

Datamatic D4200 Job 11006 Mesh Mode Pt15.247 Time Of Occupancy
One Pulse = 108mSec (see One Pulse Plot), 1 Pulse per 20 Second Period
Limit= 0.4 Sec Maximum within 20 Second Period Based on a 156kHz occ. BW.
Unit Complies

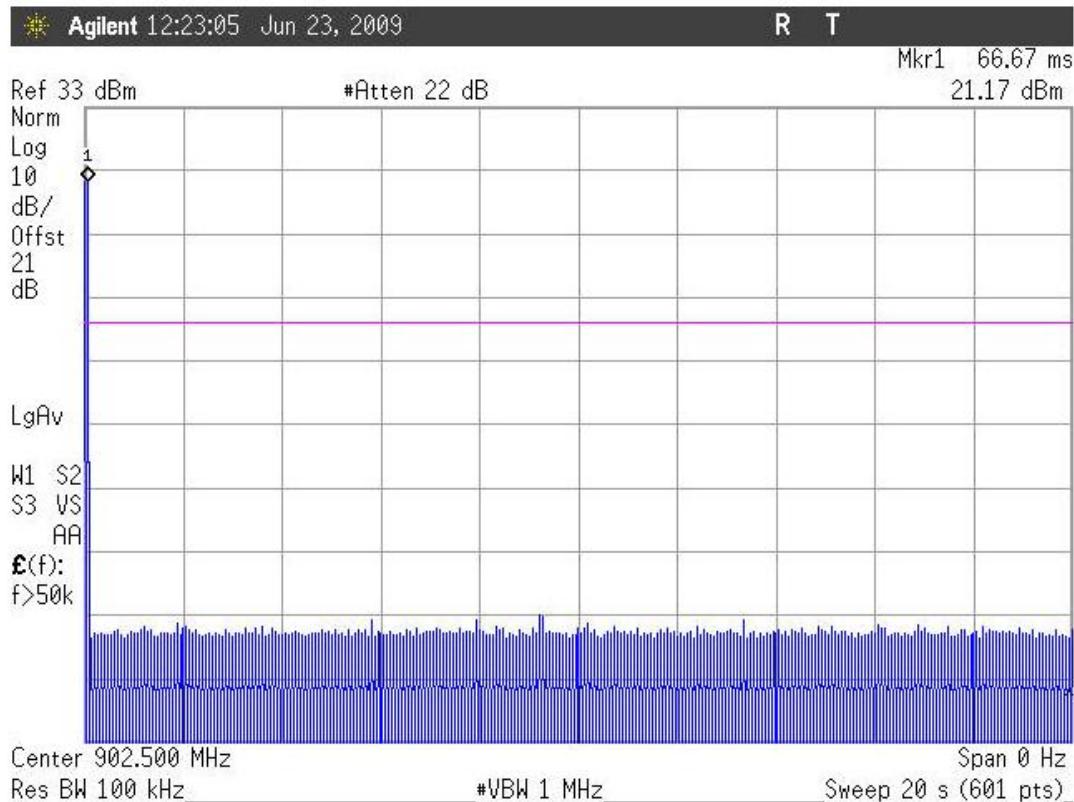


Figure 19: Time of Occupancy, Dwell time per 20 Seconds, Mesh Mode

Datamatic D4200 Job 11006 , Drive-by Mode Part 15.247 Time of Occupancy On time for a single Hop
Frequency 902.5MHz used. On time for a single Hop=40ms

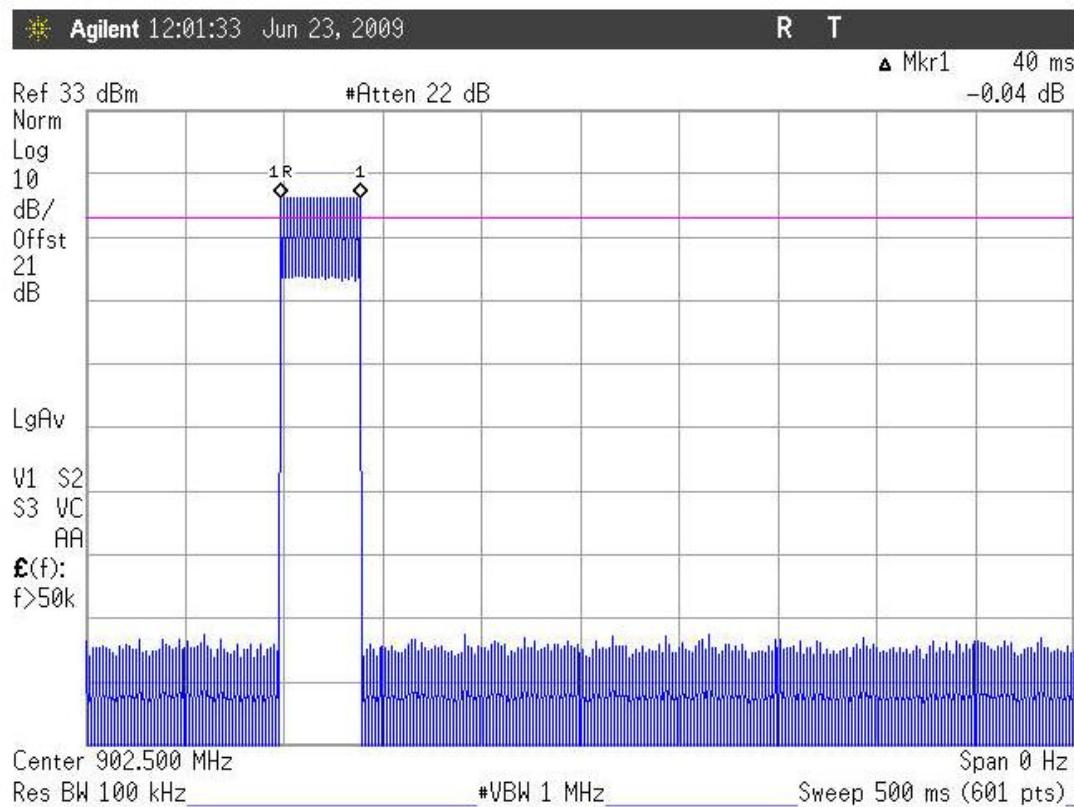


Figure 20: Time of Occupancy, Dwell time per hop, Drive-by Mode

Datamatic D4200 Job 11006 Drive-by mode , Pt15.247 Time Of Occupancy.
One Pulse = 40ms (sec One Pulse Plot), 1 Pulse per 10 Second Period
Limit= 0.4 Sec Maximum within 10 second period Based on a Occ. BW of 362kHz
Unit Complies

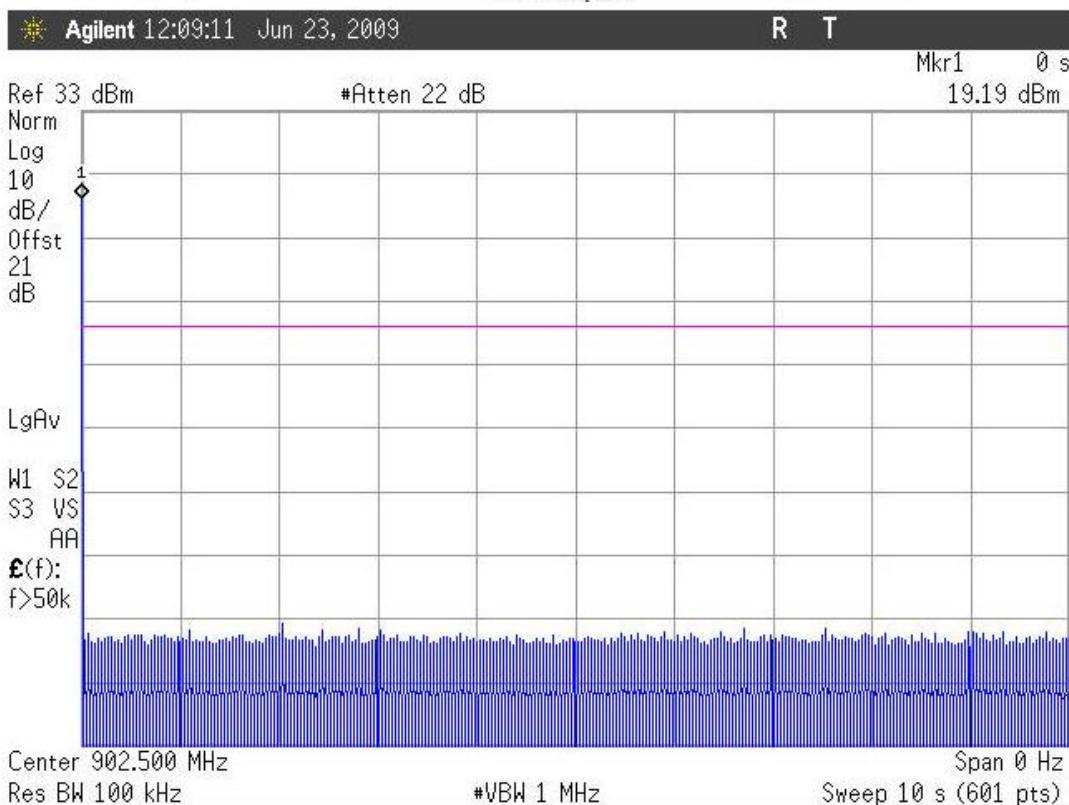


Figure 21: Time of Occupancy, Dwell time per 10 Seconds, Drive by Mode

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

The EUT must comply with requirements for spurious emissions at antenna terminals. Per §15.247(c) 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.

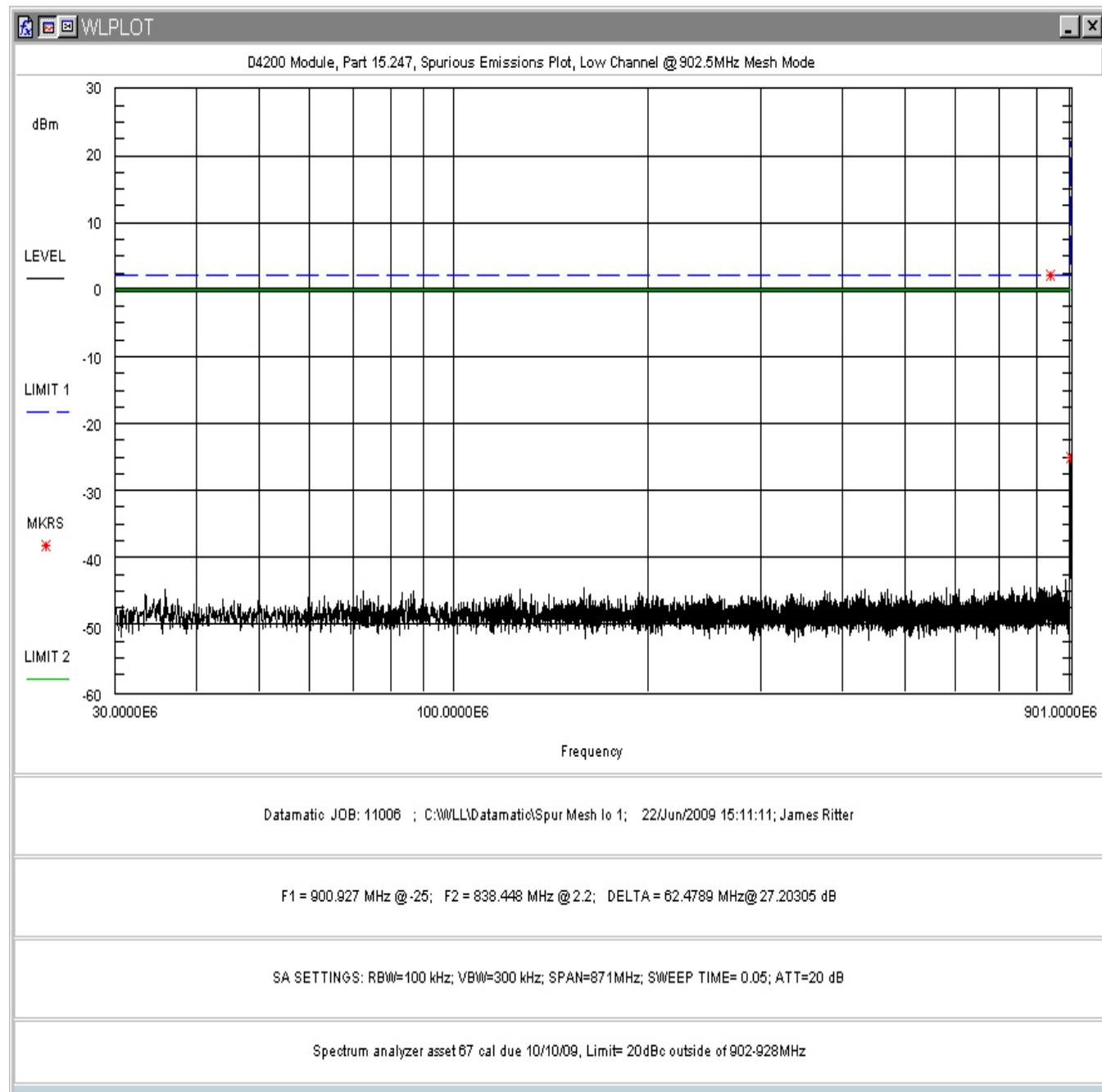


Figure 22: Conducted Spurious Emissions, Low Channel 30 – 901MHz, Mesh Mode

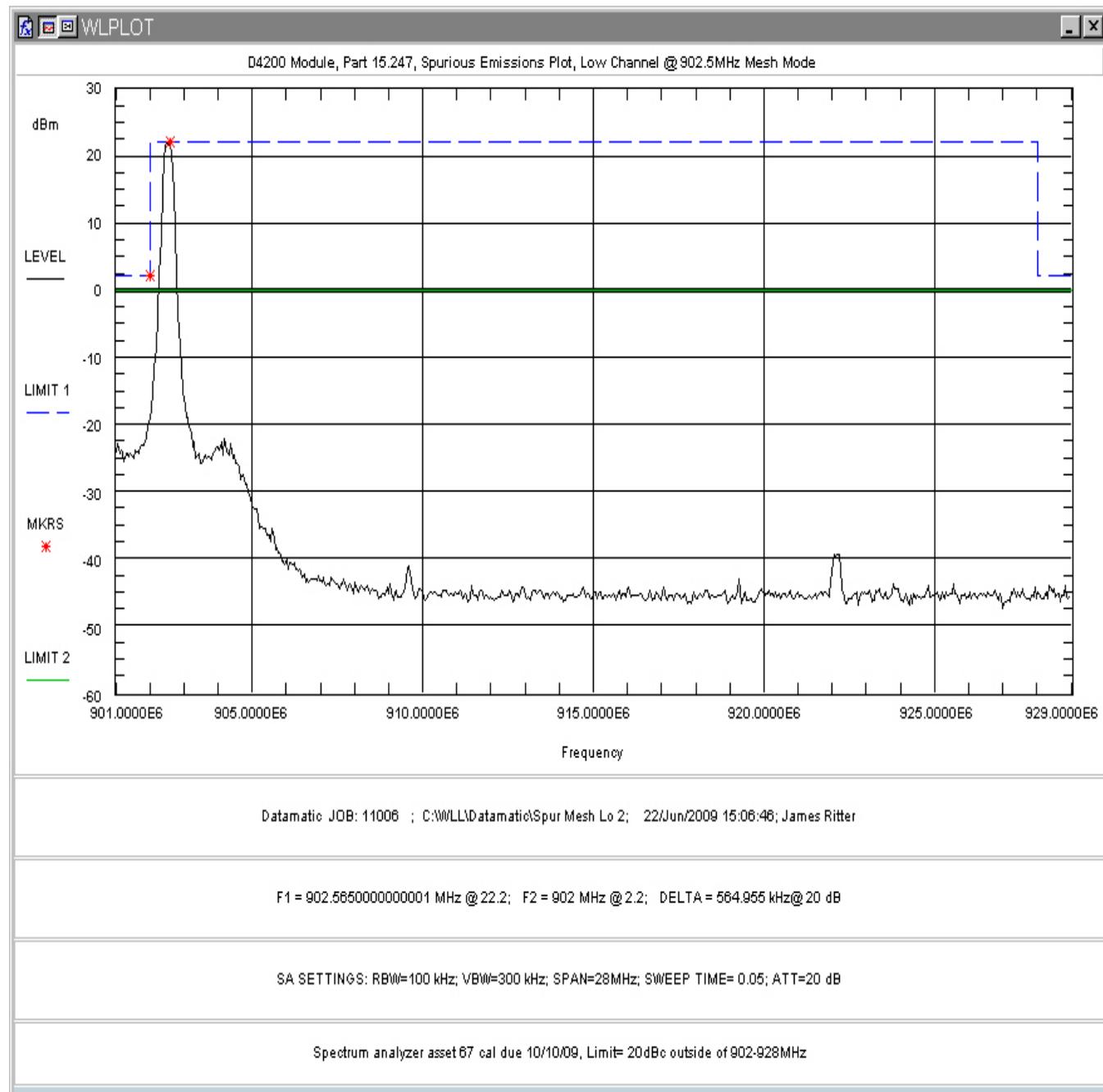


Figure 23: Conducted Spurious Emissions, Low Channel 901 – 929MHz, Mesh Mode

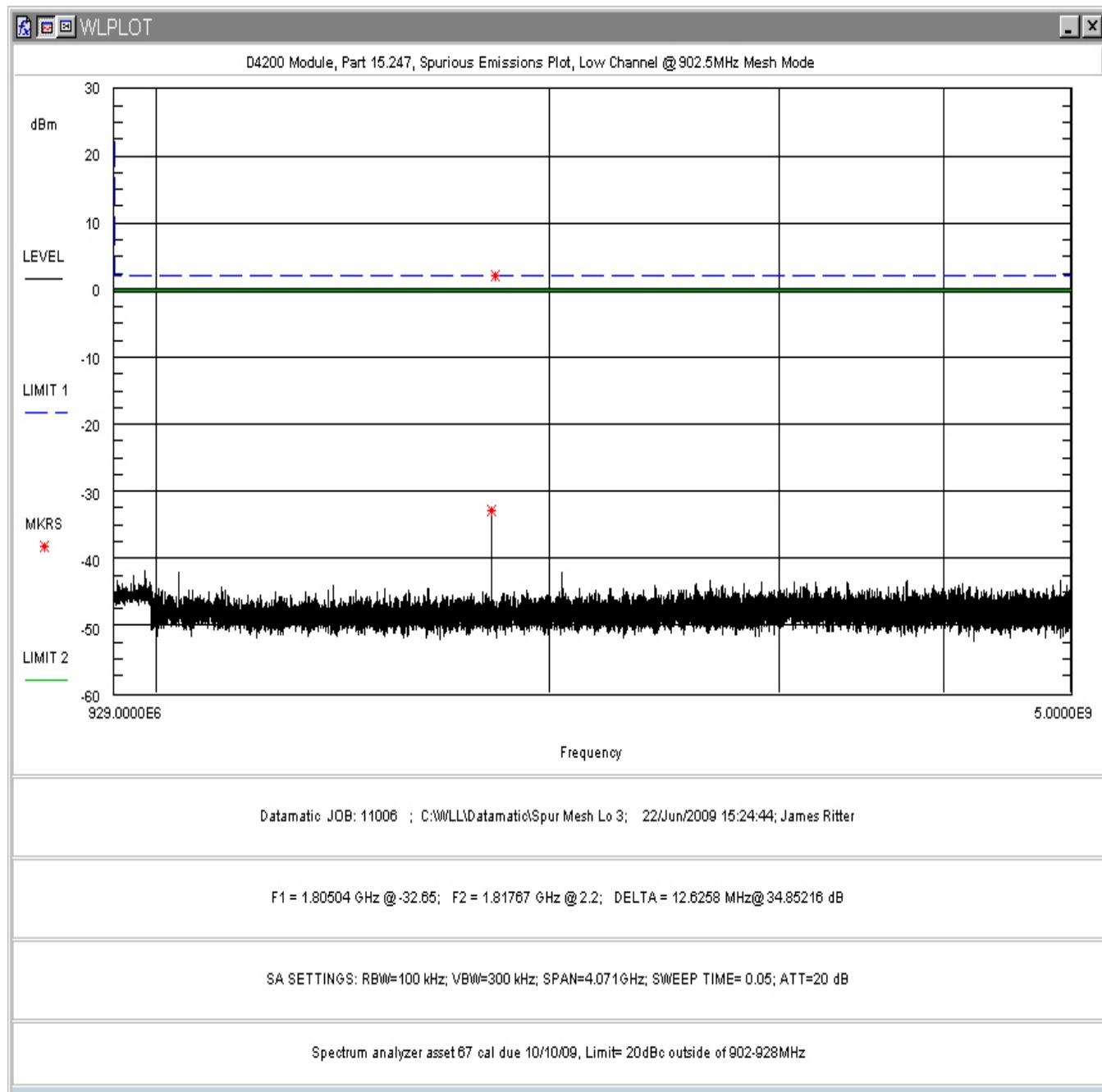


Figure 24: Conducted Spurious Emissions, Low Channel 929MHz – 5GHz, Mesh Mode

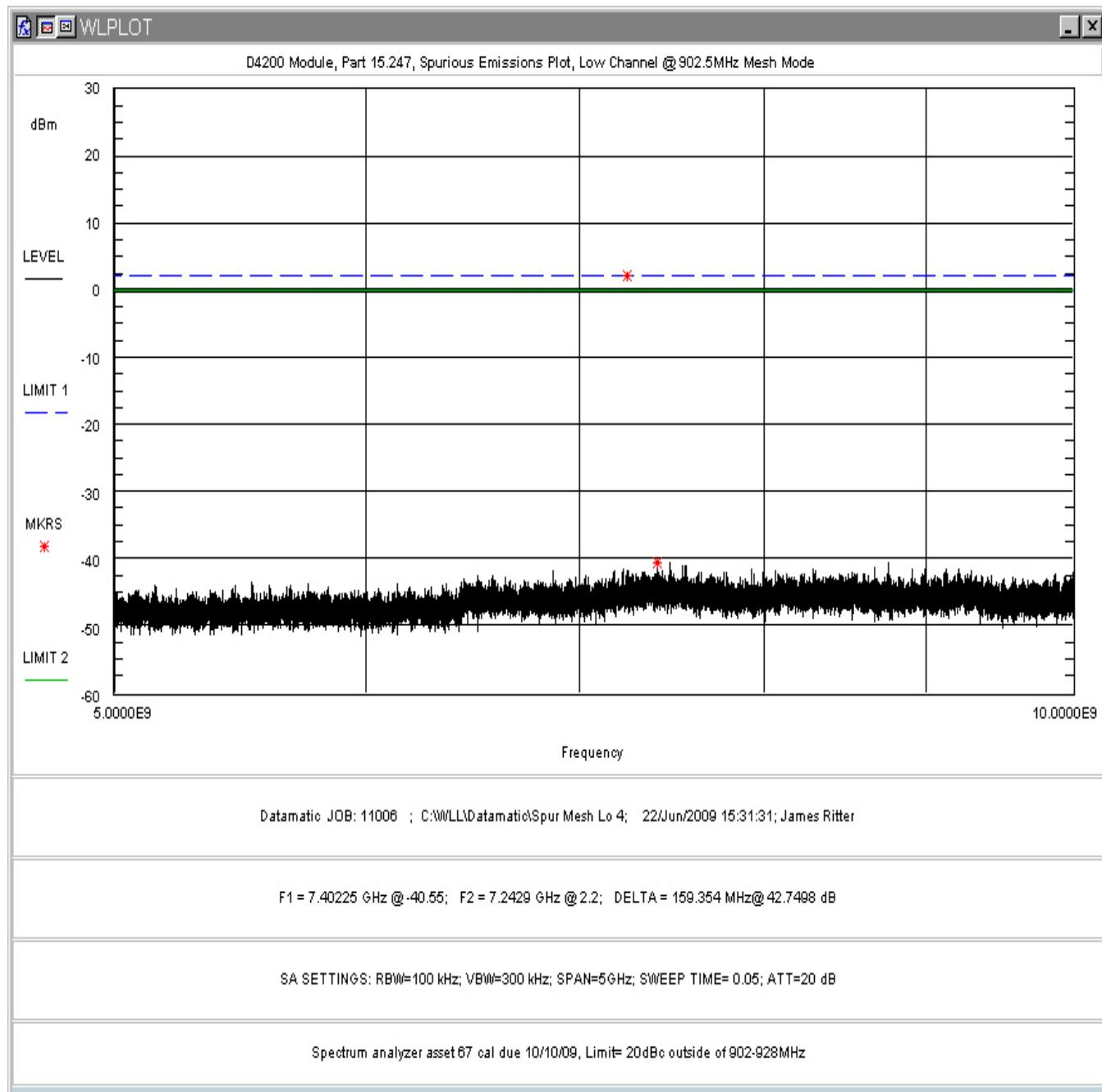


Figure 25: Conducted Spurious Emissions, Low Channel 5 -10GHz, Mesh Mode

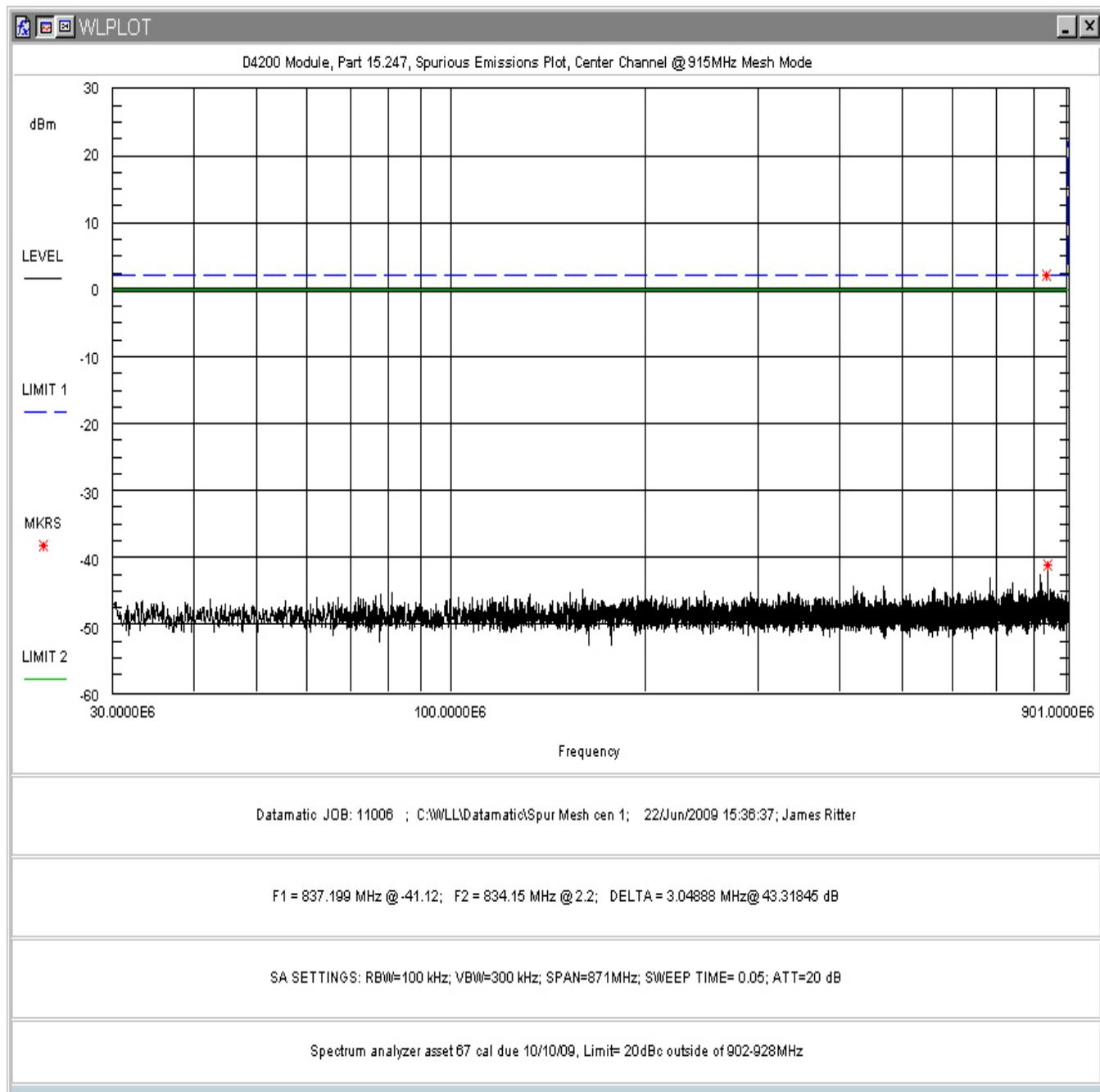


Figure 26: Conducted Spurious Emissions, Center Channel 30 – 901MHz, Mesh Mode

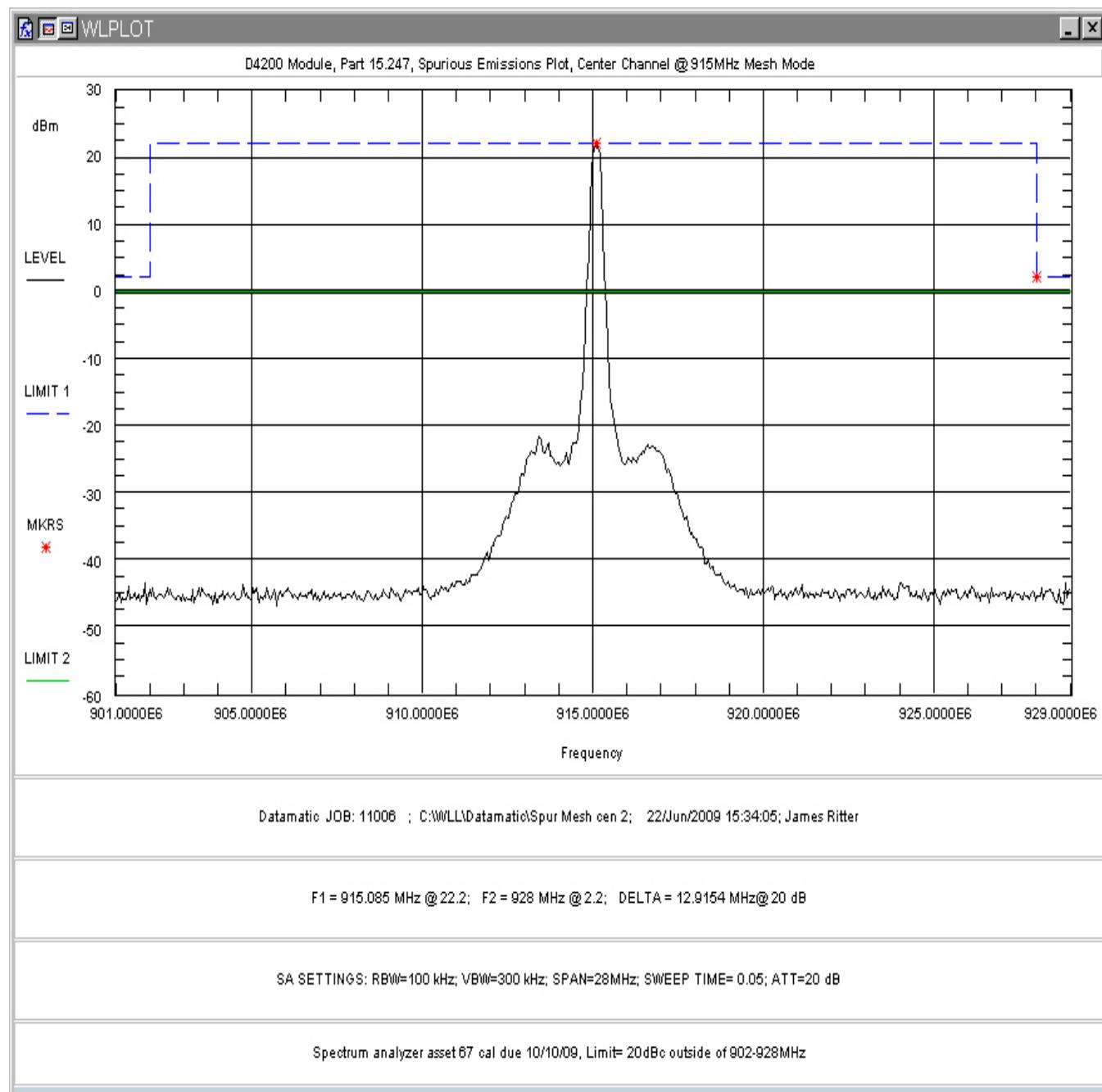


Figure 27: Conducted Spurious Emissions, Center Channel 901 – 929MHz, Mesh Mode

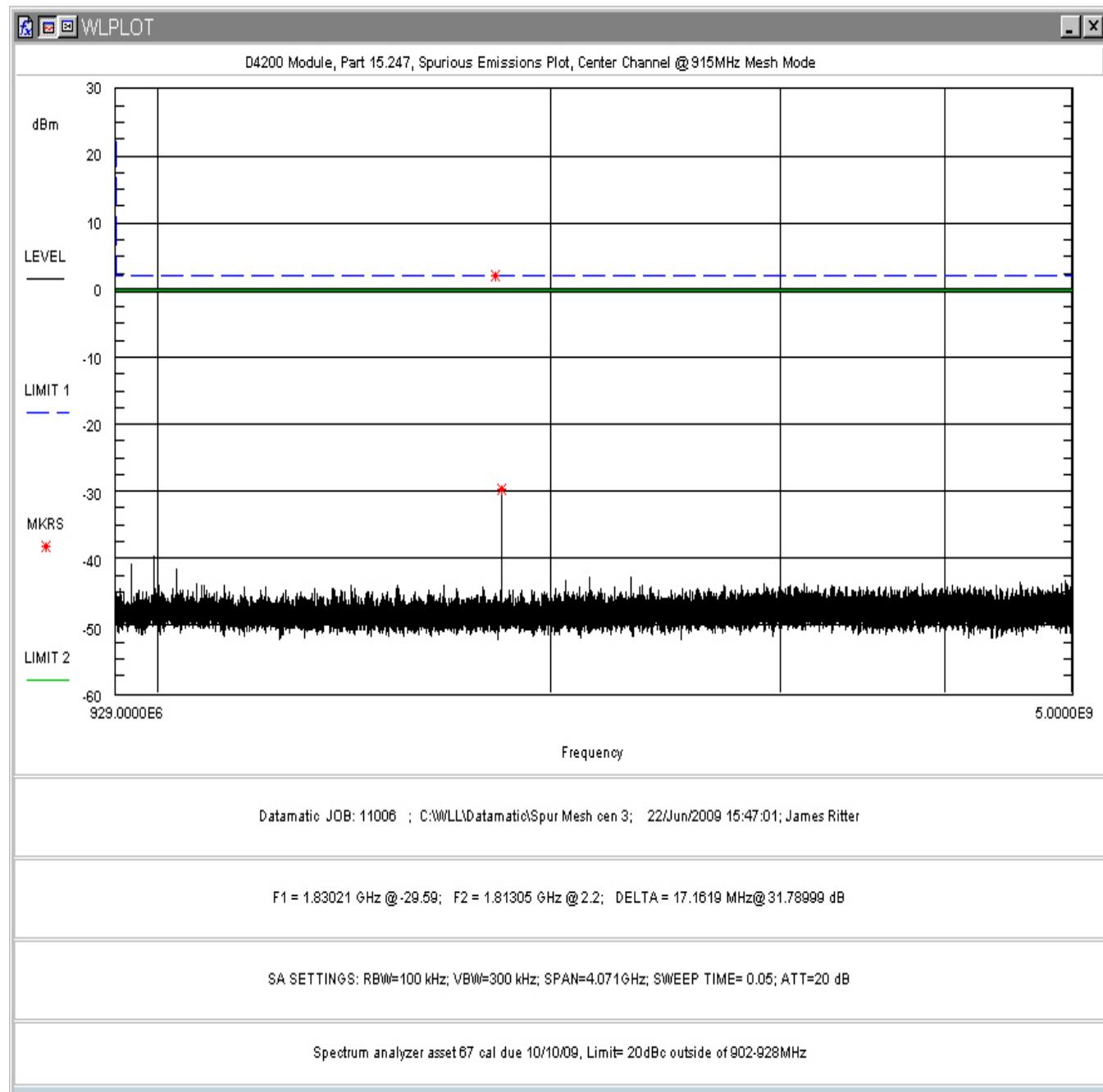


Figure 28: Conducted Spurious Emissions, Center Channel 929MHz – 5GHz, Mesh Mode

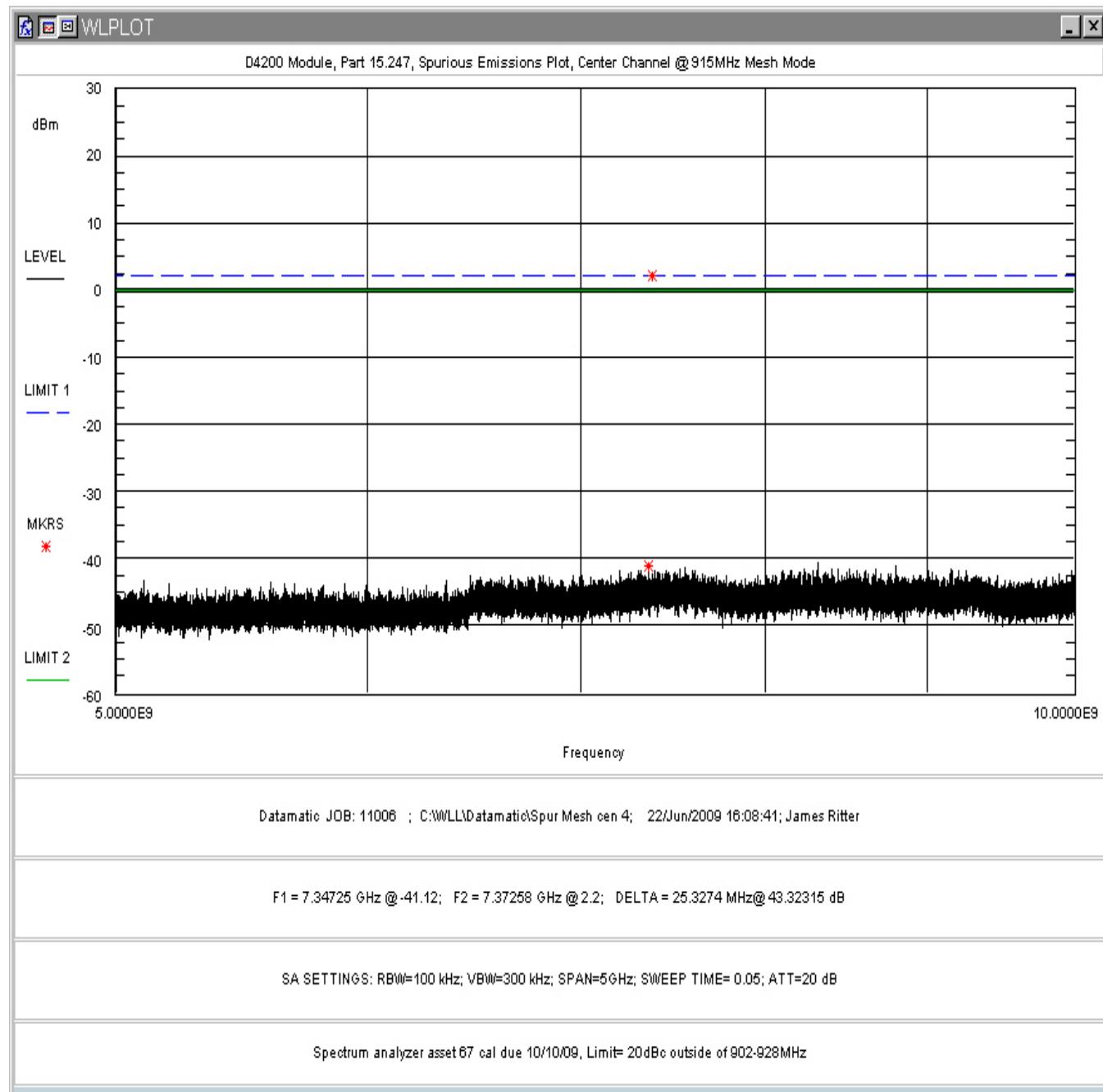


Figure 29: Conducted Spurious Emissions, Center Channel 5 - 10GHz, Mesh Mode

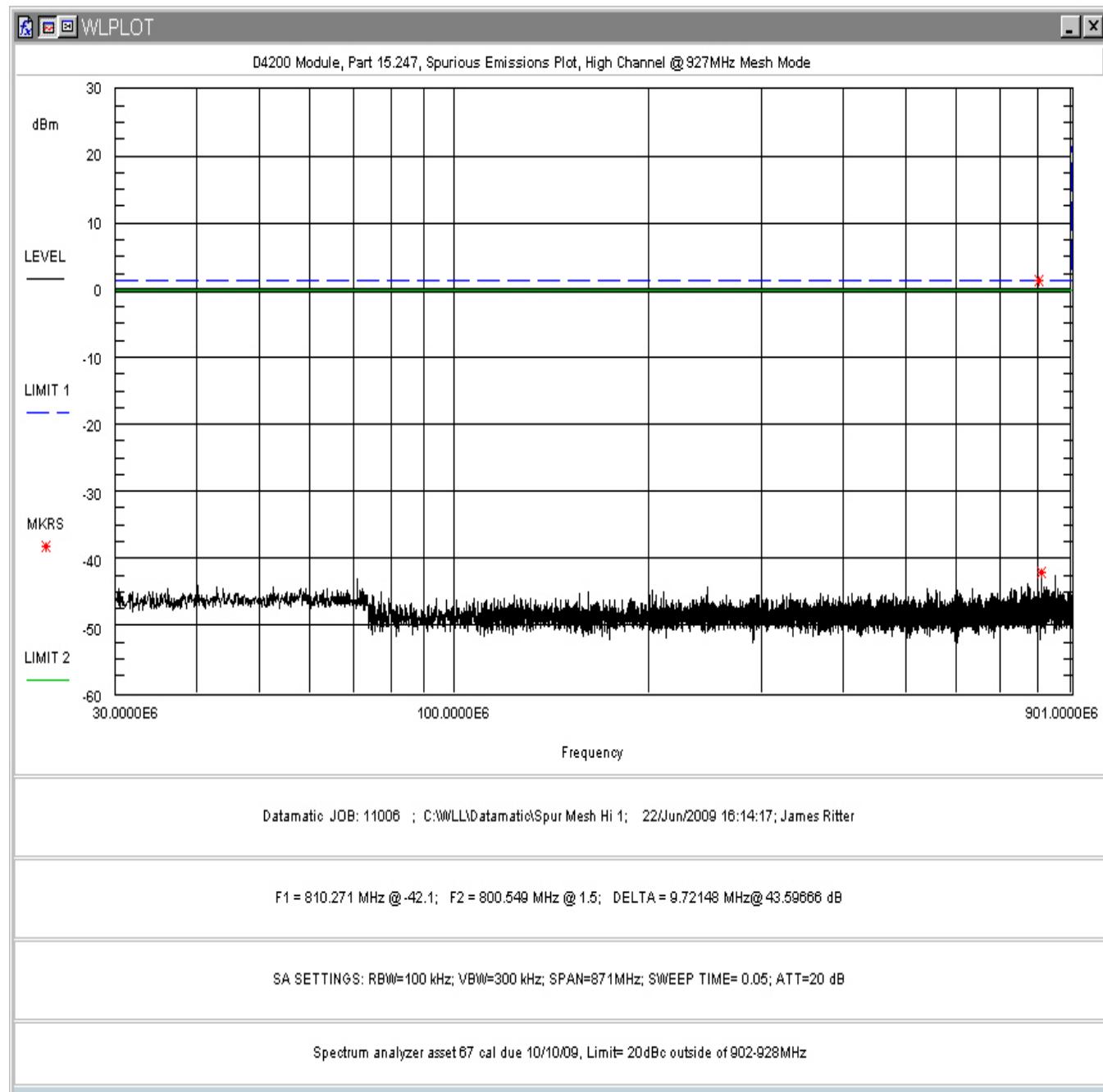


Figure 30: Conducted Spurious Emissions, High Channel 30 – 901MHz, Mesh Mode

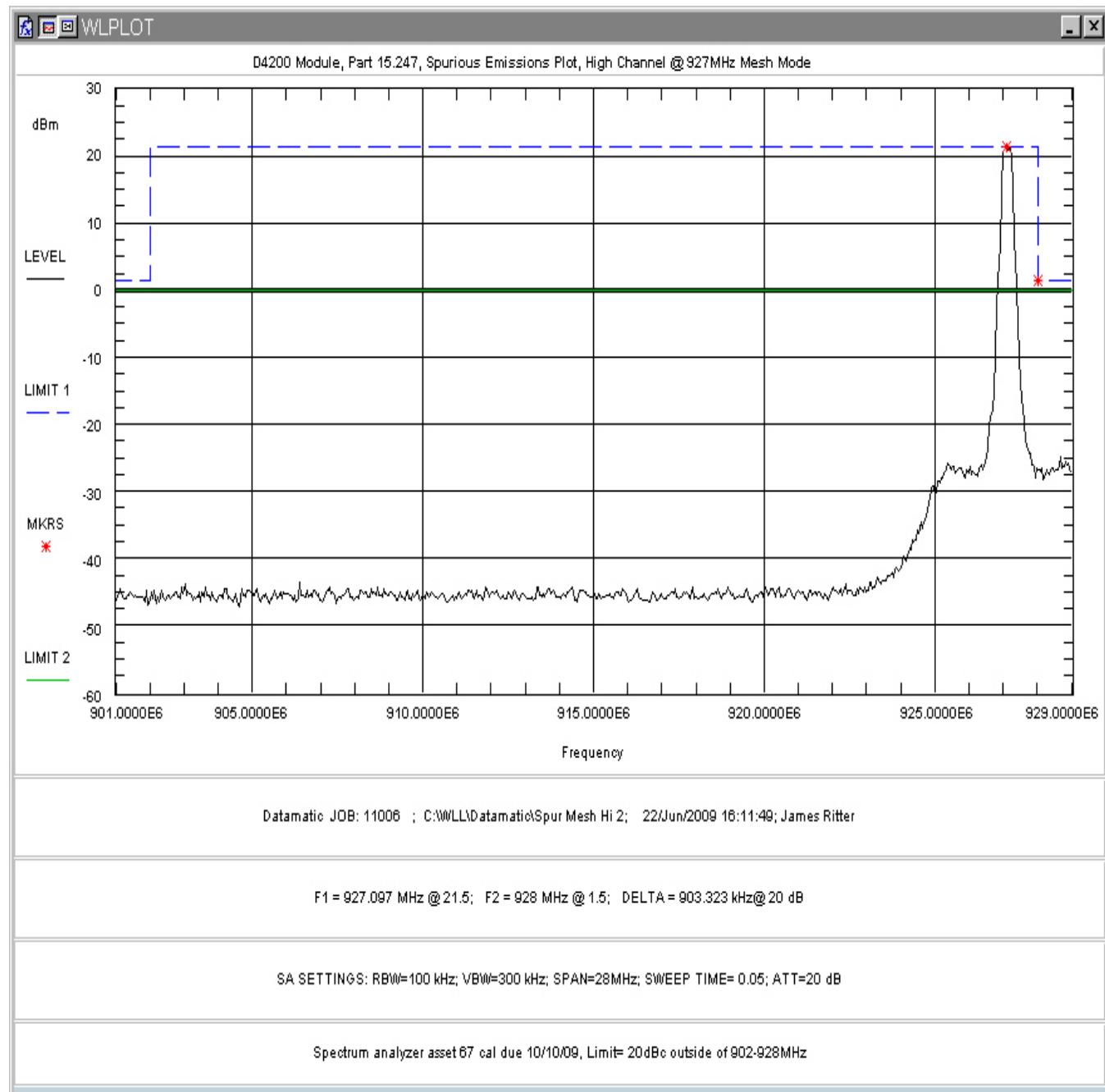


Figure 31: Conducted Spurious Emissions, High Channel 901 – 929MHz, Mesh Mode

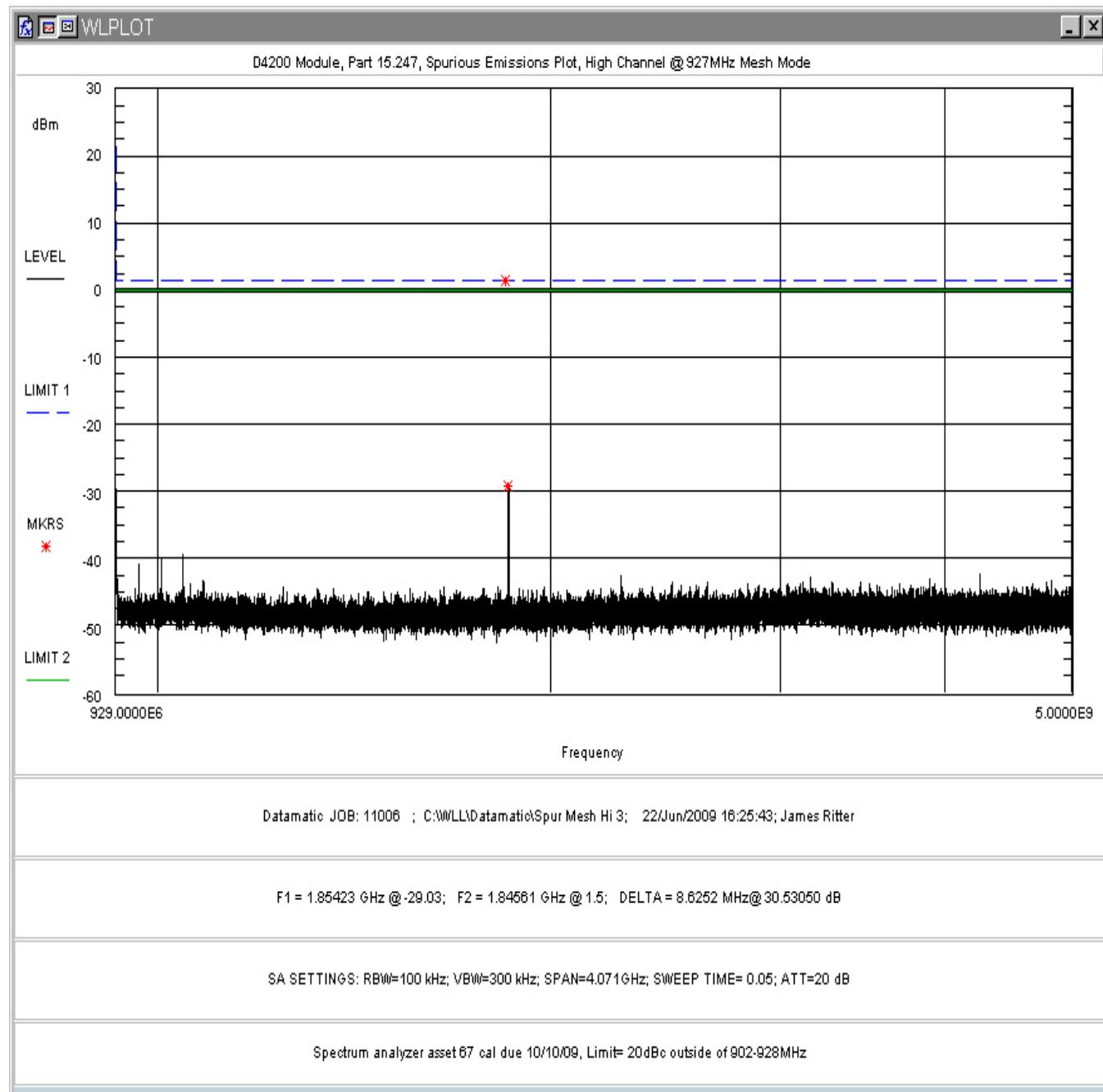


Figure 32: Conducted Spurious Emissions, High Channel 929MHz – 5GHz, Mesh Mode

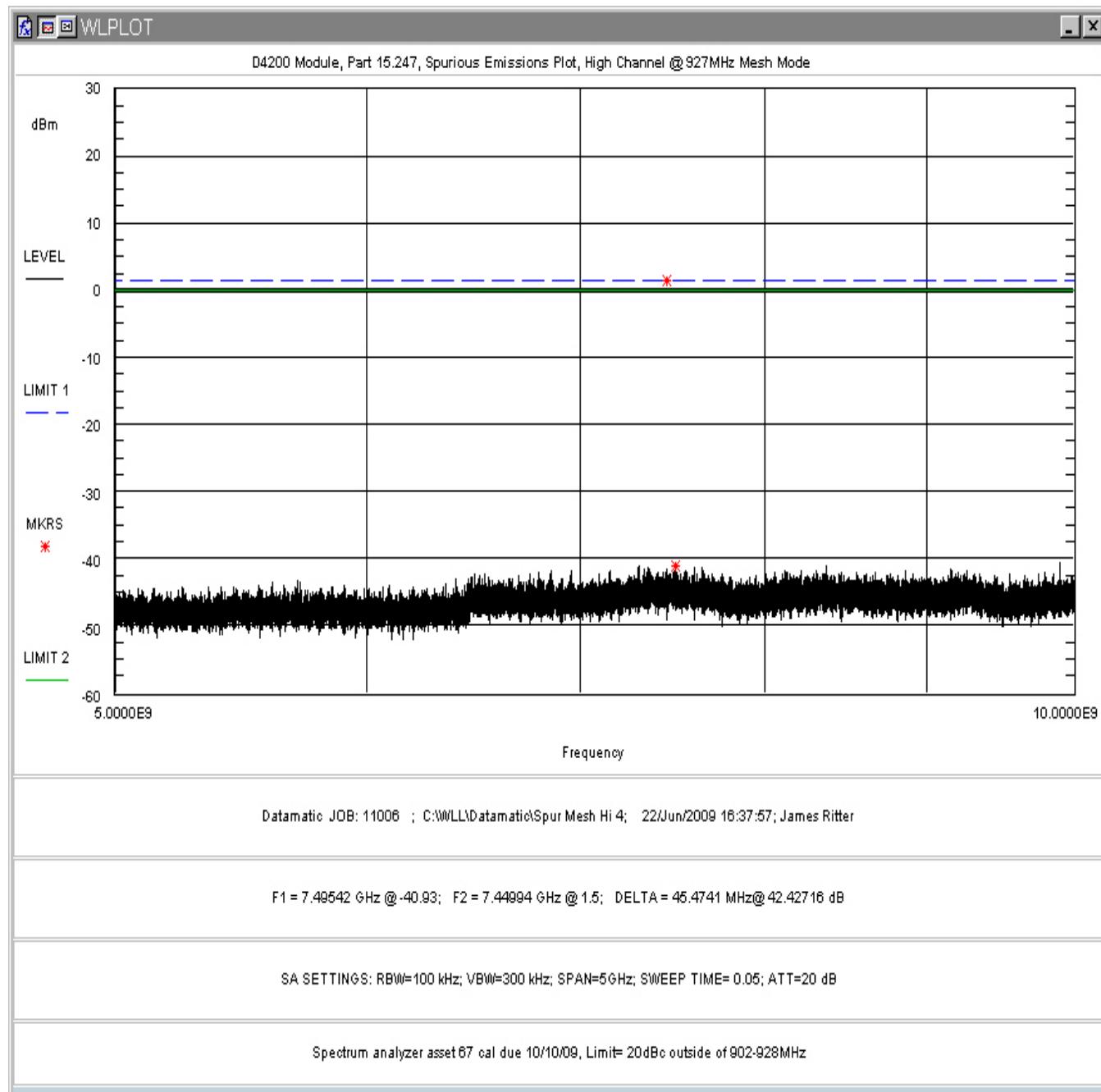


Figure 33: Conducted Spurious Emissions, High Channel 5 - 10GHz , Mesh Mode

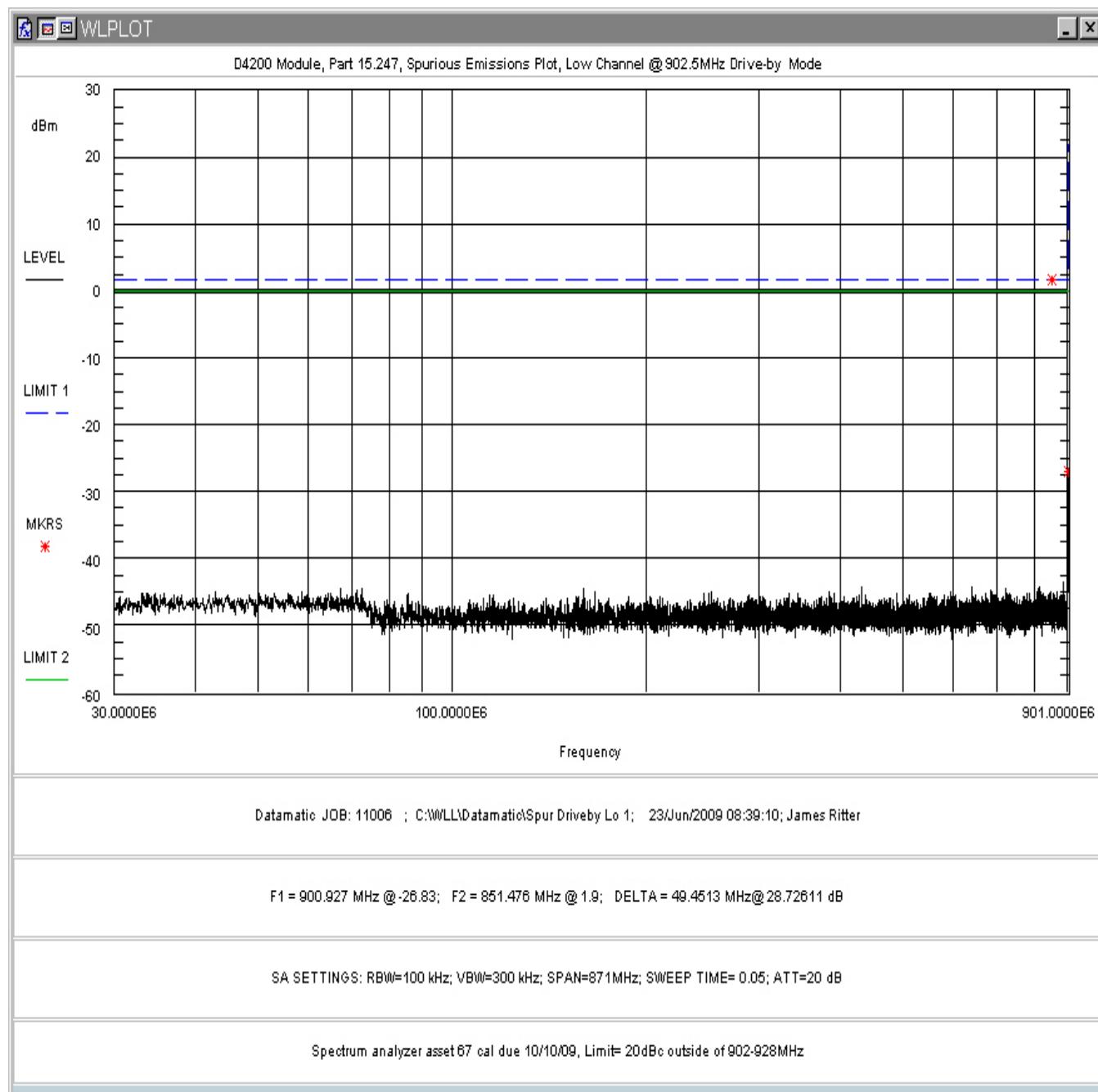


Figure 34: Conducted Spurious Emissions, Low Channel 30 – 901MHz, Drive-by Mode

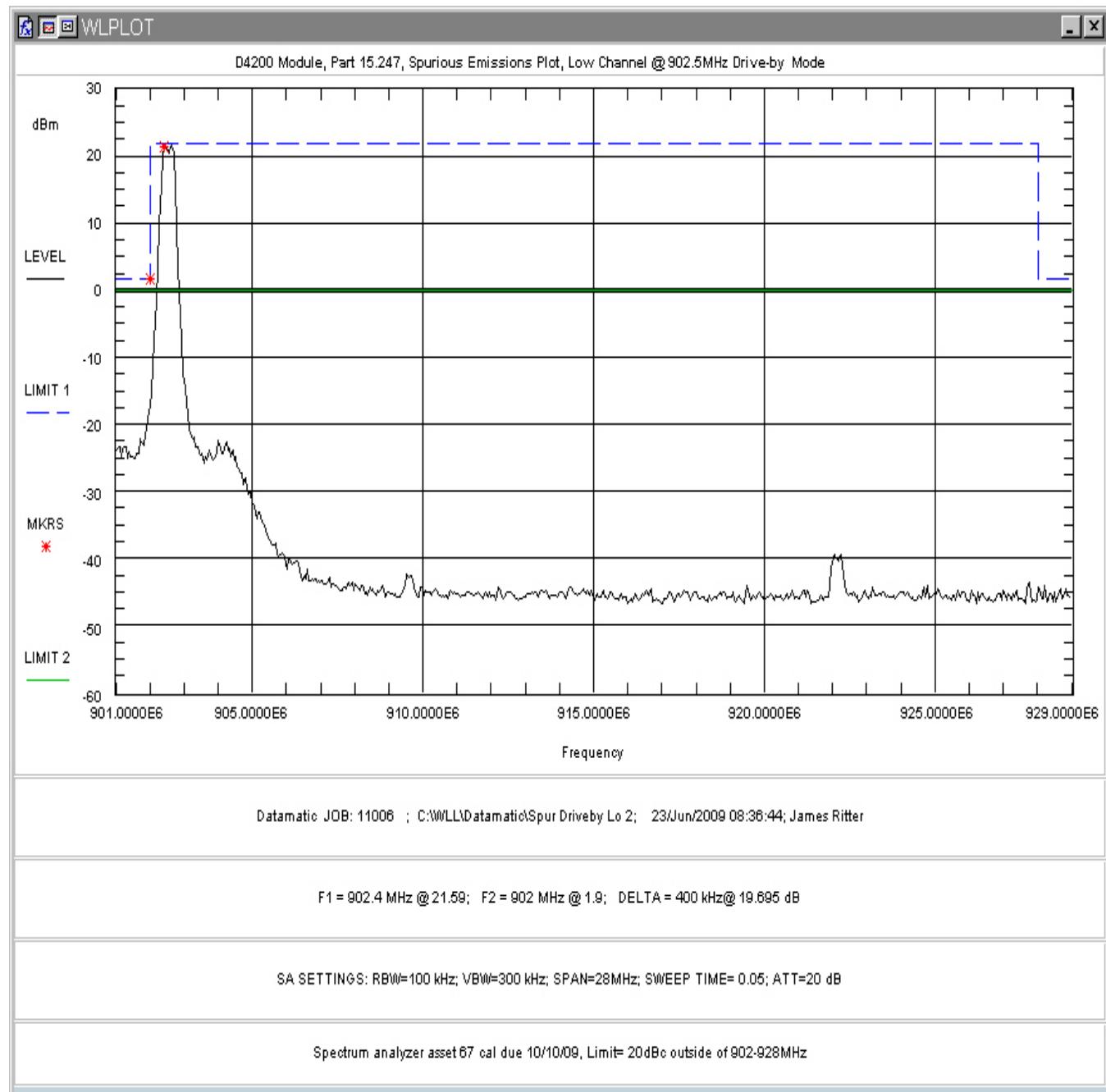


Figure 35: Conducted Spurious Emissions, Low Channel 901 – 929MHz, Drive-by Mode

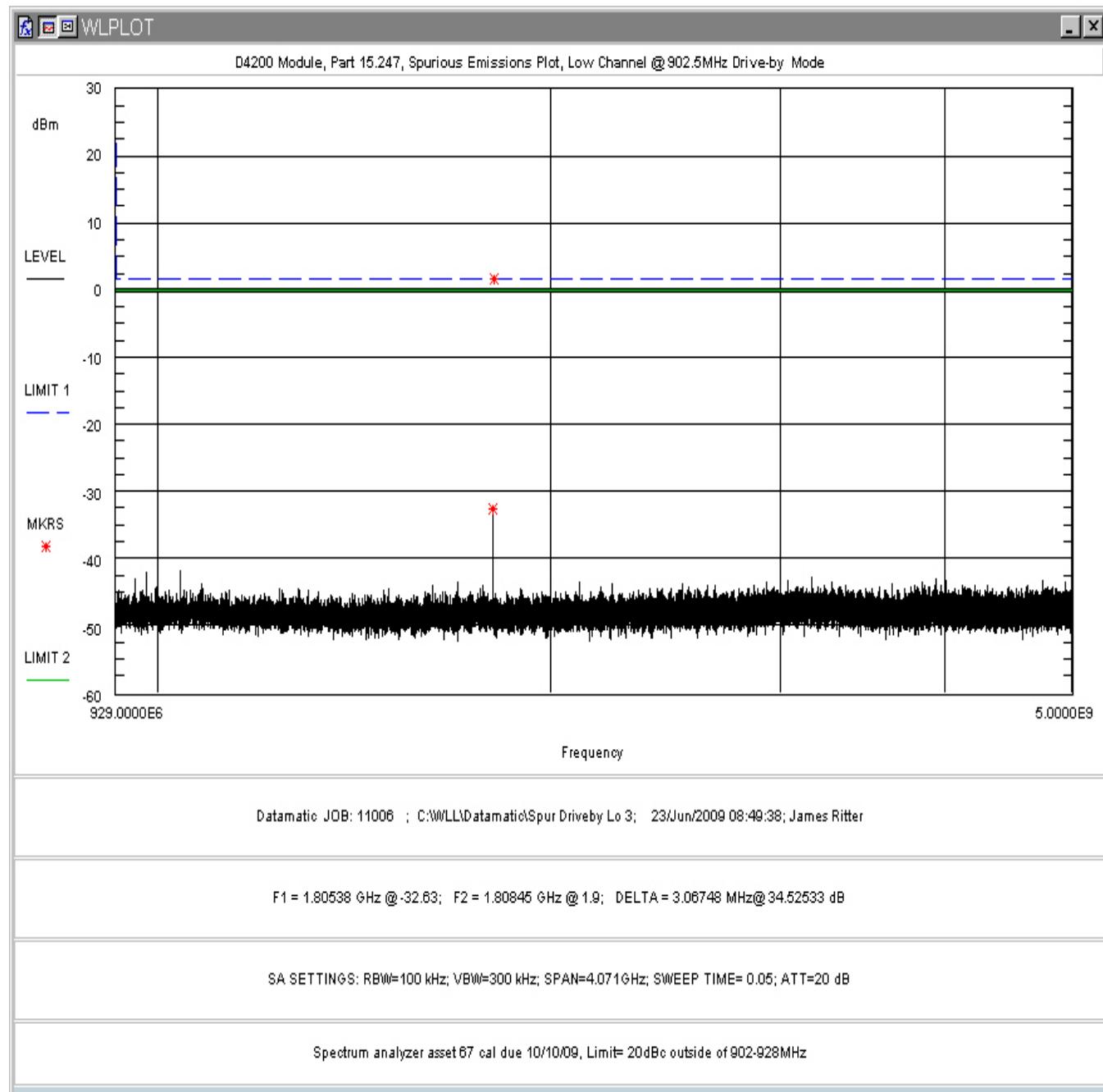


Figure 36: Conducted Spurious Emissions, Low Channel 929MHz – 5GHz, Drive-by Mode

