



Washington Laboratories, Ltd.

FCC & Industry Canada Certification Test Report
For the
EKA Systems, Inc.
EKA 900 LP
FCC ID: P9X-900LP
IC ID: TBD

WLL REPORT# 10153-01 Rev 1
April 7, 2008

Prepared for:

EKA Systems, Inc.
20201 Century Blvd. Suite 250
Gaithersburg, MD 20874

Prepared By:

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

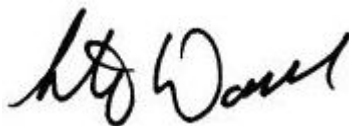


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Prepared by:



Steven Dovell
Compliance Engineer

Reviewed by:



Steven D. Koster
EMC Operations Manager

Abstract

This report has been prepared on behalf of EKA Systems, Inc. to support the attached Application for Equipment Authorization. The test report and application are submitted for a Frequency Hopping Spread Spectrum Transmitter under Part 15.247 of the FCC Rules and Regulations and Spectrum Management and Telecommunications Policy RSS-210 of Industry Canada. This Certification Test Report documents the test configuration and test results for an EKA Systems, Inc. EKA Systems 900LP.

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. The Industry Canada OATS numbers are 3035A-1 and 3035A-2 for Washington Laboratories, Ltd. Site 1 and Site 2, respectively. Washington Laboratories, Ltd. has been accepted by the FCC and approved by the American Association for Laboratory Accreditation (A2LA) under Certificate 2675.01. as an independent FCC test laboratory.

The EKA Systems, Inc. EKA Systems 900 LP complies with the limits for a Frequency Hopping Spread Spectrum Transmitter device under FCC Part 15.247 and Industry Canada RSS-210.

Table of Contents

Abstract	ii
1 Introduction	1
1.1 Compliance Statement	1
1.2 Test Scope Summary	1
1.3 Contract Information	1
1.4 Test Dates	2
1.5 Test and Support Personnel	2
2 Equipment Under Test	3
2.1 EUT Identification & Description	3
2.2 Interface Cables/Ports	3
2.3 Test Configuration	4
2.4 Testing Algorithm	4
2.5 Test Location	4
2.6 Measurements	4
2.6.1 References	4
2.6.2 Measurement Uncertainty	5
3 Test Equipment	5
4 Test Results	6
4.1 Duty Cycle Correction/ Time of Occupancy 15.247 (a)(1)(iii), RSS-210 [A8. 1 (d)]	6
4.2 RF Power Output: (15.247 (b)(1), RSS-210 [A8.4 (2)])	8
4.3 Occupied Bandwidth: 15.247 (a)(1)(iii), RSS-210 [A8. 1])	12
4.4 Channel Spacing and Number of Hop Channels: 15.247 (a)(1), RSS-210 [A8.1 (b)]; 15.247 (a)(1)(iii), RSS-210 [A8. 1 (d)]	16
4.5 Conducted Spurious Emissions at Antenna Terminals 15.247 (d), RSS-210 [A8. 5]	19
4.6 Radiated Spurious Emissions: 15.205, 15.209, RSS-210 [A8. 5]	39
4.6.1 Test Procedure	39
4.7 AC Conducted Emissions (FCC Pt.15.207, RSS-Gen [7.2.2])	47
4.7.1 Requirements	47
4.7.2 Test Procedure	47
4.7.3 Test Data	47

List of Tables

Table 1. Device Summary	3
Table 2: EUT Test Configuration	3
Table 3: Test Equipment List	5
Table 4. RF Power Output	9
Table 5. Occupied Bandwidth Results	16
Table 6: Radiated Emission Test Data, Low Frequency Data (<1GHz)	40
Table 7: Radiated Emission Test Data, High Frequency Data (>1GHz)	42
Table 8: Conducted Emission Test Data	48

List of Figures

Figure 1: Single Pulse	7
Figure 2. Duty Cycle Plot	8
Figure 3. RF Peak Power, Low Channel	10
Figure 4. RF Peak Power, Mid Channel	11
Figure 5. RF Peak Power, High Channel	12
Figure 6. Occupied Bandwidth, Low Channel	13
Figure 7. Occupied Bandwidth, Mid Channel	14
Figure 8. Occupied Bandwidth, High Channel	15
Figure 9. Channel Spacing, 500kHz	17
Figure 10. Number of Channels, Plot 1	18
Figure 11. Conducted Spurious Emissions, Low Channel, 30 - 902MHz	20
Figure 12. Conducted Spurious Emissions, Low Channel, 900 - 930MHz	21
Figure 13. Conducted Spurious Emissions, Low Channel, 928MHz - 1.2GHz	22
Figure 14. Conducted Spurious Emissions, Low Channel, 1.2 - 5GHz	23
Figure 15. Conducted Spurious Emissions, Low Channel, 5 - 10GHz	24
Figure 16. Conducted Spurious Emissions, Mid Channel, 30 - 902MHz	25
Figure 17. Conducted Spurious Emissions, Mid Channel, 900 - 930MHz	26
Figure 18. Conducted Spurious Emissions, Mid Channel, 928MHz - 1.2GHz	27
Figure 19. Conducted Spurious Emissions, Mid Channel, 1.2 - 5GHz	28
Figure 20. Conducted Spurious Emissions, Mid Channel, 5 - 10 GHz	29
Figure 21. Conducted Spurious Emissions, High Channel, 30 - 902MHz	30
Figure 22. Conducted Spurious Emissions, High Channel, 900 - 930MHz	31
Figure 23. Conducted Spurious Emissions, High Channel, 928MHz - 1.2GHz	32
Figure 24. Conducted Spurious Emissions, High Channel, 1.2 - 5 GHz	33
Figure 25. Conducted Spurious Emissions, High Channel, 5 - 10 GHz	34
Figure 26: Band Edge Low - Channel 0	35
Figure 27: Band Edge Low - Hopping	36
Figure 28: Band Edge High - Channel 49	37
Figure 29: Band Edge High - Hopping	38

1 Introduction

1.1 Compliance Statement

The EKA Systems, Inc. EKA 900 LP complied with the limits for a Frequency Hopping Spread Spectrum Transmitter device under FCC Part 15.247.

1.2 Test Scope Summary

Tests for radiated and conducted (at antenna terminal) emissions were performed. All measurements were performed in accordance with the 2003 version of ANSI C63.4 and FCC Public Notice DA 00-705 March 2000. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation.

TX Test Summary (Frequency Hopping Spread Spectrum)			
FCC Rule Part	IC Rule Part	Description	Result
15.247 (a)(1)(iii)	RSS-210 [A8. 1]	20dB Bandwidth	Pass
15.247 (b)(1)	RSS-210 [A8.4 (2)]	Transmit Output Power	Pass
15.247 (a)(1)	RSS-210 [A8.1 (b)]	Channel Separation	Pass
15.247 (a)(1)(iii)	RSS-210 [A8. 1 (d)]	Number of Channels >15	Pass
15.247 (a)(1)(iii)	RSS-210 [A8. 1 (d)]	Time of Occupancy	Pass
15.247 (d)	RSS-210 [A8. 5]	Occupied BW / Out-of-Band Emissions (Band Edge @ 20dB below)	Pass
15.205 15.209	RSS-210 [A8. 5]	General Field Strength Limits (Restricted Bands & RE Limits)	Pass
15.207	RSS-Gen [7.2.2]	AC Conducted Emissions	
RX/Digital Test Summary (Frequency Hopping Spread Spectrum)			
FCC Rule Part	IC Rule Part	Description	Result
15.207	RSS-Gen [7.2.2]	AC Conducted Emissions	
15.209	RSS-Gen [7.2.3.2]	General Field Strength Limits (Restricted Bands & RE Limits)	

1.3 Contract Information

Customer:

EKA Systems, Inc.
20201 Century Blvd.Suite 250
Gaithersburg, MD 20874

Quotation Number:

63967

1.4 Test Dates

Testing performed on the following date(s): 12/17/2007 to 12/19/2007

1.5 Test and Support Personnel

Washington Laboratories, LTD

Steven Dovell

Client Representative

Steve Seymour

2 Equipment Under Test

2.1 EUT Identification & Description

The EKA Systems, Inc. EKA 900 LP, Equipment Under Test (EUT), is a radio module that fits inside a meter and is used to transmit meter readings. It is also used as part of a mesh network where it can act as a bridge to similar units.

Table 1. Device Summary

ITEM	DESCRIPTION
Manufacturer:	EKA Systems, Inc.
FCC ID:	P9X-900LP
IC:	TBD
Model:	EKA 900 LP
FCC Rule Parts:	§15.247
Industry Canada:	RSS210
Frequency Range:	902.75 – 927.25MHz
Maximum Output Power:	36.1mW
Modulation:	OFDM
Occupied Bandwidth:	274.241kHz (6dB BW)
Keying:	Automatic
Type of Information:	Data 802.11b
Number of Channels:	50
Power Output Level	Fixed
Antenna Type	internal 2dBi
Interface Cables:	Power
Power Source & Voltage:	Host Meter @ 3.3VDC

2.2 Interface Cables/Ports

The following ports and cable I/Os are available on the 900 LP:

Table 2: EUT Test Configuration

Port ID	Connector Type	Cable Length	Shielded (Y/N)	EUT Connection/Termination Point
Power	Screw Terminal	<6 in	N	Power – Host Meter
Debug Header	10 pin header	< 6 in	N	Used for testing only – not installed in production units

2.3 Test Configuration

The following diagram shows the test configuration:

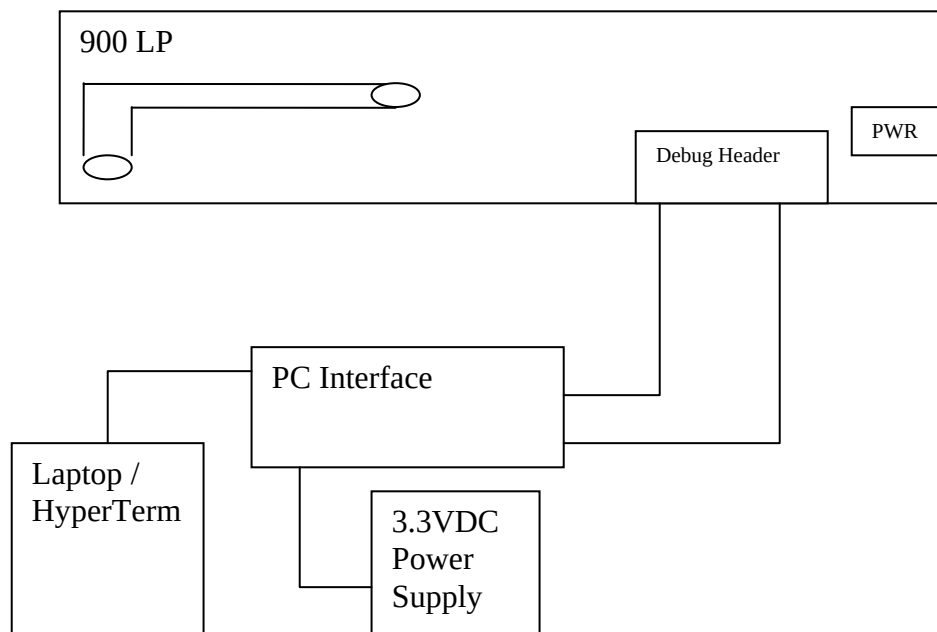


Figure 2: EUT Test Configuration

2.4 Testing Algorithm

The EUT was set for Low, Middle and High Channels in its designated frequency range via Hyperterm and proprietary software running on the EUT. Power levels were preset as well as frequencies.

2.5 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. The Industry Canada OATS numbers are 3035A-1 and 3035A-2 for Washington Laboratories, Ltd. Site 1 and Site 2, respectively. Washington Laboratories, Ltd. has been accepted by the FCC and approved by the American Association for Laboratory Accreditation (A2LA) under Certificate 2675.01. as an independent FCC test laboratory.

2.6 Measurements

2.6.1 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.

FCC Public Notice DA 00-705 Released March 30, 2000, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

2.6.2 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 3 shows a list of the test equipment used for measurements along with the calibration information.

Table 3: Test Equipment List

Test Name: Radiated Emissions		Test Date: 12/20/2007	
Asset #	Manufacturer/Model	Description	Cal. Due
00618	HP 8563A	ANALYZER, SPECTRUM	2/9/2008
00522	HP, 8449B	PRE-AMPLIFIER, 1-26.5GHZ	7/27/2008
00425	ARA, DRG-118/A	ANTENNA, DRG, 1-18GHZ	8/8/2009
00337	WLL, 1.2-5GHZ	FILTER, BAND PASS	3/2/2008
00007	ARA, LPB-2520	ANTENNA, BICONILOG ANTENNA	6/7/2008
00069	HP, 85650A	ADAPTER, QP	7/6/2008
00073	HP, 8568B	ANALYZER, SPECTRUM	7/6/2008
00071	HP, 85685A	PRESELECTOR, RF	7/6/2008

4 Test Results

4.1 Duty Cycle Correction/ Time of Occupancy 15.247 (a)(1)(iii), RSS-210 [A8. 1 (d)]

In accordance with the FCC Public Notice the spurious radiated emissions measurements may be adjusted if using a duty cycle correction factor if the dwell time per channel of the hopping signal is less than 100 ms.

The duty cycle correction factor is calculated by:

$$20 \times \text{LOG} (\text{dwell time}/100 \text{ ms})$$

The following figure shows the plot of the dwell time for the transmitter. Based on this plot, the dwell time per hop is 4.033ms. Therefore the total dwell time per 100ms is 4.03ms. This corresponds to a duty cycle correction of 27.9dB, however, the maximum allowed duty cycle correction is 20dB.

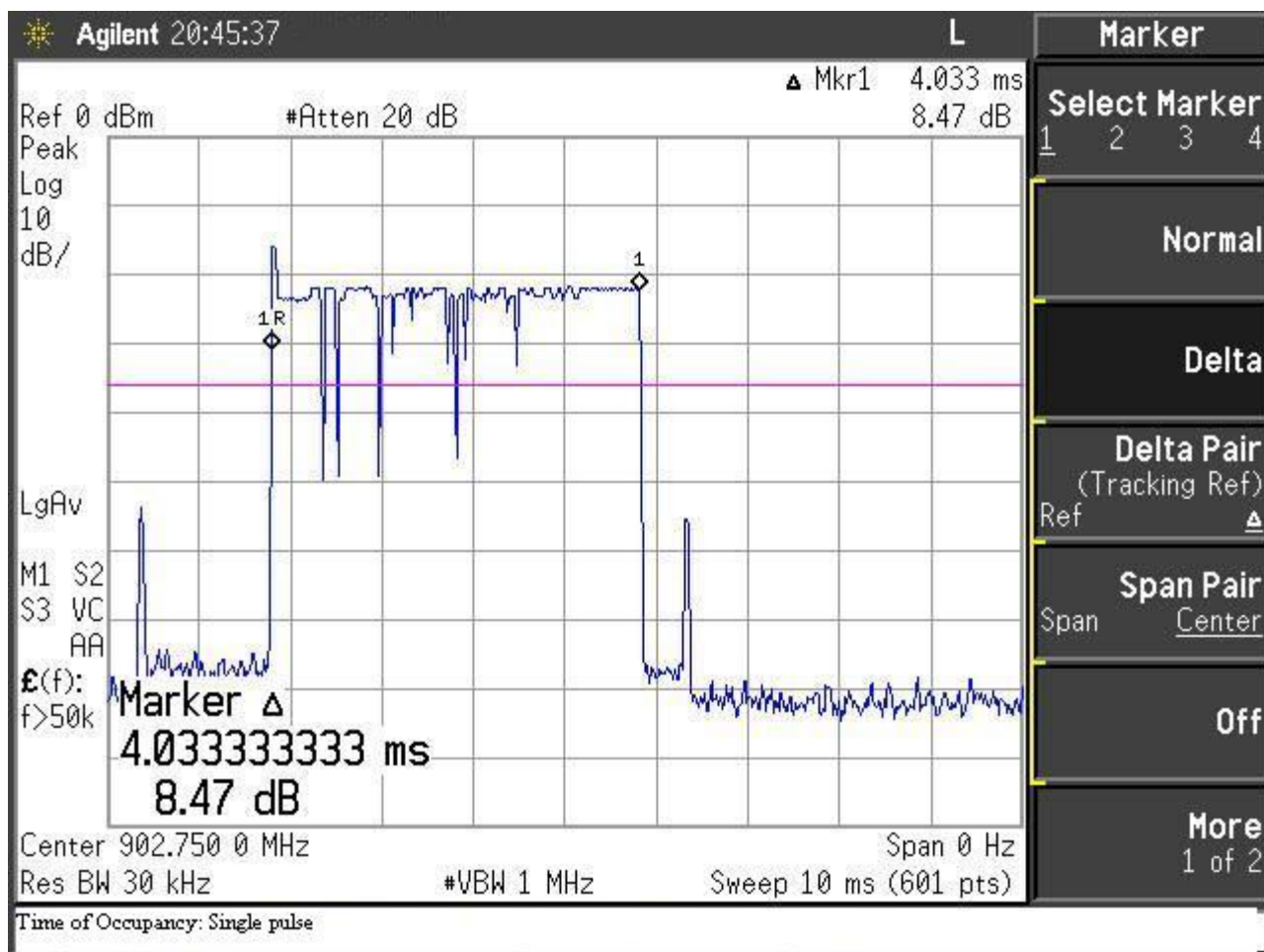


Figure 1: Single Pulse

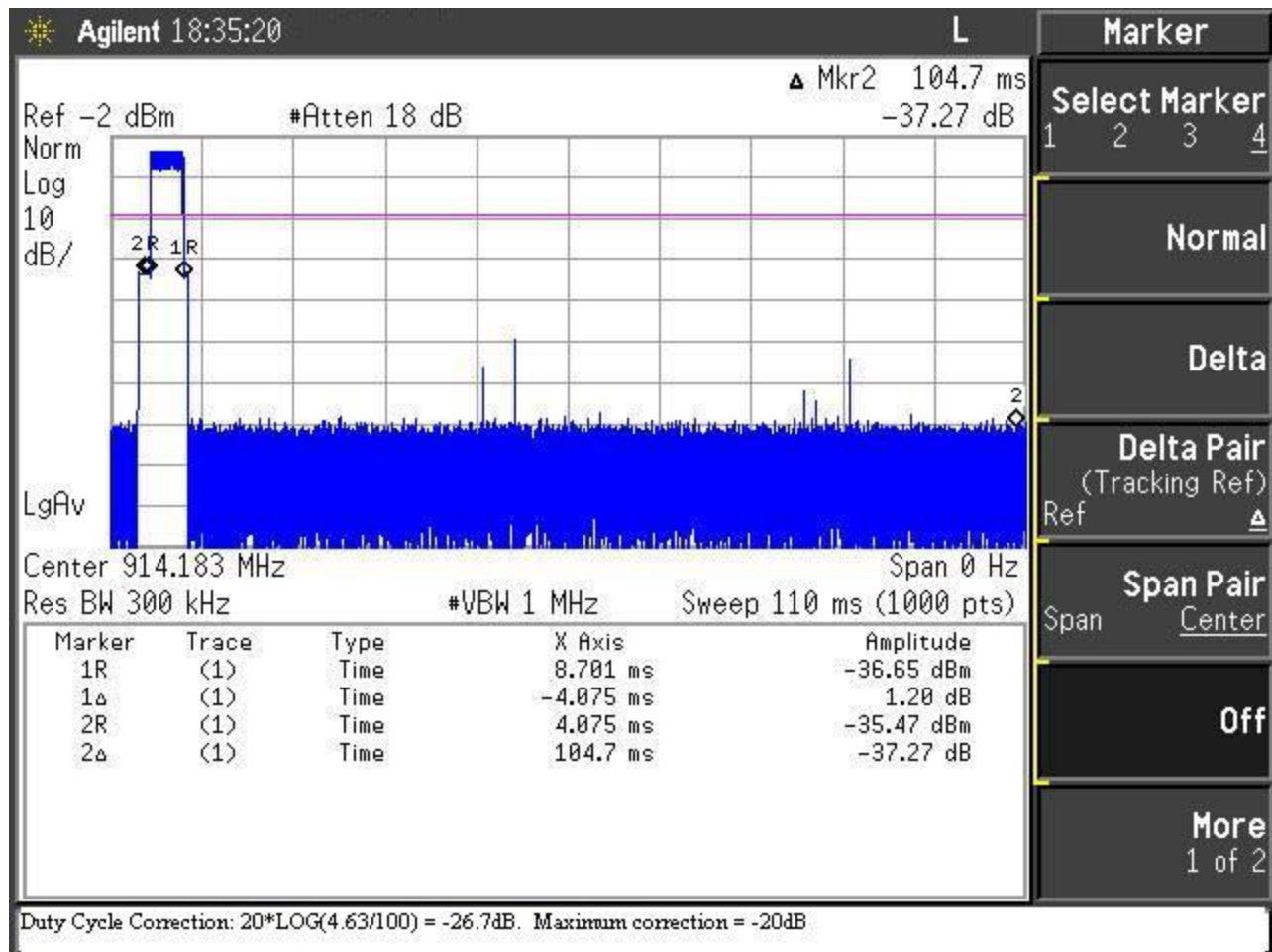


Figure 2. Duty Cycle Plot

Engineer: Steven Dovell

Test Date : 12/18/07

4.2 RF Power Output: (15.247 (b)(1), RSS-210 [A8.4 (2)])

To measure the output power the hopping sequence was stopped while the frequency dwelled on a low, high and middle channel. 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 4. RF Power Output

Channel / Frequency (MHz)	Level (dBm)	Level (mW)
0 / 902.75	15.48	35.32
24 / 914.75	15.57	36.06
49 / 927.25	15.4	34.67

Test Engineer(s): Steven Dovell

Test Date(s): 12/17/07

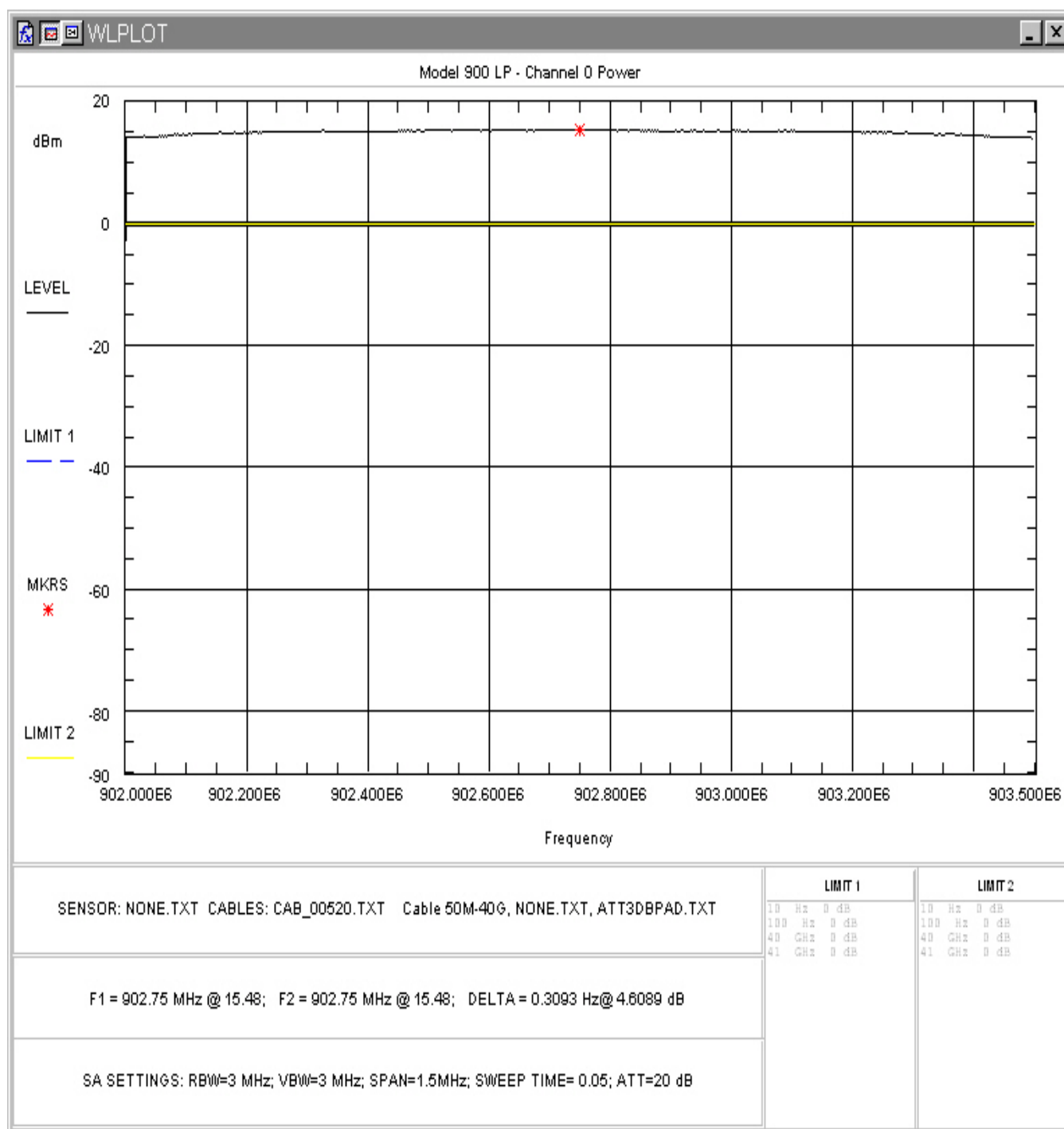


Figure 3. RF Peak Power, Low Channel

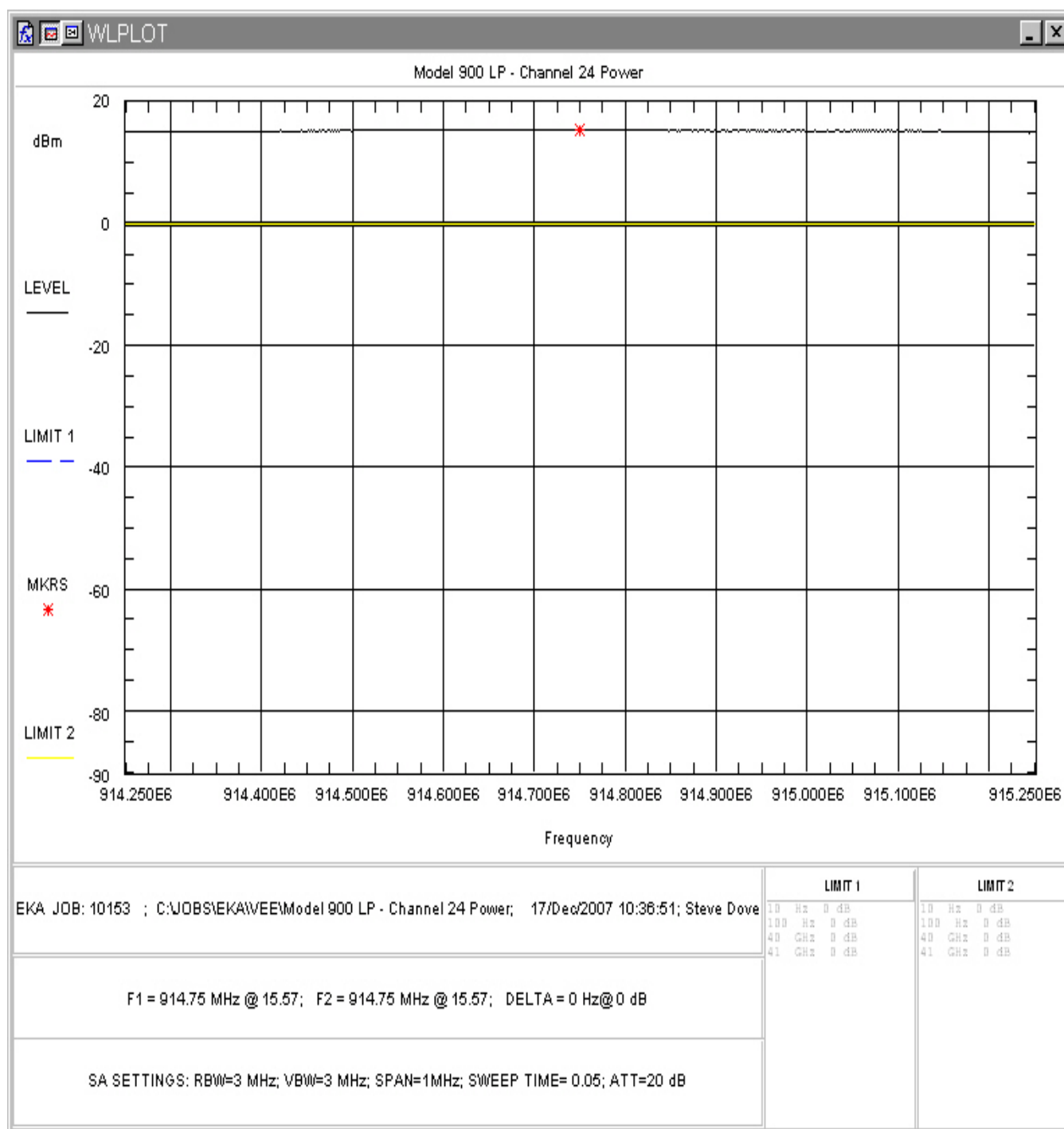


Figure 4. RF Peak Power, Mid Channel

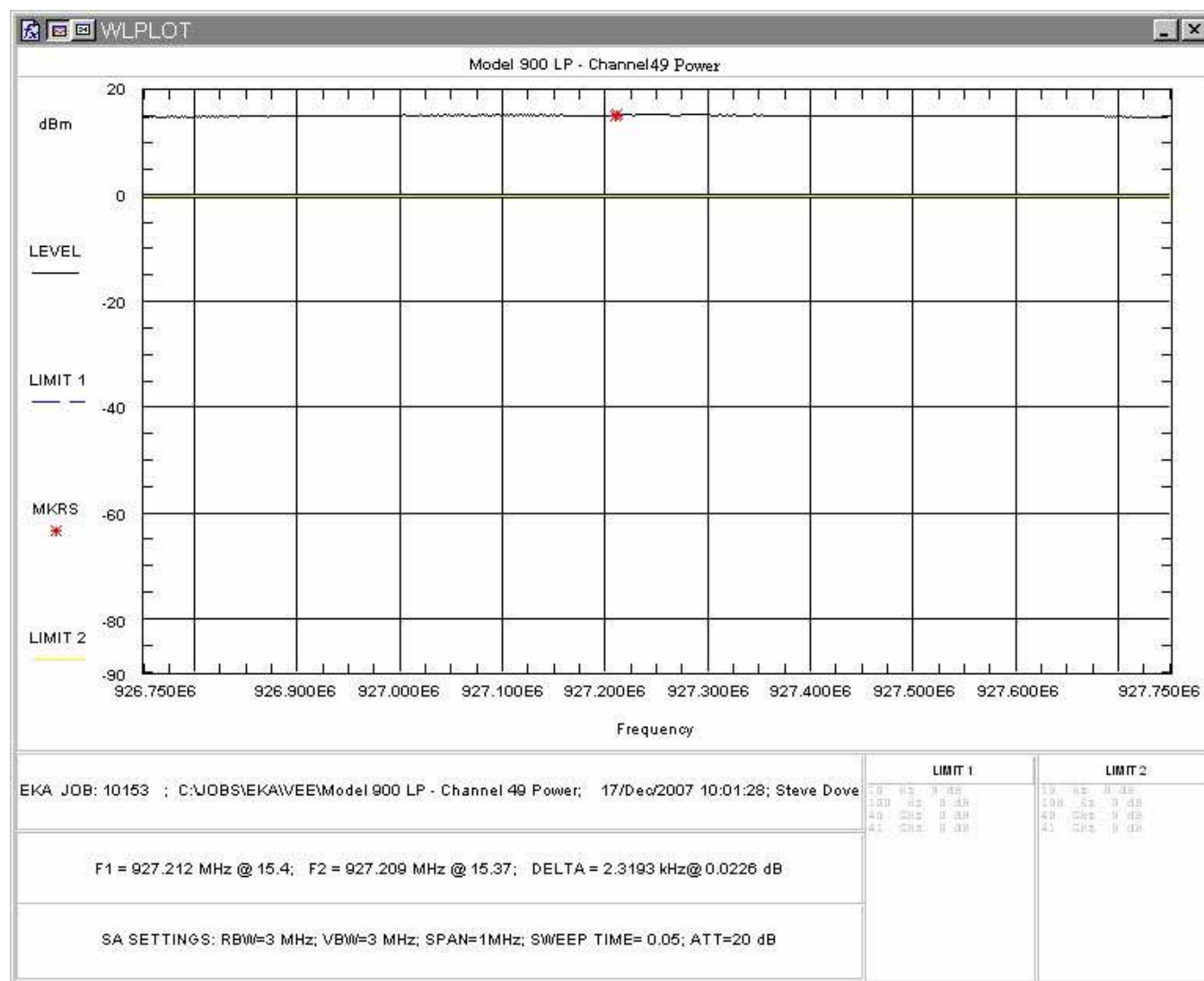


Figure 5. RF Peak Power, High Channel

4.3 Occupied Bandwidth: 15.247 (a)(1)(iii), RSS-210 [A8. 1])

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

For Frequency Hopping Spread Spectrum Systems, FCC Part 15.247 requires the maximum 20 dB bandwidth not exceed 1MHz.

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

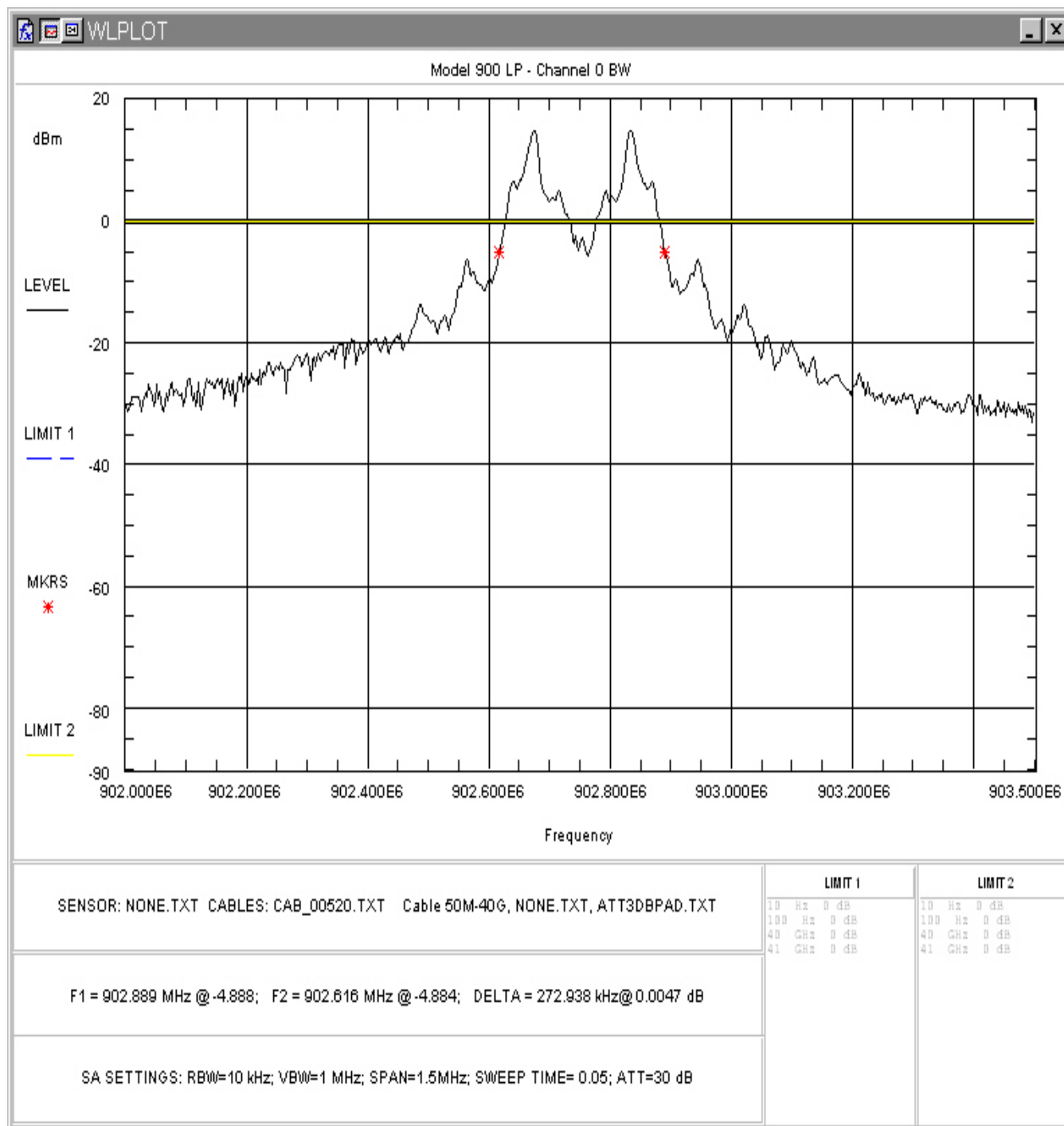


Figure 6. Occupied Bandwidth, Low Channel

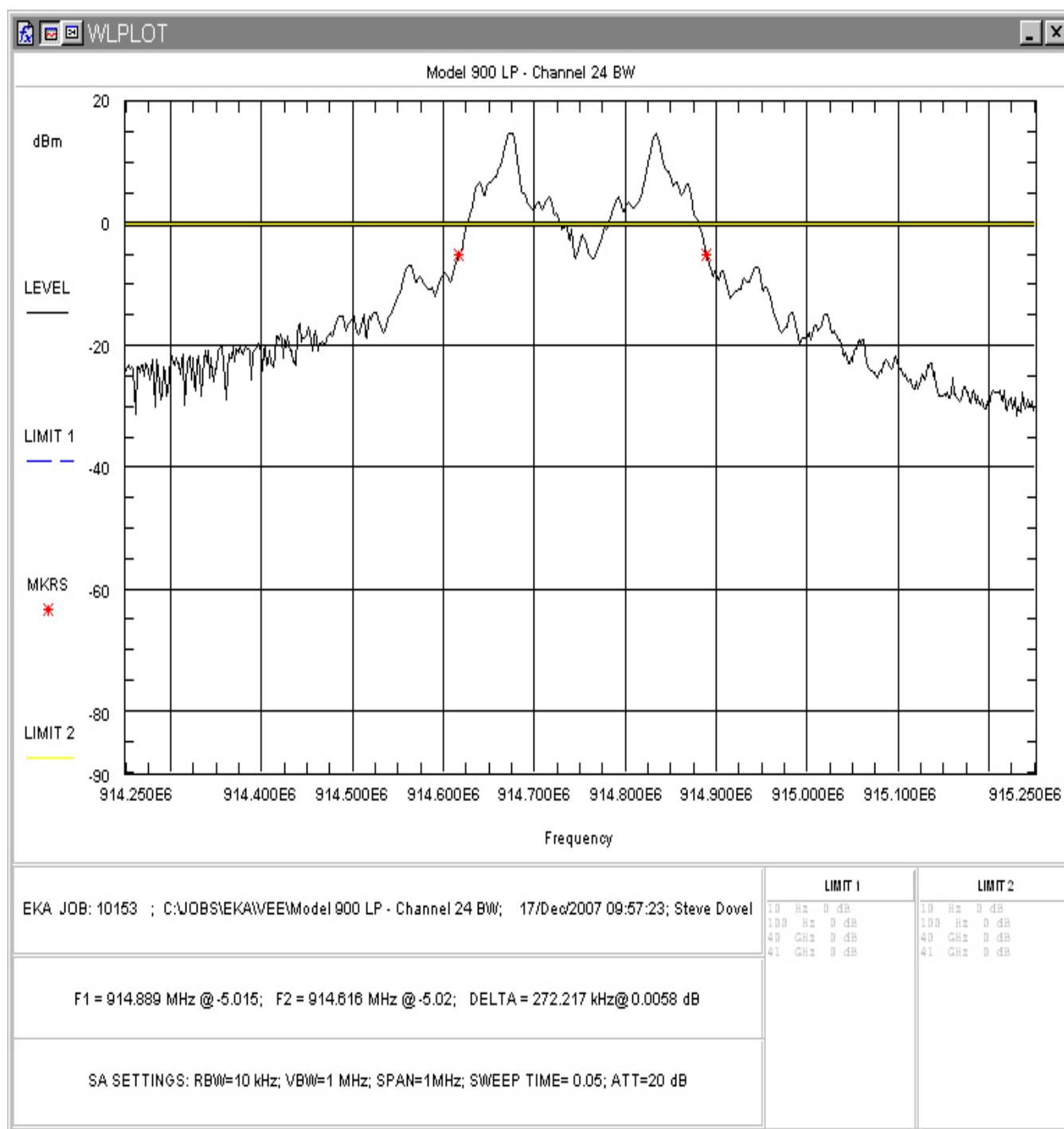


Figure 7. Occupied Bandwidth, Mid Channel

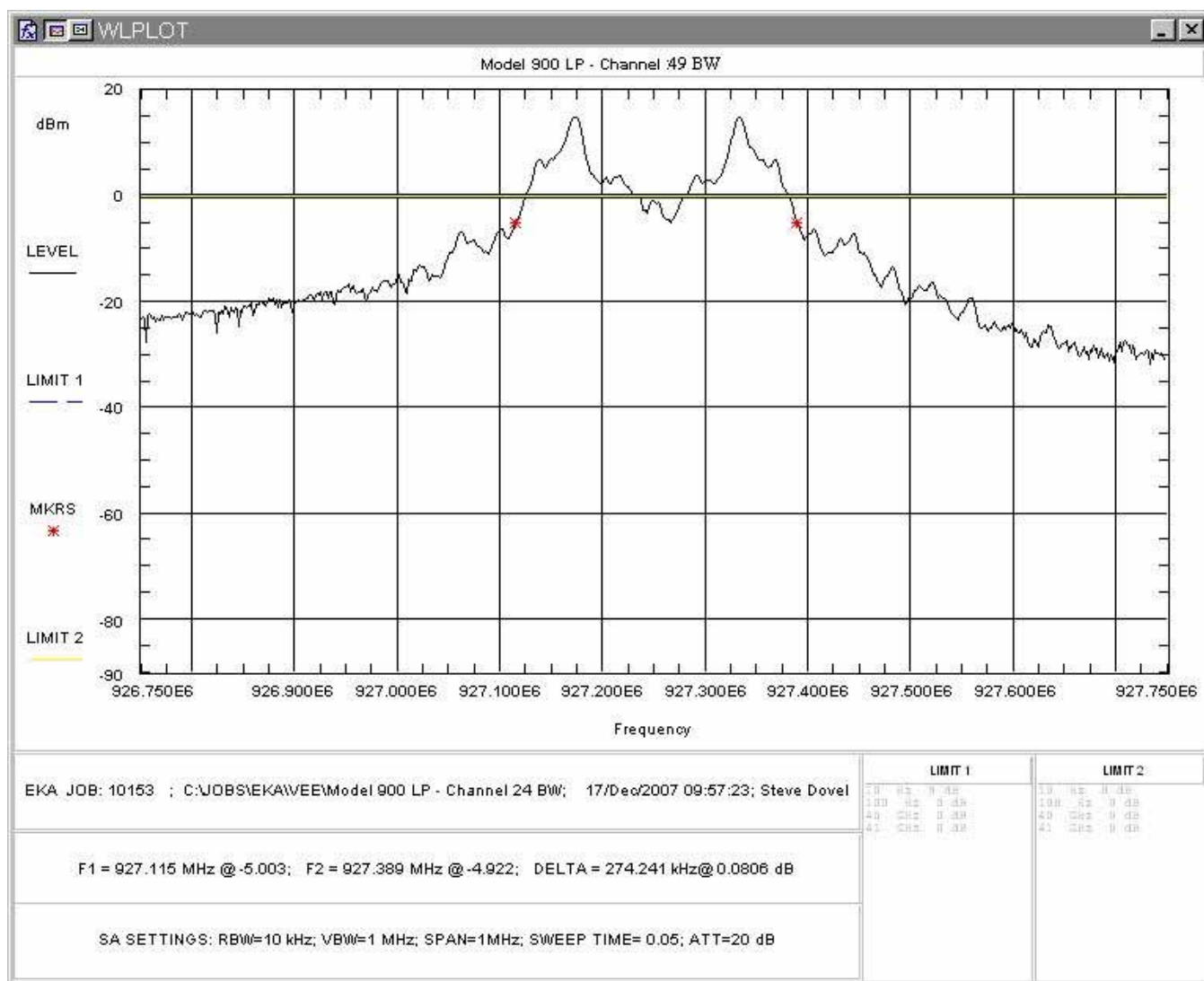


Figure 8. Occupied Bandwidth, High Channel

Table 5 provides a summary of the Occupied Bandwidth Results.

Table 5. Occupied Bandwidth Results

Channel / Frequency	Bandwidth (kHz)
0 / 902.75	272.938
24 / 914.75	272.217
49 / 927.25	274.241

Test Engineer(s): Steven Dovell

Test Date(s): 12/17/07

4.4 Channel Spacing and Number of Hop Channels: 15.247 (a)(1), RSS-210 [A8.1 (b)]; 15.247 (a)(1)(iii), RSS-210 [A8. 1 (d)]

Per the FCC requirements, frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20 dB bandwidth, whichever is greater. The maximum 20dB bandwidth measured is 274.2kHz so the channel spacing must be more than 274.2kHz. In addition, for a 2.4GHz the number of hopping channels shall be stated.

The EUT antenna was removed and the cable was connected directly into a spectrum analyzer through a 10 dB attenuator. An offset was programmed into the spectrum analyzer to compensate for the loss of the external attenuator. The spectrum analyzer resolution bandwidth was set to 100 kHz and the video bandwidth was set to 100 kHz. The channel spacing of 2 adjacent channels was measured using a spectrum analyzer span setting of 2.3MHz. Also, the number of hopping channels was measured from 2.4GHz to 2.5GHz.

The following are plots of the channel spacing and number of hopping channels data. The channel spacing was measured to be 500kHz and the number of channels used is 50.

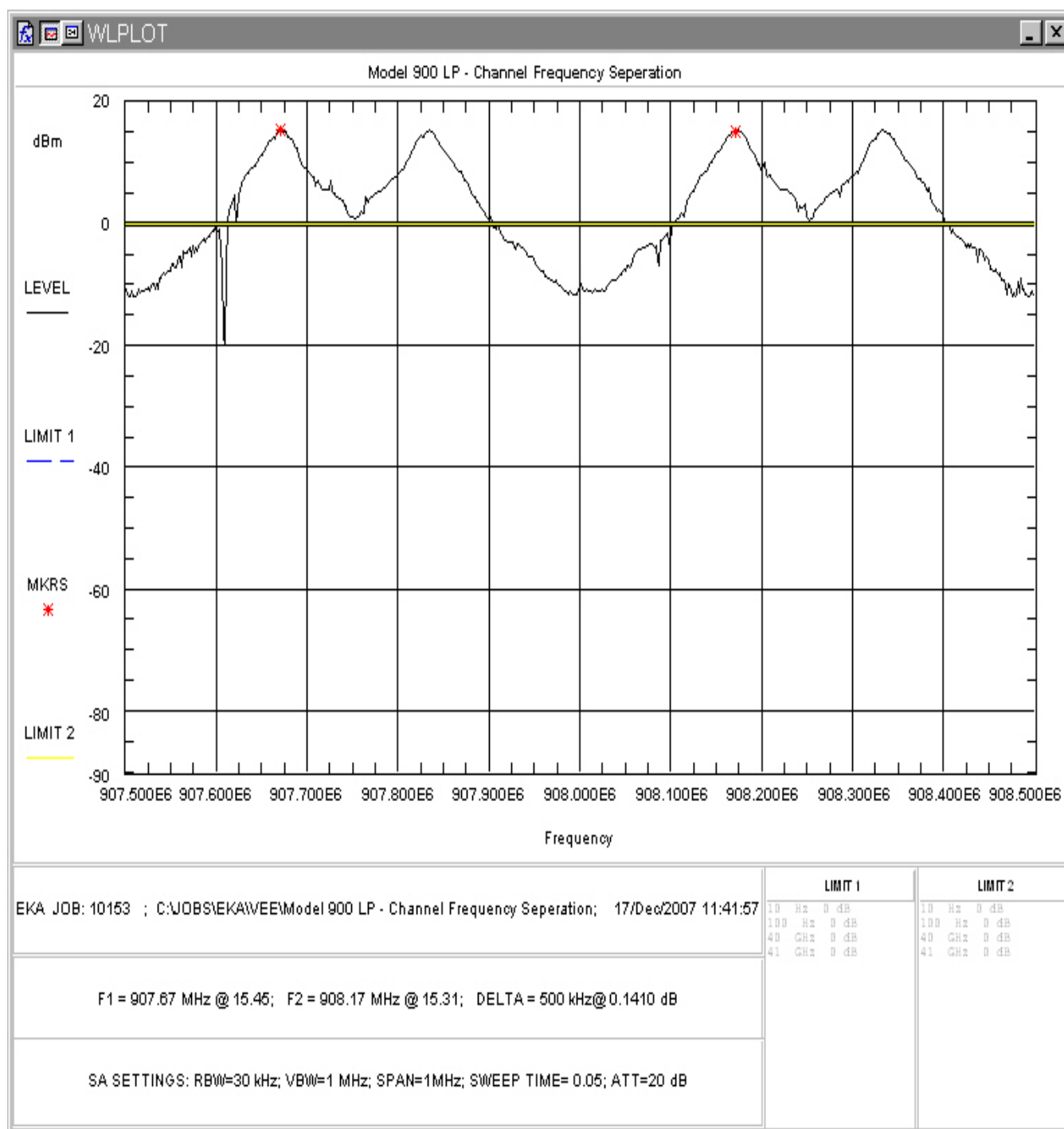


Figure 9, Channel Spacing, 500kHz

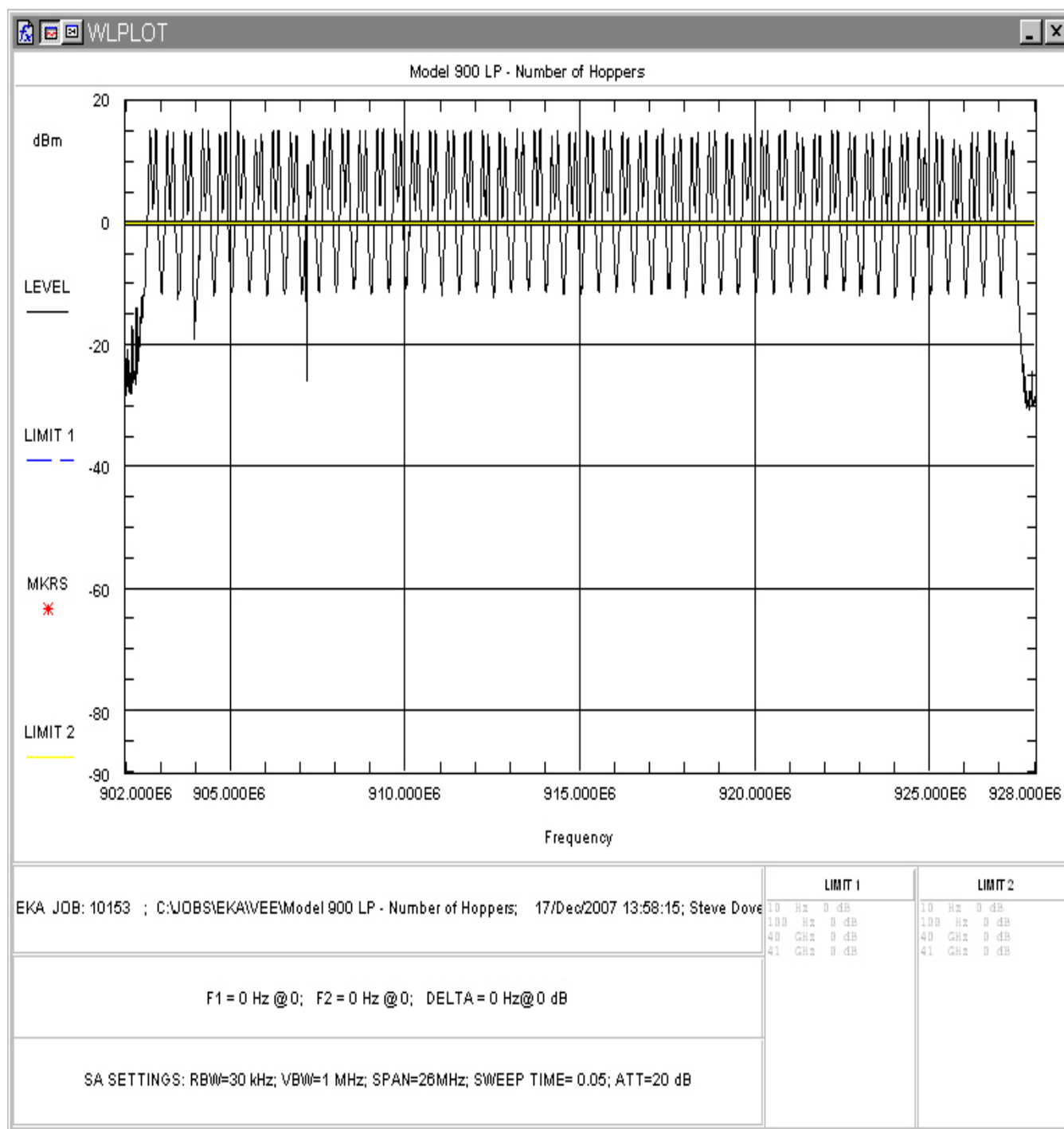


Figure 10. Number of Channels, Plot 1

4.5 Conducted Spurious Emissions at Antenna Terminals 15.247 (d), RSS-210 [A8. 5]

The EUT must comply with requirements for spurious emissions at antenna terminals. Per §15.247(d) all spurious emissions in any 100 kHz bandwidth outside the frequency band in which the spread spectrum device is operating shall be attenuated 20 dB below the highest power level in a 100 kHz bandwidth within the band containing the highest level of the desired power.

The EUT antenna was removed and the cable was connected directly into a spectrum analyzer through a 10 dB attenuator. An offset was programmed into the spectrum analyzer to compensate for the loss of the external attenuator. The spectrum analyzer resolution bandwidth was set to 100 kHz and the video bandwidth was set to 100 kHz. The amplitude of the EUT carrier frequency was measured to determine the emissions limit (20 dB below the carrier frequency amplitude). The emissions outside of the allocated frequency band were then scanned from 30 MHz up to the tenth harmonic of the carrier.

The following are plots of the conducted spurious emissions data.

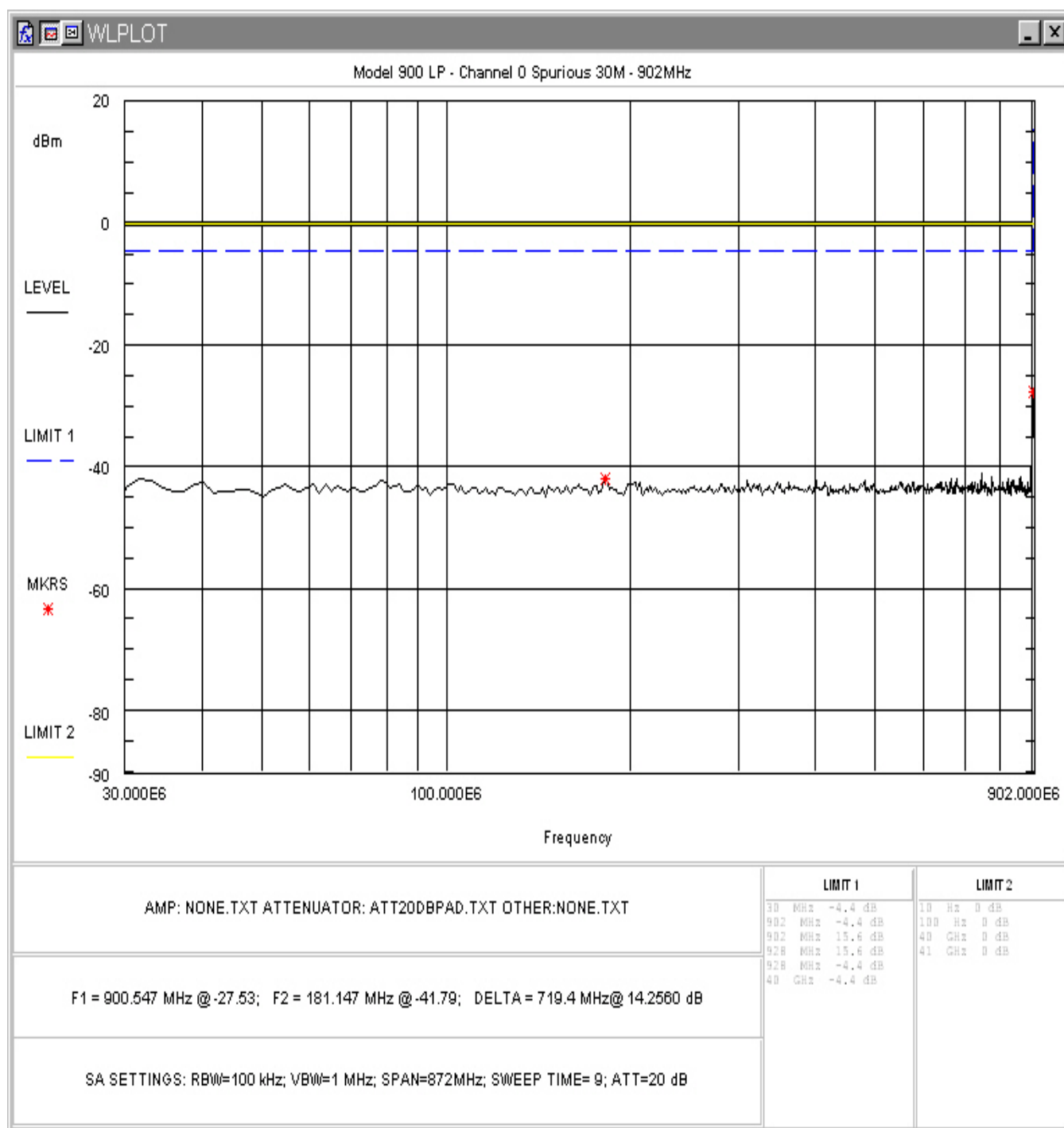


Figure 11. Conducted Spurious Emissions, Low Channel, 30 - 902MHz

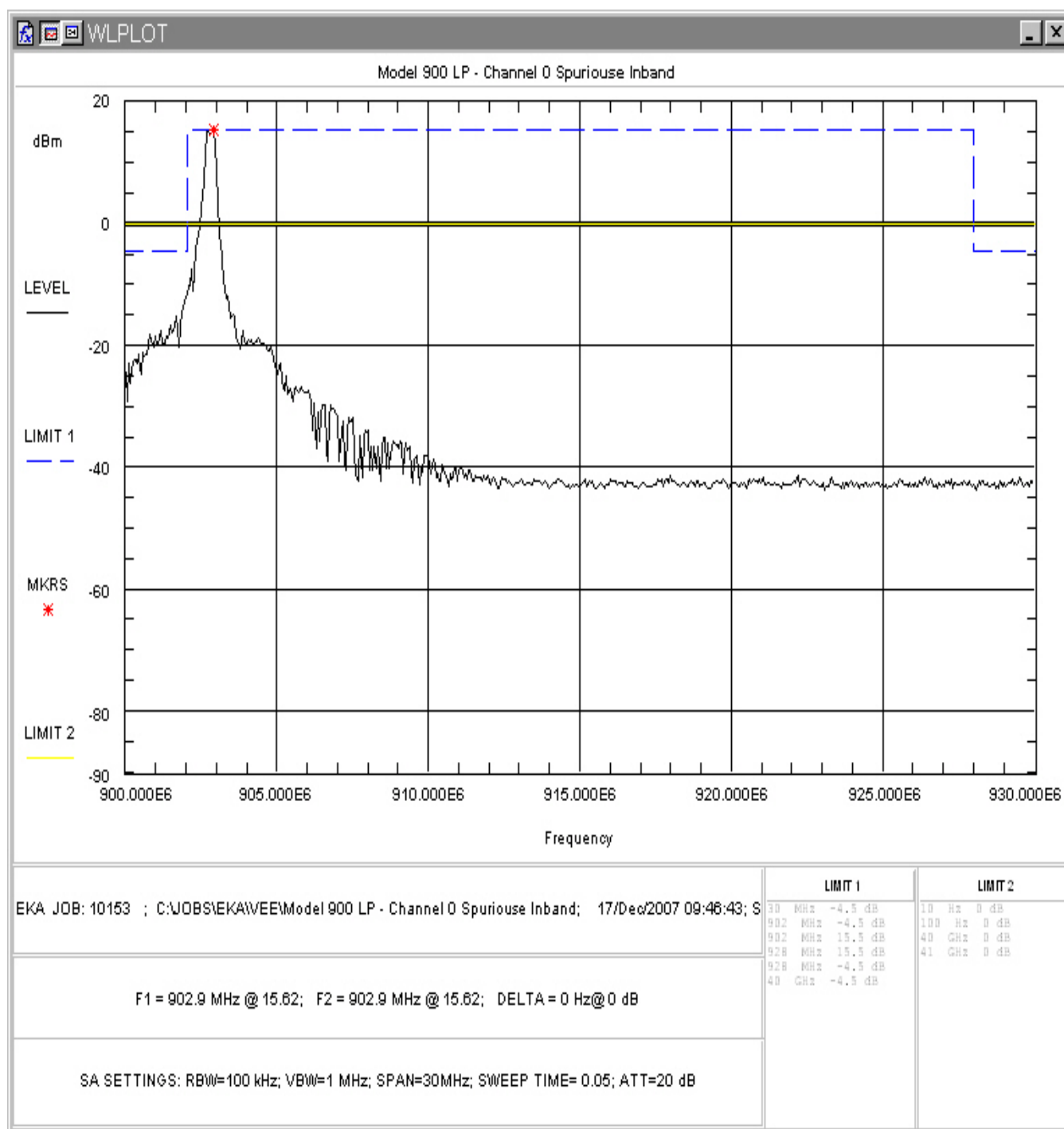


Figure 12. Conducted Spurious Emissions, Low Channel, 900 – 930MHz

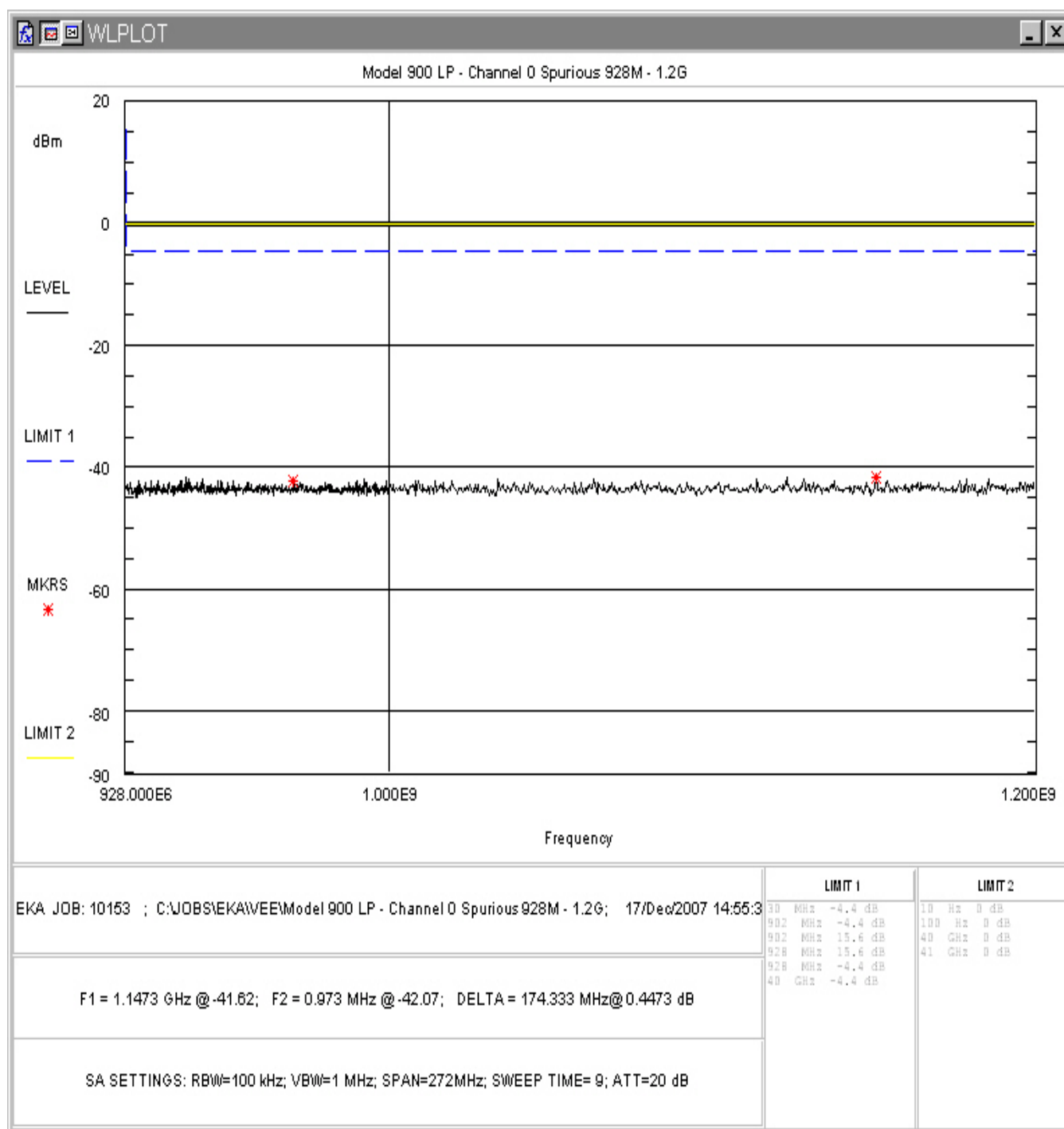


Figure 13. Conducted Spurious Emissions, Low Channel, 928MHz 1.2GHz

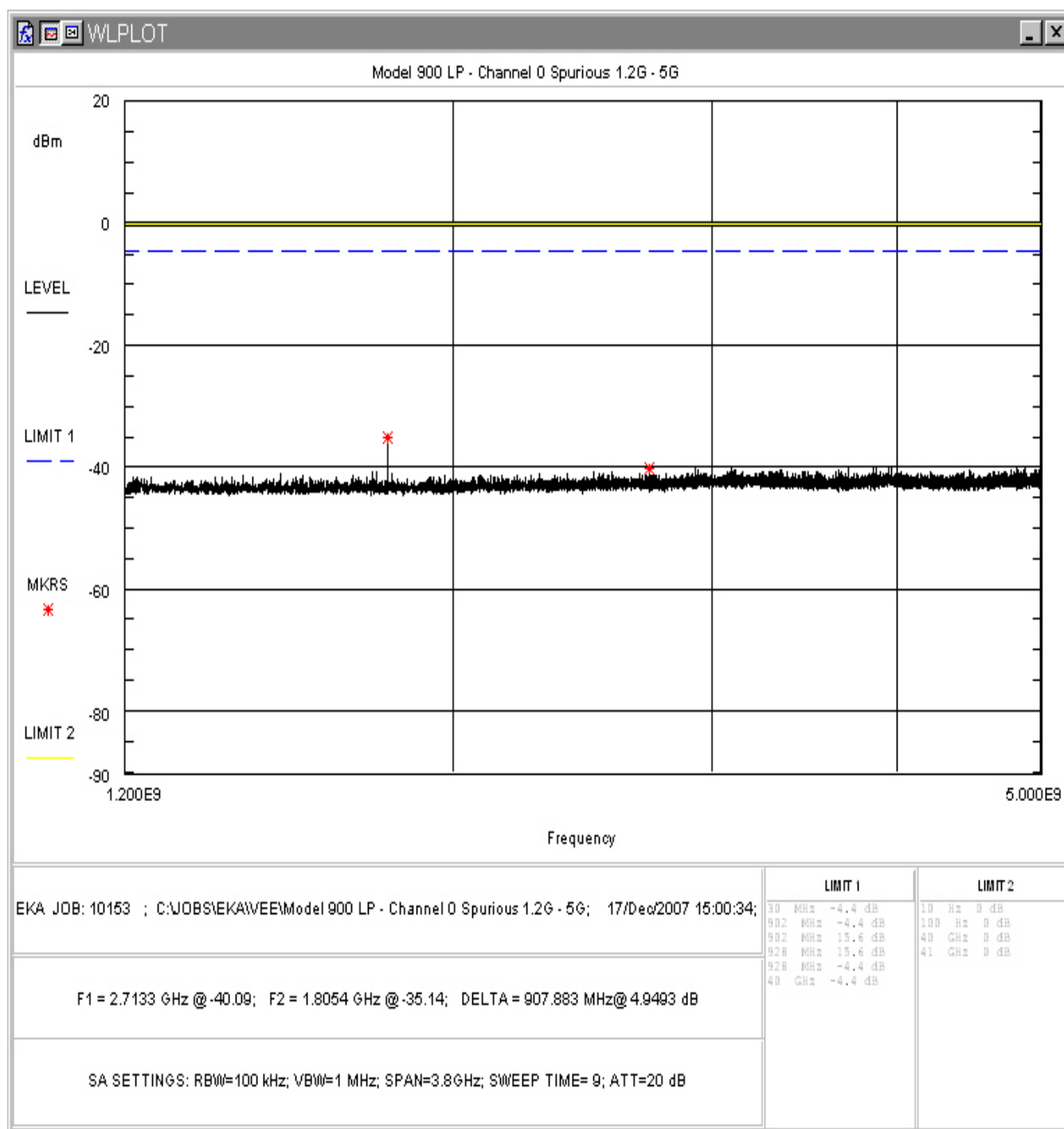


Figure 14. Conducted Spurious Emissions, Low Channel, 1.2 - 5GHz

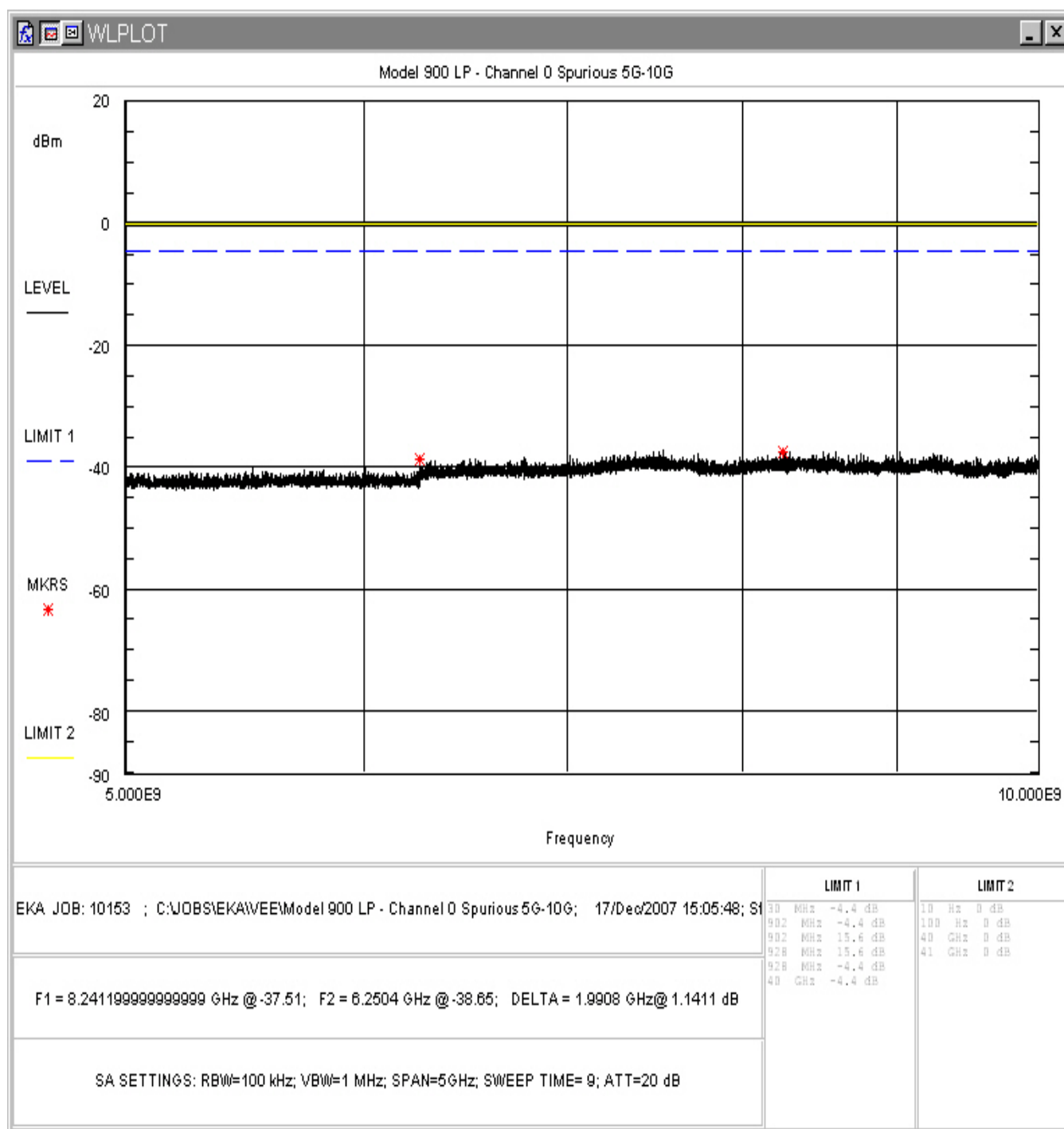


Figure 15. Conducted Spurious Emissions, Low Channel, 5 - 10GHz

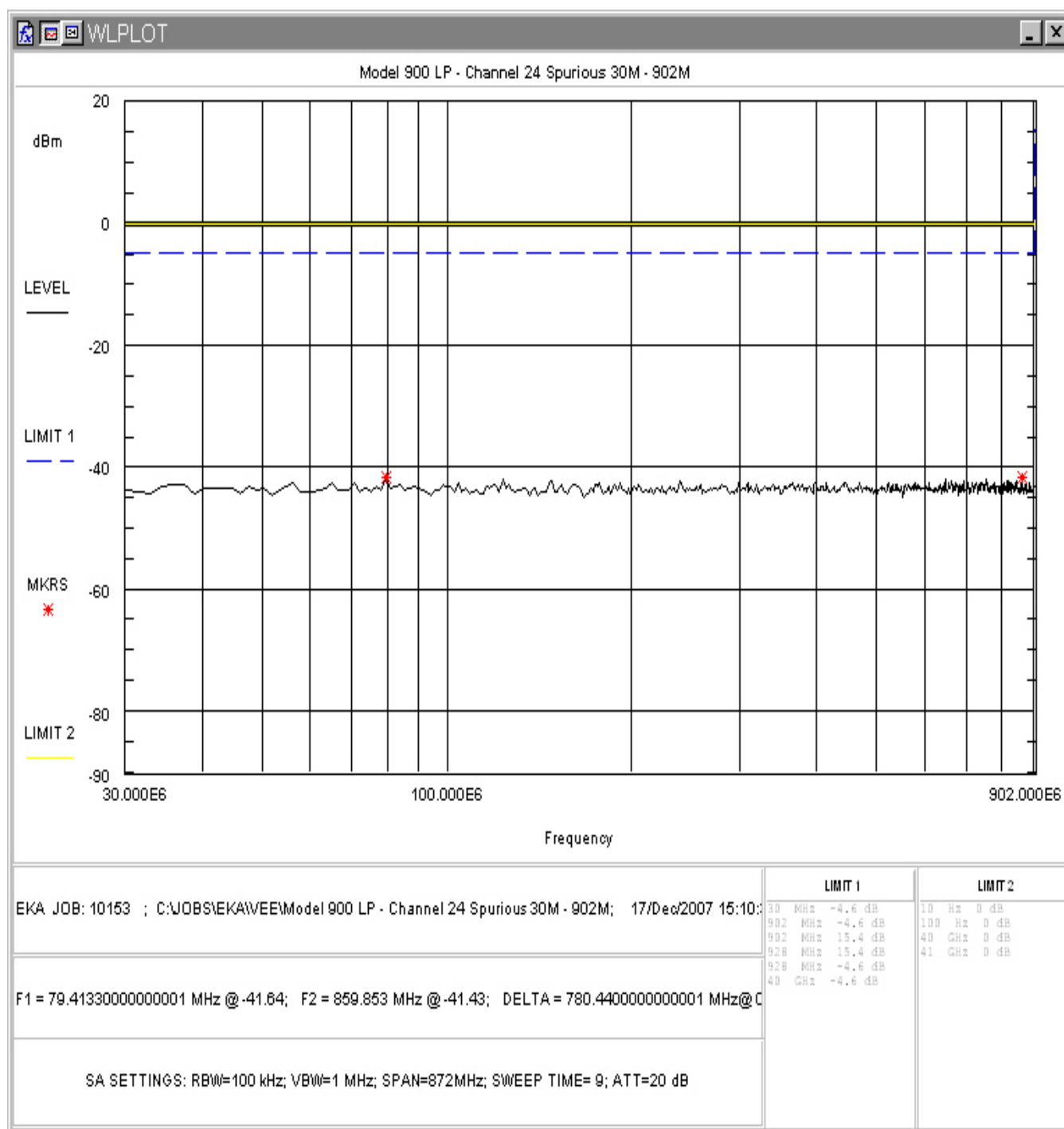


Figure 16. Conducted Spurious Emissions, Mid Channel, 30 - 902MHz

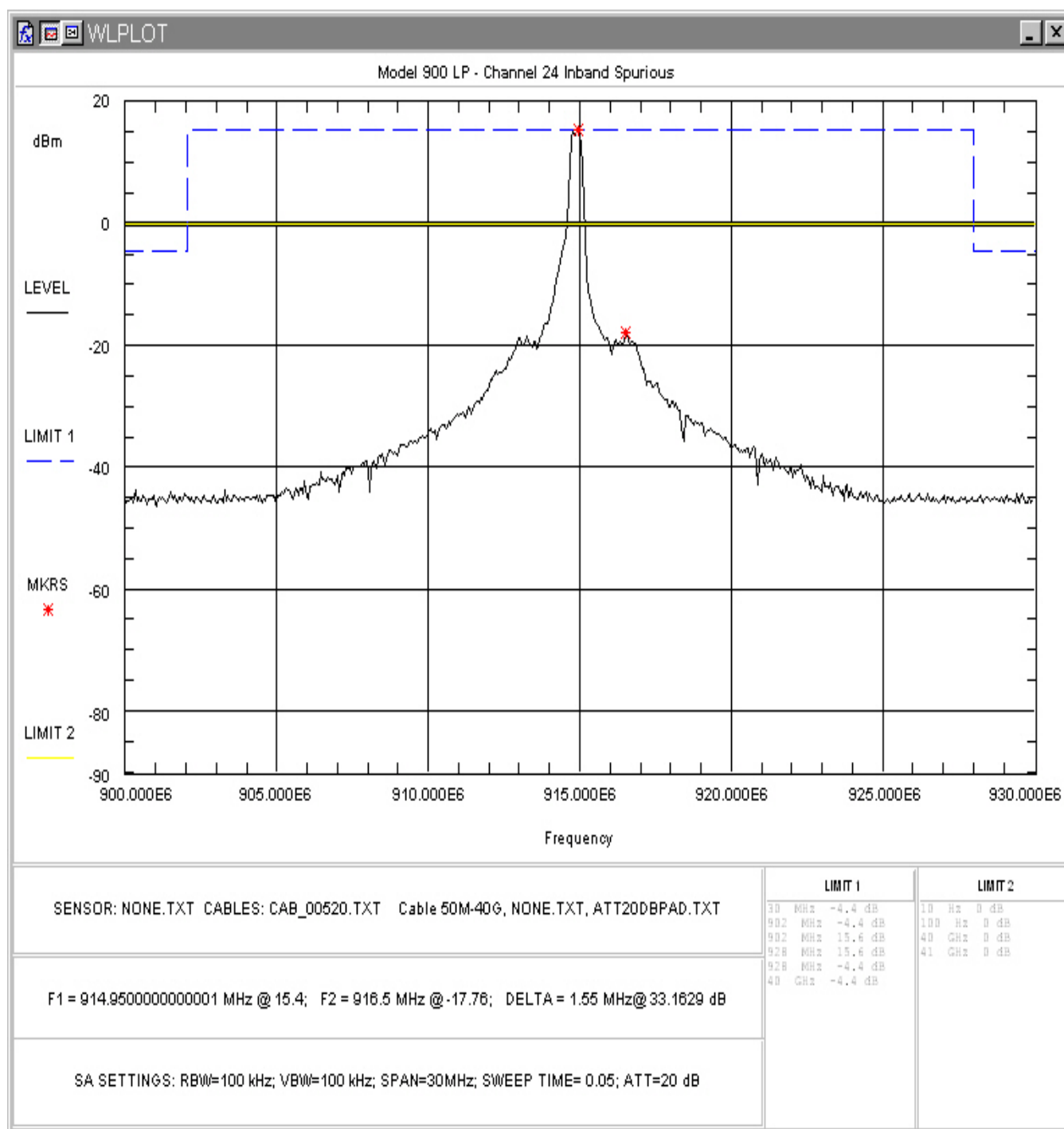


Figure 17. Conducted Spurious Emissions, Mid Channel, 900 – 930MHz

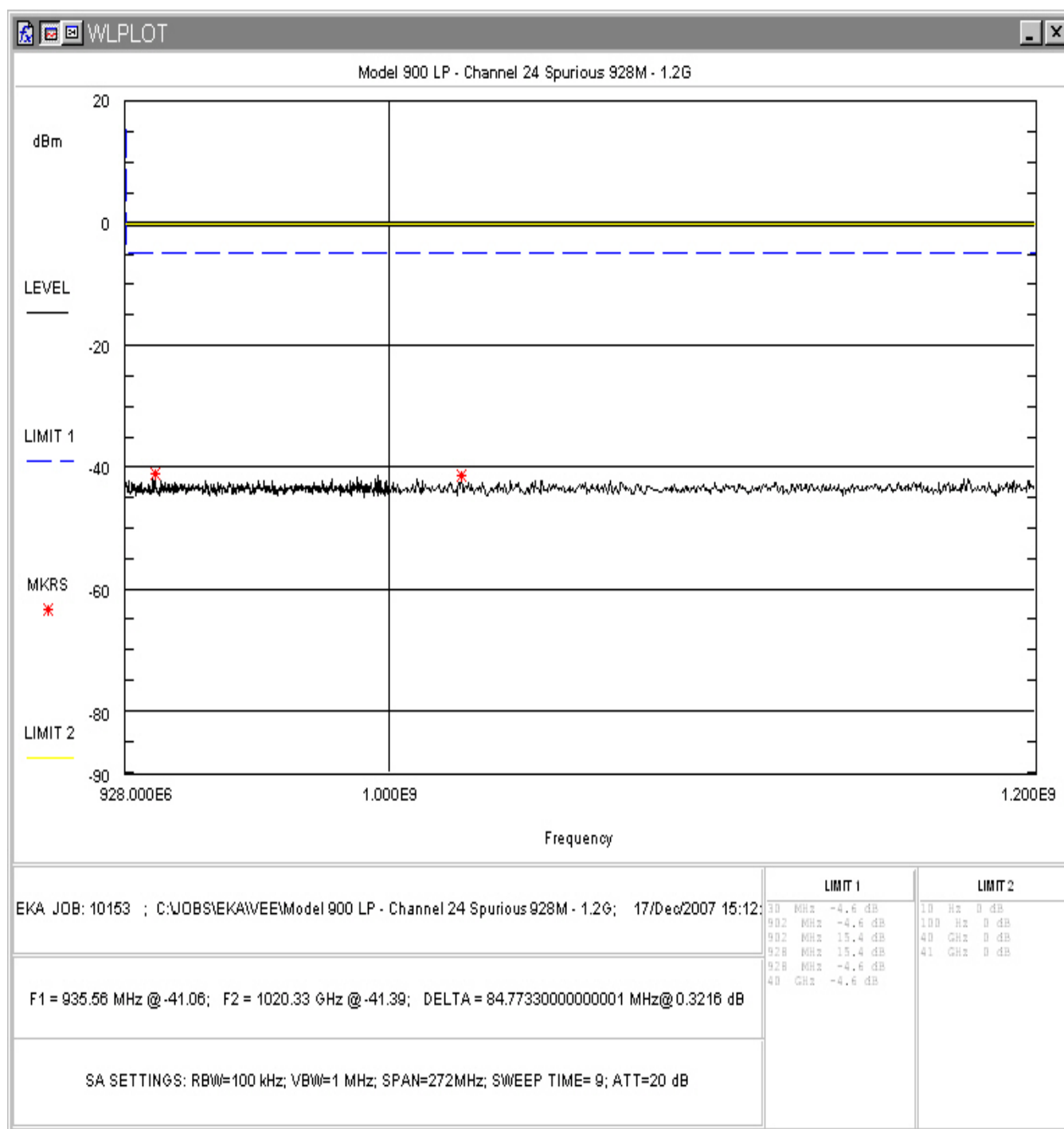


Figure 18. Conducted Spurious Emissions, Mid Channel, 928MHz – 1.2GHz

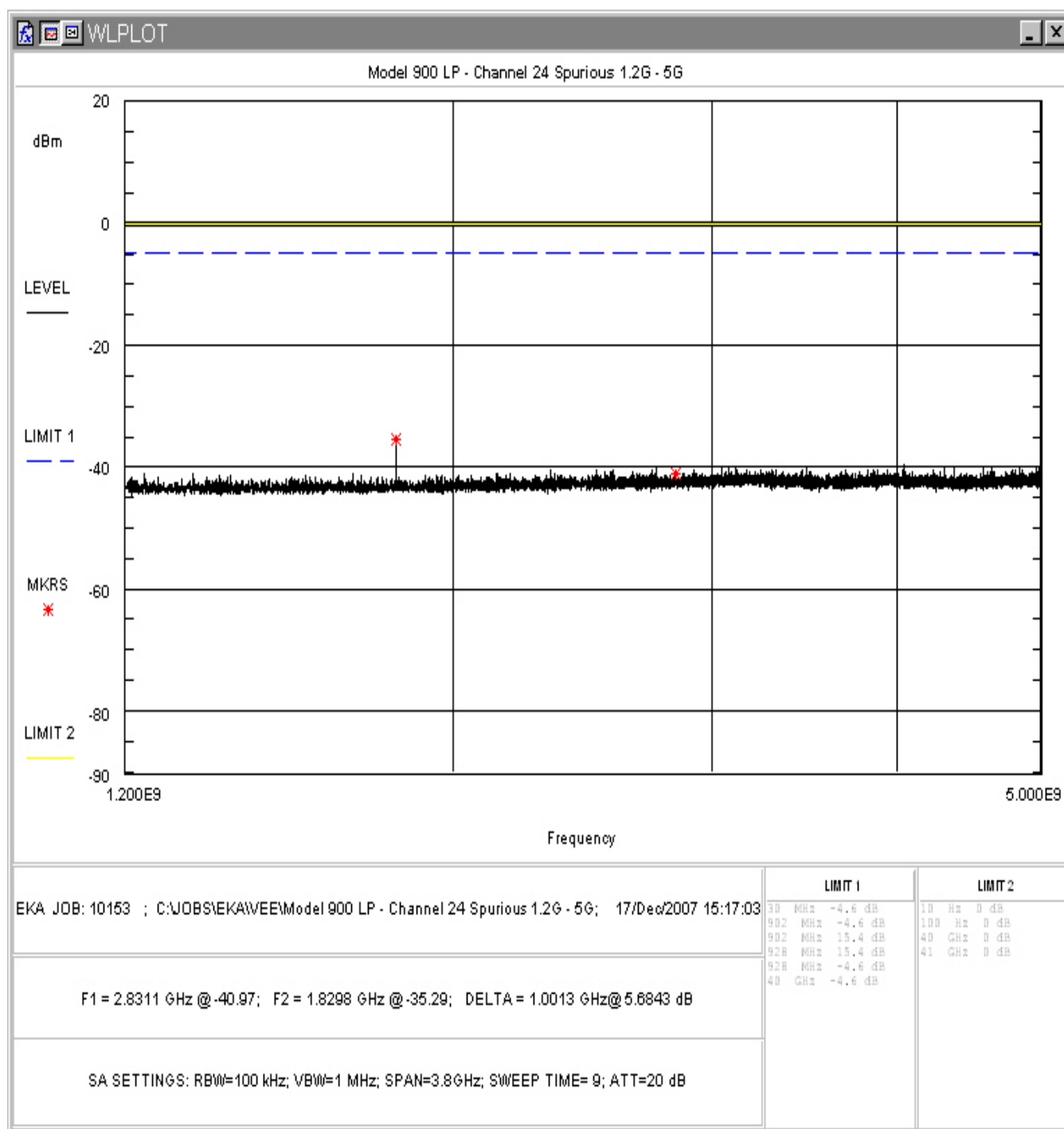


Figure 19. Conducted Spurious Emissions, Mid Channel, 1.2 – 5GHz

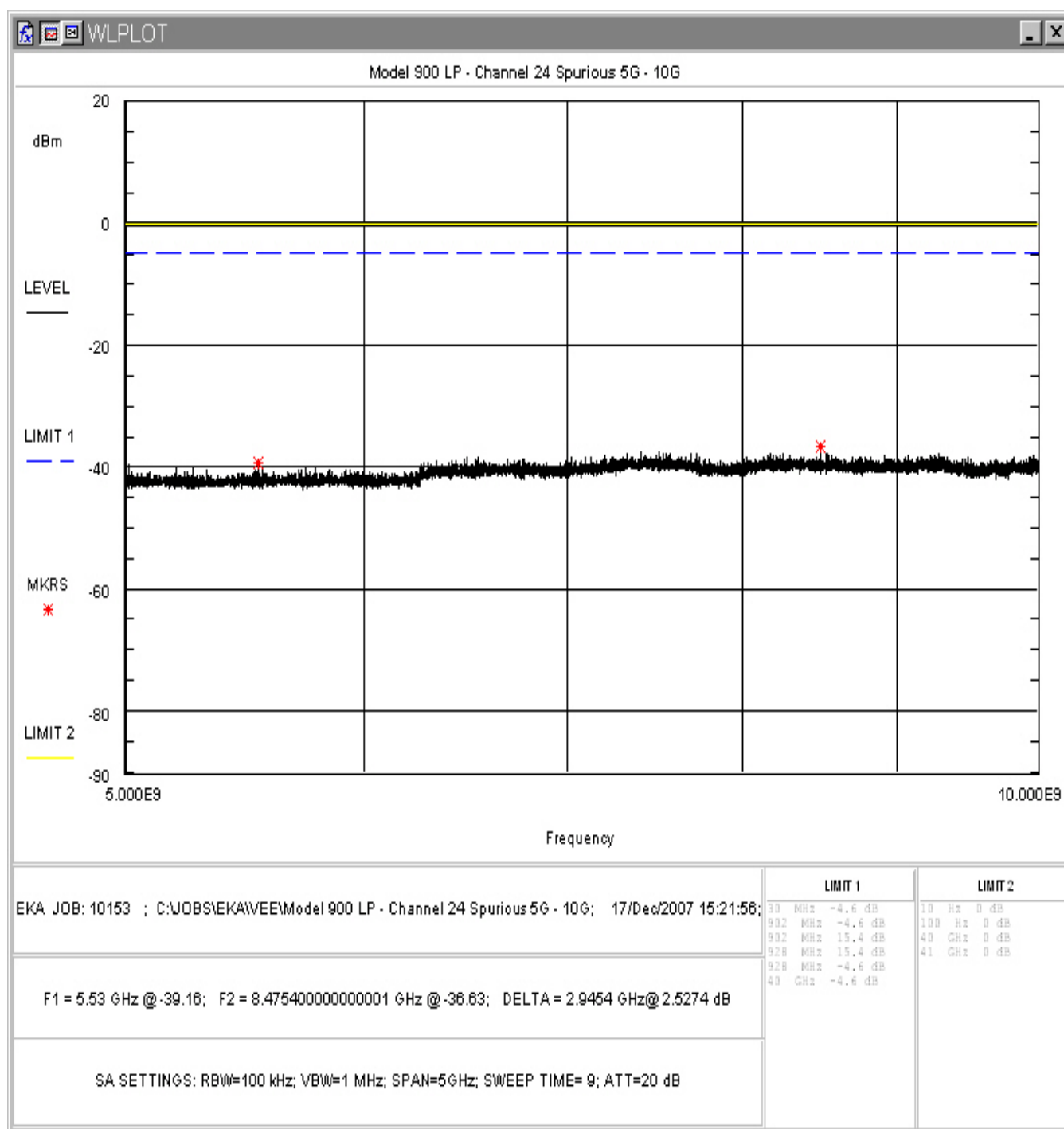


Figure 20. Conducted Spurious Emissions, Mid Channel, 5 – 10 GHz

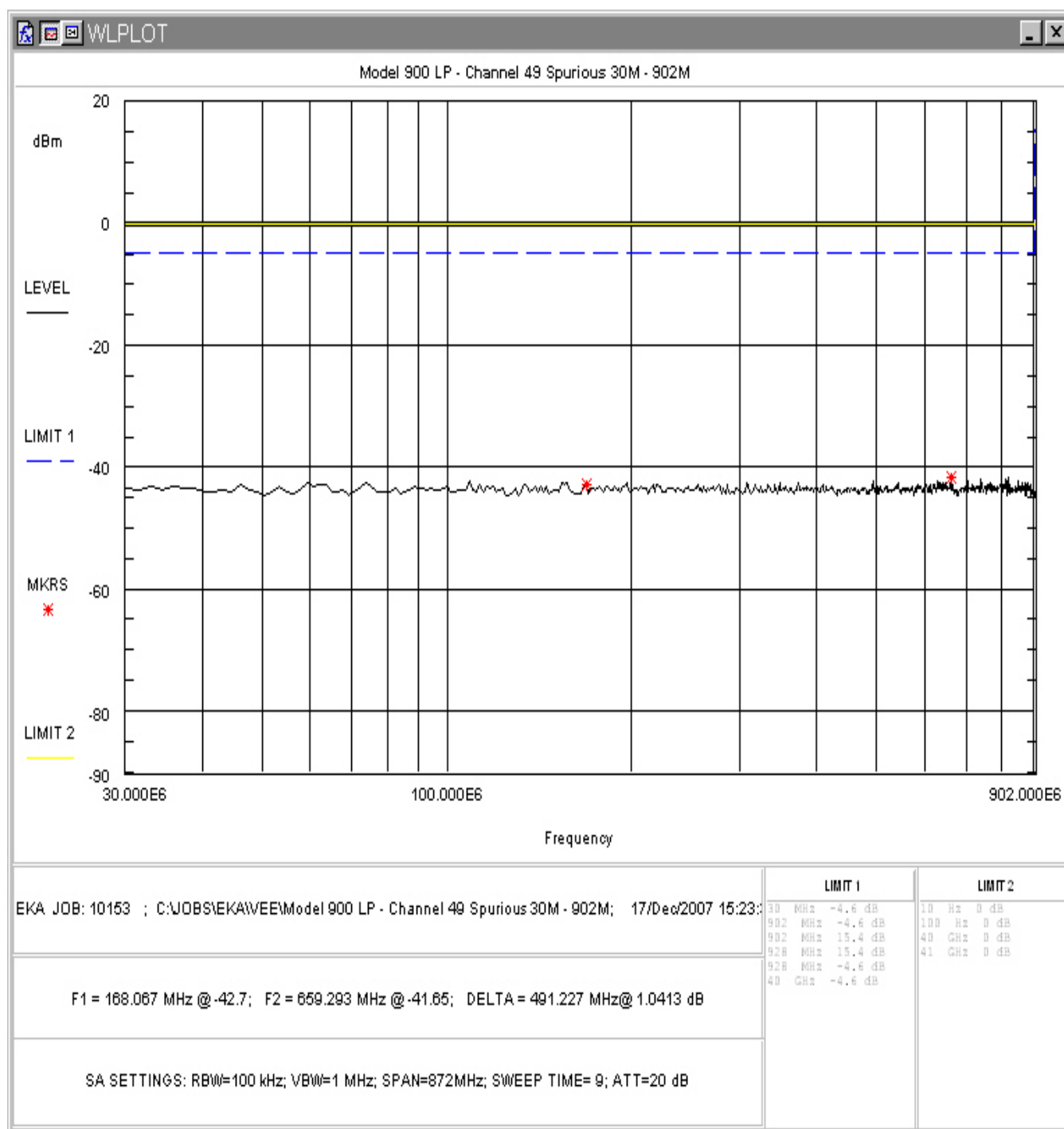


Figure 21. Conducted Spurious Emissions, High Channel, 30 - 902MHz

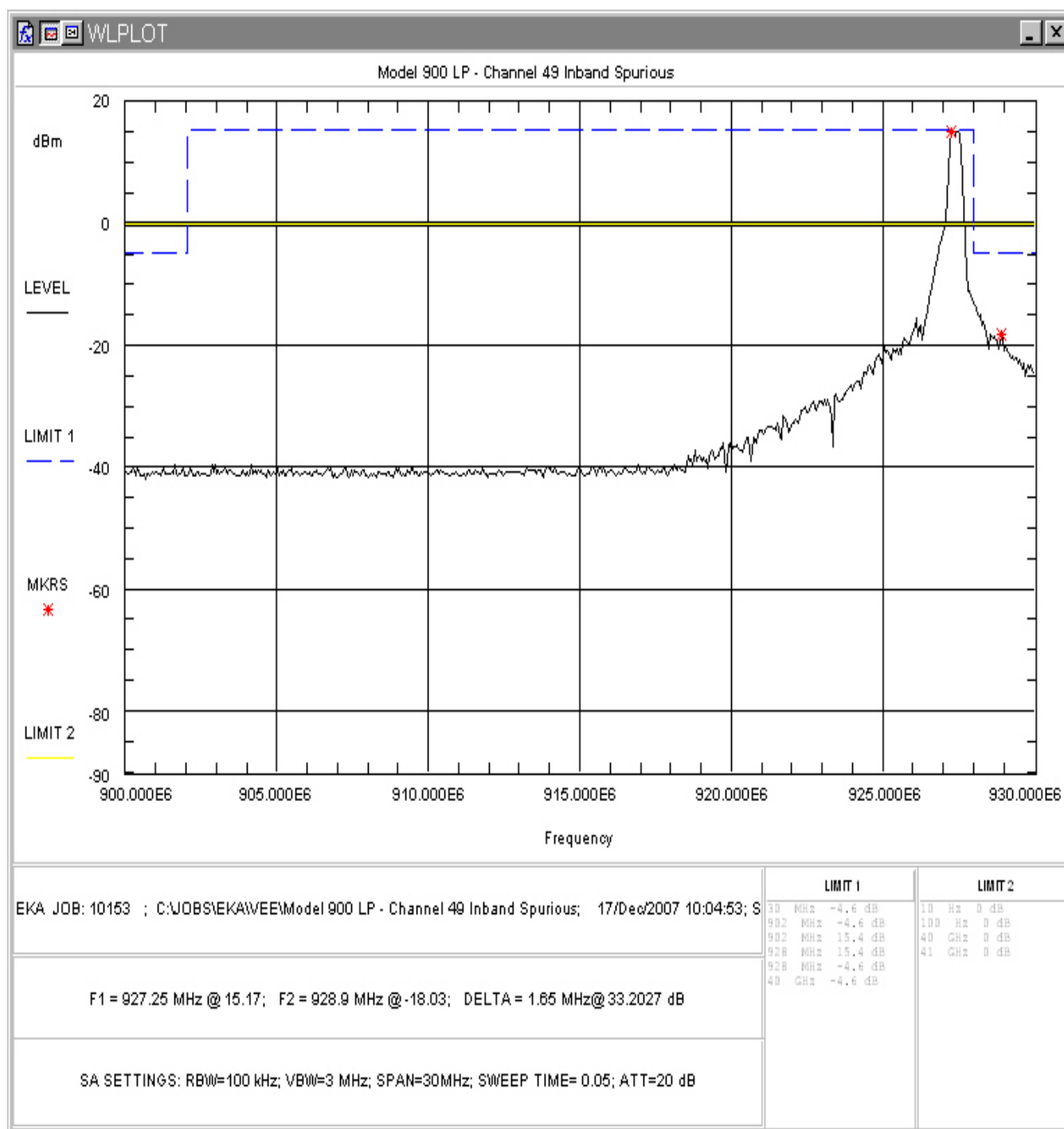


Figure 22. Conducted Spurious Emissions, High Channel, 900 – 930MHz

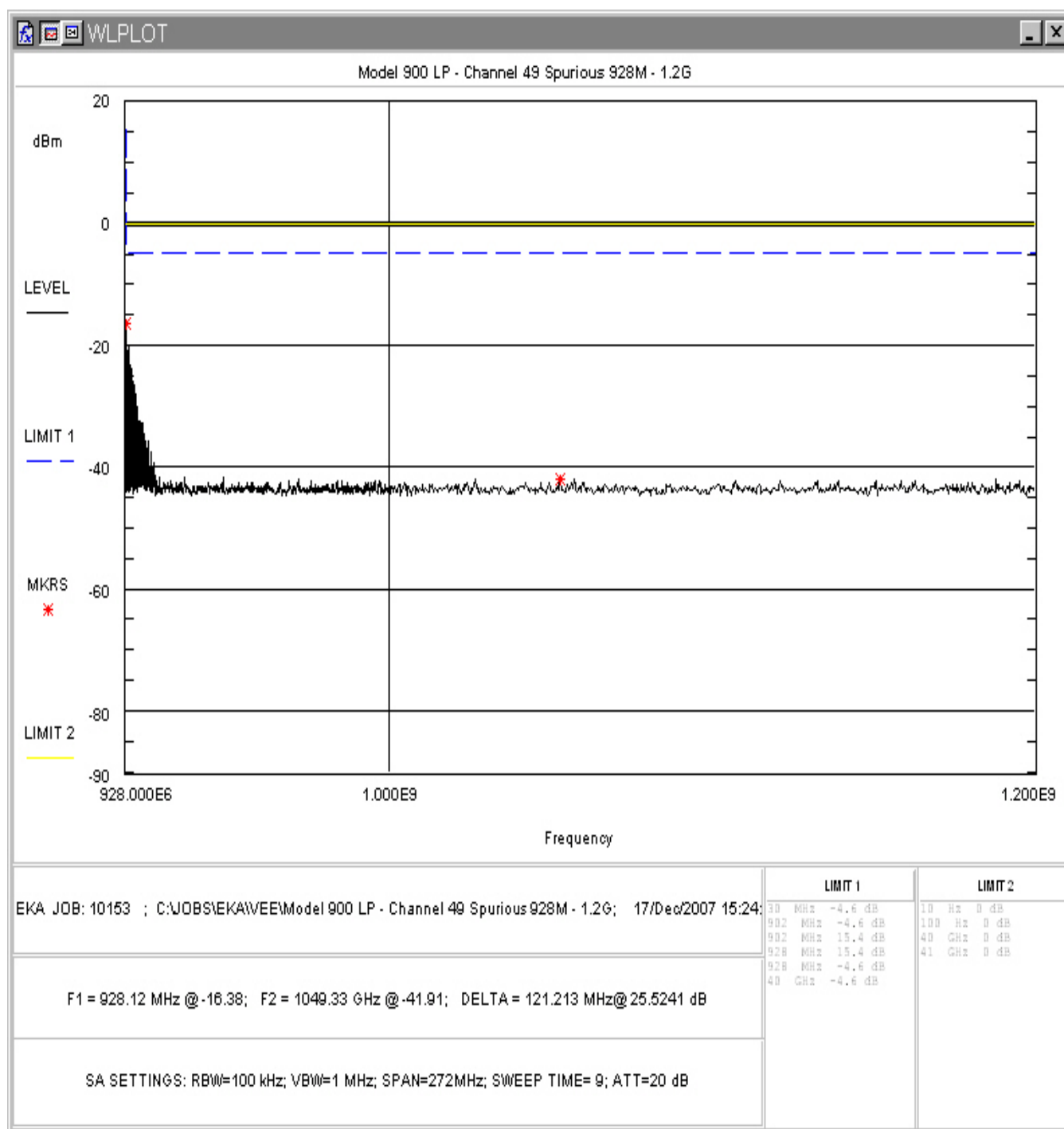


Figure 23. Conducted Spurious Emissions, High Channel, 928MHz – 1.2GHz

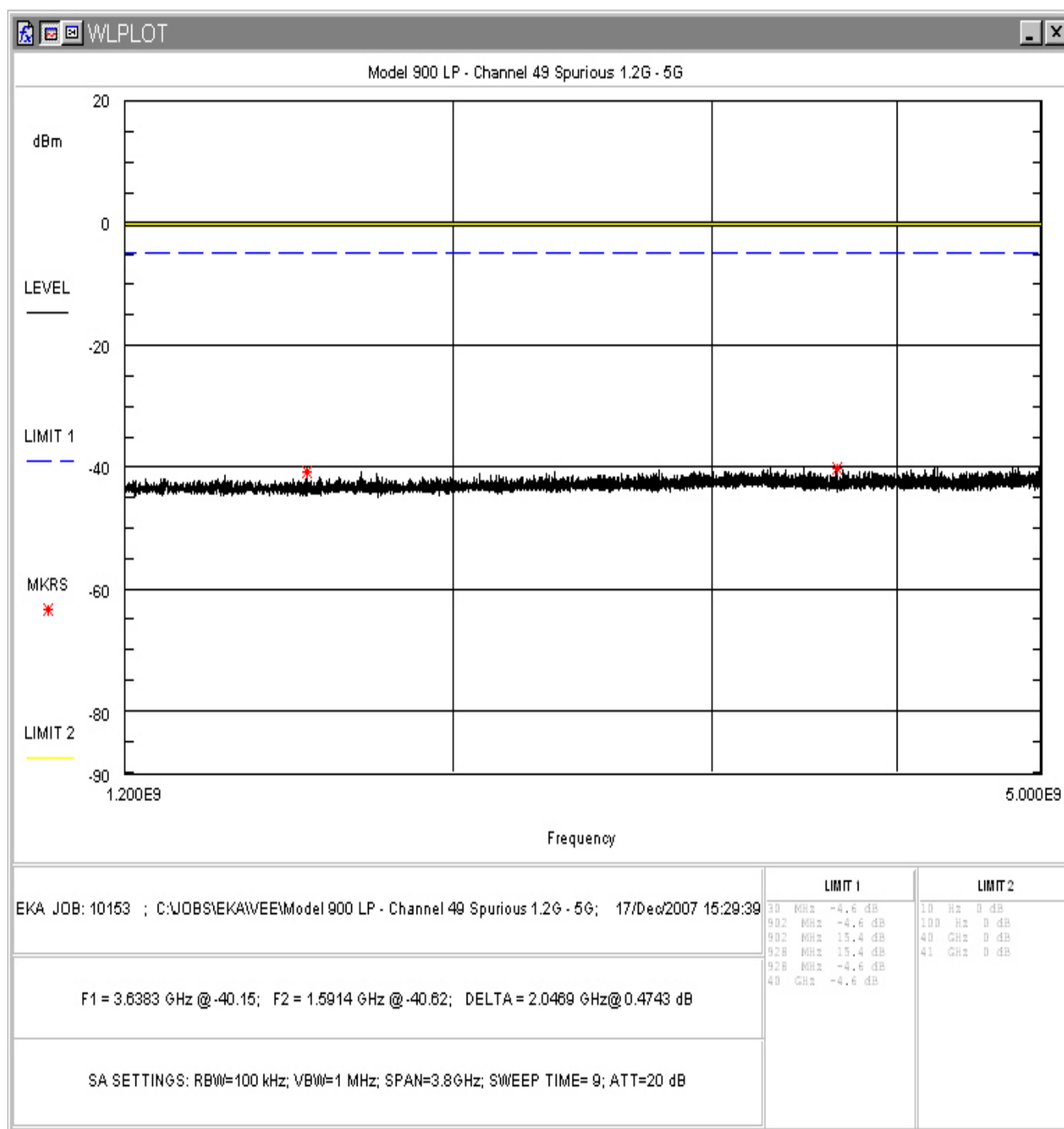


Figure 24. Conducted Spurious Emissions, High Channel, 1.2 – 5 GHz

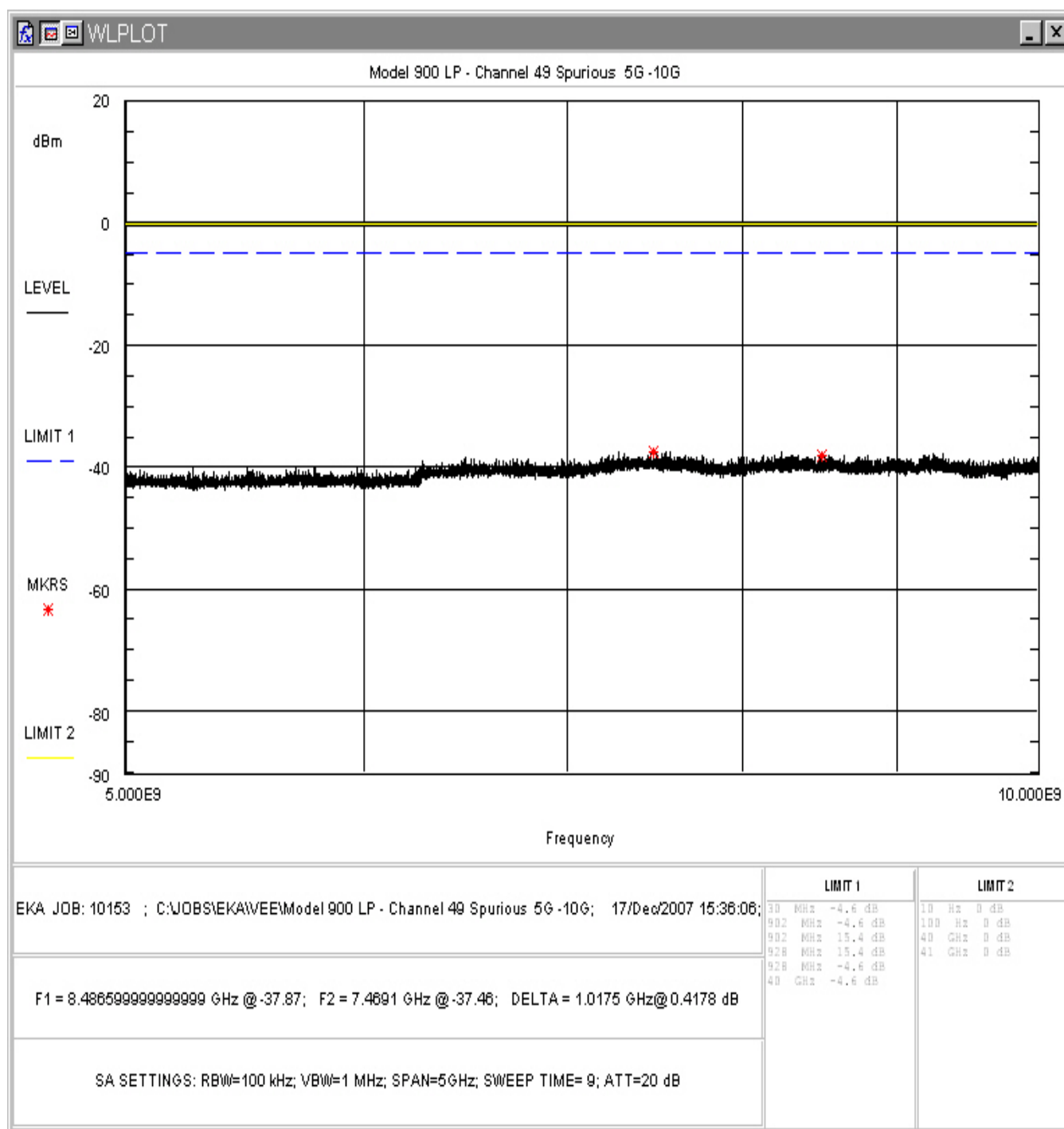


Figure 25. Conducted Spurious Emissions, High Channel, 5 – 10 GHz

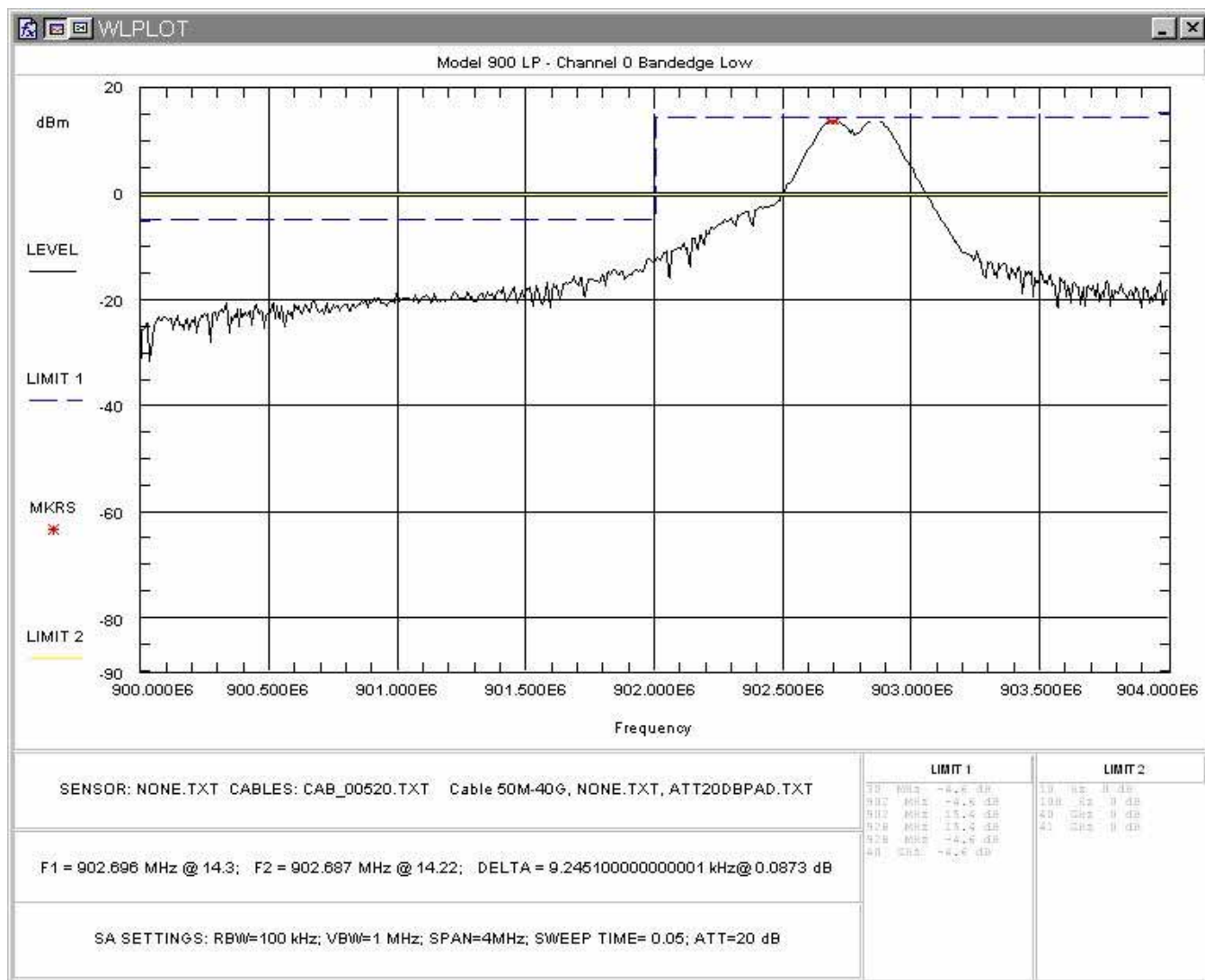


Figure 26: Band Edge Low - Channel 0

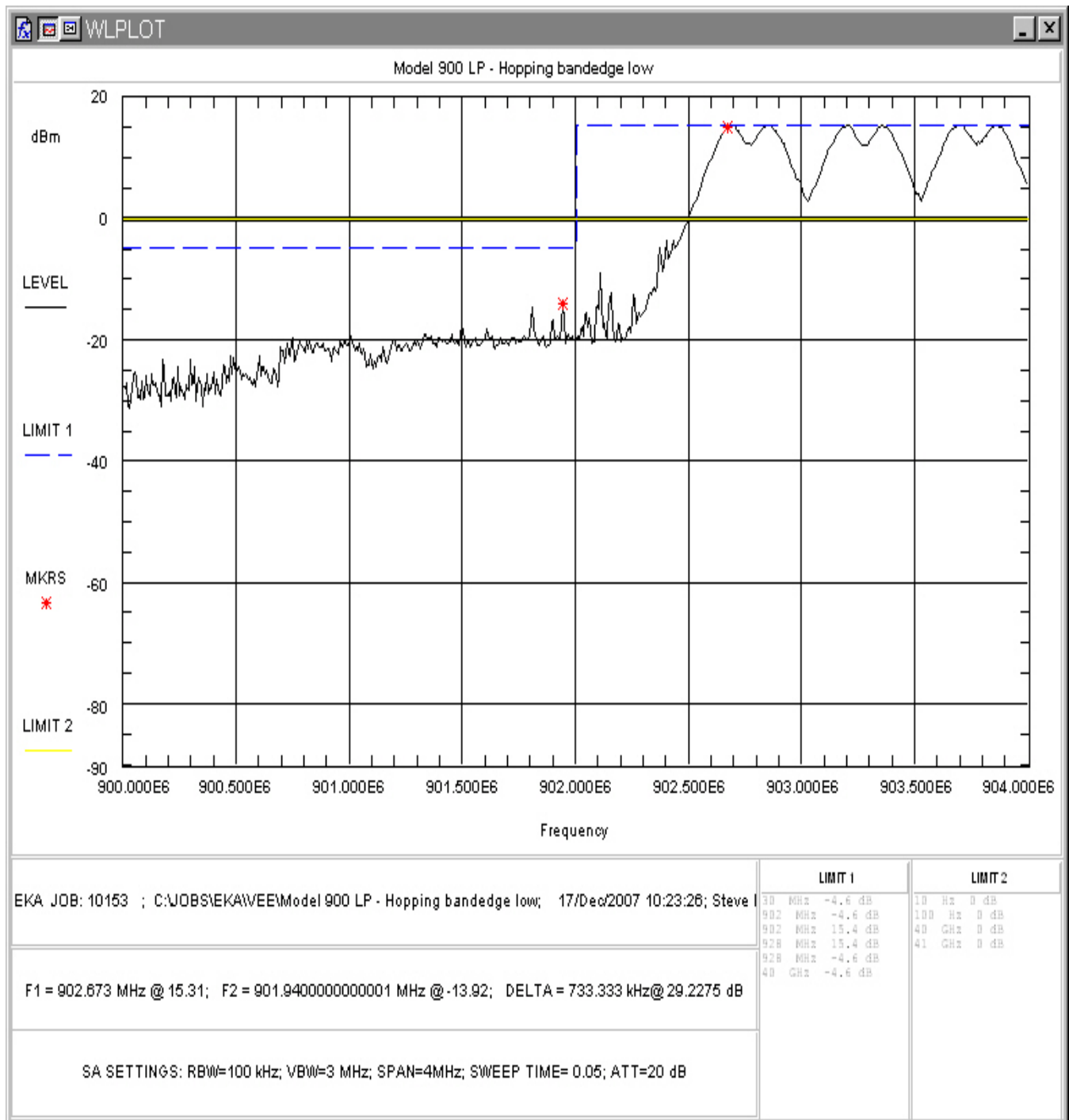


Figure 27: Band Edge Low - Hopping

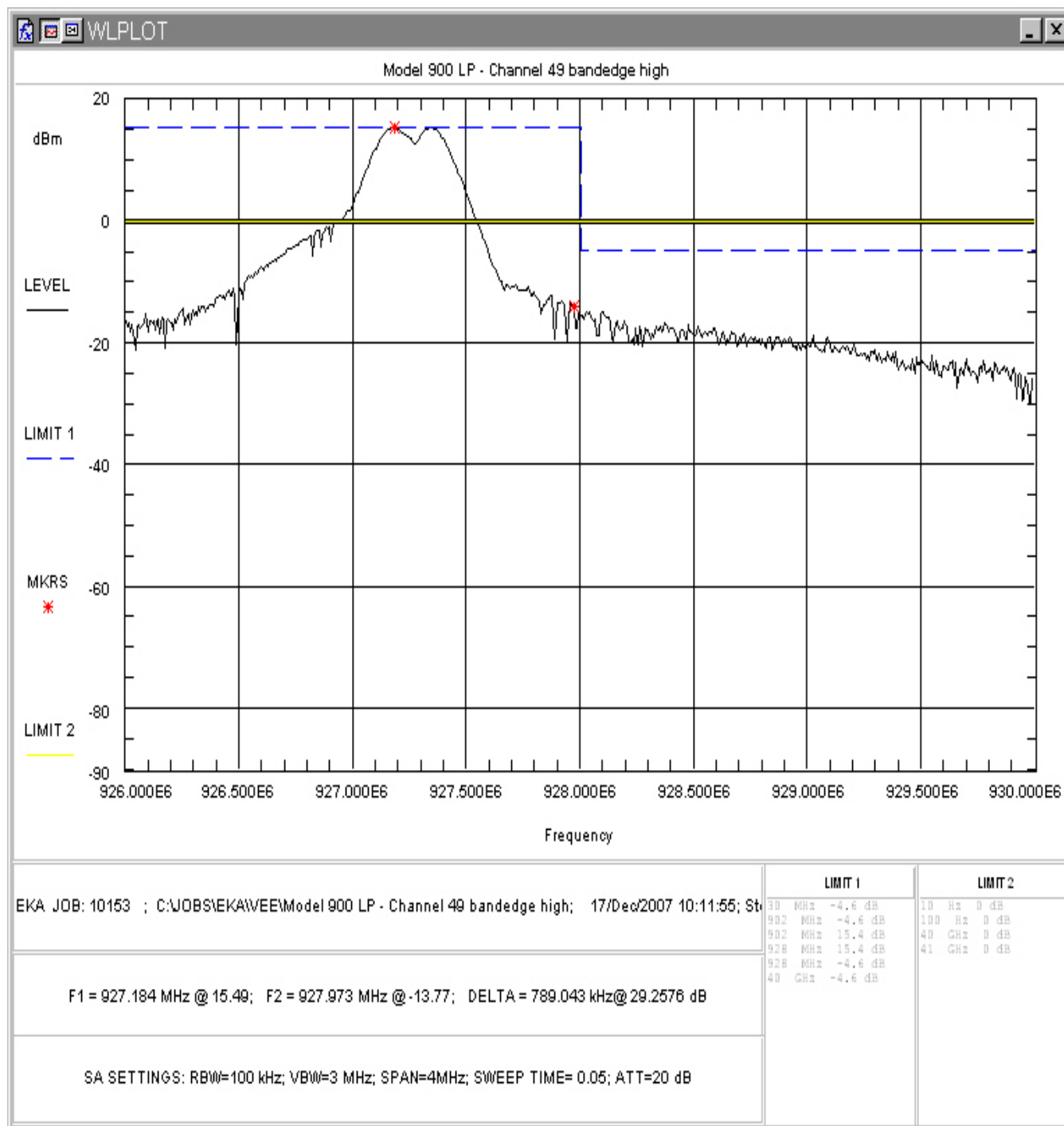


Figure 28: Band Edge High – Channel 49

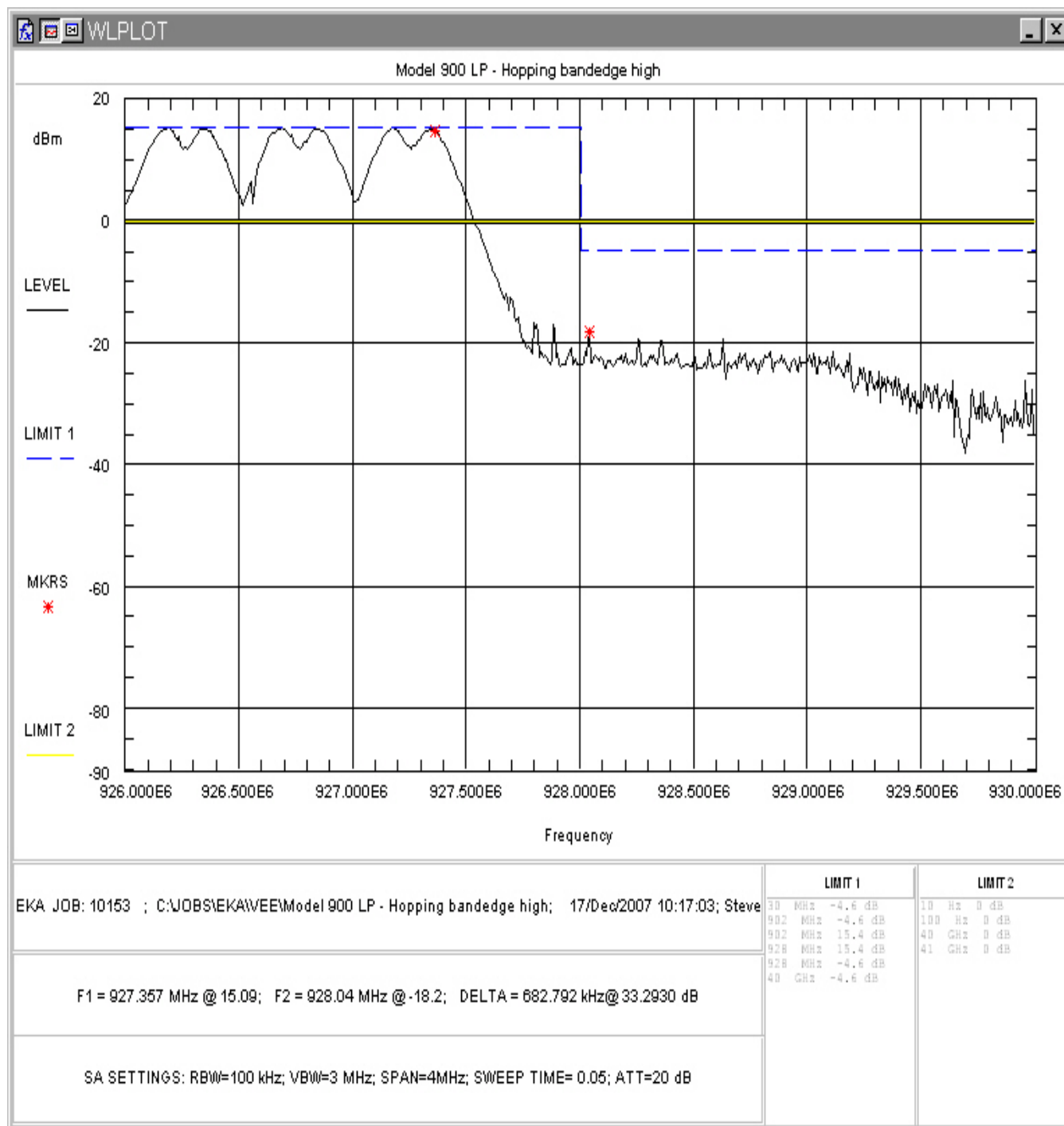


Figure 29: Band Edge High - Hopping

4.6 Radiated Spurious Emissions: 15.205, 15.209, RSS-210 [A8. 5]

The EUT must comply with the requirements for radiated spurious emissions that fall within the restricted bands of 15.205. 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. The peripherals were placed on the table in accordance with ANSI C63.4-2003. Cables were varied in position to produce maximum emissions. Both the horizontal and vertical field components were measured.

The emissions were measured using the following resolution bandwidths:

Frequency Range	Resolution Bandwidth	Video Bandwidth
30MHz-1000 MHz	120kHz	>100 kHz
>1000 MHz	1 MHz	<30 Hz (Avg.) 1MHz (Peak)

Table 6: Radiated Emission Test Data, Low Frequency Data (<1GHz)

Frequency (MHz)	Polarity H/V	Az Deg	Ant. Height (m)	SA Level (QP) (dBμV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Corr. Level (dBμV/m)	Corr. Level (μV/m)	Limit (μV/m)	Margin (dB)
X										
31.980	V	270.0	1.0	9.1	18.2	0.4	27.6	24.1	100.0	-12.4
38.370	V	90.0	1.0	9.3	17.9	0.5	27.7	24.3	100.0	-12.3
57.190	V	345.0	1.0	13.9	11.7	0.9	26.4	21.0	100.0	-13.6
63.490	V	0.0	1.0	9.7	9.6	1.0	20.3	10.3	100.0	-19.7
110.274	V	270.0	1.0	10.2	11.1	1.5	22.8	13.8	150.0	-20.7
150.344	V	180.0	1.0	16.3	9.1	1.8	27.3	23.1	150.0	-16.2
163.842	V	270.0	1.0	18.0	10.1	1.9	30.0	31.8	150.0	-13.5
169.440	V	180.0	1.0	14.6	10.1	2.0	26.7	21.6	150.0	-16.8
185.406	V	20.0	1.0	21.5	9.9	2.1	33.4	47.0	150.0	-10.1
196.620	V	300.0	1.0	19.2	10.4	2.1	31.7	38.6	150.0	-11.8
262.122	V	180.0	1.0	13.4	14.1	2.5	30.0	31.6	200.0	-16.0
450.000	V	90.0	1.0	14.0	16.5	3.1	33.6	47.7	200.0	-12.4
131.048	V	300.0	1.0	24.0	10.9	1.7	36.6	67.3	150.0	-7.0
33.394	H	90.0	4.0	6.4	18.1	0.4	24.9	17.6	100.0	-15.1
49.870	H	180.0	4.0	14.6	14.6	0.8	30.0	31.6	100.0	-10.0
65.510	H	45.0	3.0	16.1	9.0	1.0	26.1	20.2	100.0	-13.9
110.889	H	0.0	4.0	7.7	11.2	1.5	20.4	10.4	150.0	-23.1
131.050	H	300.0	4.0	22.8	10.9	1.7	35.4	58.6	150.0	-8.2
163.830	H	90.0	4.0	17.7	10.1	1.9	29.7	30.7	150.0	-13.8
169.250	H	90.0	3.3	20.7	10.1	2.0	32.8	43.5	150.0	-10.7
196.585	H	270.0	3.0	12.6	10.4	2.1	25.1	18.1	150.0	-18.4
229.345	H	120.0	2.0	13.7	12.6	2.3	28.7	27.1	200.0	-17.4
262.135	H	200.0	2.0	20.2	14.1	2.5	36.8	69.2	200.0	-9.2
385.070	H	200.0	2.3	20.1	15.6	2.9	38.6	84.9	200.0	-7.4
Y										
31.980	V	270.0	1.0	8.5	18.2	0.7	27.4	23.4	0.0	-13.0
38.370	V	300.0	1.0	18.5	17.9	0.8	37.2	72.2	0.0	-3.1
57.190	V	90.0	1.0	14.1	11.7	1.0	26.8	21.8	0.0	-13.4
63.490	V	220.0	1.0	8.6	9.6	1.3	19.5	9.4	0.0	-20.8
110.274	V	0.0	1.0	6.1	11.1	1.7	18.9	8.8	0.0	-24.8
131.048	V	350.0	1.0	27.6	10.9	2.1	40.6	106.8	0.0	-3.4
163.842	V	270.0	1.0	21.3	10.1	2.3	33.7	48.4	0.0	-10.2
169.440	V	0.0	1.0	14.3	10.1	2.3	26.7	21.6	0.0	-17.1
196.620	V	180.0	1.0	14.3	10.4	2.5	27.2	22.9	0.0	-16.7
262.122	V	180.0	1.0	21.5	14.1	3.0	38.6	85.6	0.0	-7.9
450.000	V	0.0	1.0	15.0	16.5	3.9	35.4	58.9	0.0	-11.4
33.394	H	90.0	4.0	6.4	18.1	0.7	25.2	18.2	0.0	-15.1
49.870	H	150.0	4.0	16.0	14.6	1.0	31.6	38.2	0.0	-8.6
65.510	H	90.0	3.0	15.1	9.0	1.3	25.4	18.6	0.0	-14.9
110.889	H	270.0	4.0	15.7	11.2	1.7	28.6	26.8	0.0	-15.1

Frequency (MHz)	Polarity H/V	Az Deg	Ant. Height (m)	SA Level (QP) (dB μ V)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Corr. Level (dB μ V/m)	Corr. Level (μ V/m)	Limit (μ V/m)	Margin (dB)
131.050	H	300.0	4.0	29.0	10.9	2.1	42.0	125.5	0.0	-2.0
163.830	H	45.0	3.0	20.0	10.1	2.3	32.4	41.7	0.0	-11.5
169.250	H	0.0	2.3	14.1	10.1	2.3	26.5	21.1	0.0	-17.3
196.585	H	300.0	2.2	20.2	10.4	2.5	33.1	45.2	0.0	-10.8
229.345	H	120.0	1.5	24.5	12.6	2.6	39.7	97.1	0.0	-6.6
262.135	H	180.0	1.0	26.5	14.1	3.0	43.6	152.2	0.0	-2.9
385.070	H	270.0	1.5	9.4	15.6	3.4	28.4	26.3	0.0	-18.1

Table 7: Radiated Emission Test Data, High Frequency Data (>1GHz)
(Restricted Bands)

Frequency (MHz)	Polarity H/V	Az Deg	Ant. Height (m)	SA Level (dBμV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Amp Gain (dB)	Corr. Level (dBμV/m)	Corr. Level (μV/m)	Limit (μV/m)	Margin (dB)	Notes
X	Channel 0 902.75MHz											
2708.250	V	0.0	1.0	59.8	29.7	1.7	38.1	53.2	455.8	5000.0	-20.8	Peak
2708.250	V	0.0	1.0	50.7	29.7	1.7	38.1	44.0	159.3	500.0	-9.9	Avg
3611.000	V	85.0	1.0	50.5	30.5	1.9	37.5	45.4	186.1	5000.0	-28.6	Peak
3611.000	V	85.0	1.0	44.2	30.5	1.9	37.5	39.1	90.1	500.0	-14.9	Avg
4513.750	V	0.0	1.0	48.5	32.1	2.0	37.2	45.4	186.4	5000.0	-28.6	Peak
4513.750	V	0.0	1.0	40.2	32.1	2.0	37.2	37.1	71.7	500.0	-16.9	Avg
5416.500	V	0.0	1.0	52.5	33.8	2.6	37.2	51.7	382.5	5000.0	-22.3	Peak amb
5416.500	V	0.0	1.0	42.7	33.8	2.6	37.2	41.9	123.8	500.0	-12.1	Avg amb
8124.75	V	0.0	1.0	49.3	37.4	4.8	37.7	53.8	488.7	5000.0	-20.2	Peak amb
8124.75	V	0.0	1.0	39.3	37.4	4.8	37.7	43.8	154.5	500.0	-10.2	Avg amb
2708.250	V	45.0	1.0	58.7	29.7	1.7	38.1	52.0	398.8	5000.0	-22.0	Peak
2708.250	V	45.0	1.0	48.2	29.7	1.7	38.1	41.5	119.5	500.0	-12.4	Avg
3611.000	V	270.0	1.0	52.8	30.5	1.9	37.5	47.7	242.5	5000.0	-26.3	Peak
3611.000	V	270.0	1.0	47.8	30.5	1.9	37.5	42.7	136.4	500.0	-11.3	Avg
4513.750	V	90.0	1.0	49.5	32.1	2.0	37.2	46.4	209.1	5000.0	-27.6	Peak
4513.750	V	90.0	1.0	41.8	32.1	2.0	37.2	38.7	86.2	500.0	-15.3	Avg
5416.500	V	0.0	1.0	45.5	33.8	2.6	37.2	44.7	170.9	5000.0	-29.3	Peak amb
5416.500	V	0.0	1.0	34.3	33.8	2.6	37.2	33.5	47.1	500.0	-20.5	Avg amb
8124.75	V	0.0	1.0	49.8	37.4	4.8	37.7	54.3	515.8	5000.0	-19.7	Peak amb
8124.75	V	0.0	1.0	38.5	37.4	4.8	37.7	43.0	140.4	500.0	-11.0	Avg amb
Y												
2708.250	V	50.0	1.0	53.8	29.7	1.7	38.1	47.1	227.7	5000.0	-26.8	Peak
2708.250	V	50.0	1.0	44.7	29.7	1.7	38.1	38.0	79.9	500.0	-15.9	Avg
3611.000	V	75.0	1.0	51.7	30.5	1.9	37.5	46.6	213.7	5000.0	-27.4	Peak
3611.000	V	75.0	1.0	43.2	30.5	1.9	37.5	38.1	80.3	500.0	-15.9	Avg
4513.750	V	90.0	1.0	49.7	32.1	2.0	37.2	46.6	214.0	5000.0	-27.4	Peak
4513.750	V	90.0	1.0	41.8	32.1	2.0	37.2	38.7	86.2	500.0	-15.3	Avg
5416.500	V	90.0	1.0	46.5	33.8	2.6	37.2	45.7	191.7	5000.0	-28.3	Peak amb
5416.500	V	90.0	1.0	34.7	33.8	2.6	37.2	33.9	49.3	500.0	-20.1	Avg amb
8124.75	V	0.0	1.0	49.3	37.4	4.8	37.7	53.8	488.7	5000.0	-20.2	Peak amb
8124.75	V	0.0	1.0	39.3	37.4	4.8	37.7	43.8	154.5	500.0	-10.2	Avg amb
2708.250	H	0.0	1.0	53.0	29.7	1.7	38.1	46.3	207.6	5000.0	-27.6	Peak
2708.250	H	0.0	1.0	43.7	29.7	1.7	38.1	37.0	71.2	500.0	-16.9	Avg
3611.000	H	10.0	1.0	44.7	30.5	1.9	37.5	39.6	95.4	5000.0	-34.4	Peak
3611.000	H	10.0	1.0	44.5	30.5	1.9	37.5	39.4	93.3	500.0	-14.6	Avg
4513.750	H	120.0	1.0	47.8	32.1	2.0	37.2	44.7	171.9	5000.0	-29.3	Peak
4513.750	H	120.0	1.0	38.5	32.1	2.0	37.2	35.4	58.9	500.0	-18.6	Avg
5416.500	H	120.0	1.0	48.2	33.8	2.6	37.2	47.4	233.2	5000.0	-26.6	Peak amb
5416.500	H	120.0	1.0	38.7	33.8	2.6	37.2	37.9	78.1	500.0	-16.1	Avg amb
8124.75	H	0.0	1.0	49.8	37.4	4.8	37.7	54.3	515.8	5000.0	-19.7	Peak amb

Frequency (MHz)	Polarity H/V	Az Deg	Ant. Height (m)	SA Level (dBµV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Amp Gain (dB)	Corr. Level (dBµV/m)	Corr. Level (µV/m)	Limit (µV/m)	Margin (dB)	Notes
8124.75	H	0.0	1.0	38.5	37.4	4.8	37.7	43.0	140.4	500.0	-11.0	Avg amb
Z												
2708.250	V	210.0	1.0	53.8	29.7	1.7	38.1	47.1	227.7	5000.0	-26.8	Peak
2708.250	V	210.0	1.0	44.7	29.7	1.7	38.1	38.0	79.9	500.0	-15.9	Avg
3611.000	V	250.0	1.0	51.7	30.5	1.9	37.5	46.6	213.7	5000.0	-27.4	Peak
3611.000	V	250.0	1.0	43.2	30.5	1.9	37.5	38.1	80.3	500.0	-15.9	Avg
4513.750	V	180.0	1.0	49.7	32.1	2.0	37.2	46.6	214.0	5000.0	-27.4	Peak
4513.750	V	180.0	1.0	41.8	32.1	2.0	37.2	38.7	86.2	500.0	-15.3	Avg
5416.500	V	180.0	1.0	46.5	33.8	2.6	37.2	45.7	191.7	5000.0	-28.3	Peak
5416.500	V	180.0	1.0	34.7	33.8	2.6	37.2	33.9	49.3	500.0	-20.1	Avg
8124.75	V	0.0	1.0	49.3	37.4	4.8	37.7	53.8	488.7	5000.0	-20.2	Peak amb
8124.75	V	0.0	1.0	39.3	37.4	4.8	37.7	43.8	154.5	500.0	-10.2	Avg amb
2708.250	H	270.0	1.0	53.0	29.7	1.7	38.1	46.3	207.6	5000.0	-27.6	Peak
2708.250	H	270.0	1.0	43.7	29.7	1.7	38.1	37.0	71.2	500.0	-16.9	Avg
3611.000	H	275.0	1.0	44.7	30.5	1.9	37.5	39.6	95.4	5000.0	-34.4	Peak
3611.000	H	275.0	1.0	44.5	30.5	1.9	37.5	39.4	93.3	500.0	-14.6	Avg
4513.750	H	45.0	1.0	47.8	32.1	2.0	37.2	44.7	171.9	5000.0	-29.3	Peak
4513.750	H	45.0	1.0	38.5	32.1	2.0	37.2	35.4	58.9	500.0	-18.6	Avg
5416.500	H	120.0	1.0	48.2	33.8	2.6	37.2	47.4	233.2	5000.0	-26.6	Peak
5416.500	H	120.0	1.0	38.7	33.8	2.6	37.2	37.9	78.1	500.0	-16.1	Avg
8124.75	H	0.0	1.0	49.8	37.4	4.8	37.7	54.3	515.8	5000.0	-19.7	Peak amb
8124.75	H	0.0	1.0	38.5	37.4	4.8	37.7	43.0	140.4	500.0	-11.0	Avg amb

Frequency (MHz)	Polarity H/V	Az Deg	Ant. Height (m)	SA Level (dBµV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Amp Gain (dB)	Corr. Level (dBµV/m)	Corr. Level (µV/m)	Limit (µV/m)	Margin (dB)	Notes
X	Channel 24 914.75MHz											
2744.250	V	300.0	1.0	55.7	29.7	1.7	38.0	49.1	285.2	5000.0	-24.9	Peak
2744.250	V	300.0	1.0	44.5	29.7	1.7	38.0	37.9	78.6	500.0	-16.1	Avg
3659.000	V	300.0	1.0	52.7	30.5	1.9	37.4	47.6	241.1	5000.0	-26.3	Peak
3659.000	V	300.0	1.0	46.8	30.5	1.9	37.4	41.8	122.7	500.0	-12.2	Avg
4573.750	V	250.0	1.0	52.5	32.3	2.0	37.2	49.6	300.7	5000.0	-24.4	Peak
4573.750	V	250.0	1.0	47.7	32.3	2.0	37.2	44.8	173.0	500.0	-9.2	Avg
5488.500	V	180.0	1.0	47.2	33.9	2.7	37.2	46.5	212.0	5000.0	-27.5	Peak
5488.500	V	180.0	1.0	34.5	33.9	2.7	37.2	33.8	49.1	500.0	-20.2	Avg
7318.000	V	0.0	1.0	48.2	36.9	3.3	37.6	50.8	348.0	5000.0	-23.1	Peak amb
7318.000	V	0.0	1.0	38.7	36.9	3.3	37.6	41.3	116.6	500.0	-12.6	Avg amb
8232.750	V	0.0	1.0	49.8	37.5	4.5	37.7	54.0	503.3	5000.0	-19.9	Peak amb
8232.750	V	0.0	1.0	38.5	37.5	4.5	37.7	42.7	137.0	500.0	-11.2	Avg amb
9147.500	V	0.0	1.0	51.5	38.2	2.8	37.9	54.6	539.5	5000.0	-19.3	Peak amb
9147.500	V	0.0	1.0	40.2	38.2	2.8	37.9	43.3	146.9	500.0	-10.6	Avg amb
2744.250	V	90.0	1.0	56.8	29.7	1.7	38.0	50.2	323.8	5000.0	-23.8	Peak
2744.250	V	90.0	1.0	46.0	29.7	1.7	38.0	39.4	93.4	500.0	-14.6	Avg
3659.000	V	260.0	1.0	52.7	30.5	1.9	37.4	47.7	241.9	5000.0	-26.3	Peak

Frequency (MHz)	Polarity H/V	Az Deg	Ant. Height (m)	SA Level (dBμV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Amp Gain (dB)	Corr. Level (dBμV/m)	Corr. Level (μV/m)	Limit (μV/m)	Margin (dB)	Notes
3659.000	V	260.0	1.0	47.3	30.5	1.9	37.4	42.3	129.9	500.0	-11.7	Avg
4573.750	V	225.0	1.0	46.7	32.3	2.0	37.2	43.8	154.2	5000.0	-30.2	Peak
4573.750	V	225.0	1.0	38.2	32.3	2.0	37.2	35.3	58.0	500.0	-18.7	Avg
5488.500	V	220.0	1.0	47.8	33.9	2.7	37.2	47.1	227.2	5000.0	-26.9	Peak
5488.500	V	220.0	1.0	35.5	33.9	2.7	37.2	34.8	55.1	500.0	-19.2	Avg
7318.000	V	0.0	1.0	48.2	36.9	3.3	37.6	50.8	348.0	5000.0	-23.1	Peak amb
7318.000	V	0.0	1.0	38.7	36.9	3.3	37.6	41.3	116.6	500.0	-12.6	Avg amb
8232.750	V	0.0	1.0	49.8	37.5	4.5	37.7	54.0	503.3	5000.0	-19.9	Peak amb
8232.750	V	0.0	1.0	38.5	37.5	4.5	37.7	42.7	137.0	500.0	-11.2	Avg amb
9147.500	H	0.0	1.0	51.5	38.2	2.8	37.9	54.6	539.5	5000.0	-19.3	Peak amb
9147.500	H	0.0	1.0	40.2	38.2	2.8	37.9	43.3	146.9	500.0	-10.6	Avg amb
Y												
2744.250	V	180.0	1.0	55.3	29.7	1.7	38.0	48.7	272.4	5000.0	-25.3	Peak
2744.250	V	180.0	1.0	45.7	29.7	1.7	38.0	39.1	90.2	500.0	-14.9	Avg
3659.000	V	270.0	1.0	51.2	30.5	1.9	37.4	46.2	203.6	5000.0	-27.8	Peak
3659.000	V	270.0	1.0	47.5	30.5	1.9	37.4	42.5	132.9	500.0	-11.5	Avg
4573.750	V	270.0	1.0	50.3	32.3	2.0	37.2	47.4	233.4	5000.0	-26.6	Peak
4573.750	V	270.0	1.0	45.3	32.3	2.0	37.2	42.4	131.2	500.0	-11.6	Avg
5488.500	V	180.0	1.0	46.8	33.9	2.7	37.2	46.1	202.5	5000.0	-27.9	Peak
5488.500	V	180.0	1.0	35.8	33.9	2.7	37.2	35.2	57.3	500.0	-18.8	Avg
7318.000	V	0.0	1.0	48.2	36.9	3.3	37.6	50.8	348.0	5000.0	-23.1	Peak amb
7318.000	V	0.0	1.0	38.7	36.9	3.3	37.6	41.3	116.6	500.0	-12.6	Avg amb
8232.750	V	0.0	1.0	49.8	37.5	4.5	37.7	54.0	503.3	5000.0	-19.9	Peak amb
8232.750	V	0.0	1.0	38.5	37.5	4.5	37.7	42.7	137.0	500.0	-11.2	Avg amb
9147.500	V	0.0	1.0	51.5	38.2	2.8	37.9	54.6	539.5	5000.0	-19.3	Peak amb
9147.500	V	0.0	1.0	40.2	38.2	2.8	37.9	43.3	146.9	500.0	-10.6	Avg amb
2744.250	V	180.0	1.0	56.0	29.7	1.7	38.0	49.4	295.3	5000.0	-24.6	Peak
2744.250	V	180.0	1.0	44.3	29.7	1.7	38.0	37.7	76.8	500.0	-16.3	Avg
3659.000	V	180.0	1.0	54.7	30.5	1.9	37.4	49.7	304.6	5000.0	-24.3	Peak
3659.000	V	180.0	1.0	45.8	30.5	1.9	37.4	40.8	109.3	500.0	-13.2	Avg
4573.750	V	270.0	1.0	52.5	32.3	2.0	37.2	49.6	300.7	5000.0	-24.4	Peak
4573.750	V	270.0	1.0	51.2	32.3	2.0	37.2	48.3	258.9	500.0	-5.7	Avg
5488.500	V	90.0	1.0	48.2	33.9	2.7	37.2	47.5	237.9	5000.0	-26.5	Peak
5488.500	V	90.0	1.0	34.7	33.9	2.7	37.2	34.0	50.3	500.0	-20.0	Avg
7318.000	V	0.0	1.0	48.2	36.9	3.3	37.6	50.8	348.0	5000.0	-23.1	Peak amb
7318.000	V	0.0	1.0	38.7	36.9	3.3	37.6	41.3	116.6	500.0	-12.6	Avg amb
8232.750	V	0.0	1.0	49.8	37.5	4.5	37.7	54.0	503.3	5000.0	-19.9	Peak amb
8232.750	V	0.0	1.0	38.5	37.5	4.5	37.7	42.7	137.0	500.0	-11.2	Avg amb
9147.500	H	0.0	1.0	51.5	38.2	2.8	37.9	54.6	539.5	5000.0	-19.3	Peak amb
9147.500	H	0.0	1.0	40.2	38.2	2.8	37.9	43.3	146.9	500.0	-10.6	Avg amb
Z												
2744.250	V	120.0	1.0	53.2	29.7	1.7	38.0	46.6	213.9	5000.0	-27.4	Peak
2744.250	V	120.0	1.0	42.2	29.7	1.7	38.0	35.6	60.3	500.0	-18.4	Avg
3659.000	V	250.0	1.0	49.5	30.5	1.9	37.4	44.5	167.4	5000.0	-29.5	Peak
3659.000	V	250.0	1.0	43.2	30.5	1.9	37.4	38.2	81.0	500.0	-15.8	Avg
4573.750	V	250.0	1.0	47.0	32.3	2.0	37.2	44.1	159.6	5000.0	-29.9	Peak

Frequency (MHz)	Polarity H/V	Az Deg	Ant. Height (m)	SA Level (dBμV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Amp Gain (dB)	Corr. Level (dBμV/m)	Corr. Level (μV/m)	Limit (μV/m)	Margin (dB)	Notes
4573.750	V	250.0	1.0	41.3	32.3	2.0	37.2	38.4	82.8	500.0	-15.6	Avg
5488.500	V	120.0	1.0	43.6	33.9	2.7	37.2	42.9	140.1	5000.0	-31.1	Peak
5488.500	V	120.0	1.0	35.8	33.9	2.7	37.2	35.2	57.3	500.0	-18.8	Avg
7318.000	V	0.0	1.0	48.2	36.9	3.3	37.6	50.8	348.0	5000.0	-23.1	Peak amb
7318.000	V	0.0	1.0	38.7	36.9	3.3	37.6	41.3	116.6	500.0	-12.6	Avg amb
8232.750	V	0.0	1.0	49.8	37.5	4.5	37.7	54.0	503.3	5000.0	-19.9	Peak amb
8232.750	V	0.0	1.0	38.5	37.5	4.5	37.7	42.7	137.0	500.0	-11.2	Avg amb
9147.500	V	0.0	1.0	51.5	38.2	2.8	37.9	54.6	539.5	5000.0	-19.3	Peak amb
9147.500	V	0.0	1.0	40.2	38.2	2.8	37.9	43.3	146.9	500.0	-10.6	Avg amb
2744.250	V	45.0	1.0	54.0	29.7	1.7	38.0	47.4	234.5	5000.0	-26.6	Peak
2744.250	V	45.0	1.0	42.2	29.7	1.7	38.0	35.6	60.3	500.0	-18.4	Avg
3659.000	V	180.0	1.0	49.8	30.5	1.9	37.4	44.8	173.2	5000.0	-29.2	Peak
3659.000	V	180.0	1.0	40.1	30.5	1.9	37.4	35.1	56.7	500.0	-18.9	Avg
4573.750	V	180.0	1.0	49.5	32.3	2.0	37.2	46.6	212.9	5000.0	-27.4	Peak
4573.750	V	180.0	1.0	48.1	32.3	2.0	37.2	45.2	181.2	500.0	-8.8	Avg
5488.500	V	0.0	1.0	46.2	33.9	2.7	37.2	45.5	189.0	5000.0	-28.5	Peak
5488.500	V	0.0	1.0	34.7	33.9	2.7	37.2	34.0	50.3	500.0	-20.0	Avg
7318.000	V	0.0	1.0	48.2	36.9	3.3	37.6	50.8	348.0	5000.0	-23.1	Peak amb
7318.000	V	0.0	1.0	38.7	36.9	3.3	37.6	41.3	116.6	500.0	-12.6	Avg amb
8232.750	V	0.0	1.0	49.8	37.5	4.5	37.7	54.0	503.3	5000.0	-19.9	Peak amb
8232.750	V	0.0	1.0	38.5	37.5	4.5	37.7	42.7	137.0	500.0	-11.2	Avg amb
9147.500	H	0.0	1.0	51.5	38.2	2.8	37.9	54.6	539.5	5000.0	-19.3	Peak amb
9147.500	H	0.0	1.0	40.2	38.2	2.8	37.9	43.3	146.9	500.0	-10.6	Avg amb

Frequency (MHz)	Polarity H/V	Az Deg	Ant. Height (m)	SA Level (dBμV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Amp Gain (dB)	Corr. Level (dBμV/m)	Corr. Level (μV/m)	Limit (μV/m)	Margin (dB)	Notes
X	Channel 49 927.25MHz											
2781.75	V	0.0	1.0	46.5	29.8	1.7	38.0	39.9	99.1	5000.0	-34.1	Peak
2781.75	V	0.0	1.0	43.9	29.8	1.7	38.0	37.4	74.0	500.0	-16.6	Avg
3709.00	V	25.0	1.0	52.4	30.5	1.9	37.4	47.5	236.7	5000.0	-26.5	Peak
3709.00	V	25.0	1.0	46.7	30.5	1.9	37.4	41.8	122.4	500.0	-12.2	Avg
4636.25	V	350.0	1.0	48.9	32.4	2.0	37.2	46.2	203.2	5000.0	-27.8	Peak
4636.25	V	350.0	1.0	42.0	32.4	2.0	37.2	39.2	91.1	500.0	-14.8	Avg
7418.00	V	0.0	1.0	49.3	37.0	3.6	37.6	52.2	409.6	5000.0	-21.7	Peak amb
7418.00	V	0.0	1.0	40.9	37.0	3.6	37.6	43.8	155.7	500.0	-10.1	Avg amb
8345.25	V	0.0	1.0	50.0	37.6	4.2	37.7	54.0	502.3	5000.0	-20.0	Peak amb
8345.25	V	0.0	1.0	41.0	37.6	4.2	37.7	45.0	178.2	500.0	-9.0	Avg amb
2781.75	H	0.0	1.0	59.8	29.8	1.7	38.0	53.3	462.1	5000.0	-20.7	Peak
2781.75	H	0.0	1.0	38.3	29.8	1.7	38.0	31.8	38.9	500.0	-22.2	Avg
3709.00	H	85.0	1.0	50.7	30.5	1.9	37.4	45.8	193.9	5000.0	-28.2	Peak
3709.00	H	85.0	1.0	41.7	30.5	1.9	37.4	36.8	68.8	500.0	-17.2	Avg
4636.25	H	85.0	1.0	51.8	32.4	2.0	37.2	49.0	282.5	5000.0	-25.0	Peak
4636.25	H	85.0	1.0	46.2	32.4	2.0	37.2	43.4	148.3	500.0	-10.6	Avg
7418.00	H	0.0	1.0	48.2	37.0	3.6	37.6	51.1	360.8	5000.0	-22.8	Peak amb

Frequency (MHz)	Polarity H/V	Az Deg	Ant. Height (m)	SA Level (dBμV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Amp Gain (dB)	Corr. Level (dBμV/m)	Corr. Level (μV/m)	Limit (μV/m)	Margin (dB)	Notes
7418.00	H	0.0	1.0	39.5	37.0	3.6	37.6	42.4	132.5	500.0	-11.5	Avg amb
8345.25	H	0.0	1.0	49.8	37.6	4.2	37.7	53.8	490.8	5000.0	-20.2	Peak amb
8345.25	H	0.0	1.0	39.8	37.6	4.2	37.7	43.8	155.2	500.0	-10.2	Avg amb
Y												
2781.75	V	180.0	1.0	62.3	29.8	1.7	38.0	55.8	614.1	5000.0	-18.2	Peak
2781.75	V	180.0	1.0	43.7	29.8	1.7	38.0	37.2	72.1	500.0	-16.8	Avg
3709.00	V	180.0	1.0	53.0	30.5	1.9	37.4	48.1	252.7	5000.0	-25.9	Peak
3709.00	V	180.0	1.0	48.3	30.5	1.9	37.4	43.4	147.1	500.0	-10.6	Avg
4636.25	V	170.0	1.0	53.0	32.4	2.0	37.2	50.2	324.3	5000.0	-23.8	Peak
4636.25	V	170.0	1.0	49.0	32.4	2.0	37.2	46.2	204.6	500.0	-7.8	Avg
7418.00	V	0.0	1.0	49.3	37.0	3.6	37.6	52.2	409.6	5000.0	-21.7	Peak amb
7418.00	V	0.0	1.0	40.9	37.0	3.6	37.6	43.8	155.7	500.0	-10.1	Avg amb
8345.25	V	0.0	1.0	50.0	37.6	4.2	37.7	54.0	502.3	5000.0	-20.0	Peak amb
8345.25	V	0.0	1.0	41.0	37.6	4.2	37.7	45.0	178.2	500.0	-9.0	Avg amb
2781.75	H	180.0	1.0	62.8	29.8	1.7	38.0	56.3	652.7	5000.0	-17.7	Peak
2781.75	H	180.0	1.0	51.5	29.8	1.7	38.0	45.0	177.1	500.0	-9.0	Avg
3709.00	H	0.0	1.0	51.0	30.5	1.9	37.4	46.1	200.8	5000.0	-27.9	Peak
3709.00	H	0.0	1.0	37.5	30.5	1.9	37.4	32.6	42.4	500.0	-21.4	Avg
4636.25	H	120.0	1.0	49.5	32.4	2.0	37.2	46.7	216.8	5000.0	-27.3	Peak
4636.25	H	120.0	1.0	42.3	32.4	2.0	37.2	39.5	94.6	500.0	-14.5	Avg
7418.00	H	0.0	1.0	48.2	37.0	3.6	37.6	51.1	360.8	5000.0	-22.8	Peak amb
7418.00	H	0.0	1.0	39.5	37.0	3.6	37.6	42.4	132.5	500.0	-11.5	Avg amb
8345.25	H	0.0	1.0	49.8	37.6	4.2	37.7	53.8	490.8	5000.0	-20.2	Peak amb
8345.25	H	0.0	1.0	39.8	37.6	4.2	37.7	43.8	155.2	500.0	-10.2	Avg amb
Z												
2781.75	V	225.0	1.0	58.3	29.8	1.7	38.0	51.8	388.8	5000.0	-22.2	Peak
2781.75	V	225.0	1.0	46.5	29.8	1.7	38.0	40.0	99.6	500.0	-14.0	Avg
3709.00	V	270.0	1.0	52.5	30.5	1.9	37.4	47.6	238.6	5000.0	-26.4	Peak
3709.00	V	270.0	1.0	46.7	30.5	1.9	37.4	41.8	122.4	500.0	-12.2	Avg
4636.25	V	270.0	1.0	51.7	32.4	2.0	37.2	48.9	279.3	5000.0	-25.1	Peak
4636.25	V	270.0	1.0	46.2	32.4	2.0	37.2	43.4	148.3	500.0	-10.6	Avg
7418.00	V	0.0	1.0	49.3	37.0	3.6	37.6	52.2	409.6	5000.0	-21.7	Peak amb
7418.00	V	0.0	1.0	40.9	37.0	3.6	37.6	43.8	155.7	500.0	-10.1	Avg amb
8345.25	V	0.0	1.0	50.0	37.6	4.2	37.7	54.0	502.3	5000.0	-20.0	Peak amb
8345.25	V	0.0	1.0	41.0	37.6	4.2	37.7	45.0	178.2	500.0	-9.0	Avg amb
2781.75	H	270.0	1.0	58.3	29.8	1.7	38.0	51.8	387.5	5000.0	-22.2	Peak
2781.75	H	270.0	1.0	51.5	29.8	1.7	38.0	45.0	177.1	500.0	-9.0	Avg
3709.00	H	90.0	1.0	52.0	30.5	1.9	37.4	47.1	225.3	5000.0	-26.9	Peak
3709.00	H	90.0	1.0	46.3	30.5	1.9	37.4	41.4	116.9	500.0	-12.6	Avg
4636.25	H	270.0	1.0	53.5	32.4	2.0	37.2	50.7	343.6	5000.0	-23.3	Peak
4636.25	H	270.0	1.0	49.3	32.4	2.0	37.2	46.5	211.8	500.0	-7.5	Avg
7418.00	H	0.0	1.0	48.2	37.0	3.6	37.6	51.1	360.8	5000.0	-22.8	Peak amb
7418.00	H	0.0	1.0	39.5	37.0	3.6	37.6	42.4	132.5	500.0	-11.5	Avg amb
8345.25	H	0.0	1.0	49.8	37.6	4.2	37.7	53.8	490.8	5000.0	-20.2	Peak amb
8345.25	H	0.0	1.0	39.8	37.6	4.2	37.7	43.8	155.2	500.0	-10.2	Avg amb

4.7 AC Conducted Emissions (FCC Pt.15.207, RSS-Gen [7.2.2])

4.7.1 Requirements

Test Arrangement: Table Top

Compliance Standard: FCC Class B

FCC Compliance Limits		
Frequency	Quasi-peak	Average
0.15 - 0.5MHz	66 to 56dB μ V	56 to 46dB μ V
0.5 - 5MHz	56dB μ V	46dB μ V
5 - 30MHz	60dB μ V	50dB μ V

4.7.2 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 μ H 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. The peripherals were placed on the table in accordance with ANSI C63.4-2003.

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: VdB μ V

LISN Correction Factor: LISN dB

Cable Correction Factor: CF dB

Electric Field: EdB μ V = V dB μ V + LISN dB + CF dB

4.7.3 Test Data

The EUT complied with the Conducted Emissions requirements. Table 8 provides the test results for phase and neutral line power line conducted emissions.

Table 8: Conducted Emission Test Data

LINE 1 - NEUTRAL

Frequency (MHz)	Level QP (dBµV)	Cable Loss (dB)	LISN Corr (dB)	Limit QP (dBµV)	Level Corr (dBµV)	Level AVG (dBµV)	Cable Loss (dB)	Level Corr (dBµV)	Limit AVG (dBµV)	Margin AVG (dB)	Margin QP (dB)
0.150	43.4	10.0	2.6	66.0	56.0	38.0	10.0	50.6	56.0	-5.4	-10.0
0.532	27.4	10.5	0.7	56.0	38.6	27.4	10.5	38.6	46.0	-7.4	-17.4
0.897	25.0	10.5	0.1	56.0	35.6	25.0	10.5	35.6	46.0	-10.4	-20.4
8.090	19.4	11.1	-2.7	60.0	27.9	19.4	11.1	27.9	50.0	-22.1	-32.1
10.660	17.9	11.3	-3.0	60.0	26.2	17.9	11.3	26.2	50.0	-23.8	-33.8
20.000	12.1	12.6	-3.8	60.0	20.9	12.1	12.6	20.9	50.0	-29.1	-39.1

LINE 2 - PHASE

Frequency (MHz)	Level QP (dBµV)	Cable Loss (dB)	LISN Corr (dB)	Limit QP (dBµV)	Level Corr (dBµV)	Level AVG (dBµV)	Cable Loss (dB)	Level Corr (dBµV)	Limit AVG (dBµV)	Margin AVG (dB)	Margin QP (dB)
0.152	43.6	10.0	2.6	65.9	56.2	38.0	10.0	50.6	55.9	-5.3	-9.7
0.337	33.7	10.3	0.8	59.3	44.9	33.7	10.3	44.9	49.3	-4.4	-14.4
0.789	19.5	10.5	0.3	56.0	30.3	19.5	10.5	30.3	46.0	-15.7	-25.7
2.120	12.5	10.7	-1.0	56.0	22.3	12.5	10.7	22.3	46.0	-23.7	-33.7
7.340	19.7	11.1	-2.5	60.0	28.3	19.7	11.1	28.3	50.0	-21.7	-31.7
10.690	14.0	11.3	-3.0	60.0	22.3	14.0	11.3	22.3	50.0	-27.7	-37.7