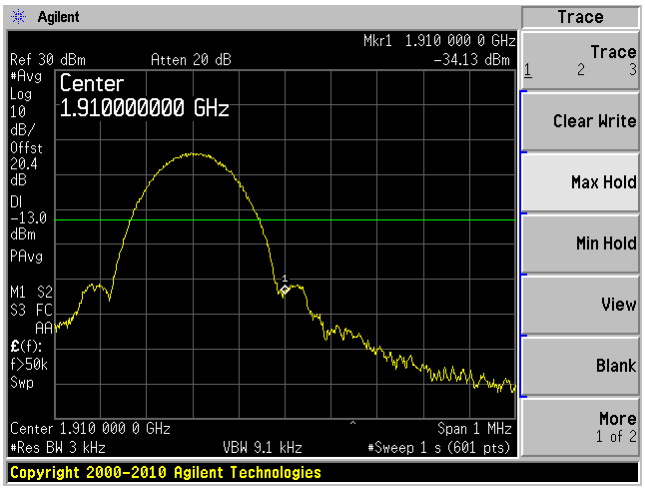
GSM - High Channel



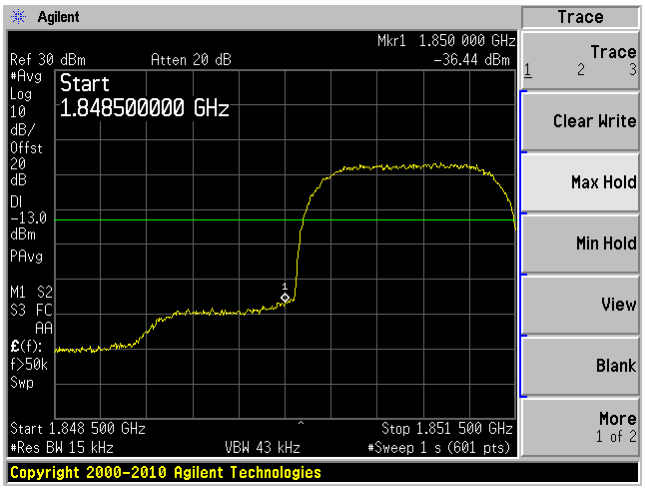
EDGE - Low Channel



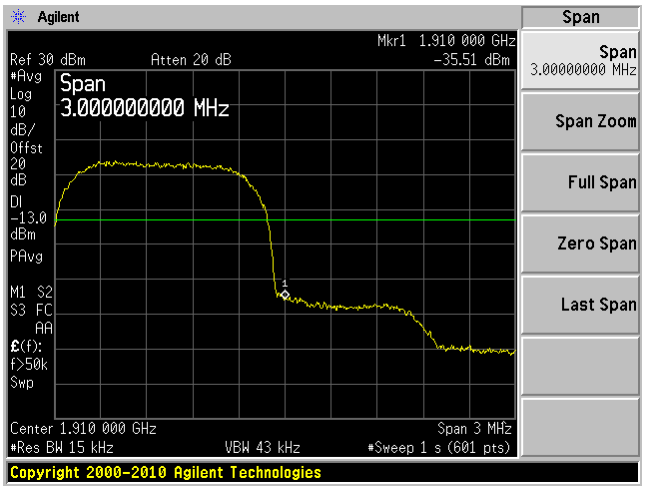
EDGE - High Channel



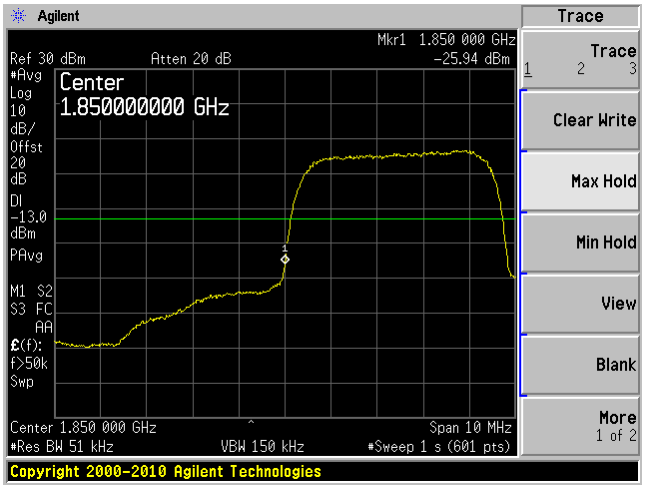
CDMA - Low Channel



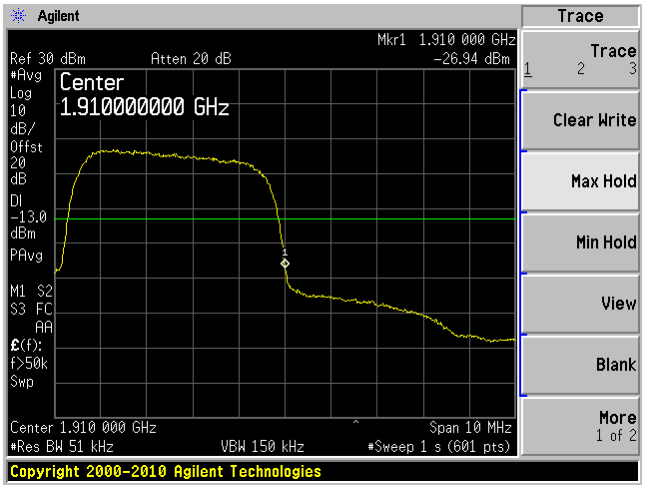
CDMA - High Channel



WCDMA - Low Channel

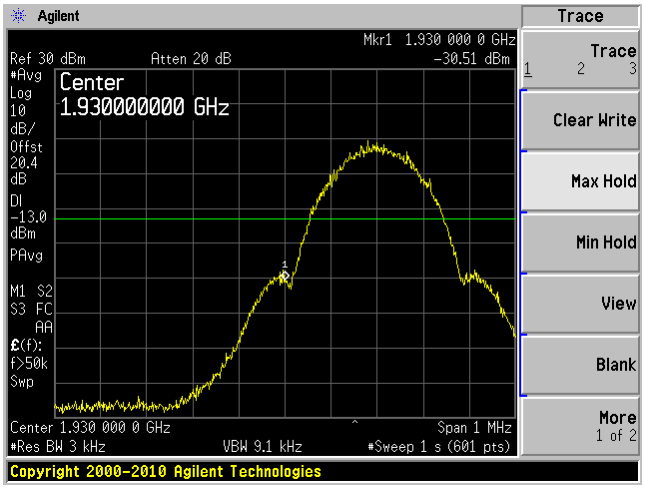


WCDMA - High Channel

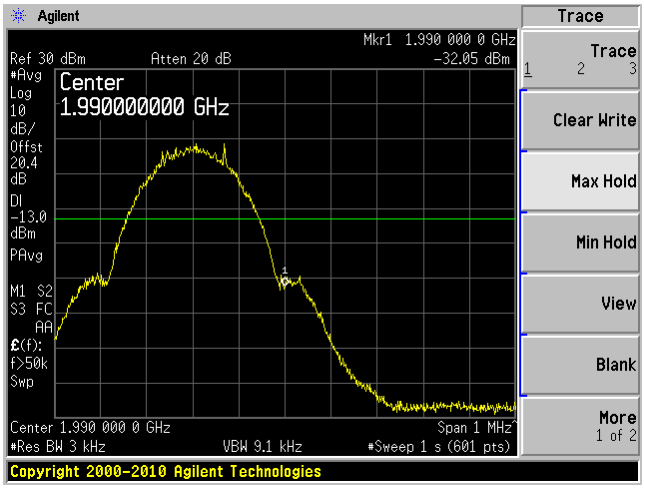


PCS Band Downlink:

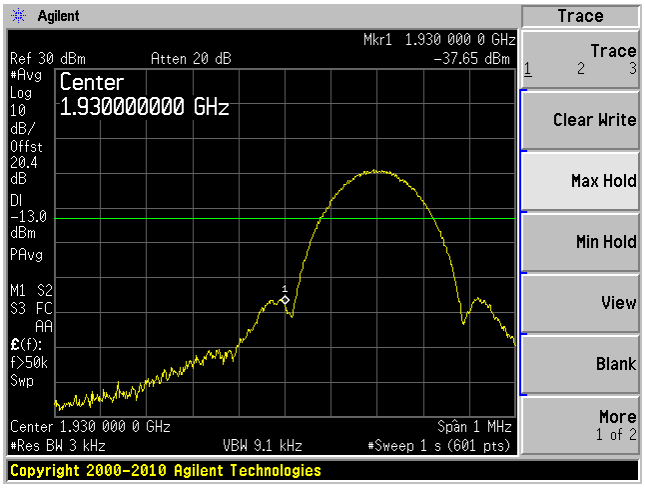
GSM - Low Channel



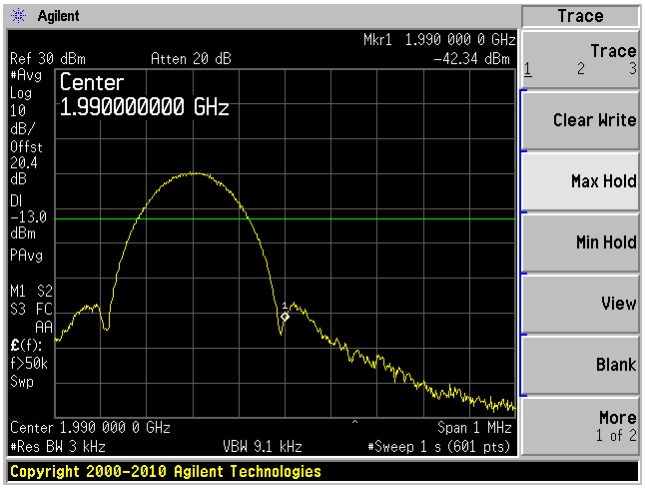
GSM - High Channel



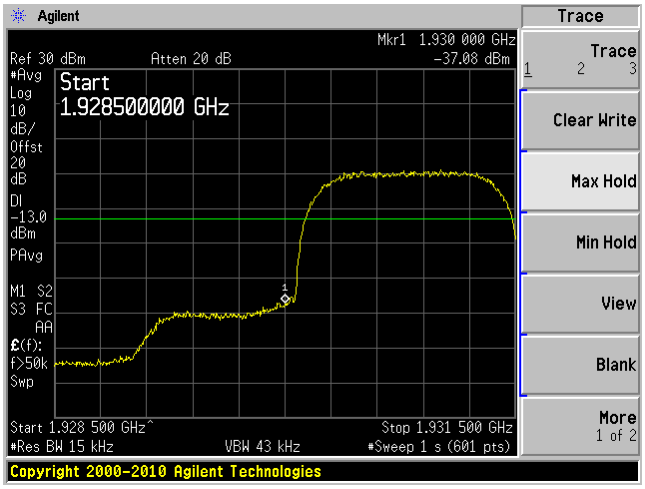
EDGE - Low Channel



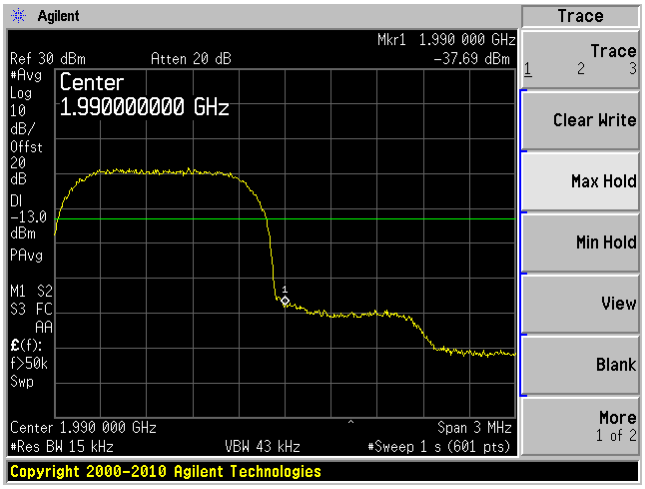
EDGE - High Channel



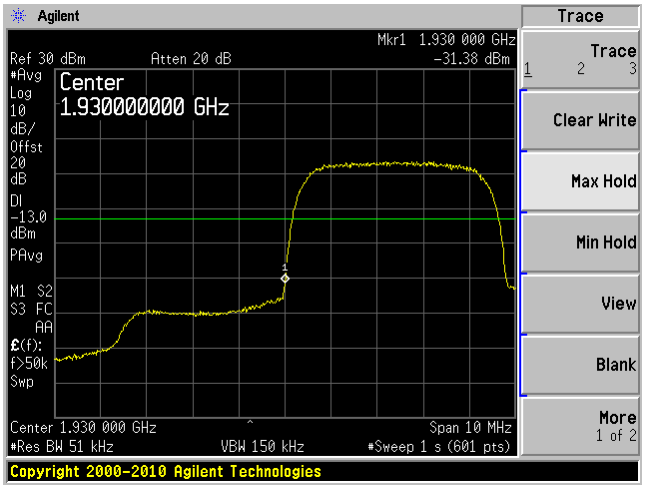
CDMA - Low Channel



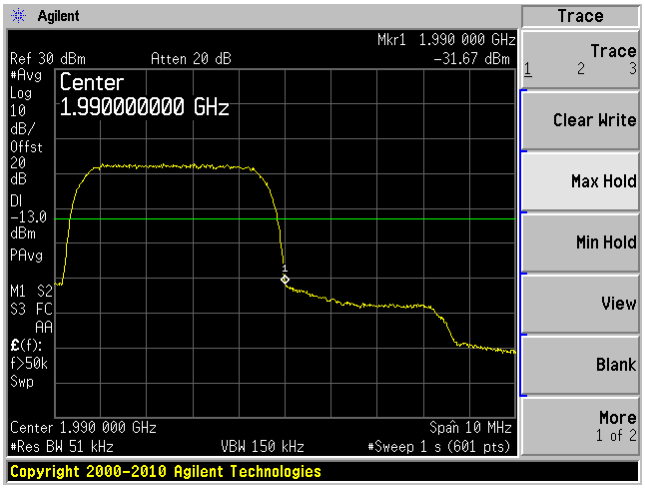
CDMA - High Channel



WCDMA - Low Channel

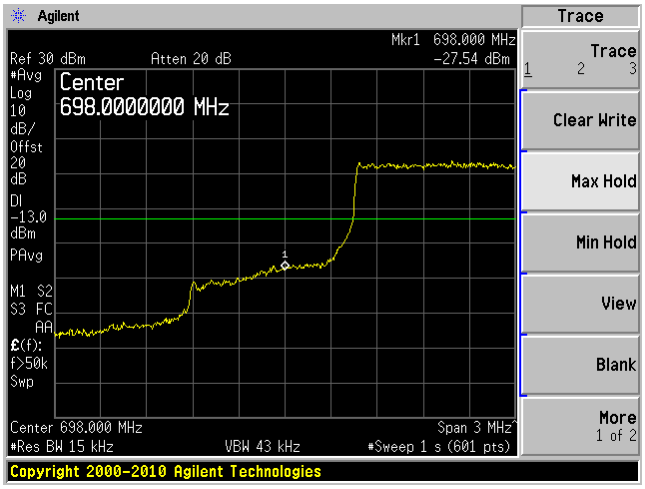


WCDMA - High Channel

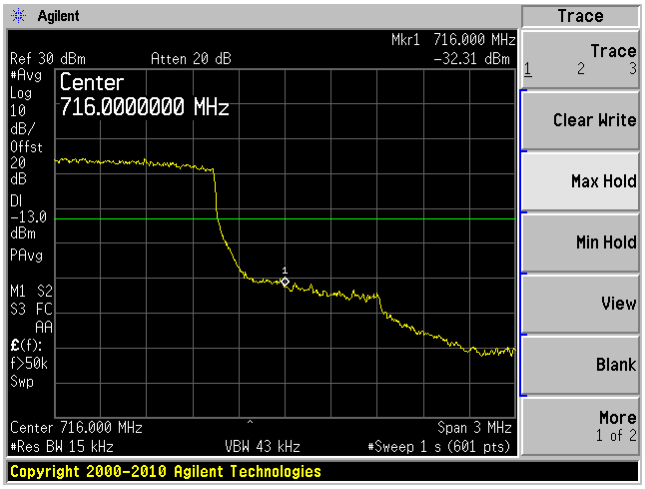


Lower LTE Band Uplink:

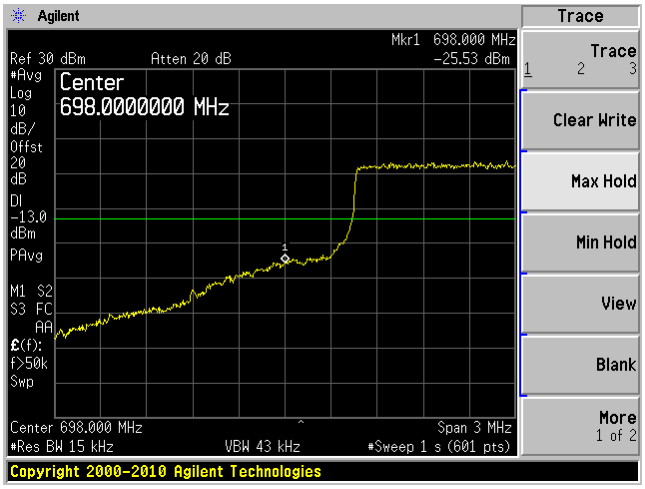
QPSK (1.4 MHz) - Low Channel



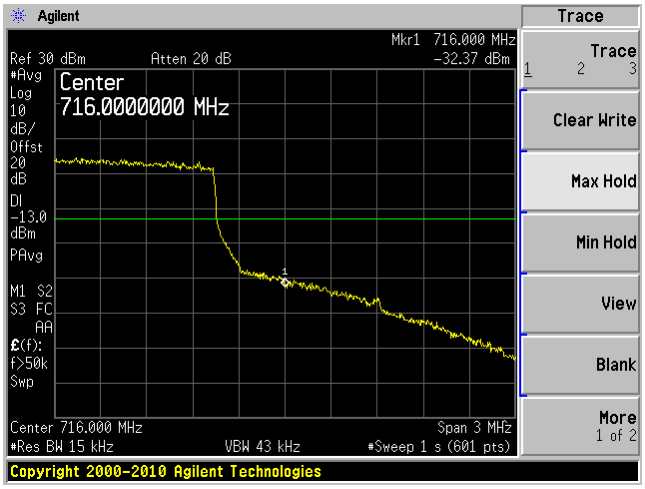
QPSK (1.4 MHz) - High Channel



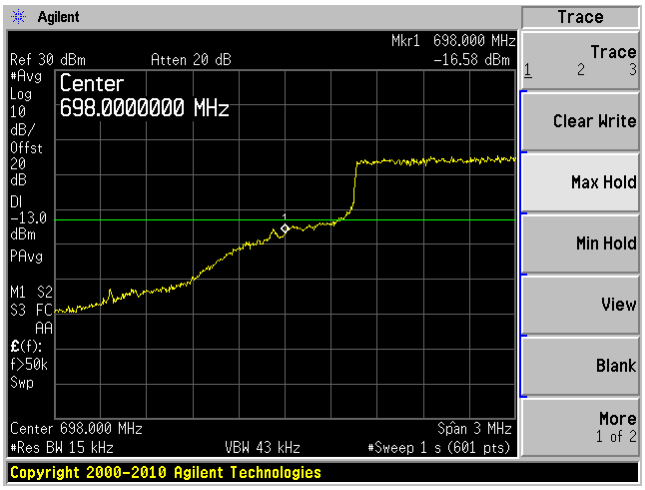
16QAM (1.4 MHz) - Low Channel



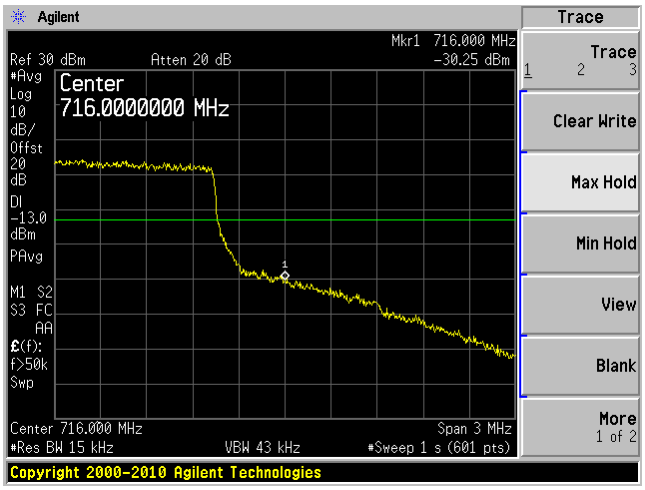
16QAM (1.4 MHz) - High Channel



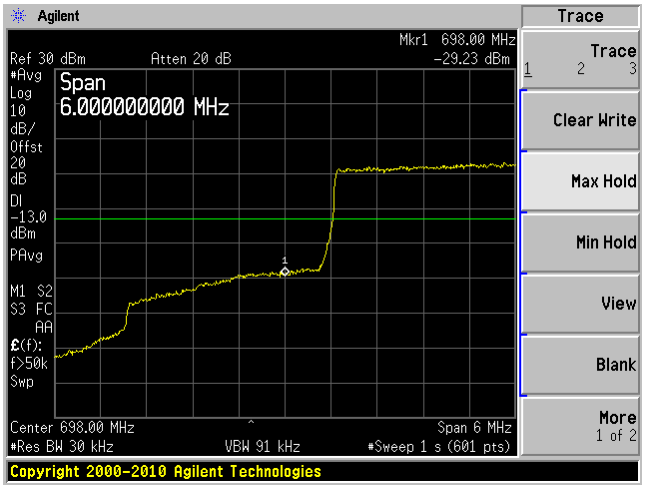
64QAM (1.4 MHz) - Low Channel



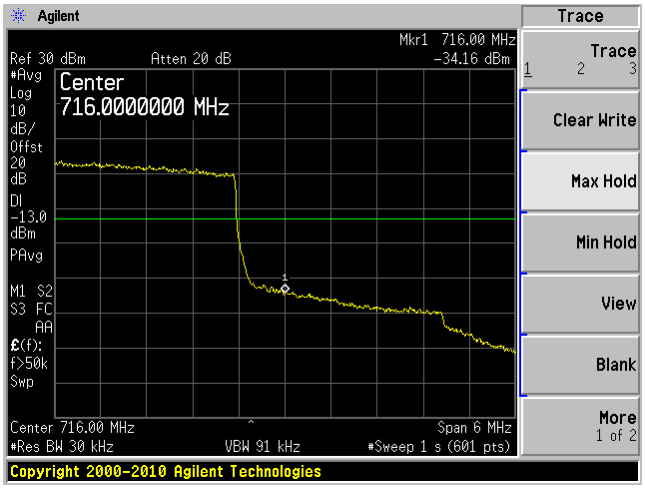
64QAM (1.4 MHz) - High Channel



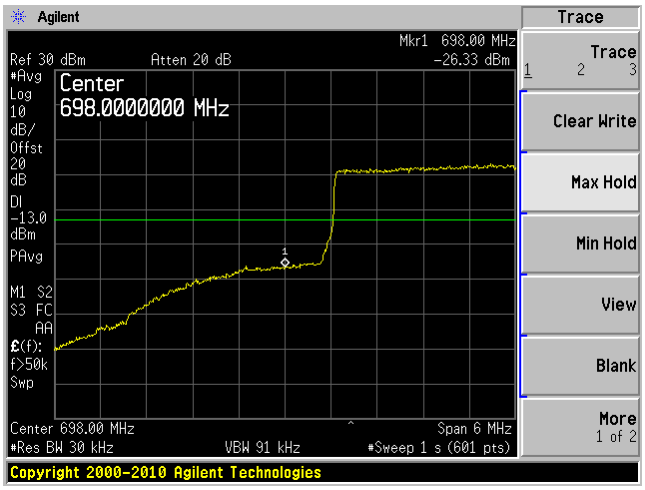
QPSK (3 MHz) - Low Channel



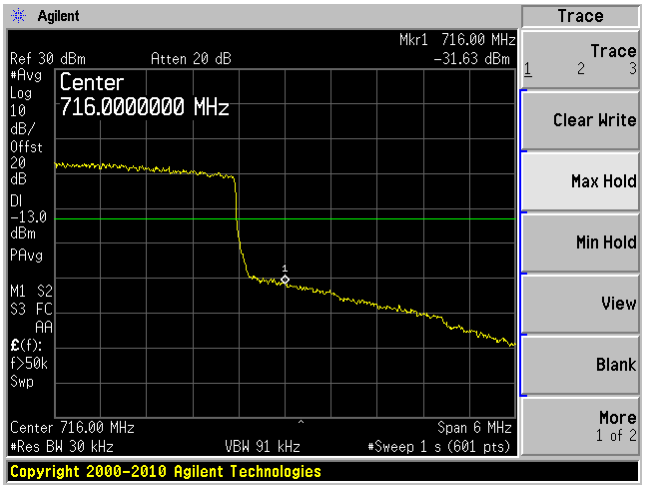
QPSK (3 MHz) - High Channel



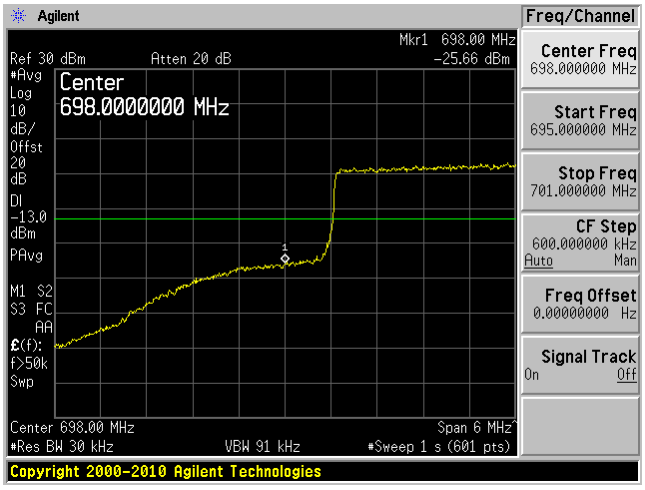
16QAM (3 MHz) - Low Channel



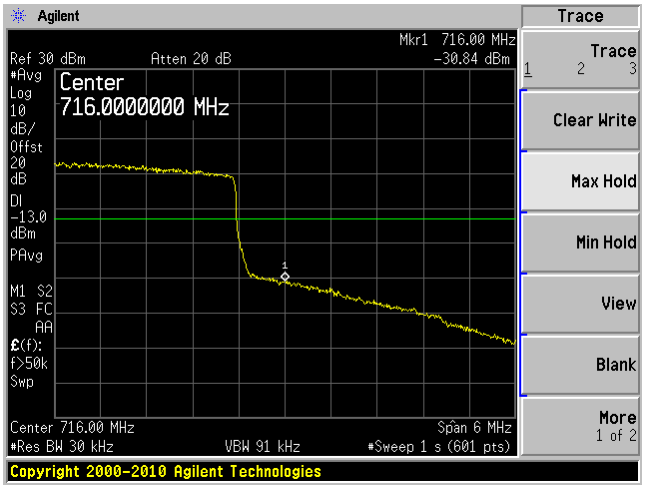
16QAM (3 MHz) - High Channel



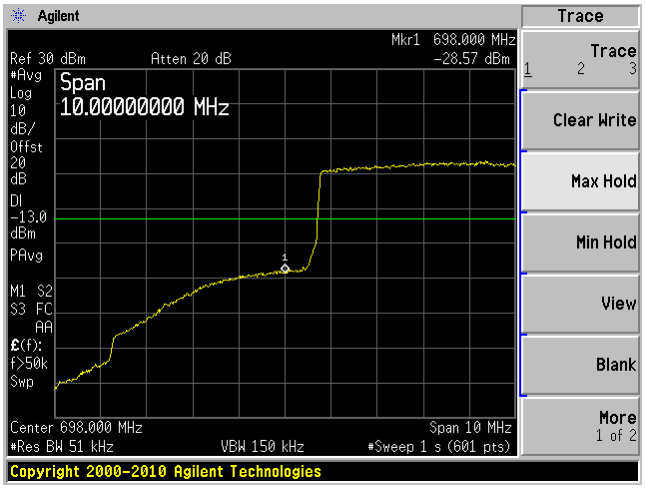
64QAM (3 MHz) - Low Channel



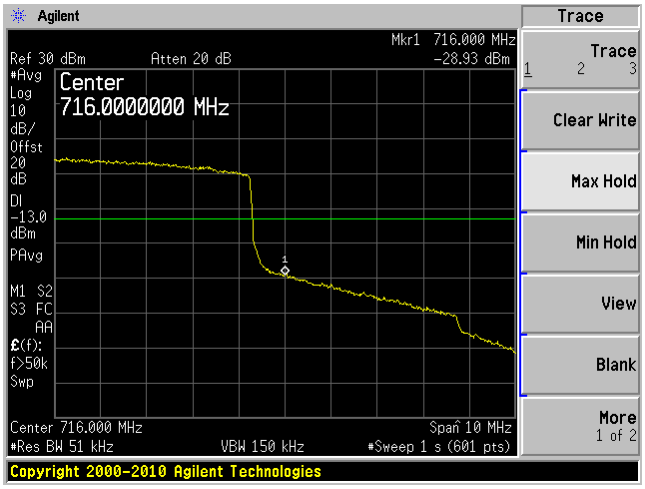
64QAM (3 MHz) - High Channel



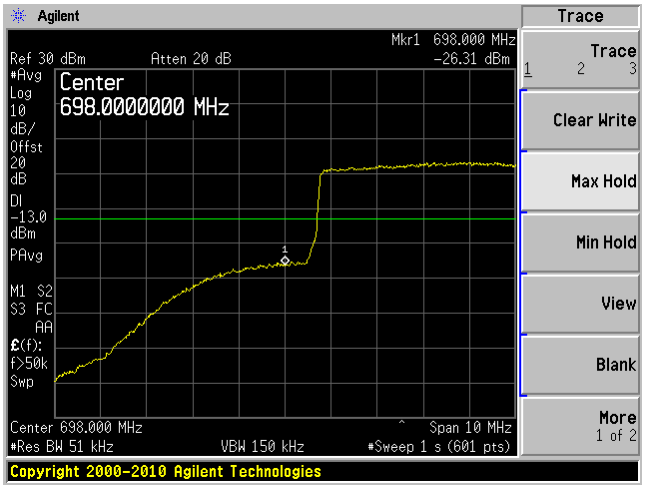
QPSK (5 MHz) - Low Channel



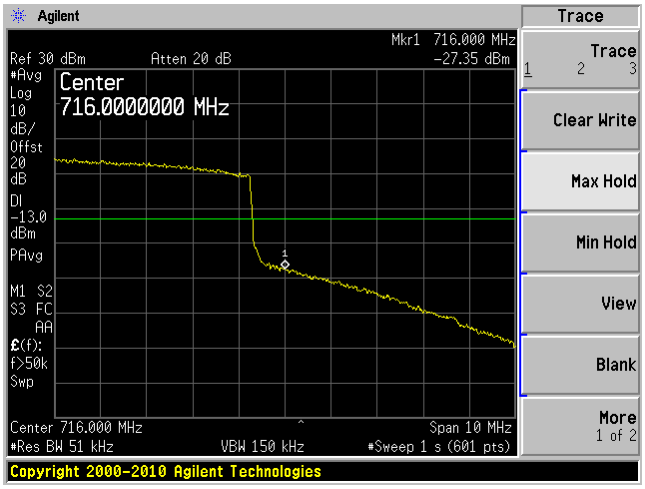
QPSK (5 MHz) - High Channel



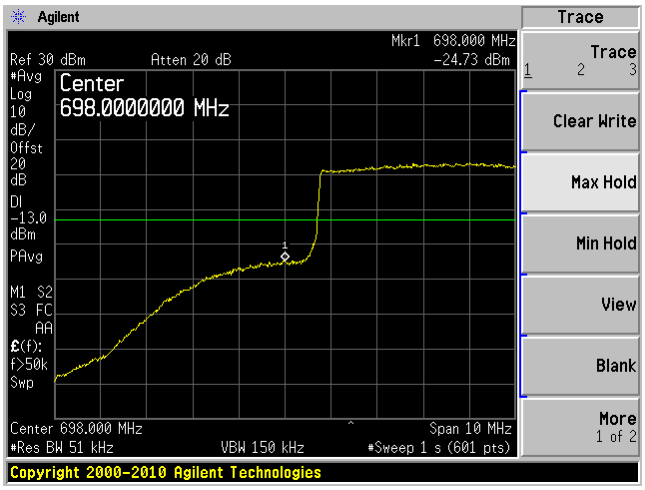
16QAM (5 MHz) - Low Channel



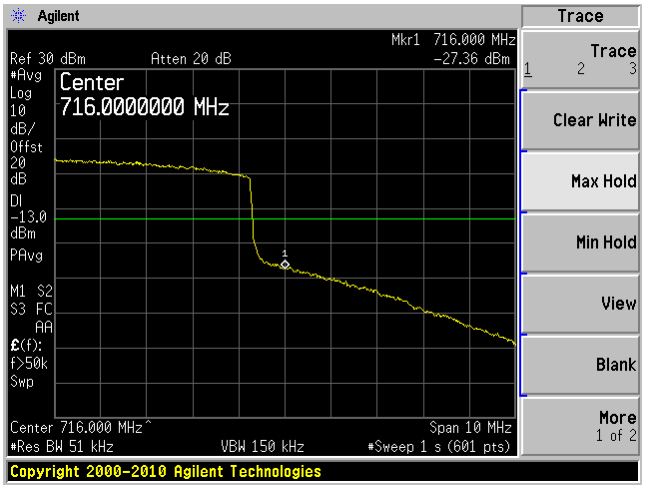
16QAM (5 MHz) - High Channel



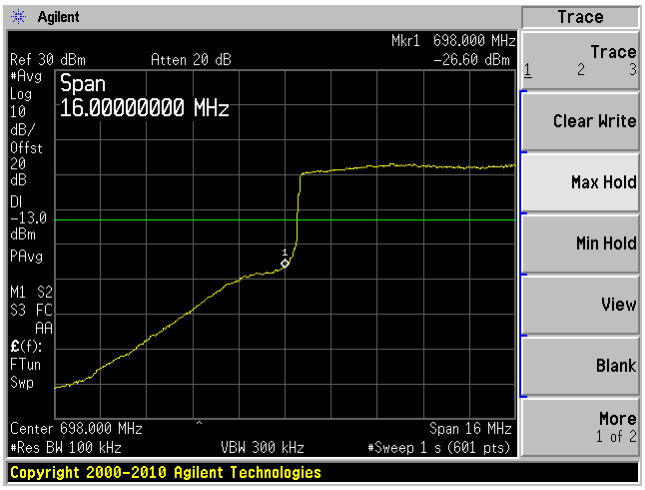
64QAM (5 MHz) - Low Channel



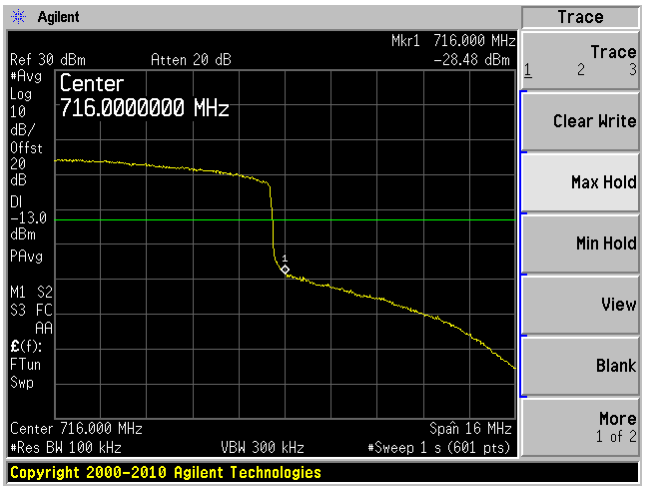
64QAM (5 MHz) - High Channel



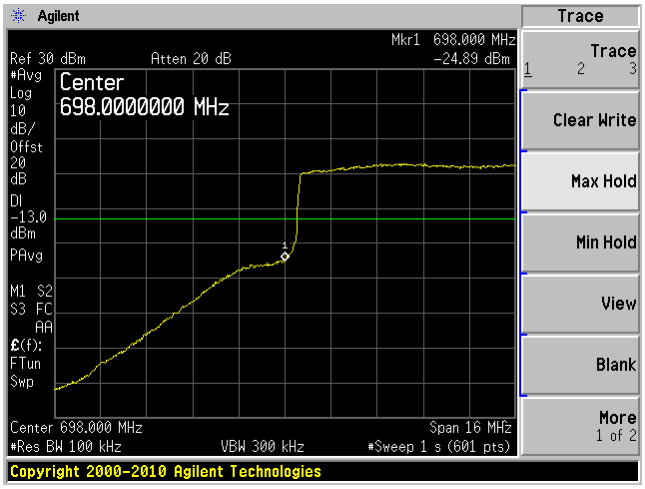
QPSK (10 MHz) - Low Channel



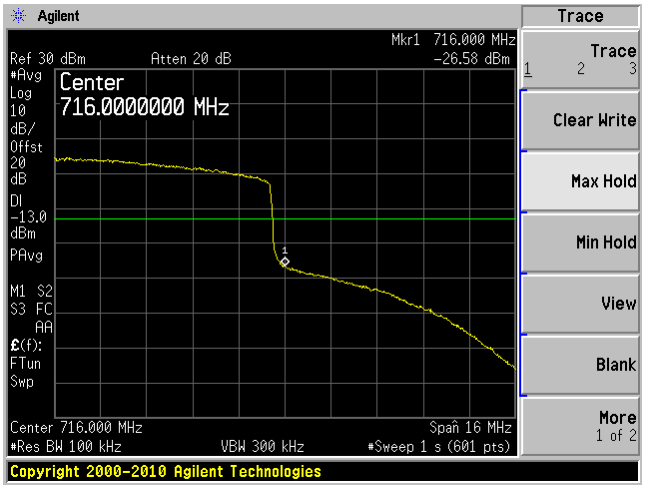
QPSK (10 MHz) - High Channel



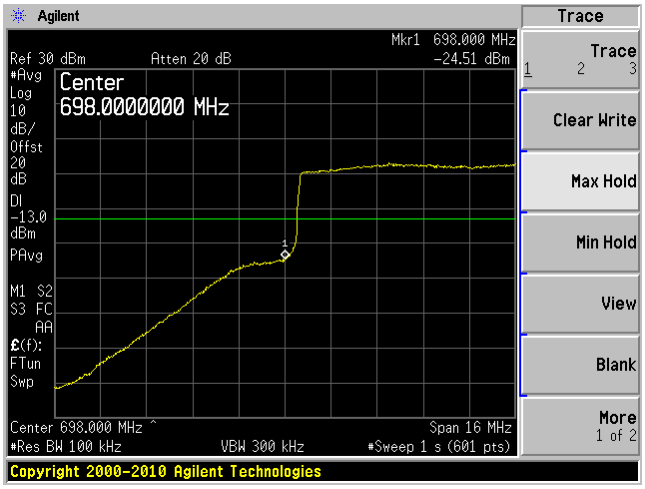
16QAM (10 MHz) - Low Channel



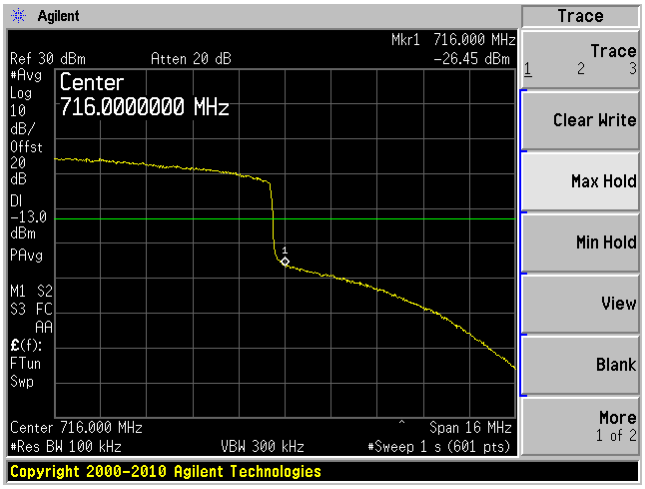
16QAM (10 MHz) - High Channel



64QAM (10 MHz) - Low Channel

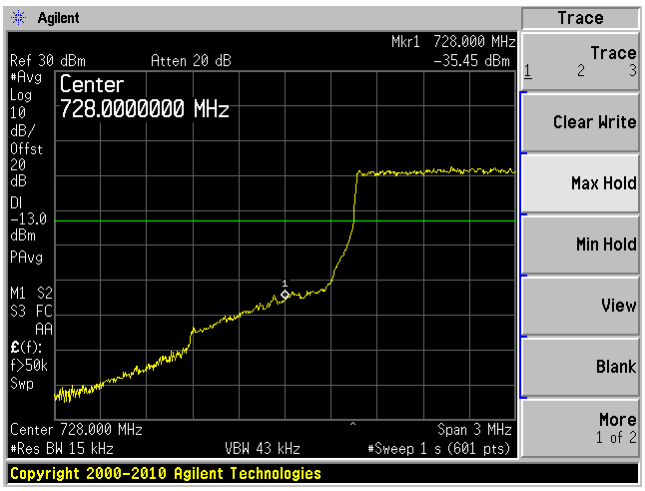


64QAM (10 MHz) - High Channel

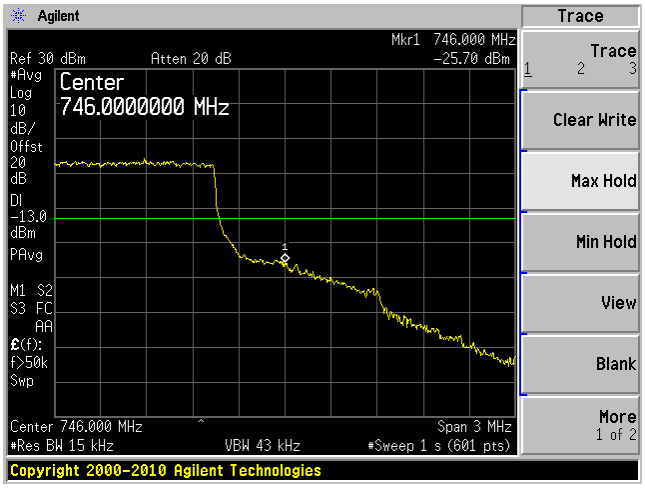


Lower LTE Band Downlink:

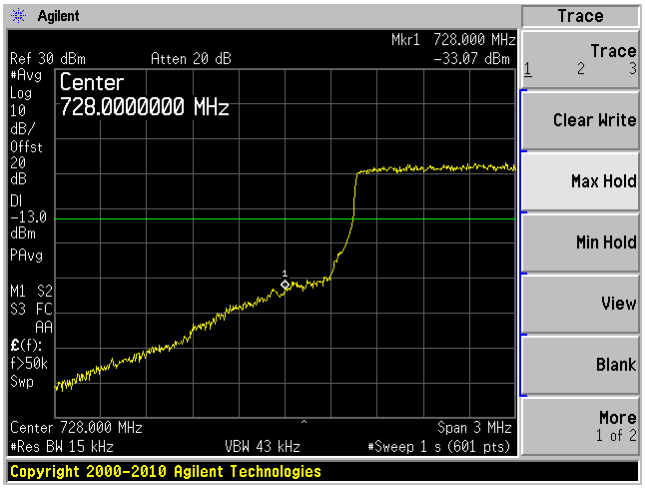
QPSK (1.4 MHz) - Low Channel



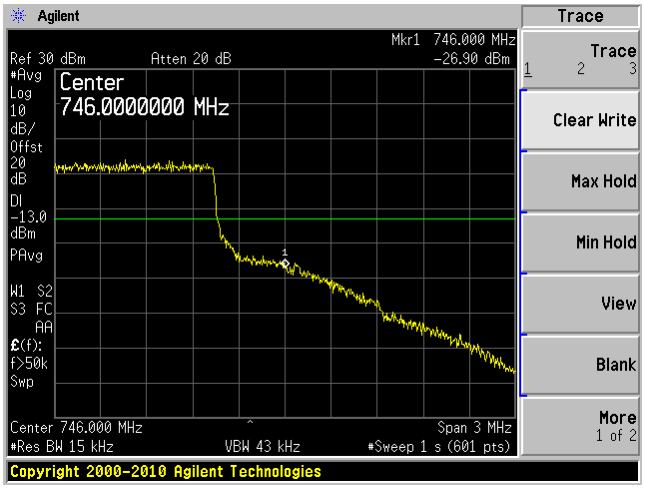
QPSK (1.4 MHz) - High Channel



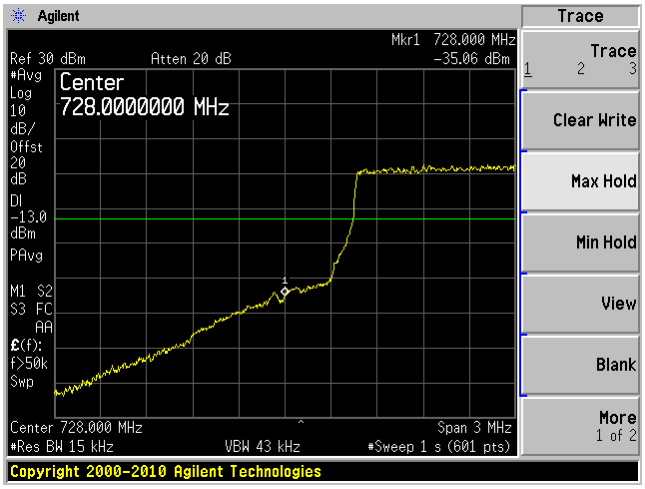
16QAM (1.4 MHz) - Low Channel



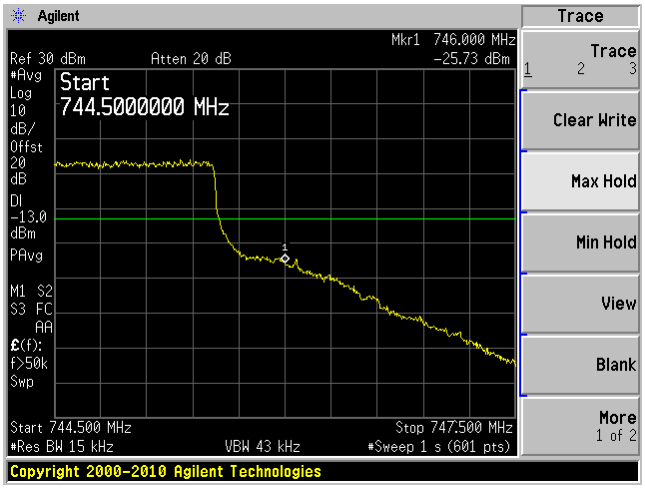
16QAM (1.4 MHz) - High Channel



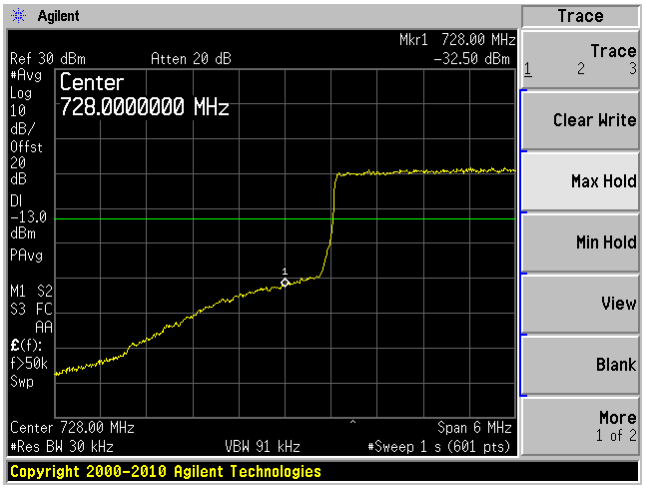
64QAM (1.4 MHz) - Low Channel



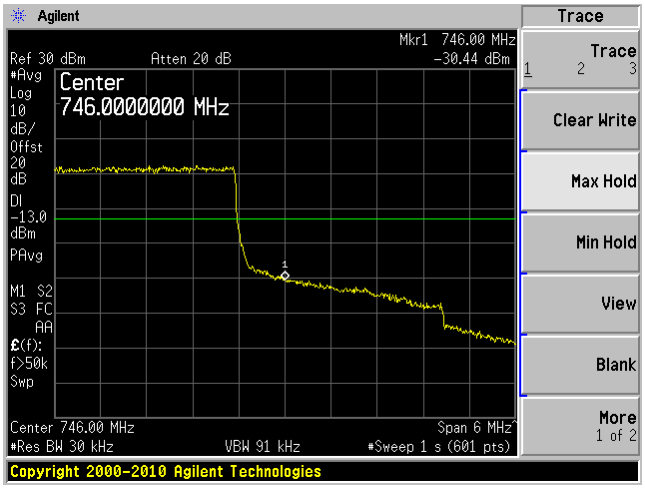
64QAM (1.4 MHz) - High Channel



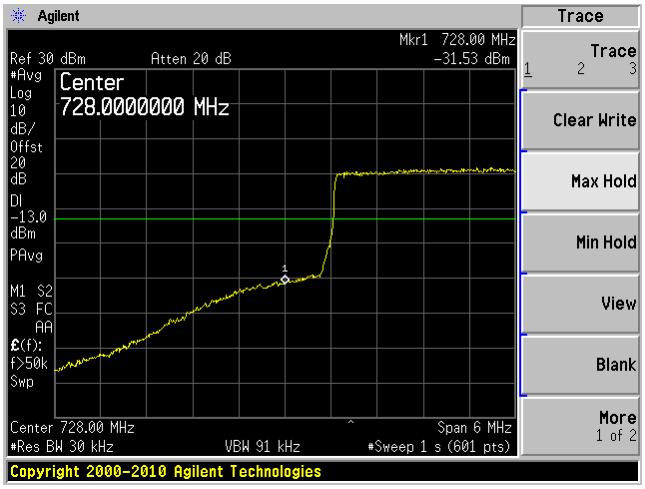
QPSK (3 MHz) - Low Channel



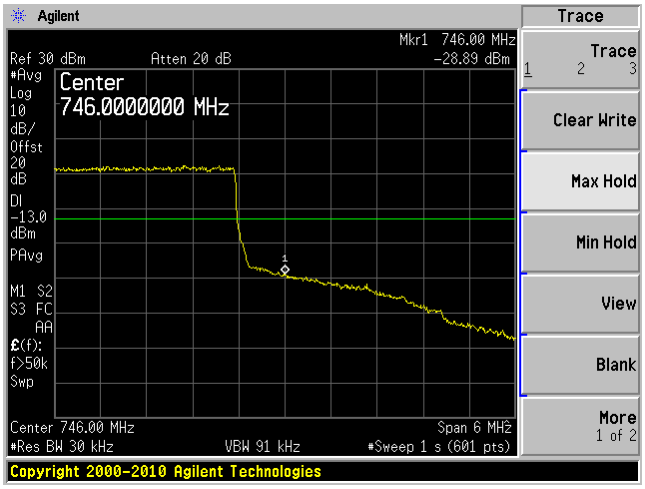
QPSK (3 MHz) - High Channel



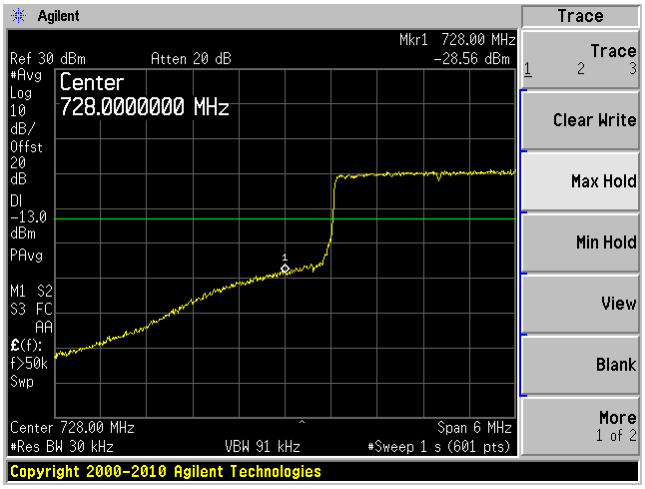
16QAM (3 MHz) - Low Channel



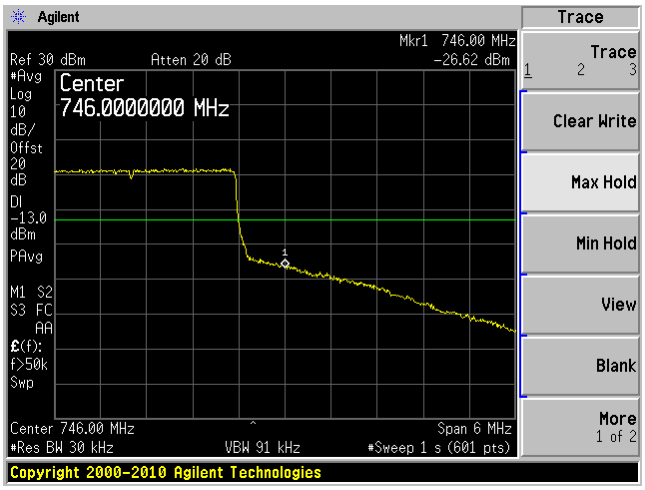
16QAM (3 MHz) - High Channel



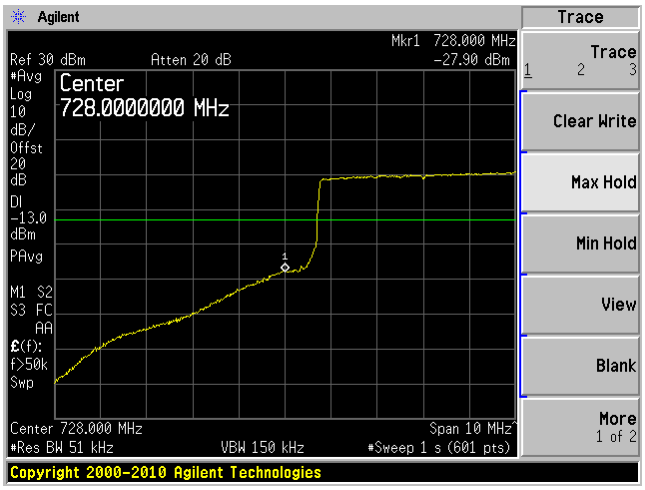
64QAM (3 MHz) - Low Channel



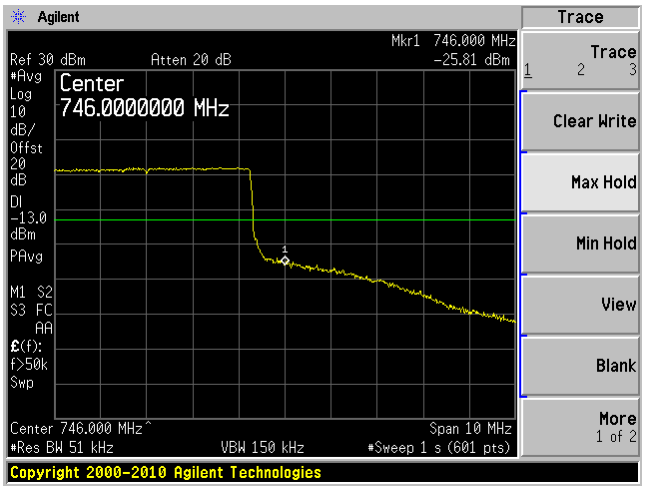
64QAM (3 MHz) - High Channel



