

FCC PART 22 TYPE APPROVAL EMI MEASUREMENT AND TEST REPORT

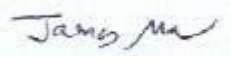
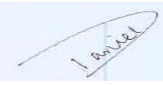
For

Telecom Technologies (USA) LLC

26112 Hitching Rail Road, Laguna Hills, CA 92653, USA

FCC ID: UM8CV800

Model: Clear Voice 800

This Report Concerns: ☒ Original Report		Product Type: Cellular Repeater
Test Engineer:	James Ma 	
Report No.:	R0607131	
Report Date:	2006-10-04	
Reviewed By:	Daniel Deng 	
Prepared By:	Bay Area Compliance Laboratory Corp. 1274 Anvilwood Ave. Sunnyvale, CA 94089, U.S.A. Tel: (408) 732-9162 Fax: (408) 732-9164	

Note: This test report is for the customer shown above and their specific product only. It may not be duplicated without prior written consent of Bay Area Compliance Laboratories Corp. This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government

TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
MECHANICAL DESCRIPTION	4
EUT PHOTO	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S).....	5
TEST METHODOLOGY	5
TEST FACILITY	5
SYSTEM TEST CONFIGURATION.....	6
JUSTIFICATION	6
BLOCK DIAGRAM.....	6
EQUIPMENT MODIFICATIONS	6
POWER SUPPLY AND LINE FILTERS	6
TEST SETUP BLOCK DIAGRAM	7
SUMMARY OF TEST RESULTS	8
§2.1046 & §22.913(A) - RF POWER OUTPUT	9
APPLICABLE STANDARD	9
TEST PROCEDURE	9
TEST EQUIPMENT LIST AND DETAILS.....	9
ENVIRONMENTAL CONDITIONS	10
REVERSE (UPLINK).....	10
REVERSE (UPLINK).....	10
REVERSE (UPLINK).....	11
§2.1049 & §22.917(B) - OCCUPIED BANDWIDTH.....	30
APPLICABLE STANDARDS.....	30
TEST PROCEDURE	30
TEST EQUIPMENT LIST AND DETAILS.....	30
ENVIRONMENTAL CONDITIONS	30
TEST RESULTS	30
REVERSE (UPLINK)	30
REVERSE (UPLINK)	31
REVERSE (UPLINK)	31
§2.1051 & §22.917(A) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS.....	50
APPLICABLE STANDARDS.....	50
TEST PROCEDURE	50
TEST EQUIPMENT LIST AND DETAILS.....	50
ENVIRONMENTAL CONDITIONS	50
TEST RESULTS:	50
§2.1053 - SPURIOUS RADIATED EMISSION.....	54
APPLICABLE STANDARDS.....	54
TEST PROCEDURE	54
TEST EQUIPMENT LIST AND DETAILS.....	54
ENVIRONMENTAL CONDITIONS	55
SUMMARY OF TEST RESULTS	55
§22.917 – BAND EDGE.....	56
APPLICABLE STANDARDS.....	56
TEST PROCEDURE	56
TEST EQUIPMENT LIST AND DETAILS.....	56
ENVIRONMENTAL CONDITIONS	56
TEST RESULTS	56

§2.1055(A), §2.1055(D) & §22.355 - FREQUENCY STABILITY	59
APPLICABLE STANDARD	59
TEST PROCEDURE	59
TEST EQUIPMENT LIST AND DETAILS.....	59
ENVIRONMENTAL CONDITIONS	59
IS-138A (3.4.4) TWO-TONE TEST	61
APPLICABLE STANDARDS.....	61
TEST PROCEDURE	61
TEST EQUIPMENT LIST AND DETAILS.....	61
TEST RESULTS	61
PLOTS OF TWO-TONE TEST RESULT.....	61

GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

This repeater designed to improve the speech quality or expand the BTS Coverage in a region where BTS Signals are weak. It does so by amplifying and retransmitting the signals in the cellular (800MHz) Band.

Features:

- Amplify weak received signals
- Indicates BTS signal levels
- Auto shutdown function in high power or oscillating occasions
- Design for minimum deterioration and impact for WLAN

Mechanical Description

The *Telecom Technologies (USA) LLC*'s product, *FCCID: UM8CV800*, *model: Clear Voice 800*, is measured approximately *139.7mmL x 114.3mmW x 38.1mmH x 2lbs Weight*.

** The test data gathered are from production sample, serial number: TTUSA1000, provided by the manufacturer.*

EUT Photo



Additional photos in Exhibit C

Objective

This type approval report is prepared on behalf of *Telecom Technologies (USA) LLC* in accordance with Part 2, Subpart J, and Part 22 Subpart H of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for output power, modulation characteristic, occupied bandwidth, spurious emission at antenna terminal, spurious radiated emission, frequency stability, band edge and radiated margin.

Related Submittal(s)/Grant(s)

No Related Submittals

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

Applicable Standards: TIA EIA 603-C, ANSI 63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

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.

Test Facility

The Test site used by BACL Corp. to collect radiated and conducted emission measurement data is located at it's facility in Sunnyvale, California, USA.

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 has 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 facility also complies with the test methods and procedures set forth in ANSI C63.4-2003& TIA/EIA-603.

The Federal Communications Commission, Industry Canada, and Voluntary Control Council for Interference have the reports on file and are listed under FCC file 31040/SIT 1300F2, IC registration number: 3062A, and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC, IC, and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm>

SYSTEM TEST CONFIGURATION

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.

Block Diagram

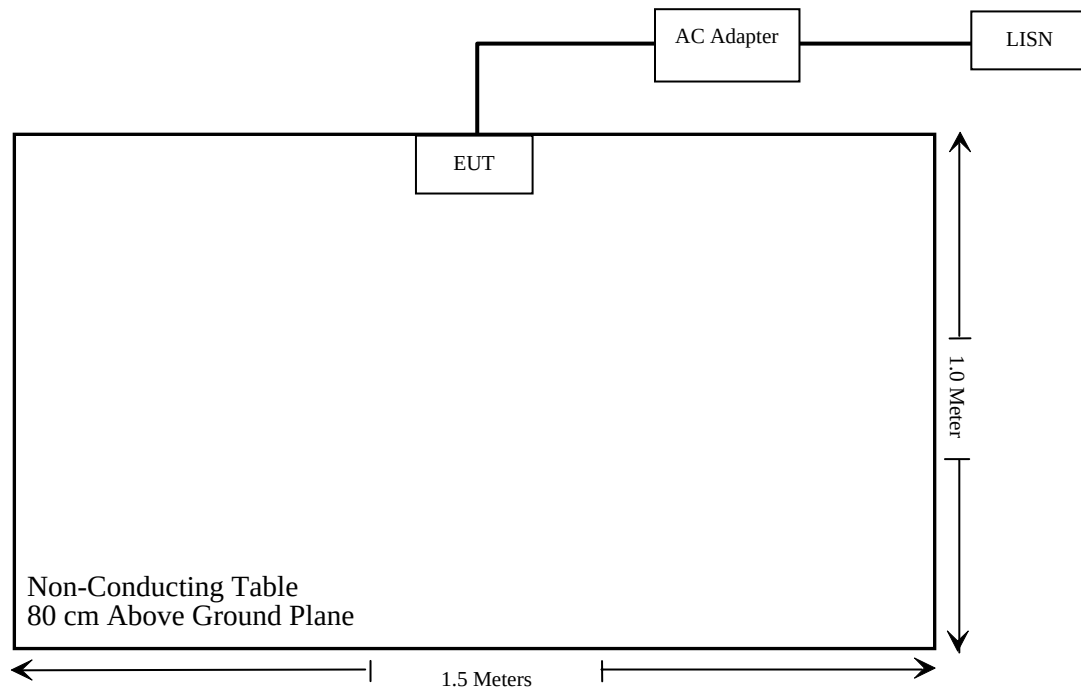
Please refer to Exhibit D.

Equipment Modifications

No modifications were made to the EUT.

Power Supply and Line Filters

Manufacturer	Description	Model	Serial Number
TERA TELECOM	Power Adaptor	TTA-5020K	T66000037A

Test Setup Block Diagram

SUMMARY OF TEST RESULTS

Results reported relate only to the product tested, serial number: *TTUSA1000*.

FCC RULE	DESCRIPTION OF TEST	Result
§2.1046 § 22.913	RF power output	Compliant
§ 2.1049 § 22.917(b)	Emission Bandwidth	Compliant
2.1051 § 22.917(a)	Spurious emissions at antenna terminals	Compliant
2.1053	Spurious Radiated Emissions	Compliant
§ 22.917	Band Edge	Compliant
§ 2.1047	Modulation Characteristics	N/A
§ 2.1055 § 22.355	Frequency stability	Compliant
IS-138a (3.4.4)	Two-Tone Test	Compliant
2.1091	RF Exposure	Compliant

§2.1046 & §22.913(a) - RF POWER OUTPUT

Applicable Standard

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

Test Procedure

Conducted Measurement:

The antenna was removed and SMA connector was connected to the transmitter output. The transmitter output was connected to a calibrated coaxial attenuator (50 Ohm), the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter was determined by adding the value of the attenuator to the power meter reading.

The test was performed at three frequencies (low, middle, and high channels) and on all power levels which can be setup on the transmitter.

Radiated Measurement:

The transmitter was placed on a wooden 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.

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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	E4446A	US44300386	2006-03-06
R&S	Generator, Signal	SMIQ03	849192/0085	2006-06-02

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

Environmental Conditions

Temperature:	27° C
Relative Humidity:	37%
ATM Pressure:	1020 mbar

* The testing was performed by James Ma on 2006-07-19.

Conducted Power: CDMA**Forward (downlink)**

Channel	Frequency (MHz)	Output Power in dBm	Output Power in W	Antenna in dBi	Limit in ERP dBm
Low	869.73	5.19	0.0033	0	38.45
Middle	881.40	7.31	0.00538	0	38.45
High	893.19	5.81	0.00381	0	38.45

Reverse (uplink)

Channel	Frequency (MHz)	Output Power in dBm	Output Power in W	Antenna in dBi	Limit in ERP dBm
Low	824.73	7.16	0.00520	5	38.45
Middle	836.40	7.30	0.00537	5	38.45
High	848.19	3.73	0.00236	5	38.45

Conducted Power: GSM**Forward (downlink)**

Channel	Frequency (MHz)	Output Power in dBm	Antenna in dBi	Limit in ERP dBm
Low	869.20	5.17	0	38.45
Middle	881.60	7.80	0	38.45
High	893.80	6.39	0	38.45

Reverse (uplink)

Channel	Frequency (MHz)	Output Power in dBm	Antenna in dBi	Limit in ERP dBm
Low	824.20	6.51	5	38.45
Middle	836.60	7.15	5	38.45
High	848.80	4.94	5	38.45

Conducted Power: TDMA**Forward (downlink)**

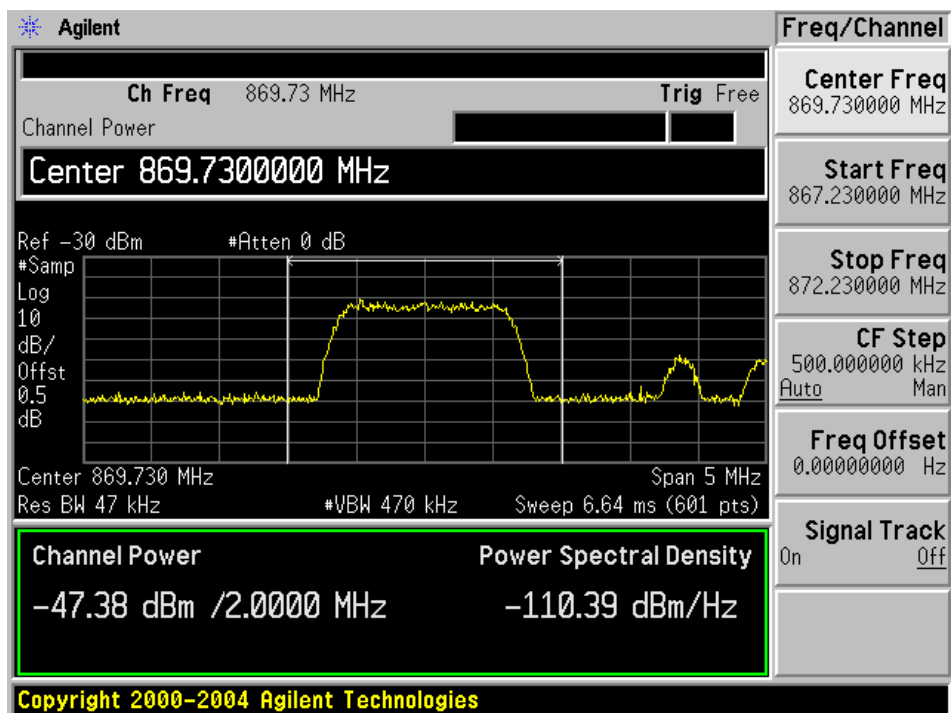
Channel	Frequency (MHz)	Output Power in dBm	Antenna in dBi	Limit in ERP dBm
Low	869.04	2.84	0	38.45
Middle	881.48	6.39	0	38.45
High	893.92	4.94	0	38.45

Reverse (uplink)

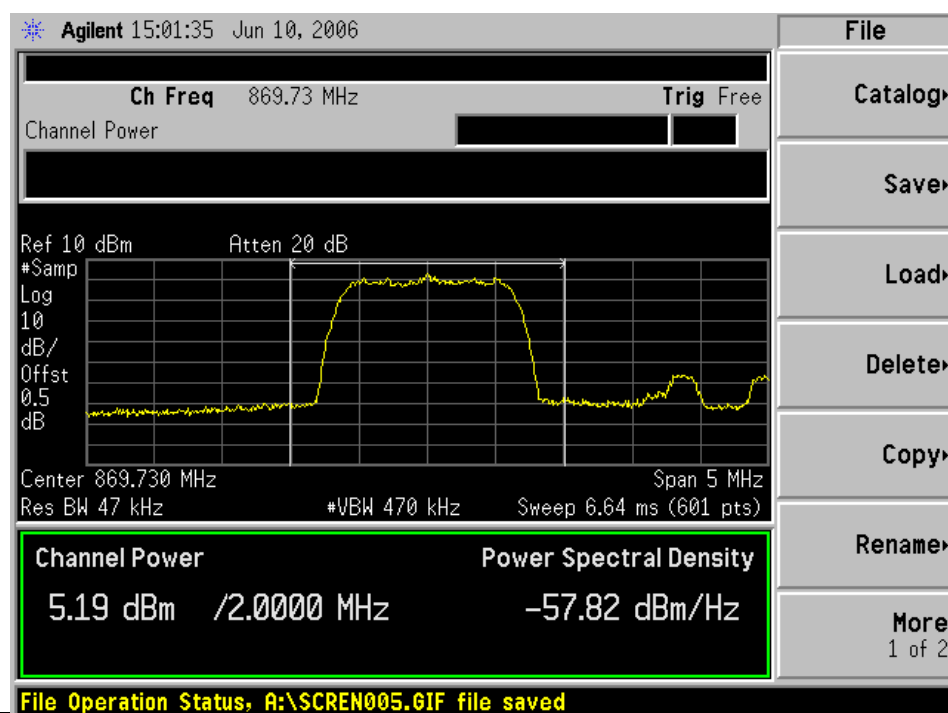
Channel	Frequency (MHz)	Output Power in dBm	Antenna in dBi	Limit in ERP dBm
Low	824.04	2.11	5	38.45
Middle	836.48	4.22	5	38.45
High	848.92	0.68	5	38.45

CDMA**Forward (downlink):***Low channel*

Input:

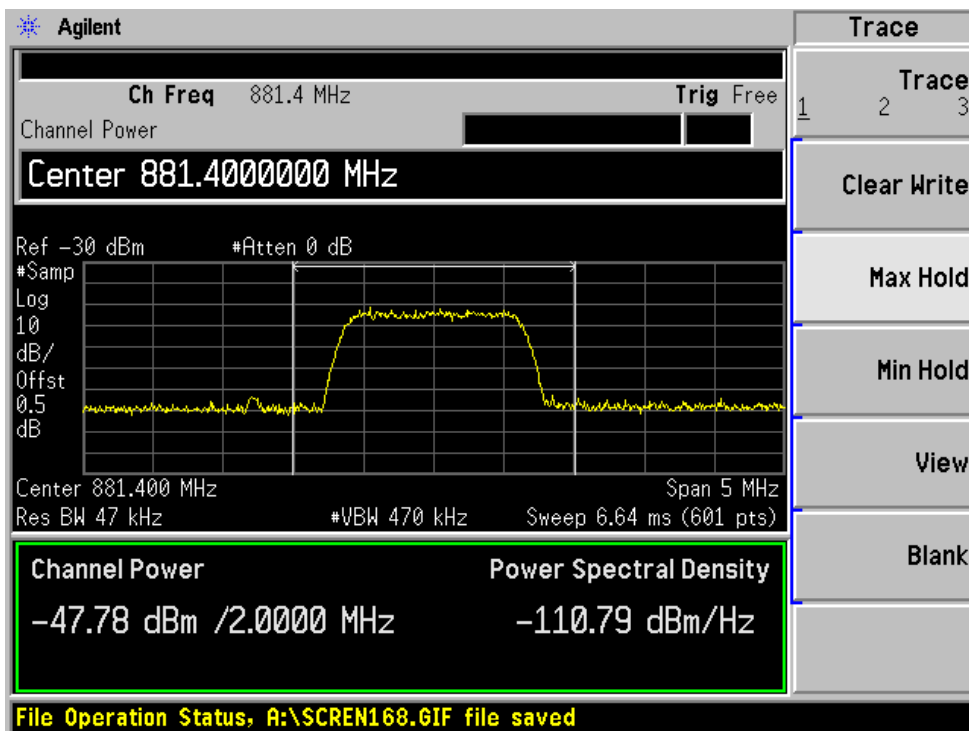


Output:

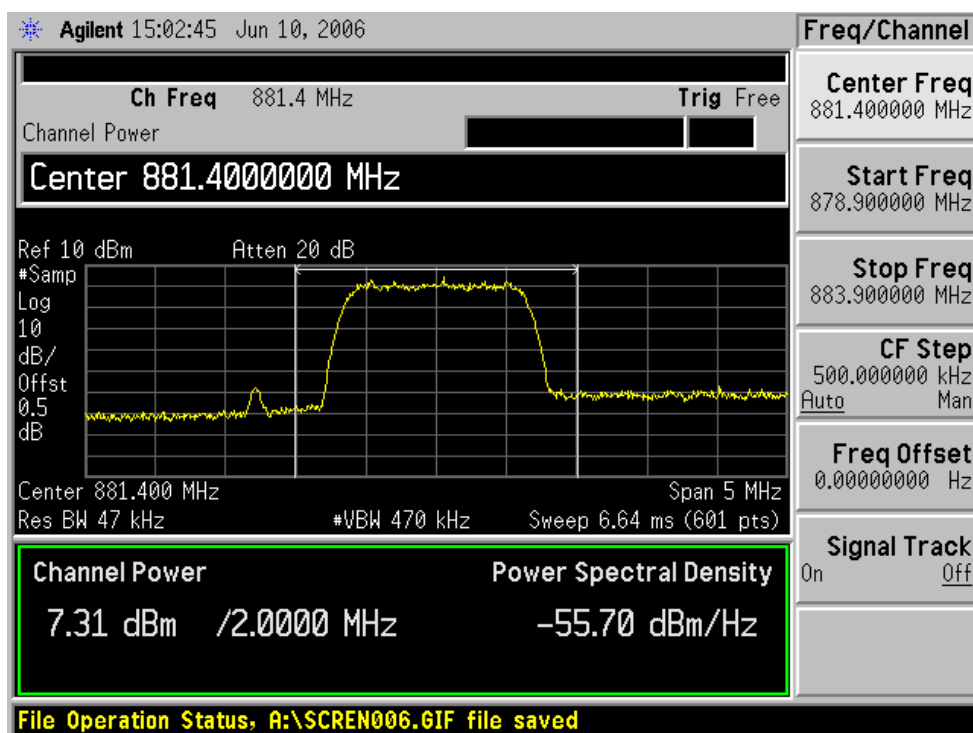


Mid channel

Input:

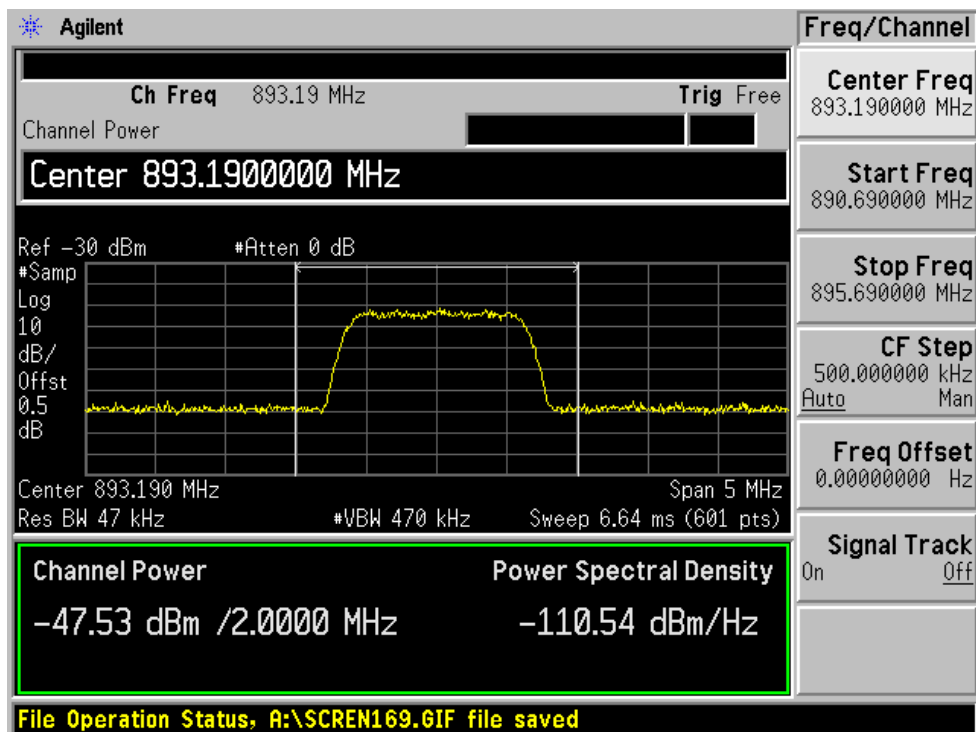


Output:

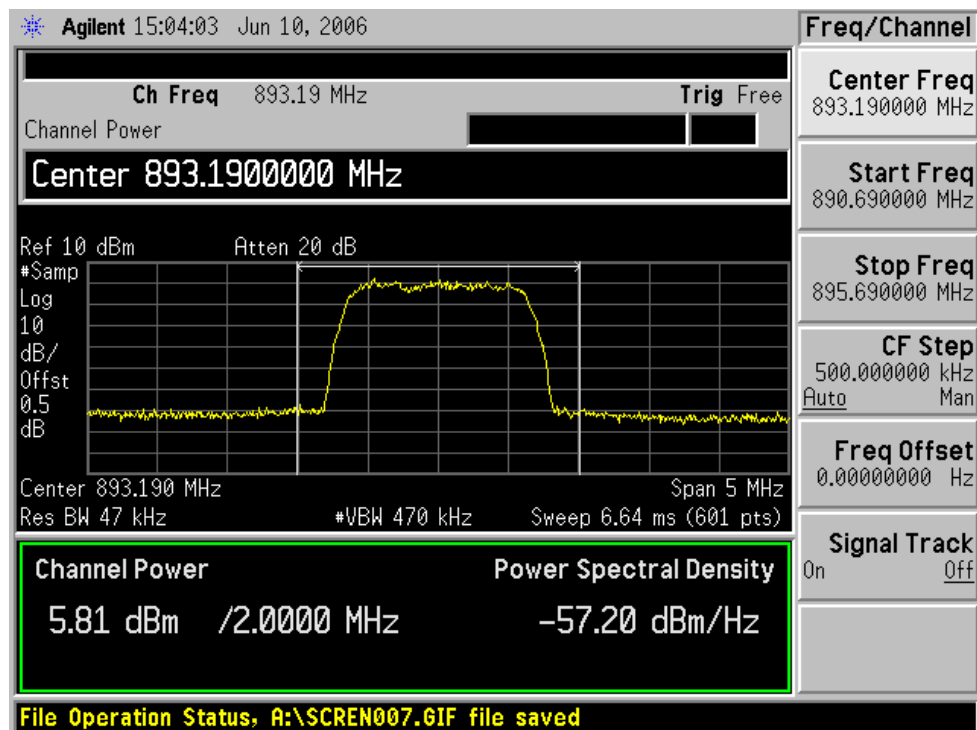


High channel

Input:

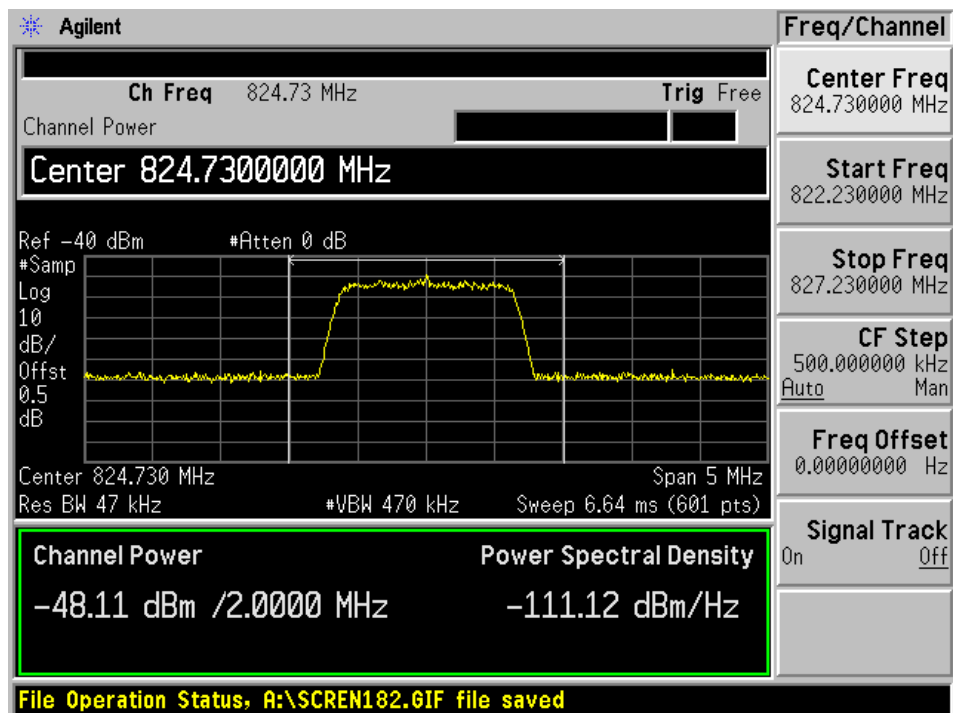


Output:

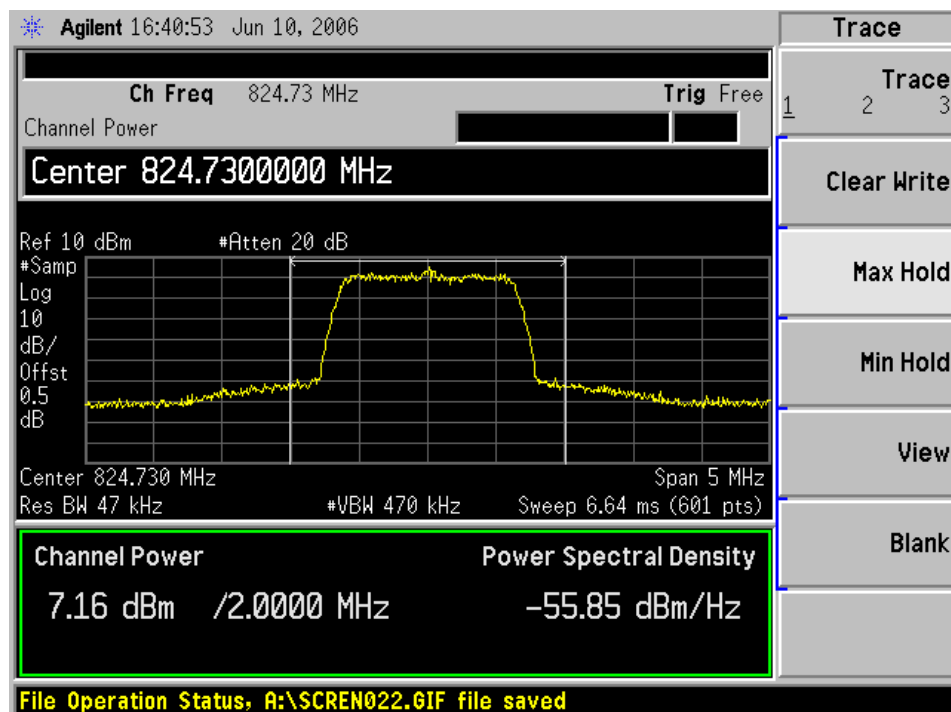


**CDMA
Reverse (uplink):***Low Channel*

Input:

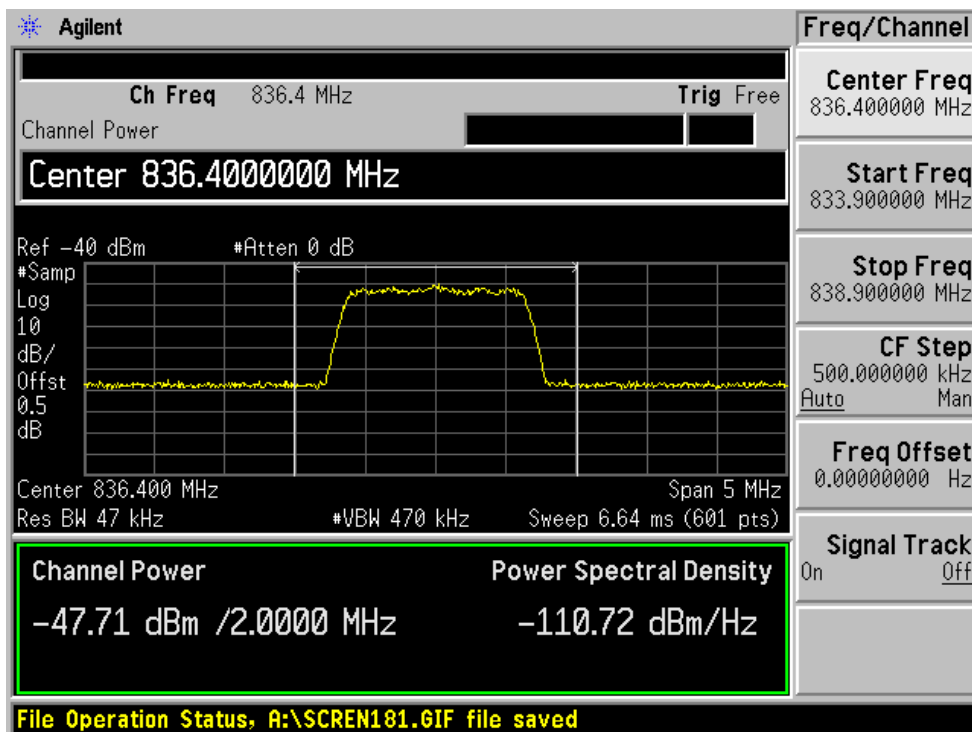


Output:

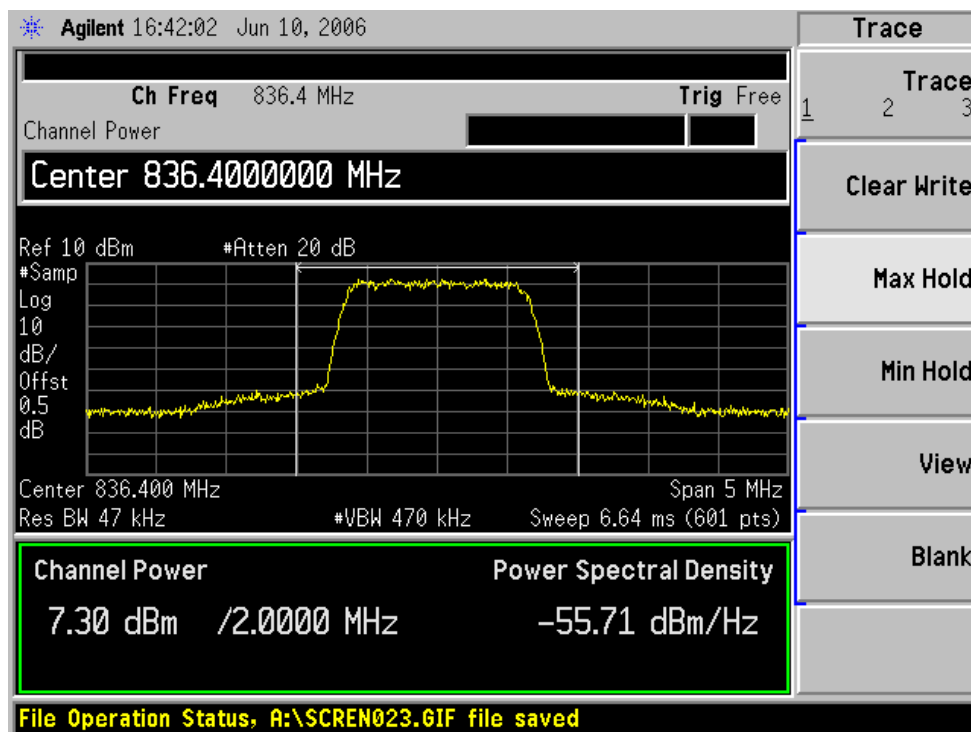


Mid Channel

Input:

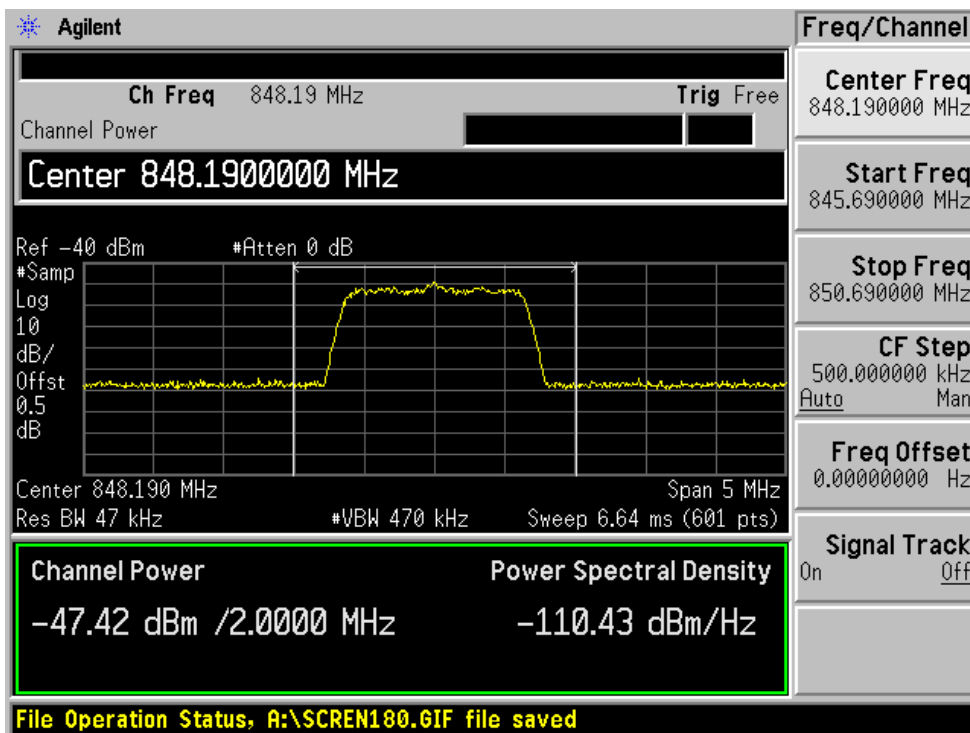


Output:

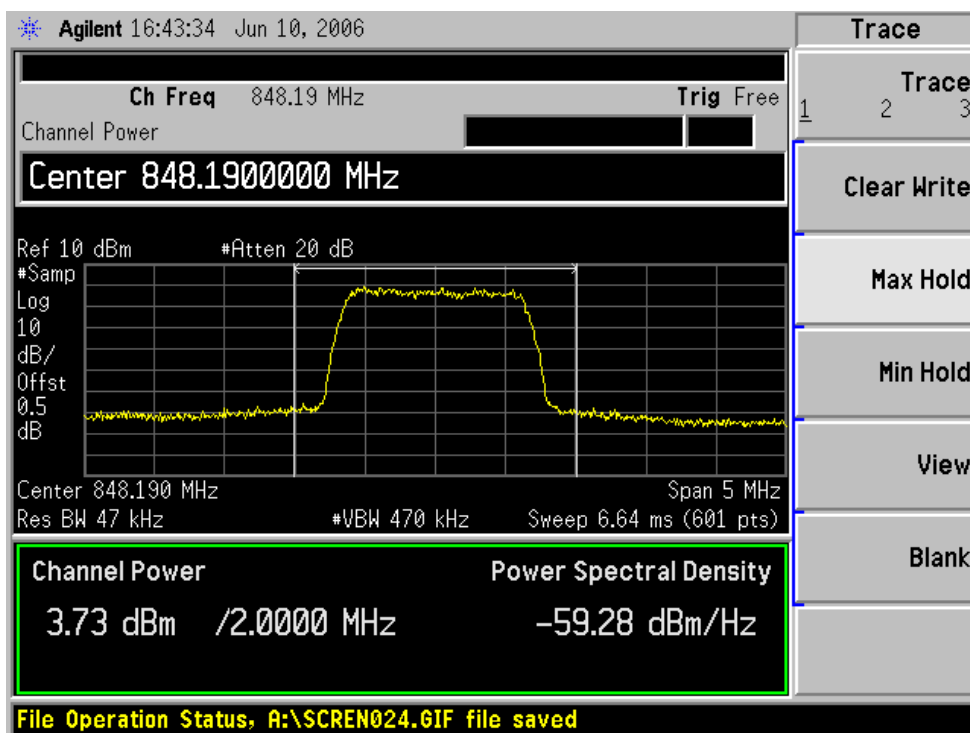


High Channel

Input:



Output:

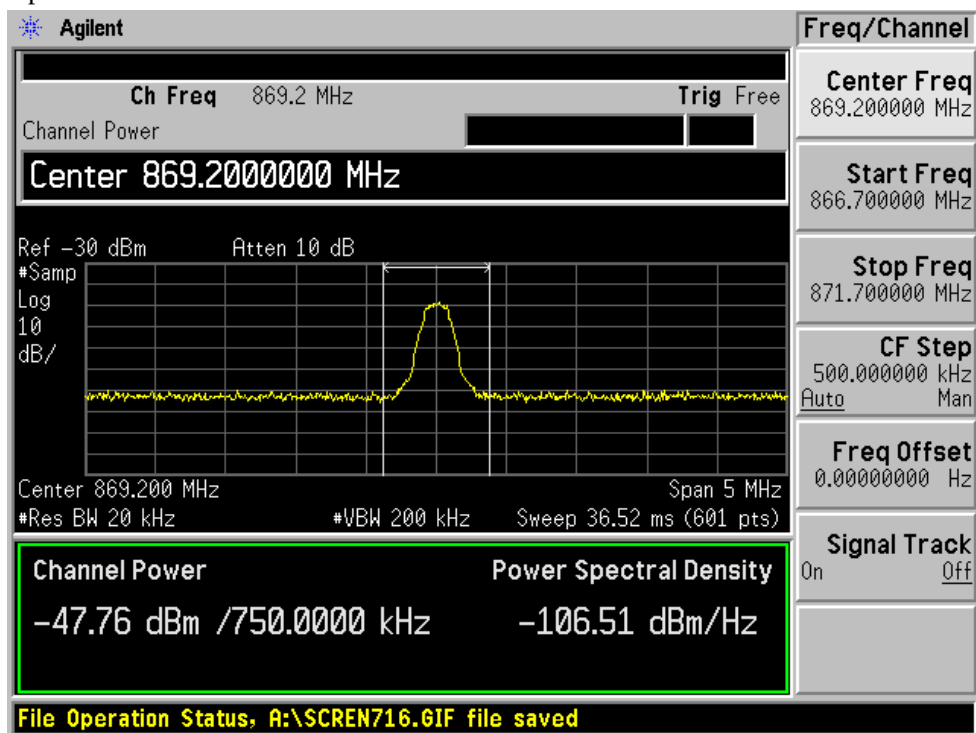


GSM

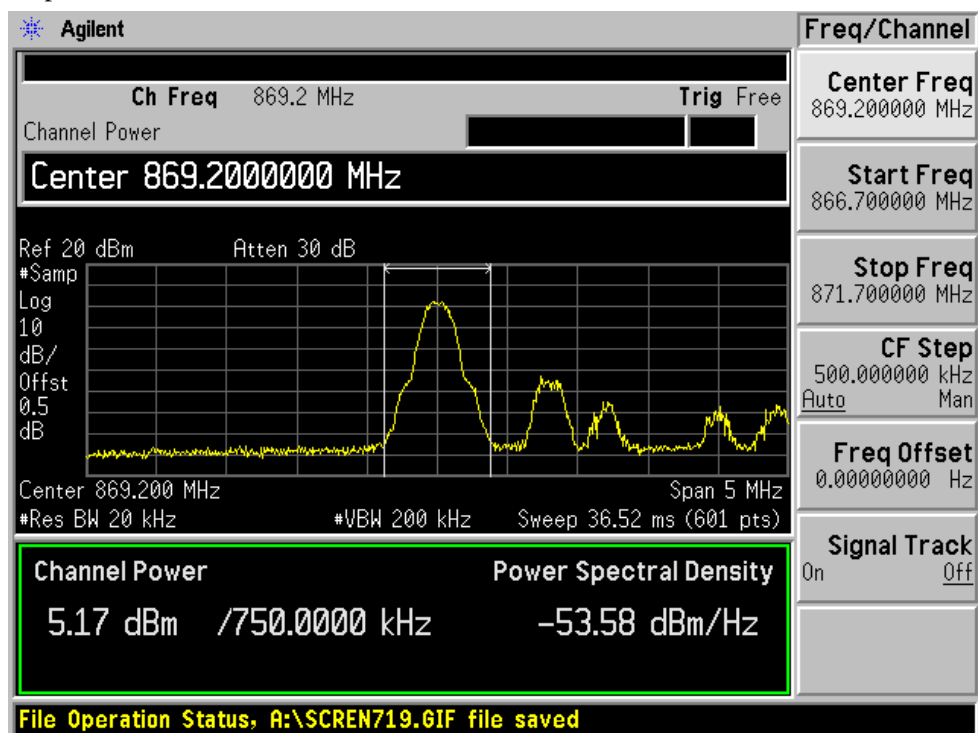
Forward (Down Link)

Low Channel

Input:

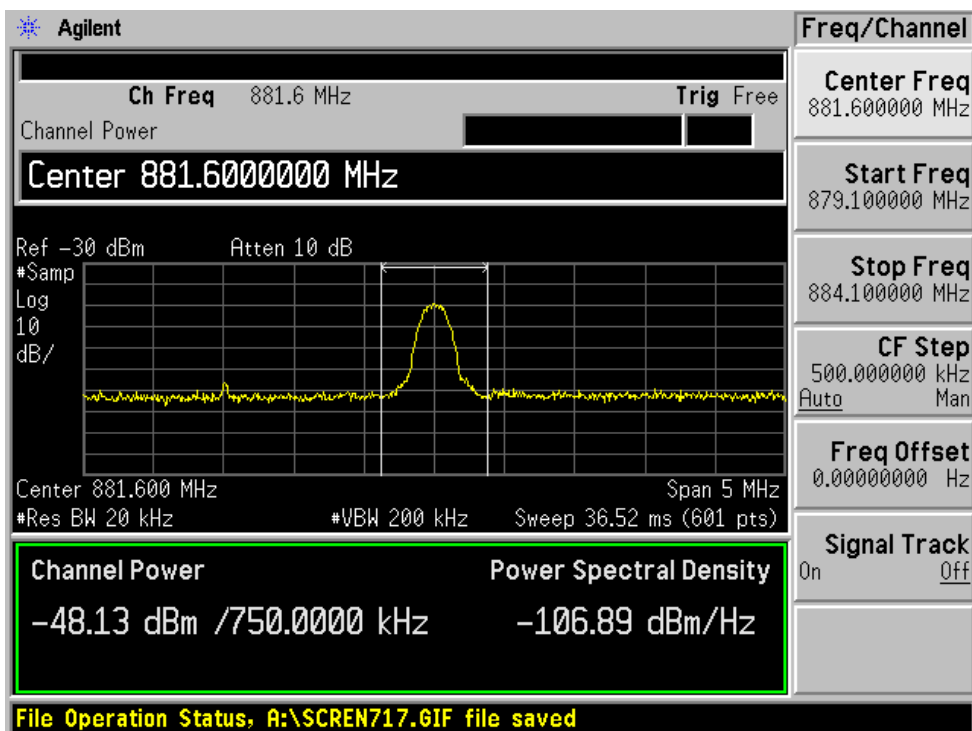


Output:

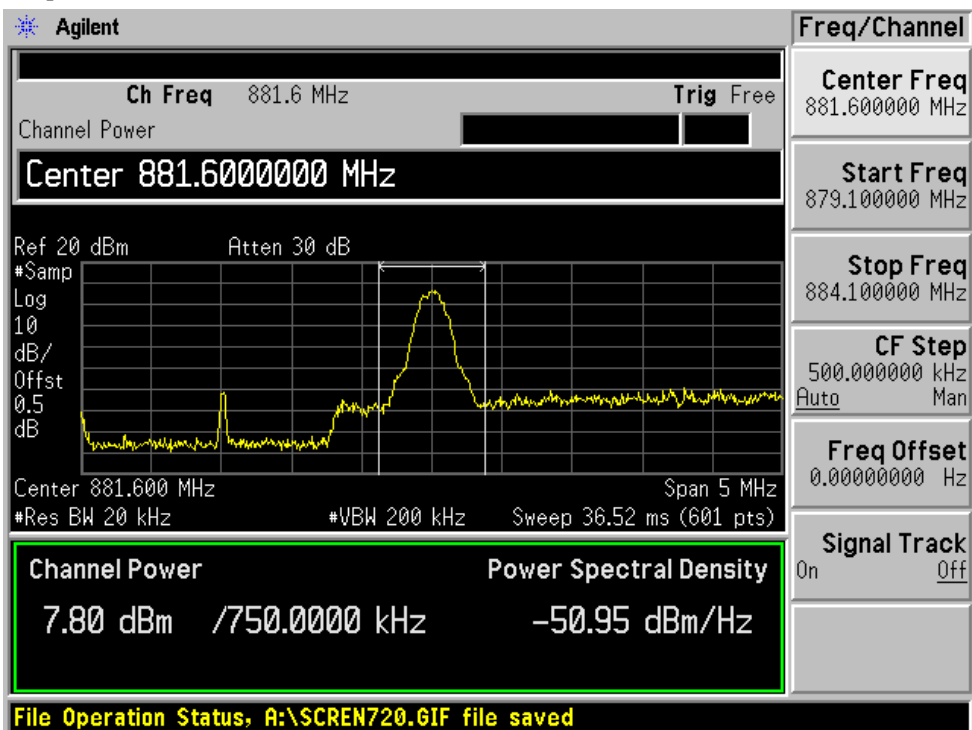


Mid Channel

Input:

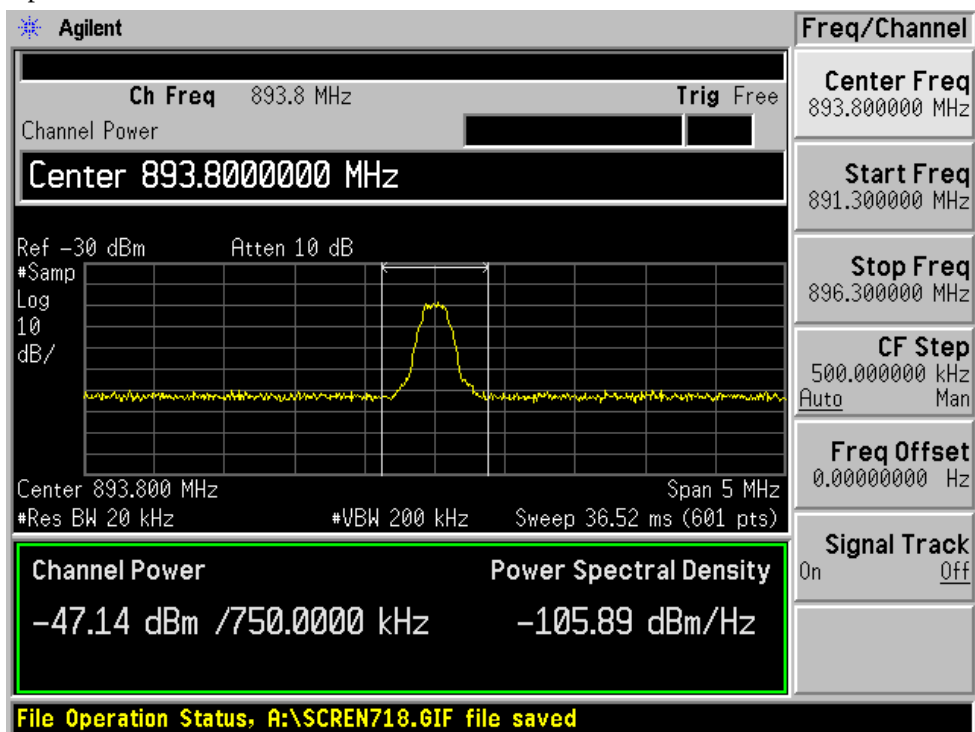


Output:

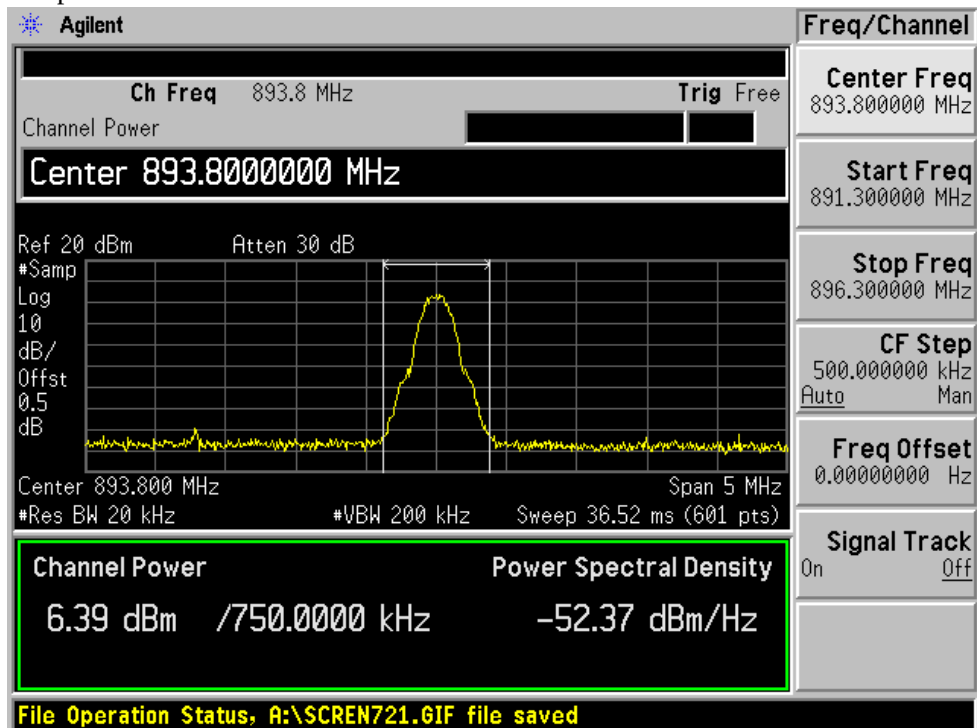


High Channel

Input:



Output:

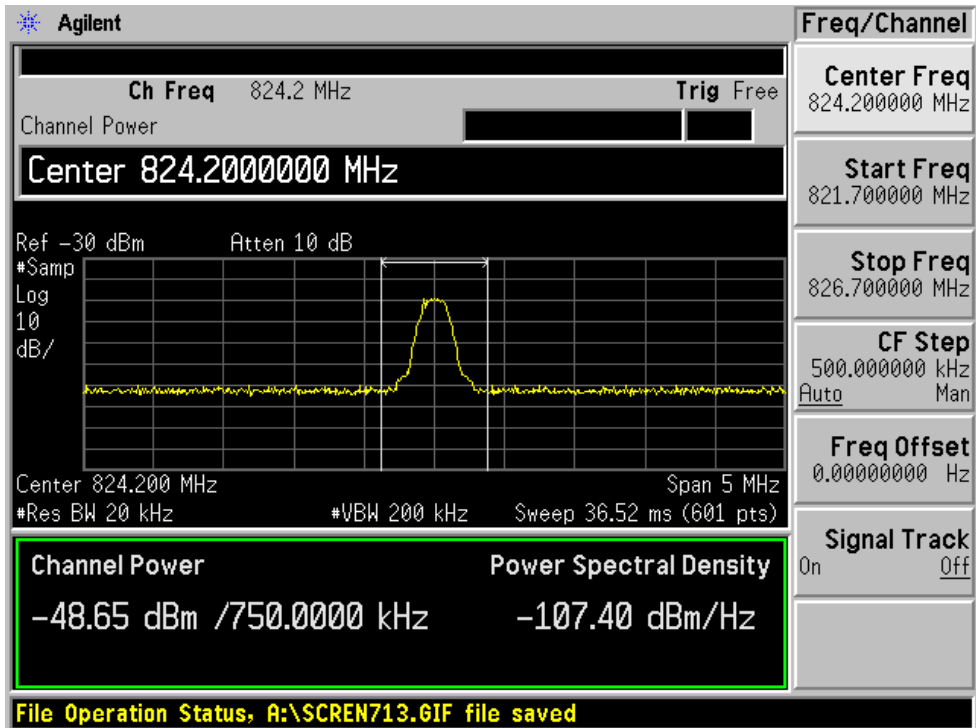


GSM

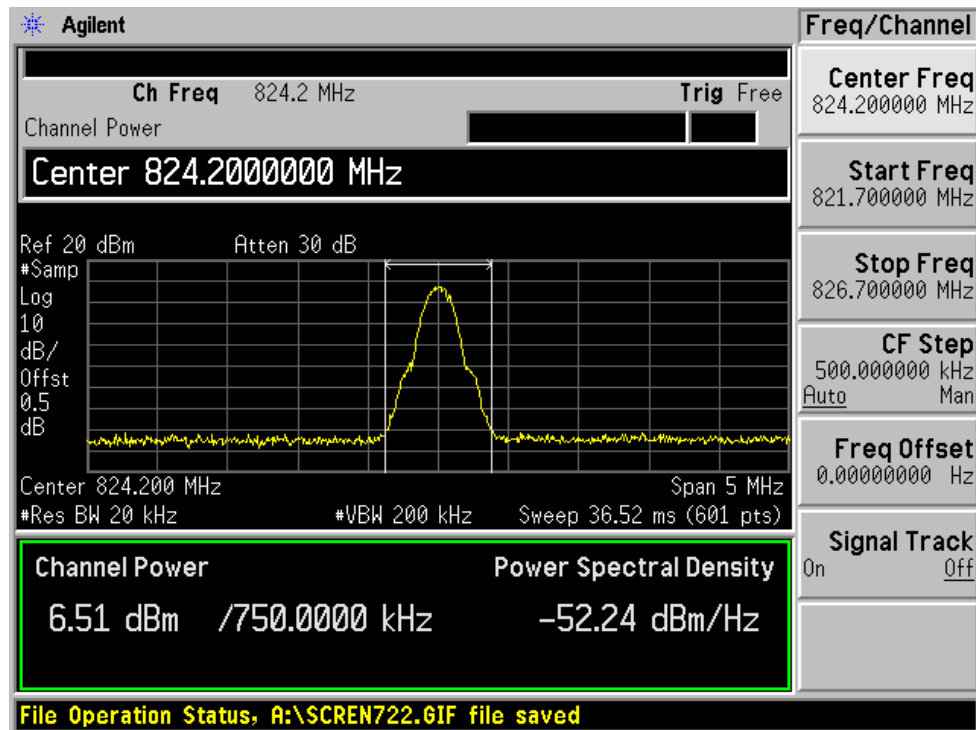
Reverse (Uplink)

Low Channel

Input:

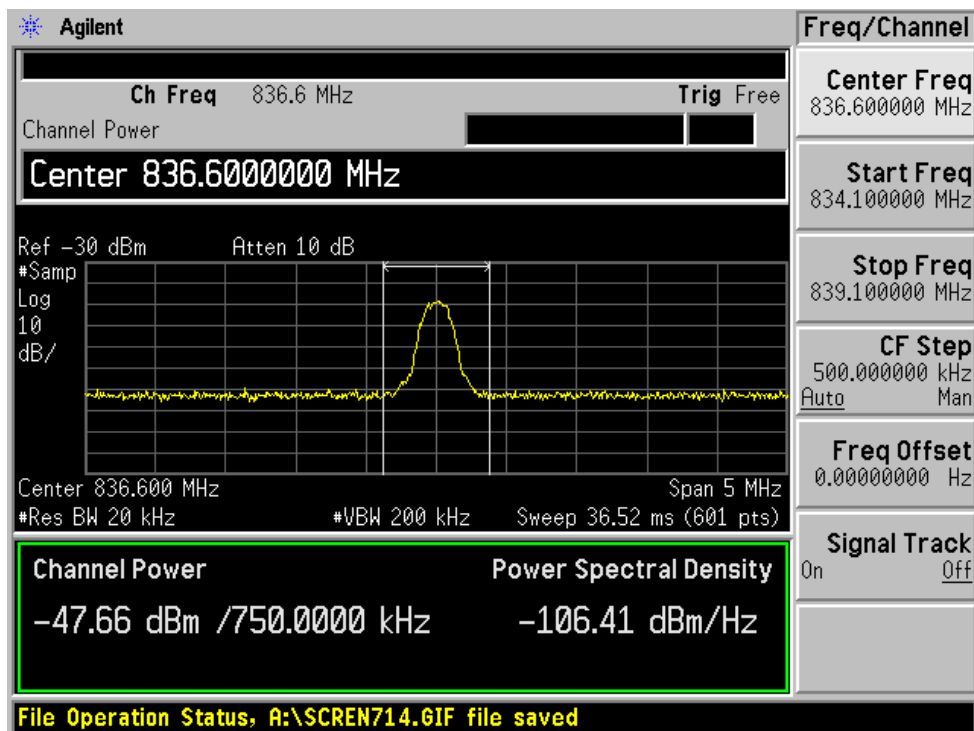


Output:

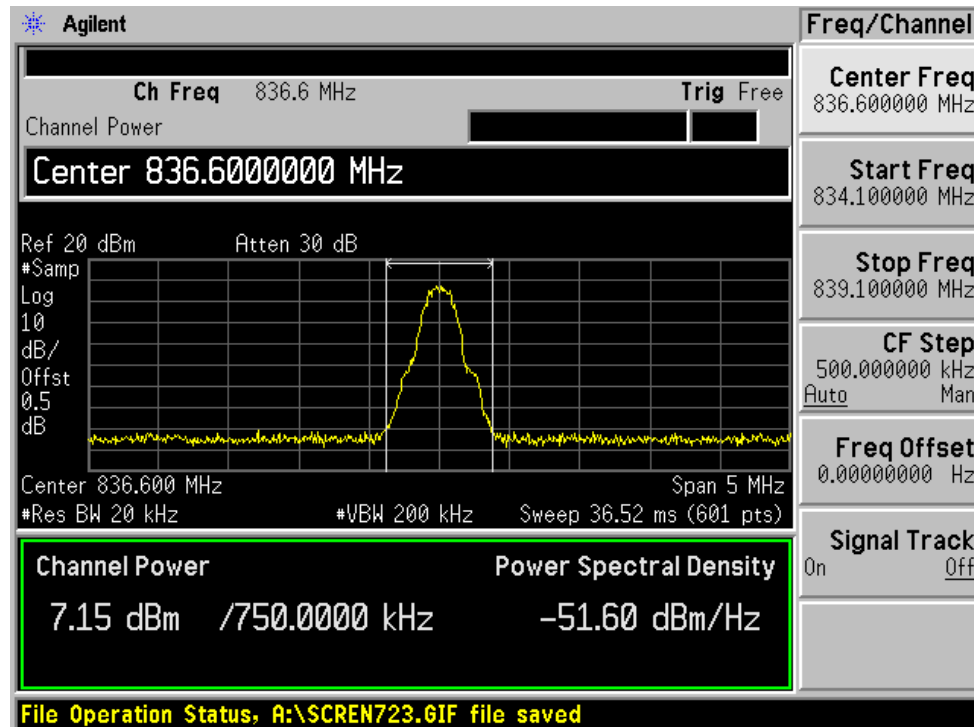


Mid Channel

Input:

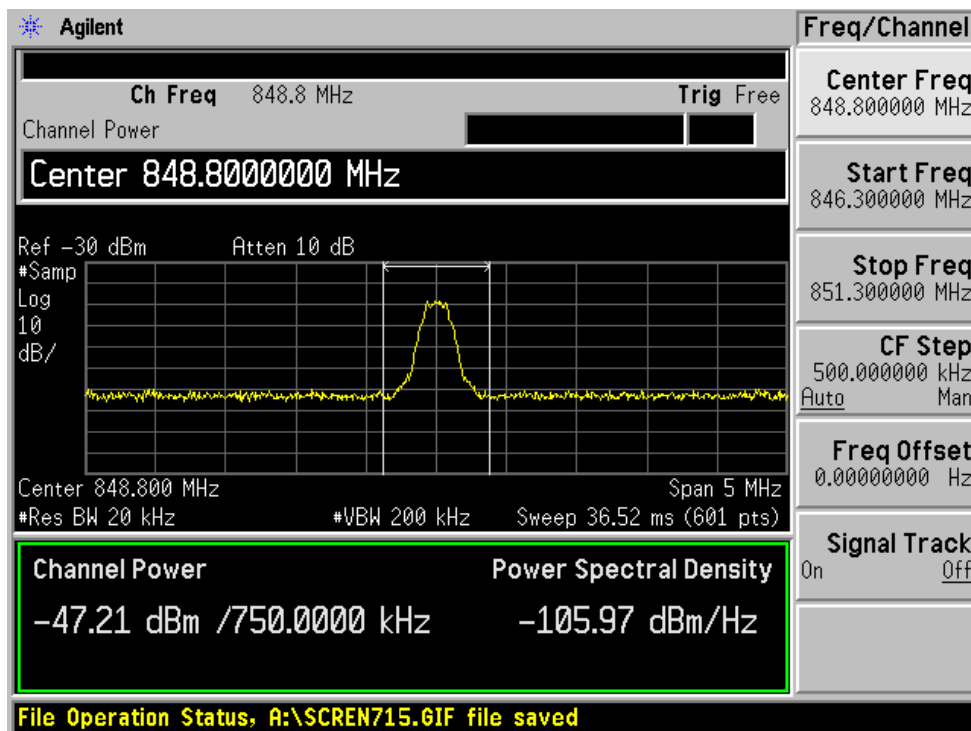


Output:

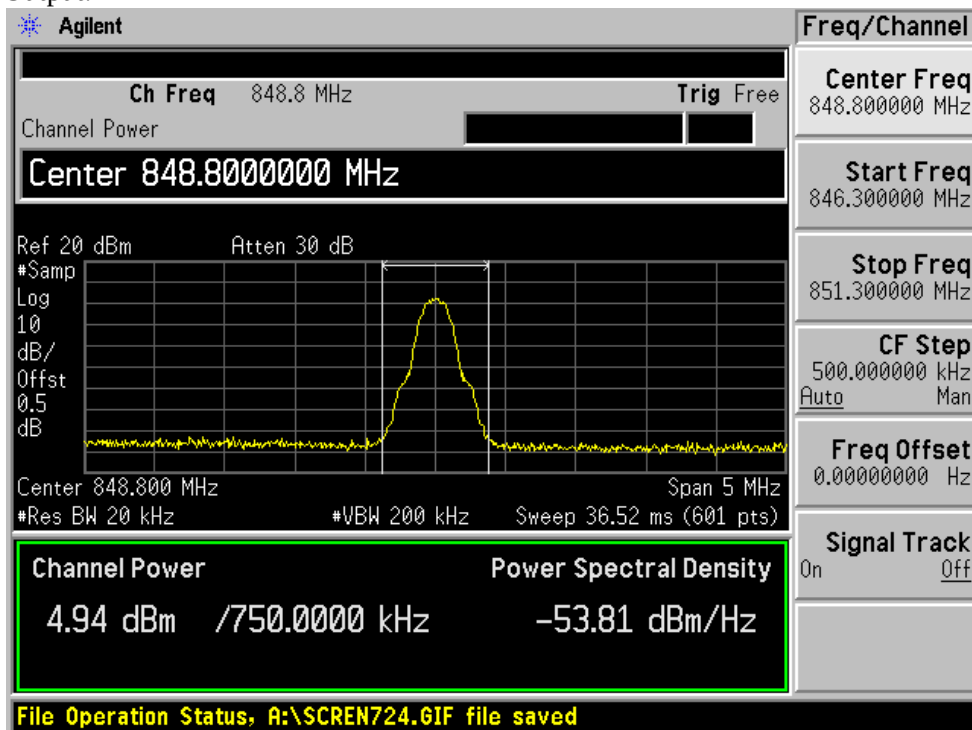


High Channel

Input:



Output:

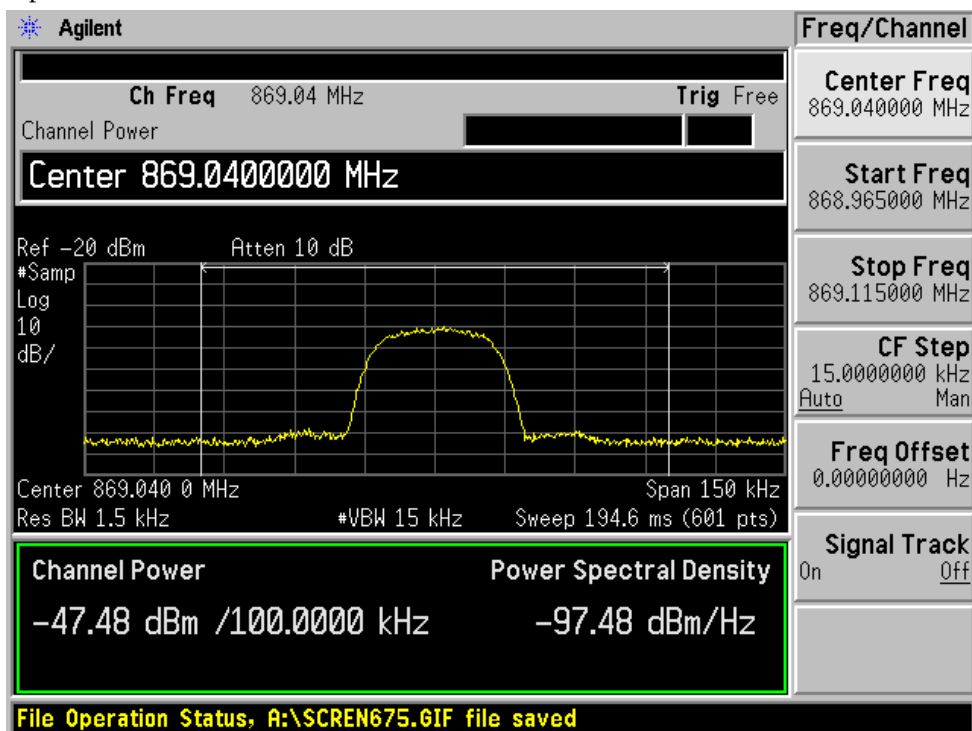


TDMA

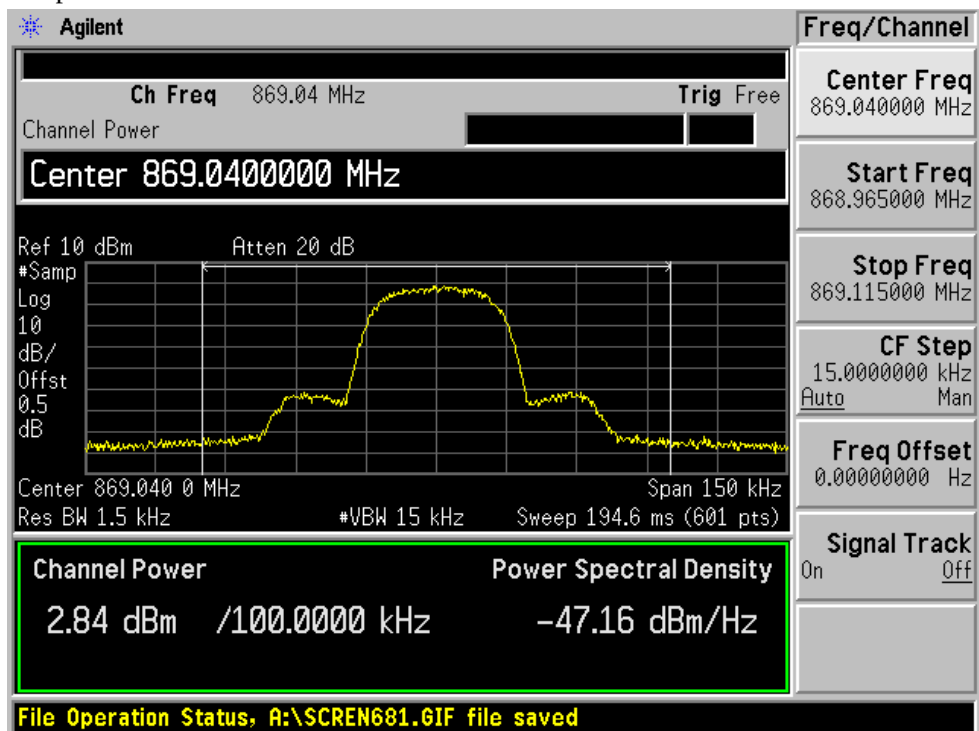
Forward (Down Link)

Low Channel

Input:

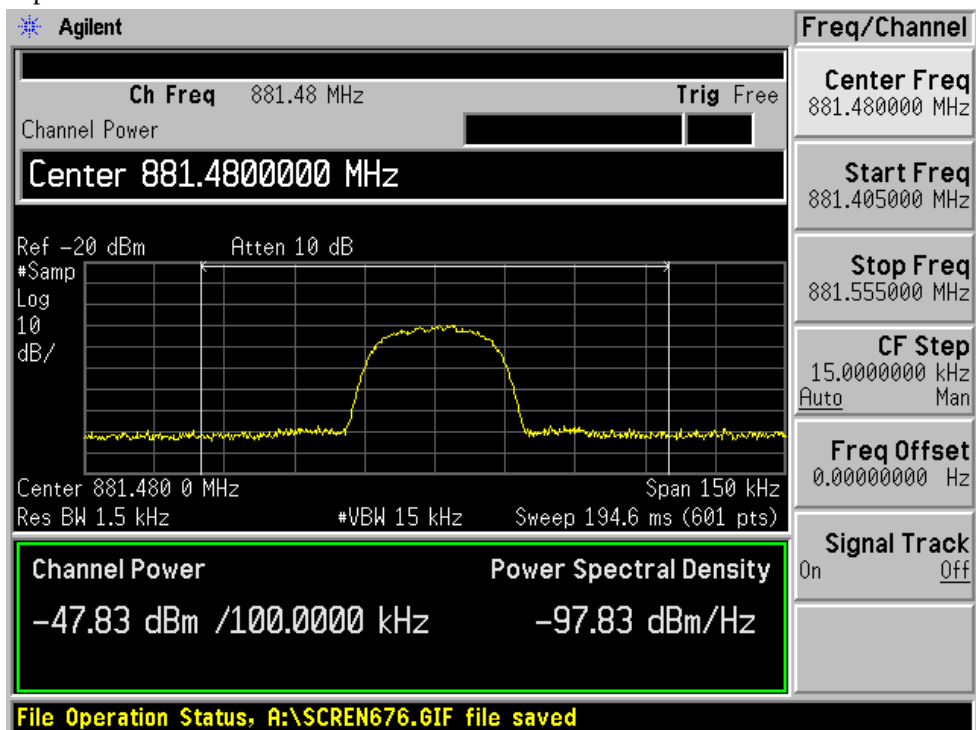


Output:

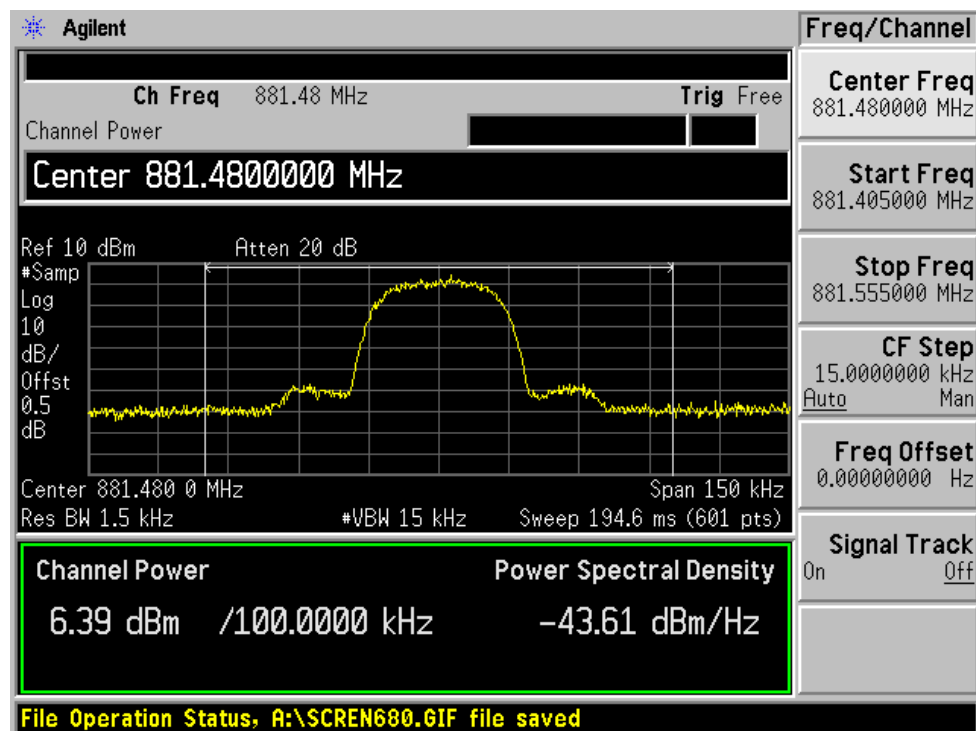


Mid Channel

Input:

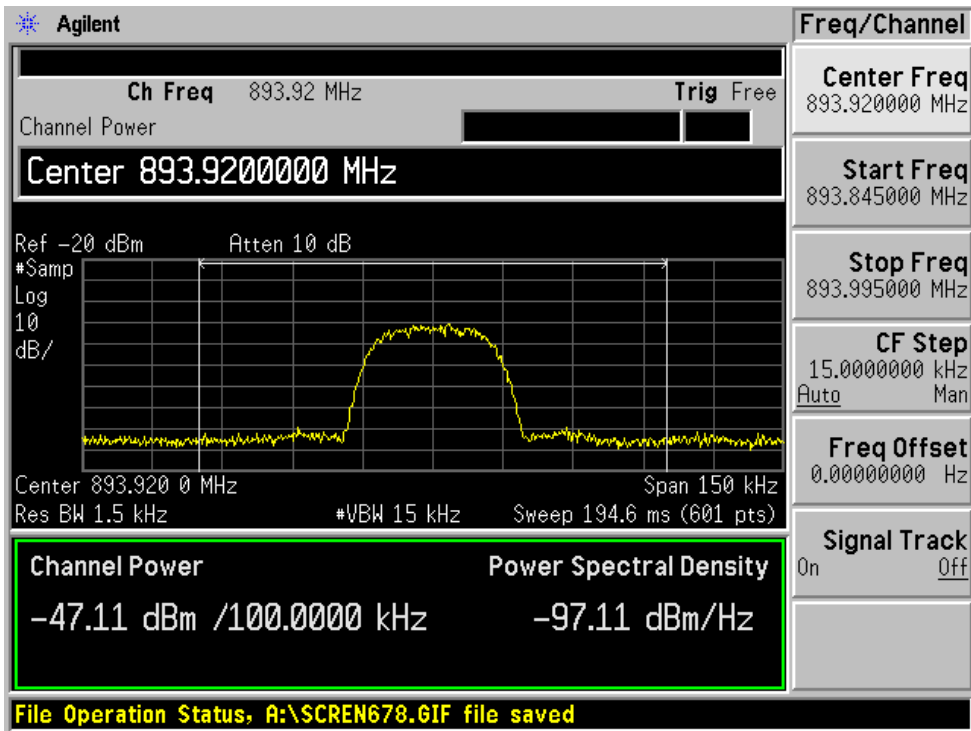


Output:

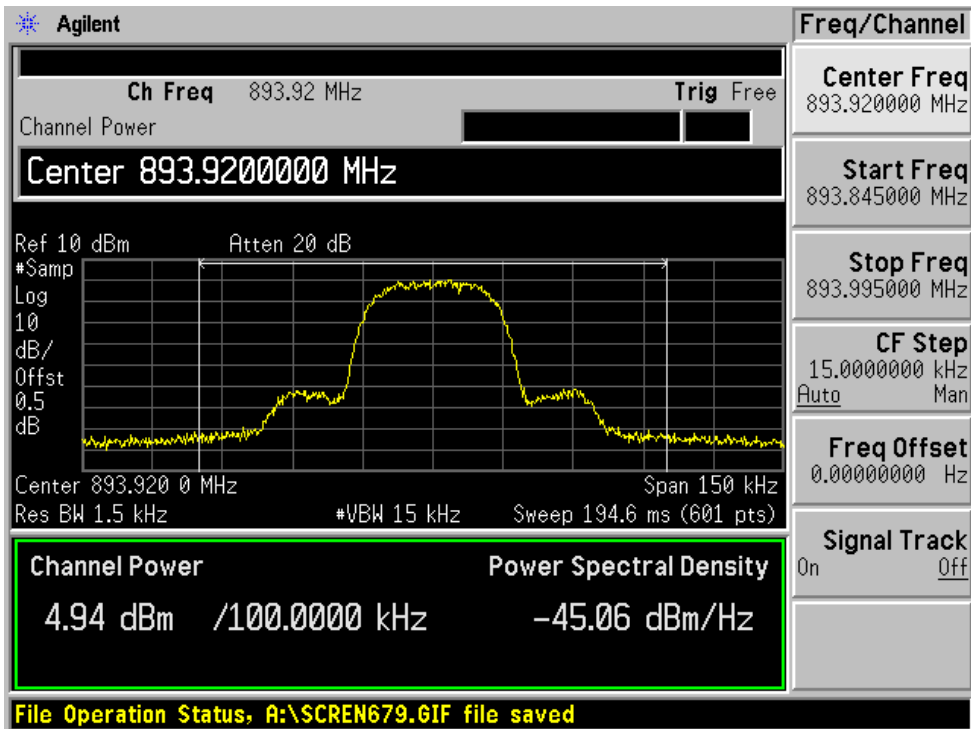


High Channel

Input:



Output:

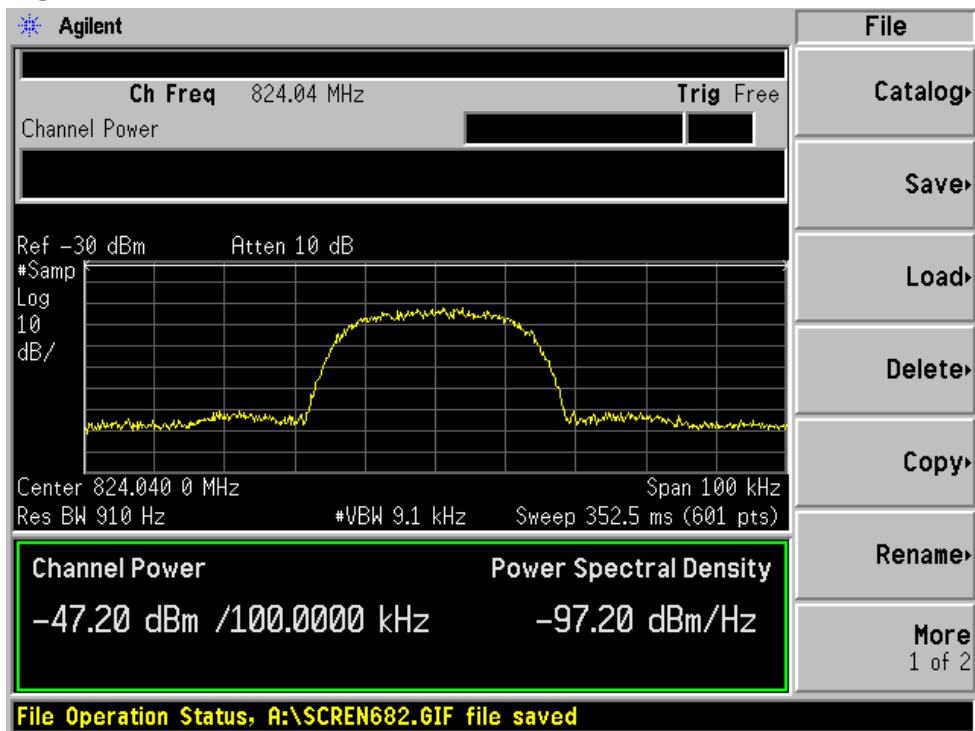


TDMA

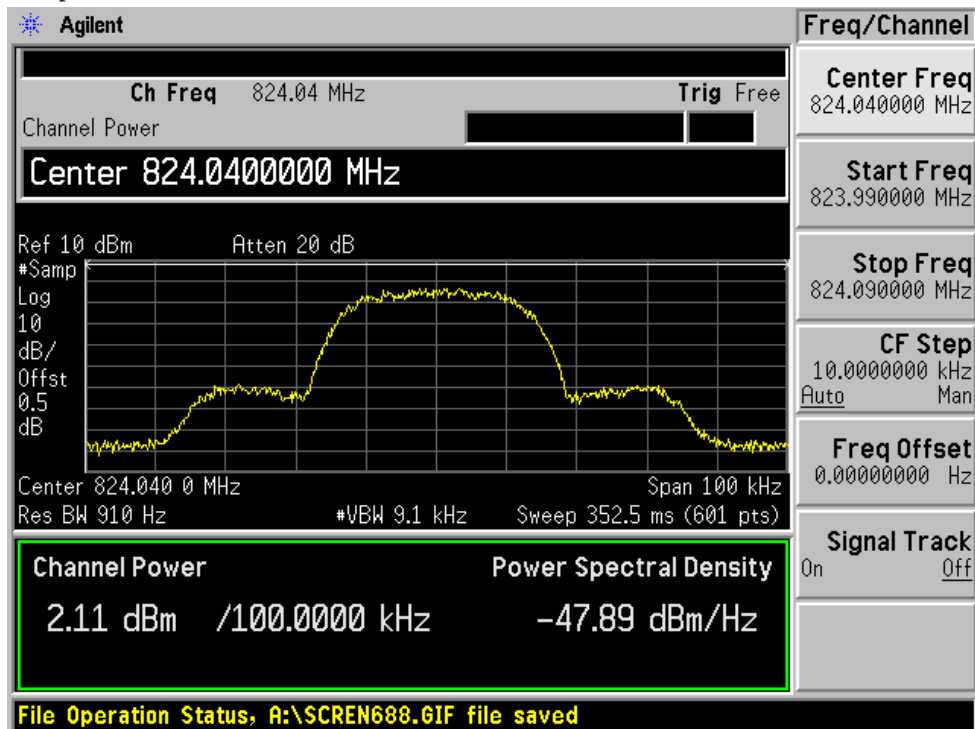
Reverse (Uplink)

Low Channel

Input:

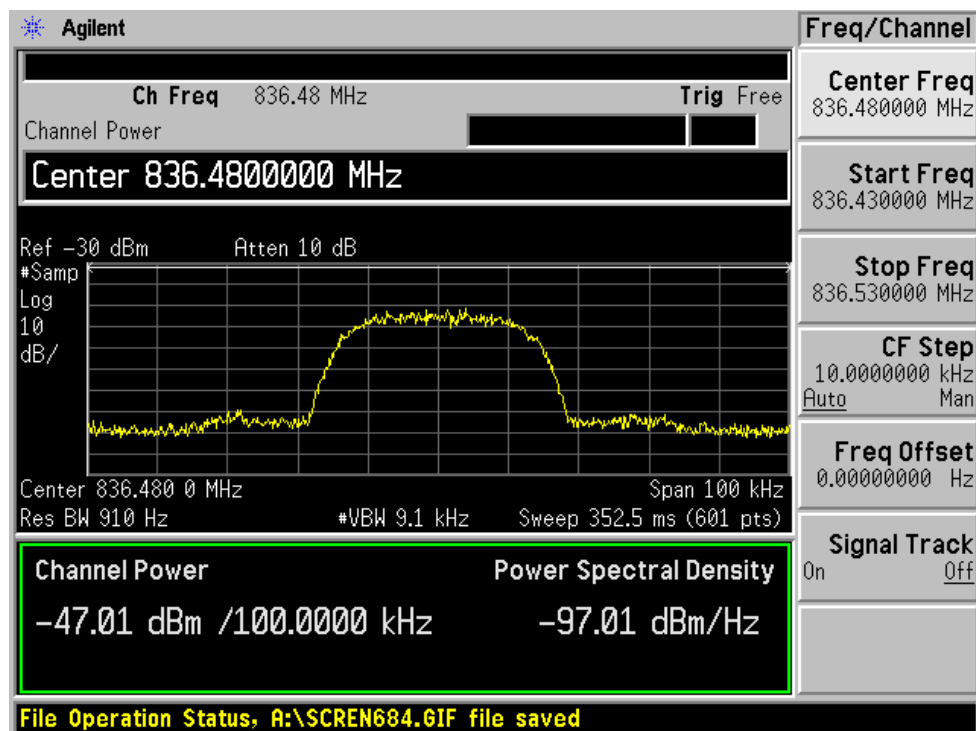


Output:

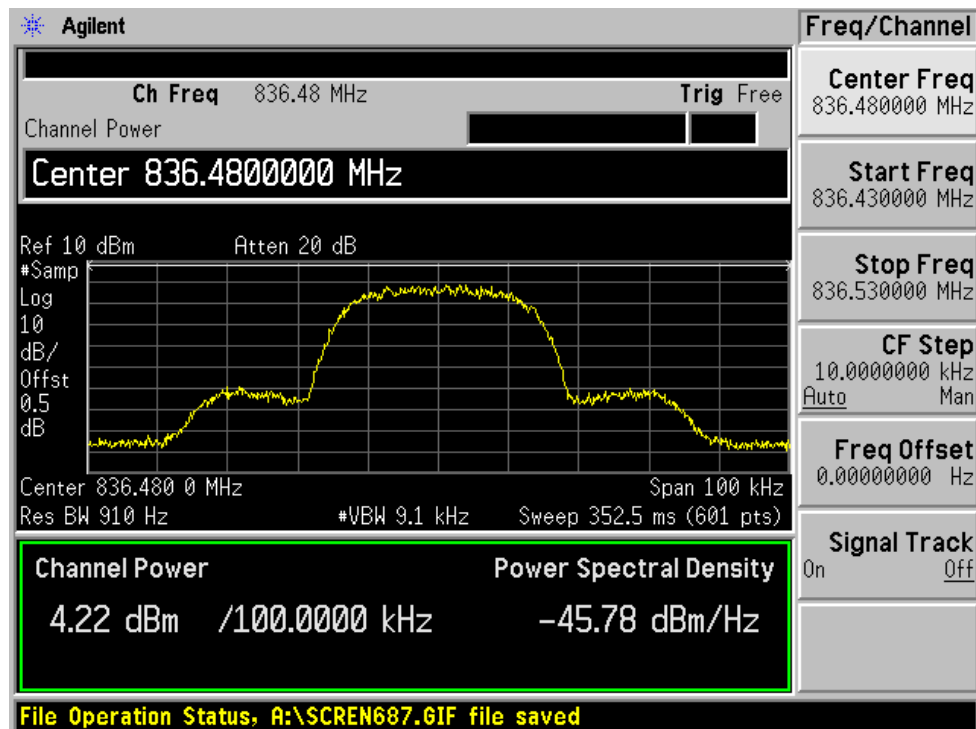


Mid Channel

Input:

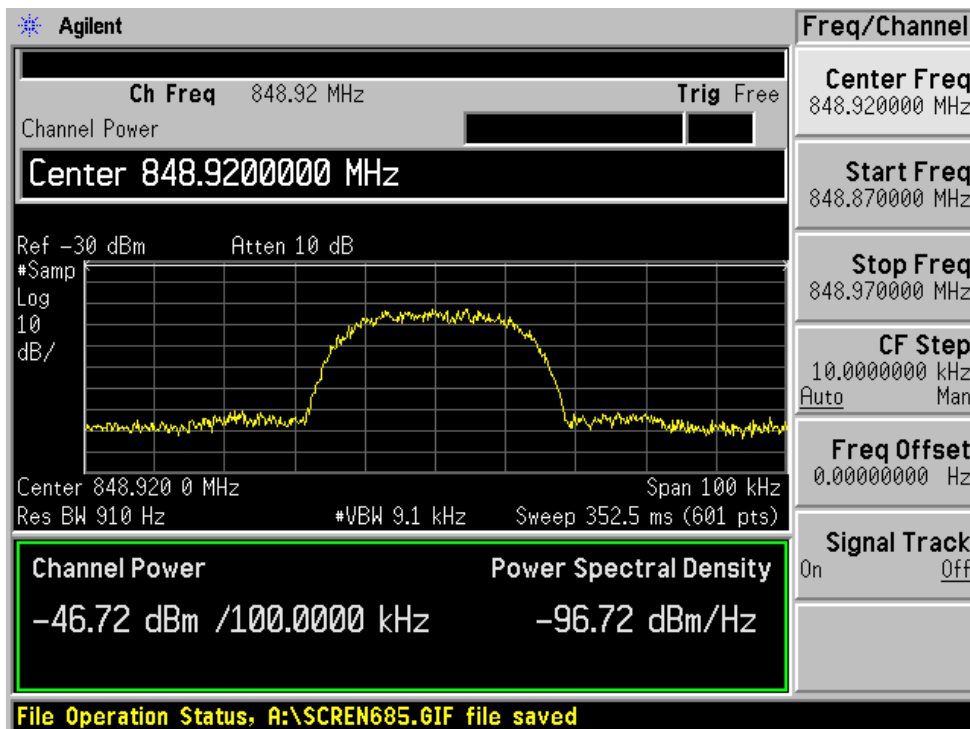


Output:

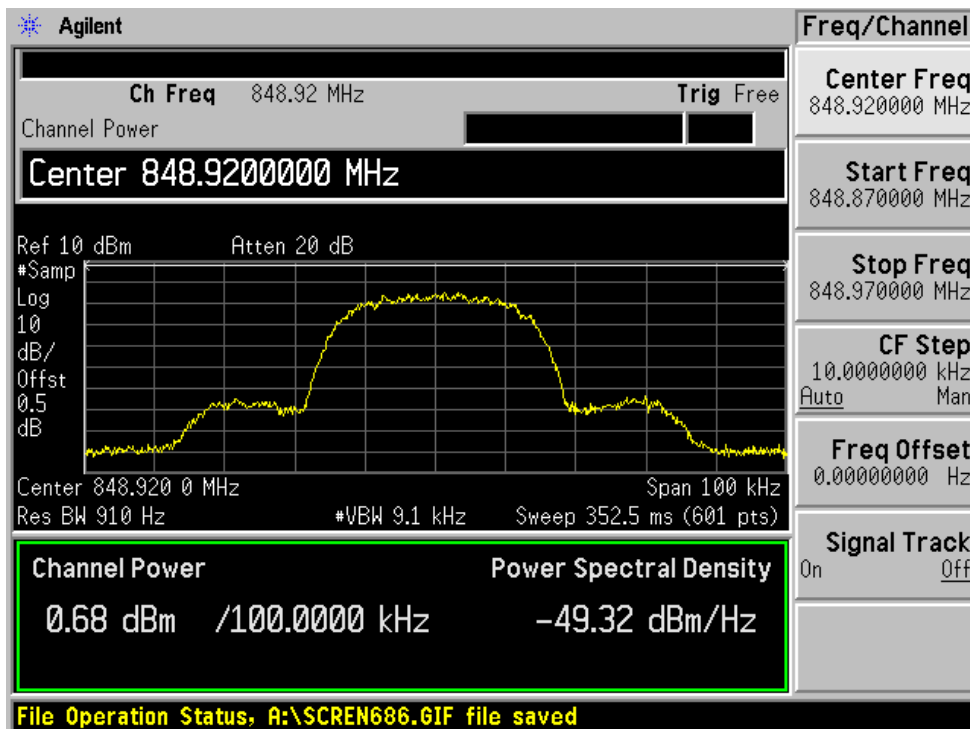


High Channel

Input:



Output:



§2.1049 & §22.917(b) - OCCUPIED BANDWIDTH

Applicable Standards

Requirements: CFR 47, Section 2.1049 and 22.917(b).

Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 30 KHz and the spectrum was recorded.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	E4446A	US44300386	2006-03-06
R&S	Generator, Signal	SMIQ03	849192/0085	2006-06-02

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

Environmental Conditions

Temperature:	27° C
Relative Humidity:	37%
ATM Pressure:	1020 mbar

* The testing was performed by James Ma on 2006-07-19.

Test Results

CDMA

Forward (downlink)

Channel	Channel frequency (MHz)	99% Power Bandwidth (MHz)	26 dB Bandwidth (MHz)
Low	869.73	1.264	1.441
Middle	881.40	1.269	1.436
High	893.19	1.263	1.433

Reverse (uplink)

Channel	Channel frequency (MHz)	99% Power Bandwidth (MHz)	26 dB Bandwidth (MHz)
Low	824.73	1.271	1.434
Middle	836.40	1.267	1.417
High	848.19	1.274	1.419

GSM*Forward (downlink)*

Channel	Channel frequency (MHz)	99% Power Bandwidth (KHz)	26 dB Bandwidth (KHz)
Low	869.20	269.29	367.16
Middle	881.60	270.12	369.00
High	893.80	269.10	367.73

Reverse (uplink)

Channel	Channel frequency (MHz)	99% Power Bandwidth (KHz)	26 dB Bandwidth (KHz)
Low	824.20	269.83	369.43
Middle	836.60	269.33	368.32
High	848.80	268.82	368.51

TDMA*Forward (downlink)*

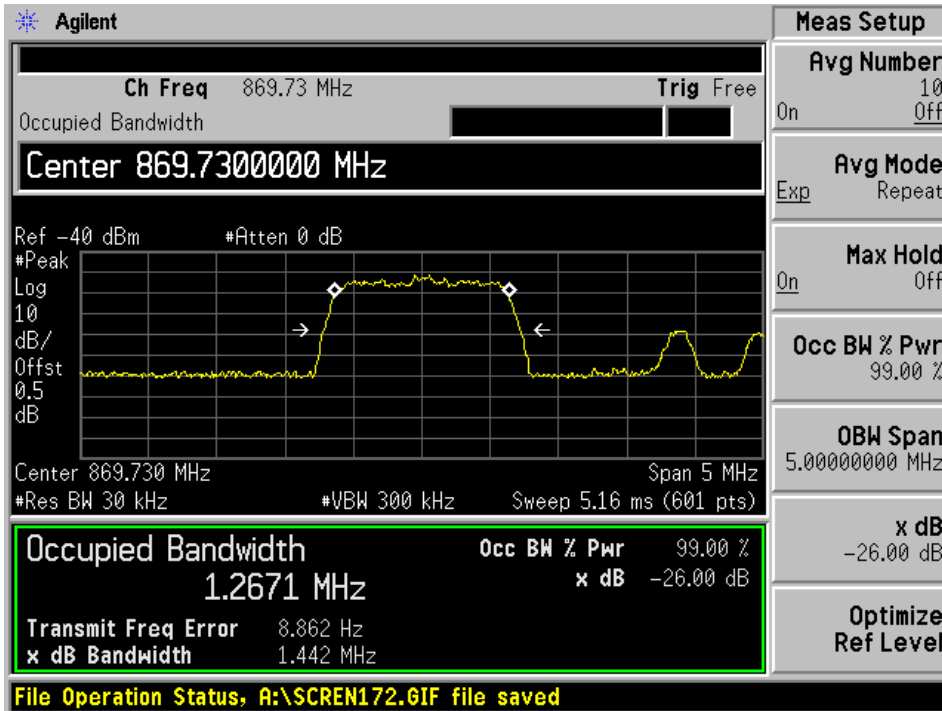
Channel	Channel frequency (MHz)	99% Power Bandwidth (KHz)	26 dB Bandwidth (KHz)
Low	869.04	26.92	33.41
Middle	881.48	27.18	33.29
High	893.92	27.04	33.32

Reverse (uplink)

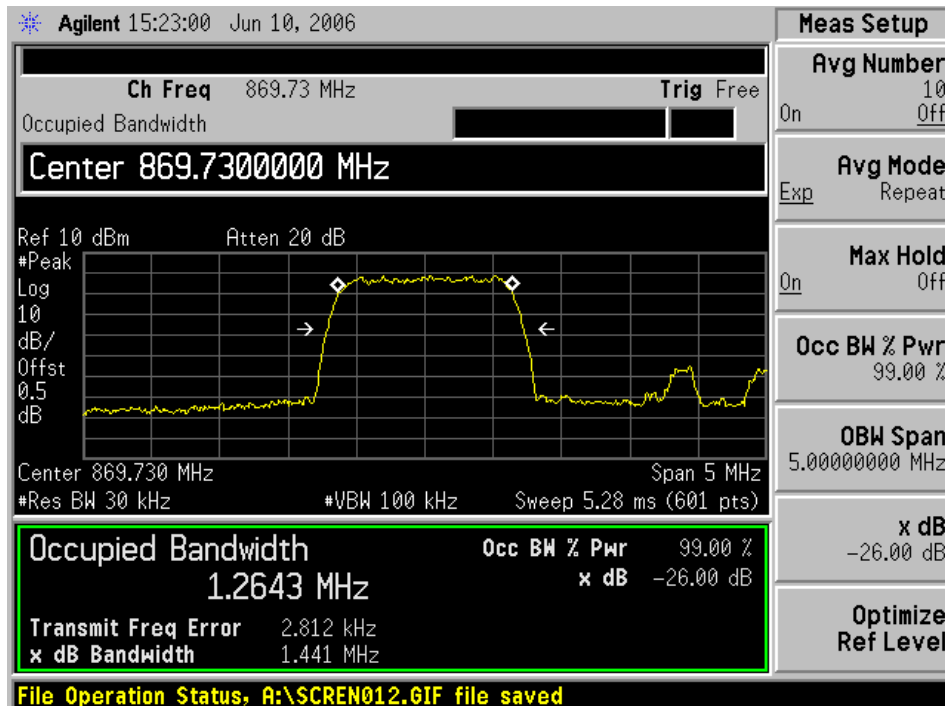
Channel	Channel frequency (MHz)	99% Power Bandwidth (KHz)	26 dB Bandwidth (KHz)
Low	824.04	27.37	33.02
Middle	836.48	27.18	32.94
High	848.92	27.37	33.36

**CDMA
Forward (Downlink)***Low channel*

Input:

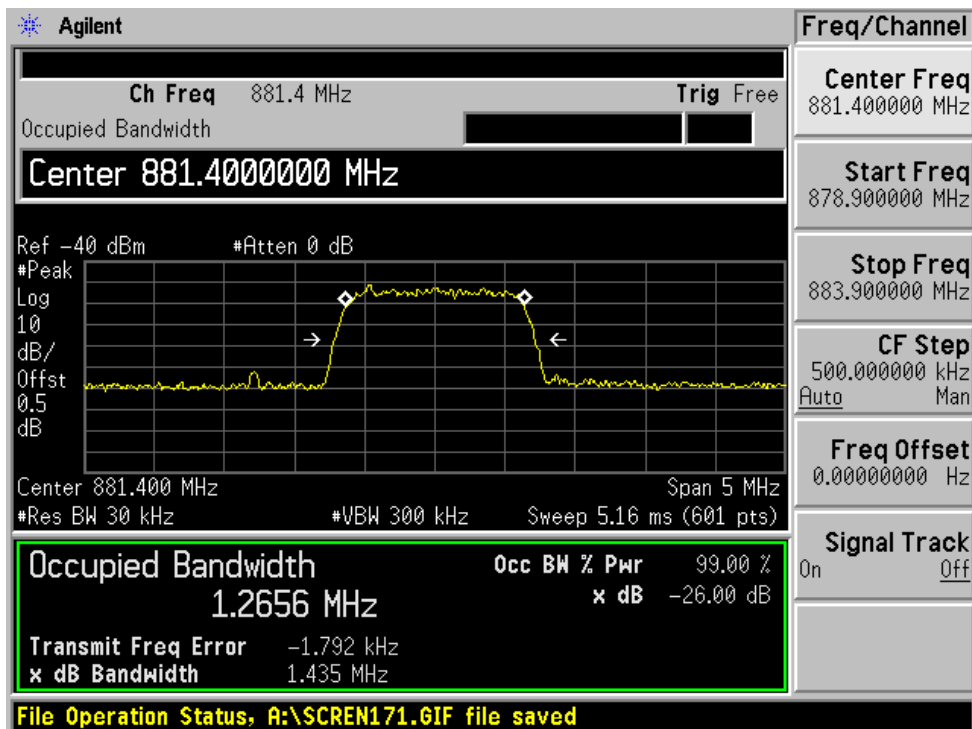


Output

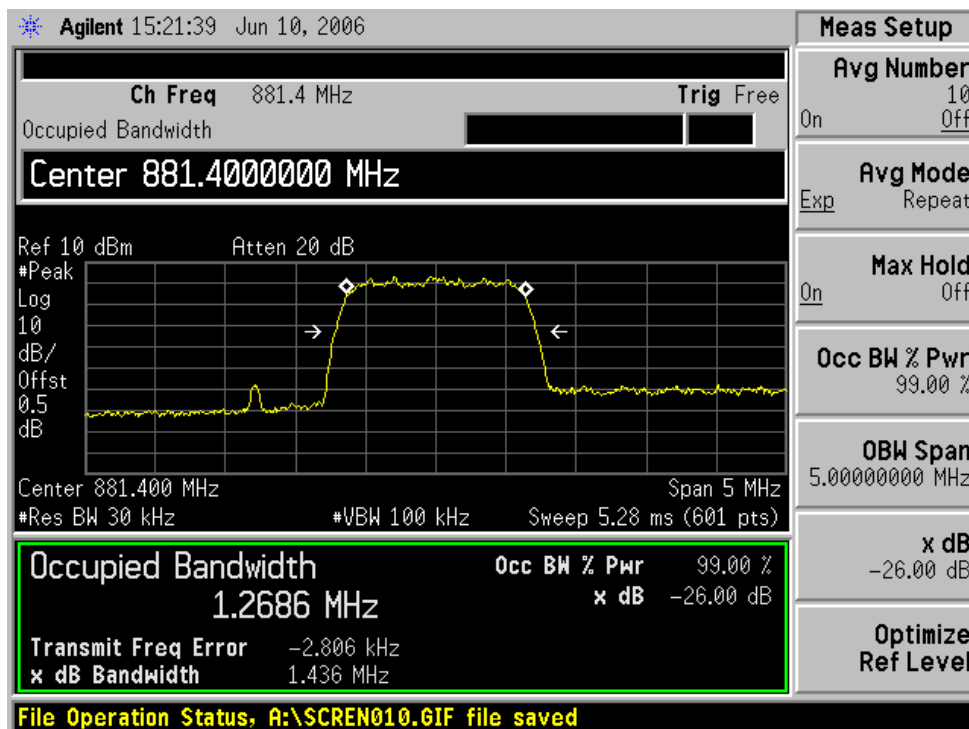


Mid Channel

Input:

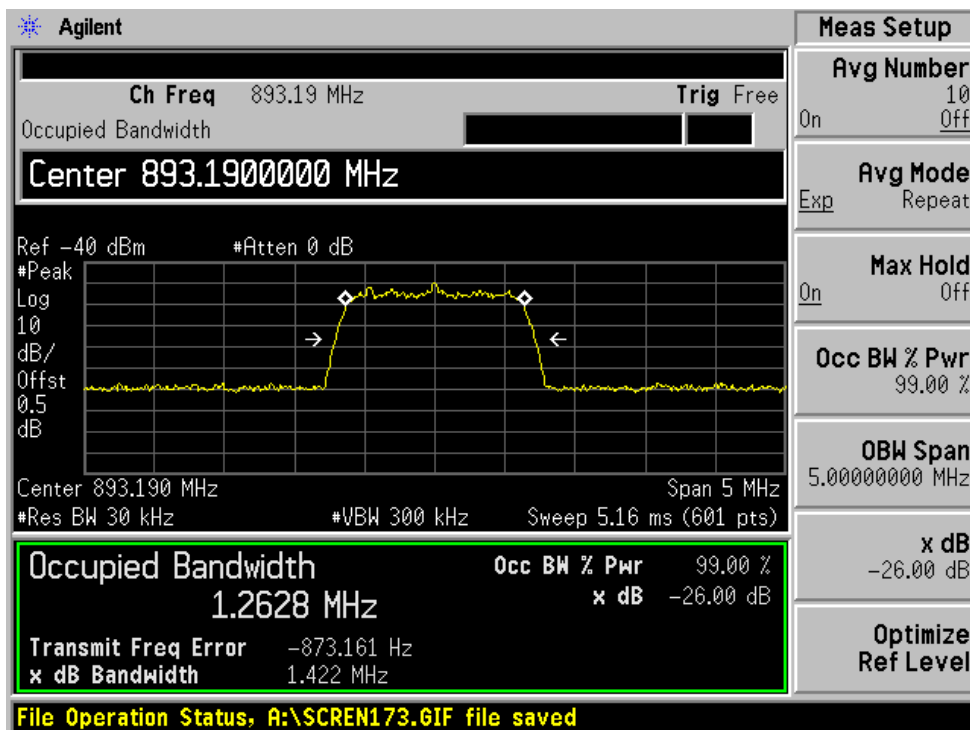


Output:

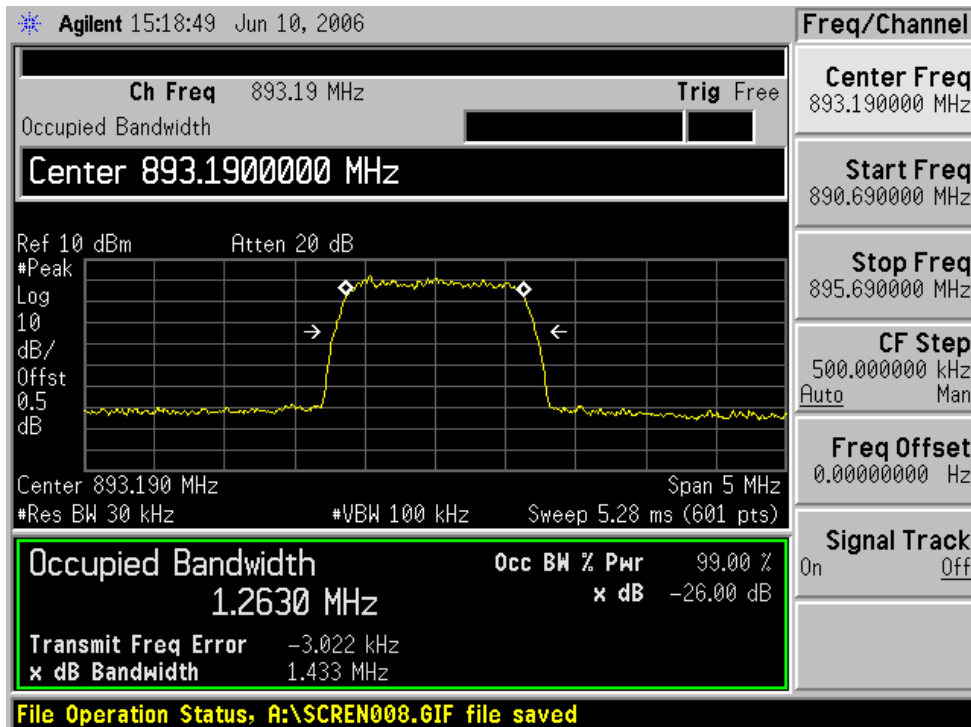


High Channel

Input:

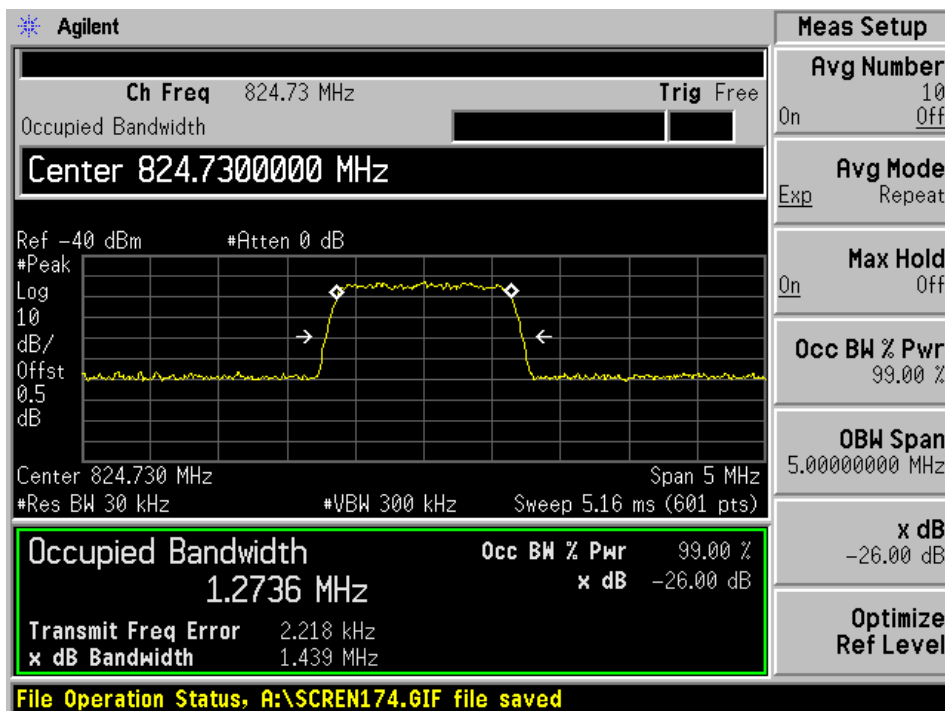


Output:

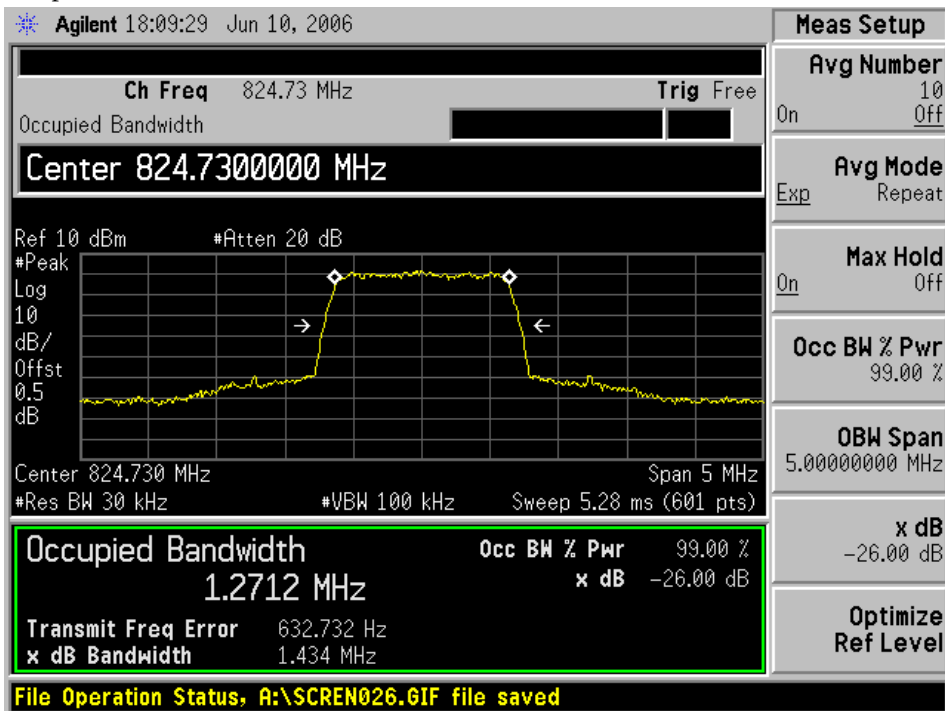


**CDMA
Reverse (Uplink)***Low Channel*

Input:

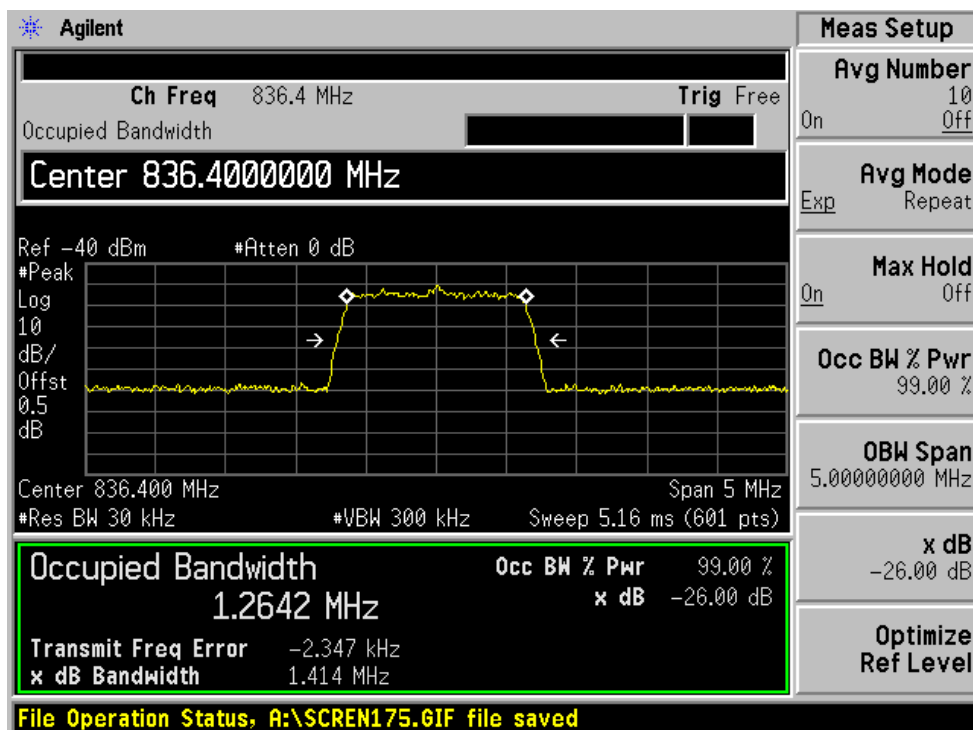


Output:

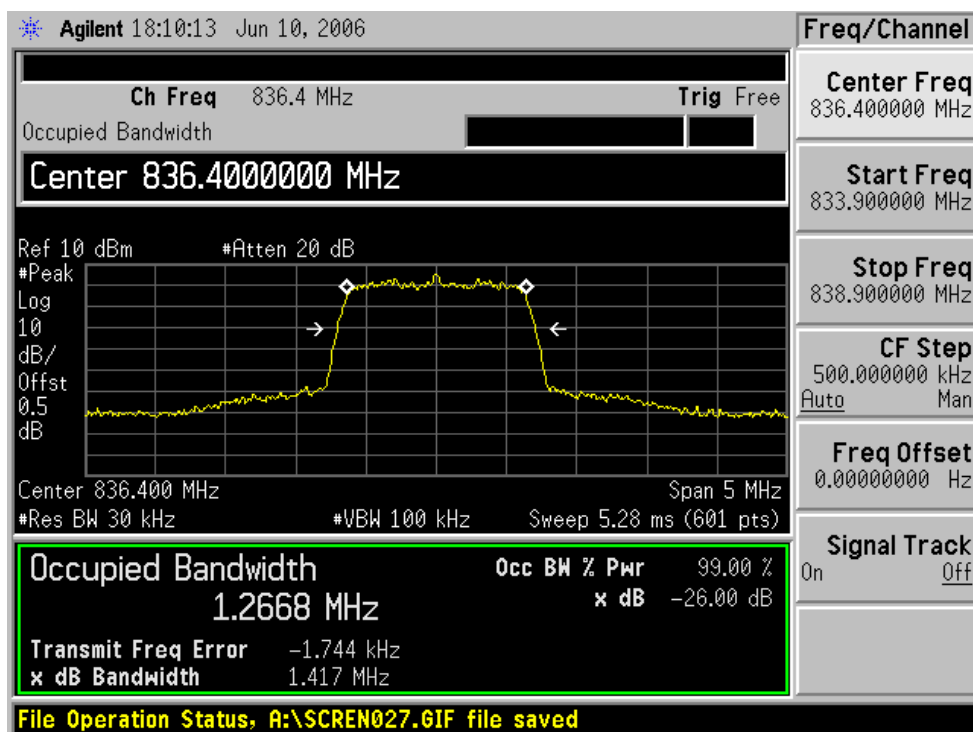


Mid channel

Input:

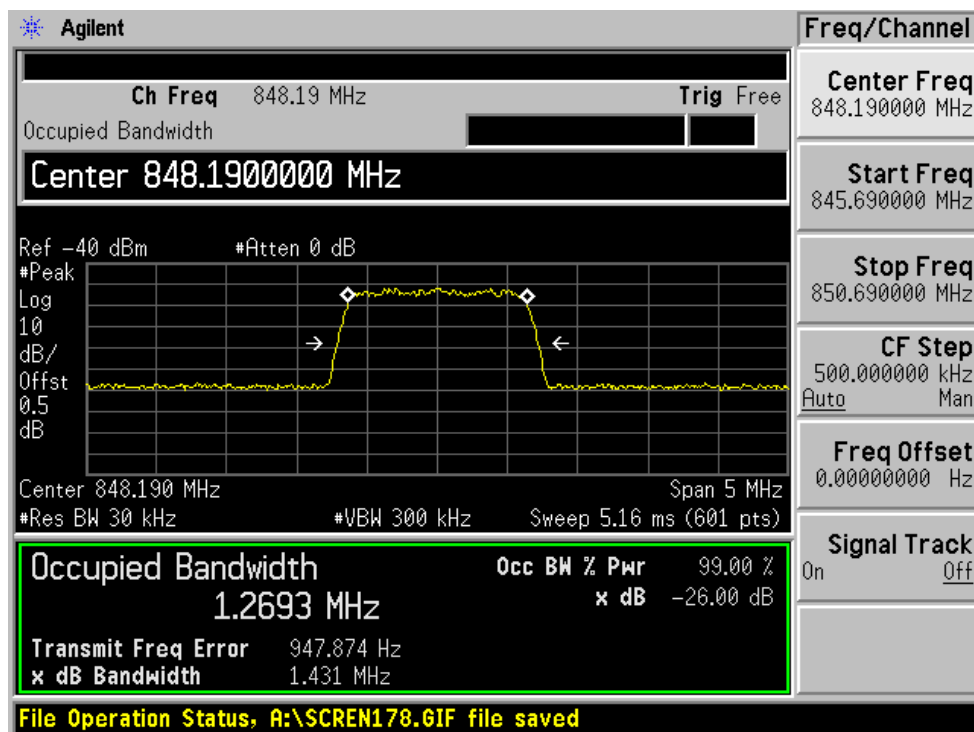


Output:

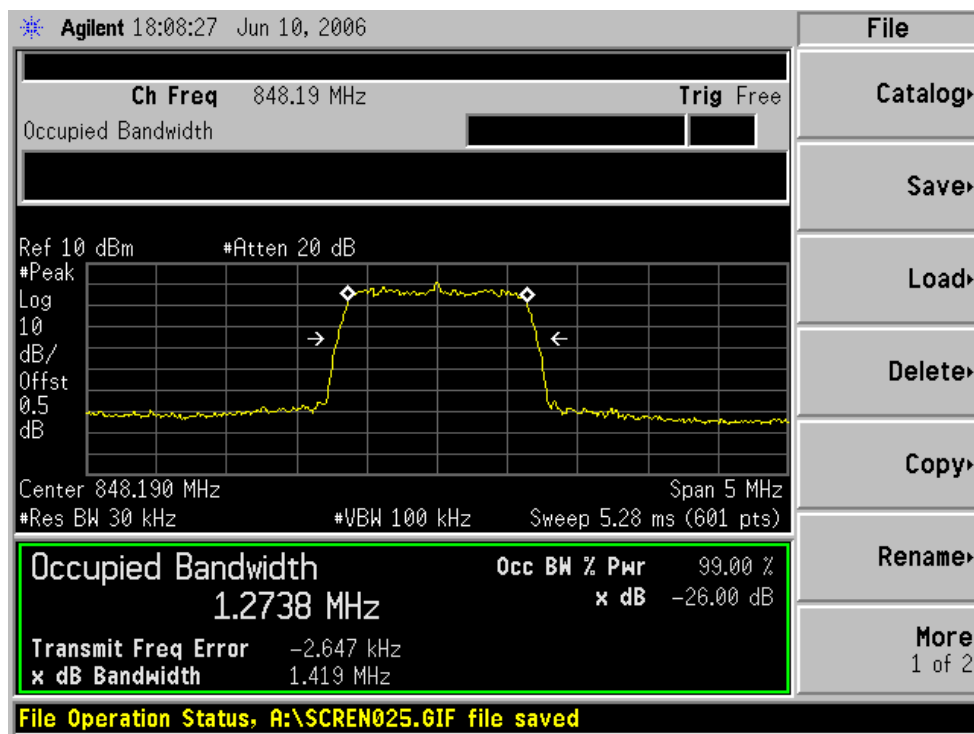


High channel

Input:

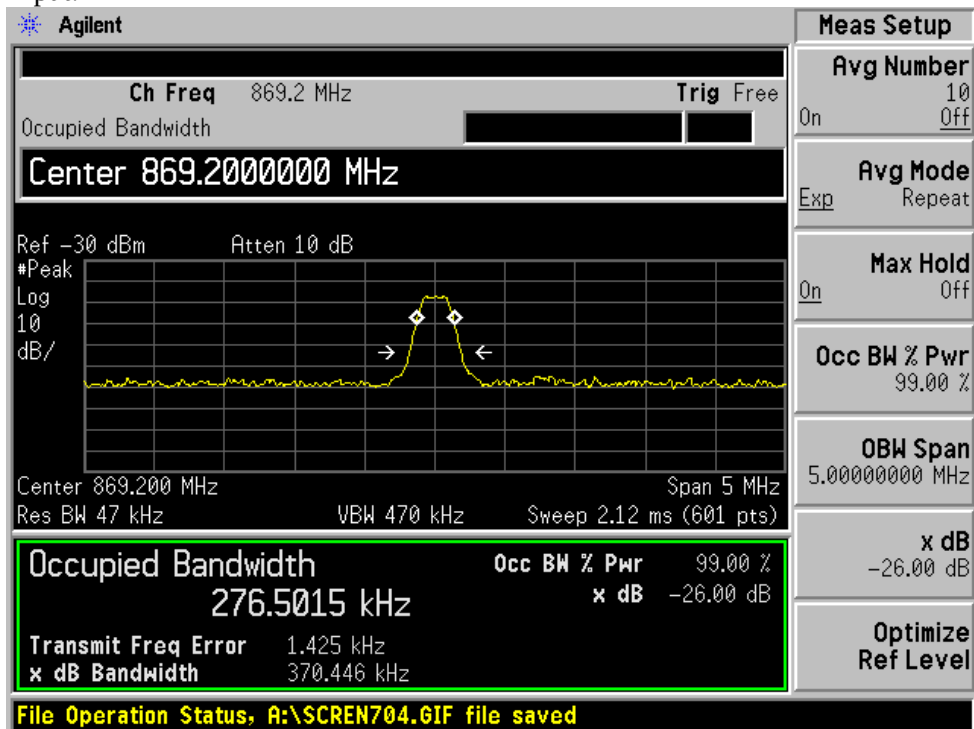


Output:

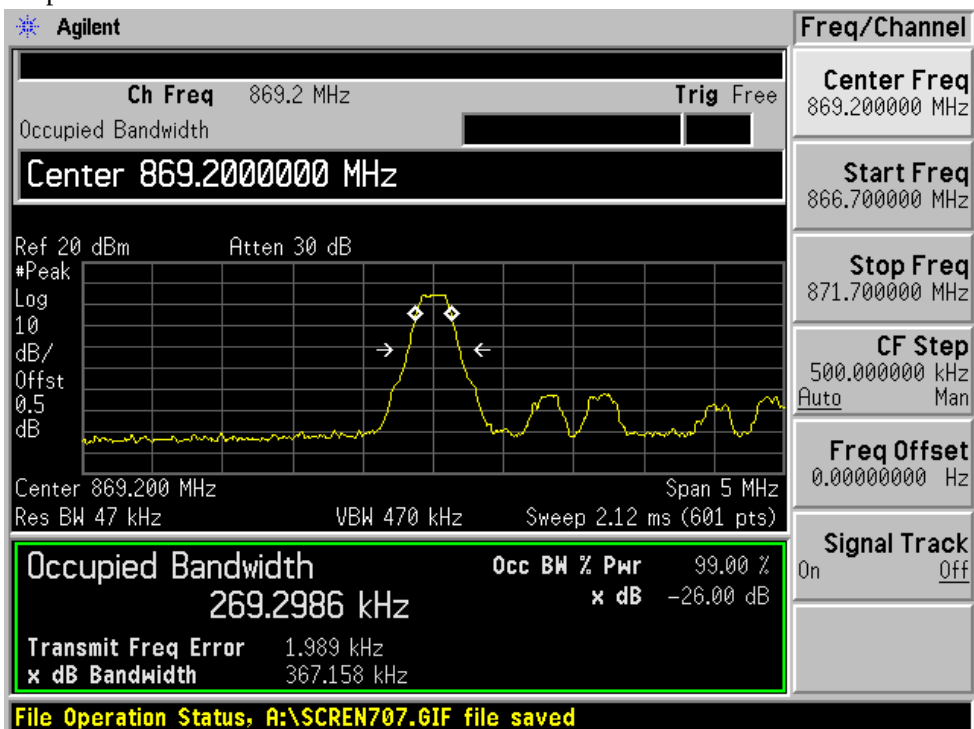


GSM**Forward (Downlink)***Low channel*

Input:

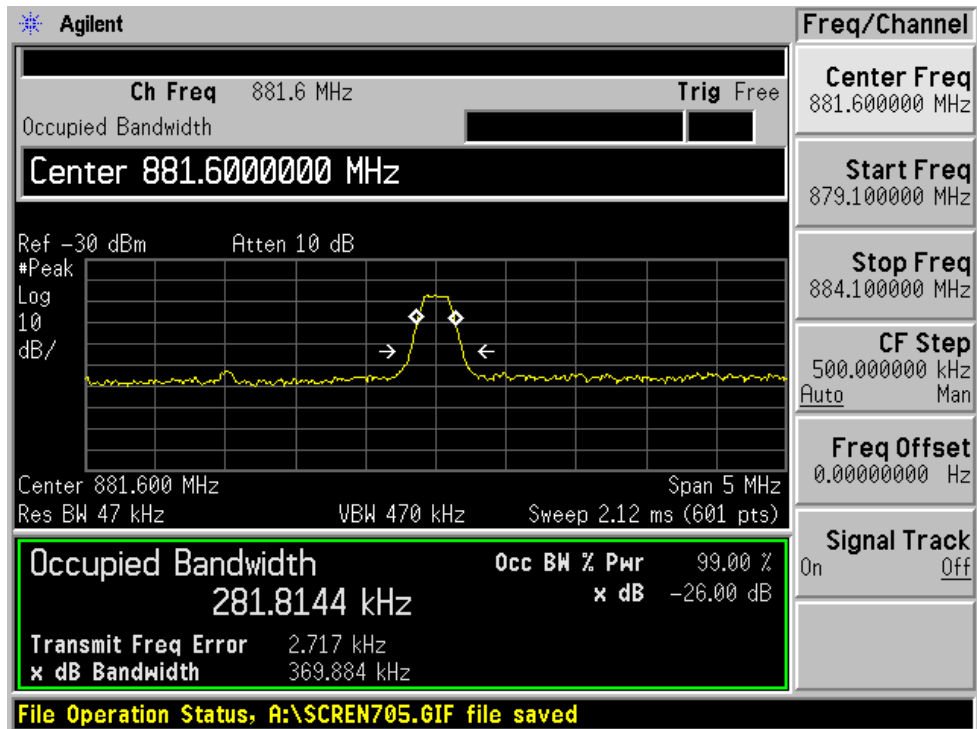


Output

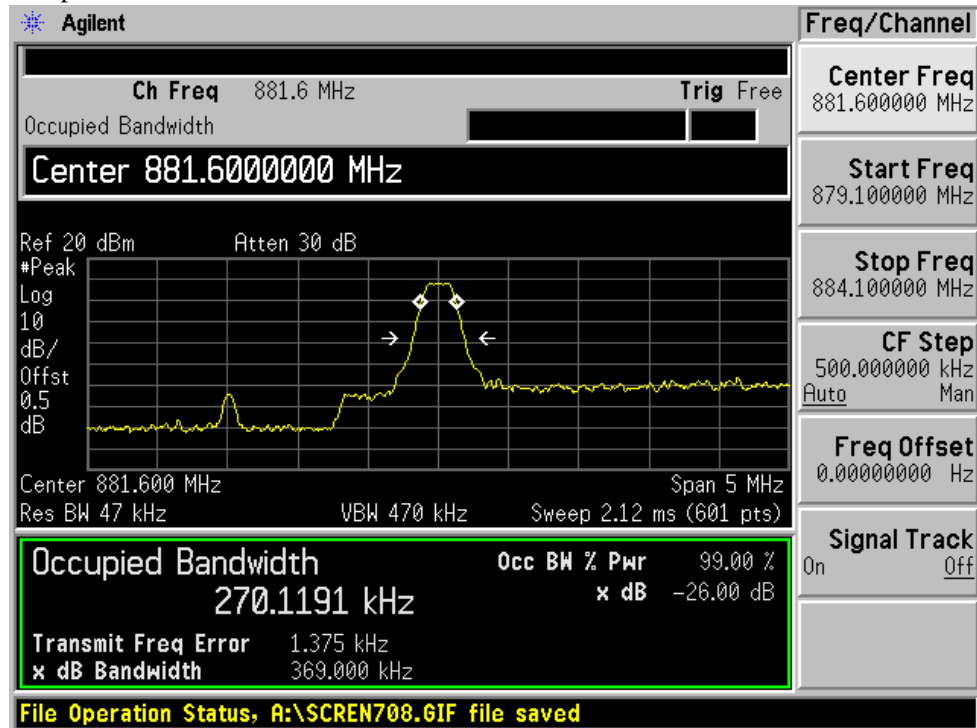


Mid Channel

Input:

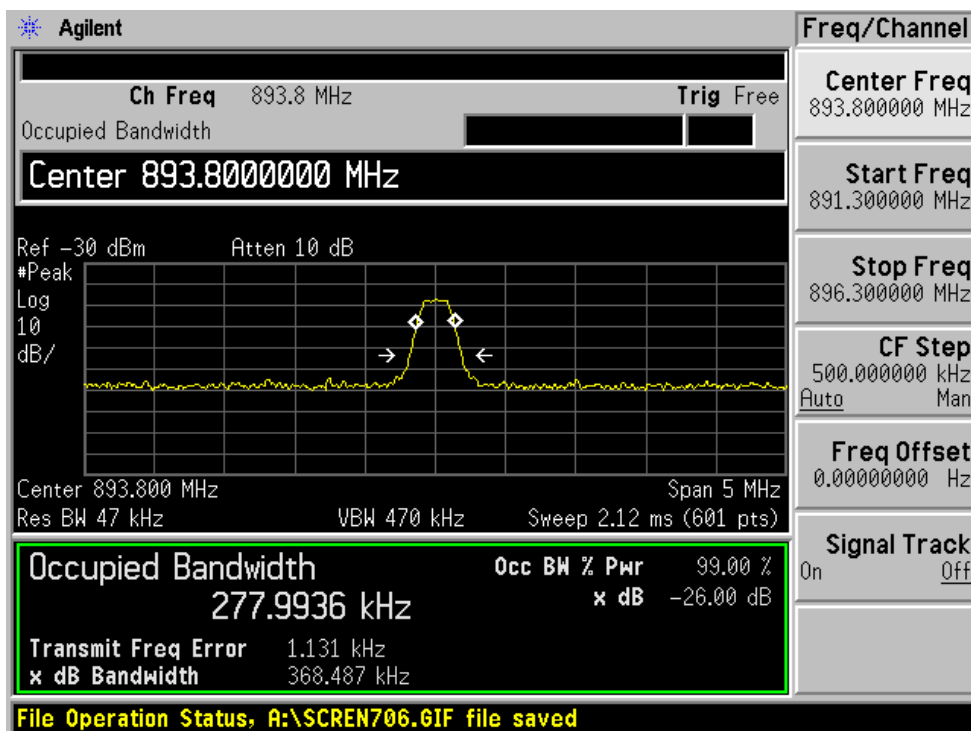


Output:

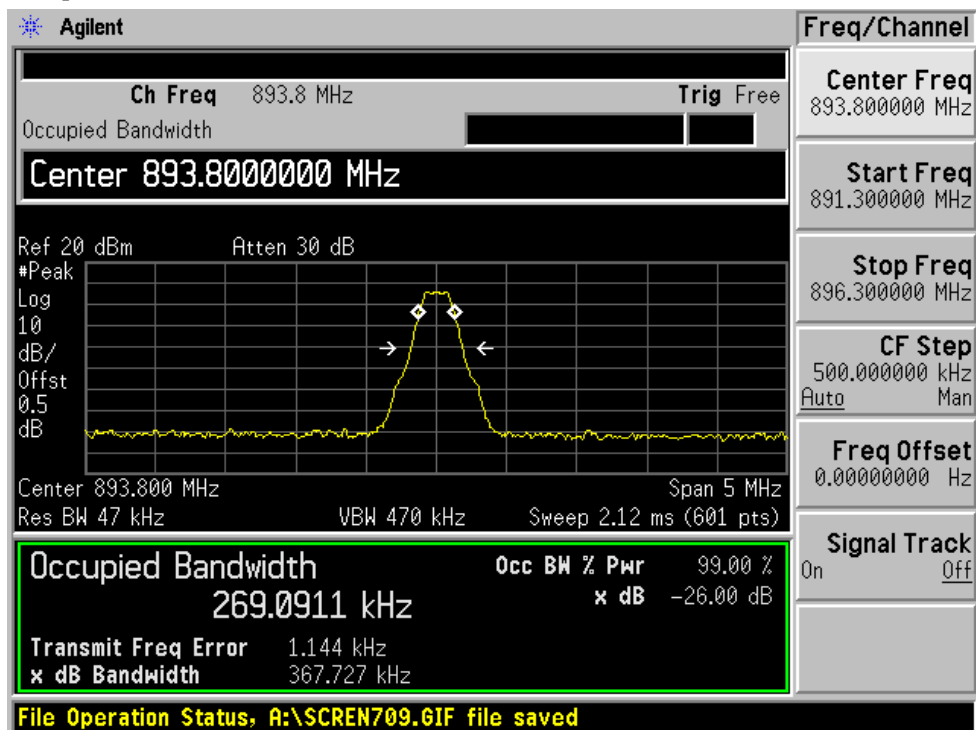


High Channel

Input:

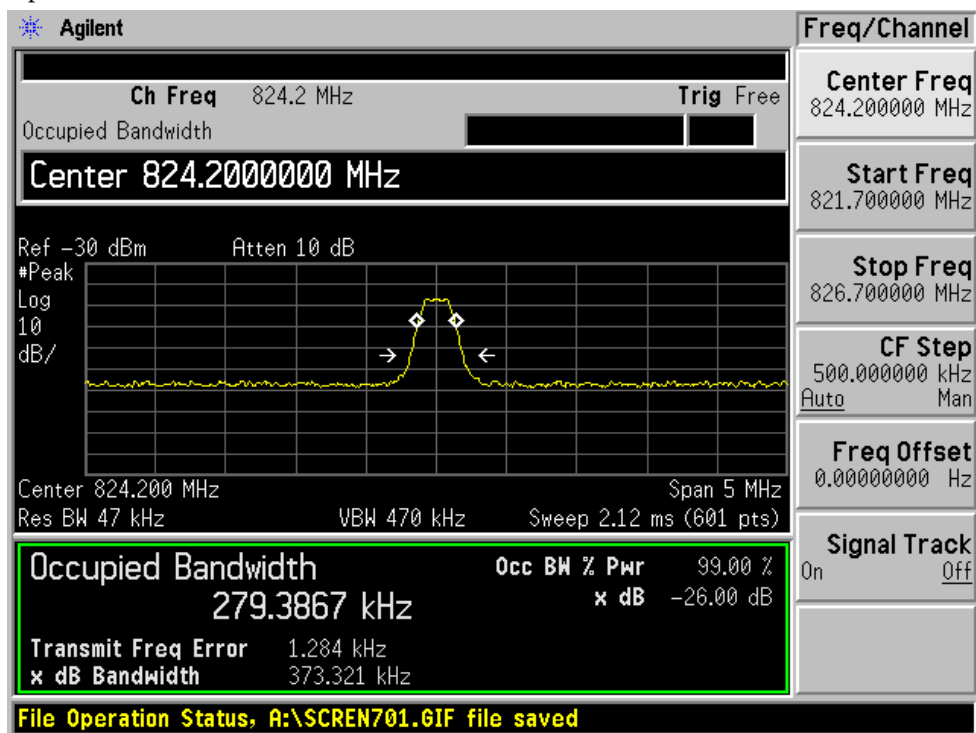


Output:

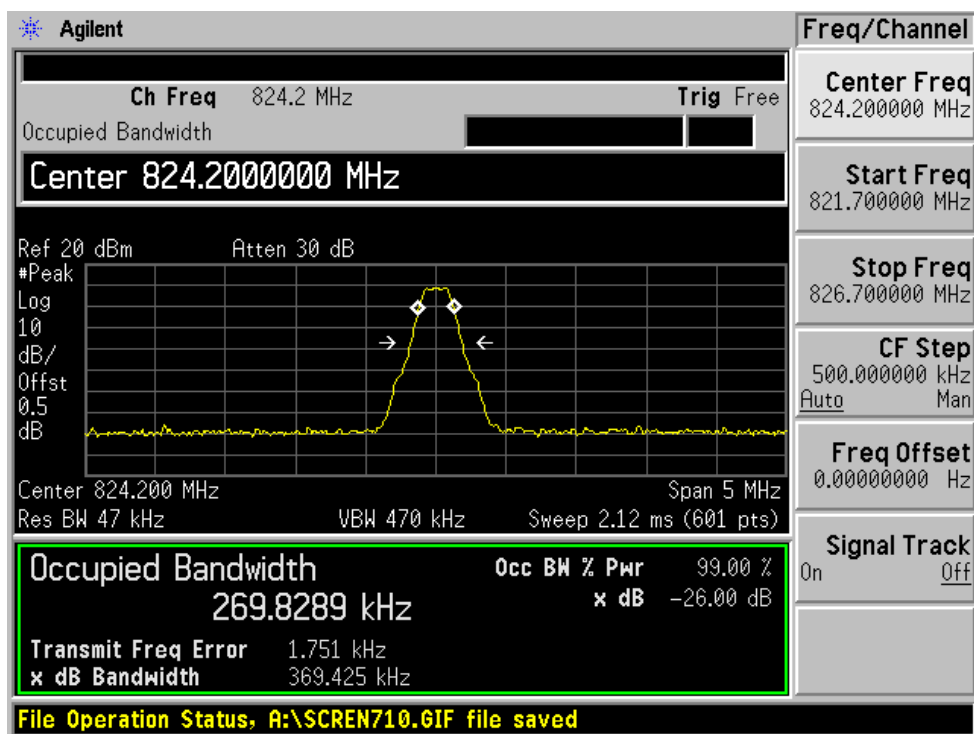


GSM
Reverse (Uplink)
Low Channel

Input:

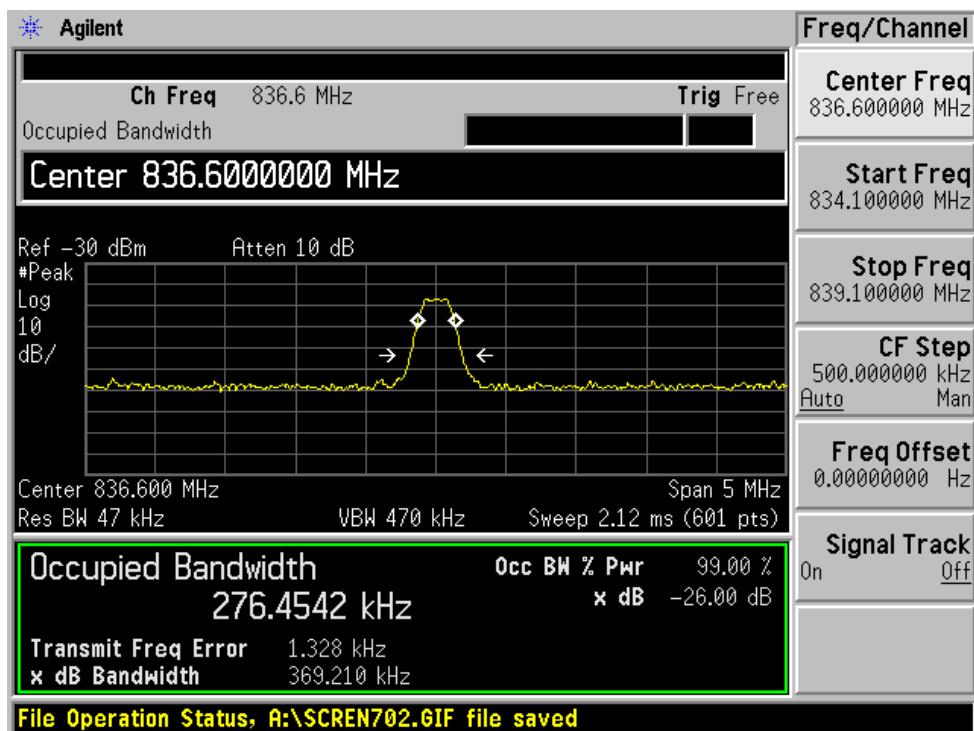


Output:

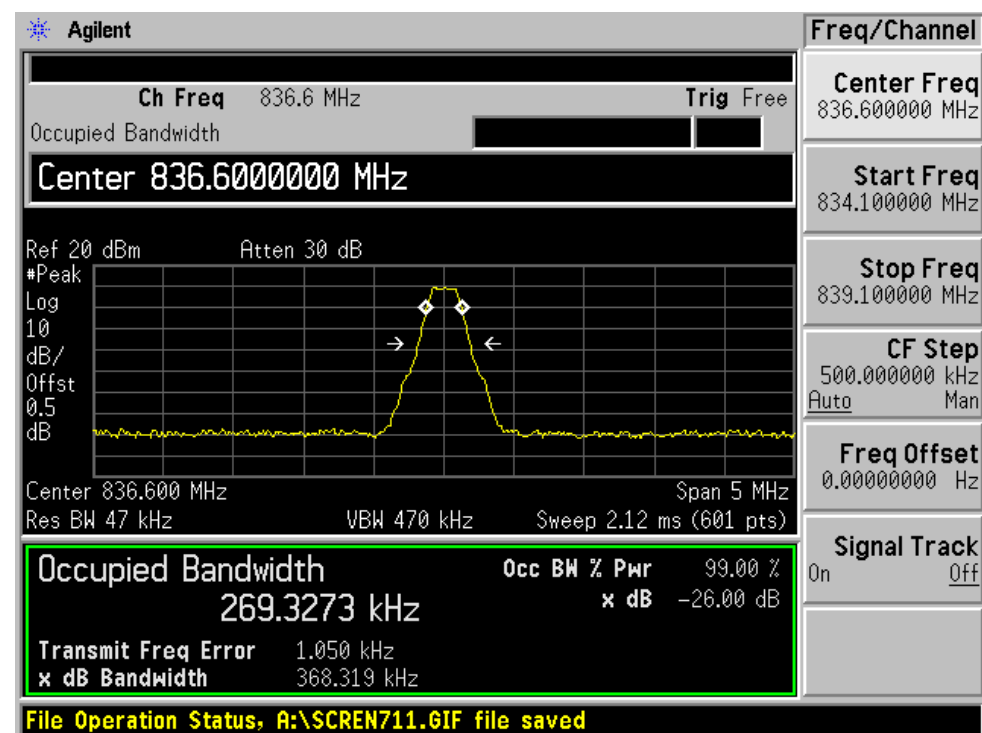


Mid channel

Input:

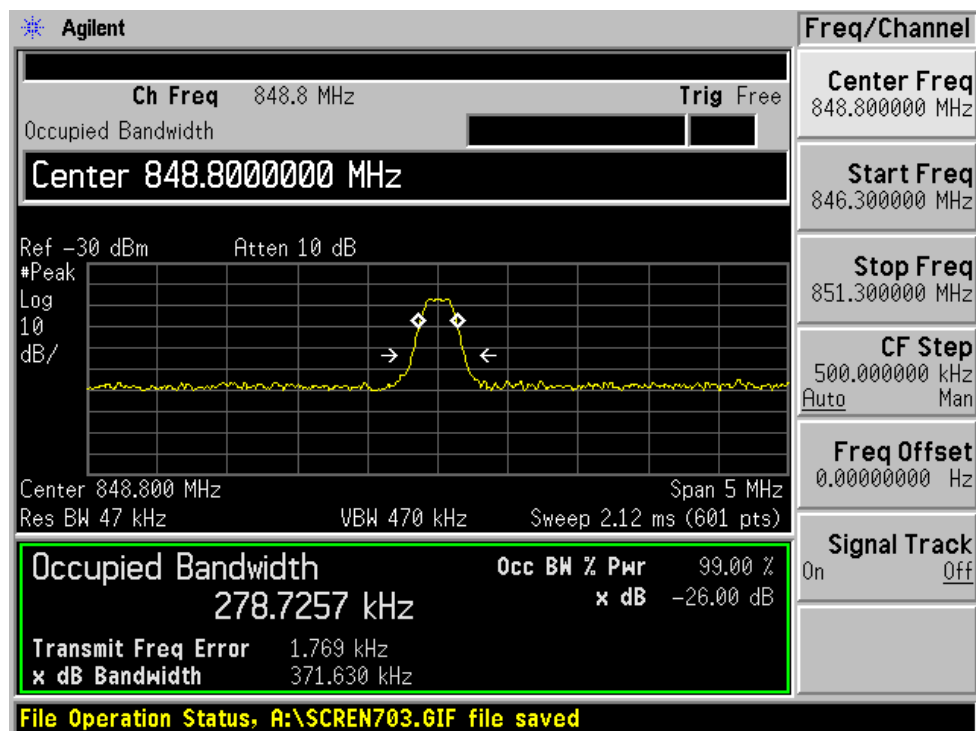


Output:

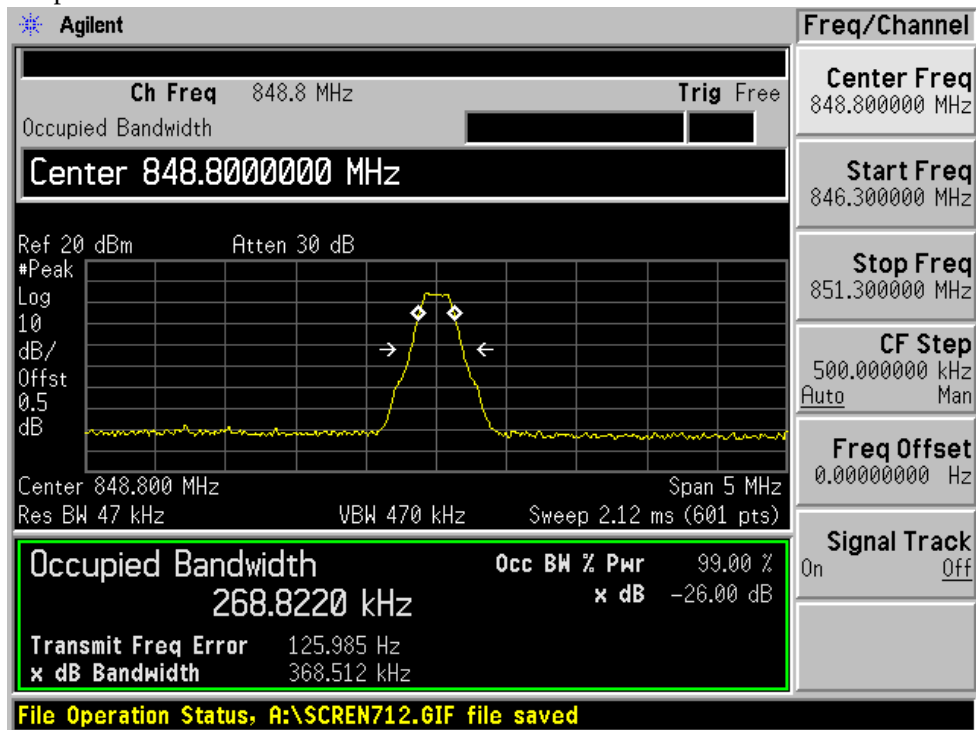


High channel

Input:



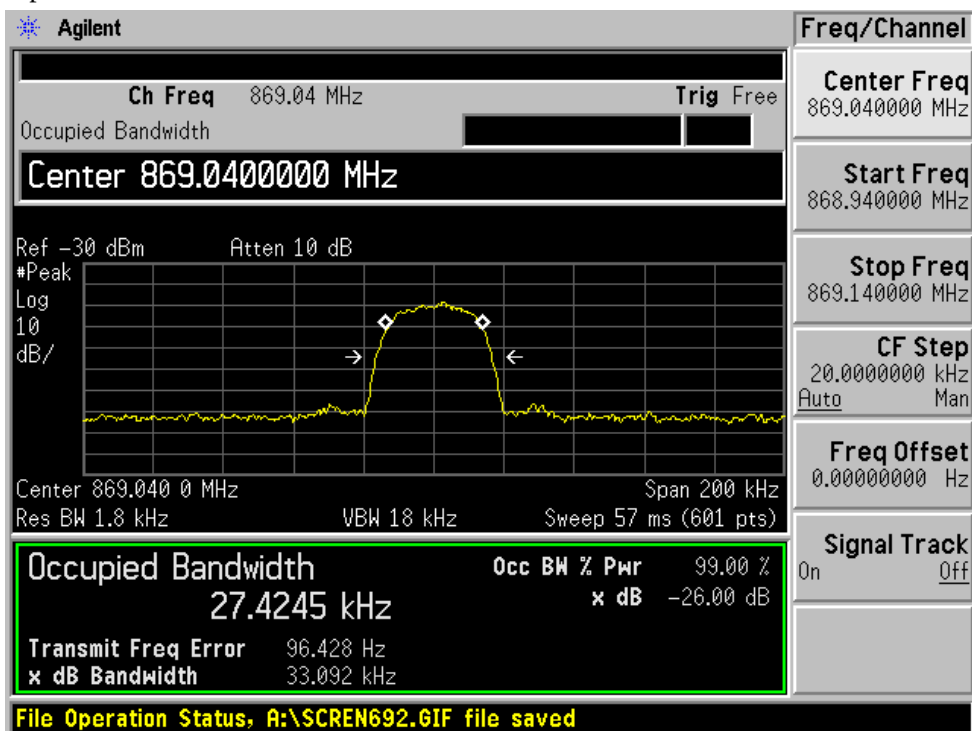
Output:



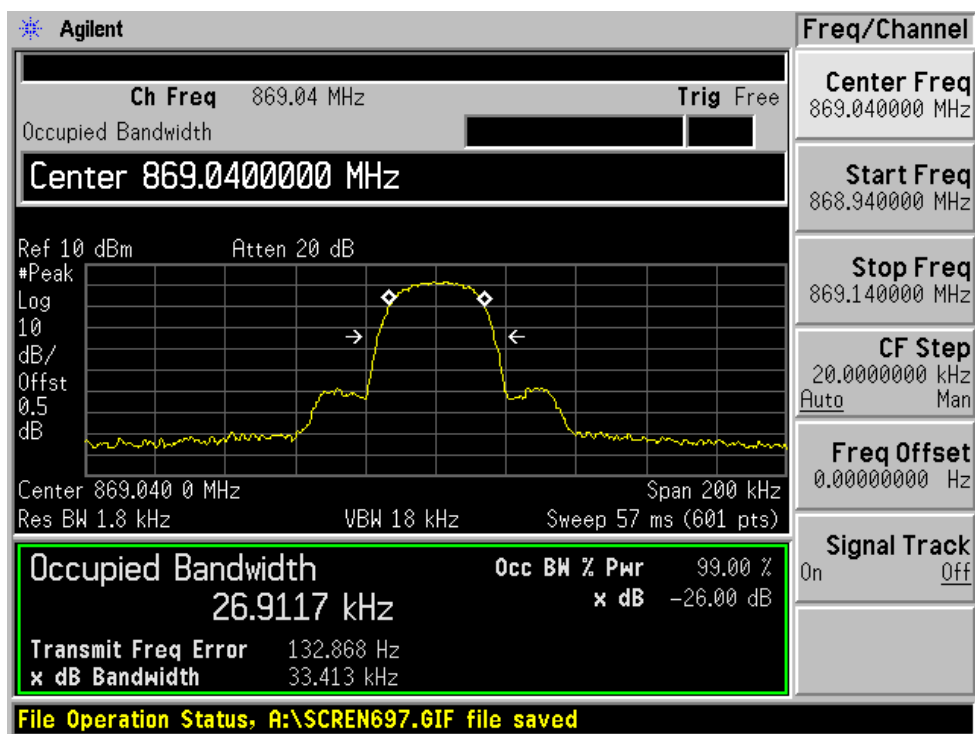
**TDMA
Forward (Downlink)**

Low channel

Input:

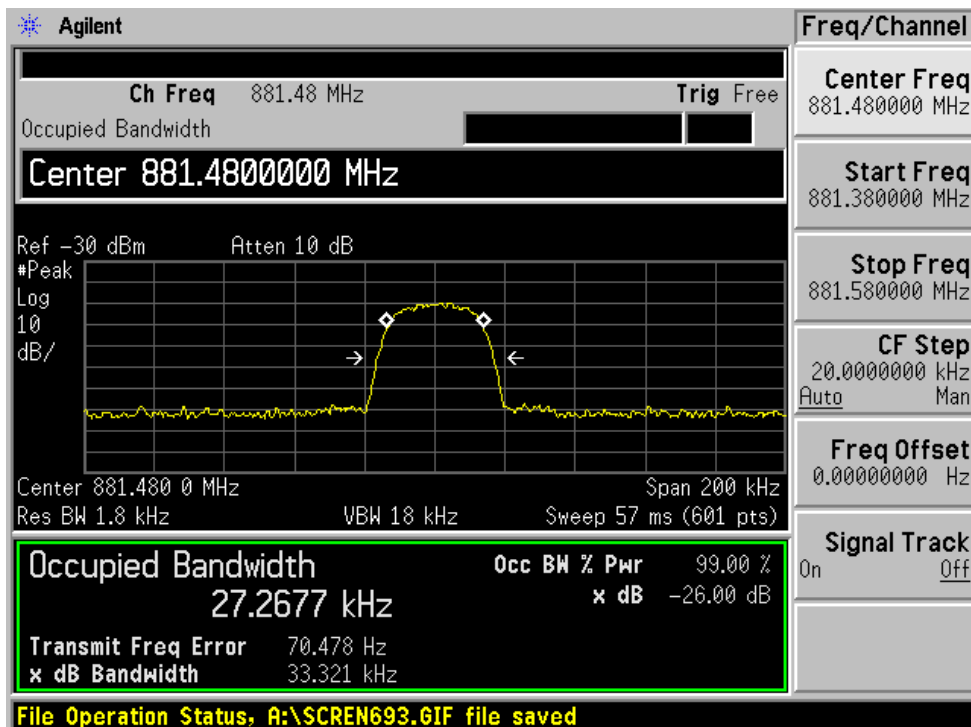


Output

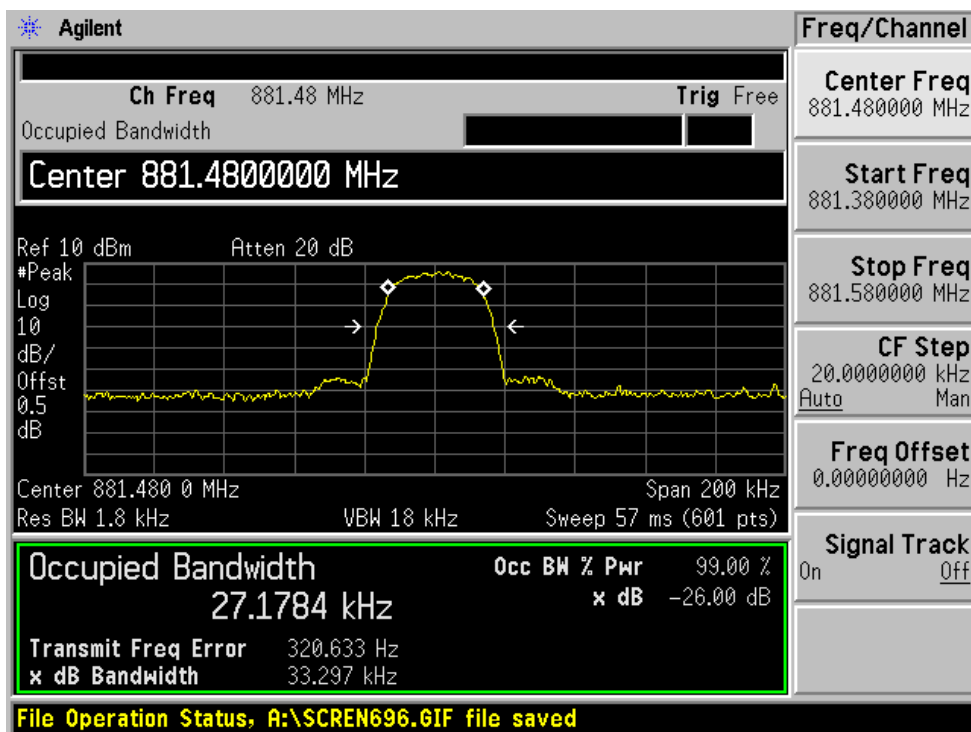


Mid Channel

Input:

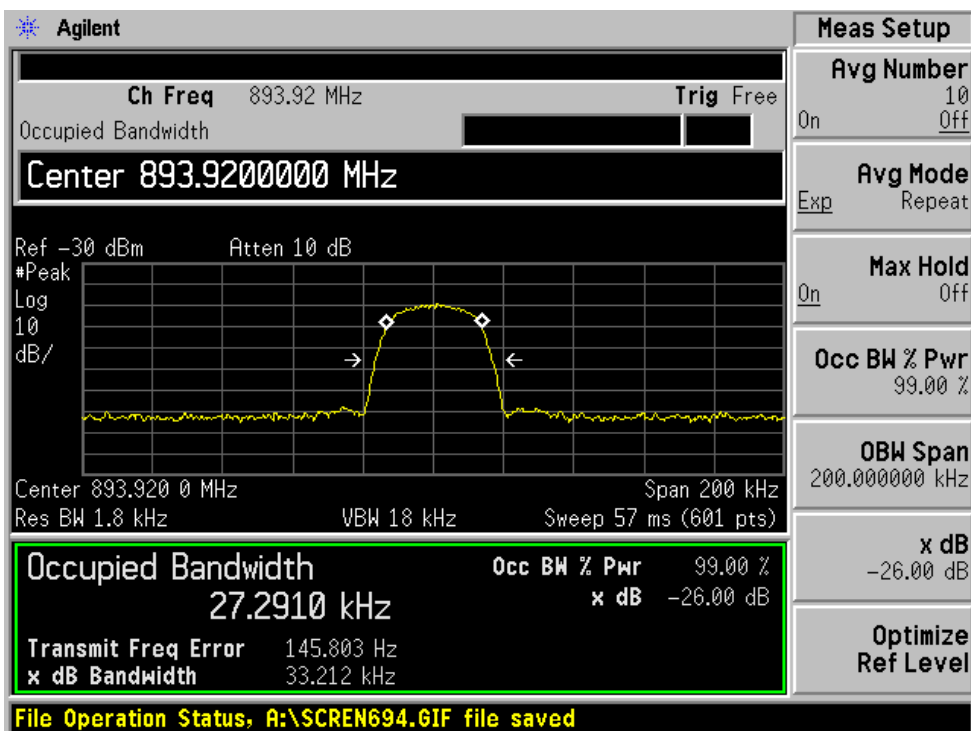


Output:

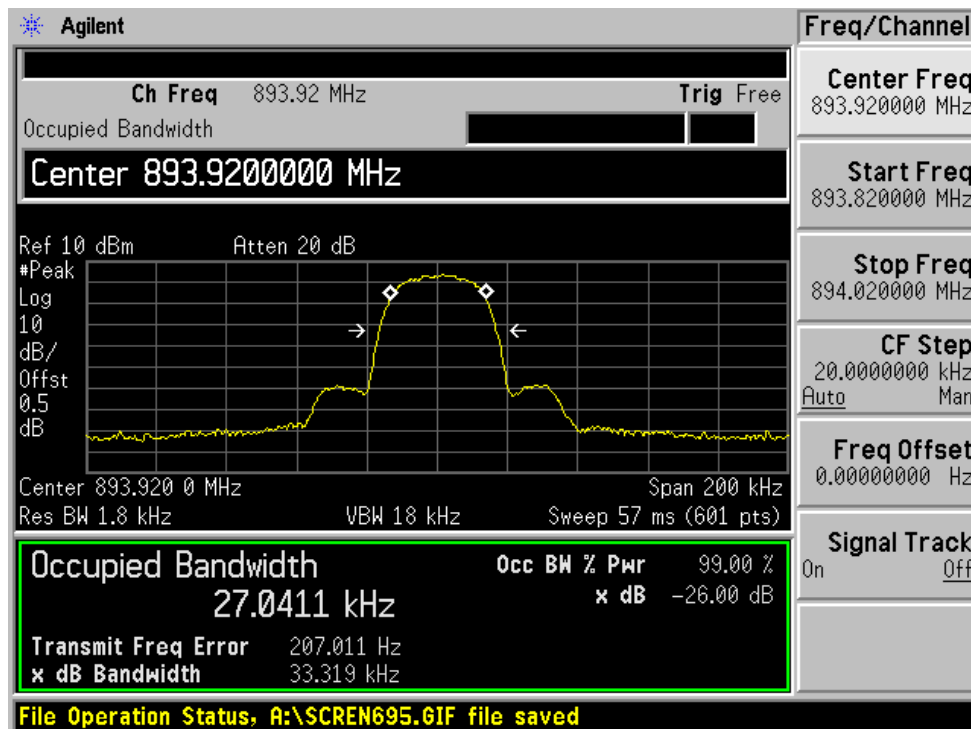


High Channel

Input:

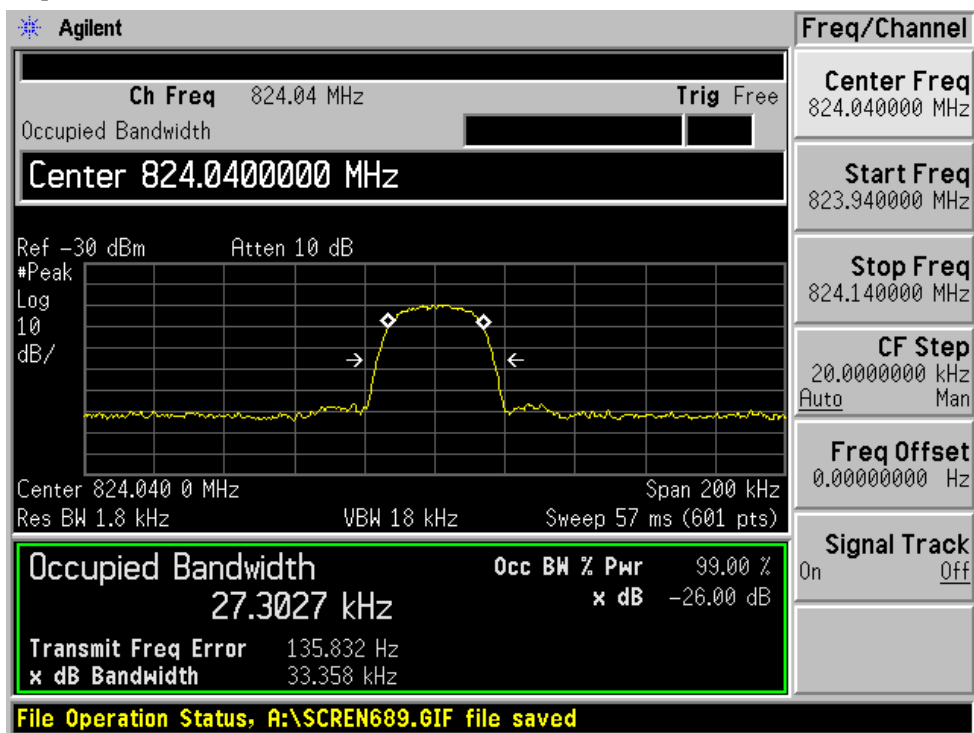


Output:

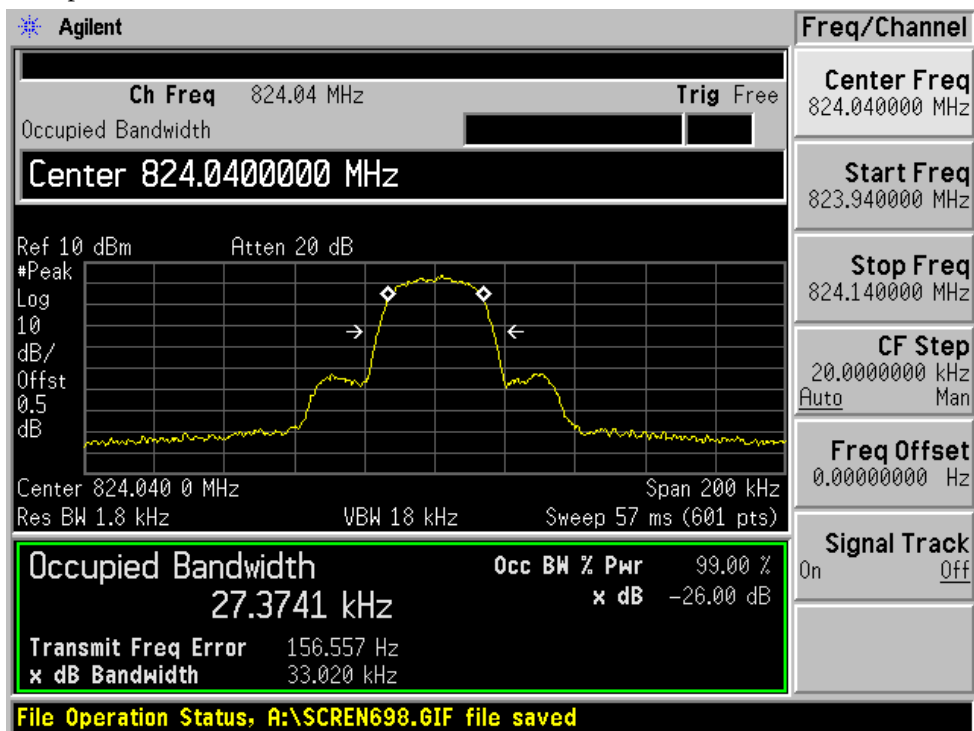


TDMA
Reverse (Uplink)*Low Channel*

Input:

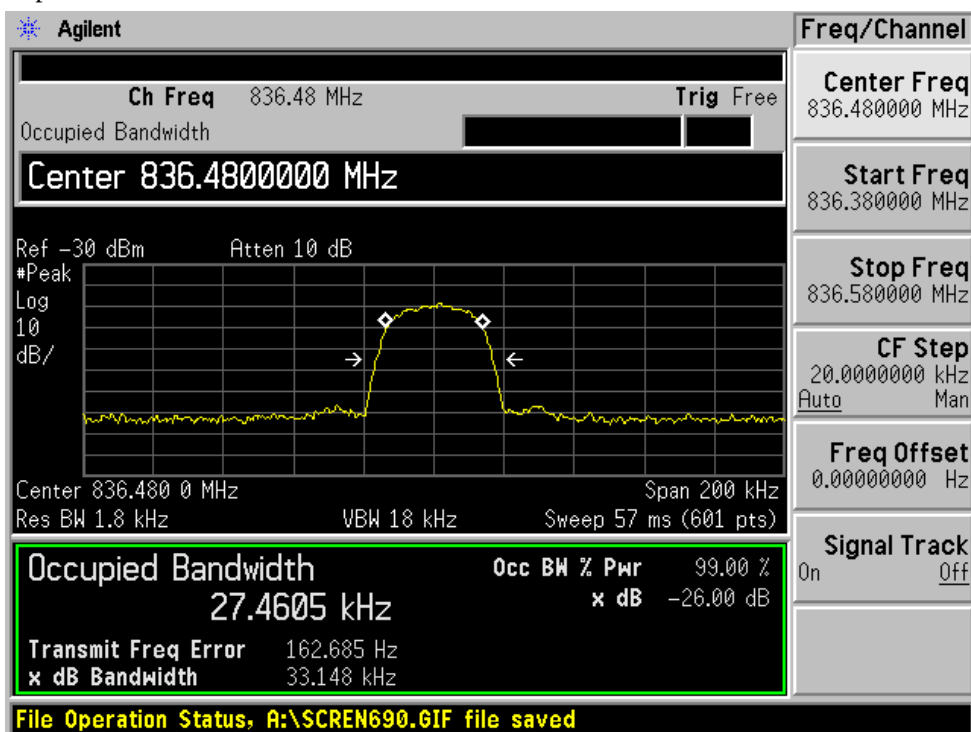


Output:

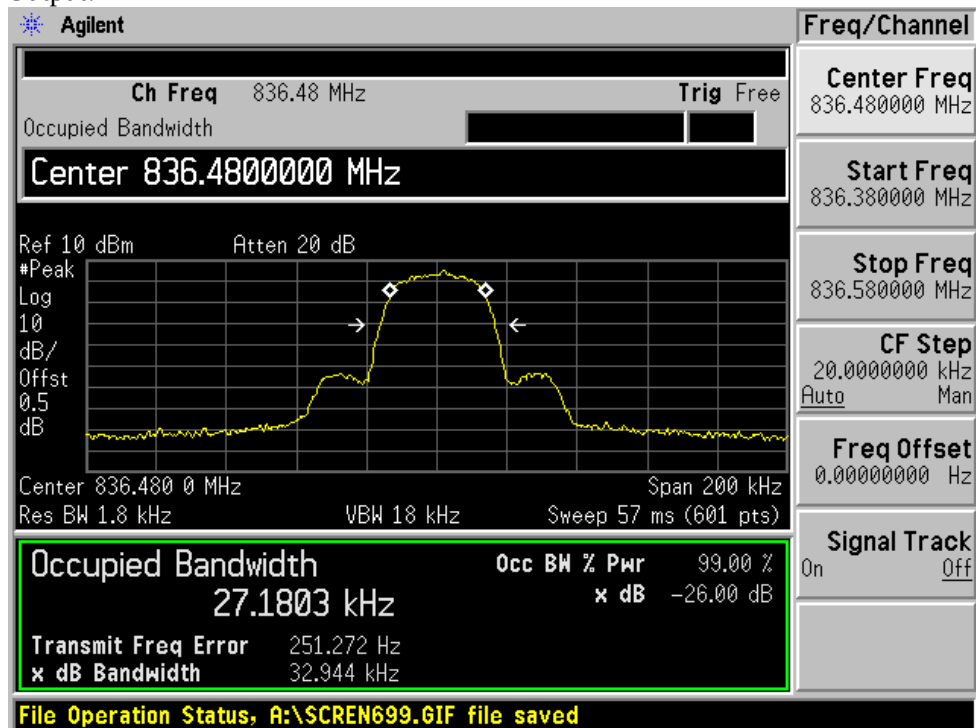


Mid channel

Input:

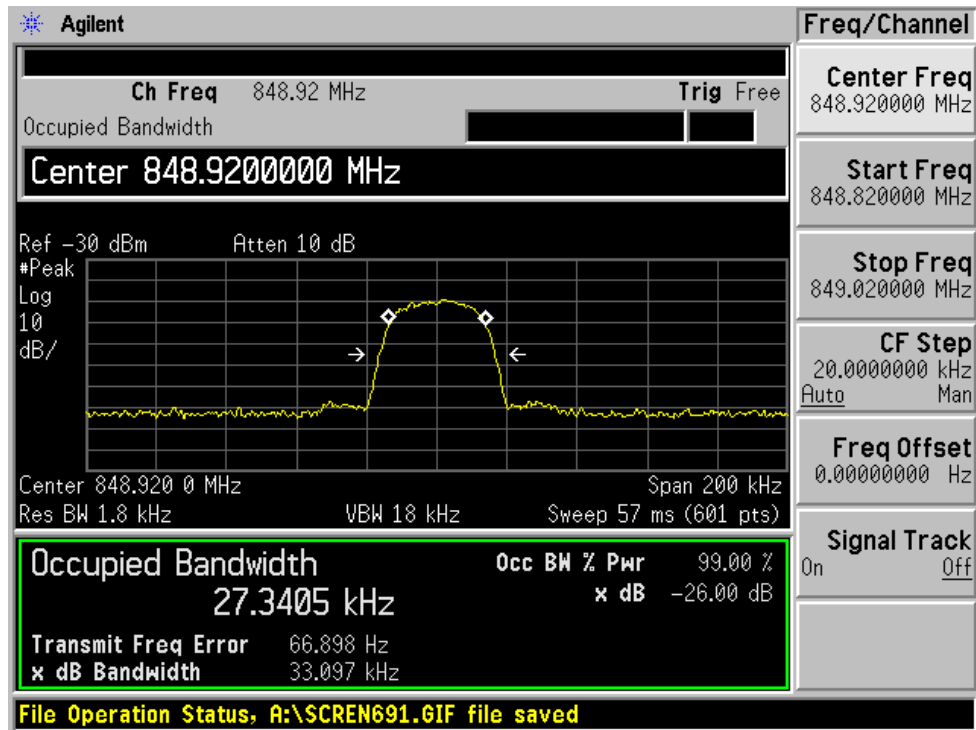


Output:

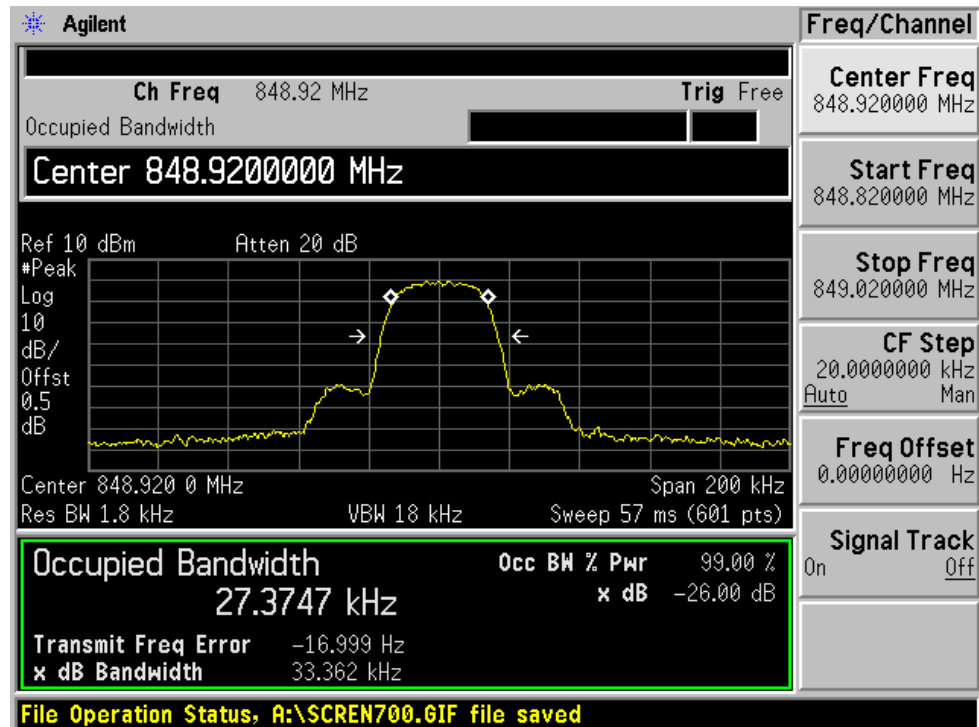


High channel

Input:



Output:



§2.1051 & §22.917(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS**Applicable Standards**

Requirements: CFR 47, § 2.1051, § 22.917.

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1057.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer 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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	E4446A	US44300386	2006-03-06
R&S	Generator, Signal	SMIQ03	849192/0085	2006-06-02

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

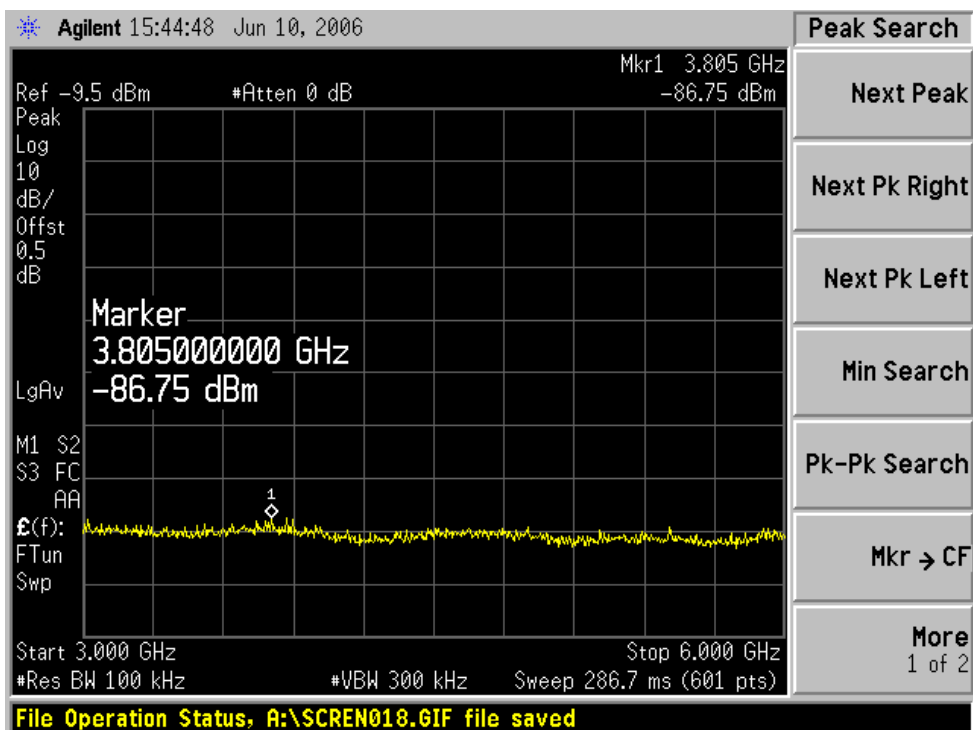
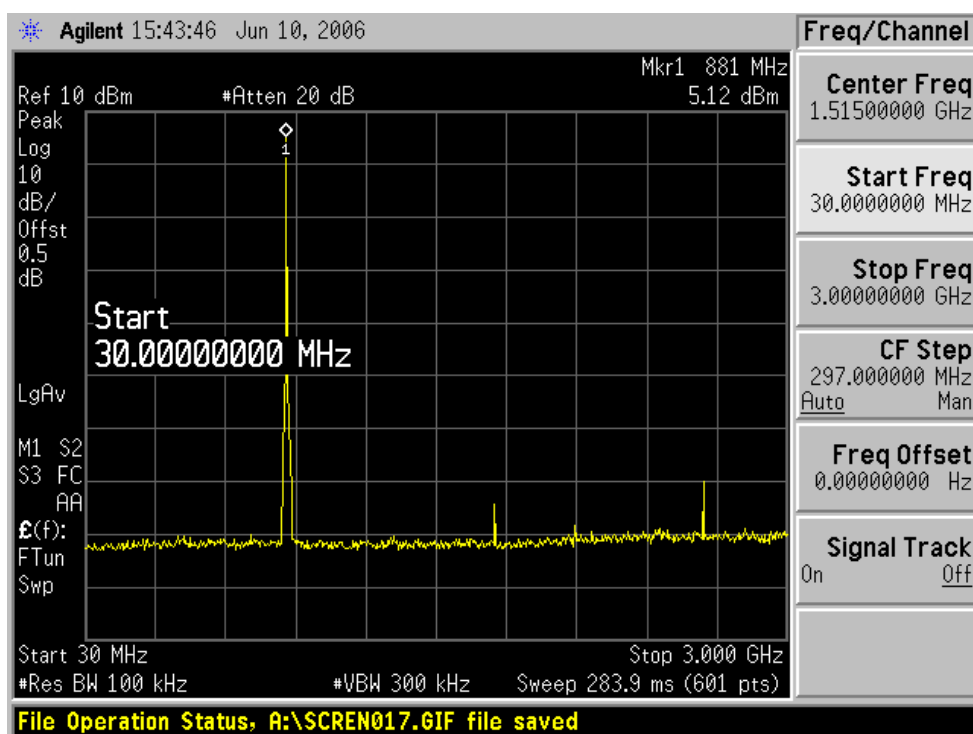
Environmental Conditions

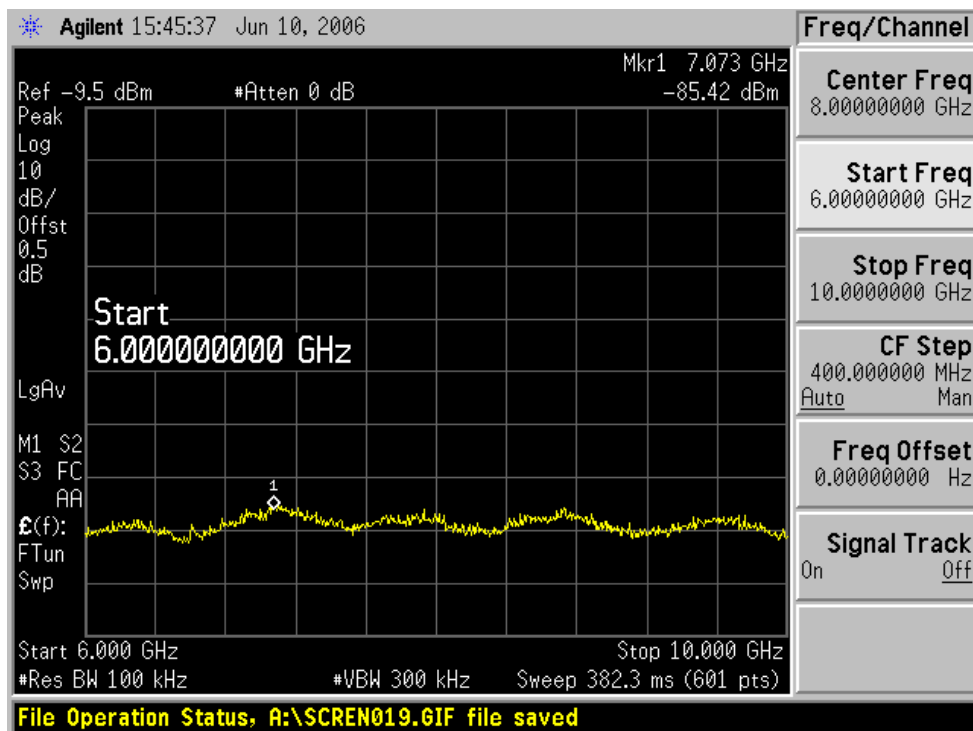
Temperature:	27° C
Relative Humidity:	37%
ATM Pressure:	1020 mbar

** The testing was performed by James Ma on 2006-07-19.*

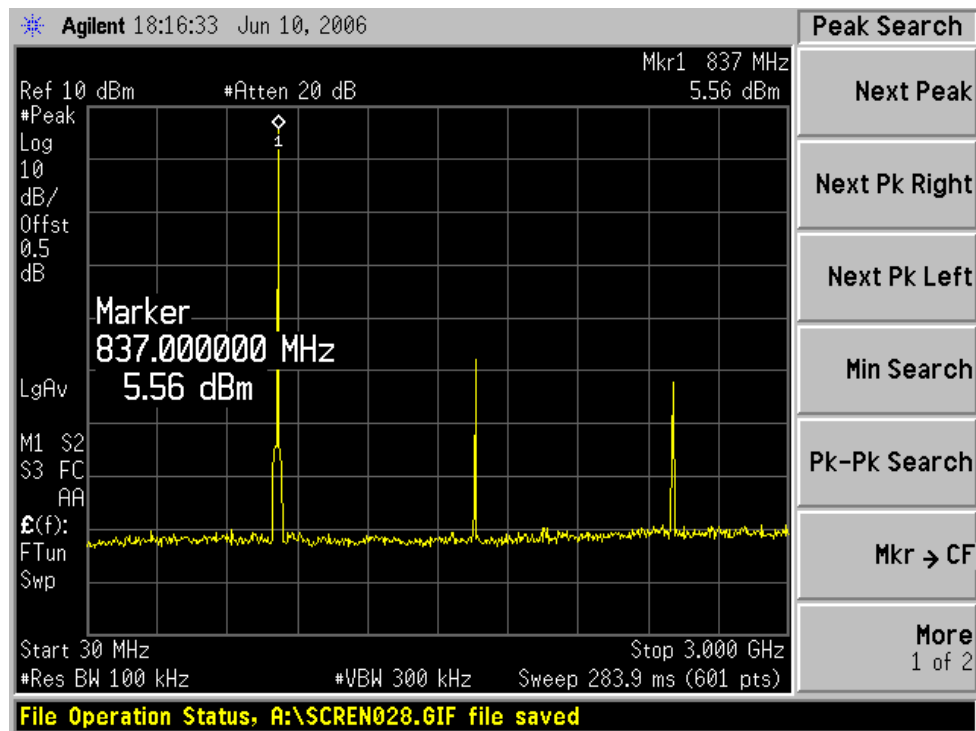
Test Results:

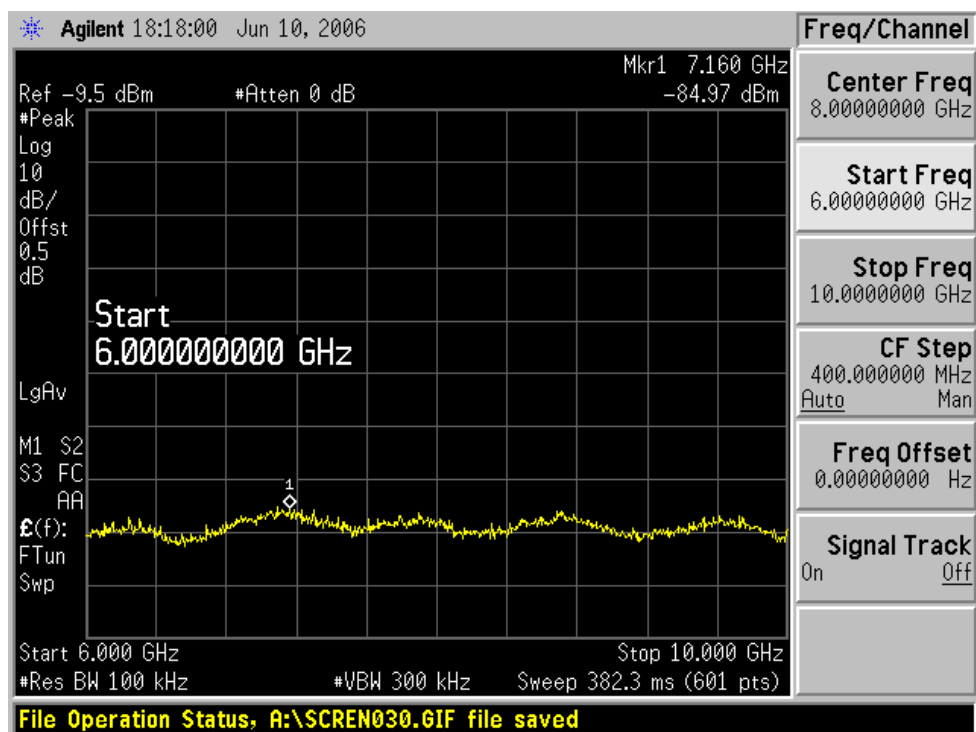
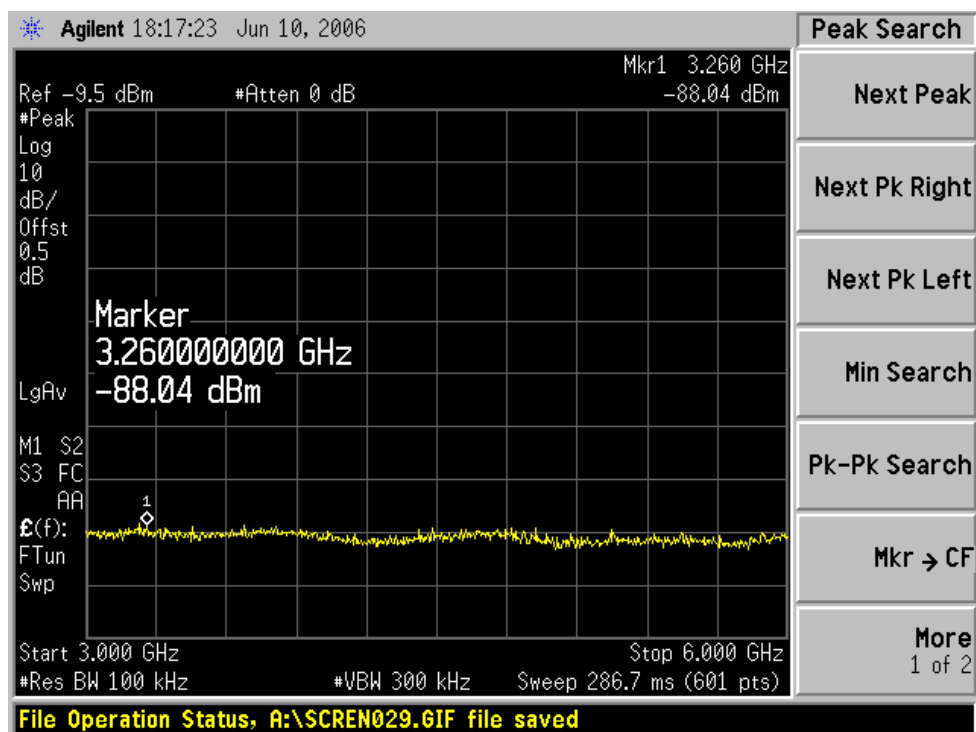
Please refer to the hereinafter plots.

Forward (Downlink)



Reverse (Uplink)





§2.1053 - SPURIOUS RADIATED EMISSION

Applicable Standards

Requirements: CFR 47, § 2.1053.

Test Procedure

The transmitter was placed on a wooden 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 = $10 \lg (\text{TXpwr in Watts}/0.001)$ – the absolute level

Spurious attenuation limit in dB = $43 + 10 \text{ Log}_{10} (\text{power out in Watts})$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	E4446A	US44300386	2006-03-06
Sunol Science	30MHz ~ 3 GHz Antenna	JB3	A020106-3/S006628	2006-02-14
HP	Pre, Amplifier (1 ~ 26.5 GHz)	8449B	3147A00400	2006-08-21
HP	Generator, Signal	83650B	3614A00276	2006-05-10
Sunol Sciences	Antenna, Horn, Std	DRH-118	A052704	2005-10-02
A.R.A	Antenna, Horn, DRG	DRG-118/A	1132	2005-10-17

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

Environmental Conditions

Temperature:	27° C
Relative Humidity:	37%
ATM Pressure:	1020 mbar

* The testing was performed by James Ma on 2006-07-24.

Summary of Test Results

-9.7 dB margin at 2644.2 MHz Downlink

-9.7 dB margin at 1672.8MHz Uplink

Forward (Down Link) – Omni Antenna Gain = 0 dBi

Run # 1 - 1 :Primary scan 30MHz-10GHz , Middle Channel = 881.4 MHz

Indicated		Table	Test Antenna		Substituted		Antenna	Cable	Absolute	Limit	Margin
Frequency	Amp.	Angle	Height	Polar	Frequency	Level	Gain	Loss	Level		
MHz	dBuV/m	Degree	Meter	H/V	MHz	dBm	Correction	dB	dBm	dBm	dB
2644.2	38.50	180	1.8	v	2644.2	-31.5	11.3	2.5	-22.7	-13	-9.7
1762.8	38.20	200	1.5	h	1762.8	-32.4	11.5	1.9	-22.8	-13	-9.8
2644.2	38.00	180	1.8	h	2644.2	-32.0	11.3	2.5	-23.2	-13	-10.2
1762.8	40.30	130	1.2	v	1762.8	-33.2	11.5	1.9	-23.6	-13	-10.6
3525.6	35.70	120	2.0	v	3525.6	-34.3	11.2	2.7	-25.8	-13	-12.8
3525.6	35.10	120	2.0	h	3525.6	-34.9	11.2	2.7	-26.4	-13	-13.4

Reverse (Up Link) - Patch Antenna Gain = 5 dBi

Run # 1 - 2 :Primary scan 30MHz -10GHz , Middle Channel = 836.4 MHz

Indicated		Table	Test Antenna		Substituted		Antenna	Cable	Absolute	Limit	Margin
Frequency	Amp.	Angle	Height	Polar	Frequency	Level	Gain	Loss	Level		
MHz	dBuV/m	Degree	Meter	H/V	MHz	dBm	Correction	dB	dBm	dBm	dB
1672.8	43.40	220	1.2	v	1672.8	-32.3	11.5	1.9	-22.7	-13	-9.7
1672.8	34.10	160	1.2	h	1672.8	-36.3	11.5	1.9	-26.7	-13	-13.7
2509.2	37.90	180	1.8	v	2509.2	-32.1	11.3	2.5	-23.3	-13	-10.3
2509.2	32.30	200	1.8	h	2509.2	-36.7	11.3	2.5	-27.9	-13	-14.9
3345.6	31.30	120	2.0	v	3345.6	-38.5	11.2	2.7	-30	-13	-17.0
3345.6	28.80	120	2.0	h	3345.6	-42.2	11.2	2.7	-33.7	-13	-20.7

Note: Measured Without Preamplifier

§22.917 – BAND EDGE

Applicable Standards

According to § 22.917, the power of any emission 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.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. Adjust the carrier frequency as close to the frequency block edges both upper and lower. Sufficient scans were taken to show any out of band-edge emission.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	E4446A	US44300386	2006-03-06

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

Environmental Conditions

Temperature:	27° C
Relative Humidity:	37%
ATM Pressure:	1020 mbar

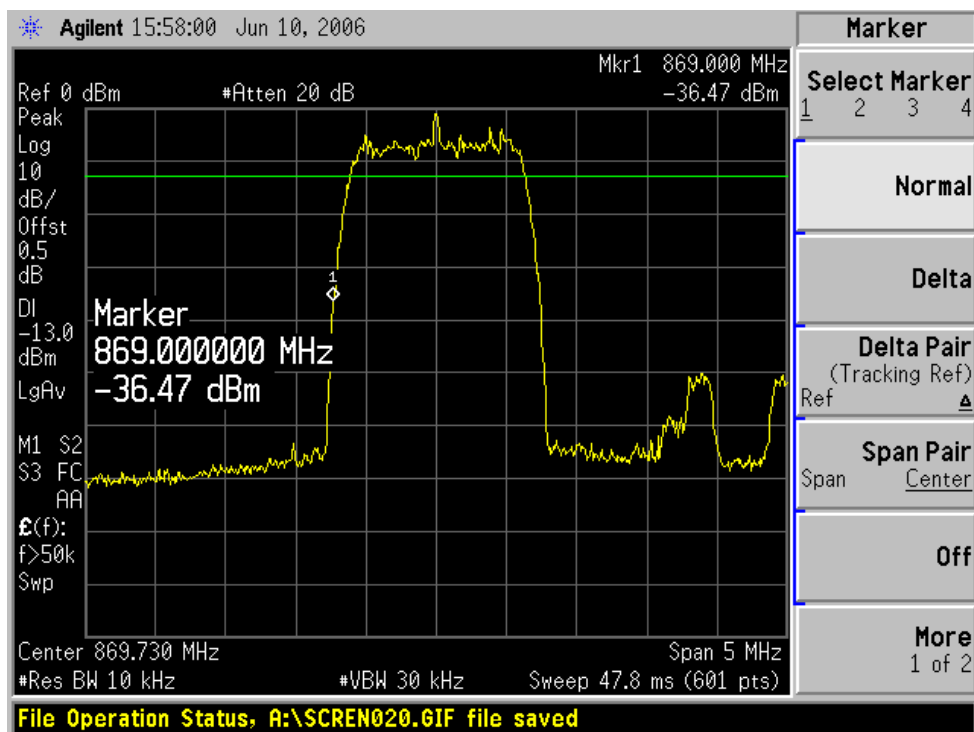
* *The testing was performed by James Ma on 2006-07-19.*

Test Results

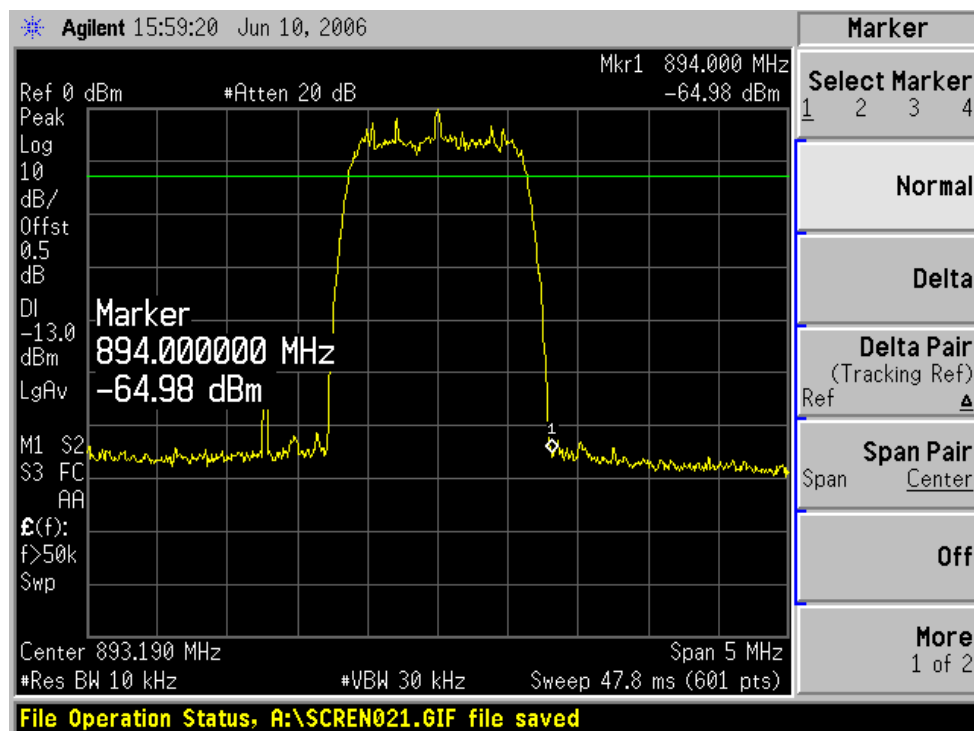
Please refer to plots hereinafter.

Forward (Downlink)

Lowest Channel:

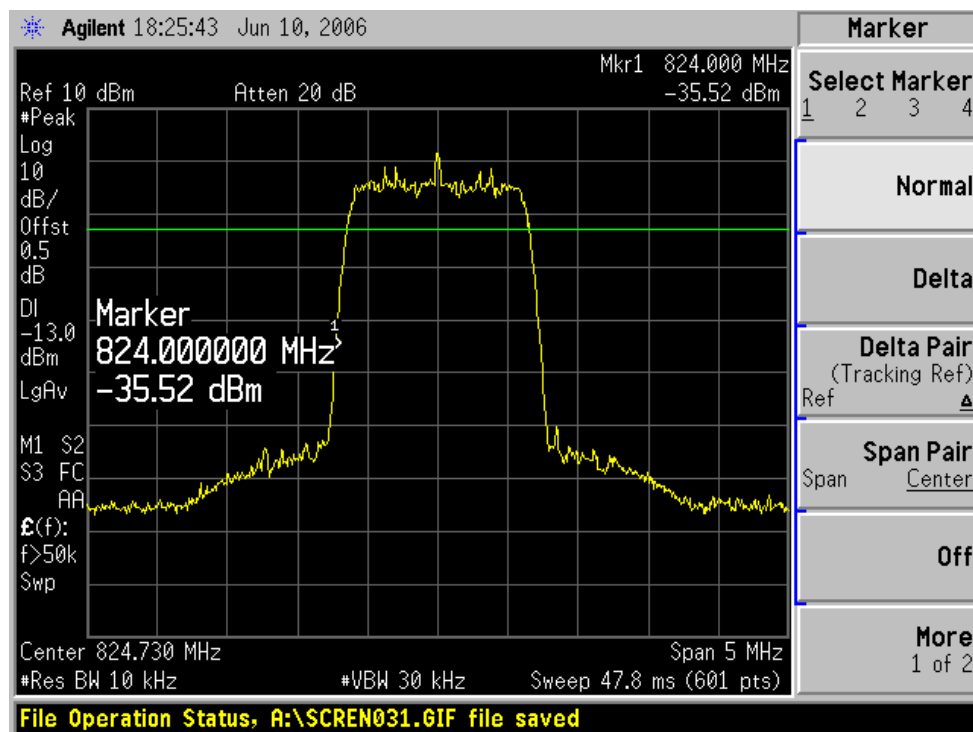


Highest Channel:

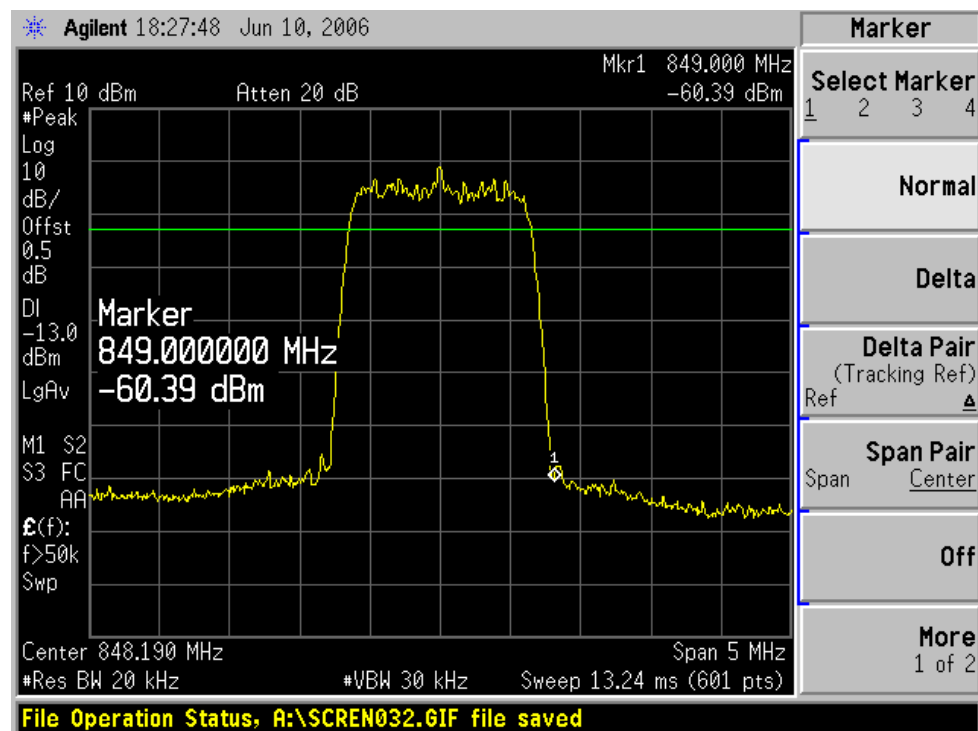


Reverse (Uplink)

Lowest Channel:



Highest Channel:



§2.1055(a), §2.1055(d) & §22.355 - FREQUENCY STABILITY

Applicable Standard

Requirements: FCC § 2.1055 (a), § 2.1055 (d) & following:

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

Table C-1_Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency range (MHz)	Base, fixed (ppm)	Mobile [le]3 watts (ppm)	Mobile [le]3 watts (ppm)
25 to 50.....	20.0	20.0	50.0
50 to 450.....	5.0	5.0	50.0
450 to 512.....	2.5	5.0	5.0
821 to 896.....	1.5	2.5	2.5
928 to 929.....	5.0	n/a	n/a
929 to 960.....	1.5	n/a	n/a
2110 to 2220.....	10.0	n/a	n/a

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a f Spectrum Analyzer via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Spectrum Analyzer.

Frequency Stability vs. Voltage: An external variable DC power supply Source. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the end point. The output frequency was recorded for each voltage.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Communications	E5515C	GB44051221	2005-08-08
Agilent	Analyzer, Spectrum	E4446A	US44300386	2005-11-10

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

Environmental Conditions

Temperature:	27° C
Relative Humidity:	37%
ATM Pressure:	1020 mbar

* The testing was performed by James Ma on 2006-07-21.

Reference Frequency: Mid Channel**Forward (Down Link)**

Reference Frequency: Mid Channel = 881.40 MHz						
Condition		Ref Freq	Measured Freq	Freq Error	Freq Error	Limit
Voltage (V dc)	Temperature (C)	MHz	MHz	Hz	PPM	PPM
7.5	50	881.400000	881.399708	292	0.3312911	1.5
7.5	40	881.400000	881.399613	387	0.4390742	1.5
7.5	30	881.400000	881.399506	494	0.5604720	1.5
7.5	20	881.400000	881.399614	386	0.4379396	1.5
7.5	10	881.400000	881.399798	202	0.2291808	1.5
7.5	0	881.400000	881.399830	170	0.1928750	1.5
7.5	-10	881.400000	881.399856	144	0.1633764	1.5
7.5	-20	881.400000	881.399861	139	0.1577037	1.5
7.5	-30	881.400000	881.399872	128	0.1452235	1.5

Reverse (Up Link)

Reference Frequency: Mid Channel = 836.40 MHz						
Condition		Ref Freq	Measured Freq	Freq Error	Freq Error	Limit
Voltage (V dc)	Temperature (C)	MHz	MHz	Hz	PPM	PPM
7.5	50	836.400000	836.399920	80	0.0956480	1.5
7.5	40	836.400000	836.399918	82	0.0980392	1.5
7.5	30	836.400000	836.399913	87	0.1040172	1.5
7.5	20	836.400000	836.399911	89	0.1064084	1.5
7.5	10	836.400000	836.399904	96	0.1147776	1.5
7.5	0	836.400000	836.399873	127	0.1518412	1.5
7.5	-10	836.400000	836.399875	125	0.1494500	1.5
7.5	-20	836.400000	836.399878	122	0.1458632	1.5
7.5	-30	836.400000	836.399880	120	0.1434720	1.5

IS-138a (3.4.4) TWO-TONE TEST

Applicable Standards

According to IS-138A (3.4.4), Intermodulation products must be attenuated below the rated power of the EUT by at least $43 + 10\log(P)$, equivalent to -13 dBm.

Test Procedure

The RF output of the EUT was connected to a spectrum analyzer 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. Two input signals are equal in level (and can be raised equally), were send to the EUT.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	E4446A	US44300386	2006-03-06
Rohde & Schwarz	Signal Generator	SMIQ03	DE23746	2006-07-03

* The testing was performed by James Ma on 2006-07-20.

Test Results

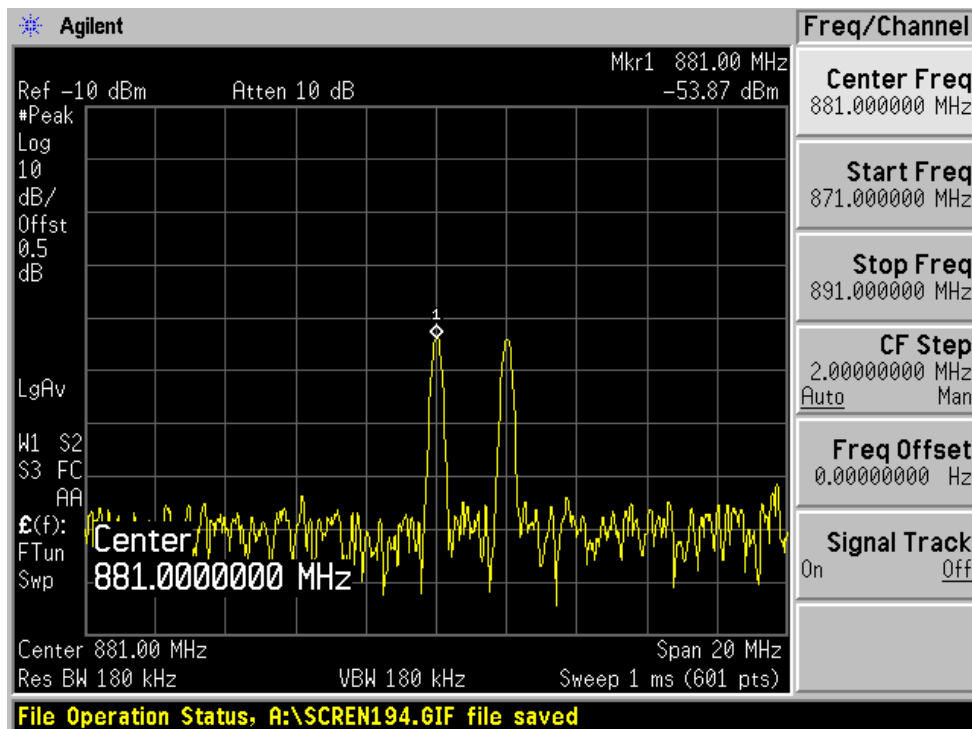
Mode	Channel	Measured
Up-link	Mid	< -13dBm
Down-link	Mid	< -13dBm

Plots of Two-Tone Test Result

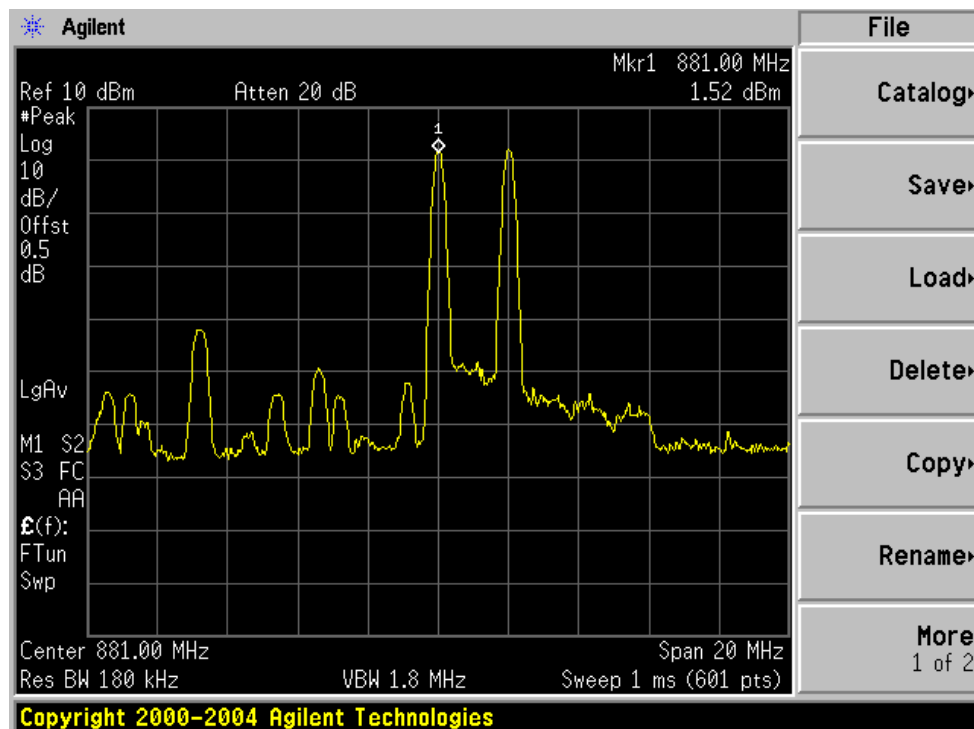
Please refer to plots hereinafter.

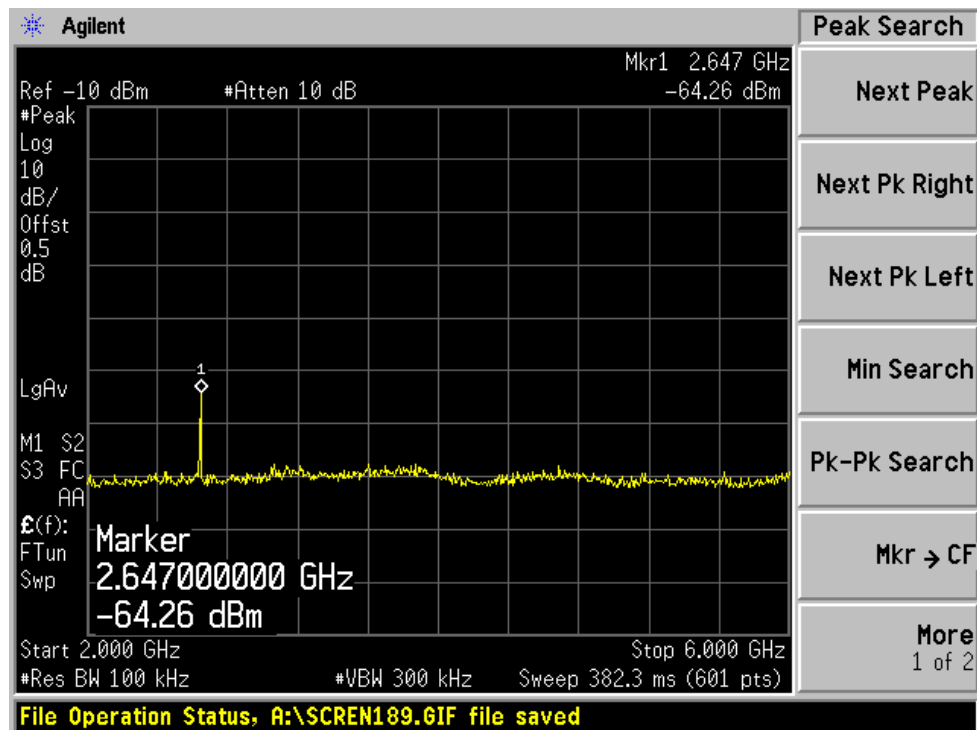
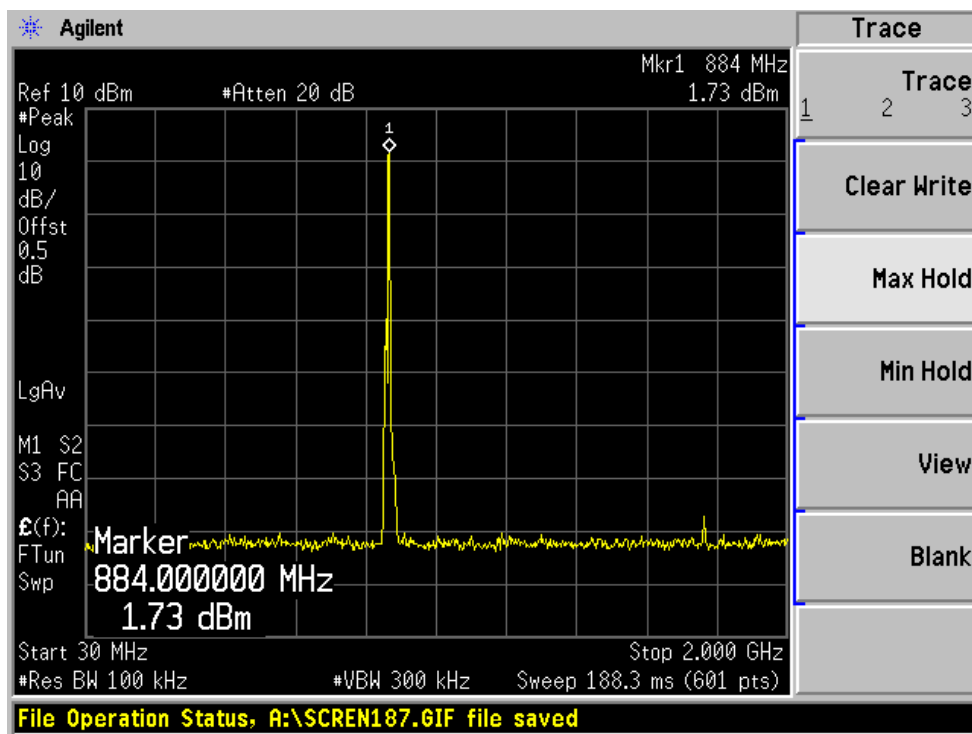
Forward (Downlink)

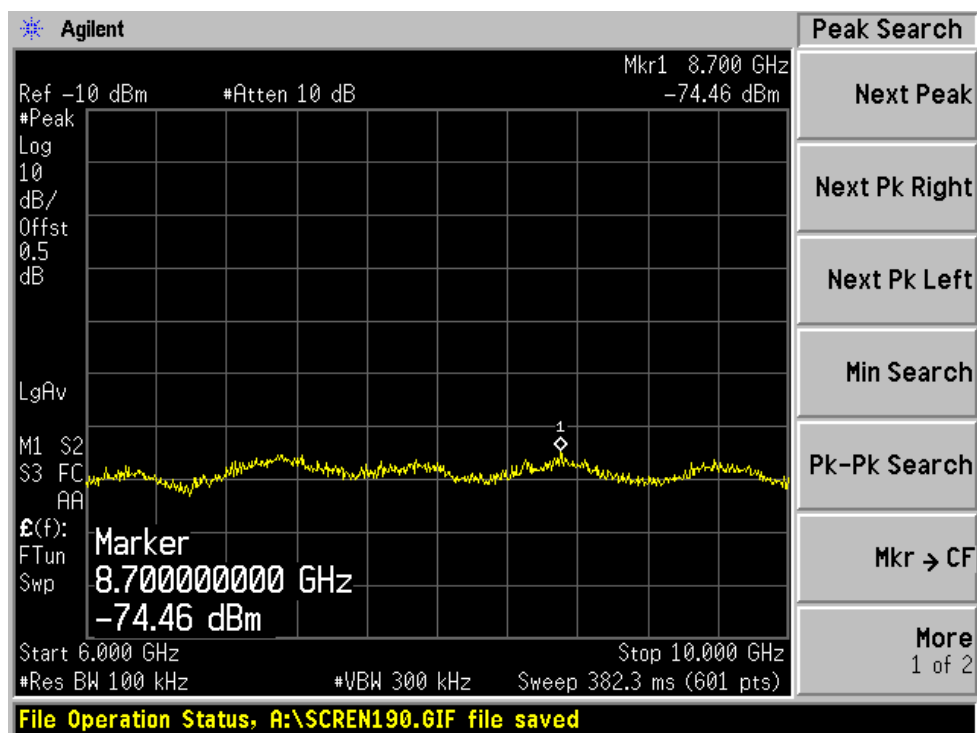
Input:



Output:

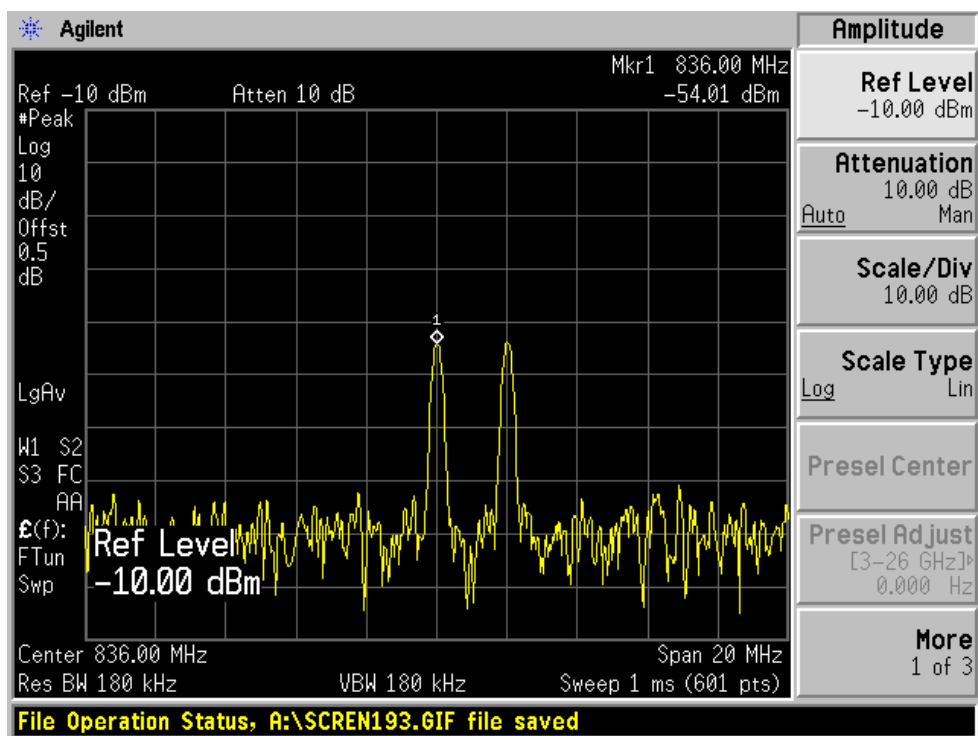






Reverse (Uplink)

Input:



Output:

