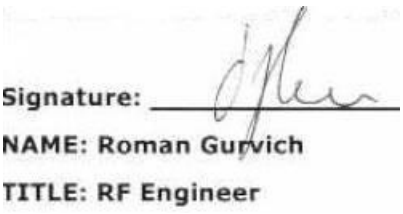
FCC TEST REPORT

FCC Rules & Regulations Part 20.21

For:
Mobile Communications, Inc
230 Earl Stewart Dr., Aurora, ON, Canada L4G6V8

FCC ID: S4RBTUX623

Report Type: Original Report	Product Type: Consumer wide-band booster
Test Engineer:	Roman Gurvich
Report Number:	BTUX623
Report Date:	Feb. 26, 2016
Test Procedure:	As specified in KDB publication 935210 D03 V04 and IEEE C63.26/D14 with FCC PBA 942758
Prepared By:	 Signature: _____ NAME: Roman Gurvich TITLE: RF Engineer

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1 GENERAL INFORMATION

1.1 Product Description Equipment Under Test (EUT)

This test and measurement report has been compiled on behalf of Mobile Communications Inc. and their product models: BTUX623 and BTUX615
FCC ID: S4RBTUX623, which will be henceforth in this report to as the EUT (Equipment Under Test). The EUT is a Cellular/PCS Consumer wide-band bi-directional coupling booster.

EUT Description	Consumer Booster
FCC ID	S4RBTUX623
Operation Frequency	Bands 2, 4, 5, 12, 13, 17, 25
Modulations	CDMA, WCDMA, LTE, HSPA, GSM, GPRS, EDGE
Type of Equipment	Wideband Consumer Signal Booster

1.2 Mechanical Description

The EUT measures approximately 116 mm (L) x 64 mm (W) x 32 mm (H), and weighs approximately 0.29 kg.

1.3 Objective

This type approval report is prepared on behalf of Mobile Communications Inc. in accordance with Part 20.21 of the Federal Communication Commissions rules.

The objective is to determine compliance FCC rules.

1.4 Test Methodology

All tests and measurements indicated in this document were performed at Mobile Communications Inc in accordance with the Code of Federal Regulations Title 20.21.

The “Wideband Consumer Signal Booster Measurement Guidance” draft, KDB publication # 935210 D03 V04, was used in test procedure to test EUT.

1.5 Measurement Uncertainty

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

Based on NIS81, The Treatment of Uncertainty in EMC Measurements, the values ranging from $\pm$ 2.0 dB for Conducted Emissions tests and $\pm$ 4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at Mobile Communications, Inc.

1.6 Test Facility

The test conducted at Mobile Communications Inc. located at 230 Earl Stewart Drive, Aurora, Ontario, Canada, L4G6V8. Conducted emissions measurement data collected and presented in this report.

1.7 Test Equipment

#	Description	Manufacturer	Model No	Serial No	Calibration Date
1	Spectrum Analyzer	Agilent	E4440A	MY46188068	2/23/2016
2	Signal Generator #1	Agilent	E4438C	US42081132	1/12/2016
3	Signal Generator #2	Agilent	E4438C	US42081138	1/12/2016
4	Power Supply	Instek	GPS-3303	E877636	N/A
5	Bi-Directional Coupler	Minicurcuits	ZABDC10-25HP	N/A	N/A
6	Bi-Directional Coupler	Minicurcuits	ZFBDC20-900HP	N/A	N/A
7	Variable RF Attenuator	Fairview Microwave	SA3101N	N/A	N/A
8	Fixed RF Attenuator	Weinschel	5W-20	N/A	N/A
9	RF Test Cables	Smoothtalker	SEMRC205	N/A	N/A
10	Co-Ax Cable	Smoothtalker	ACX100	N/A	N/A

2 Summary of Test Results

2.1 Rules Applied

FCC Rules	Description of Tests	Results
§ 20.21 (e)(3)	Authorized Frequency Band	Comply
§ 20.21 (e)(8)(i)(B)	Bidirectional Capability	Comply
§ 20.21 (e)(8)(i)(D)	Power Limits	Comply
§ 20.21 (e)(8)(i)(C)(2)	Booster Gain Limits	Comply
§ 20.21 (e)(8)(i)(F)	Intermodulation Limits	Comply
§ 20.21 (e)(8)(i)(E)	Out of Band Emission Limits	Comply
2.1051 22.917 (a) 24.234 (a) 27.53 (c) 27.53 (e) 27.53 (f) 27.53 (g) 27.53 (h)	Conducted Spurious Emissions	Comply
§ 20.21 (e)(8)(i)(A)	Noise Limits	Comply
§ 20.21 (e)(8)(i)(I)	Uplink Inactivity	Note i
§ 20.21 (e)(8)(i)(H)	Transmit Power OFF Mode	Note ii
§ 20.21 (e)(8)(i)(C)(1)	Variable Booster Gain Limits	Comply
§ 2.1049	Occupied Bandwidth	Comply
§ 20.21 (e)(8)(ii)(A)	Anti-Oscillation	Comply
§ 20.21 (e)(8)(ii)(B)	Gain Control	Comply
2.1053	Radiated Spurious Emissions	Comply
20.21 (e)(8)(i)(B)	Spectrum Block Filtering	Note iii
§ 20.21 (e)(8)(i)(G)	Booster Antenna Kitting	Note iv

2.2 Notes

i) EUT uplink noise level does not exceed -70 dBm/MHz at maximum gain. Thus Part 20.21 § (e)(8)(i)(I) does not apply.

ii) EUT meets requirements for Noise and Gain limits. Thus Part 20.21 § (e)(8)(i)(H) does not apply.

iii) Does not apply to EUT

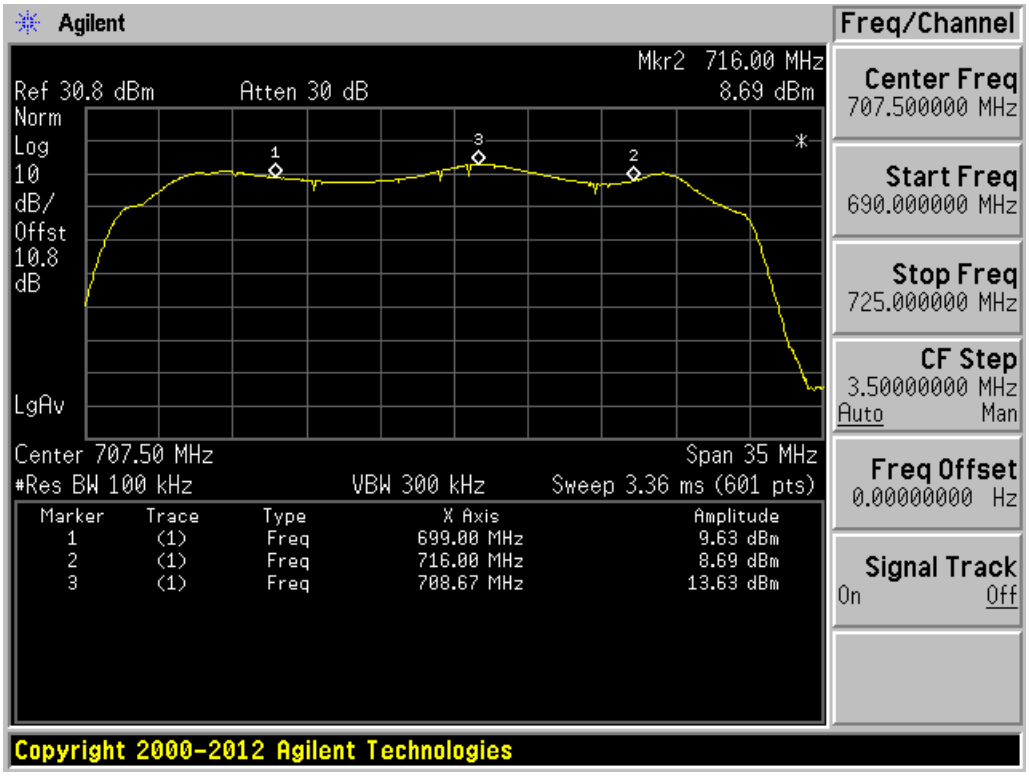
iv) EUT user manual specifies all antennas and cables to be used. All technical documentation provided with the application for FCC equipment authorization that shows compliance of all antennas, cables and/or coupling devices with the requirements of this section.

3 Test Report

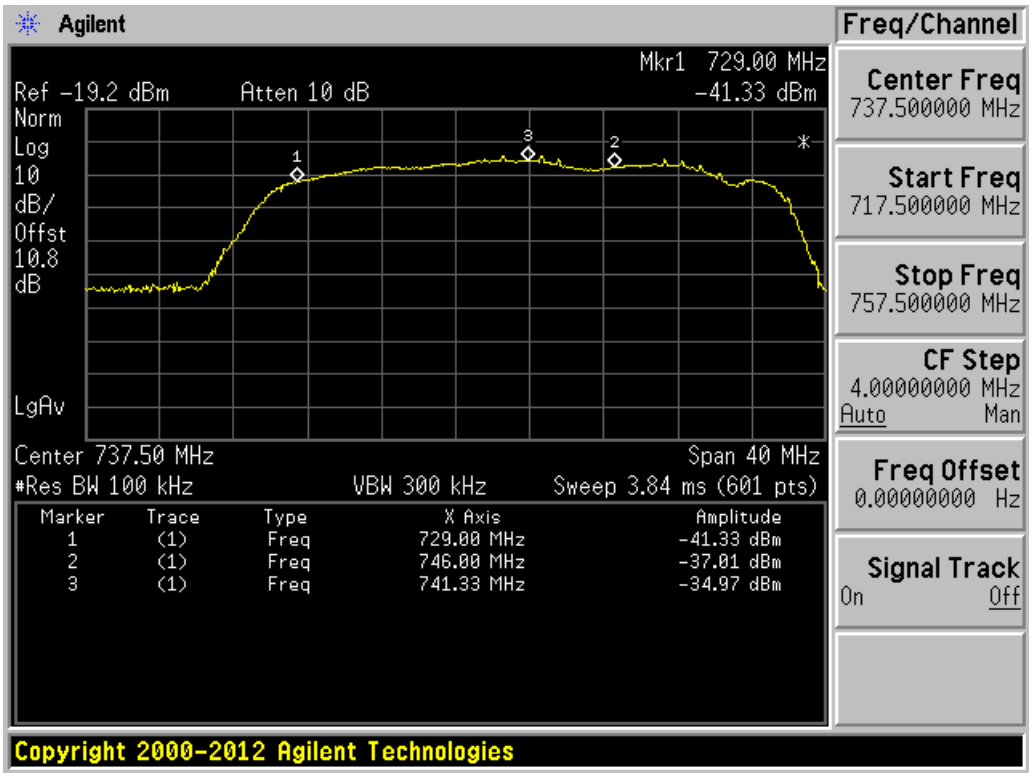
3.1 Authorized Frequency Band Verification Test

This test conducted in accordance with KDB 935210 D03 V04 Signal Booster Measurements, § 7.1
This comply with FCC Rule: § 20.21(e)(3) Frequency Bands

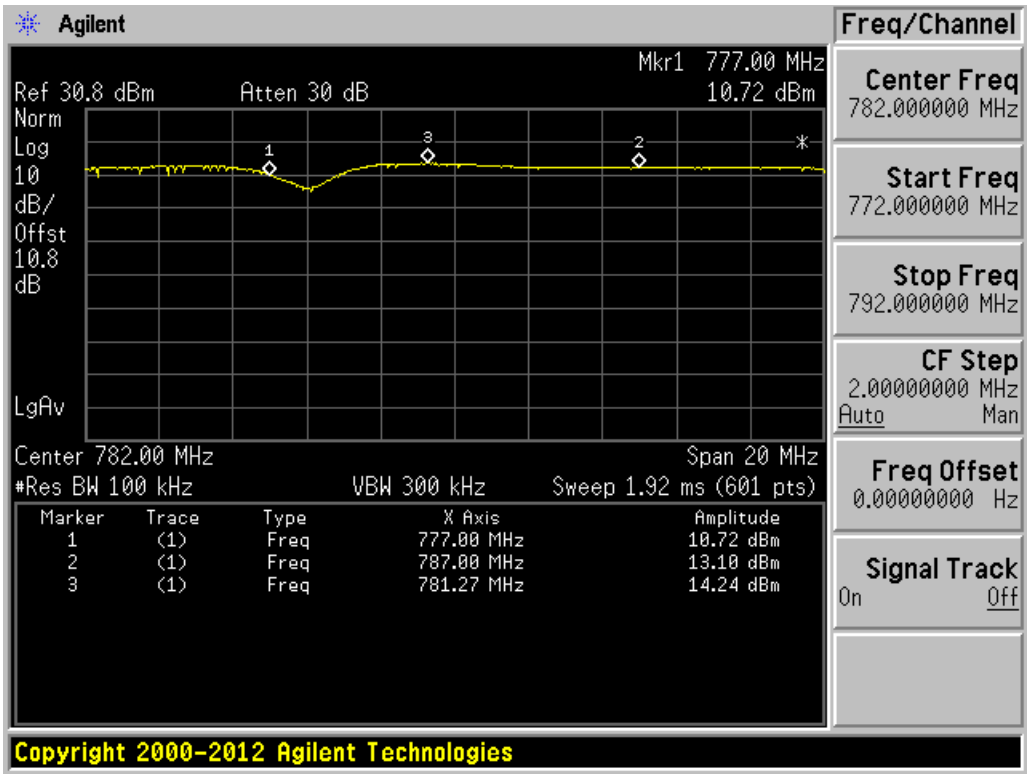
3.1.1 Authorized frequency band test results



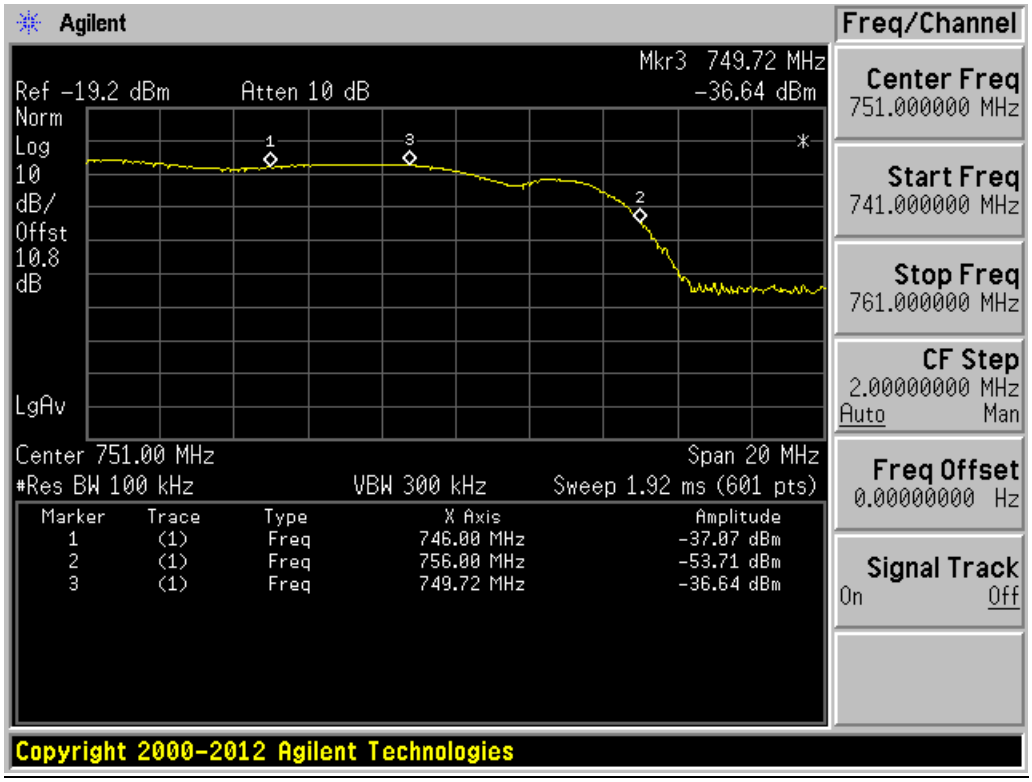
Uplink Band 12 & 17



Downlink Band 12 & 17



Uplink Band 13



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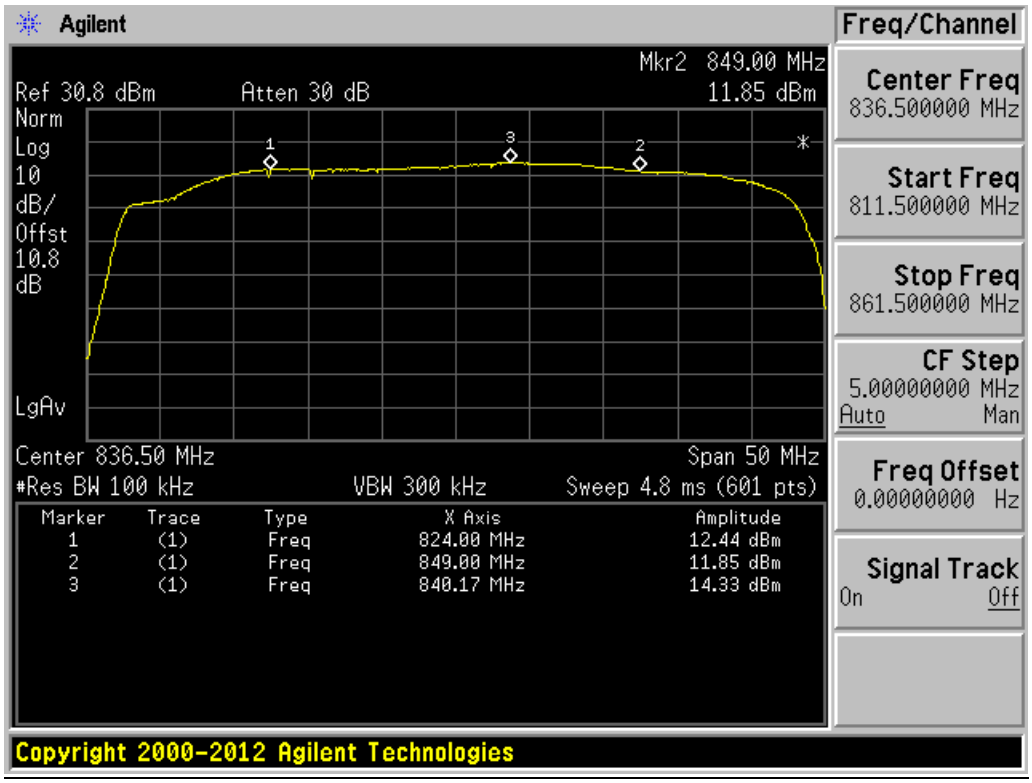
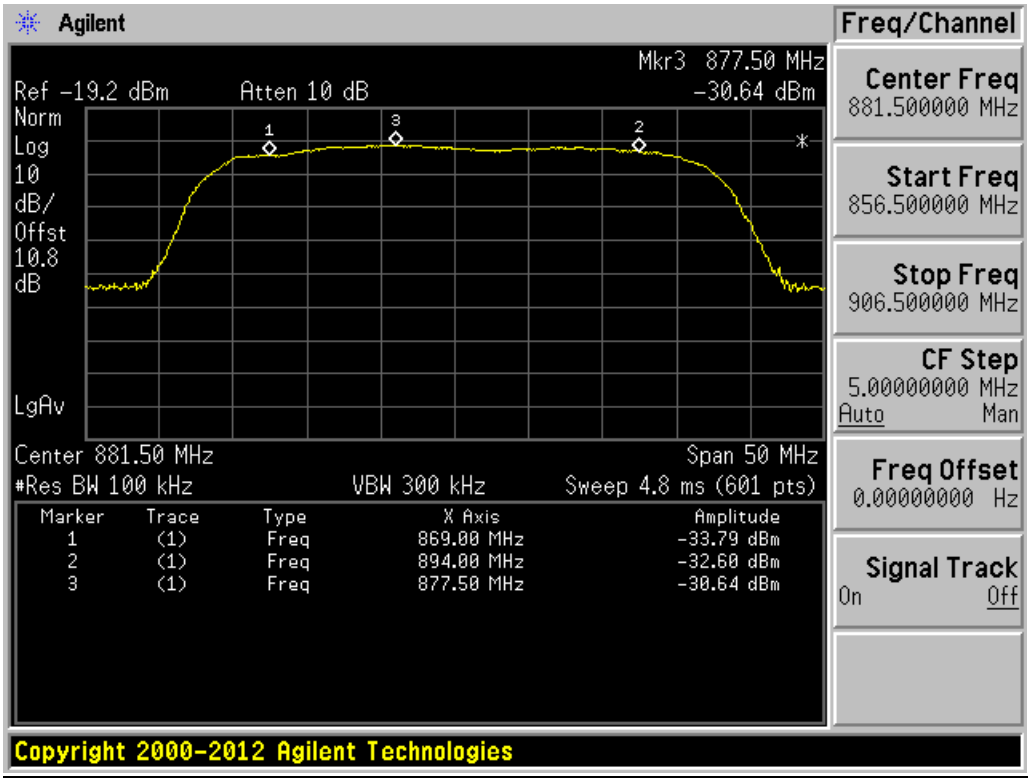


Uplink Band 5



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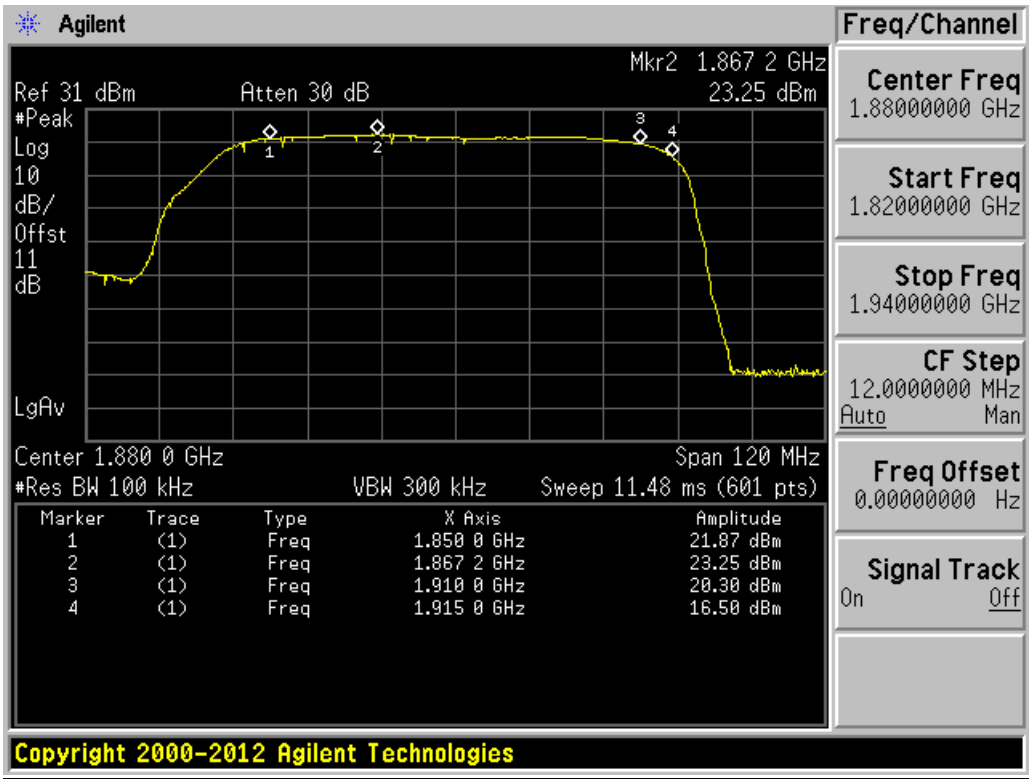
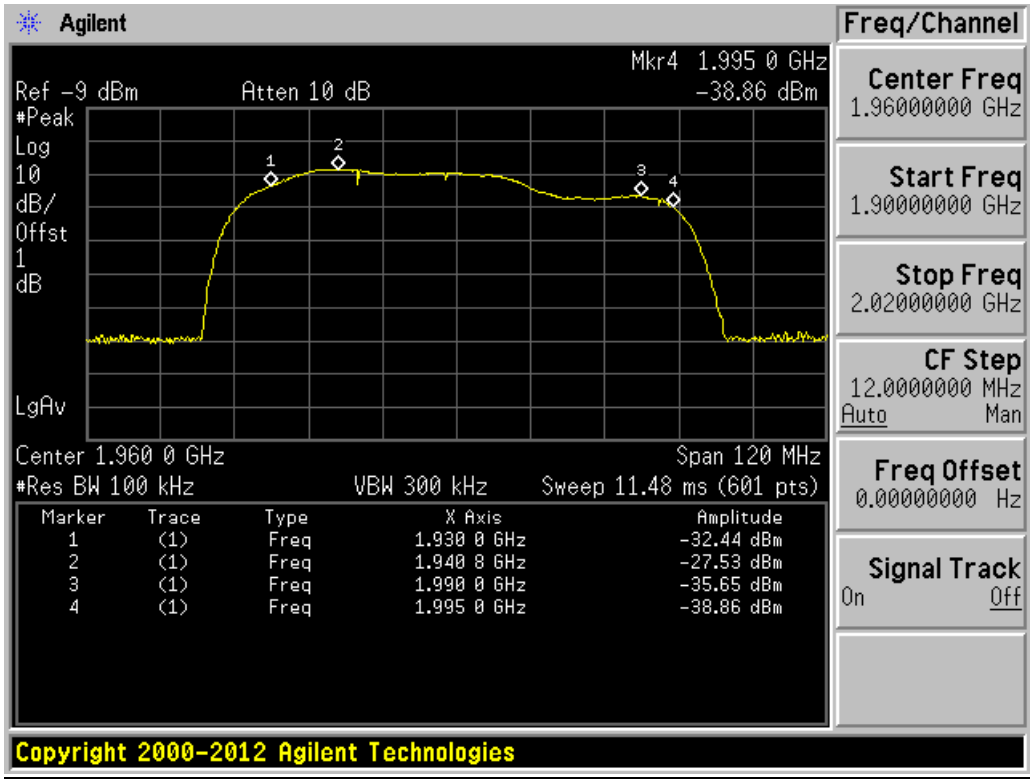
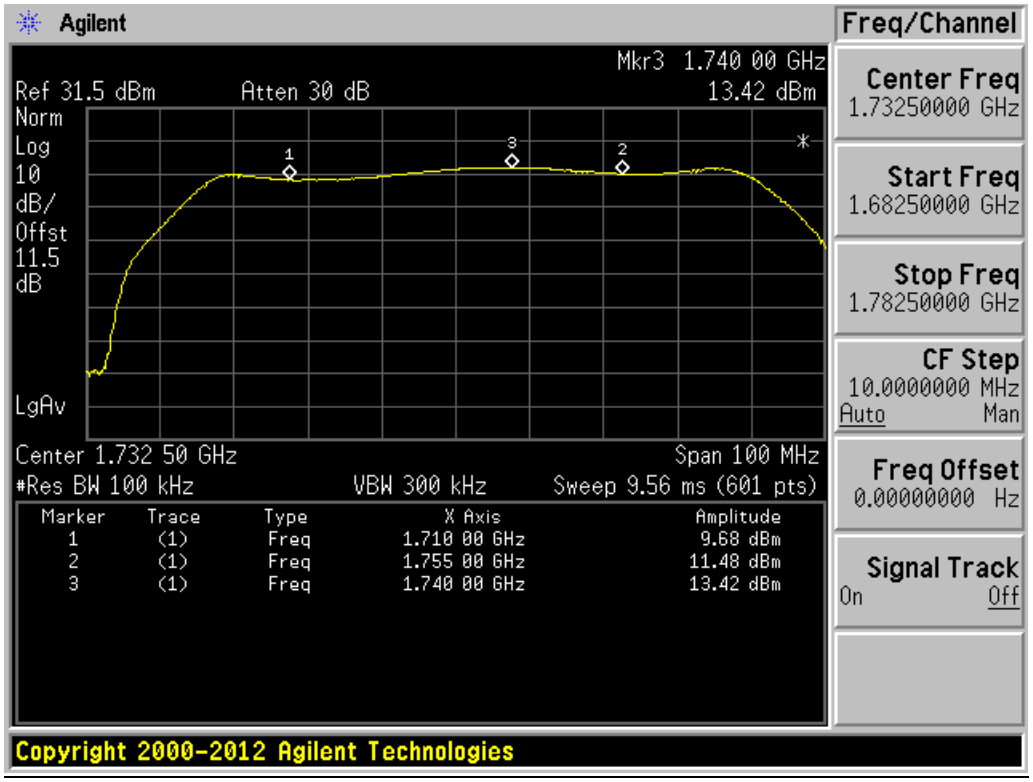


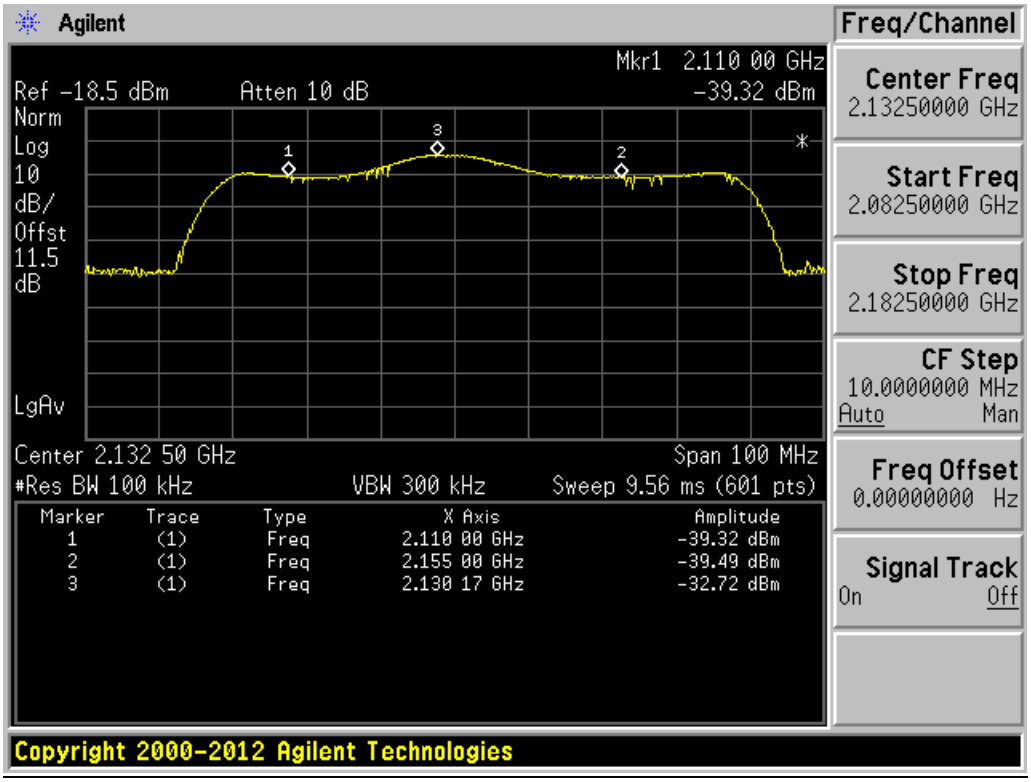
Uplink Band 2 & 25



Downlink Band 2 & 25



Uplink Band 4



Downlink Band 4

3.2 Maximum Power Measurement Test

This test conducted in accordance with KDB 935210 D03 V04 Signal Booster Measurements, § 7.2
This comply with FCC Rule: § 20.21(e)(8)(i)(D) Power Limits and § 20.21(e)(8)(i)(B) Bidirectional Capability

3.2.1 Maximum power test results

Table 1: Burst power (Pulsed CW)

Freq (MHz)	P in (dBm)	Pout (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
840.2	8.2	27.6	17	30	Pass
877.5	-46.9	-24.1	NA	17	Pass
708.7	9.7	26.4	17	30	Pass
741.3	-49.9	-27.1	NA	17	Pass
781.3	4.6	21.4	17	30	Pass
749.7	-49.9	-28.9	NA	17	Pass
1860.0	9.0	27.1	17	30	Pass
1941.4	-45.8	-23.7	NA	17	Pass
1740.0	9.5	24.6	17	30	Pass
2130.2	-42.8	-24.1	NA	17	Pass

Table 2: Channel power (AWGN 4.1 MHz)

Freq (MHz)	P in (dBm)	Pout (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
840.2	8.0	26.4	17	30	Pass
877.5	-45.7	-23.2	NA	17	Pass
708.7	8.0	23.2	17	30	Pass
741.3	-47.7	-26.1	NA	17	Pass
781.3	5.5	21.1	17	30	Pass
749.7	-46.2	-26.7	NA	17	Pass
1860.0	8.0	25.6	17	30	Pass
1941.4	-46.4	-24.7	NA	17	Pass
1740.0	8.5	22.2	17	30	Pass
2130.2	-43.8	-24.9	NA	17	Pass

3.2.2 Maximum input test results

AWGN				Pulsed CW			
Freq	Band	P in	P out	Freq	Band	P in	P out
840.2	5 Tx	7.0	23.4	840.2	5 Tx	7.0	24.7
840.2	5 Tx	9.0	24.9	840.2	5 Tx	9.0	26.4
840.2	5 Tx	11.0	25.3	840.2	5 Tx	11.0	26.8
840.2	5 Tx	13.0	25.4	840.2	5 Tx	13.0	26.9
840.2	5 Tx	15.0	25.7	840.2	5 Tx	15.0	27.1
840.2	5 Tx	17.0	25.6	840.2	5 Tx	17.0	27.4
840.2	5 Tx	19.0	25.2	840.2	5 Tx	19.0	27.2
840.2	5 Tx	21.0	25.7	840.2	5 Tx	21.0	26.5
840.2	5 Tx	23.0	25.6	840.2	5 Tx	23.0	26.7
840.2	5 Tx	25.0	25.2	840.2	5 Tx	25.0	27.1
840.2	5 Tx	27.0	25.7	840.2	5 Tx	27.0	27.4

AWGN				Pulsed CW			
Freq	Band	P in	P out	Freq	Band	P in	P out
708.7	12 Tx	7.0	22.8	708.7	12 Tx	7.0	25.2
708.7	12 Tx	9.0	24.0	708.7	12 Tx	9.0	26.6
708.7	12 Tx	11.0	23.8	708.7	12 Tx	11.0	26.5
708.7	12 Tx	13.0	23.9	708.7	12 Tx	13.0	26.6
708.7	12 Tx	15.0	24.0	708.7	12 Tx	15.0	26.7
708.7	12 Tx	17.0	24.1	708.7	12 Tx	17.0	26.4
708.7	12 Tx	19.0	23.9	708.7	12 Tx	19.0	26.3
708.7	12 Tx	21.0	24.0	708.7	12 Tx	21.0	26.5
708.7	12 Tx	23.0	24.0	708.7	12 Tx	23.0	26.5
708.7	12 Tx	25.0	24.1	708.7	12 Tx	25.0	26.7
708.7	12 Tx	27.0	23.9	708.7	12 Tx	27.0	26.4

AWGN				Pulsed CW			
Freq	Band	P in	P out	Freq	Band	P in	P out
781.3	13 Tx	7.0	17.4	781.3	13 Tx	7.0	19.2
781.3	13 Tx	9.0	18.3	781.3	13 Tx	9.0	20.9
781.3	13 Tx	11.0	18.2	781.3	13 Tx	11.0	20.8
781.3	13 Tx	13.0	18.5	781.3	13 Tx	13.0	22.1
781.3	13 Tx	15.0	18.7	781.3	13 Tx	15.0	21.8
781.3	13 Tx	17.0	18.5	781.3	13 Tx	17.0	21.9
781.3	13 Tx	19.0	19.7	781.3	13 Tx	19.0	22.1
781.3	13 Tx	21.0	18.5	781.3	13 Tx	21.0	21.9
781.3	13 Tx	23.0	18.6	781.3	13 Tx	23.0	22.0
781.3	13 Tx	25.0	18.7	781.3	13 Tx	25.0	21.9
781.3	13 Tx	27.0	18.5	781.3	13 Tx	27.0	22.1

AWGN				Pulsed CW			
Freq	Band	P in	P out	Freq	Band	P in	P out
1860	2 Tx	7.0	24.0	1860	2 Tx	7.0	24.4
1860	2 Tx	9.0	25.2	1860	2 Tx	9.0	24.8
1860	2 Tx	11.0	25.3	1860	2 Tx	11.0	24.9
1860	2 Tx	13.0	24.8	1860	2 Tx	13.0	25.2
1860	2 Tx	15.0	25.1	1860	2 Tx	15.0	25.4
1860	2 Tx	17.0	25.2	1860	2 Tx	17.0	25.7
1860	2 Tx	19.0	24.8	1860	2 Tx	19.0	24.6
1860	2 Tx	21.0	25.3	1860	2 Tx	21.0	25.1
1860	2 Tx	23.0	24.4	1860	2 Tx	23.0	25.5
1860	2 Tx	25.0	25.3	1860	2 Tx	25.0	25.4
1860	2 Tx	27.0	24.8	1860	2 Tx	27.0	25.7

AWGN				Pulsed CW			
Freq	Band	P in	P out	Freq	Band	P in	P out
1740	4 Tx	7.0	21.2	1740	4 Tx	7.0	22.3
1740	4 Tx	9.0	22.1	1740	4 Tx	9.0	22.1
1740	4 Tx	11.0	21.5	1740	4 Tx	11.0	22.6
1740	4 Tx	13.0	21.8	1740	4 Tx	13.0	22.7
1740	4 Tx	15.0	21.4	1740	4 Tx	15.0	23.1
1740	4 Tx	17.0	21.3	1740	4 Tx	17.0	23.2
1740	4 Tx	19.0	21.7	1740	4 Tx	19.0	23.4
1740	4 Tx	21.0	21.5	1740	4 Tx	21.0	22.6
1740	4 Tx	23.0	21.0	1740	4 Tx	23.0	22.7
1740	4 Tx	25.0	21.5	1740	4 Tx	25.0	23.2
1740	4 Tx	27.0	21.4	1740	4 Tx	27.0	22.8

AWGN				Pulsed CW			
Freq	Band	P in	P out	Freq	Band	P in	P out
877.5	5 Rx	-40.0	-23.2	877.5	5 Rx	-40.0	-26.0
877.5	5 Rx	-38.0	-23.3	877.5	5 Rx	-38.0	-25.9
877.5	5 Rx	-36.0	-23.2	877.5	5 Rx	-36.0	-25.8
877.5	5 Rx	-34.0	-23.1	877.5	5 Rx	-34.0	-25.9
877.5	5 Rx	-32.0	-23.2	877.5	5 Rx	-32.0	-25.9
877.5	5 Rx	-30.0	-23.2	877.5	5 Rx	-30.0	-26.1
877.5	5 Rx	-28.0	-23.2	877.5	5 Rx	-28.0	-26.2
877.5	5 Rx	-26.0	-23.2	877.5	5 Rx	-26.0	-25.4
877.5	5 Rx	-24.0	-23.7	877.5	5 Rx	-24.0	-26.8
877.5	5 Rx	-22.0	-23.5	877.5	5 Rx	-22.0	-26.6
877.5	5 Rx	-20.0	-23.4	877.5	5 Rx	-20.0	-25.6

AWGN				Pulsed CW			
Freq	Band	P in	P out	Freq	Band	P in	P out
741.3	12 Rx	-40.0	-25.0	741.3	12 Rx	-40.0	-27.4
741.3	12 Rx	-38.0	-25.6	741.3	12 Rx	-38.0	-26.7
741.3	12 Rx	-36.0	-25.7	741.3	12 Rx	-36.0	-27.2
741.3	12 Rx	-34.0	-25.0	741.3	12 Rx	-34.0	-27.6
741.3	12 Rx	-32.0	-25.3	741.3	12 Rx	-32.0	-26.8
741.3	12 Rx	-30.0	-25.7	741.3	12 Rx	-30.0	-27.2
741.3	12 Rx	-28.0	-26.0	741.3	12 Rx	-28.0	-27.3
741.3	12 Rx	-26.0	-25.4	741.3	12 Rx	-26.0	-27.3
741.3	12 Rx	-24.0	-24.6	741.3	12 Rx	-24.0	-27.2
741.3	12 Rx	-22.0	-24.7	741.3	12 Rx	-22.0	-26.4
741.3	12 Rx	-20.0	-23.9	741.3	12 Rx	-20.0	-25.9

AWGN				Pulsed CW			
Freq	Band	P in	P out	Freq	Band	P in	P out
749.7	13 Rx	-40.0	-25.9	749.7	13 Rx	-40.0	-28.4
749.7	13 Rx	-38.0	-26.0	749.7	13 Rx	-38.0	-28.5
749.7	13 Rx	-36.0	-26.3	749.7	13 Rx	-36.0	-29.0
749.7	13 Rx	-34.0	-26.7	749.7	13 Rx	-34.0	-29.5
749.7	13 Rx	-32.0	-26.5	749.7	13 Rx	-32.0	-28.5
749.7	13 Rx	-30.0	-26.3	749.7	13 Rx	-30.0	-29.0
749.7	13 Rx	-28.0	-26.5	749.7	13 Rx	-28.0	-28.8
749.7	13 Rx	-26.0	-26.0	749.7	13 Rx	-26.0	-29.0
749.7	13 Rx	-24.0	-25.4	749.7	13 Rx	-24.0	-28.8
749.7	13 Rx	-22.0	-25.1	749.7	13 Rx	-22.0	-28.5
749.7	13 Rx	-20.0	-25.4	749.7	13 Rx	-20.0	-26.2

AWGN				Pulsed CW			
Freq	Band	P in	P out	Freq	Band	P in	P out
1941.4	2 Rx	-40.0	-24.5	1941.4	2 Rx	-40.0	-26.3
1941.4	2 Rx	-38.0	-24.6	1941.4	2 Rx	-38.0	-26.2
1941.4	2 Rx	-36.0	-24.5	1941.4	2 Rx	-36.0	-26.1
1941.4	2 Rx	-34.0	-24.3	1941.4	2 Rx	-34.0	-26.0
1941.4	2 Rx	-32.0	-24.4	1941.4	2 Rx	-32.0	-26.3
1941.4	2 Rx	-30.0	-24.6	1941.4	2 Rx	-30.0	-26.6
1941.4	2 Rx	-28.0	-24.8	1941.4	2 Rx	-28.0	-26.7
1941.4	2 Rx	-26.0	-25.1	1941.4	2 Rx	-26.0	-25.9
1941.4	2 Rx	-24.0	-24.2	1941.4	2 Rx	-24.0	-26.5
1941.4	2 Rx	-22.0	-24.6	1941.4	2 Rx	-22.0	-26.6
1941.4	2 Rx	-20.0	-24.2	1941.4	2 Rx	-20.0	-26.0

AWGN				Pulsed CW			
Freq	Band	P in	P out	Freq	Band	P in	P out
2130.2	4 Rx	-40.0	-24.8	2130.2	4 Rx	-40.0	-25.5
2130.2	4 Rx	-38.0	-23.8	2130.2	4 Rx	-38.0	-25.3
2130.2	4 Rx	-36.0	-23.7	2130.2	4 Rx	-36.0	-25.2
2130.2	4 Rx	-34.0	-23.4	2130.2	4 Rx	-34.0	-25.2
2130.2	4 Rx	-32.0	-23.9	2130.2	4 Rx	-32.0	-25.3
2130.2	4 Rx	-30.0	-24.2	2130.2	4 Rx	-30.0	-25.5
2130.2	4 Rx	-28.0	-24.3	2130.2	4 Rx	-28.0	-25.9
2130.2	4 Rx	-26.0	-23.7	2130.2	4 Rx	-26.0	-25.1
2130.2	4 Rx	-24.0	-23.9	2130.2	4 Rx	-24.0	-25.4
2130.2	4 Rx	-22.0	-24.1	2130.2	4 Rx	-22.0	-25.8
2130.2	4 Rx	-20.0	-23.8	2130.2	4 Rx	-20.0	-25.7

3.3 Maximum Booster Gain Computation

This test conducted in accordance with KDB 935210 D03 V04 Signal Booster Measurements, § 7.3
This comply with FCC Rule: § 20.21(e)(8)(i)(C)(2) Booster Gain Limits and § 20.21(e)(8)(i)(B) Bidirectional Capability

3.3.1 Maximum gain test results

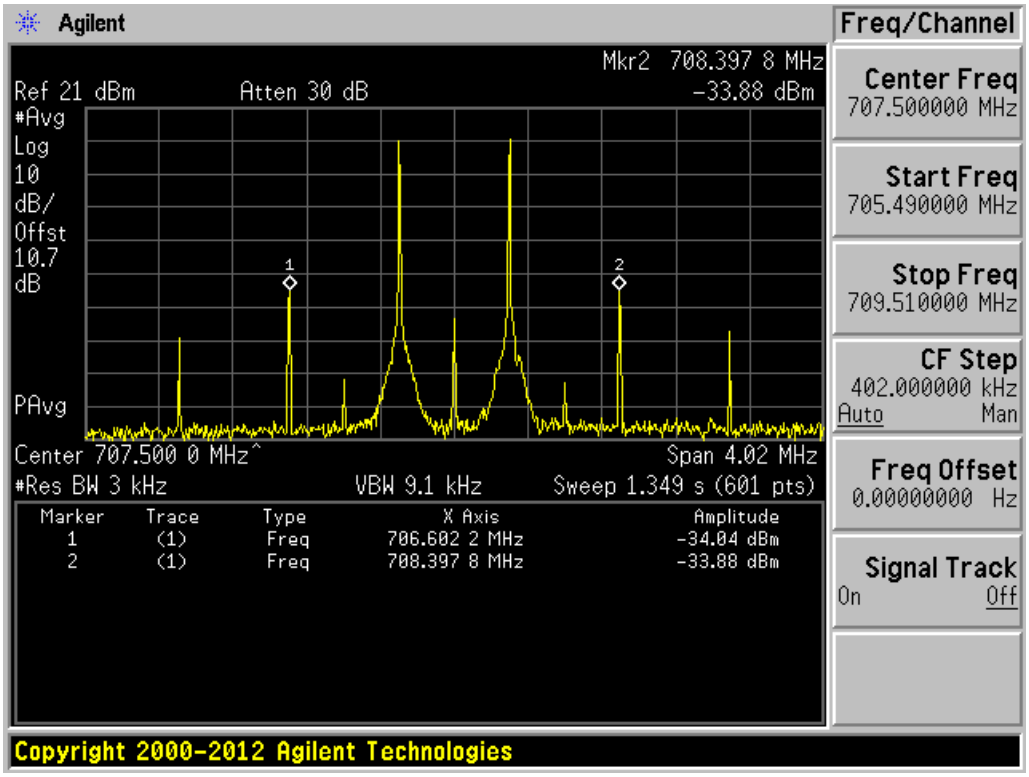
Table 3: Maximum Booster Gain

Calculated Gain for Pulsed CW signal					
Freq (MHz)	P in (dBm)	Pout (dBm)	Max Gain (dB)	Limit (dB)	Result
840.2	8.2	27.6	19.4	23	Pass
877.5	-46.9	-24.1	22.8	23	Pass
708.7	9.7	26.4	16.7	23	Pass
741.3	-49.9	-27.1	22.8	23	Pass
781.3	4.6	21.4	16.8	23	Pass
749.7	-49.9	-28.9	21.0	23	Pass
1860.0	9.0	27.1	18.1	23	Pass
1941.4	-45.8	-23.7	22.1	23	Pass
1740.0	9.5	24.6	15.1	23	Pass
2130.2	-42.8	-24.1	18.7	23	Pass
Calculated Gain for AWGN signal					
Freq (MHz)	P in (dBm)	Pout (dBm)	Max Gain (dB)	Limit (dB)	Result
840.2	8.0	26.4	18.4	23	Pass
877.5	-45.7	-23.2	22.5	23	Pass
708.7	8.0	23.2	15.2	23	Pass
741.3	-47.7	-26.1	21.6	23	Pass
781.3	5.5	21.1	15.6	23	Pass
749.7	-46.2	-26.7	19.5	23	Pass
1860.0	8.0	25.6	17.6	23	Pass
1941.4	-46.4	-24.7	21.7	23	Pass
1740.0	8.5	22.2	13.7	23	Pass
2130.2	-43.8	-24.9	18.9	23	Pass

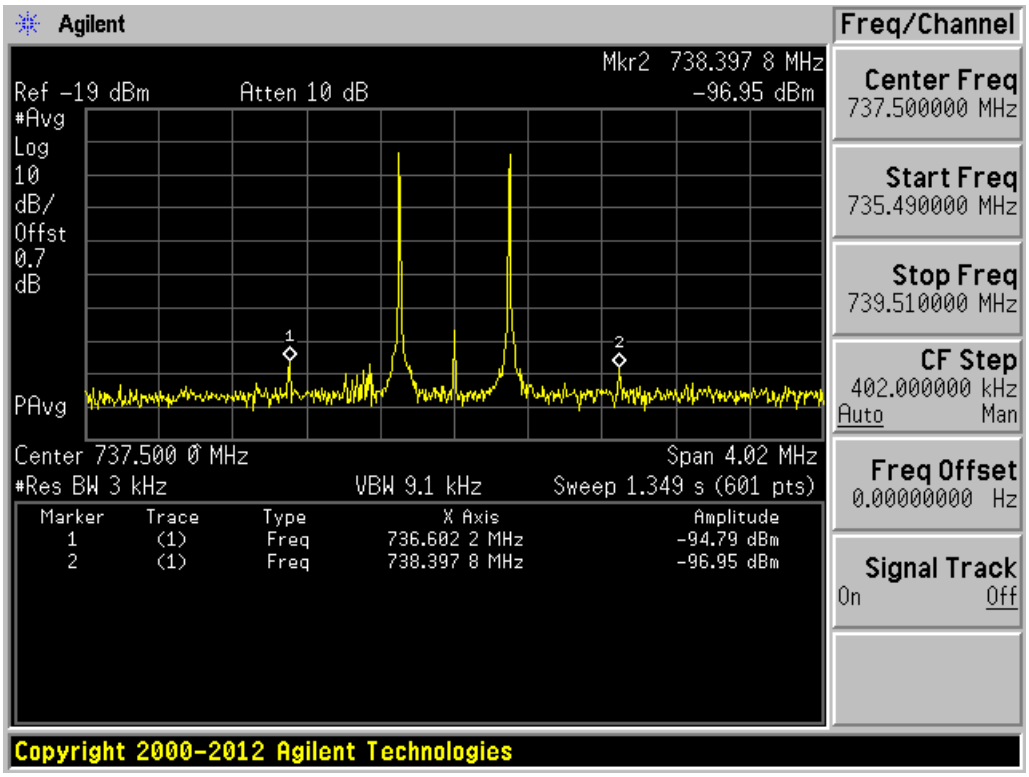
3.4 Intermodulation Product Test

This test conducted in accordance with KDB 935210 D03 V04 Signal Booster Measurements, § 7.4
This comply with FCC Rule: § 20.21(e)(8)(i)(F) Intermodulation Limits

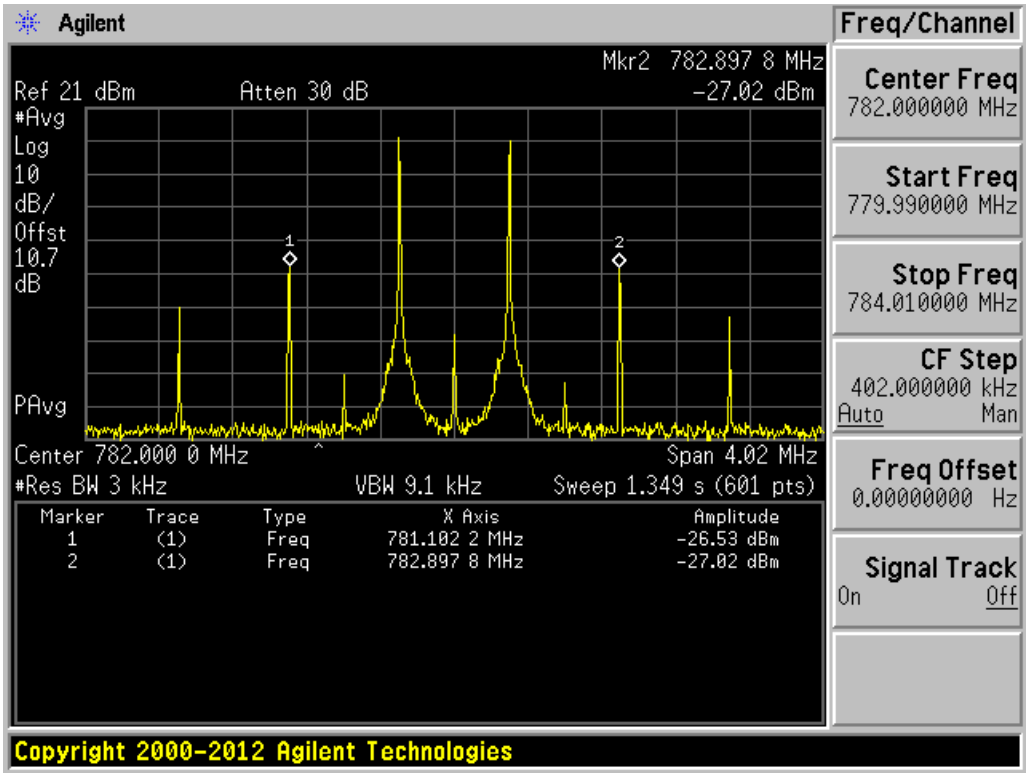
3.4.1 Intermodulation product test results