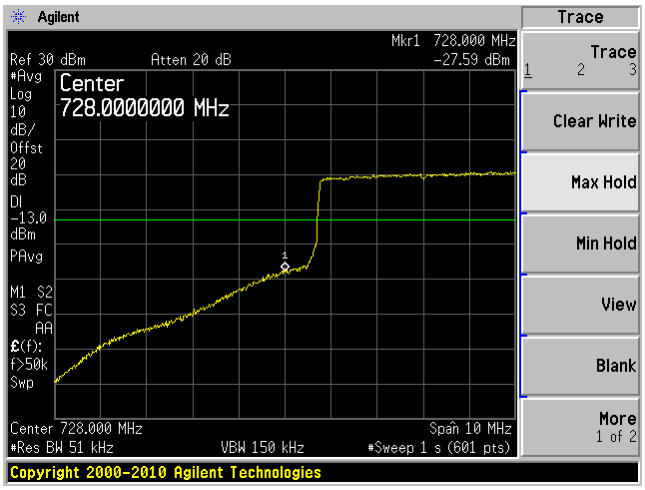
QPSK (5 MHz) - Low Channel



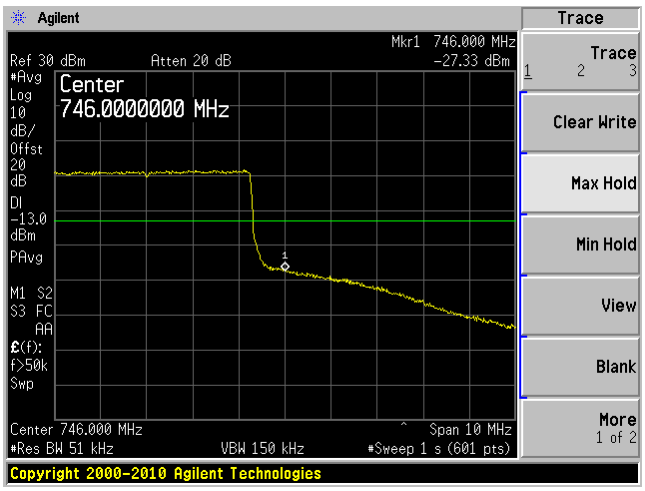
QPSK (5 MHz) - High Channel



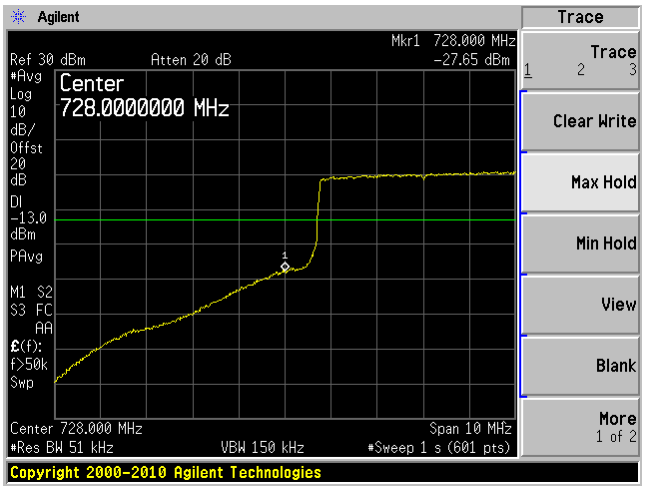
16QAM (5 MHz) - Low Channel



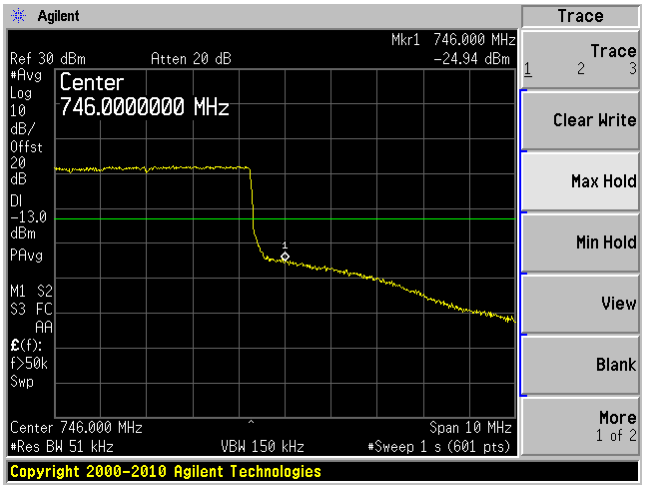
16QAM (5 MHz) - High Channel



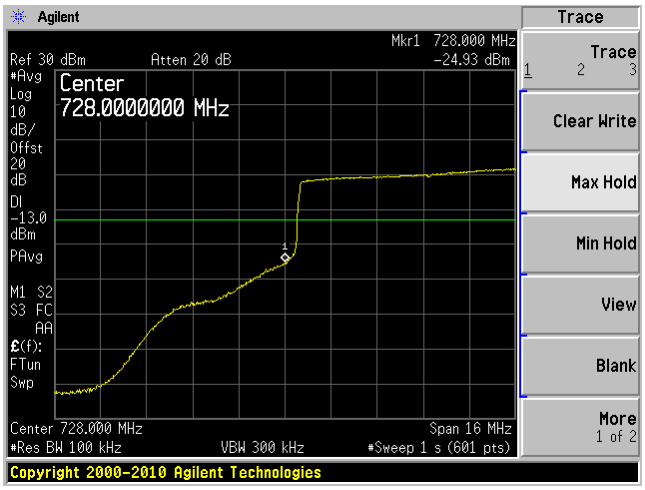
64QAM (5 MHz) - Low Channel



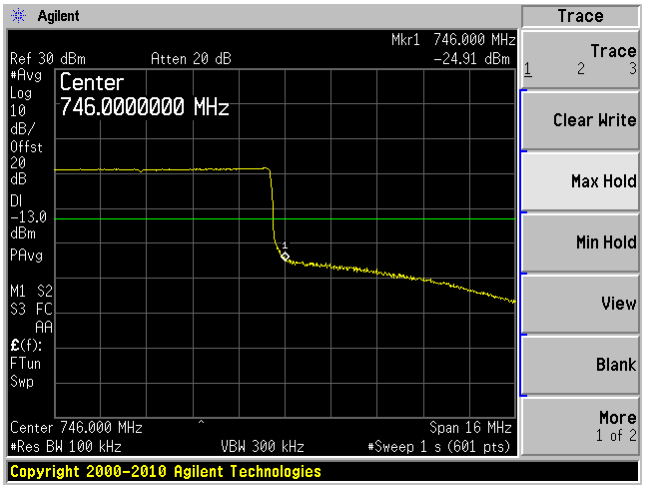
64QAM (5 MHz) - High Channel



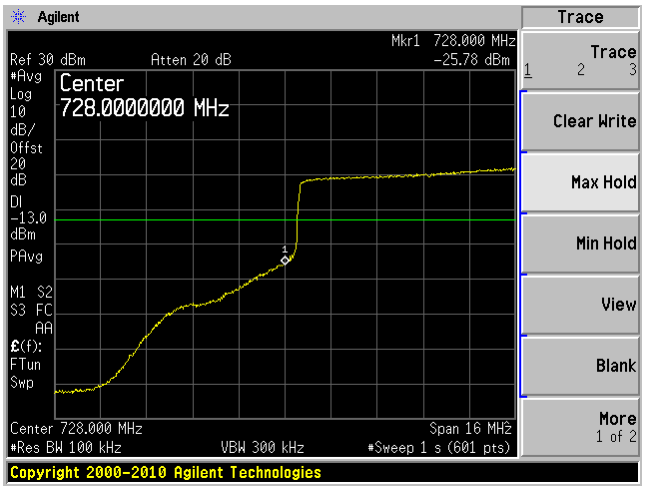
QPSK (10 MHz) - Low Channel



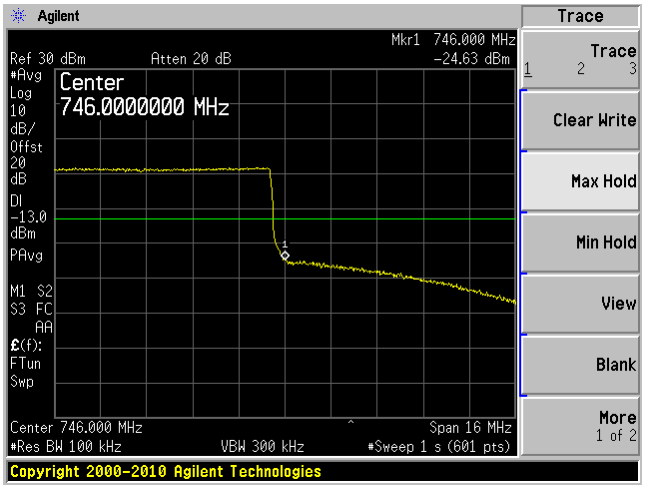
QPSK (10 MHz) - High Channel



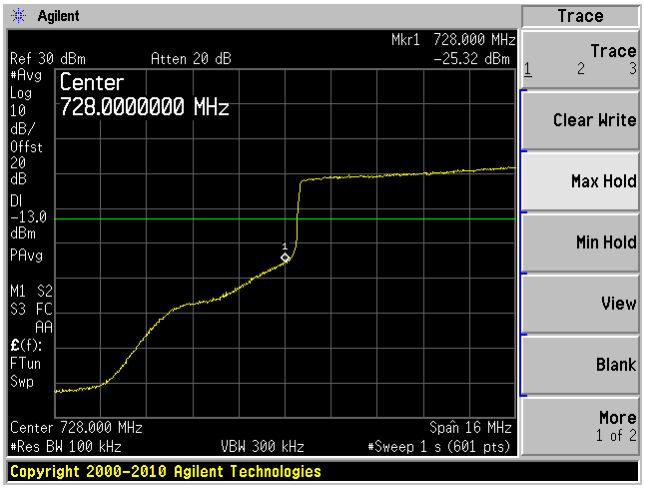
16QAM (10 MHz) - Low Channel



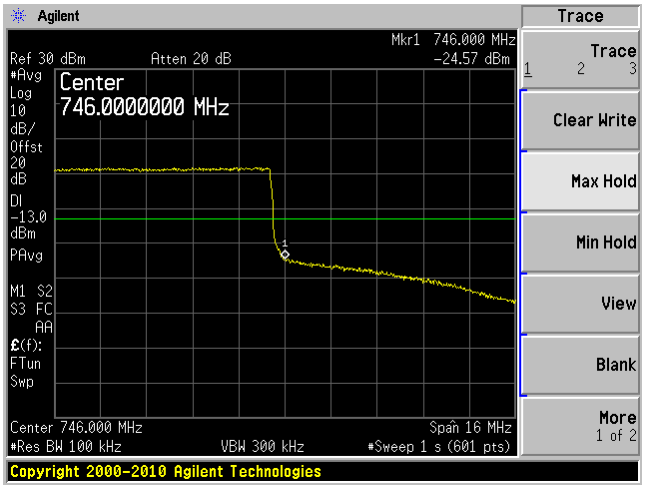
16QAM (10 MHz) - High Channel



64QAM (10 MHz) - Low Channel

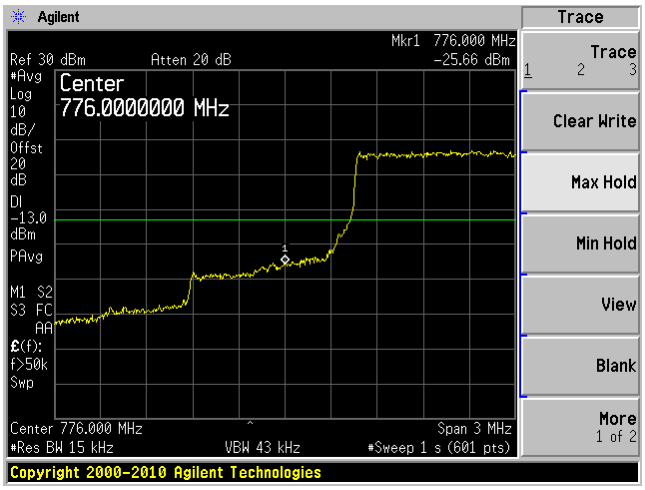


64QAM (10 MHz) - High Channel

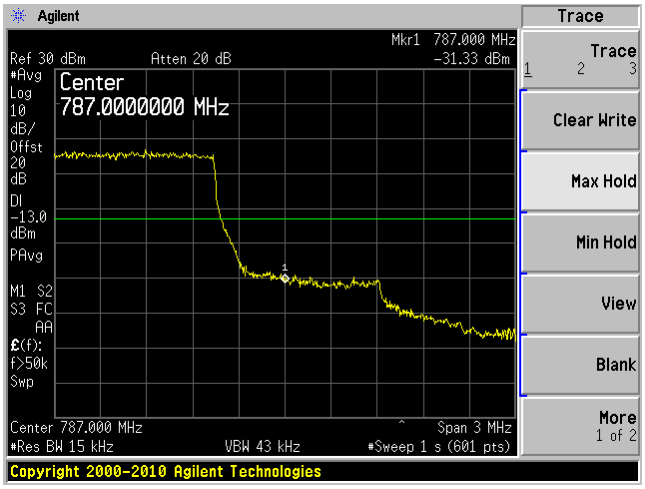


Upper LTE Band Uplink:

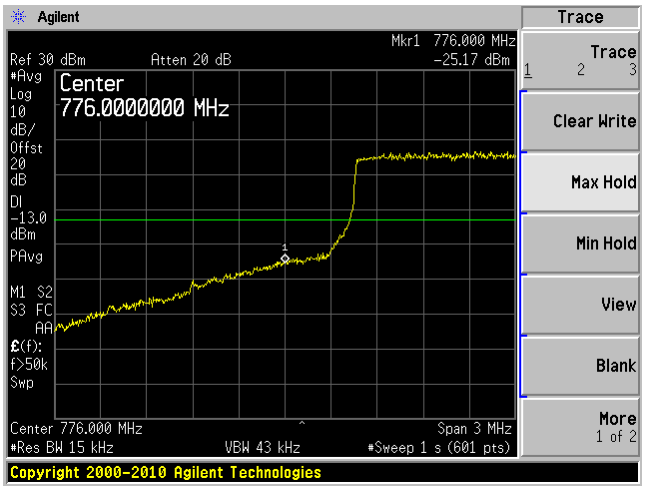
QPSK (1.4 MHz) - Low Channel



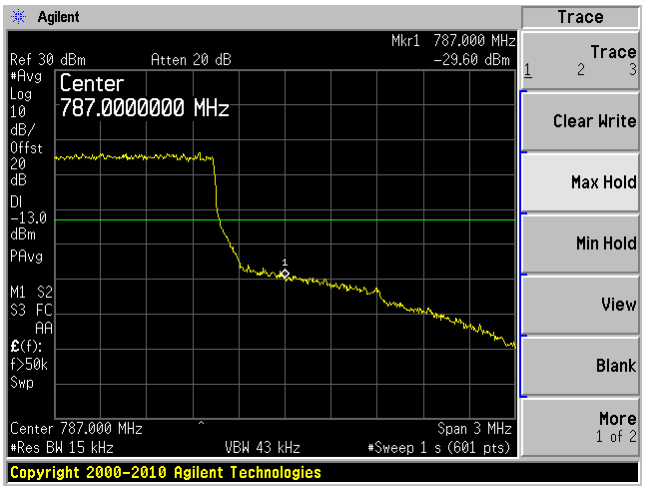
QPSK (1.4 MHz) - High Channel



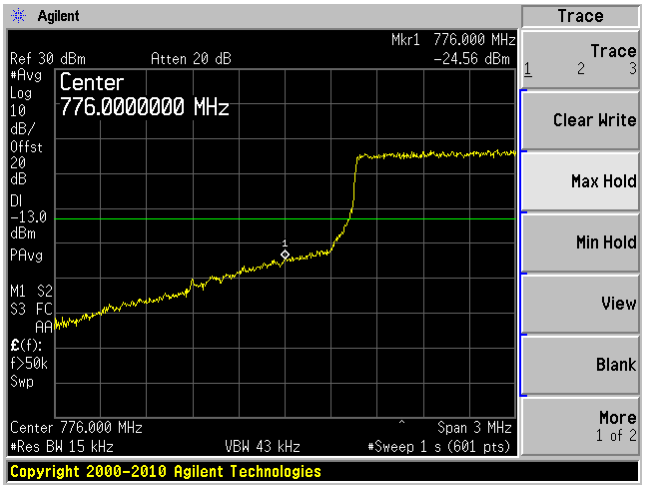
16QAM (1.4 MHz) - Low Channel



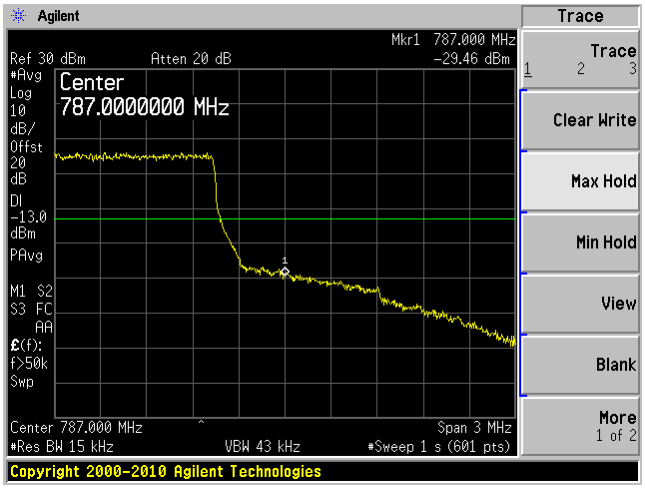
16QAM (1.4 MHz) - High Channel



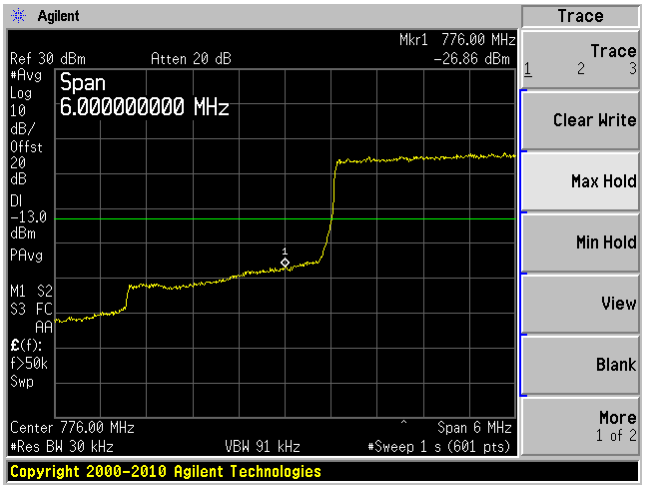
64QAM (1.4 MHz) - Low Channel



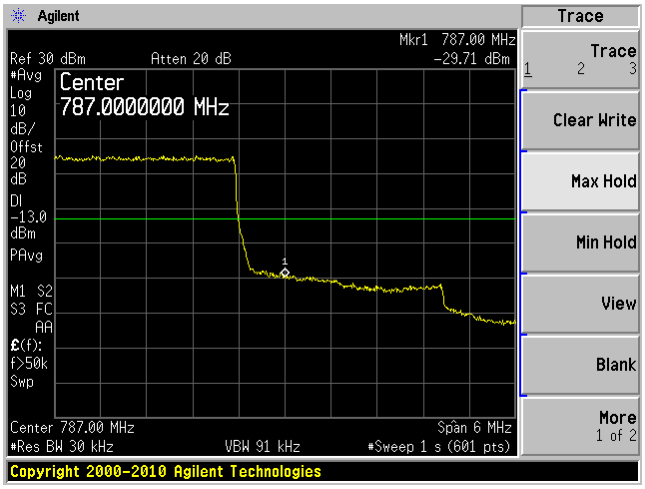
64QAM (1.4 MHz) - High Channel



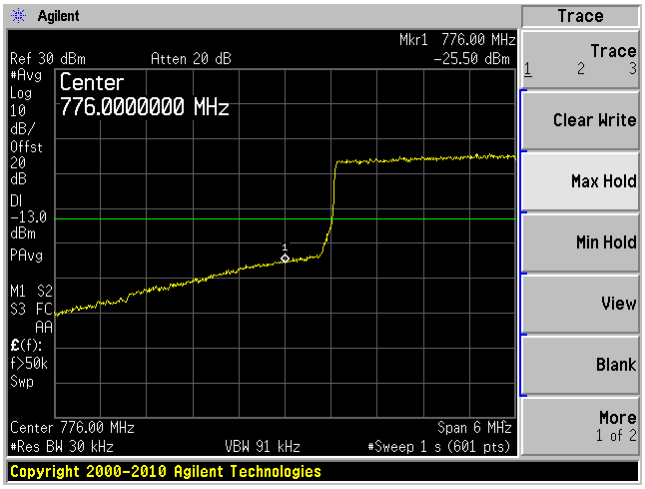
QPSK (3 MHz) - Low Channel



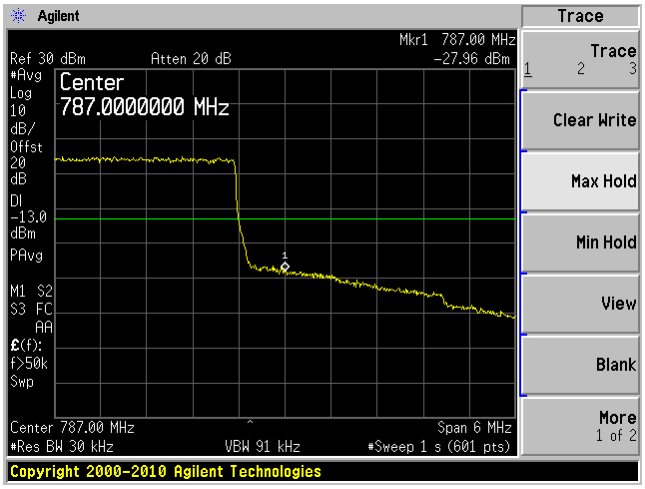
QPSK (3 MHz) - High Channel



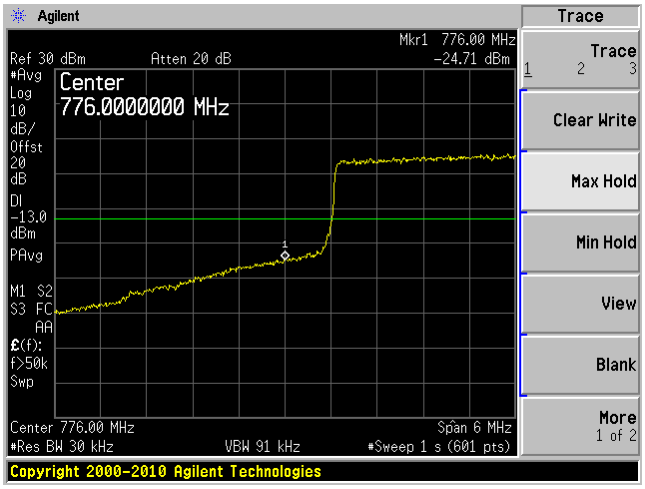
16QAM (3 MHz) - Low Channel



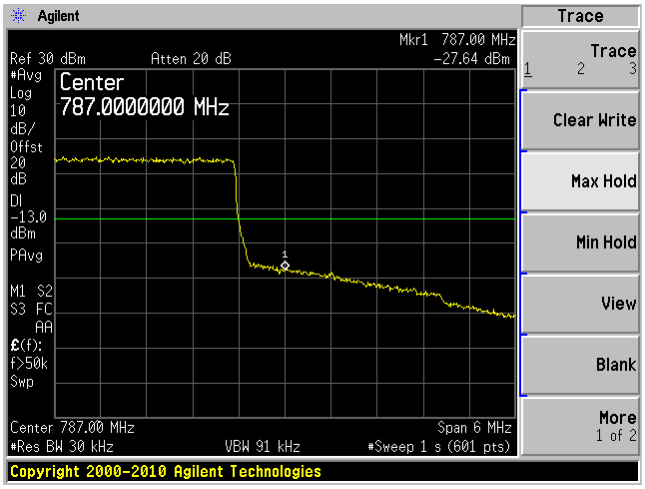
16QAM (3 MHz) - High Channel



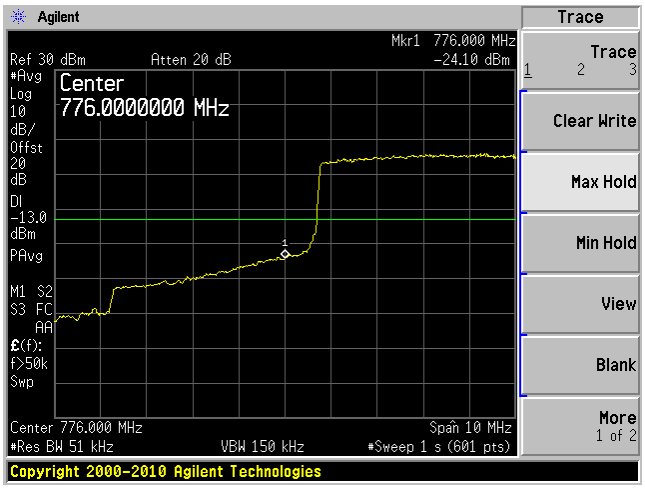
64QAM (3 MHz) - Low Channel



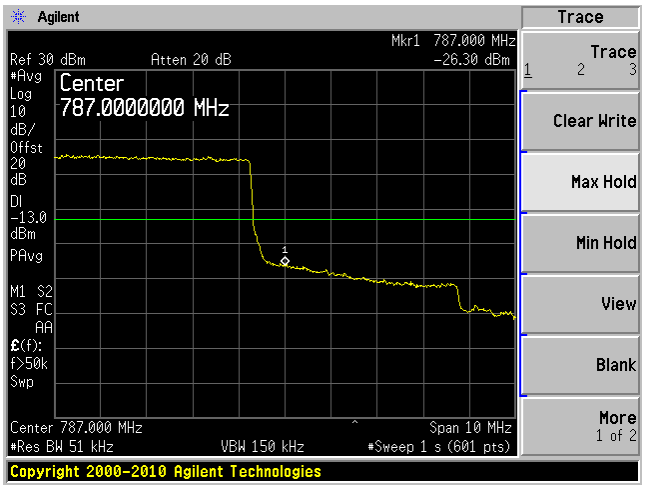
64QAM (3 MHz) - High Channel



