

**HUM-900-PRO-CAS
ANT-916-PW-LP
Protocol A**

FCC 15.247

Linx Technologies
 Hummingbird MCA
 Model: HUM-900-PRO-CAS
 Configuration: Module 3 - Protocol A

Date: 01/22/2015
 Lab: D
 Tested By: Kyle Fujimoto

Peak Output Power

Freq. (MHz)	Level (dBuV)	Level (V/m)	Antenna Gain (dBi)	Numeric Gain	Power Output (Watts)	Power Output (mW)	Power Output (dBm)	Comments
902.971	102.5	0.1333521	2.4	1.7378	0.0030699	3.06988	4.87	Vert. X-Axis
915	101.31	0.1162787	2.4	1.7378	0.0023341	2.33411	3.68	Vert. X-Axis
926.653	99.07	0.0898463	2.4	1.7378	0.0013935	1.39355	1.44	Vert. X-Axis
902.971	97.19	0.0723602	2.4	1.7378	0.0009039	0.9039	-0.44	Vert. Y-Axis
915	98.55	0.0846253	2.4	1.7378	0.0012363	1.23629	0.92	Vert. Y-Axis
926.653	98.92	0.088308	2.4	1.7378	0.0013462	1.34624	1.29	Vert. Y-Axis
902.971	103.77	0.1543476	2.4	1.7378	0.0041126	4.11265	6.14	Vert. Z-Axis
915	103.27	0.1457136	2.4	1.7378	0.0036654	3.6654	5.64	Vert. Z-Axis
926.653	102.42	0.1321296	2.4	1.7378	0.0030138	3.01385	4.79	Vert. Z-Axis
902.971	107.58	0.2393316	2.4	1.7378	0.0098883	9.88829	9.95	Horiz. X-Axis
915	107.15	0.2277718	2.4	1.7378	0.0089561	8.95615	9.52	Horiz. X-Axis
926.653	105.78	0.194536	2.4	1.7378	0.0065331	6.53313	8.15	Horiz. X-Axis
902.971	97.77	0.0773571	2.4	1.7378	0.001033	1.03305	0.14	Horiz. Y-Axis
915	98.03	0.0797076	2.4	1.7378	0.0010968	1.09678	0.40	Horiz. Y-Axis
926.653	97.86	0.0781628	2.4	1.7378	0.0010547	1.05468	0.23	Horiz. Y-Axis
902.971	106.6	0.2137962	2.4	1.7378	0.0078908	7.8908	8.97	Horiz. Z-Axis
915	104.8	0.1737801	2.4	1.7378	0.0052134	5.2134	7.17	Horiz. Z-Axis
926.653	103.61	0.1515305	2.4	1.7378	0.0039639	3.96389	5.98	Horiz. Z-Axis

The Power in Watts is obtained by the following Formula Below:

$$P = [(E \cdot D)^2] / (30 \cdot G)$$

P = Power in Watts

E = The Measured Maximum Field Strength in V/m

G = The Numeric Gain of the Transmitting Antenna over an Isotropic Radiator

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol A - Module 3
ANT-916-PW-LP Antenna

Date: 01/28/2015
Lab: B
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.94	38.49	V	82.5	-44.01	Peak	1.25	315	Not in Restricted Band
2708.91	39.81	V	74	-34.19	Peak	1.25	45	
2708.91	25.82	V	54	-28.18	Avg	1.25	45	
3611.88	47.97	V	74	-26.03	Peak	1.35	155	
3611.88	38.48	V	54	-15.52	Avg	1.35	155	
4514.86	45.48	V	74	-28.52	Peak	1.25	180	
4514.86	38.08	V	54	-15.92	Avg	1.25	180	
5417.83	48.89	V	74	-25.11	Peak	1.25	135	
5417.83	36.37	V	54	-17.63	Avg	1.25	135	
6320.8	44.61	V	82.5	-37.89	Peak	1.25	135	Not in Restricted Band
7223.77								No Emissions Detected
8126.74								No Emissions Detected
9029.71								No Emissions Detected

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Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol A - Module 3
ANT-916-PW-LP Antenna

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**Low Channel
Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.94	42.83	V	77.19	-34.36	Peak	1.25	45	Not in Restricted Band
2708.91	39.71	V	74	-34.29	Peak	1.5	135	
2708.91	27.05	V	54	-26.95	Avg	1.5	135	
3611.88	45.72	V	74	-28.28	Peak	1.25	135	
3611.88	36.11	V	54	-17.89	Avg	1.25	135	
4514.86	42.74	V	74	-31.26	Peak	1.35	145	
4514.86	31.21	V	54	-22.79	Avg	1.35	145	
5417.83	46.52	V	74	-27.48	Peak	1.25	315	
5417.83	32.82	V	54	-21.18	Avg	1.25	315	
6320.8	48.38	V	77.19	-28.81	Peak	1.35	135	Not in Restricted Band
7223.77								No Emissions Detected
8126.74								No Emissions Detected
9029.71								No Emissions Detected

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**Low Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.94	39.17	V	83.77	-44.6	Peak	1.25	155	Not in Restricted Band
2708.91	40.93	V	74	-33.07	Peak	1.25	155	
2708.91	29.55	V	54	-24.45	Avg	1.25	155	
3611.88	47.47	V	74	-26.53	Peak	1.35	155	
3611.88	42.44	V	54	-11.56	Avg	1.35	155	
4514.86	47.14	V	74	-26.86	Peak	1.25	165	
4514.86	39.35	V	54	-14.65	Avg	1.25	165	
5417.83	47.15	V	74	-26.85	Peak	1.35	175	
5417.83	35.57	V	54	-18.43	Avg	1.35	175	
6320.8	51.23	V	83.77	-32.54	Peak	1.25	185	Not in Restricted Band
7223.77								No Emissions Detected
8126.74								No Emissions Detected
9029.71								No Emissions Detected

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**Low Channel
Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.94	40.31	H	87.58	-47.27	Peak	1.25	315	Not in Restricted Band
2708.91	40.77	H	74	-33.23	Peak	1.35	125	
2708.91	26.29	H	54	-27.71	Avg	1.35	125	
3611.88	47.46	H	74	-26.54	Peak	1.25	165	
3611.88	40.69	H	54	-13.31	Avg	1.25	165	
4514.86	45.08	H	74	-28.92	Peak	1.35	175	
4514.86	32.57	H	54	-21.43	Avg	1.35	175	
5417.83	48.67	H	74	-25.33	Peak	1.25	185	
5417.83	36.33	H	54	-17.67	Avg	1.25	185	
6320.8	51.2	H	87.58	-36.38	Peak	1.25	135	Not in Restricted Band
7223.77								No Emissions Detected
8126.74								No Emissions Detected
9029.71								No Emissions Detected

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 Hummingbird MCA Module
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**Low Channel
Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.94	41.22	H	77.77	-36.55	Peak	1.25	180	Not in Restricted Band
2708.91	39.88	H	74	-34.12	Peak	1.35	135	
2708.91	29.88	H	54	-24.12	Avg	1.35	135	
3611.88	48.92	H	74	-25.08	Peak	1.25	135	
3611.88	44.12	H	54	-9.88	Avg	1.25	135	
4514.86	44.41	H	74	-29.59	Peak	1.35	135	
4514.86	35.16	H	54	-18.84	Avg	1.35	135	
5417.83	46.51	H	74	-27.49	Peak	1.25	225	
5417.83	35.17	H	54	-18.83	Avg	1.25	225	
6320.8	51.46	H	77.77	-26.31	Peak	1.35	225	Not in Restricted Band
7223.77								No Emissions Detected
8126.74								No Emissions Detected
9029.71								No Emissions Detected

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Linx Technologies
Hummingbird MCA Module
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**Low Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.94	43.64	H	86.6	-42.96	Peak	1.25	225	Not in Restricted Band
2708.91	44.21	H	74	-29.79	Peak	1.35	265	
2708.91	25.58	H	54	-28.42	Avg	1.35	265	
3611.88	46.86	H	74	-27.14	Peak	1.25	275	
3611.88	40.14	H	54	-13.86	Avg	1.25	275	
4514.86	45.39	H	74	-28.61	Peak	1.35	285	
4514.86	37.21	H	54	-16.79	Avg	1.35	285	
5417.83	48.59	H	74	-25.41	Peak	1.25	45	
5417.83	34.37	H	54	-19.63	Avg	1.25	45	
6320.8	50.01	H	86.6	-36.59	Peak	1.35	75	Not in Restricted Band
7223.77								No Emissions Detected
8126.74								No Emissions Detected
9029.71								No Emissions Detected

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Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol A - Module 3
ANT-916-PW-LP Antenna

Date: 01/28/2015
Lab: B
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Middle Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1830	40.43	V	81.31	-40.88	Peak	1.25	225	Not in Restricted Band
2745	41.09	V	74	-32.91	Peak	1.25	165	
2745	26.59	V	54	-27.41	Avg	1.25	165	
3660	46.26	V	74	-27.74	Peak	1.35	135	
3660	38.89	V	54	-15.11	Avg	1.35	135	
4575	47.79	V	74	-26.21	Peak	1.25	125	
4575	34.21	V	54	-19.79	Avg	1.25	125	
5490	48.11	V	74	-25.89	Peak	1.35	165	
5490	33.04	V	54	-20.96	Avg	1.35	165	
6405	51.79	V	81.31	-29.52	Peak	1.25	175	Not in Restricted Band
7320								No Emissions Detected
7320								
8235								No Emissions Detected
8235								
9150								No Emissions Detected
9150								

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Middle Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1830	45.65	V	78.55	-32.9	Peak	1.25	45	Not in Restricted Band
2745	41.79	V	74	-32.21	Peak	1.25	135	
2745	29.25	V	54	-24.75	Avg	1.25	135	
3660	46.04	V	74	-27.96	Peak	1.35	135	
3660	37.29	V	54	-16.71	Avg	1.35	135	
4575	45.54	V	74	-28.46	Peak	1.25	145	
4575	36.12	V	54	-17.88	Avg	1.25	145	
5490	48.14	V	74	-25.86	Peak	1.35	155	
5490	33.21	V	54	-20.79	Avg	1.35	155	
6405	51.55	V	78.55	-27	Peak	1.25	145	Not in Restricted Band
7320								No Emissions Detected
8235								No Emissions Detected
9150								No Emissions Detected

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Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol A - Module 3
ANT-916-PW-LP Antenna

Date: 01/28/2015
Lab: B
Tested By: Kyle Fujimoto

**Middle Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1830	41.71	V	83.27	-41.56	Peak	1.25	135	Not in Restricted Band
2745	41.43	V	74	-32.57	Peak	1.35	225	
2745	29.58	V	54	-24.42	Avg	1.35	225	
3660	46.66	V	74	-27.34	Peak	1.25	225	
3660	39.33	V	54	-14.67	Avg	1.25	225	
4575	46.71	V	74	-27.29	Peak	1.35	0	
4575	38.49	V	54	-15.51	Avg	1.35	0	
5490	49.26	V	74	-24.74	Peak	1.25	155	
5490	34.71	V	54	-19.29	Avg	1.25	155	
6405	51.39	V	83.27	-31.88	Peak	1.25	135	Not in Restricted Band
7320								No Emissions Detected
8235								No Emissions Detected
9150								No Emissions Detected

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Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol A - Module 3
ANT-916-PW-LP Antenna

Date: 01/28/2015
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**Middle Channel
Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1830	43.08	H	87.15	-44.07	Peak	1.25	155	Not in Restricted Band
2745	40.22	H	74	-33.78	Peak	1.25	155	
2745	27.27	H	54	-26.73	Avg	1.25	155	
3660	45.83	H	74	-28.17	Peak	1.15	135	
3660	39.13	H	54	-14.87	Avg	1.15	135	
4575	47.27	H	74	-26.73	Peak	1.25	0	
4575	39.33	H	54	-14.67	Avg	1.25	0	
5490	47.97	H	74	-26.03	Peak	1.35	125	
5490	34.31	H	54	-19.69	Avg	1.35	125	
6405	51.04	H	87.15	-36.11	Peak	1.25	145	Not in Restricted Band
7320								No Emissions Detected
8235								No Emissions Detected
9150								No Emissions Detected

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Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol A - Module 3
ANT-916-PW-LP Antenna

Date: 01/28/2015
Lab: B
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1830	40.11	H	78.03	-37.92	Peak	1.25	135	Not in Restricted Band
2745	41.42	H	74	-32.58	Peak	1.25	315	
2745	27.78	H	54	-26.22	Avg	1.25	315	
3660	47.53	H	74	-26.47	Peak	1.35	180	
3660	40.35	H	54	-13.65	Avg	1.35	180	
4575	44.81	H	74	-29.19	Peak	1.25	180	
4575	35.18	H	54	-18.82	Avg	1.25	180	
5490	48.46	H	74	-25.54	Peak	1.35	135	
5490	35.35	H	54	-18.65	Avg	1.35	135	
6405	51.21	H	78.03	-26.82	Peak	1.25	145	Not in Restricted Band
7320								No Emissions Detected
8235								No Emissions Detected
9150								No Emissions Detected

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Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol A - Module 3
ANT-916-PW-LP Antenna

Date: 01/28/2015

Lab: B

Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1830	44.78	H	84.8	-40.02	Peak	1.25	135	Not in Restricted Band
2745	41.66	H	74	-32.34	Peak	1.35	90	
2745	30.55	H	54	-23.45	Avg	1.35	90	
3660	47.21	H	74	-26.79	Peak	1.25	135	
3660	40.34	H	54	-13.66	Avg	1.25	135	
4575	46.42	H	74	-27.58	Peak	1.25	145	
4575	38.41	H	54	-15.59	Avg	1.25	145	
5490	49.06	H	74	-24.94	Peak	1.35	225	
5490	38.02	H	54	-15.98	Avg	1.35	225	
6405	51.92	H	84.8	-32.88	Peak	1.25	135	Not in Restricted Band
7320								No Emissions Detected
8235								No Emissions Detected
9150								No Emissions Detected

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Linx Technologies
 Hummingbird MCA Module
 Model: HUM-900-PRO-CAS
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 ANT-916-PW-LP Antenna

Date: 01/28/2015
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 Tested By: Kyle Fujimoto

High Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1853.3	42.85	V	79.07	-36.22	Peak	1.25	155	Not in Restricted Band
2779.9	41.21	V	74	-32.79	Peak	1.25	165	
2779.9	26.43	V	54	-27.57	Avg	1.25	165	
3706.6	45.65	V	74	-28.35	Peak	1.35	175	
3706.6	35.34	V	54	-18.66	Avg	1.35	175	
4633.25	48.24	V	74	-25.76	Peak	1.25	0	
4633.25	42.91	V	54	-11.09	Avg	1.25	0	
5559.9	48.72	V	74	-25.28	Peak	1.35	225	
5559.9	37.32	V	54	-16.68	Avg	1.35	225	
6486.55	51.54	V	79.07	-27.53	Peak	1.25	135	Not in Restricted Band
7413.2								No Emissions Detected
8339.85								No Emissions Detected
9266.5								No Emissions Detected

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High Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1853.3	45.07	V	78.92	-33.85	Peak	1.25	180	Not in Restricted Band
2779.9	40.21	V	74	-33.79	Peak	1.75	135	
2779.9	27.37	V	54	-26.63	Avg	1.75	135	
3706.6	43.62	V	74	-30.38	Peak	1.25	145	
3706.6	29.64	V	54	-24.36	Avg	1.25	145	
4633.25	44.76	V	74	-29.24	Peak	1.35	225	
4633.25	30.82	V	54	-23.18	Avg	1.35	225	
5559.9	48.72	V	74	-25.28	Peak	1.25	135	
5559.9	36.18	V	54	-17.82	Avg	1.25	135	
6486.55	51.34	V	78.92	-27.58	Peak	1.35	125	Not in Restricted Band
7413.2								No Emissions Detected
8339.85								No Emissions Detected
9266.5								No Emissions Detected

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**High Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1853.3	42.19	V	82.42	-40.23	Peak	1.25	45	Not in Restricted Band
2779.9	42.19	V	74	-31.81	Peak	1.35	145	
2779.9	32.53	V	54	-21.47	Avg	1.35	145	
3706.6	47.95	V	74	-26.05	Peak	1.25	155	
3706.6	41.79	V	54	-12.21	Avg	1.25	155	
4633.25	48.59	V	74	-25.41	Peak	1.35	0	
4633.25	42.62	V	54	-11.38	Avg	1.35	0	
5559.9	50.45	V	74	-23.55	Peak	1.25	90	
5559.9	38.04	V	54	-15.96	Avg	1.25	90	
6486.55	52.21	V	82.42	-30.21	Peak	1.25	90	Not in Restricted Band
7413.2								No Emissions Detected
8339.85								No Emissions Detected
9266.5								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol A - Module 3
ANT-916-PW-LP Antenna

Date: 01/28/2015
Lab: B
Tested By: Kyle Fujimoto

**High Channel
Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1853.3	46.08	H	85.78	-39.7	Peak	1.25	45	Not in Restricted Band
2779.9	41.01	H	74	-32.99	Peak	1.25	155	
2779.9	25.42	H	54	-28.58	Avg	1.25	155	
3706.6	46.57	H	74	-27.43	Peak	1.5	135	
3706.6	39.84	H	54	-14.16	Avg	1.5	135	
4633.25	45.64	H	74	-28.36	Peak	1.75	180	
4633.25	37.56	H	54	-16.44	Avg	1.75	180	
5559.9	49.16	H	74	-24.84	Peak	1.25	180	
5559.9	36.11	H	54	-17.89	Avg	1.25	180	
6486.55	51.81	H	85.78	-33.97	Peak	1.25	225	Not in Restricted Band
7413.2								No Emissions Detected
7413.2								
8339.85								No Emissions Detected
8339.85								
9266.5								No Emissions Detected
9266.5								

FCC 15.247

Linx Technologies
 Hummingbird MCA Module
 Model: HUM-900-PRO-CAS
 Configuration: Protocol A - Module 3
 ANT-916-PW-LP Antenna

Date: 01/28/2015
 Lab: B
 Tested By: Kyle Fujimoto

**High Channel
Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1853.3	42.19	H	77.86	-35.67	Peak	1.25	315	Not in Restricted Band
2779.9	40.89	H	74	-33.11	Peak	1.25	135	
2779.9	30.47	H	54	-23.53	Avg	1.25	135	
3706.6	45.64	H	74	-28.36	Peak	1.35	225	
3706.6	35.86	H	54	-18.14	Avg	1.35	225	
4633.25	45.94	H	74	-28.06	Peak	1.25	155	
4633.25	35.45	H	54	-18.55	Avg	1.25	155	
5559.9	50.93	H	74	-23.07	Peak	1.35	225	
5559.9	39.74	H	54	-14.26	Avg	1.35	225	
6486.55	53.22	H	77.86	-24.64	Peak	1.25	225	Not in Restricted Band
7413.2								No Emissions Detected
8339.85								No Emissions Detected
9266.5								No Emissions Detected

FCC 15.247

Linx Technologies
 Hummingbird MCA Module
 Model: HUM-900-PRO-CAS
 Configuration: Protocol A - Module 3
 ANT-916-PW-LP Antenna

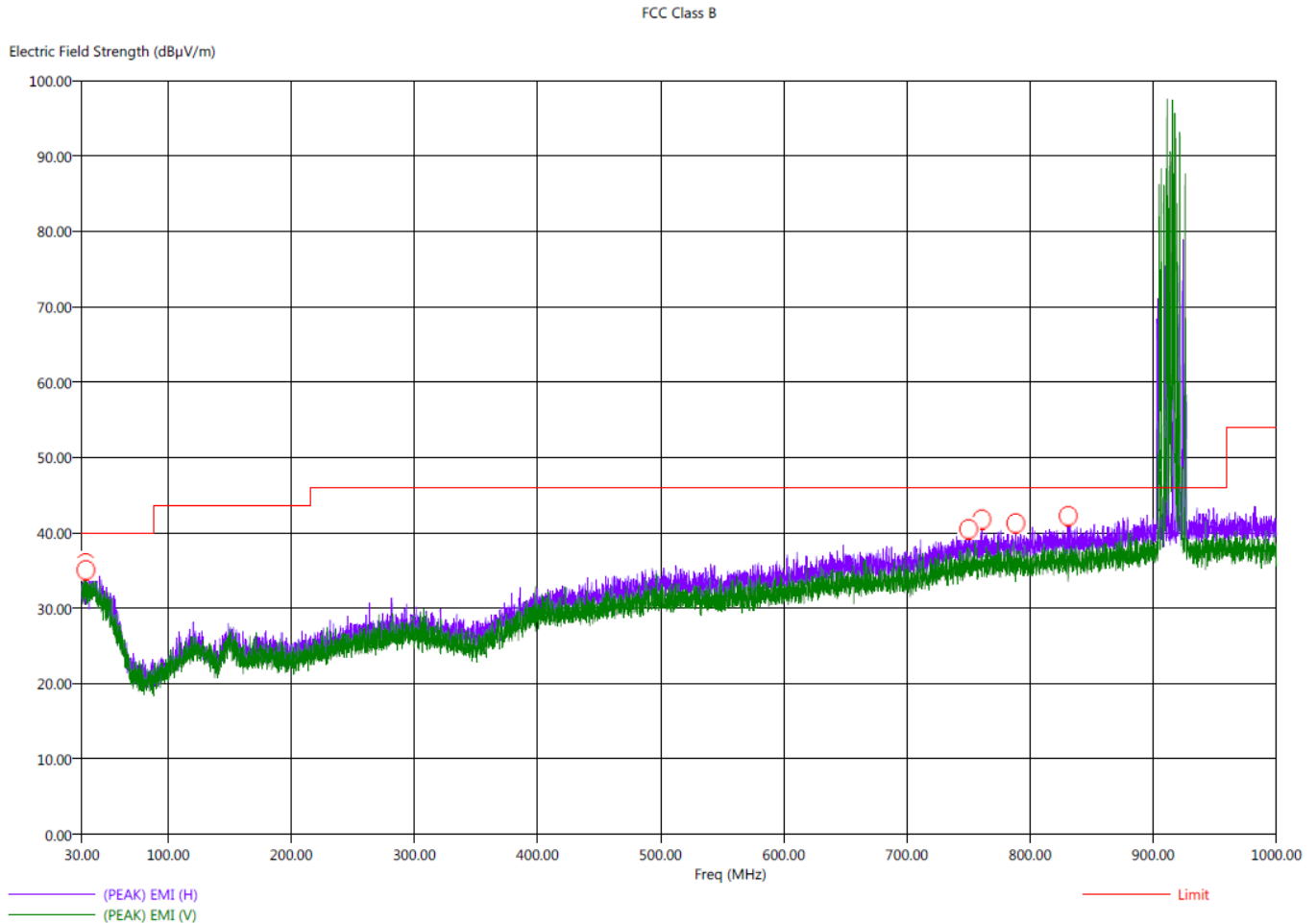
Date: 01/28/2015
 Lab: B
 Tested By: Kyle Fujimoto

**High Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1853.3	45.94	H	83.61	-37.67	Peak	1.25	135	Not in Restricted Band
2779.9	41.62	H	74	-32.38	Peak	1.35	135	
2779.9	26.82	H	54	-27.18	Avg	1.35	135	
3706.6	46.91	H	74	-27.09	Peak	1.25	145	
3706.6	35.71	H	54	-18.29	Avg	1.25	145	
4633.25	46.42	H	74	-27.58	Peak	1.35	155	
4633.25	32.26	H	54	-21.74	Avg	1.35	155	
5559.9	49.74	H	74	-24.26	Peak	1.25	145	
5559.9	35.94	H	54	-18.06	Avg	1.25	145	
6486.55	52.55	H	83.61	-31.06	Peak	1.35	155	Not in Restricted Band
7413.2								No Emissions Detected
8339.85								No Emissions Detected
9266.5								No Emissions Detected

Title: Pre-Scan - FCC Class B
File: Agilent - Radiated Pre-Scan 30-1000Mhz - FCC Class B_Module_3_Protocol_A_Z-Axis_02-05-2015.set
Operator: Kenneth Lee
EUT Type: Hummingbird MCA
EUT Condition: Continuously Transmitting - Frequency Hopping - Protocol A - Module 3 - Z-Axis - Worst Case
Comments: Customer: Linx Technologies
M/N: HUM-900-PRO-CAS
Note: Antenna - ANT-916-PW-LP

2/5/2015 6:26:33 PM
Sequence: Preliminary Scan

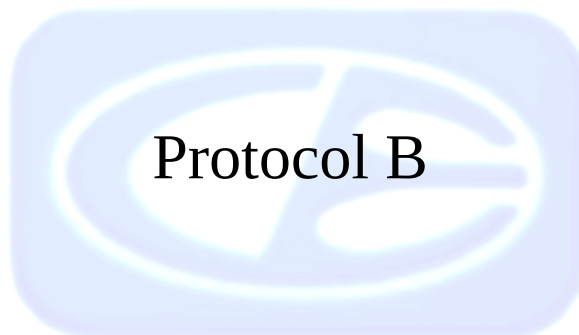


Title: Radiated Final - 30-1000 MHz - FCC Class B
File: Agilent - Radiated Final Scan 30-1000Mhz - FCC Class B_Module 3_Protocol_A_Z-Axis_02-05-2015.set
Operator: Kenneth Lee
EUT Type: Hummingbird MCA
EUT Condition: Continuously Transmitting - Frequency Hopping - Protocol A - Module 3 - Z-Axis - Worst Case
Comments: Customer: Linx Technologies
M/N: HUM-900-PRO-CAS
Note: Antenna - ANT-916-PW-LP

2/5/2015 6:40:39 PM
Sequence: Final Measurements

Final Scan - FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBμV/m)	(OP) EMI (dBμV/m)	(PEAK) Margin (dB)	(OP) Margin (dB)	Limit (dBμV/m)	Transducer (dB)	Cable (dB)	Twr Ht (cm)	Ttbl Aql (deg)
33.10	H	34.97	30.73	-5.03	-9.27	40.00	23.59	0.38	175.43	107.25
33.40	V	34.50	30.72	-5.50	-9.28	40.00	23.58	0.38	207.85	232.00
750.10	H	40.51	36.43	-5.49	-9.57	46.00	25.90	2.36	223.91	21.25
760.90	H	40.96	36.58	-5.04	-9.42	46.00	25.90	2.36	191.61	237.25
788.50	H	41.50	36.61	-4.50	-9.39	46.00	25.90	2.37	239.19	308.50
831.10	H	41.12	36.97	-4.88	-9.03	46.00	26.21	2.46	320.50	191.50



FCC 15.247

Linx Technologies
 Hummingbird MCA
 Model: HUM-900-PRO-CAS
 Configuration: Module 3 - Protocol B

Date: 01/21/2015
 Lab: D
 Tested By: Kyle Fujimoto

Peak Output Power

Freq. (MHz)	Level (dBuV)	Level (V/m)	Antenna Gain (dBi)	Numeric Gain	Power Output (Watts)	Power Output (mW)	Power Output (dBm)	Comments
902.971	102.6	0.1348963	2.4	1.7378	0.0031414	3.14139	4.97	Vert. X-Axis
915	100.4	0.1047129	2.4	1.7378	0.0018929	1.89287	2.77	Vert. X-Axis
926.277	98.41	0.0832722	2.4	1.7378	0.0011971	1.19707	0.78	Vert. X-Axis
902.971	100.4	0.1047129	2.4	1.7378	0.0018929	1.89287	2.77	Vert. Y-Axis
915	99.58	0.0952796	2.4	1.7378	0.0015672	1.56719	1.95	Vert. Y-Axis
926.277	99.93	0.0991973	2.4	1.7378	0.0016987	1.69872	2.30	Vert. Y-Axis
902.971	100.06	0.1006932	2.4	1.7378	0.0017503	1.75034	2.43	Vert. Z-Axis
915	101.01	0.1123311	2.4	1.7378	0.0021783	2.17832	3.38	Vert. Z-Axis
926.277	100.66	0.1078947	2.4	1.7378	0.0020097	2.00965	3.03	Vert. Z-Axis
902.971	106.26	0.2055891	2.4	1.7378	0.0072966	7.29661	8.63	Horiz. X-Axis
915	105.76	0.1940886	2.4	1.7378	0.0065031	6.50311	8.13	Horiz. X-Axis
926.277	106.66	0.2152782	2.4	1.7378	0.0080006	8.00058	9.03	Horiz. X-Axis
902.971	100.3	0.1035142	2.4	1.7378	0.0018498	1.84979	2.67	Horiz. Y-Axis
915	99.88	0.0986279	2.4	1.7378	0.0016793	1.67927	2.25	Horiz. Y-Axis
926.277	96	0.0630957	2.4	1.7378	0.0006873	0.68726	-1.63	Horiz. Y-Axis
902.971	104.15	0.1612501	2.4	1.7378	0.0044887	4.48871	6.52	Horiz. Z-Axis
915	104.88	0.1753881	2.4	1.7378	0.0053103	5.31033	7.25	Horiz. Z-Axis
926.277	104.97	0.1772148	2.4	1.7378	0.0054215	5.42152	7.34	Horiz. Z-Axis

The Power in Watts is obtained by the following Formula Below:

$$P = [(E \cdot D)^2] / (30 \cdot G)$$

P = Power in Watts

E = The Measured Maximum Field Strength in V/m

G = The Numeric Gain of the Transmitting Antenna over an Isotropic Radiator

FCC 15.247

Linx Technologies
 Hummingbird MCA Module
 Model: HUM-900-PRO-CAS
 Configuration: Protocol B - Module 3
 ANT-916-PW-LP Antenna

Date: 01/27/2015
 Lab: B
 Tested By: Kenneth Lee

**Low Channel
Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.94	41.85	V	82.6	-40.75	Peak	2.75	210	Not in Restricted Band
2708.91	41.58	V	74	-32.42	Peak	2	250	
2708.91	30.39	V	54	-23.61	Avg	2	250	
3611.88	45.49	V	74	-28.51	Peak	2	280	
3611.88	37.39	V	54	-16.61	Avg	2	280	
4514.86	44.79	V	74	-29.21	Peak	1	340	
4514.86	35.36	V	54	-18.64	Avg	1	340	
5417.83	46.93	V	74	-27.07	Peak	1.1	300	
5417.83	36.83	V	54	-17.17	Avg	1.1	300	
6320.8	46.56	V	82.6	-36.04	Peak	1	10	Not in Restricted Band
7223.77								No Emissions Detected
8126.74								No Emissions Detected
9029.71								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol B - Module 3
ANT-916-PW-LP Antenna

Date: 01/27/2015
Lab: B
Tested By: Kenneth Lee

**Low Channel
Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.94	42.27	V	80.4	-38.13	Peak	1	0	Not in Restricted Band
2708.91	41.48	V	74	-32.52	Peak	1	115	
2708.91	31.42	V	54	-22.58	Avg	1	115	
3611.88	46.25	V	74	-27.75	Peak	1.25	180	
3611.88	39.91	V	54	-14.09	Avg	1.25	180	
4514.86	44.66	V	74	-29.34	Peak	3	250	
4514.86	34.59	V	54	-19.41	Avg	3	250	
5417.83	47.39	V	74	-26.61	Peak	1.75	160	
5417.83	35.31	V	54	-18.69	Avg	1.75	160	
6320.8	47.72	V	80.4	-32.68	Peak	1	240	Not in Restricted Band
7223.77								No Emissions Detected
8126.74								No Emissions Detected
9029.71								No Emissions Detected

FCC 15.247

Linx Technologies
 Hummingbird MCA Module
 Model: HUM-900-PRO-CAS
 Configuration: Protocol B - Module 3
 ANT-916-PW-LP Antenna

Date: 01/27/2015
 Lab: B
 Tested By: Kenneth Lee

Low Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.94	41.2	V	80.06	-38.86	Peak	1.75	0	Not in Restricted Band
2708.91	41.84	V	74	-32.16	Peak	1	250	
2708.91	33.4	V	54	-20.6	Avg	1	250	
3611.88	46.79	V	74	-27.21	Peak	1.25	45	
3611.88	39.53	V	54	-14.47	Avg	1.25	45	
4514.86	44.99	V	74	-29.01	Peak	1	0	
4514.86	37.09	V	54	-16.91	Avg	1	0	
5417.83	47.07	V	74	-26.93	Peak	1.5	150	
5417.83	37.03	V	54	-16.97	Avg	1.5	150	
6320.8	51.99	V	80.06	-28.07	Peak	1.5	140	Not in Restricted Band
7223.77								No Emissions Detected
8126.74								No Emissions Detected
9029.71								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol B - Module 3
ANT-916-PW-LP Antenna

Date: 01/27/2015
Lab: B
Tested By: Kenneth Lee

**Low Channel
Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.94	40.72	H	86.26	-45.54	Peak	2.75	290	Not in Restricted Band
2708.91	43.01	H	74	-30.99	Peak	3	90	
2708.91	35.66	H	54	-18.34	Avg	3	90	
3611.88	45.67	H	74	-28.33	Peak	1	45	
3611.88	39.13	H	54	-14.87	Avg	1	45	
4514.86	44.35	H	74	-29.65	Peak	2.75	270	
4514.86	35.28	H	54	-18.72	Avg	2.75	270	
5417.83	48.78	H	74	-25.22	Peak	1.5	340	
5417.83	37.47	H	54	-16.53	Avg	1.5	340	
6320.8	47.73	H	86.26	-38.53	Peak	1.75	15	Not in Restricted Band
7223.77								No Emissions Detected
7223.77								
8126.74								No Emissions Detected
8126.74								
9029.71								No Emissions Detected
9029.71								

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol B - Module 3
ANT-916-PW-LP Antenna

Date: 01/27/2015
Lab: B
Tested By: Kenneth Lee

**Low Channel
Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.94	41.06	H	80.3	-39.24	Peak	1	335	Not in Restricted Band
2708.91	40.75	H	74	-33.25	Peak	1	160	
2708.91	30.51	H	54	-23.49	Avg	1	160	
3611.88	48.81	H	74	-25.19	Peak	1.25	240	
3611.88	43.48	H	54	-10.52	Avg	1.25	240	
4514.86	45.13	H	74	-28.87	Peak	2.5	180	
4514.86	35.21	H	54	-18.79	Avg	2.5	180	
5417.83	49.03	H	74	-24.97	Peak	1	180	
5417.83	38.13	H	54	-15.87	Avg	1	180	
6320.8	49.64	H	80.3	-30.66	Peak	1.75	240	Not in Restricted Band
7223.77								No Emissions Detected
8126.74								No Emissions Detected
9029.71								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol B - Module 3
ANT-916-PW-LP Antenna

Date: 01/27/2015
Lab: B
Tested By: Kenneth Lee

**Low Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.94	42.73	H	84.15	-41.42	Peak	1	270	Not in Restricted Band
2708.91	39.79	H	74	-34.21	Peak	1	250	
2708.91	29.71	H	54	-24.29	Avg	1	250	
3611.88	44.74	H	74	-29.26	Peak	1.5	0	
3611.88	35.72	H	54	-18.28	Avg	1.5	0	
4514.86	44.17	H	74	-29.83	Peak	1	345	
4514.86	32.91	H	54	-21.09	Avg	1	345	
5417.83	47.44	H	74	-26.56	Peak	1.15	120	
5417.83	37.09	H	54	-16.91	Avg	1.15	120	
6320.8	50.59	H	84.15	-33.56	Peak	1.5	160	Not in Restricted Band
7223.77								No Emissions Detected
8126.74								No Emissions Detected
9029.71								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol B - Module 3
ANT-916-PW-LP Antenna

Date: 01/27/2015
Lab: B
Tested By: Kenneth Lee

Middle Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1830	42.91	V	80.4	-37.49	Peak	1.75	0	Not in Restricted Band
2745	40.73	V	74	-33.27	Peak	1	90	
2745	25.71	V	54	-28.29	Avg	1	90	
3660	43.88	V	74	-30.12	Peak	2	270	
3660	34.68	V	54	-19.32	Avg	2	270	
4575	46.38	V	74	-27.62	Peak	1.5	180	
4575	37.58	V	54	-16.42	Avg	1.5	180	
5490	48.14	V	74	-25.86	Peak	1	160	
5490	35.97	V	54	-18.03	Avg	1	160	
6405	49.54	V	80.4	-30.86	Peak	1.25	170	Not in Restricted Band
7320								No Emissions Detected
7320								
8235								No Emissions Detected
8235								
9150								No Emissions Detected
9150								

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol B - Module 3
ANT-916-PW-LP Antenna

Date: 01/27/2015
Lab: B
Tested By: Kenneth Lee

Middle Channel**Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1830	45.11	V	79.58	-34.47	Peak	1	25	Not in Restricted Band
2745	41.66	V	74	-32.34	Peak	2.75	90	
2745	31.59	V	54	-22.41	Avg	2.75	90	
3660	44.74	V	74	-29.26	Peak	1	180	
3660	37.81	V	54	-16.19	Avg	1	180	
4575	45.41	V	74	-28.59	Peak	2.5	235	
4575	33.97	V	54	-20.03	Avg	2.5	235	
5490	46.82	V	74	-27.18	Peak	1.5	235	
5490	35.59	V	54	-18.41	Avg	1.5	235	
6405	50.13	V	79.58	-29.45	Peak	1	200	Not in Restricted Band
7320								No Emissions Detected
8235								No Emissions Detected
9150								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol B - Module 3
ANT-916-PW-LP Antenna

Date: 01/27/2015
Lab: B
Tested By: Kenneth Lee

**Middle Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1830	42.96	V	81.01	-38.05	Peak	1.5	250	Not in Restricted Band
2745	42.29	V	74	-31.71	Peak	1.75	110	
2745	34.18	V	54	-19.82	Avg	1.75	110	
3660	46.83	V	74	-27.17	Peak	1.5	120	
3660	39.58	V	54	-14.42	Avg	1.5	120	
4575	46.95	V	74	-27.05	Peak	1.1	0	
4575	38.81	V	54	-15.19	Avg	1.1	0	
5490	50.36	V	74	-23.64	Peak	1.25	90	
5490	41.62	V	54	-12.38	Avg	1.25	90	
6405	49.93	V	81.01	-31.08	Peak	1.75	110	Not in Restricted Band
7320								No Emissions Detected
8235								No Emissions Detected
9150								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol B - Module 3
ANT-916-PW-LP Antenna

Date: 01/27/2015
Lab: B
Tested By: Kenneth Lee

**Middle Channel
Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1830	43.41	H	85.76	-42.35	Peak	1.1	170	Not in Restricted Band
2745	43.12	H	74	-30.88	Peak	1.5	135	
2745	36.49	H	54	-17.51	Avg	1.5	135	
3660	45.91	H	74	-28.09	Peak	2.25	45	
3660	38.37	H	54	-15.63	Avg	2.25	45	
4575	47.81	H	74	-26.19	Peak	1	35	
4575	40.13	H	54	-13.87	Avg	1	35	
5490	48.75	H	74	-25.25	Peak	1.75	335	
5490	38.75	H	54	-15.25	Avg	1.75	335	
6405	50.65	H	85.76	-35.11	Peak	1.1	190	Not in Restricted Band
7320								No Emissions Detected
8235								No Emissions Detected
9150								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol B - Module 3
ANT-916-PW-LP Antenna

Date: 01/27/2015
Lab: B
Tested By: Kenneth Lee

**Middle Channel
Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1830	41.72	H	79.88	-38.16	Peak	1	0	Not in Restricted Band
2745	40.3	H	74	-33.7	Peak	1	170	
2745	30.91	H	54	-23.09	Avg	1	170	
3660	48.92	H	74	-25.08	Peak	1.25	190	
3660	43.75	H	54	-10.25	Avg	1.25	190	
4575	44.71	H	74	-29.29	Peak	1.5	350	
4575	34.1	H	54	-19.9	Avg	1.5	350	
5490	47.49	H	74	-26.51	Peak	1.75	240	
5490	36.44	H	54	-17.56	Avg	1.75	240	
6405	50.83	H	79.88	-29.05	Peak	2	180	Not in Restricted Band
7320								No Emissions Detected
8235								No Emissions Detected
9150								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol B - Module 3
ANT-916-PW-LP Antenna

Date: 01/27/2015
Lab: B
Tested By: Kenneth Lee

Middle Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1830	44.73	H	84.88	-40.15	Peak	2	45	Not in Restricted Band
2745	41.4	H	74	-32.6	Peak	1	235	
2745	31.27	H	54	-22.73	Avg	1	235	
3660	46.02	H	74	-27.98	Peak	1	170	
3660	38.63	H	54	-15.37	Avg	1	170	
4575	46.31	H	74	-27.69	Peak	1	130	
4575	37.47	H	54	-16.53	Avg	1	130	
5490	48.68	H	74	-25.32	Peak	1	120	
5490	38.44	H	54	-15.56	Avg	1	120	
6405	50.83	H	84.88	-34.05	Peak	1.25	180	Not in Restricted Band
7320								No Emissions Detected
8235								No Emissions Detected
9150								No Emissions Detected

FCC 15.247

Linx Technologies
 Hummingbird MCA Module
 Model: HUM-900-PRO-CAS
 Configuration: Protocol B - Module 3
 ANT-916-PW-LP Antenna

Date: 01/27/2015
 Lab: B
 Tested By: Kenneth Lee

High Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1852.55	42.77	V	78.41	-35.64	Peak	3	45	Not in Restricted Band
2778.83	41.23	V	74	-32.77	Peak	1.5	225	
2778.83	29.03	V	54	-24.97	Avg	1.5	225	
3705.11	45.96	V	74	-28.04	Peak	1	120	
3705.11	37.09	V	54	-16.91	Avg	1	120	
4631.39	46.9	V	74	-27.1	Peak	1.75	190	
4631.39	37.05	V	54	-16.95	Avg	1.75	190	
5557.66	48.76	V	74	-25.24	Peak	2	340	
5557.66	37.89	V	54	-16.11	Avg	2	340	
6483.94	52.15	V	78.41	-26.26	Peak	2	180	Not in Restricted Band
7410.22								No Emissions Detected
8336.49								No Emissions Detected
9262.77								No Emissions Detected

FCC 15.247

Linx Technologies
 Hummingbird MCA Module
 Model: HUM-900-PRO-CAS
 Configuration: Protocol B - Module 3
 ANT-916-PW-LP Antenna

Date: 01/27/2015
 Lab: B
 Tested By: Kenneth Lee

High Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1852.55	42.71	V	79.93	-37.22	Peak	1	335	Not in Restricted Band
2778.83	41.74	V	74	-32.26	Peak	1.1	270	
2778.83	30.33	V	54	-23.67	Avg	1.1	270	
3705.11	46.75	V	74	-27.25	Peak	1	230	
3705.11	37.66	V	54	-16.34	Avg	1	230	
4631.39	44.97	V	74	-29.03	Peak	1.75	245	
4631.39	34.23	V	54	-19.77	Avg	1.75	245	
5557.66	49.39	V	74	-24.61	Peak	2	245	
5557.66	37.99	V	54	-16.01	Avg	2	245	
6483.94	51.2	V	79.93	-28.73	Peak	1.5	190	Not in Restricted Band
7410.22								No Emissions Detected
8336.49								No Emissions Detected
9262.77								No Emissions Detected

FCC 15.247

Linx Technologies
 Hummingbird MCA Module
 Model: HUM-900-PRO-CAS
 Configuration: Protocol B - Module 3
 ANT-916-PW-LP Antenna

Date: 01/27/2015
 Lab: B
 Tested By: Kenneth Lee

**High Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1852.55	44.66	V	80.66	-36	Peak	1	240	Not in Restricted Band
2778.83	43.09	V	74	-30.91	Peak	1.5	310	
2778.83	34.02	V	54	-19.98	Avg	1.5	310	
3705.11	48.12	V	74	-25.88	Peak	1.75	45	
3705.11	40.93	V	54	-13.07	Avg	1.75	45	
4631.39	47.23	V	74	-26.77	Peak	1.1	0	
4631.39	37.29	V	54	-16.71	Avg	1.1	0	
5557.66	50.21	V	74	-23.79	Peak	1.25	100	
5557.66	40.42	V	54	-13.58	Avg	1.25	100	
6483.94	51.01	V	80.66	-29.65	Peak	1.2	120	Not in Restricted Band
7410.22								No Emissions Detected
8336.49								No Emissions Detected
9262.77								No Emissions Detected

FCC 15.247

Linx Technologies
 Hummingbird MCA Module
 Model: HUM-900-PRO-CAS
 Configuration: Protocol B - Module 3
 ANT-916-PW-LP Antenna

Date: 01/27/2015
 Lab: B
 Tested By: Kenneth Lee

**High Channel
Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1852.55	45.3	H	86.66	-41.36	Peak	2.5	210	Not in Restricted Band
2778.83	41.88	H	74	-32.12	Peak	1	280	
2778.83	32.05	H	54	-21.95	Avg	1	280	
3705.11	47.67	H	74	-26.33	Peak	1.5	190	
3705.11	40.04	H	54	-13.96	Avg	1.5	190	
4631.39	45.81	H	74	-28.19	Peak	2.25	290	
4631.39	35.82	H	54	-18.18	Avg	2.25	290	
5557.66	49.12	H	74	-24.88	Peak	2.75	45	
5557.66	38.24	H	54	-15.76	Avg	2.75	45	
6483.94	51.36	H	86.66	-35.3	Peak	1	230	Not in Restricted Band
7410.22								No Emissions Detected
8336.49								No Emissions Detected
9262.77								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol B - Module 3
ANT-916-PW-LP Antenna

Date: 01/27/2015
Lab: B
Tested By: Kenneth Lee

**High Channel
Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1852.55	45.32	H	76	-30.68	Peak	1	15	Not in Restricted Band
2778.83	41.69	H	74	-32.31	Peak	1	170	
2778.83	30.9	H	54	-23.1	Avg	1	170	
3705.11	48.37	H	74	-25.63	Peak	1.15	200	
3705.11	40.42	H	54	-13.58	Avg	1.15	200	
4631.39	46.62	H	74	-27.38	Peak	3	160	
4631.39	35.92	H	54	-18.08	Avg	3	160	
5557.66	50.36	H	74	-23.64	Peak	1.75	180	
5557.66	41.19	H	54	-12.81	Avg	1.75	180	
6483.94	50.47	H	76	-25.53	Peak	1	190	Not in Restricted Band
7410.22								No Emissions Detected
8336.49								No Emissions Detected
9262.77								No Emissions Detected

FCC 15.247

Linx Technologies
 Hummingbird MCA Module
 Model: HUM-900-PRO-CAS
 Configuration: Protocol B - Module 3
 ANT-916-PW-LP Antenna

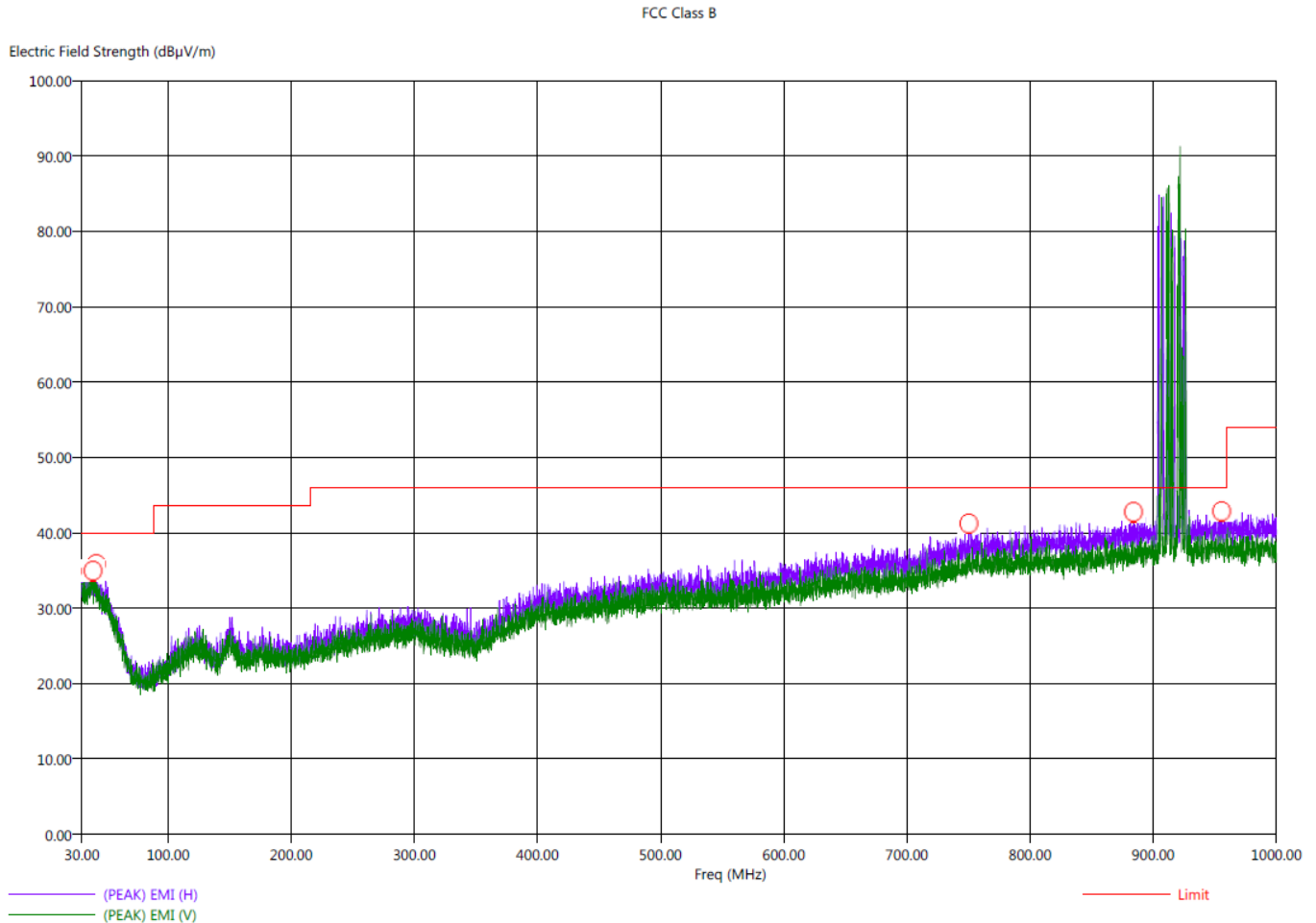
Date: 01/27/2015
 Lab: B
 Tested By: Kenneth Lee

**High Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1852.55	45.2	H	84.97	-39.77	Peak	1	60	Not in Restricted Band
2778.83	41.75	H	74	-32.25	Peak	1	230	
2778.83	31.57	H	54	-22.43	Avg	1	230	
3705.11	45.67	H	74	-28.33	Peak	1	45	
3705.11	36.31	H	54	-17.69	Avg	1	45	
4631.39	45.47	H	74	-28.53	Peak	1.25	135	
4631.39	34.75	H	54	-19.25	Avg	1.25	135	
5557.66	49.53	H	74	-24.47	Peak	3	45	
5557.66	38.2	H	54	-15.8	Avg	3	45	
6483.94	51.47	H	84.97	-33.5	Peak	1.5	180	Not in Restricted Band
7410.22								No Emissions Detected
8336.49								No Emissions Detected
9262.77								No Emissions Detected

Title: Pre-Scan - FCC Class B
File: Agilent - Radiated Pre-Scan 30-1000Mhz - FCC Class B_Module_3_Protocol_B_X-Axis_02-05-2015.set
Operator: Kenneth Lee
EUT Type: Hummingbird MCA
EUT Condition: Continuously Transmitting - Frequency Hopping - Protocol B - Module 3 - X-Axis - Worst Case
Comments: Customer: Linx Technologies
M/N: HUM-900-PRO-CAS
Note: Antenna - ANT-916-PW-LP

2/5/2015 7:28:21 PM
Sequence: Preliminary Scan

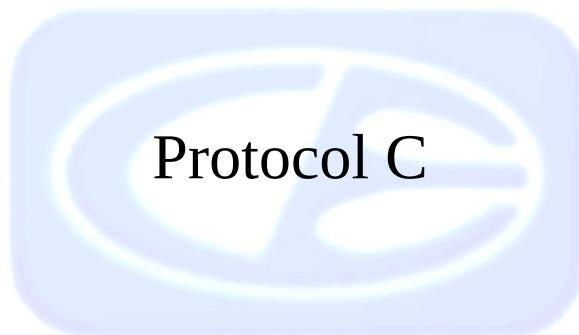


Title: Radiated Final - 30-1000 MHz - FCC Class B
File: Agilent - Radiated Final Scan 30-1000Mhz - FCC Class B_Module_3_Protocol_B_X-Axis_02-05-2015.set
Operator: Kenneth Lee
EUT Type: Hummingbird MCA
EUT Condition: Continuously Transmitting - Frequency Hopping - Protocol B - Module 3- X-Axis - Worst Case
Comments: Customer: Linx Technologies
M/N: HUM-900-PRO-CAS
Note: Antenna - ANT-916-PW-LP

2/5/2015 7:40:09 PM
Sequence: Final Measurements

Final Scan - FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBμV/m)	(OP) EMI (dBμV/m)	(PEAK) Margin (dB)	(OP) Margin (dB)	Limit (dBμV/m)	Transducer (dB)	Cable (dB)	Twr Ht (cm)	Ttbl Aql (deg)
37.20	H	35.60	31.33	-4.40	-8.67	40.00	23.95	0.41	352.68	360.25
39.20	V	36.01	31.56	-3.99	-8.44	40.00	24.12	0.42	207.79	109.50
41.70	H	35.62	31.23	-4.38	-8.77	40.00	23.77	0.44	207.55	237.75
750.40	H	40.36	36.69	-5.64	-9.31	46.00	25.90	2.36	272.02	2.75
884.00	H	42.66	38.61	-3.34	-7.39	46.00	26.81	2.60	159.55	112.25
955.70	H	44.07	39.45	-1.93	-6.55	46.00	27.68	2.73	159.49	129.50



FCC 15.247Linx Technologies
Hummingbird MCA
HUM-900-RC-CAS
Configuration: Module 3 - Protocol CDate: 01/29/2015
Lab: D
Tested By: Kyle Fujimoto**Peak Output Power**

Freq. (MHz)	Level (dBuV)	Level (V/m)	Antenna Gain (dBi)	Numeric Gain	Power Output (Watts)	Power Output (mW)	Power Output (dBm)	Comments
902.75	104.61	0.17002	2.4	1.7378	0.0049902	4.99024	6.98	Vert. X-Axis
908.749	102.55	0.134122	2.4	1.7378	0.0031054	3.10543	4.92	Vert. X-Axis
914.747	98.41	0.0832722	2.4	1.7378	0.0011971	1.19707	0.78	Vert. X-Axis
902.75	101.57	0.1198119	2.4	1.7378	0.0024781	2.47811	3.94	Vert. Y-Axis
908.749	98.75	0.0865964	2.4	1.7378	0.0012946	1.29456	1.12	Vert. Y-Axis
914.747	99.93	0.0991973	2.4	1.7378	0.0016987	1.69872	2.30	Vert. Y-Axis
902.75	102.36	0.13122	2.4	1.7378	0.0029725	2.9725	4.73	Vert. Z-Axis
908.749	102.27	0.1298674	2.4	1.7378	0.0029115	2.91153	4.64	Vert. Z-Axis
914.747	100.66	0.1078947	2.4	1.7378	0.0020097	2.00965	3.03	Vert. Z-Axis
902.75	106.33	0.2072526	2.4	1.7378	0.0074152	7.41517	8.70	Horiz. X-Axis
908.749	105.35	0.1851399	2.4	1.7378	0.0059173	5.91727	7.72	Horiz. X-Axis
914.747	106.66	0.2152782	2.4	1.7378	0.0080006	8.00058	9.03	Horiz. X-Axis
902.75	102.72	0.1367729	2.4	1.7378	0.0032294	3.2294	5.09	Horiz. Y-Axis
908.749	97.64	0.0762079	2.4	1.7378	0.0010026	1.00259	0.01	Horiz. Y-Axis
914.747	96	0.0630957	2.4	1.7378	0.0006873	0.68726	-1.63	Horiz. Y-Axis
902.75	101.14	0.114025	2.4	1.7378	0.0022445	2.24451	3.51	Horiz. Z-Axis
908.749	99.56	0.0950605	2.4	1.7378	0.00156	1.55999	1.93	Horiz. Z-Axis
914.747	104.97	0.1772148	2.4	1.7378	0.0054215	5.42152	7.34	Horiz. Z-Axis

The Power in Watts is obtained by the following Formula Below:

$$P = [(E \cdot D)^2] / (30 \cdot G)$$

P = Power in Watts

E = The Measured Maximum Field Strength in V/m

G = The Numeric Gain of the Transmitting Antenna over an Isotropic Radiator

FCC 15.247

Linx Technologies
 Hummingbird MCA Module
 Model: HUM-900-PRO-CAS
 Configuration: Protocol C - Module 3
 ANT-916-PW-LP Antenna

Date: 01/31/2015
 Lab: B
 Tested By: Kyle Fujimoto

**Low Channel
Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.5	35.78	V	84.61	-48.83	Peak	1.25	315	Not in Restricted Band
2708.25	37.08	V	74	-36.92	Peak	1.25	180	
2708.25	25.27	V	54	-28.73	Avg	1.25	180	
3611	43.75	V	74	-30.25	Peak	1.35	315	
3611	27.98	V	54	-26.02	Avg	1.35	315	
4513.75	43.05	V	74	-30.95	Peak	1.25	135	
4513.75	28.56	V	54	-25.44	Avg	1.25	135	
5416.5	45.53	V	74	-28.47	Peak	1.35	155	
5416.5	32.47	V	54	-21.53	Avg	1.35	155	
6319.25	48.72	V	84.61	-35.89	Peak	1.25	135	Not in Restricted Band
7222								No Emissions Detected
8124.75								No Emissions Detected
9027.5								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol C - Module 3
ANT-916-PW-LP Antenna

Date: 01/31/2015
Lab: B
Tested By: Kyle Fujimoto

**Low Channel
Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.5	40.87	V	81.57	-40.7	Peak	1.25	0	Not in Restricted Band
2708.25	38.02	V	74	-35.98	Peak	1.35	225	
2708.25	25.21	V	54	-28.79	Avg	1.35	225	
3611	43.26	V	74	-30.74	Peak	1.25	155	
3611	25.17	V	54	-28.83	Avg	1.25	155	
4513.75	40.88	V	74	-33.12	Peak	1.35	145	
4513.75	25.62	V	54	-28.38	Avg	1.35	145	
5416.5	43.12	V	74	-30.88	Peak	1.25	225	
5416.5	30.65	V	54	-23.35	Avg	1.25	225	
6319.25	48.01	V	81.57	-33.56	Peak	1.25	180	Not in Restricted Band
7222								No Emissions Detected
8124.75								No Emissions Detected
9027.5								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol C - Module 3
ANT-916-PW-LP Antenna

Date: 01/31/2015
Lab: B
Tested By: Kyle Fujimoto

**Low Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.5	39.25	V	82.36	-43.11	Peak	1.25	155	Not in Restricted Band
2708.25	38.86	V	74	-35.14	Peak	1.25	225	
2708.25	24.48	V	54	-29.52	Avg	1.25	225	
3611	41.46	V	74	-32.54	Peak	1.35	235	
3611	25.54	V	54	-28.46	Avg	1.35	235	
4513.75	41.41	V	74	-32.59	Peak	1.25	225	
4513.75	27.01	V	54	-26.99	Avg	1.25	225	
5416.5	43.71	V	74	-30.29	Peak	1.35	135	
5416.5	30.91	V	54	-23.09	Avg	1.35	135	
6319.25	48.36	V	82.36	-34	Peak	1.25	145	Not in Restricted Band
7222								No Emissions Detected
8124.75								No Emissions Detected
9027.5								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol C - Module 3
ANT-916-PW-LP Antenna

Date: 01/31/2015
Lab: B
Tested By: Kyle Fujimoto

**Low Channel
Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.5	43.91	H	86.33	-42.42	Peak	1.25	180	Not in Restricted Band
2708.25	37.56	H	74	-36.44	Peak	1.35	315	
2708.25	23.08	H	54	-30.92	Avg	1.35	315	
3611	39.71	H	74	-34.29	Peak	1.25	325	
3611	26.15	H	54	-27.85	Avg	1.25	325	
4513.75	41.35	H	74	-32.65	Peak	1.25	335	
4513.75	25.61	H	54	-28.39	Avg	1.25	335	
5416.5	44.11	H	74	-29.89	Peak	1.15	125	
5416.5	30.73	H	54	-23.27	Avg	1.15	125	
6319.25	47.22	H	86.33	-39.11	Peak	1.25	135	Not in Restricted Band
7222								No Emissions Detected
8124.75								No Emissions Detected
9027.5								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol C - Module 3
ANT-916-PW-LP Antenna

Date: 01/31/2015
Lab: B
Tested By: Kyle Fujimoto

**Low Channel
Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.5	59.06	H	82.72	-23.66	Peak	1.25	135	Not in Restricted Band
2708.25	36.91	H	74	-37.09	Peak	1.35	145	
2708.25	23.21	H	54	-30.79	Avg	1.35	145	
3611	43.95	H	74	-30.05	Peak	1.25	155	
3611	27.25	H	54	-26.75	Avg	1.25	155	
4513.75	40.75	H	74	-33.25	Peak	1.25	155	
4513.75	25.81	H	54	-28.19	Avg	1.25	155	
5416.5	43.92	H	74	-30.08	Peak	1.25	135	
5416.5	30.91	H	54	-23.09	Avg	1.25	135	
6319.25	49.93	H	82.72	-32.79	Peak	1.25	145	Not in Restricted Band
7222								No Emissions Detected
8124.75								No Emissions Detected
9027.5								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol C - Module 3
ANT-916-PW-LP Antenna

Date: 01/31/2015
Lab: B
Tested By: Kyle Fujimoto

**Low Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.5	44.62	H	81.14	-36.52	Peak	1.25	225	Not in Restricted Band
2708.25	38.59	H	74	-35.41	Peak	1.35	235	
2708.25	23.03	H	54	-30.97	Avg	1.35	235	
3611	40.01	H	74	-33.99	Peak	1.25	155	
3611	25.93	H	54	-28.07	Avg	1.25	155	
4513.75	39.38	H	74	-34.62	Peak	1.25	315	
4513.75	26.23	H	54	-27.77	Avg	1.25	315	
5416.5	44.42	H	74	-29.58	Peak	1.15	0	
5416.5	31.03	H	54	-22.97	Avg	1.15	0	
6319.25	50.16	H	81.14	-30.98	Peak	1.25	0	Not in Restricted Band
7222								No Emissions Detected
8124.75								No Emissions Detected
9027.5								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol C - Module 3
ANT-916-PW-LP Antenna

Date: 01/31/2015
Lab: B
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1817.5	38.88	V	82.55	-43.67	Peak	1.25	155	Not in Restricted Band
2726.25	36.37	V	74	-37.63	Peak	1.35	145	
2726.25	23.29	V	54	-30.71	Avg	1.35	145	
3635	40.95	V	74	-33.05	Peak	1.25	155	
3635	25.39	V	54	-28.61	Avg	1.25	155	
4543.75	41.39	V	74	-32.61	Peak	1.35	165	
4543.75	26.01	V	54	-27.99	Avg	1.35	165	
5452.49	44.33	V	74	-29.67	Peak	1.25	175	
5452.49	30.56	V	54	-23.44	Avg	1.25	175	
6361.24	48.02	V	82.55	-34.53	Peak	1.35	185	Not in Restricted Band
7269.99								No Emissions Detected
7269.99								
8178.74								No Emissions Detected
8178.74								
9087.49								No Emissions Detected
9087.49								

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol C - Module 3
ANT-916-PW-LP Antenna

Date: 01/31/2015
Lab: B
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1817.5	40.09	V	78.75	-38.66	Peak	1.25	155	Not in Restricted Band
2726.25	37.97	V	74	-36.03	Peak	1.35	165	
2726.25	22.79	V	54	-31.21	Avg	1.35	165	
3635	39.19	V	74	-34.81	Peak	1.45	175	
3635	25.19	V	54	-28.81	Avg	1.45	175	
4543.75	40.66	V	74	-33.34	Peak	1.25	225	
4543.75	25.75	V	54	-28.25	Avg	1.25	225	
5452.49	43.16	V	74	-30.84	Peak	1.35	245	
5452.49	30.21	V	54	-23.79	Avg	1.35	245	
6361.24	48.31	V	78.75	-30.44	Peak	1.25	255	Not in Restricted Band
7269.99								No Emissions Detected
8178.74								No Emissions Detected
9087.49								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol C - Module 3
ANT-916-PW-LP Antenna

Date: 01/31/2015
Lab: B
Tested By: Kyle Fujimoto

**Middle Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1817.5	42.51	V	82.27	-39.76	Peak	1.25	155	Not in Restricted Band
2726.25	40.31	V	74	-33.69	Peak	1.35	175	
2726.25	25.79	V	54	-28.21	Avg	1.35	175	
3635	44.45	V	74	-29.55	Peak	1.25	185	
3635	28.82	V	54	-25.18	Avg	1.25	185	
4543.75	44.28	V	74	-29.72	Peak	1.35	225	
4543.75	27.97	V	54	-26.03	Avg	1.35	225	
5452.49	44.77	V	74	-29.23	Peak	1.25	165	
5452.49	32.19	V	54	-21.81	Avg	1.25	165	
6361.24	50.65	V	82.27	-31.62	Peak	1.25	155	Not in Restricted Band
7269.99								No Emissions Detected
8178.74								No Emissions Detected
9087.49								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol C - Module 3
ANT-916-PW-LP Antenna

Date: 01/31/2015
Lab: B
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1817.5	45.32	H	85.35	-40.03	Peak	1.25	180	Not in Restricted Band
2726.25	41.87	H	74	-32.13	Peak	1.25	175	
2726.25	28.85	H	54	-25.15	Avg	1.25	175	
3635	41.71	H	74	-32.29	Peak	1.25	185	
3635	26.94	H	54	-27.06	Avg	1.25	185	
4543.75	41.93	H	74	-32.07	Peak	1.15	175	
4543.75	26.33	H	54	-27.67	Avg	1.15	175	
5452.49	43.96	H	74	-30.04	Peak	1.25	185	
5452.49	30.59	H	54	-23.41	Avg	1.25	185	
6361.24	48.02	H	85.35	-37.33	Peak	1.25	175	Not in Restricted Band
7269.99								No Emissions Detected
8178.74								No Emissions Detected
9087.49								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol C - Module 3
ANT-916-PW-LP Antenna

Date: 01/31/2015
Lab: B
Tested By: Kyle Fujimoto

**Middle Channel
Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1817.5	43.69	H	77.64	-33.95	Peak	1.25	135	Not in Restricted Band
2726.25	36.86	H	74	-37.14	Peak	1.35	145	
2726.25	24.11	H	54	-29.89	Avg	1.35	145	
3635	43.59	H	74	-30.41	Peak	1.25	135	
3635	28.23	H	54	-25.77	Avg	1.25	135	
4543.75	41.93	H	74	-32.07	Peak	1.55	145	
4543.75	26.61	H	54	-27.39	Avg	1.55	145	
5452.49	43.73	H	74	-30.27	Peak	1.45	135	
5452.49	31.31	H	54	-22.69	Avg	1.45	135	
6361.24	48.13	H	77.64	-29.51	Peak	1.35	125	Not in Restricted Band
7269.99								No Emissions Detected
8178.74								No Emissions Detected
9087.49								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol C - Module 3
ANT-916-PW-LP Antenna

Date: 01/31/2015
Lab: B
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1817.5	47.18	H	79.56	-32.38	Peak	1.25	155	Not in Restricted Band
2726.25	38.38	H	74	-35.62	Peak	1.25	90	
2726.25	23.73	H	54	-30.27	Avg	1.25	90	
3635	40.94	H	74	-33.06	Peak	1.35	225	
3635	26.61	H	54	-27.39	Avg	1.35	225	
4543.75	41.97	H	74	-32.03	Peak	1.25	155	
4543.75	26.78	H	54	-27.22	Avg	1.25	155	
5452.49	47.21	H	74	-26.79	Peak	1.35	315	
5452.49	33.02	H	54	-20.98	Avg	1.35	315	
6361.24	49.38	H	79.56	-30.18	Peak	1.25	155	Not in Restricted Band
7269.99								No Emissions Detected
8178.74								No Emissions Detected
9087.49								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol C - Module 3
ANT-916-PW-LP Antenna

Date: 01/31/2015
Lab: B
Tested By: Kyle Fujimoto

High Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1829.49	42.35	V	78.41	-36.06	Peak	1.25	180	Not in Restricted Band
2744.24	37.37	V	74	-36.63	Peak	1.25	0	
2744.24	25.02	V	54	-28.98	Avg	1.25	0	
3658.99	42.41	V	74	-31.59	Peak	1.25	135	
3658.99	26.96	V	54	-27.04	Avg	1.25	135	
4573.74	44.38	V	74	-29.62	Peak	1.35	225	
4573.74	29.23	V	54	-24.77	Avg	1.35	225	
5488.48	46.68	V	74	-27.32	Peak	1.25	155	
5488.48	32.04	V	54	-21.96	Avg	1.25	155	
6403.23	48.51	V	78.41	-29.9	Peak	1.25	175	Not in Restricted Band
7317.98								No Emissions Detected
8232.72								No Emissions Detected
9147.47								No Emissions Detected

FCC 15.247

Linx Technologies
 Hummingbird MCA Module
 Model: HUM-900-PRO-CAS
 Configuration: Protocol C - Module 3
 ANT-916-PW-LP Antenna

Date: 01/31/2015
 Lab: B
 Tested By: Kyle Fujimoto

High Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1829.49	43.29	V	79.93	-36.64	Peak	1.25	155	Not in Restricted Band
2744.24	38.17	V	74	-35.83	Peak	1.25	145	
2744.24	25.14	V	54	-28.86	Avg	1.25	145	
3658.99	42.46	V	74	-31.54	Peak	1.35	155	
3658.99	27.49	V	54	-26.51	Avg	1.35	155	
4573.74	42.91	V	74	-31.09	Peak	1.45	165	
4573.74	27.76	V	54	-26.24	Avg	1.45	165	
5488.48	45.54	V	74	-28.46	Peak	1.55	175	
5488.48	32.05	V	54	-21.95	Avg	1.55	175	
6403.23	48.94	V	79.93	-30.99	Peak	1.25	155	Not in Restricted Band
7317.98								No Emissions Detected
8232.72								No Emissions Detected
9147.47								No Emissions Detected

FCC 15.247

Linx Technologies
 Hummingbird MCA Module
 Model: HUM-900-PRO-CAS
 Configuration: Protocol C - Module 3
 ANT-916-PW-LP Antenna

Date: 01/31/2015
 Lab: B
 Tested By: Kyle Fujimoto

**High Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1829.49	42.98	V	80.66	-37.68	Peak	1.25	135	Not in Restricted Band
2744.24	40.83	V	74	-33.17	Peak	1.25	135	
2744.24	25.15	V	54	-28.85	Avg	1.25	135	
3658.99	44.71	V	74	-29.29	Peak	1.35	145	
3658.99	27.88	V	54	-26.12	Avg	1.35	145	
4573.74	44.41	V	74	-29.59	Peak	1.25	155	
4573.74	28.83	V	54	-25.17	Avg	1.25	155	
5488.48	47.26	V	74	-26.74	Peak	1.15	165	
5488.48	31.96	V	54	-22.04	Avg	1.15	165	
6403.23	50.17	V	80.66	-30.49	Peak	1.15	175	Not in Restricted Band
7317.98								No Emissions Detected
8232.72								No Emissions Detected
9147.47								No Emissions Detected

FCC 15.247

Linx Technologies
 Hummingbird MCA Module
 Model: HUM-900-PRO-CAS
 Configuration: Protocol C - Module 3
 ANT-916-PW-LP Antenna

Date: 01/31/2015
 Lab: B
 Tested By: Kyle Fujimoto

**High Channel
Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1829.49	46.78	H	86.66	-39.88	Peak	1.25	155	Not in Restricted Band
2744.24	40.68	H	74	-33.32	Peak	1.25	165	
2744.24	24.99	H	54	-29.01	Avg	1.25	165	
3658.99	43.47	H	74	-30.53	Peak	1.25	135	
3658.99	28.05	H	54	-25.95	Avg	1.25	135	
4573.74	44.86	H	74	-29.14	Peak	1.55	145	
4573.74	29.18	H	54	-24.82	Avg	1.55	145	
5488.48	45.99	H	74	-28.01	Peak	1.25	90	
5488.48	32.09	H	54	-21.91	Avg	1.25	90	
6403.23	48.61	H	86.66	-38.05	Peak	1.55	135	Not in Restricted Band
7317.98								No Emissions Detected
8232.72								No Emissions Detected
9147.47								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol C - Module 3
ANT-916-PW-LP Antenna

Date: 01/31/2015
Lab: B
Tested By: Kyle Fujimoto

**High Channel
Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1829.49	41.26	H	76	-34.74	Peak	1.25	155	Not in Restricted Band
2744.24	38.23	H	74	-35.77	Peak	1.25	145	
2744.24	25.11	H	54	-28.89	Avg	1.25	145	
3658.99	44.12	H	74	-29.88	Peak	1.55	165	
3658.99	29.47	H	54	-24.53	Avg	1.55	165	
4573.74	43.72	H	74	-30.28	Peak	1.65	175	
4573.74	28.62	H	54	-25.38	Avg	1.65	175	
5488.48	45.68	H	74	-28.32	Peak	1.25	185	
5488.48	32.11	H	54	-21.89	Avg	1.25	185	
6403.23	46.68	H	76	-29.32	Peak	1.35	195	Not in Restricted Band
7317.98								No Emissions Detected
8232.72								No Emissions Detected
9147.47								No Emissions Detected

FCC 15.247

Linx Technologies
Hummingbird MCA Module
Model: HUM-900-PRO-CAS
Configuration: Protocol C - Module 3
ANT-916-PW-LP Antenna

Date: 01/31/2015
Lab: B
Tested By: Kyle Fujimoto

**High Channel
Transmit Mode - Z-Axis**

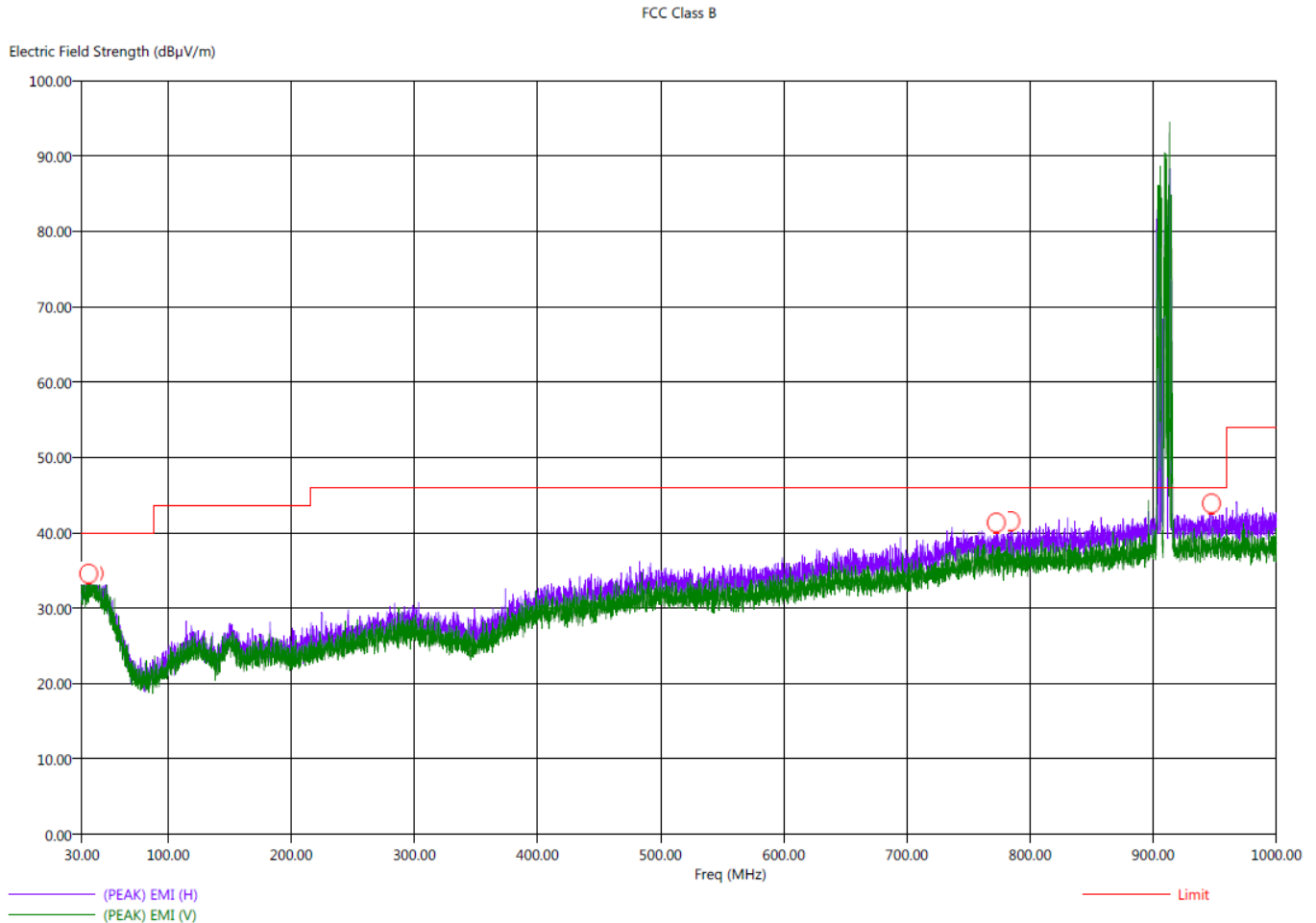
Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1829.49	41.29	H	84.97	-43.68	Peak	1.25	155	Not in Restricted Band
2744.24	40.39	H	74	-33.61	Peak	1.25	145	
2744.24	24.82	H	54	-29.18	Avg	1.25	145	
3658.99	42.53	H	74	-31.47	Peak	1.35	155	
3658.99	26.93	H	54	-27.07	Avg	1.35	155	
4573.74	43.53	H	74	-30.47	Peak	1.25	165	
4573.74	28.22	H	54	-25.78	Avg	1.25	165	
5488.48	44.73	H	74	-29.27	Peak	1.35	175	
5488.48	32.03	H	54	-21.97	Avg	1.35	175	
6403.23	47.92	H	84.97	-37.05	Peak	1.25	185	Not in Restricted Band
7317.98								No Emissions Detected
8232.72								No Emissions Detected
9147.47								No Emissions Detected



Tested By: Kyle Fujimoto

Title: Pre-Scan - FCC Class B
File: Agilent - Radiated Pre-Scan 30-1000Mhz - FCC Class B_Module_3_Protocol_C_Y-Axis_02-05-2015.set
Operator: Kenneth Lee
EUT Type: Hummingbird MCA
EUT Condition: Continuously Transmitting - Frequency Hopping - Protocol C - Module 3 - Y-Axis - Worst Case
Comments: Customer: Linx Technologies
M/N: HUM-900-RC-CAS
Note: Antenna - ANT-916-PW-LP

2/5/2015 8:16:31 PM
Sequence: Preliminary Scan

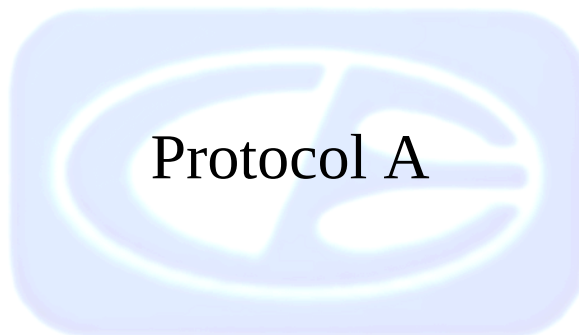


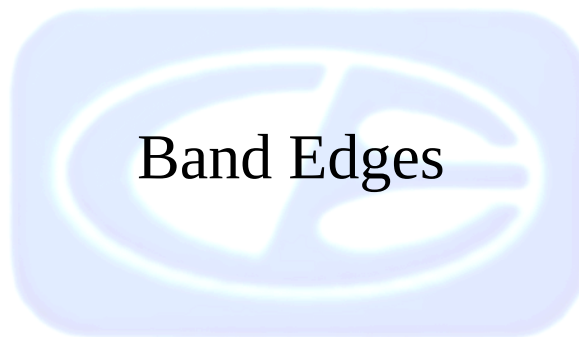
Title: Radiated Final - 30-1000 MHz - FCC Class B
File: Agilent - Radiated Final Scan 30-1000Mhz - FCC Class B_Module 3_Protocol_B_Y-Axis_02-05-2015.set
Operator: Kenneth Lee
EUT Type: Hummingbird MCA
EUT Condition: Continuously Transmitting - Frequency Hopping - Protocol C - Module 3 - Y-Axis - Worst Case
Comments: Customer: Linx Technologies
M/N: HUM-900-RC-CAS
Note: Antenna - ANT-916-PW-LP

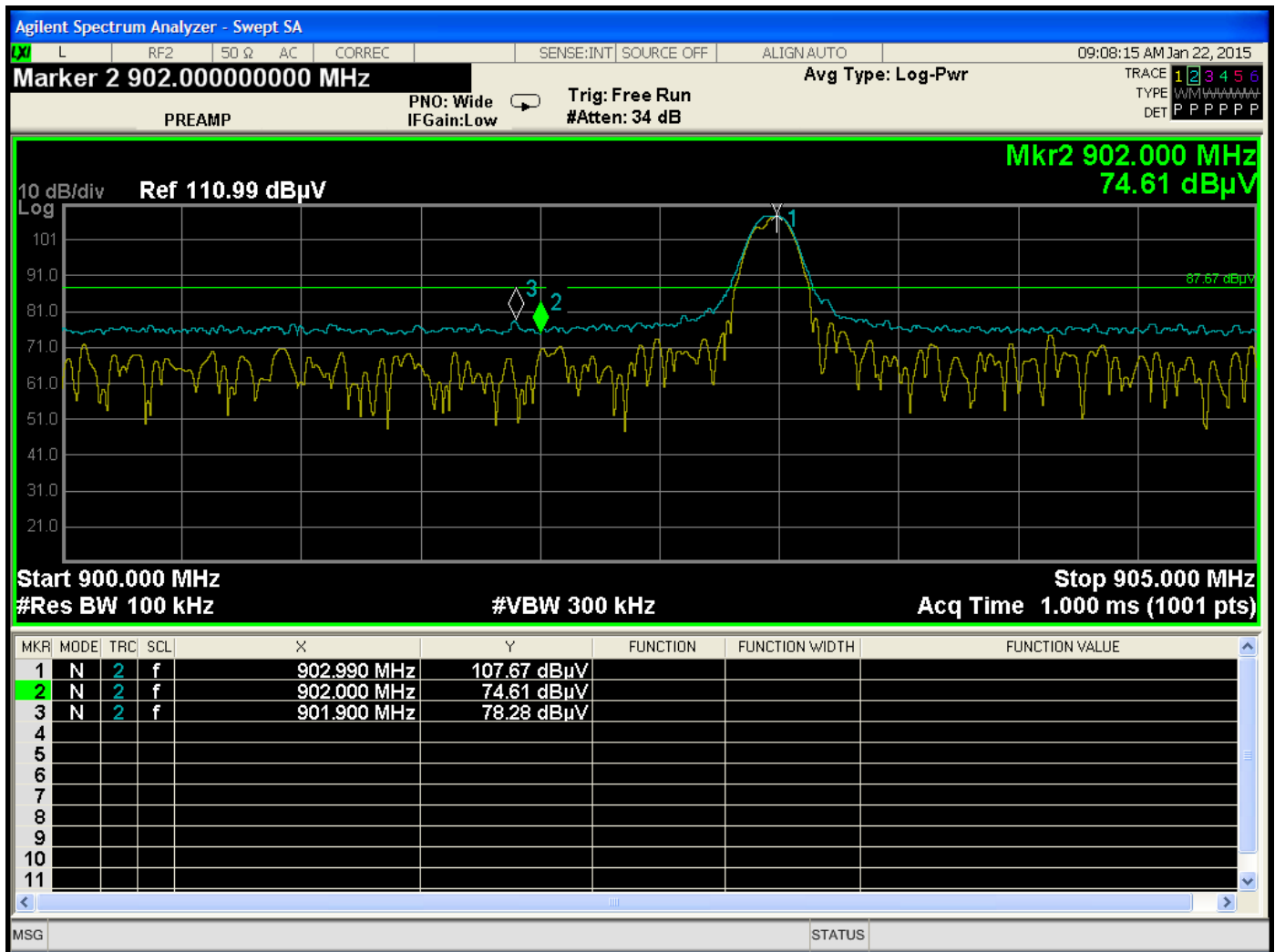
2/5/2015 8:28:31 PM
Sequence: Final Measurements

Final Scan - FCC Class B

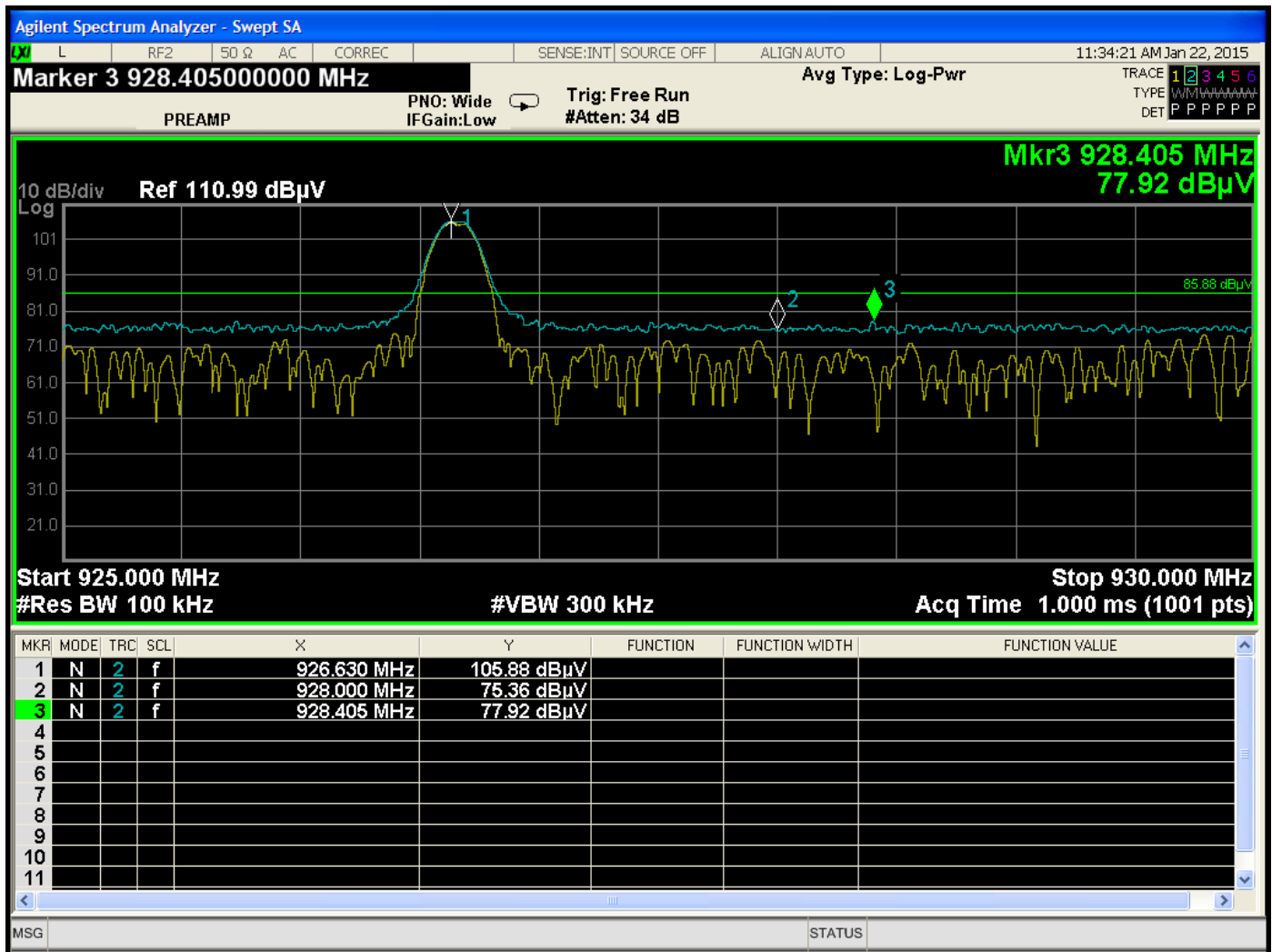
Freq (MHz)	Pol	(PEAK) EMI (dBμV/m)	(OP) EMI (dBμV/m)	(PEAK) Margin (dB)	(OP) Margin (dB)	Limit (dBμV/m)	Transducer (dB)	Cable (dB)	Twr Ht (cm)	Ttbl Aql (deq)
35.60	V	34.95	31.10	-5.05	-8.90	40.00	23.72	0.39	191.55	112.50
40.00	V	36.36	31.59	-3.64	-8.41	40.00	24.17	0.43	399.85	56.25
41.40	H	35.44	31.05	-4.56	-8.95	40.00	23.66	0.44	367.79	255.00
772.70	H	41.17	36.74	-4.83	-9.26	46.00	25.90	2.36	399.85	26.75
784.30	H	41.26	36.82	-4.74	-9.18	46.00	25.90	2.37	384.32	310.50
947.40	H	43.22	39.32	-2.78	-6.68	46.00	27.66	2.71	175.49	169.25



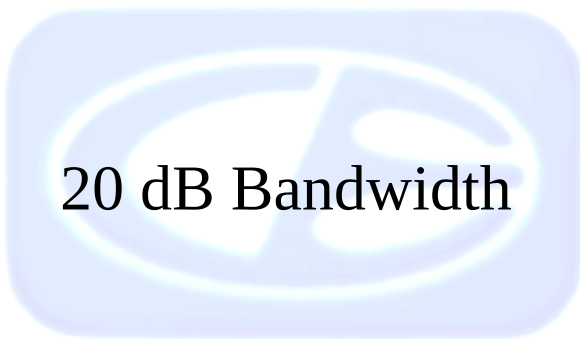




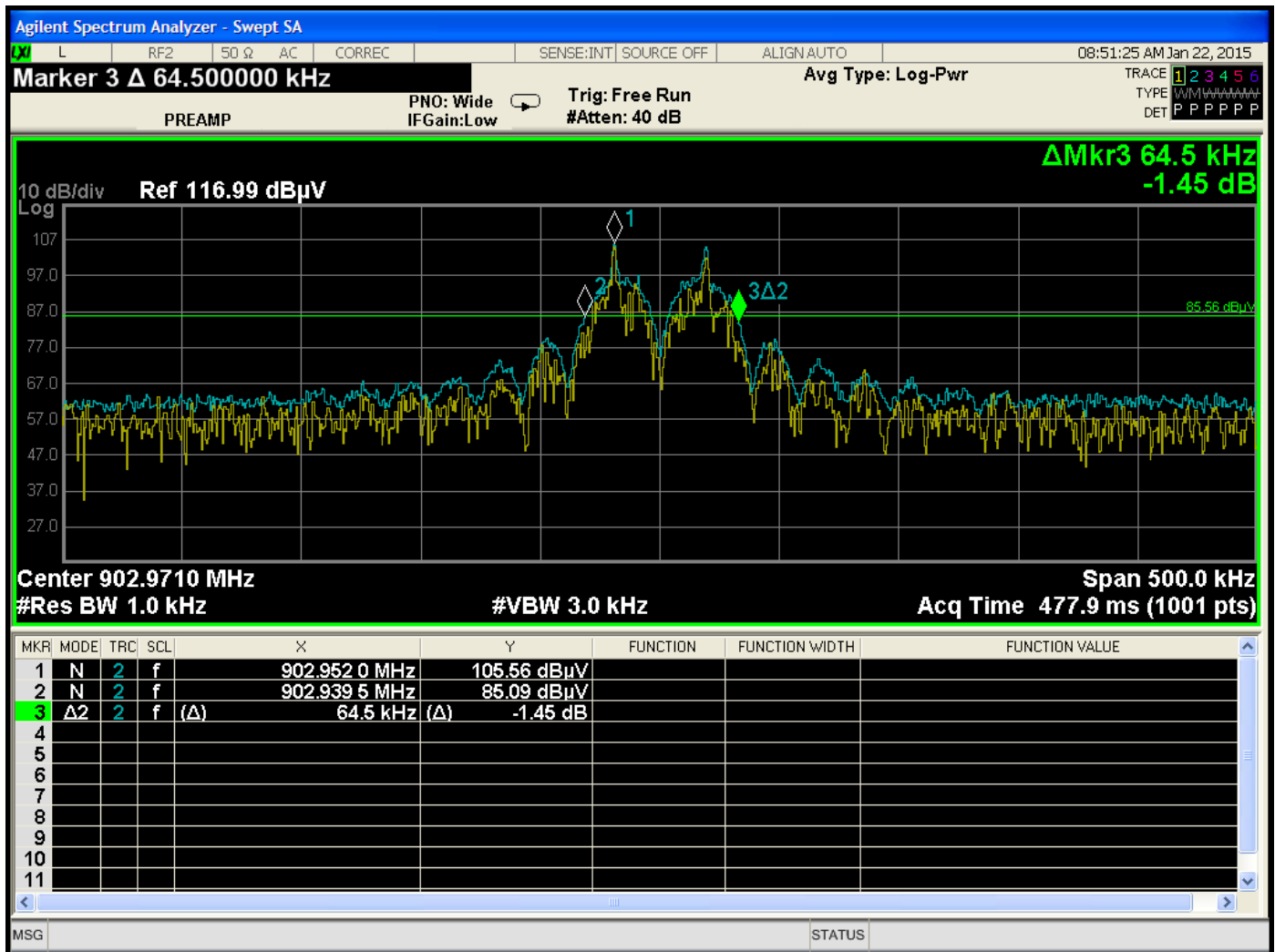
Band Edge – Low Channel – Protocol A



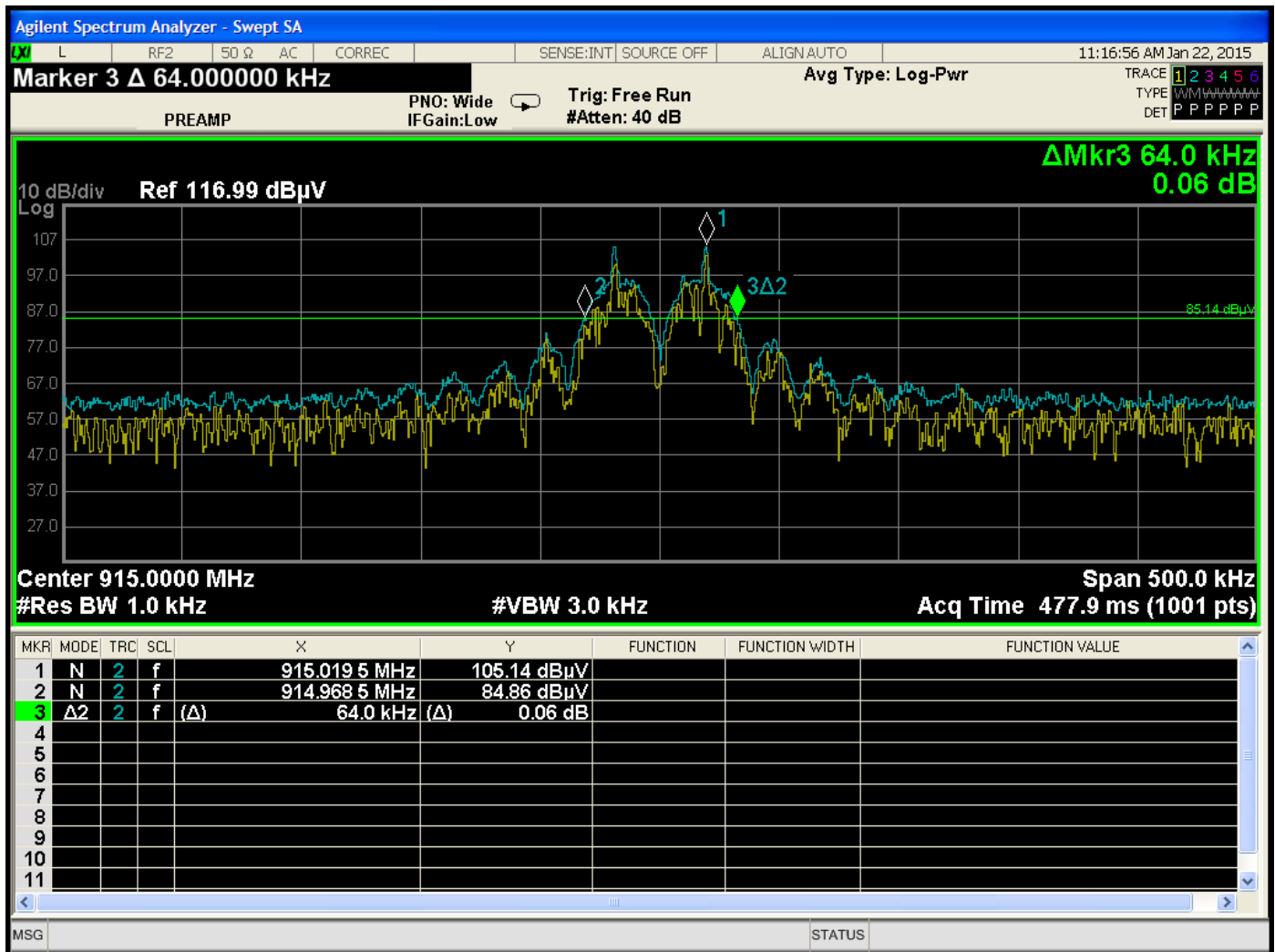
Band Edge – High Channel – Protocol A



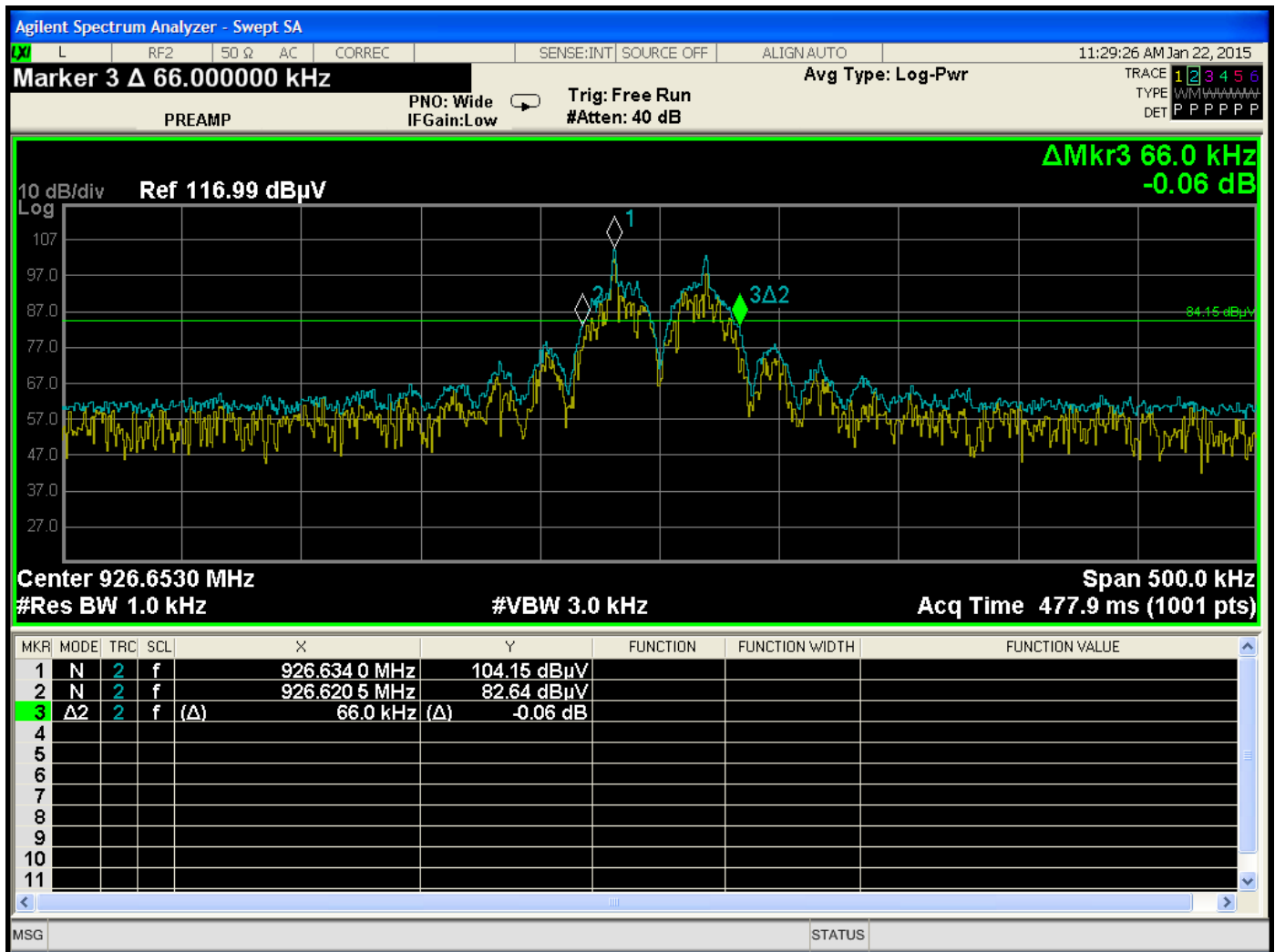
20 dB Bandwidth



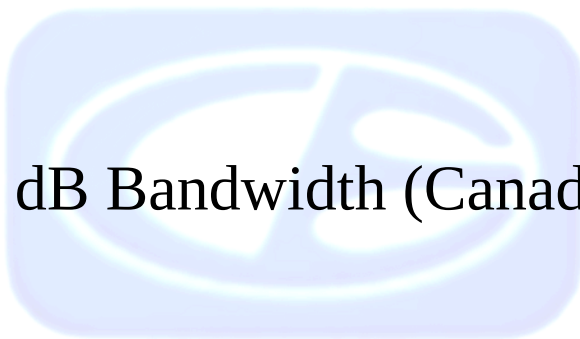
20 dB Bandwidth – Low Channel – Protocol A



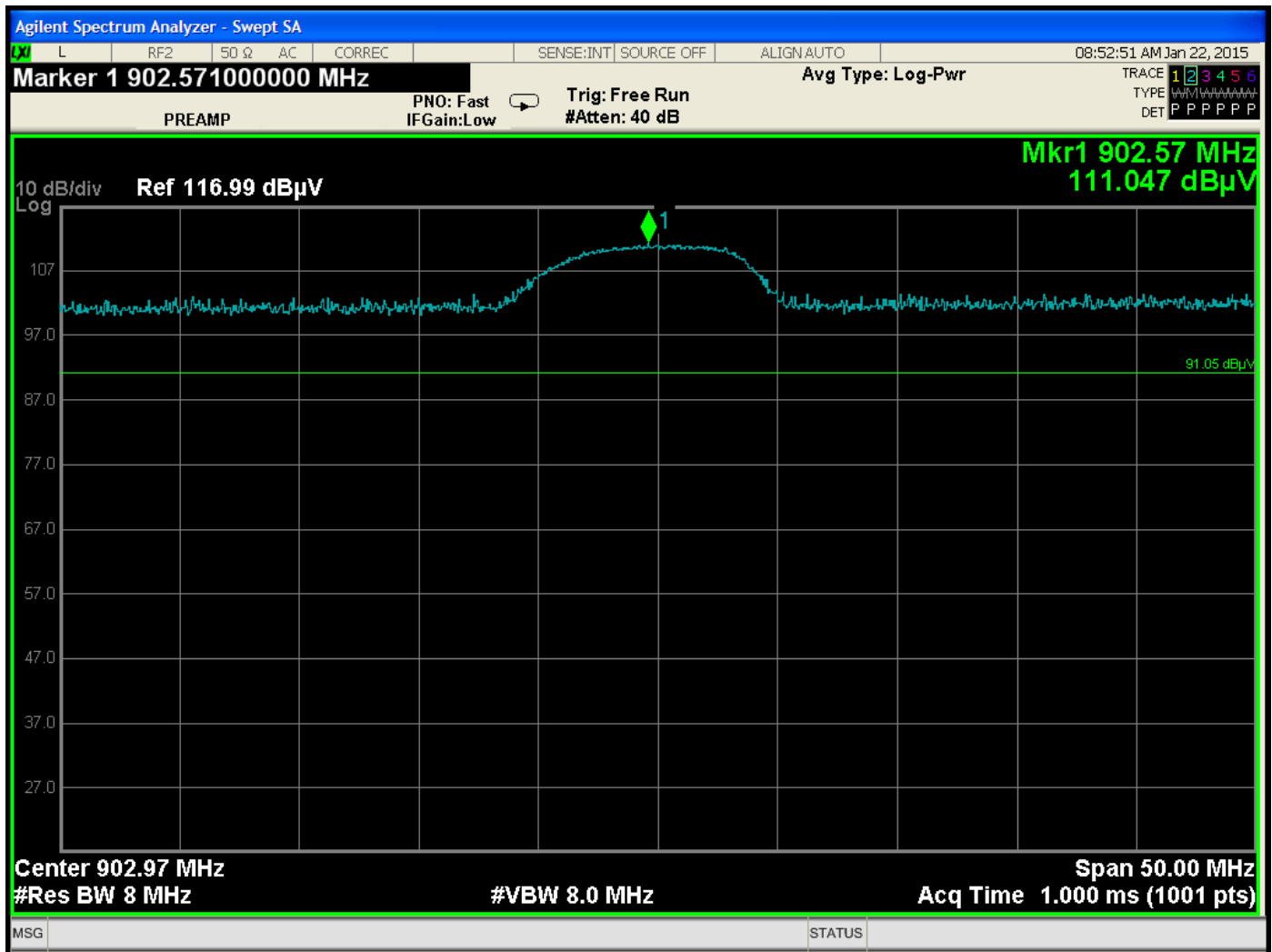
20 dB Bandwidth – Middle Channel – Protocol A



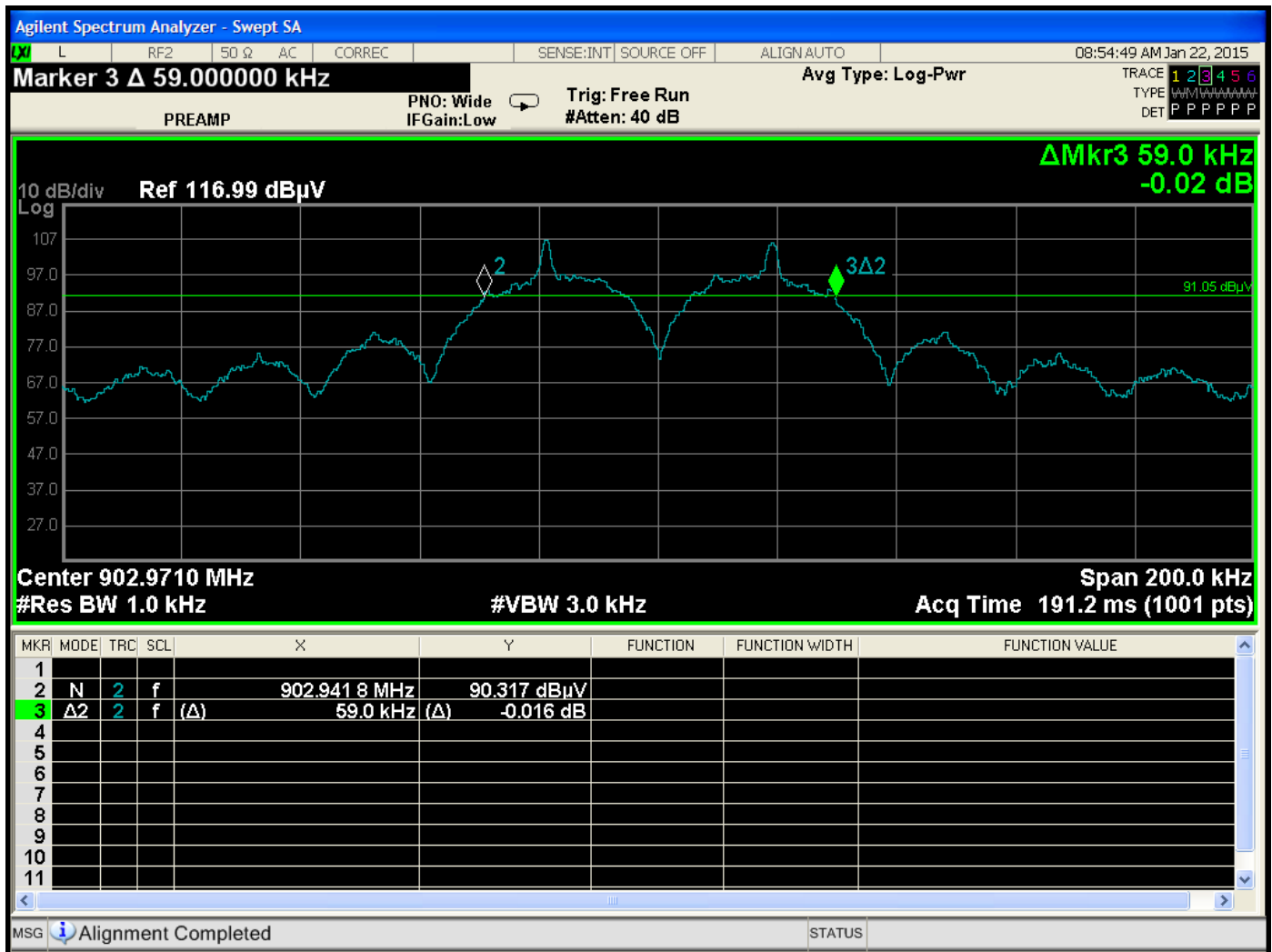
20 dB Bandwidth – High Channel – Protocol A



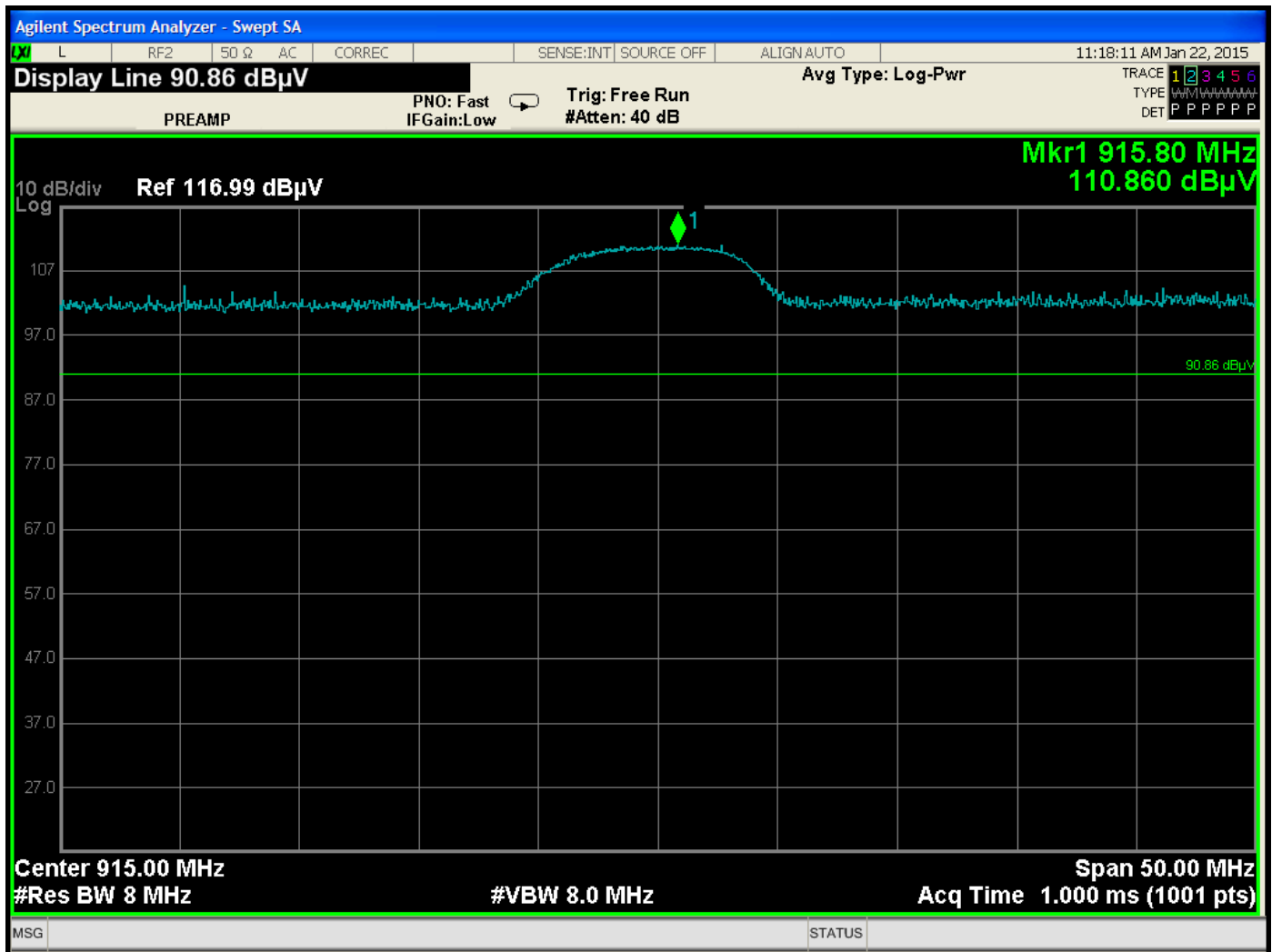
20 dB Bandwidth (Canada)



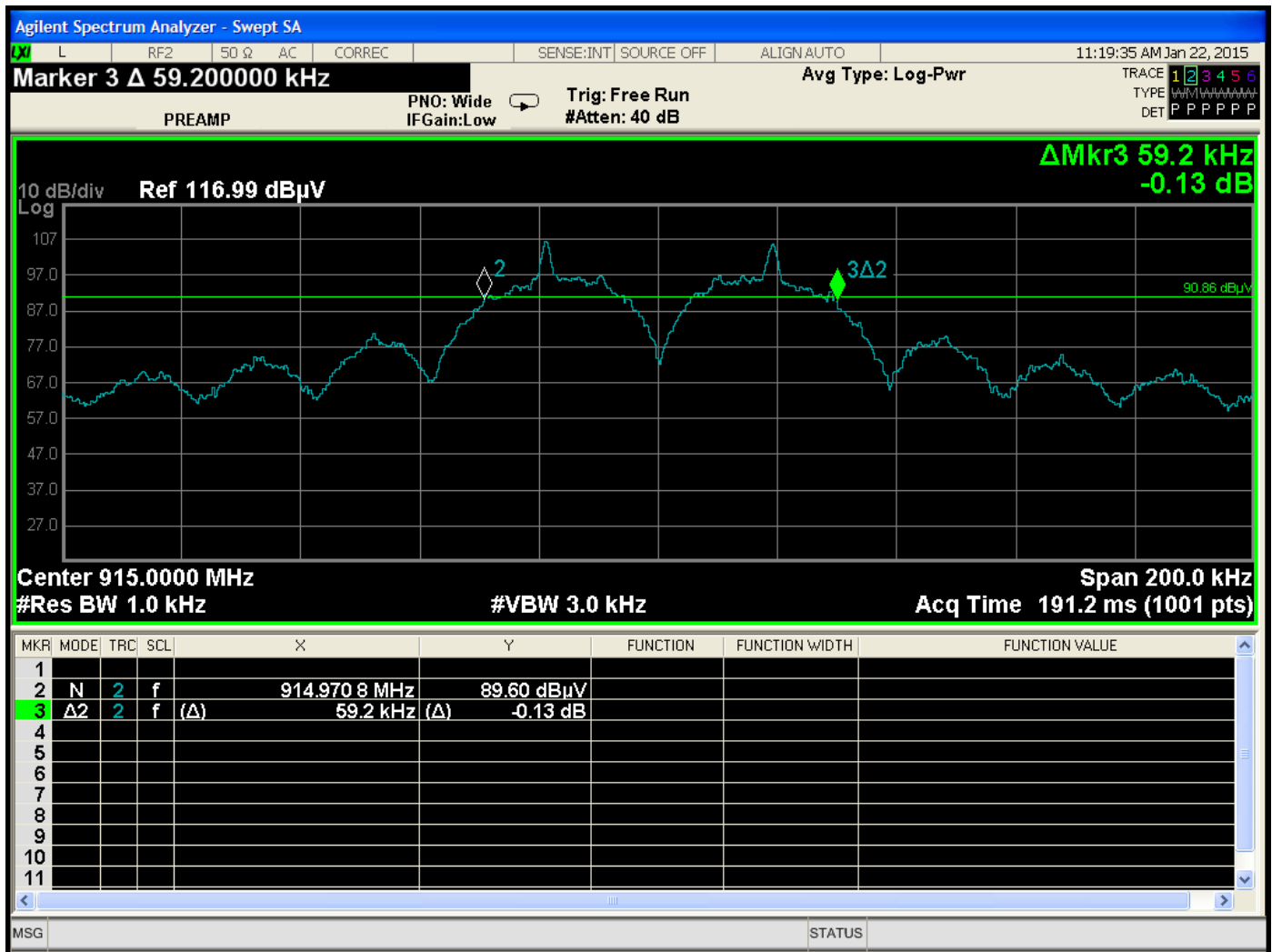
20 dB Bandwidth – Reference Level – Low Channel – Protocol A



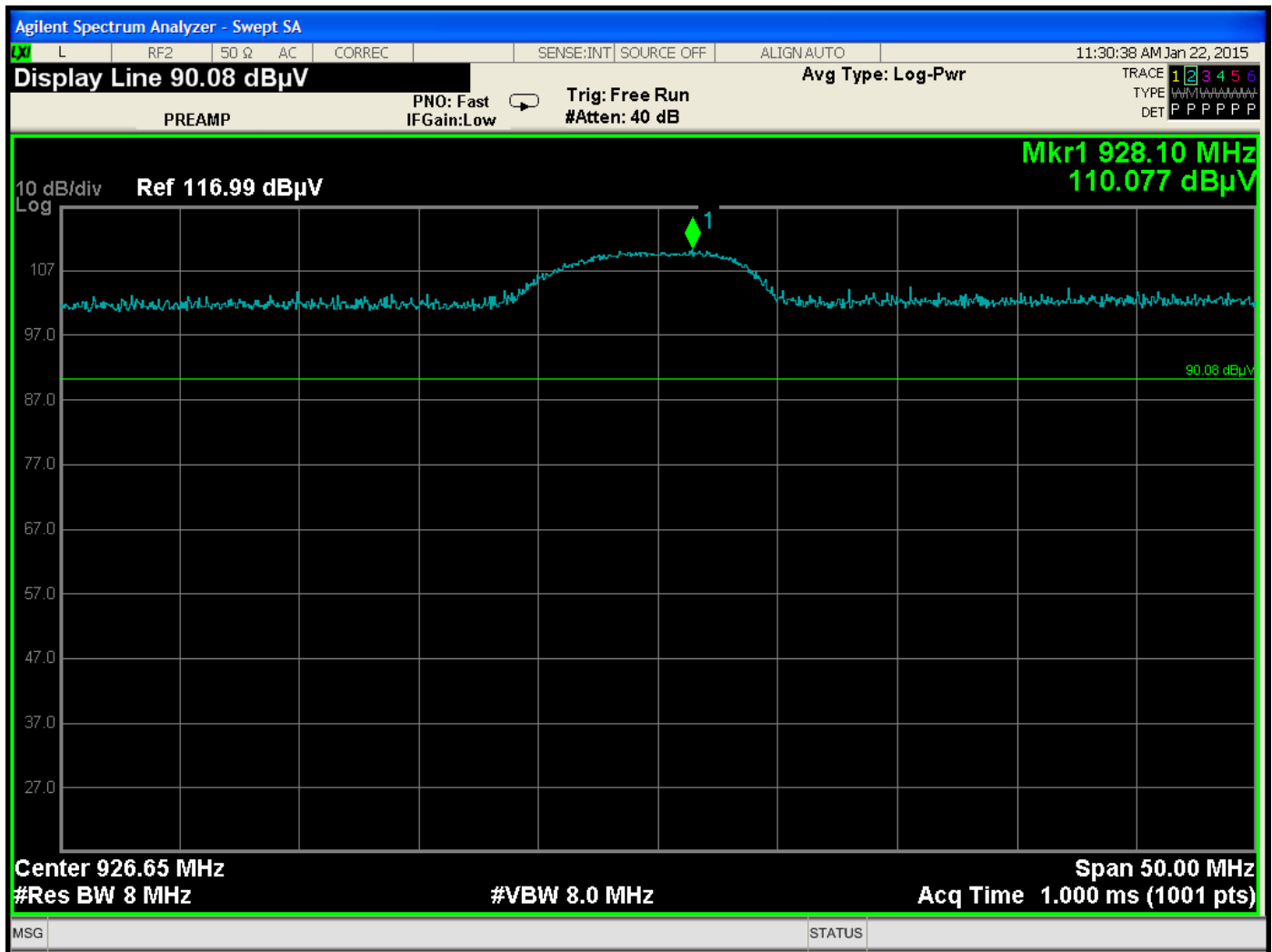
20 dB Bandwidth – 1 KHz RBW – Low Channel – Protocol A



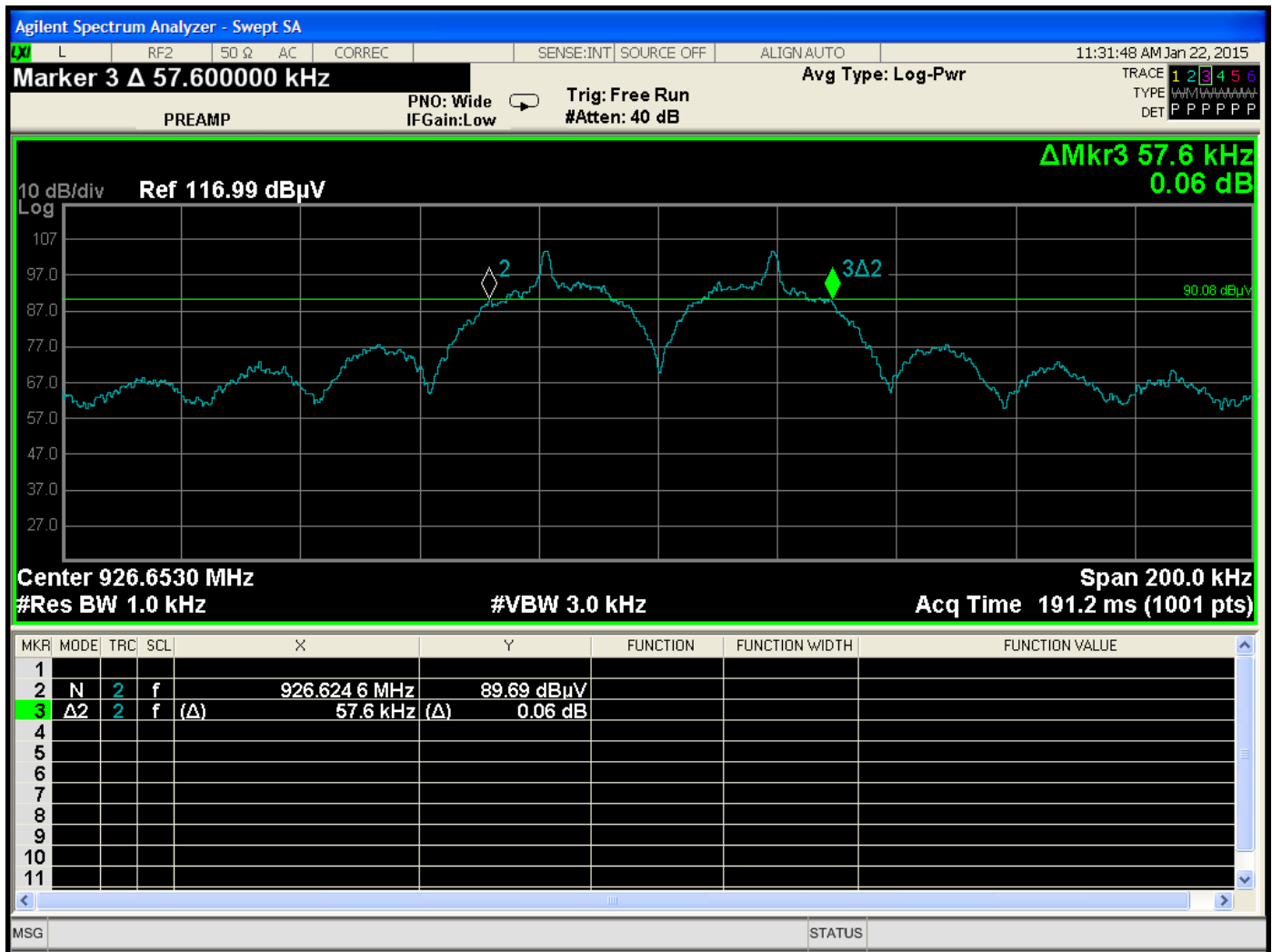
20 dB Bandwidth – Reference Level – Middle Channel – Protocol A



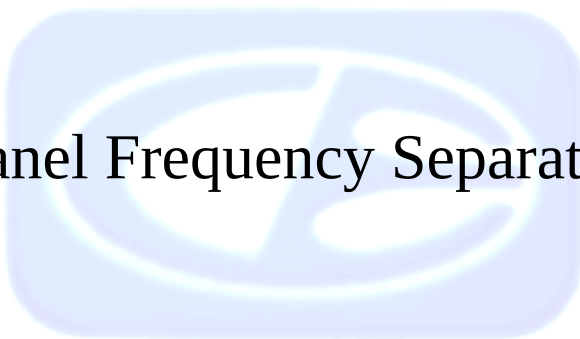
20 dB Bandwidth – 1 KHz RBW – Middle Channel – Protocol A



20 dB Bandwidth – Reference Level – High Channel – Protocol A



20 dB Bandwidth – 1 KHz RBW – High Channel – Protocol A



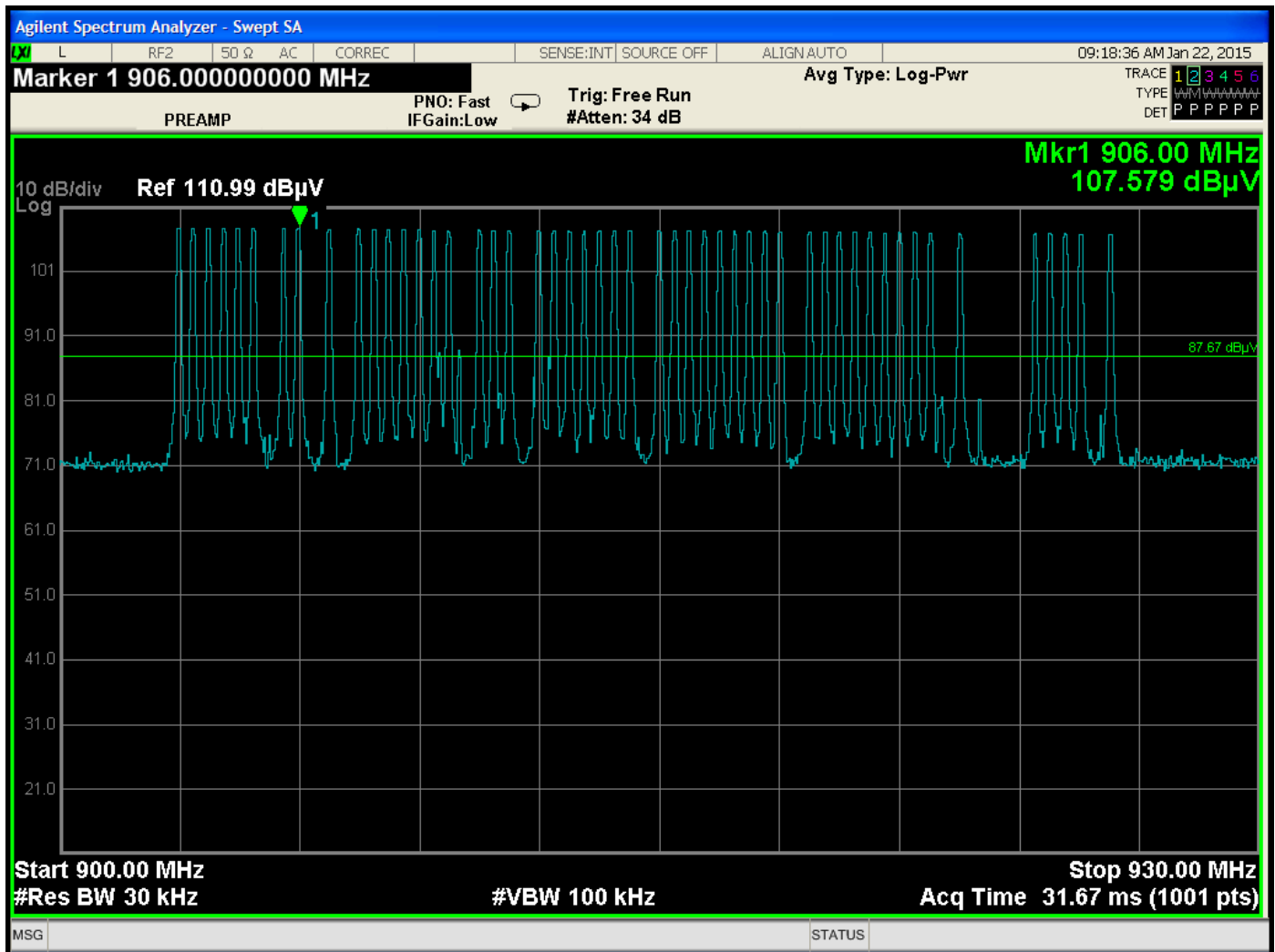
Chanel Frequency Separation



Channel Frequency Separation – Protocol A



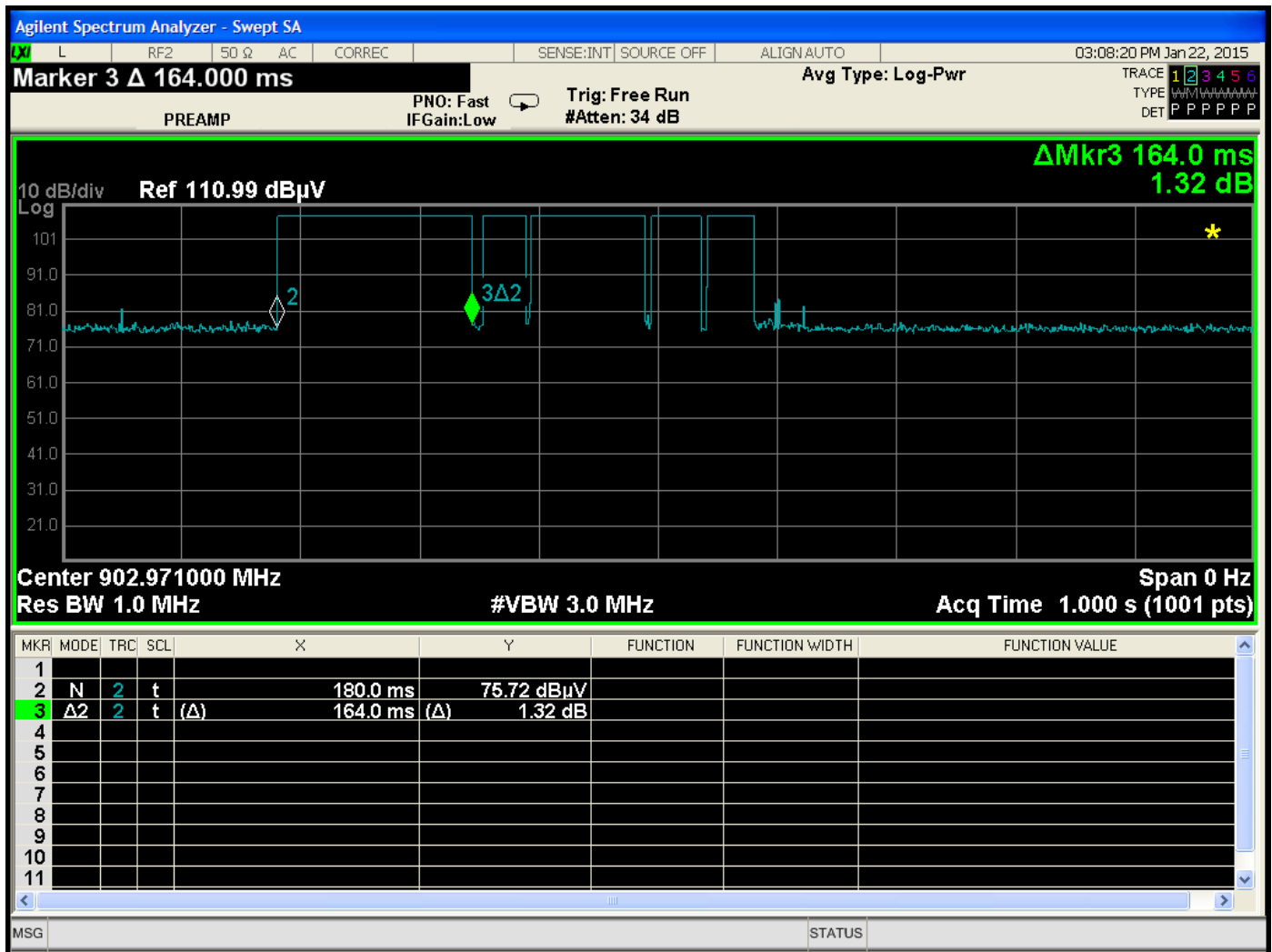
Number of Hopping Frequencies



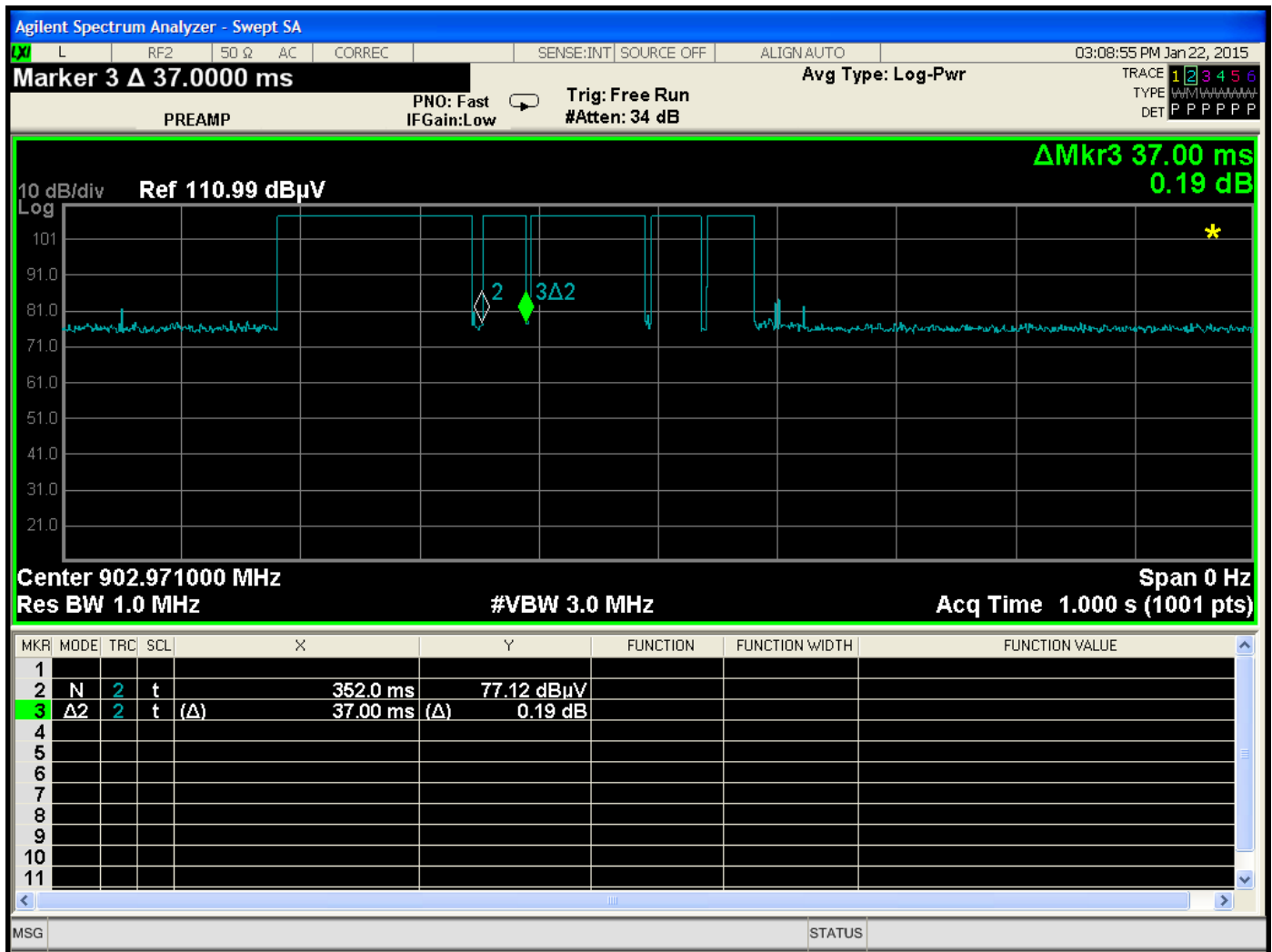
Number of Hopping Frequencies – Protocol A



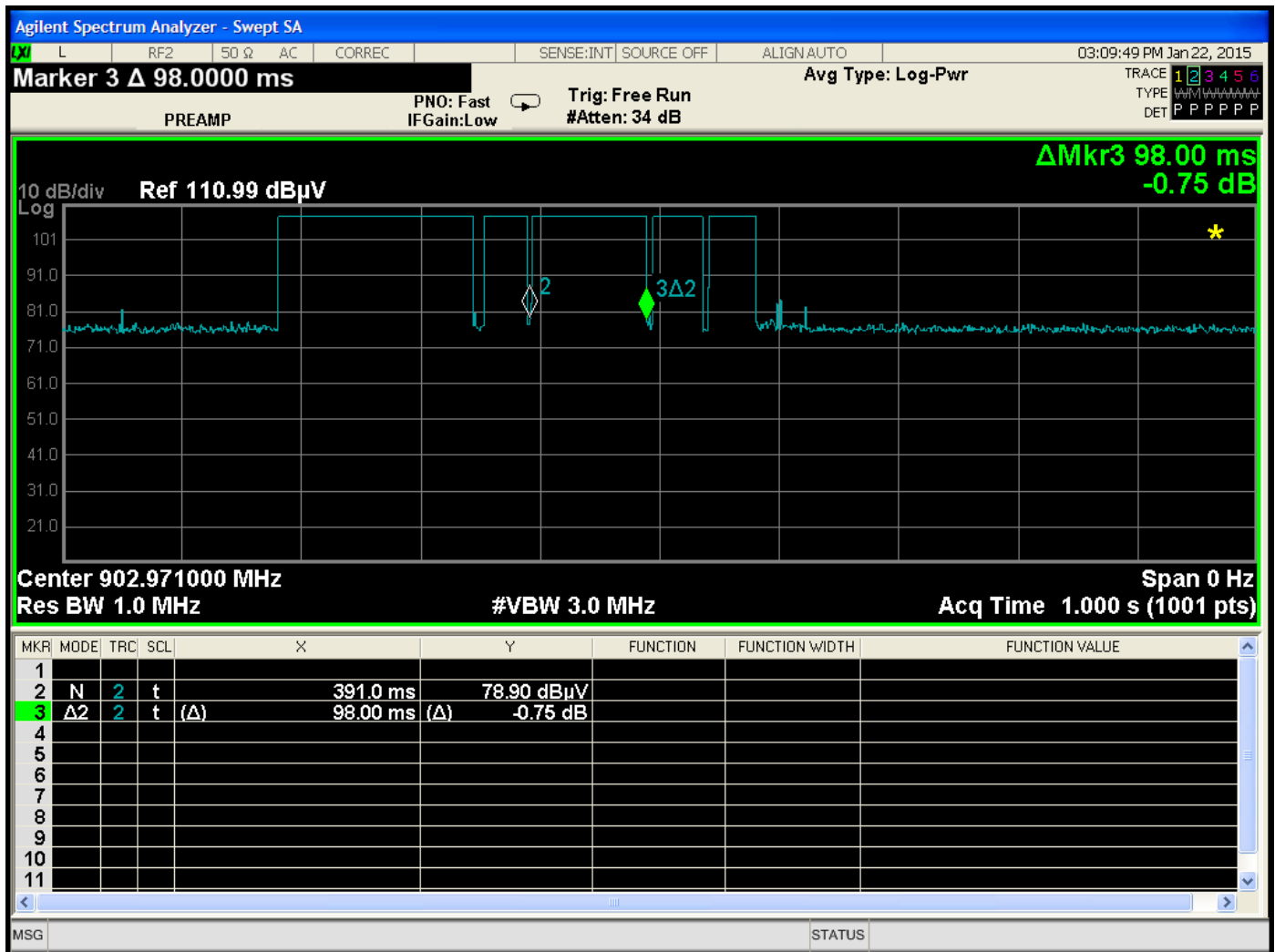
Time of Occupancy



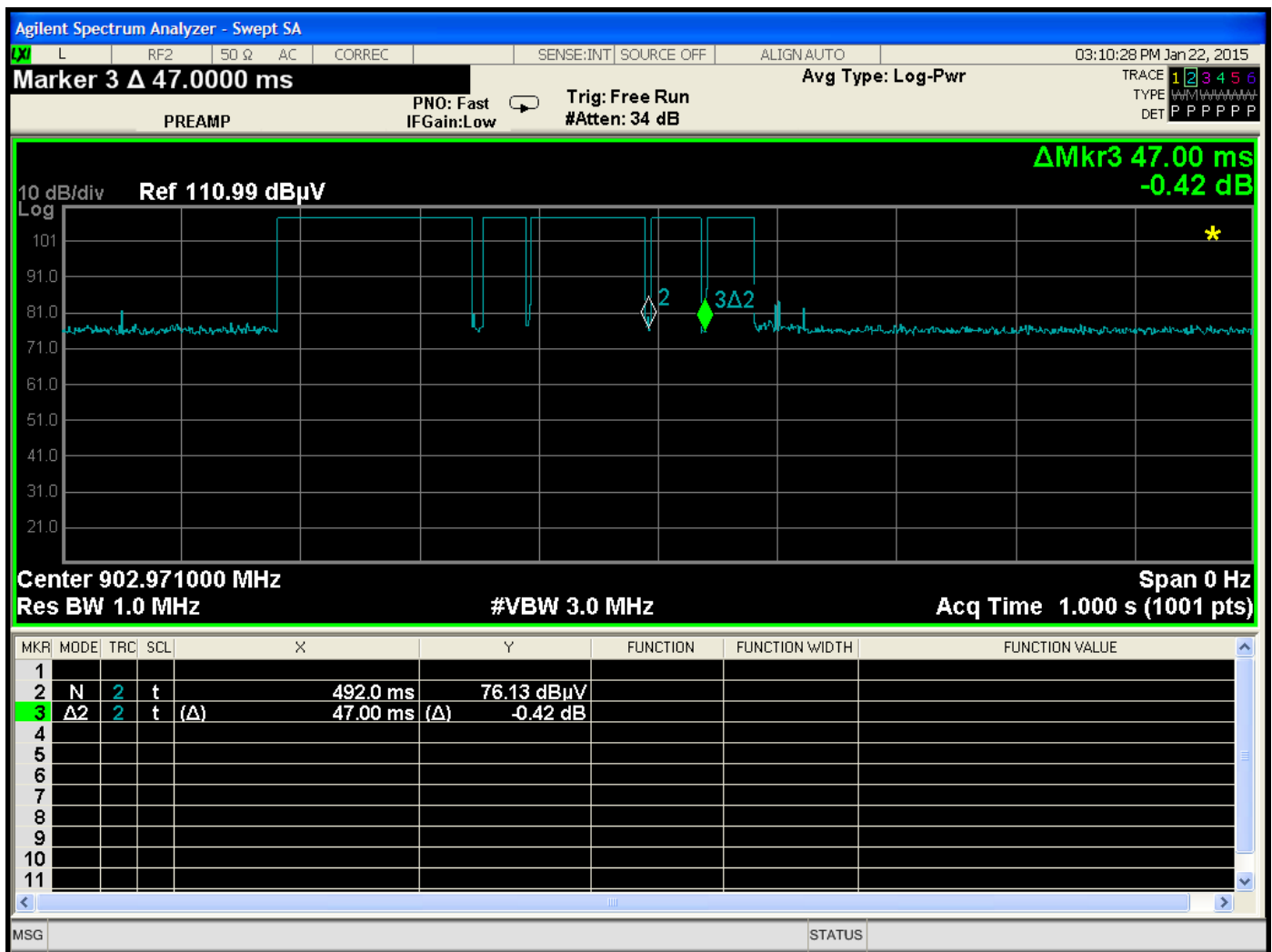
Time of Occupancy – Time of Pulse One = 164 ms



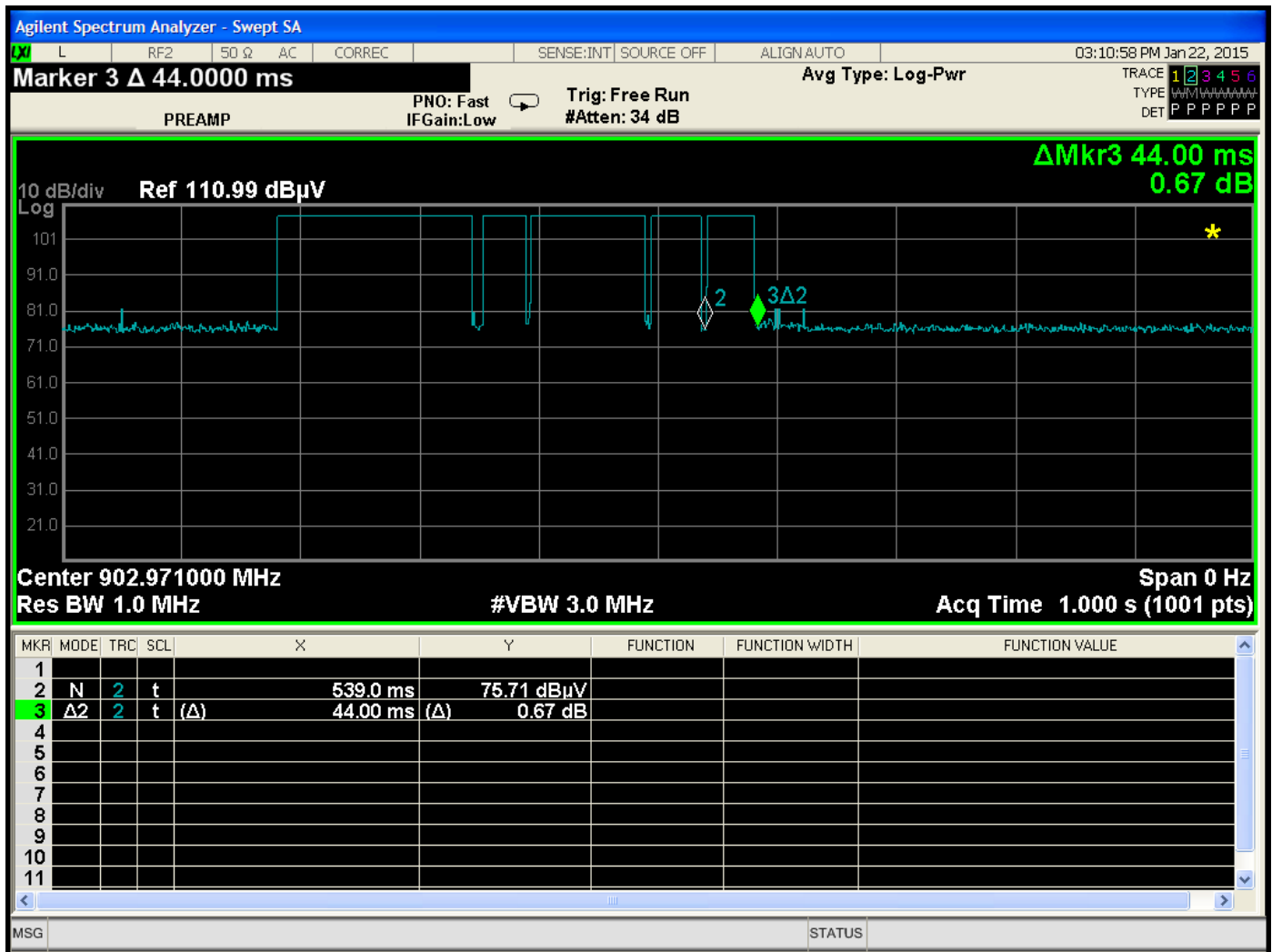
Time of Occupancy – Time of Pulse Two = 37 ms



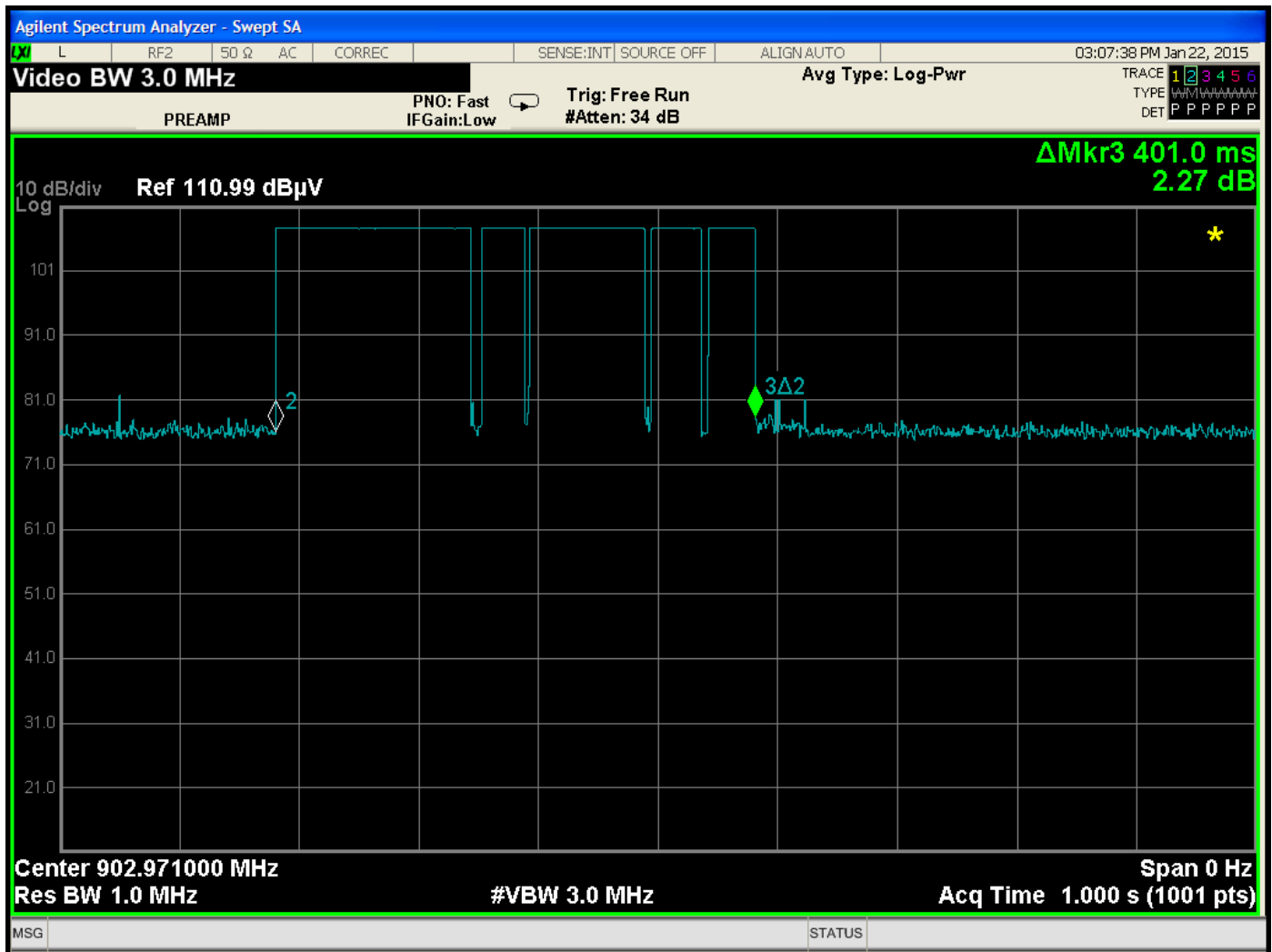
Time of Occupancy – Time of Pulse Three = 98 ms



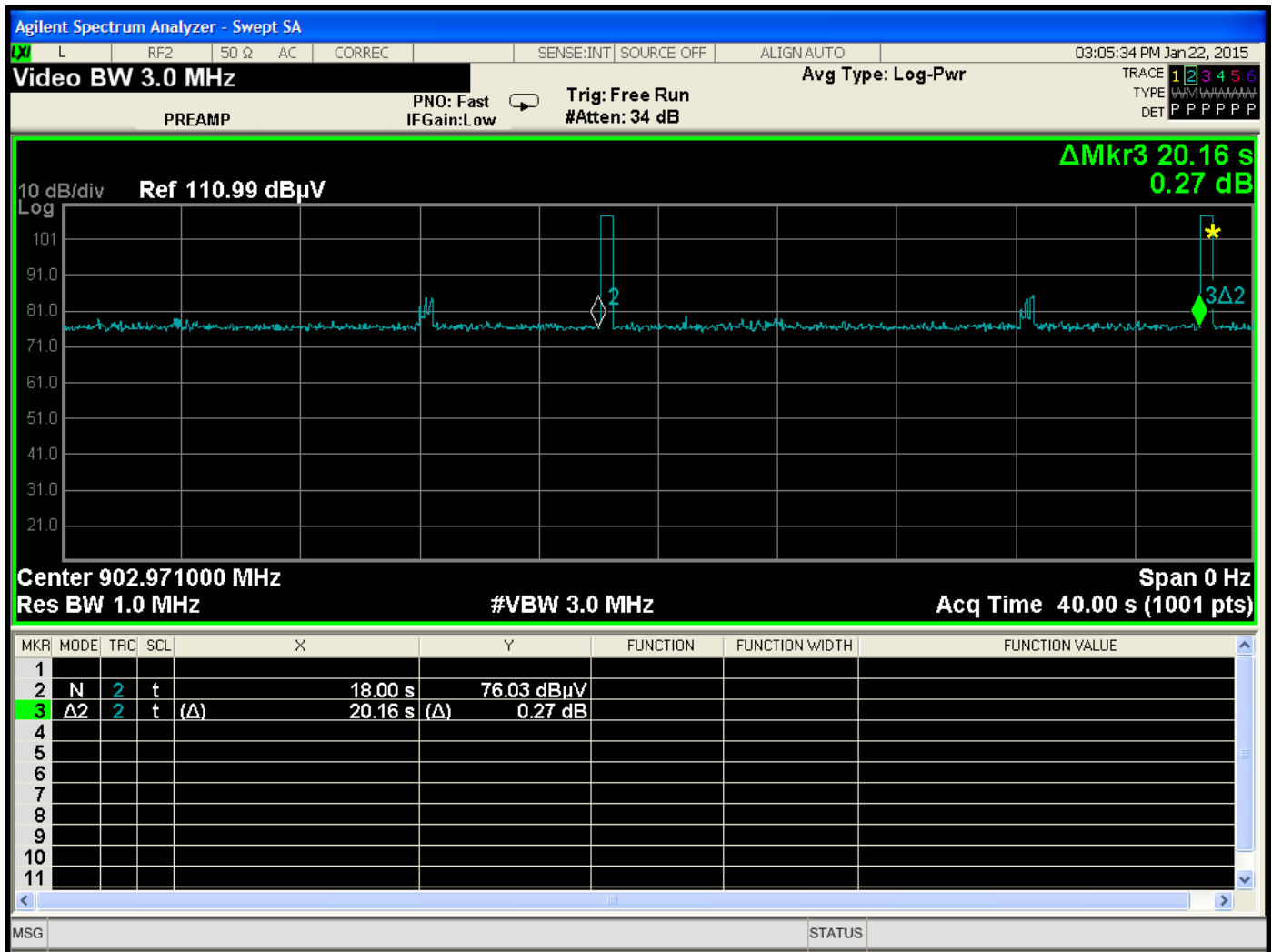
Time of Occupancy – Time of Pulse Four = 47 ms



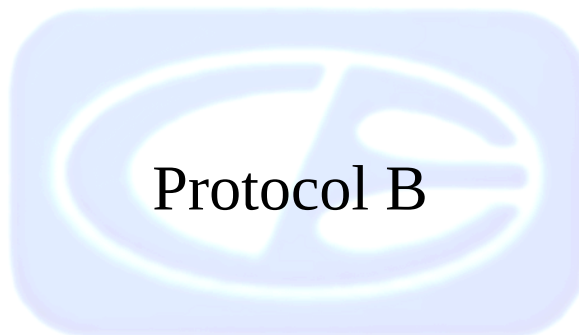
Time of Occupancy – Time of Pulse Five = 44 ms

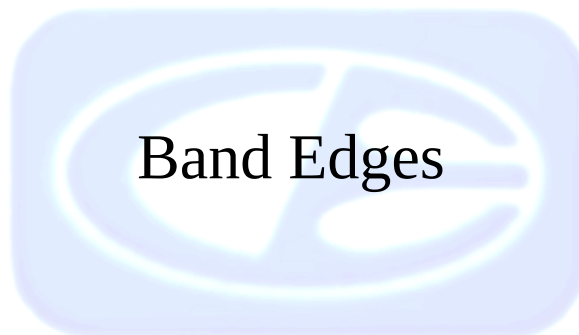


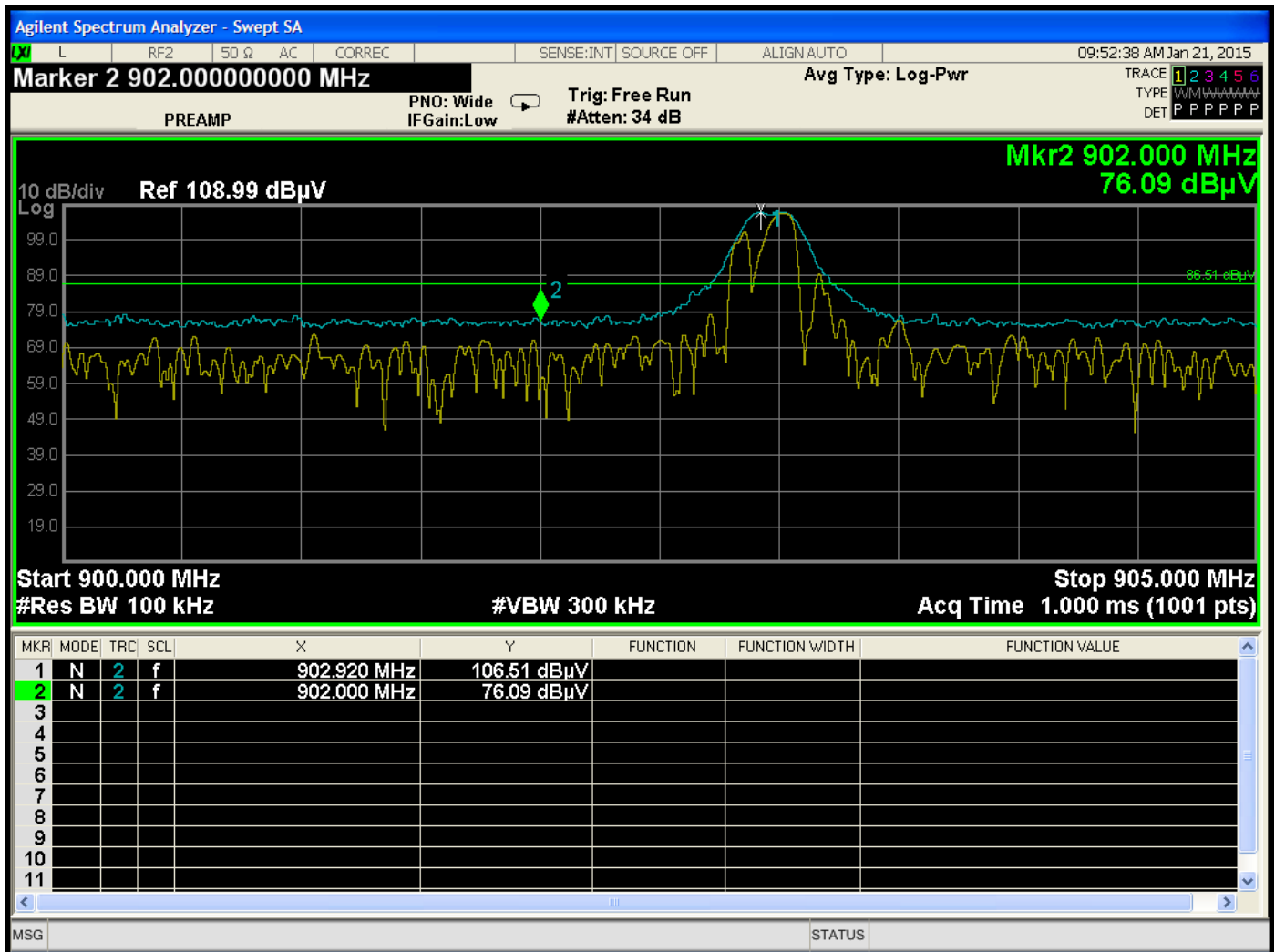
Time of Occupancy – Time of Pulse Train with Blanking = 390 ms



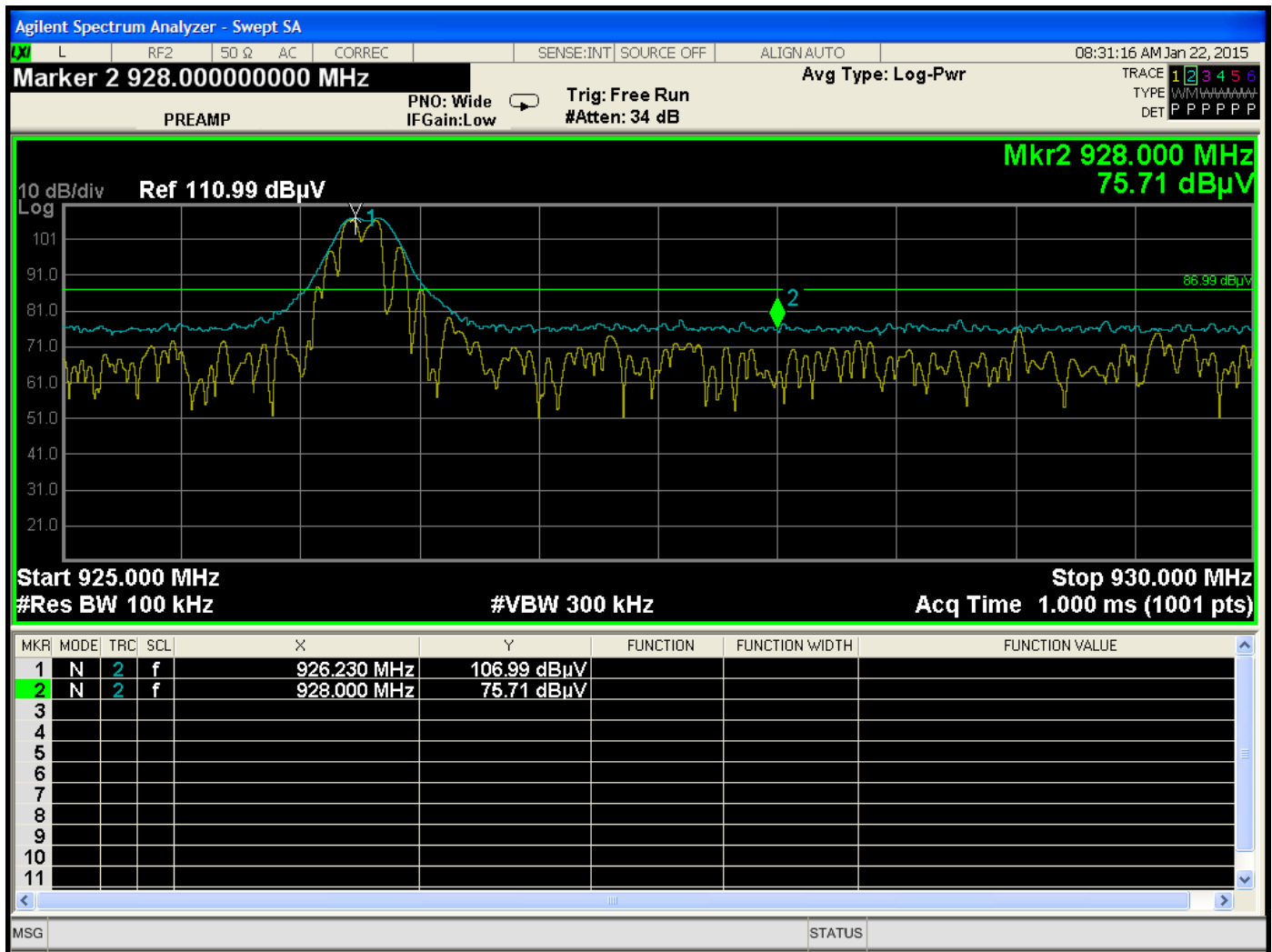
Time of Occupancy – Time Between Pulses = 20.16 s







Band Edge – Low Channel – Protocol B



Band Edge – High Chanel – Protocol B





20 dB Bandwidth – Low Channel – Protocol B

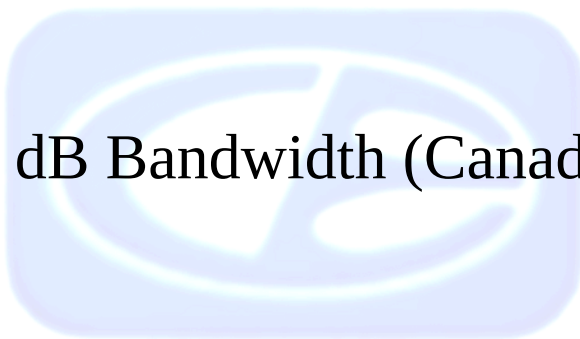


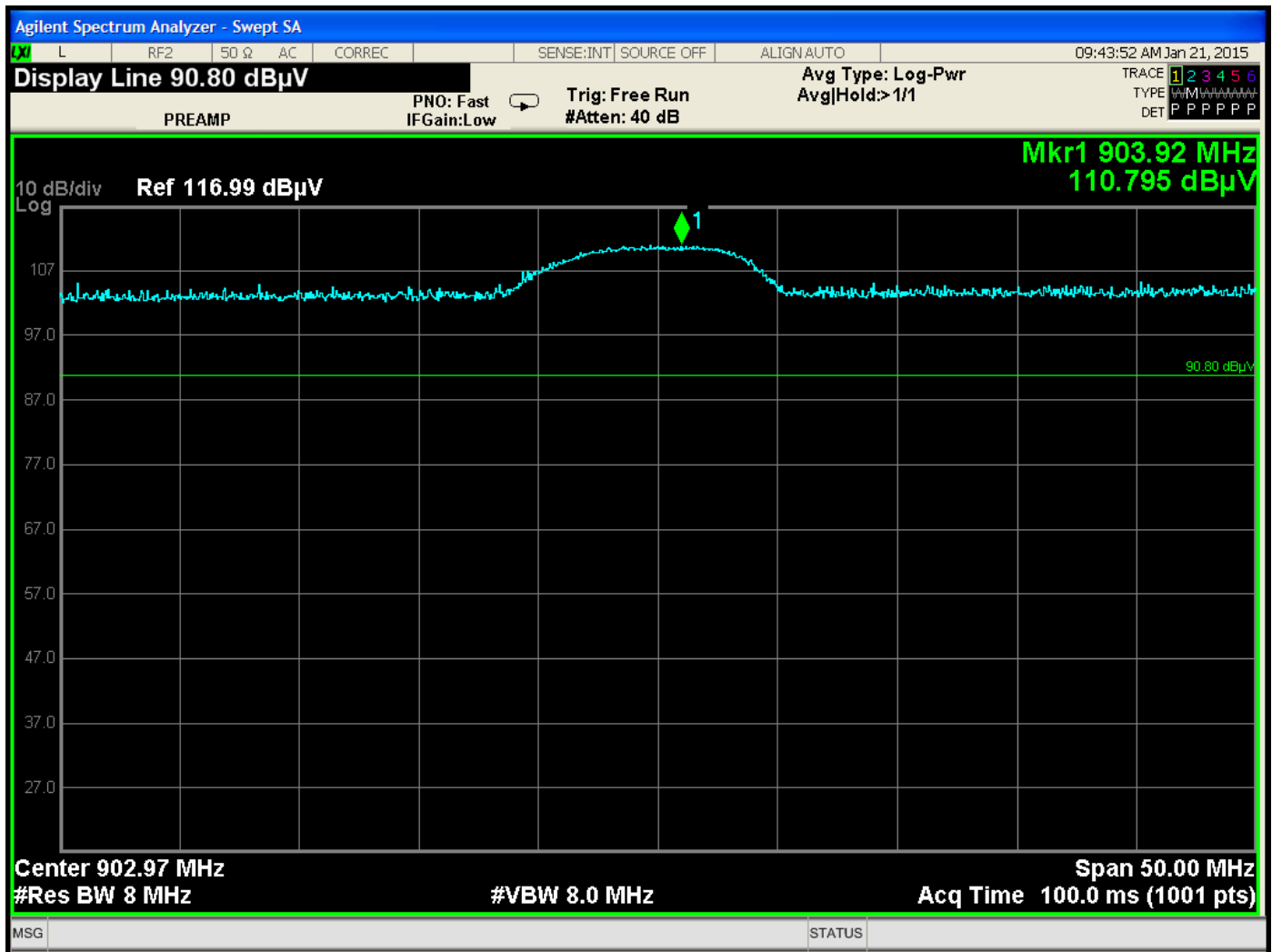
20 dB Bandwidth – Middle Channel – Protocol B



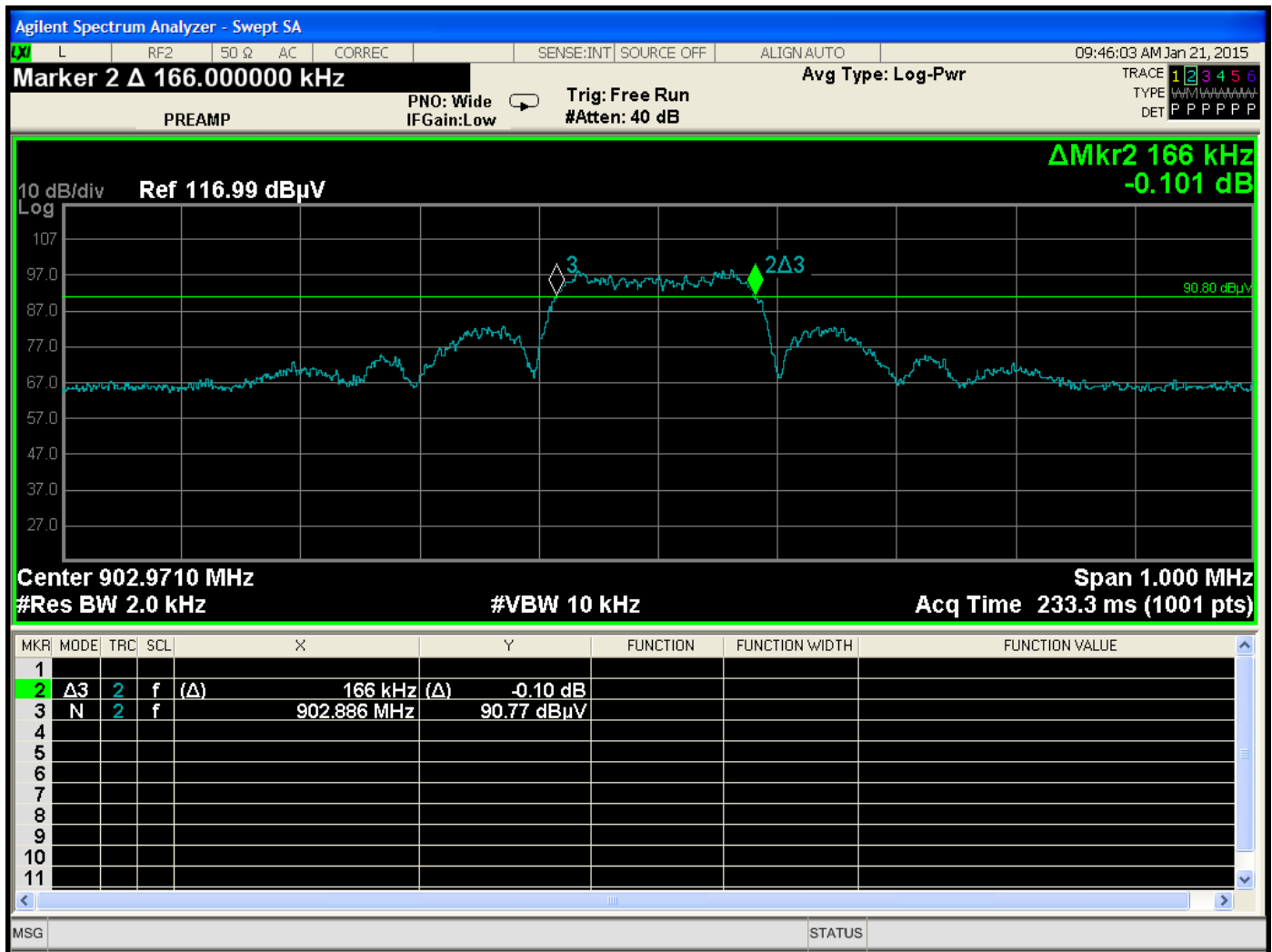
20 dB Bandwidth – High Channel – Protocol B

20 dB Bandwidth (Canada)

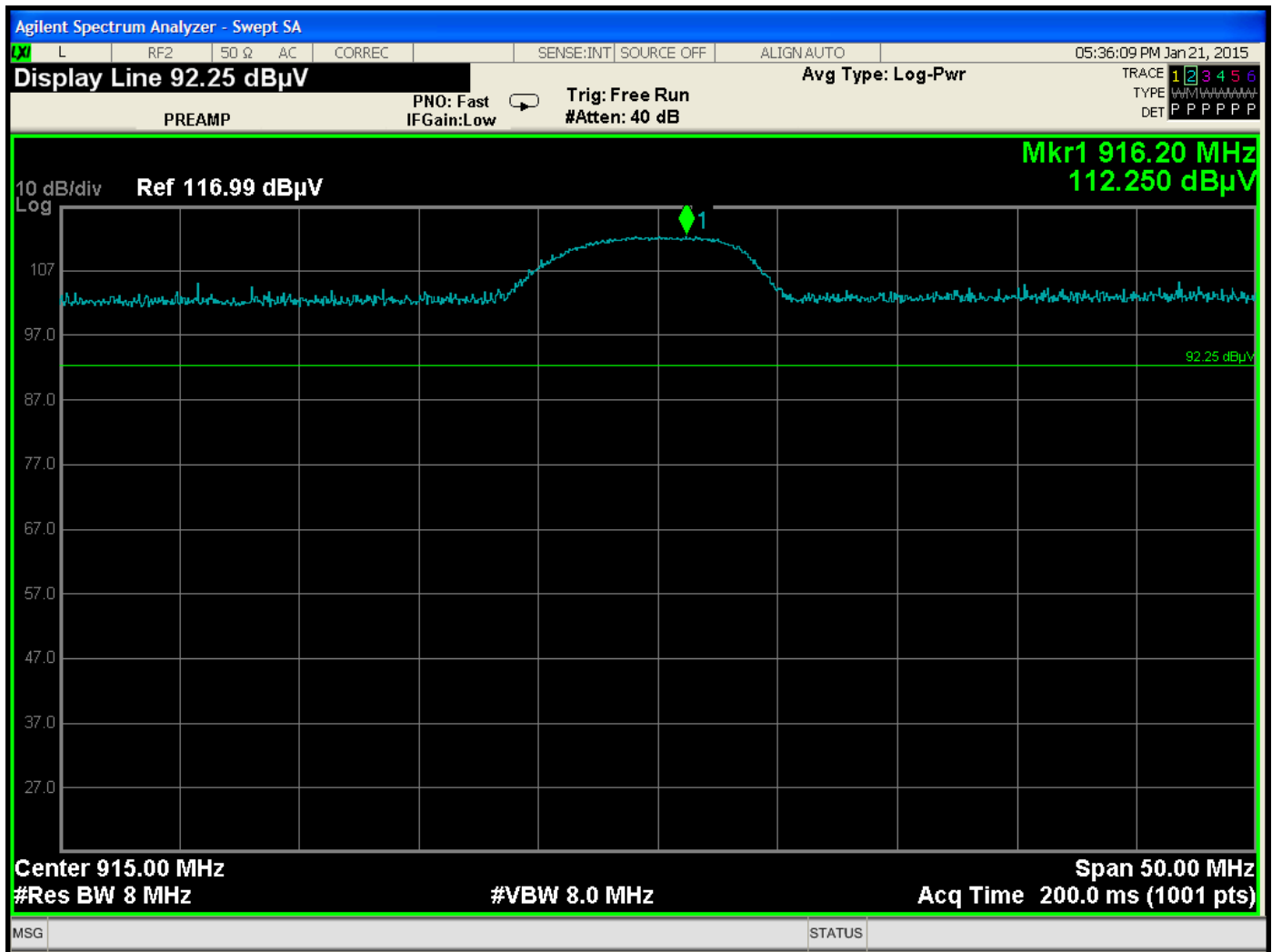




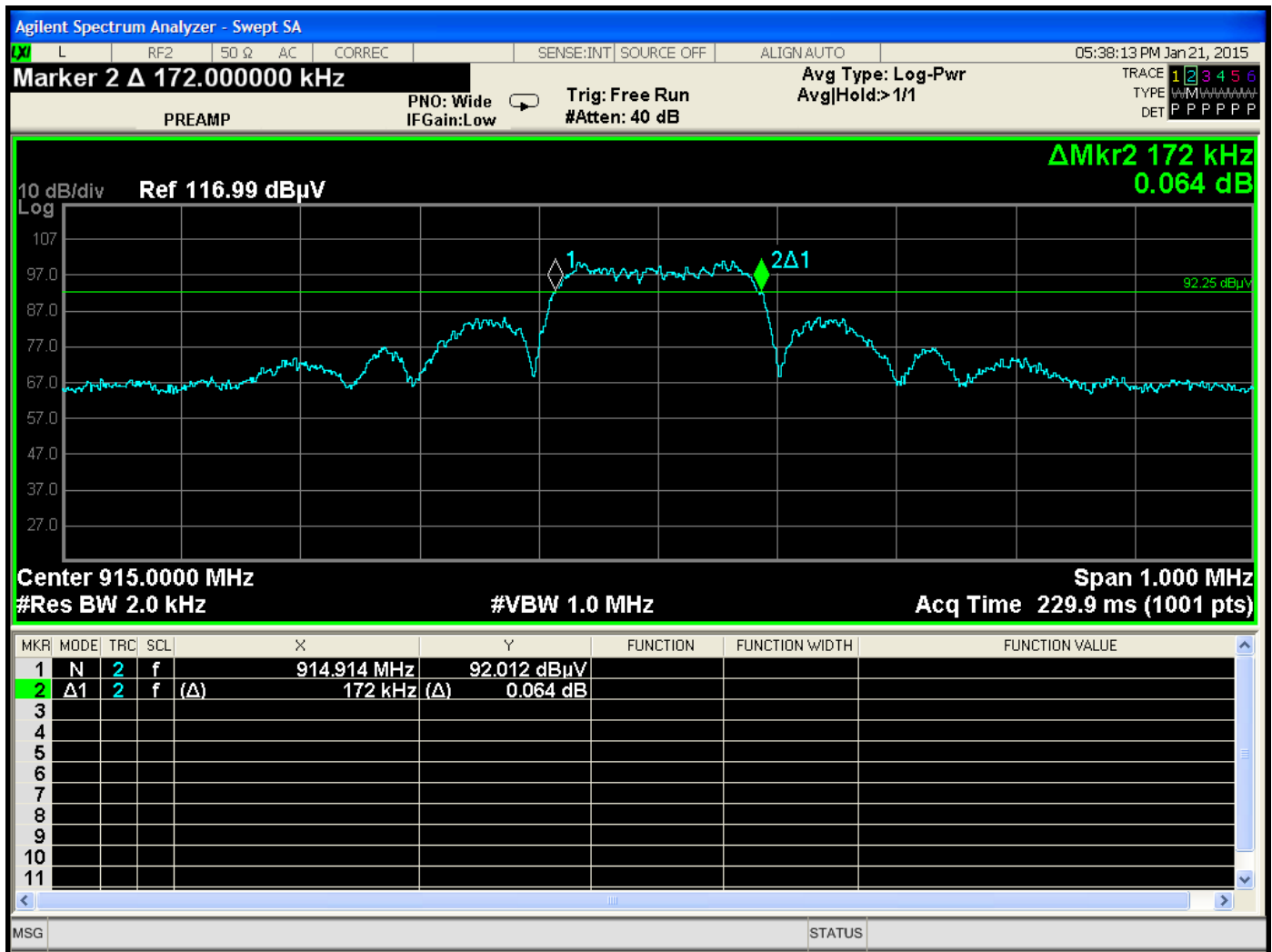
20 dB Bandwidth – Reference Level – Low Channel – Protocol B



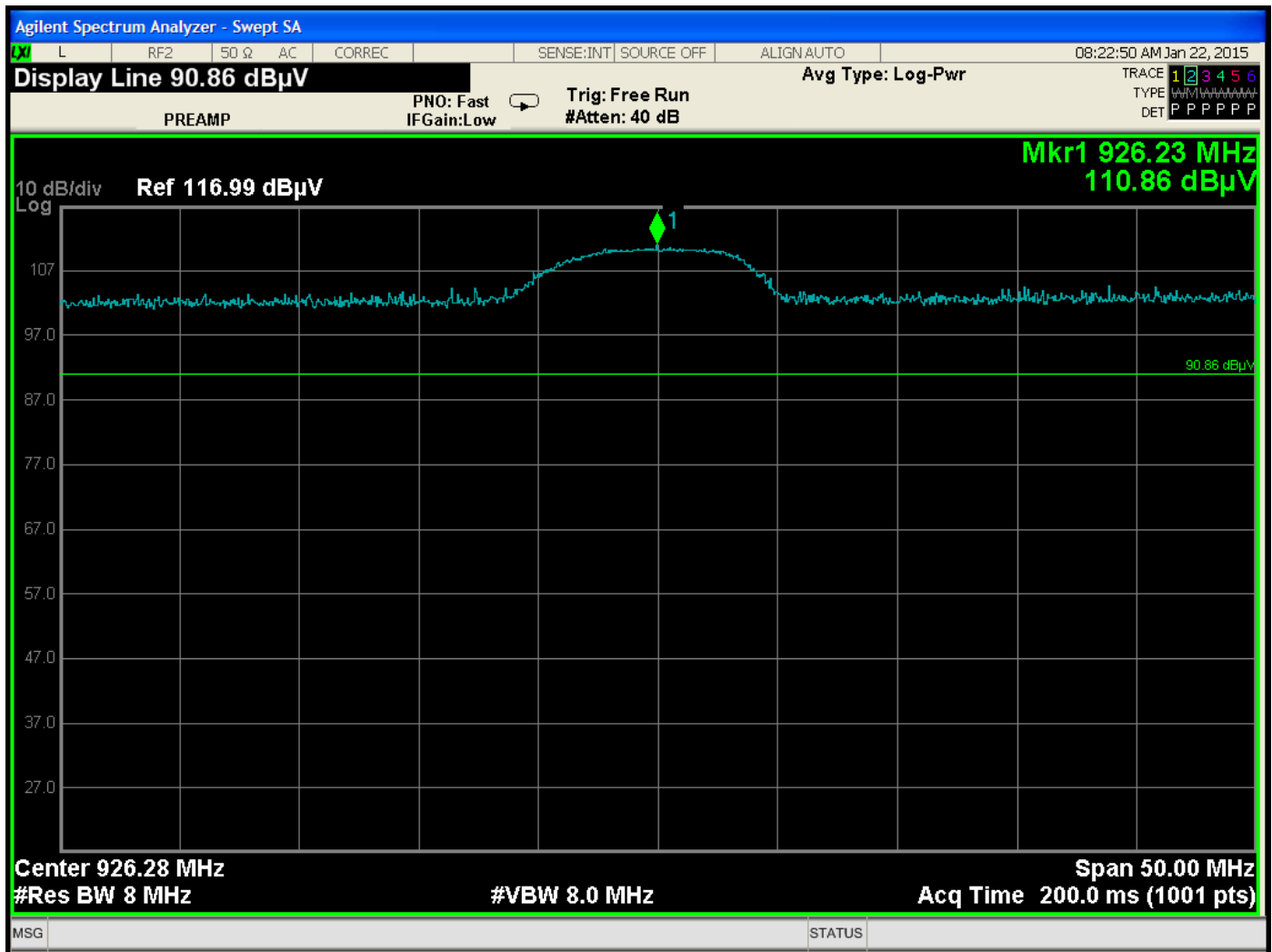
20 dB Bandwidth – 2 KHz RBW – Low Channel – Protocol B



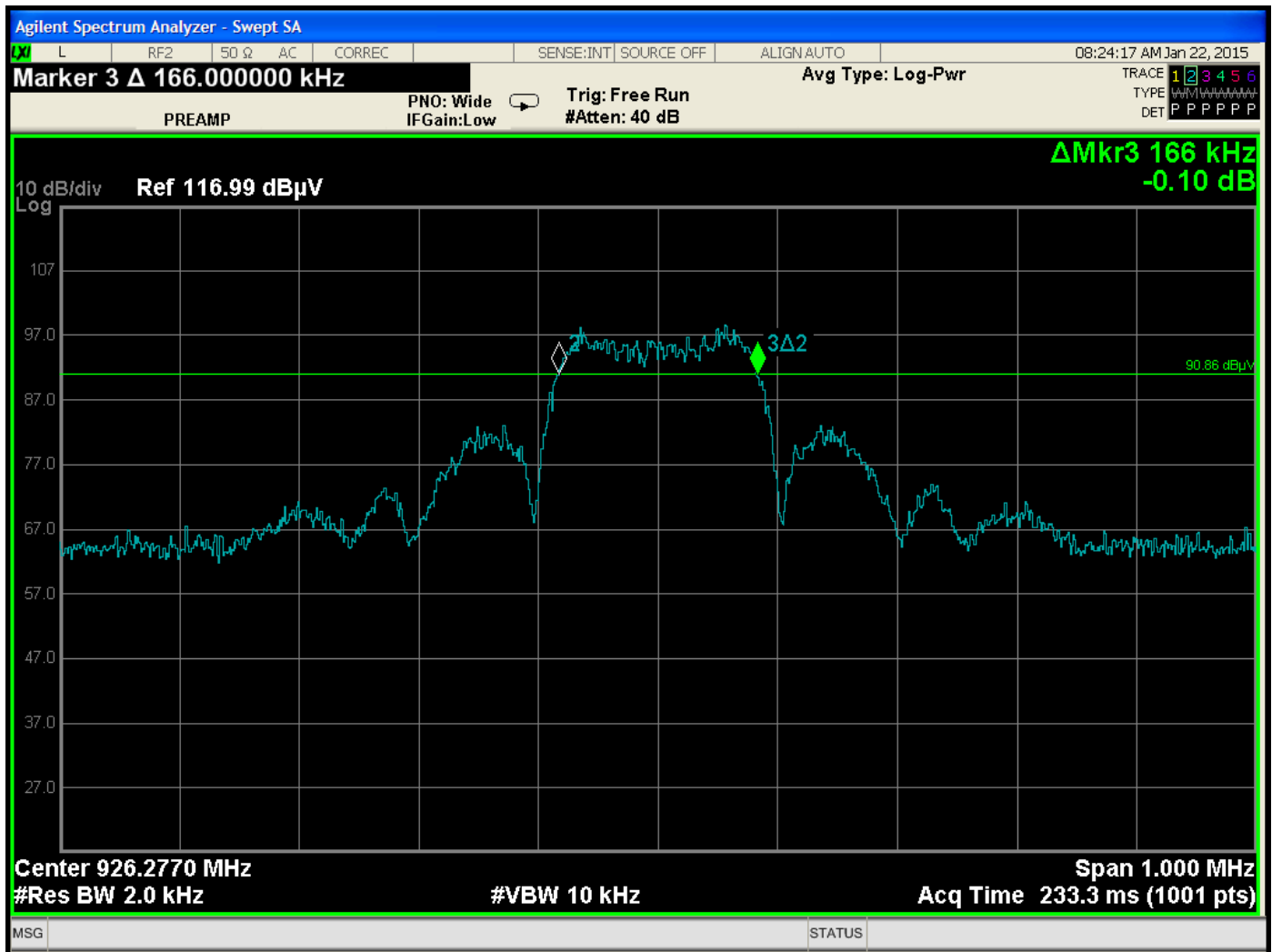
20 dB Bandwidth – Reference Level – Middle Channel – Protocol B



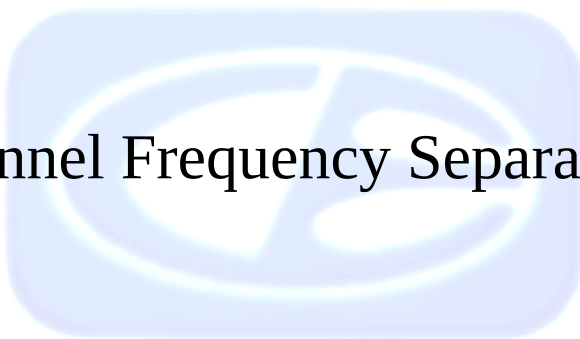
20 dB Bandwidth – 2 KHz RBW – Middle Channel – Protocol B



20 dB Bandwidth – Reference Level – High Channel – Protocol B



20 dB Bandwidth – 2 KHz RBW – High Channel – Protocol B



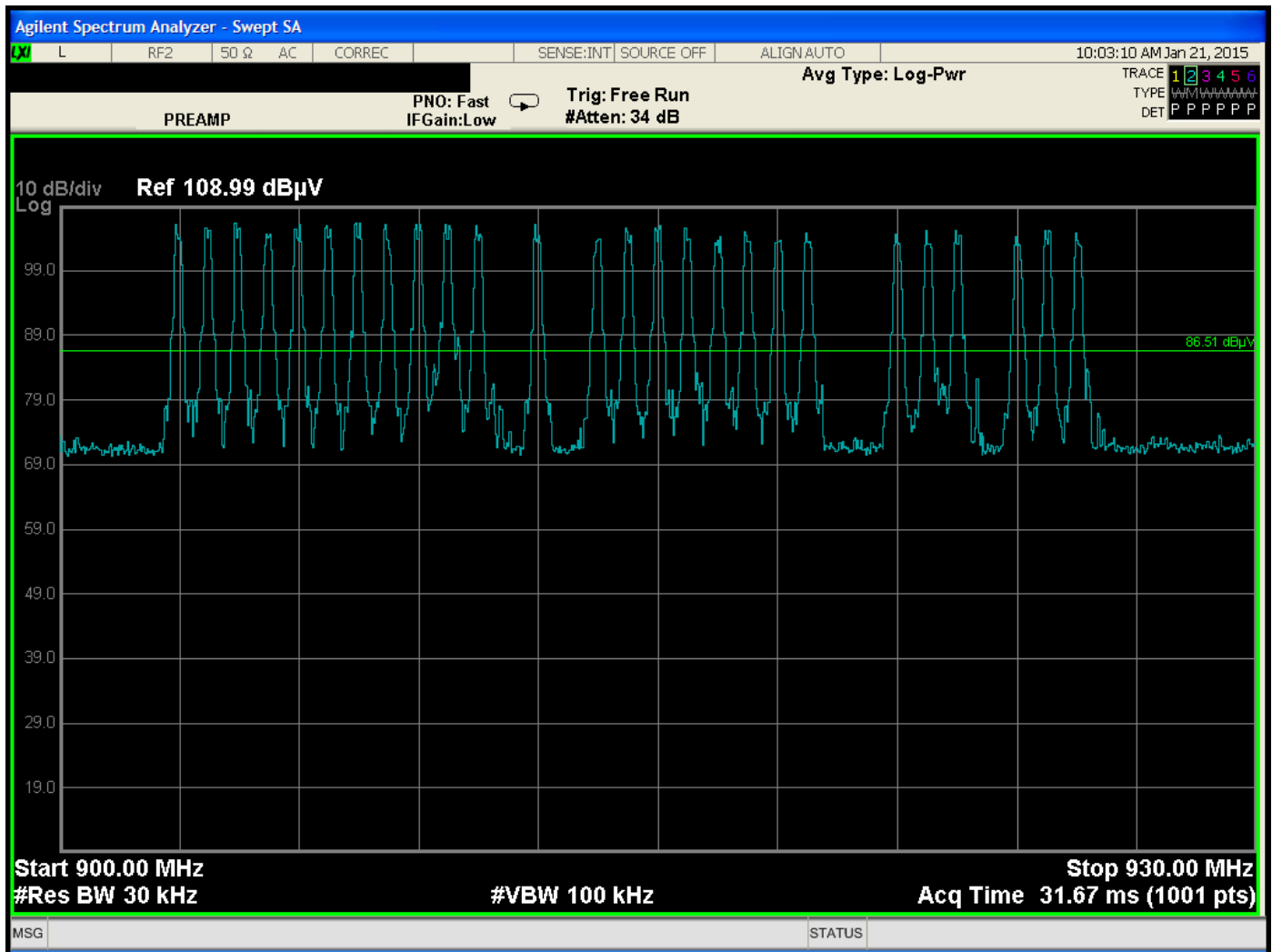
Channel Frequency Separation



Channel Frequency Separation – Protocol B



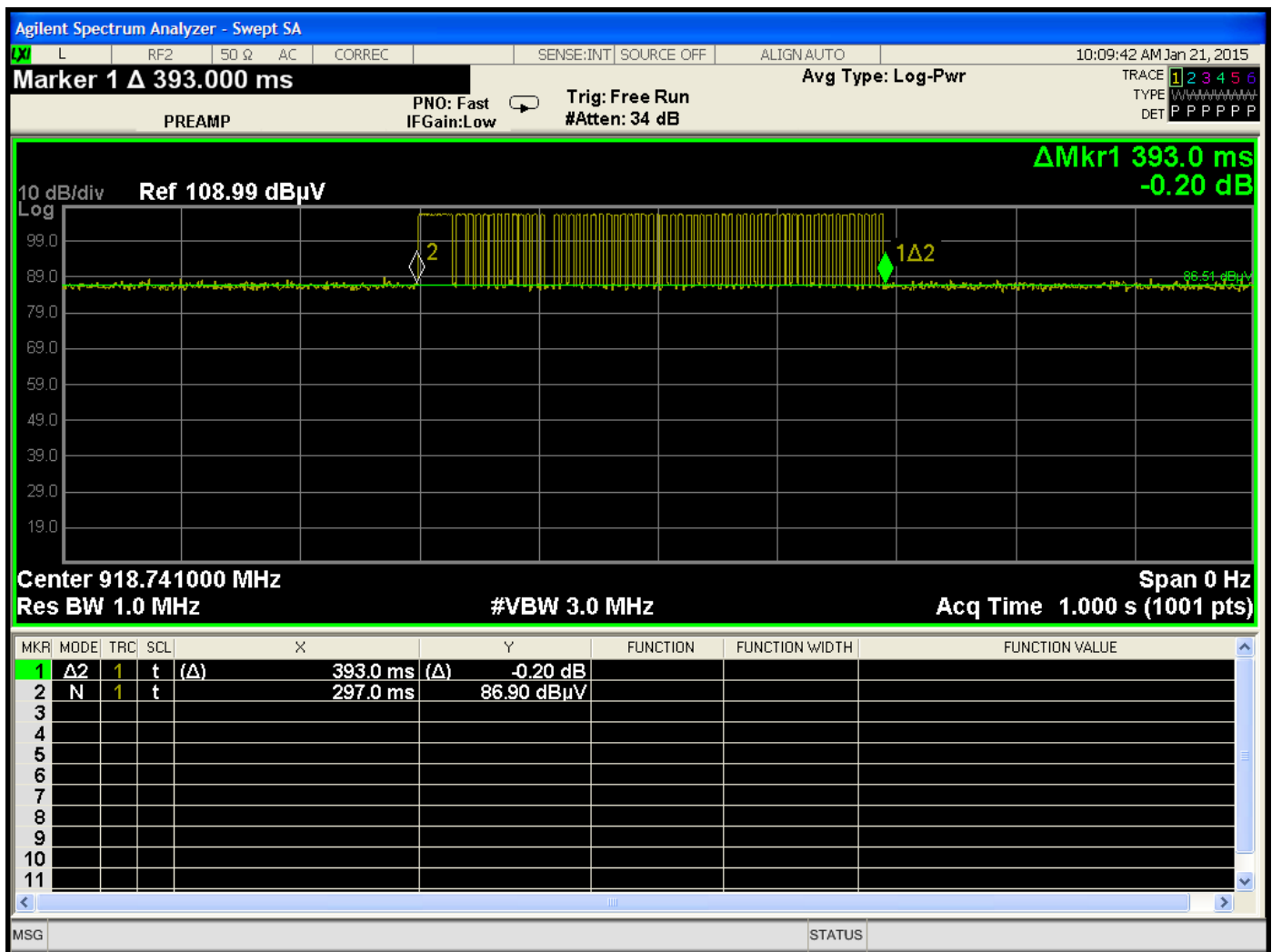
Number of Hopping Frequencies



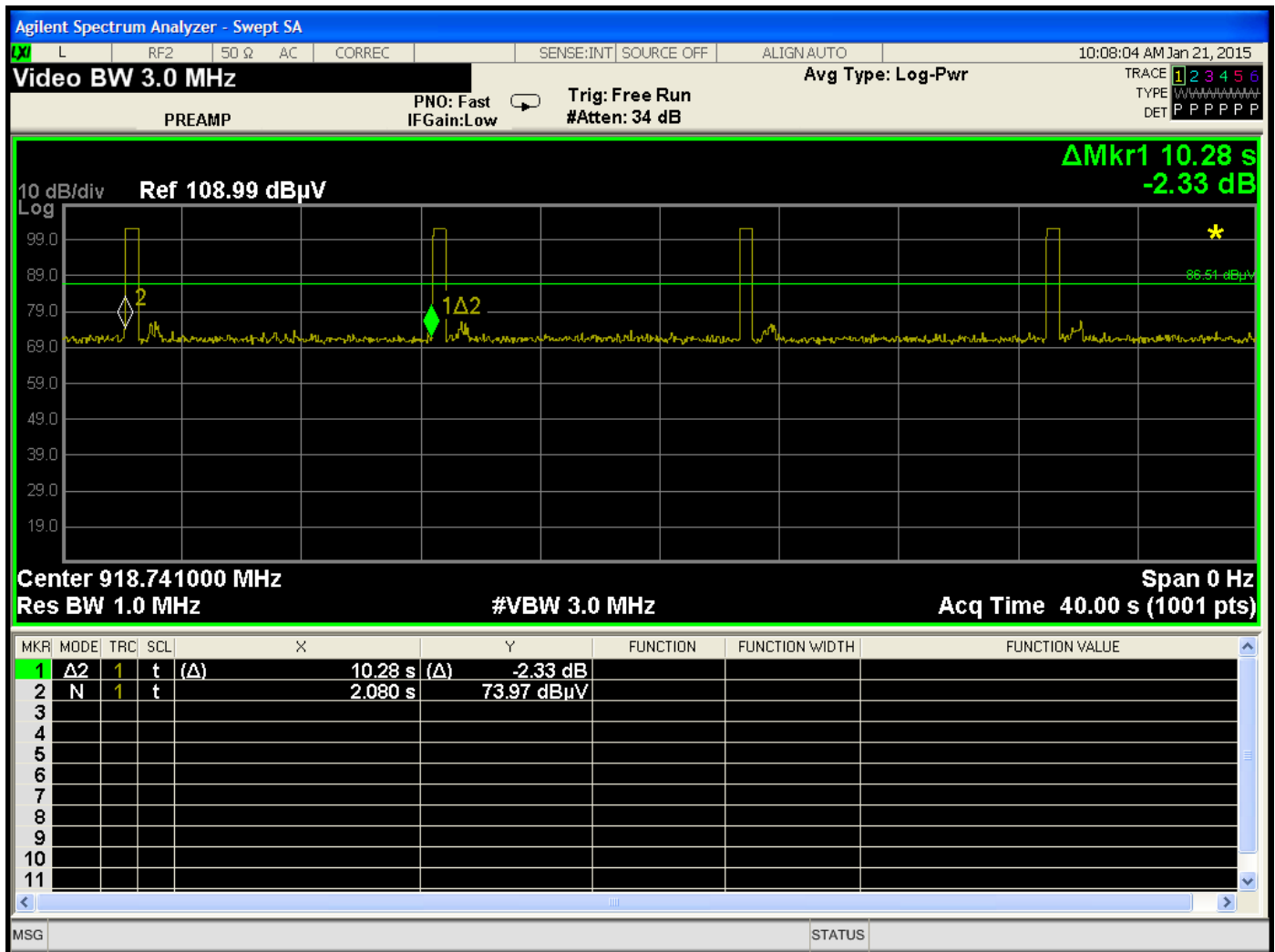
Number of Hopping Frequencies – Protocol B



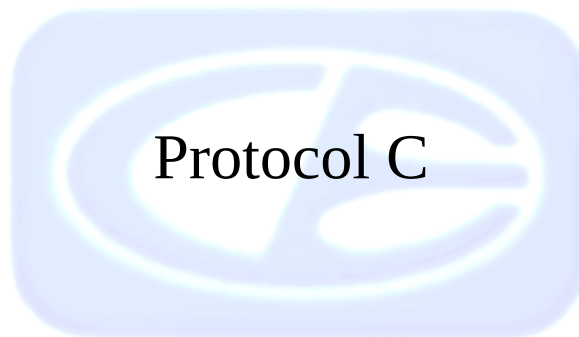
Time of Occupancy

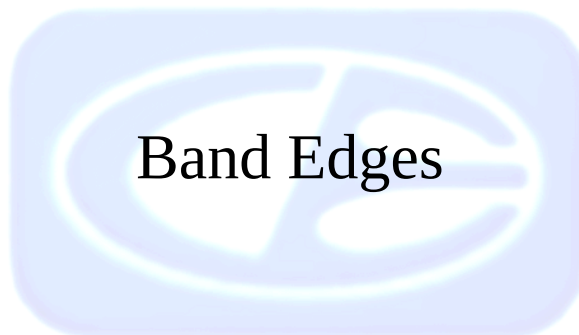


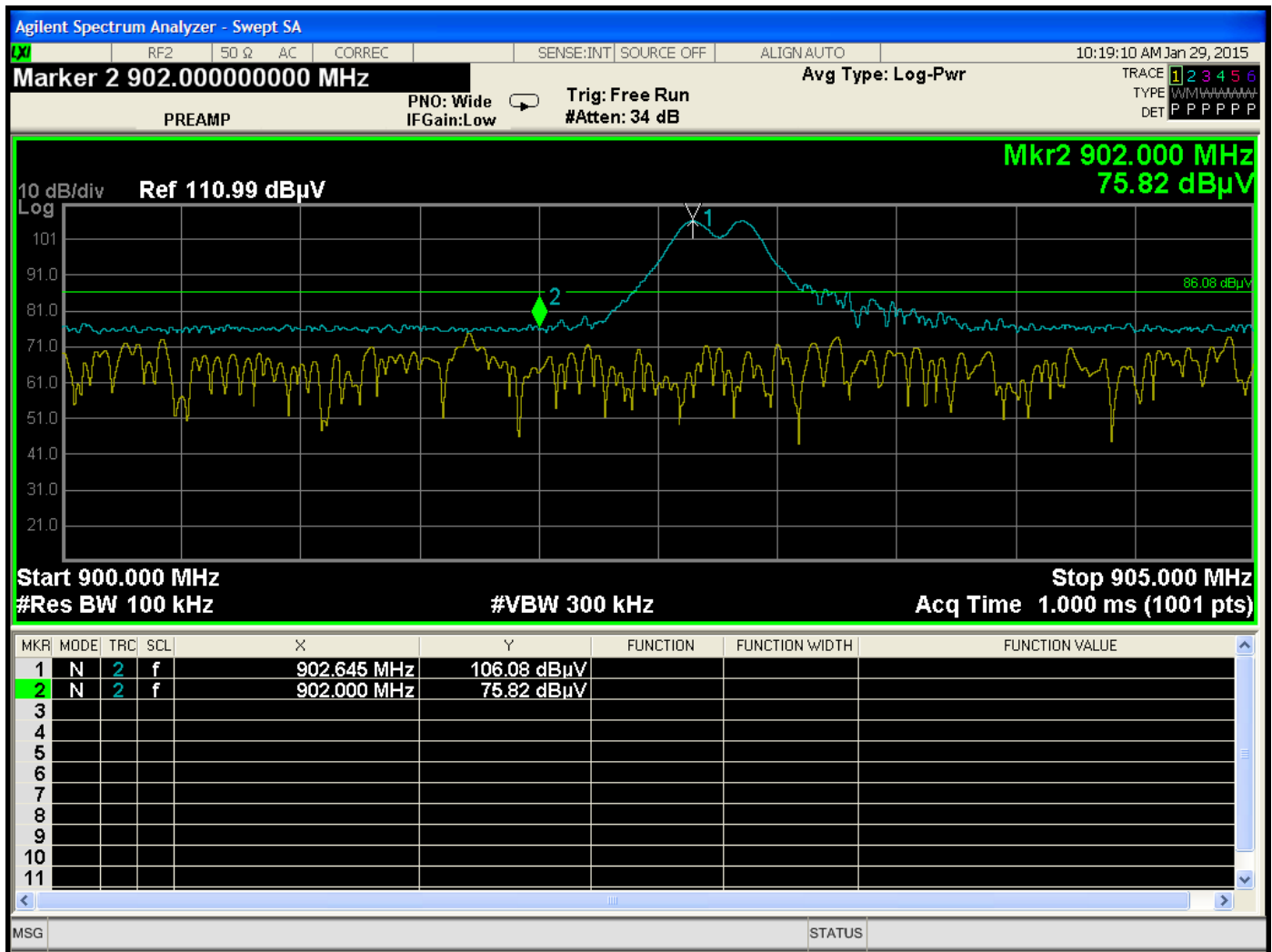
Time of Occupancy – Time of One Pulse = 393 ms



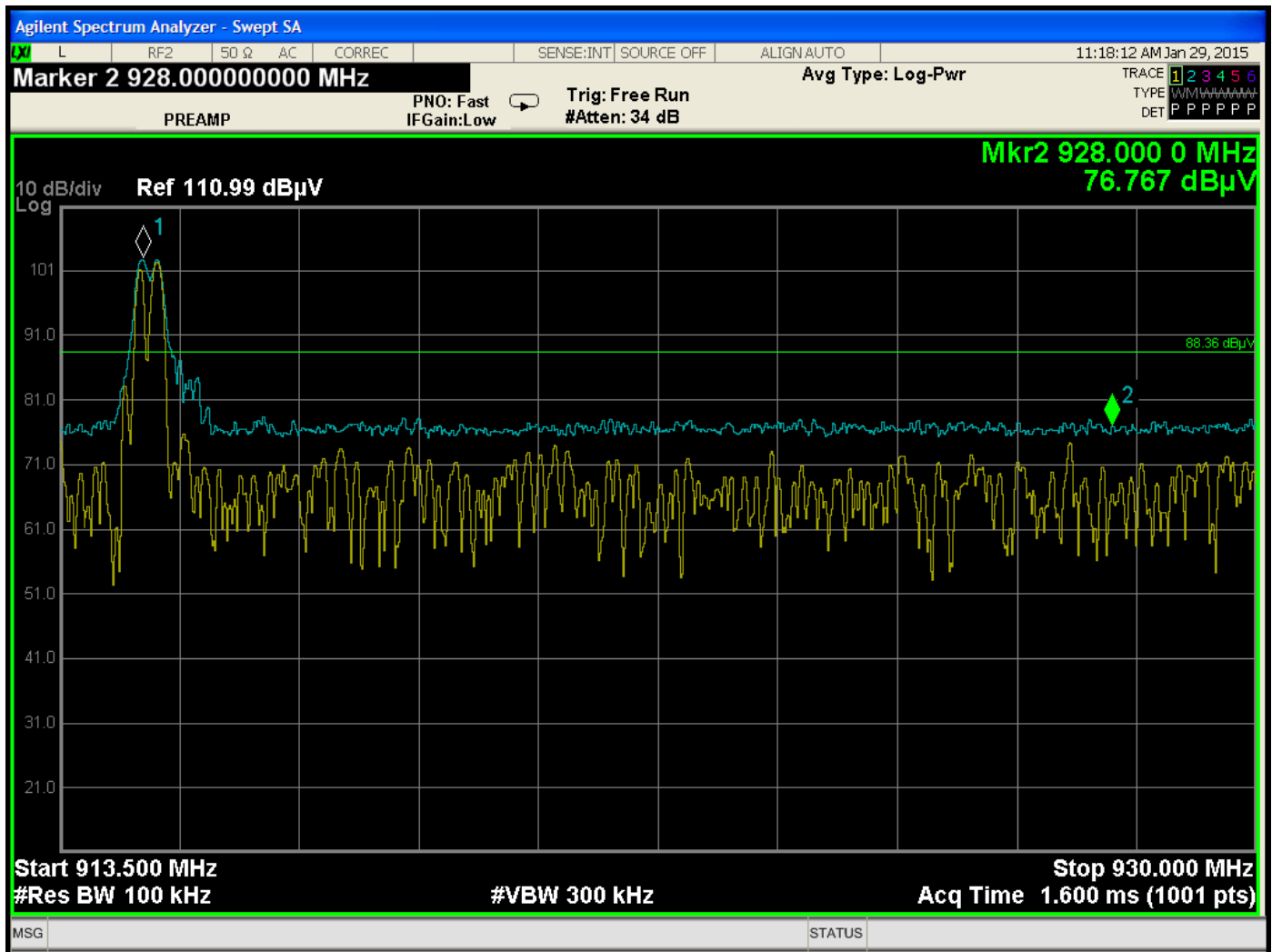
Time of Occupancy – Time Between Pulses = 10.28 s



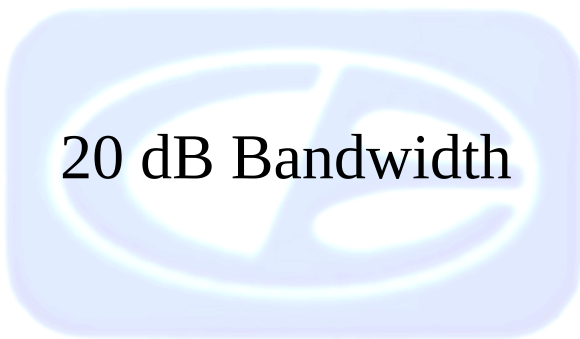




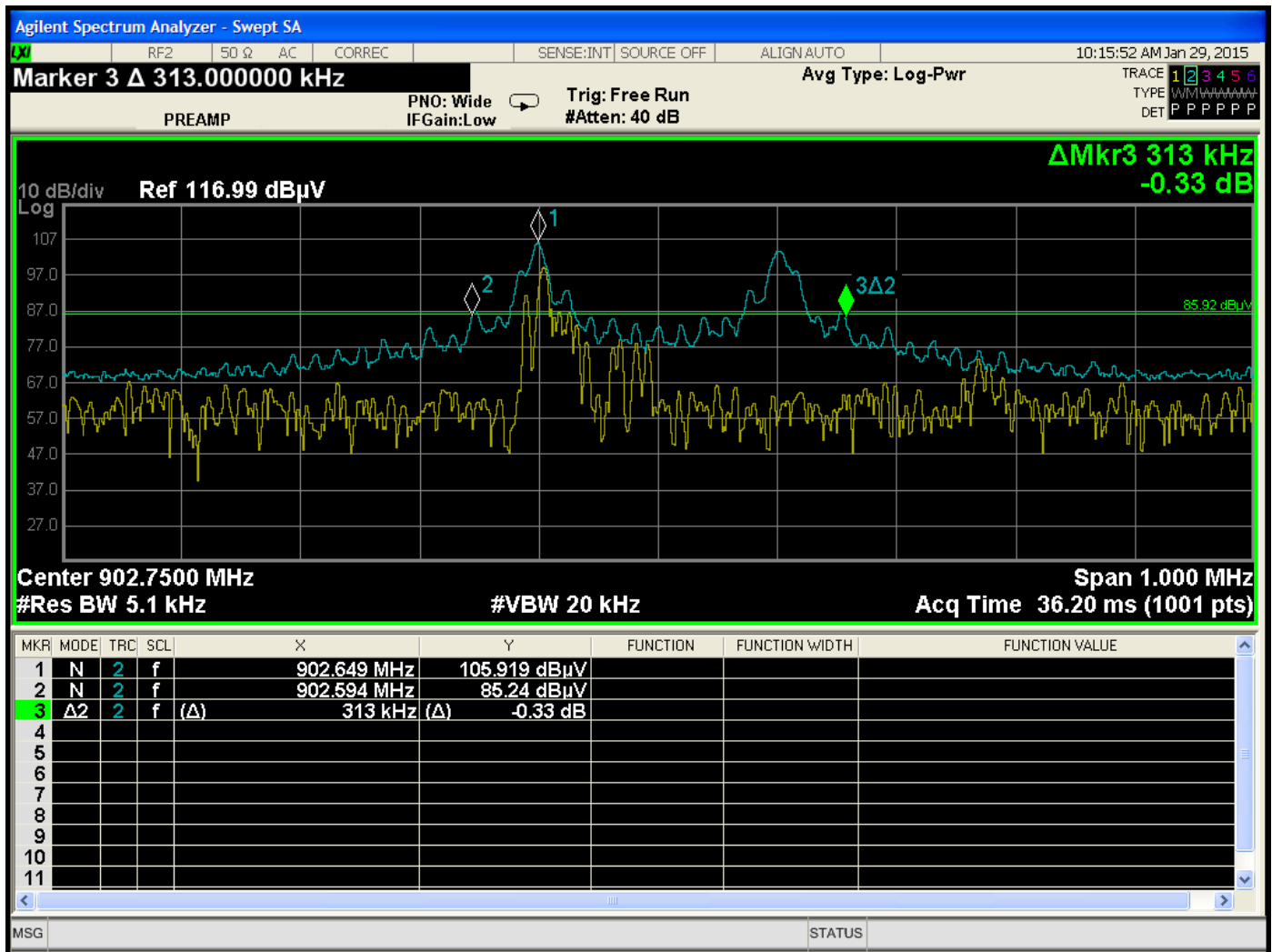
Band Edge – Low Channel – Protocol C



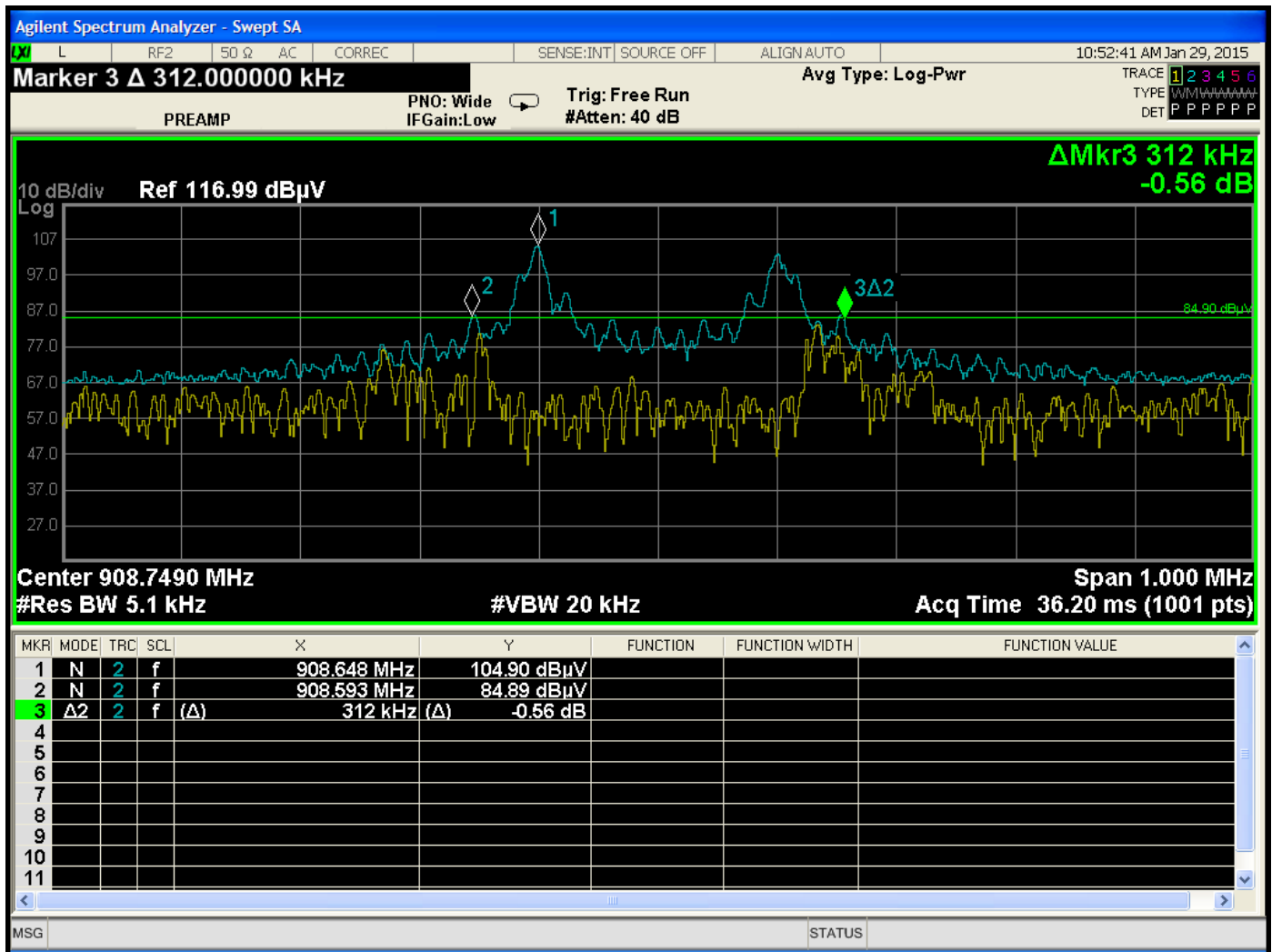
Band Edge – High Channel – Protocol C



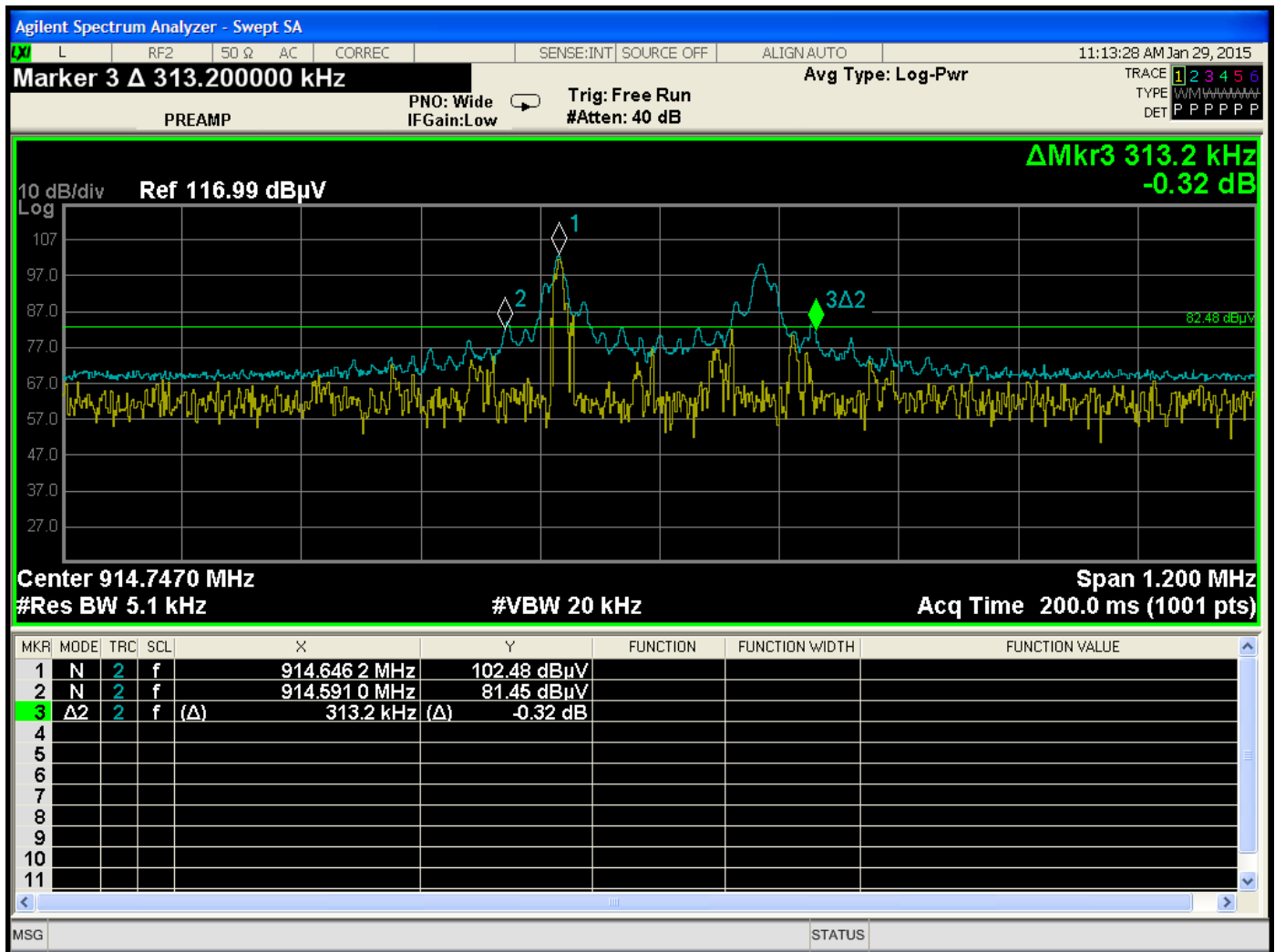
20 dB Bandwidth



20 dB Bandwidth – Low Channel – Protocol C

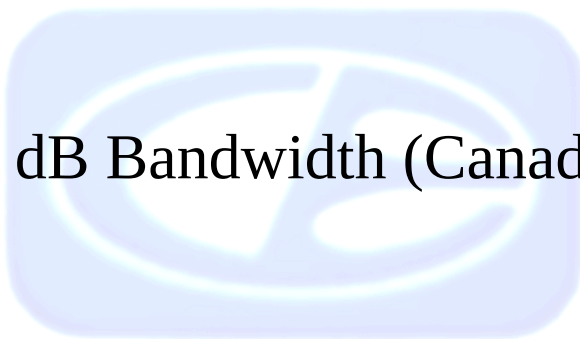


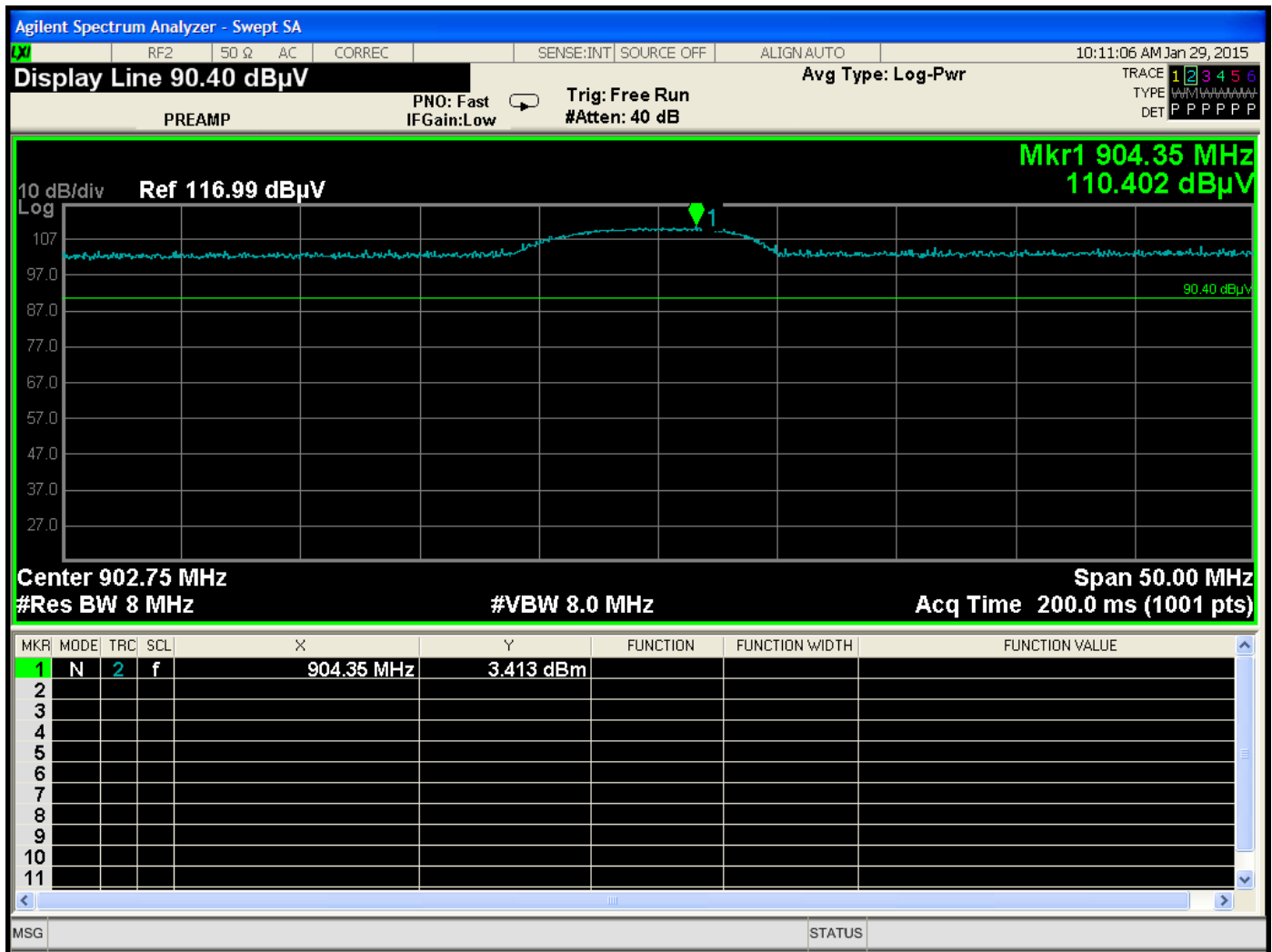
20 dB Bandwidth – Middle Channel – Protocol C



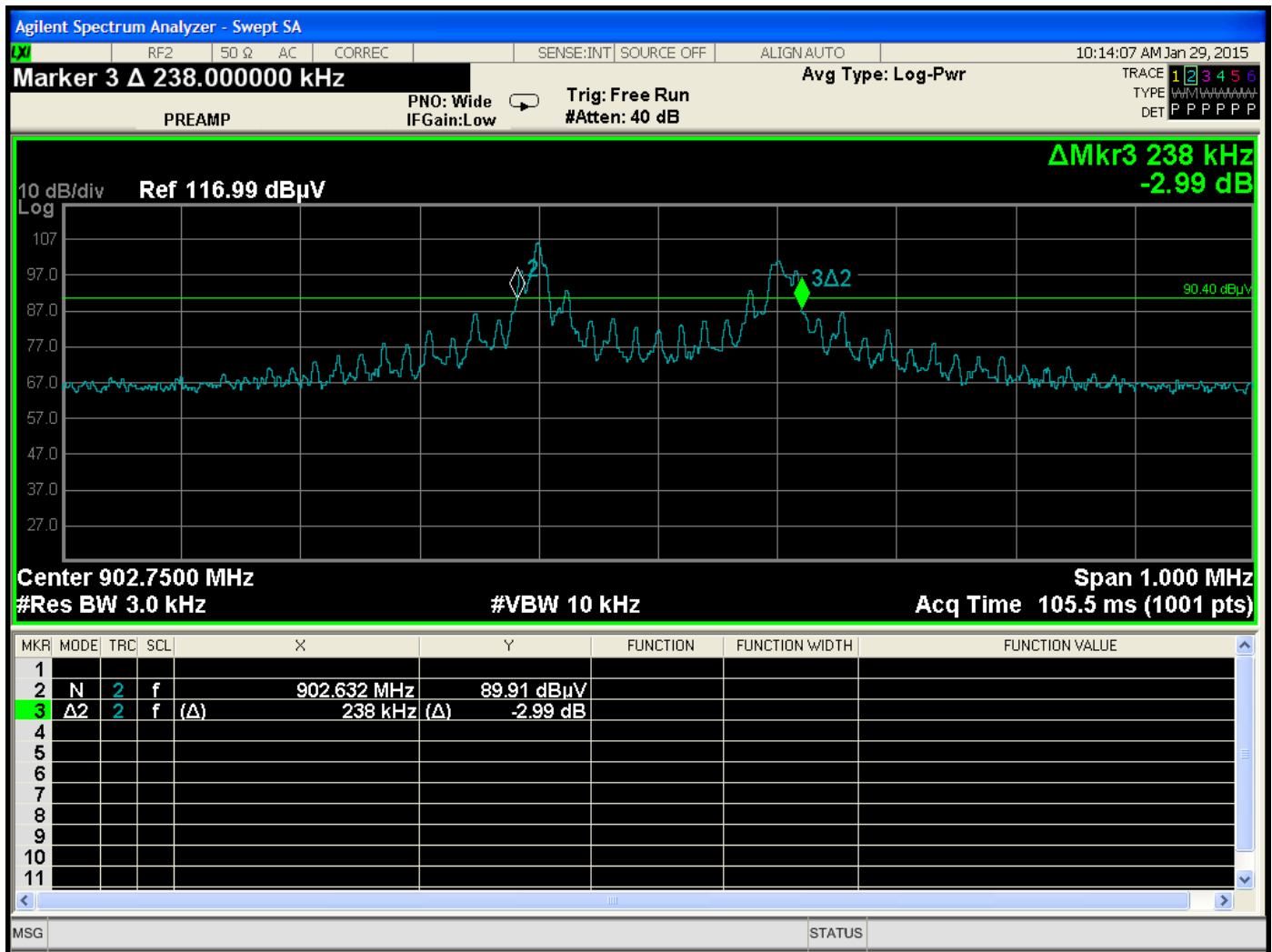
20 dB Bandwidth – High Channel – Protocol C

20 dB Bandwidth (Canada)

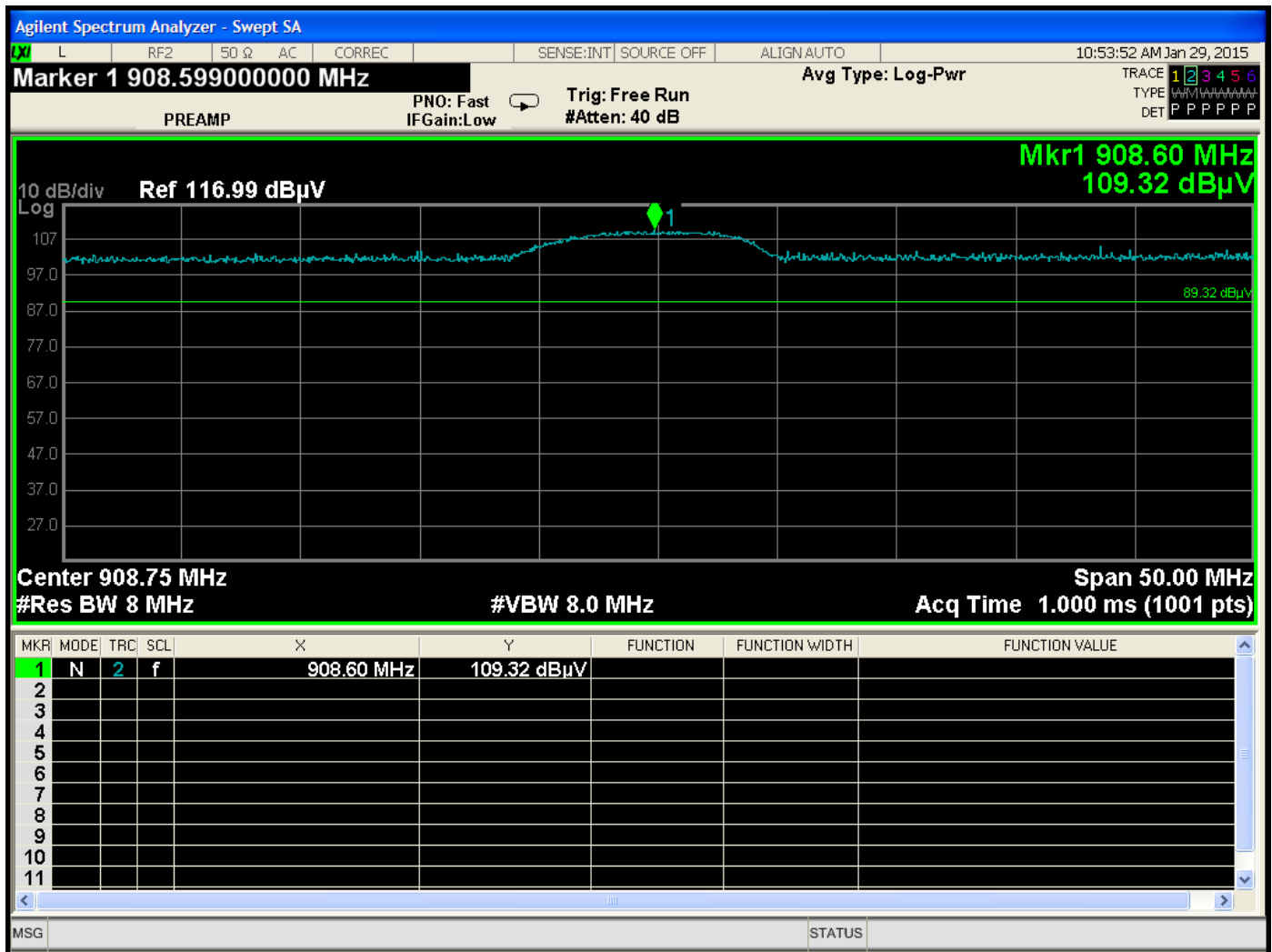




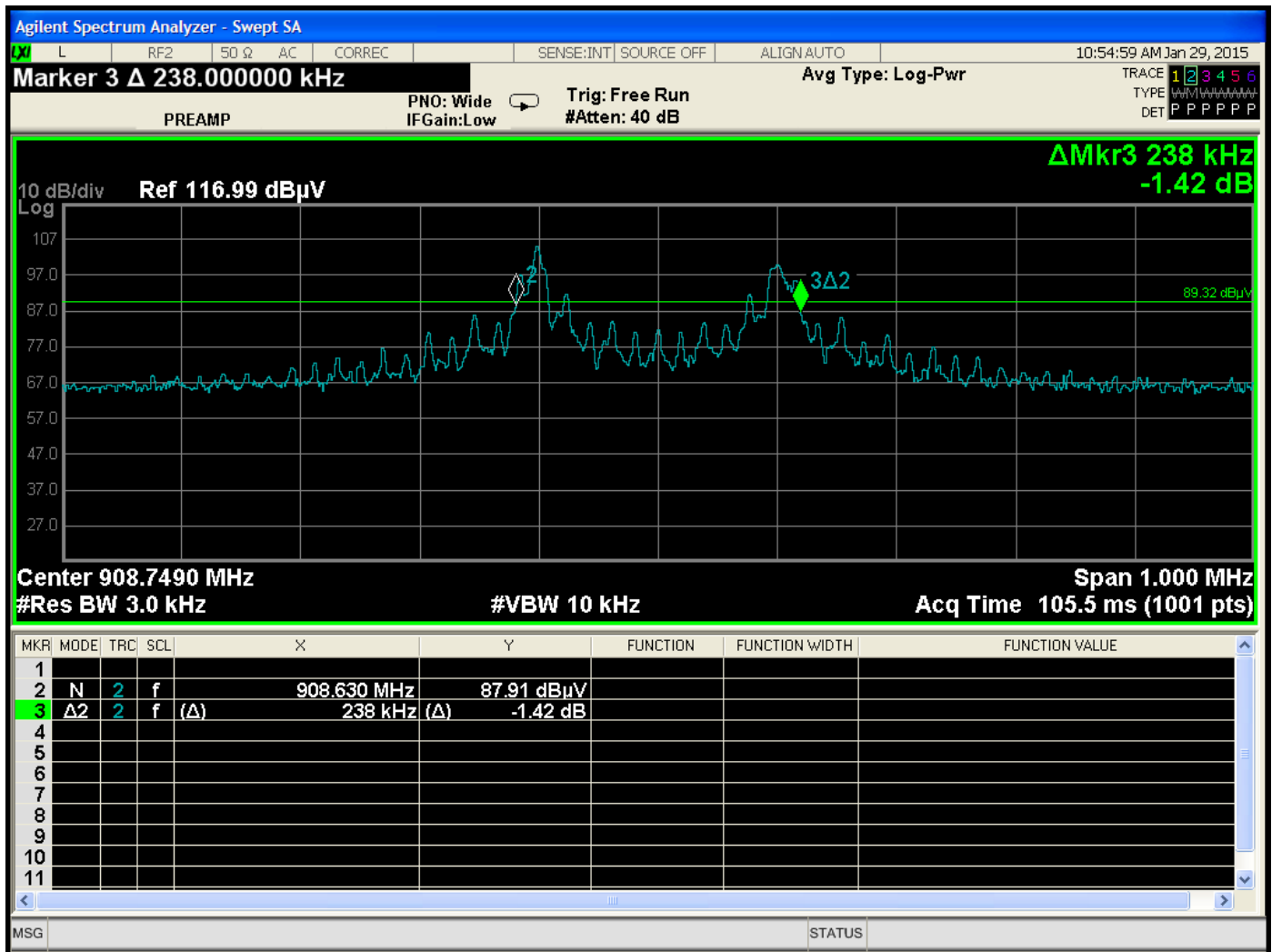
20 dB Bandwidth – Reference Level – Low Channel – Protocol C



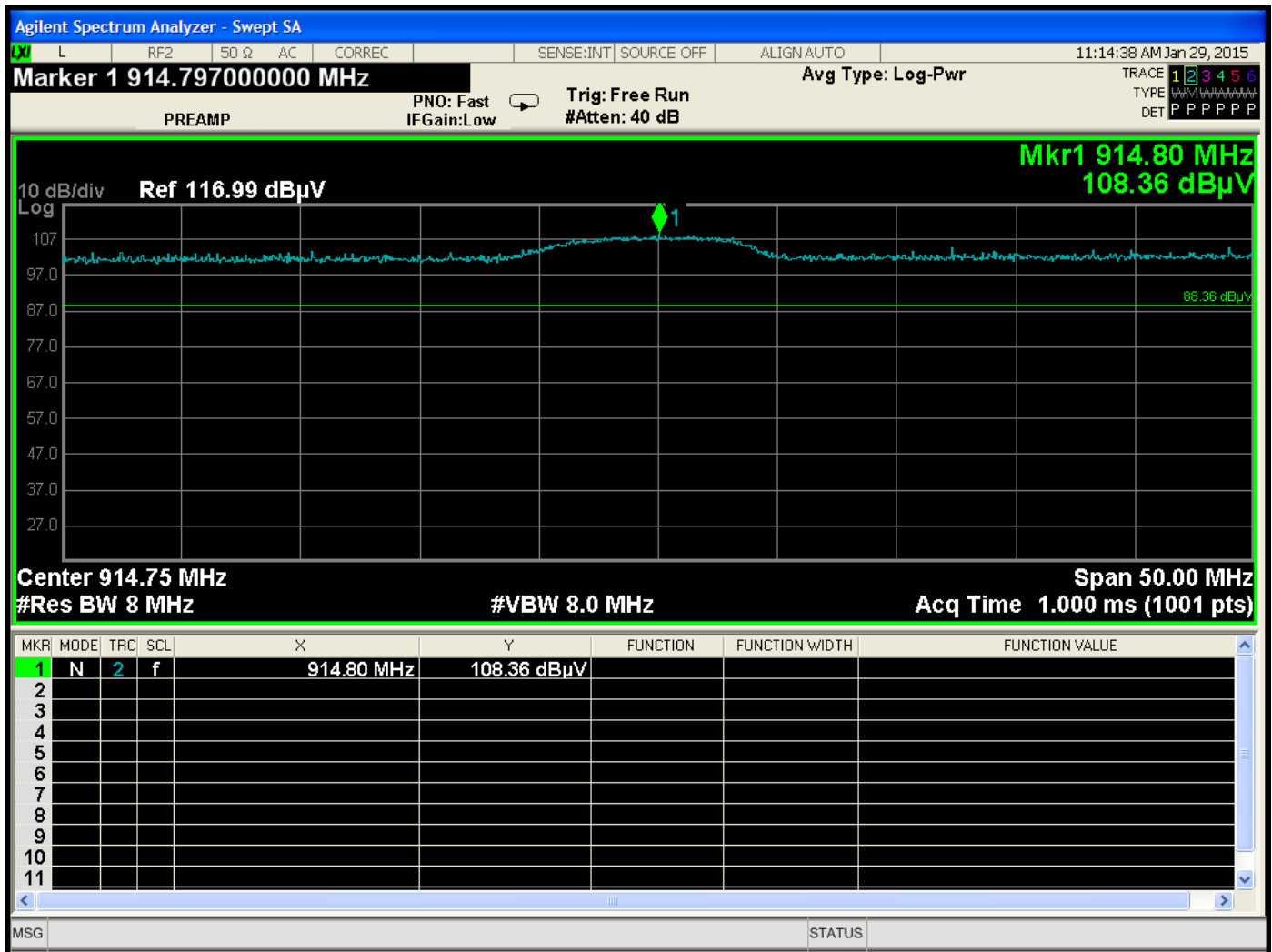
20 dB Bandwidth – 3 KHz RBW – Low Channel – Protocol C



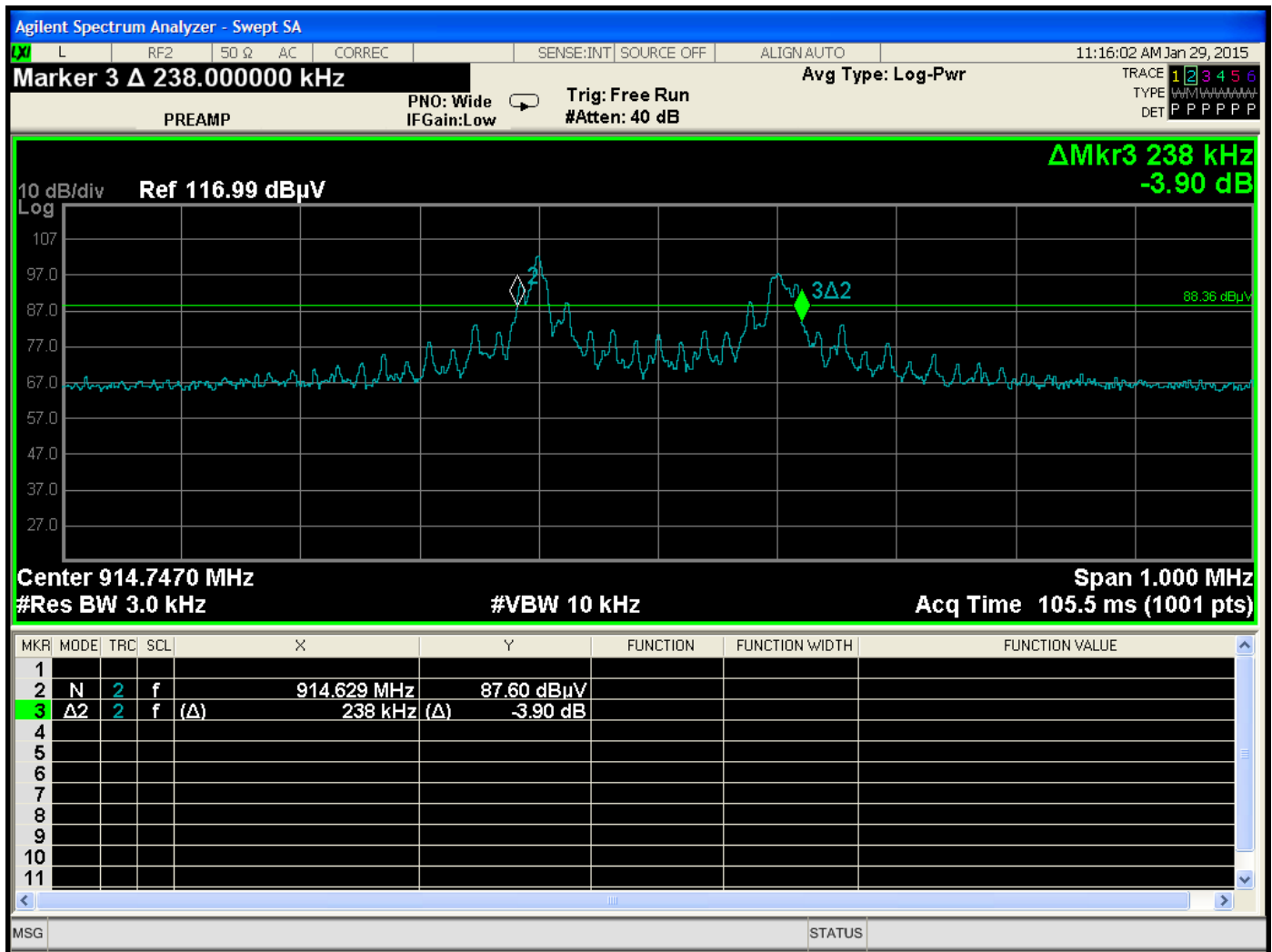
20 dB Bandwidth – Reference Level – Middle Channel – Protocol C



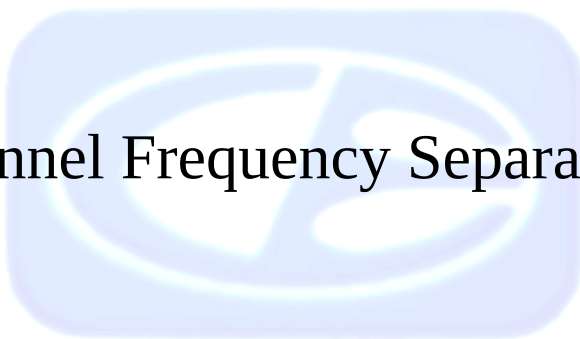
20 dB Bandwidth – 3 KHz RBW – Middle Channel – Protocol C



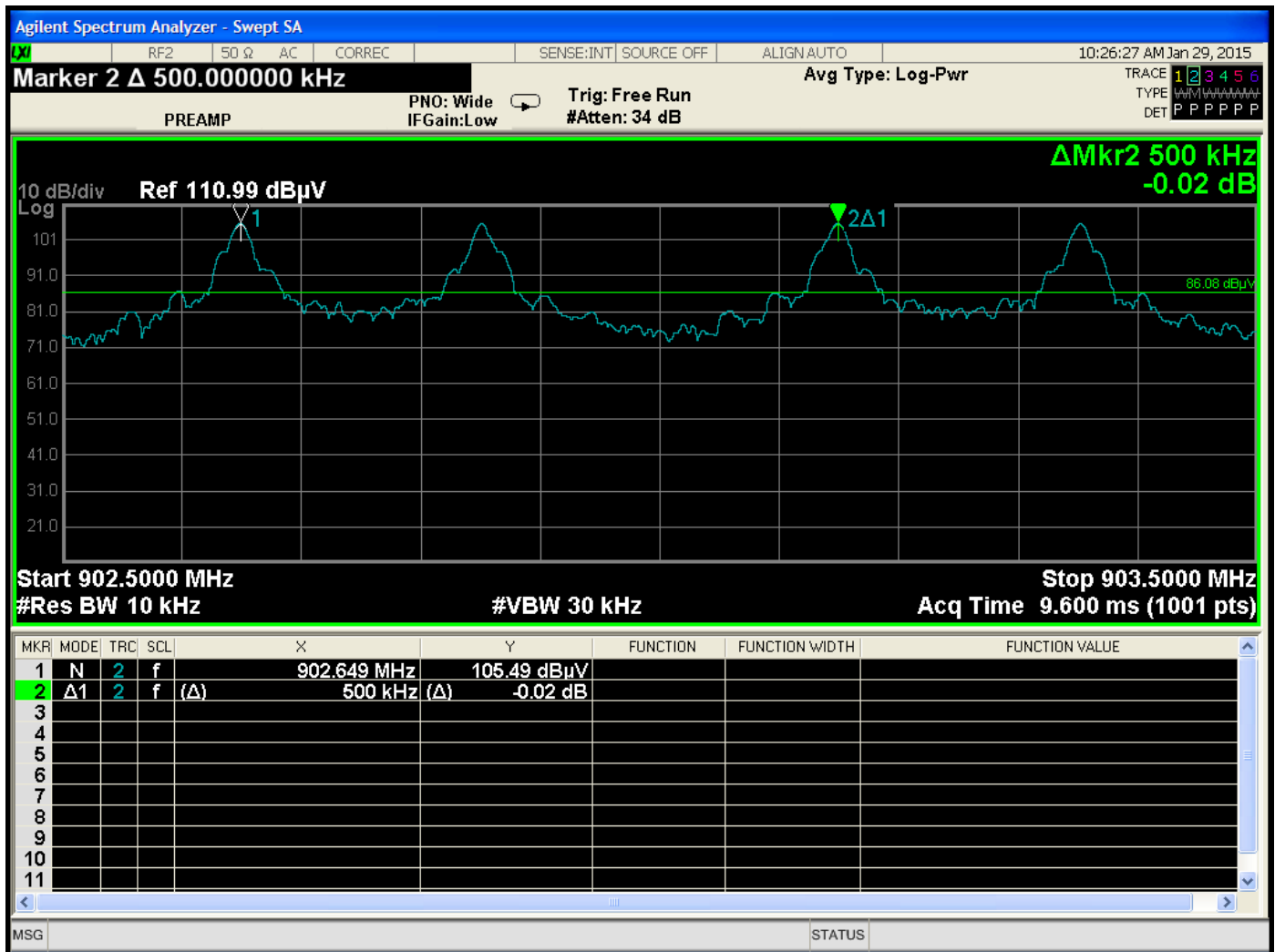
20 dB Bandwidth – Reference Level – High Channel – Protocol C



20 dB Bandwidth – 3 KHz RBW – High Channel – Protocol C



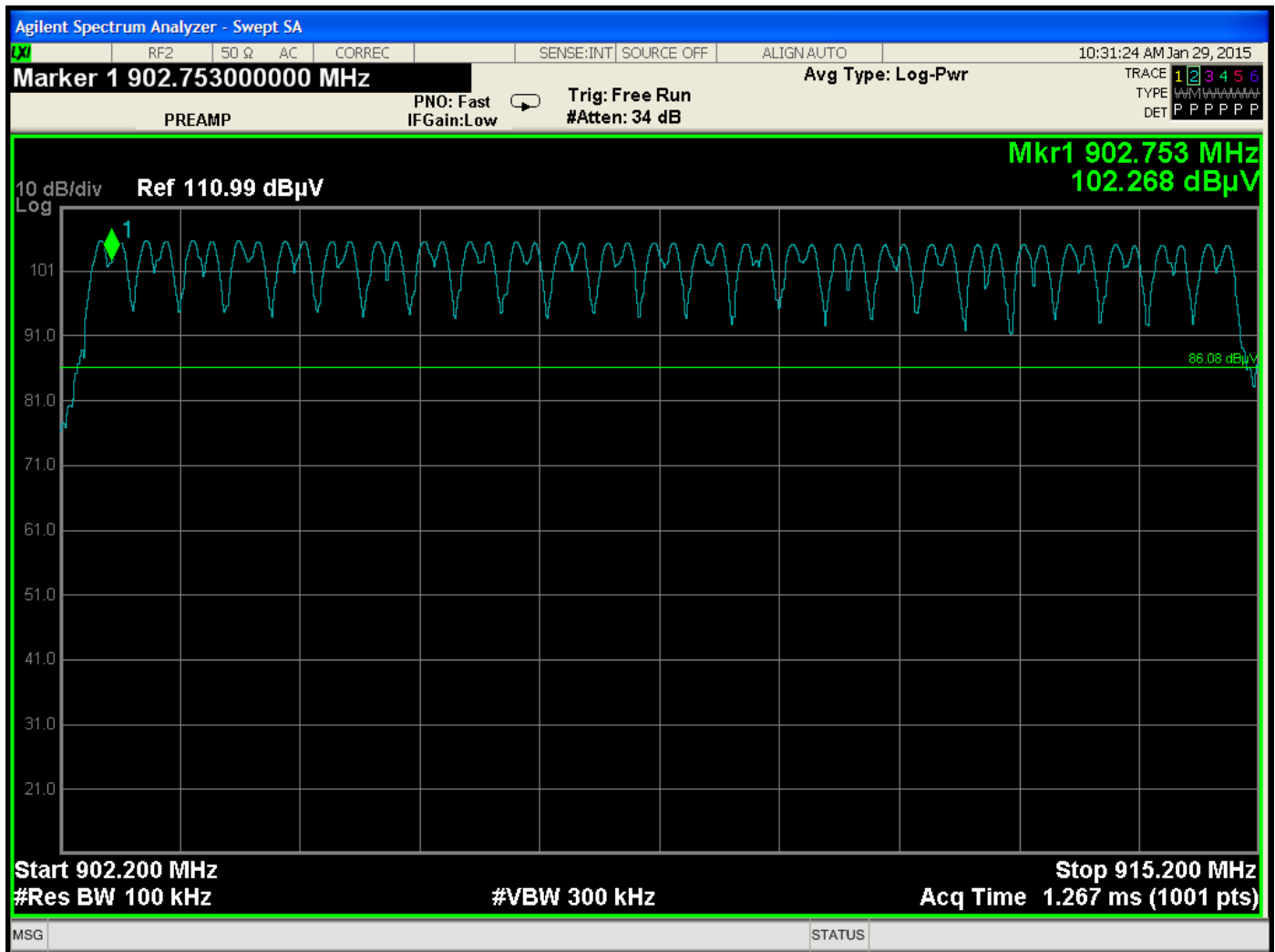
Channel Frequency Separation



Channel Frequency Separation – Protocol C



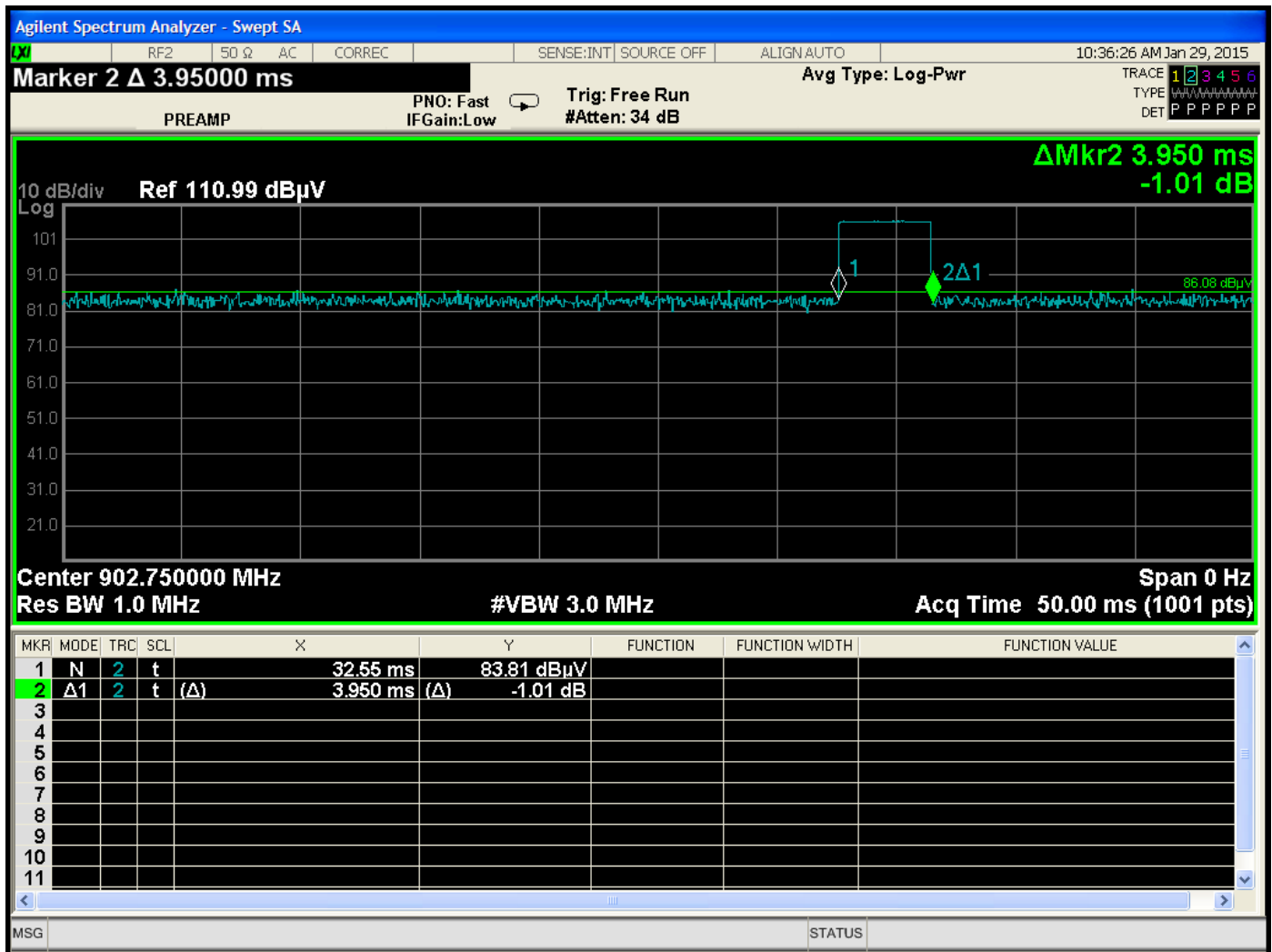
Number of Hopping Frequencies



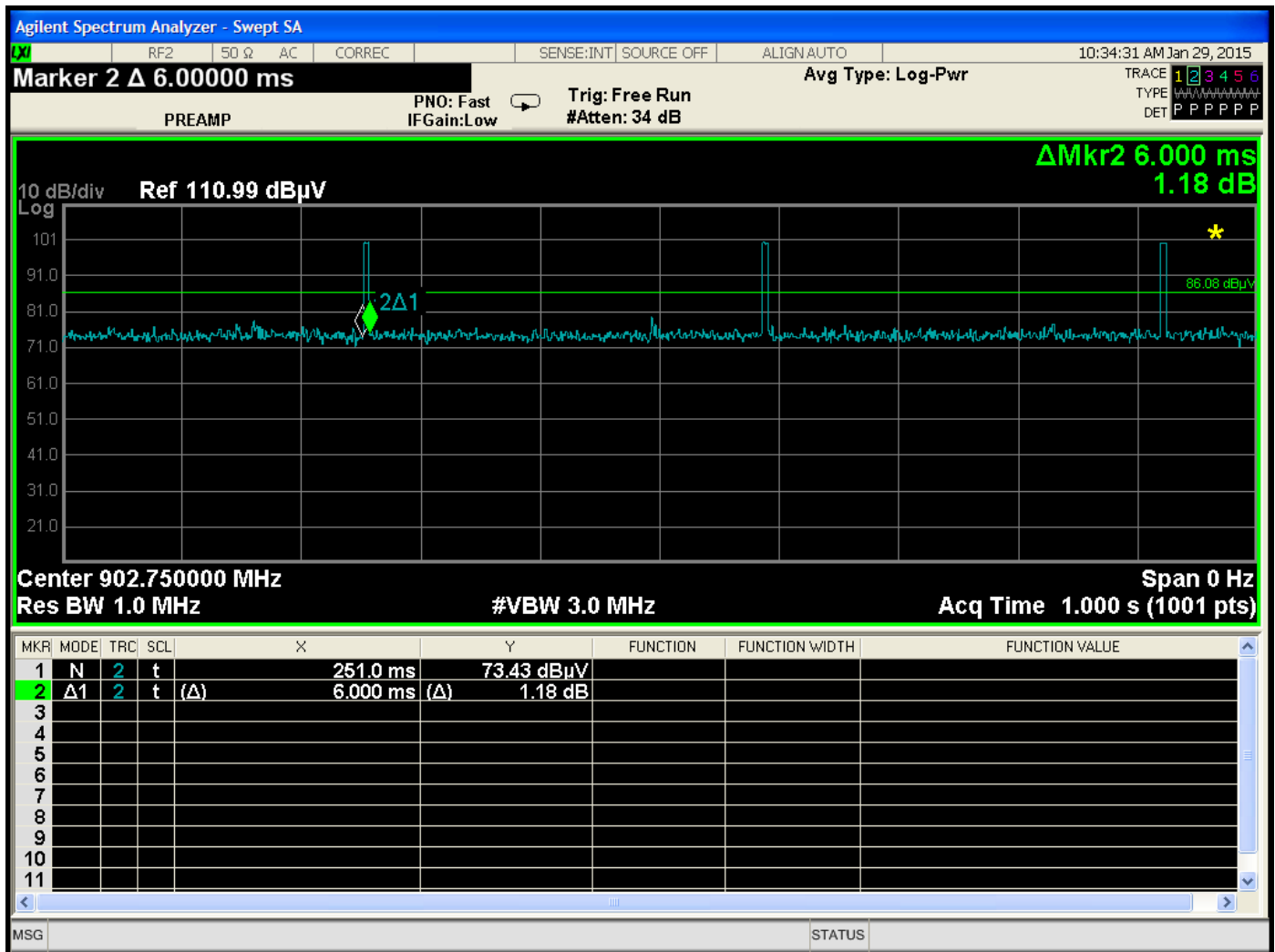
Number of Hopping Frequencies – Protocol C



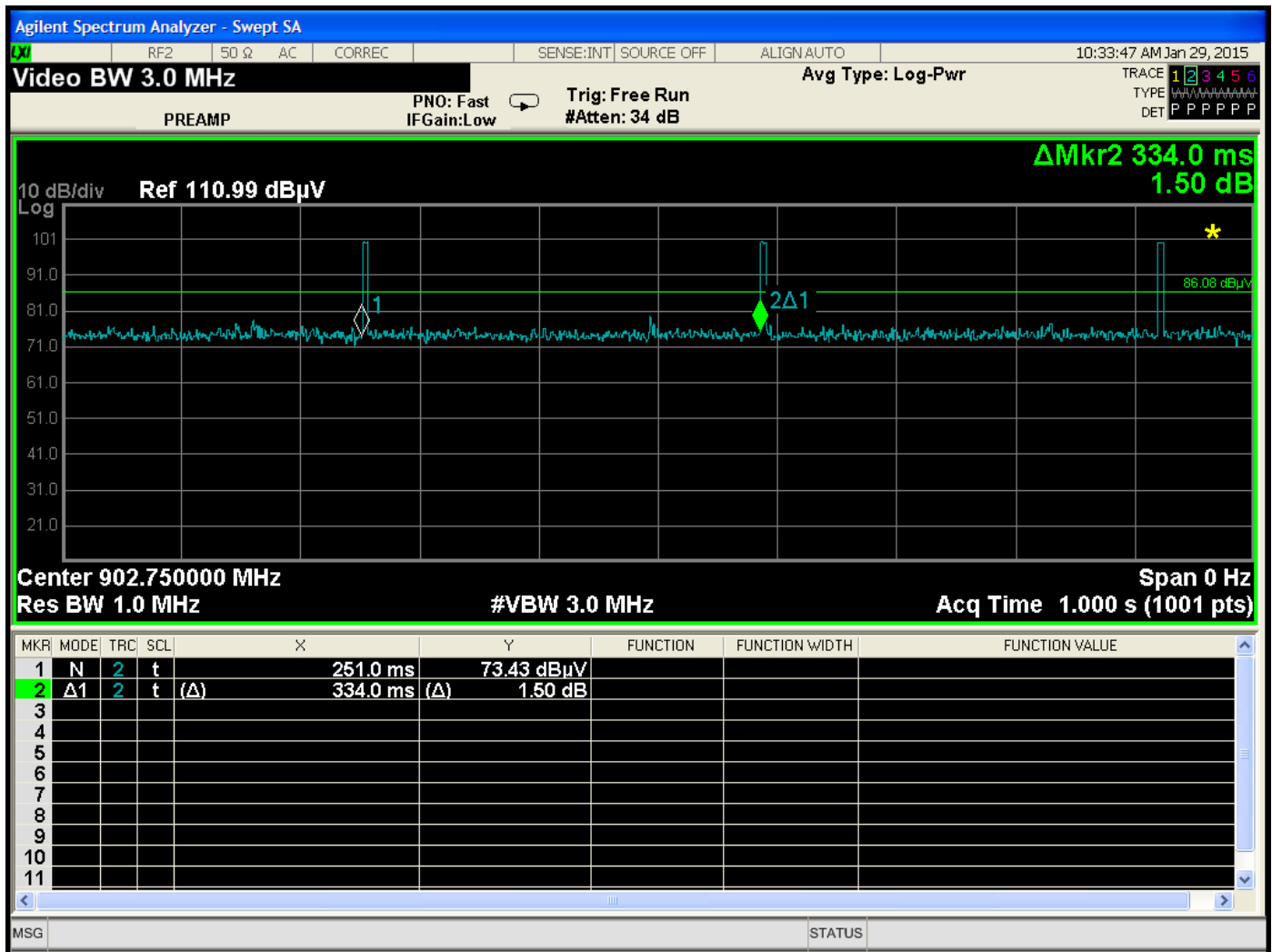
Time of Occupancy



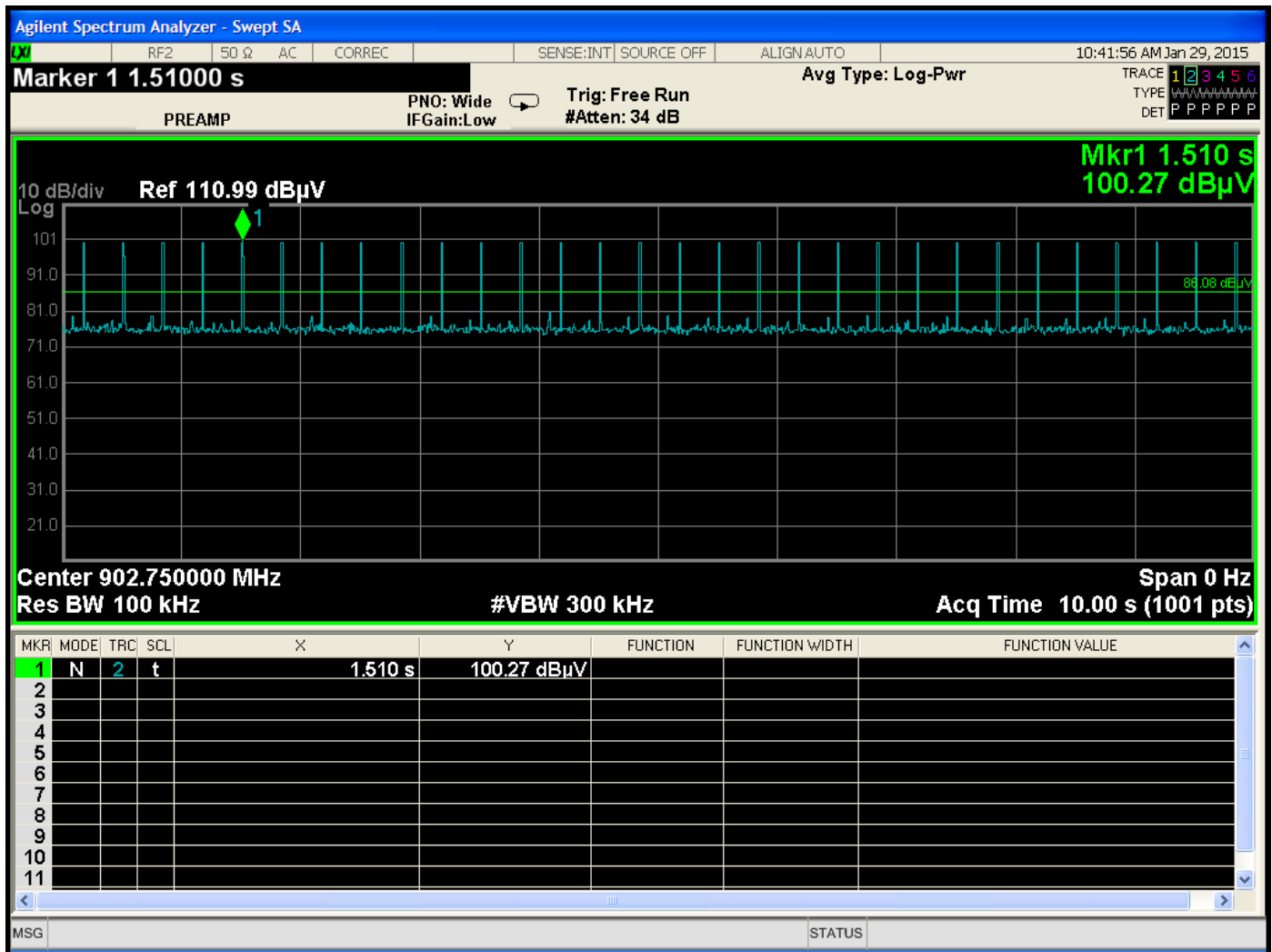
Time of Occupancy – 50 ms Scale – Time of One Pulse = 3.95 ms



Time of Occupancy – 1 s Scale – Time of One Pulse = 6 ms



Time of Occupancy – 1 s Scale – Time Between Pulses = 334 ms



Time of Occupancy – Number of Pulses in 10 s = 30

Time of Occupancy – 30 pulses * 3.95 ms = 118.5 ms