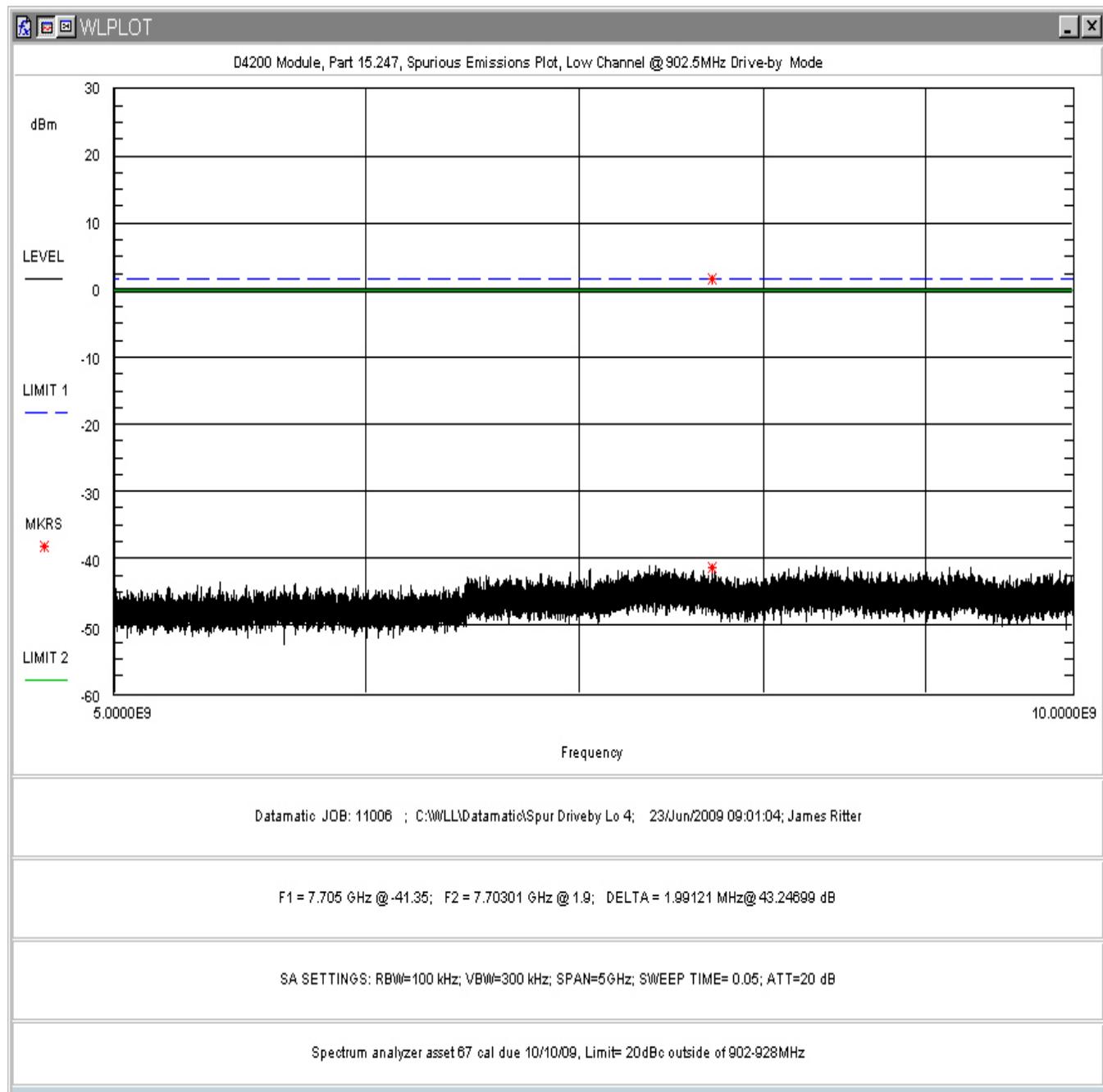


Figure 37: Conducted Spurious Emissions, Low Channel 5-10GHz, Drive-by Mode

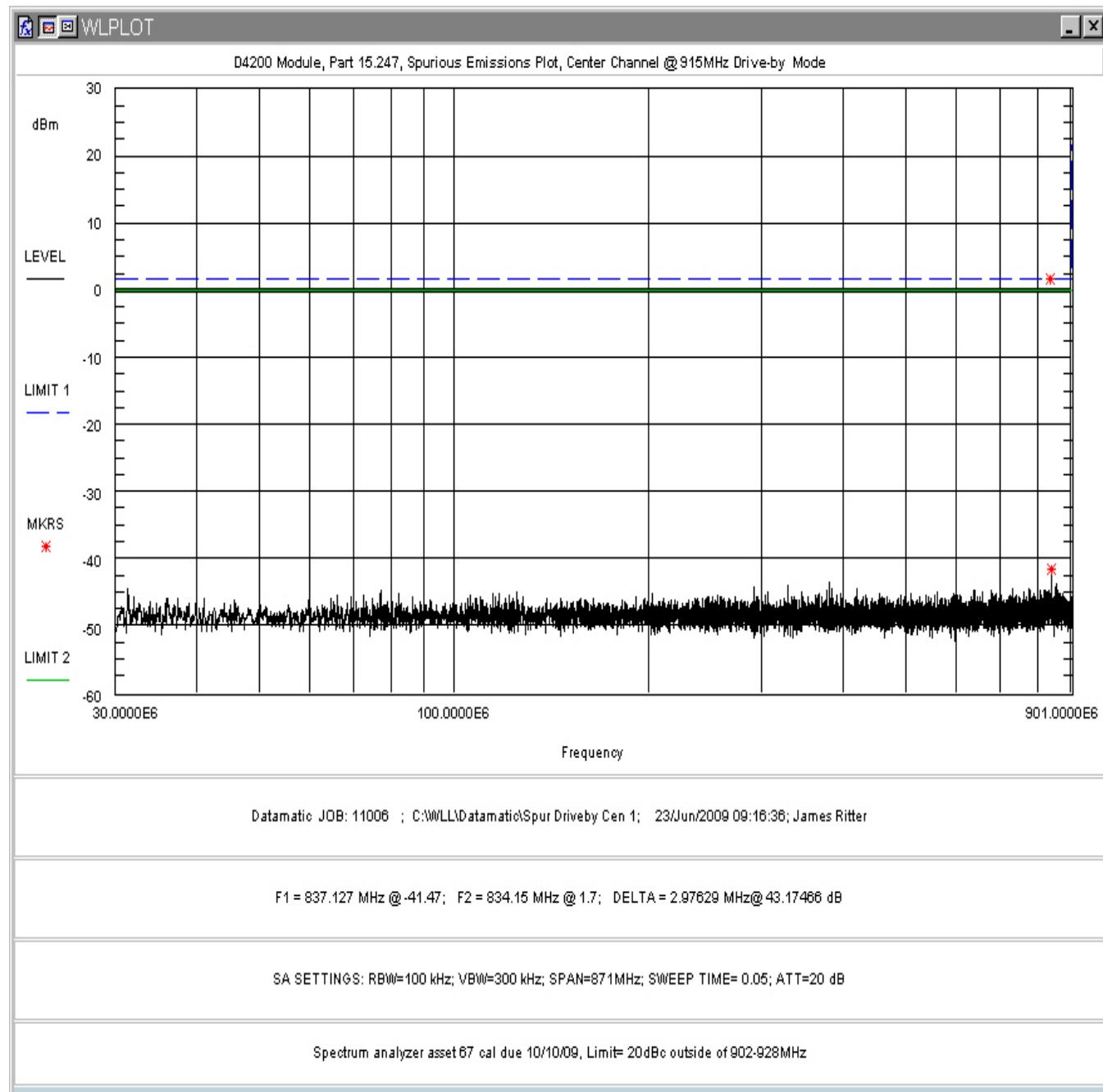


Figure 38: Conducted Spurious Emissions, Center Channel 30 – 901MHz, Drive-by Mode

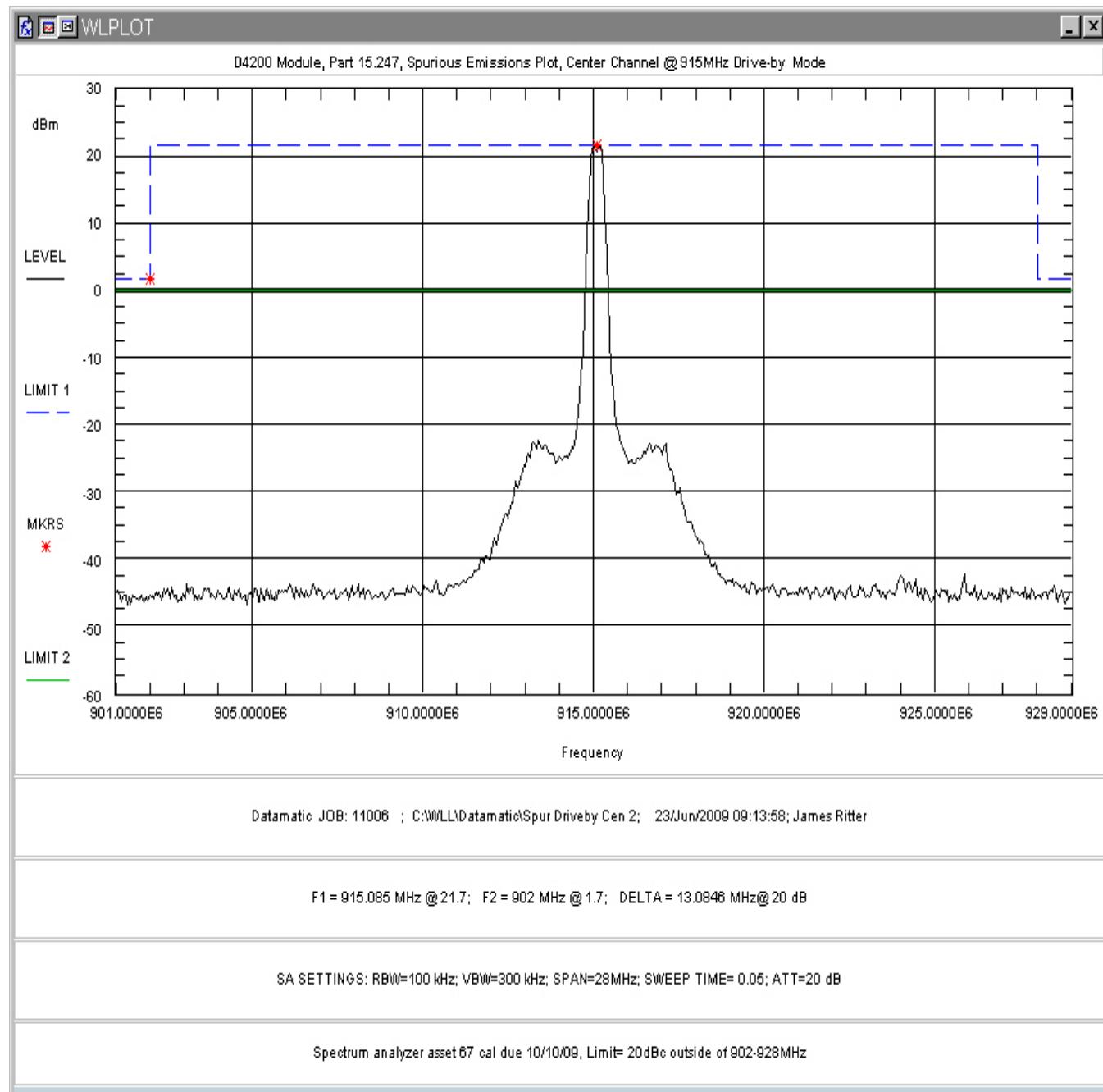


Figure 39: Conducted Spurious Emissions, Center Channel 901 – 929MHz, Drive-by Mode

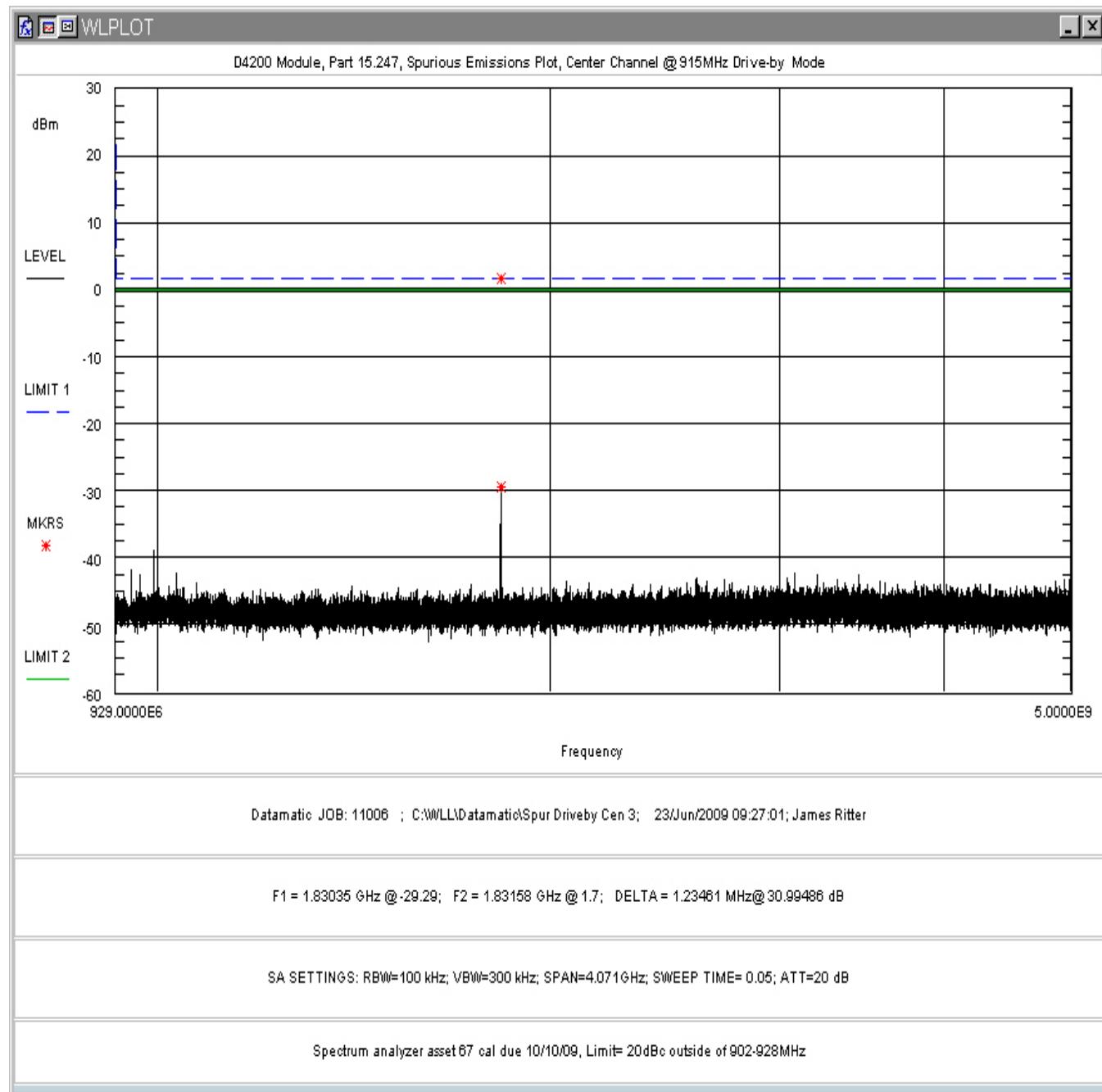


Figure 40: Conducted Spurious Emissions, Center Channel 929MHz – 5GHz, Drive-by Mode

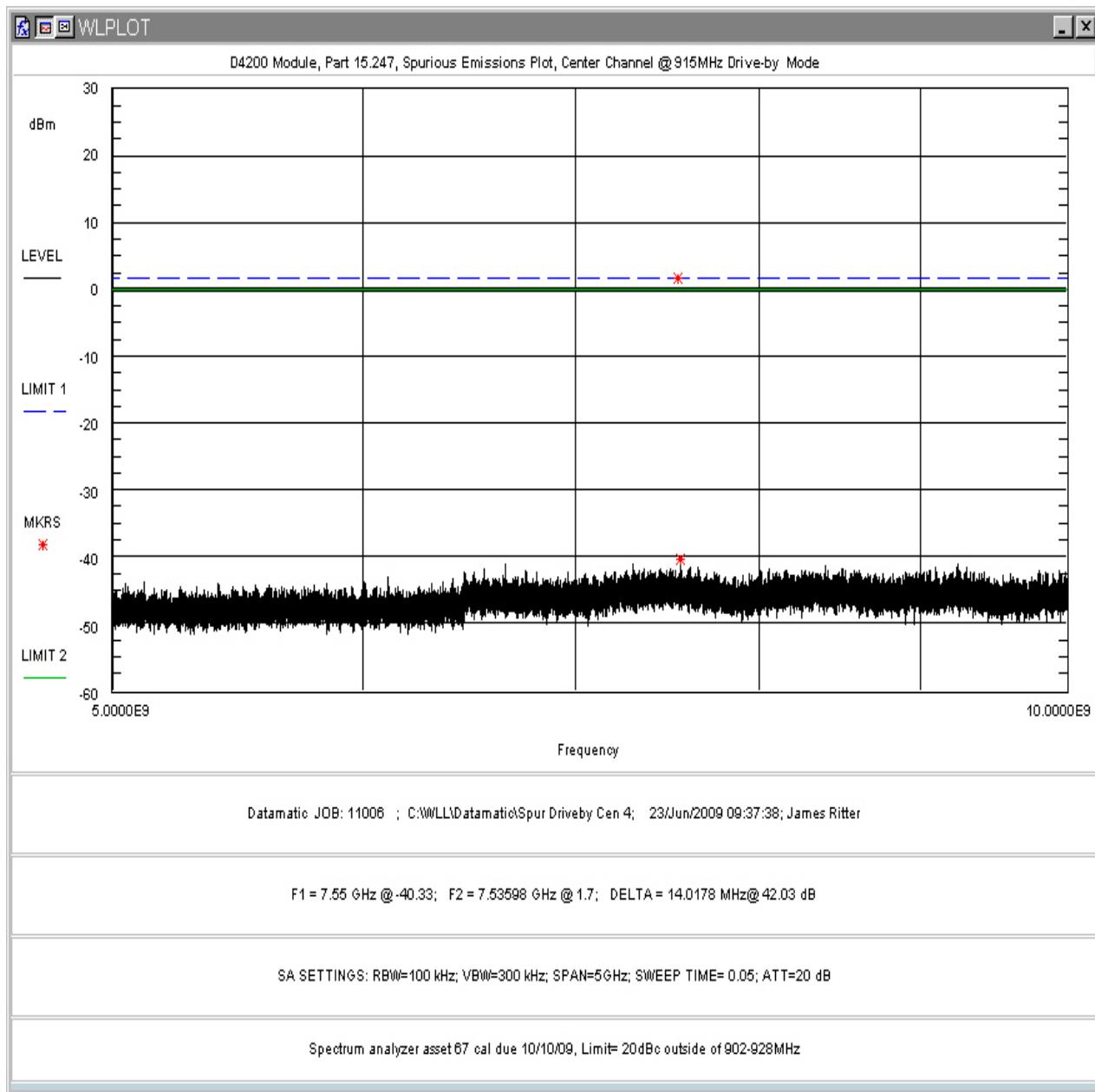


Figure 41: Conducted Spurious Emissions, Center Channel 5 - 10GHz, Drive-by Mode

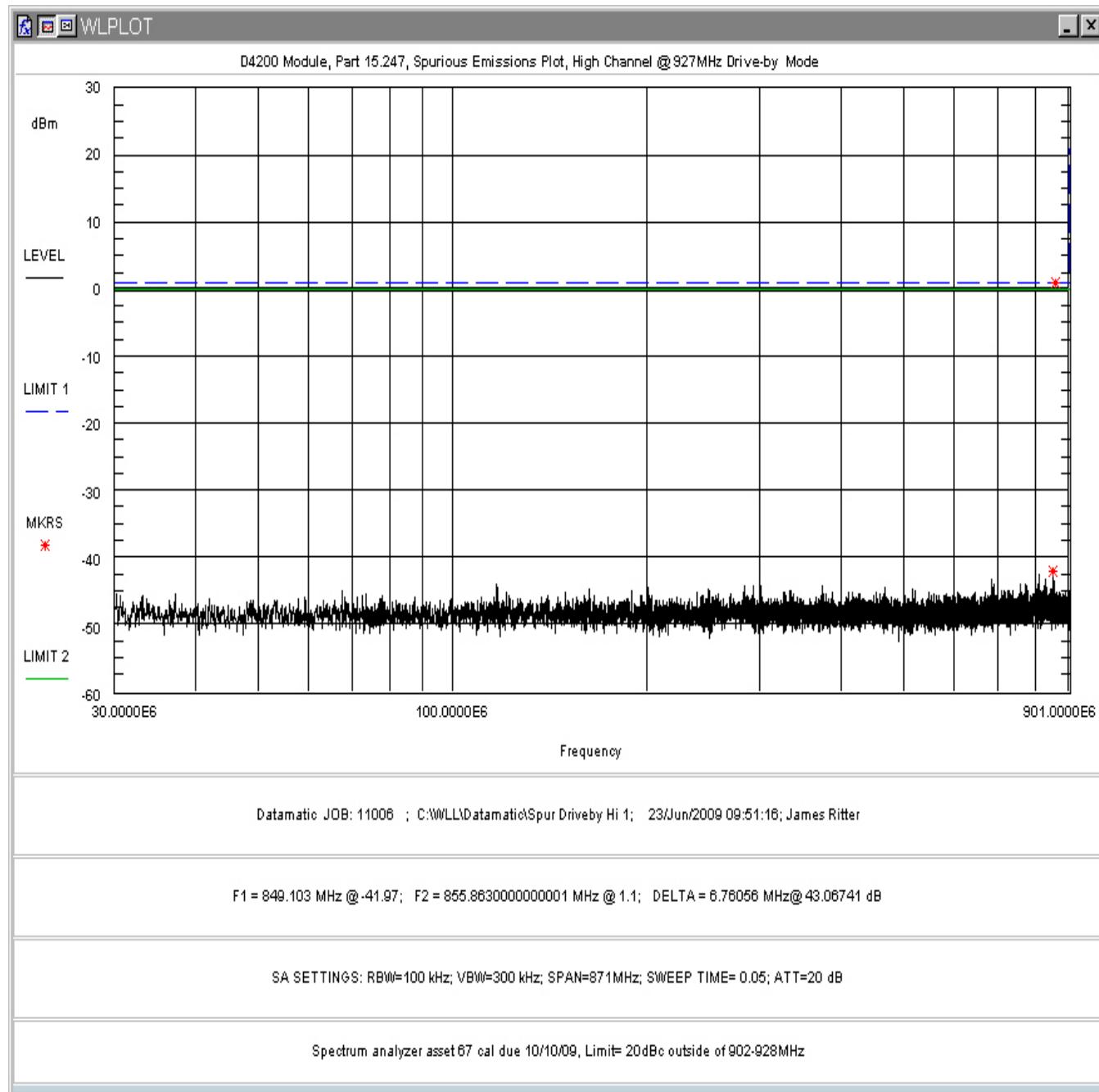


Figure 42: Conducted Spurious Emissions, High Channel 30 – 901MHz, Drive-by Mode

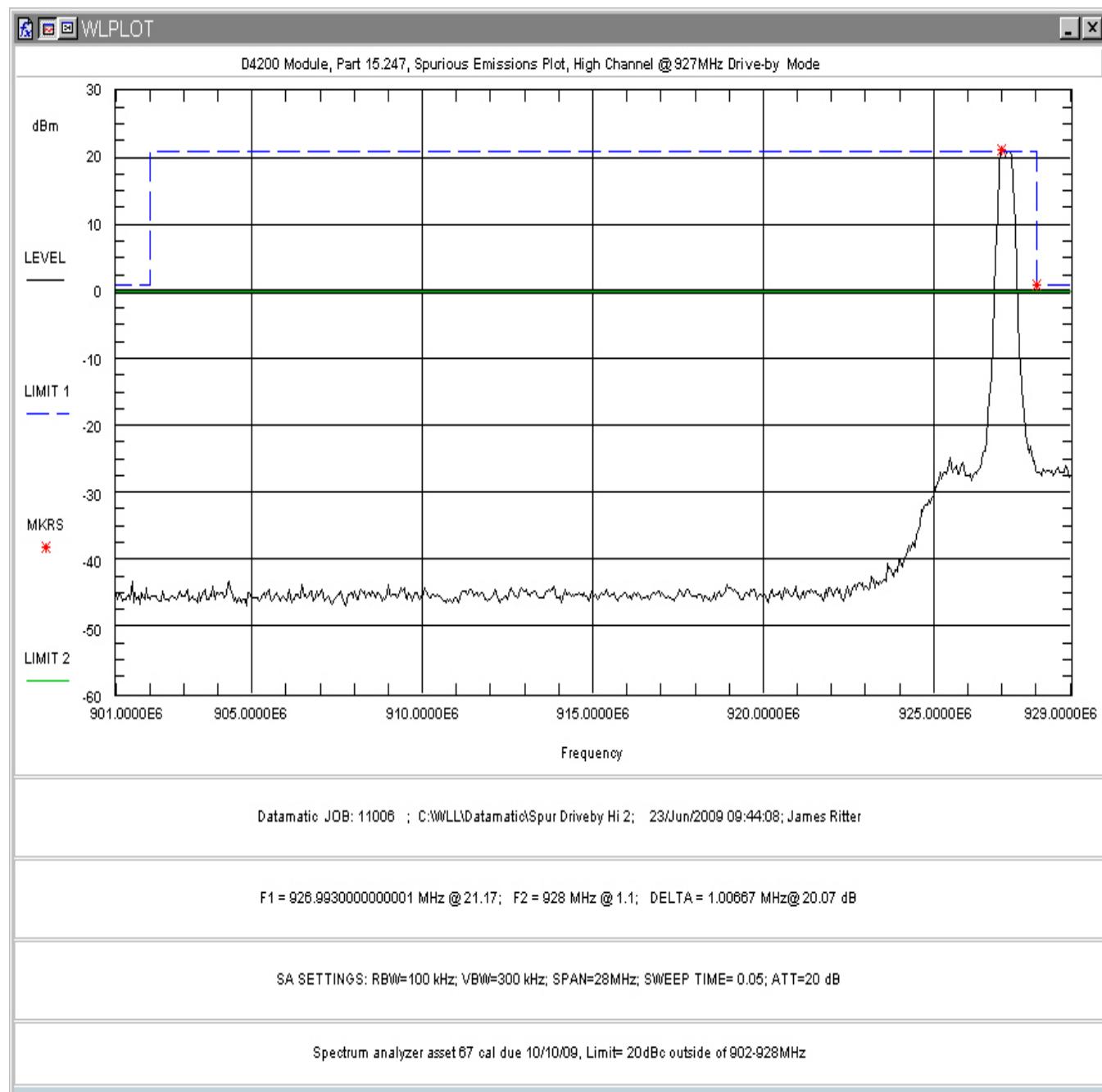


Figure 43: Conducted Spurious Emissions, High Channel 901 – 929MHz, Drive-by Mode

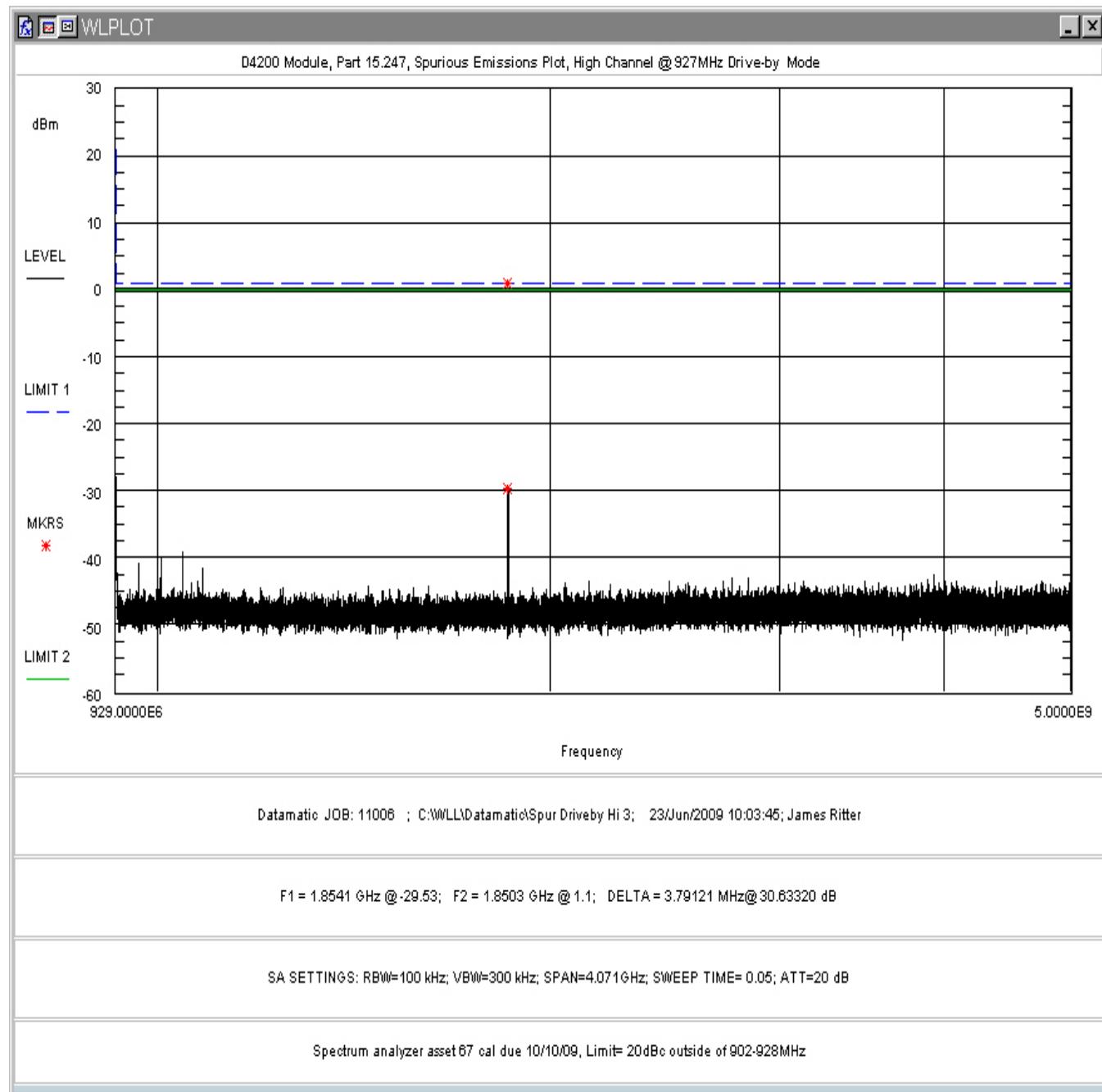


Figure 44: Conducted Spurious Emissions, High Channel 929MHz – 5GHz, Drive-by Mode

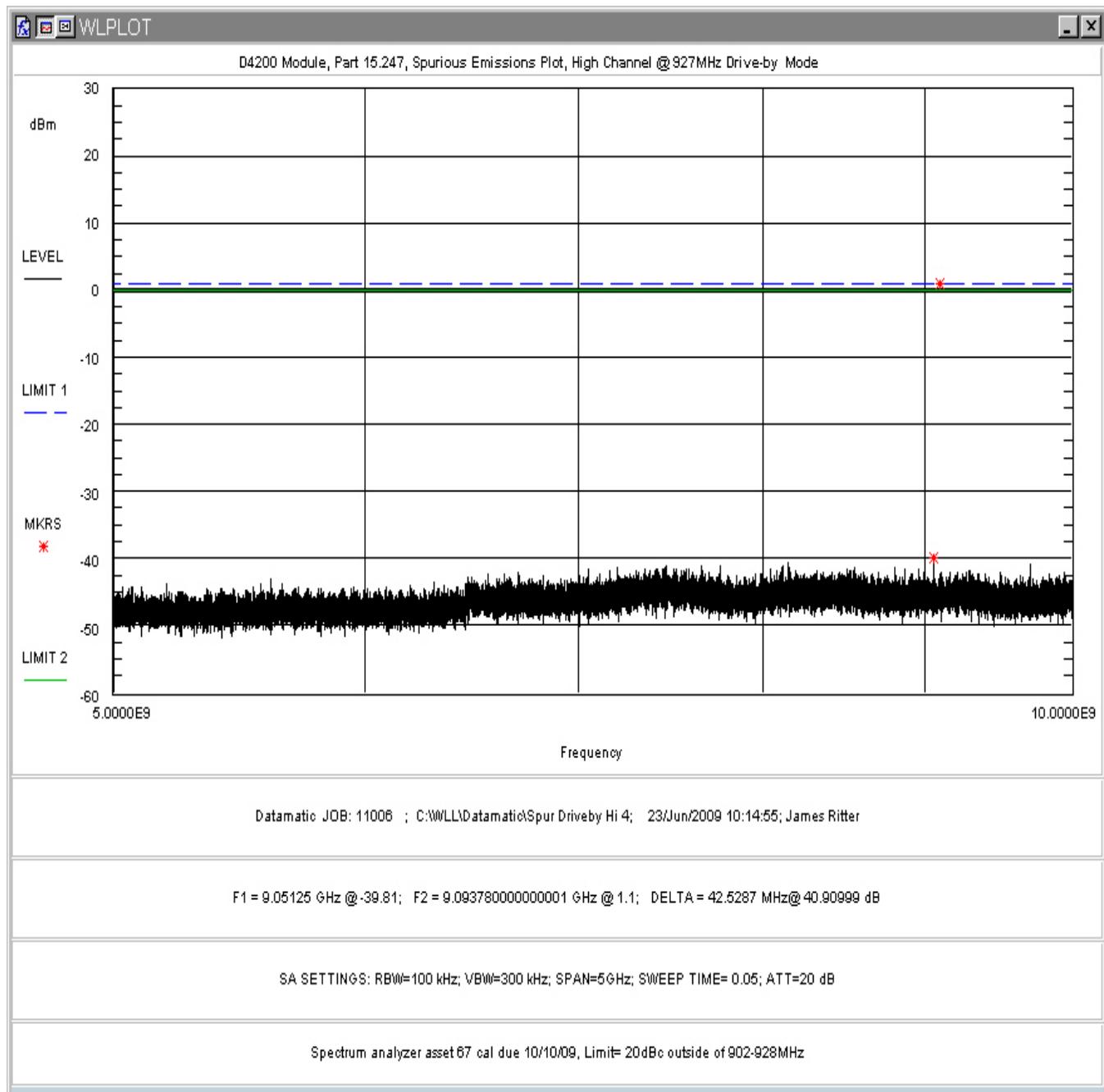


Figure 45: Conducted Spurious Emissions, High Channel 5 - 10GHz, Drive-by Mode

4.7 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.

4.7.1 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 EUT was tested in three orthogonals to determine the angle of maximum emissions. The worst case emissions are reported.

The emissions were measured using the following resolution bandwidths:

Table 7: Spectrum Analyzer Settings

Frequency Range	Resolution Bandwidth	Video Bandwidth
30MHz-1000 MHz	120kHz	>100 kHz
>1000 MHz	1 MHz	10 Hz (Avg.), 1MHz (Peak)

Table 8: Radiated Emission Test Data, (Rx only)

Frequency (MHz)	Polarity H/V	Azimuth (Degree)	Ant. Height (m)	SA Level (dBuV)	Corr. Factors (dB)	Corr. Level (uV/m)	Limit (uV/m)	Margin (dB)	Comments
38.10	V	0.00	1.00	7.90	15.9	15.6	100.0	-16.2	
157.86	V	180.00	1.00	8.80	13.4	12.9	150.0	-21.3	
247.90	V	95.00	1.70	6.00	13.6	9.6	200.0	-26.4	
352.76	V	90.00	1.50	5.40	17.8	14.5	200.0	-22.8	
614.00	V	0.00	1.00	5.00	23.2	25.8	200.0	-17.8	
960.00	V	0.00	1.00	5.00	0.0	1.8	500.0	-49.0	
965.95	V	145.00	1.00	12.80	28.5	116.4	500.0	-12.7	
38.10	H	180.00	4.00	5.40	15.9	11.7	100.0	-18.7	
157.86	H	90.00	4.00	10.20	13.4	15.1	150.0	-19.9	
297.90	H	270.00	2.20	1.40	16.3	7.7	200.0	-28.3	
352.76	H	0.00	2.60	3.90	17.8	12.2	200.0	-24.3	
392.82	H	85.00	3.28	12.40	18.6	35.7	200.0	-15.0	
614.00	H	0.00	4.00	1.00	23.2	16.3	200.0	-21.8	
960.00	H	0.00	4.00	1.00	28.5	29.9	500.0	-24.5	

Table 9: Radiated Emission Test Data, High Frequency Data (Restricted Bands)
TX Frequency = 902.5MHz

Frequency (MHz)	Polarity H/V	Azimuth (Degree)	Ant. Height (m)	SA Level (dBuV)	Corr Factors (dB)	Corr. Level (uV/m)	Limit (uV/m)	Margin (dB)	Comments
Y									
960.00	V	0.00	1.00	5.00	0.0	1.8	500.0	-49.0	Band Edge
614.00	V	0.00	1.00	5.00	0.0	1.8	200.0	-41.0	Band Edge
38.10	V	0.00	1.00	7.90	0.0	2.5	100.0	-32.1	
980.52	V	90.00	1.00	9.20	0.0	2.9	500.0	-44.8	
1116.93	V	90.00	1.84	47.70	-8.4	92.1	5000.0	-34.7	Peak
1353.72	V	270.00	2.10	58.00	-6.8	363.3	5000.0	-22.8	Peak
2707.50	V	180.00	1.30	49.50	-1.8	242.6	5000.0	-26.3	Peak
3610.00	V	90.00	1.27	46.50	-0.2	206.0	5000.0	-27.7	Peak
4512.50	V	90.00	1.30	53.20	1.8	559.4	5000.0	-19.0	Peak
5415.00	V	220.00	1.20	45.70	3.8	297.7	5000.0	-24.5	Peak
8122.50	V	250.00	1.28	44.80	8.8	478.6	5000.0	-20.4	Peak
9025.00	V	230.00	1.25	44.60	9.7	516.6	5000.0	-19.7	Peak
1116.93	V	90.00	1.84	33.30	-8.4	17.6	500.0	-29.1	AVG
1353.72	V	270.00	2.10	52.00	-6.8	182.1	500.0	-8.8	AVG
2707.50	V	180.00	1.30	36.20	-1.8	52.5	500.0	-19.6	AVG
3610.00	V	90.00	1.27	33.50	-0.2	46.1	500.0	-20.7	AVG
4512.50	V	90.00	1.30	37.30	1.8	89.7	500.0	-14.9	AVG
5415.00	V	220.00	120.00	32.50	3.8	65.1	500.0	-17.7	AVG
8122.50	V	250.00	1.28	34.70	8.8	149.6	500.0	-10.5	AVG
9025.00	V	230.00	1.25	33.70	9.7	147.3	500.0	-10.6	AVG
38.10	H	180.00	4.00	5.40	0.0	1.9	100.0	-34.6	
614.00	H	0.00	1.00	5.00	0.0	1.8	200.0	-41.0	Band Edge
960.00	V	0.00	1.00	5.00	0.0	1.8	500.0	-49.0	Band Edge
1353.72	H	185.00	2.00	71.00	-6.8	1622.8	5000.0	-9.8	Peak
2707.50	H	45.00	1.50	50.80	-1.8	281.8	5000.0	-25.0	Peak
3610.00	H	0.00	1.53	50.30	-0.2	319.0	5000.0	-23.9	Peak
4512.50	H	45.00	1.70	54.80	1.8	672.5	5000.0	-17.4	Peak
5415.00	H	90.00	1.80	45.60	3.8	294.3	5000.0	-24.6	Peak
8122.50	H	90.00	1.80	43.70	8.8	421.7	5000.0	-21.5	Peak
9025.00	H	85.00	1.80	45.20	9.7	553.5	5000.0	-19.1	Peak
1353.72	H	185.00	2.00	59.80	-6.8	447.0	500.0	-1.0	AVG
2707.50	H	45.00	1.50	46.80	-1.8	177.8	500.0	-9.0	AVG
3610.00	H	0.00	1.53	45.70	-0.2	187.9	500.0	-8.5	AVG
4512.50	H	45.00	1.70	52.00	1.8	487.2	500.0	-0.2	AVG
5415.00	H	90.00	1.80	36.30	3.8	100.9	500.0	-13.9	AVG
8122.50	H	90.00	1.80	34.20	8.8	141.3	500.0	-11.0	AVG
9025.00	H	85.00	1.80	34.80	9.7	167.2	500.0	-9.5	AVG

Table 10: Radiated Emission Test Data, High Frequency Data (Restricted Bands)
TX Frequency = 915MHz

Frequency (MHz)	Polarity H/V	Azimuth (Degree)	Ant. Height (m)	SA Level (dBuV)	Corr Factors (dB)	Corr. Level (uV/m)	Limit (uV/m)	Margin (dB)	Comments
Y									
960.00	V	0.00	1.00	5.00	0.0	1.8	500.0	-49.0	Band Edge
614.00	V	0.00	1.00	5.00	0.0	1.8	200.0	-41.0	Band Edge
38.10	V	0.00	1.00	7.90	0.0	2.5	100.0	-32.1	
992.93	V	120.00	1.14	12.30	0.0	4.1	500.0	-41.7	
2745.00	V	60.00	1.78	56.80	-1.7	567.3	5000.0	-18.9	Peak
3660.00	V	345.00	1.73	49.20	-0.1	284.3	5000.0	-24.9	Peak
4575.00	V	60.00	1.75	52.70	1.9	536.7	5000.0	-19.4	Peak
7320.00	V	270.00	1.70	51.00	8.3	927.4	5000.0	-14.6	Peak
8235.00	V	80.00	1.70	44.30	8.9	458.5	5000.0	-20.8	Peak
9150.00	V	180.00	1.75	42.50	9.9	415.6	5000.0	-21.6	Peak
2745.00	V	60.00	1.78	54.70	-1.7	445.4	500.0	-1.0	AVG
3660.00	V	345.00	1.73	43.30	-0.1	144.1	500.0	-10.8	AVG
4575.00	V	60.00	1.75	48.80	1.9	342.5	500.0	-3.3	AVG
7320.00	V	270.00	1.70	45.20	8.3	475.6	500.0	-0.4	AVG
8235.00	V	80.00	1.70	31.10	8.9	100.3	500.0	-14.0	AVG
9150.00	V	180.00	1.75	31.20	9.9	113.2	500.0	-12.9	AVG
960.00	H	0.00	4.00	1.00	0.0	1.1	500.0	-53.0	Band Edge
614.00	H	0.00	4.00	1.00	0.0	1.1	200.0	-45.0	
38.10	H	180.00	4.00	5.40	0.0	1.9	100.0	-34.6	
988.74	H	180.00	2.57	11.30	0.0	3.7	500.0	-42.7	
992.93	H	180.00	2.56	15.00	0.0	5.6	500.0	-39.0	
2745.00	H	250.00	1.70	52.70	-1.7	353.8	5000.0	-23.0	Peak
3660.00	H	190.00	1.55	48.00	-0.1	247.6	5000.0	-26.1	Peak
4575.00	H	125.00	1.80	52.60	1.9	530.5	5000.0	-19.5	Peak
7320.00	H	120.00	1.80	49.20	8.3	753.8	5000.0	-16.4	Peak
8235.00	H	45.00	1.84	44.70	8.9	480.1	5000.0	-20.4	Peak
9150.00	H	0.00	1.78	44.00	9.9	494.0	5000.0	-20.1	Peak
2745.00	H	250.00	1.70	48.80	-1.7	225.8	500.0	-6.9	AVG
3660.00	H	190.00	1.55	42.70	-0.1	134.5	500.0	-11.4	AVG
4575.00	H	125.00	1.80	49.00	1.9	350.5	500.0	-3.1	AVG
7320.00	H	120.00	1.80	44.30	8.3	428.8	500.0	-1.3	AVG
8235.00	H	45.00	1.84	33.80	8.9	136.9	500.0	-11.3	AVG
9150.00	H	0.00	1.78	33.20	9.9	142.5	500.0	-10.9	AVG

Table 11: Radiated Emission Test Data, High Frequency Data (Restricted Bands)
TX Frequency = 927MHz

Frequency (MHz)	Polarity H/V	Azimuth (Degree)	Ant. Height (m)	SA Level (dBuV)	Corr Factors (dB)	Corr. Level (uV/m)	Limit (uV/m)	Margin (dB)	Comments
Y									
960.00	V	0.00	1.00	5.00	0.0	1.8	500.0	-49.0	Band Edge
614.00	H	0.00	4.00	1.00	0.0	1.1	200.0	-45.0	Band Edge
38.10	V	0.00	1.00	7.90	0.0	2.5	100.0	-32.1	
992.93	V	120.00	1.14	12.30	0.0	4.1	500.0	-41.7	
2781.00	V	175.00	1.48	53.20	-1.7	377.9	5000.0	-22.4	Peak
3708.00	V	300.00	1.50	51.70	0.0	383.3	5000.0	-22.3	Peak
4635.00	V	350.00	1.50	51.70	2.0	485.7	5000.0	-20.3	Peak
7416.00	V	270.00	1.50	43.00	8.5	375.6	5000.0	-22.5	Peak
8343.00	V	0.00	1.50	43.00	9.0	400.3	5000.0	-21.9	Peak
9270.00	V	0.00	1.50	43.00	10.1	450.5	5000.0	-20.9	Peak
2781.00	V	175.00	1.48	50.50	-1.7	277.0	500.0	-5.1	AVG
3708.00	V	300.00	1.50	47.50	0.0	236.3	500.0	-6.5	AVG
4635.00	V	350.00	1.50	46.80	2.0	276.3	500.0	-5.2	AVG
7416.00	V	270.00	1.50	35.70	8.5	162.1	500.0	-9.8	AVG
8343.00	V	0.00	1.50	32.20	9.0	115.4	500.0	-12.7	AVG
9270.00	V	0.00	1.50	31.20	10.1	115.8	500.0	-12.7	AVG
960.00	H	0.00	1.00	5.00	0.0	1.8	500.0	-49.0	Band Edge
614.00	H	0.00	4.00	1.00	0.0	1.1	200.0	-45.0	Band Edge
38.10	H	180.00	4.00	5.40	0.0	1.9	100.0	-34.6	
988.74	H	180.00	2.57	11.30	0.0	3.7	500.0	-42.7	
992.93	H	180.00	2.56	15.00	0.0	5.6	500.0	-39.0	
2781.00	H	380.00	1.62	52.80	-1.7	360.9	5000.0	-22.8	Peak
3708.00	H	190.00	1.60	50.20	0.0	322.5	5000.0	-23.8	Peak
4635.00	H	0.00	1.70	52.80	2.0	551.3	5000.0	-19.2	Peak
7416.00	H	125.00	1.76	46.00	8.5	530.6	5000.0	-19.5	Peak
8343.00	H	0.00	1.70	46.00	9.0	565.4	5000.0	-18.9	Peak
9270.00	H	0.00	1.70	43.70	10.1	488.4	5000.0	-20.2	Peak
2781.00	H	380.00	1.62	50.00	-1.7	261.5	500.0	-5.6	AVG
3708.00	H	190.00	1.60	46.00	0.0	198.9	500.0	-8.0	AVG
4635.00	H	0.00	1.70	49.80	2.0	390.3	500.0	-2.2	AVG
7416.00	H	125.00	1.76	37.30	8.5	194.9	500.0	-8.2	AVG
8343.00	H	0.00	1.70	32.30	9.0	116.8	500.0	-12.6	AVG
9270.00	H	0.00	1.70	32.70	10.1	137.6	500.0	-11.2	AVG