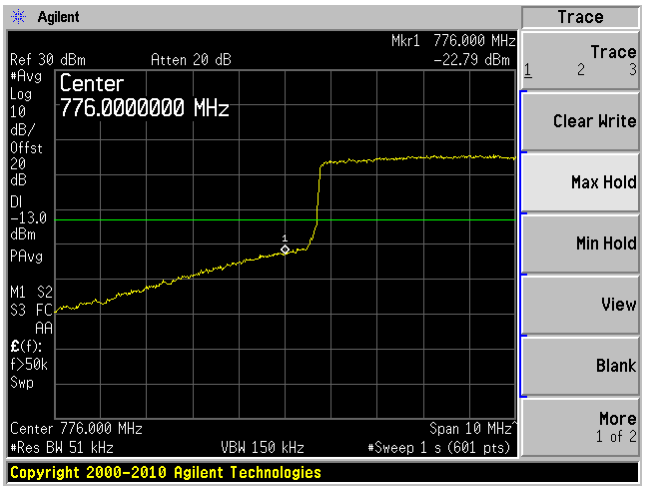
QPSK (5 MHz) - Low Channel



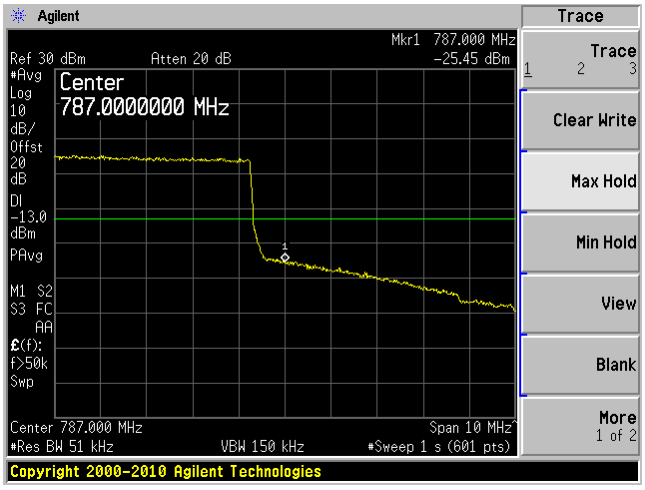
QPSK (5 MHz) - High Channel



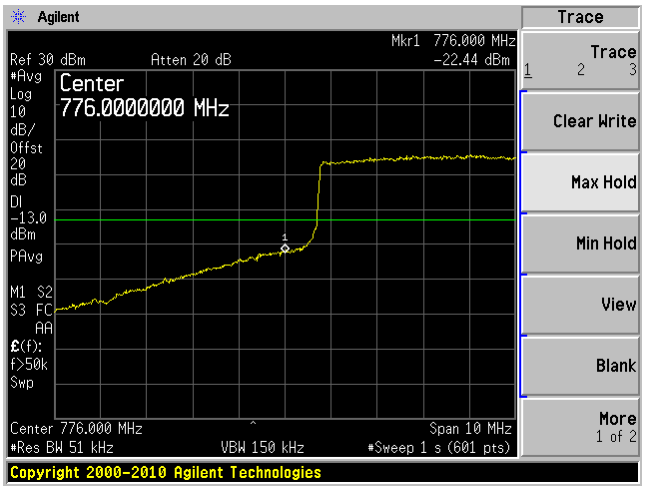
16QAM (5 MHz) - Low Channel



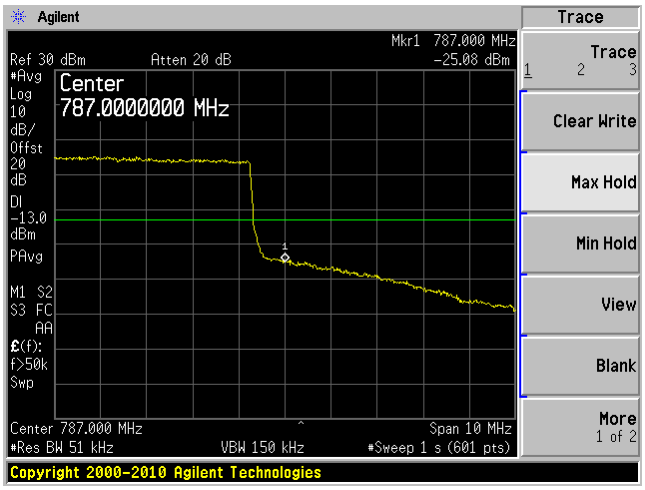
16QAM (5 MHz) - High Channel



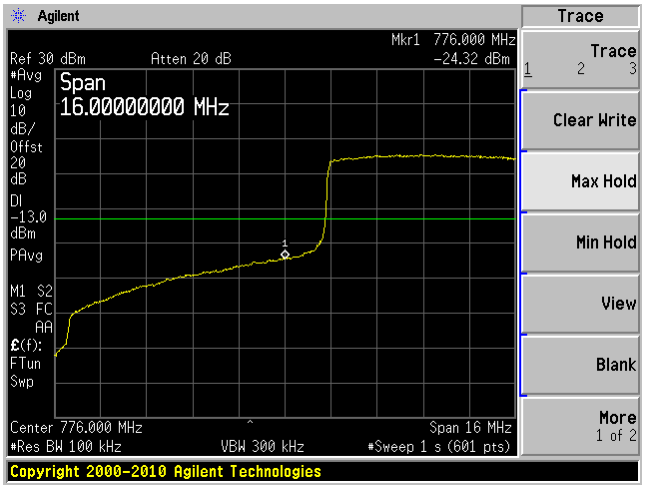
64QAM (5 MHz) - Low Channel



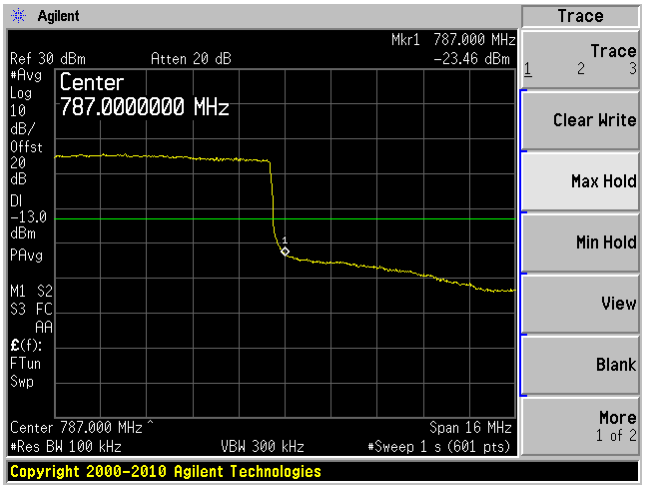
64QAM (5 MHz) - High Channel



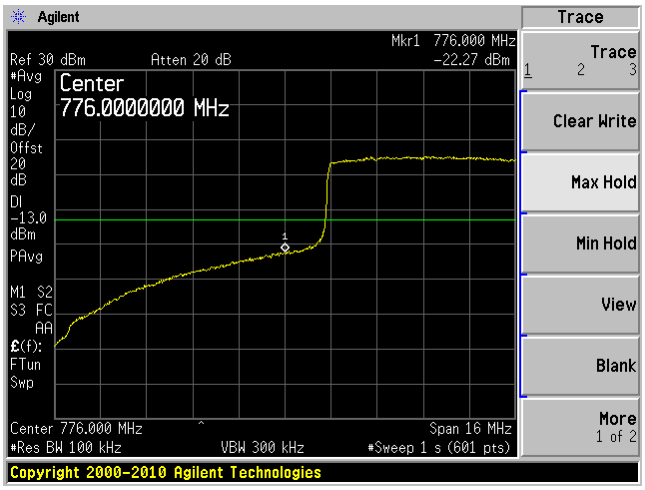
QPSK (10 MHz) - Low Channel



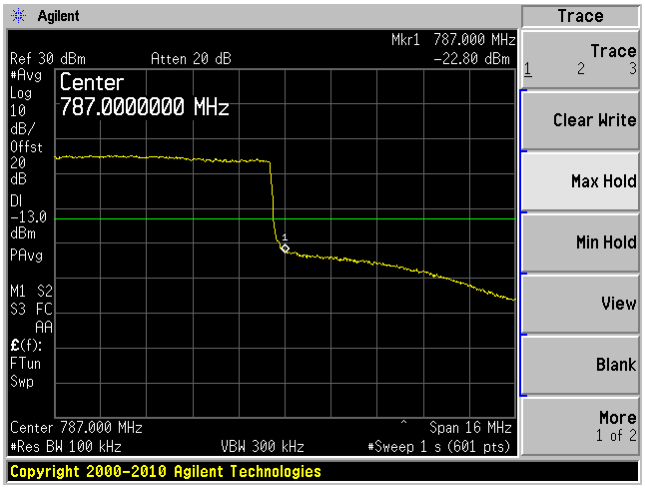
QPSK (10 MHz) - High Channel



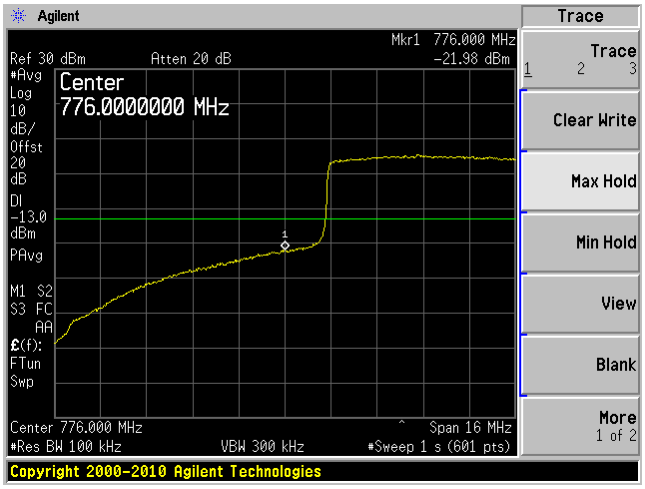
16QAM (10 MHz) - Low Channel



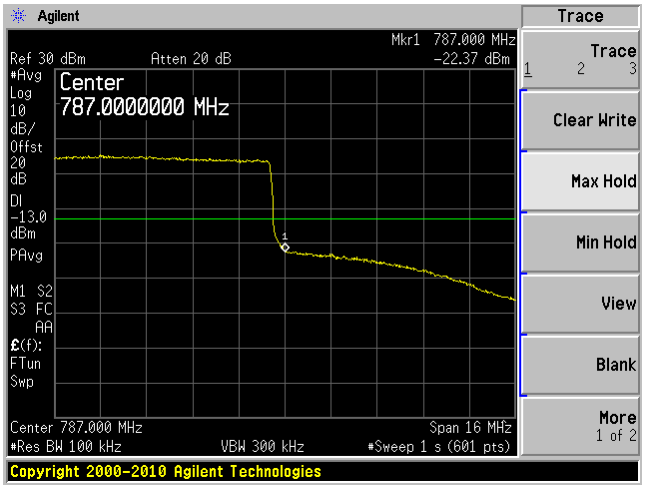
16QAM (10 MHz) - High Channel



64QAM (10 MHz) - Low Channel

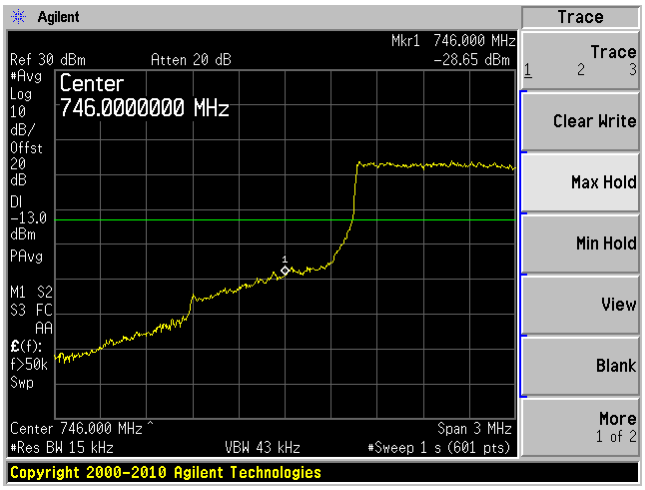


64QAM (10 MHz) - High Channel

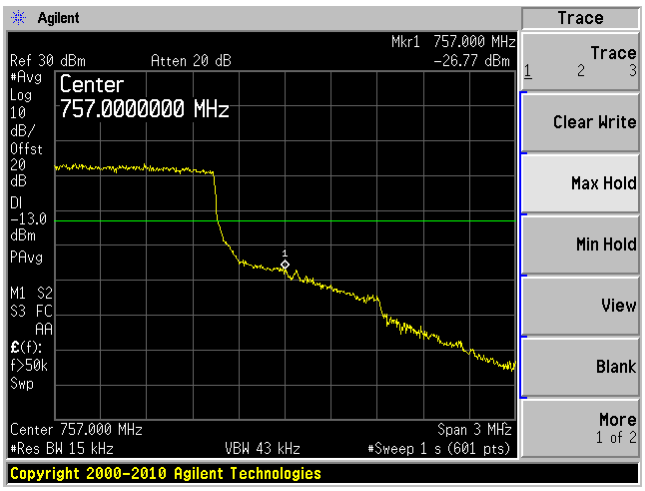


Upper LTE Band Downlink:

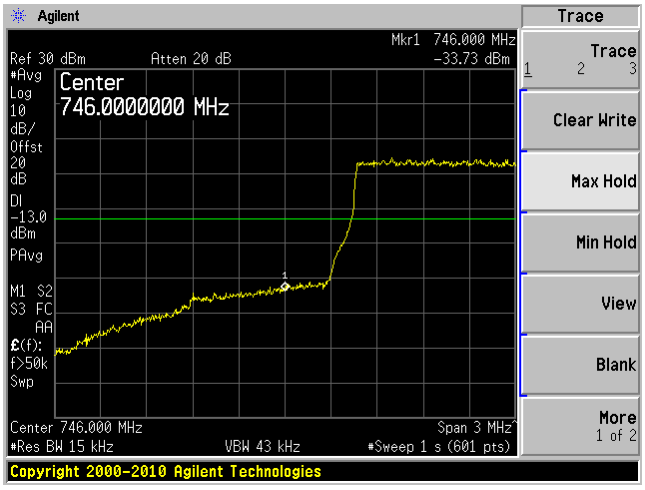
QPSK (1.4 MHz) - Low Channel



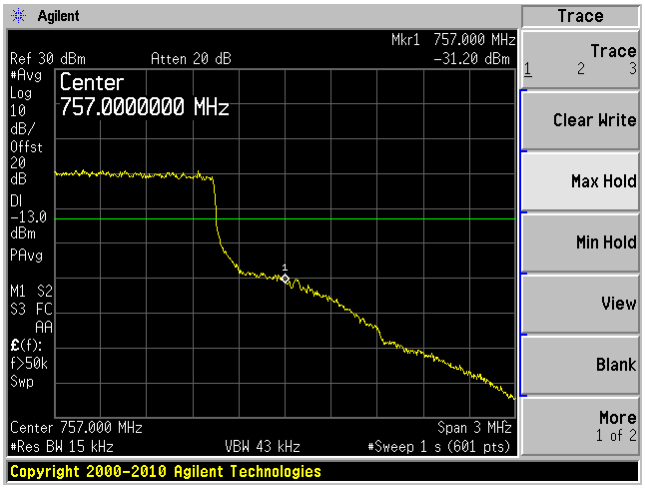
QPSK (1.4 MHz) - High Channel



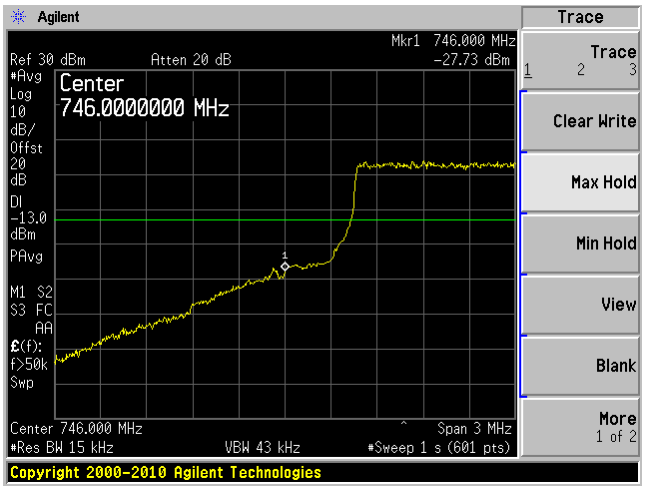
16QAM (1.4 MHz) - Low Channel



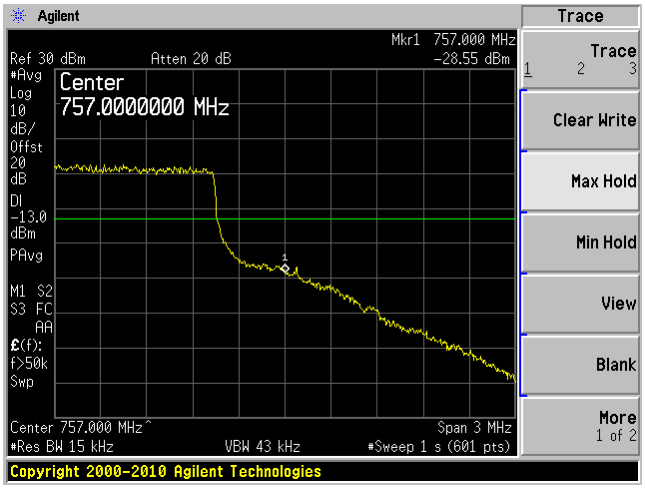
16QAM (1.4 MHz) - High Channel



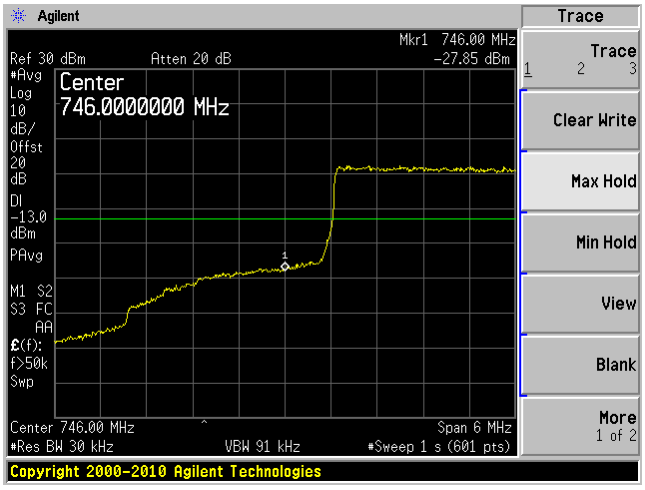
64QAM (1.4 MHz) - Low Channel



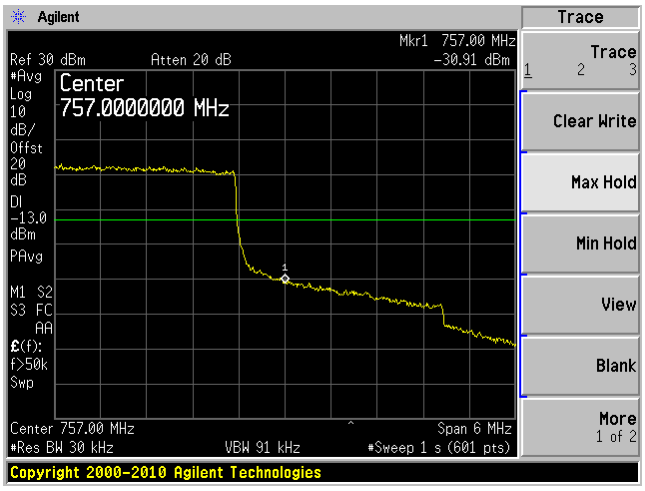
64QAM (1.4 MHz) - High Channel



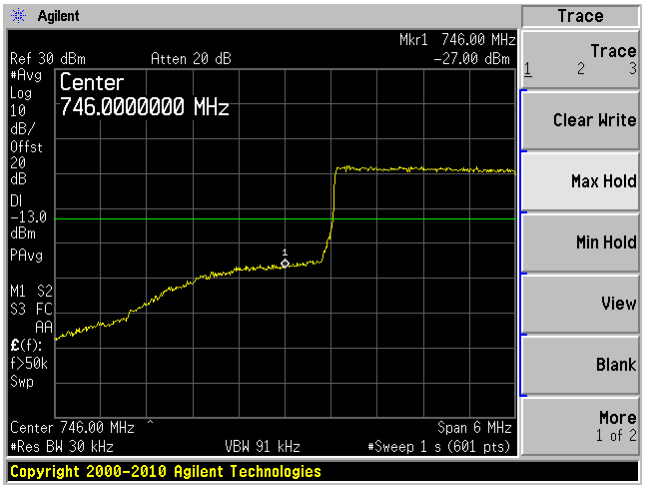
QPSK (3 MHz) - Low Channel



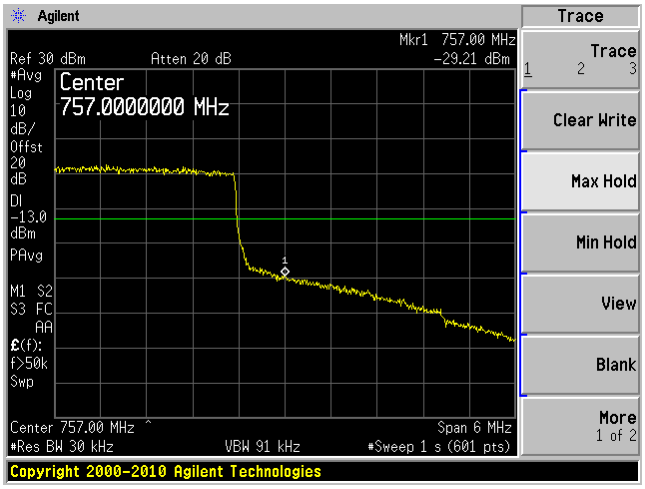
QPSK (3 MHz) - High Channel



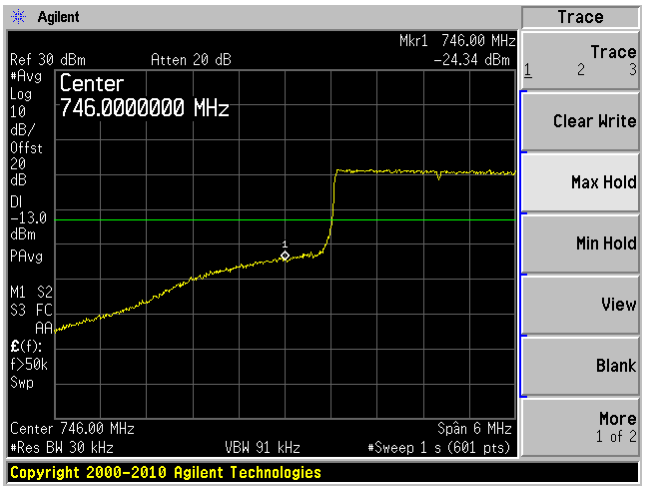
16QAM (3 MHz) - Low Channel



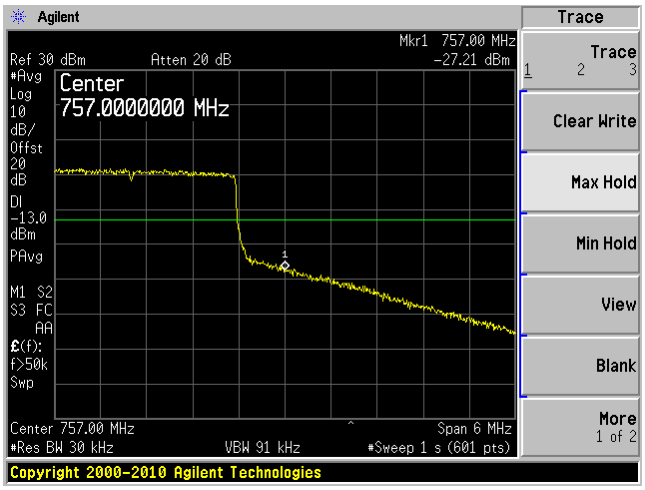
16QAM (3 MHz) - High Channel



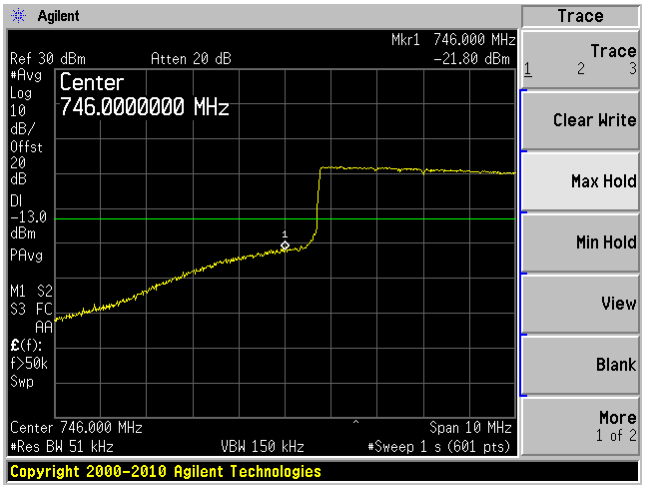
64QAM (3 MHz) - Low Channel



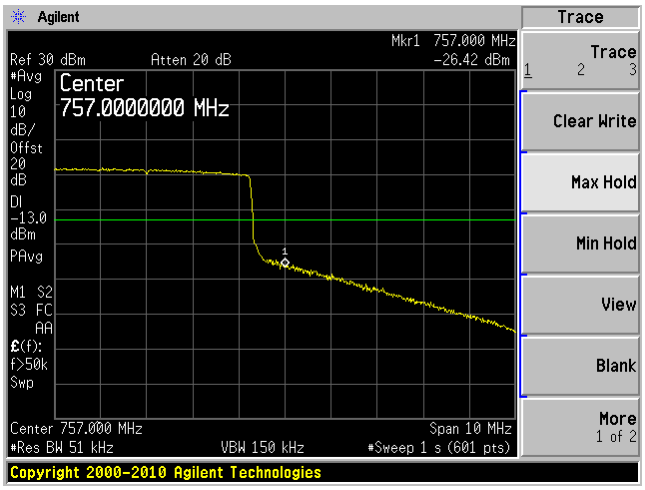
64QAM (3 MHz) - High Channel



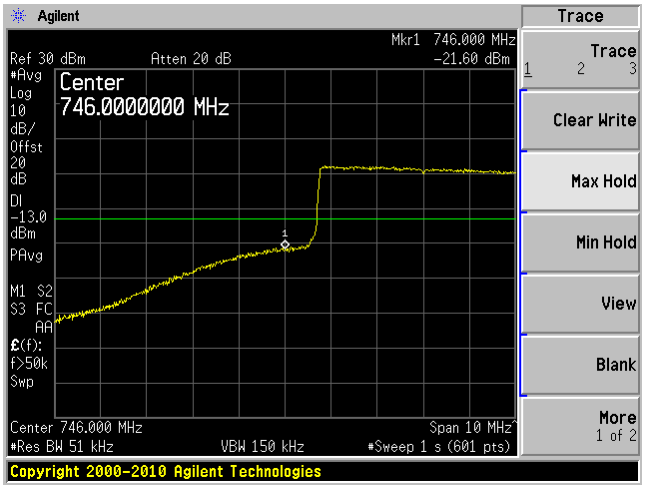
QPSK (5 MHz) - Low Channel



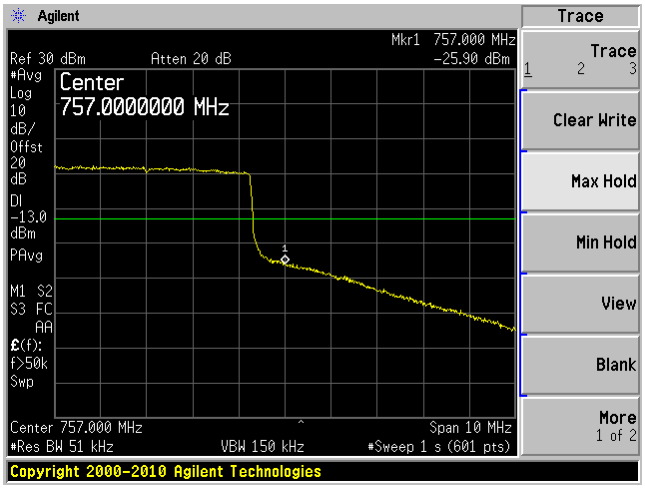
QPSK (5 MHz) - High Channel



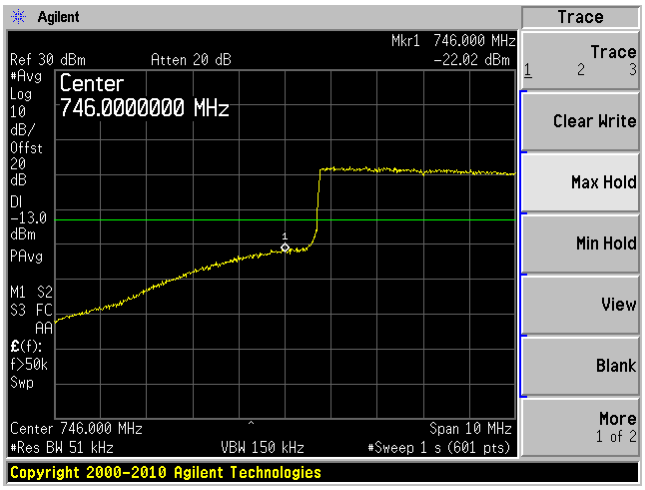
16QAM (5 MHz) - Low Channel



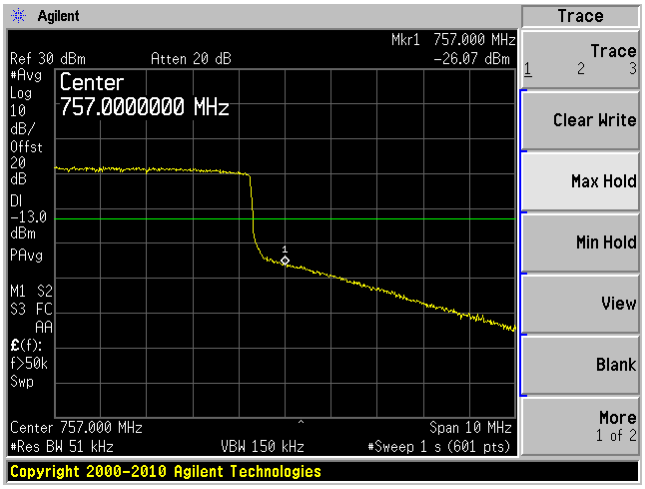
16QAM (5 MHz) - High Channel



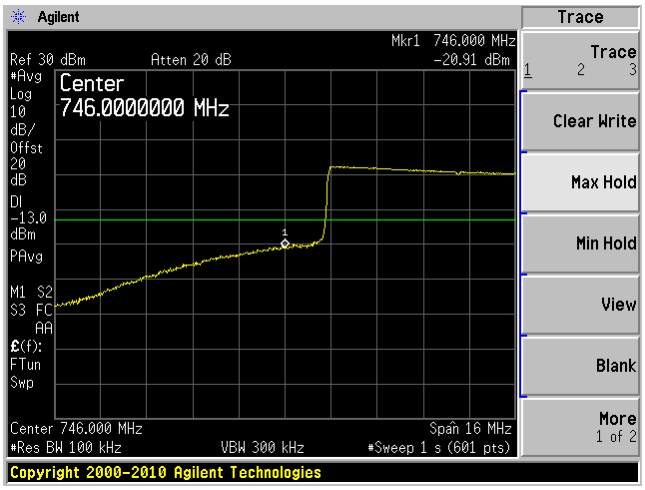
64QAM (5 MHz) - Low Channel



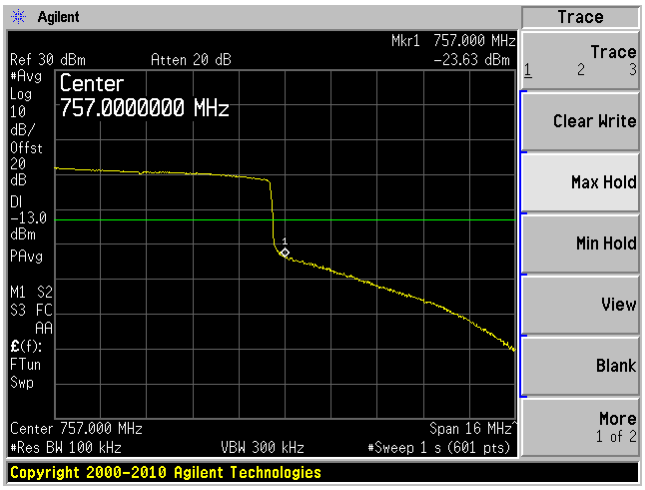
64QAM (5 MHz) - High Channel



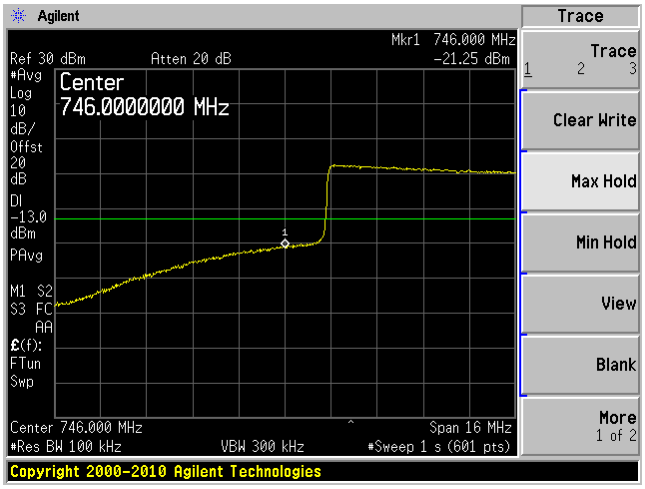
QPSK (10 MHz) - Low Channel



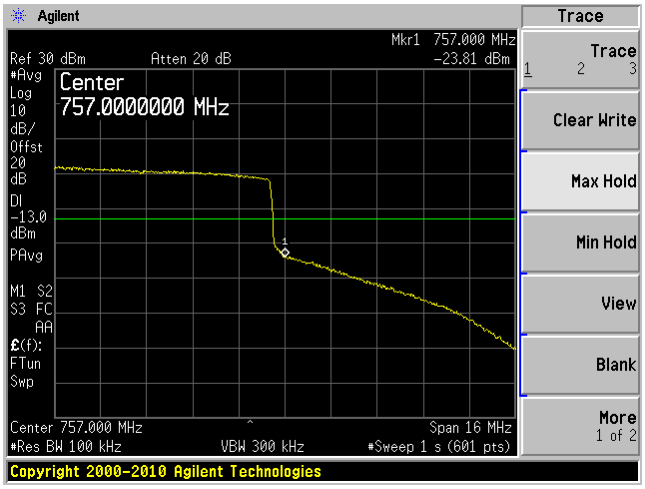
QPSK (10 MHz) - High Channel



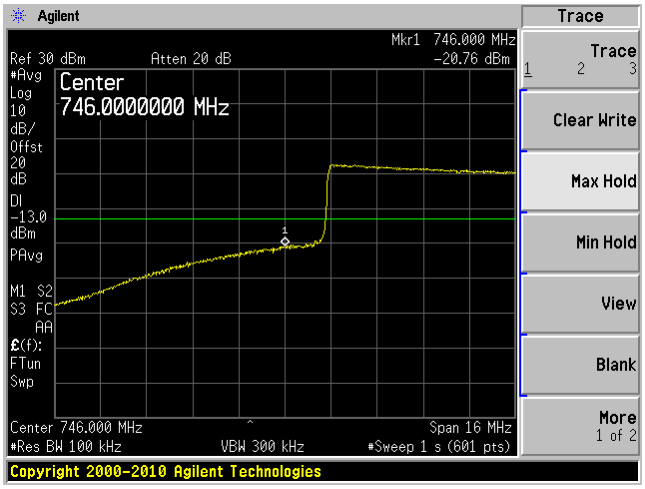
16QAM (10 MHz) - Low Channel



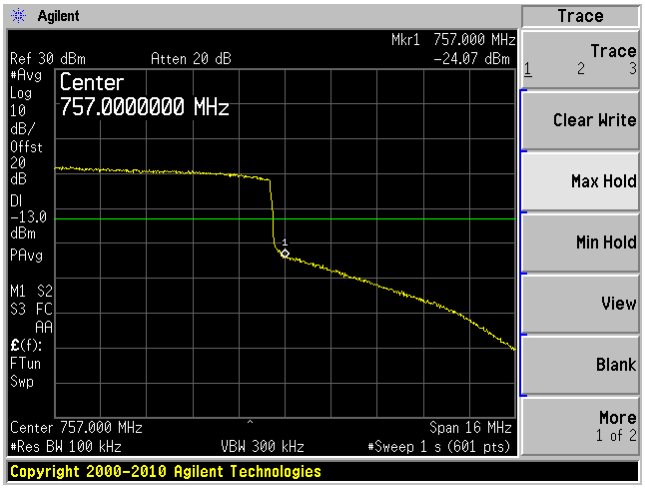
16QAM (10 MHz) - High Channel



64QAM (10 MHz) - Low Channel

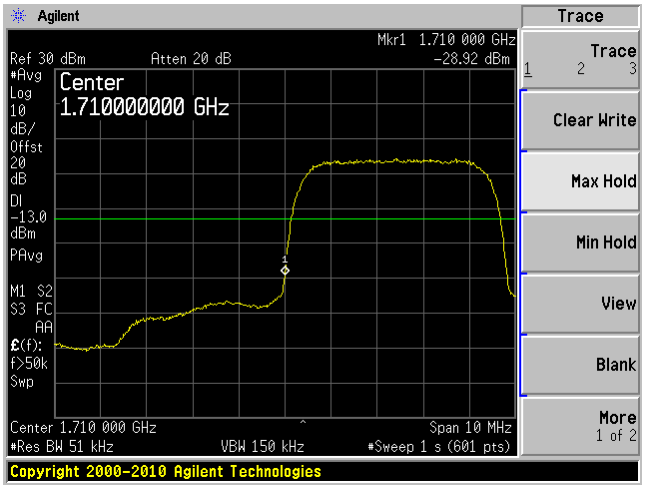


64QAM (10 MHz) - High Channel

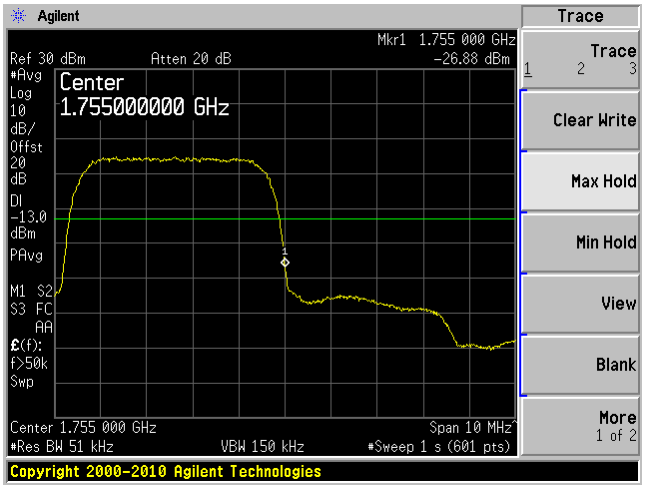


AWS Band Uplink:

WCDMA – Low Channel

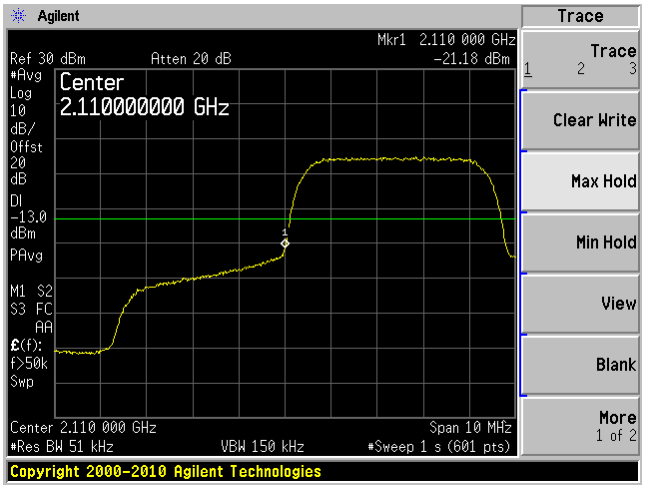


WCDMA – High Channel

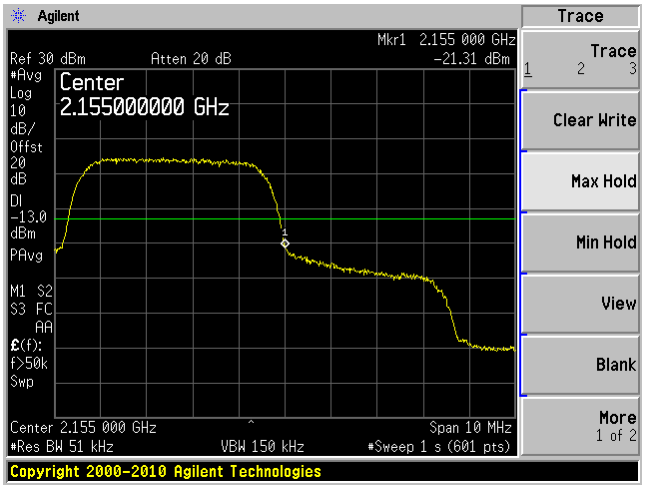


AWS Band Downlink:

WCDMA – Low Channel



WCDMA – High Channel



9 FCC §1.1307(B)(1) & §2.1091 - RF Exposure

9.1 Applicable Standard

According to §1.1310 and §2.1091 (Mobile Devices) RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

Note: f = frequency in MHz
* = Plane-wave equivalent power density

9.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

9.3 Test Result

Cellular Band UL:

Maximum peak output power at antenna input terminal (dBm):	26.06
Maximum peak output power at antenna input terminal (mW):	403.65
Prediction distance (cm):	20
Prediction frequency (MHz):	836.6
Antenna Gain, typical (dBi):	9
Cable Loss (dB)	1.8
Maximum Antenna Gain+ Cable Loss (numeric):	5.2481
Power density at predication frequency and distance (mW/cm^2):	0.4214
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	0.5577

Cellular Band DL:

Maximum peak output power at antenna input terminal (dBm):	23.57
Maximum peak output power at antenna input terminal (mW):	227.51
Prediction distance (cm):	20
Prediction frequency (MHz):	869.2
Antenna Gain, typical (dBi):	9
Cable Loss (dB)	1.8
Maximum Antenna Gain+ Cable Loss (numeric):	5.2481
Power density at predication frequency and distance (mW/cm^2):	0.2375
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	0.5795

PCS Band UL:

Maximum peak output power at antenna input terminal (dBm):	26.86
Maximum peak output power at antenna input terminal (mW):	485.29
Prediction distance (cm):	20
Prediction frequency (MHz):	1880
Antenna Gain, typical (dBi):	9
Cable Loss (dB)	3
Maximum Antenna Gain+ Cable Loss (numeric):	3.9811
Power density at predication frequency and distance (mW/cm^2):	0.3844
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	1.0

PCS Band DL:

Maximum peak output power at antenna input terminal (dBm):	22.83
Maximum peak output power at antenna input terminal (mW):	191.87
Prediction distance (cm):	20
Prediction frequency (MHz):	1960
Antenna Gain, typical (dBi):	9
Cable Loss (dB)	3
Maximum Antenna Gain+ Cable Loss (numeric):	3.9811
Power density at predication frequency and distance (mW/cm^2):	0.1520
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	1.0

Note: To meet 33 dBm (2 watts) EIRP limit in PCS band, the gain of antenna used with this booster must be offset by coaxial cable loss such that the antenna gain less cable loss does not exceed 6 dBi.

Lower LTE Band UL:

Maximum peak output power at antenna input terminal (dBm):	23.05
Maximum peak output power at antenna input terminal (mW):	201.84
Prediction distance (cm):	20
Prediction frequency (MHz):	709
Antenna Gain, typical (dBi):	9
Cable Loss (dB)	1.8
Maximum Antenna Gain+ Cable Loss (numeric):	5.2481
Power density at predication frequency and distance (mW/cm^2):	0.2107
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	0.4727

Lower LTE Band DL:

Maximum peak output power at antenna input terminal (dBm):	20.23
Maximum peak output power at antenna input terminal (mW):	105.44
Prediction distance (cm):	20
Prediction frequency (MHz):	743
Antenna Gain, typical (dBi):	9
Cable Loss (dB)	1.8
Maximum Antenna Gain+ Cable Loss (numeric):	5.2481
Power density at predication frequency and distance (mW/cm^2):	0.1101
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	0.4953

Upper LTE Band UL:

Maximum peak output power at antenna input terminal (dBm):	23.91
Maximum peak output power at antenna input terminal (mW):	246.04
Prediction distance (cm):	20
Prediction frequency (MHz):	779
Antenna Gain, typical (dBi):	9
Cable Loss (dB)	1.8
Maximum Antenna Gain+ Cable Loss (numeric):	5.2481
Power density at predication frequency and distance (mW/cm^2):	0.2569
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	0.5193

Upper LTE Band DL:

Maximum peak output power at antenna input terminal (dBm):	19.90
Maximum peak output power at antenna input terminal (mW):	97.72
Prediction distance (cm):	20
Prediction frequency (MHz):	754
Antenna Gain, typical (dBi):	9
Cable Loss (dB)	1.8
Maximum Antenna Gain+ Cable Loss (numeric):	5.2481
Power density at predication frequency and distance (mW/cm^2):	0.1020
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	0.5027

AWS Band UL:

Maximum peak output power at antenna input terminal (dBm):	23.40
Maximum peak output power at antenna input terminal (mW):	218.78
Prediction distance (cm):	20
Prediction frequency (MHz):	1732.4
Antenna Gain, typical (dBi):	9
Cable Loss (dB)	4
Maximum Antenna Gain+ Cable Loss (numeric):	3.1623
Power density at predication frequency and distance (mW/cm^2):	0.1376
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	1.0

AWS Band DL:

Maximum peak output power at antenna input terminal (dBm):	22.02
Maximum peak output power at antenna input terminal (mW):	159.22
Prediction distance (cm):	20
Prediction frequency (MHz):	2112.4
Antenna Gain, typical (dBi):	9
Cable Loss (dB)	4
Maximum Antenna Gain+ Cable Loss (numeric):	3.1623
Power density at predication frequency and distance (mW/cm^2):	0.1002
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	1.0

Note: To meet 30 dBm (1watts) EIRP limit in AWS band, the gain of antenna used with this booster must be offset by coaxial cable loss such that the antenna gain less cable loss does not exceed 5 dBi.

Results

For uplink and downlink, the highest power density levels at 20 cm are below the MPE uncontrolled exposure limit.