

TEST REPORT

Product : R500 Data Collector
Trade mark : **SinoGNSS**
By ComNav Technology Ltd.
Model/Type reference : R500
Serial Number : N/A
Report Number : EED32L00018303
FCC ID : 2ACHBR500
Date of Issue : Aug. 06, 2019
Test Standards : 47 CFR Part 2
47 CFR Part 22 subpart H
47 CFR Part 24 subpart E
Test result : PASS

Prepared for:

ComNav Technology Ltd.
Building 2, No. 618 Chengliu Middle Rd.

Prepared by:

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Date:

Aug. 06, 2019

Check No.: 3319509675



2 Version

Version No.	Date	Description
00	2019-08-06	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
GSM 850			
Conducted output power	Part 2.1046(a)/Part 22.913(a)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
Effective Radiated Power of Transmitter(ERP)	Part 2.1046(a)/Part 22.913(a)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
99% &26dB Occupied Bandwidth	Part 2.1049(h)	Part 22.917(b) &KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	Part 2.1051/Part 22.917(a)	Part 22.917(b) &KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	Part 2.1051/ Part 2.1057/ Part 22.917(a)(b)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	Part 2.1053/ Part 2.1057/ Part 22.917(a)(b)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
Frequency stability	Part 2.1055/ Part 22.355	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
GSM 1900			
Conducted output power	Part 2.1046(a) /Part 24.232(c)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
Effective Radiated Power of Transmitter(EIRP)	Part 2.1046(a) / Part 24.232(c)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
peak-to-average ratio	Part 24.232(d)	KDB 971168 D01v03r01	PASS
99% &26dB Occupied Bandwidth	Part 2.1049(h)	Part 24.238(b) &KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	Part 2.1051/ Part 24.238(a)	Part 24.238(b) &KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	Part 2.1051/ Part 2.1057/ Part 24.238(a)(b)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	Part 2.1053 /Part 2.1057 / Part 24.238(a)(b)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
Frequency stability	Part 2.1055/Part 24.235	TIA-603-E-2016&KDB 971168 D01v03r01	PASS

Remark:

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

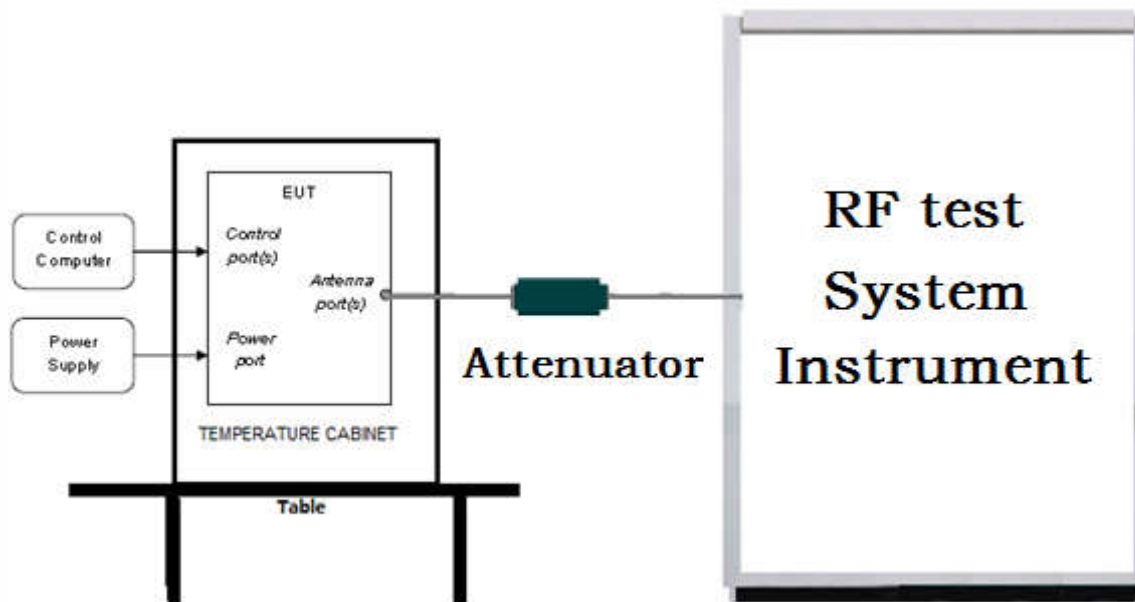
4 Content

1 COVER PAGE	1
2 VERSION	2
3 TEST SUMMARY	3
4 CONTENT	4
5 TEST REQUIREMENT	5
5.1 TEST SETUP	5
5.1.1 For Conducted test setup	5
5.1.2 For Radiated Emissions test setup	5
5.2 TEST ENVIRONMENT	6
5.3 TEST CONDITION	7
6 GENERAL INFORMATION	9
6.1 CLIENT INFORMATION	9
6.2 GENERAL DESCRIPTION OF EUT	9
6.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD	9
6.4 DESCRIPTION OF SUPPORT UNITS	11
6.5 TEST LOCATION	11
6.6 DEVIATION FROM STANDARDS	11
6.7 ABNORMALITIES FROM STANDARD CONDITIONS	11
6.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER	11
6.9 MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS, $k=2$)	11
7 EQUIPMENT LIST	12
8 RADIO TECHNICAL REQUIREMENTS SPECIFICATION	15
Appendix A) RF Power Output	16
Appendix B) Peak-to-Average Ratio	17
Appendix C) BandWidth	18
Appendix D) Band Edges Compliance	37
Appendix E) Spurious Emission at Antenna Terminal	49
Appendix F) Frequency Stability	139
Appendix G) Effective Radiated Power of Transmitter (ERP/EIRP)	147
Appendix H) Field strength of spurious radiation	149
PHOTOGRAPHS OF TEST SETUP	168
PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS	170

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:

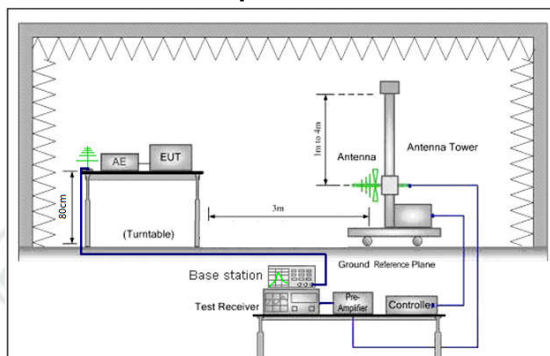


Figure 1.30MHz to 1GHz

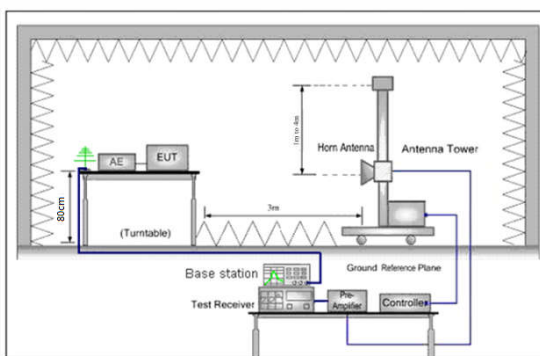


Figure 2. above 1GHz

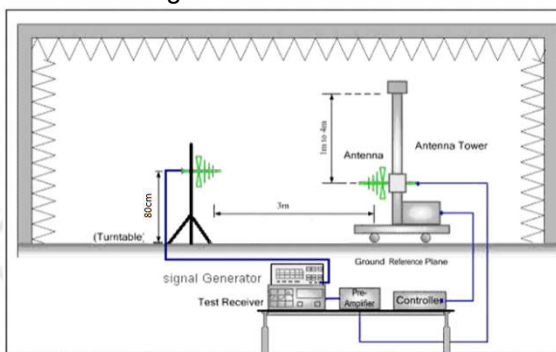


Figure 1. 30MHz to 1GHz

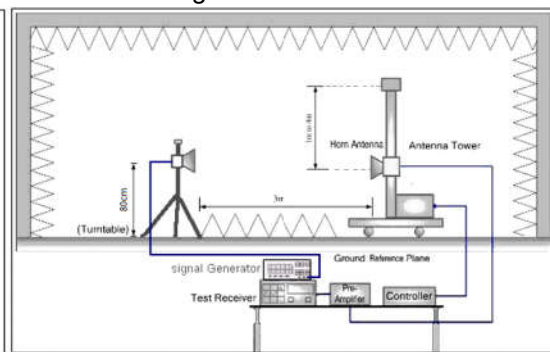


Figure 2. above 1GHz

5.2 Test Environment

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	101kPa

5.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(cm)	High(H)
GSM/GPRE/ EDGE850	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
GSM/GPRE/ EDGE1900	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

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 (dBm)			GSM1900 (dBm)		
Channel	128	190	251	512	661	810
Frequency(MHz)	824.2MHz	836.6MHz	848.8MHz	1850.2MHz	1880MHz	1909.8MHz
GSM	33.89	33.52	33.86	29.75	30.47	30.43
GPRS Class 12	33.92	33.83	33.81	29.86	30.54	30.43
EDGE Class 12	29.05	28.73	28.73	27.09	27.98	27.50

SIM 2 Card Conducted transmitter power measurement result.

band	GSM850 (dBm)			GSM1900 (dBm)		
Channel	128	190	251	512	661	810
Frequency(MHz)	824.2MHz	836.6MHz	848.8MHz	1850.2MHz	1880MHz	1909.8MHz
GSM	32.66	33.17	33.22	28.97	29.88	26.88
GPRS Class 12	32.66	33.13	33.17	31.00	30.58	30.98
EDGE Class 12	26.98	27.38	27.45	27.80	27.01	27.19

Pre-scan all mode and data rates and positions, find worse case mode of SIM1 card are chosen to the report, the worse case mode as below:

band	Radiated	Conducted
GSM/GPRS/EDGE 850	1) GSM Link 2) GPRS 8 Link 3) EDGE 8 Link	1) GSM Link 2) GPRS 8 Link 3) EDGE 8 Link
GSM/GPRS/EDGE 1900	1) GSM Link 2) GPRS 8 Link 3) EDGE 8 Link	1) GSM Link 2) GPRS 8 Link 3) EDGE 8 Link

Test Mode	Test Modes description
GSM/TM1	GSM system, GSM, GMSK modulation
GSM/TM2	GSM system, GPRS, GMSK modulation
GSM/TM3	GSM system, EDGE, 8PSK modulation

6 General Information

6.1 Client Information

Applicant:	ComNav Technology Ltd.
Address of Applicant:	Building 2, No. 618 Chengliu Middle Rd.
Manufacturer:	ComNav Technology Ltd.
Address of Manufacturer:	Building 2, No. 618 Chengliu Middle Rd.
Factory:	ComNav Technology Ltd.
Address of Factory:	Building 2, No. 618 Chengliu Middle Rd.

6.2 General Description of EUT

Product Name:	R500 Data Collector	
Model No.(EUT):	R500	
Trade Mark:	 By ComNav Technology Ltd.	
EUT Supports Radios application:	BT4.0, 3.1+EDR	2402MHz to 2480MHz
	NFC	13.56MHz
	GSM	850/1900 GSM, GPRS, EGPRS
Power Supply:	AC adapter	MODEL No.: HKA01105021-XE INPUT: 100-240V~50/60Hz 0.5A OUTPUT: 5V --- 2.1A
	Li-ion Battery	MODEL No.: BL-R500 Capacity: 6500mAh, 24.0Wh Nominal Voltage: 3.7V Limited Charging Voltage: 4.2V
Sample Received Date:	Jan. 25, 2019	
Sample tested Date:	Jan. 25, 2019 to Jul. 28, 2019	

6.3 Product Specification subjective to this standard

Frequency Band:	GSM/GPRS/EDGE 850: Tx: 824.20 -848.80MHz; Rx: 869.20 – 893.80MHz GSM/GPRS/EDGE 1900: Tx: 1850.20 – 1909.80MHz; Rx: 1930.20 – 1989.80MHz	
Modulation Type:	GSM/GPRS Mode with GMSK Modulation EDGE Mode with 8PSK Modulation	
Antenna Type and Gain:	GSM 850	PIFA antenna, -2.16 dBi
	PCS 1900	PIFA antenna, -0.12 dBi
	BT	PIFA antenna, 3.01 dBi
	NFC	FPC antenna, 0 dBi
Test Voltage:	AC 120V, 60Hz, DC 3.7V	

GSM 850

PCS 1900

Freq (M H z)	Effi (%)	Gain (dB i)
790	24.76	-3.41
800	26.79	-2.52
810	29.77	-2.45
820	31.22	-2.36
830	32.23	-2.26
840	32.24	-2.16
850	34.67	-2.01
860	33.23	-2.18
870	35.44	-1.93
880	37.73	-1.64
890	37.4	-1.79
900	39.86	-1.54
910	38.41	-1.59
920	38.94	-1.47
930	36.14	-1.93
940	34.83	-1.99
950	31.25	-2.49
960	30.89	-2.58

Freq (M H z)	Effi (%)	Gain (dB i)
1700	43.17	0.52
1710	45.57	0.56
1720	44.83	0.16
1730	45.51	-0.22
1740	44.72	-0.25
1750	44.01	-0.18
1760	45.54	0.03
1770	45.99	0.11
1780	44.21	0.07
1790	39.99	-0.11
1800	39.59	0.01
1810	40.88	0.29
1820	39.25	0.39
1830	38.14	0.39
1840	36.83	0.15
1850	35.89	-0.12
1860	36.31	-0.34
1870	38.66	-0.36
1880	40.22	-0.46
1890	39.94	-0.65
1900	39.47	-0.97
1910	42.22	-0.97
1920	44.35	-0.75
1930	45.68	-0.58
1940	47.17	-0.18
1950	50.31	0.43
1960	53.01	0.83
1970	55.79	1.15
1980	58.59	1.26
1990	58.7	1.08
2000	58.38	0.86

6.4 Description of Support Units

The EUT has been tested independently

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

RF test system					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Spectrum Analyzer	Keysight	N9010A	MY54510339	03-01-2019	02-29-2020
Signal Generator	Keysight	N5182B	MY53051549	03-01-2019	02-29-2020
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	07-26-2019	07-25-2020
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-09-2019	01-08-2020
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-09-2019	01-08-2020
DC Power	Keysight	E3642A	MY56376072	03-01-2019	02-29-2020
PC-1	Lenovo	R4960d	---	03-01-2019	02-29-2020
BT&WI-FI Automatic control	R&S	OSP120	101374	03-01-2019	02-29-2020
RF control unit	JS Tonscend	JS0806-2	158060006	03-01-2019	02-29-2020
BT&WI-FI Automatic test software	JS Tonscend	JS1120-3	---	03-01-2019	02-29-2020

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	maturo	NCD/070/1071112	---	01-09-2019	01-08-2020
Temperature/Humidity Indicator	Shanghai qixiang	HM10	1804298	07-26-2019	07-25-2020
Cable line	Fulai(7M)	SF106	5219/6A	01-09-2019	01-08-2020
Cable line	Fulai(6M)	SF106	5220/6A	01-09-2019	01-08-2020
Cable line	Fulai(3M)	SF106	5216/6A	01-09-2019	01-08-2020
Cable line	Fulai(3M)	SF106	5217/6A	01-09-2019	01-08-2020

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	03-27-2019	03-26-2020
Spectrum Analyzer	Keysight	N9020B	MY57111112	03-27-2019	03-26-2020
Spectrum Analyzer	Keysight	N9030B	MY57140871	03-27-2019	03-26-2020
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	5-21-2020
Preamplifier	EMCI	EMC001330	980563	05-08-2019	05-07-2020
Preamplifier	JS Tonscend	980380	EMC051845 SE	01-16-2019	01-15-2020
Temperature/ Humidity Indicator	biaozhi	GM1360	EE1186631	04-30-2019	04-29-2020
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	01-09-2019	01-08-2020
Cable line	Times	SFT205-NMSM-2.50M	394812-0002	01-09-2019	01-08-2020
Cable line	Times	SFT205-NMSM-2.50M	394812-0003	01-09-2019	01-08-2020
Cable line	Times	SFT205-NMSM-2.50M	393495-0001	01-09-2019	01-08-2020
Cable line	Times	EMC104-NMNM-1000	SN160710	01-09-2019	01-08-2020
Cable line	Times	SFT205-NMSM-3.00M	394813-0001	01-09-2019	01-08-2020
Cable line	Times	SFT205-NMNM-1.50M	381964-0001	01-09-2019	01-08-2020
Cable line	Times	SFT205-NMSM-7.00M	394815-0001	01-09-2019	01-08-2020
Cable line	Times	HF160-KMKM-3.00M	393493-0001	01-09-2019	01-08-2020

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-E-2016	Land Mobile FM or PM -Communications Equipment -Measurement and Performance Standards
5	KDB971168 D01	KDB971168 D01 Power Meas License Digital Systems v03r01

Test Results List:

Test Requirement	Test method	Test item	Verdict	Note
Part 2.1046(a)/Part 22.913(a)/ part 24.232(c)	TIA-603-E-2016& KDB 971168 D01v03r01	Conducted output power	PASS	Appendix A)
Part 24.232(d)	KDB 971168 D01v03r01	peak-to-average ratio	PASS	Appendix B)
Part 2.1049(h)	Part 22.917(b)/ Part 24.238(b)/ Part 27.53(h) &KDB 971168 D01v03r01	99% &26dB Occupied Bandwidth	PASS	Appendix C)
Part 2.1051/Part 22.917(a)/ Part 24.238(a)	Part 22.917(b)/ Part 24.238(b)/ Part 27.53(h) &KDB 971168 D01v03r01	Band Edge at antenna terminals	PASS	Appendix D)
Part 2.1051/ Part 2.1057/ Part 22.917(a)(b)/ Part 24.238(a)(b)	TIA-603-E-2016& KDB 971168 D01v03r01	Spurious emissions at antenna terminals	PASS	Appendix E)
Part 2.1055/ Part 22.355/ Part 24.235	TIA-603-E-2016& KDB 971168 D01v03r01	Frequency stability	PASS	Appendix F)
Part 2.1053/ Part 2.1057/ Part 22.917(a)(b)/ Part 24.238(a)(b)	TIA-603-E-2016& KDB 971168 D01v03r01	Field strength of spurious radiation	PASS	Appendix G)
Part 2.1046(a)/Part 22.913(a)/ Part 24.232(c)	TIA-603-E-2016& KDB 971168 D01v03r01	Effective Radiated Power of Transmitter(ERP)	PASS	Appendix H)

Appendix A) RF Power Output

Test Band	Test Mode	Test Channel	Measured(dbm)	Limit (dbm)	Verdict
GSM850	GSM/TM1	LCH	33.89	38.5	PASS
		MCH	33.52	38.5	PASS
		HCH	33.86	38.5	PASS
	GSM/TM2	LCH	33.92	38.5	PASS
		MCH	33.83	38.5	PASS
		HCH	33.81	38.5	PASS
	GSM/TM3	LCH	29.05	38.5	PASS
		MCH	28.73	38.5	PASS
		HCH	28.73	38.5	PASS
Test Band	Test Mode	Test Channel	Measured(dbm)	Limit (dbm)	Verdict
GSM1900	GSM/TM1	LCH	29.75	33	PASS
		MCH	30.47	33	PASS
		HCH	30.43	33	PASS
	GSM/TM2	LCH	29.86	33	PASS
		MCH	30.54	33	PASS
		HCH	30.43	33	PASS
	GSM/TM3	LCH	27.09	33	PASS
		MCH	27.98	33	PASS
		HCH	27.50	33	PASS

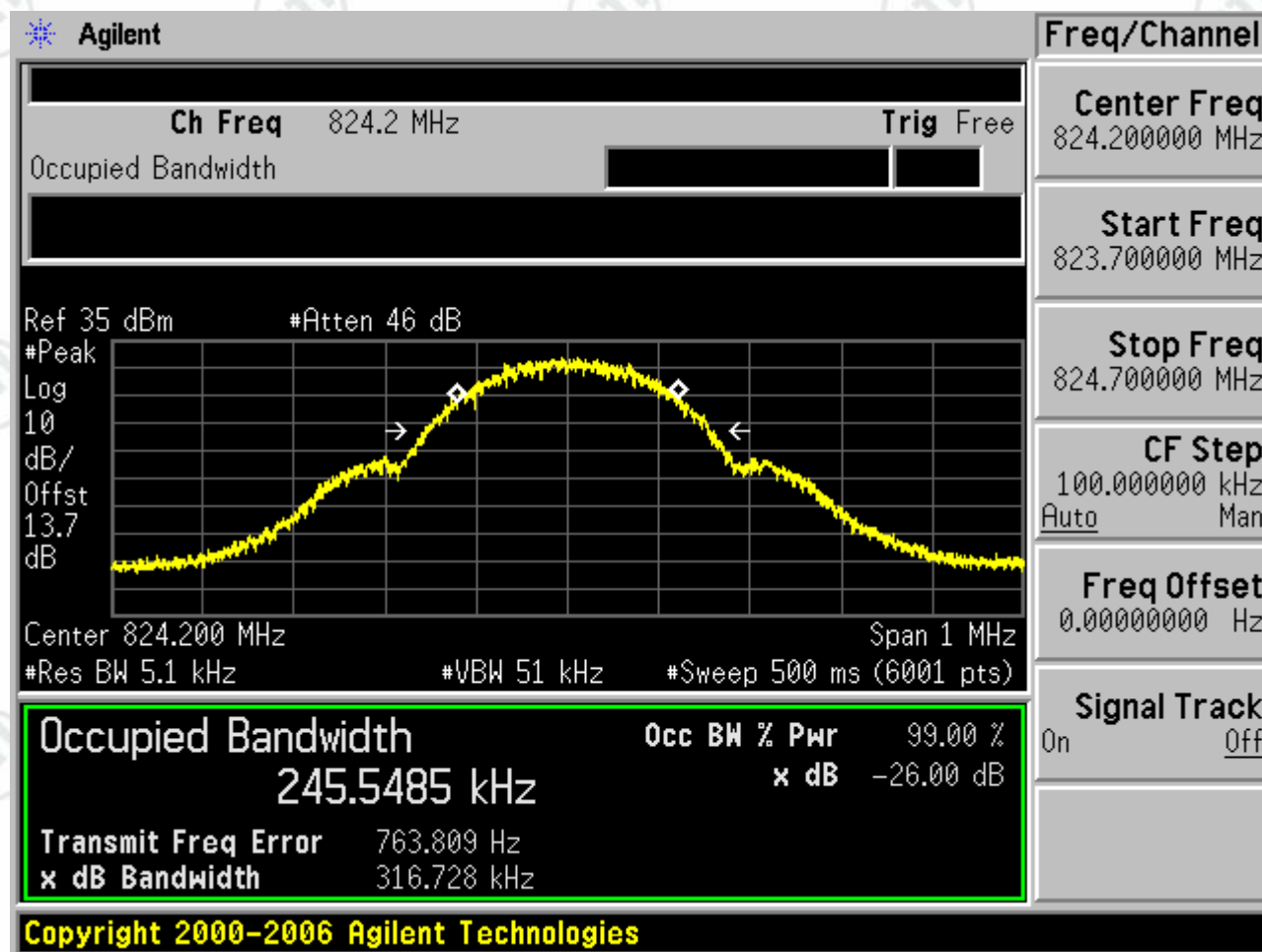
Appendix B) Peak-to-Average Ratio

Test Band	Test Mode	Test Channel	Measured (db)	Limit (db)	Verdict
GSM1900	GSM/TM1	LCH	0.13	13	PASS
		MCH	0.13	13	PASS
		HCH	0.14	13	PASS
	GSM/TM2	LCH	0.13	13	PASS
		MCH	0.13	13	PASS
		HCH	0.14	13	PASS
	GSM/TM3	LCH	2.58	13	PASS
		MCH	2.46	13	PASS
		HCH	2.58	13	PASS

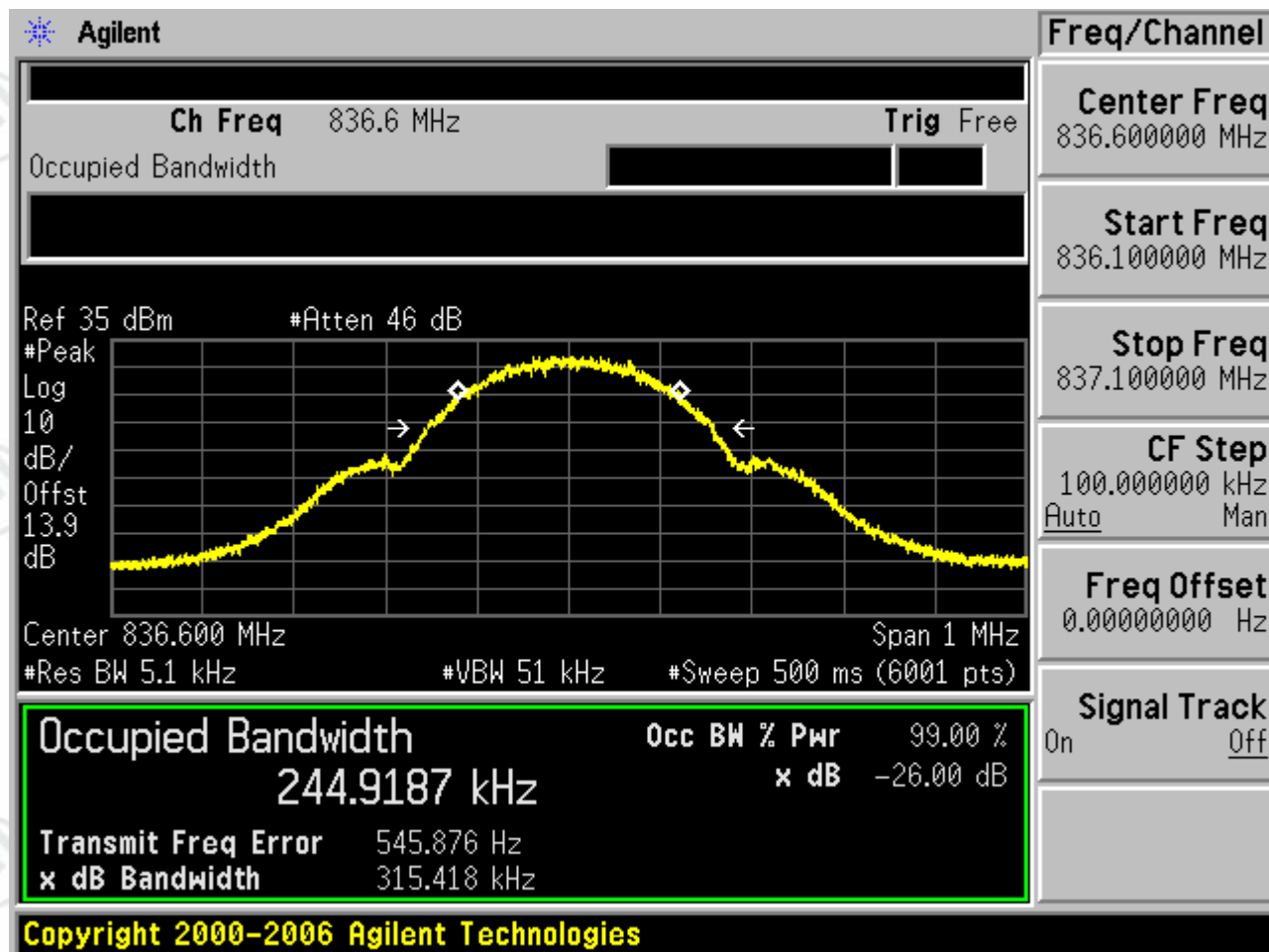
Appendix C) BandWidth

Test Band	Test Mode	Test Channel	Occupied Bandwidth (MHZ)	Emission Bandwidth (MHZ)	Verdict
GSM850	GSM/TM1	LCH	245.5	317	PASS
		MCH	244.9	315	PASS
		HCH	244.8	320	PASS
	GSM/TM2	LCH	246.2	315	PASS
		MCH	245.7	315	PASS
		HCH	244.4	314	PASS
	GSM/TM3	LCH	248.5	317	PASS
		MCH	248.5	316	PASS
		HCH	249.7	314	PASS
Test Band	Test Mode	Test Channel	Occupied Bandwidth (MHZ)	Emission Bandwidth (MHZ)	Verdict
GSM1900	GSM/TM1	LCH	245.8	317	PASS
		MCH	246.3	315	PASS
		HCH	244.7	319	PASS
	GSM/TM2	LCH	245.1	313	PASS
		MCH	245.4	316	PASS
		HCH	245.3	312	PASS
	GSM/TM3	LCH	253.3	324	PASS
		MCH	253.4	312	PASS
		HCH	251.7	320	PASS

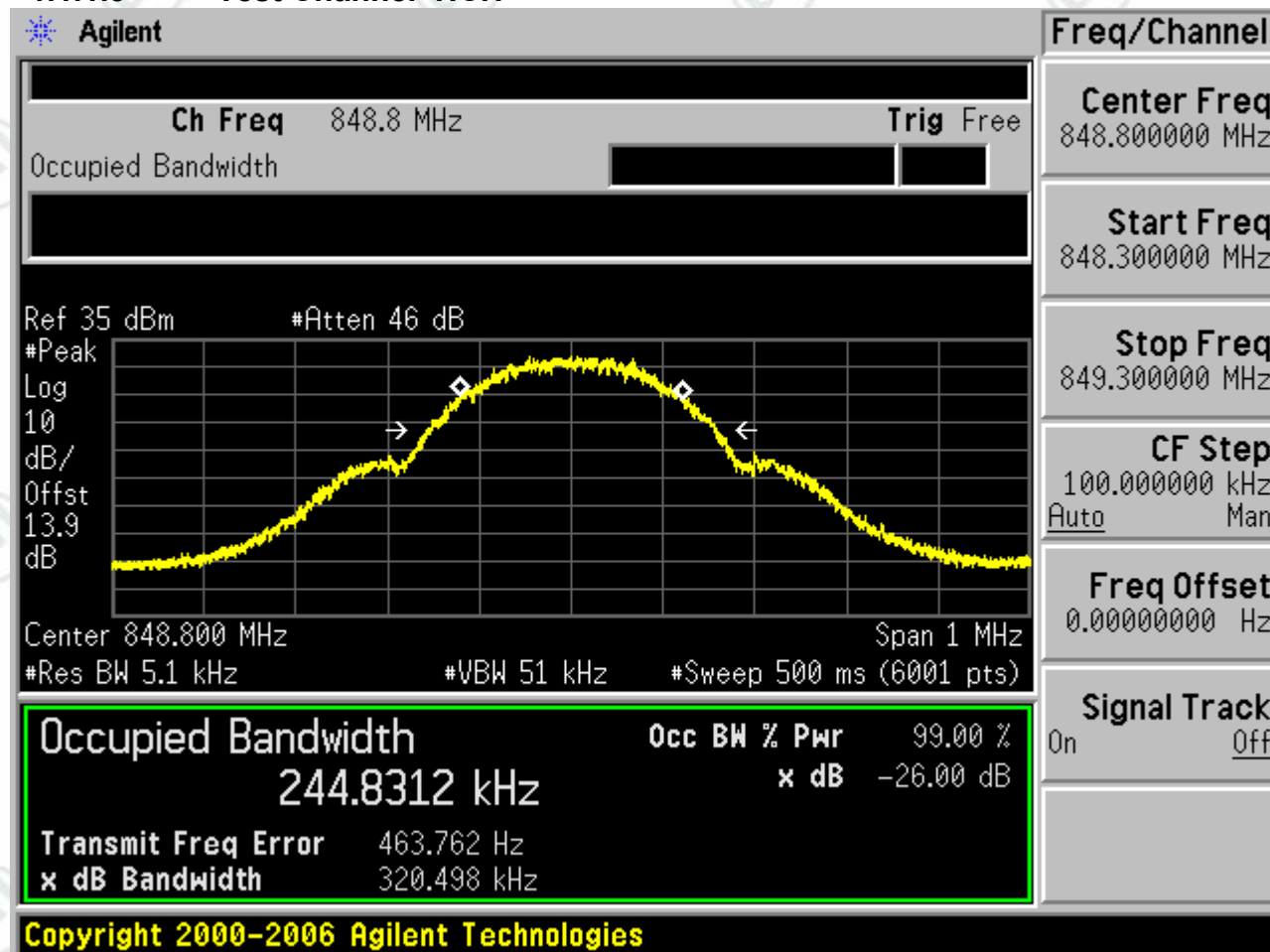
- 1 For GSM
 - 1.1 Test Band=GSM850
 - 1.1.1 Test Mode=GSM/TM1
 - 1.1.1.1 Test Channel=LCH