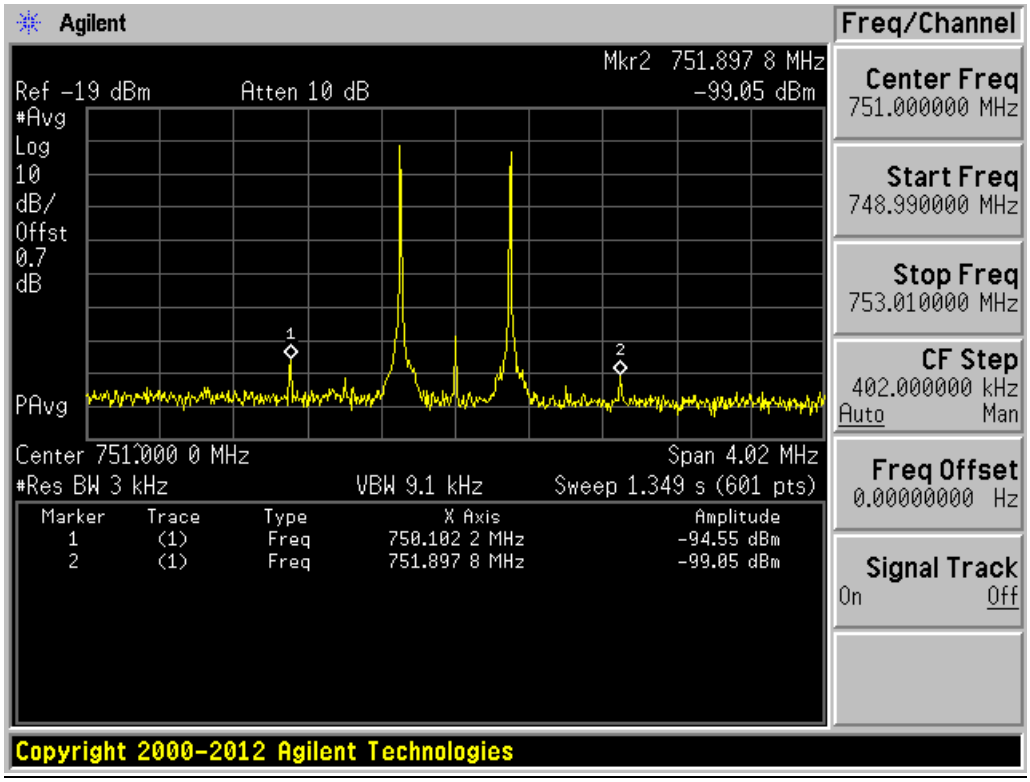
Uplink Band 12 & 17



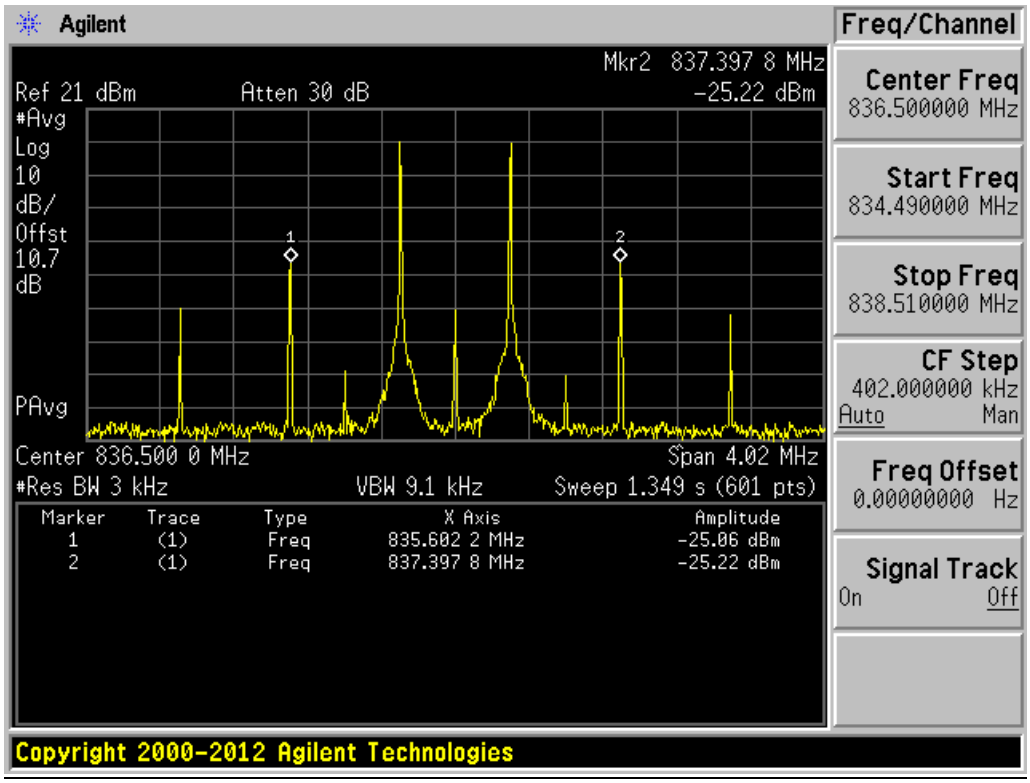
Downlink Band 12 & 17



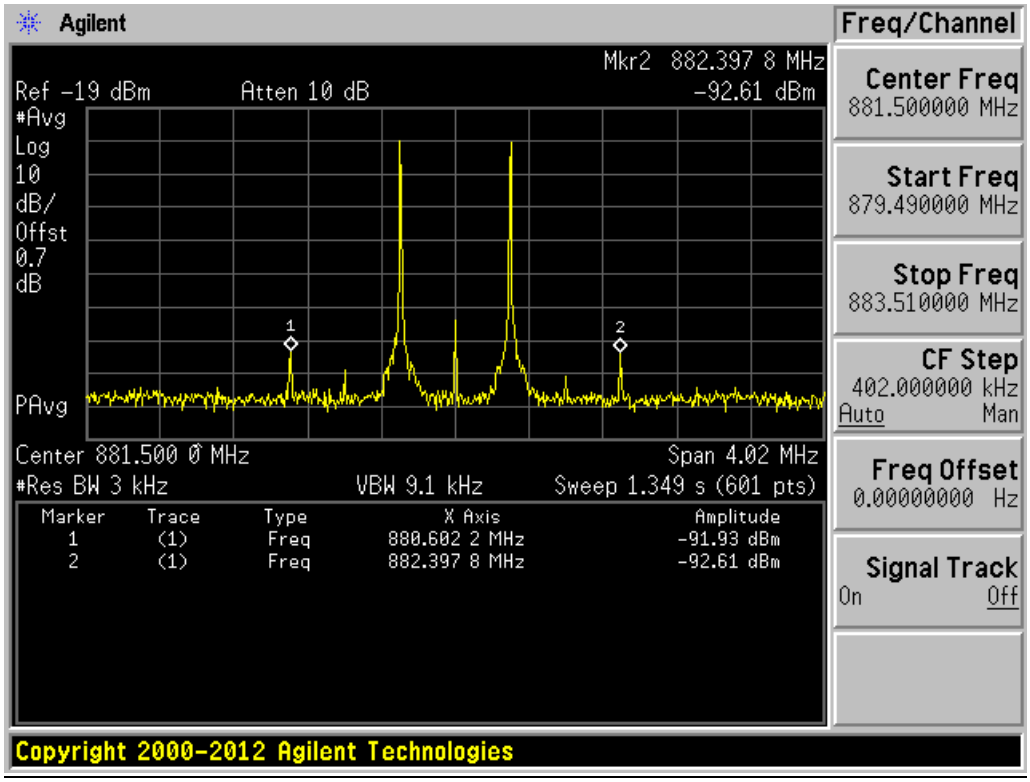
Uplink Band 13



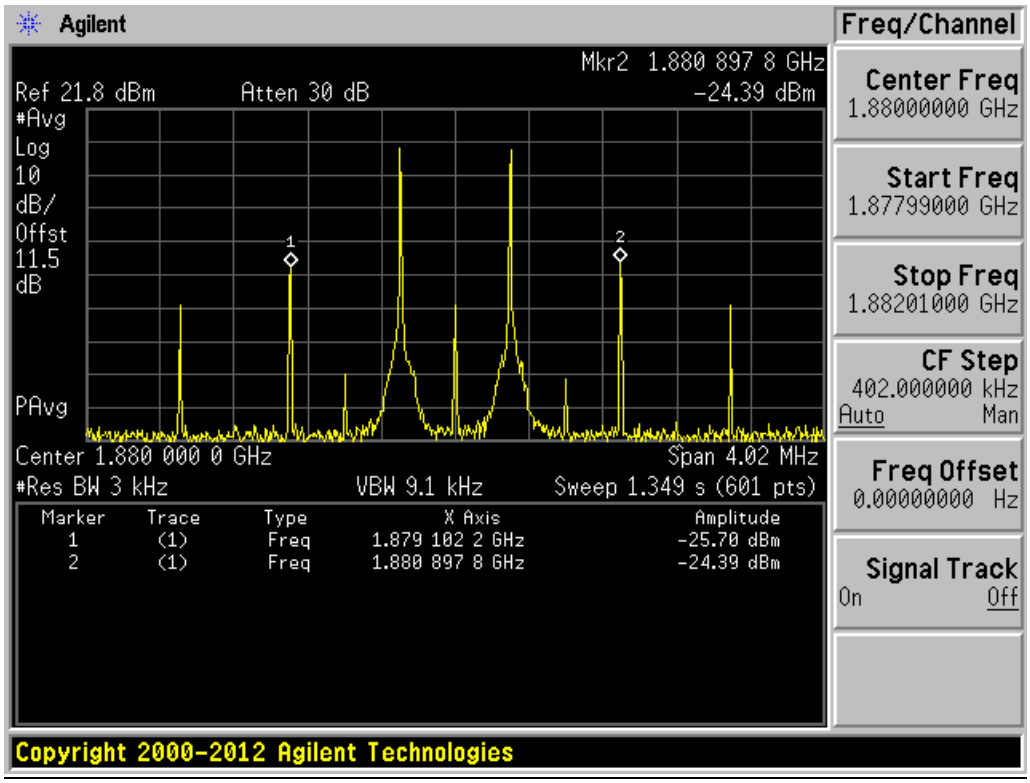
Downlink Band 13



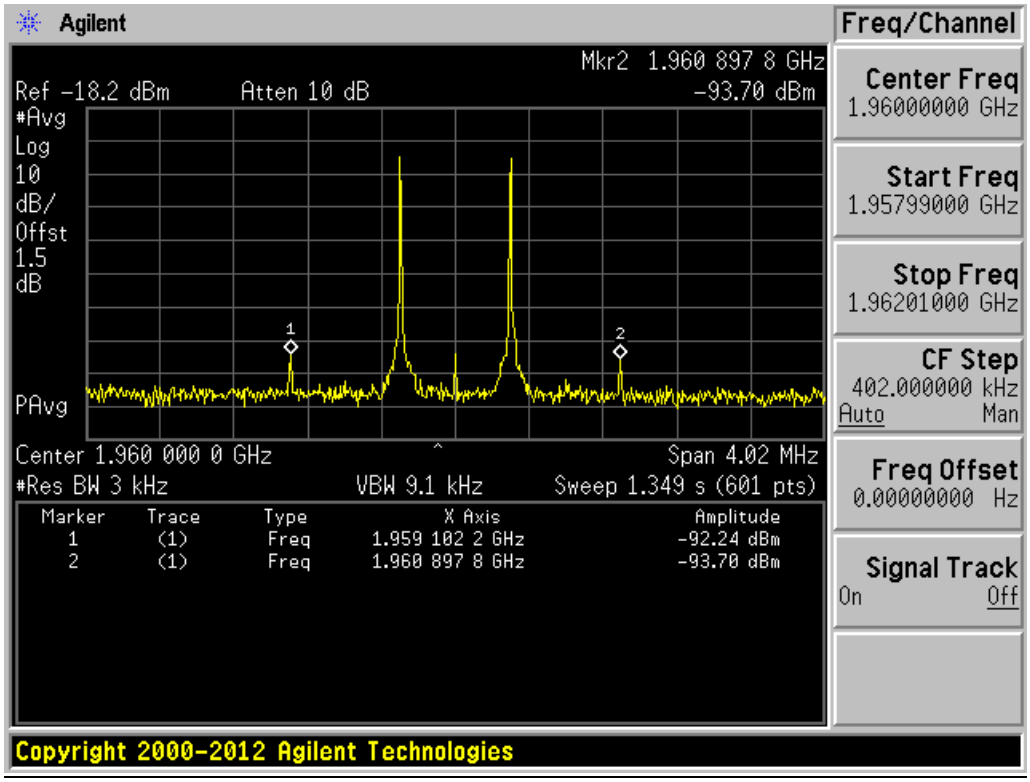
Uplink Band 5



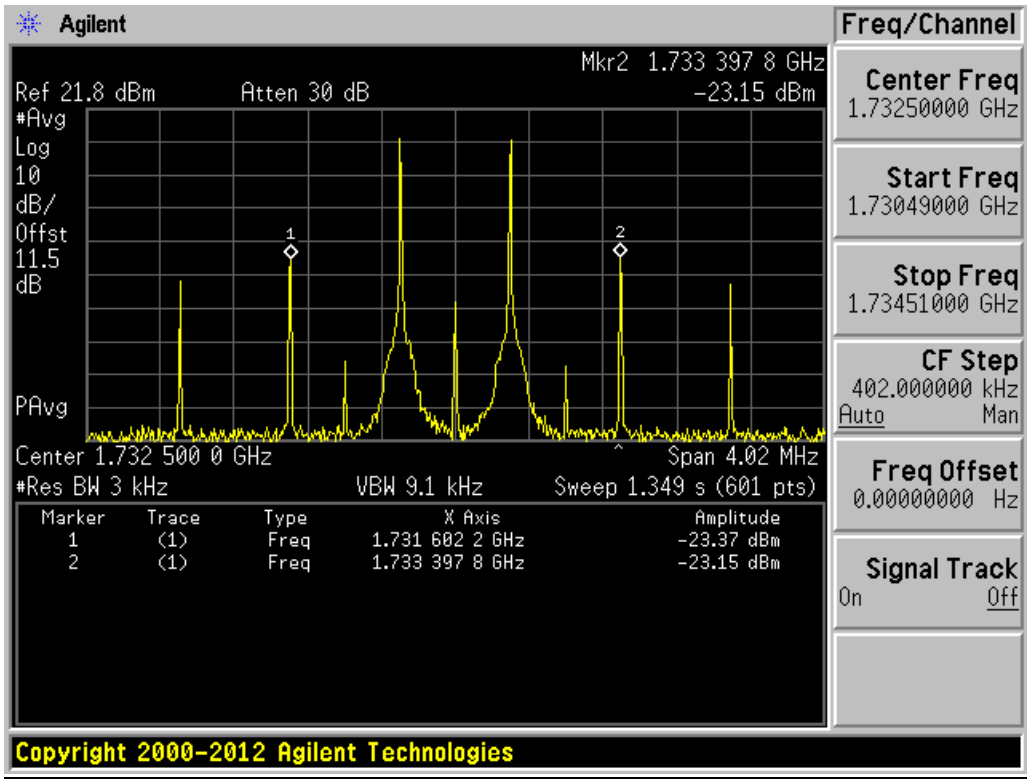
Downlink Band 5



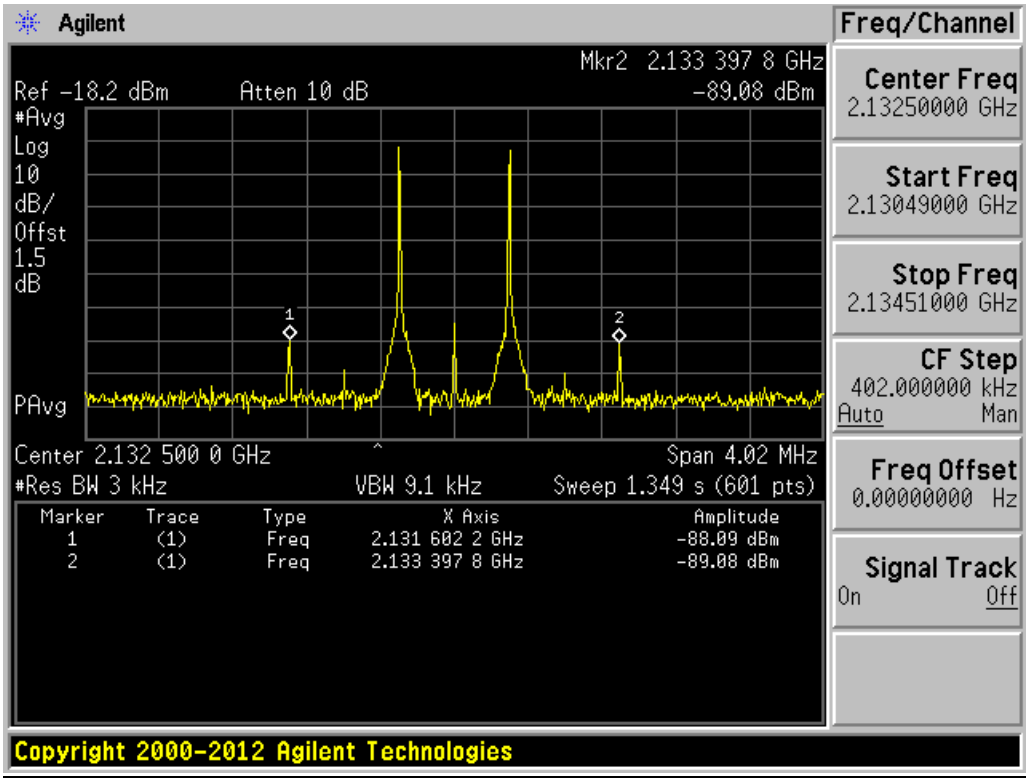
Uplink Band 2 & 25



Downlink Band 2 & 25



Uplink Band 4

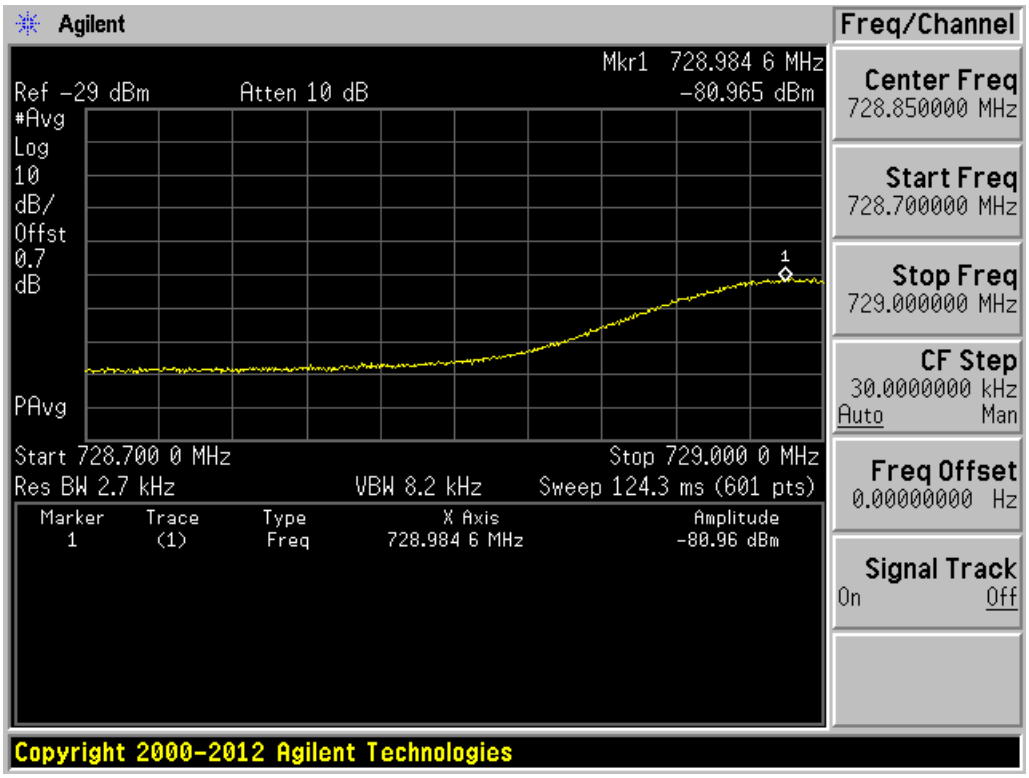


Downlink Band 4

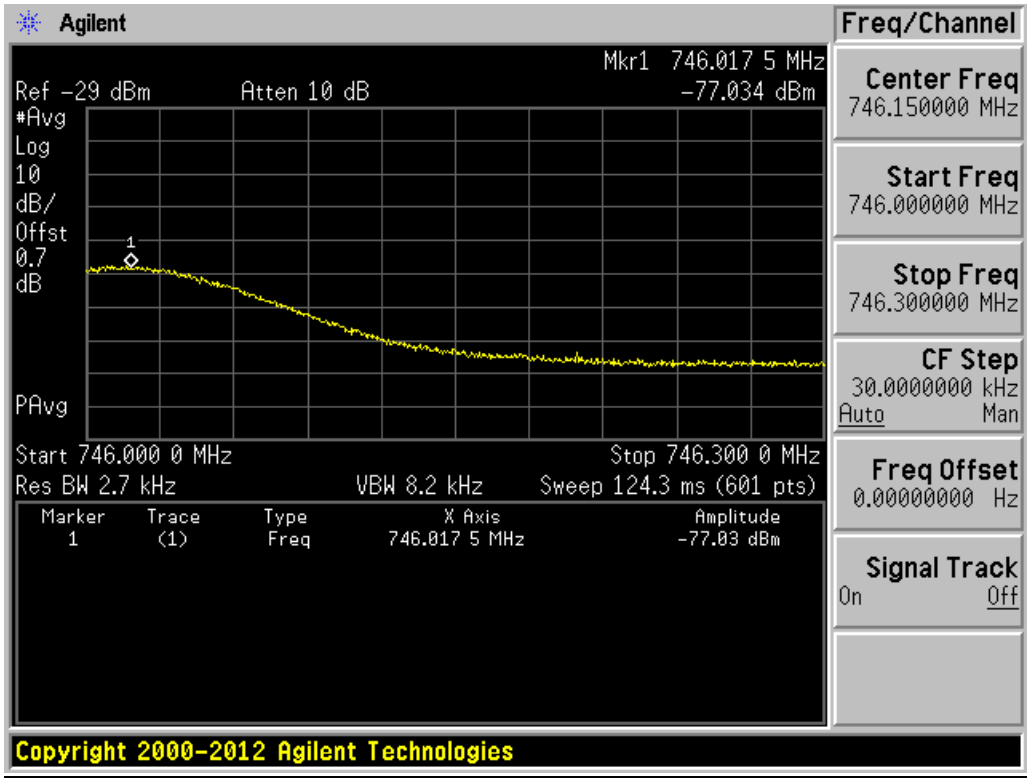
3.5 Out-Of-Band Emissions Test

This test conducted in accordance with KDB 935210 D03 V04, Signal Booster Measurements, § 7.5
This comply with FCC Rule: § 20.21(e)(8)(i)(E) Out of Band Emission Limits

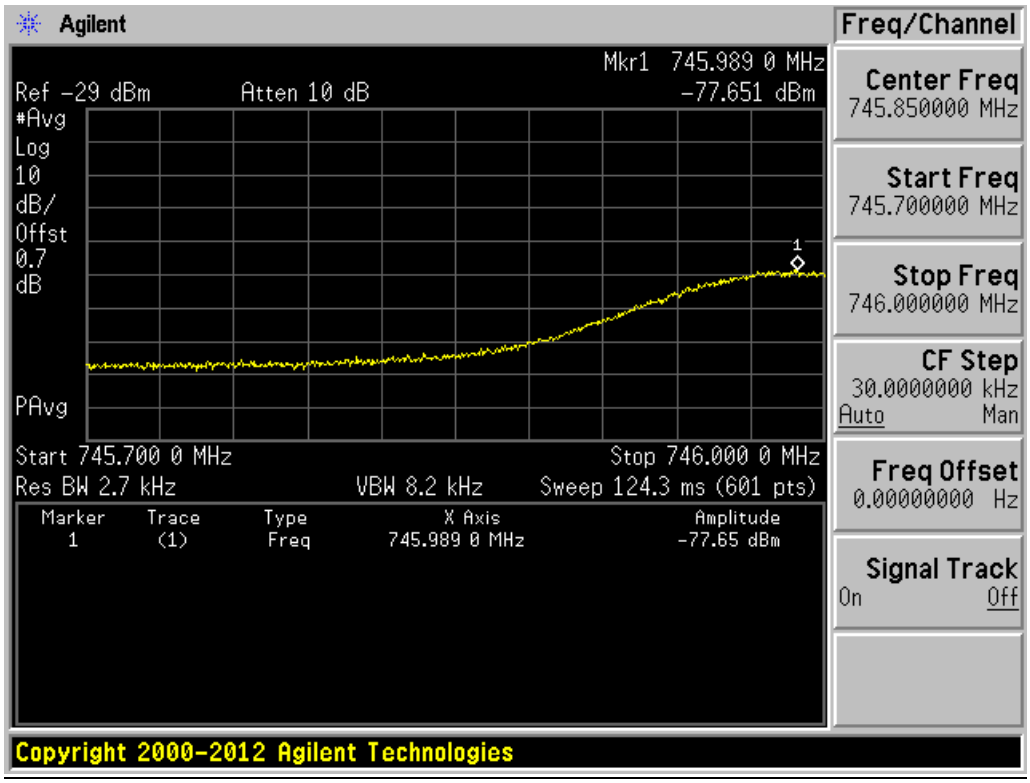
3.5.1 Out of band emissions test results



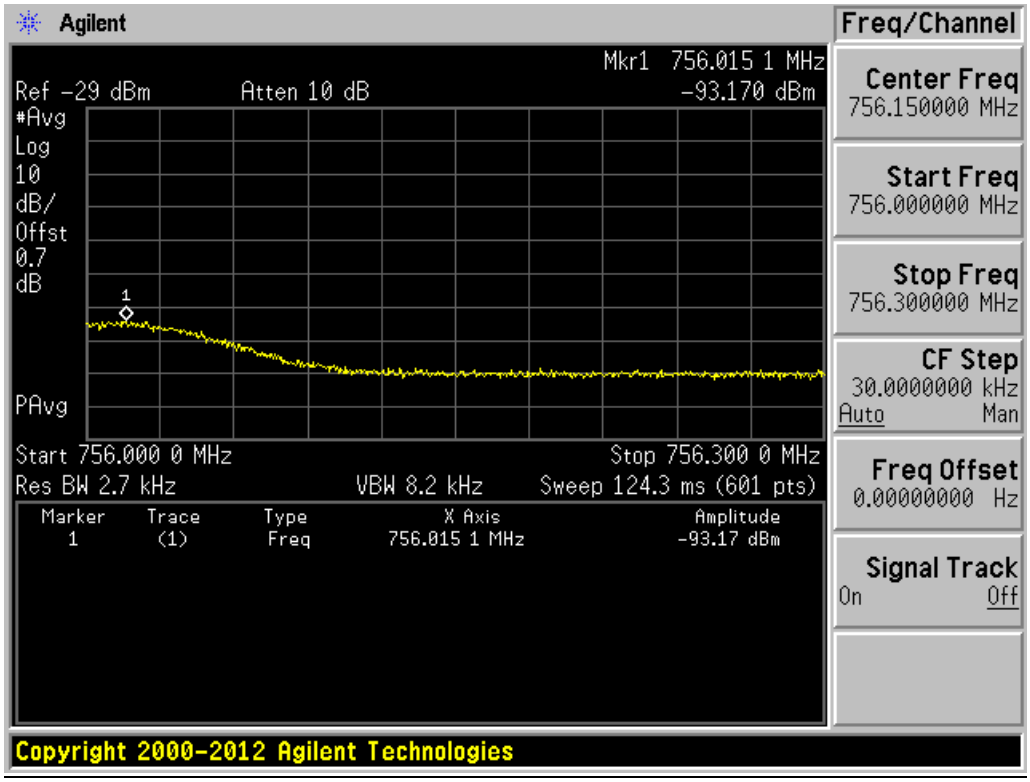
Downlink, Band 12 & 17, GSM 729.2 MHz



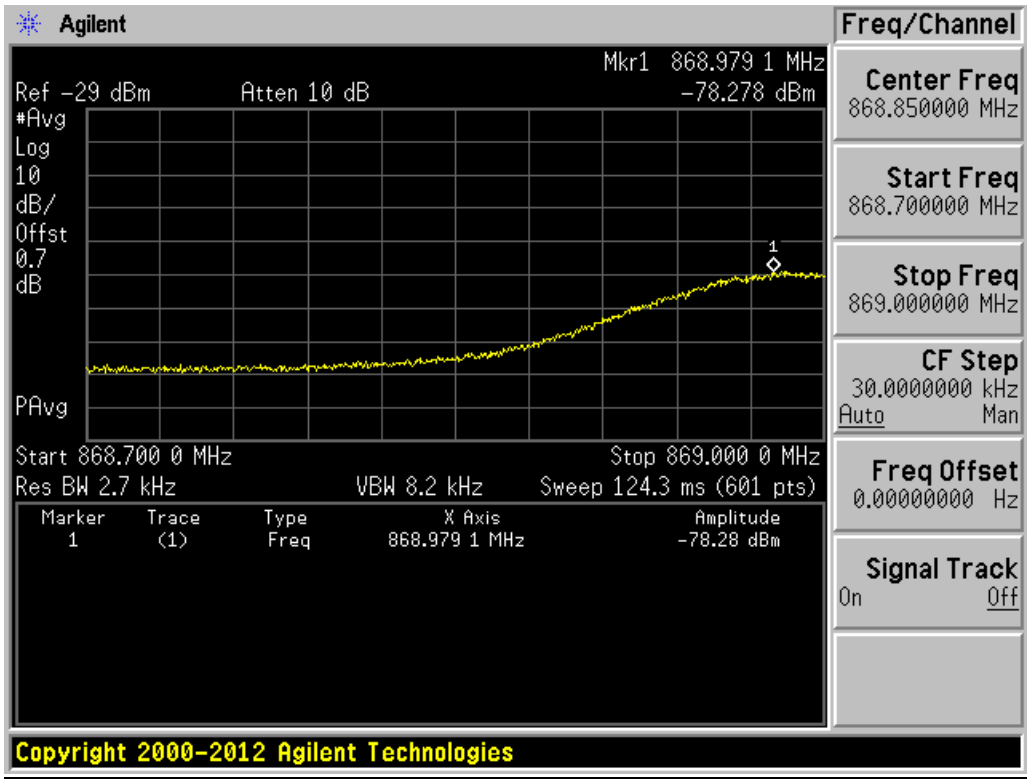
Downlink, Band 12 & 17, GSM 745.8 MHz



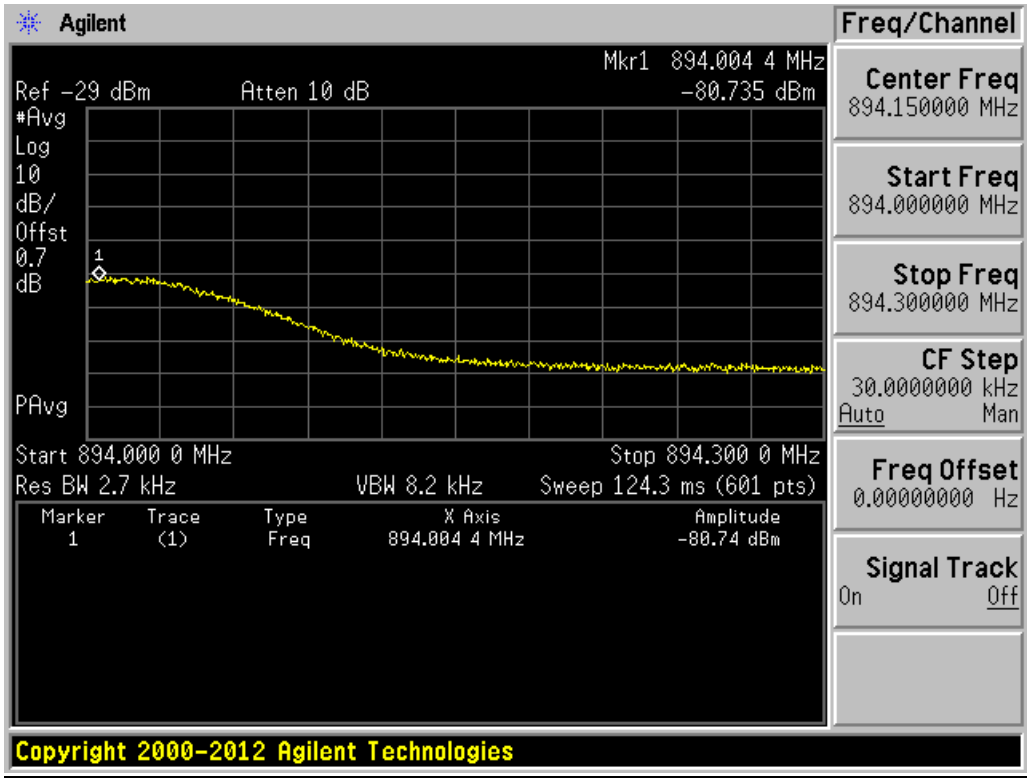
Downlink, Band 13, GSM 746.2 MHz



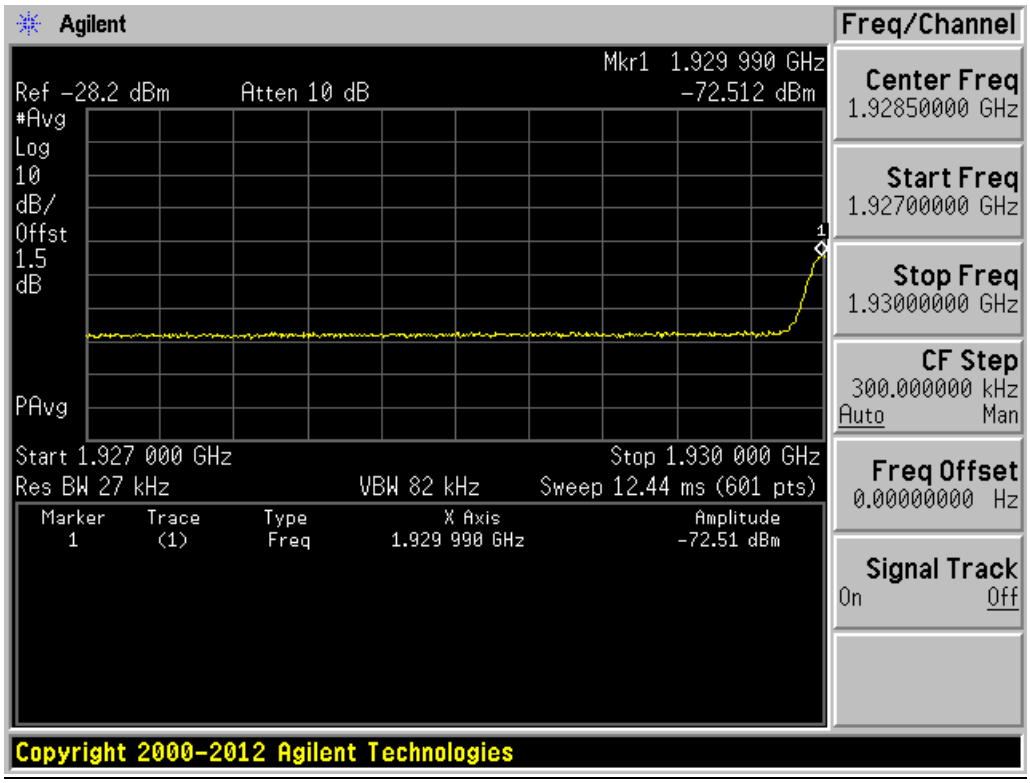
Downlink, Band 13, GSM 755.8 MHz



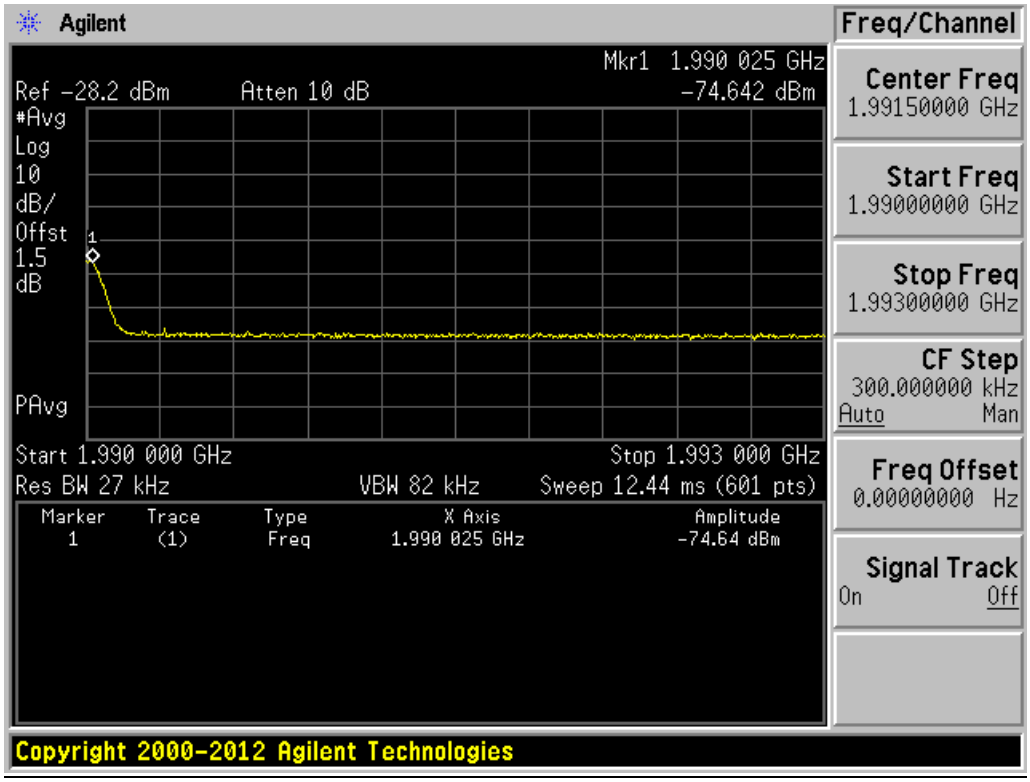
Downlink, Band 5, GSM 869.2 MHz



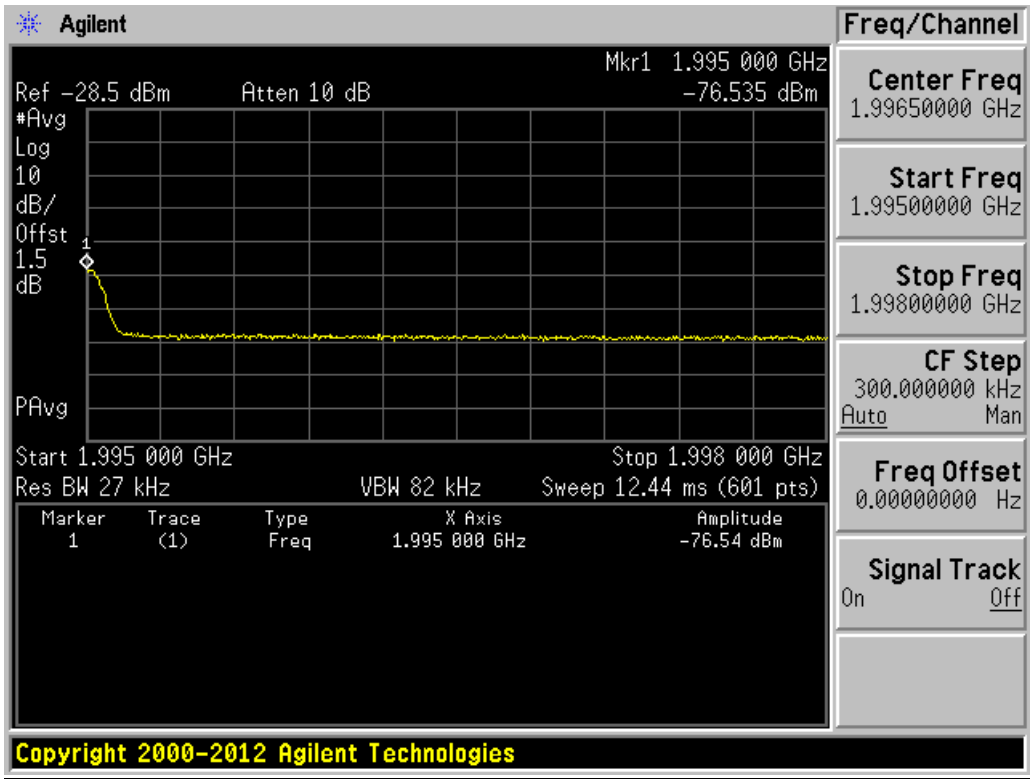
Downlink, Band 5, GSM 893.8 MHz



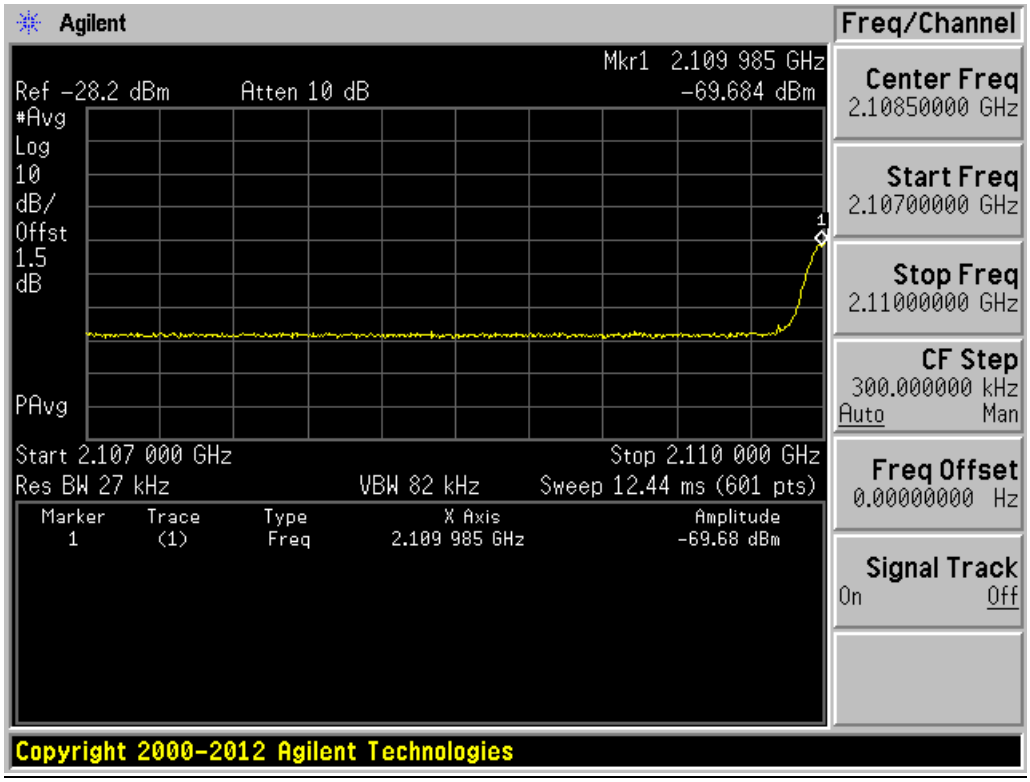
Downlink, Band 2 & 25, GSM 1930.2 MHz



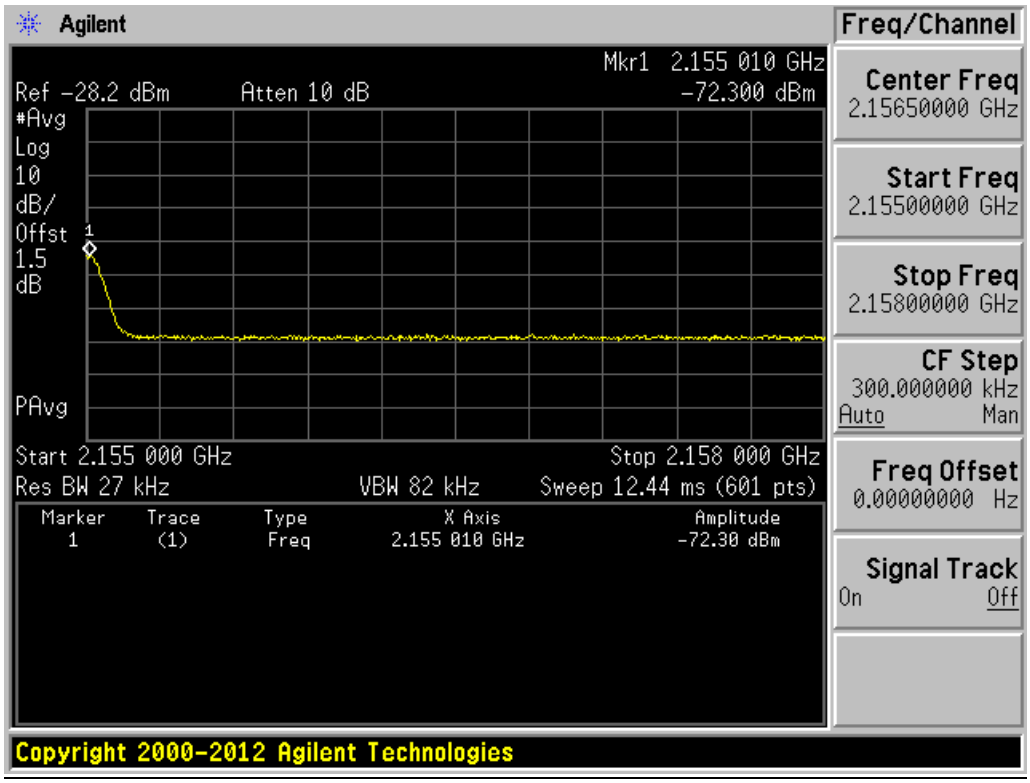
Downlink, Band 2, GSM 1989.8 MHz



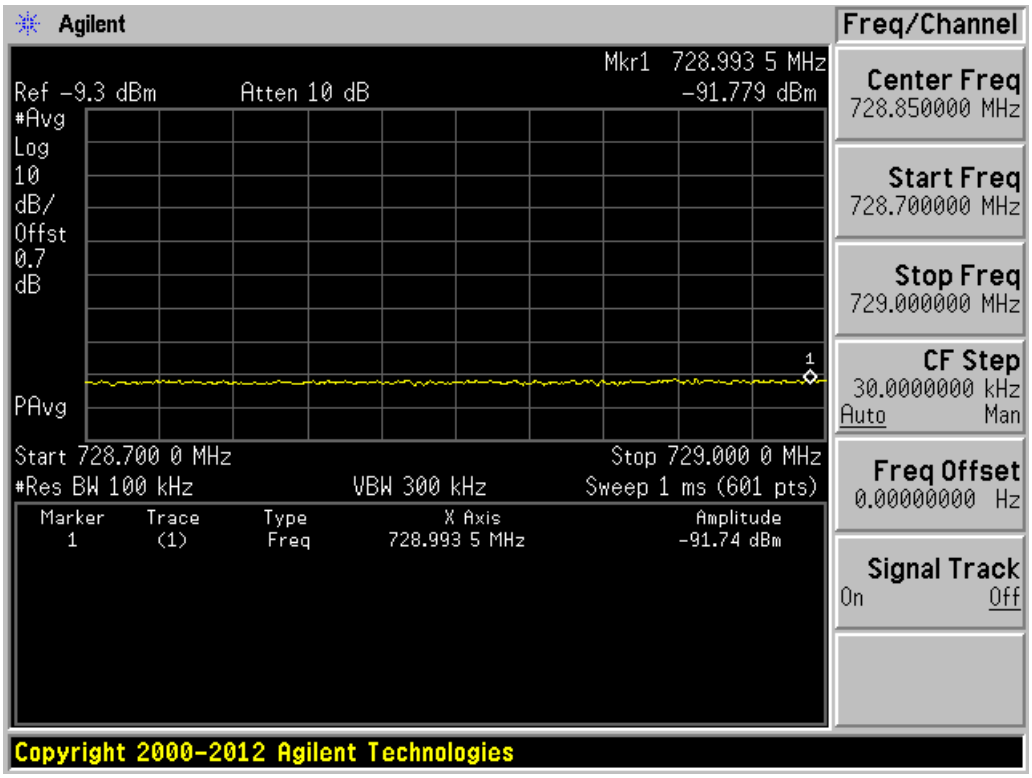
Downlink, Band 25, GSM 1994.8 MHz



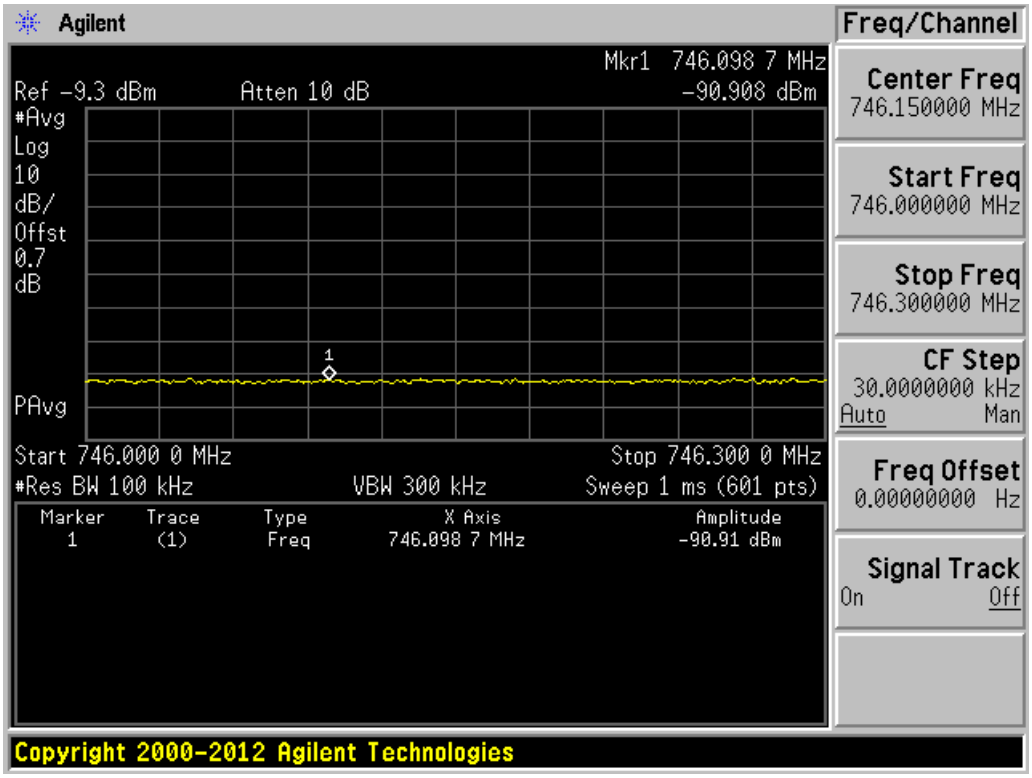
Downlink, Band 4, GSM 2110.2 MHz



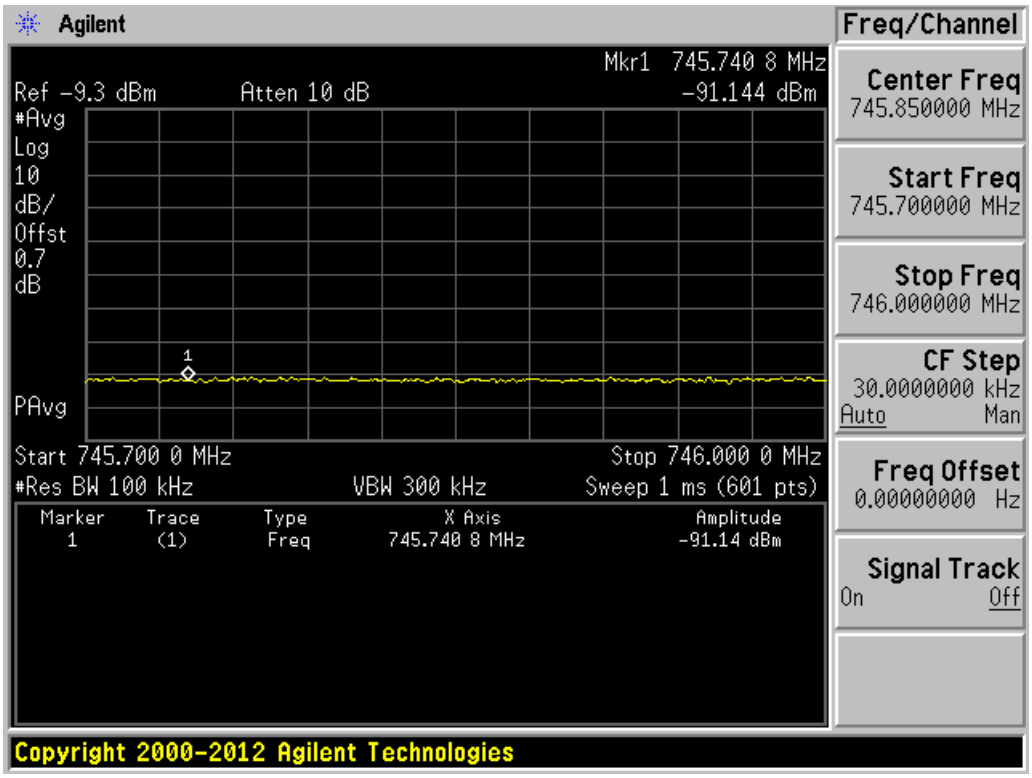
Downlink, Band 4, GSM 2154.8 MHz



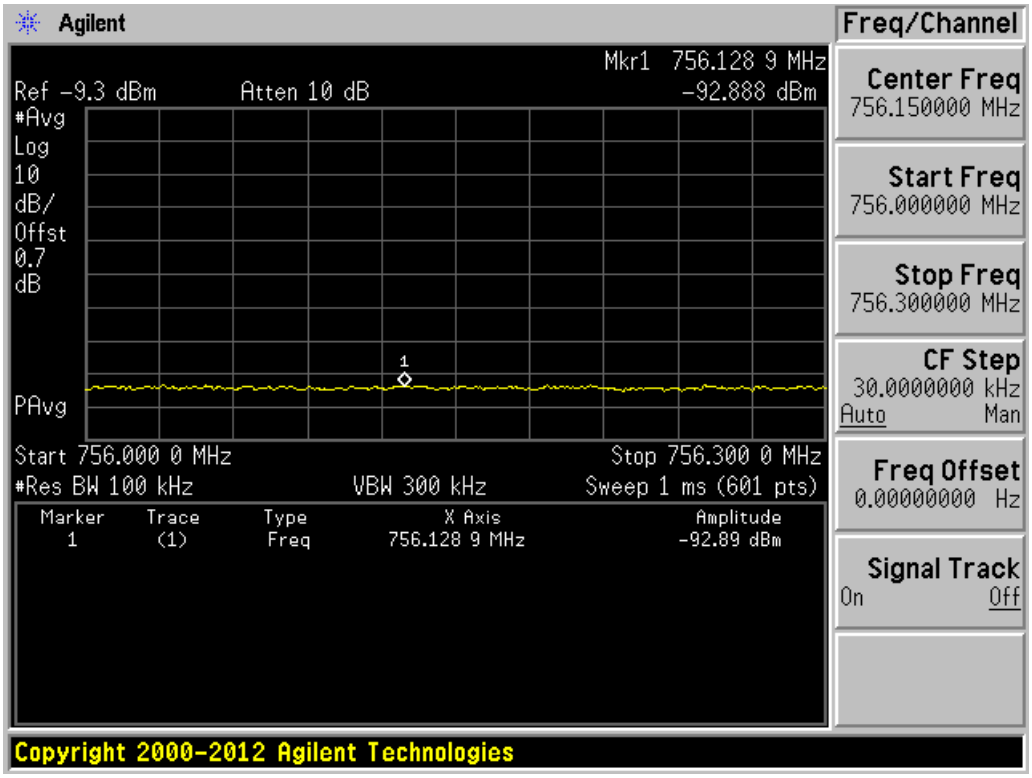
Downlink, Band 12 & 17, CDMA 730.25 MHz



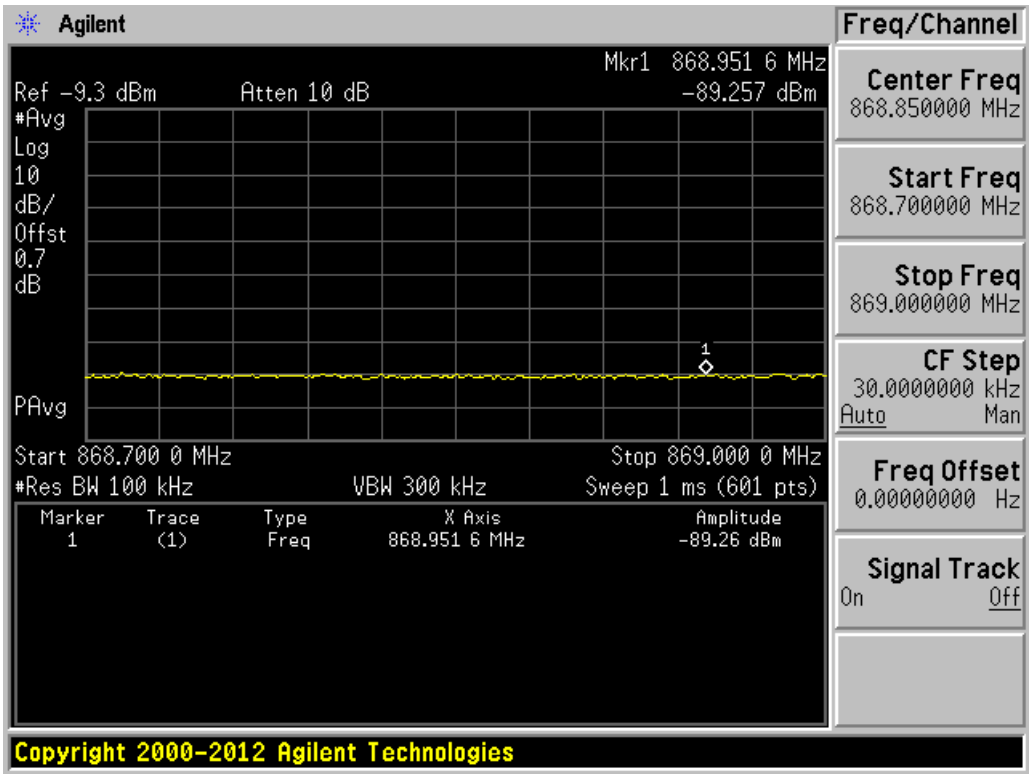
Downlink, Band 12 & 17, CDMA 744.75 MHz



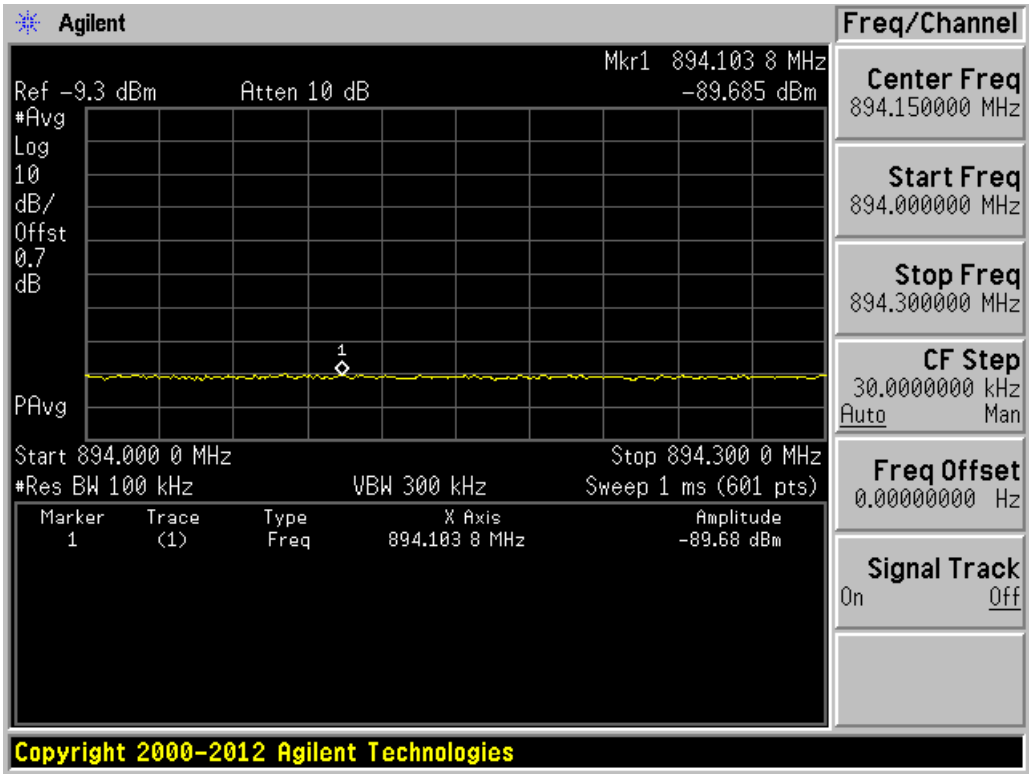
Downlink, Band 13, CDMA 747.25 MHz



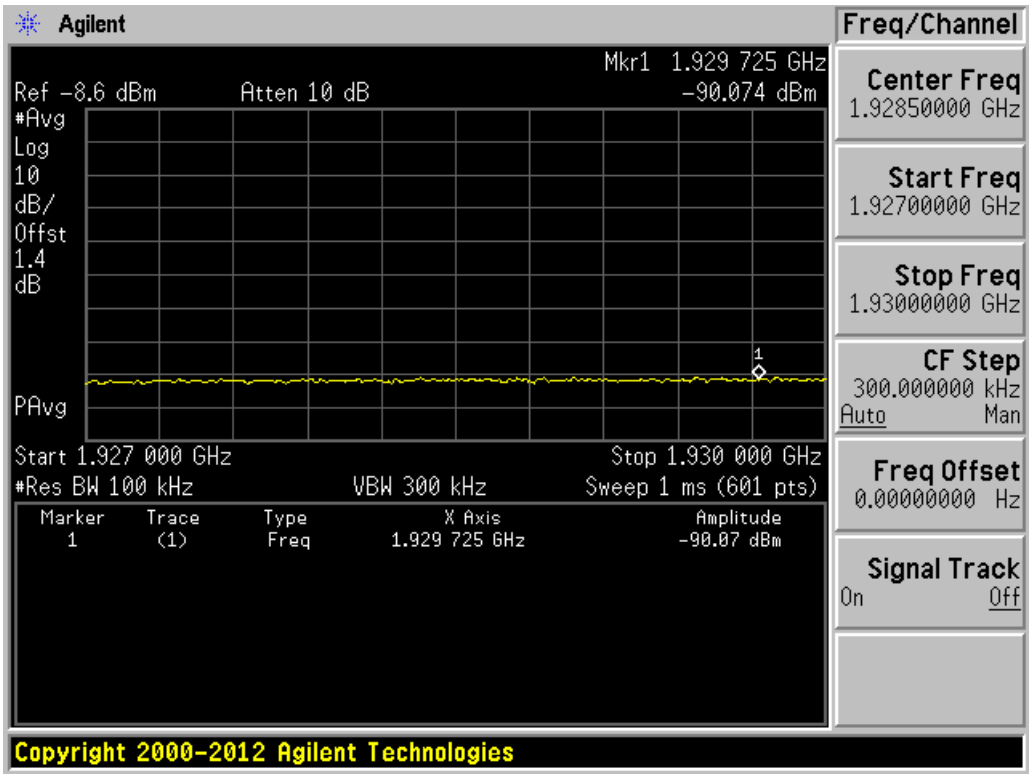
Downlink, Band 13, CDMA 754.75 MHz



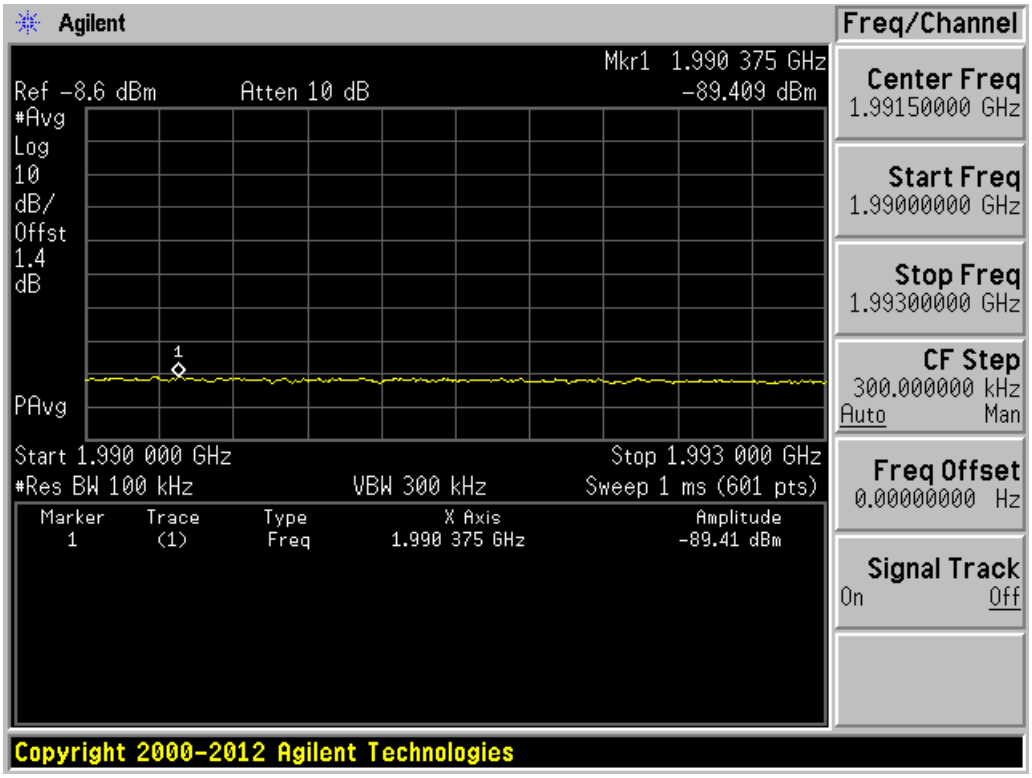
Downlink, Band 5, CDMA 869.88 MHz



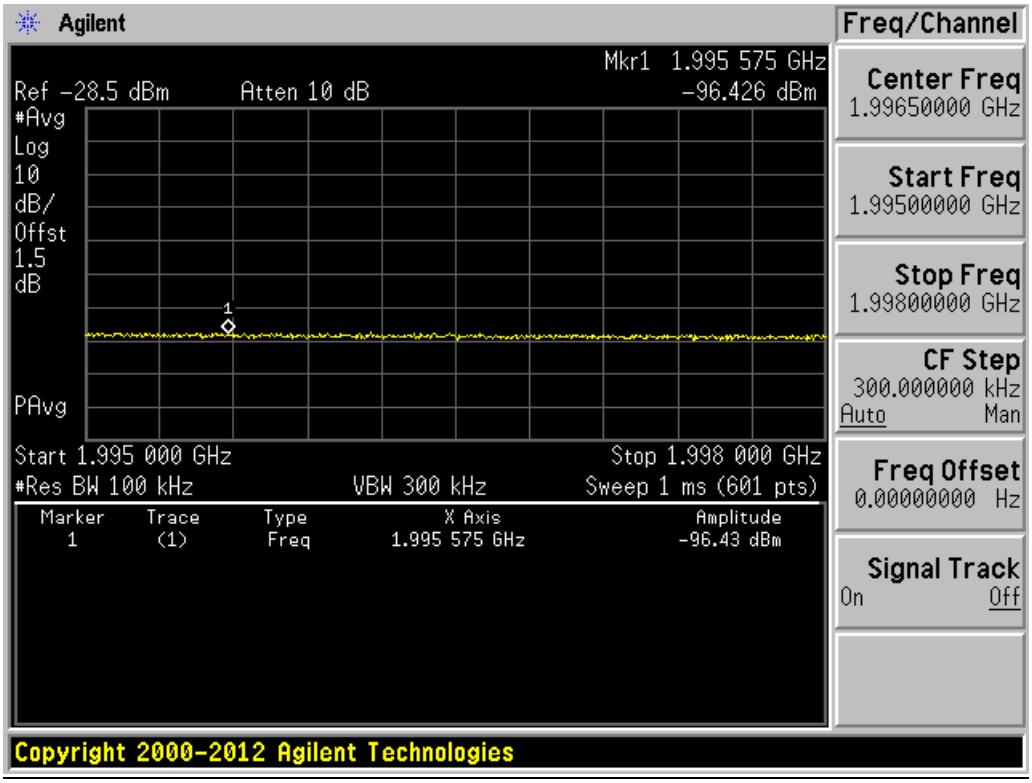
Downlink, Band 5, CDMA 893.1 MHz



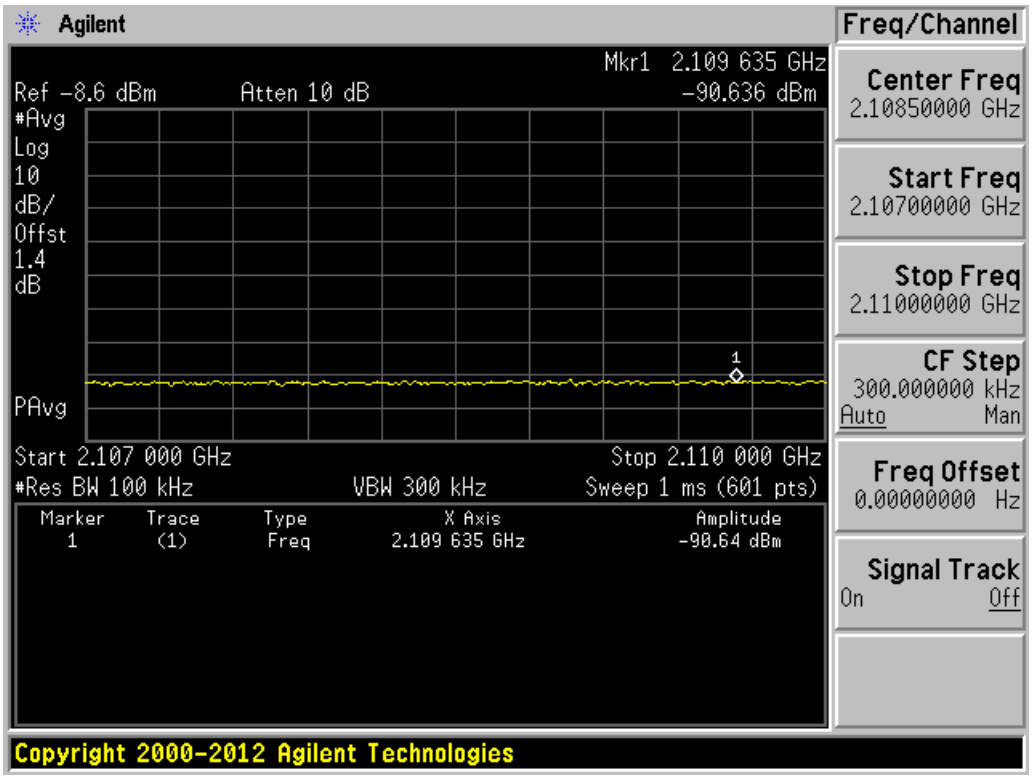
Downlink, Band 2 & 25, CDMA 1931.25 MHz



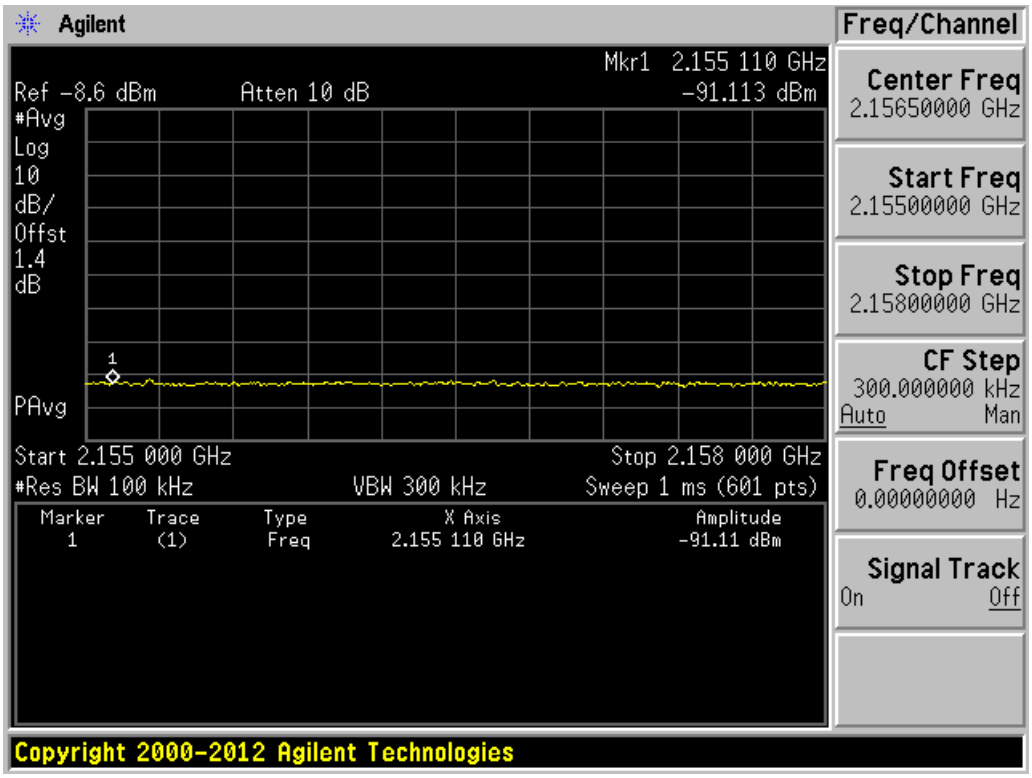
Downlink, Band 2, CDMA 1988.75 MHz



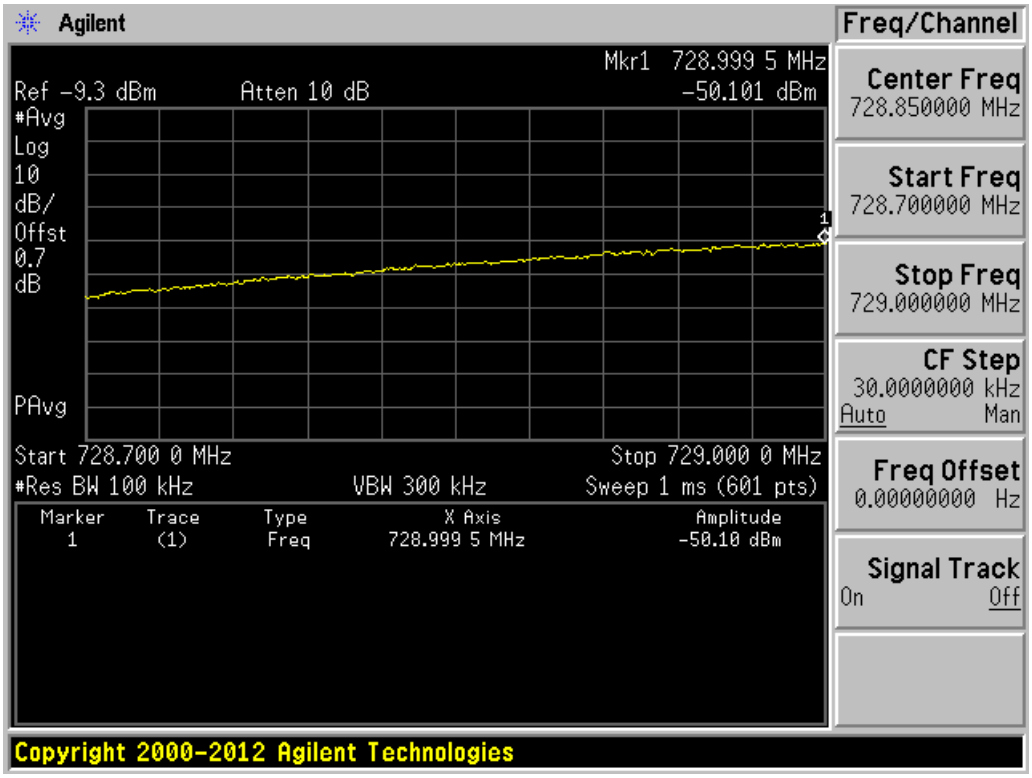
Downlink, Band 25, CDMA 1993.75 MHz



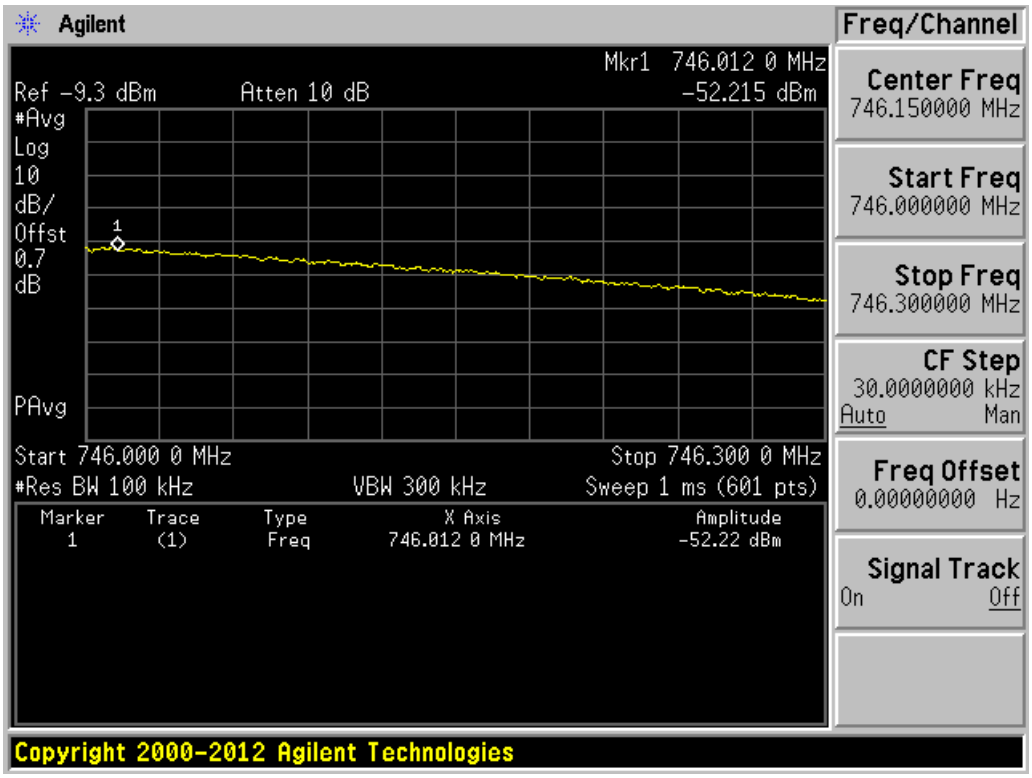
Downlink, Band 4, CDMA 2111.25 MHz



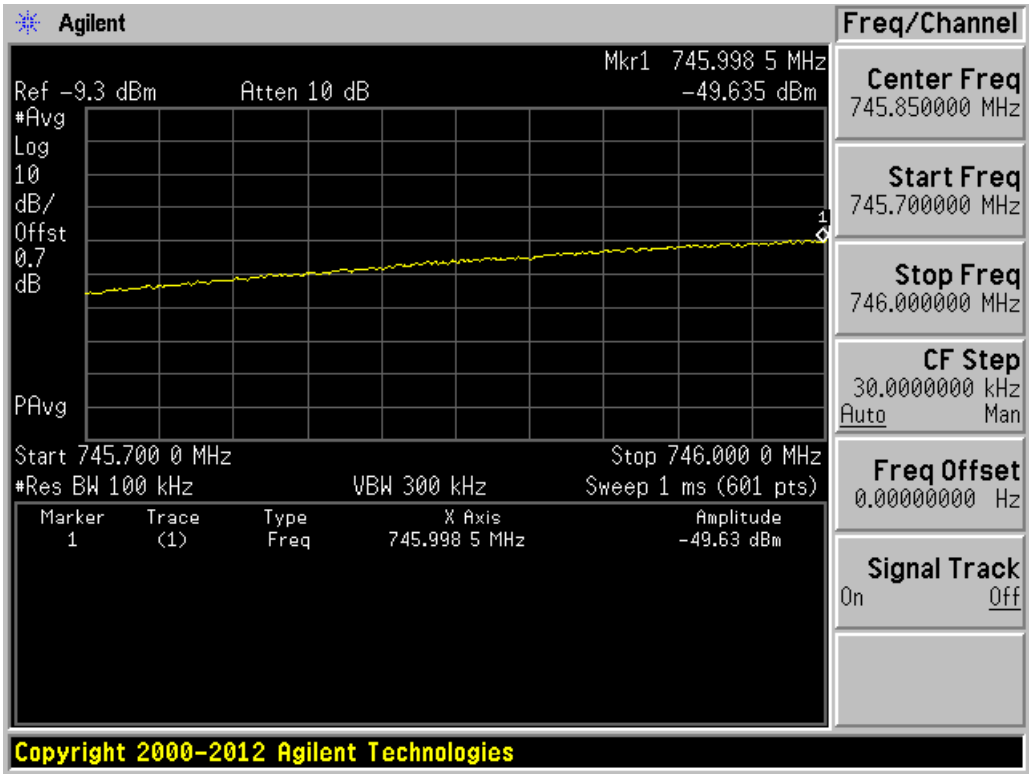
Downlink, Band 4, CDMA 2153.75 MHz



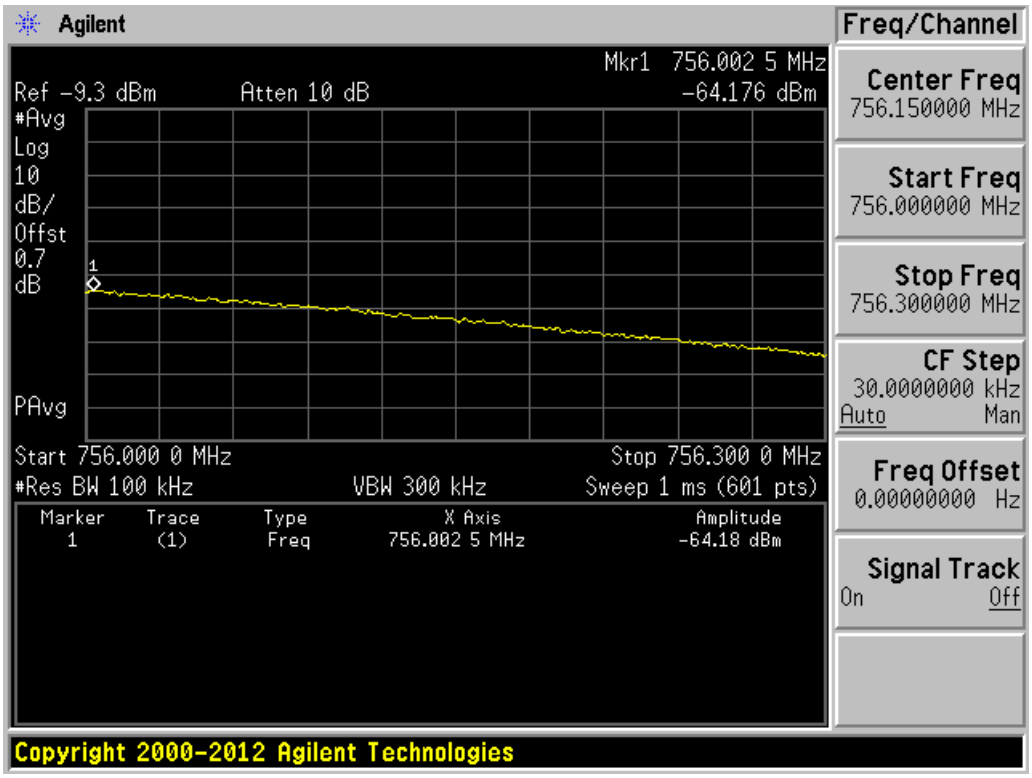
Downlink, Band 12 & 17, WCDMA/LTE 731.5 MHz



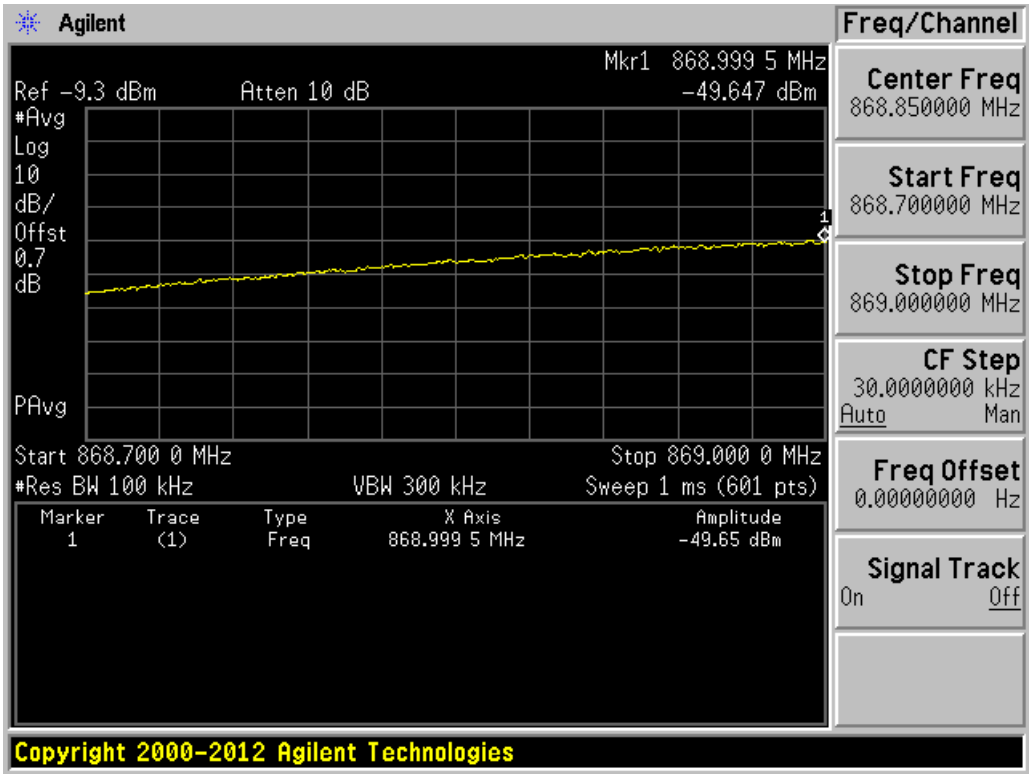
Downlink, Band 12 & 17, WCDMA/LTE 743.5 MHz



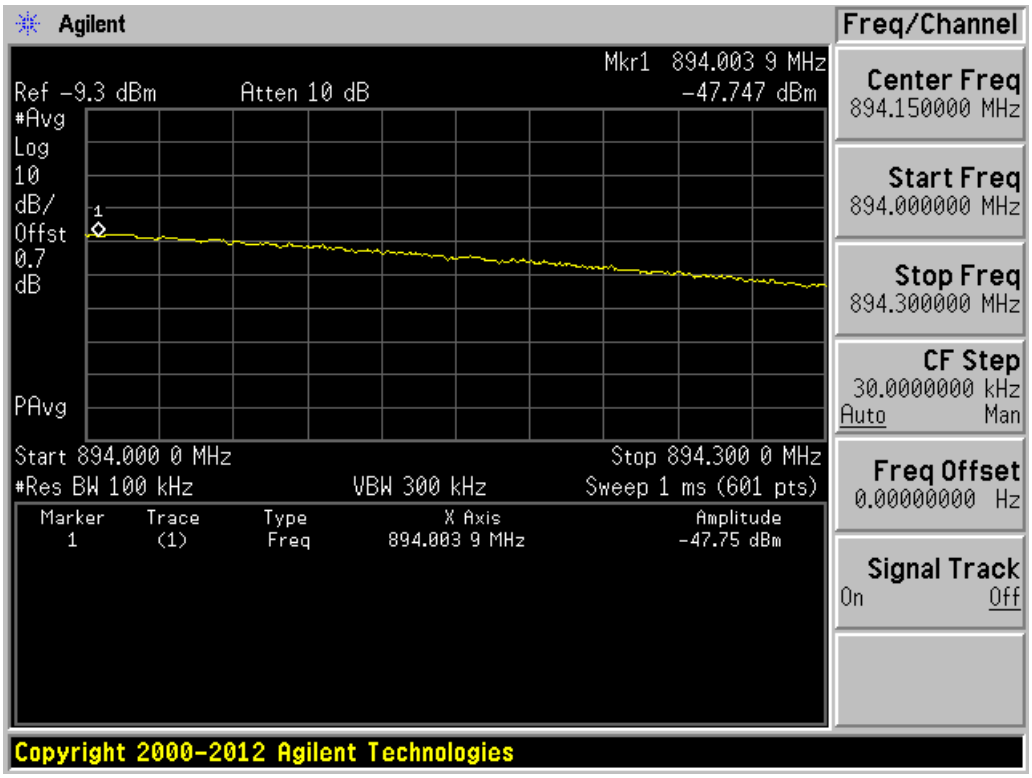
Downlink, Band 13, WCDMA/LTE 748.5 MHz



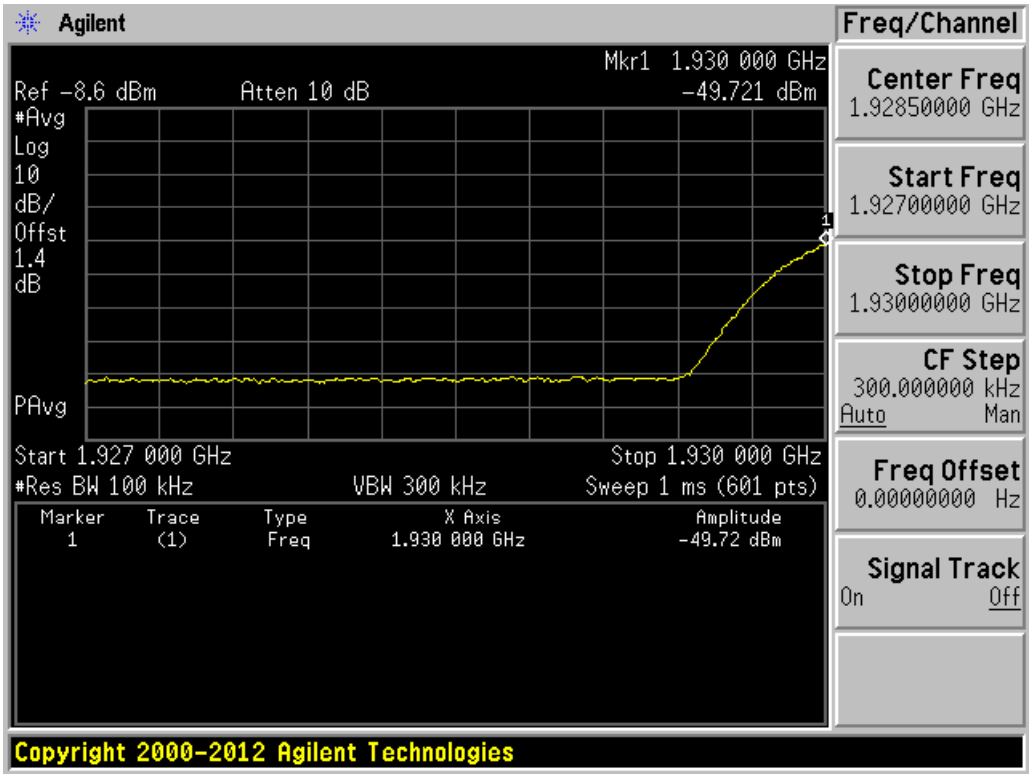
Downlink, Band 13, WCDMA/LTE 753.5 MHz



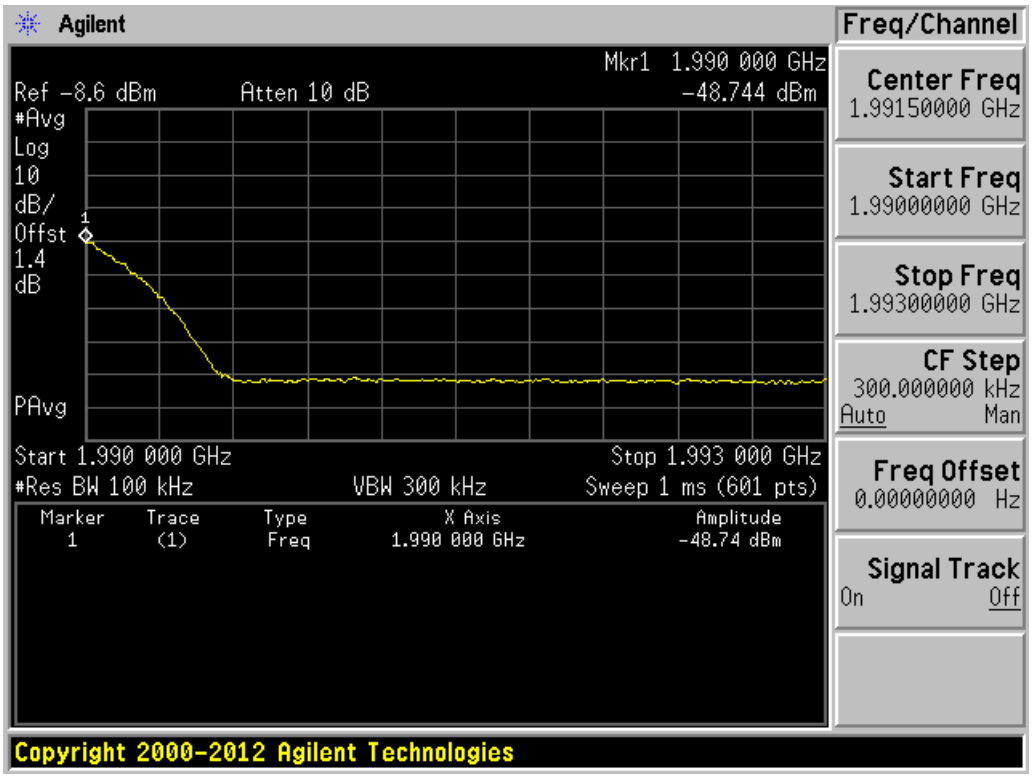
Downlink, Band 5, WCDMA/LTE 871.5 MHz



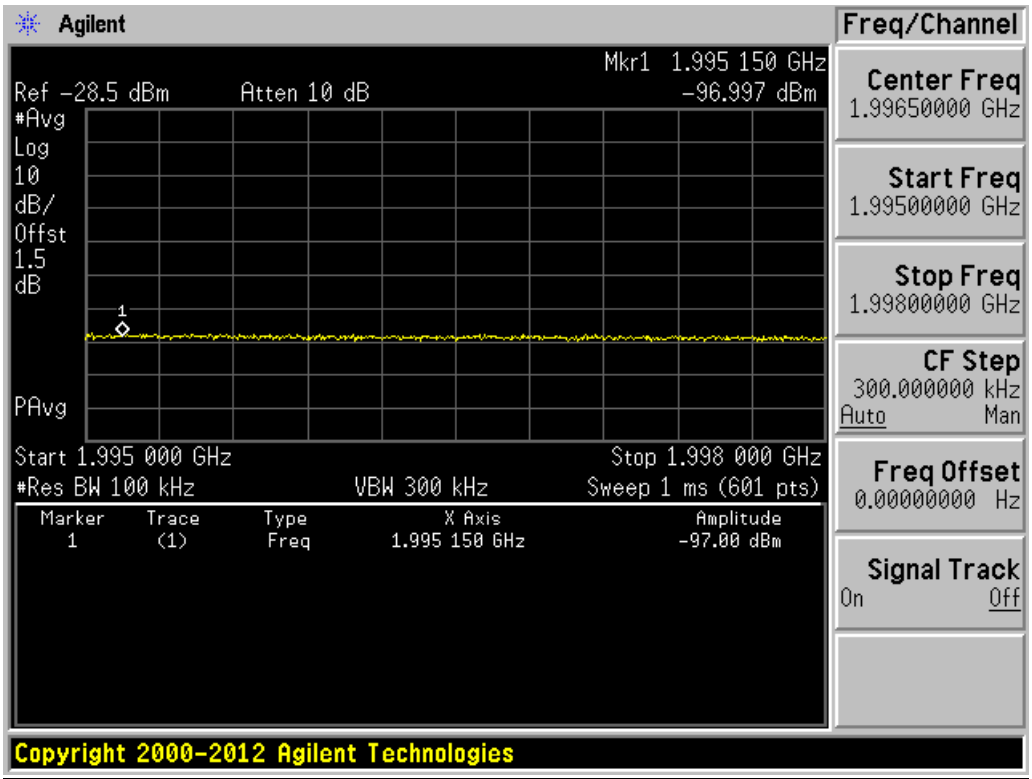
Downlink, Band 5, WCDMA/LTE 891.5 MHz



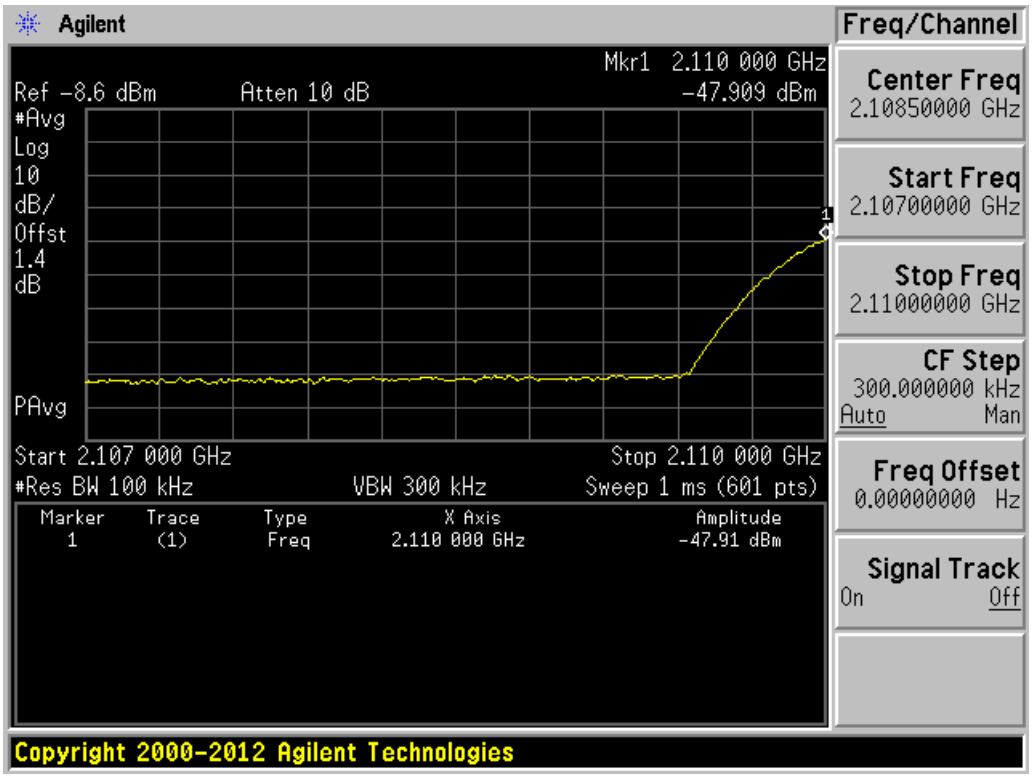
Downlink, Band 2 & 25, WCDMA/LTE 1932.5 MHz



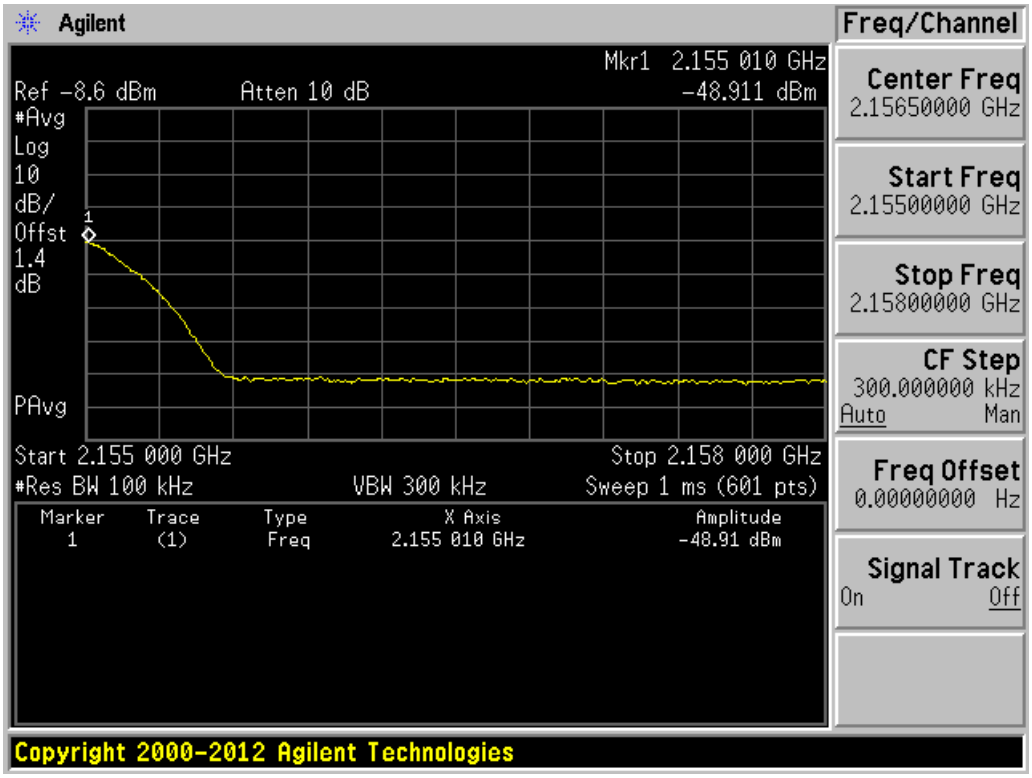
Downlink, Band 2, WCDMA/LTE 1987.5 MHz



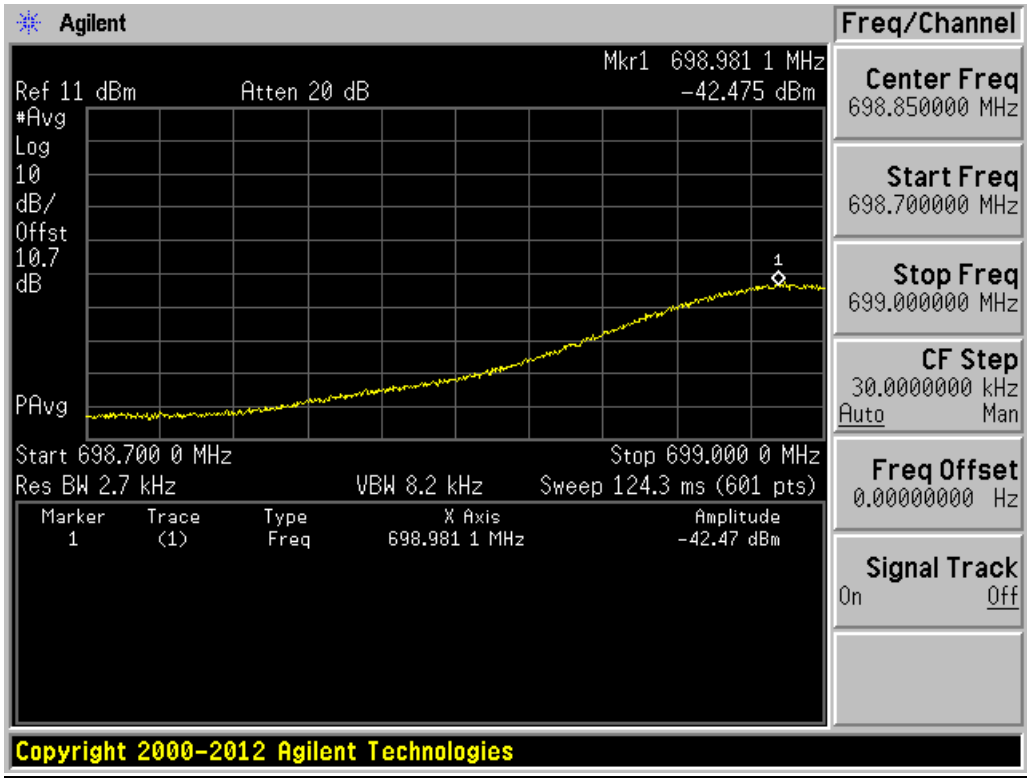
Downlink, Band 25, WCDMA/LTE 1992.5 MHz



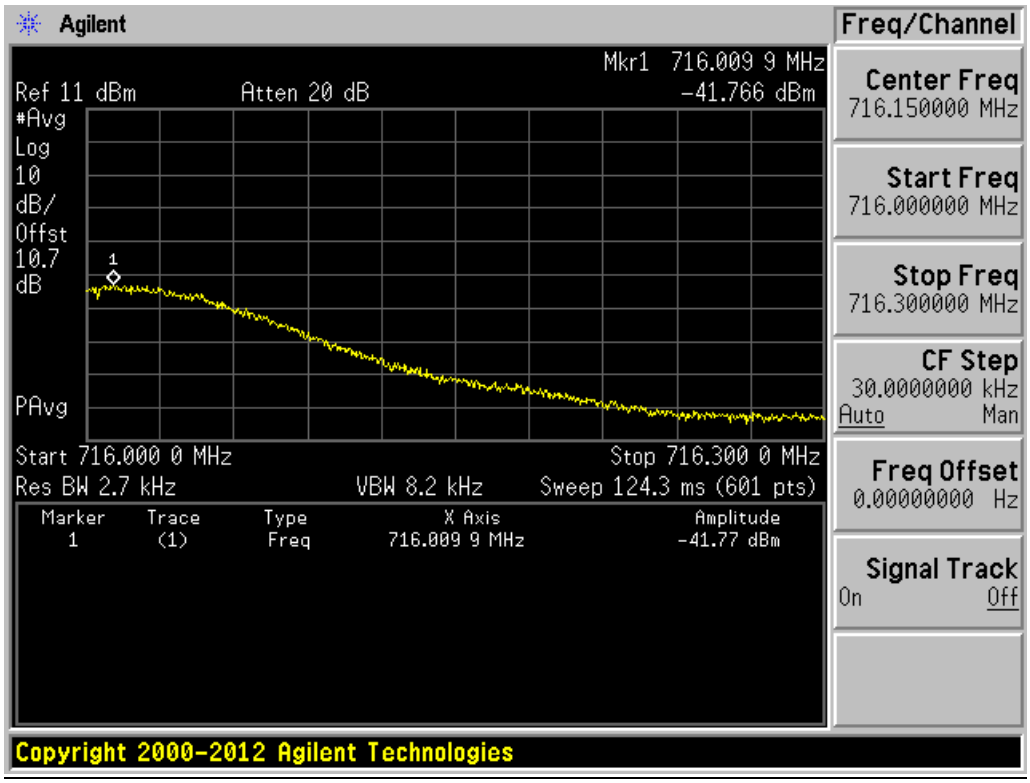
Downlink, Band 4, WCDMA/LTE 2112.5 MHz



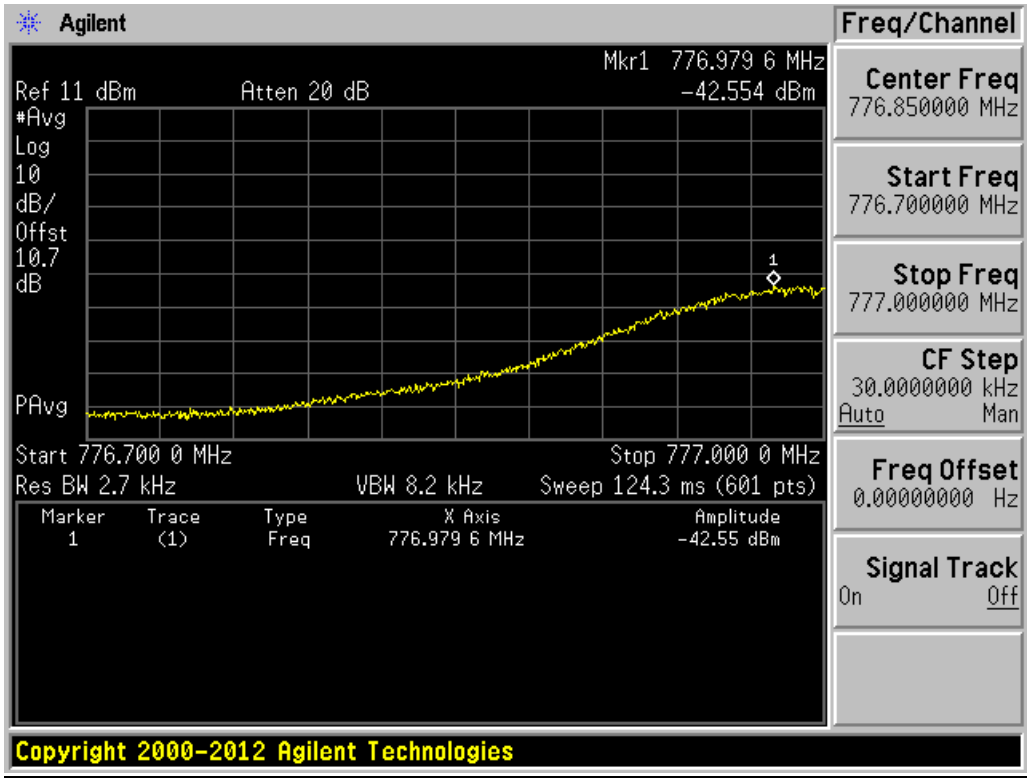
Downlink, Band 4, WCDMA/LTE 2152.5 MHz



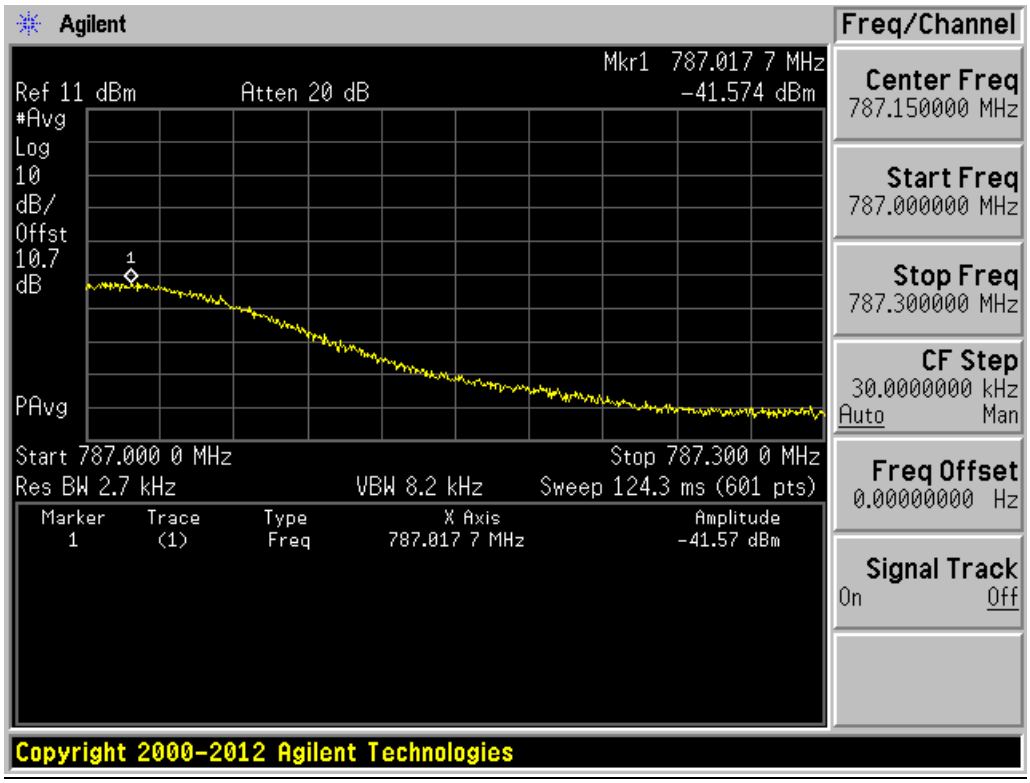
Uplink, Band 12 & 17, GSM 699.2 MHz



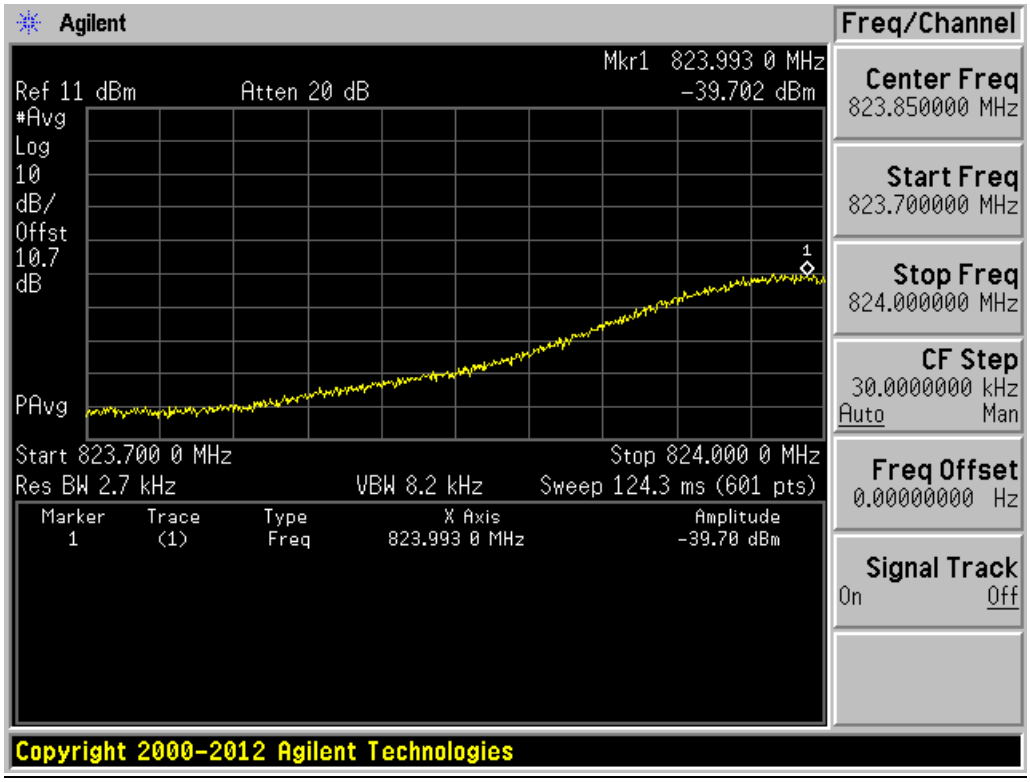
Uplink, Band 12 & 17, GSM 715.8 MHz



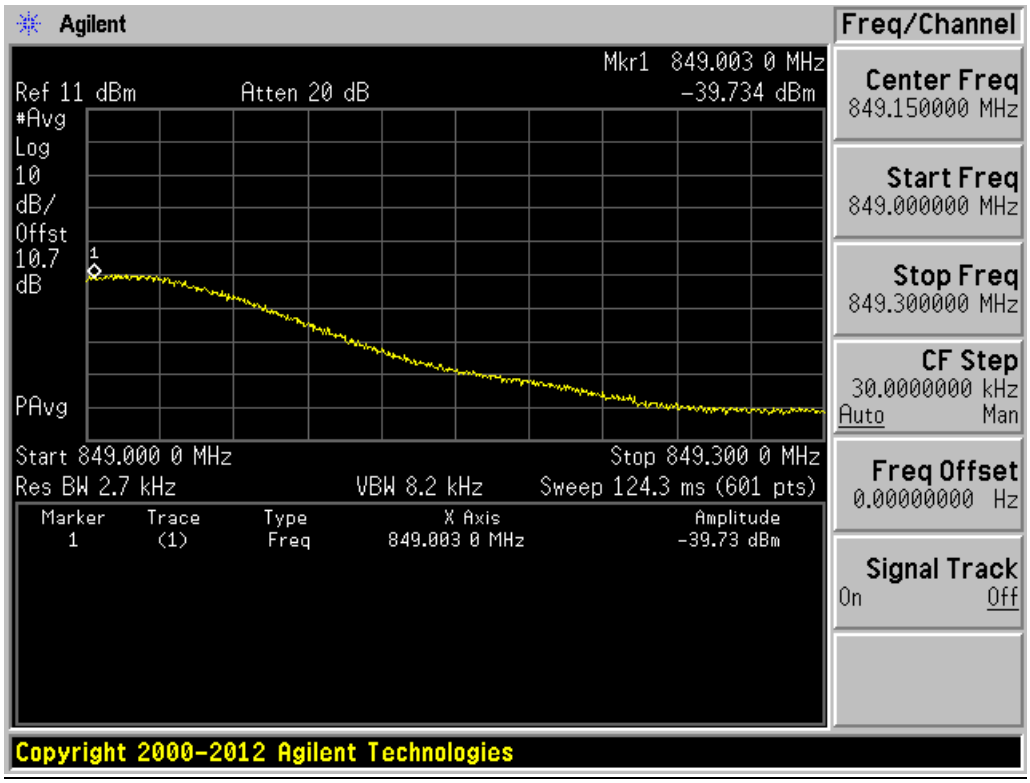
Uplink, Band 13, GSM 777.2 MHz



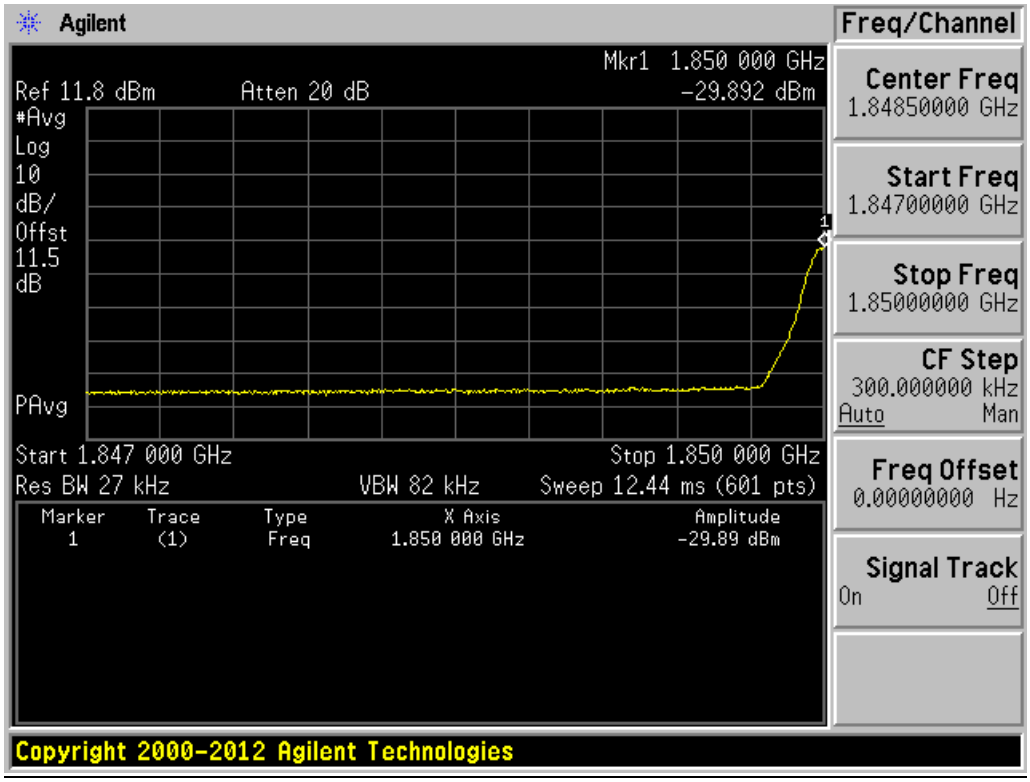
Uplink, Band 13, GSM 786.8 MHz



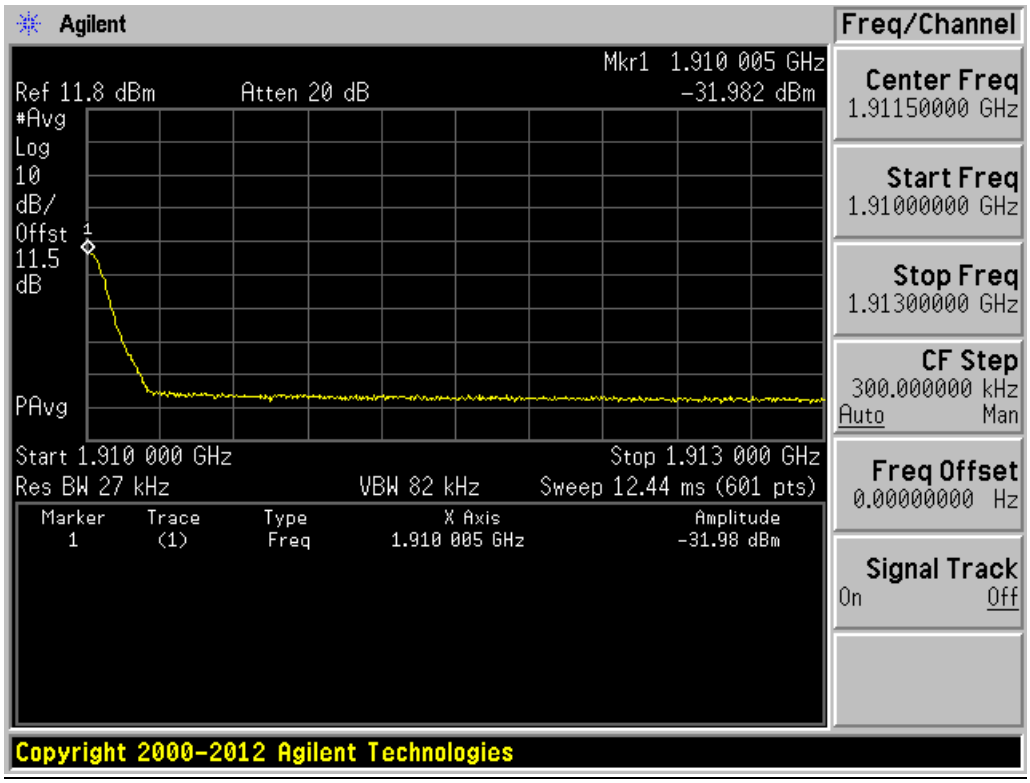
Uplink, Band 5, GSM 824.2 MHz



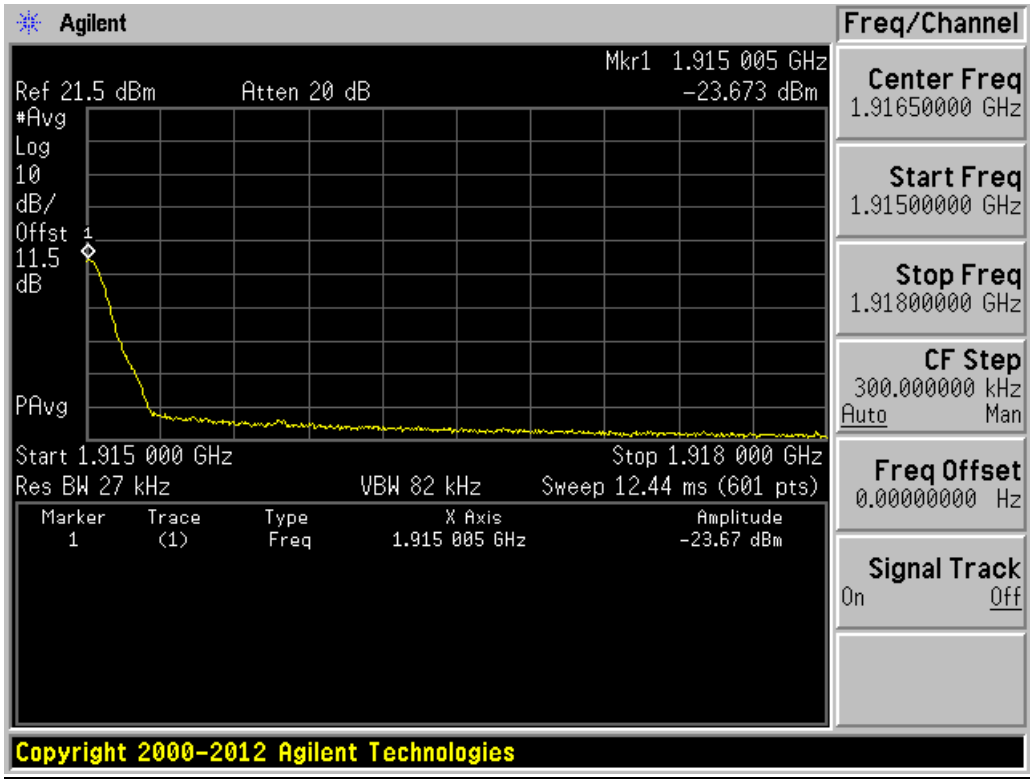
Uplink, Band 5, GSM 848.8 MHz



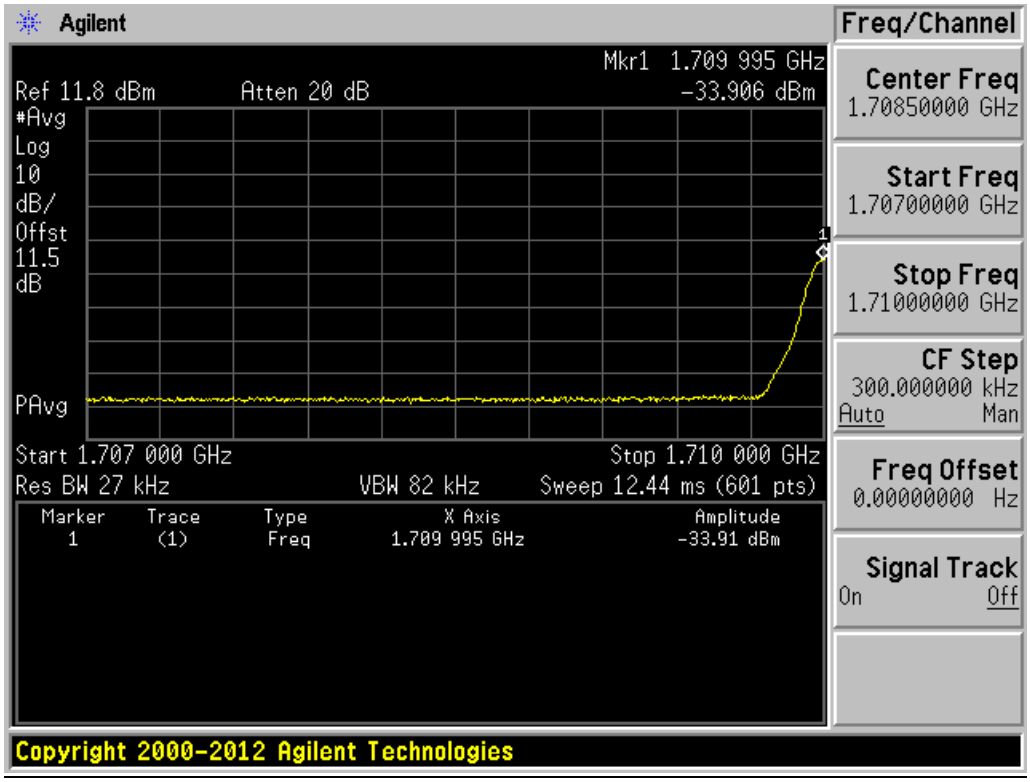
Uplink, Band 2 & 25, GSM 1850.2 MHz



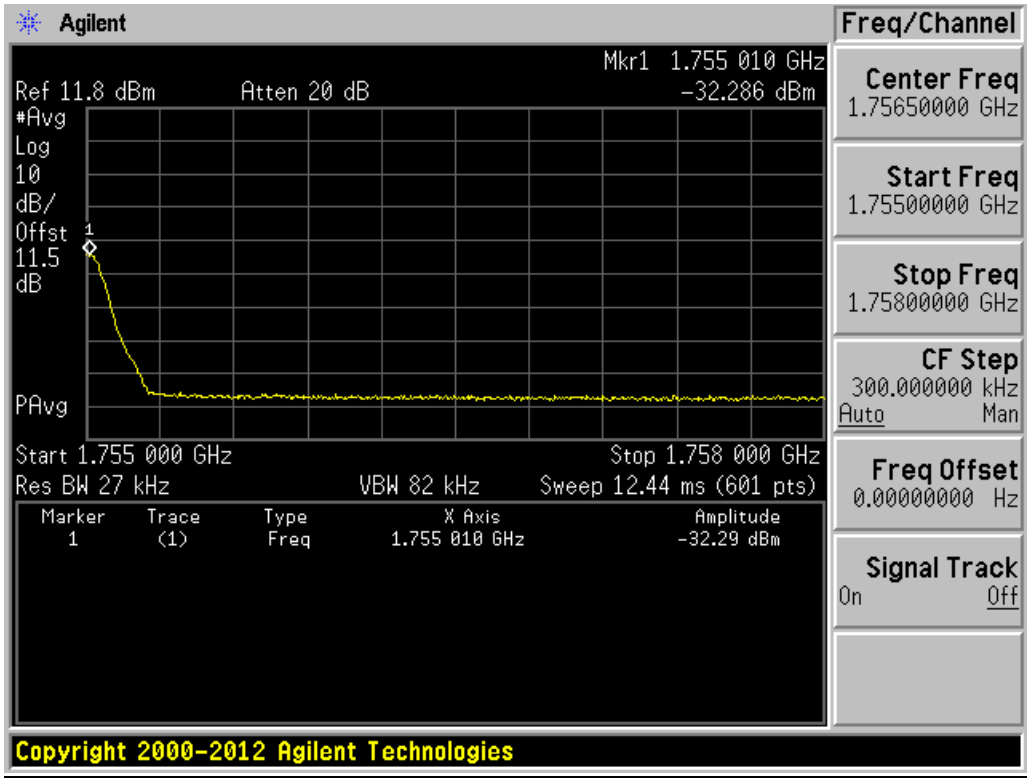
Uplink, Band 2, GSM 1909.8 MHz



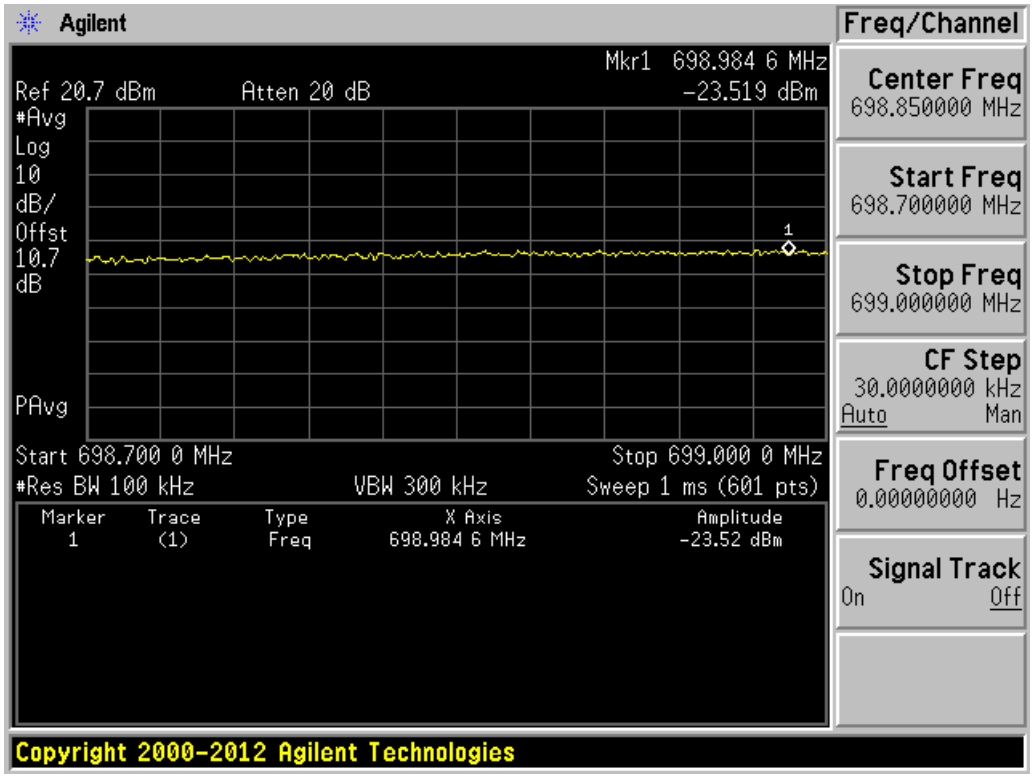
Uplink, Band 25, GSM 1914.8 MHz



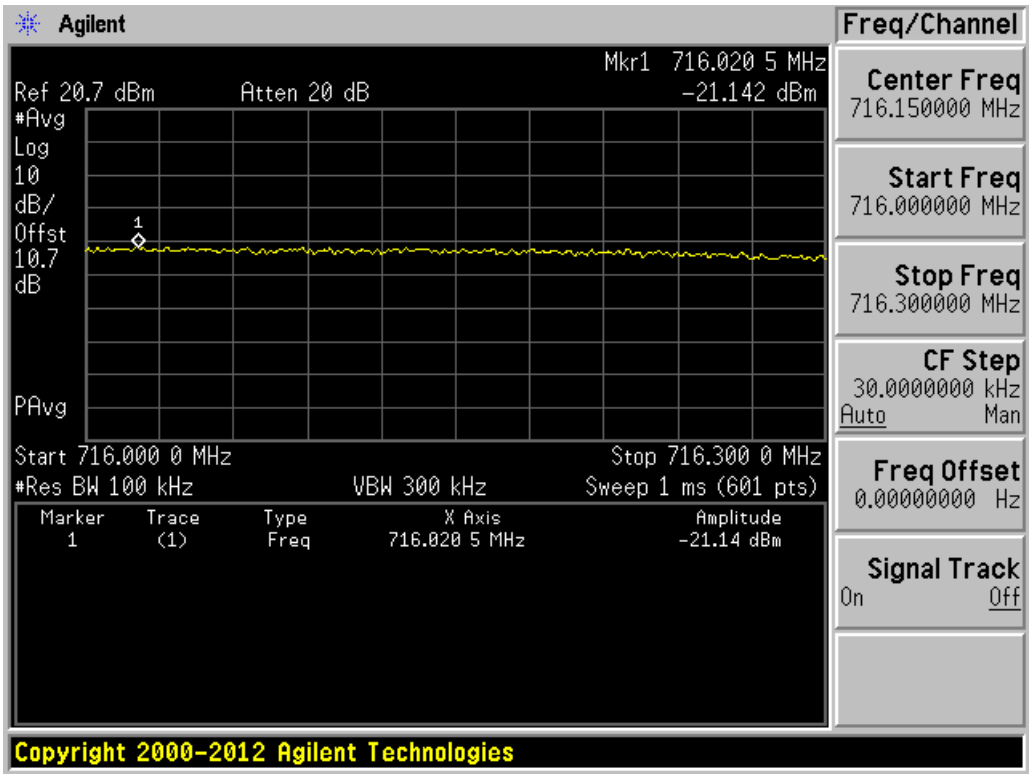
Uplink, Band 4, GSM 1710.2 MHz



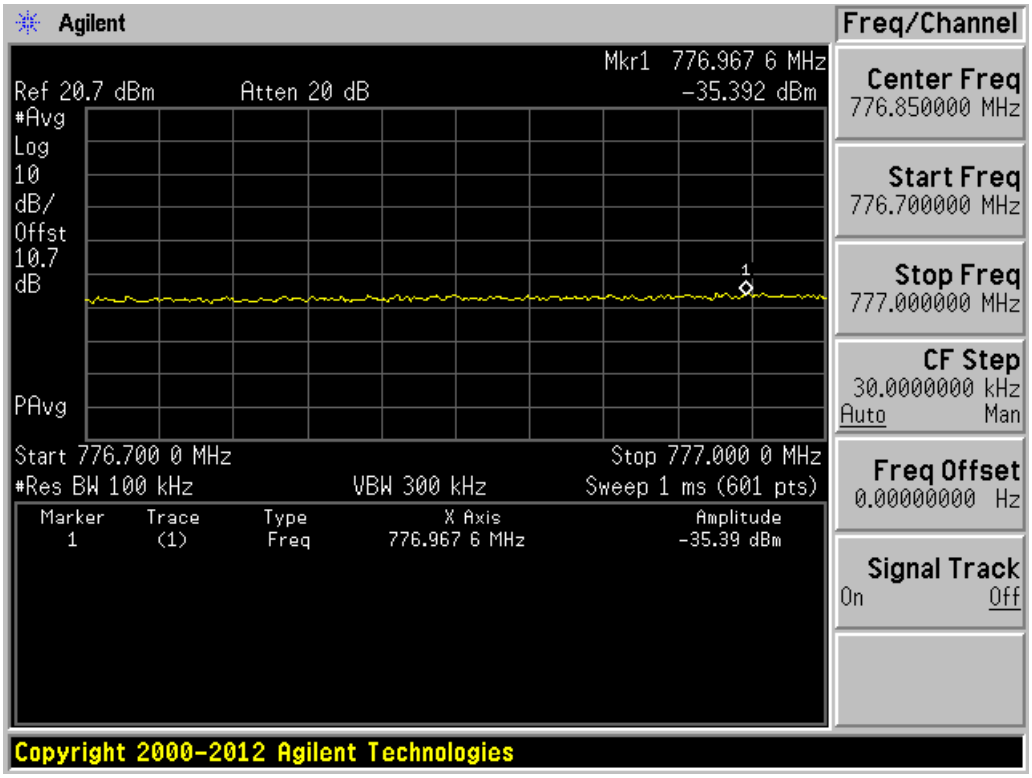
Uplink, Band 4, GSM 1754.8 MHz



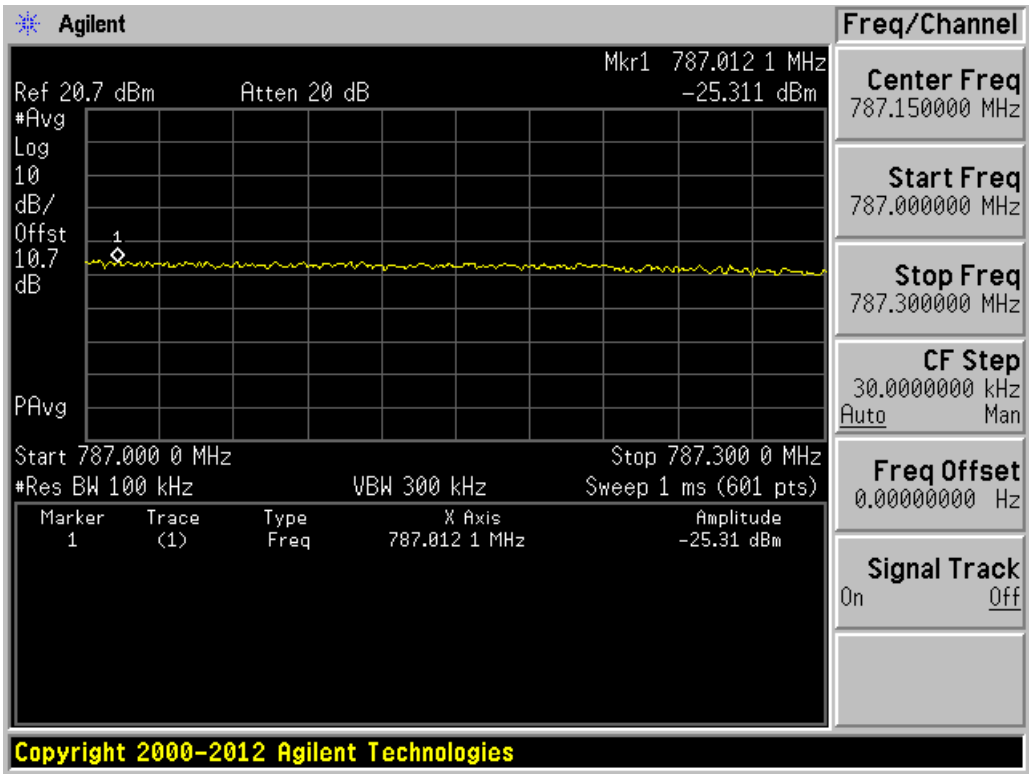
Uplink, Band 12 & 17, CDMA 700.25 MHz



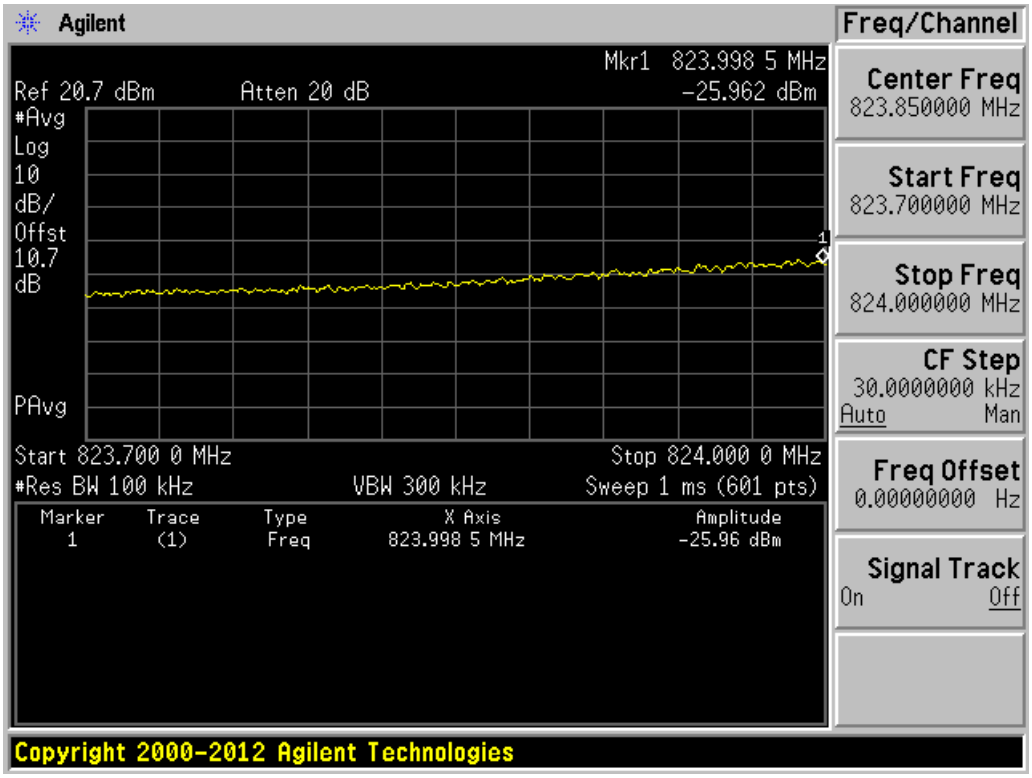
Uplink, Band 12 & 17, CDMA 714.75 MHz



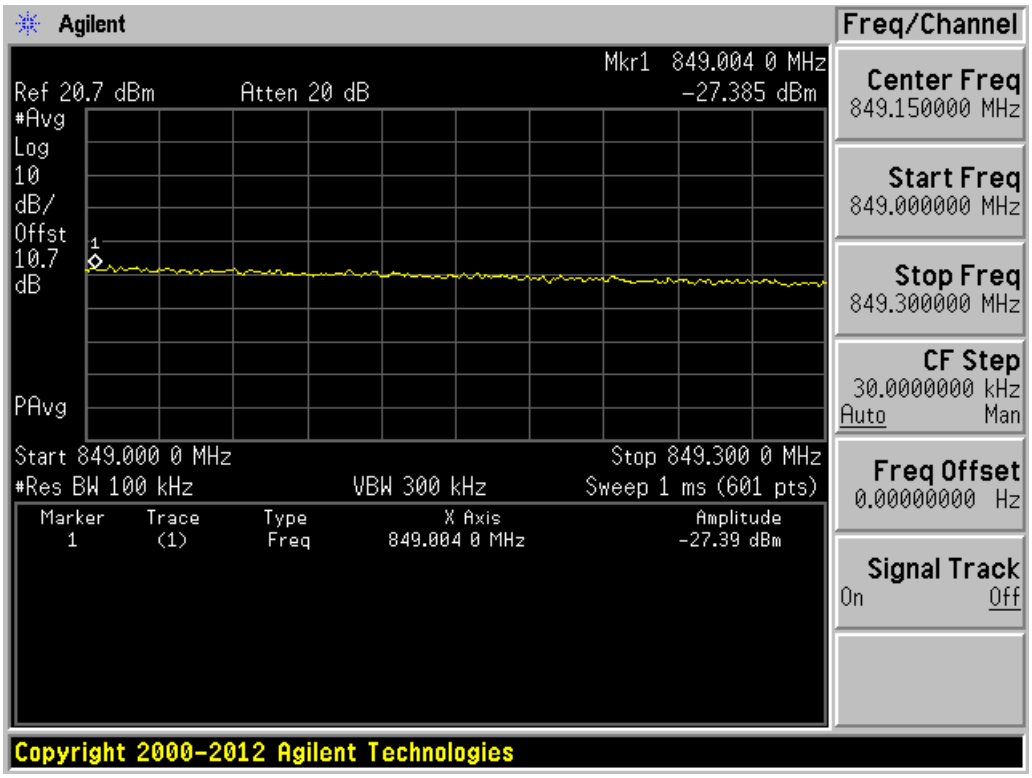
Uplink, Band 13, CDMA 778.25 MHz



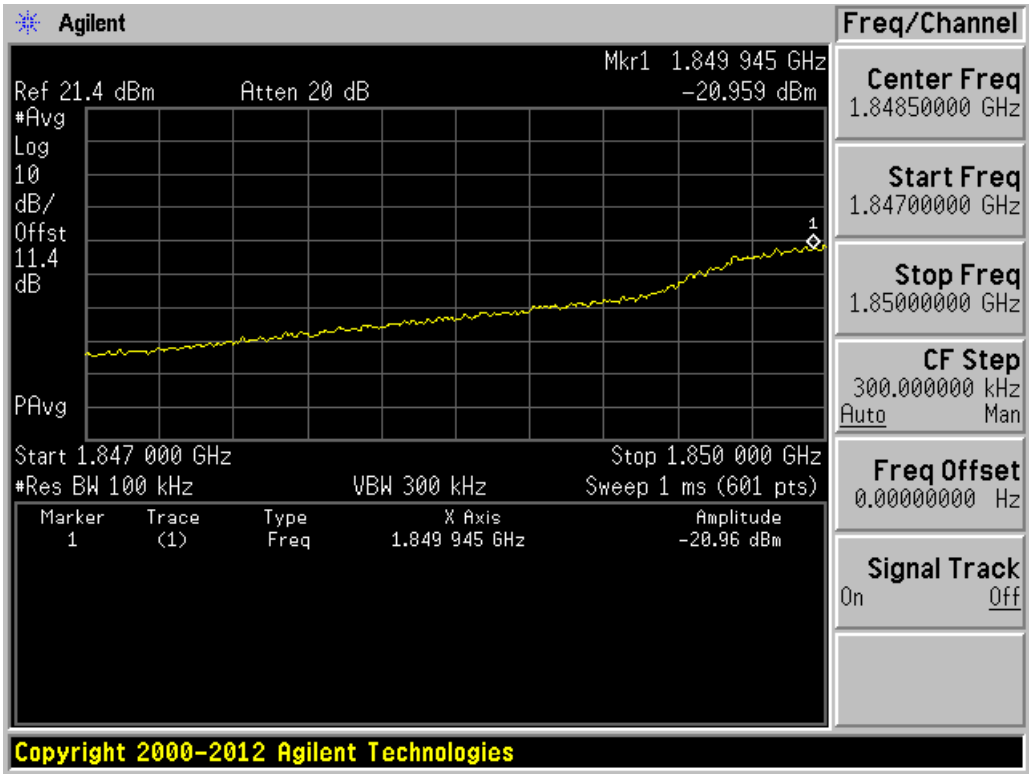
Uplink, Band 13, CDMA 786.75 MHz



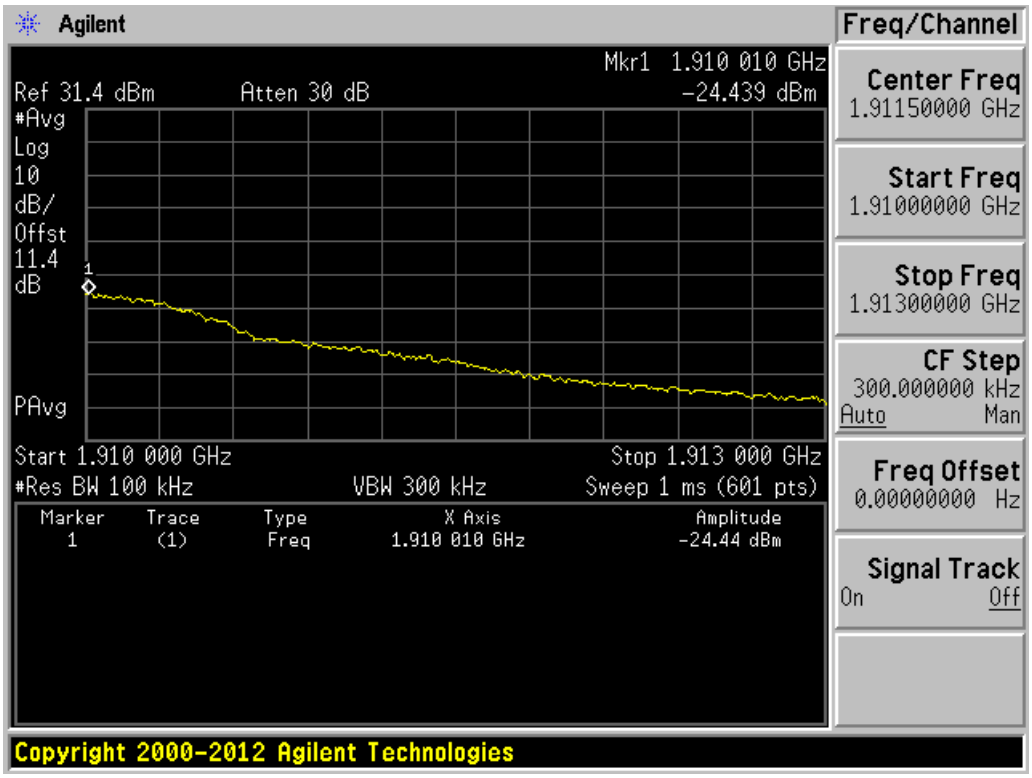
Uplink, Band 5, CDMA 824.88 MHz



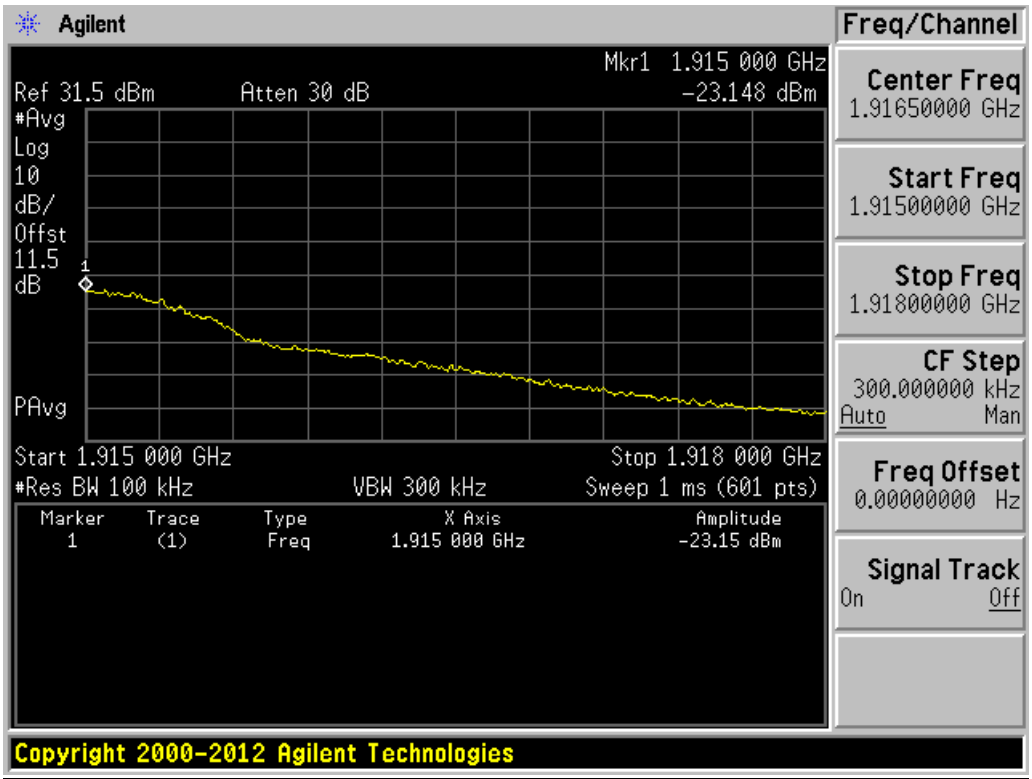
Uplink, Band 5, CDMA 848.1 MHz



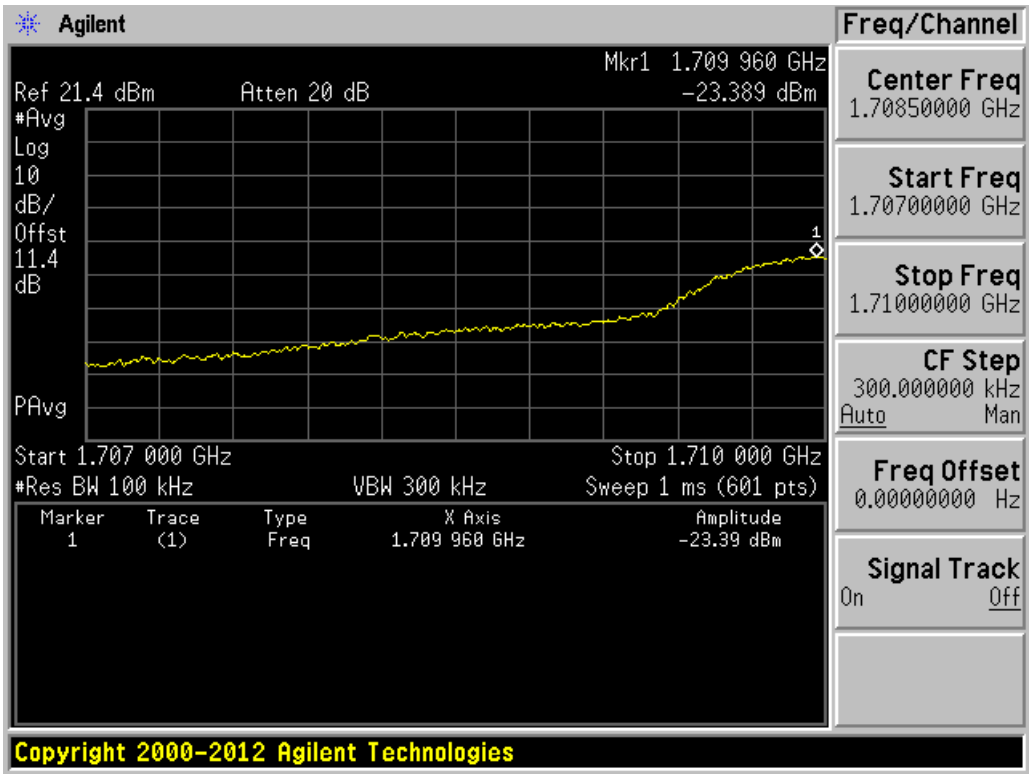
Uplink, Band 2 & 25, CDMA 1851.25 MHz



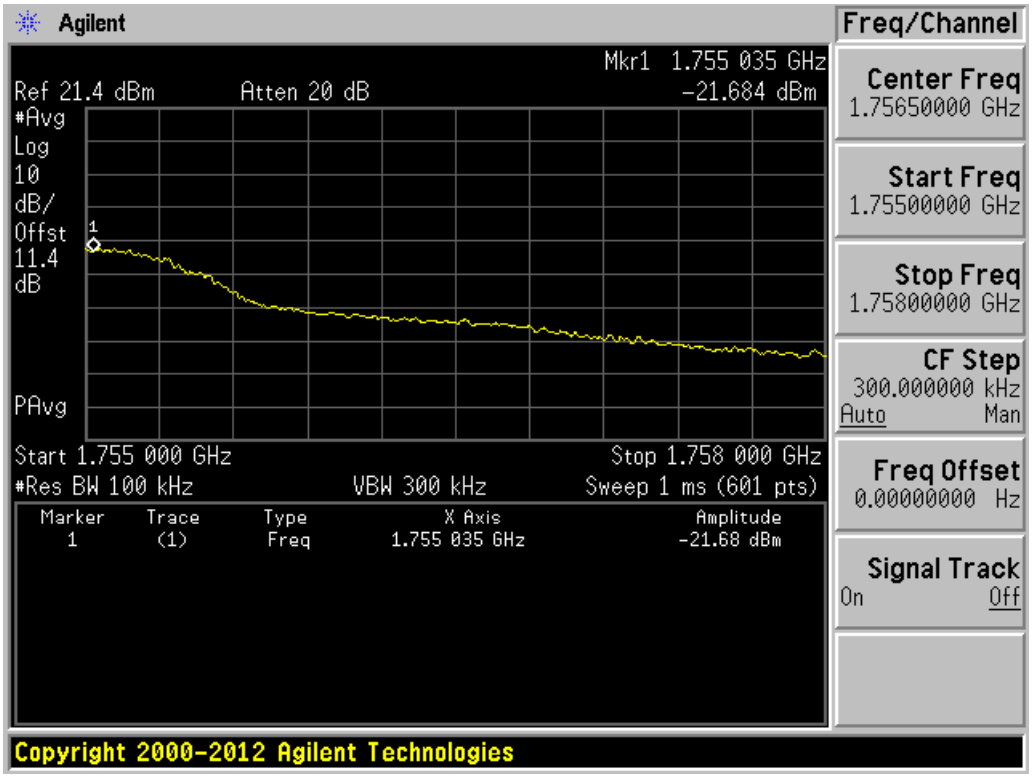
Uplink, Band 2 , CDMA 1908.75 MHz



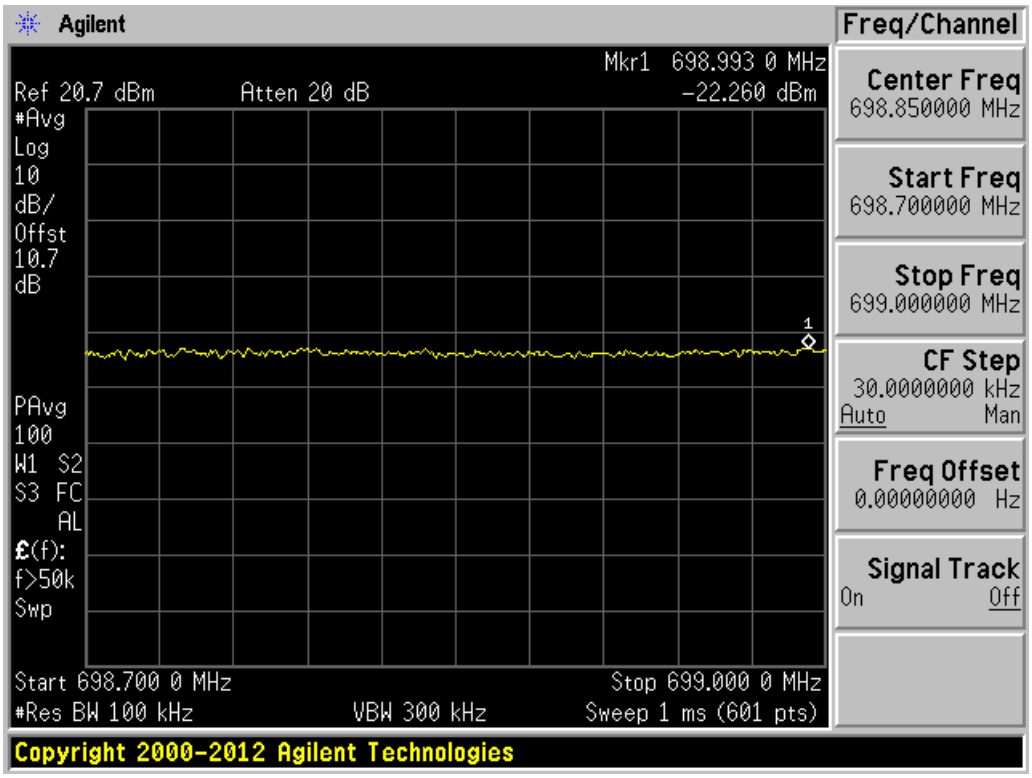
Uplink, Band 25 , CDMA 1913.75 MHz



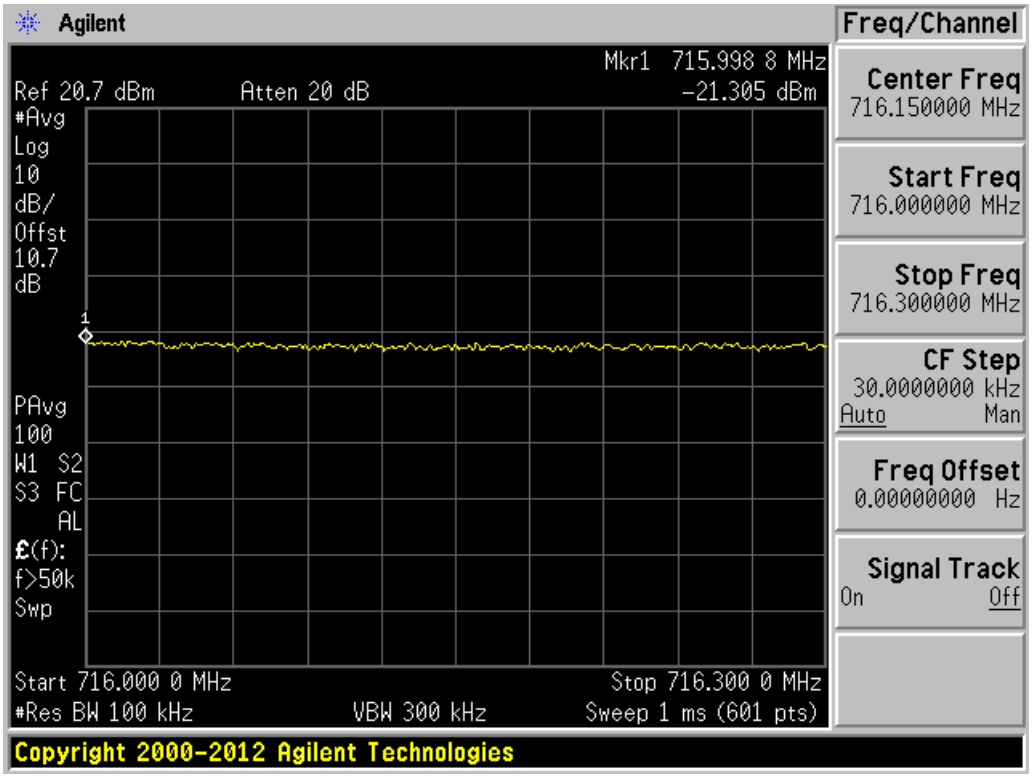
Uplink, Band 4, CDMA 1711.25 MHz



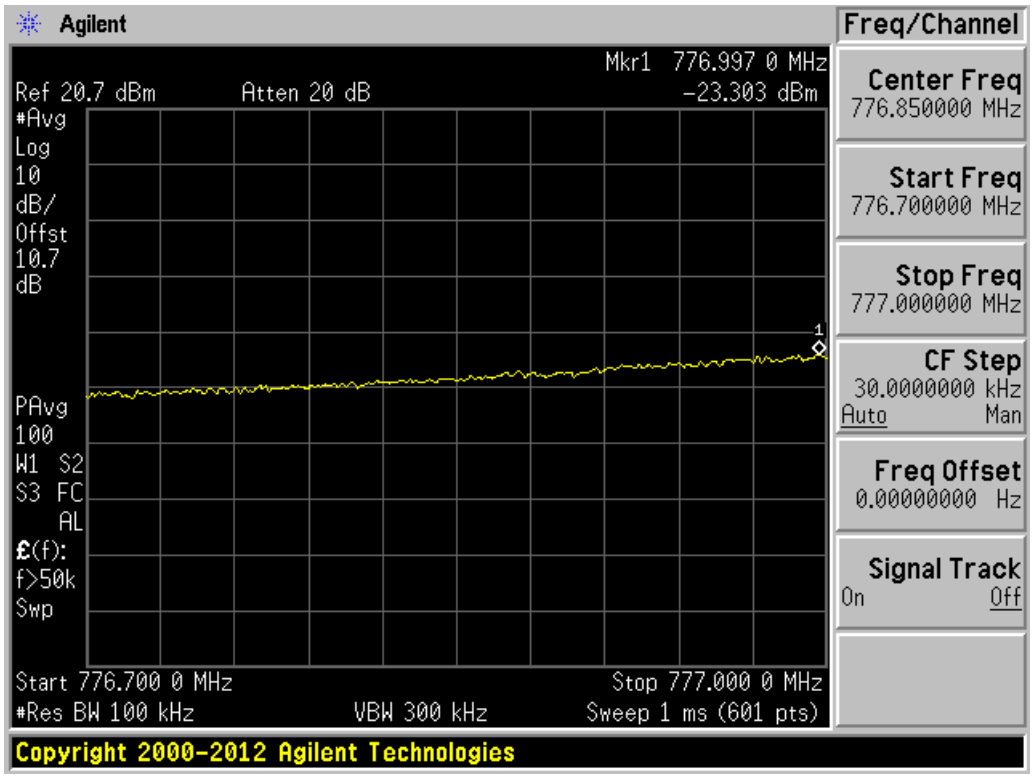
Uplink, Band 4, CDMA 1753.75 MHz



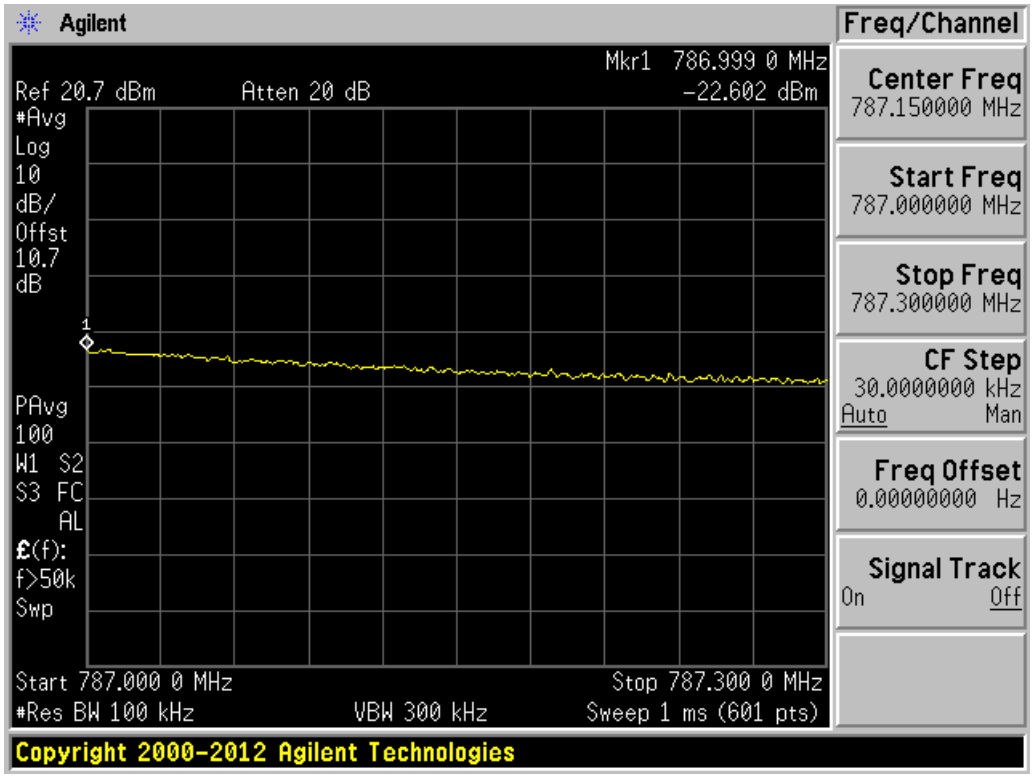
Uplink, Band 12 &17, WCDMA/LTE 701.5 MHz



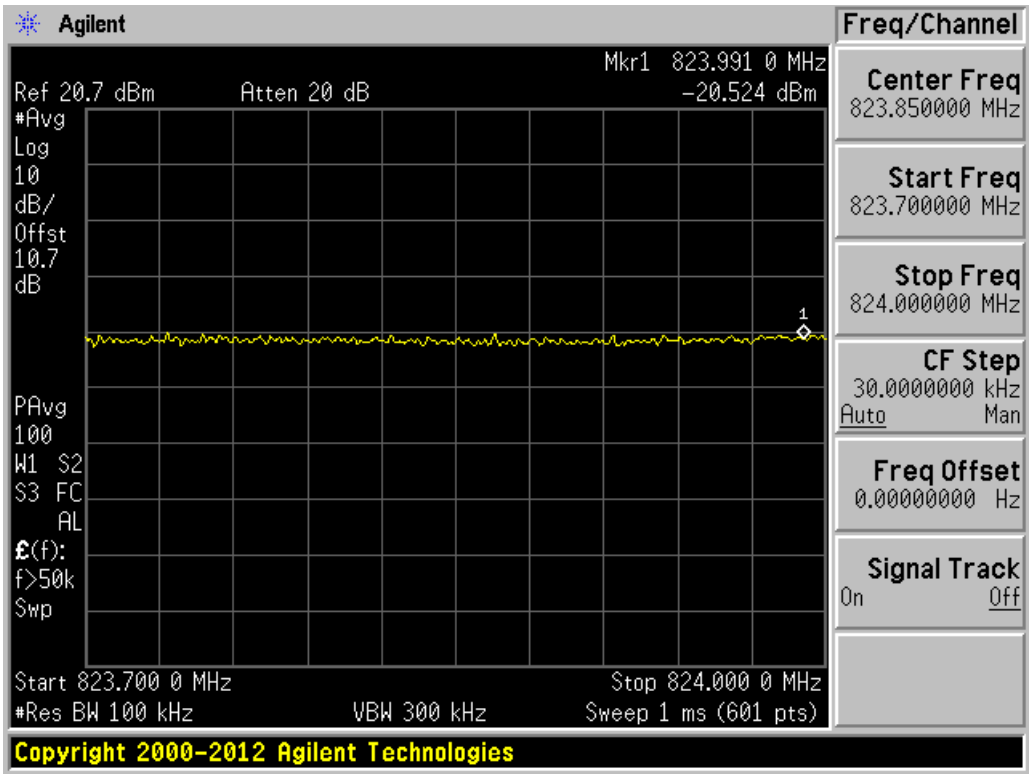
Uplink, Band 12 & 17, WCDMA/LTE 713.5 MHz



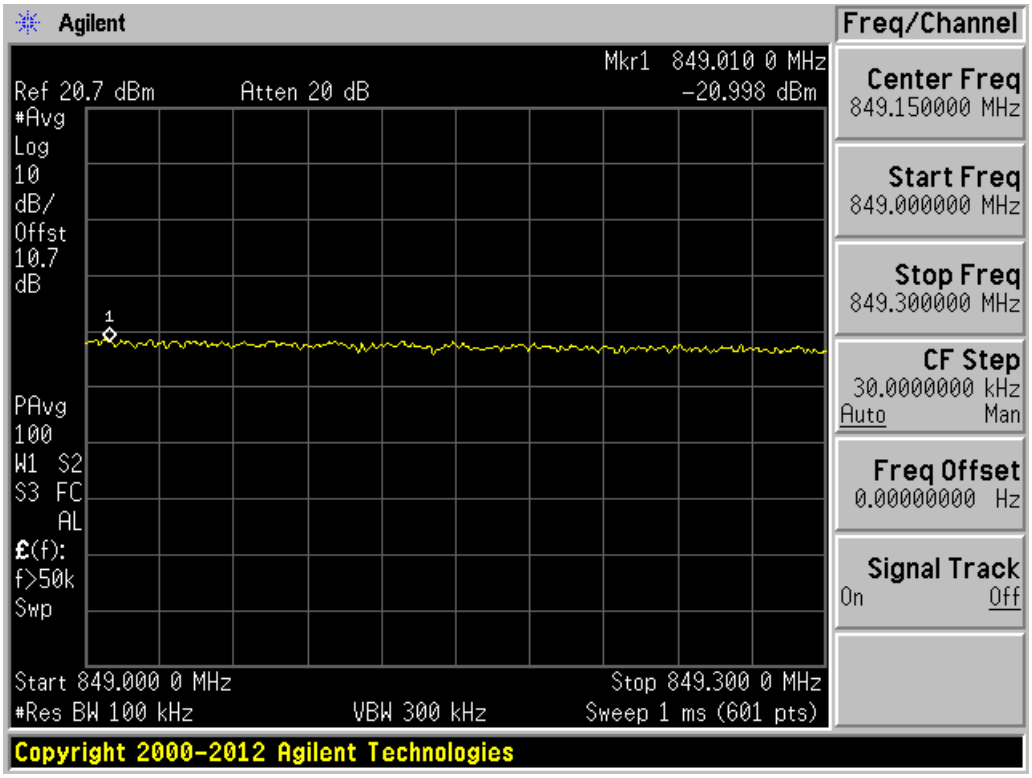
Uplink, Band 13, WCDMA/LTE 779.5 MHz



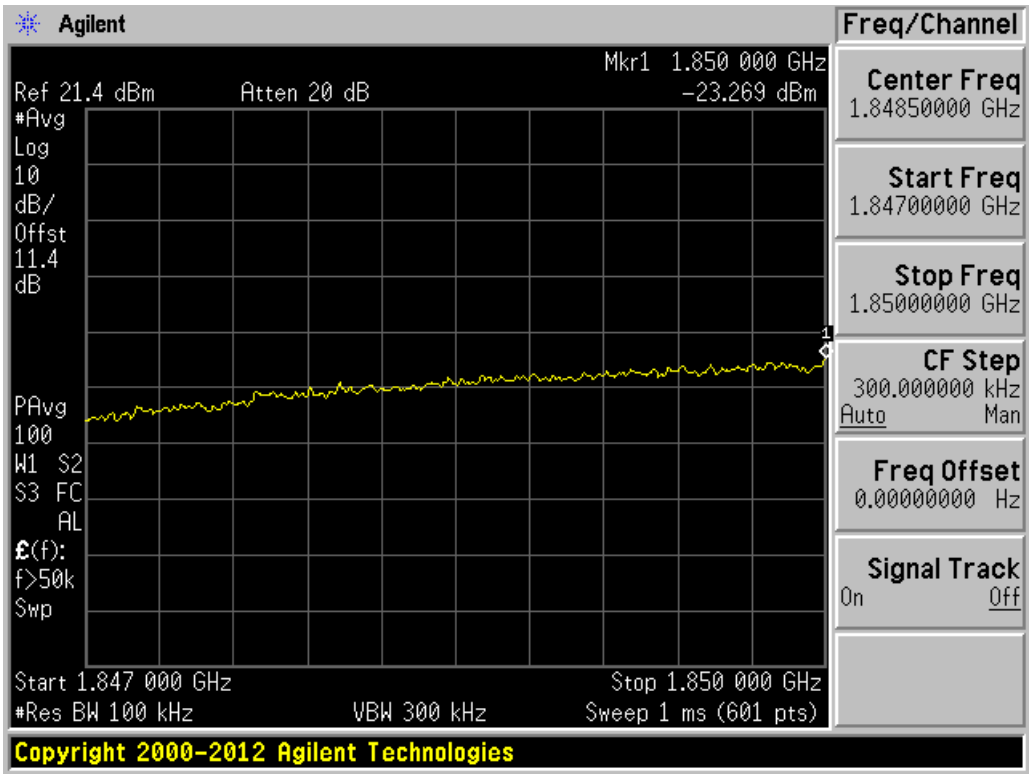
Uplink, Band 13, WCDMA/LTE 784.5 MHz



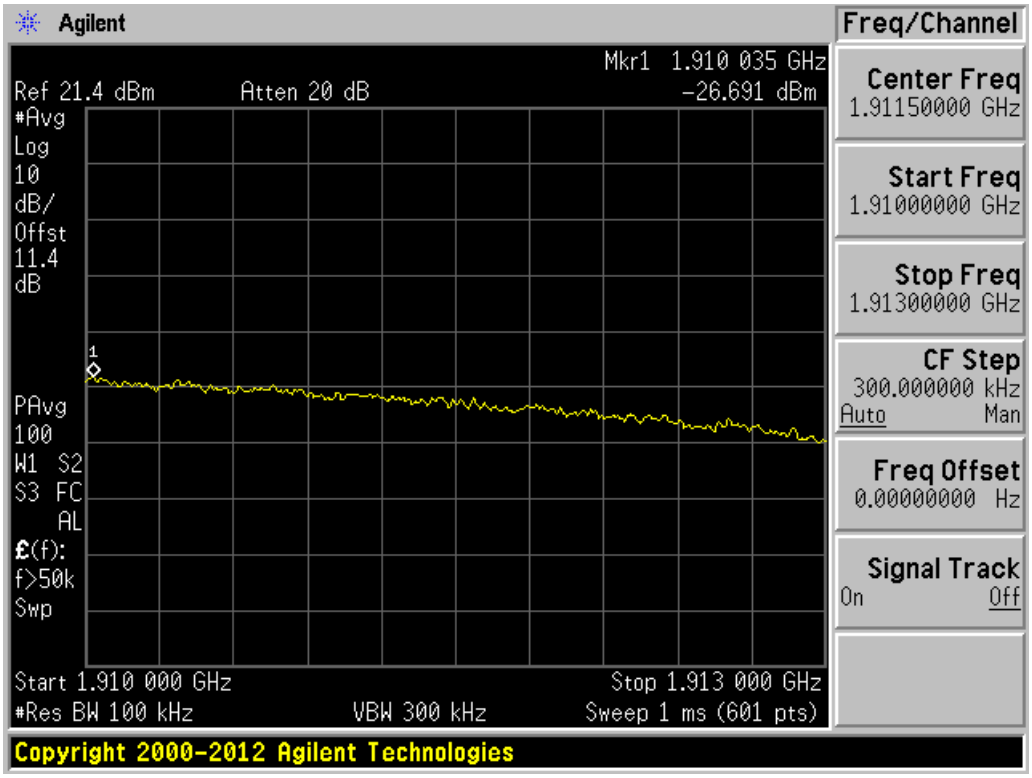
Uplink, Band 5, WCDMA/LTE 826.5 MHz



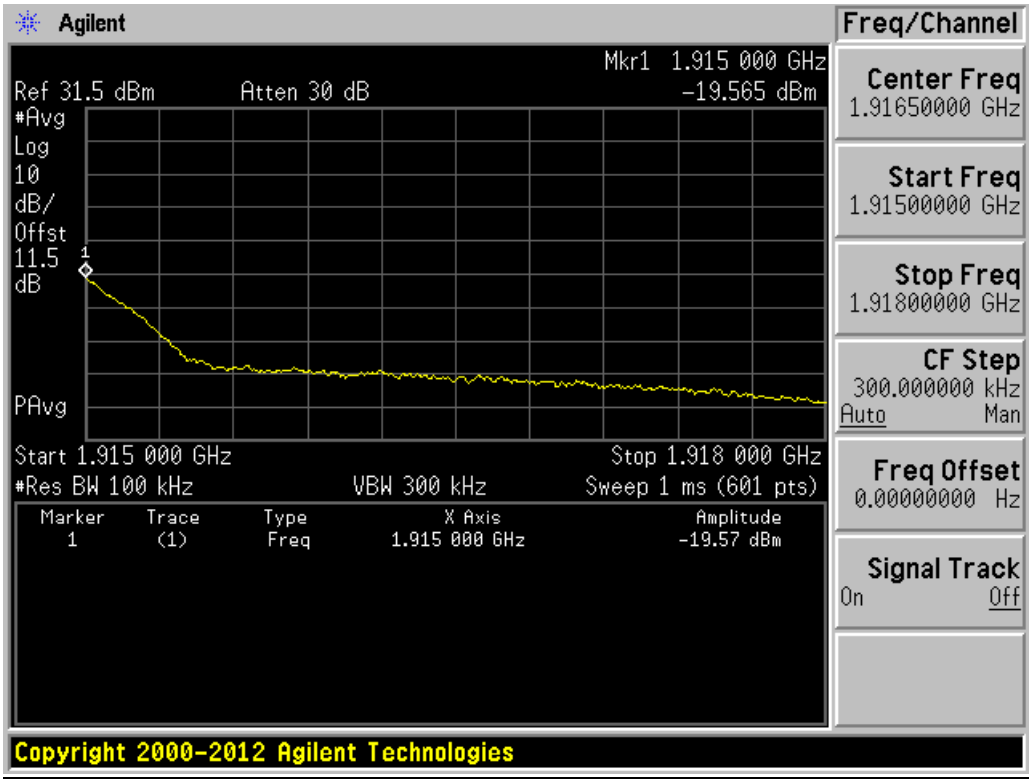
Uplink, Band 5, WCDMA/LTE 846.5 MHz



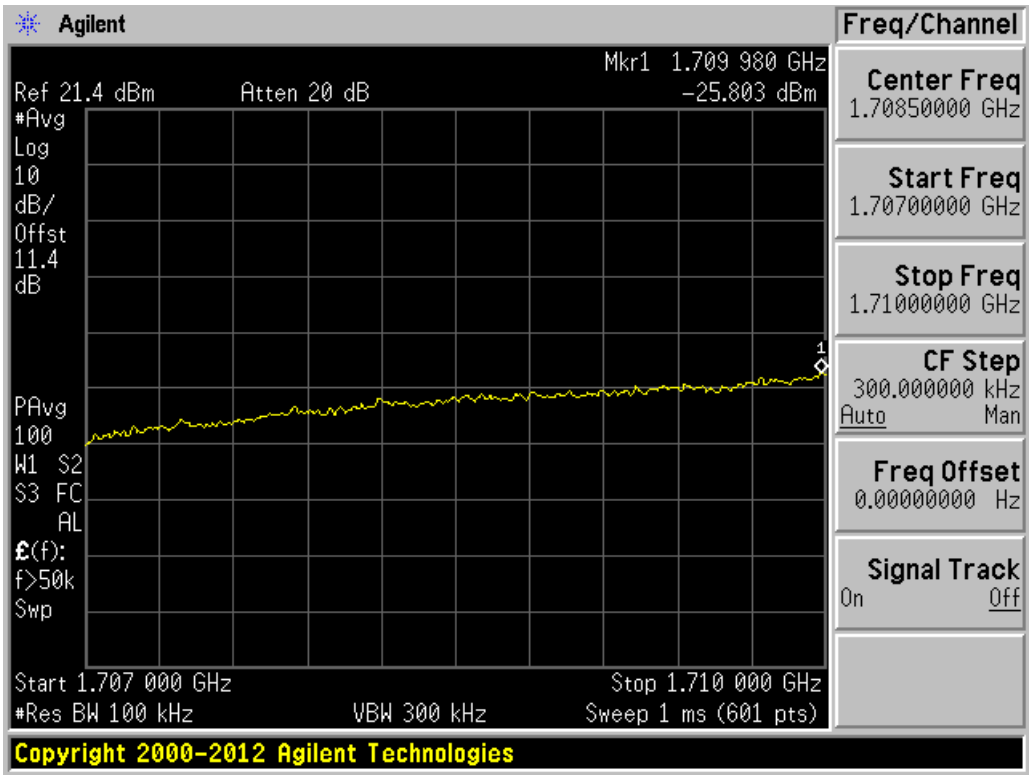
Uplink, Band 2 & 25, WCDMA/LTE 1852.5 MHz



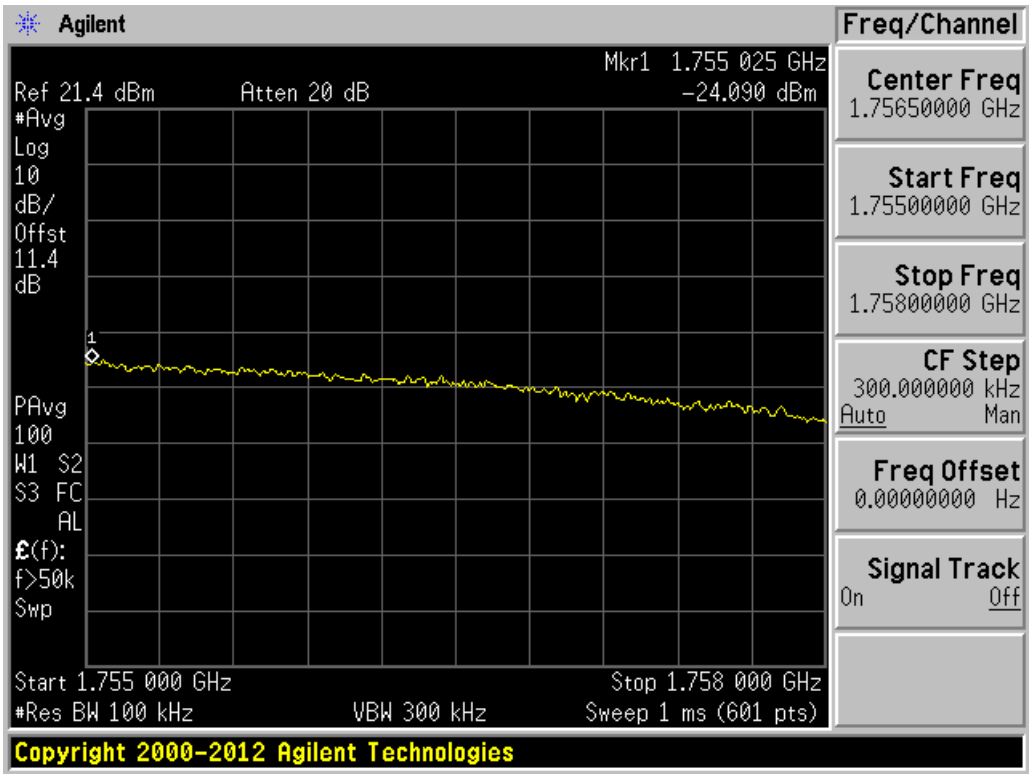
Uplink, Band 2, WCDMA/LTE 1907.5 MHz



Uplink, Band 25, WCDMA/LTE 1912.5 MHz



Uplink, Band 4, WCDMA/LTE 1712.5 MHz



Uplink, Band 4, WCDMA/LTE 1752.5 MHz

3.6 Conducted Spurious Emissions Test

This test conducted in accordance with KDB 935210 D03 V04 Signal Booster Measurements, § 7.6.
This comply with FCC Rule: § 2.1051 Measurements required: Spurious emissions at antenna terminals.

3.6.1 Conducted spurious emissions test results

Table 4

Band	FCC Rule Apply	Path	Frequency of Operation (MHz)	Highest Emission (dBm)	Measured Frequency (MHz)	Limit	Result
2, 25	24.238	Uplink	1850-1915	-45.3	3750	-13	Pass
		Downlink	1930-1995	-76.4	13640	-13	Pass
4	27.53(h)	Uplink	1710-1755	-43.1	1756	-13	Pass
		Downlink	2110-2155	-76.1	20840	-13	Pass
5	22.917	Uplink	824-849	-33.1	850	-13	Pass
		Downlink	869-894	-78.6	1949	-13	Pass
12, 17	27.53(f)	Uplink	699-716	-35.3	698	-13	Pass
		Downlink	729-746	-78.8	880	-13	Pass
13	27.53(c)	Uplink	777-787	-20.7	788	-13	Pass
		Downlink	746-756	-48.9	758	-13	Pass

Table 5

Operation in 777-787 MHz. FCC Rule 27.53(c)						
Emissions Frequency Range	Measured Frequency (MHz)	RBW (kHz)	Correction Factor	Measured Level (dBm)	Limit (dBm)	Result
764-776	776	6.25	0	-52.4	-35	Pass
794-806	794	6.25	0	-77.7	-35	Pass

Table 6

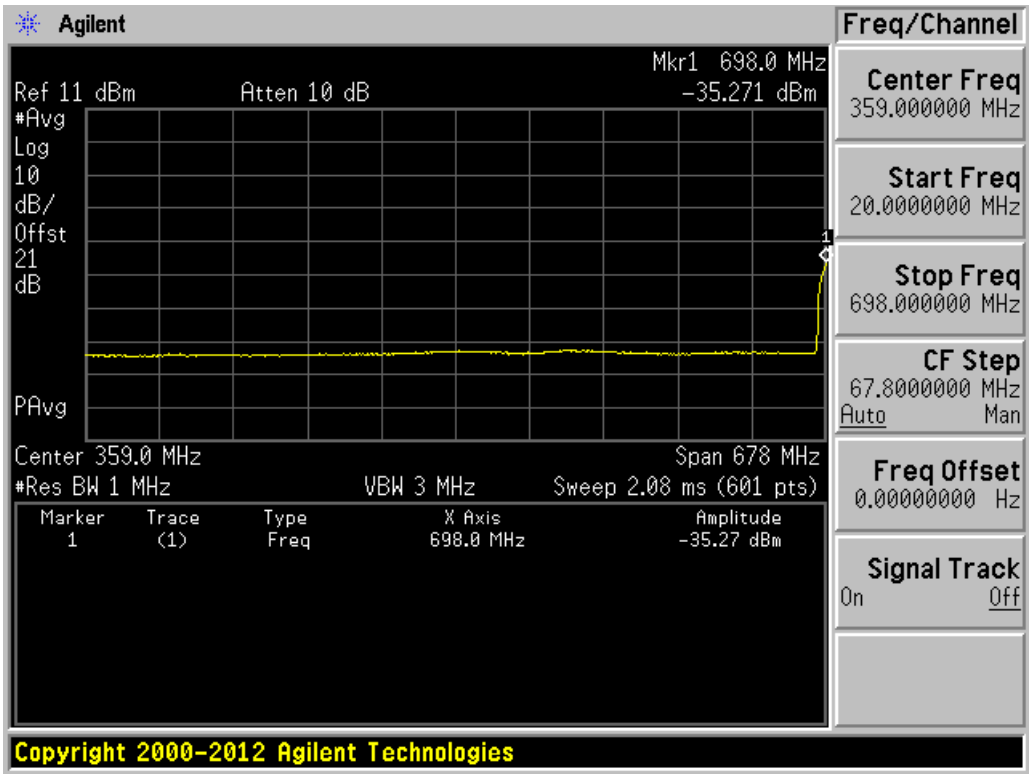
Operation in 746-756 MHz. FCC Rule 27.53(c)						
Emissions Frequency Range	Measured Frequency (MHz)	RBW (kHz)	Correction Factor	Measured Level (dBm)	Limit (dBm)	Result
764-776	771	6.25	0	-104.5	-35	Pass
794-806	801	6.25	0	-104.3	-35	Pass

Table 7

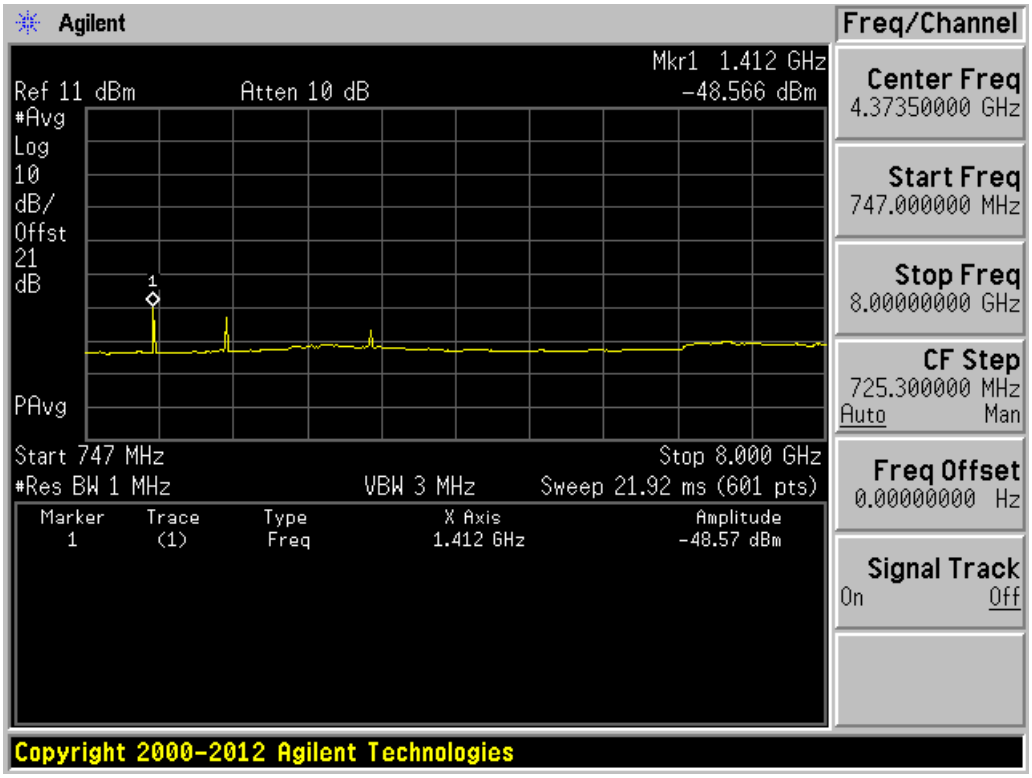
Operation in 777-787 MHz. FCC Rule 27.53(e)						
Emissions Frequency Range	Measured Frequency (MHz)	Measured Level (dBm/MHz)	Net Antenna Gain (dB)	Calculated EIRP (dBm/MHz)	Limit (dBm/MHz)	Result
1559-1610	1563.1	-55.3	1	-54.3	-40	Pass

Table 8

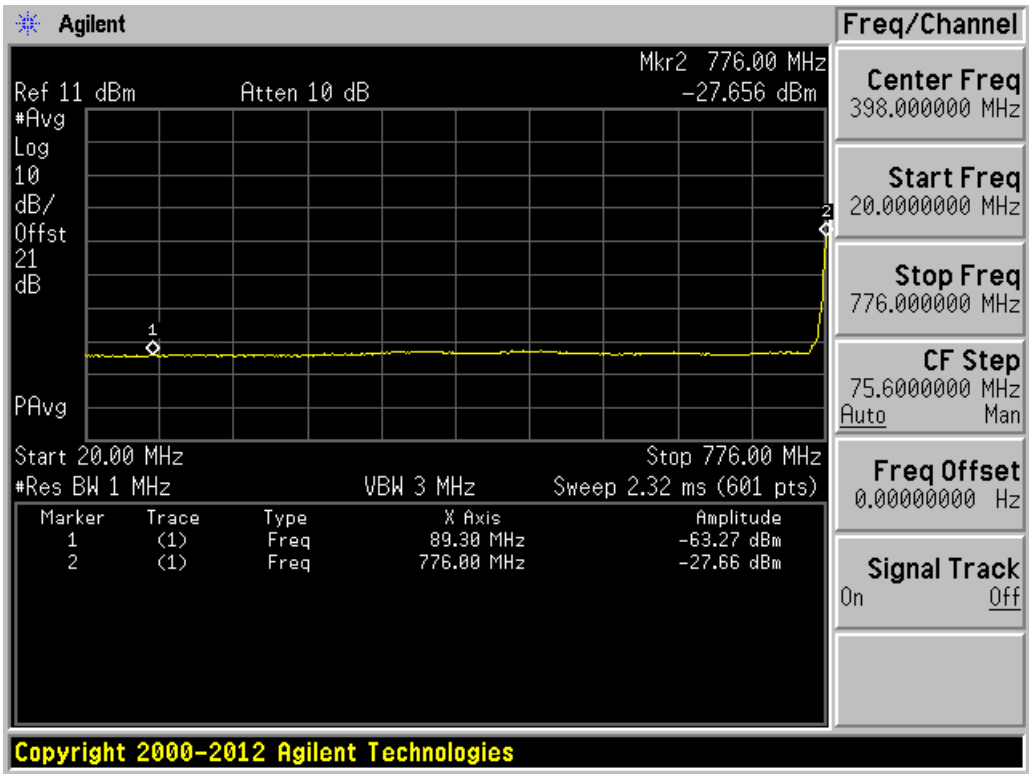
Operation in 746-756 MHz. FCC Rule 27.53(e)						
Emissions Frequency Range	Measured Frequency (MHz)	Measured Level (dBm/MHz)	Net Antenna Gain (dB)	Calculated EIRP (dBm/MHz)	Limit (dBm/MHz)	Result
1559-1610	1601.2	-82.1	1	-81.1	-40	Pass



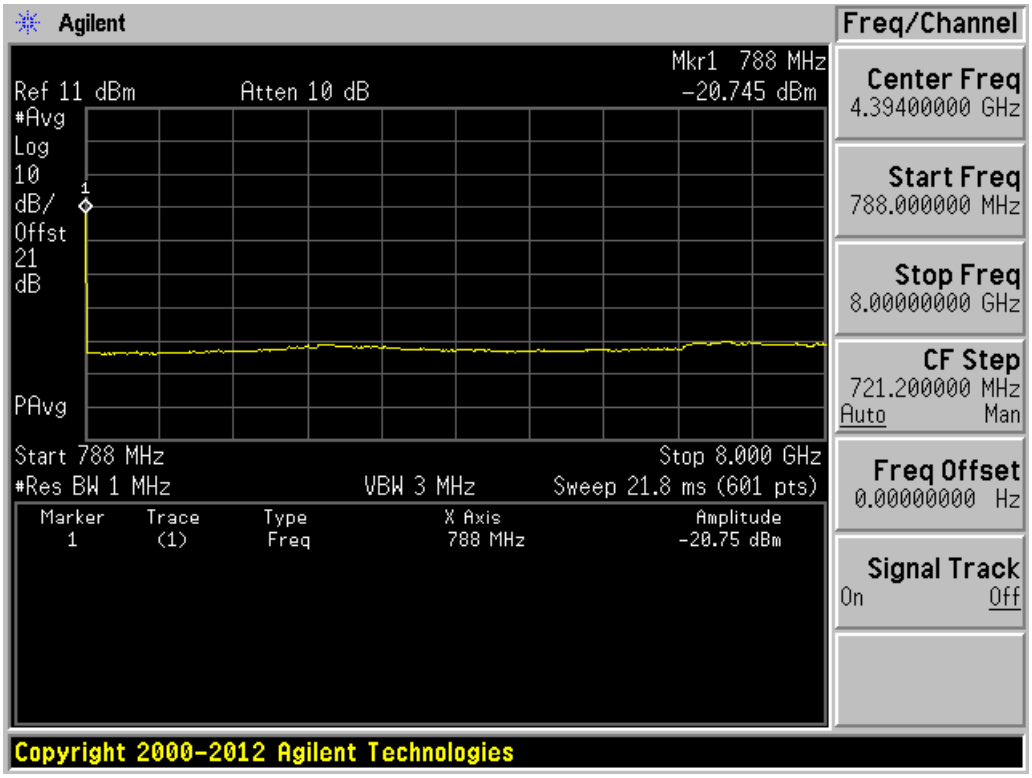
FCC Rule Part 27.53(f). Uplink. Band 12 & 17. 20 MHz to 698 MHz



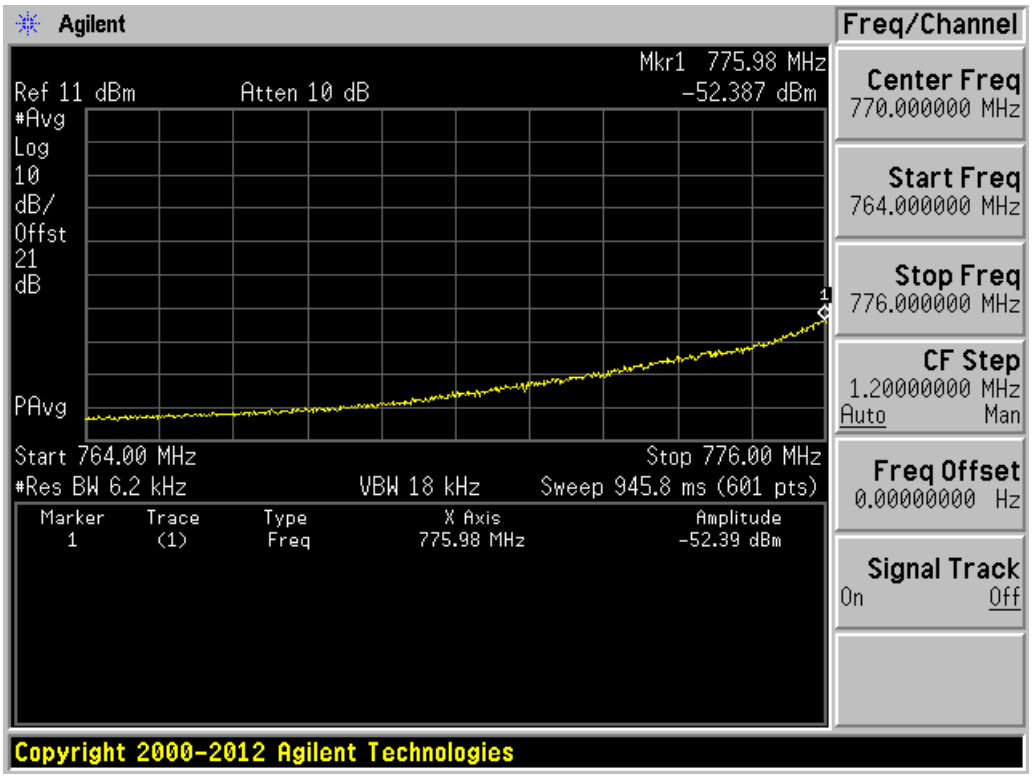
FCC Rule Part 27.53(f). Uplink. Band 12 & 17. 747 MHz to 8 GHz



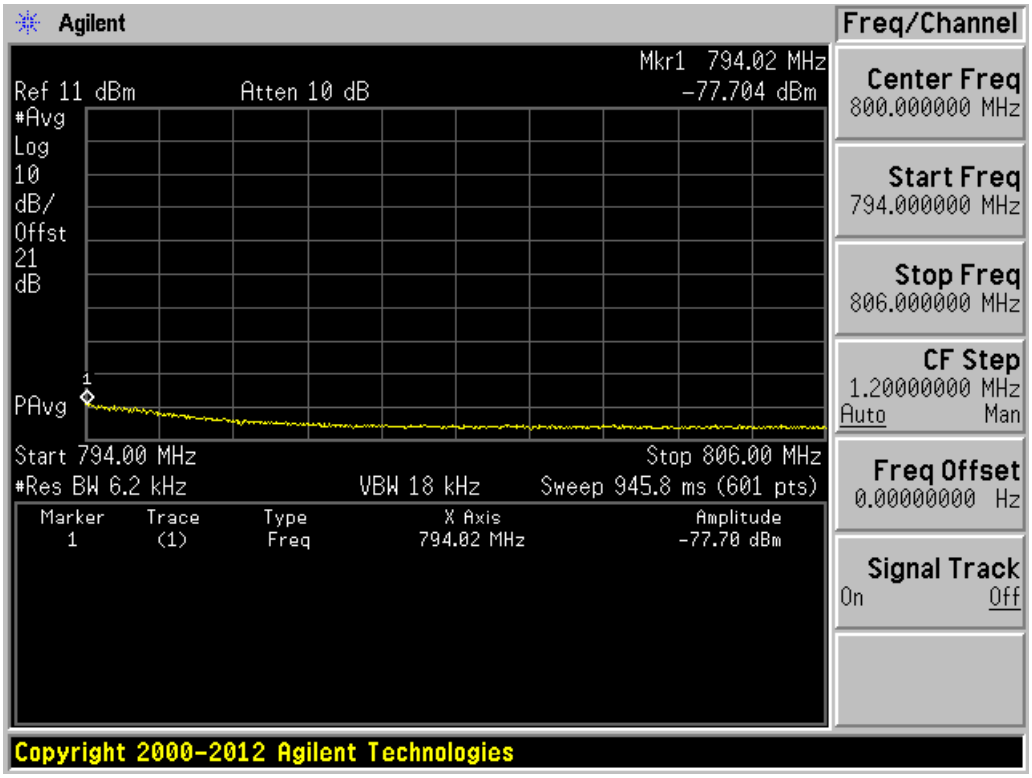
FCC Rule Part 27.53(c). Uplink. Band 13. 20 MHz to 776 MHz



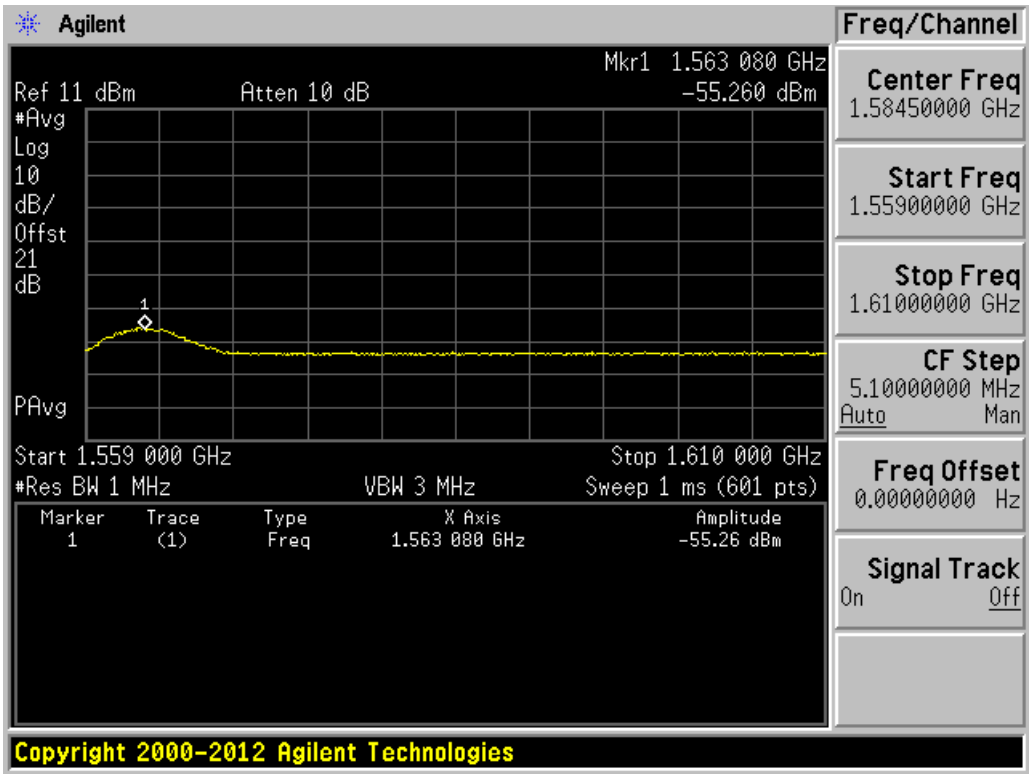
FCC Rule Part 27.53(c). Uplink. Band 13. 788 MHz to 8 GHz



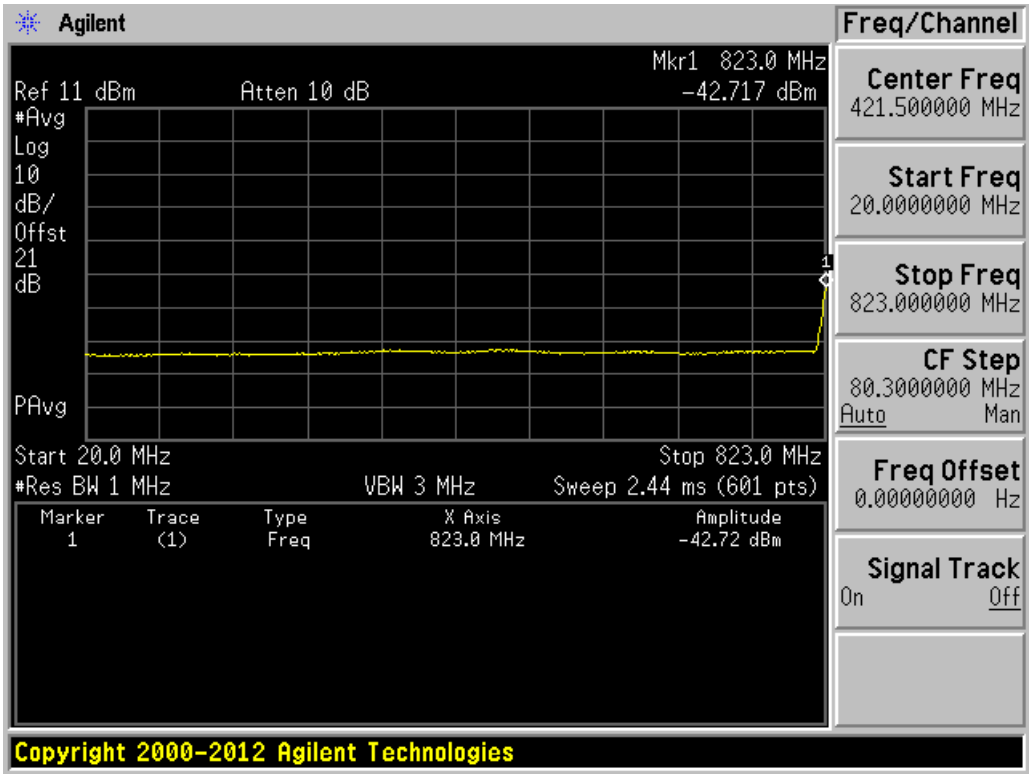
FCC Rule Part 27.53(c). Uplink. Band 13. 764 MHz to 776 MHz



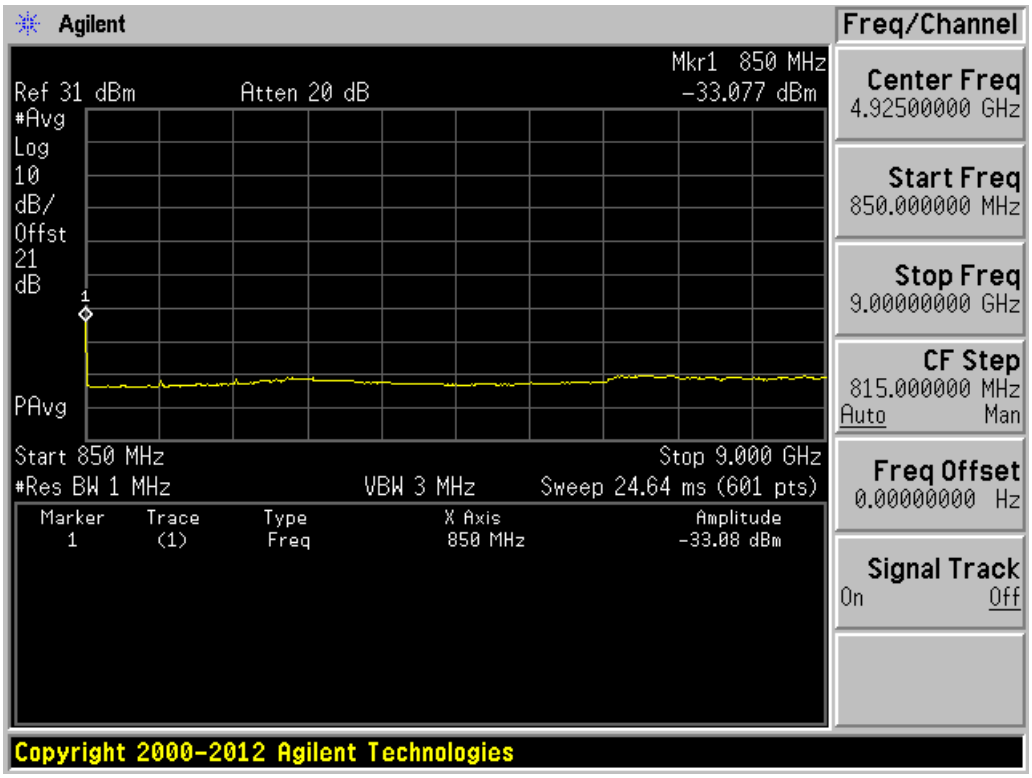
FCC Rule Part 27.53(c). Uplink. Band 13. 794 MHz to 806 MHz



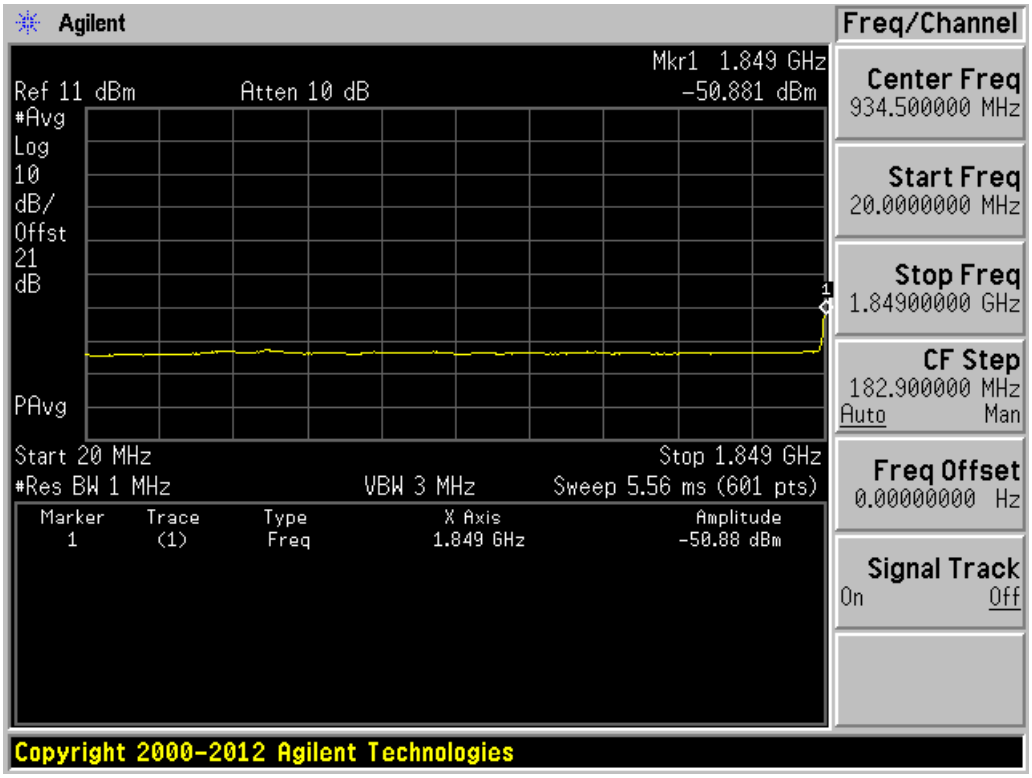
FCC Rule Part 27.53(e). Uplink. Band 13. 1559 MHz to 1610 MHz



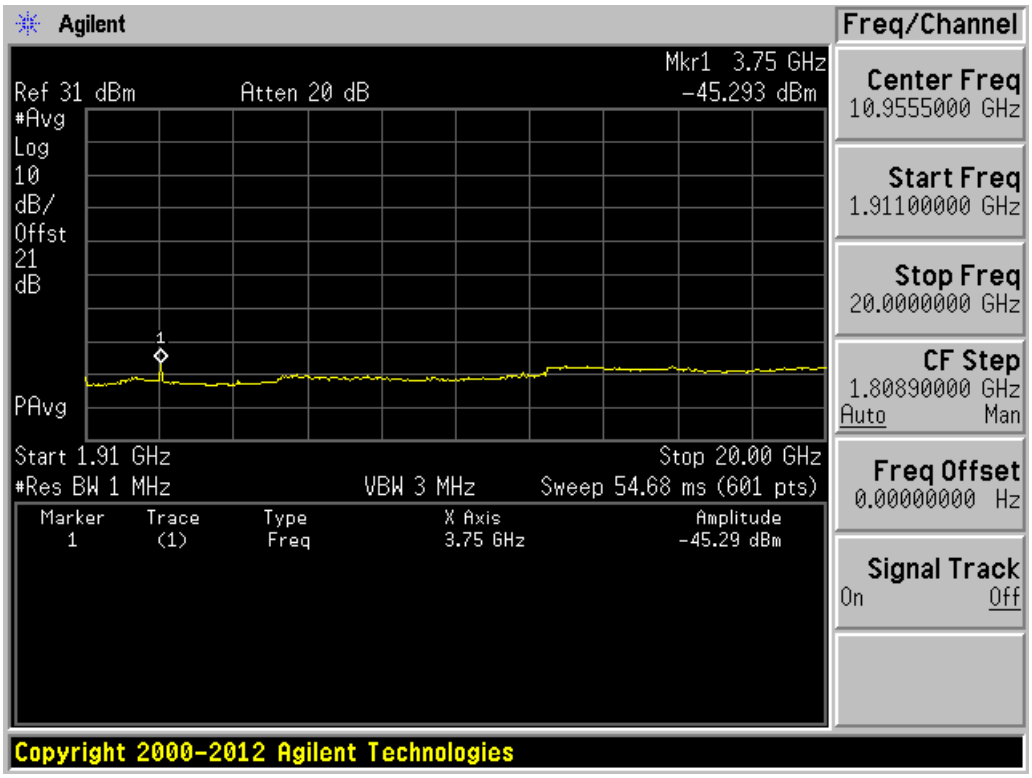
FCC Rule Part 22.917. Uplink. Band 5. 20 MHz to 823 MHz



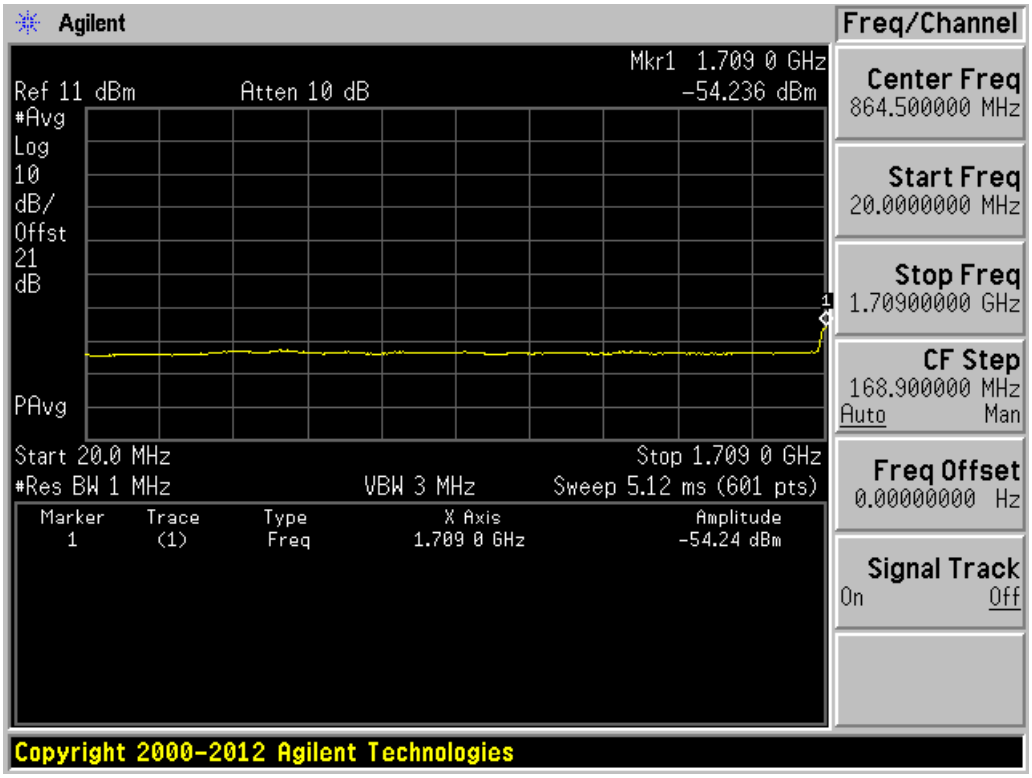
FCC Rule Part 22.917. Uplink. Band 5. 850 MHz to 9 GHz



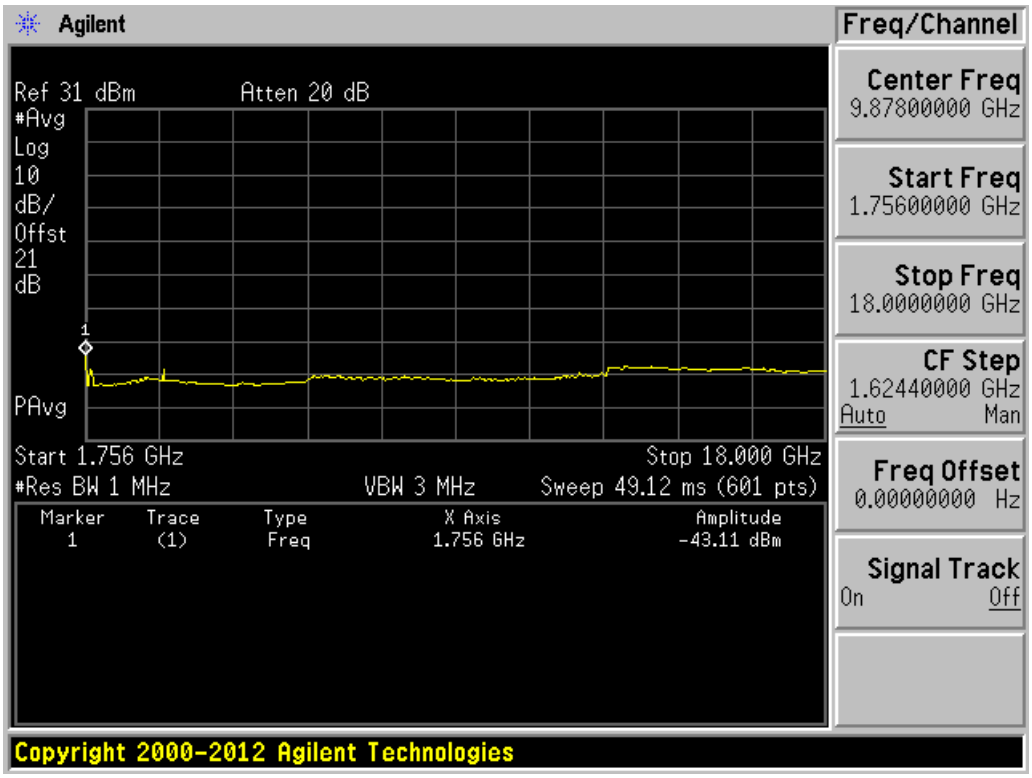
FCC Rule Part 24.238. Uplink. Band 2 & 25. 20 MHz to 1849 MHz



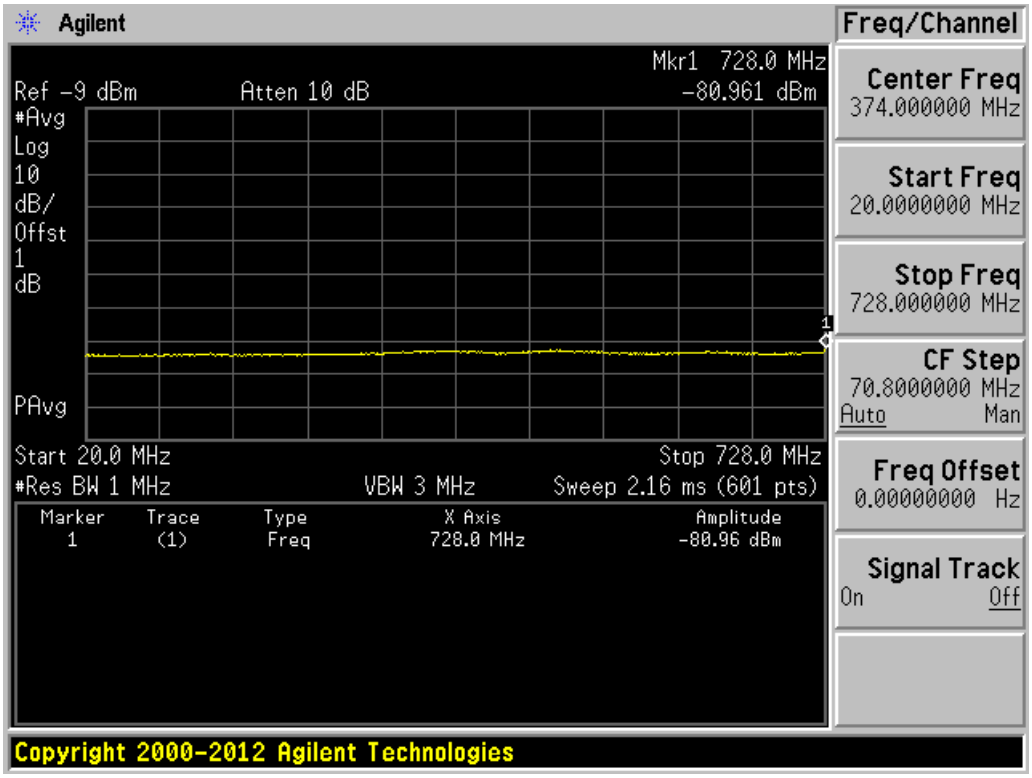
FCC Rule Part 24.238. Uplink. Band 2 & 25. 1911 MHz to 20 GHz



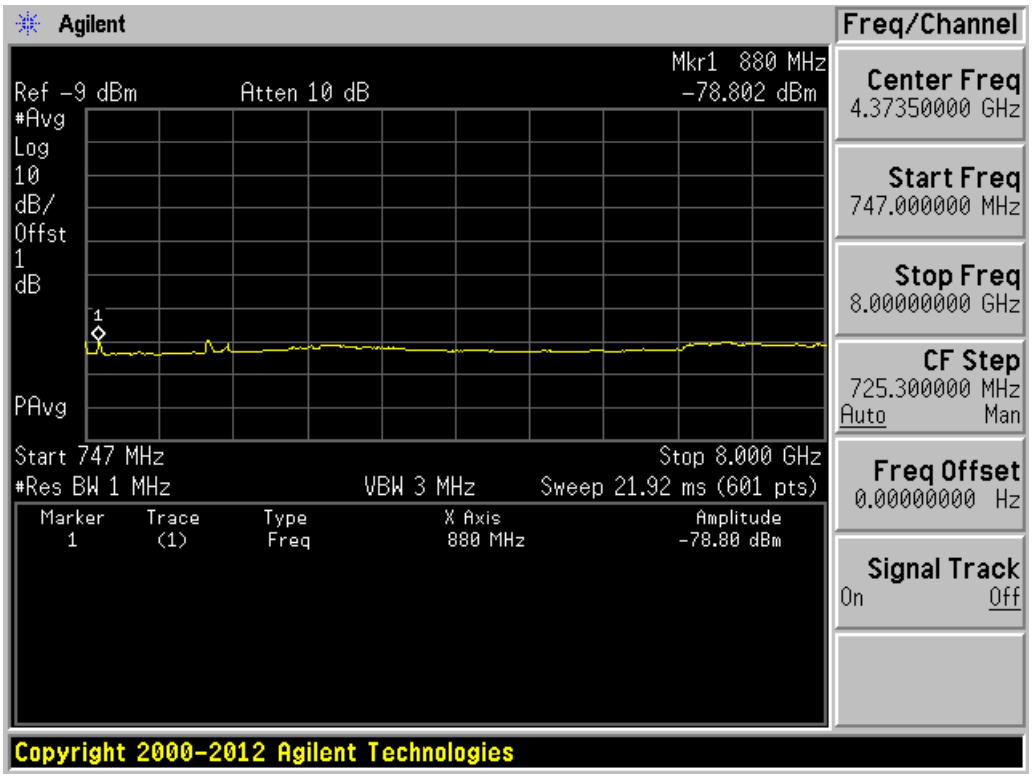
FCC Rule Part 27.53(h). Uplink. Band 4. 20 MHz to 1709 MHz



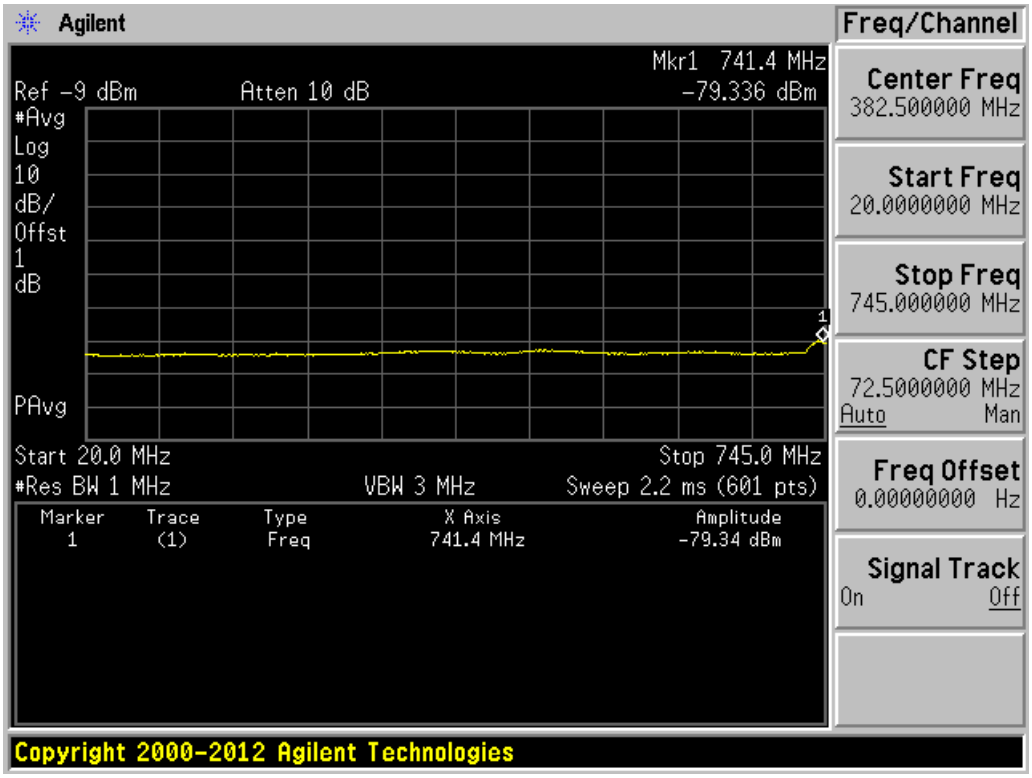
FCC Rule Part 27.53(h). Uplink. Band 4. 1756 MHz to 18 GHz



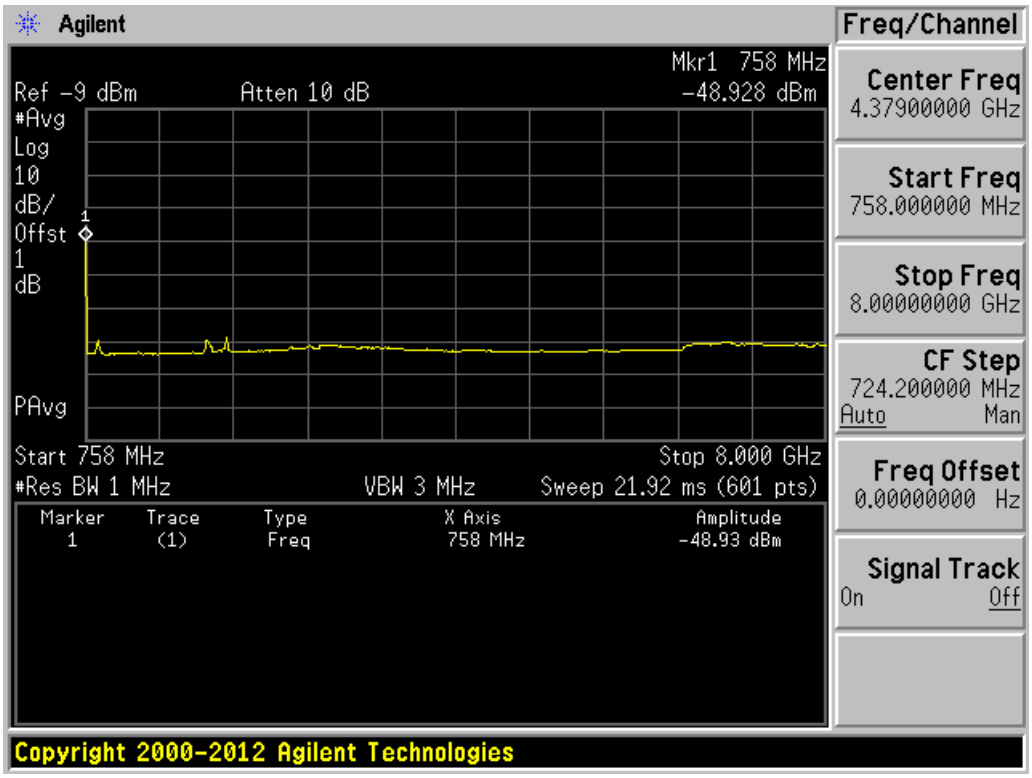
FCC Rule Part 27.53(f). Downlink. Band 12 & 17. 20 MHz to 728 MHz



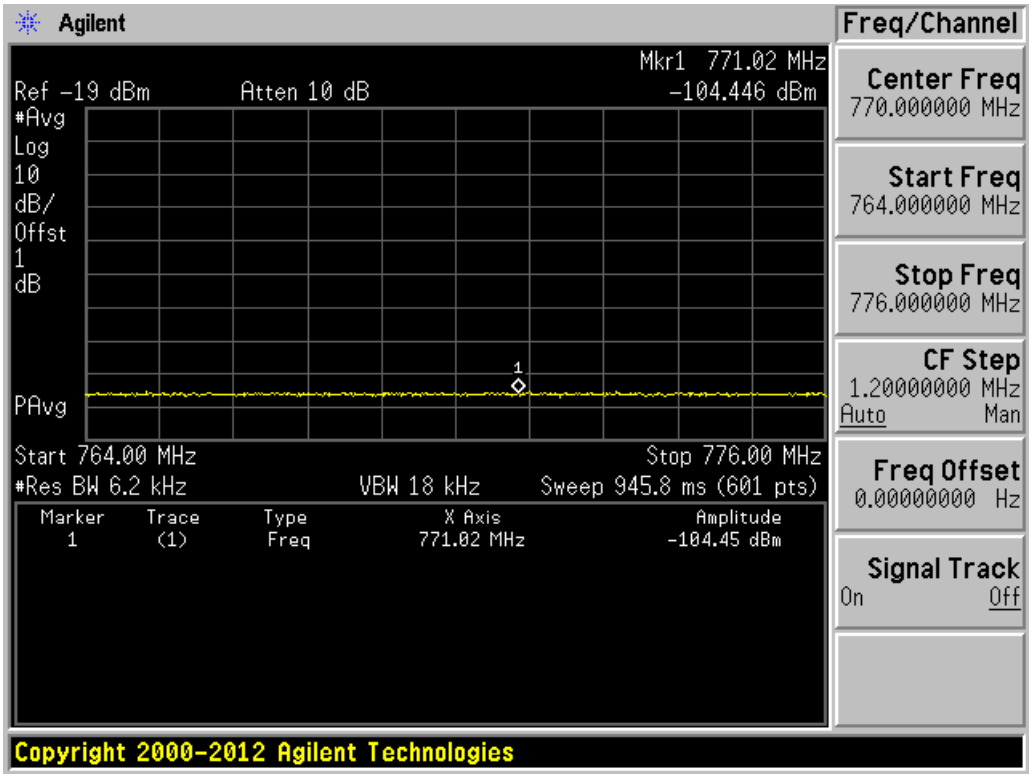
FCC Rule Part 27.53(f). Downlink. Band 12 & 17. 747 MHz to 8 GHz



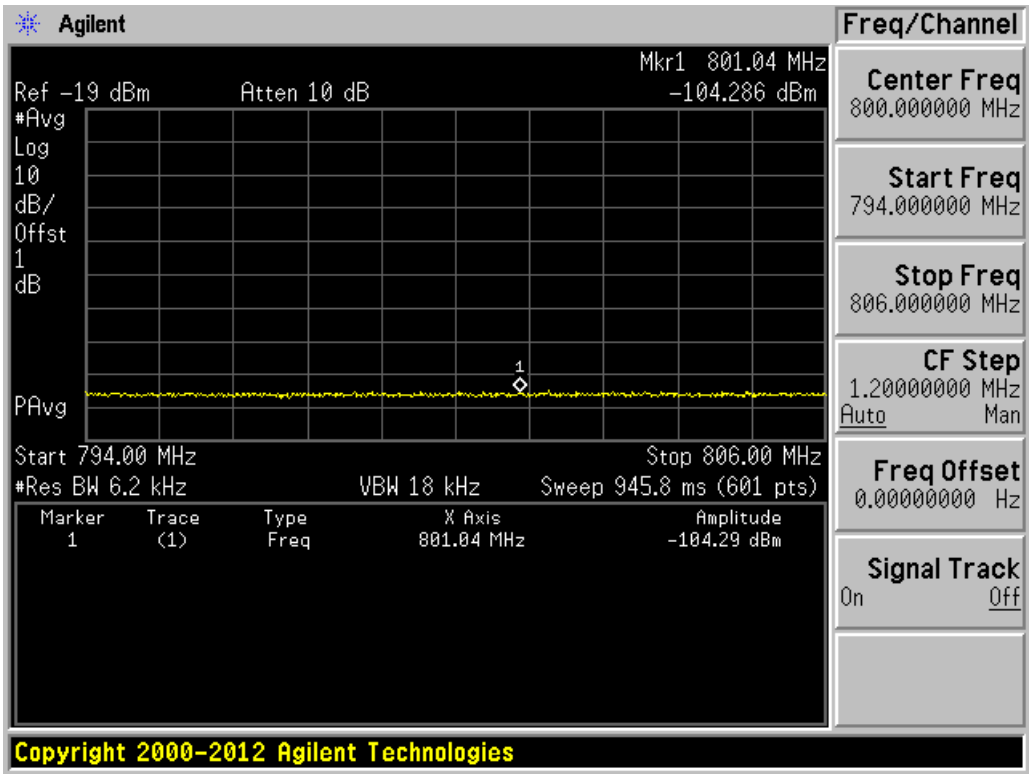
FCC Rule Part 27.53(c). Downlink. Band 13. 20 MHz to 745 MHz



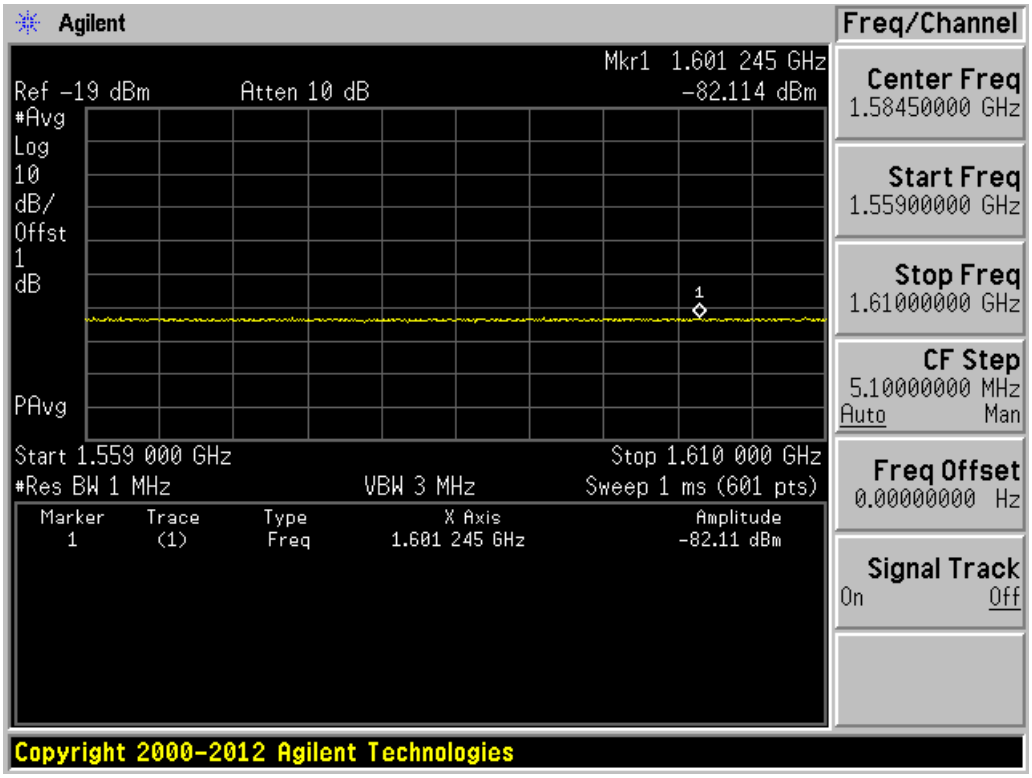
FCC Rule Part 27.53(c). Downlink. Band 13. 758 MHz to 8 GHz



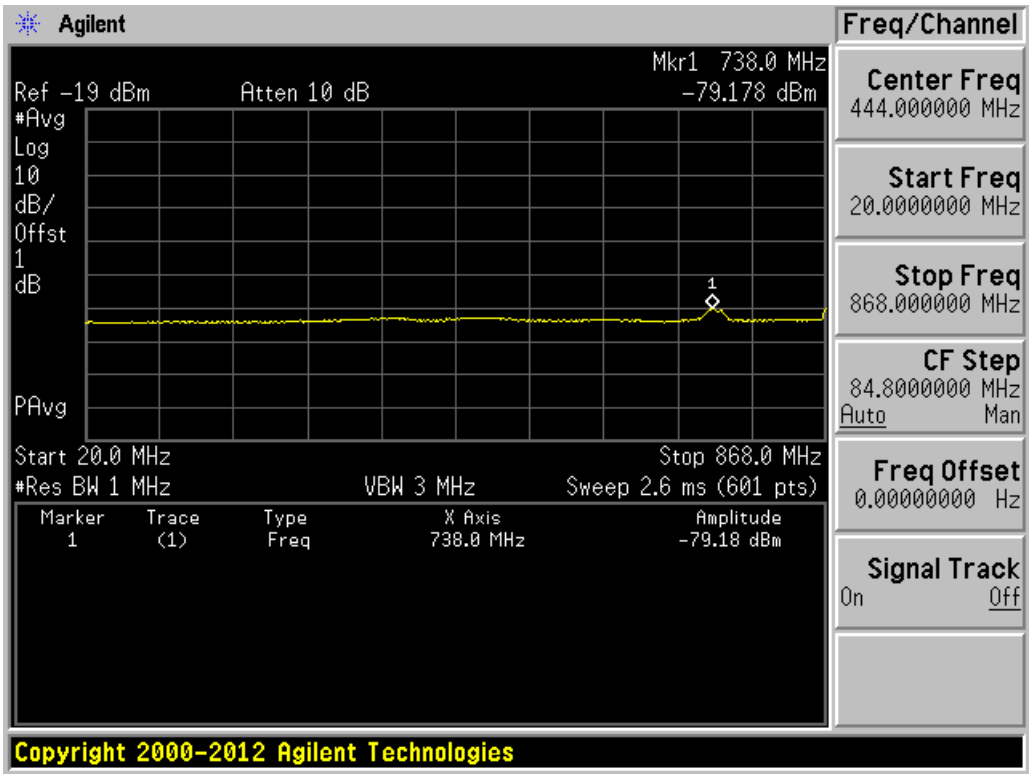
FCC Rule Part 27.53(c). Downlink. Band 13. 764 MHz to 776 MHz



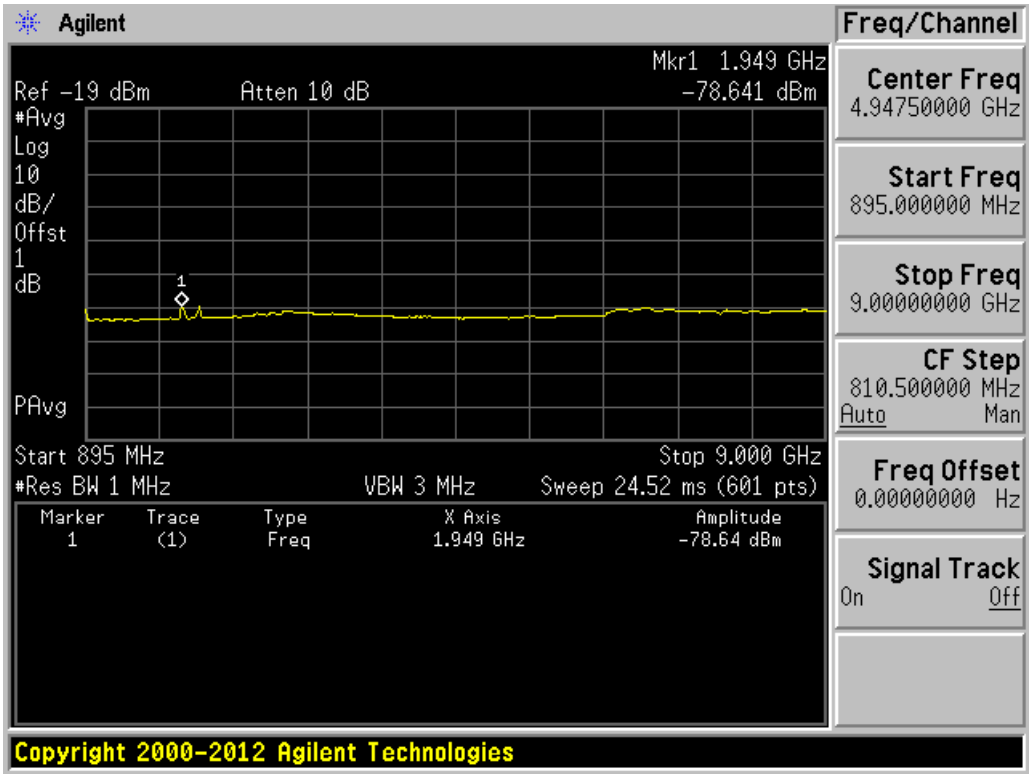
FCC Rule Part 27.53(c). Downlink. Band 13. 794 MHz to 806 MHz



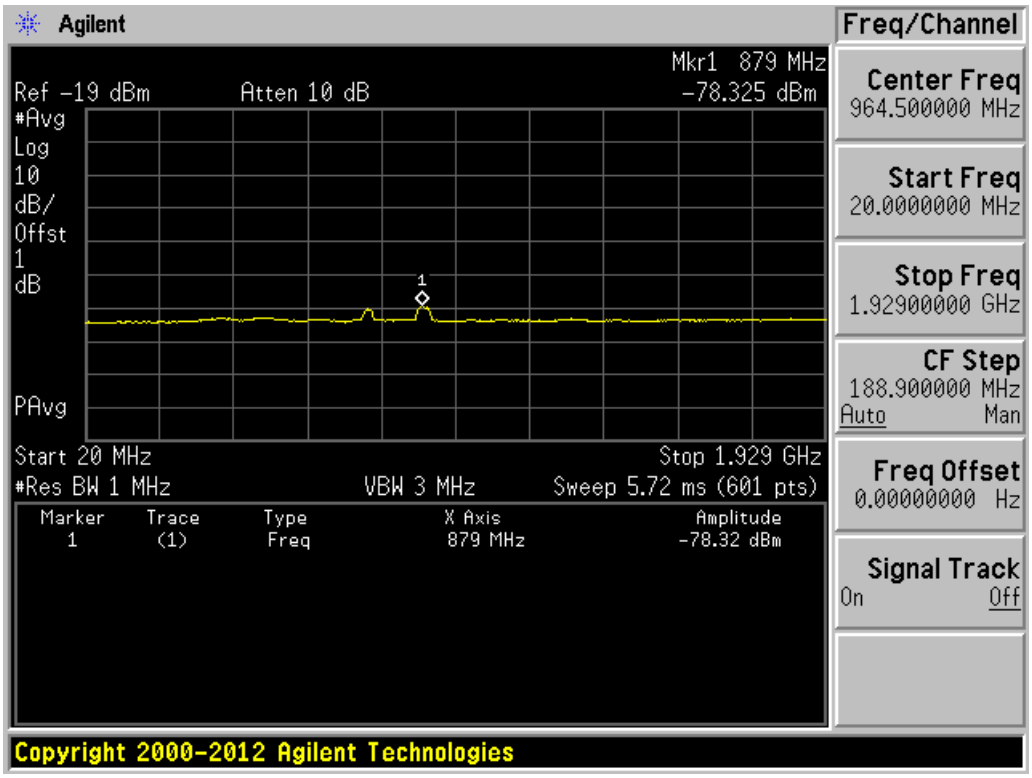
FCC Rule Part 27.53(e). Downlink. Band 13. 1559 MHz to 1610 MHz



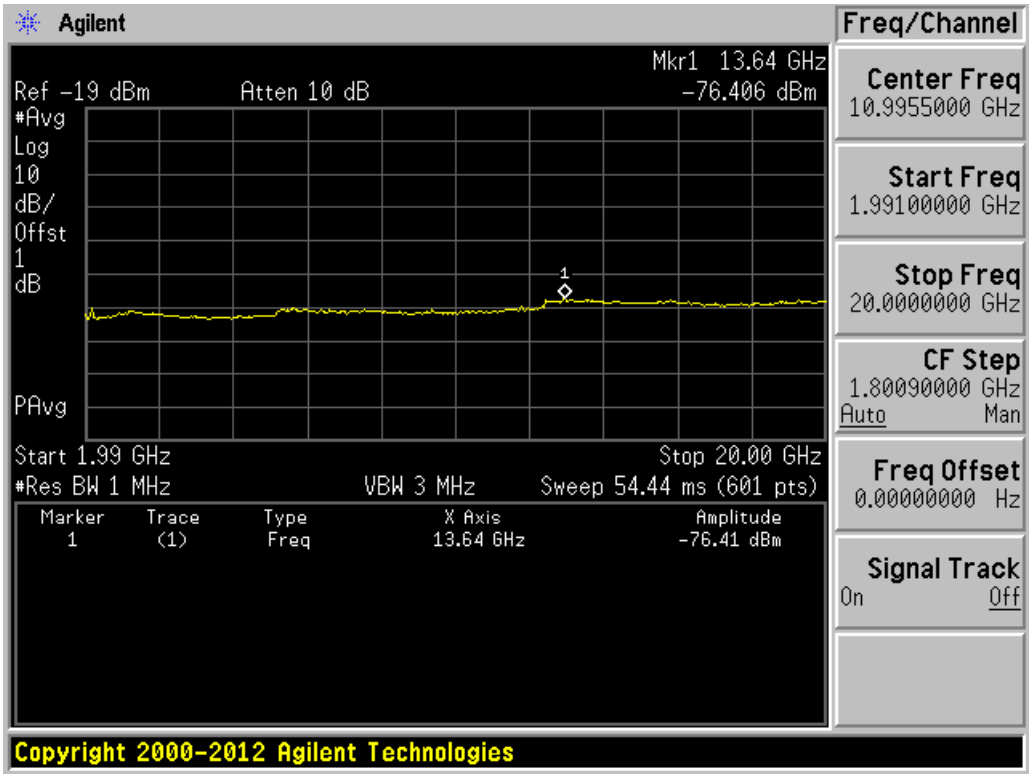
FCC Rule Part 22.917. Downlink. Band 5. 20 MHz to 868 MHz



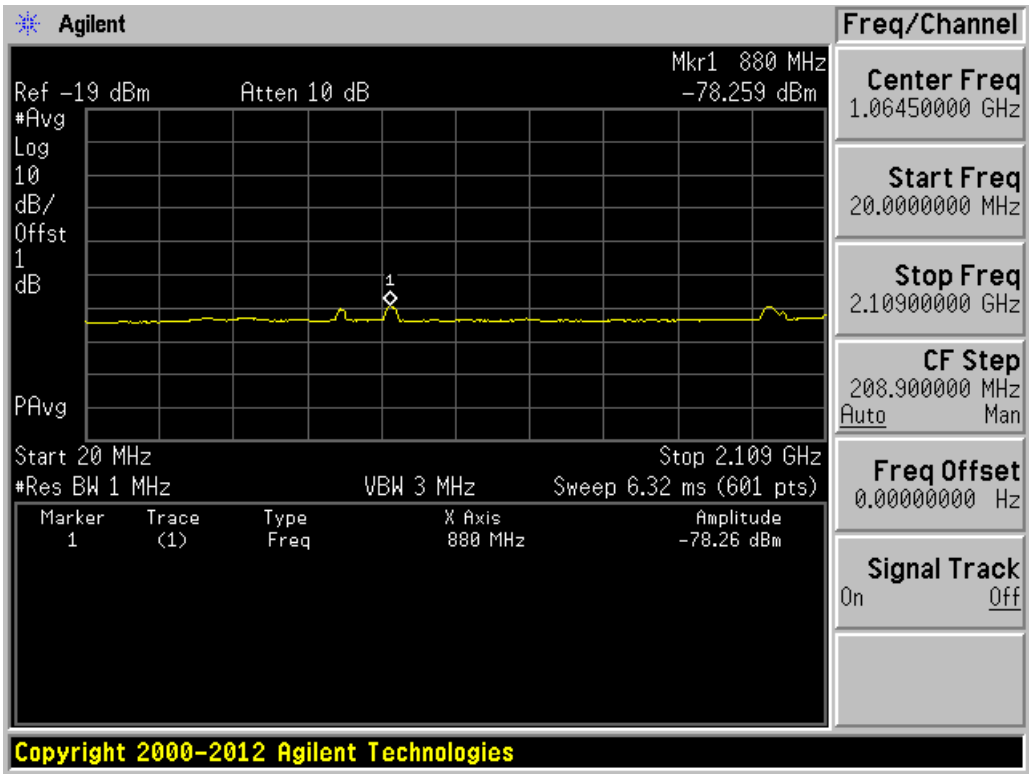
FCC Rule Part 22.917. Downlink. Band 5. 895 MHz to 9 GHz



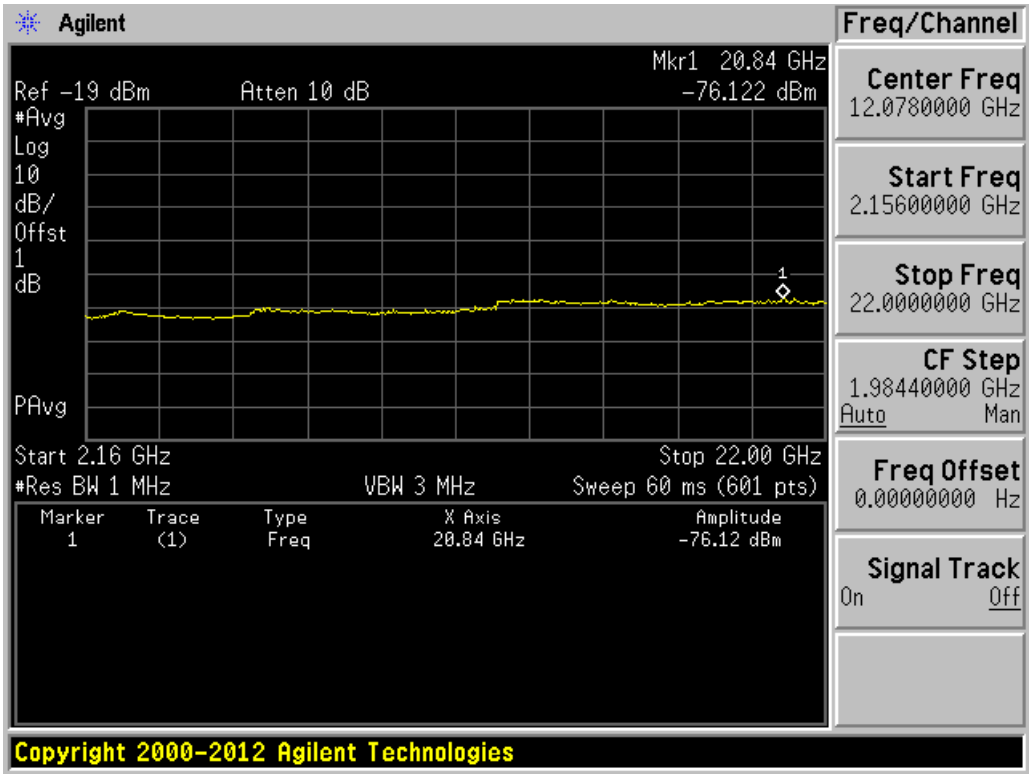
FCC Rule Part 24.238. Downlink. Band 2 & 25. 20 MHz to 1929 MHz



FCC Rule Part 24.238. Downlink. Band 2 & 25. 1991 MHz to 20 GHz



FCC Rule Part 27.53(h). Downlink. Band 4. 20 MHz to 2109 MHz



FCC Rule Part 27.53(h). Downlink. Band 4. 2156 MHz to 22 GHz

3.7 Noise Limits Test

This test conducted in accordance with KDB 935210 D03V04 Signal Booster Measurements, § 7.7
This comply with FCC Rule: § 20.21(e)(8)(i)(A) Noise Limits and § 20.21(e)(8)(i)(H) Transmit Power Off Mode

3.7.1 Test results for noise power in presence of downlink signal

Table 9

Variable Noise Limits. Band 12 & 17		
RSSI (dBm)	Max Rule (dBm/MHz)	Measured Uplink Noise (dBm/MHz)
-90	-59.0	-79.9
-70	-59.0	-79.8
-50	-59.0	-80.1
-45	-59.0	-79.9
-43	-60.0	-79.8
-42	-61.0	-80.2

Table 10

Variable Noise Limits. Band 13		
RSSI (dBm)	Max Rule (dBm/MHz)	Measured Uplink Noise (dBm/MHz)
-90	-59.0	-80.1
-70	-59.0	-80.2
-50	-59.0	-79.9
-45	-59.0	-79.9
-43	-60.0	-79.8
-42	-61.0	-80.9

Table 11

Variable Noise Limits. Band 5		
RSSI (dBm)	Max Rule (dBm/MHz)	Measured Uplink Noise (dBm/MHz)
-90	-59.0	-79.3
-70	-59.0	-79.5
-50	-59.0	-79.5
-45	-59.0	-79.3
-43	-60.0	-79.3
-42	-61.0	-79.4

Table 12

Variable Noise Limits. Band 2 & 25		
RSSI (dBm)	Max Rule (dBm/MHz)	Measured Uplink Noise (dBm/MHz)
-90	-59.0	-83.4
-70	-59.0	-83.5
-50	-59.0	-83.4
-45	-59.0	-83.2
-43	-60.0	-83.2
-42	-61.0	-83.5

Table13

Variable Noise Limits. Band 4		
RSSI (dBm)	Max Rule (dBm/MHz)	Measured Uplink Noise (dBm/MHz)
-90	-59.0	-87.9
-70	-59.0	-87.9
-50	-59.0	-88.0
-45	-59.0	-88.2
-43	-60.0	-88.2
-42	-61.0	-88.1

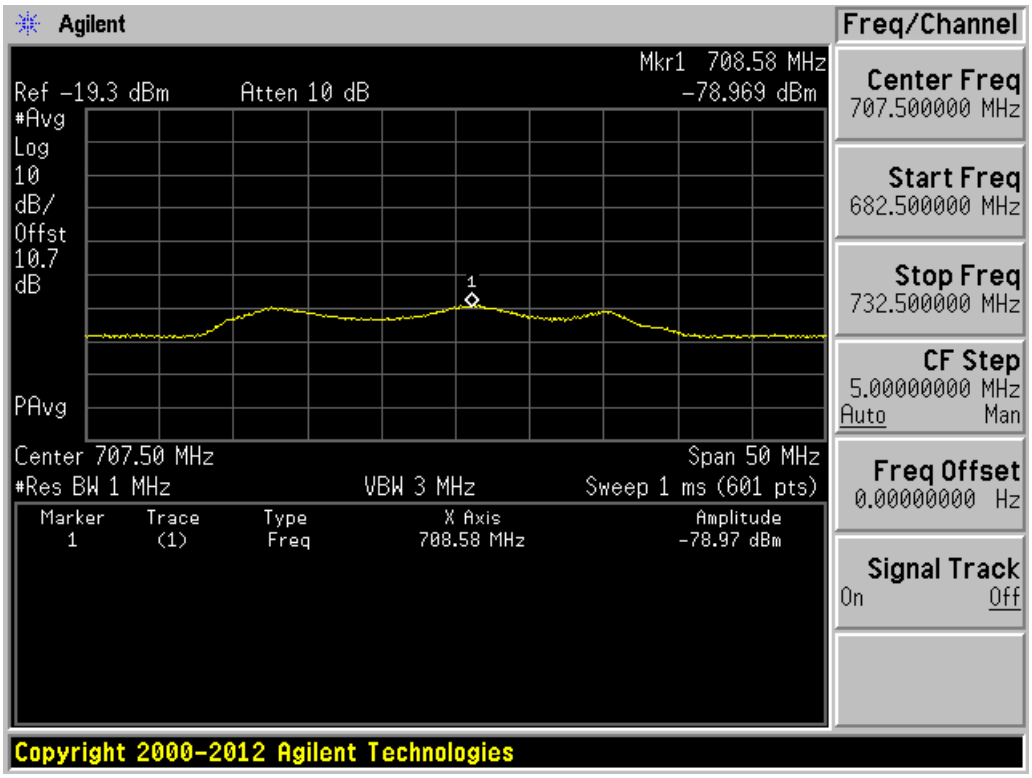
Notes: RSSI dependent area shown in gray.

3.7.2 Maximum noise power test results

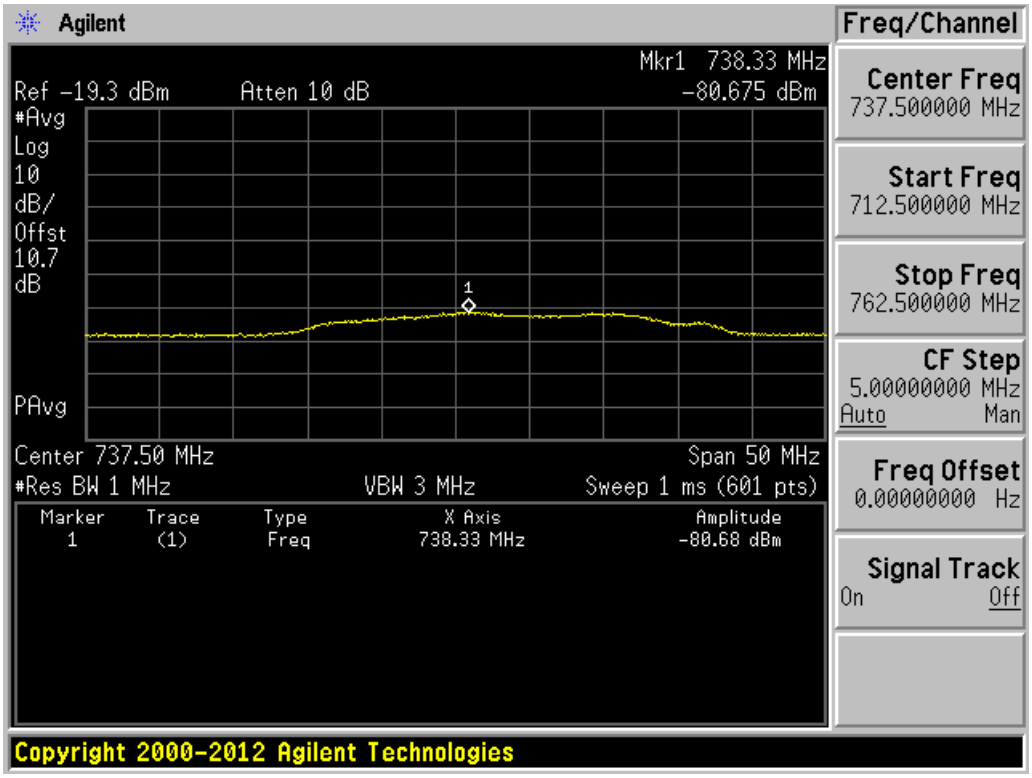
Spectrum Analyzer screenshots for EUT with terminated input ports. Output port connected to Spectrum Analyzer.

Table 14

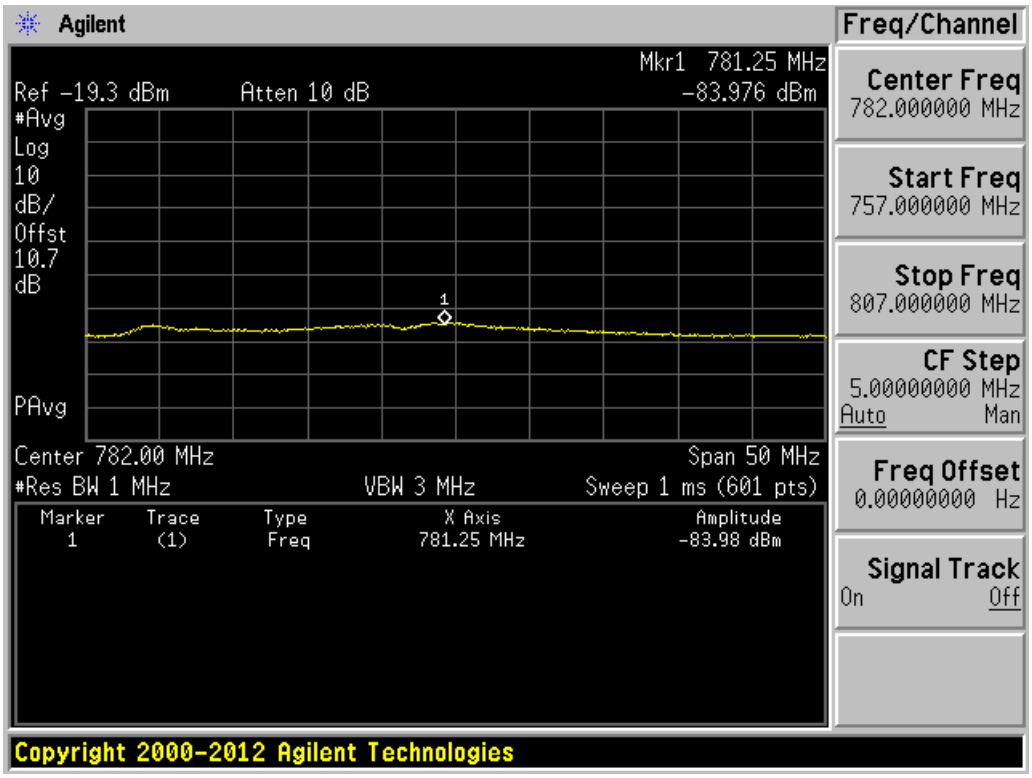
Mobile Booster Maximum Noise			
Operational Band	Max Noise Rule (dBm/MHz)	Measured Noise (dBm/MHz)	Result
Band 12 & 17 TX	-59.0	-79.0	Pass
Band 12 & 17 RX	-59.0	-80.7	Pass
Band 13 TX	-59.0	-84.0	Pass
Band 13 RX	-59.0	-81.3	Pass
Band 5 TX	-59.0	-79.2	Pass
Band 5 RX	-59.0	-80.0	Pass
Band 2 & 25 TX	-59.0	-81.1	Pass
Band 2 & 25 RX	-59.0	-79.3	Pass
Band 4 TX	-59.0	-81.6	Pass
Band 4 RX	-59.0	-83.8	Pass



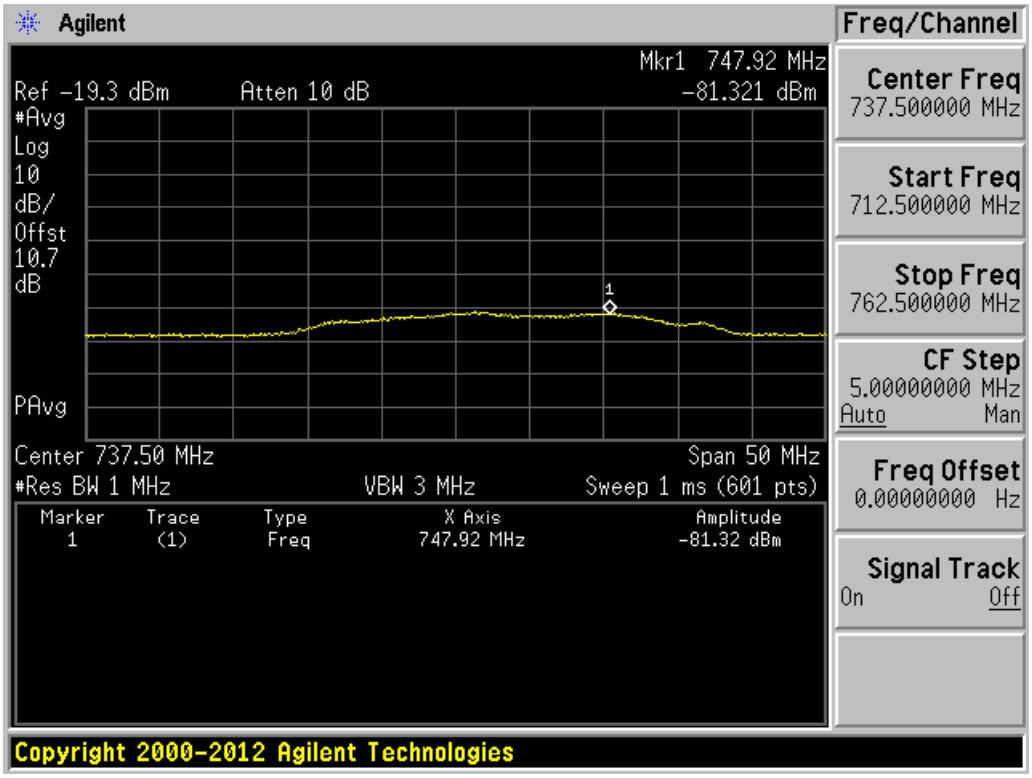
Uplink. Band 12 & 17



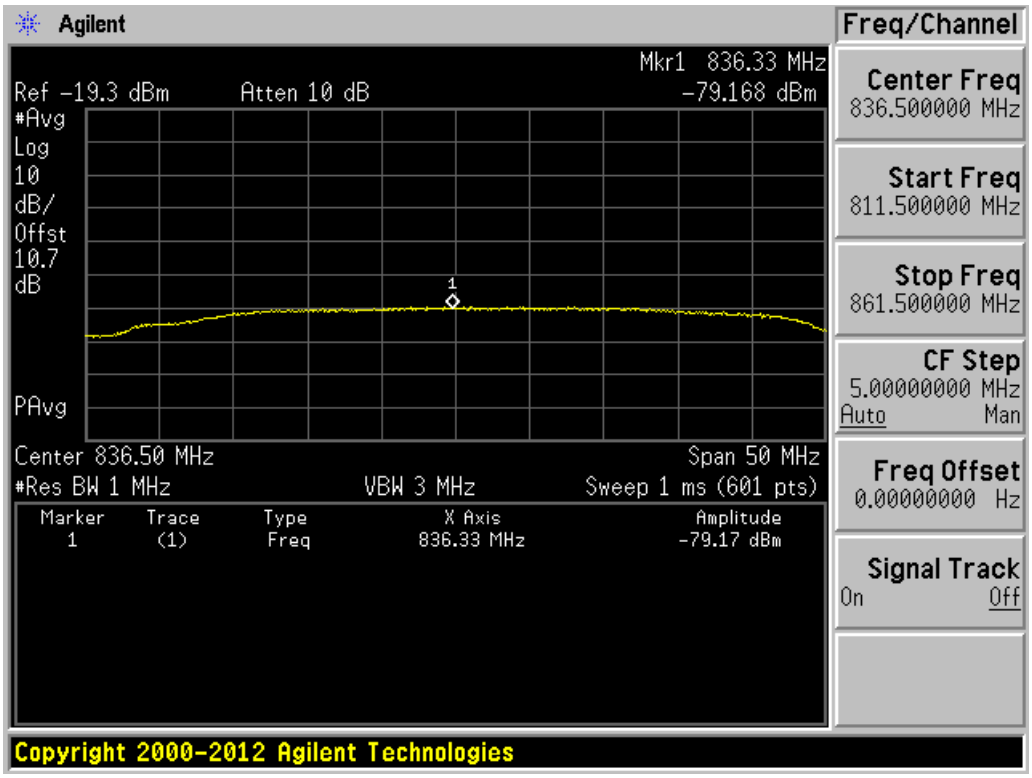
Downlink. Band 12 & 17



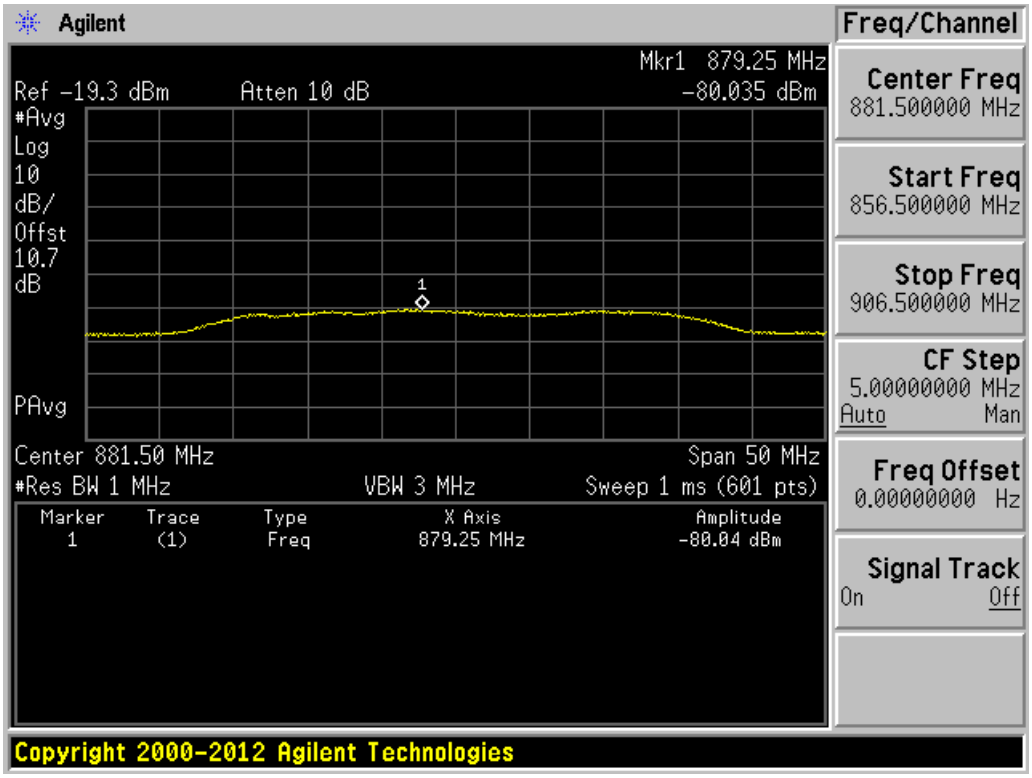
Uplink. Band 13



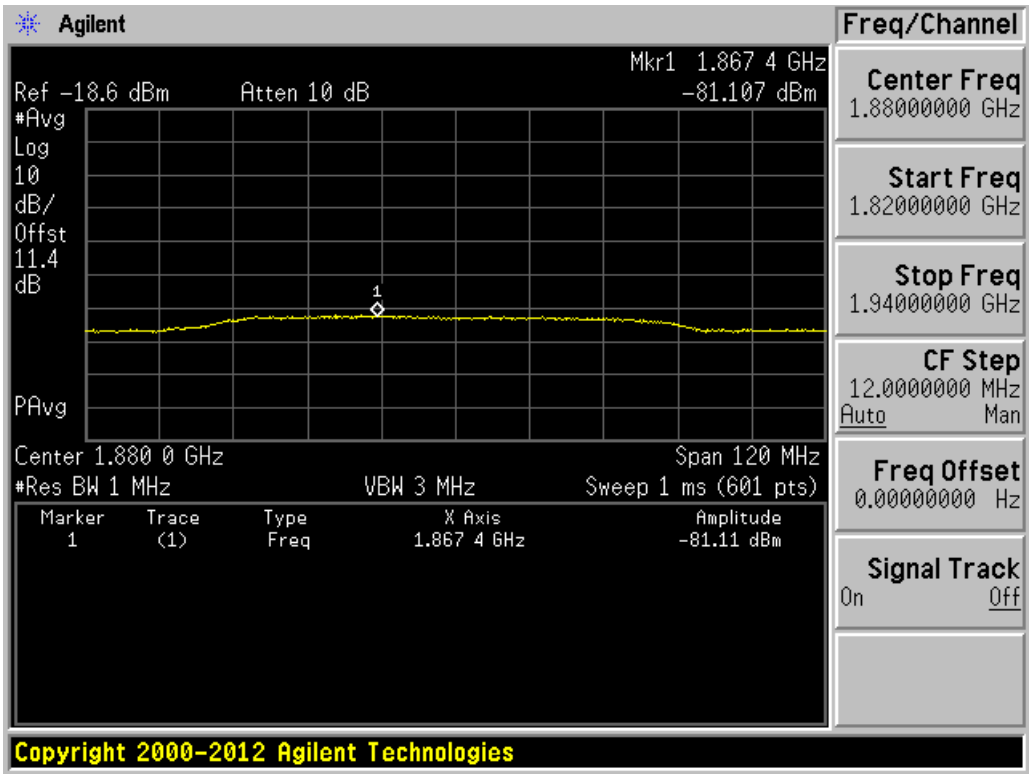
Downlink. Band 13



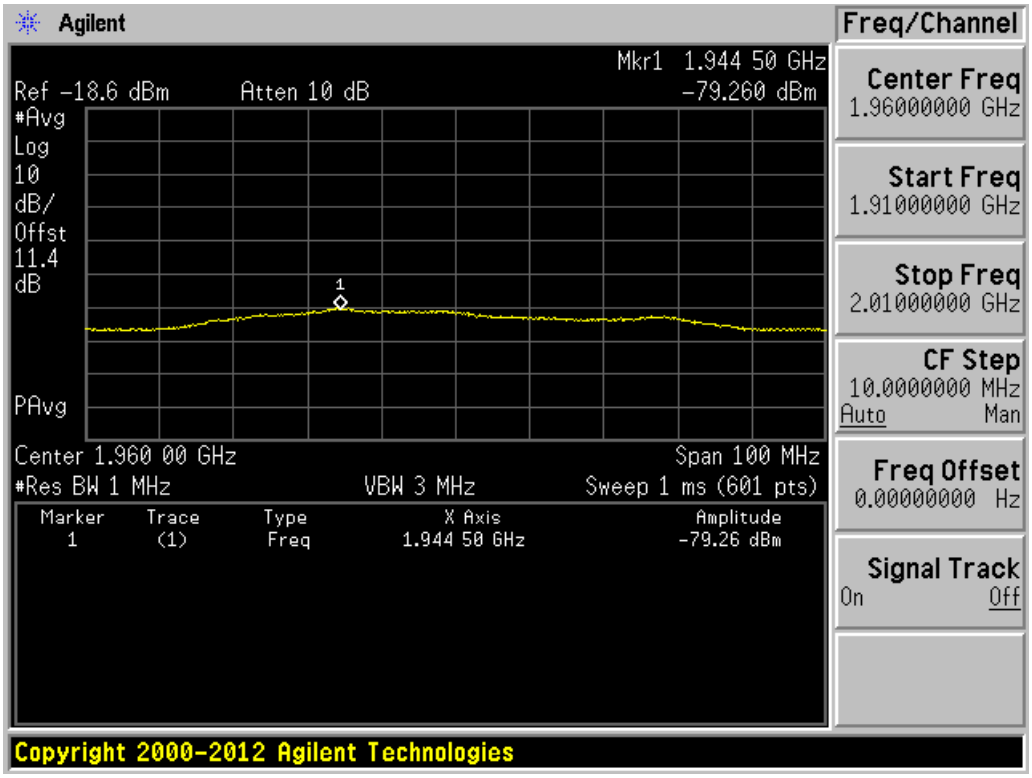
Uplink. Band 5



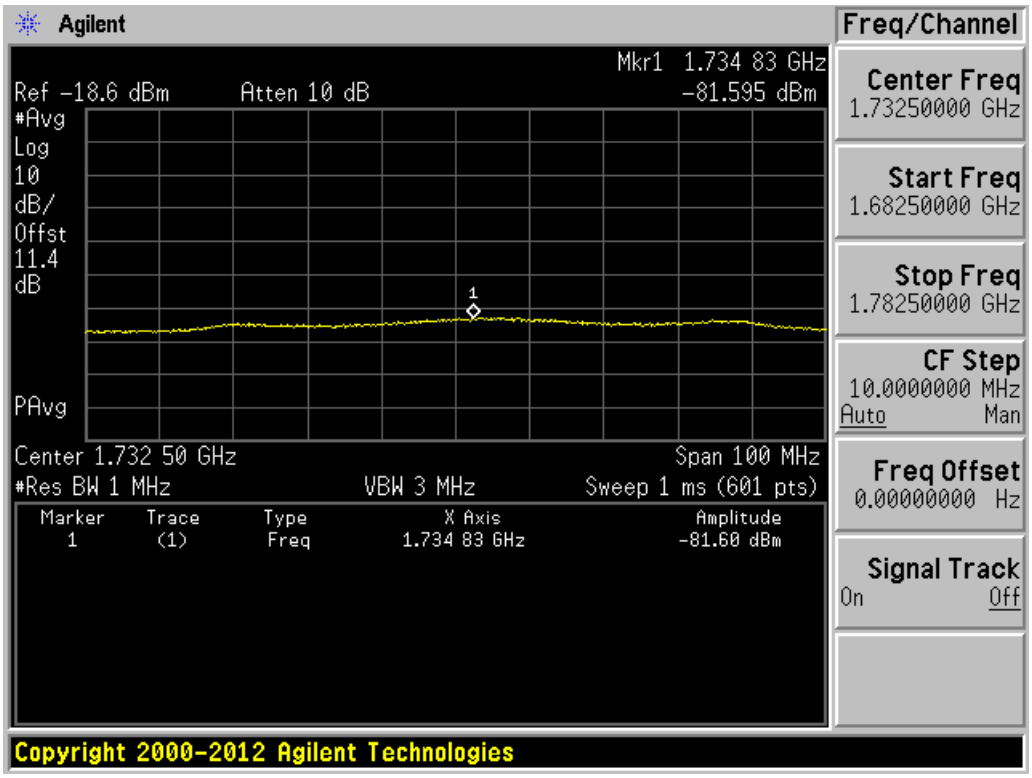
Downlink. Band 5



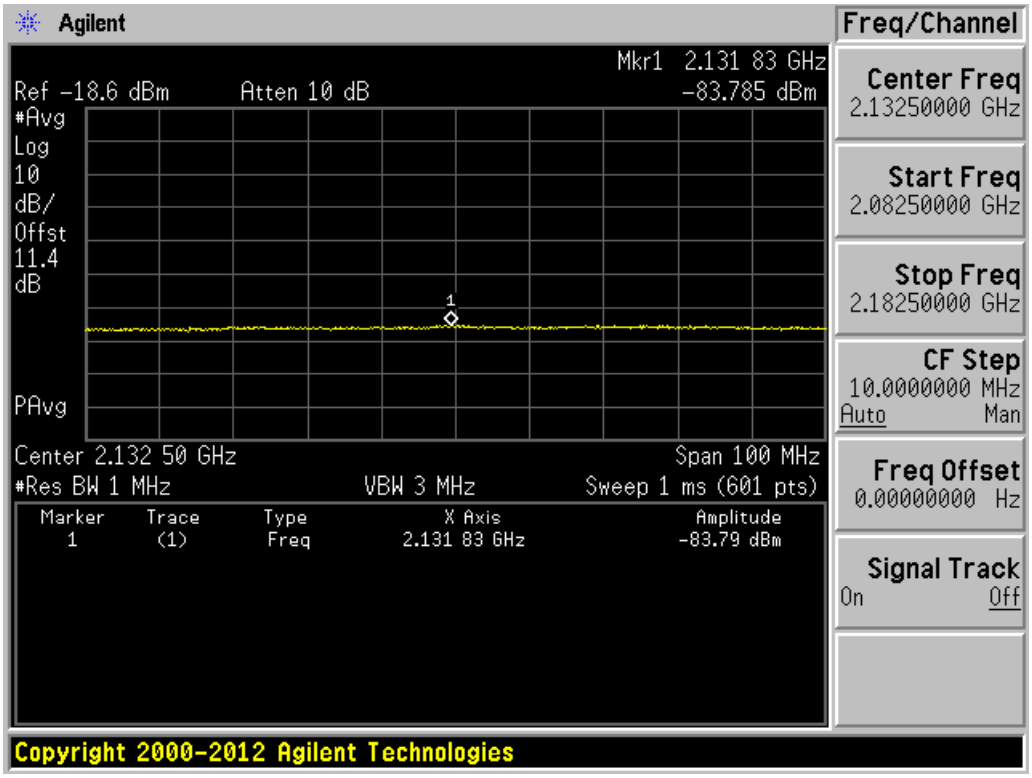
Uplink. Band 2 & 25



Downlink. Band 2 & 25



Uplink. Band 4



Downlink. Band 4

3.7.3 Variable uplink noise timing test procedure.

Note: Booster designed to keep noise power below -70 dBm/MHz. Noise power does not change with gain control feature.

3.8 Uplink Inactivity Test

This test conducted in accordance with KDB 935210 D03 V04 Signal Booster Measurements, § 7.8
This comply with FCC Rule: § 20.21(e)(8)(i)(I) Uplink Inactivity

This section does not apply because EUT's uplink noise level at maximum gain does not exceed -70 dBm/MHz.

3.9 Variable Booster Gain Test

This test conducted in accordance with KDB 935210 D03 V04 Signal Booster Measurements, § 7.9
This comply with FCC Rule: § 20.21(e)(8)(i)(C)(1) Booster Gain Limits and § 20.21(e)(8)(i)(H) Transmit Power Off Mode

3.9.1 Variable booster gain test results

Table 15

Uplink Variable Gain 1740 MHz (BTUX623)					
RSSI (dBm)	MSCL (dB)	P in (dBm)	P out (dBm)	Gain (dB)	Max Gain Rule
-90	7.0	0.0	16.4	16.4	23.0
-70	7.0	0.0	16.5	16.5	23.0
-60	7.0	0.0	16.7	16.7	23.0
-50	7.0	0.0	16.6	16.6	23.0
-40	7.0	0.0	12.6	12.6	13.0
-30	7.0	0.0	2.8	2.8	3.0
Uplink Variable Gain 1740 MHz (BTUX615)					
RSSI (dBm)	MSCL (dB)	P in (dBm)	P out (dBm)	Gain (dB)	Max Gain Rule
-90	2.0	4.0	16.8	12.8	15.0
-70	2.0	4.0	16.7	12.7	15.0
-60	2.0	4.0	16.7	12.7	15.0
-50	2.0	4.0	16.8	12.8	15.0
-40	2.0	4.0	10.2	6.2	8.0
-30	2.0	4.0	1.7	-2.3	-2.0

Table 16

Uplink Variable Gain 1860 MHz (BTUX623)					
RSSI (dBm)	MSCL (dB)	P in (dBm)	P out (dBm)	Gain (dB)	Max Gain Rule
-90	7.0	0.0	17.7	17.7	23.0
-70	7.0	0.0	17.6	17.6	23.0
-60	7.0	0.0	17.6	17.6	23.0
-50	7.0	0.0	17.8	17.8	23.0
-40	7.0	0.0	10.1	10.1	13.0
-30	7.0	0.0	0.8	0.8	3.0
Uplink Variable Gain 1860 MHz (BTUX615)					
RSSI (dBm)	MSCL (dB)	P in (dBm)	P out (dBm)	Gain (dB)	Max Gain Rule
-90	2.0	4.0	16.3	12.3	15.0
-70	2.0	4.0	16.3	12.3	15.0
-60	2.0	4.0	16.2	12.2	15.0
-50	2.0	4.0	16.3	12.3	15.0
-40	2.0	4.0	10.5	6.5	8.0
-30	2.0	4.0	1.4	-2.6	-2.0

Table 17

Uplink Variable Gain 840.2 MHz (BTUX623)					
RSSI (dBm)	MSCL (dB)	P in (dBm)	P out (dBm)	Gain (dB)	Max Gain Rule
-90	7.0	0.0	18.4	18.4	23.0
-70	7.0	0.0	18.6	18.6	23.0
-60	7.0	0.0	18.5	18.5	23.0
-50	7.0	0.0	18.4	18.4	23.0
-40	7.0	0.0	10.4	10.4	13.0
-30	7.0	0.0	0.7	0.7	3.0
Uplink Variable Gain 840.2 MHz (BTUX615)					
RSSI (dBm)	MSCL (dB)	P in (dBm)	P out (dBm)	Gain (dB)	Max Gain Rule
-90	2.0	4.0	16.9	12.9	15.0
-70	2.0	4.0	16.7	12.7	15.0
-60	2.0	4.0	16.9	12.9	15.0
-50	2.0	4.0	16.7	12.7	15.0
-40	2.0	4.0	11.9	7.9	8.0
-30	2.0	4.0	2.1	-1.9	-2.0

Table 18

Uplink Variable Gain 708.7 MHz (BTUX623)					
RSSI (dBm)	MSCL (dB)	P in (dBm)	P out (dBm)	Gain (dB)	Max Gain Rule
-90	7.0	0.0	16.7	16.7	23.0
-70	7.0	0.0	16.8	16.8	23.0
-60	7.0	0.0	16.7	16.7	23.0
-50	7.0	0.0	16.7	16.7	23.0
-40	7.0	0.0	7.8	7.8	13.0
-30	7.0	0.0	-1.5	-1.5	3.0
Uplink Variable Gain 708.7 MHz (BTUX615)					
RSSI (dBm)	MSCL (dB)	P in (dBm)	P out (dBm)	Gain (dB)	Max Gain Rule
-90	2.0	4.0	16.6	12.6	15.0
-70	2.0	4.0	16.5	12.5	15.0
-60	2.0	4.0	16.8	12.8	15.0
-50	2.0	4.0	16.7	12.7	15.0
-40	2.0	4.0	12.1	8.1	8.0
-30	2.0	4.0	2.3	-1.7	-2.0

Table 19

Uplink Variable Gain 781.3 MHz (BTUX623)					
RSSI (dBm)	MSCL (dB)	P in (dBm)	P out (dBm)	Gain (dB)	Max Gain Rule
-90	7.0	0.0	16.7	16.8	23.0
-70	7.0	0.0	16.8	16.8	23.0
-60	7.0	0.0	16.7	16.7	23.0
-50	7.0	0.0	16.7	16.7	23.0
-40	7.0	0.0	7.6	7.6	13.0
-30	7.0	0.0	-1.0	-1.0	3.0
Uplink Variable Gain 781.3 MHz (BTUX615)					
RSSI (dBm)	MSCL (dB)	P in (dBm)	P out (dBm)	Gain (dB)	Max Gain Rule
-90	2.0	4.0	16.9	12.9	15.0
-70	2.0	4.0	16.8	12.8	15.0
-60	2.0	4.0	16.7	12.7	15.0
-50	2.0	4.0	16.7	12.7	15.0
-40	2.0	4.0	12.3	8.3	8.0
-30	2.0	4.0	2.5	-1.5	-2.0

Note: RSSI dependent area shown in gray.

3.9.2 Variable uplink gain timing test results

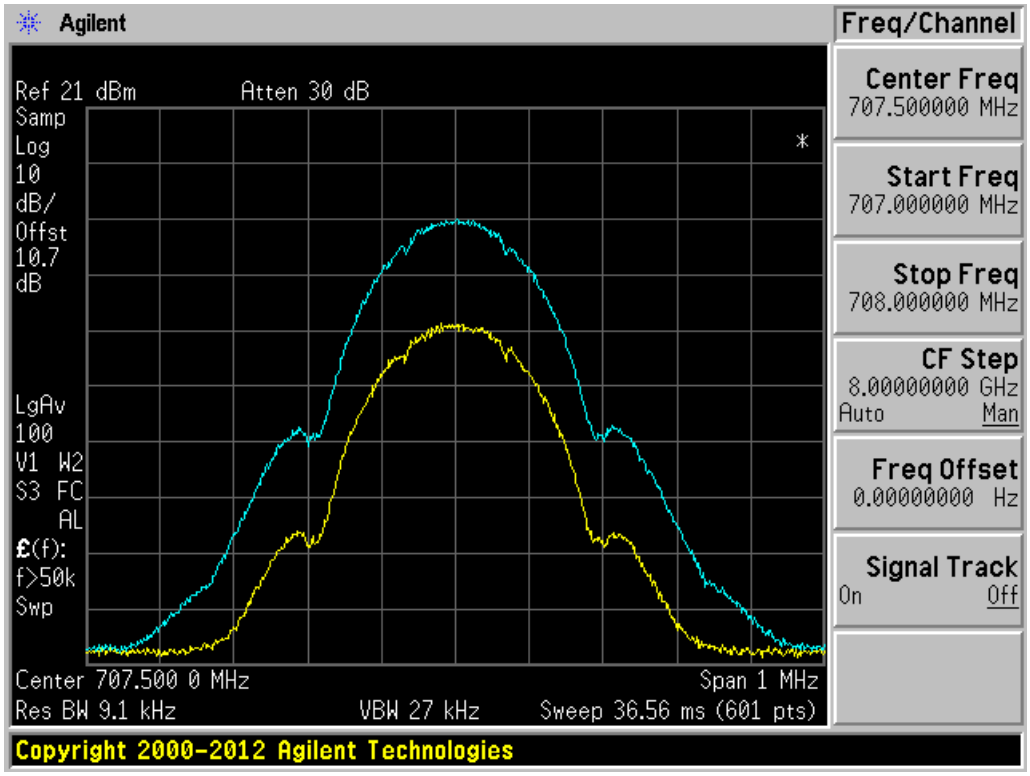
Table 20

Variable Gain Timing			
Operational Band	Max Rule (s)	Measured (s)	Result
Band 12 & 17 TX	1.0	0.03	Pass
Band 13 TX	1.0	0.03	Pass
Band 5 TX	1.0	0.03	Pass
Band 2 & 25 TX	1.0	0.03	Pass
Band 4 TX	1.0	0.03	Pass

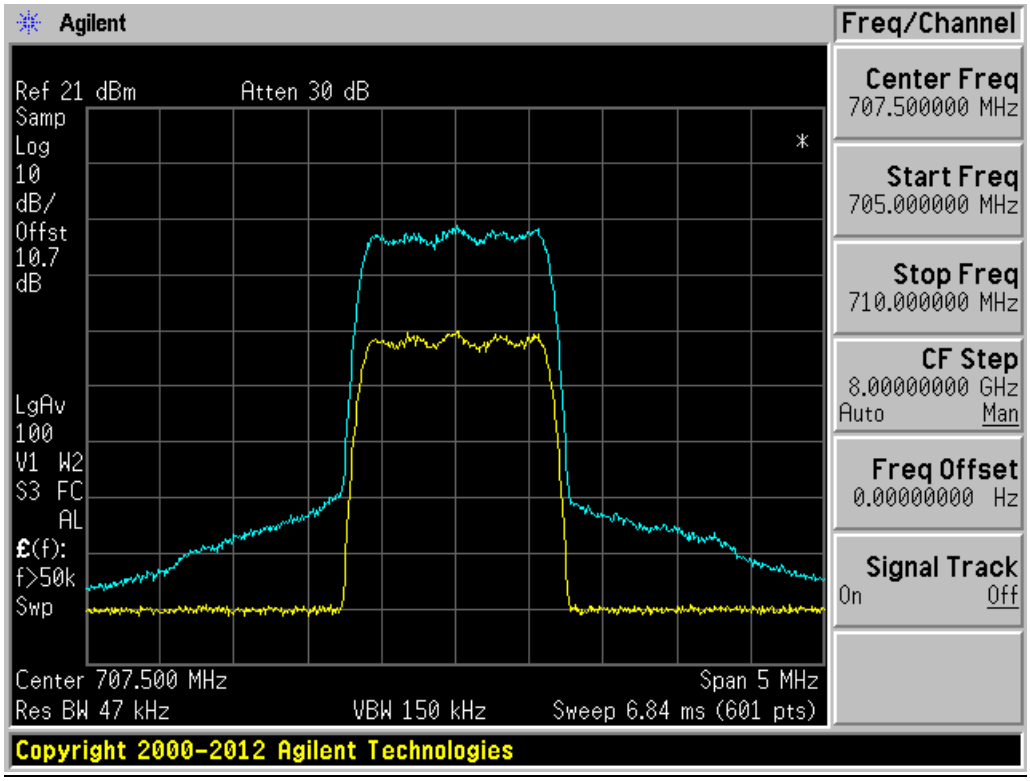
3.10 Occupied Bandwidth Test

This test conducted in accordance with KDB 935210 D03 V04 Signal Booster Measurements, § 7.10
This comply with FCC Rule: § 2.1049 Measurements required: Occupied bandwidth

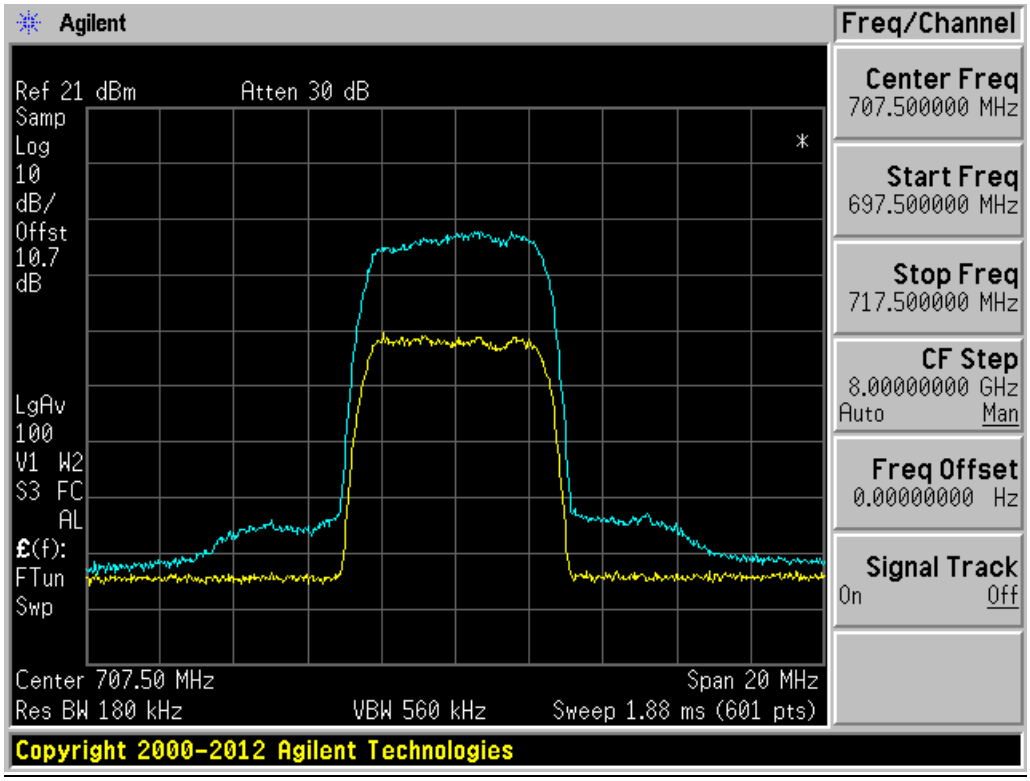
3.10.1 Occupied bandwidth Test Results.



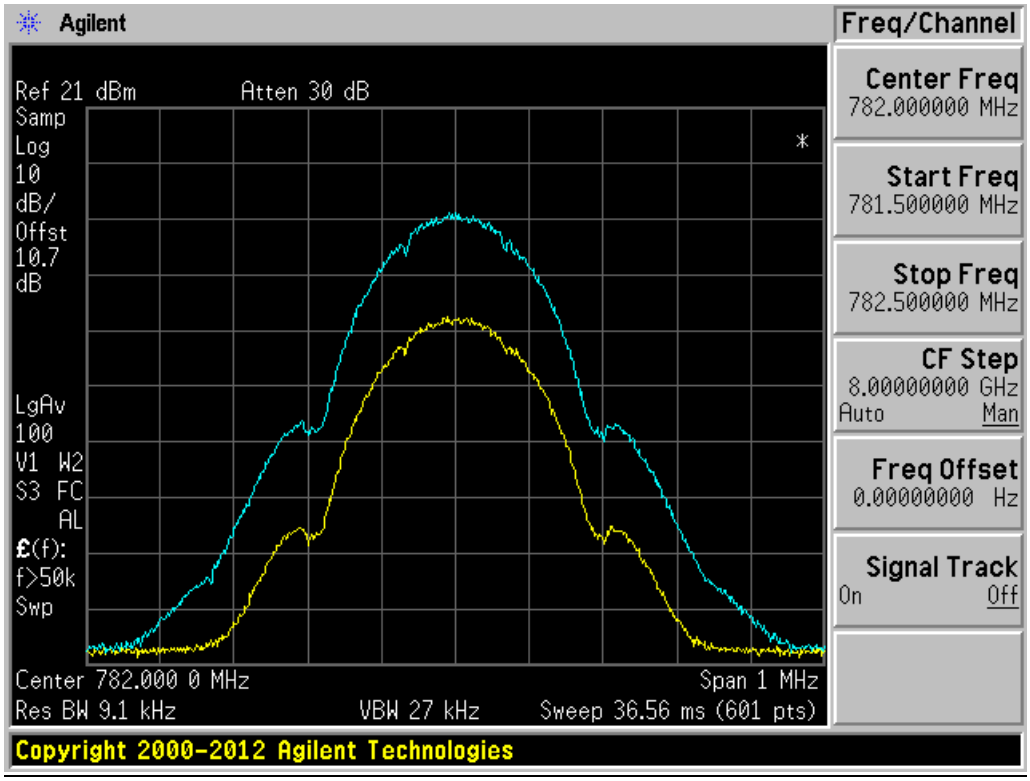
Uplink. Band 12 & 17. GSM



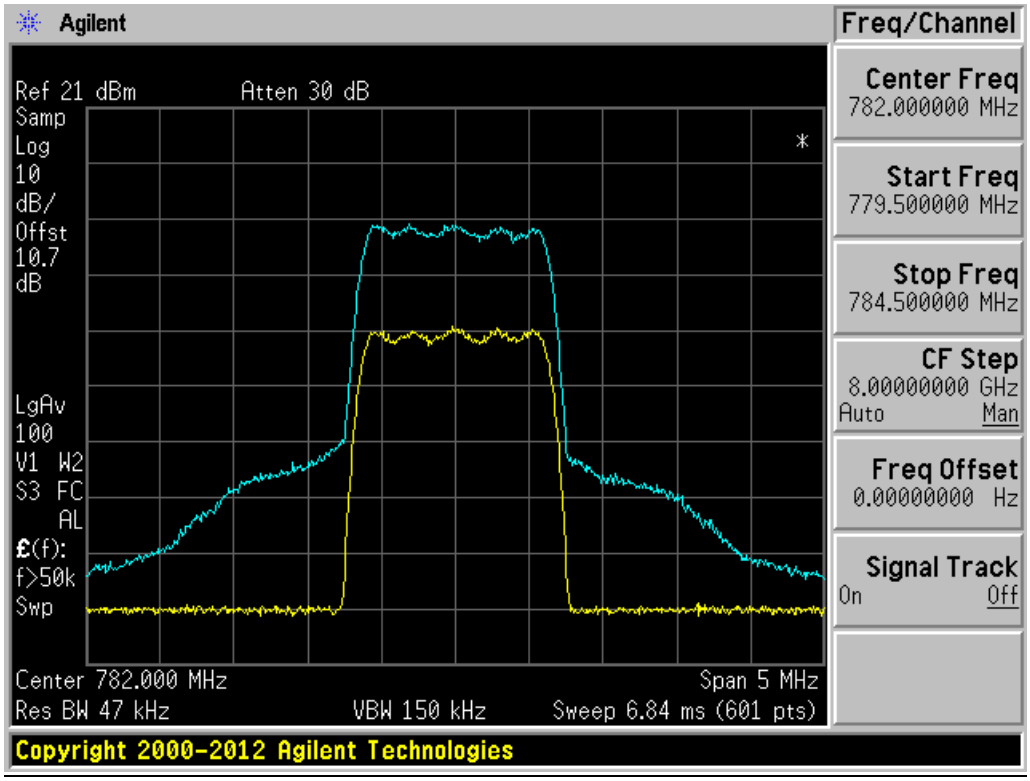
Uplink. Band 12 & 17. CDMA



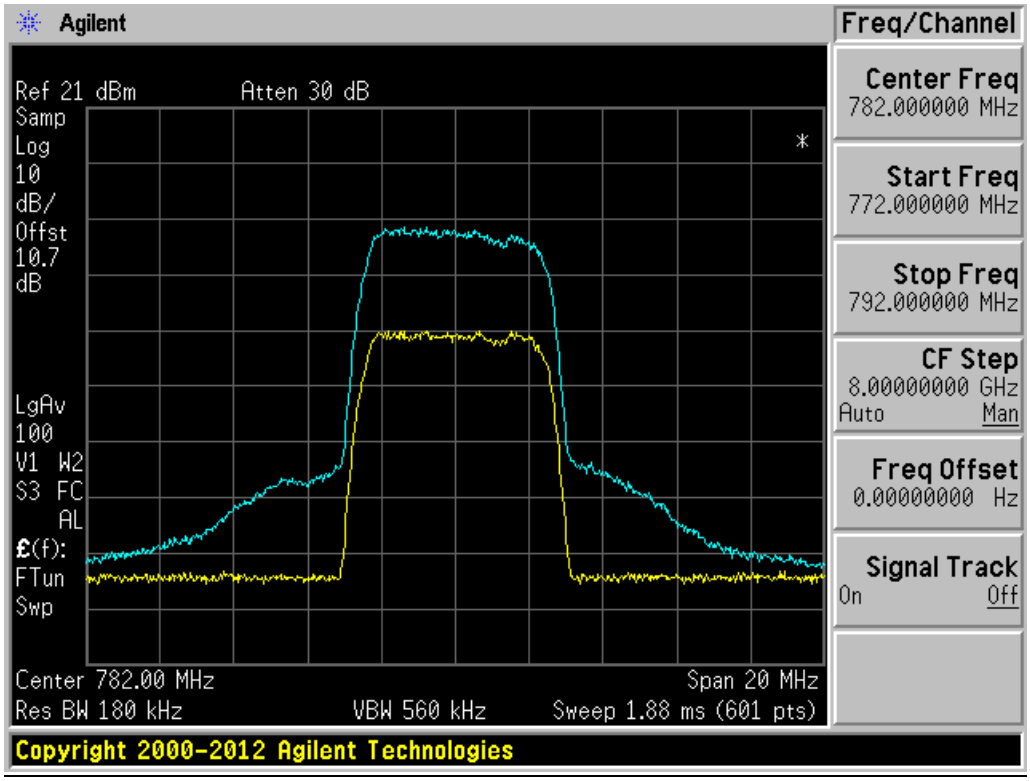
Uplink. Band 12 & 17. WCDMA/LTE



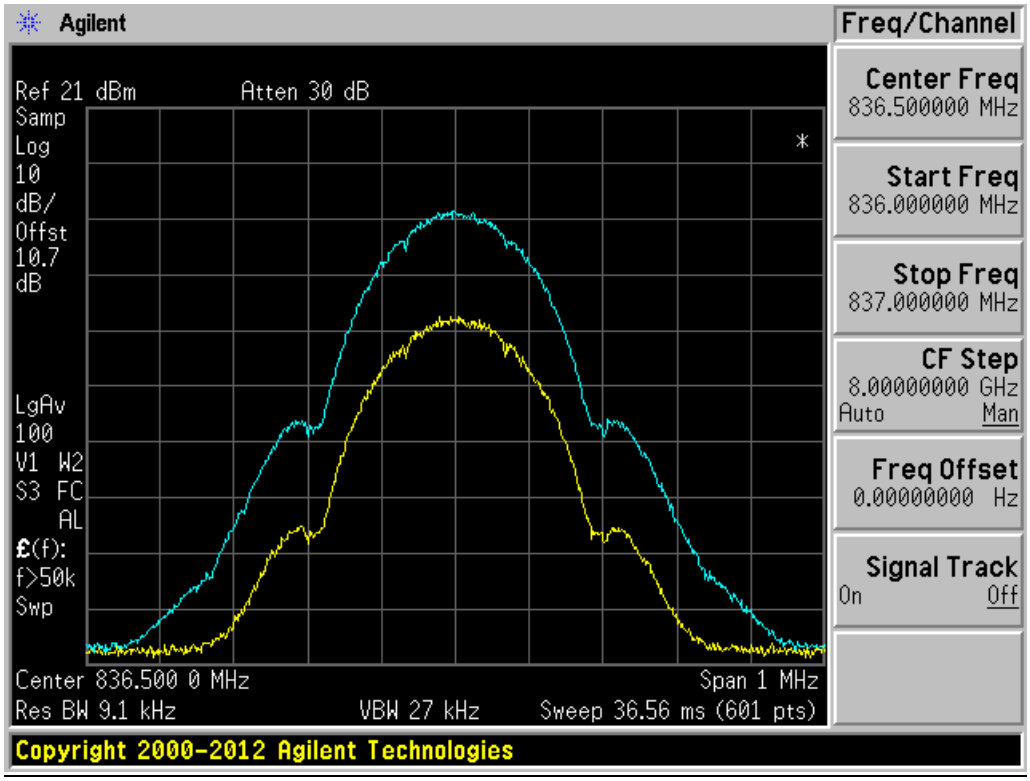
Uplink. Band 13. GSM



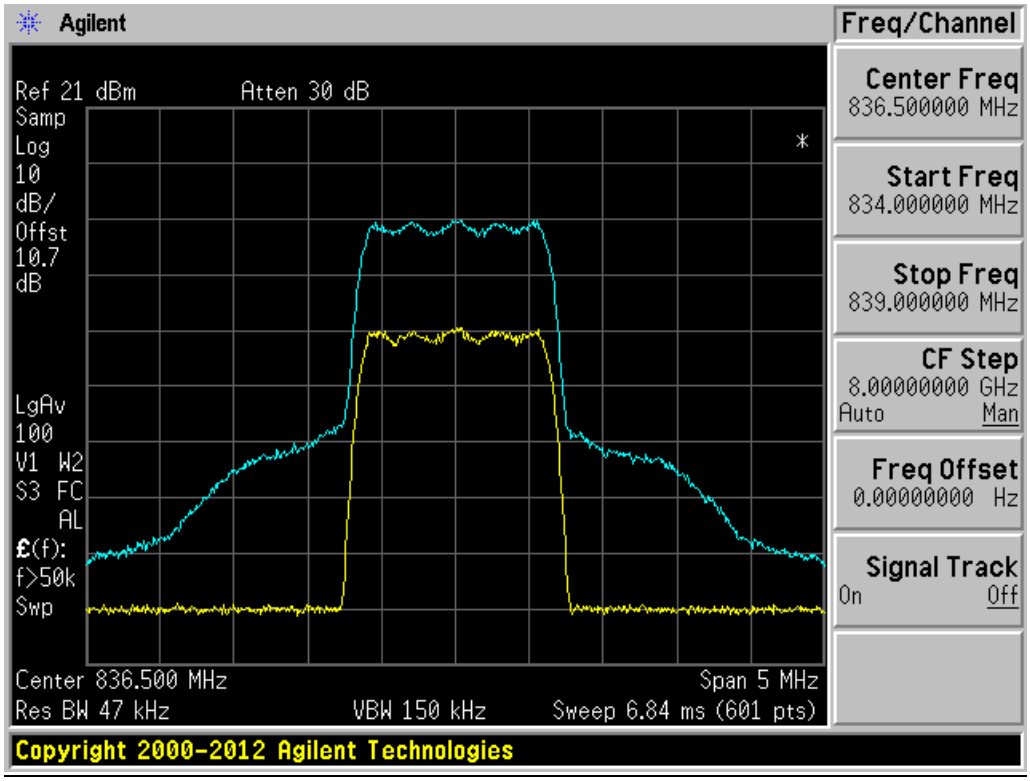
Uplink. Band 13. CDMA



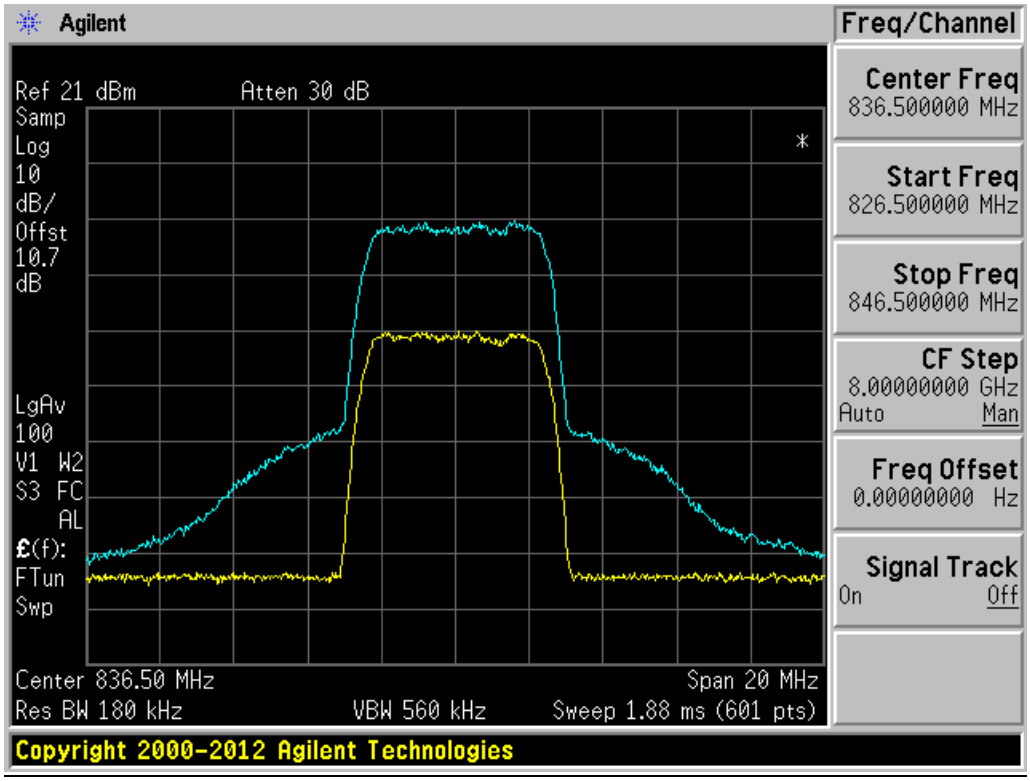
Uplink. Band 13. WCDMA/LTE



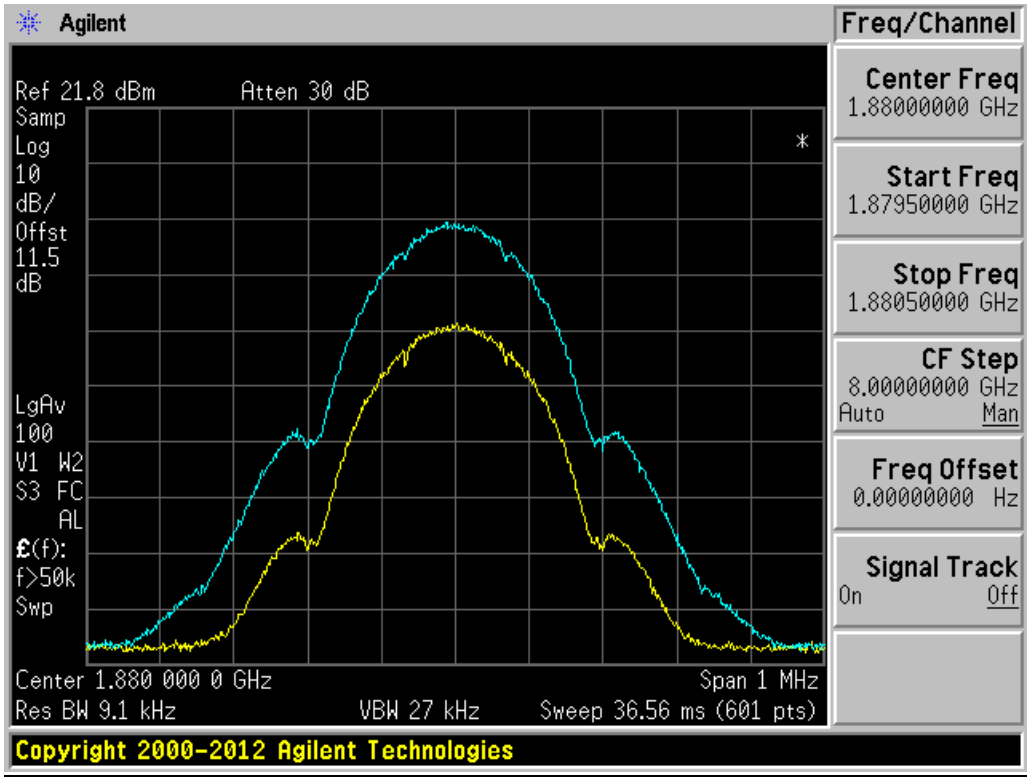
Uplink. Band 5. GSM



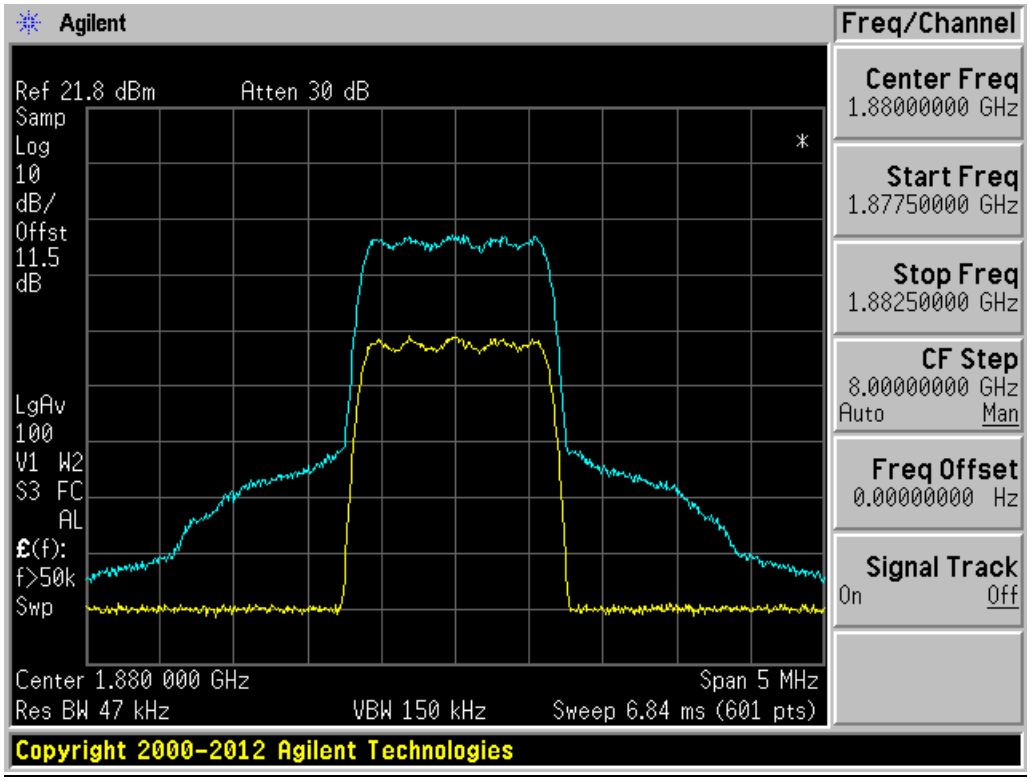
Uplink. Band 5. CDMA



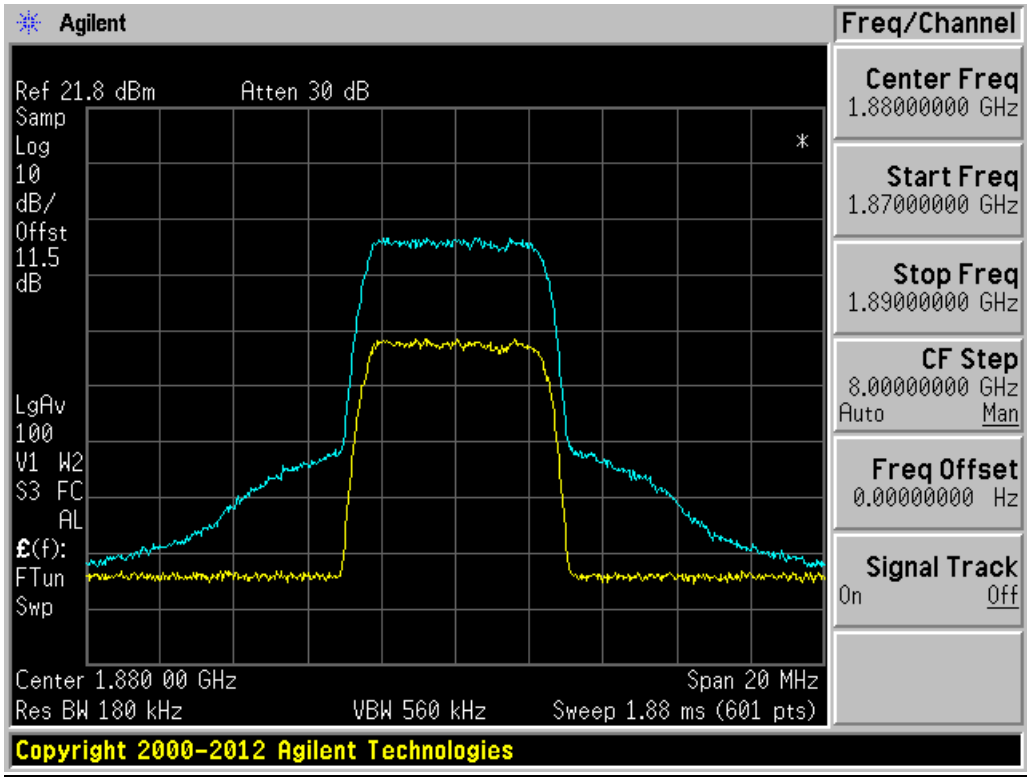
Uplink. Band 5. WCDMA/LTE



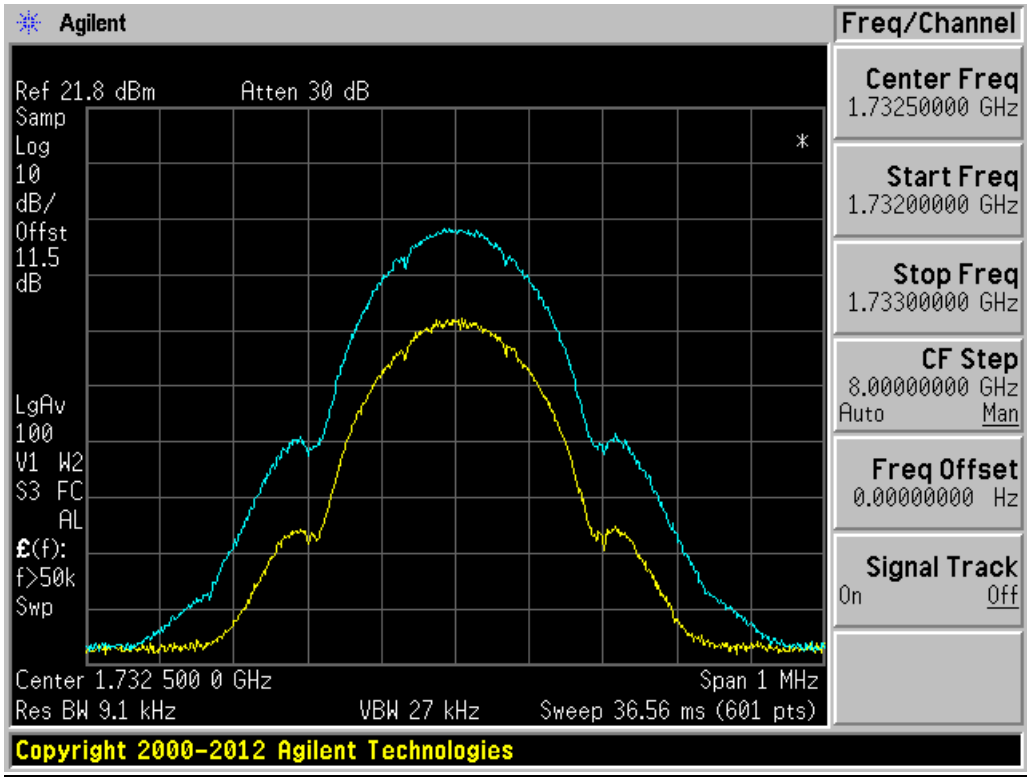
Uplink. Band 2 & 25. GSM



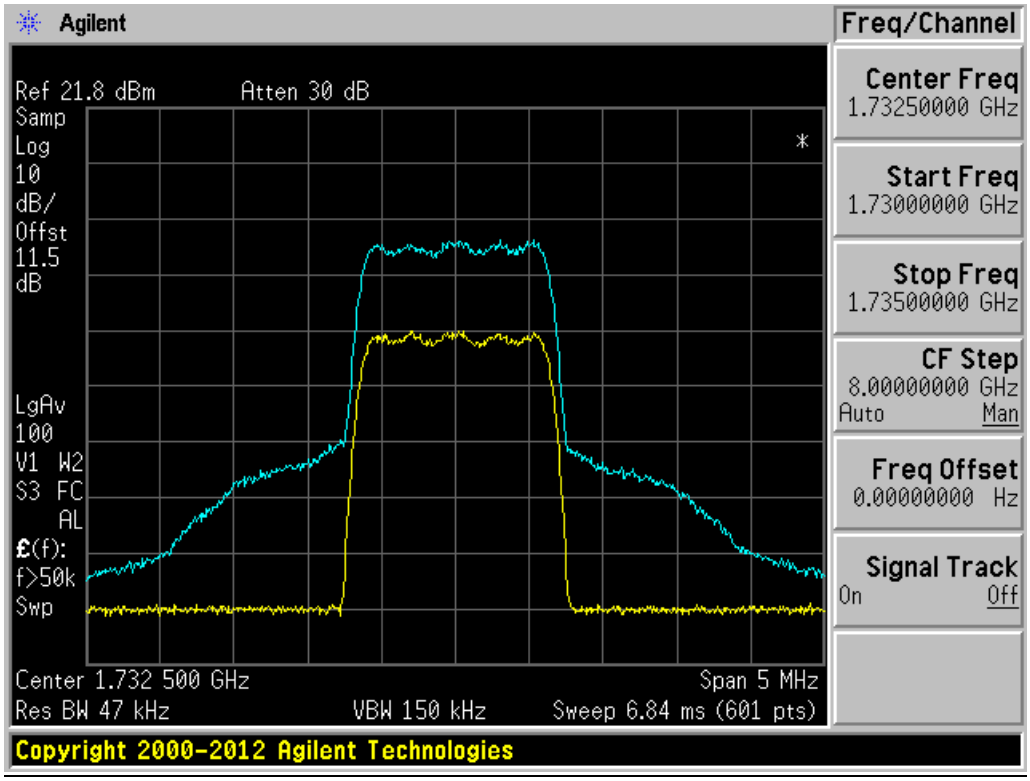
Uplink. Band 2 & 25. CDMA



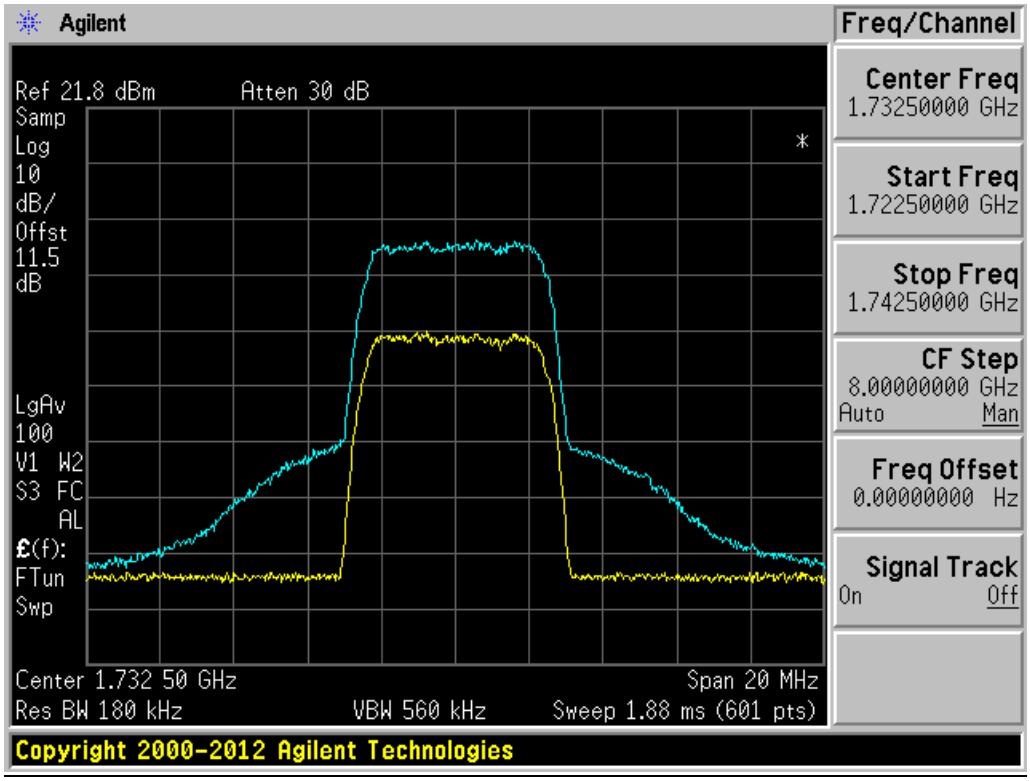
Uplink. Band 2 & 25. WCDMA/LTE



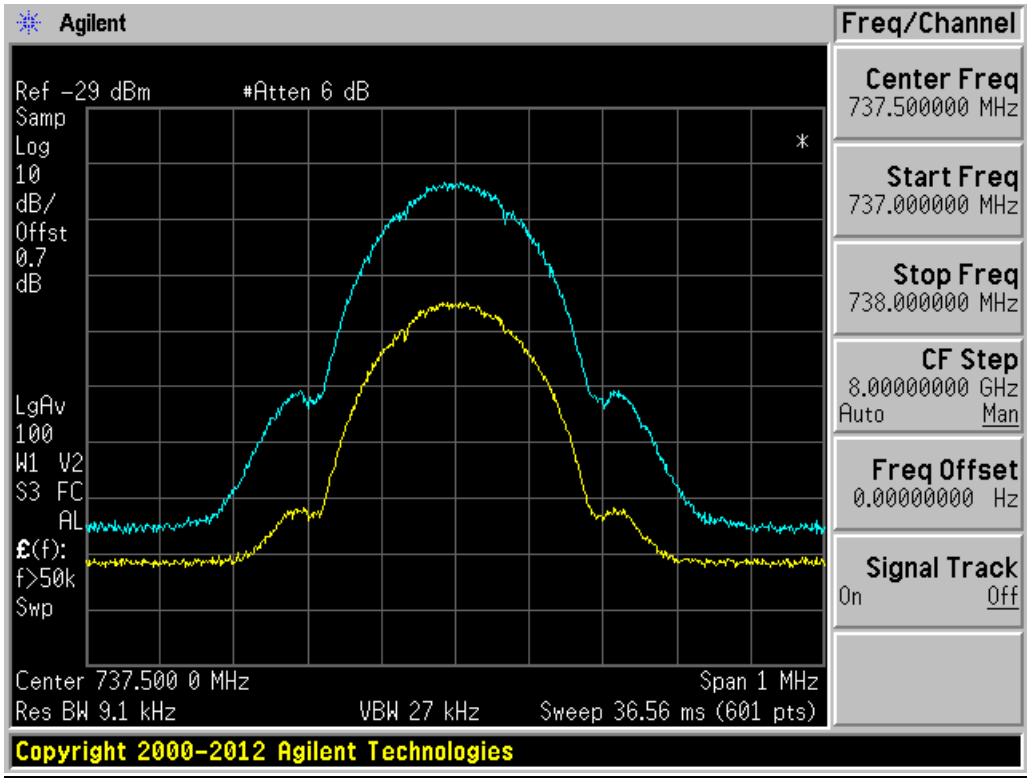
Uplink. Band 4. GSM



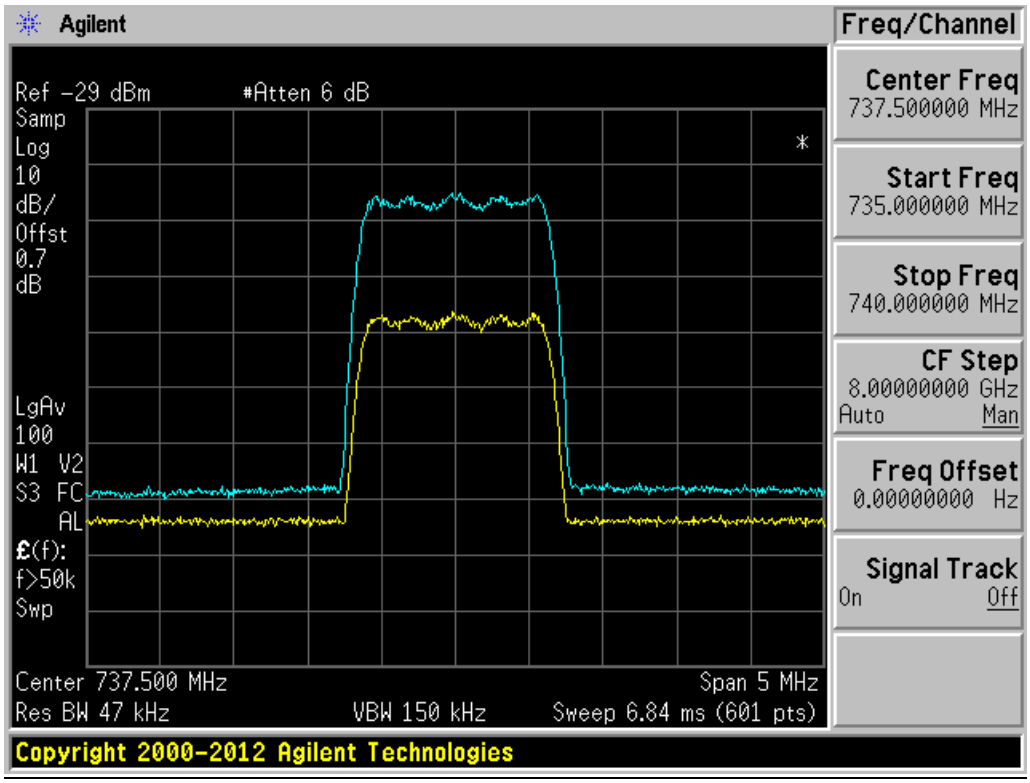
Uplink. Band 4. CDMA



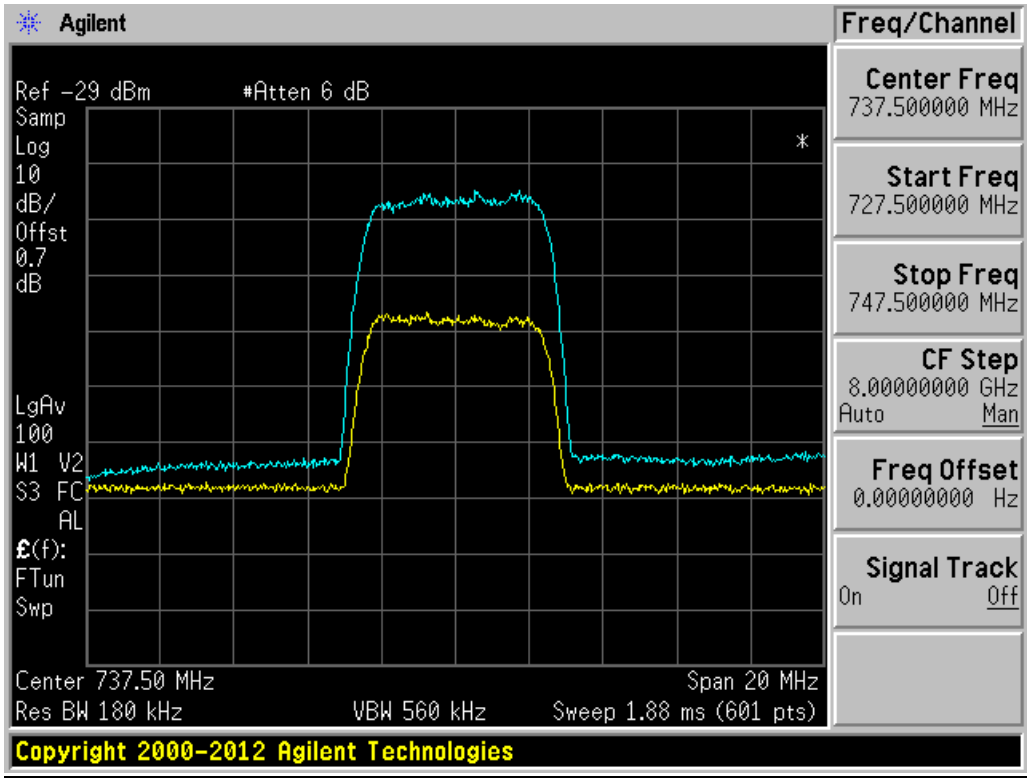
Uplink. Band 4. WCDMA/LTE



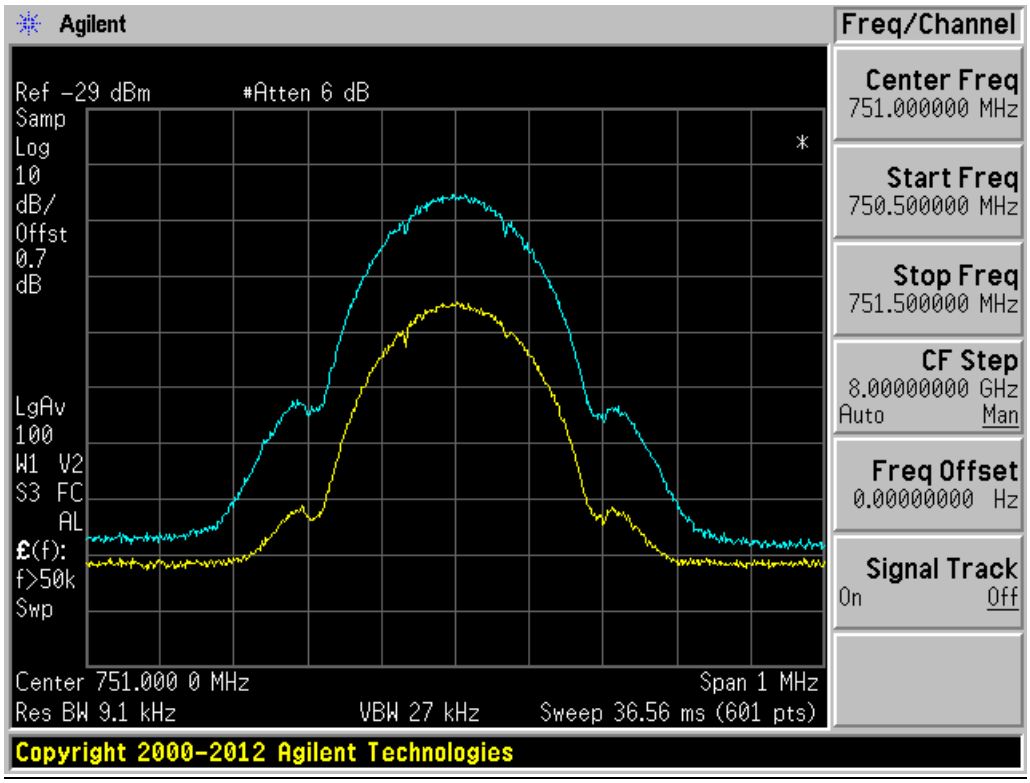
Downlink. Band 12 & 17. GSM



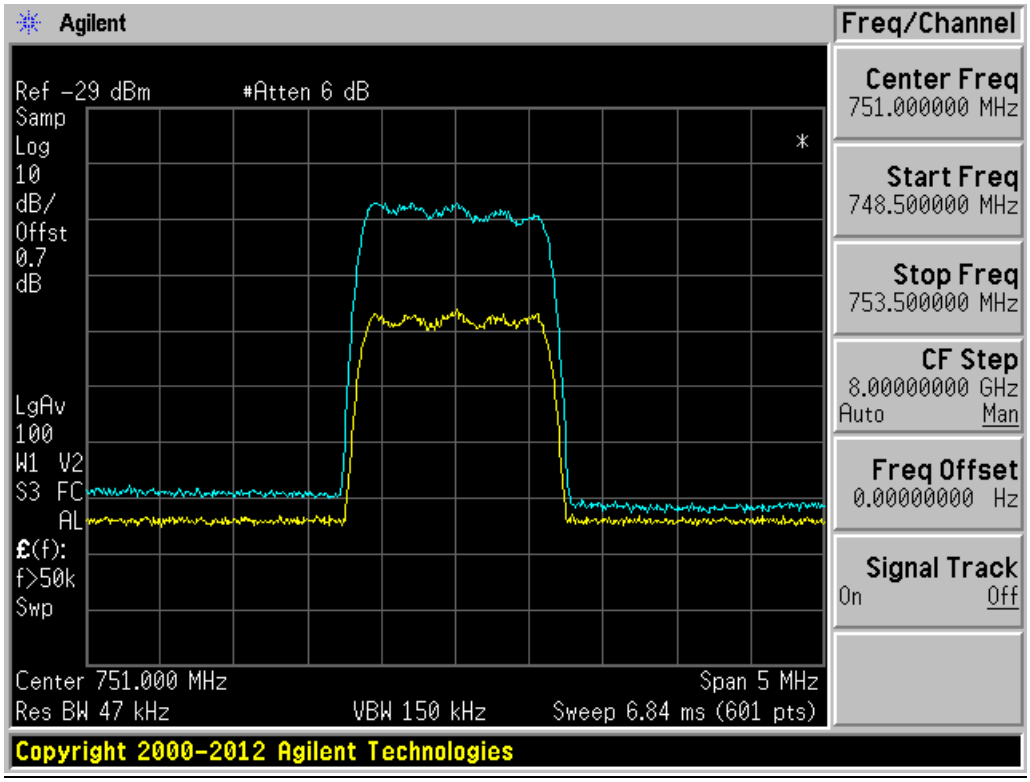
Downlink. Band 12 & 17. CDMA



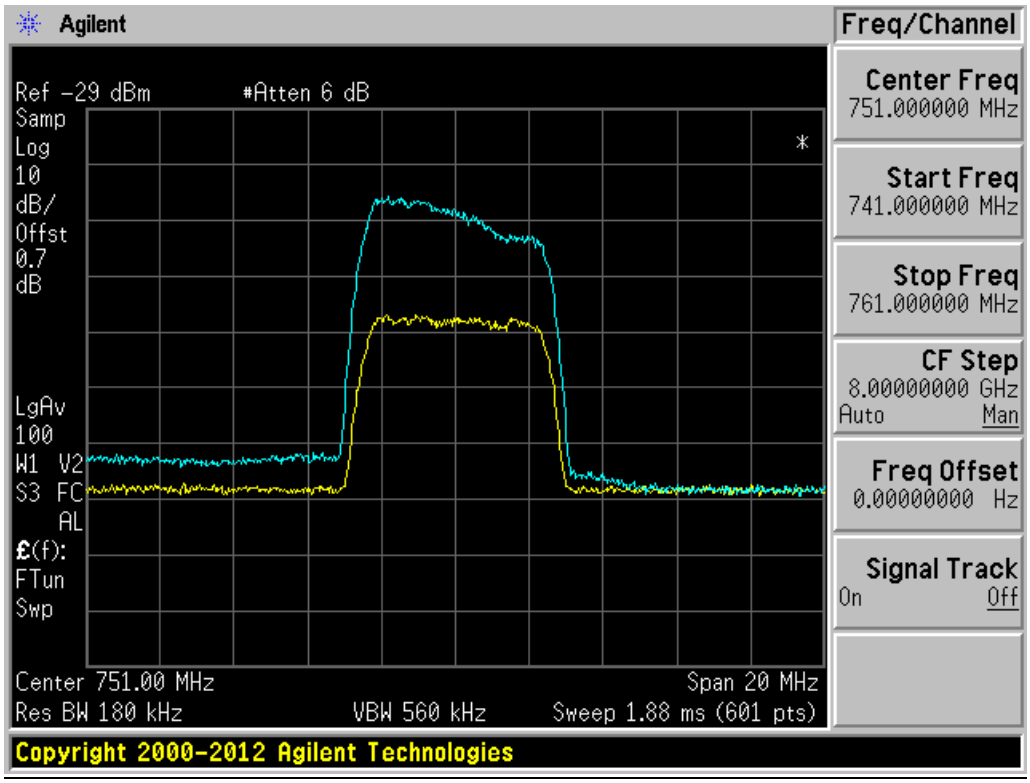
Downlink. Band 12 & 17. WCDMA/LTE



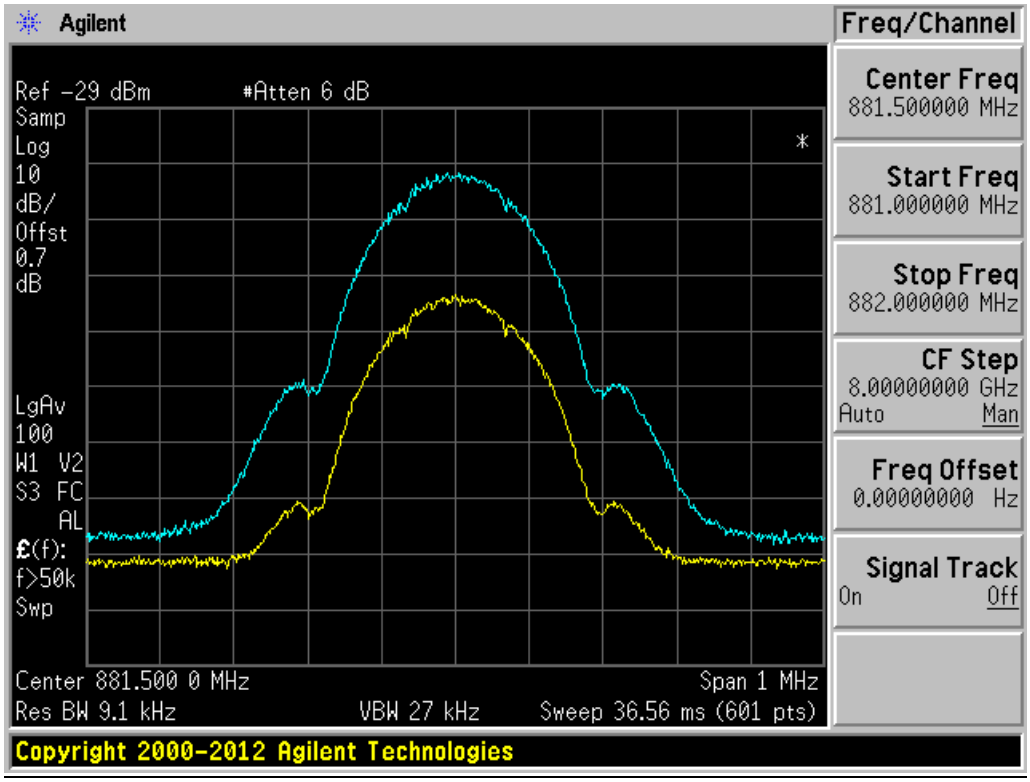
Downlink. Band 13. GSM



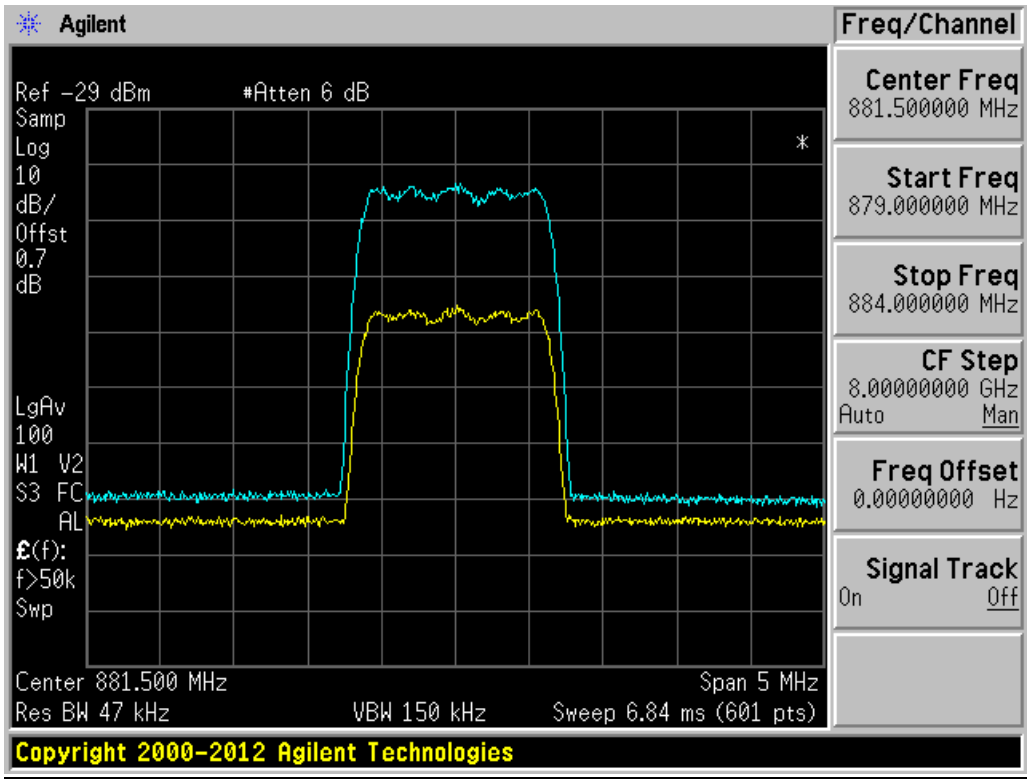
Downlink. Band 13. CDMA



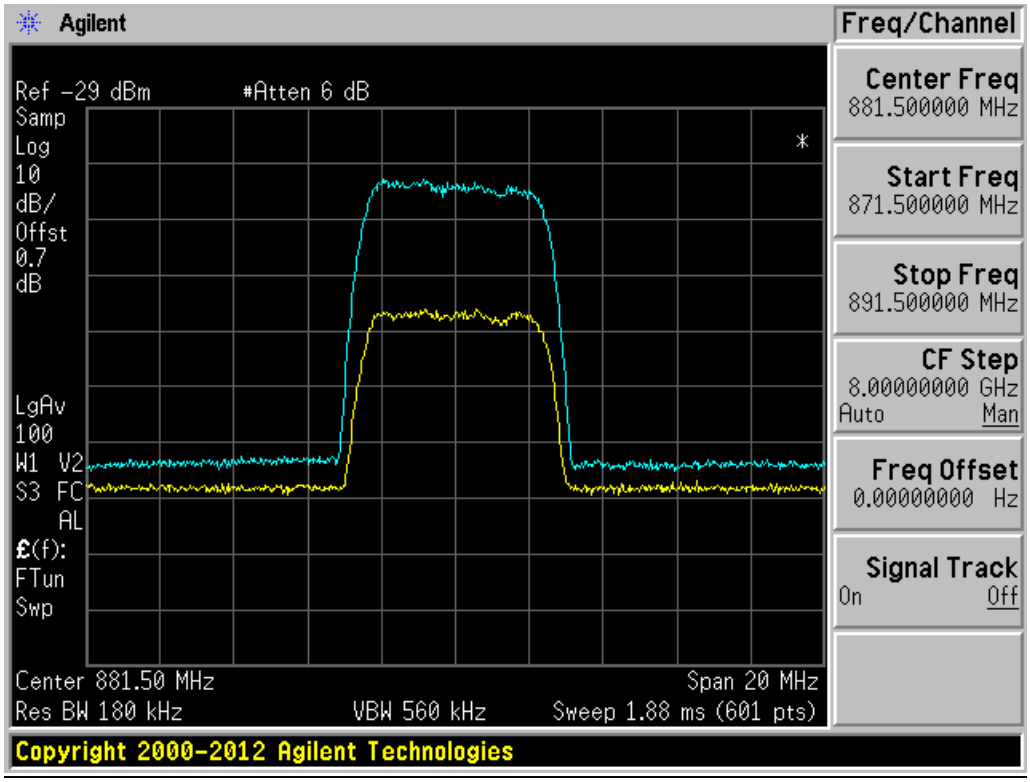
Downlink. Band 13. WCDMA/LTE



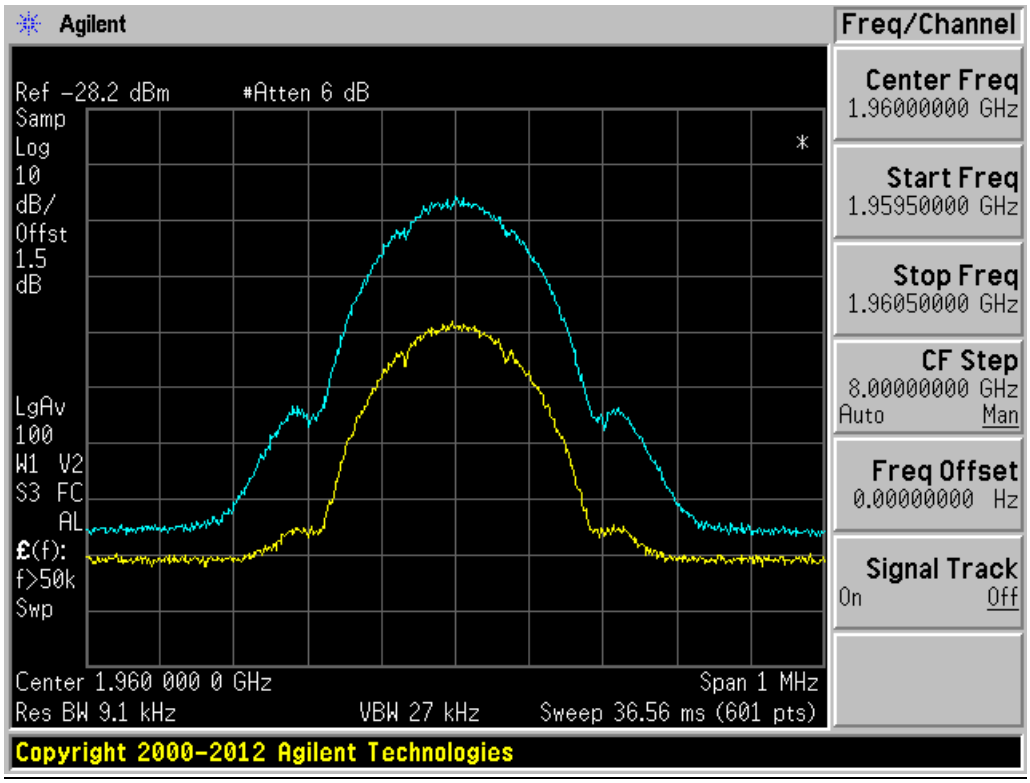
Downlink. Band 5. GSM



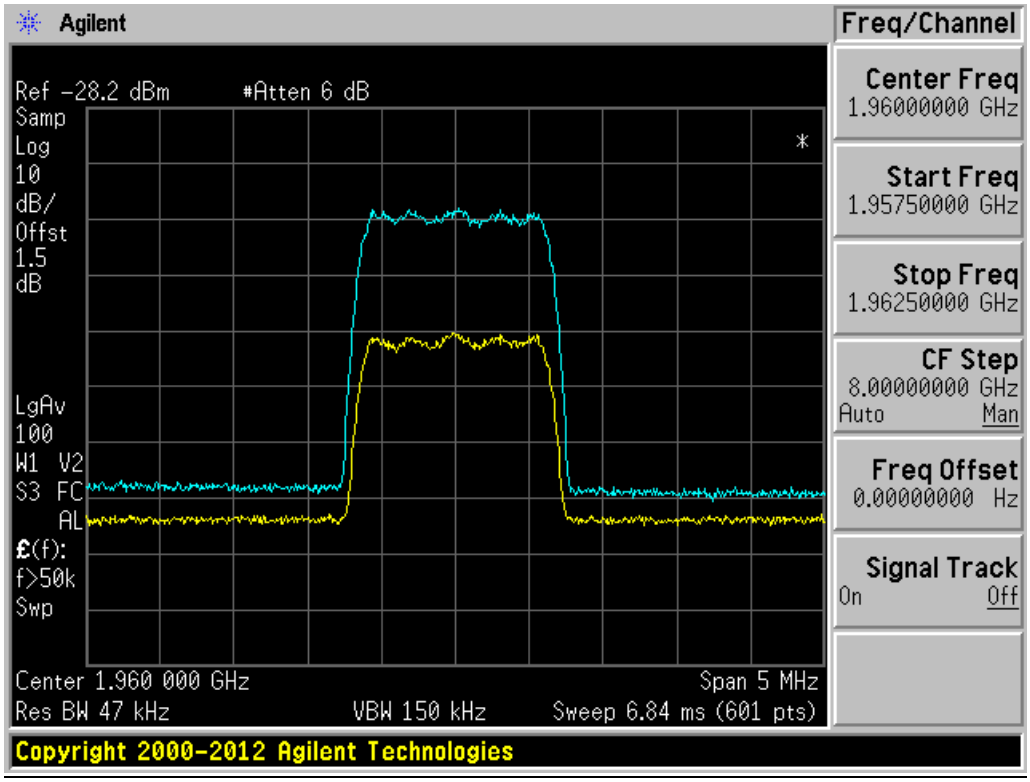
Downlink. Band 5. CDMA



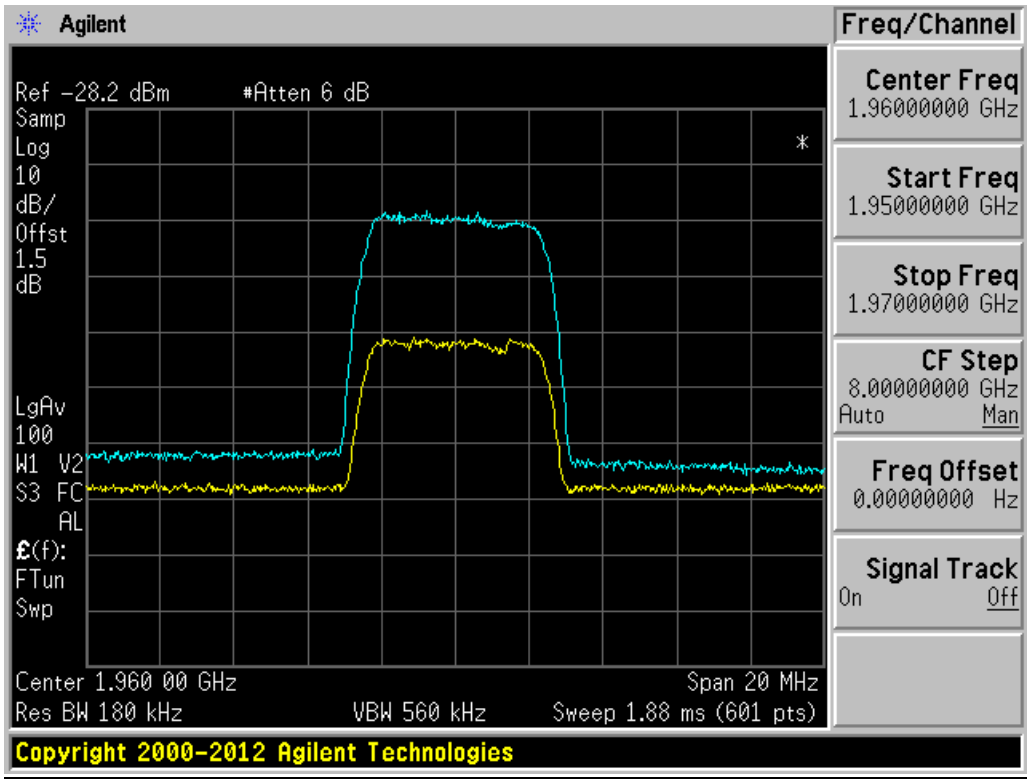
Downlink. Band 5. WCDMA/LTE



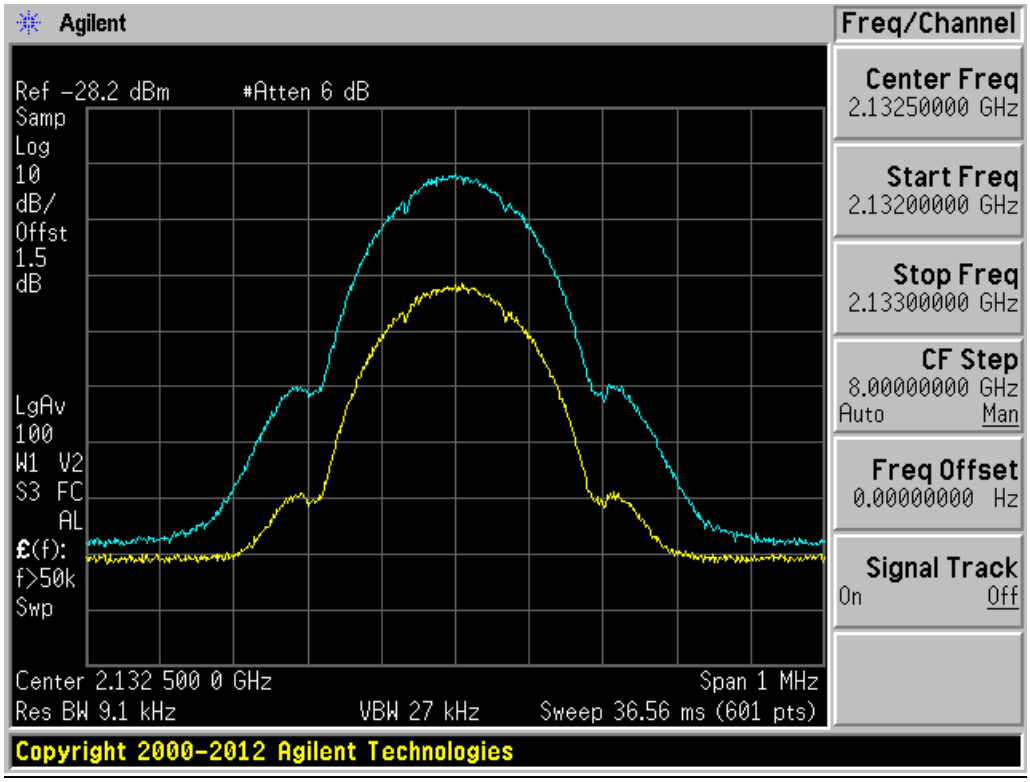
Downlink. Band 2 & 25. GSM



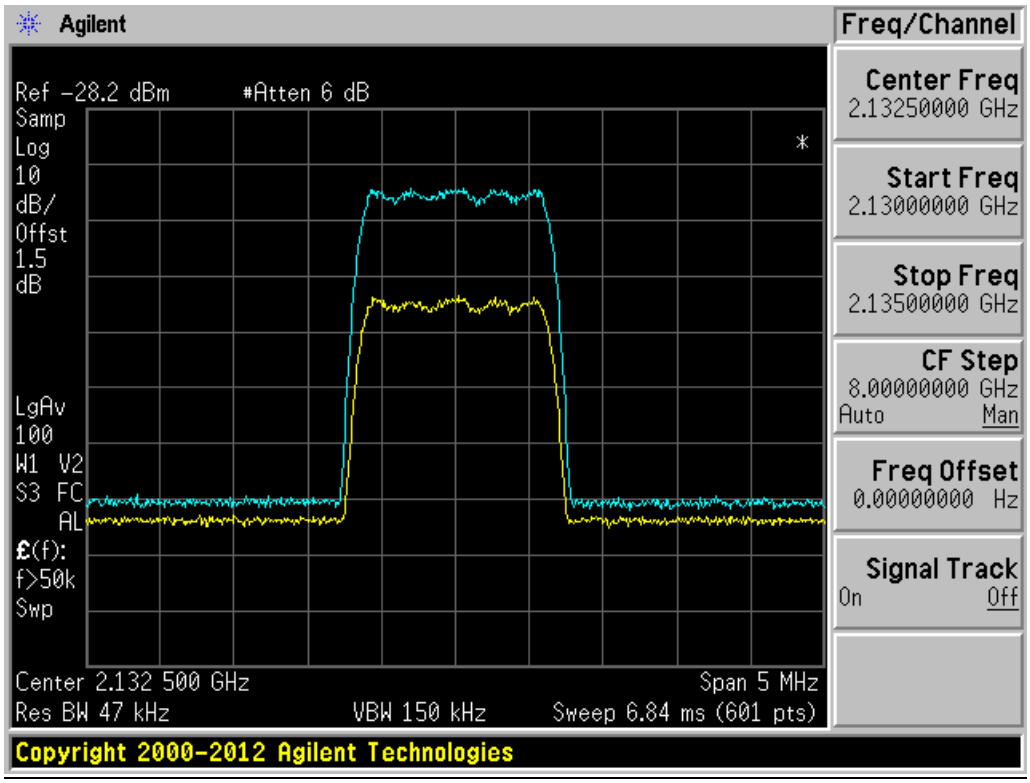
Downlink. Band 2 & 25. CDMA



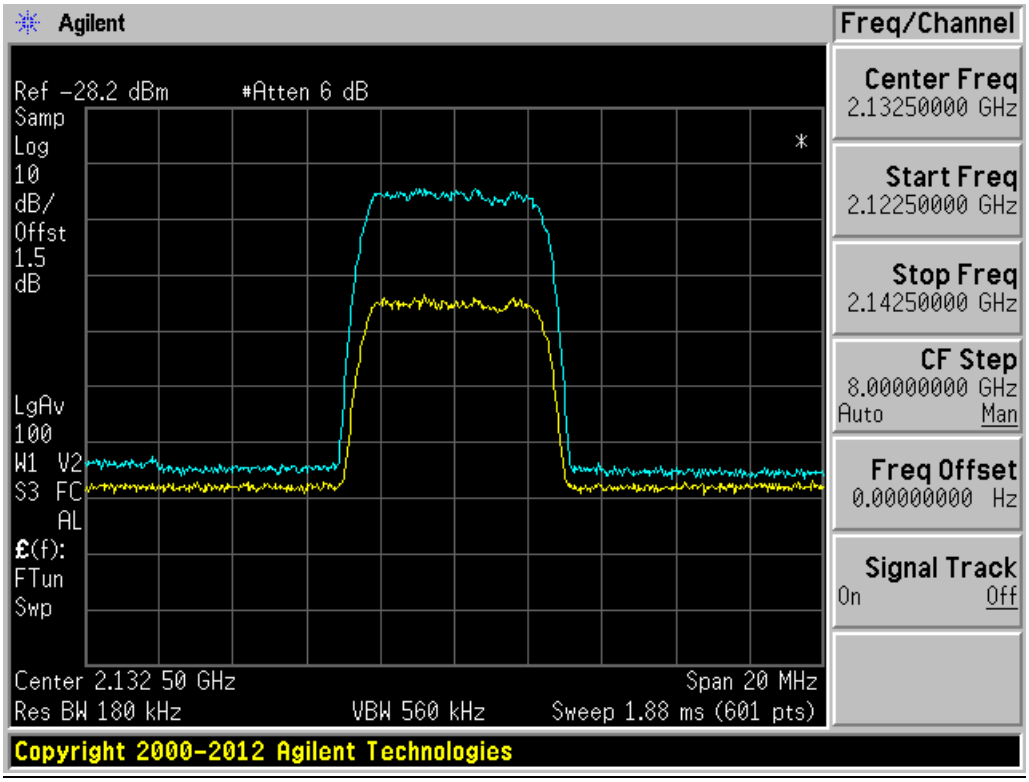
Downlink. Band 2 & 25. WCDMA/LTE



Downlink. Band 4. GSM



Downlink. Band 4. CDMA

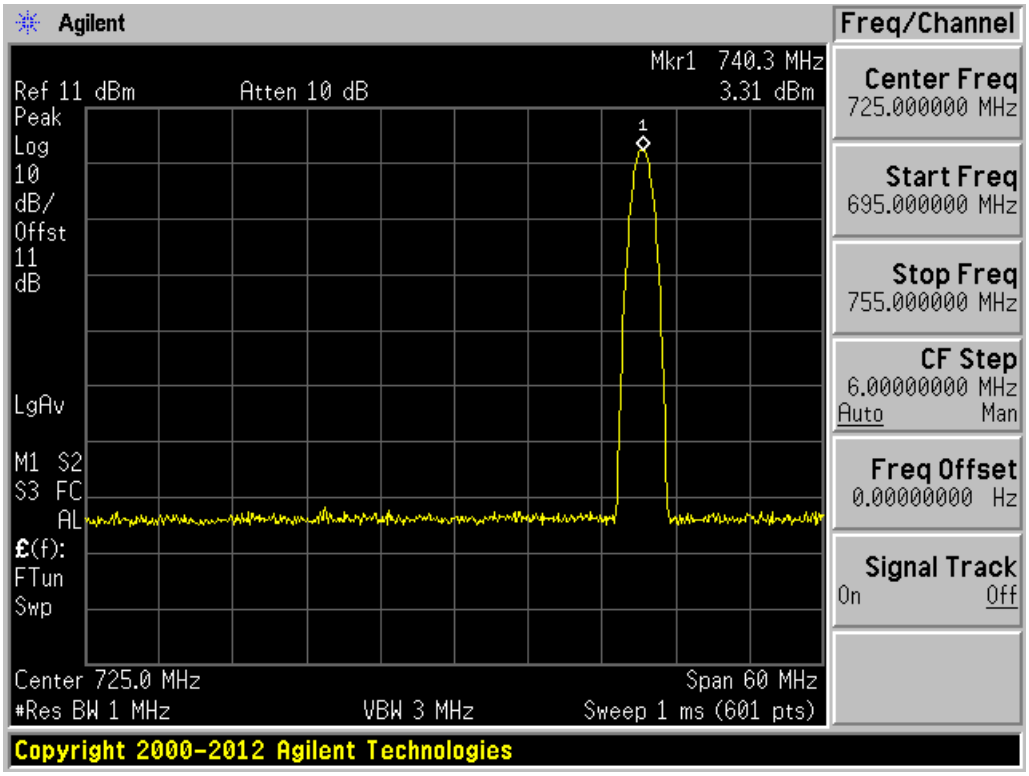


Downlink. Band 4. WCDMA/LTE

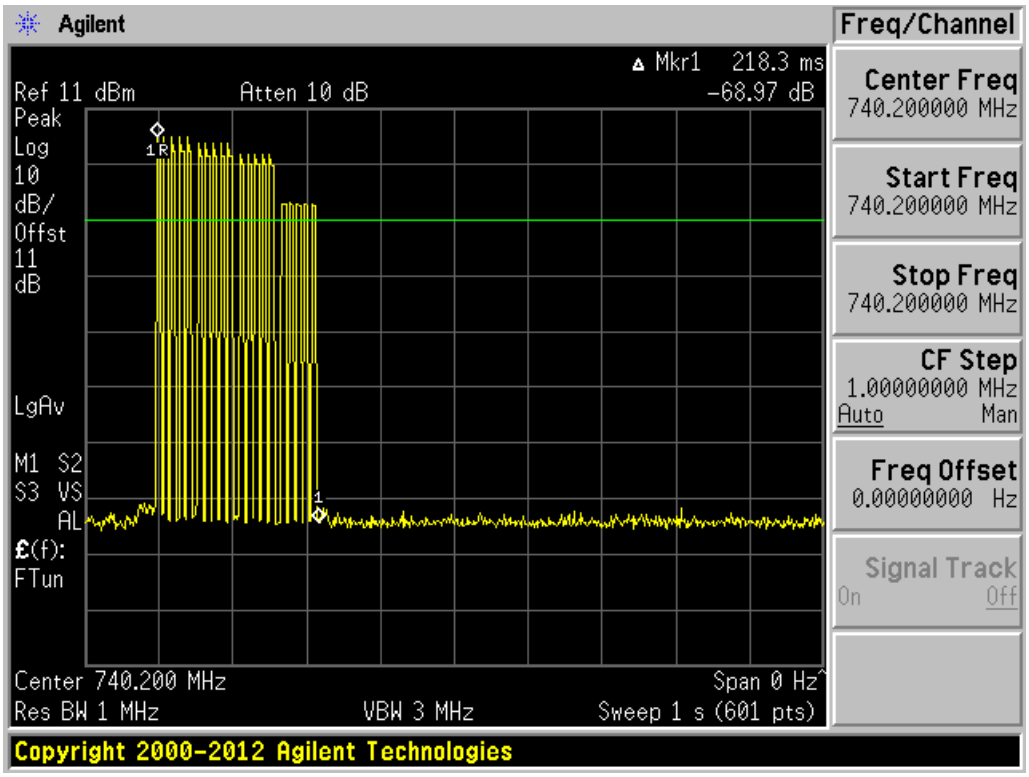
3.11 Oscillation Detection Test

This test conducted in accordance with KDB 935210 D03 V04 Signal Booster Measurements, § 7.11 and FCC inquiry #942758
This comply with FCC Rule: § 20.21(e)(8)(ii)(A) Anti-Oscillation

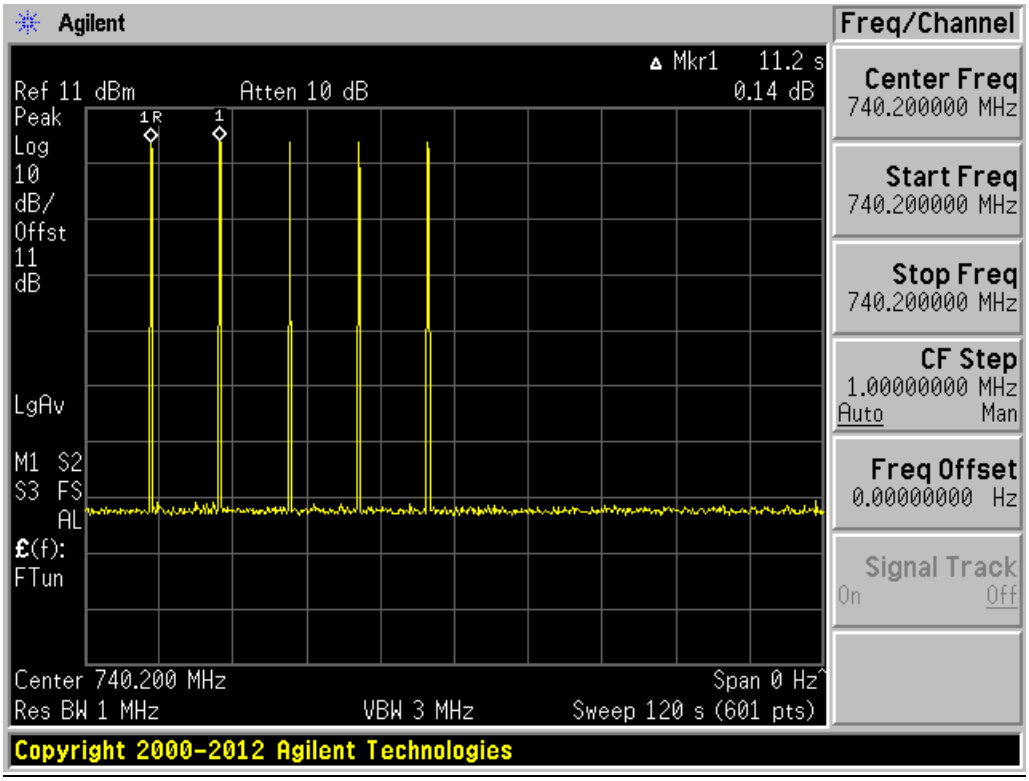
3.11.1 Oscillation Detection and Restart Test results



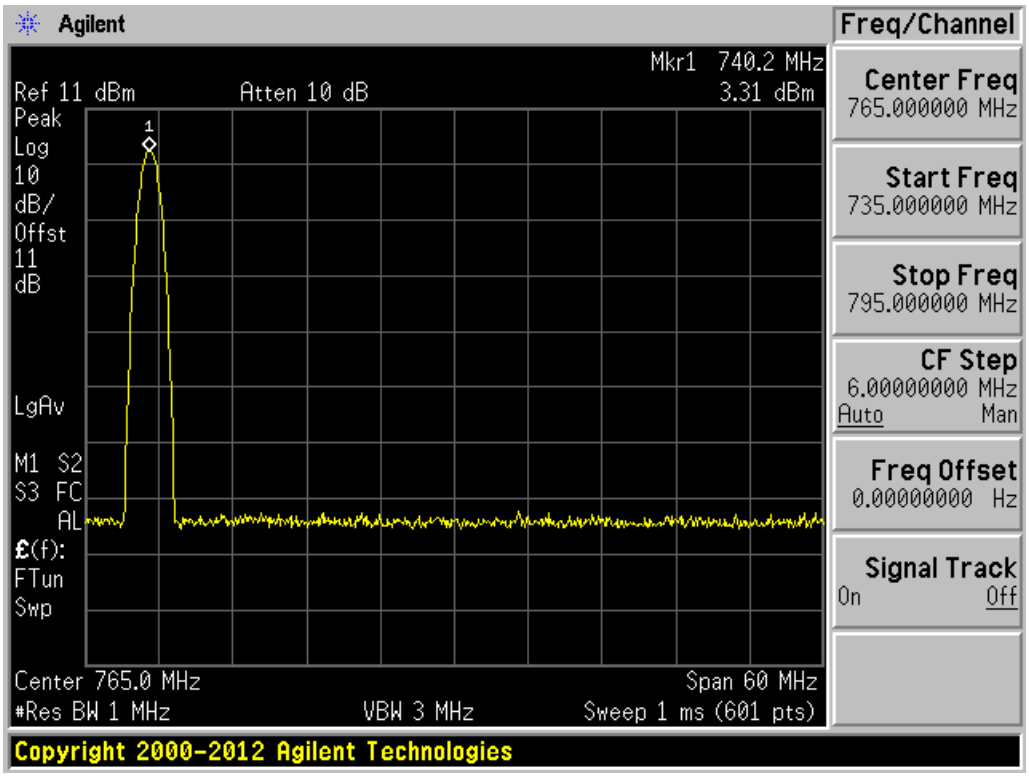
Band 12 & 17. Frequency of oscillation



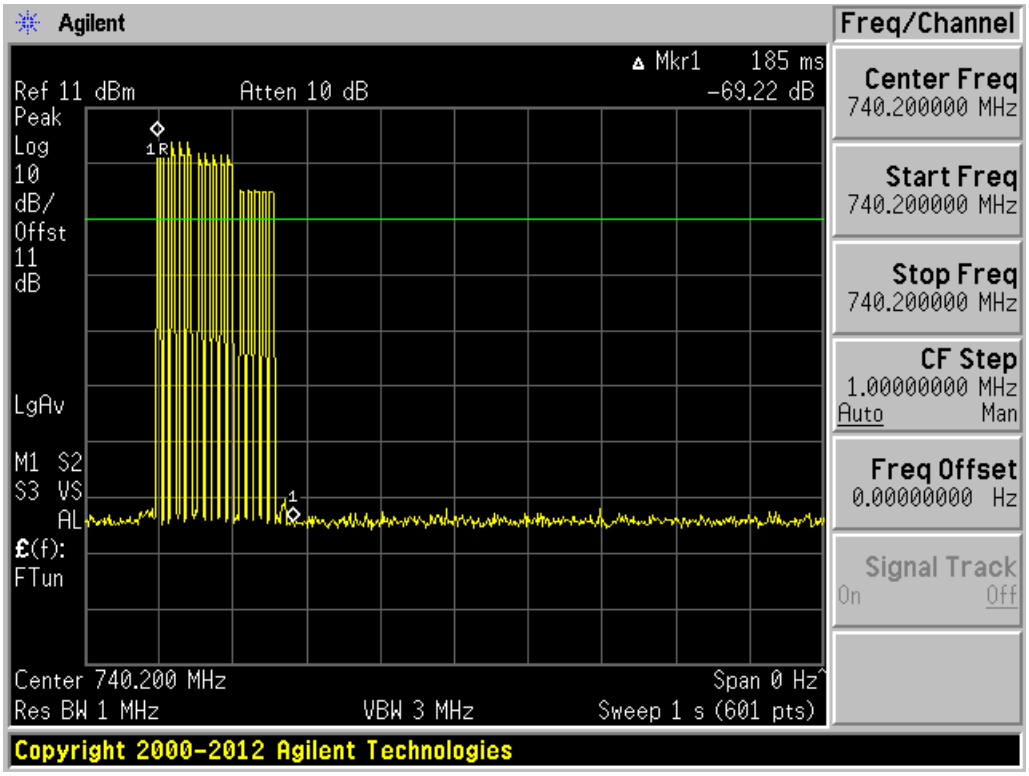
Band 12 & 17. Oscillation detection and control



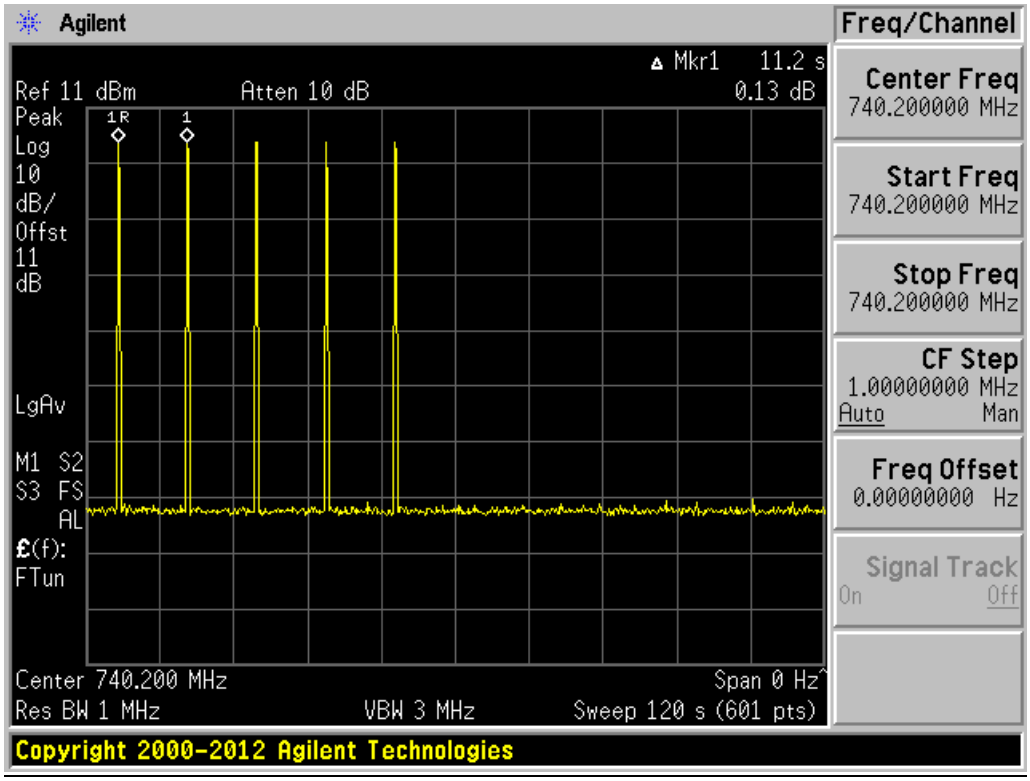
Band 12 & 17. 120 seconds sweep. (DUT in the Test Mode)



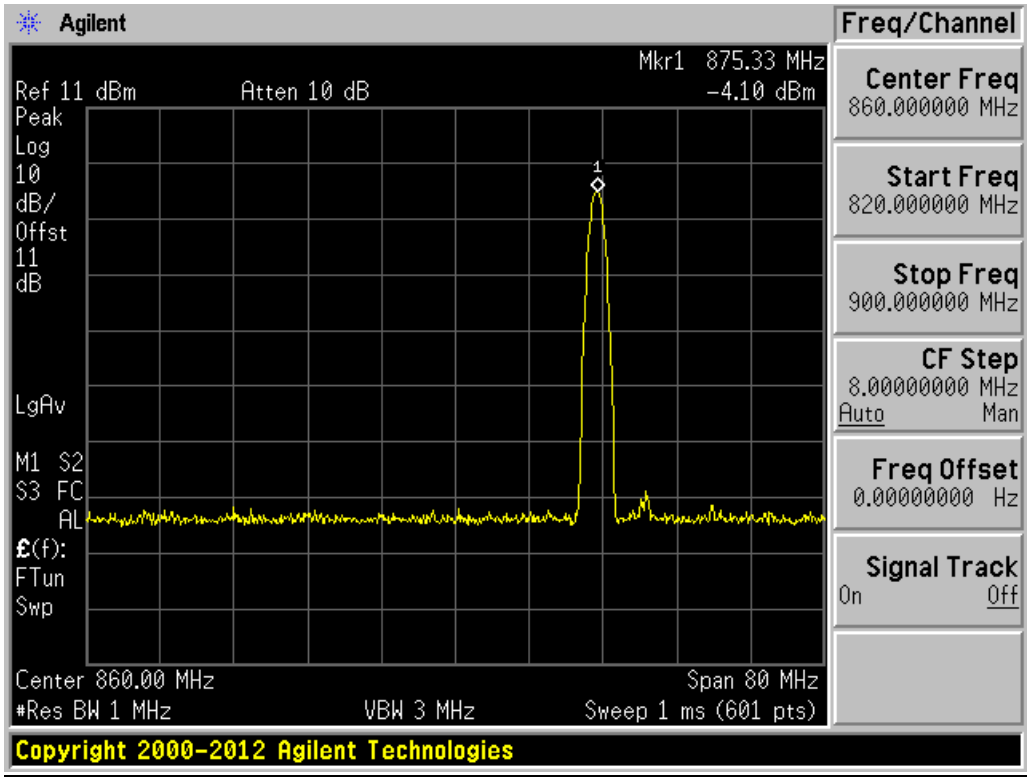
Band 13. Frequency of oscillation



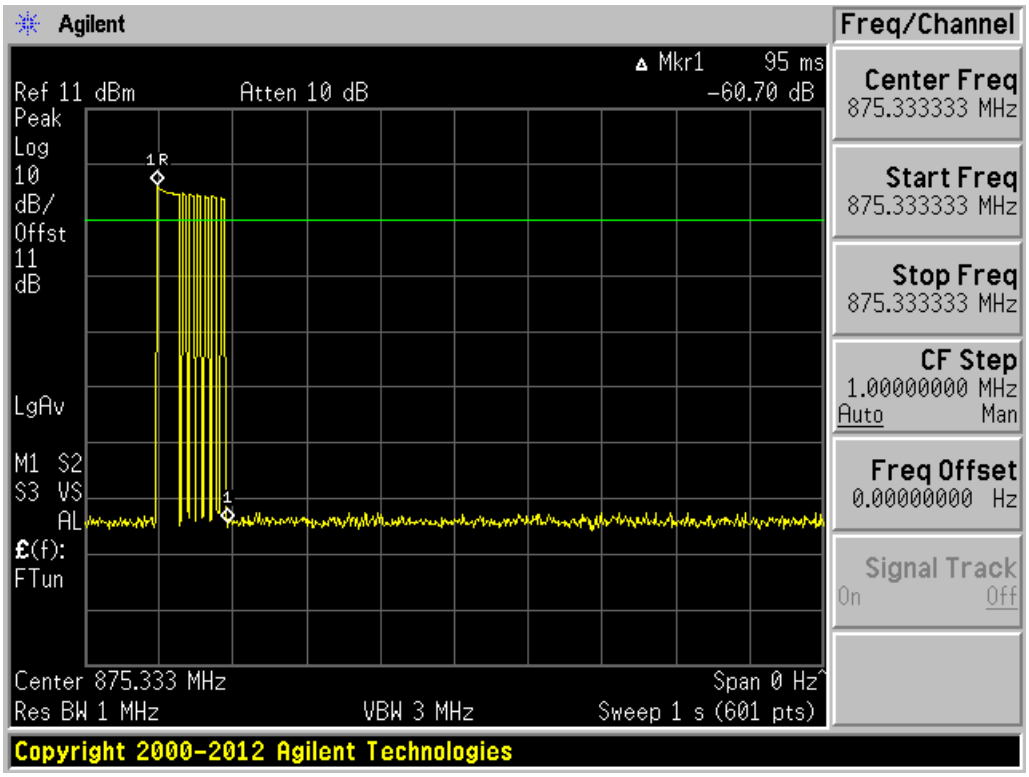
Band 13. Oscillation detection and control



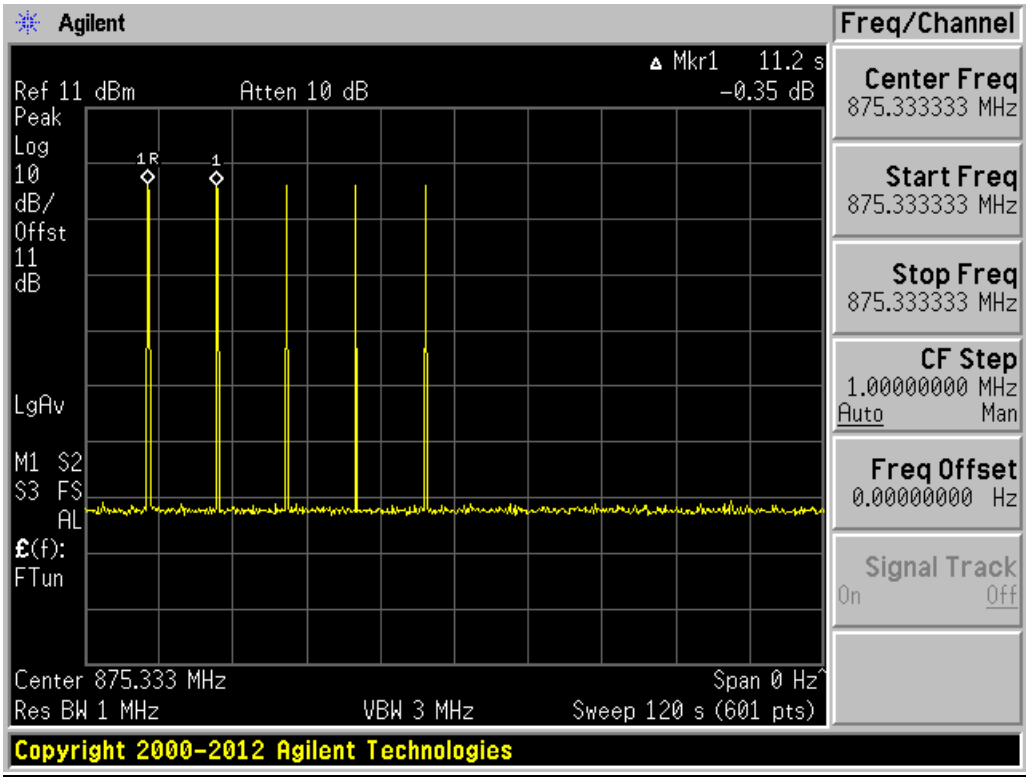
Band 13. 120 seconds sweep. (DUT in the Test Mode)



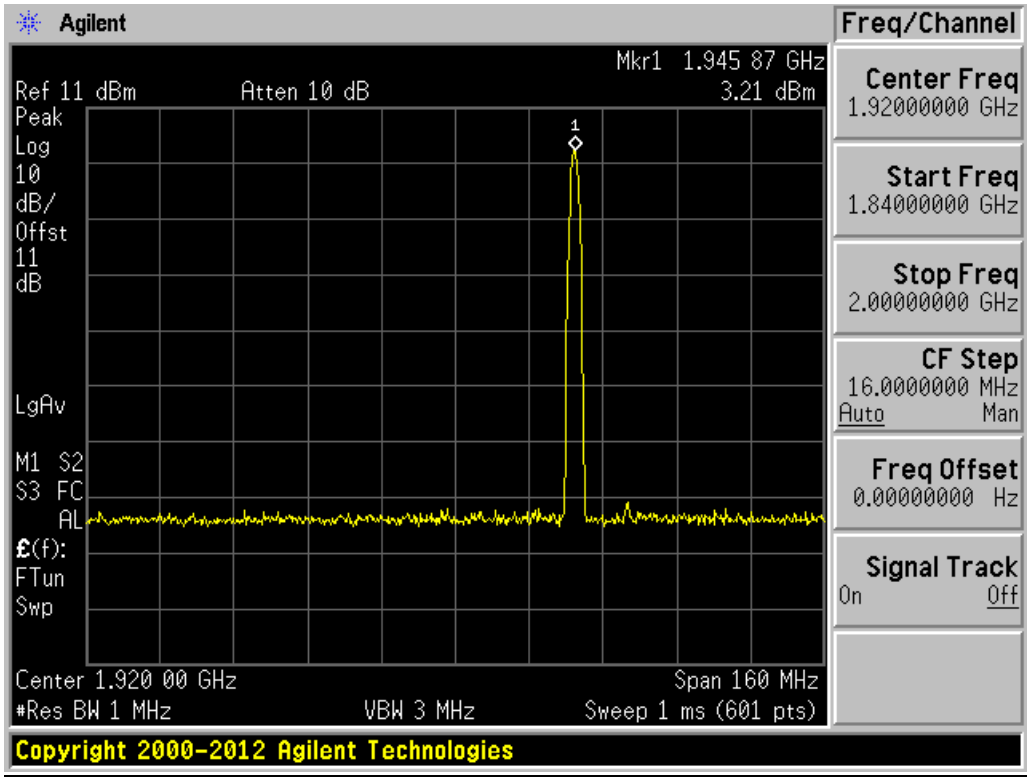
Band 5. Frequency of oscillation



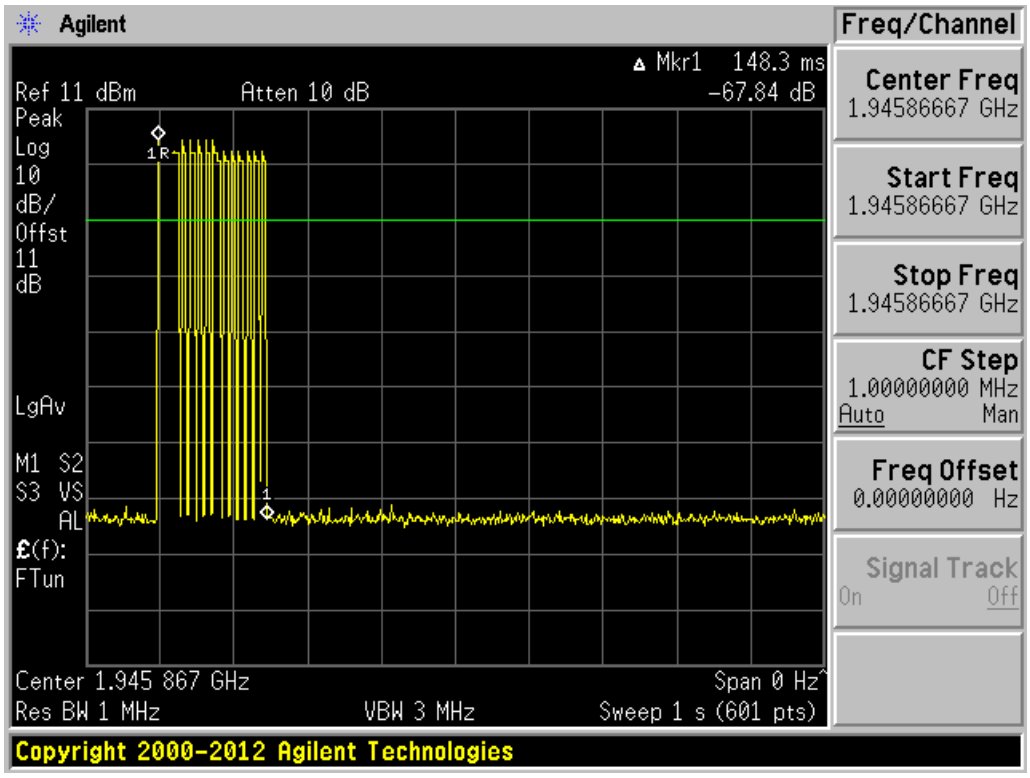
Band 5. Oscillation detection and control



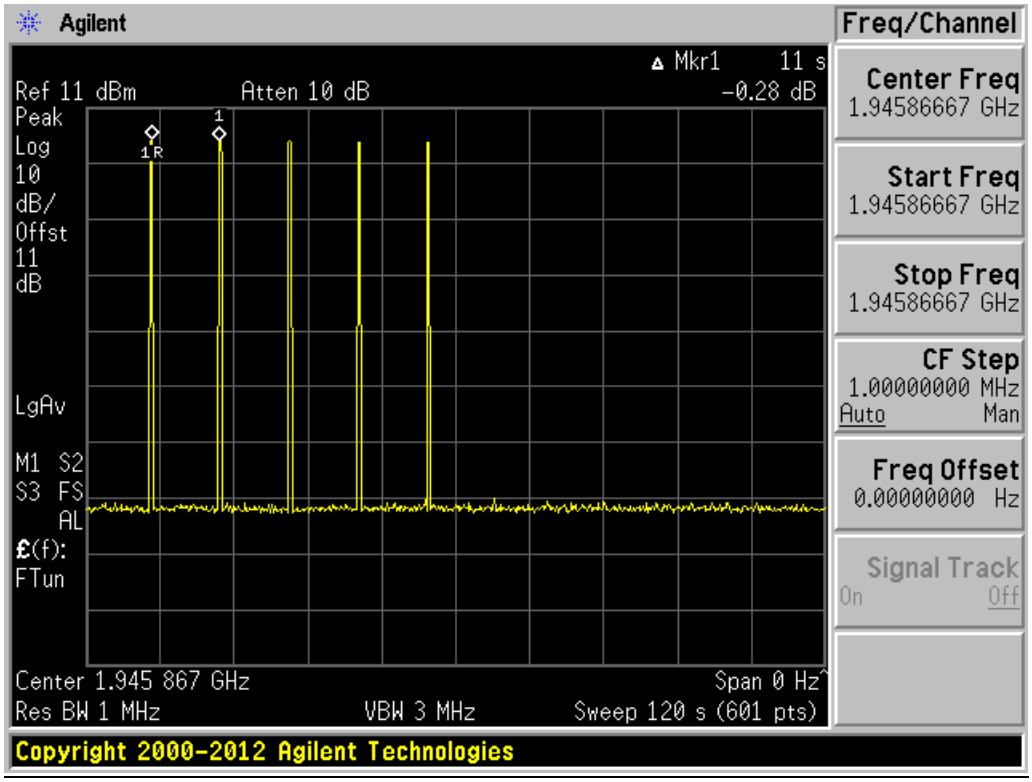
Band 5. 120 seconds sweep. (DUT in the Test Mode)



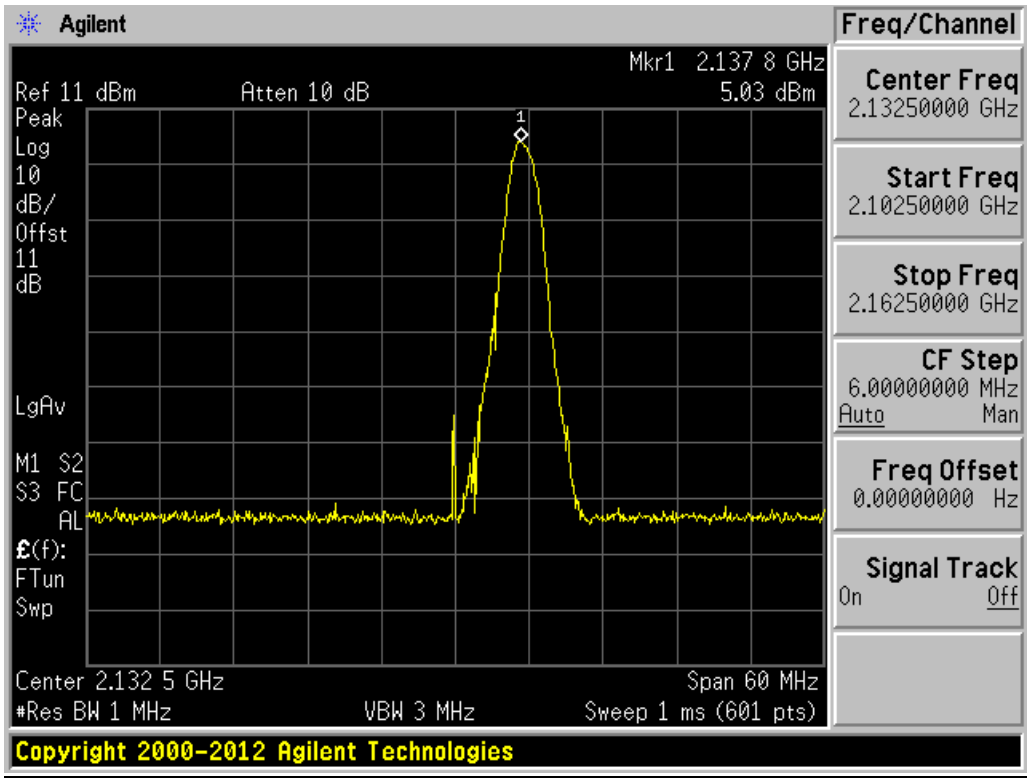
Band 2 & 25. Frequency of oscillation



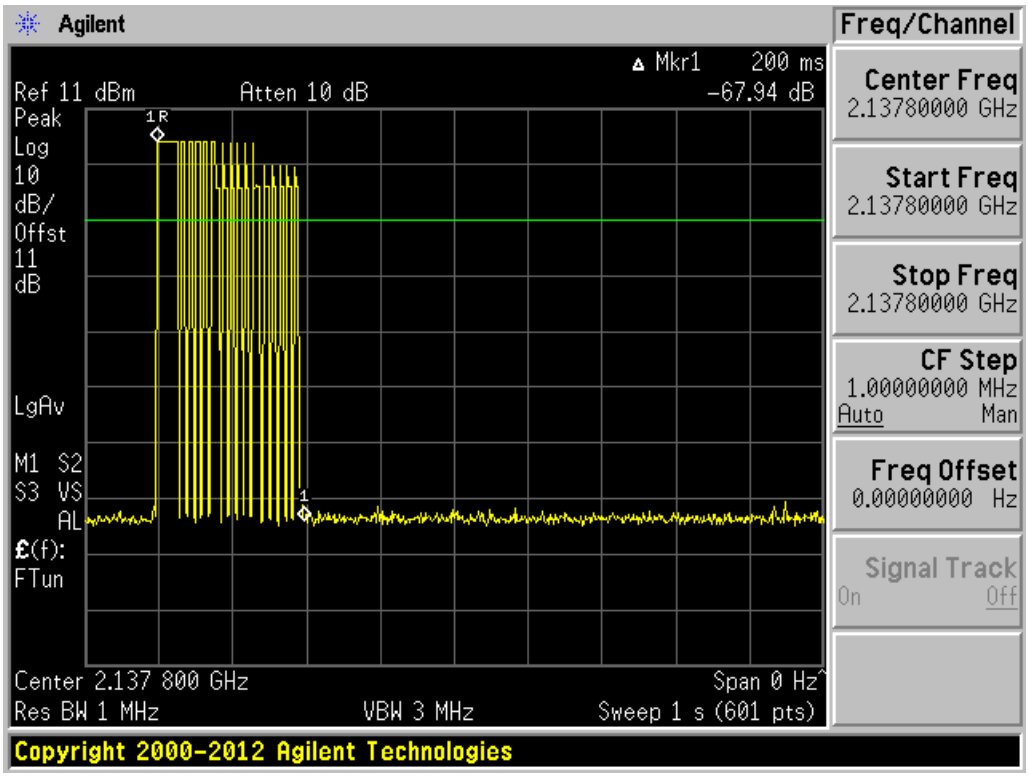
Band 2 & 25. Oscillation detection and control



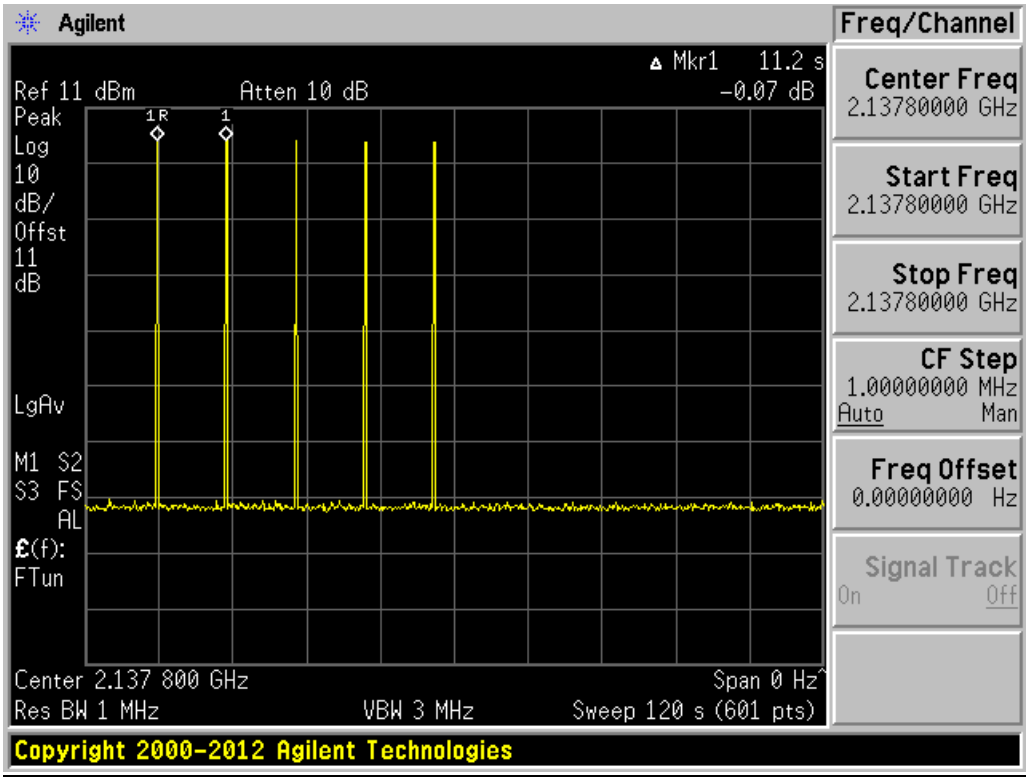
Band 2 & 25. 120 seconds sweep. (DUT in the Test Mode)



Band 4. Frequency of oscillation



Band 4. Oscillation detection and control



Band 4. 120 seconds sweep. (DUT in the Test Mode)

3.11.2 Oscillation Mitigation Test results

Table 21: Band 12 & 17

4.1 MHz AWGN signal @ Pout -5 dBm, 713.5 MHz							
Frequency Range 699-716							
Isolation to Gain	Peak Freq	Peak Level	Valley Freq	Valley Level	Delta	Limit	Result
5	707.2	-79.2	703.7	-79.2	0.0	12	Pass
4	707.2	-79.1	703.7	-79.6	0.5	12	Pass
3	707.2	-78.8	703.7	-78.0	-0.8	12	Pass
2	707.2	-78.1	703.7	-78.3	0.2	12	Pass
1	707.2	-78.9	703.7	-78.4	-0.5	12	Pass
0	707.2	-78.5	703.7	-78.4	-0.1	12	Pass
-1	707.2	-78.8	703.7	-79.1	0.3	12	Pass
-2	707.2	-78.0	703.7	-78.0	0.0	12	Pass
-3	707.2	-77.8	703.7	-79.0	1.2	12	Pass
-4	707.2	-77.3	703.7	-78.1	0.8	12	Pass
-5	707.2	-78.2	703.7	-78.3	0.1	12	Pass
4.1 MHz AWGN signal @ Pout -50 dBm, 731.5 MHz							
Frequency Range 729-746							
Isolation to Gain	Peak Freq	Peak Level	Valley Freq	Valley Level	Delta	Limit	Result
5	740.2	-78.2	737.6	-78.8	0.6	12	Pass
4	740.2	-78.1	737.6	-78.9	0.8	12	Pass
3	740.2	-77.8	737.6	-78.8	1.0	12	Pass
2	740.2	-77.4	737.6	-79.0	1.6	12	Pass
1	740.2	-76.7	737.6	-79.1	2.4	12	Pass
0	740.2	-74.1	737.6	-79.2	5.1	12	Pass
-1	740.2	-77.9	737.6	-77.9	0.0	12	Pass
-2	740.2	-77.4	737.6	-78.0	0.6	12	Pass
-3	740.2	-77.5	737.6	-77.8	0.3	12	Pass
-4	740.2	-77.4	737.6	-78.4	1.0	12	Pass
-5	740.2	-76.3	737.6	-78.4	2.1	12	Pass

Table 22: Band 13

CW signal @ Pout -5 dBm, 786 MHz							
Frequency Range 777-787							
Isolation to Gain	Peak Freq	Peak Level	Valley Freq	Valley Level	Delta	Limit	Result
5	780.2	-78.3	-782.0	-78.2	-0.1	12	Pass
4	780.2	-78.4	-782.0	-78.6	0.2	12	Pass
3	780.2	-78.6	-782.0	-78.5	-0.1	12	Pass
2	780.2	-78.5	-782.0	-78.7	0.2	12	Pass
1	780.2	-78.1	-782.0	-79.0	0.9	12	Pass
0	780.2	-78.8	-782.0	-78.6	-0.2	12	Pass
-1	780.2	-78.5	-782.0	-78.3	-0.2	12	Pass
-2	780.2	-78.5	-782.0	-78.3	-0.2	12	Pass
-3	780.2	-78.3	-782.0	-78.3	0.0	12	Pass
-4	780.2	-78.4	-782.0	-79.1	0.7	12	Pass
-5	780.2	-78.3	-782.0	-78.3	0.0	12	Pass
CW signal @ Pout -50 dBm, 755 MHz							
Frequency Range 746-756							
Isolation to Gain	Peak Freq	Peak Level	Valley Freq	Valley Level	Delta	Limit	Result
5	749	-78.6	750.6	-78.8	0.2	12	Pass
4	749	-78.5	750.6	-78.8	0.3	12	Pass
3	749	-78.5	750.6	-78.6	0.1	12	Pass
2	749	-77.6	750.6	-79.2	1.6	12	Pass
1	749	-77.6	750.6	-79.1	1.5	12	Pass
0	749	-78.0	750.6	-78.2	0.2	12	Pass
-1	749	-78.1	750.6	-78.3	0.2	12	Pass
-2	749	-77.9	750.6	-78.9	1.0	12	Pass
-3	749	-77.9	750.6	-79.0	1.1	12	Pass
-4	749	-77.4	750.6	-78.9	1.5	12	Pass
-5	749	-77.2	750.6	-79.1	1.9	12	Pass

Table 23: Band 5

4.1 MHz AWGN signal @ Pout -5 dBm, 846.5 MHz							
Frequency Range 824-849							
Isolation to Gain	Peak Freq	Peak Level	Valley Freq	Valley Level	Delta	Limit	Result
5	836.0	-78.2	832.0	-78.8	0.6	12	Pass
4	836.0	-78.1	832.0	-78.8	0.7	12	Pass
3	836.0	-78.5	832.0	-78.6	0.1	12	Pass
2	836.0	-77.6	832.0	-79.2	1.6	12	Pass
1	836.0	-77.6	832.0	-79.1	1.5	12	Pass
0	836.0	-78.0	832.0	-79.2	1.2	12	Pass
-1	836.0	-78.1	832.0	-77.9	-0.2	12	Pass
-2	836.0	-77.9	832.0	-78.0	0.1	12	Pass
-3	836.0	-77.9	832.0	-77.8	-0.1	12	Pass
-4	836.0	-77.4	832.0	-78.4	1.0	12	Pass
-5	836.0	-77.2	832.0	-78.4	1.2	12	Pass
4.1 MHz AWGN signal @ Pout -50 dBm, 891.5 MHz							
Frequency Range 869-894							
Isolation to Gain	Peak Freq	Peak Level	Valley Freq	Valley Level	Delta	Limit	Result
5	880.6	-78.1	877.5	-78.2	0.1	12	Pass
4	880.6	-78.6	877.5	-78.6	0.0	12	Pass
3	880.6	-78.3	877.5	-78.5	0.2	12	Pass
2	880.6	-77.2	877.5	-78.7	1.5	12	Pass
1	880.6	-76.7	877.5	-79.0	2.3	12	Pass
0	880.6	-78.5	877.5	-78.6	0.1	12	Pass
-1	880.6	-77.9	877.5	-78.3	0.4	12	Pass
-2	880.6	-78.0	877.5	-78.3	0.3	12	Pass
-3	880.6	-77.8	877.5	-78.3	0.5	12	Pass
-4	880.6	-77.3	877.5	-79.1	1.8	12	Pass
-5	880.6	-78.2	877.5	-78.3	0.1	12	Pass

Table 24: Band 2 & 25

4.1 MHz AWGN signal @ Pout -5 dBm, 1907.5 MHz							
Frequency Range 1850-1915							
Isolation to Gain	Peak Freq	Peak Level	Valley Freq	Valley Level	Delta	Limit	Result
5	1860.5	-78.5	1868.0	-79.1	0.6	12	Pass
4	1860.5	-78.1	1868.0	-78.0	-0.1	12	Pass
3	1860.5	-78.3	1868.0	-79.0	0.7	12	Pass
2	1860.5	-78.4	1868.0	-78.1	-0.3	12	Pass
1	1860.5	-78.2	1868.0	-78.3	0.1	12	Pass
0	1860.5	-78.0	1868.0	-78.7	0.7	12	Pass
-1	1860.5	-78.5	1868.0	-79.0	0.5	12	Pass
-2	1860.5	-78.5	1868.0	-78.6	0.1	12	Pass
-3	1860.5	-78.3	1868.0	-78.3	0.0	12	Pass
-4	1860.5	-78.2	1868.0	-78.3	0.1	12	Pass
-5	1860.5	-78.4	1868.0	-78.5	0.1	12	Pass
4.1 MHz AWGN signal @ Pout -50 dBm, 1987.5 MHz							
Frequency Range 1930-1995							
Isolation to Gain	Peak Freq	Peak Level	Valley Freq	Valley Level	Delta	Limit	Result
5	1945.2	-76.4	1952.5	-78.0	1.6	12	Pass
4	1945.2	-75.6	1952.5	-78.4	2.8	12	Pass
3	1945.2	-74.9	1952.5	-78.0	3.1	12	Pass
2	1945.2	-72.9	1952.5	-79.0	6.1	12	Pass
1	1945.2	-72.1	1952.5	-78.1	6.0	12	Pass
0	1945.2	-78.2	1952.5	-78.3	0.1	12	Pass
-1	1945.2	-78.2	1952.5	-78.2	0.0	12	Pass
-2	1945.2	-77.8	1952.5	-78.1	0.3	12	Pass
-3	1945.2	-77.3	1952.5	-78.2	0.9	12	Pass
-4	1945.2	-77.1	1952.5	-78.7	1.6	12	Pass
-5	1945.2	-76.0	1952.5	-79.1	3.1	12	Pass

Table 25: Band 4

4.1 MHz AWGN signal @ Pout -5 dBm, 1712.5 MHz							
Tested frequency range 1710-1755							
Isolation to Gain	Peak Freq	Peak Level	Valley Freq	Valley Level	Delta	Limit	Result
5	1733.5	-79.2	1727.5	-79.9	0.7	12	Pass
4	1733.5	-79.1	1727.5	-79.5	0.4	12	Pass
3	1733.5	-78.8	1727.5	-79.5	0.7	12	Pass
2	1733.5	-79.1	1727.5	-79.6	0.5	12	Pass
1	1733.5	-78.9	1727.5	-79.1	0.2	12	Pass
0	1733.5	-79.0	1727.5	-79.2	0.2	12	Pass
-1	1733.5	-79.2	1727.5	-79.3	0.1	12	Pass
-2	1733.5	-78.8	1727.5	-79.6	0.8	12	Pass
-3	1733.5	-78.8	1727.5	-79.5	0.7	12	Pass
-4	1733.5	-79.0	1727.5	-79.4	0.4	12	Pass
-5	1733.5	-79.1	1727.5	-79.2	0.1	12	Pass
4.1 MHz AWGN signal @ Pout -50 dBm, 2112.5 MHz							
Tested frequency range 2110-2155							
Isolation to Gain	Peak Freq	Peak Level	Valley Freq	Valley Level	Delta	Limit	Result
5	2138.0	-78.3	2132.0	-79.1	0.8	12	Pass
4	2138.0	-78.4	2132.0	-78.6	0.2	12	Pass
3	2138.0	-78.6	2132.0	-78.7	0.1	12	Pass
2	2138.0	-78.5	2132.0	-78.7	0.2	12	Pass
1	2138.0	-78.1	2132.0	-79.0	0.9	12	Pass
0	2138.0	-78.8	2132.0	-78.9	0.1	12	Pass
-1	2138.0	-78.5	2132.0	-78.6	0.1	12	Pass
-2	2138.0	-78.5	2132.0	-78.8	0.3	12	Pass
-3	2138.0	-78.6	2132.0	-78.6	0.0	12	Pass
-4	2138.0	-78.4	2132.0	-79.1	0.7	12	Pass
-5	2138.0	-78.3	2132.0	-78.3	0.0	12	Pass

3.12 Radiated Spurious Emissions Test.

This test conducted in accordance with KDB 935210 D03 V04 Signal Booster Measurements, § 7.12
This comply with FCC Rule: § 2.1053 Measurements required: Field strength of spurious radiation

3.12.1 Radiated spurious emissions test results.

These tests are provided on a separate document.

4 MSCL Calculations and Measurements

4.1 Test Methodology for Coupling Holders:

MSCL was calculated using the 'measurement method'. Several CMRS devices (mobile phones) were inserted into model coupling holders. Each holder was connected to a Rhode & Shwartz CMU200 communications radio test set as shown on Figure 1. The CMU200 was used to initiate and hold a cellular telephone call with the mobile phone (transmit and receive GSM signal to and from mobile phone in the holder). The information reported by the CMU200 was used to calculate MSCL of all active TX bands of the booster.

TX MSCL was determined by Subtracting 'BTS RSSI' (power measured by the CMU200) from 'CMRS Power' (power transmitted from the mobile phone).

Mobile Communications Inc. is the manufacturer of the BTH series of mobile phone-specific and universal coupling holders. Table 26 lists lowest MSCL recorded using 3 mobile phones connected into several holders. The data in Table 26 represents the lowest TX MSCL of all holders that were tested for this report and is a true representation of minimum TX MSCL for the complete series of BTH holders.

Test Methodology for Coupling Antennas:
MSCL was calculated using the 'measurement method'. A CMRS device (mobile phone) was placed onto coupling antenna. The Coupling antenna was connected to a Rhode & Shwartz CMU200 communications radio test set. The CMU200 was used to initiate and hold a data session with computing devices. The devices were moved to different locations on the coupling antenna to determine the location of lowest coupling loss during the test. The information reported by the CMU200 was used to calculate MSCL of all active TX bands of the booster.
.
TX MSCL was determined by Subtracting 'BTS RSSI' (power measured by the CMU200) from 'CMRS Power' (power transmitted from the mobile phone).

Mobile Communications Inc. is the manufacturer of coupling antennas. Table 27 lists test data for 2 coupling antennas placed directly onto various computing devices and moved to several positions on the device during the test to determine the location with the lowest coupling loss. The data in Table 27 represents the lowest TX MSCL for the coupling antennas listed in this report.

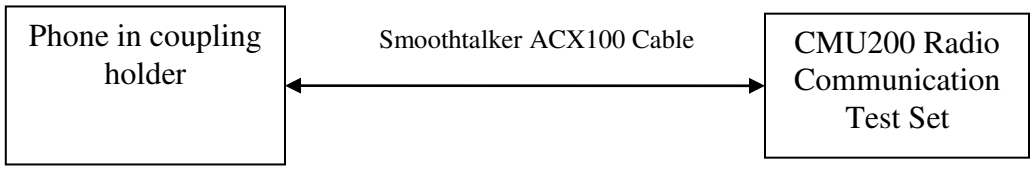


Figure 1

Table 26: MSCL calculations for coupling holders authorized for use with voice capable cellular devices

Coupling holders

Coupling Part # or series	Description	Cable	TX MSCL
BTH series cell phone holders	Coupling phone Holder	4 ft. SEMRC105	7

Table 27: MSCL calculations for coupling antennas authorized for use with non-voice capable cellular devices such as tablets, modems, computers, etc.

Coupling antennas

Coupling antenna Part #	Description	Cable	TX MSCL
SEMRP1X	coupling antenna	4 ft. SEMRC105	8
SEMRP1XL	coupling antenna	7 ft. SEMRC105	8

Table Definitions:
MSCL - Mobile Station Coupling Loss
CMRS - Commercial Mobile Radio Service (Mobile phone)
BTS - Base Transceiver Station (In test Rohde & Schwarz CMU-200 Radio Communication Test Set used to determine MSCL)

5 Antenna Kitting

(G) Booster Antenna Kitting. All consumer boosters must be sold with user manuals specifying all antennas and cables that meet the requirements of this section. All consumer boosters must be sold together with antennas, cables, and/or coupling devices that meet the requirements of this section. The grantee is required to submit a technical document with the application for FCC equipment authorization that shows compliance of all antennas, cables and/or coupling devices with the requirements of this section, including any antenna or equipment upgrade options that may be available at initial purchase or as a subsequent upgrade.

Coupling holders:

Holder Part # or series	Description	Cable	TX MSCL Cellular band/PCS band
BTH series	Coupling phone Holder	4 ft. C105	7

Cables:

Cables:	Description	Cable	Minimum Cable loss in dB
ACX100	extension cable	4 ft. C105	-0.44
ACX900	extension cable	9 ft. C105	-1.00
CBXmaXfe10	extension cable	10 ft. C205	-1.00
CBXmaXfe20	extension cable	20 ft. C205	-2.00
CBXmaXfe30	extension cable	30 ft. C205	-3.00
CBXmaXfe40	extension cable	40 ft. C205	-4.00
CBXmaXfe50	extension cable	50 ft. C205	-5.00
CBXmaXfe60	extension cable	60 ft. C205	-6.00

Antennas:

Antenna Part #	Description	Cable	Minimum Cable loss in dB	Maximum Antenna Gain (dBi)	Net gain (dBi)
SEMiniX1	External antenna	10ft RG174U	-2.5	0	-2.5
SEM2M series	External antenna	10 ft. C105	-2.5	0	-2.5
SEM11M series	External antenna	10 ft. C105	-2.5	2	-0.5
SEM14M series	External antenna	10 ft. C105	-2.5	3	0.5
SEM2LGM series	External antenna	11 ft. C205	-2.0	0	-2.0
SEM11LGM series	External antenna	11 ft. C205	-2.0	2	0.0
SEM14LGM series	External antenna	11 ft. C205	-2.0	3	1.0
SEM26LGM series	External antenna	11 ft. C205	-2.0	3	1.0
SEM2LGML series	External antenna	18 ft. C205	-2.5	0	-2.5
SEM11LGML series	External antenna	18 ft. C205	-2.5	2	-0.5
SEM14LGML series	External antenna	18 ft. C205	-2.5	3	0.5
SEM26LGML series	External antenna	18 ft. C205	-2.5	3	0.5
SEM2TH series	External antenna	14 ft. C205	-2.0	0	-2.0
SEM11TH series	External antenna	14 ft. C205	-2.0	2	0.0
SEM14TH series	External antenna	14 ft. C205	-2.0	3	1.0
SEM26TH series	External antenna	14 ft. C205	-2.0	3	1.0
SEM2THL series	External antenna	25 ft. C205	-3.0	0	-2.75
SEM11THL series	External antenna	25 ft. C205	-3.0	2	-1.0
SEM14THL series	External antenna	25 ft. C205	-3.0	3	0
SEM26THL series	External antenna	25 ft. C205	-3.0	3	0
SEMD1 series	External antenna	18 ft. C205	-3.0	3	0
SEMDA2 series	External antenna	18 ft. C205	-3.0	3	0
SEMO series	External antenna	18 ft. C205	-2.5	0	-2.5
SEMPN1 series	External antenna	20 ft. C205	-3.0	3	0