

TEST REPORT

Product : Smart Helmet
Trade mark :  wearable
Model/Type reference : KC-N901
Serial Number : N/A
Report Number : EED32M00050704
FCC ID : 2AVZ7KC-N901
Date of Issue : Jun. 03, 2020
Test Standards : 47 CFR Part 2
47 CFR Part 22 subpart H
47 CFR Part 24 subpart E
Test result : PASS

Prepared for:

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Jun. 03, 2020

Check No.:3096344197



2 Version

Version No.	Date	Description
00	Jun. 03, 2020	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
GSM 850, WCDMA(Band V)			
Conducted output power	Part 2.1046(a)/Part 22.913(a)	ITA-603-C-2004 &KDB 971168 D01v02r02	PASS
Effective Radiated Power of Transmitter(ERP)	Part 2.1046(a)/Part 22.913(a)	ITA-603-C-2004 &KDB 971168 D01v02r02	PASS
99%&26dB Occupied Bandwidth	Part 2.1049(h)	Part 22.917(b) &KDB 971168 D01v02r02	PASS
Band Edge at antenna terminals	Part 2.1051/Part 22.917(a)	Part 22.917(b) &KDB 971168 D01v02r02	PASS
Spurious emissions at antenna terminals	Part 2.1051/ Part 2.1057/ Part 22.917(a)(b)	ITA-603-C-2004 &KDB 971168 D01v02r02	PASS
Field strength of spurious radiation	Part 2.1053/ Part 2.1057/ Part 22.917(a)(b)	ITA-603-C-2004 &KDB 971168 D01v02r02	PASS
Frequency stability	Part 2.1055/ Part 22.355	ITA-603-C-2004 &KDB 971168 D01v02r02	PASS
GSM 1900,WCDMA(Band II)			
Conducted output power	Part 2.1046(a) /Part 24.232(c)	ITA-603-C-2004&KDB 971168 D01v02r02	PASS
Effective Radiated Power of Transmitter(EIRP)	Part 2.1046(a) / Part 24.232(c)	ITA-603-C-2004 &KDB 971168 D01v02r02	PASS
peak-to-average ratio	Part 24.232(d)	KDB 971168 D01v02r02	PASS
99% &26dBOccupied Bandwidth	Part 2.1049(h)	Part 24.238(b) &KDB 971168 D01v02r02	PASS
Band Edge at antenna terminals	Part 2.1051/ Part 24.238(a)	Part 24.238(b) &KDB 971168 D01v02r02	PASS
Spurious emissions at antenna terminals	Part 2.1051/ Part 2.1057/ Part 24.238(a)(b)	ITA-603-C-2004 &KDB 971168 D01v02r02	PASS
Field strength of spurious radiation	Part 2.1053 /Part 2.1057 / Part 24.238(a)(b)	ITA-603-C-2004 &KDB 971168 D01v02r02	PASS
Frequency stability	Part 2.1055/Part 24.235	ITA-603-C-2004 &KDB 971168 D01v02r02	PASS

Remark:

The tested sample(s) and the sample information are provided by the client.

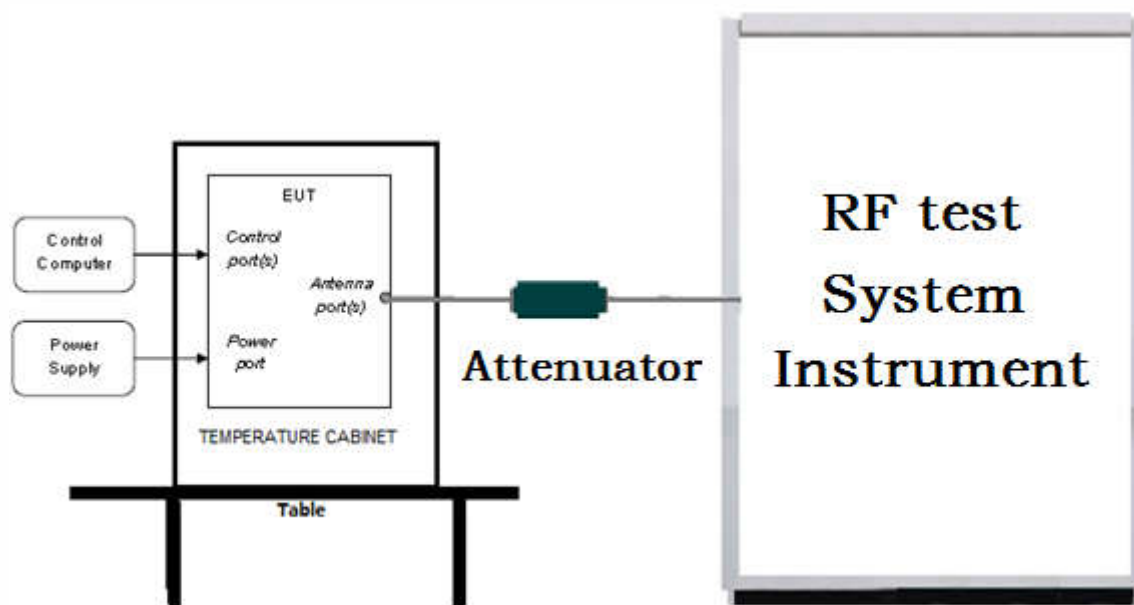
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5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

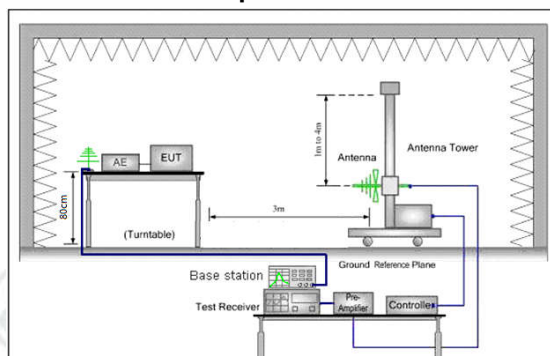


Figure 1. 30MHz to 1GHz

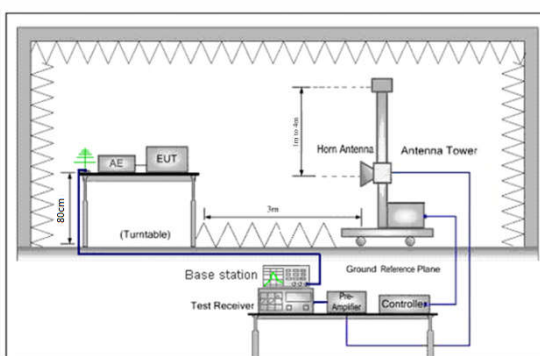


Figure 2. above 1GHz

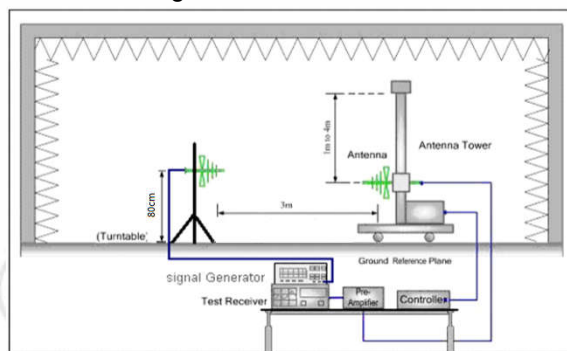


Figure 1. 30MHz to 1GHz

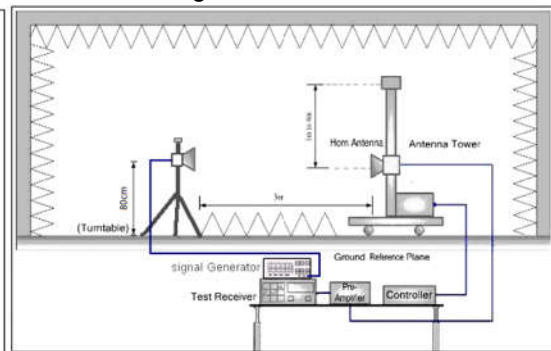


Figure 2. above 1GHz

5.2 Test Environment

Operating Environment:	
Temperature:	23.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010mbar

5.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(cm)	High(H)
GSM/GPRS/EGPRS 850	Tx (824 MHz ~849 MHz)	Channel 128	Channel 190	Channel 251
		824.2MHz	836.6 MHz	848.8 MHz
	Rx (869 MHz ~894 MHz)	Channel 128	Channel 190	Channel 251
		869.2 MHz	881.6 MHz	893.8 MHz
WCDMA band V	Tx (824 MHz ~849 MHz)	Channel 4132	Channel 4182	Channel 4233
		826.4 MHz	836.4 MHz	846.6 MHz
	Rx (869 MHz ~894 MHz)	Channel 4357	Channel 4407	Channel 4458
		871.4 MHz	881.4 MHz	891.6 MHz
GSM/GPRS/EGPRS 1900	Tx (1850 MHz ~1910 MHz)	Channel 512	Channel 661	Channel 810
		1850.2MHz	1880.0 MHz	1909.8 MHz
	Rx (1930 MHz ~1990 MHz)	Channel 512	Channel 661	Channel 810
		1930.2 MHz	1960.0 MHz	1989.8 MHz
WCDMA Band II	Tx (1850 MHz ~1910 MHz)	Channel 9262	Channel 9400	Channel 9538
		1852.4 MHz	1880.0 MHz	1907.6 MHz
	Rx (1930 MHz ~1990 MHz)	Channel 9662	Channel 9800	Channel 9938
		1932.4 MHz	1960.0 MHz	1987.6 MHz

Test mode:

Pre-scan under all rate at lowest middle and highest channel ,find the transmitter power as below:

SIM 1 Card Conducted transmitter power measurement result.

band	GSM850			GSM1900		
Channel	128	190	251	512	661	810
Frequency(MHz)	824.2MHz	836.6MHz	848.8MHz	1850.2MHz	1880MHz	1909.8MHz
GSM	32.56dBm	33.87dBm	32.89dBm	29.96dBm	29.59dBm	29.31dBm
GPRS Class 8	32.59dBm	33.84dBm	32.84dBm	30.02dBm	29.56dBm	29.21dBm
GPRS Class 10	32.17dBm	33.53dBm	32.51dBm	29.94dBm	29.54dBm	29.12dBm
GPRS Class 11	30.90dBm	32.26dBm	31.22dBm	29.75dBm	28.24dBm	28.98dBm
GPRS Class 12	29.81dBm	31.20dBm	30.16dBm	28.62dBm	27.24dBm	28.30dBm
EGPRS Class 8	26.83dBm	28.26dBm	27.39dBm	26.96dBm	26.65dBm	26.33dBm
EGPRS Class 10	25.31dBm	26.67dBm	25.76dBm	26.82dBm	25.36dBm	26.16dBm
EGPRS Class 11	23.20dBm	24.71dBm	23.70dBm	24.64dBm	23.10dBm	24.04dBm
EGPRS Class 12	22.02dBm	23.50dBm	22.57dBm	23.46dBm	21.91dBm	22.71dBm

band	WCDMA Band V			WCDMA Band II		
Channel	4132	4182	4233	9262	9400	9538
Frequency(MHz)	826.4MHz	836.4MHz	846.6MHz	1852.4MHz	1880MHz	1907.6MHz
RMC 12.2K	22.20dBm	22.96dBm	22.31dBm	22.26dBm	20.93dBm	23.77dBm

Pre-scan all mode and data rates and positions,find worse case mode are chosen to the report ,the worse case mode as below:

band	Radiated	Conducted
GSM/GPRS/EGPRS 850	1)GSM Link 2)GPRS 8 Link 3)EGPRS 8 Link	1)GSM Link 2)GPRS 8 Link 3)EGPRS 8 Link
GSM/GPRS/EGPRS 1900	1)GSM Link 2)GPRS 8 Link 3)EGPRS 8 Link	1)GSM Link 2)GPRS 8 Link 3)EGPRS 8 Link
WCDMA Band V	1)RMC 12.2Kbps Link	1)RMC 12.2Kbps Link
WCDMA Band II	1)RMC 12.2Kbps Link	1)RMC 12.2Kbps Link

Test Mode	Test Modes description
GSM/TM1	GSM system, GSM, GMSK modulation
GSM/TM2	GSM system, GPRS, GMSK modulation
GSM/TM3	GSM system, EGPRS, 8PSK modulation
Test Mode	Test Modes description
UMTS/TM1	WCDMA system, QPSK modulation

6 General Information

6.1 Client Information

Applicant:	Shenzhen Kuang-Chi Space Technology Co., Ltd
Address of Applicant:	301-B077, Building 2, No.1, Mawu Road, Baoan Community, Longgang District, Shenzhen, Guangdong, China
Manufacturer:	Shenzhen Kuang-Chi Space Technology Co., Ltd.
Address of Manufacturer:	301-B077, Building 2, No.1, Mawu Road, Baoan Community, Longgang District, Shenzhen, Guangdong, China
Factory:	Shenzhen Kuang-Chi Space Technology Co., Ltd
Address of Factory:	301-B077, Building 2, No.1, Mawu Road, Baoan Community, Longgang District, Shenzhen, Guangdong, China

6.2 General Description of EUT

Product Name:	Smart Helmet		
Model No.(EUT):	KC-N901		
Trade Mark:	 wearable		
EUT Supports Radios application:	2g	GSM/GPRS /EGPRS850	UL: 824MHz to849MHz ;DL:869MHz to894MHz
		GSM/GPRS /EGPRS1900	UL: 1850MHz to1910MHz ;DL:1930MHz to1990MHz
	3g	WCDMA Band 2	UL: 1850MHz to1910 MHz ; DL:1930MHz to1990MHz
		WCDMA Band 5	UL: 824MHz to849MHz ;DL:869MHz to894MHz
Power Supply:	LI-ION BATTERY		RATED CAPACITY 5000mAh (19Wh) TYPICAL CAPACITY5100mAh (19.38Wh) NOMINAL VOLTAGE:3.8V--- LIMITED CHARGE VOLTAGE:4.35--- MODEL:GQ-V496594P
Sample Received Date:	Mar.18, 2020		
Sample tested Date:	Mar.18, 2020 to May 06, 2020		

6.3 Product Specification subjective to this standard

Frequency Band:	GSM/GPRS/EGPRS 850: Tx:824.20 -848.80MHz;Rx: 869.20 – 893.80MHz GSM/GPRS/EGPRS 1900: Tx:1850.20 – 1909.80MHz;Rx:1930.20 – 1989.80MHz WCDMA Band V:Tx:826.40 -846.60MHz;Rx: 871.40 – 891.60MHz WCDMA Band II:Tx:1852.40 – 1907.60MHz;Rx:1932.40 – 1987.60MHz
Modulation Type:	GMSK (GSM/GPRS) , GMSK/8PSK (EGPRS) QPSK for WCDMA
Antenna Type and Gain:	Type:2G :monopole antenna; 3G:monopole antenna Gain: 2G GSM 850: 1.5dBi , GSM 1900: 1.5dBi; 3G:Band 2: 1.5dBi, Band 5: 1.0dBi
Test Voltage:	BATTERY 3.8V

6.4 Description of Support Units

The EUT has been tested with associated equipment below

Associated equipment name		Manufacturer	model	S/N serial number	Supplied by	Certification
AE1	Notebook	DELL	DELL 3490	D245DX2	DELL	CE&FCC

6.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd
 Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China
 Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385
 No tests were sub-contracted.
 FCC Designation No.: CN1164

6.6 Deviation from Standards

None.

6.7 Abnormalities from Standard Conditions

None.

6.8 Other Information Requested by the Customer

None.

6.9 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.3dB (30MHz-1GHz)
		4.5dB (1GHz-12.75GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

7 Equipment List

Communication RF test system					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Spectrum Analyzer	Agilent	E4440A	MY46185649	11-05-2019	11-04-2020
Communication test set	R&S	CMW200	111935	02-17-2020	02-16-2021
Signal Generator	Keysight	E8257D	MY53401106	02-17-2020	02-16-2021
Communication test set	R&S	CMW500	152394	02-17-2020	02-16-2021
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	---	---
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	---	---
band rejection filter	Sinoscite	FL5CX01CA09C L12-0395-001	---	---	---
band rejection filter	Sinoscite	FL5CX01CA08C L12-0393-001	---	---	---
band rejection filter	Sinoscite	FL5CX02CA04C L12-0396-002	---	---	---
band rejection filter	Sinoscite	FL5CX02CA03C L12-0394-001	---	---	---
DC Power	Keysight	E3642A	MY55156236	02-17-2020	02-16-2021
DC Power	Keysight	E3642A	MY56376035	02-17-2020	02-16-2021
PC-2	Lenovo	R4960d	---	---	---
PC-3	Lenovo	R4960d	---	---	---
RF control unit	JS Tonscend	JS0806-1	158060004	02-17-2020	02-16-2021
DC power Box	JS Tonscend	JS0806-4	158060007	---	---
LTE Automatic test software	JS Tonscend	JS1120-1	---	---	---
WCDMA Automatic test software	JS Tonscend	JS1120-3	---	---	---
GSM Automatic test software	JS Tonscend	JS1120-3	---	---	---
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	07-26-2019	07-25-2020

Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100435	05-20-2019 04-28-2020	05-19-2020 04-27-2021
Temperature/ Humidity Indicator	Defu	TH128	/	06-14-2019	06-13-2020
LISN	R&S	ENV216	100098	03-05-2020	03-04-2021
Barometer	changchun	DYM3	1188	06-20-2019	06-19-2020

3M full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
RSE Automatic test software	JS Tonscend	JS36-RSE	10166	06-19-2019	06-18-2020
Receiver	Keysight	N9038A	MY57290136	03-05-2020	03-04-2021
Spectrum Analyzer	Keysight	N9020B	MY57111112	03-05-2020	03-04-2021
Spectrum Analyzer	Keysight	N9030B	MY57140871	03-05-2020	03-04-2021
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-25-2018	04-24-2021
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-25-2018	04-24-2021
Horn Antenna	ETS-LINDGREN	3117	00057407	07-10-2018	07-09-2021
Preamplifier	EMCI	EMC184055SE	980596	05-22-2019	05-21-2020
Communication test set	R&S	CMW500	102898	01-14-2020	01-13-2021
Preamplifier	EMCI	EMC001330	980563	05-08-2019 04-22-2020	05-07-2020 04-21-2021
Preamplifier	JS Tonscend	980380	EMC051845 SE	01-09-2020	01-08-2021
Temperature/Humidity Indicator	biaozhi	GM1360	EE1186631	04-30-2019 04-27-2020	04-29-2020 04-26-2021
Fully Anechoic Chamber	TDK	FAC-3	---	01-17-2018	01-16-2021
Filter bank	JS Tonscend	JS0806-F	188060094	04-10-2018	04-09-2021
Cable line	Times	SFT205-NMSM-2.50M	394812-0001	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0002	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0003	---	---
Cable line	Times	SFT205-NMSM-2.50M	393495-0001	---	---
Cable line	Times	EMC104-NMNM-1000	SN160710	---	---
Cable line	Times	SFT205-NMSM-3.00M	394813-0001	---	---
Cable line	Times	SFT205-NMNM-1.50M	381964-0001	---	---
Cable line	Times	SFT205-NMSM-7.00M	394815-0001	---	---
Cable line	Times	HF160-KMKM-3.00M	393493-0001	---	---

3M Semi/full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05-24-2019	05-23-2022
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-618	07-26-2019	07-25-2020
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04-25-2018	04-24-2021
Receiver	R&S	ESCI7	100938-003	10-21-2019	10-20-2020
Multi device Controller	matur	NCD/070/107 11112	---	---	---
Temperature/ Humidity Indicator	Shanghai qixiang	HM10	1804298	07-26-2019	07-25-2020
Communication test set	Agilent	E5515C	GB47050534	03-01-2019	02-28-2022
Cable line	Fulai(7M)	SF106	5219/6A	---	---
Cable line	Fulai(6M)	SF106	5220/6A	---	---
Cable line	Fulai(3M)	SF106	5216/6A	---	---
Cable line	Fulai(3M)	SF106	5217/6A	---	---
band rejection filter	Sinoscite	FL5CX01CA0 8CL12-0393-001	---	---	---

8 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	PART 22	PART 22 – PUBLIC MOBILE SERVICES Subpart H – Cellular Radiotelephone Service
2	PART 24	PART 24 – PERSONAL COMMUNICATIONS SERVICES Subpart E – Broadband PCS
3	PART 2	Frequency allocations and radio treaty matters; general rules and regulations
4	TIA-603-C-2004	Land Mobile FM or PM -Communications Equipment -Measurement and Performance Standards
5	KDB971168 D01	KDB971168 D01 Power Meas License Digital Systems v02r02

Test Results List:

Test Requirement	Test method	Test item	Verdict	Note
Part 2.1046(a)/Part 22.913(a)/ part 24.232(c)	ITA-603-C&KDB 971168 D01v02r02	Conducted output power	PASS	Appendix A)
Part 24.232(d)	KDB 971168 D01v02r02	peak-to-average ratio	PASS	Appendix C)
Part 2.1049(h)	Part 22.917(b)/ Part 24.238(b) &KDB 971168 D01v02r02	99% &26dB Occupied Bandwidth	PASS	Appendix B)
Part 2.1051/Part 22.917(a)/ Part 24.238(a)	Part 22.917(b)/ Part 24.238(b) &KDB 971168 D01v02r02	Band Edge at antenna terminals	PASS	Appendix D)
Part 2.1051/ Part 2.1057/ Part 22.917(a)(b)/ Part 24.238(a)(b)	ITA-603-C &KDB 971168 D01v02r02	Spurious emissions at antenna terminals	PASS	Appendix E)
Part 2.1055/ Part 22.355/ Part 24.235	ITA-603-C &KDB 971168 D01v02r02	Frequency stability	PASS	Appendix F)
Part 2.1053/ Part 2.1057/ Part 22.917(a)(b)/ Part 24.238(a)(b)	ITA-603-C &KDB 971168 D01v02r02	Field strength of spurious radiation	PASS	Appendix H)
Part 2.1046(a)/Part 22.913(a)/ Part 24.232(c)	ITA-603-C &KDB 971168 D01v02r02	Effective Radiated Power of Transmitter(ERP)	PASS	Appendix G)

Appendix A)RF Power Output

Test Band	Test Mode	Test Channel	Measured (dbm)	Limit (dbm)	Verdict
GSM850	GSM/TM1	LCH	32.56	38.5	PASS
		MCH	33.87	38.5	PASS
		HCH	32.89	38.5	PASS
	GSM/TM2	LCH	32.59	38.5	PASS
		MCH	33.84	38.5	PASS
		HCH	32.84	38.5	PASS
	GSM/TM3	LCH	26.83	38.5	PASS
		MCH	28.26	38.5	PASS
		HCH	27.39	38.5	PASS
Test Band	Test Mode	Test Channel	Measured (dbm)	Limit (dbm)	Verdict
GSM1900	GSM/TM1	LCH	29.96	33	PASS
		MCH	29.59	33	PASS
		HCH	29.31	33	PASS
	GSM/TM2	LCH	30.02	33	PASS
		MCH	29.56	33	PASS
		HCH	29.21	33	PASS
	GSM/TM3	LCH	26.96	33	PASS
		MCH	26.65	33	PASS
		HCH	26.33	33	PASS

Test Band	Test Mode	Test Channel	Measured (dbm)	Limit (dbm)	Verdict
WCDMA850	UMTS/TM1	LCH	22.20	38.5	PASS
		MCH	22.96	38.5	PASS
		HCH	22.31	38.5	PASS

Test Band	Test Mode	Test Channel	Measured (dbm)	Limit (dbm)	Verdict
WCDMA1900	UMTS/TM1	LCH	22.26	33	PASS
		MCH	20.93	33	PASS
		HCH	23.77	33	PASS

Appendix B)BandWidth

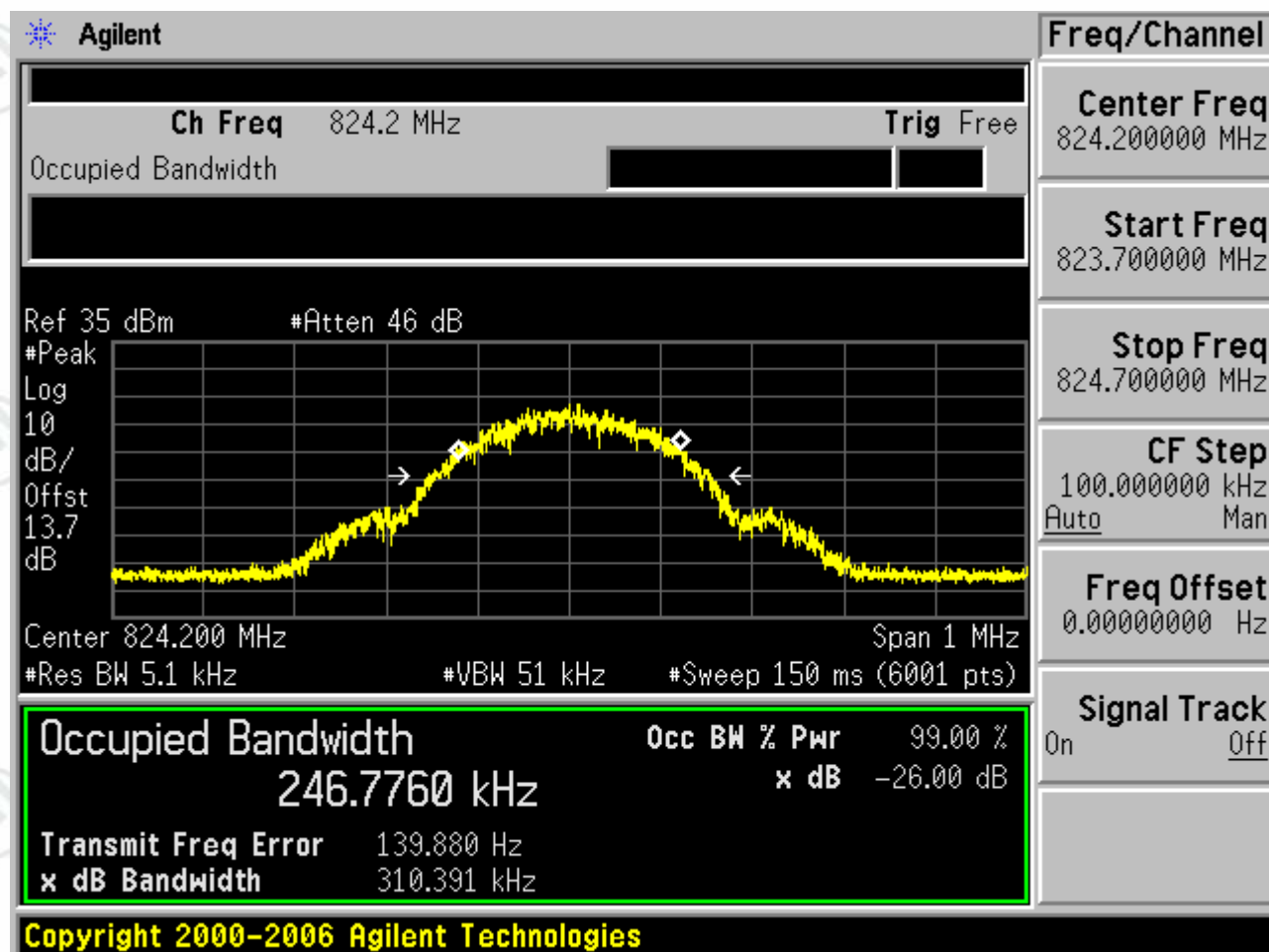
Test Band	Test Mode	Test Channel	Occupied Bandwidth (KHZ)	Emission Bandwidth (KHZ)	Verdict
GSM850	GSM/TM1	LCH	246.8	310	PASS
		MCH	247.7	311	PASS
		HCH	247.6	316	PASS
	GSM/TM2	LCH	244.0	310	PASS
		MCH	244.4	311	PASS
		HCH	242.7	316	PASS
	GSM/TM3	LCH	254.0	317	PASS
		MCH	251.0	315	PASS
		HCH	250.3	321	PASS

Test Band	Test Mode	Test Channel	Occupied Bandwidth (KHZ)	Emission Bandwidth (KHZ)	Verdict
GSM1900	GSM/TM1	LCH	245.4	315	PASS
		MCH	248.3	314	PASS
		HCH	245.4	314	PASS
	GSM/TM2	LCH	247.7	315	PASS
		MCH	246.2	309	PASS
		HCH	245.1	314	PASS
	GSM/TM3	LCH	249.1	313	PASS
		MCH	254.4	309	PASS
		HCH	249.0	314	PASS

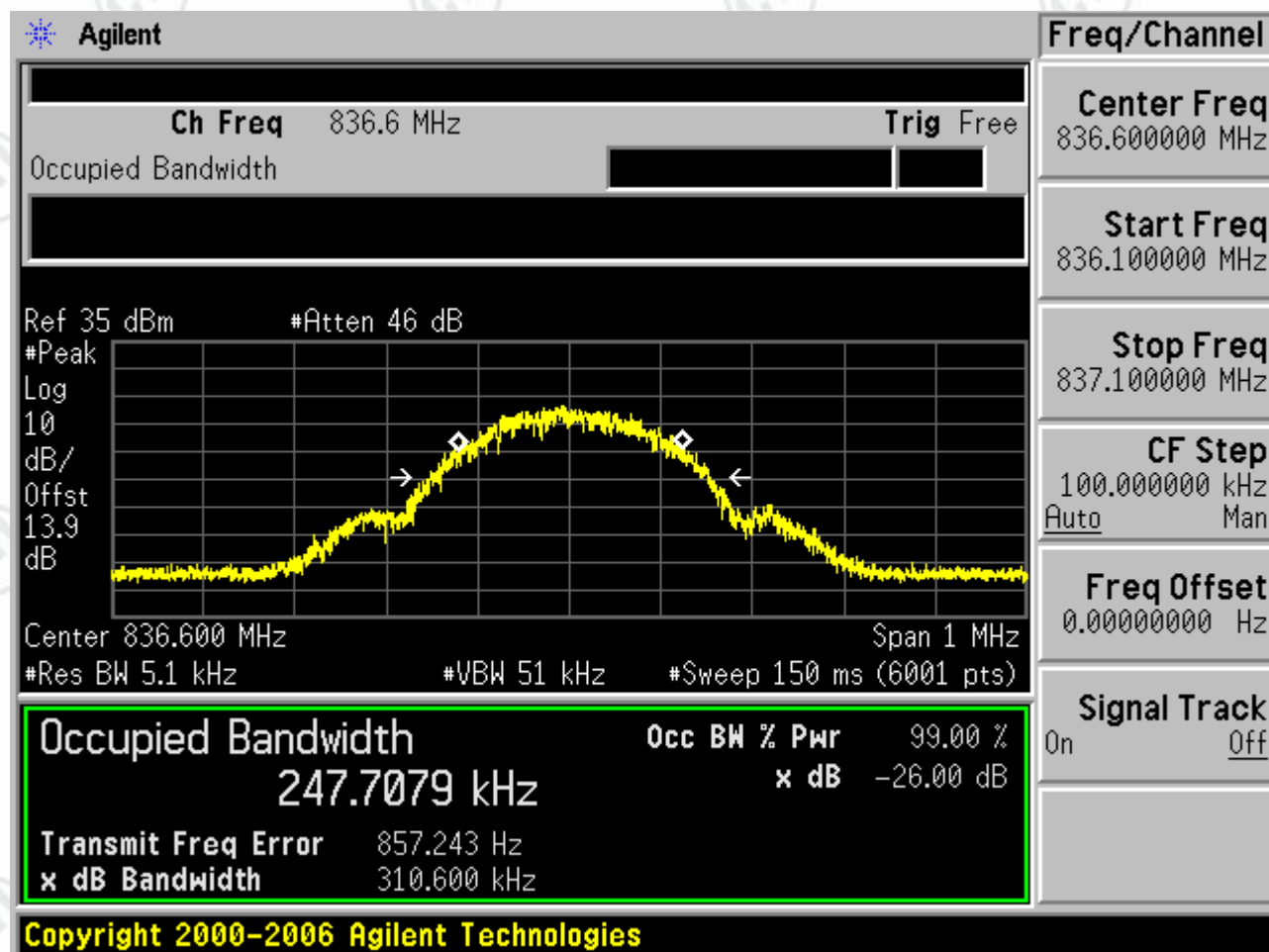
Test Band	Test Mode	Test Channel	Occupied Bandwidth (KHZ)	Emission Bandwidth (KHZ)	Verdict
WCDMA850	UMTS/TM1	LCH	4149.3	4703	PASS
		MCH	4162.0	4701	PASS
		HCH	4182.2	4701	PASS

Test Band	Test Mode	Test Channel	Occupied Bandwidth (KHZ)	Emission Bandwidth (KHZ)	Verdict
WCDMA1900	UMTS/TM1	LCH	4174.6	4681	PASS
		MCH	4162.5	4711	PASS
		HCH	4170.3	4737	PASS

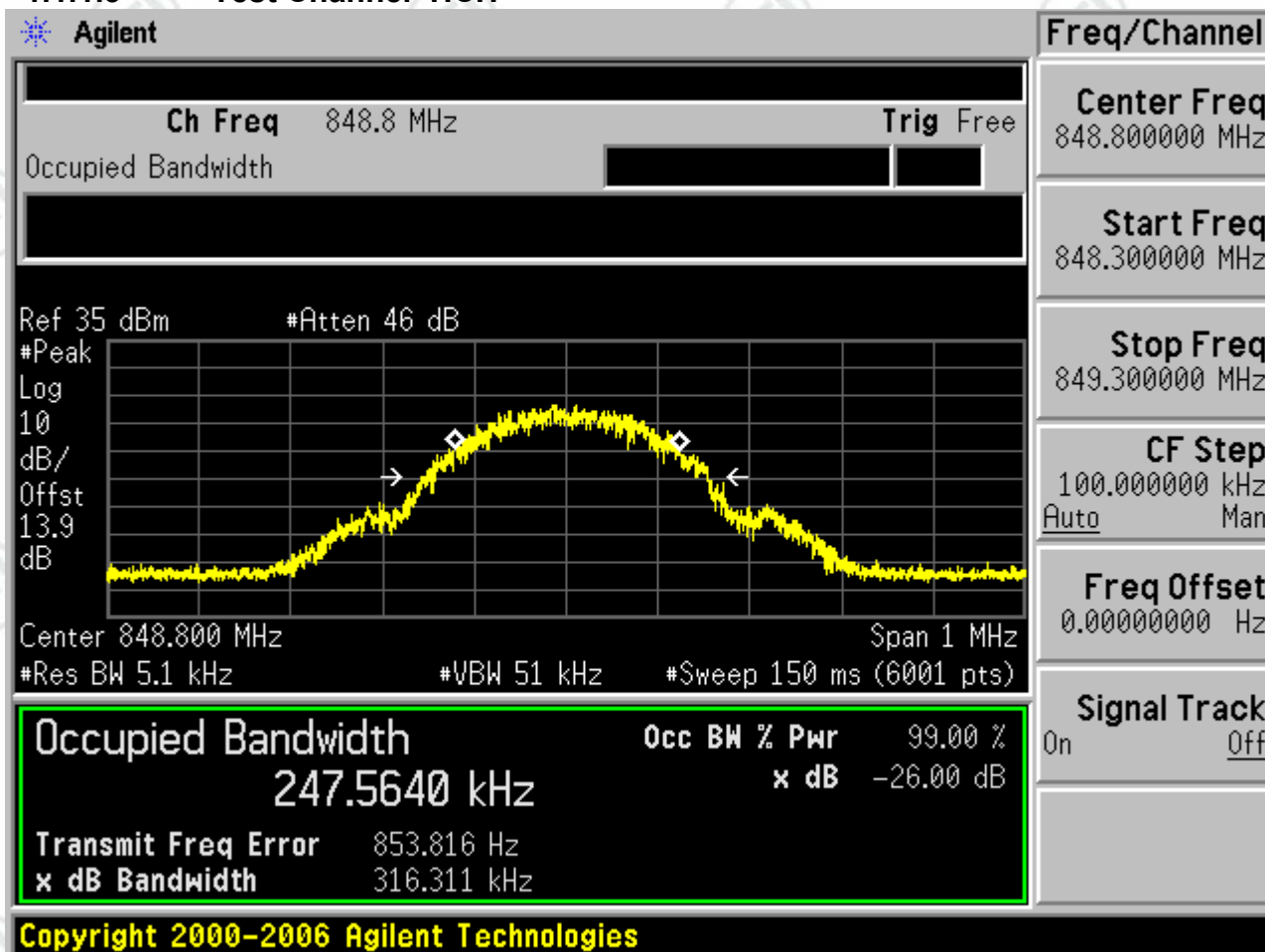
- 1 For GSM
1.1 Test Band=GSM850
1.1.1 Test Mode=GSM/TM1
1.1.1.1 Test Channel=LCH



1.1.1.2 Test Channel=MCH

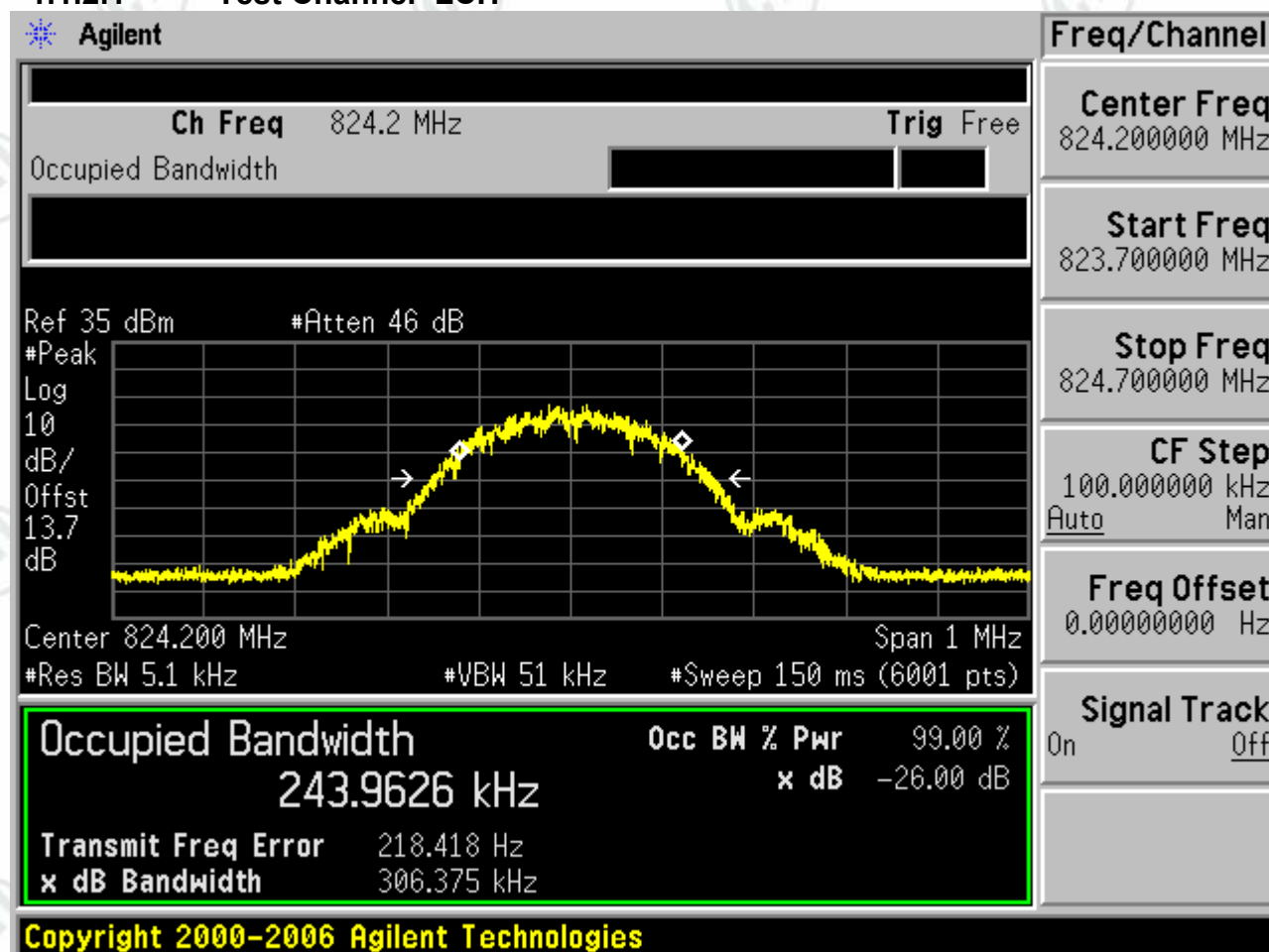


1.1.1.3 Test Channel=HCH

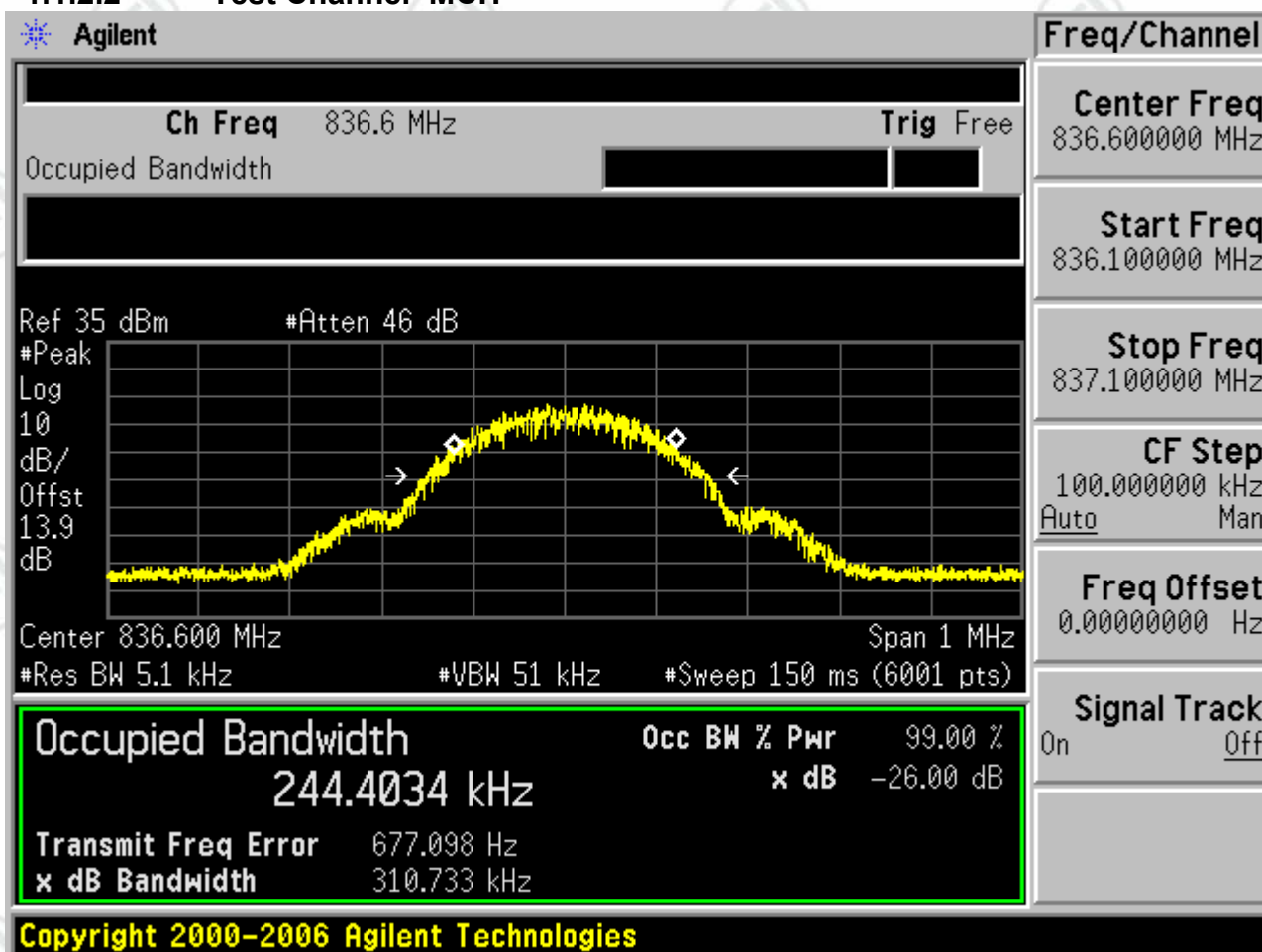


1.1.2 Test Mode=GSM/TM2

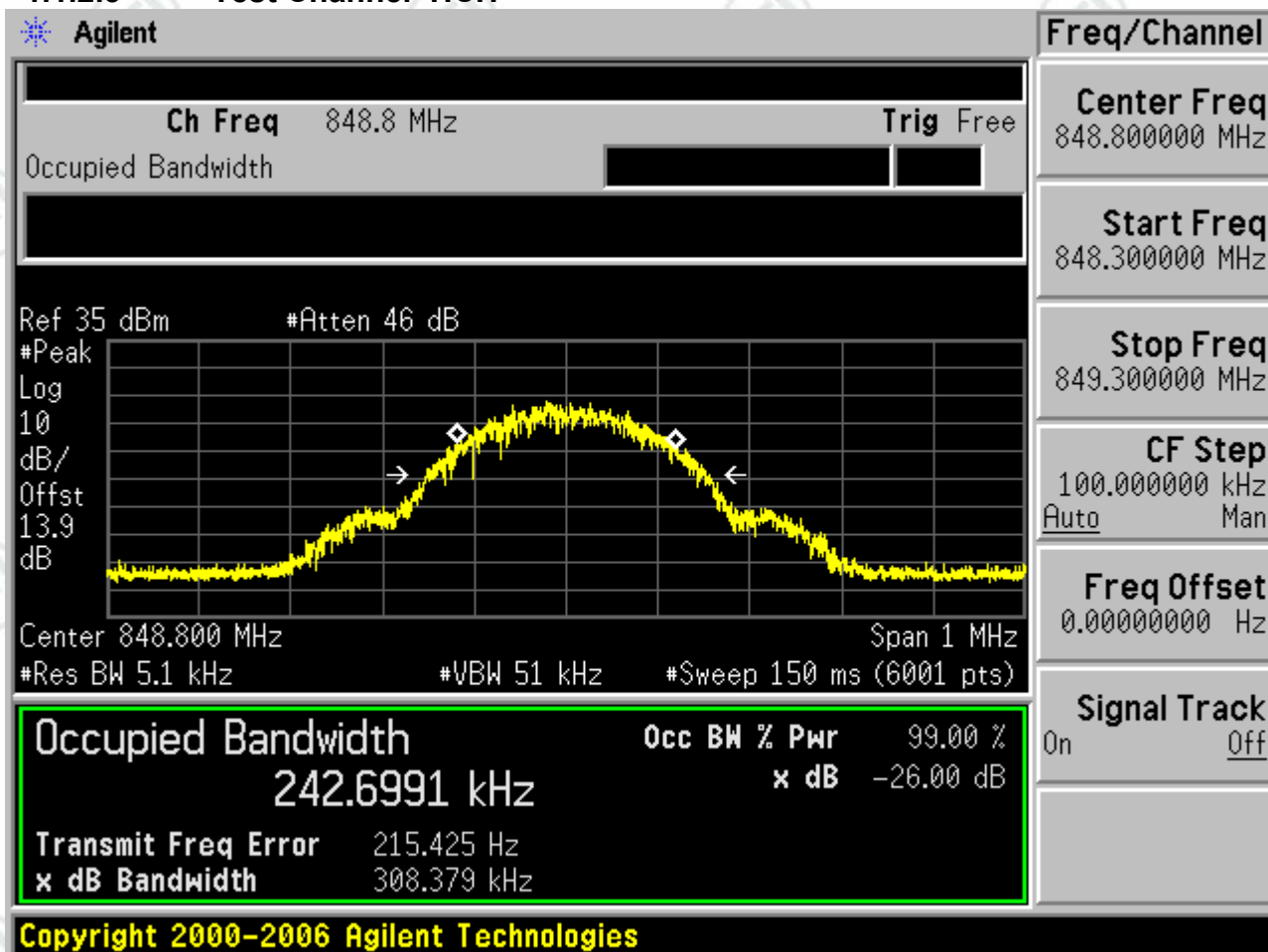
1.1.2.1 Test Channel=LCH



1.1.2.2 Test Channel=MCH

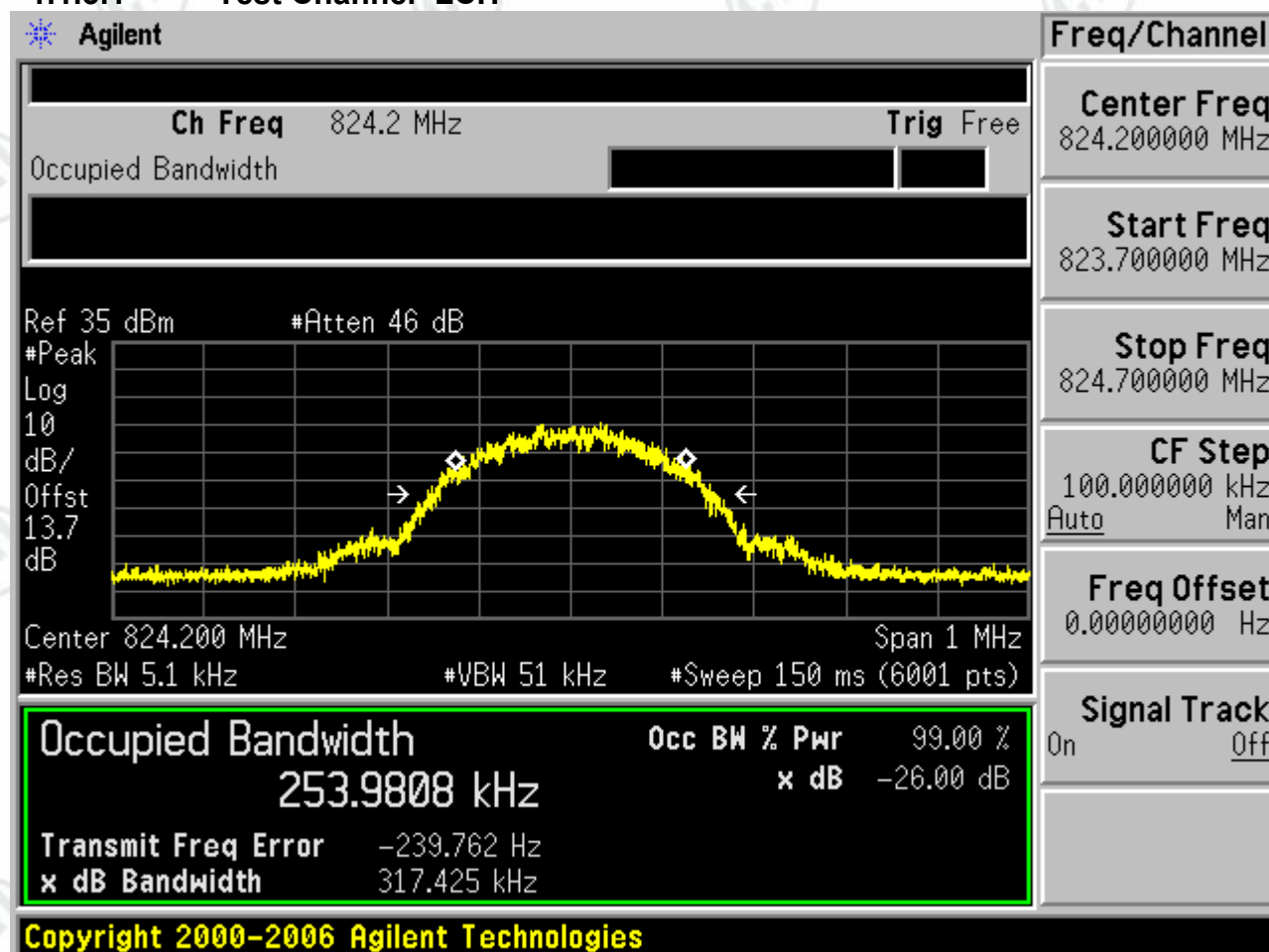


1.1.2.3 Test Channel=HCH

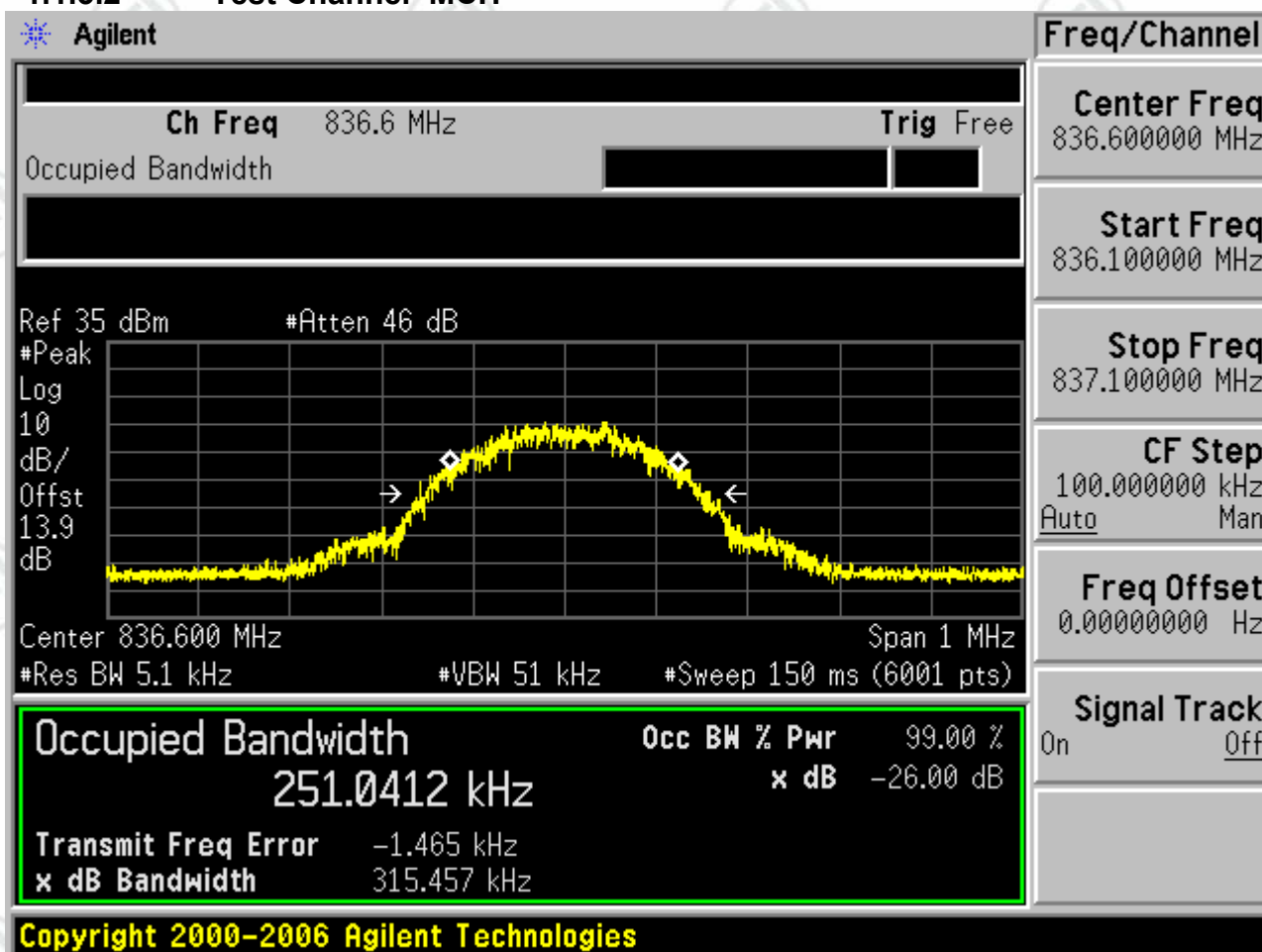


1.1.3 Test Mode=GSM/TM3

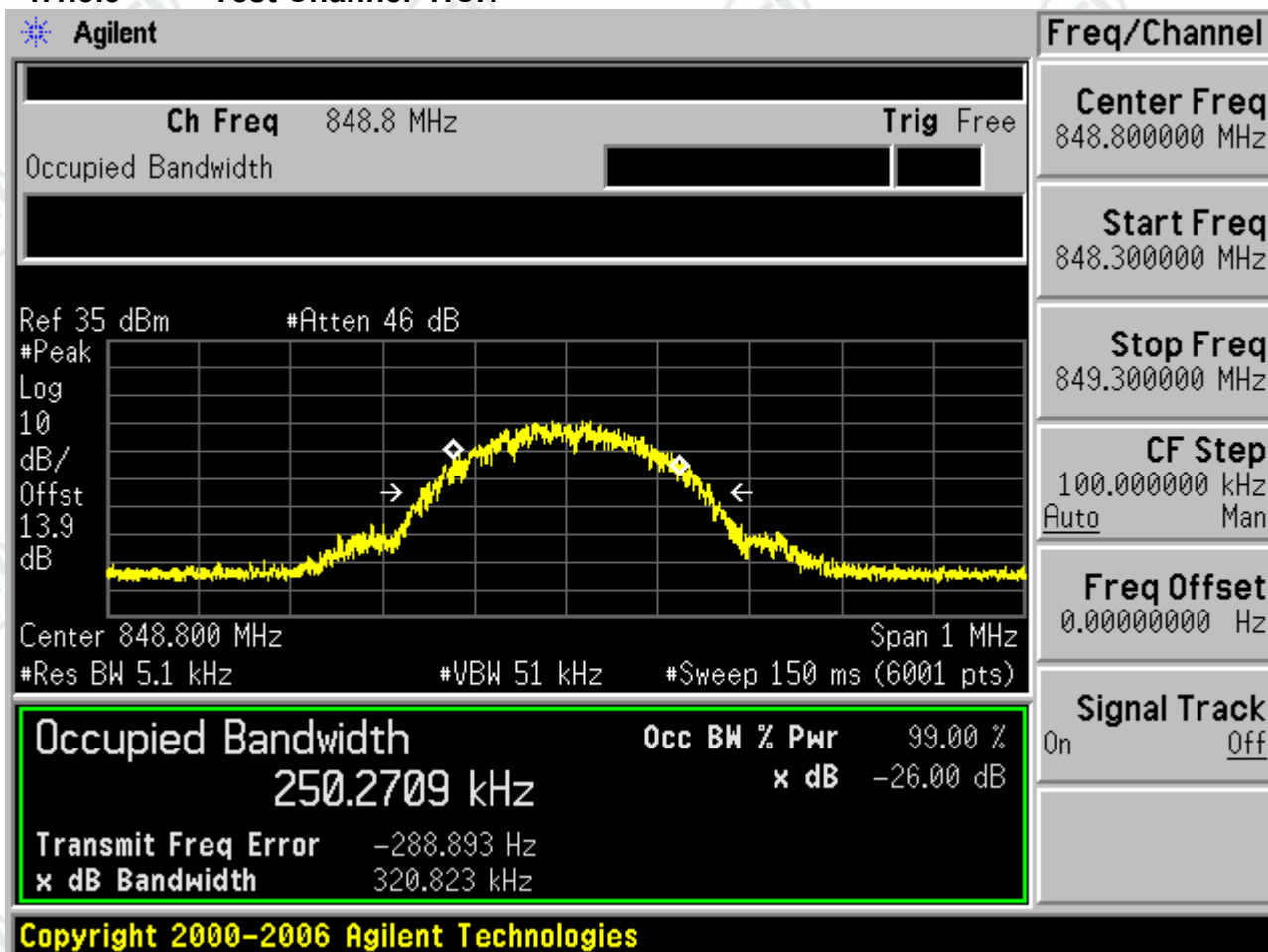
1.1.3.1 Test Channel=LCH



1.1.3.2 Test Channel=MCH



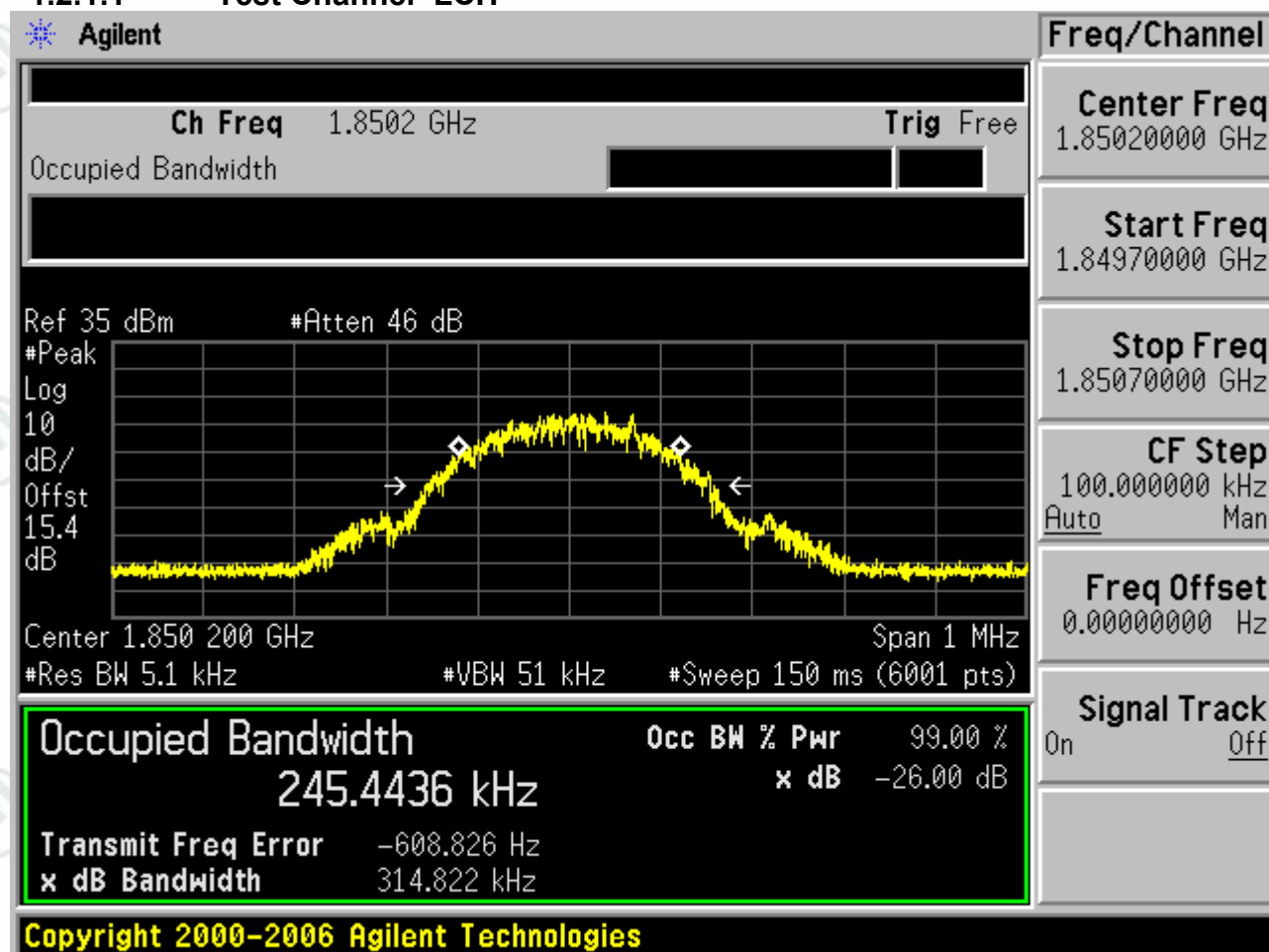
1.1.3.3 Test Channel=HCH



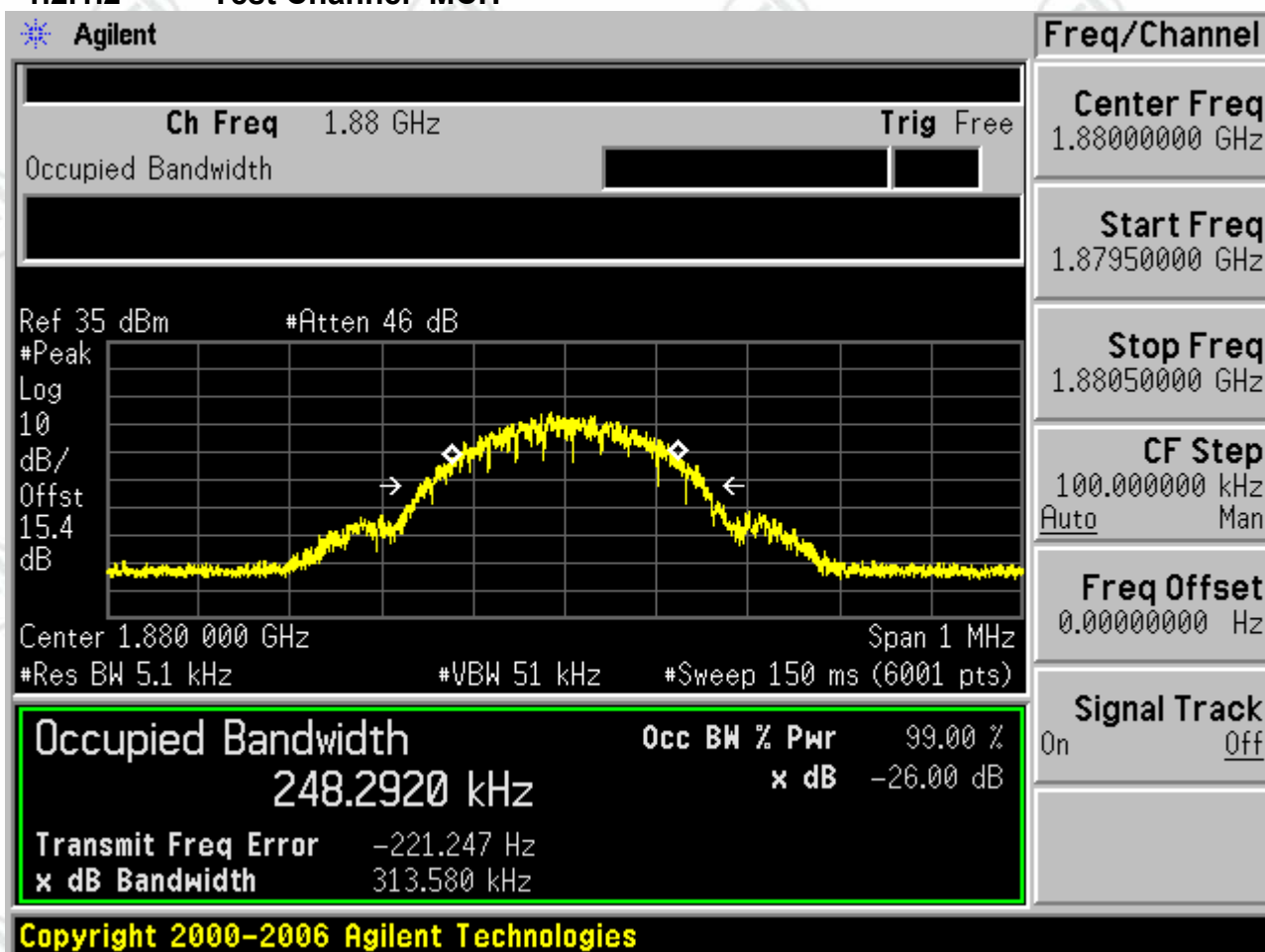
1.2 Test Band=GSM1900

1.2.1 Test Mode=GSM/TM1

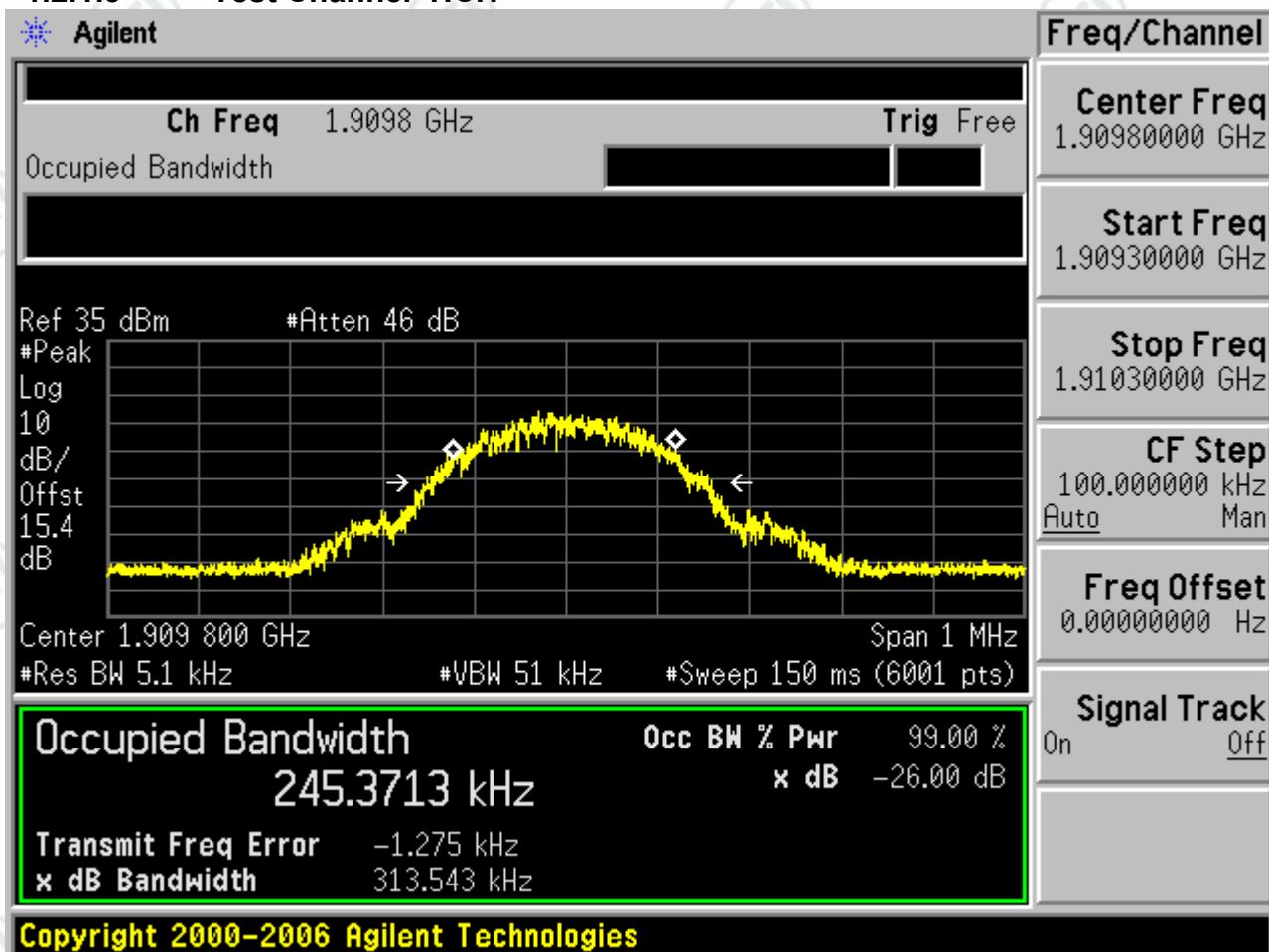
1.2.1.1 Test Channel=LCH



1.2.1.2 Test Channel=MCH

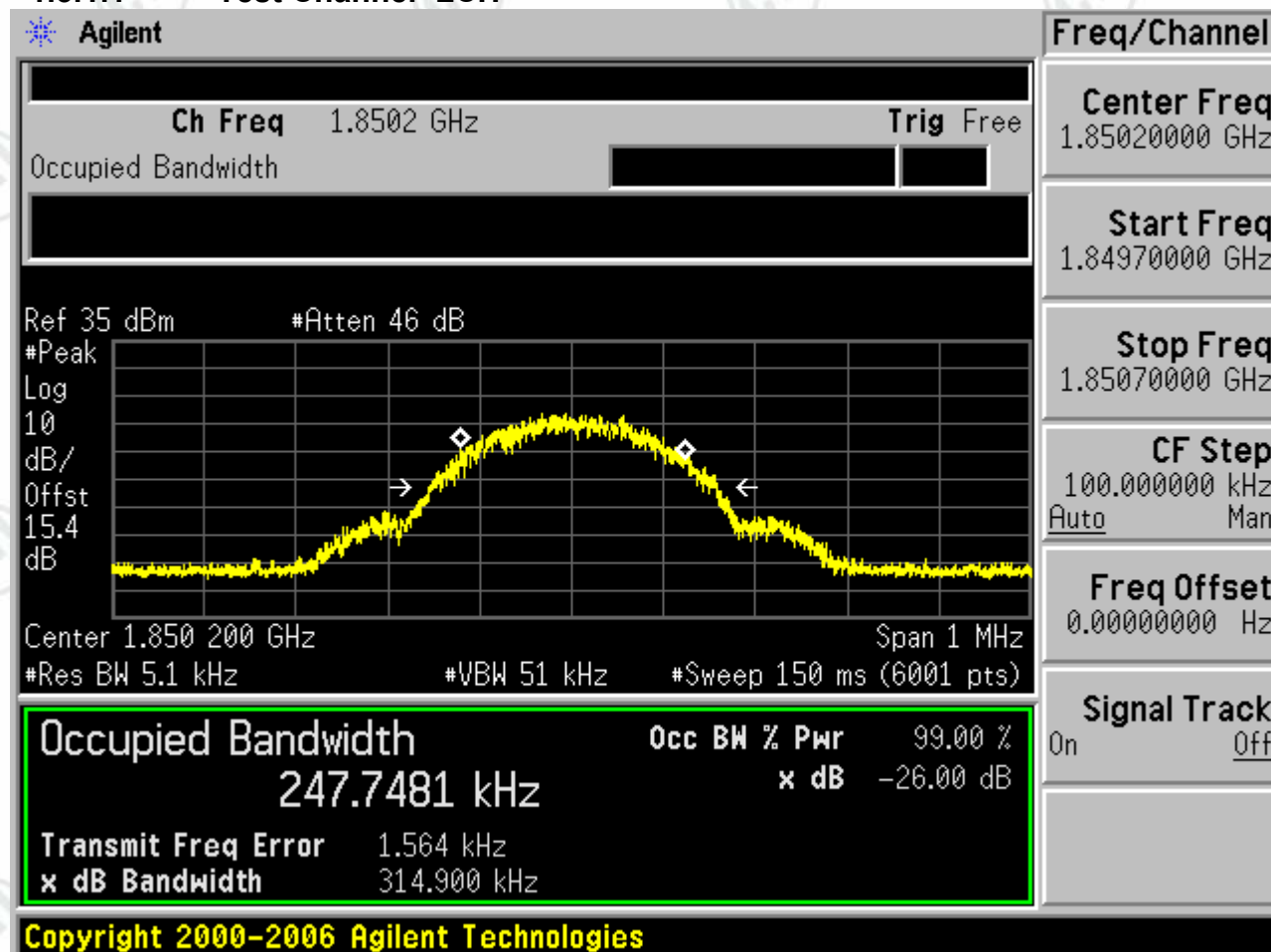


1.2.1.3 Test Channel=HCH

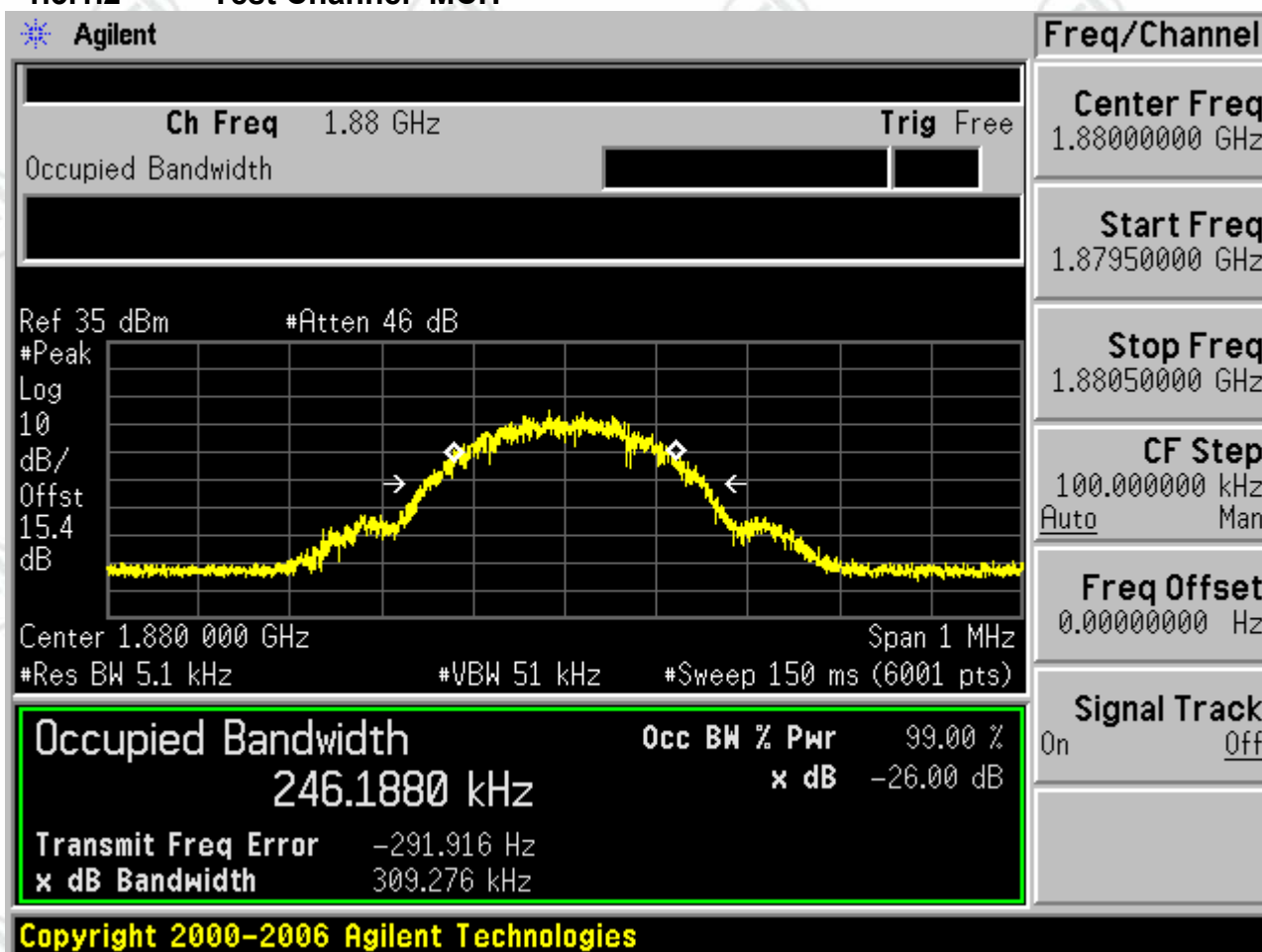


1.3 Test Mode=GSM/TM2

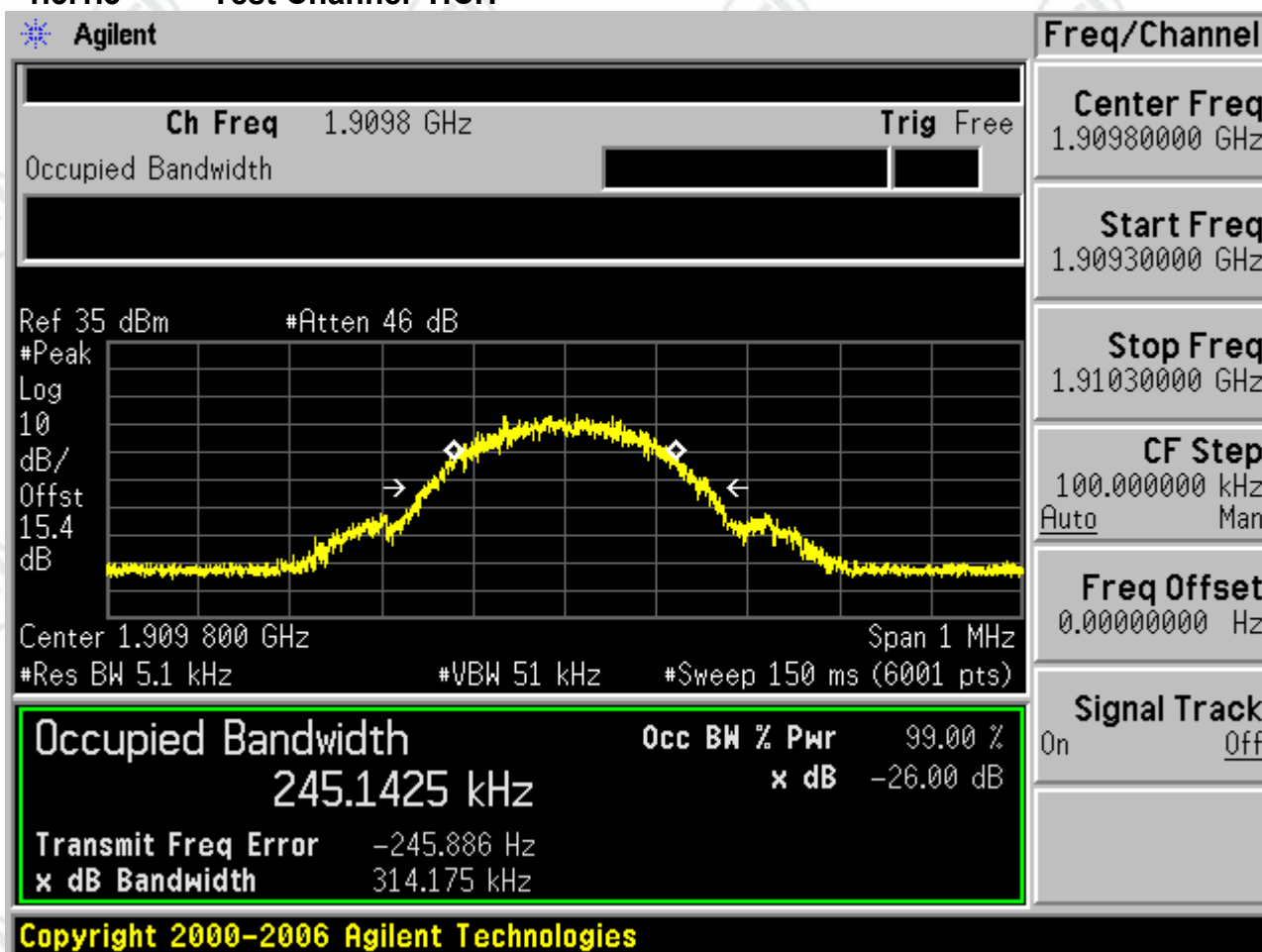
1.3.1.1 Test Channel=LCH



1.3.1.2 Test Channel=MCH

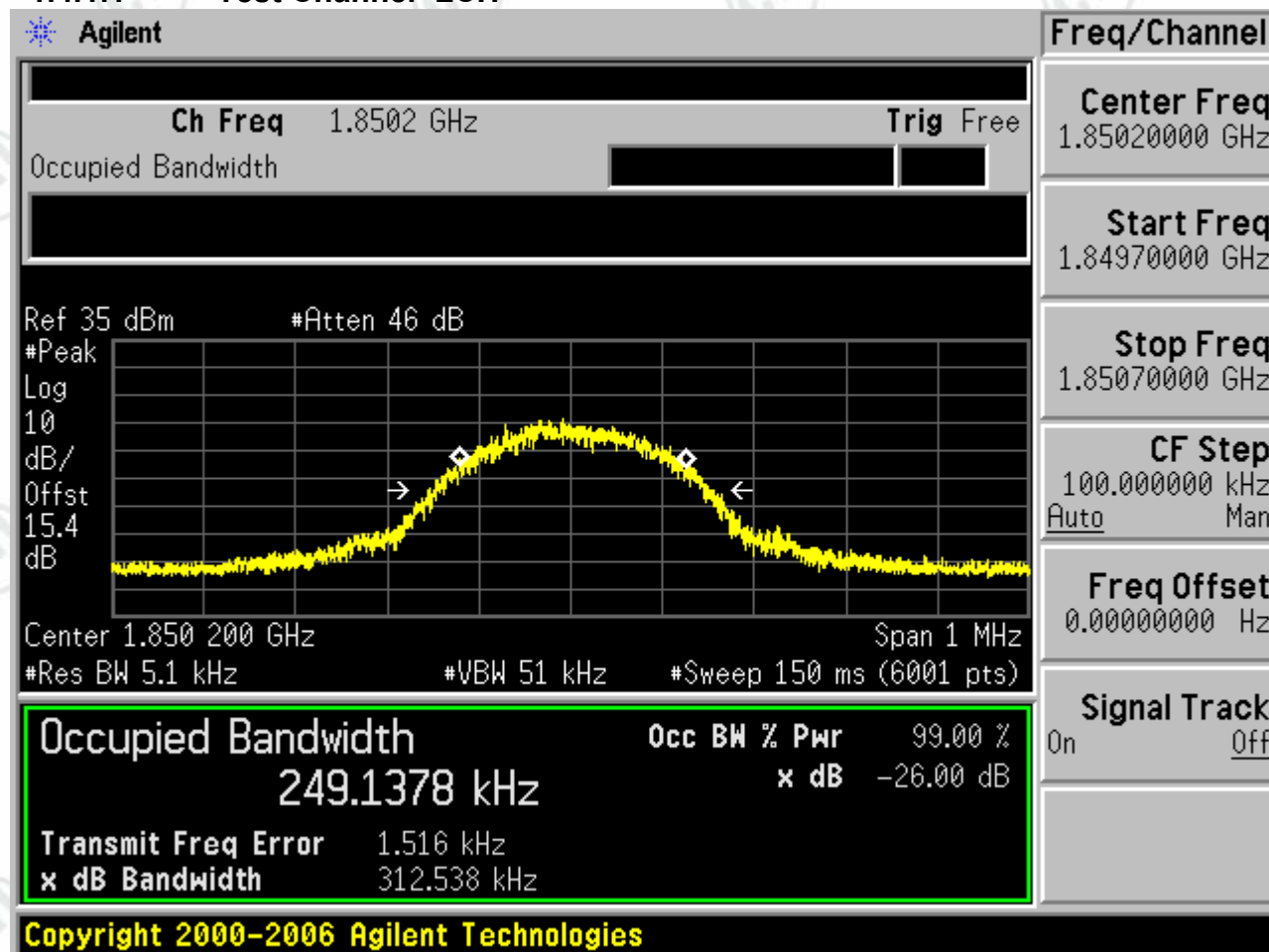


1.3.1.3 Test Channel=HCH

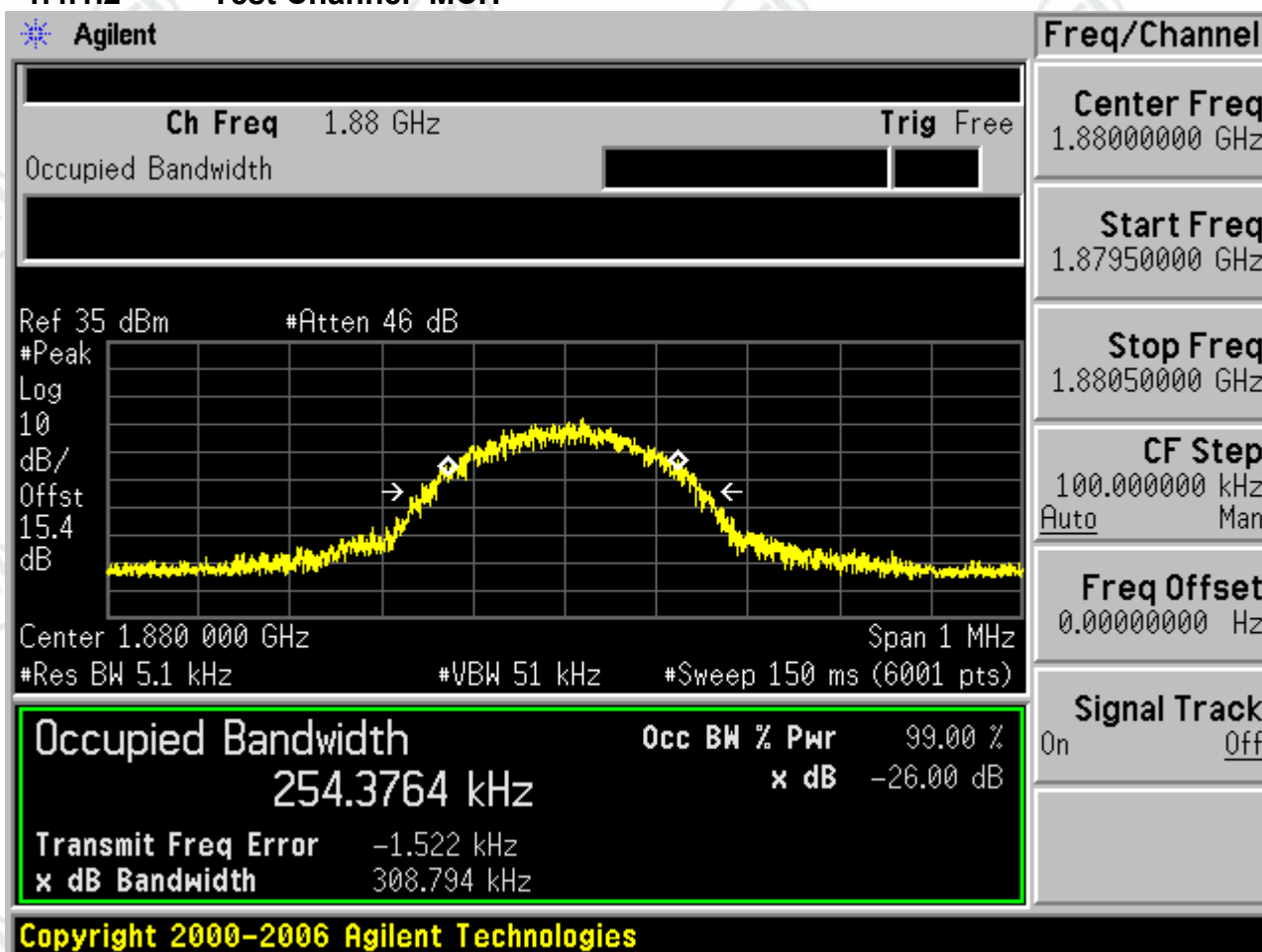


1.4 Test Mode=GSM/TM3

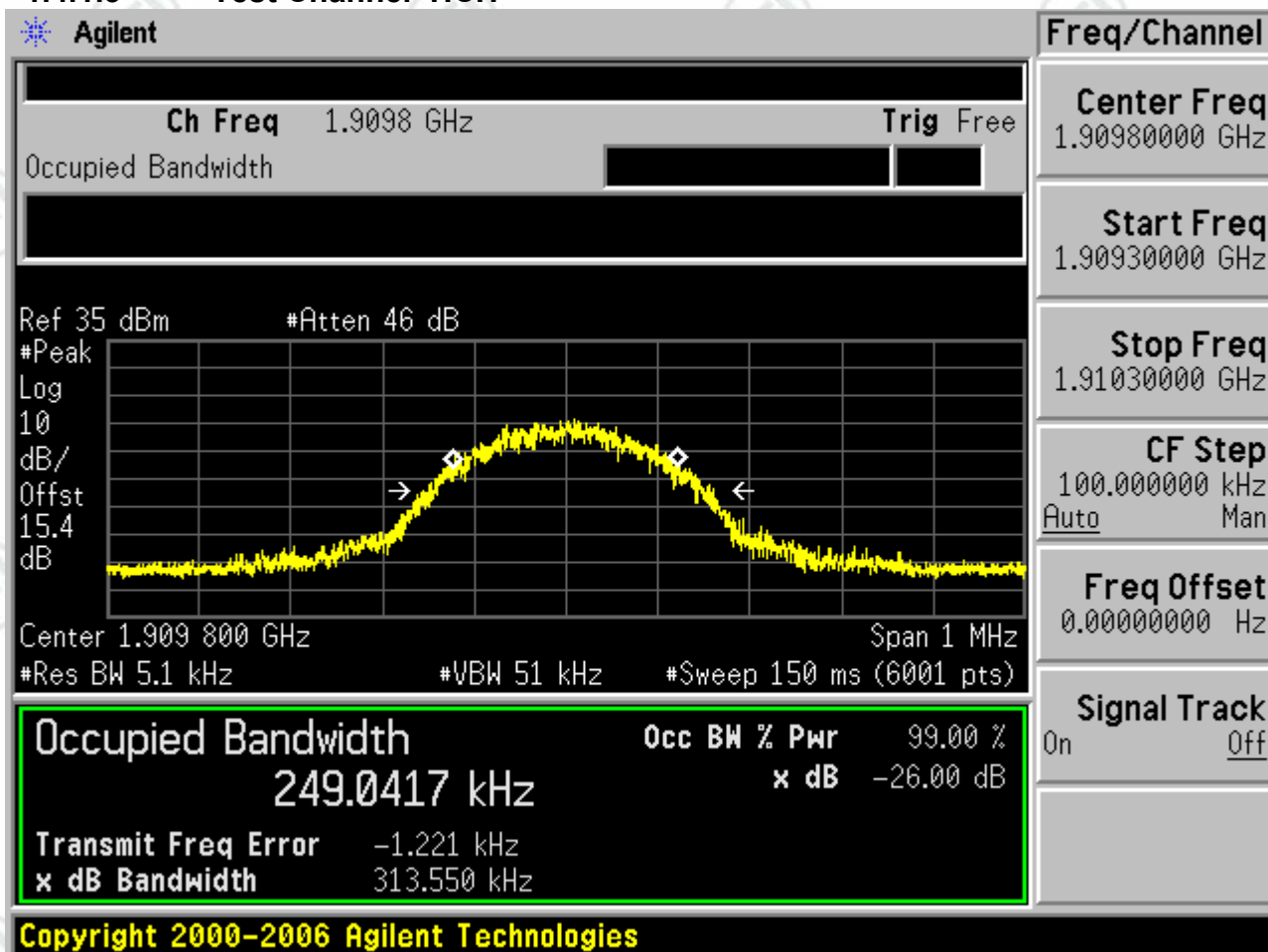
1.4.1.1 Test Channel=LCH



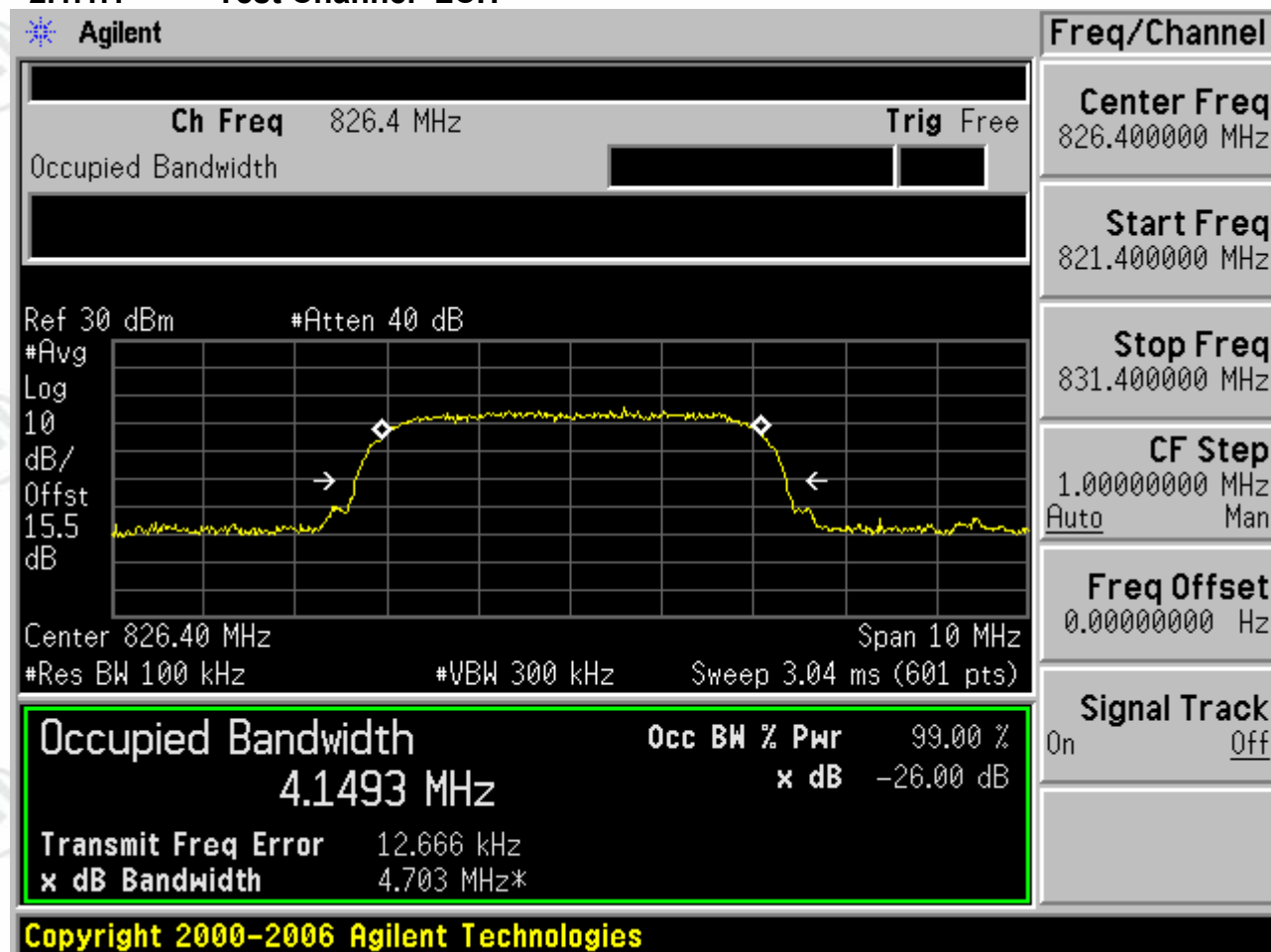
1.4.1.2 Test Channel=MCH



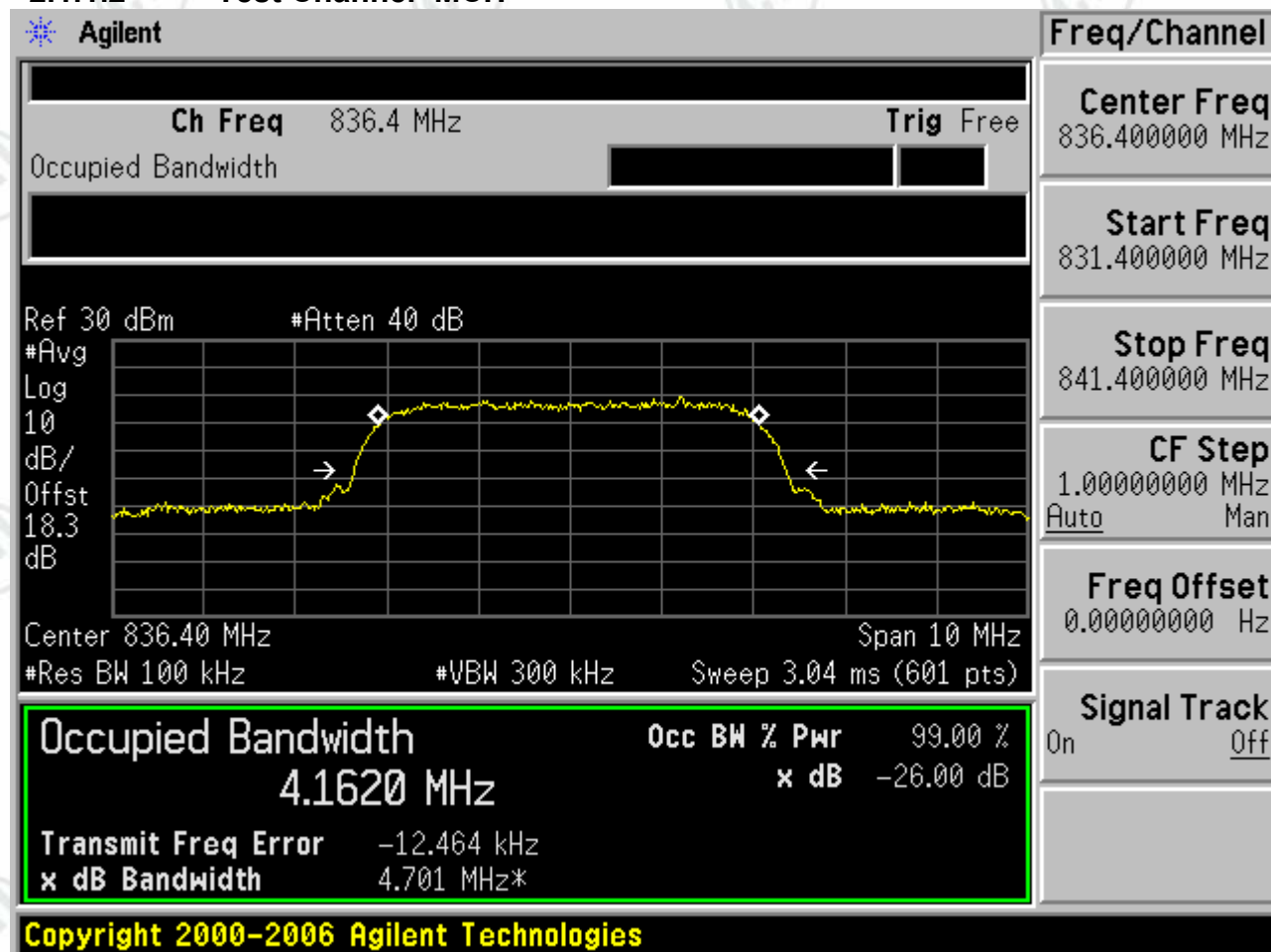
1.4.1.3 Test Channel=HCH



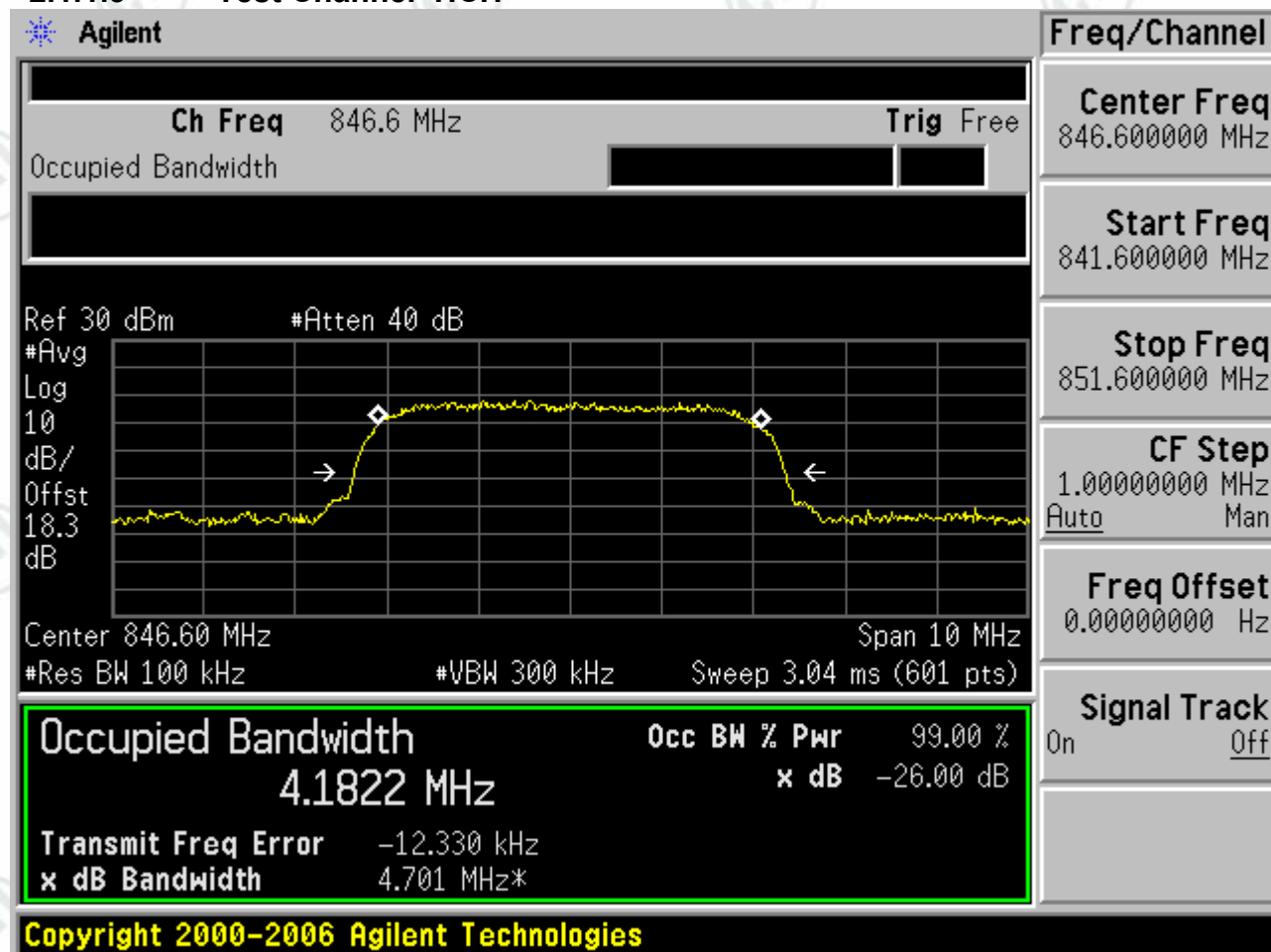
- 2 For WCDMA
2.1 Test Band=WCDMA850
2.1.1 Test Mode=UMTS/TM1
2.1.1.1 Test Channel=LCH



2.1.1.2 Test Channel=MCH



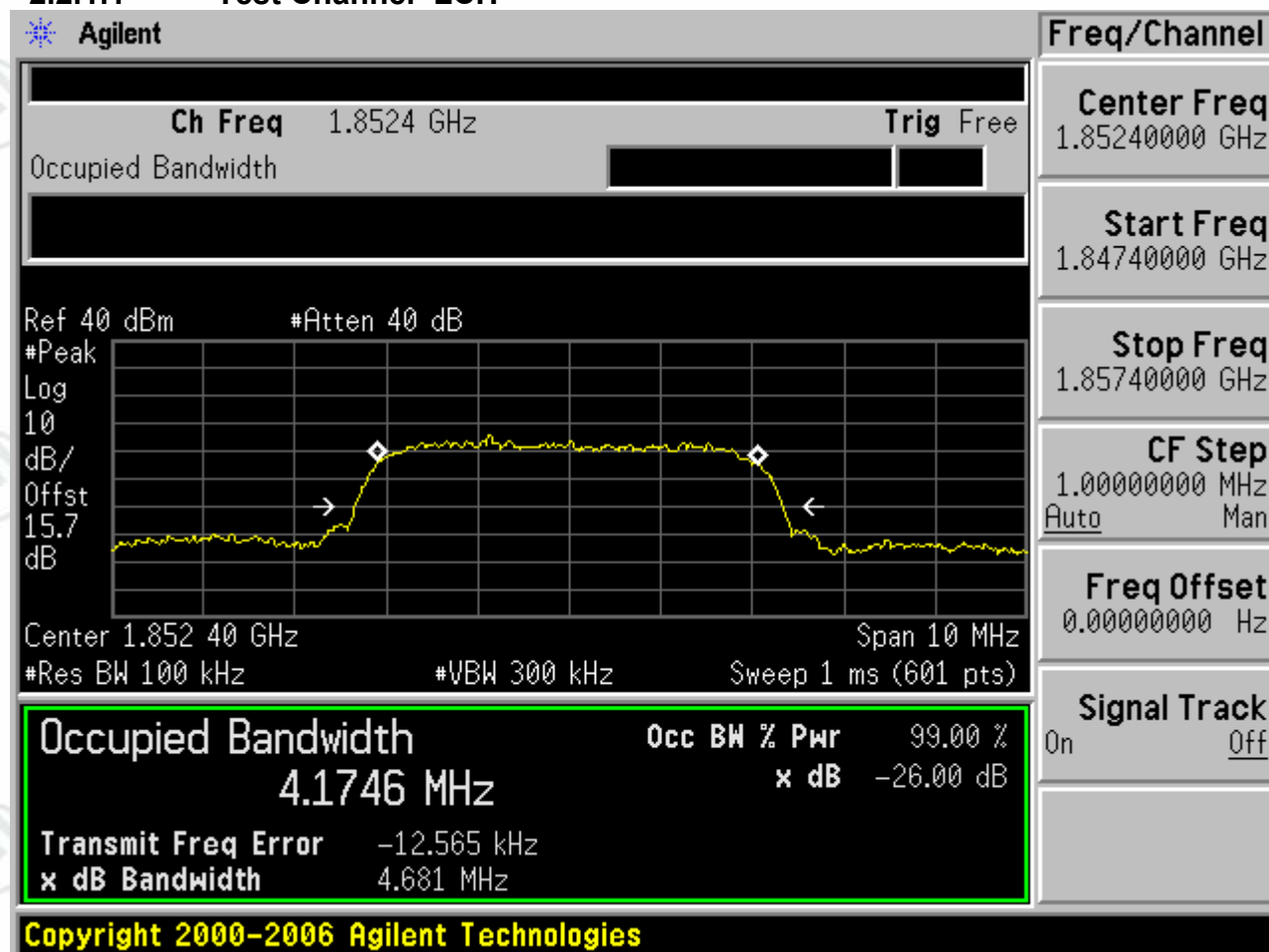
2.1.1.3 Test Channel=HCH



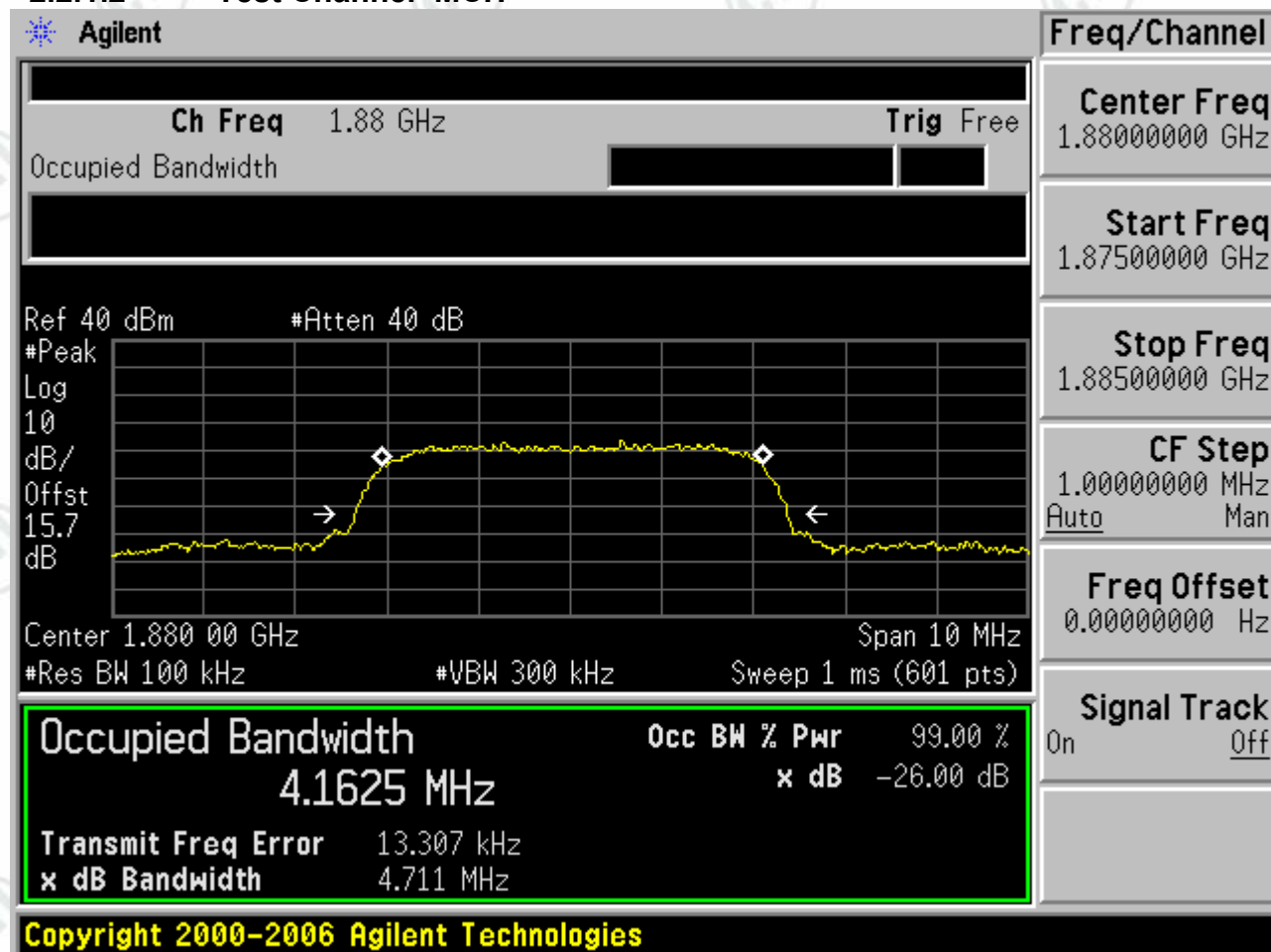
2.2 Test Band=WCDMA1900

2.2.1 Test Mode=UMTS/TM1

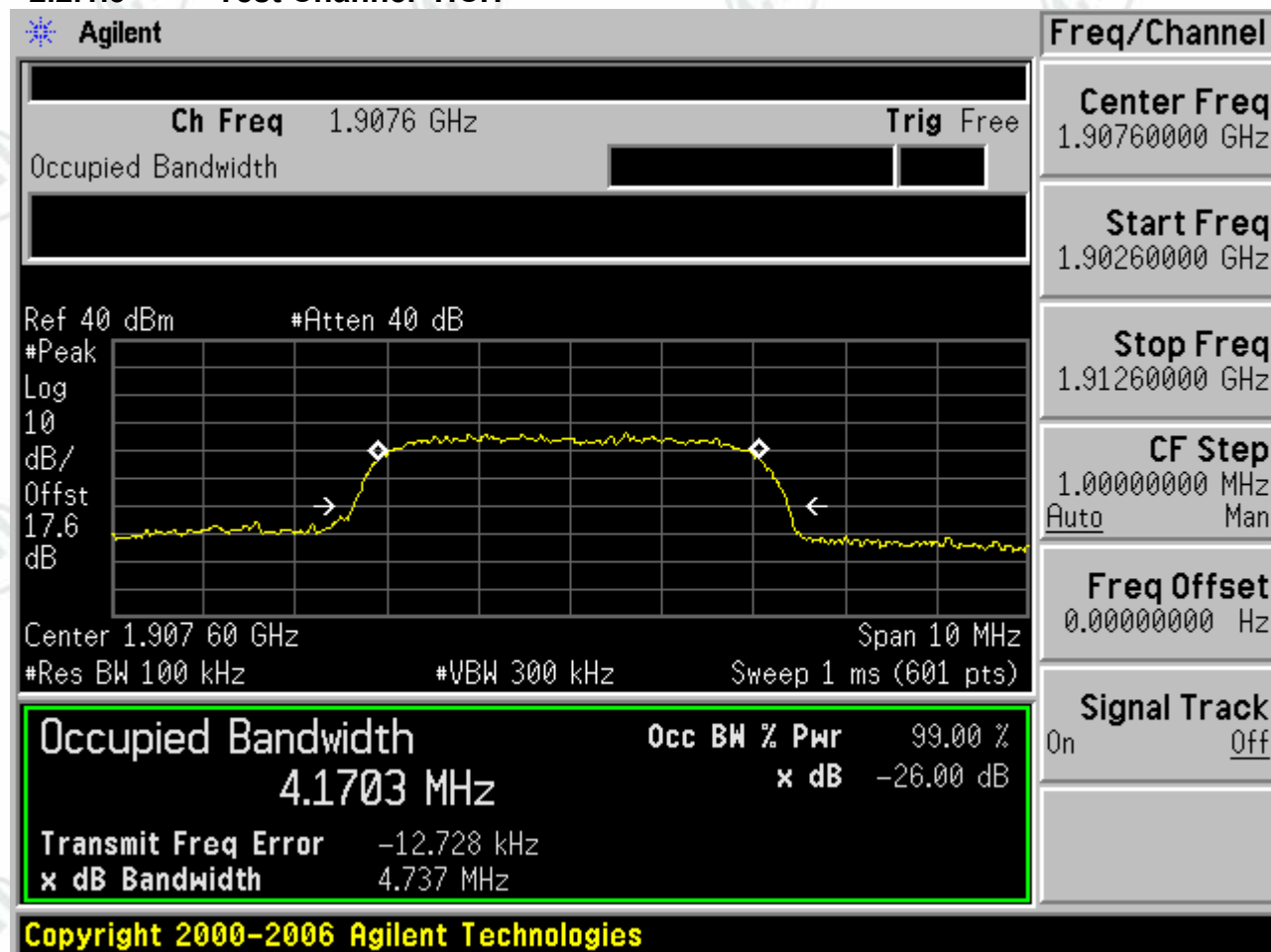
2.2.1.1 Test Channel=LCH



2.2.1.2 Test Channel=MCH



2.2.1.3 Test Channel=HCH



Appendix C) Peak-to-Average Ratio

Test Band	Test Mode	Test Channel	Measured (dbm)	Limit (dbm)	Verdict
GSM850	GSM/TM1	LCH	2.72	13	PASS
		MCH	9.19	13	PASS
		HCH	8.96	13	PASS
	GSM/TM2	LCH	3.14	13	PASS
		MCH	10.38	13	PASS
		HCH	10.46	13	PASS
	GSM/TM3	LCH	8.66	13	PASS
		MCH	11.34	13	PASS
		HCH	12.34	13	PASS

Test Band	Test Mode	Test Channel	Measured (dbm)	Limit (dbm)	Verdict
GSM1900	GSM/TM1	LCH	3.94	13	PASS
		MCH	9.8	13	PASS
		HCH	9.8	13	PASS
	GSM/TM2	LCH	2.85	13	PASS
		MCH	9.47	13	PASS
		HCH	9.1	13	PASS
	GSM/TM3	LCH	5.76	13	PASS
		MCH	11.08	13	PASS
		HCH	12.05	13	PASS

Test Band	Test Mode	Test Channel	Measured(db)	Limit (db)	Verdict
WCDMA850	UMTS/TM1	LCH	3.20	13	PASS
		MCH	3.46	13	PASS
		HCH	3.11	13	PASS

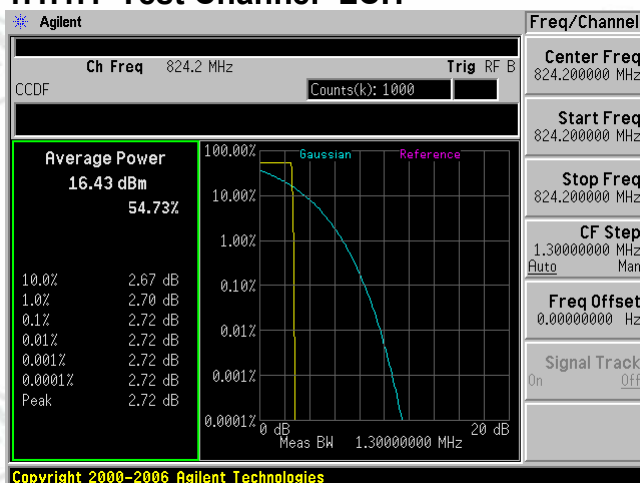
Test Band	Test Mode	Test Channel	Measured(db)	Limit (db)	Verdict
WCDMA1900	UMTS/TM1	LCH	3.27	13	PASS
		MCH	3.08	13	PASS
		HCH	2.69	13	PASS

1 For GSM

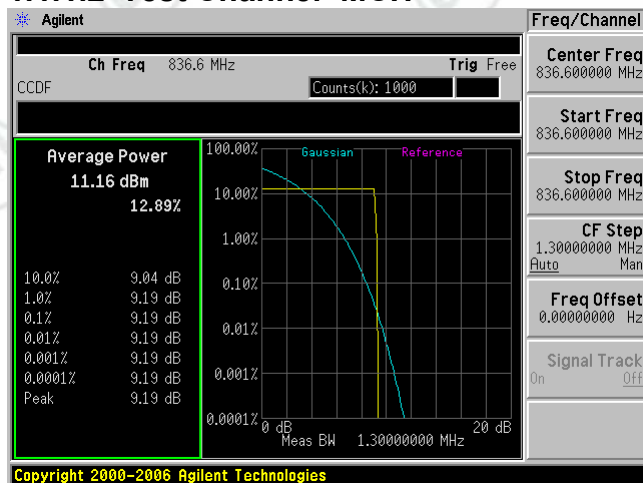
1.1 Test Band=GSM 850

1.1.1 Test Mode=UMTS/TM1

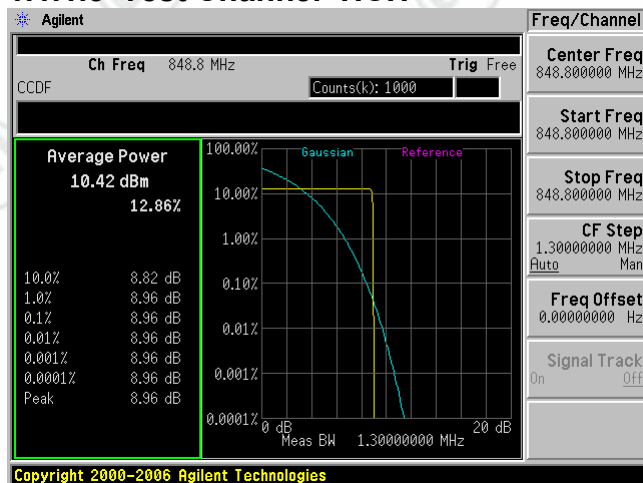
1.1.1.1 Test Channel=LCH



1.1.1.2 Test Channel=MCH

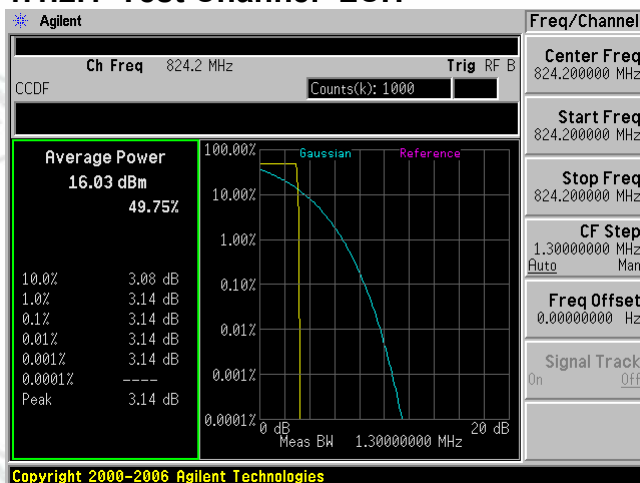


1.1.1.3 Test Channel=HCH

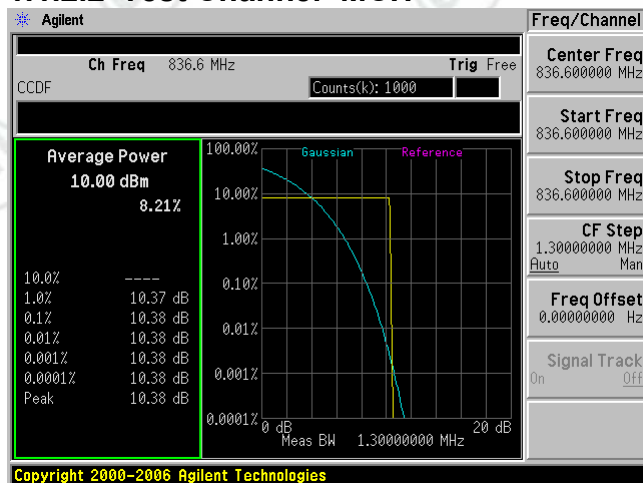


1.1.2 Test Mode=UMTS/TM2

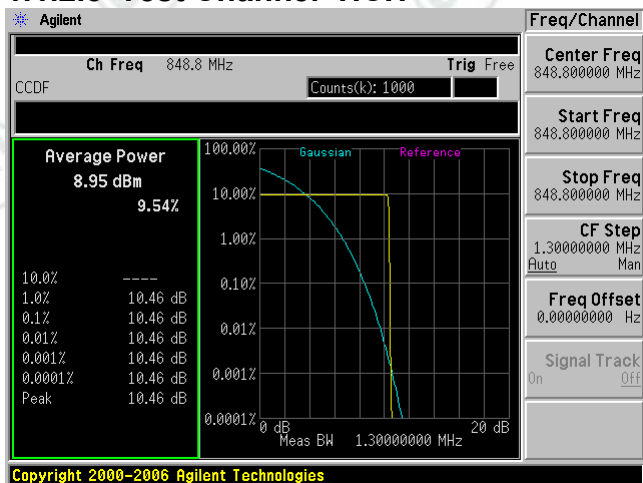
1.1.2.1 Test Channel=LCH



1.1.2.2 Test Channel=MCH



1.1.2.3 Test Channel=HCH

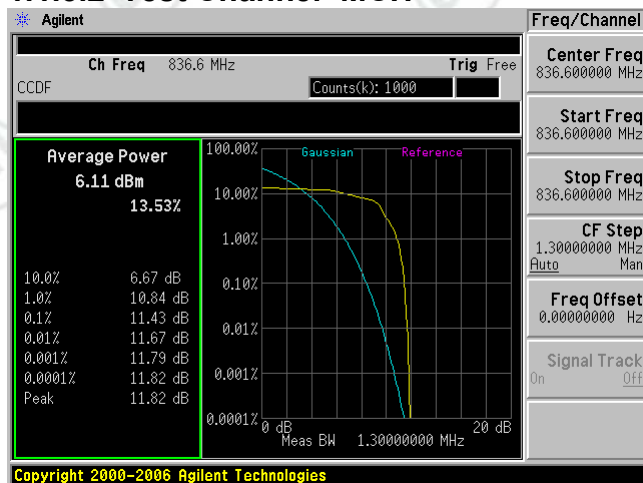


1.1.3 Test Mode=UMTS/TM3

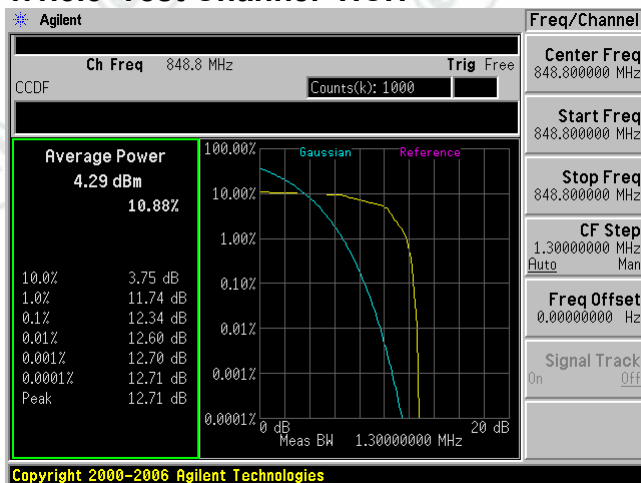
1.1.3.1 Test Channel=LCH



1.1.3.2 Test Channel=MCH



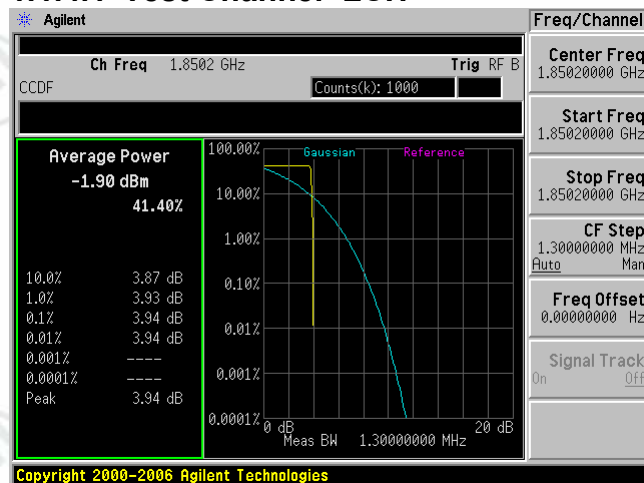
1.1.3.3 Test Channel=HCH



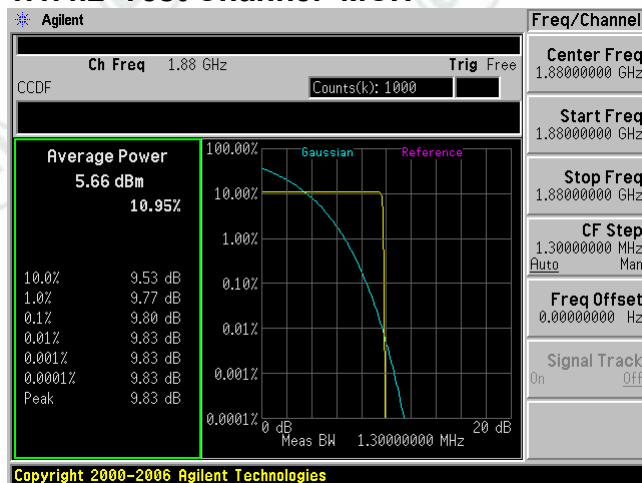
Test Band=GSM 1900

1.1.4 Test Mode=UMTS/TM1

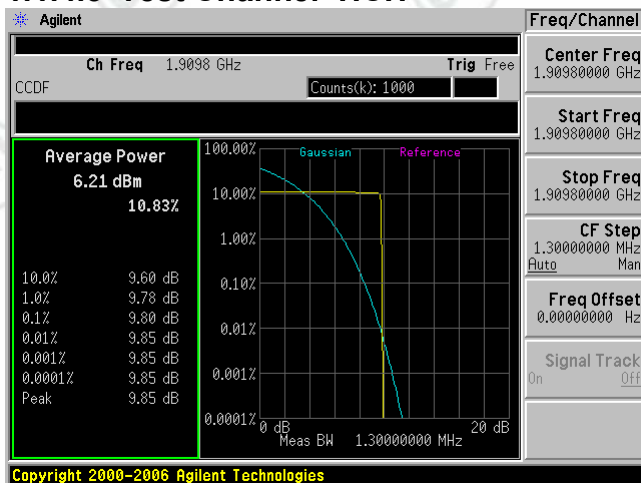
1.1.4.1 Test Channel=LCH



1.1.4.2 Test Channel=MCH

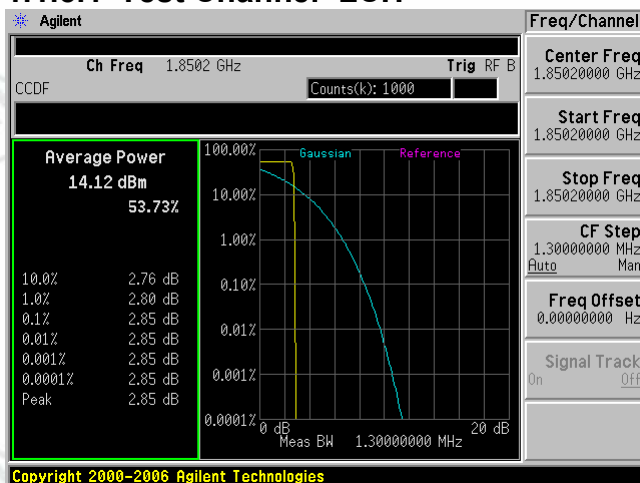


1.1.4.3 Test Channel=HCH

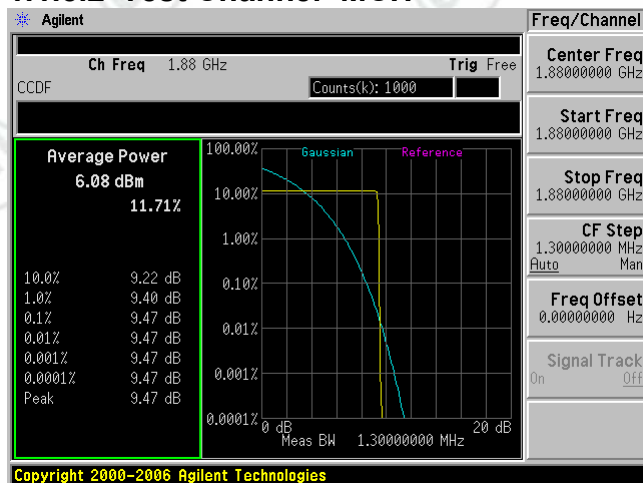


1.1.5 Test Mode=UMTS/TM2

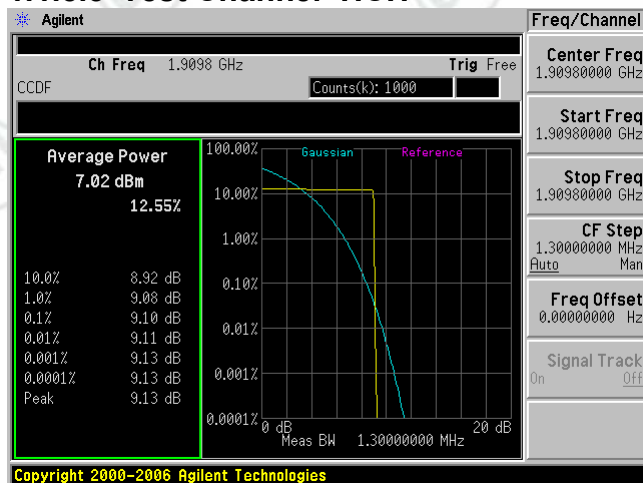
1.1.5.1 Test Channel=LCH



1.1.5.2 Test Channel=MCH

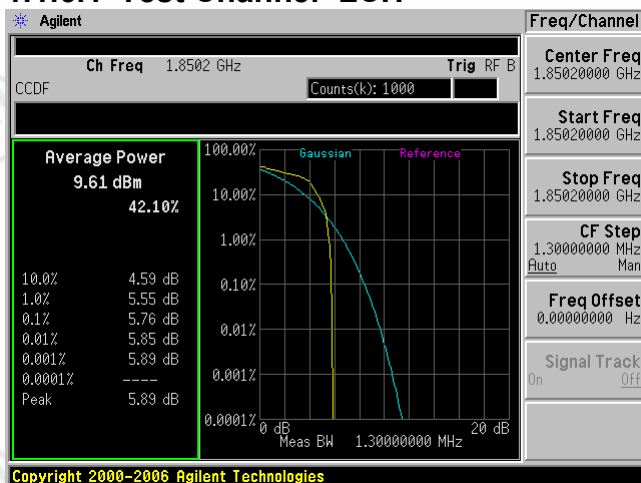


1.1.5.3 Test Channel=HCH

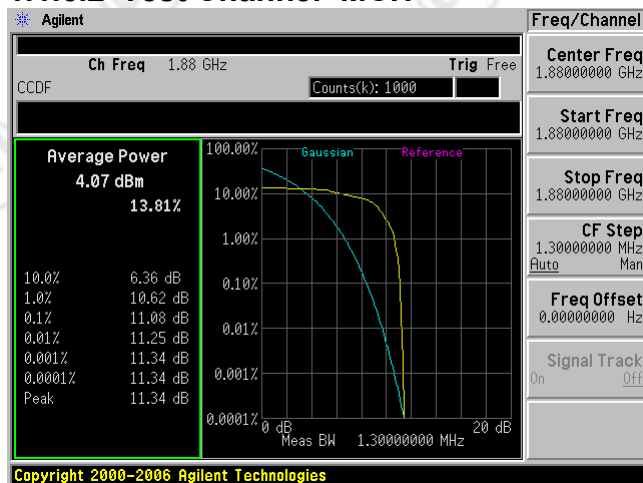


1.1.6 Test Mode=UMTS/TM3

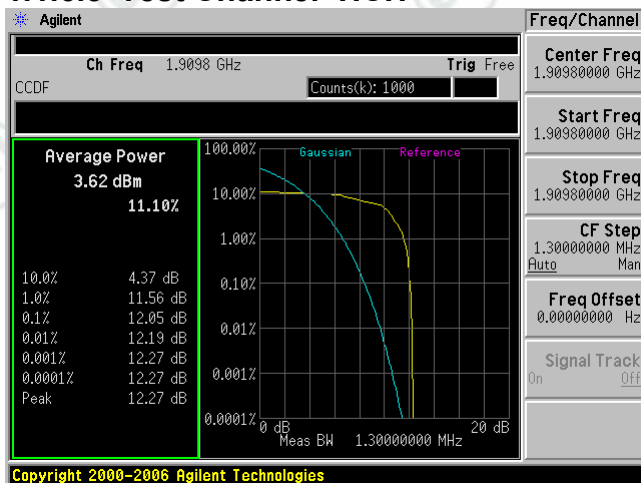
1.1.6.1 Test Channel=LCH



1.1.6.2 Test Channel=MCH



1.1.6.3 Test Channel=HCH

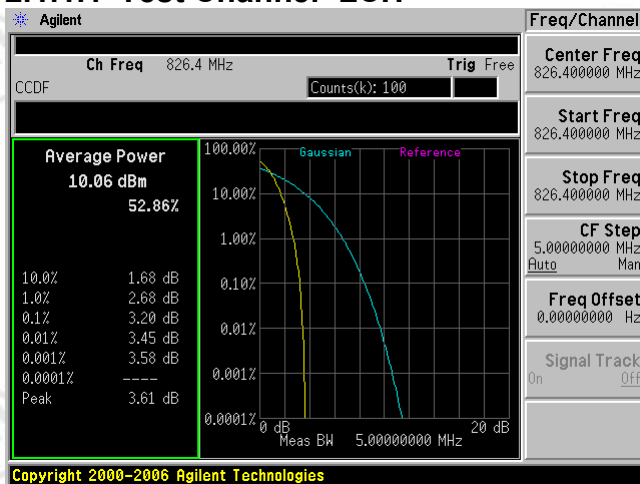


2 For WCDMA

2.1 Test Band=WCDMA 850

2.1.1 Test Mode=UMTS/TM1

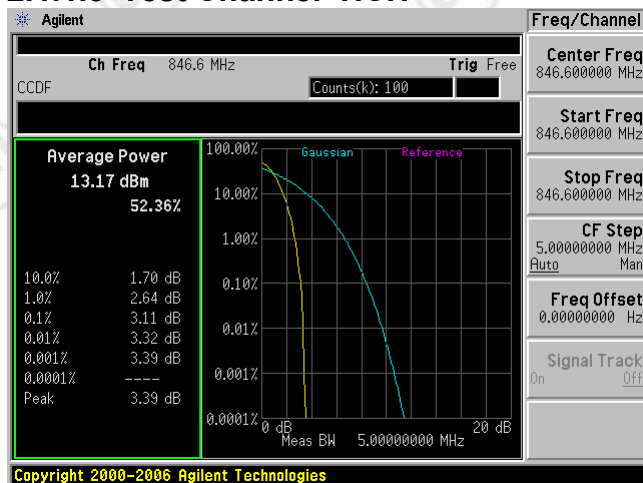
2.1.1.1 Test Channel=LCH



2.1.1.2 Test Channel=MCH



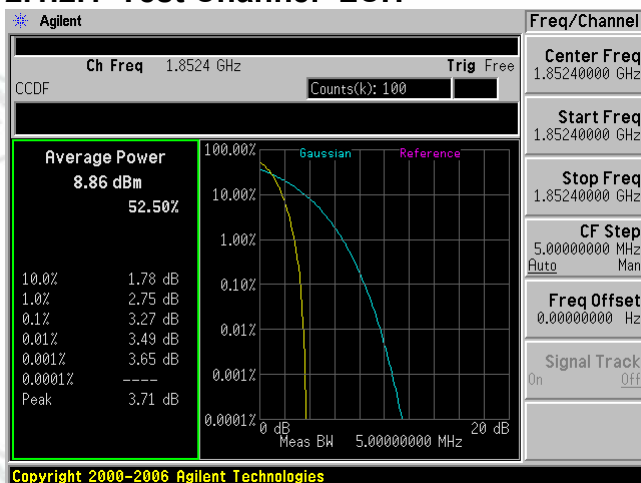
2.1.1.3 Test Channel=HCH



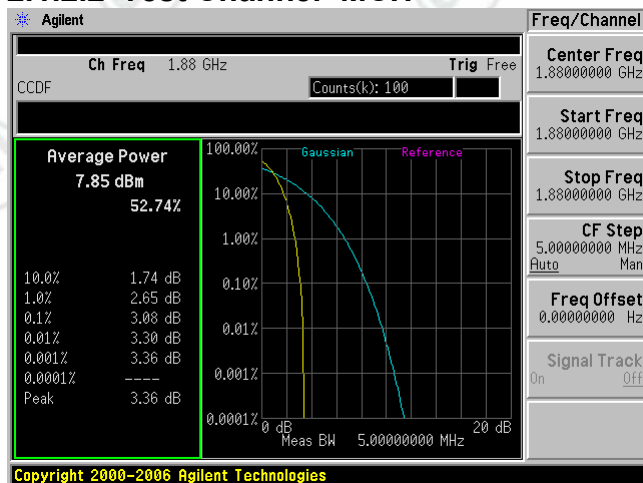
Test Band=WCDMA 1900

2.1.2 Test Mode=UMTS/TM1

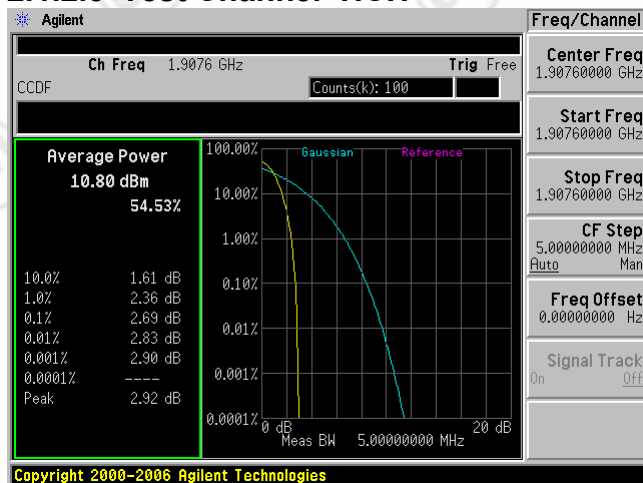
2.1.2.1 Test Channel=LCH



2.1.2.2 Test Channel=MCH

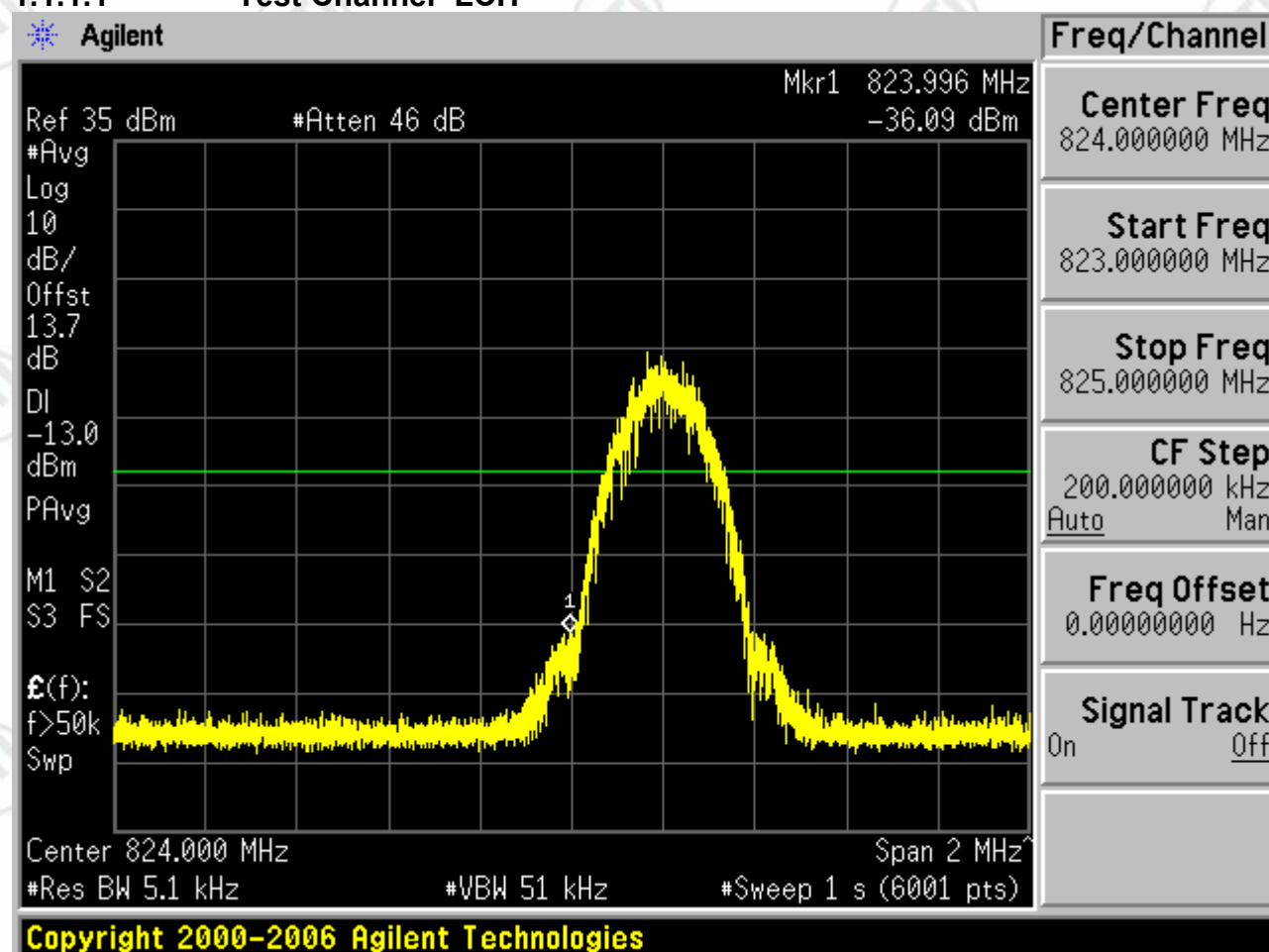


2.1.2.3 Test Channel=HCH

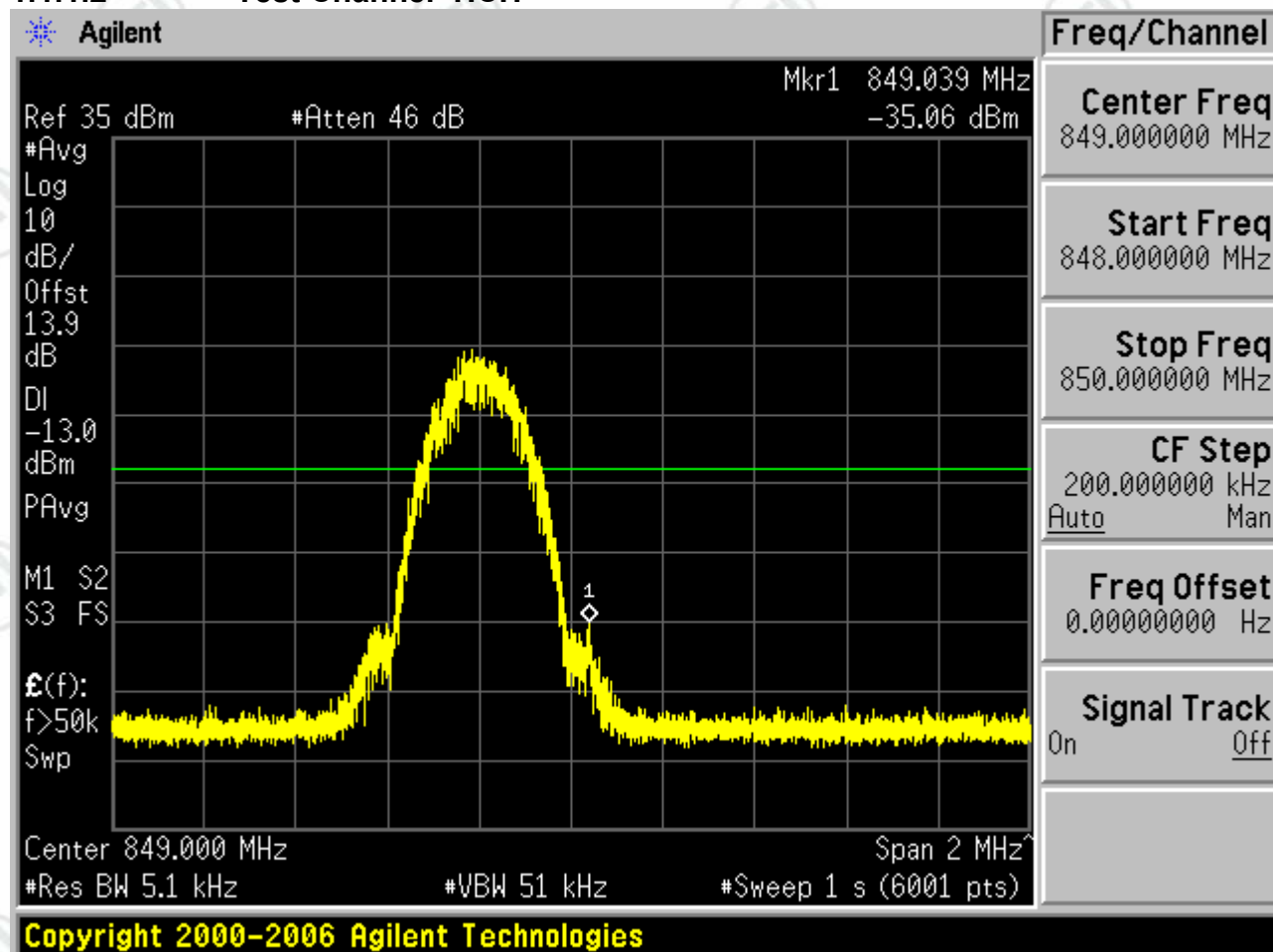


Appendix D) Band Edges Compliance

1 For GSM
1.1 Test Band=GSM850
1.1.1 Test Mode=GSM/TM1
1.1.1.1 Test Channel=LCH

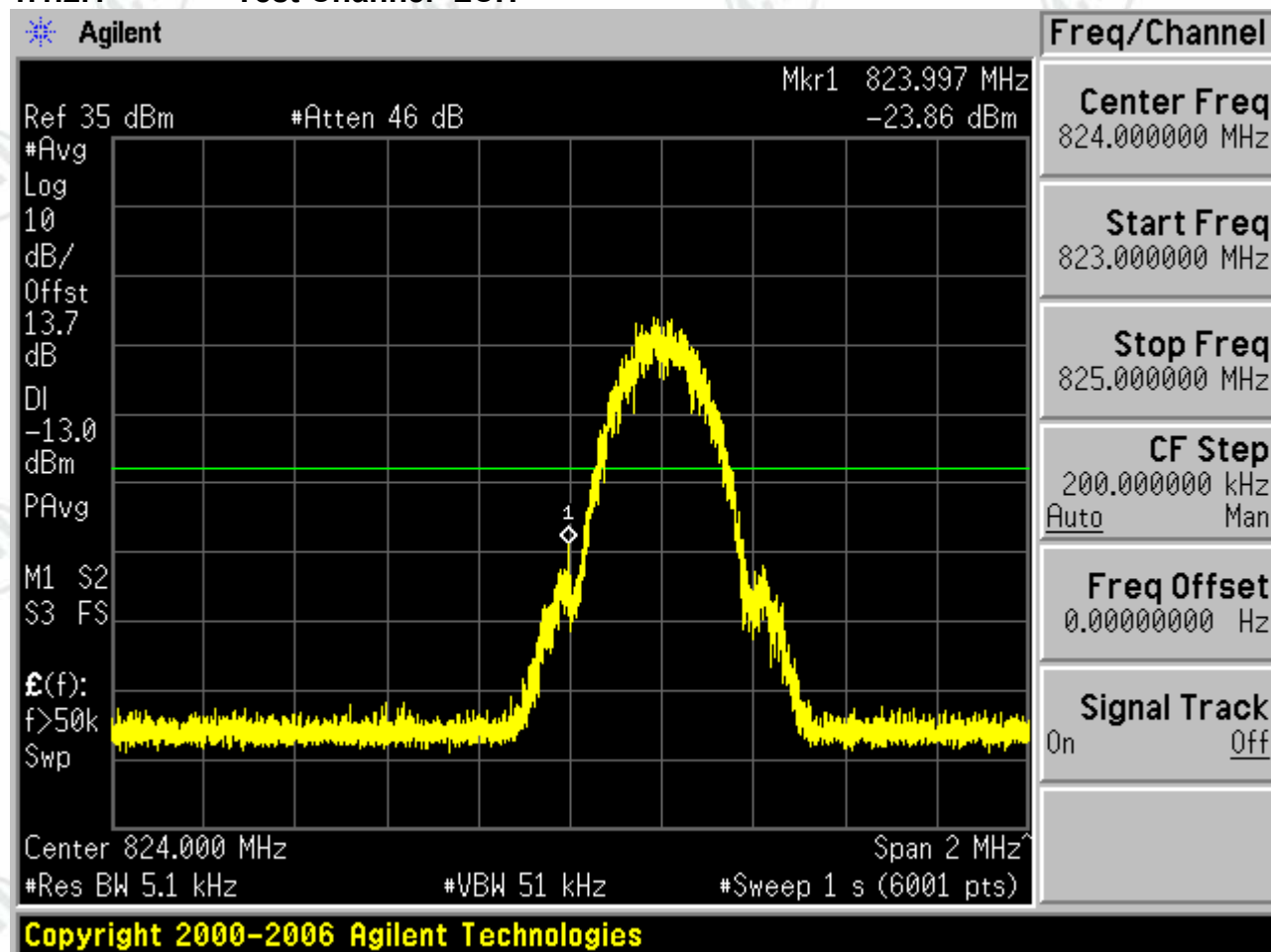


1.1.1.2 Test Channel=HCH

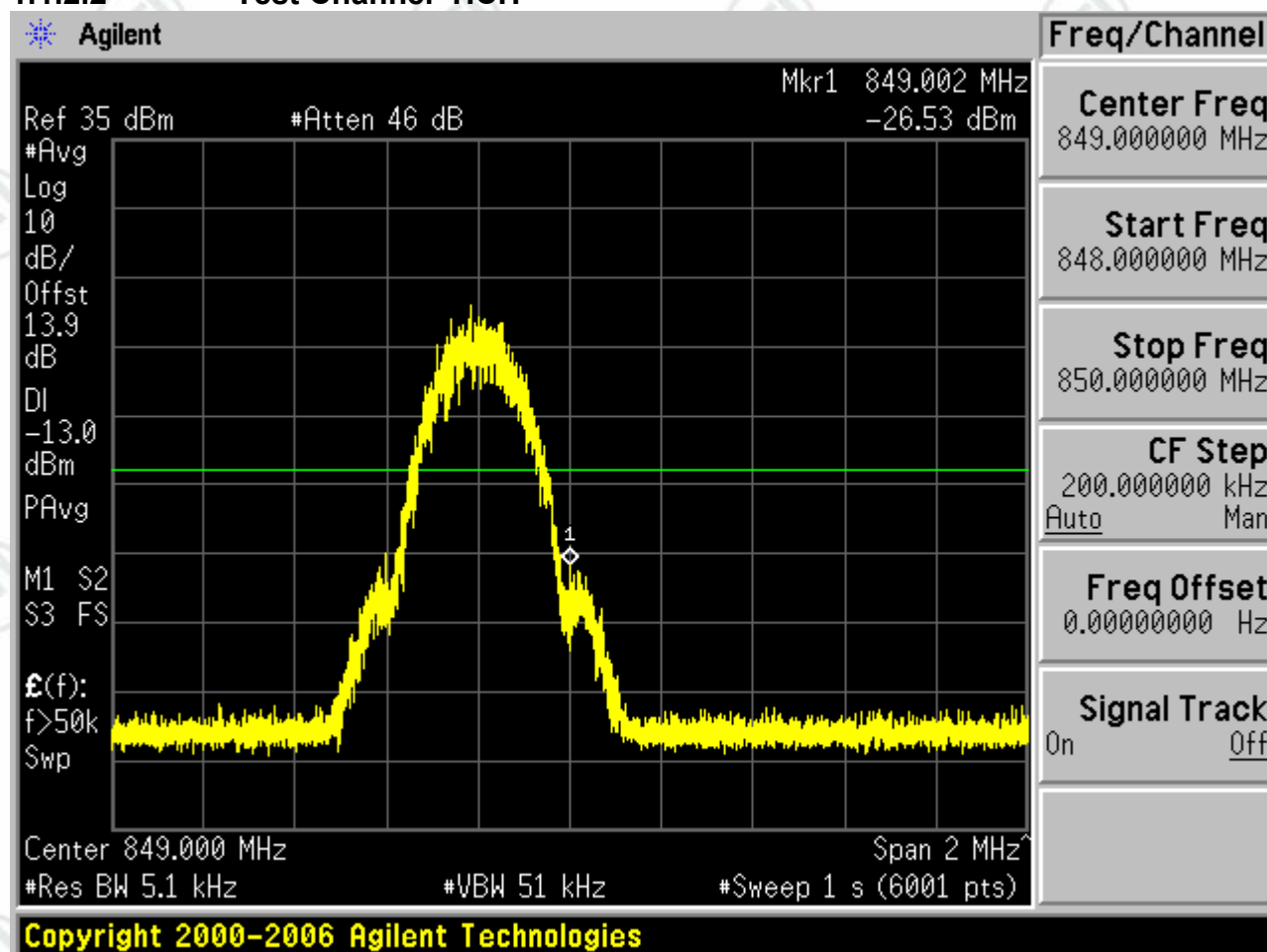


1.1.2 Test Mode=GSM/TM2

1.1.2.1 Test Channel=LCH

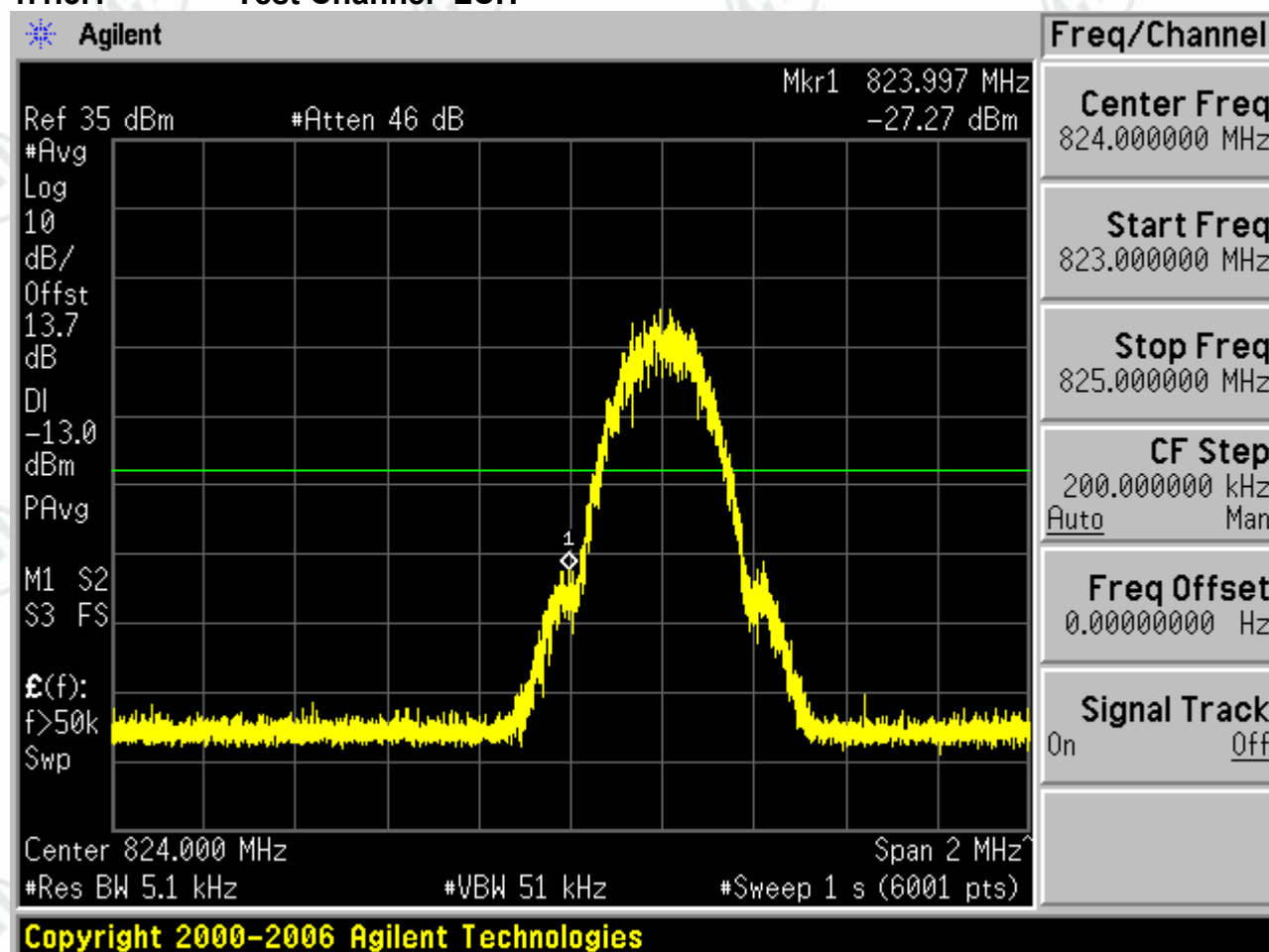


1.1.2.2 Test Channel=HCH

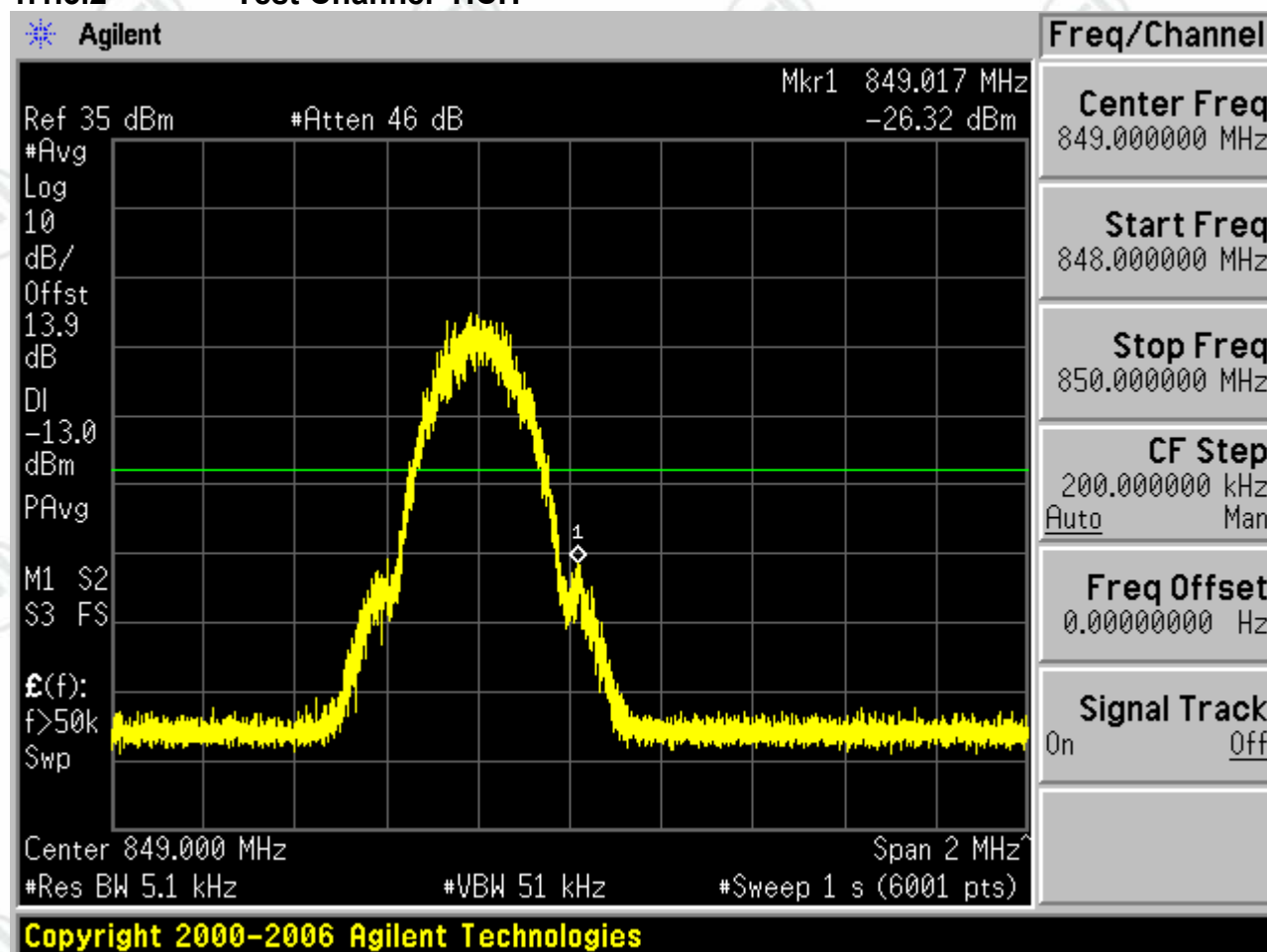


1.1.3 Test Mode=GSM/TM3

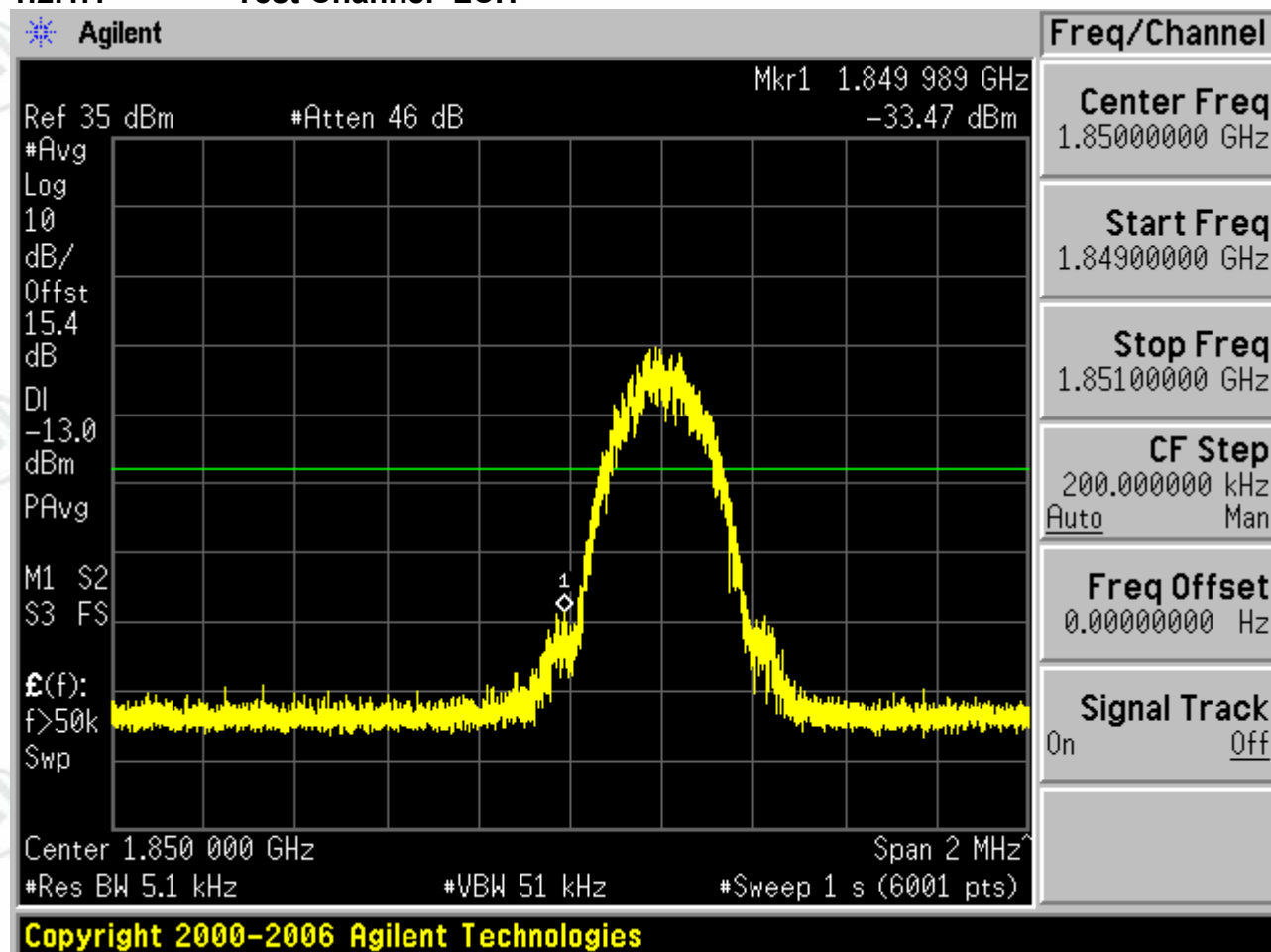
1.1.3.1 Test Channel=LCH



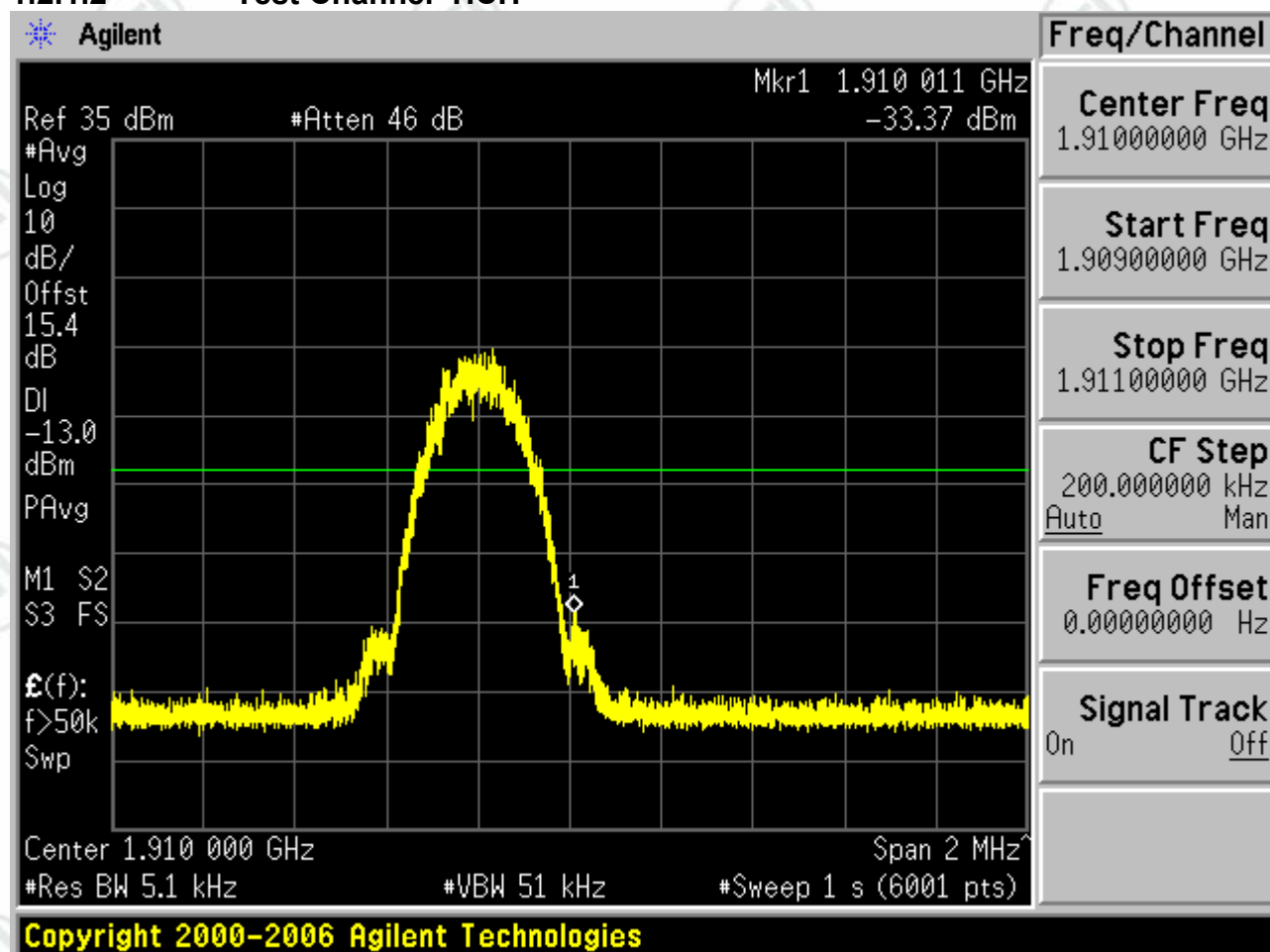
1.1.3.2 Test Channel=HCH



1.2 Test Band=GSM1900
1.2.1 Test Mode=GSM/TM1
1.2.1.1 Test Channel=LCH

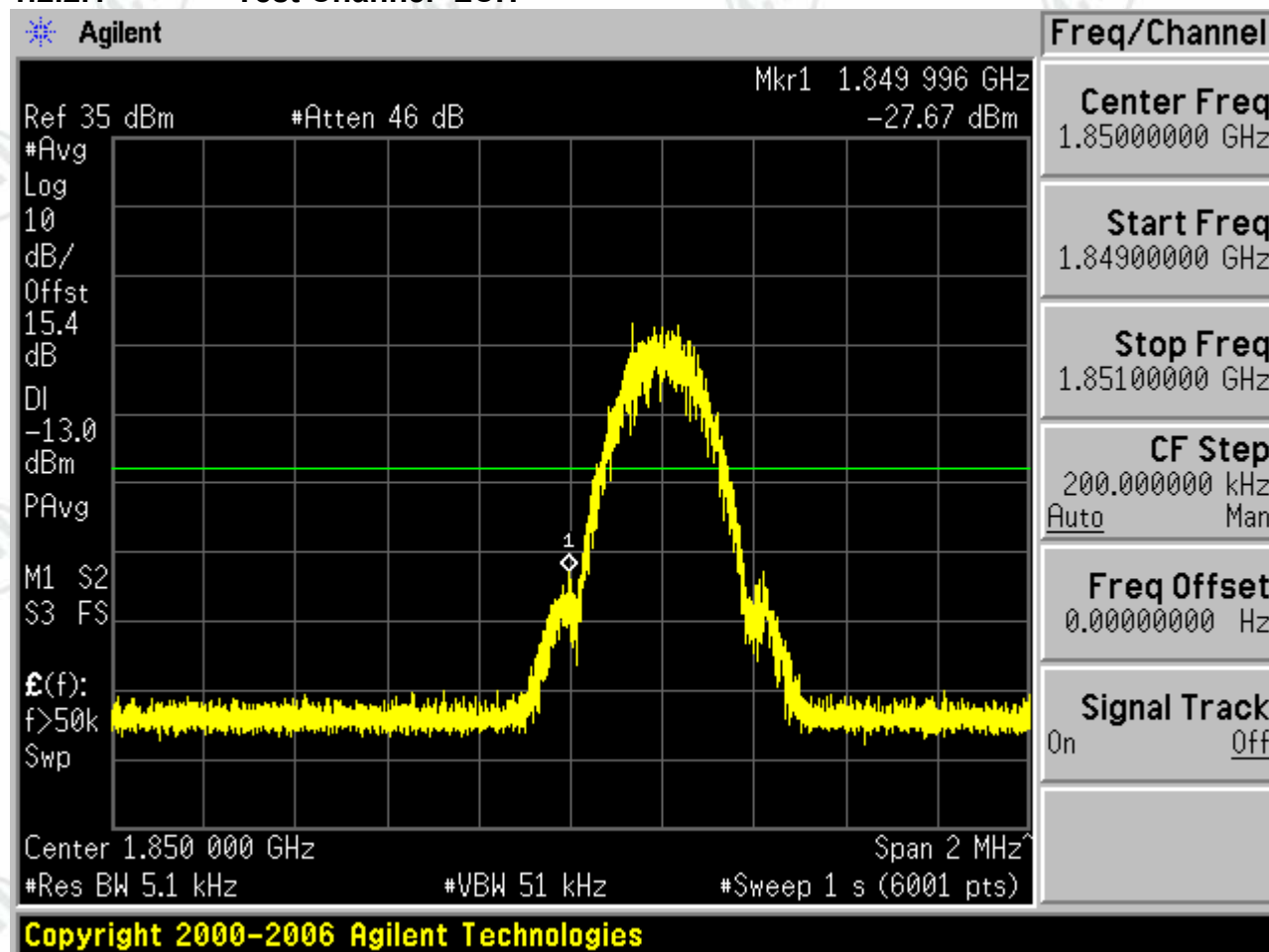


1.2.1.2 Test Channel=HCH

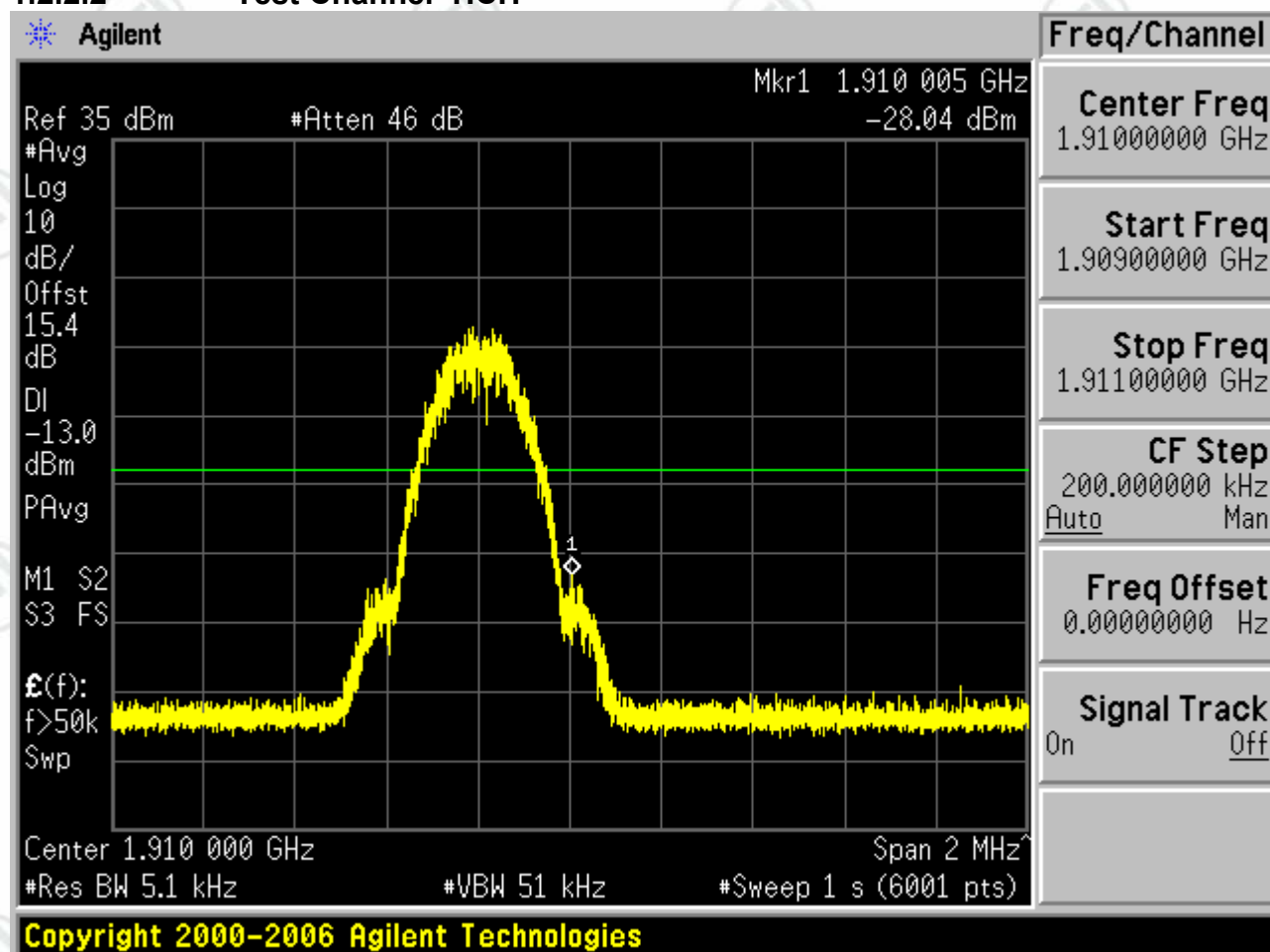


1.2.2 Test Mode=GSM/TM2

1.2.2.1 Test Channel=LCH

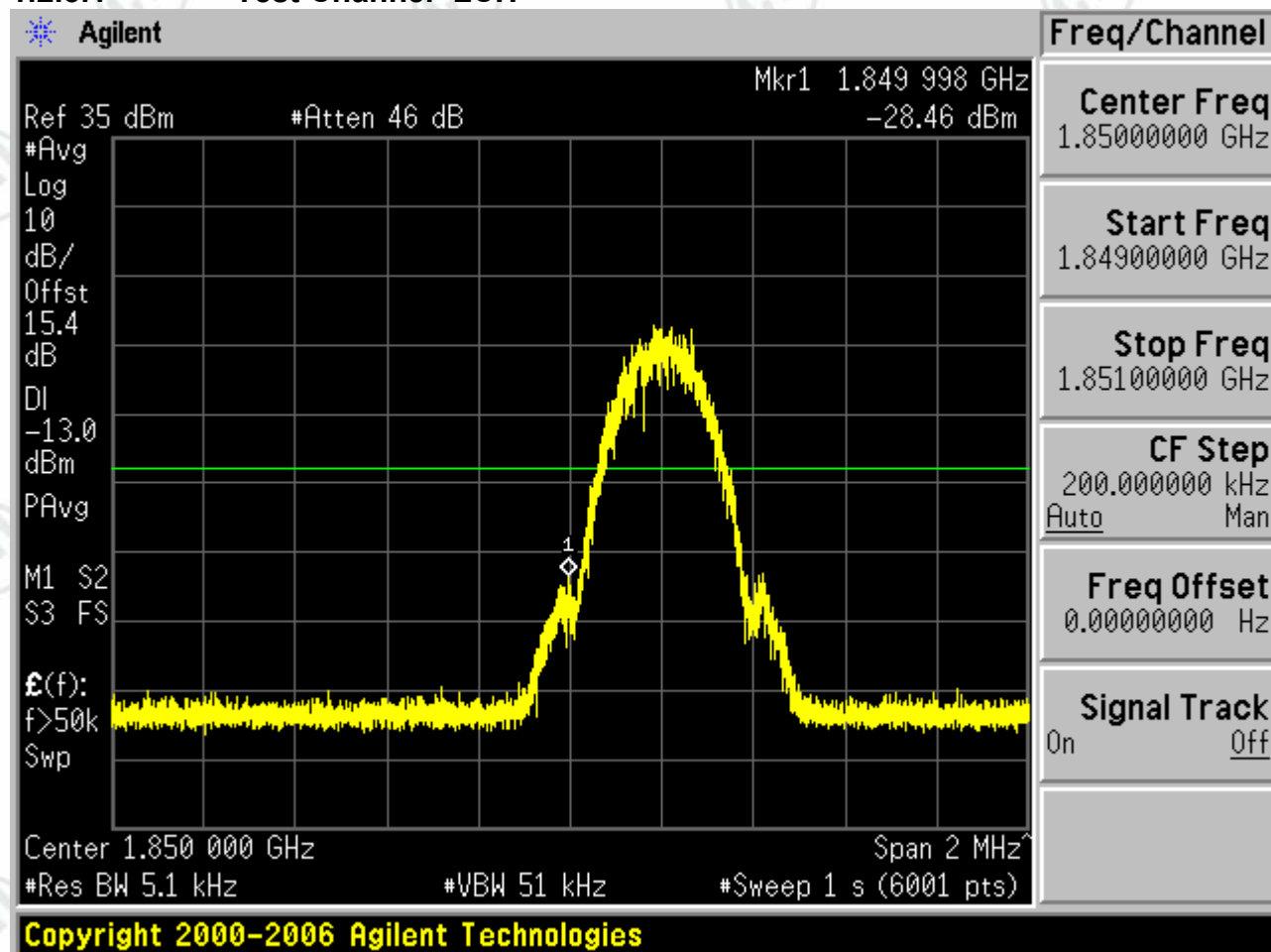


1.2.2.2 Test Channel=HCH

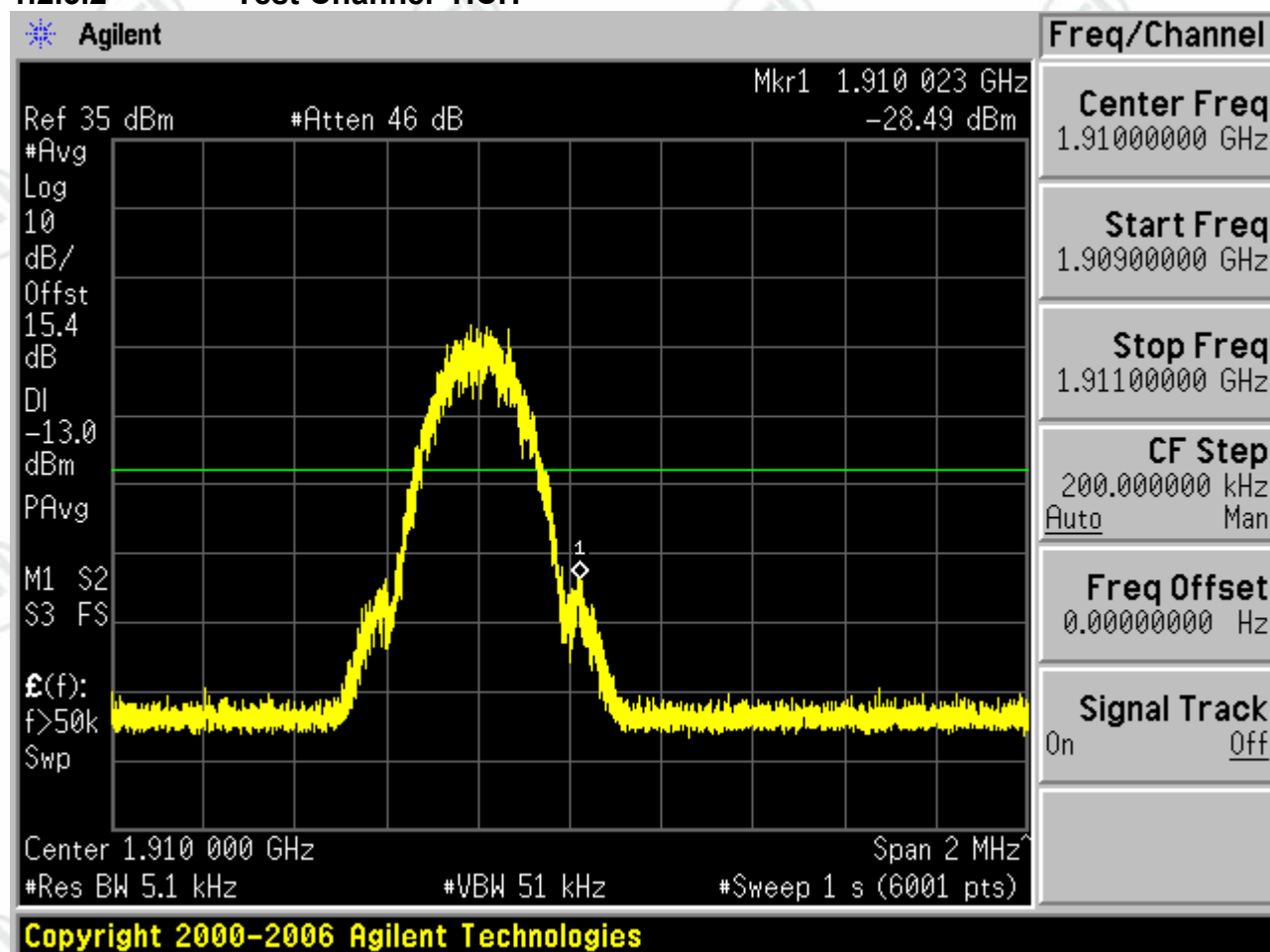


1.2.3 Test Mode=GSM/TM3

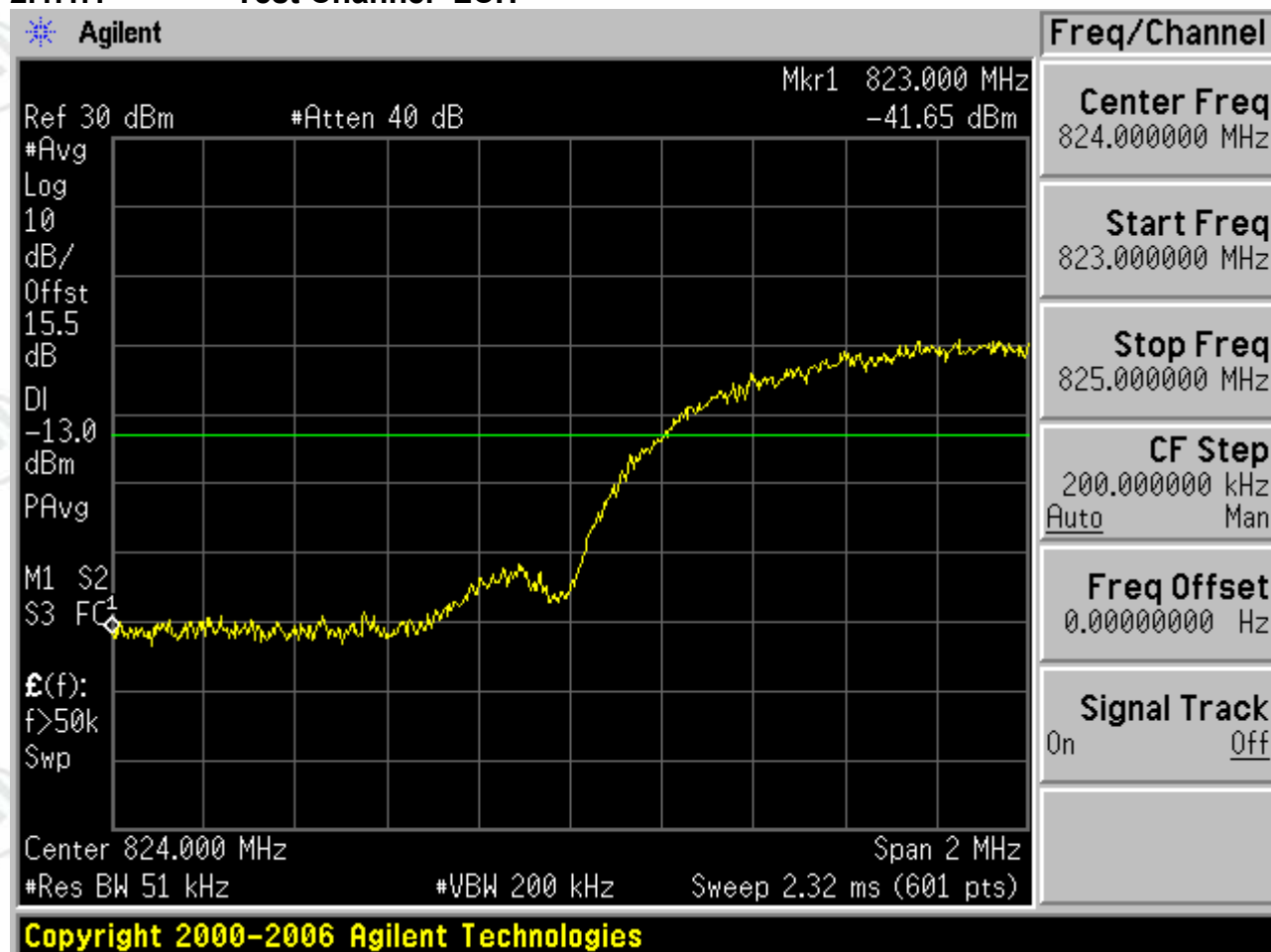
1.2.3.1 Test Channel=LCH



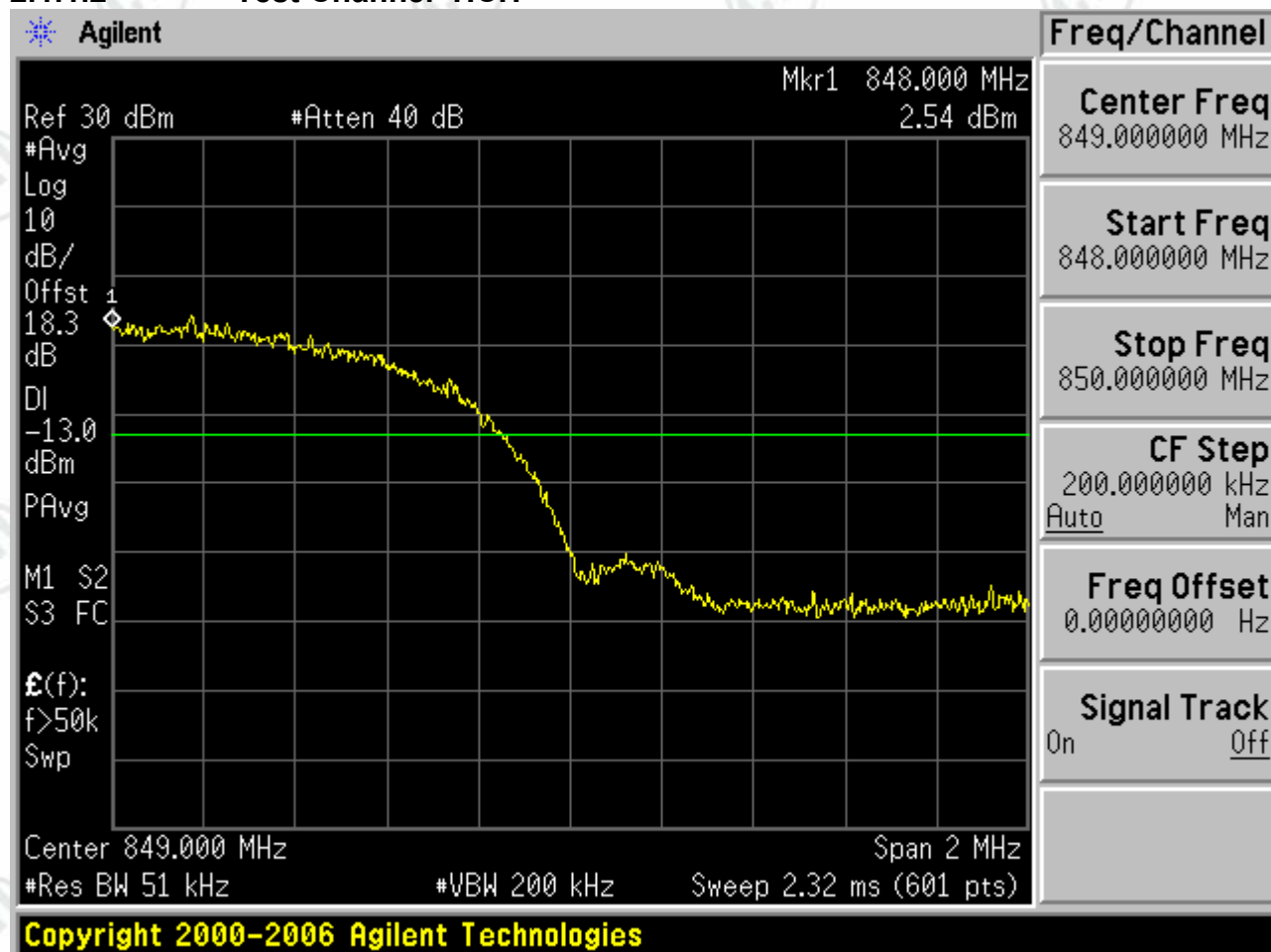
1.2.3.2 Test Channel=HCH



2 For WCDMA
2.1 Test Band=WCDMA850
2.1.1 Test Mode=UMTS/TM1
2.1.1.1 Test Channel=LCH



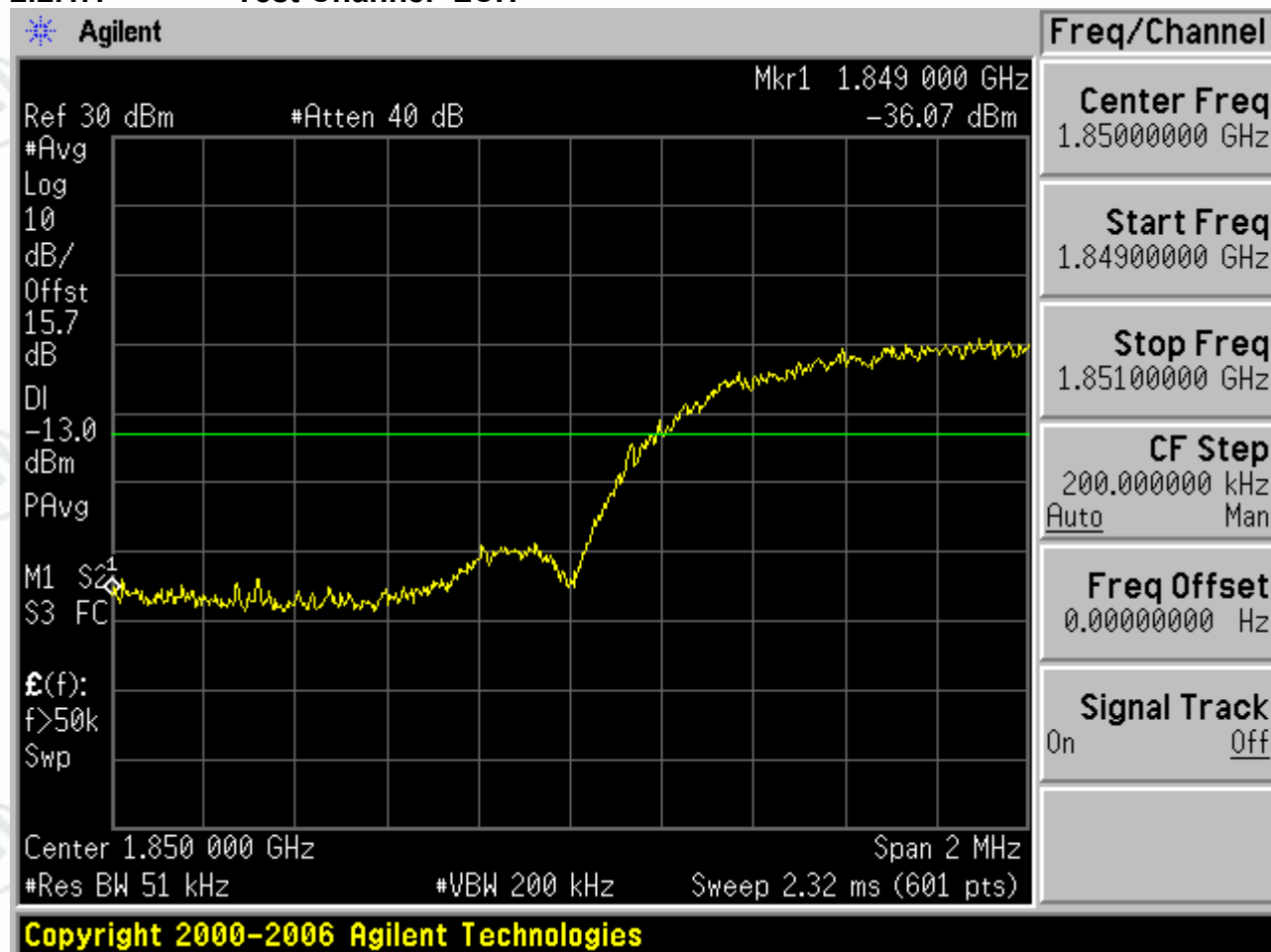
2.1.1.2 Test Channel=HCH



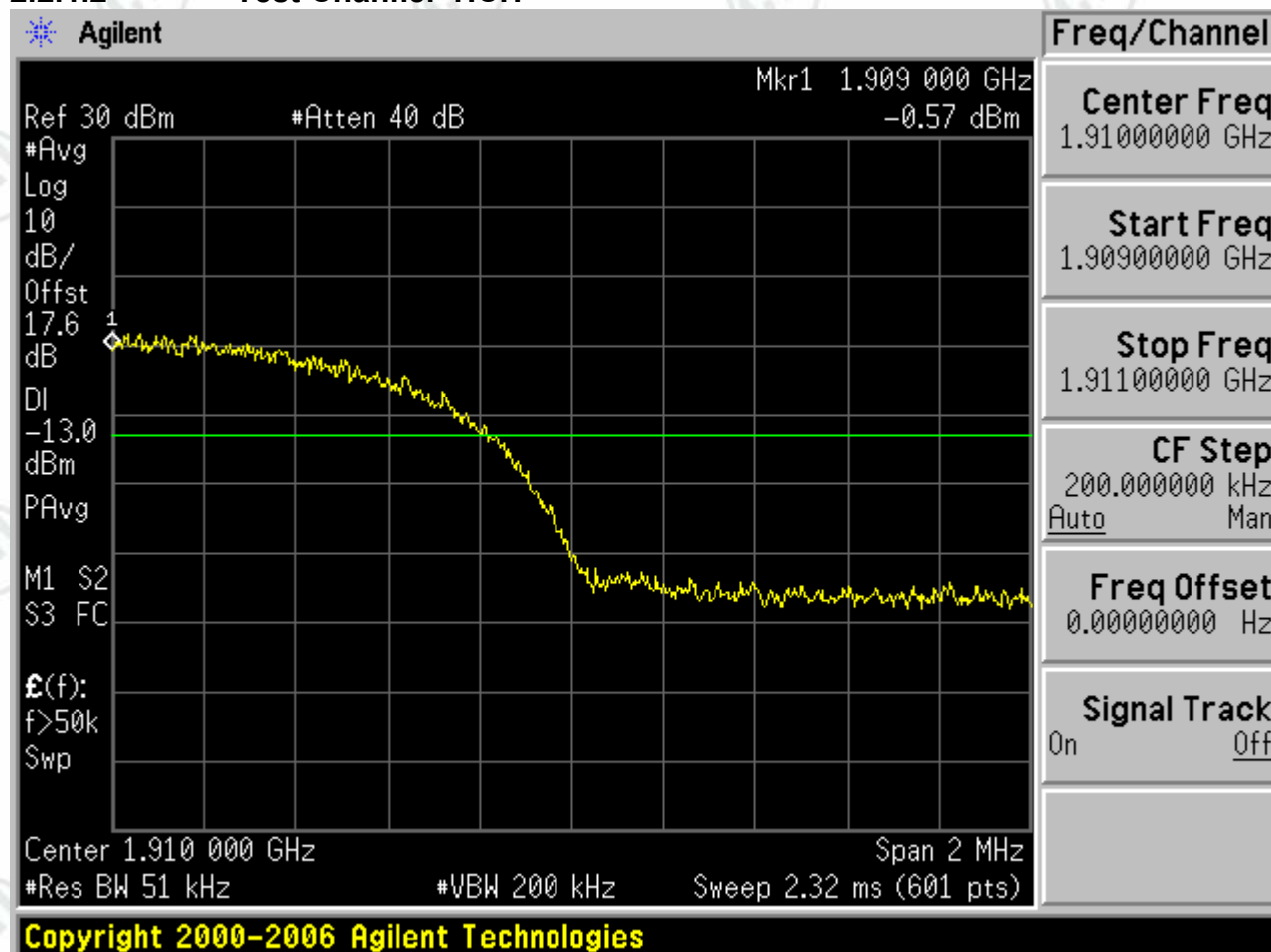
2.2 Test Band=WCDMA1900

2.2.1 Test Mode=UMTSTM1

2.2.1.1 Test Channel=LCH

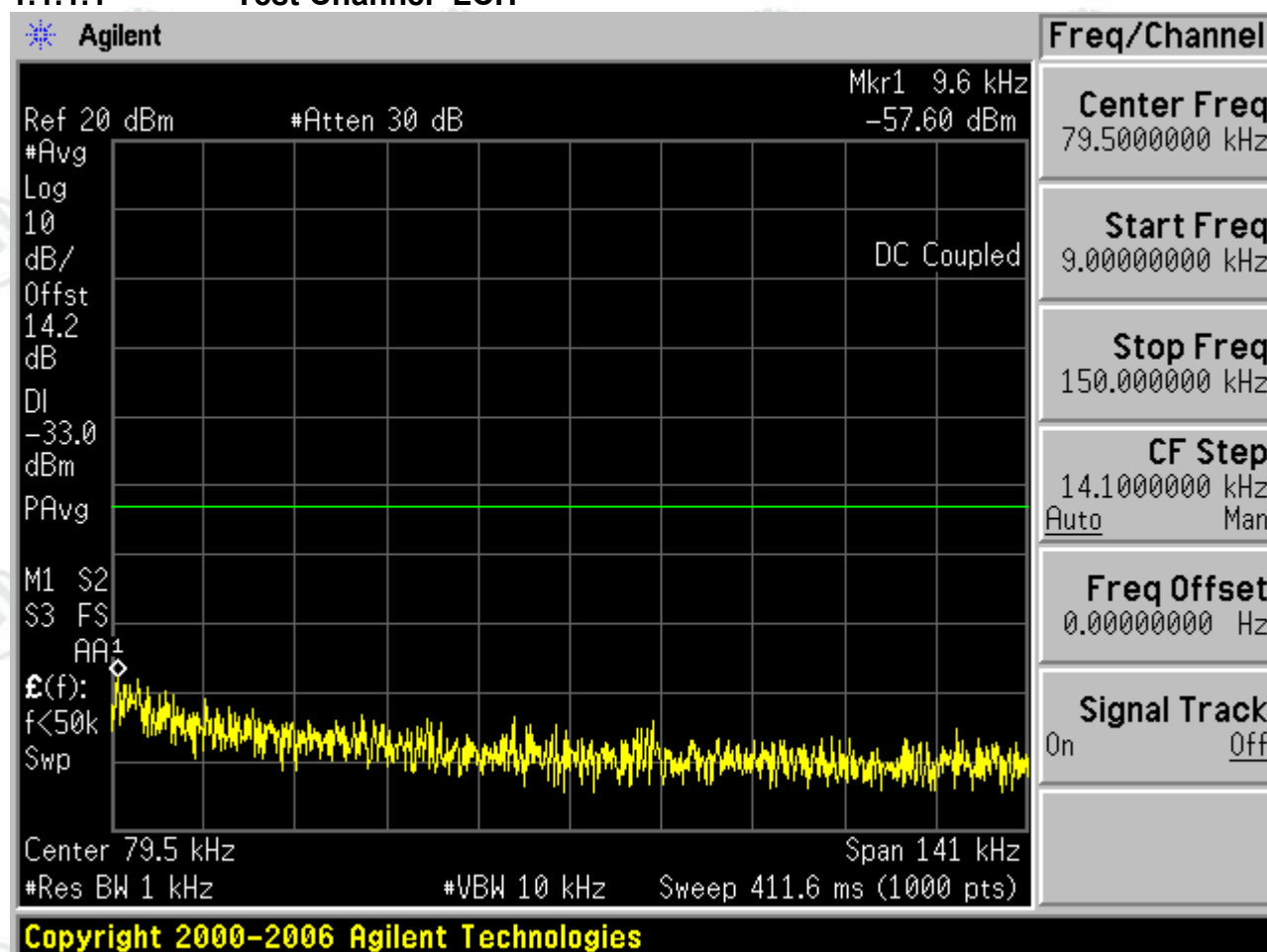


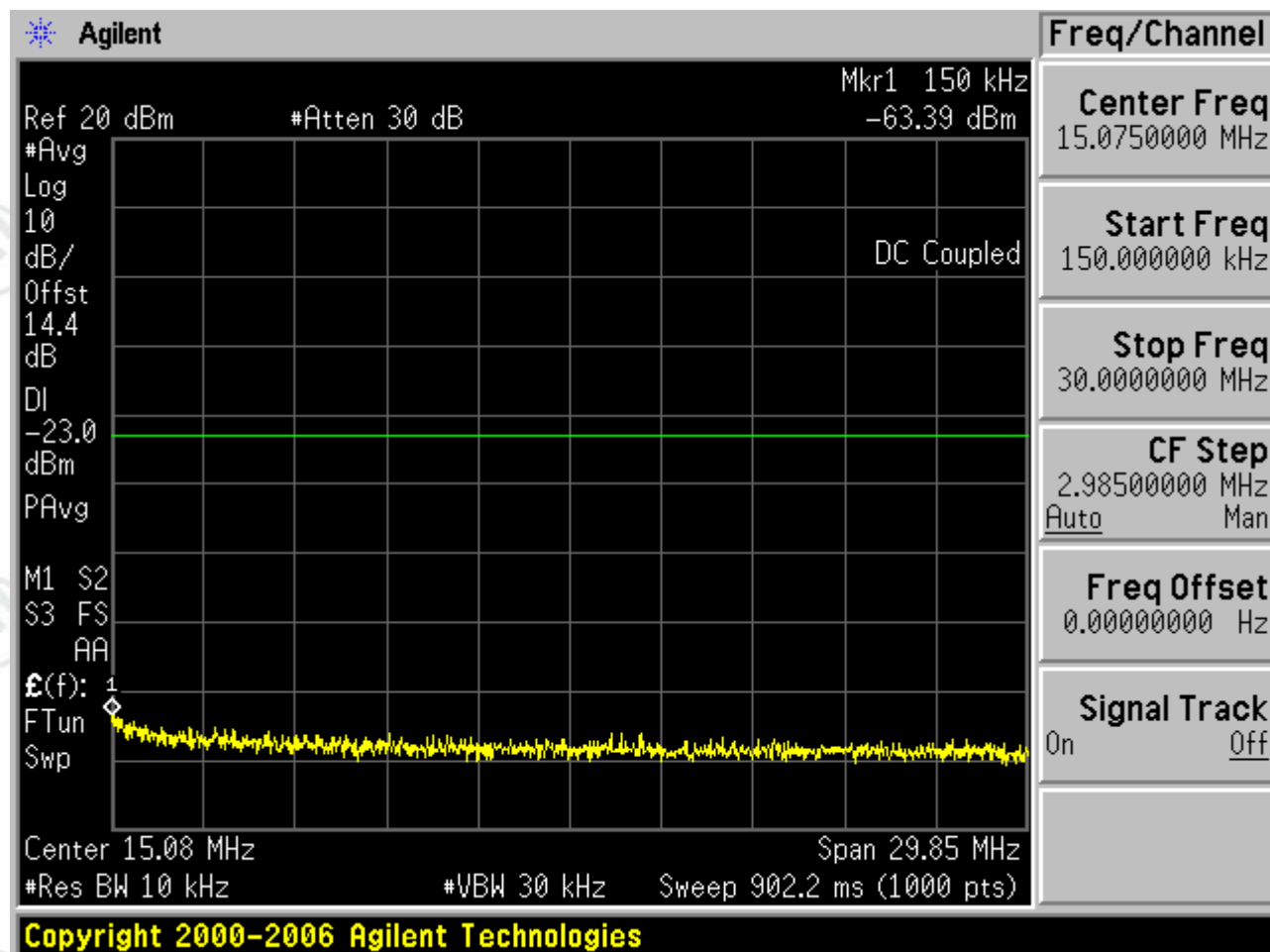
2.2.1.2 Test Channel=HCH

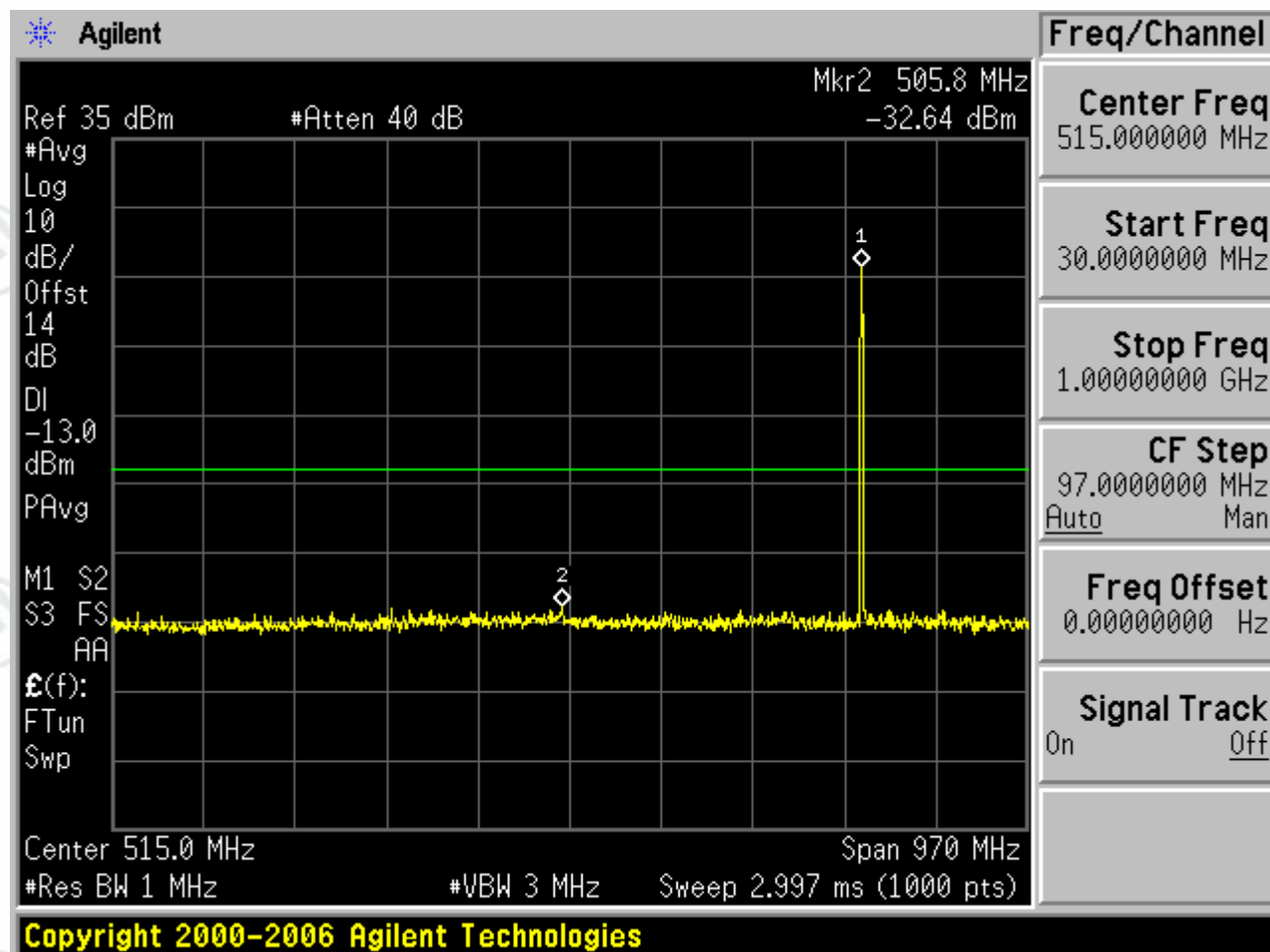


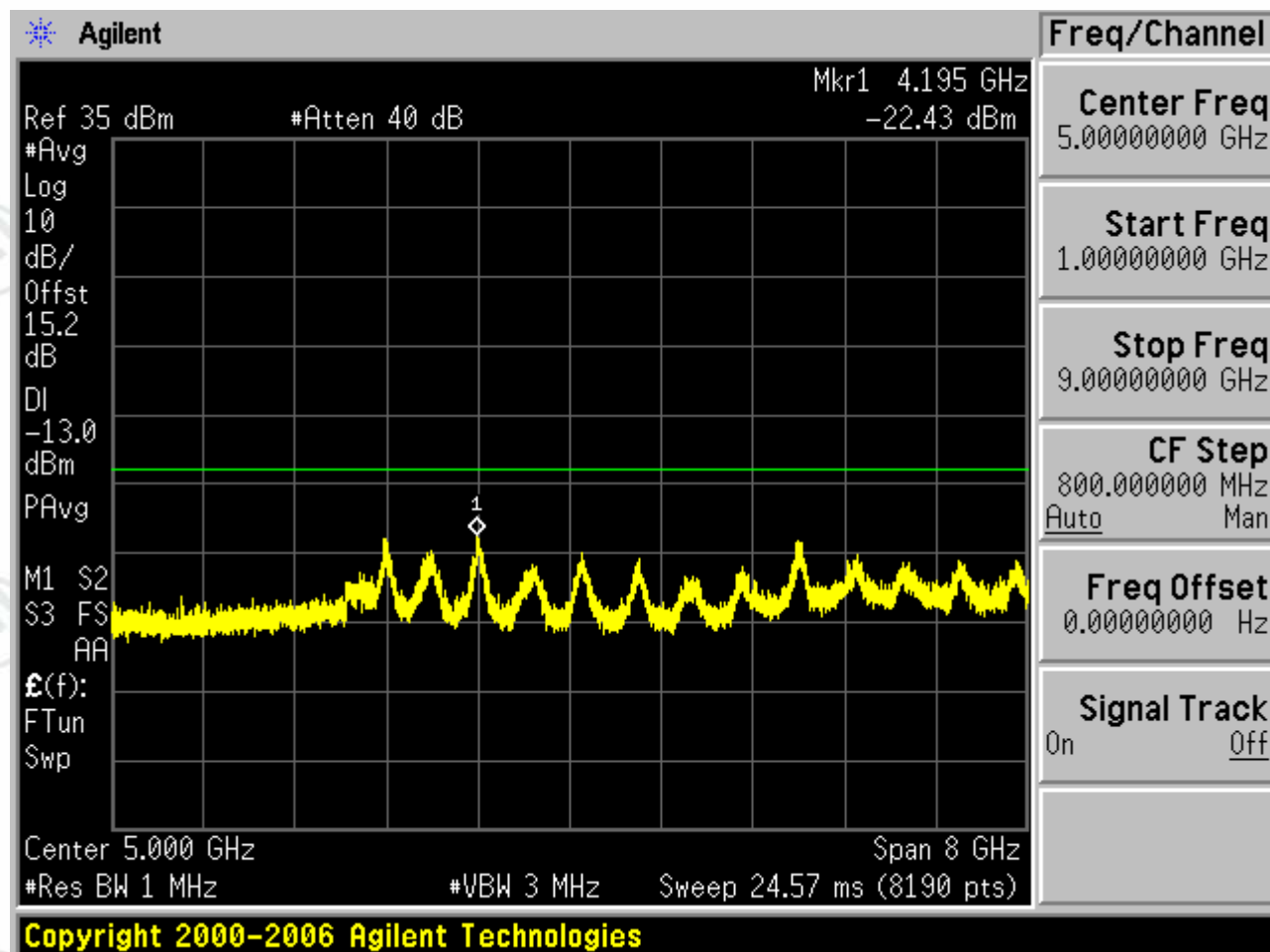
Appendix E)Spurious Emission at Antenna Terminal

1 For GSM
1.1 Test Band=GSM850
1.1.1 Test Mode=GSM/TM1
1.1.1.1 Test Channel=LCH

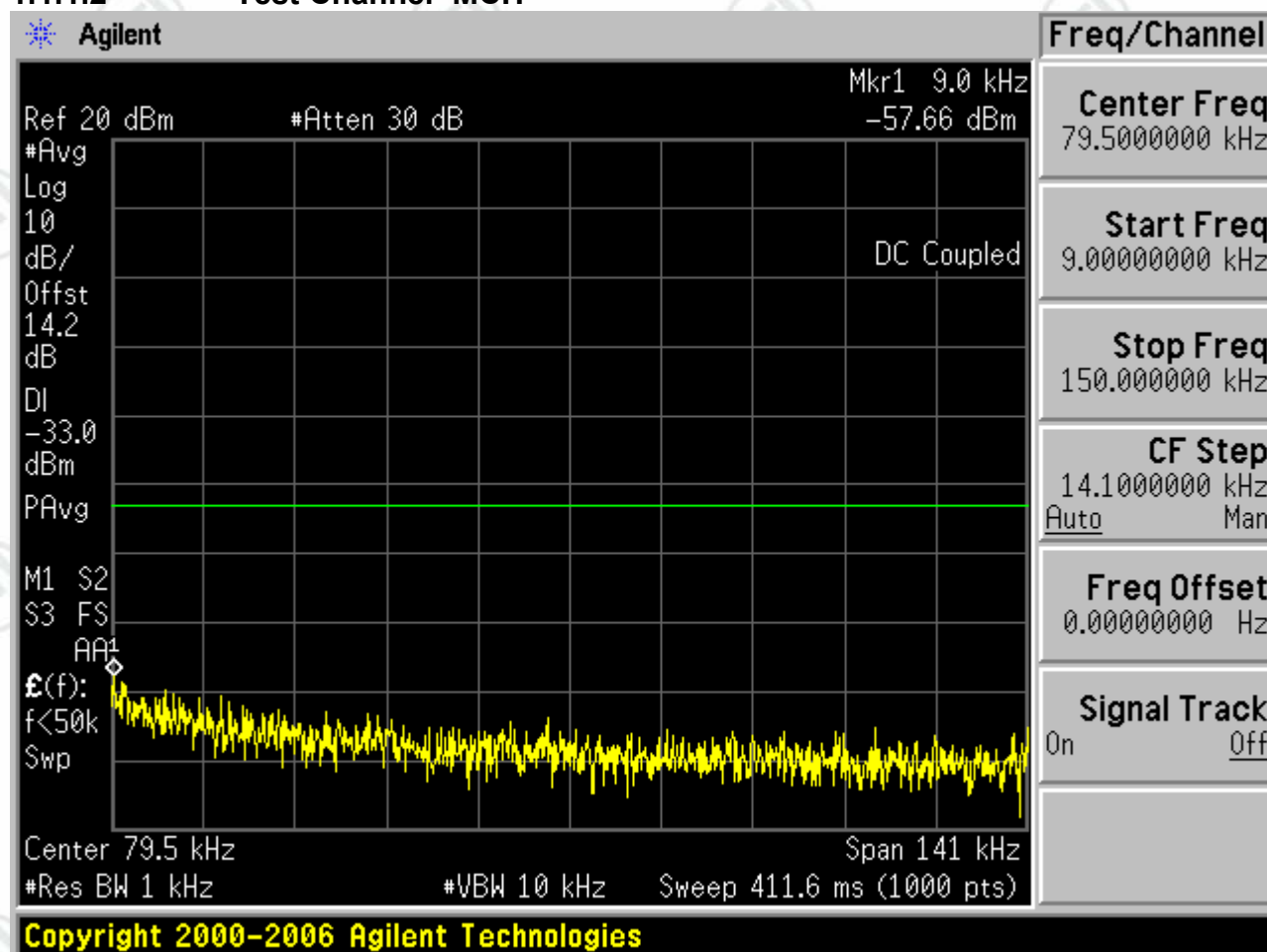


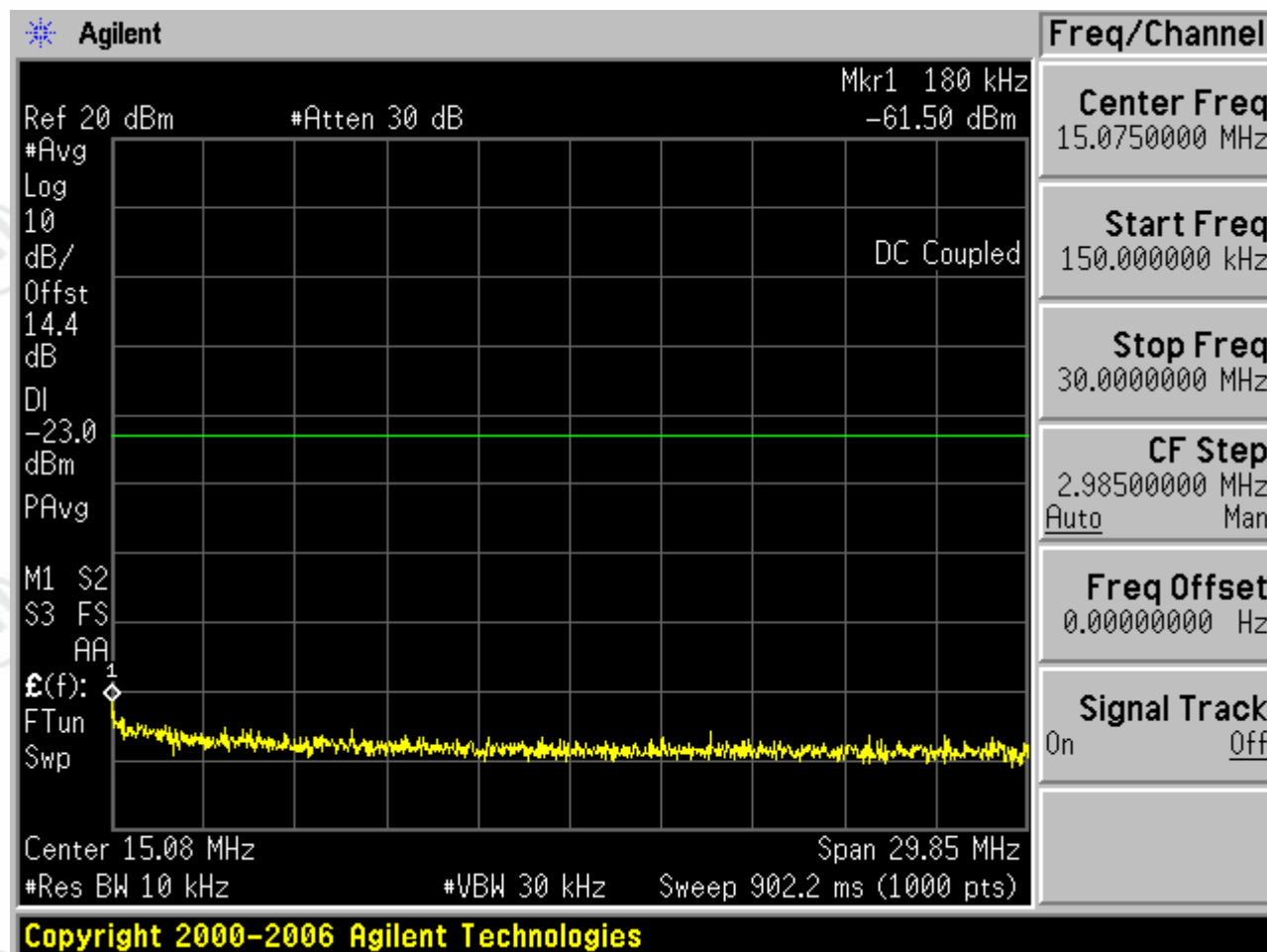


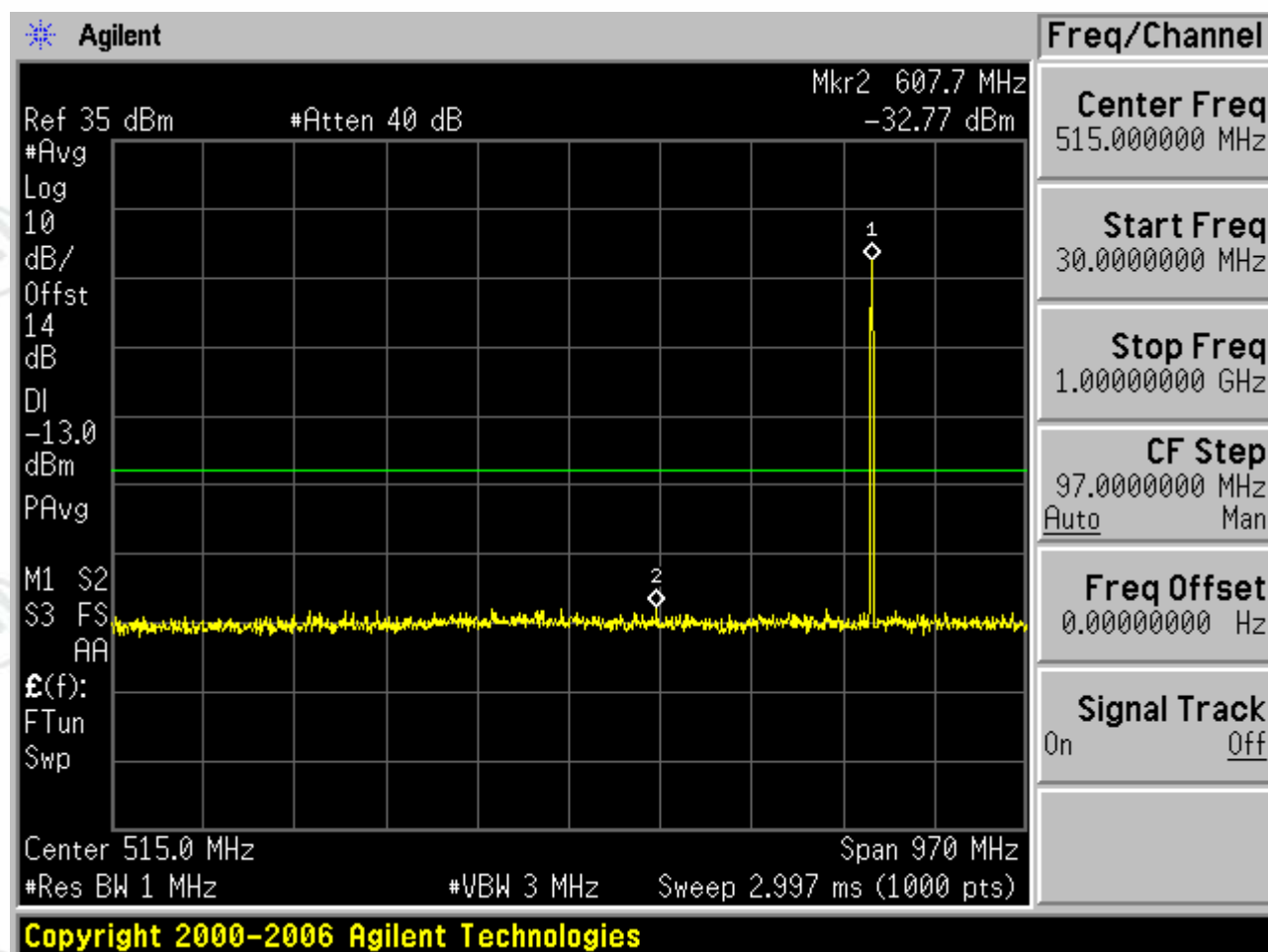


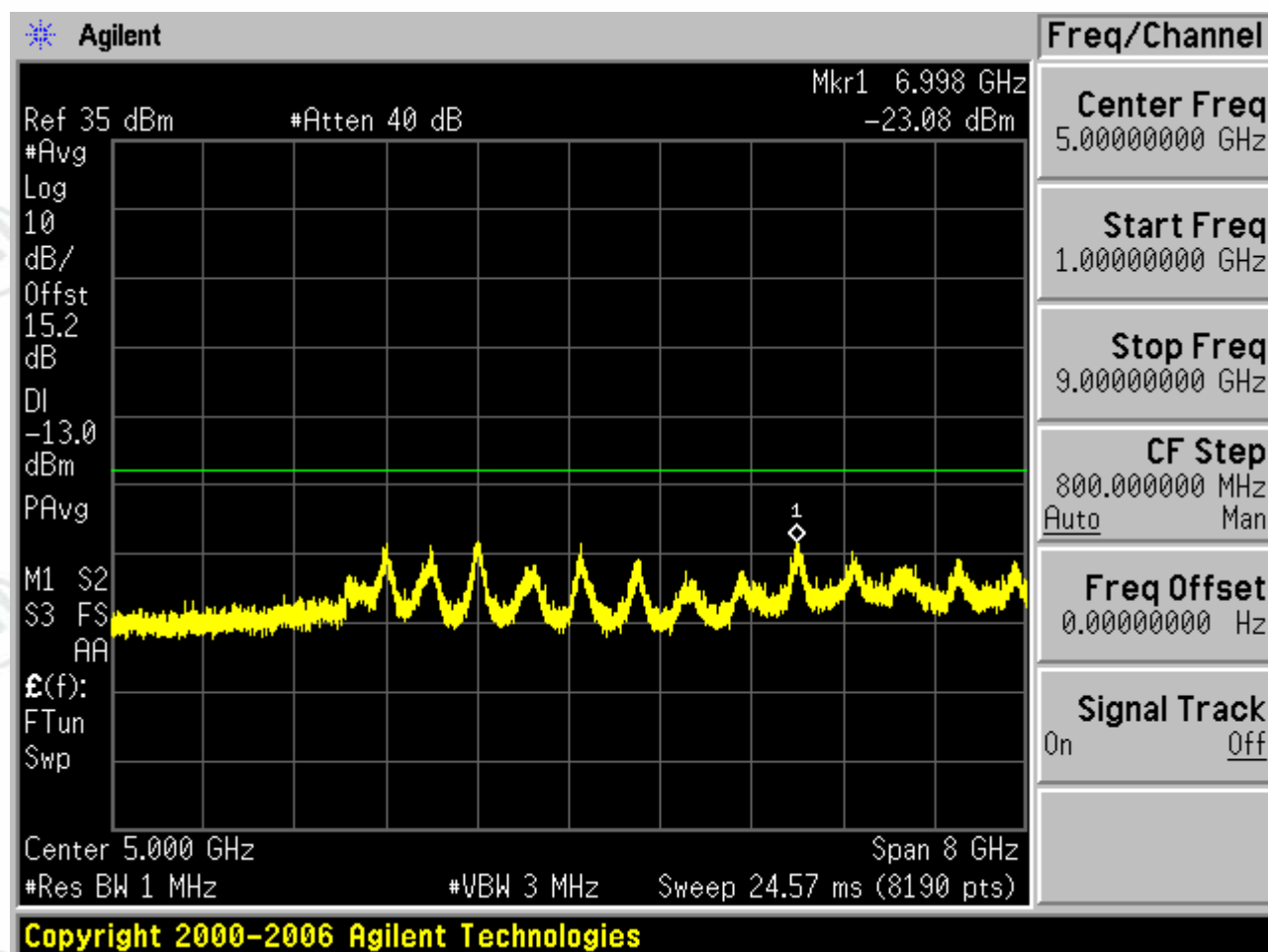


1.1.1.2 Test Channel=MCH

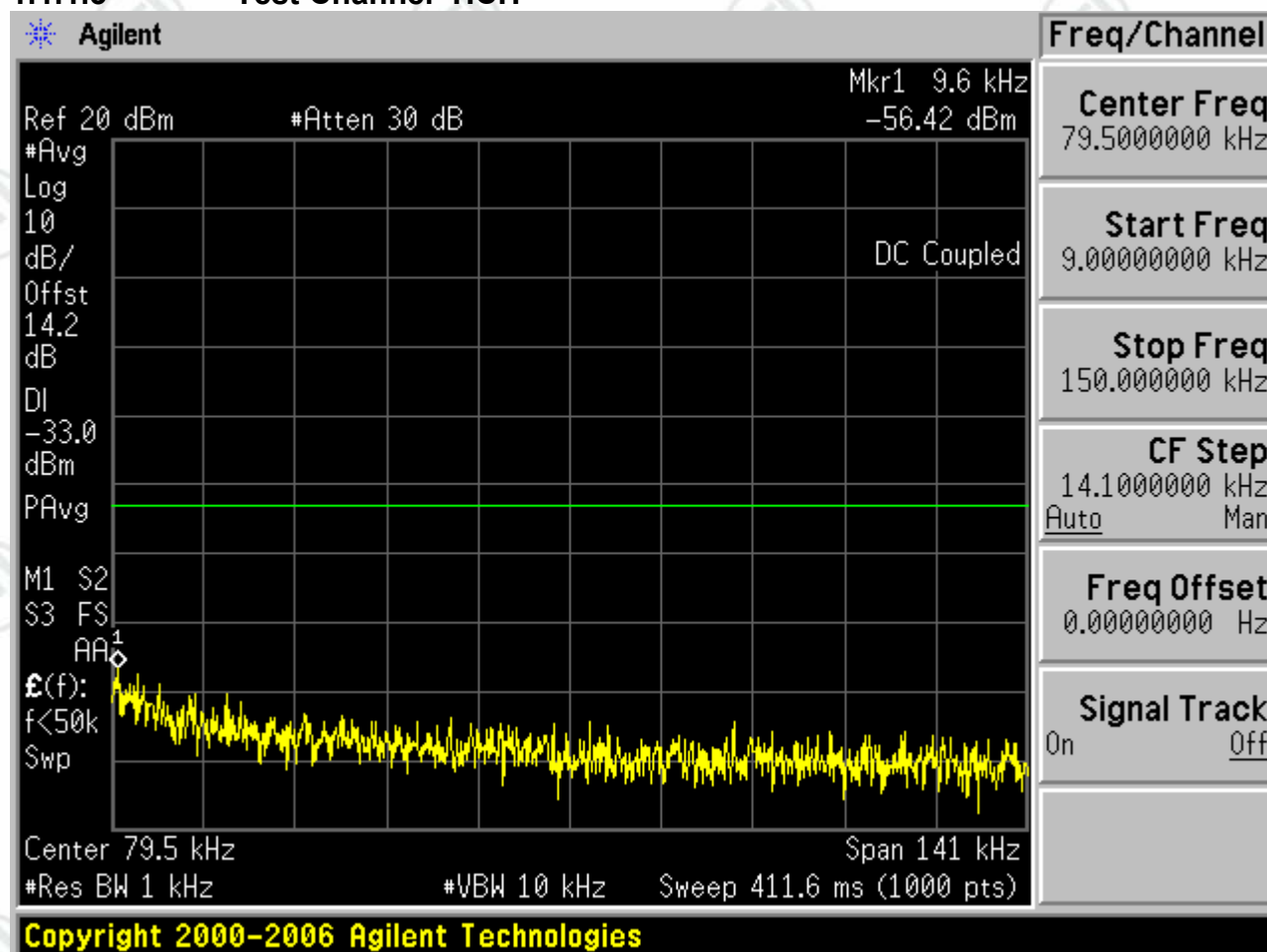


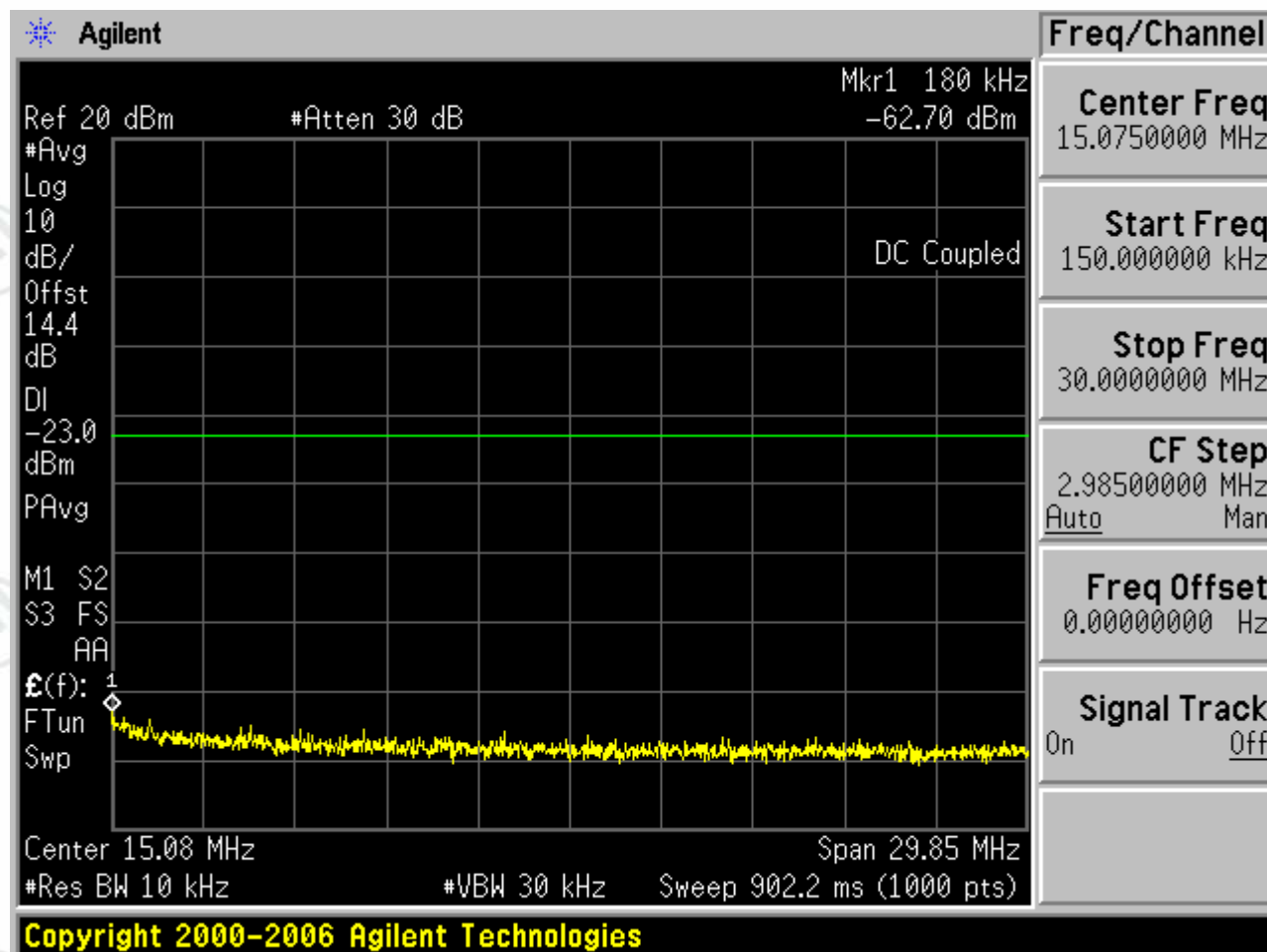


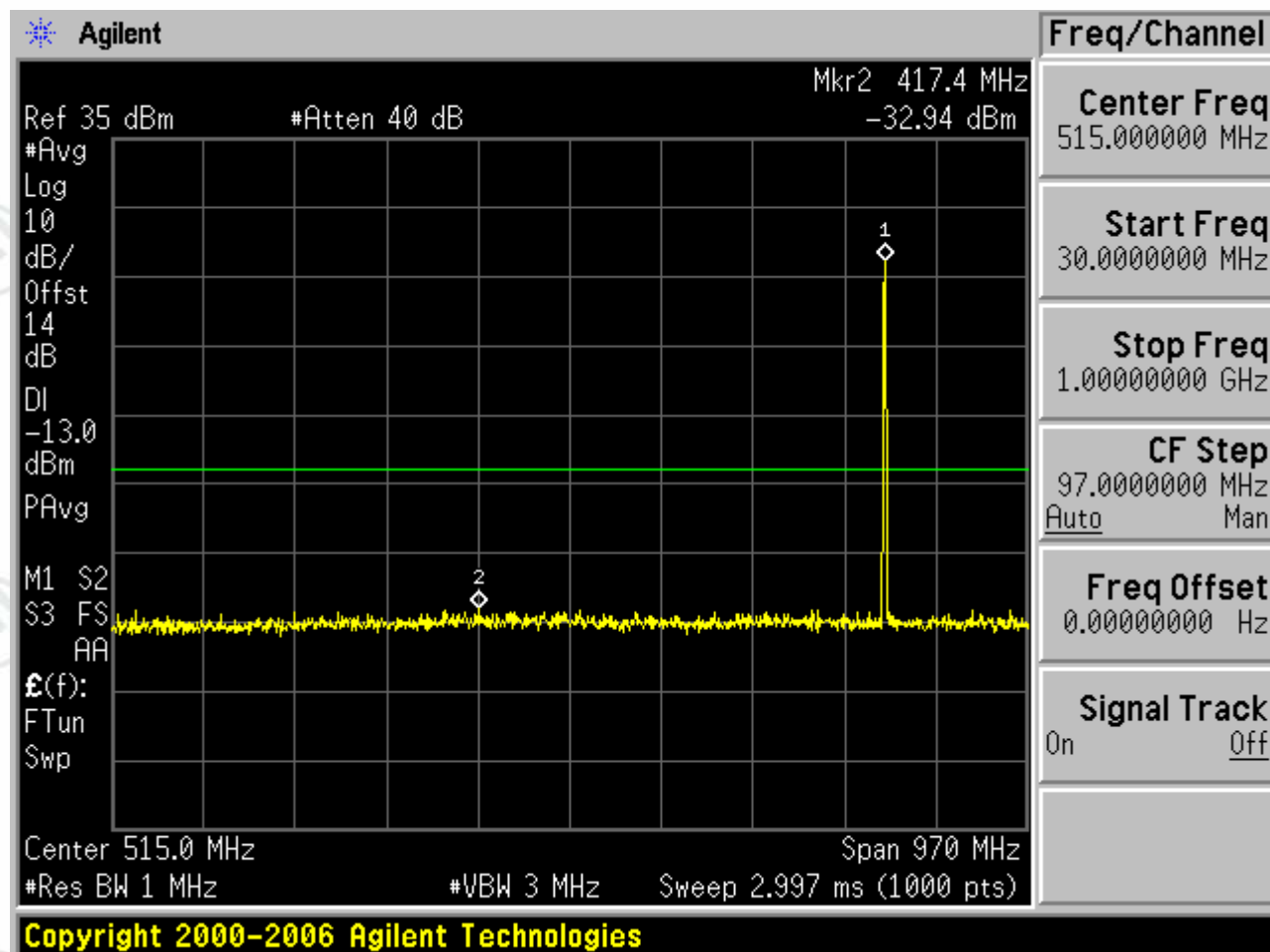


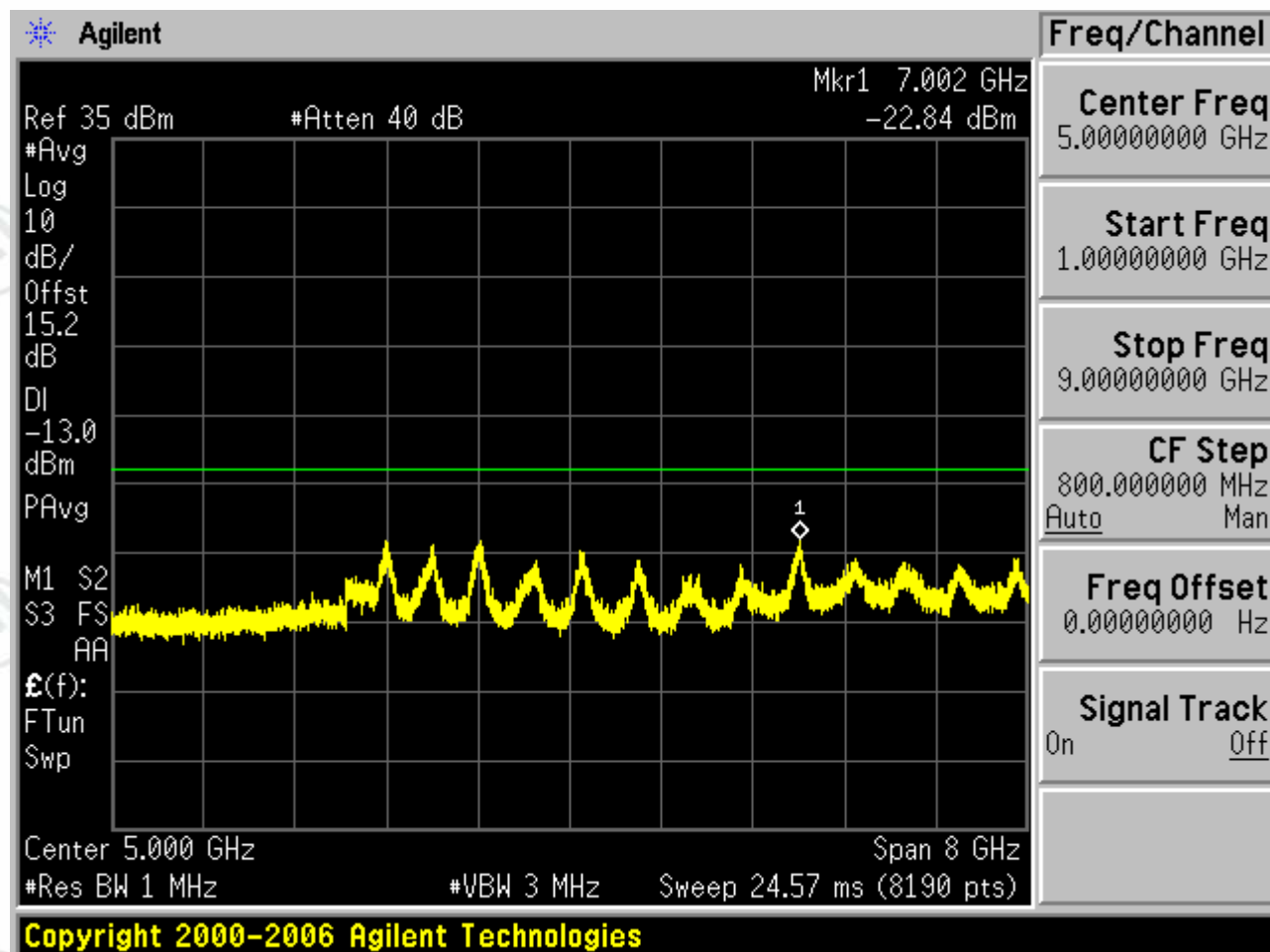


1.1.1.3 Test Channel=HCH



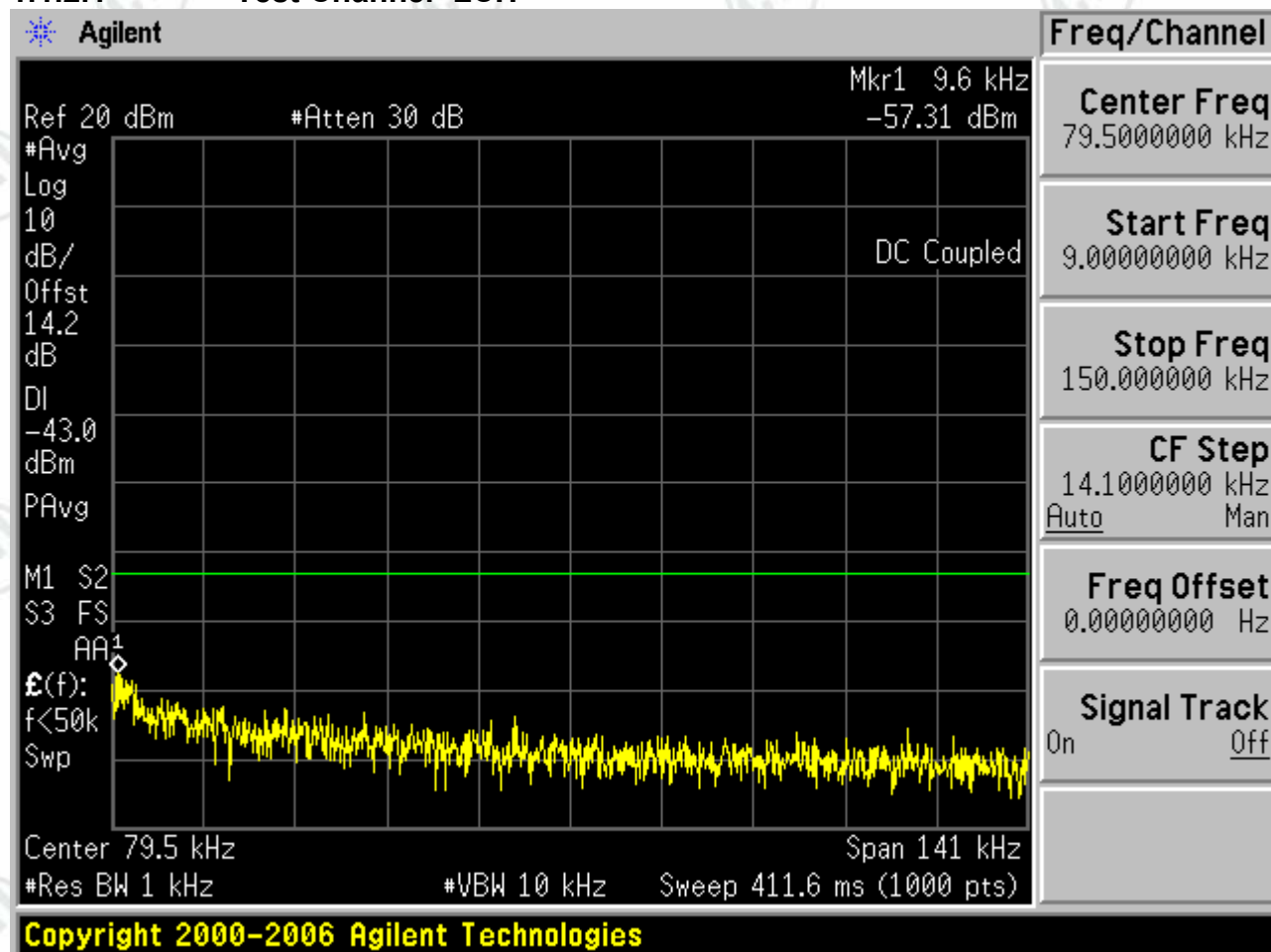


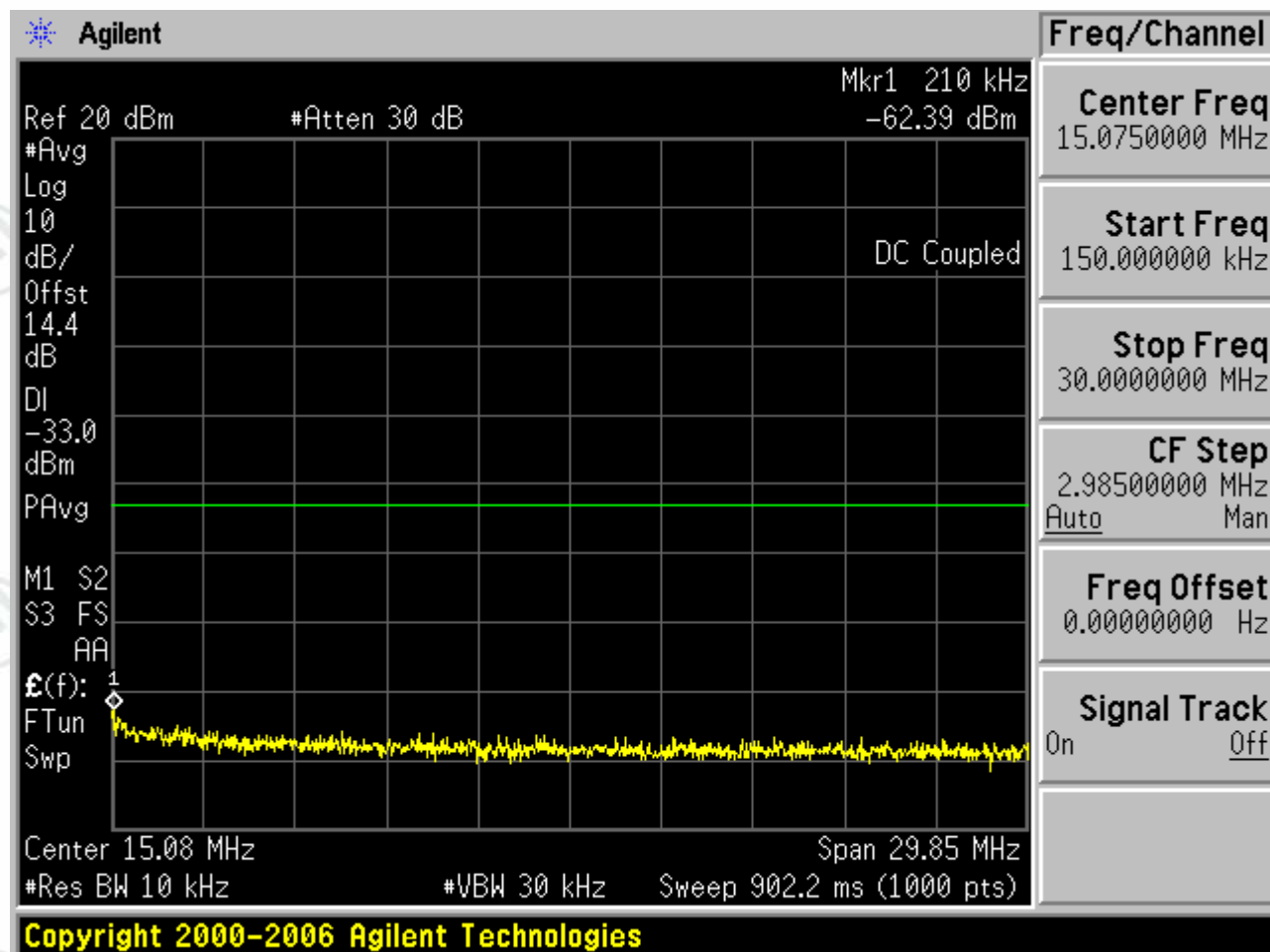


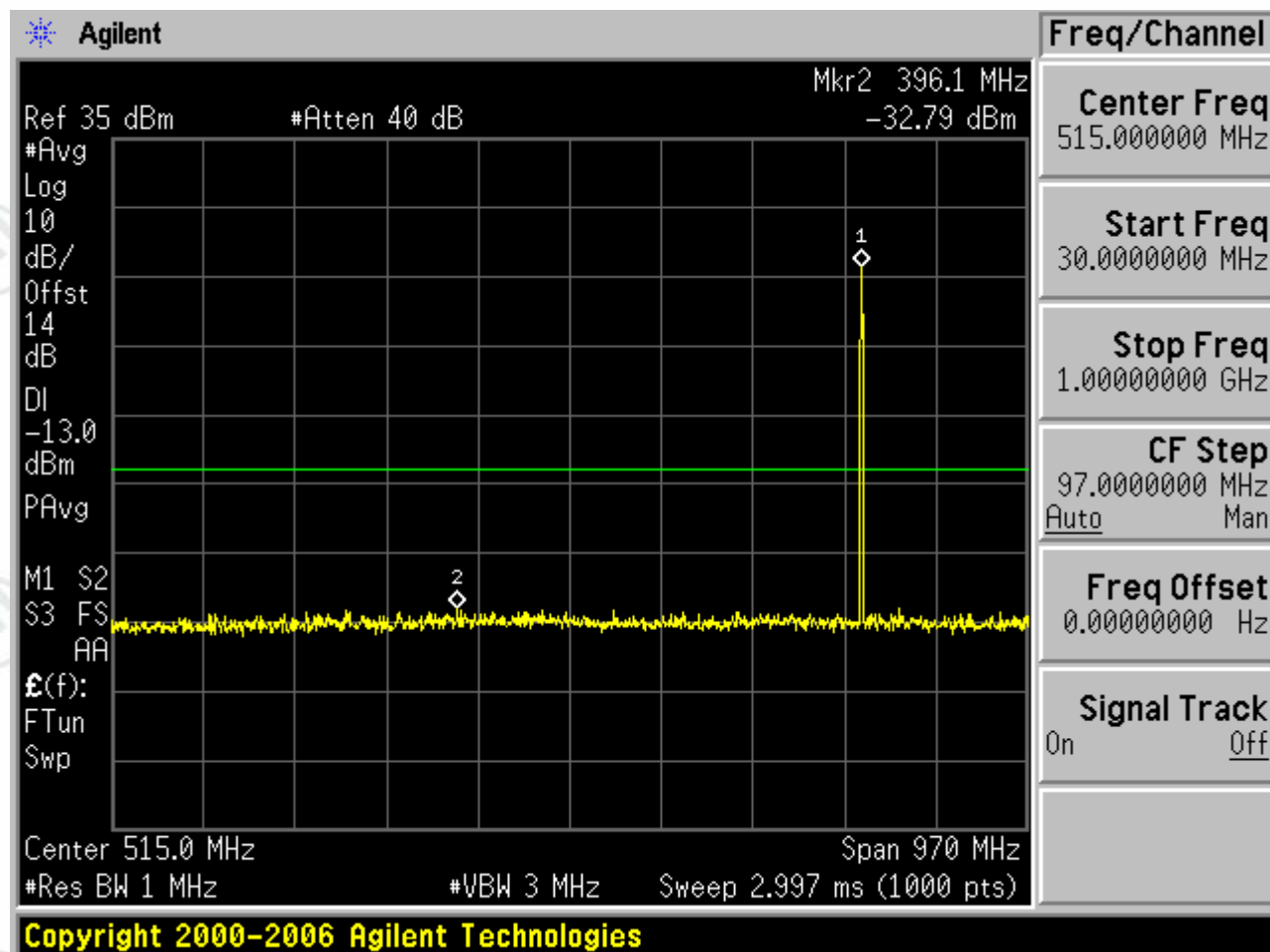


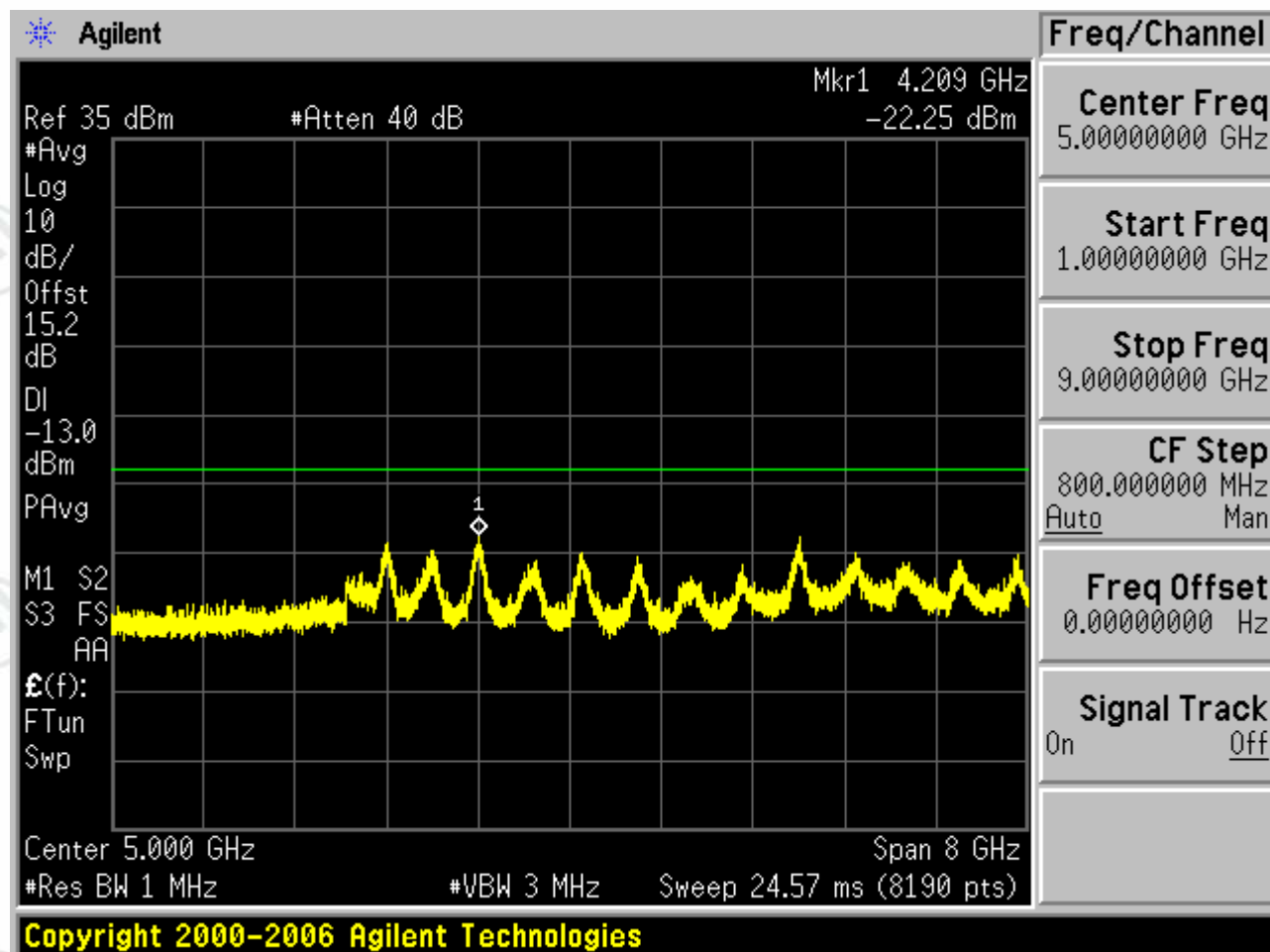
1.1.2 Test Mode=GSM/TM2

1.1.2.1 Test Channel=LCH

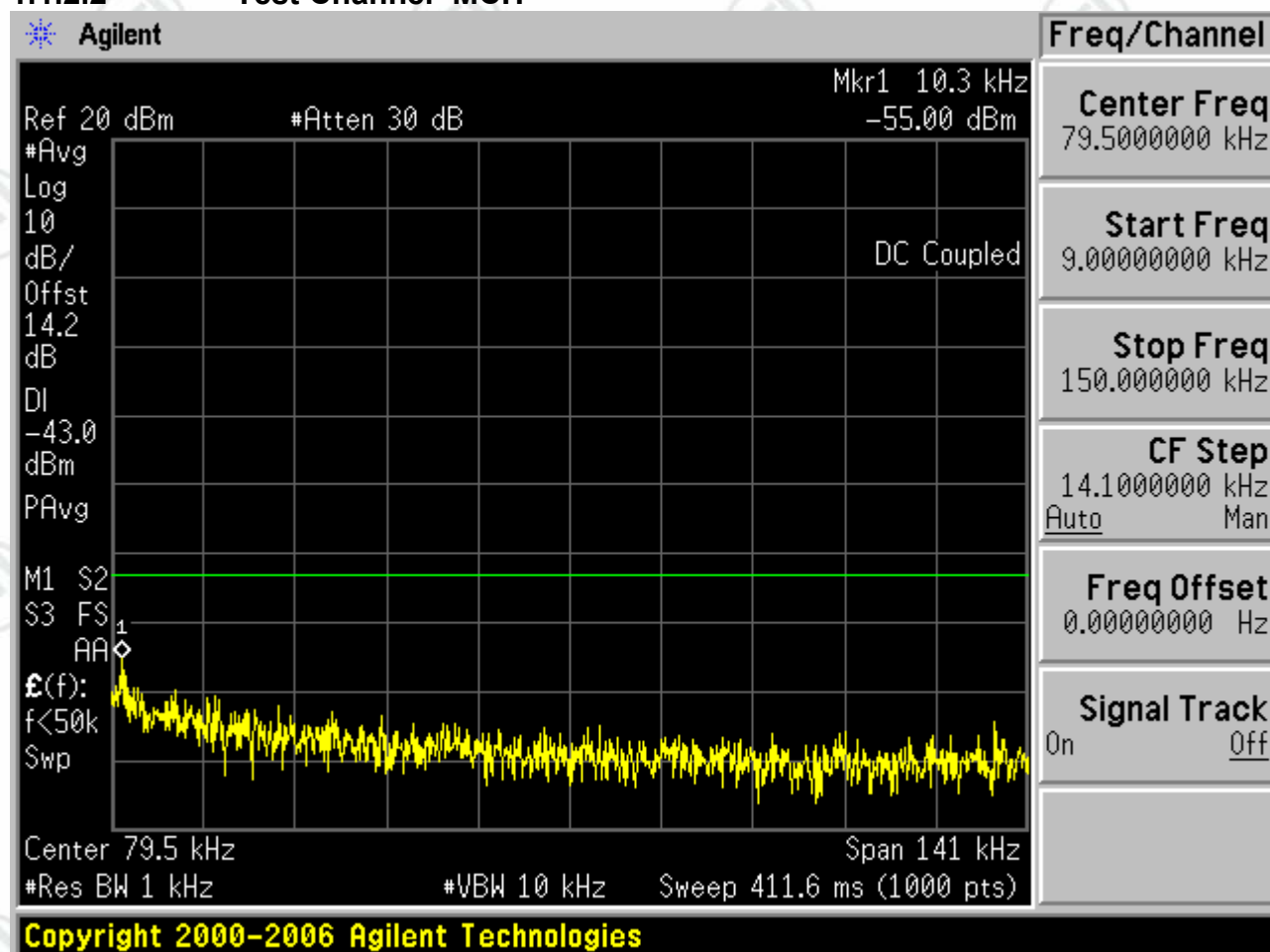


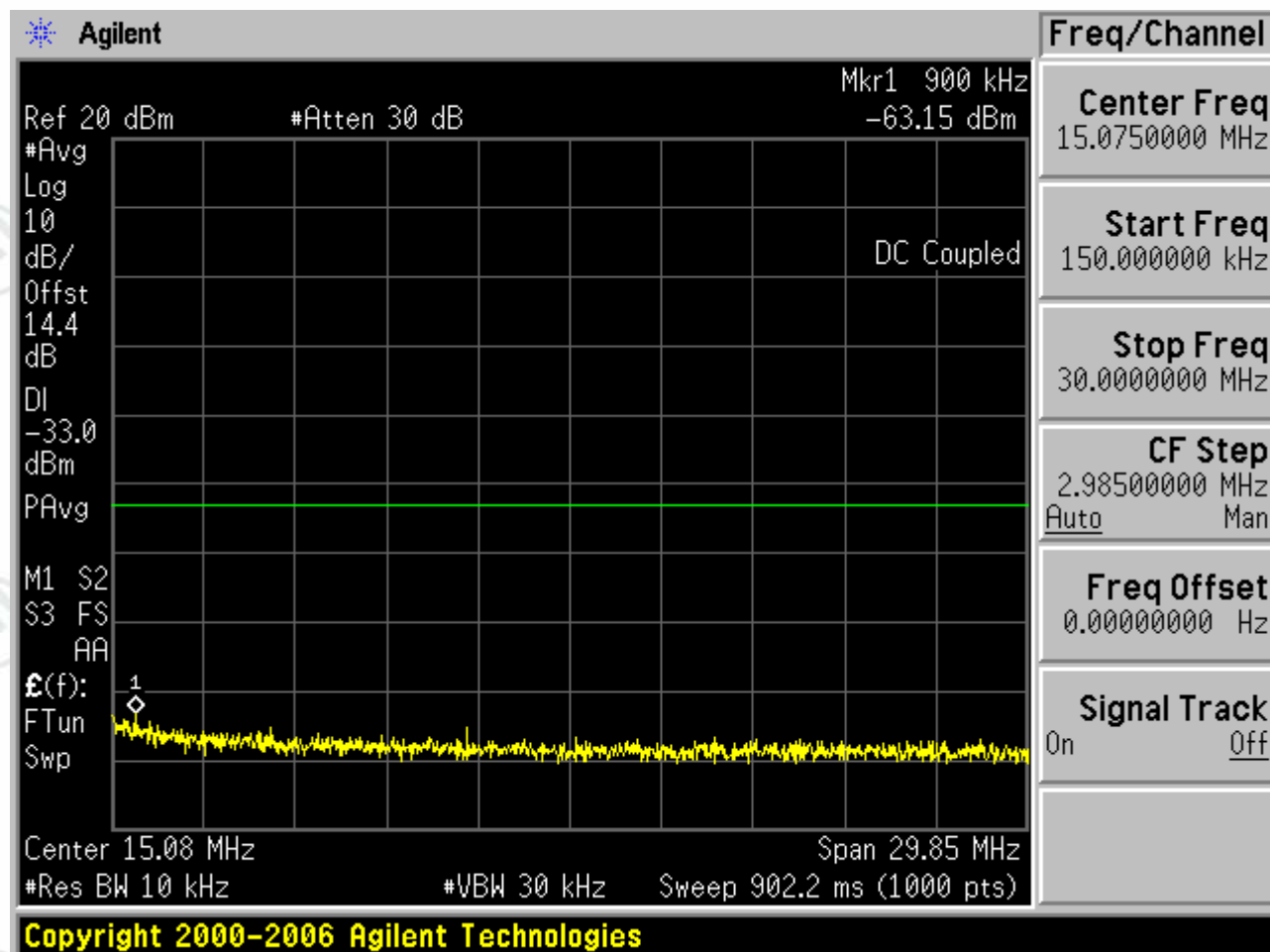


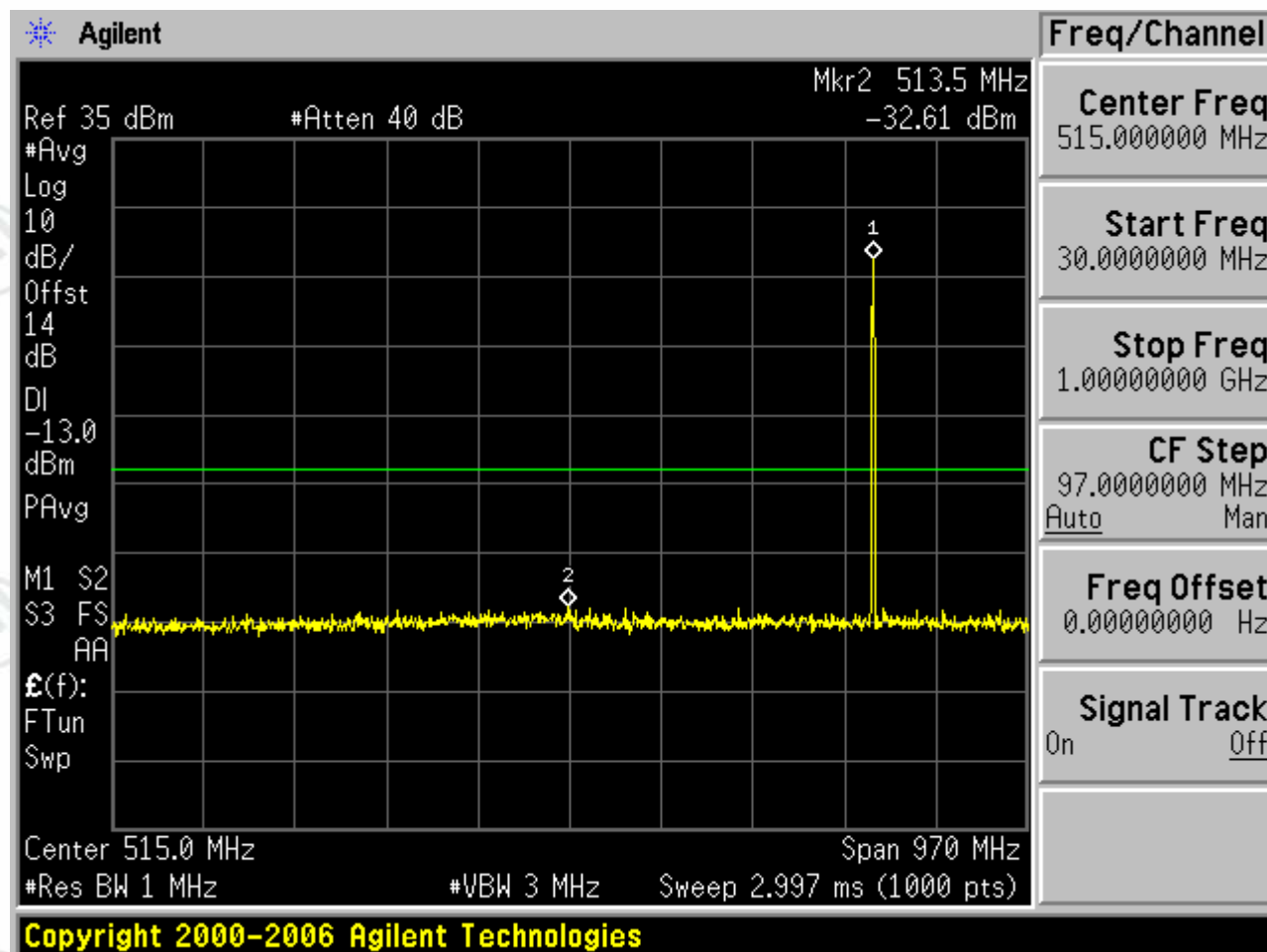


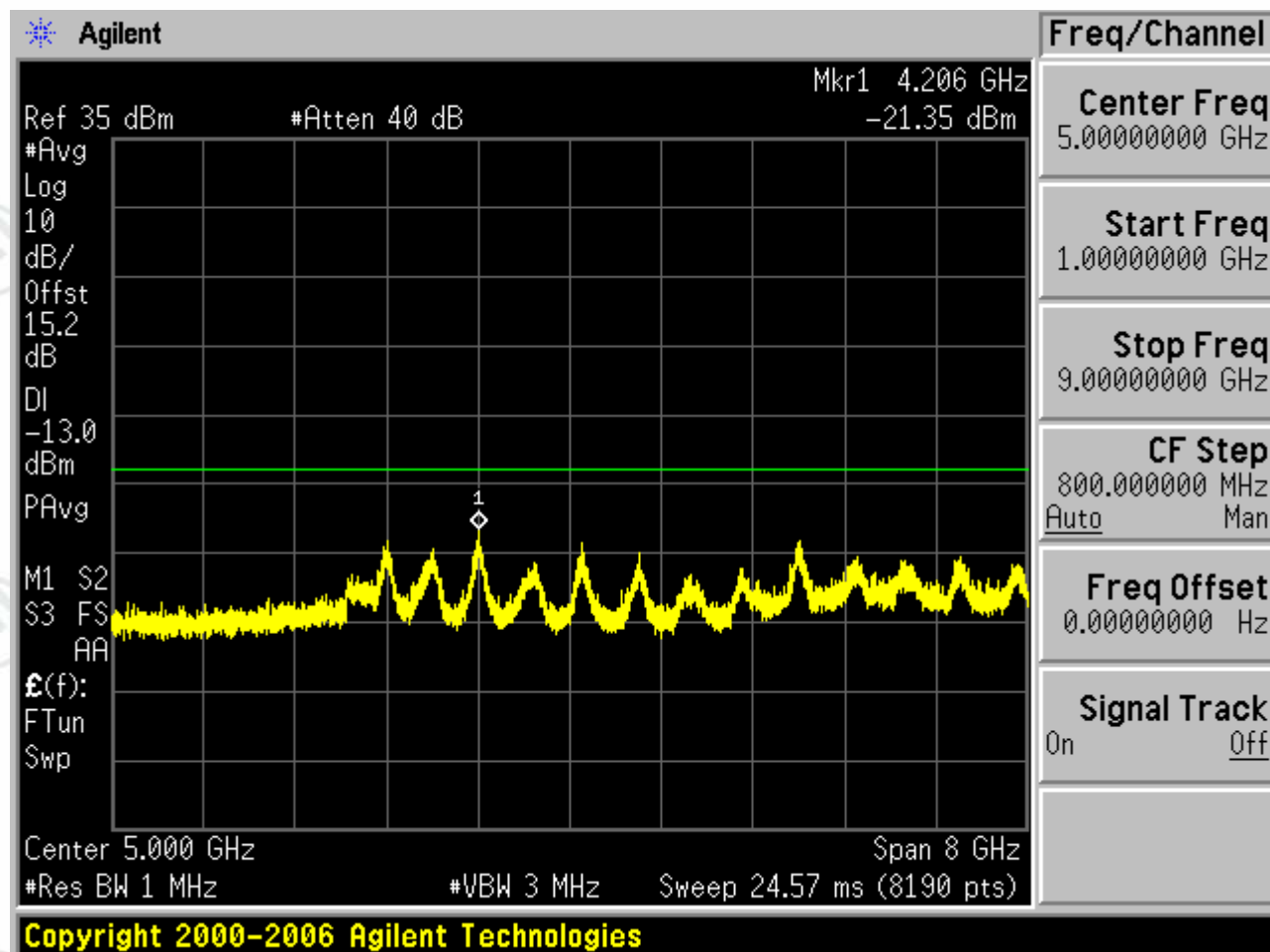


1.1.2.2 Test Channel=MCH

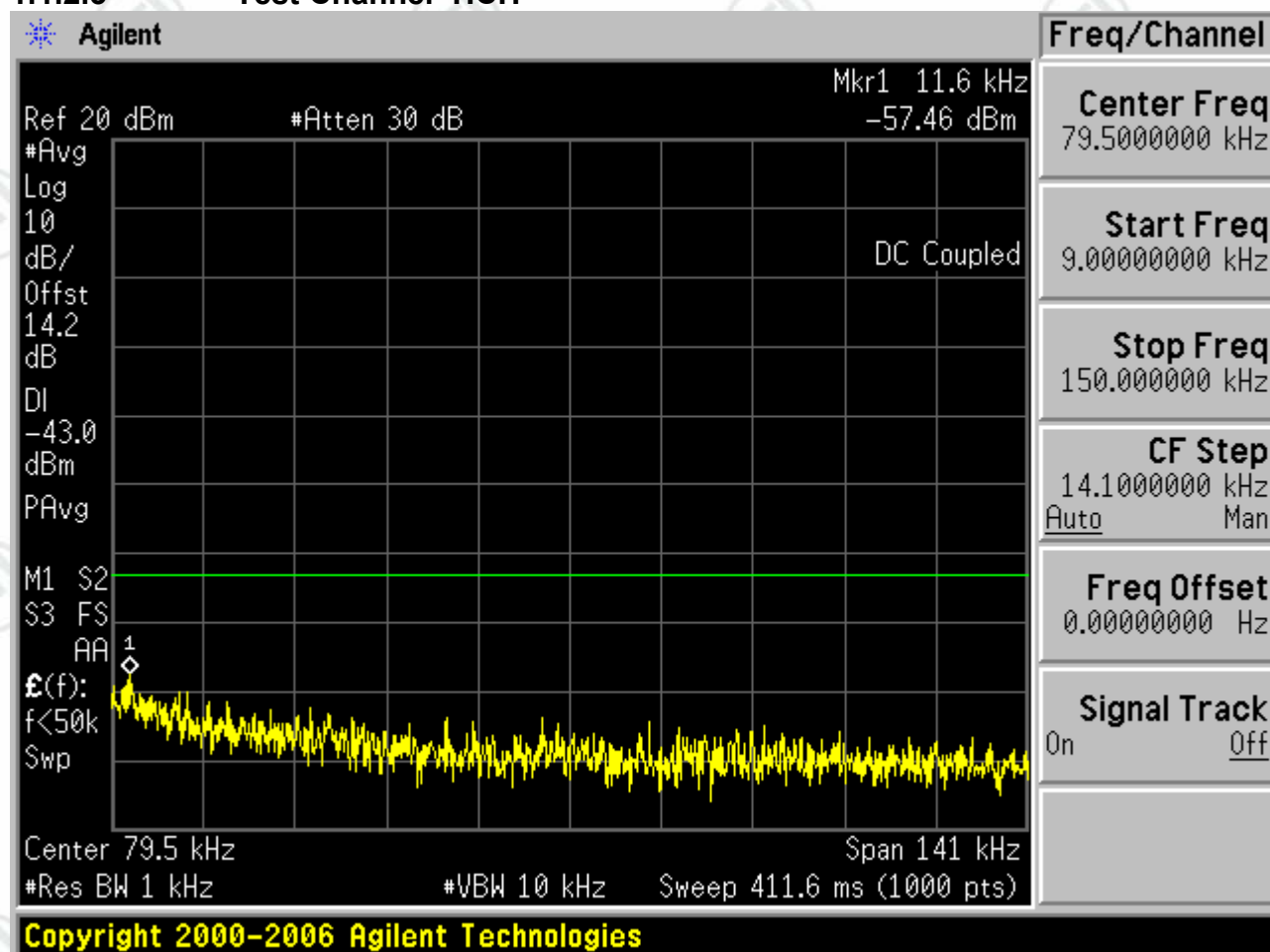


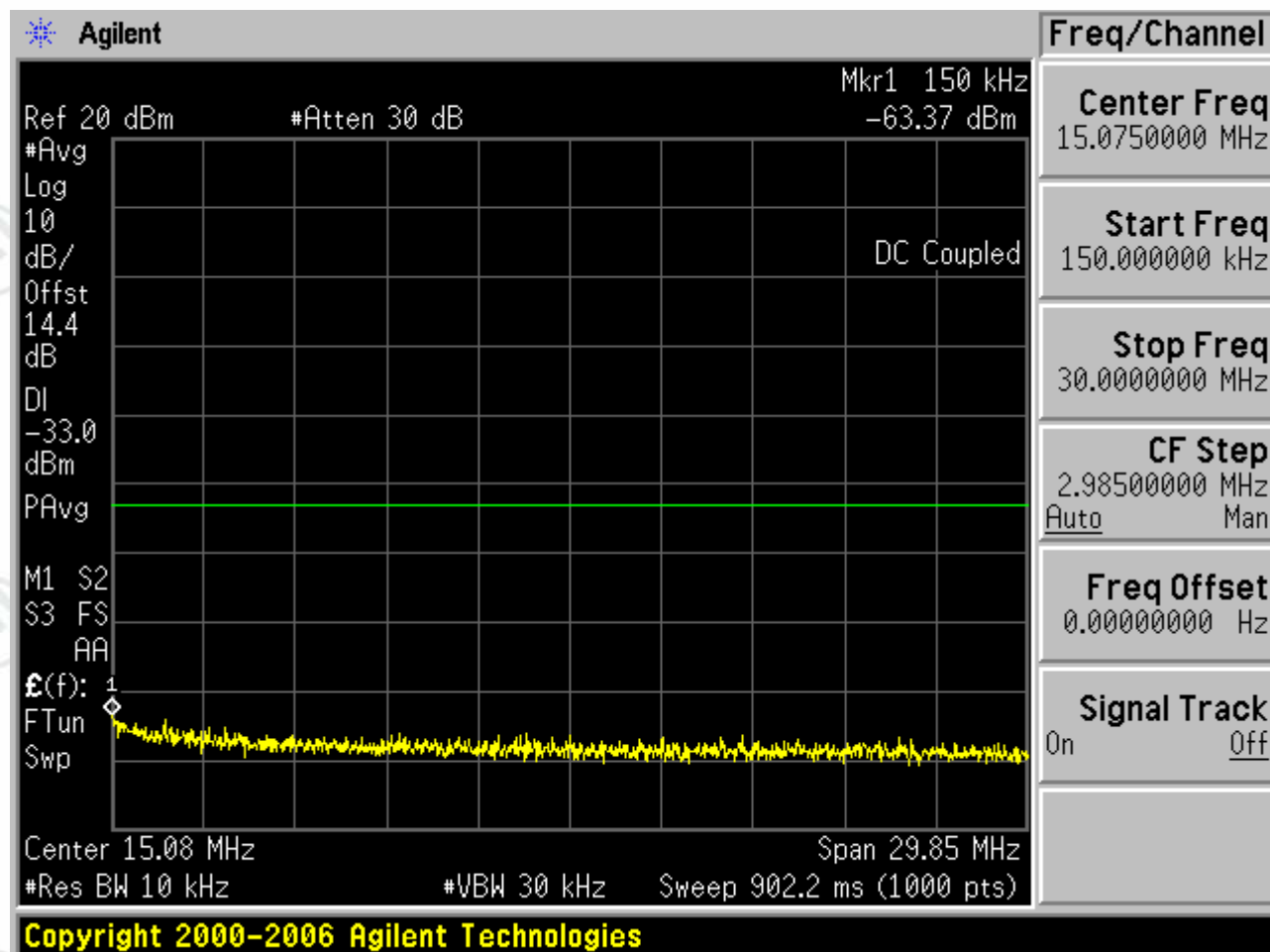


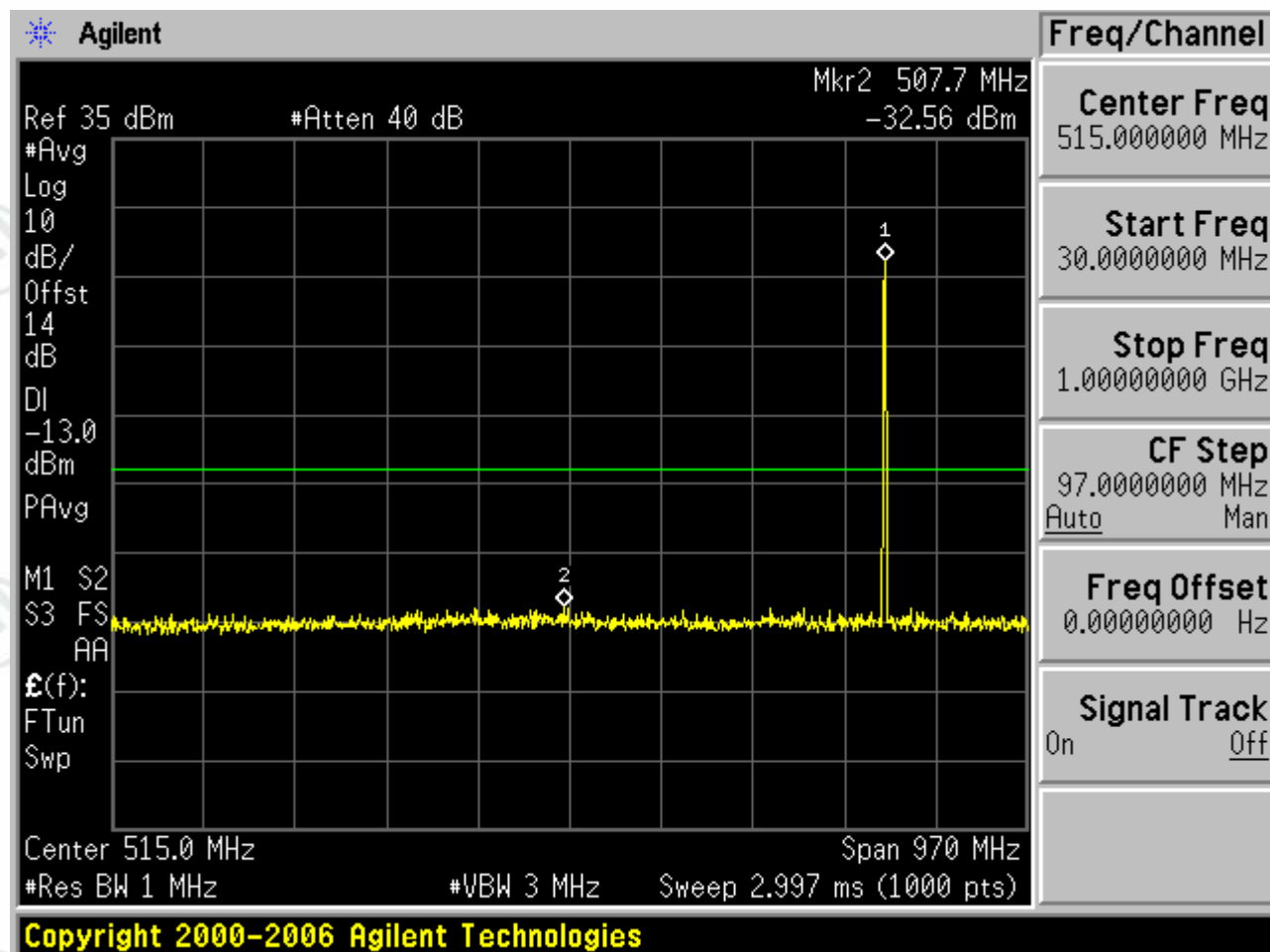


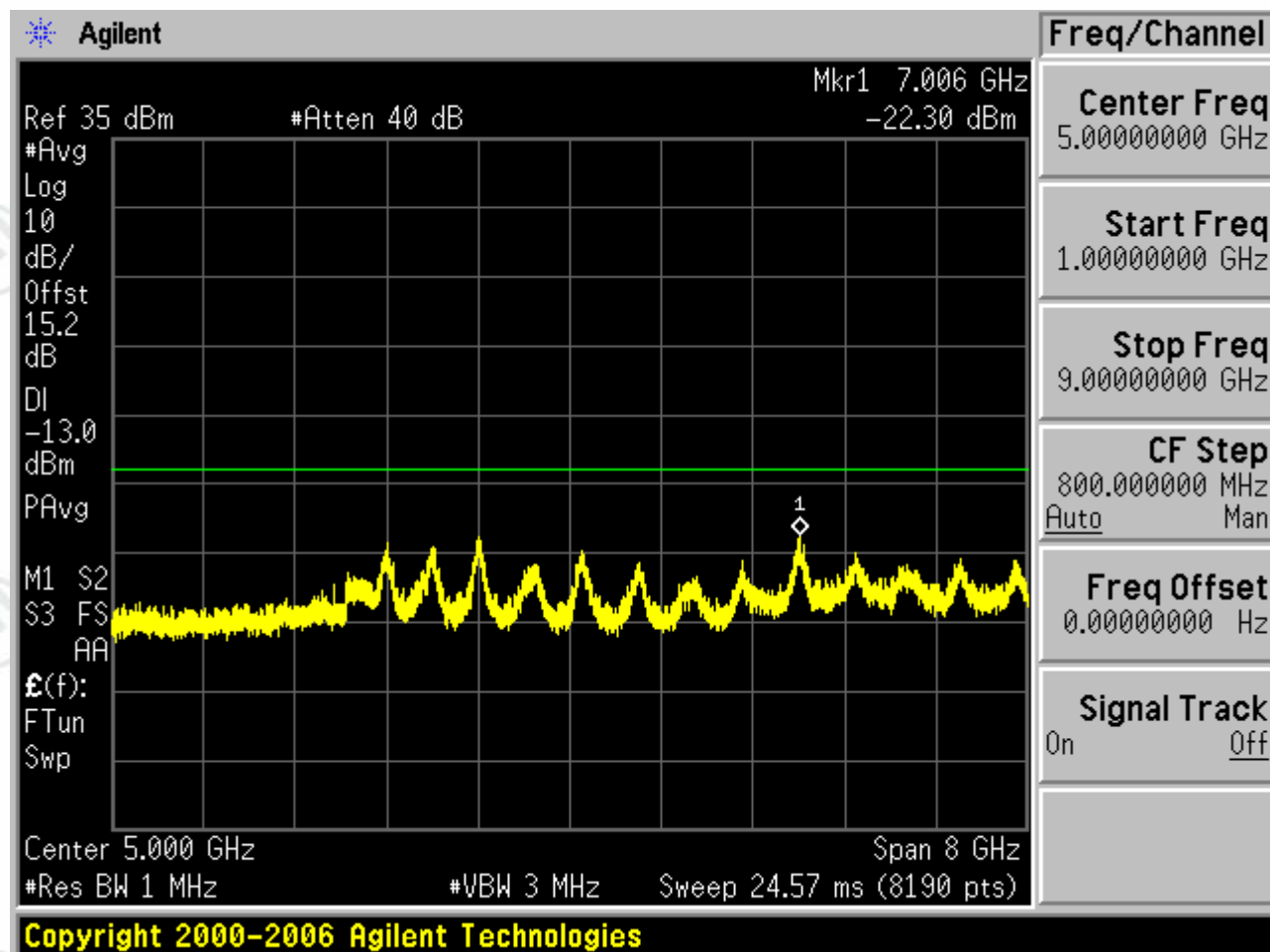


1.1.2.3 Test Channel=HCH



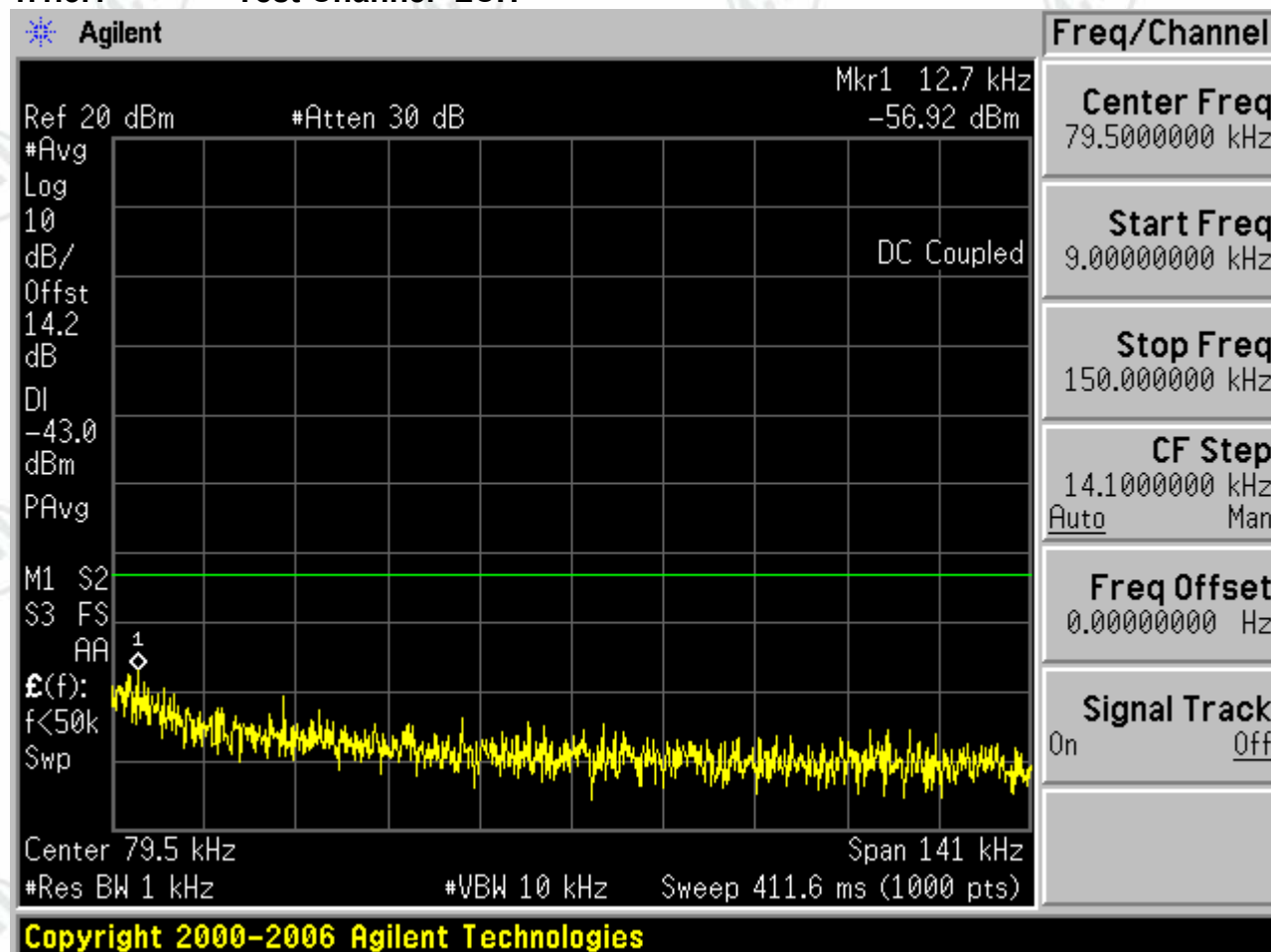


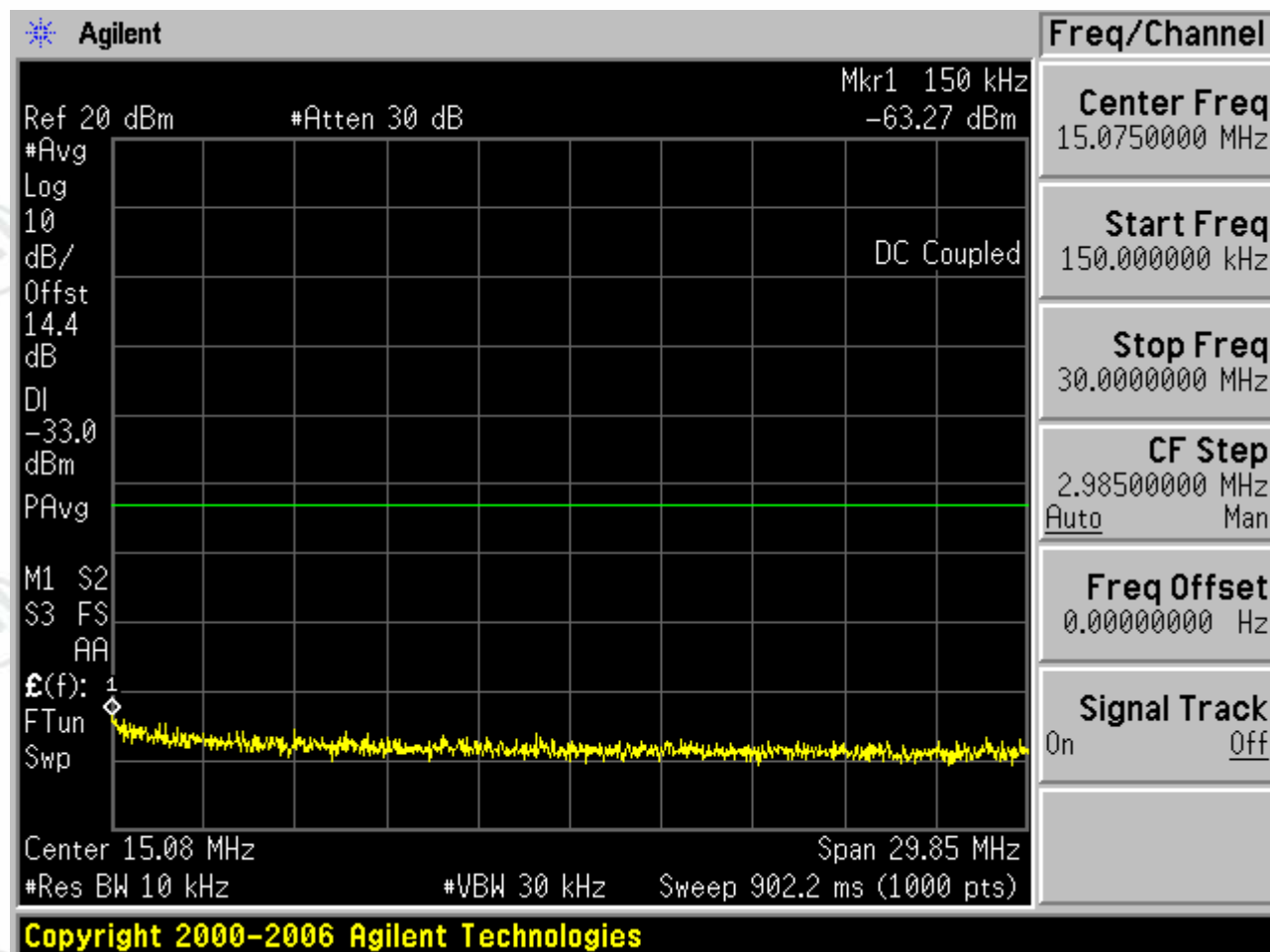


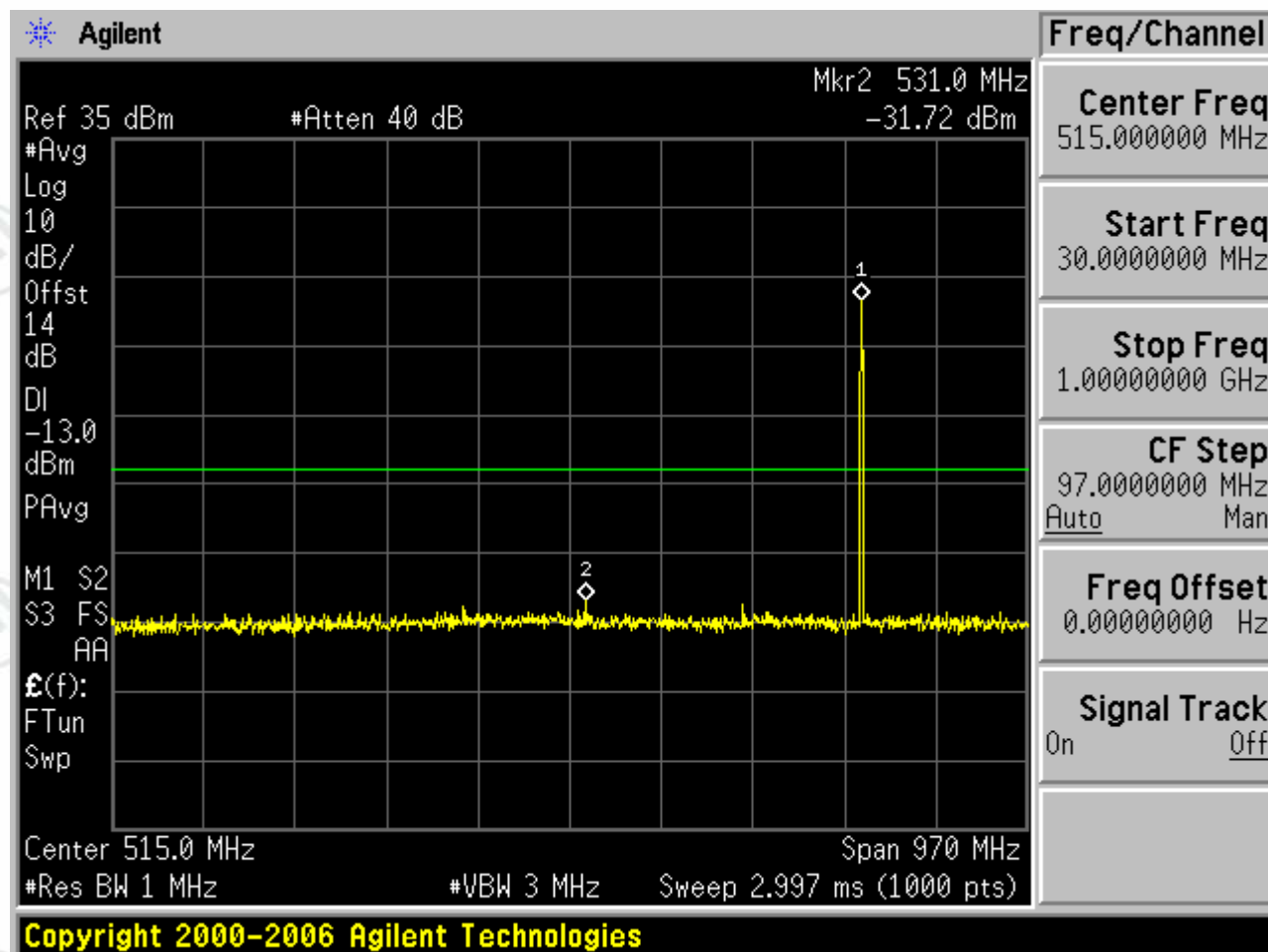


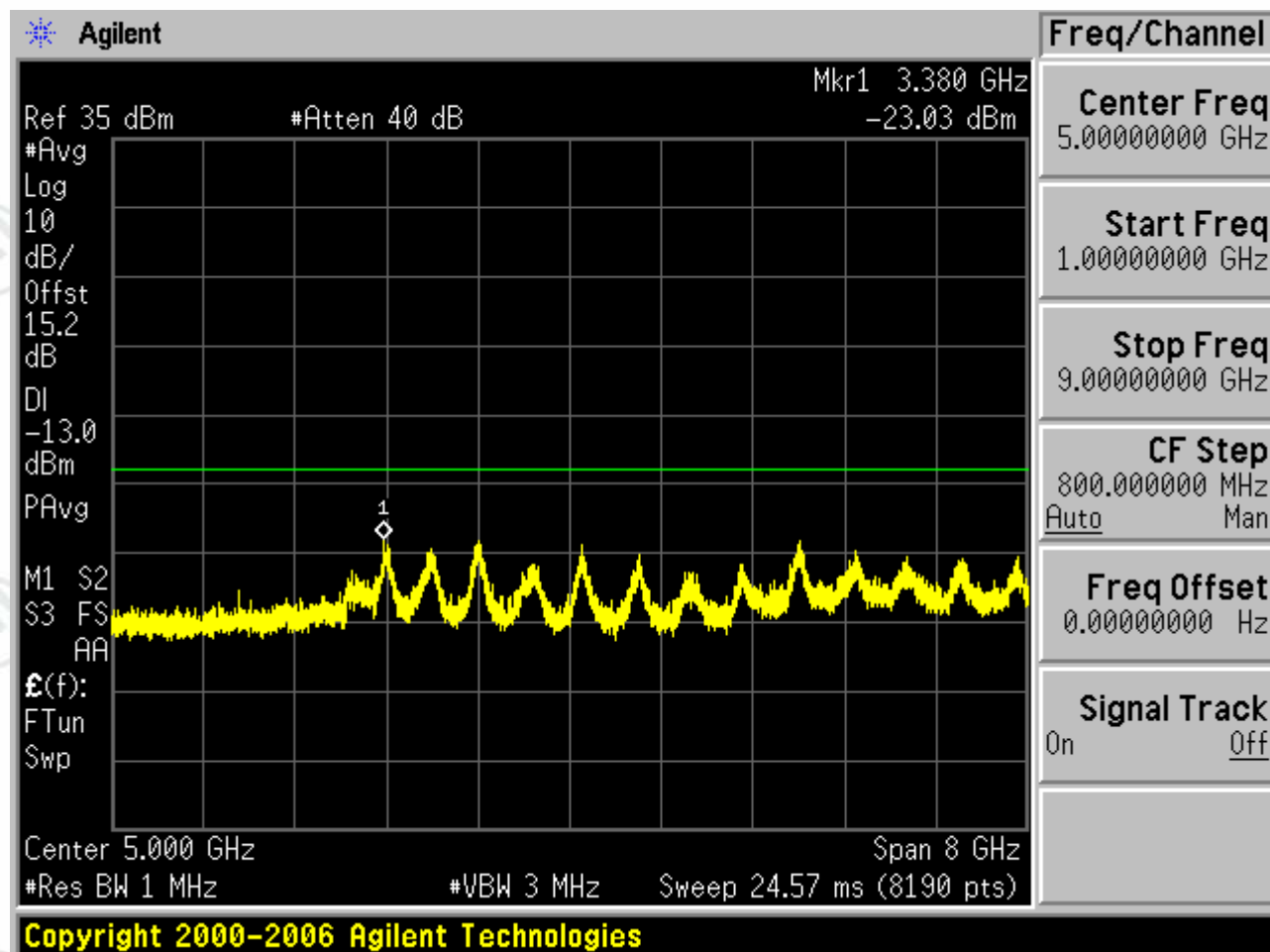
1.1.3 Test Mode=GSM/TM3

1.1.3.1 Test Channel=LCH

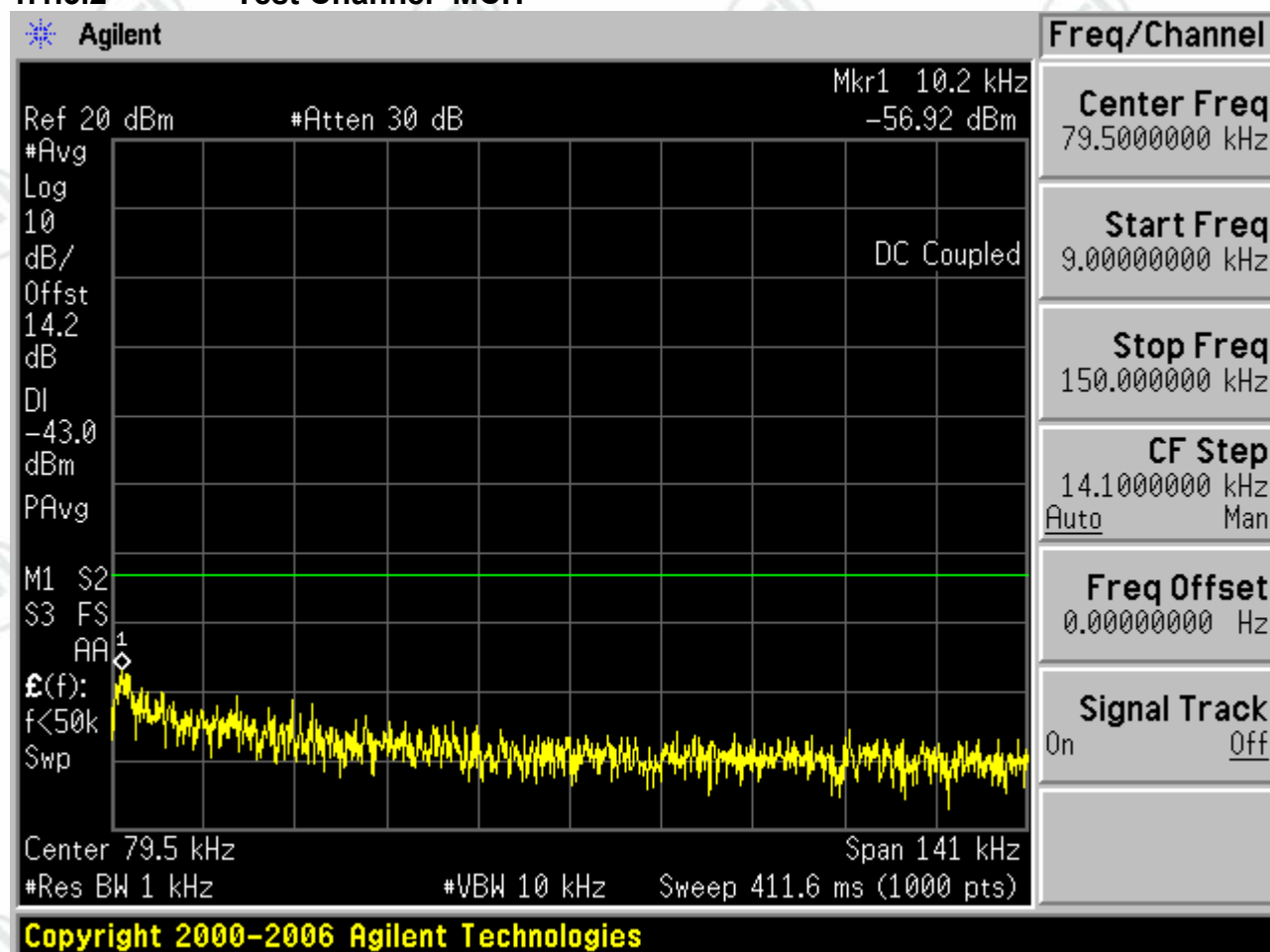


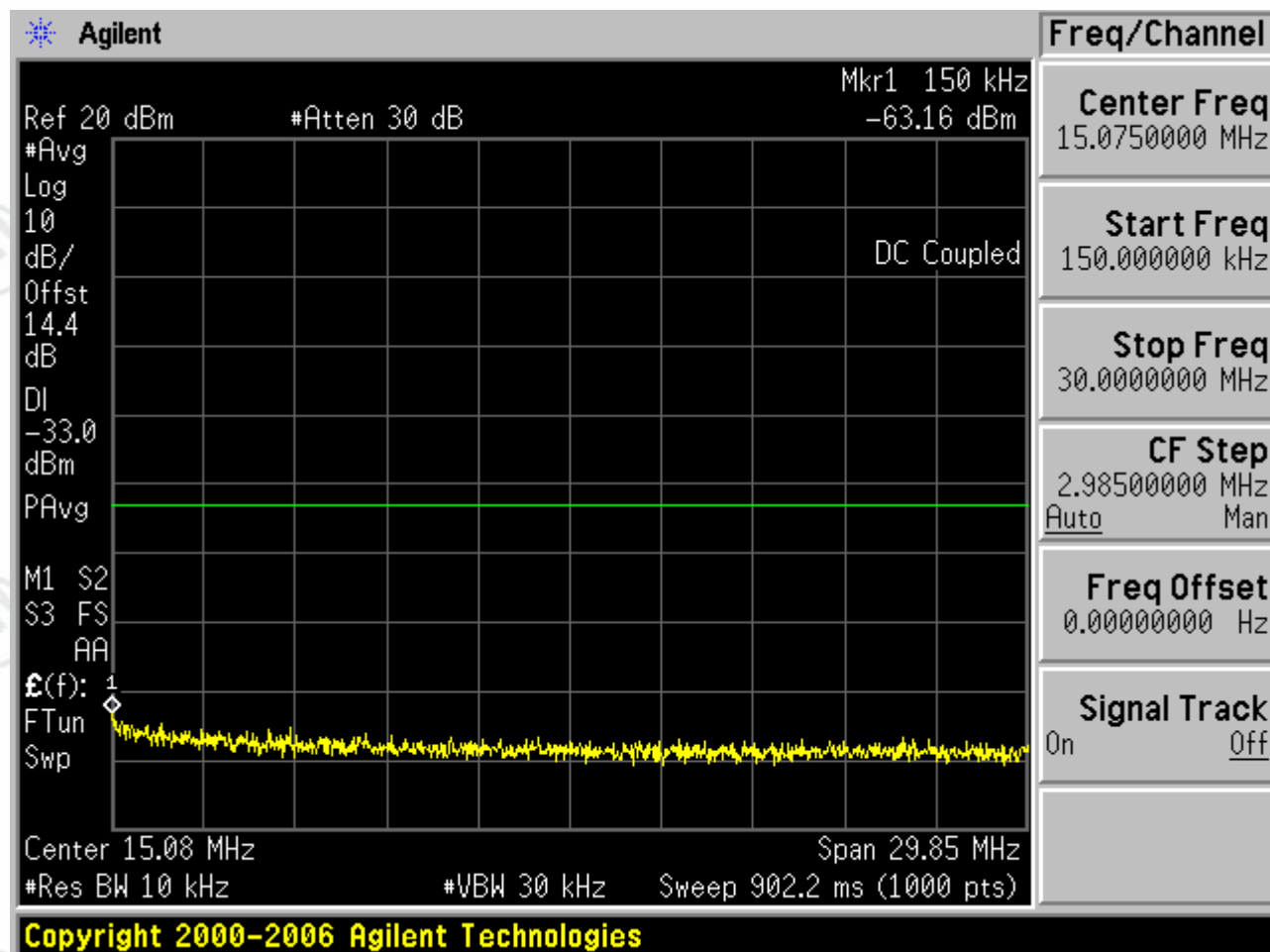


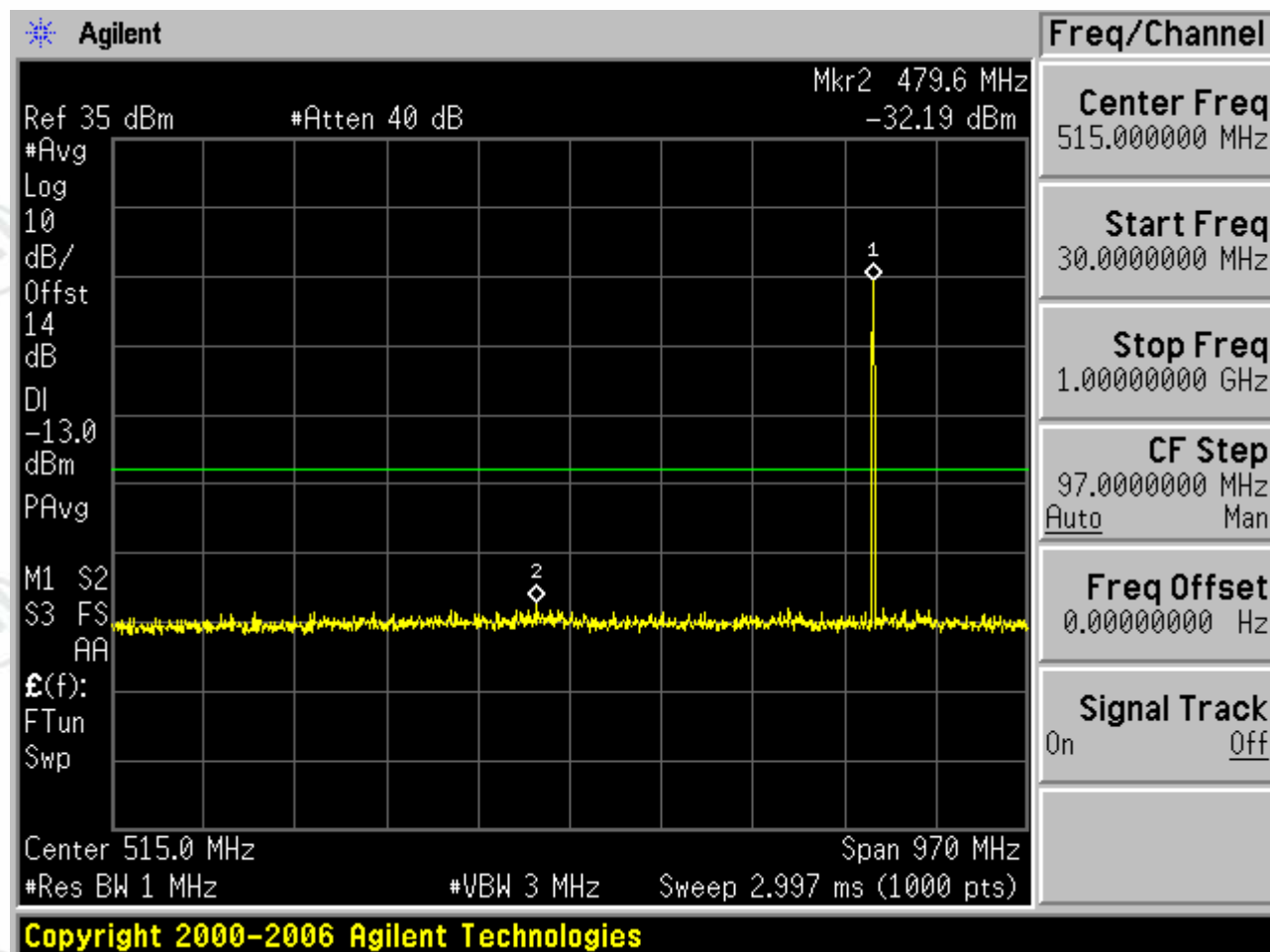


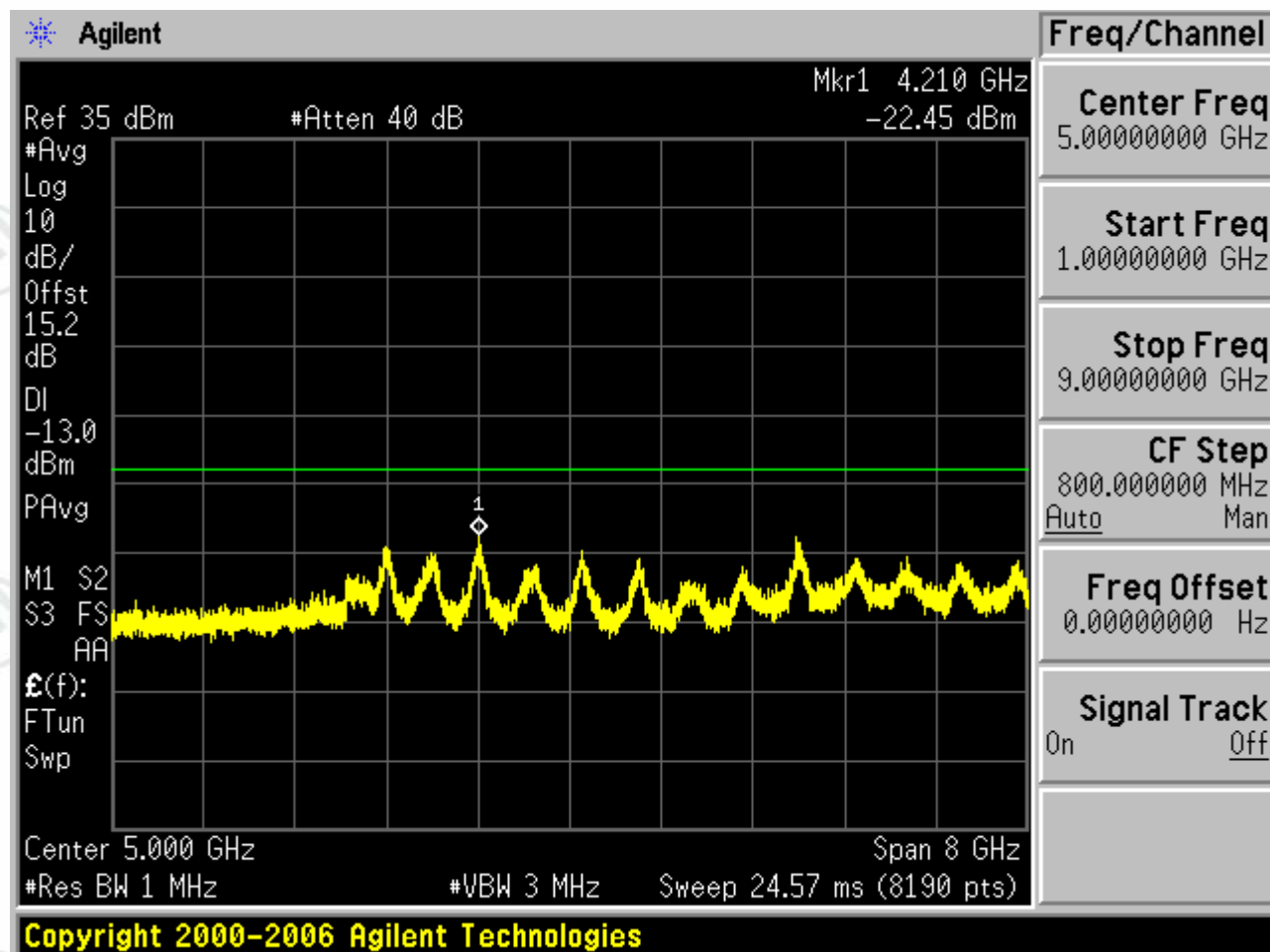


1.1.3.2 Test Channel=MCH

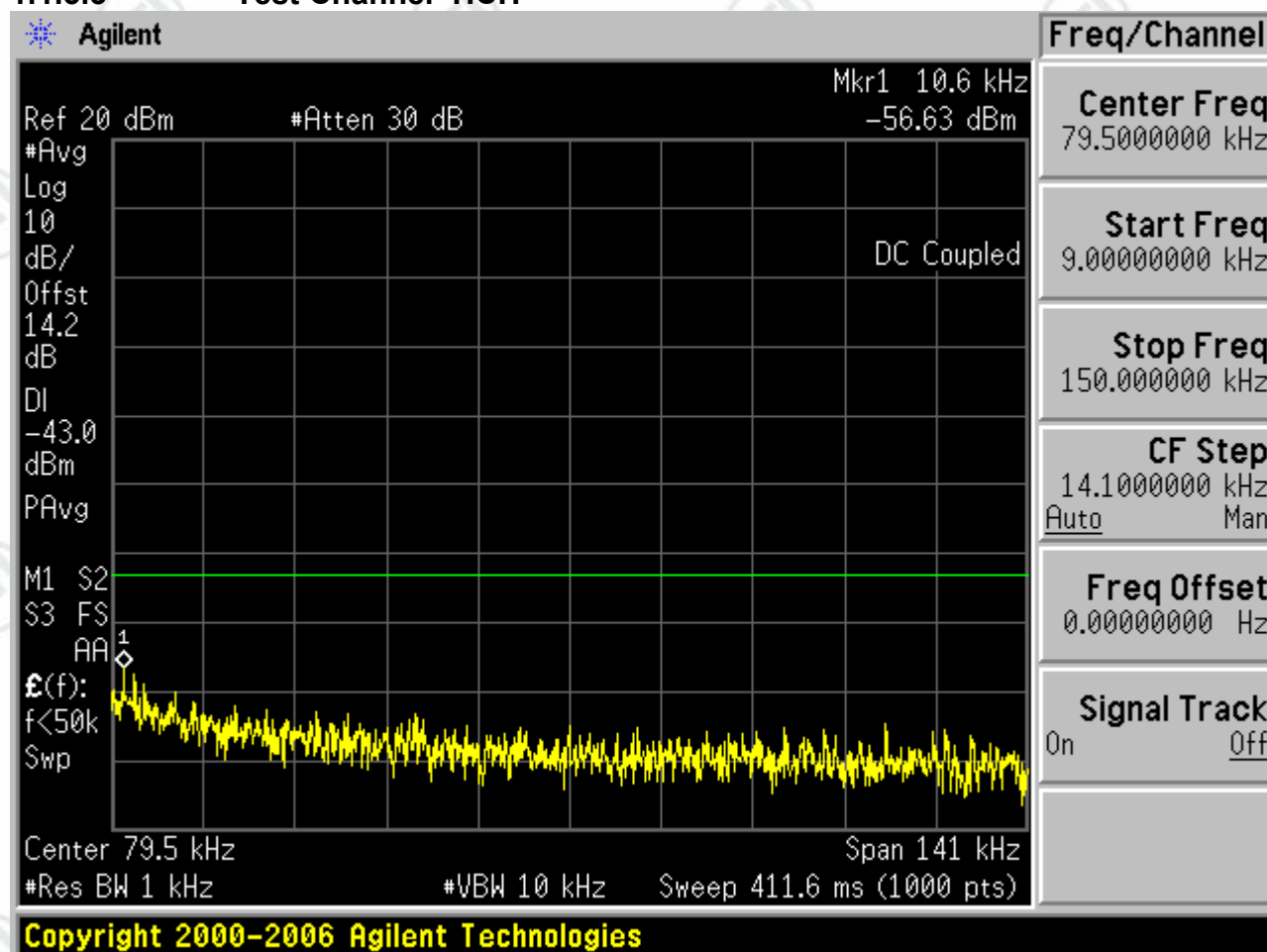


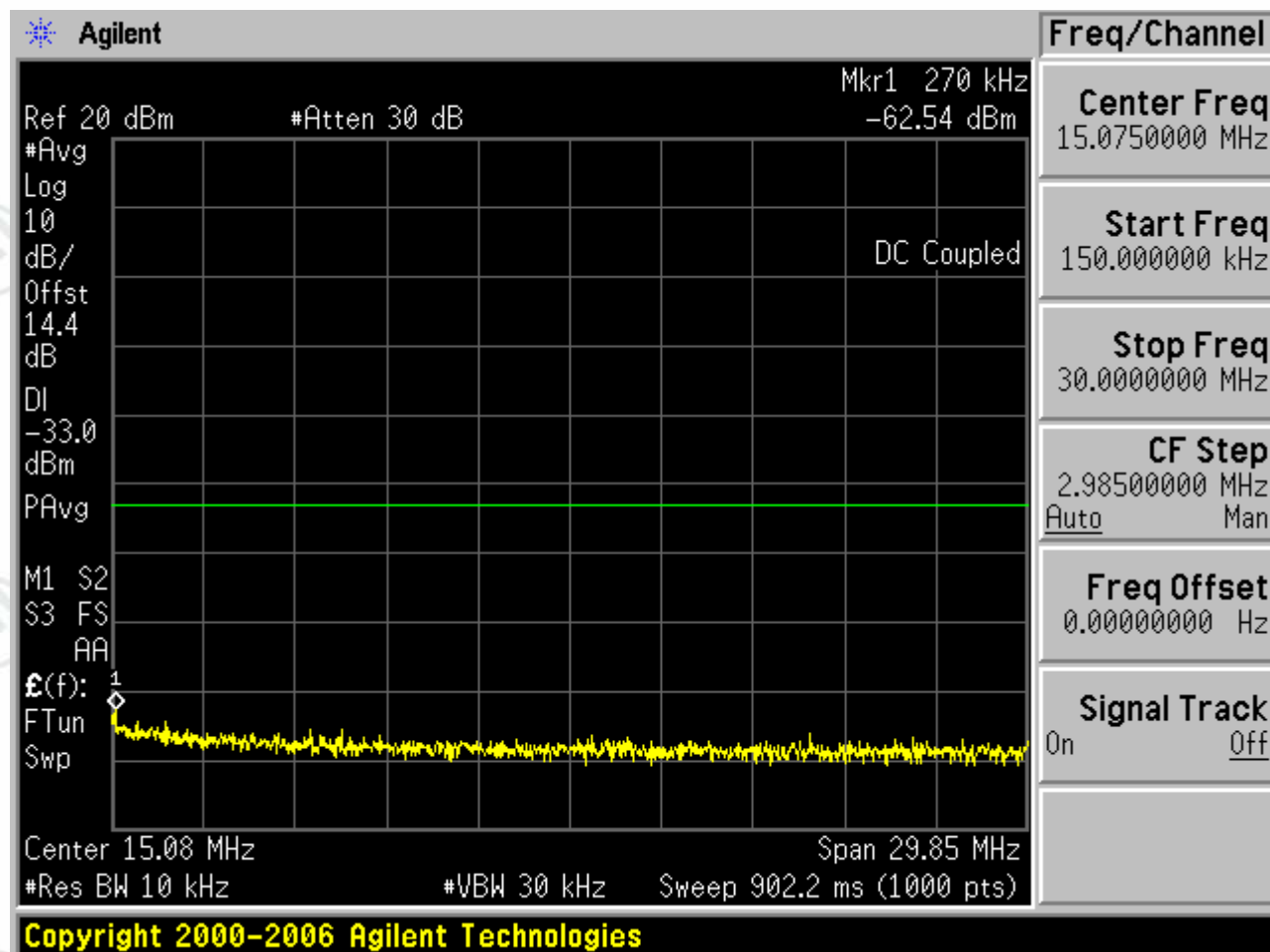


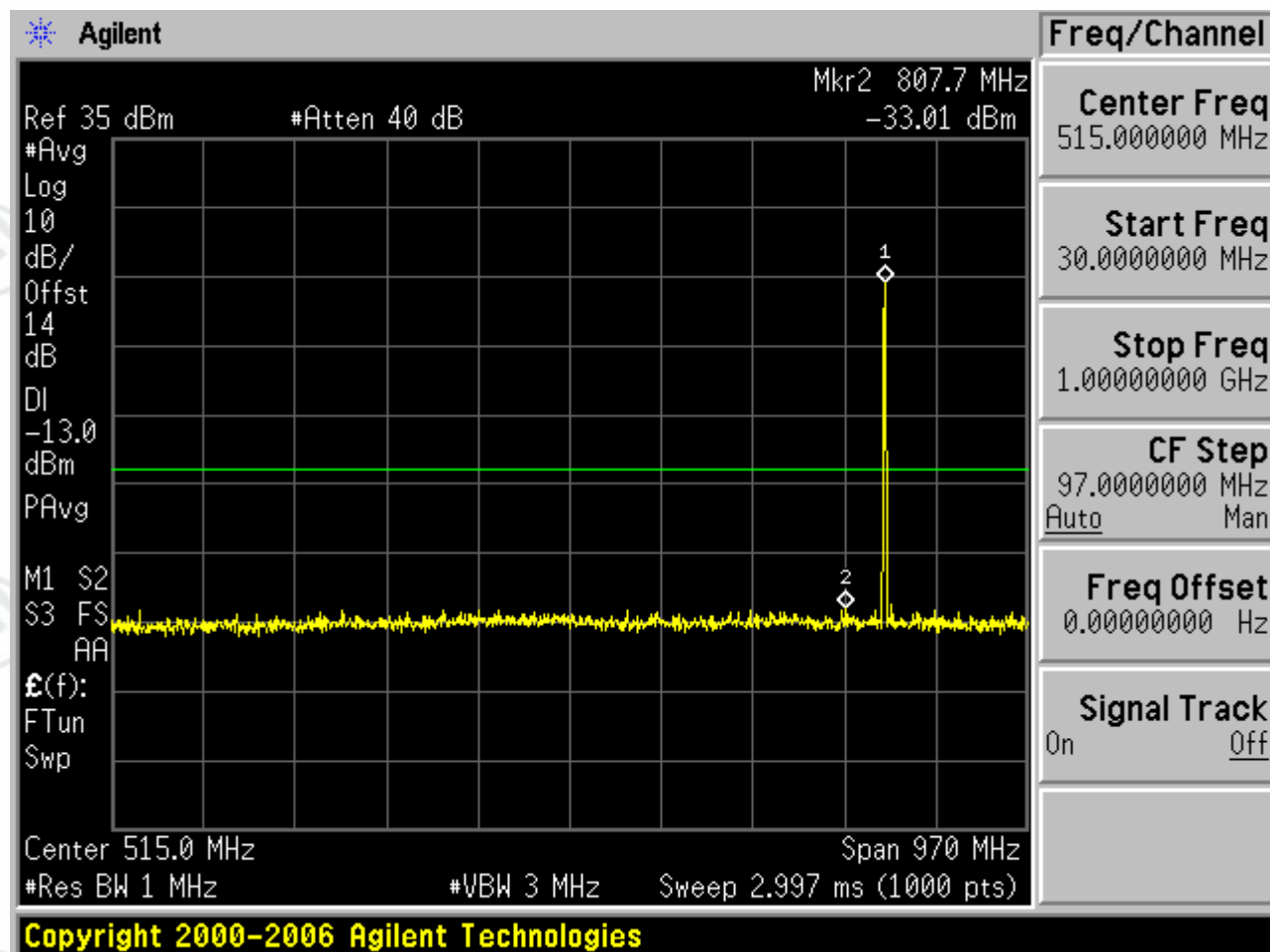


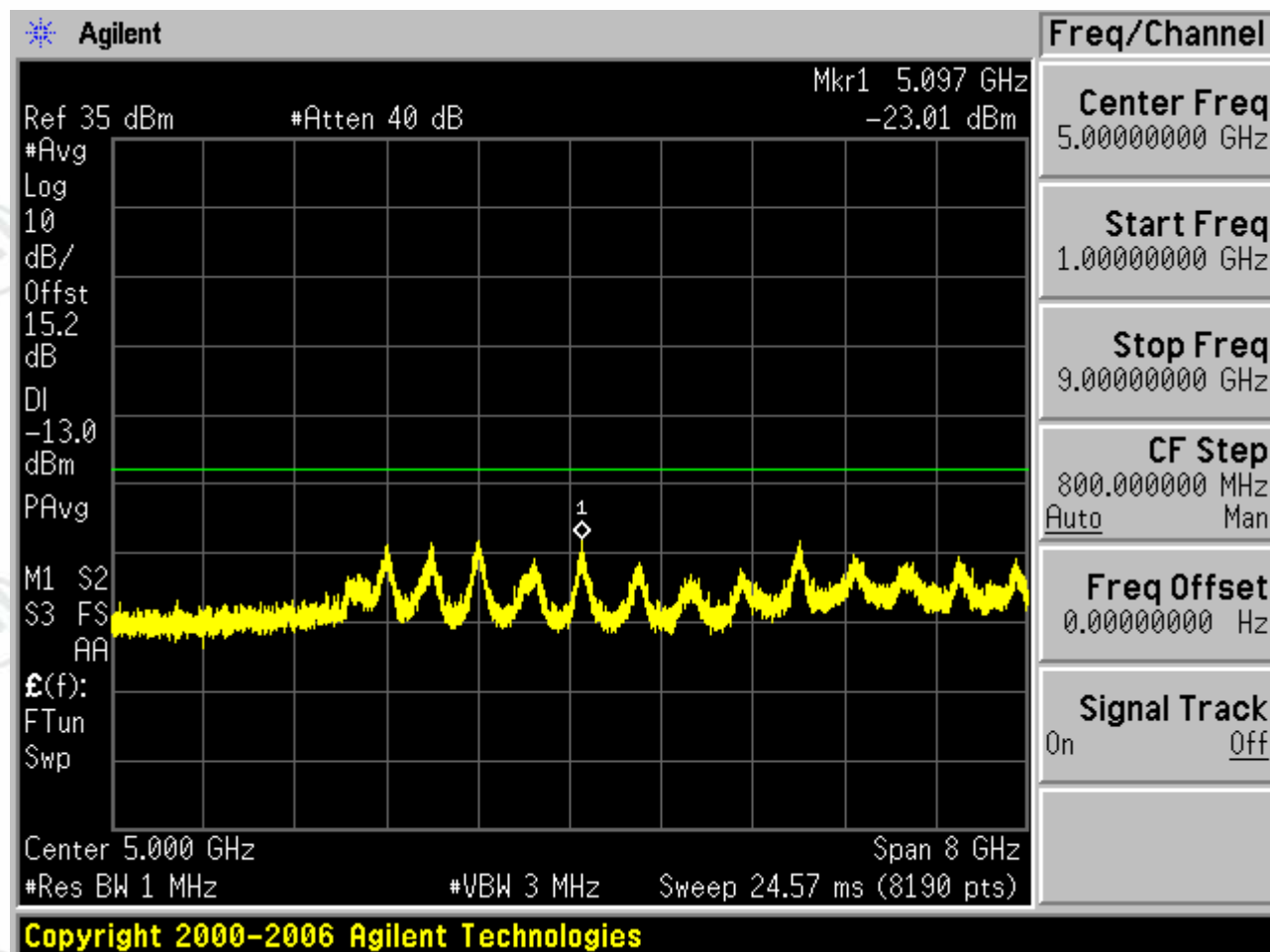


1.1.3.3 Test Channel=HCH

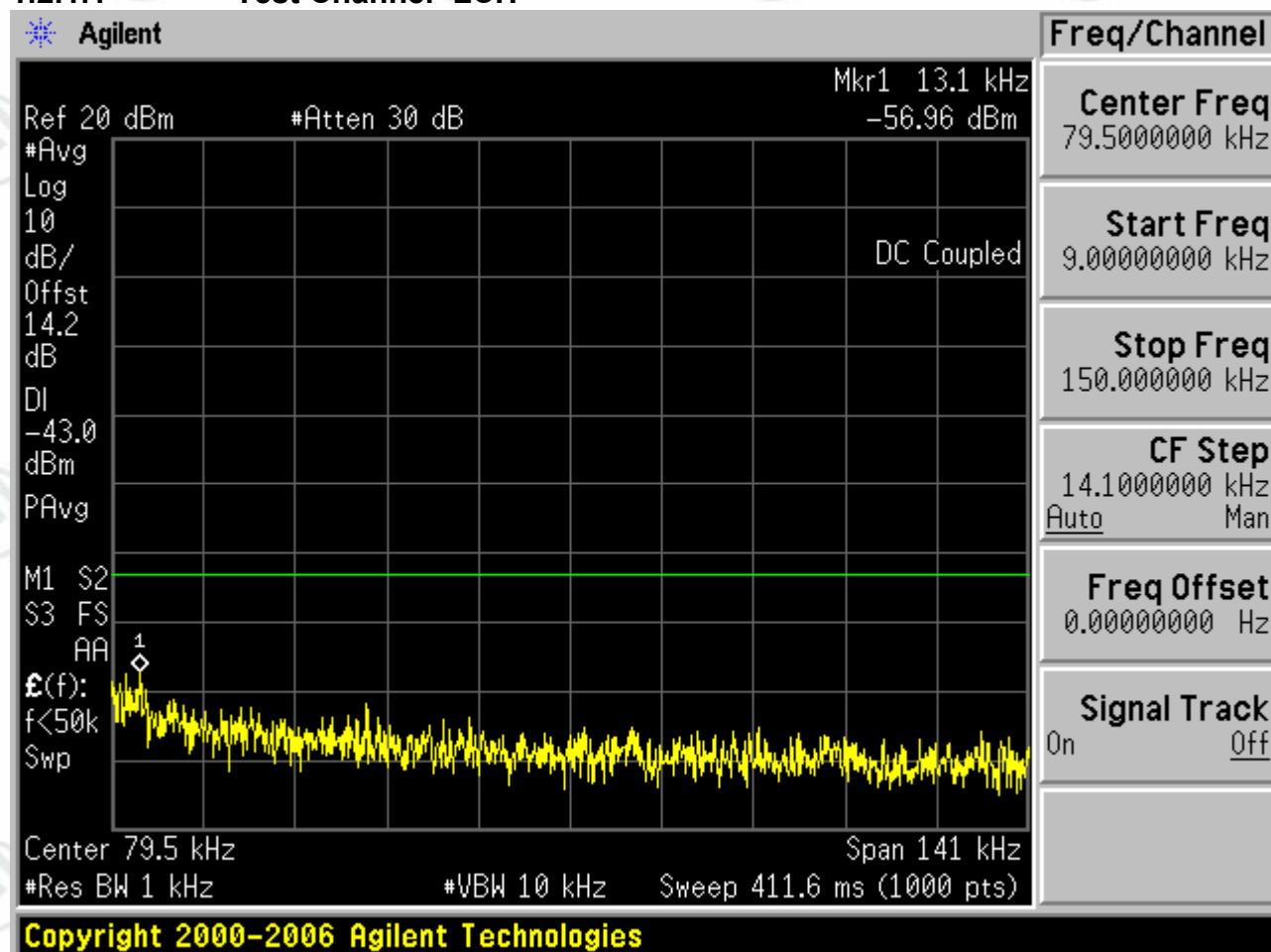


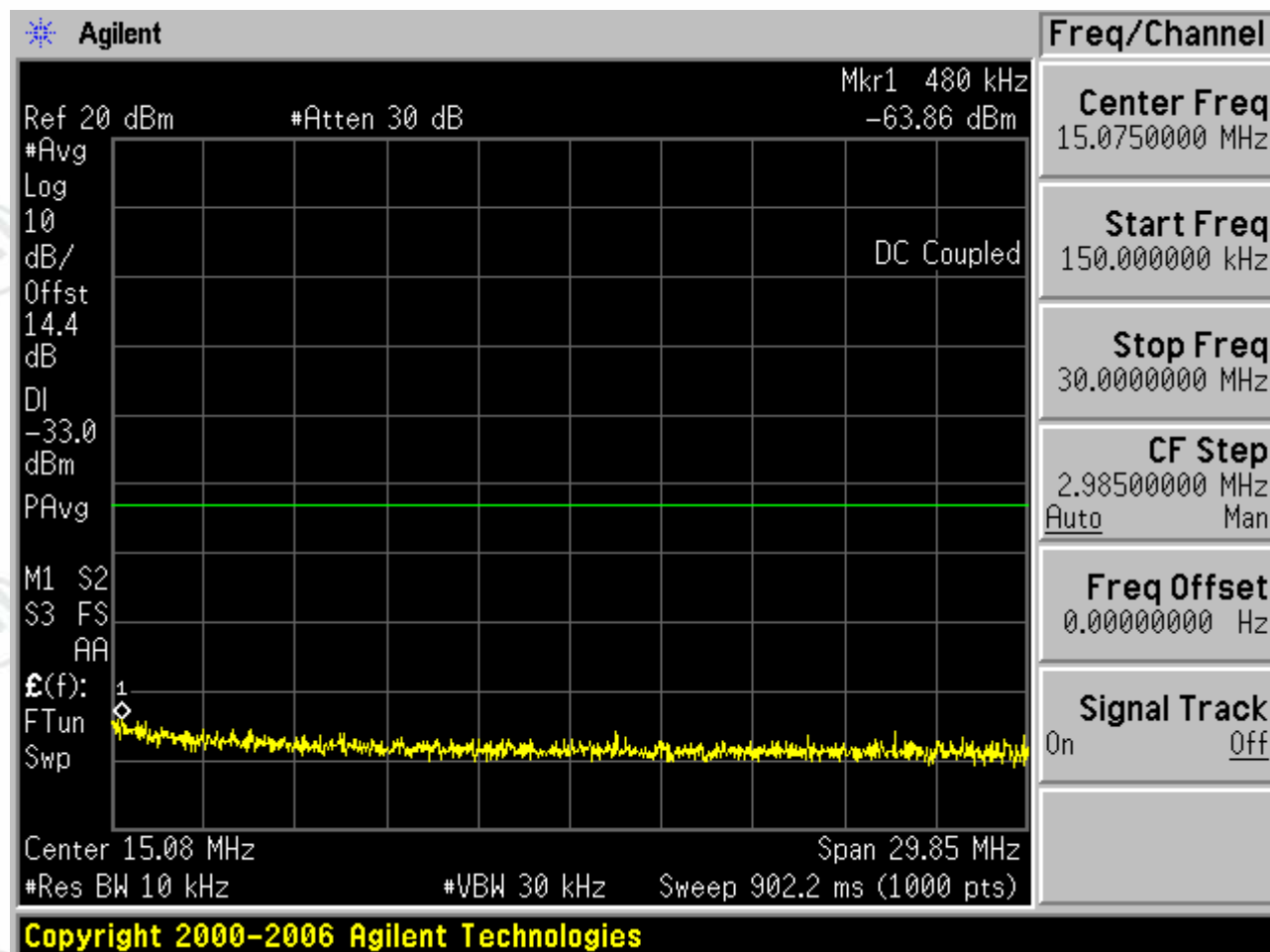


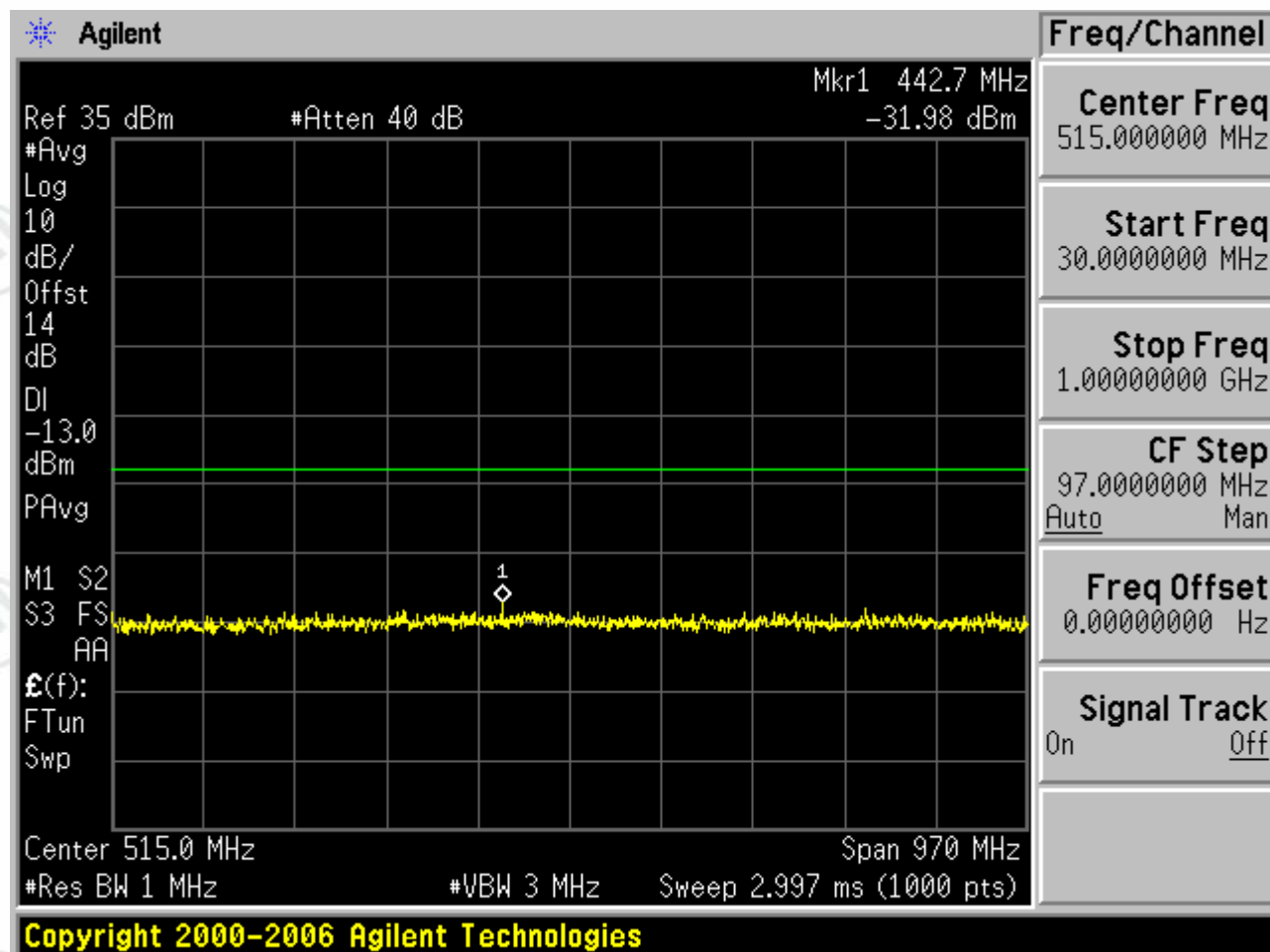


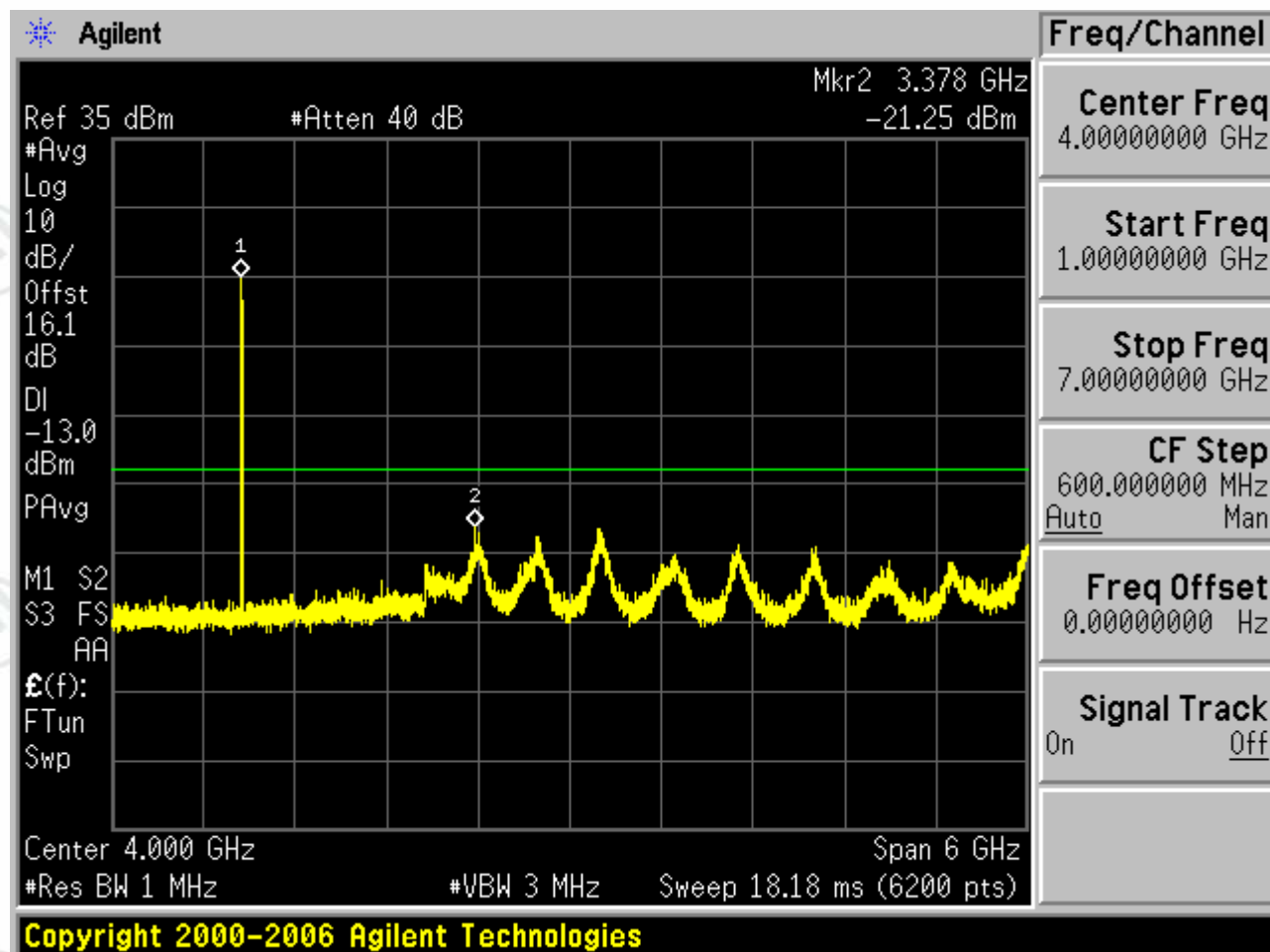


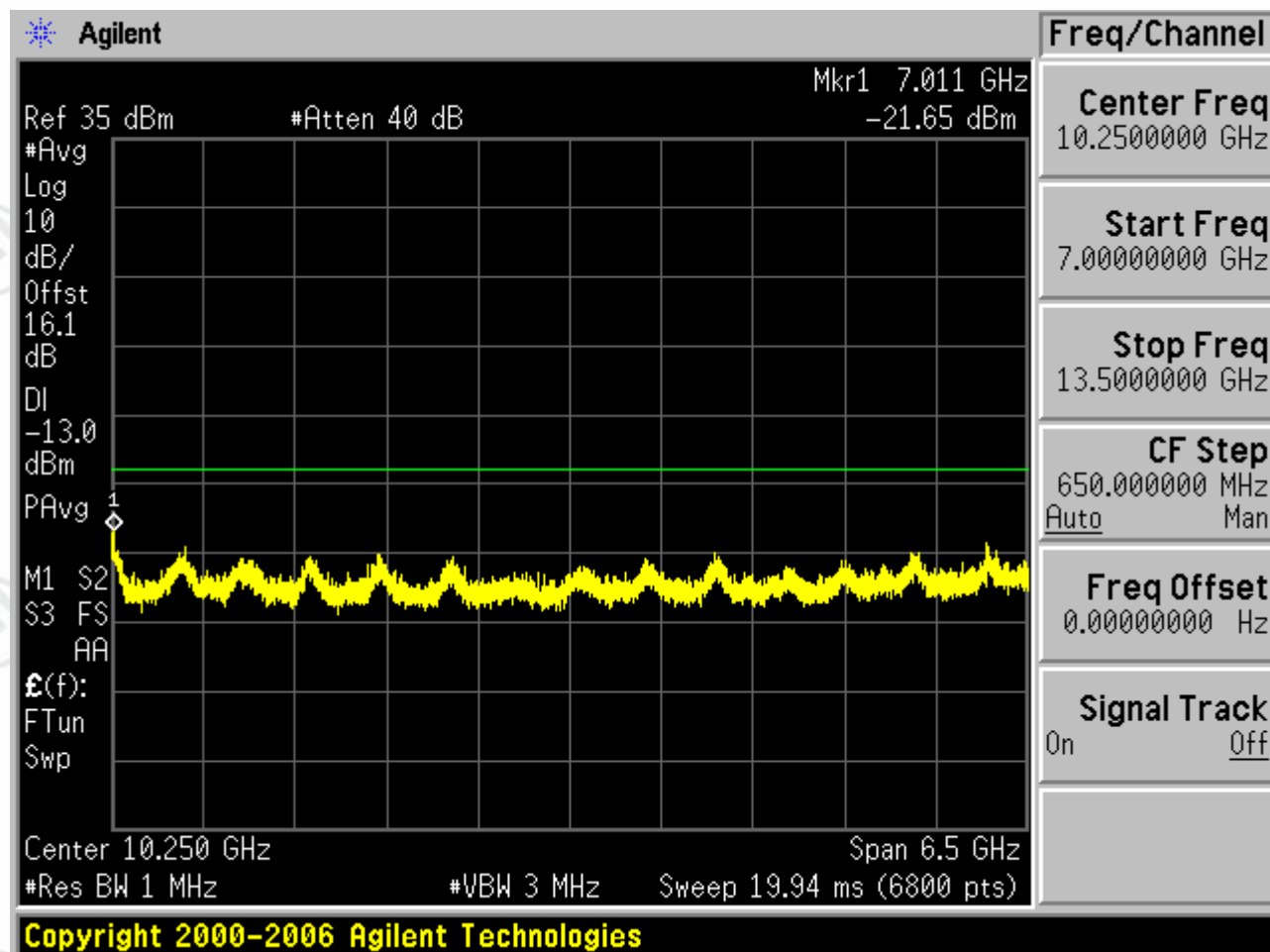
1.2 Test Band=GSM1900
1.2.1 Test Mode=GSM/TM1
1.2.1.1 Test Channel=LCH

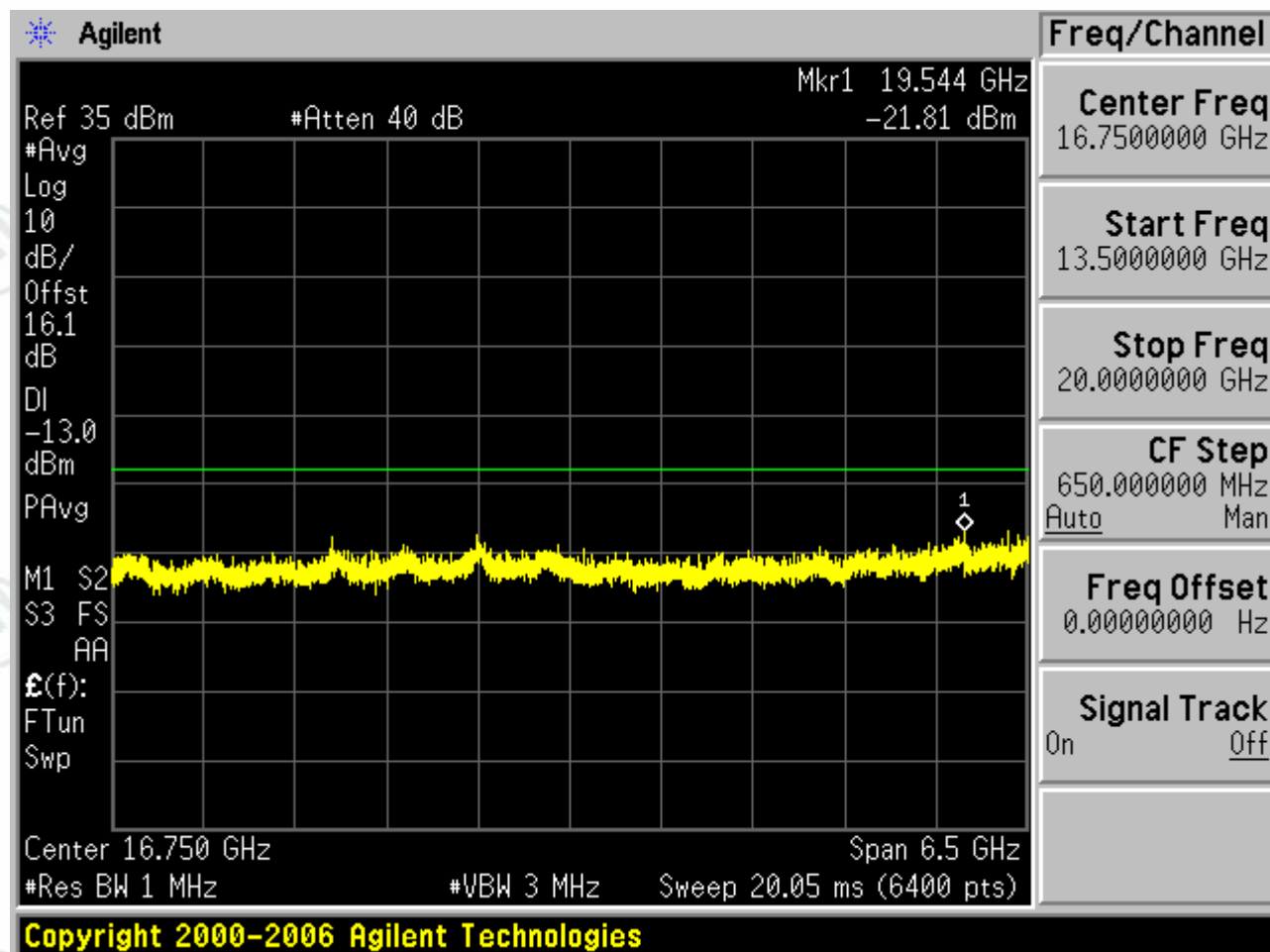




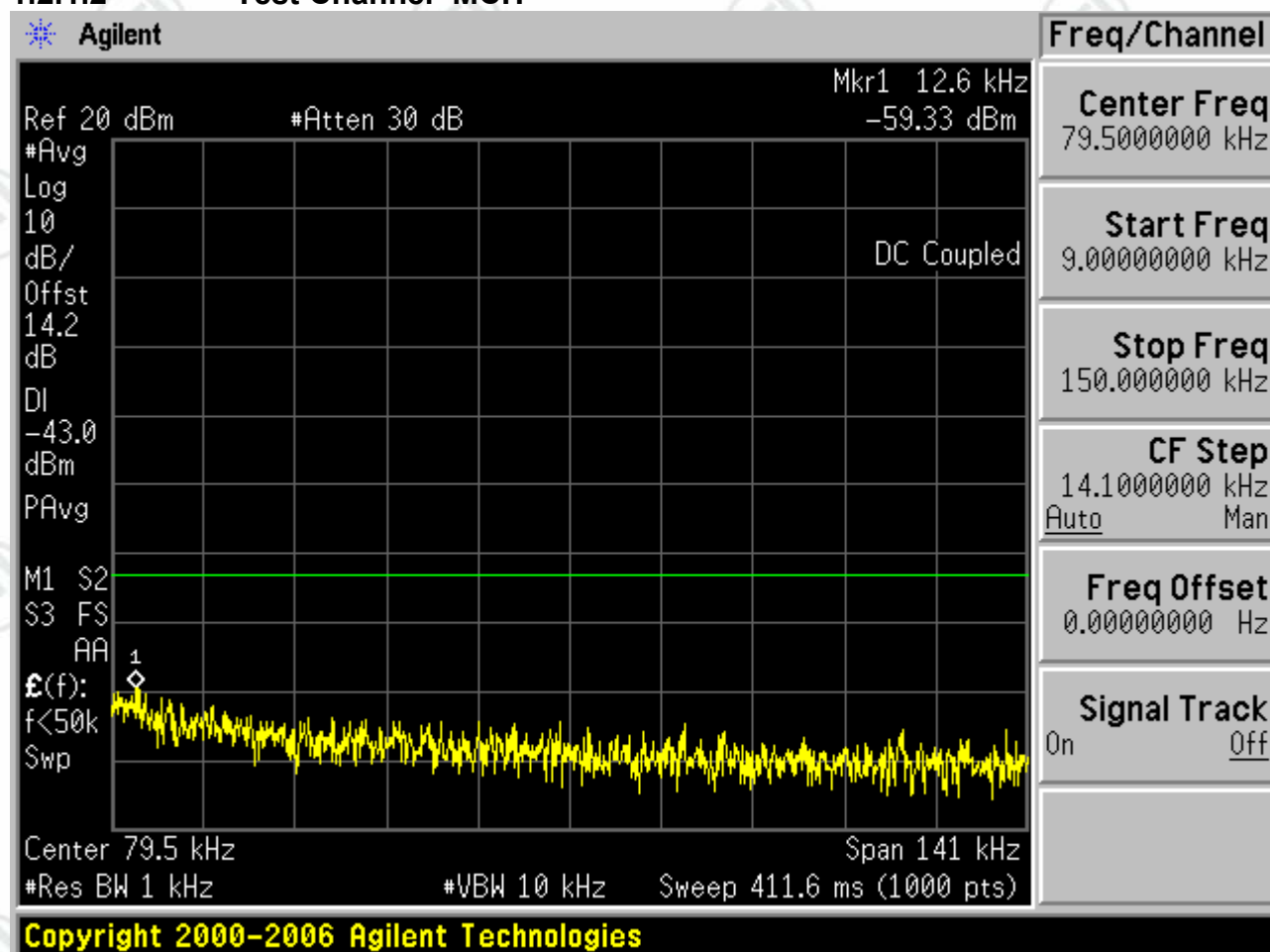


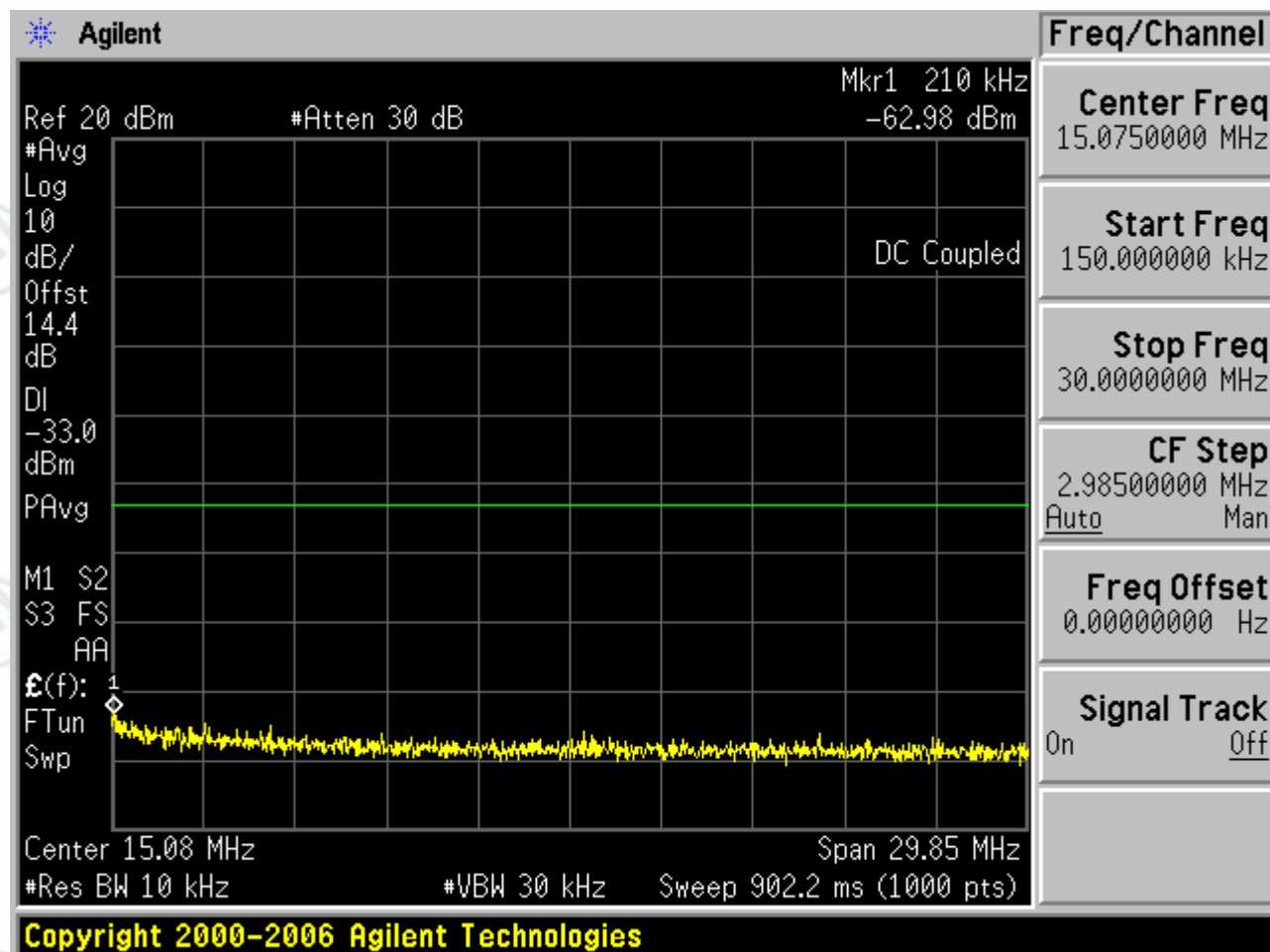


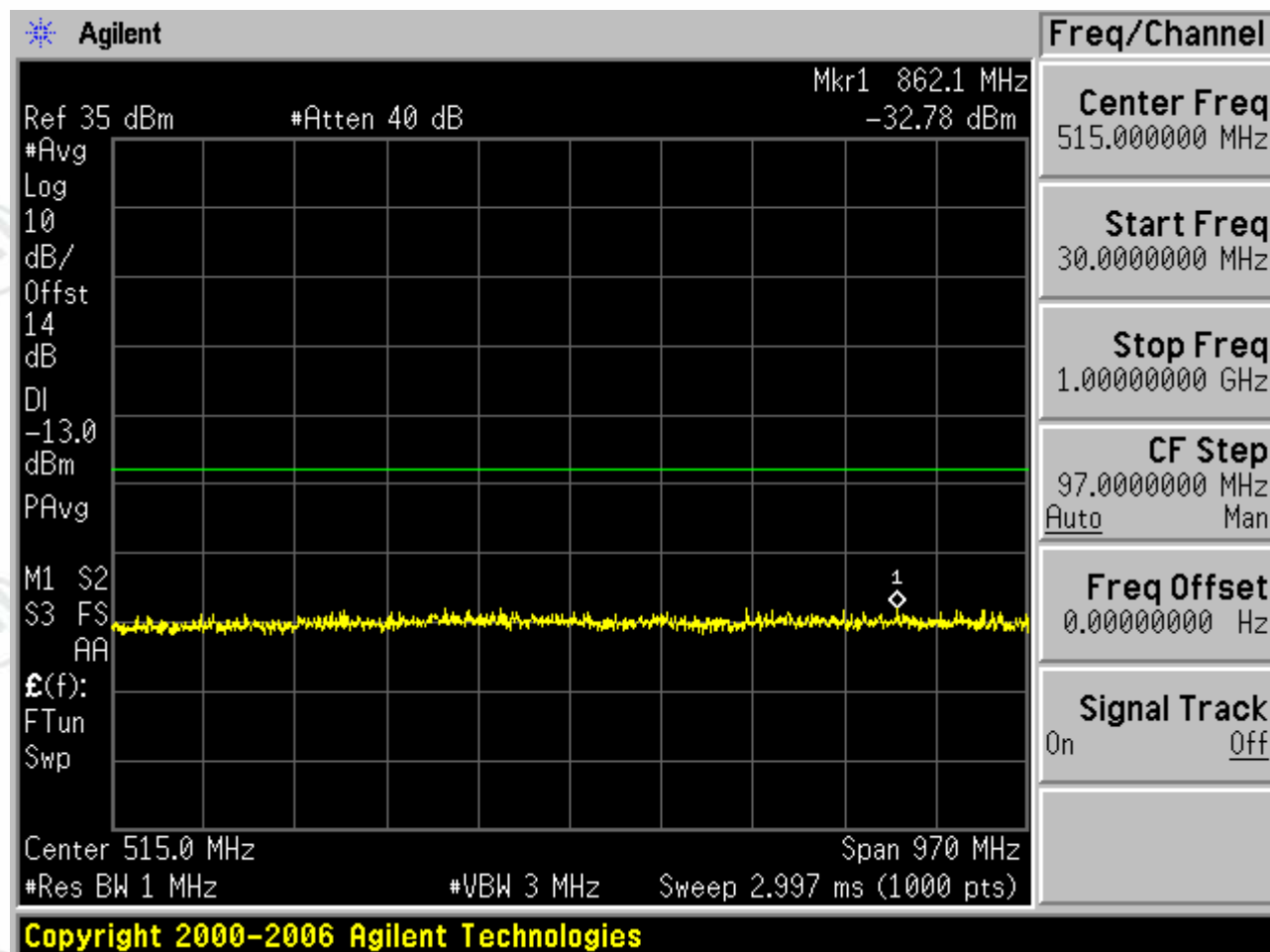


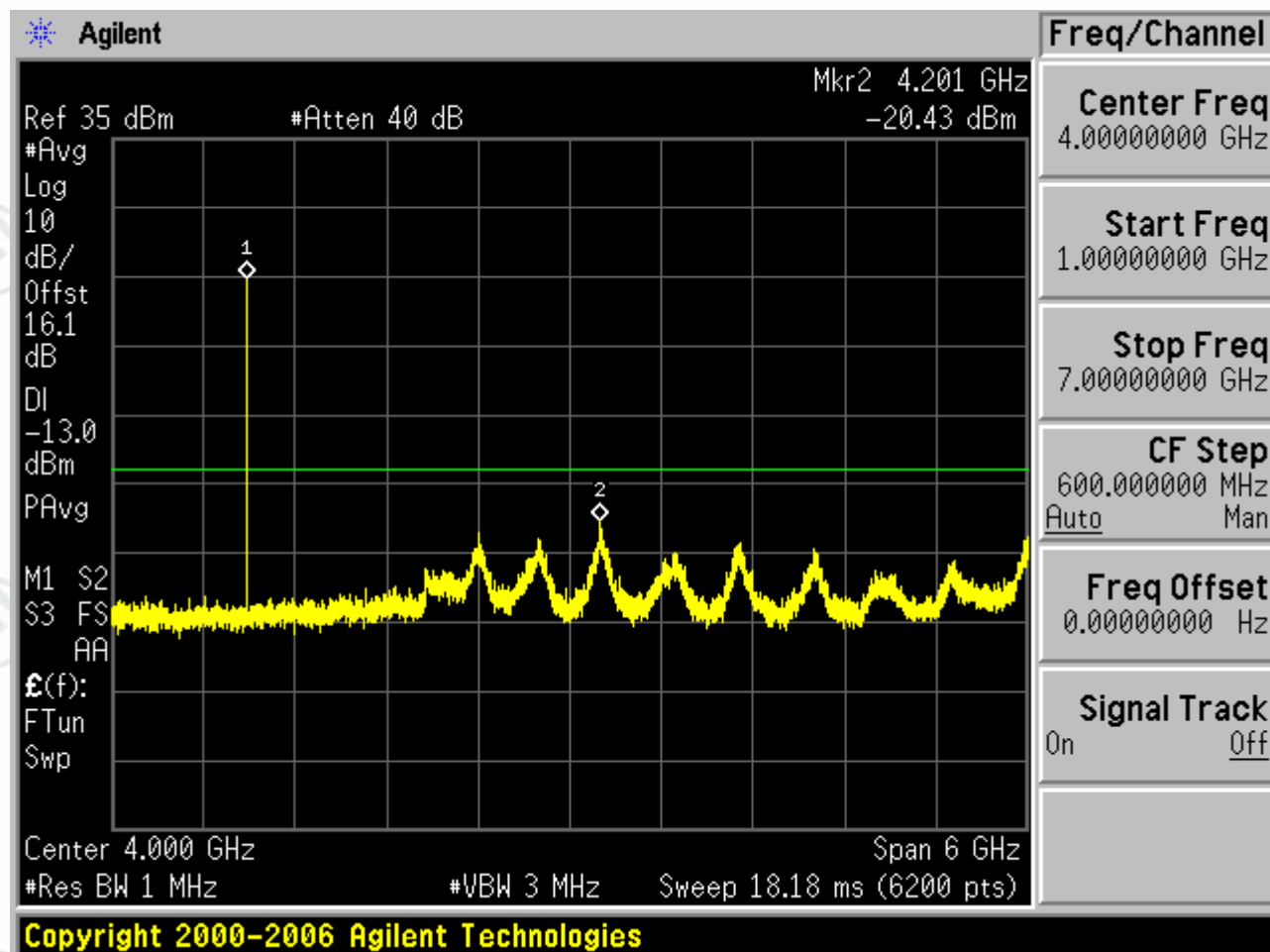


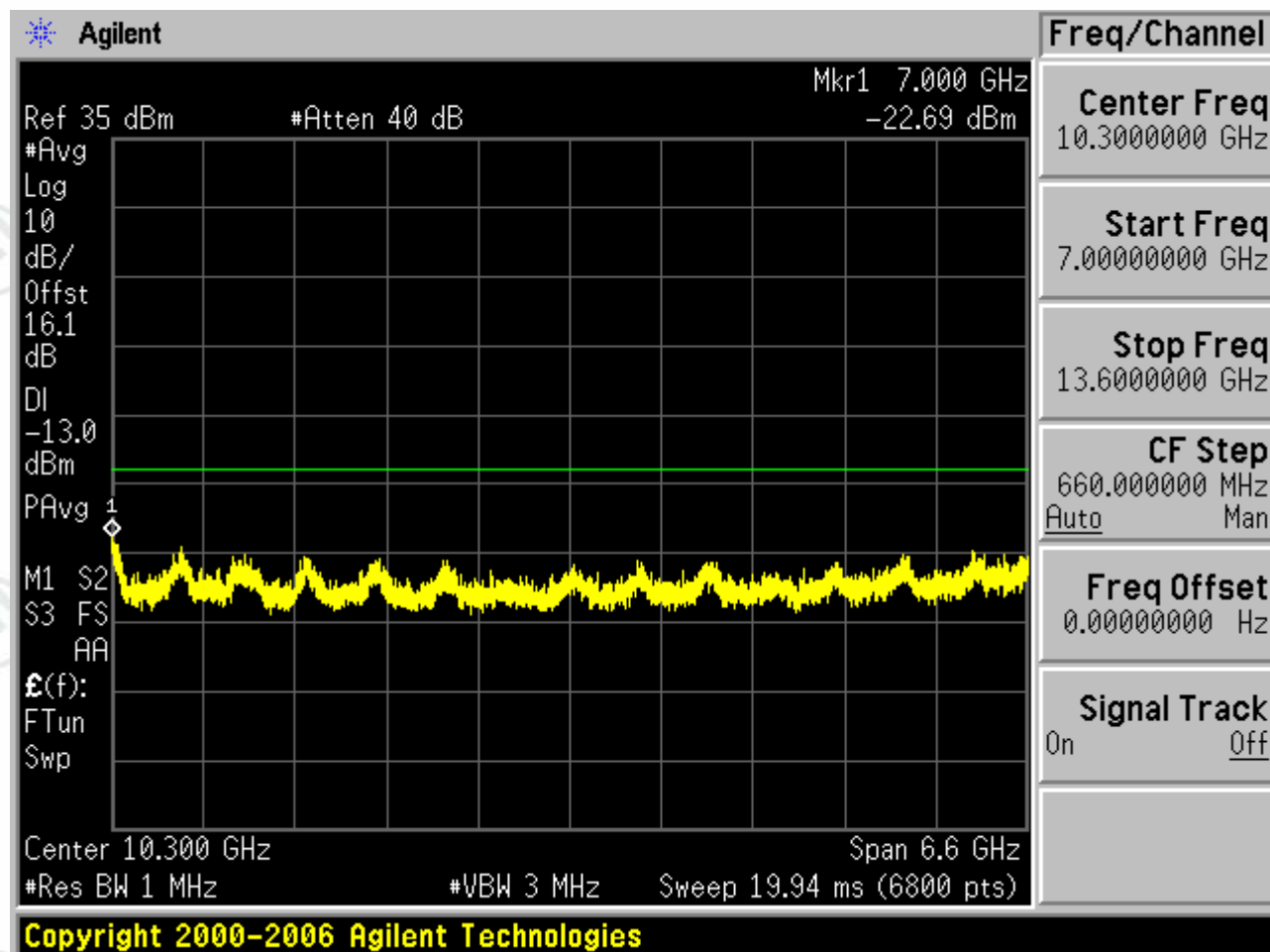
1.2.1.2 Test Channel=MCH

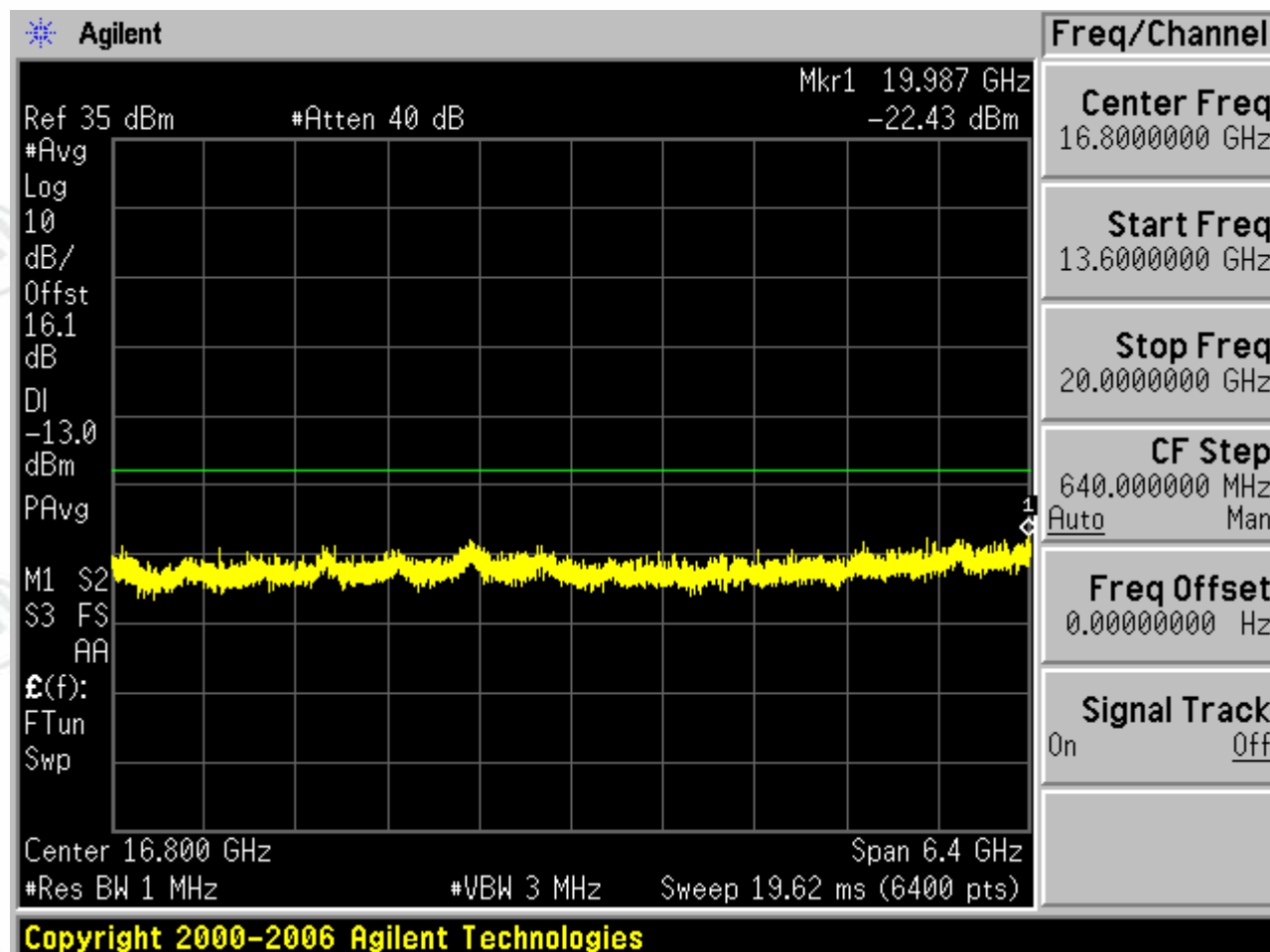




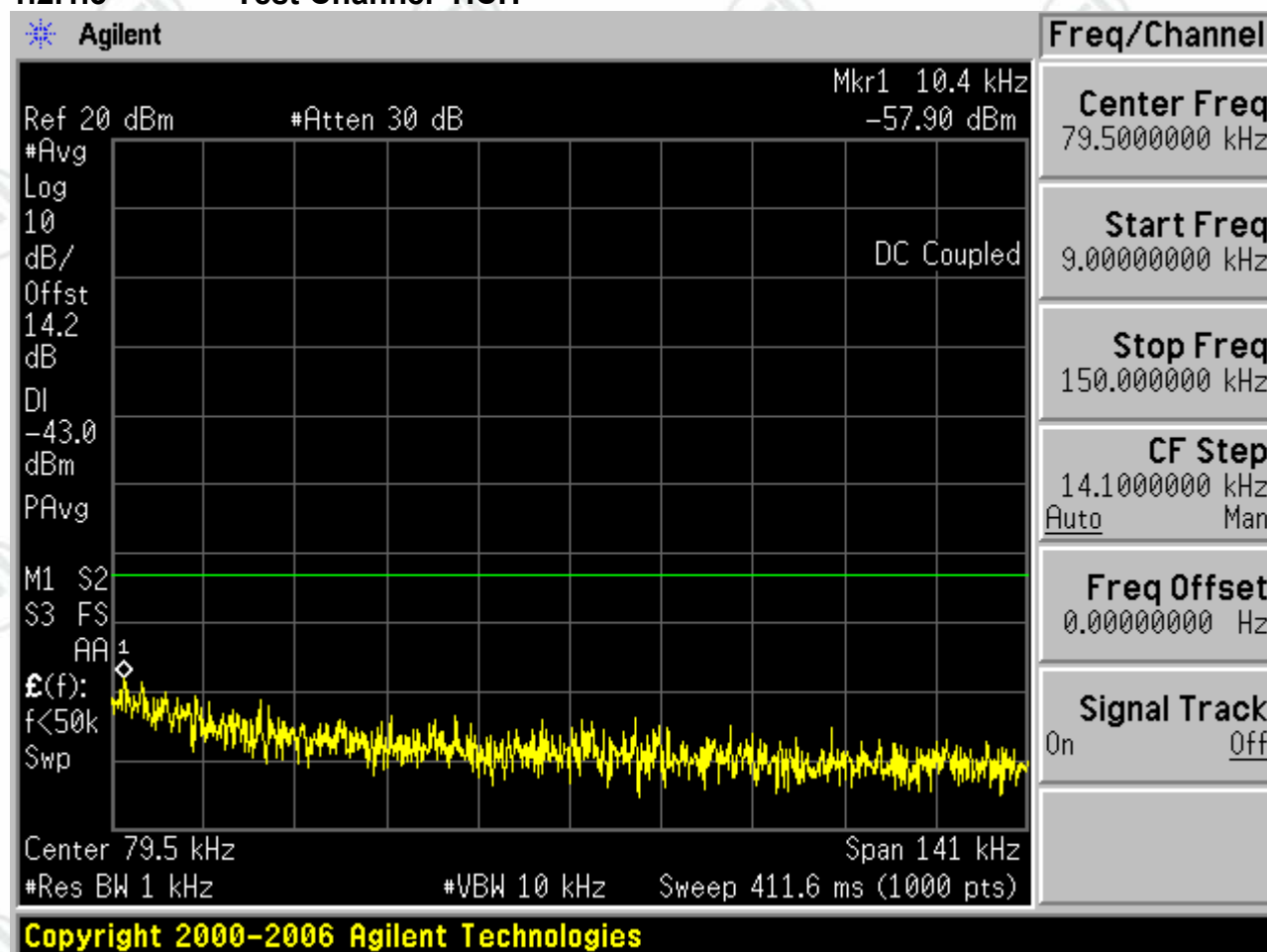


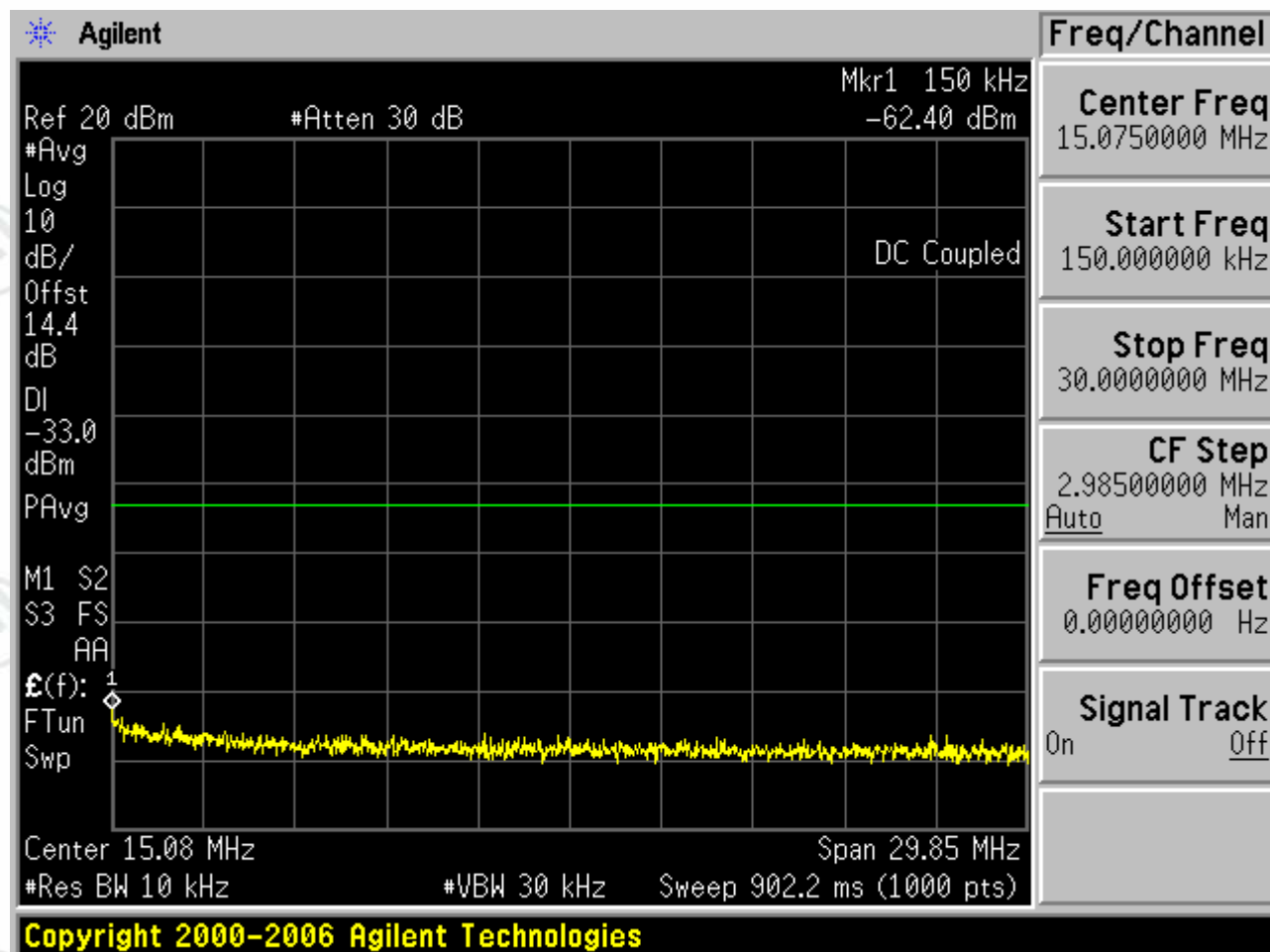


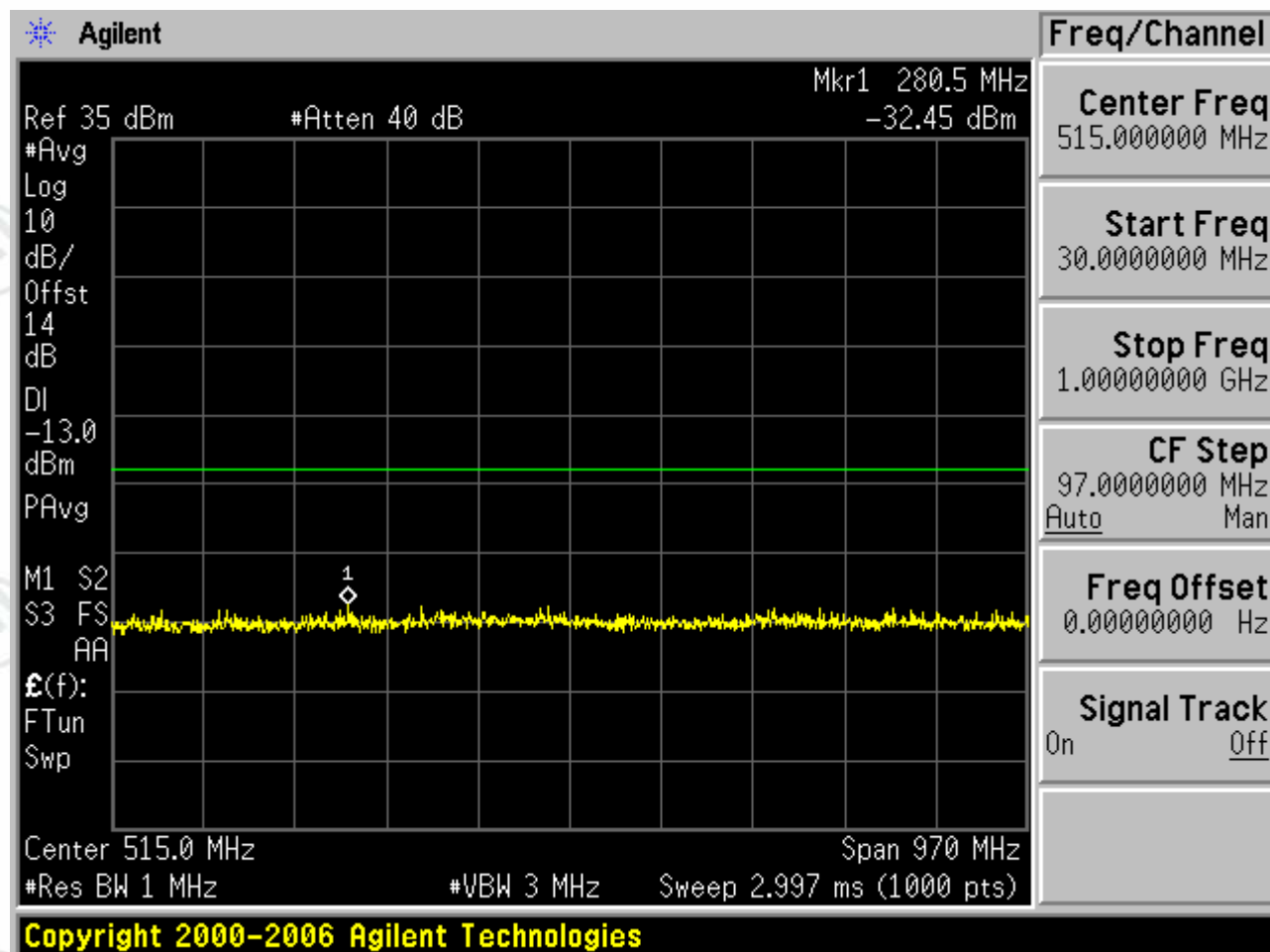


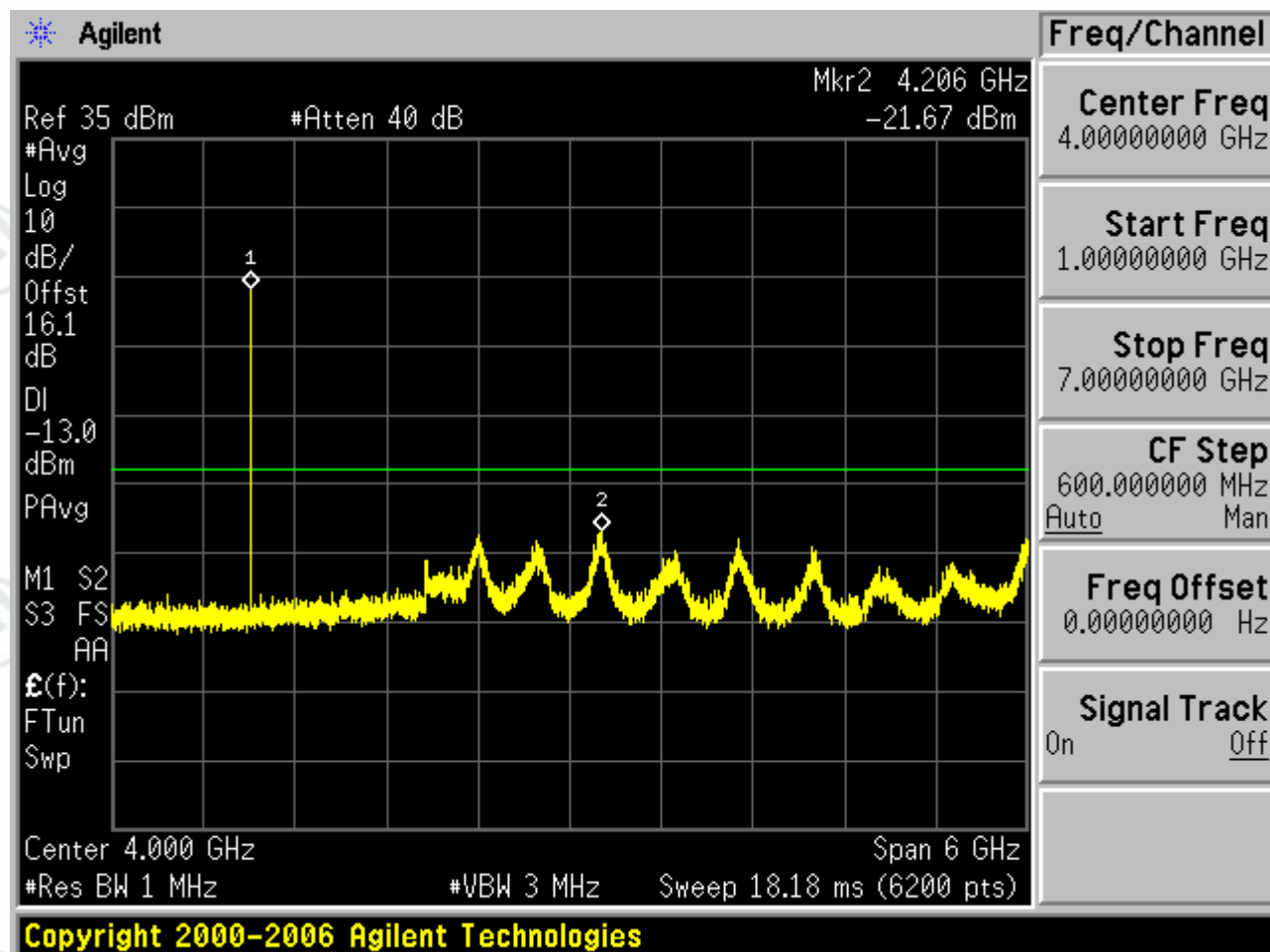


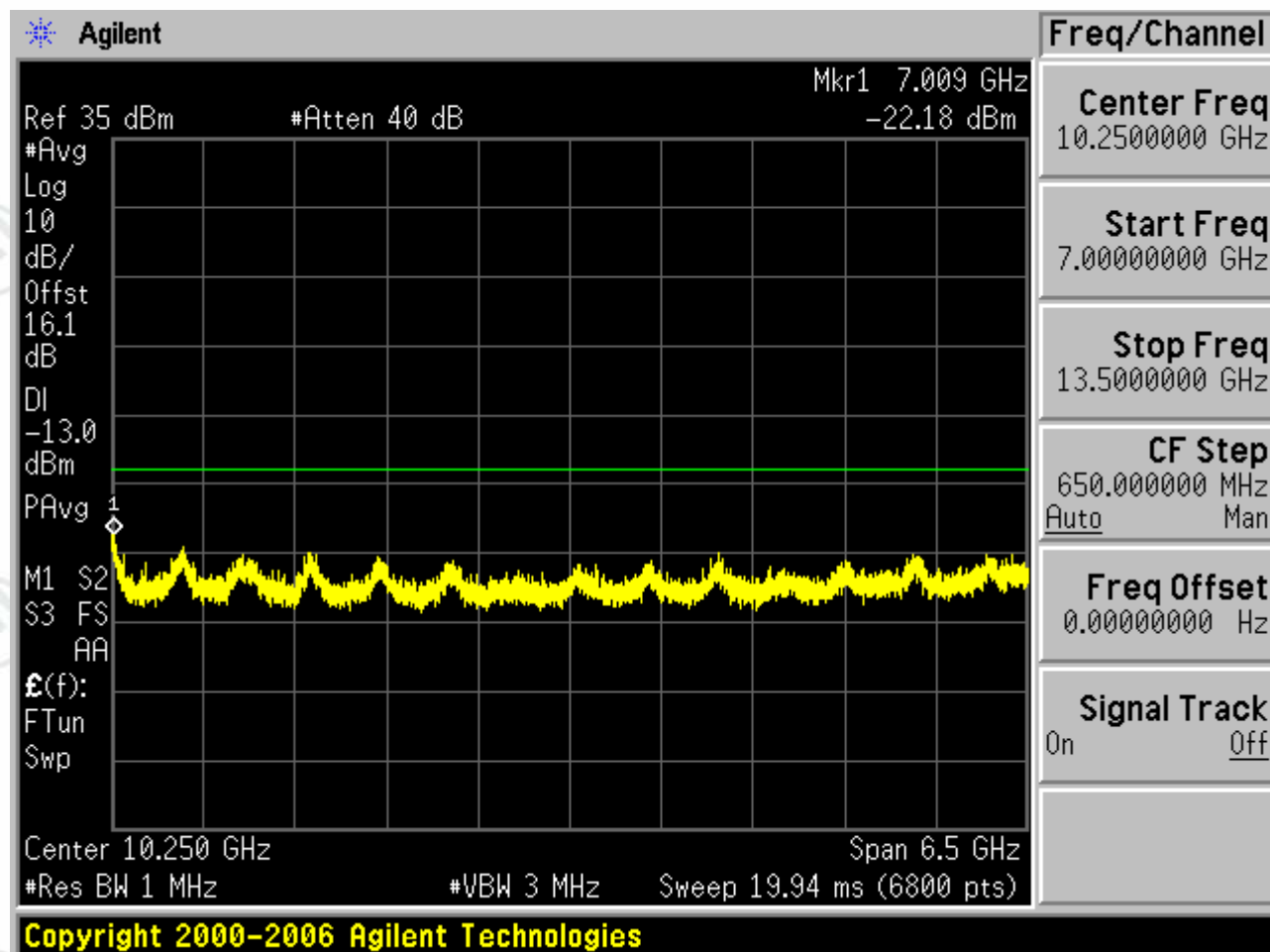
1.2.1.3 Test Channel=HCH

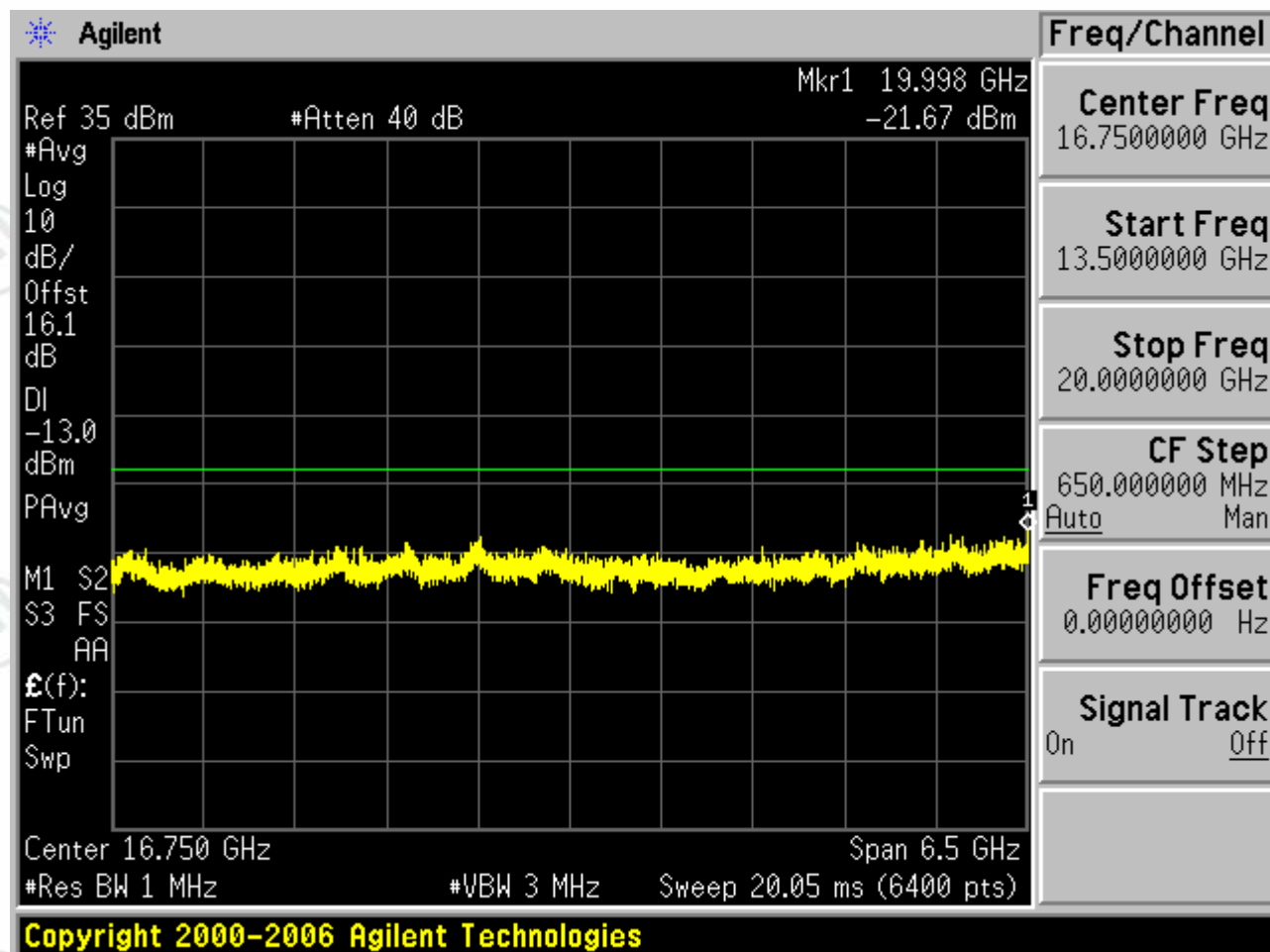






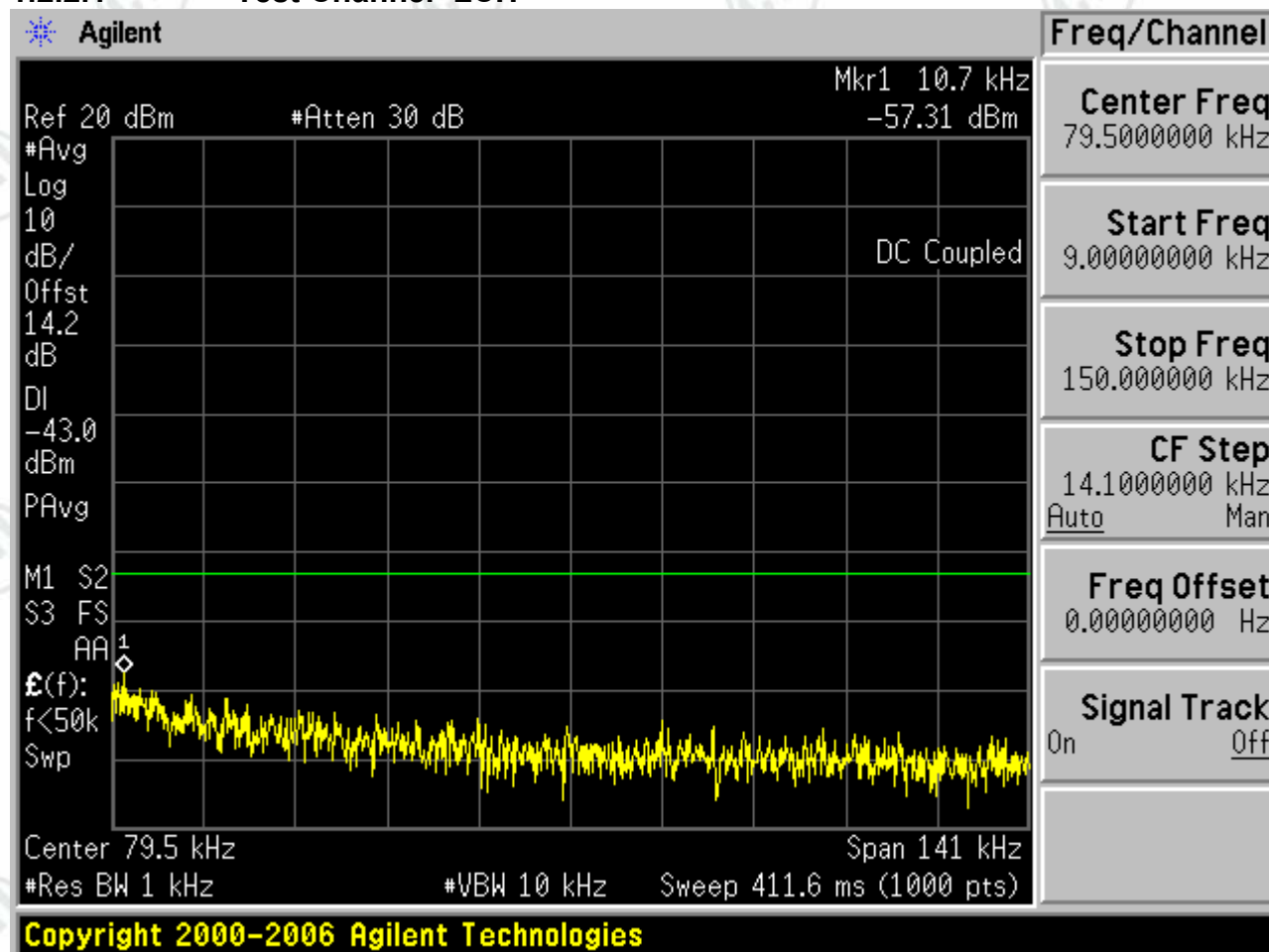


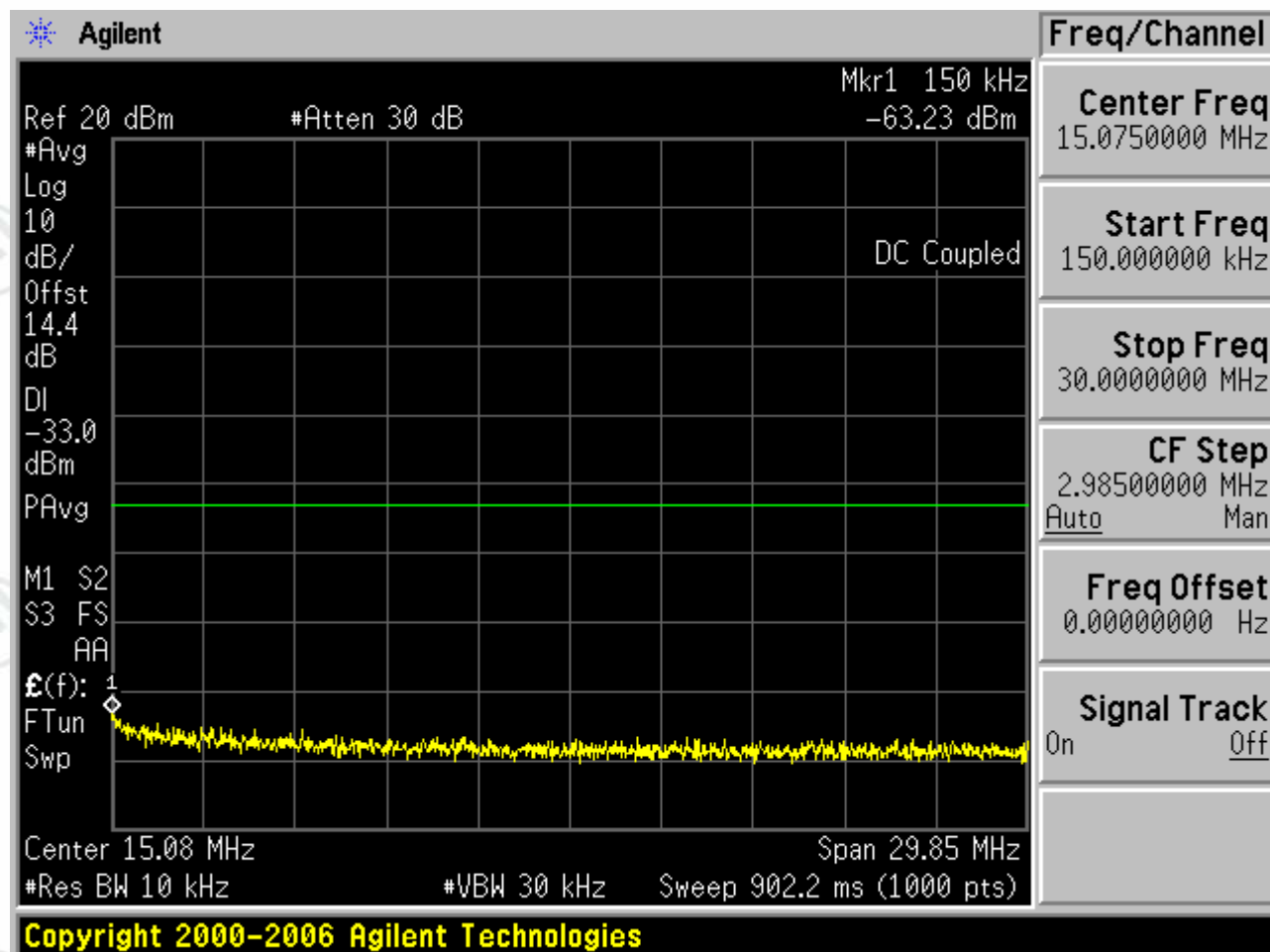


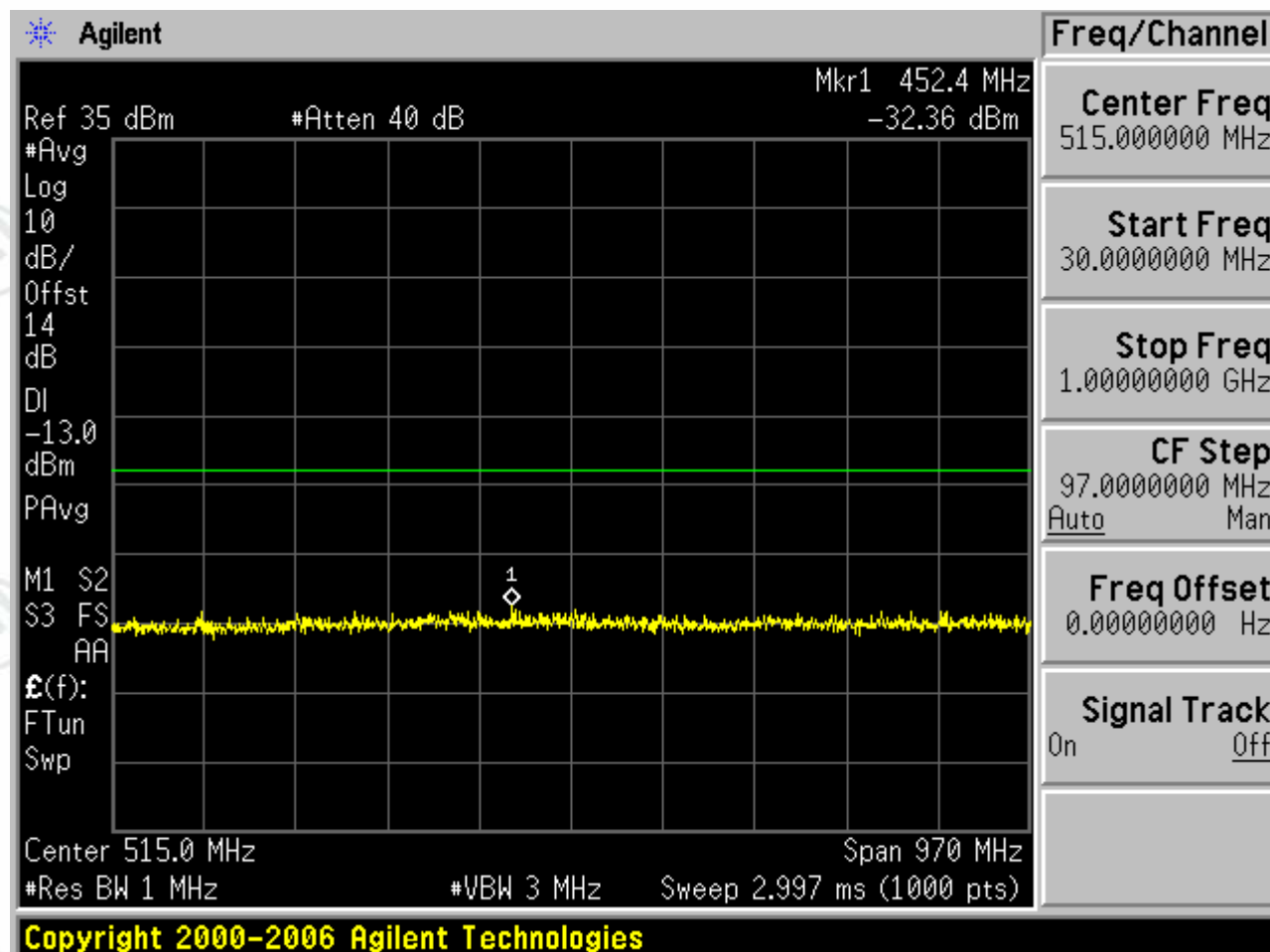


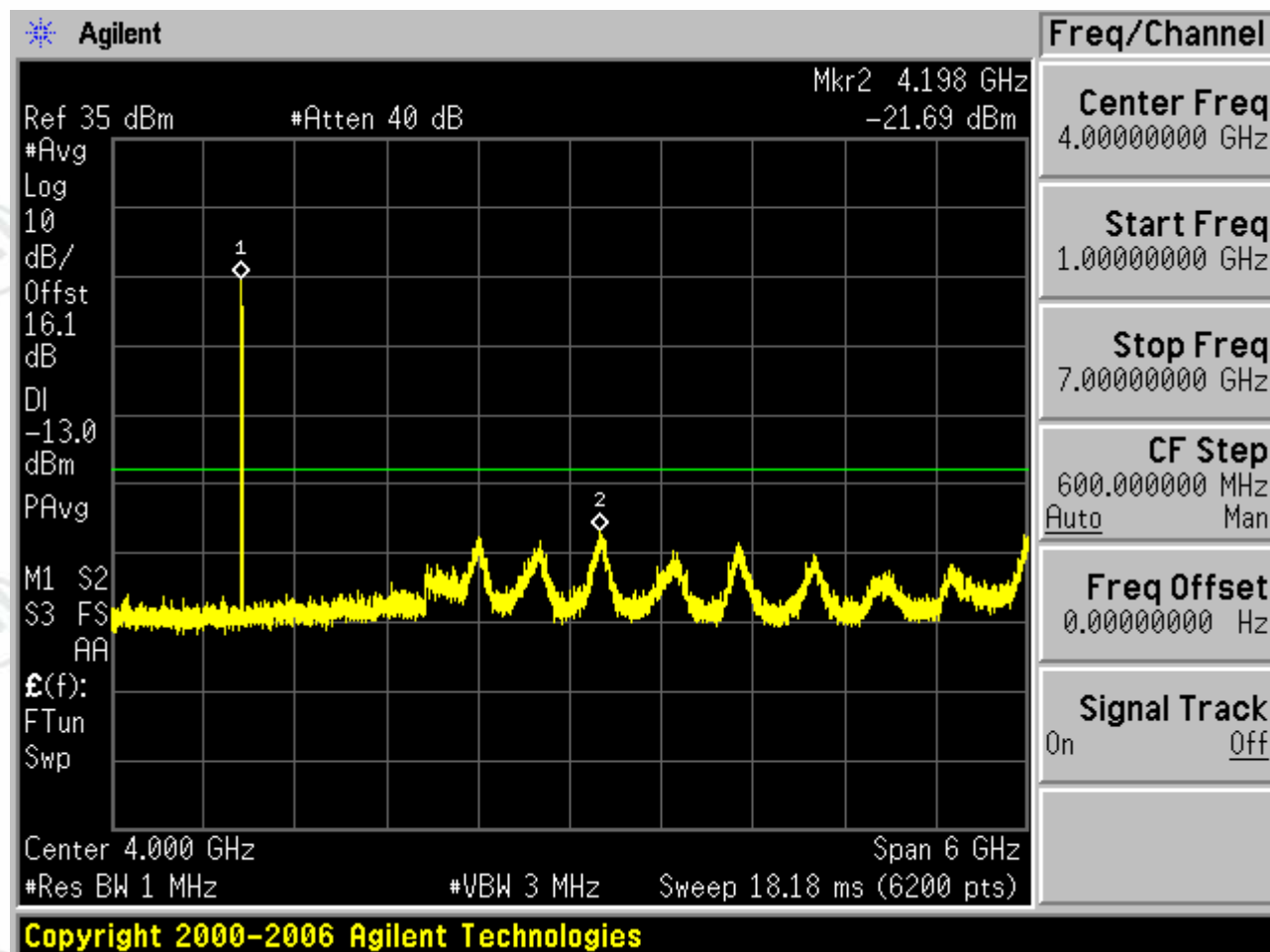
1.2.2 Test Mode=GSM/TM2

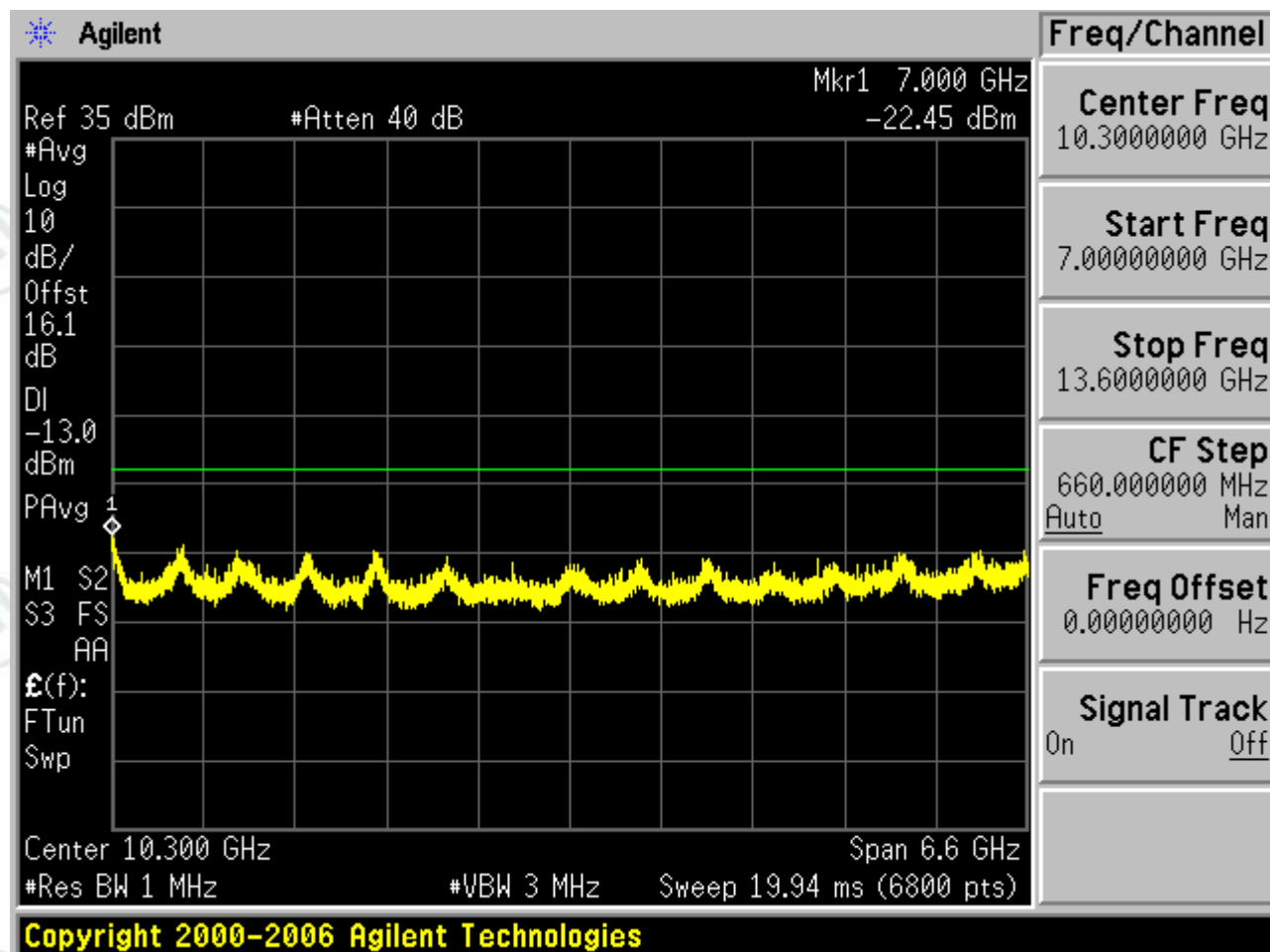
1.2.2.1 Test Channel=LCH

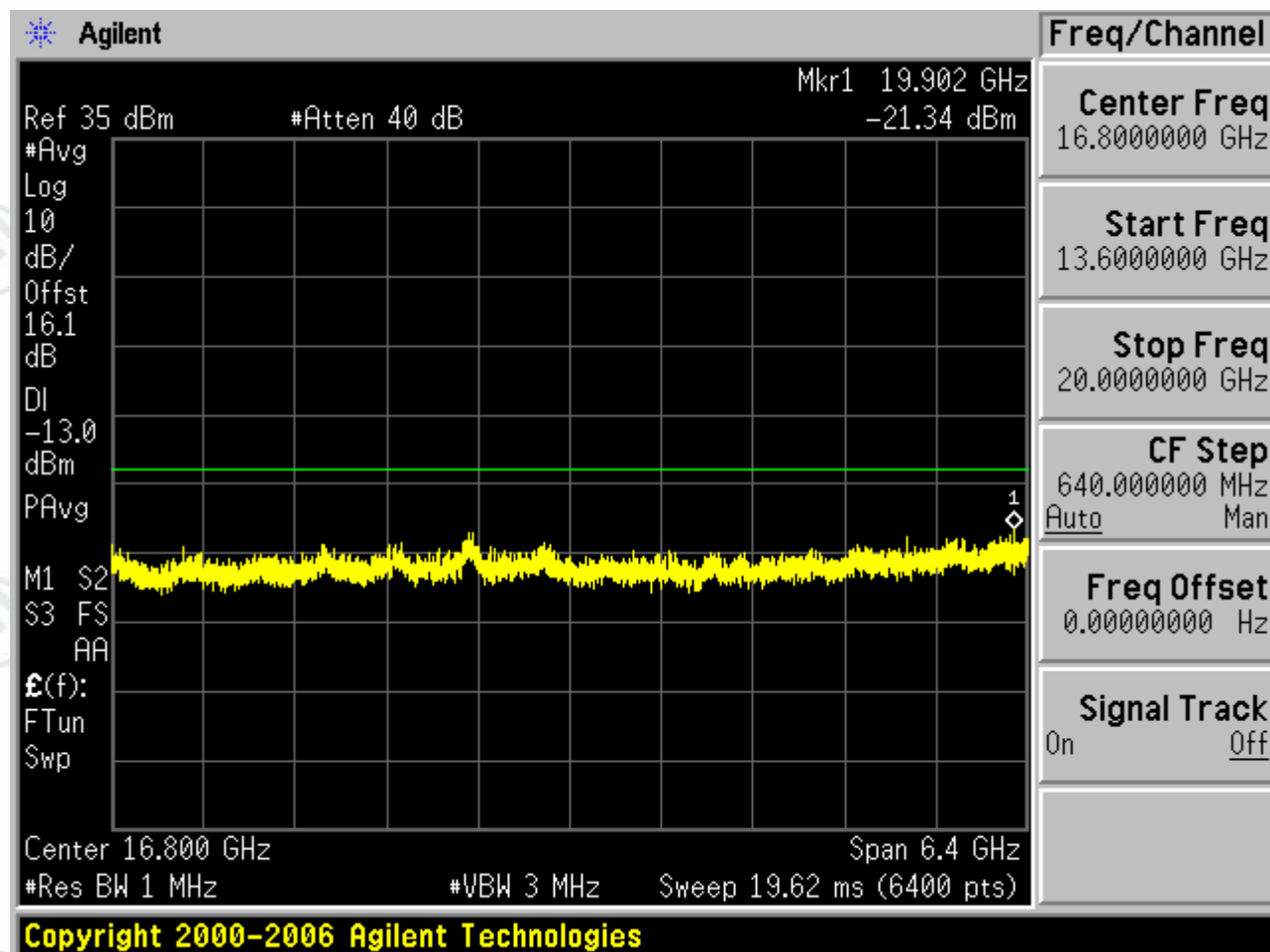




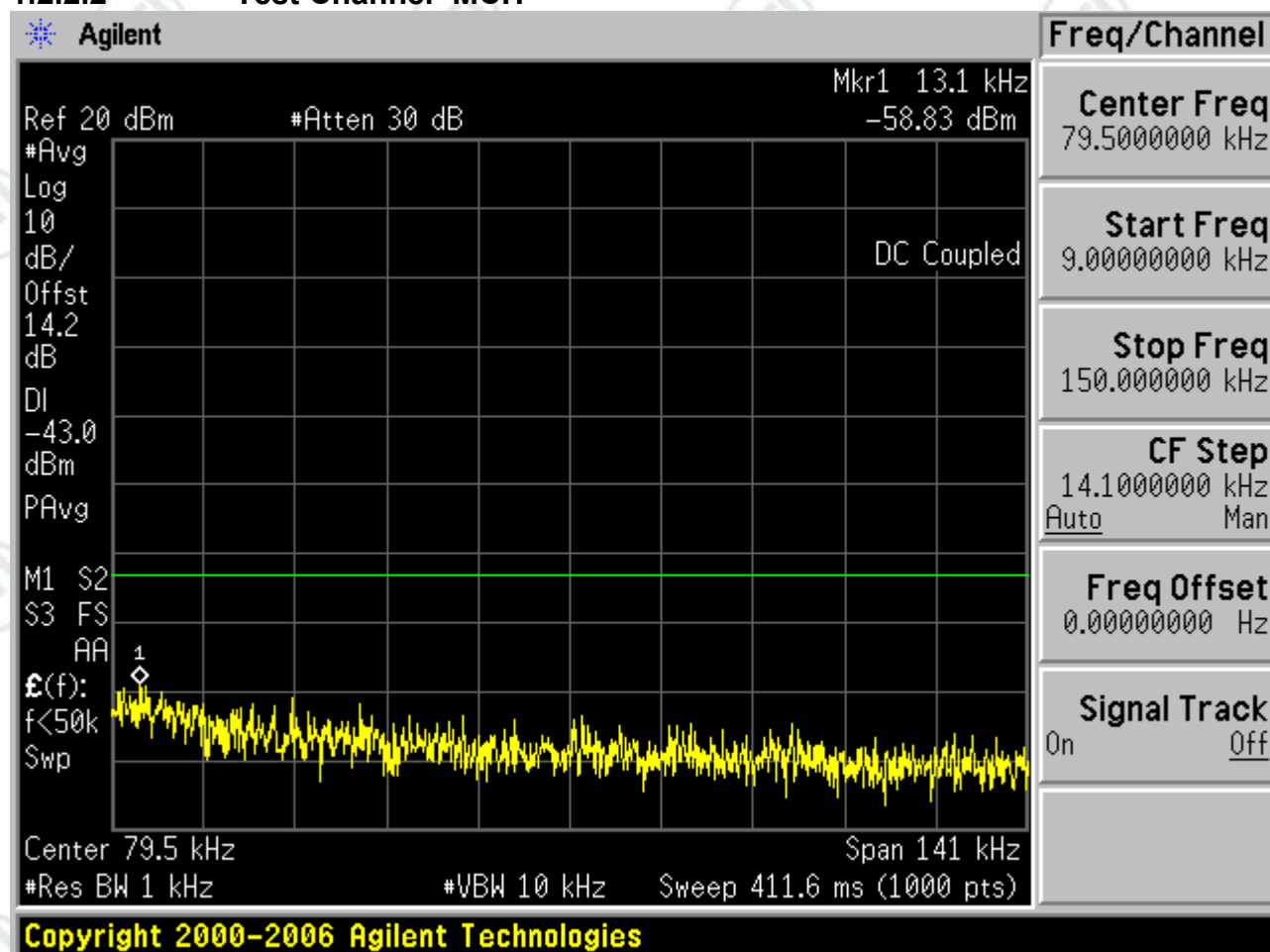


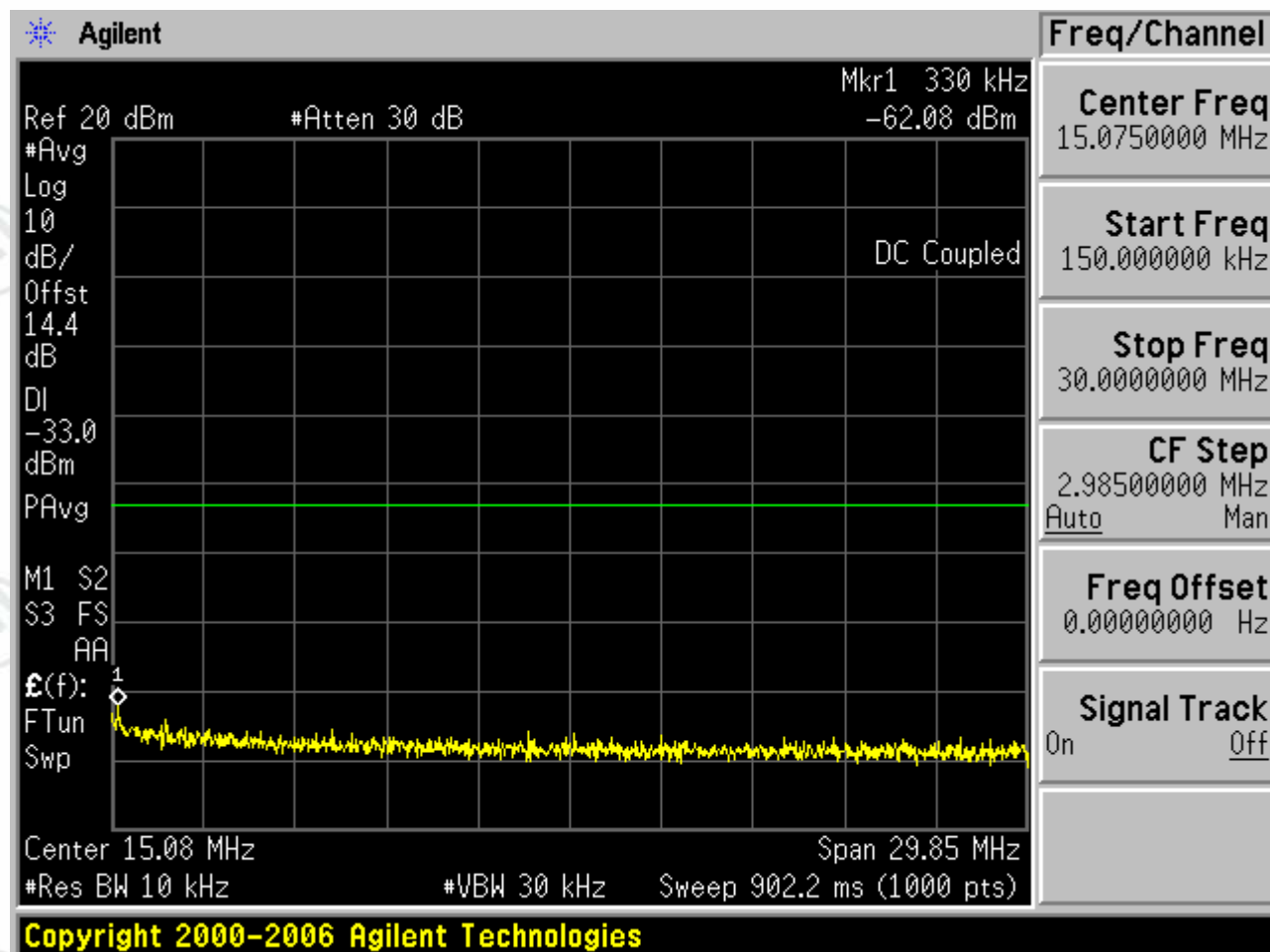


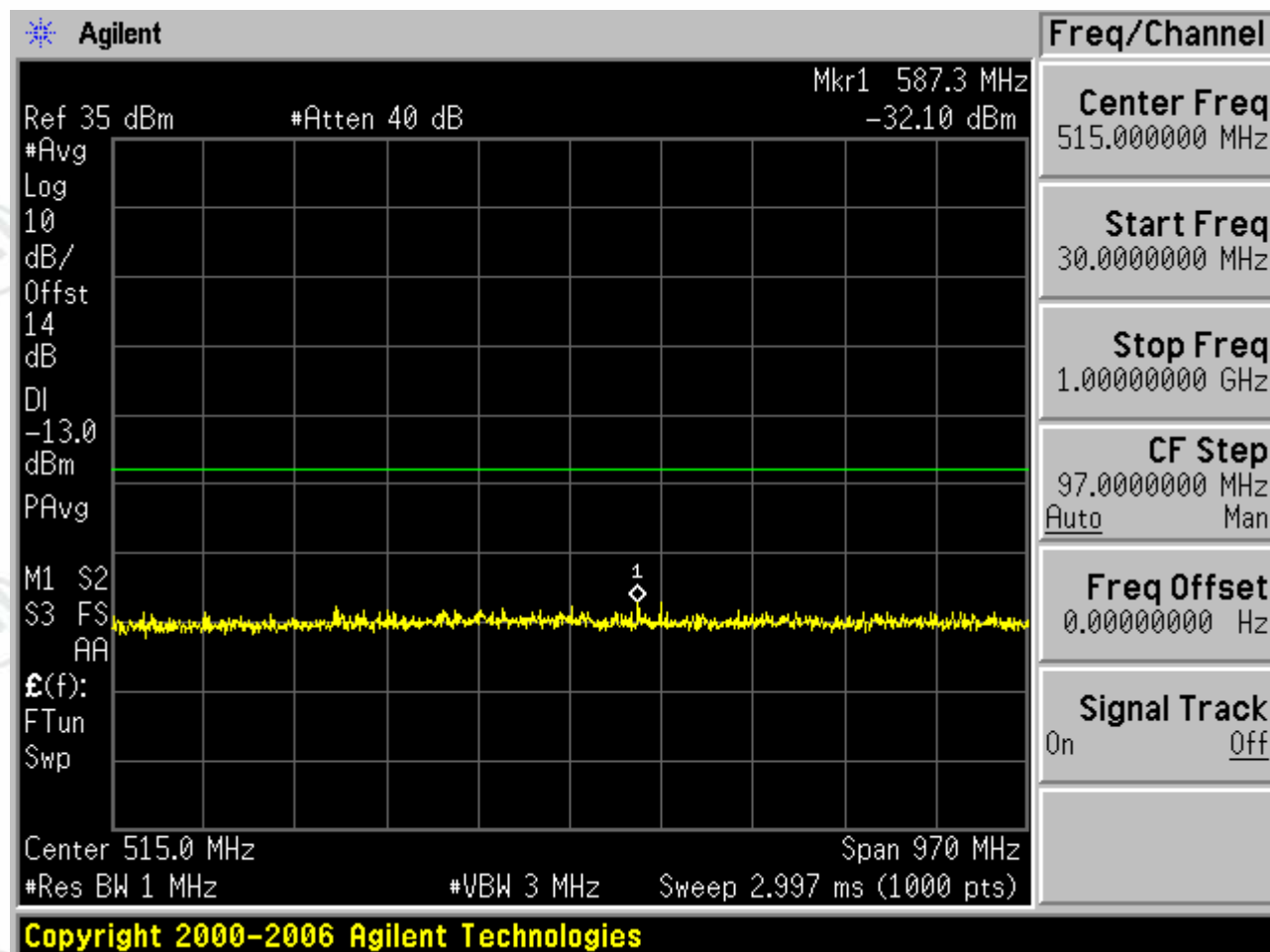


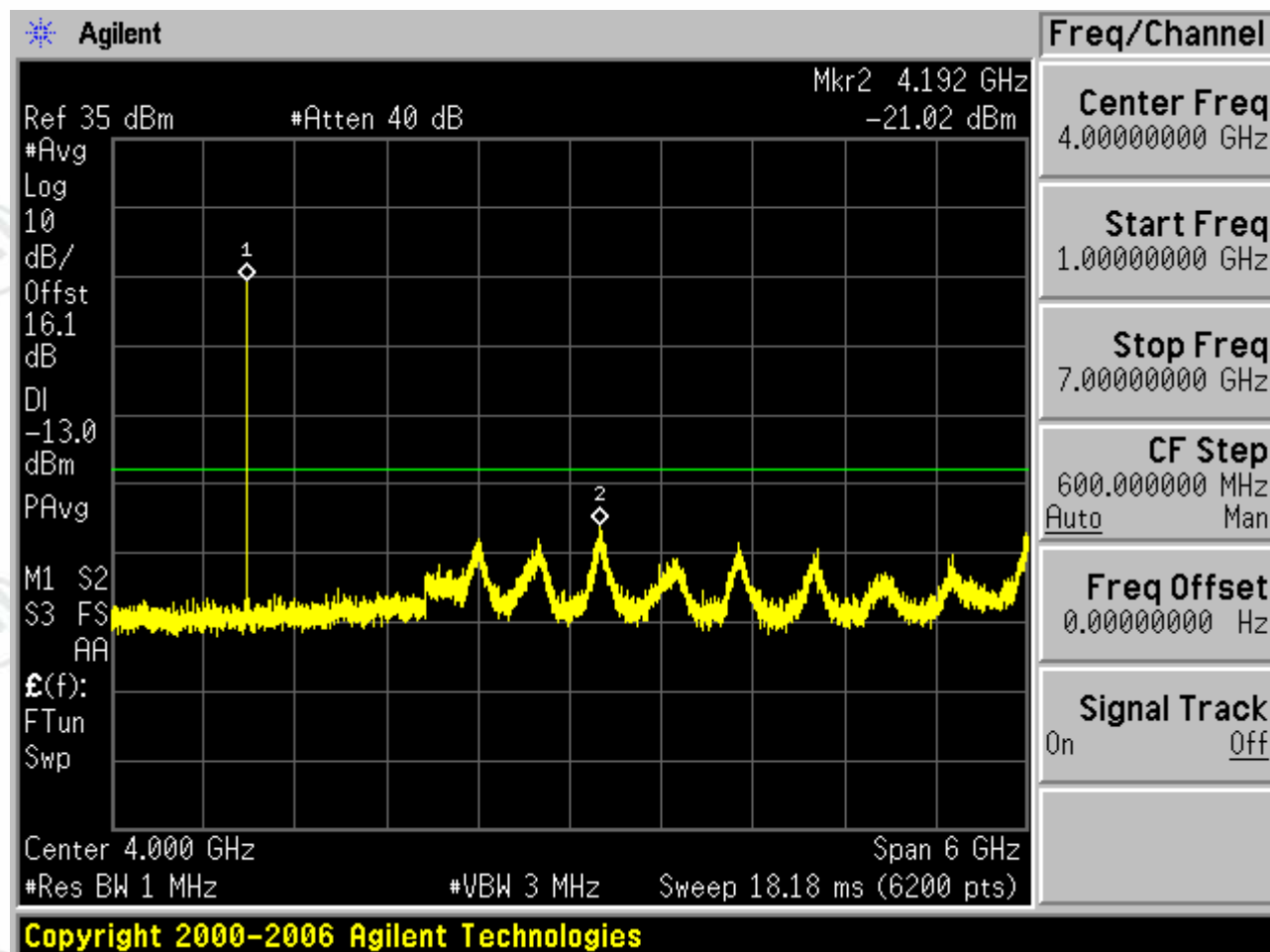


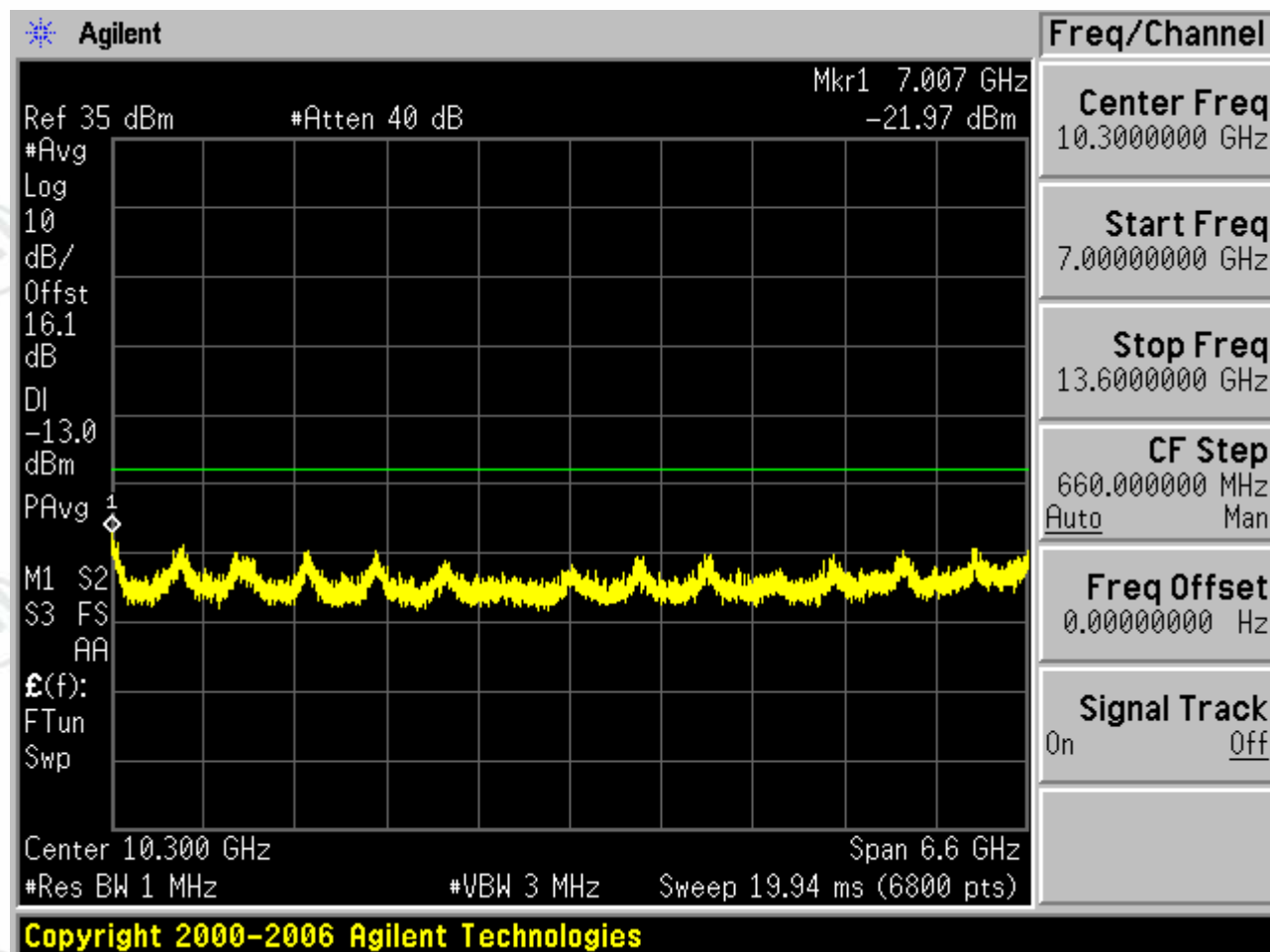
1.2.2.2 Test Channel=MCH

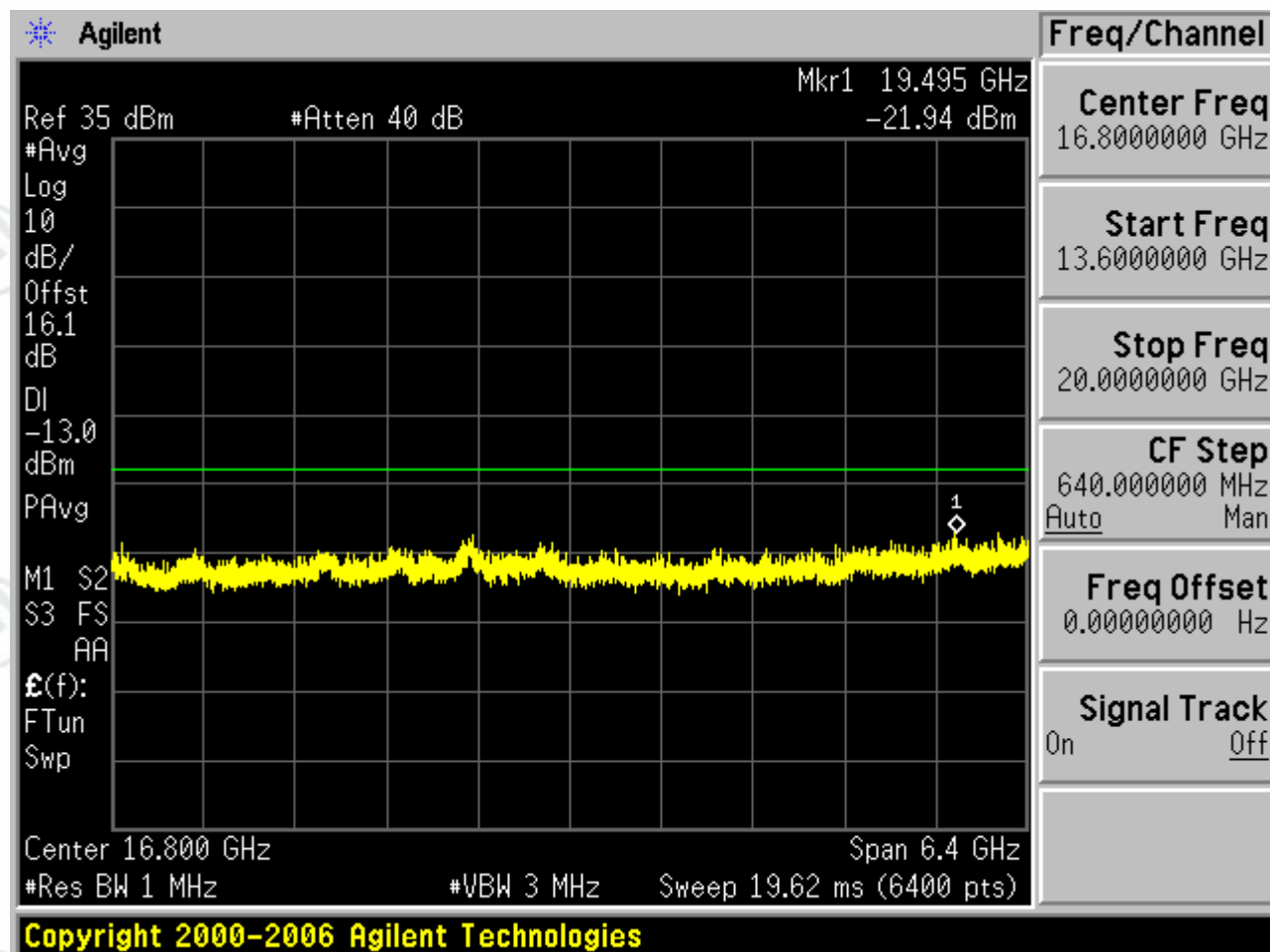




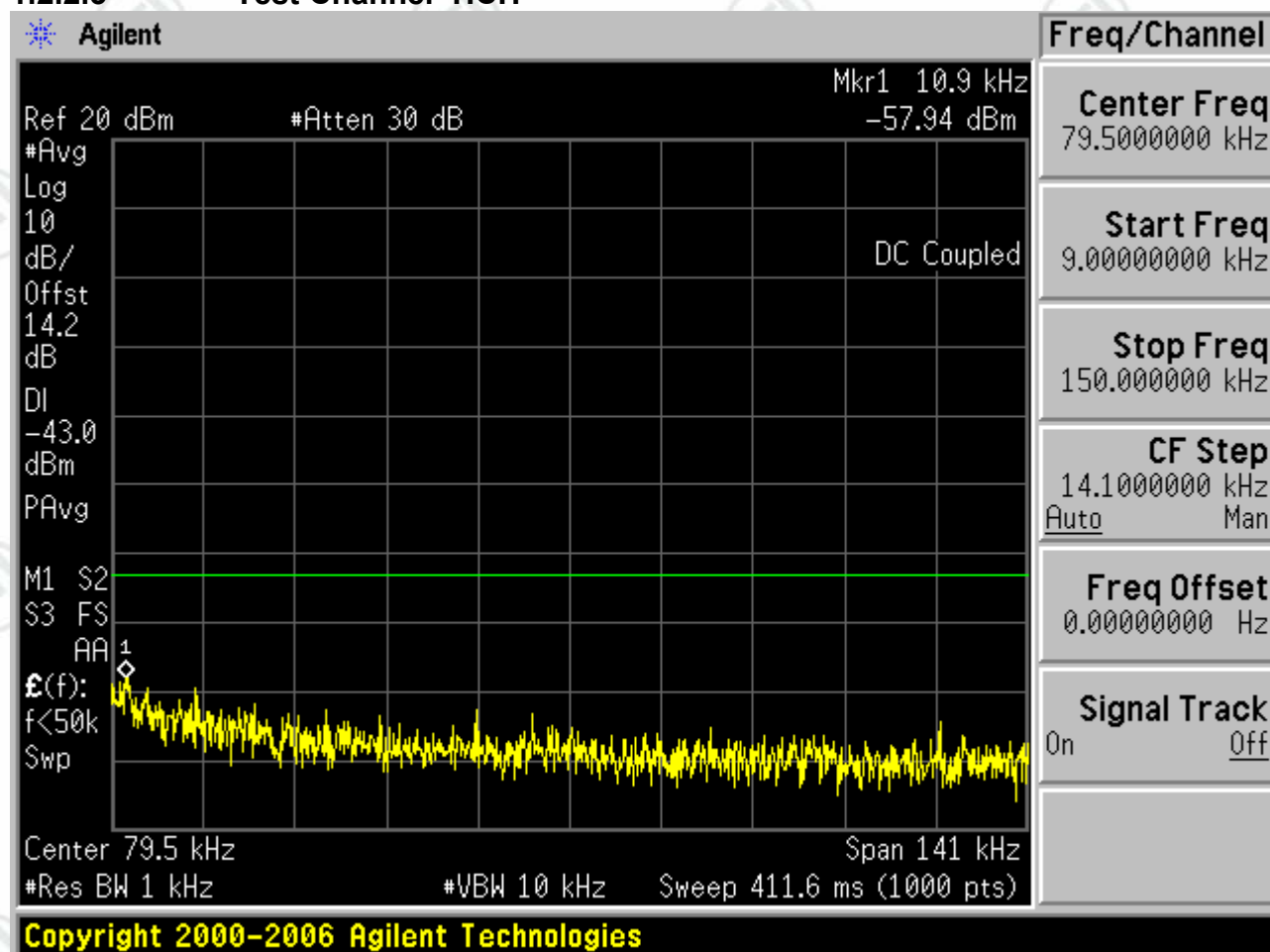


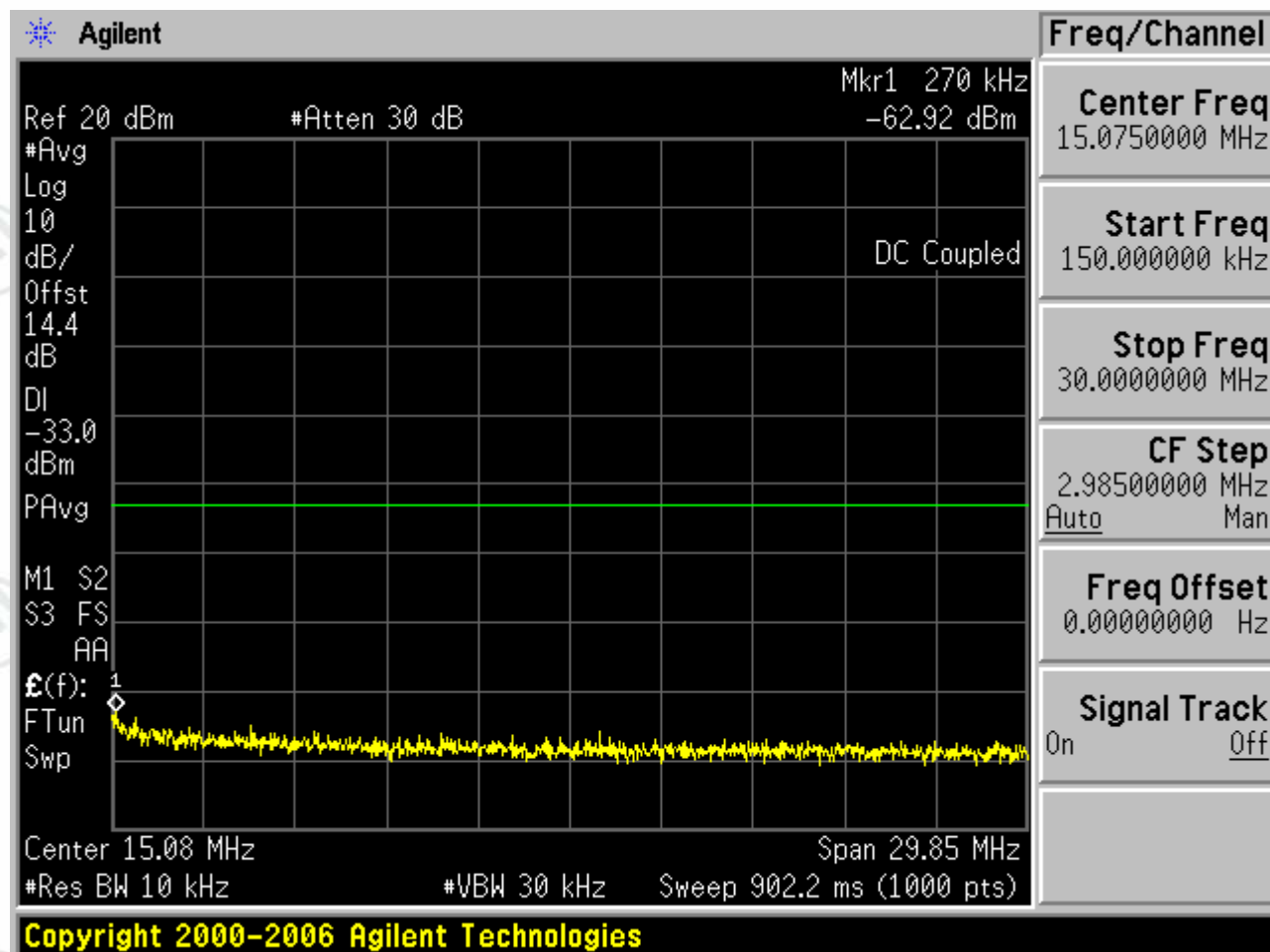


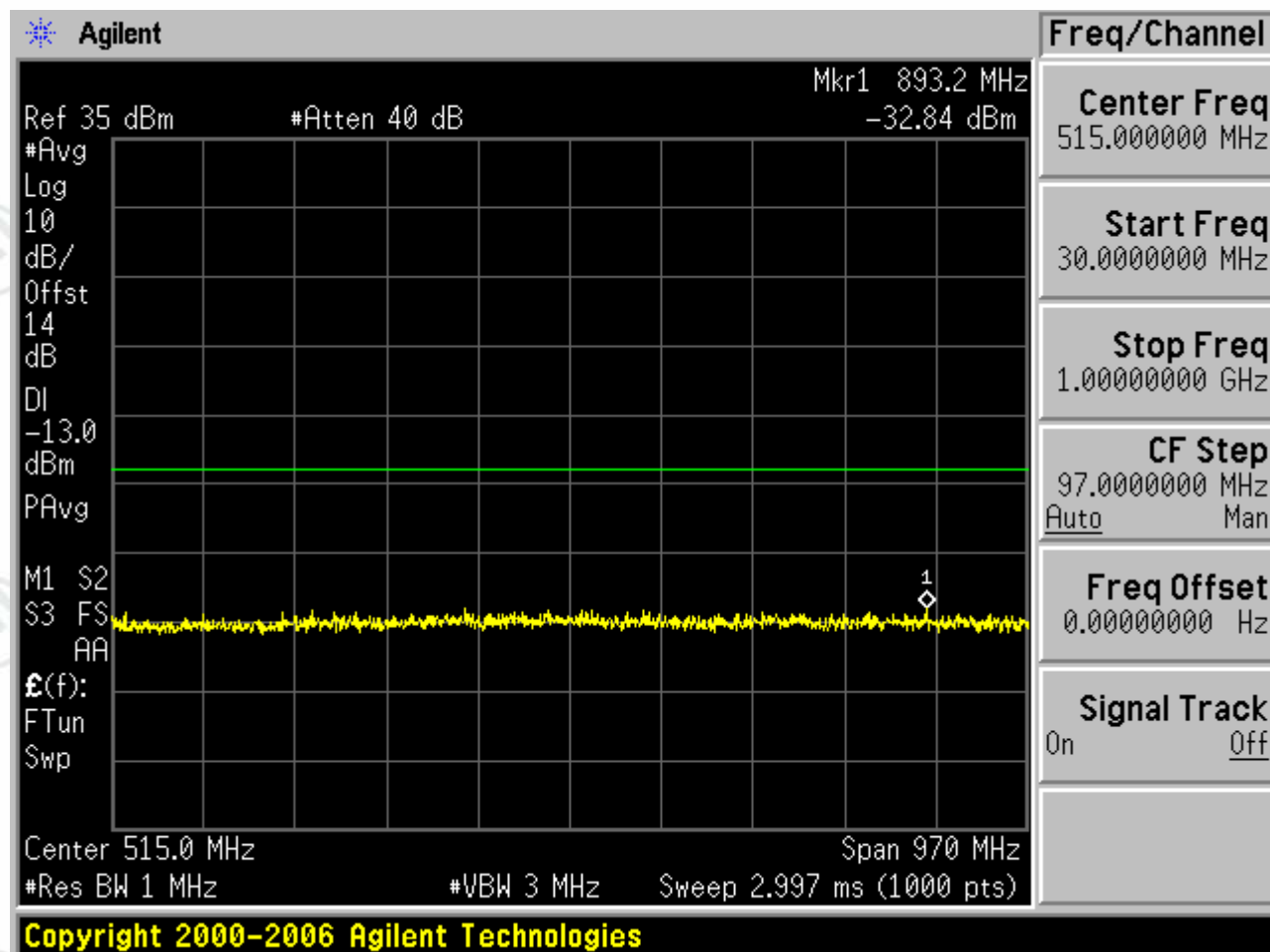


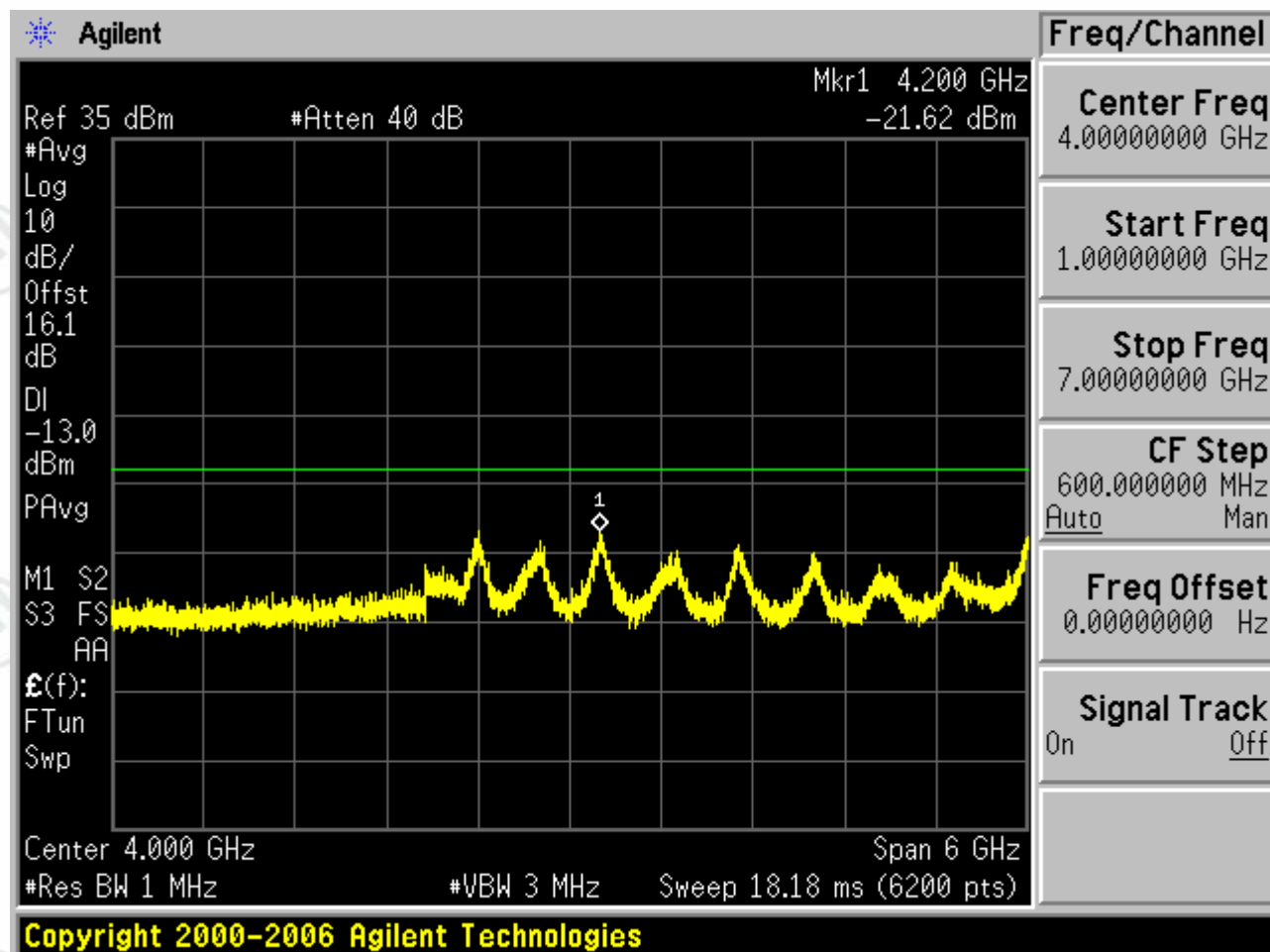


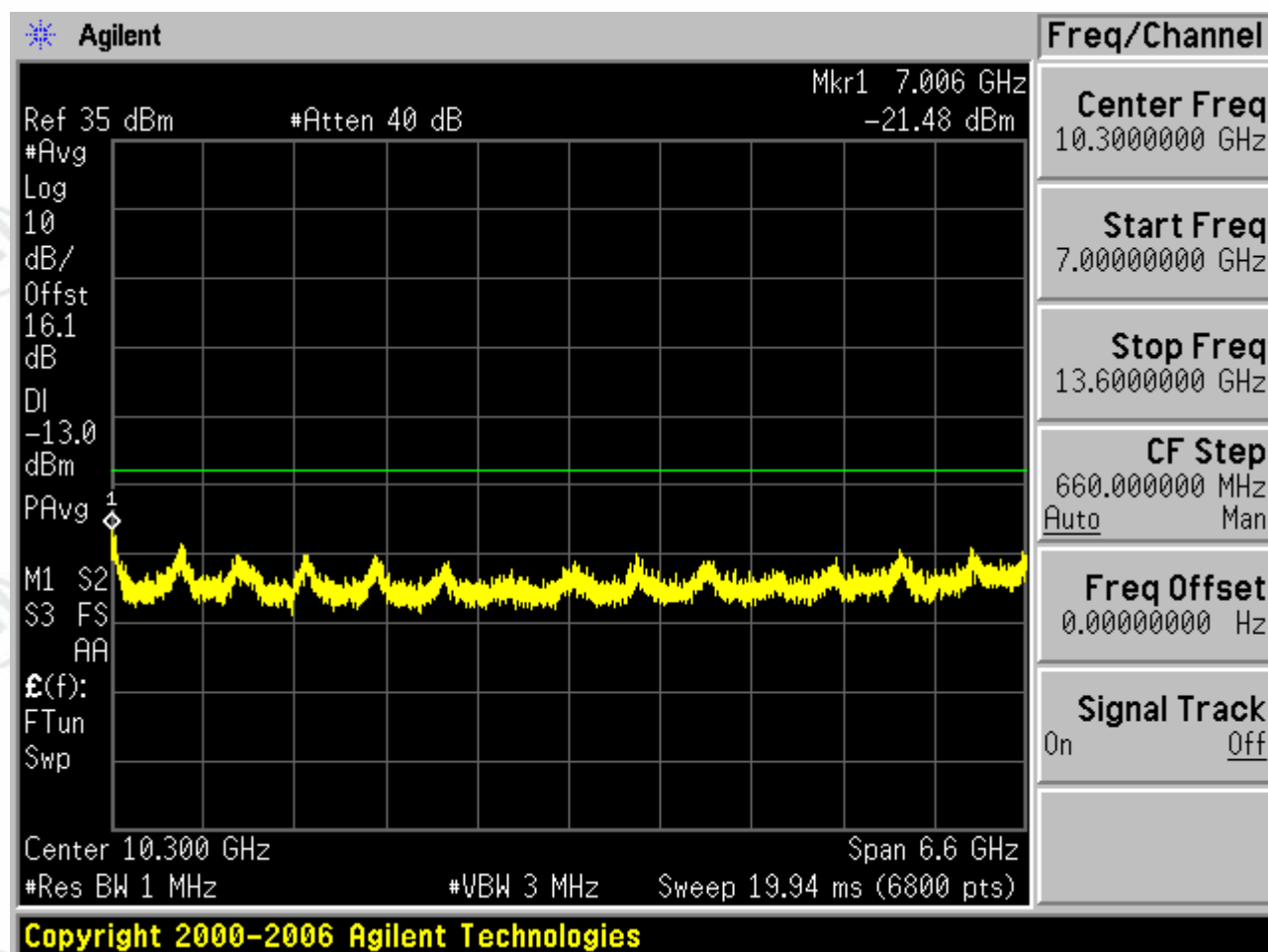
1.2.2.3 Test Channel=HCH

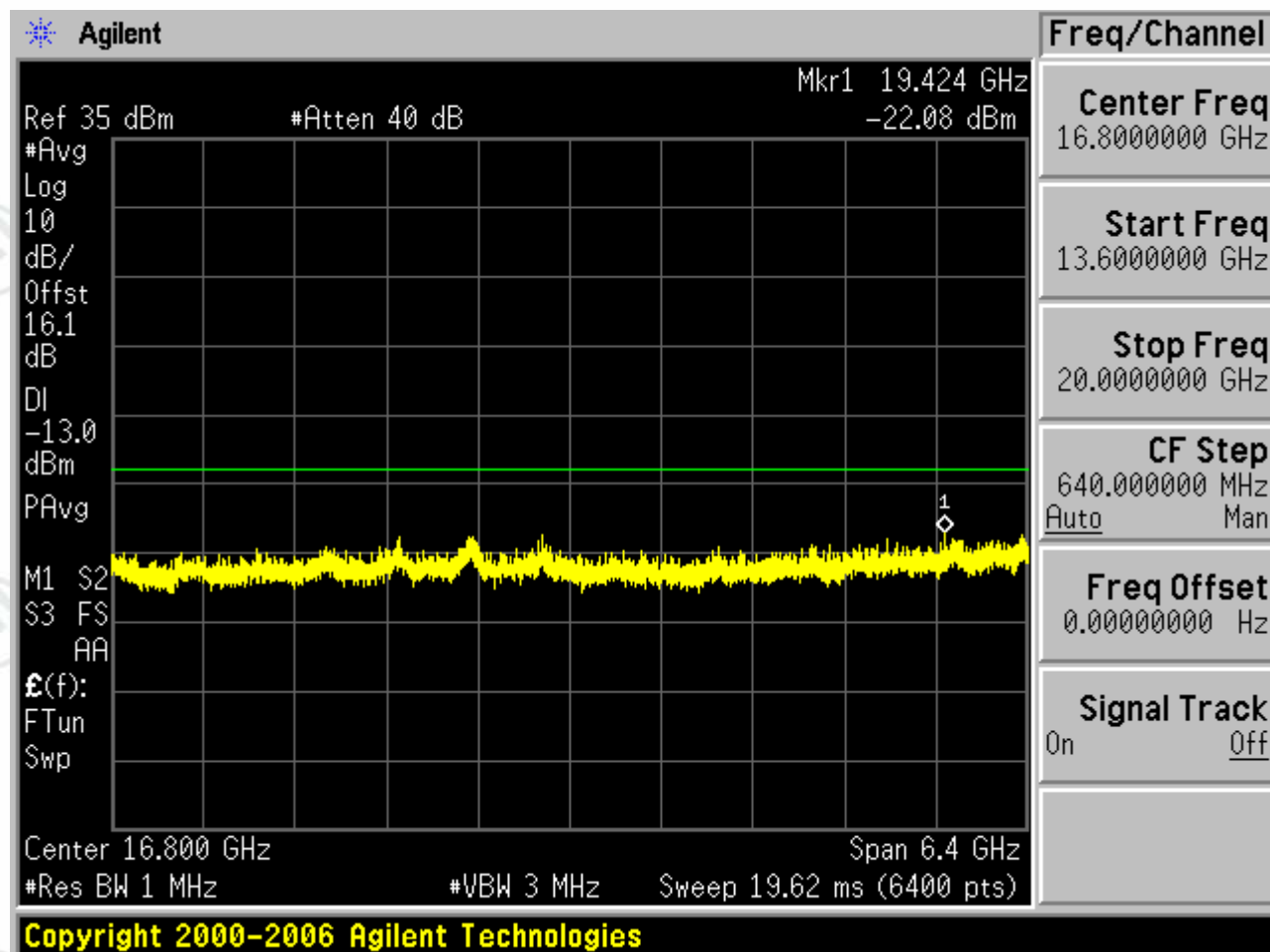






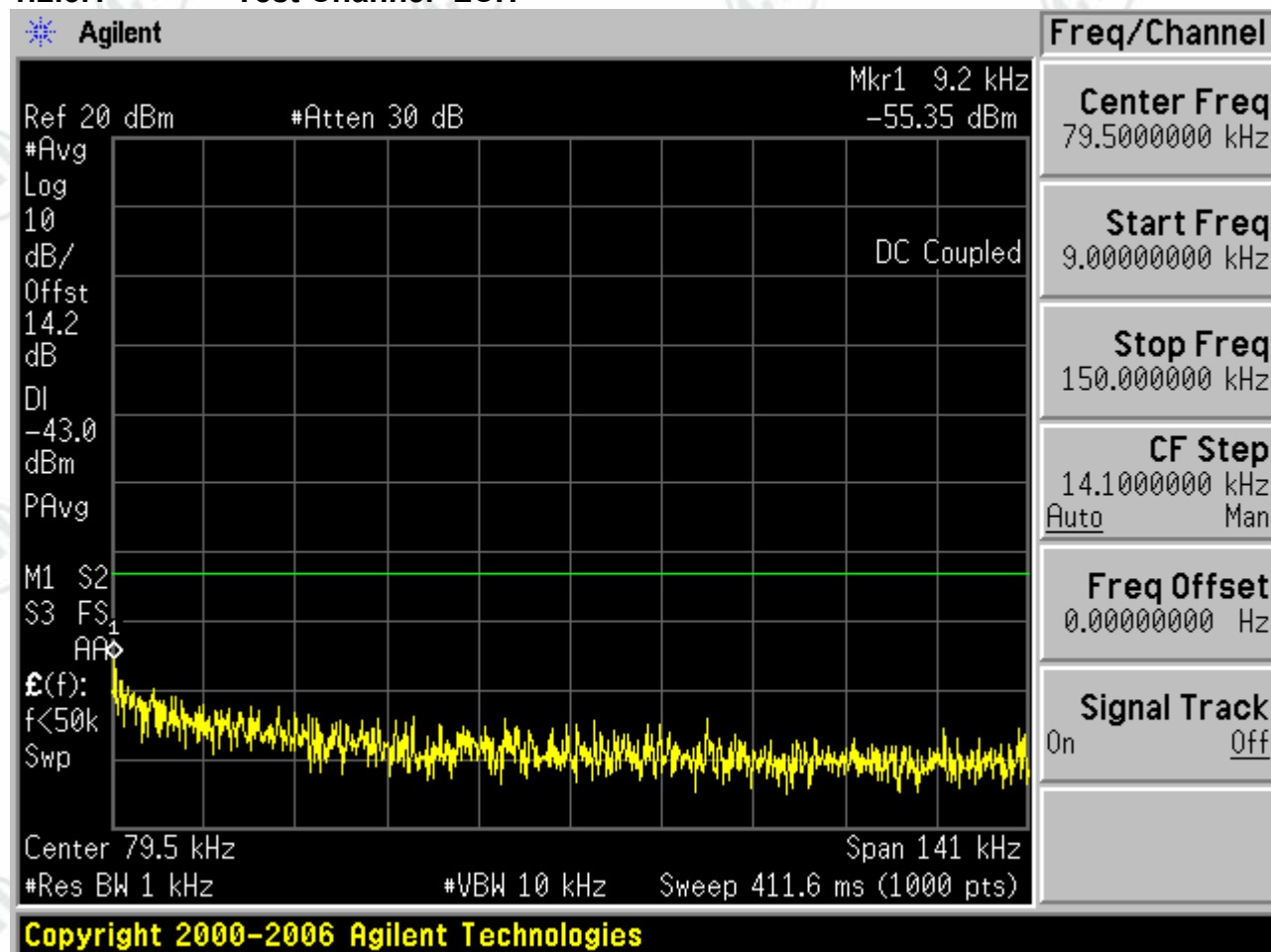


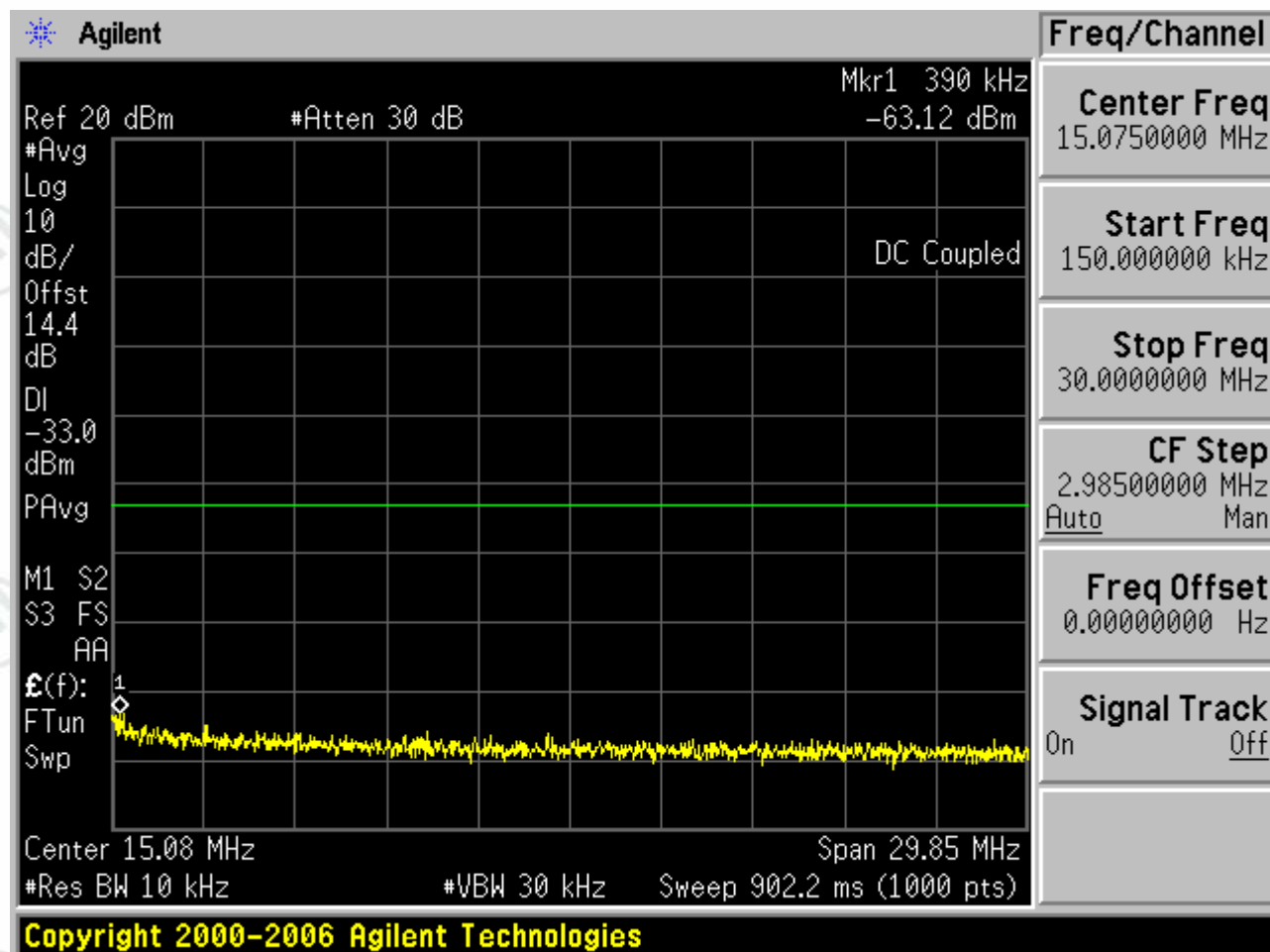


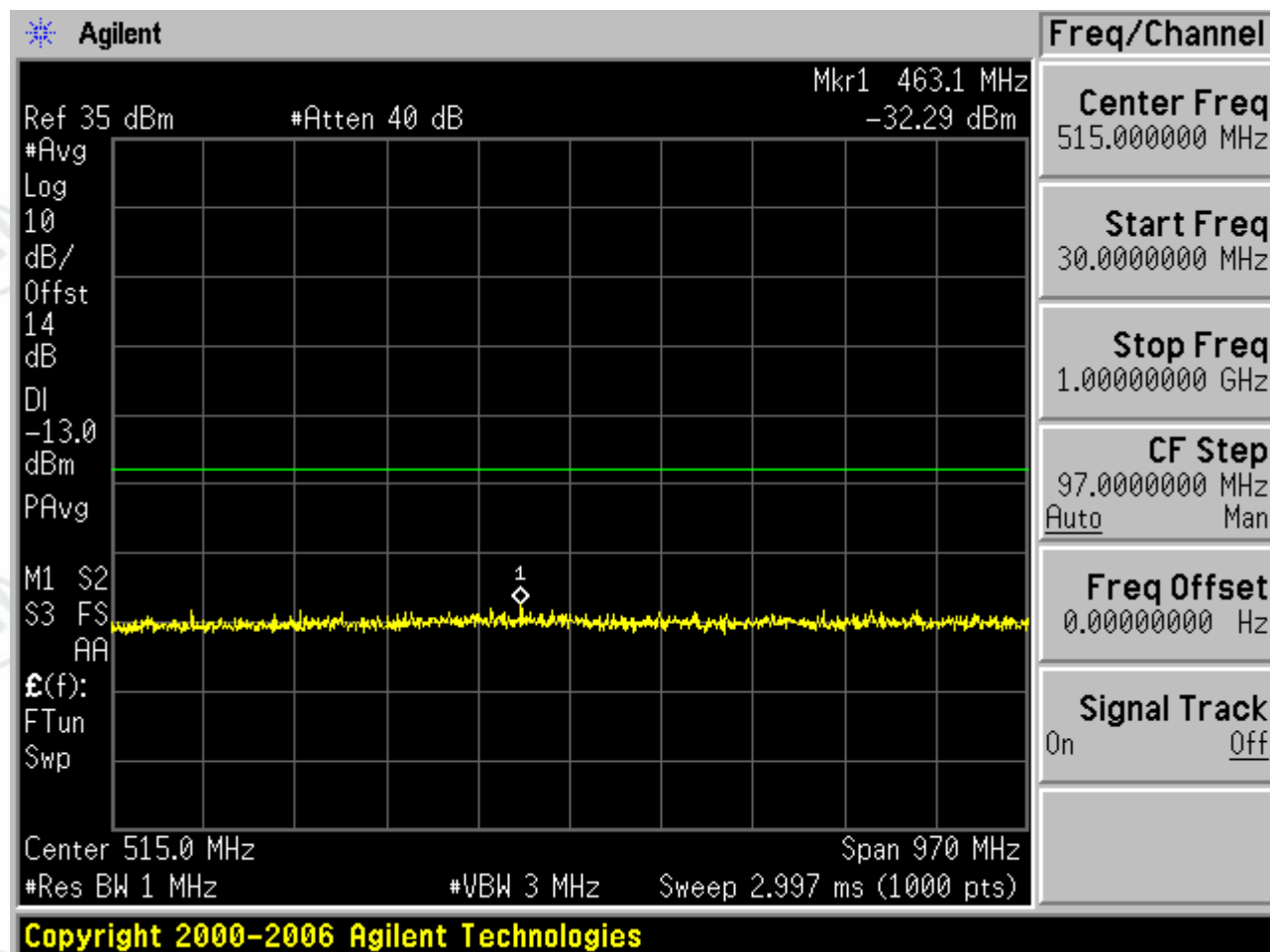


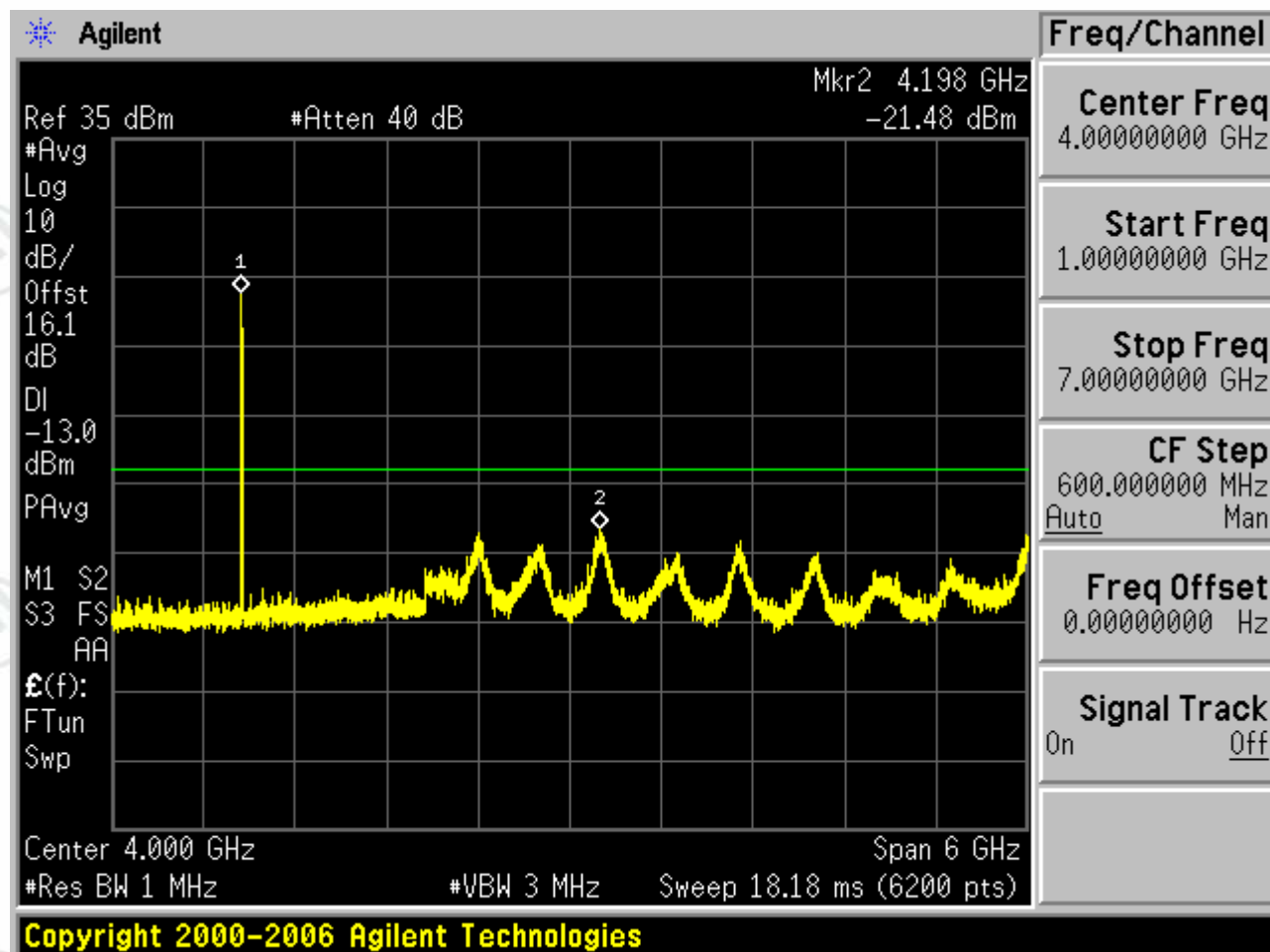
1.2.3 Test Mode=GSM/TM3

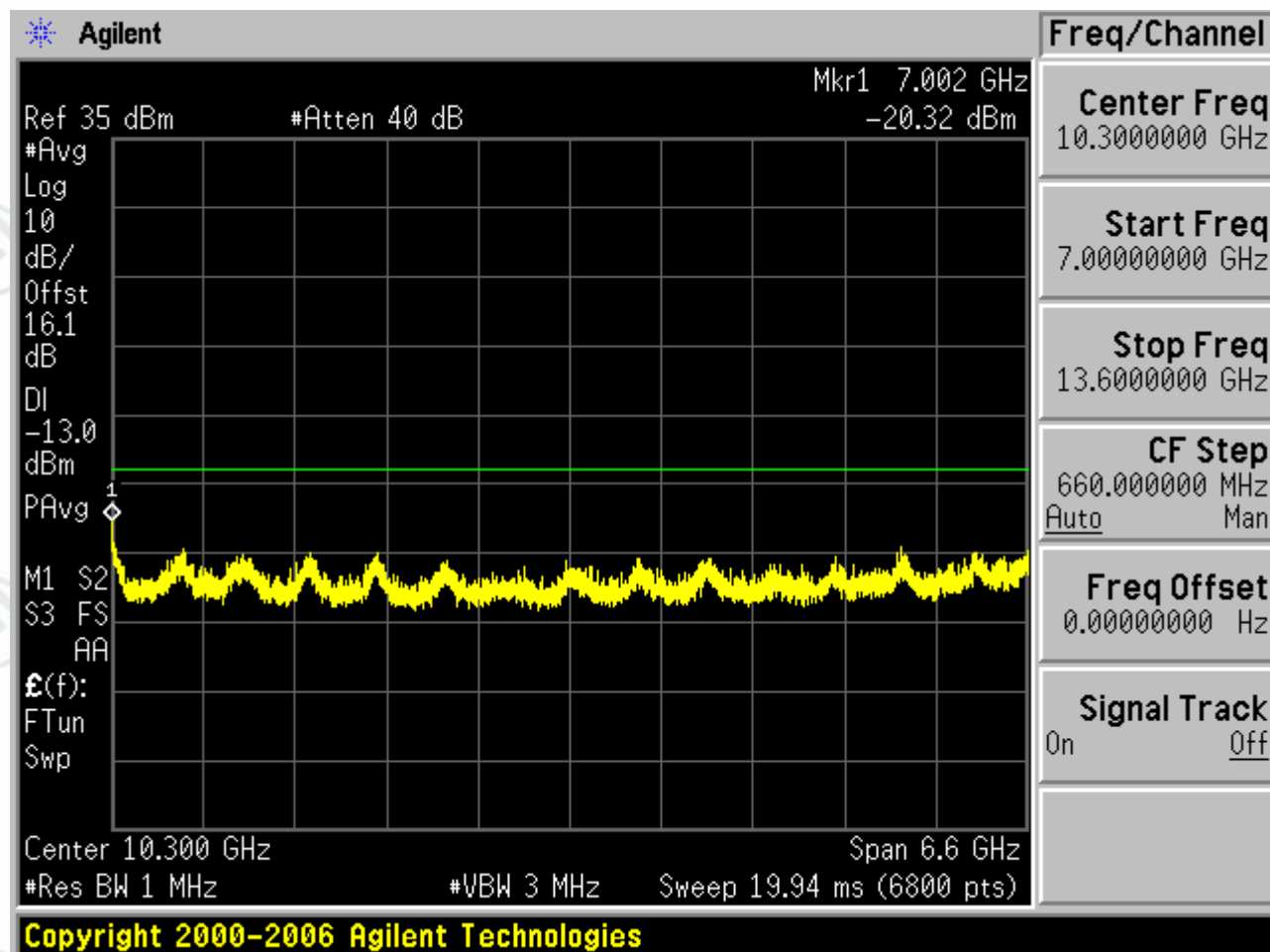
1.2.3.1 Test Channel=LCH

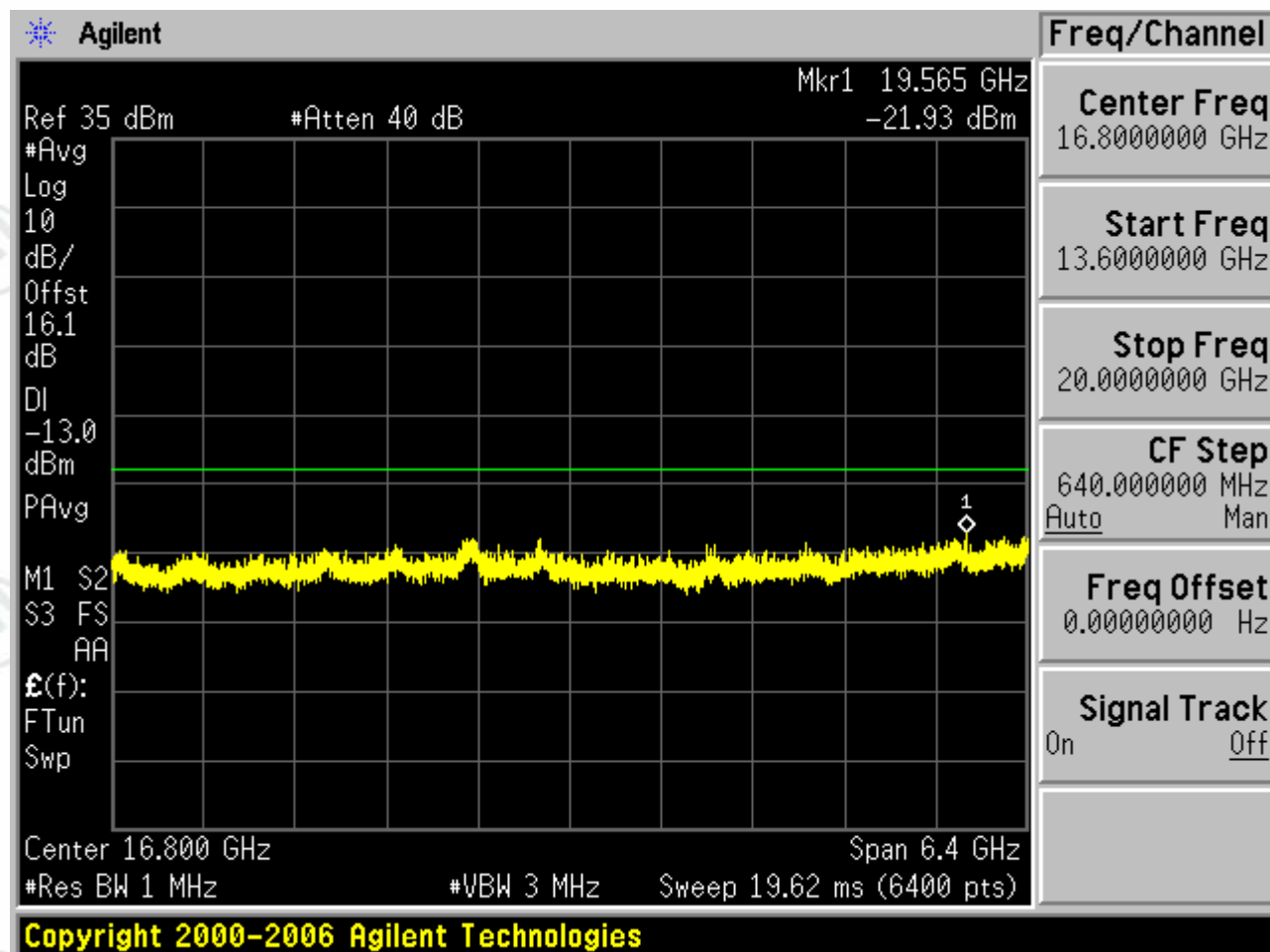




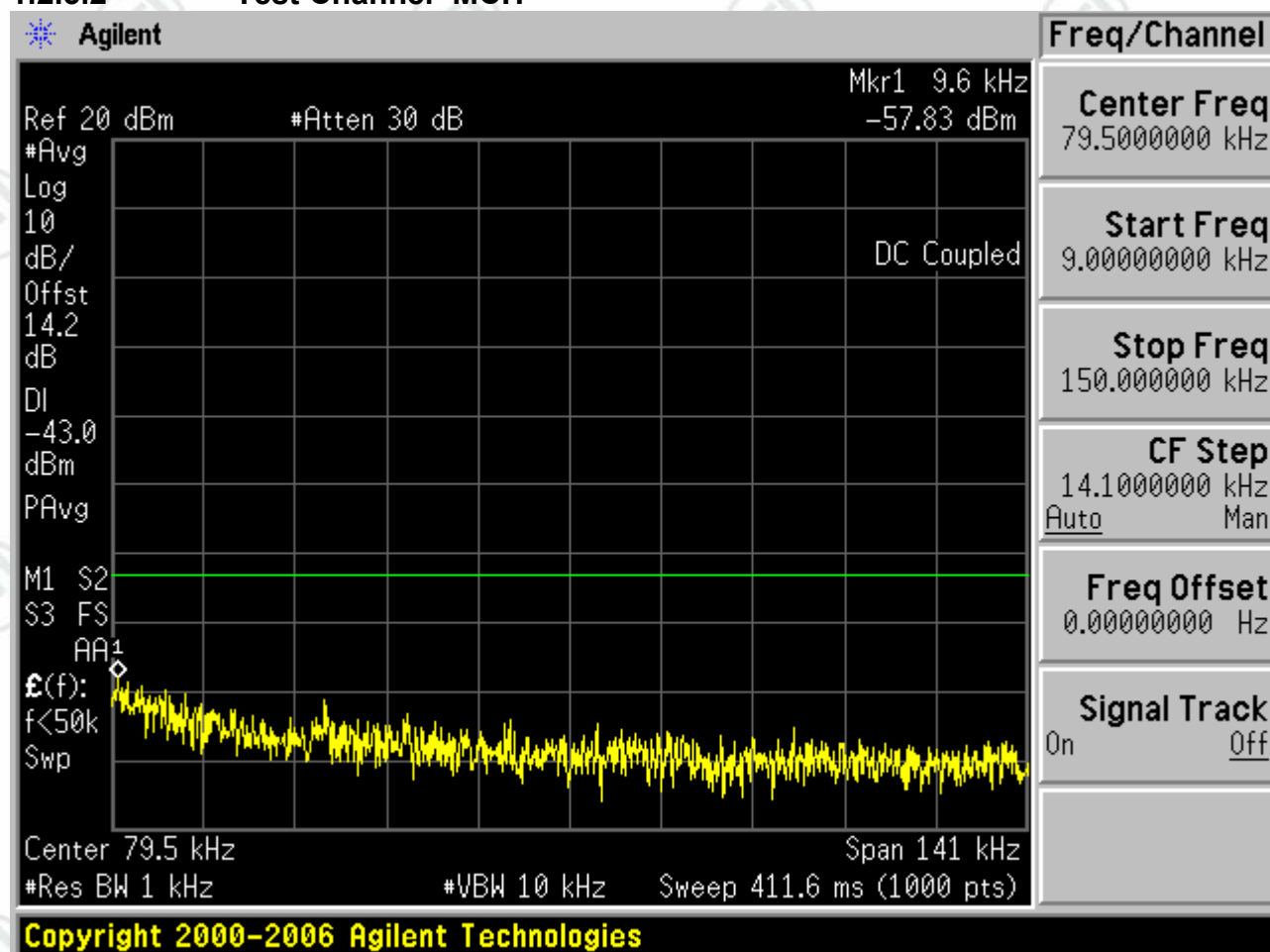


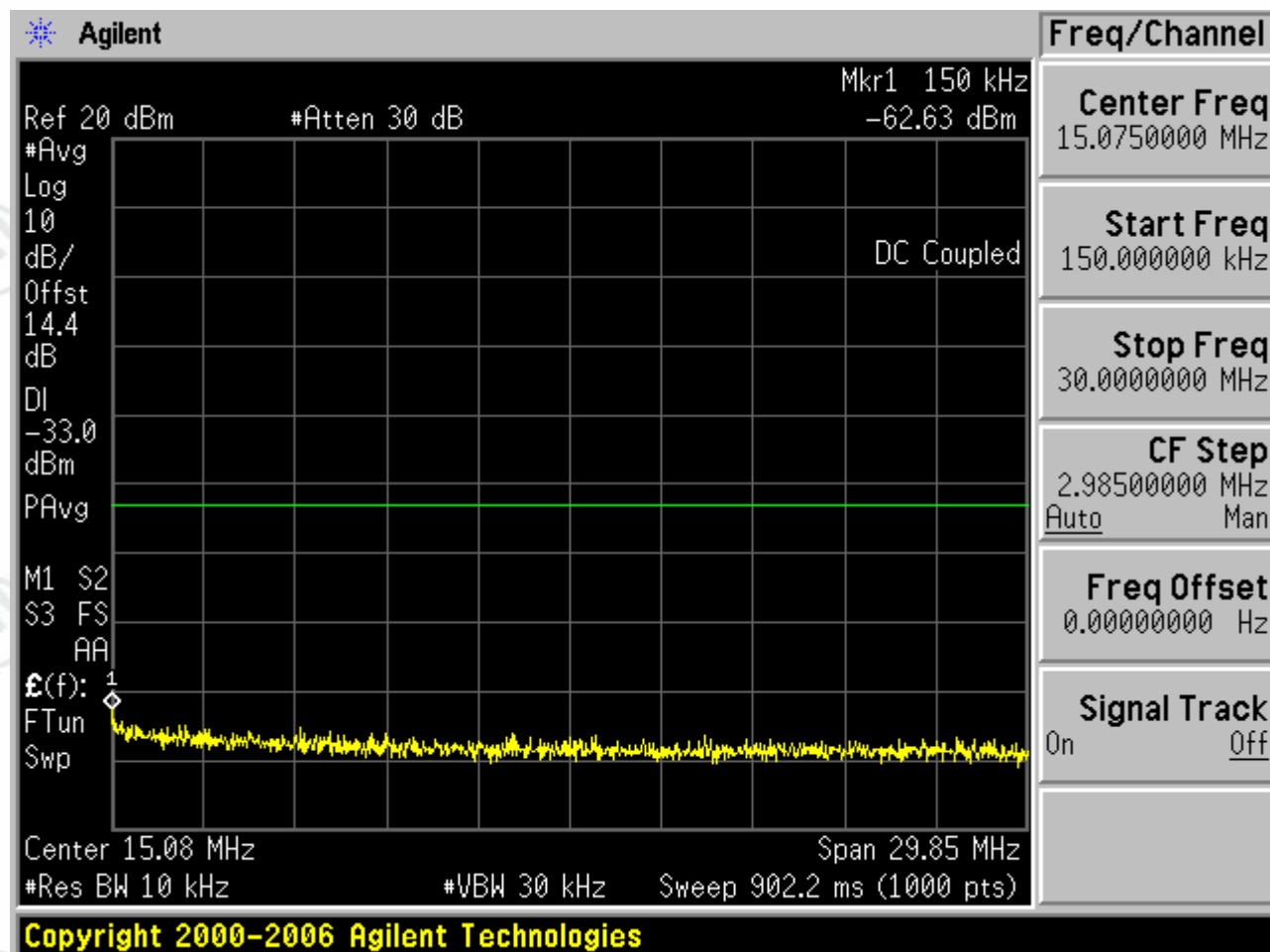


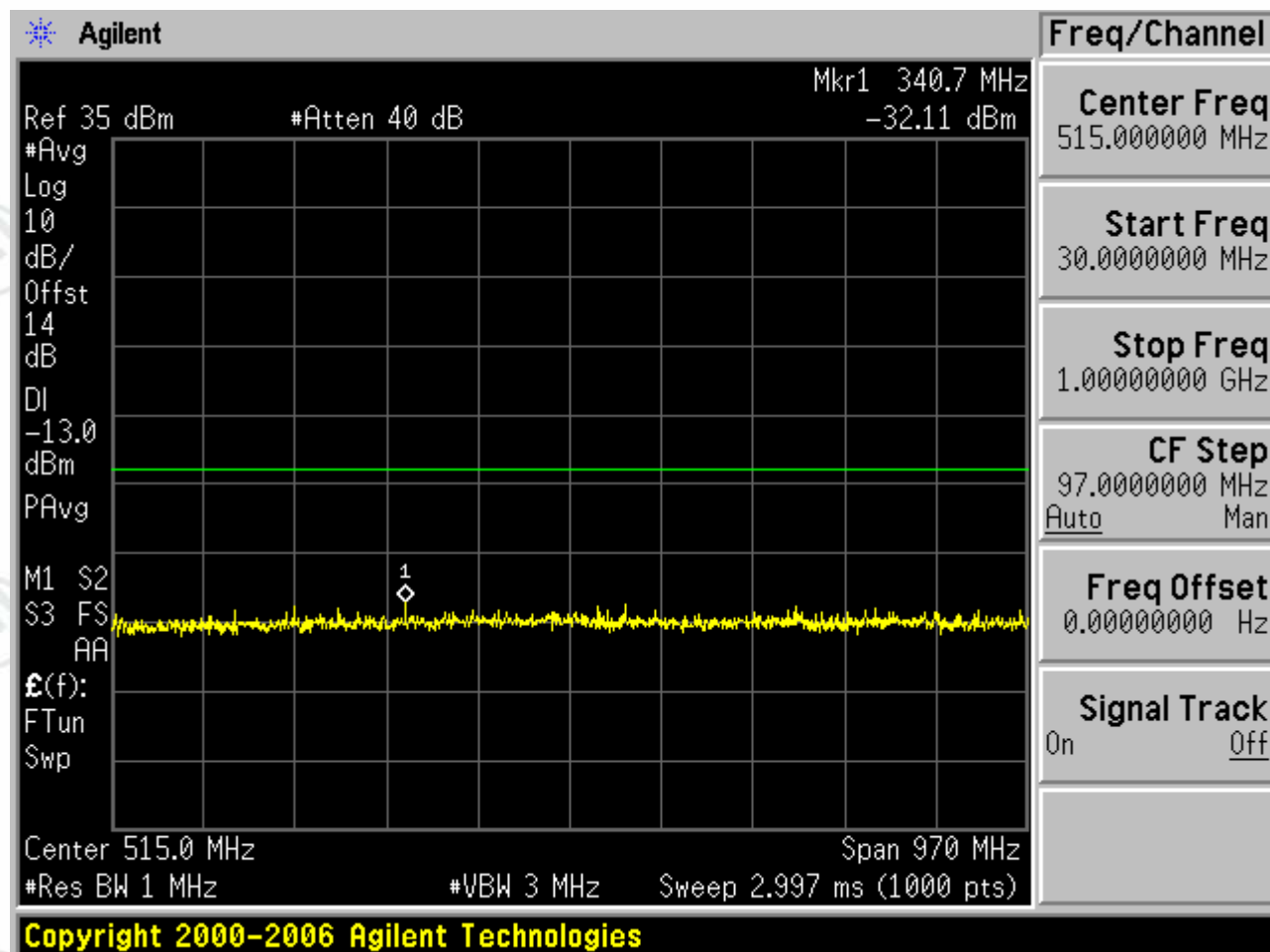


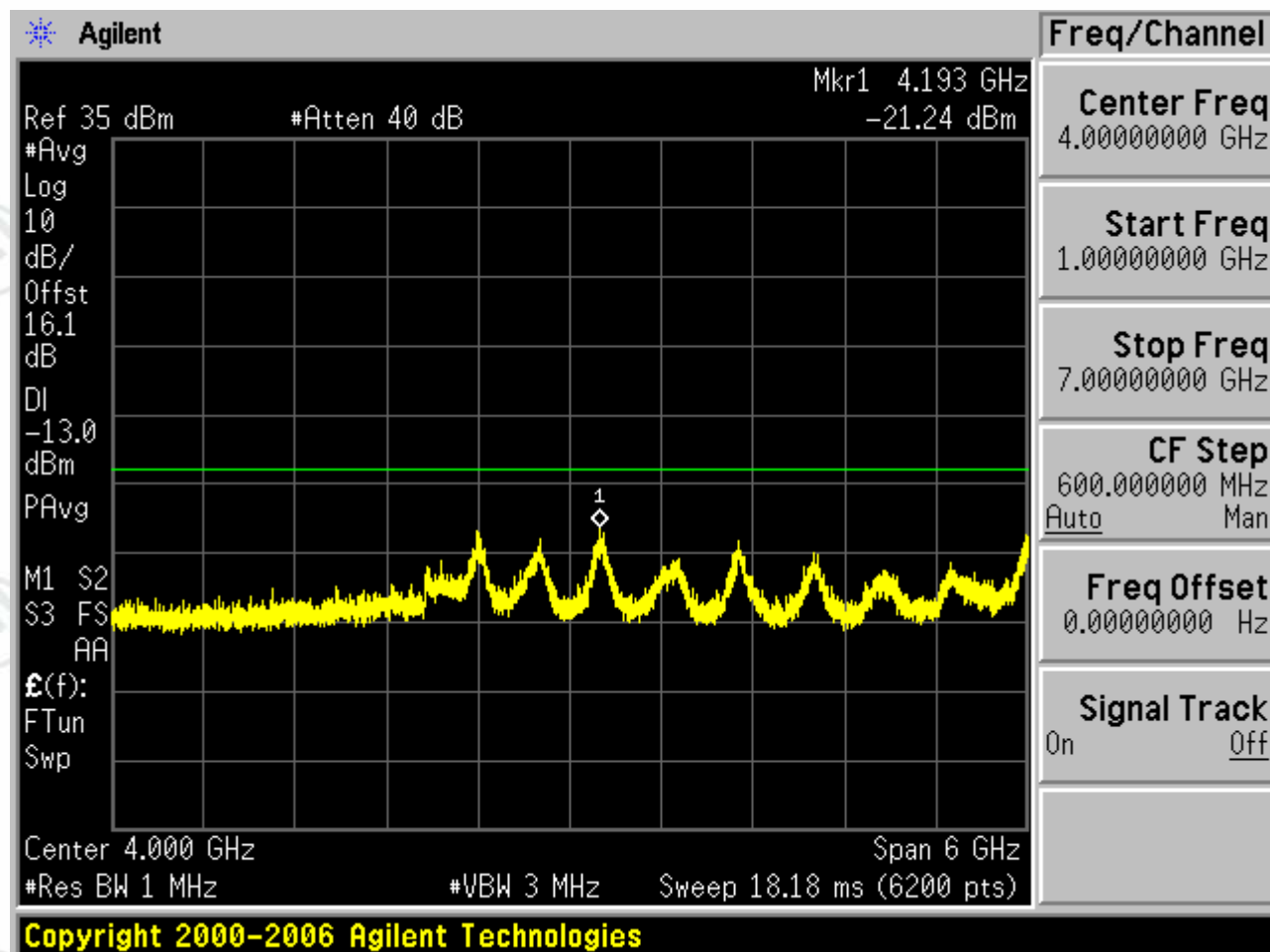


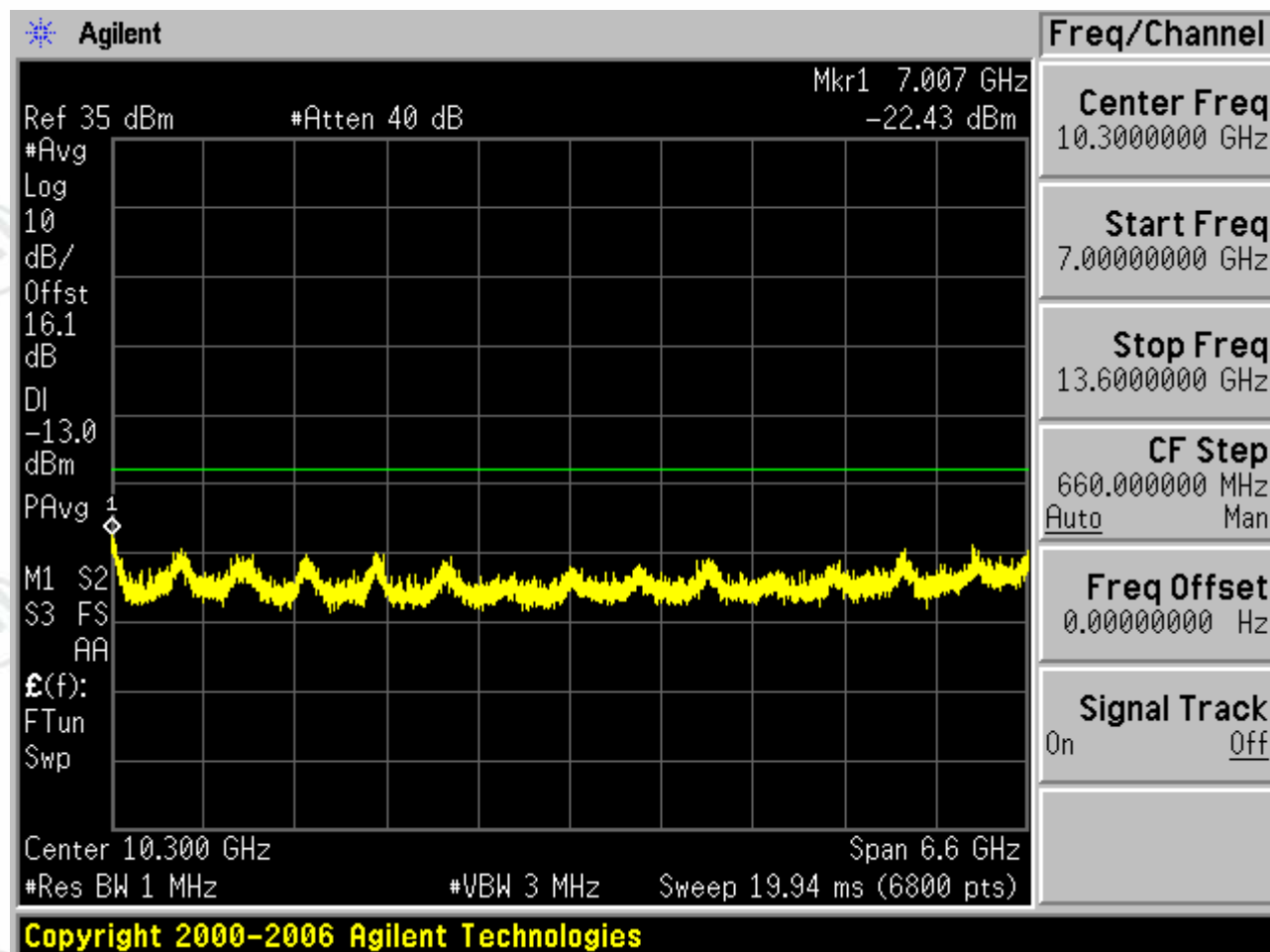
1.2.3.2 Test Channel=MCH

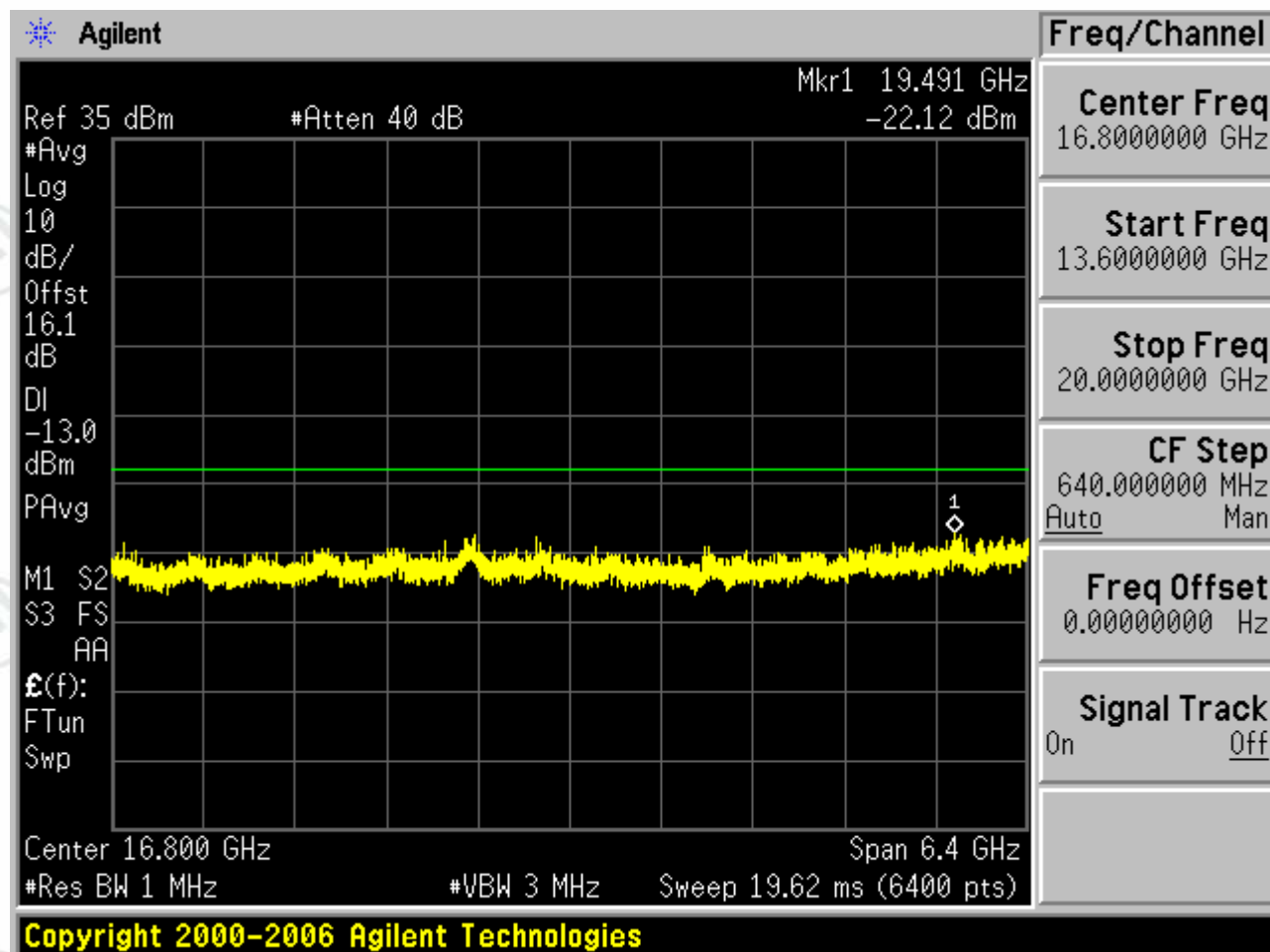




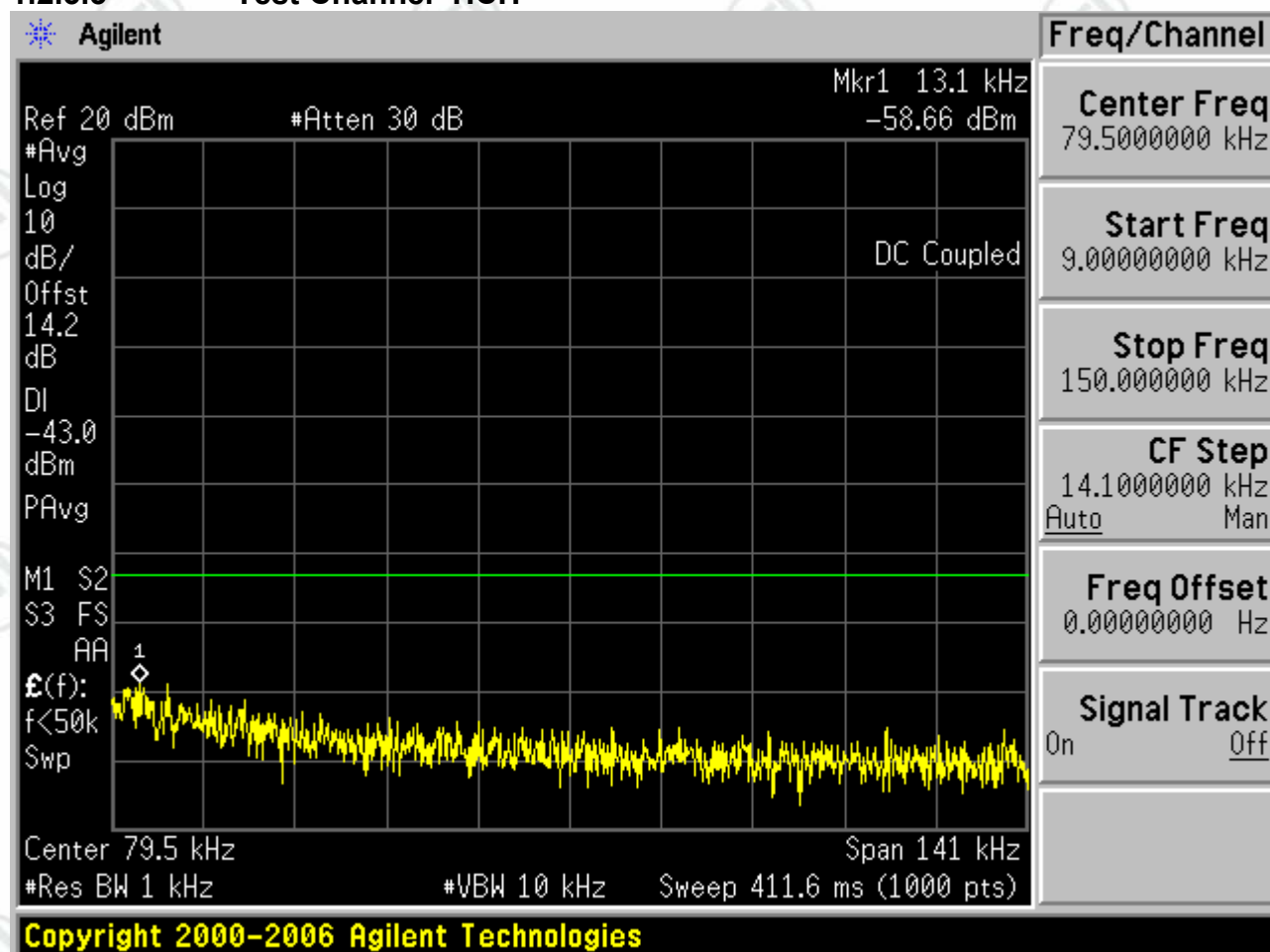


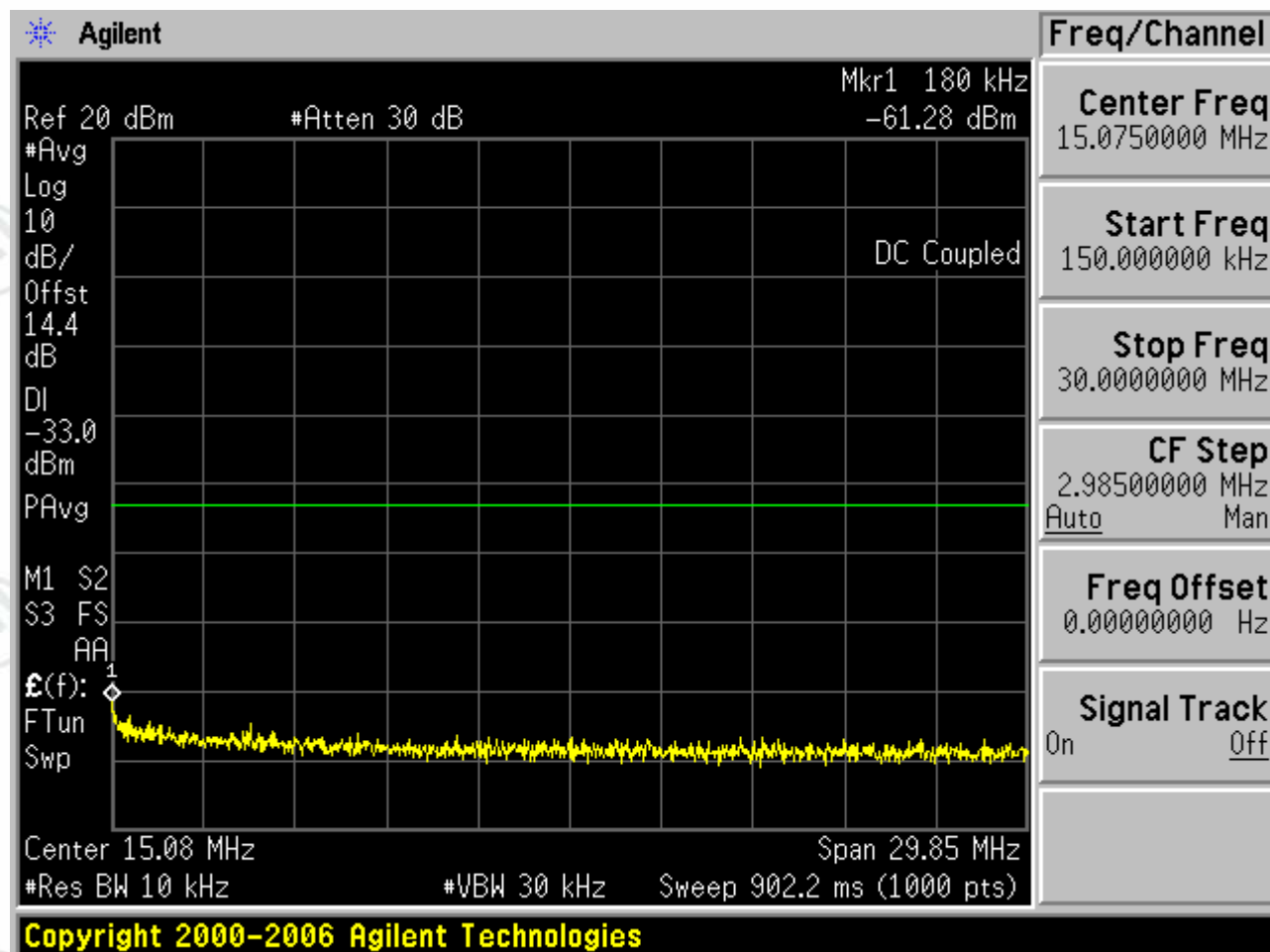


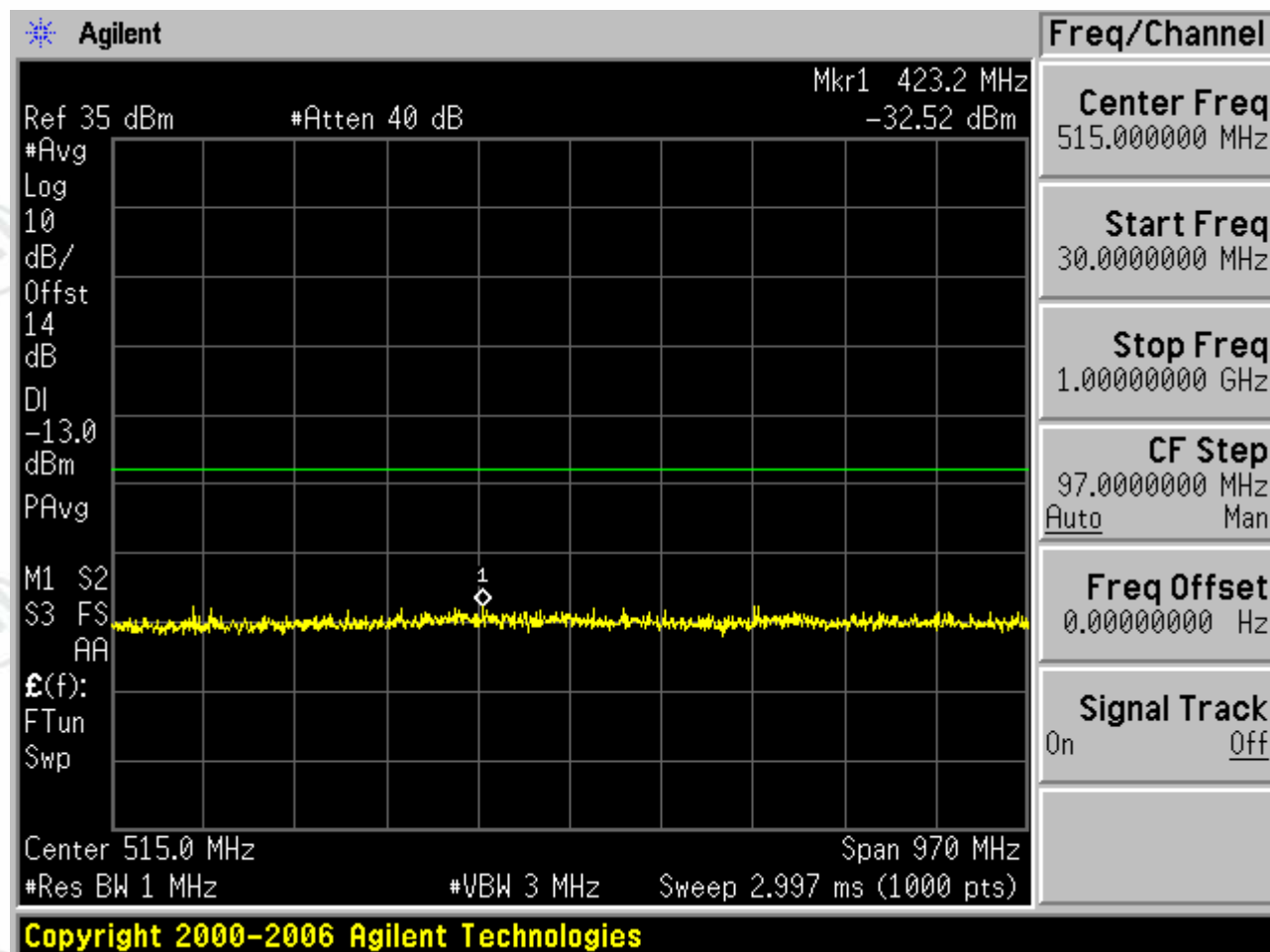


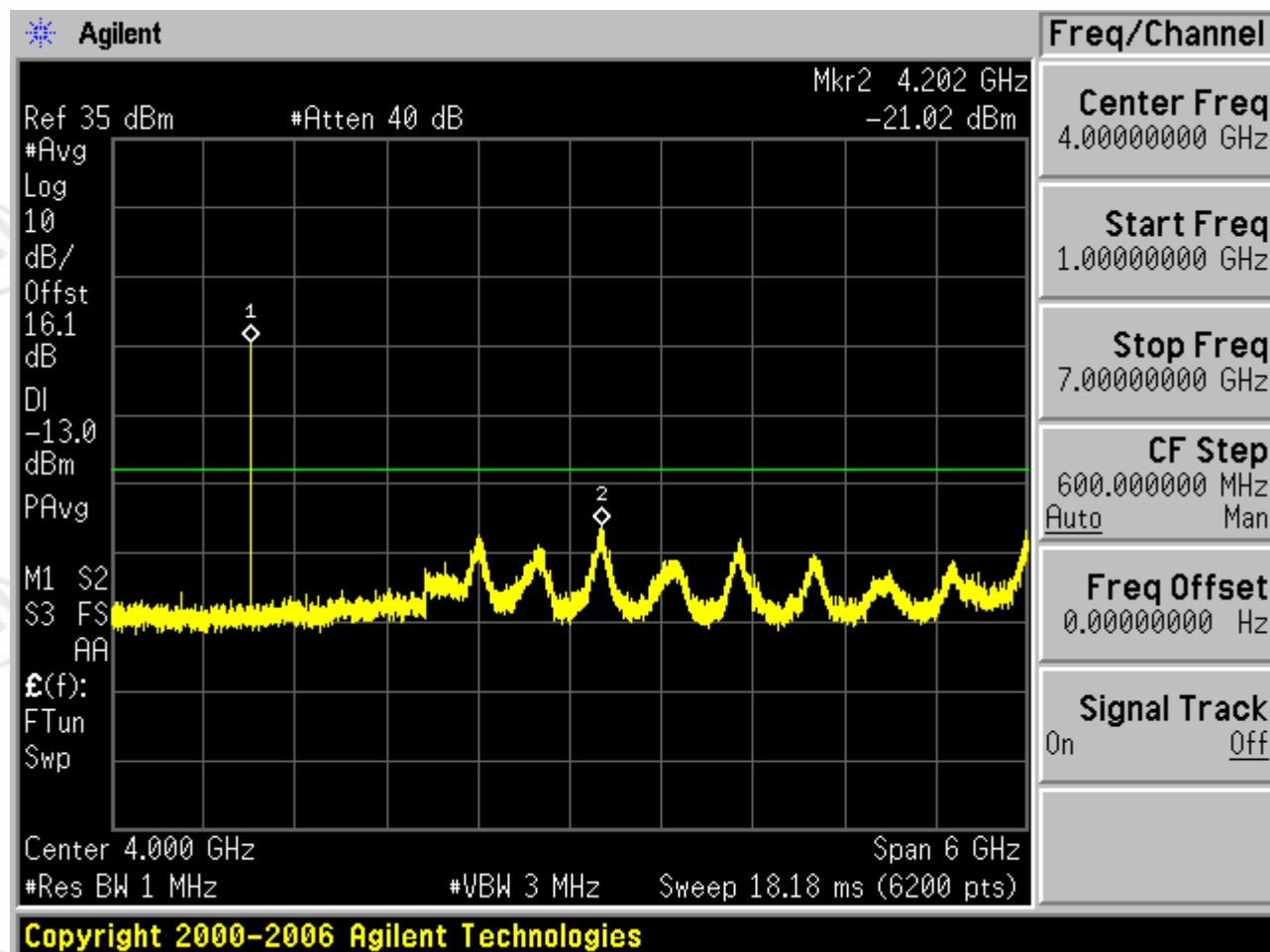


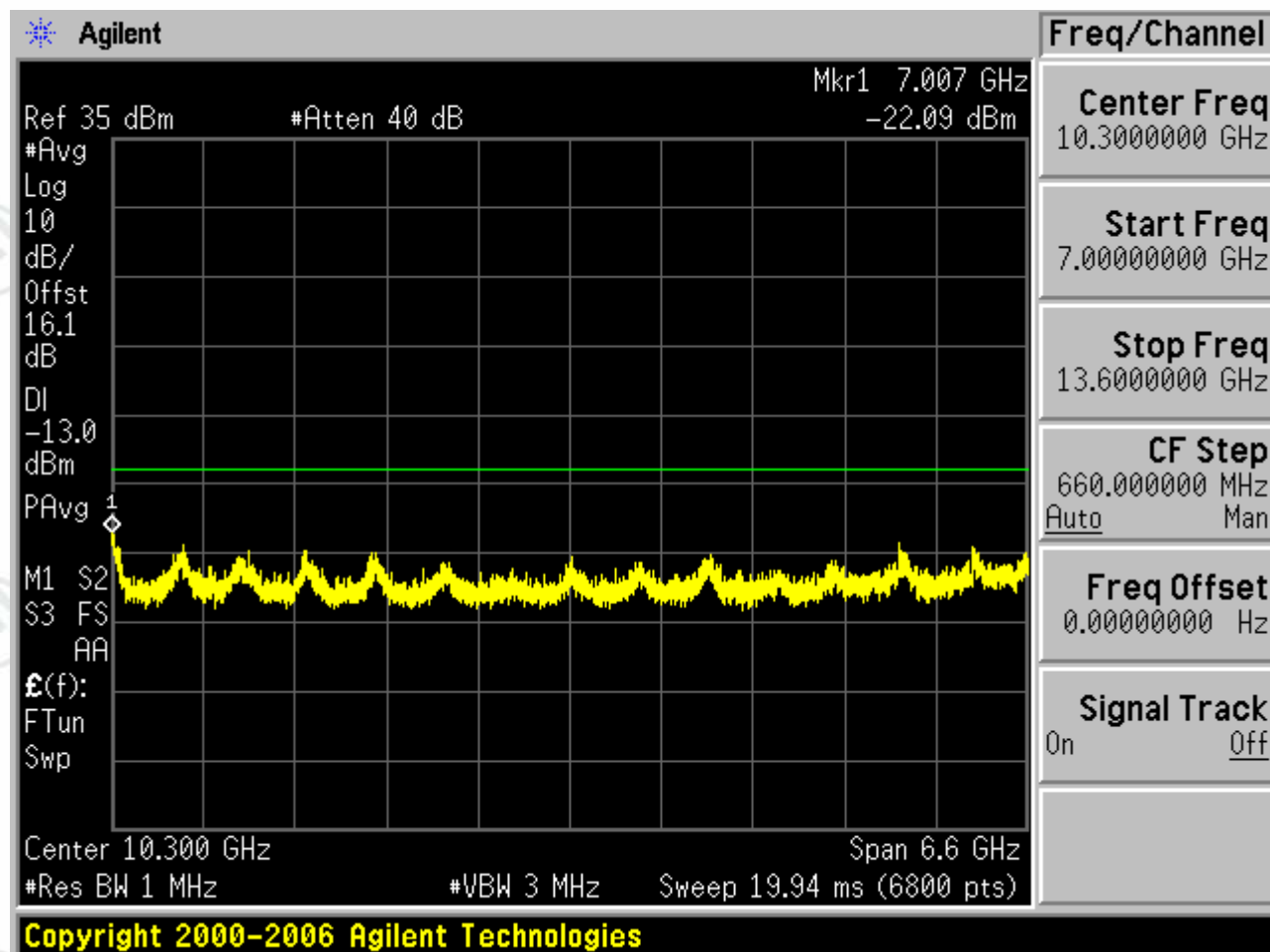
1.2.3.3 Test Channel=HCH

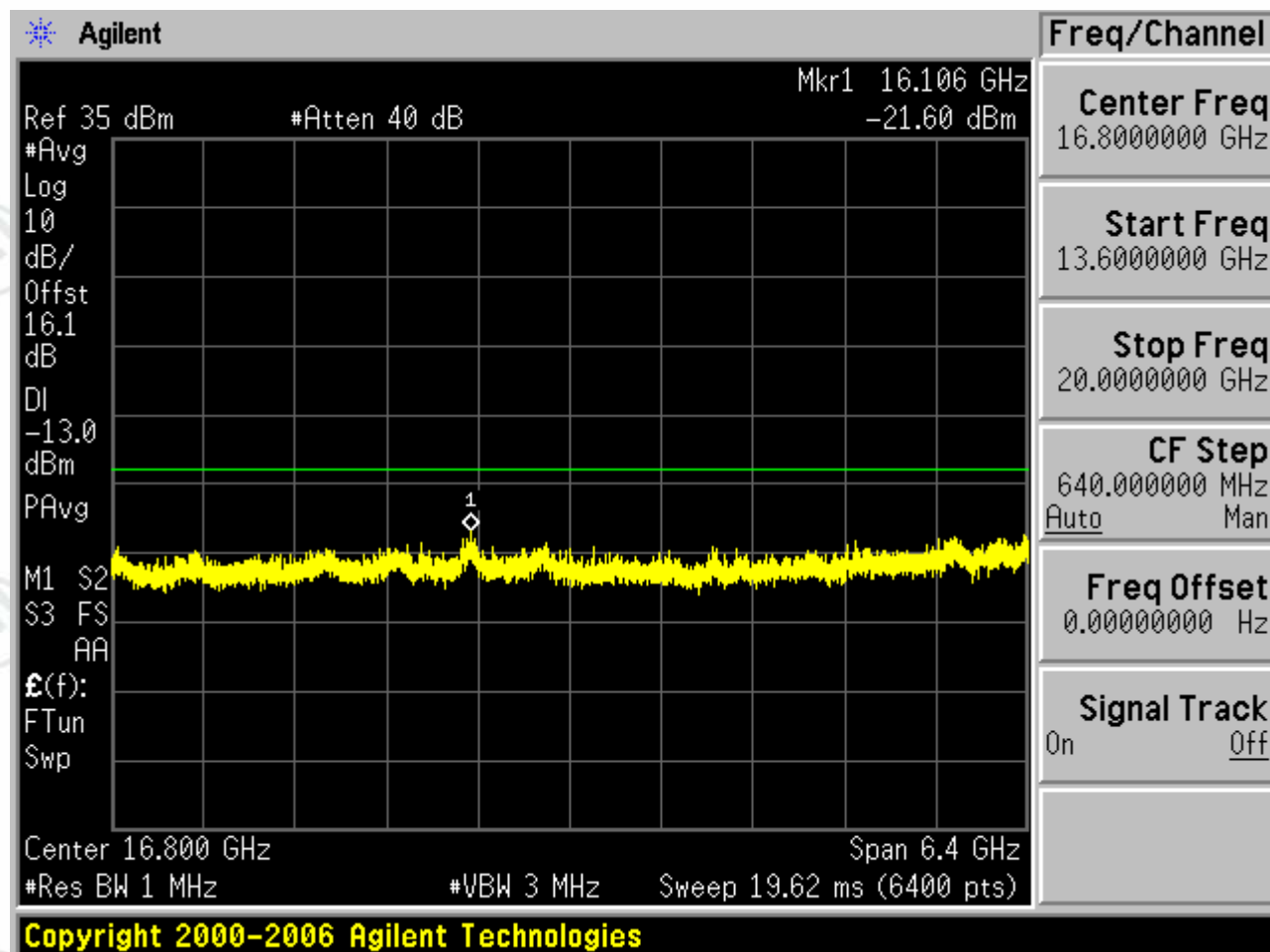




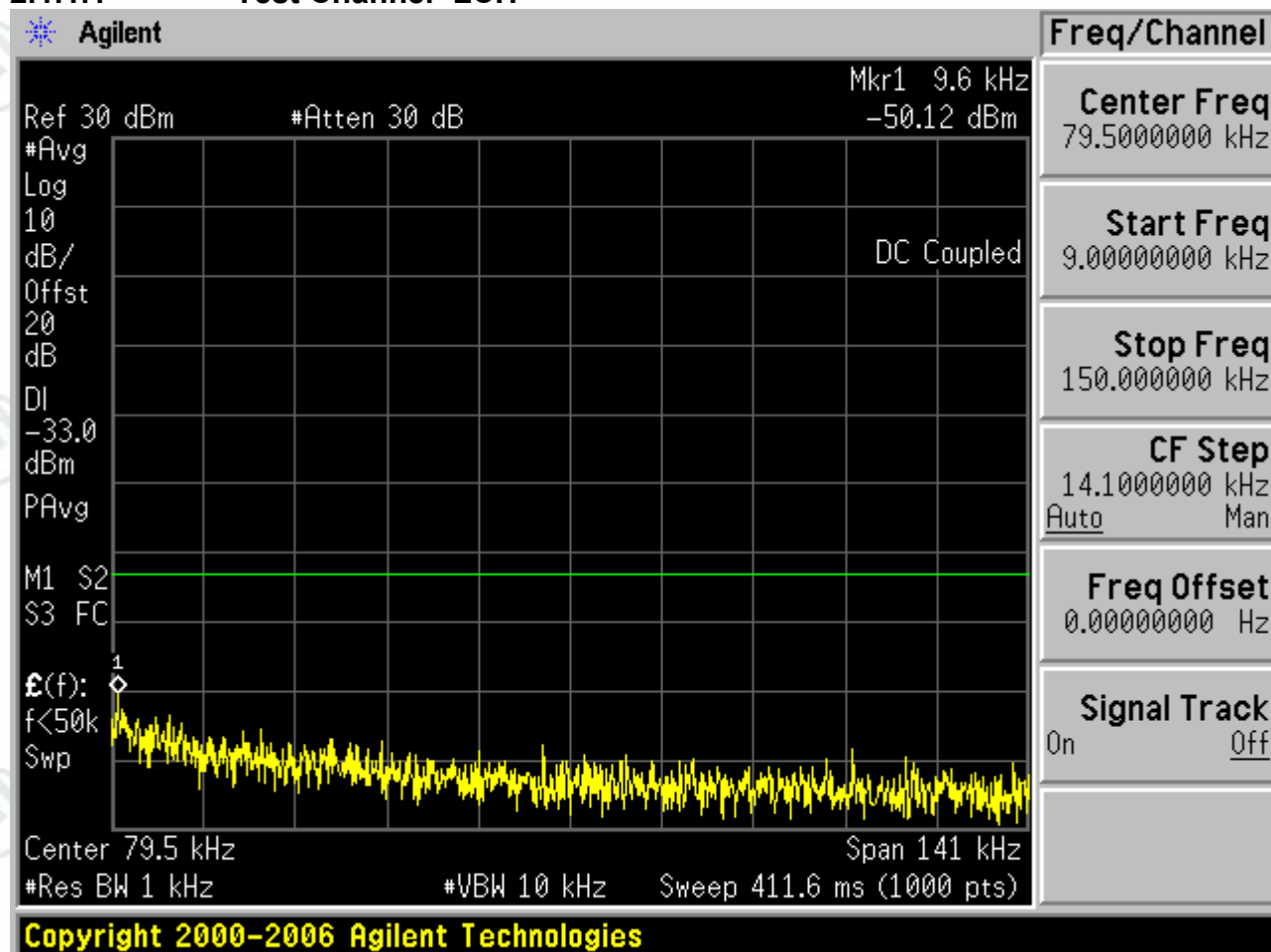


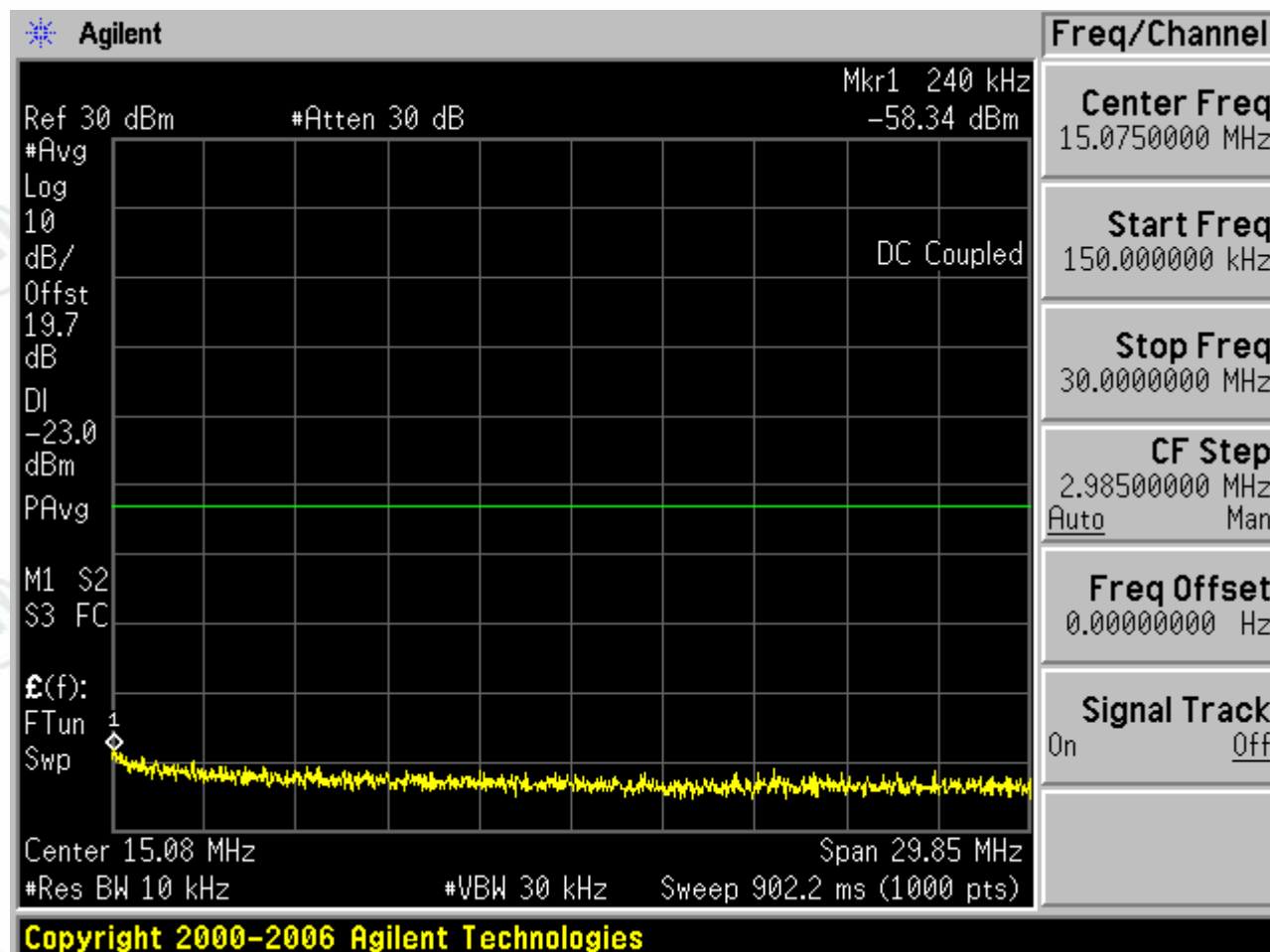


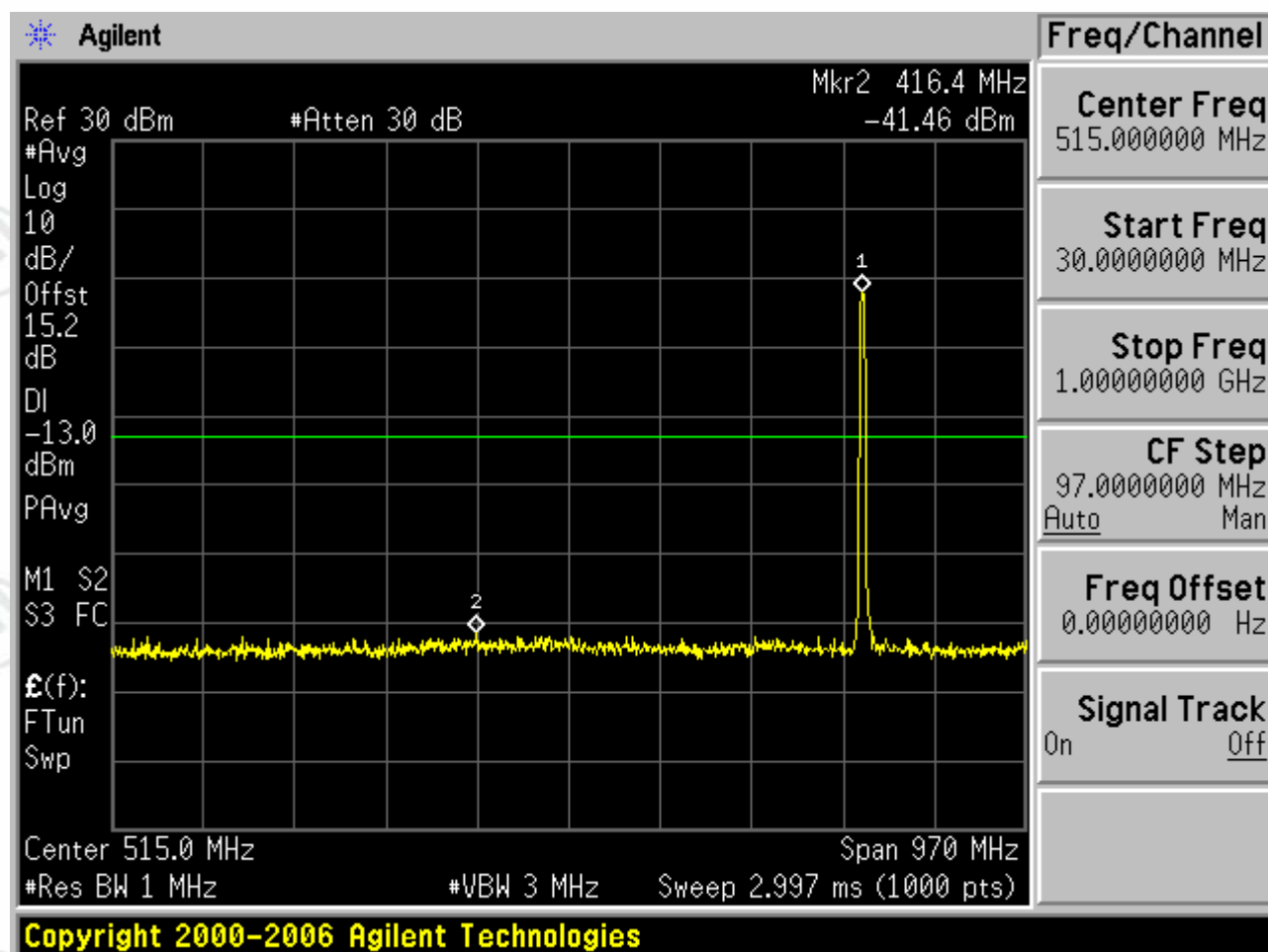


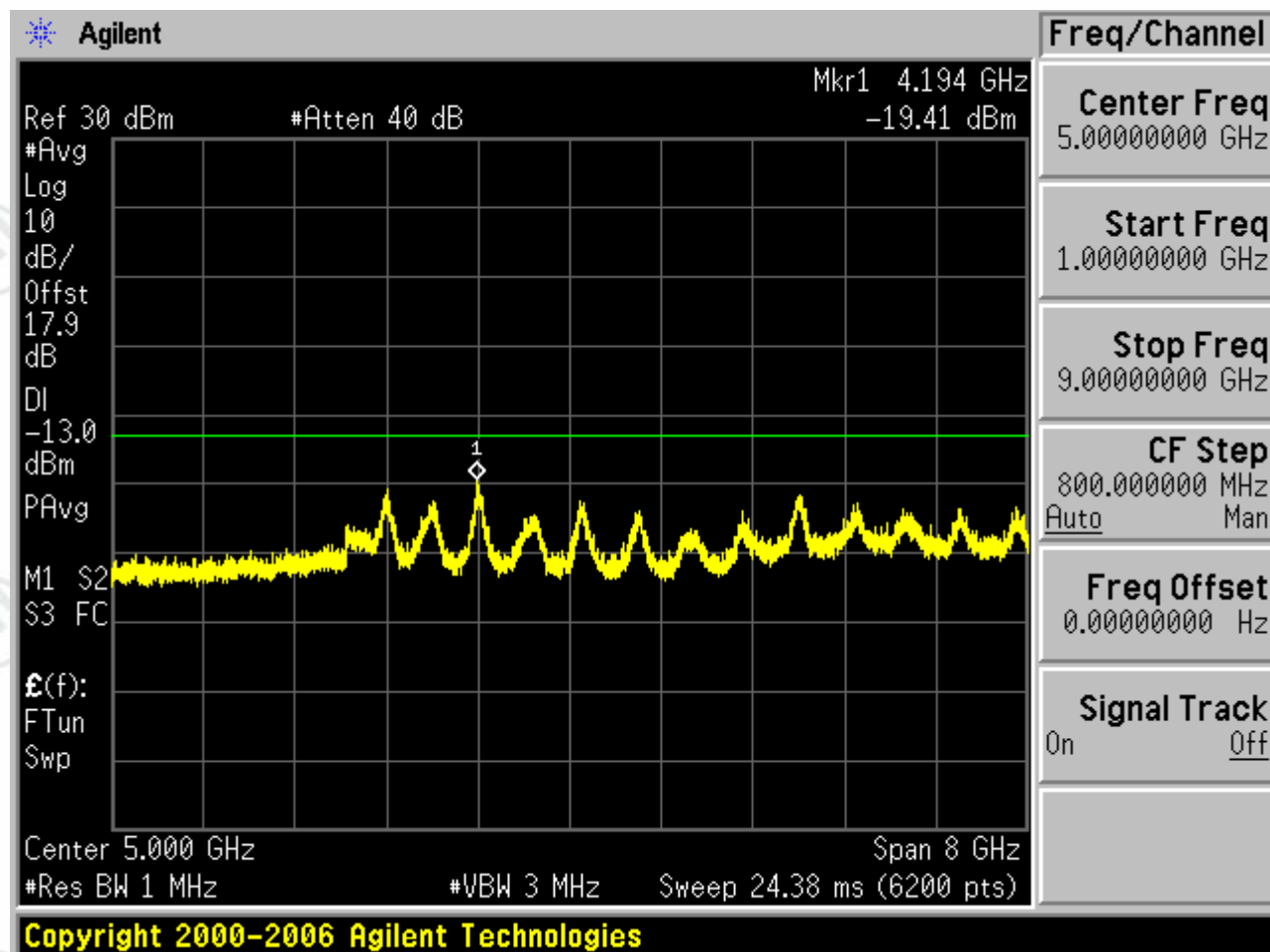


2 For WCDMA
2.1 Test Band=WCDMA850
2.1.1 Test Mode=UMTS/TM1
2.1.1.1 Test Channel=LCH

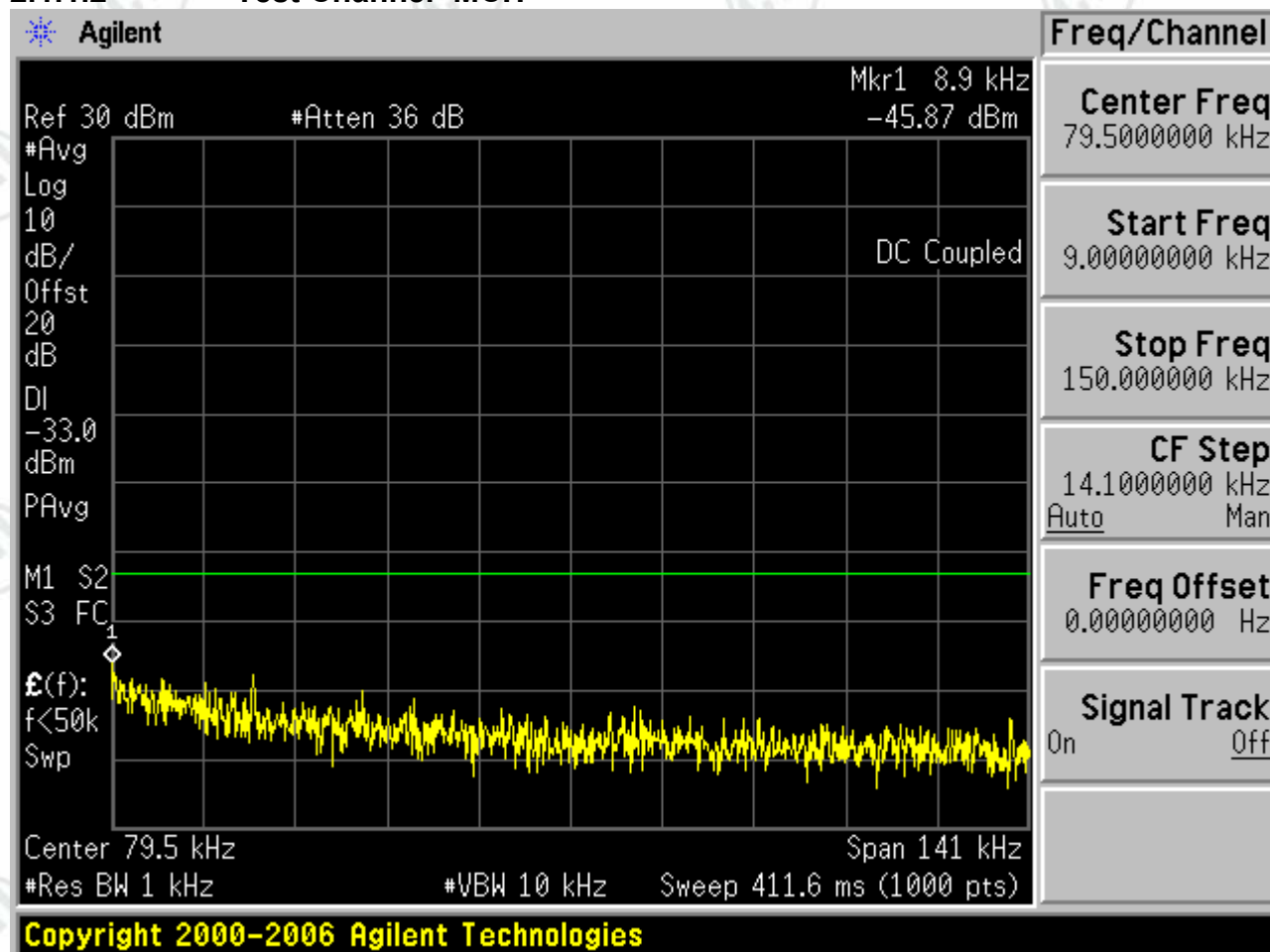


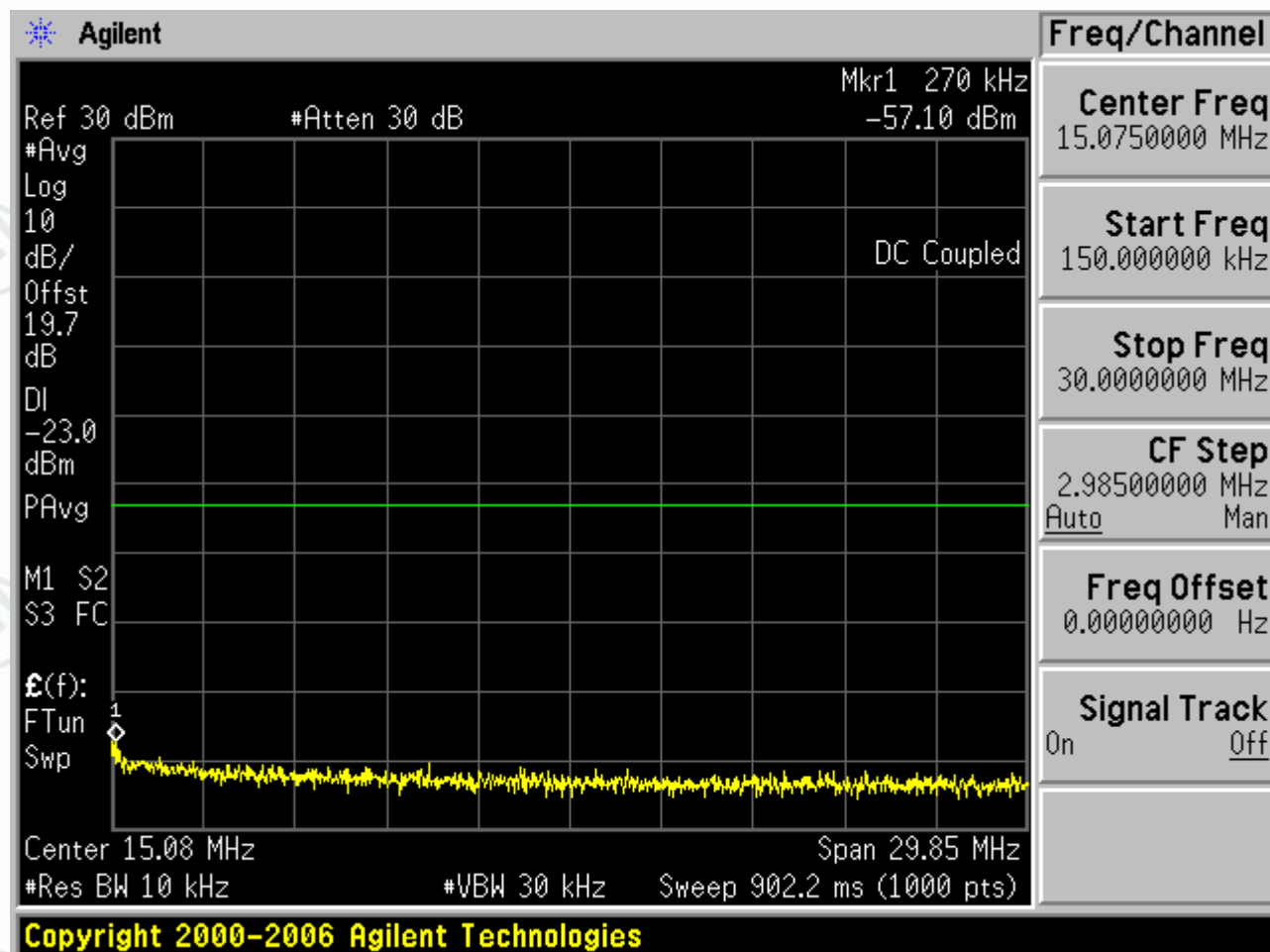


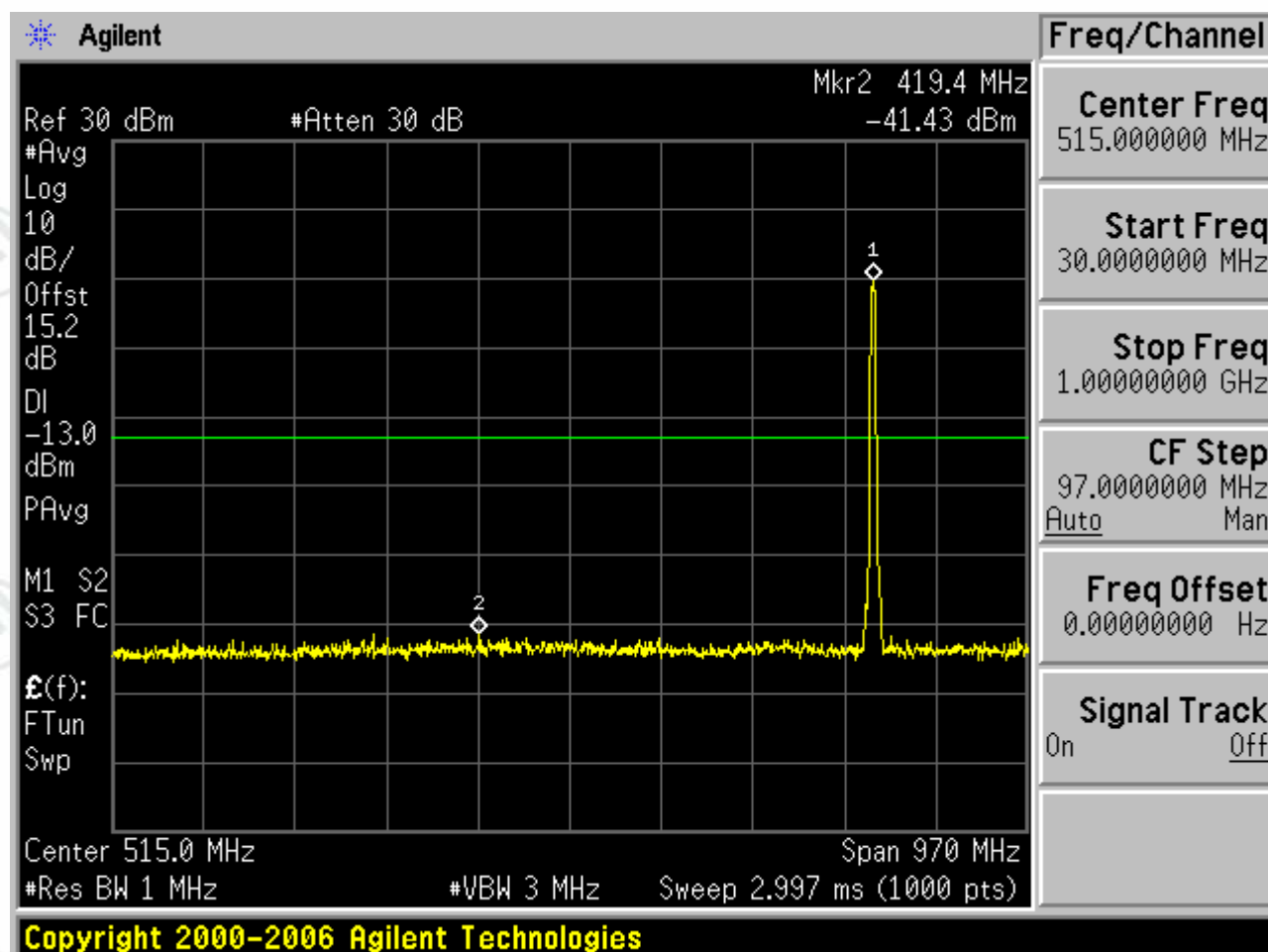


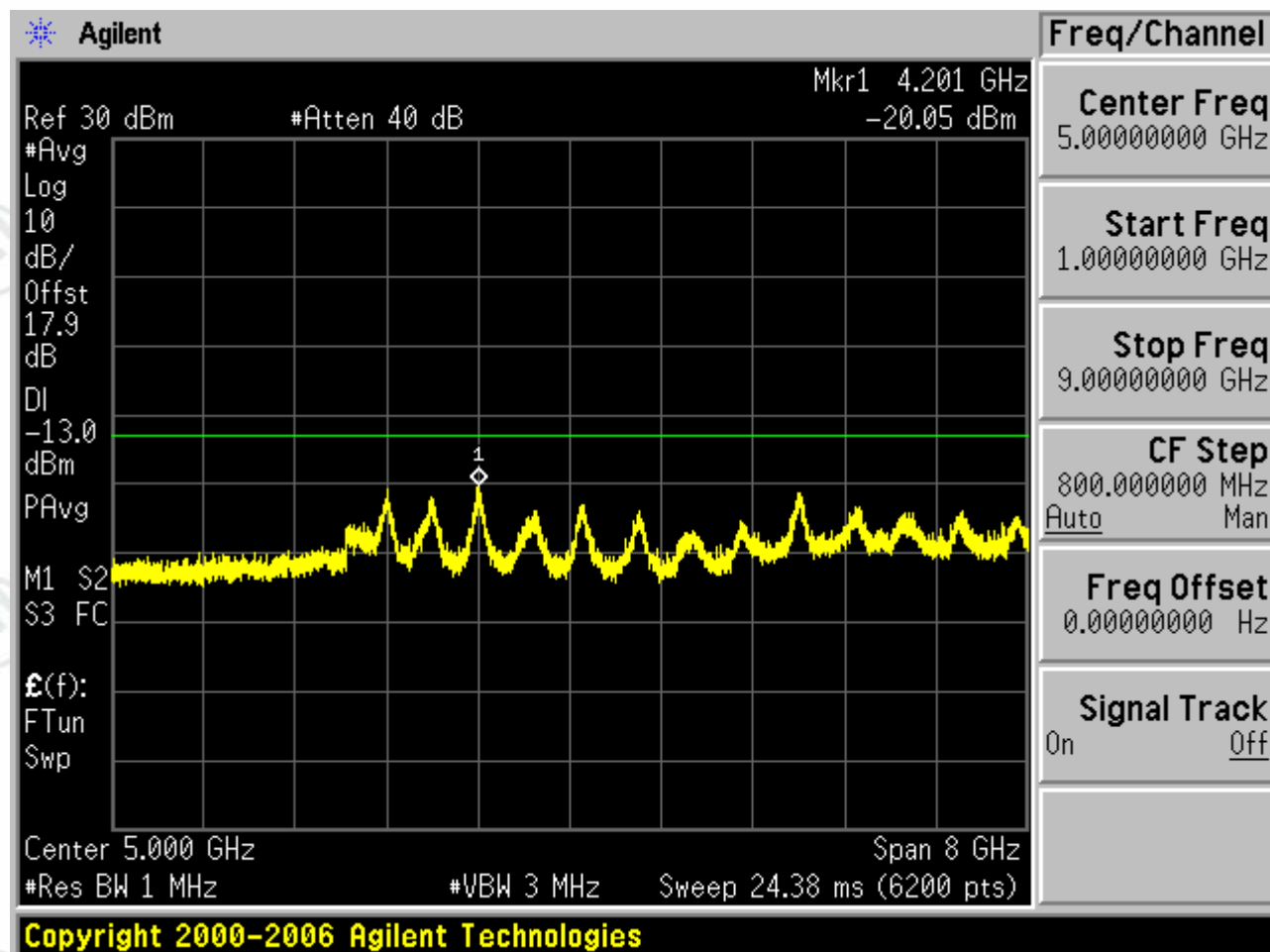


2.1.1.2 Test Channel=MCH

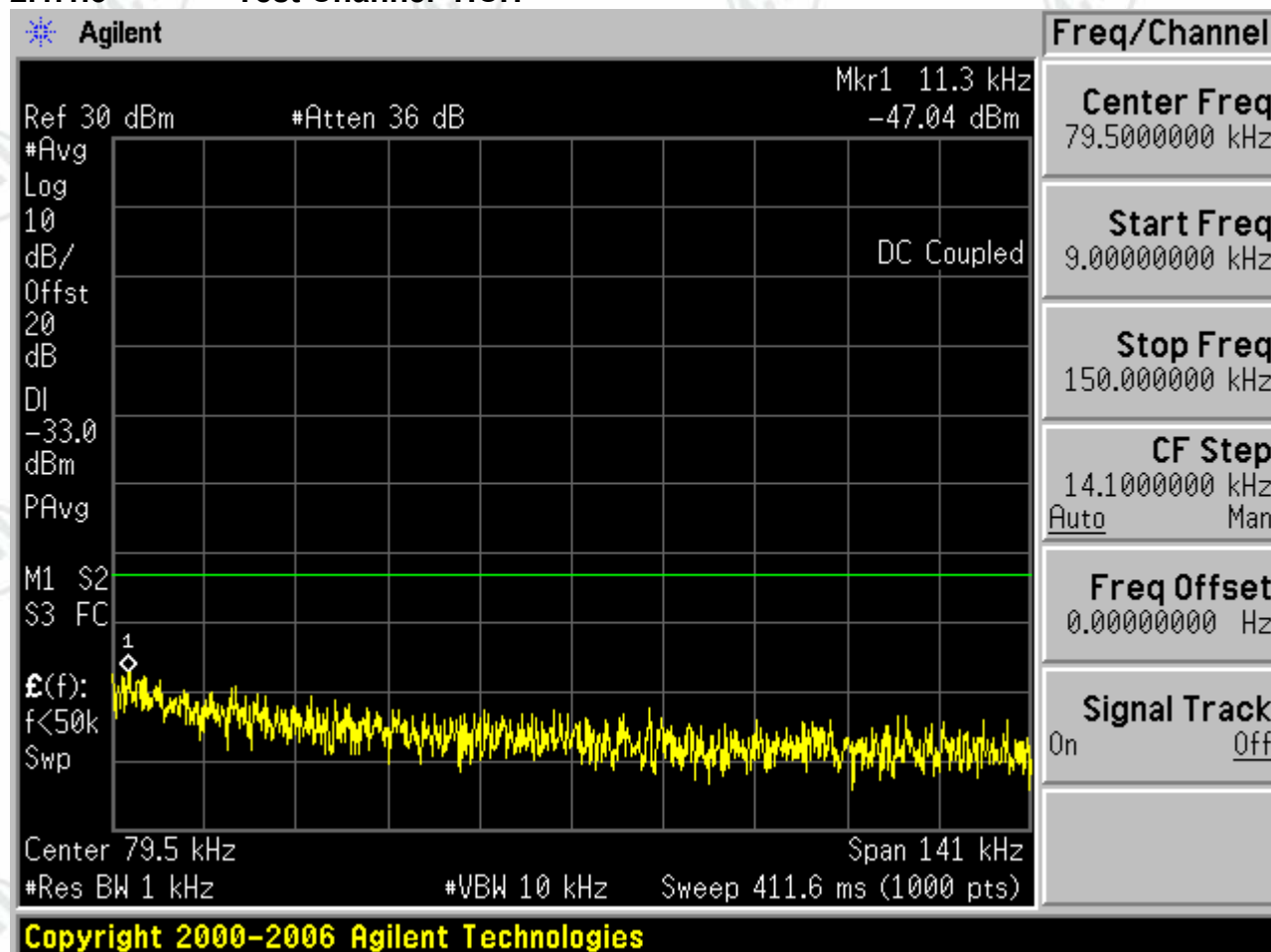


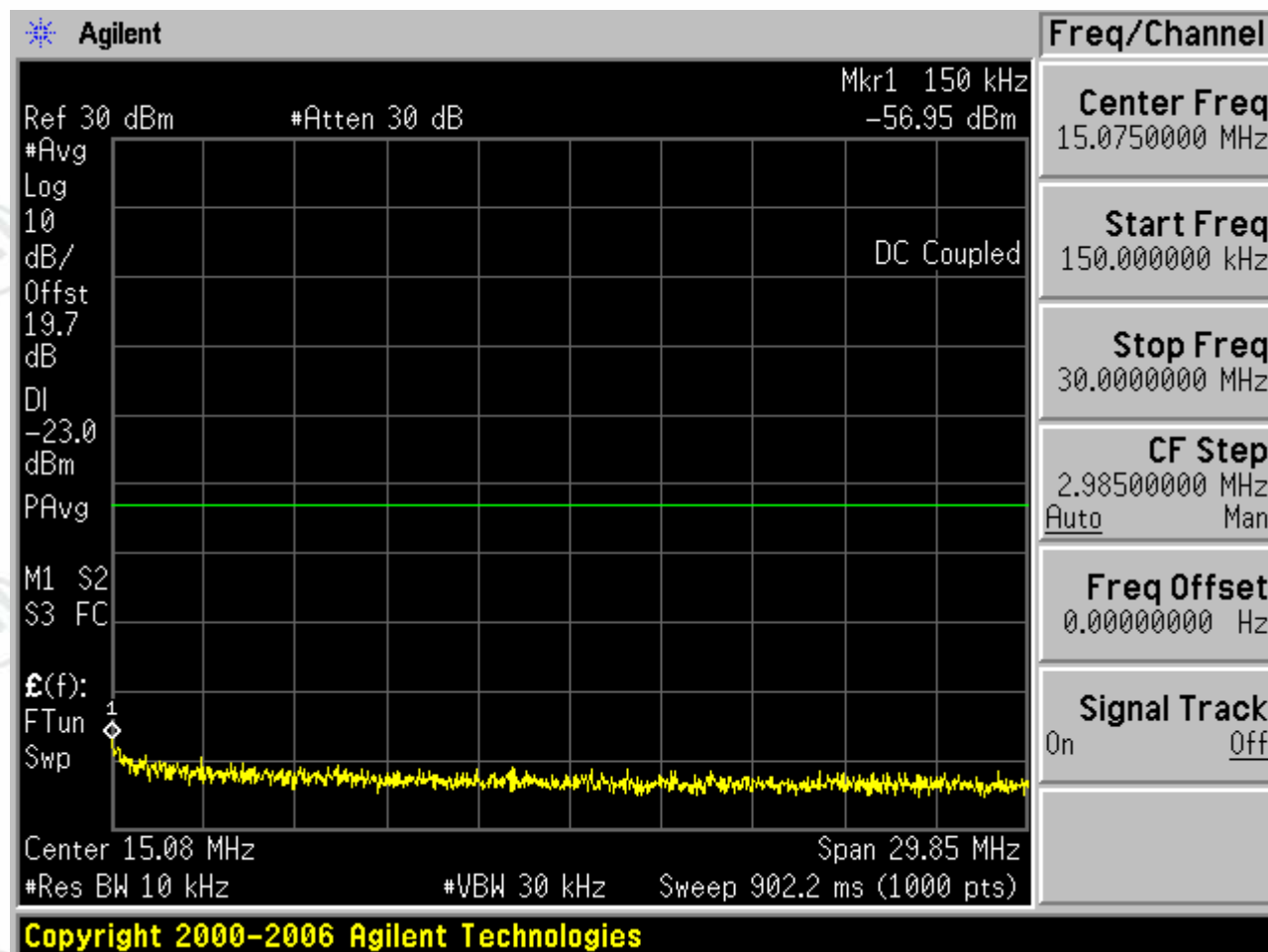


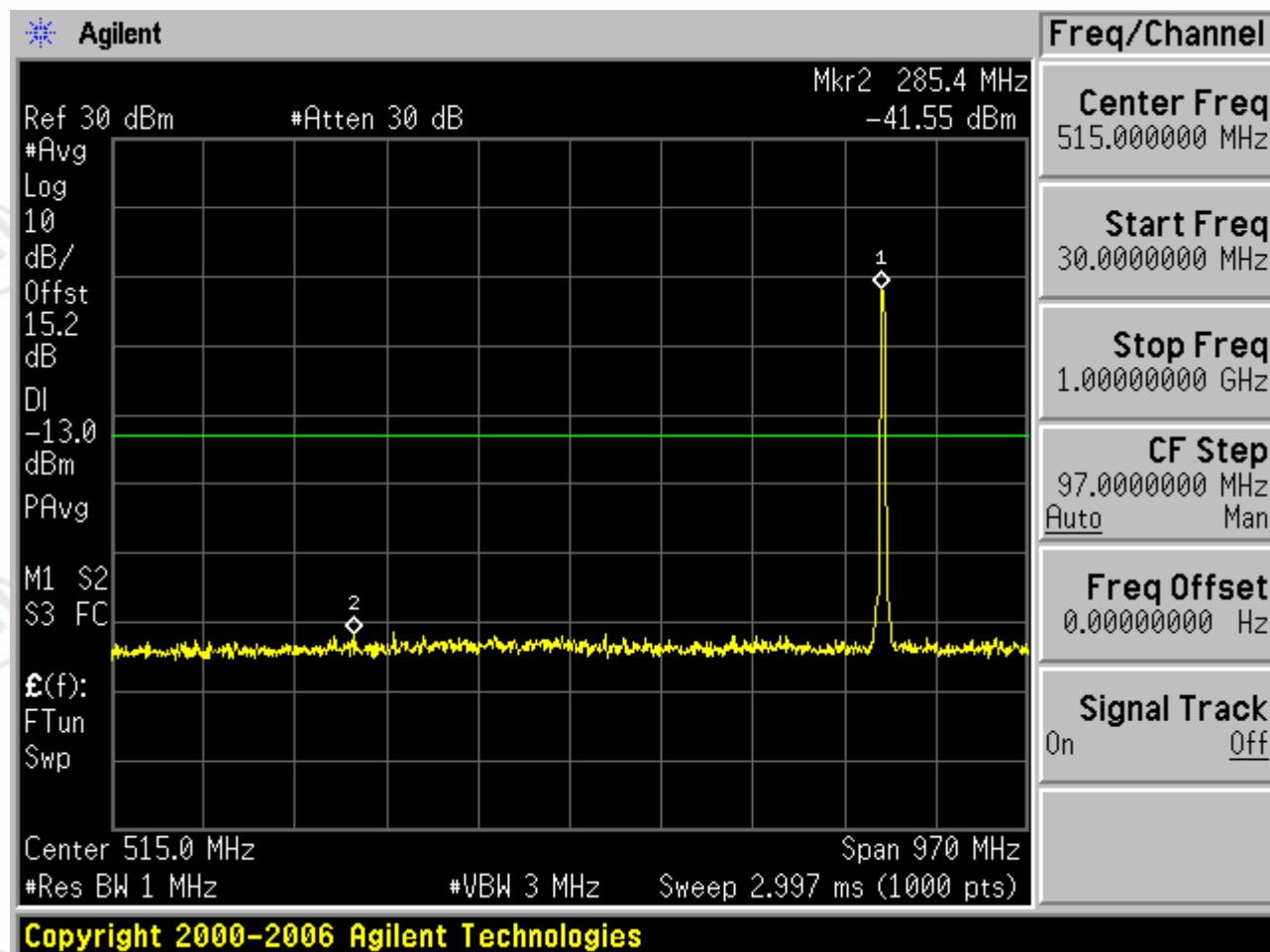


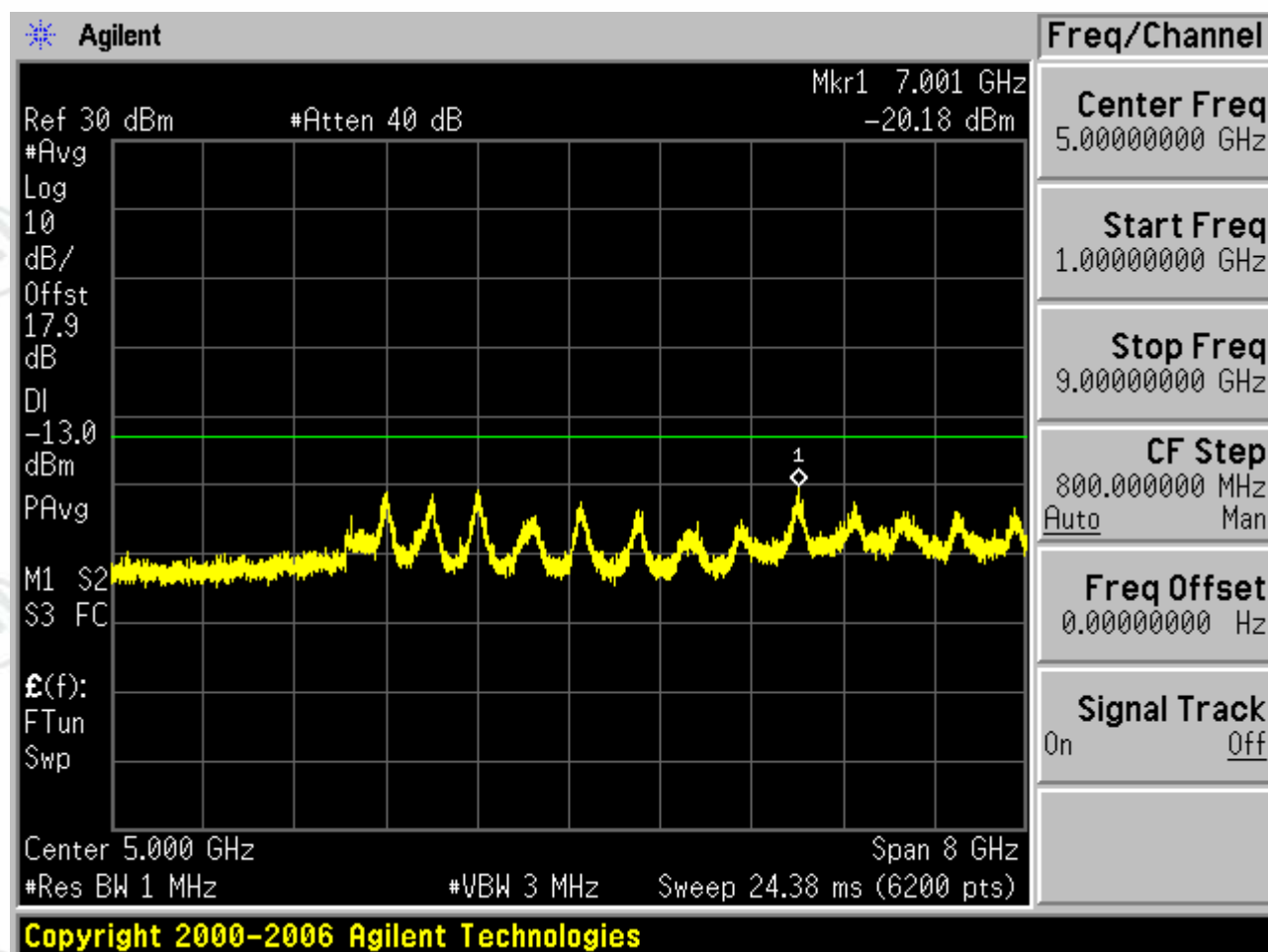


2.1.1.3 Test Channel=HCH





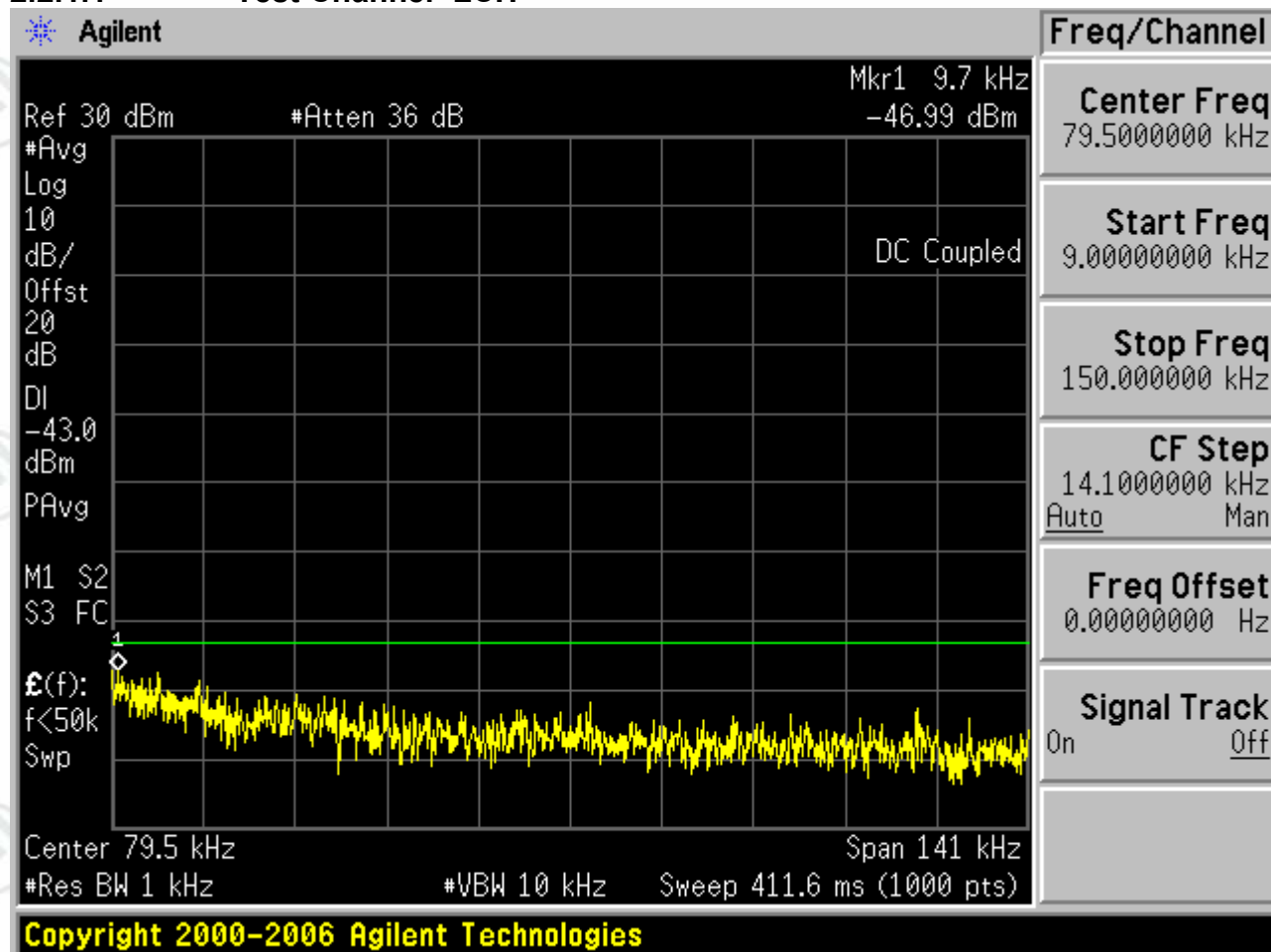


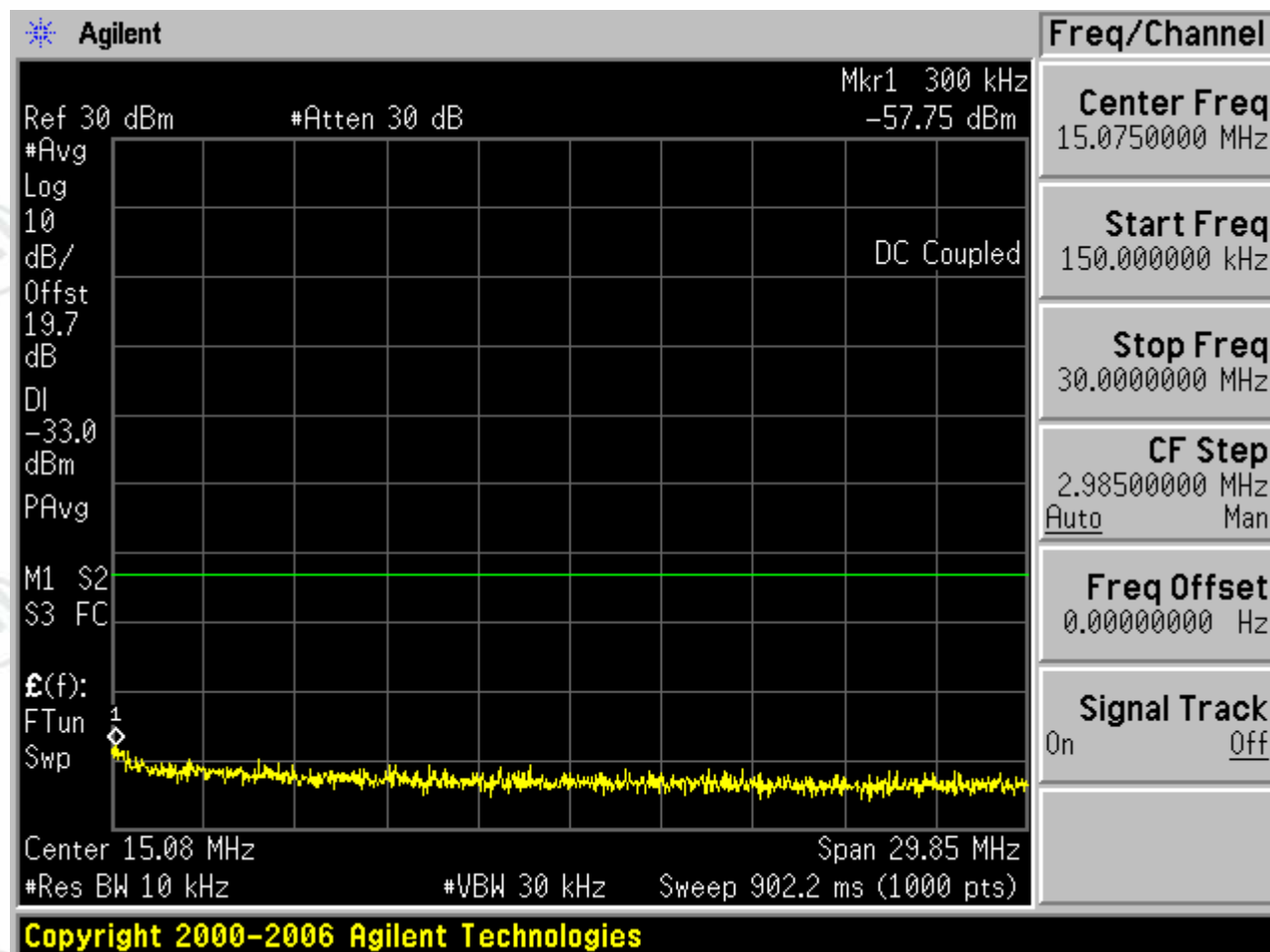


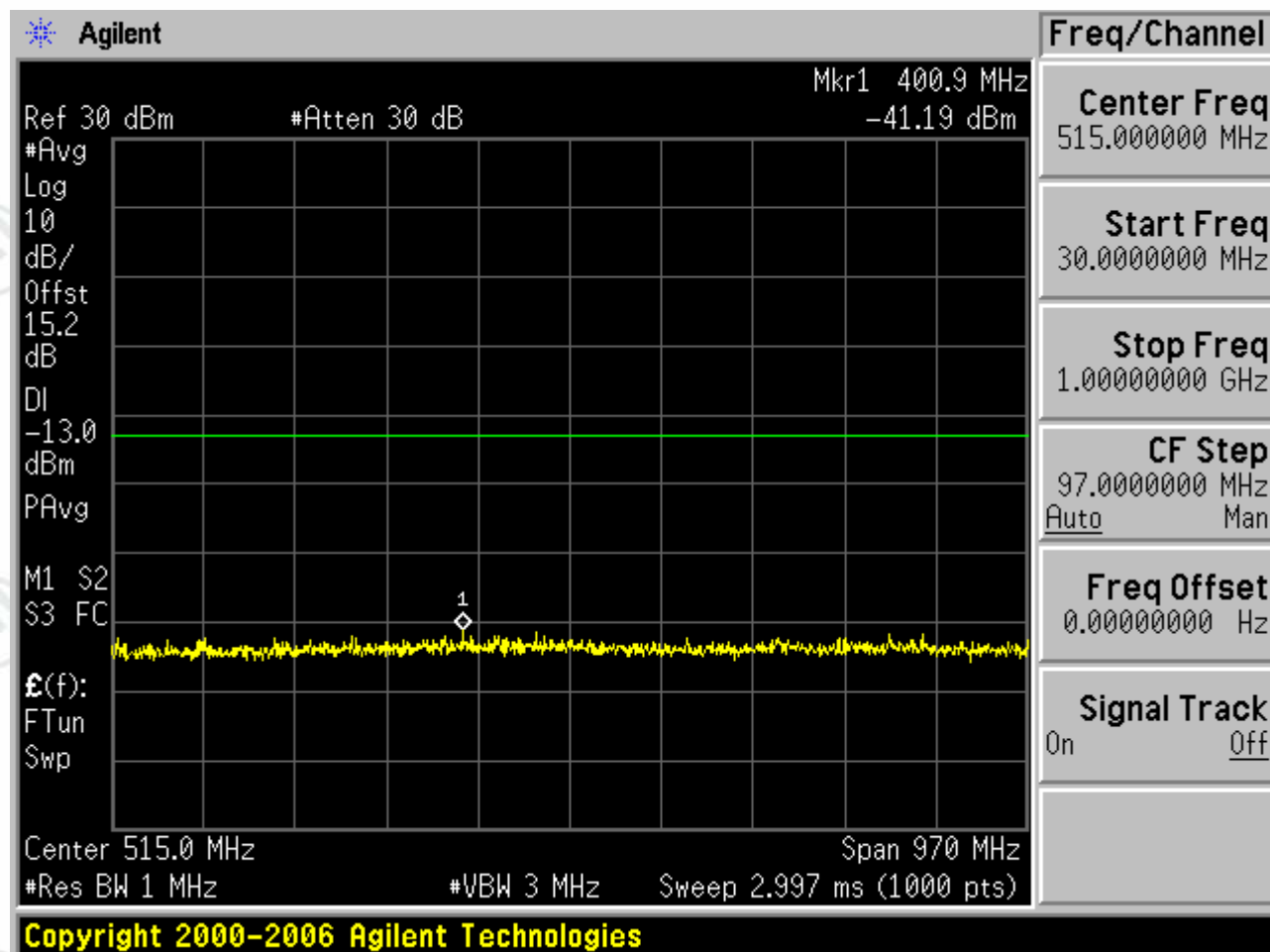
2.2 Test Band=WCDMA1900

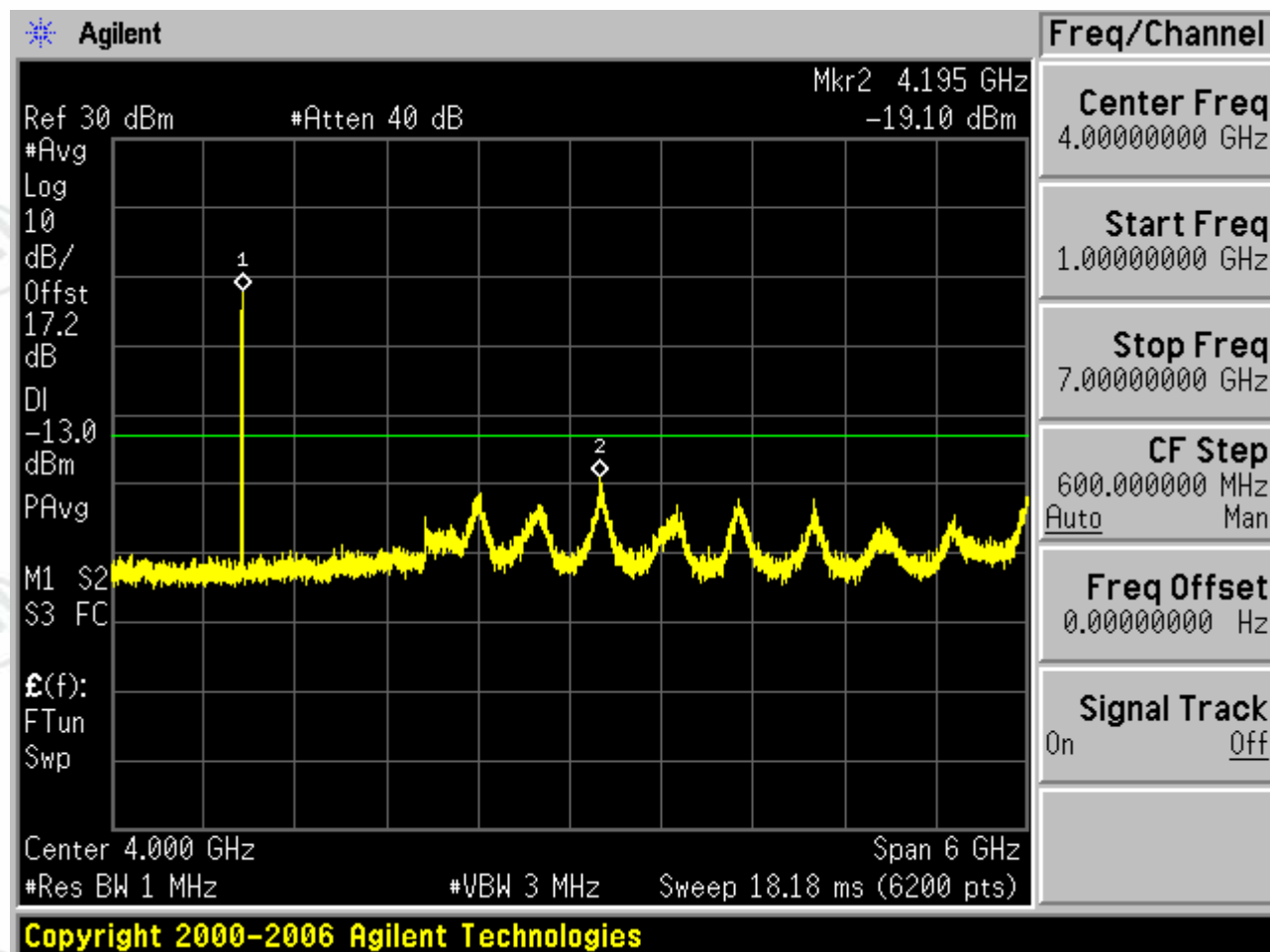
2.2.1 Test Mode=UMTS/TM1

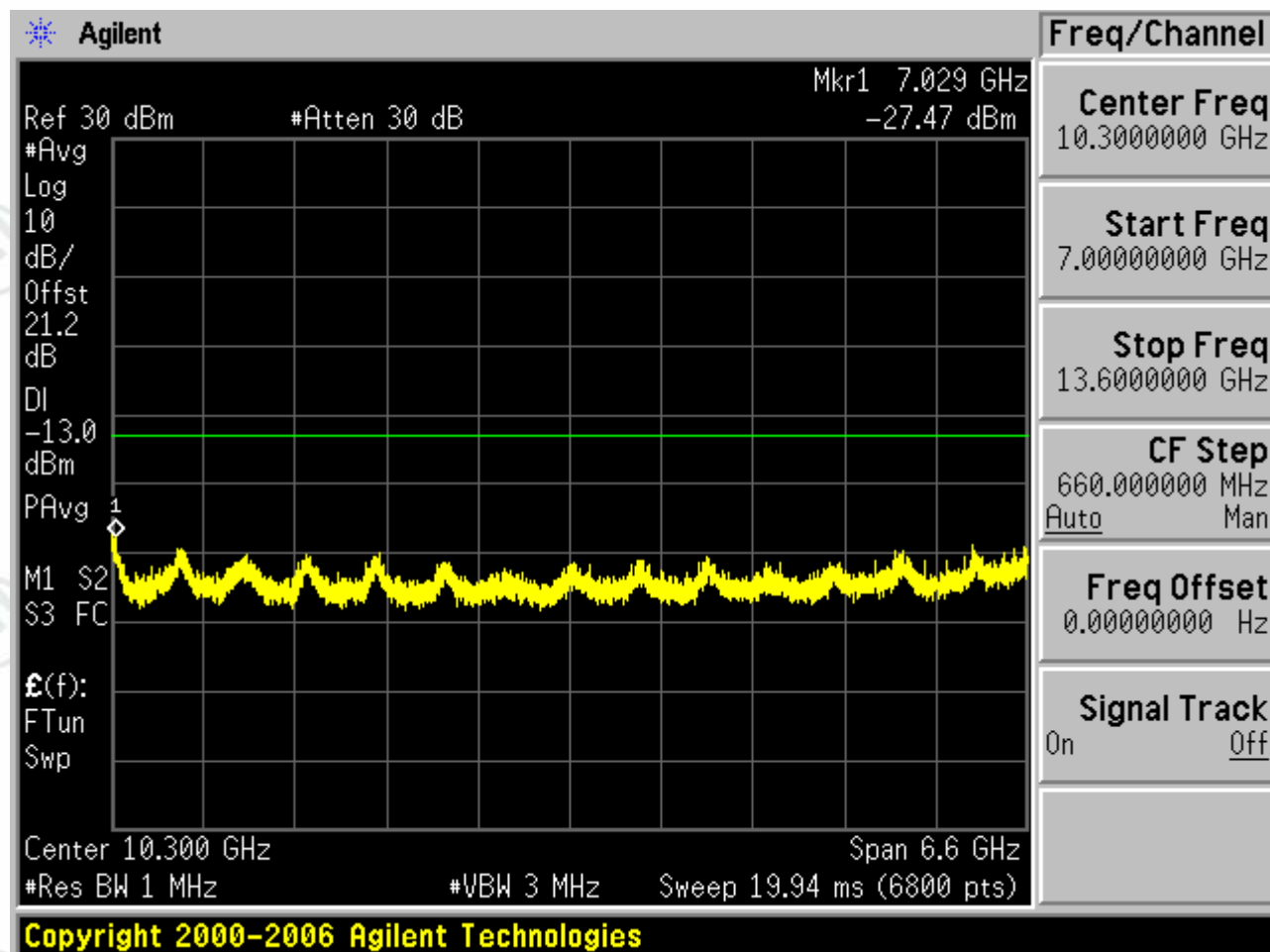
2.2.1.1 Test Channel=LCH

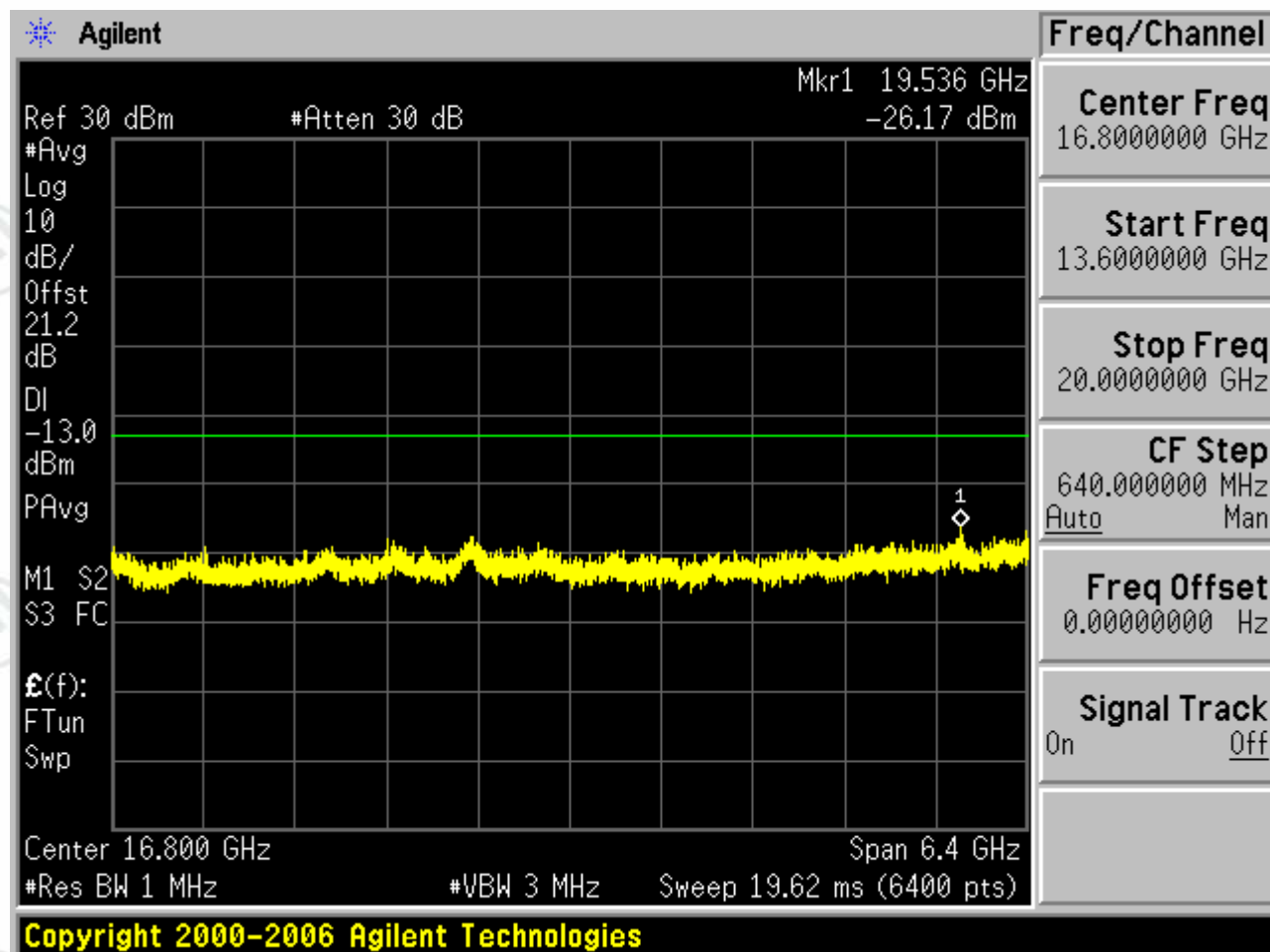




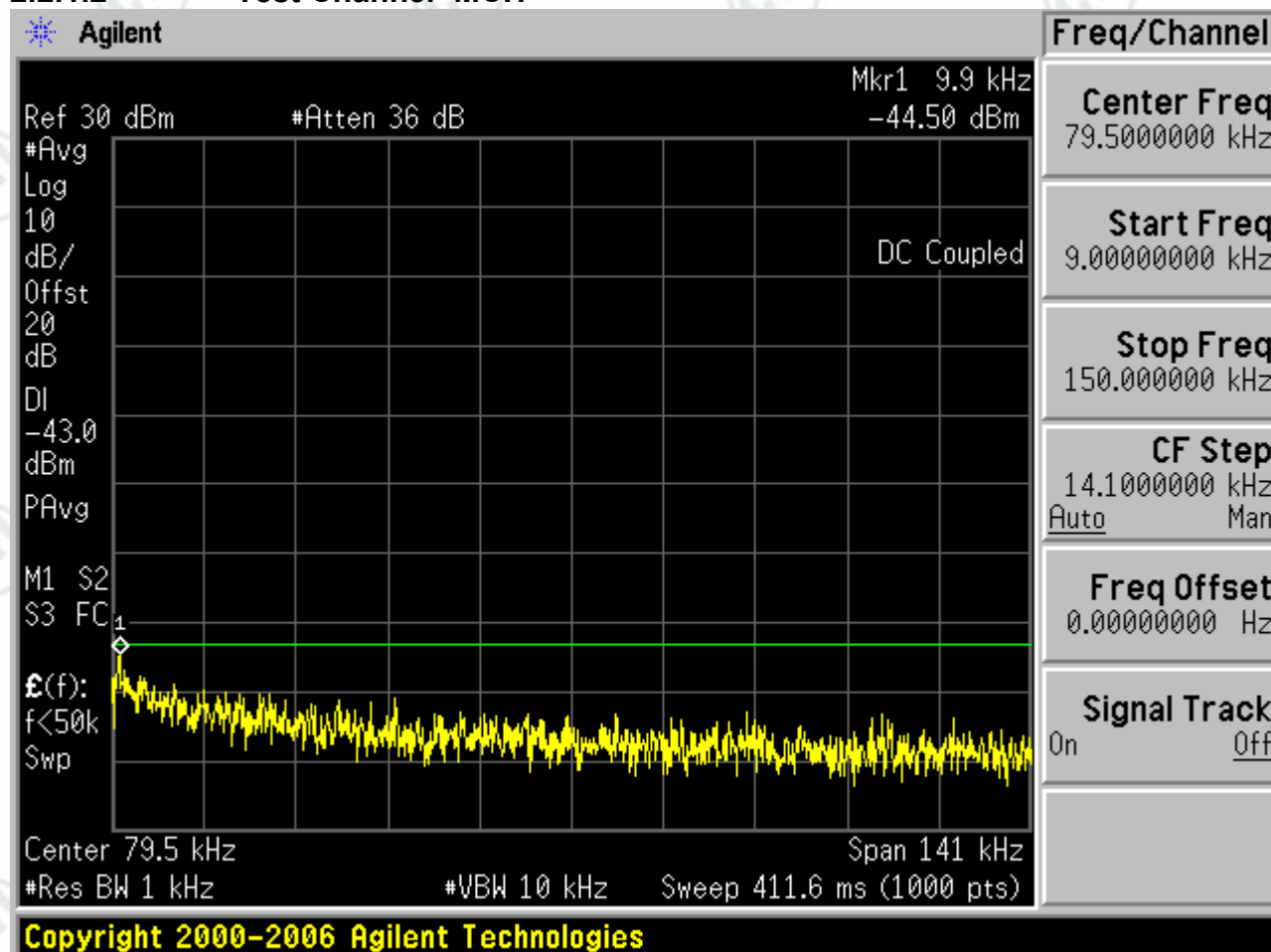


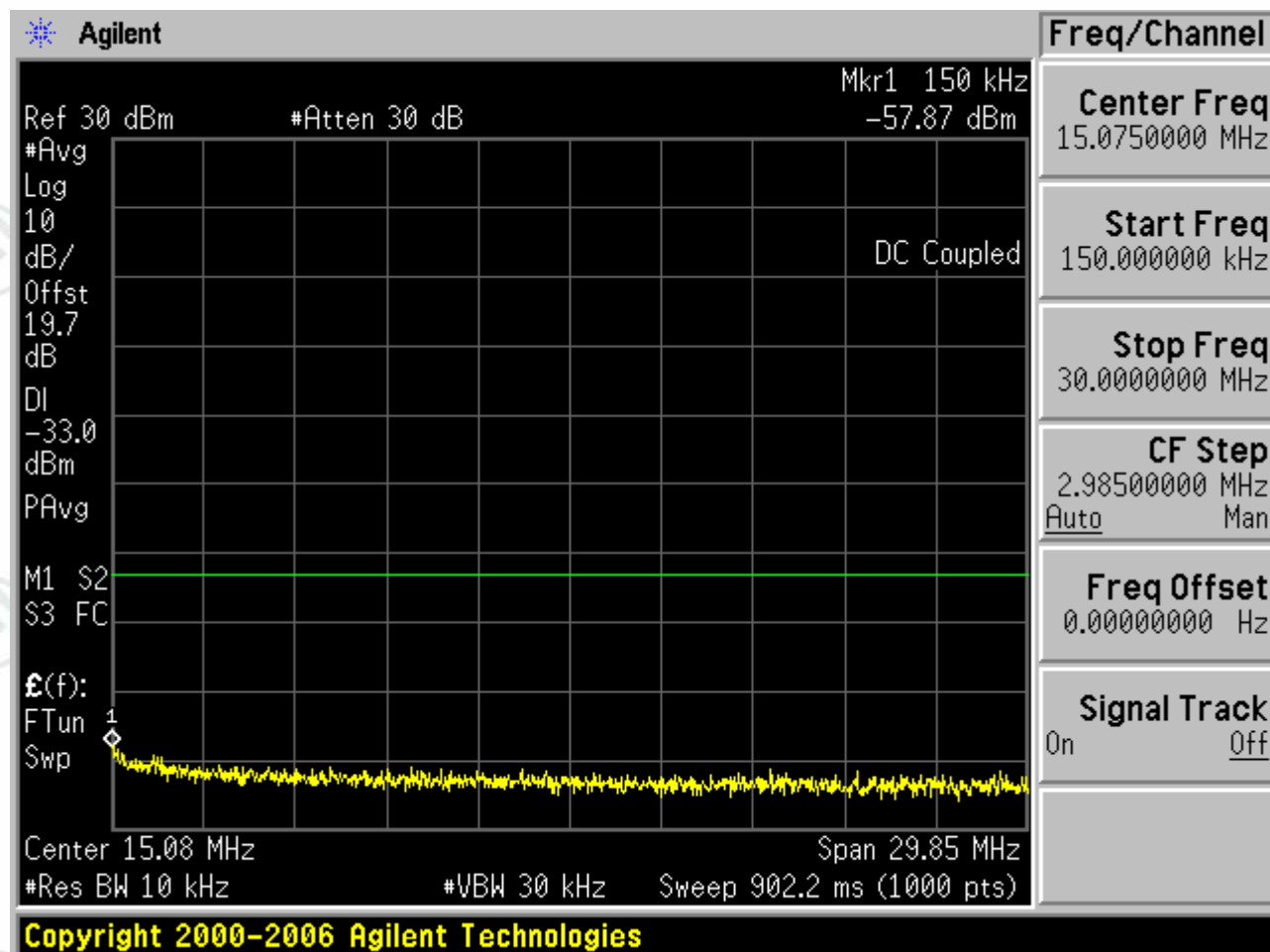


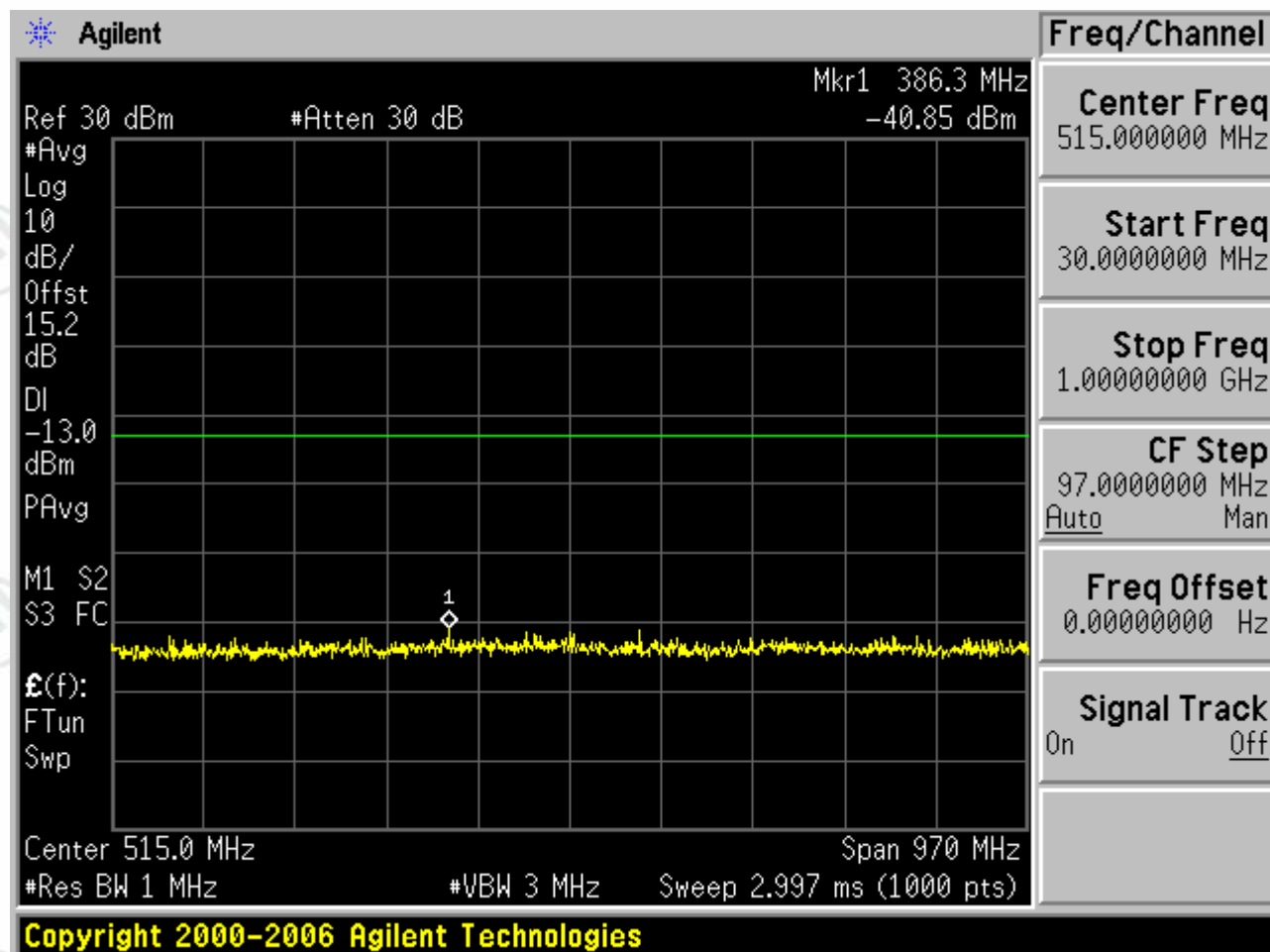


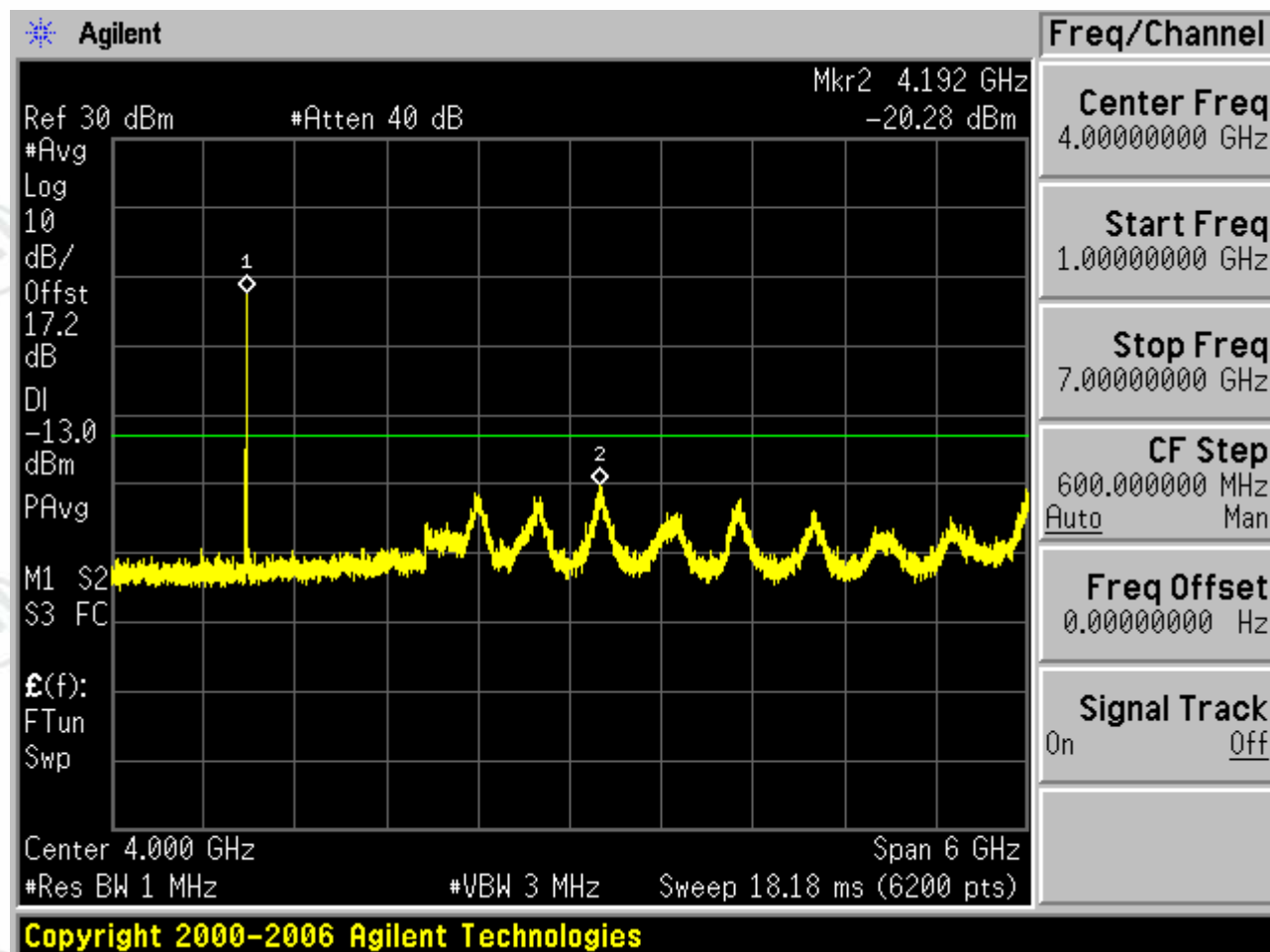


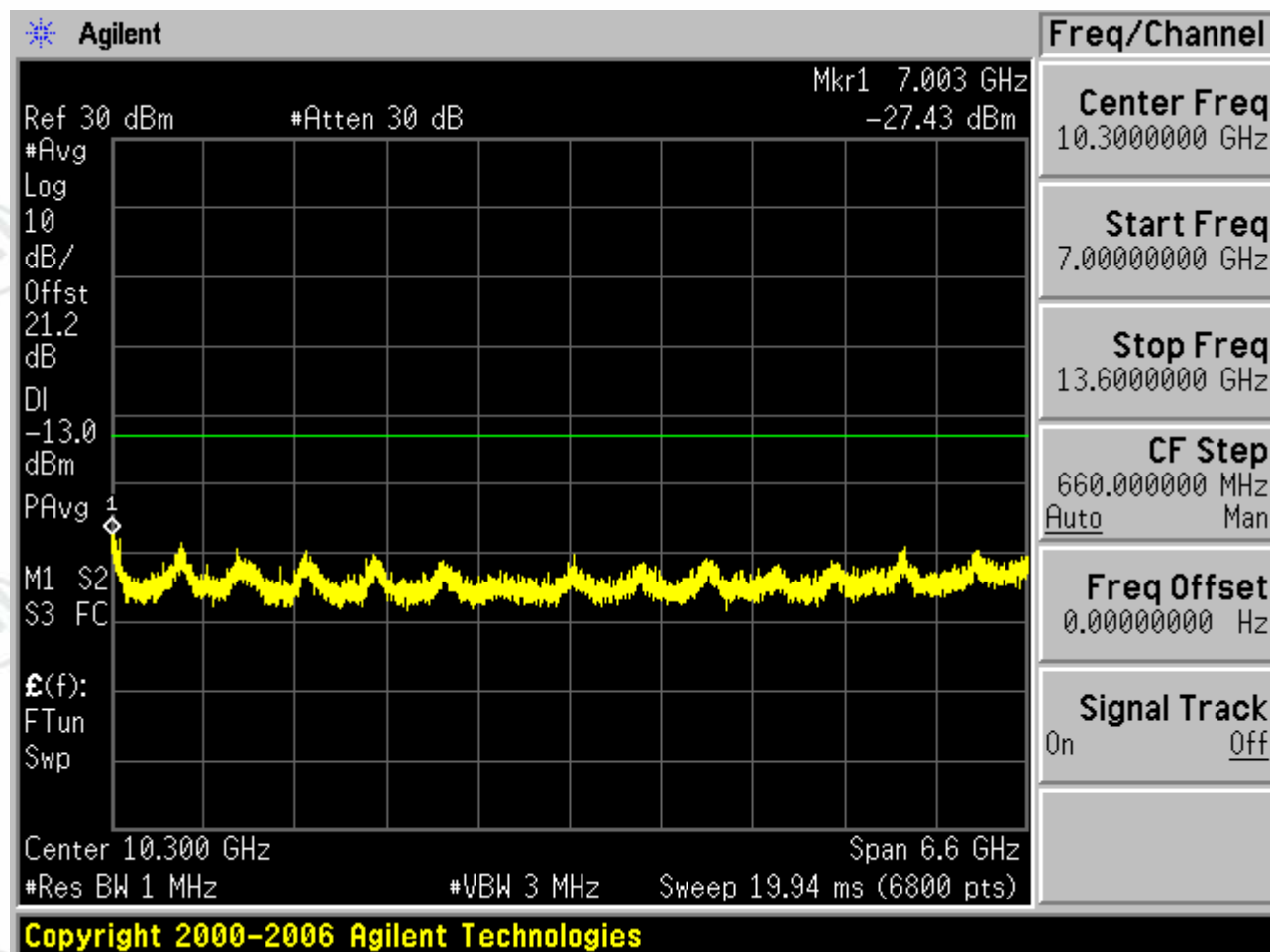
2.2.1.2 Test Channel=MCH

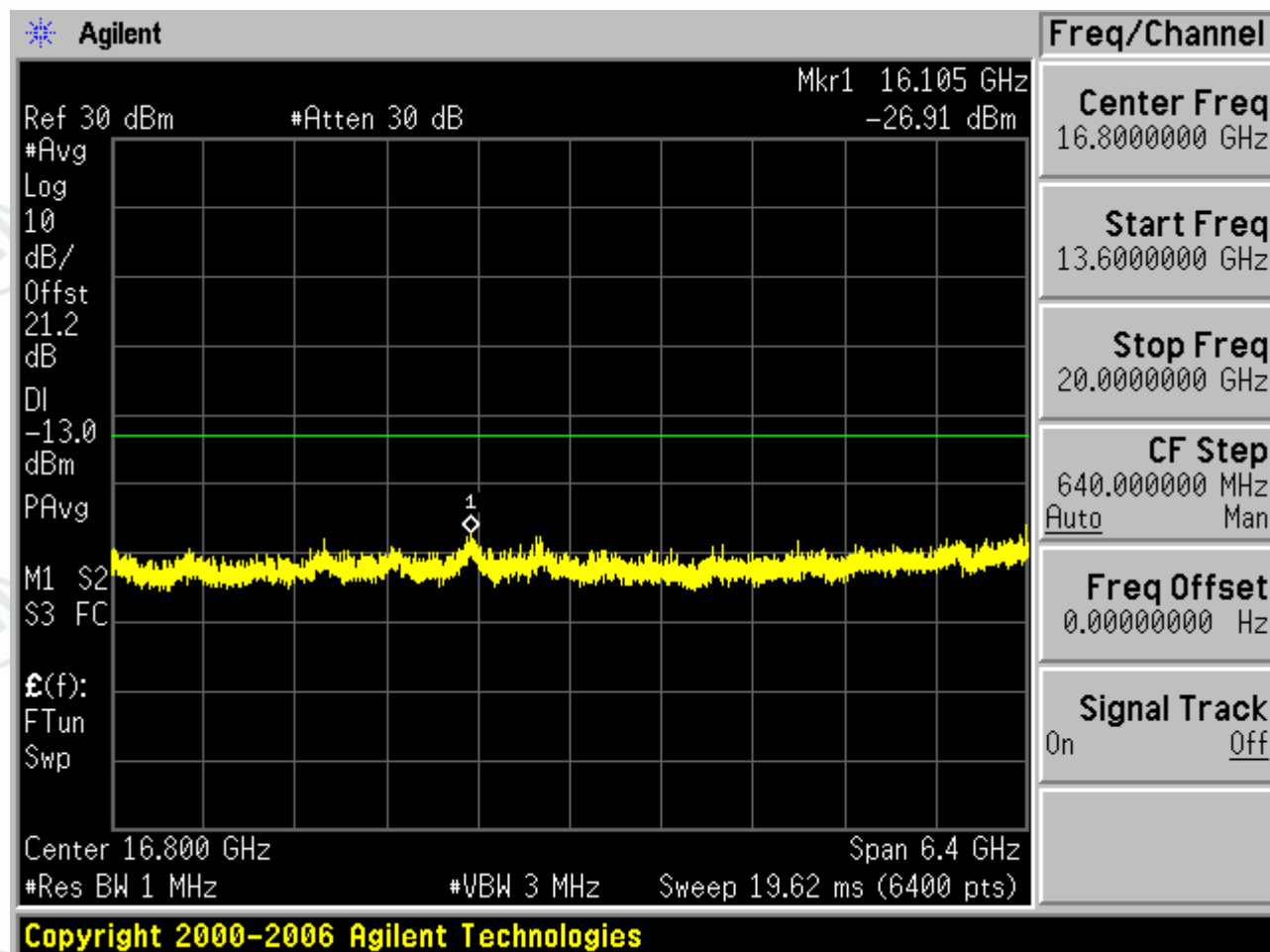




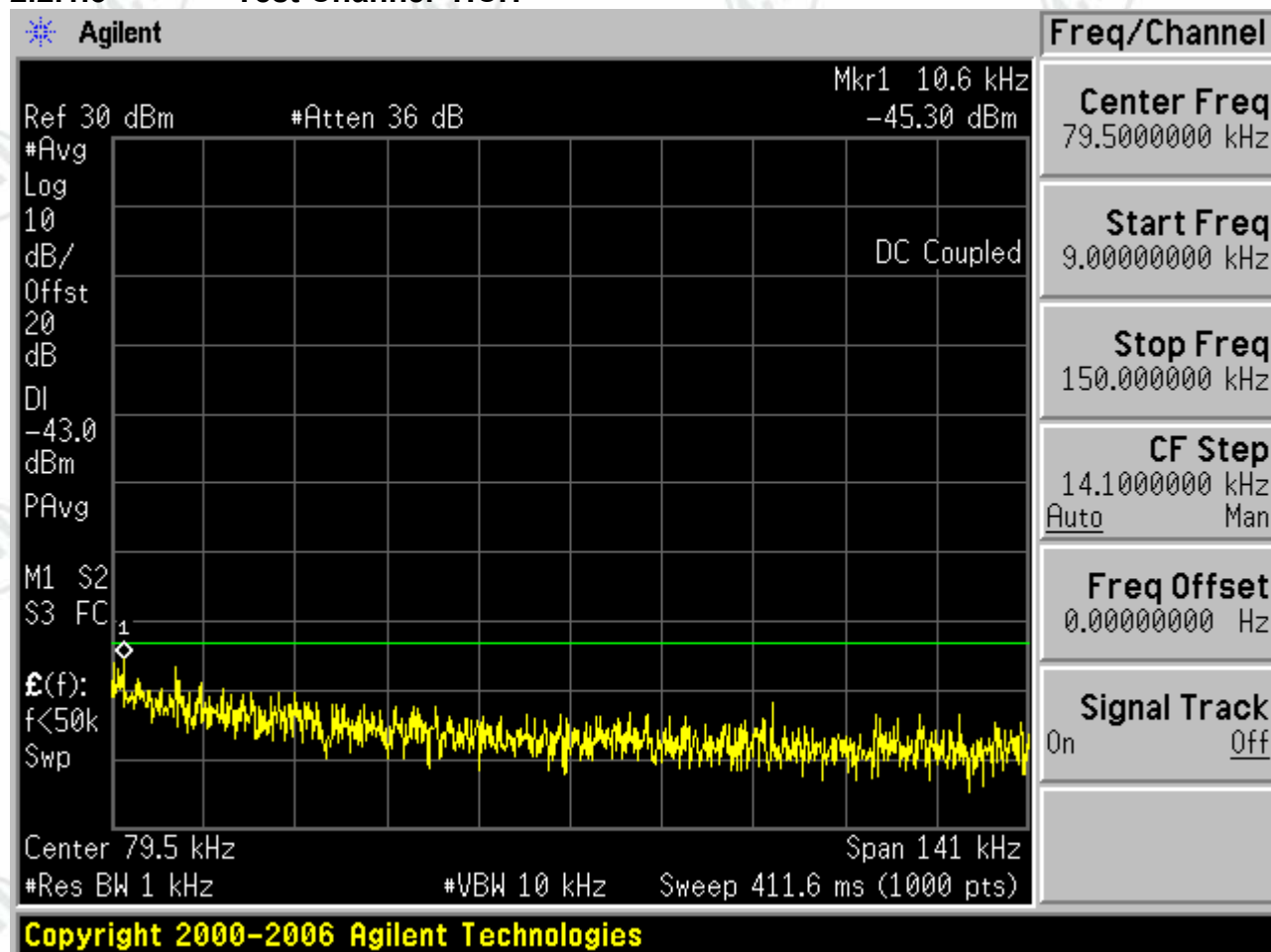


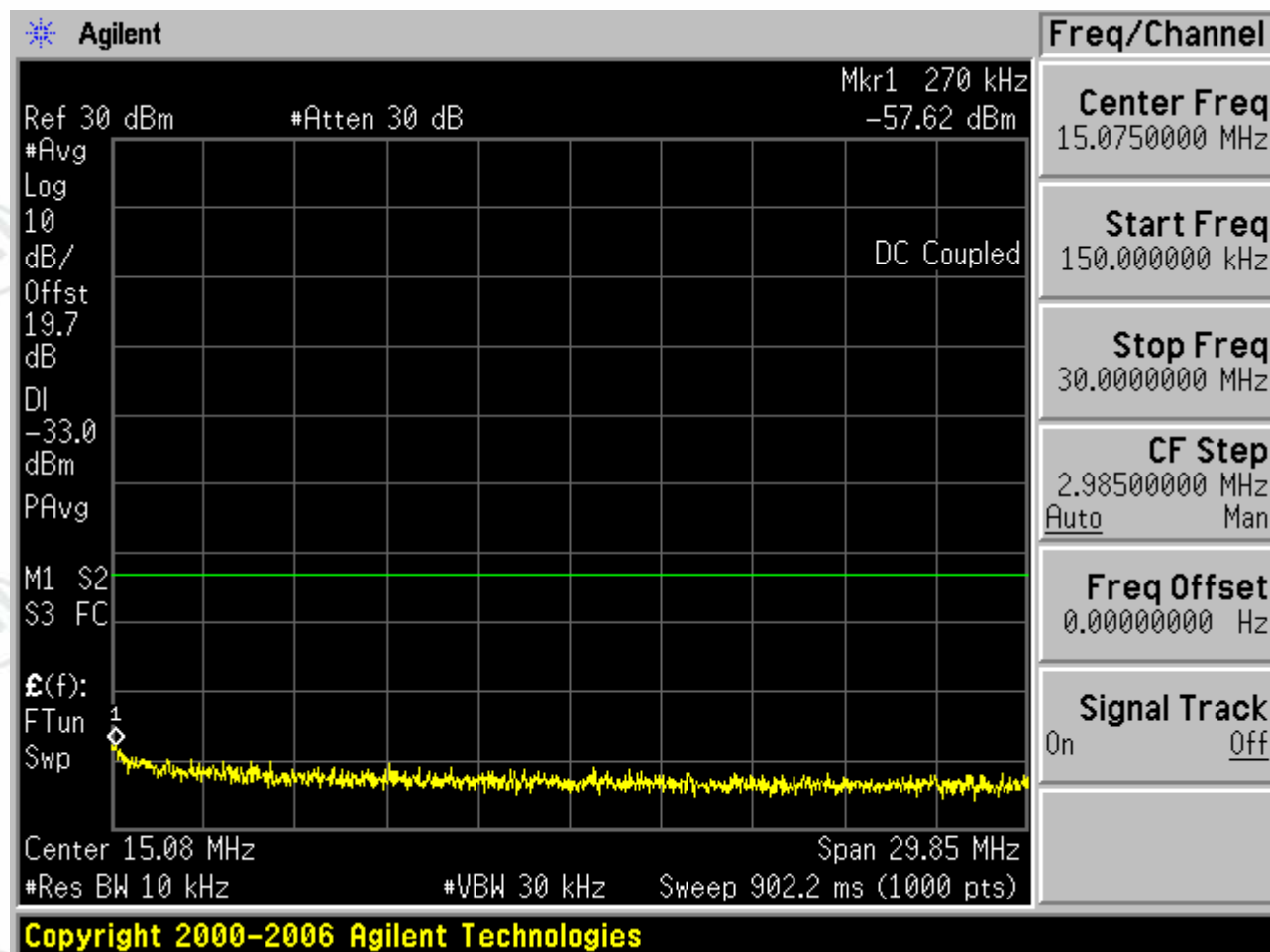


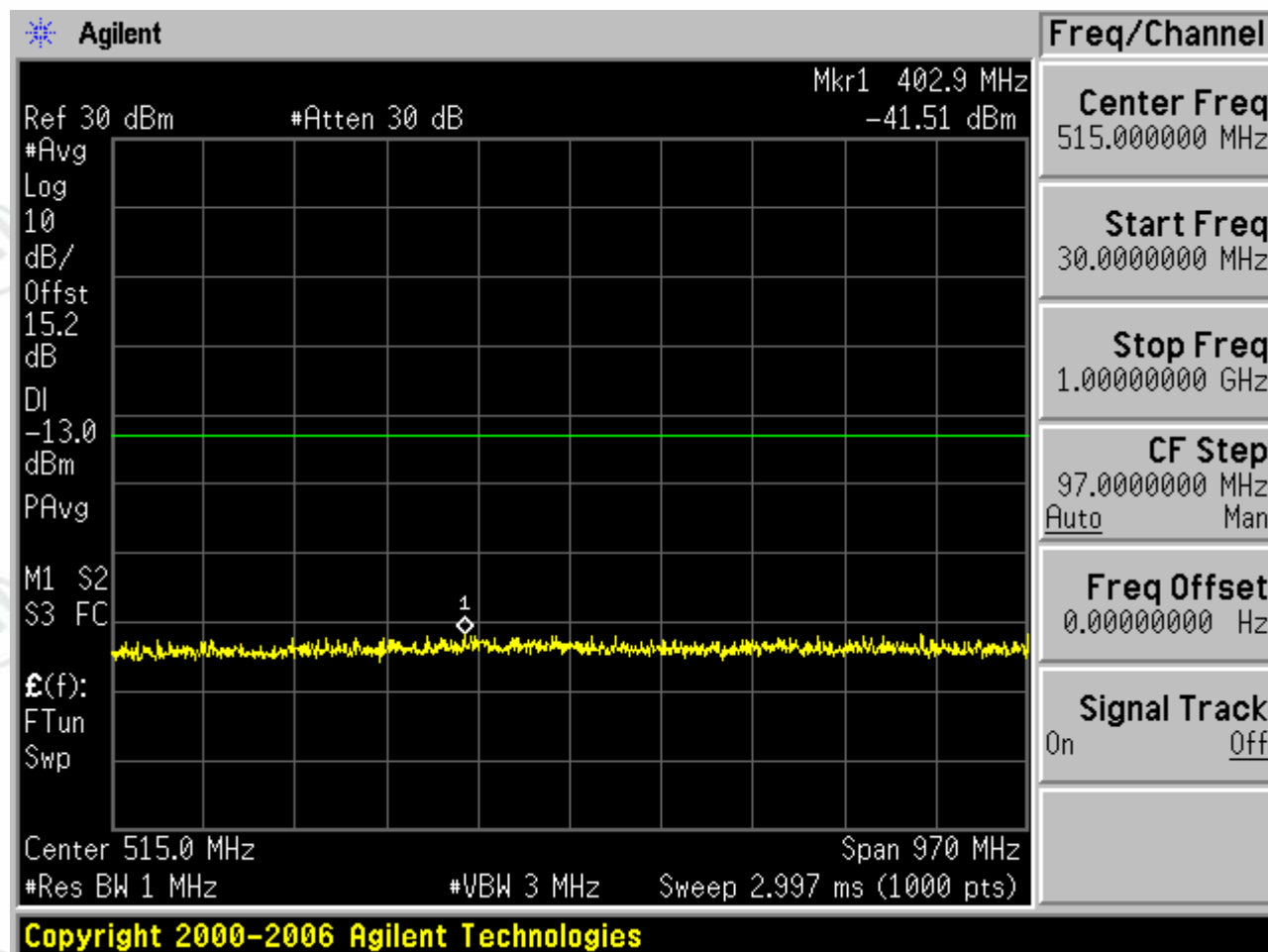


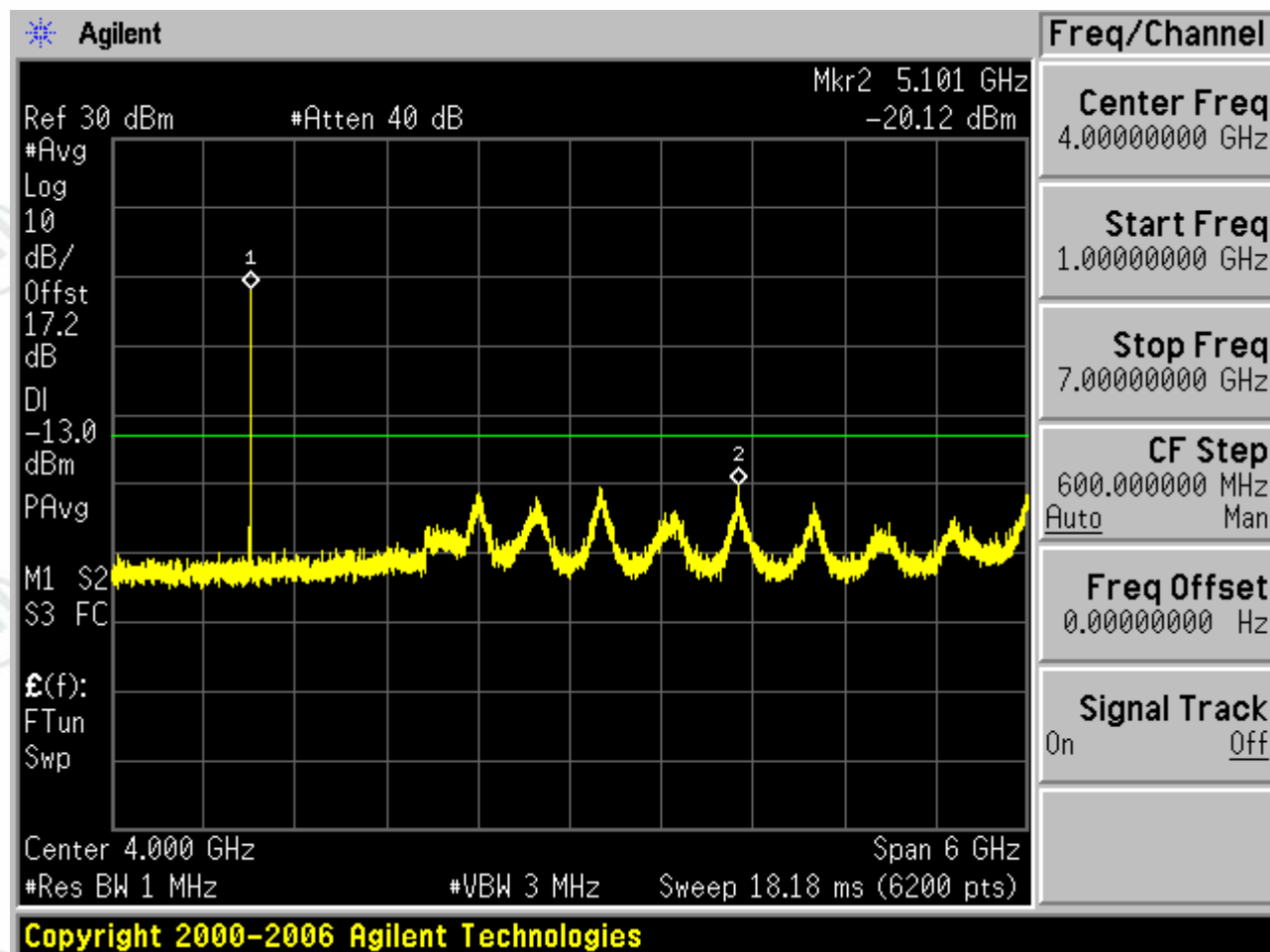


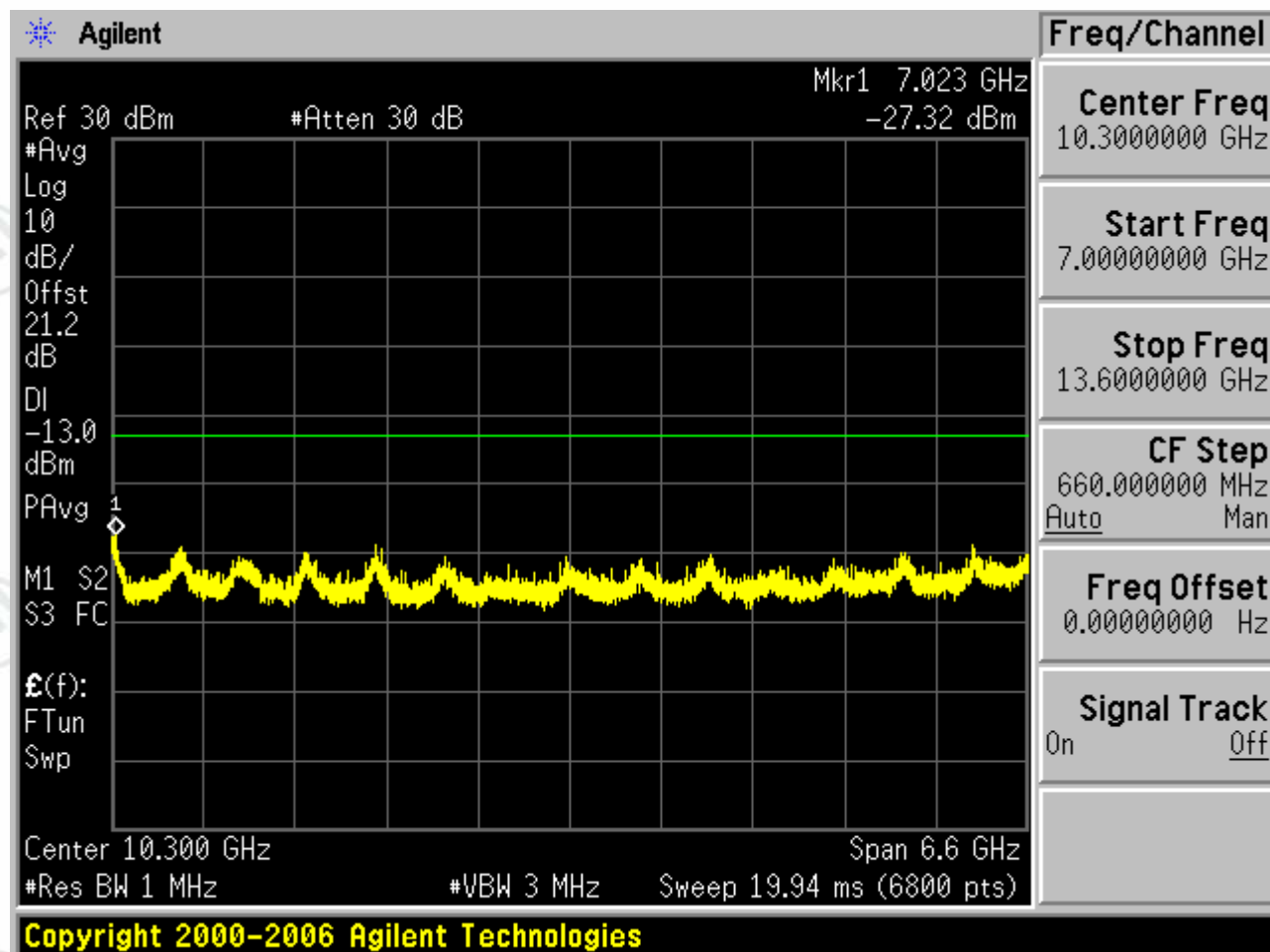
2.2.1.3 Test Channel=HCH

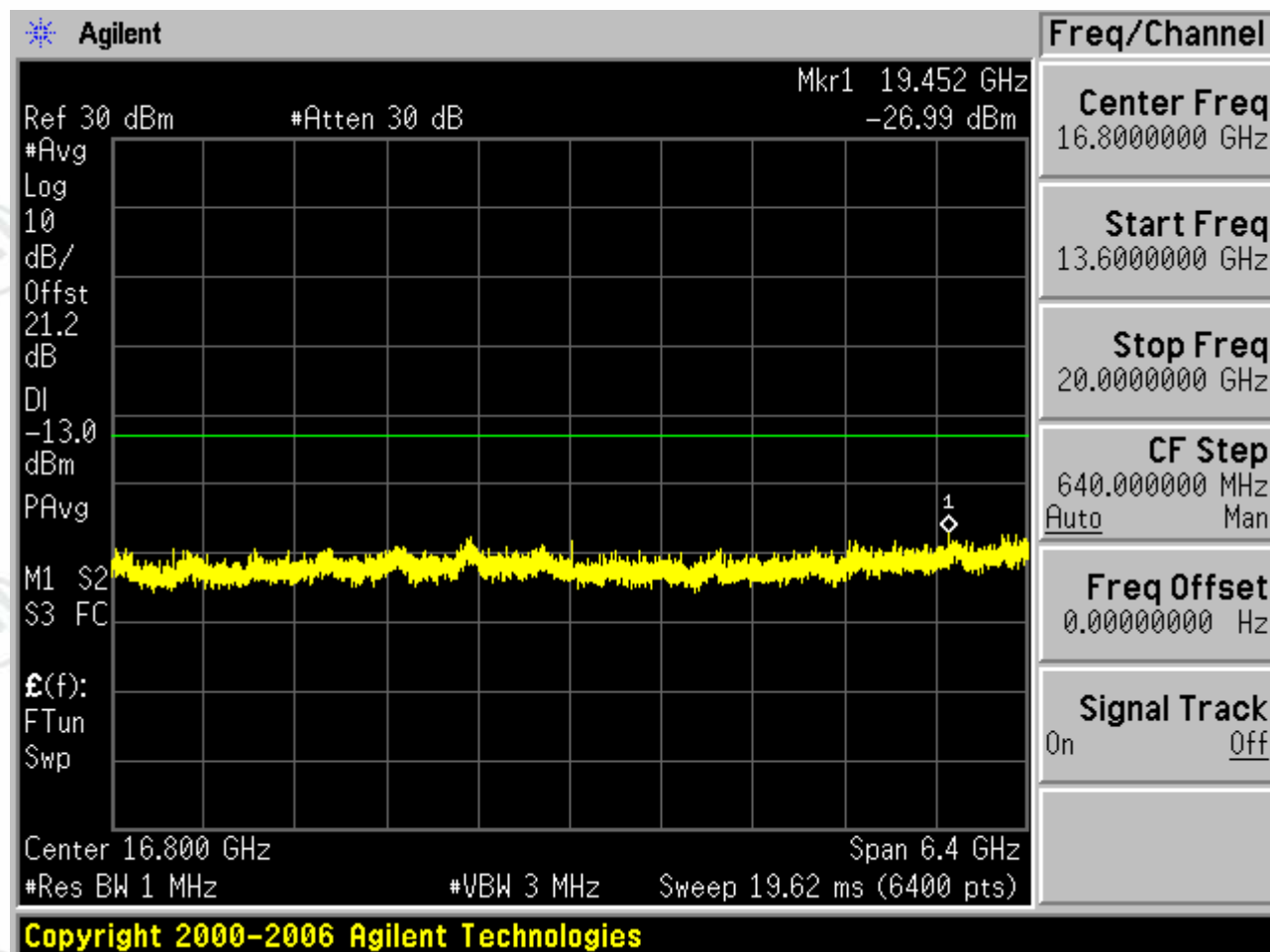












Appendix F) Frequency Stability

Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM850	TM1	LCH	TN	VL	-10.40	-0.012618	±2.5	PASS
			TN	VN	-10.85	-0.013164	±2.5	PASS
			TN	VH	-11.43	-0.013868	±2.5	PASS
		MCH	TN	VL	-4.97	-0.005941	±2.5	PASS
			TN	VN	-8.01	-0.009574	±2.5	PASS
			TN	VH	-6.20	-0.007411	±2.5	PASS
		HCH	TN	VL	-10.20	-0.012017	±2.5	PASS
			TN	VN	-9.04	-0.010650	±2.5	PASS
			TN	VH	-7.43	-0.008754	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM850	TM2	LCH	TN	VL	-4.58	-0.005557	±2.5	PASS
			TN	VN	-10.14	-0.012303	±2.5	PASS
			TN	VH	-10.07	-0.012218	±2.5	PASS
		MCH	TN	VL	-6.78	-0.008104	±2.5	PASS
			TN	VN	-9.75	-0.011654	±2.5	PASS
			TN	VH	-9.10	-0.010877	±2.5	PASS
		HCH	TN	VL	-7.30	-0.008600	±2.5	PASS
			TN	VN	-6.13	-0.007222	±2.5	PASS
			TN	VH	-5.62	-0.006621	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM850	TM3	LCH	TN	VL	7.78	0.009439	±2.5	PASS
			TN	VN	3.97	0.004817	±2.5	PASS
			TN	VH	4.68	0.005678	±2.5	PASS
		MCH	TN	VL	4.78	0.005714	±2.5	PASS
			TN	VN	3.55	0.004243	±2.5	PASS
			TN	VH	3.91	0.004674	±2.5	PASS
		HCH	TN	VL	4.36	0.005137	±2.5	PASS
			TN	VN	3.42	0.004029	±2.5	PASS
			TN	VH	3.58	0.004218	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM1900	TM1	LCH	TN	VL	-2.45	-0.001324	±2.5	PASS
			TN	VN	2.39	0.001292	±2.5	PASS
			TN	VH	3.16	0.001708	±2.5	PASS
		MCH	TN	VL	3.81	0.002027	±2.5	PASS
			TN	VN	8.07	0.004293	±2.5	PASS
			TN	VH	7.17	0.003814	±2.5	PASS
		HCH	TN	VL	2.58	0.001351	±2.5	PASS
			TN	VN	2.84	0.001487	±2.5	PASS
			TN	VH	2.78	0.001456	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM1900	TM2	LCH	TN	VL	9.69	0.005237	±2.5	PASS
			TN	VN	8.33	0.004502	±2.5	PASS
			TN	VH	6.78	0.003664	±2.5	PASS
		MCH	TN	VL	3.03	0.001612	±2.5	PASS
			TN	VN	4.65	0.002473	±2.5	PASS
			TN	VH	-0.71	-0.000378	±2.5	PASS
		HCH	TN	VL	-0.13	-0.000068	±2.5	PASS
			TN	VN	4.65	0.002435	±2.5	PASS
			TN	VH	2.26	0.001183	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM1900	TM3	LCH	TN	VL	21.66	0.011707	±2.5	PASS
			TN	VN	20.02	0.010820	±2.5	PASS
			TN	VH	11.75	0.006351	±2.5	PASS
		MCH	TN	VL	13.79	0.007335	±2.5	PASS
			TN	VN	12.37	0.006580	±2.5	PASS
			TN	VH	14.75	0.007846	±2.5	PASS
		HCH	TN	VL	10.56	0.005529	±2.5	PASS
			TN	VN	10.75	0.005629	±2.5	PASS
			TN	VH	9.14	0.004786	±2.5	PASS

Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM850	TM1	LCH	VN	-30	-12.07	-0.014645	±2.5	PASS
			VN	-20	-7.10	-0.008614	±2.5	PASS
			VN	-10	-8.85	-0.010738	±2.5	PASS
			VN	0	-8.59	-0.010422	±2.5	PASS
			VN	10	-8.20	-0.009949	±2.5	PASS
			VN	20	-8.52	-0.010337	±2.5	PASS
			VN	30	-8.52	-0.010337	±2.5	PASS
			VN	40	-9.43	-0.011441	±2.5	PASS
			VN	50	-7.23	-0.008772	±2.5	PASS
GSM850	TM1	MCH	VN	-30	-6.52	-0.007793	±2.5	PASS
			VN	-20	-8.72	-0.010423	±2.5	PASS
			VN	-10	-8.01	-0.009574	±2.5	PASS
			VN	0	-4.84	-0.005785	±2.5	PASS
			VN	10	-7.88	-0.009419	±2.5	PASS
			VN	20	-3.87	-0.004626	±2.5	PASS
			VN	30	-6.52	-0.007793	±2.5	PASS
			VN	40	-7.81	-0.009335	±2.5	PASS
			VN	50	-6.13	-0.007327	±2.5	PASS
GSM850	TM1	HCH	VN	-30	-6.01	-0.007081	±2.5	PASS
			VN	-20	-6.20	-0.007304	±2.5	PASS
			VN	-10	-5.62	-0.006621	±2.5	PASS
			VN	0	-4.52	-0.005325	±2.5	PASS
			VN	10	-5.29	-0.006232	±2.5	PASS
			VN	20	-4.78	-0.005631	±2.5	PASS
			VN	30	-5.75	-0.006774	±2.5	PASS
			VN	40	-5.55	-0.006539	±2.5	PASS
			VN	50	-6.59	-0.007764	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM850	TM2	LCH	VN	-30	-9.04	-0.010968	±2.5	PASS
			VN	-20	5.55	0.006734	±2.5	PASS
			VN	-10	0.58	0.000704	±2.5	PASS
			VN	0	-4.84	-0.005872	±2.5	PASS
			VN	10	0.39	0.000473	±2.5	PASS
			VN	20	-0.52	-0.000631	±2.5	PASS
			VN	30	-0.39	-0.000473	±2.5	PASS
			VN	40	-3.03	-0.003676	±2.5	PASS
GSM850	TM2	MCH	VN	50	-5.42	-0.006576	±2.5	PASS
			VN	-30	-6.78	-0.008104	±2.5	PASS
			VN	-20	0.32	0.000383	±2.5	PASS
			VN	-10	-4.26	-0.005092	±2.5	PASS
			VN	0	-4.84	-0.005785	±2.5	PASS
			VN	10	-5.81	-0.006945	±2.5	PASS
			VN	20	-1.03	-0.001231	±2.5	PASS
			VN	30	-0.84	-0.001004	±2.5	PASS
GSM850	TM2	HCH	VN	40	-6.01	-0.007184	±2.5	PASS
			VN	50	-5.88	-0.007028	±2.5	PASS
			VN	-30	-6.46	-0.007611	±2.5	PASS
			VN	-20	-2.20	-0.002592	±2.5	PASS
			VN	-10	-4.65	-0.005478	±2.5	PASS
			VN	0	-1.81	-0.002132	±2.5	PASS
			VN	10	-2.91	-0.003428	±2.5	PASS
			VN	20	-3.75	-0.004418	±2.5	PASS
			VN	30	-4.33	-0.005101	±2.5	PASS
			VN	40	-7.04	-0.008294	±2.5	PASS
			VN	50	-4.97	-0.005855	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM850	TM3	LCH	VN	-30	3.16	0.003834	±2.5	PASS
			VN	-20	9.56	0.011599	±2.5	PASS
			VN	-10	9.88	0.011987	±2.5	PASS
			VN	0	11.66	0.014147	±2.5	PASS
			VN	10	6.30	0.007644	±2.5	PASS
			VN	20	4.33	0.005254	±2.5	PASS
			VN	30	1.78	0.002160	±2.5	PASS
			VN	40	3.26	0.003955	±2.5	PASS
GSM850	TM3	MCH	VN	50	1.52	0.001844	±2.5	PASS
			VN	-30	4.23	0.005056	±2.5	PASS
			VN	-20	5.20	0.006216	±2.5	PASS
			VN	-10	2.10	0.002510	±2.5	PASS
			VN	0	-0.52	-0.000622	±2.5	PASS
			VN	10	2.74	0.003275	±2.5	PASS
			VN	20	2.97	0.003550	±2.5	PASS
			VN	30	0.23	0.000275	±2.5	PASS
GSM850	TM3	HCH	VN	40	3.58	0.004279	±2.5	PASS
			VN	50	4.04	0.004829	±2.5	PASS
			VN	-30	4.62	0.005443	±2.5	PASS
			VN	-20	8.56	0.010085	±2.5	PASS
			VN	-10	1.19	0.001402	±2.5	PASS
			VN	0	4.65	0.005478	±2.5	PASS
			VN	10	3.03	0.003570	±2.5	PASS
			VN	20	2.07	0.002439	±2.5	PASS
			VN	30	1.78	0.002097	±2.5	PASS
			VN	40	3.97	0.004677	±2.5	PASS
			VN	50	-0.81	-0.000954	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM1900	TM1	LCH	VN	-30	1.36	0.000735	±2.5	PASS
			VN	-20	6.26	0.003383	±2.5	PASS
			VN	-10	3.36	0.001816	±2.5	PASS
			VN	0	0.32	0.000173	±2.5	PASS
			VN	10	5.42	0.002929	±2.5	PASS
			VN	20	2.32	0.001254	±2.5	PASS
			VN	30	-0.84	-0.000454	±2.5	PASS
			VN	40	3.87	0.002092	±2.5	PASS
GSM1900	TM1	MCH	VN	50	4.39	0.002373	±2.5	PASS
			VN	-30	5.10	0.002713	±2.5	PASS
			VN	-20	5.62	0.002989	±2.5	PASS
			VN	-10	5.17	0.002750	±2.5	PASS
			VN	0	4.00	0.002128	±2.5	PASS
			VN	10	4.07	0.002165	±2.5	PASS
			VN	20	4.33	0.002303	±2.5	PASS
			VN	30	1.49	0.000793	±2.5	PASS
GSM1900	TM1	HCH	VN	40	5.17	0.002750	±2.5	PASS
			VN	50	1.16	0.000617	±2.5	PASS
			VN	-30	1.23	0.000644	±2.5	PASS
			VN	-20	5.94	0.003110	±2.5	PASS
			VN	-10	8.91	0.004665	±2.5	PASS
			VN	0	7.49	0.003922	±2.5	PASS
			VN	10	5.10	0.002670	±2.5	PASS
			VN	20	9.10	0.004765	±2.5	PASS
			VN	30	6.97	0.003650	±2.5	PASS
			VN	40	7.94	0.004158	±2.5	PASS
			VN	50	4.71	0.002466	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM1900	TM2	LCH	VN	-30	0.13	0.000070	±2.5	PASS
			VN	-20	20.47	0.011064	±2.5	PASS
			VN	-10	24.92	0.013469	±2.5	PASS
			VN	0	20.08	0.010853	±2.5	PASS
			VN	10	18.53	0.010015	±2.5	PASS
			VN	20	-0.32	-0.000173	±2.5	PASS
			VN	30	13.75	0.007432	±2.5	PASS
			VN	40	10.20	0.005513	±2.5	PASS
GSM1900	TM2	MCH	VN	50	13.62	0.007361	±2.5	PASS
			VN	-30	6.84	0.003638	±2.5	PASS
			VN	-20	1.29	0.000686	±2.5	PASS
			VN	-10	7.94	0.004223	±2.5	PASS
			VN	0	9.23	0.004910	±2.5	PASS
			VN	10	10.07	0.005356	±2.5	PASS
			VN	20	9.75	0.005186	±2.5	PASS
			VN	30	10.14	0.005394	±2.5	PASS
GSM1900	TM2	HCH	VN	40	7.94	0.004223	±2.5	PASS
			VN	50	7.81	0.004154	±2.5	PASS
			VN	-30	2.07	0.001084	±2.5	PASS
			VN	-20	9.10	0.004765	±2.5	PASS
			VN	-10	10.53	0.005514	±2.5	PASS
			VN	0	3.87	0.002026	±2.5	PASS
			VN	10	4.91	0.002571	±2.5	PASS
			VN	20	10.59	0.005545	±2.5	PASS
			VN	30	8.65	0.004529	±2.5	PASS
			VN	40	1.87	0.000979	±2.5	PASS
			VN	50	8.65	0.004529	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM1900	TM3	LCH	VN	-30	14.50	0.007837	±2.5	PASS
			VN	-20	31.87	0.017225	±2.5	PASS
			VN	-10	30.48	0.016474	±2.5	PASS
			VN	0	23.70	0.012809	±2.5	PASS
			VN	10	24.63	0.013312	±2.5	PASS
			VN	20	18.60	0.010053	±2.5	PASS
			VN	30	14.69	0.007940	±2.5	PASS
			VN	40	9.81	0.005302	±2.5	PASS
GSM1900	TM3	MCH	VN	50	6.59	0.003562	±2.5	PASS
			VN	-30	11.56	0.006149	±2.5	PASS
			VN	-20	4.42	0.002351	±2.5	PASS
			VN	-10	5.46	0.002904	±2.5	PASS
			VN	0	16.89	0.008984	±2.5	PASS
			VN	10	6.33	0.003367	±2.5	PASS
			VN	20	14.72	0.007830	±2.5	PASS
			VN	30	14.17	0.007537	±2.5	PASS
GSM1900	TM3	HCH	VN	40	2.81	0.001495	±2.5	PASS
			VN	50	10.46	0.005564	±2.5	PASS
			VN	-30	8.72	0.004566	±2.5	PASS
			VN	-20	9.43	0.004938	±2.5	PASS
			VN	-10	5.91	0.003095	±2.5	PASS
			VN	0	3.58	0.001875	±2.5	PASS
			VN	10	3.20	0.001676	±2.5	PASS
			VN	20	-4.04	-0.002115	±2.5	PASS
			VN	30	12.27	0.006425	±2.5	PASS
			VN	40	17.21	0.009011	±2.5	PASS
			VN	50	9.33	0.004885	±2.5	PASS

Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
WCDMA850	TM1	LCH	TN	VL	-13.41	-0.016230	±2.5	PASS
			TN	VN	-6.77	-0.008198	±2.5	PASS
			TN	VH	-14.60	-0.017670	±2.5	PASS
		MCH	TN	VL	-9.16	-0.010946	±2.5	PASS
			TN	VN	-6.77	-0.013318	±2.5	PASS
			TN	VH	-7.02	-0.008392	±2.5	PASS
		HCH	TN	VL	-9.02	-0.010652	±2.5	PASS
			TN	VN	-6.77	-0.005443	±2.5	PASS
			TN	VH	-2.67	-0.003154	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
WCDMA1900	TM1	LCH	TN	VL	-19.59	-0.010577	±2.5	PASS
			TN	VN	-14.51	-0.007834	±2.5	PASS
			TN	VH	-16.68	-0.009003	±2.5	PASS
		MCH	TN	VL	-12.08	-0.006428	±2.5	PASS
			TN	VN	-14.51	-0.001096	±2.5	PASS
			TN	VH	-15.50	-0.008246	±2.5	PASS
		HCH	TN	VL	-11.51	-0.006031	±2.5	PASS
			TN	VN	-14.51	-0.005263	±2.5	PASS
			TN	VH	-15.17	-0.007951	±2.5	PASS

Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp .	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
WCDMA850	TM1	LCH	VN	-30	-5.72	-0.006924	±2.5	PASS
			VN	-20	-9.72	-0.011762	±2.5	PASS
			VN	-10	-9.03	-0.010931	±2.5	PASS
			VN	0	-9.86	-0.011928	±2.5	PASS
			VN	10	-11.80	-0.014273	±2.5	PASS
			VN	20	-10.76	-0.013017	±2.5	PASS
			VN	30	-14.83	-0.017947	±2.5	PASS
			VN	40	-10.16	-0.012297	±2.5	PASS
WCDMA850	TM1	MCH	VN	50	-7.23	-0.008752	±2.5	PASS
			VN	-30	-8.03	-0.009596	±2.5	PASS
			VN	-20	-8.26	-0.009870	±2.5	PASS
			VN	-10	-3.94	-0.004707	±2.5	PASS
			VN	0	-5.84	-0.006987	±2.5	PASS
			VN	10	-9.03	-0.010800	±2.5	PASS
			VN	20	-9.46	-0.011311	±2.5	PASS
			VN	30	-10.21	-0.012205	±2.5	PASS
WCDMA850	TM1	HCH	VN	40	-10.30	-0.012314	±2.5	PASS
			VN	50	-4.15	-0.004962	±2.5	PASS
			VN	-30	-9.16	-0.010814	±2.5	PASS
			VN	-20	-0.35	-0.000415	±2.5	PASS
			VN	-10	0.55	0.000649	±2.5	PASS
			VN	0	-7.72	-0.009120	±2.5	PASS
			VN	10	-12.41	-0.014653	±2.5	PASS
			VN	20	-10.13	-0.011968	±2.5	PASS
WCDMA850	TM1	HCH	VN	30	-4.87	-0.005750	±2.5	PASS
			VN	40	-7.66	-0.009048	±2.5	PASS
			VN	50	-3.34	-0.003947	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
WCDMA1900	TM1	LCH	VN	-30	-16.02	-0.008649	±2.5	PASS
			VN	-20	-22.23	-0.012002	±2.5	PASS
			VN	-10	-17.09	-0.009226	±2.5	PASS
			VN	0	-10.73	-0.005791	±2.5	PASS
			VN	10	-10.96	-0.005914	±2.5	PASS
			VN	20	-14.42	-0.007784	±2.5	PASS
			VN	30	-10.99	-0.005931	±2.5	PASS
			VN	40	-20.95	-0.011310	±2.5	PASS
			VN	50	-9.40	-0.005074	±2.5	PASS
WCDMA1900	TM1	MCH	VN	-30	-16.83	-0.008952	±2.5	PASS
			VN	-20	-8.77	-0.004667	±2.5	PASS
			VN	-10	-10.57	-0.005625	±2.5	PASS
			VN	0	-13.84	-0.007362	±2.5	PASS
			VN	10	-13.05	-0.006940	±2.5	PASS
			VN	20	-12.08	-0.006428	±2.5	PASS
			VN	30	-13.67	-0.007272	±2.5	PASS
			VN	40	-12.02	-0.006396	±2.5	PASS
			VN	50	-14.36	-0.007638	±2.5	PASS
WCDMA1900	TM1	HCH	VN	-30	-11.31	-0.005927	±2.5	PASS
			VN	-20	-12.76	-0.006687	±2.5	PASS
			VN	-10	-14.83	-0.007775	±2.5	PASS
			VN	0	-13.47	-0.007063	±2.5	PASS
			VN	10	-13.93	-0.007303	±2.5	PASS
			VN	20	-8.56	-0.004487	±2.5	PASS
			VN	30	-11.95	-0.006263	±2.5	PASS
			VN	40	-10.64	-0.005575	±2.5	PASS
			VN	50	-5.45	-0.002856	±2.5	PASS

Appendix G) Effective Radiated Power of Transmitter (ERP/EIRP)

Receiver Setup:	<table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><tr><td>30MHz-1GHz</td><td>peak</td><td>120kHz</td><td>300kHz</td><td>Peak</td></tr><tr><td>Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak</td></tr></table>					Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	peak	120kHz	300kHz	Peak	Above 1GHz	Peak	1MHz	3MHz	Peak
Frequency	Detector	RBW	VBW	Remark																
30MHz-1GHz	peak	120kHz	300kHz	Peak																
Above 1GHz	Peak	1MHz	3MHz	Peak																
Measurement Procedure:	Test procedure as below: 1) The EUT was powered ON and placed on a 0.8m high table at a 3 meter fully Anechoic Chamber. The antenna of the transmitter was extended to its maximum length. modulation mode and the measuring receiver shall be tuned to the frequency of the transmitter under test. 2) The EUT was set 3 meters(above 18GHz the distance is 1 meter) away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3) The disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made. 4) Steps 1) to 3) were performed with the EUT and the receive antenna in both vertical and horizontal polarization. 5) The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter. 6) A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 3) is obtained for this set of conditions. 7) The output power into the substitution antenna was then measured. 8) Steps 6) and 7)were repeated with both antennas polarized. 9) Calculate power in dBm by the following formula: ERP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBd) EIRP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBi) EIRP=ERP+2.15dB where: Pg is the generator output power into the substitution antenna. 10) Test the EUT in the lowest channel, the middle channel the Highest channel 11) The radiation measurements are performed in X, Y, Z axis positioning for EUT operation mode,And found the X axis positioning which it is worse case. 12) Repeat above procedures until all frequencies measured was complete.																			
Limit:	<table><tr><td>Mode</td><td>GPRS 850/WCDMA Band V</td><td>GPRS 1900/WCDMA Band II</td></tr><tr><td>Frequency</td><td>824 – 849MHz</td><td>1850 – 1910MHz</td></tr><tr><td>Limit</td><td>38.45dBm (7W)</td><td>33.01dBm (2W)</td></tr></table>					Mode	GPRS 850/WCDMA Band V	GPRS 1900/WCDMA Band II	Frequency	824 – 849MHz	1850 – 1910MHz	Limit	38.45dBm (7W)	33.01dBm (2W)						
Mode	GPRS 850/WCDMA Band V	GPRS 1900/WCDMA Band II																		
Frequency	824 – 849MHz	1850 – 1910MHz																		
Limit	38.45dBm (7W)	33.01dBm (2W)																		

Measurement Data

GSM 850 (Voice)							
Channel/fc (MHz)	Height (cm)	Azimuth (deg)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
128/824.2	150	76	20.79	33.01	20.22	Pass	H
	150	4	18.98	33.01	16.03	Pass	V
190/836.6	150	75	20.32	33.01	21.69	Pass	H
	150	220	18.51	33.01	14.50	Pass	V
251/848.8	150	156	20.51	33.01	20.50	Pass	H
	150	180	18.58	33.01	14.43	Pass	V

GPRS 850							
Channel/fc (MHz)	Height (cm)	Azimuth (deg)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
128/824.2	150	60	20.11	33.01	22.90	Pass	H
	150	19	18.73	33.01	17.28	Pass	V
190/836.6	150	132	20.79	33.01	21.22	Pass	H
	150	212	18.77	33.01	14.24	Pass	V
251/848.8	150	132	20.24	33.01	20.77	Pass	H
	150	212	18.39	33.01	14.62	Pass	V

EDGE 850							
Channel/fc (MHz)	Height (cm)	Azimuth (deg)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
128/824.2	150	60	20.53	33.01	22.48	Pass	H
	150	19	18.66	33.01	17.35	Pass	V
190/836.6	150	133	20.79	33.01	21.22	Pass	H
	150	212	19.00	33.01	14.01	Pass	V
251/848.8	150	132	21.00	33.01	21.01	Pass	H
	150	212	18.63	33.01	14.38	Pass	V

WCDMA band V							
Channel/fc (MHz)	Height (cm)	Azimuth (deg)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
4132/826.4	150	348	20.98	38.45	17.47	Pass	H
	150	209	18.22	38.45	21.23	Pass	V
4182/836.6	150	344	20.72	38.45	17.73	Pass	H
	150	215	18.01	38.45	21.44	Pass	V
4233/846.6	150	42	20.85	38.45	17.60	Pass	H
	150	213	18.11	38.45	21.34	Pass	V

GSM 1900 (Voice)							
Channel/fc (MHz)	Height (cm)	Azimuth (deg)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
512/1850.2	150	324	20.81	33.01	17.20	Pass	H
	150	293	18.20	33.01	16.81	Pass	V
661/1880.0	150	332	20.42	33.01	17.59	Pass	H
	150	252	18.32	33.01	16.69	Pass	V
810/1909.8	150	332	20.61	33.01	17.40	Pass	H
	150	252	18.48	33.01	16.53	Pass	V

GPRS 1900							
Channel/fc (MHz)	Height (cm)	Azimuth (deg)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
512/1850.2	150	341	21.01	33.01	17.00	Pass	H
	150	268	18.29	33.01	16.72	Pass	V
661/1880.0	150	341	20.47	33.01	17.54	Pass	H
	150	276	18.56	33.01	16.45	Pass	V
810/1909.8	150	341	20.72	33.01	17.29	Pass	H
	150	284	18.58	33.01	16.43	Pass	V

EDGE1900							
Channel/fc (MHz)	Height (cm)	Azimuth (deg)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
512/1850.2	150	317	21.01	33.01	17.00	Pass	H
	150	259	18.21	33.01	16.80	Pass	V
661/1880.0	150	325	20.53	33.01	17.48	Pass	H
	150	268	18.50	33.01	16.51	Pass	V
810/1909.8	150	317	20.73	33.01	17.28	Pass	H
	150	276	18.59	33.01	16.42	Pass	V

WCDMA band II							
Channel/fc (MHz)	Height (cm)	Azimuth (deg)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
9262/1852.4	150	120	21.21	33.01	11.80	Pass	H
	150	240	18.34	33.01	16.67	Pass	V
9400/1880.0	150	121	21.82	33.01	11.19	Pass	H
	150	239	18.44	33.01	16.57	Pass	V
9538/1907.6	150	121	21.76	33.01	11.25	Pass	H
	150	236	18.56	33.01	16.45	Pass	V

Appendix H) Field strength of spurious radiation

Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-30MHz	Peak	10kHz	30kHz	Peak
	30MHz-1GHz	Peak	120kHz	300kHz	Peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Measurement Procedure:	1. Scan up to 10th harmonic, find the maximum radiation frequency to measure. 2. The technique used to find the Spurious Emissions of the transmitter was the antenna substitution method. Substitution method was performed to determine the actual ERP/EIRP emission levels of the EUT. Test procedure as below: 1) The EUT was powered ON and placed on a 0.8m high table at a 3 meter fully Anechoic Chamber. The antenna of the transmitter was extended to its maximum length. modulation mode and the measuring receiver shall be tuned to the frequency of the transmitter under test. 2) The EUT was set 3 meters (above 18GHz the distance is 1 meter) away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3) The disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made. 4) Steps 1) to 3) were performed with the EUT and the receive antenna in both vertical and horizontal polarization. 5) The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter. 6) A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 3) is obtained for this set of conditions. 7) The output power into the substitution antenna was then measured. 8) Steps 6) and 7) were repeated with both antennas polarized. 9) Calculate power in dBm by the following formula: $\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBd)}$ $\text{EIRP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBi)}$ $\text{EIRP} = \text{ERP} + 2.15\text{dB}$ where: Pg is the generator output power into the substitution antenna. 10) Test the EUT in the lowest channel, the middle channel the Highest channel 11) The radiation measurements are performed in X, Y, Z axis positioning for EUT operation mode, And found the X axis positioning which it is worse case. 12) Repeat above procedures until all frequencies measured was complete.				
Limit:	Attenuated at least 43+10log(P)				

Test Data:

