

FCC RF Test Report

Product Name: Smart Phone

Product Model: HUAWEI D2-6114, D2-6114, HW-03E

Report Number: SYBH(Z-RF)014012013-2003

FCC ID: QISD2-6114

Reliability Laboratory of Huawei Technologies Co., Ltd.

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Notice

1. The laboratory has Passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.
2. The laboratory has Passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.
3. The laboratory has been listed by the US Federal Communications Commission to perform electromagnetic emission measurements. The site recognition number is 97456.
4. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1 and 6369A-3.
5. The laboratory has been listed by the VCCI to perform EMC measurements. The accreditation numbers of test site No.1 are R-2364, G-415, C-2583, and T-256, and the accreditation numbers of test site No.2 are R-3760, G-485, C-4210 and T-1237.
6. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
7. The test report is invalid if there is any evidence of erasure and/or falsification.
8. The test report is only valid for the test samples.
9. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.



Applicant: Huawei Technologies Co., Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
 Bantian, Longgang District, Shenzhen, 518129, P.R.C
Product Name: Smart Phone
Product Model: HUAWEI D2-6114, D2-6114, HW-03E

Date of Receipt Sample: 2013-01-21
Start Date of Test: 2013-01-22
End Date of Test: 2013-02-07

Test Result: Pass

Approved by Senior	2013-2-24	Dai Linjun	
Engineer:	Date	Name	Signature
Prepared by:	2013-2-24	Guo Xingxing	
	Date	Name	Signature



Modification Record

No.	Last Report No.	Modification Description
1		First report.



CONTENT

1	General Information	6
1.1	Applied Standard	6
1.2	Test Location	6
1.3	Test Environment Condition	6
2	Test Summary	7
3	Description of the Equipment under Test (EUT)	8
3.1	General Description	8
3.2	EUT Identity	8
3.3	Technical Description	9
3.4	Test Modes	10
3.5	EUT Configurations	11
3.6	Test Environments	12
3.7	Test Setups	13
3.8	Test Conditions	16
4	Main Test Instruments	18



1 General Information

1.1 Applied Standard

Applied Rules: 47 CFR FCC Part 2, Subpart J (2012-10-1 Edition)
47 CFR FCC Part 15, Subpart C (2012-10-1 Edition)

Test Method: FCC KDB 558074 D01 DTS Meas Guidance v02
FCC KDB 662911 D01 Multiple Transmitter Output v01r2

1.2 Test Location

Test Location 1: Reliability Laboratory of Huawei Technologies Co., Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
Bantian, Longgang District, Shenzhen, 518129, P.R.C

1.3 Test Environment Condition

Ambient Temperature: 19.5to 25 °C
Ambient Relative Humidity: 40 to 55 %
Atmospheric Pressure: Not applicable

2 Test Summary

Test Item	FCC Part No.	Requirements	Test Result	Verdict (NOTE 2)
DTS (6 dB) Bandwidth	15.247(a)(2)	≥ 500 kHz.	Appendix A	Pass
Maximum Peak Conducted Output Power	15.247(b)(3)	For directional gain: < 30 dBm – (G[dBi] – 6 [dB]), peak; Otherwise: < 30 dBm, peak.	Appendix B	Pass
Maximum Power Spectral Density Level	15.247(e)	For directional gain: < 8 dBm/3 kHz – (G[dBi] – 6 [dB]), peak. Otherwise: < 8 dBm/3 kHz, peak.	Appendix C	Pass
Band Edges Compliance	15.247(d)	< -20 dBm/100 kHz if total peak power \leq power limit.	Appendix D	Pass
Unwanted Emissions into Non-Restricted Frequency Bands	15.247(d)	< -20 dBm/100 kHz if total peak power \leq power limit.	Appendix E	Pass
Unwanted Emissions into Restricted Frequency Bands (Conducted)	15.247(d) 15.209 (NOTE 1)	FCC Part 15.209 field strength limit;	Appendix F	Pass
Unwanted Emissions into Restricted Frequency Bands (Radiated)				
AC Power Line Conducted Emissions	15.207	FCC Part 15.207 conducted limit;	Appendix G	Pass



3 Description of the Equipment under Test (EUT)

3.1 General Description

HUAWEI D2-6114, D2-6114, HW-03E is subscriber equipment in the LTE/UMTS/GSM system. The LTE frequency band is Band I, Band XIX and Band XXI, not included in this report. The HSUPA/HSDPA/UMTS frequency band is Band I, Band V, Band VI, and Band XIX. The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900. The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/UMTS/GSM protocol processing, voice, video, MMS service, GPS, AGPS, Felica and WIFI etc. Externally it provides micro SD card interface, earphone port (to provide voice service) and USIM card interface. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

NOTE: Only WLAN test data included in this report.

3.2 EUT Identity

NOTE: Unless otherwise noted in the report, the functional boards installed in the units shall be selected from the below list, but not means all the functional boards listed below shall be installed in one unit.

3.2.1 Board

Board		
Software	Hardware Version	Description
4.1..1301141	HL1U9701LM	Main board of Mobile Phone

3.2.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
Rechargeable Li-ion	HB5R1HV	Huawei Technologies Co., Ltd.	Battery Model: HB5R1HV Rated capacity: 2150mAh Nominal Voltage:  +3.8V Charging Voltage:  +4.35V

3.3 Technical Description

Characteristics	Description			
IEEE 802.11 WLAN Mode Supported	<input checked="" type="checkbox"/> 802.11b (20 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11g (20 MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11n (20 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11n (40 MHz channel bandwidth)			
TX/RX Operating Range	2412-2462 MHz band	$f_c = 2407 \text{ MHz} + N * 5 \text{ MHz}$, where: - f_c = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 1 to 11 for the 20 MHz channel bandwidth.		
Data Rate	802.11b	1 Mbps, 2 Mbps, 5.5 Mbps, 11 Mbps		
	802.11g	6 Mbps, 9 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 36 Mbps, 48 Mbps, 54 Mbps		
	802.11n (SISO)	MCS 0 to MCS 7		
	802.11n (MIMO)	MCS 8 to MCS 15		
Modulation Type	DBPSK/DQPSK/CCK (DSSS), BPSK/QPSK/16QAM/64QAM (OFDM).			
Emission Designator	10M0G1D (for 802.11b mode), 16M4G7D (for 802.11g mod), 17M6G7D (for 802.11n 20MHz mode), 36M5G7D (for 802.11n with 40MHz mode)			
TX Power Control	<input checked="" type="checkbox"/> Supported, <input type="checkbox"/> Not Supported			
Standby Mode	<input type="checkbox"/> Supported, <input checked="" type="checkbox"/> Not Supported			
Equipment Type	<input type="checkbox"/> Stand-alone equipment, <input type="checkbox"/> Plug-in radio device, <input checked="" type="checkbox"/> Combined equipment			
Antenna	Description	Isotropic Antenna,2400~2500MHz/5150~5850MHz,3dBi/5dBi,isotropic,5W,N-J,no		
	Type	<input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated		
	Ports	<input checked="" type="checkbox"/> BG 1, <input checked="" type="checkbox"/> BG 2		
	Smart System	<input checked="" type="checkbox"/> SISO (for 802.11b/g/n), <input type="checkbox"/> MIMO (for 802.11n): 2 Tx & 2 Rx, <input type="checkbox"/> Diversity (for 802.11b/g) : Tx & Rx		
	Gain	0.9dBi (per antenna port, max.)		
	Remark	When the EUT is put into service, the practical maximum antenna gain should NOT exceed the value as described above.		
Power Supply	Type	<input checked="" type="checkbox"/> AC/DC Adapter	<input type="checkbox"/> PoE:	<input type="checkbox"/> Other:



3.4 Test Modes

NOTE: Typical working modes for each IEEE 802.11 mode are selected to perform tests.

Test Mode	Test Modes Description
11B	IEEE 802.11b with data rate of 11 Mbps using SISO mode.
11G	IEEE 802.11g with data rate of 54 Mbps using SISO mode.
11N20	IEEE 802.11n with data rate of MCS7 and bandwidth of 20 MHz using SISO mode.
11N40	IEEE 802.11n with data rate of MCS7 and bandwidth of 20 MHz using SISO mode.

3.5 EUT Configurations

3.5.1 General Configurations

Configuration	Description
Test Antenna Ports	Until otherwise specified, <ul style="list-style-type: none"> - All TX tests are performed at all TX antenna ports of the EUT, and - All RX tests are performed at all RX antenna ports of the EUT.
Multiple RF Sources	Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.

3.5.2 Customized Configurations

Test Mode	RF Ch.	BG Port	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]
11B	L	BG 1	Ch No. 1 / 2412 MHz	---	20
		BG 2		---	20
	M	BG 1	Ch No. 6 / 2437 MHz	---	20
		BG 2		---	20
	H	BG 1	Ch No. 11 / 2462 MHz	---	20
		BG 2		---	20
11G	L	BG 1	Ch No. 1 / 2412 MHz	---	20
		BG 2		---	20
	M	BG 1	Ch No. 6 / 2437 MHz	---	20
		BG 2		---	20
	H	BG 1	Ch No. 11 / 2462 MHz	---	20
		BG 2		---	20
11N20	L	BG 1	Ch No. 1 / 2412 MHz	---	20
		BG 2		---	20
	M	BG 1	Ch No. 6 / 2437 MHz	---	20
		BG 2		---	20
	H	BG 1	Ch No. 11 / 2462 MHz	---	20
		BG 2		---	20
11N40	L	BG 1	Ch No. 3 / 2422 MHz	---	40
		BG 2		---	40
	M	BG 1	Ch No. 6 / 2437 MHz	---	40
		BG 2		---	40
	H	BG 1	Ch No. 9 / 2452 MHz	---	40
		BG 2		---	40



3.6 Test Environments

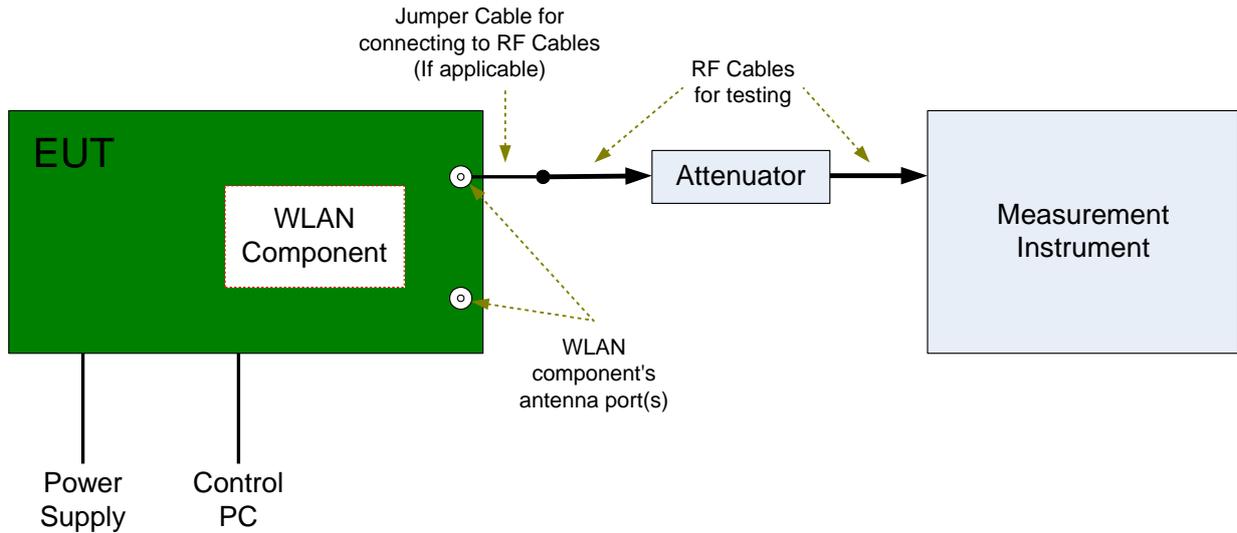
NOTE: The values used in the test report may be stringent than the declared.

Environment Parameter	Selected Values During Tests		
	Temperature	Voltage	Relative Humidity
NTNV	Ambient	3.8 VDC	Ambient

3.7 Test Setups

3.7.1 Test Setup 1

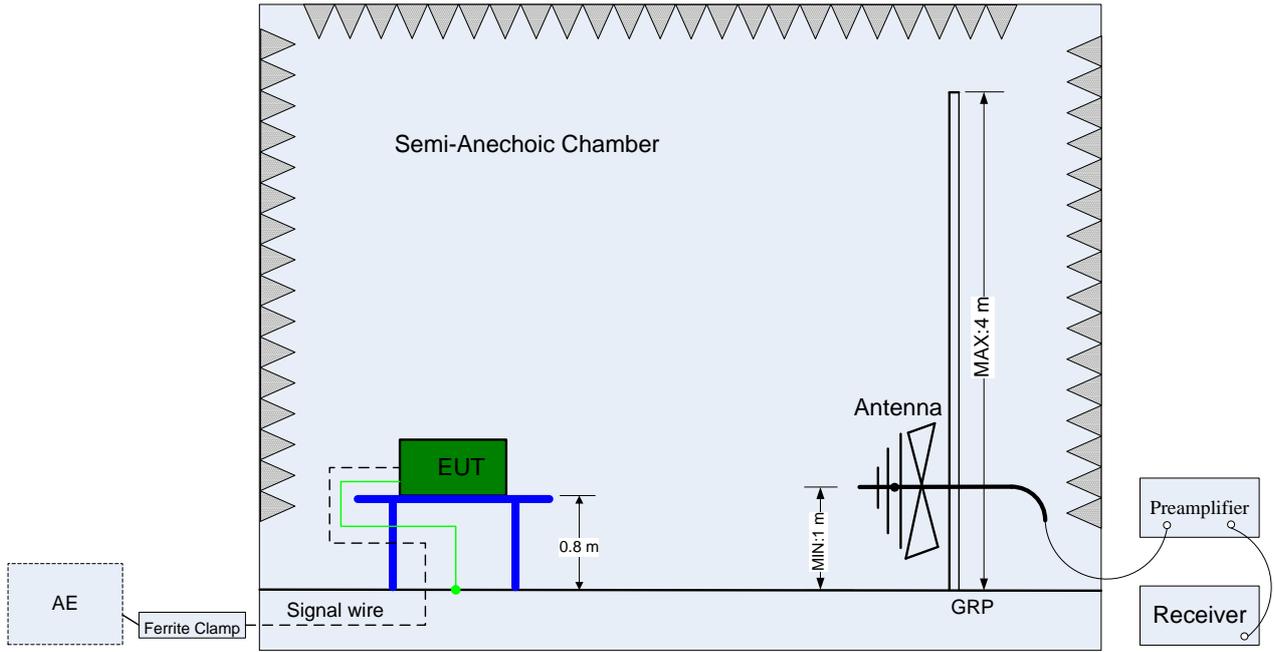
The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



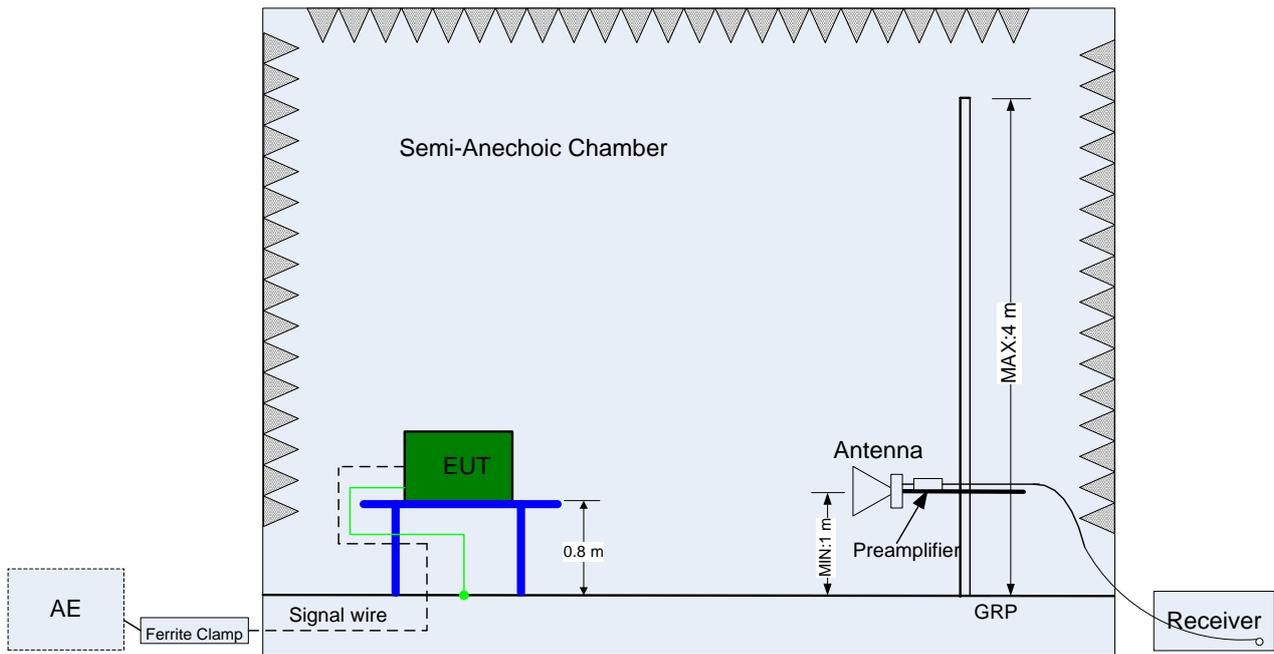
3.7.2 Test Setup 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.4. The test distance is 3m. The setup is according to ANSI C63.4 and CAN/CSA-CEI/IEC CISPR 22.

The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).



(Below 1 GHz)

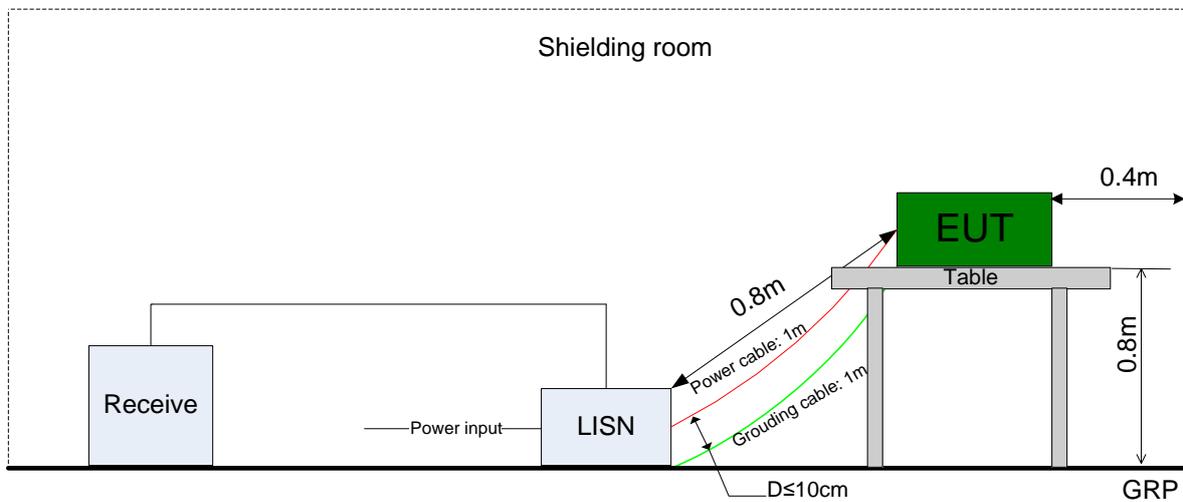


(Above 1 GHz)

3.7.3 Test Setup 3

The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8 m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.



3.8 Test Conditions

Test Case	Test Conditions	
	Configuration	Description
DTS (6 dB) Bandwidth	Measurement Method	FCC KDB 558074 §7.1.1 Option 2.
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L, 11B_M, 11B_H 11G_L, 11G_M, 11G_H 11N20_L, 11 N20_M, 11 N20_H 11N40_L, 11 N40_M, 11 N40_H
Maximum Peak Conducted Output Power	Measurement Method	FCC KDB 558074 §7.2.1.2 Option 2 (integrated band power method).
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L, 11B_M, 11B_H 11G_L, 11G_M, 11G_H 11N20_L, 11 N20_M, 11 N20_H 11N40_L, 11 N40_M, 11 N40_H
Maximum Power Spectral Density Level	Measurement Method	FCC KDB 558074 §7.3.1 Option 1 (peak PSD).
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L, 11B_M, 11B_H 11G_L, 11G_M, 11G_H 11N20_L, 11 N20_M, 11 N20_H 11N40_L, 11 N40_M, 11 N40_H
Unwanted Emissions into Non-Restricted Frequency Bands	Measurement Method	FCC KDB 558074 §7.4.1, use Peak PSD.
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L, 11B_M, 11B_H 11G_L, 11G_M, 11G_H 11N20_L, 11 N20_M, 11 N20_H 11N40_L, 11 N40_M, 11 N40_H
Unwanted Emissions into Restricted Frequency Bands (Conducted)	Measurement Method	FCC KDB 558074 §7.4.2, Conducted (antenna-port).
	Test Environment	NTNV
	Test Setup	Test Setup 1
	EUT Configuration	11B_L, 11B_M, 11B_H 11G_L, 11G_M, 11G_H 11N20_L, 11 N20_M, 11 N20_H 11N40_L, 11 N40_M, 11 N40_H
Unwanted Emissions into Restricted	Measurement Method	FCC KDB 558074 §7.4.2, Radiated (cabinet/case emissions with impedance matching for antenna-port).
	Test Environment	NTNV



Test Case	Test Conditions	
	Configuration	Description
Frequency Bands (Radiated)	Test Setup	Test Setup 2
	EUT Placement	<input checked="" type="checkbox"/> Flatwise, <input type="checkbox"/> Upright, <input type="checkbox"/> Hung
	EUT Configuration	(1) 30 MHz to 1 GHz: 11B_B (Worst Conf.). (2) 1 GHz to 3 GHz: 11B_L, 11B_H 11G_L, 11G_H 11N20_L, 11 N20_H 11N40_L, 11 N40_H (3) 3 GHz to 18 GHz: 11B_L (Worse Conf.), 11B_H (Worse Conf.). (4) 18 GHz to 26.5 GHz: 11B_L (Worse Conf.), 11B_H (Worse Conf.).
	Measurement Method	AC mains conducted.
AC Power Line Conducted Emissions	Test Environment	NTNV
	Test Setup	Test Setup 3
	EUT Configuration	11B_L (Worst Conf.).



4 Main Test Instruments

Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal. Due
Power supply	KEITHLEY	2303	1288003	2012-11-19	2014-11-18
Spectrum Analyzer	Agilent	E4440A	MY48250119	2012-08-20	2013-08-19
Signal Analyzer	R&S	FSQ31	200021	2012-11-09	2013-11-08
Spectrum Analyzer	Agilent	N9030A	MY49431698	2012-11-09	2013-11-08
Temperature Chamber	WEISS	WKL64	56246002940010	2013-01-29	2014-01-28
Signal generator	Agilent	E8257D	MY49281095	2012-09-14	2013-09-13
Spectrum analyzer	R&S	FSU3	200474	2013-01-29	2014-01-28
Spectrum analyzer	R&S	FSU43	100144	2013-01-29	2014.01.28
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100304	2013-02-02	2014-02-01
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100391	2011-10-12	2013-10-11
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBE CK	VULB 9163	9163-521	2011-12-09	2013-12-08
Pyramidal Horn Antenna(26GHz-40GH z)	ETS-Lindgren	3160-10	00123940	2011-02-28	2013-02-27
Pyramidal Horn Antenna(18GHz-26.5G Hz)	ETS-Lindgren	3160-09	00125912	2011-02-28	2013-02-27

END



Appendix for Test Report

Appendix A: DTS (6 dB) Bandwidth

In this document, the "DTS6dBBW" refers to the measured "DTS (6 dB) Bandwidth" value. In this Appendix, the "fc(DTS6dBBW)" refers to the centre of the measured "DTS6dBBW". The introduction of the "fc(DTS6dBBW)" is due to that other measurements use it as the spectrum analyzer setting.

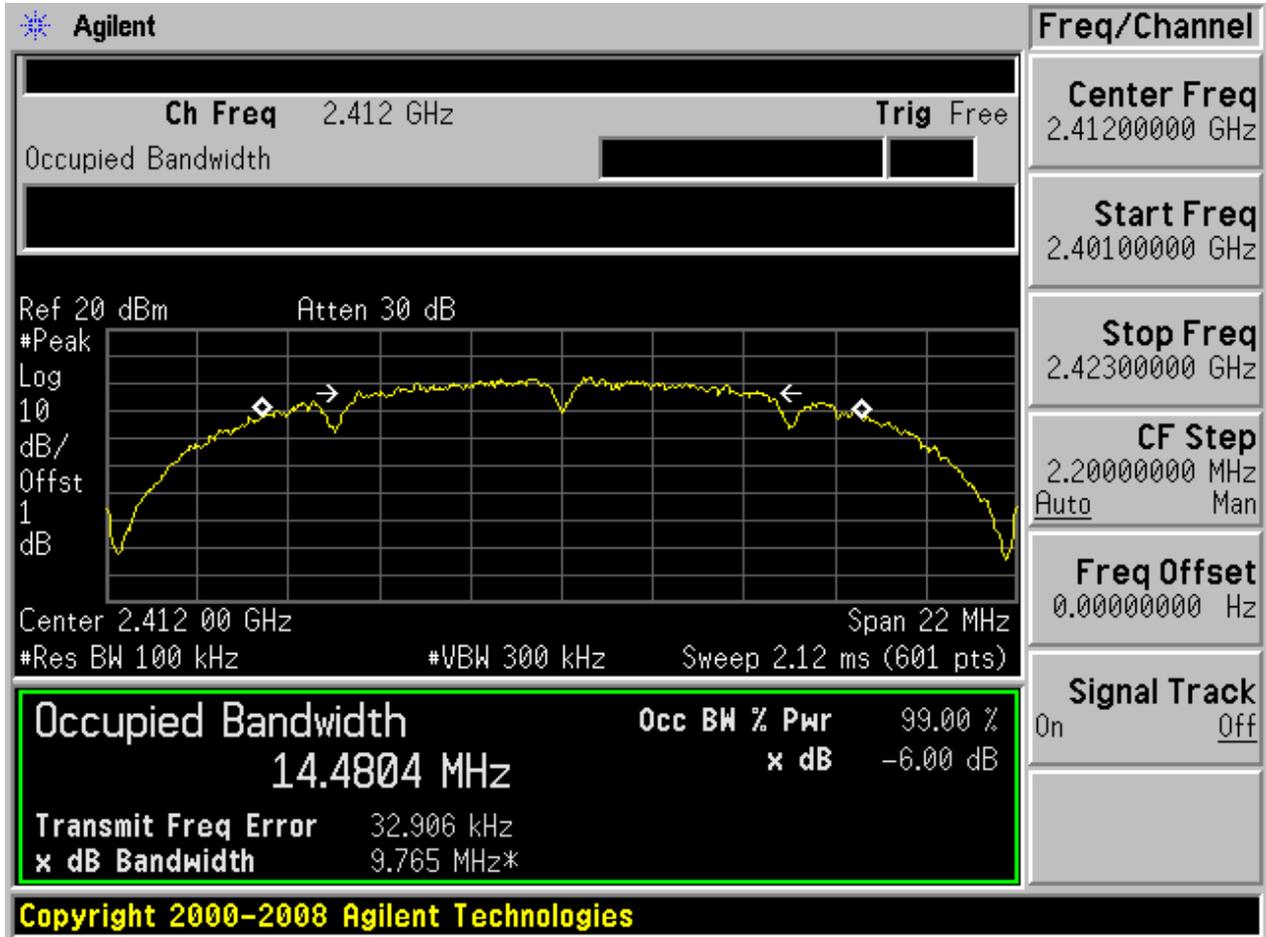
For measurements on smart antenna systems (devices with multiple transmit chains), the test is performed at each chain, and used as respective results for each chain.

Part I - Test Results

Test Mode	Test Channel	Frequency[MHz]	Ant	DTS6dBBW[MHz]	Verdict
11B	L	2412	BG 1	9.77	pass
11B	L	2412	BG 2	9.77	pass
11B	M	2437	BG 1	9.84	pass
11B	M	2437	BG 2	9.99	pass
11B	H	2462	BG 1	9.99	pass
11B	H	2462	BG 2	9.87	pass
11G	L	2412	BG 1	16.34	pass
11G	L	2412	BG 2	16.36	pass
11G	M	2437	BG 1	15.10	pass
11G	M	2437	BG 2	15.99	pass
11G	H	2462	BG 1	15.19	pass
11G	H	2462	BG 2	15.35	pass
11N20	L	2412	BG 1	17.58	pass
11N20	L	2412	BG 2	17.30	pass
11N20	M	2437	BG 1	16.58	pass
11N20	M	2437	BG 2	17.32	pass
11N20	H	2462	BG 1	16.68	pass
11N20	H	2462	BG 2	14.40	pass
11N40	L	2422	BG 1	36.46	pass
11N40	L	2422	BG 2	32.00	pass
11N40	M	2437	BG 1	33.85	pass
11N40	M	2437	BG 2	33.83	pass
11N40	H	2452	BG 1	35.44	pass
11N40	H	2452	BG 2	32.31	pass

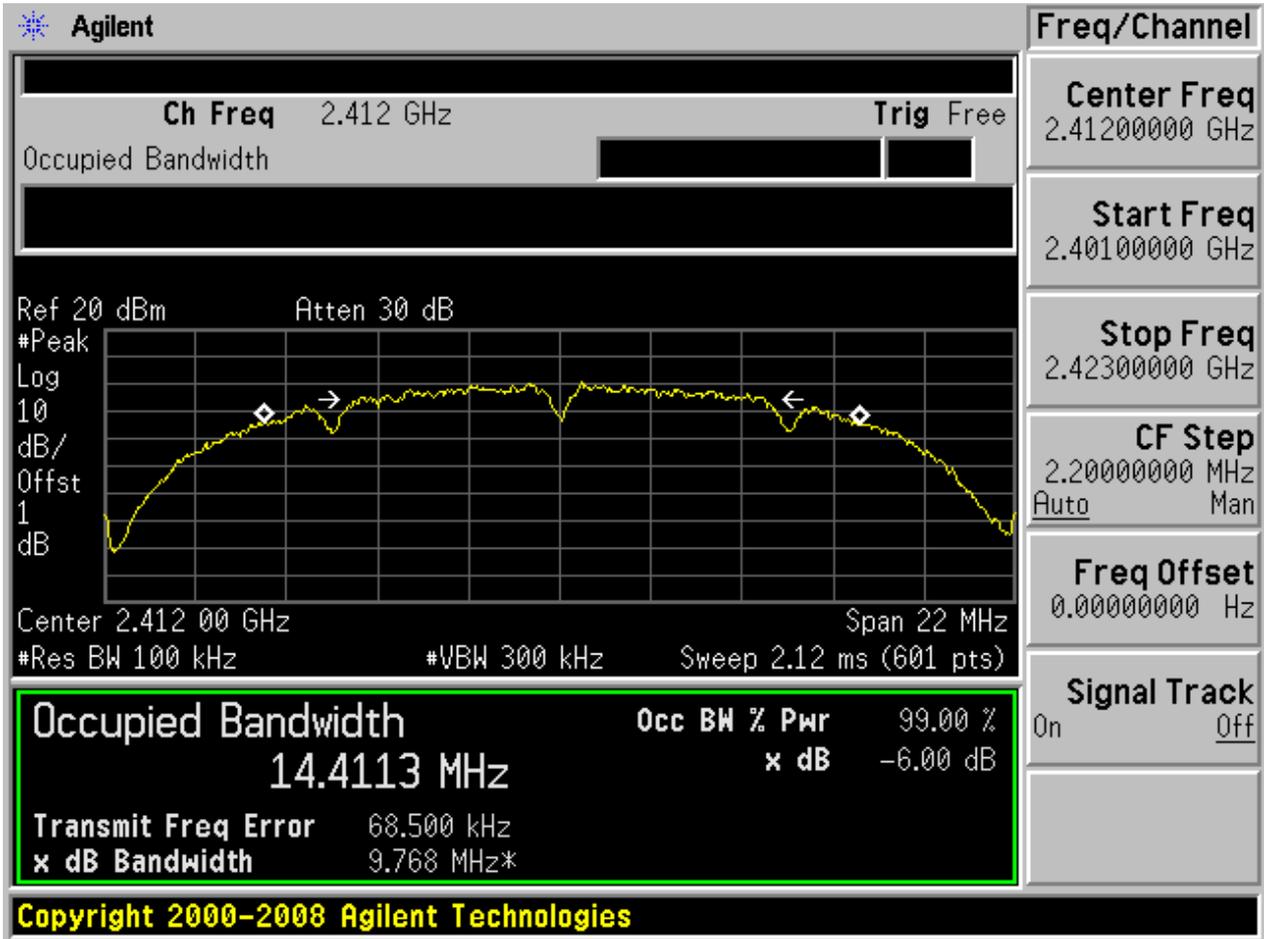
Part II - Test Plots

2.1 11B_L@BG 1



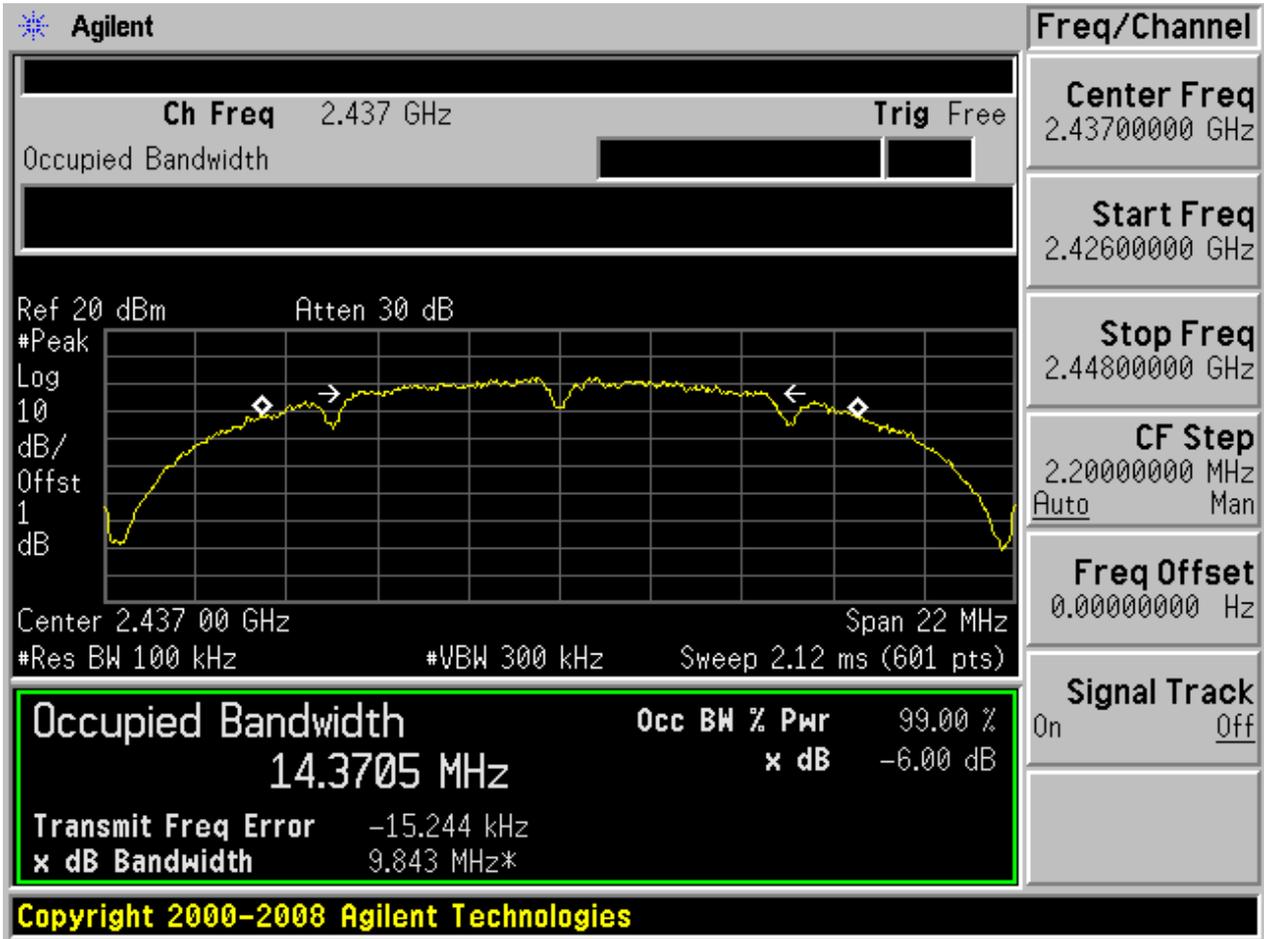


2.2 11B_L@BG 2



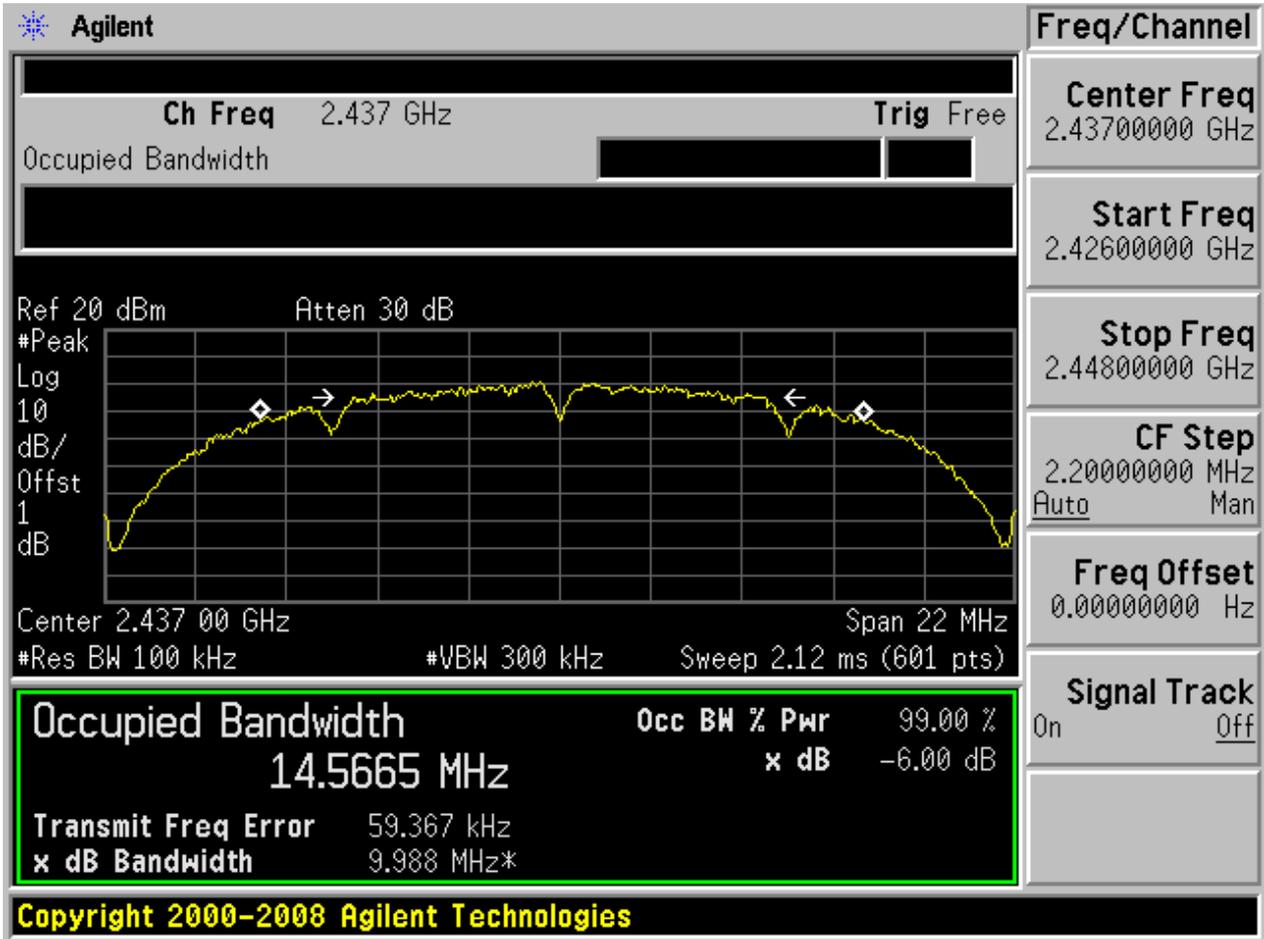


2.3 11B_M@BG 1



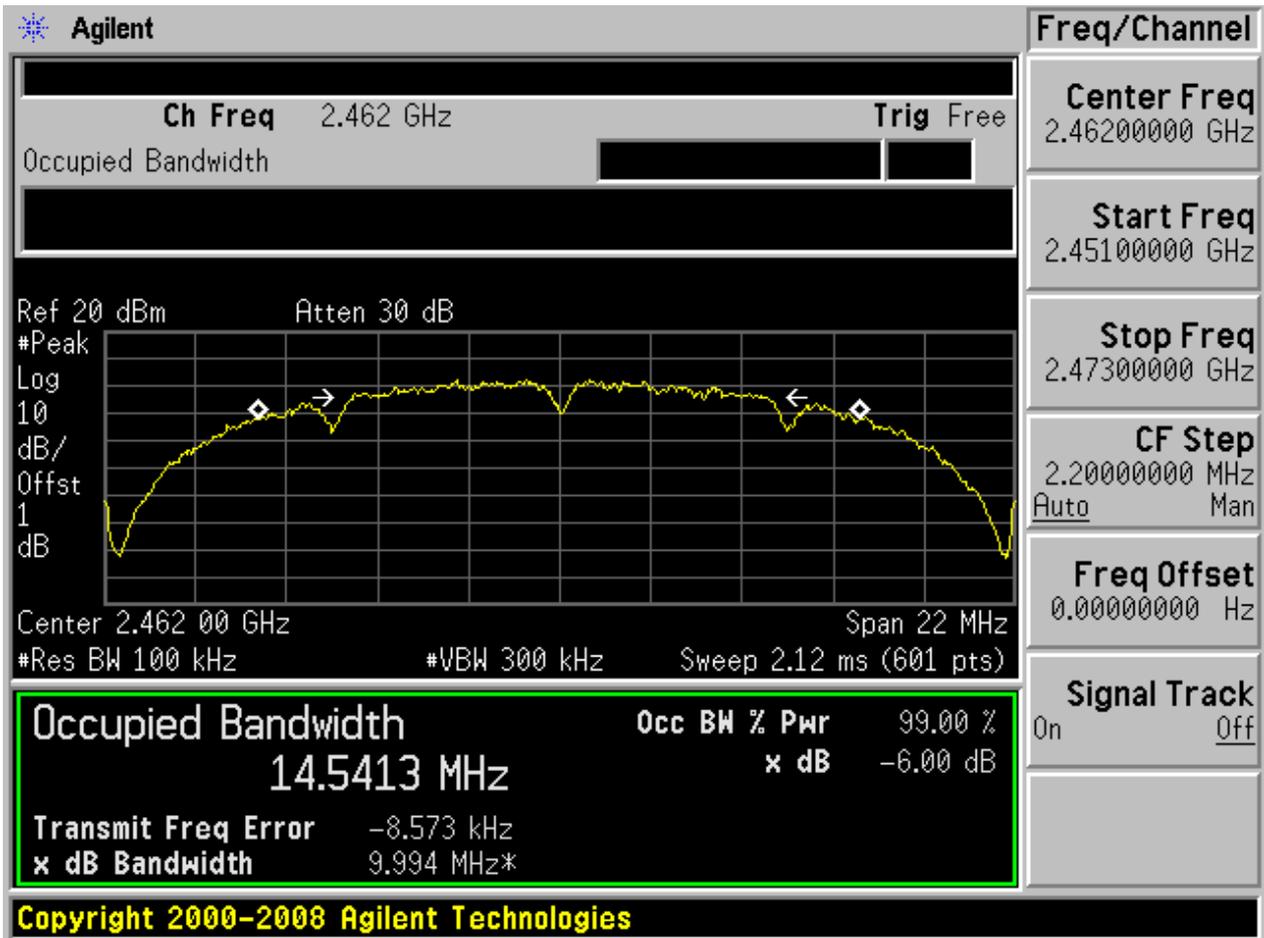


2.4 11B_M@BG 2



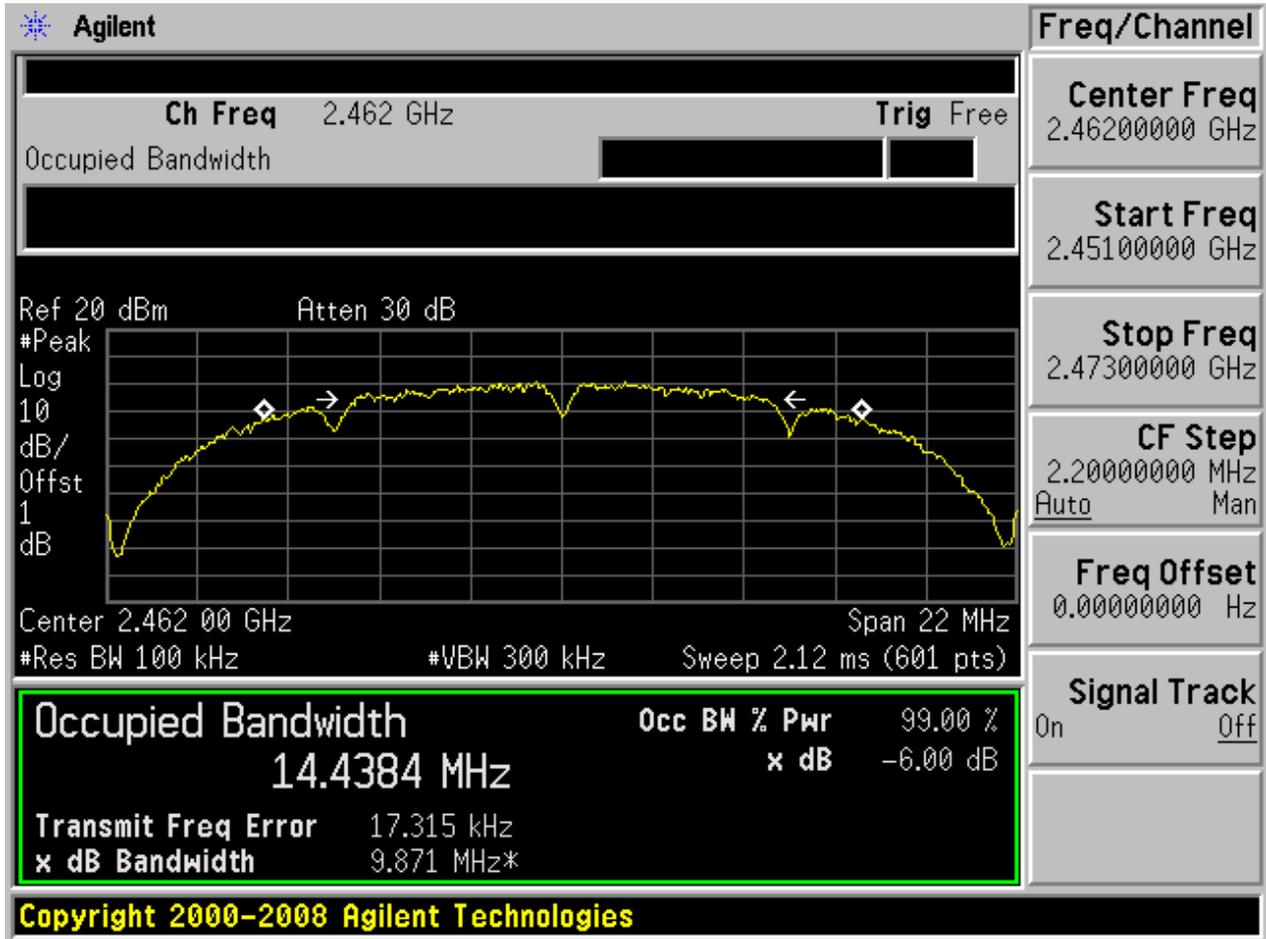


2.5 11B_H@BG 1



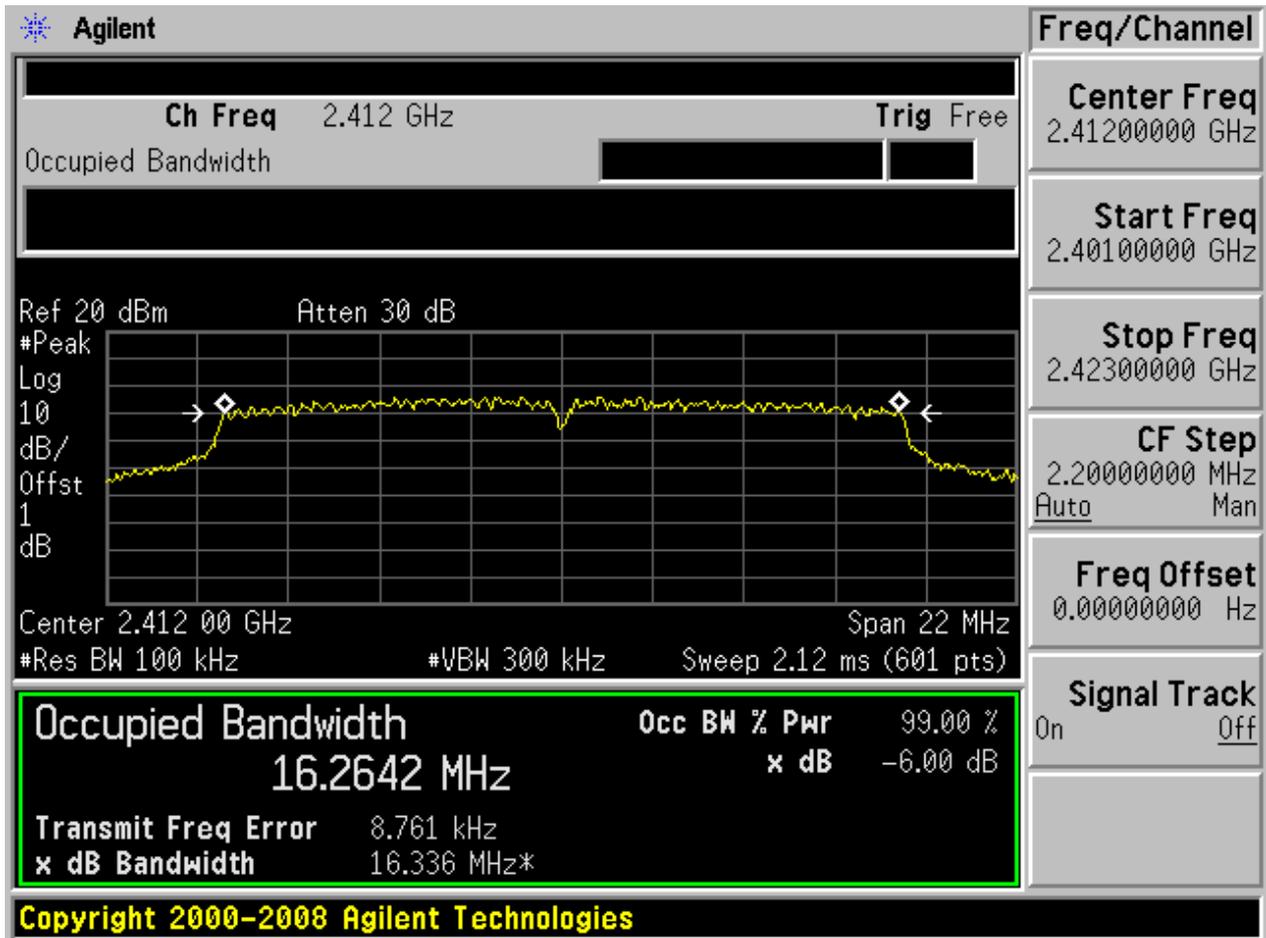


2.6 11B_H@BG 2



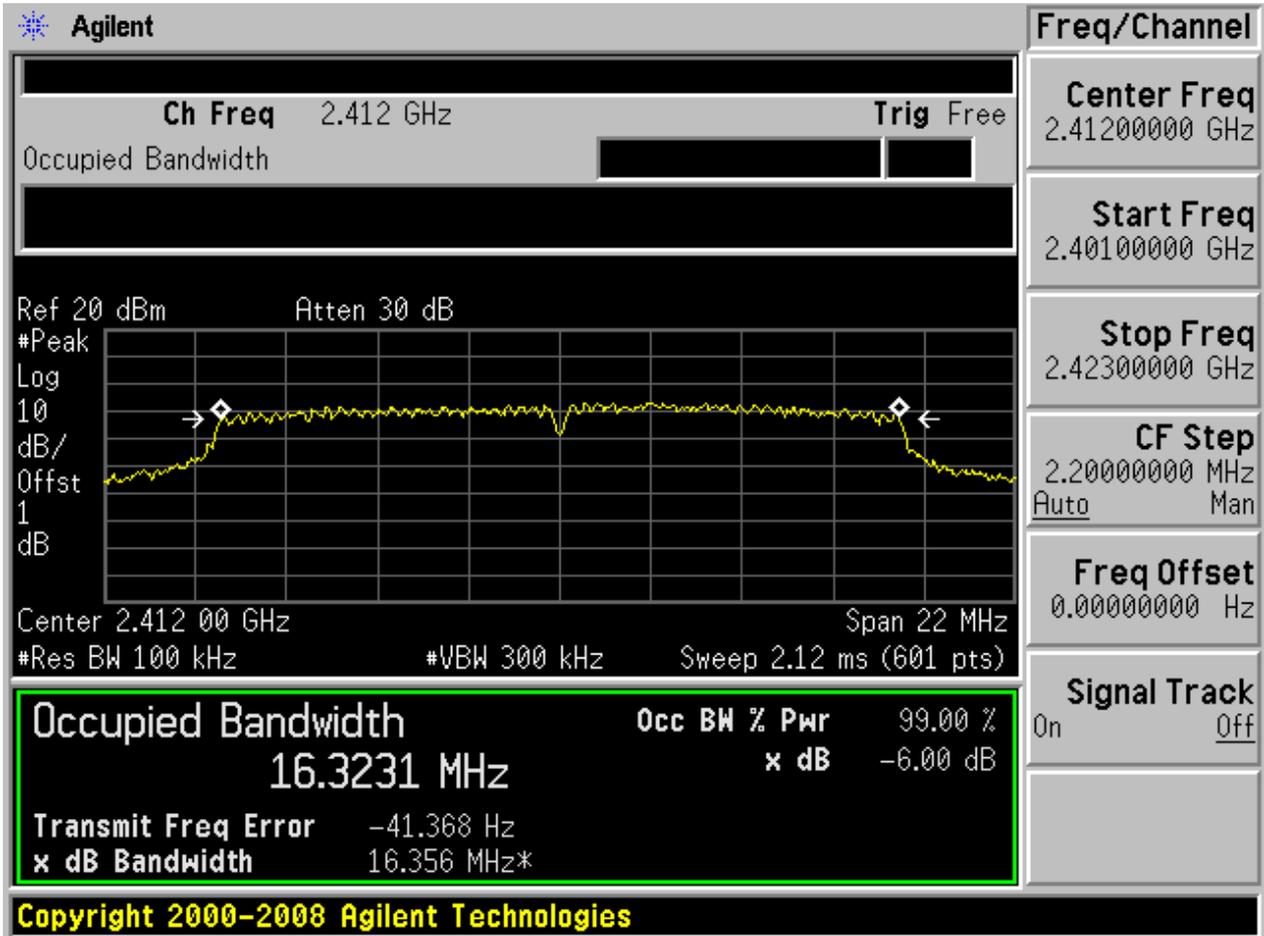


2.7 11G_L@BG 1



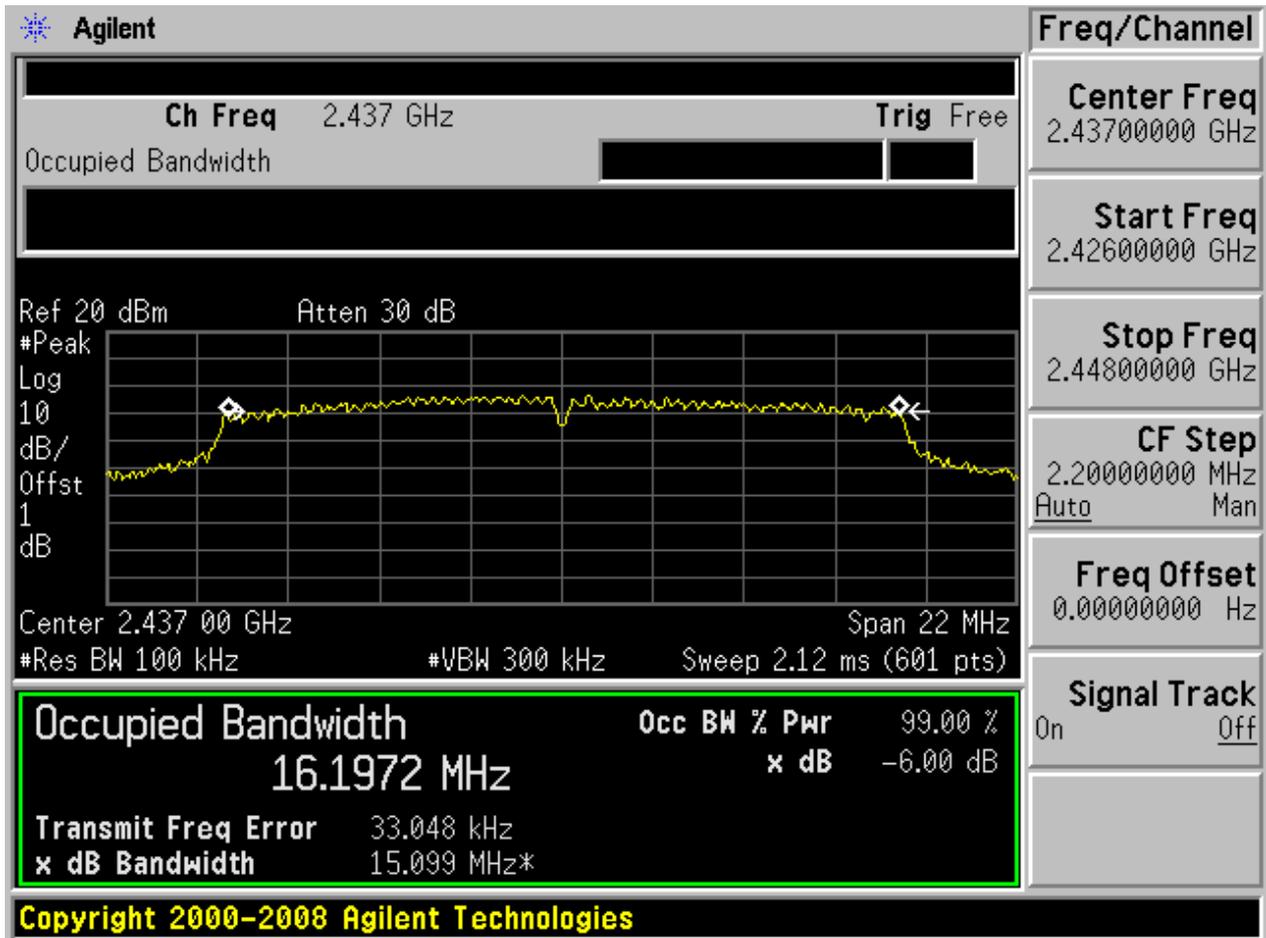


2.8 11G_L@BG 2



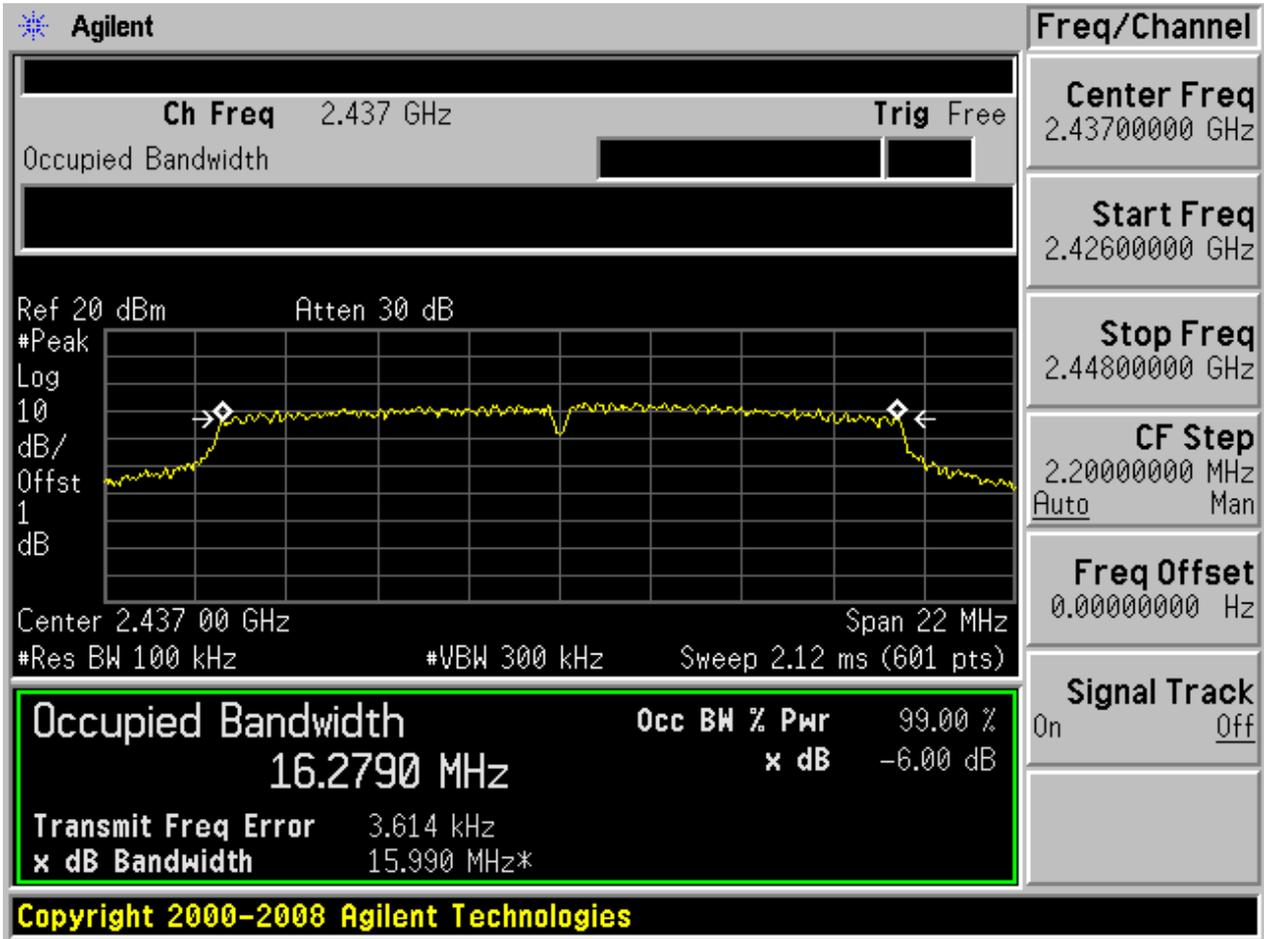


2.9 11G_M@BG 1



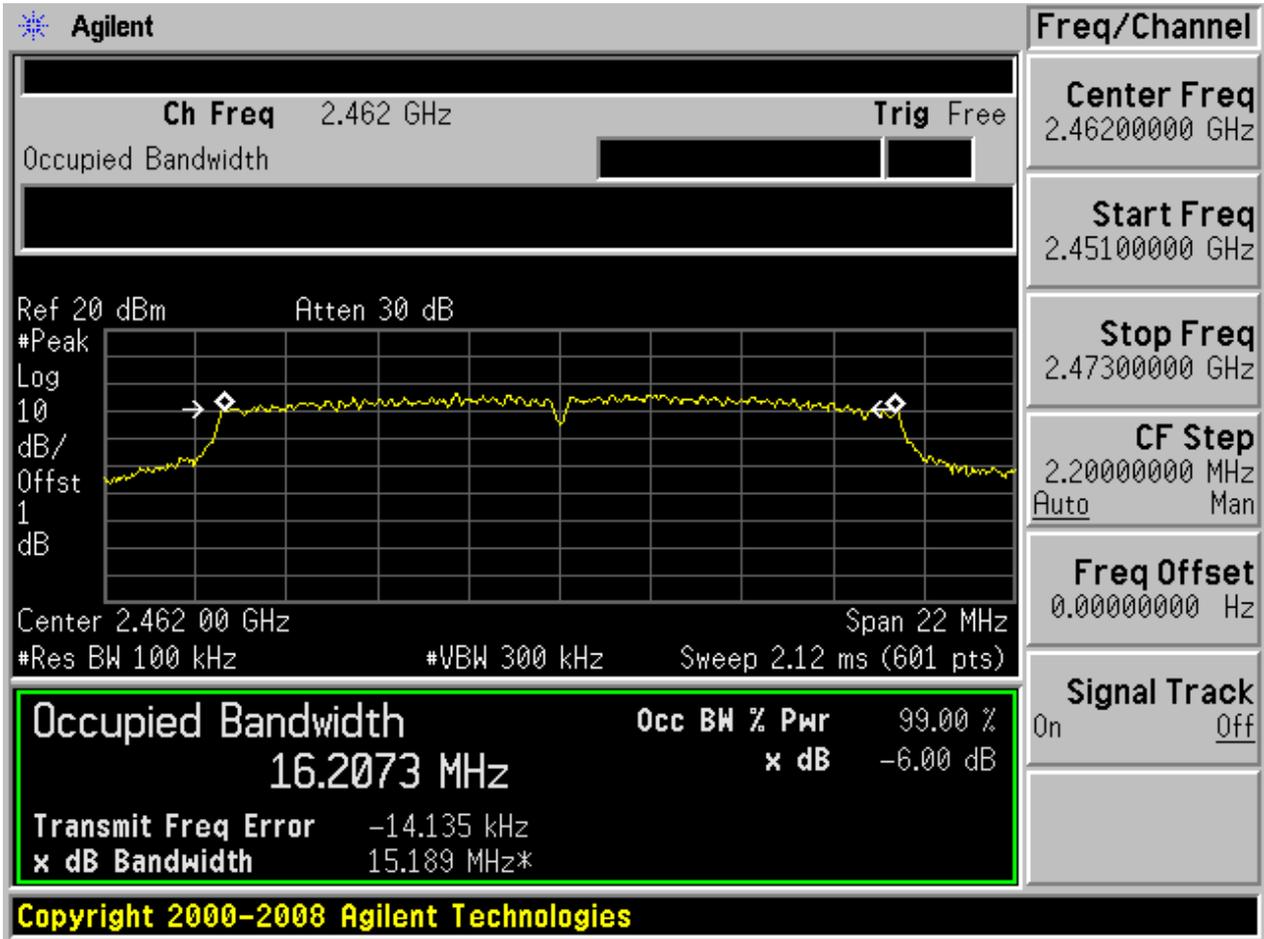


2.10 11G_M@BG 2



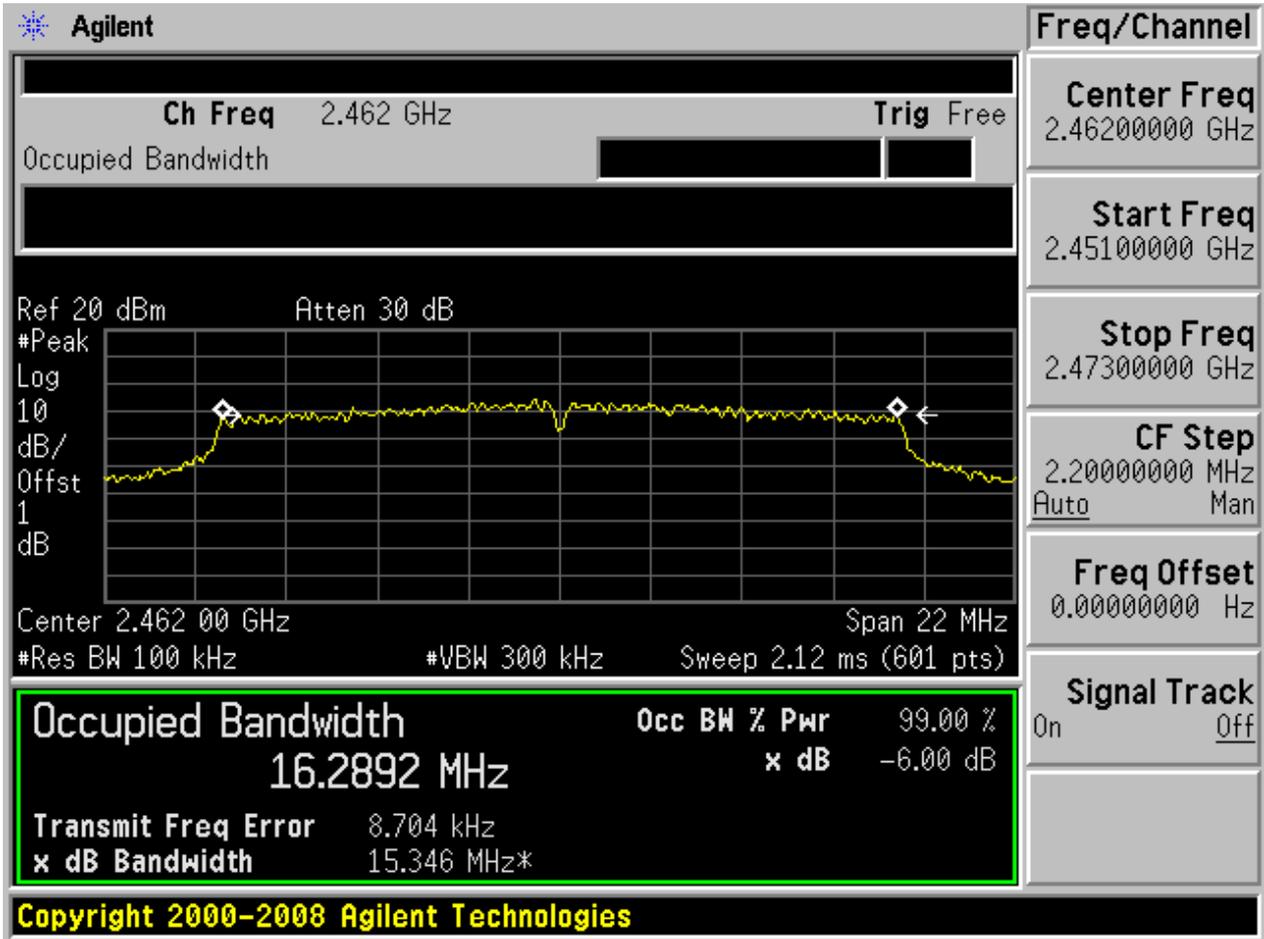


2.11 11G_H@BG 1



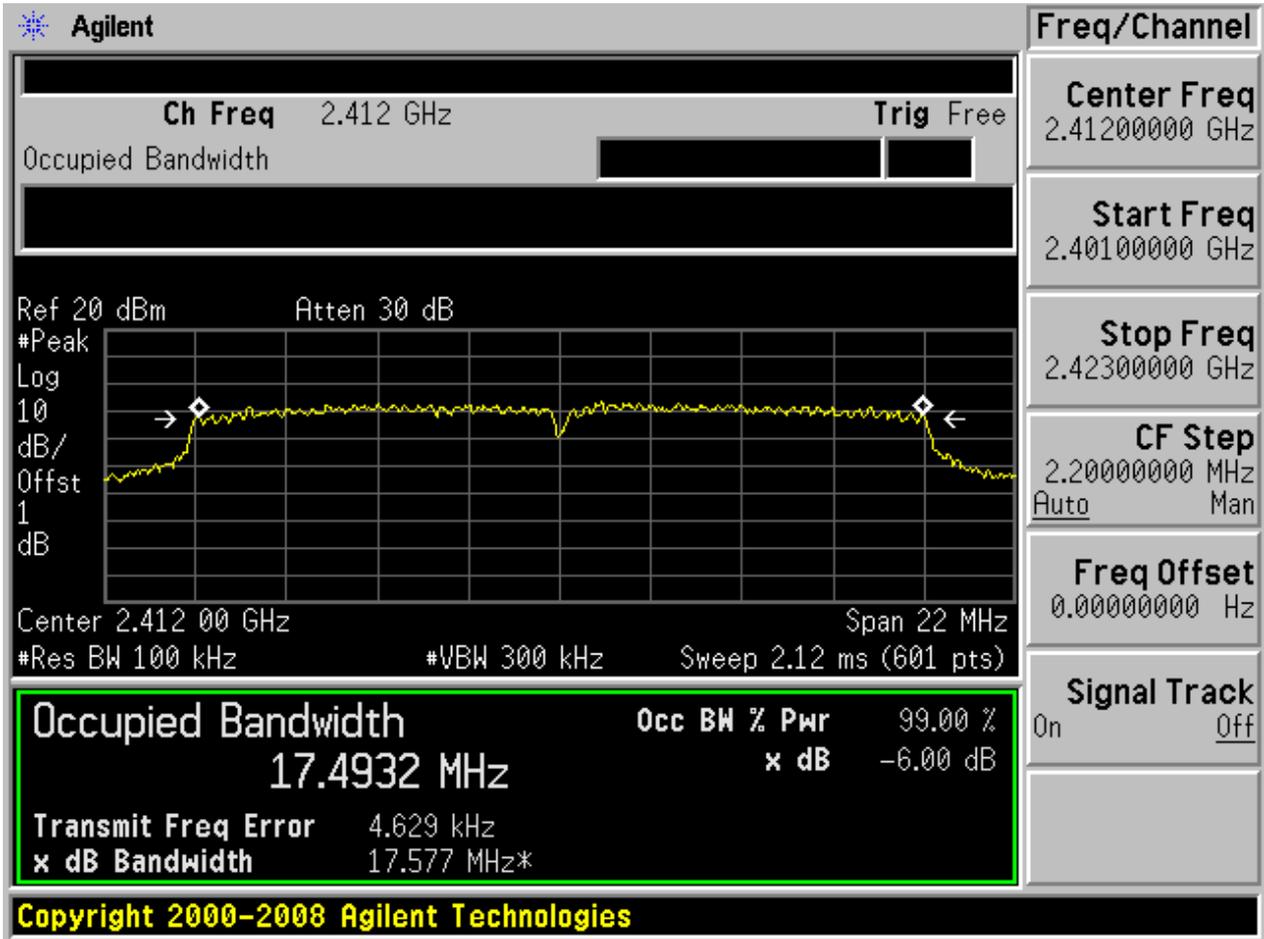


2.12 11G_H@BG 2



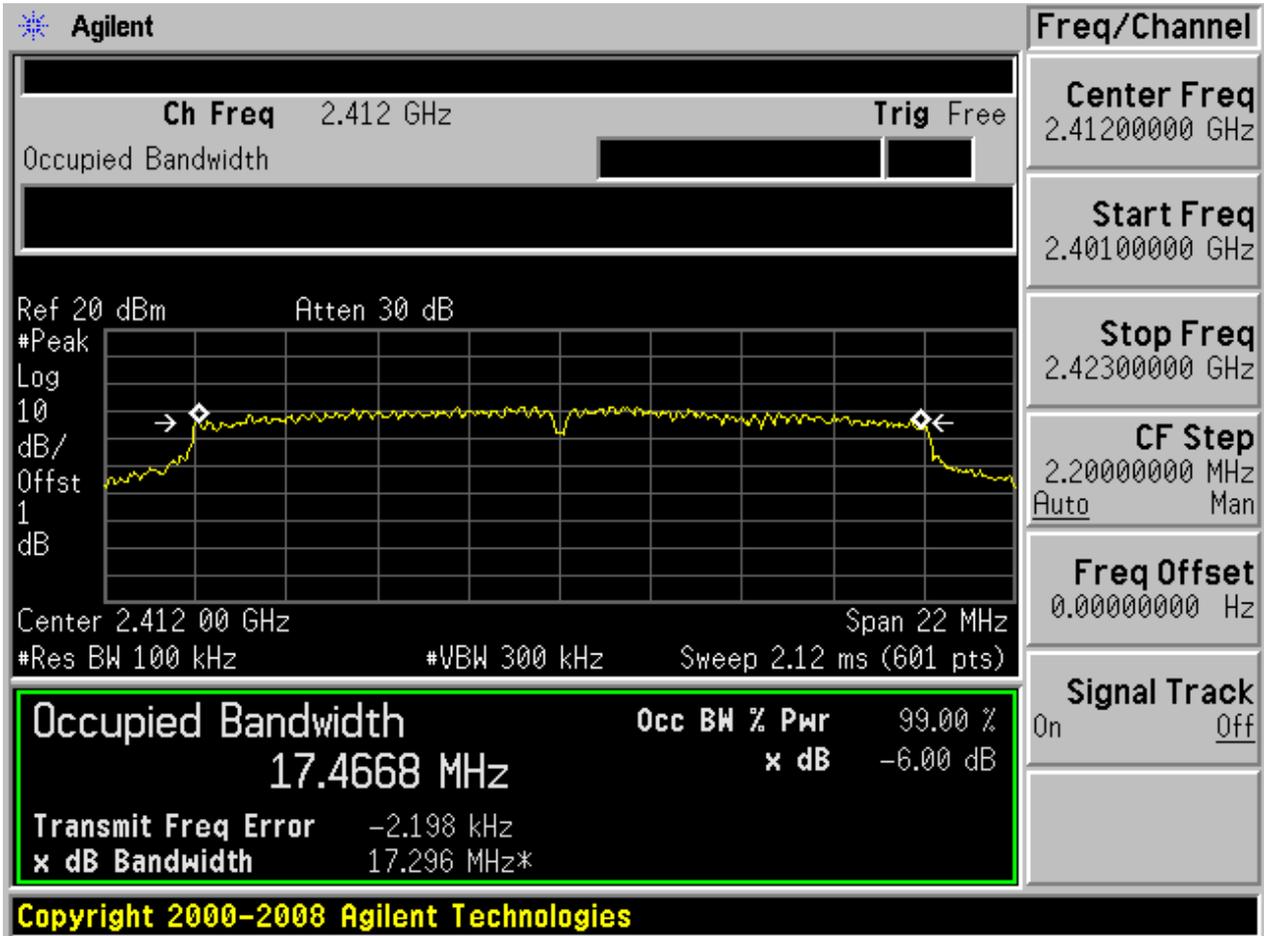


2.13 11N20_L@BG 1



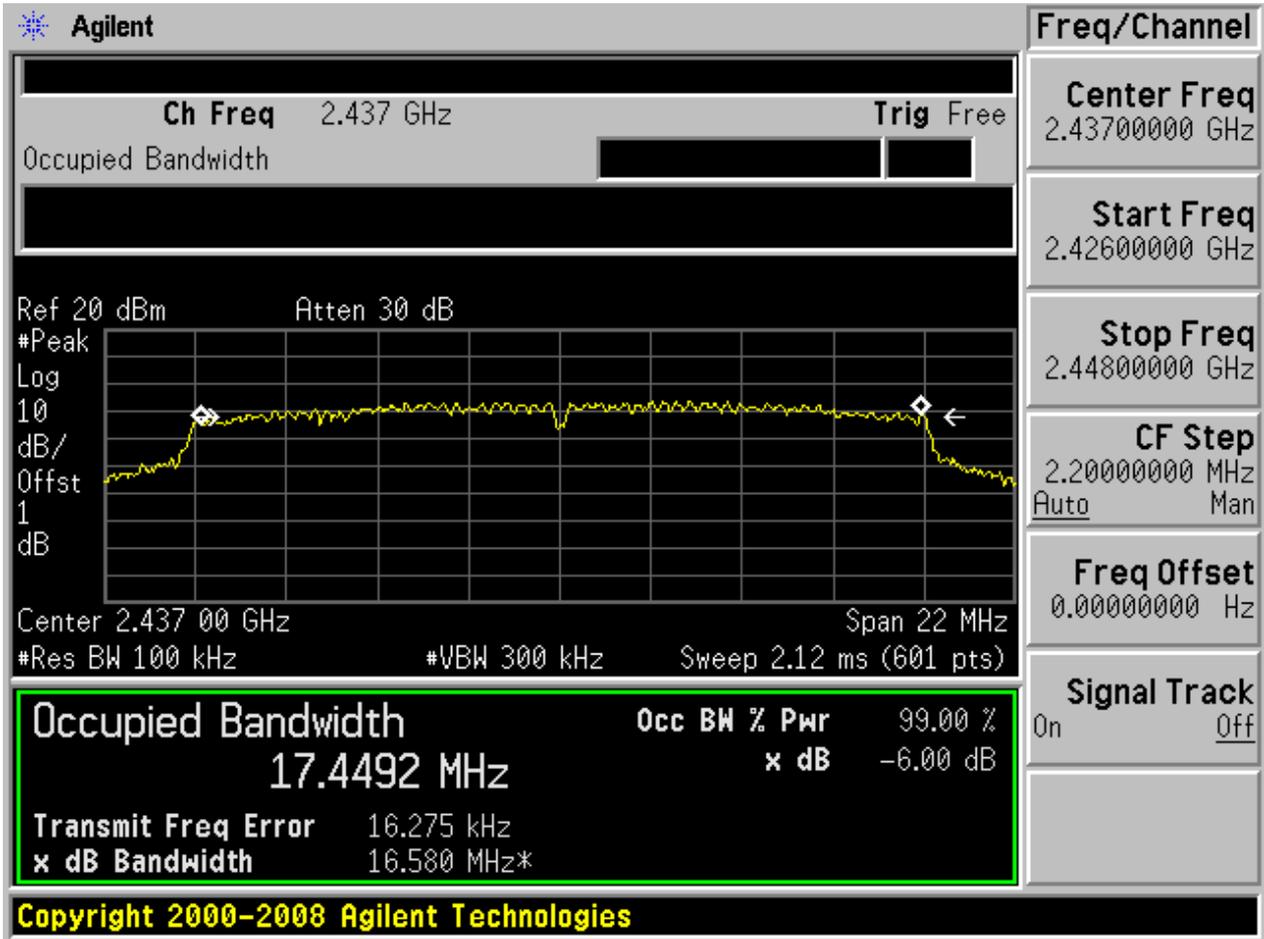


2.14 11N20_L@BG 2



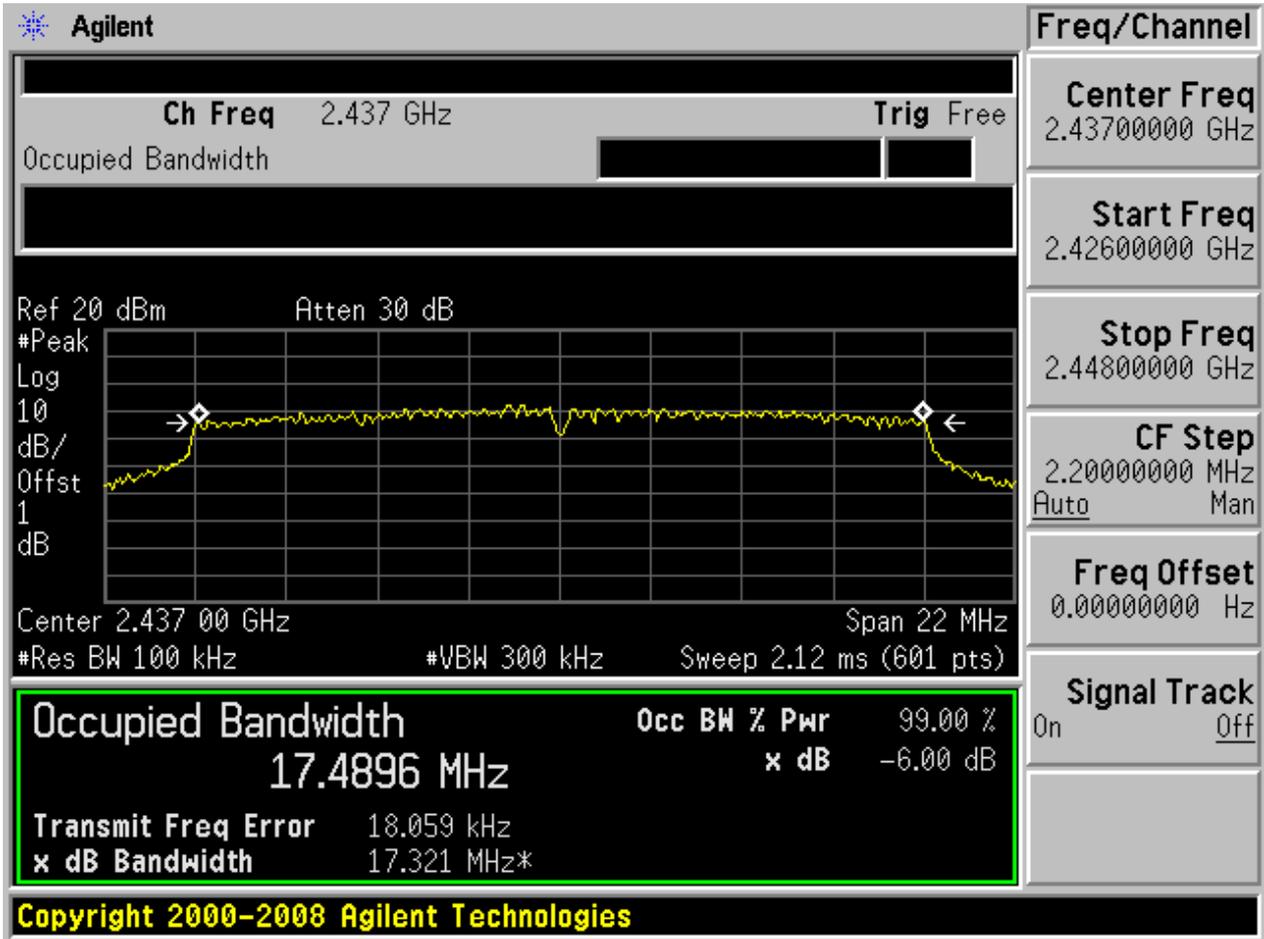


2.15 11N20_M@BG 1



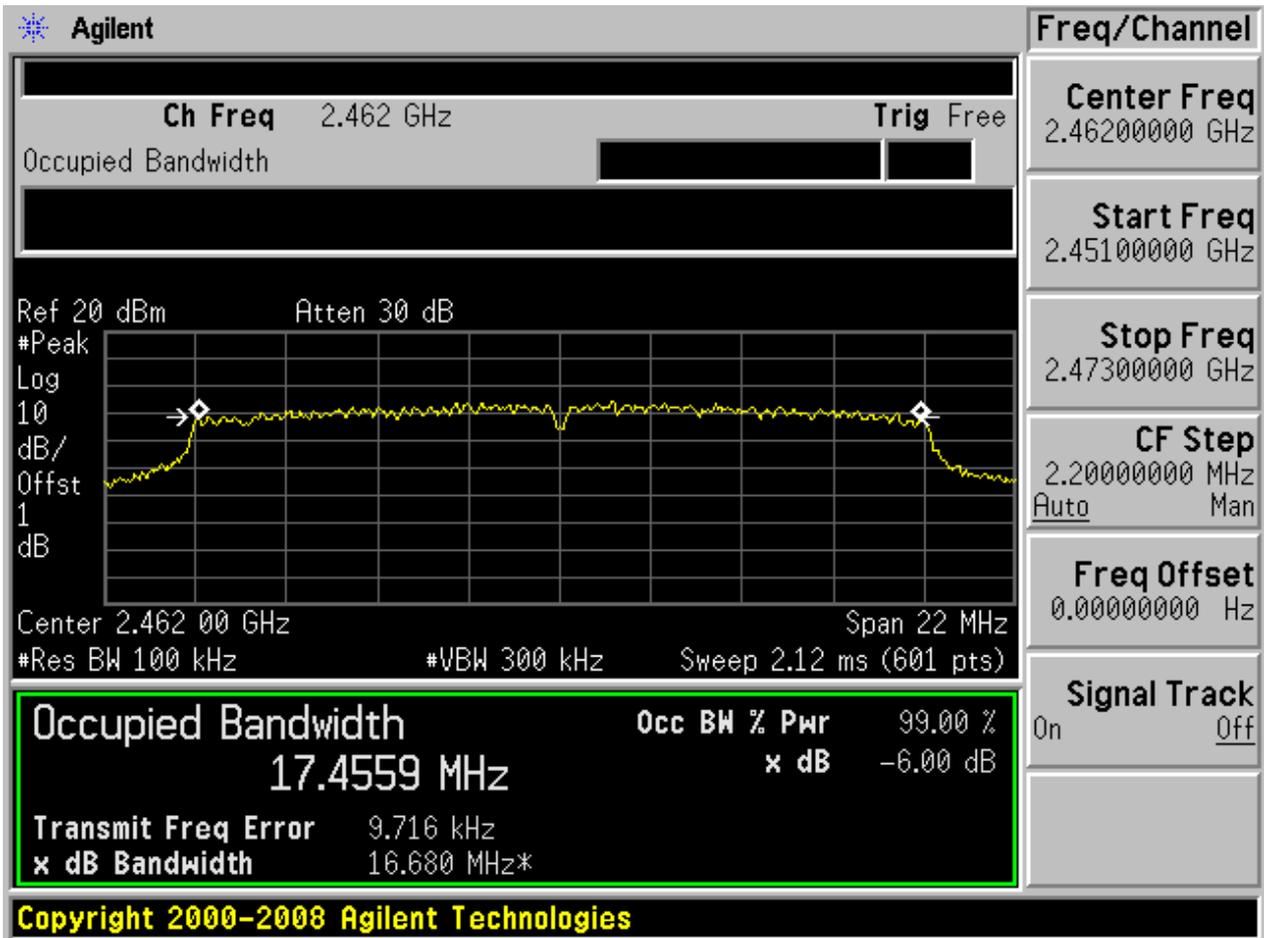


2.16 11N20_M@BG 2



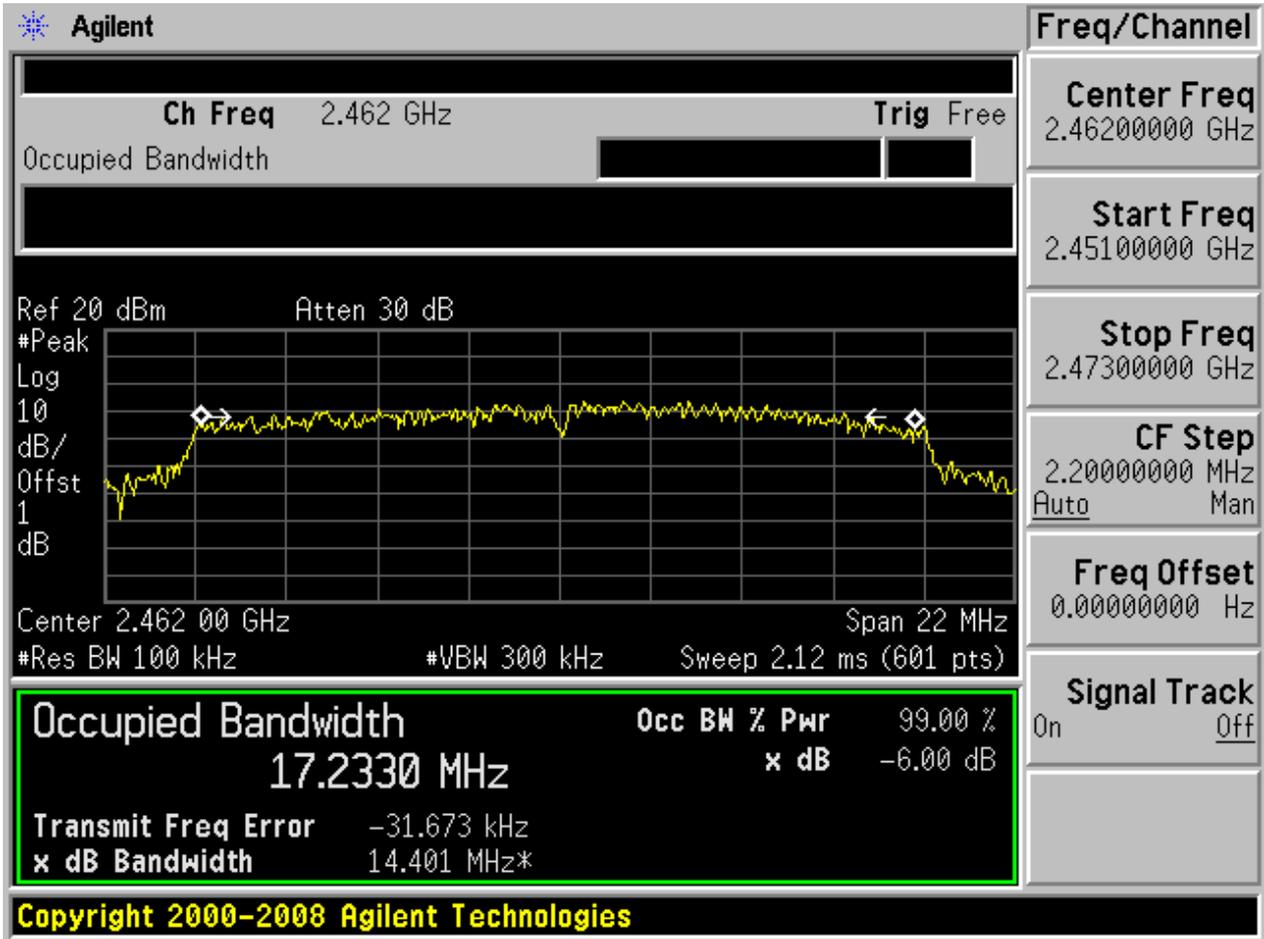


2.17 11N20_H@BG 1



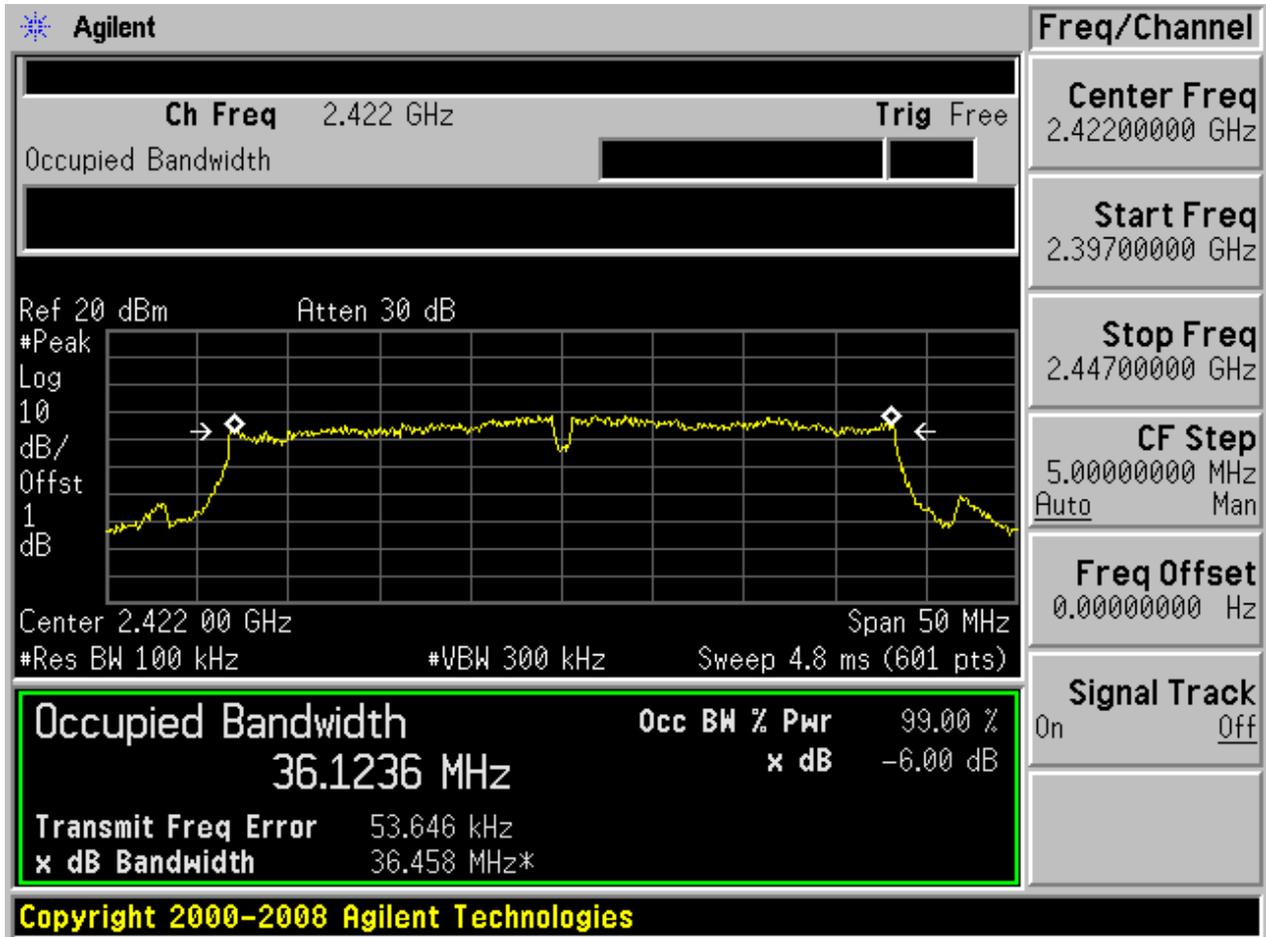


2.18 11N20_H@BG 2



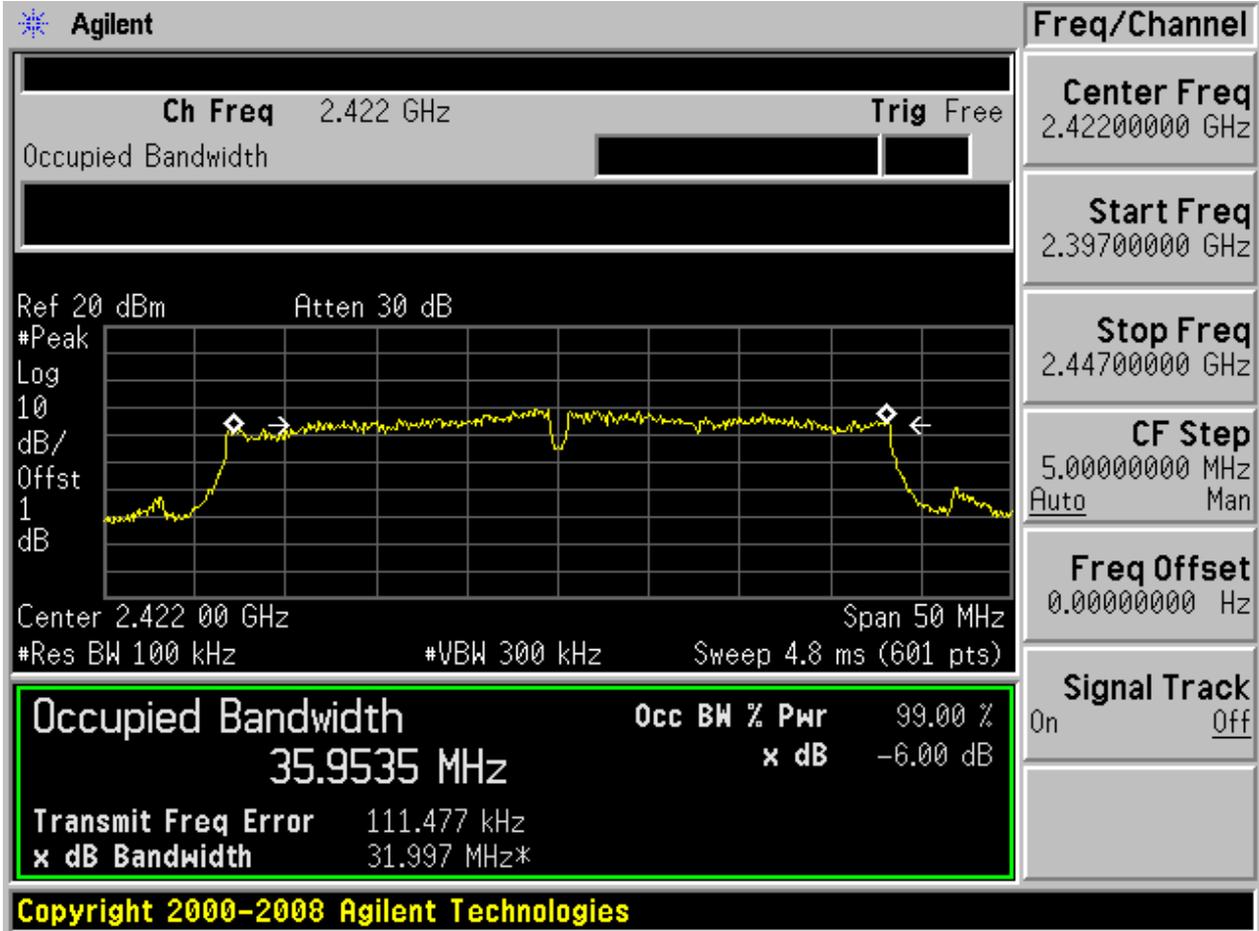


2.19 11N40_L@BG 1



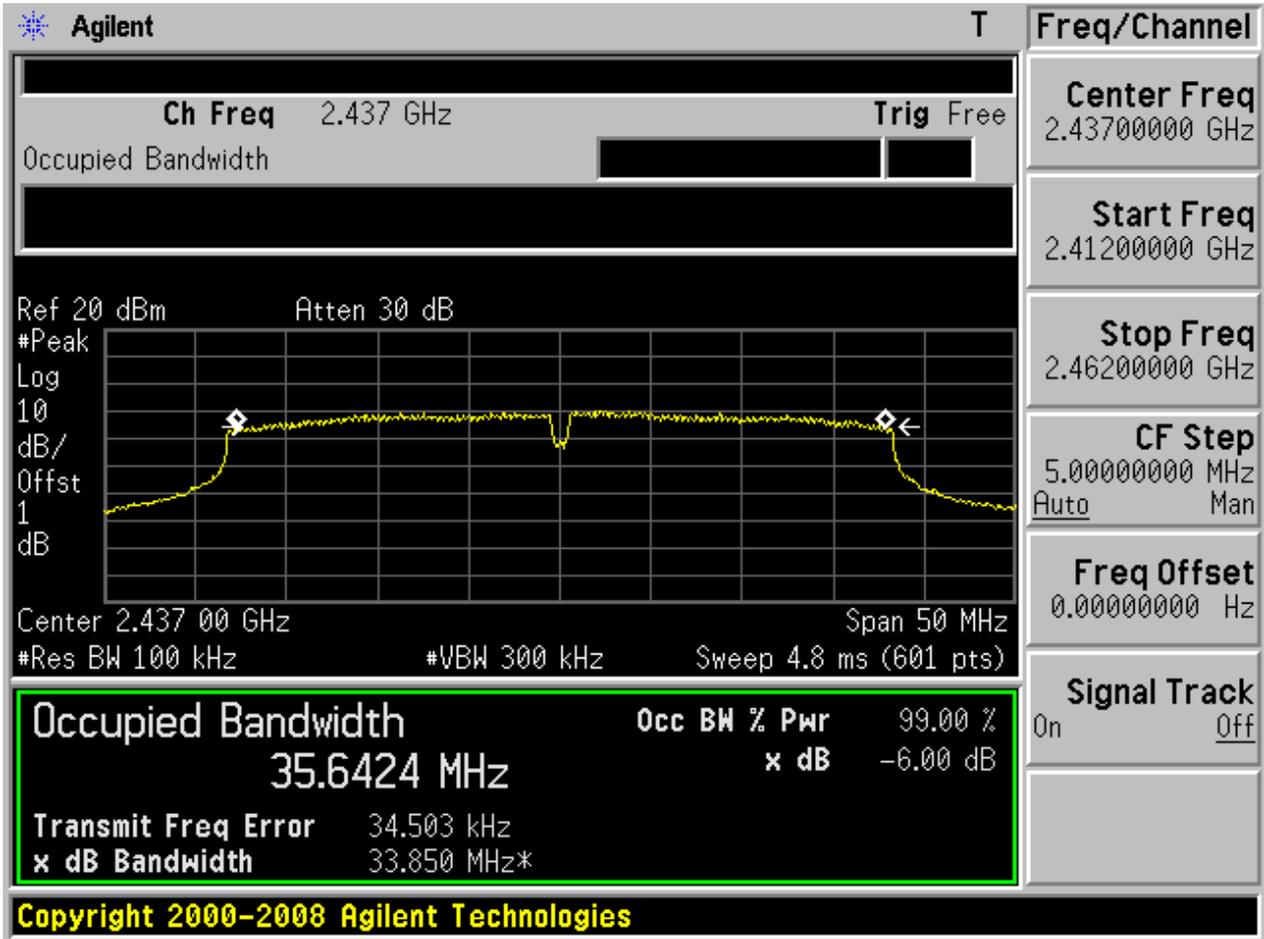


2.20 11N40_L@BG 2



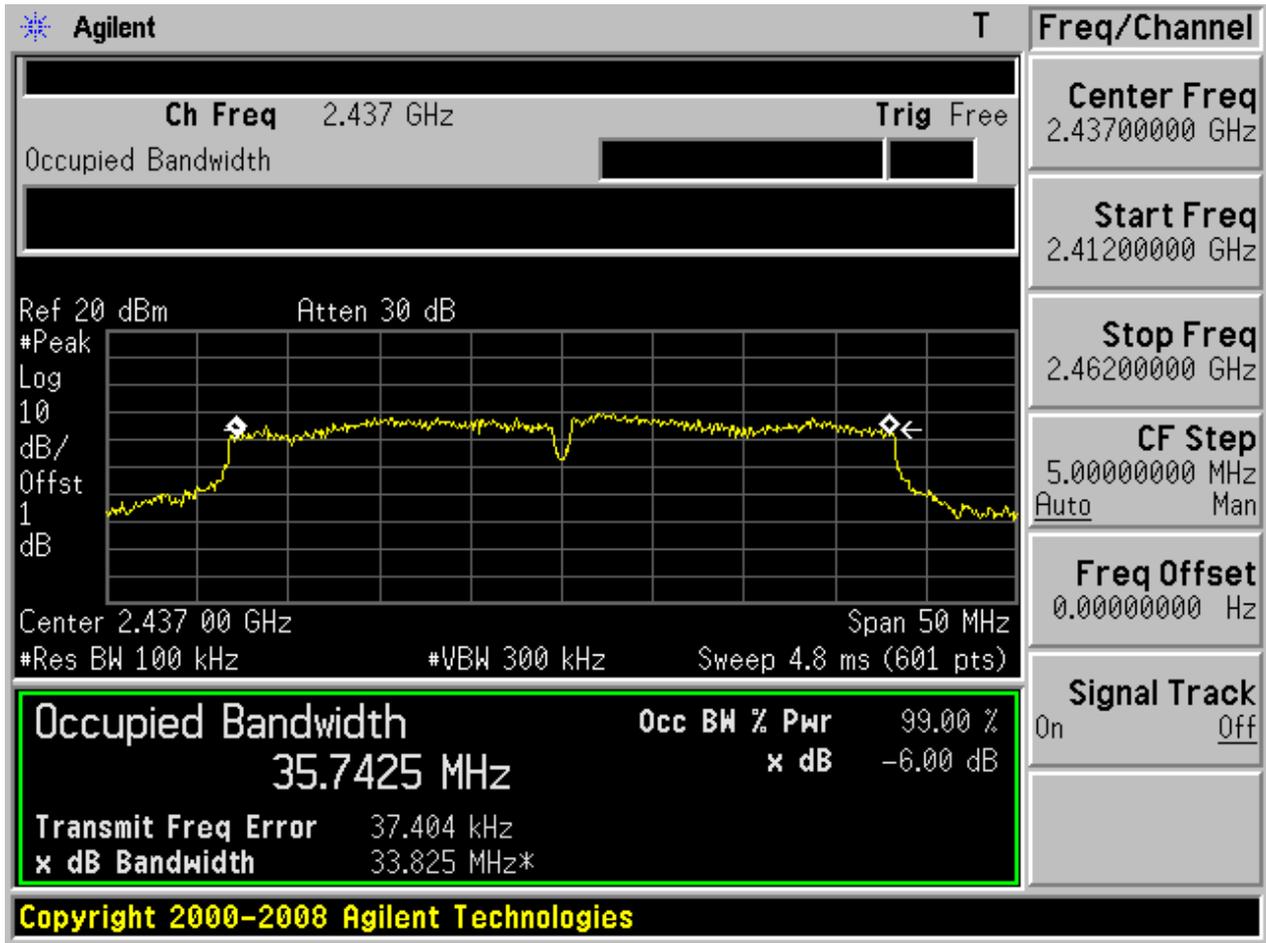


2.21 11N40_M@BG 1



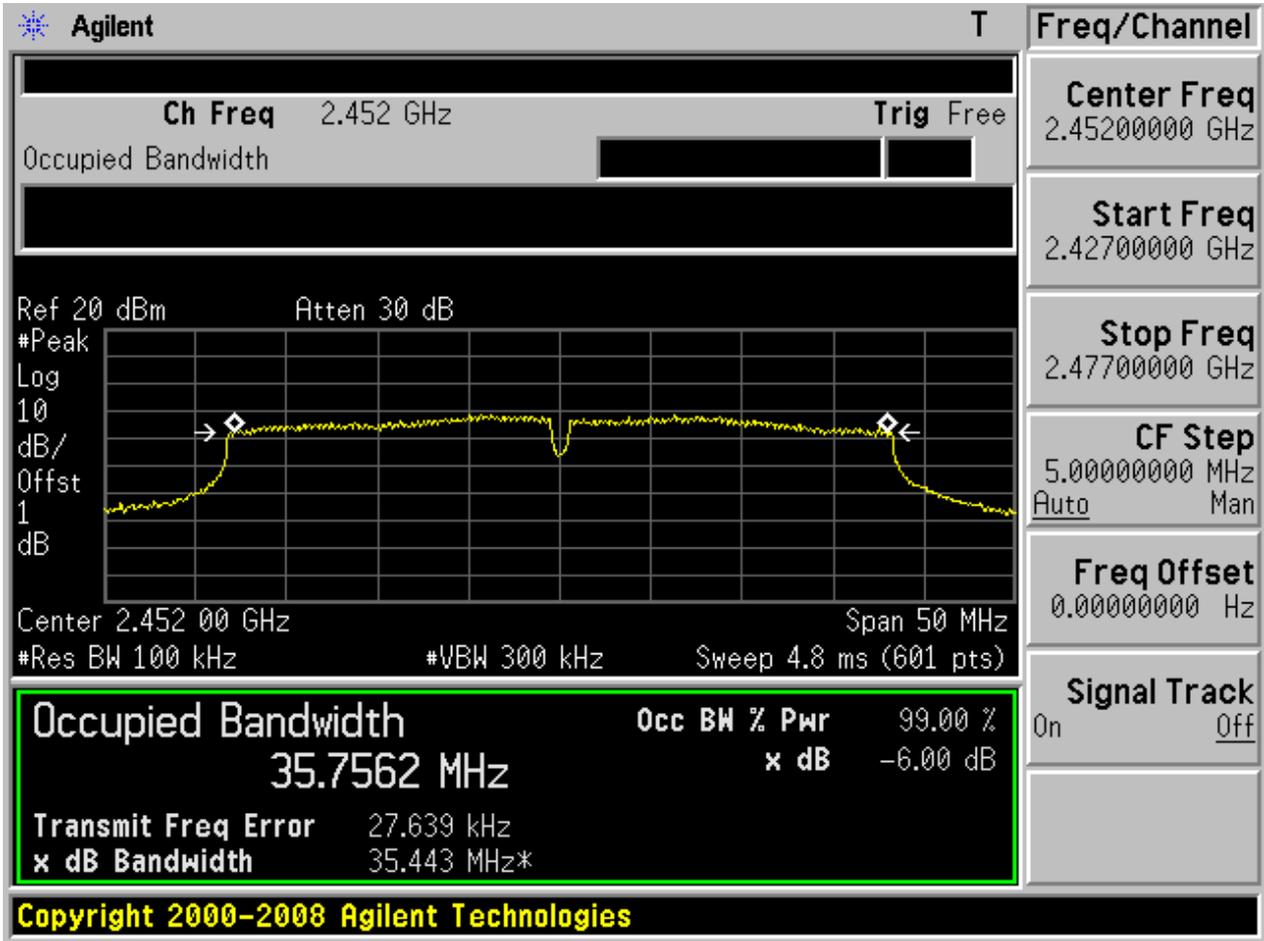


2.22 11N40_M@BG 2



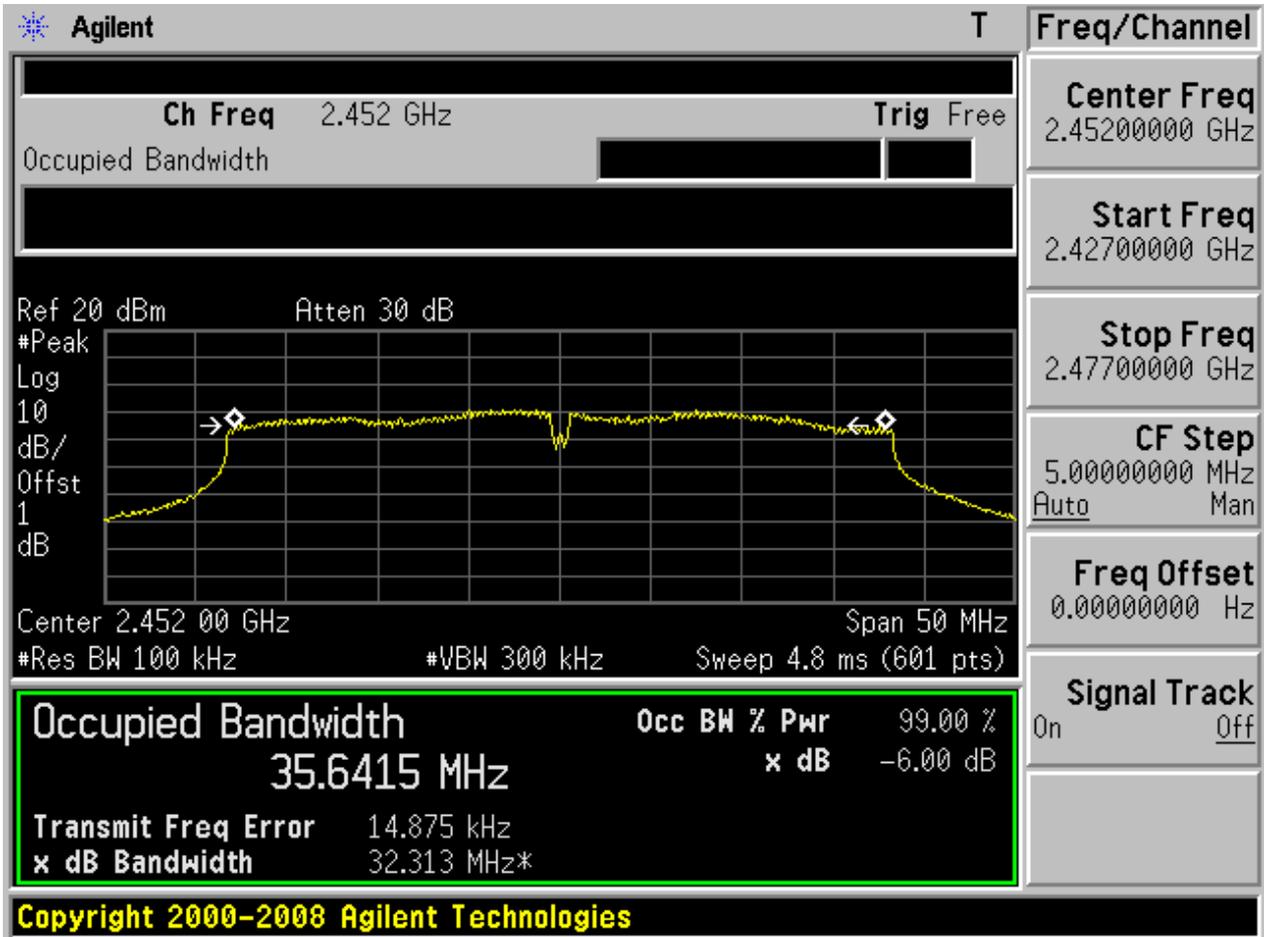


2.23 11N40_H@BG 1





2.24 11N40_H@BG 2



Appendix B: Conducted Peak output power

In this Appendix, the “Pmax” refers to the measured “Maximum Peak Conducted Output Power” value. The “fc(DTS6dBBW)” and “DTS6dBBW” in “DTS (6 dB) Bandwidth” are used to determine the integrated band power.

1 Result Table

Test Mode	Test Channel	Frequency[MHz]	BG	Meas. Level (Cond.) [dBm]	Verdict
11B	L	2412	BG 1	23.35	pass
11B	L	2412	BG 2	21.75	pass
11B	M	2437	BG 1	23.27	pass
11B	M	2437	BG 2	21.83	pass
11B	H	2462	BG 1	23.55	pass
11B	H	2462	BG 2	21.79	pass
11G	L	2412	BG 1	22.83	pass
11G	L	2412	BG 2	19.73	pass
11G	M	2437	BG 1	22.85	pass
11G	M	2437	BG 2	19.97	pass
11G	H	2462	BG 1	23.05	pass
11G	H	2462	BG 2	19.85	pass
11N20	L	2412	BG 1	20.85	pass
11N20	L	2412	BG 2	18.96	pass
11N20	M	2437	BG 1	20.97	pass
11N20	M	2437	BG 2	18.59	pass
11N20	H	2462	BG 1	21.01	pass
11N20	H	2462	BG 2	18.75	pass
11N40	L	2422	BG 1	21.95	pass
11N40	L	2422	BG 2	19.88	pass
11N40	M	2437	BG 1	21.85	pass
11N40	M	2437	BG 2	19.77	pass
11N40	H	2452	BG 1	21.93	pass
11N40	H	2452	BG 2	19.96	pass

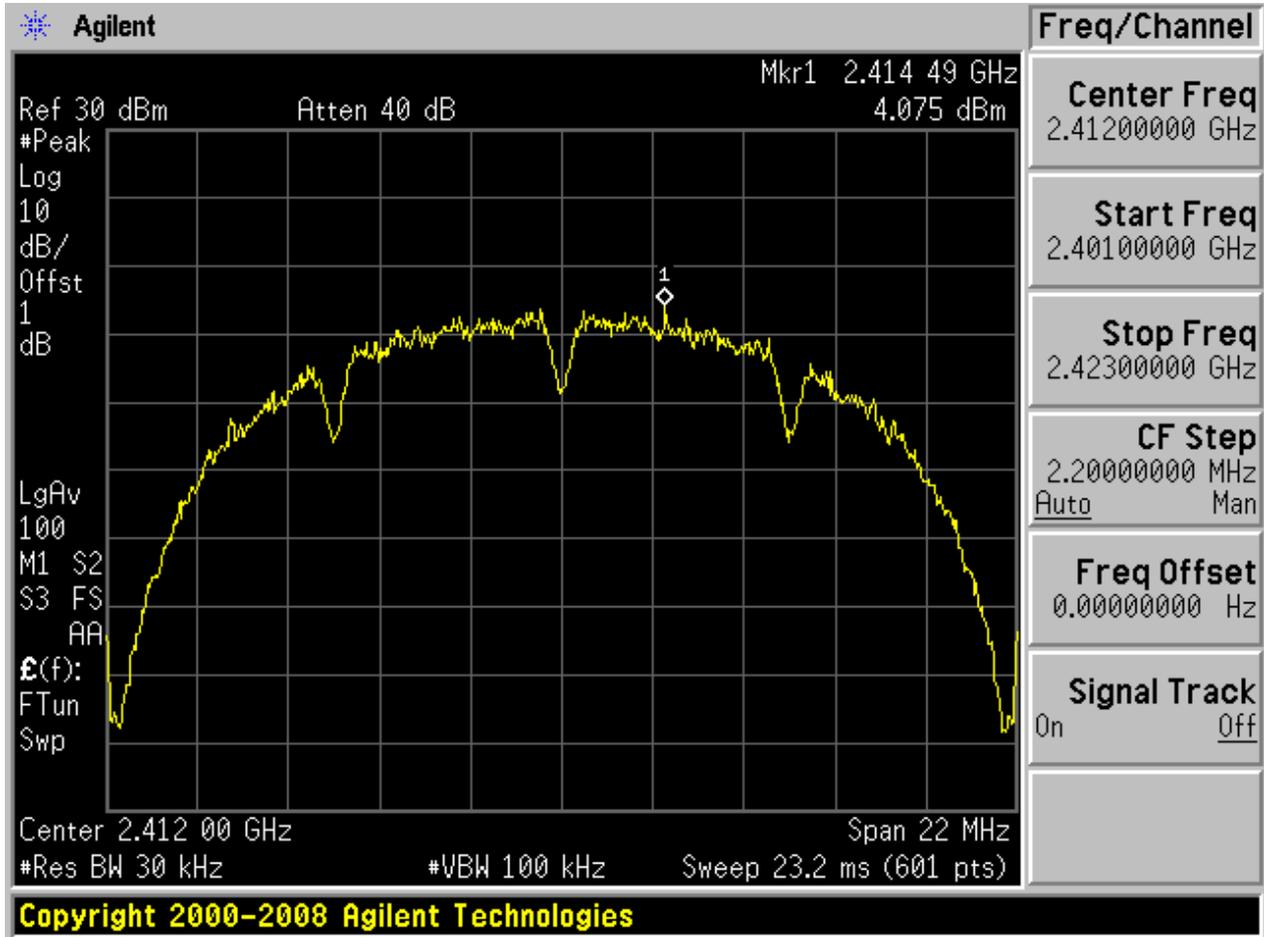
Appendix C: Maximum Power Spectral Density Level

Part I - Test Results

Test Mode	Test Channel	Frequency[MHz]	Ant	PD[MHz]	Verdict
11B	L	2412	BG 1	4.08	pass
11B	L	2412	BG 2	2.50	pass
11B	M	2437	BG 1	4.81	pass
11B	M	2437	BG 2	4.21	pass
11B	H	2462	BG 1	4.09	pass
11B	H	2462	BG 2	2.85	pass
11G	L	2412	BG 1	-0.35	pass
11G	L	2412	BG 2	-3.54	pass
11G	M	2437	BG 1	-0.63	pass
11G	M	2437	BG 2	-3.82	pass
11G	H	2462	BG 1	-0.26	pass
11G	H	2462	BG 2	-3.48	pass
11N20	L	2412	BG 1	-2.19	pass
11N20	L	2412	BG 2	-4.12	pass
11N20	M	2437	BG 1	-2.07	pass
11N20	M	2437	BG 2	-3.97	pass
11N20	H	2462	BG 1	-2.35	pass
11N20	H	2462	BG 2	-4.32	pass
11N40	L	2422	BG 1	-5.71	pass
11N40	L	2422	BG 2	-5.71	pass
11N40	M	2437	BG 1	-5.76	pass
11N40	M	2437	BG 2	-8.06	pass
11N40	H	2452	BG 1	-5.93	pass
11N40	H	2452	BG 2	-7.33	pass

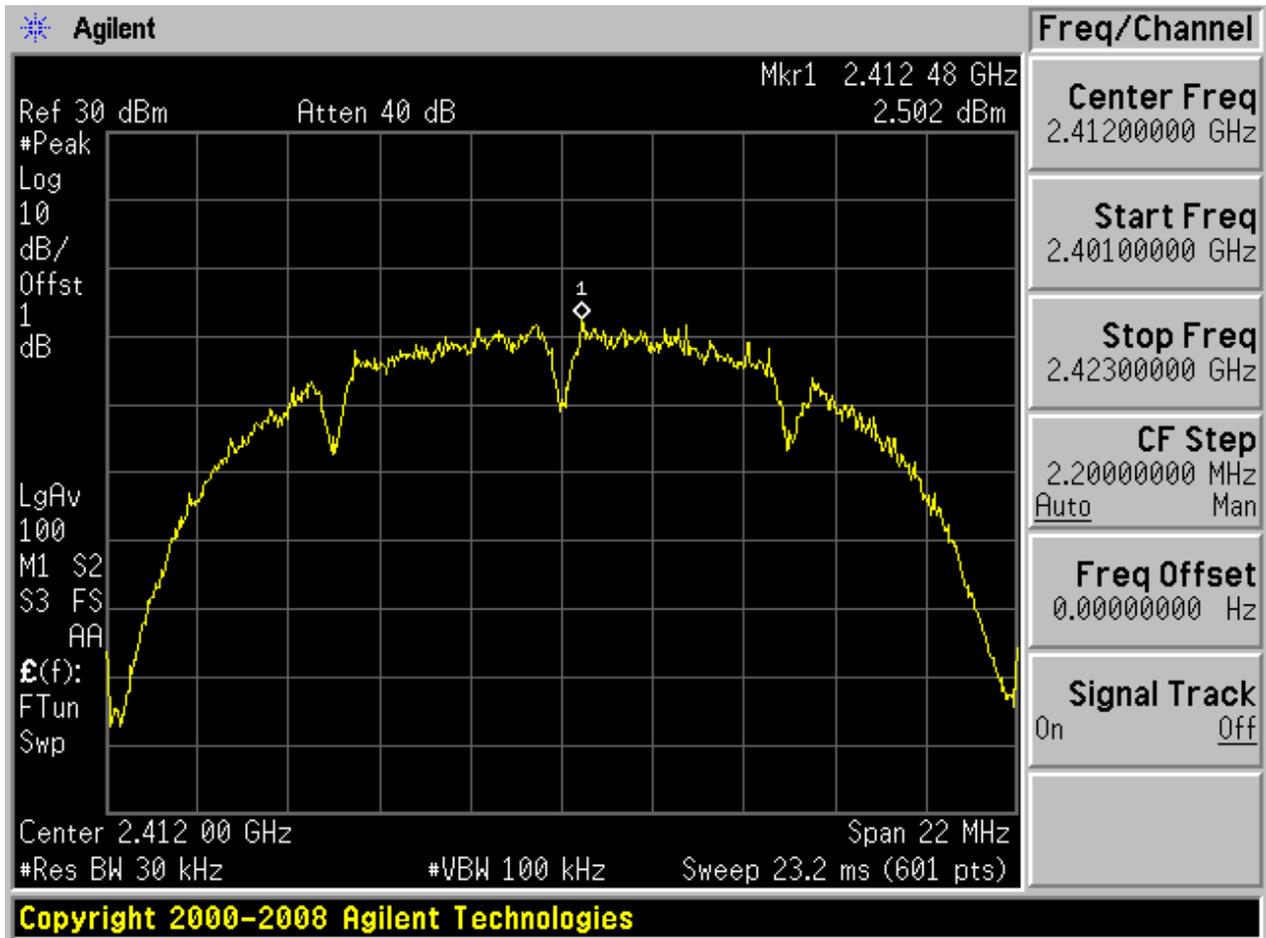
Part II - Test Plots

2.1 11B_L@BG 1



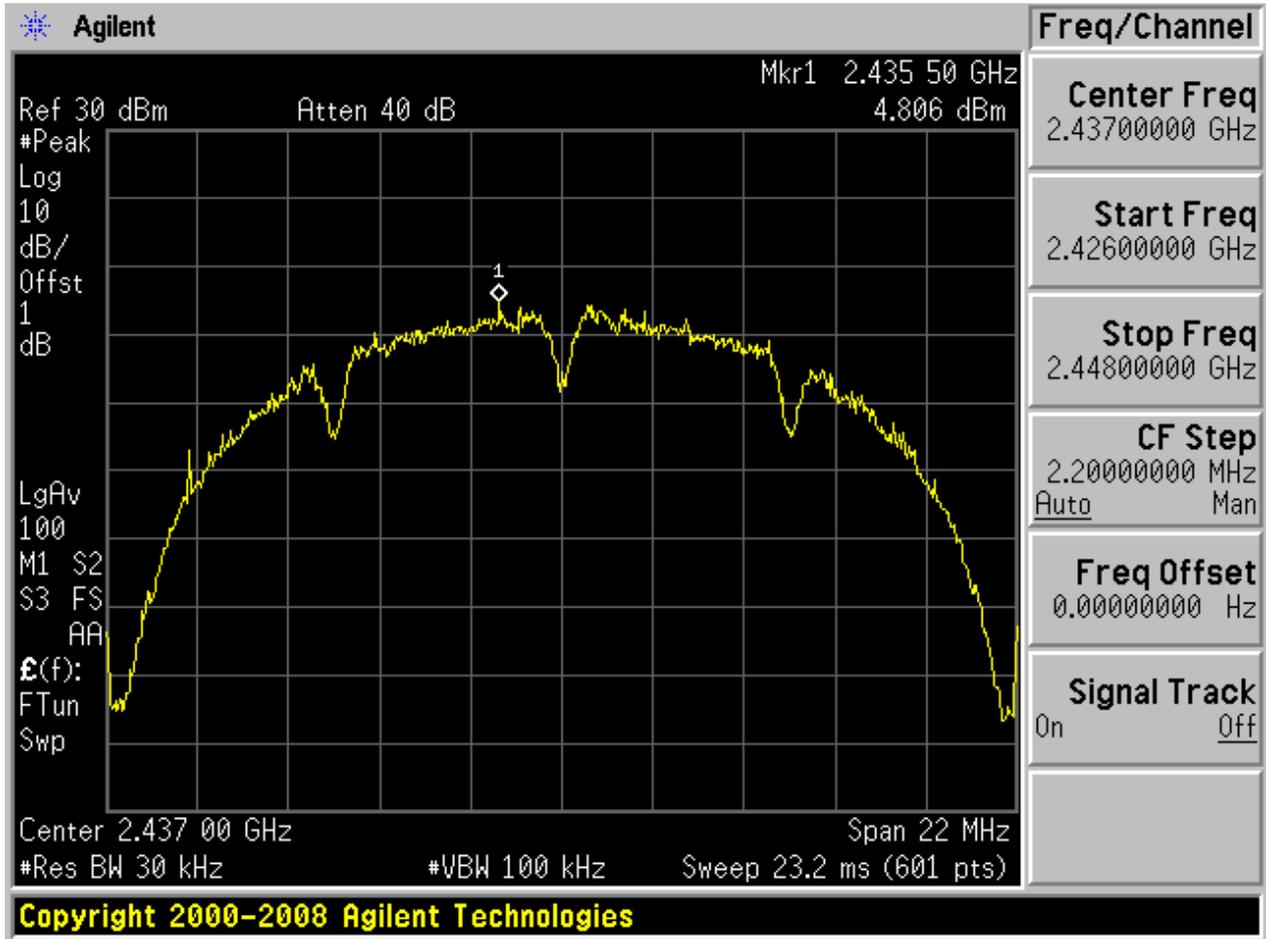


2.2 11B_L@BG 2



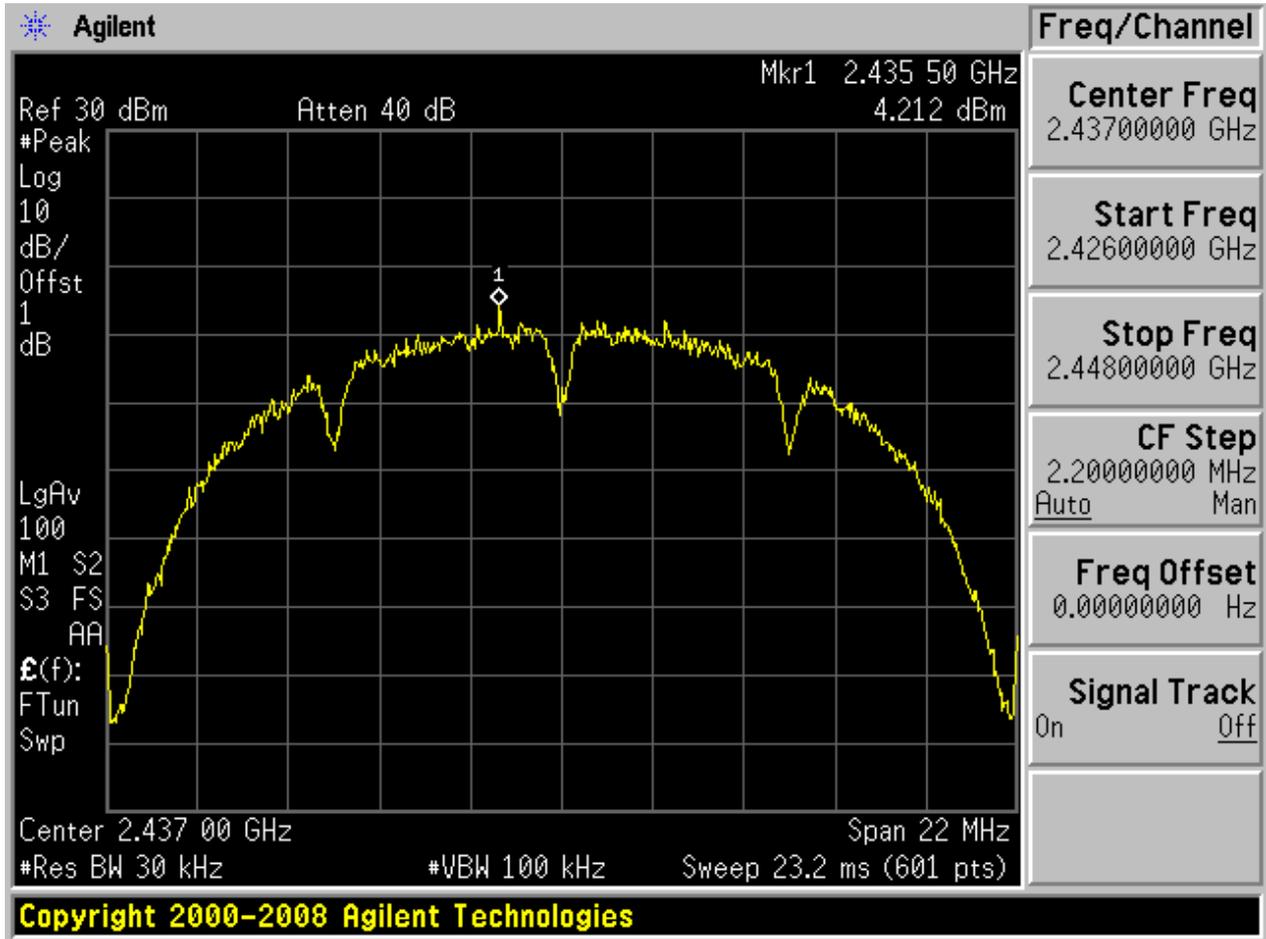


2.3 11B_M@BG 1

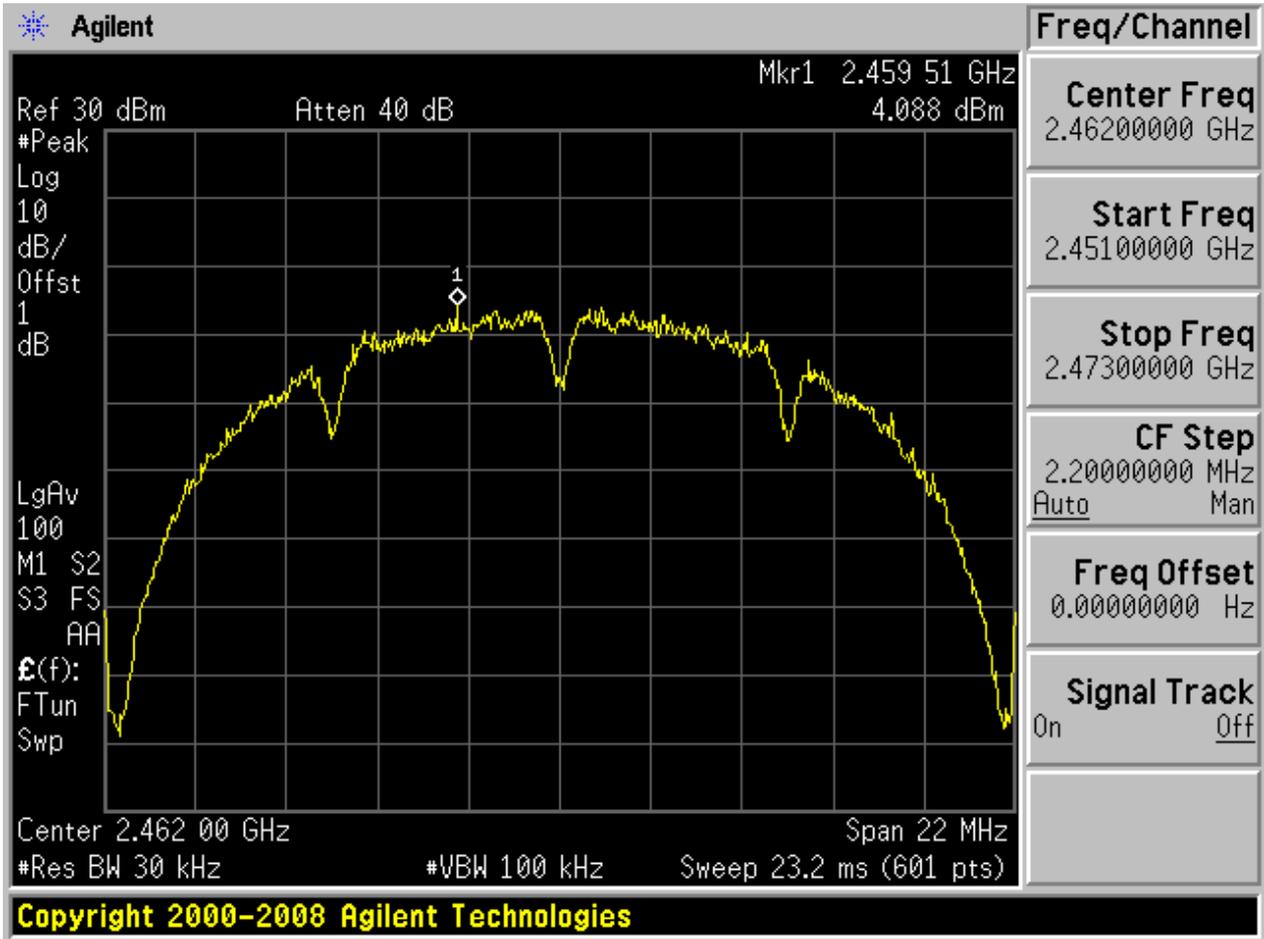




2.4 11B_M@BG 2

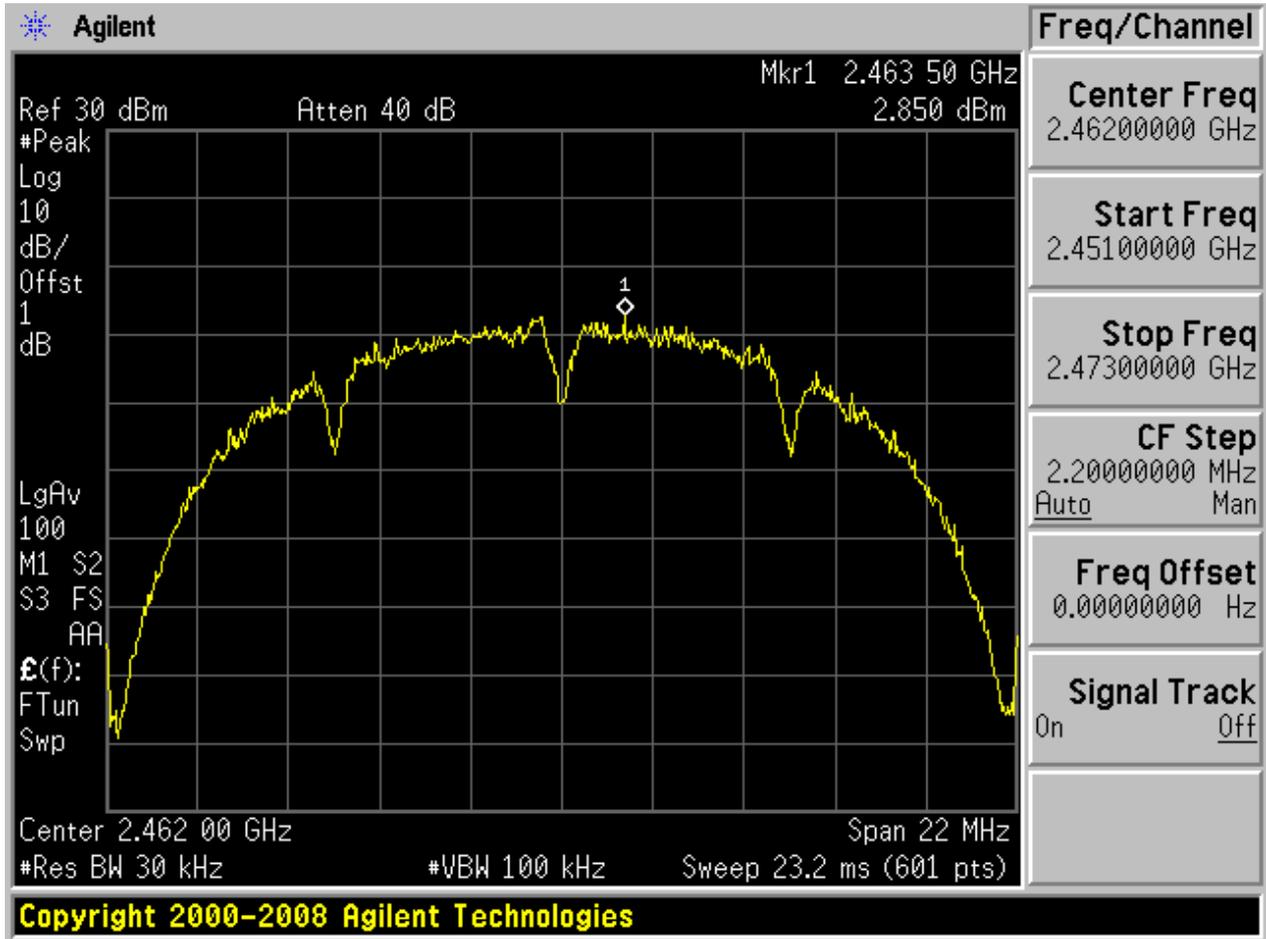


2.5 11B_H@BG 1



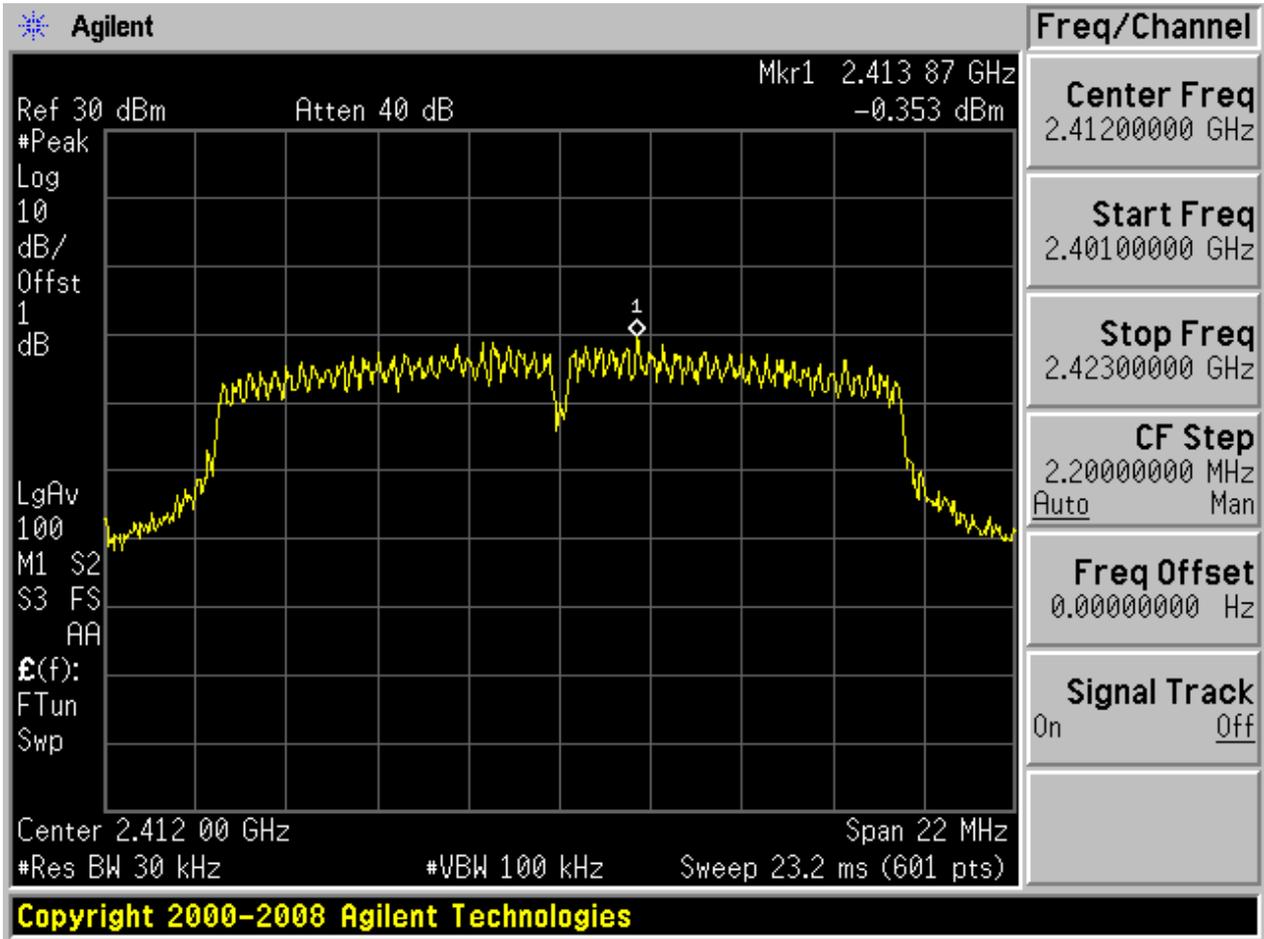


2.6 11B_H@BG 2



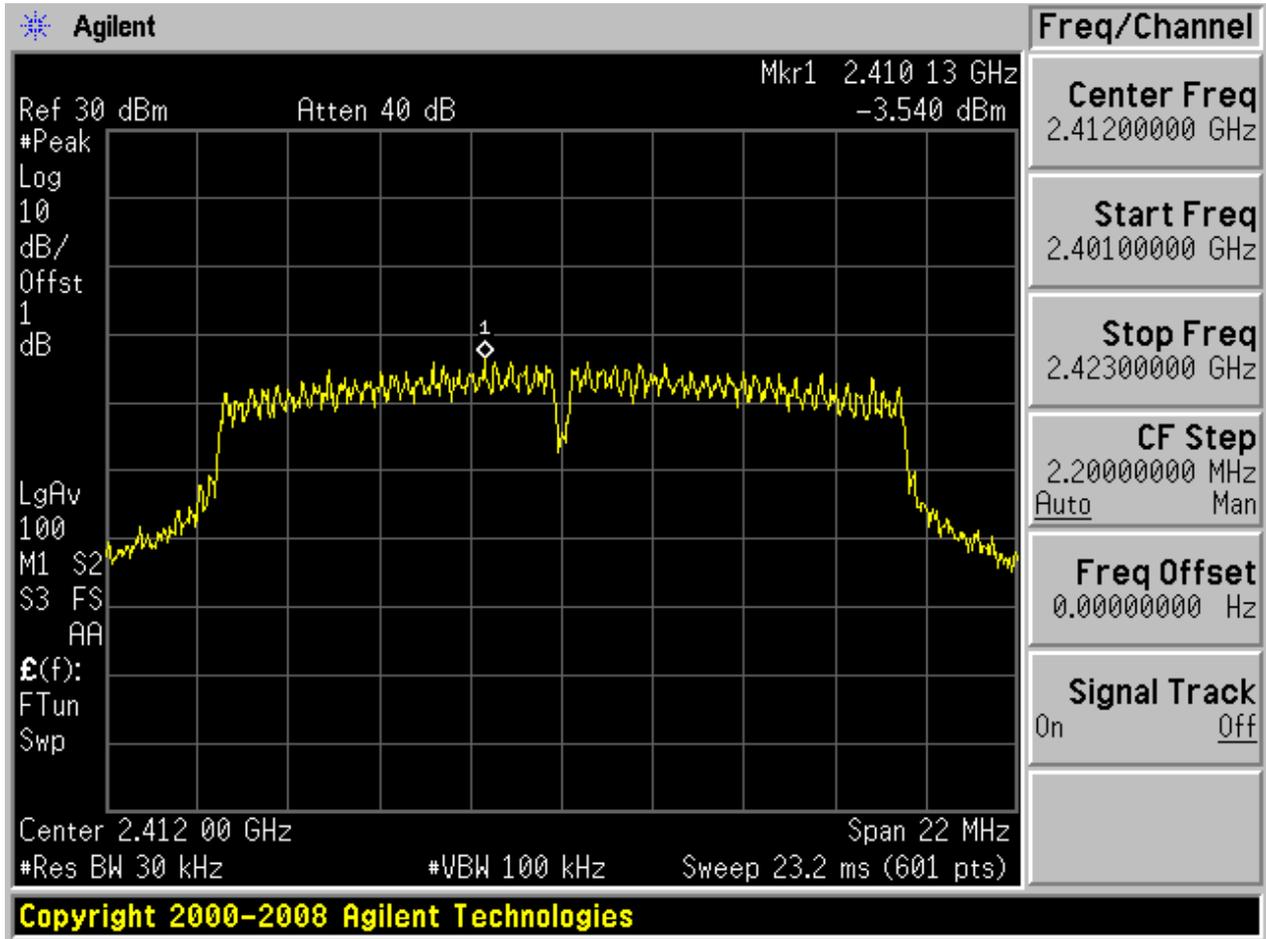


2.7 11G_L@BG 1



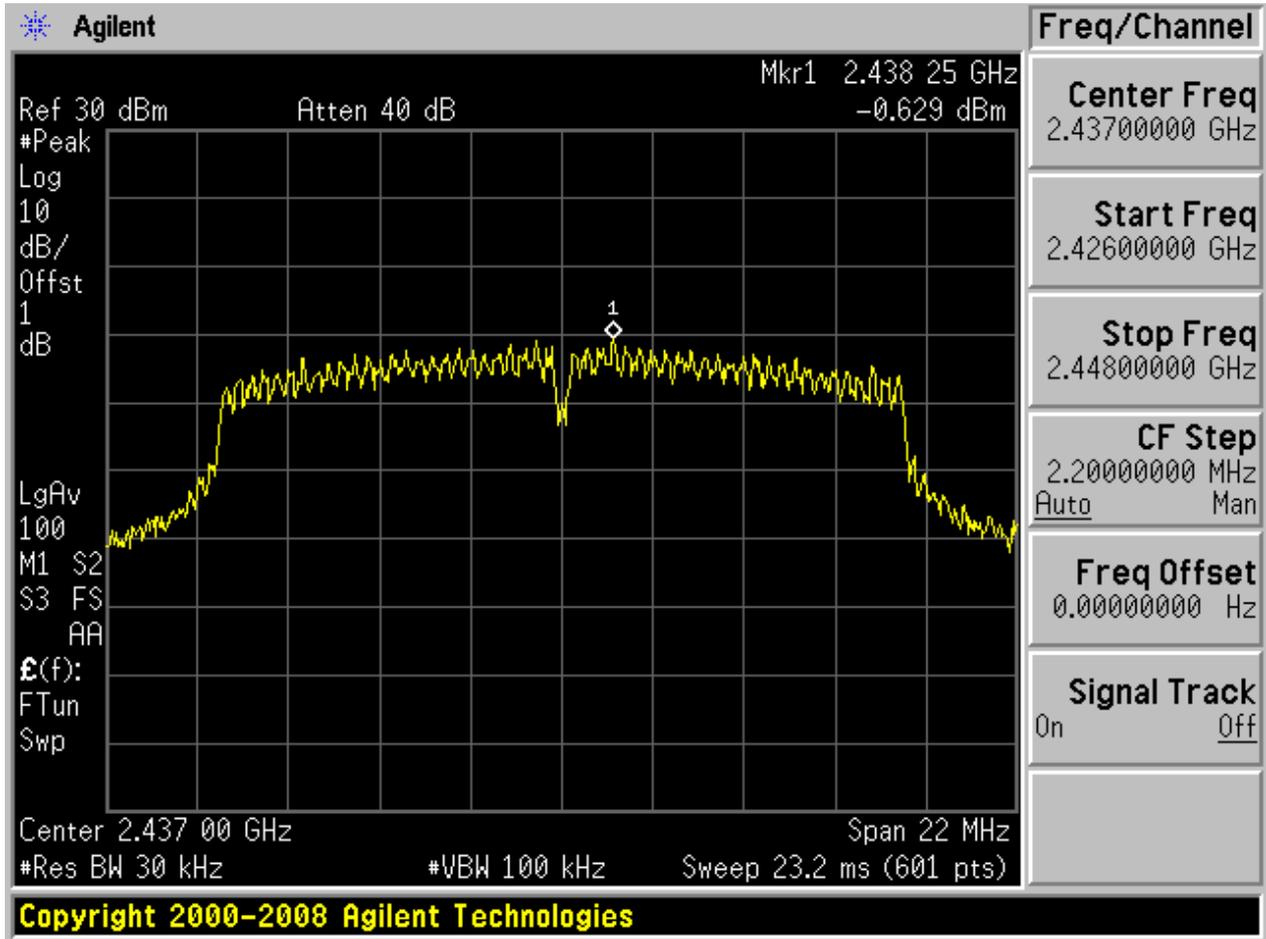


2.8 11G_L@BG 2



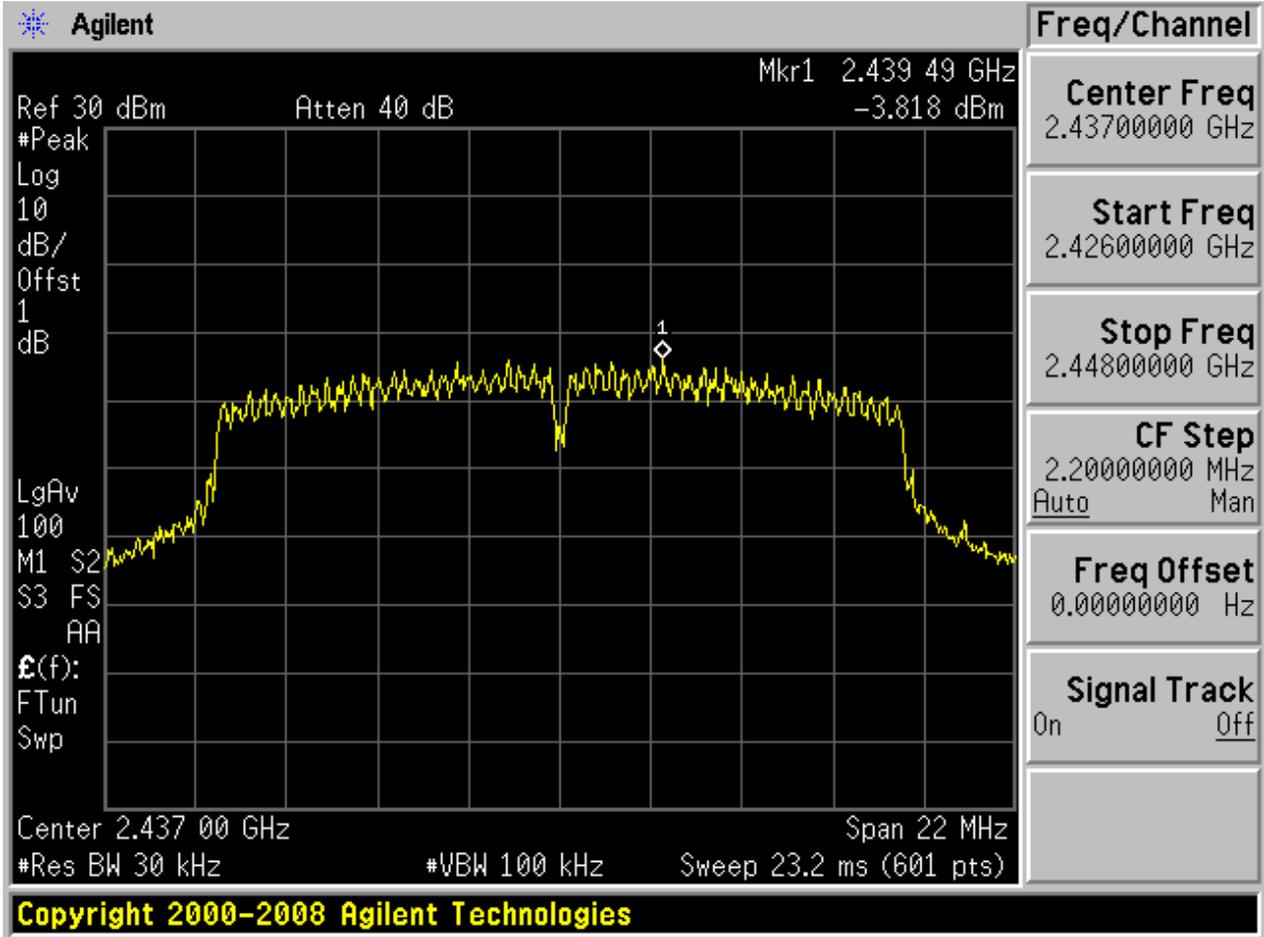


2.9 11G_M@BG 1



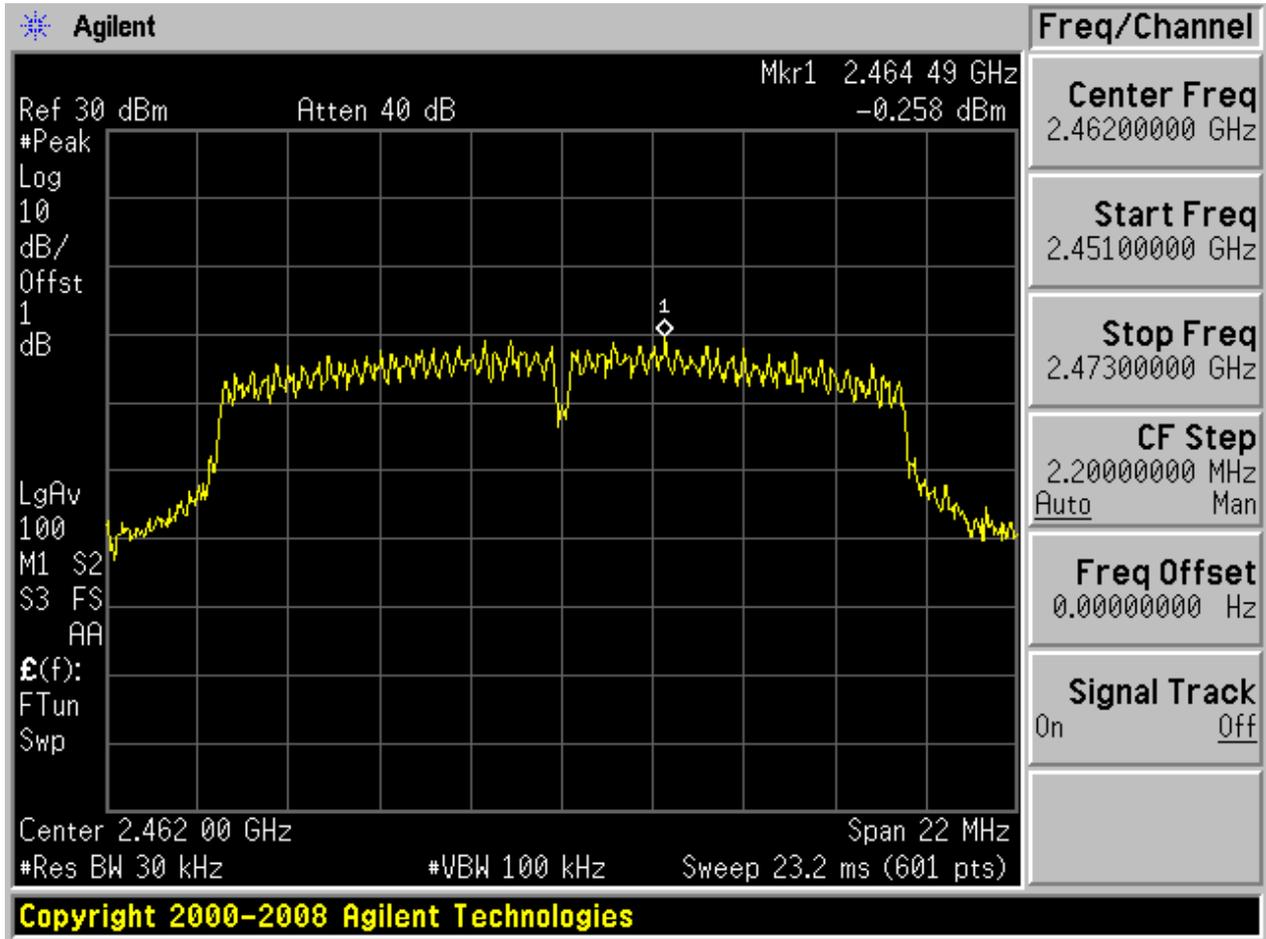


2.10 11G_M@BG 2



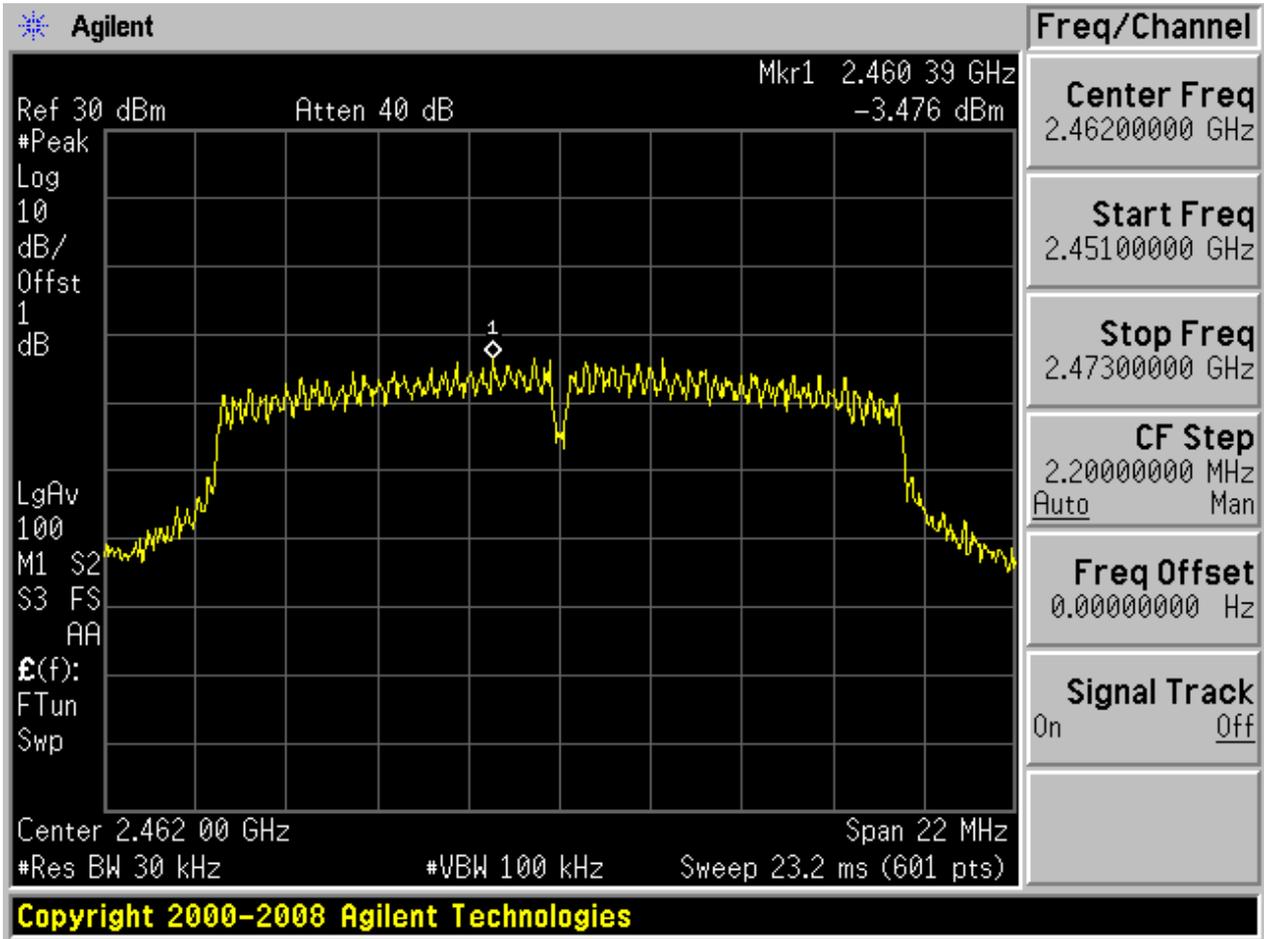


2.11 11G_H@BG 1



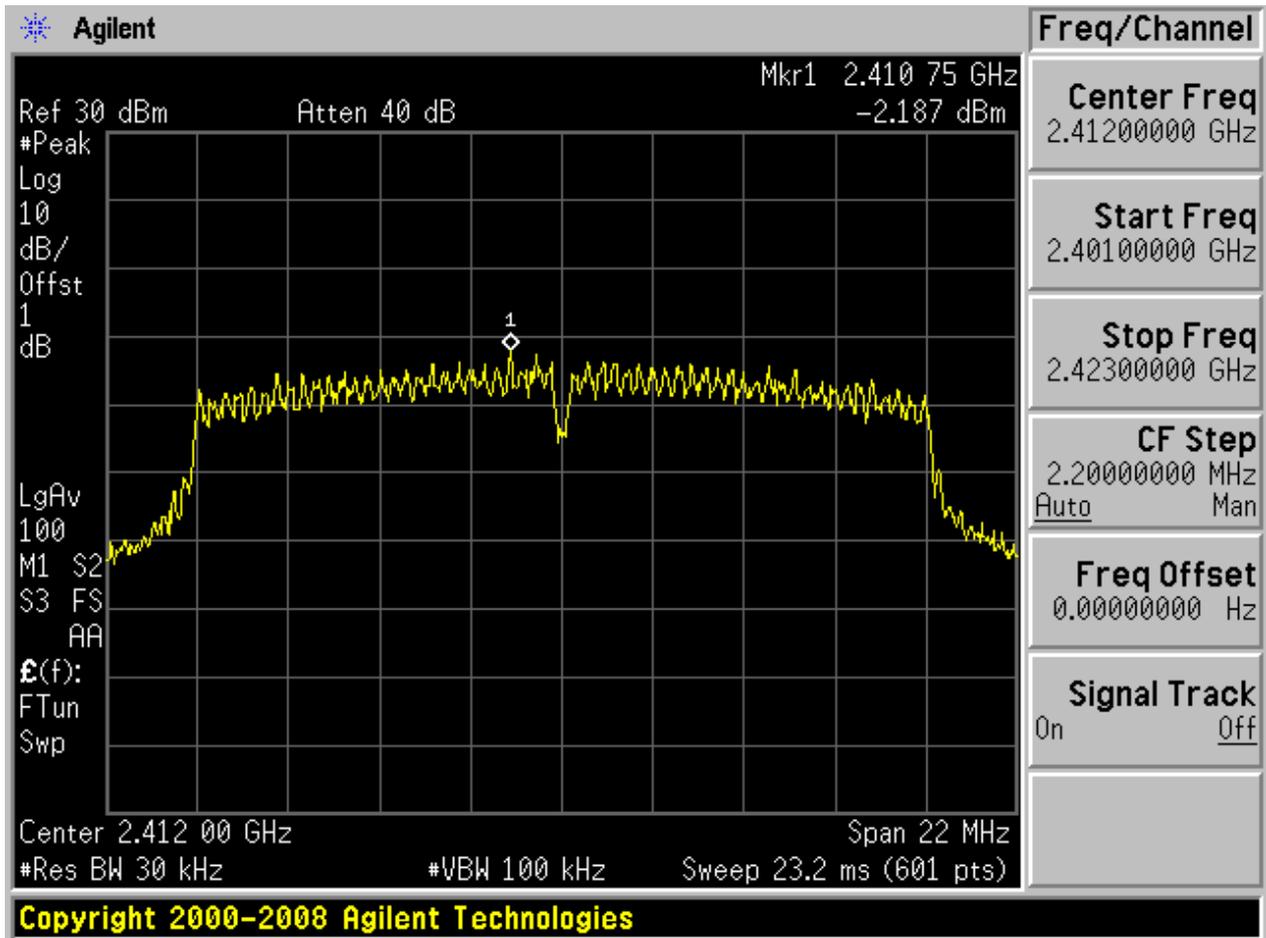


2.12 11G_H@BG 2



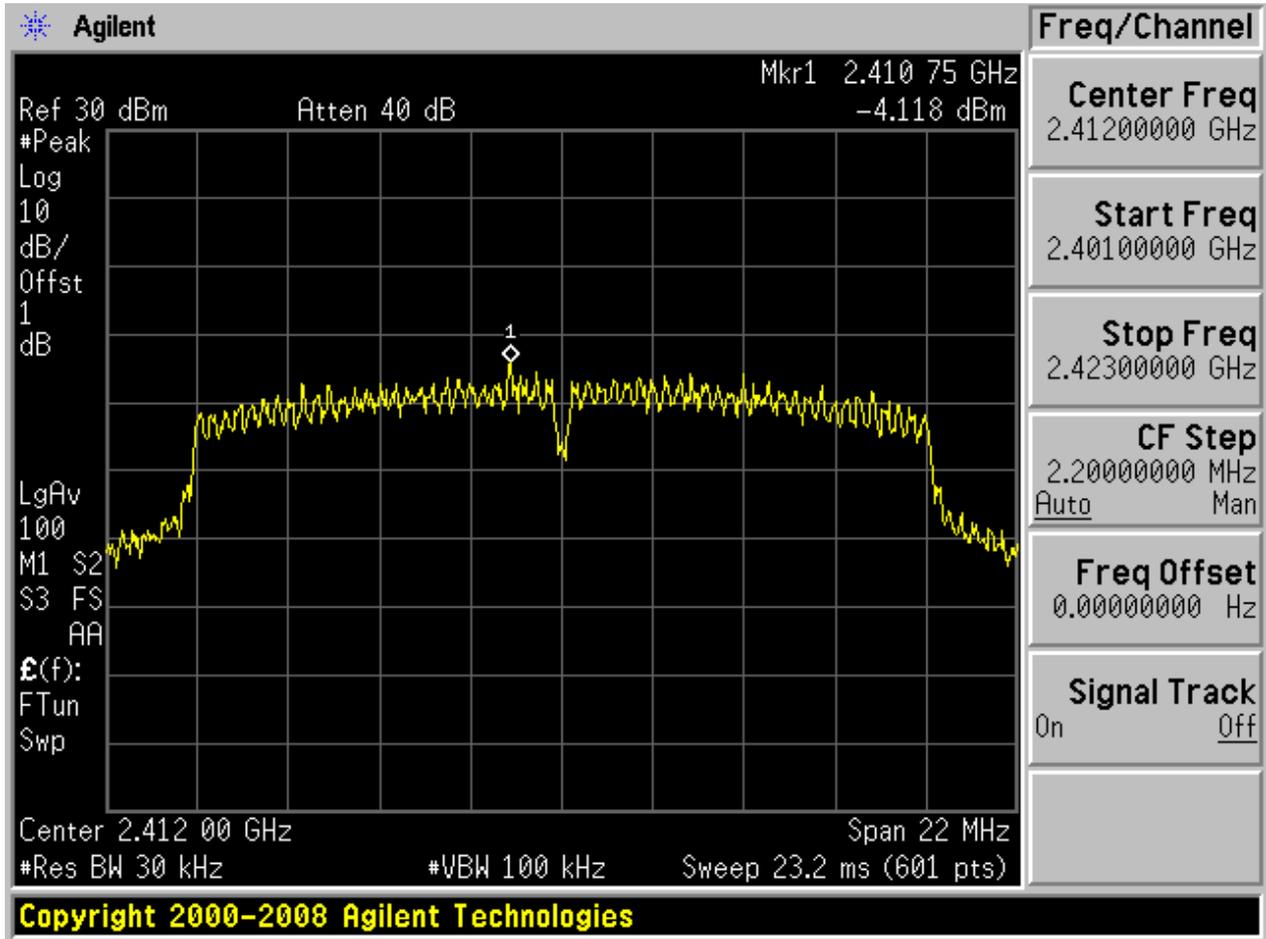


2.13 11N20_L@BG 1



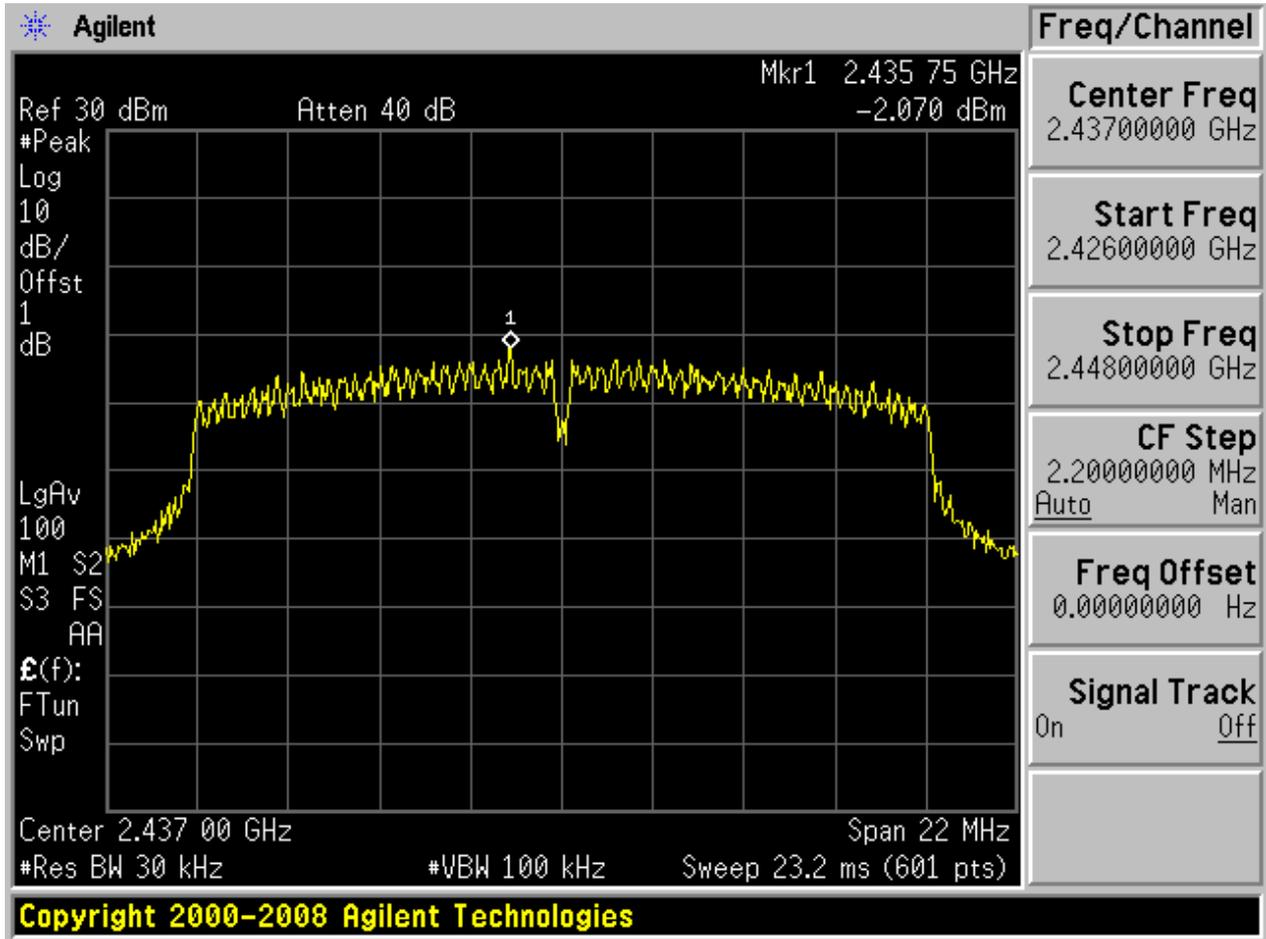


2.14 11N20_L@BG 2



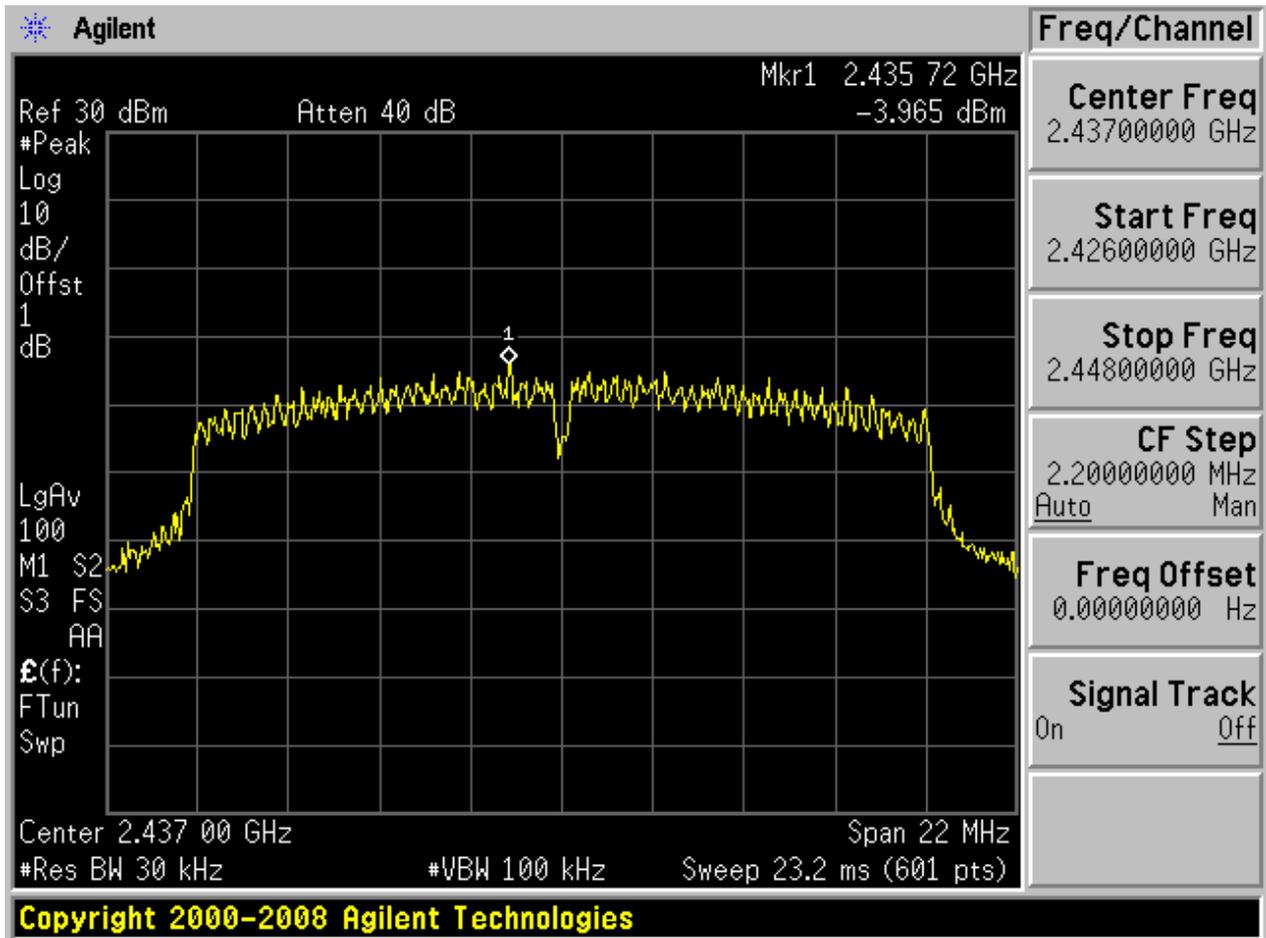


2.15 11N20_M@BG 1

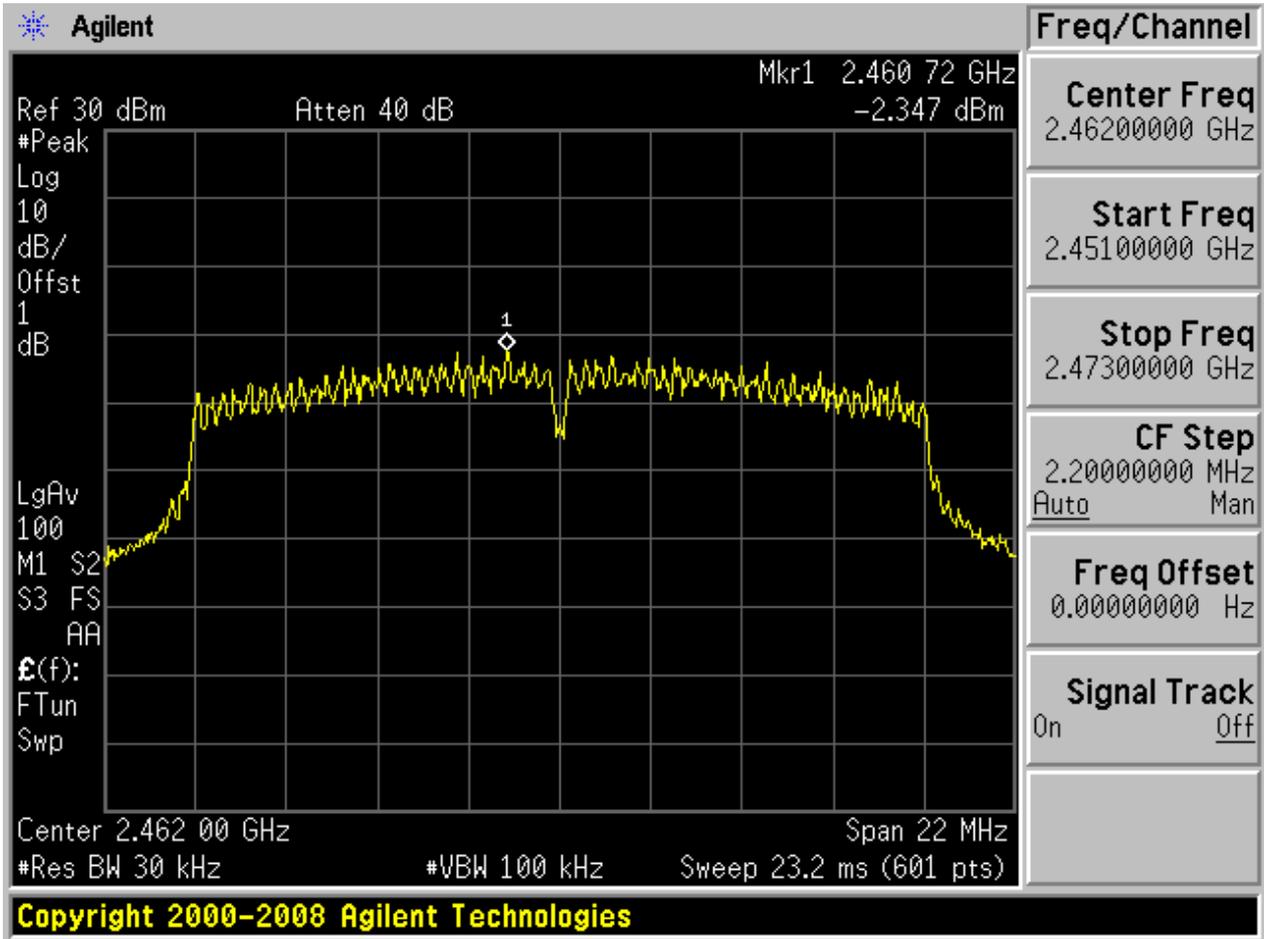




2.16 11N20_M@BG 2

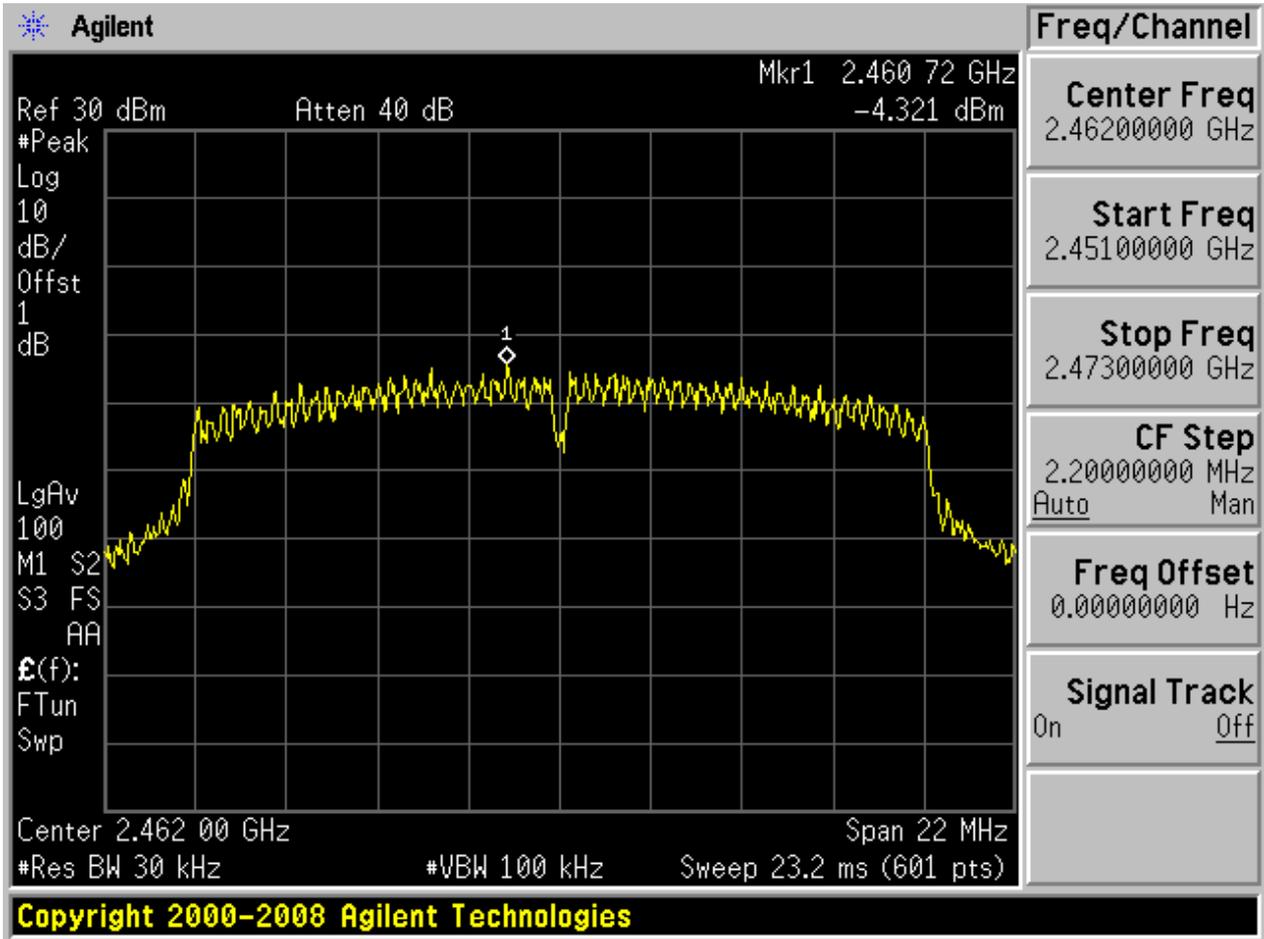


2.17 11N20_H@BG 1



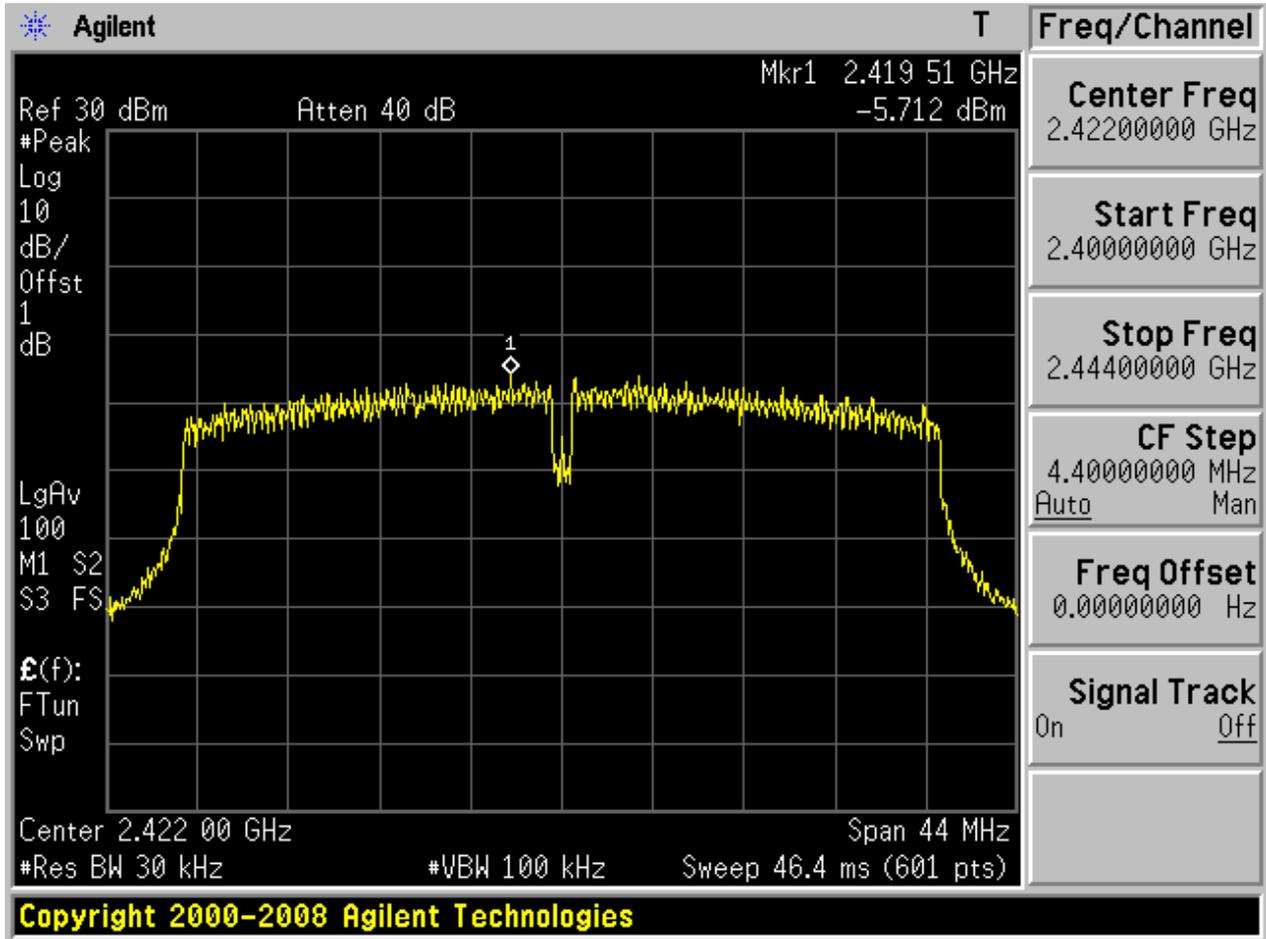


2.18 11N20_H@BG 2



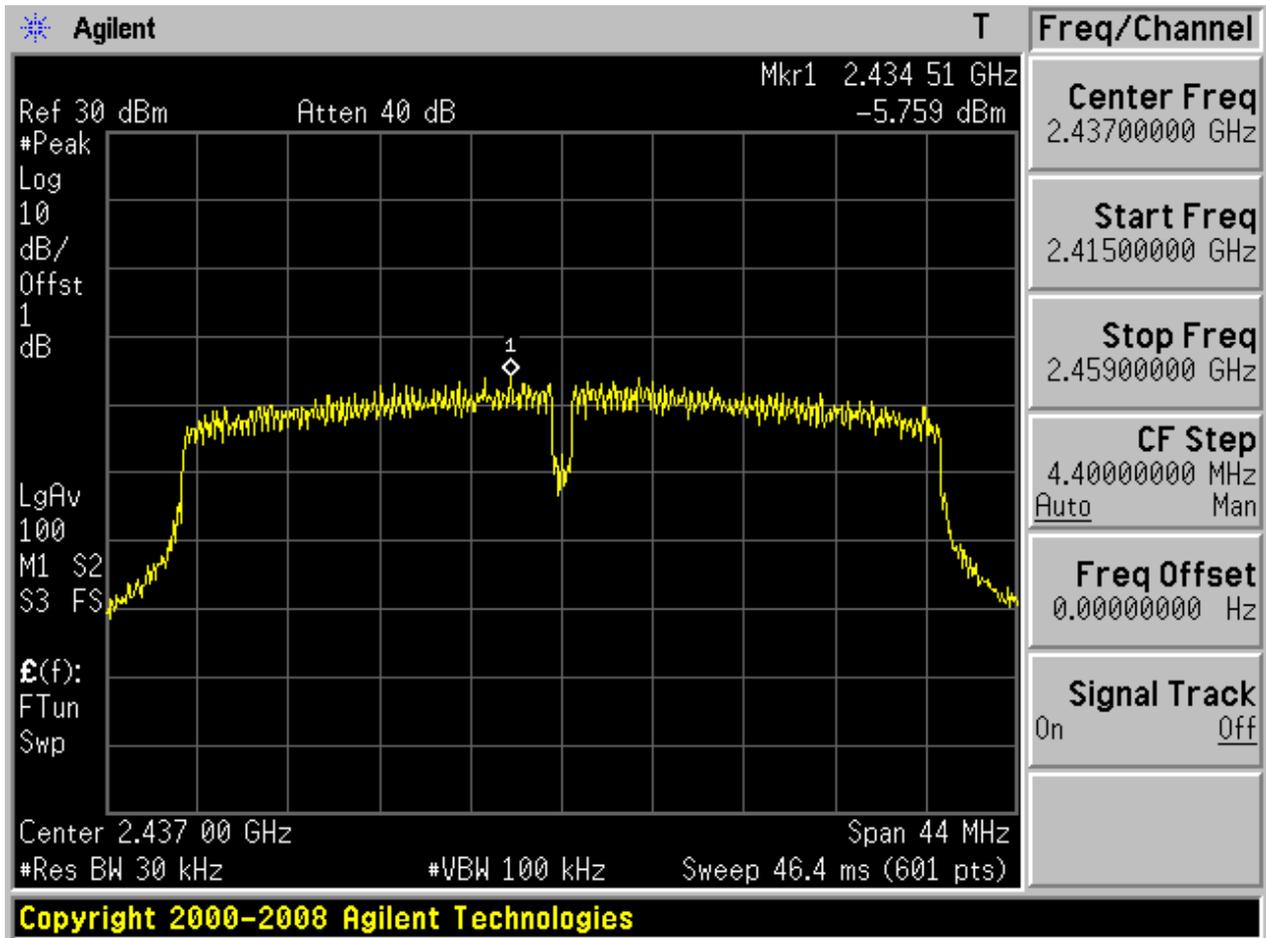


2.19 11N40_L@BG 1



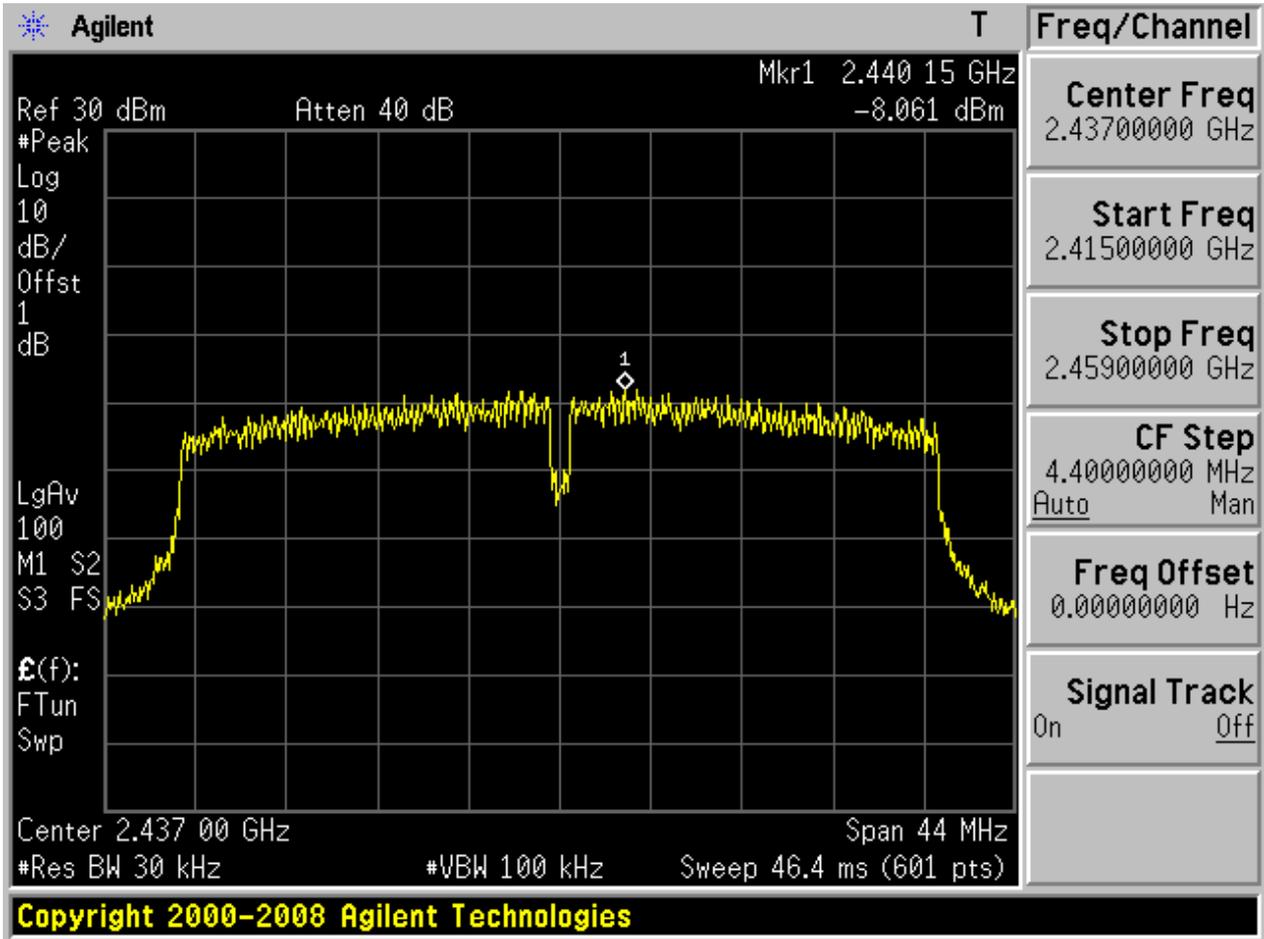


2.21 11N40_M@BG 1



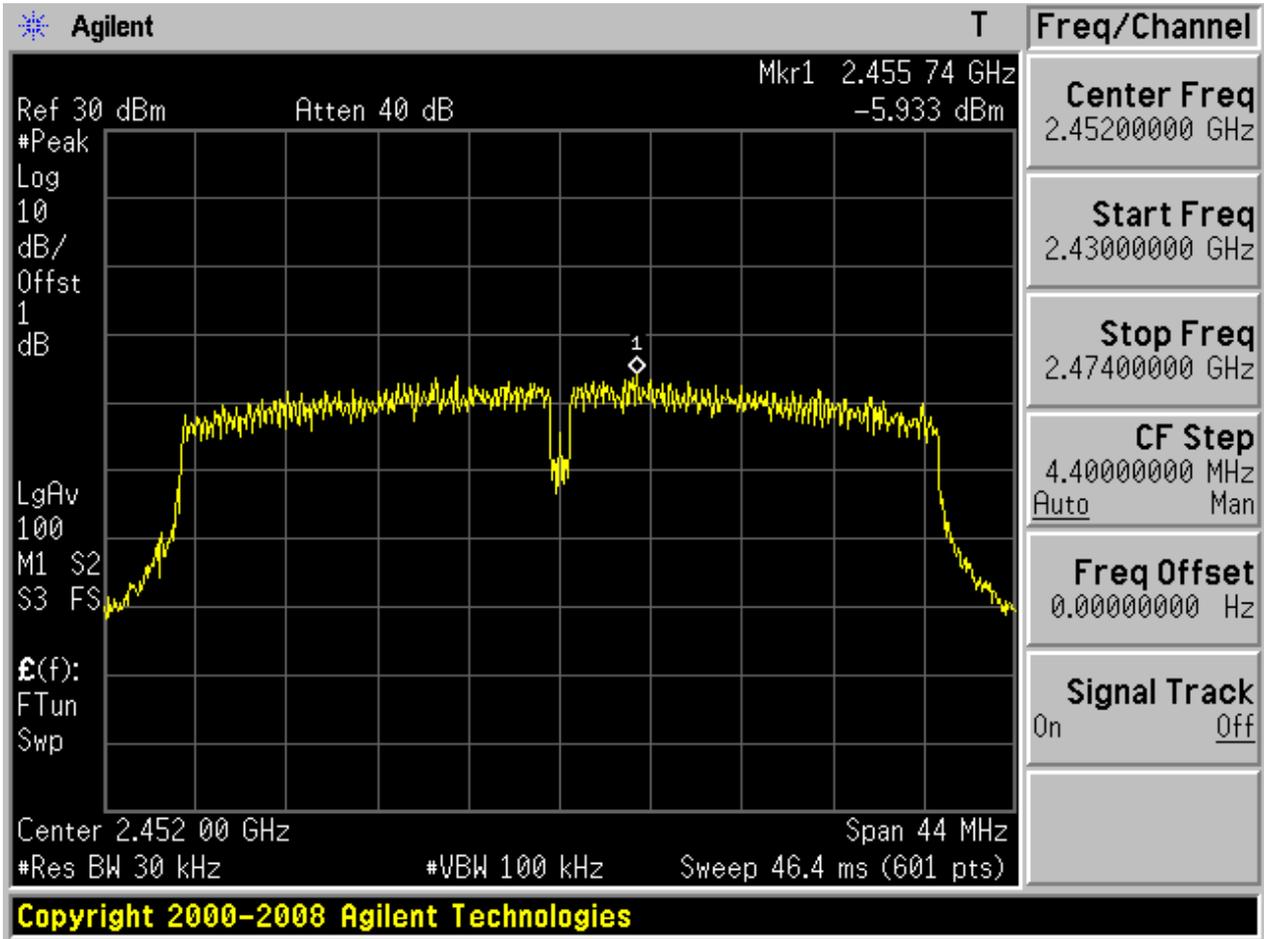


2.22 11N40_M@BG 2



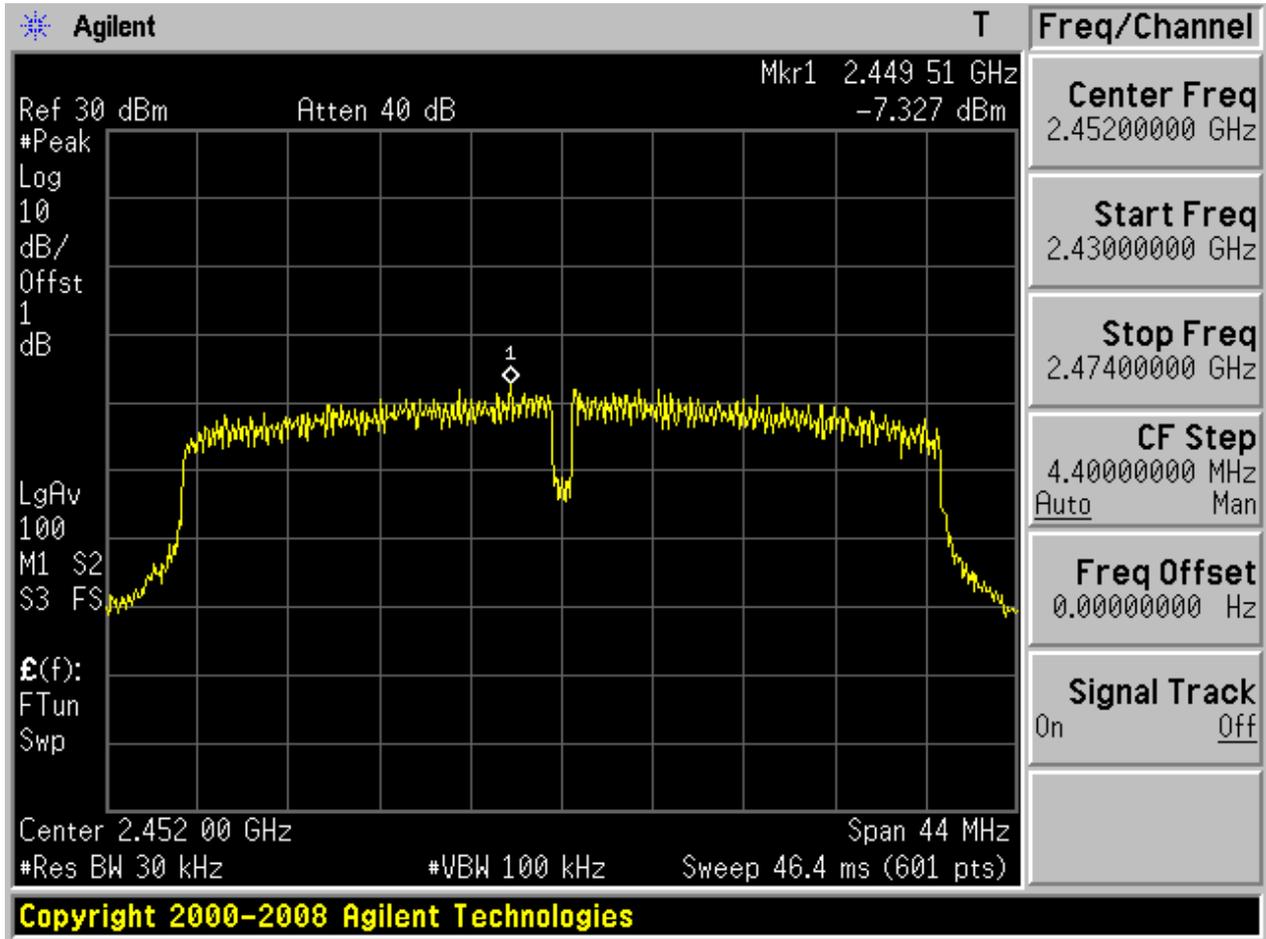


2.23 11N40_H@BG 1





2.24 11N40_H@BG 2





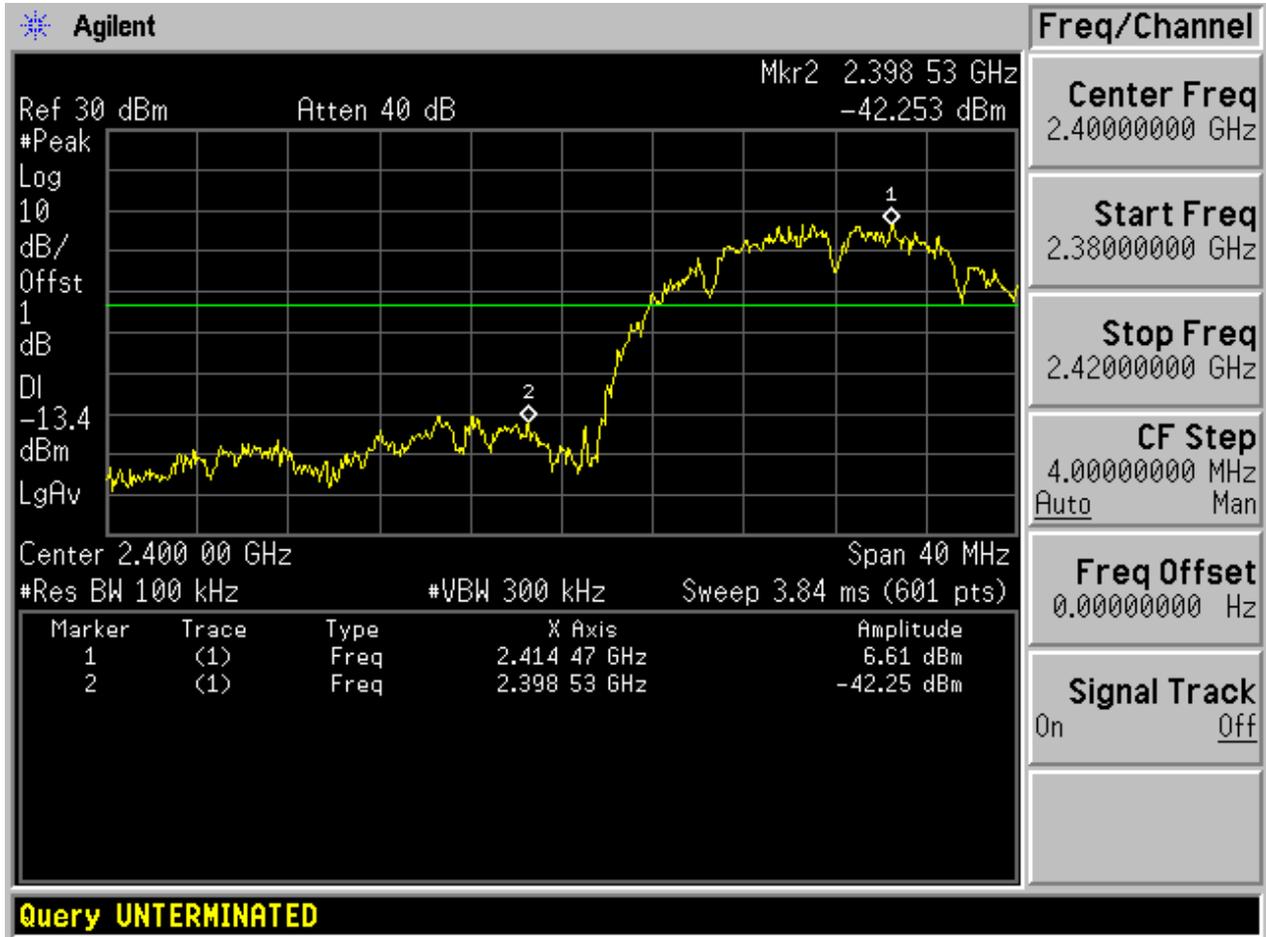
Appendix D: Band Edges Compliance

Part I - Test Results

Test Mode	Test Channel	Frequency[M Hz]	Ant	Carrier Power[dBm]	Max.Spurious Level[dBm]	Verdict
11B	L	2412	BG 1	6.60	-42.25	pass
11B	L	2412	BG 2	5.48	-39.68	pass
11B	H	2462	BG 1	7.73	-37.58	pass
11B	H	2462	BG 2	5.26	-43.07	pass
11G	L	2412	BG 1	2.19	-26.14	pass
11G	L	2412	BG 2	1.65	-29.53	pass
11G	H	2462	BG 1	0.81	-26.93	pass
11G	H	2462	BG 2	-2.37	-29.58	pass
11N20	L	2412	BG 1	-1.94	-39.30	pass
11N20	L	2412	BG 2	-3.50	-29.70	pass
11N20	H	2462	BG 1	-1.26	-34.65	pass
11N20	H	2462	BG 2	-2.06	-30.36	pass
11N40	L	2422	BG 1	-1.84	-39.32	pass
11N40	L	2422	BG 2	-4.35	-44.54	pass
11N40	H	2452	BG 1	-6.83	-36.69	pass
11N40	H	2452	BG 2	-4.92	-38.04	pass

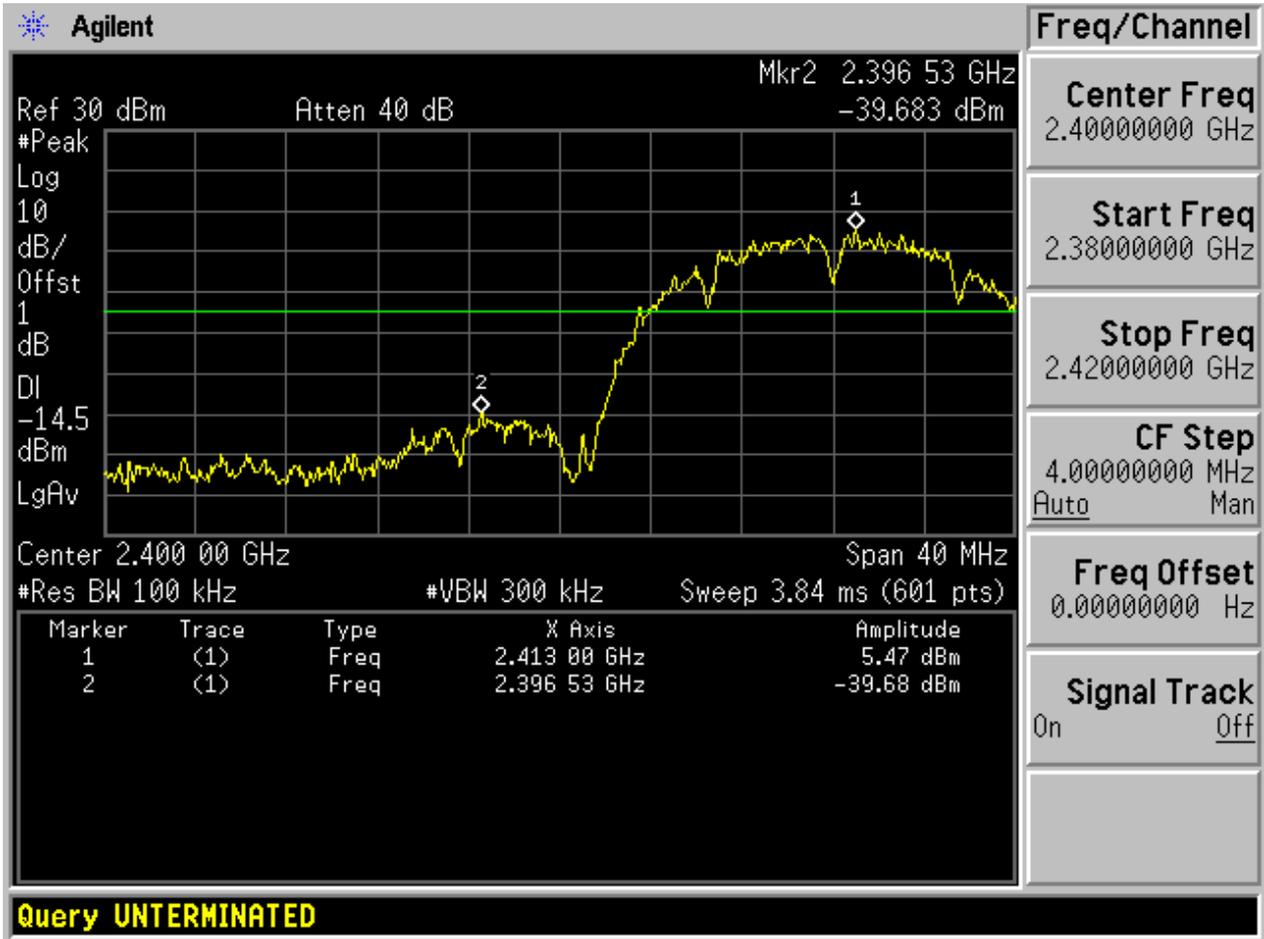
Part II - Test Plots

2.1 11B_L@BG 1

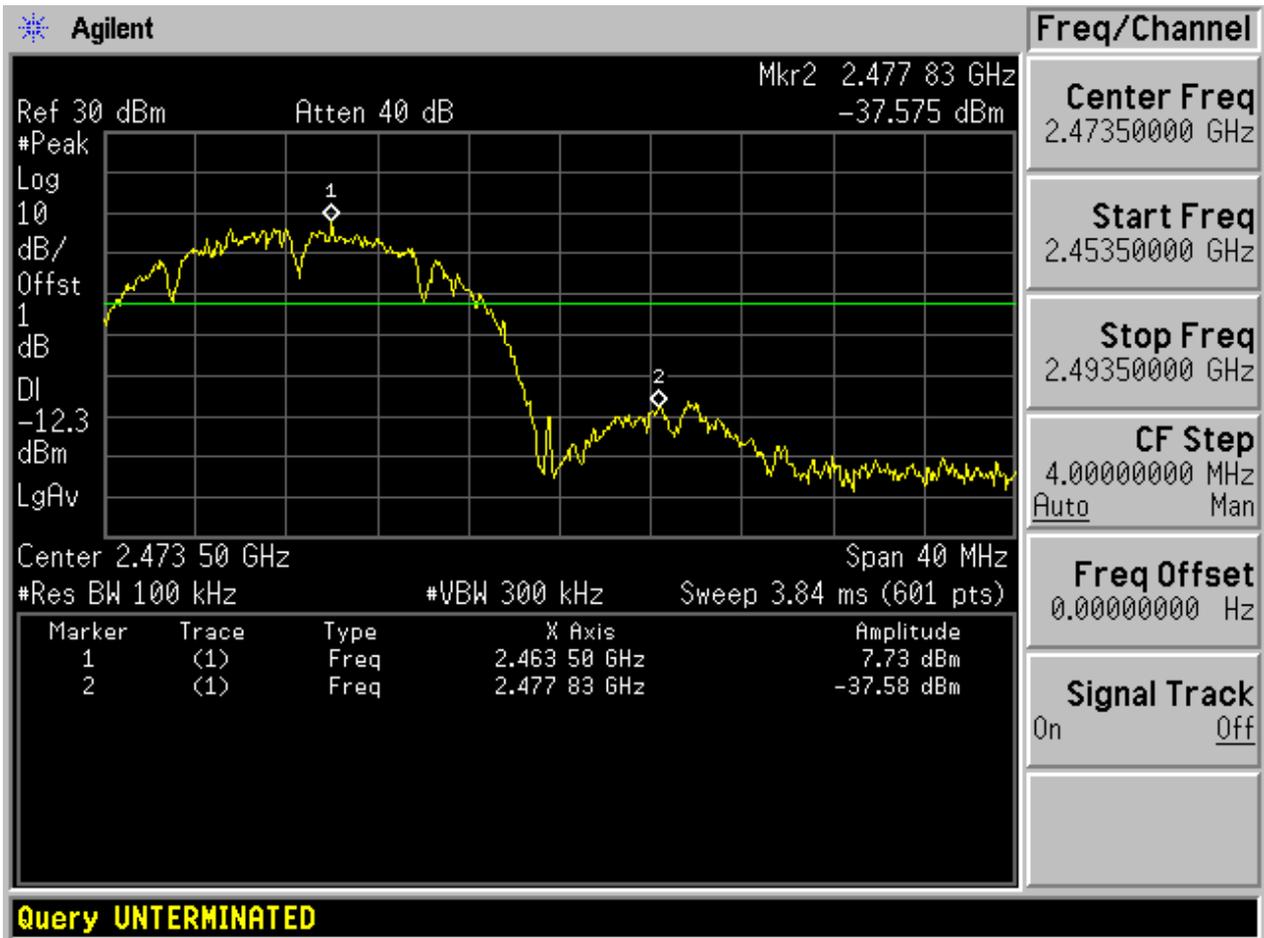




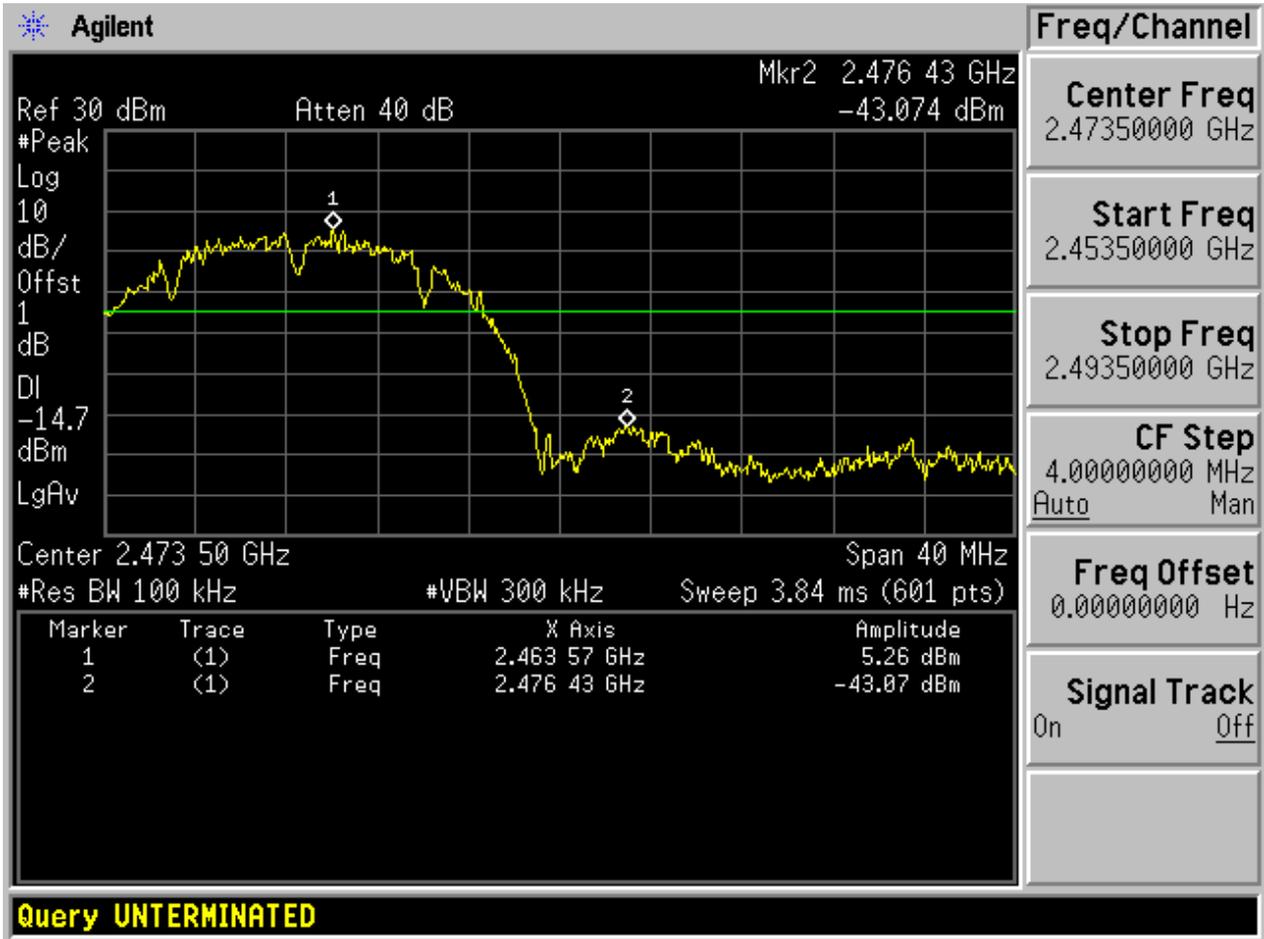
2.2 11B_L@BG 2



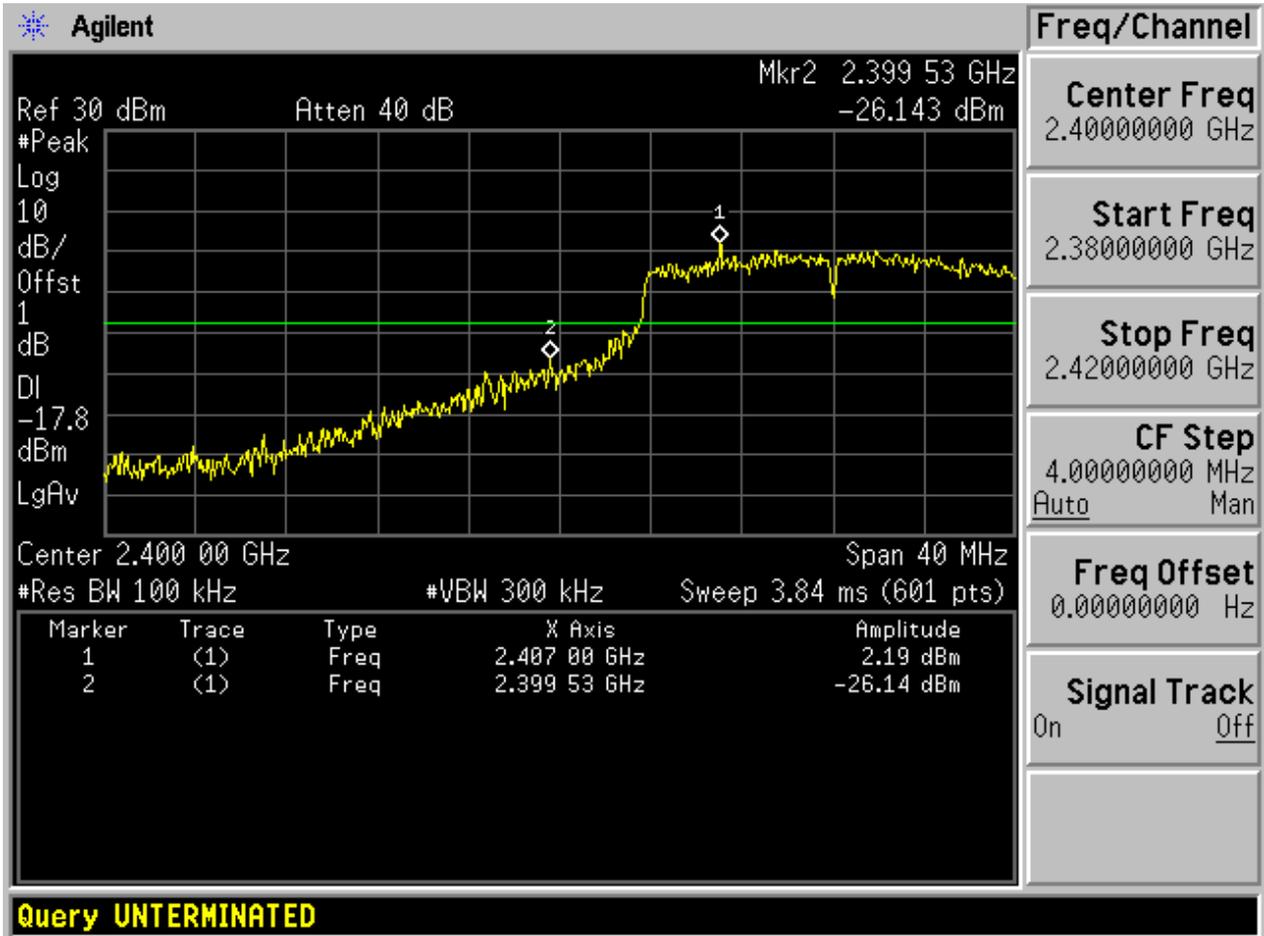
2.3 11B_H@BG 1



2.4 11B_H@BG 2

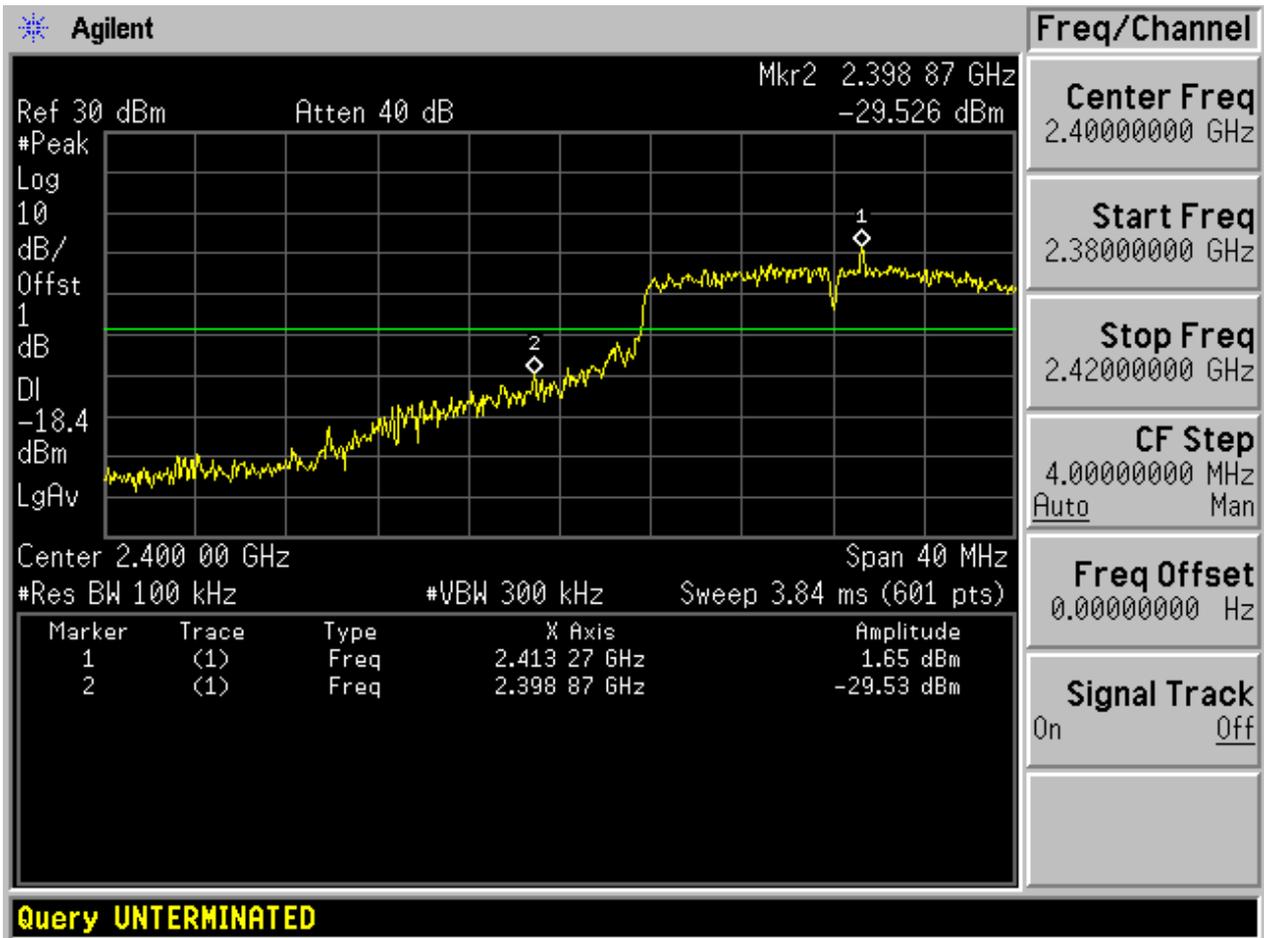


2.5 11G_L@BG 1



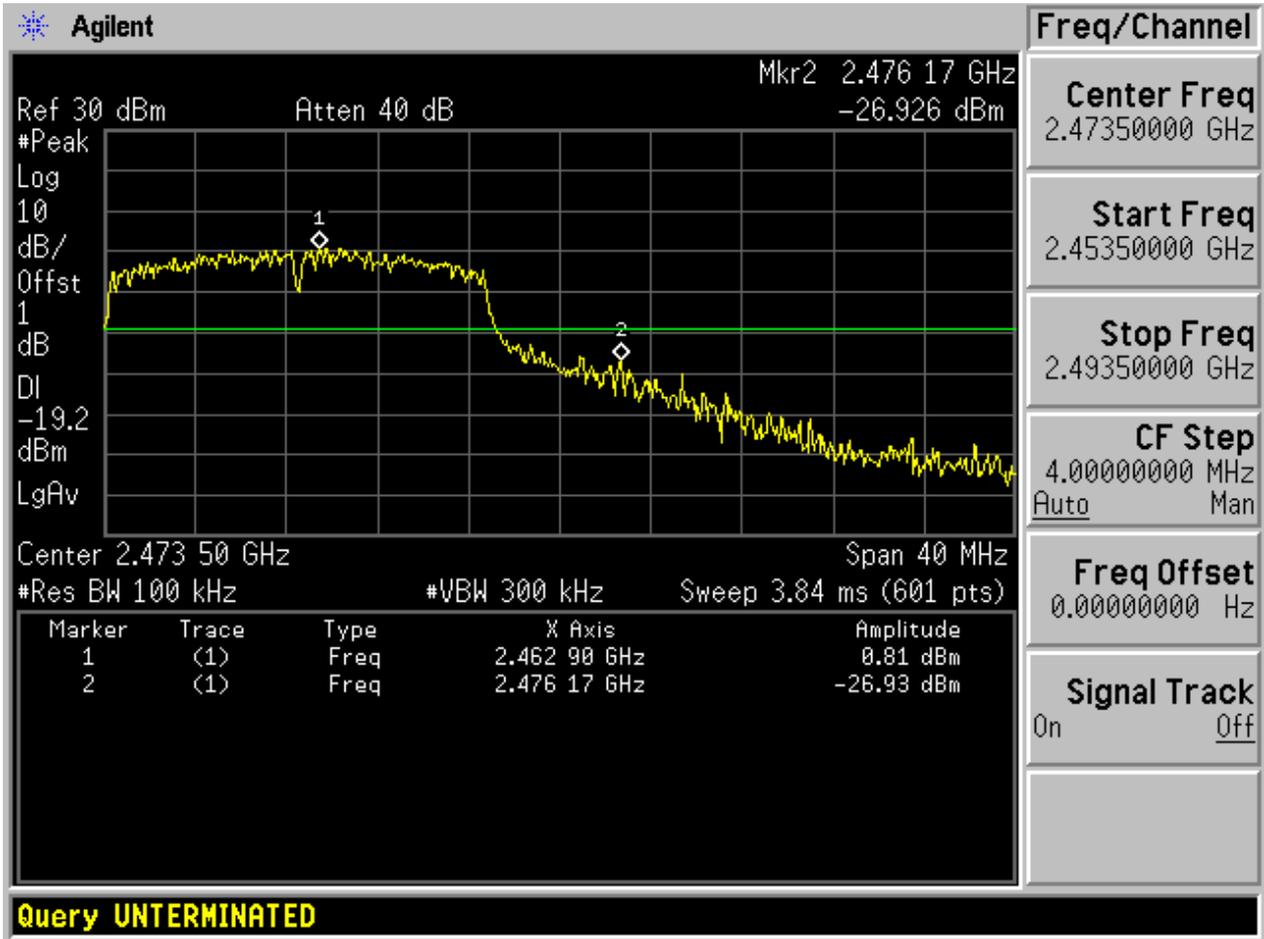


2.6 11G_L@BG 2



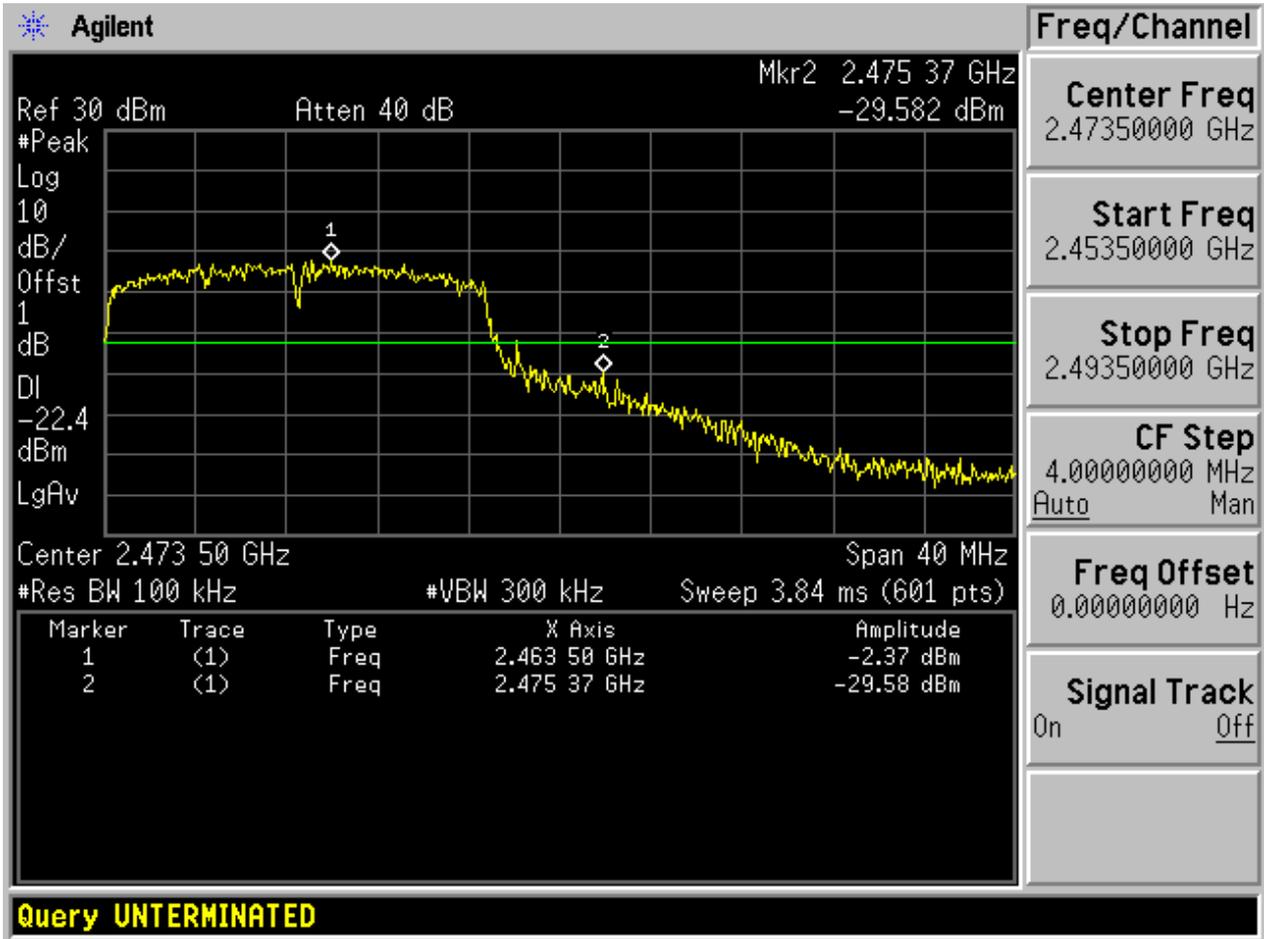


2.7 11G_H@BG 1



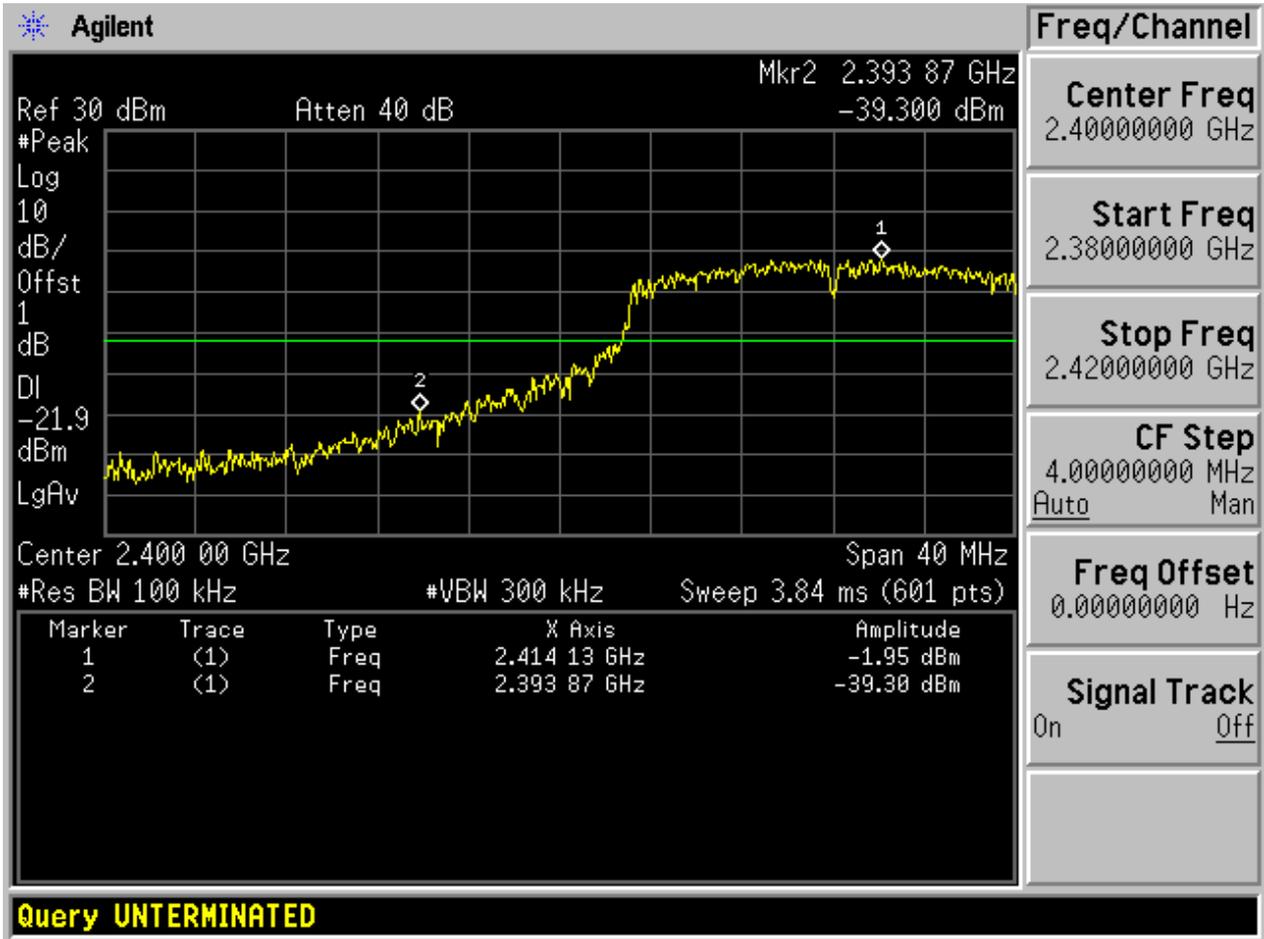


2.8 11G_H@BG 2



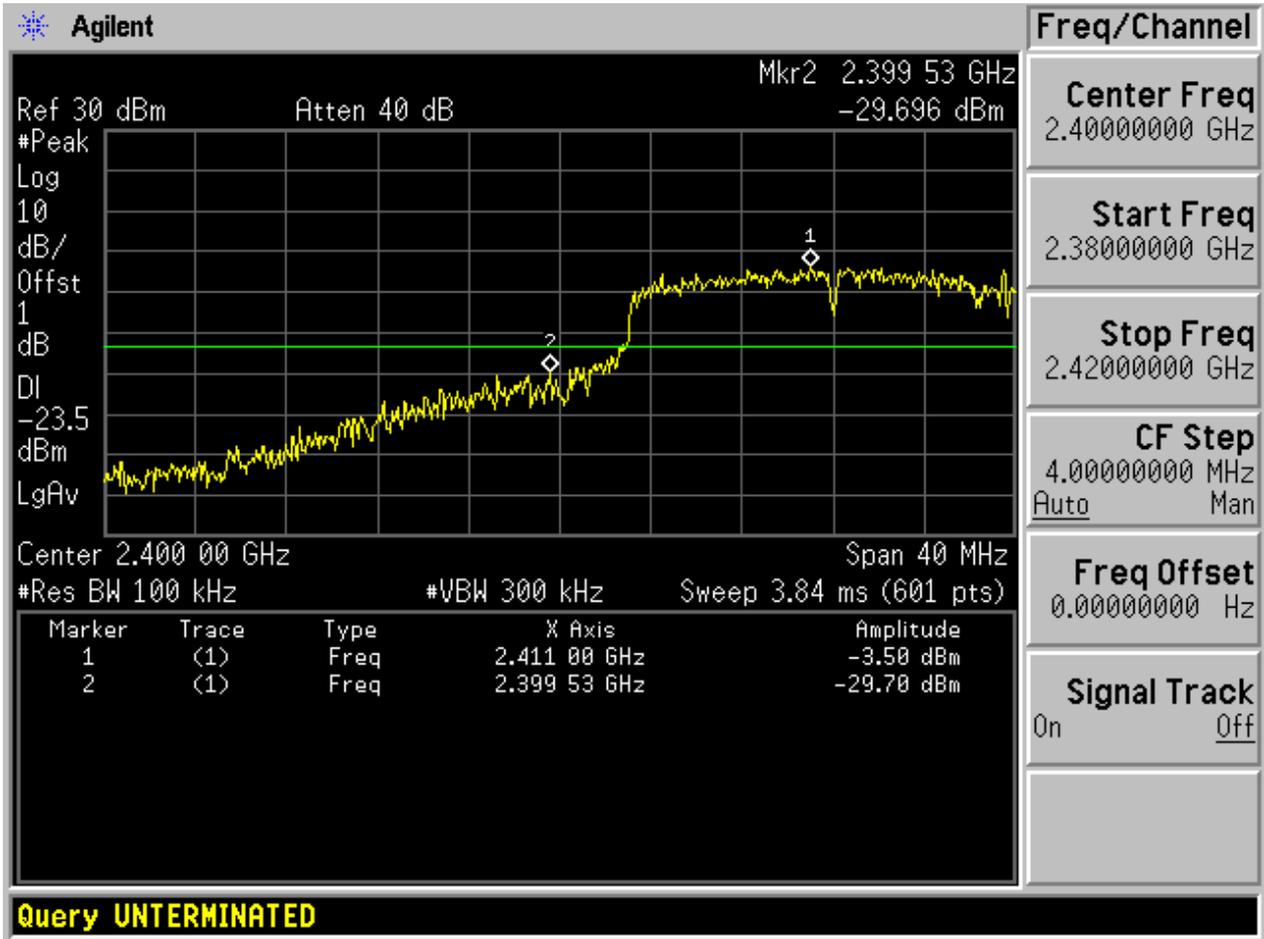


2.9 11N20_L@BG 1



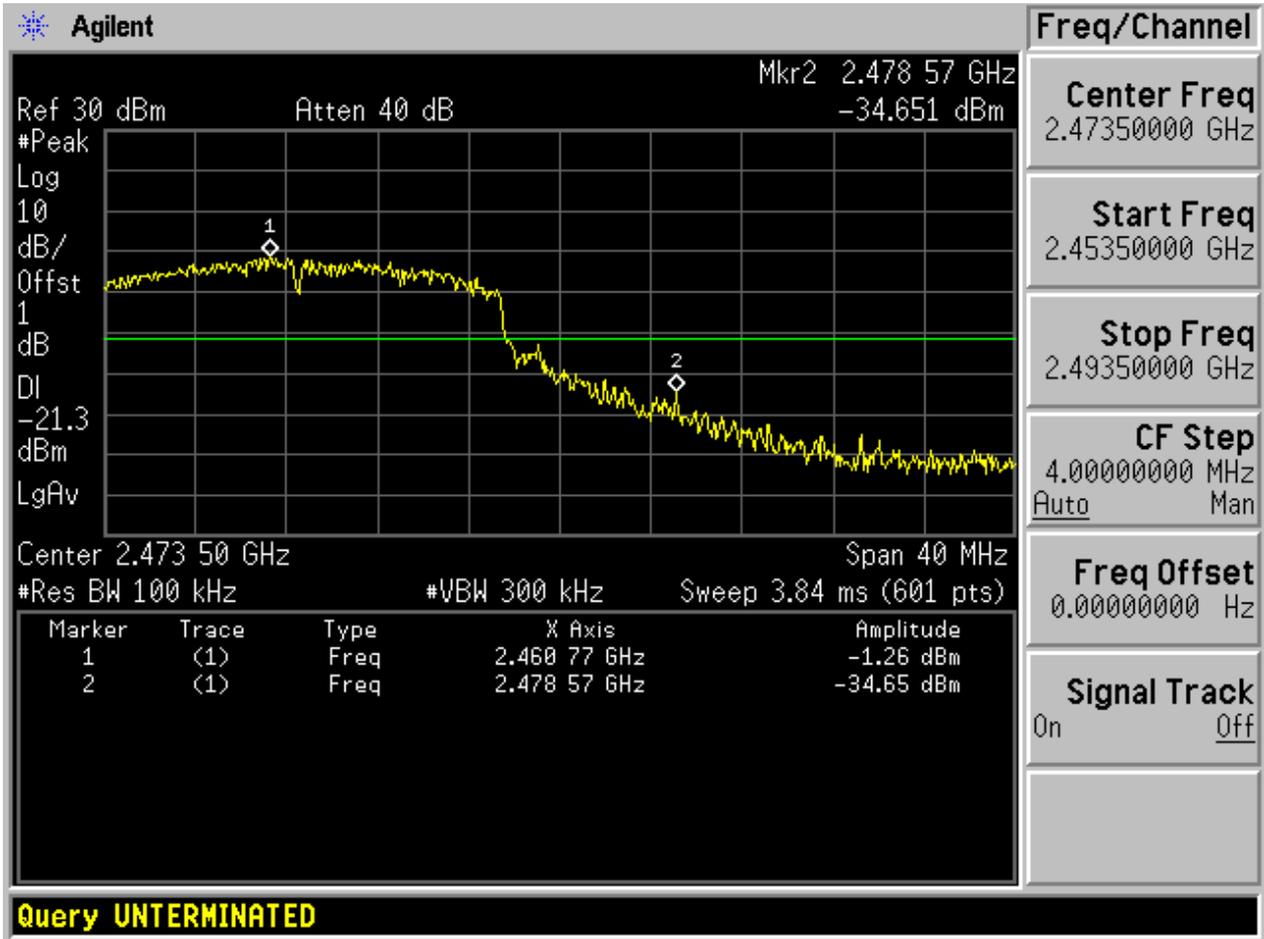


2.10 11N20_L@BG 2





2.11 11N20_H@BG 1



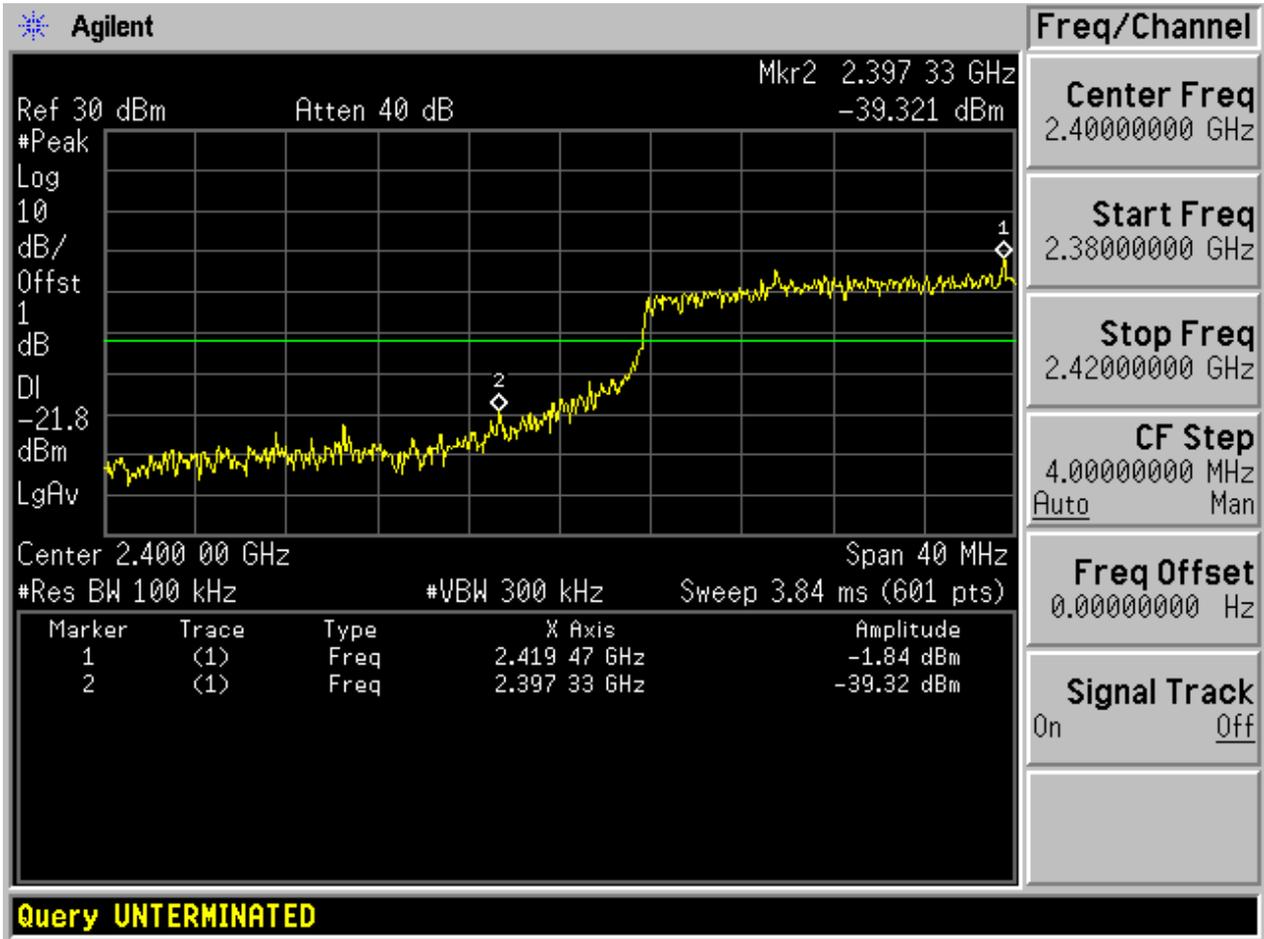


2.12 11N20_H@BG 2



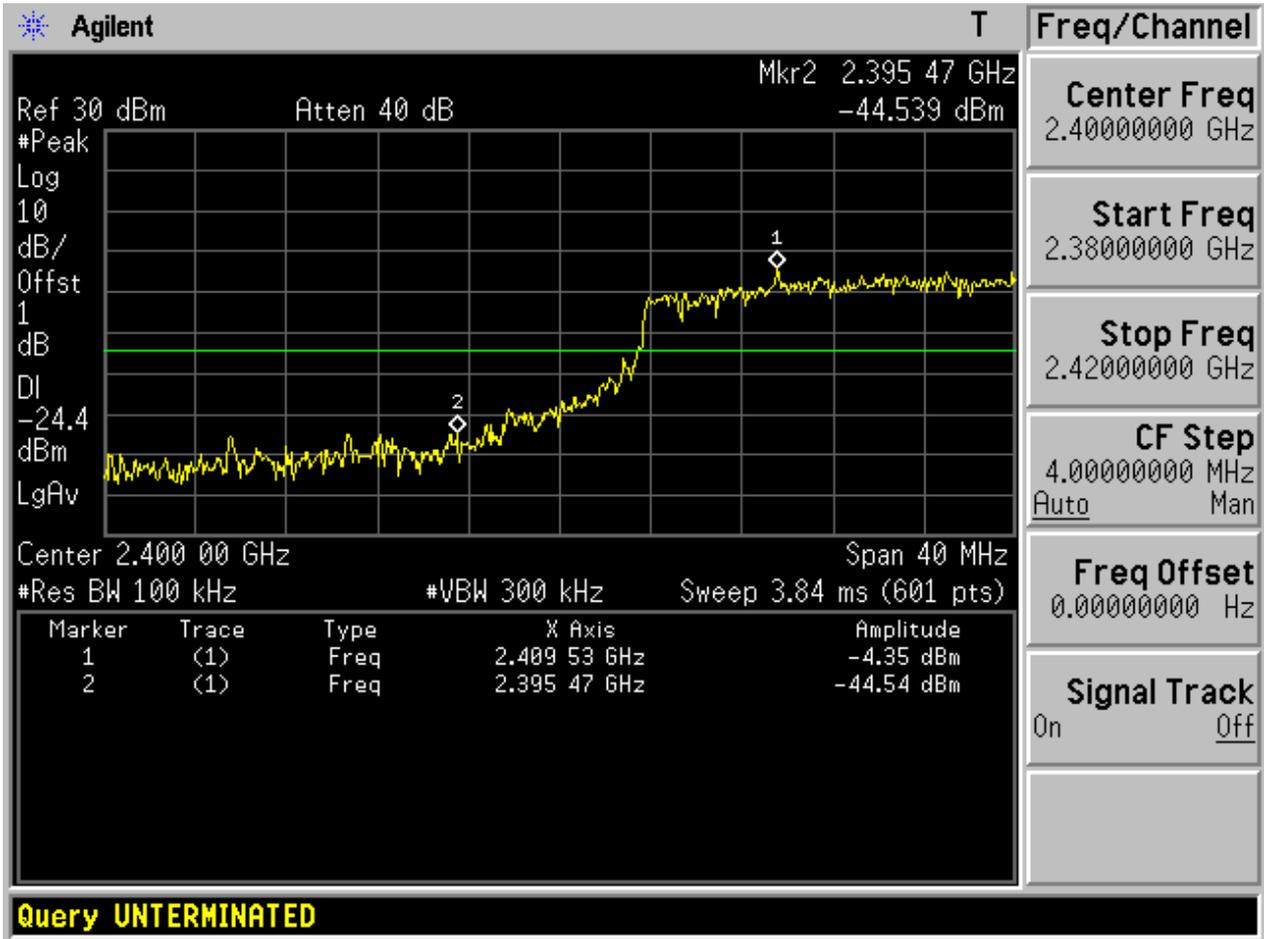


2.13 11N40_L@BG 1



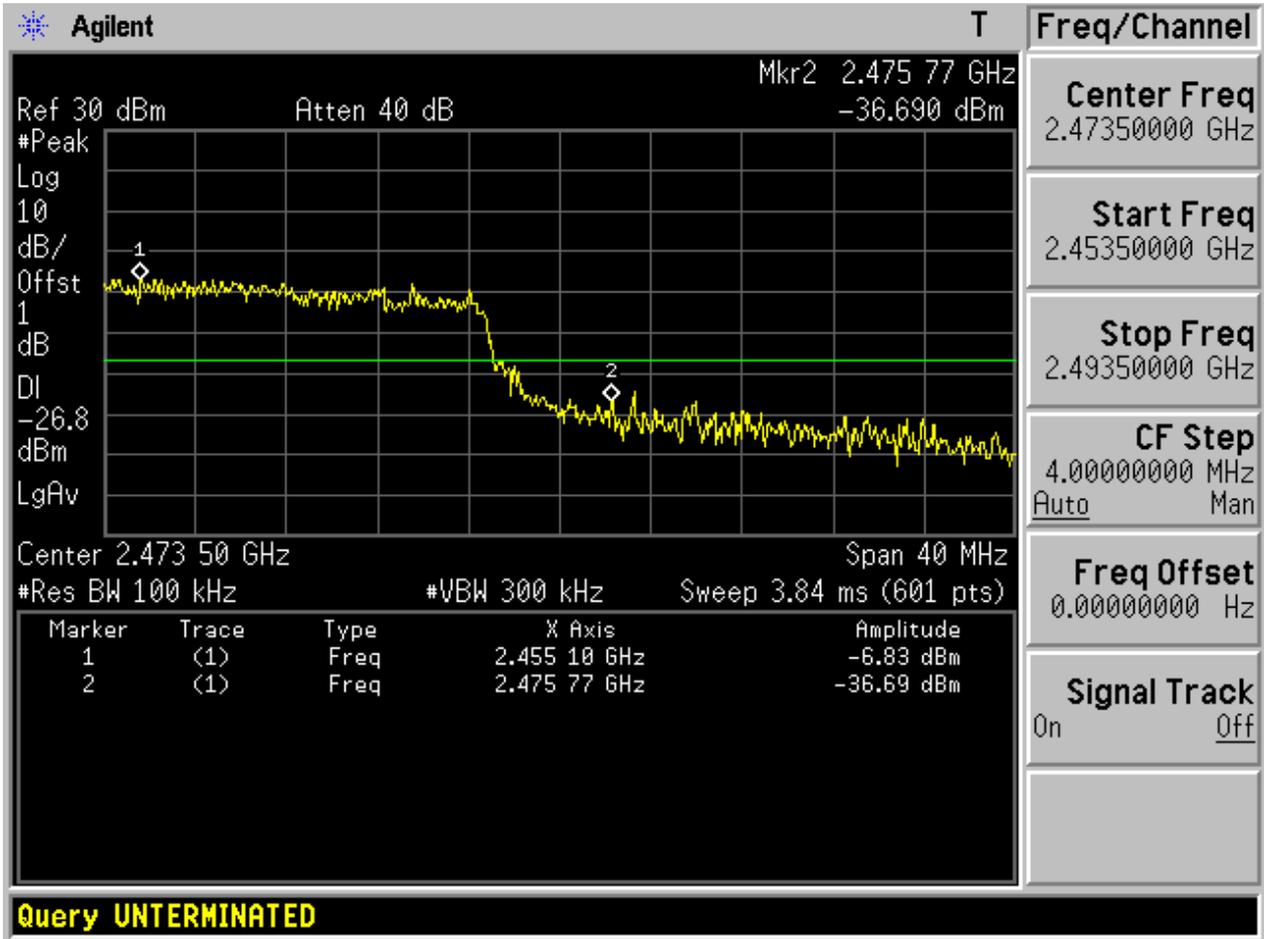


2.14 11N40_L@BG 2

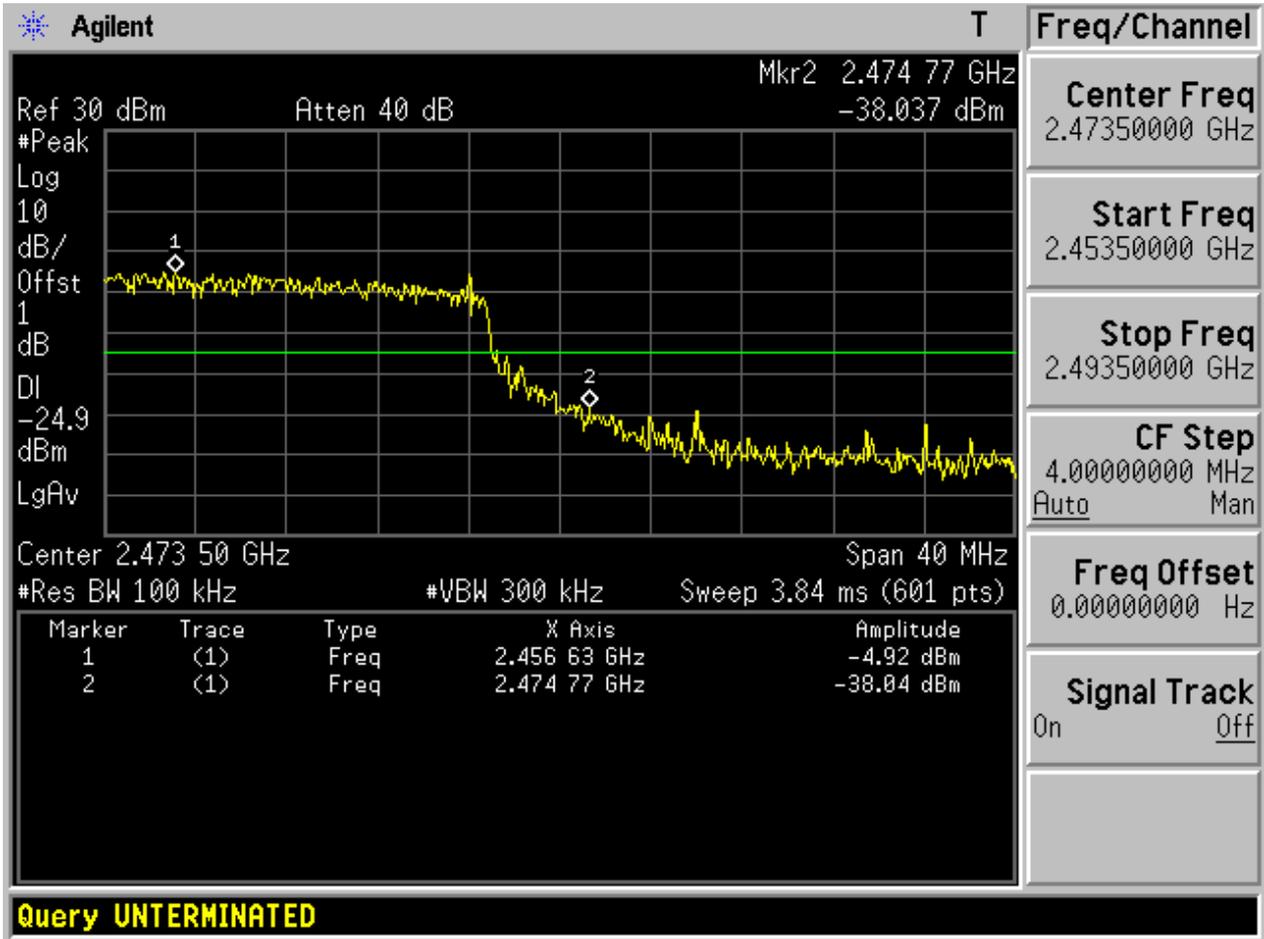




2.15 11N40_H@BG 1



2.16 11N40_H@BG 2



Appendix E: Unwanted Emissions into Non-Restricted Frequency

Bands

In this Appendix, the "Pref", which is used as the reference level, refers to the peak power level in any 100 kHz bandwidth within the fundamental emission, the "Puw" refers to the maximum emission power in 100 kHz band segments outside of the authorized frequency band.

Considering that the higher ratio of RBW to the span for the frequency ranges below 30 MHz makes the results determination be complicated, a narrower RBW other than 100 kHz is used for these ranges. The measured value should add a RBW correction factor (RBWCF) where $RBWCF [dB] = 10 \times \lg(100 [kHz]/\text{narrower RBW [kHz]})$. As to this Appendix, the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

For measurements on smart antenna systems (devices with multiple transmit chains), the test is performed at each chain and used as respective results for each chain, due to the relative-limit requirement.

In the result table, the "< Limit" denotes that "The Puw [dBm] is less than Pref[dBm]-20[dBm], see test plots for detailed".

Part I - Test Results

Test Mode	Test Channel	Frequency[MHz]	Ant	Pref[dBm]	Puw[dBm]	Verdict
11B	B	2412	BG 1	8.36	<limit	pass
11B	B	2412	BG 2	6.44	<limit	pass
11B	M	2437	BG 1	8.58	<limit	pass
11B	M	2437	BG 2	6.74	<limit	pass
11B	T	2462	BG 1	8.58	<limit	pass
11B	T	2462	BG 2	7.00	<limit	pass
11G	B	2412	BG 1	4.16	<limit	pass
11G	B	2412	BG 2	1.55	<limit	pass
11G	M	2437	BG 1	4.40	<limit	pass
11G	M	2437	BG 2	1.38	<limit	pass
11G	T	2462	BG 1	4.37	<limit	pass
11G	T	2462	BG 2	1.72	<limit	pass
11N20	B	2412	BG 1	2.25	<limit	pass
11N20	B	2412	BG 2	0.20	<limit	pass
11N20	M	2437	BG 1	1.80	<limit	pass
11N20	M	2437	BG 2	0.72	<limit	pass
11N20	T	2462	BG 1	2.39	<limit	pass

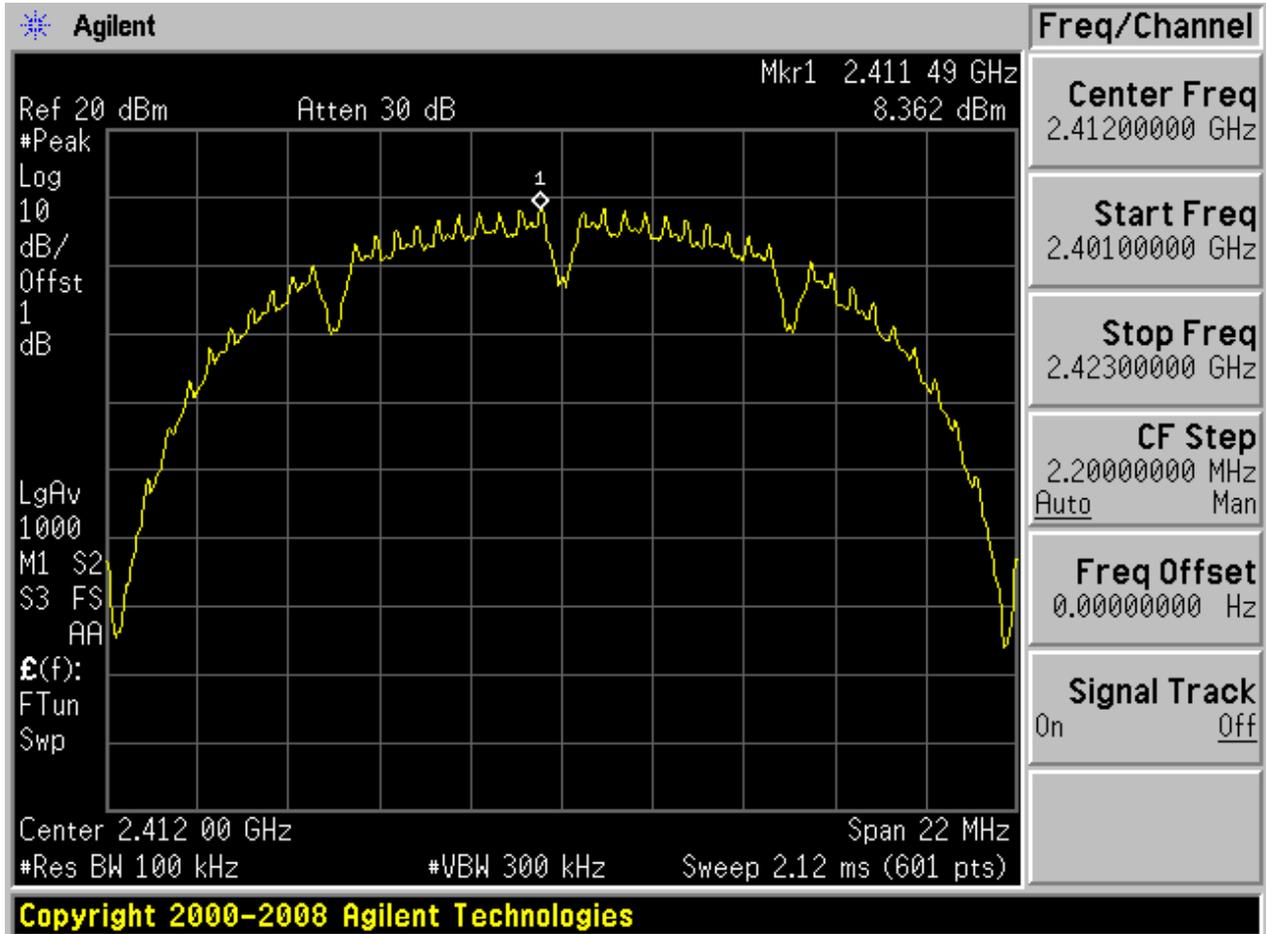


Test Mode	Test Channel	Frequency[MHz]	Ant	Pref[dBm]	Puw[dBm]	Verdict
11N20	T	2462	BG 2	0.82	<limit	pass
11N40	B	2422	BG 1	-1.12	<limit	pass
11N40	B	2422	BG 2	-1.08	<limit	pass
11N40	M	2437	BG 1	-0.98	<limit	pass
11N40	M	2437	BG 2	-2.89	<limit	pass
11N40	T	2452	BG 1	-0.90	<limit	pass
11N40	T	2452	BG 2	-2.72	<limit	pass

Part II - Test Plots

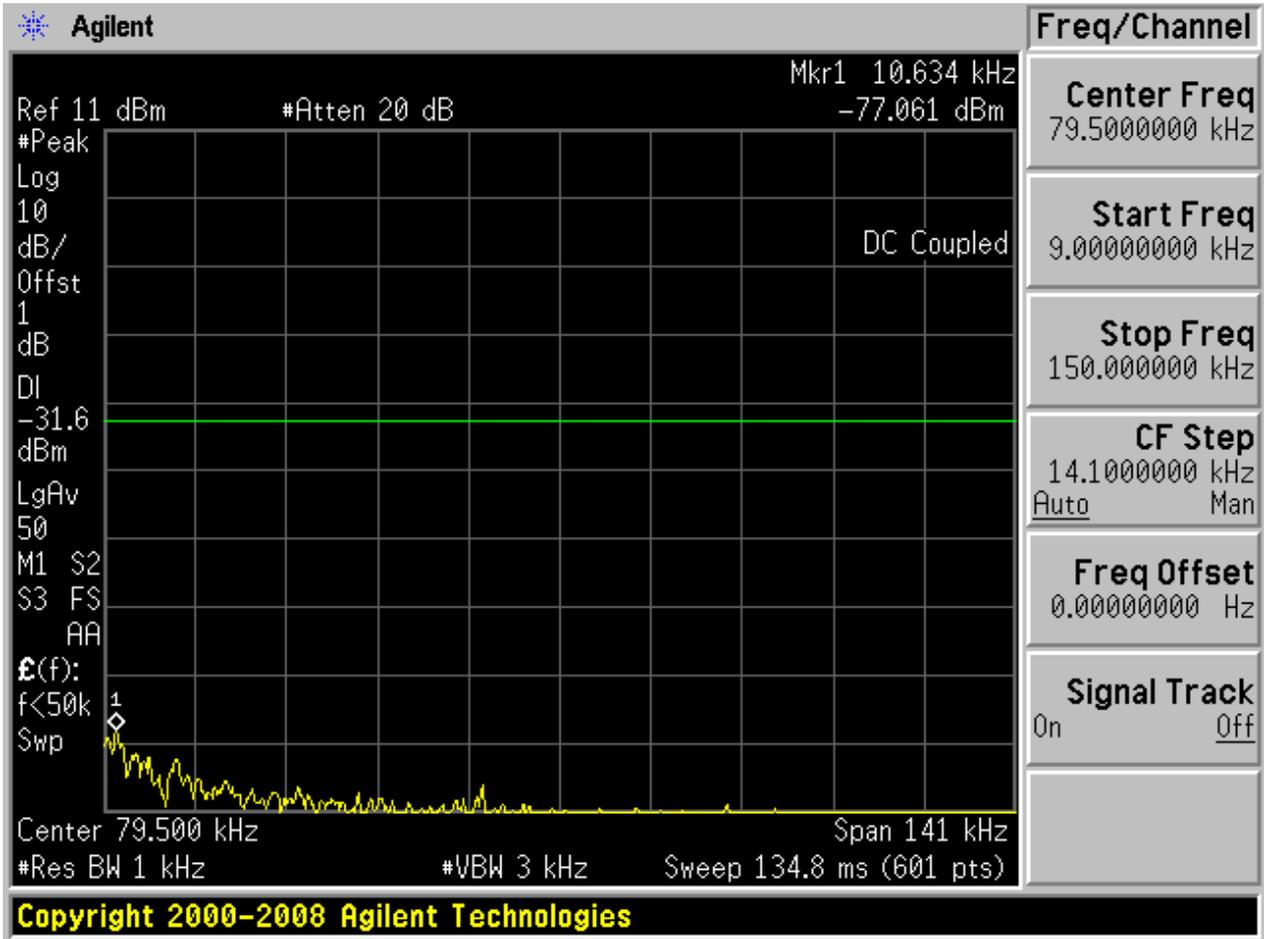
2.1 11B_L@BG 1

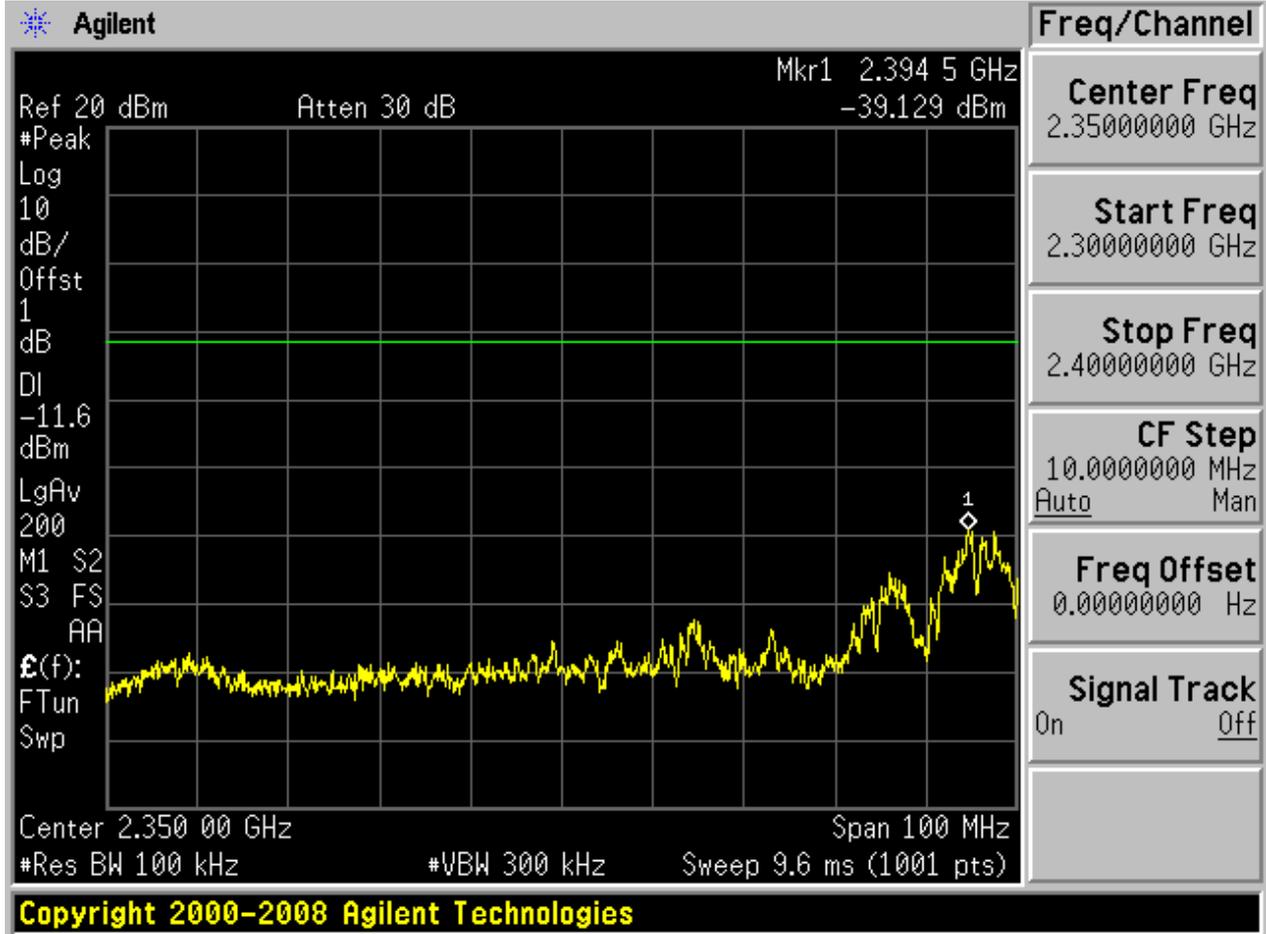
Pref:

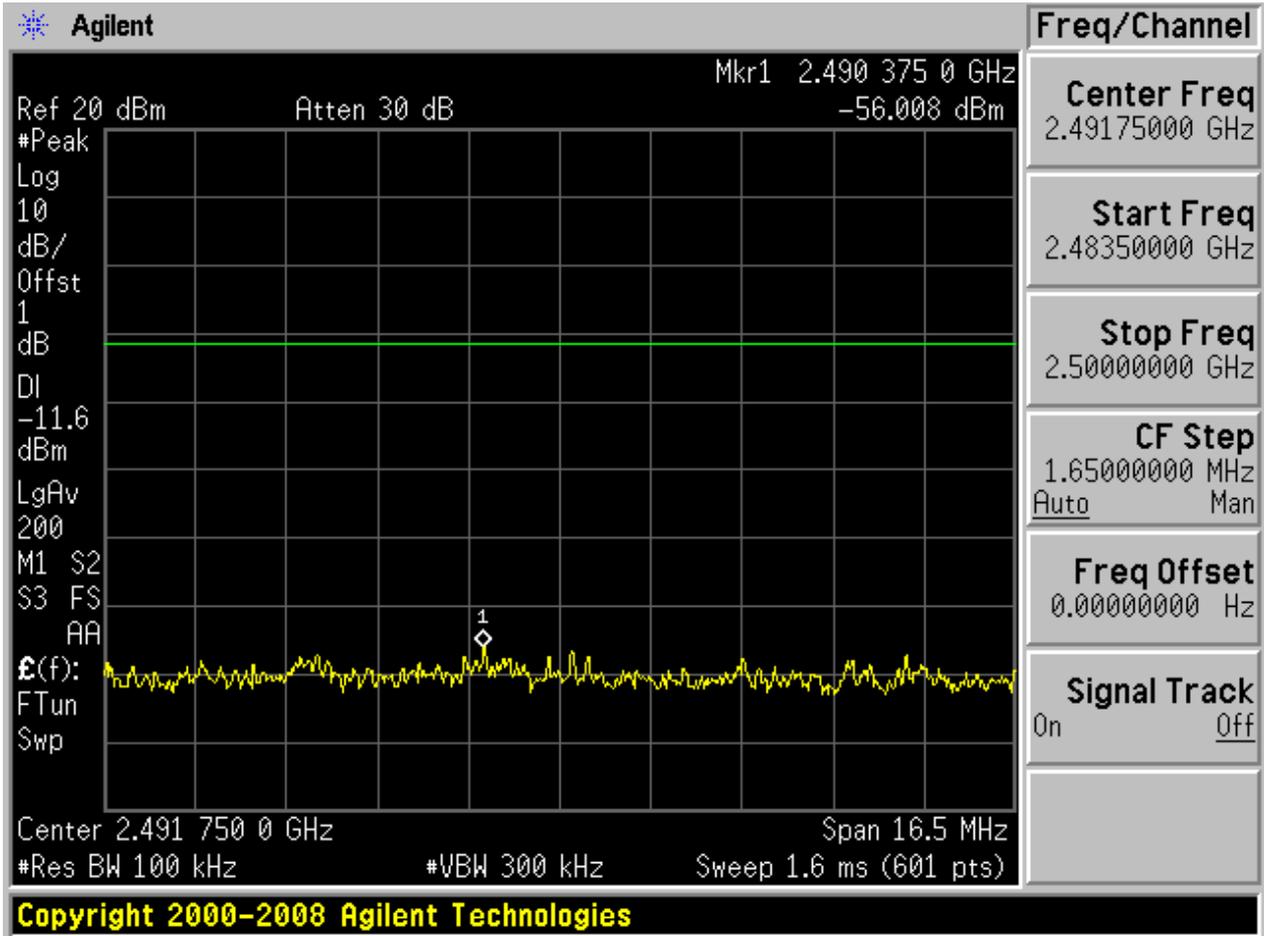


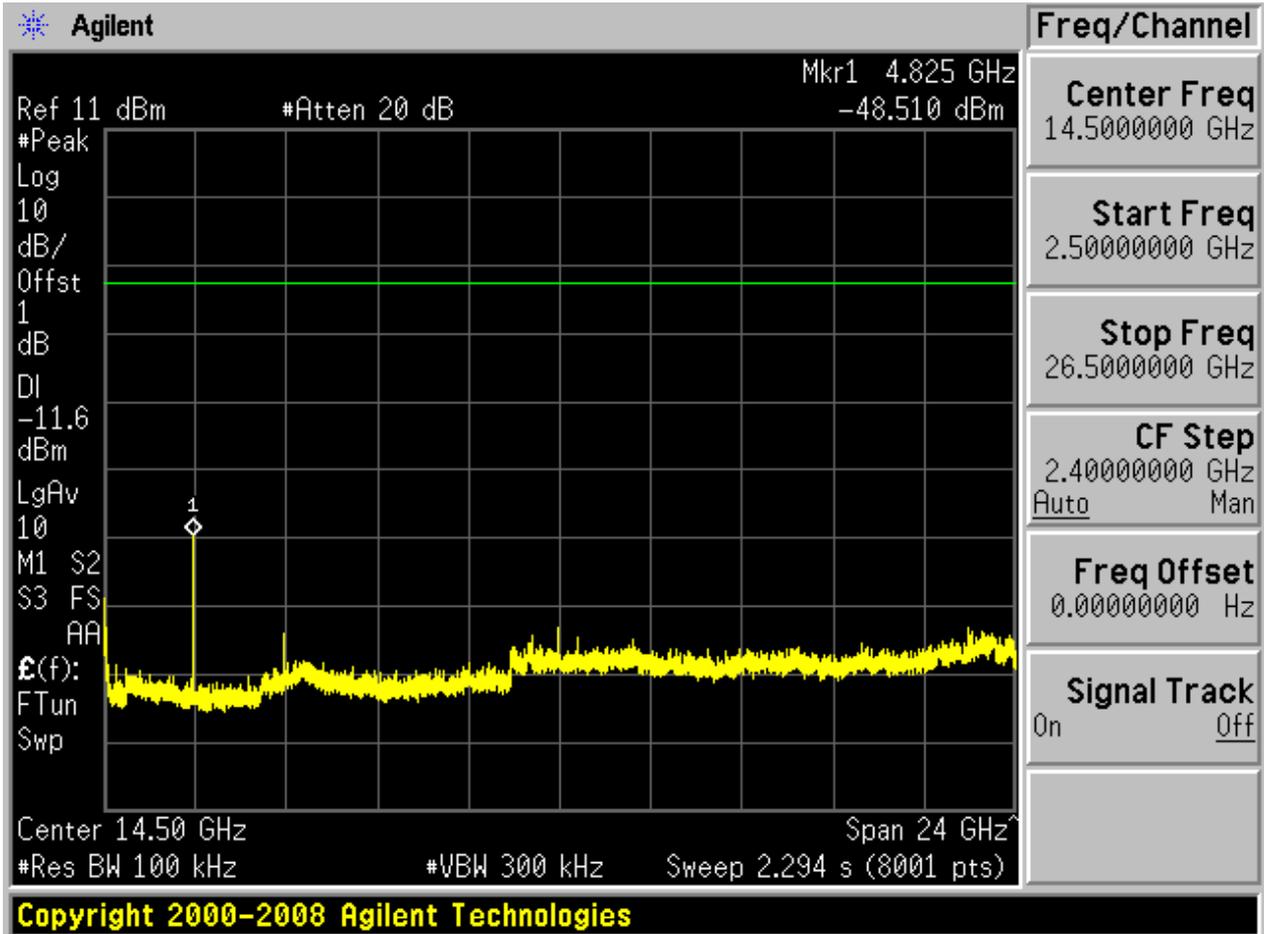


Puw:





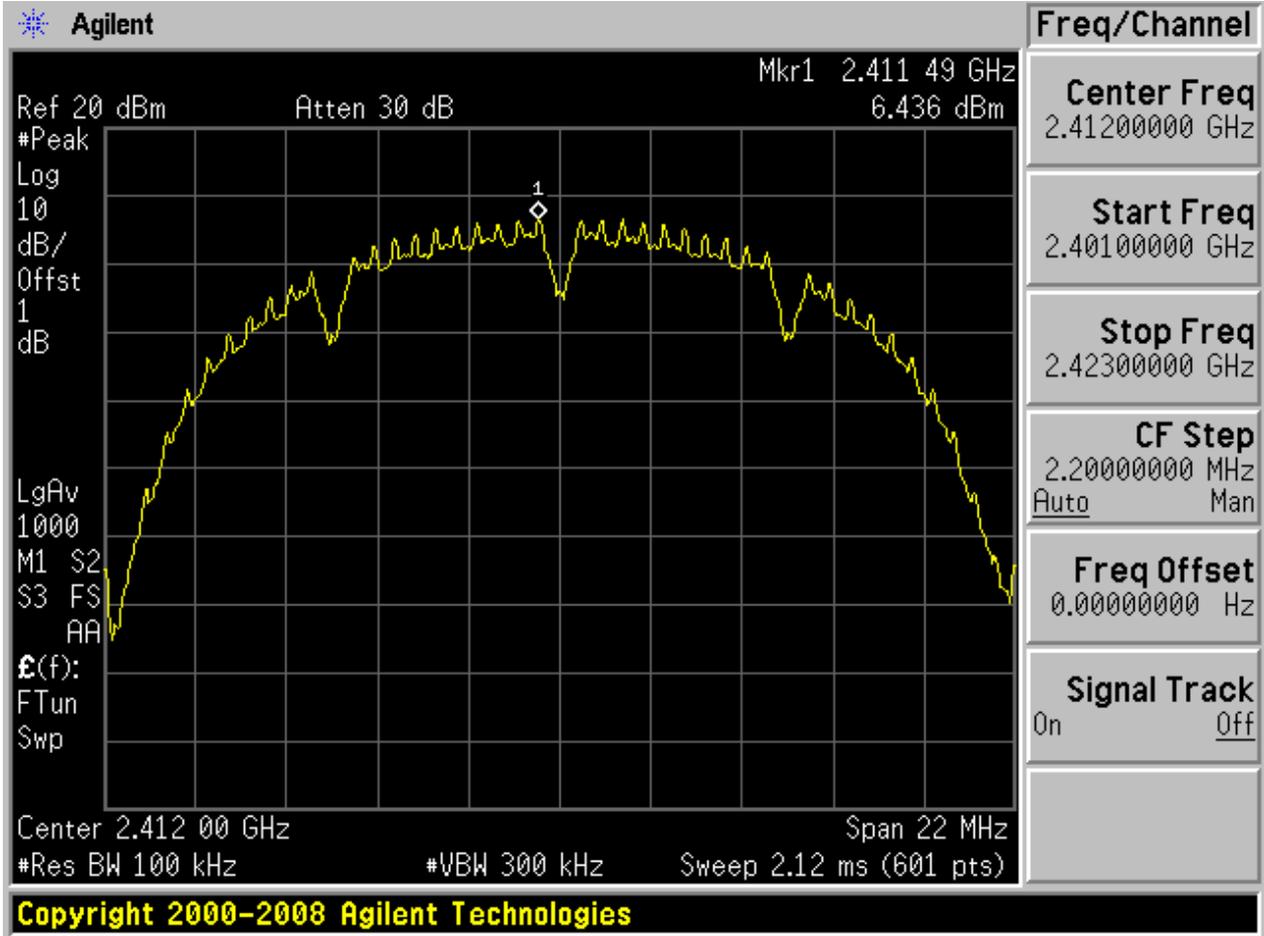






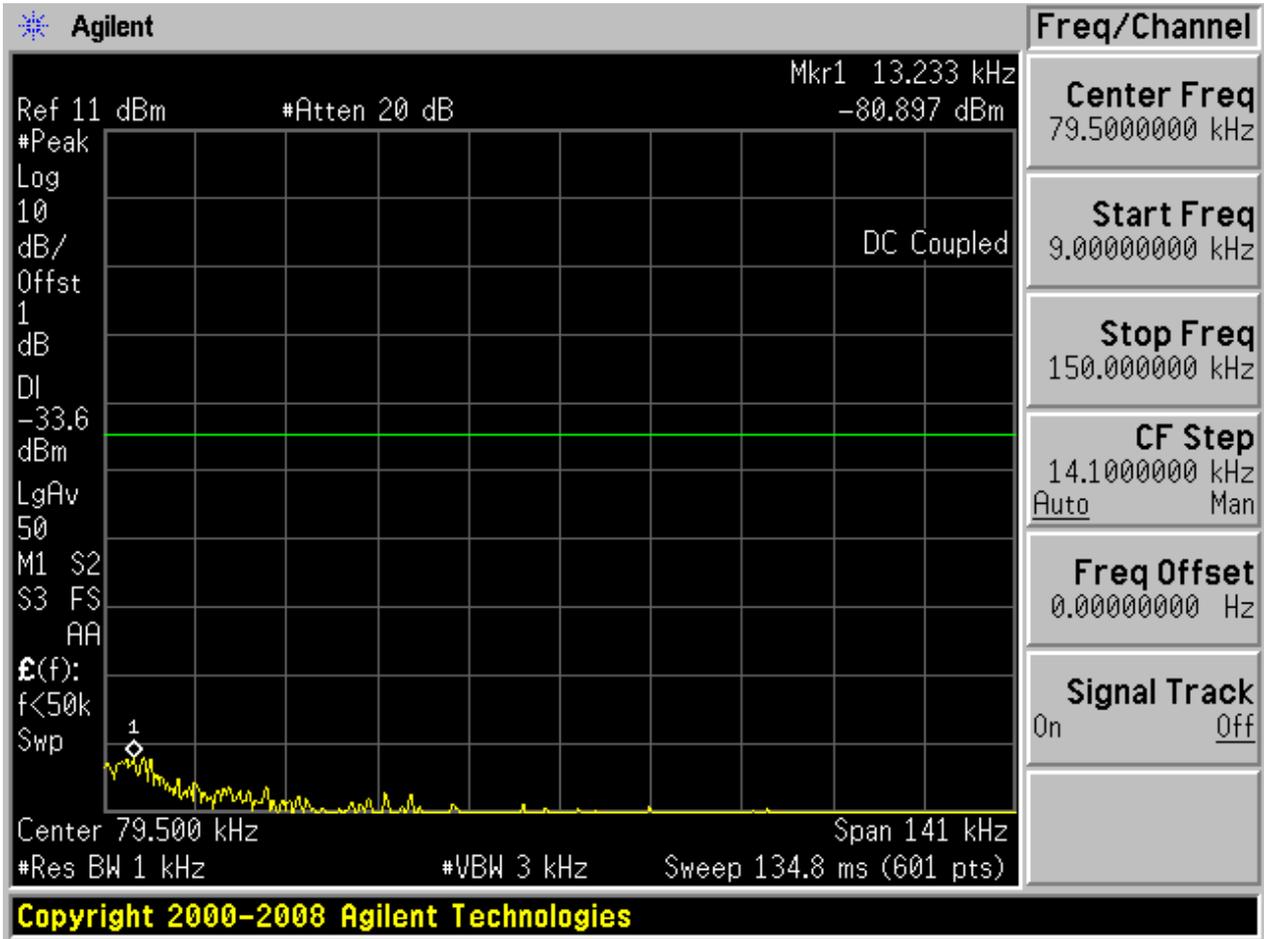
2.2 11B_L@BG 2

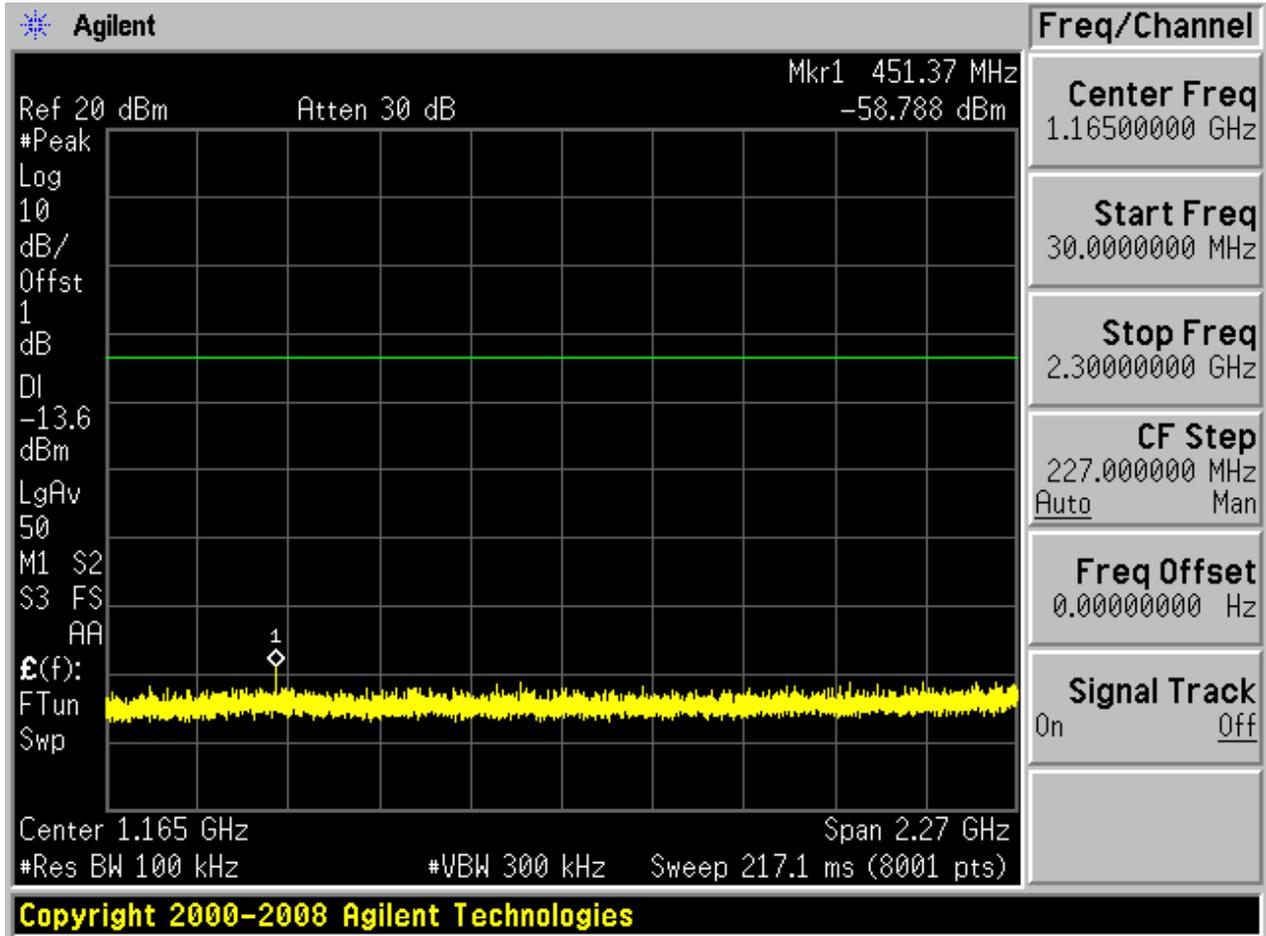
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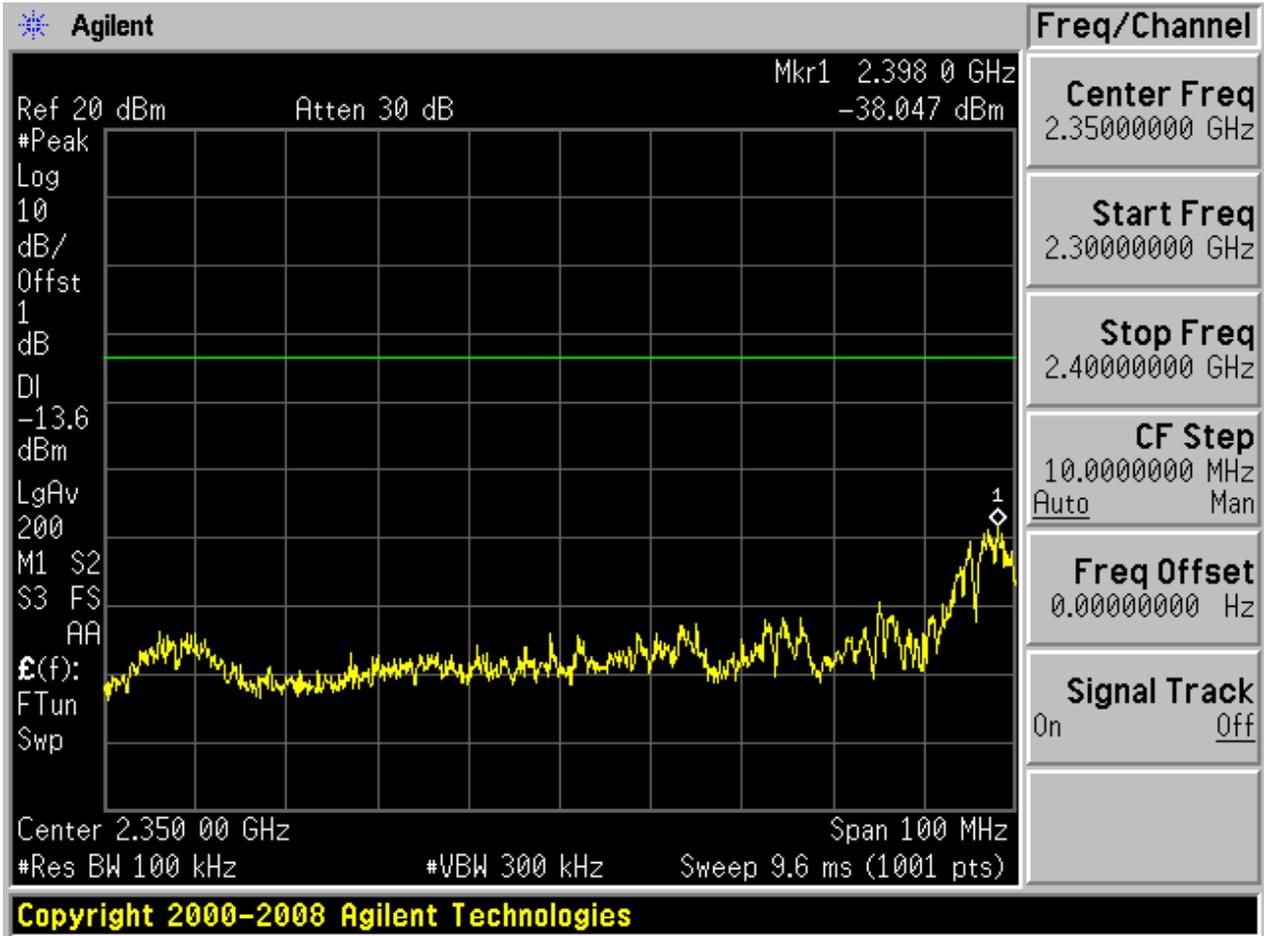


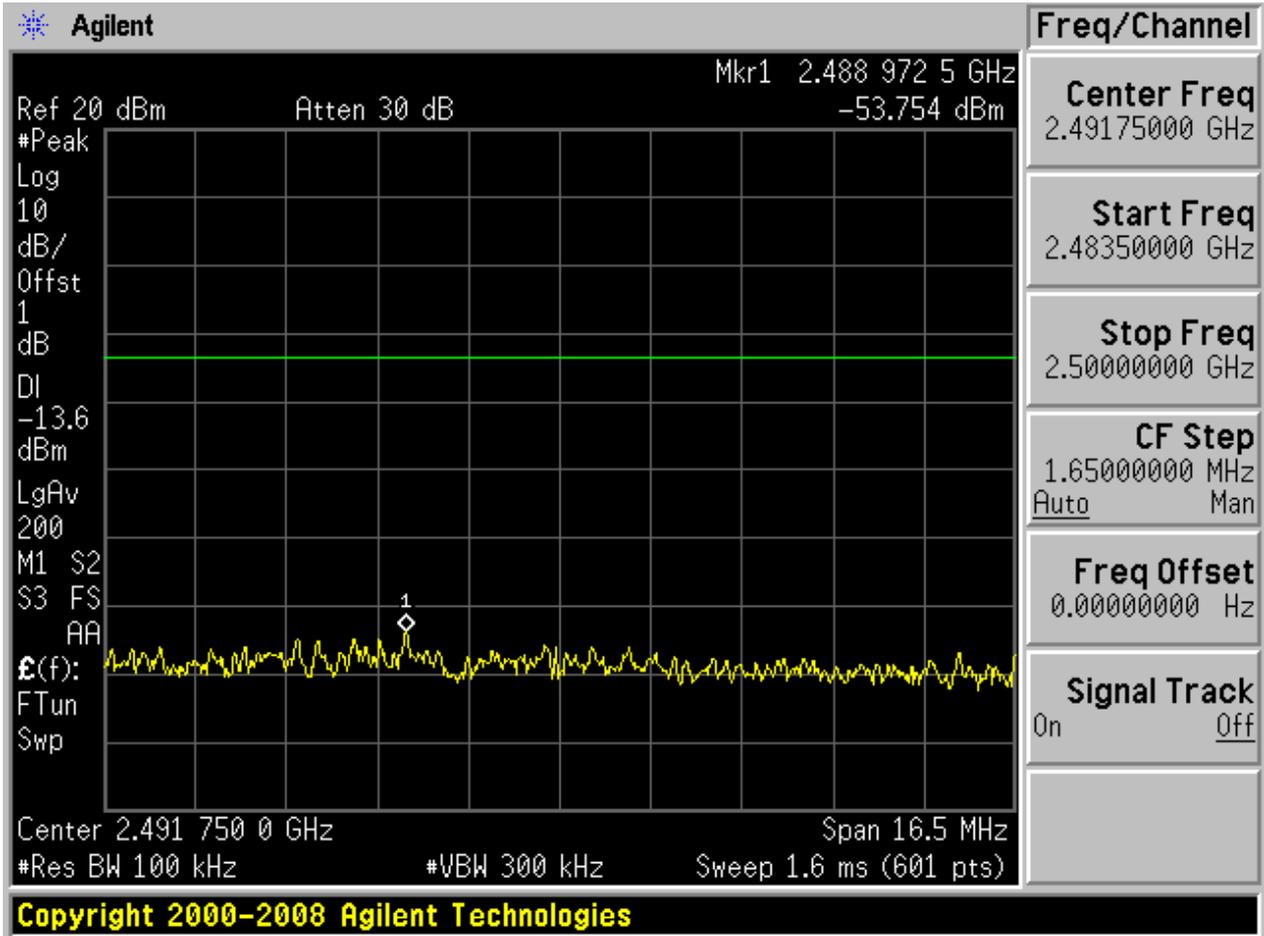


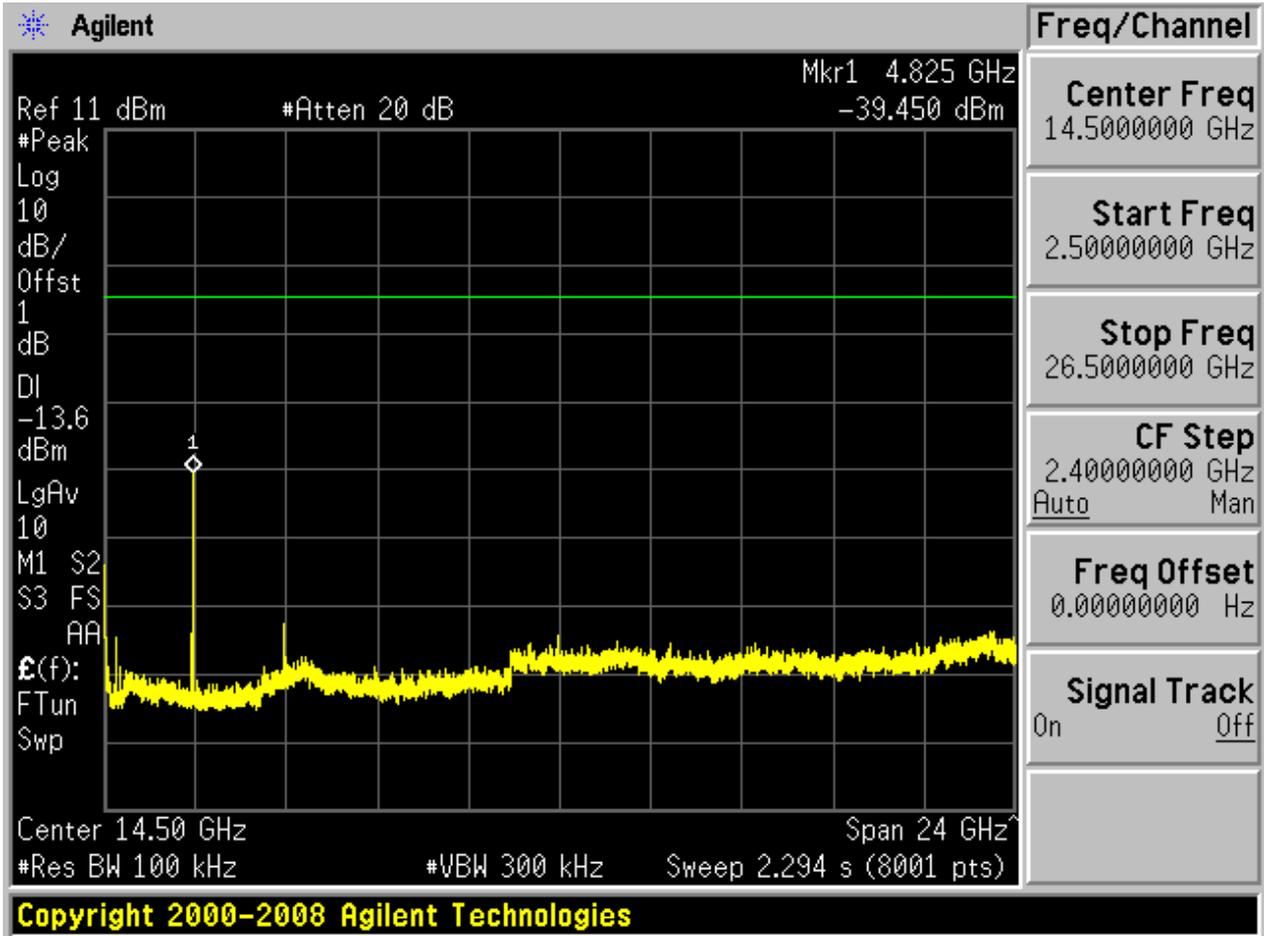
Puw:





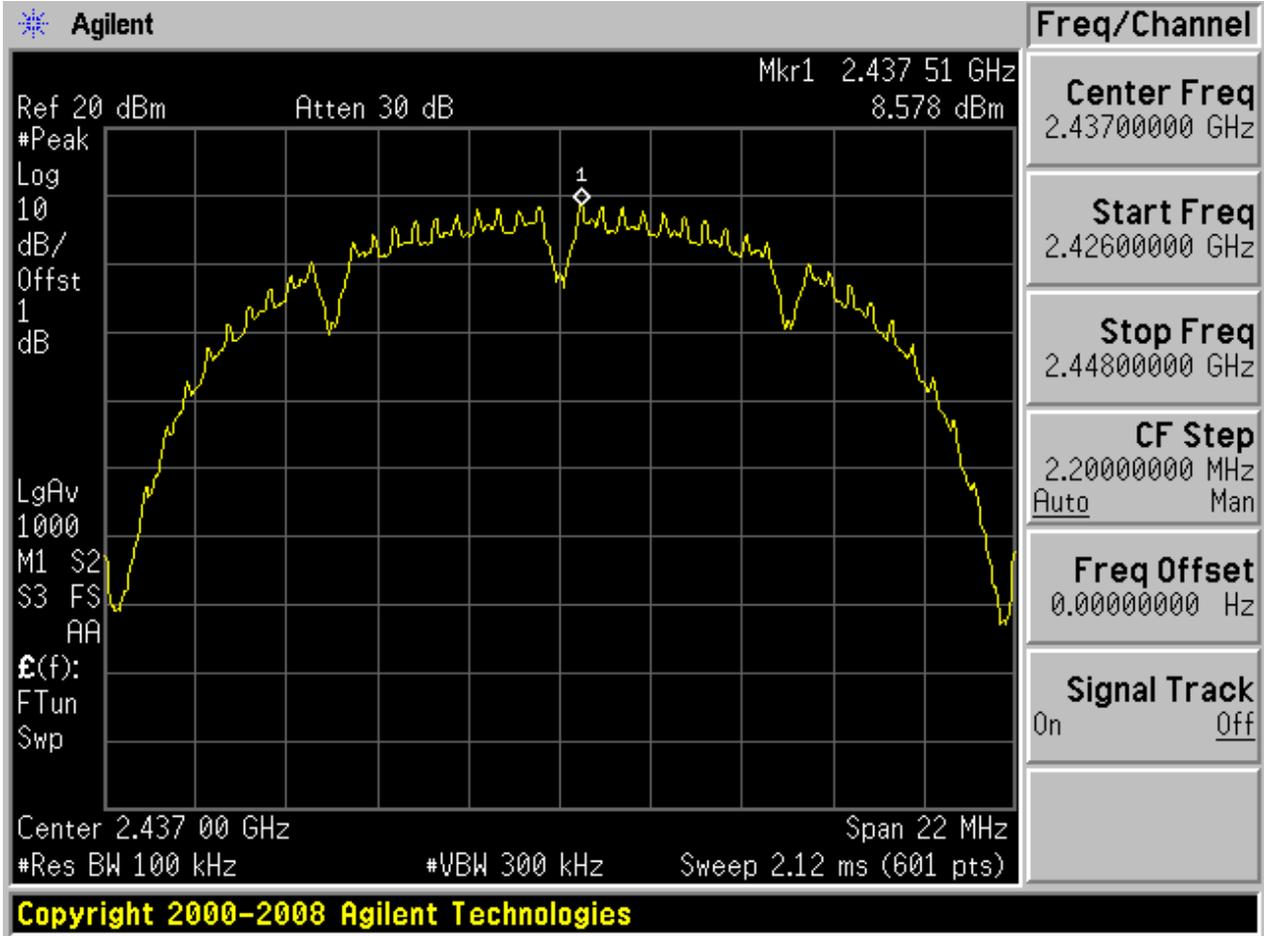






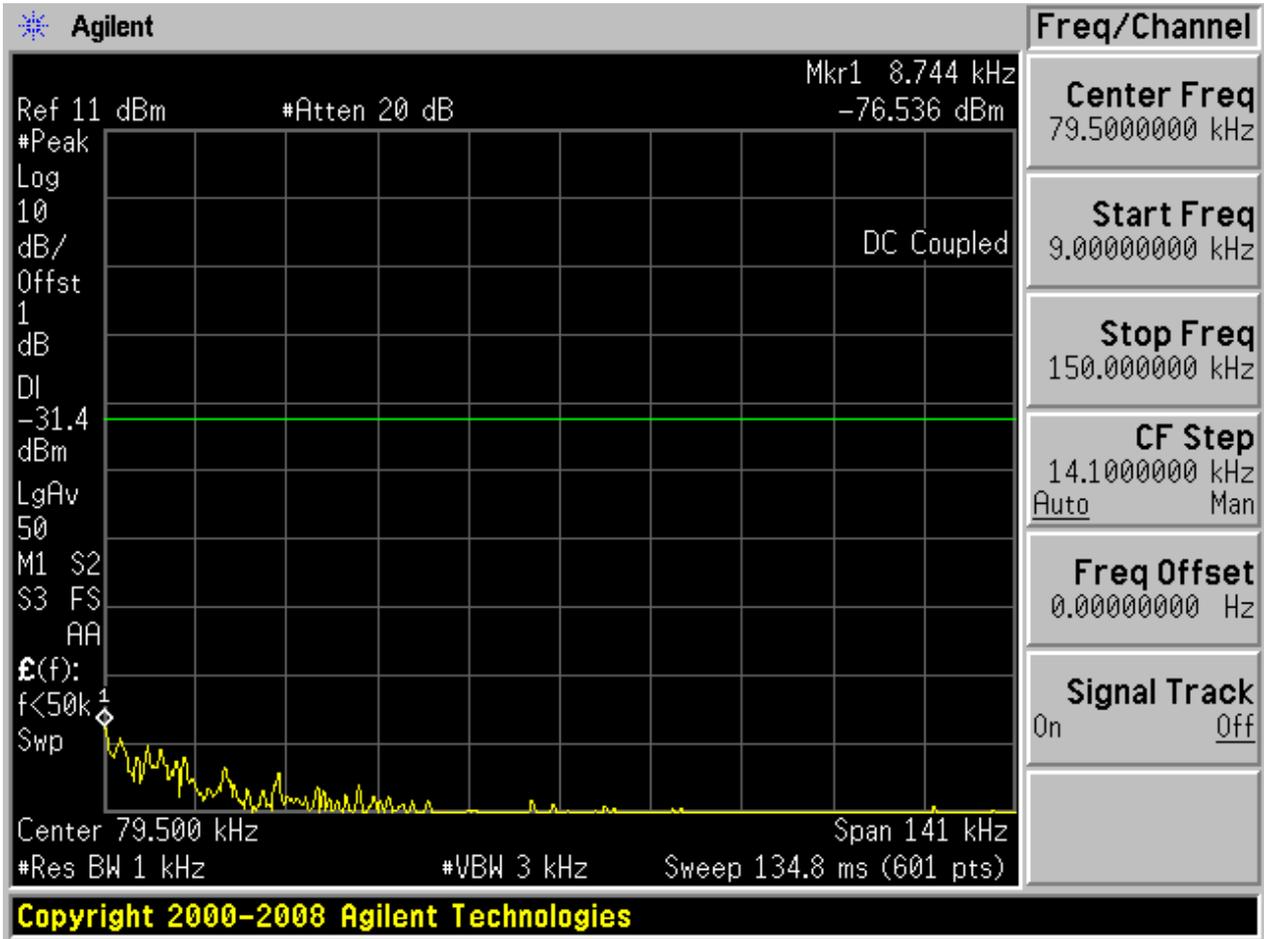
2.3 11B_M@BG 1

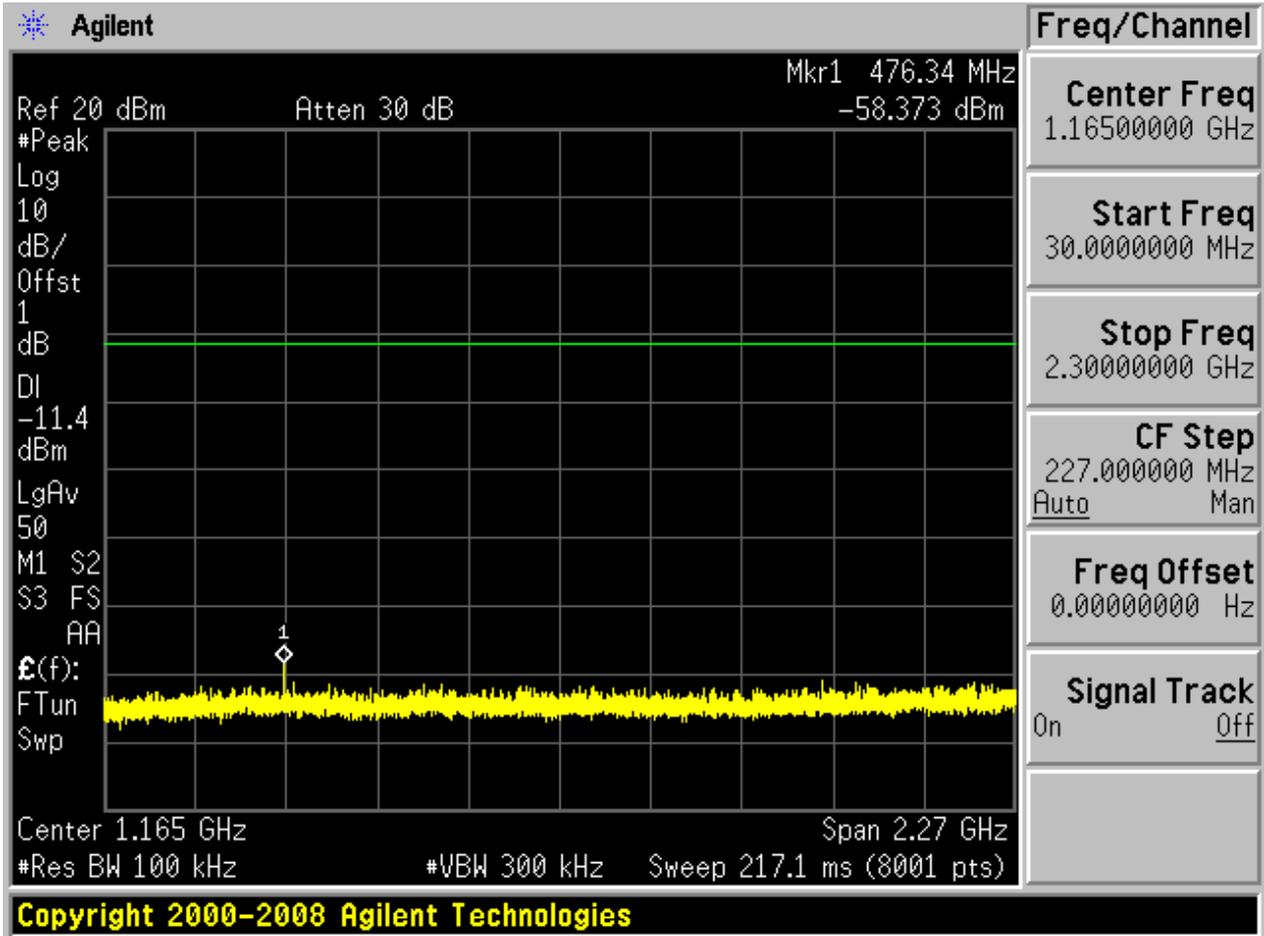
Pref:

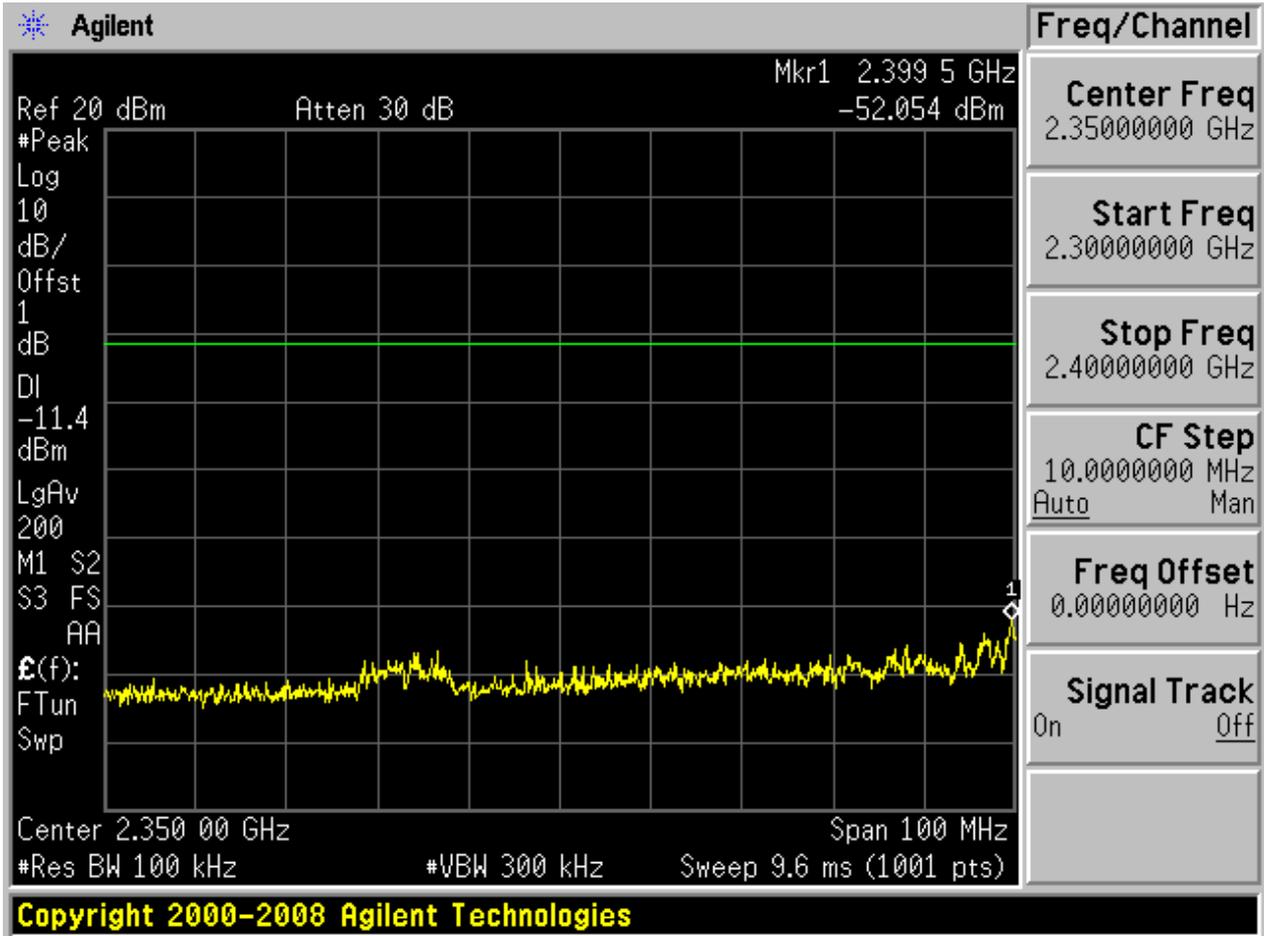


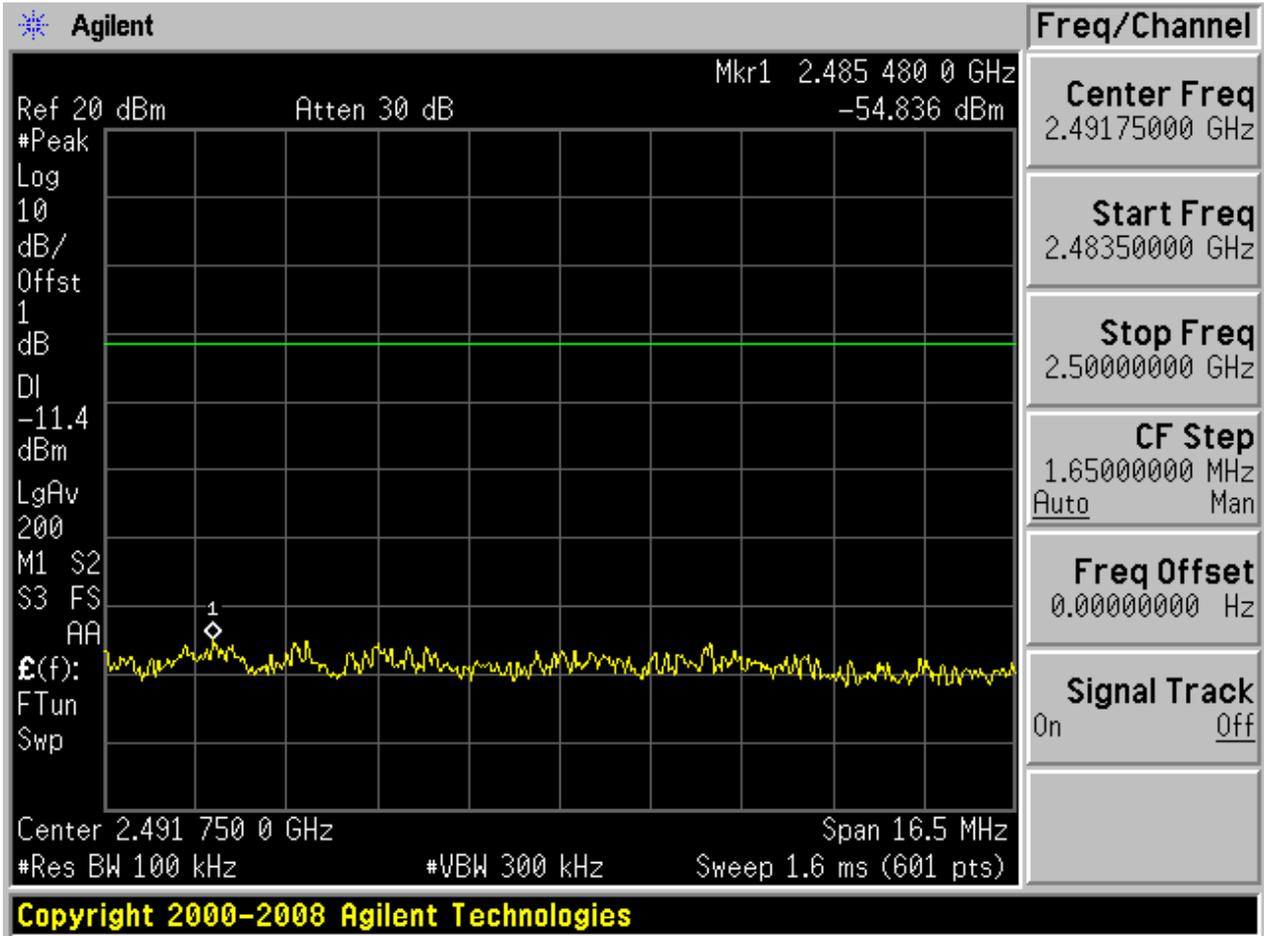


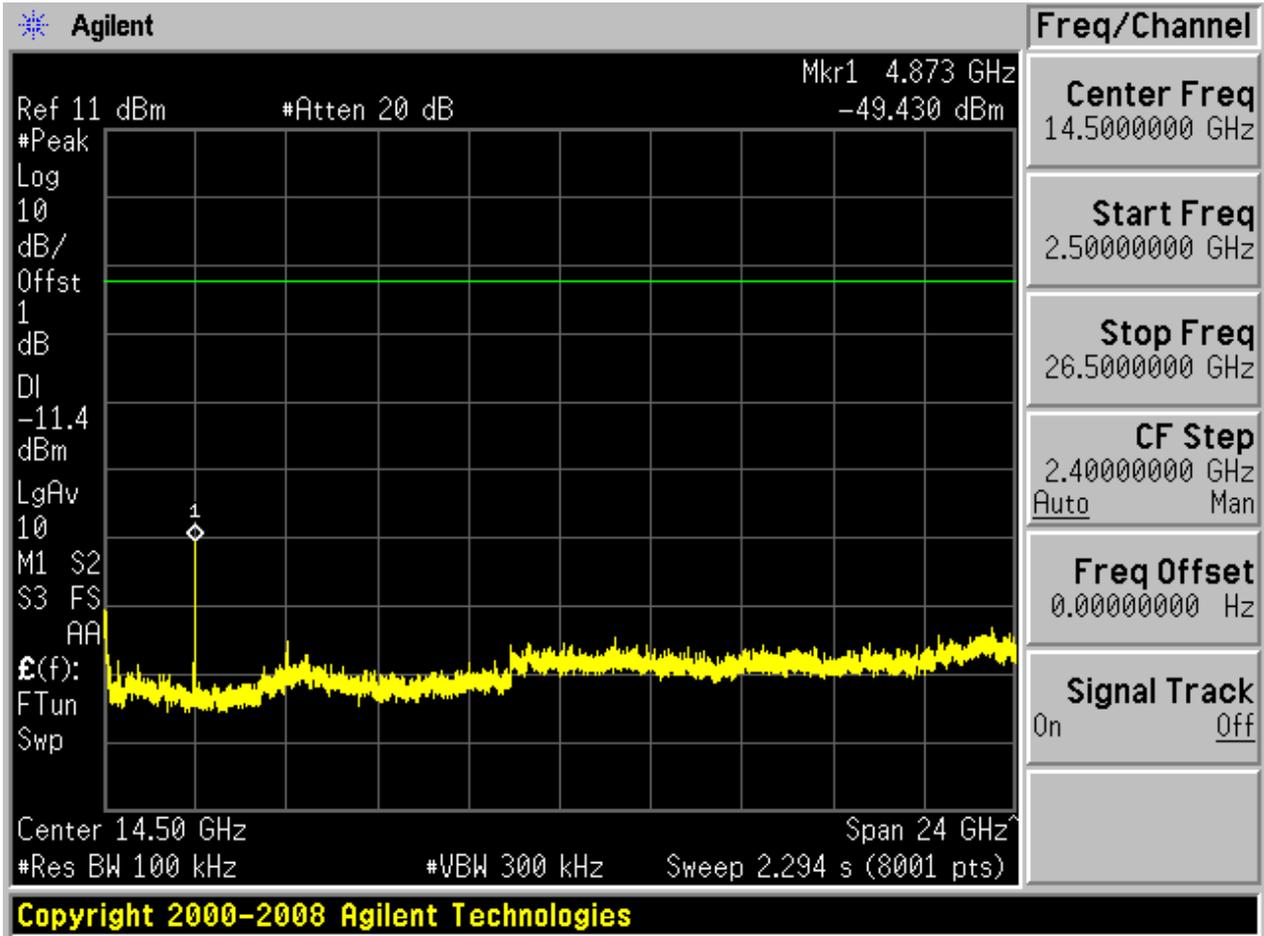
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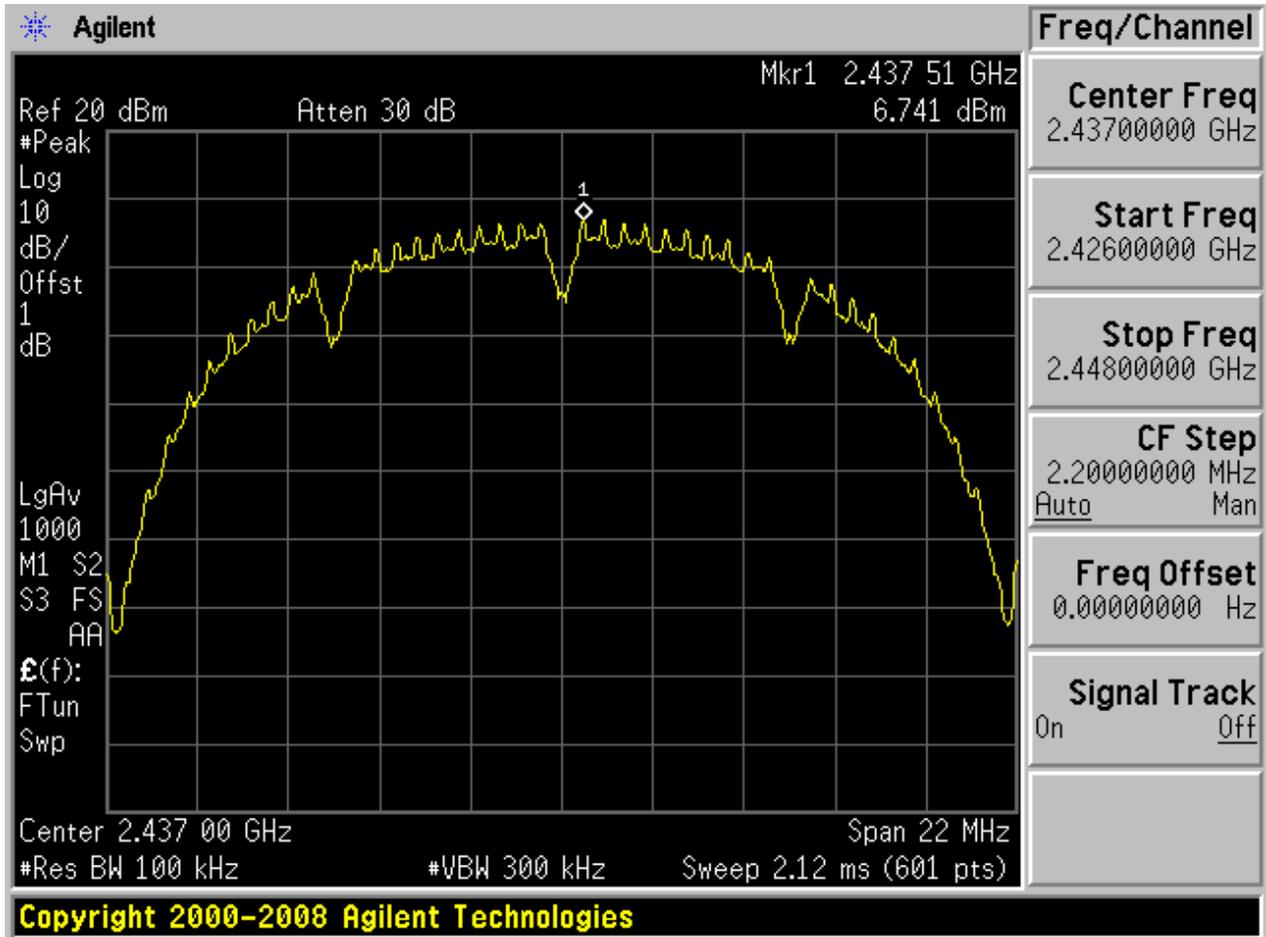






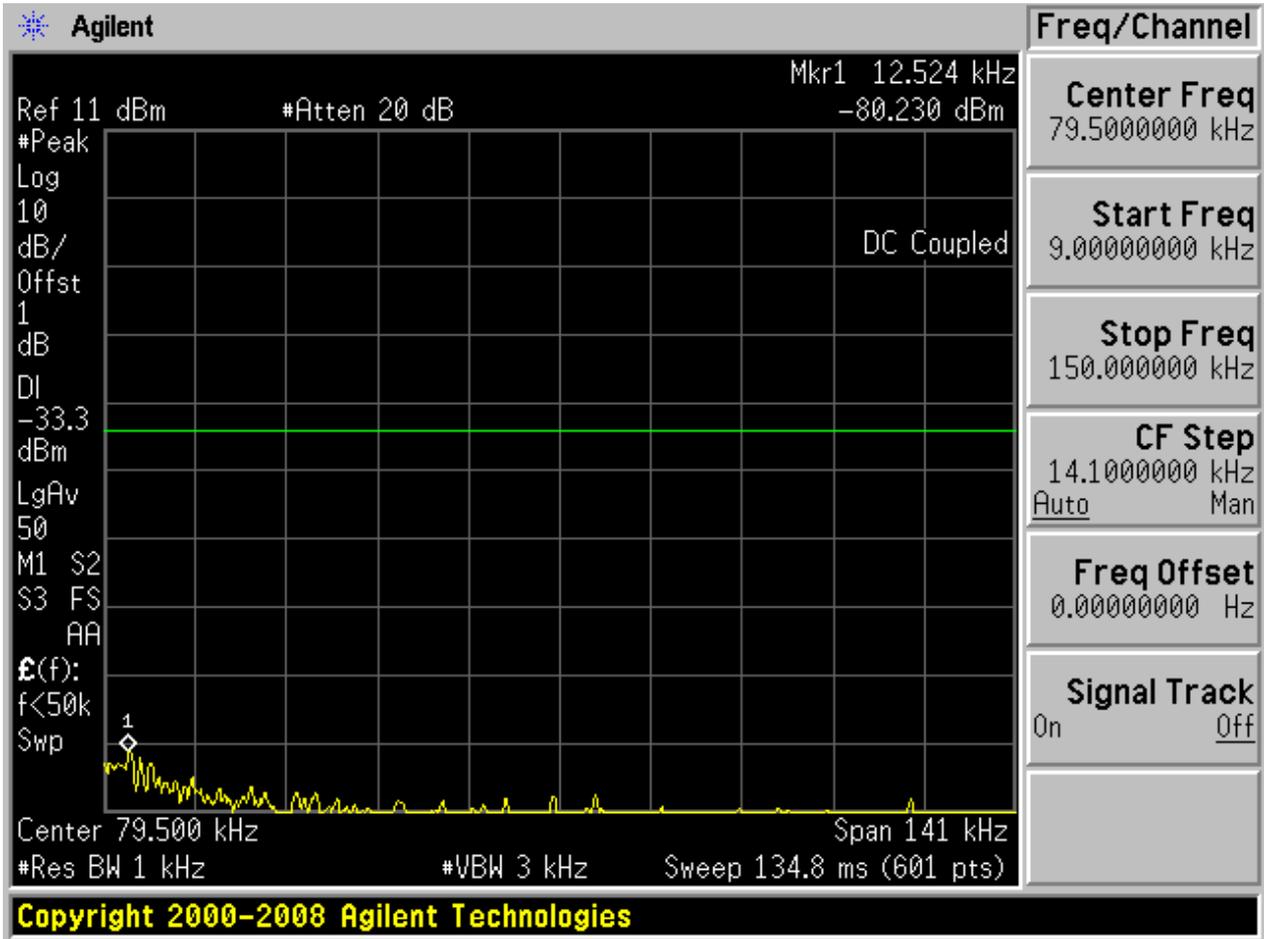
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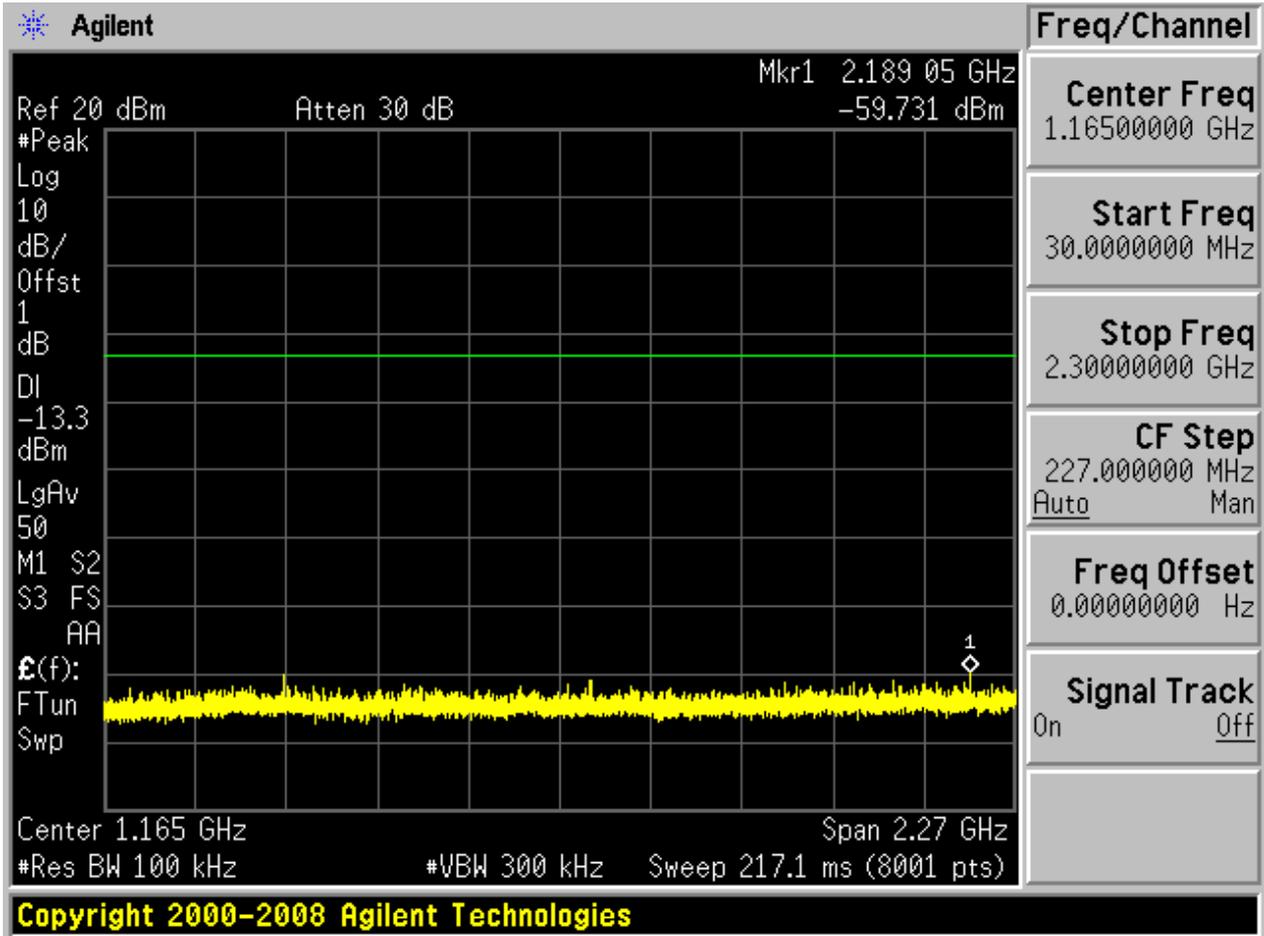
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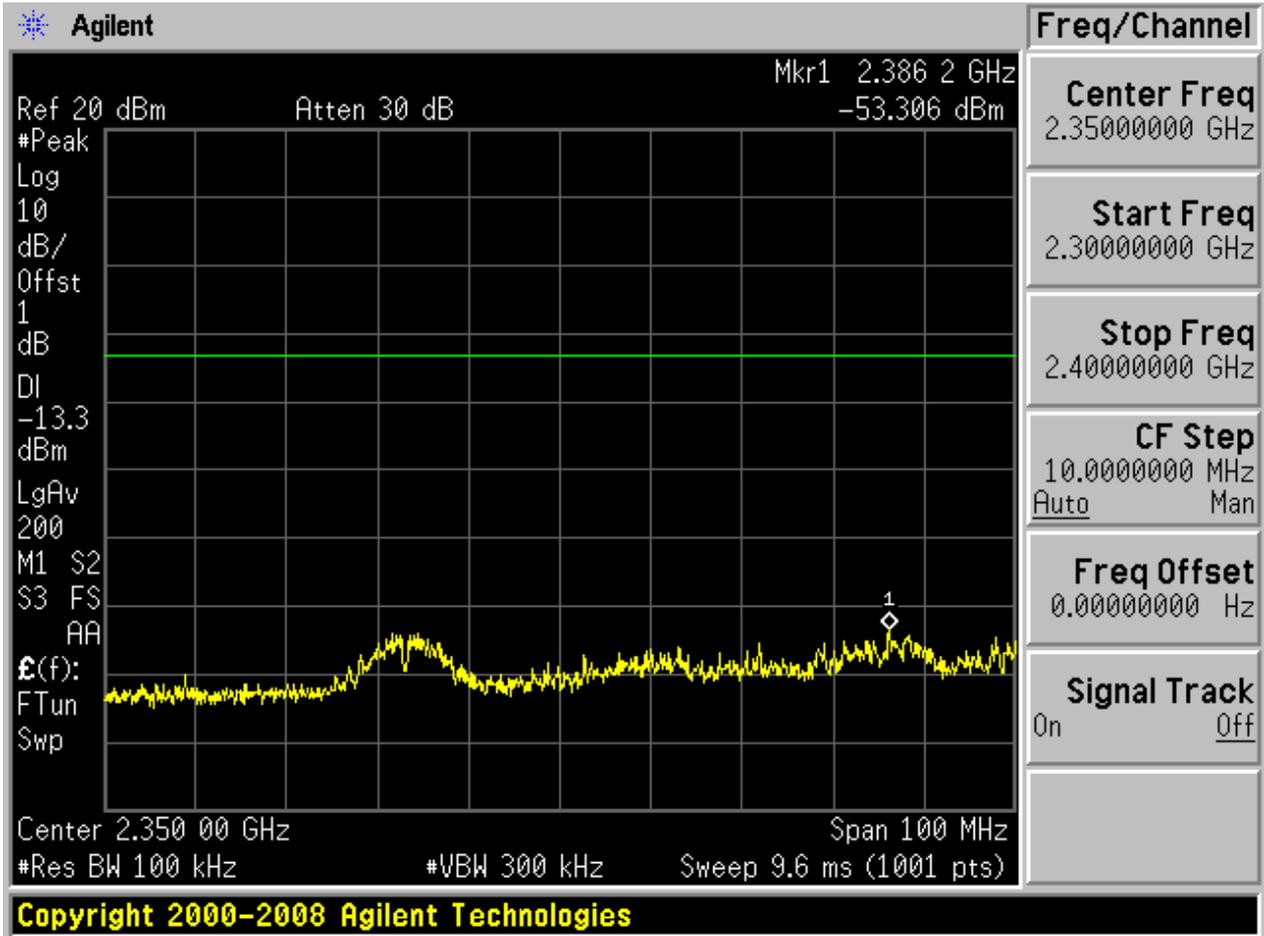


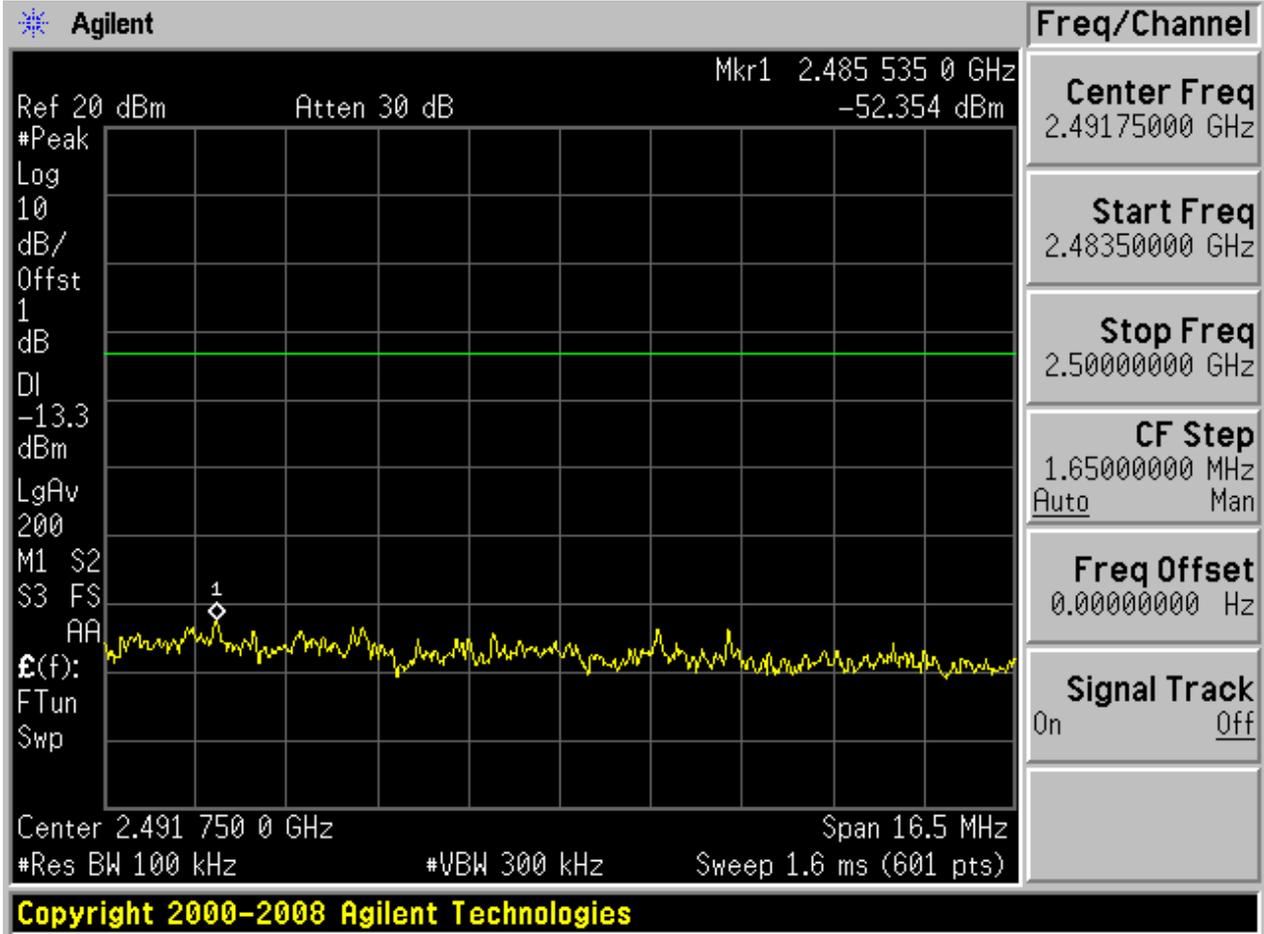


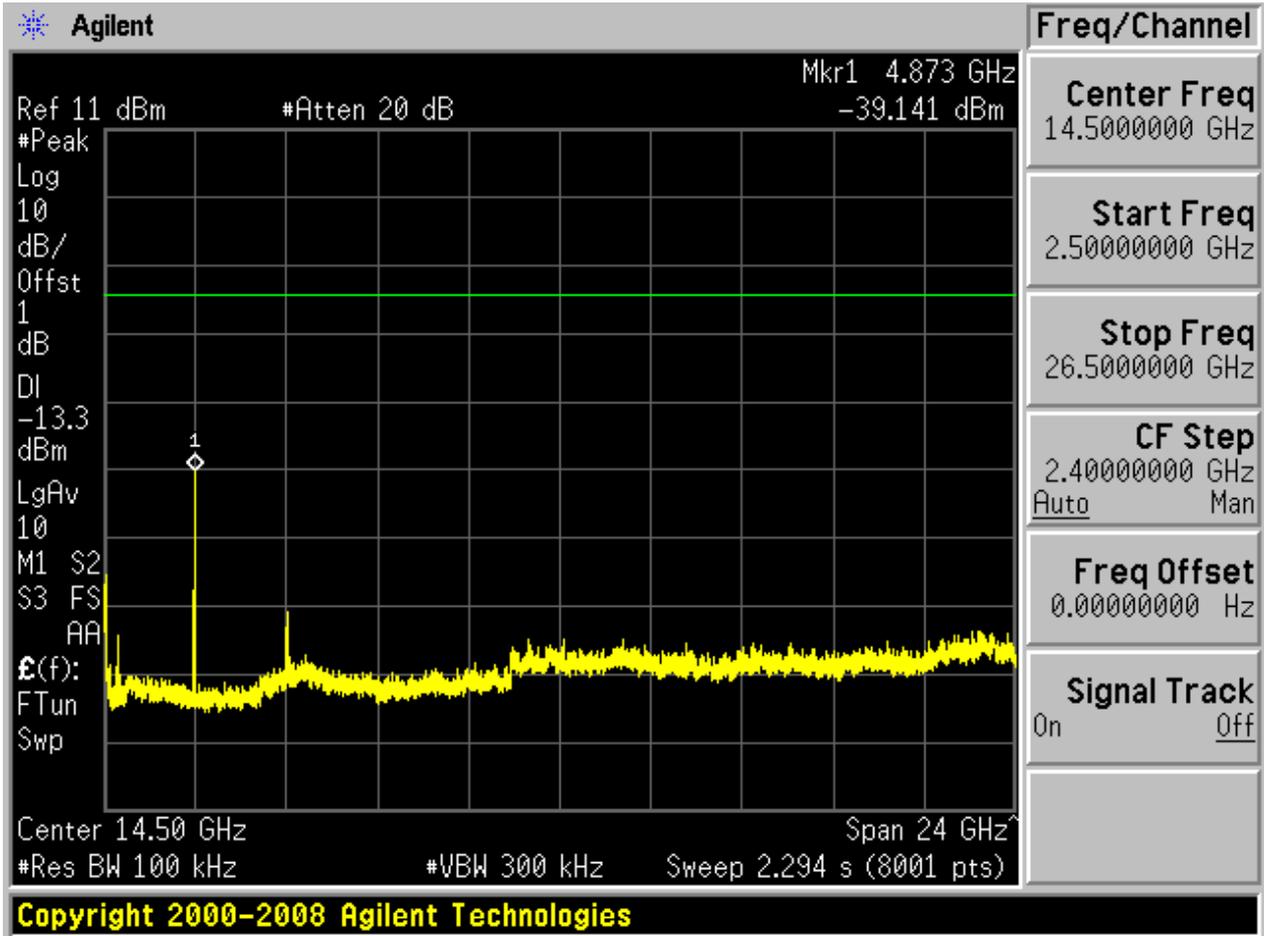
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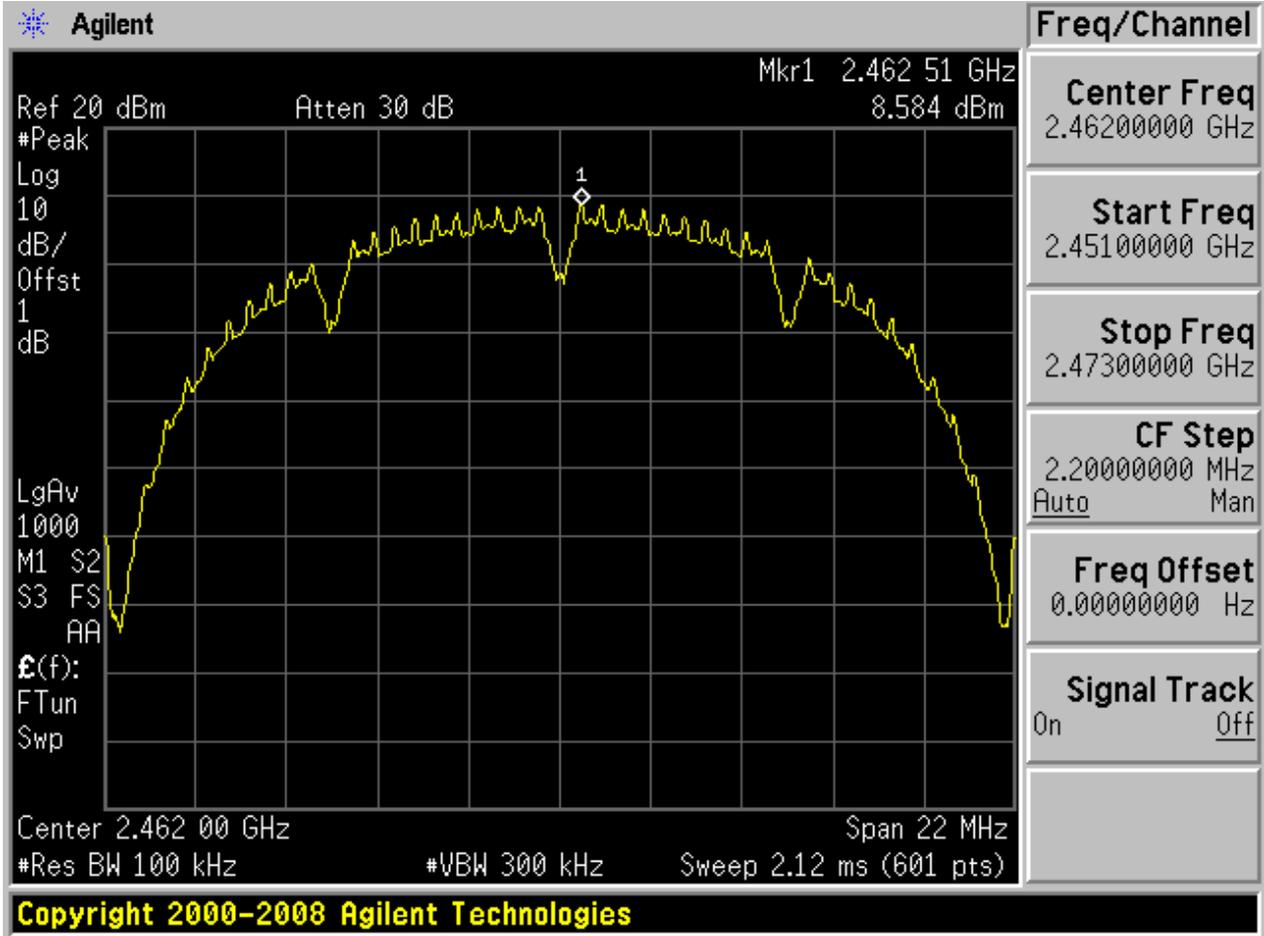






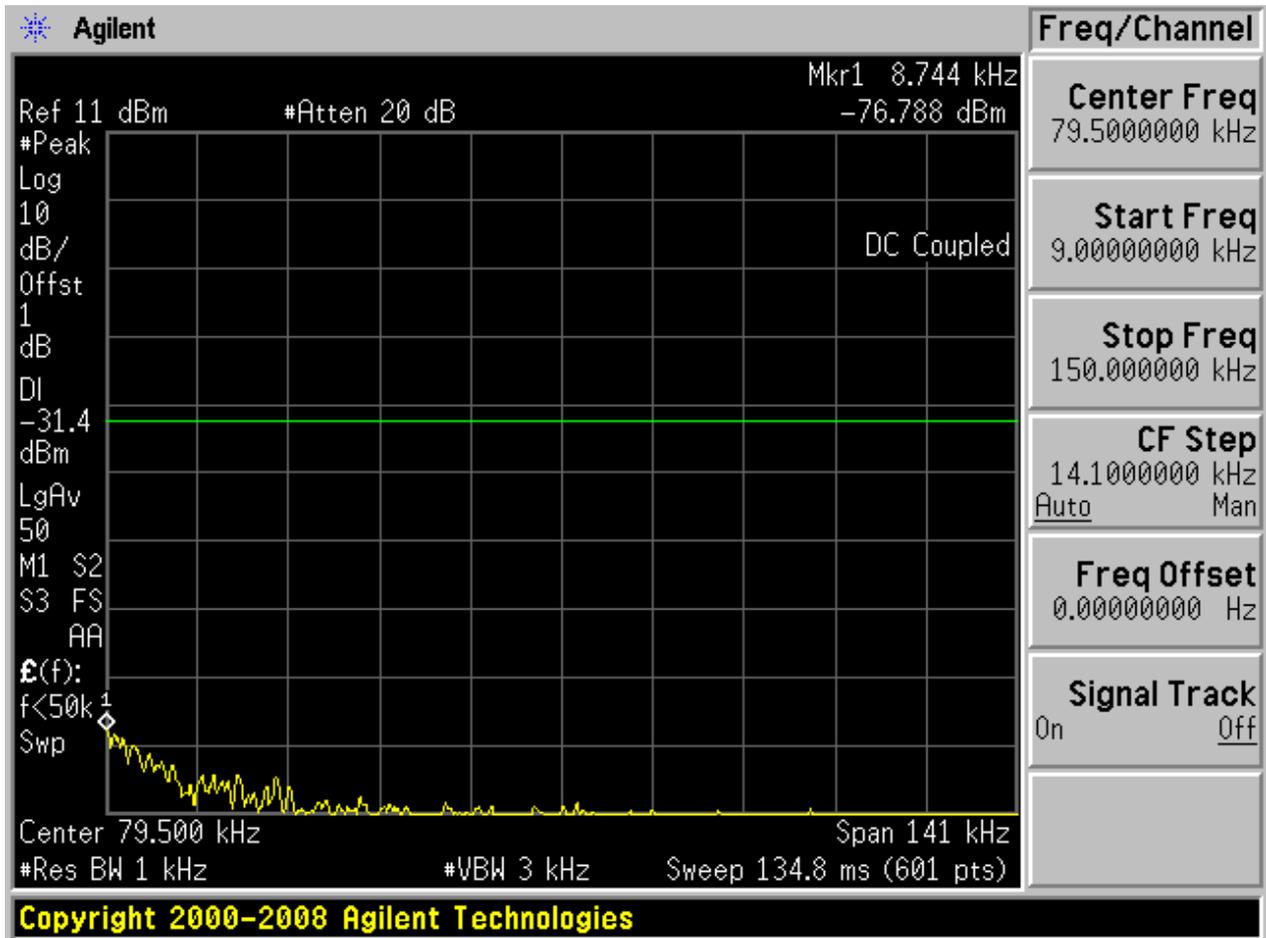
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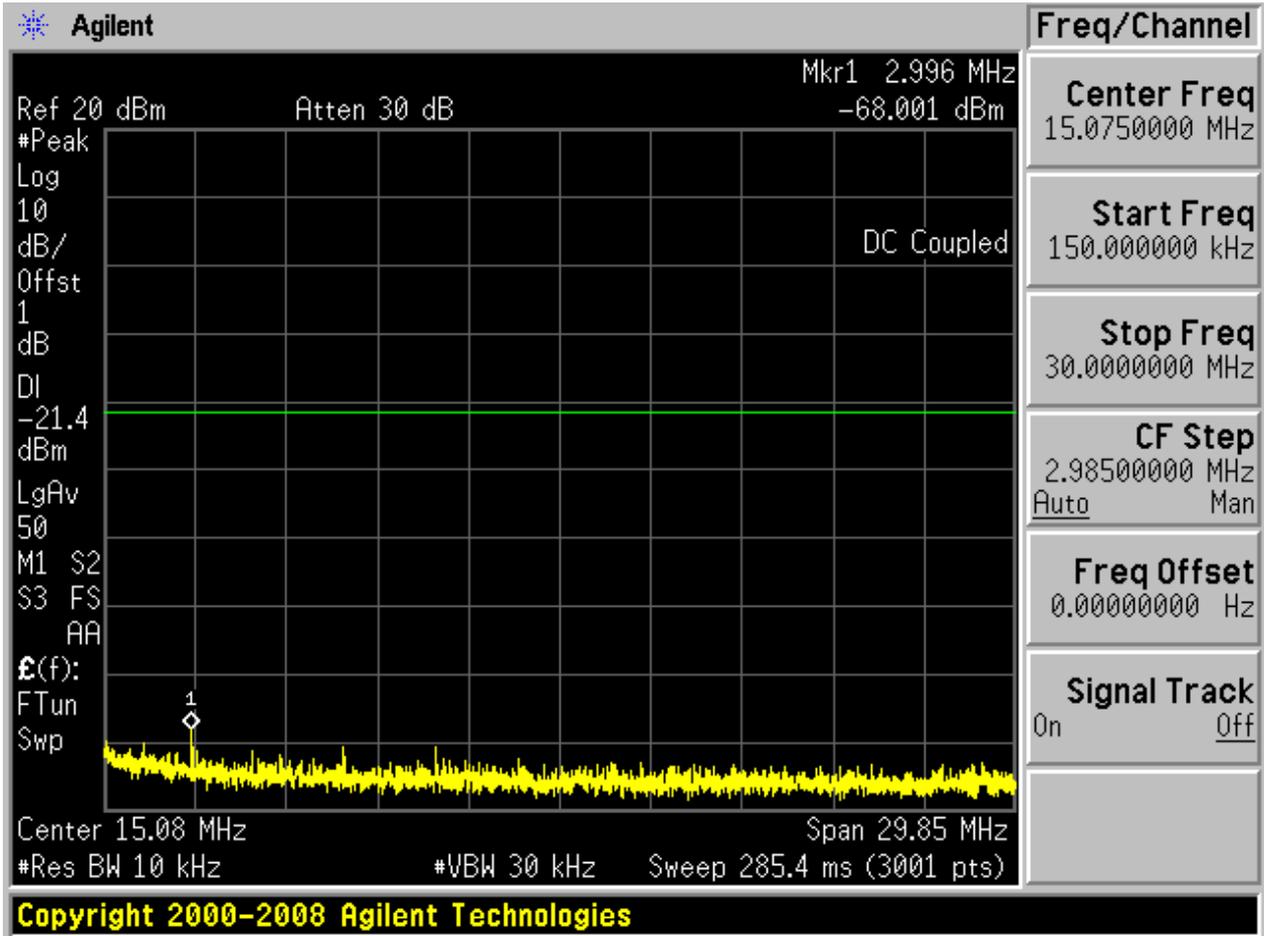
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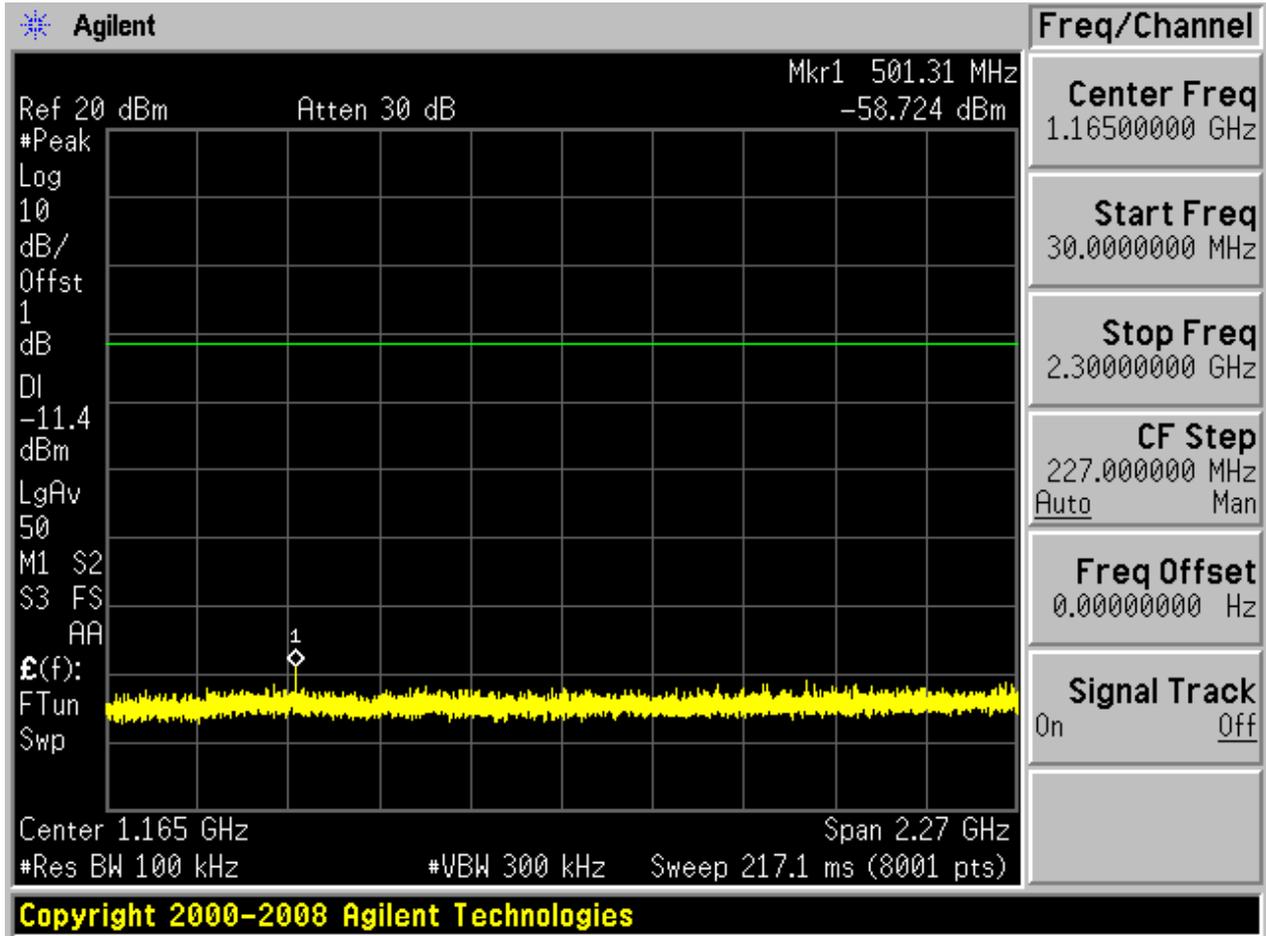


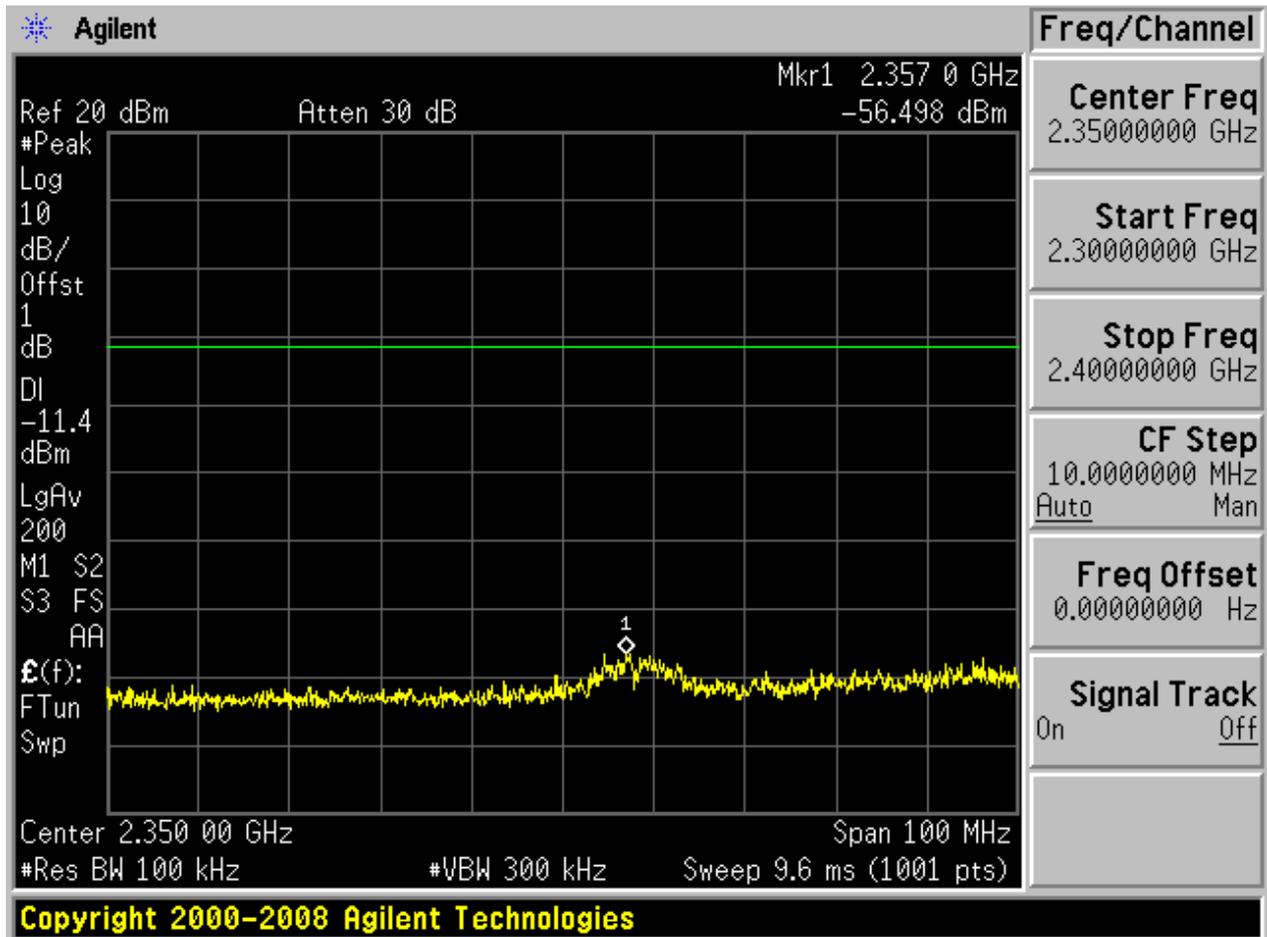


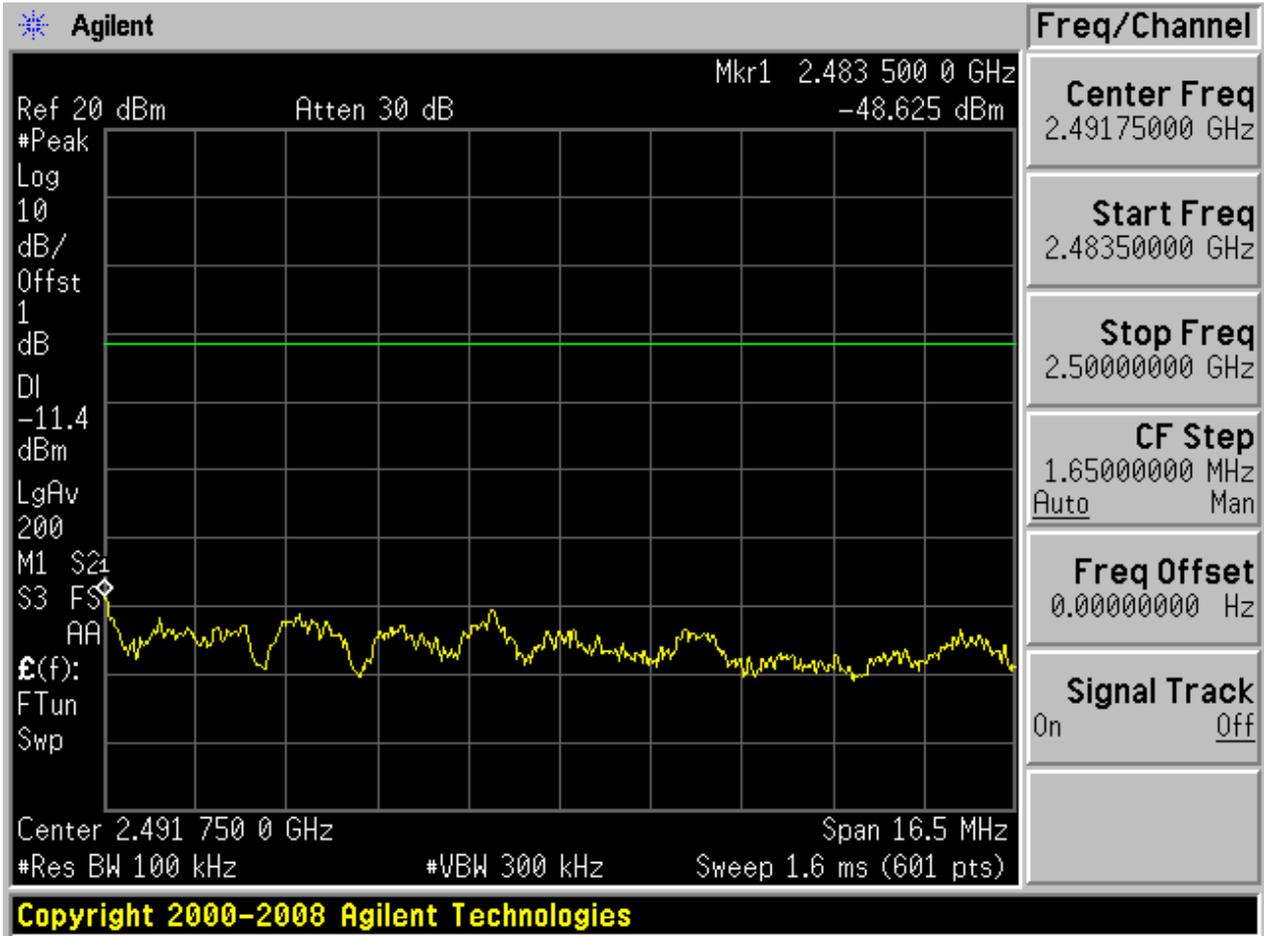
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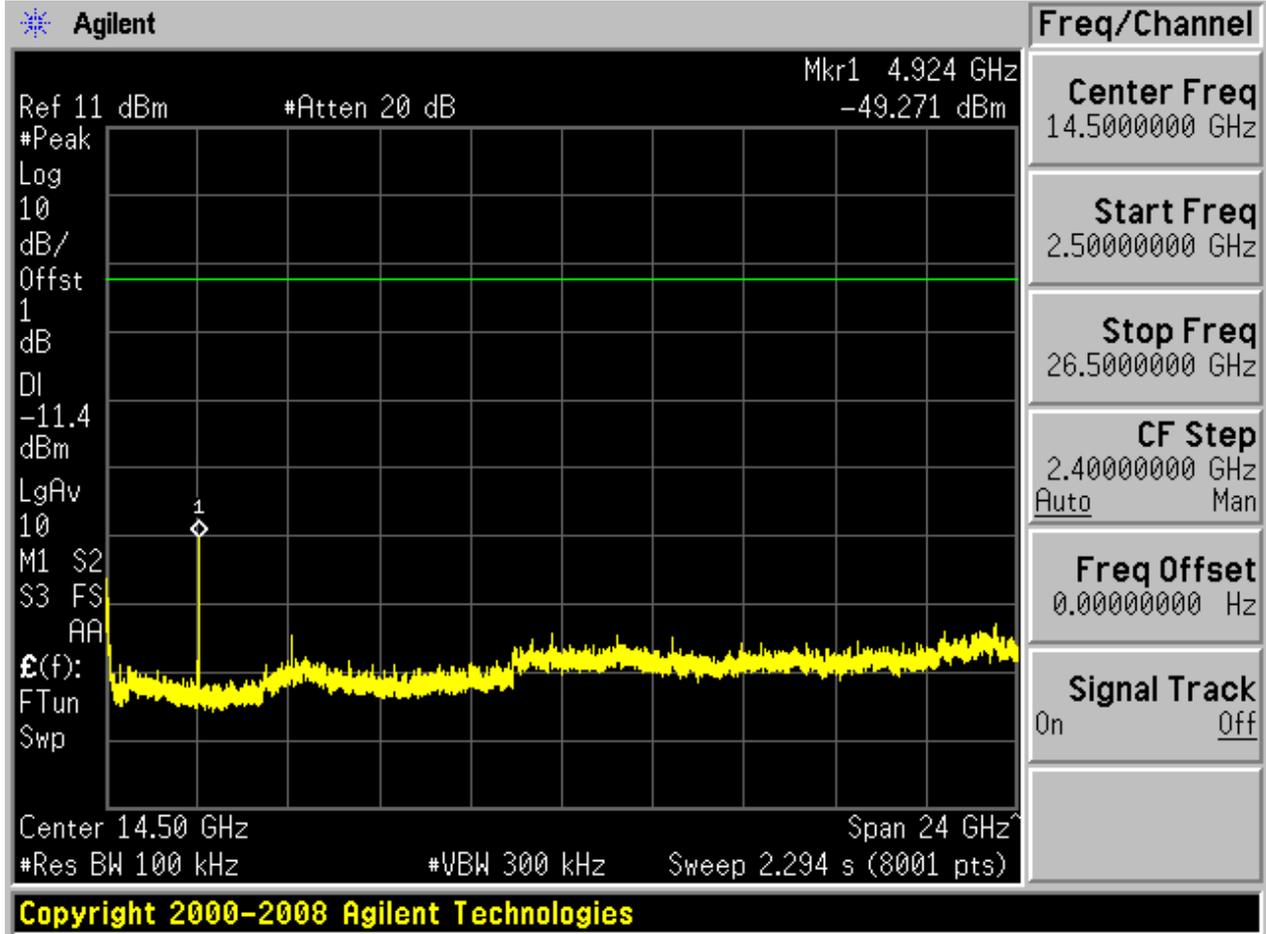








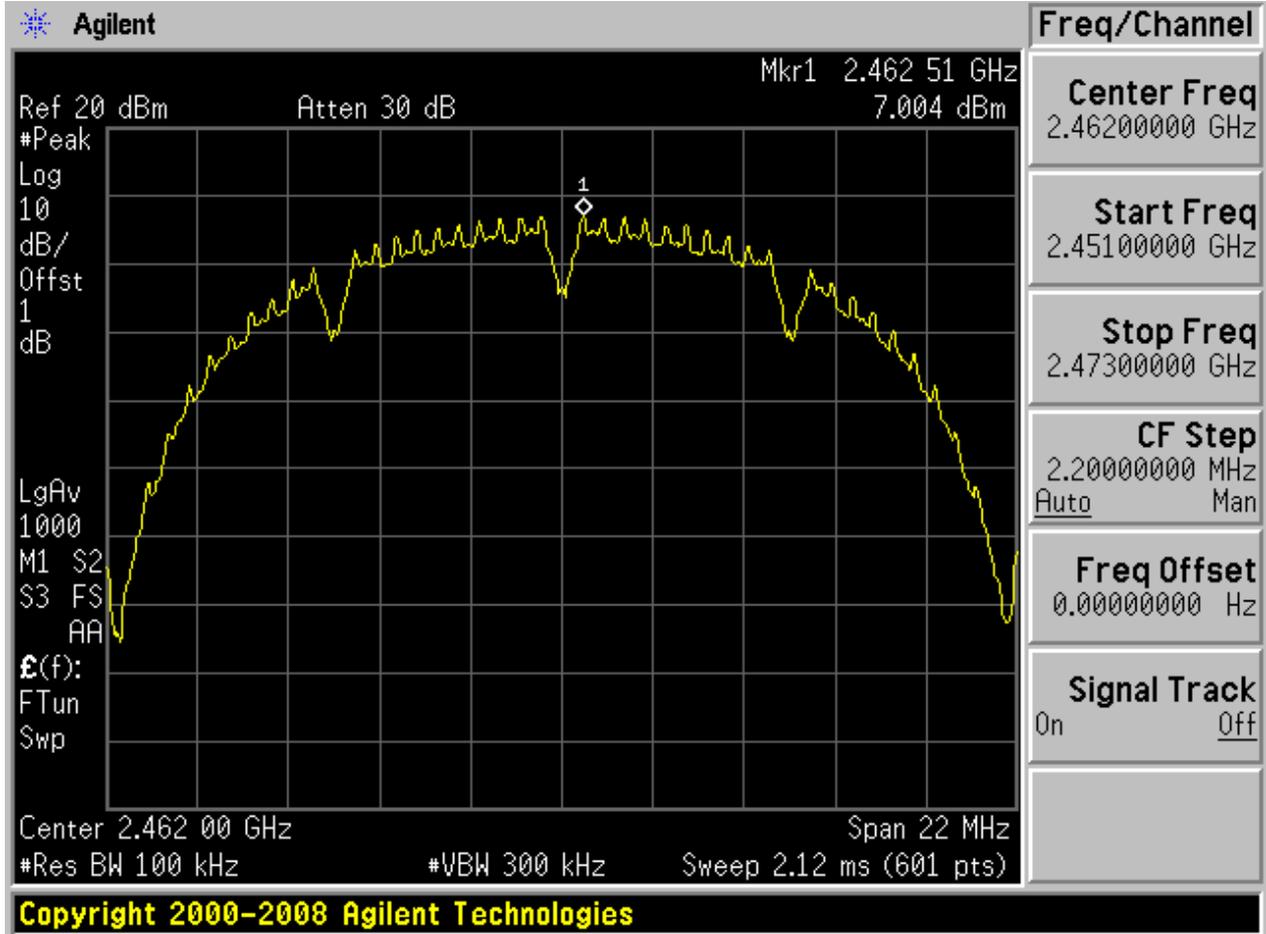






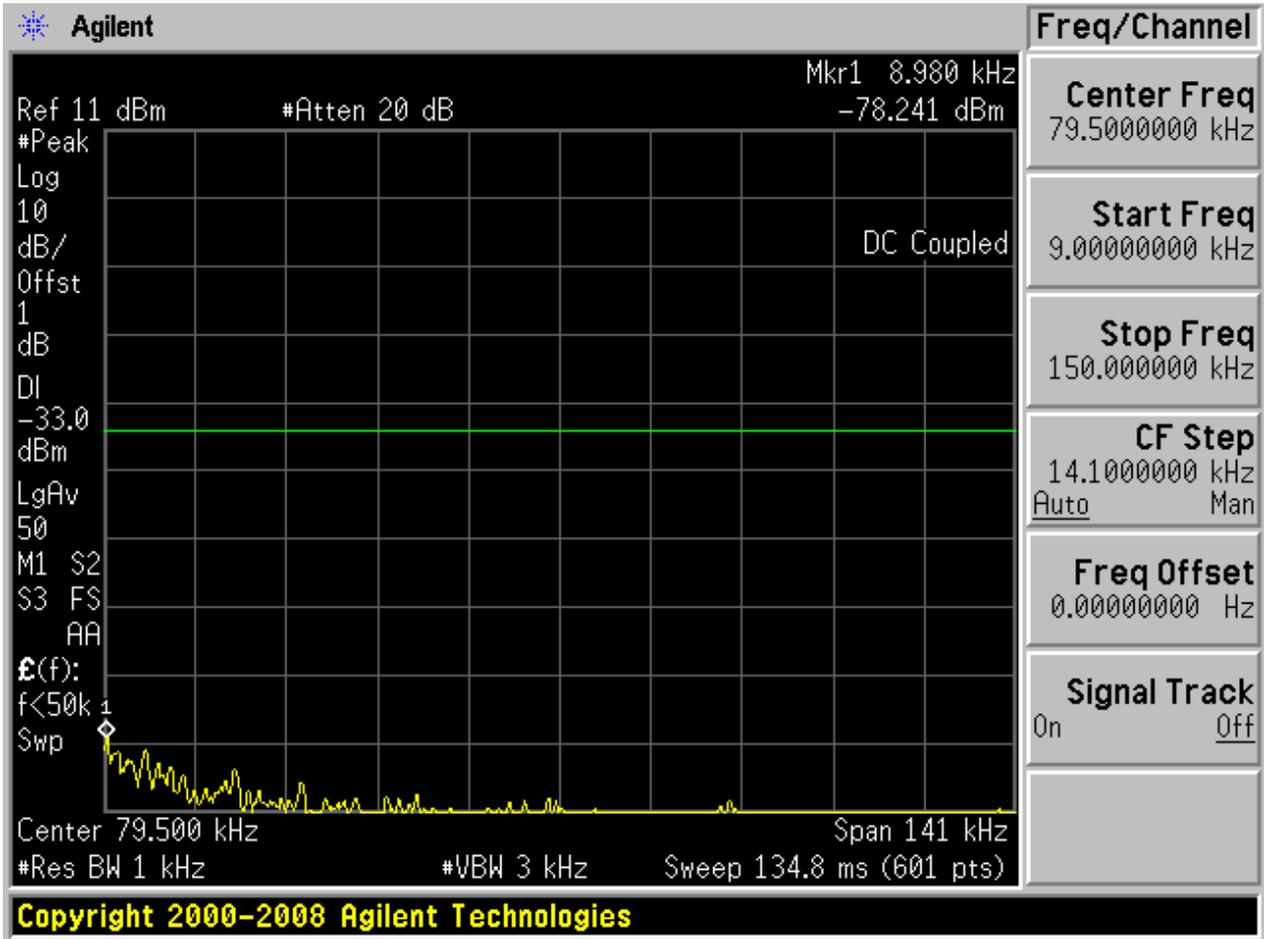
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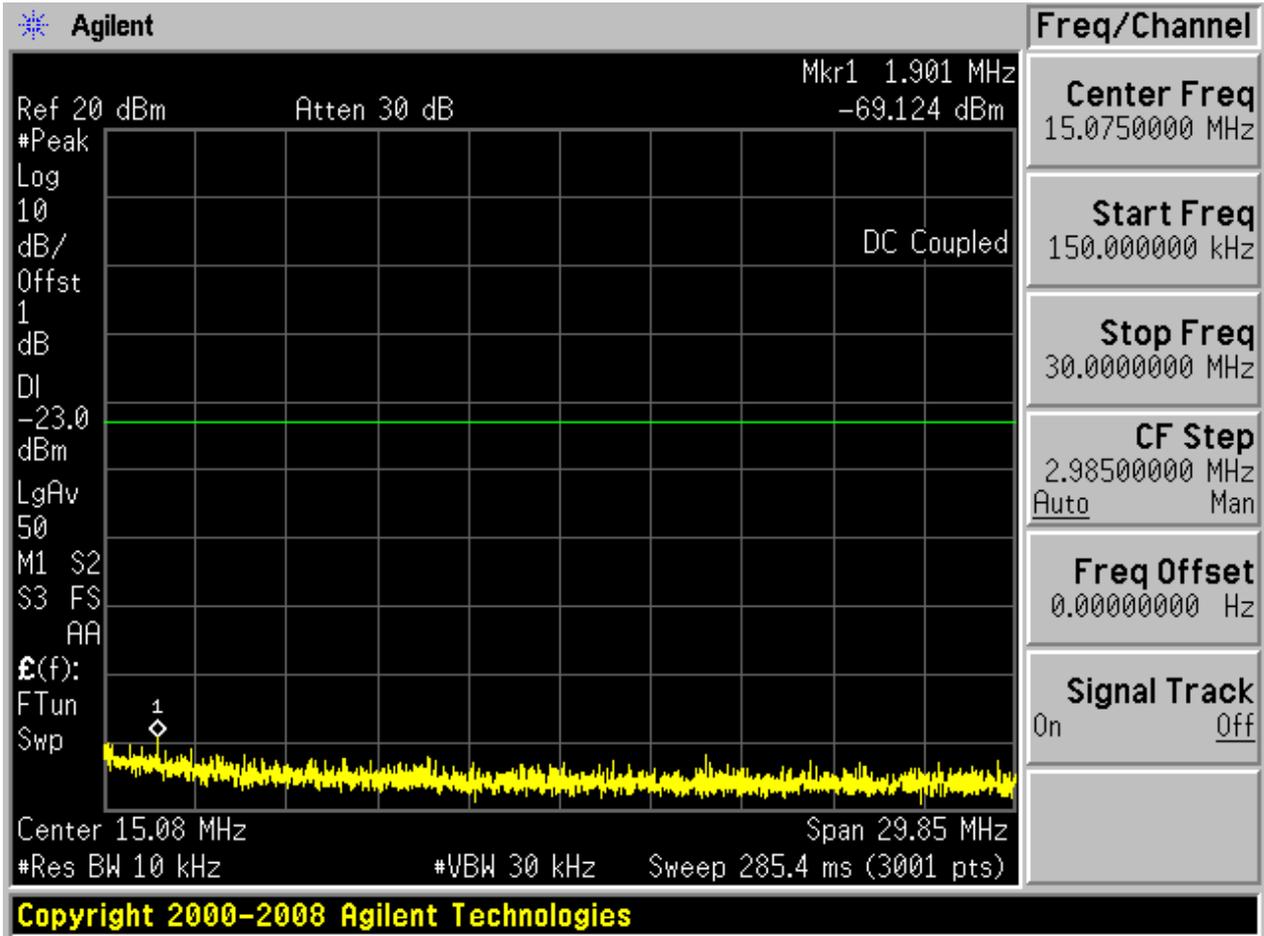
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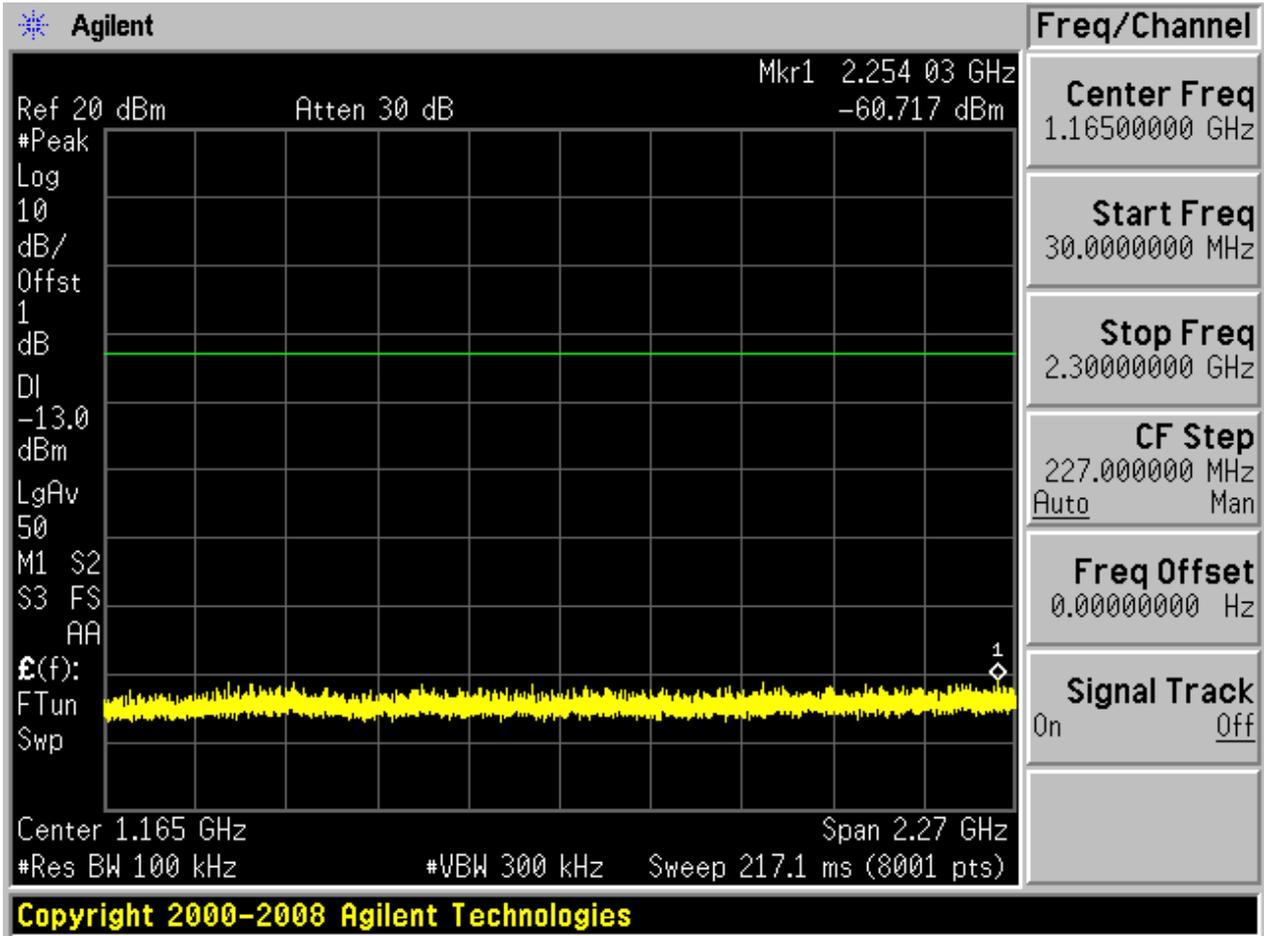


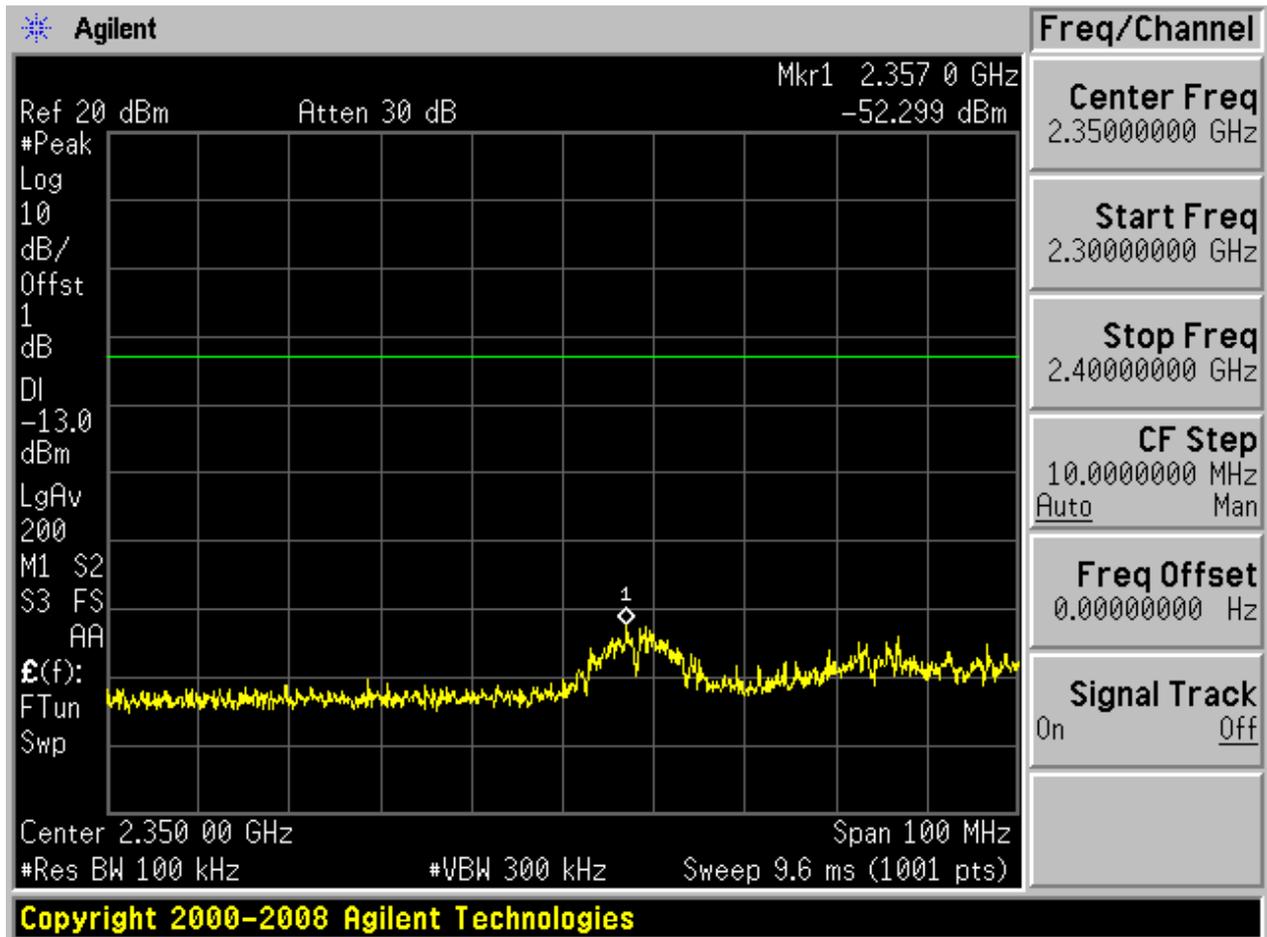


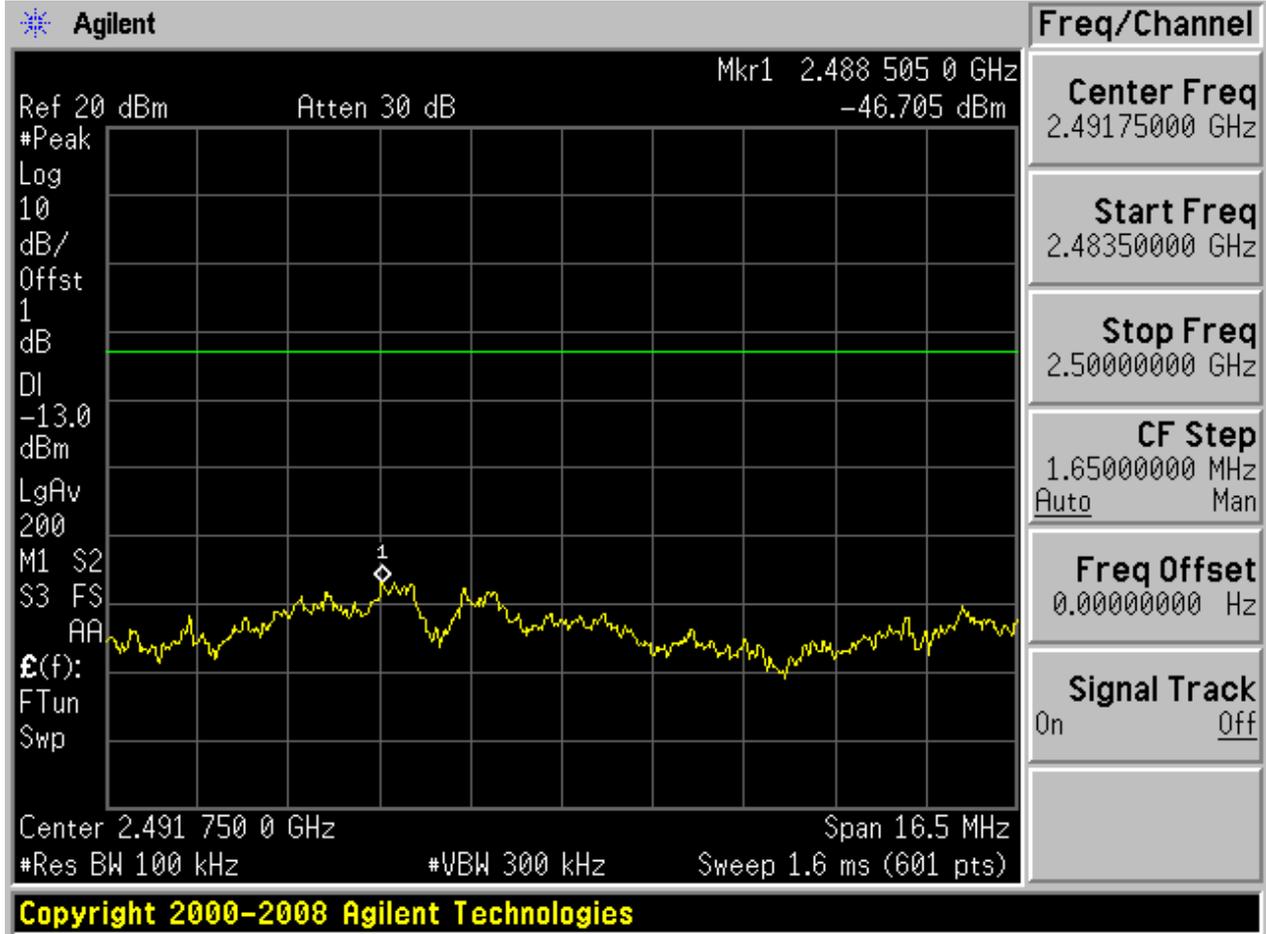
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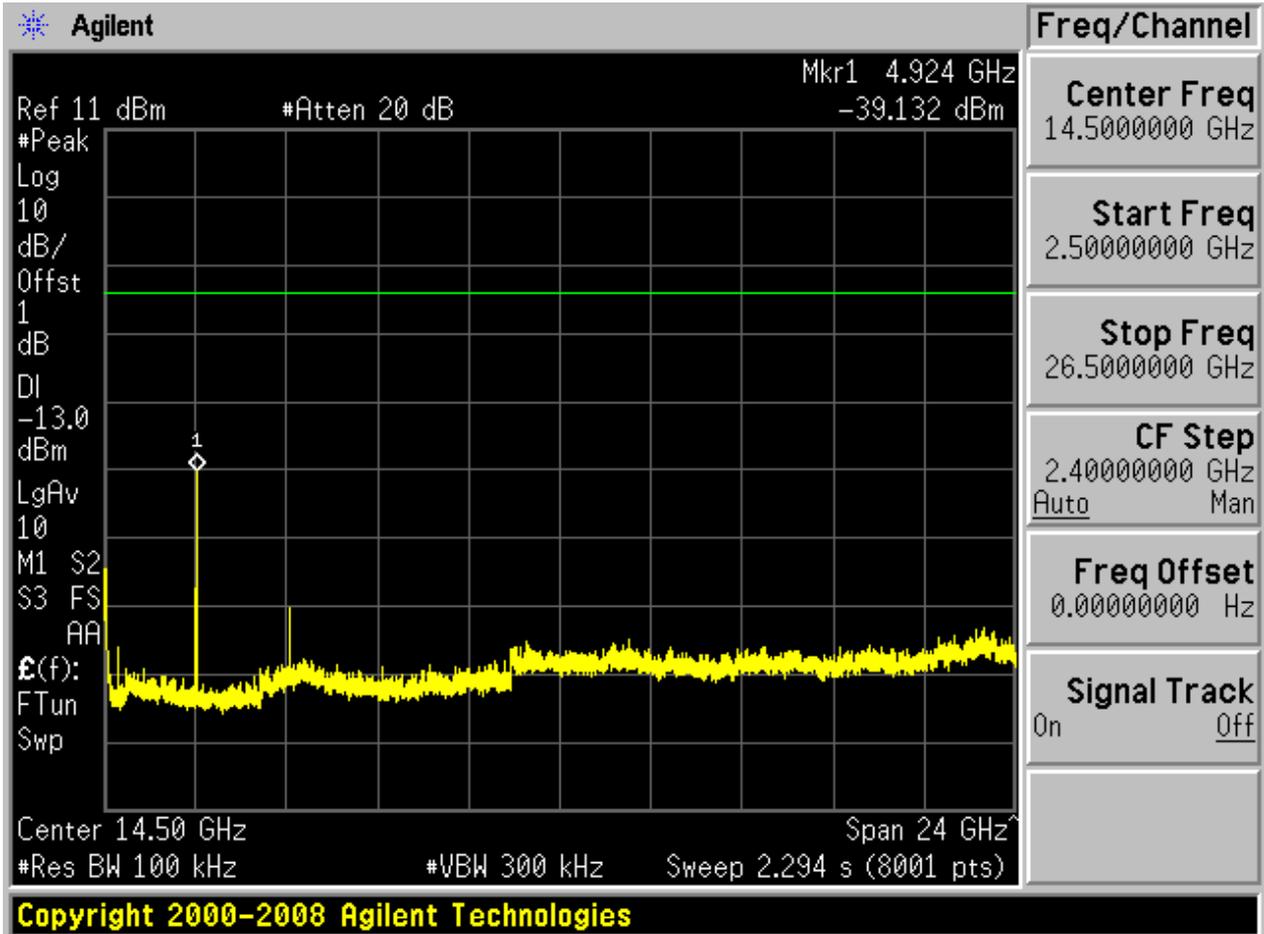








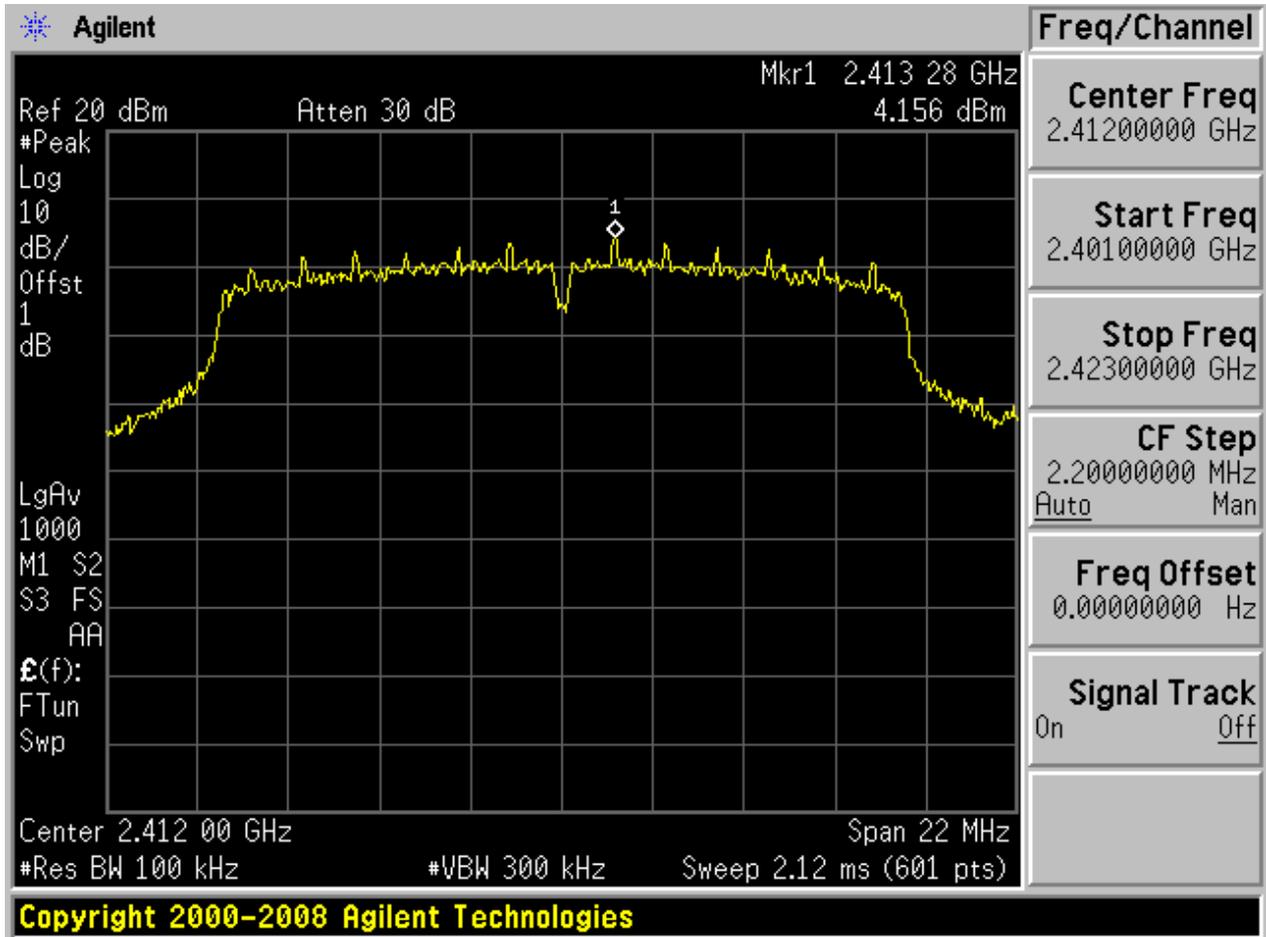






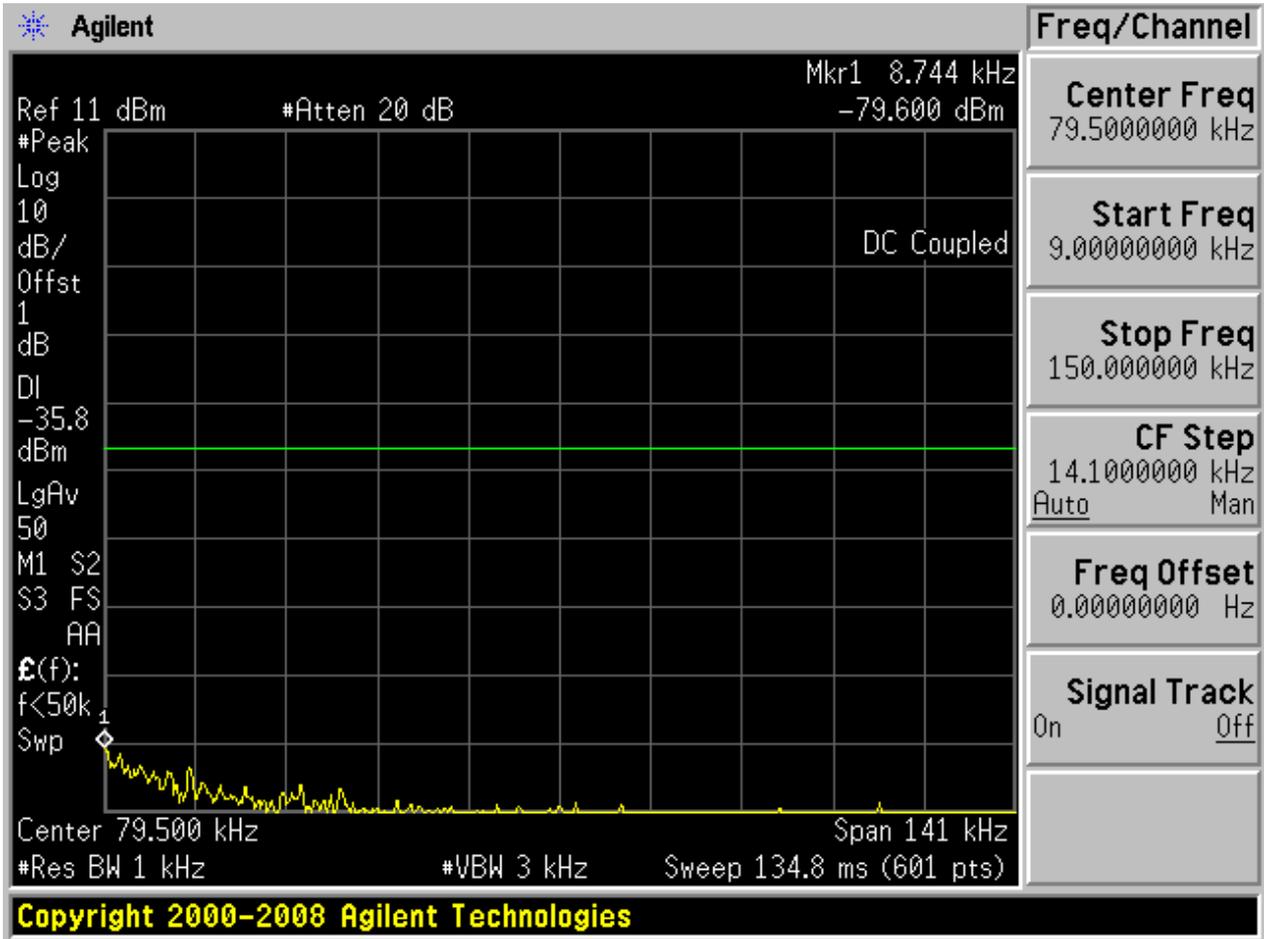
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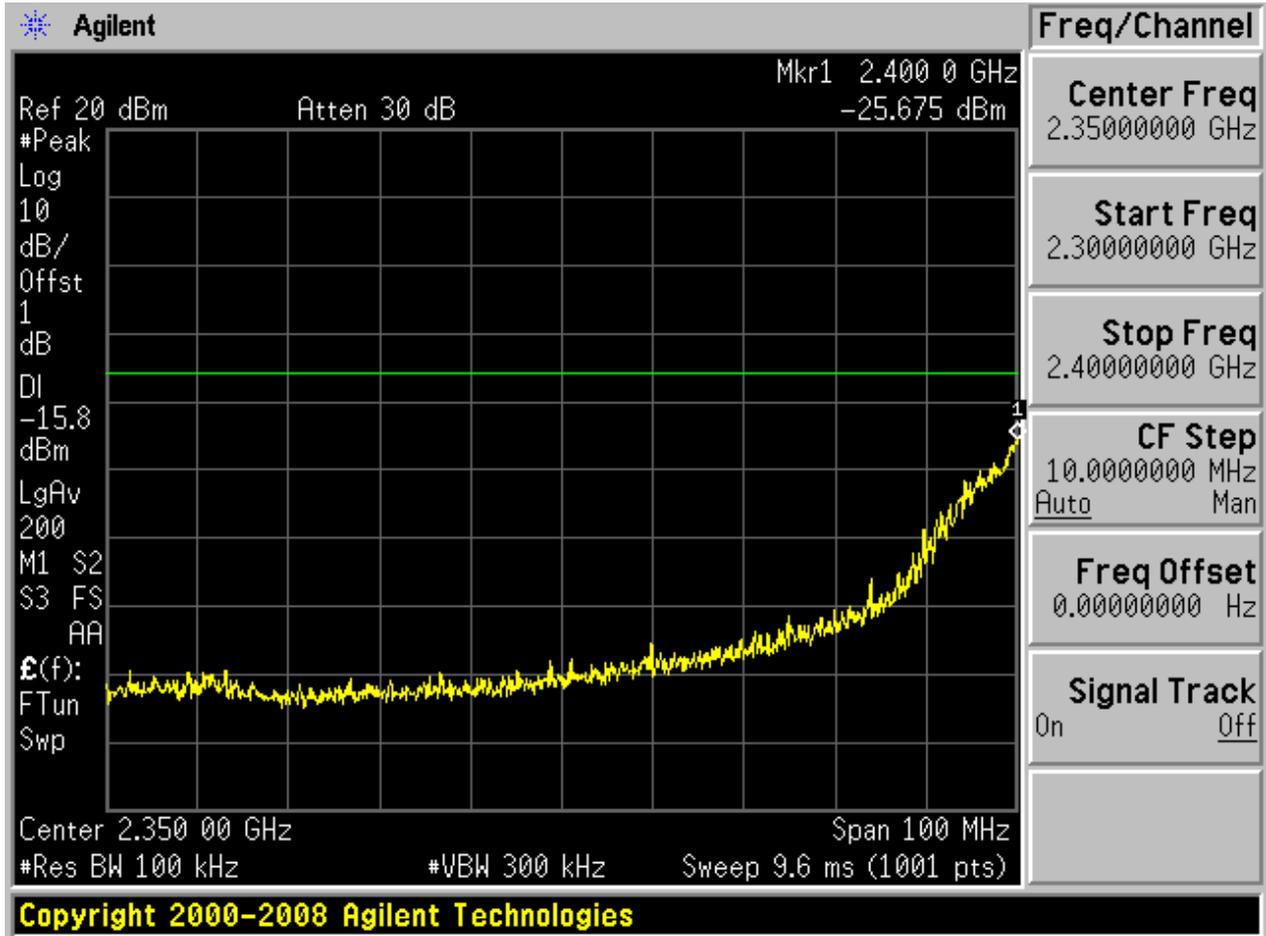
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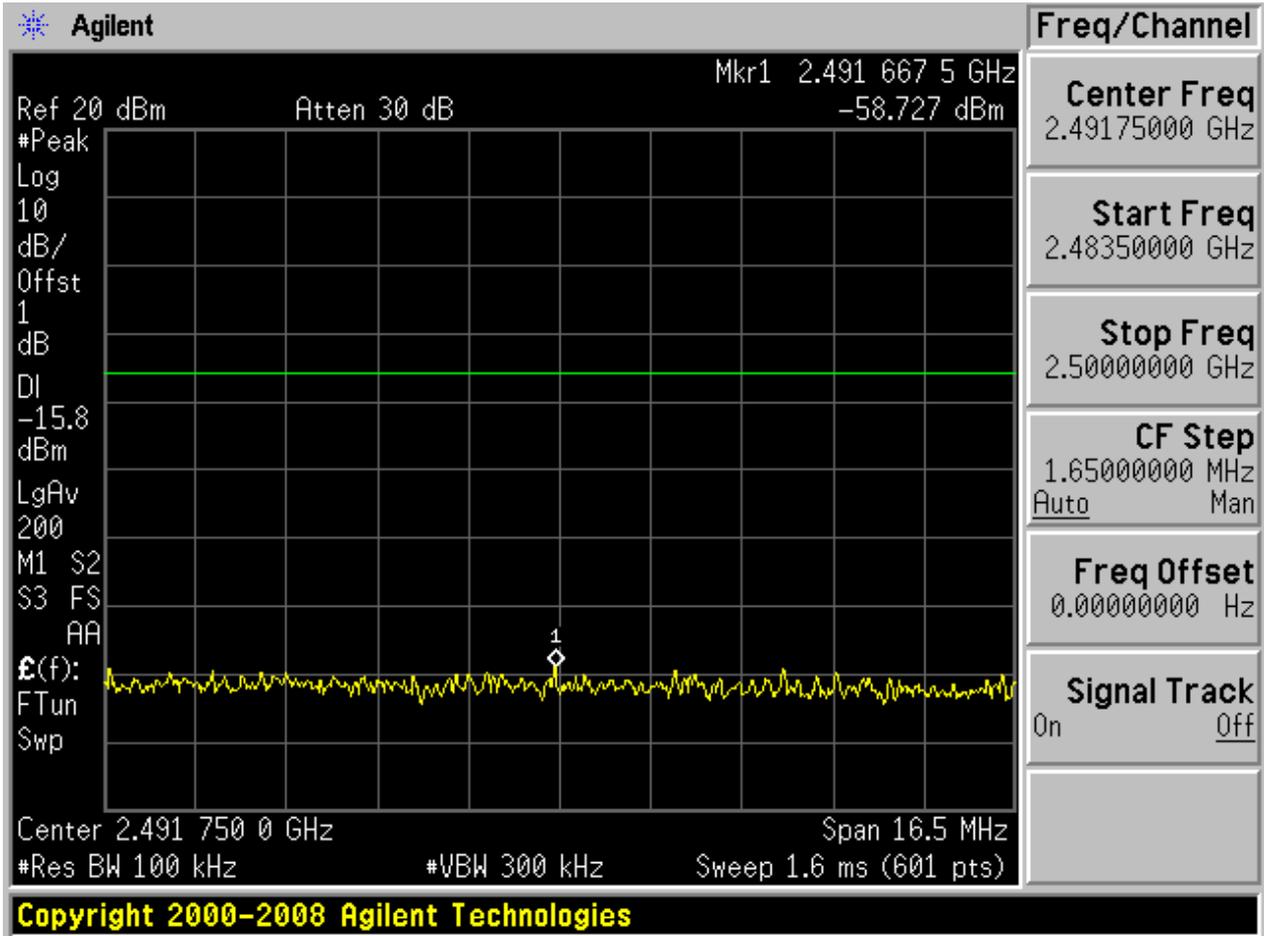


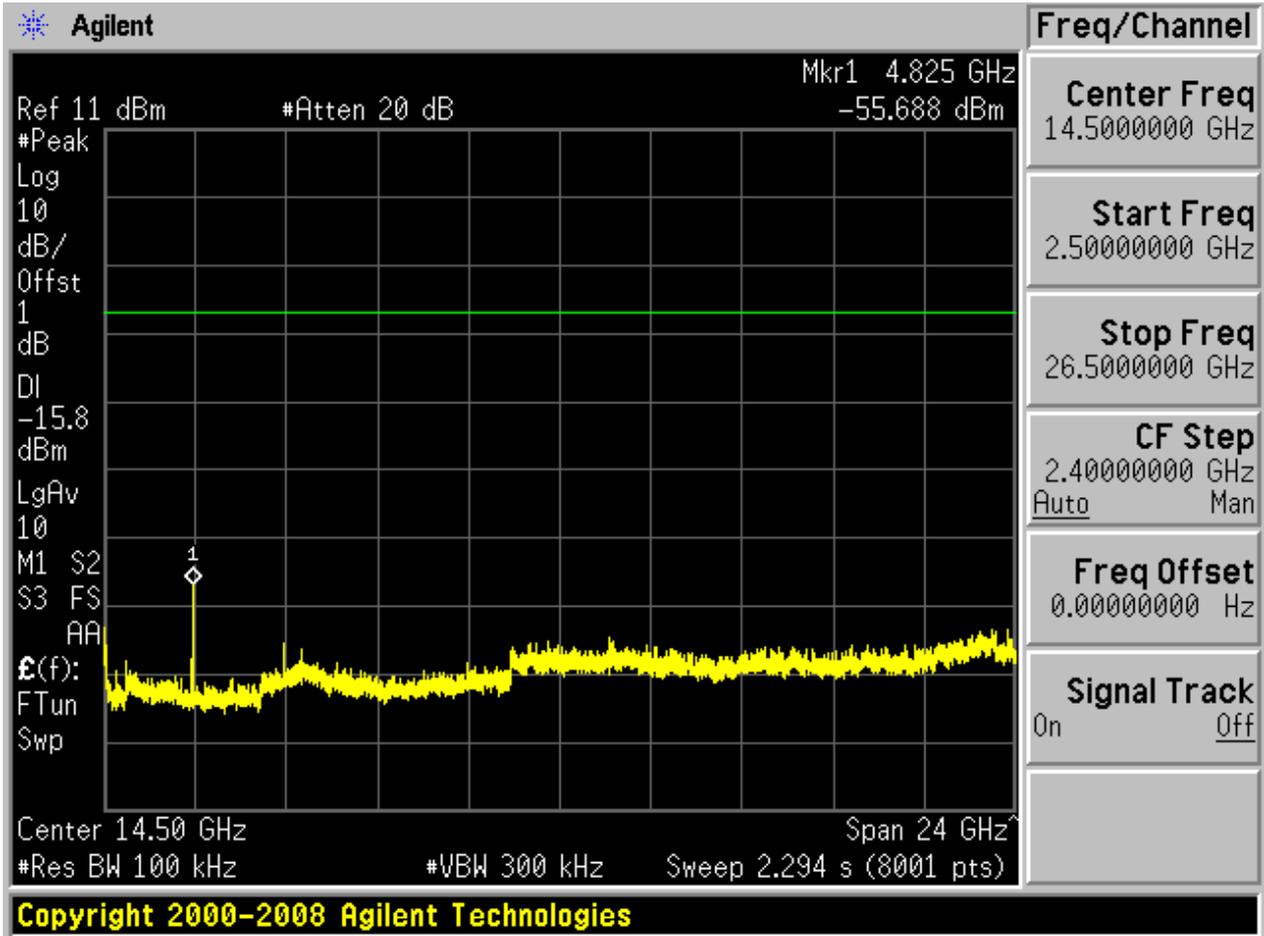


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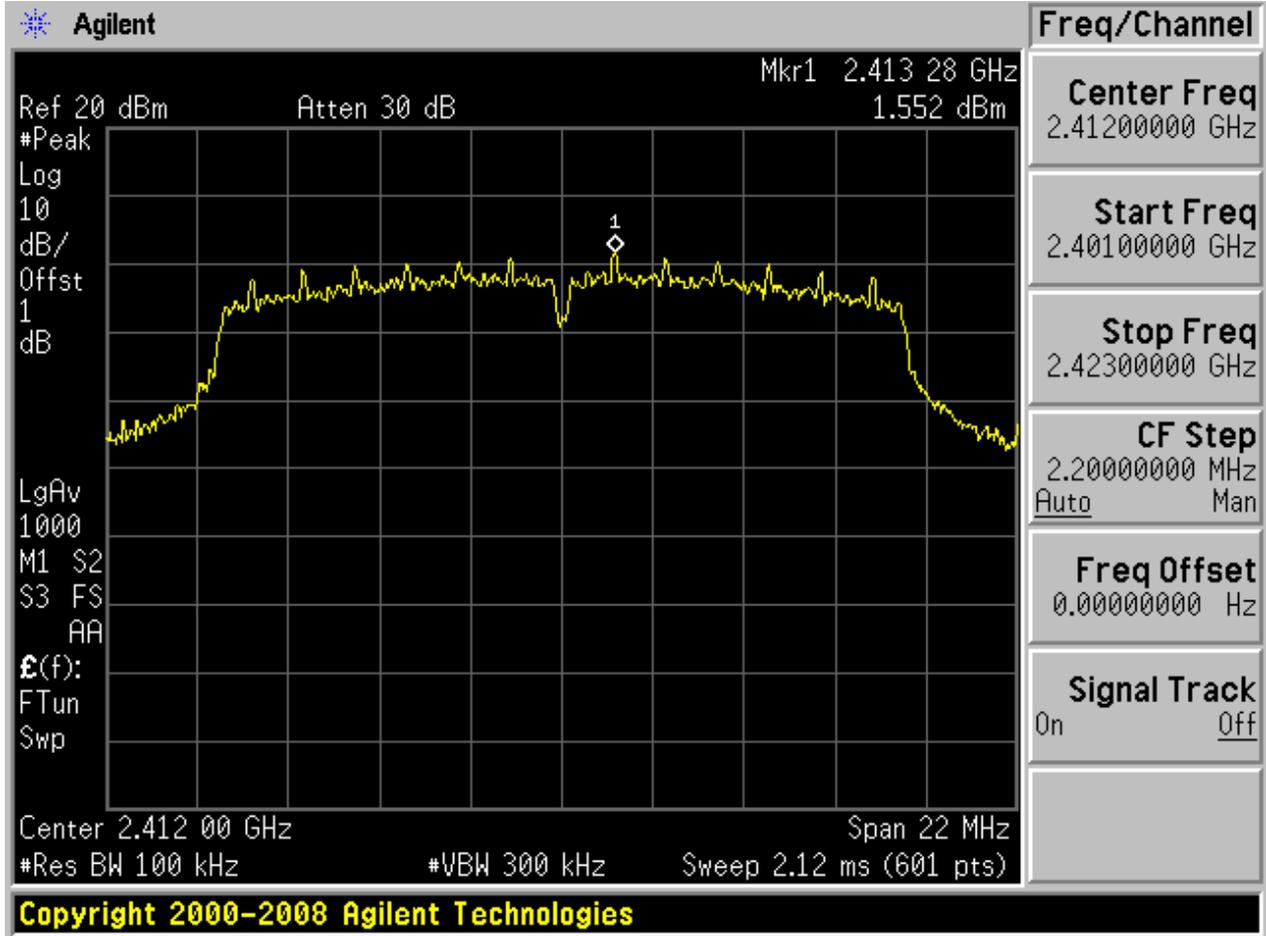






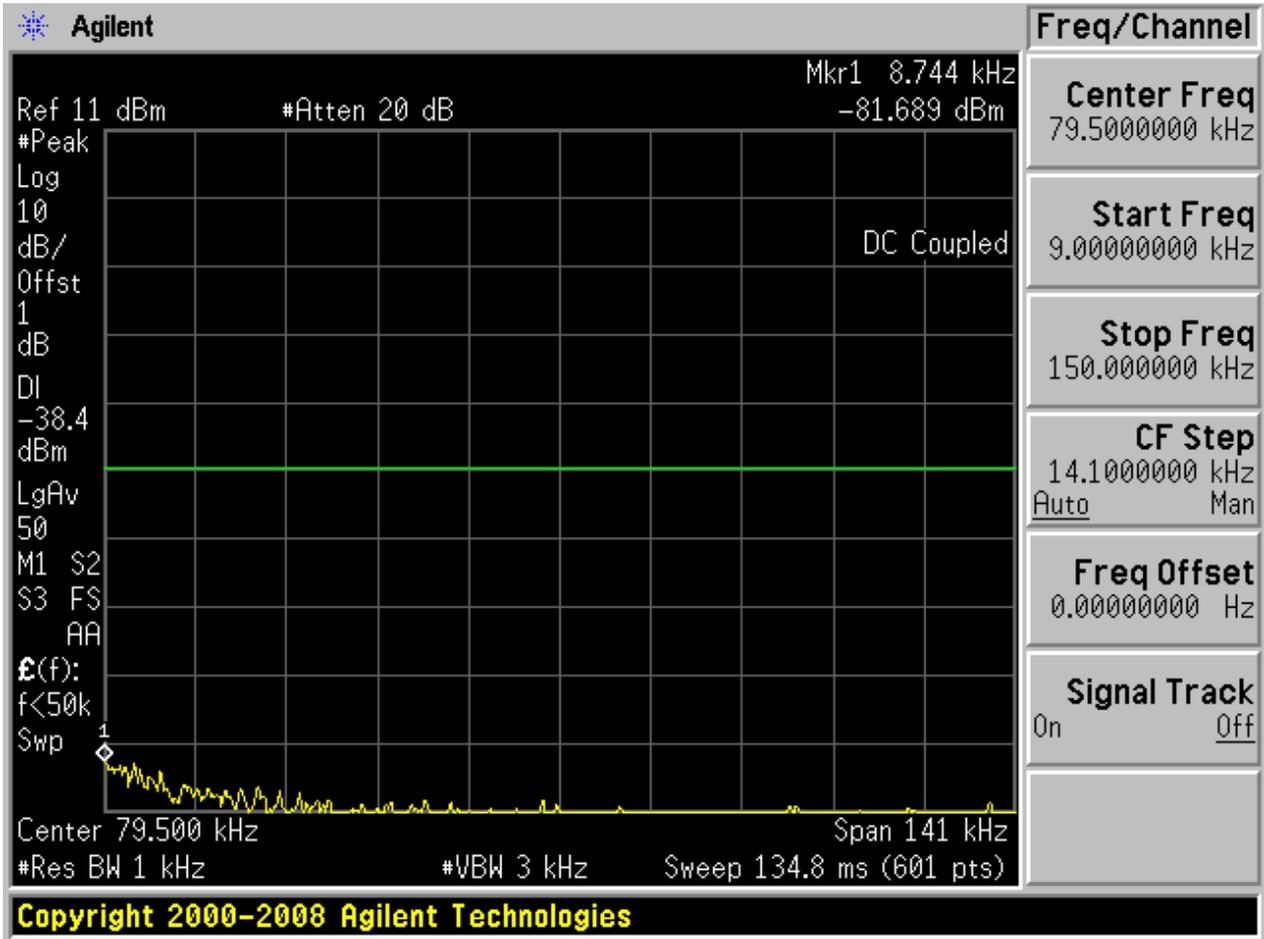
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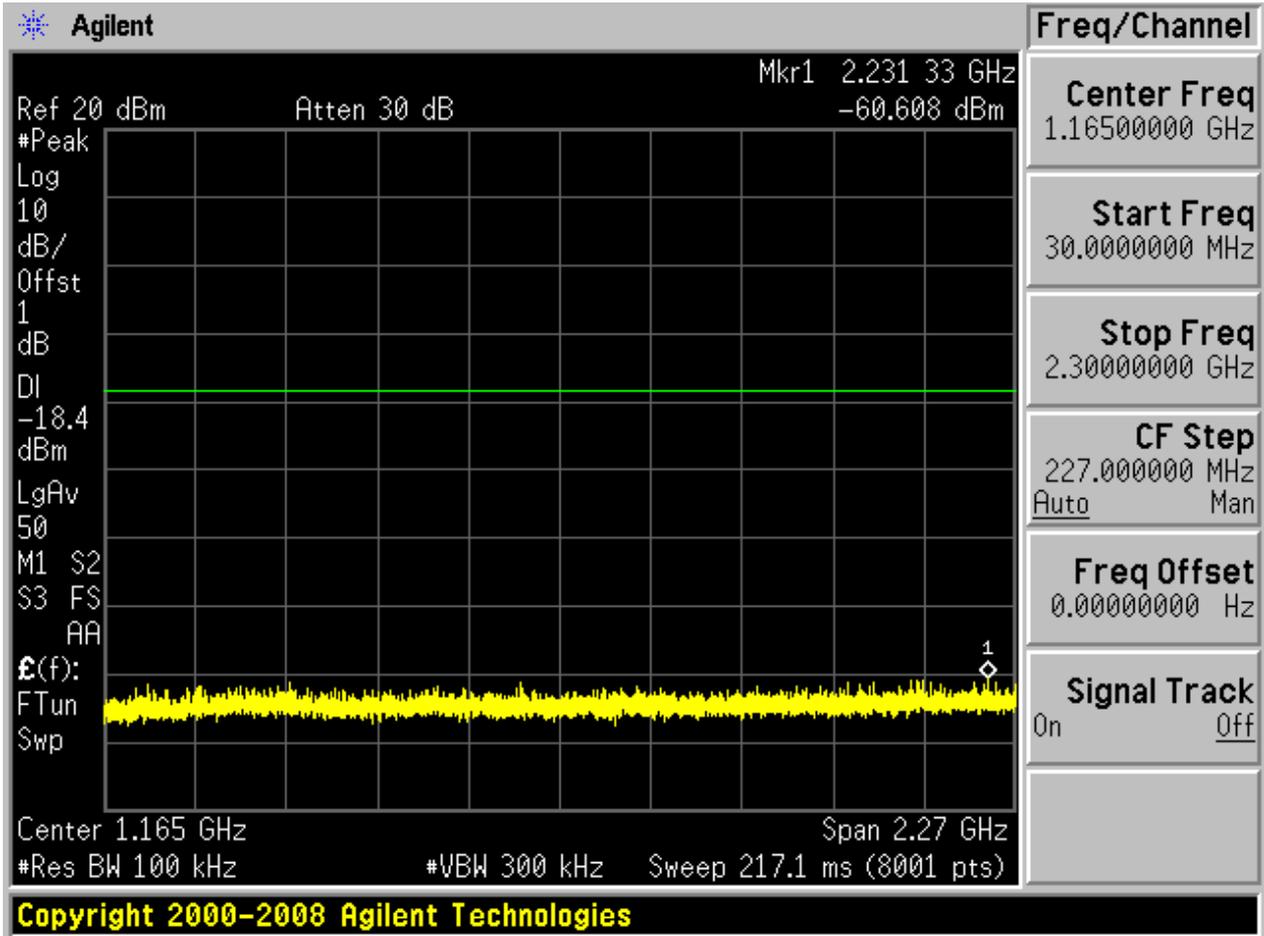
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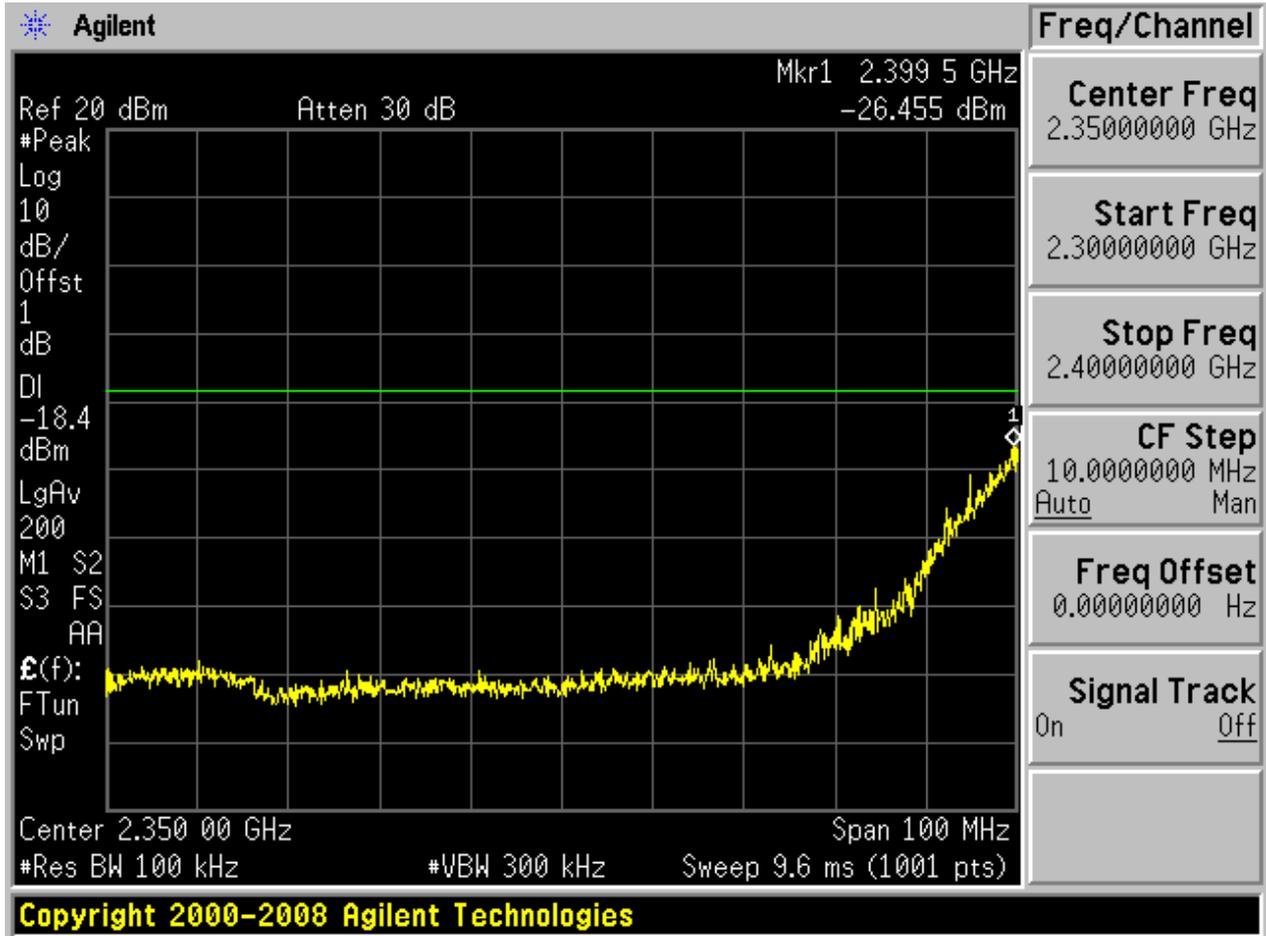


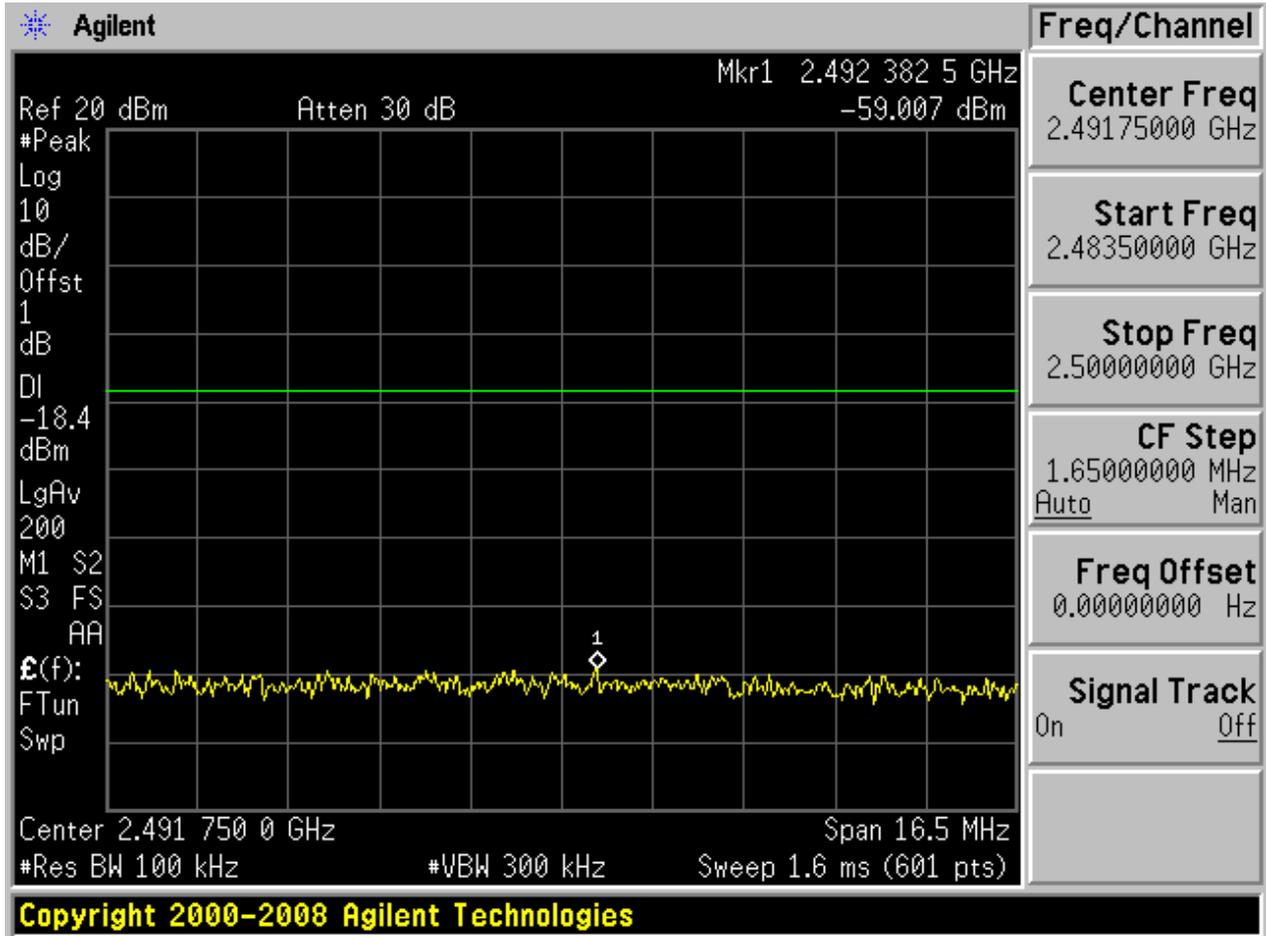


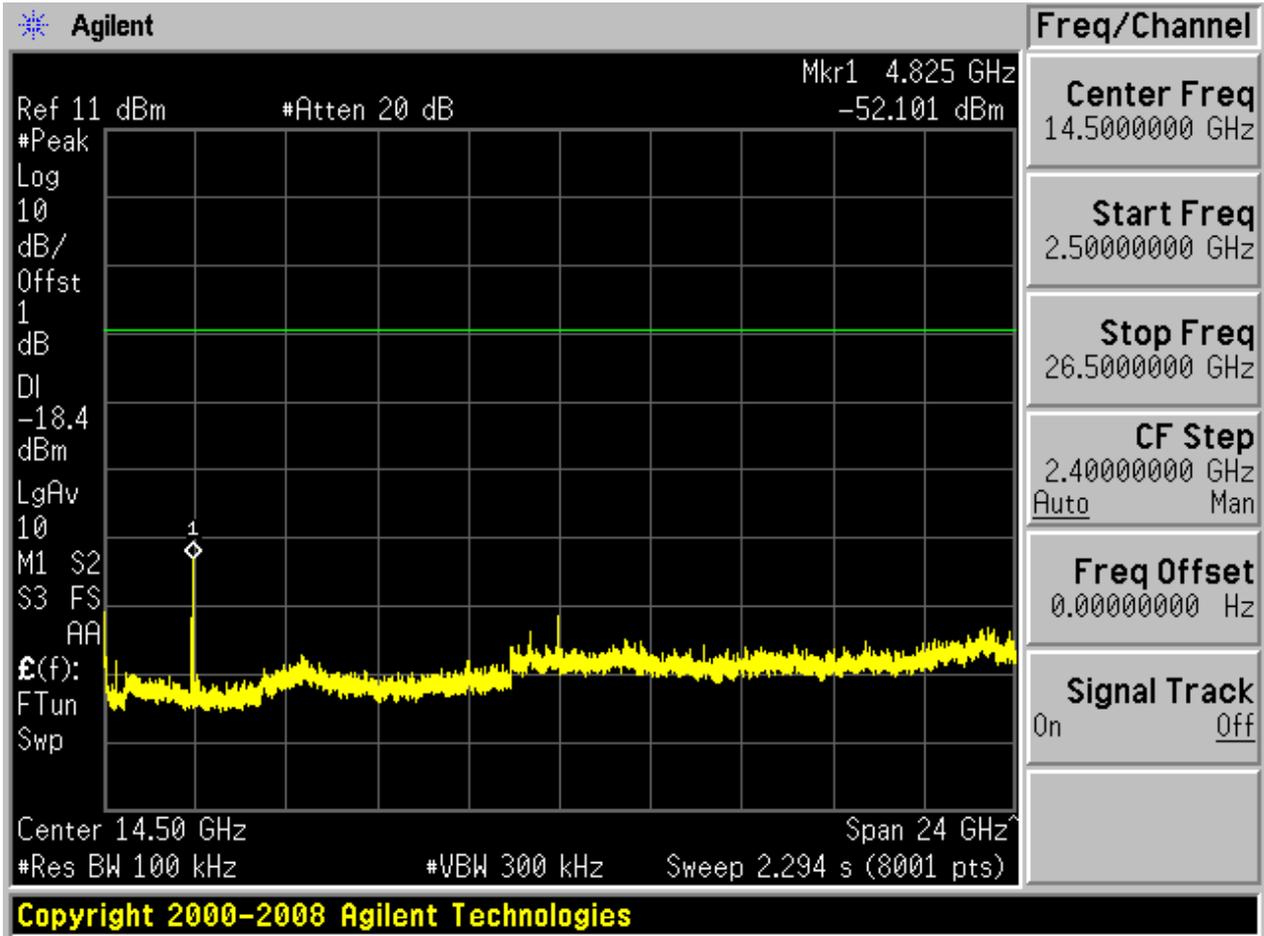
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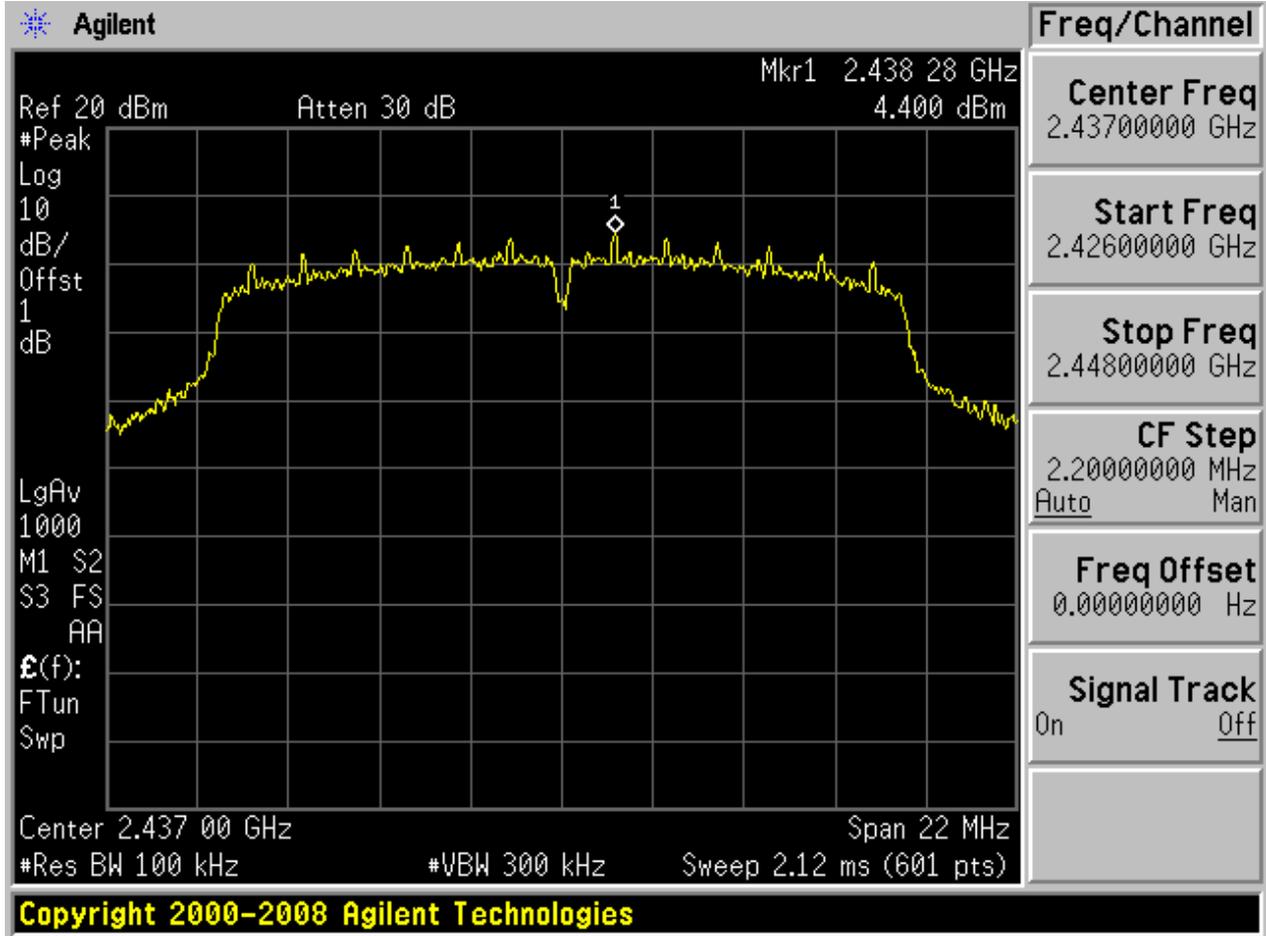






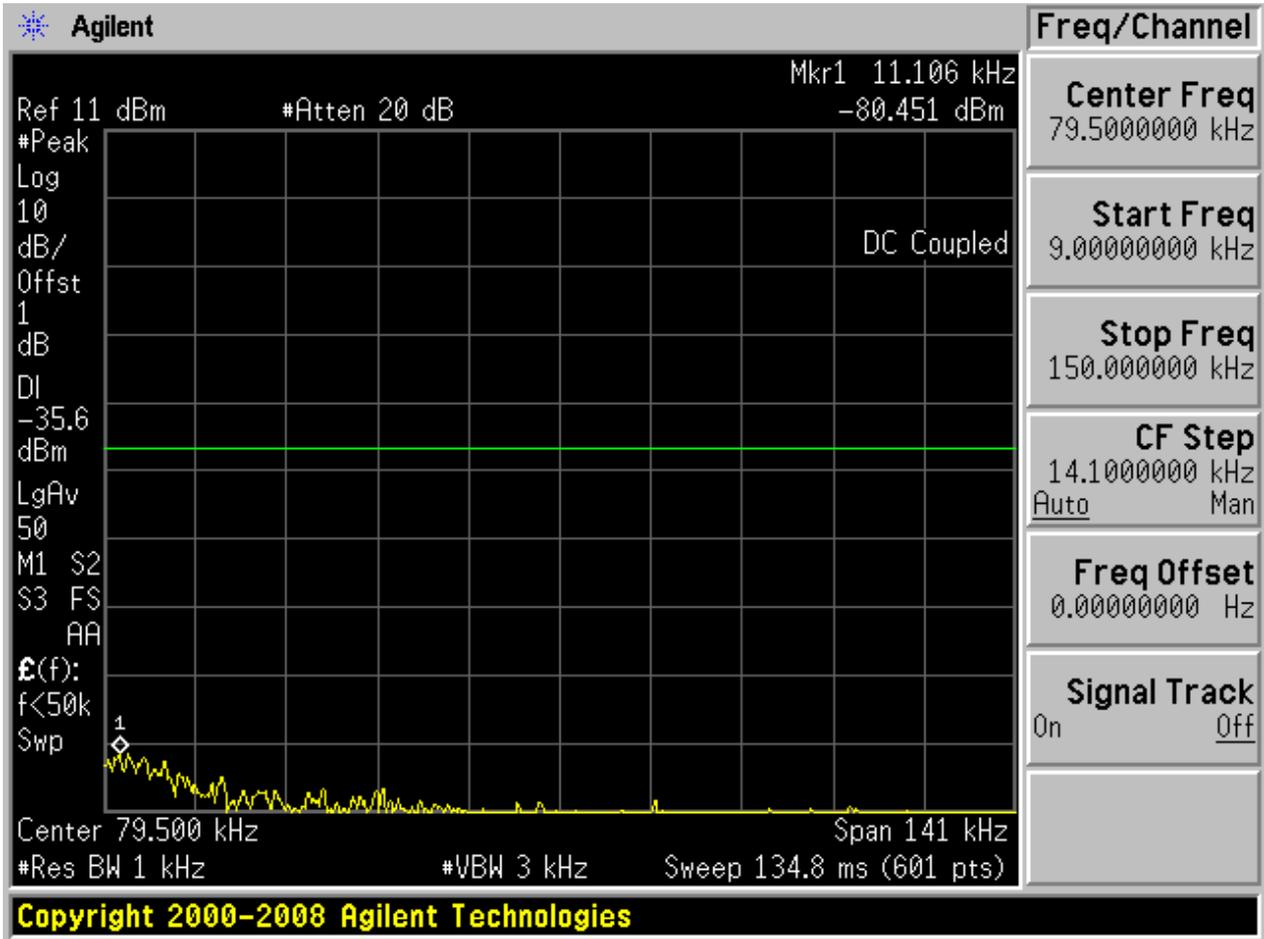
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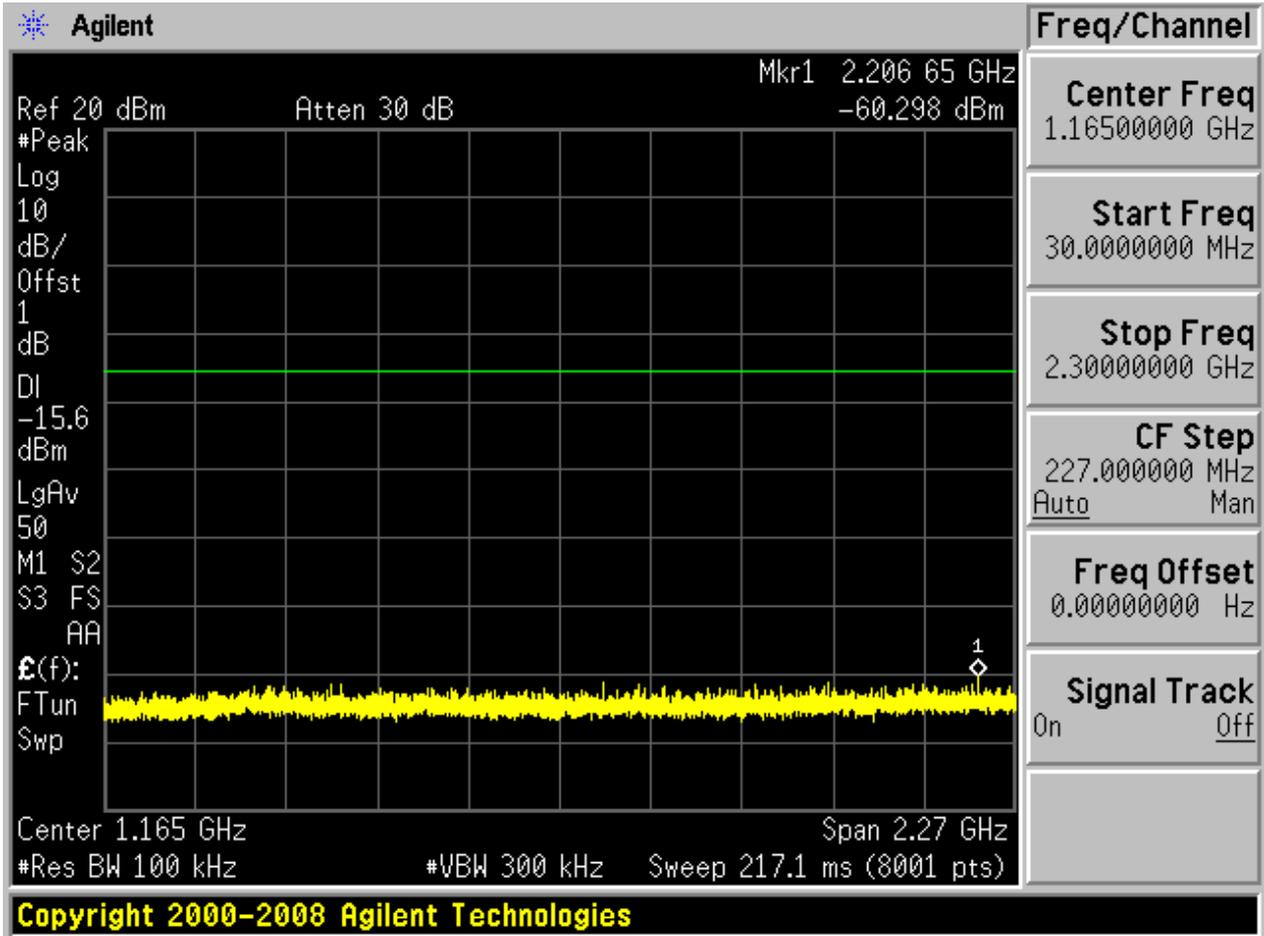
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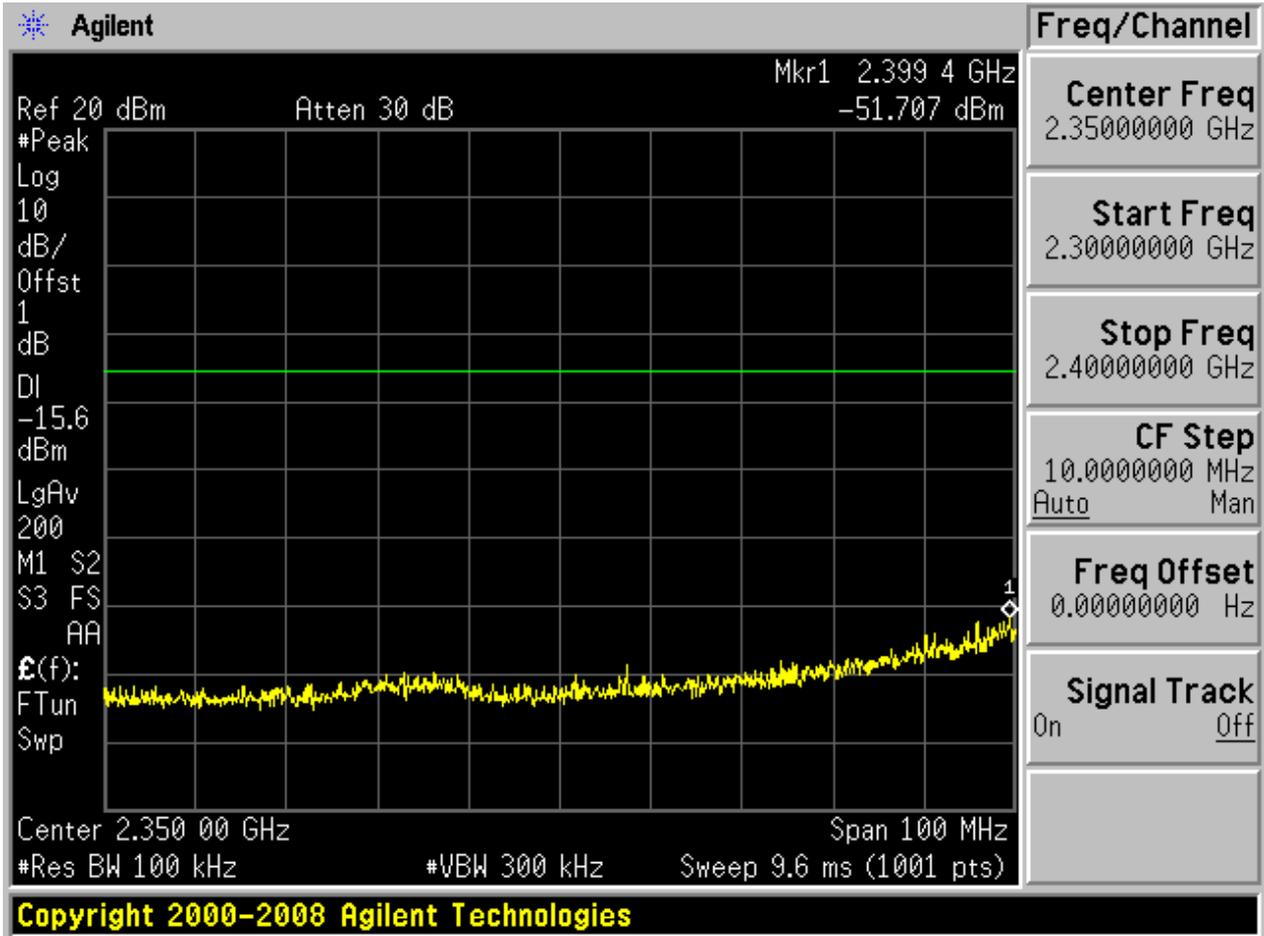


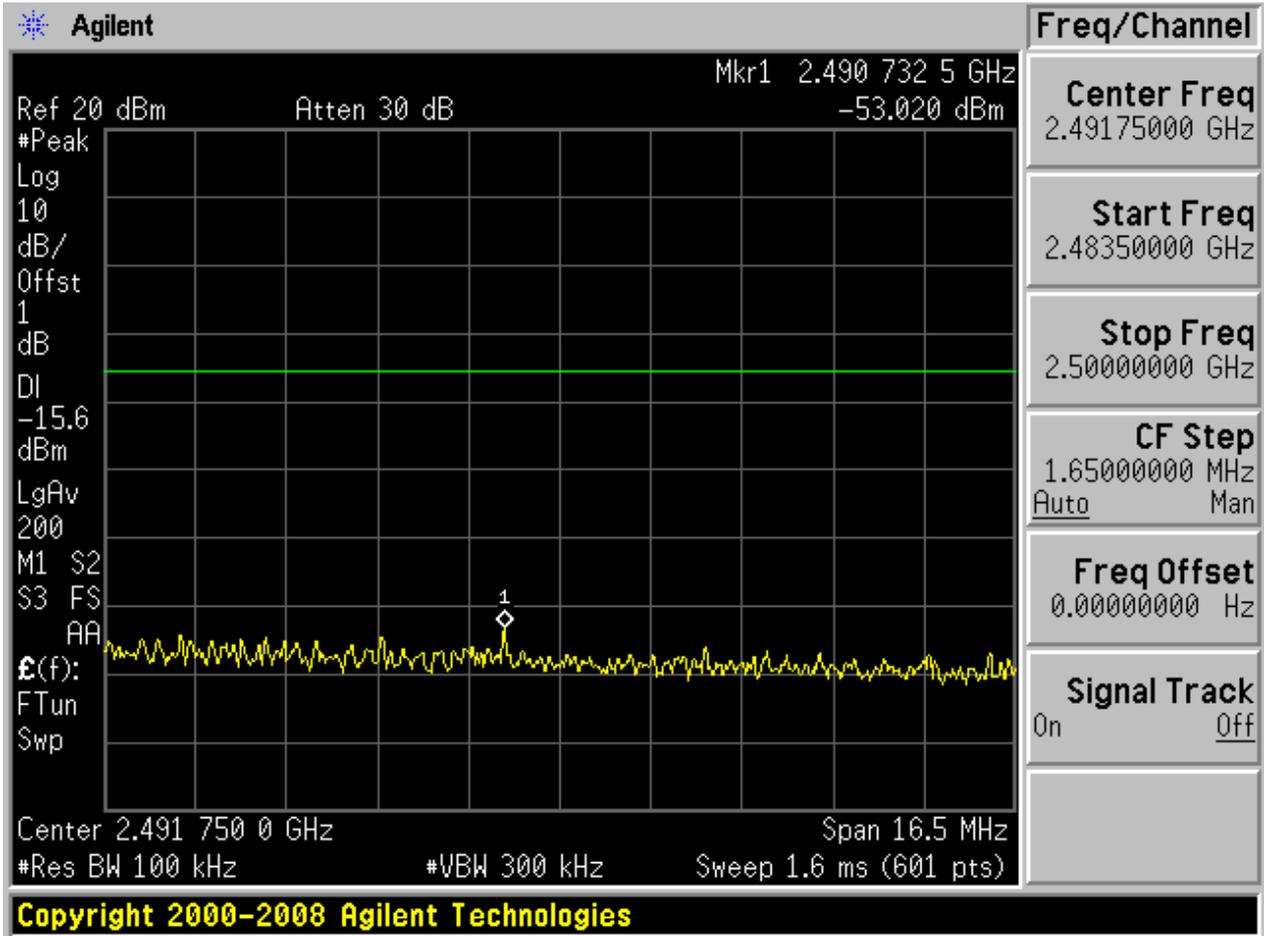


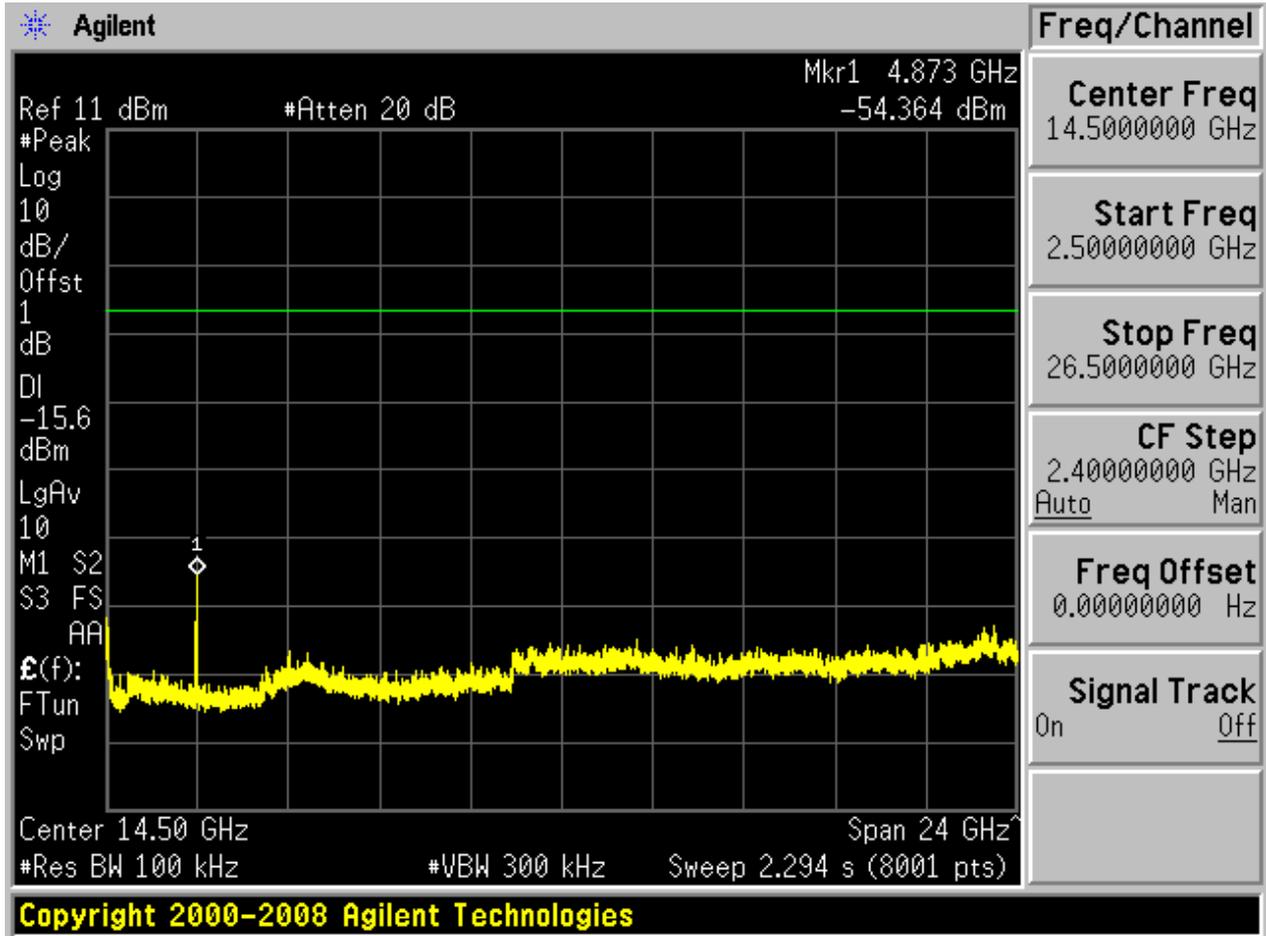
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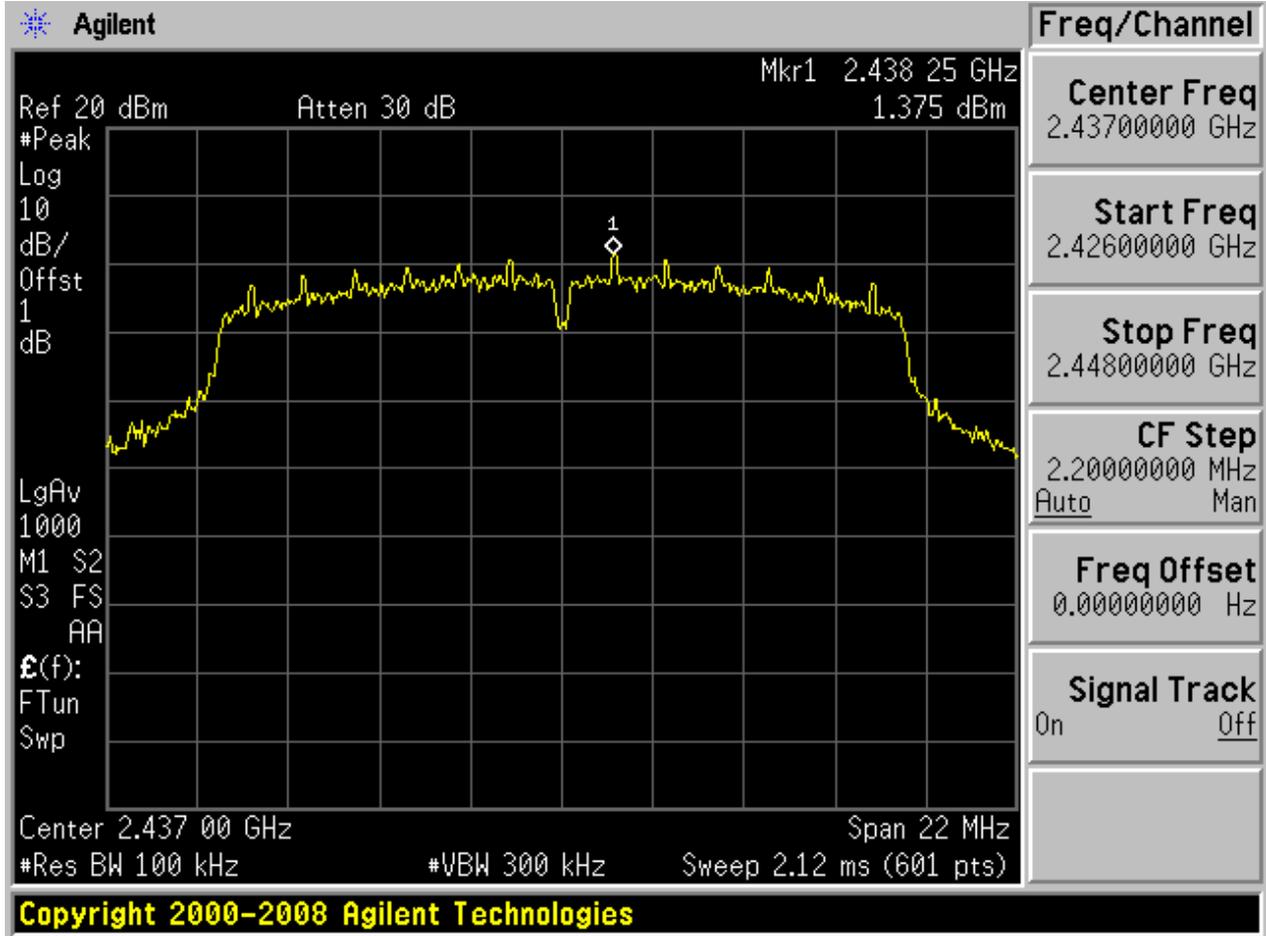






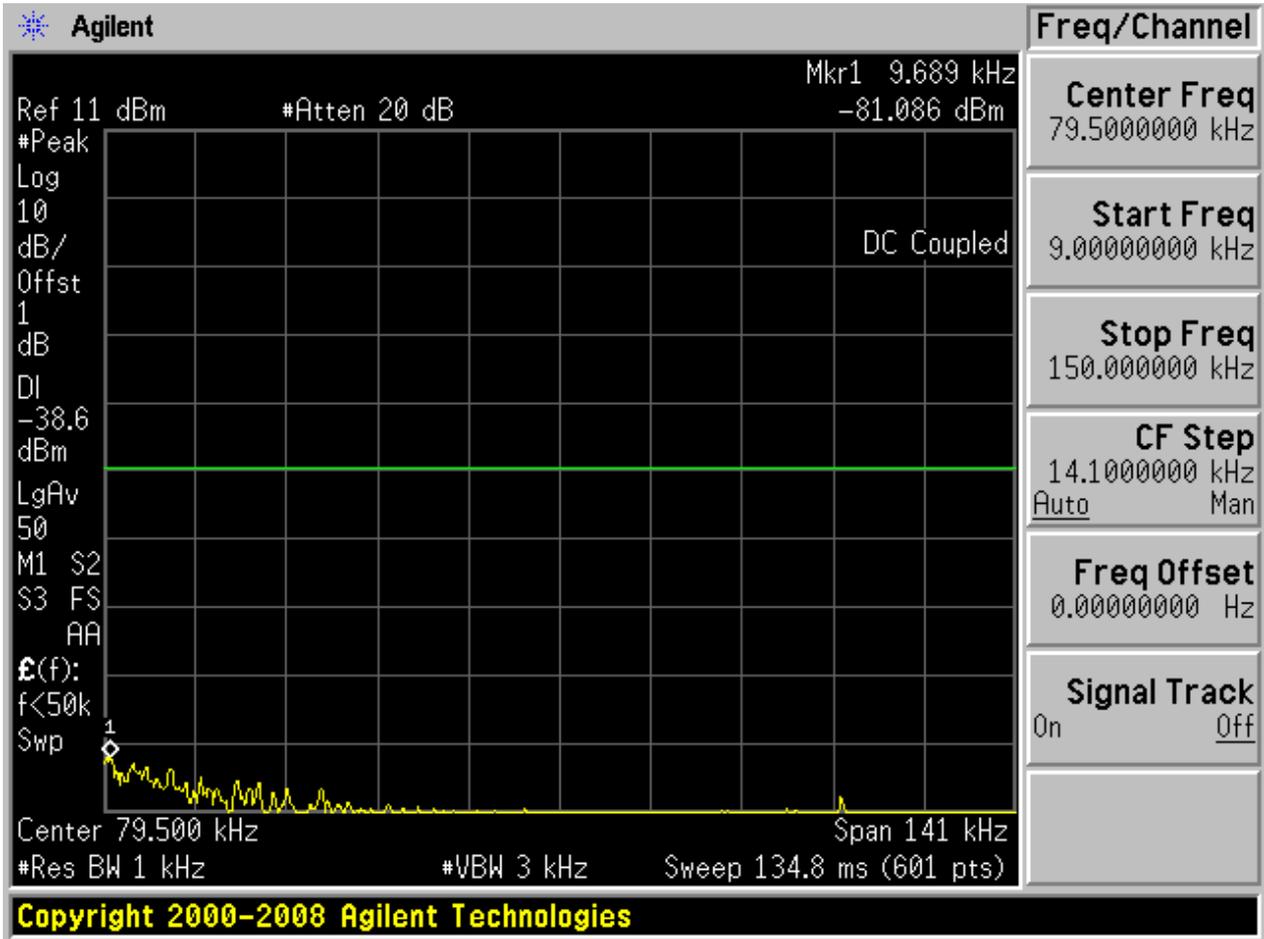
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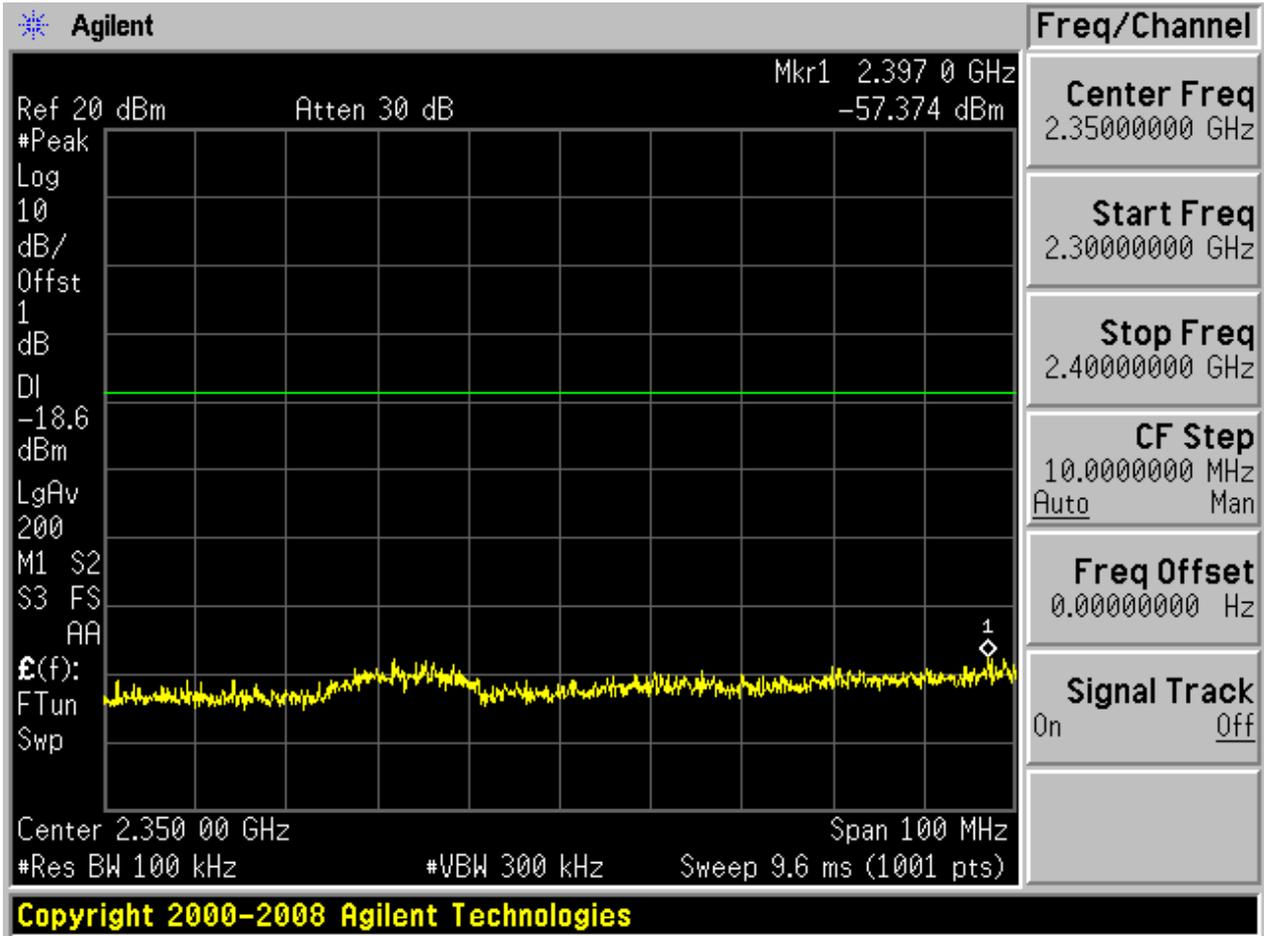
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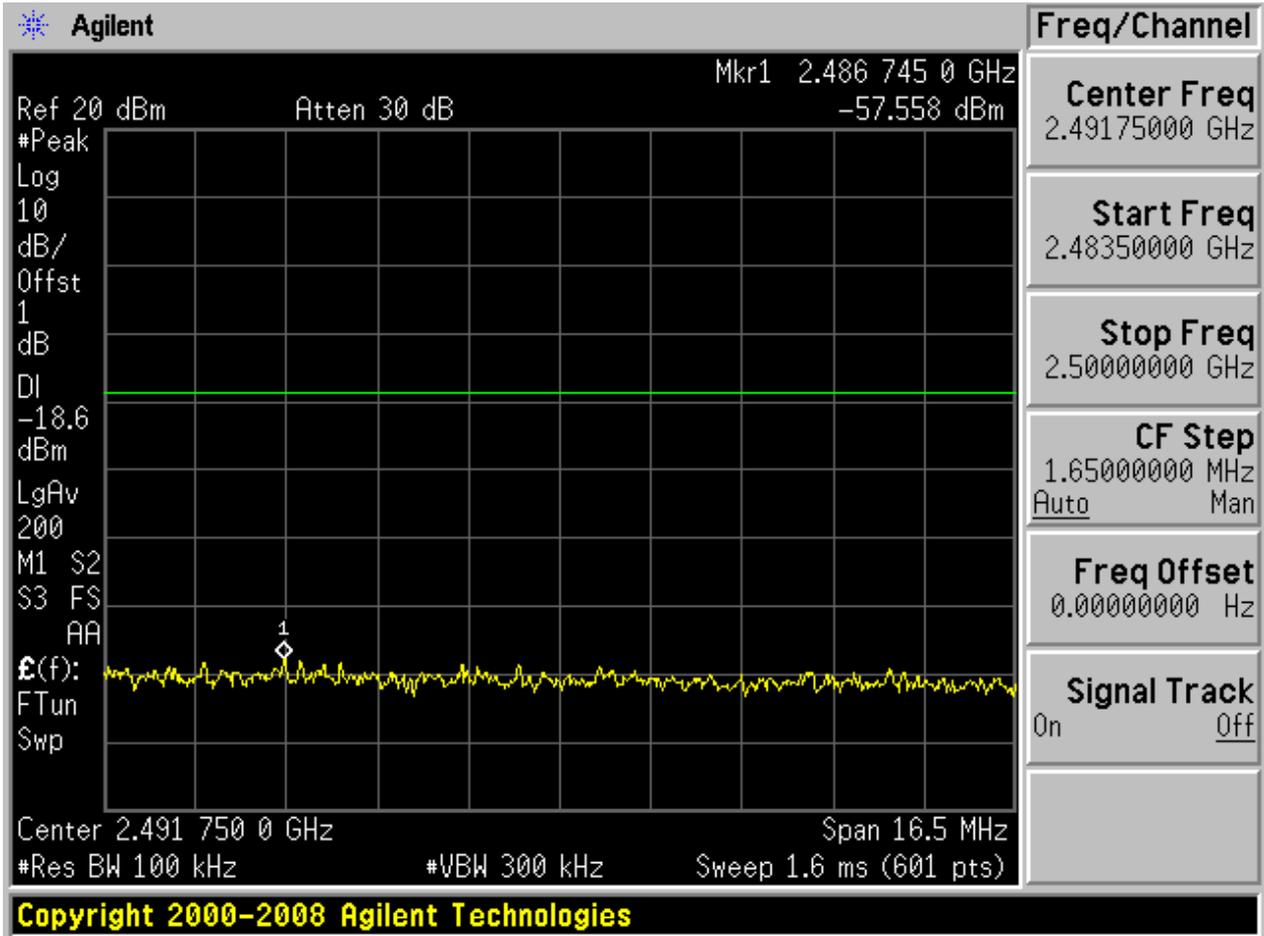


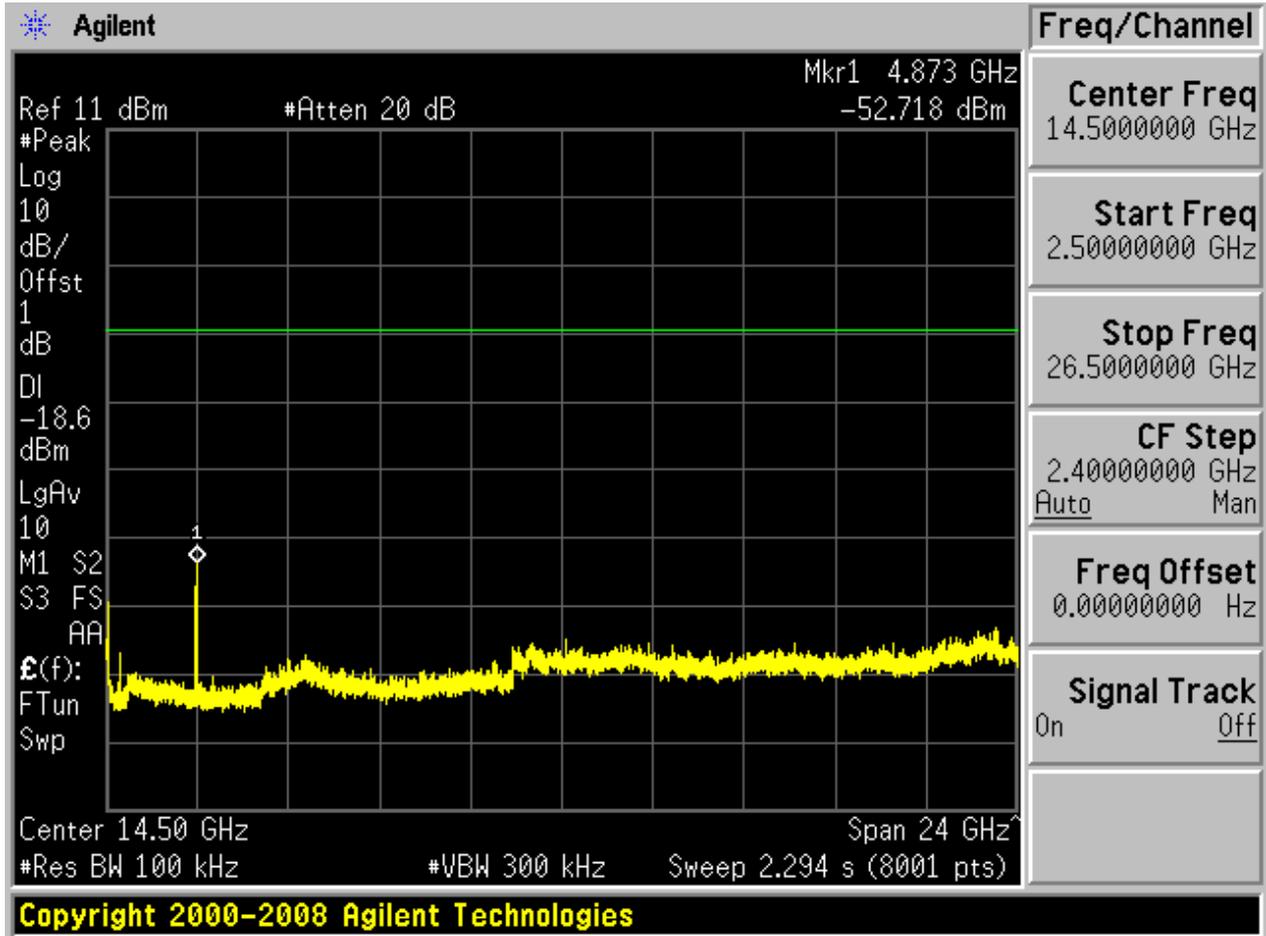


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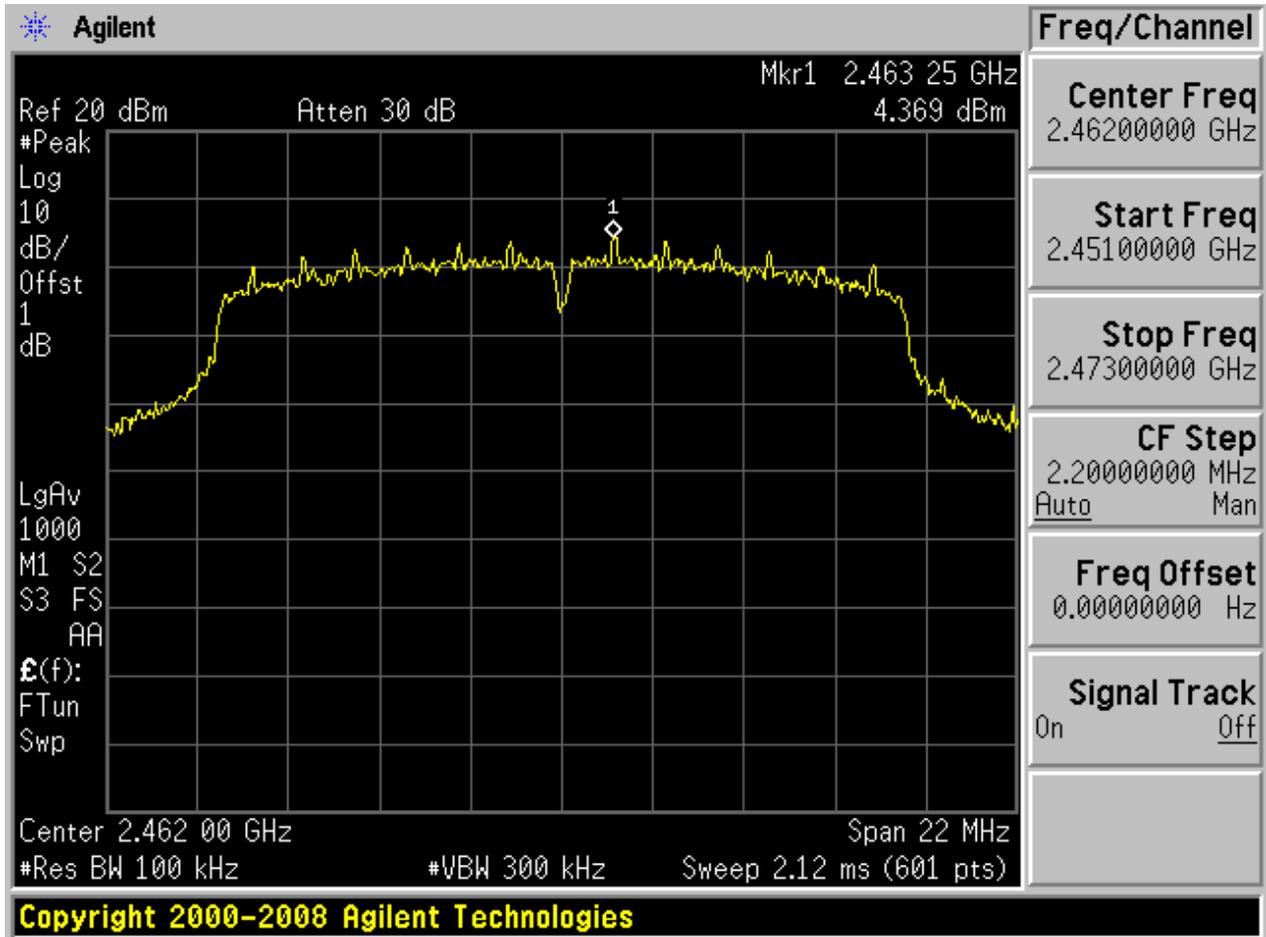






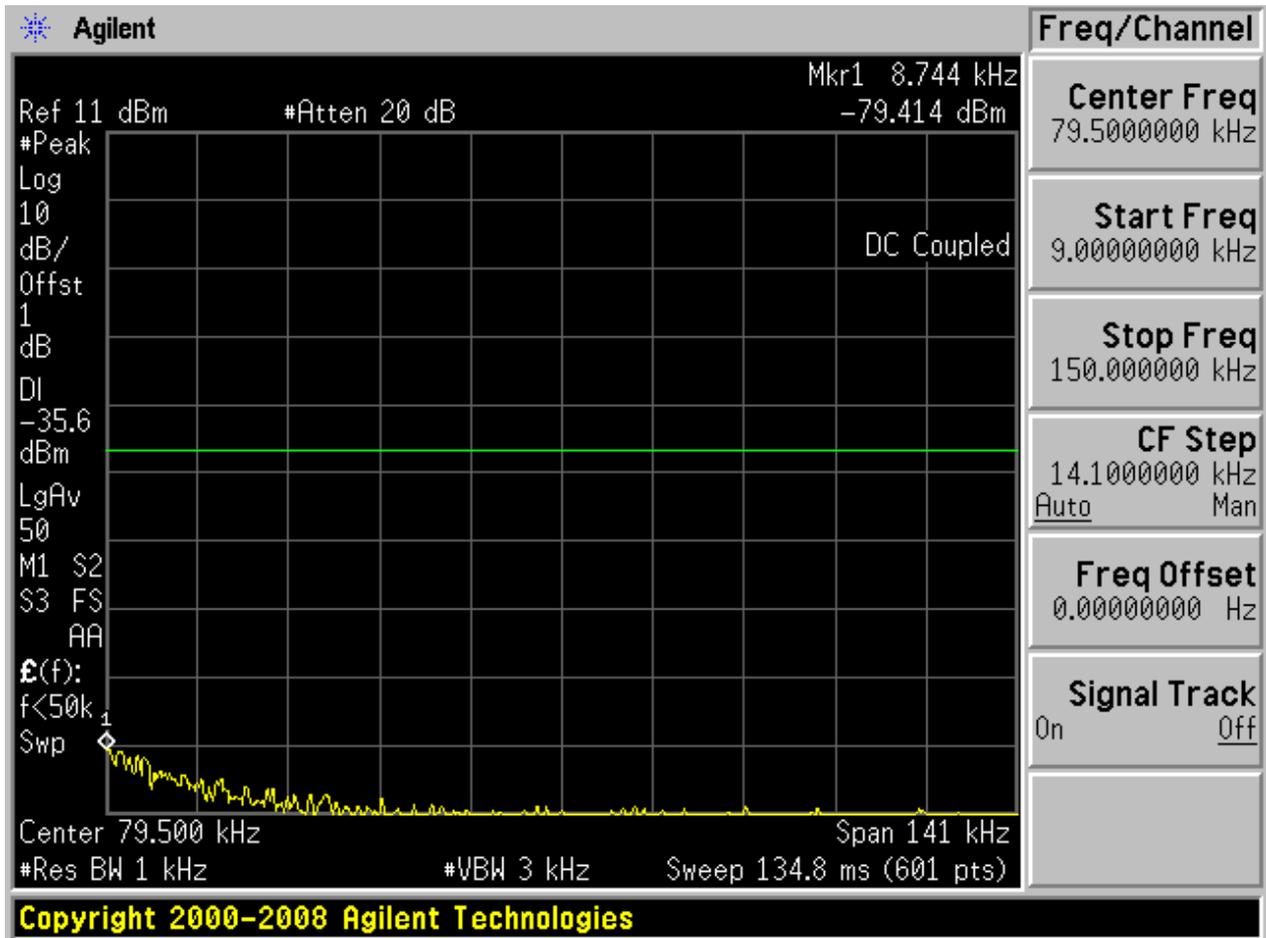
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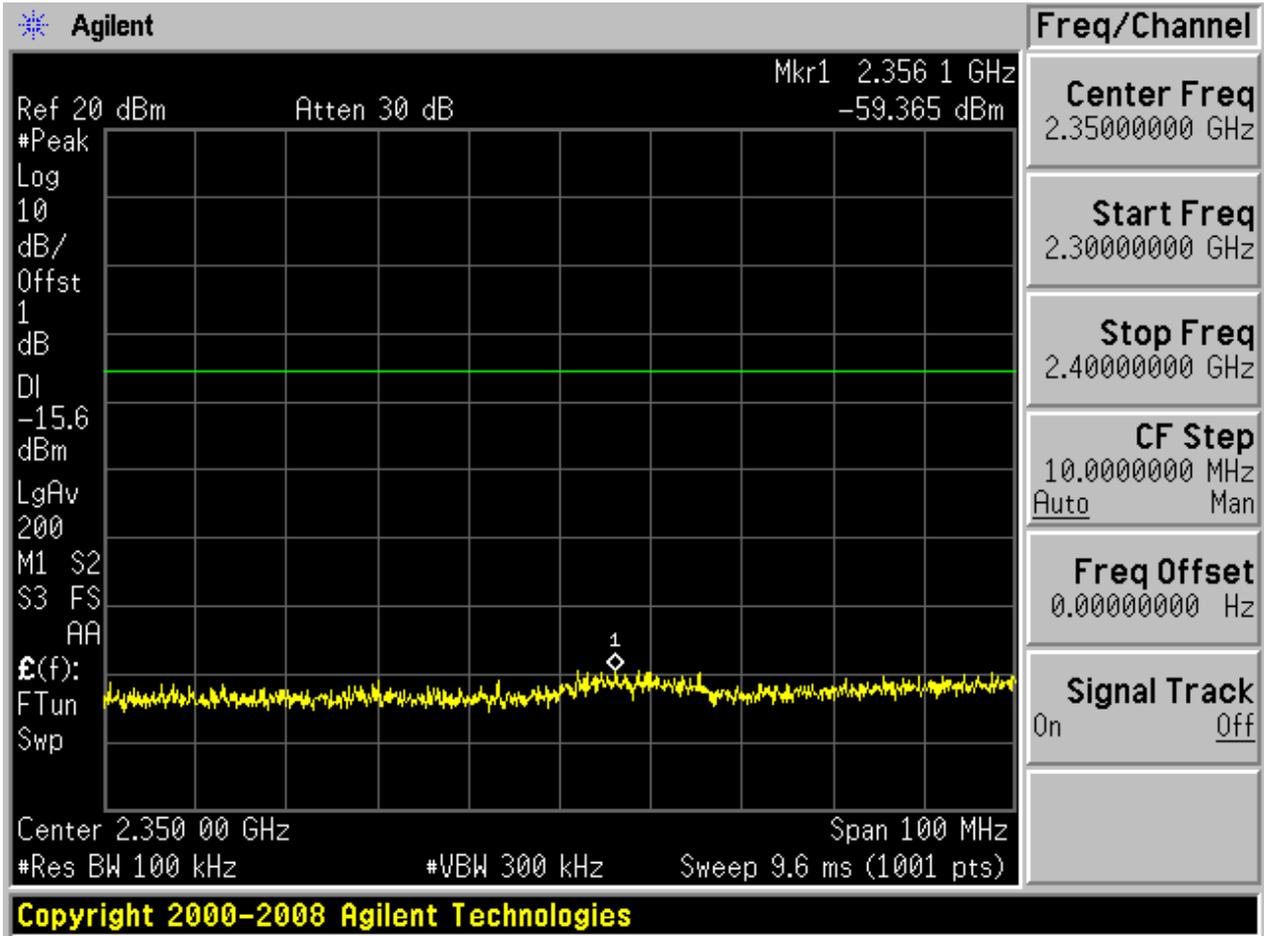
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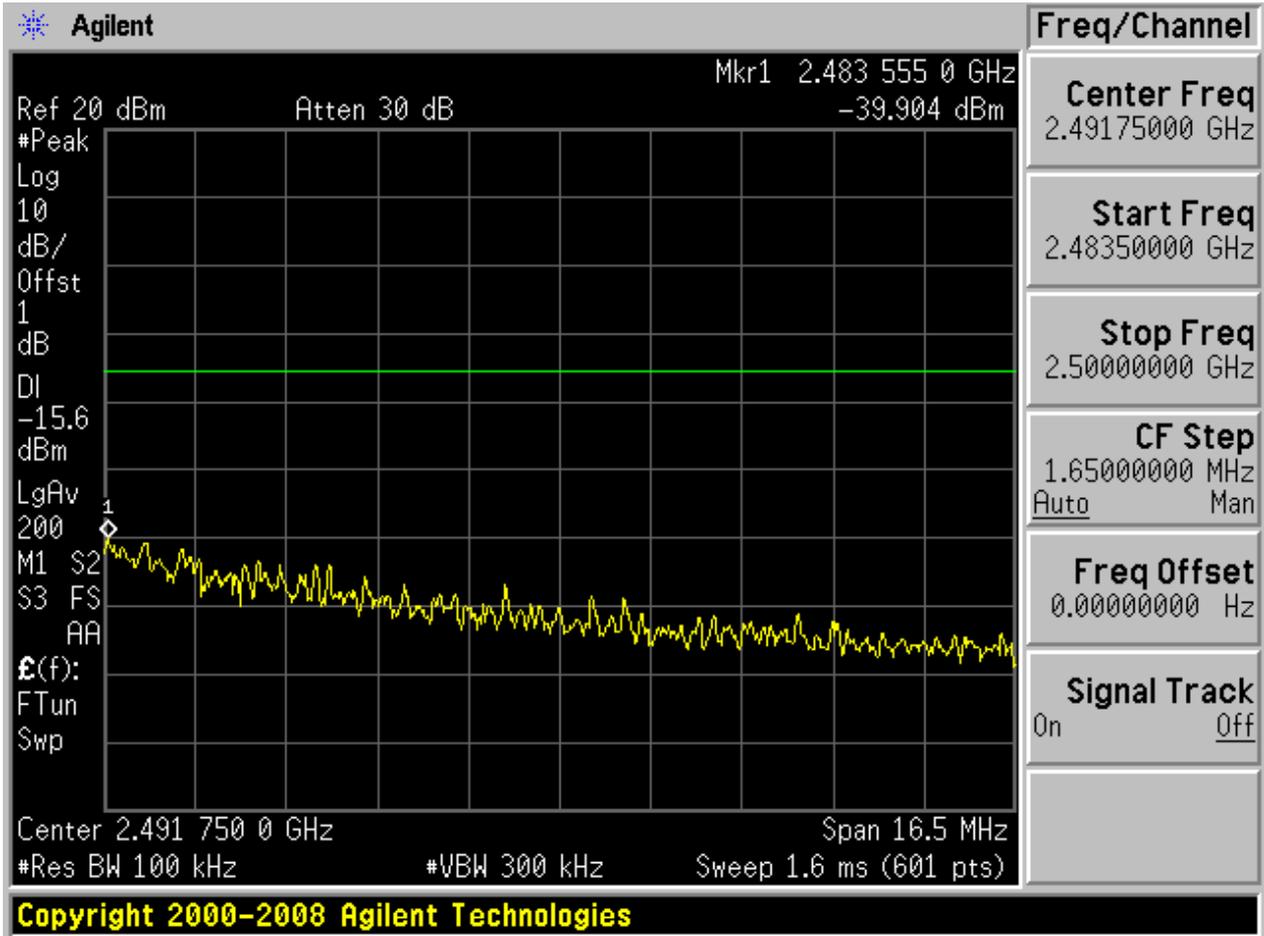


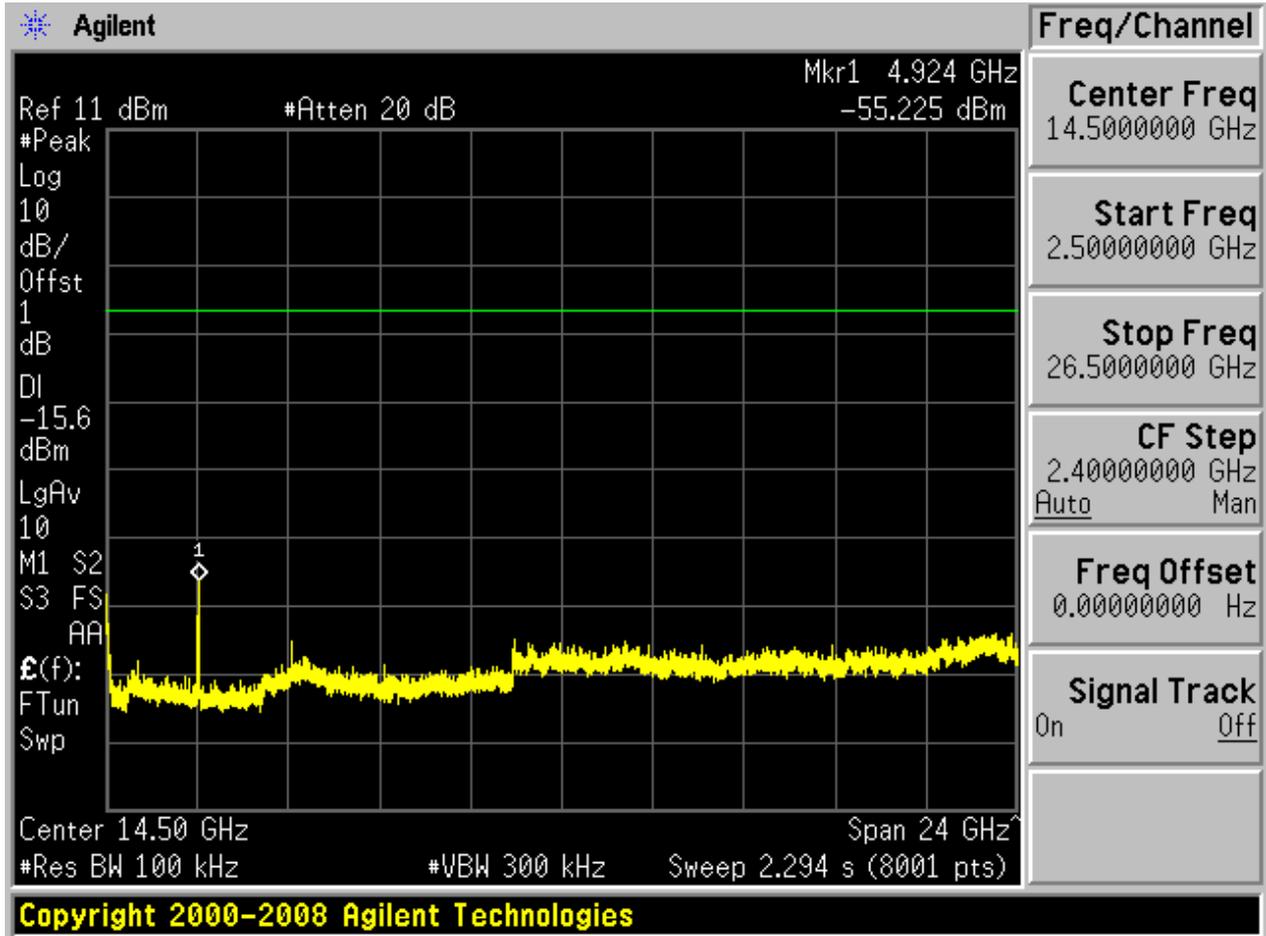


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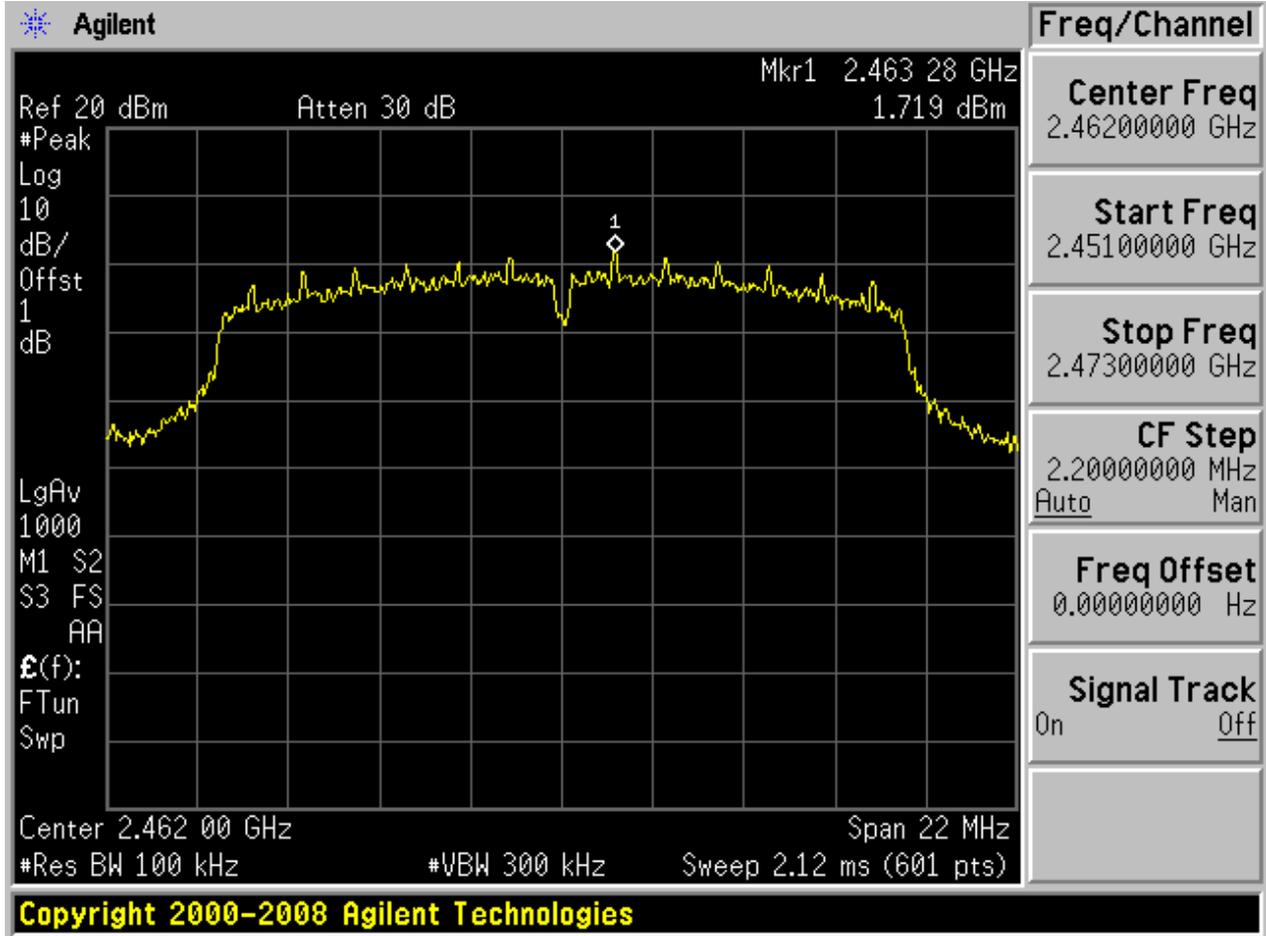






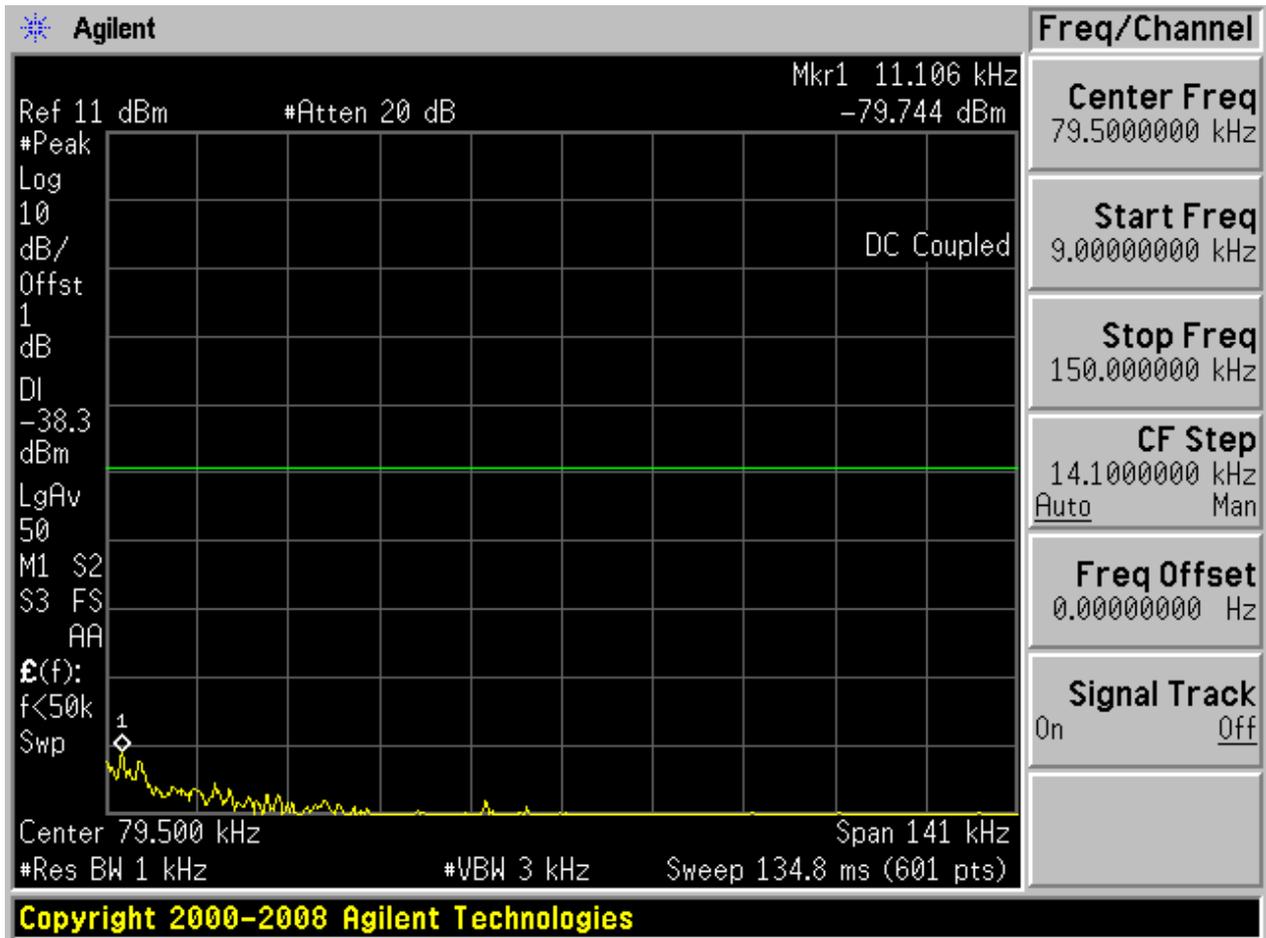
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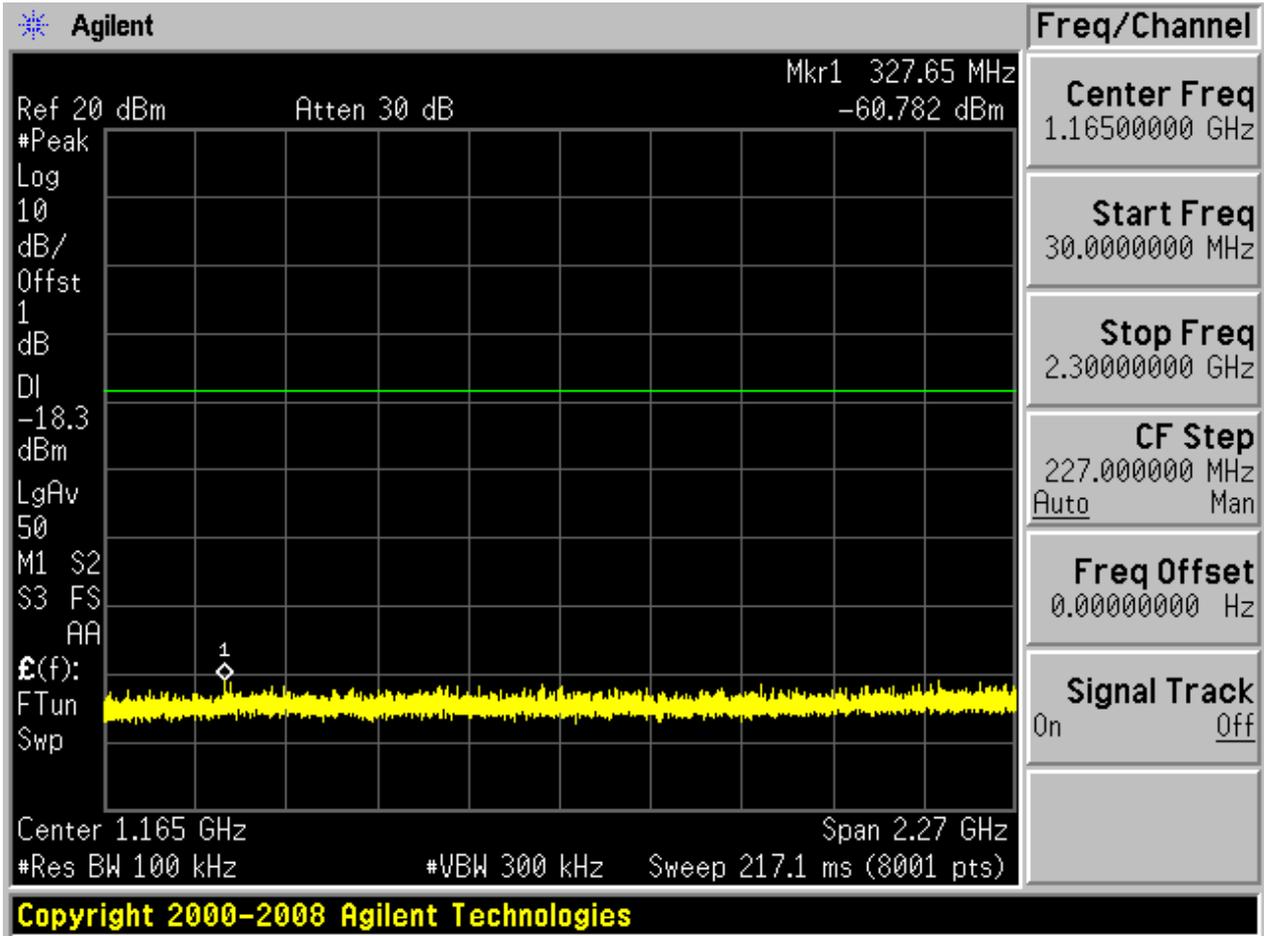
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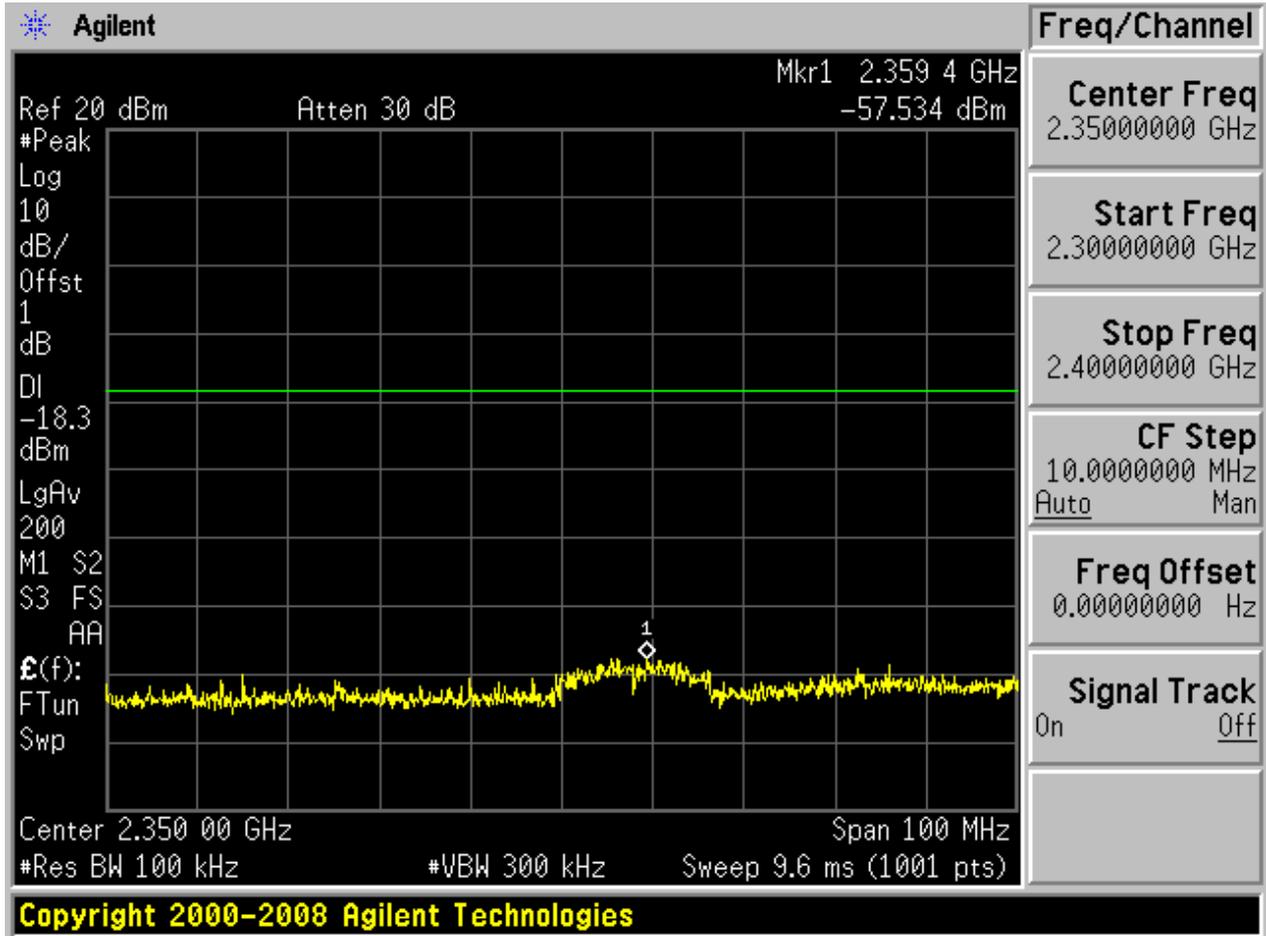


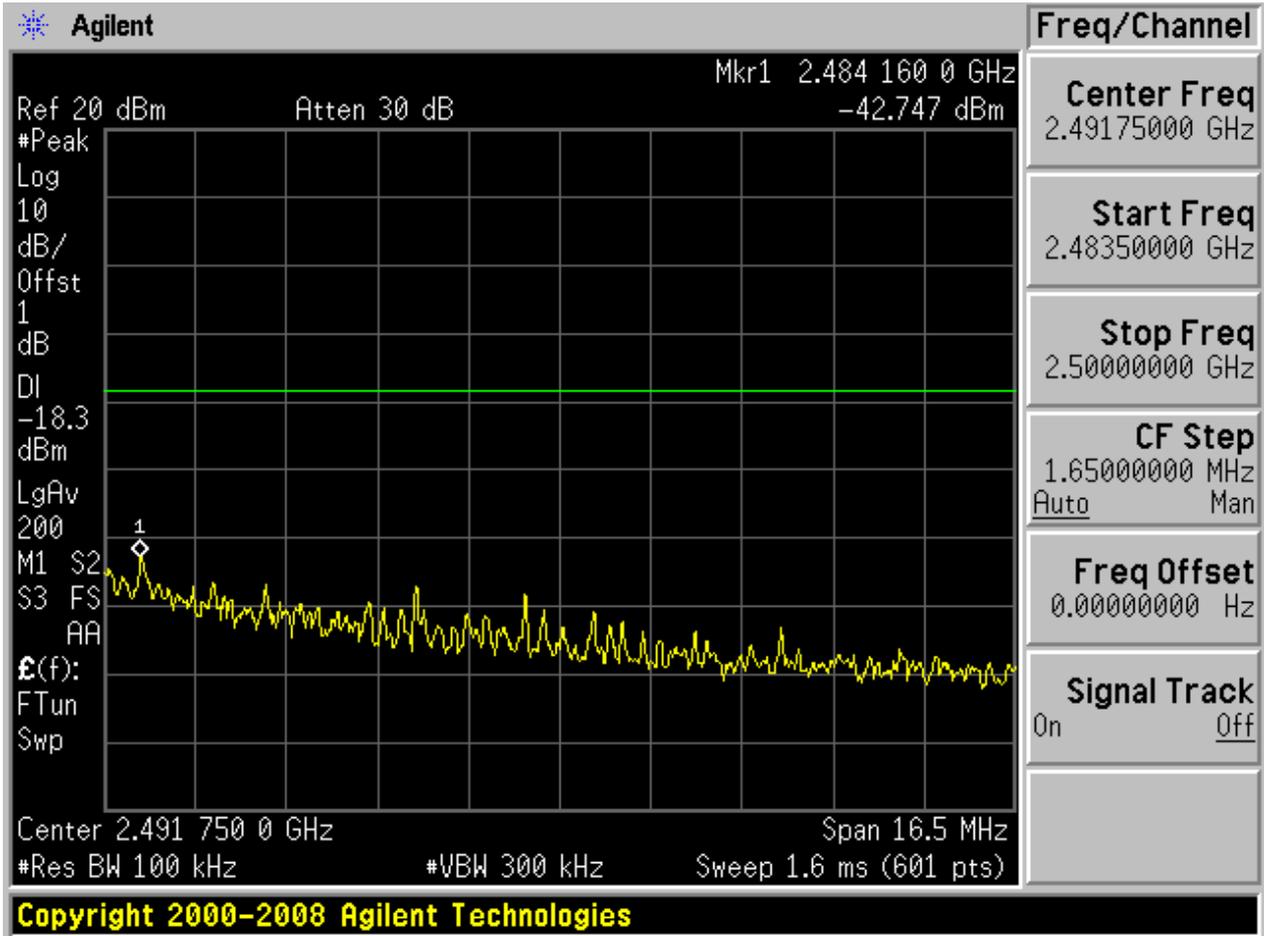


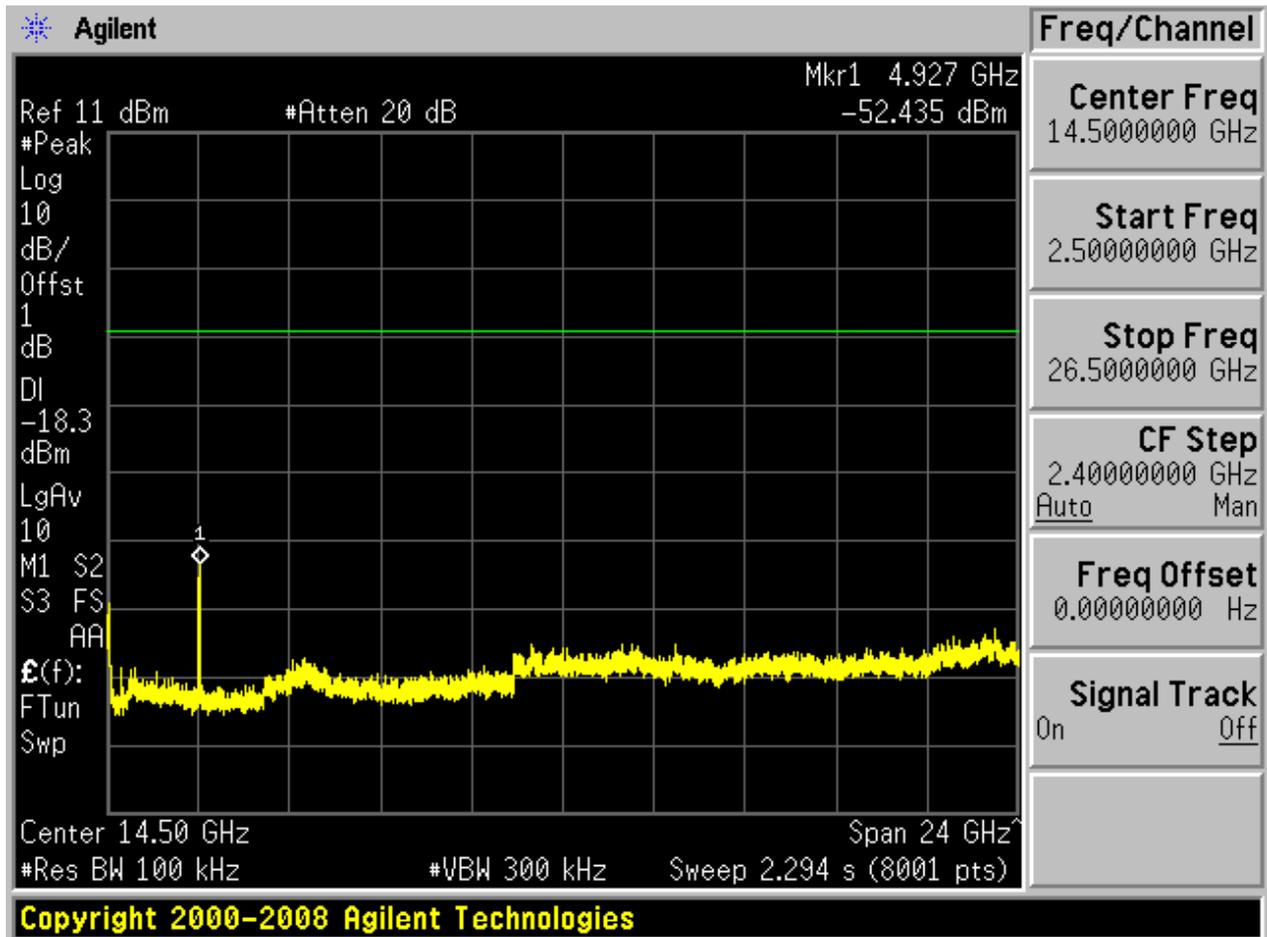
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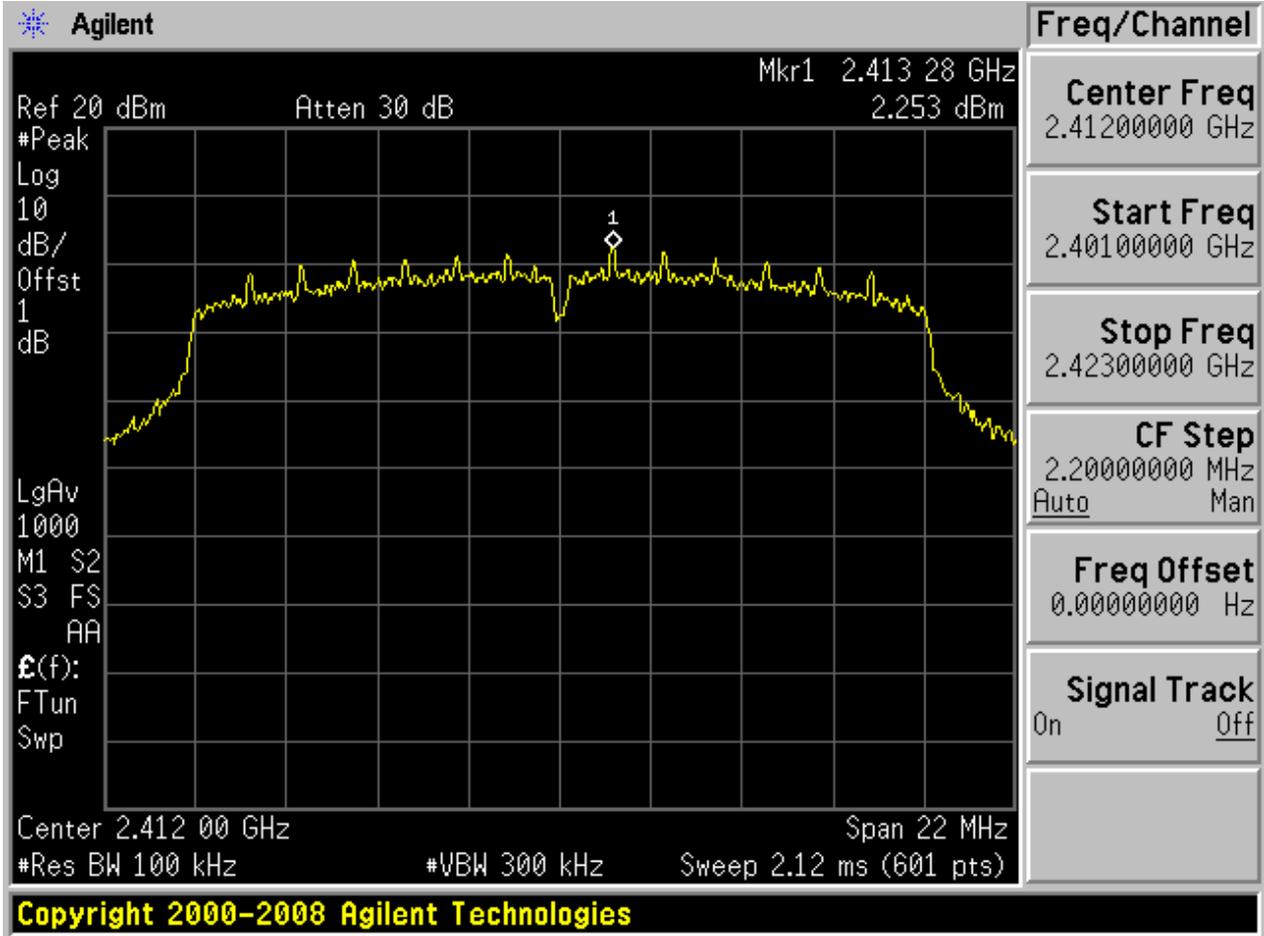






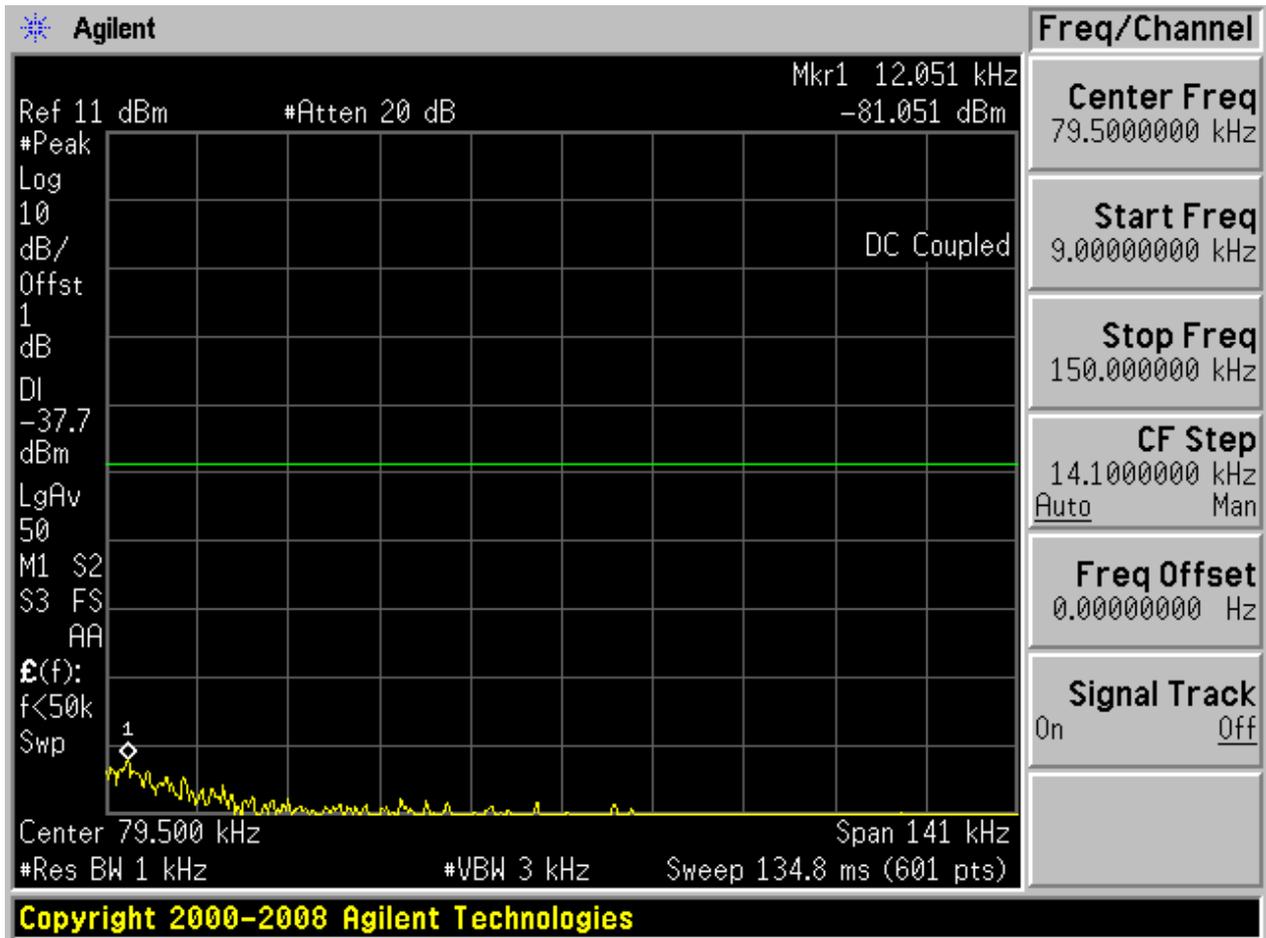
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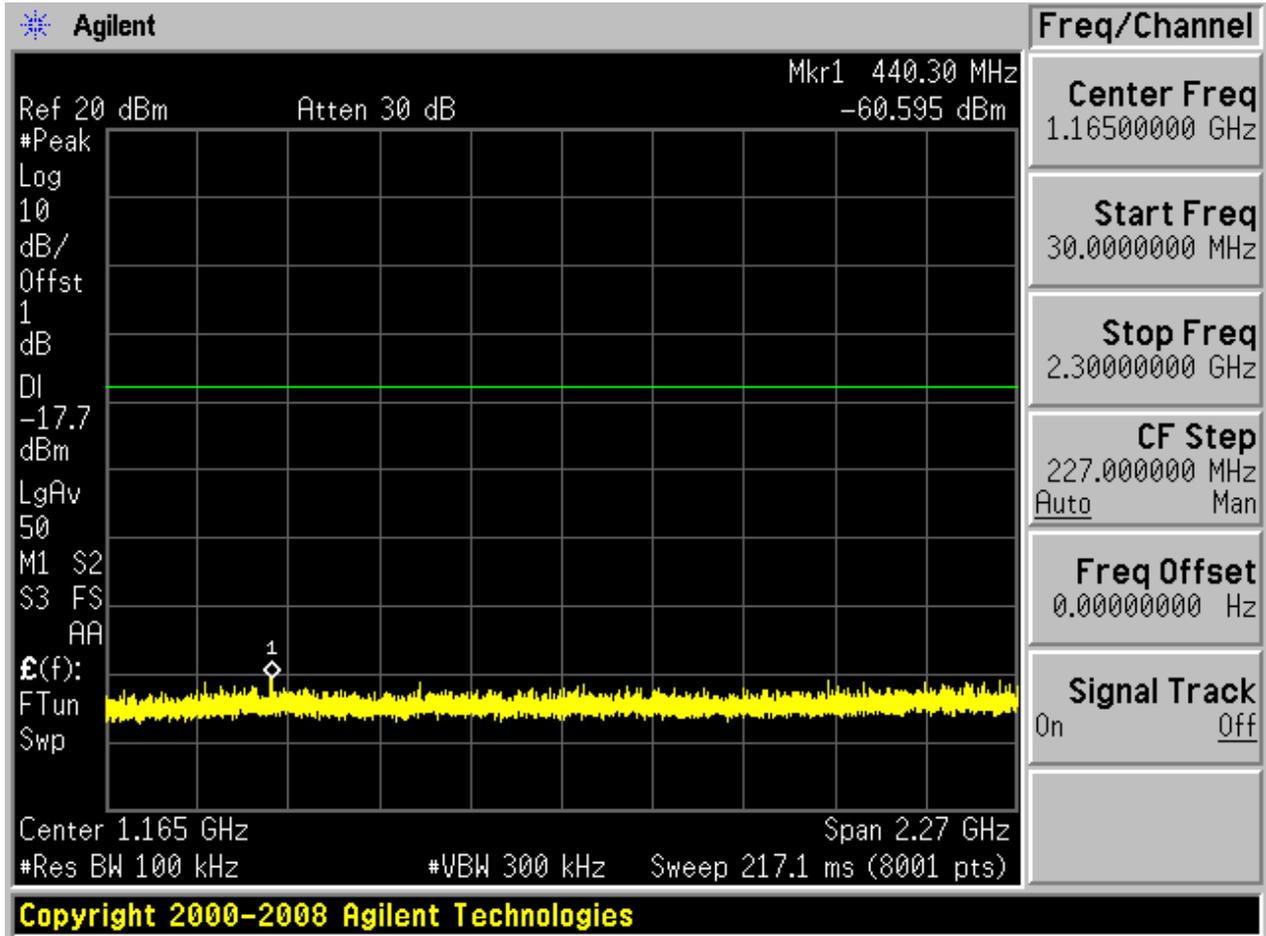
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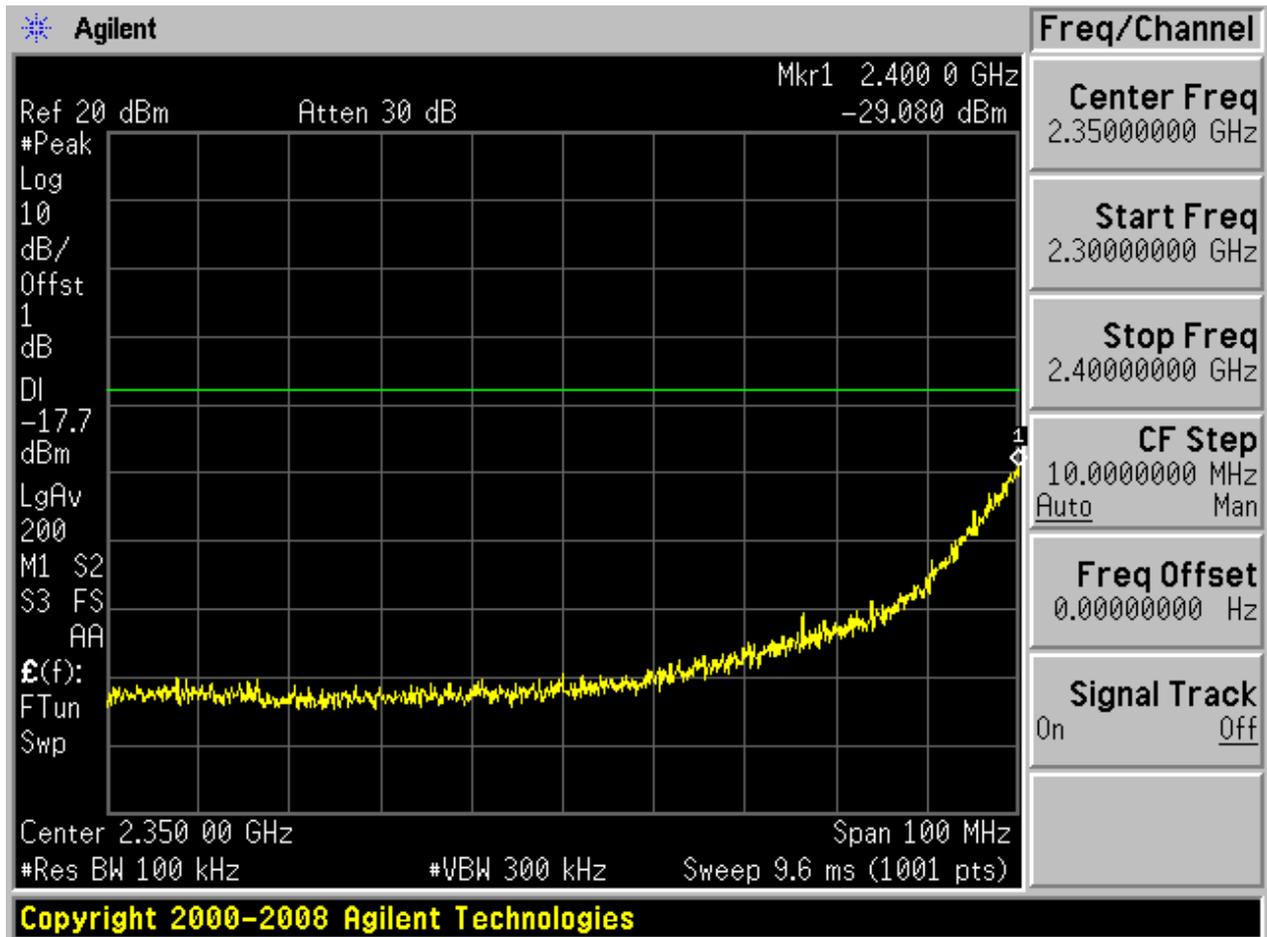


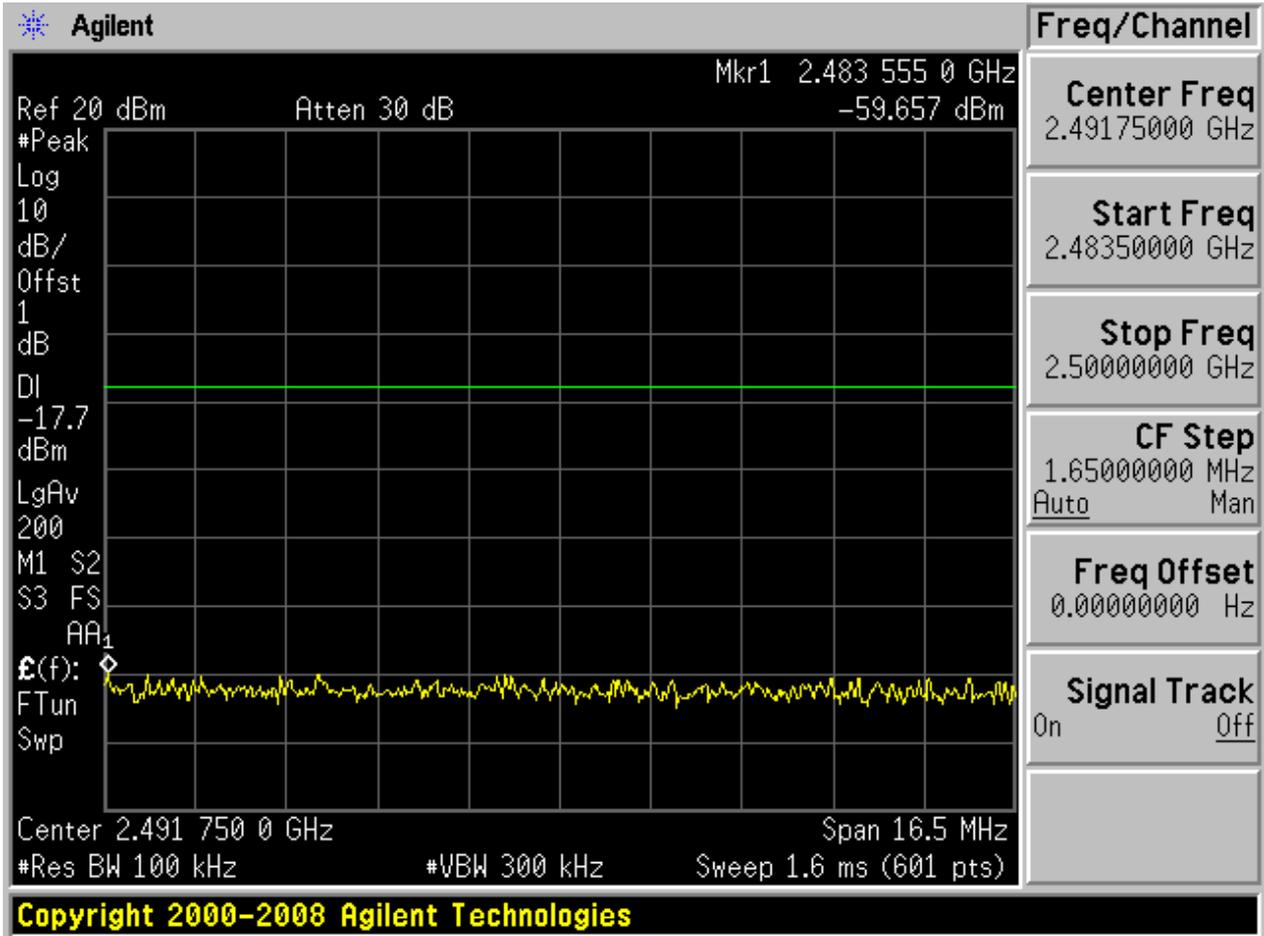


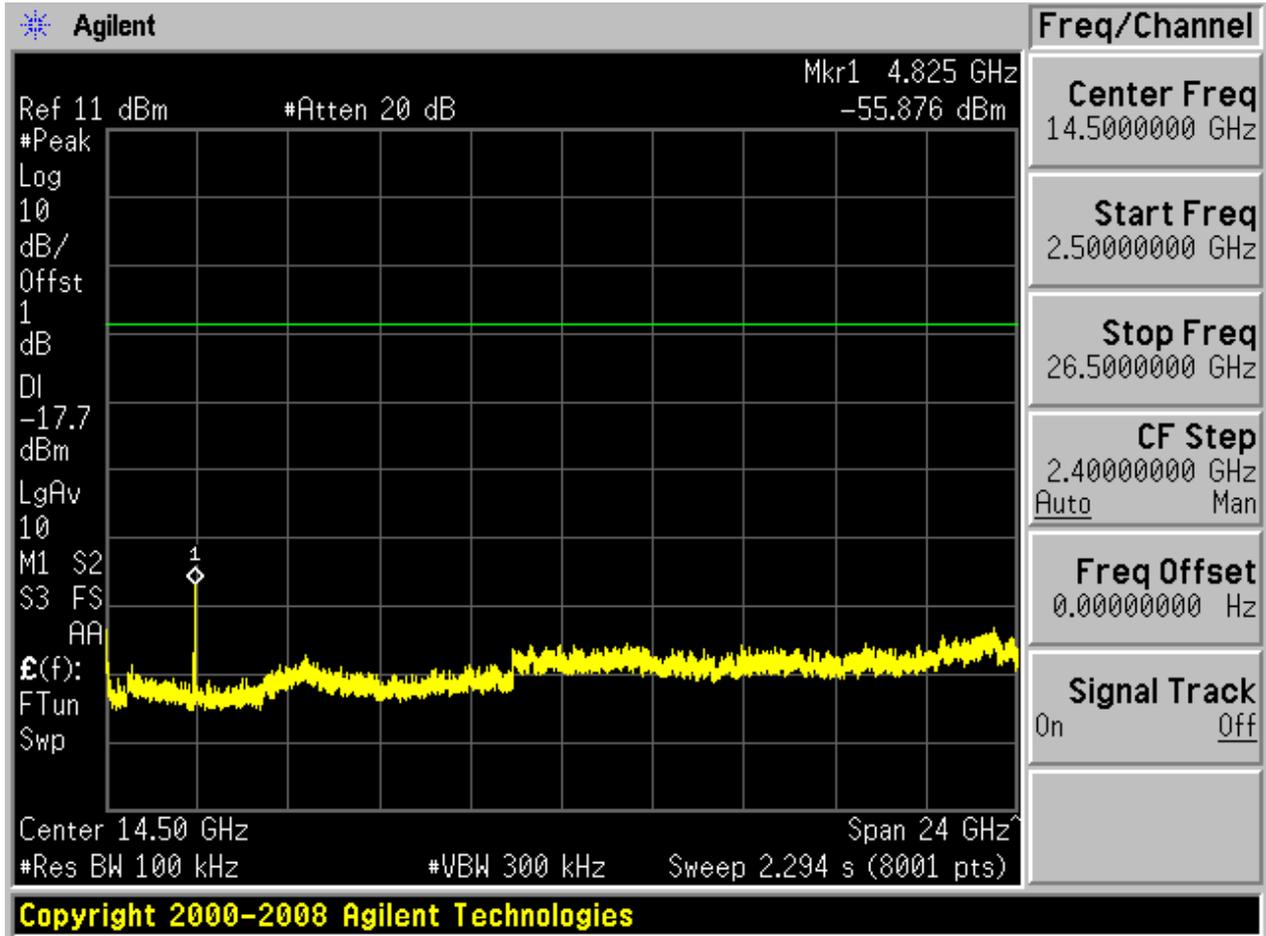
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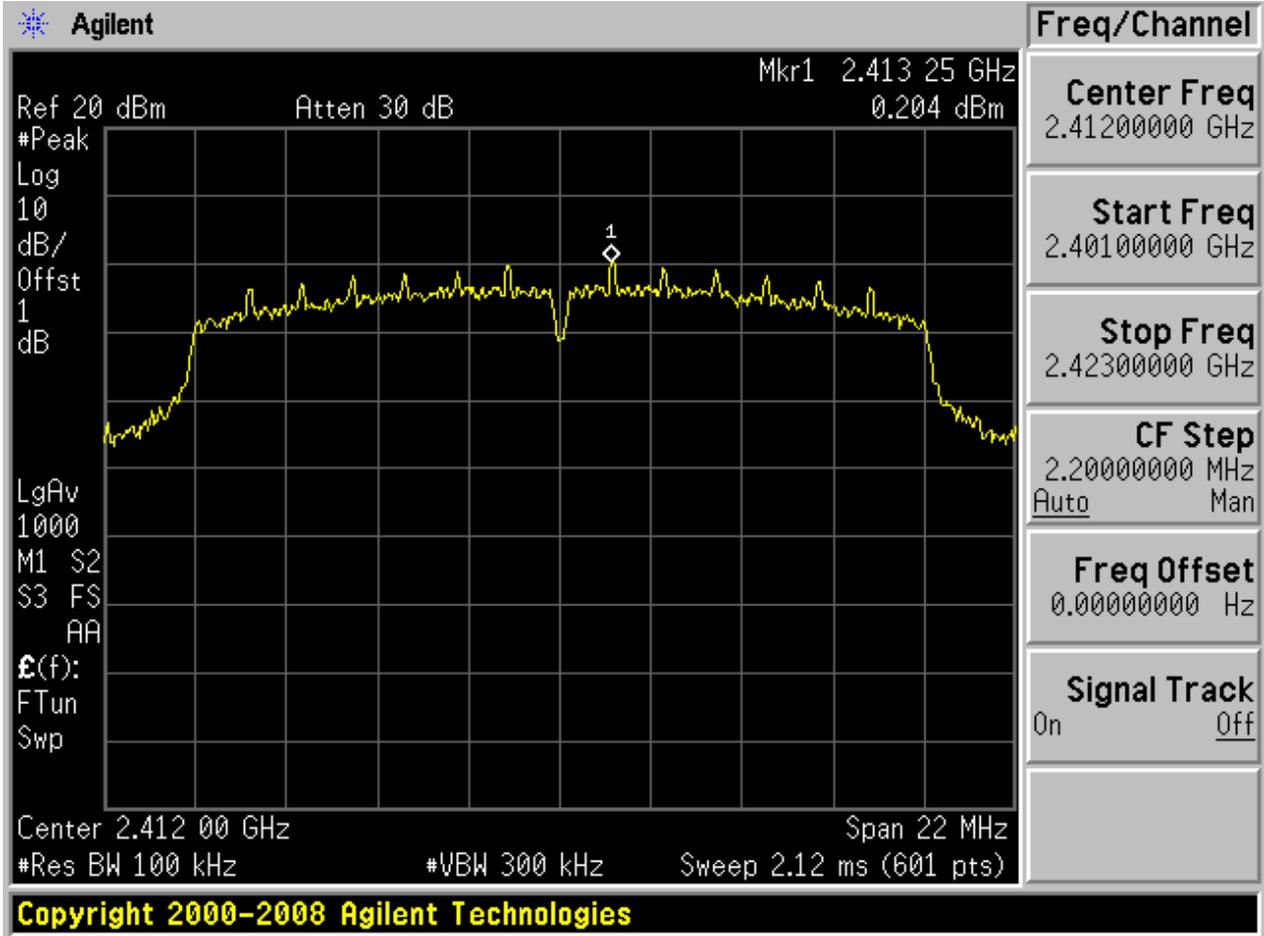






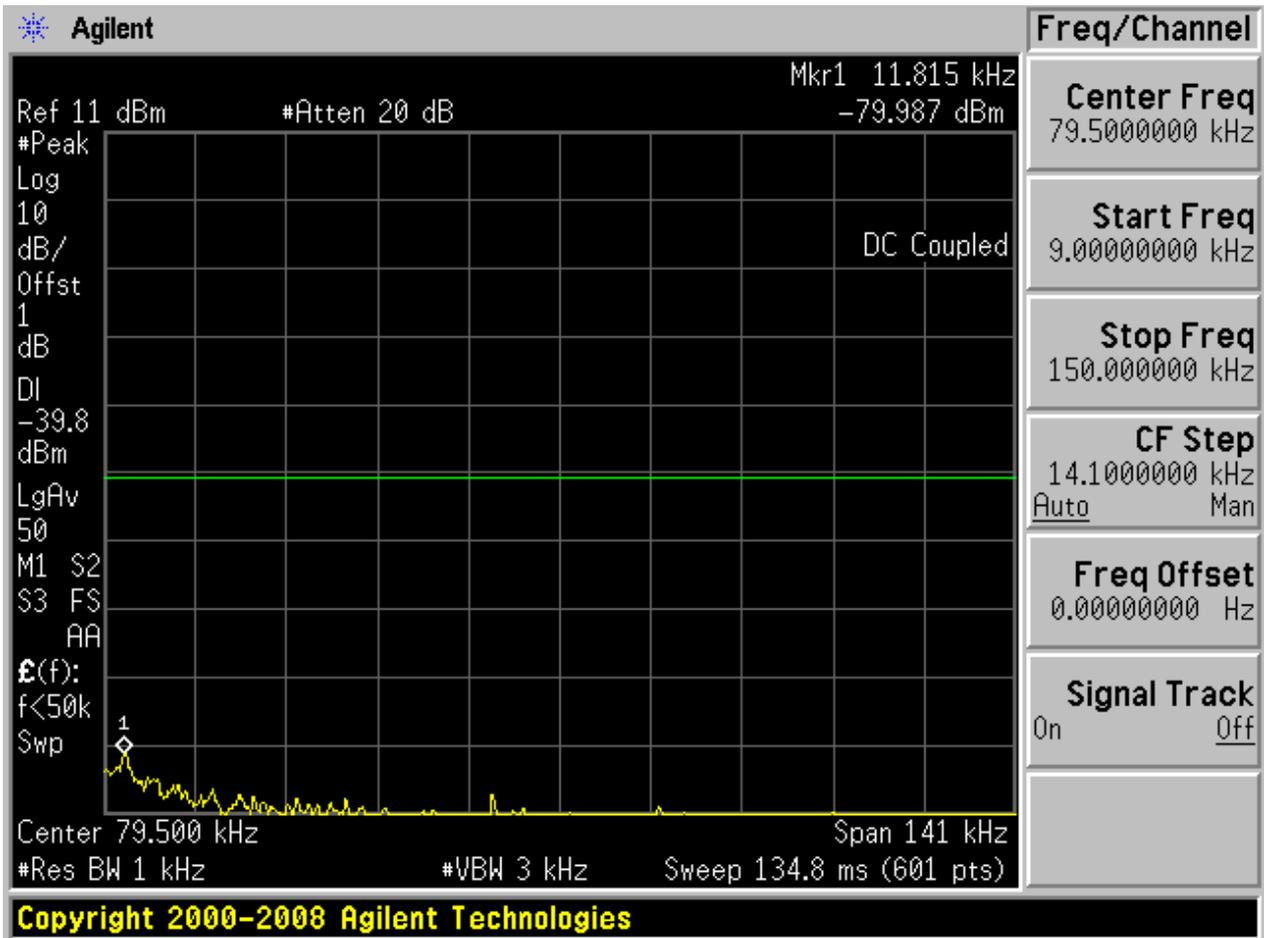
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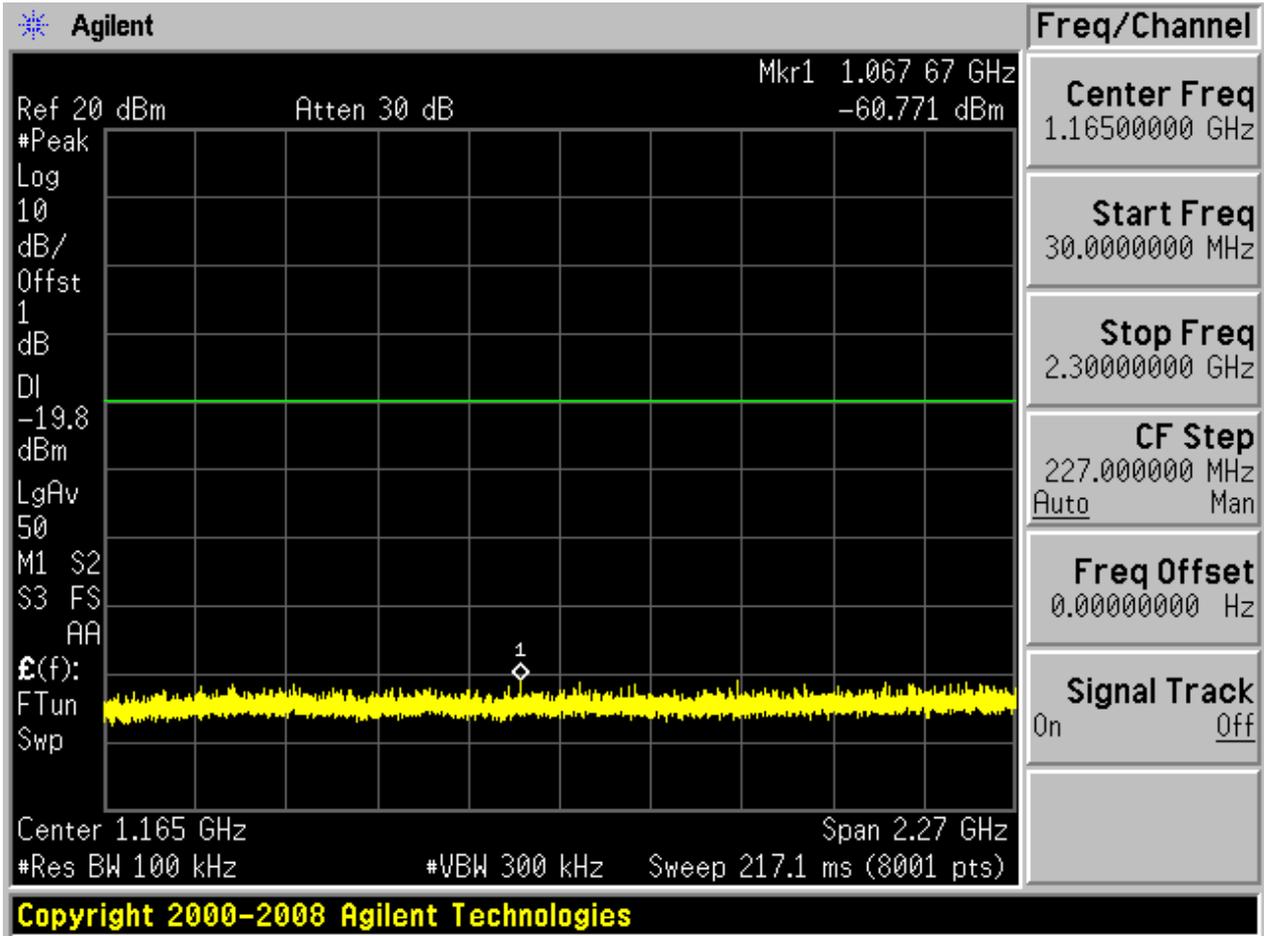
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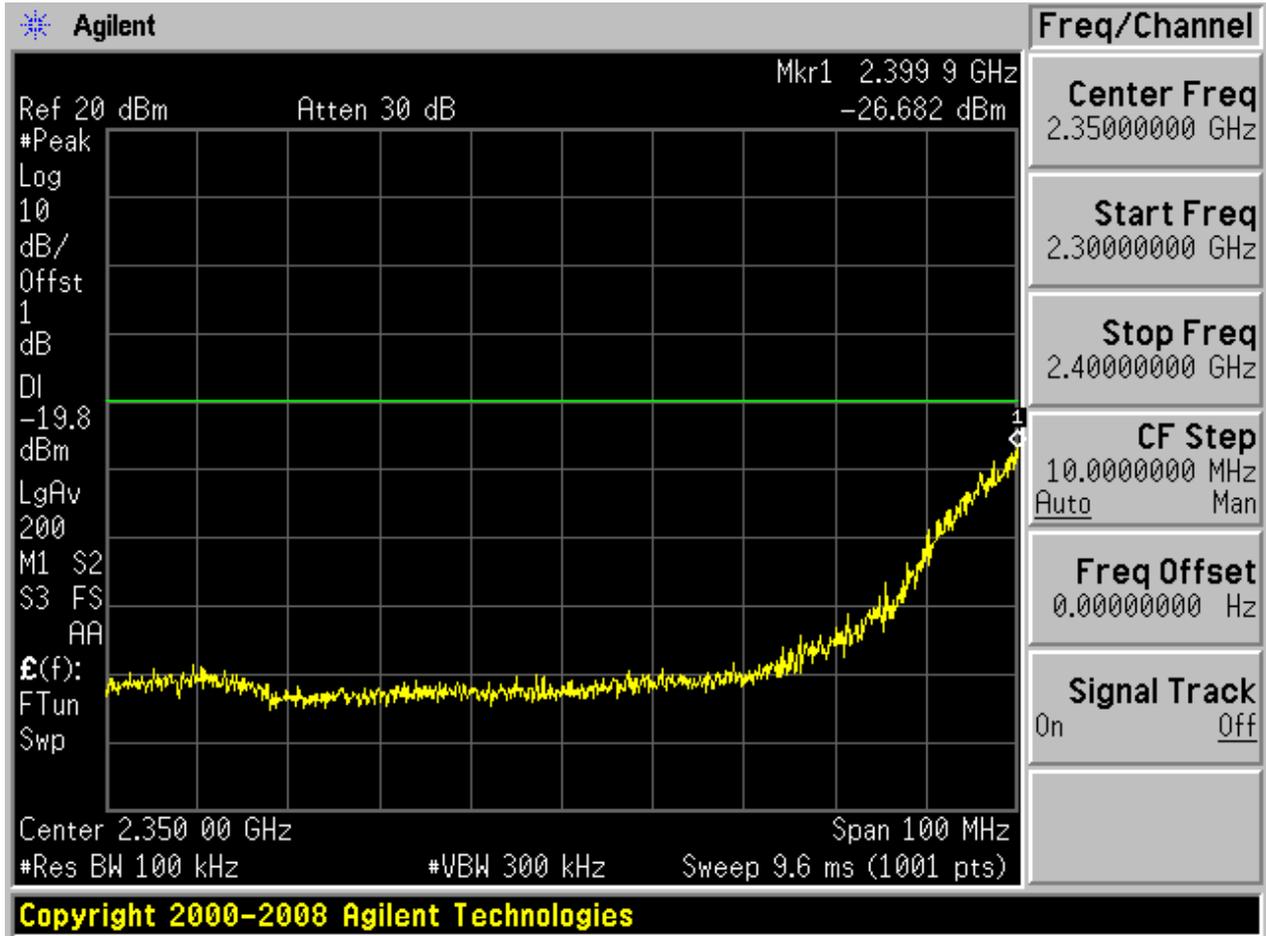


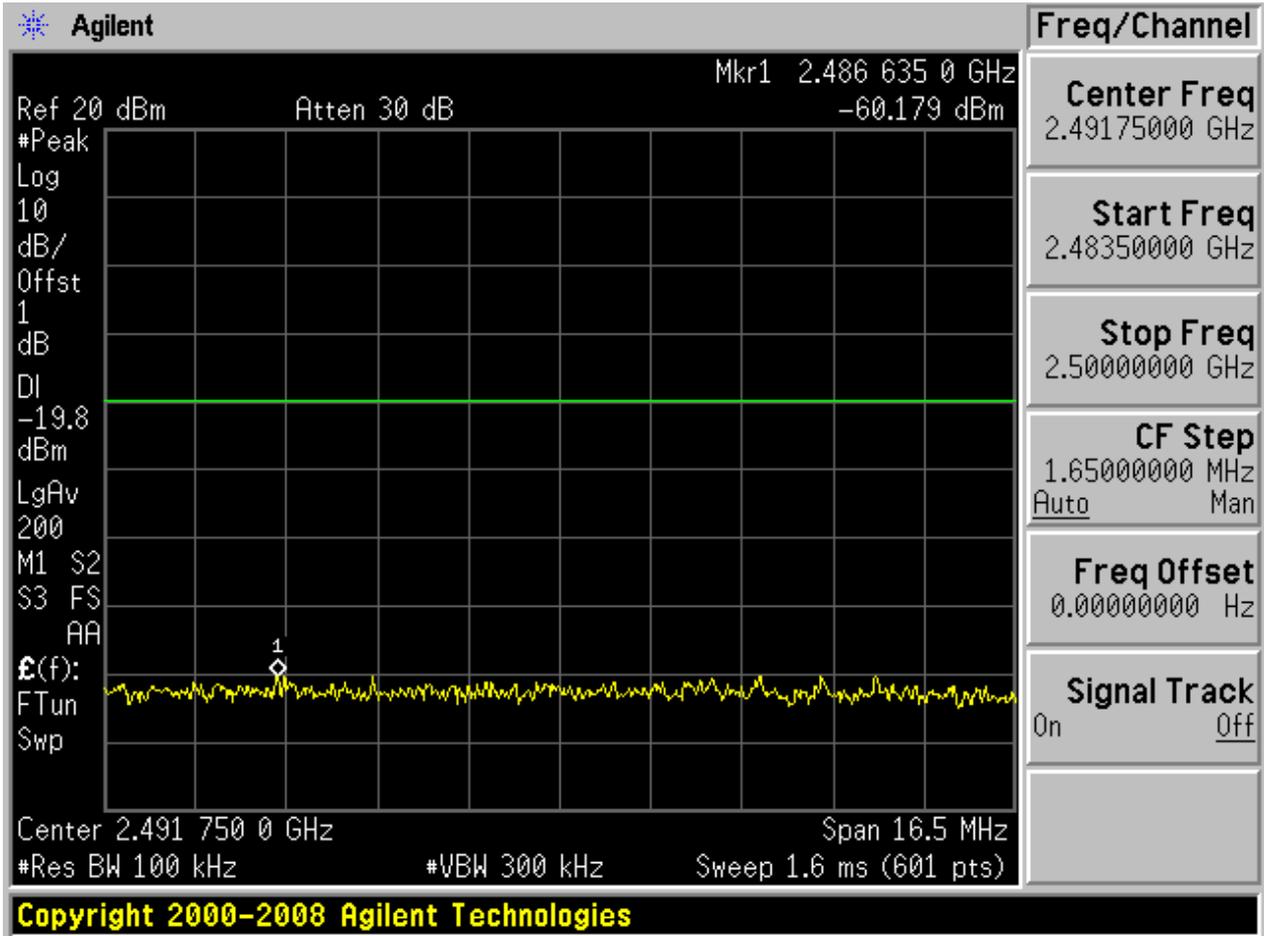


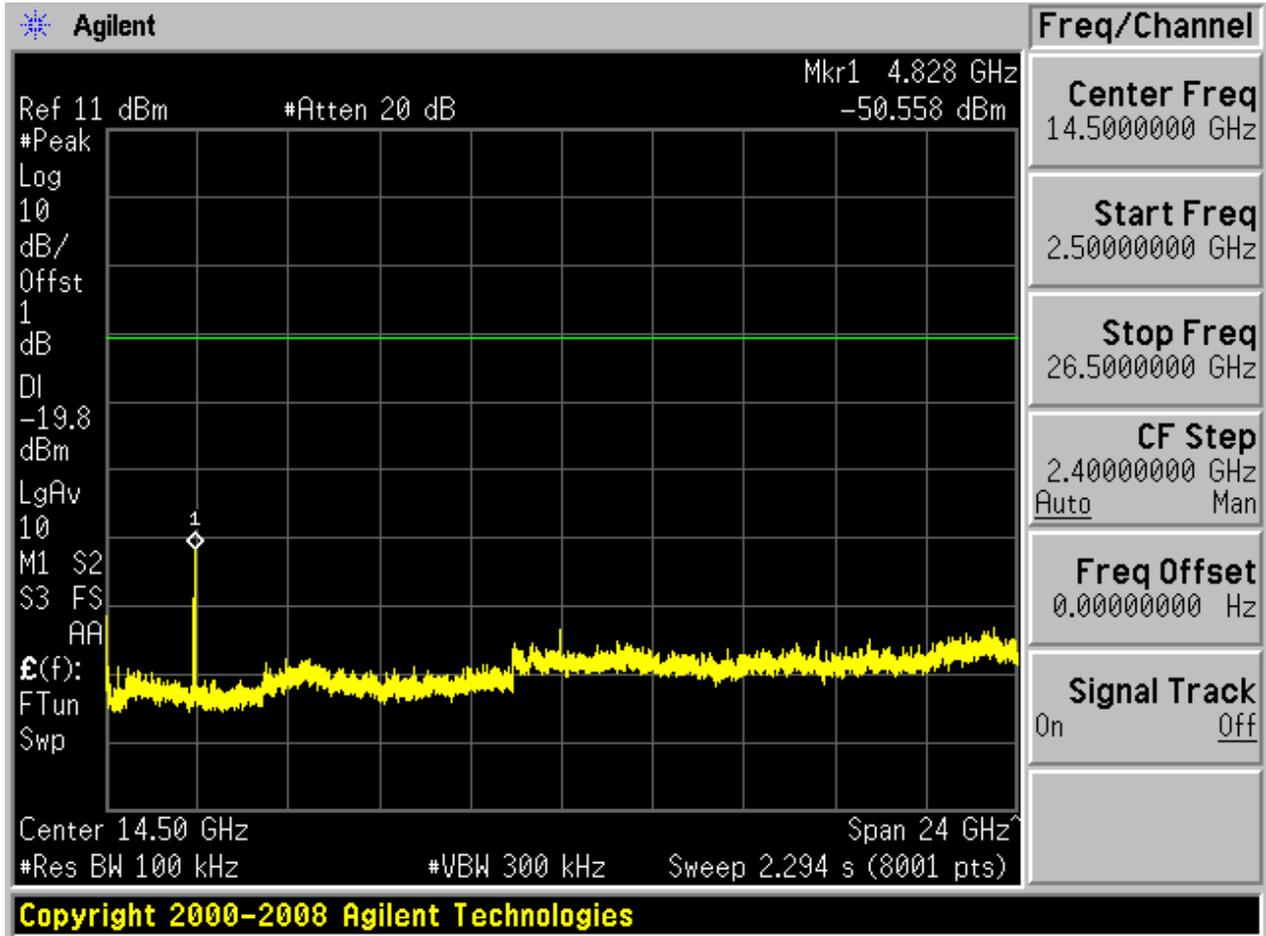
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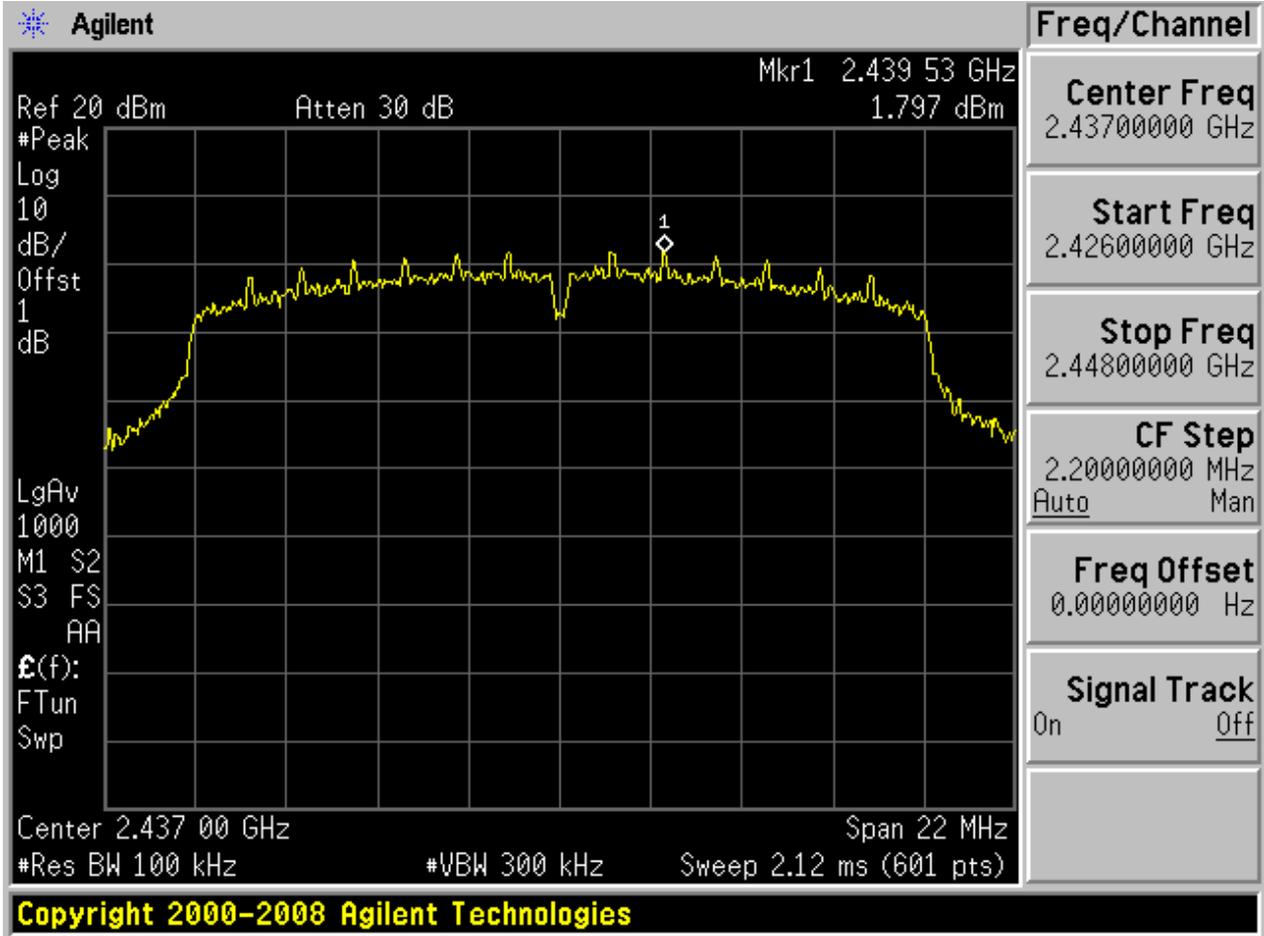






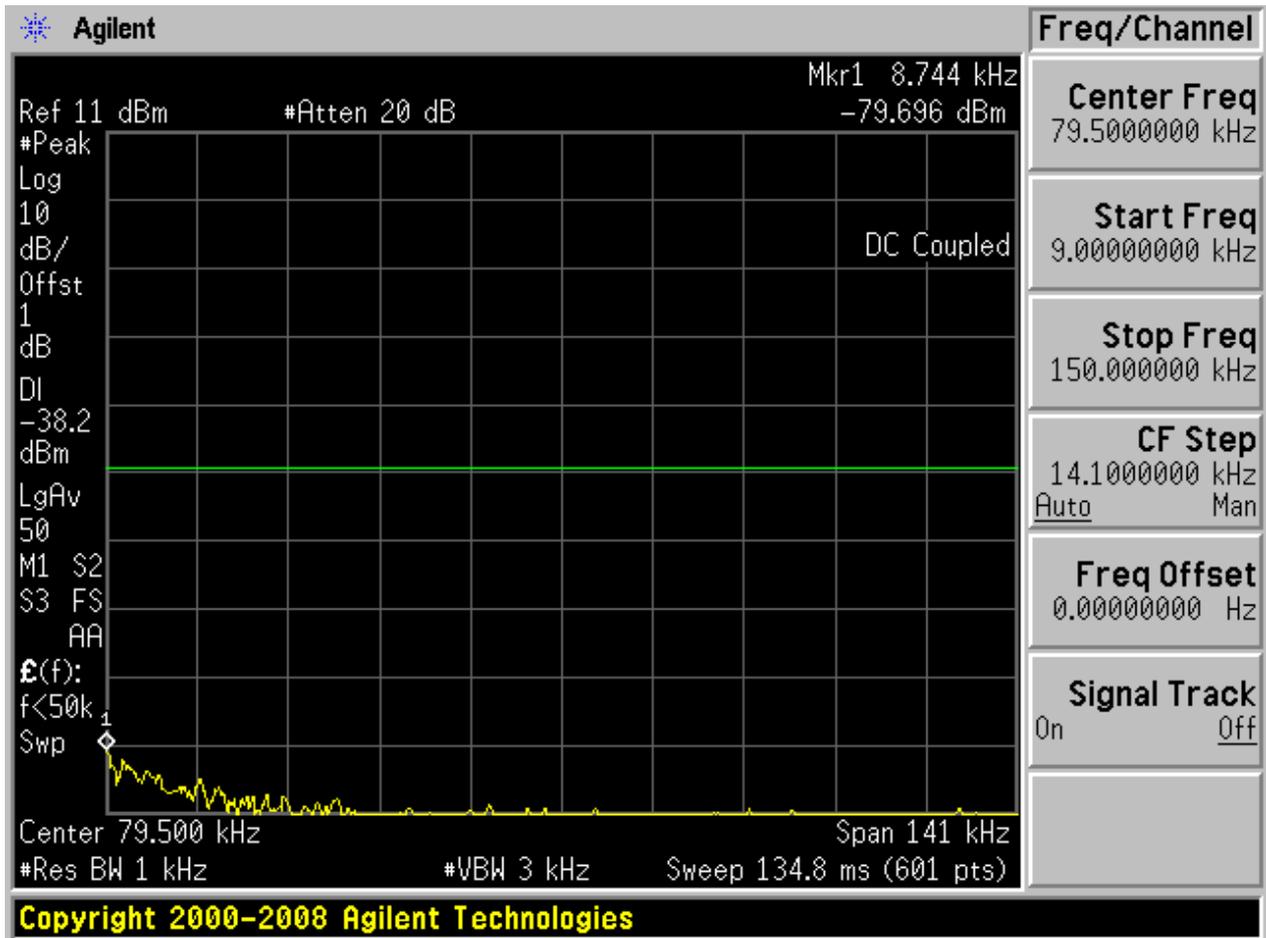
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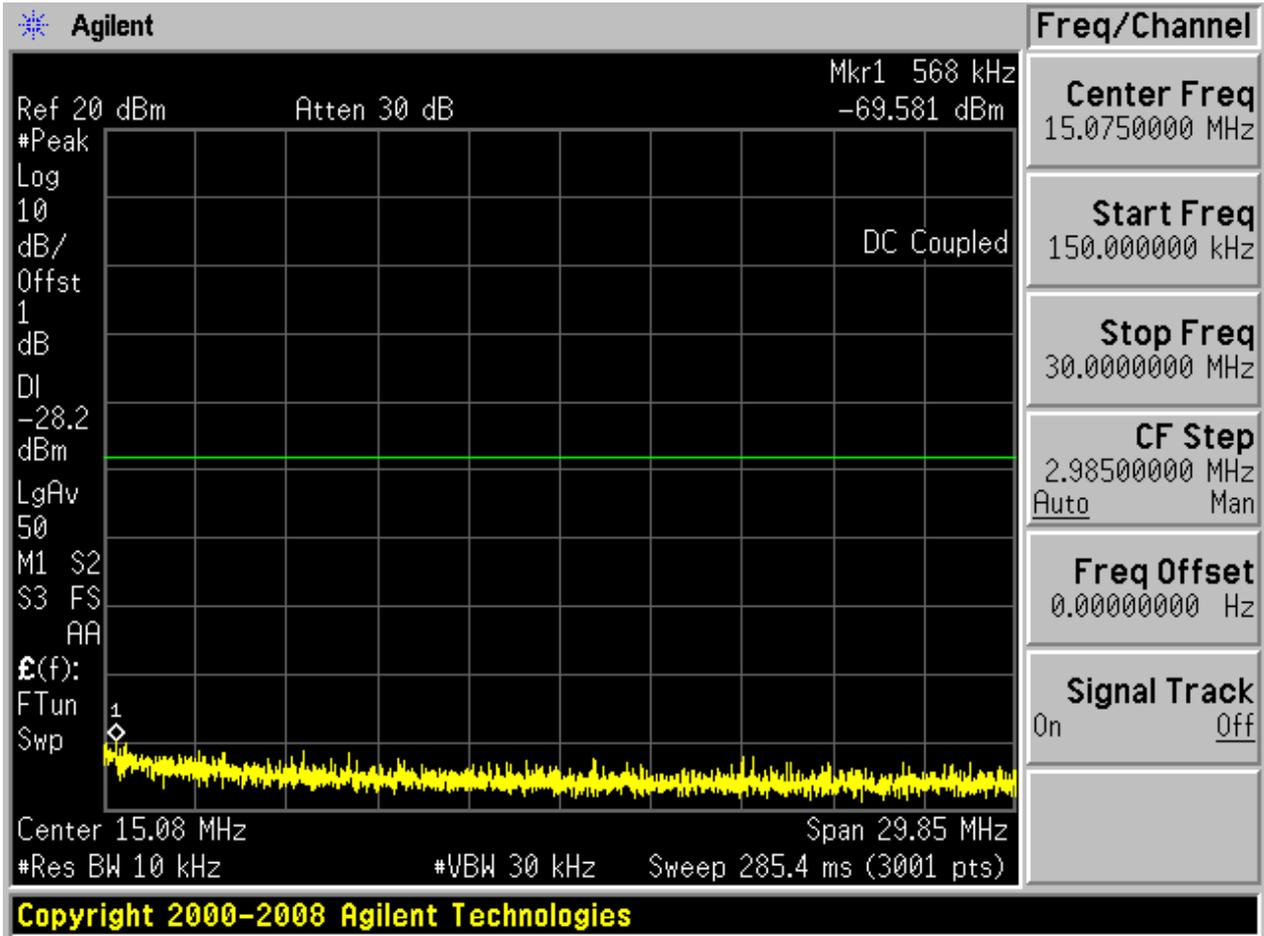
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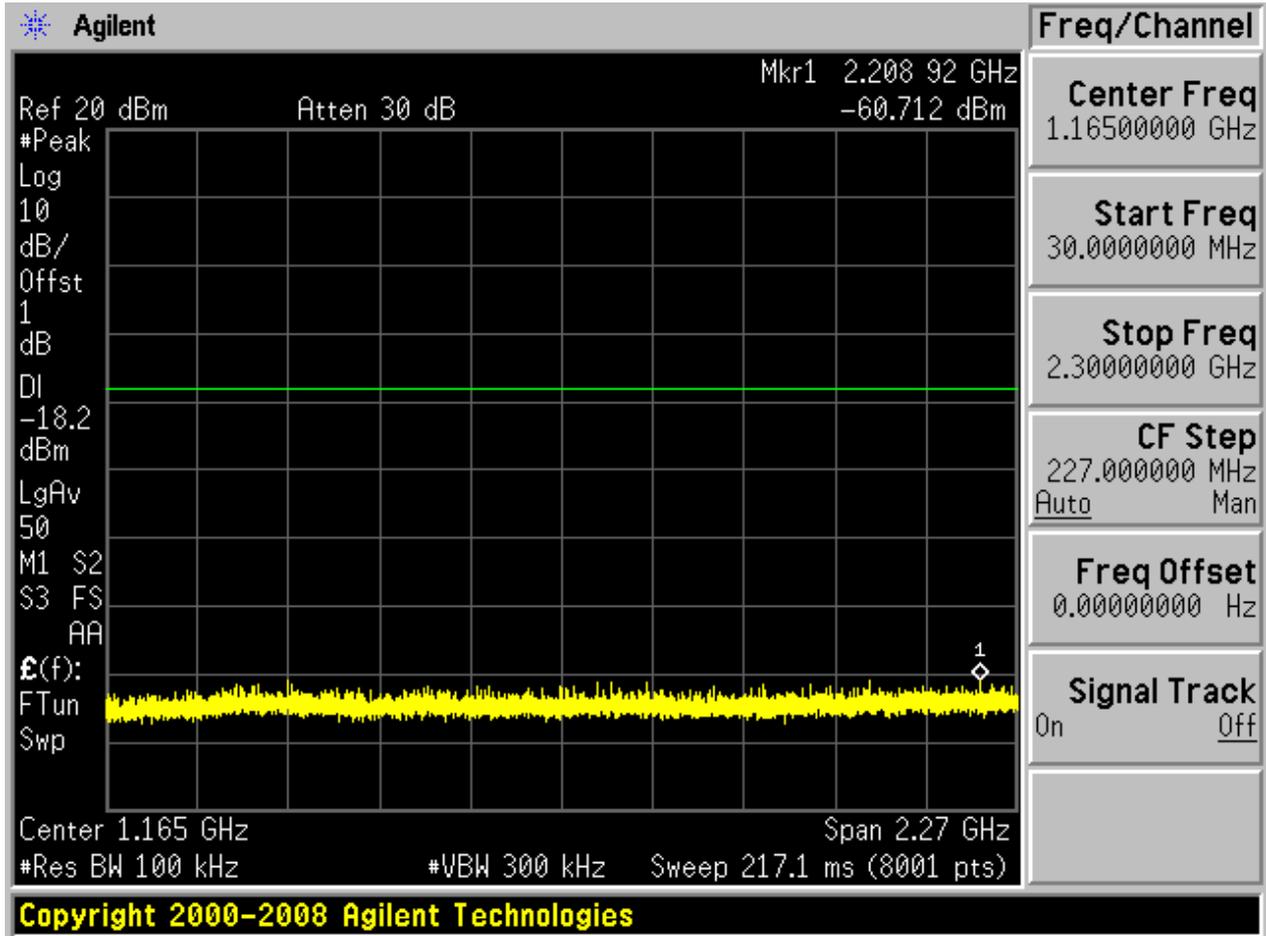


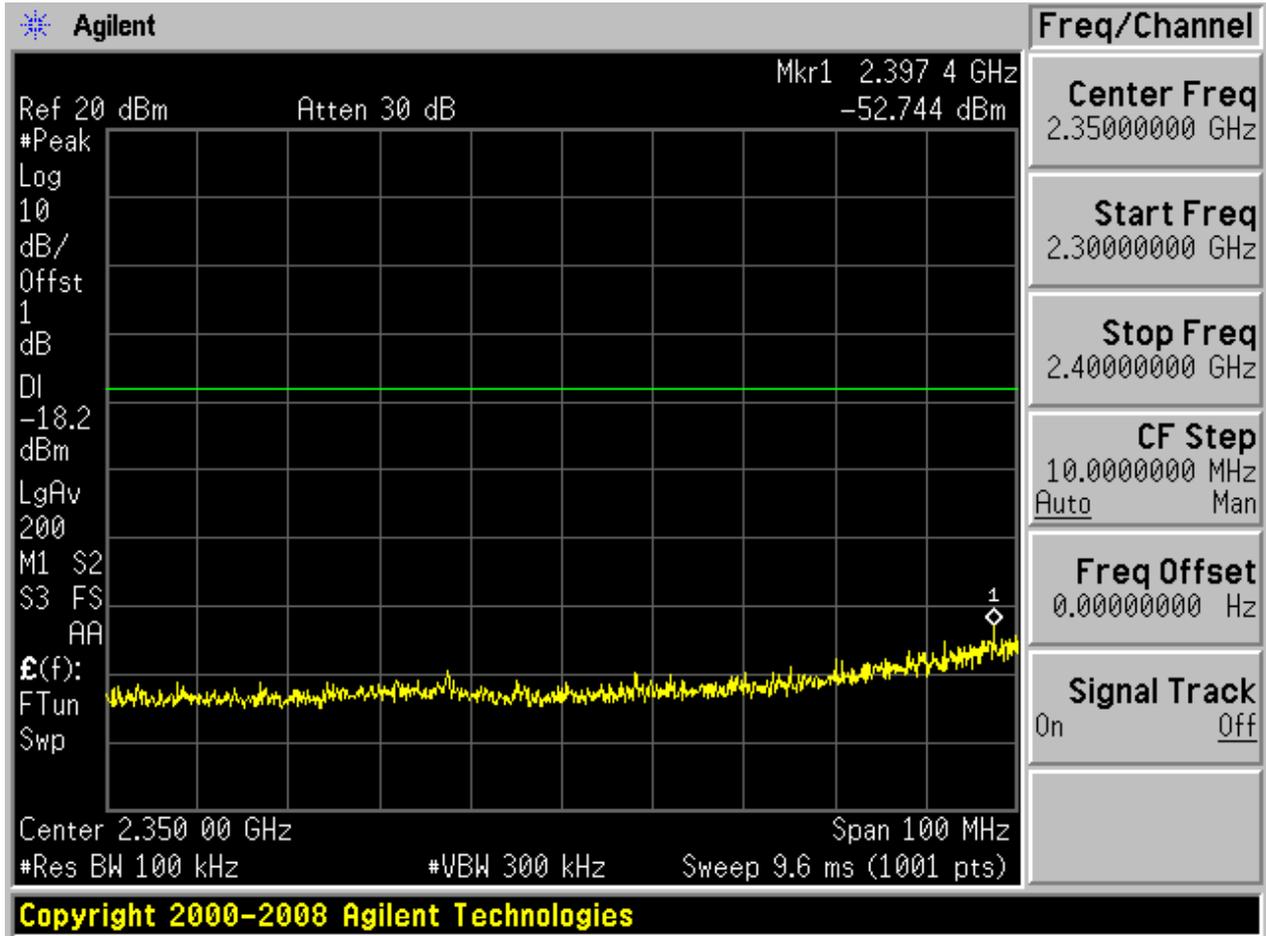


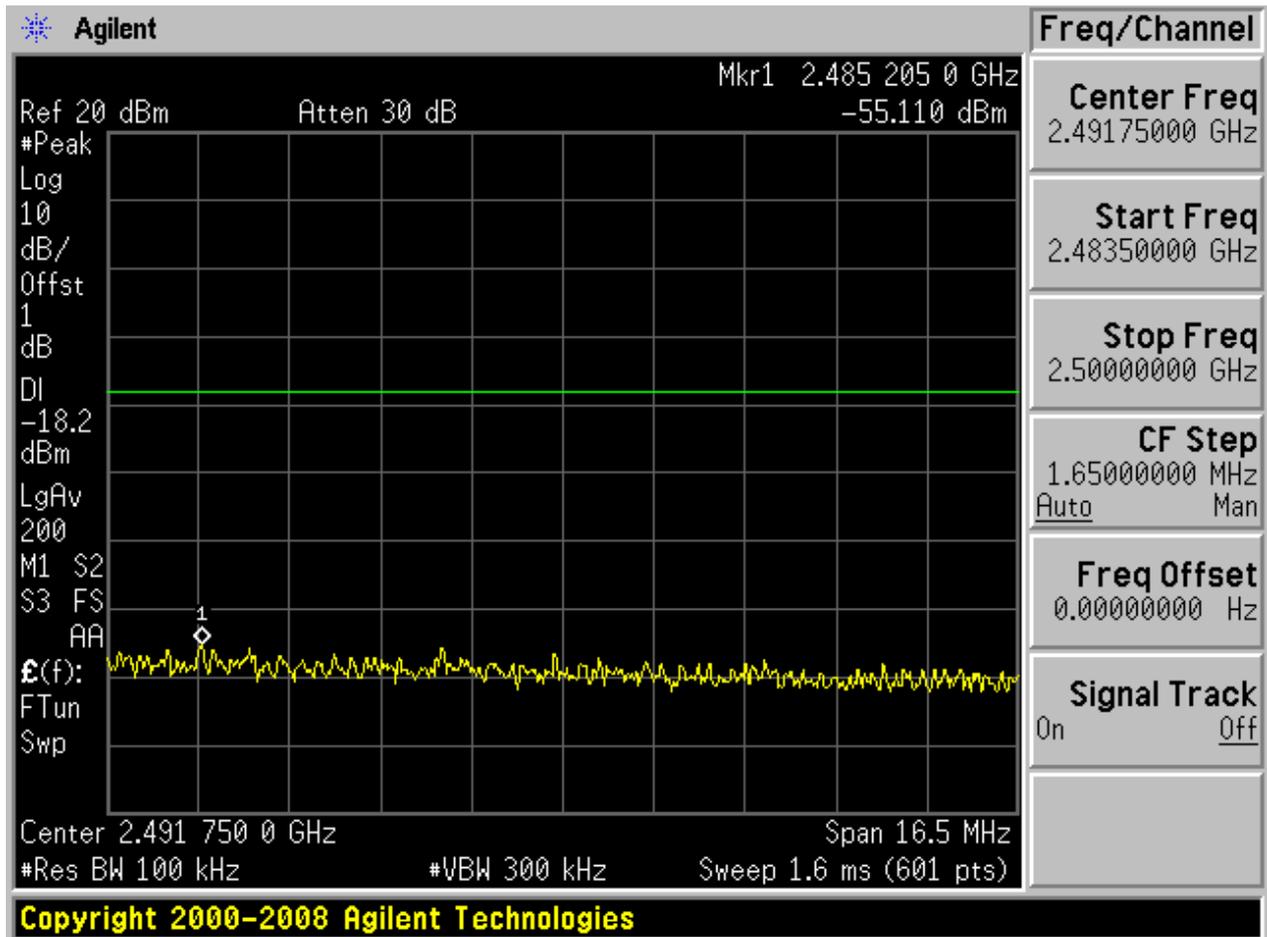
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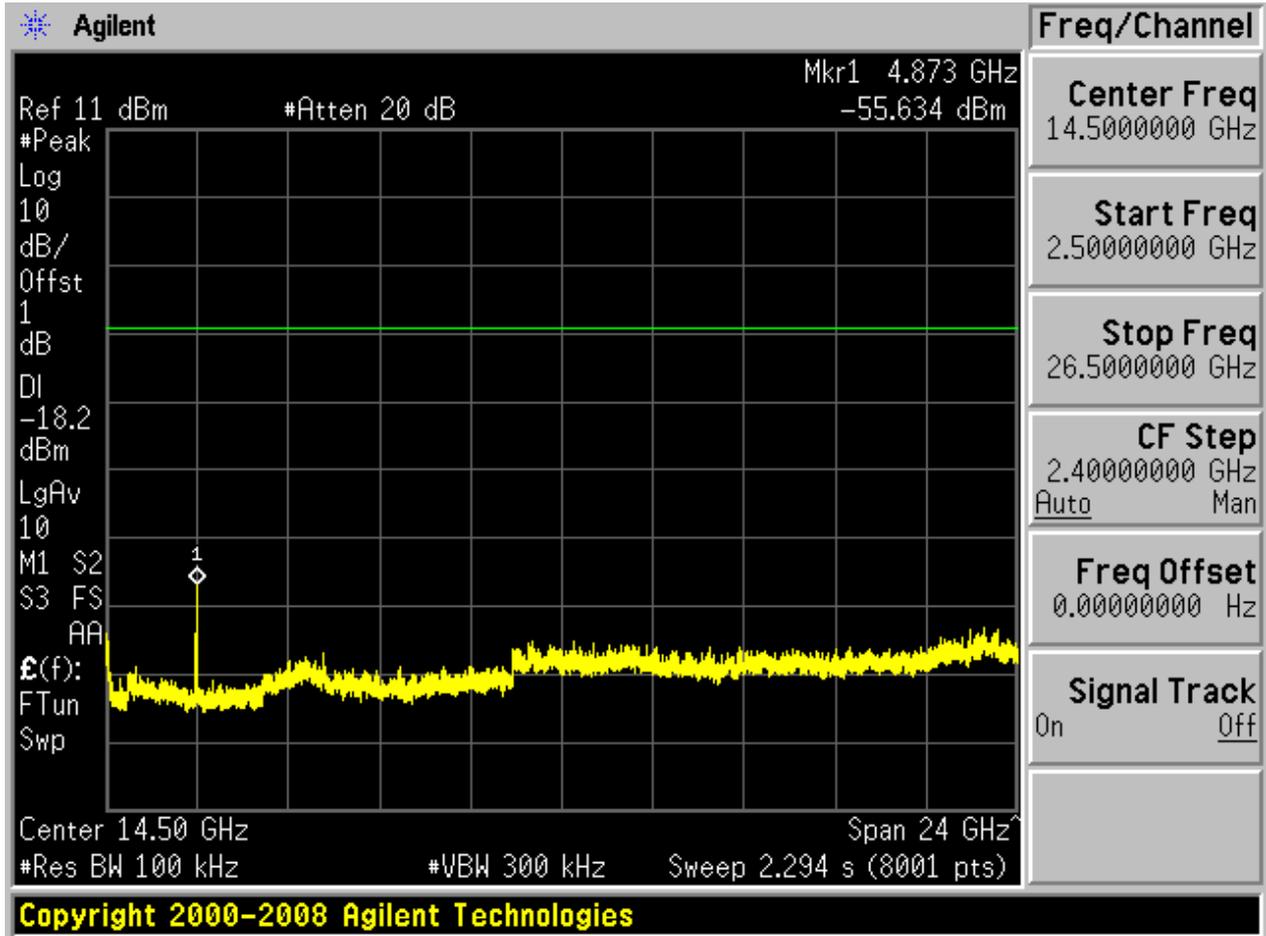








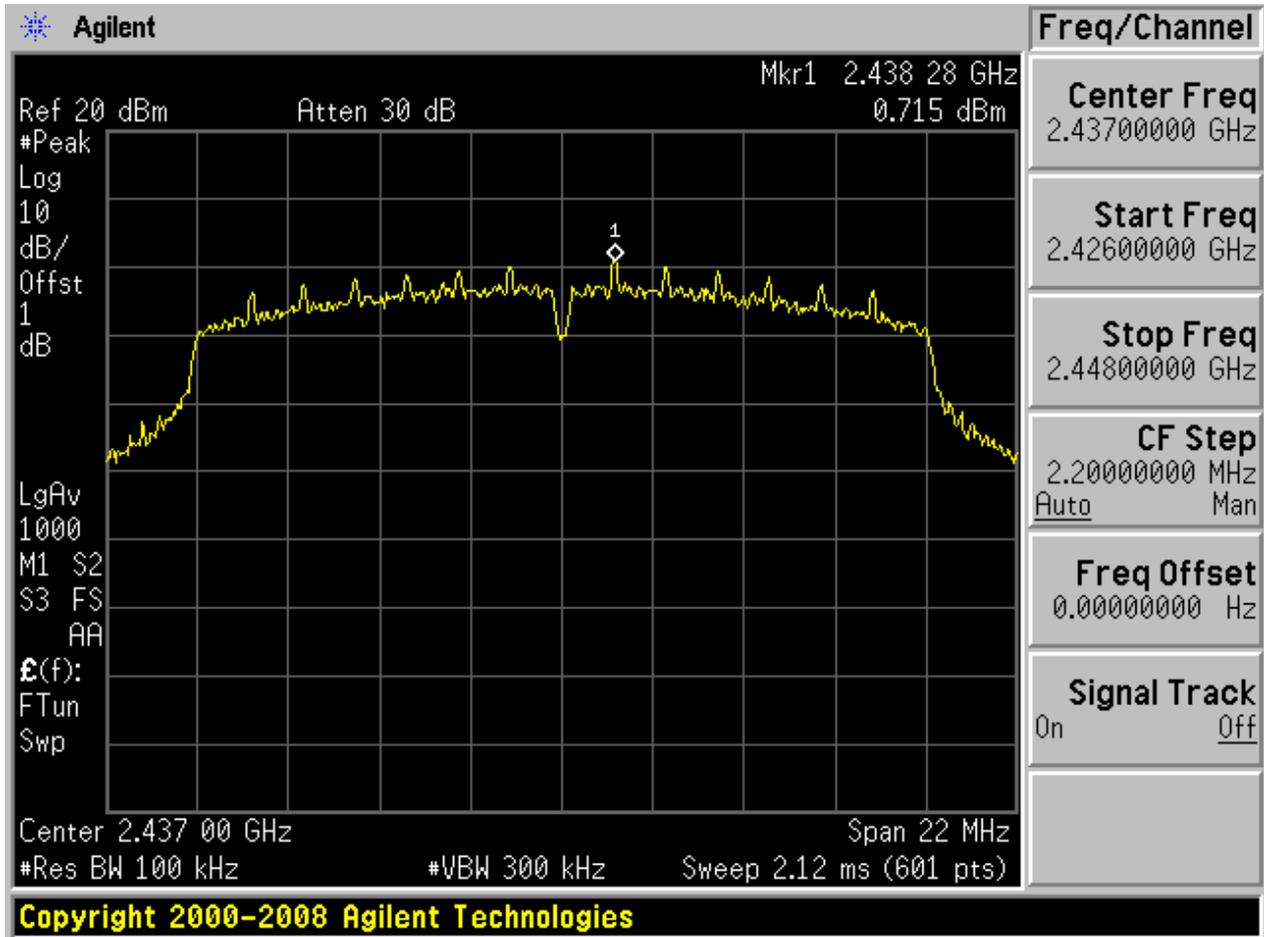






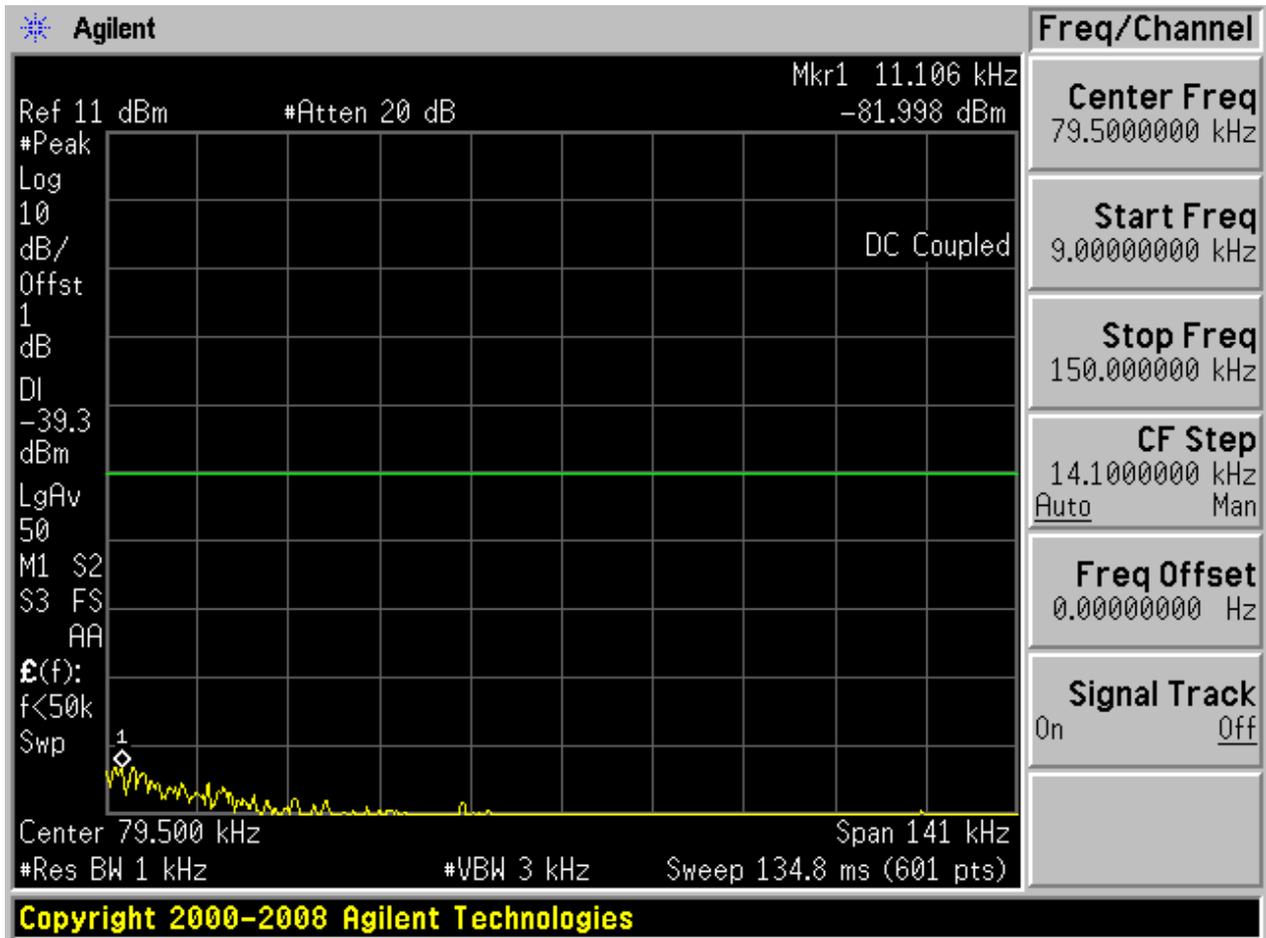
2.16 11N20_M@BG 2

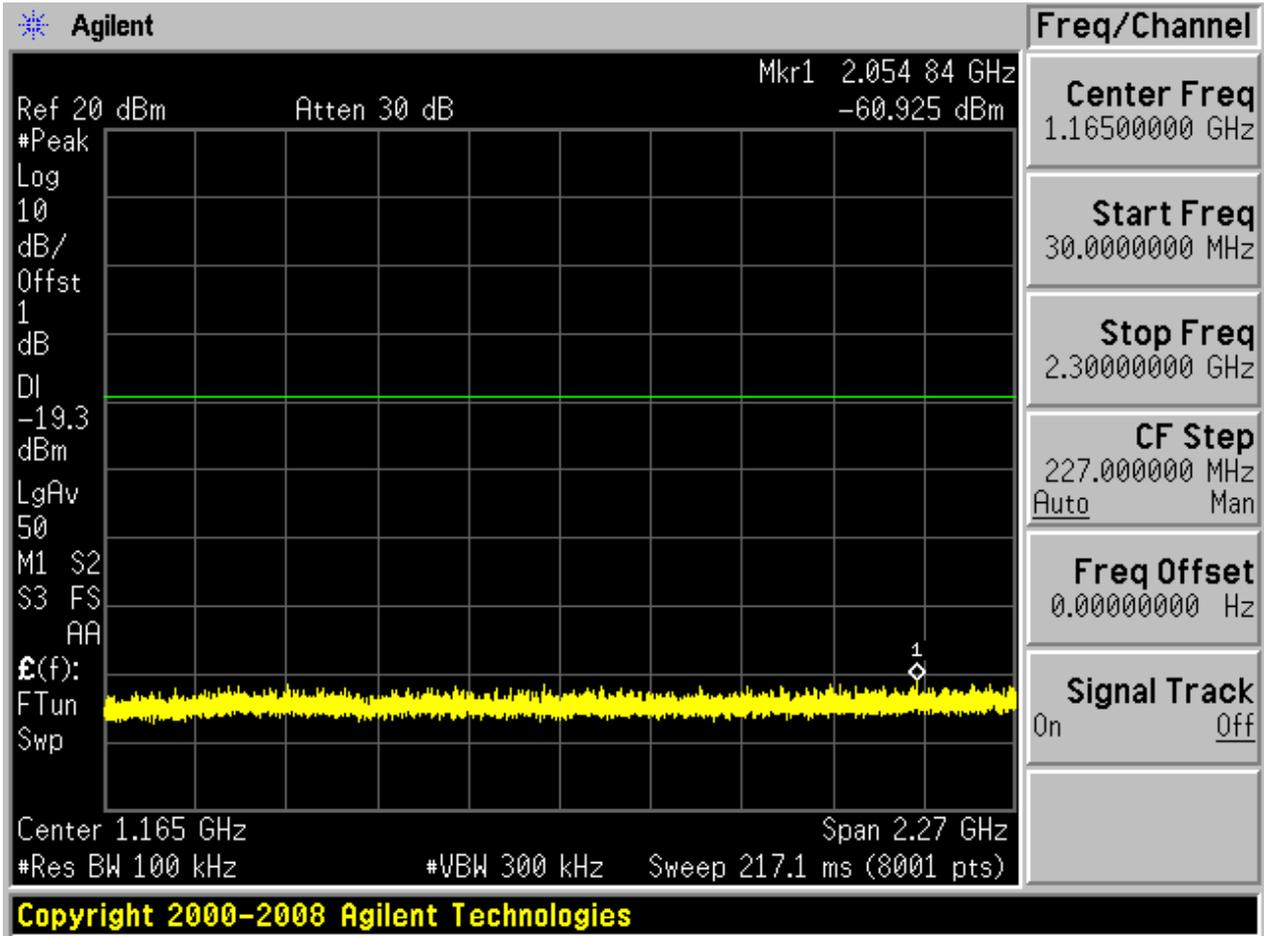
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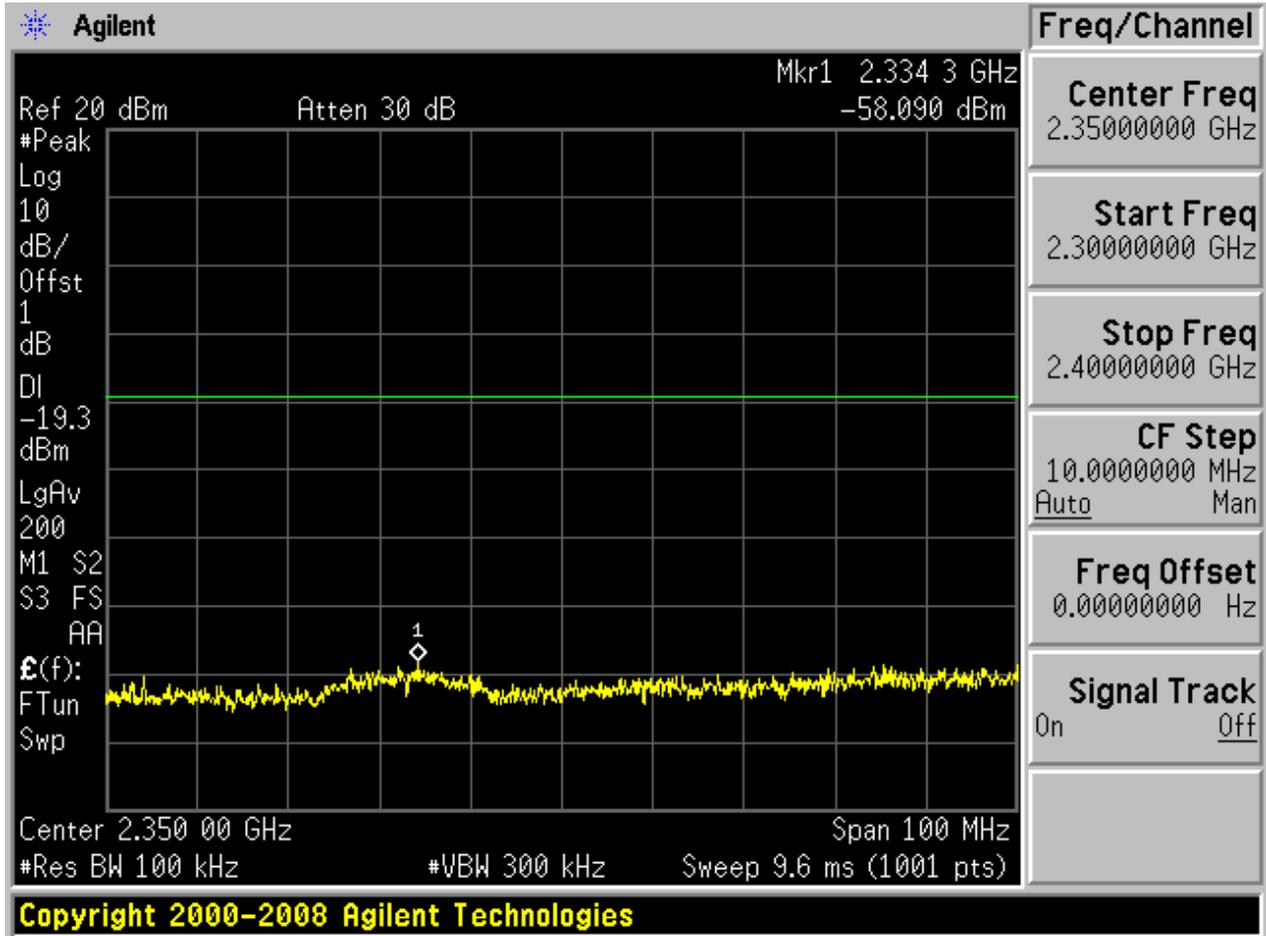


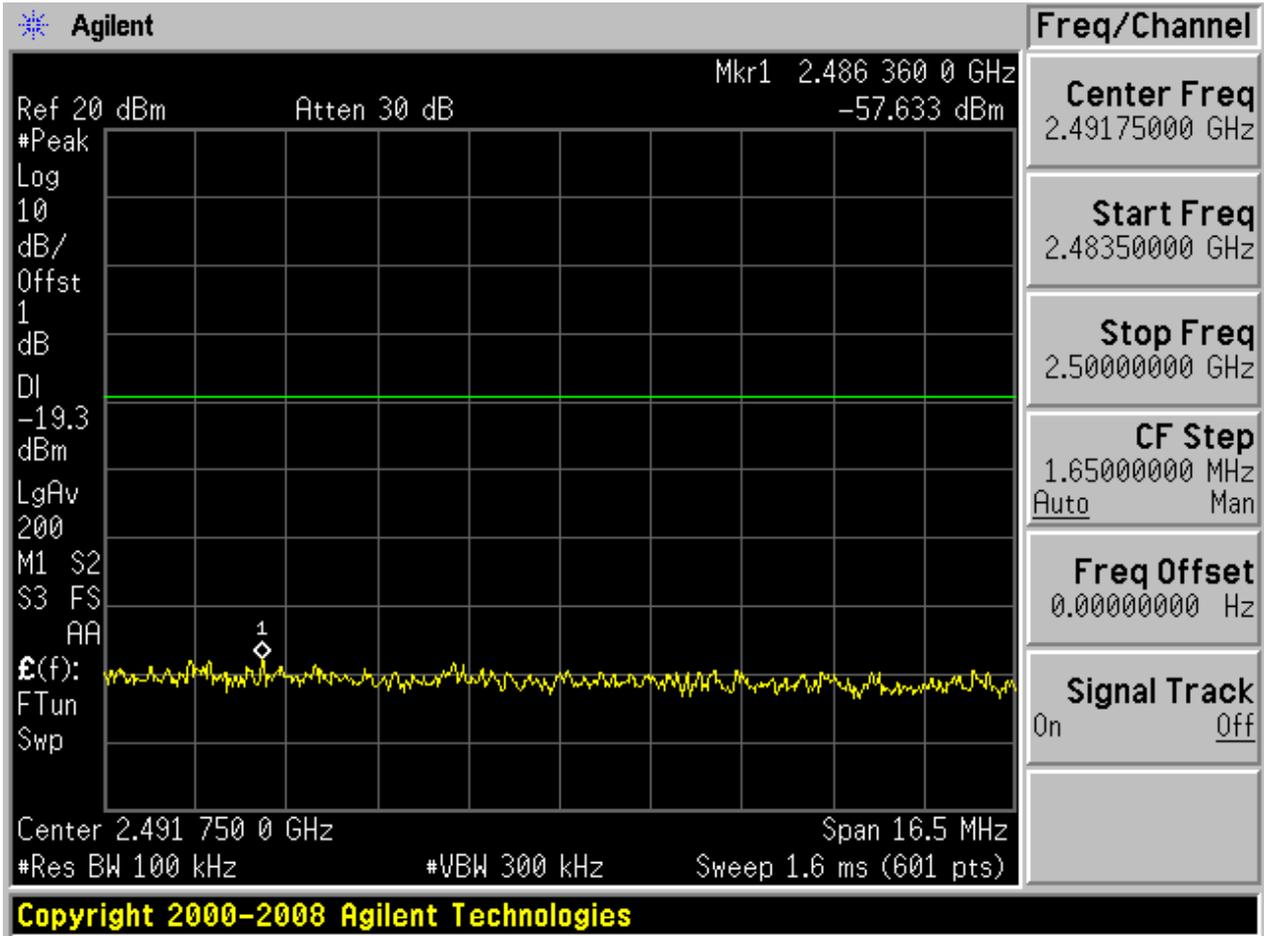


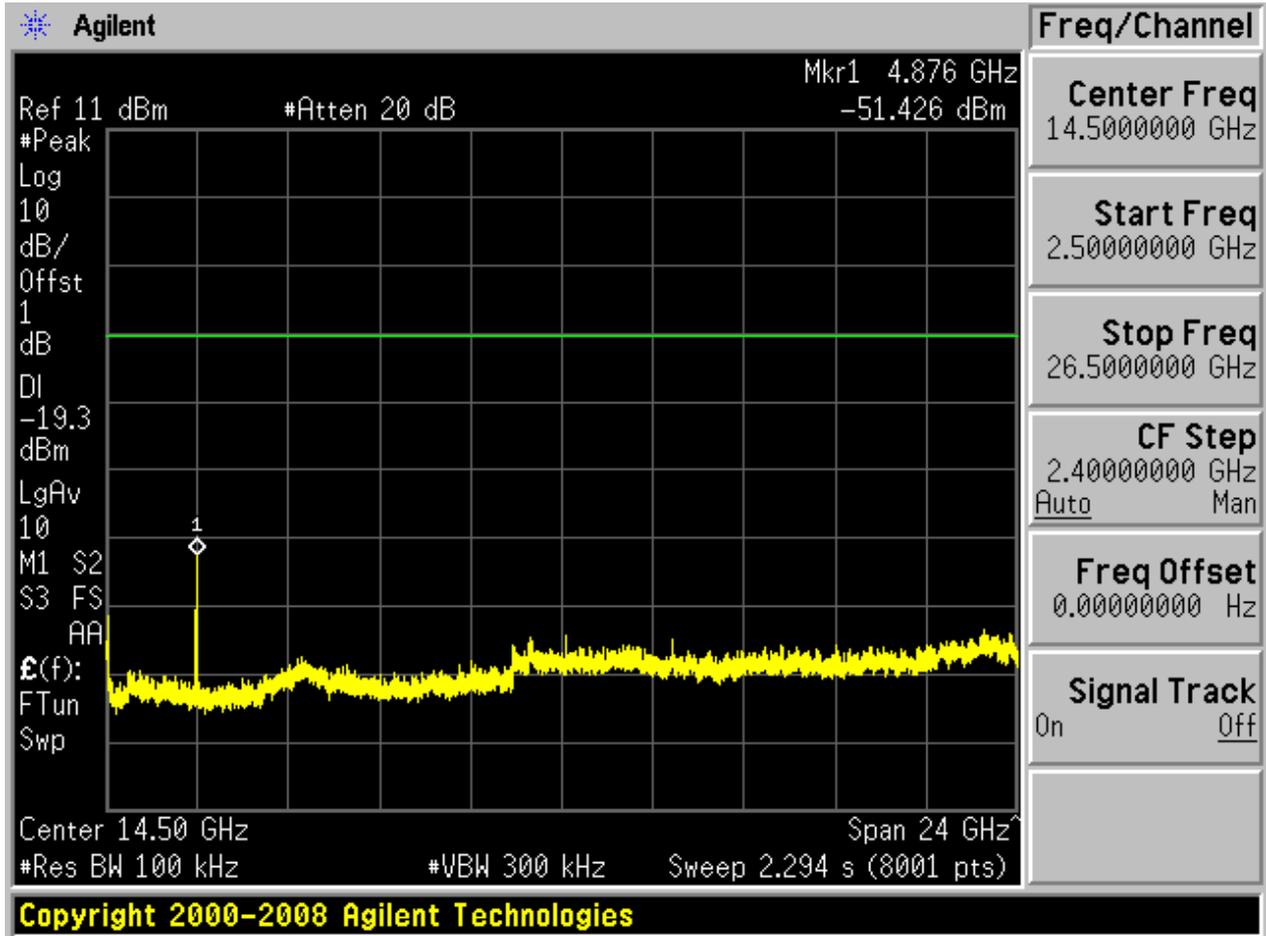
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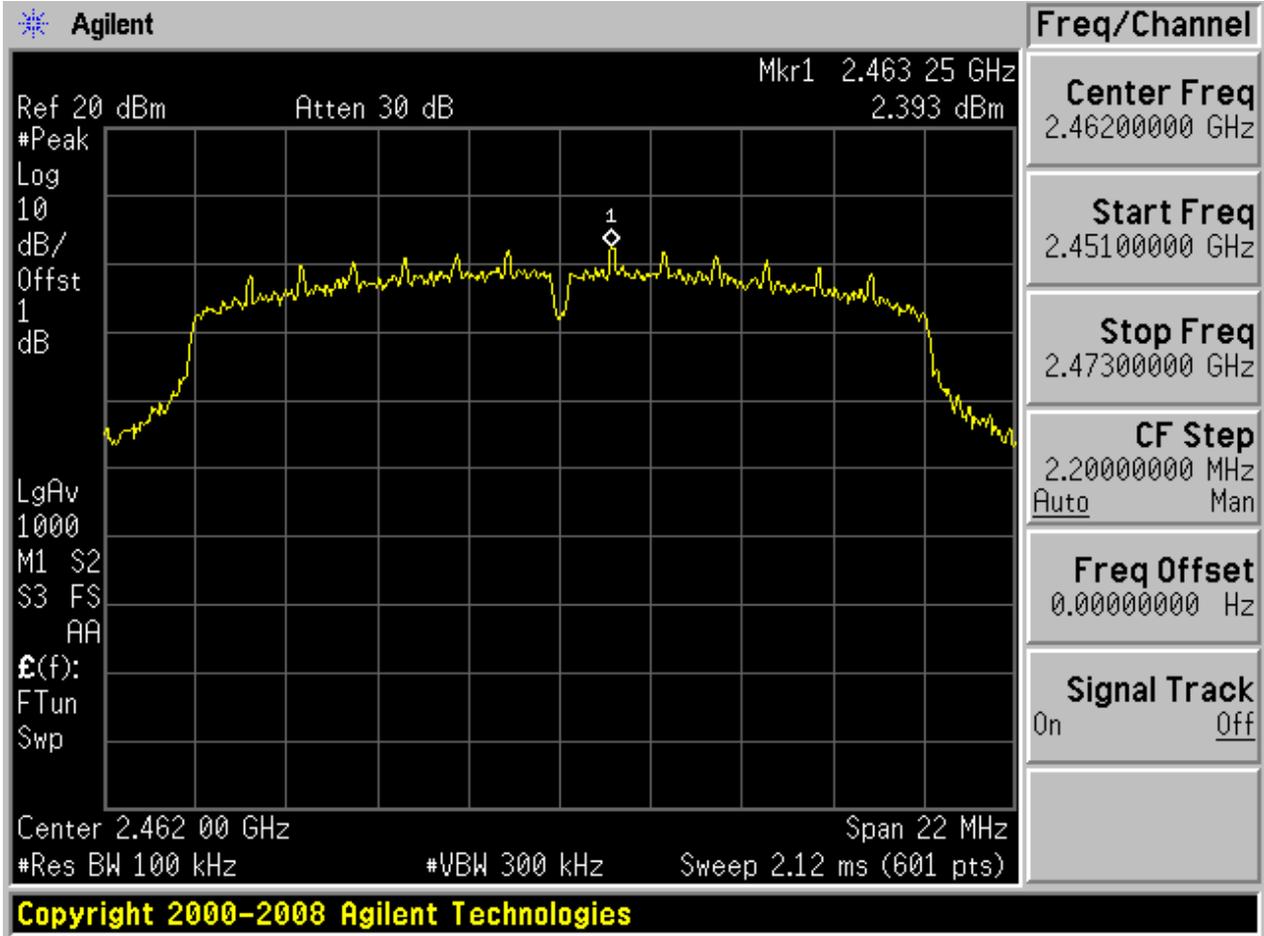






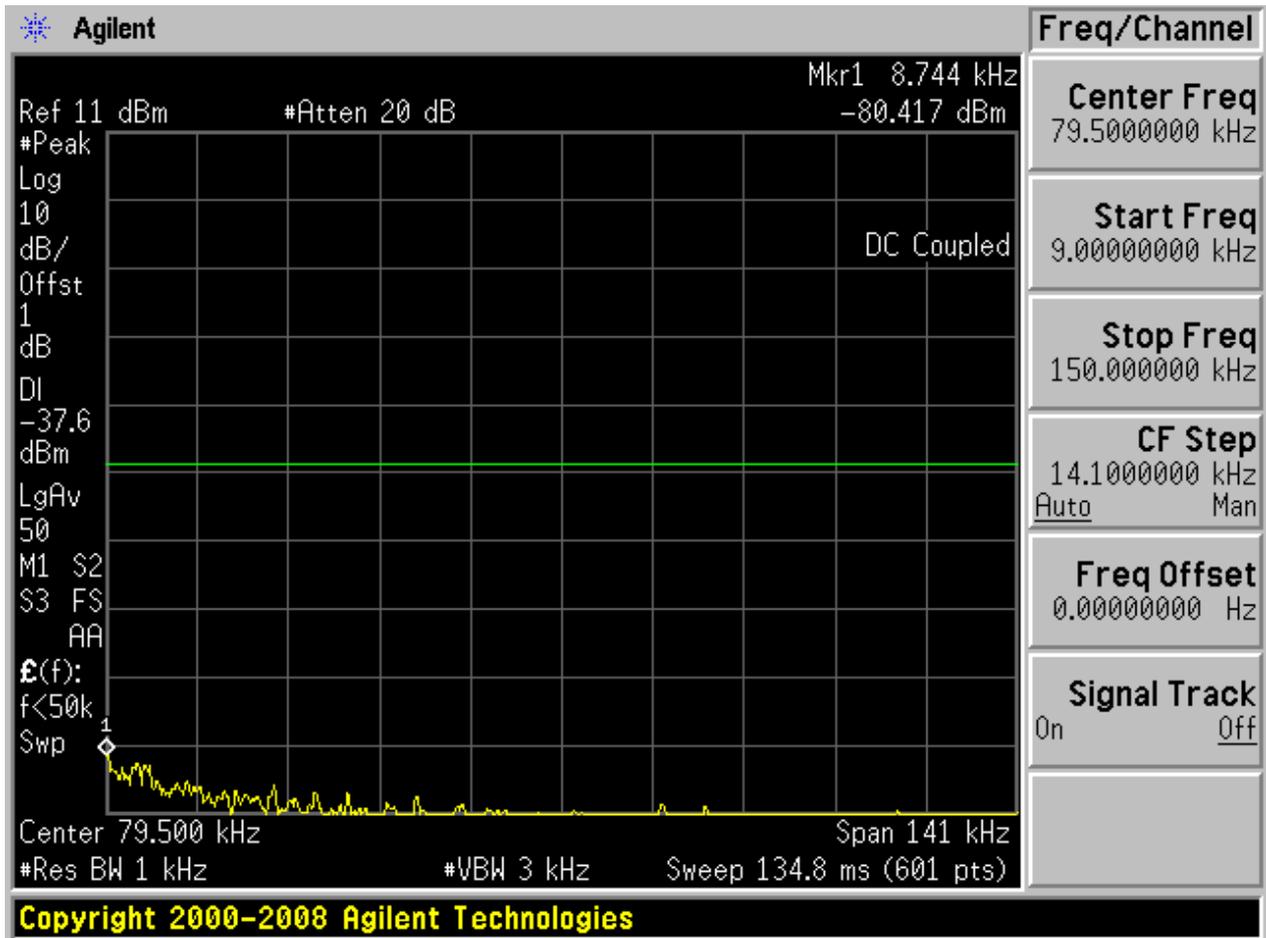
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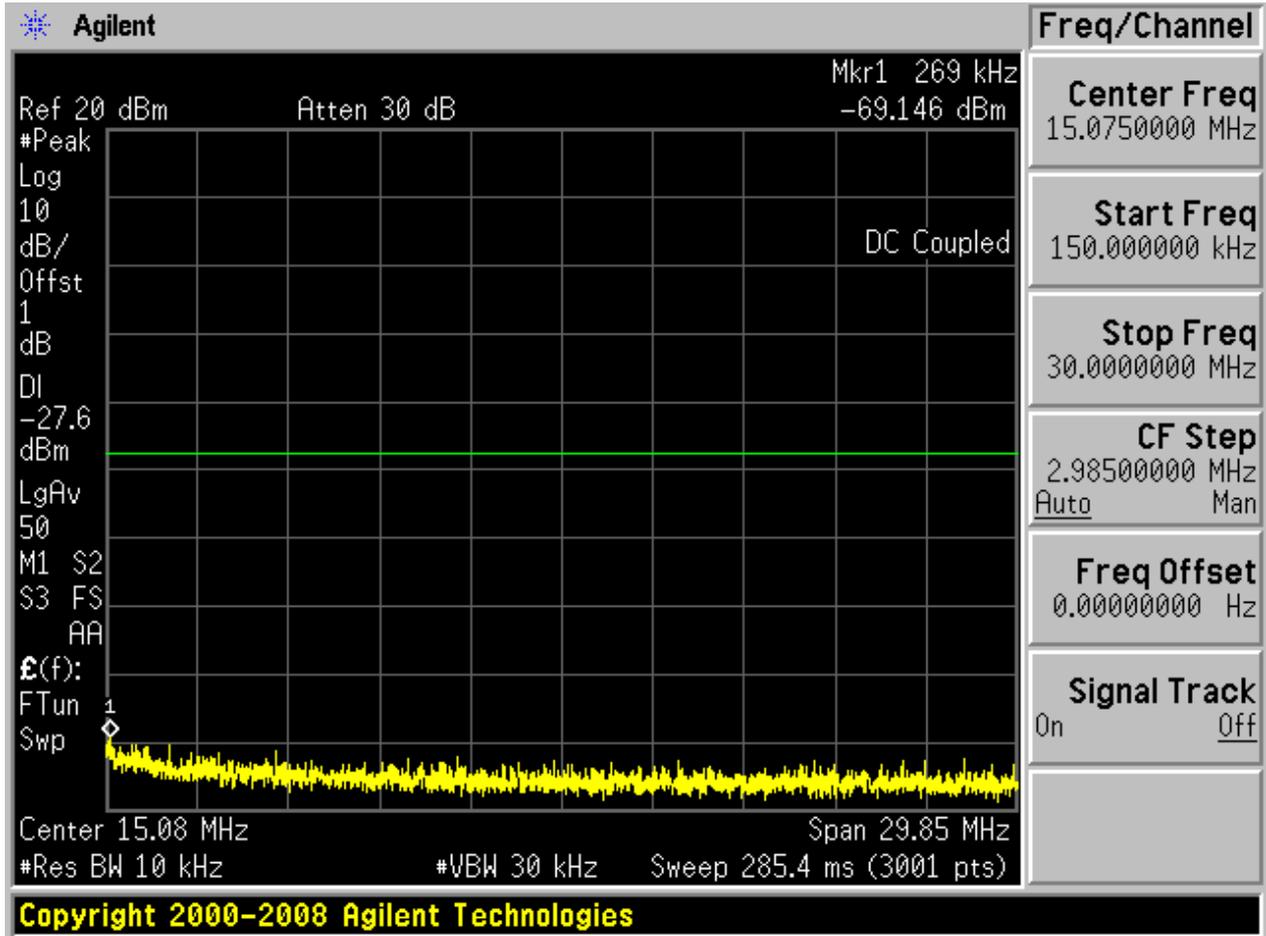
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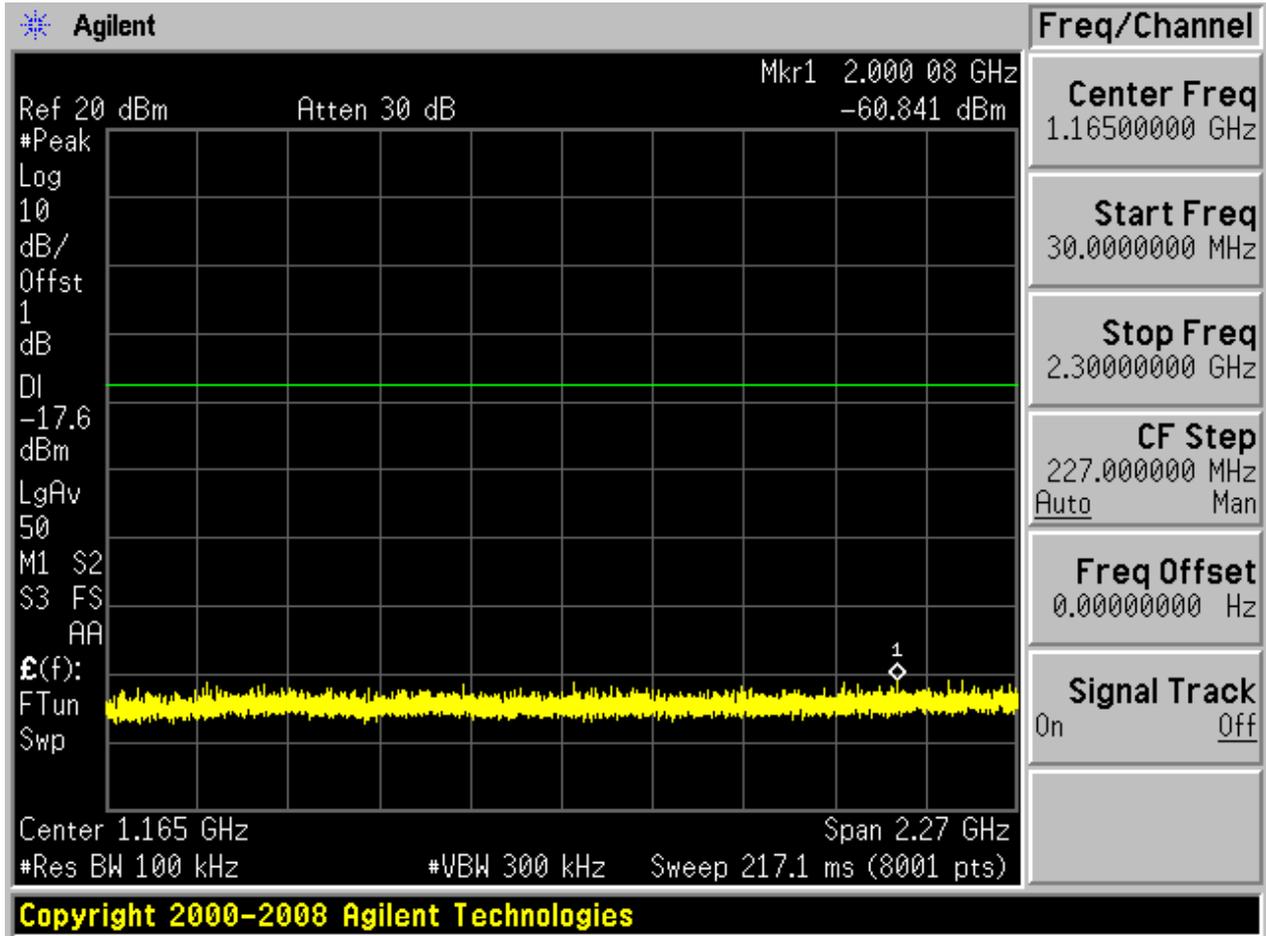


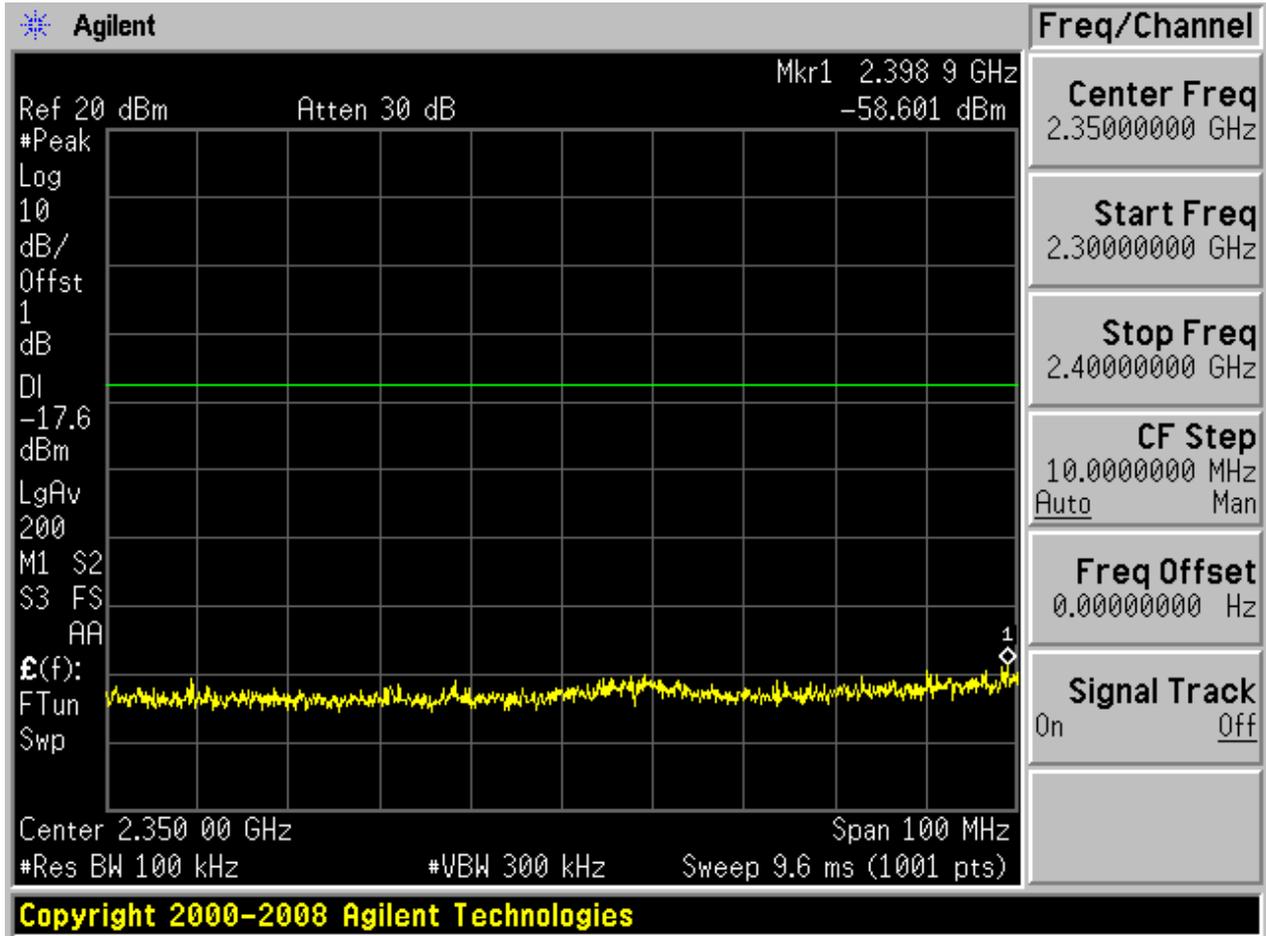


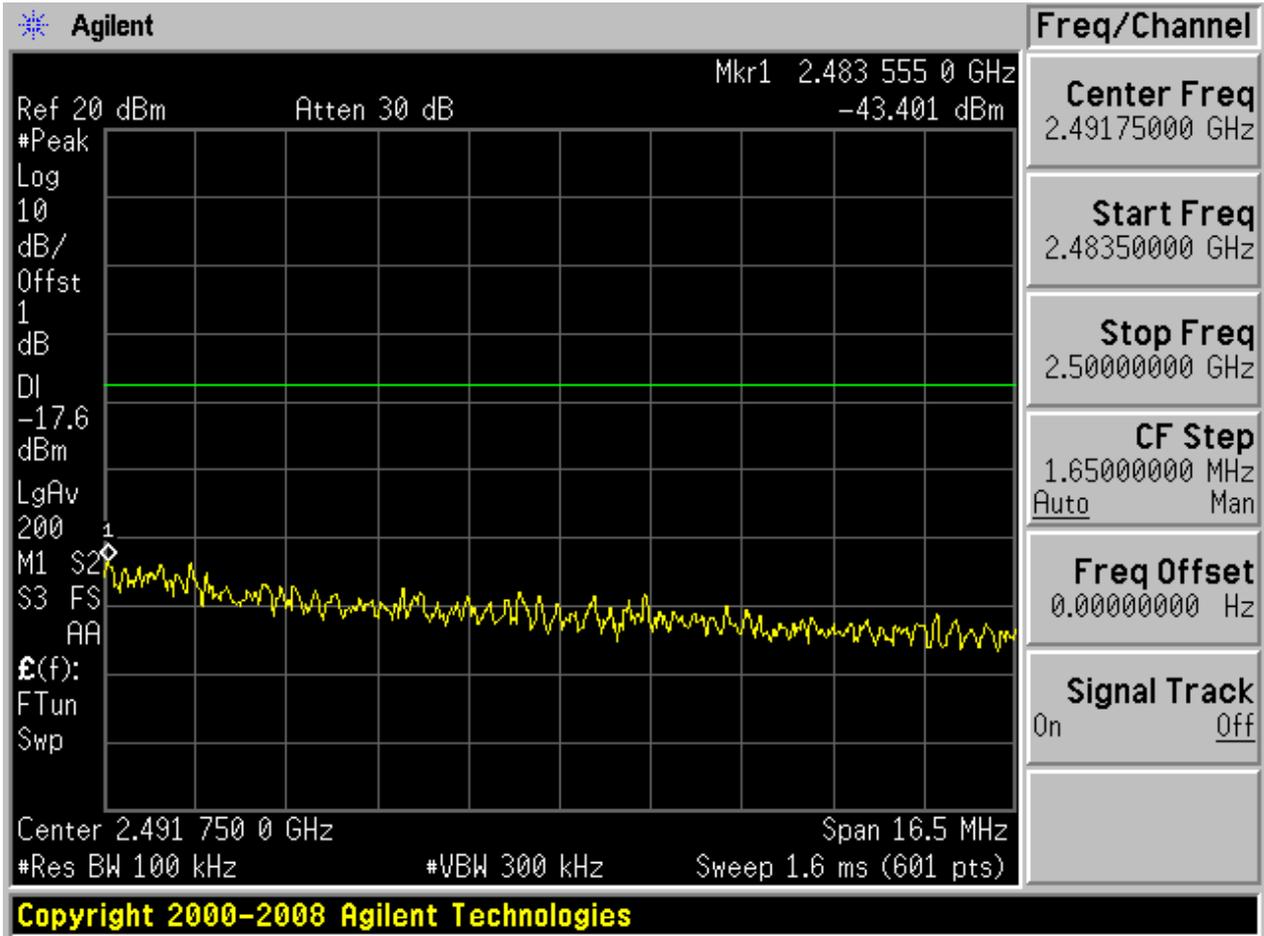
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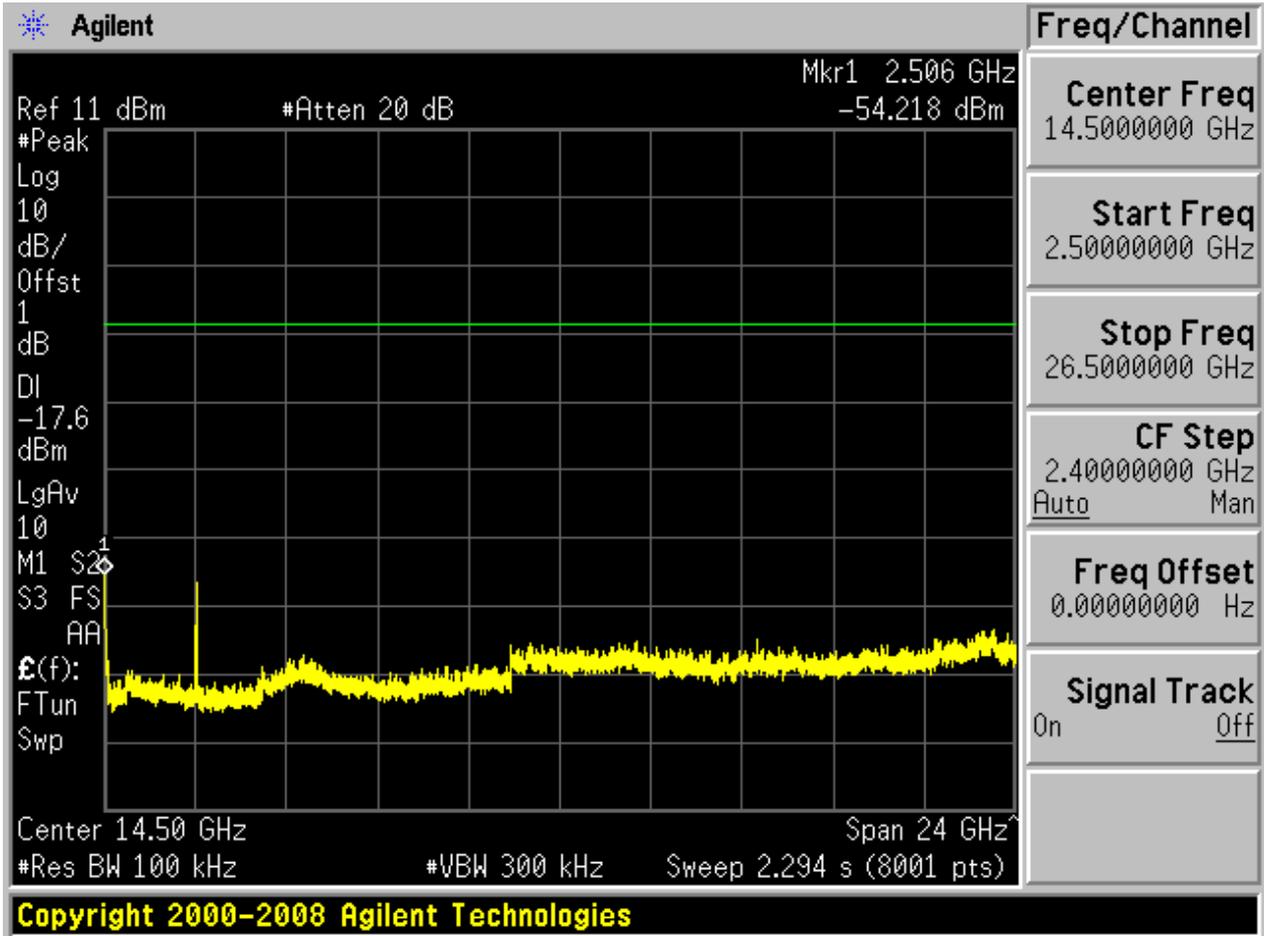








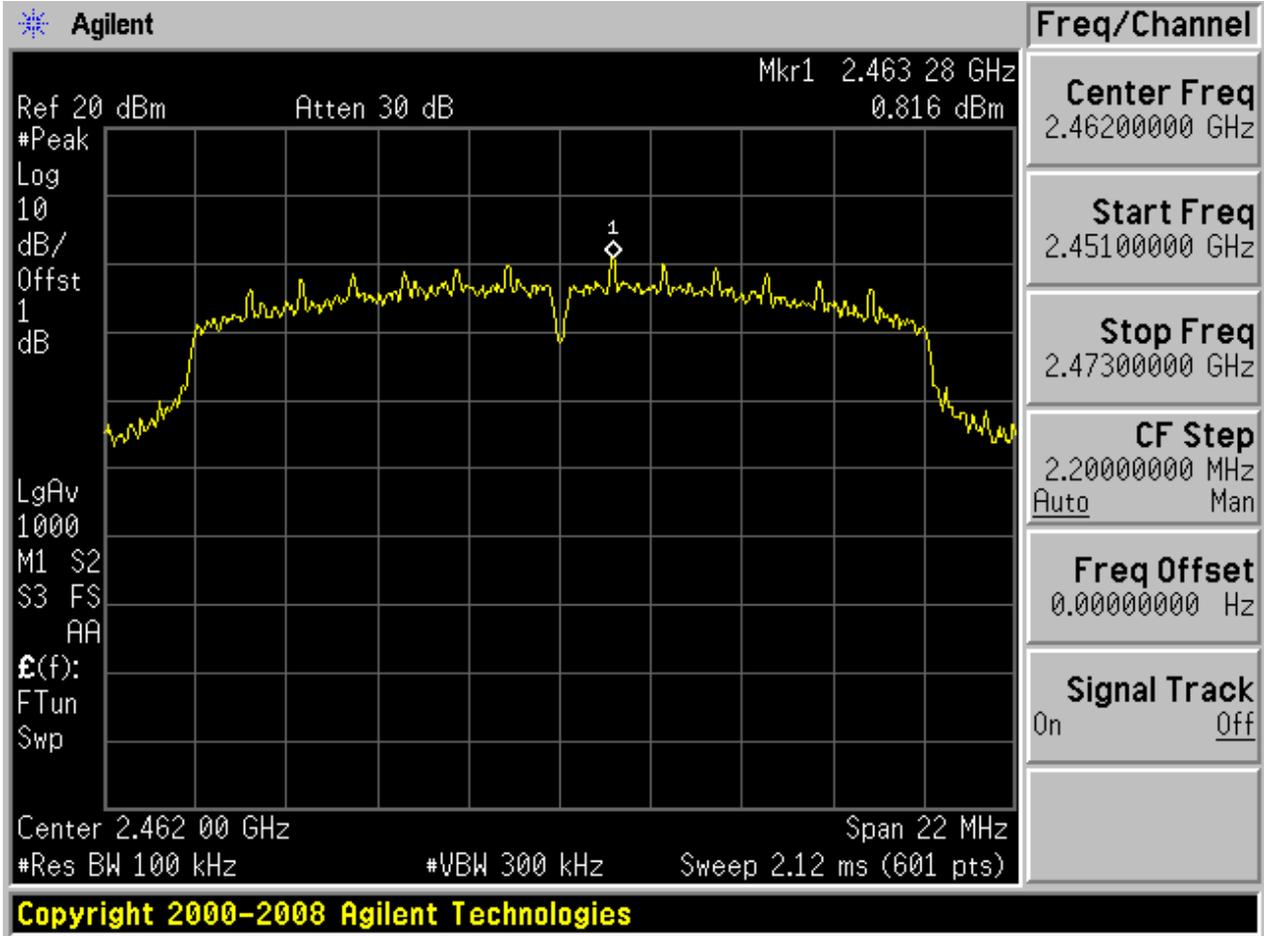






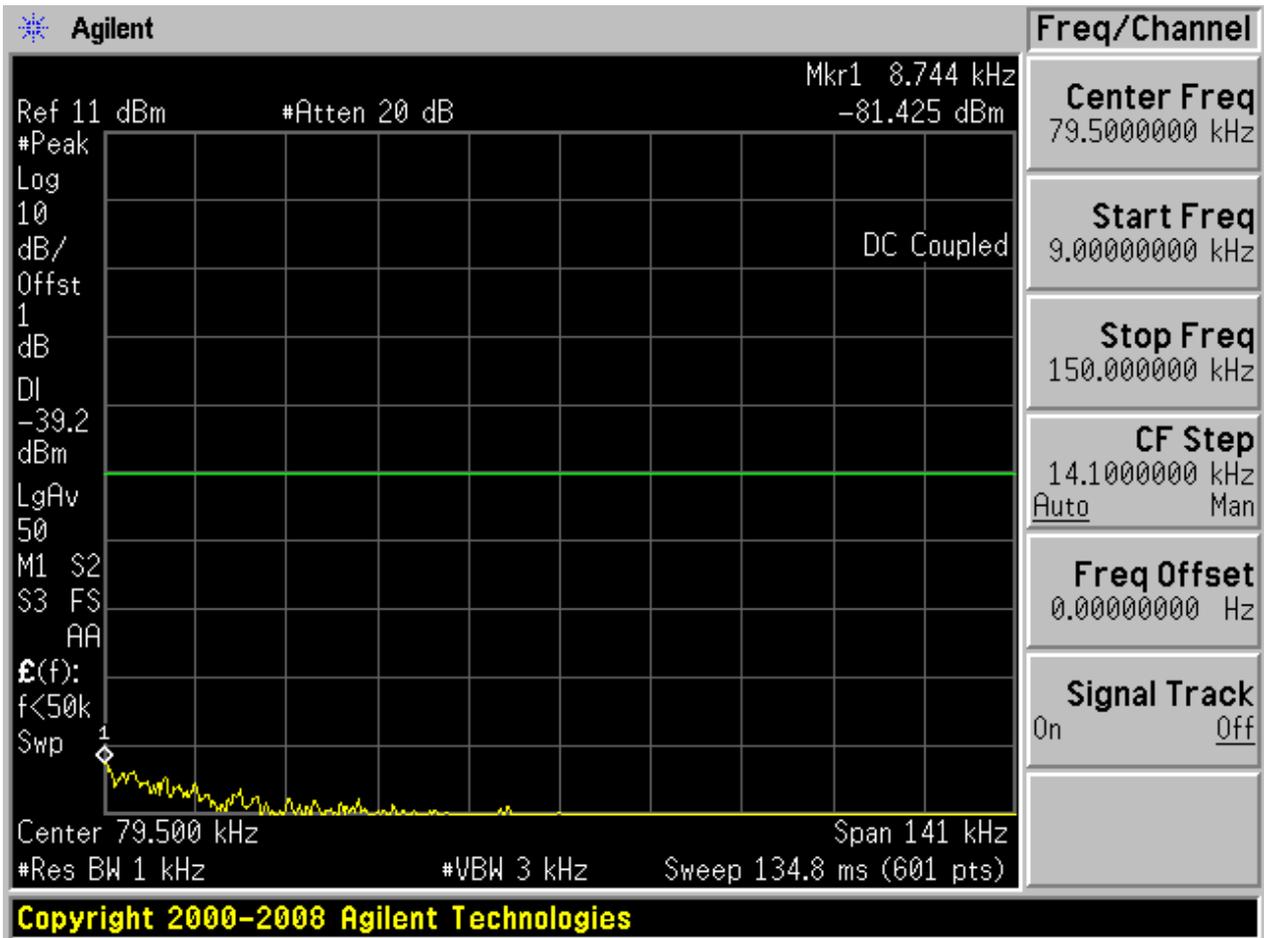
2.18 11N20_H@BG 2

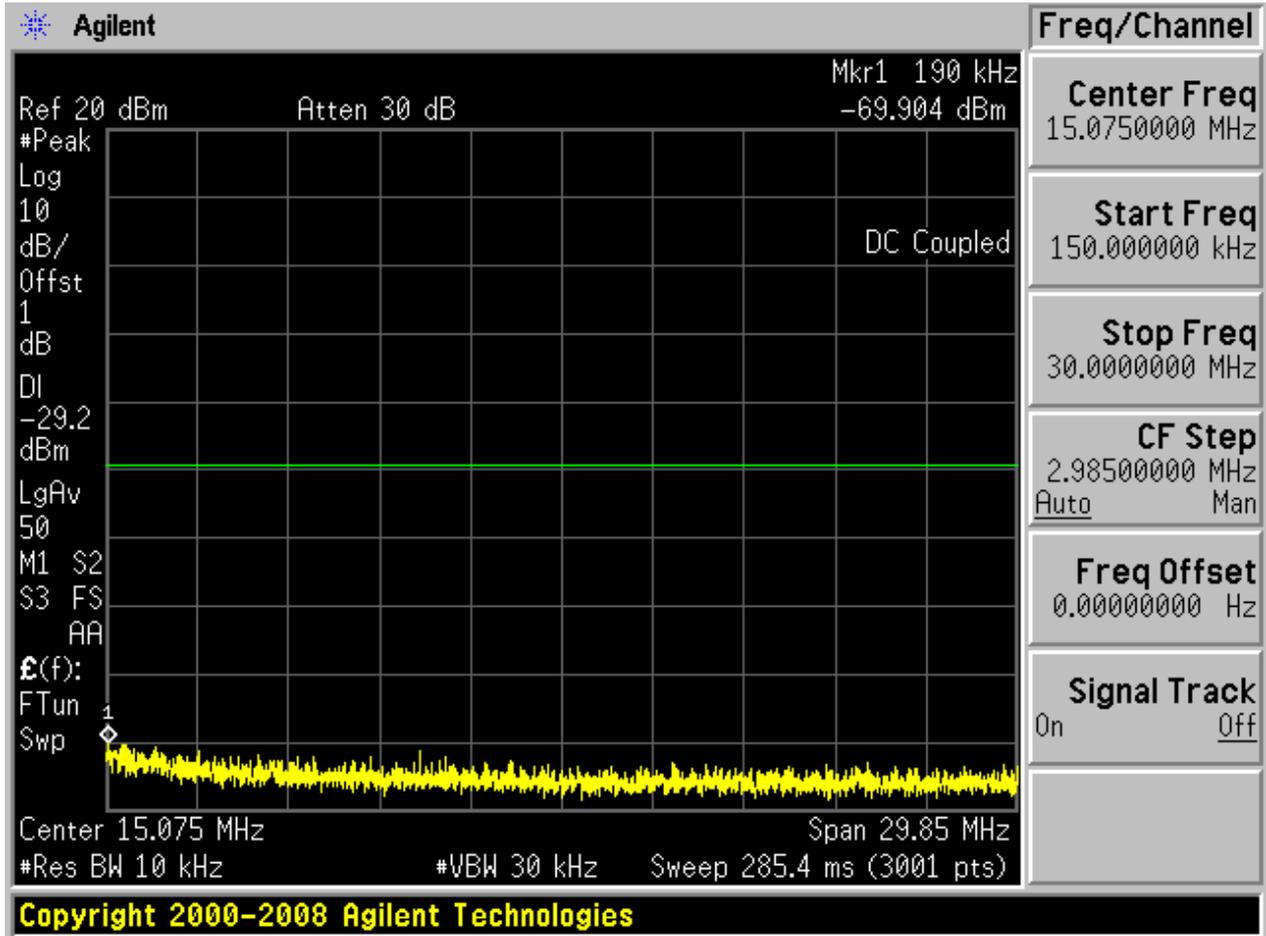
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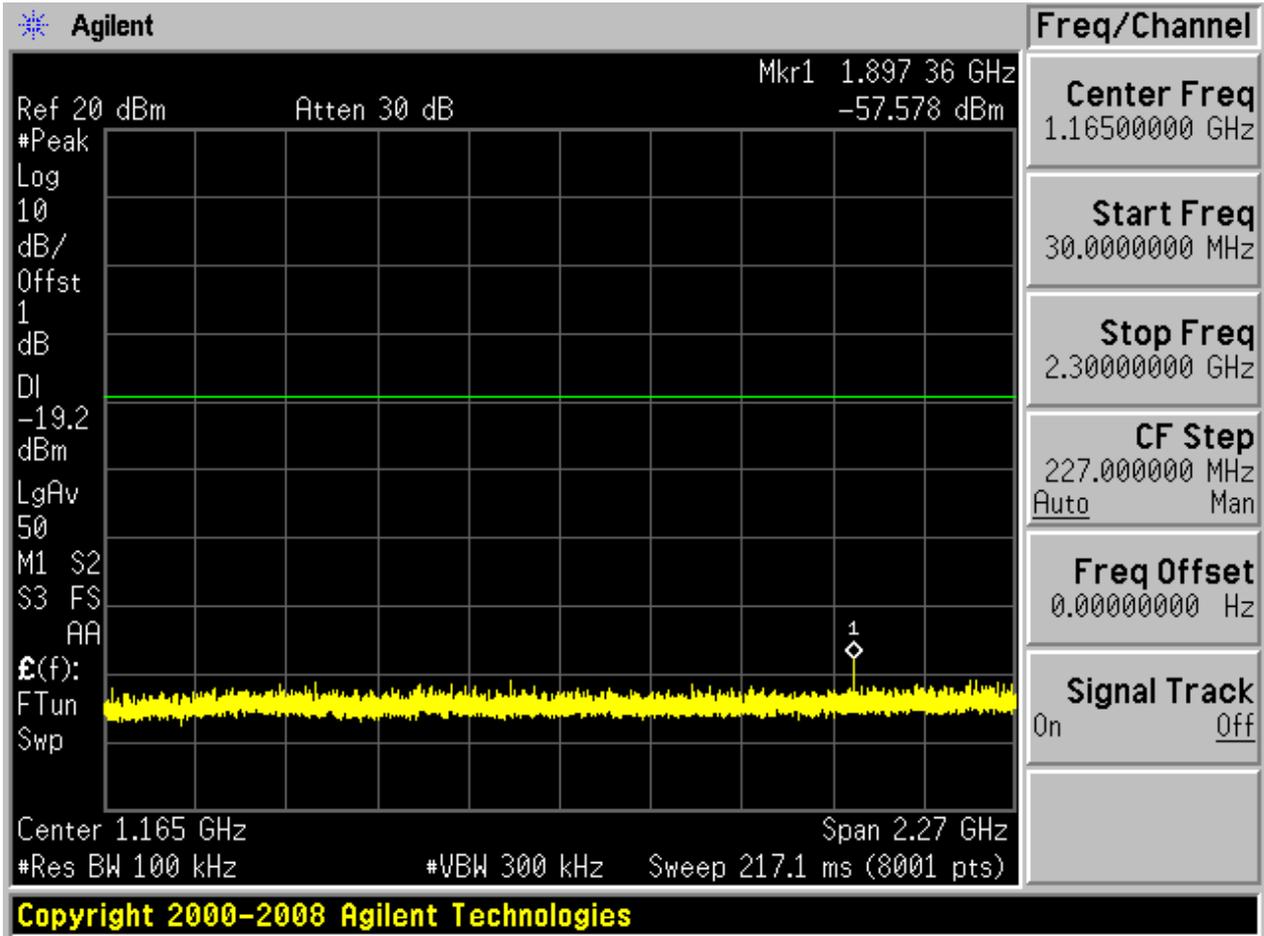


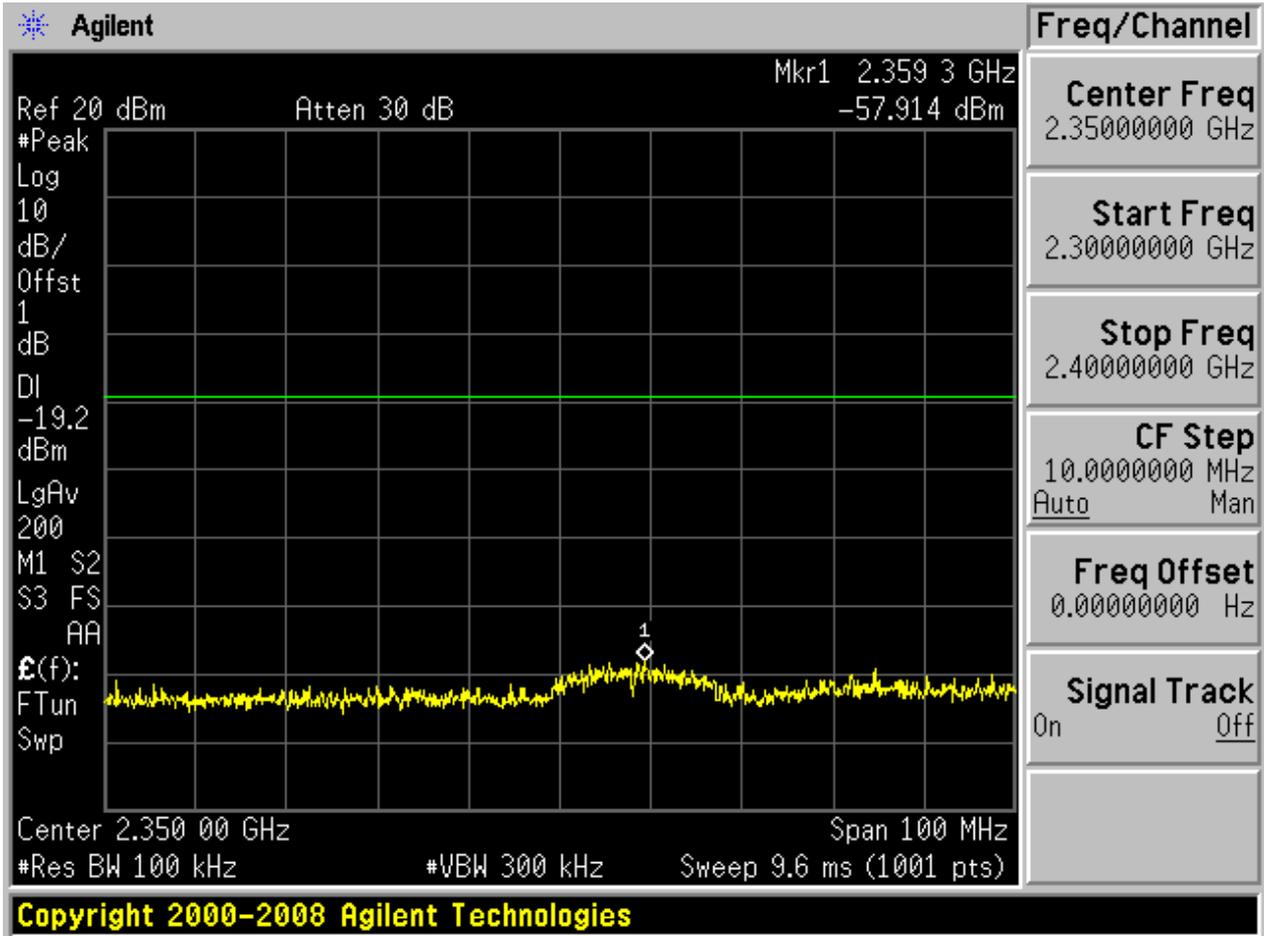


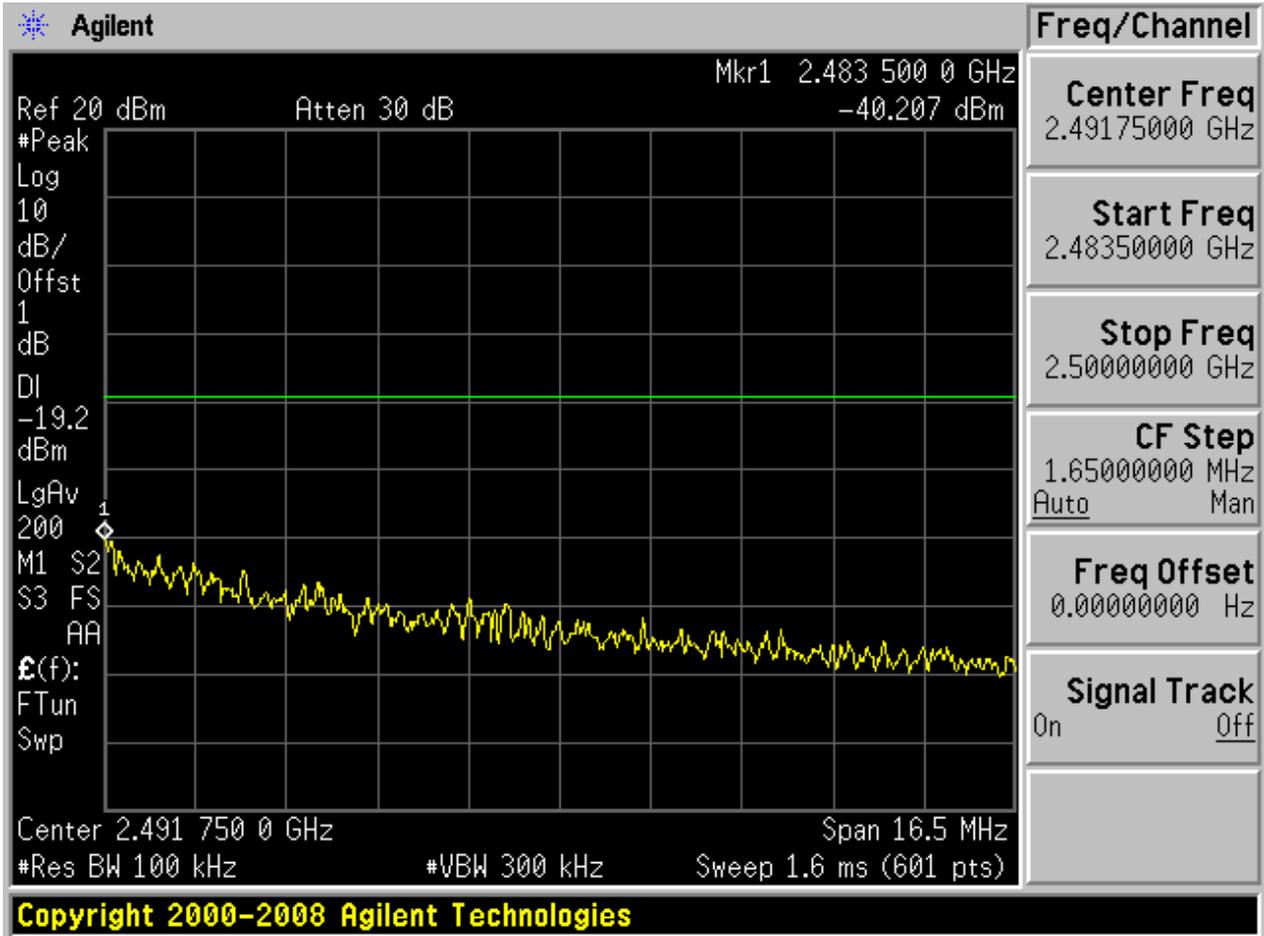
Puw:

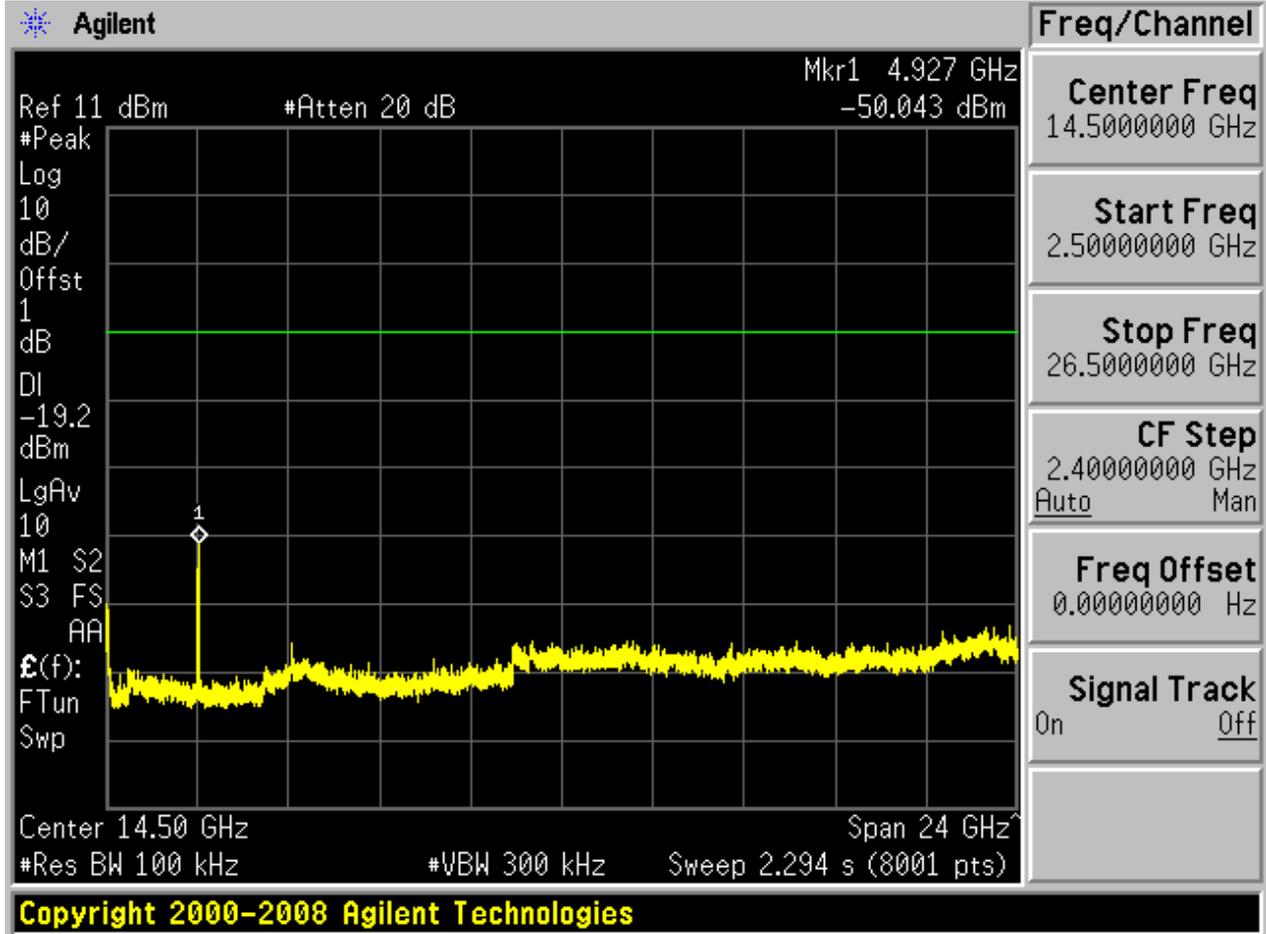








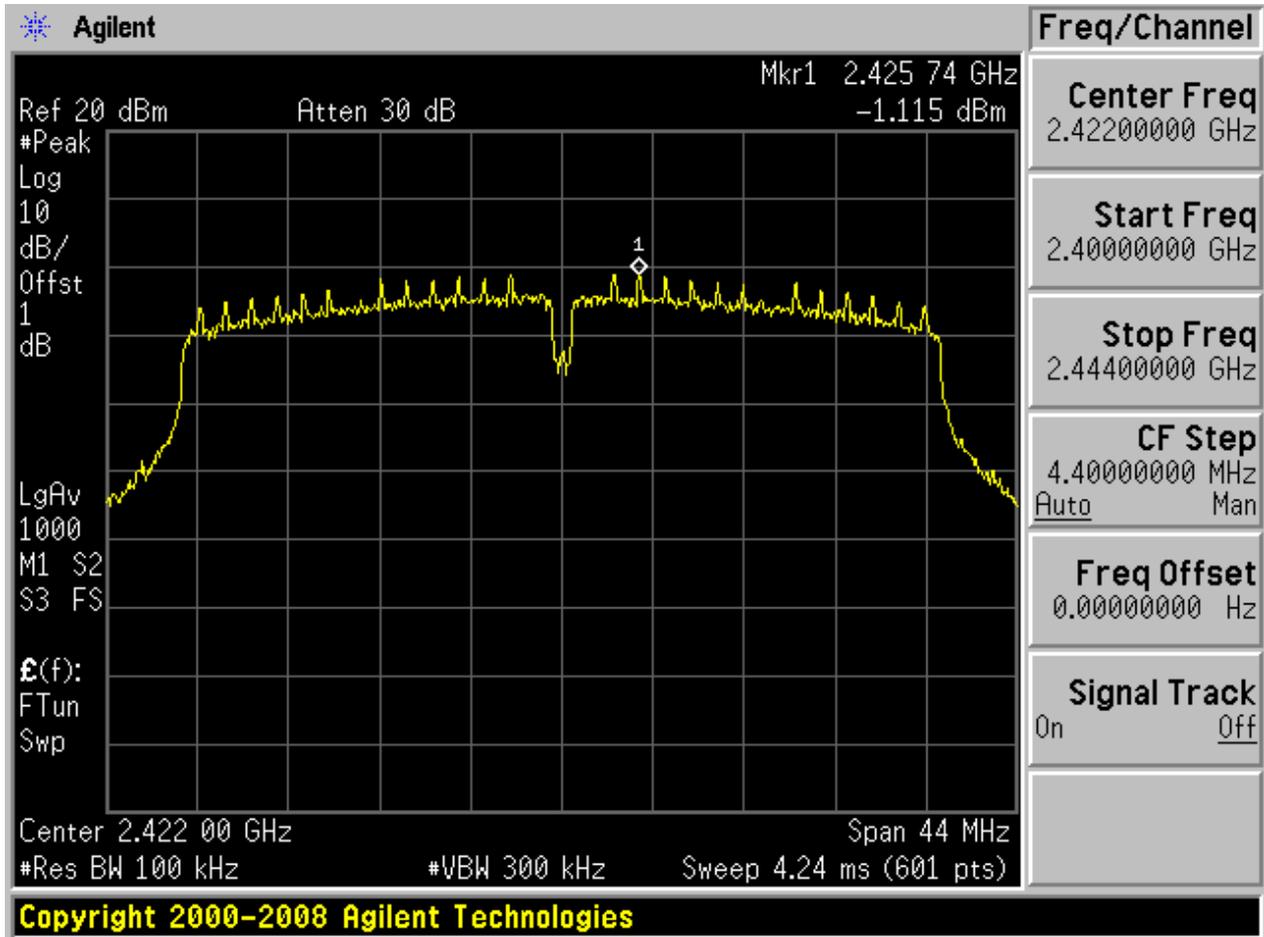






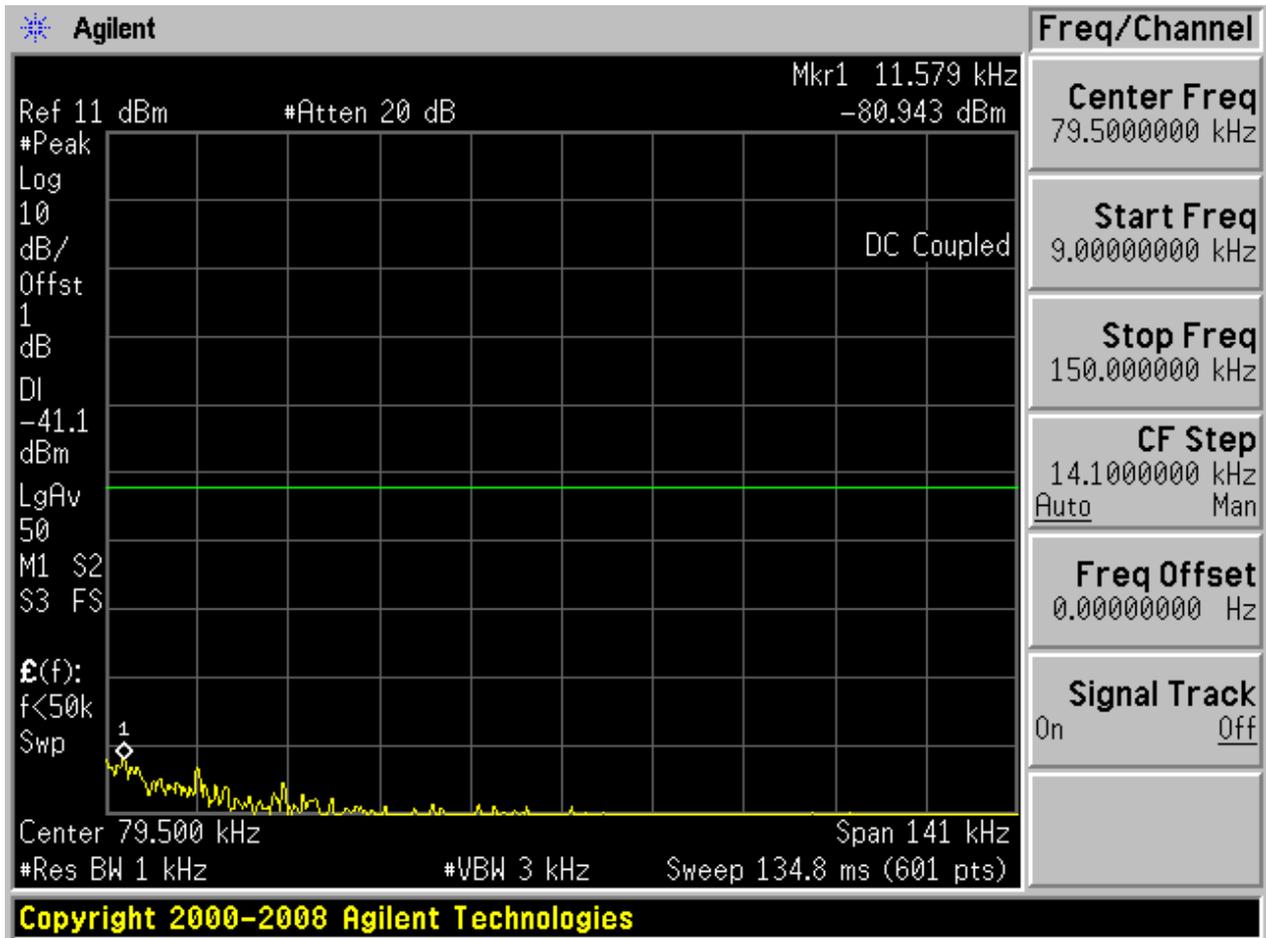
2.19 11N40_L@BG 1

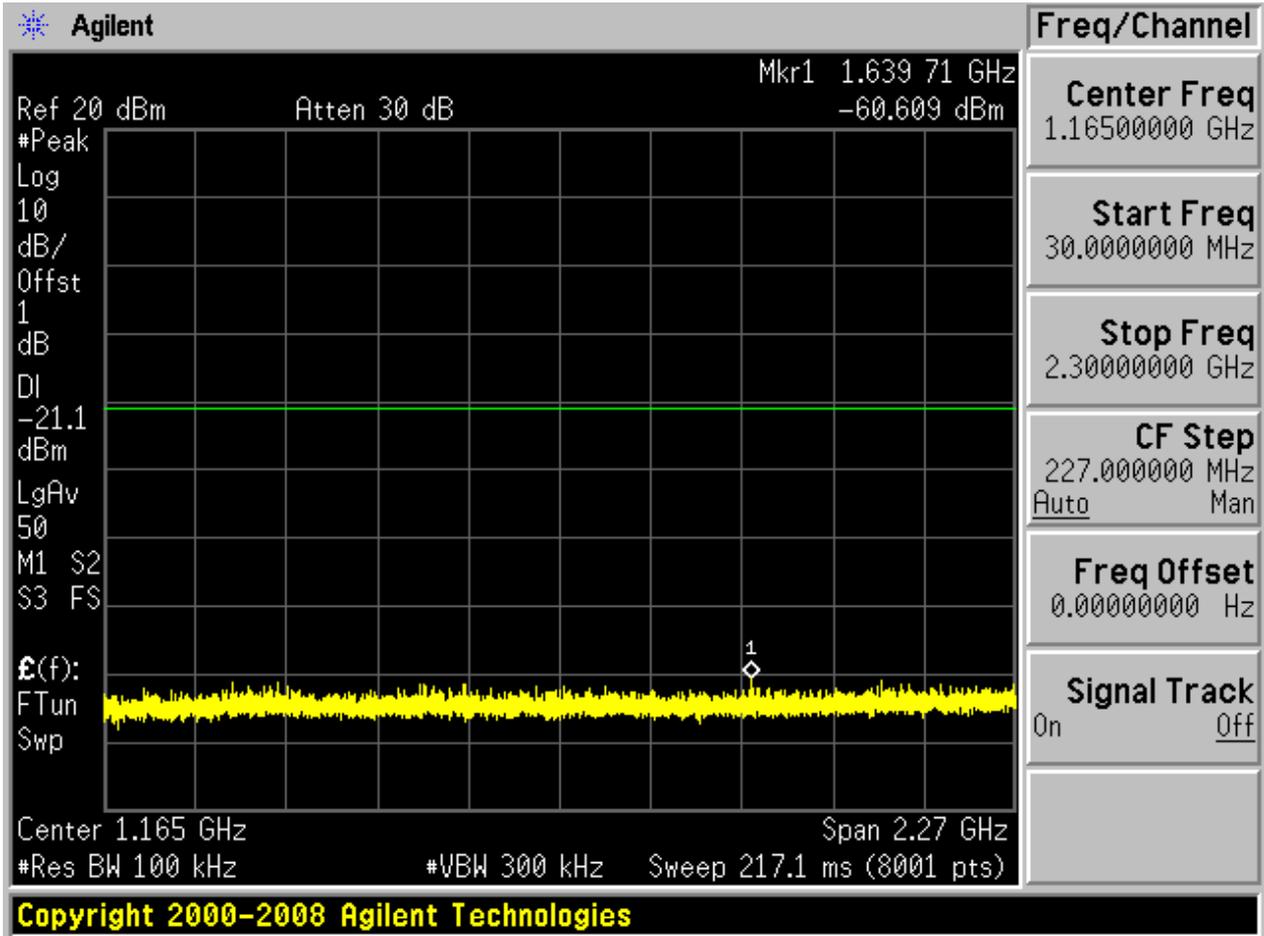
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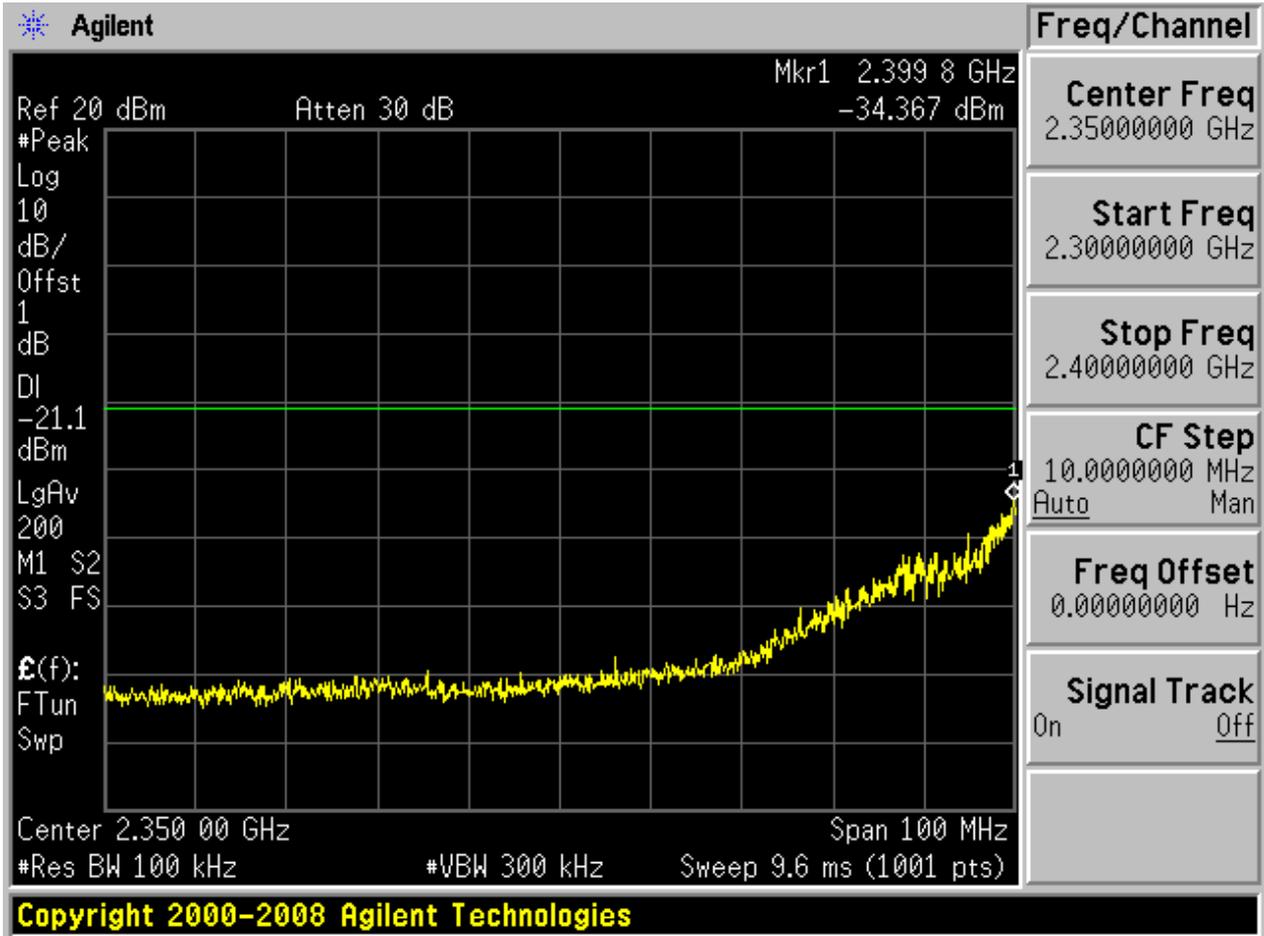


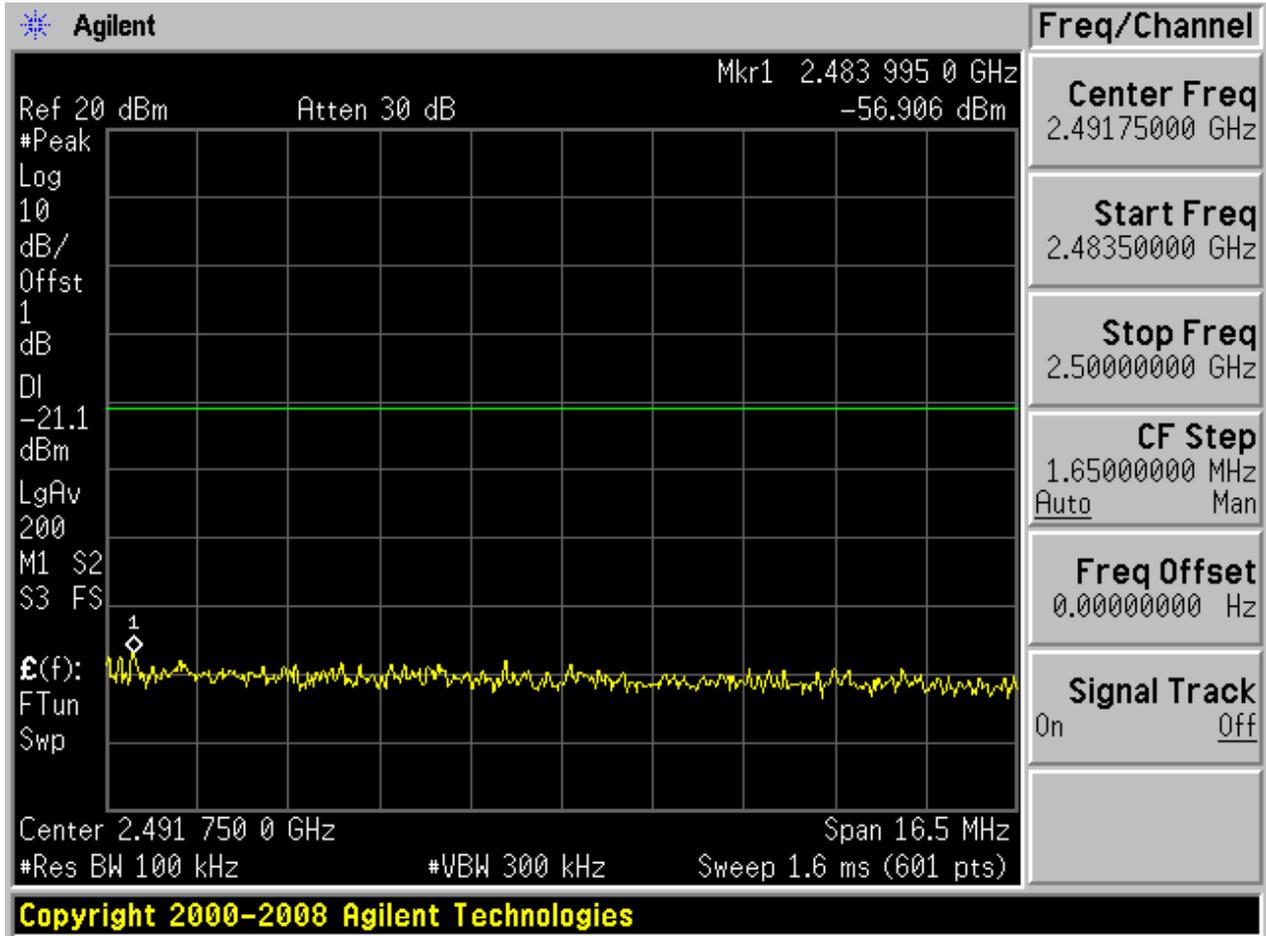


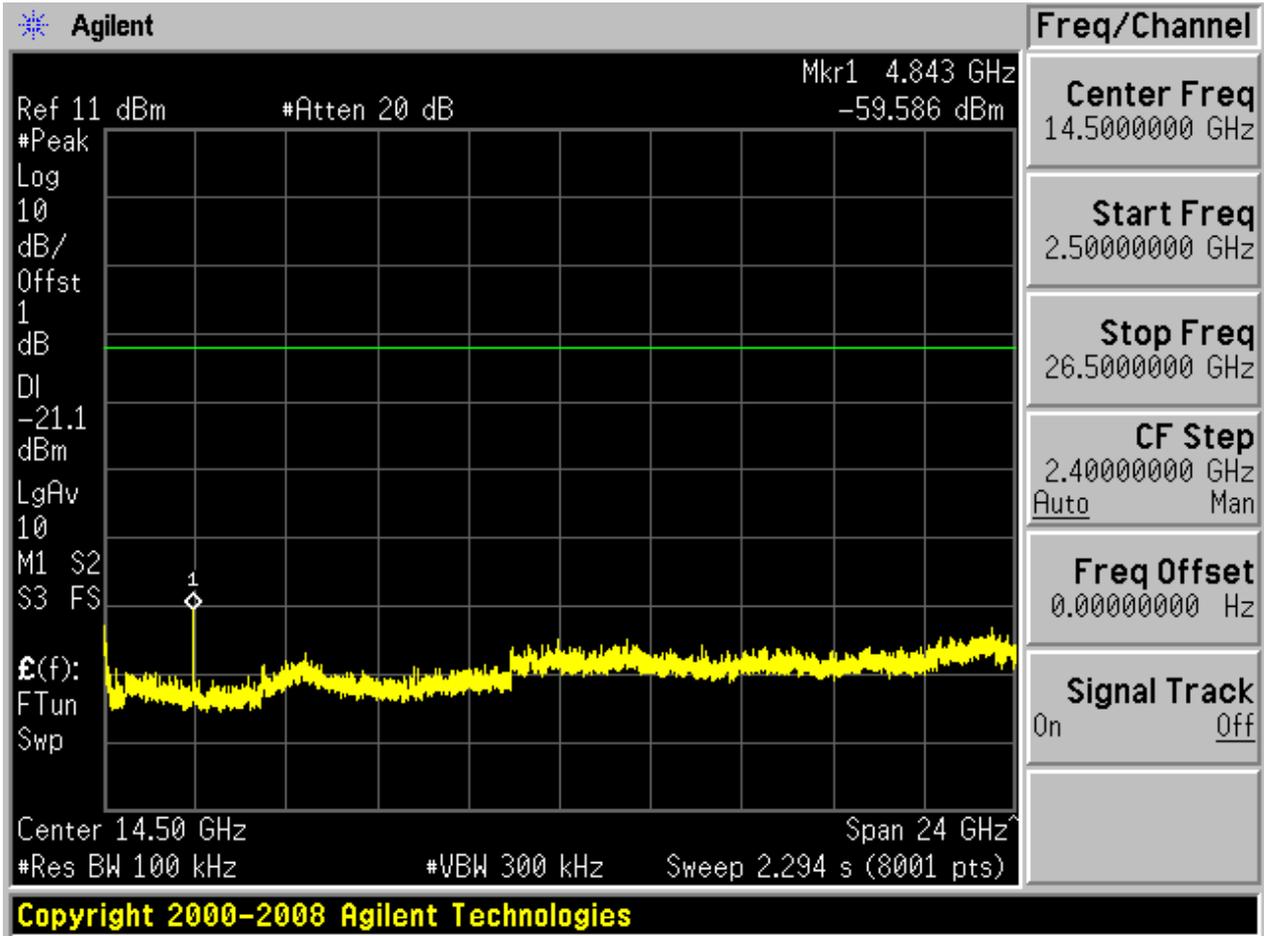
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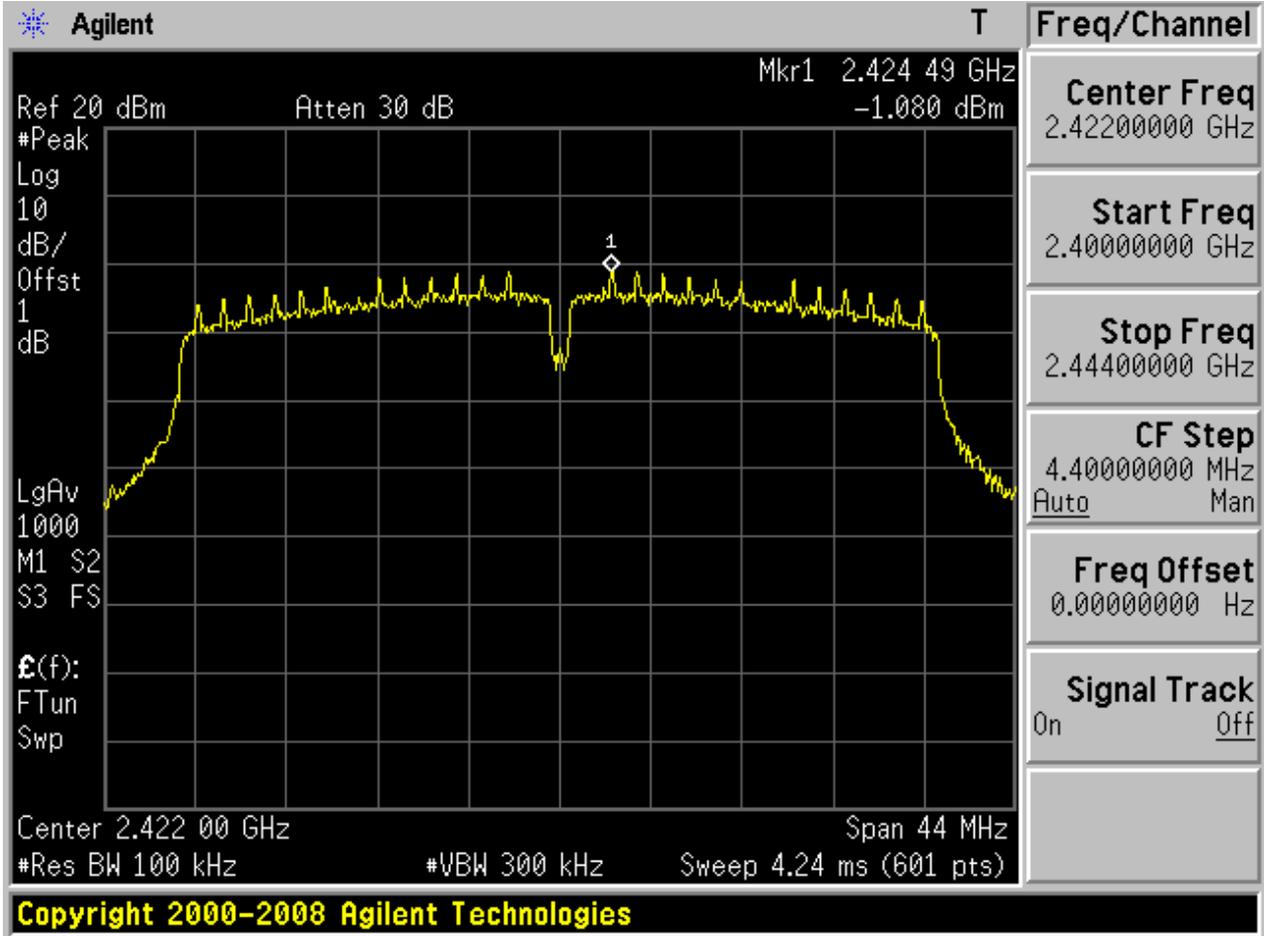






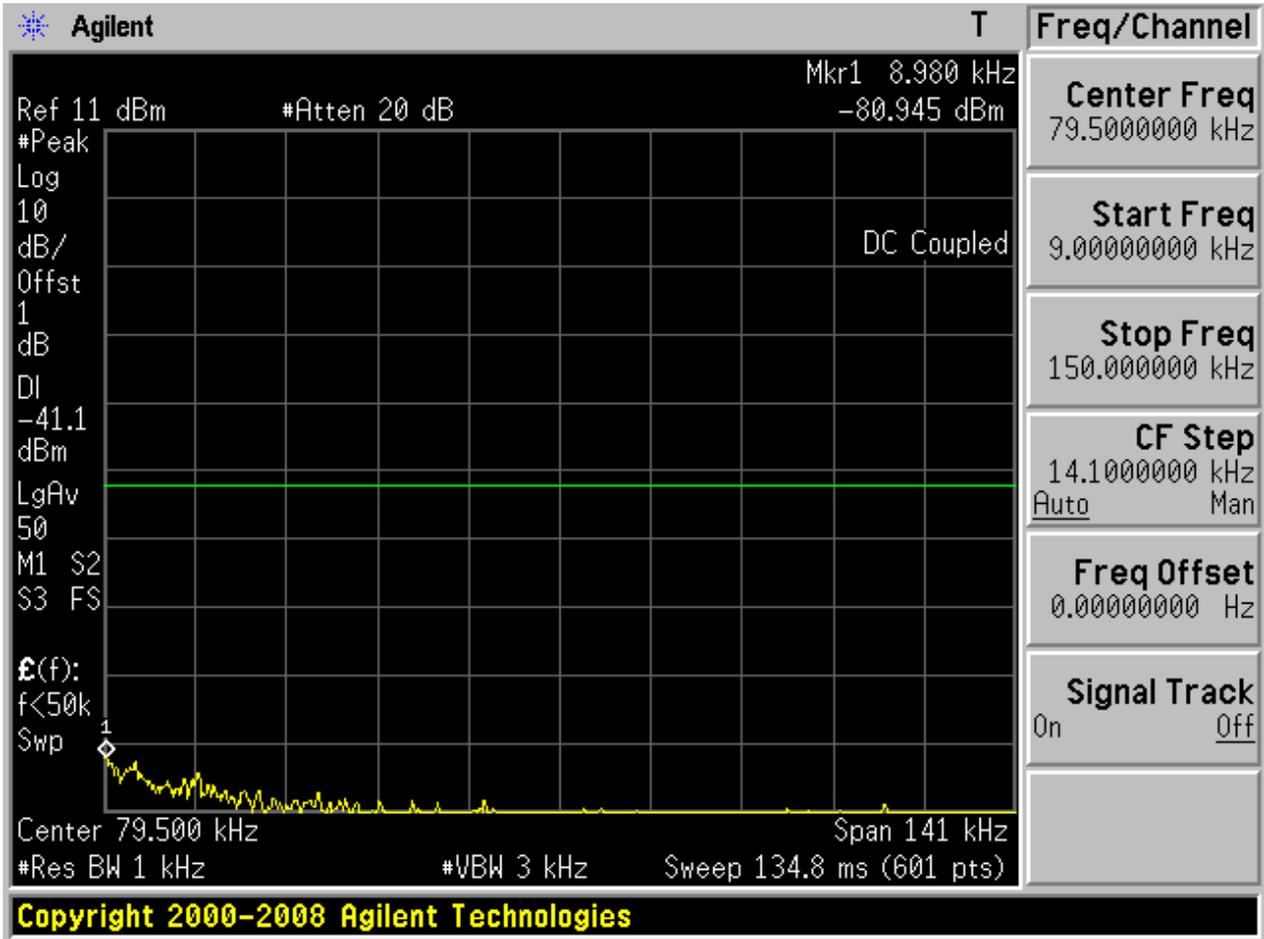
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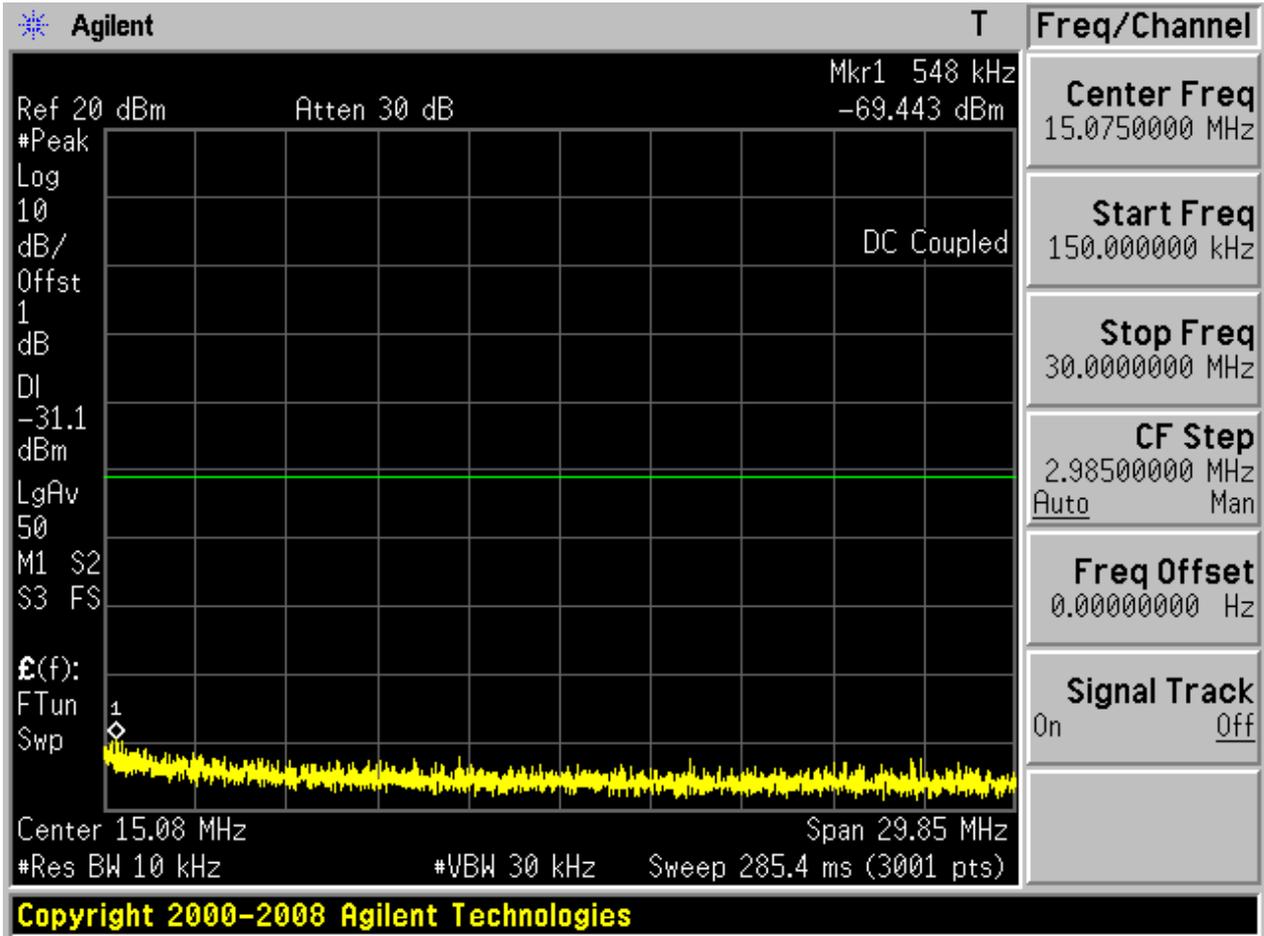
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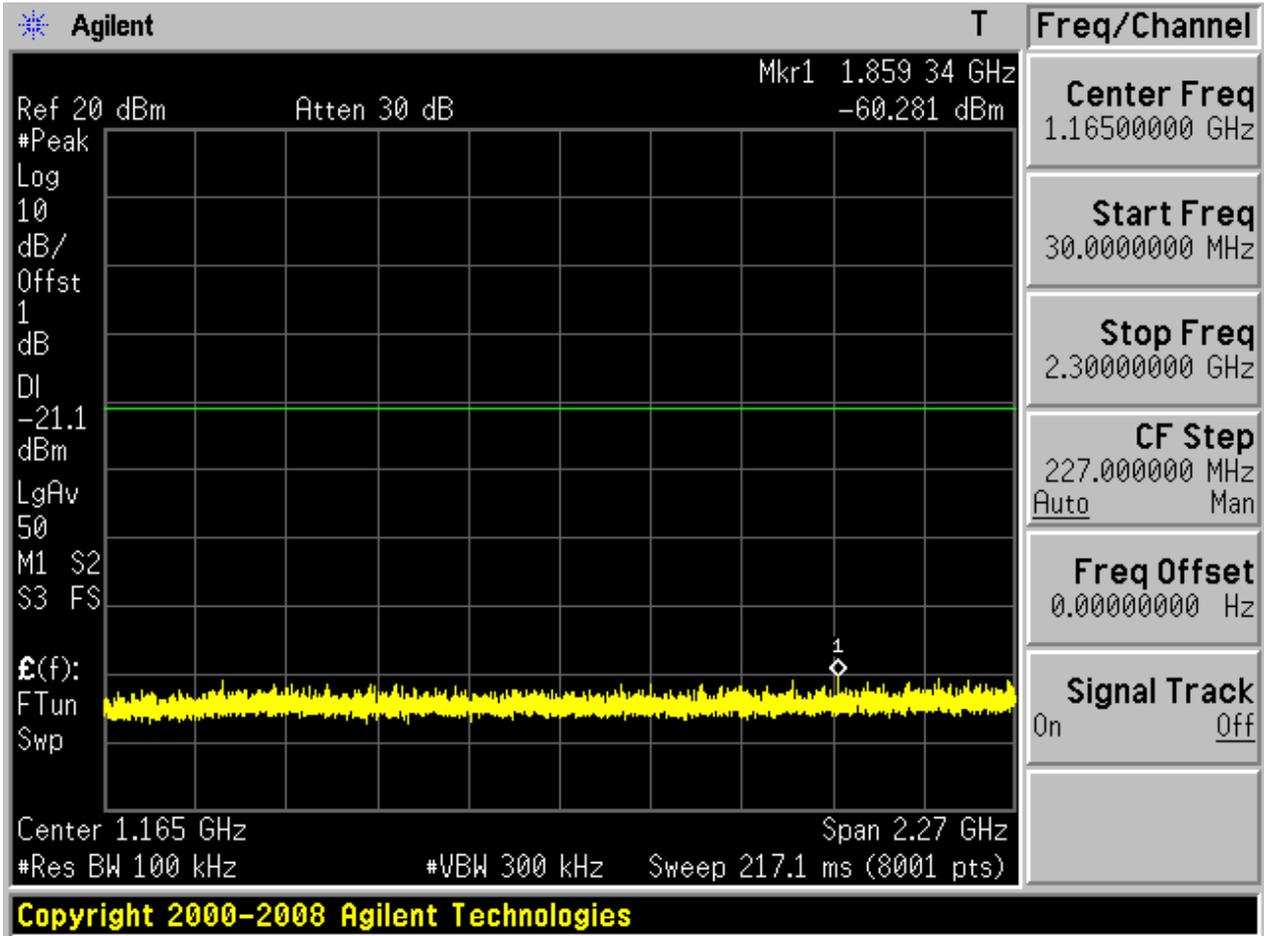


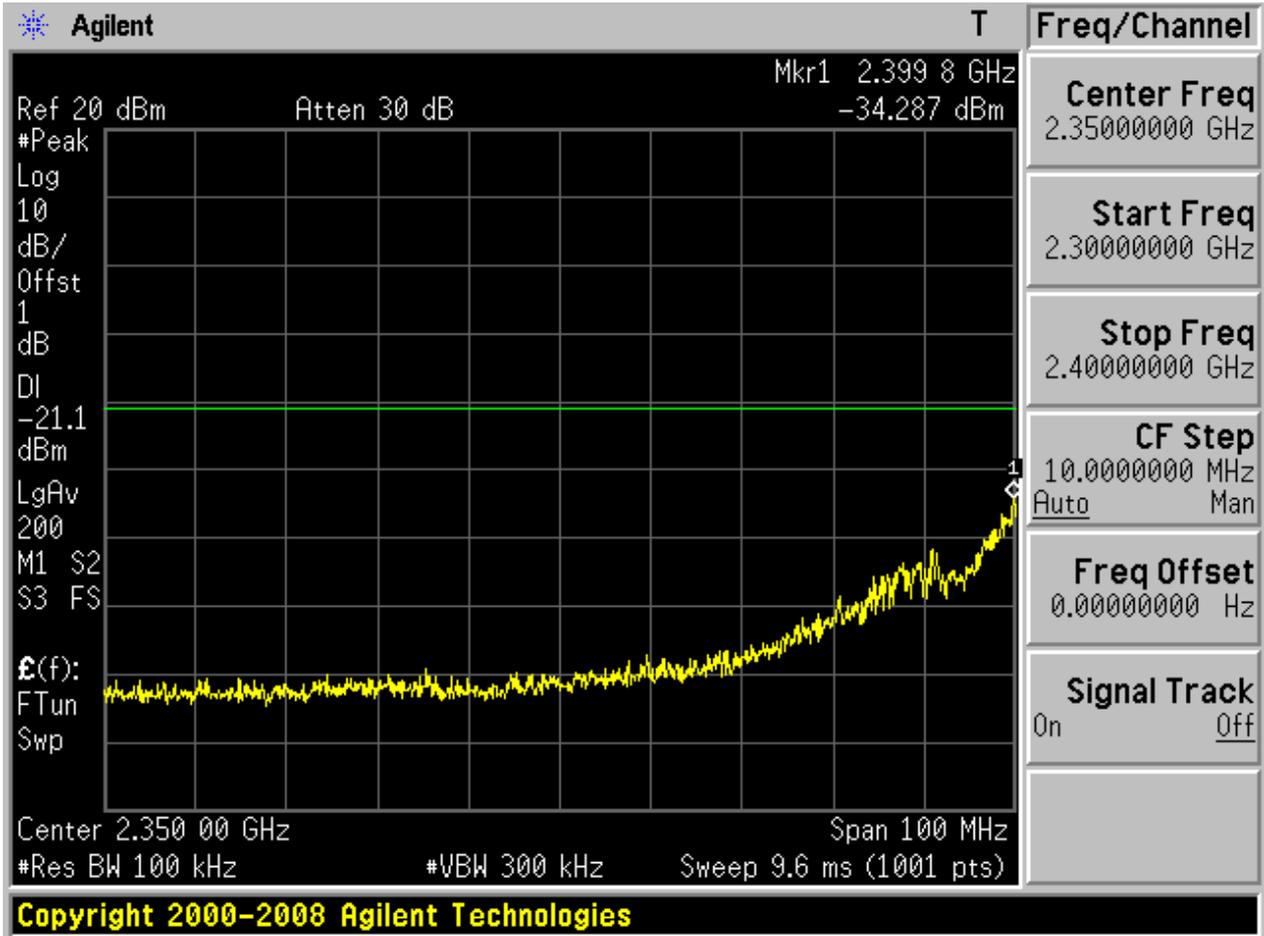


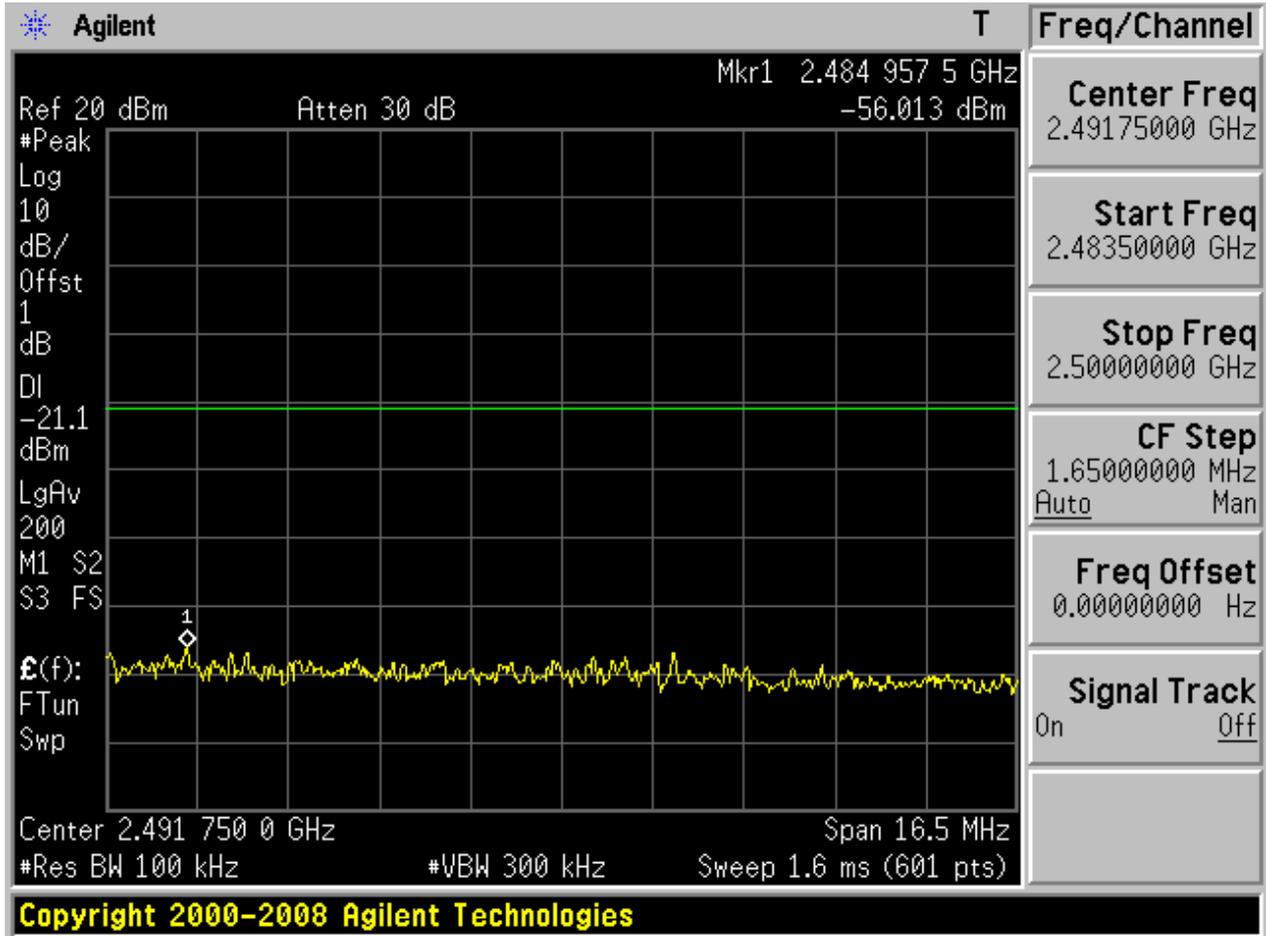
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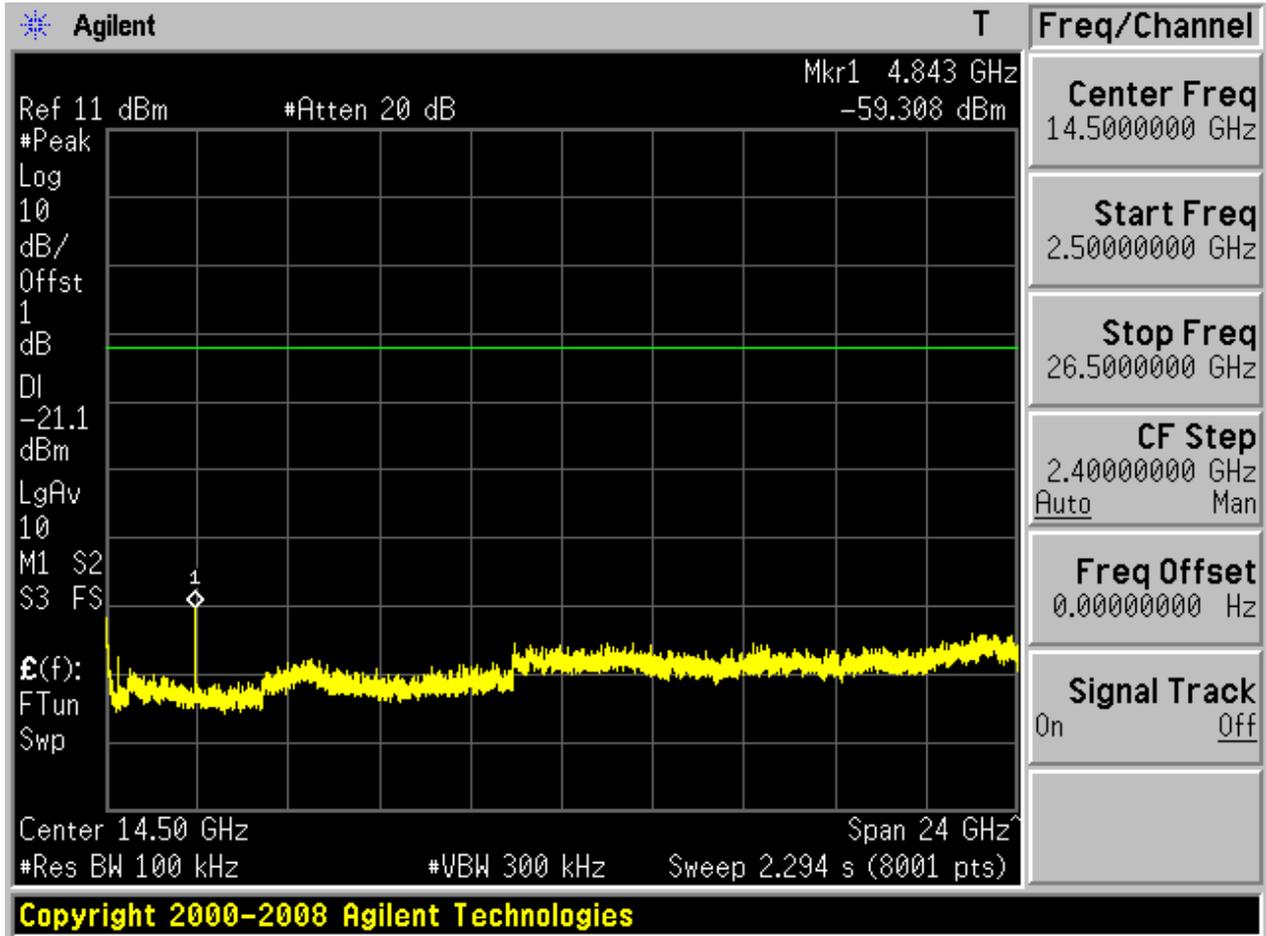








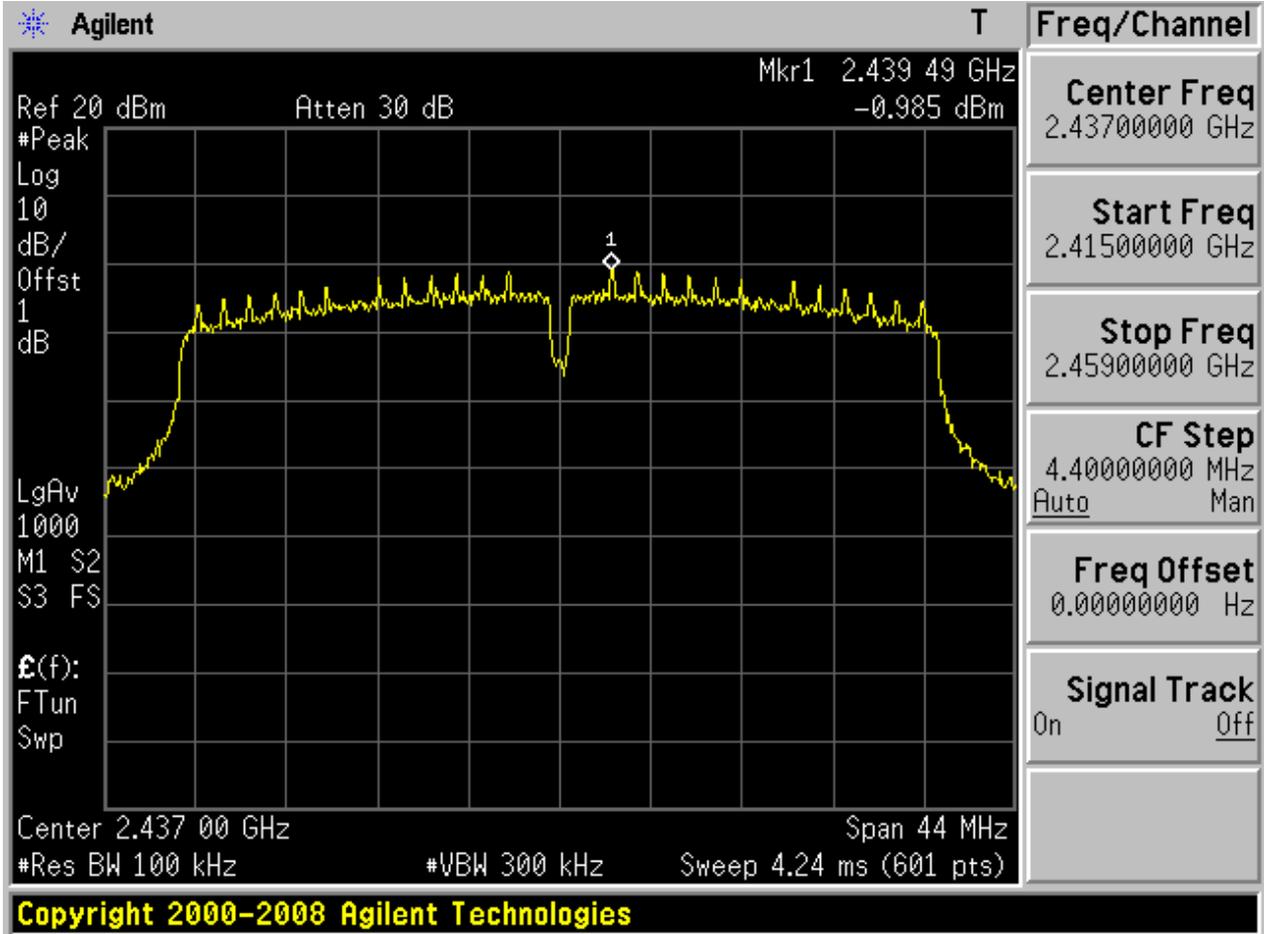






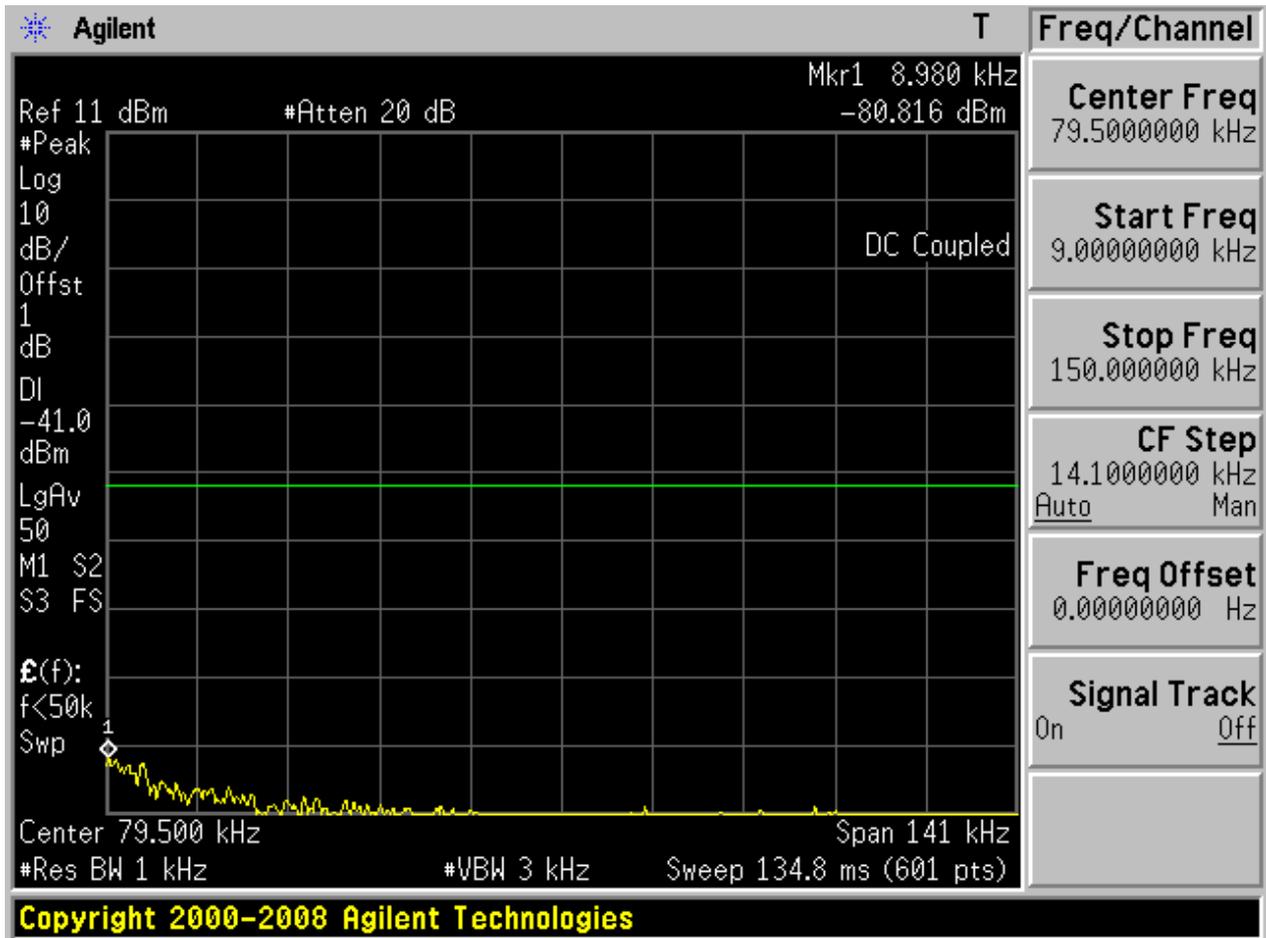
2.21 11N40_M@BG 1

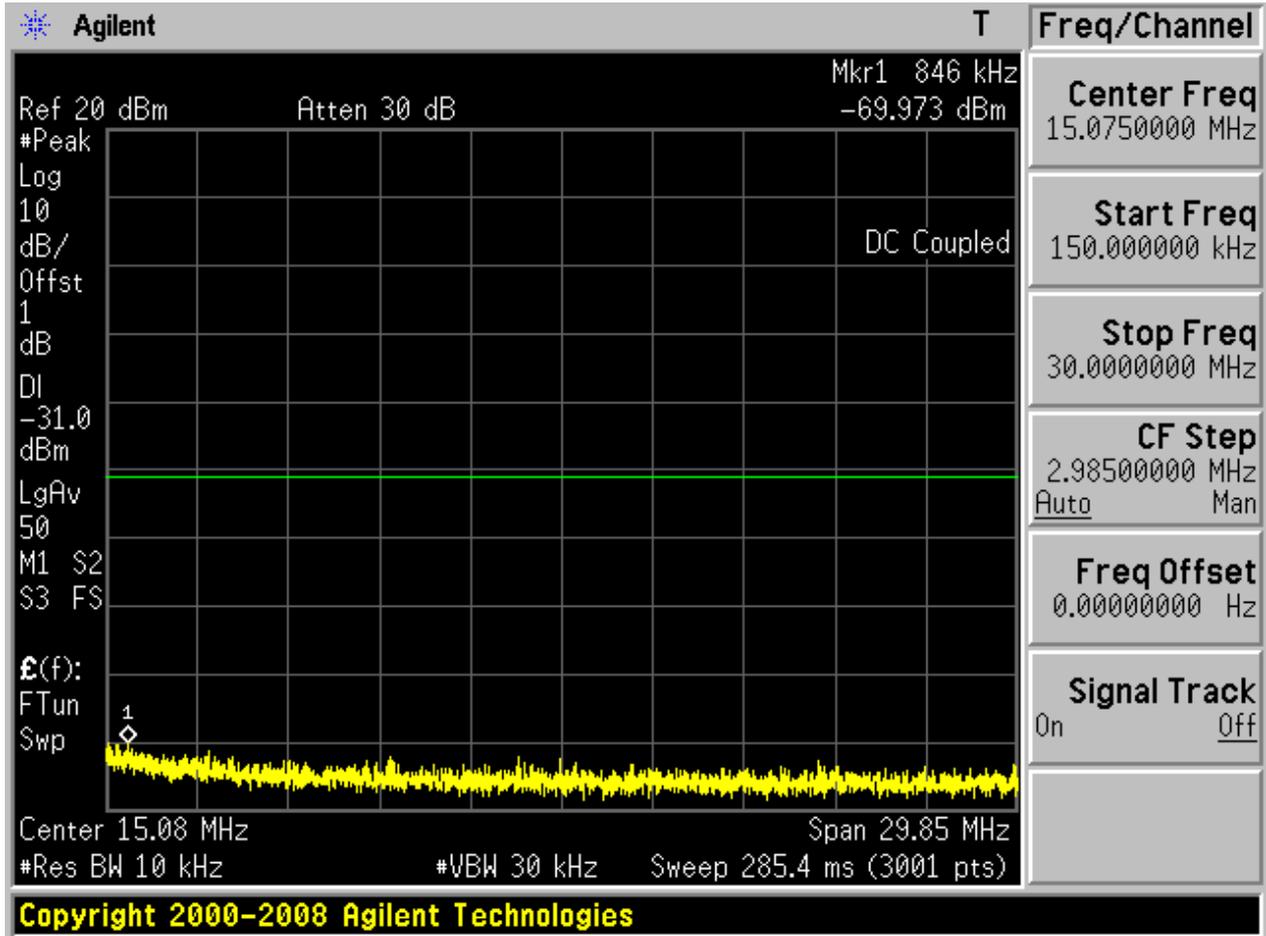
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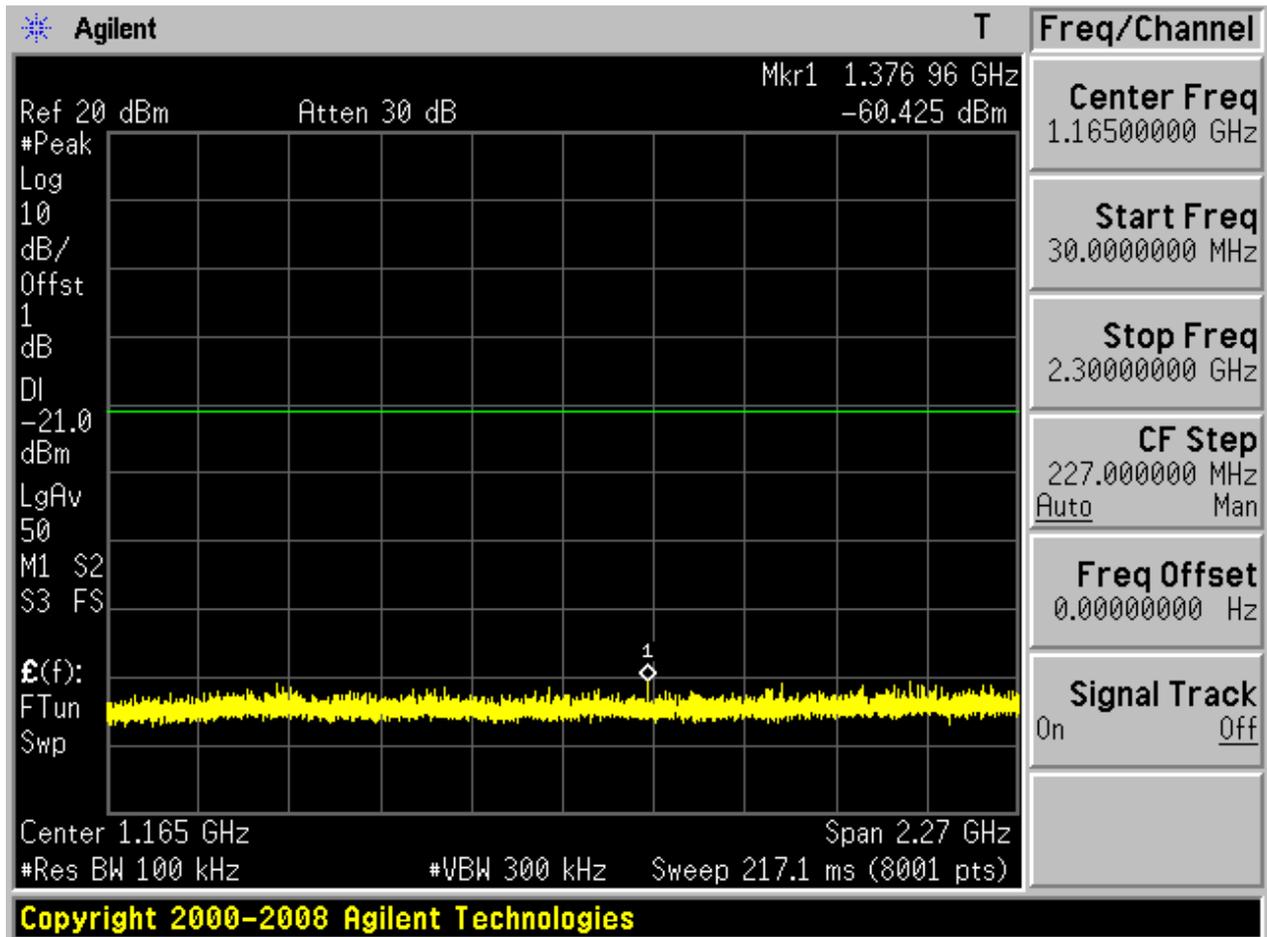


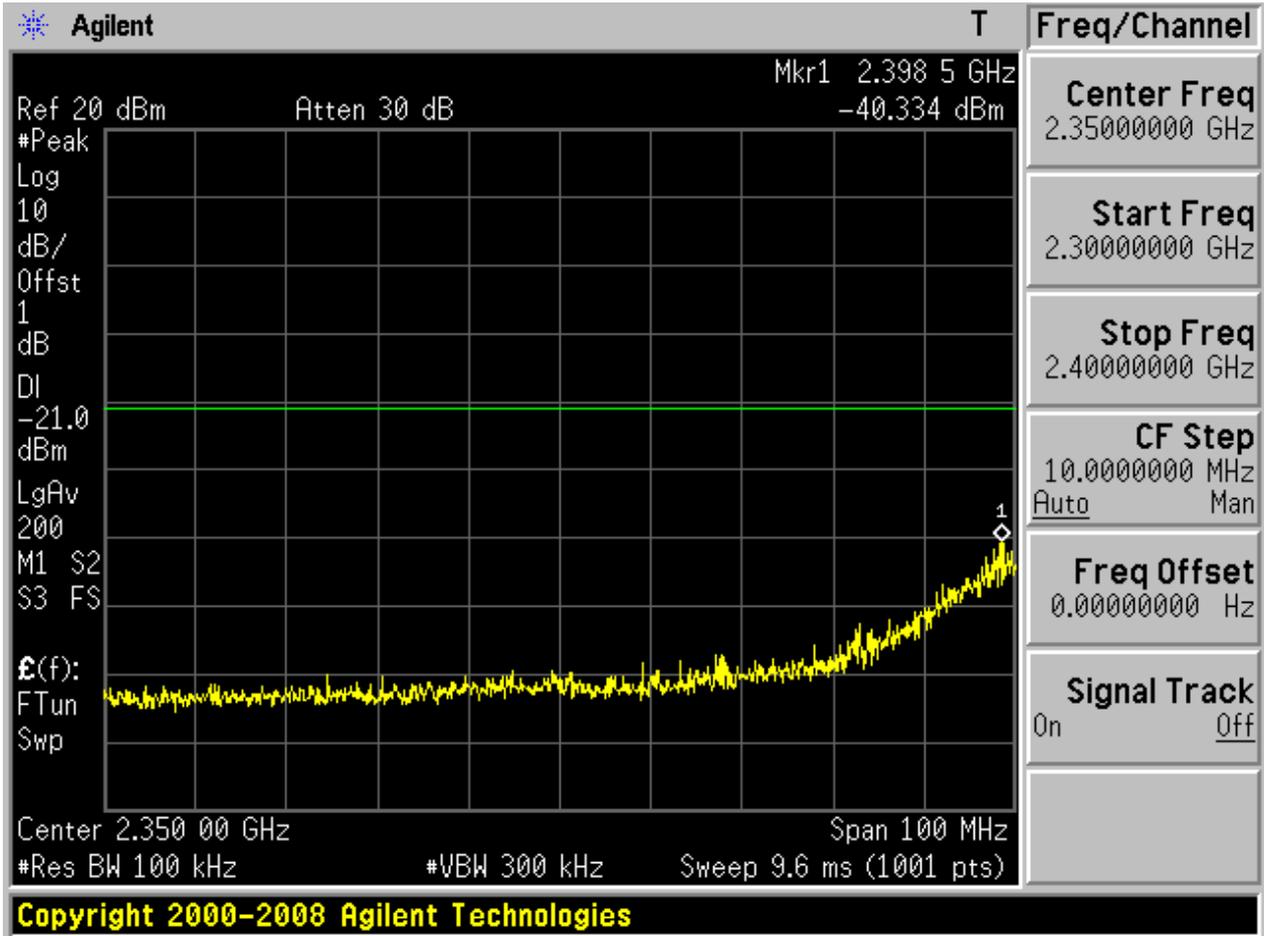


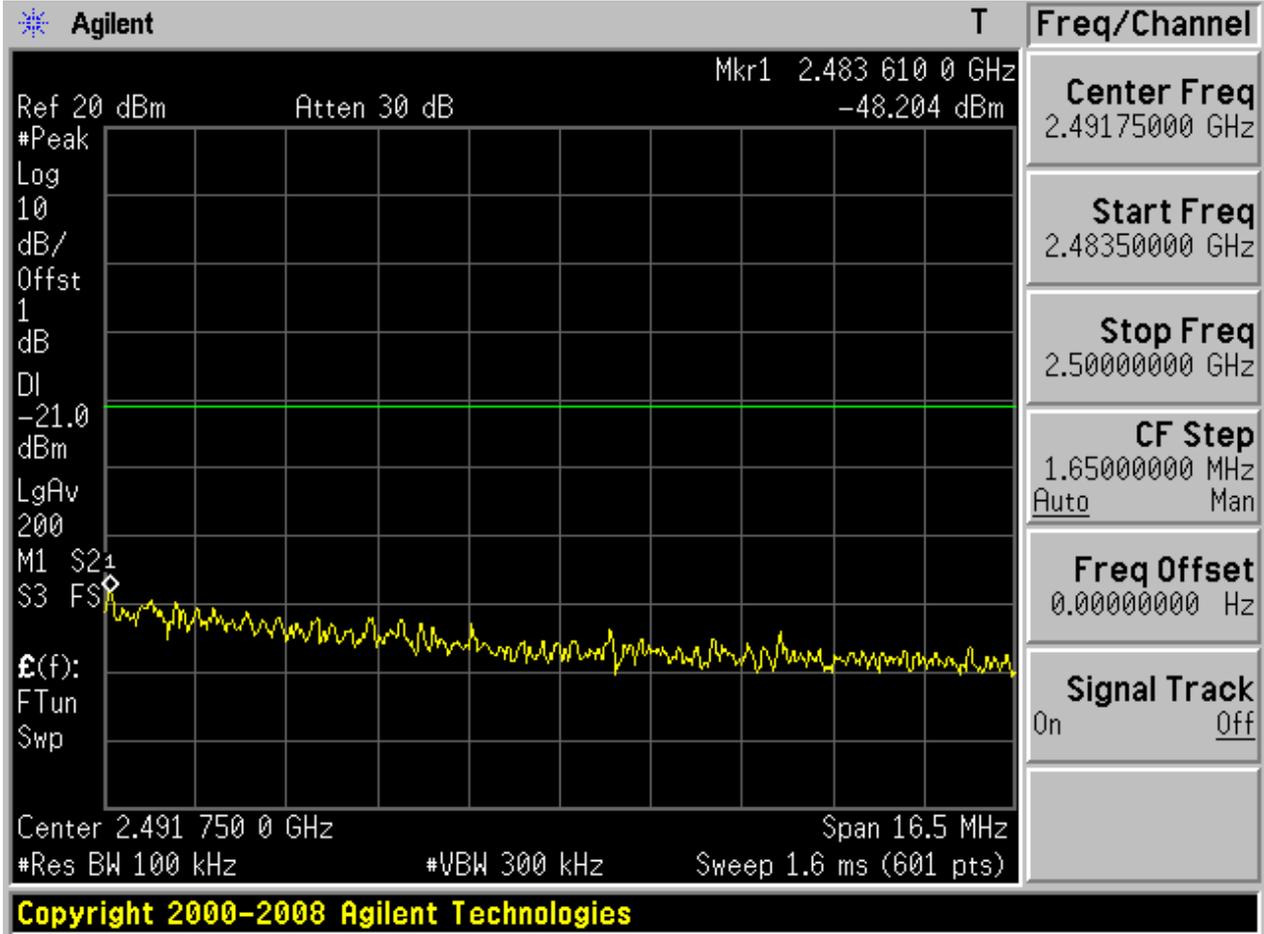
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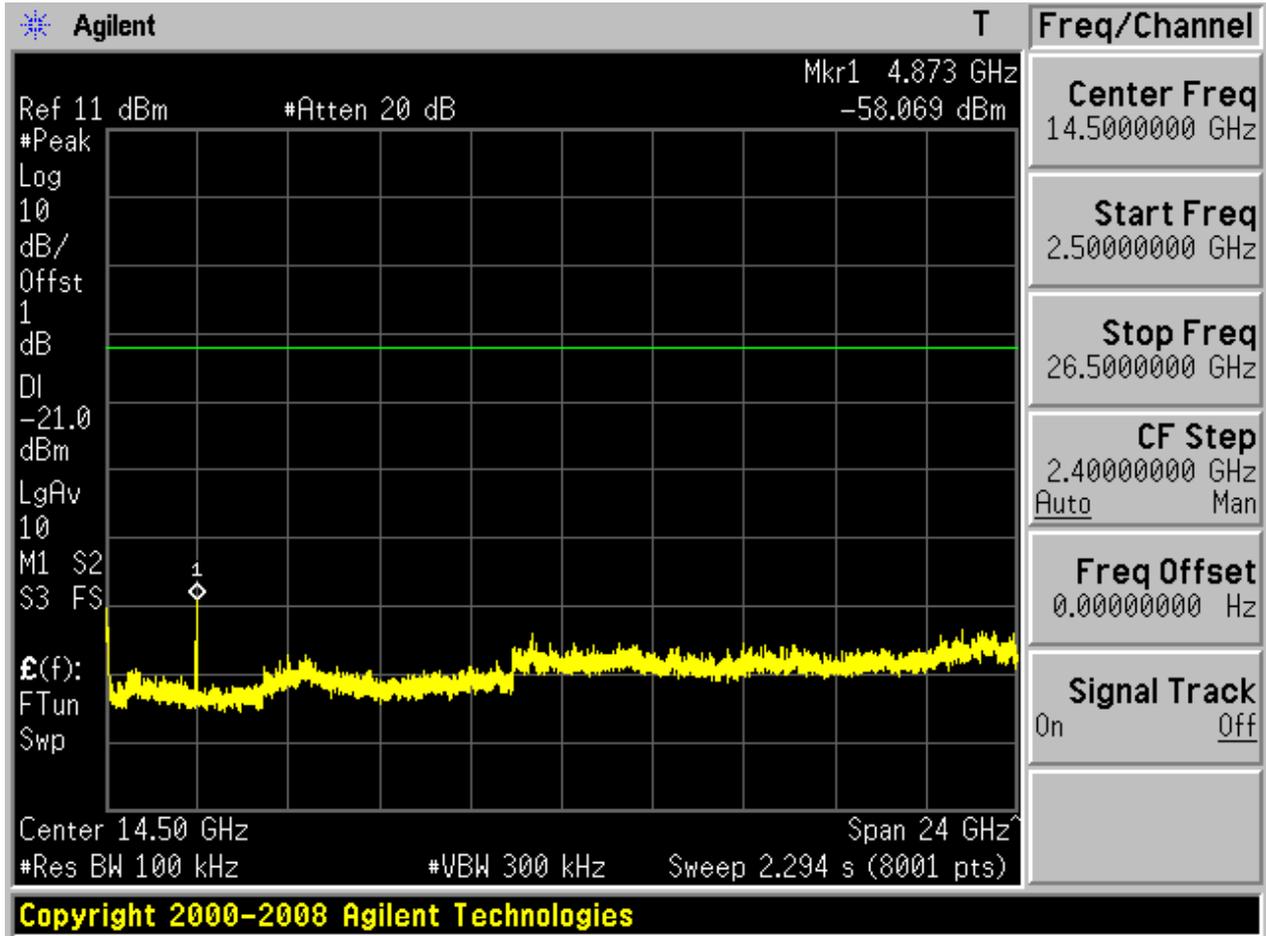






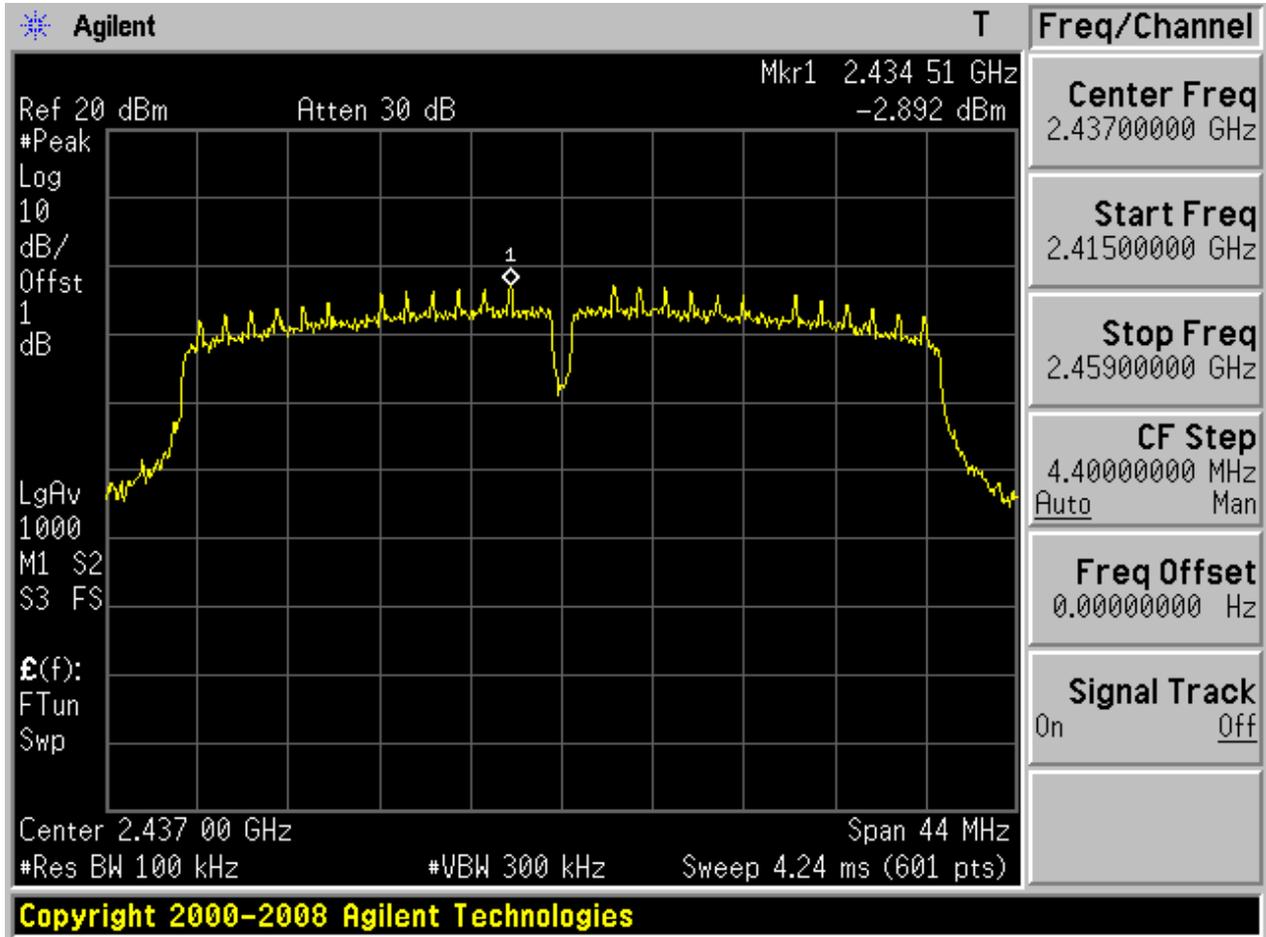






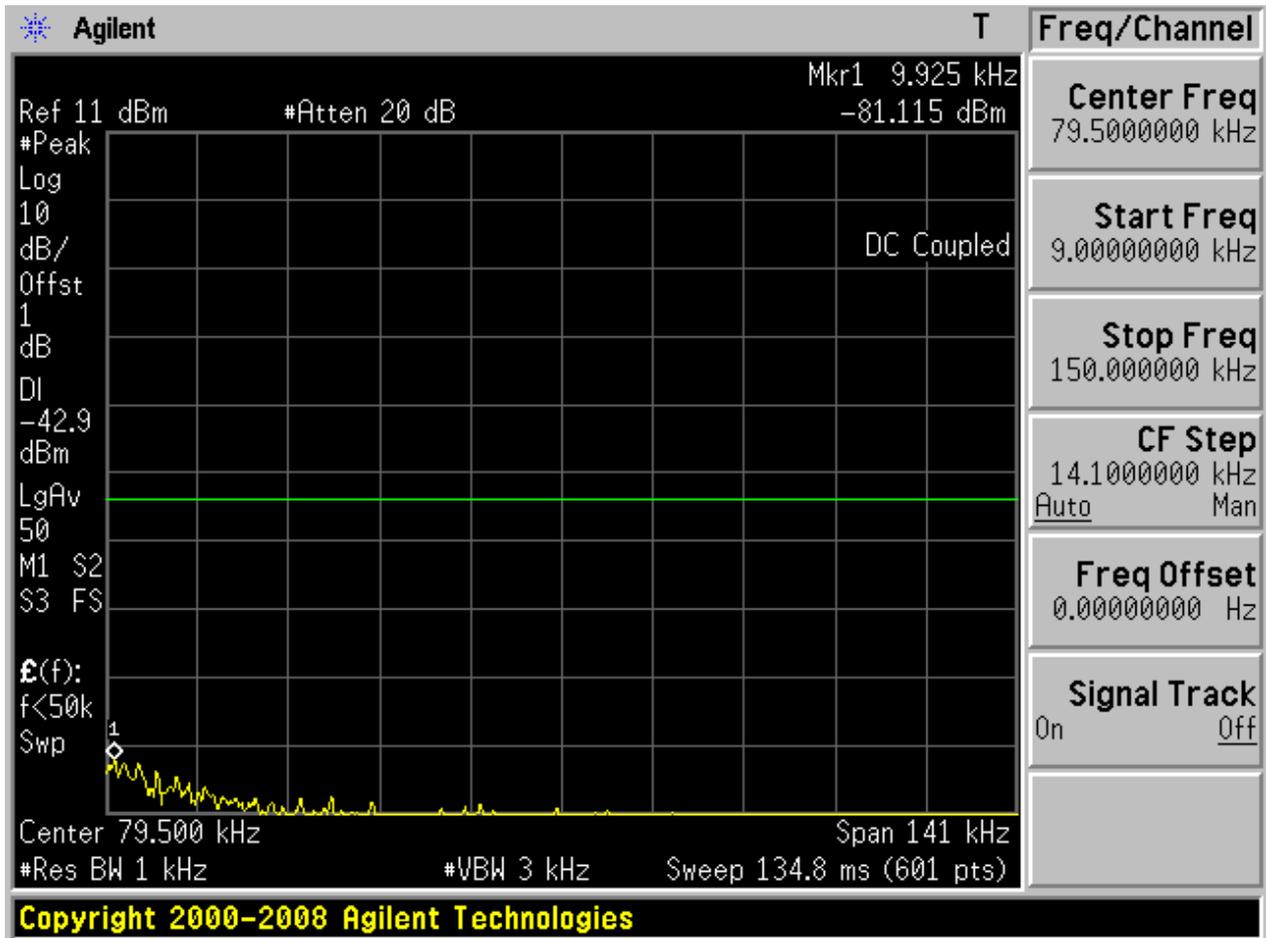
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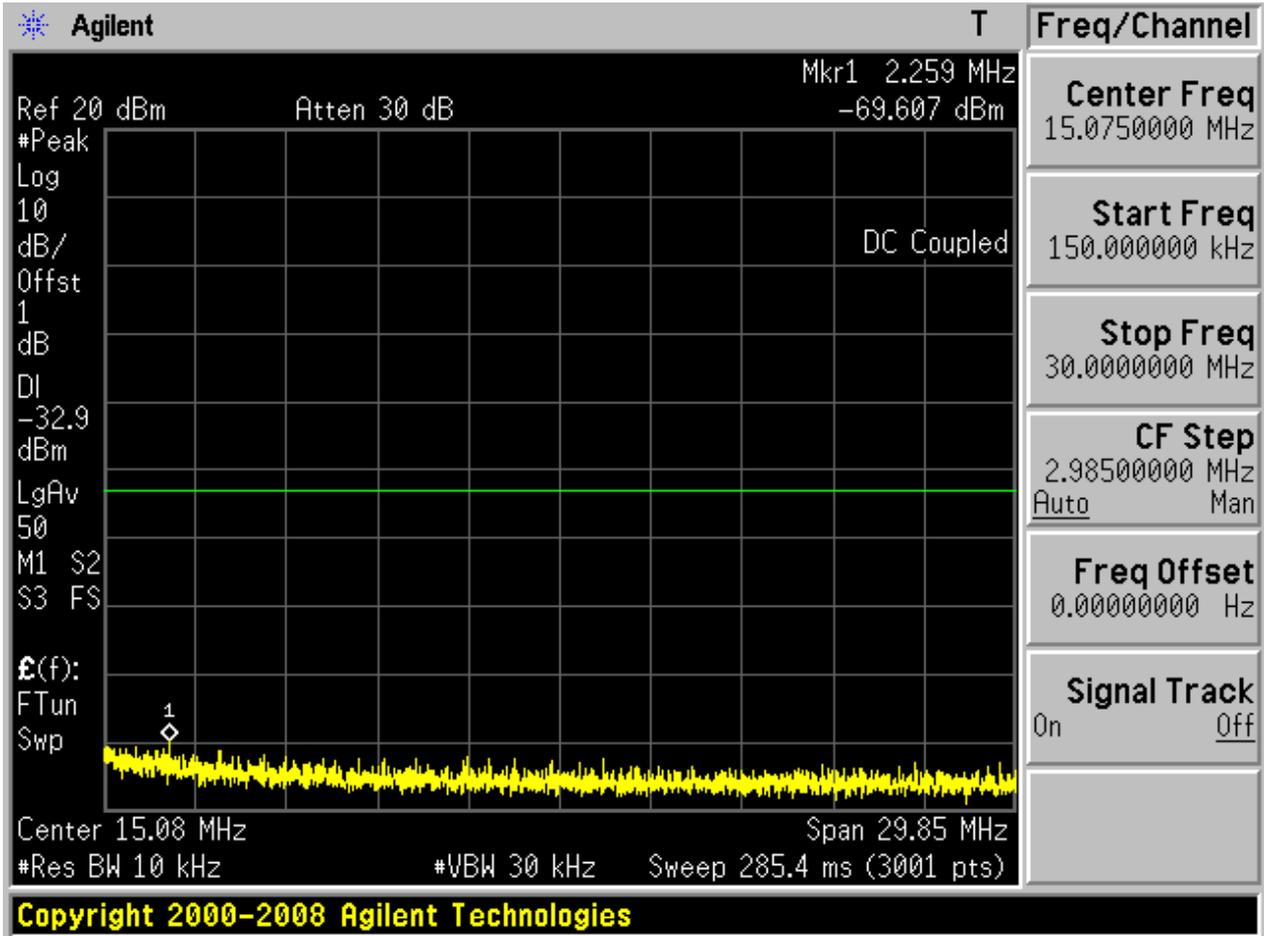
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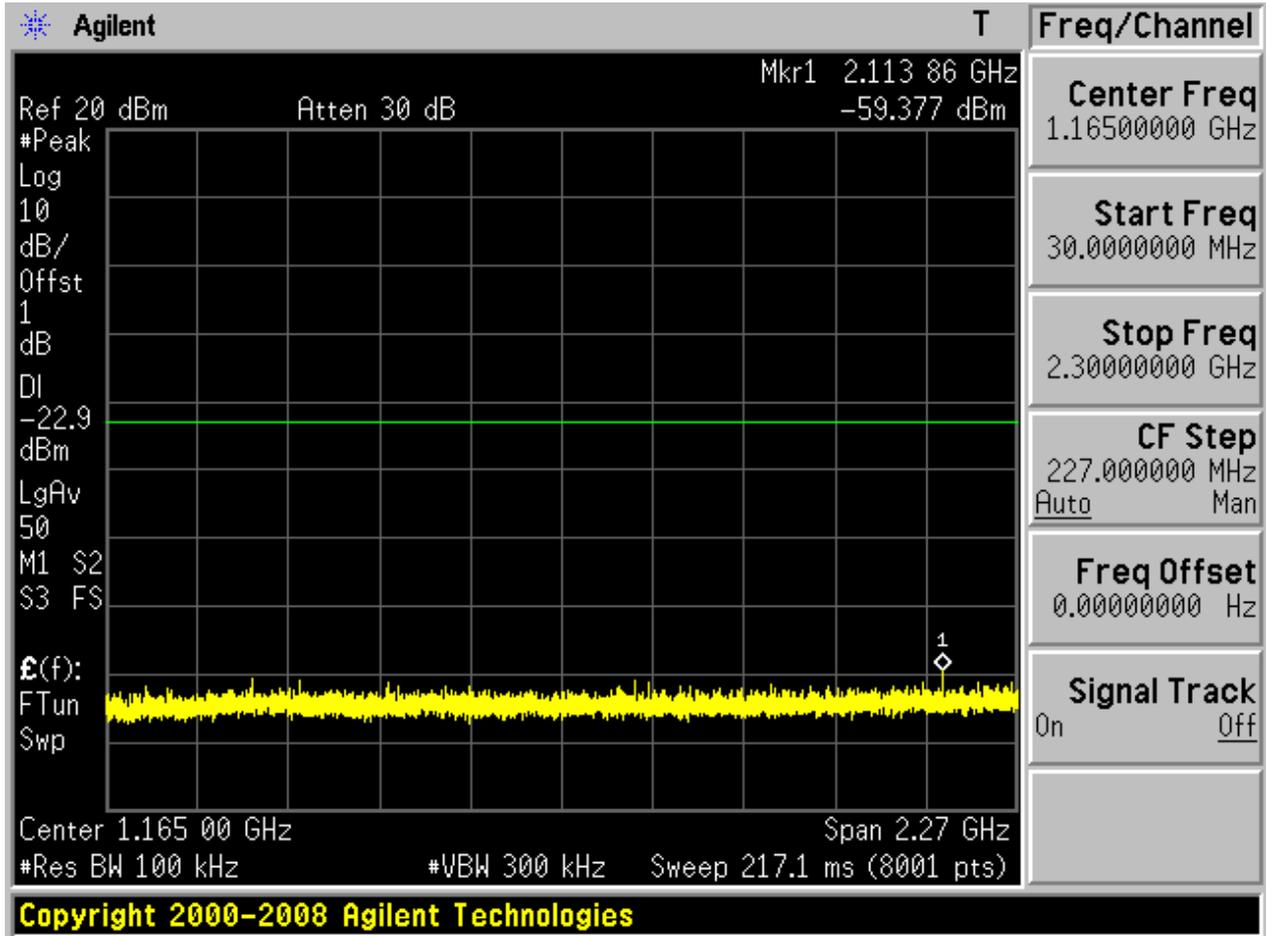


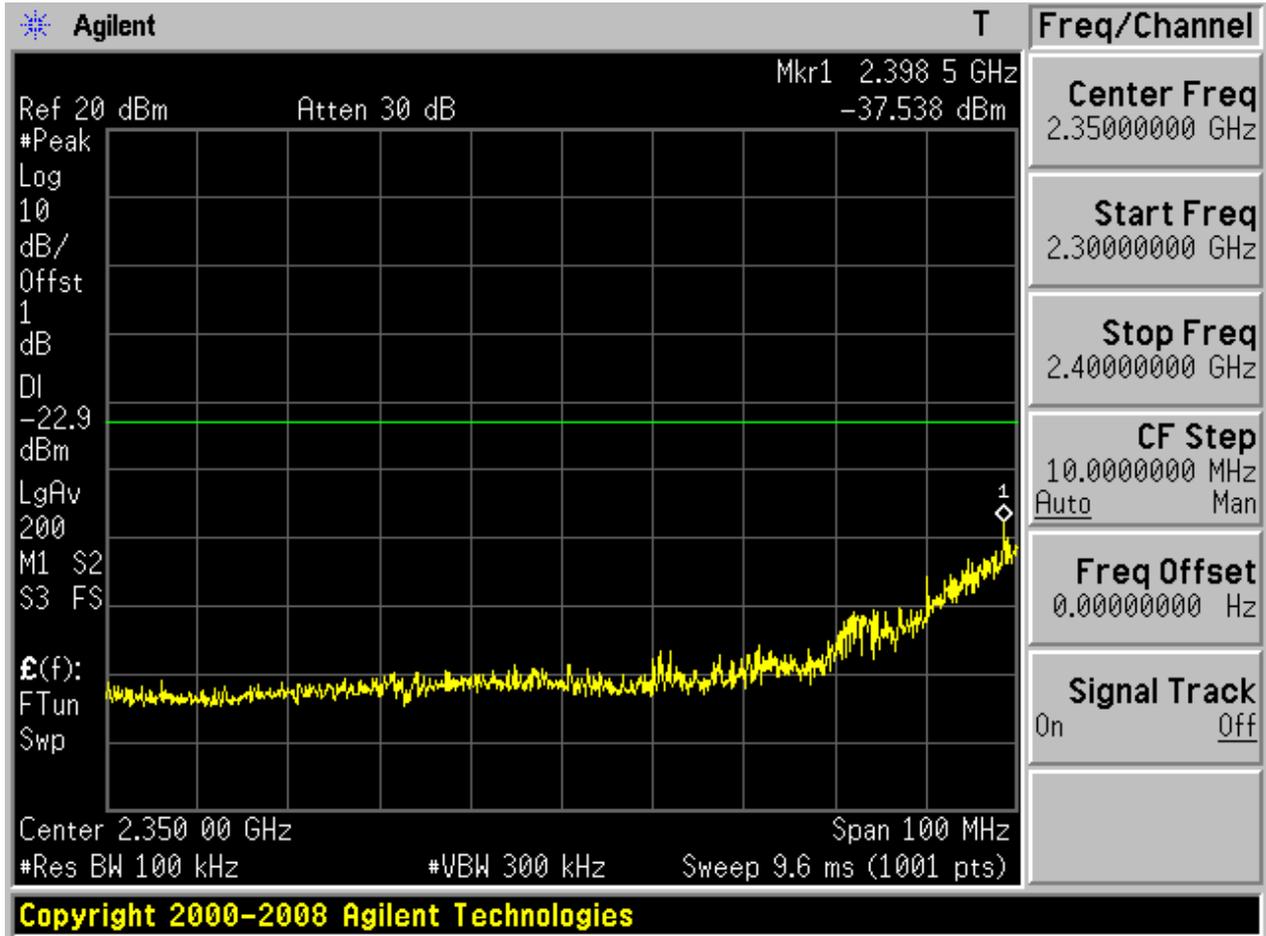


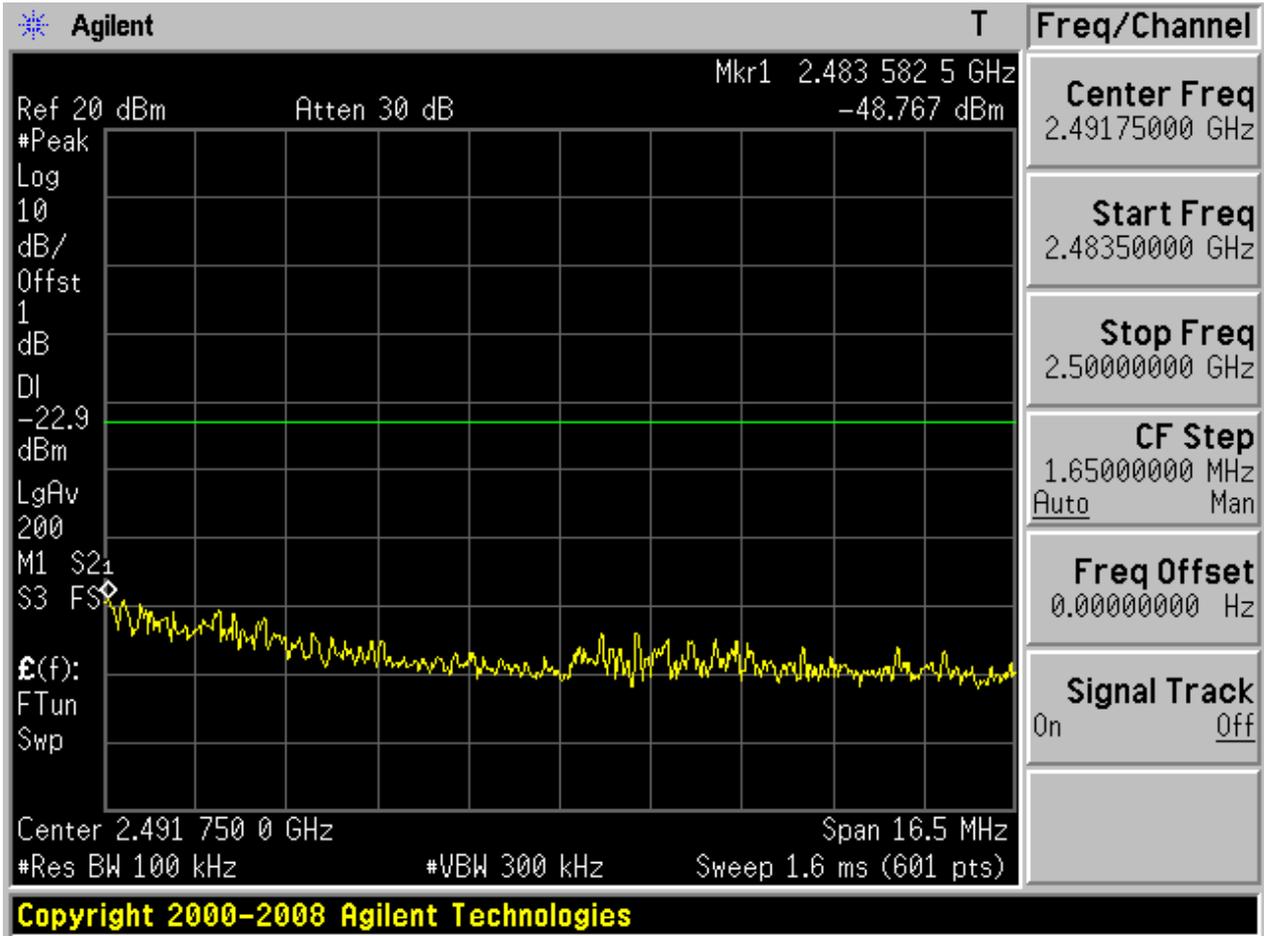
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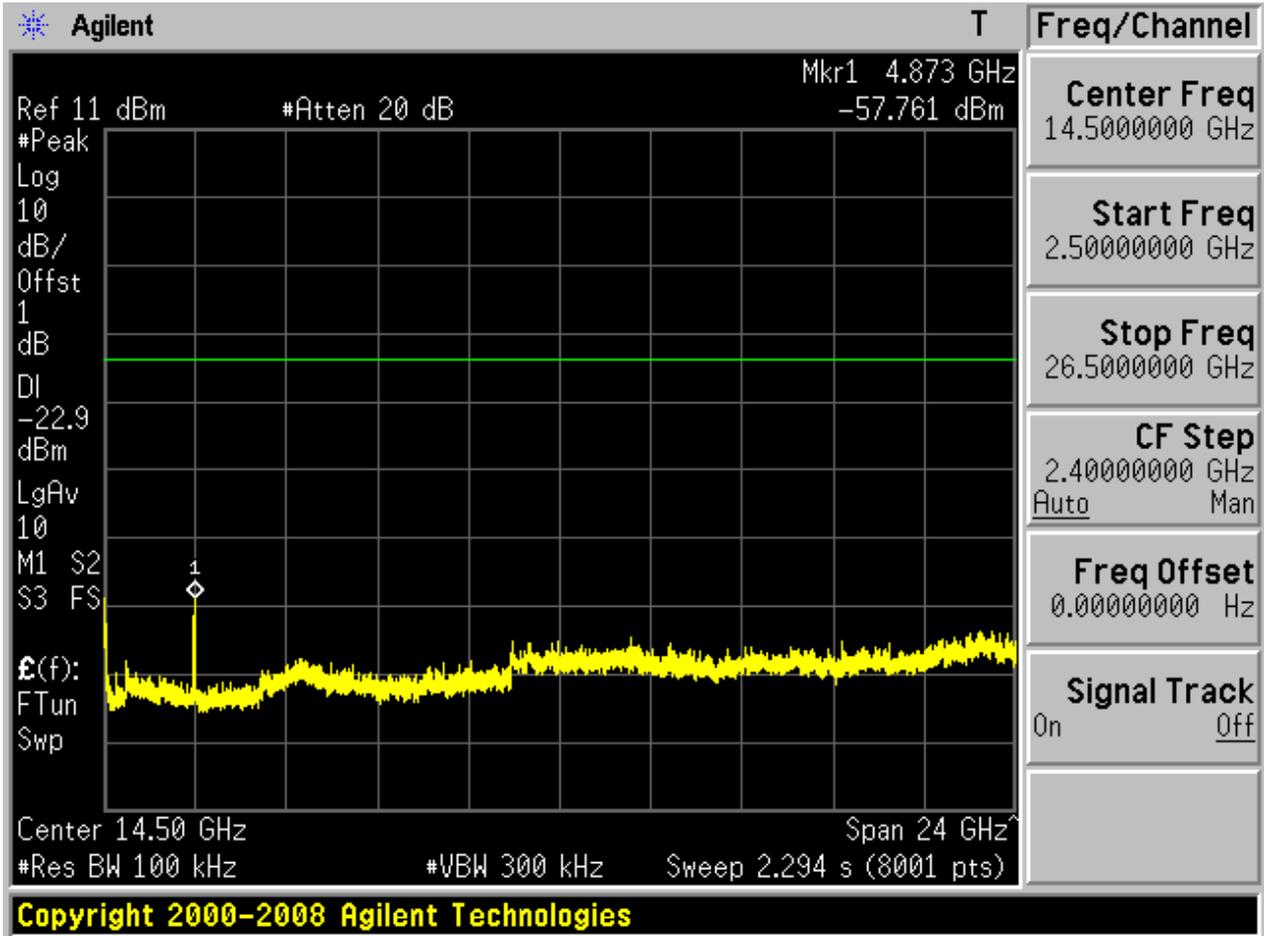








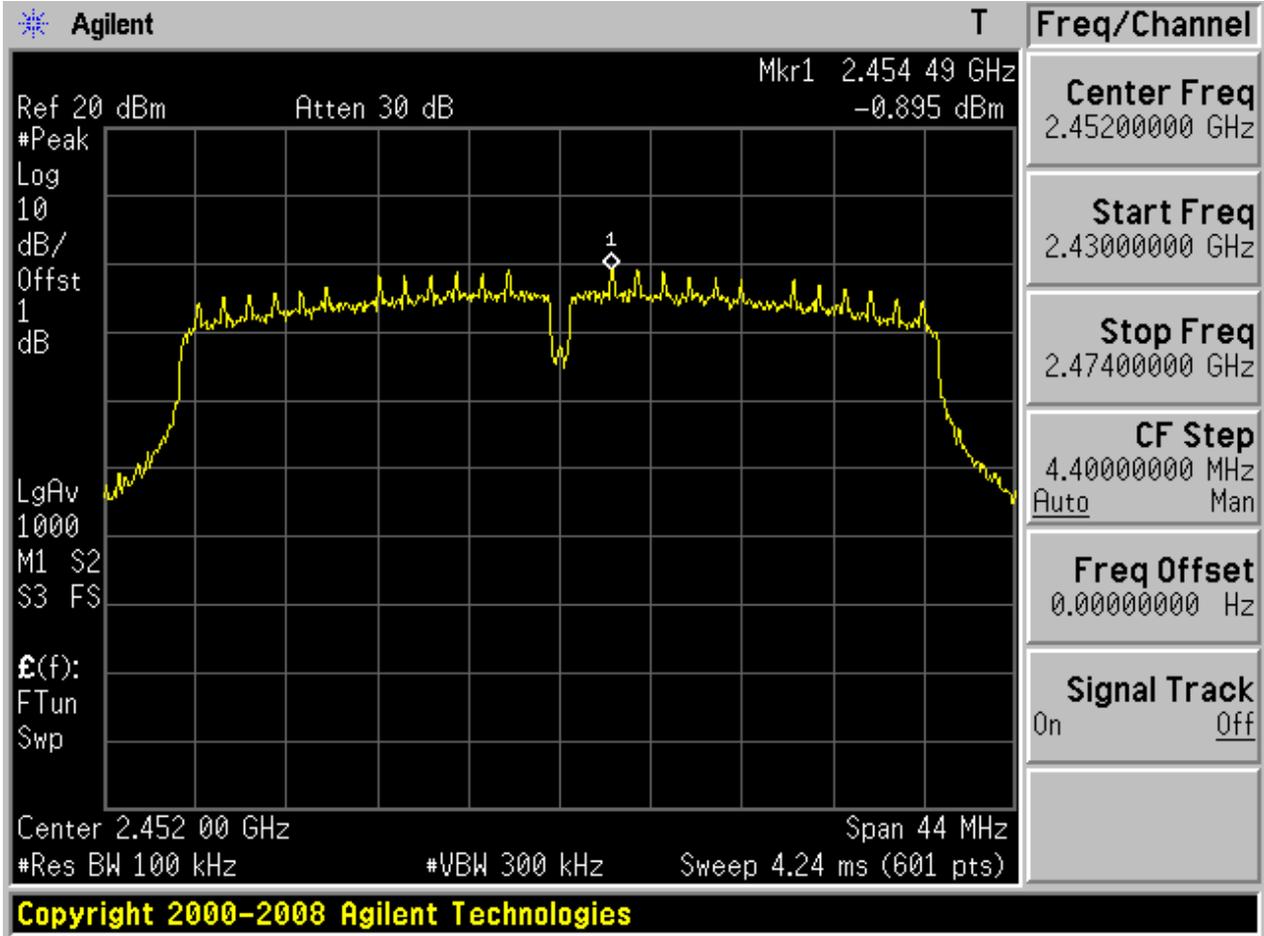






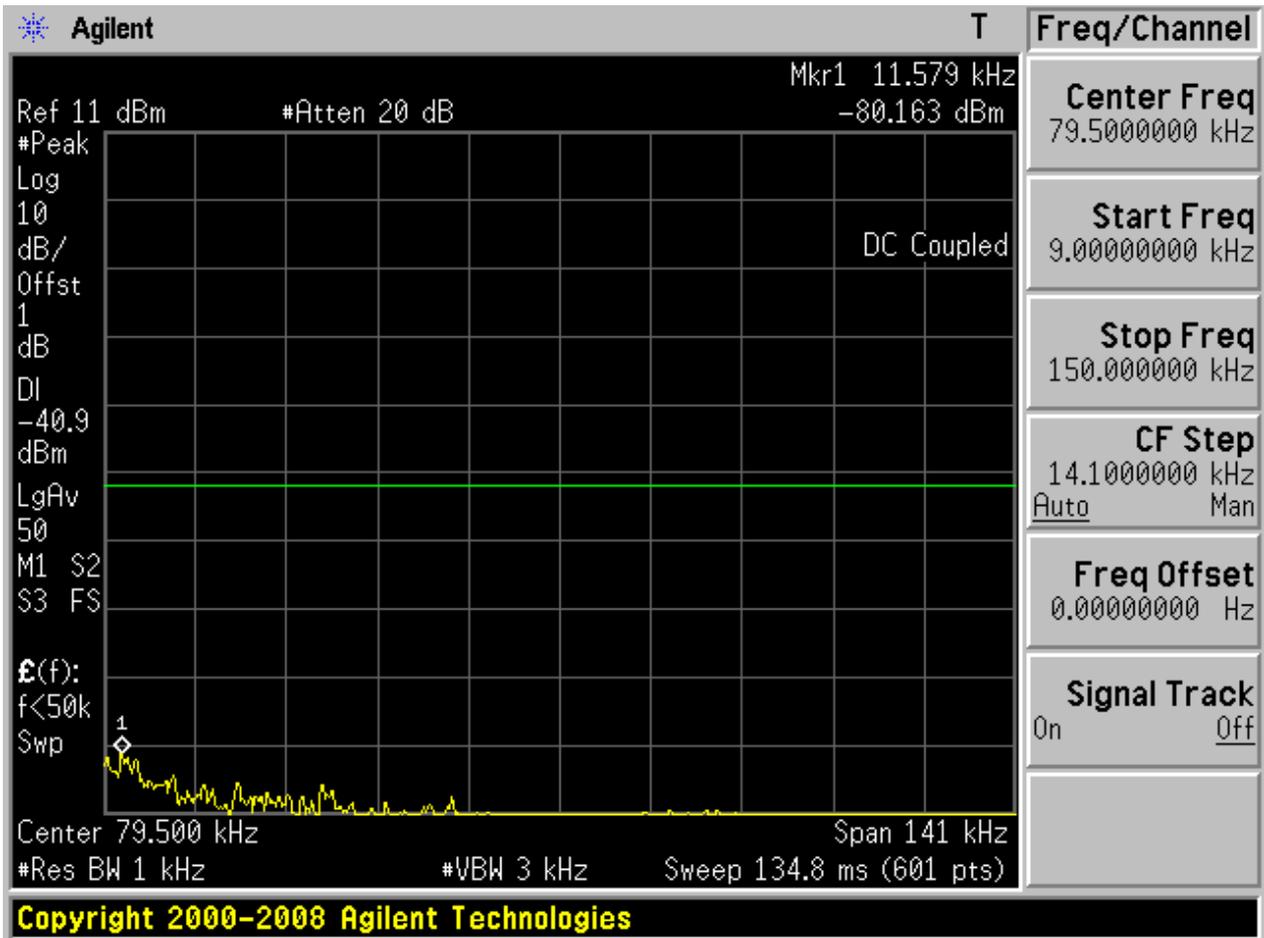
2.23 11N40_H@BG 1

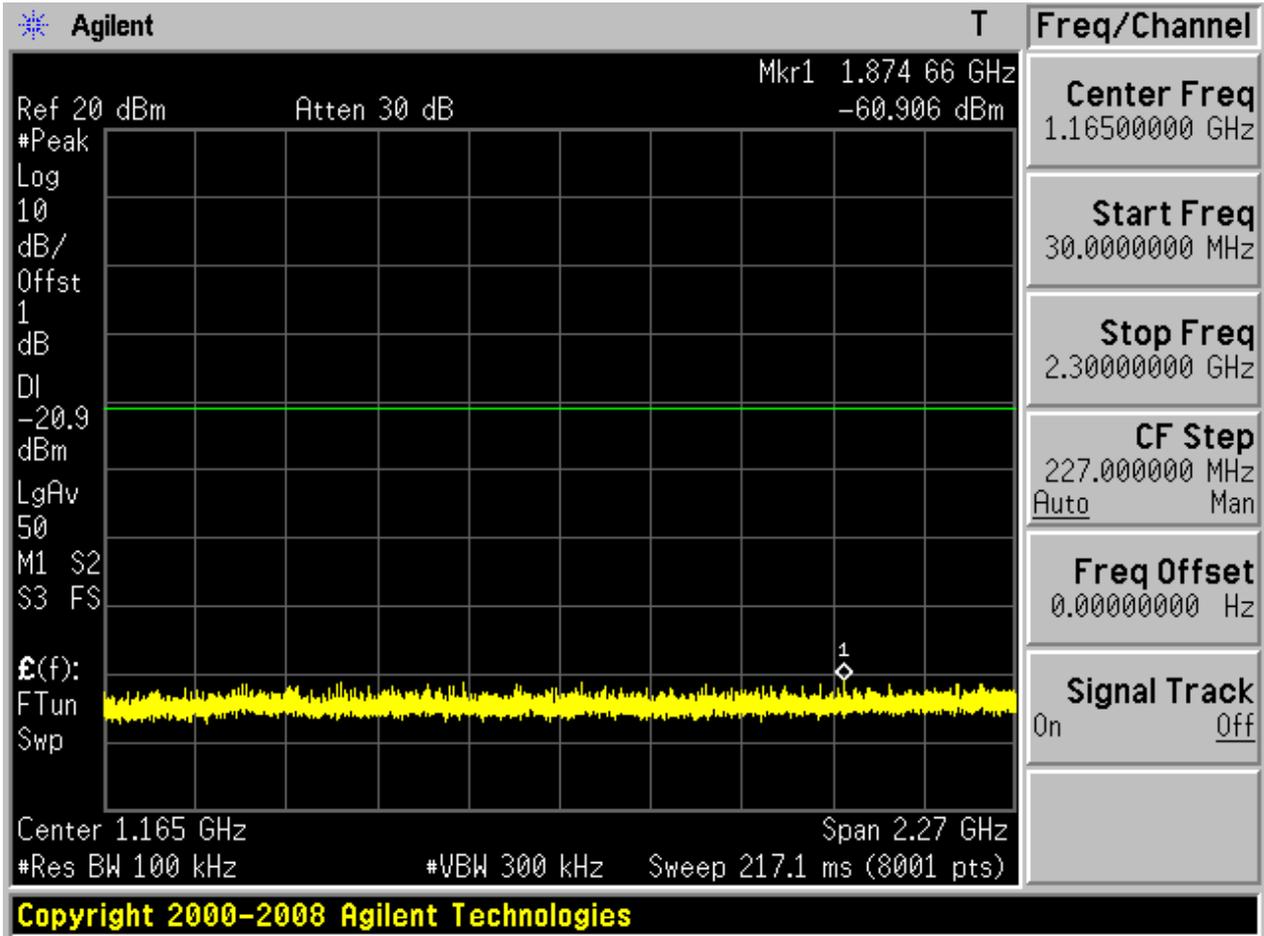
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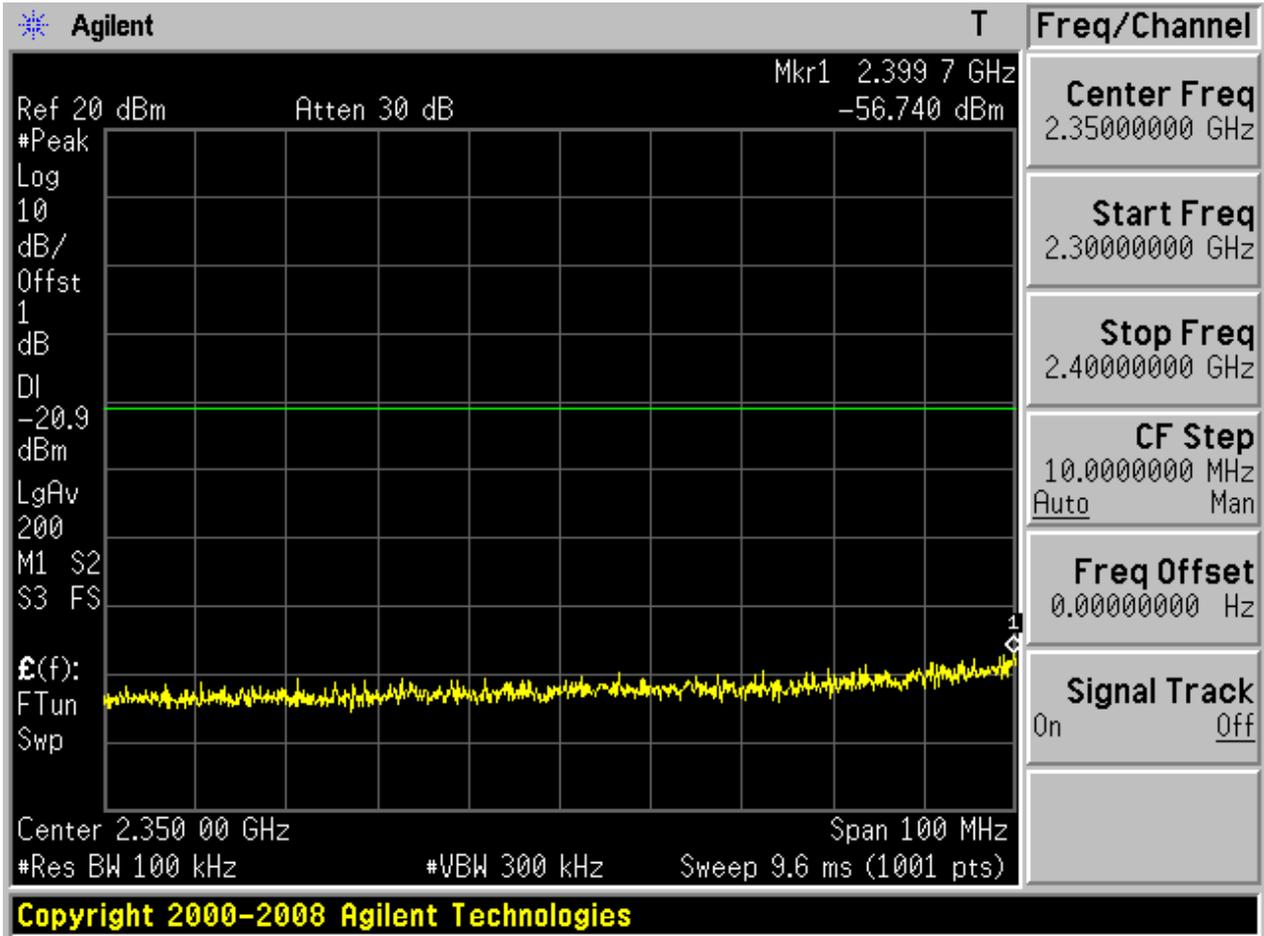


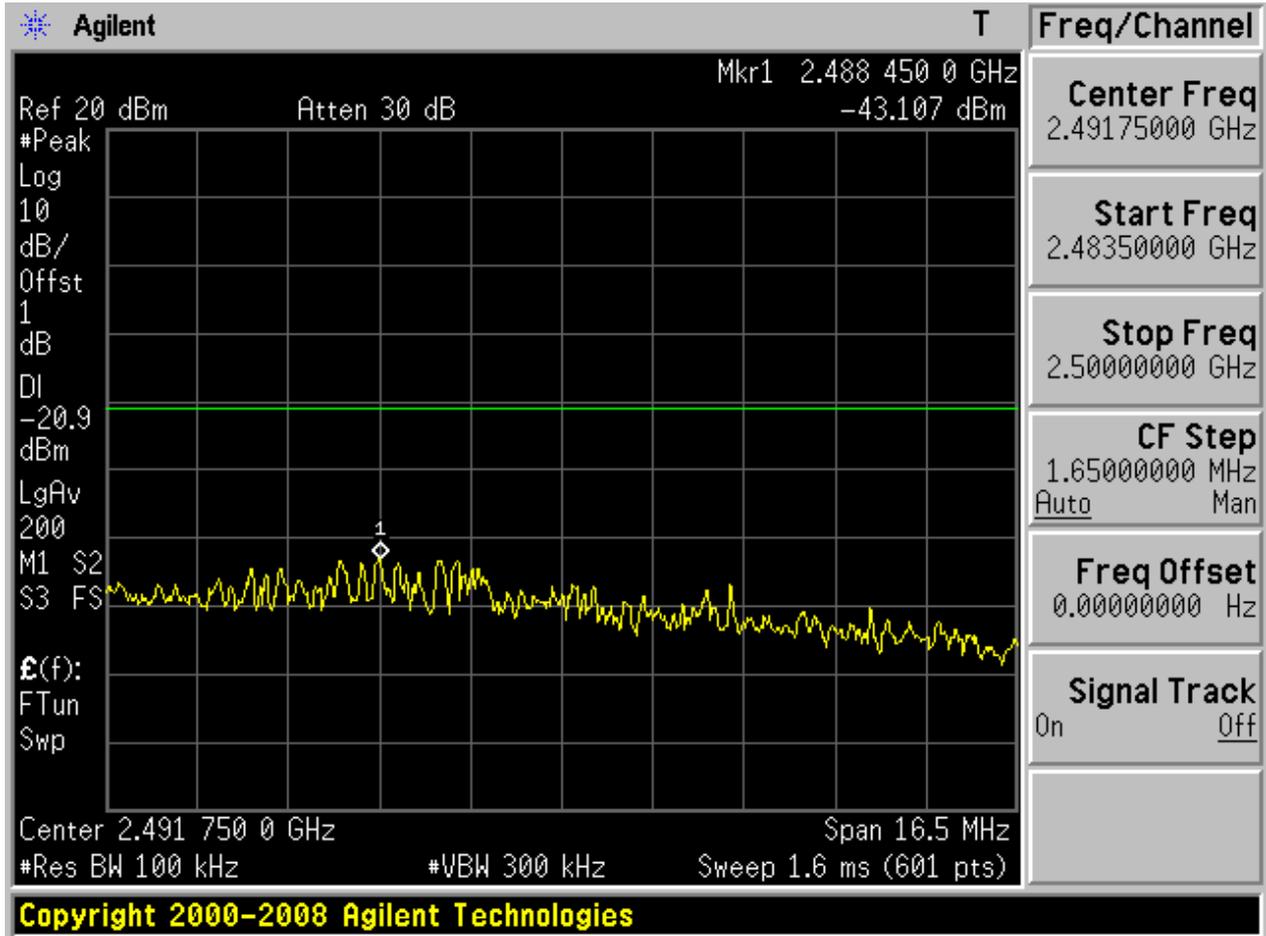


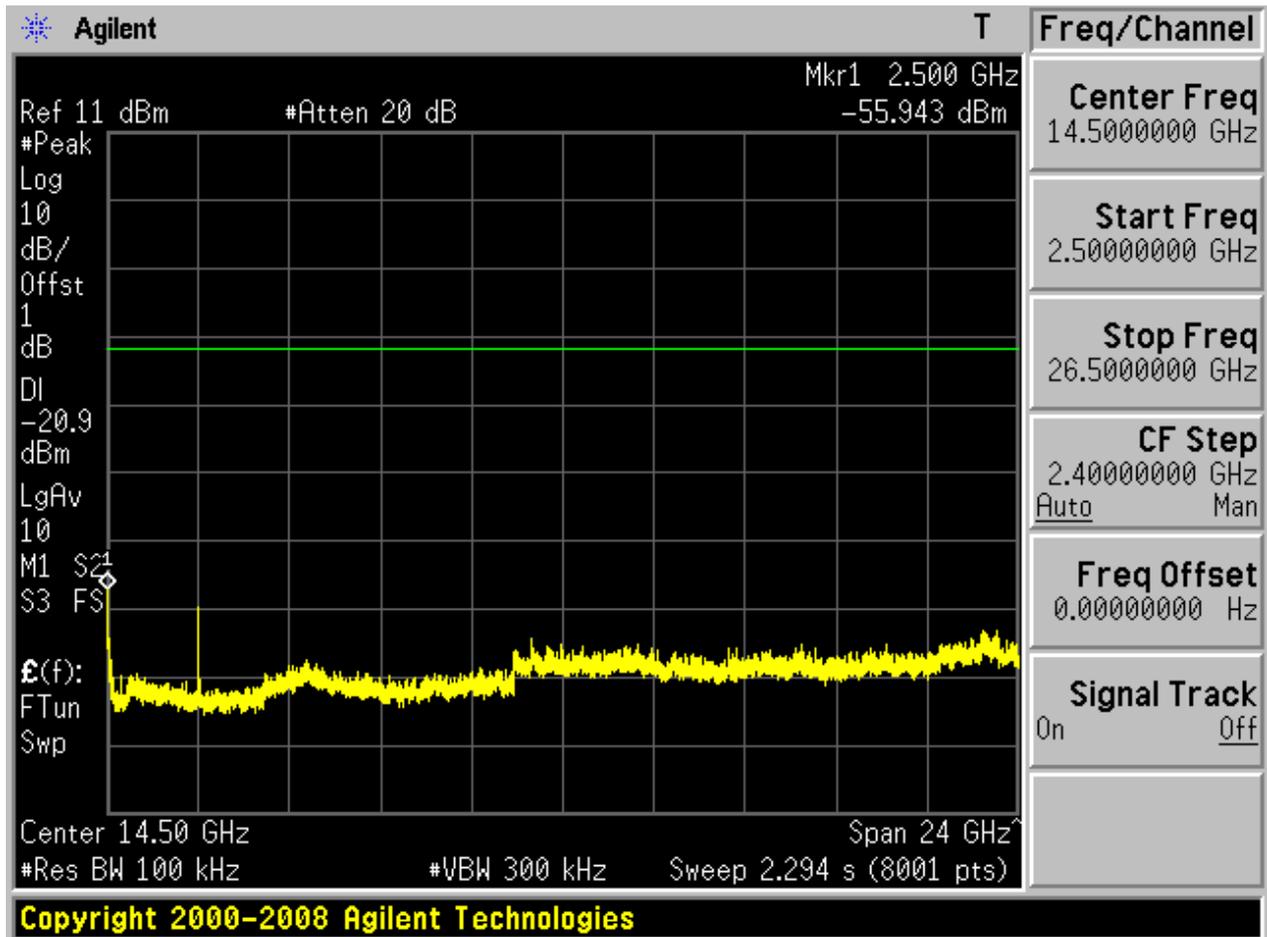
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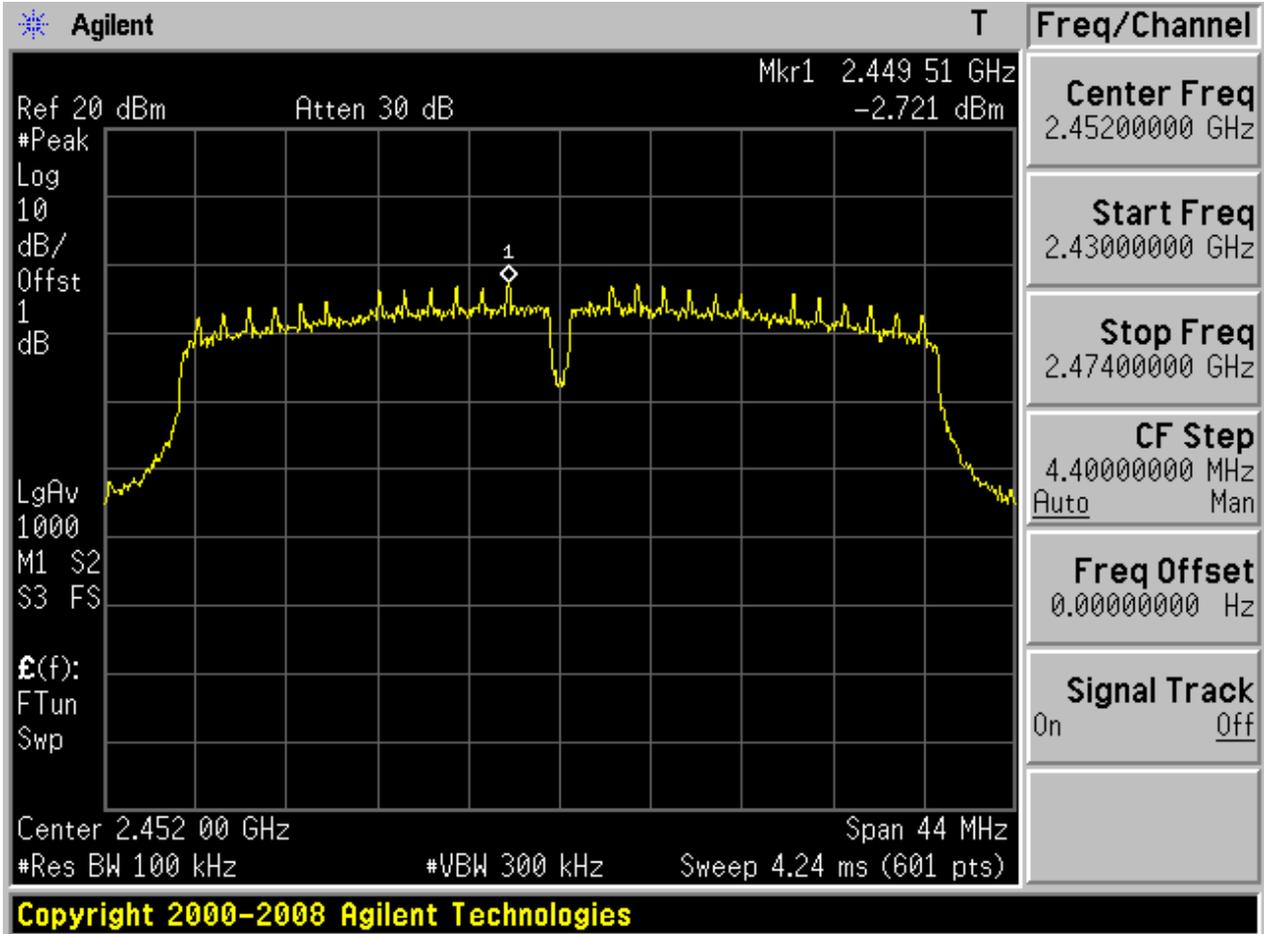






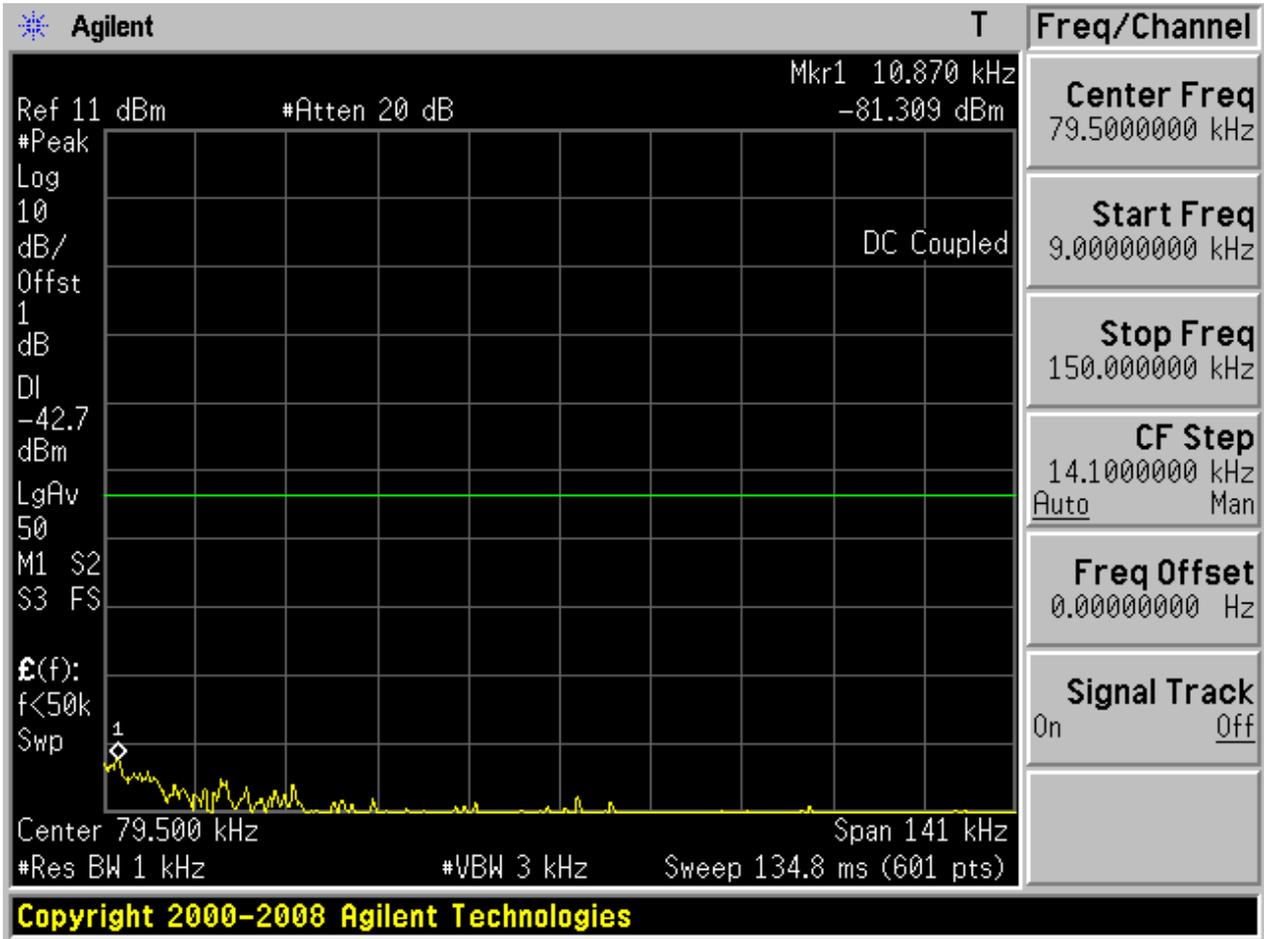
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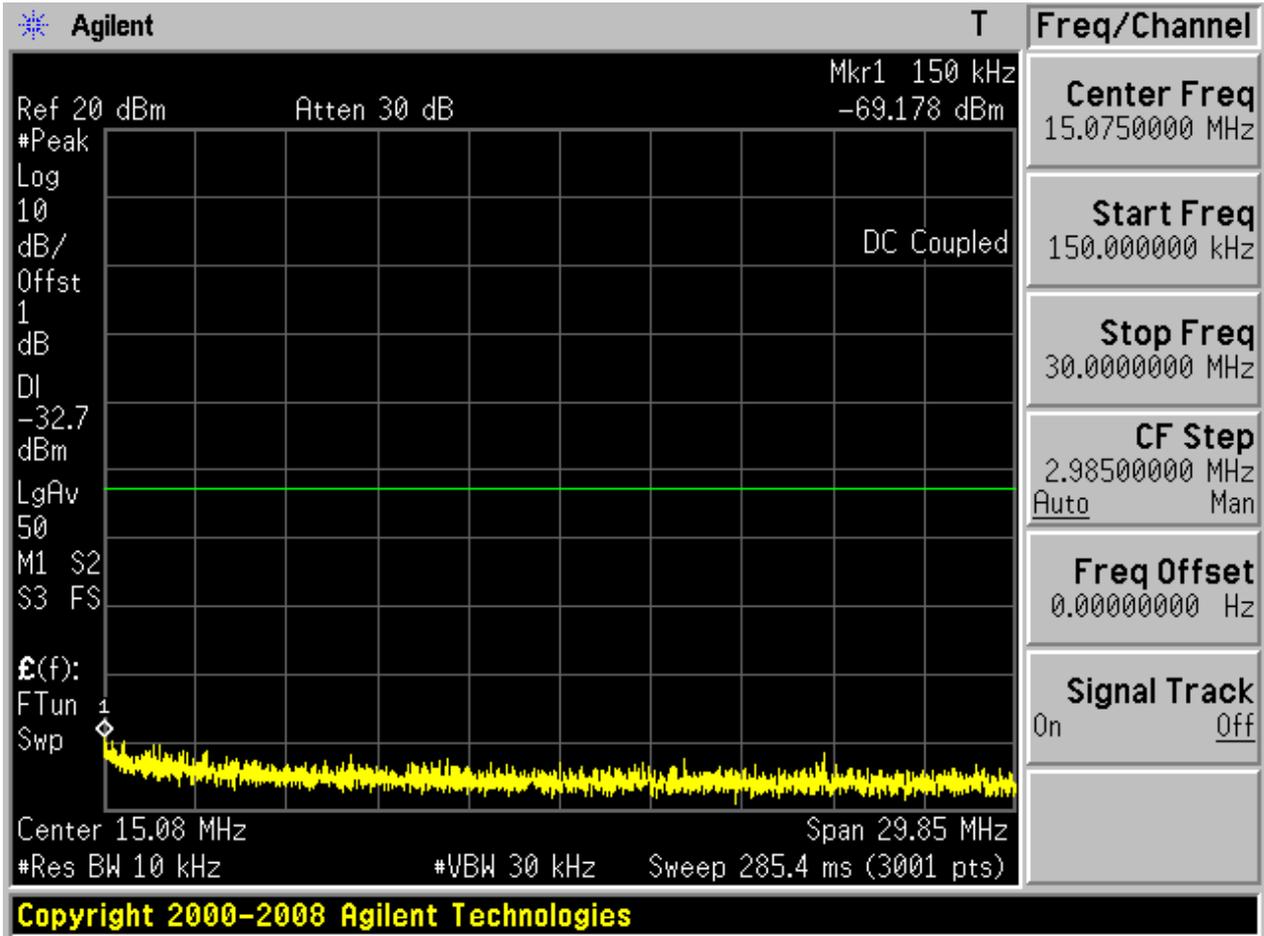
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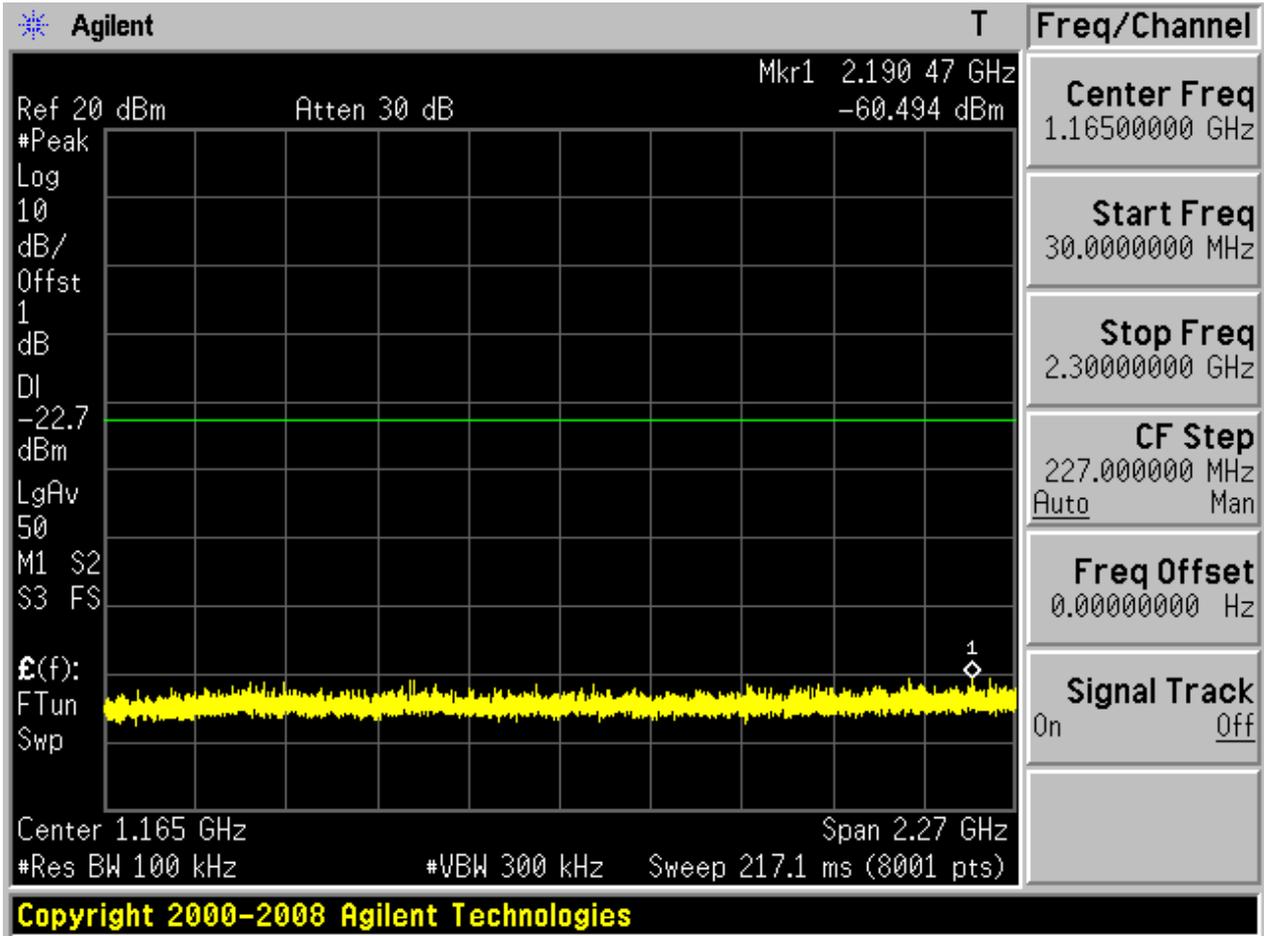


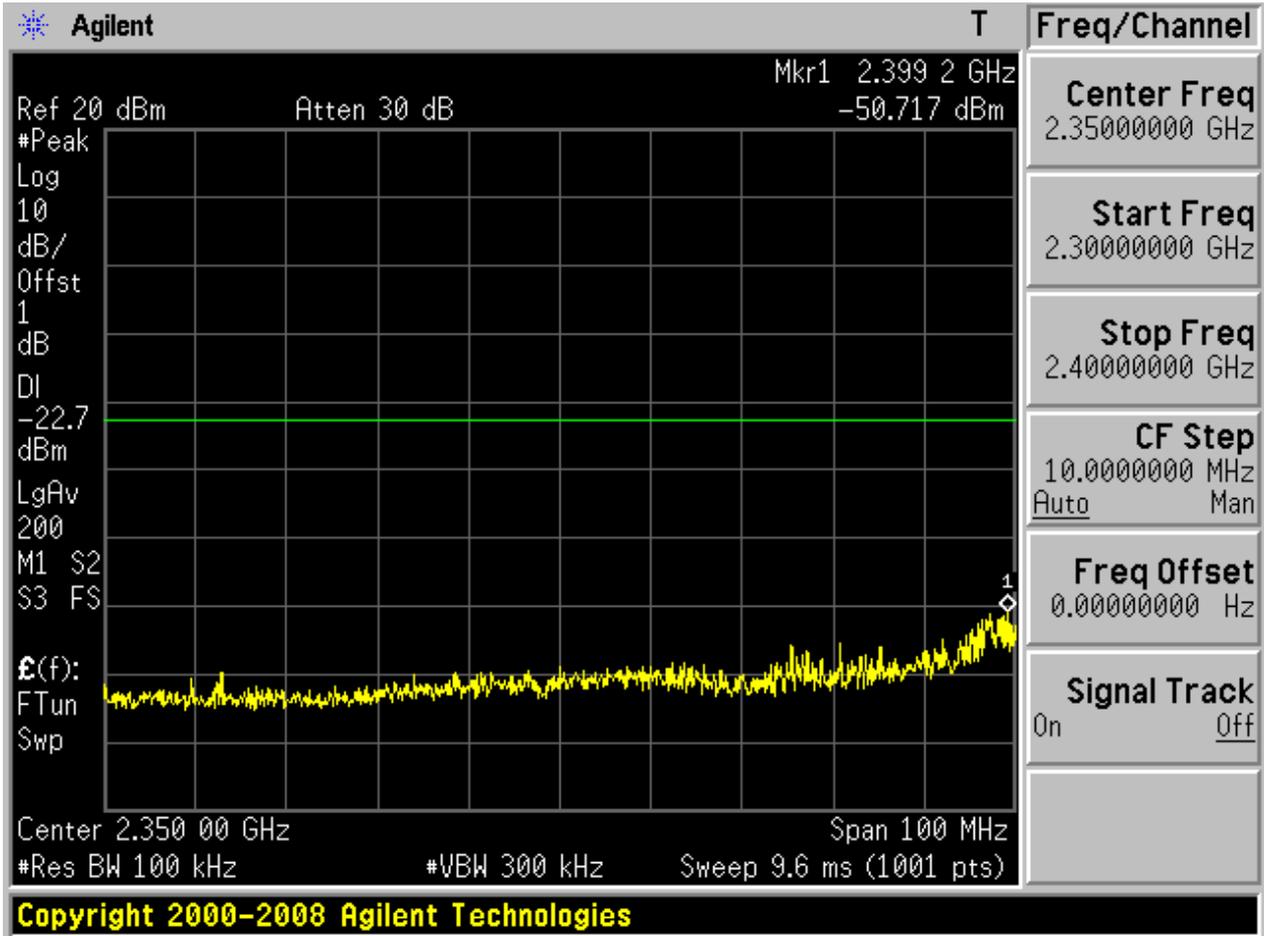


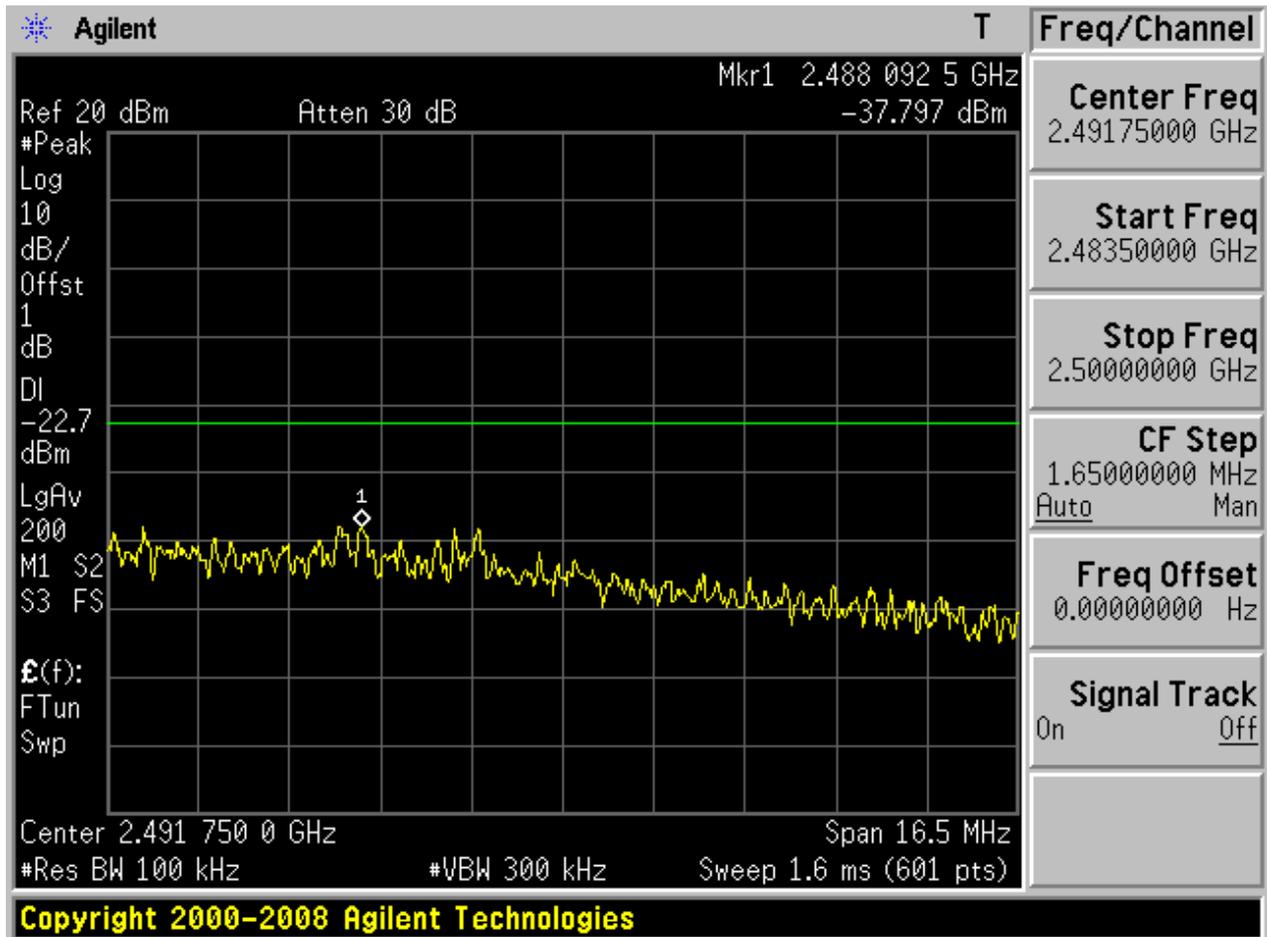
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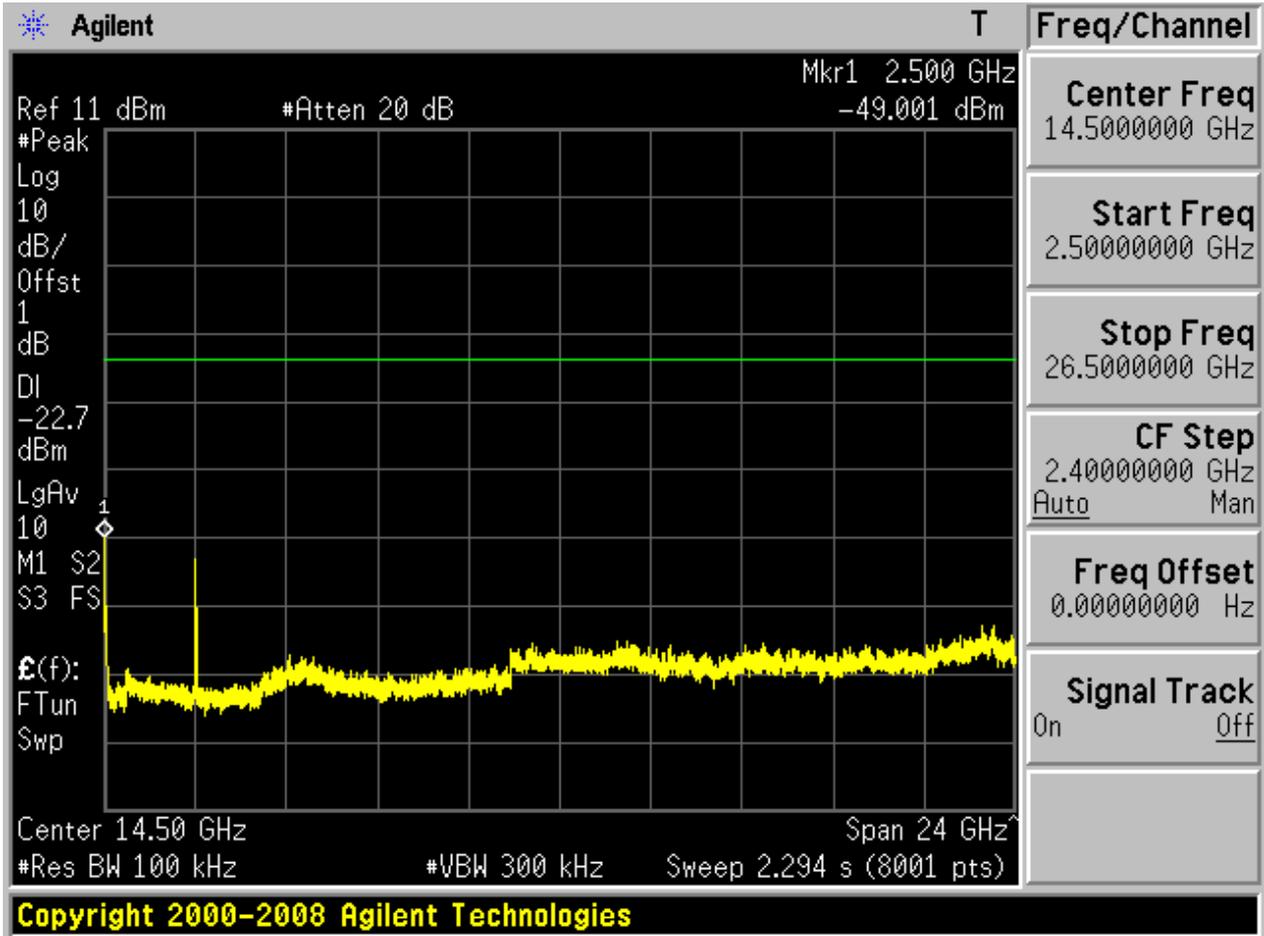












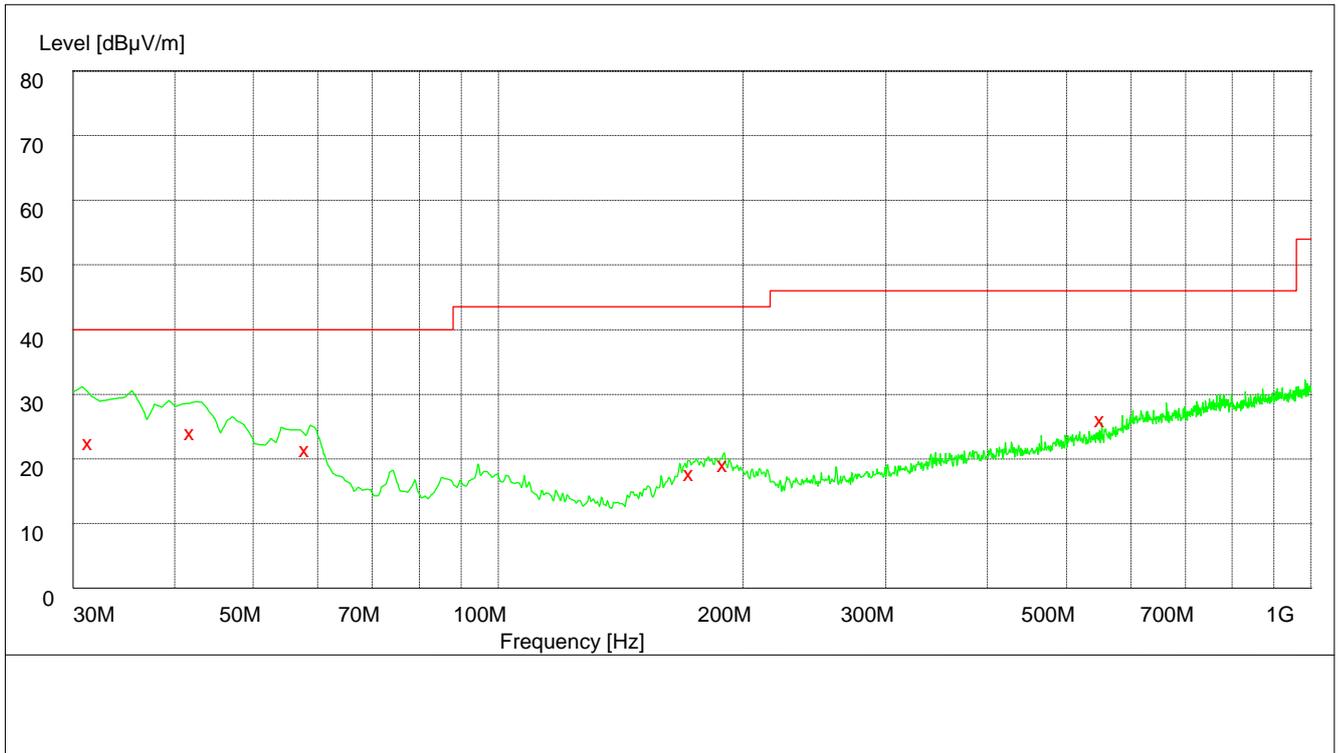


Appendix F: Radiated Spurious Emission & Spurious in Restricted Band

Part 1: Testing Range of “30 MHz to 1 GHz”

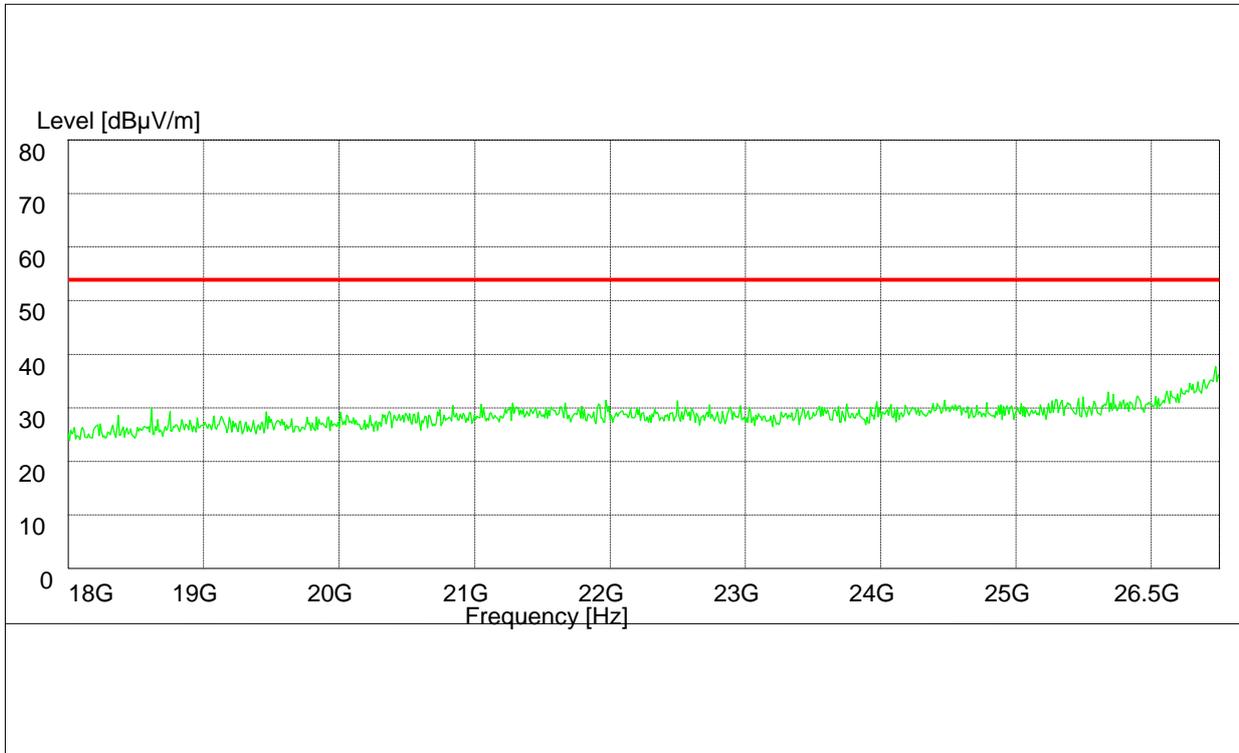
Note 1: The test results and plot for testing range of “30 MHz to 1 GHz” showed as below **is the WORST case for all Test Modes and Channels**. This range will not be presented for each Test Mode and each Channel.

Note 2: **The emissions in this range are mainly from the Platform Device (Notepad PC and its ancillary components)**.



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Plarization
229.100000	31.50	13.3	46.0	14.5	100.0	329.00	VERTICAL
319.200000	30.60	16.0	46.0	14.4	125.0	203.00	HORIZONTAL
401.300000	27.80	17.8	46.0	28.2	110.0	325.00	VERTICAL
475.200000	30.60	19.5	46.0	15.4	141.0	122.00	HORIZONTAL
555.000000	31.10	21.5	46.0	14.9	108.0	309.00	VERTICAL
638.100000	33.50	22.8	46.0	12.5	107.0	213.00	HORIZONTAL

Part 2: Testing Range of “18 GHz to 26.5 GHz”



Note: No peak found in pre- test.

Part 3: Testing Range of “2.3GHz to 2.51GHz”

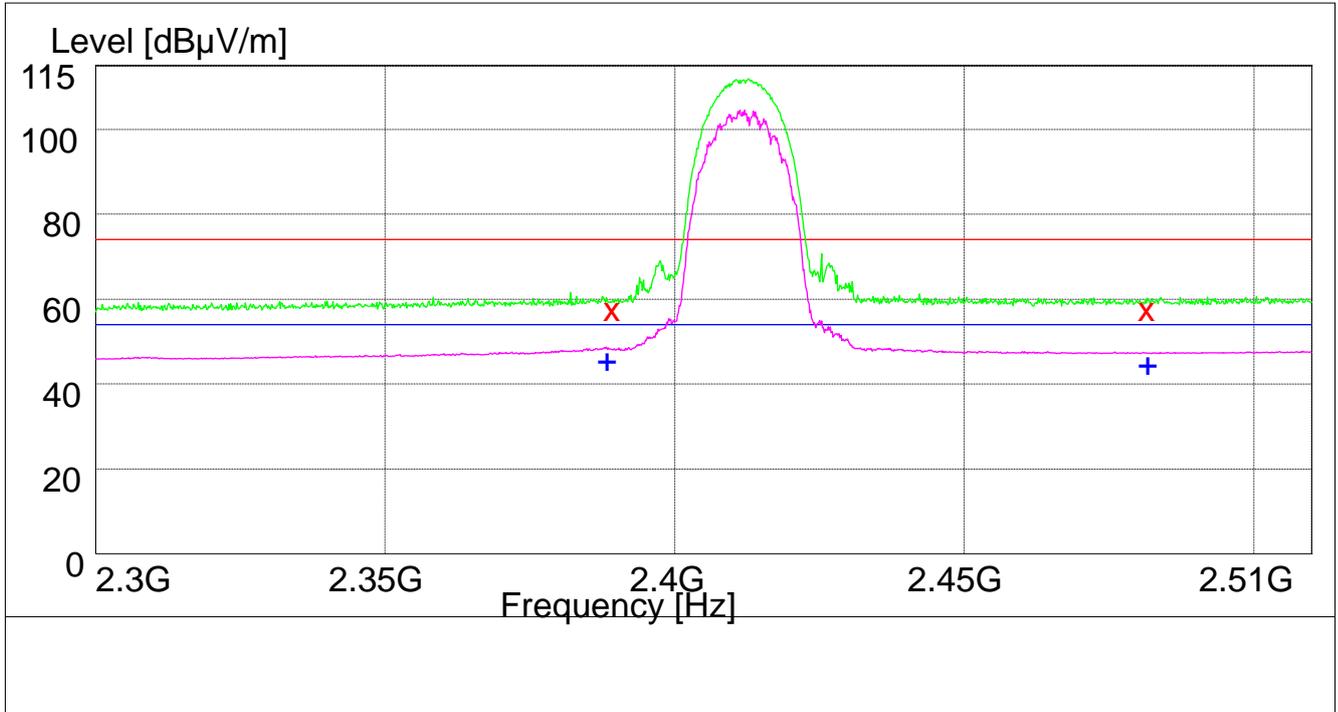
Note 1: The test results and plot for testing range of “2.3 GHz to 2.51 GHz” showed as below is the WORST case for all Test Modes. The testing range of “2.3 GHz to 2.51 GHz” is for checking radiated emissions located in restricted bands near the EUT operating bands.

Note 2: Two limits are required in the testing range above 1 GHz, that is Peak limit (74 dB μ V/m) and Average Limit (54 dB μ V/m).

Note 3: The peak spike exceeds the limit line is EUT’s operating frequency.

Test Mode: 11b

Channel 01



Note: The peak exceeds the limit line is carrier frequency.

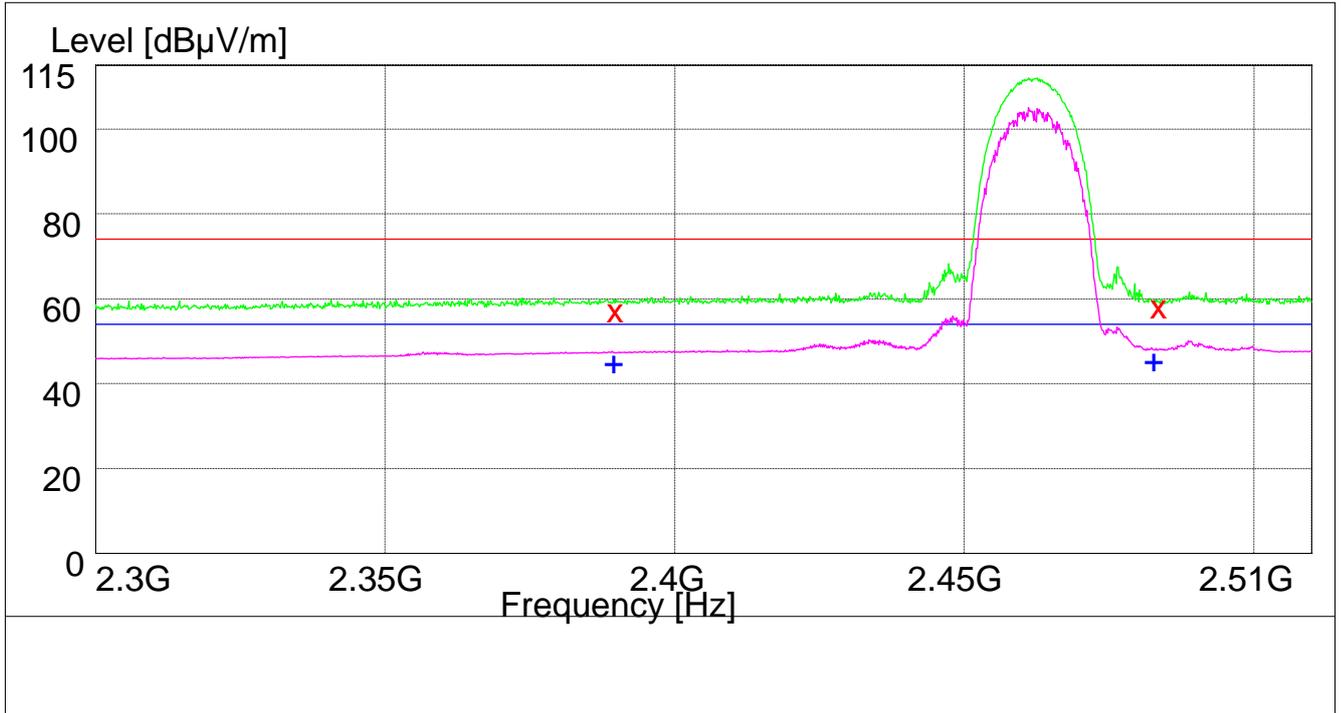
MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	59.30	33.5	74.0	13.7	150.0	343.00	VERTICAL
2483.500000	58.50	33.7	74.0	14.0	100.0	267.00	HORIZONTAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	49.90	33.5	54.0	6.4	100.0	173.00	HORIZONTAL
2483.500000	46.40	33.7	54.0	7.2	104.0	145.00	HORIZONTAL

Channel 11



Note: The peak exceeds the limit line is carrier frequency.

MEASUREMENT RESULT: PK Detector

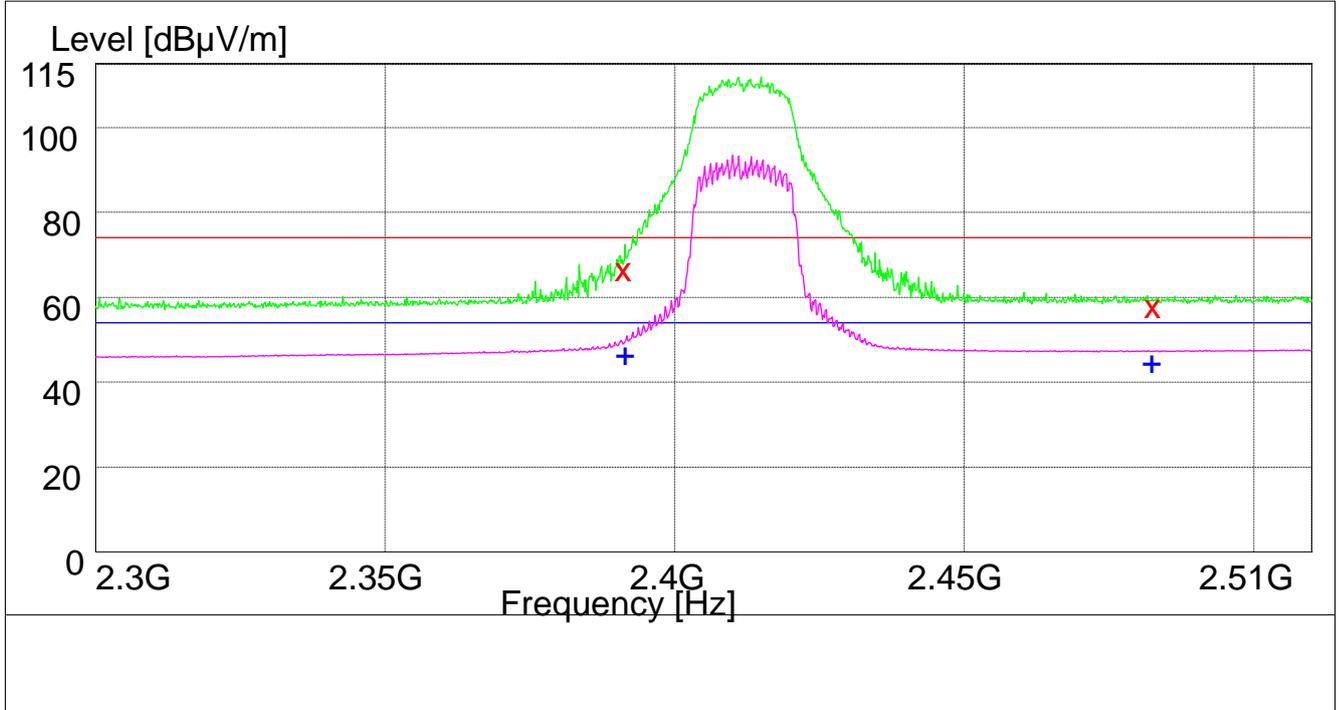
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	60.30	34.8	74.0	13.7	123.0	64.00	VERTICAL
2483.500000	60.20	35.1	74.0	13.8	150.0	128.00	VERTICAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	47.30	33.5	54.0	7.0	150.0	353.00	HORIZONTAL
2483.500000	48.50	33.7	54.0	7.5	100.0	187.00	HORIZONTAL

Test Mode: 11G

Channel 01



Note: The peak exceeds the limit line is carrier frequency.

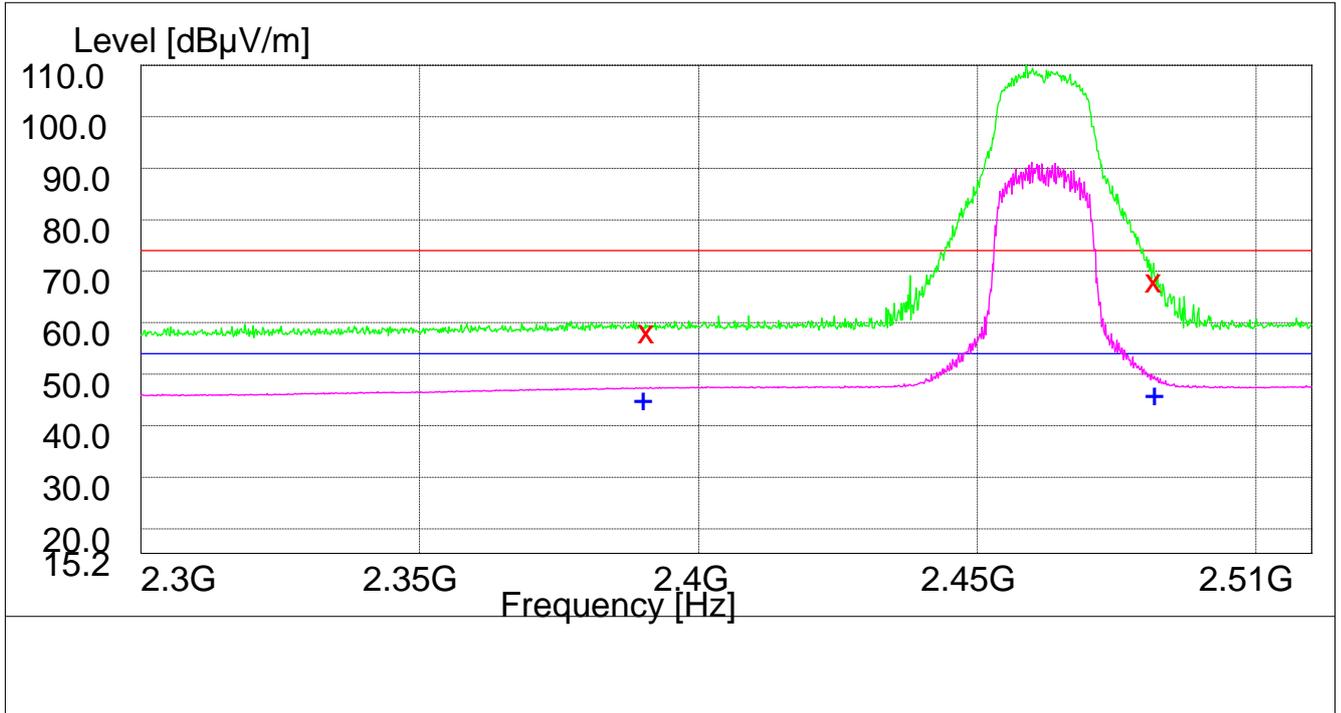
MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	61.50	33.5	74.0	4.7	100.0	178.00	HORIZONTAL
2483.500000	60.30	33.7	74.0	13.6	144.0	234.00	VERTICAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	47.90	33.5	54.0	7.6	100.0	171.00	HORIZONTAL
2483.500000	48.40	33.7	54.0	7.2	112.0	359.00	HORIZONTAL

Channel 11



Note: The peak exceeds the limit line is carrier frequency.

MEASUREMENT RESULT: PK Detector

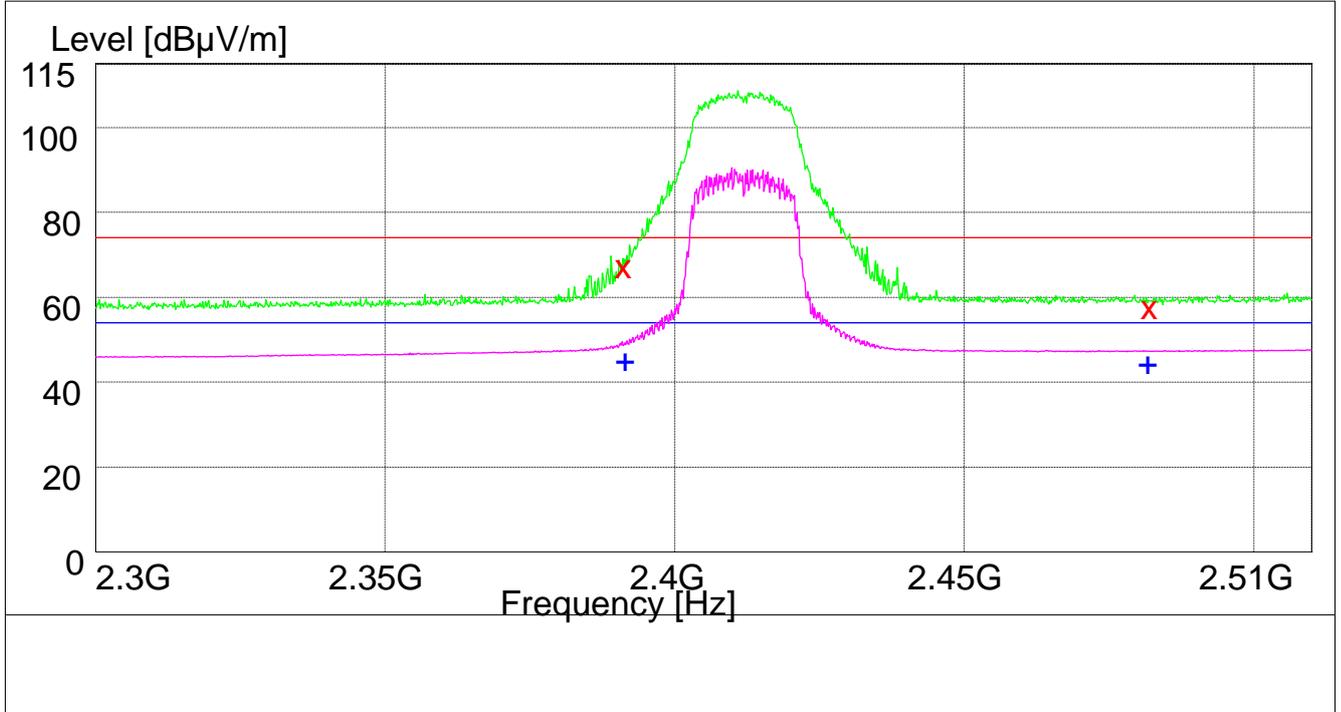
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	60.90	33.5	74.0	13.4	100.0	315.00	VERTICAL
2483.500000	61.40	33.7	74.0	4.5	100.0	183.00	HORIZONTAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	48.30	33.5	54.0	7.1	132.0	78.00	HORIZONTAL
2483.500000	49.40	33.7	54.0	7.0	100.0	166.00	HORIZONTAL

Test Mode: 11N

Channel 01



Note: The peak exceeds the limit line is carrier frequency.

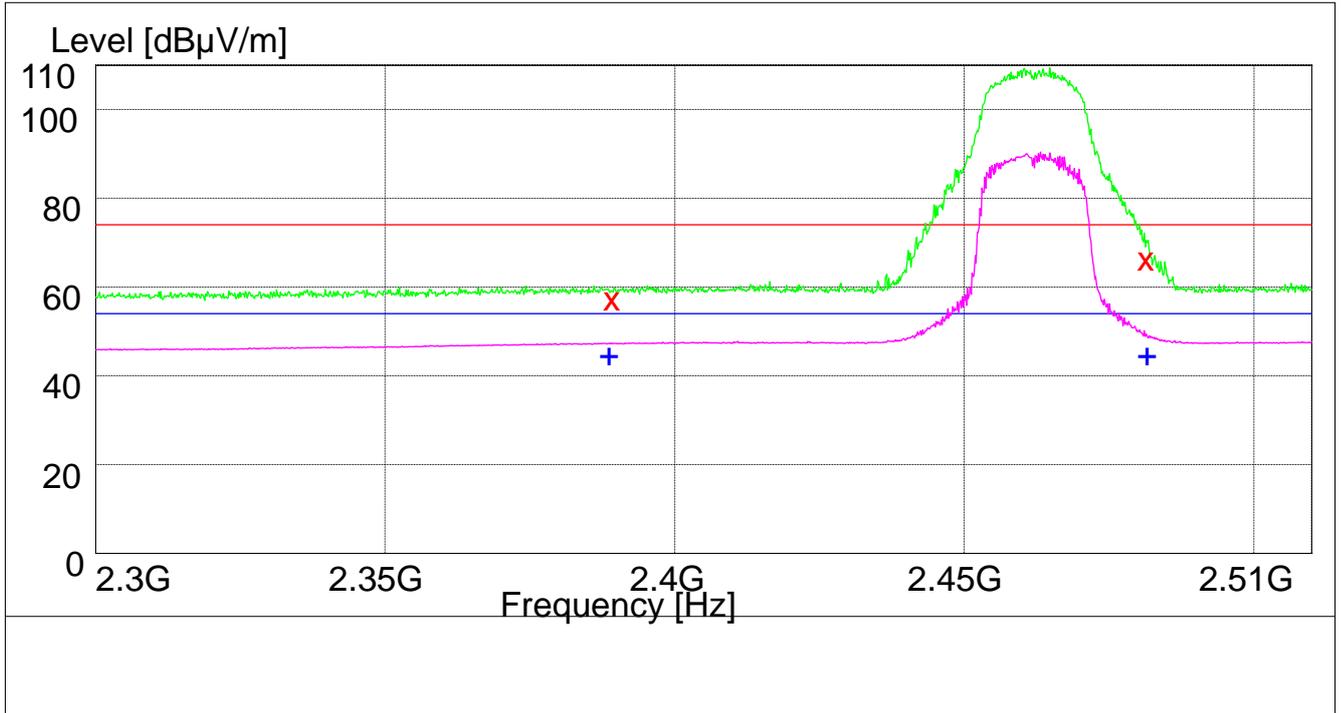
MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	60.50	33.5	74.0	4.5	100.0	164.00	HORIZONTAL
2483.500000	60.30	33.7	74.0	13.5	147.0	286.00	VERTICAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	47.80	33.5	54.0	7.6	100.0	173.00	HORIZONTAL
2483.500000	48.50	33.7	54.0	7.3	100.0	4.00	HORIZONTAL

Channel 11



Note: The peak exceeds the limit line is carrier frequency.

MEASUREMENT RESULT: PK Detector

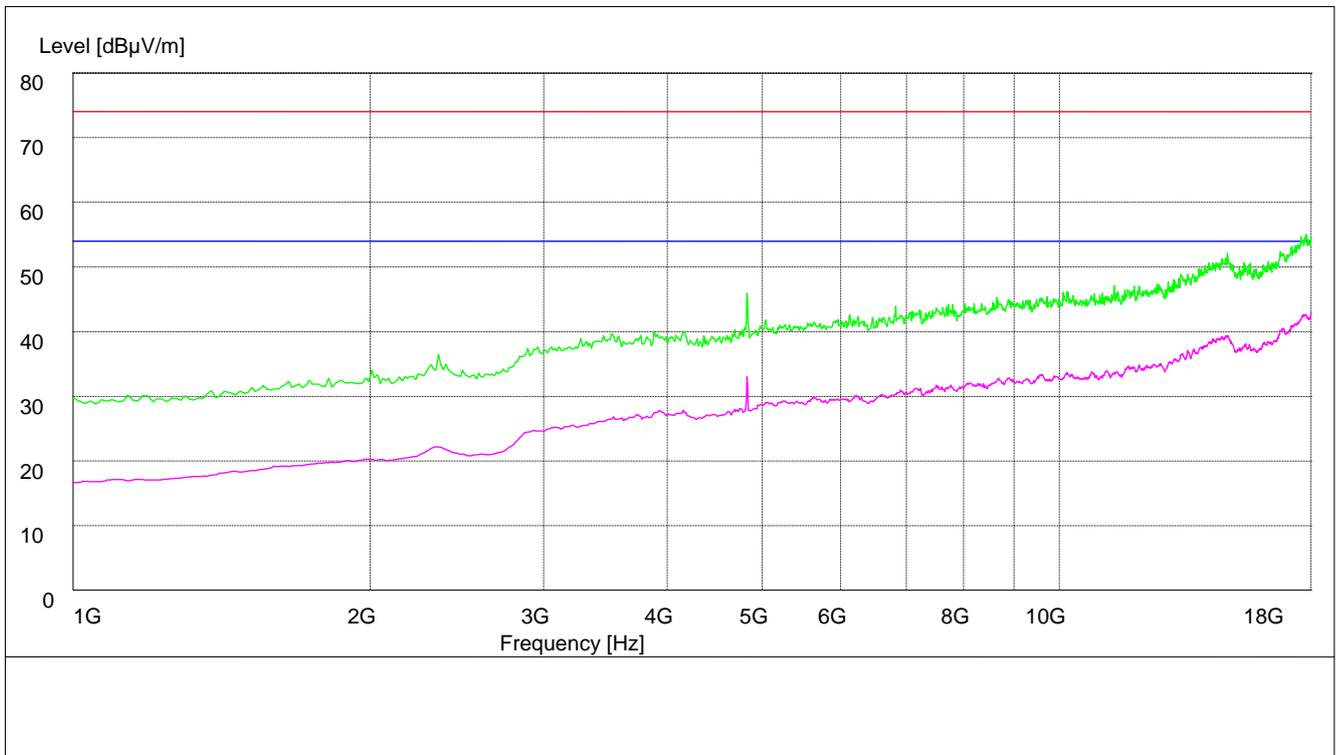
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	61.50	33.5	74.0	14.4	137.0	25.00	VERTICAL
2483.500000	60.50	33.7	74.0	5.1	100.0	174.00	HORIZONTAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	48.50	33.5	54.0	7.1	100.0	329.00	VERTICAL
2483.500000	49.60	33.7	54.0	7.2	100.0	176.00	HORIZONTAL

Part 4: Testing Range of “1 GHz to 18 GHz”

- Note 1: The test results and plot for testing range of “1 GHz to 18 GHz” showed as below is the WORST case for all Test Modes and Channels. This range will not be presented for each Test Mode and each Channel.
- Note 2: The testing range of “1 GHz to 18 GHz” is for checking radiated emissions located in restricted bands far away from the EUT operating bands.
- Note 3: Two limits are required in the testing range above 1 GHz, that is Peak limit (74 dB μ V/m) and Average Limit (54 dB μ V/m).

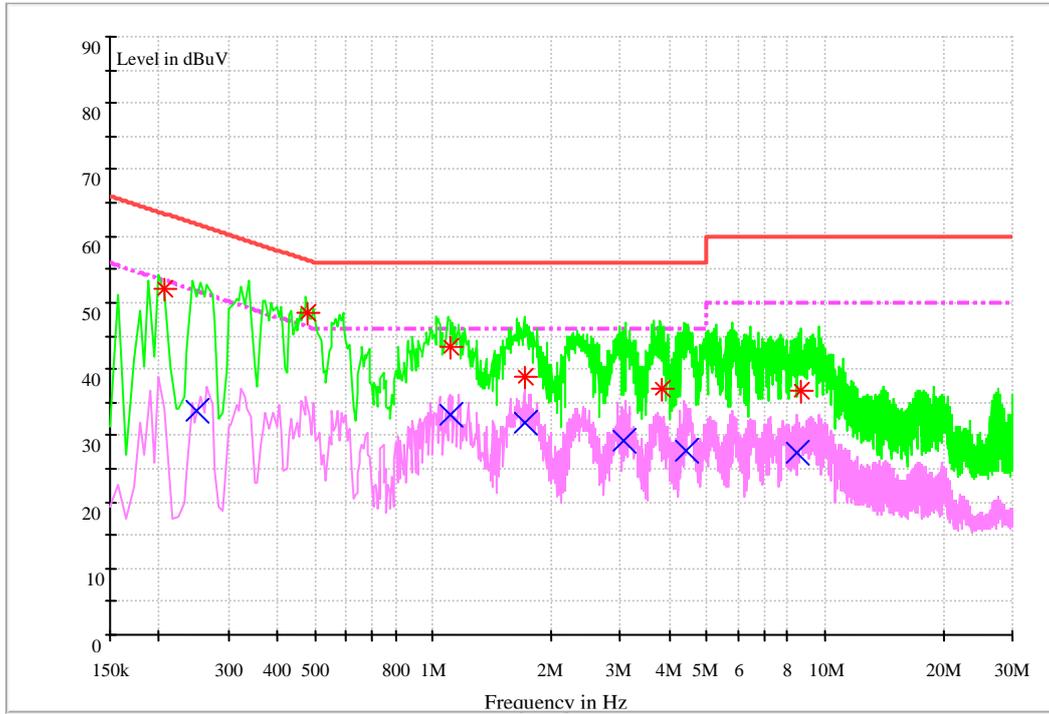




Appendix G: Conducted Emission at Power Port

Channel 40

CLASS B Voltage with ENV216



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dB μ V	Line	Transd dB	Margin dB	Limit dB μ V	PE
0.206032	51.9	N	9.7	11.5	63.4	FLO
0.479479	48.3	N	9.7	8.0	56.3	FLO
1.102024	43.2	N	9.7	12.8	56.0	FLO
1.709531	38.8	N	9.7	17.2	56.0	FLO
3.814590	37.0	N	9.7	19.0	56.0	FLO
8.678388	36.8	N	9.9	23.2	60.0	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dB μ V	Line	Transd dB	Margin dB	Limit dB μ V	PE
0.248262	33.7	N	9.7	18.1	51.8	FLO
1.103708	33.2	N	9.7	12.8	46.0	FLO
1.708586	32.1	N	9.7	13.9	46.0	FLO
3.065370	29.1	N	9.7	16.9	46.0	FLO
4.412966	27.6	N	9.8	18.4	46.0	FLO
8.466660	27.3	N	9.9	22.7	50.0	FLO

END