Washington Laboratories, Ltd.

FCC Certification Test Report
For the
Airorlite Communications, Inc.
Model 50289 Bi-Directional Booster (Uplink)

FCC ID: UT650289BA8800UL

WLL JOB: 9520
February 19, 2007

Prepared for:

Airorlite Communications, Inc.
17-01 Pollitt Drive
Fair Lawn, NJ07410

Prepared By:

Washington Laboratories, Ltd.
7560 Lindbergh Drive
Gaithersburg, Maryland 20879

FCC Certification Test Report
for the
Airorlite Communications, Inc.
Model 50289 Bi-Directional Booster (Uplink)
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February 9, 2007

WLL JOB# 9520

Prepared by: Brian J. Dettling
Documentation Specialist

Reviewed by: Michael Violette
President

Abstract

This report has been prepared on behalf of Airorlite Communications, Inc. to support the attached Application for Equipment Authorization. The test report and application are submitted for a Licensed Transmitter under Part 90 of the FCC Rules. This Certification Test Report documents the test configuration and test results for a Airorlite Communications, Inc. Model 50289 Bi-Directional Booster (Uplink).

Testing was performed on an Open Area Test Site (OATS) of Washington Laboratories, Ltd, 7560 Lindbergh Drive, Gaithersburg, MD 20879. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by NIST NVLAP (NVLAP Lab Code: 200066-0) as an independent FCC test laboratory.

The Airorlite Communications, Inc. Model 50289 Bi-Directional Booster (Uplink) complies with the limits for a Licensed Transmitter device under FCC Part 90.

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1 Introduction

1.1 Compliance Statement

The Airorlite Communications, Inc. Model 50289 Bi-Directional Booster (Uplink) complies with the limits for a Licensed Transmitter device under FCC Part 90.

1.2 Test Scope

Tests for radiated and conducted (at antenna terminal) emissions were performed. All measurements were performed in accordance with FCC Public Notice DA 00-705 and the 2003 version of ANSI C63.4. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation.

1.3 Contract Information

Customer:	Airorlite Communications, Inc. 17-01 Pollitt Drive Fair Lawn, NJ07410
Purchase Order Number:	001700
Quotation Number:	63230

1.4 Test Dates

Testing was performed on the following date(s):	December 21, 2006 to January 11, 2007

1.5 Test and Support Personnel

Washington Laboratories, LTD	Steve Dovell, Adam Black
Client Representative	Lee Masoian, Rick Kieselowsky

2 Equipment Under Test

2.1 EUT Identification & Description

The Airorlite Communications, Inc. Model 50289 Bi-Directional Booster (Uplink) is an eight channel bi-directional amplifier utilizing 16 channels of synchronized down-up conversions.

The multi-channel booster is divided into two independent 8 channel systems (8 high bands and 8 low bands) for full duplex operations. Downlink signals are received at the roof antenna, 8 selected frequencies are processed (filtering and amplification), and rebroadcast on radiating cable. Conversely, uplink signals induced onto radiating cable are similarly processed and rebroadcast on the roof antenna. The downlink channels are the high band signals (864-869 MHz), and the 8 uplink channels are low band (819-824 MHz).

Each system consisting of a LNA/8-way splitter, 8 channel modules (down-up converters with synthesized LO), 8-way combiner, and RF power amplifiers with an 8-way power combiner. In addition a duplexer combines the uplink RF output and downlink RF input to a common “Off the Air” antenna.

The RF signal flow of the two systems is identical. RF band pass filters internal to the system modules determine high band or low band operations.

Table 1. Device Summary

ITEM	DESCRIPTION
Manufacturer:	Airorlite Communications, Inc.
FCC ID:	UT650289BA8800UL
Model:	Model 50289 Bi-Directional Booster (Uplink)
FCC Rule Parts:	§90
Frequency Range:	819 - 824MHz
Maximum Output Power:	375mW (25.7dBm)
Antenna Gain (dBd)	5.0
Modulation:	N/A
Necessary Bandwidth:	N/A
Keying:	N/A
Type of Information:	Depends on system
Number of Channels:	8
Power Output Level	Fixed
Antenna Connector	N-type
Frequency Tolerance:	N/A
Emission Type(s):	F1E
Interface Cables:	N/A
Power Source & Voltage:	120Vac

2.2 Test Configuration

The Model 50289 Bi-Directional Booster (Uplink) was configured with the Downlink unit and a signal generator. See diagram below.

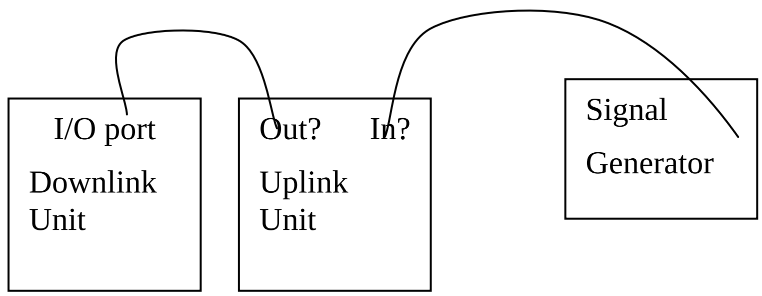

Figure 1. Test Configuration.

2.3 Testing Algorithm

A signal Generator was setup and used to send an RF signal into the RF input port on the unit under test.

Worst case emission levels are provided in the test results data.

2.4 Test Location

All measurements herein were performed at Washington Laboratories, Ltd. test center in Gaithersburg, MD. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by NIST NVLAP (NVLAP Lab Code: 200066-0) as an independent FCC test laboratory.

2.5 Measurements

2.5.1 References

ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation

ANSI C63.4 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

Land Mobile FM or PM Communications Equipment Measurement and Performance Standards (ANSI/TIA/EIA-603-93)

2.6 Measurement Uncertainty

All results reported herein relate only to the equipment tested. For the purposes of the measurements performed by Washington Laboratories, the measurement uncertainty is ±2.3 dB. This has been calculated for a *worst-case situation* (radiated emissions measurements performed on an open area test site).

The following measurement uncertainty calculation is provided:

$$\text{Total Uncertainty} = (A^2 + B^2 + C^2)^{1/2}/(n-1)$$

where:

A = Antenna calibration uncertainty, in dB = 2 dB

B = Spectrum Analyzer uncertainty, in dB = 1 dB

C = Site uncertainty, in dB = 4 dB

n = number of factors in uncertainty calculation = 3

Thus, Total Uncertainty = $0.5\ (2^2 + 1^2 + 4^2)^{1/2} = \pm 2.3$ dB.

3 Test Equipment

Table 2 shows a list of the test equipment used for measurements along with the calibration information.

Table 2: Test Equipment List

Site 1 List:

WLL Asset #	Manufacturer Model/Type	Function	Cal. Due
00070	HP, 85685A	Preselector, RF w/opt 8ZE	07/03/2007
00074	HP, 8593A	Analyzer, Spectrum	10/13/2007
00066	HP, 8449B	Pre-Amplifier, RF. 1-26.5GHz	06/22/2007
00001	A.H., Systems, SAS-200/518	Antenna, LP, 1-18GHz	03/11/2007
00004	ARA, DRG-118/A	Antenna, DRG, 1-18GHz	02/02/2007
00028	EMCO,3146	Antenna, Log Periodic	09/15/2008
00382	Sunol,JB1	Antenna, Biconlog	01/25/2007
00068	HP, 85650A	Adapter, QP	07/03/2007
00072	HP, 8568B	Analyzer, Spectrum	07/03/2007

4 Test Results

4.1 RF Power Output: (FCC Part §2.1046 § 90.219)

The output from the transmitter was connected to an attenuator and then to the input of the RF Spectrum Analyzer. The analyzer offset was adjusted to compensate for the attenuator and other losses in the system.

Table 3. RF Power Output

Frequency	Level	Antenna Gain	ERP W	Limit § 90.219	Pass/Fail
Low Channel 819.0125MHz	24.34 dBm	5.0 dBi	0.89	5 W ERP	Pass
Mid Channel 821.5MHz	25.75 dBm	5.0 dBi	1.12	5 W ERP	Pass
High Channel 823.9875MHz	24.76 dBm	5.0 dBi	0.946	5 W ERP	Pass

Table 4. Antenna Specifications

Item: 473442 des: 806-2300 MicroFill, Outdoor

Parameter	**Specification**
Specific Freq. (MHz)	806-960/1710-2300
Bandwidth @ Rated VSWR (MHz)	154/590 MHz
Polarization	Vertical
Bending Moment (ft lbs)	Not Specified
Connector (direct)	N Female
Connector Placement	Bottom
Downtilt (deg)	None
Front to Back Ratio (dB)	Not Specified
Gain (dBd)	4.5/5.0
Gain(dBi)	6.6/7.1
General Freq. (MHz)	806-960/1710-2300
H. Beamwidth	70 Deg.
Incl. Hardware	Fits 4 Holes In Backplate
Intermodulation	Not Specified
Jumper Included	None
Lateral Thrust @ RWV (lbs)	Not Specified
Lightning Prot.	DC Ground
Maximum Power Input (Watts)	75
Mount Hdw. Incl.	Light Duty Outdoor Wall
Vertical Beamwidth	50 Deg

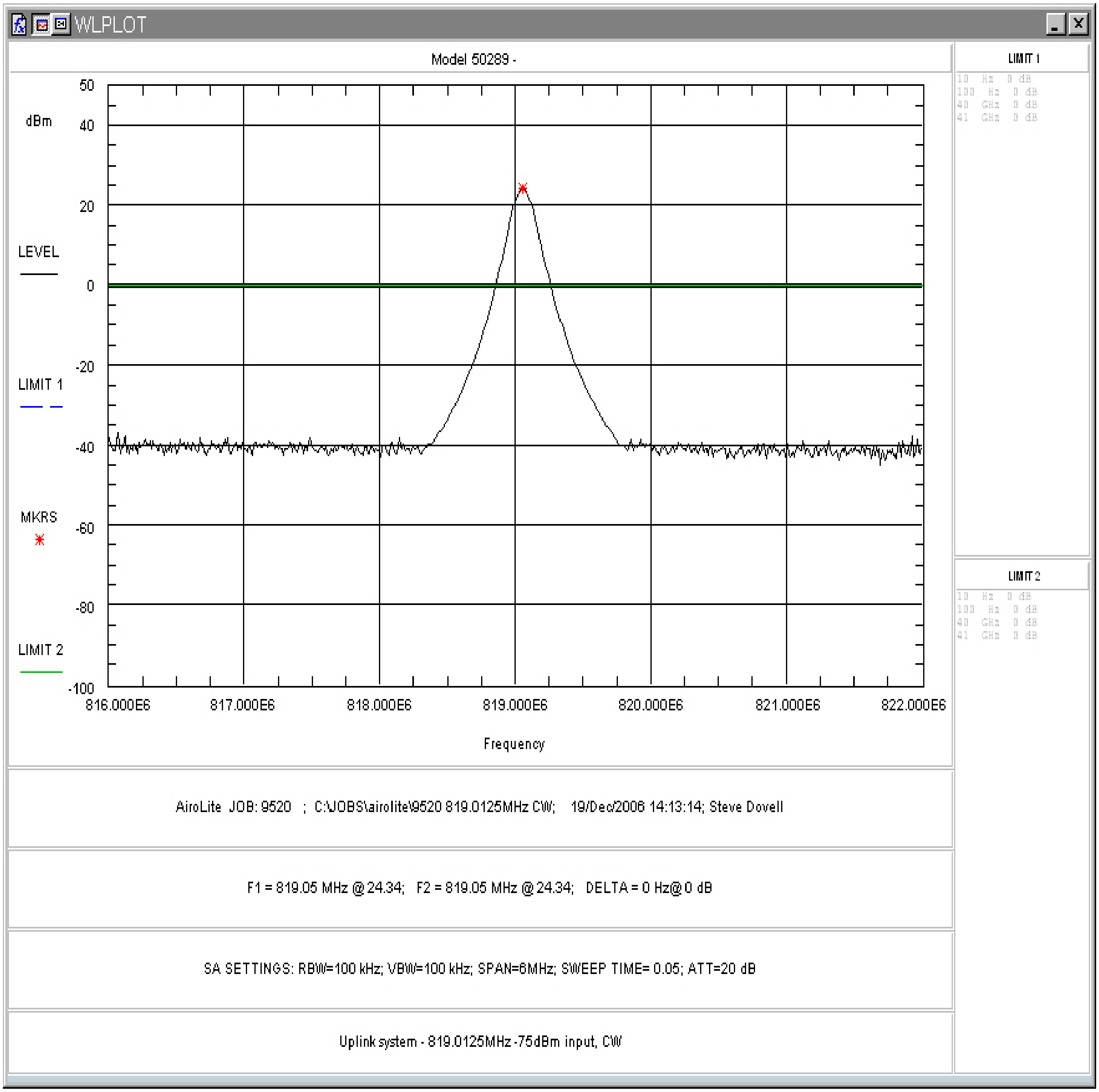

Figure 4-1. RF Peak Power, Low Channel, Carrier Wave

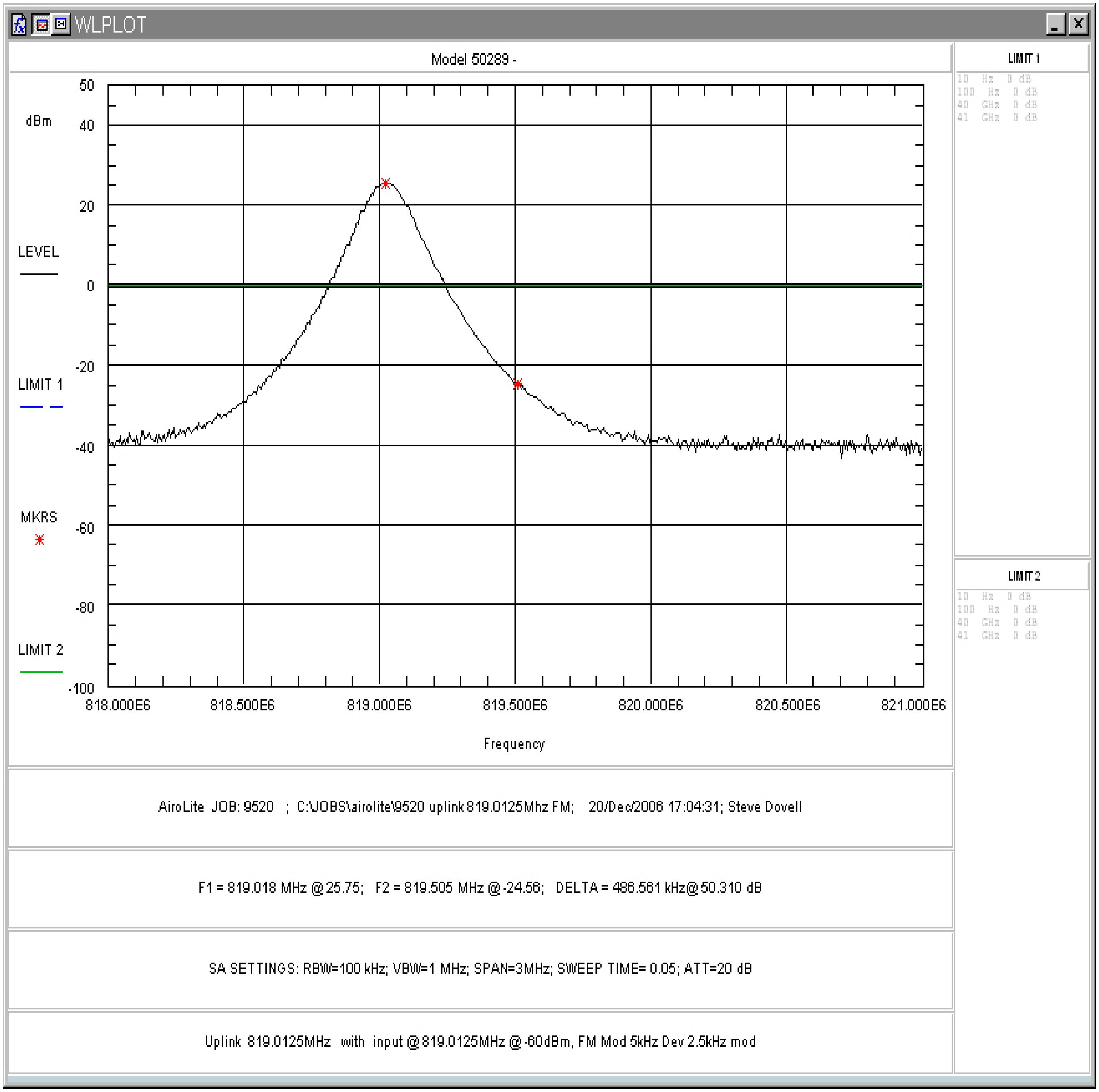

Figure 4-2. RF Peak Power, Low Channel, Frequency Modulation

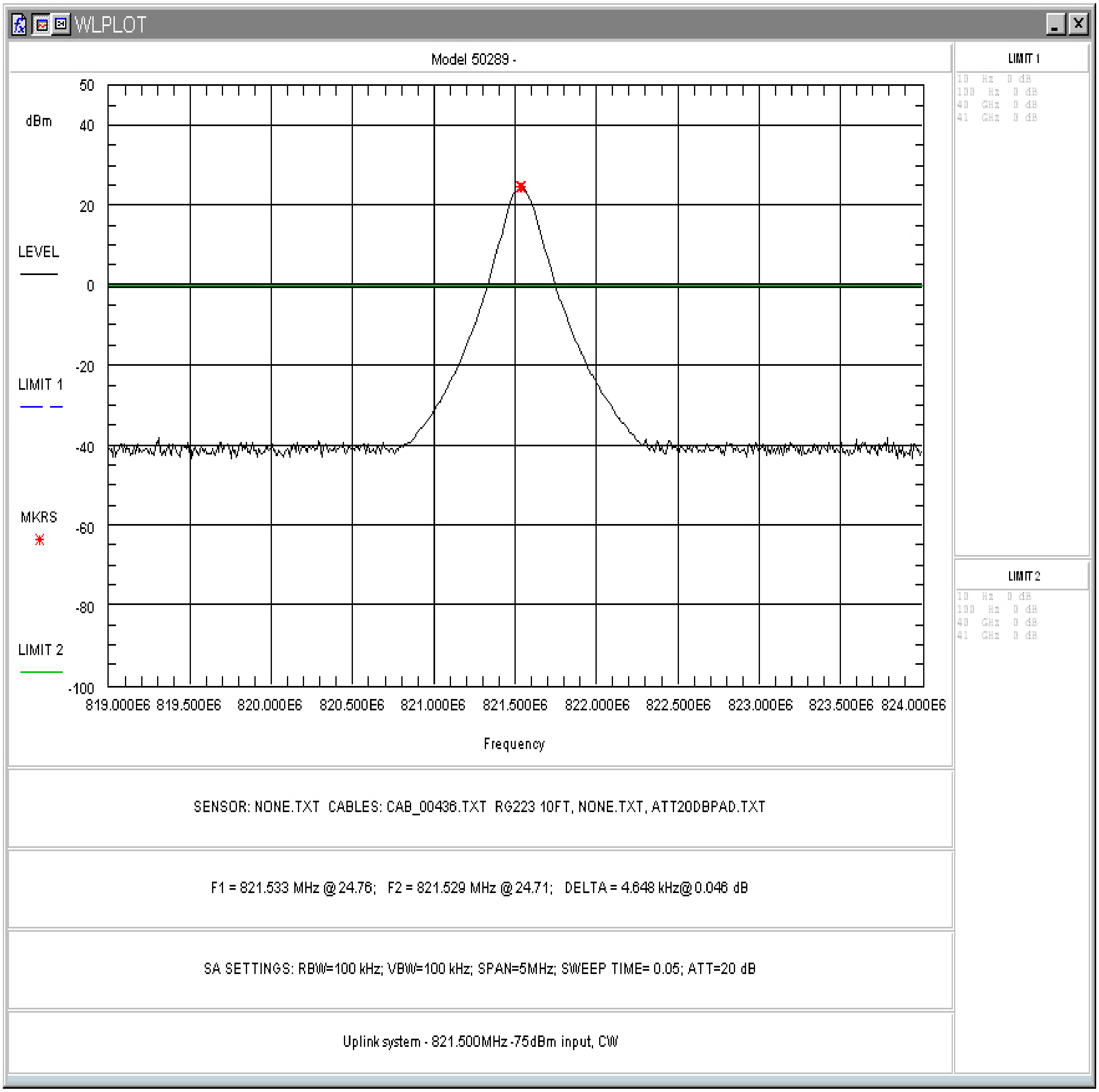

Figure 4-3. RF Peak Power, Mid Channel, Carrier Wave

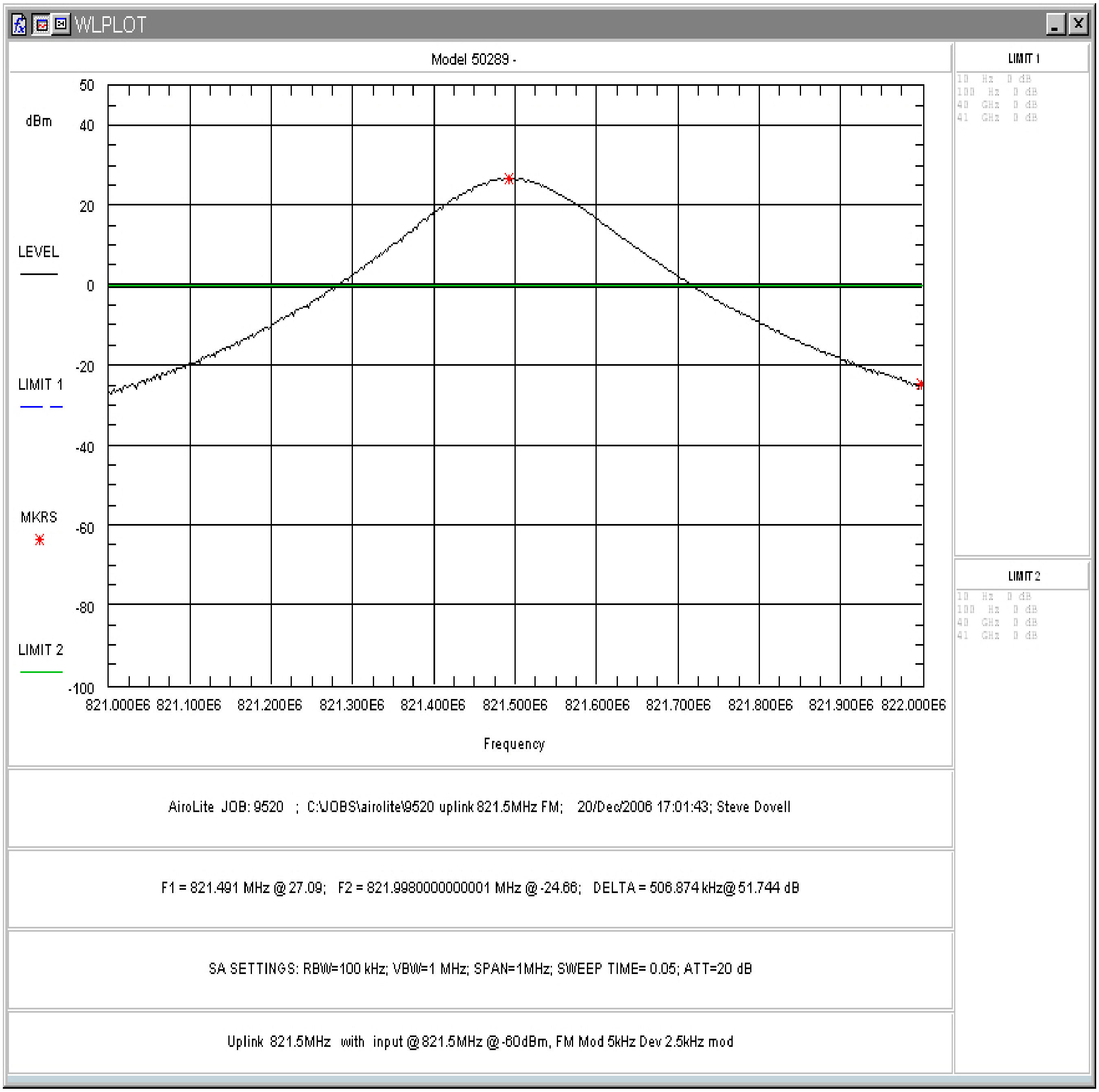

Figure 4-4. RF Peak Power, Mid Channel, Frequency Modulation

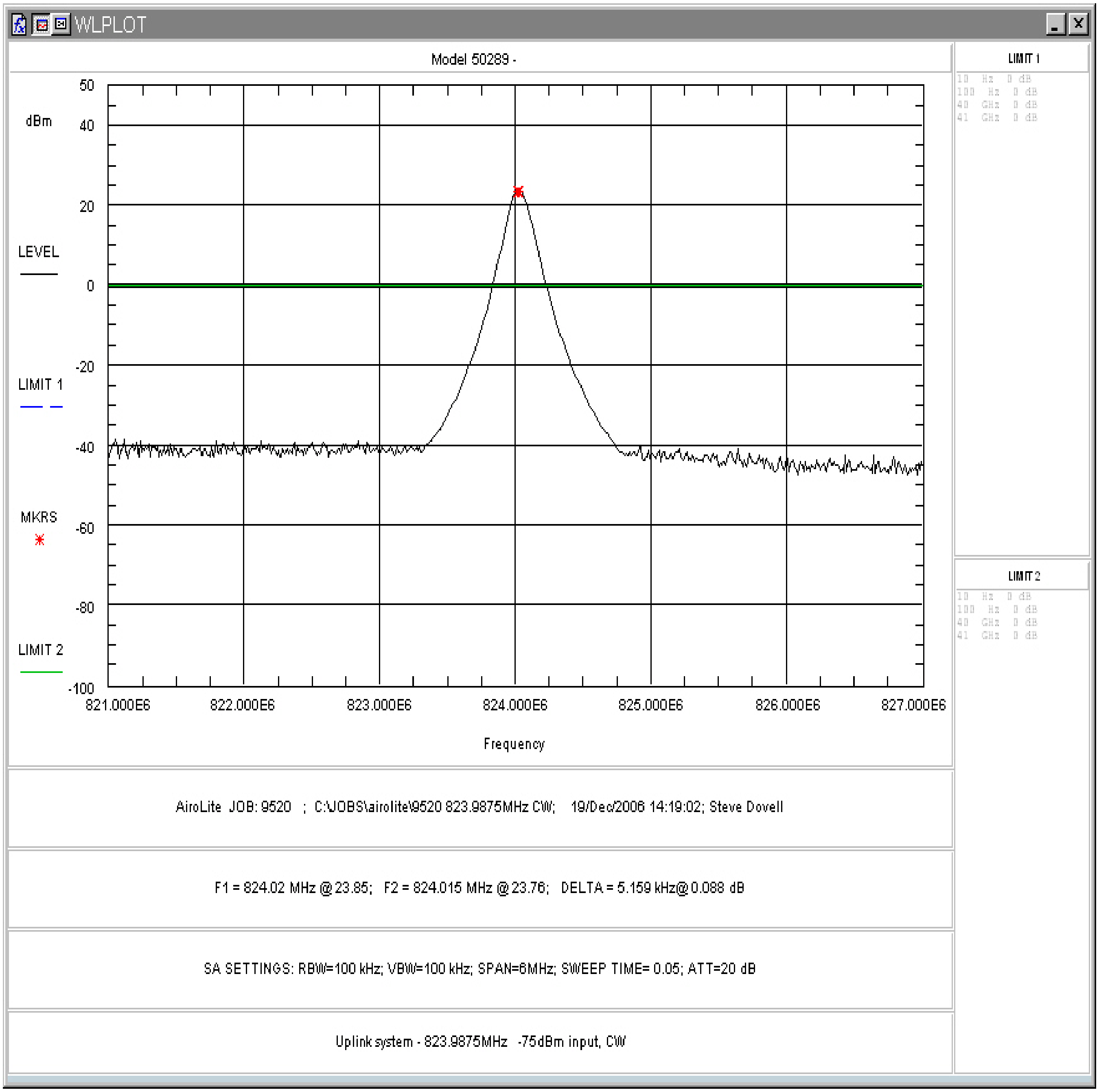

Figure 4-5. RF Peak Power, High Channel, Carrier Wave

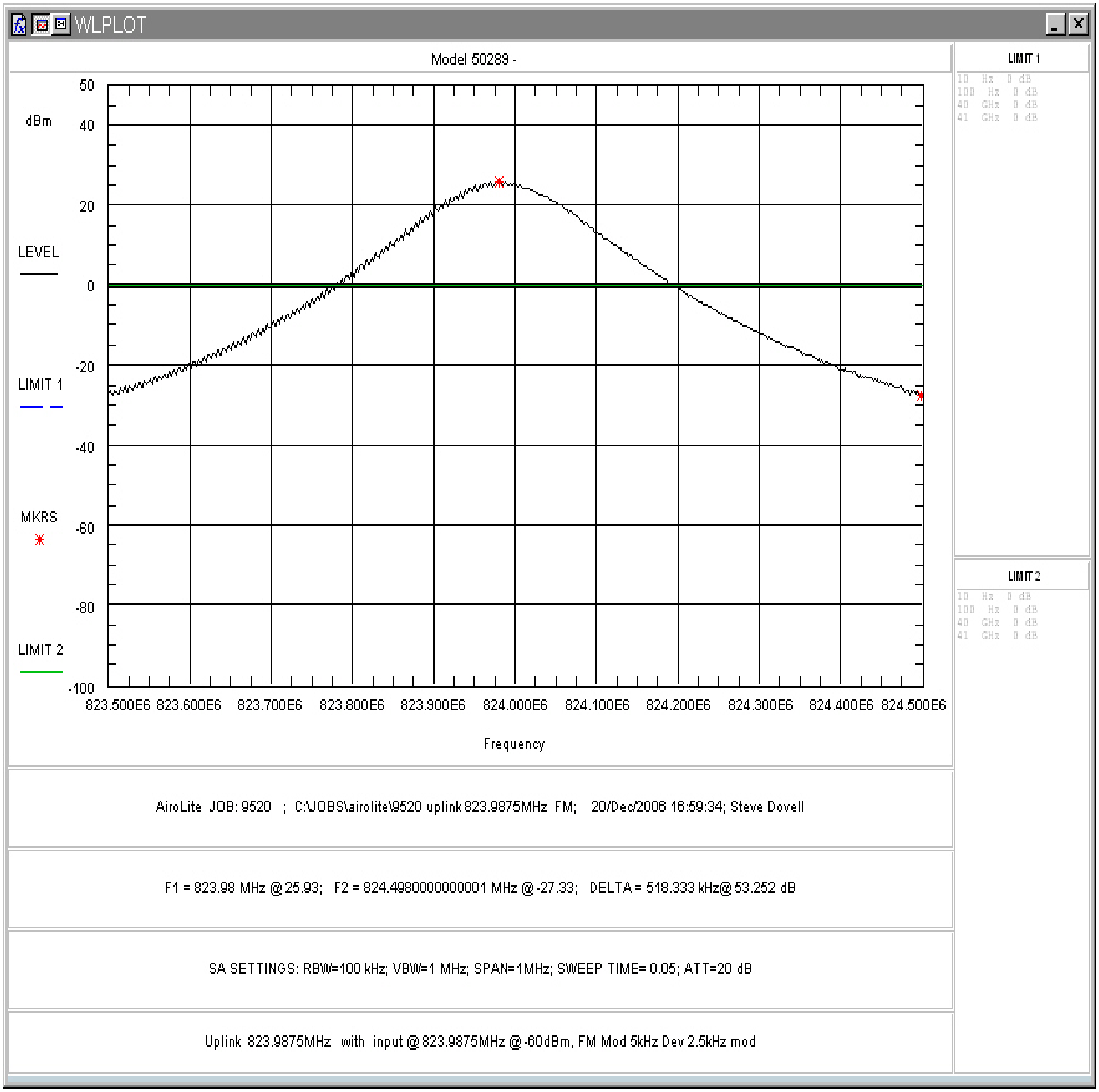

Figure 4-6. RF Peak Power, High Channel, Frequency Modulation

4.2 Occupied Bandwidth: (FCC Part §2.1049)

Occupied bandwidth was performed by coupling the output of the EUT to the input of a spectrum analyzer.

At full modulation, the occupied bandwidth was measured as shown:

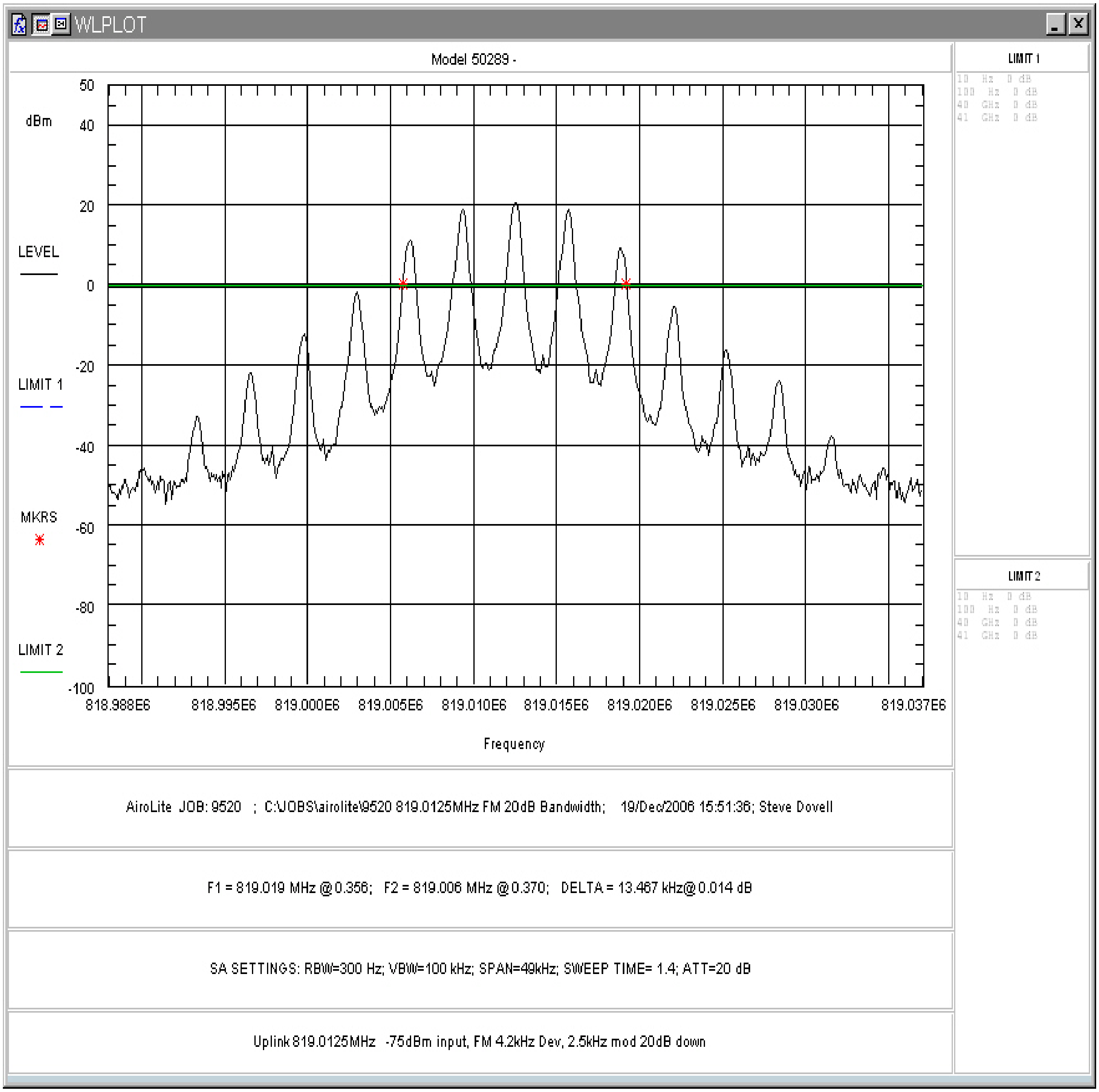

Figure 4-7. Occupied Bandwidth, Low Channel

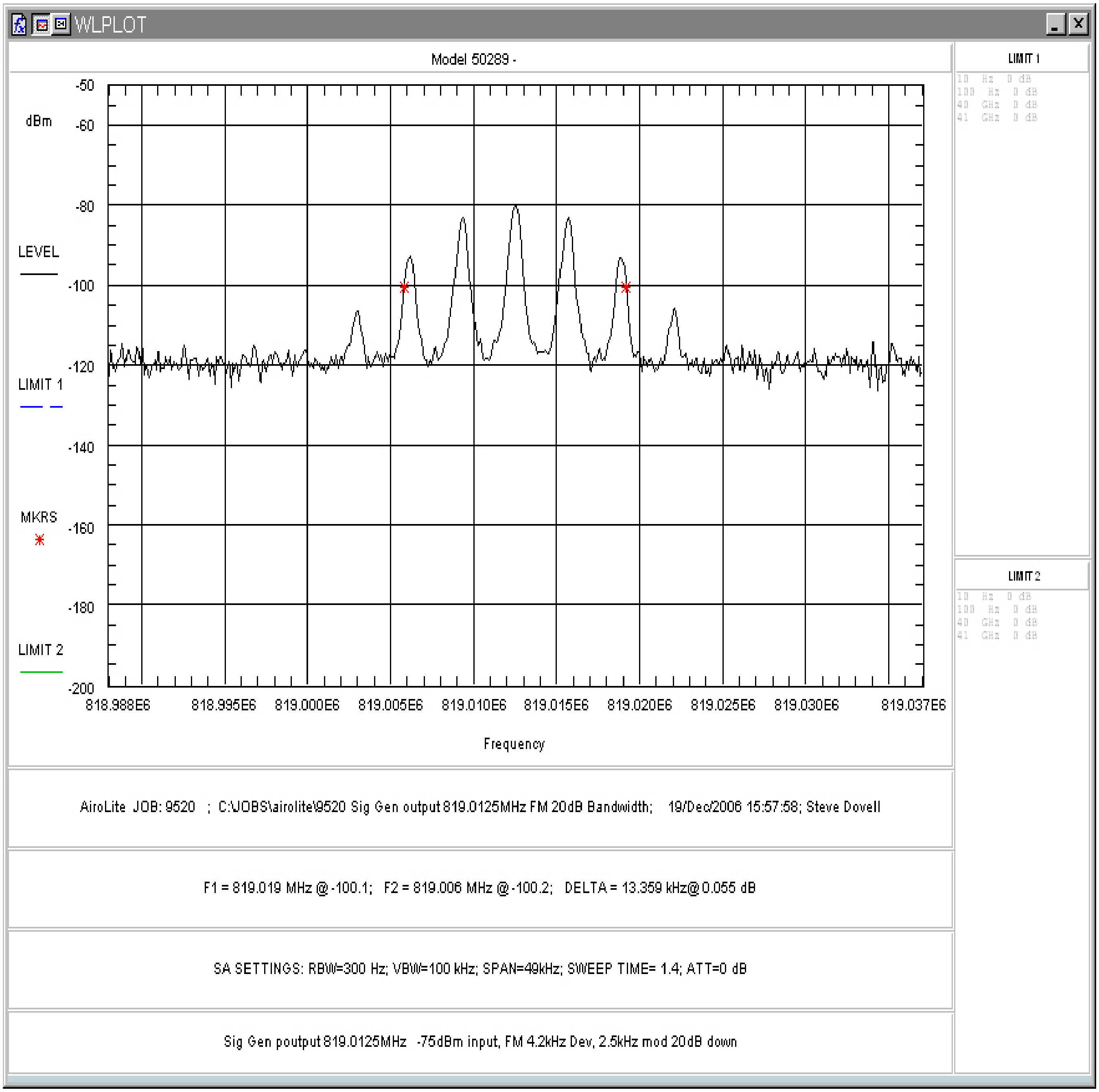

Figure 4-8. Occupied Bandwidth, Low Channel with Signal Generator Output

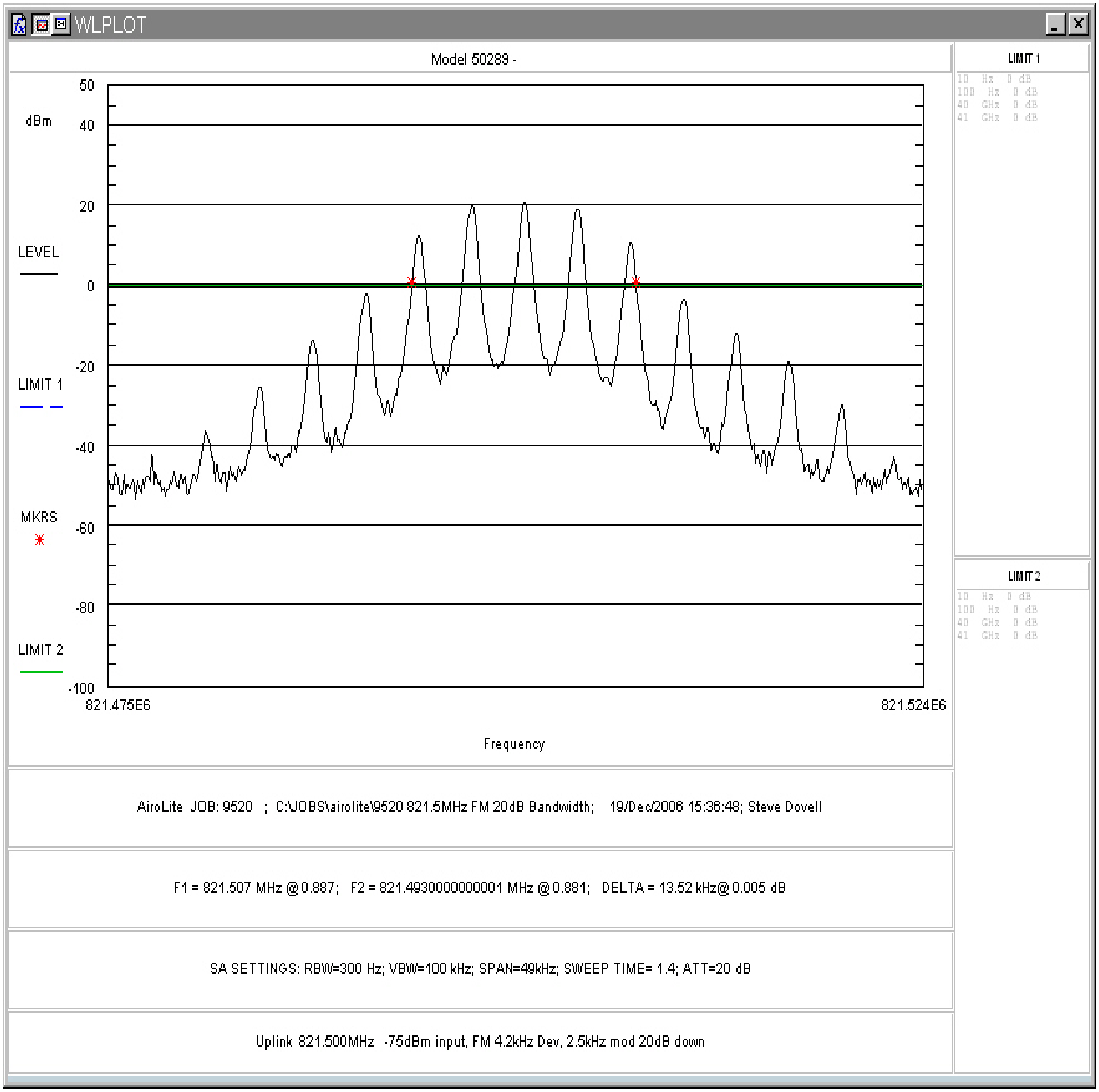

Figure 4-9. Occupied Bandwidth, Mid Channel

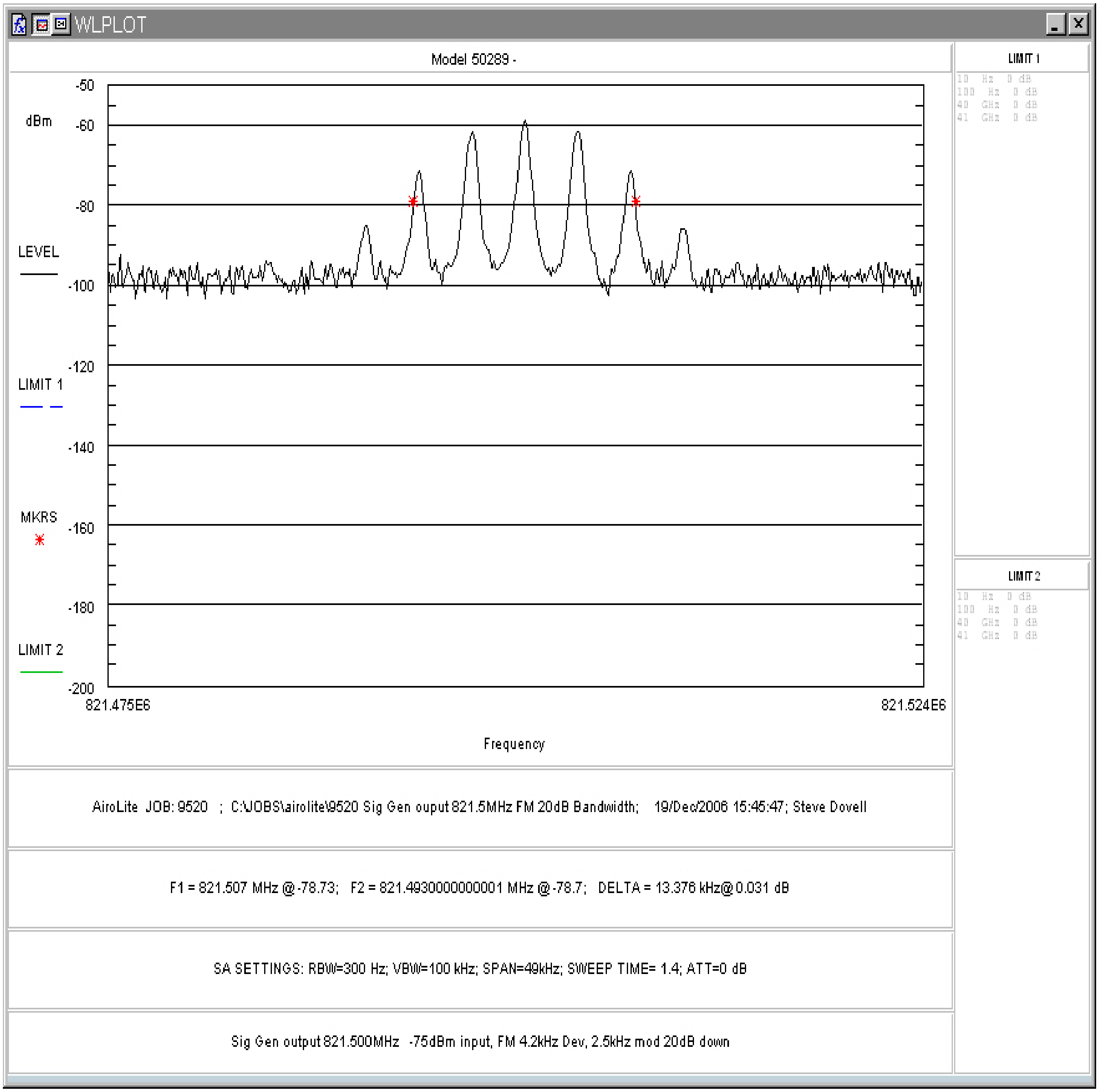

Figure 4-10. Occupied Bandwidth, Mid Channel with Signal Generator Output

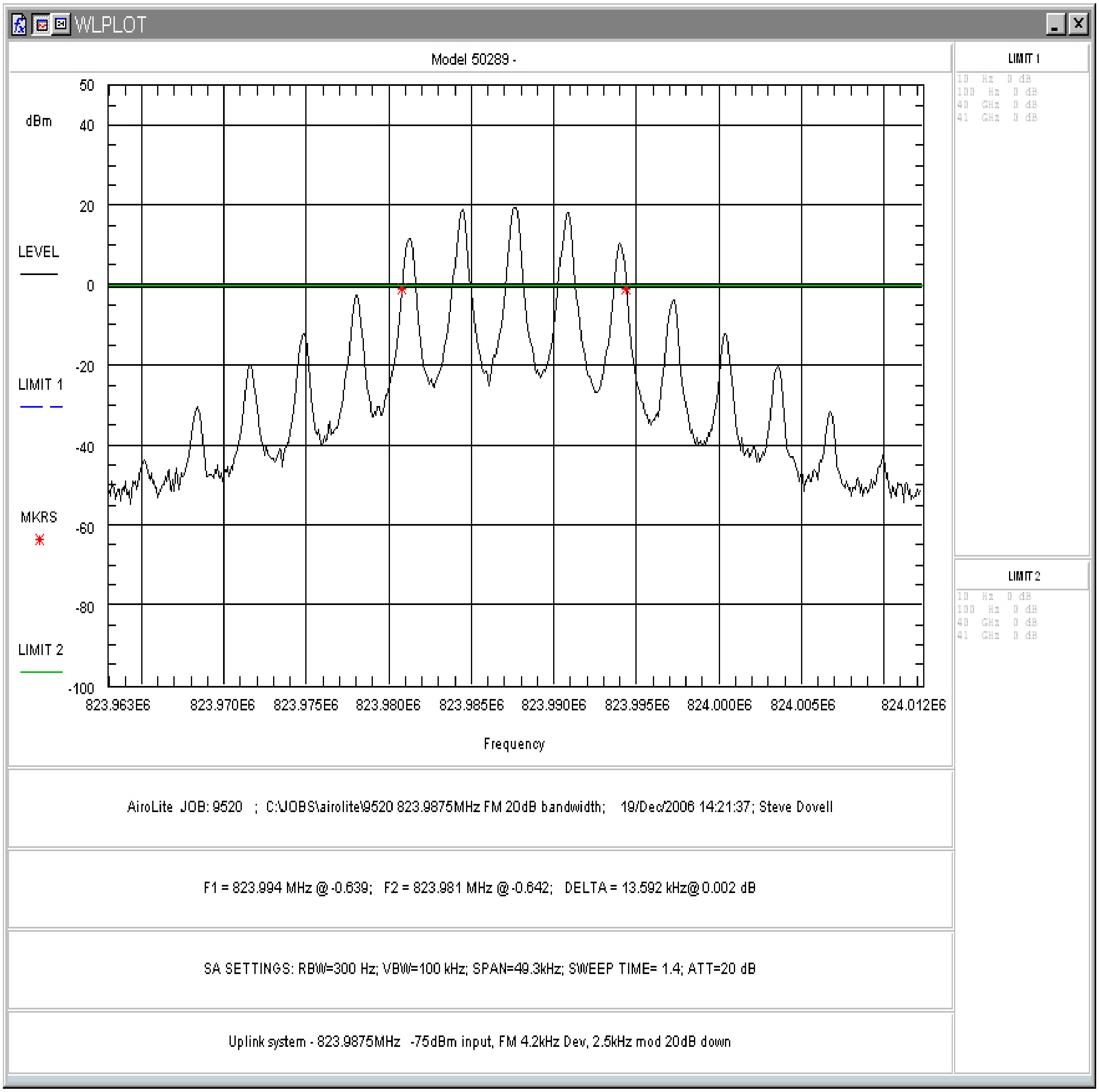

Figure 4-11. Occupied Bandwidth, High Channel

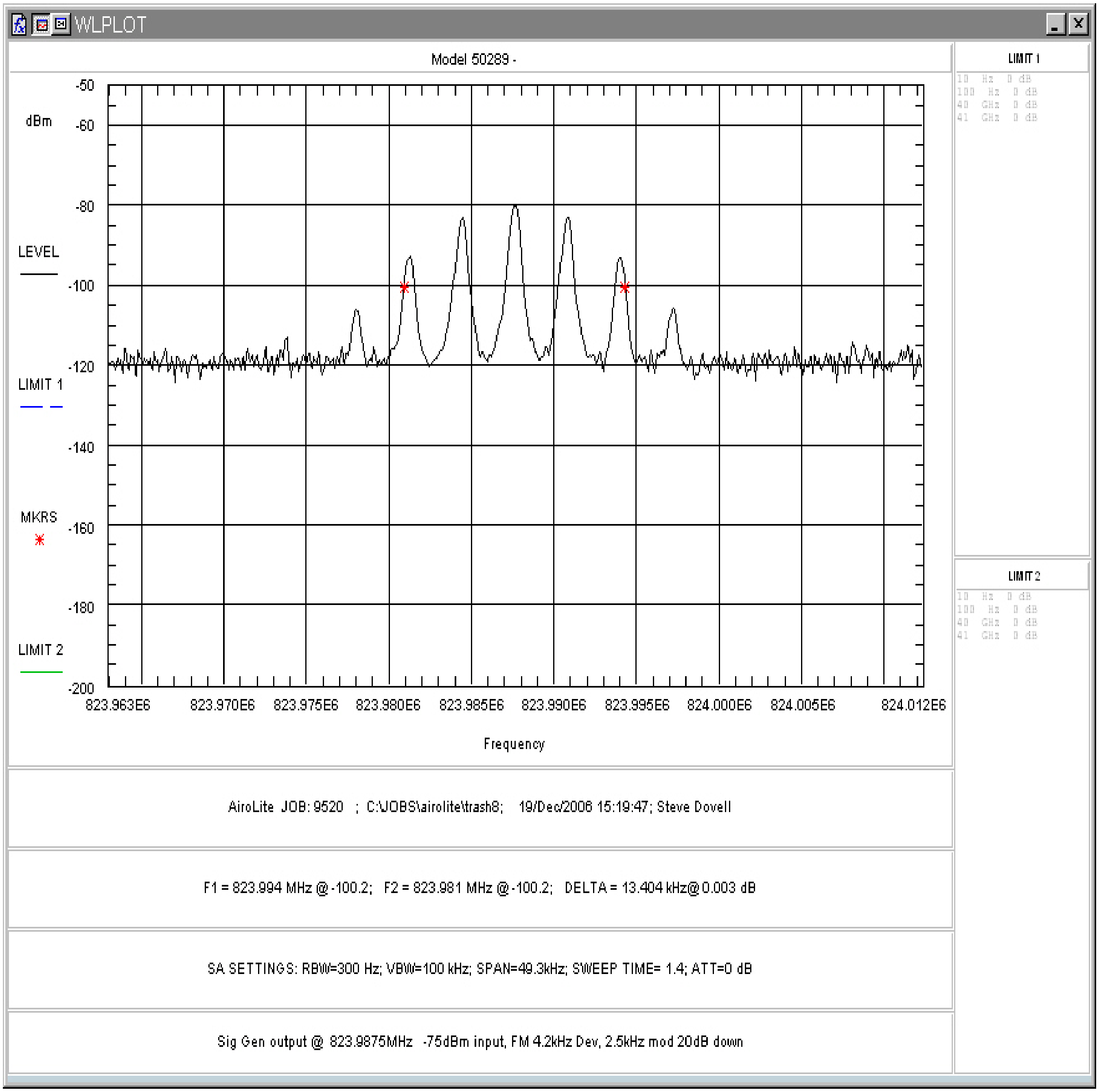

Figure 4-12. Occupied Bandwidth, High Channel with Signal Generator Output

Table 5 provides a summary of the Occupied Bandwidth Results.

Table 5. Occupied Bandwidth Results

Frequency	Bandwidth	Limit	Pass/Fail
Low Channel: 819.0125MHz	13.467kHz	-	Pass
with Signal Generator Output 819.0125MHz	13.359kHz	-	Pass
Mid Channel 821.5MHz	13.52kHz	-	Pass
with Signal Generator Output 821.5MHz	13.376kHz	-	Pass
High Channel 823.9875MHz	13.592kHz	-	Pass
with Signal Generator Output 823.9875MHz	13.404kHz	-	Pass

4.3 Out of band response

The out of band response was measured by sweeping the input signal across the channel band and measuring the output response. The signal generator was set to -60dBm, which is the maximum input signal for the device.

The limit line is set to the absolute limit of -13dBm. The limit band edges are set to ± 125% of the occupied bandwidth.

The results are shown in the following figures.

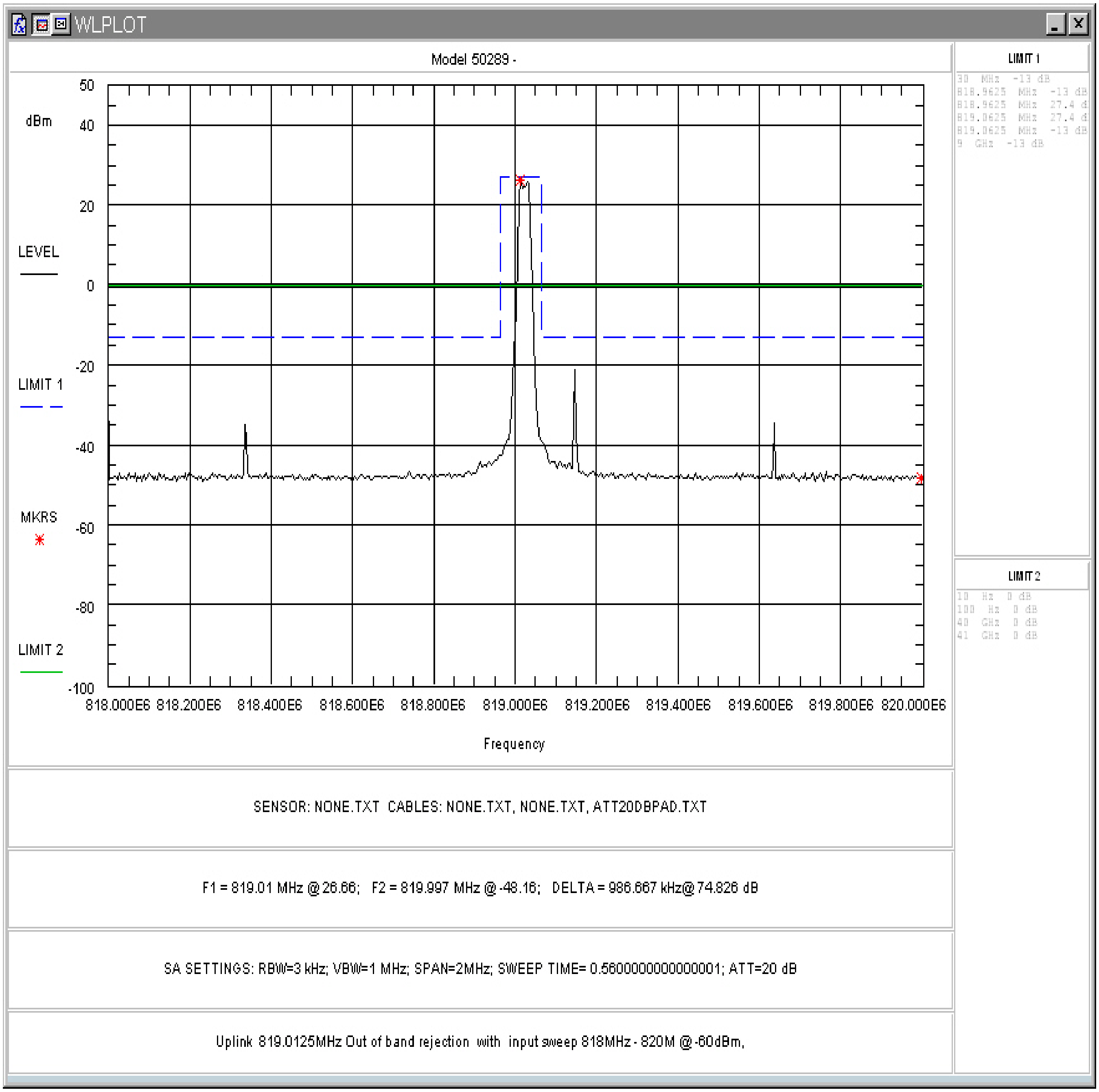

Figure 4-13. Band Reject, Low Channel

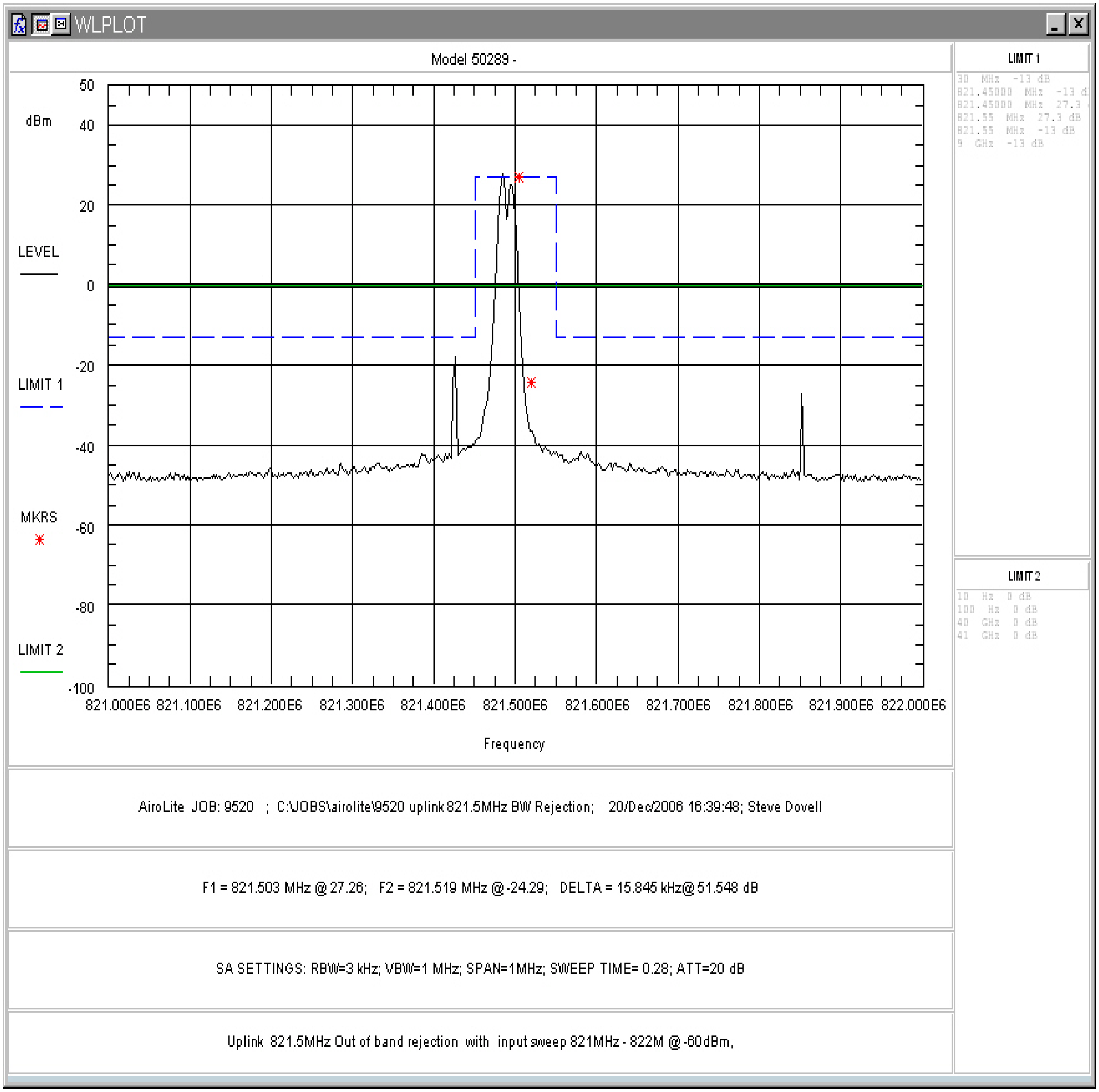

Figure 4-14. Band Reject, Mid Channel

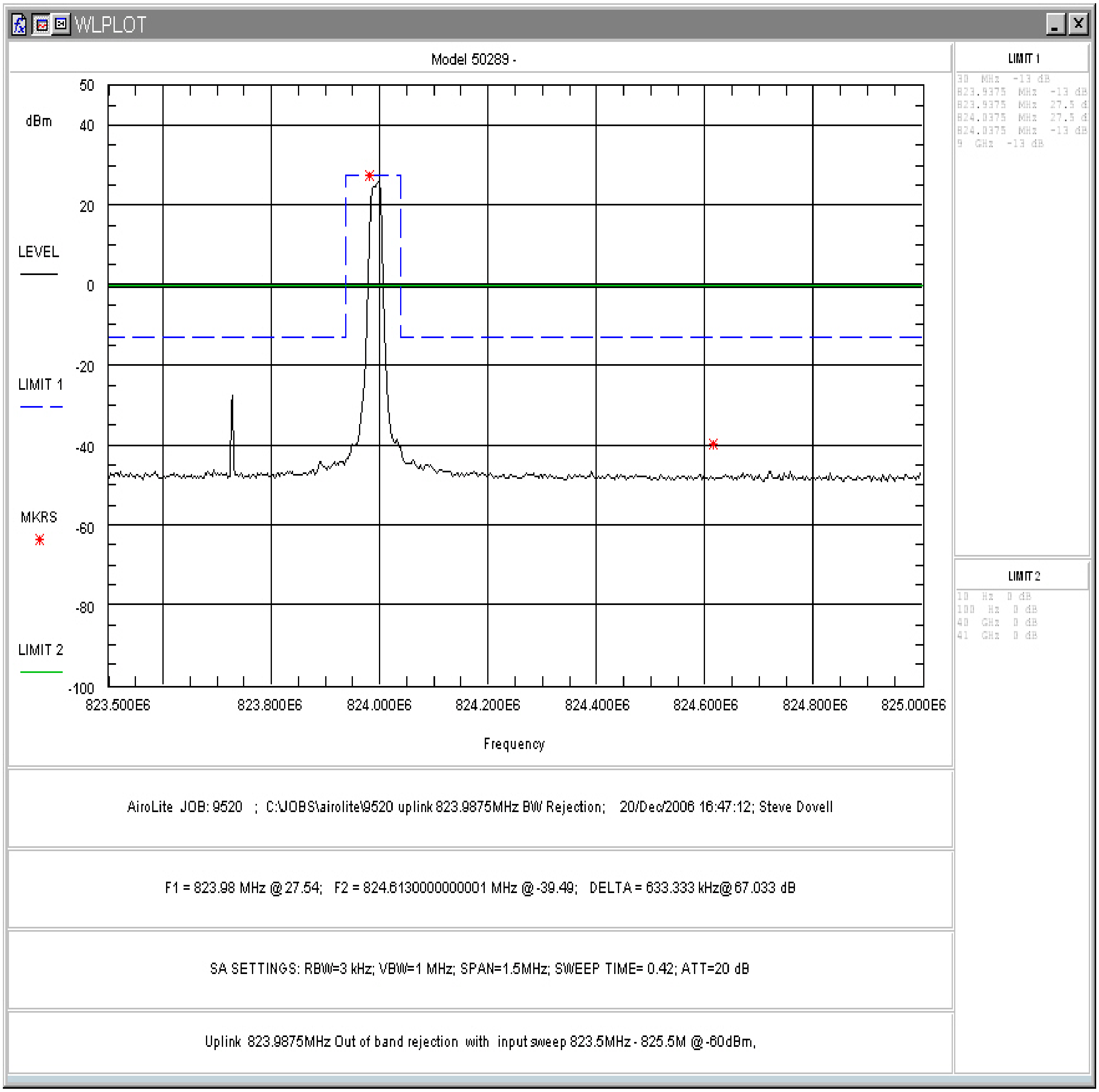

Figure 4-15. Band Reject, High Channel

4.4 Conducted Spurious Emissions at Antenna Terminals (FCC Part §2.1051)

The following are plots of the conducted spurious emissions data.

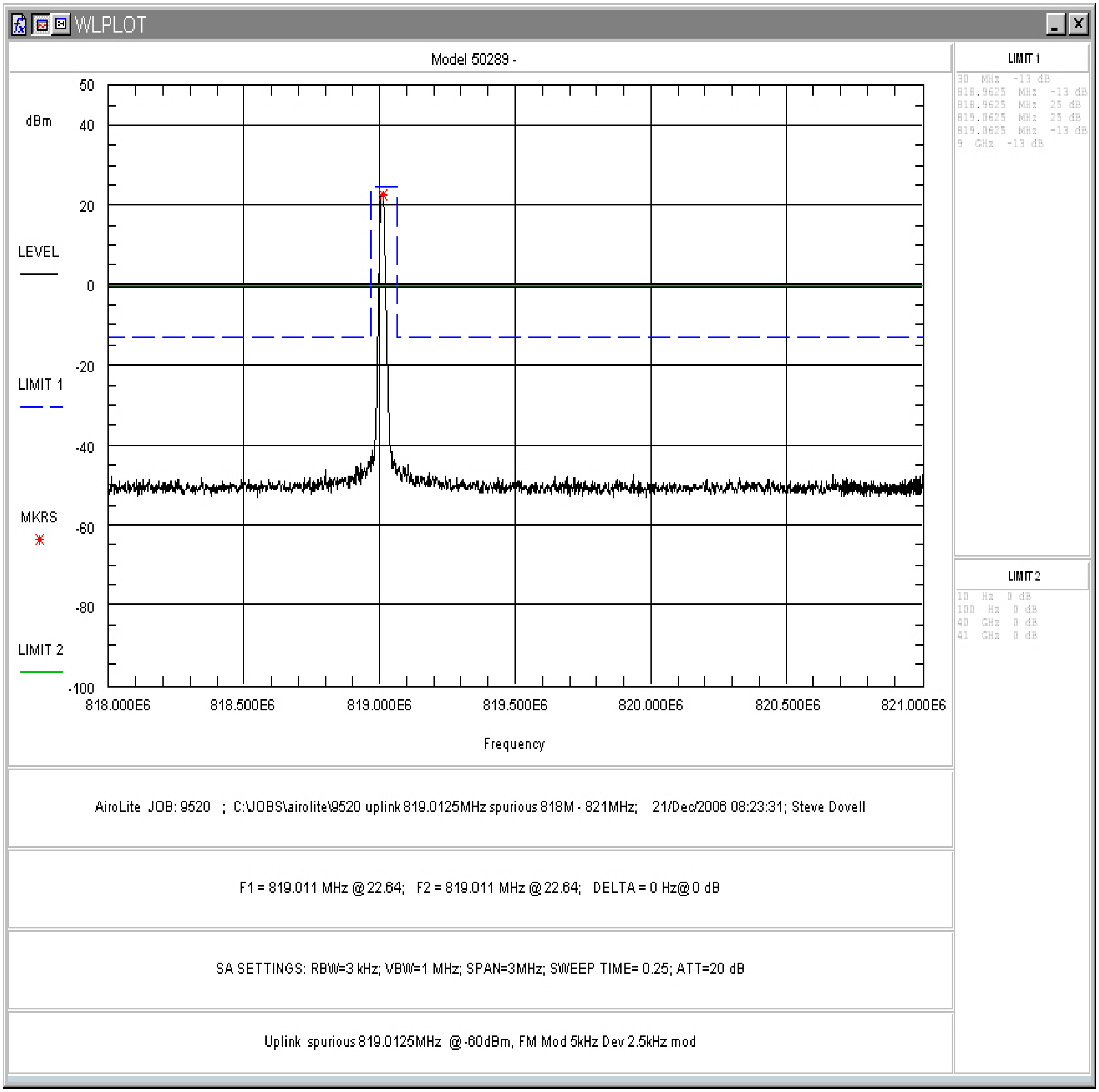

Figure 4-16. Conducted Spurious Emissions, Low Channel Inband

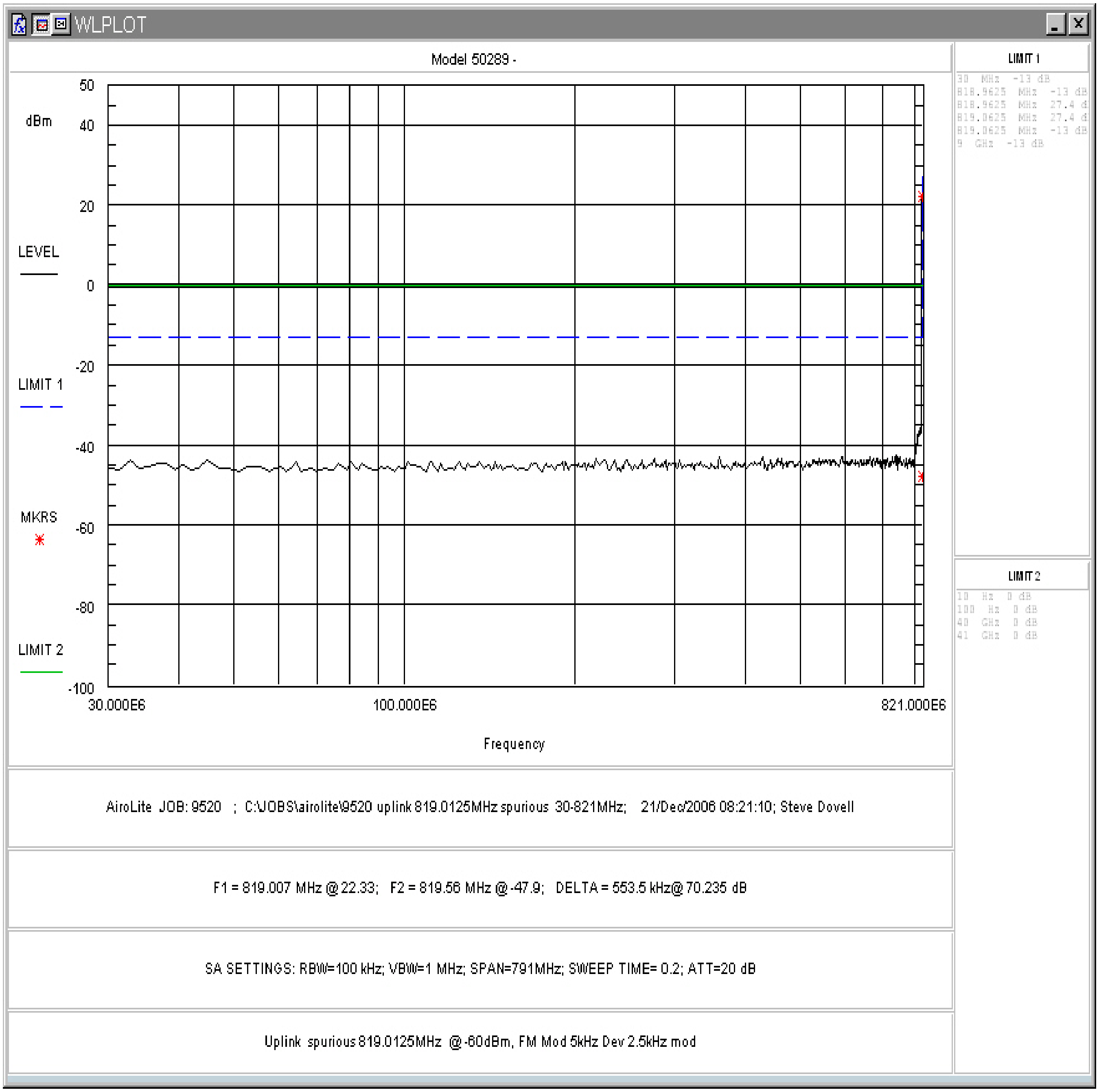

Figure 4-17. Conducted Spurious Emissions, Low Channel 30 – 821MHz

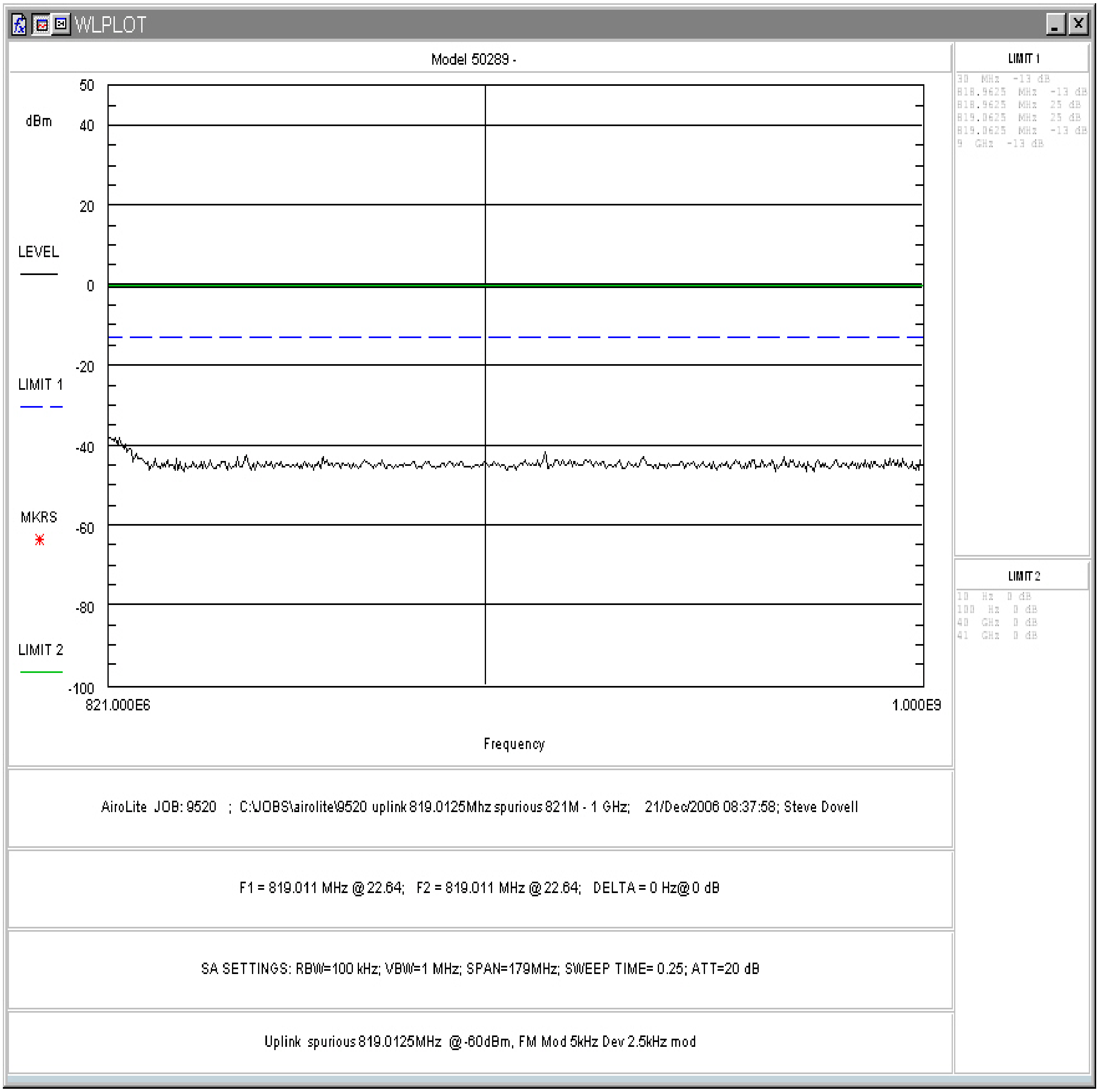

Figure 4-18. Conducted Spurious Emissions, Low Channel 821 – 1000MHz

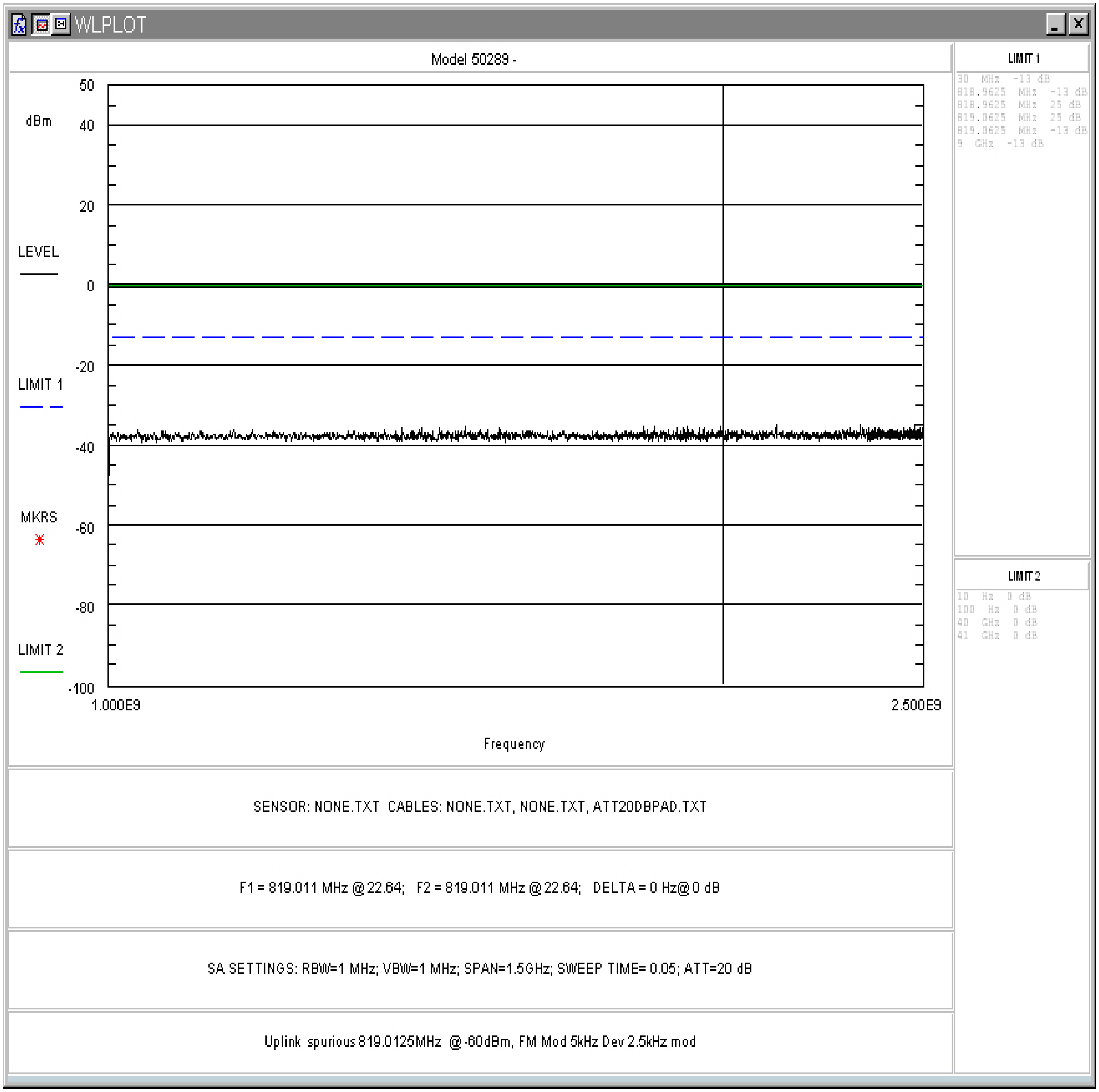

Figure 4-19. Conducted Spurious Emissions, Low Channel 15 – 2.5GHz

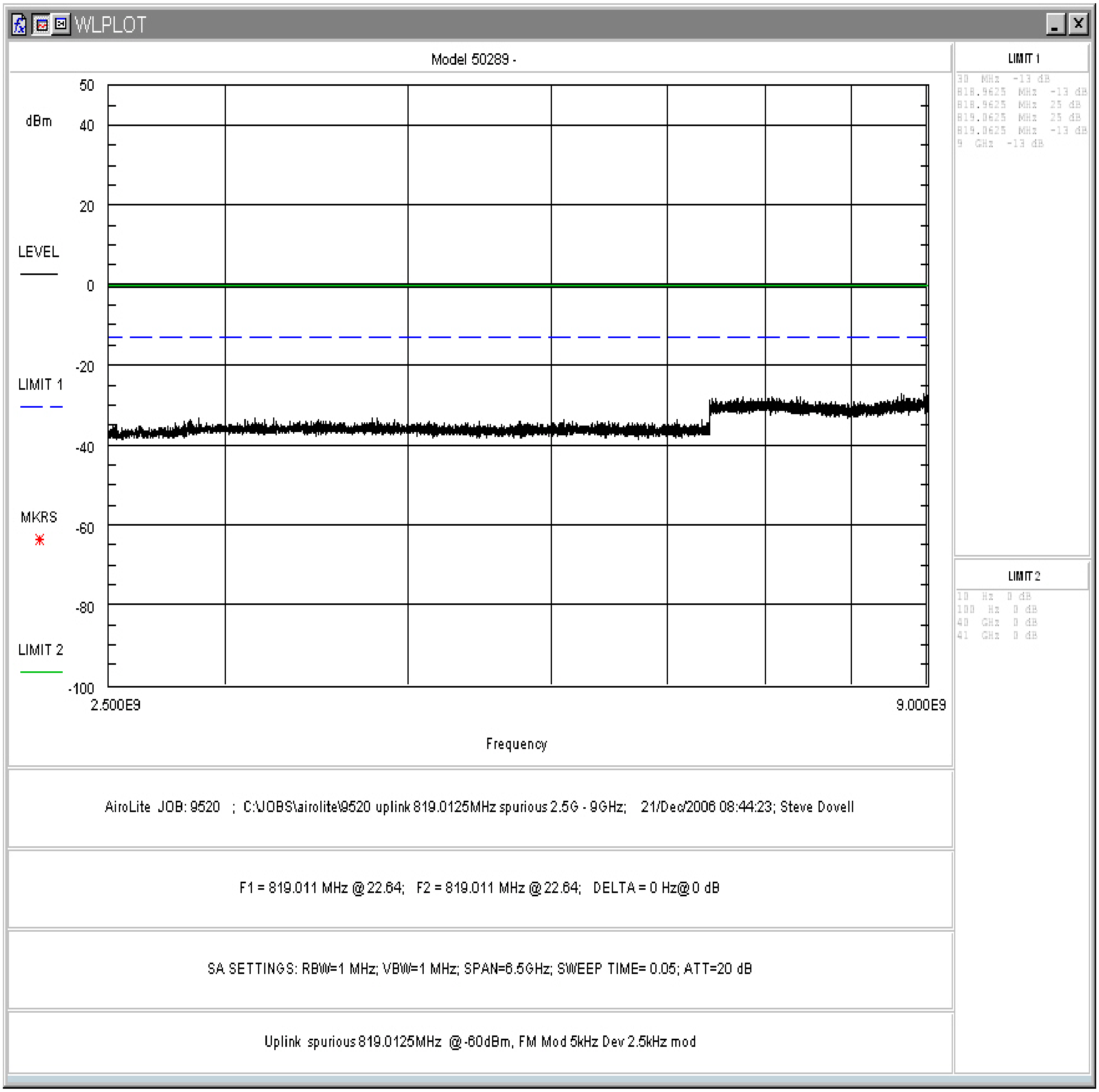

Figure 4-20. Conducted Spurious Emissions, Low Channel 2.5 – 9GHz

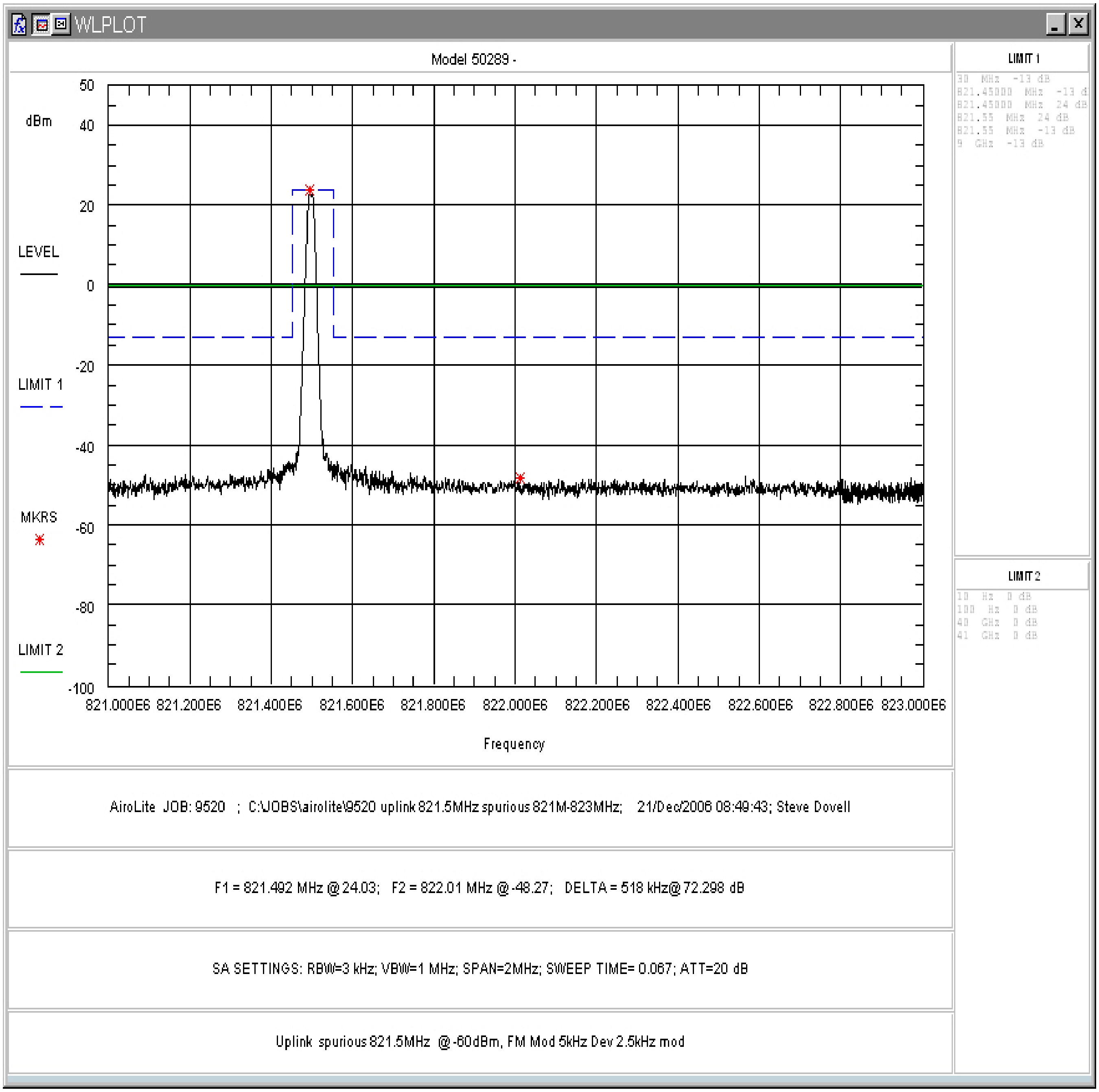

Figure 4-21. Conducted Spurious Emissions, Mid Channel Inband

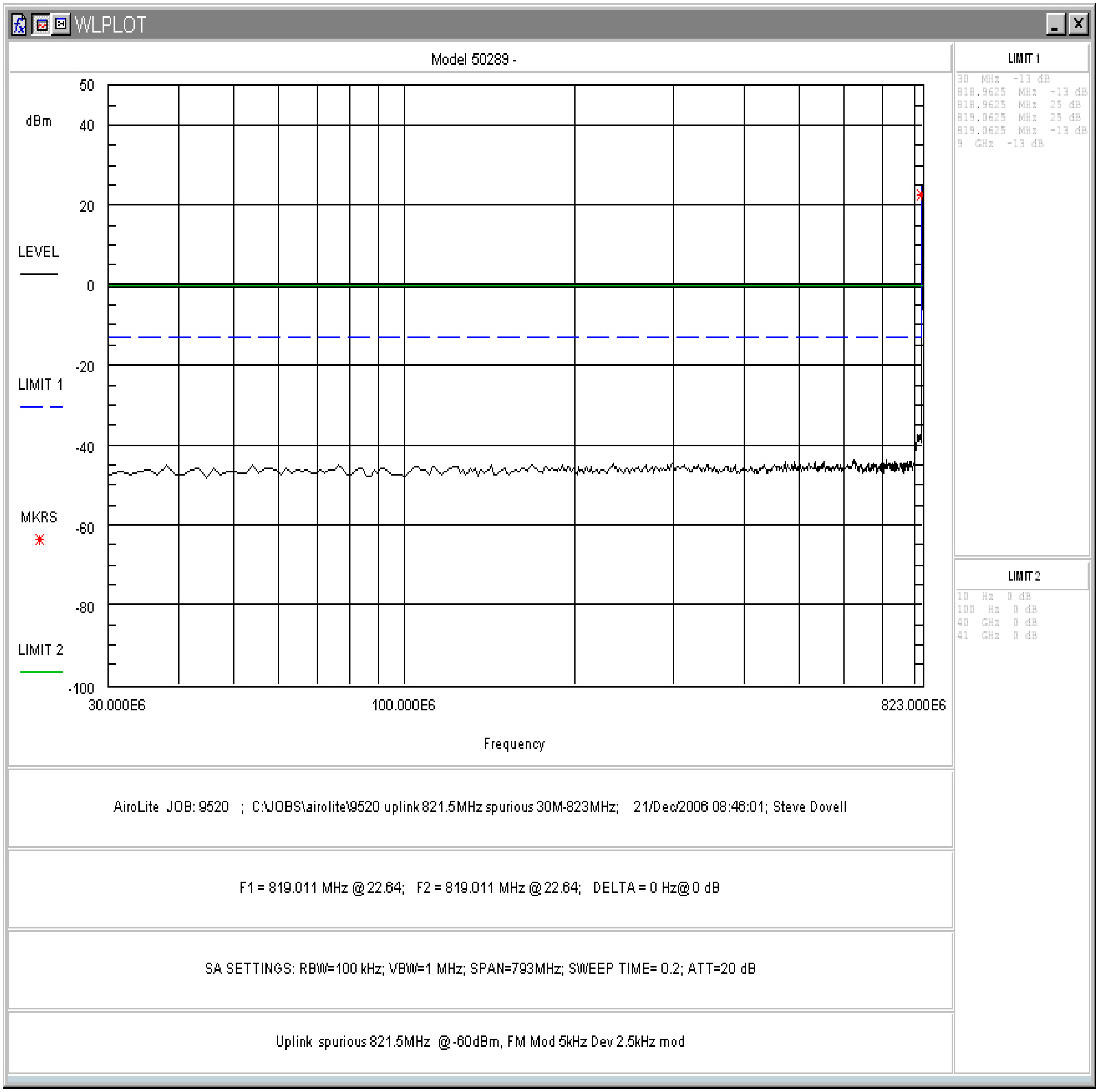

Figure 4-22. Conducted Spurious Emissions, Mid Channel 30 – 823MHz

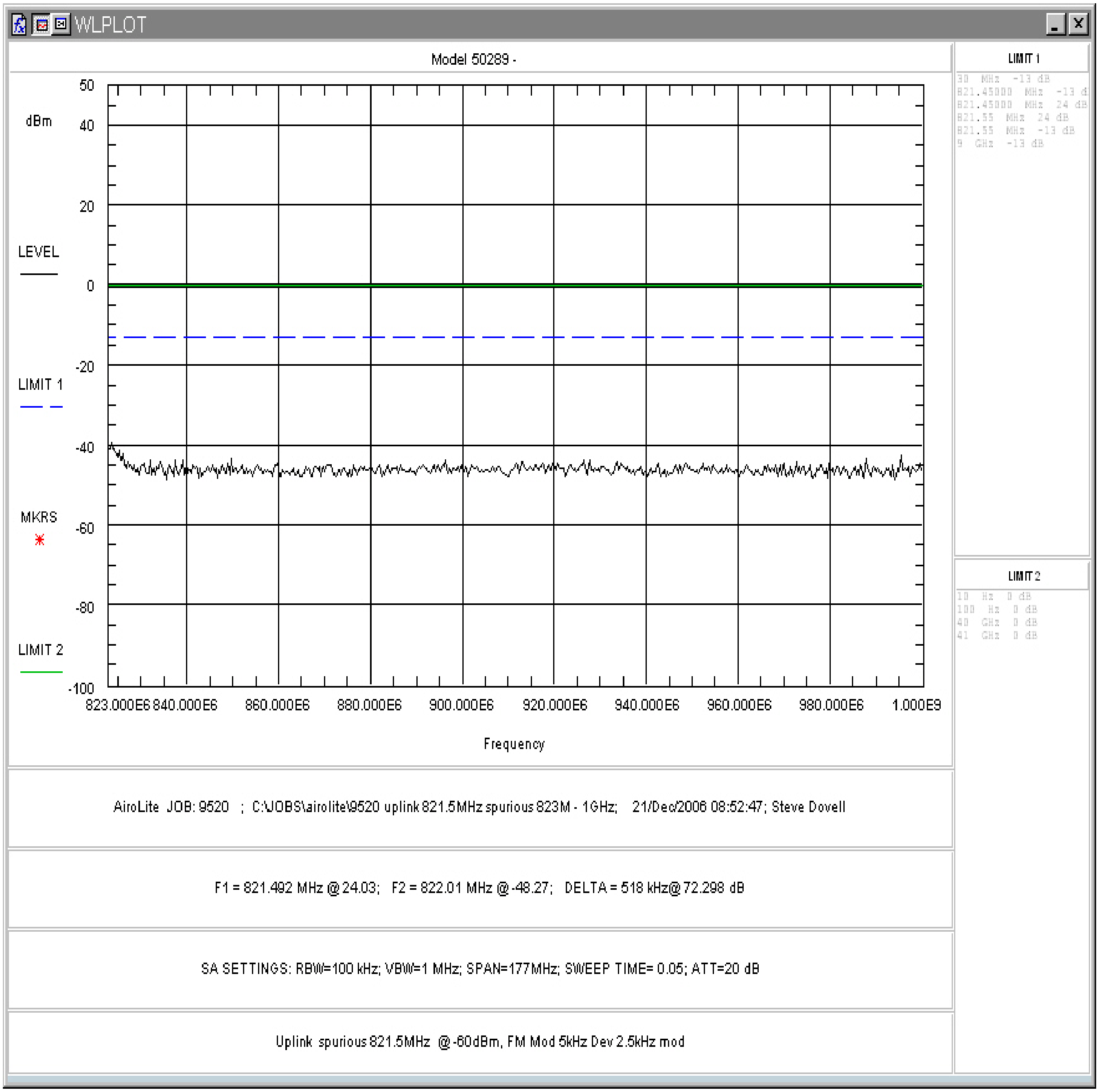

Figure 4-23. Conducted Spurious Emissions, Mid Channel 823 – 1000MHz

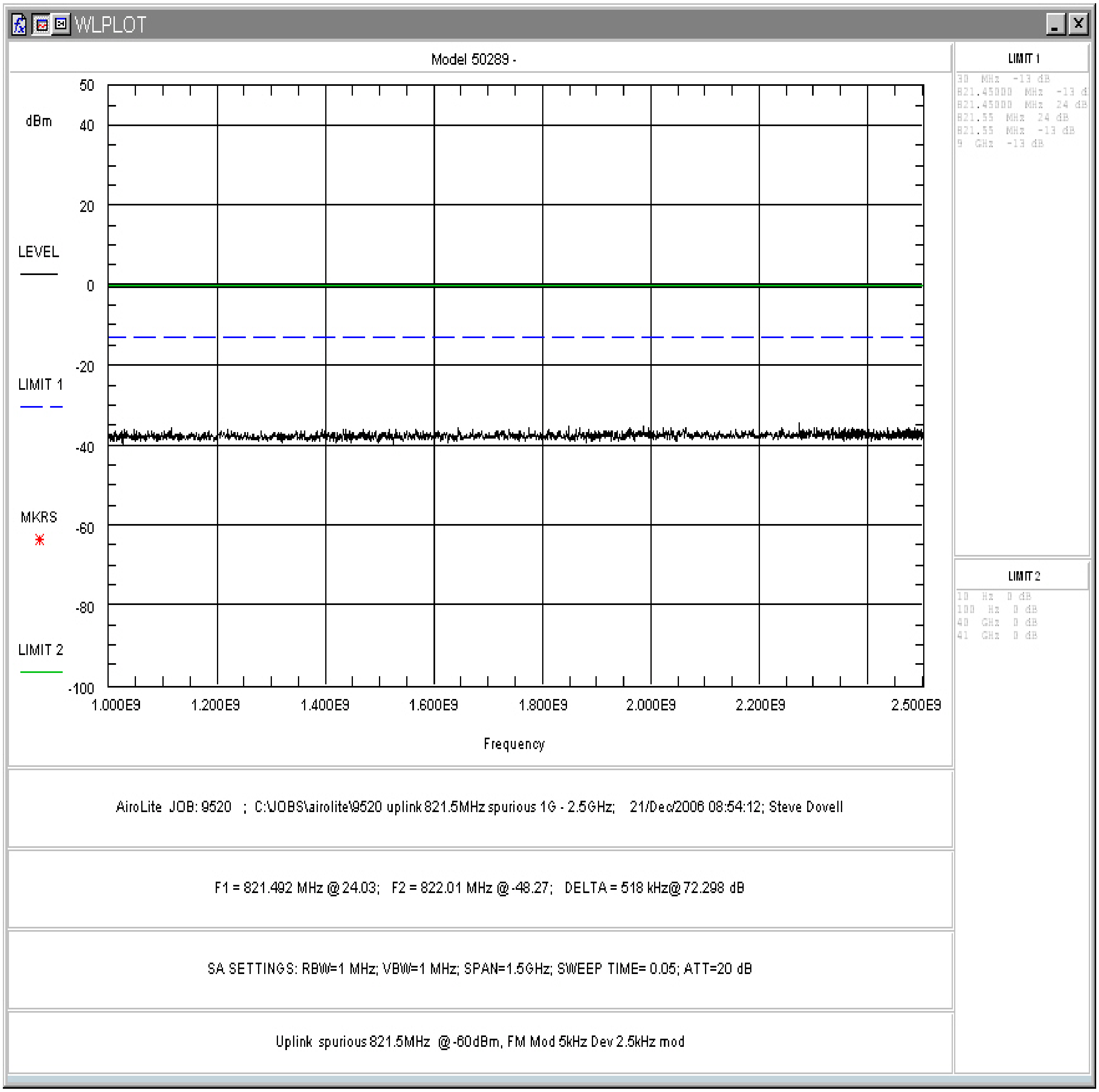

Figure 4-24. Conducted Spurious Emissions, Mid Channel 1 – 2.5GHz

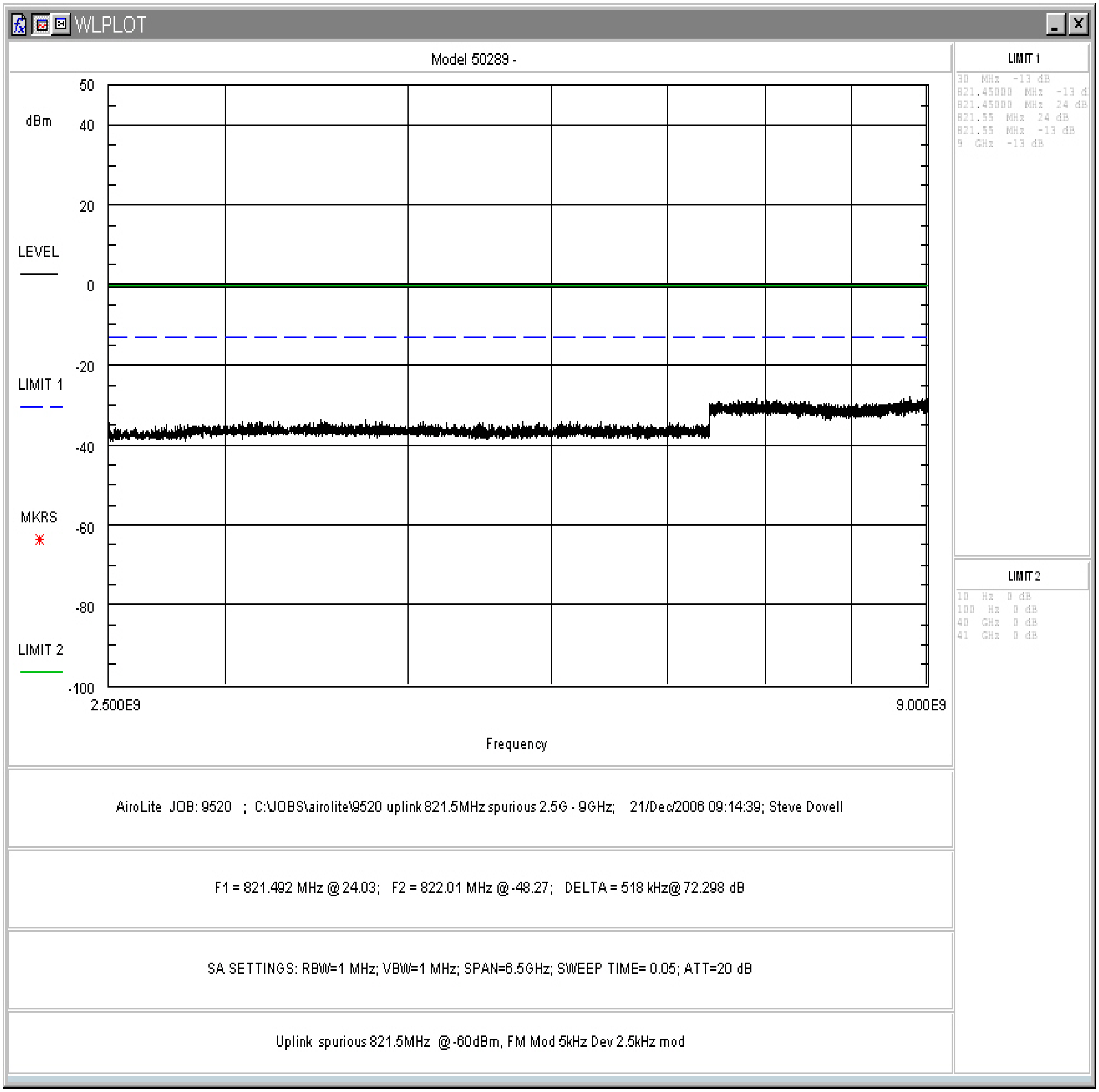

Figure 4-25. Conducted Spurious Emissions, Mid Channel 2.5 – 9GHz

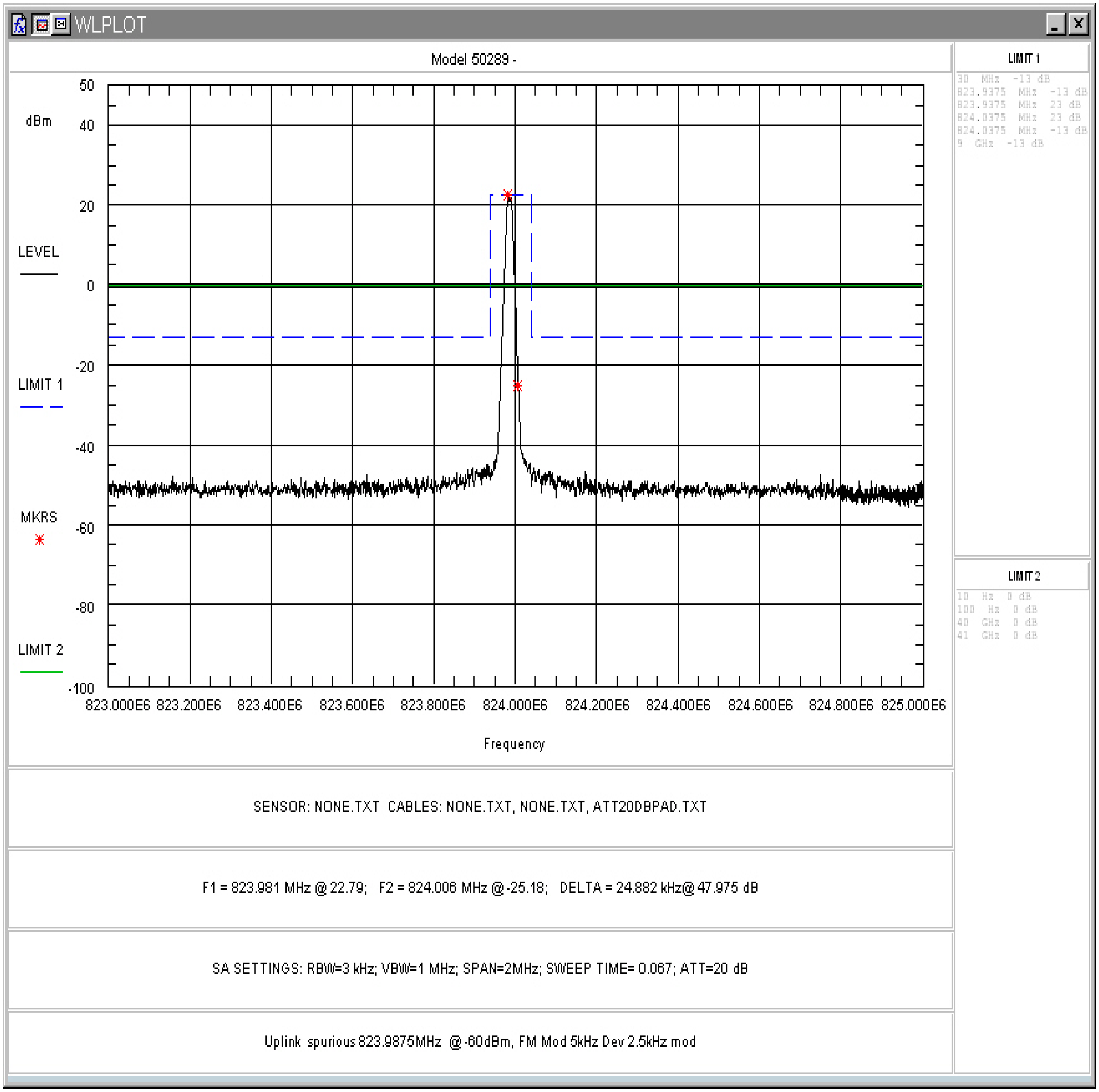

Figure 4-26. Conducted Spurious Emissions, High Channel Inband

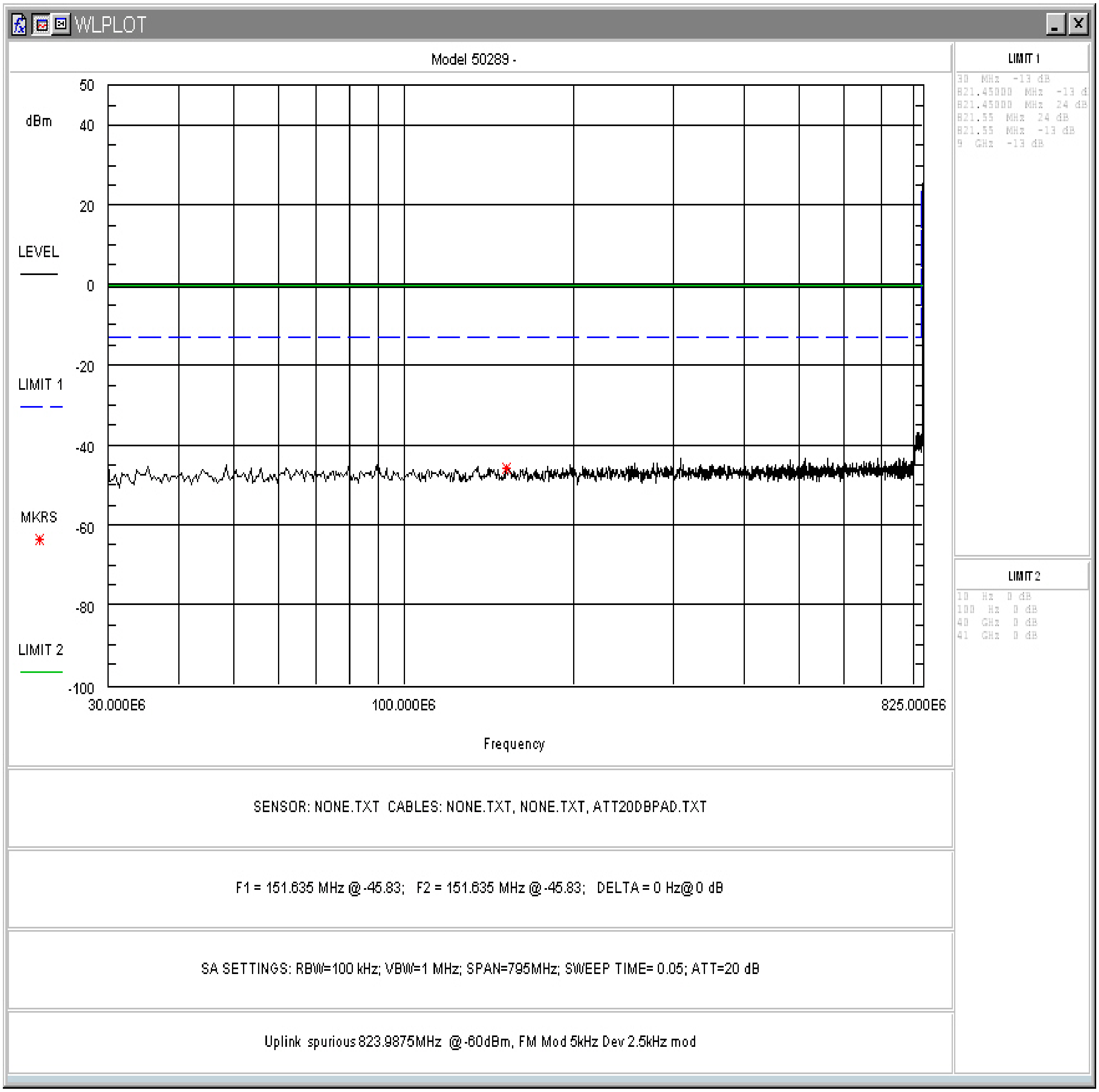

Figure 4-27. Conducted Spurious Emissions, High Channel 30 – 825MHz

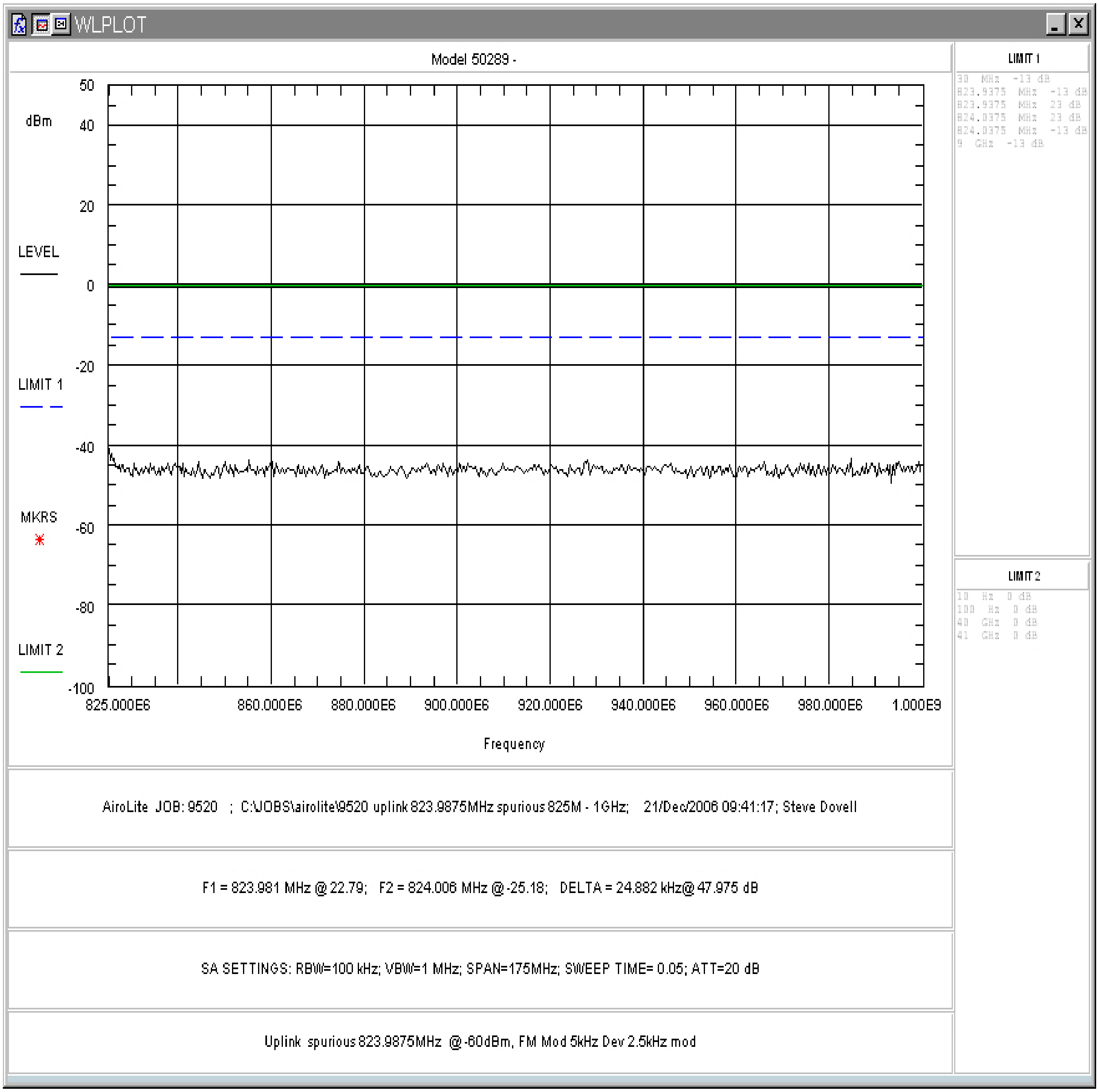

Figure 4-28. Conducted Spurious Emissions, High Channel 825 – 1000MHz

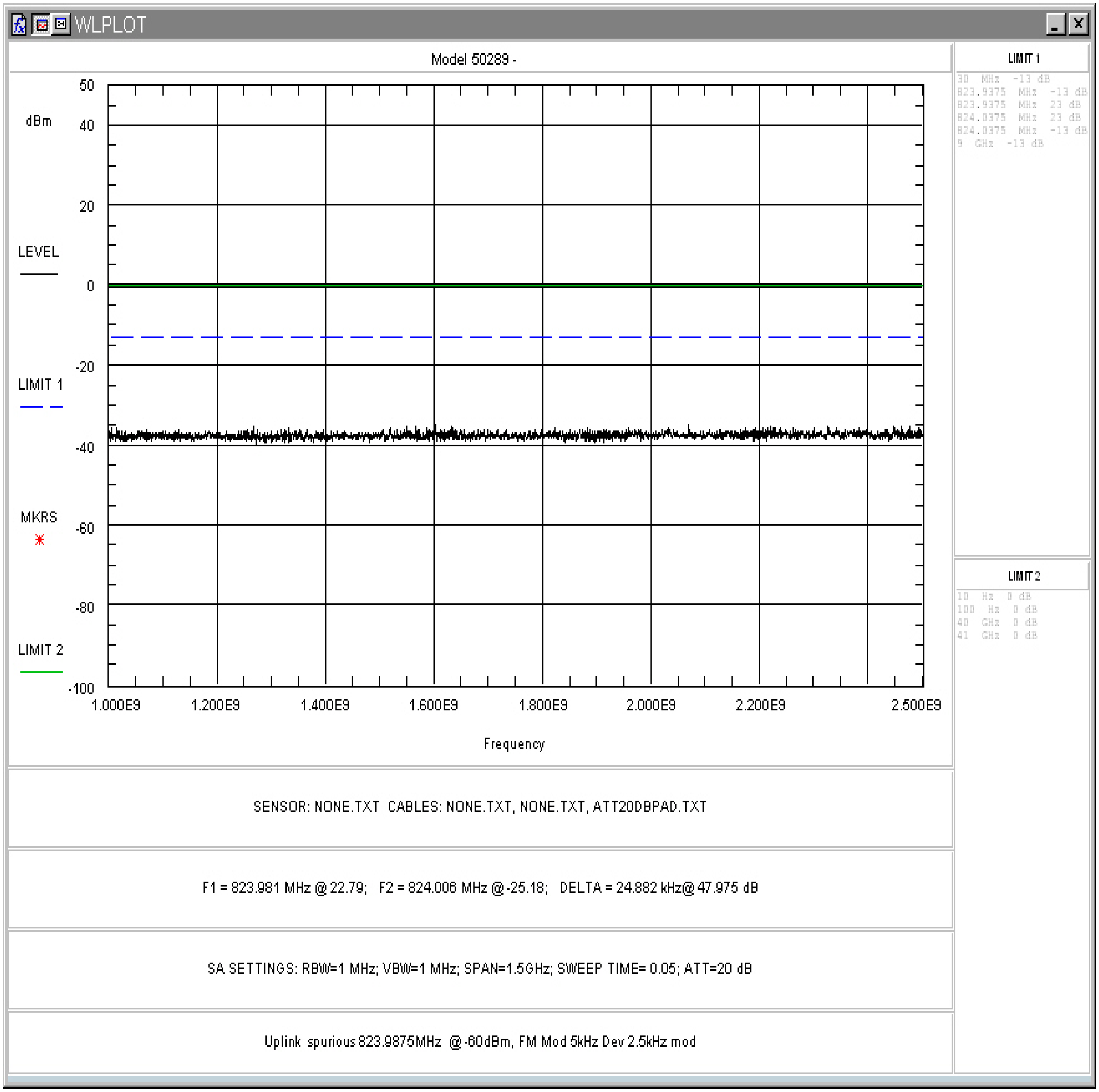

Figure 4-29. Conducted Spurious Emissions, High Channel 1 – 2.5GHz

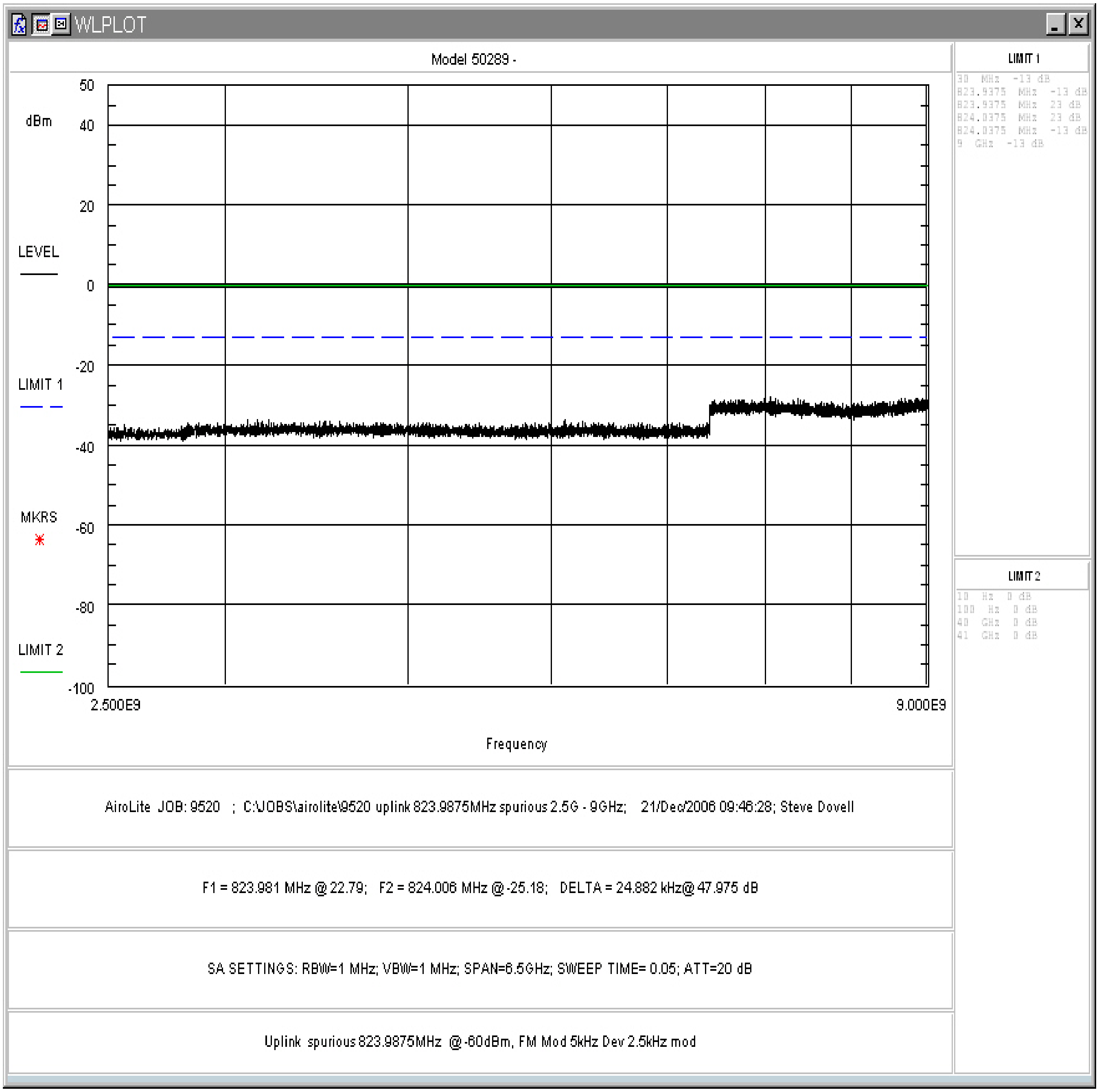

Figure 4-30. Conducted Spurious Emissions, High Channel 2.5 – 9GHz

4.5 Intermodulated Spurious Emissions

Testing for intermodulated spurious emissions was performed using two signal generators, both set at -50dBm. The first signal generator was set at 864.0125MHz with FM Modulation, 4.2kHz deviation, 1kHz tone. The second was set at 868.9875MHz with 4.2kHz deviation and a 2.5kHz tone.Testing was performed from 30M – 8GHz. The data is presented in the charts below.

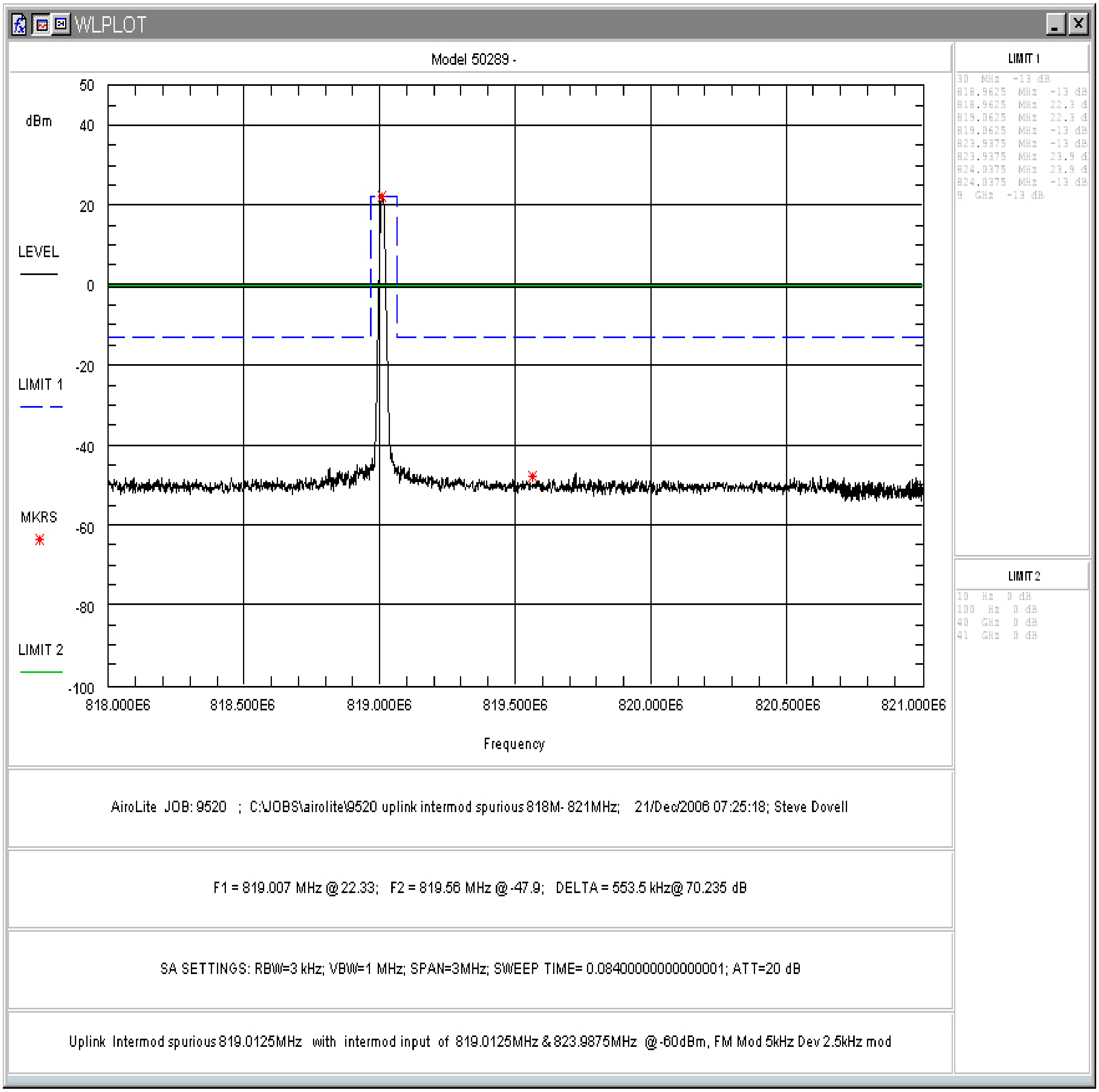

Figure 4-31. Intermodulated Spurious Emissions, In-band, Low Channel

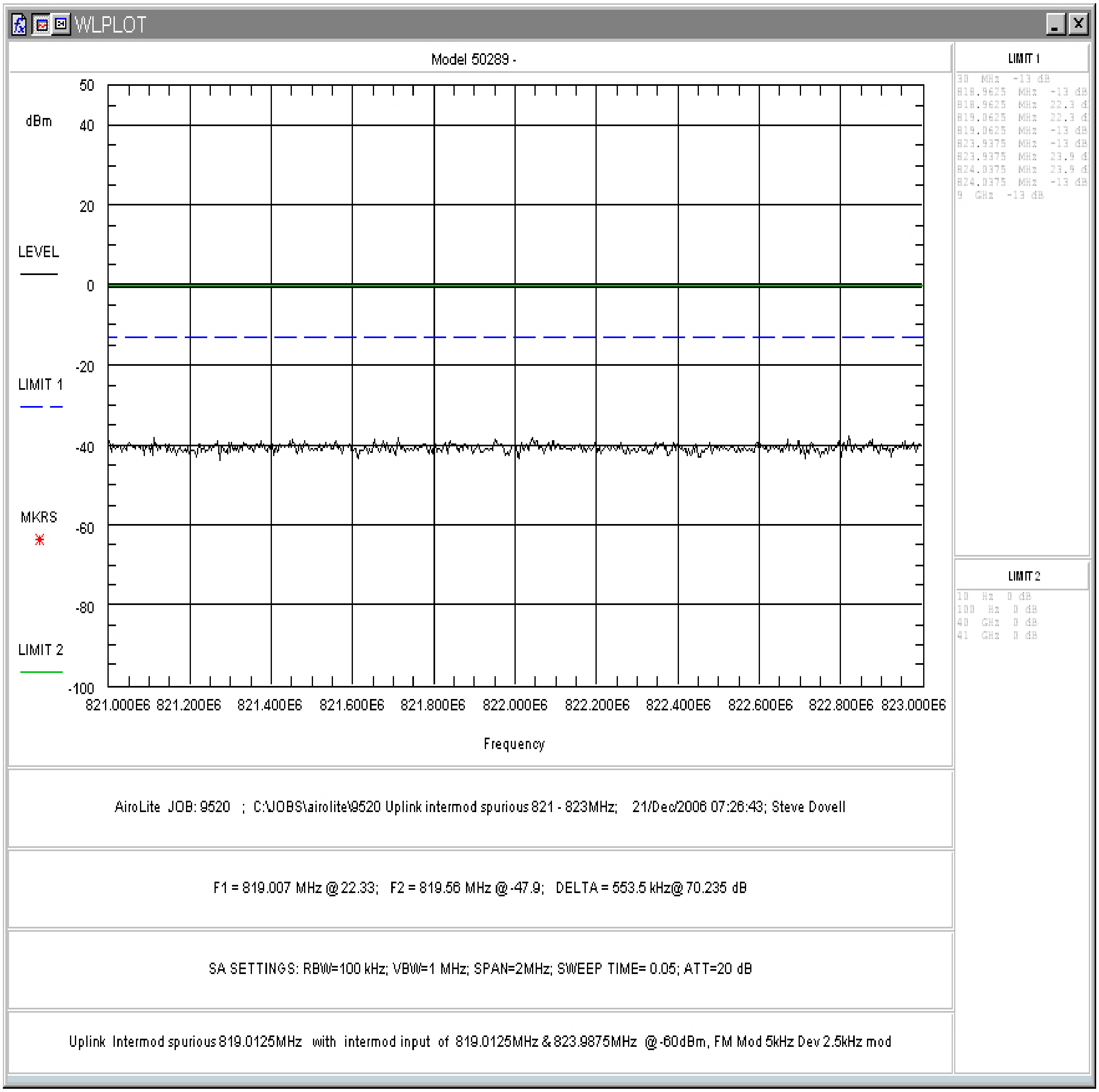

Figure 4-32. Intermodulated Spurious Emissions, In-band, Mid Channel

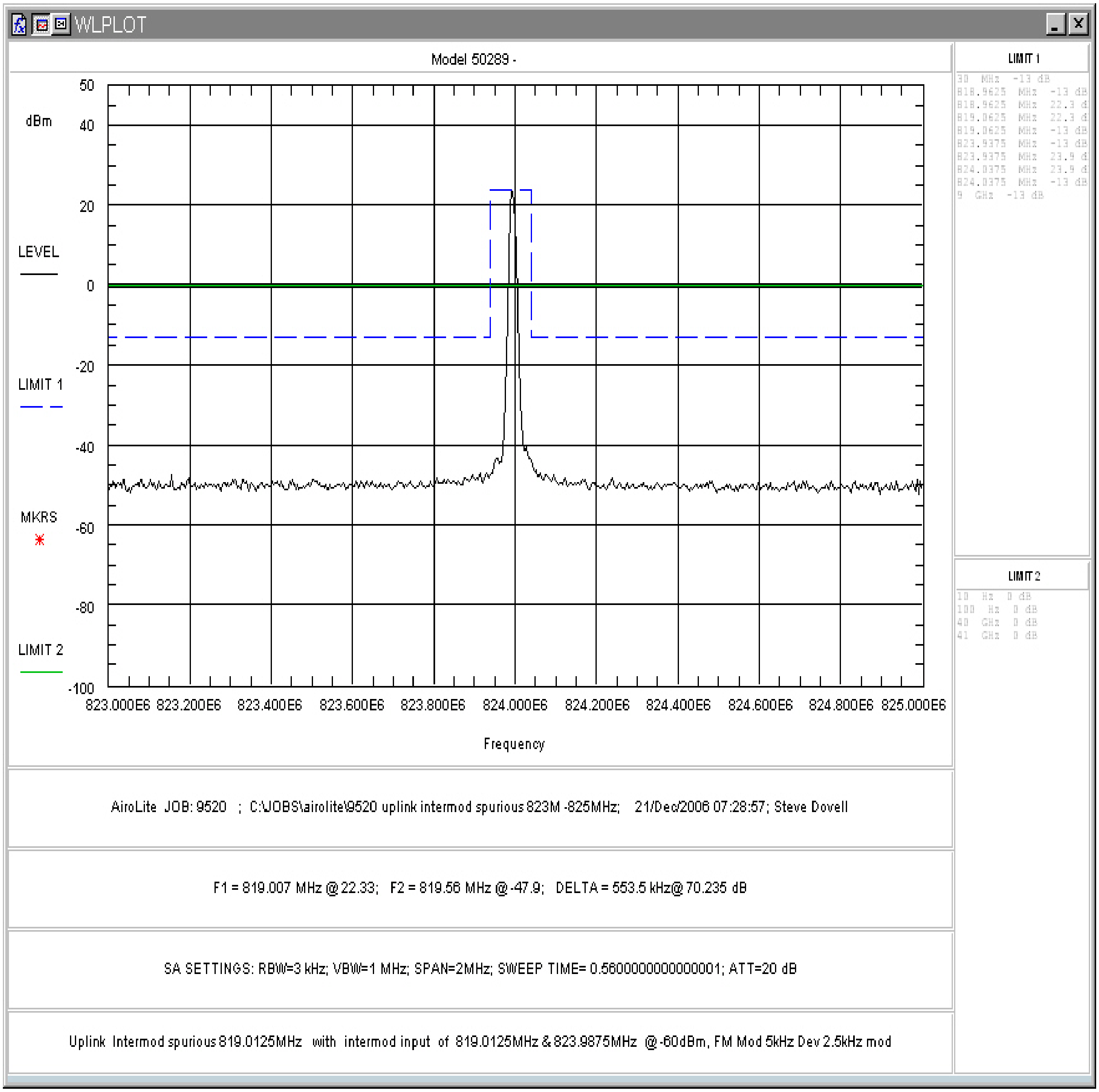

Figure 4-33. Intermodulated Spurious Emissions, In-band, High Channel

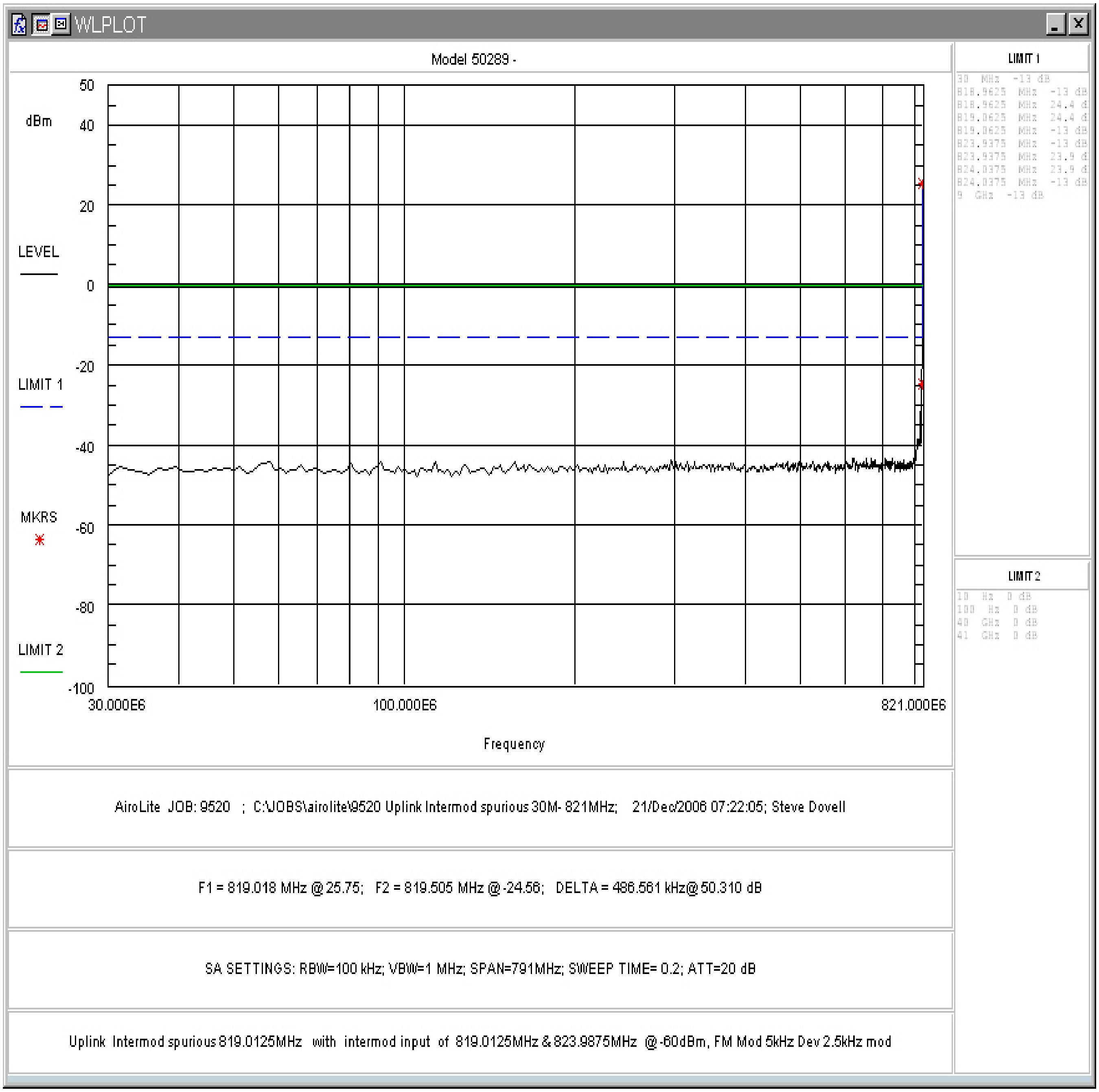

Figure 4-34. Intermodulated Spurious Emissions, 30 – 821MHz

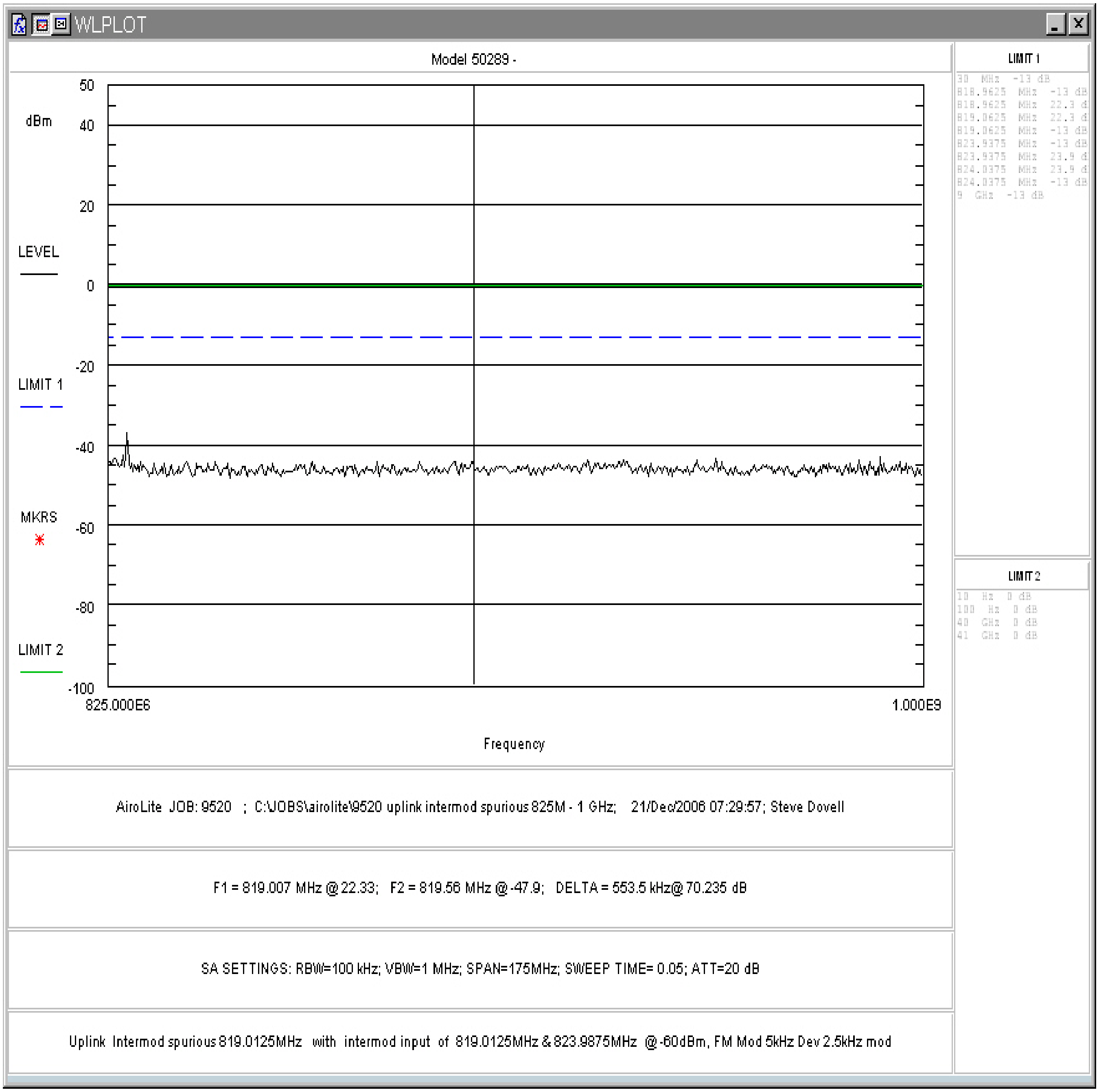

Figure 4-35. Intermodulated Spurious Emissions, 825 – 1000MHz

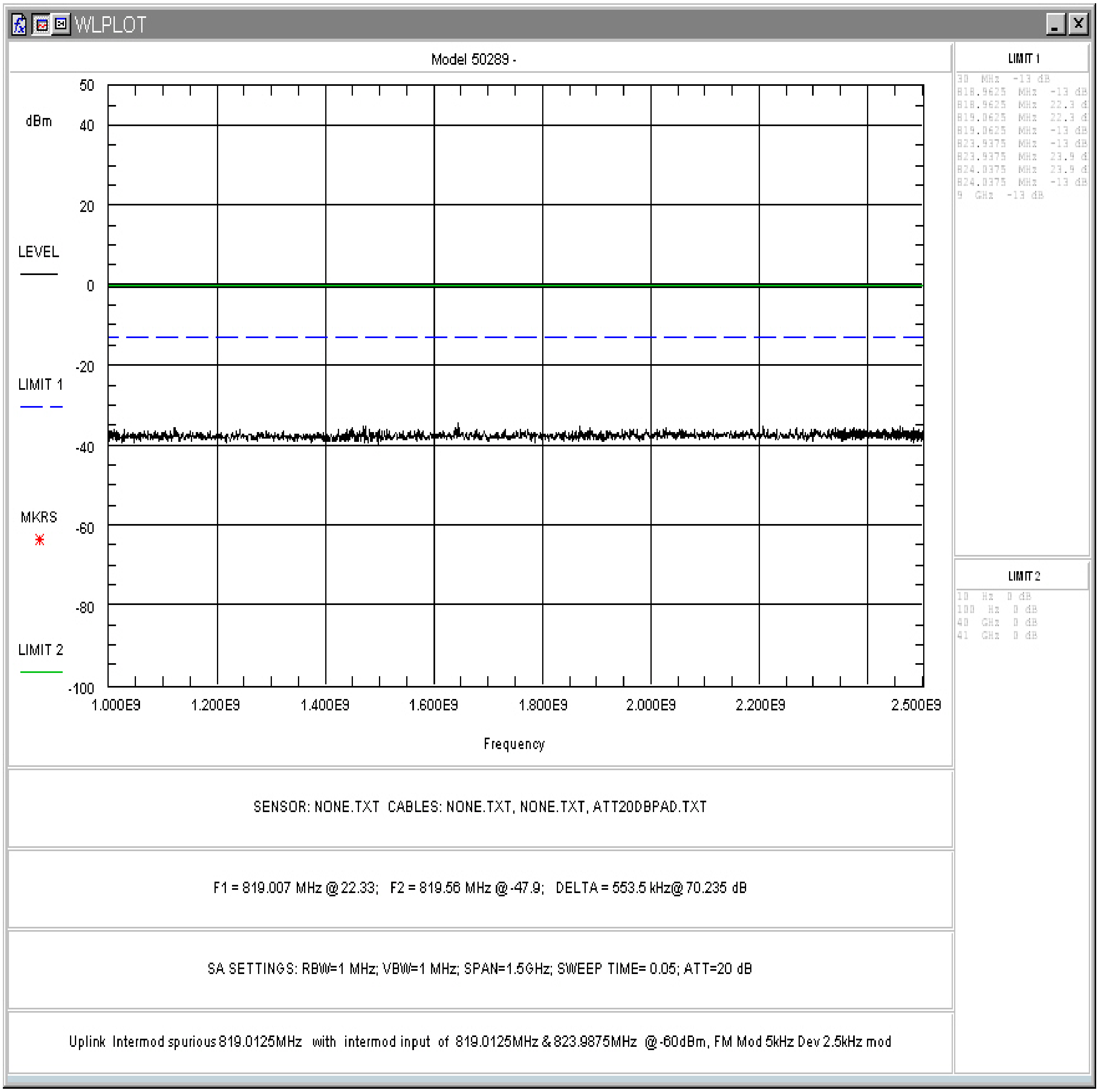

Figure 4-36. Intermodulated Spurious Emissions, 1 – 2.5GHz

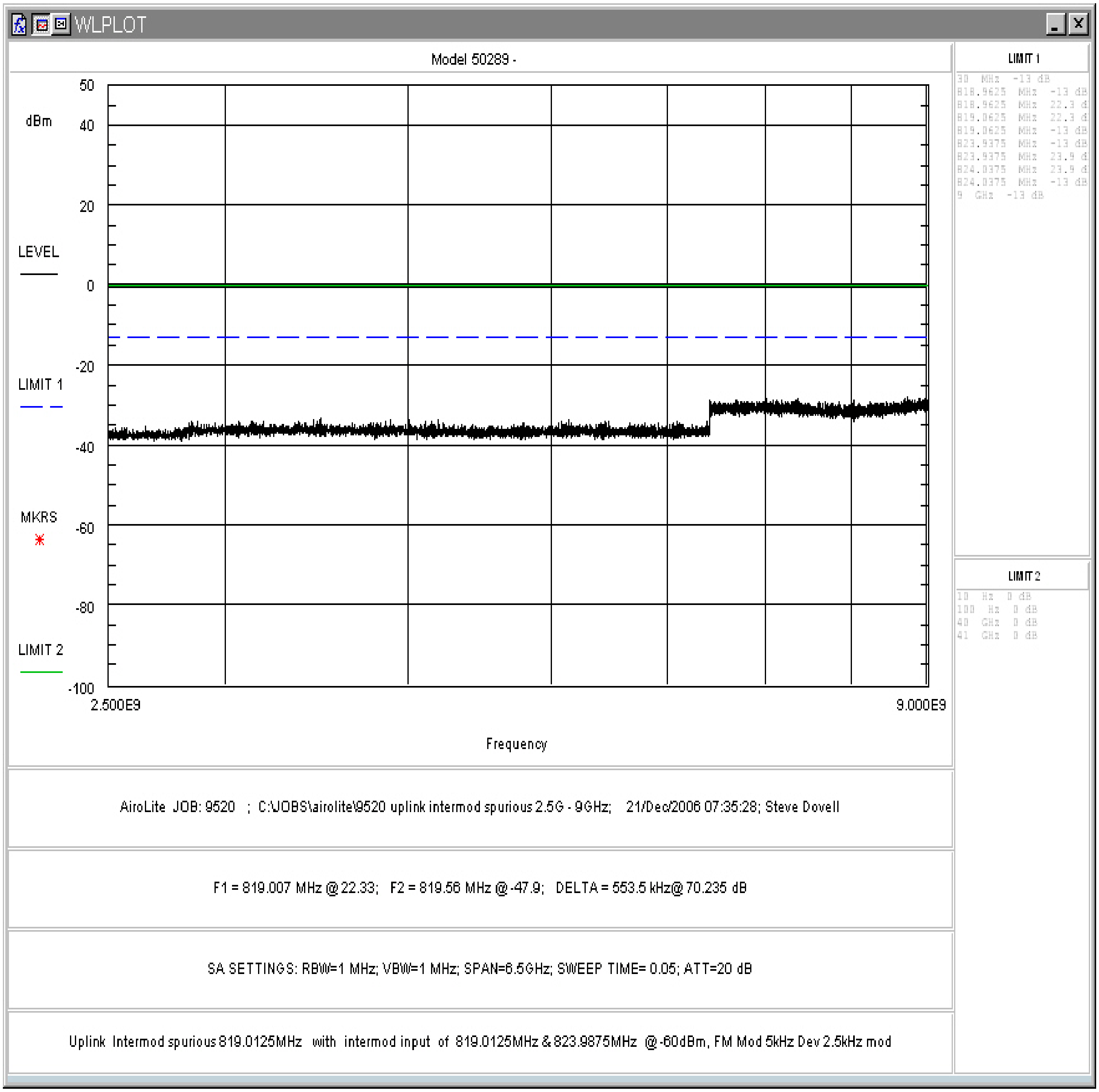

Figure 4-37. Intermodulated Spurious Emissions, 2.5 – 9GHz

4.6 Radiated Spurious Emissions: (FCC Part §2.1053)

The EUT must comply with the requirements for radiated spurious emissions that fall within the restricted bands.These emissions must meet the limits specified in §15.209 and §15.35(b) for peak measurements.

4.6.1 Test Procedure

The EUT was placed on motorized turntable for radiated testing on a 3-meter open field test site. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Receiving antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. Cables were varied in position to produce maximum emissions. Both the horizontal and vertical field components were measured.

The output was terminated in 50ohms and the radiated spurious emissions measured.

Table 6: Radiated Emission Frequency Data

Low	Mid	High
819.013	821.500	823.988
1638.025	1643.000	1647.975
2457.038	2464.500	2471.963
3276.050	3286.000	3295.950
4095.063	4107.500	4119.938
4914.075	4929.000	4943.925
5733.088	5750.500	5767.913
6552.100	6572.000	6591.900
7371.113	7393.500	7415.888
8190.125	8215.000	8239.875

Table 7: Radiated Emission Test Data, Low Channel

Frequency (MHz)	Polarity H/V	Az Deg	Ant. Hght (m)	Spurious Level dBµV	Sub. Sig. Gen. Level dBm	Sub. Power Level dBm	Sub. Ant. Factor dB/m	Sub. Ant. Gain dBi	EIRP Level dBm	Limit dBm	Margin dB
819.013	V	210.0	1.0	30.8	-40.2	-53.1	21.5	7.0	-46.1	-13.0	-33.1
1638.025	V	0.0	1.0	39.4	-69.4	-72.9	28.6	5.9	-67.0	-13.0	-54.0
2457.038	V	0.0	1.0	36.9	-69.9	-75.9	32.8	5.2	-70.7	-13.0	-57.7
3276.050	V	0.0	1.0	39.9	-66.7	-75.6	35.1	5.4	-70.2	-13.0	-57.2
4095.063	V	0.0	1.0	40.3	-60.1	-70.9	36.3	6.1	-64.8	-13.0	-51.8
4914.075	V	0.0	1.0	40.4	-54.3	-69.2	36.4	7.6	-61.6	-13.0	-48.6
5733.088	V	0.0	1.0	40.6	-50.5	-67.1	38.1	7.2	-59.9	-13.0	-46.9
6552.100	V	0.0	1.0	45.3	-43.1	-62.8	39.0	7.5	-55.3	-13.0	-42.3
7371.113	V	0.0	1.0	45.6	-34.4	-58.9	40.5	7.0	-51.9	-13.0	-38.9
8190.125	V	0.0	1.0	46.0	-25.5	-56.8	42.4	6.1	-50.7	-13.0	-37.7
819.013	H	194.0	1.0	27.9	-38.1	-51.0	21.5	7.0	-44.0	-13.0	-31.0
1638.025	H	0.0	1.0	39.4	-74.5	-77.6	28.6	5.9	-71.7	-13.0	-58.7
2457.038	H	0.0	1.0	36.4	-71.0	-76.8	32.8	5.2	-71.6	-13.0	-58.6
3276.050	H	0.0	1.0	39.4	-67.3	-75.5	35.1	5.4	-70.1	-13.0	-57.1
4095.063	H	0.0	1.0	39.7	-60.5	-71.2	36.3	6.1	-65.1	-13.0	-52.1
4914.075	H	0.0	1.0	39.6	-57.2	-71.8	36.4	7.6	-64.2	-13.0	-51.2
5733.088	H	0.0	1.0	38.2	-51.4	-67.9	38.1	7.2	-60.7	-13.0	-47.7
6552.100	H	0.0	1.0	44.4	-41.3	-60.9	39.0	7.5	-53.4	-13.0	-40.4
7371.113	H	0.0	1.0	44.5	-34.7	-59.9	40.5	7.0	-52.9	-13.0	-39.9
8190.125	H	0.0	1.0	47.1	-25.7	-57.1	42.4	6.1	-51.0	-13.0	-38.0

Table 8: Radiated Emission Test Data, Mid Channel

Frequency (MHz)	Polarity H/V	Az Deg	Ant. Hght (m)	Spurious Level dBµV	Sub. Sig. Gen. Level dBm	Sub. Power Level dBm	Sub. Ant. Factor dB/m	Sub. Ant. Gain dBi	EIRP Level dBm	Limit dBm	Margin dB
821.500	V	16.0	1.0	30.2	-39.9	-53.3	21.6	6.9	-46.4	-13.0	-33.4
1643.000	V	0.0	1.0	39.8	-71.2	-78.1	28.7	5.9	-72.2	-13.0	-59.2
2464.500	V	0.0	1.0	36.6	-69.7	-77.8	32.8	5.2	-72.6	-13.0	-59.6
3286.000	V	0.0	1.0	40.0	-62.1	-71.8	35.1	5.4	-66.4	-13.0	-53.4
4107.500	V	0.0	1.0	39.8	-58.4	-69.2	36.3	6.2	-63.0	-13.0	-50.0
4929.000	V	0.0	1.0	40.0	-53.1	-68.7	36.4	7.6	-61.1	-13.0	-48.1
5750.500	V	0.0	1.0	38.7	-50.1	-66.7	38.2	7.2	-59.5	-13.0	-46.5
6572.000	V	0.0	1.0	44.5	-40.3	-60.1	39.1	7.5	-52.6	-13.0	-39.6
7393.500	V	0.0	1.0	46.3	-34.1	-58.9	40.6	7.0	-51.9	-13.0	-38.9
8215.000	V	0.0	1.0	47.0	-24.8	-57.3	42.4	6.1	-51.2	-13.0	-38.2
821.500	H	200.0	1.0	29.6	-39.1	-52.4	21.6	6.9	-45.5	-13.0	-32.5
1643.000	H	0.0	1.0	41.2	-74.6	-80.0	28.7	5.9	-74.1	-13.0	-61.1
2464.500	H	0.0	1.0	37.7	-70.9	-79.1	32.8	5.2	-73.9	-13.0	-60.9
3286.000	H	0.0	1.0	38.8	-66.2	-74.1	35.1	5.4	-68.7	-13.0	-55.7
4107.500	H	0.0	1.0	40.1	-62.4	-72.6	36.3	6.2	-66.4	-13.0	-53.4
4929.000	H	0.0	1.0	39.5	-55.8	-70.9	36.4	7.6	-63.3	-13.0	-50.3
5750.500	H	0.0	1.0	39.2	-50.1	-66.7	38.2	7.2	-59.5	-13.0	-46.5
6572.000	H	0.0	1.0	44.8	-42.1	-61.9	39.1	7.5	-54.4	-13.0	-41.4
7393.500	H	0.0	1.0	45.5	-34.4	-59.2	40.6	7.0	-52.2	-13.0	-39.2
8215.000	H	0.0	1.0	45.8	-26.2	-58.9	42.4	6.1	-52.8	-13.0	-39.8

Table 9: Radiated Emission Test Data, High Channel

Frequency (MHz)	Polarity H/V	Az Deg	Ant. Hght (m)	Spurious Level dBμV	Sub. Sig. Gen. Level dBm	Sub. Power Level dBm	Sub. Ant. Factor dB/m	Sub. Ant. Gain dBi	EIRP Level dBm	Limit dBm	Margin dB
823.988	V	188.0	1.0	32.5	-37.9	-51.3	21.6	6.9	-44.4	-13.0	-31.4
1647.975	V	0.0	1.0	39.6	-75.8	-81.5	28.7	5.9	-75.6	-13.0	-62.6
2471.963	V	0.0	1.0	38.2	-70.4	-77.9	32.9	5.2	-72.7	-13.0	-59.7
3295.950	V	0.0	1.0	38.9	-65.1	-74.6	35.1	5.5	-69.1	-13.0	-56.1
4119.938	V	0.0	1.0	38.8	-60.4	-71.9	36.3	6.2	-65.7	-13.0	-52.7
4943.925	V	0.0	1.0	40.4	-54.3	-69.9	36.4	7.6	-62.3	-13.0	-49.3
5767.913	V	0.0	1.0	39.3	-51.3	-66.9	38.2	7.2	-59.7	-13.0	-46.7
6591.900	V	0.0	1.0	43.9	-42.5	-60.3	39.1	7.5	-52.8	-13.0	-39.8
7415.888	V	0.0	1.0	45.7	-34.3	-56.1	40.6	7.0	-49.1	-13.0	-36.1
8239.875	V	0.0	1.0	46.0	-26.6	-52.6	42.4	6.1	-46.5	-13.0	-33.5
823.988	H	200.0	1.0	27.8	-41.1	-54.2	21.6	6.9	-47.3	-13.0	-34.3
1647.975	H	0.0	1.0	40.1	-75.5	-81.2	28.7	5.9	-75.3	-13.0	-62.3
2471.963	H	0.0	1.0	39.3	-70.5	-78.0	32.9	5.2	-72.8	-13.0	-59.8
3295.950	H	0.0	1.0	39.4	-64.8	-74.3	35.1	5.5	-68.8	-13.0	-55.8
4119.938	H	0.0	1.0	39.0	-59.9	-71.3	36.3	6.2	-65.1	-13.0	-52.1
4943.925	H	0.0	1.0	39.6	-51.0	-66.9	36.4	7.6	-59.3	-13.0	-46.3
5767.913	H	0.0	1.0	40.9	-46.9	-62.7	38.2	7.2	-55.5	-13.0	-42.5
6591.900	H	0.0	1.0	44.8	-39.7	-58.1	39.1	7.5	-50.6	-13.0	-37.6
7415.888	H	0.0	1.0	45.6	-32.1	-54.1	40.6	7.0	-47.1	-13.0	-34.1
8239.875	H	0.0	1.0	46.9	-24.9	-50.7	42.4	6.1	-44.6	-13.0	-31.6

4.7 Conducted Emissions

Limits for AC power conducted emissions are shown in the following table.

Compliance Limits		
Frequency	**Quasi-peak**	**Average**
0.15-0.5MHz	66 to 56dBµV	56 to 46dBµV
0.5 to 5MHz	56dBµV	46dBµV
0.5-30MHz	60dBµV	50dBµV

4.7.1 Test Procedure

The EUT was placed on an 80 cm high 1 X 1.5 m non-conductive table above a ground plane. Power to the EUT was provided through a Solar Corporation 50 Ω/50 µH Line Impedance Stabilization Network bonded to a 3 X 2 meter ground plane. The LISN has its AC input supplied from a filtered AC power source. Power was supplied to the peripherals through a second LISN. Power and data cables were moved about to obtain maximum emissions.

The 50 Ω output of the LISN was connected to the input of the spectrum analyzer and the emissions in the frequency range of 150 kHz to 30 MHz were measured. The detector function was set to quasi-peak, peak, or average as appropriate, and the resolution bandwidth during testing was at least 9 kHz, with all post-detector filtering no less than 10 times the resolution bandwidth. For average measurements the post-detector filter was set to 10 Hz.

At frequencies where quasi-peak or peak measurements comply with the average limit, no average measurements need be performed.

At frequencies where quasi-peak or peak measurements comply with the average limit, no average measurements need be performed. The Conducted emissions level to be compared to the FCC limit is calculated as shown in the following example.

Example:

Spectrum Analyzer Voltage: VdBµV

LISN Correction Factor: LISN dB

Cable Correction Factor: CF dB

Electric Field: EdBµV =V dBµV + LISN dB + CF dB

4.7.2 Test Data

Table 10 provides the test results for power line conducted emissions.

Table 10: Conducted Emission Test Data

819.0125MHz TX

LINE 1 - NEUTRAL

Frequency (MHz)	Level QP (dBµV)	Cable Loss (dB)	LISN Corr (dB)	Limit QP (dBµV)	Level Corr (dBµV)	Margin QP (dB)	Level AVG (dBµV)	Cable Loss (dB)	Level Corr (dBµV)	Limit AVG (dBµV)	Margin AVG (dB)
0.213	56.5	10.2	-1.9	79.0	64.8	-14.2	56.7	10.2	65.0	66.0	-1.0
1.160	48.0	10.3	-6.0	73.0	52.3	-20.7	45.5	10.3	49.8	60.0	-10.2
5.548	47.2	10.9	-9.8	73.0	48.2	-24.8	47.2	10.9	48.2	60.0	-11.8
7.763	45.5	11.1	-10.7	73.0	45.9	-27.1	45.5	11.1	45.9	60.0	-14.1
9.228	50.0	11.2	-11.1	73.0	50.1	-22.9	50.0	11.2	50.1	60.0	-9.9
11.844	53.7	11.3	-11.7	73.0	53.3	-19.7	39.0	11.3	38.6	60.0	-21.4
21.345	36.6	11.8	-13.1	73.0	35.3	-37.7	36.6	11.8	35.3	60.0	-24.7
26.144	34.5	12.0	-13.6	73.0	32.9	-40.1	34.5	12.0	32.9	60.0	-27.1

LINE 2 - PHASE

Frequency (MHz)	Level QP (dBµV)	Cable Loss (dB)	LISN Corr (dB)	Limit QP (dBµV)	Level Corr (dBµV)	Margin QP (dB)	Level AVG (dBµV)	Cable Loss (dB)	Level Corr (dBµV)	Limit AVG (dBµV)	Margin AVG (dB)
0.213	57.9	10.2	-2.2	79.0	65.9	-13.1	56.5	10.2	64.5	66.0	-1.5
0.224	52.2	10.2	-2.3	79.0	60.0	-19.0	50.7	10.2	58.5	66.0	-7.5
1.160	52.1	10.3	-6.3	73.0	56.1	-16.9	45.9	10.3	49.9	60.0	-10.1
7.759	45.3	11.1	-11.0	73.0	45.4	-27.6	45.3	11.1	45.4	60.0	-14.6
9.227	48.7	11.2	-11.4	73.0	48.5	-24.5	48.7	11.2	48.5	60.0	-11.5
11.838	57.0	11.3	-12.0	73.0	56.4	-16.6	39.5	11.3	38.9	60.0	-21.1
21.224	30.0	11.8	-13.4	73.0	28.4	-44.6	30.0	11.8	28.4	60.0	-31.6
26.234	36.9	12.0	-13.9	73.0	35.0	-38.0	36.9	12.0	35.0	60.0	-25.0

4.8 Frequency Stability: (FCC Part §2.1055)

Frequency as a function of temperature and voltage variation shall be maintained within the FCC-prescribed tolerances.

There are no frequency-determining elements in the EUT. Hence, Frequency stability is not required.

