

Appendix

Main Test Instruments

Conducted Emission					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal. Due date
				(yyyy-mm-dd)	(yyyy-mm-dd)
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2017/5/10	2020/5/9
LISN	Rohde & Schwarz	ENV216	SEM007-01	2018/9/2	2019/9/2
LISN	ETS-LINDGREN	Feb-16	SEM007-02	2019/3/2	2020/3/1
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2018/7/12	2019/7/11
2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	EMC0122	2019/2/11	2020/2/10
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2019/3/2	2020/3/1

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal. Due date
				(yyyy-mm-dd)	(yyyy-mm-dd)
DC Power Supply	Agilent Technologies Inc	66311B	W009-09	2018/9/15	2019/9/15
Signal Analyzer	Rohde & Schwarz	FSV	W025-05	2019/1/13	2020/1/12
Coaxial Cable	SGS	N/A	SEM031-01	2018/7/13	2019/7/12
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2018/9/2	2019/9/2
Temperature Chamber	GIANT FORCE	ICT-150-40-CP-AR	W027-03	2018/11/27	2019/11/27
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2018/9/2	2019/9/2

Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	±0.75dB
2	RF power density, conducted	±2.84dB
3	Spurious emissions, conducted	±0.75dB
4	Conduct emission test	±3.12 dB (9KHz- 30MHz)
5	Temperature test	±1°C
6	Humidity test	±3%
7	DC and low frequency voltages	±0.5%

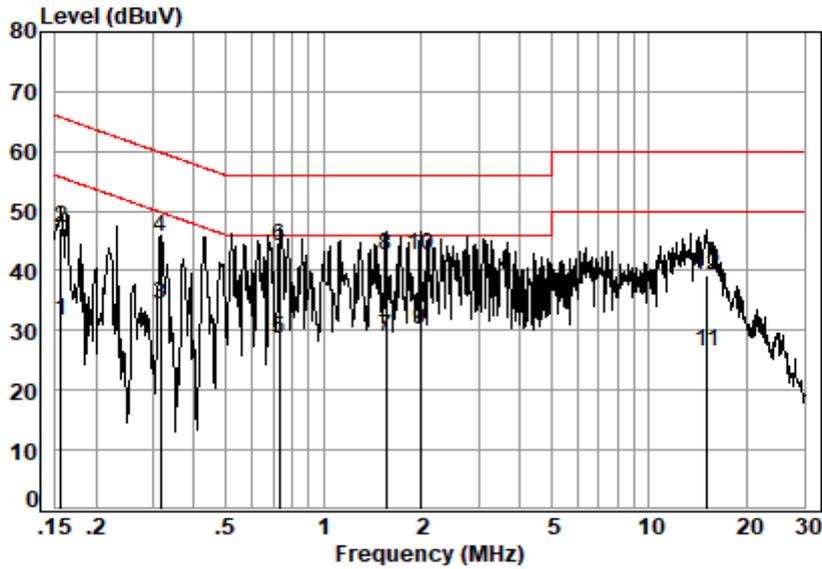
AC Power Line Conducted Emissions

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

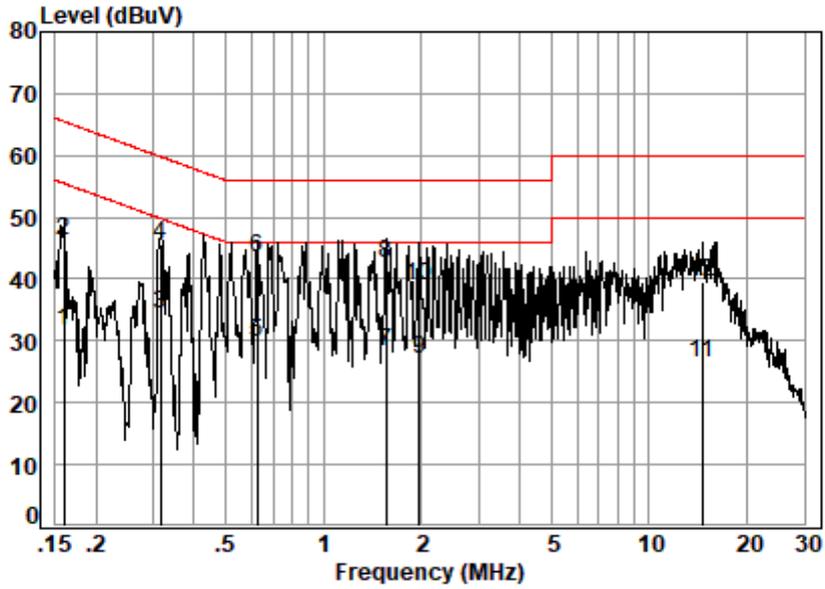
Live Line:



Site : Shielding Room
 Condition: Line
 Job No. : 16976CR
 Test mode: BT

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.16	0.01	9.66	22.00	31.67	55.65	-23.98	Average
2	0.16	0.01	9.66	37.36	47.03	65.65	-18.62	QP
3	0.31	0.04	9.67	24.61	34.32	49.84	-15.52	Average
4	0.31	0.04	9.67	35.86	45.57	59.84	-14.27	QP
5	0.73	0.08	9.70	18.74	28.52	46.00	-17.48	Average
6	0.73	0.08	9.70	34.39	44.17	56.00	-11.83	QP
7	1.55	0.13	9.73	19.02	28.88	46.00	-17.12	Average
8	1.55	0.13	9.73	32.86	42.72	56.00	-13.28	QP
9	1.98	0.16	9.72	20.30	30.18	46.00	-15.82	Average
10	1.98	0.16	9.72	32.84	42.72	56.00	-13.28	QP
11	15.07	0.21	10.35	16.04	26.60	50.00	-23.40	Average
12	15.07	0.21	10.35	28.64	39.20	60.00	-20.80	QP

Neutral Line:



Site : Shielding Room
 Condition: Neutral
 Job No. : 16976CR
 Test mode: BT

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.16	0.01	9.63	21.94	31.58	55.52	-23.94	Average
2	0.16	0.01	9.63	36.52	46.16	65.52	-19.36	QP
3	0.31	0.04	9.64	24.61	34.29	49.84	-15.55	Average
4	0.31	0.04	9.64	35.89	45.57	59.84	-14.27	QP
5	0.62	0.07	9.64	20.15	29.86	46.00	-16.14	Average
6	0.62	0.07	9.64	33.92	43.63	56.00	-12.37	QP
7	1.55	0.13	9.70	18.59	28.42	46.00	-17.58	Average
8	1.55	0.13	9.70	32.69	42.52	56.00	-13.48	QP
9	1.97	0.16	9.69	17.20	27.05	46.00	-18.95	Average
10	1.97	0.16	9.69	29.16	39.01	56.00	-16.99	QP
11	14.59	0.21	10.34	16.00	26.55	50.00	-23.45	Average
12	14.59	0.21	10.34	28.91	39.46	60.00	-20.54	QP

Remarks:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

Duty Cycle

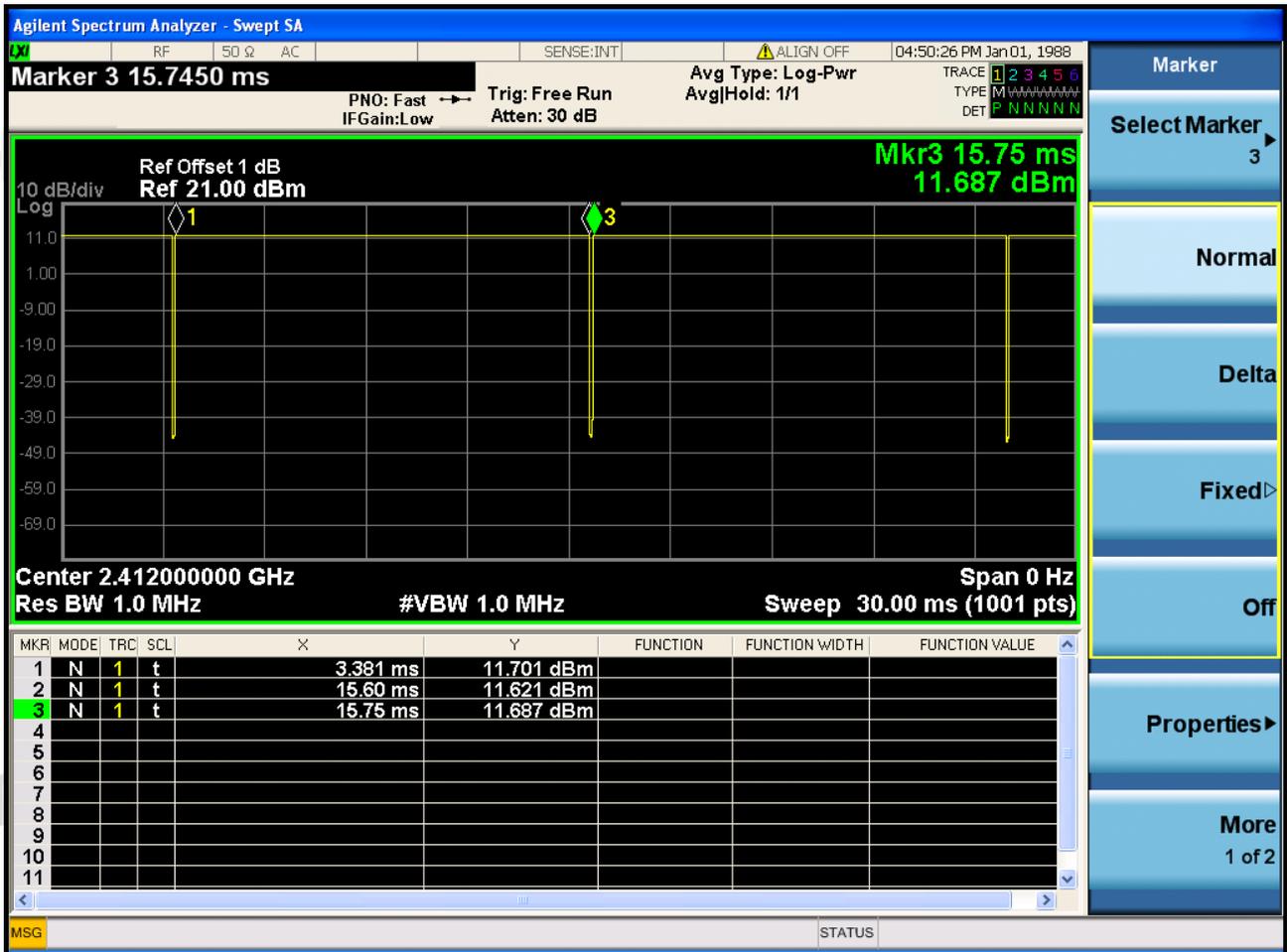
Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]
11B	CH1	98.79
11G	CH1	96.39
11N20	CH1	96.12

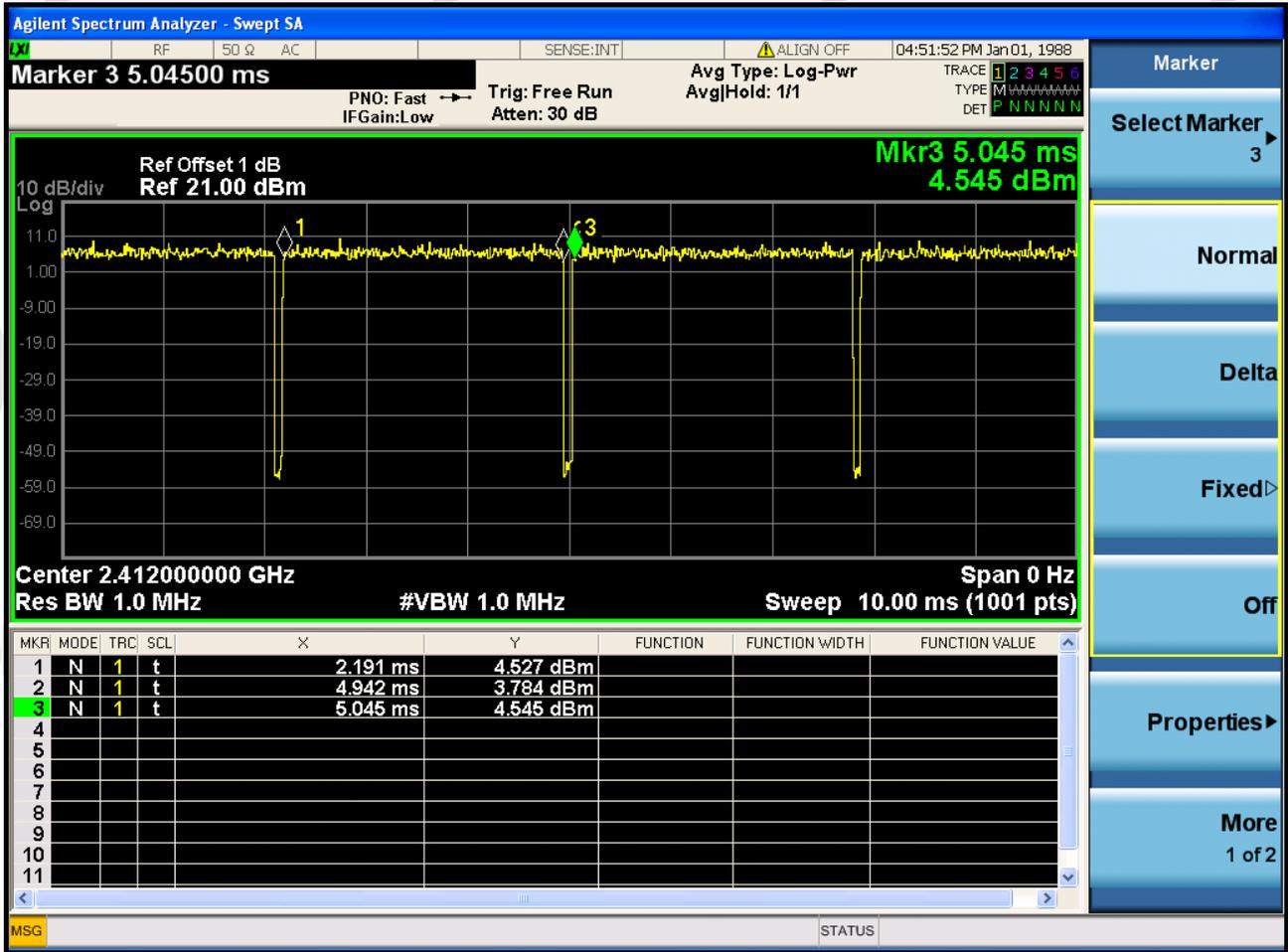
Test Plots

ANT1

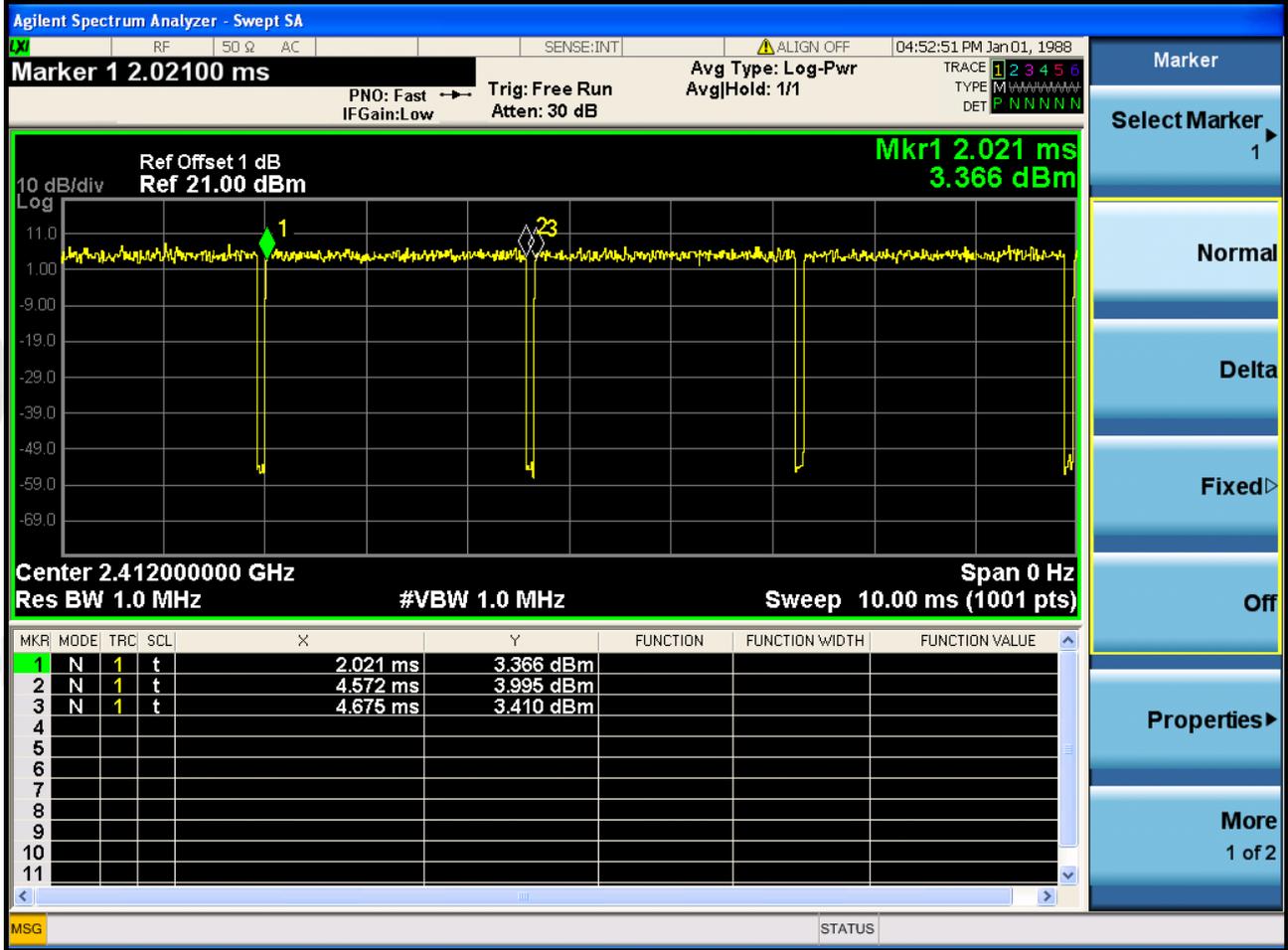
11B



11G



11N20



Conducted Output Power

Test Results

Measurement Data of Peak Power:

Mode	Test Channel	Peak Output Power (dBm)	Limit (dBm)	Result
802.11B	CH1	22.95	30.00	Pass
	CH6	23.10	30.00	Pass
	CH11	22.69	30.00	Pass
	CH13	4.32	30.00	Pass
802.11G	CH1	23.11	30.00	Pass
	CH6	25.09	30.00	Pass
	CH11	22.90	30.00	Pass
	CH13	4.27	30.00	Pass
802.11N20	CH1	20.66	30.00	Pass
	CH6	23.57	30.00	Pass
	CH11	20.50	30.00	Pass
	CH13	4.24	30.00	Pass

DTS (6 dB) Bandwidth&99% Occupied Bandwidth

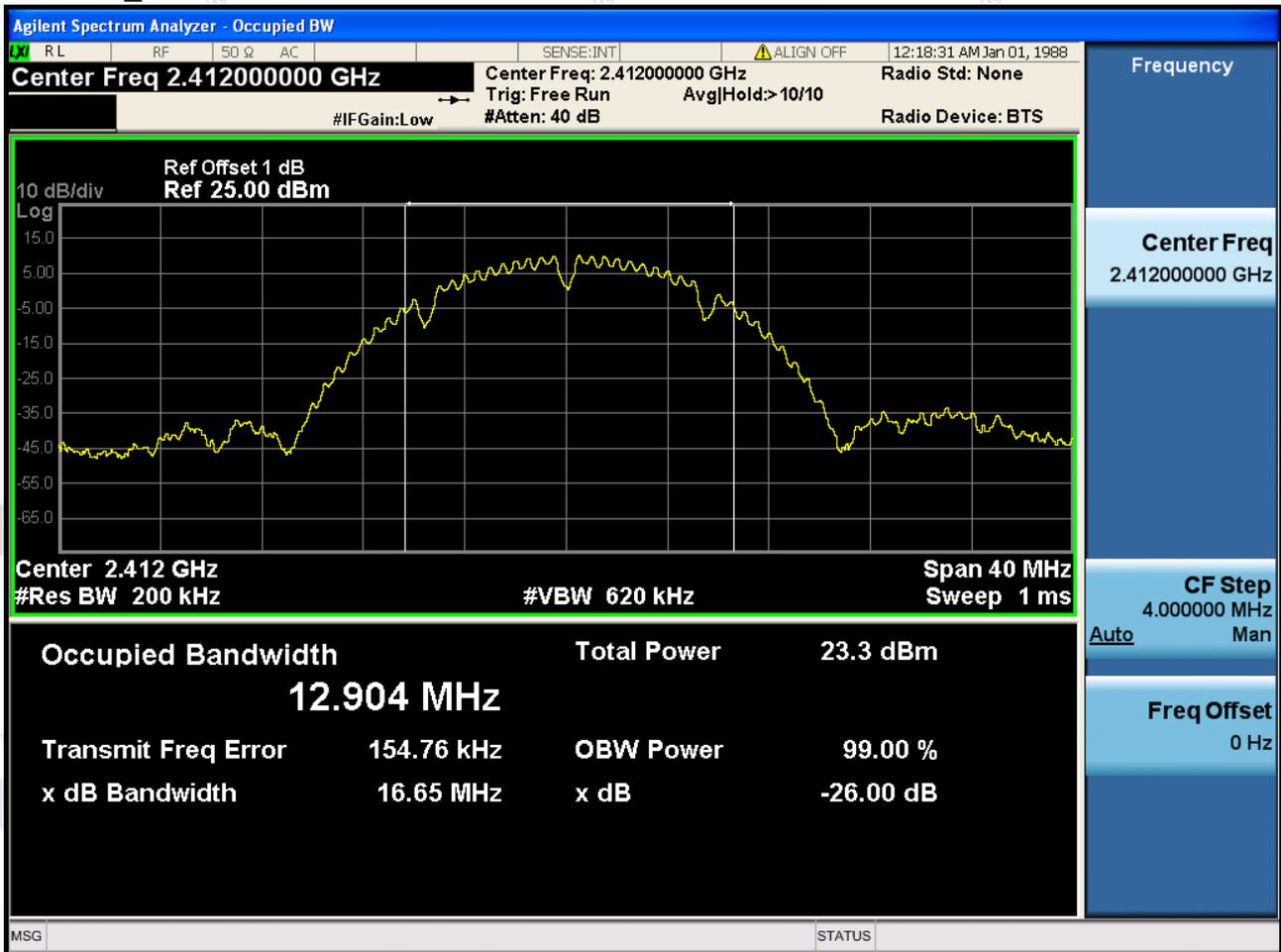
Test Results

Mode	Test Channel	Occupied Bandwidth (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)	Result
802.11B	CH1	12.90	12.90	≥500	Pass
	CH6	12.96	12.92	≥500	Pass
	CH11	12.86	12.84	≥500	Pass
	CH13	13.22	12.94	≥500	Pass
802.11G	CH1	16.53	16.38	≥500	Pass
	CH6	16.69	16.54	≥500	Pass
	CH11	16.83	16.59	≥500	Pass
	CH13	16.66	16.53	≥500	Pass
802.11N20	CH1	17.64	12.56	≥500	Pass
	CH6	17.84	17.70	≥500	Pass
	CH11	17.92	17.75	≥500	Pass
	CH13	17.82	17.68	≥500	Pass

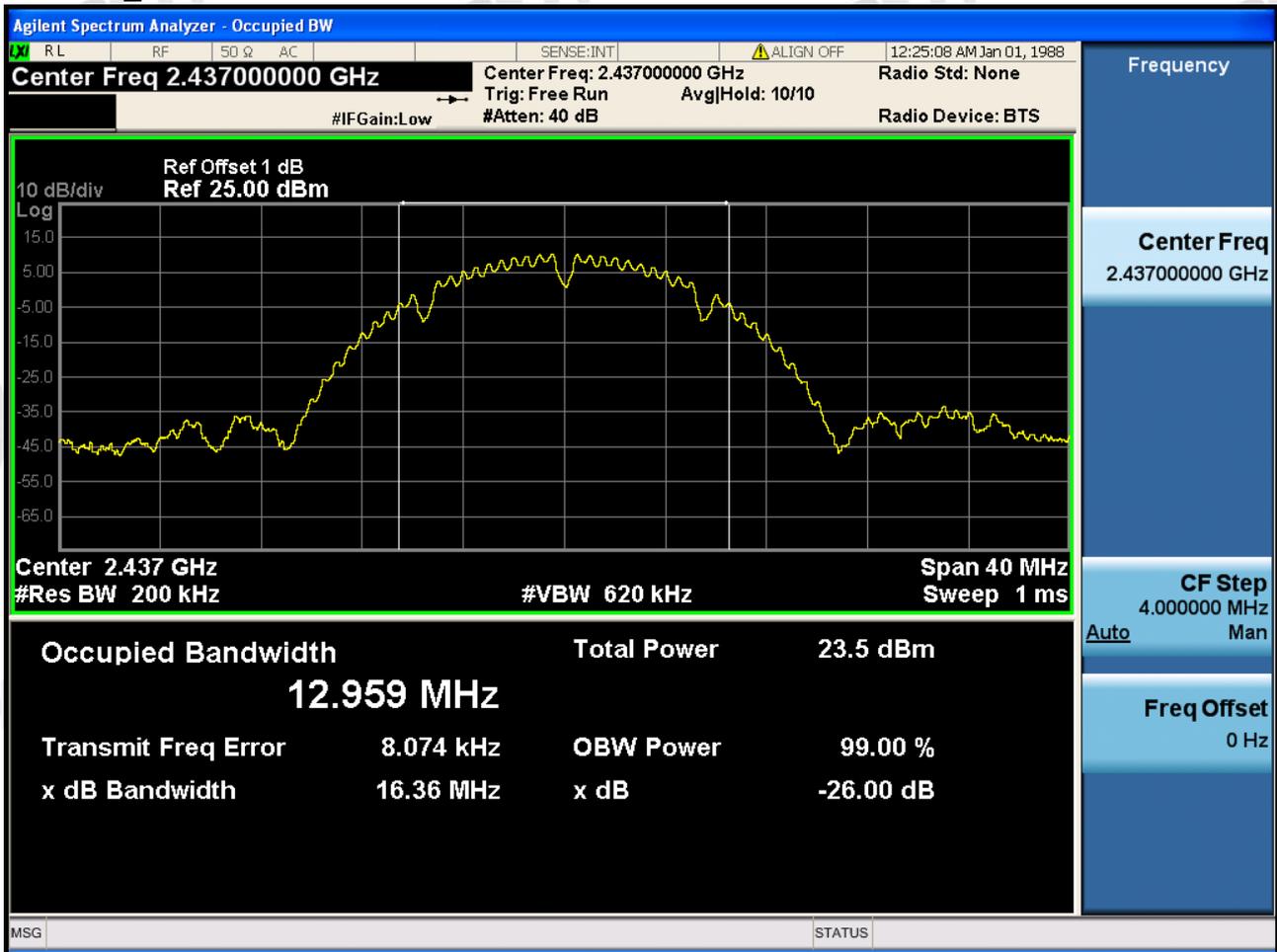
Test plots For Occupied Bandwidth

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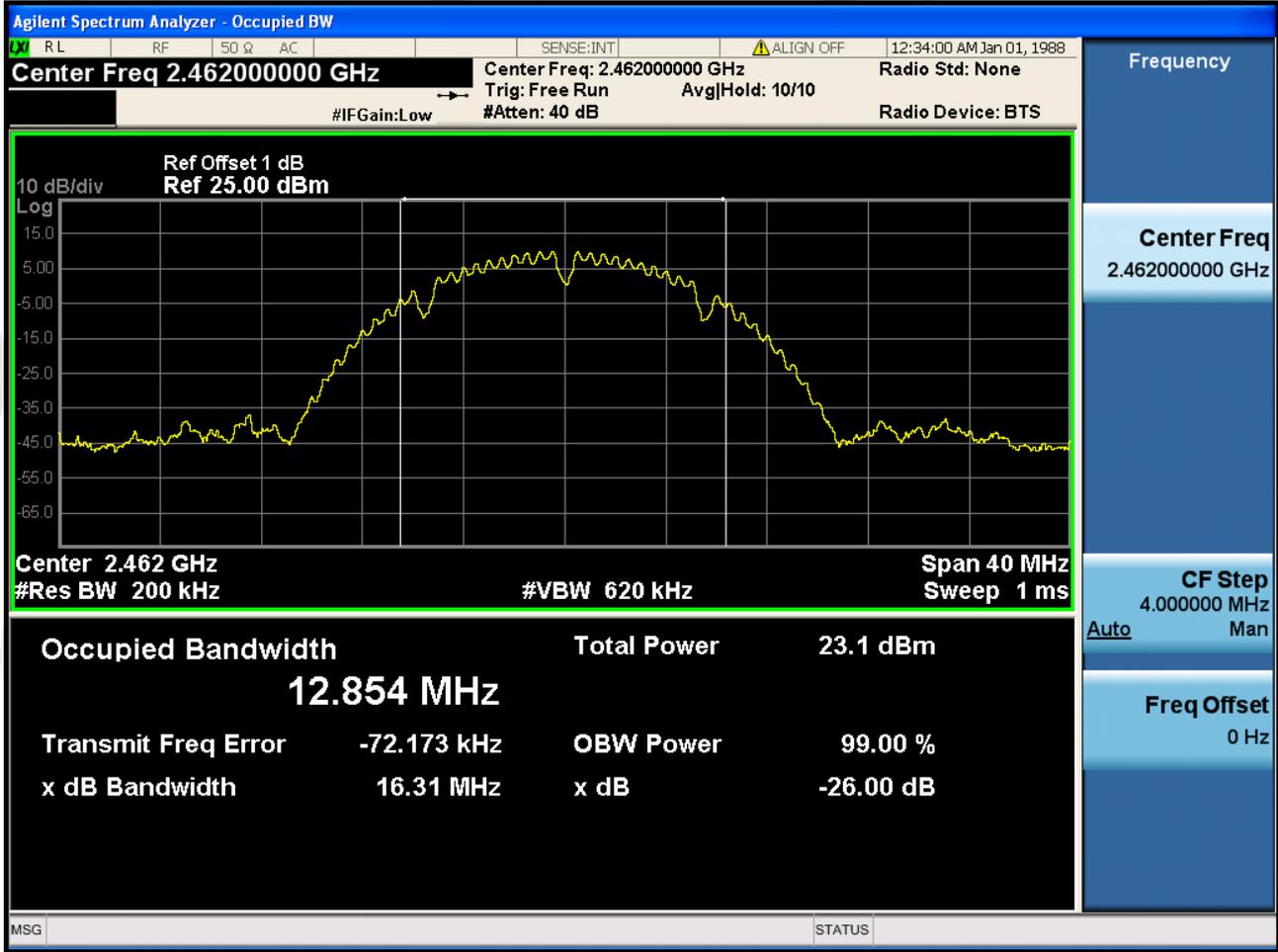
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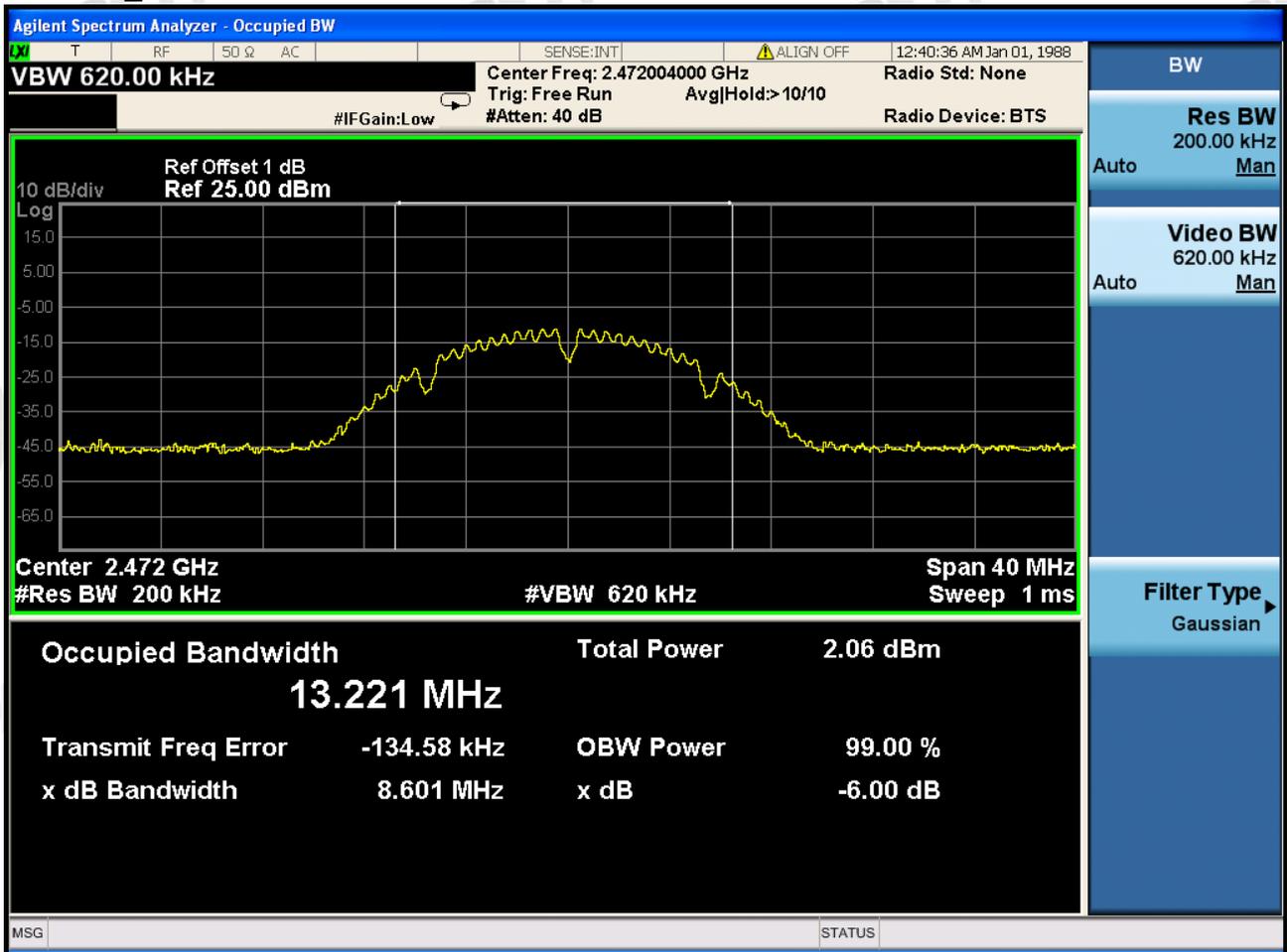
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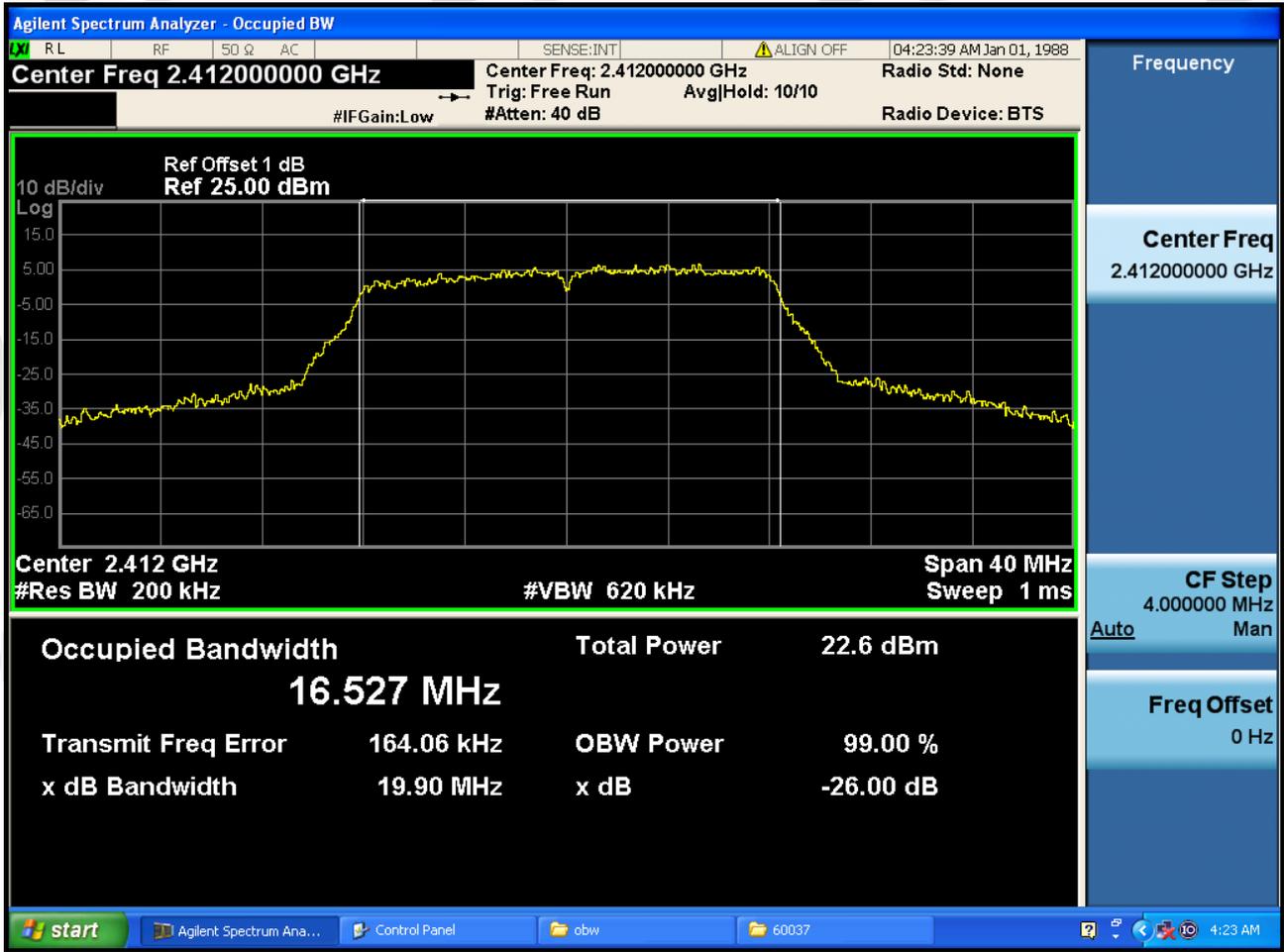
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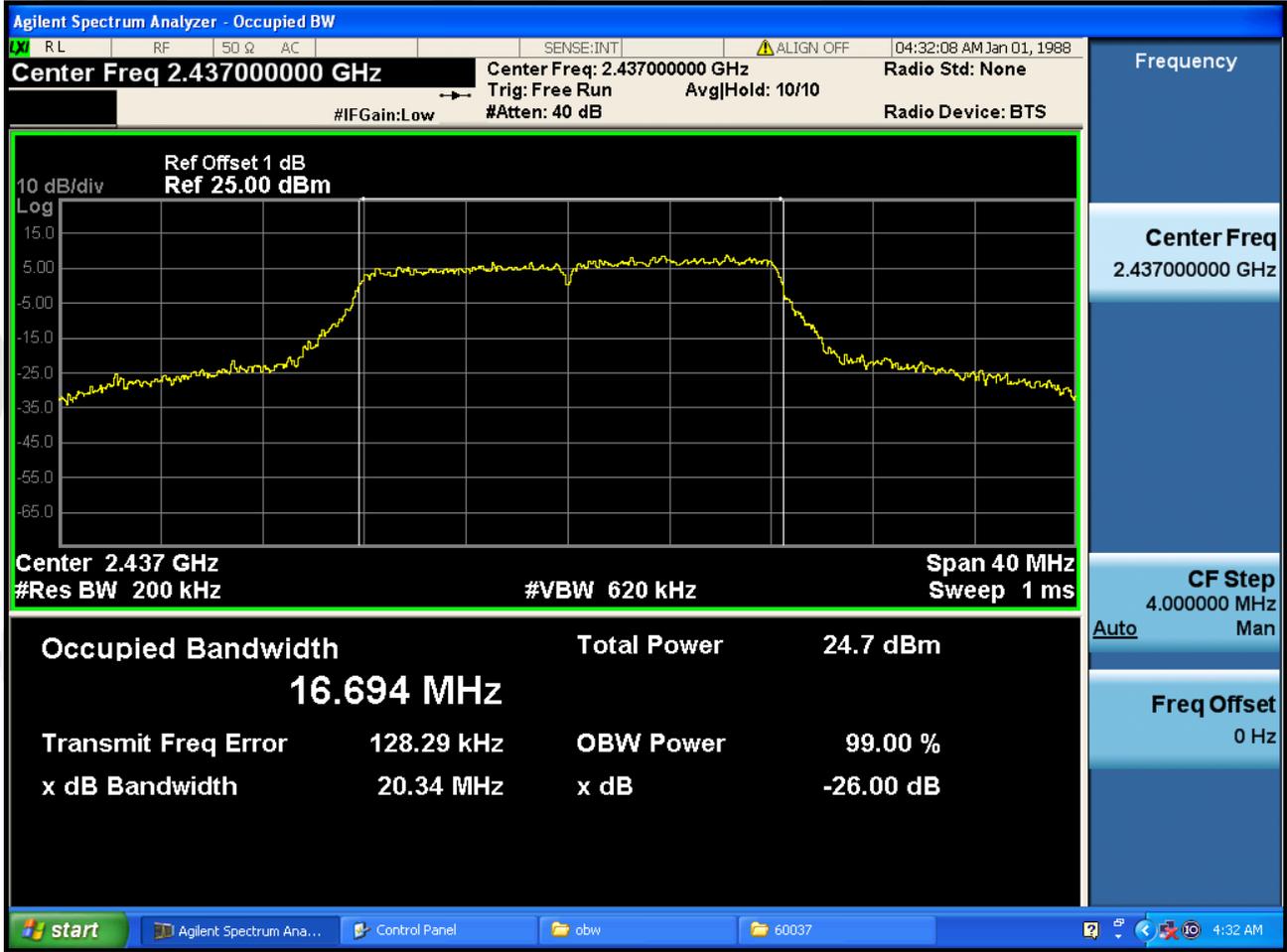
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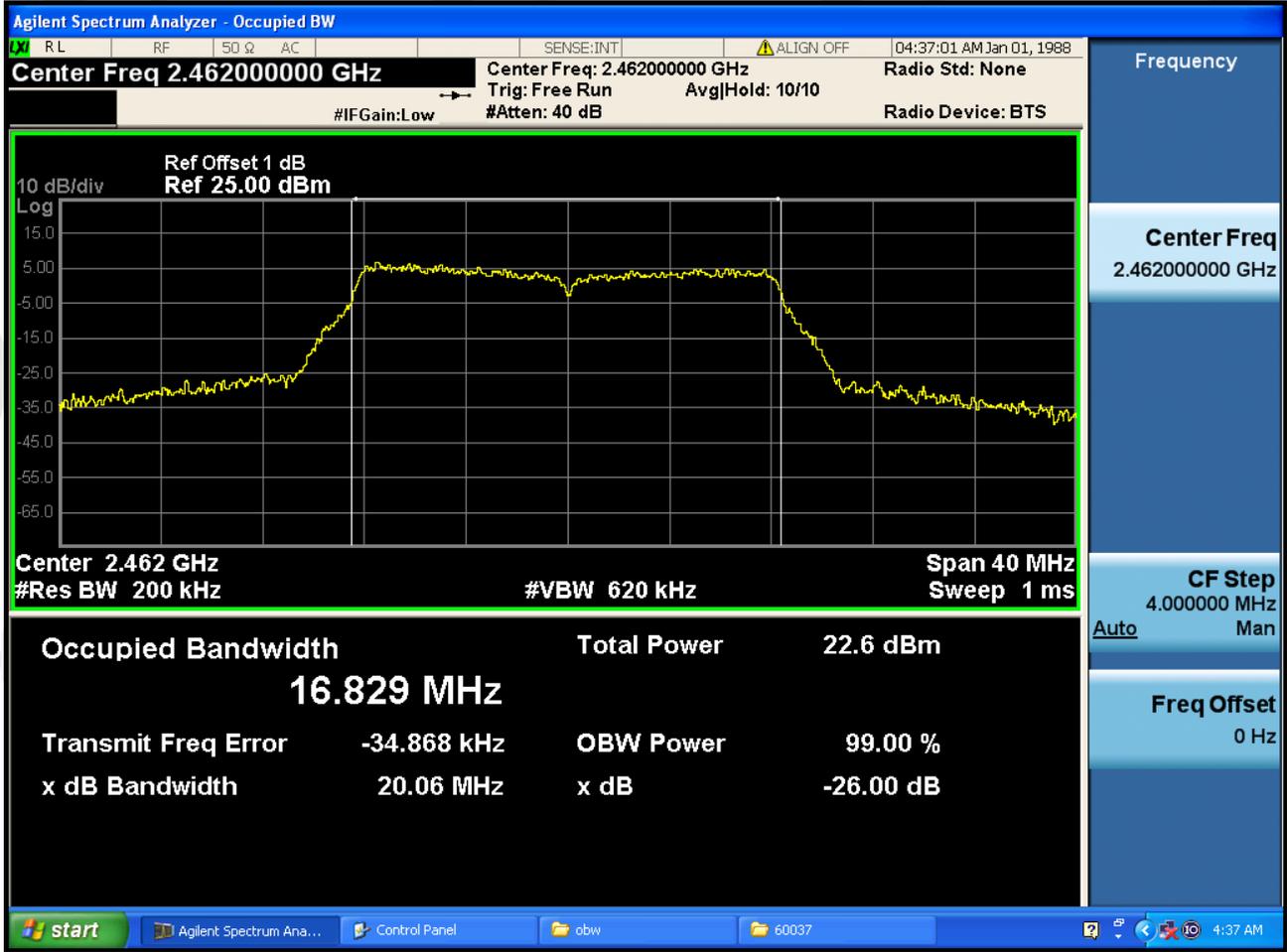
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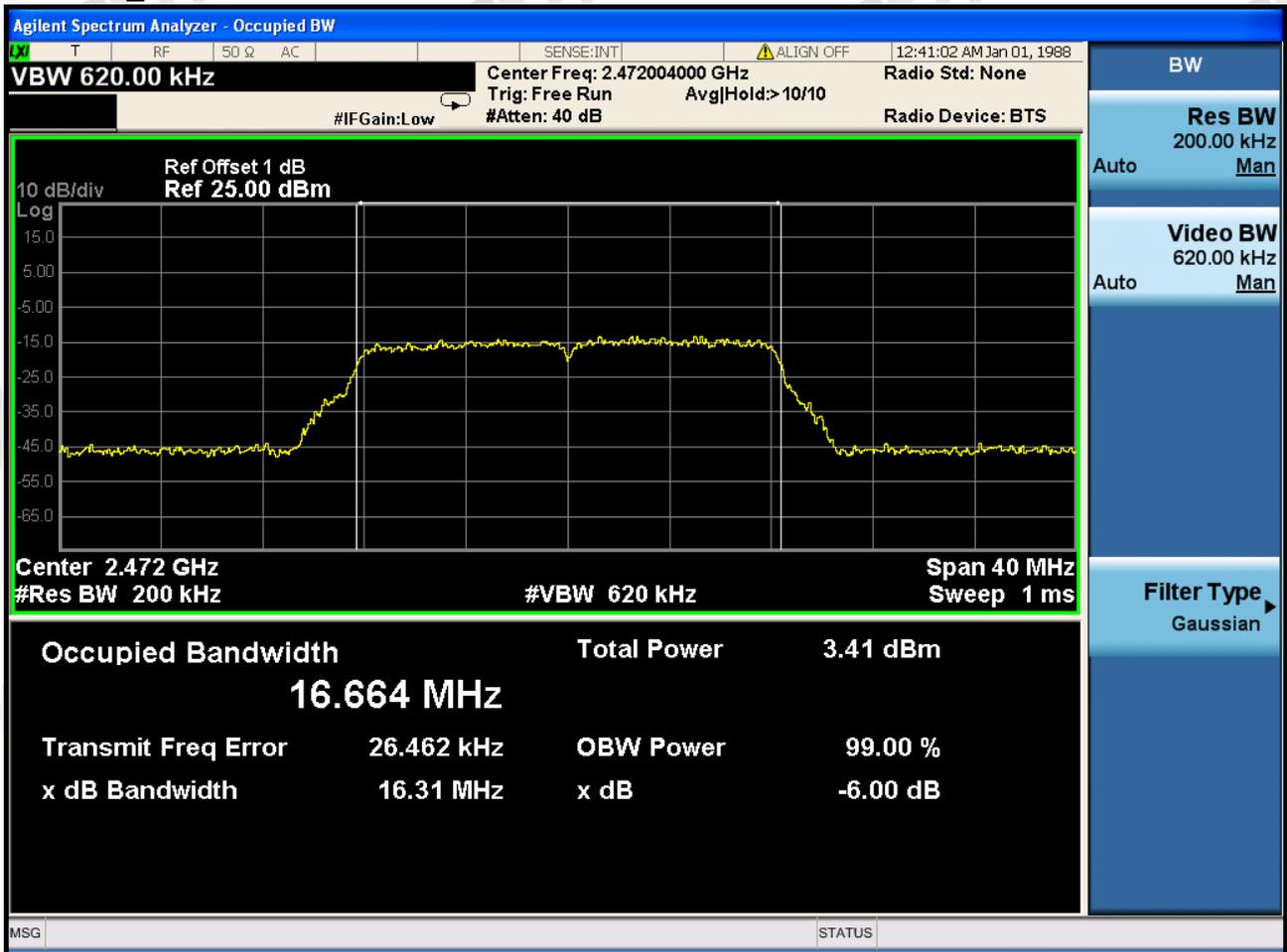
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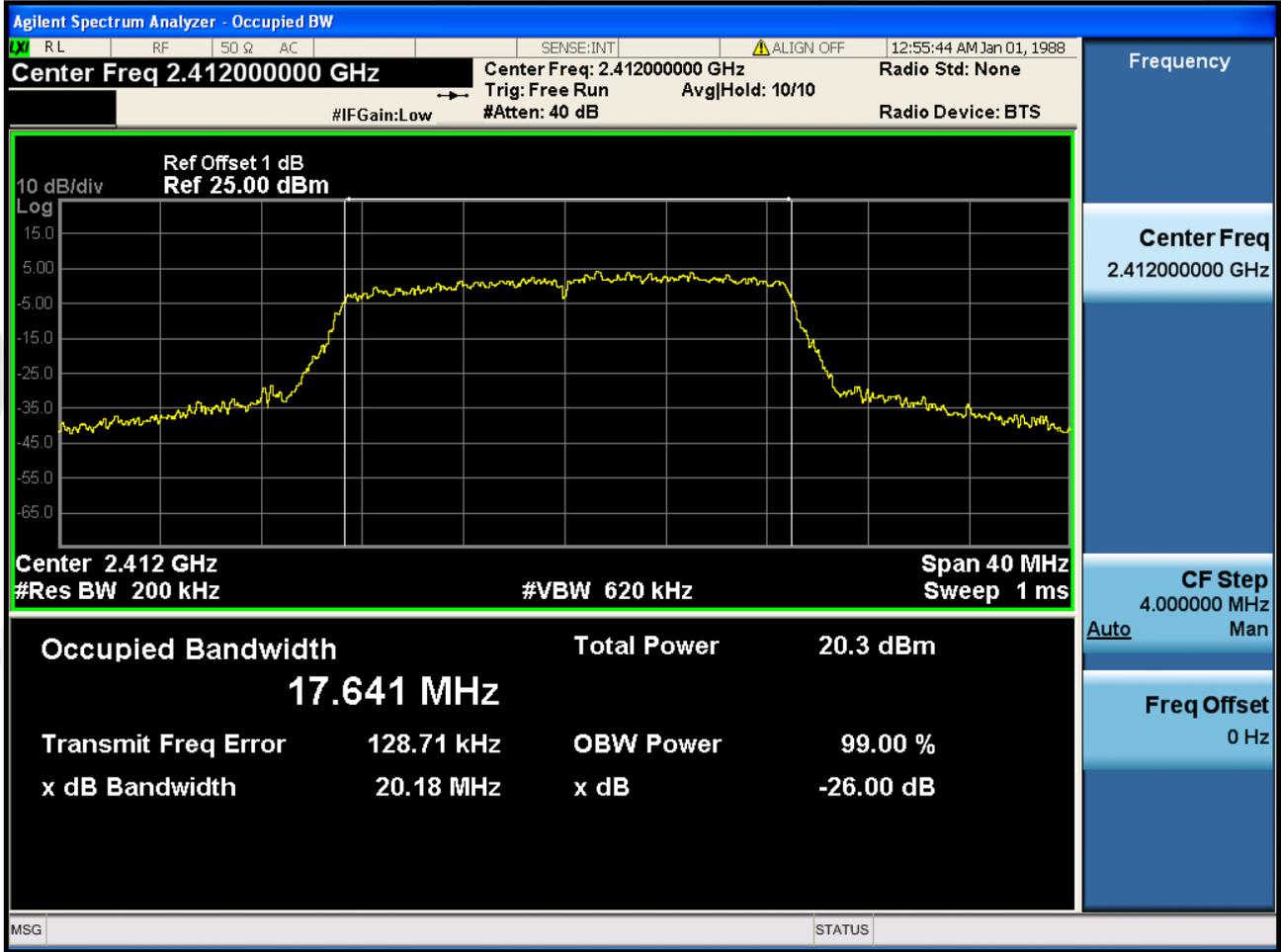
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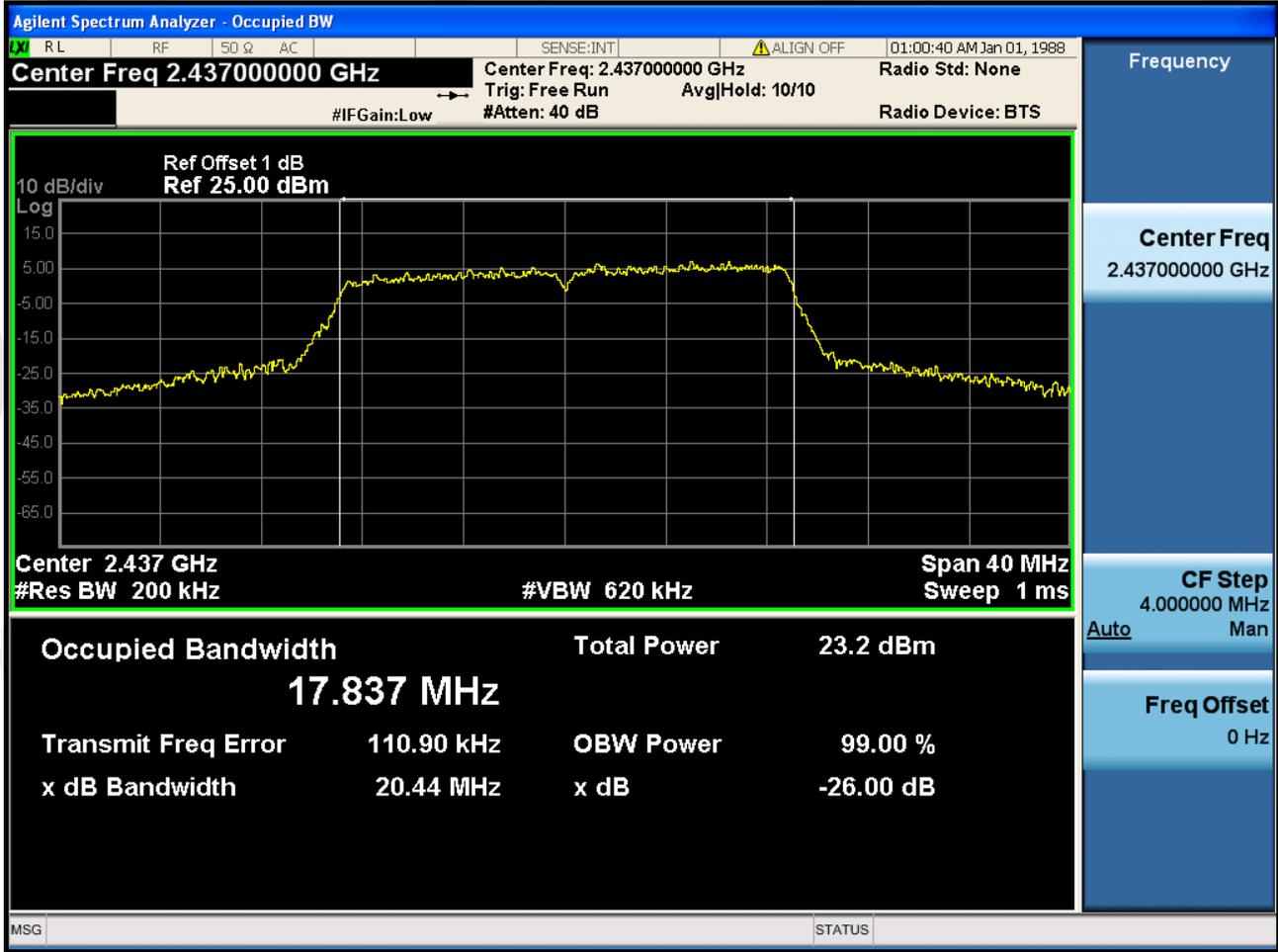
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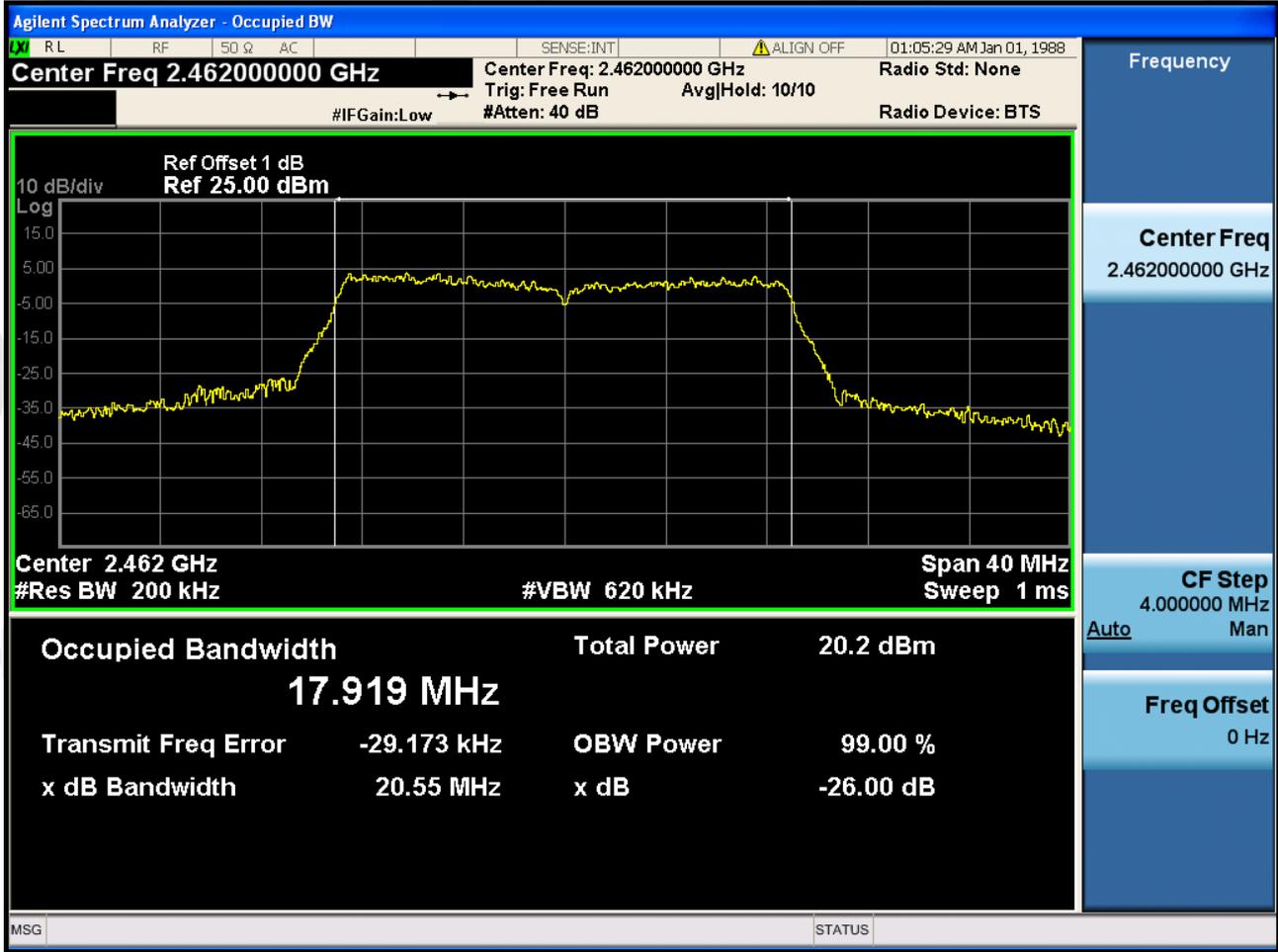
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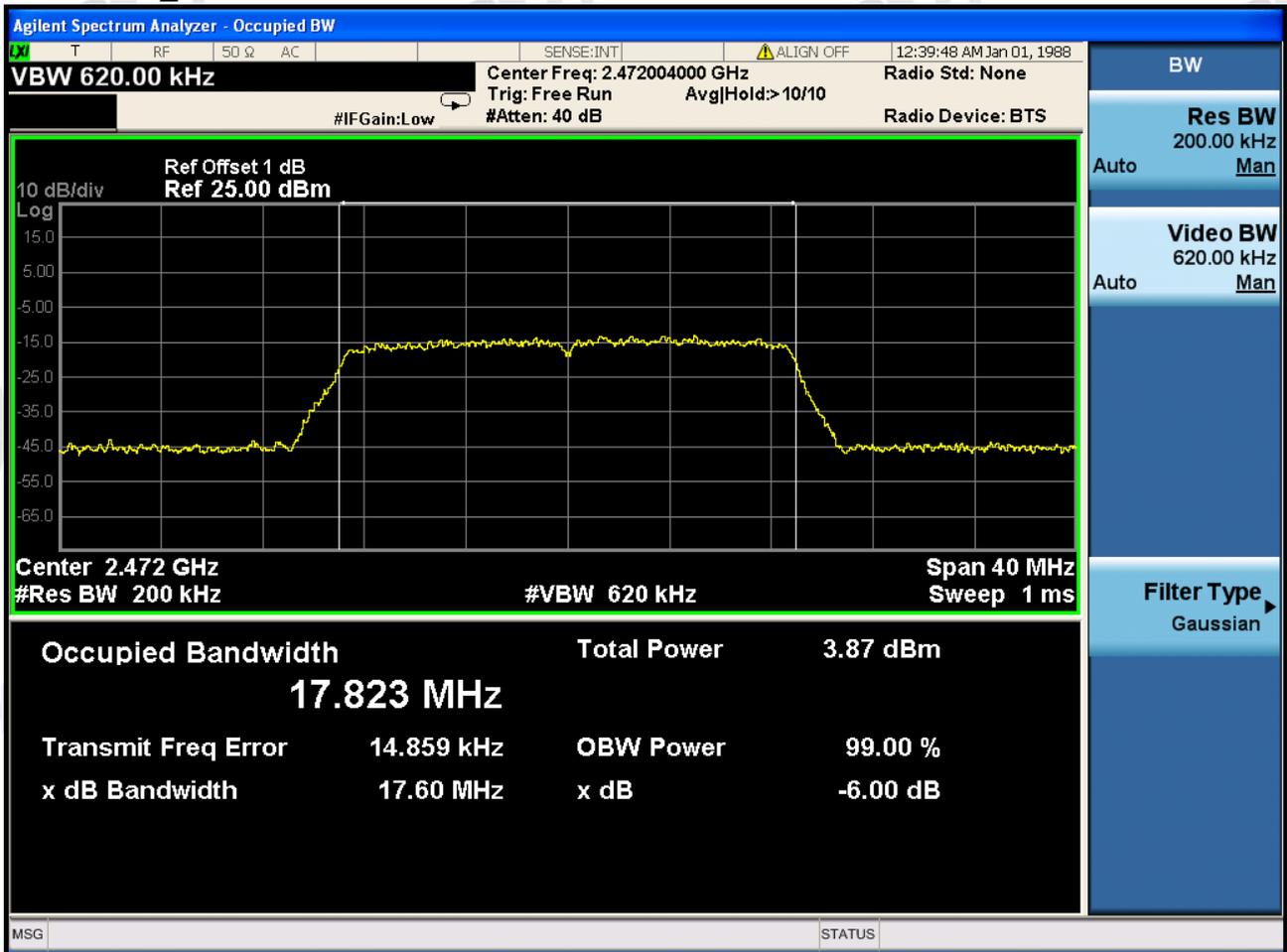
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802.11 N20_CH11



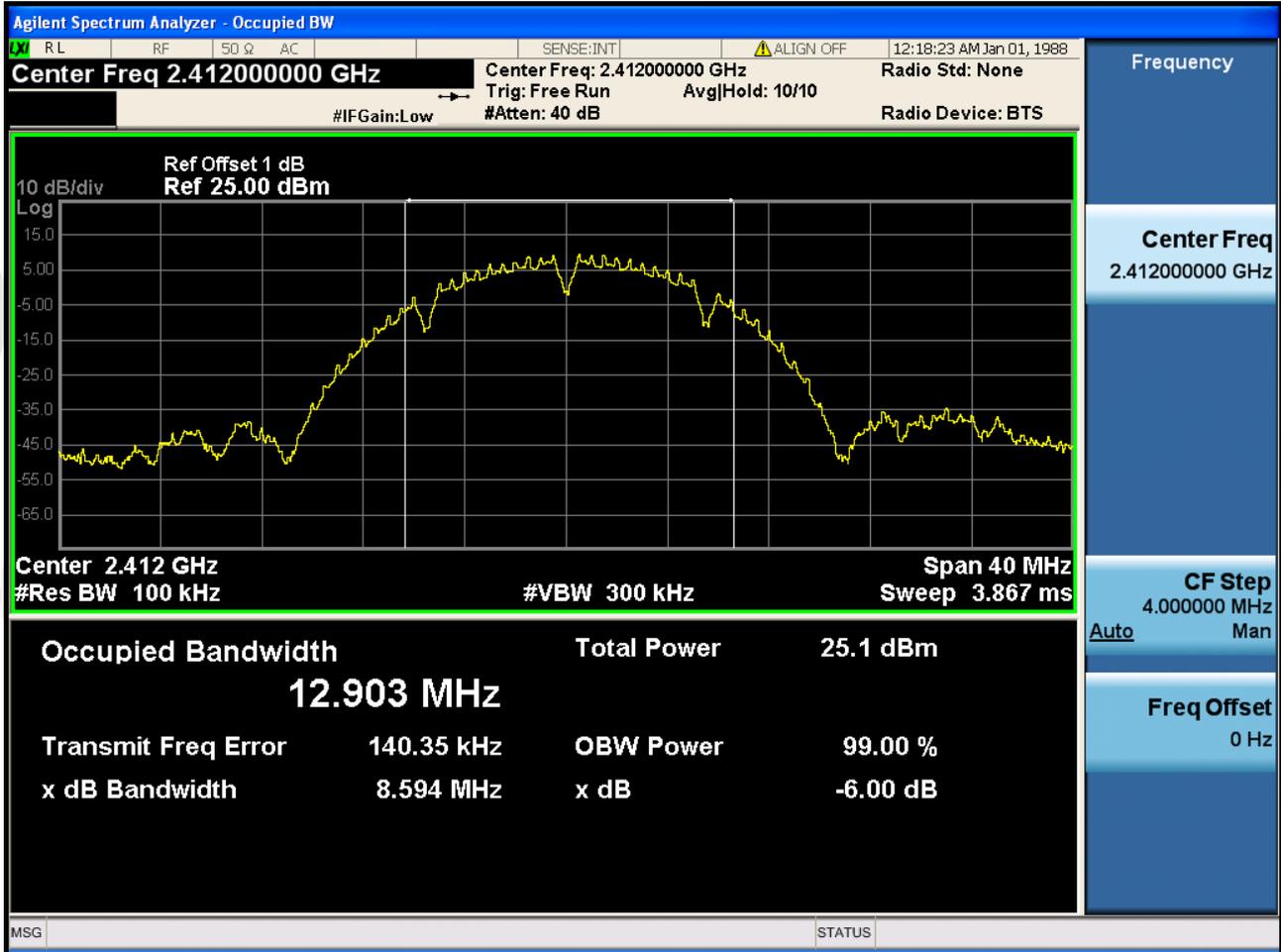
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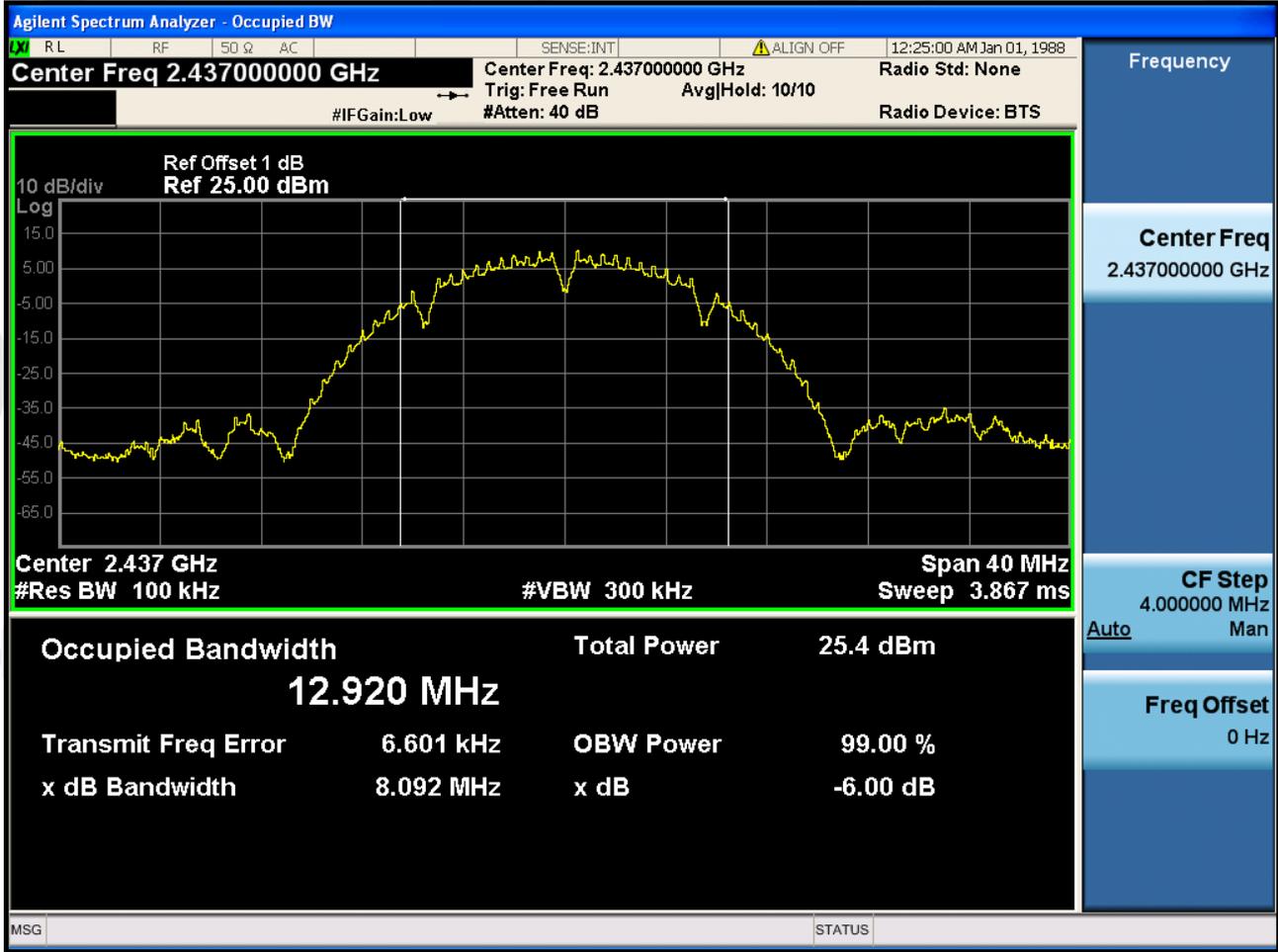
Test plots For 6dB Emission Bandwidth

ANT1

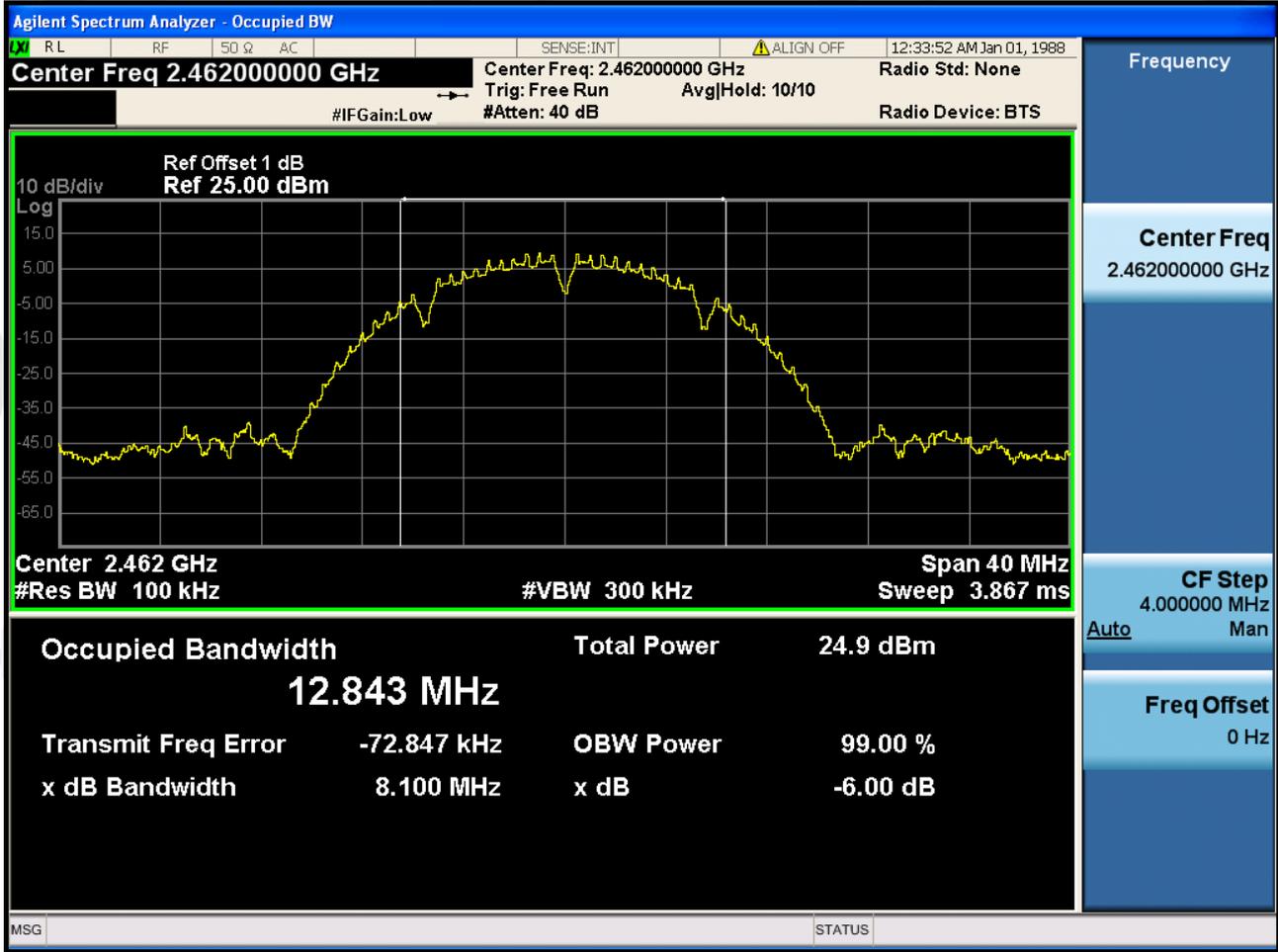
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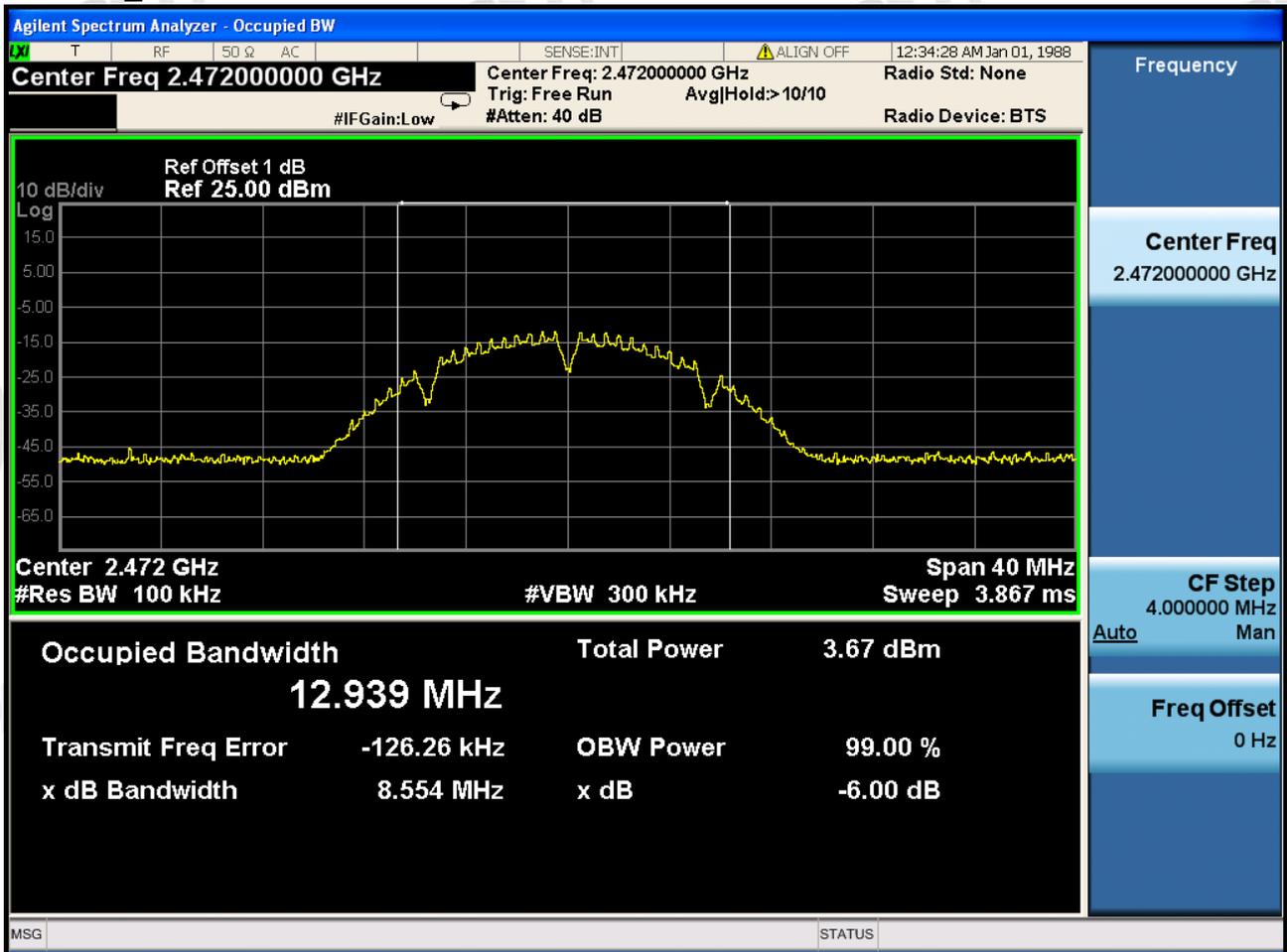
802.11B_CH6



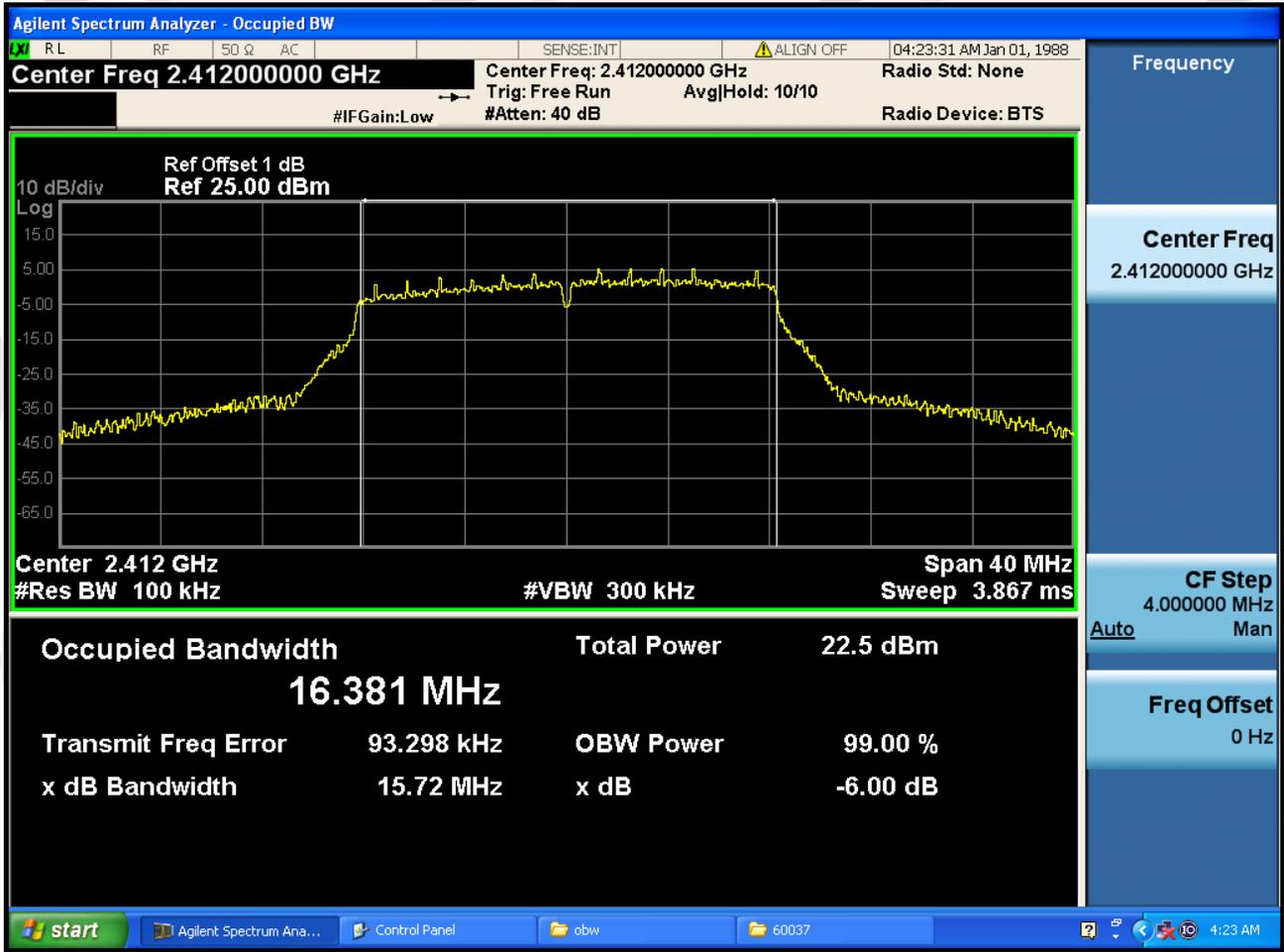
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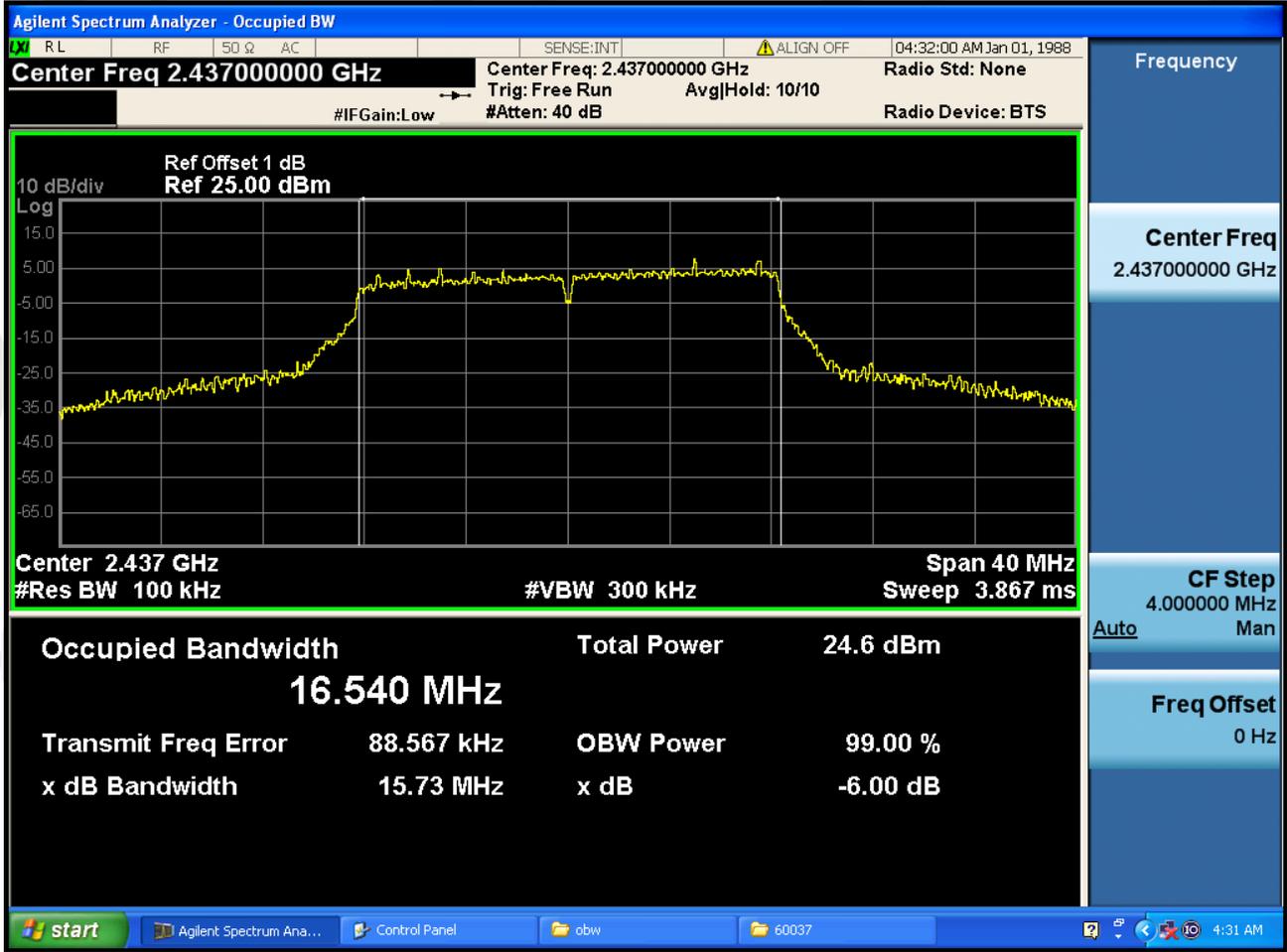
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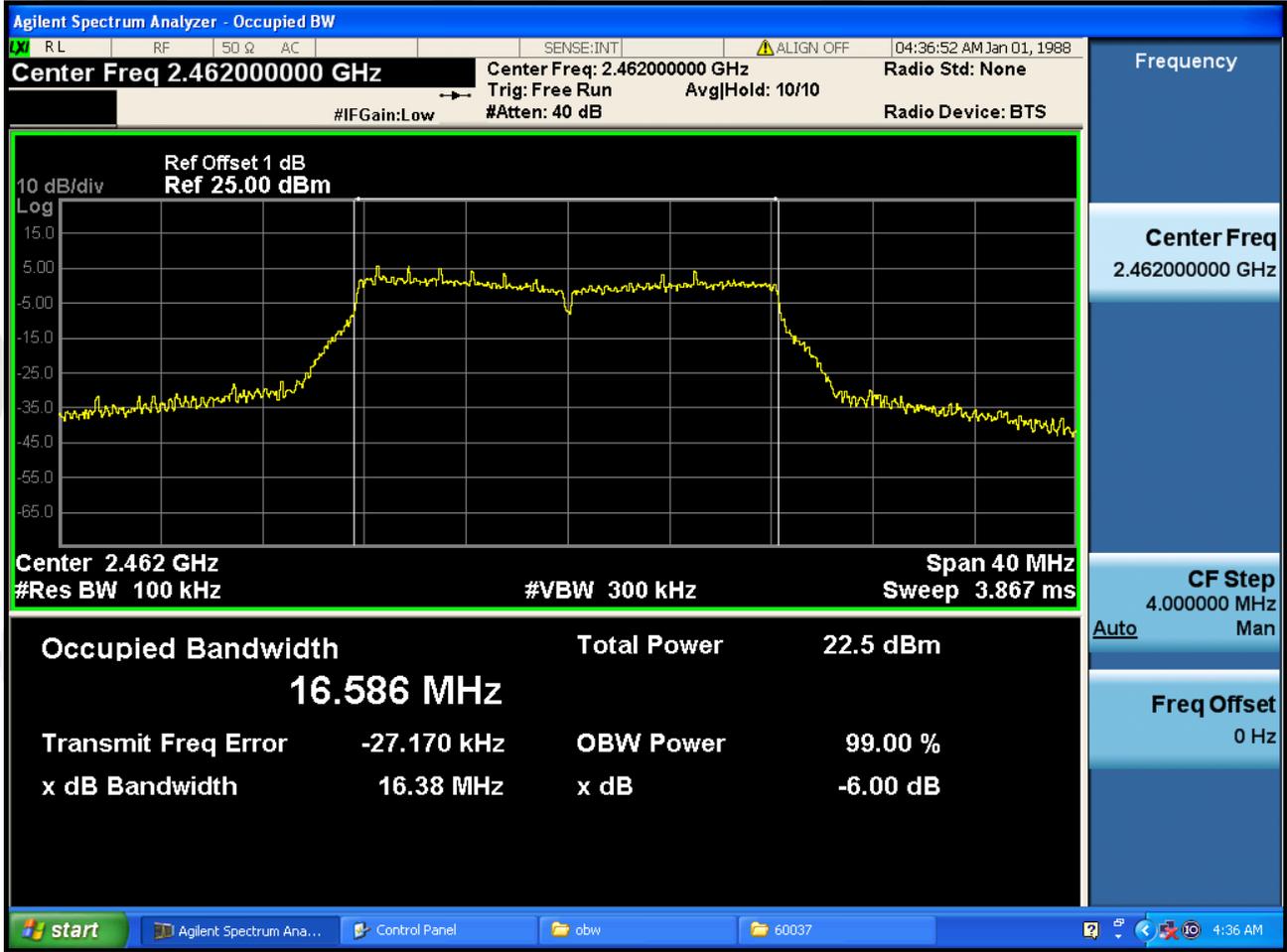
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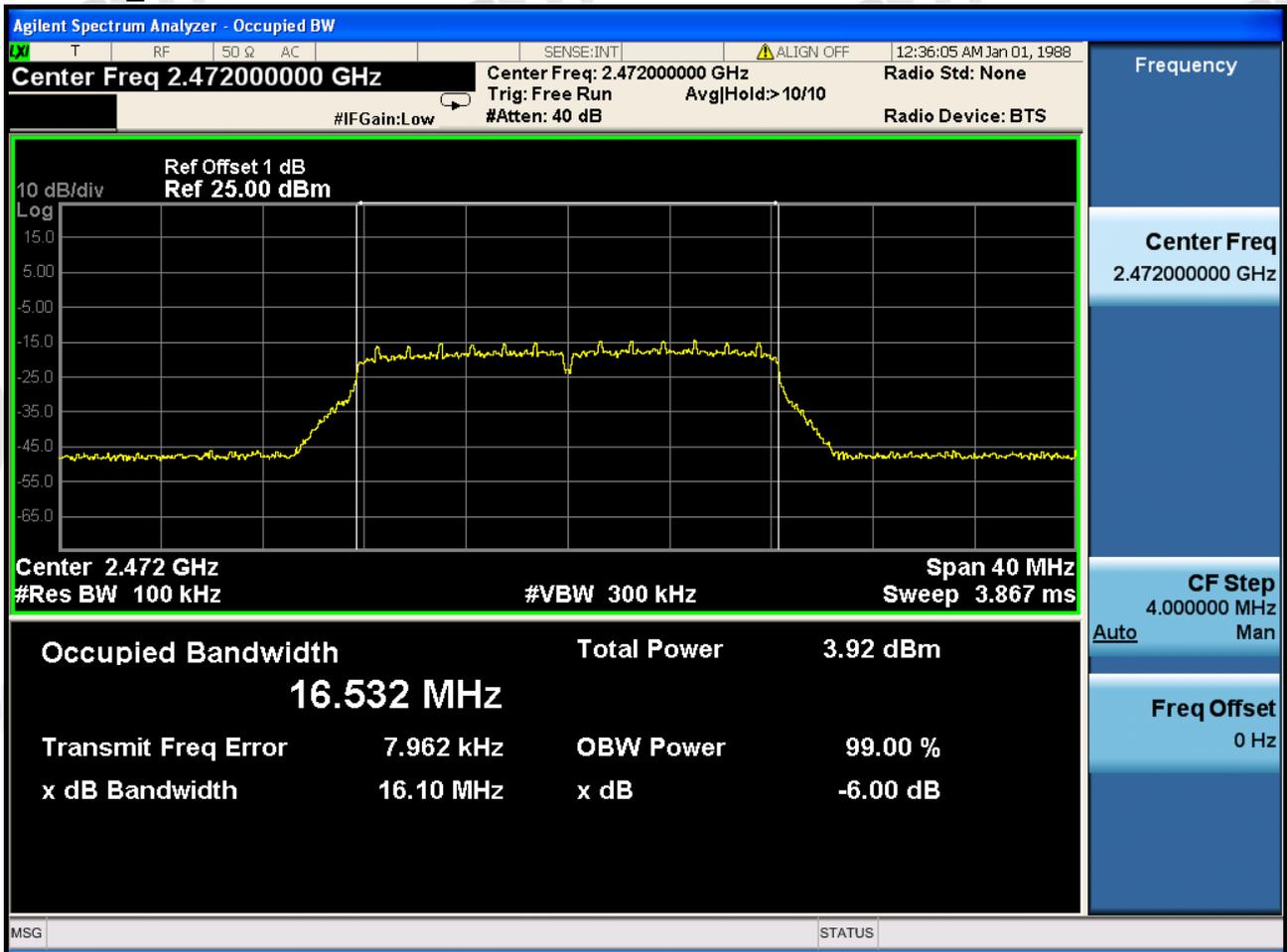
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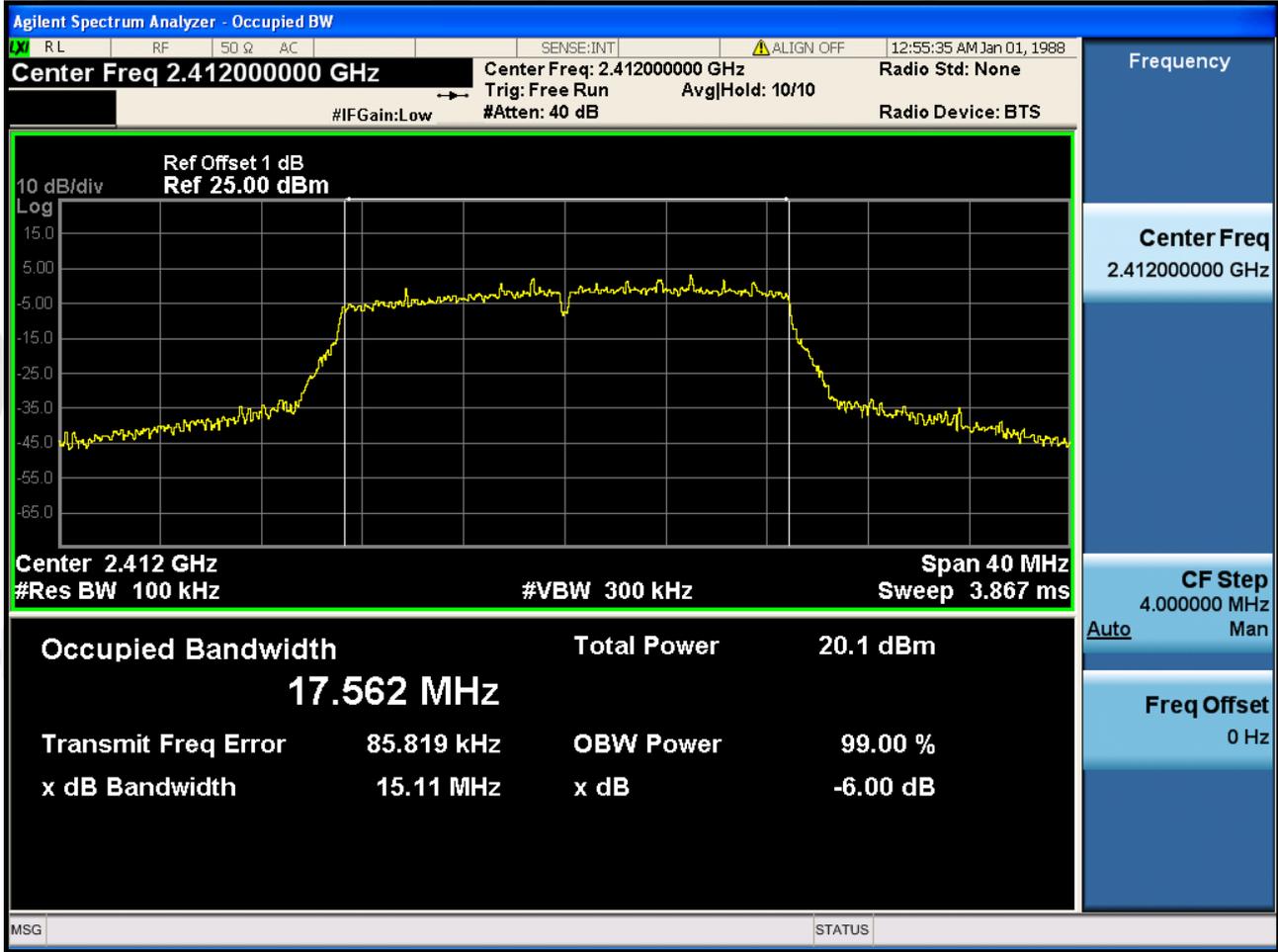
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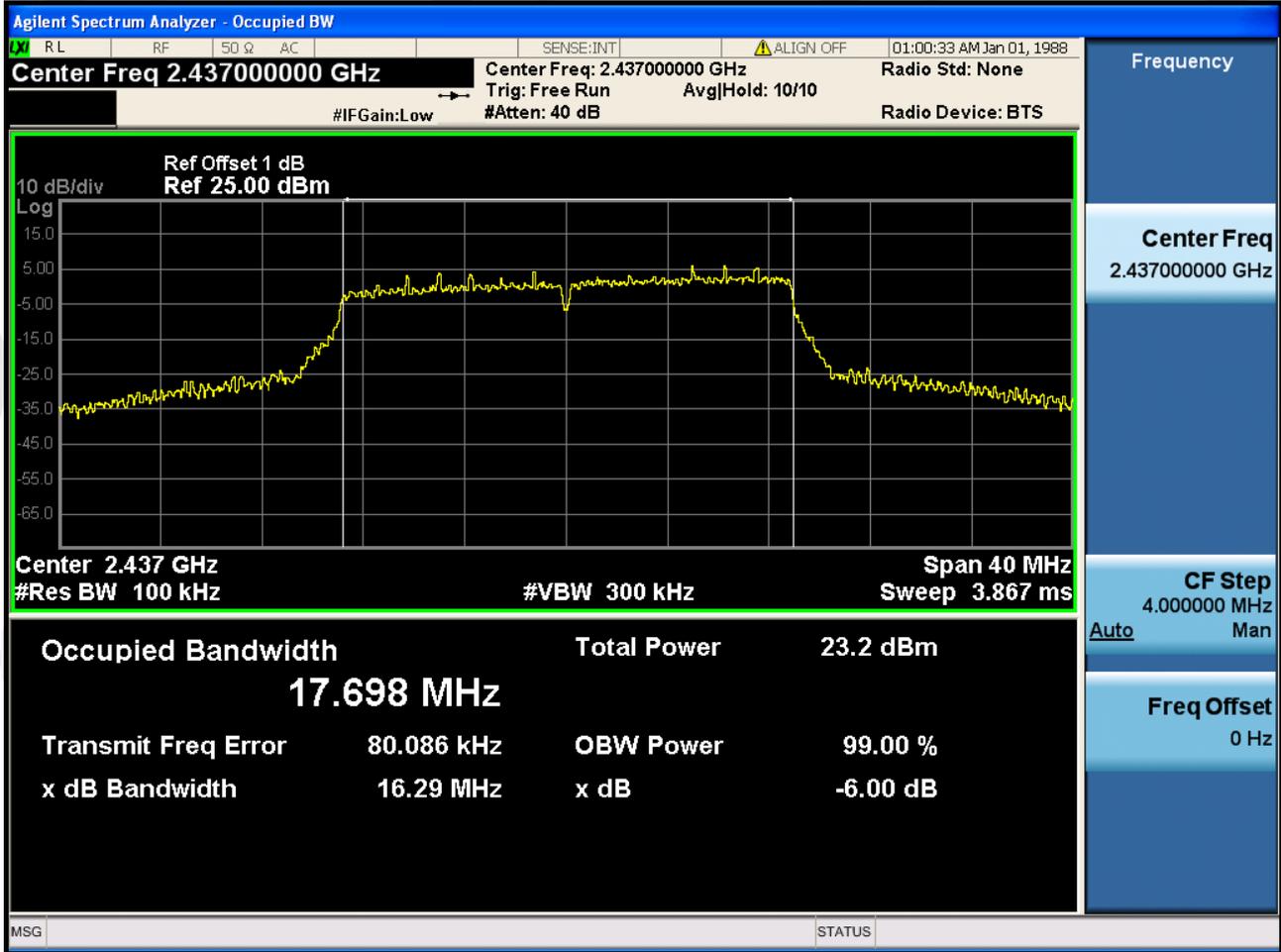
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802.11N20_CH1



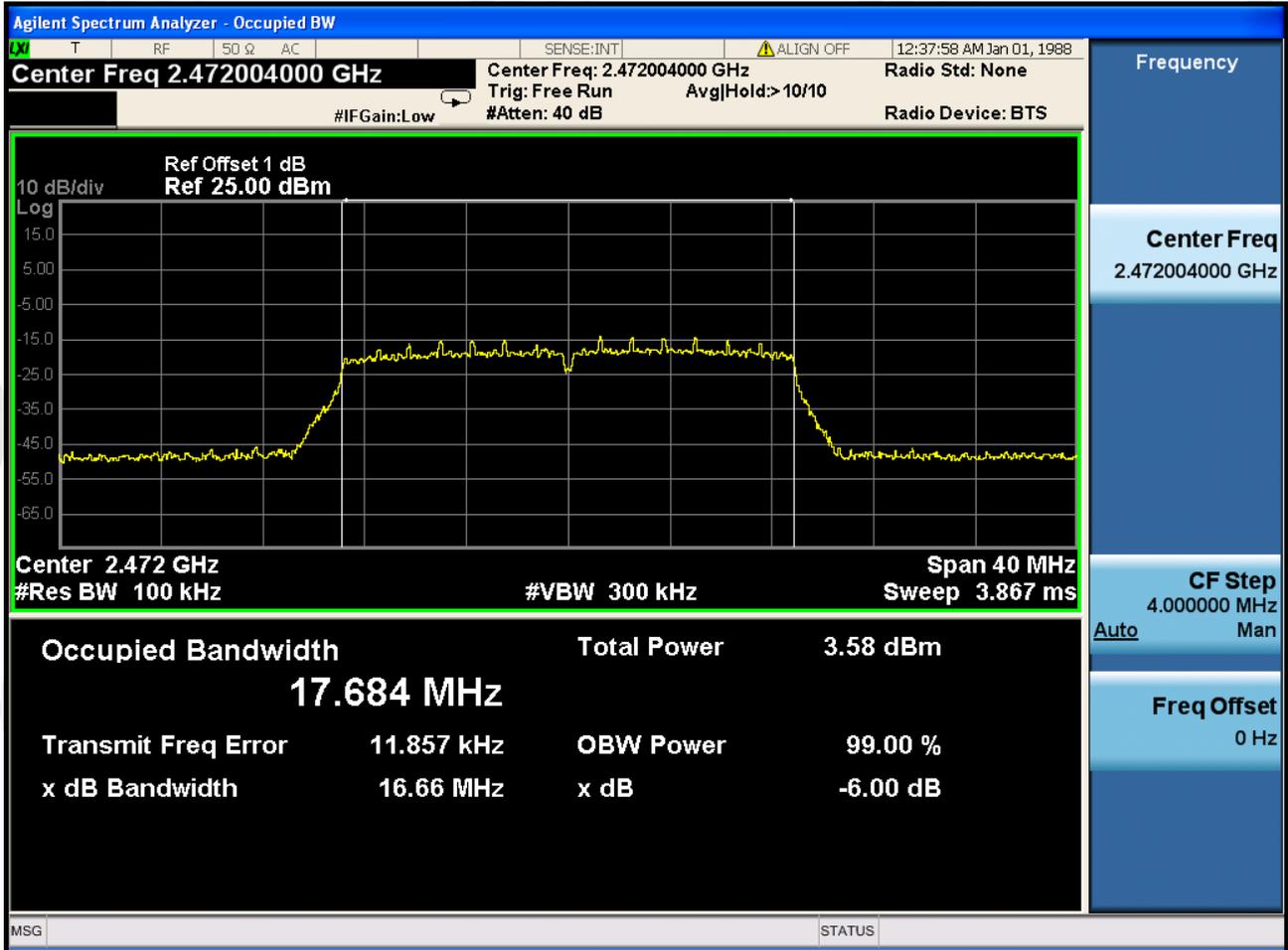
802.11 N20_CH6



802.11 N20 CH11



802.11N20_CH13



Power Spectral Density

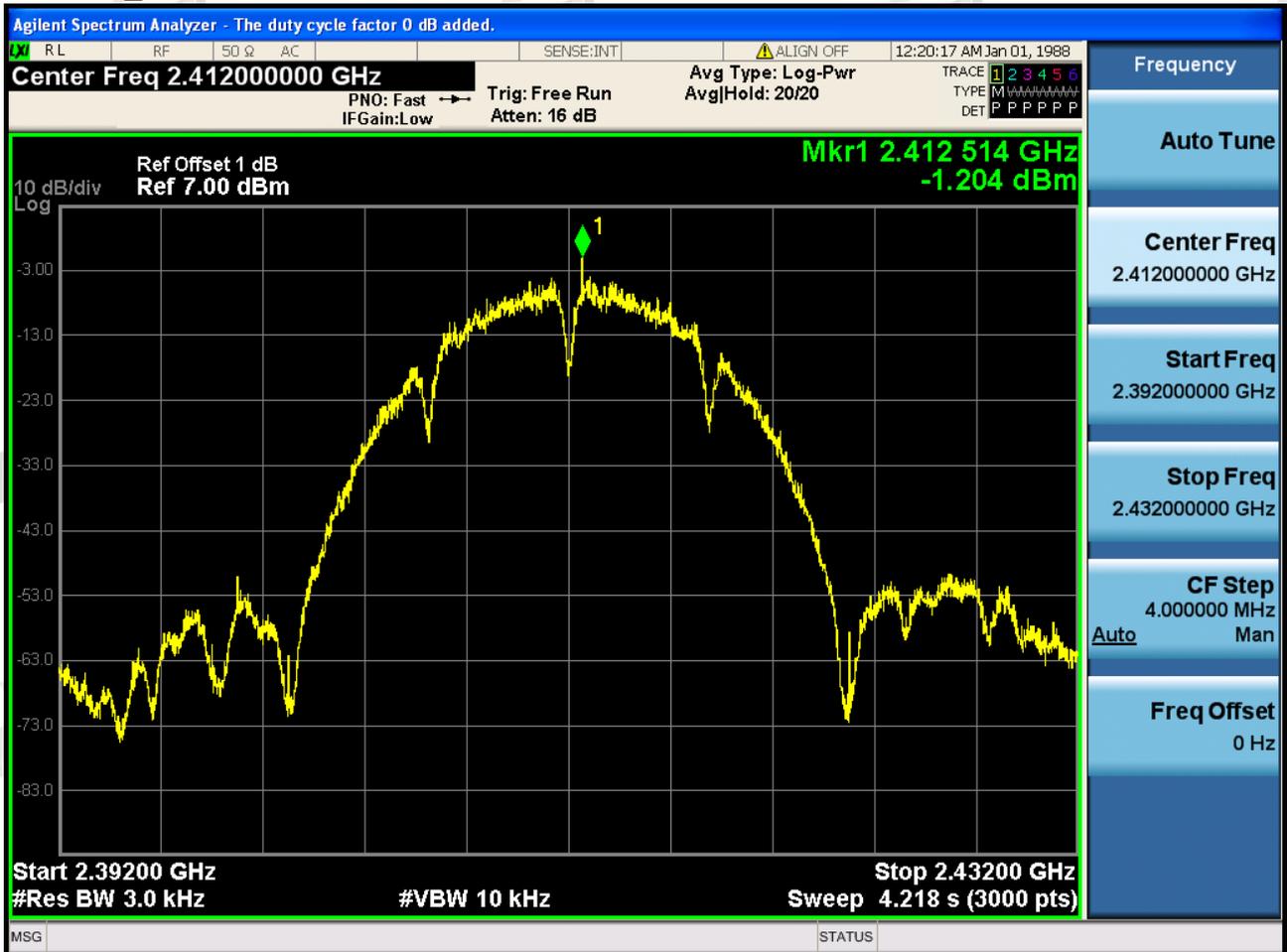
Test Results

Mode	Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
802.11B	CH1	-1.20	≤8.00	Pass
	CH6	-3.95	≤8.00	Pass
	CH11	-3.68	≤8.00	Pass
	CH13	-22.98	≤8.00	Pass
802.11G	CH1	-8.13	≤8.00	Pass
	CH6	-6.56	≤8.00	Pass
	CH11	-5.30	≤8.00	Pass
	CH13	-27.80	≤8.00	Pass
802.11N20	CH1	-11.44	≤8.00	Pass
	CH6	-7.63	≤8.00	Pass
	CH11	-11.22	≤8.00	Pass
	CH13	-28.29	≤8.00	Pass

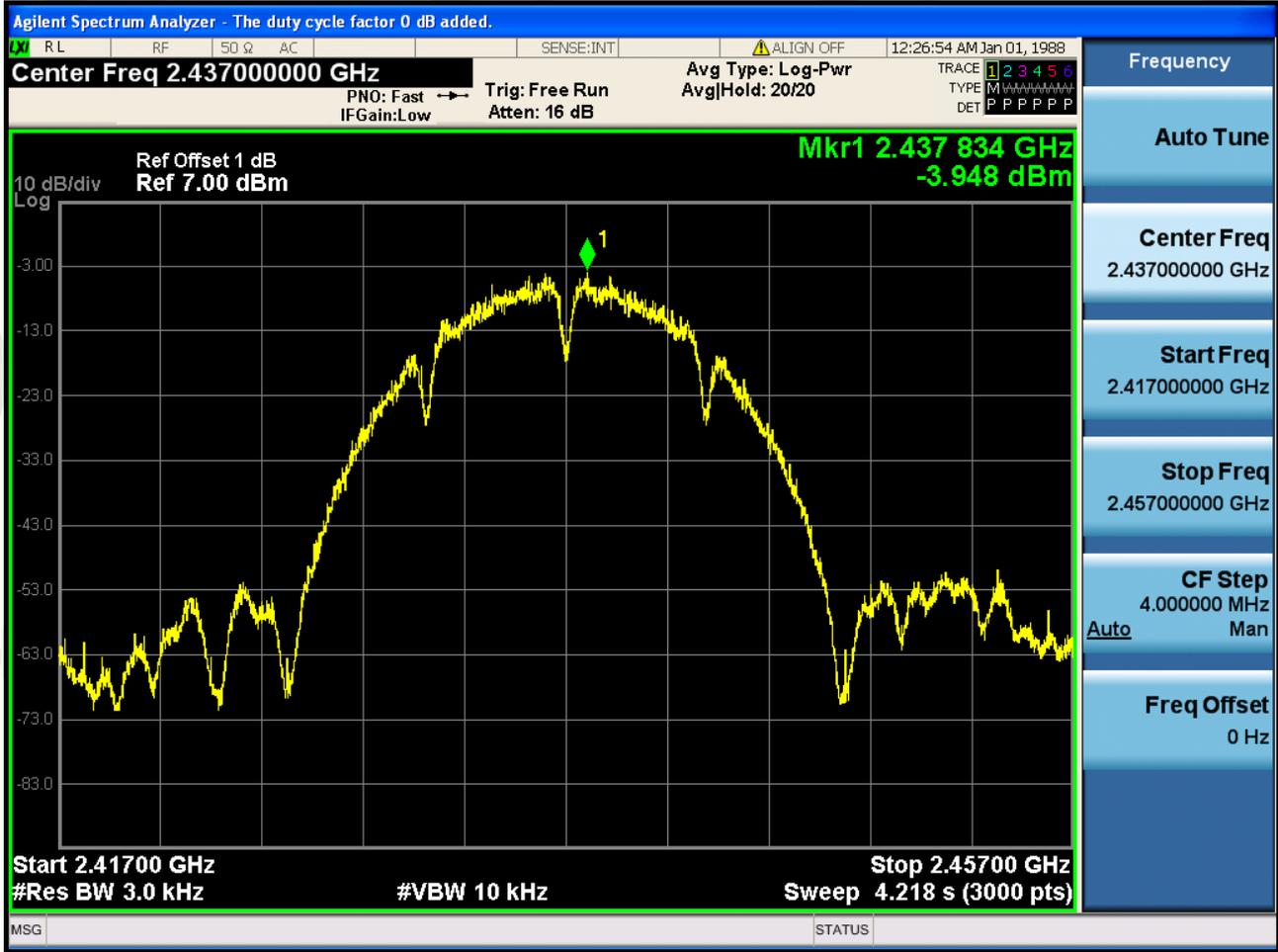
Test plots

ANT1

802.11B_CH1



802.11B_CH6



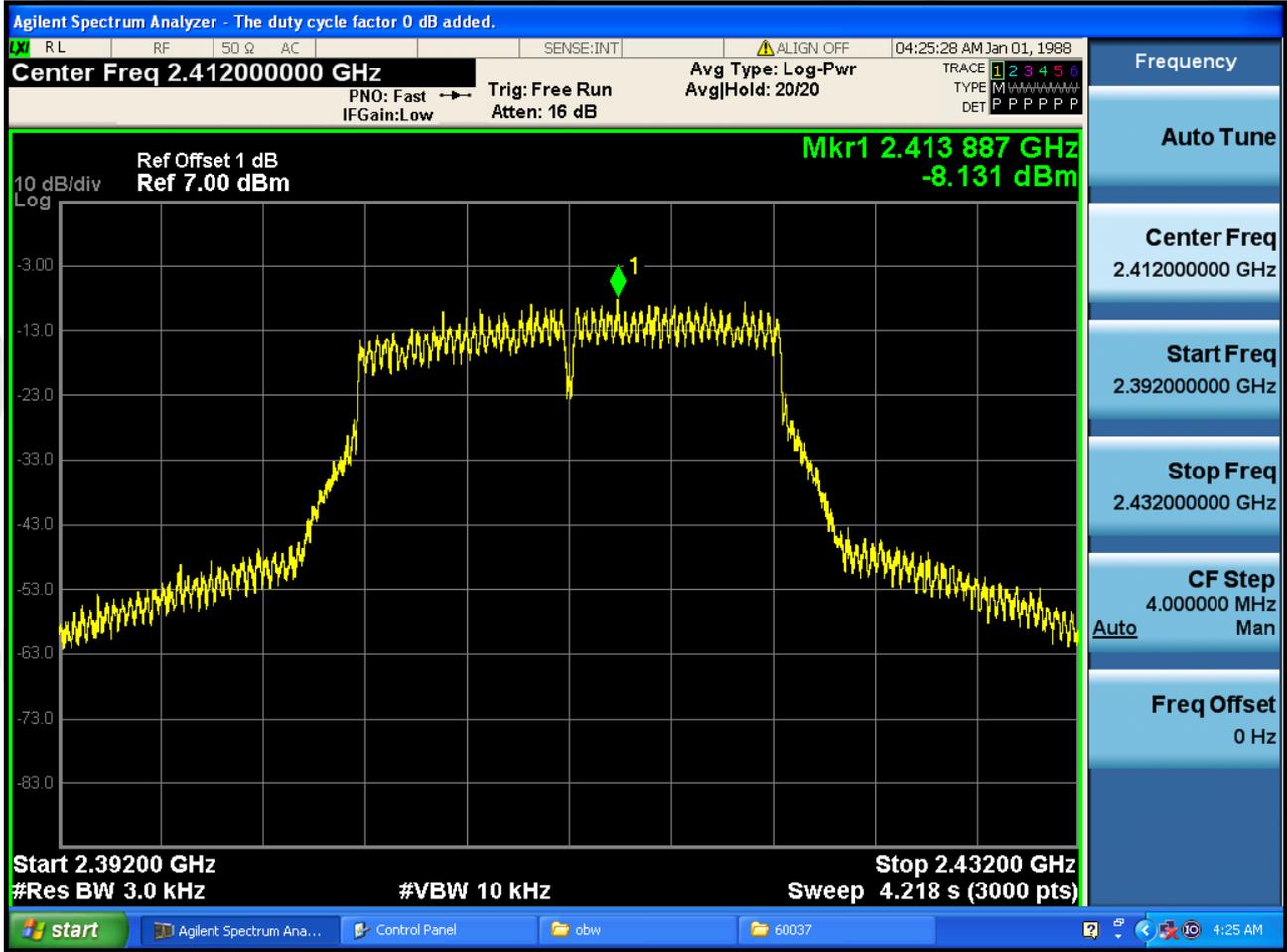
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802.11B_CH13



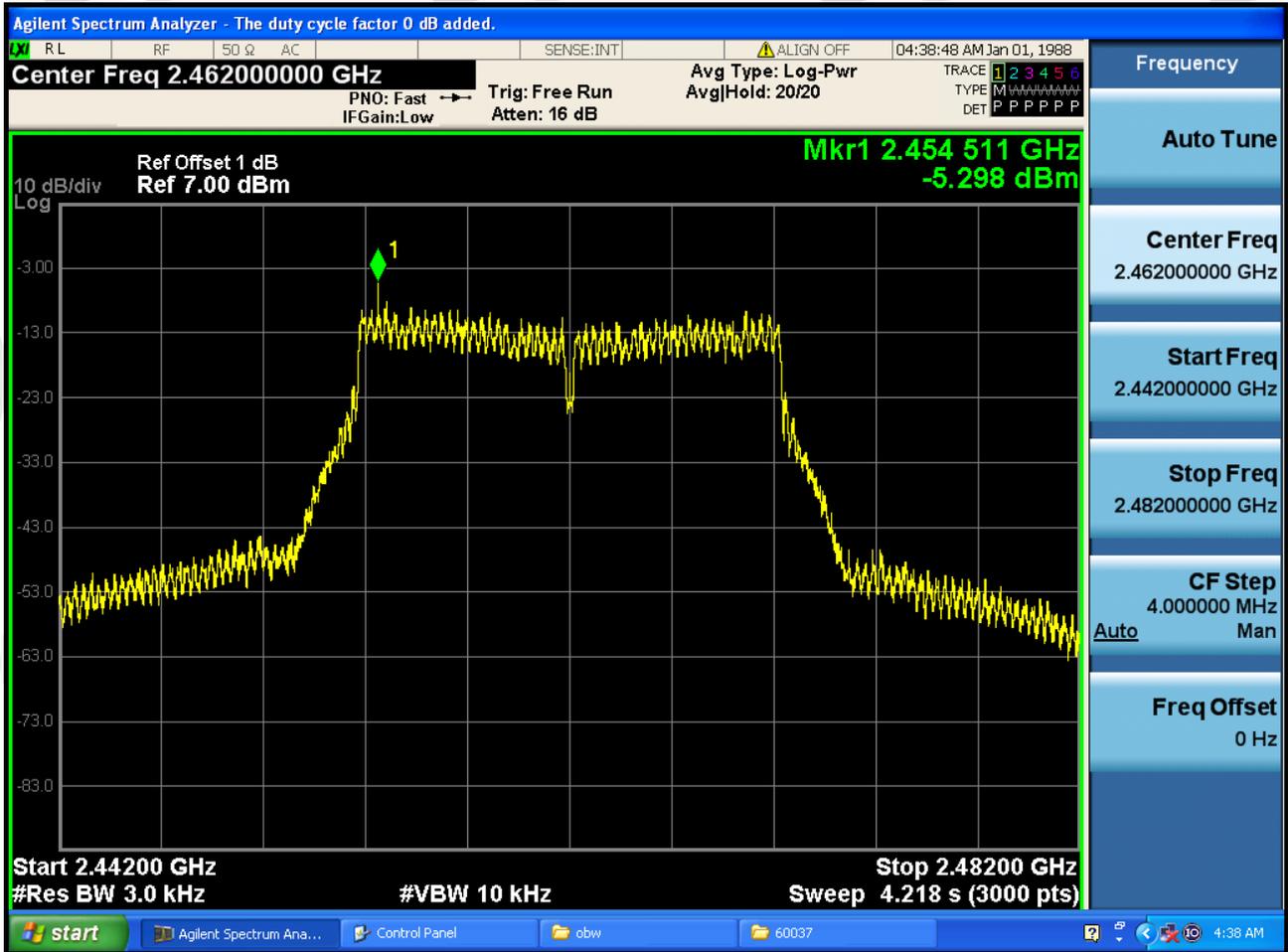
802.11G_CH1



802.11G_CH6



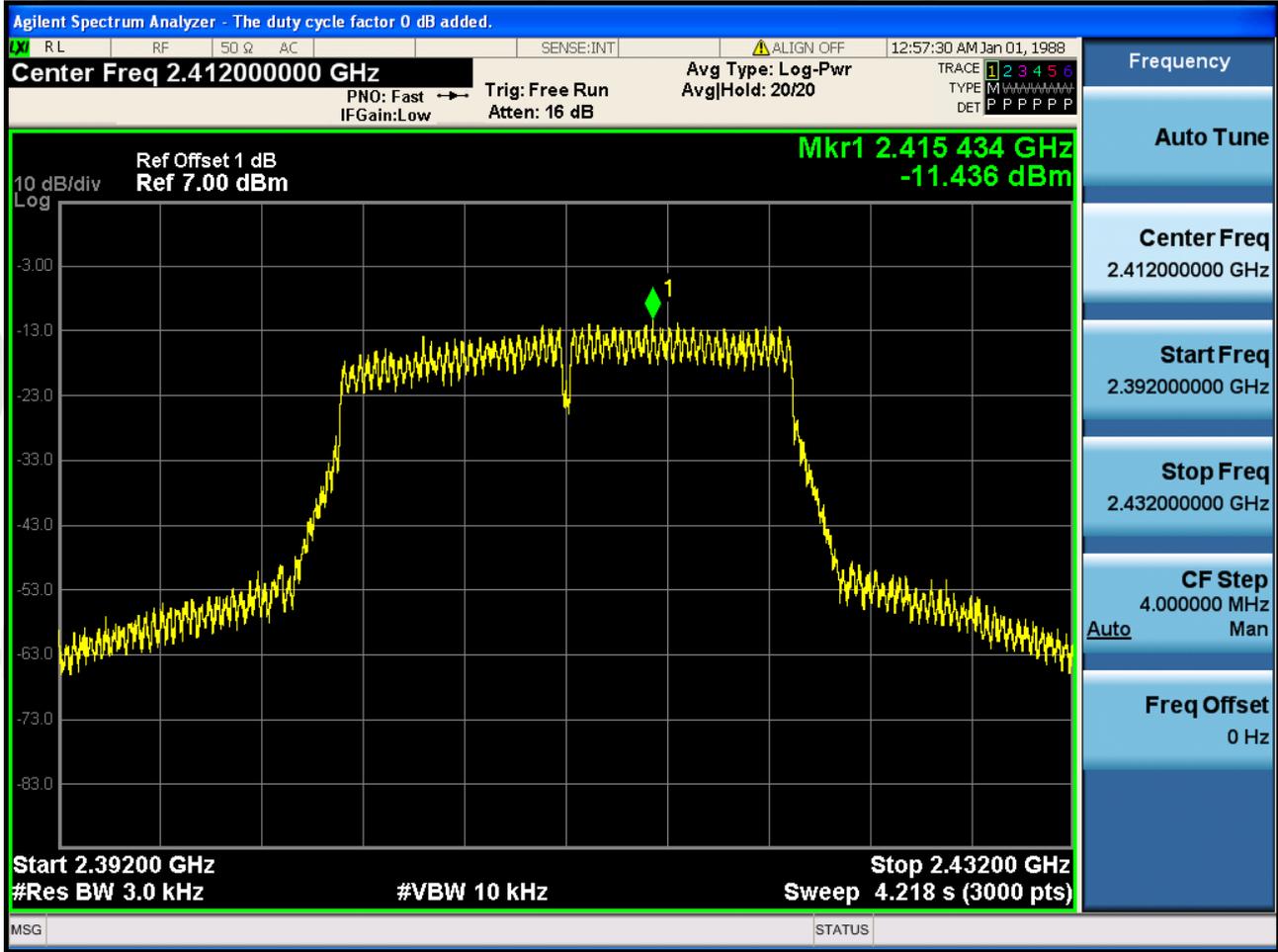
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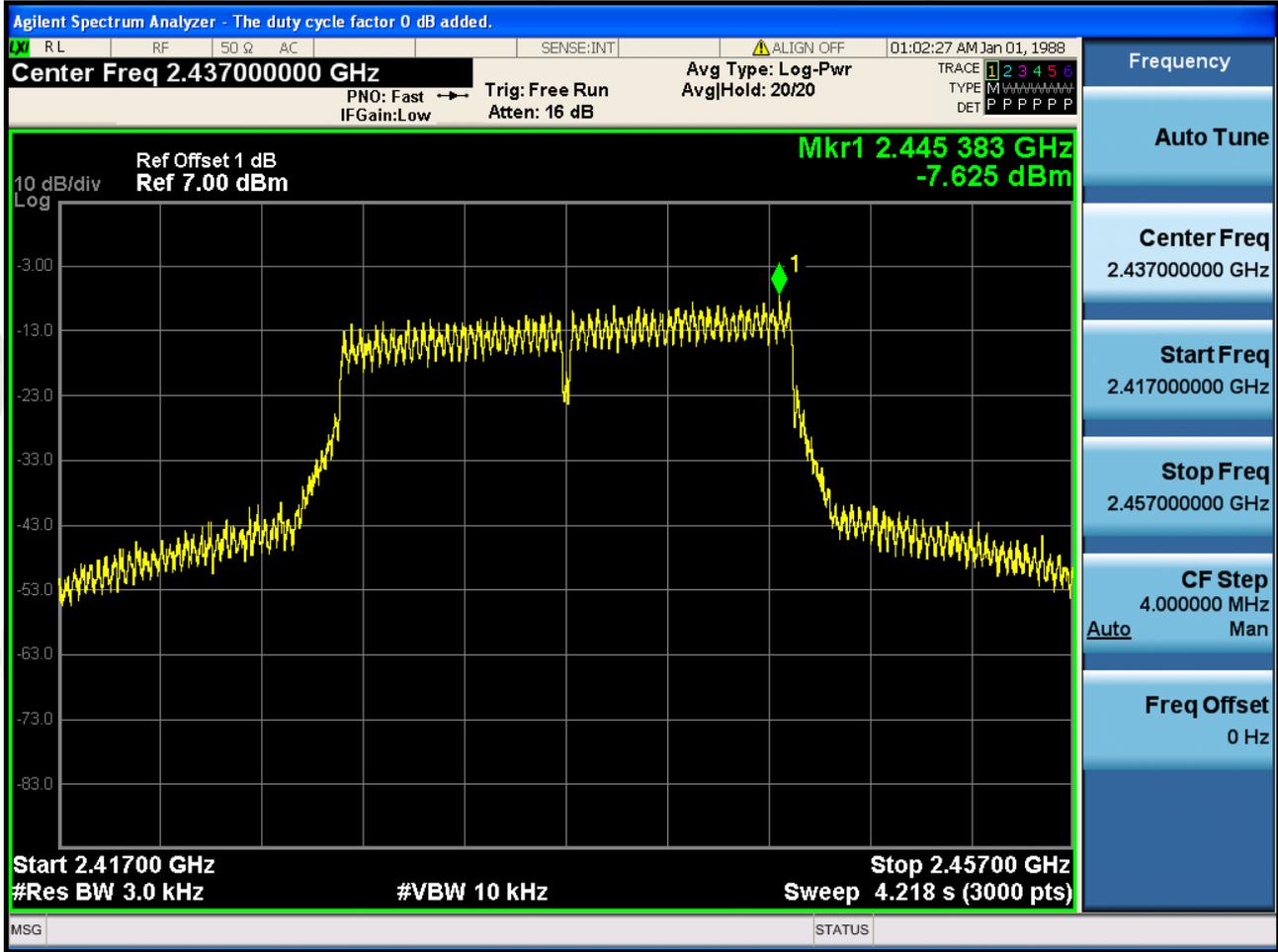
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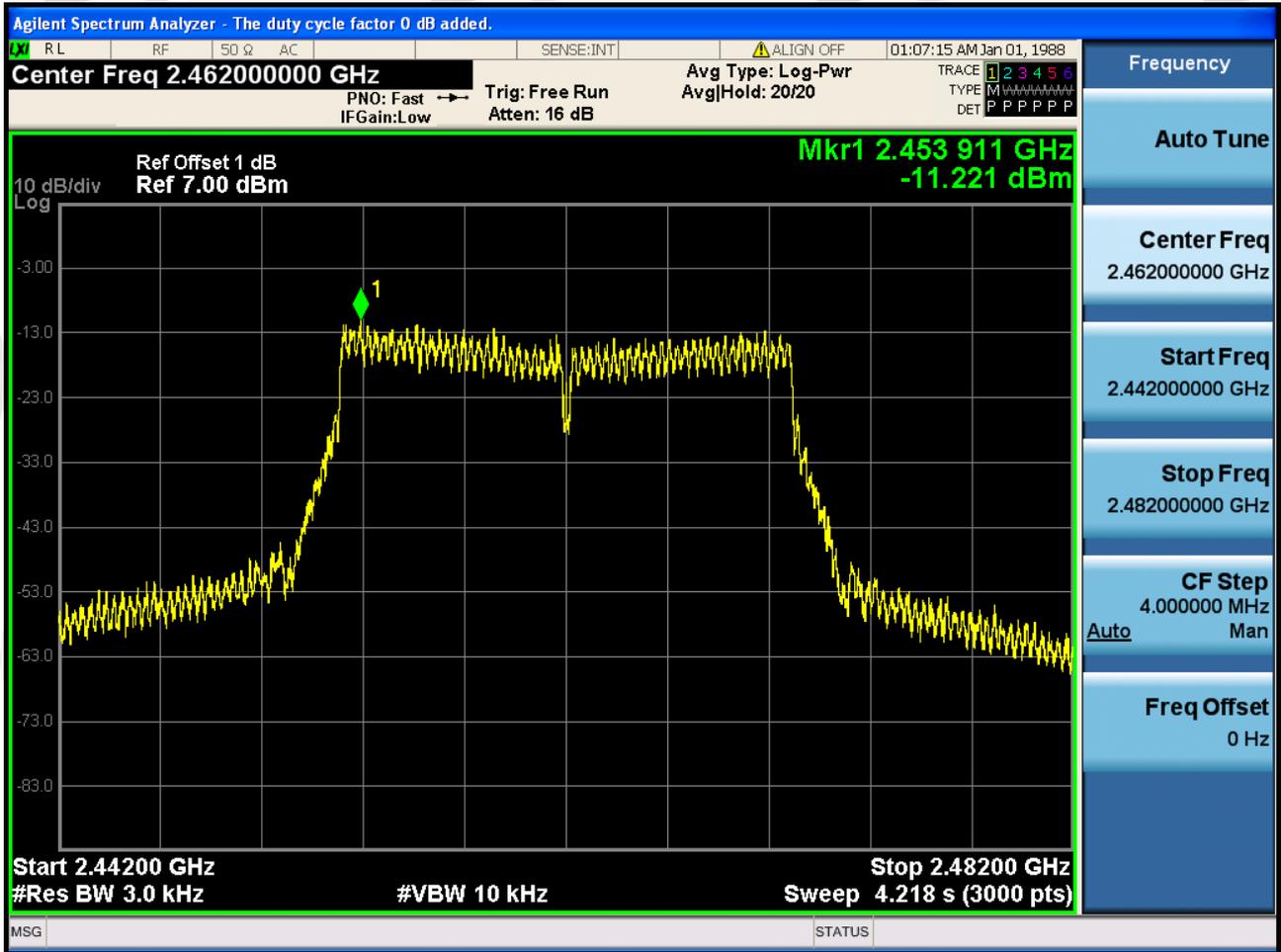
802.11N20_CH1



802.11 N20_CH6



802.11 N20_CH11



802.11N20 CH13



Band-edge for RF Conducted Emissions

Test plots

ANT1

802.11B_CH1



802.11B_CH13



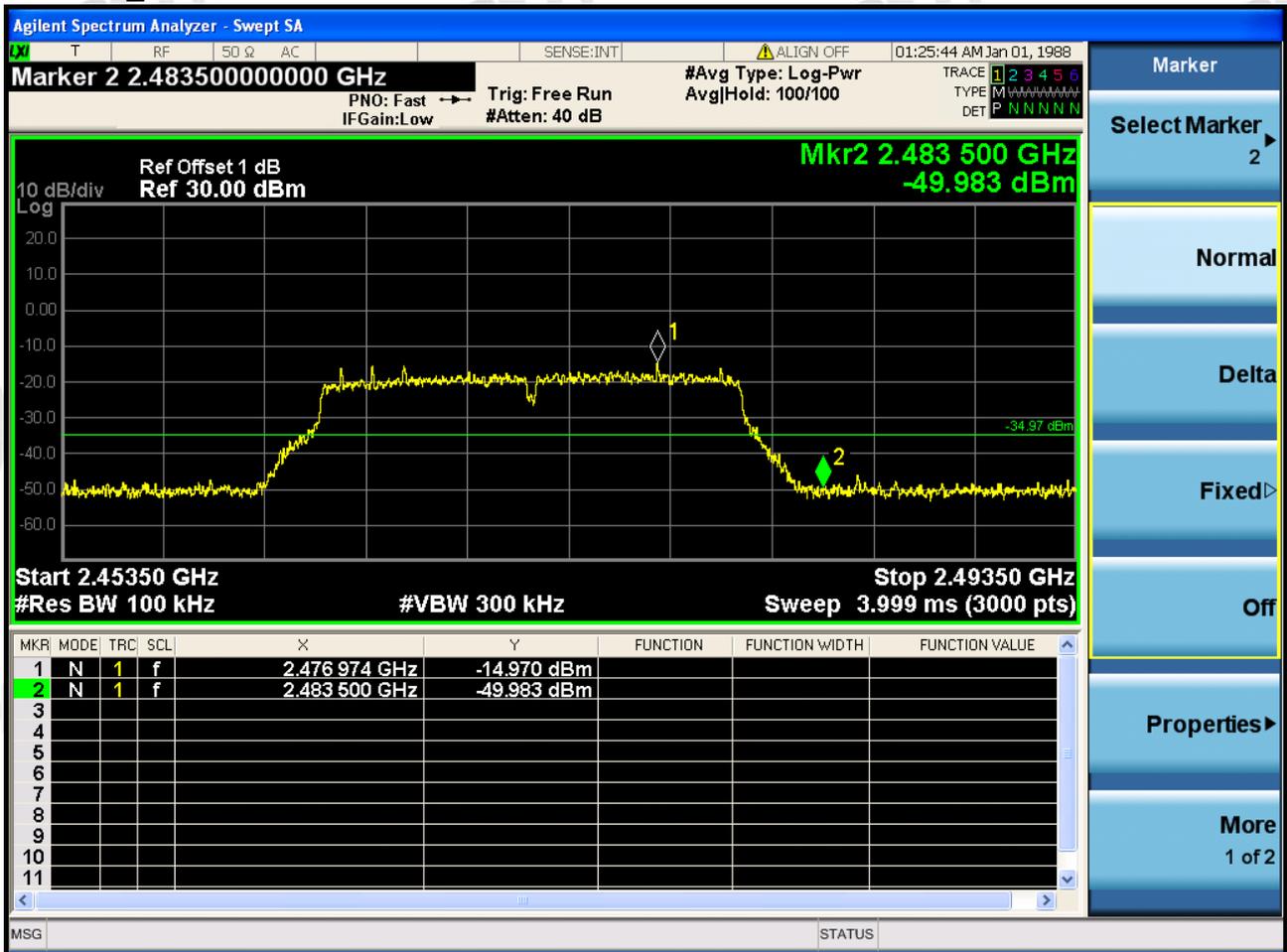
802.11G_CH1



802.11G_CH11



802.11G_CH13



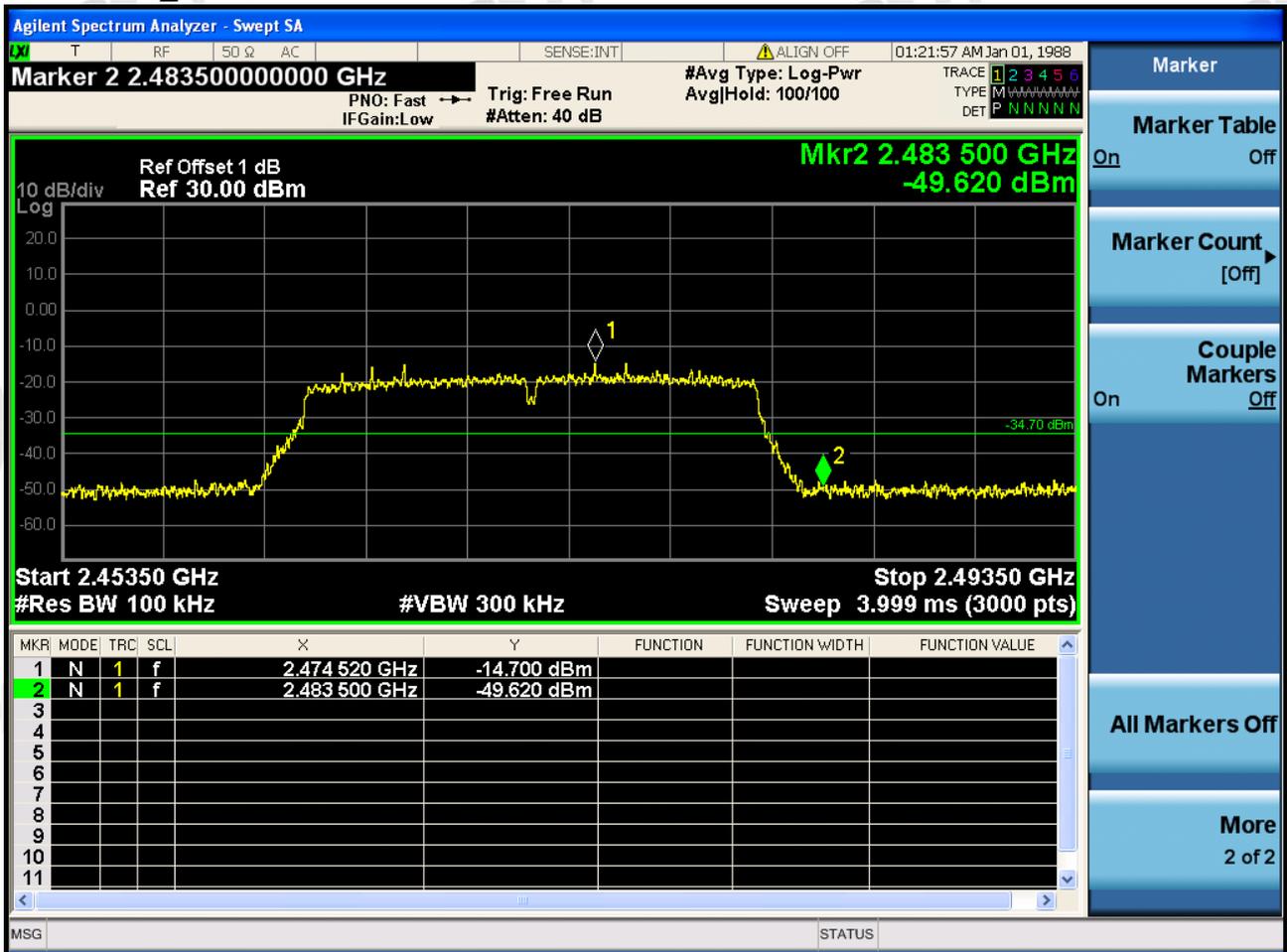
802.11N20_CH1



802.11 N20_CH11



802.11N20_CH13



RF Conducted Spurious Emissions

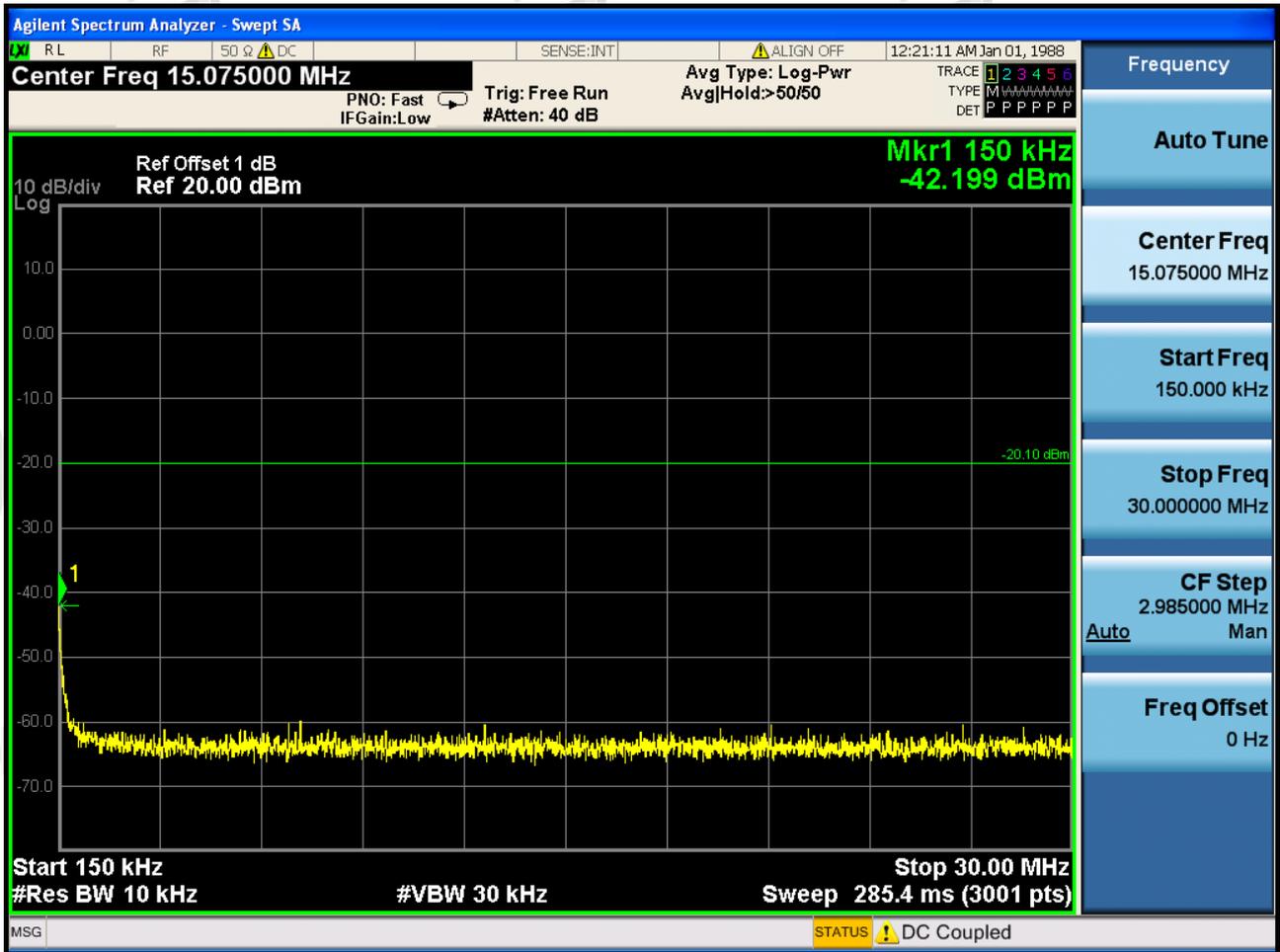
Test plots

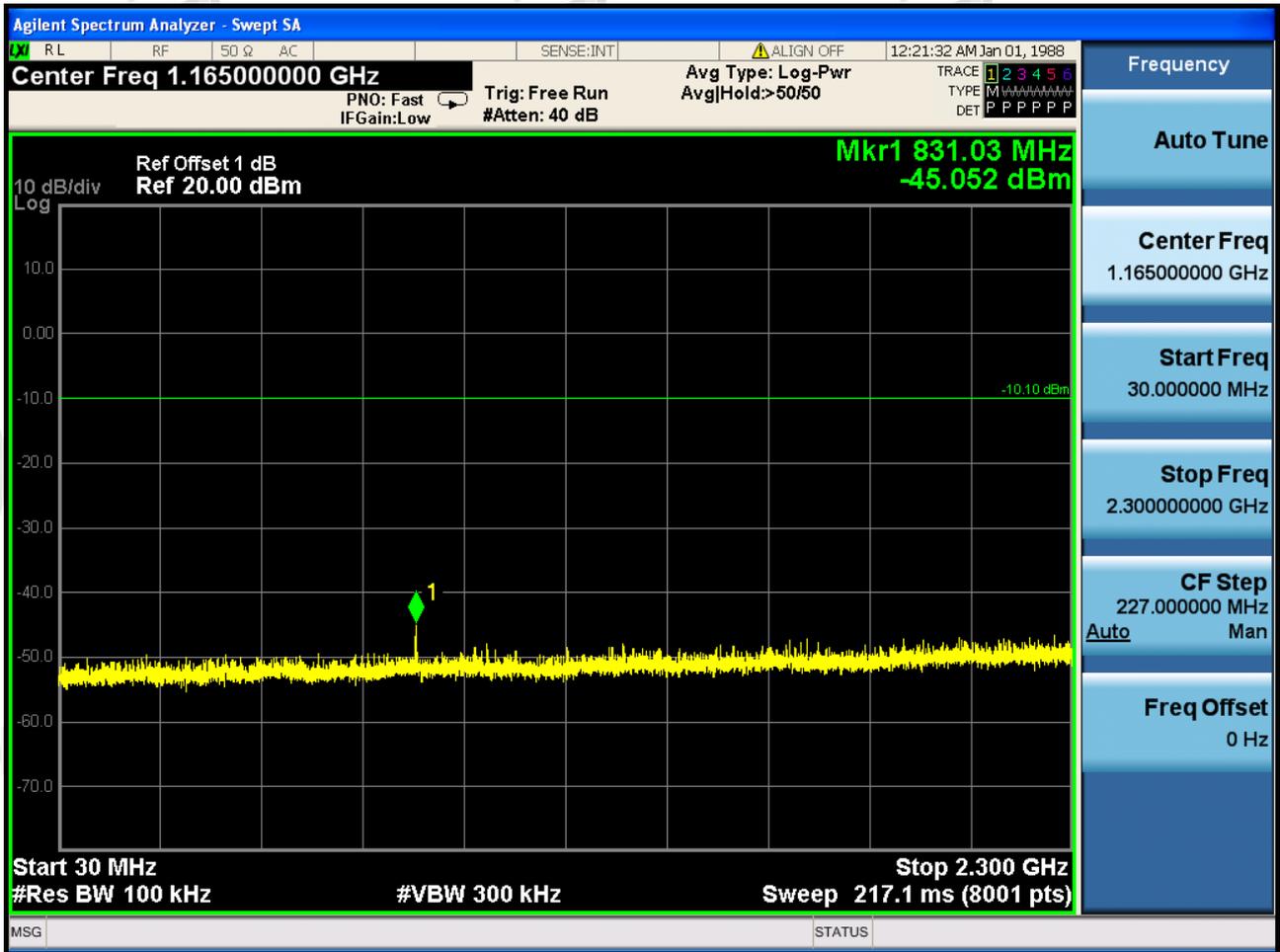
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802.11B_CH1

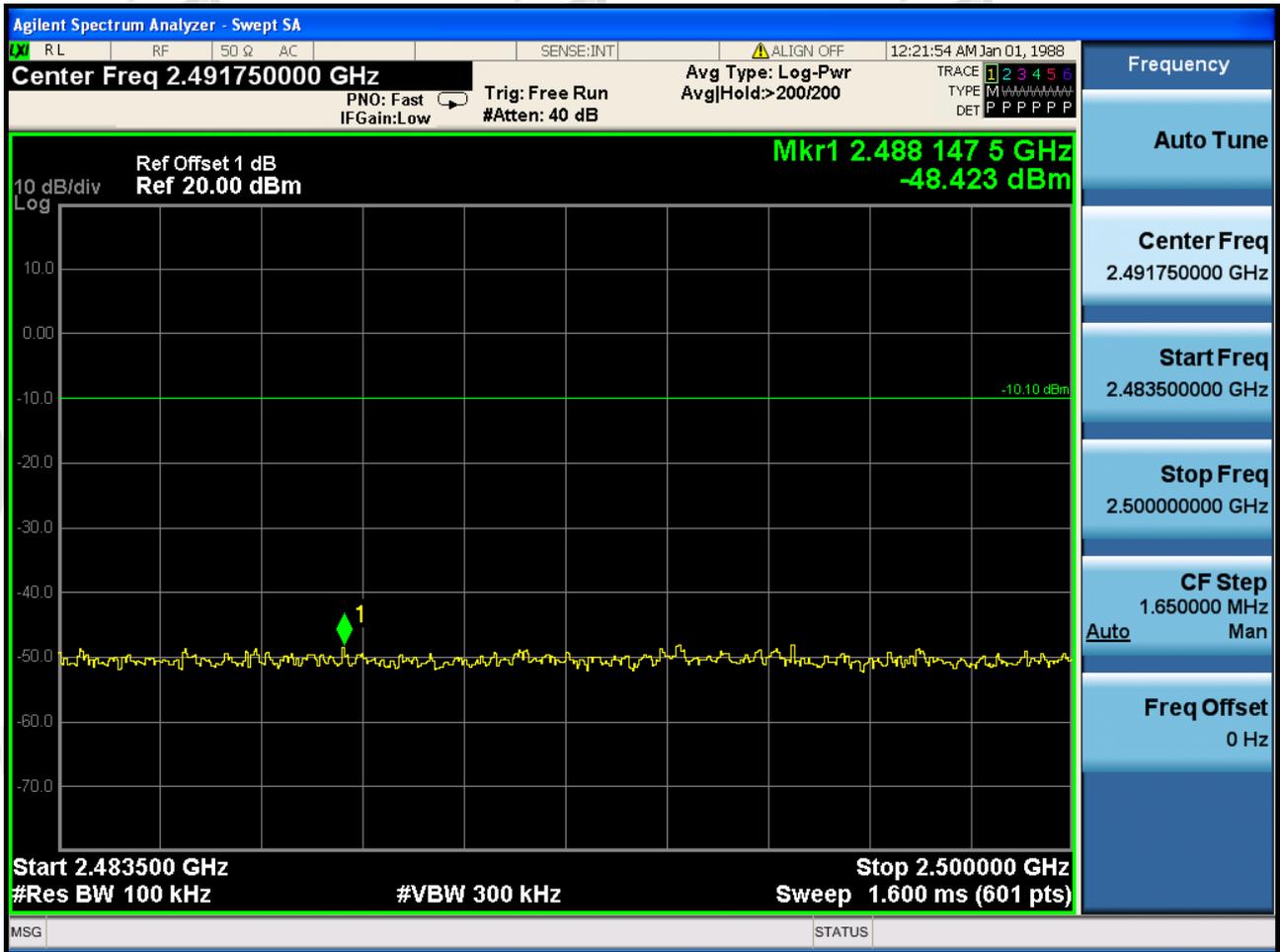














802.11B_CH6