1.1.1.2 Test Channel=MCH

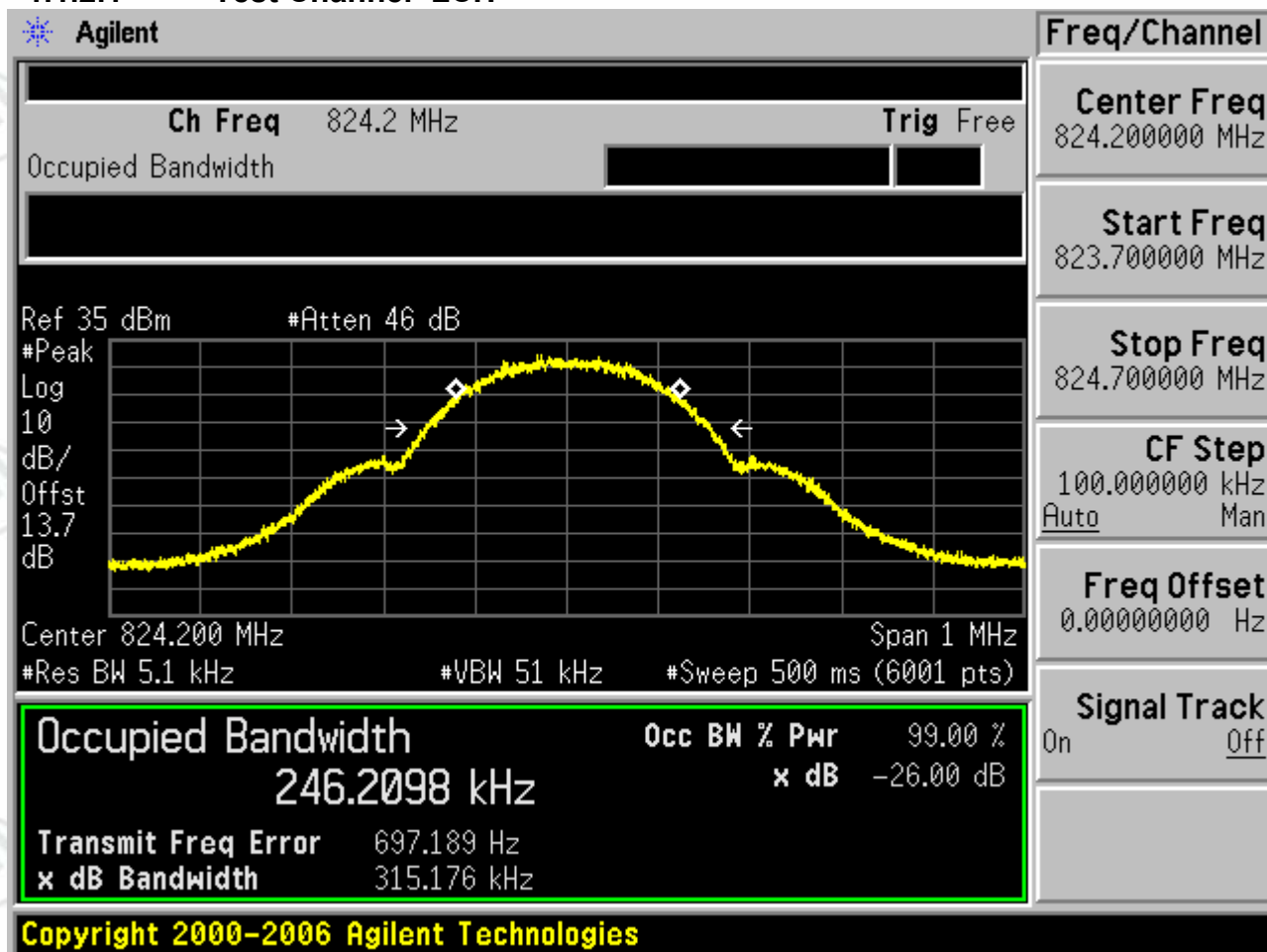


1.1.1.3 Test Channel=HCH

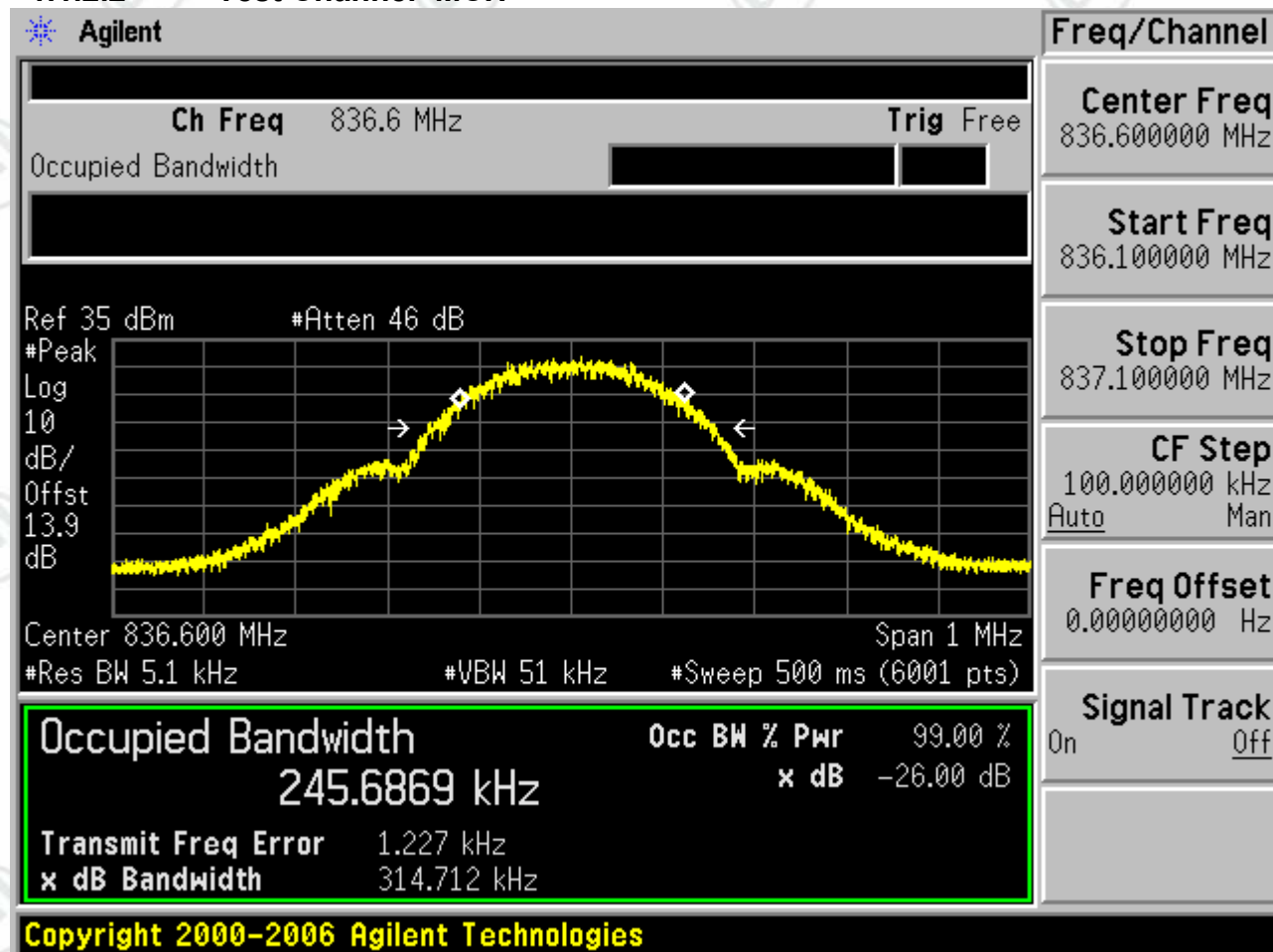


1.1.2 Test Mode=GSM/TM2

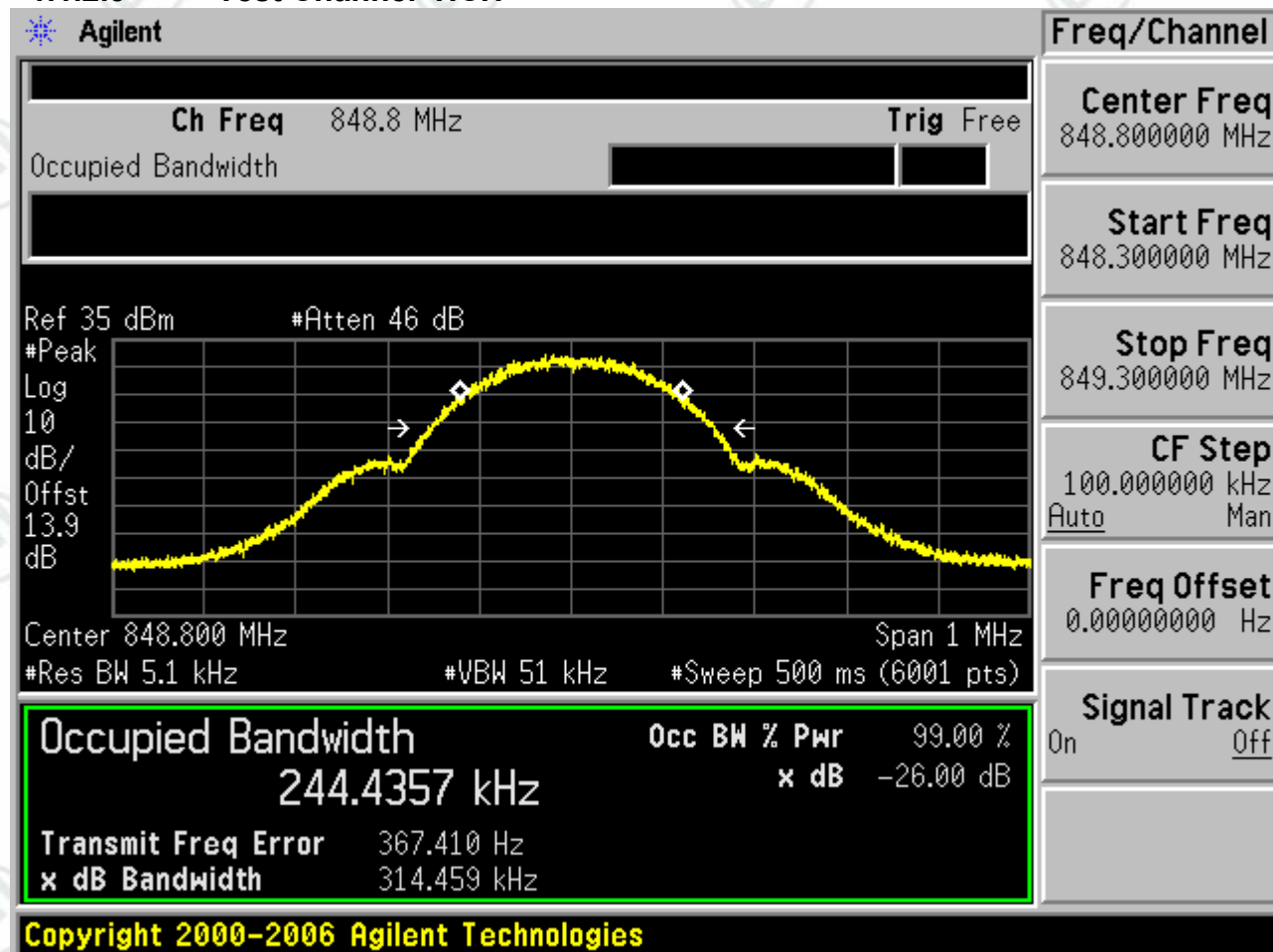
1.1.2.1 Test Channel=LCH



1.1.2.2 Test Channel=MCH

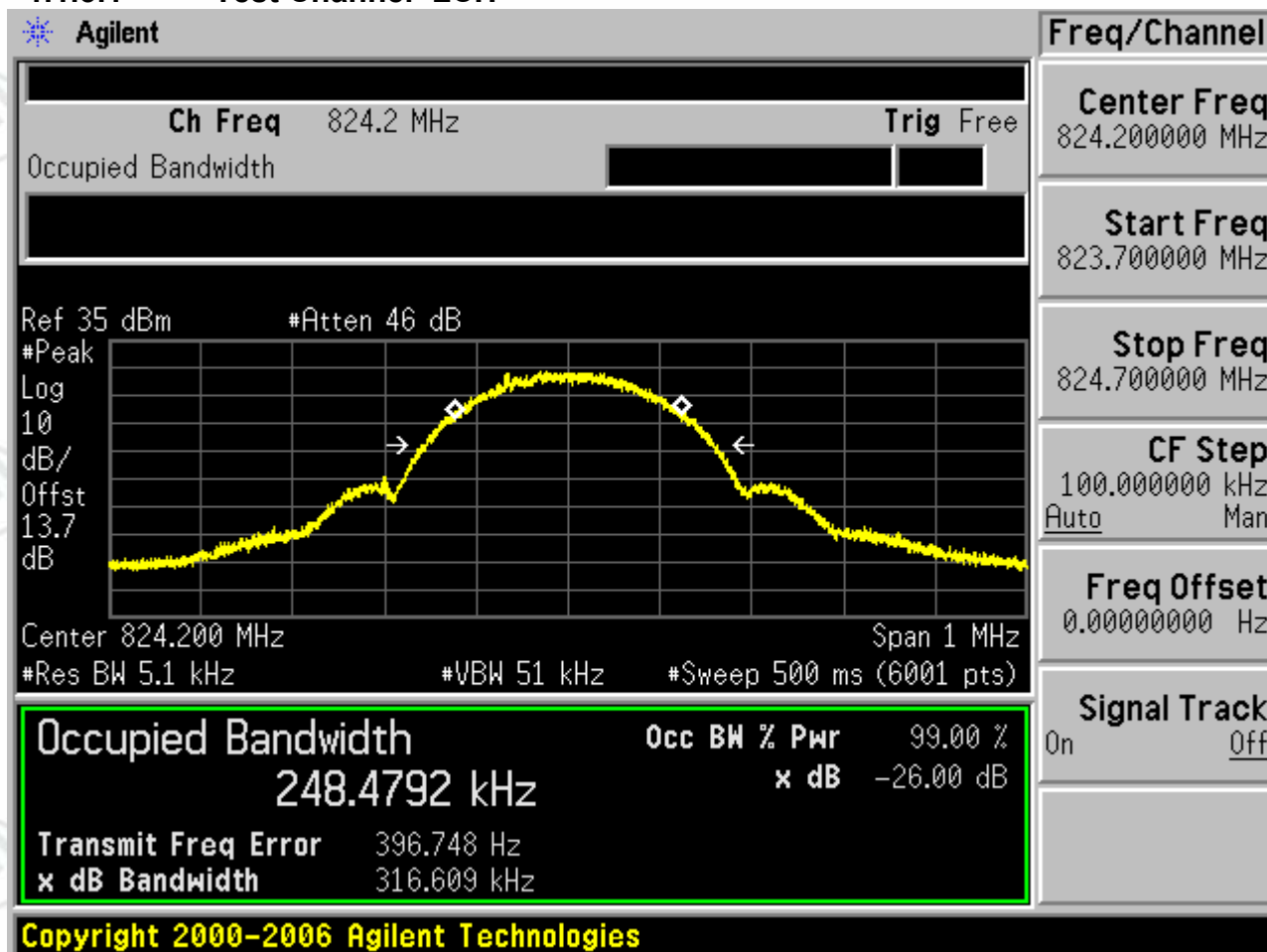


1.1.2.3 Test Channel=HCH

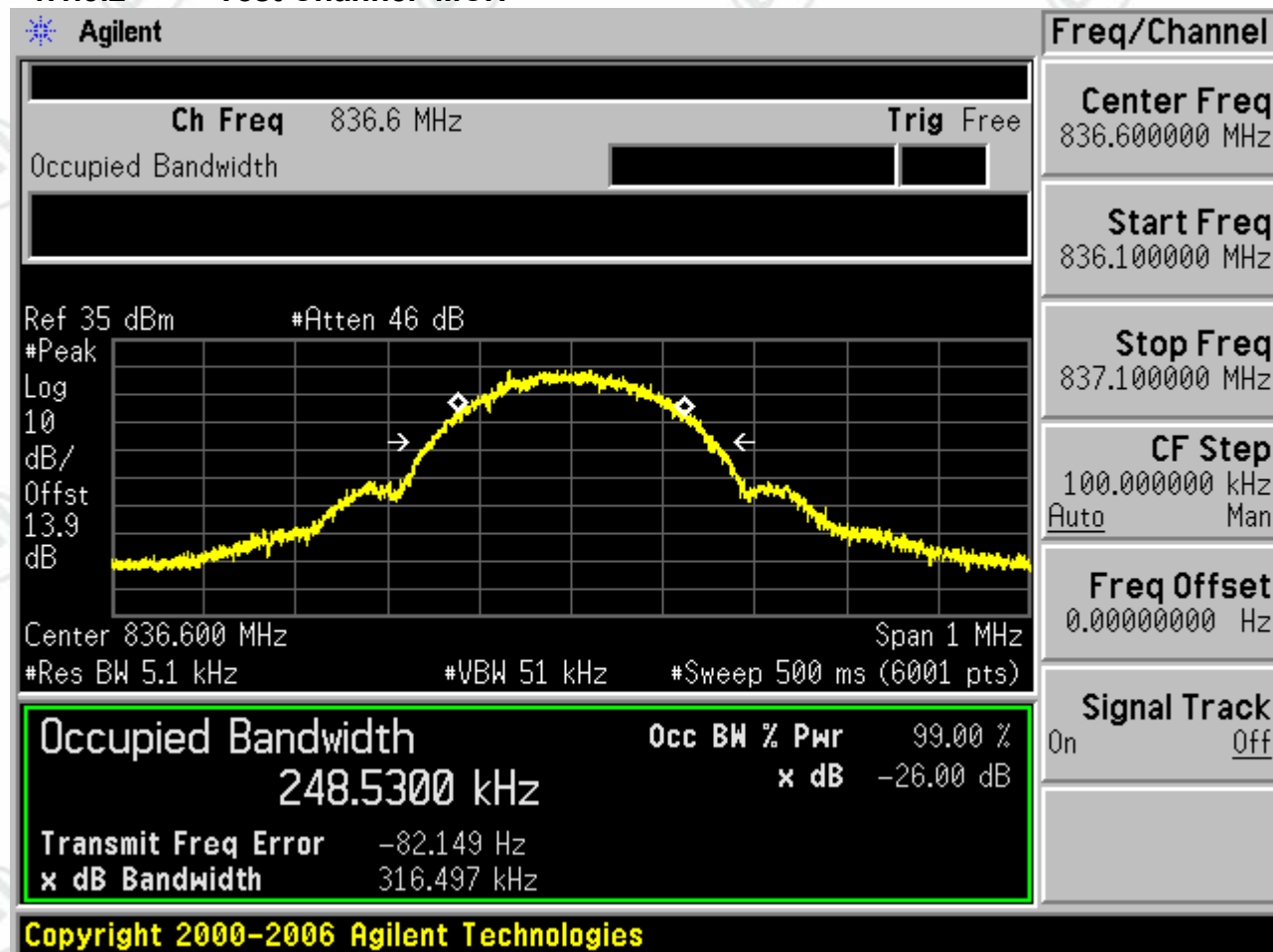


1.1.3 Test Mode=GSM/TM3

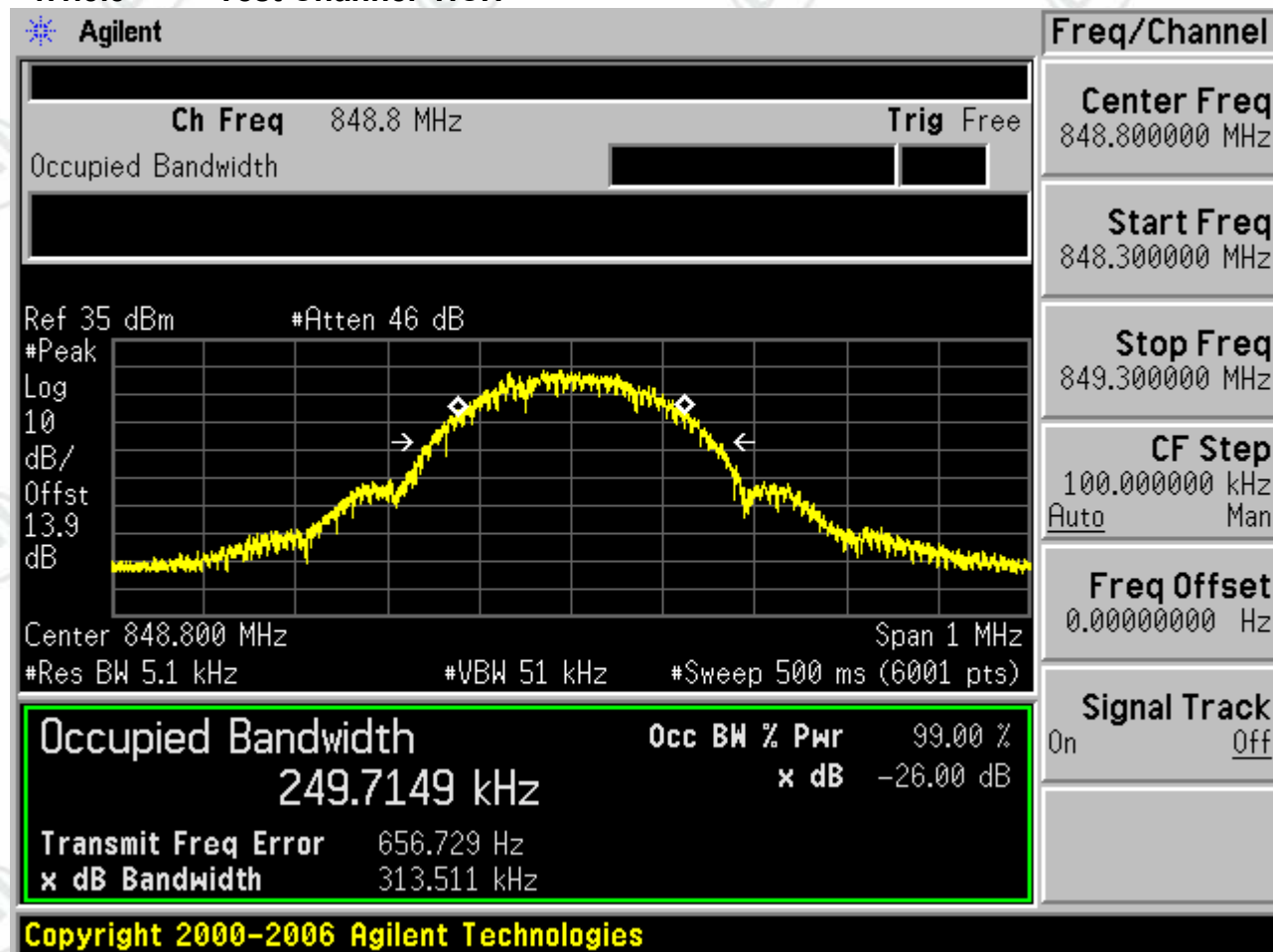
1.1.3.1 Test Channel=LCH



1.1.3.2 Test Channel=MCH



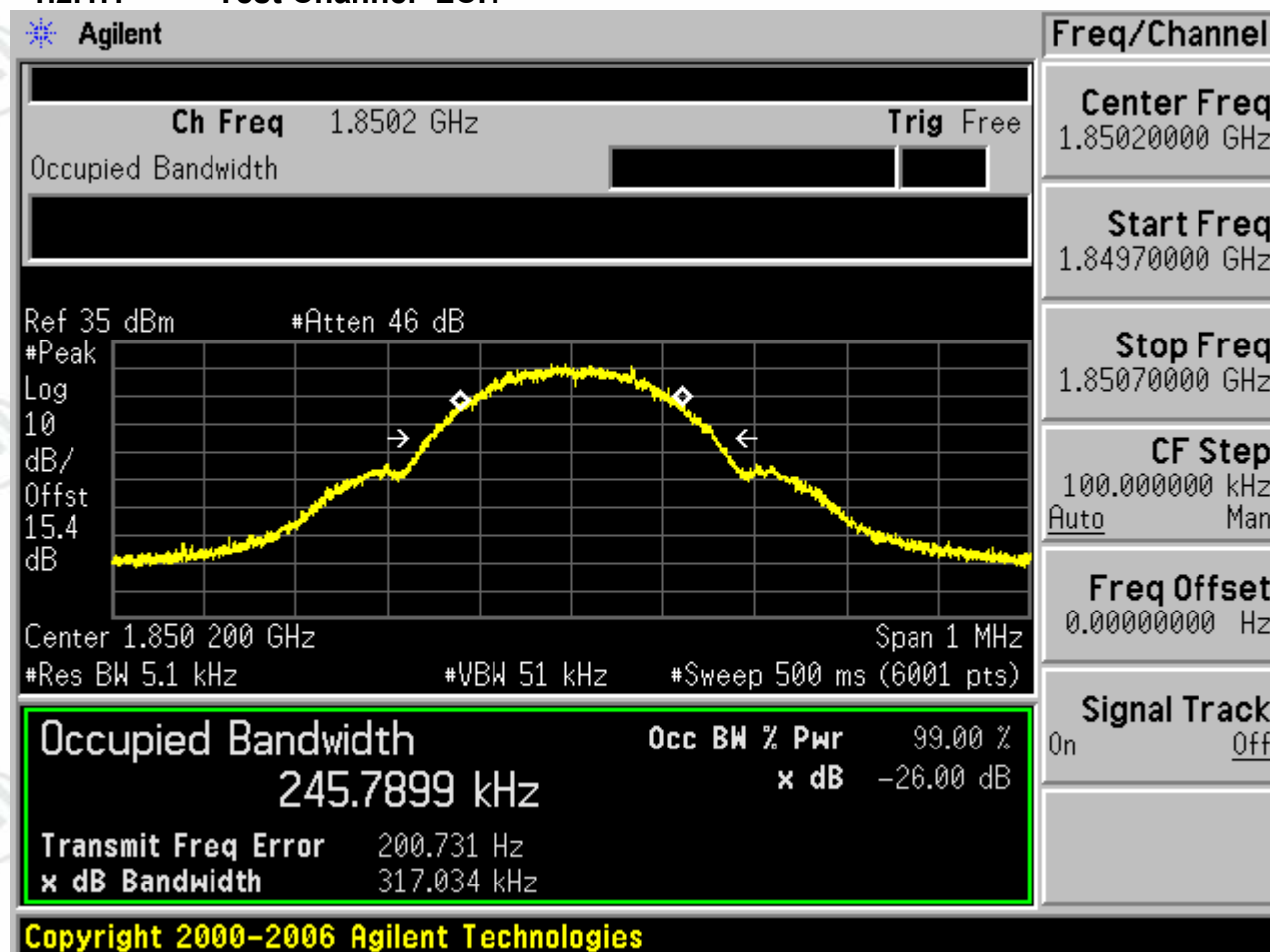
1.1.3.3 Test Channel=HCH



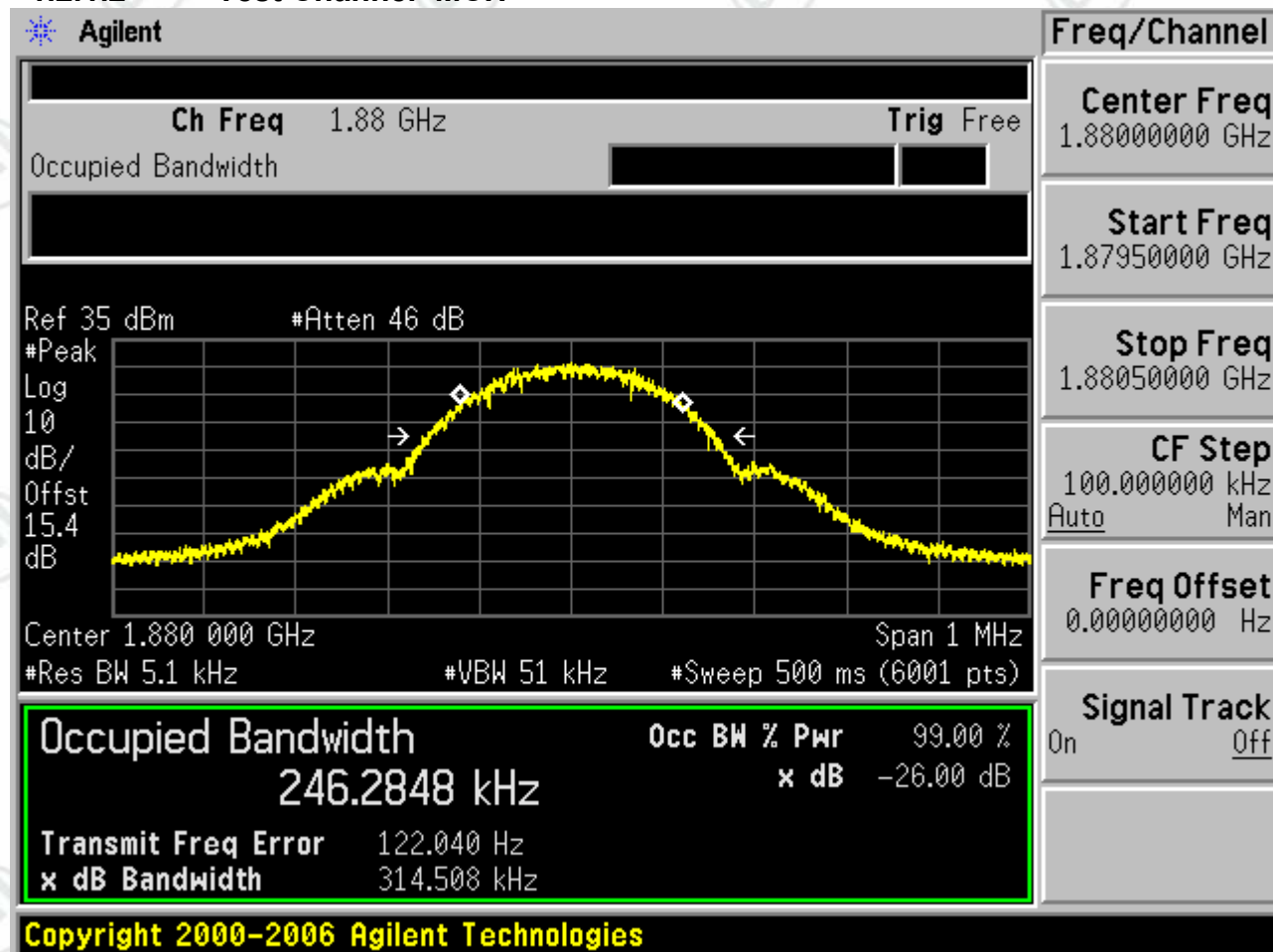
1.2 Test Band=GSM1900

1.2.1 Test Mode=GSM/TM1

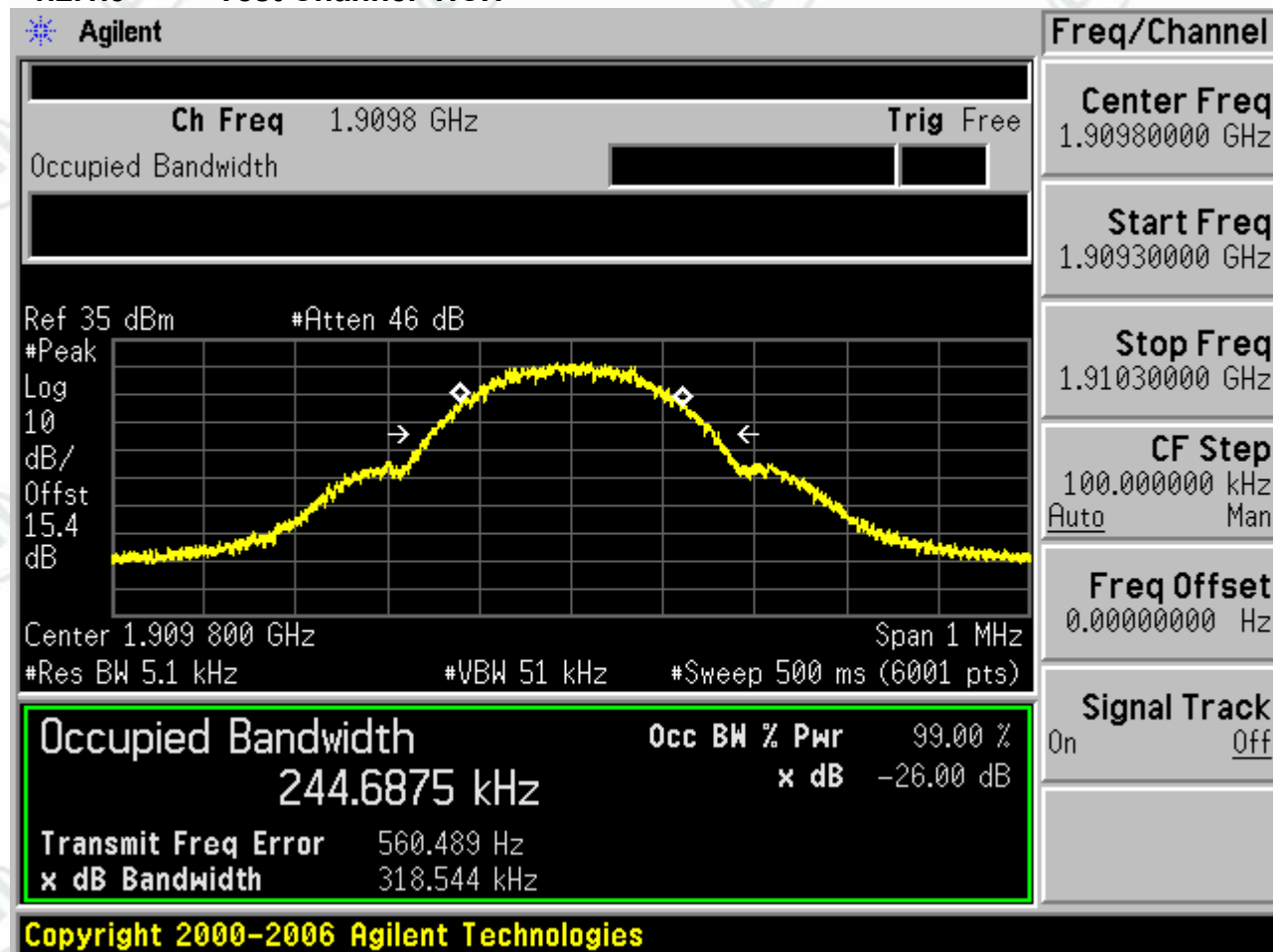
1.2.1.1 Test Channel=LCH



1.2.1.2 Test Channel=MCH

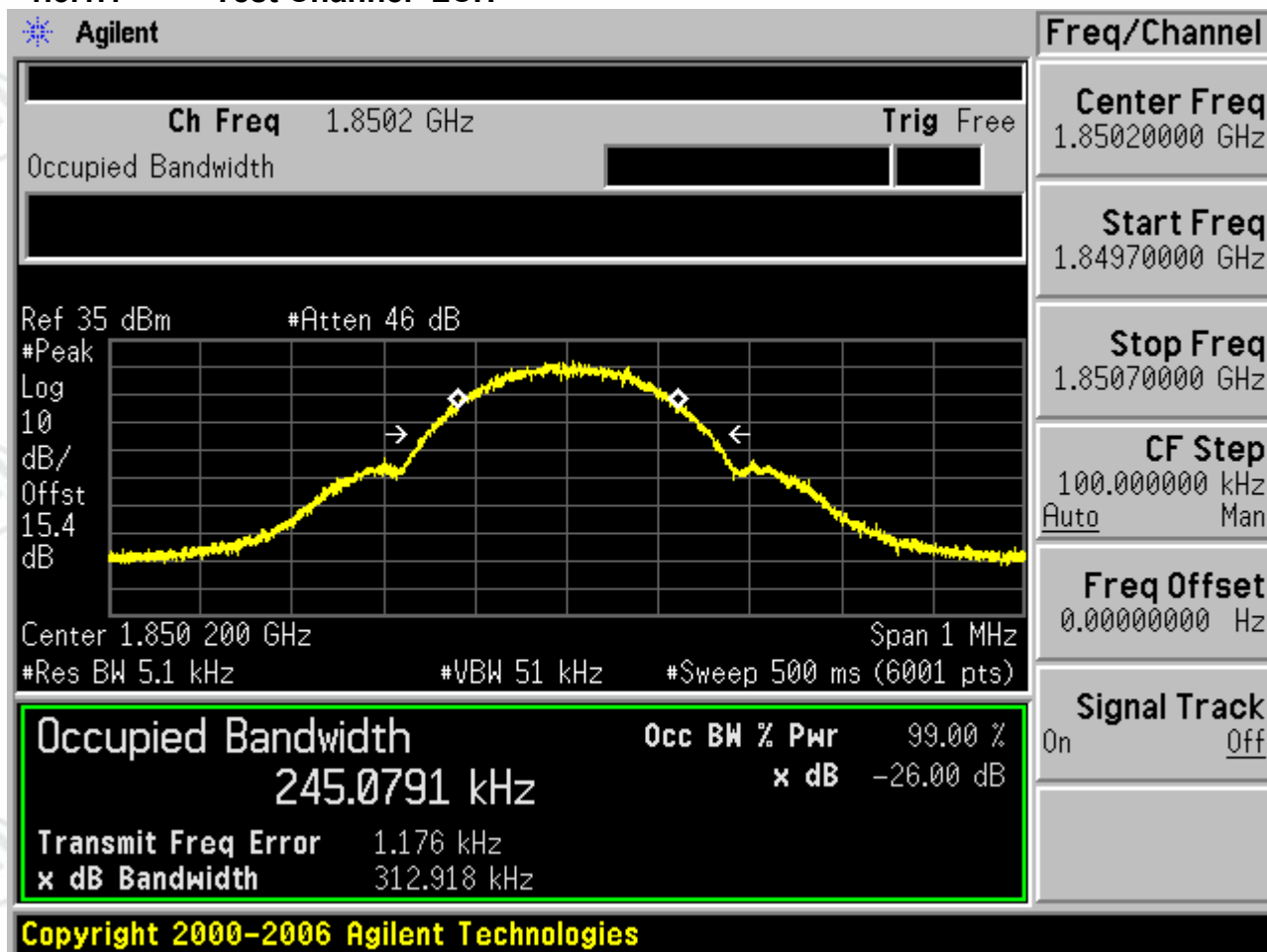


1.2.1.3 Test Channel=HCH

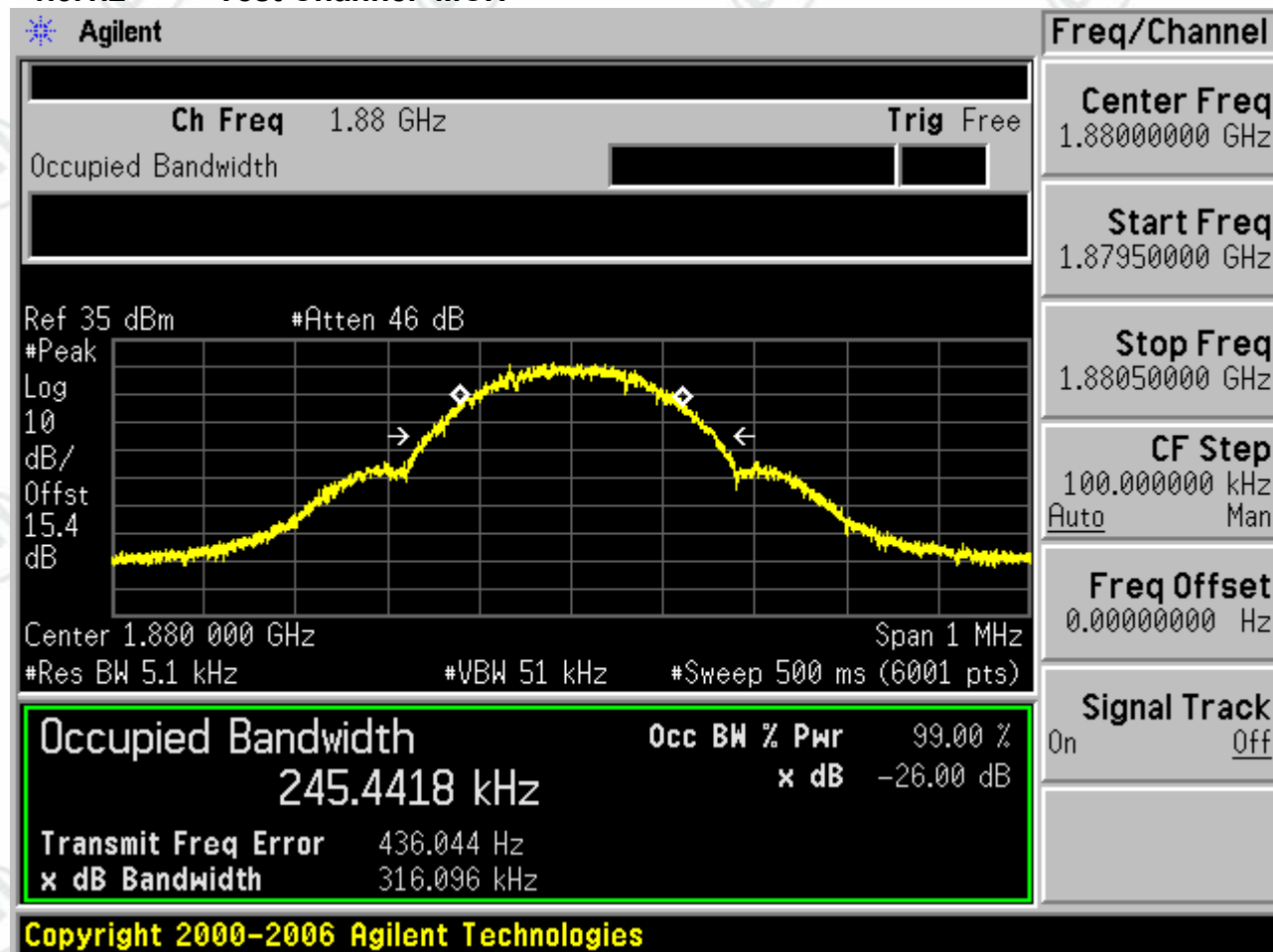


1.3 Test Mode=GSM/TM2

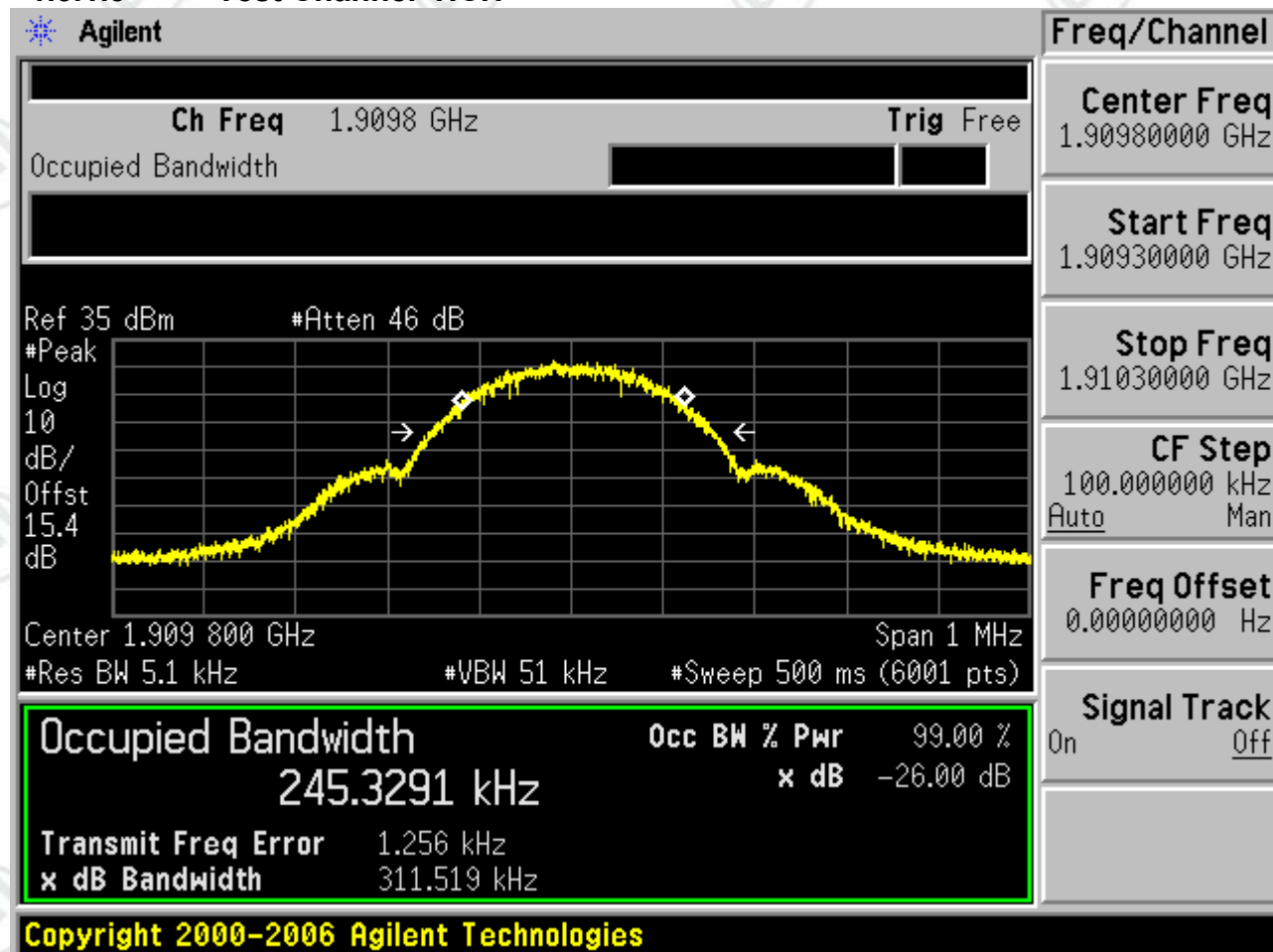
1.3.1.1 Test Channel=LCH



1.3.1.2 Test Channel=MCH

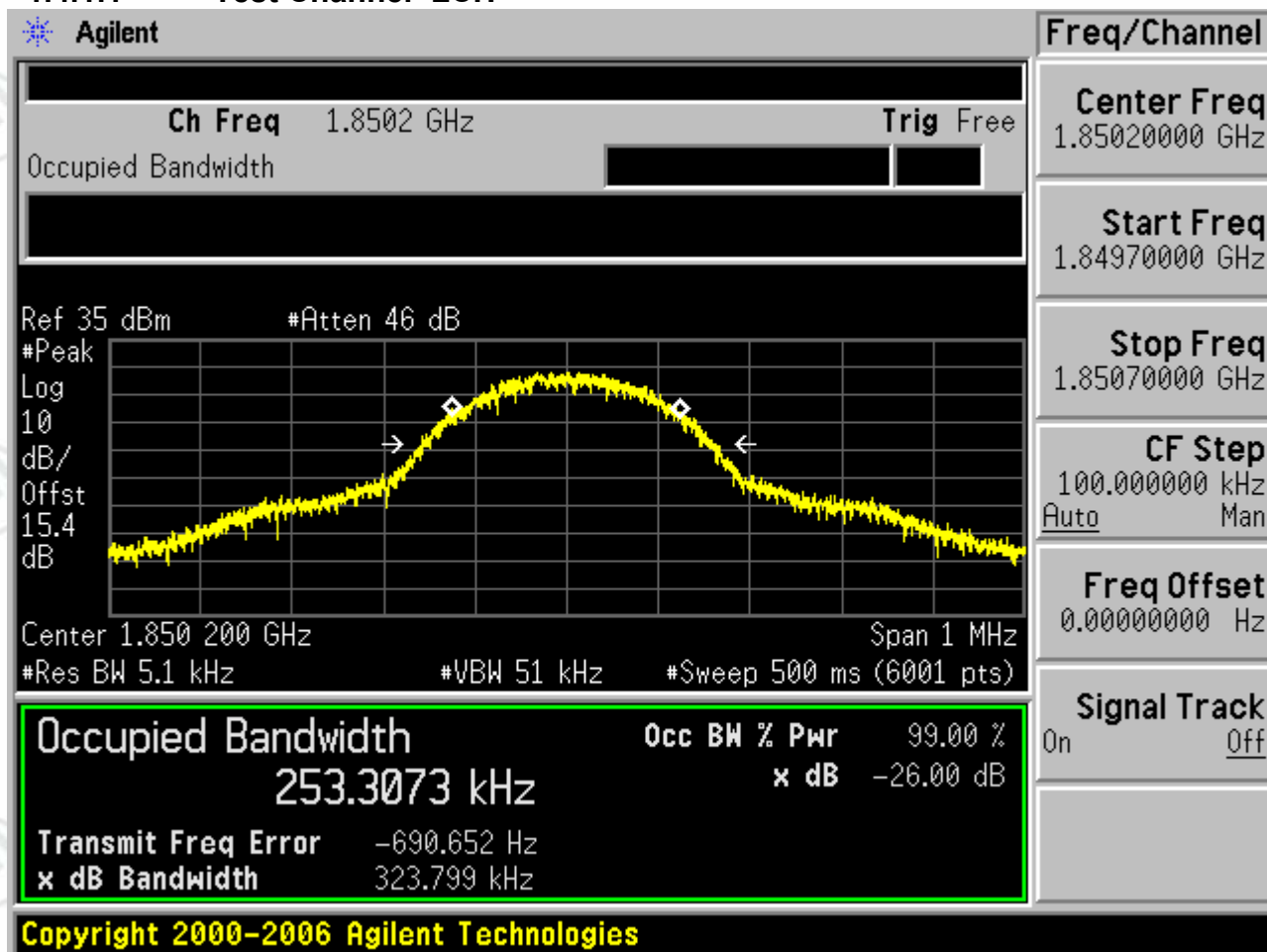


1.3.1.3 Test Channel=HCH

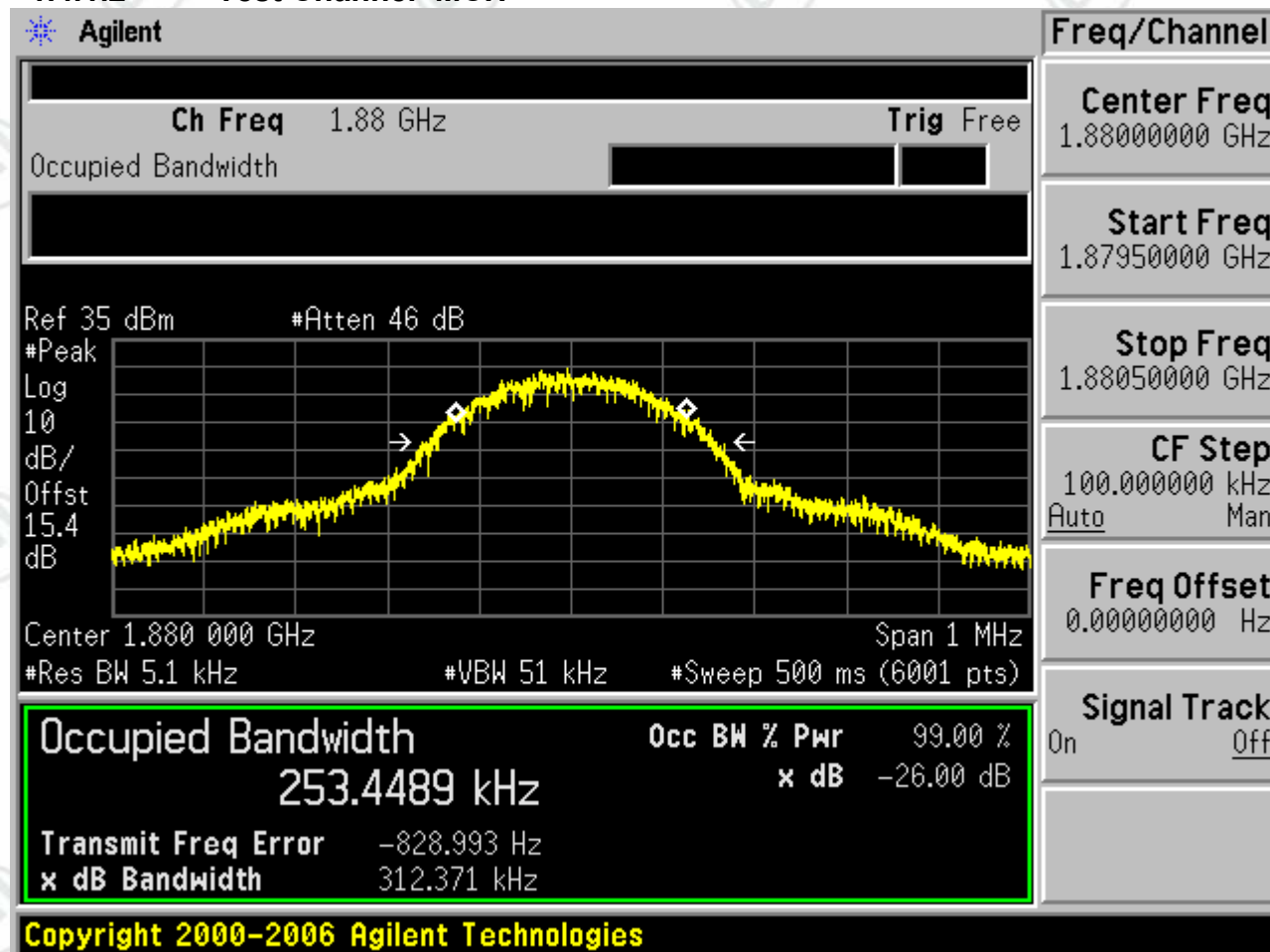


1.4 Test Mode=GSM/TM3

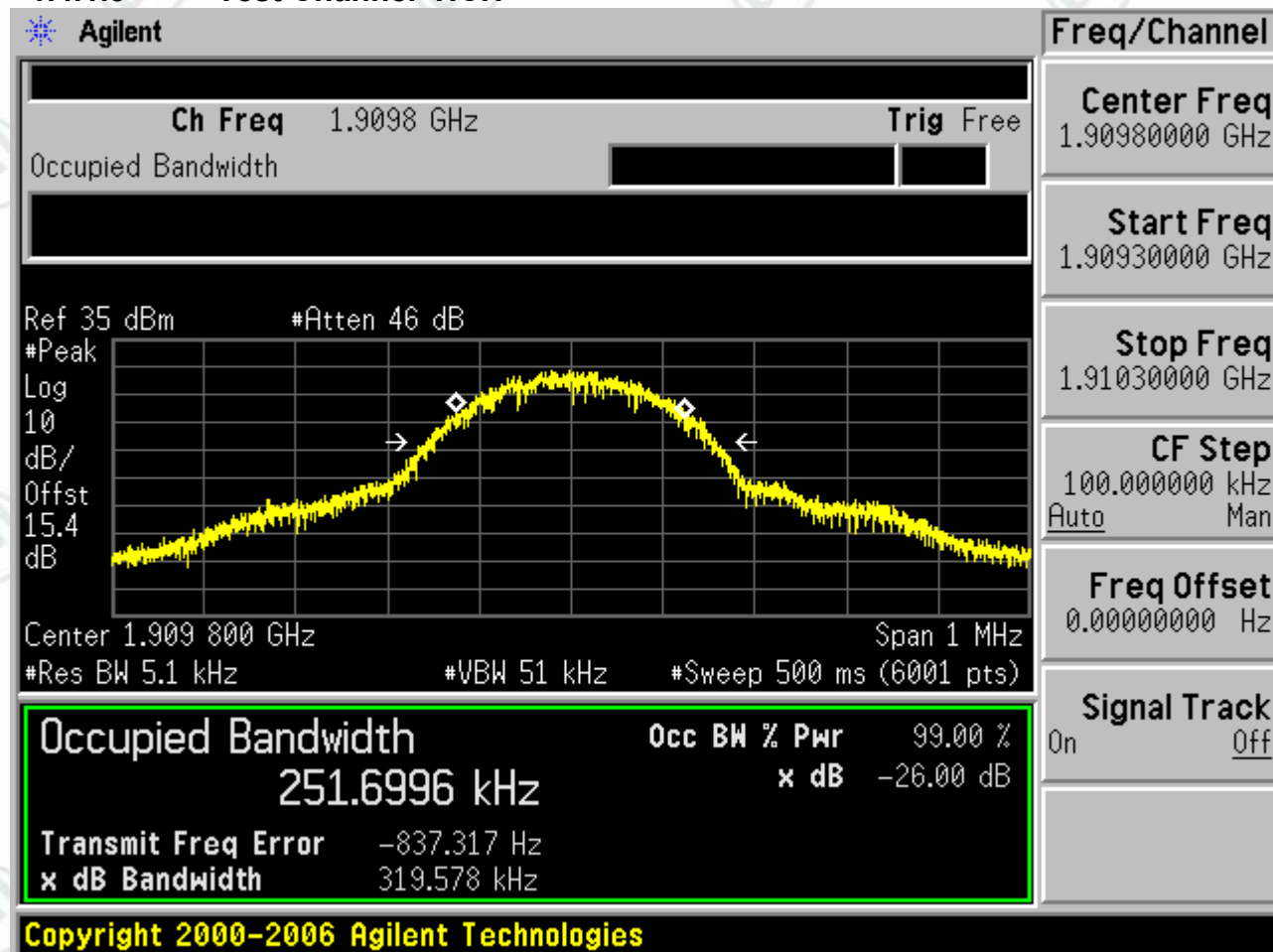
1.4.1.1 Test Channel=LCH



1.4.1.2 Test Channel=MCH



1.4.1.3 Test Channel=HCH



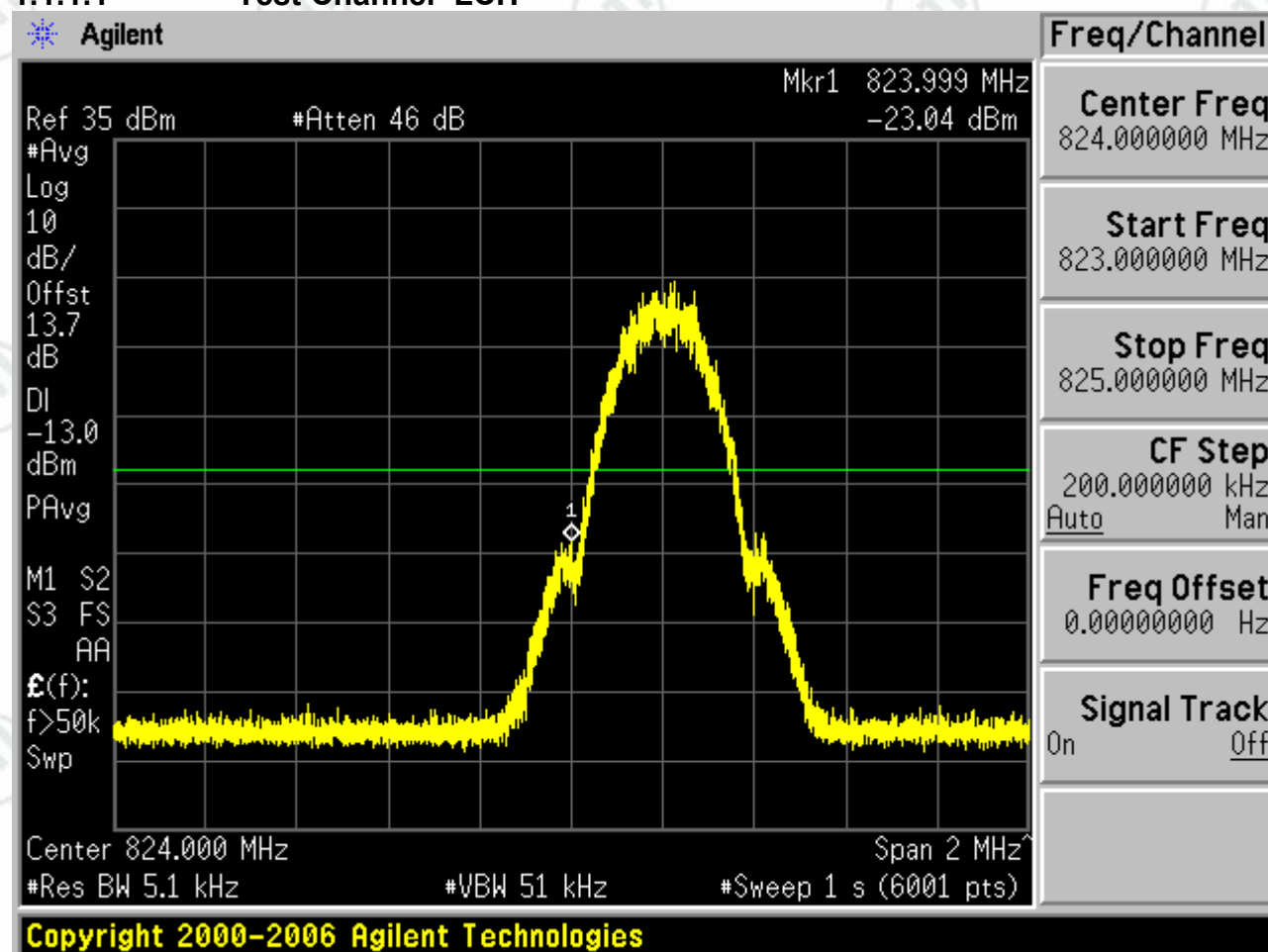
Appendix D) Band Edges Compliance

1 For GSM

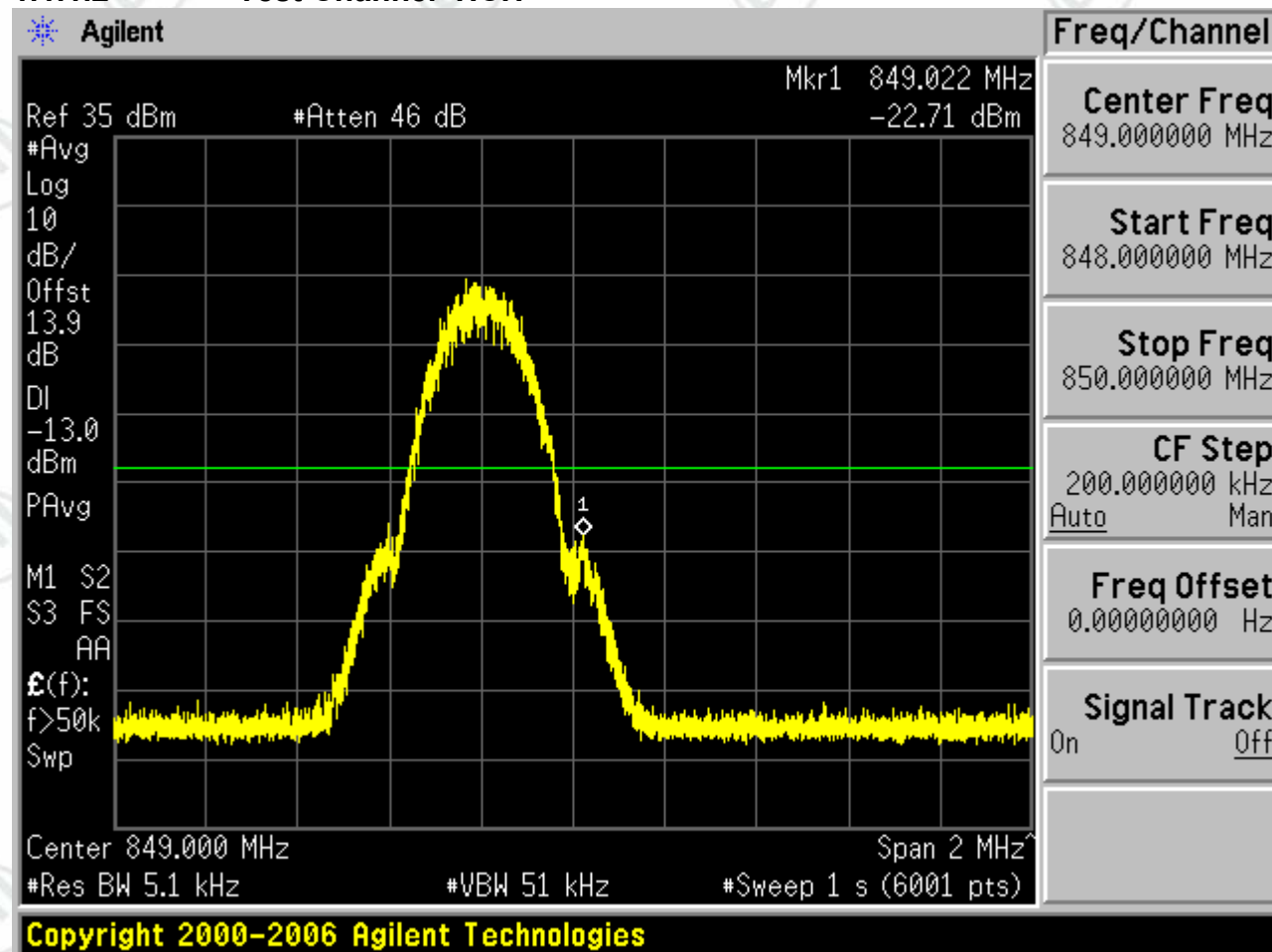
1.1 Test Band=GSM850

1.1.1 Test Mode=GSM/TM1

1.1.1.1 Test Channel=LCH

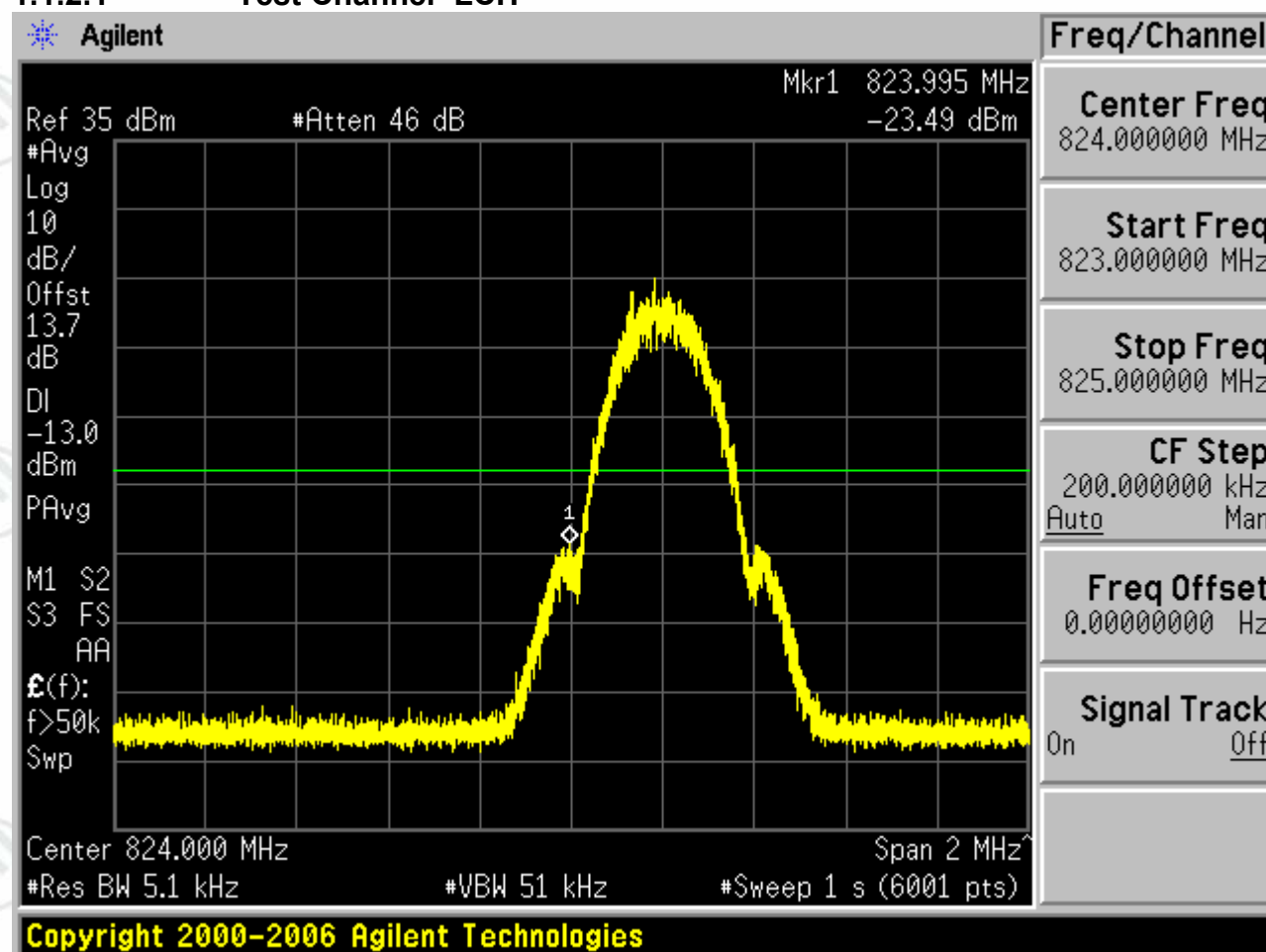


1.1.1.2 Test Channel=HCH

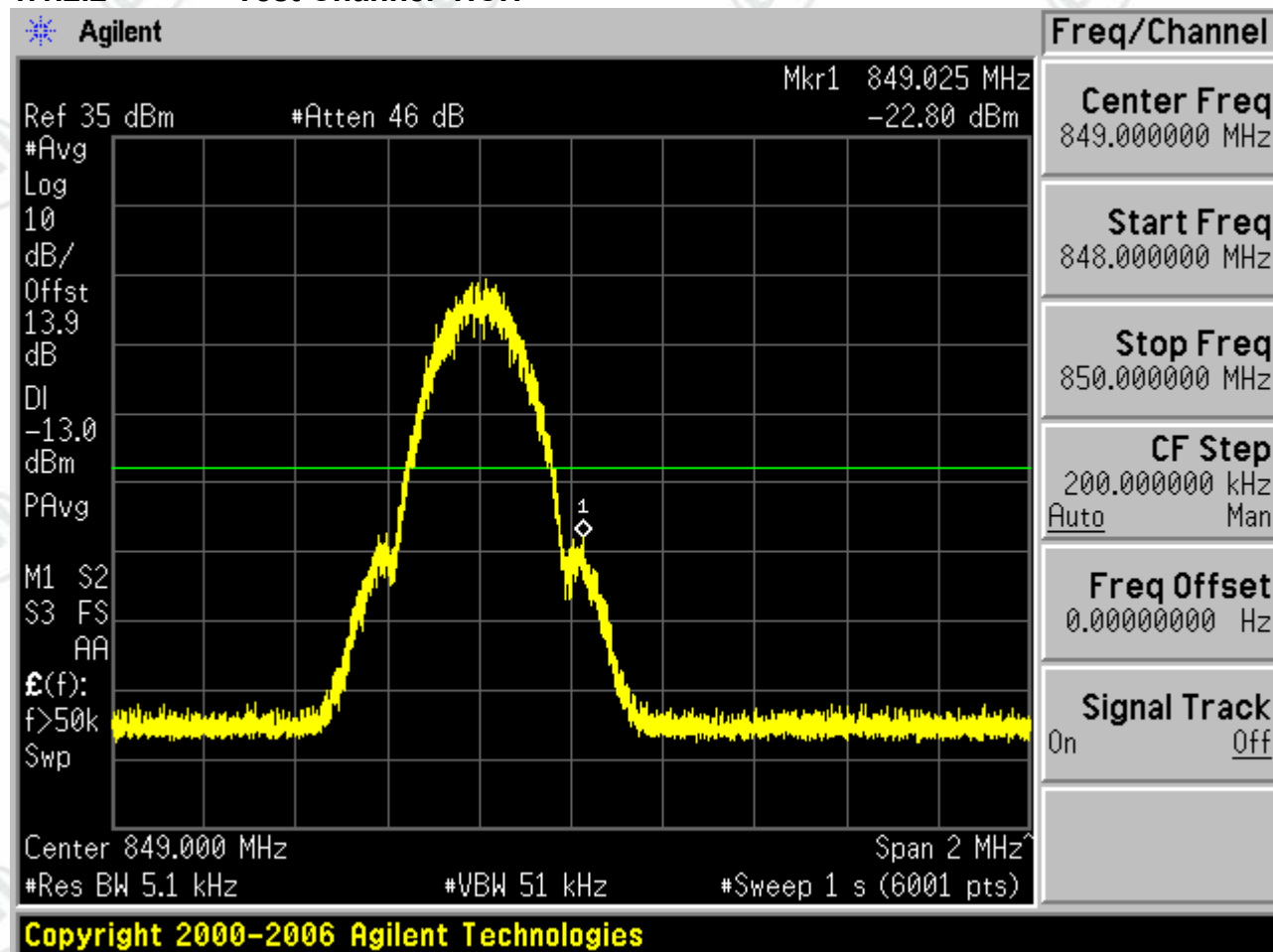


1.1.2 Test Mode=GSM/TM2

1.1.2.1 Test Channel=LCH

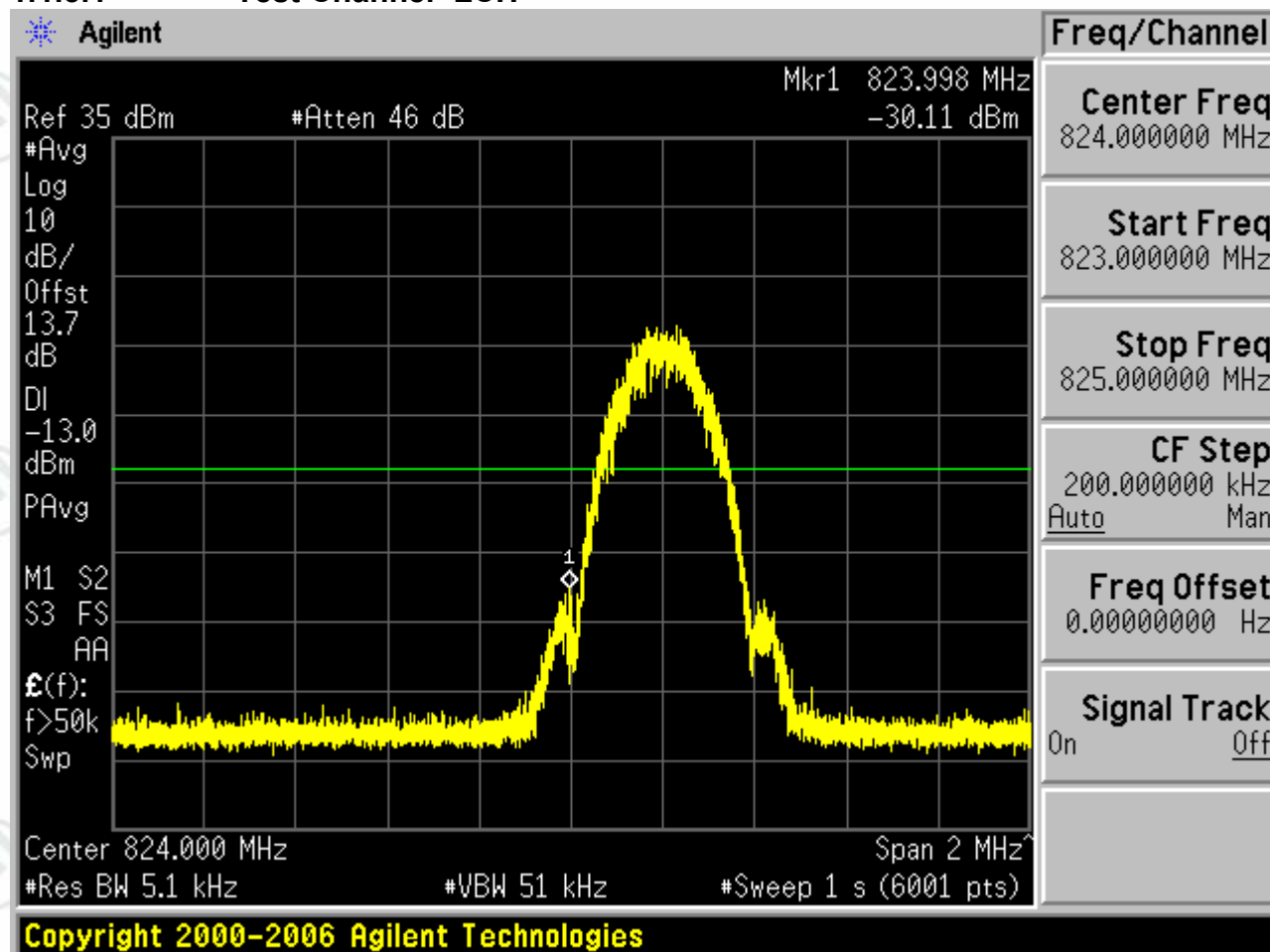


1.1.2.2 Test Channel=HCH

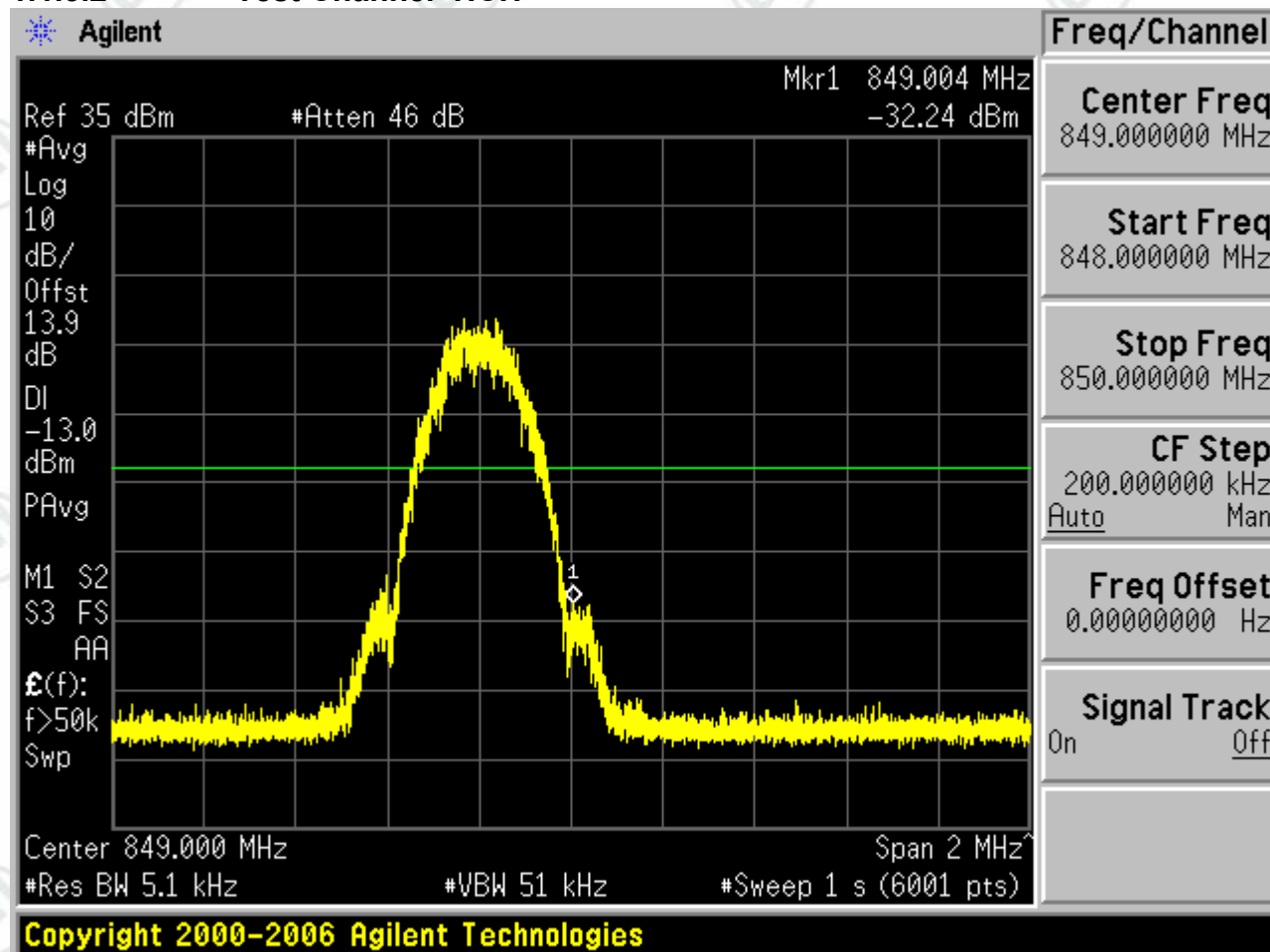


1.1.3 Test Mode=GSM/TM3

1.1.3.1 Test Channel=LCH



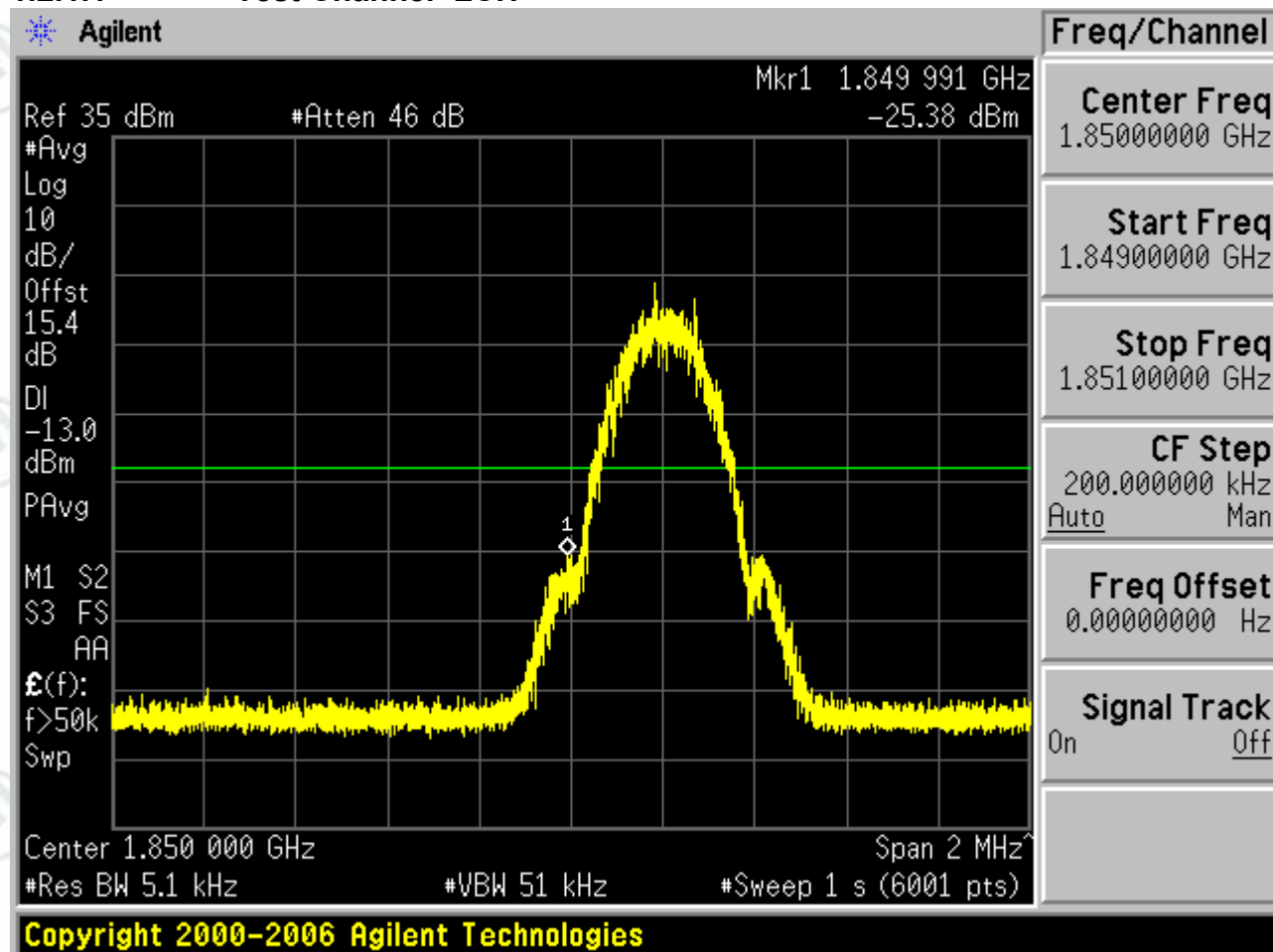
1.1.3.2 Test Channel=HCH



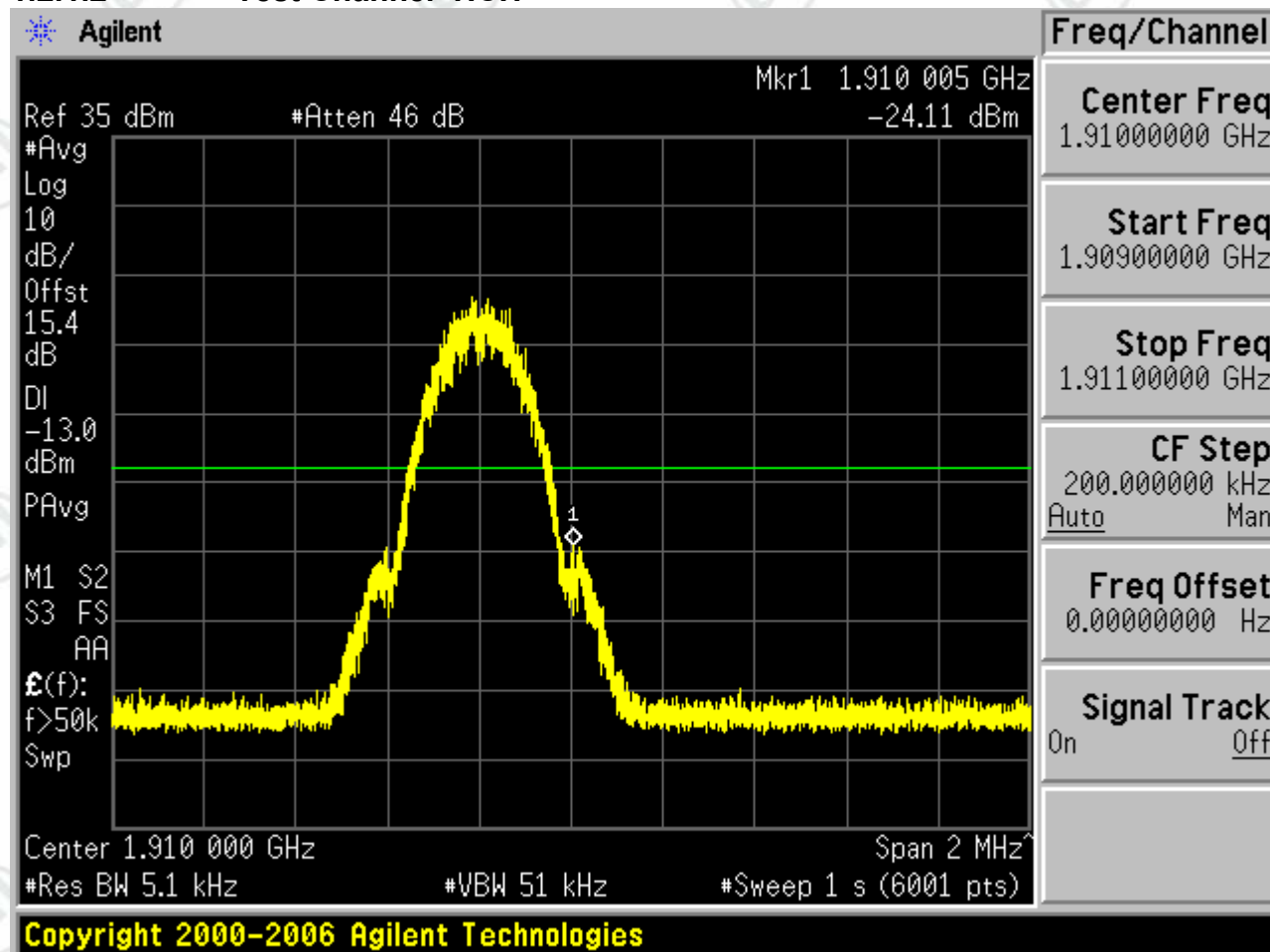
1.2 Test Band=GSM1900

1.2.1 Test Mode=GSM/TM1

1.2.1.1 Test Channel=LCH

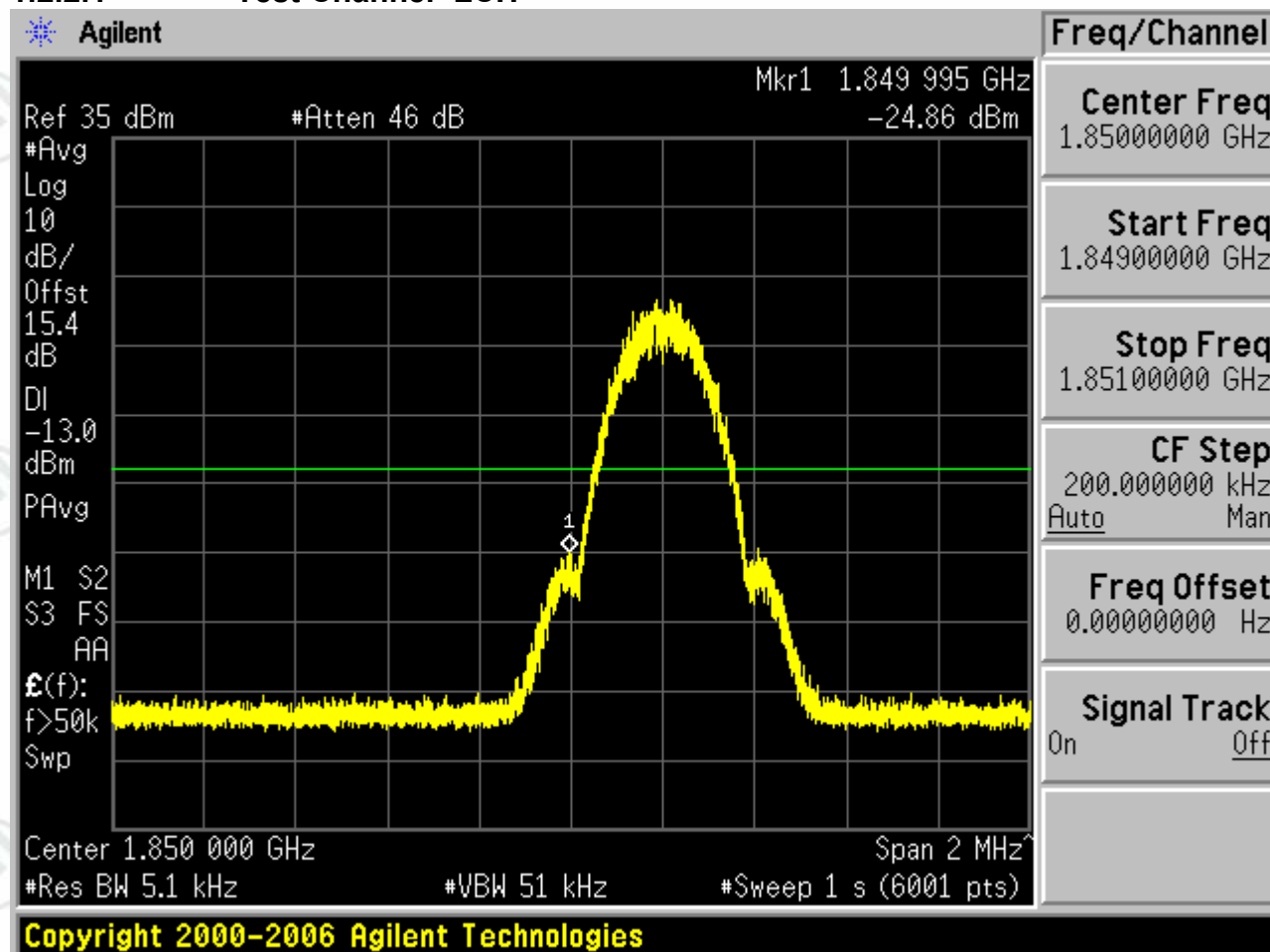


1.2.1.2 Test Channel=HCH

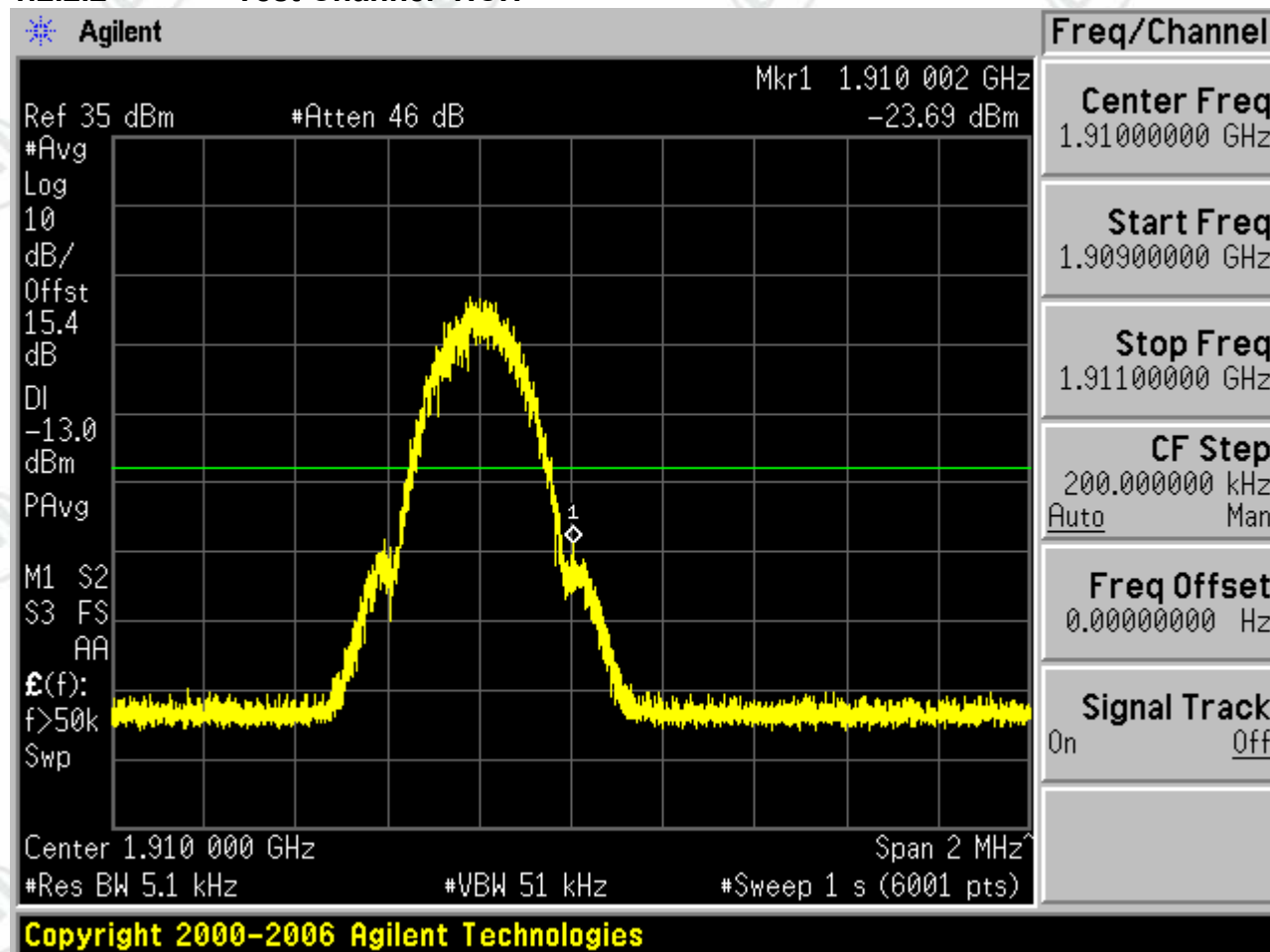


1.2.2 Test Mode=GSM/TM2

1.2.2.1 Test Channel=LCH

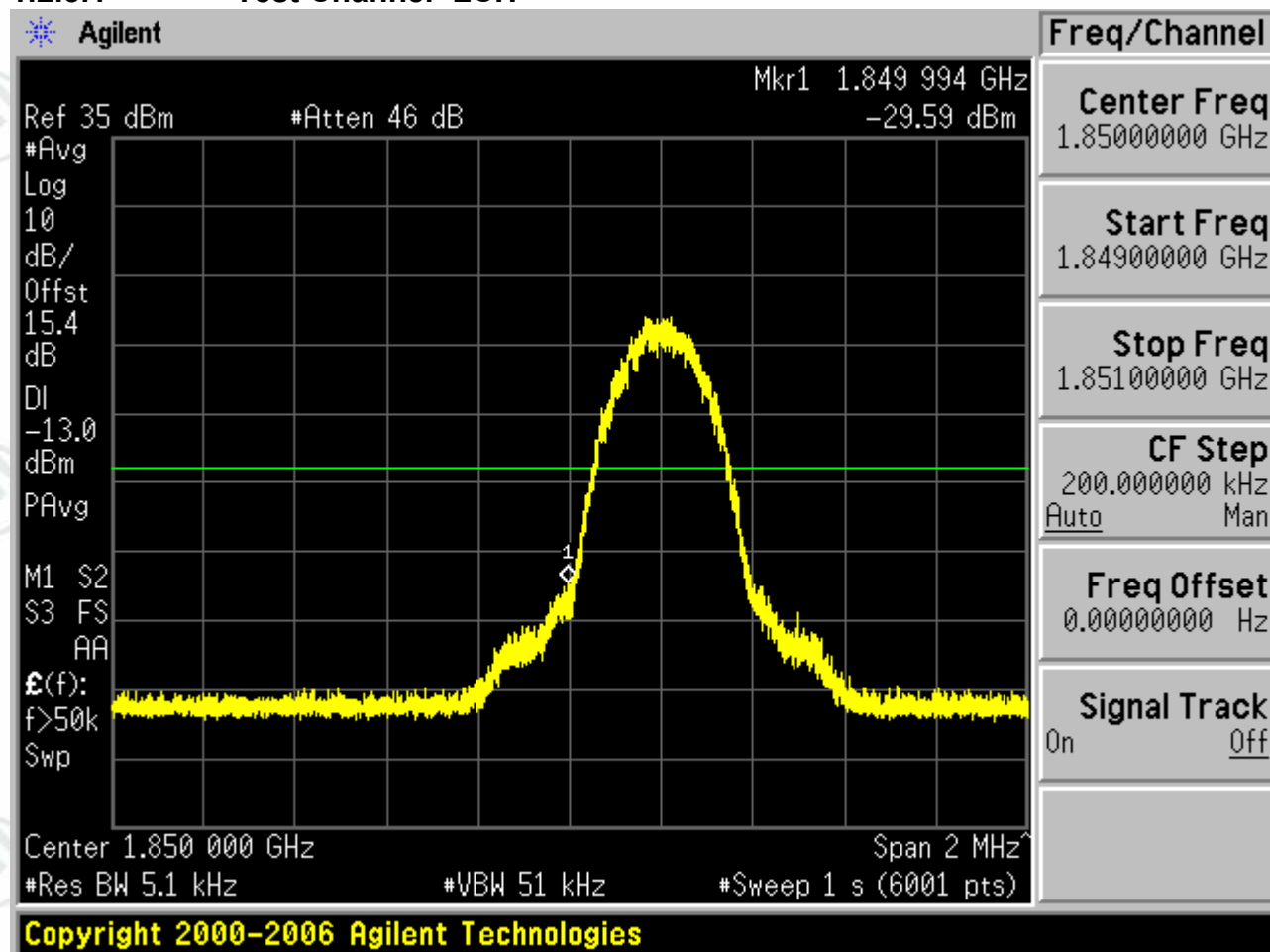


1.2.2.2 Test Channel=HCH

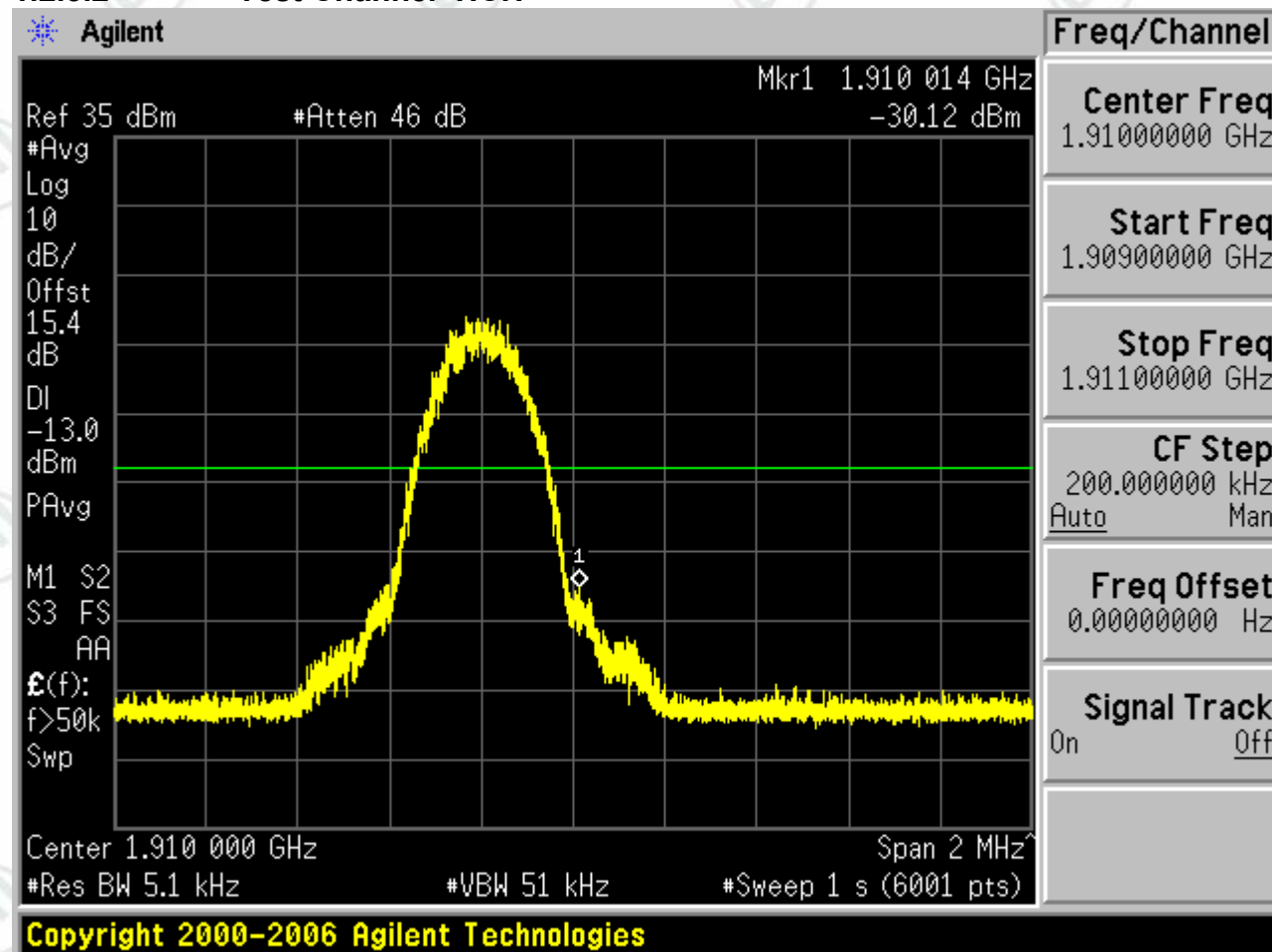


1.2.3 Test Mode=GSM/TM3

1.2.3.1 Test Channel=LCH

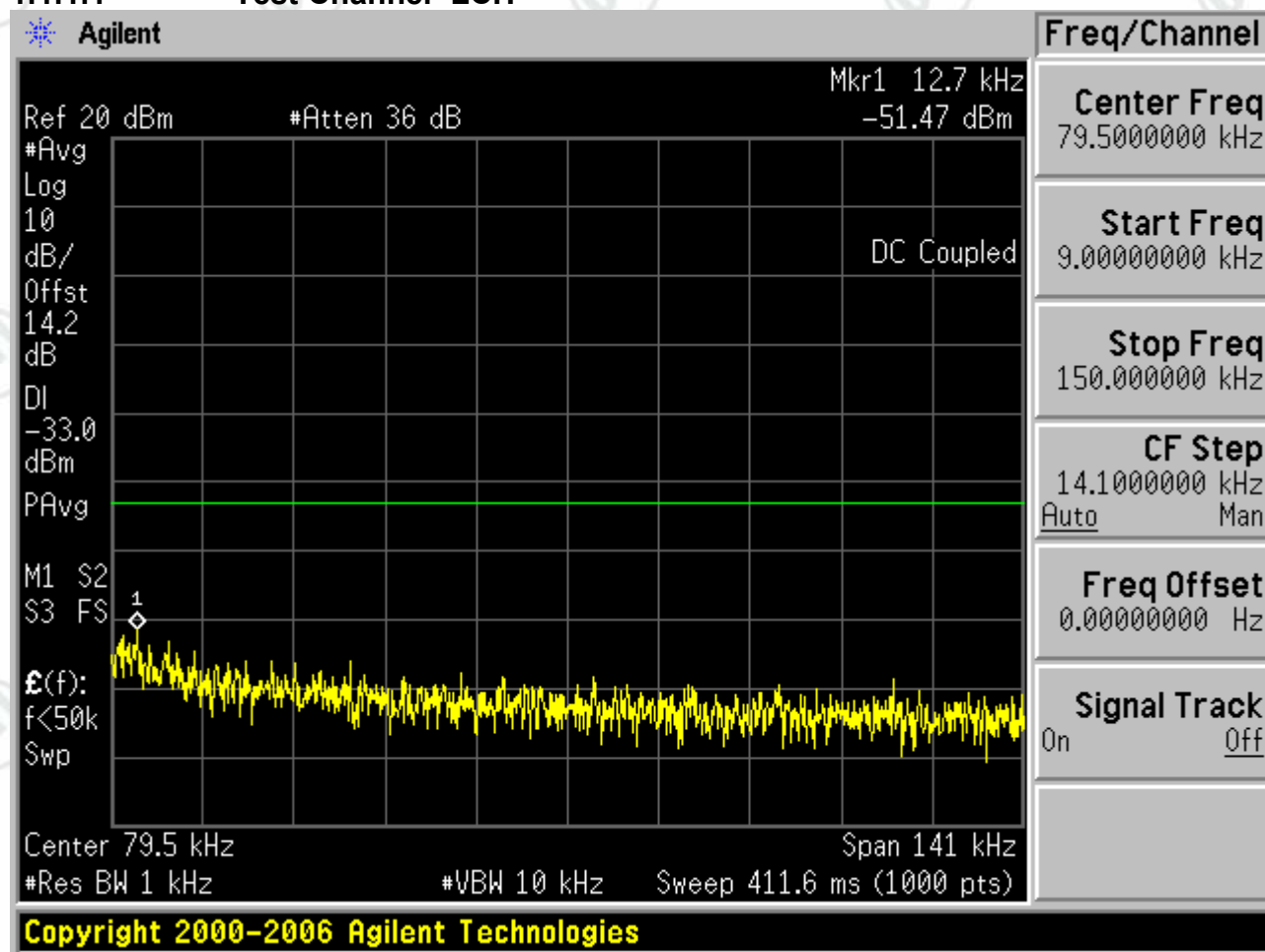


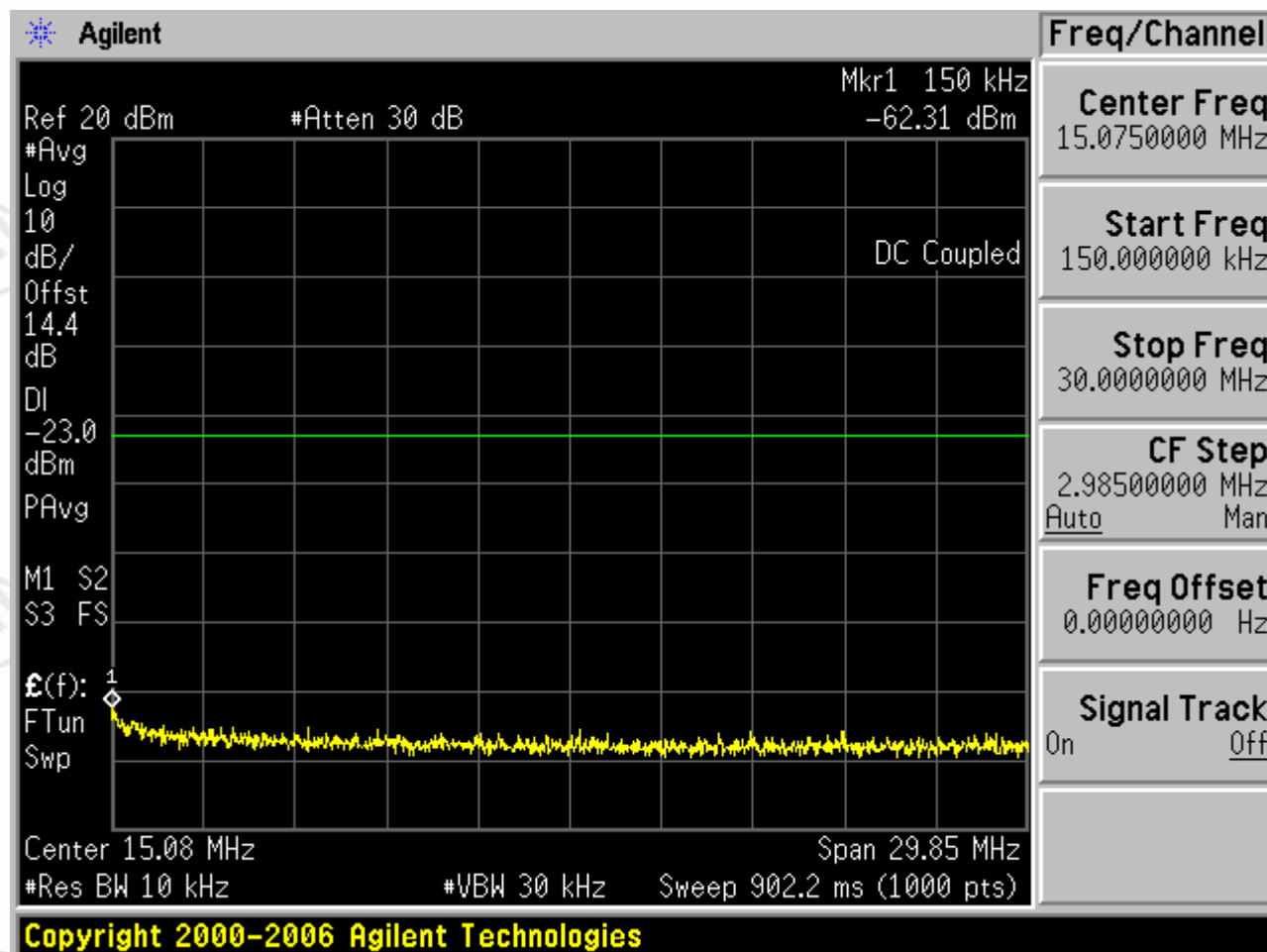
1.2.3.2 Test Channel=HCH

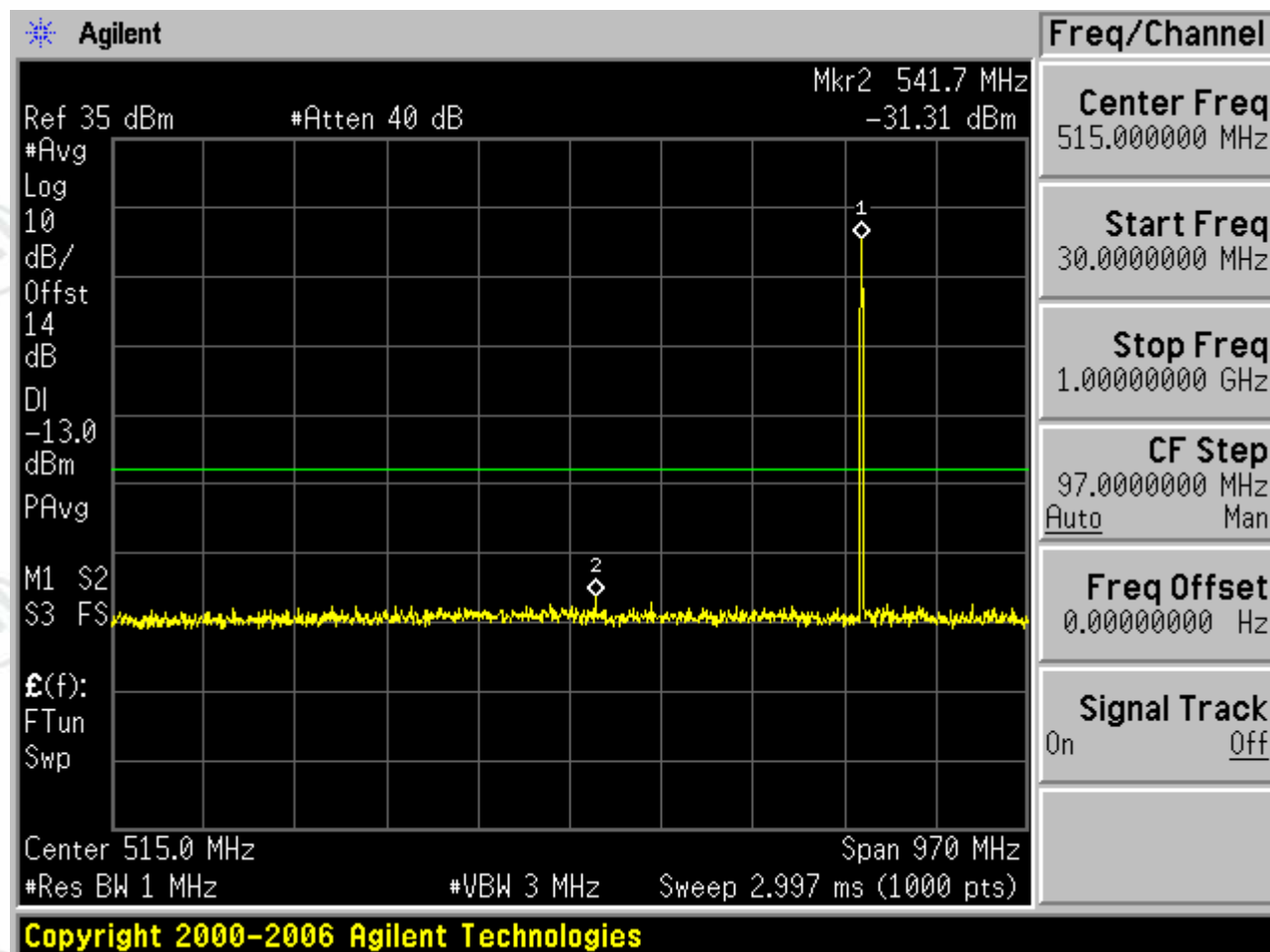


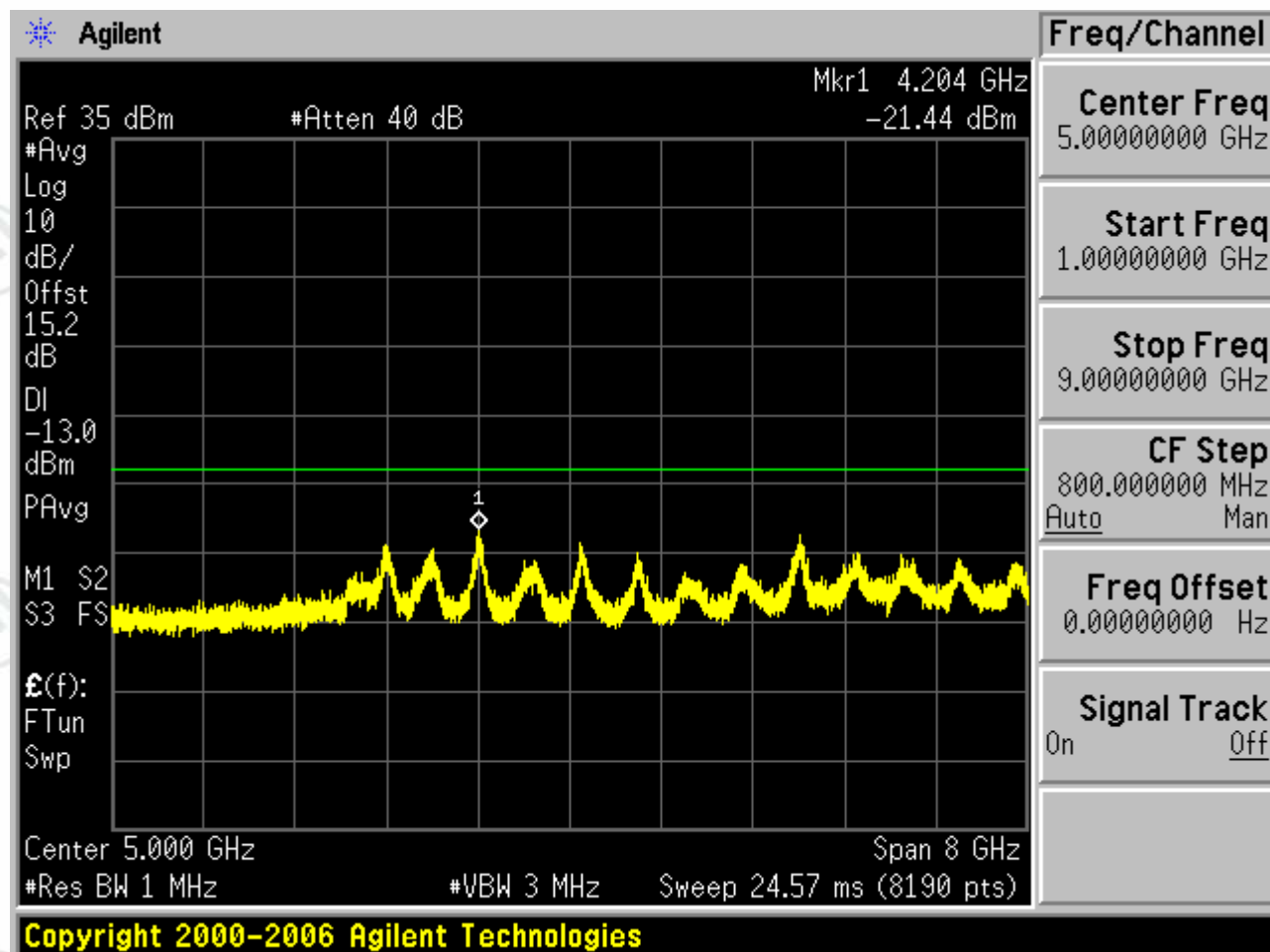
Appendix E) Spurious Emission at Antenna Terminal

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

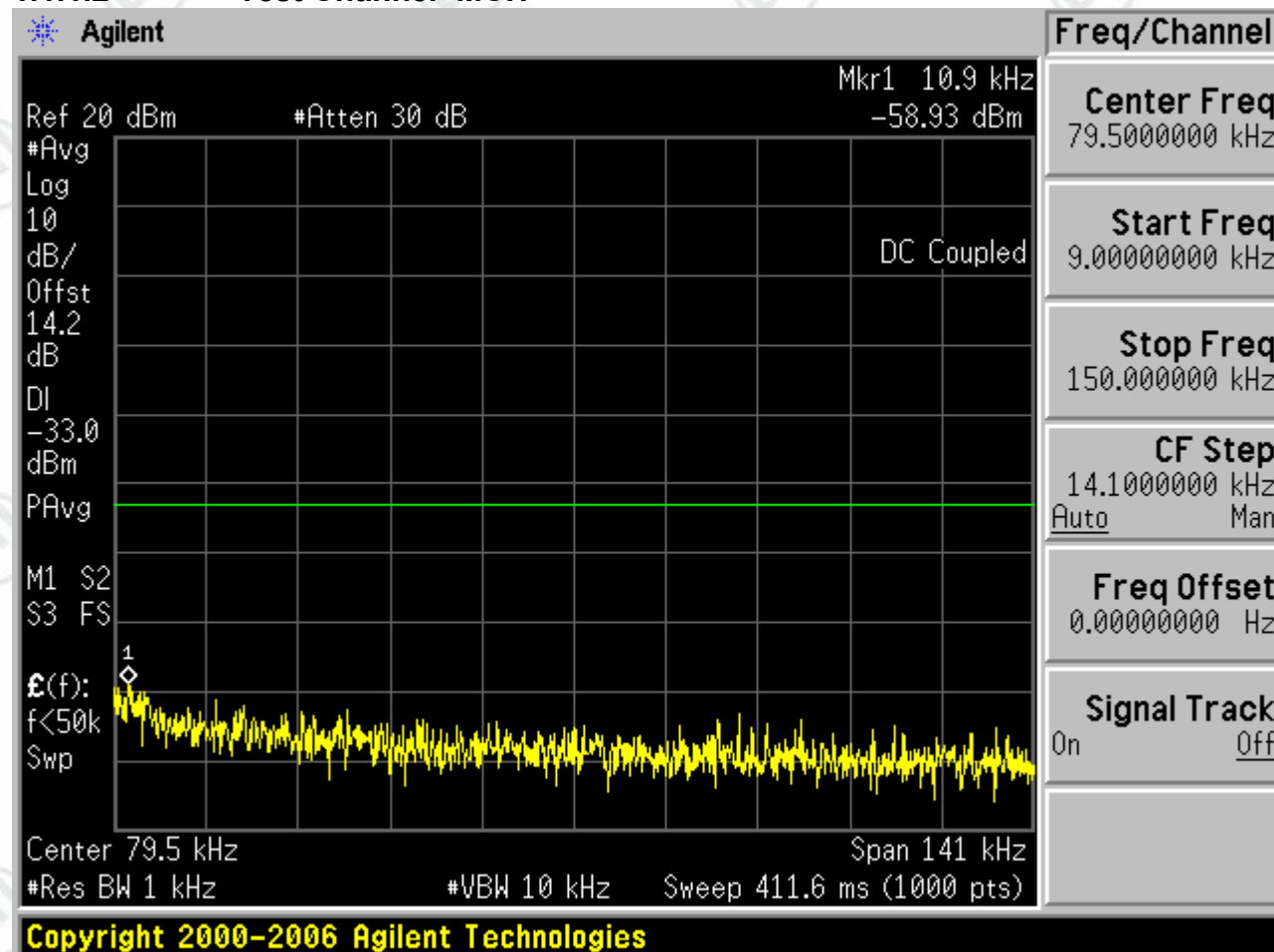


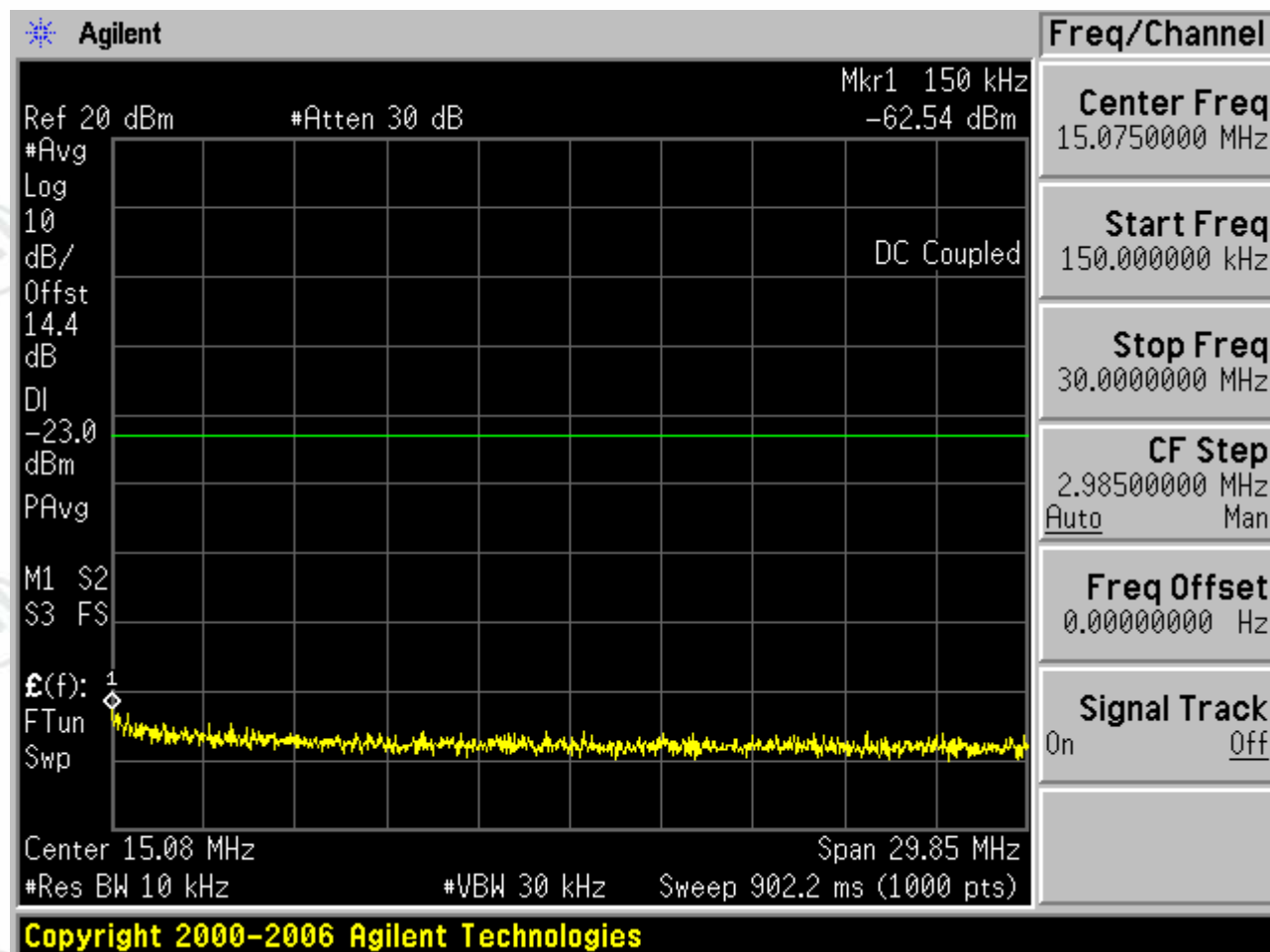


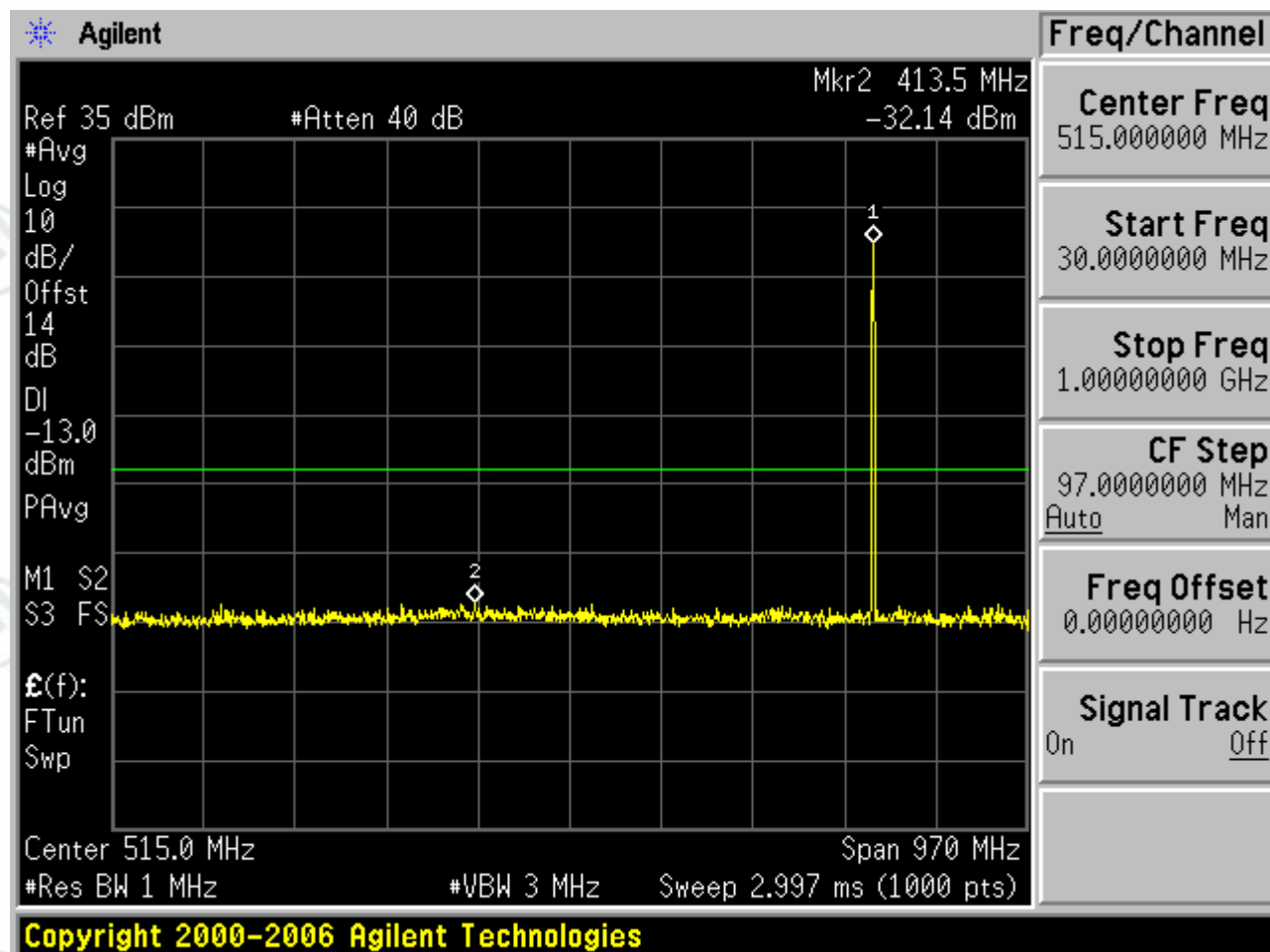


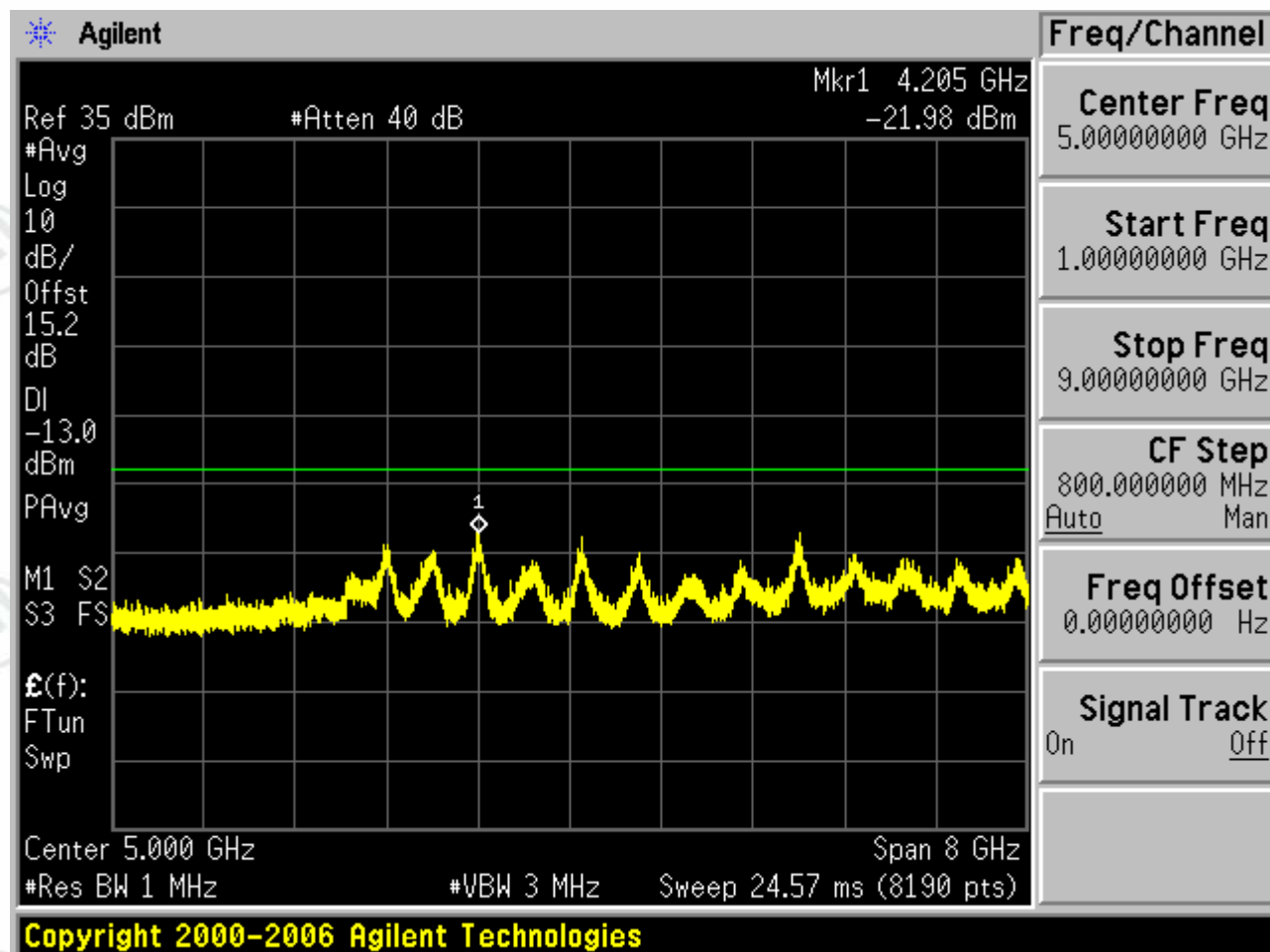


1.1.1.2 Test Channel=MCH

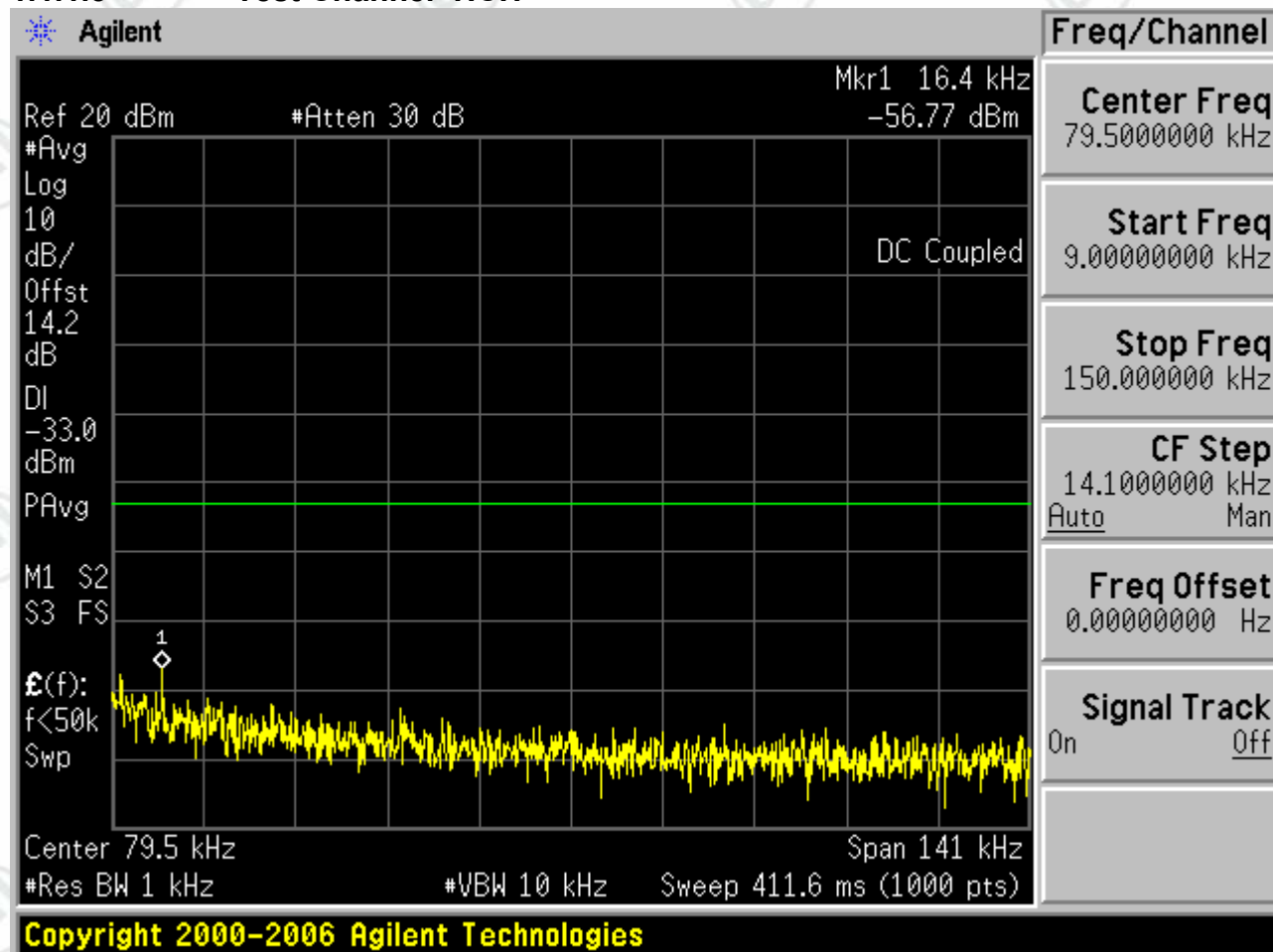


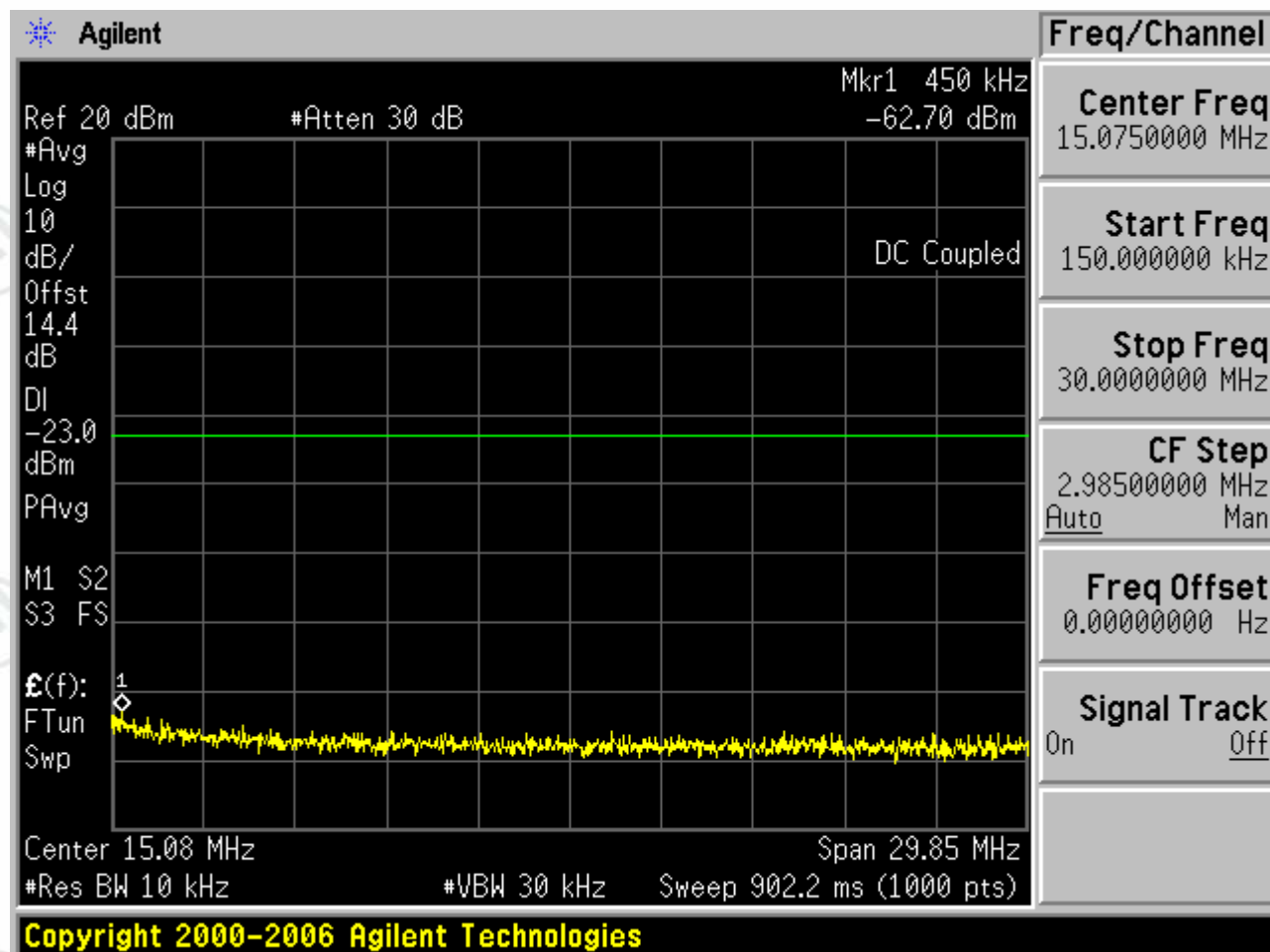


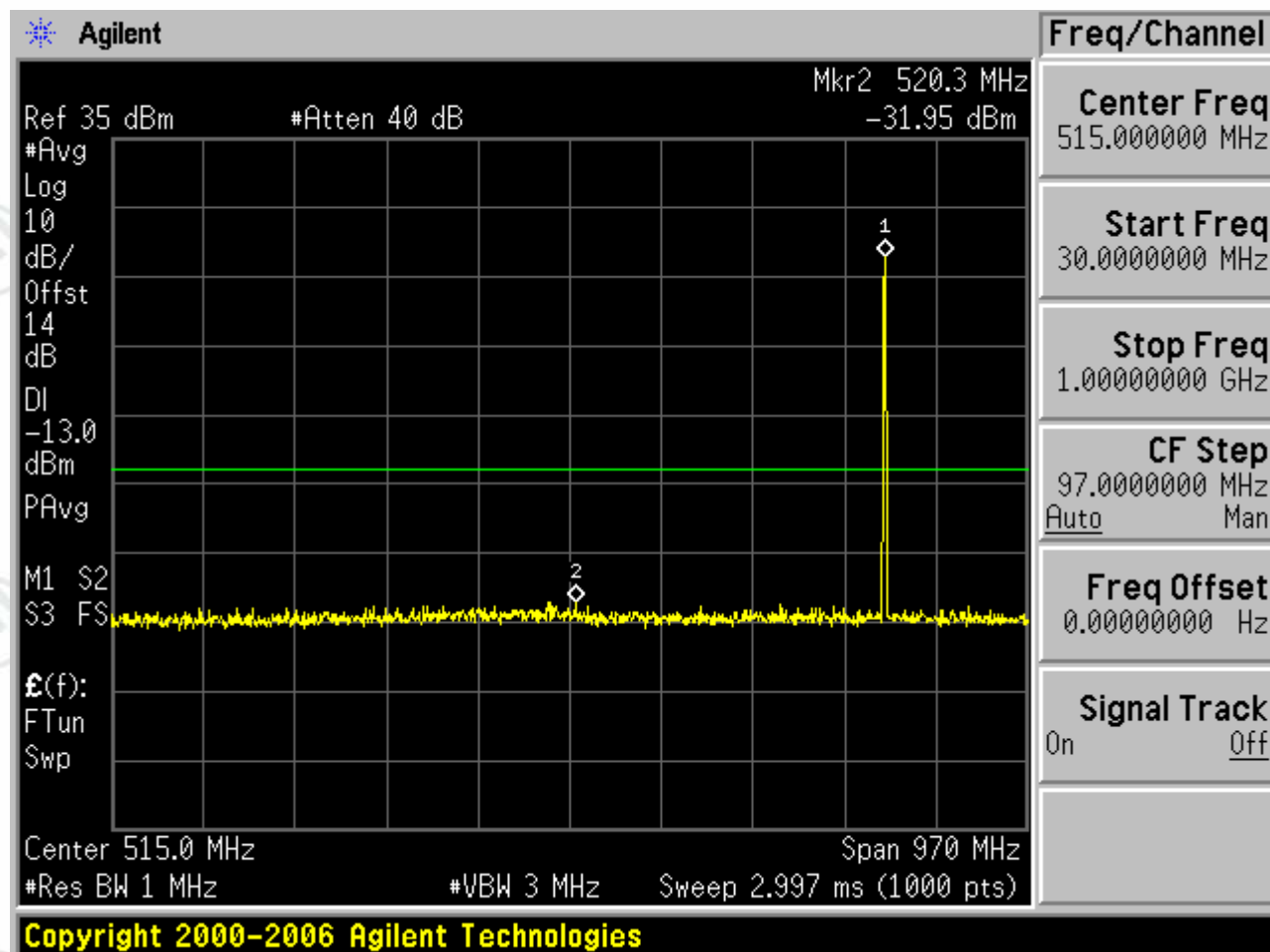


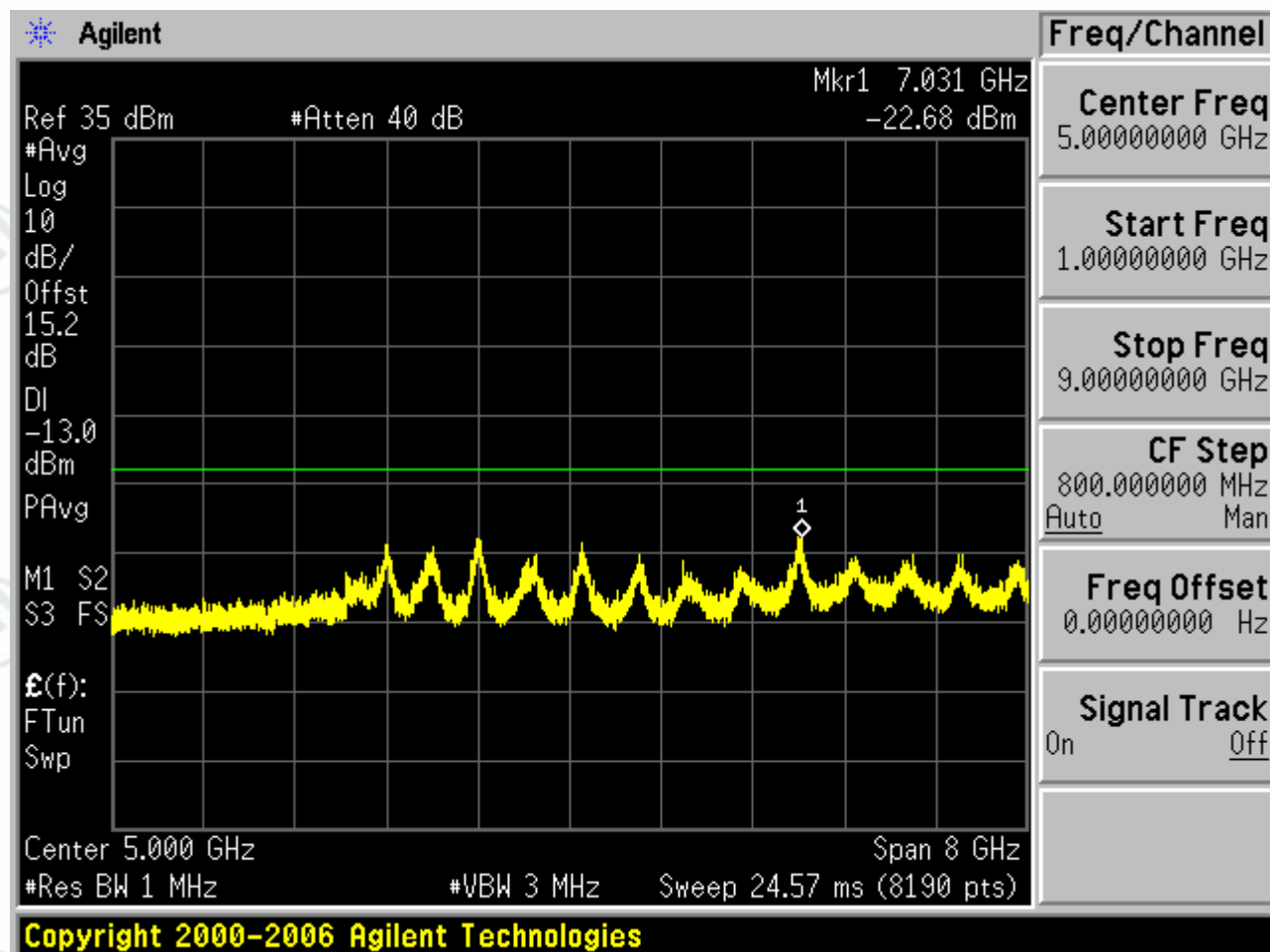


1.1.1.3 Test Channel=HCH



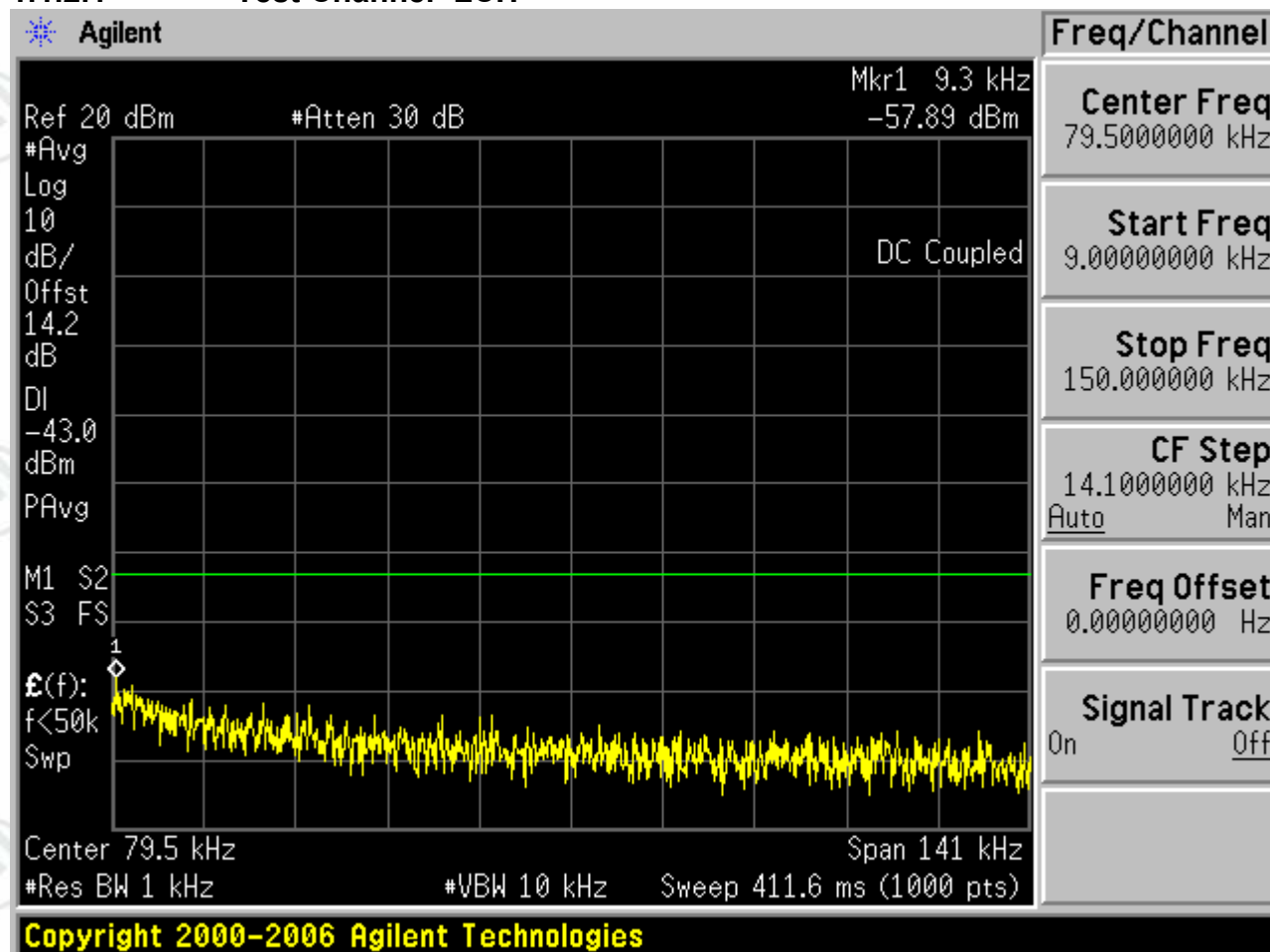


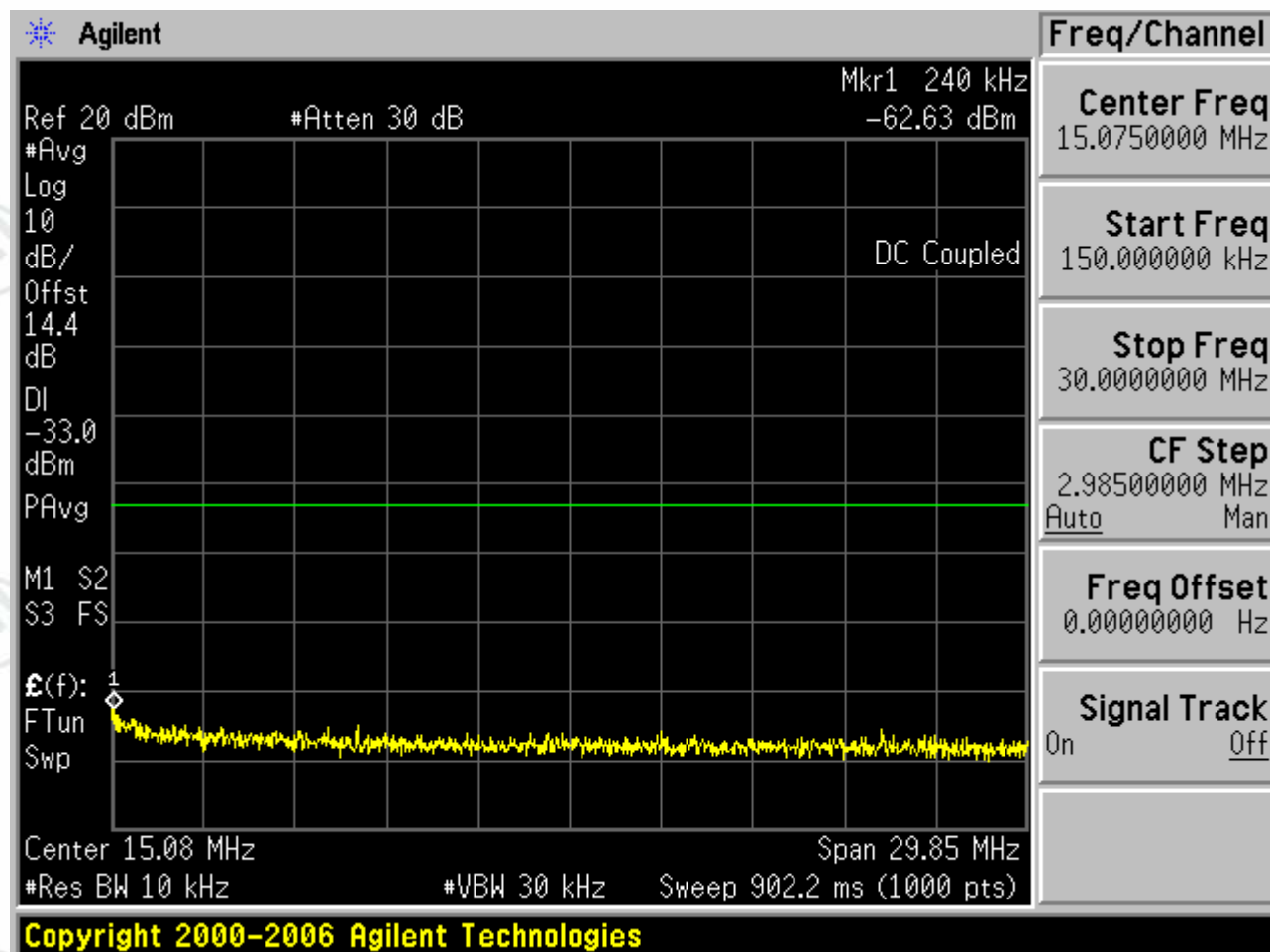


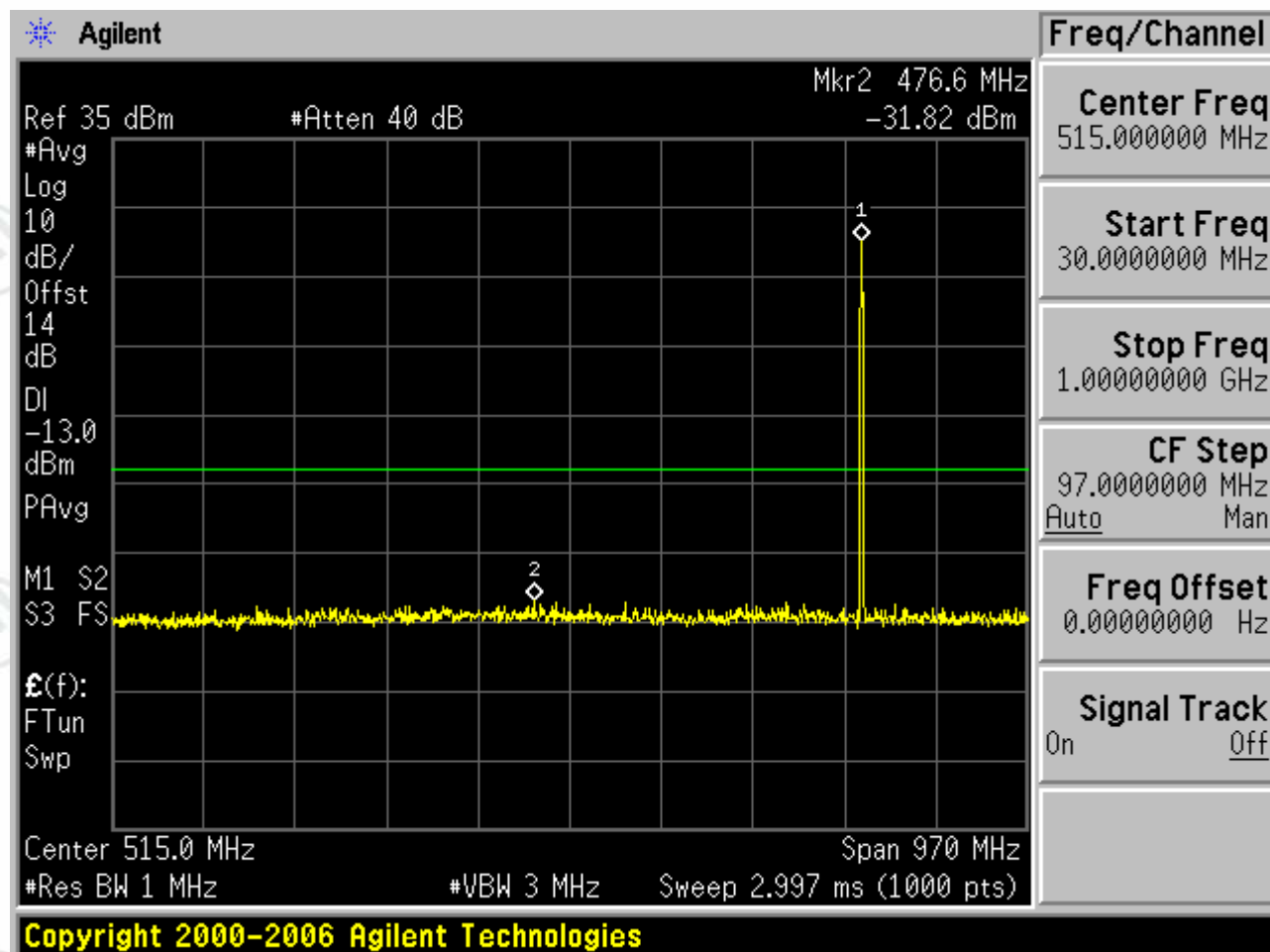


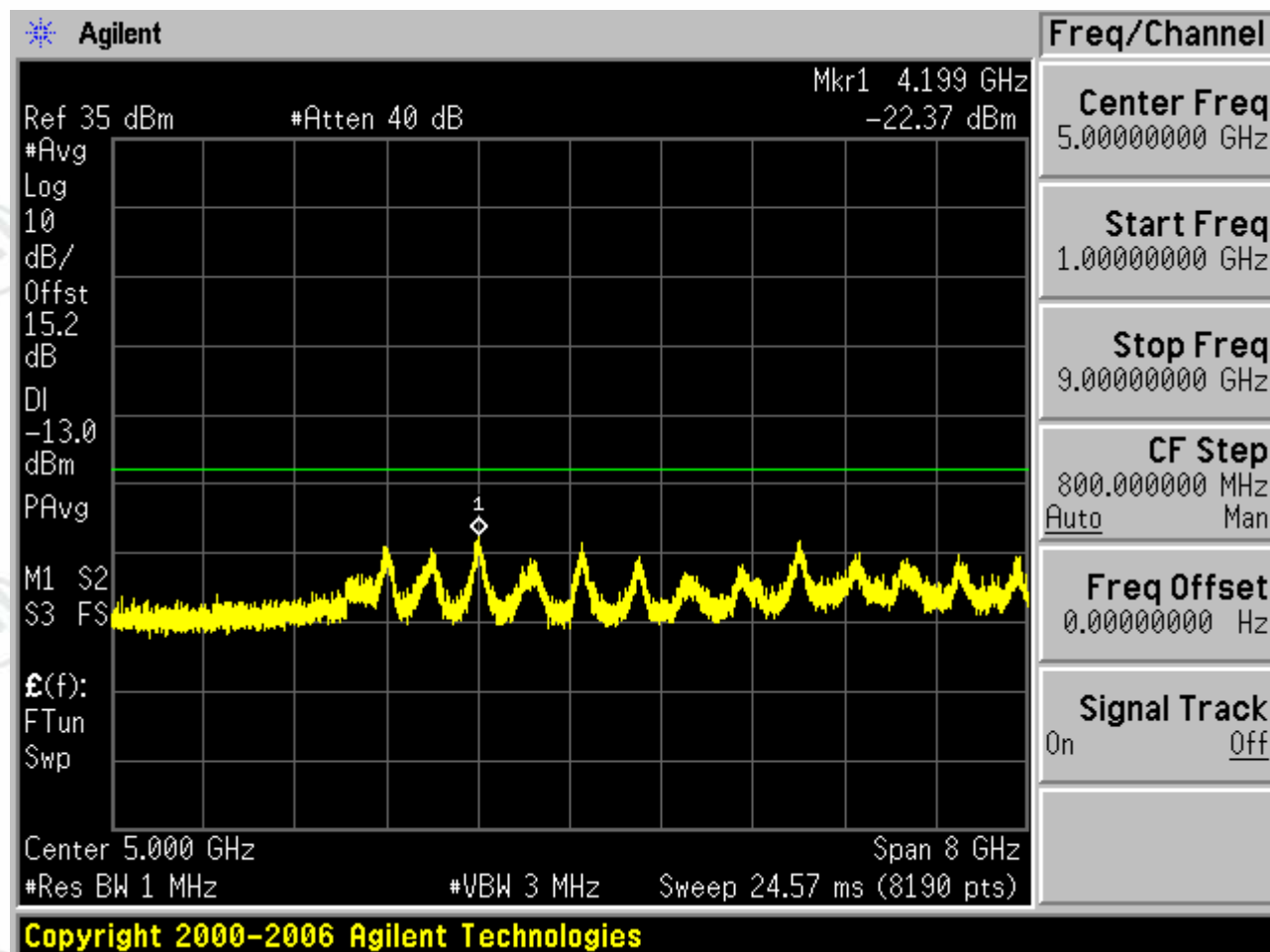
1.1.2 Test Mode=GSM/TM2

1.1.2.1 Test Channel=LCH

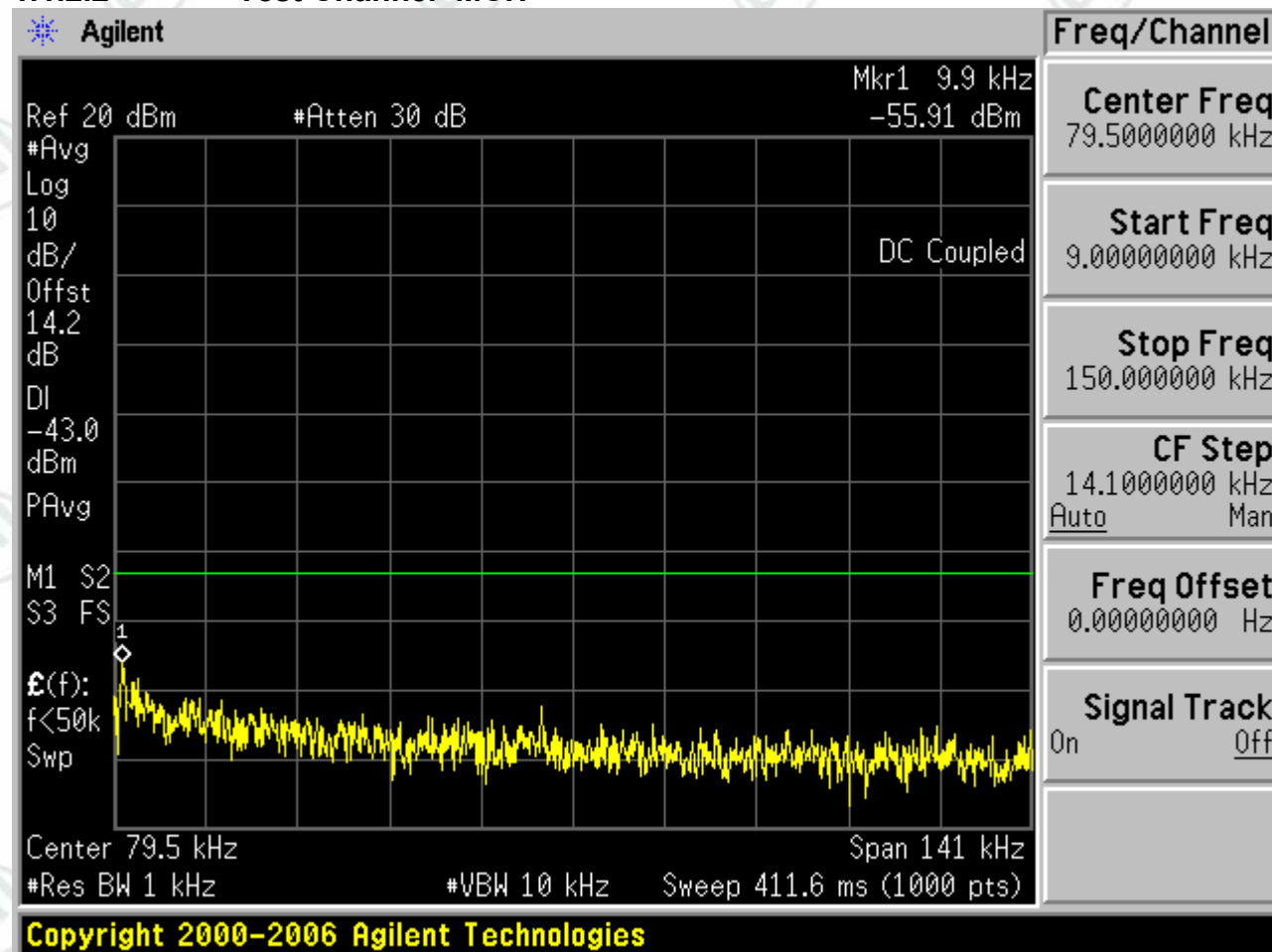


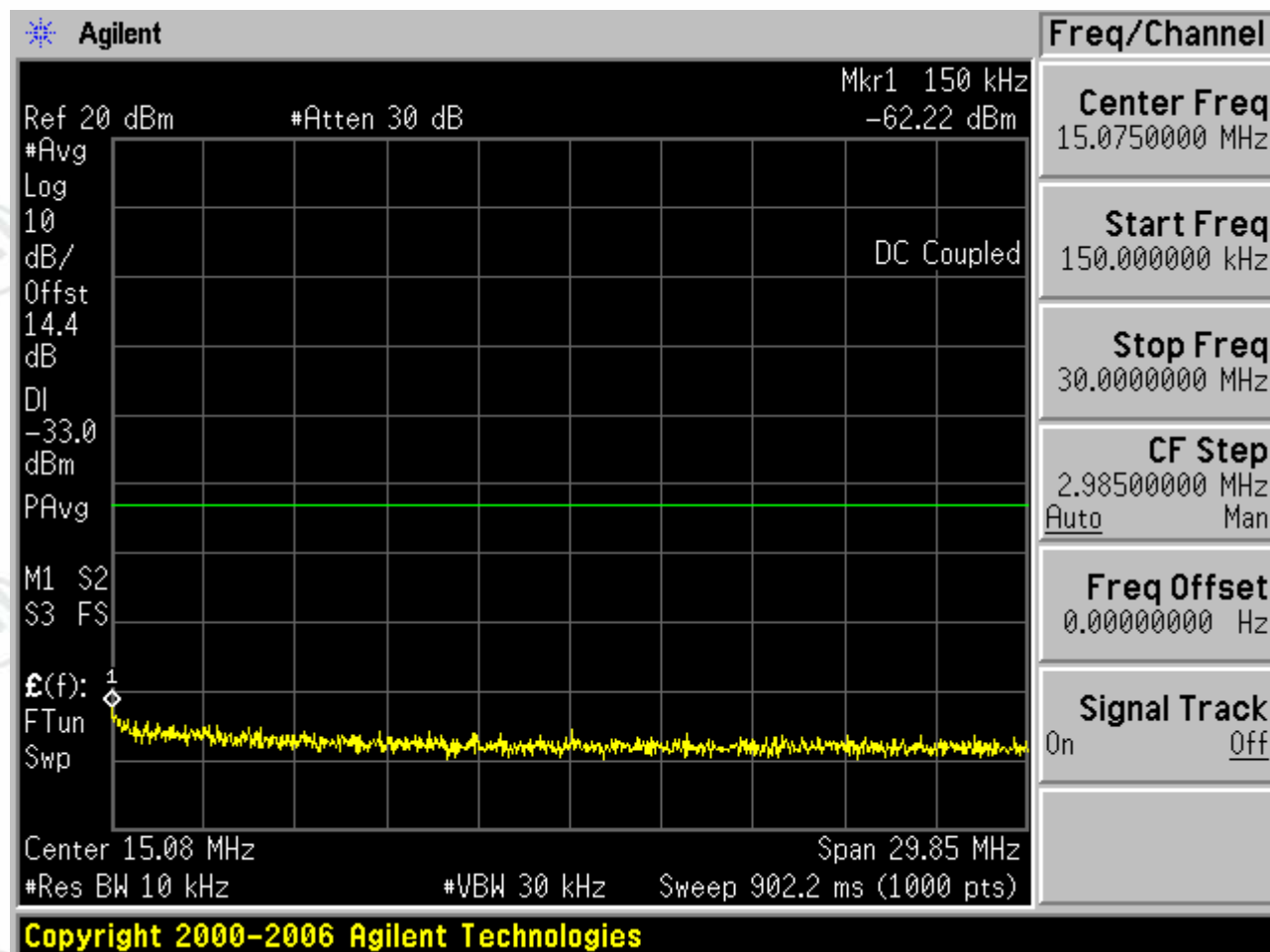


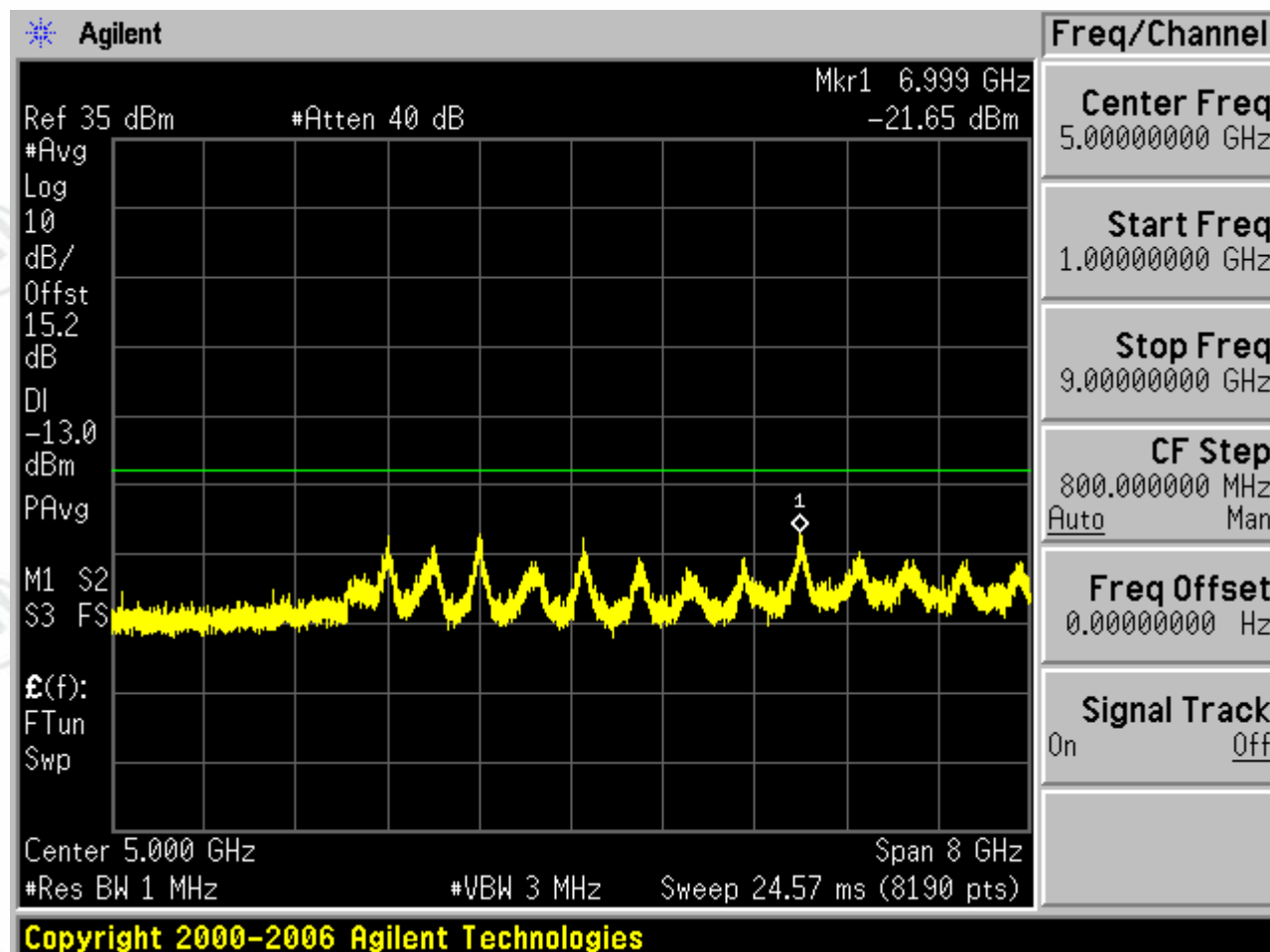




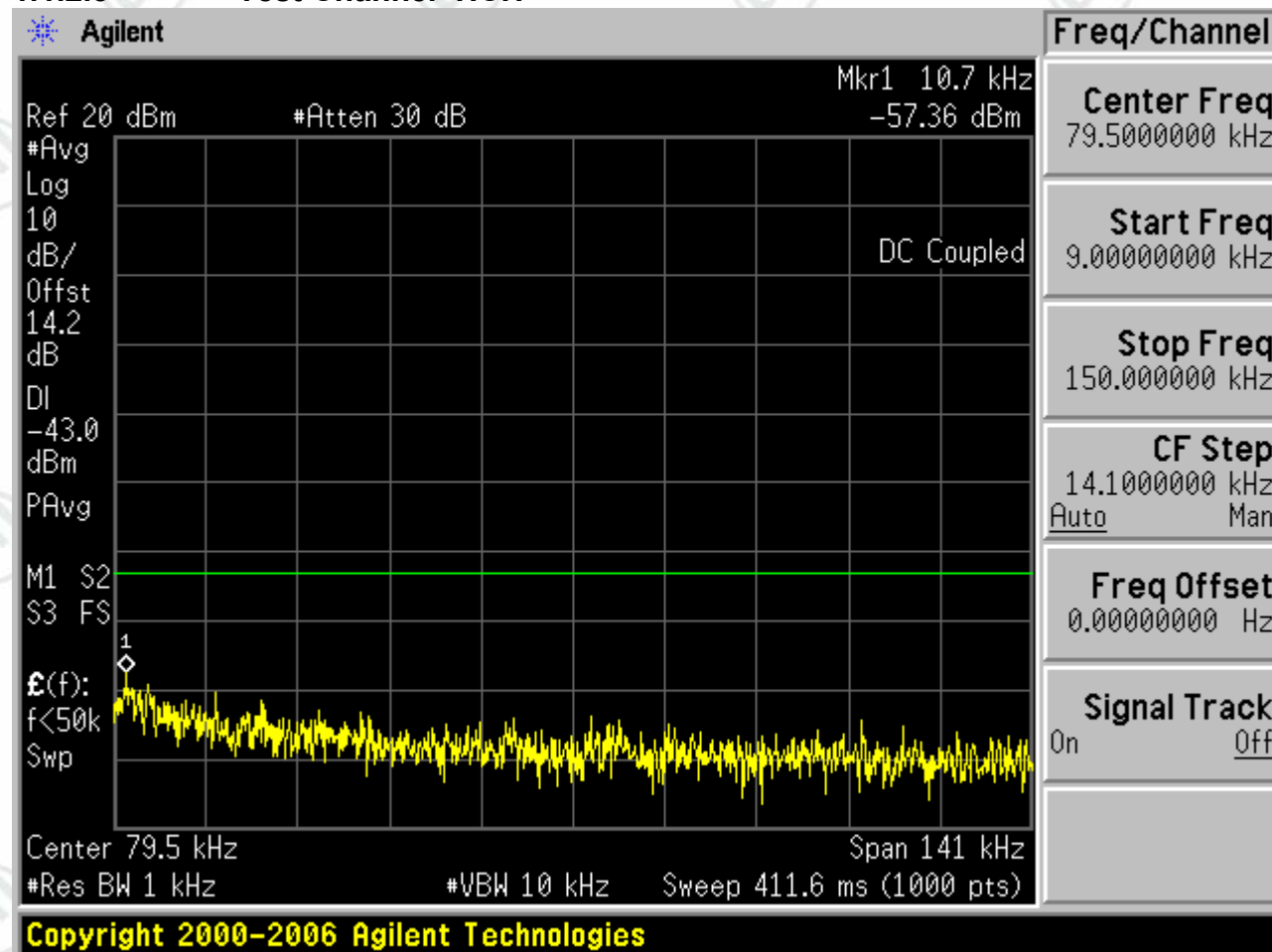
1.1.2.2 Test Channel=MCH

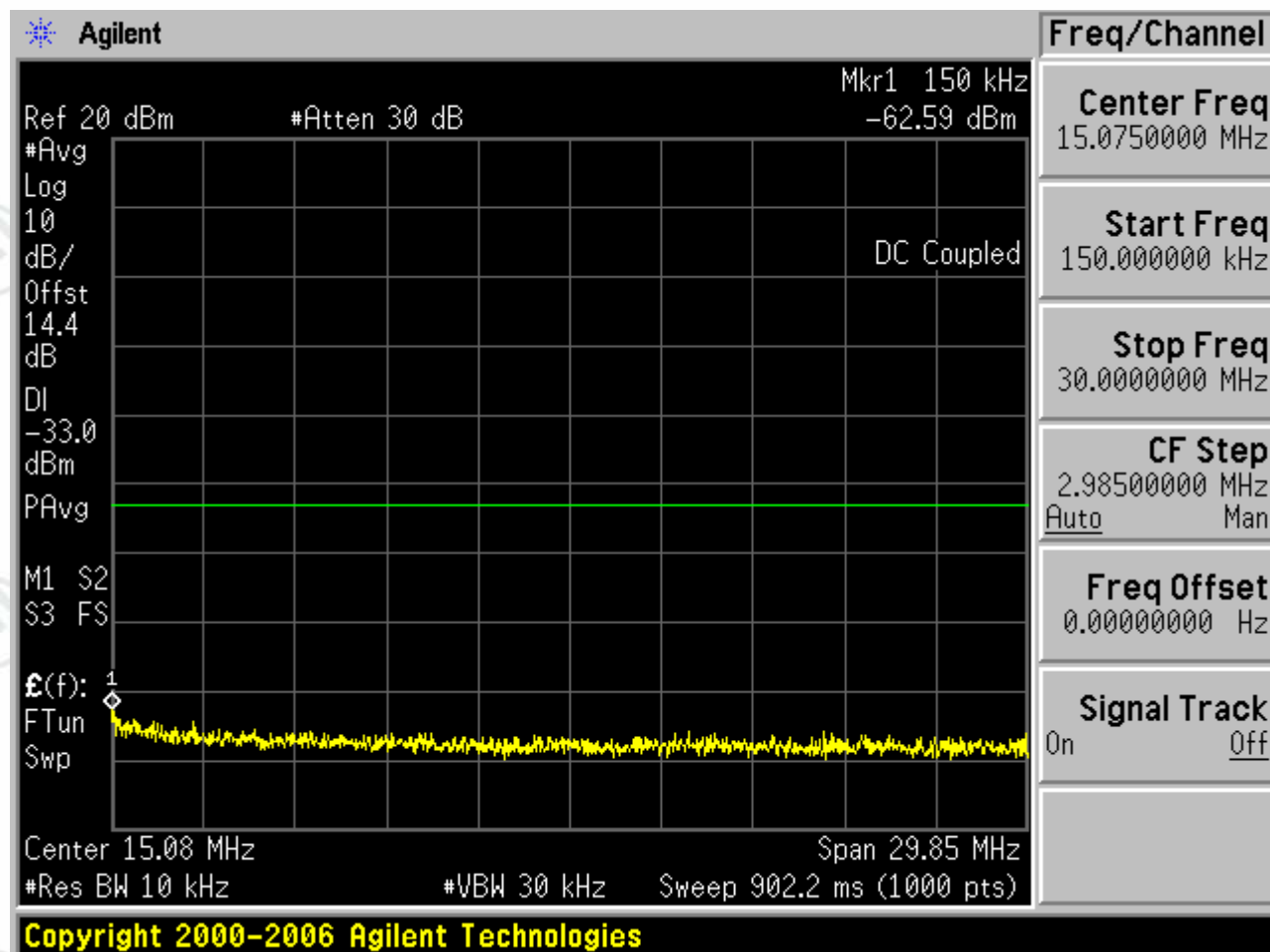


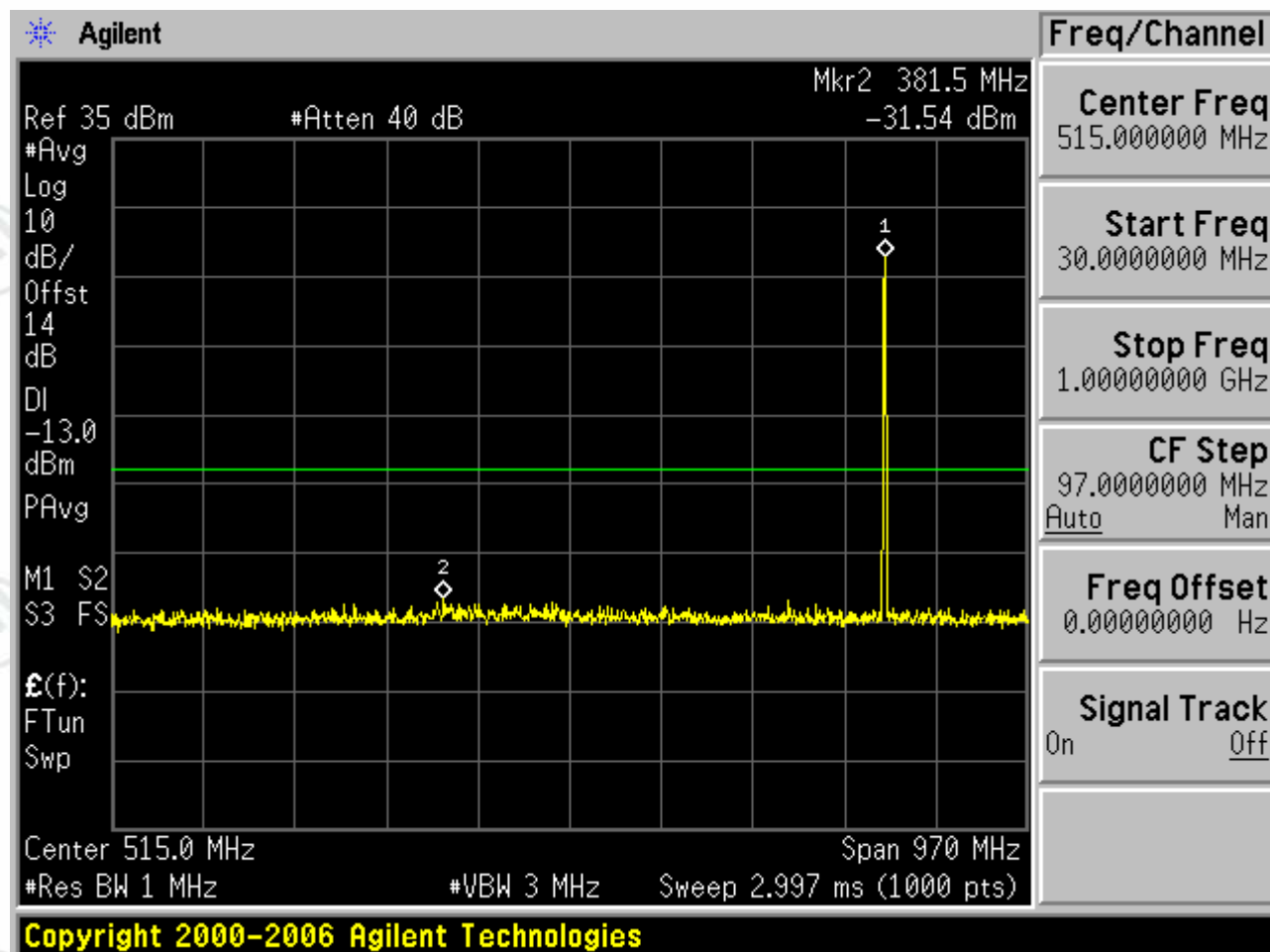


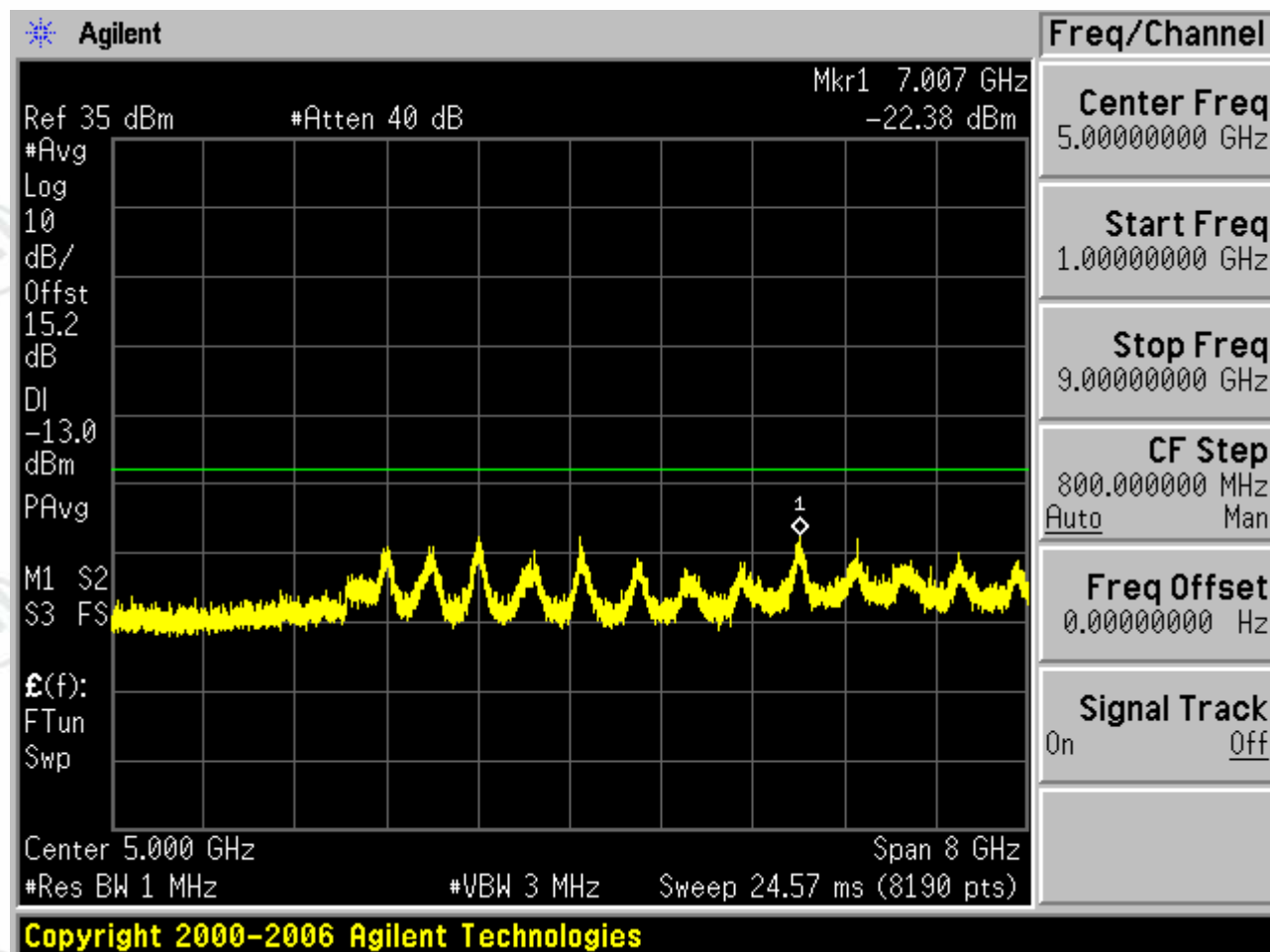


1.1.2.3 Test Channel=HCH



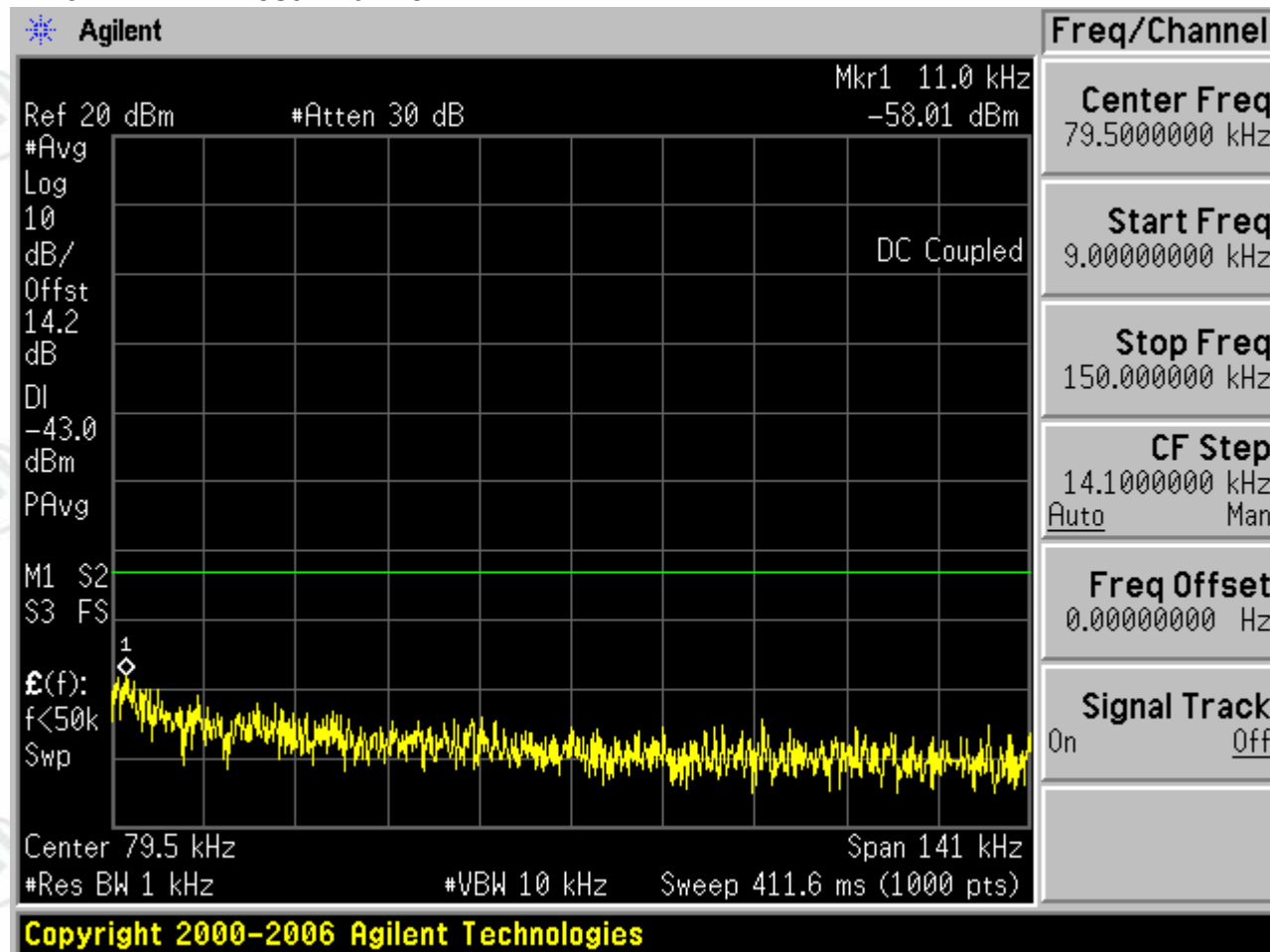


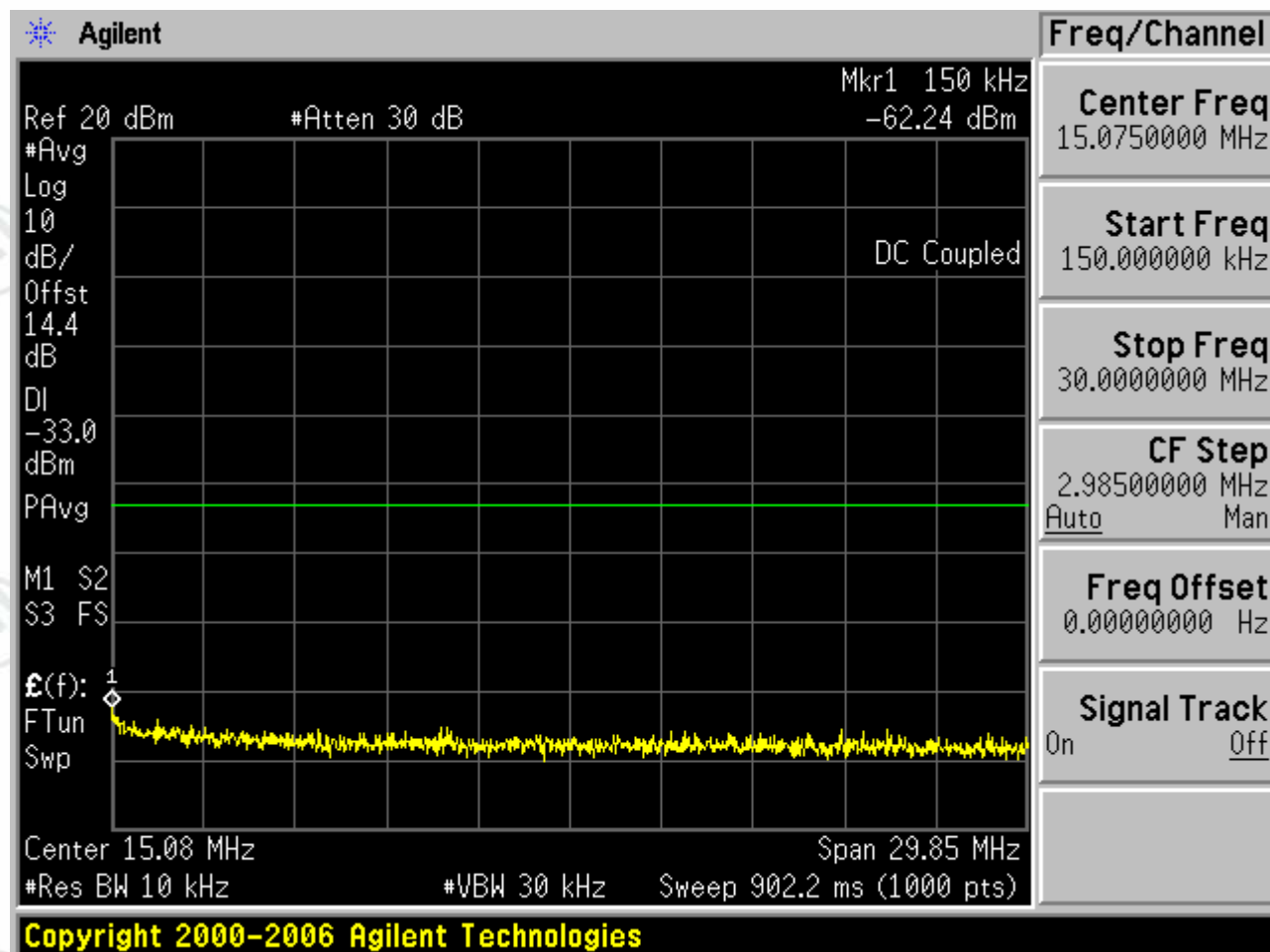


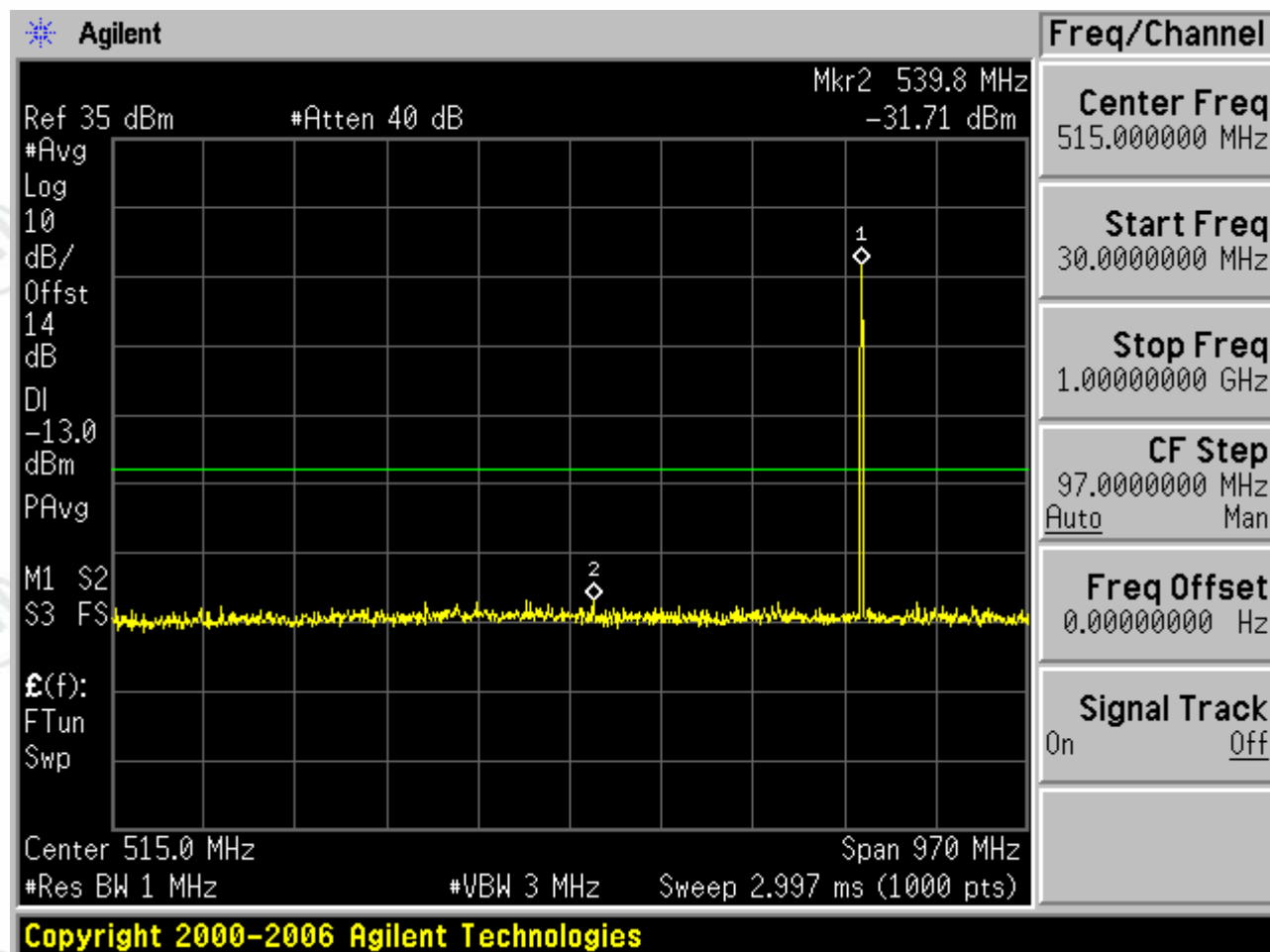


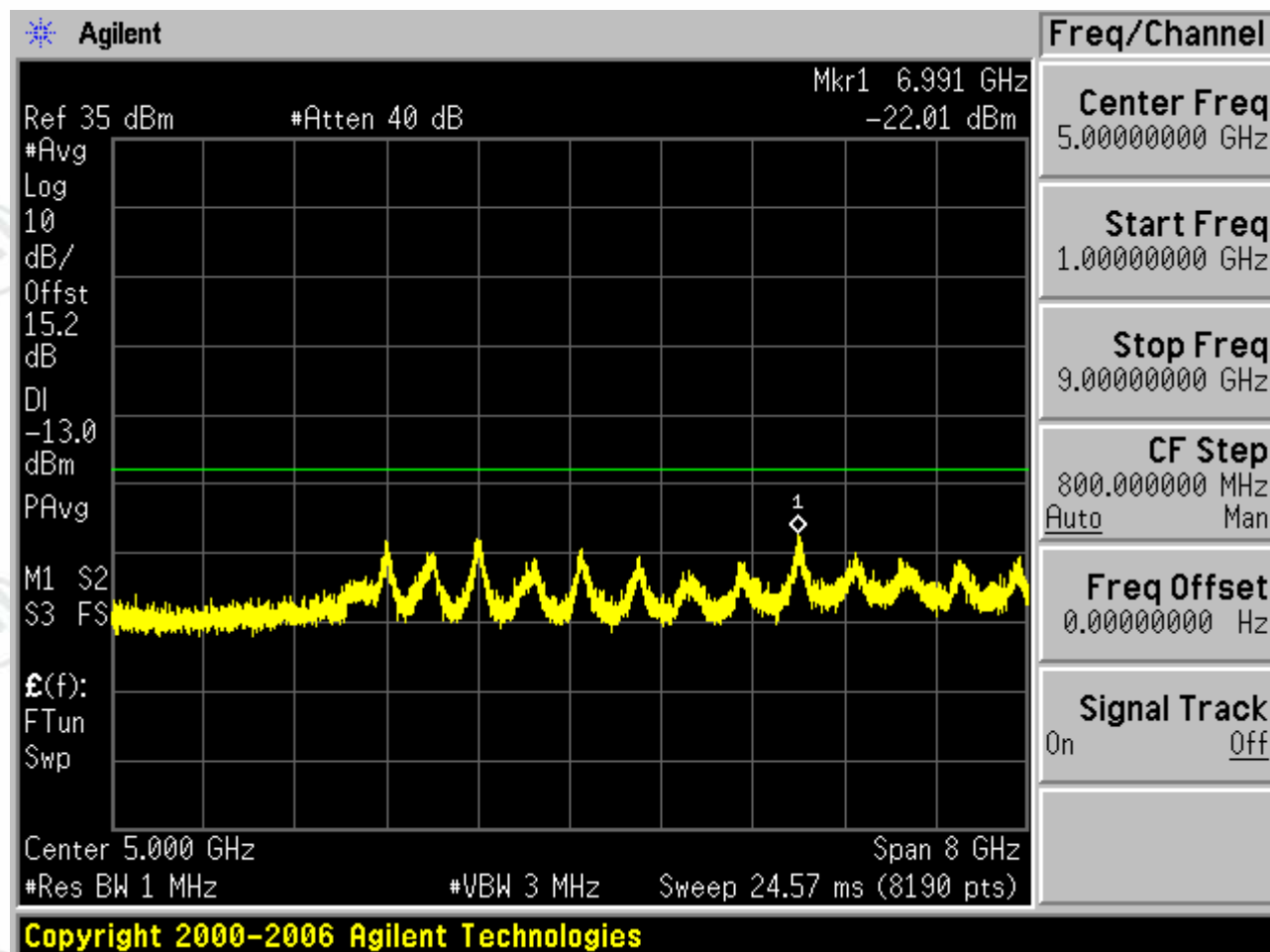
1.1.3 Test Mode=GSM/TM3

1.1.3.1 Test Channel=LCH

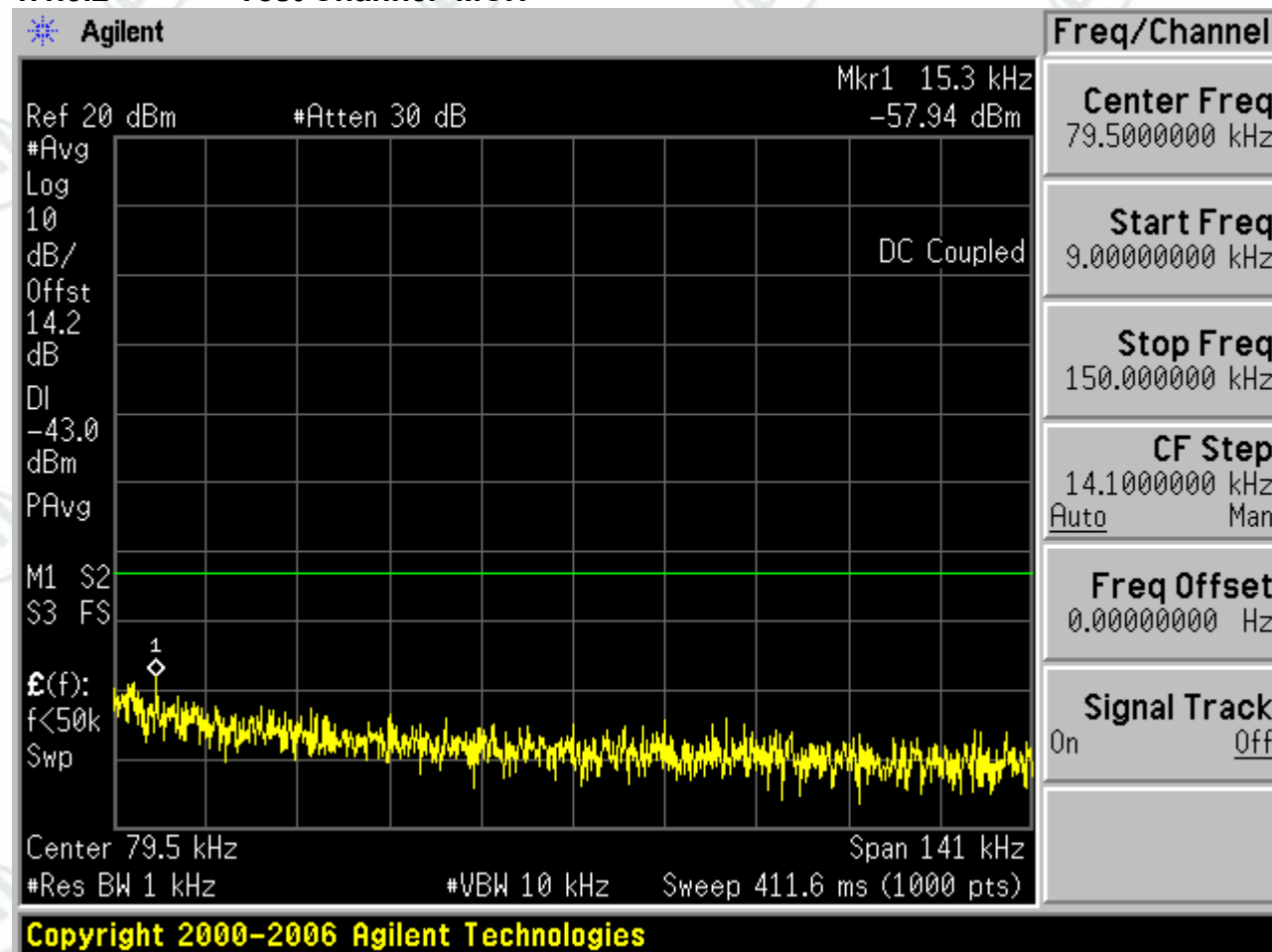


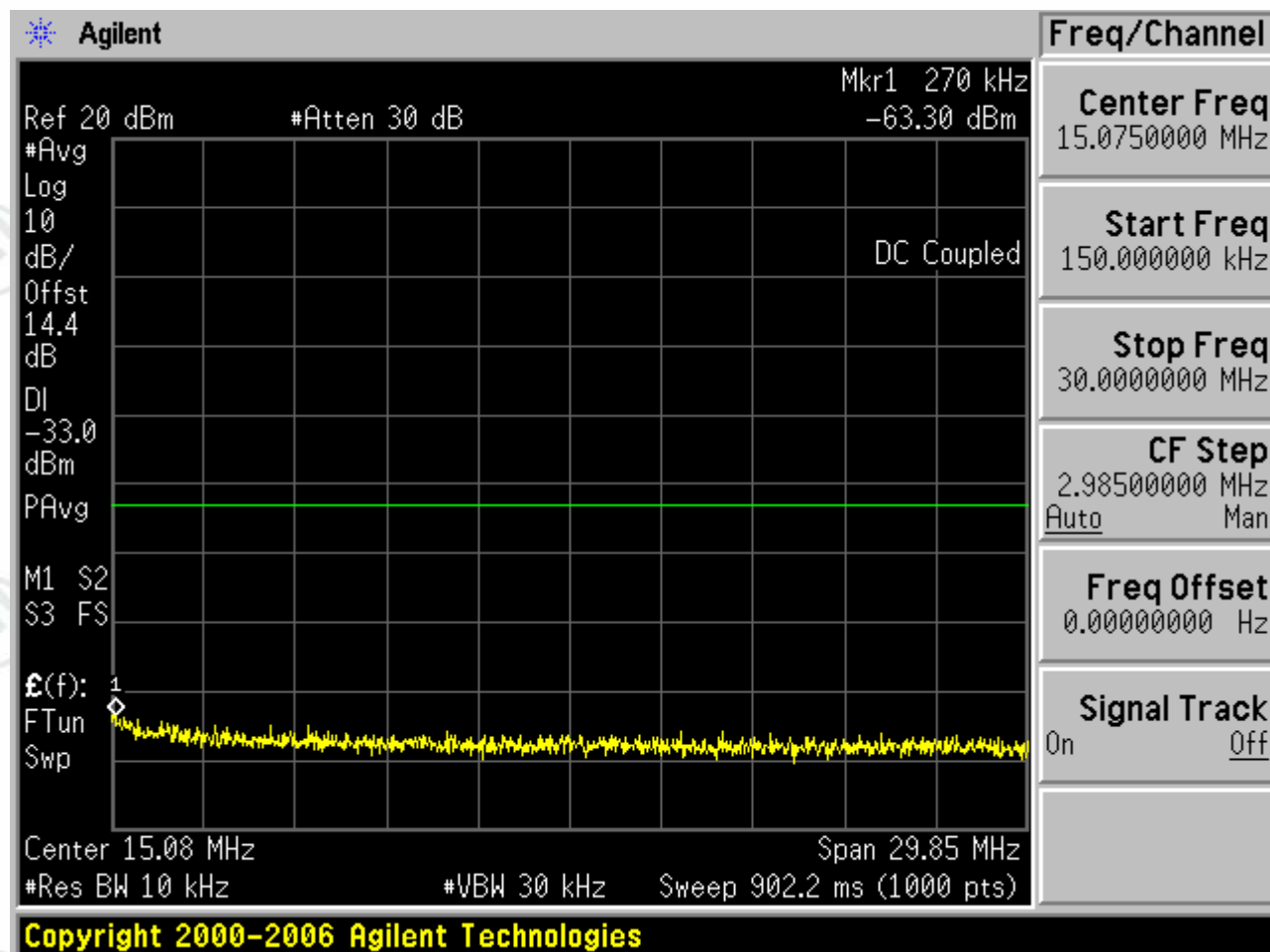


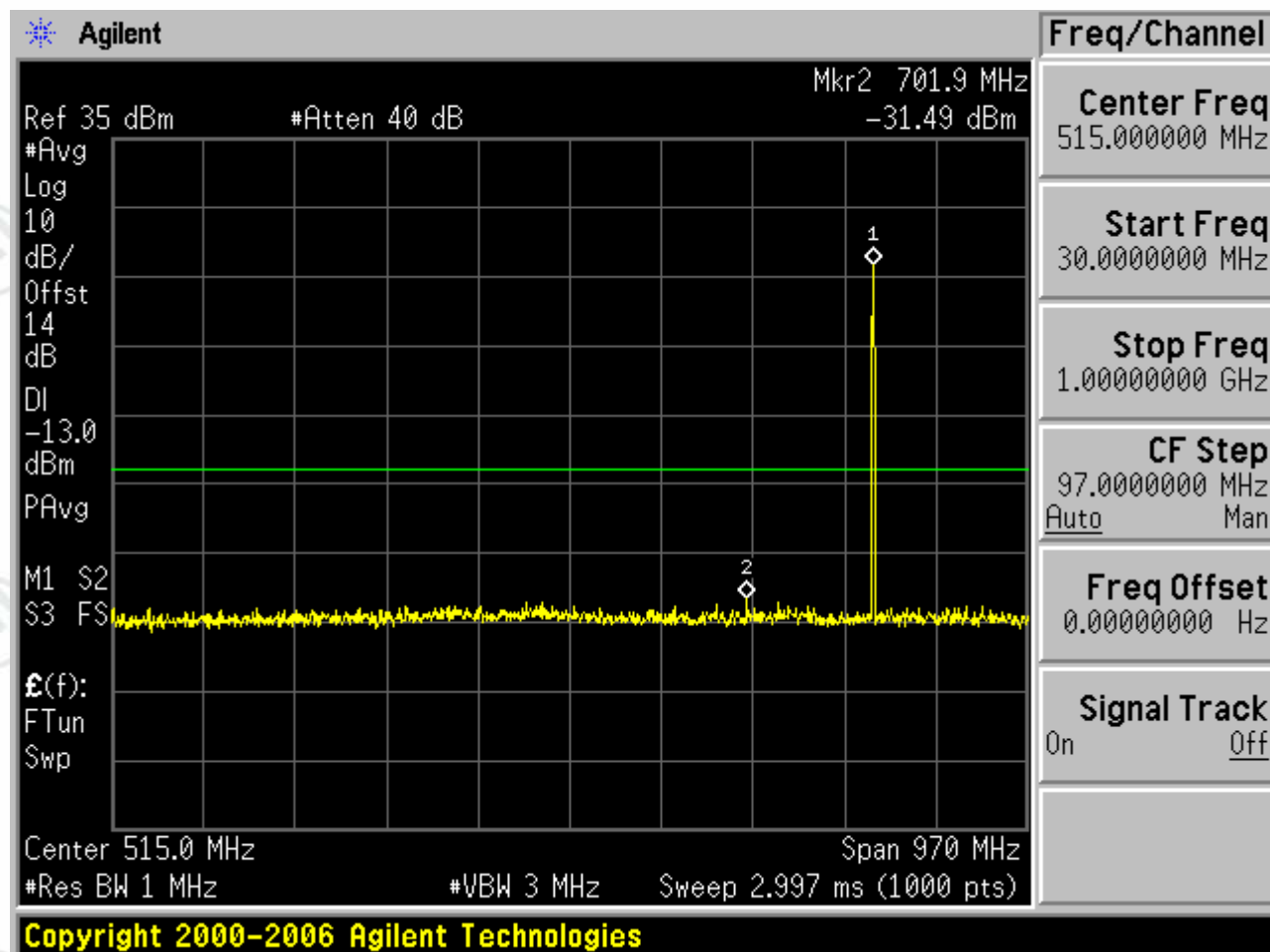


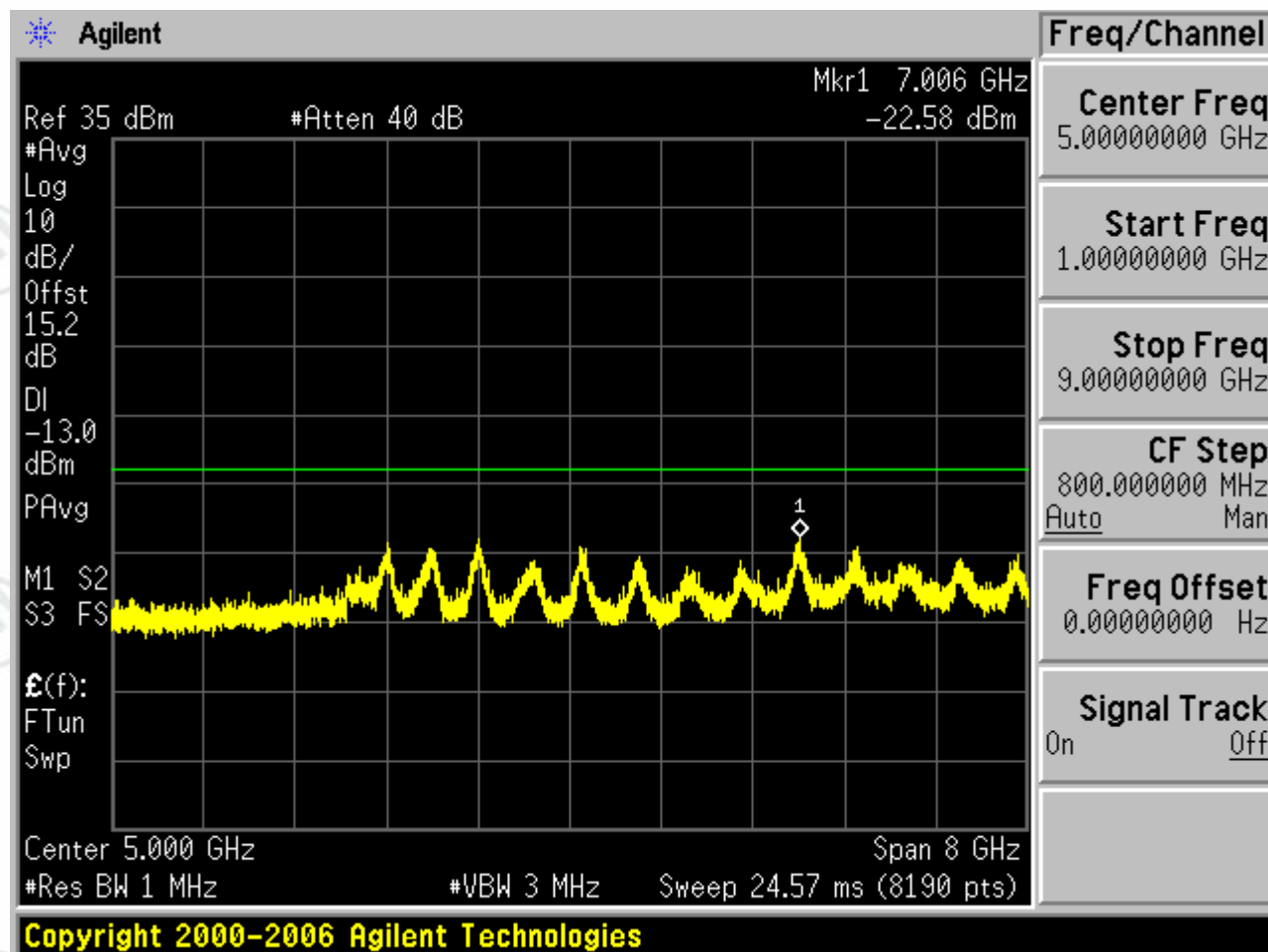


1.1.3.2 Test Channel=MCH

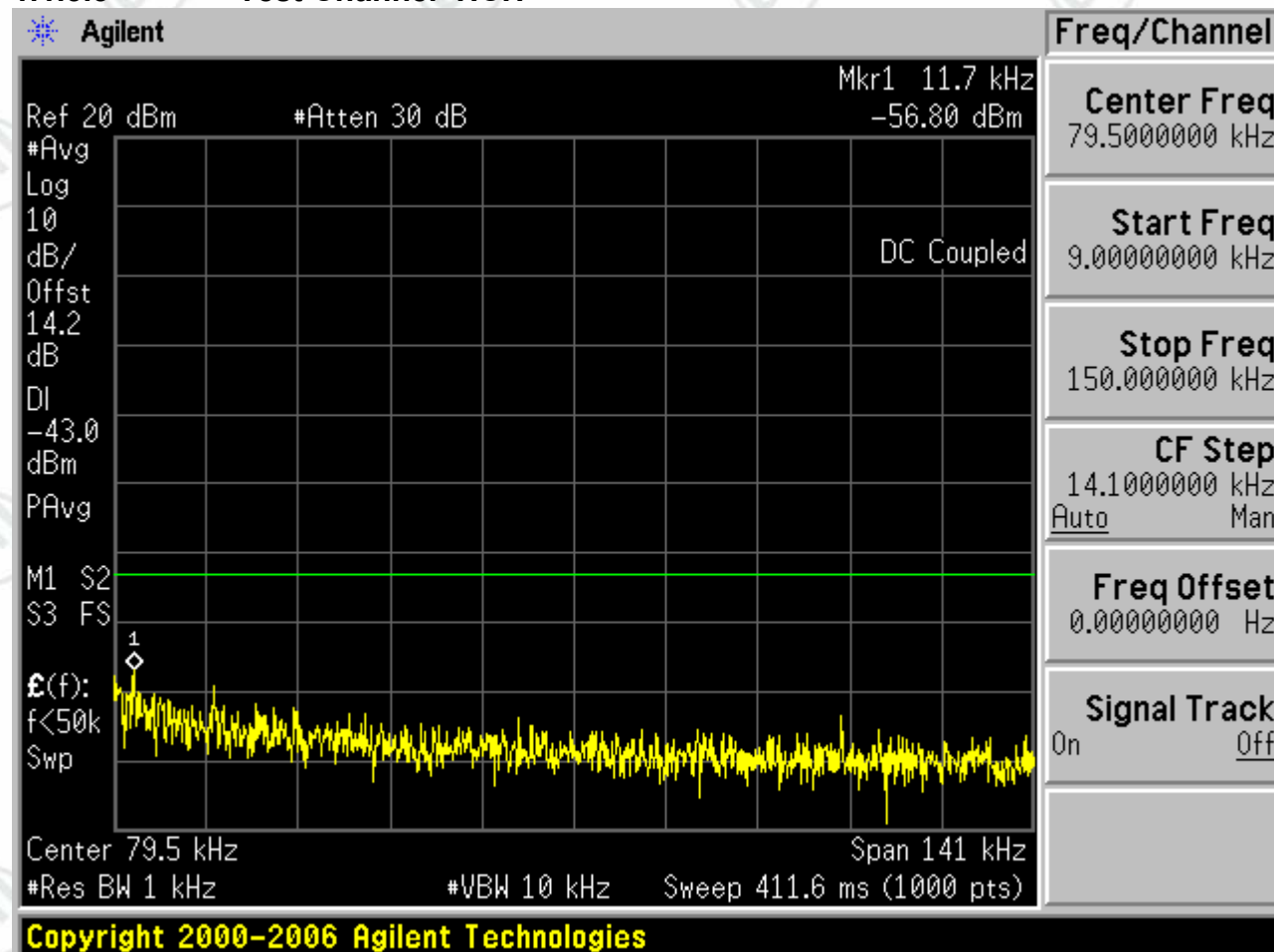


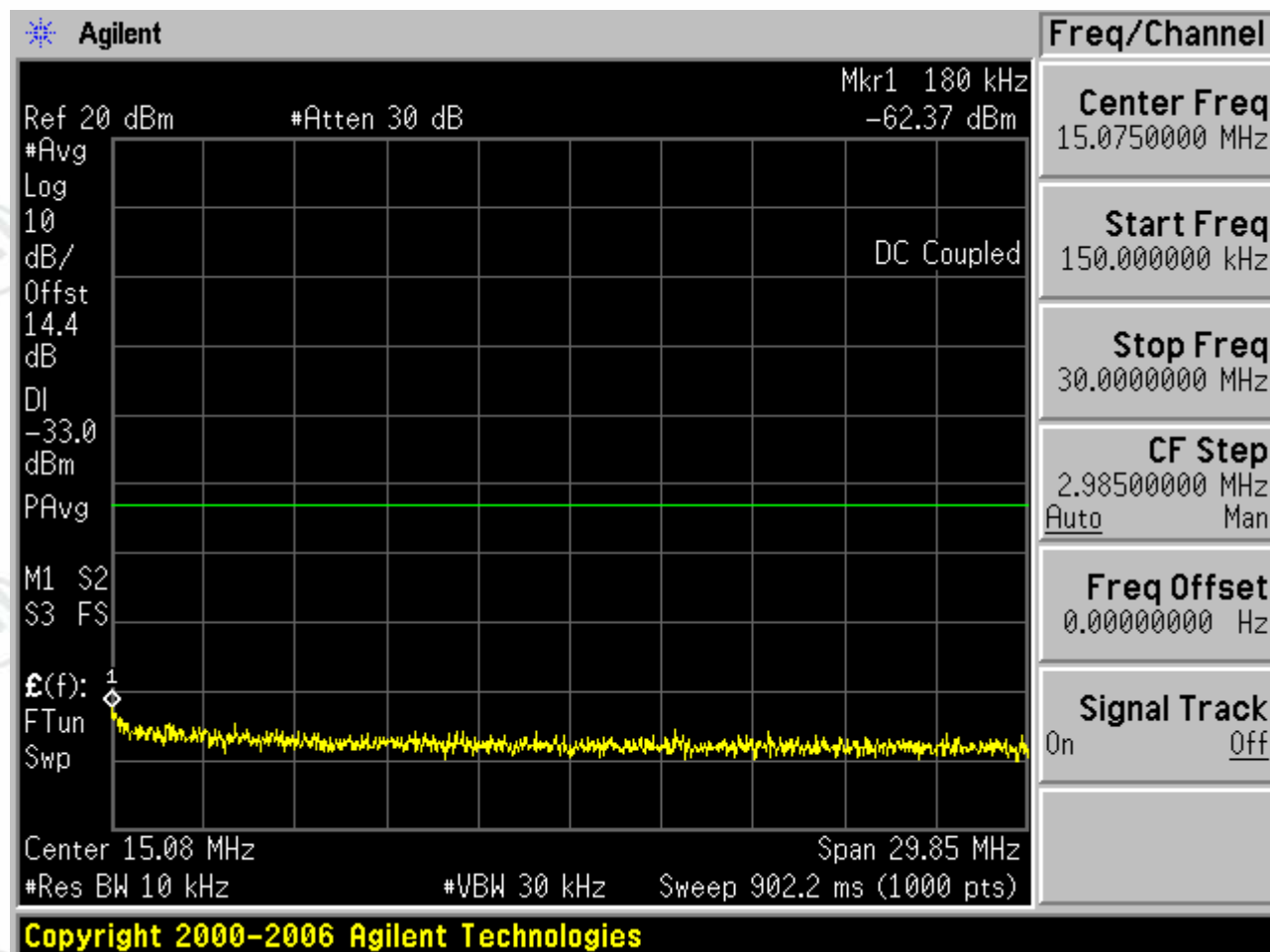


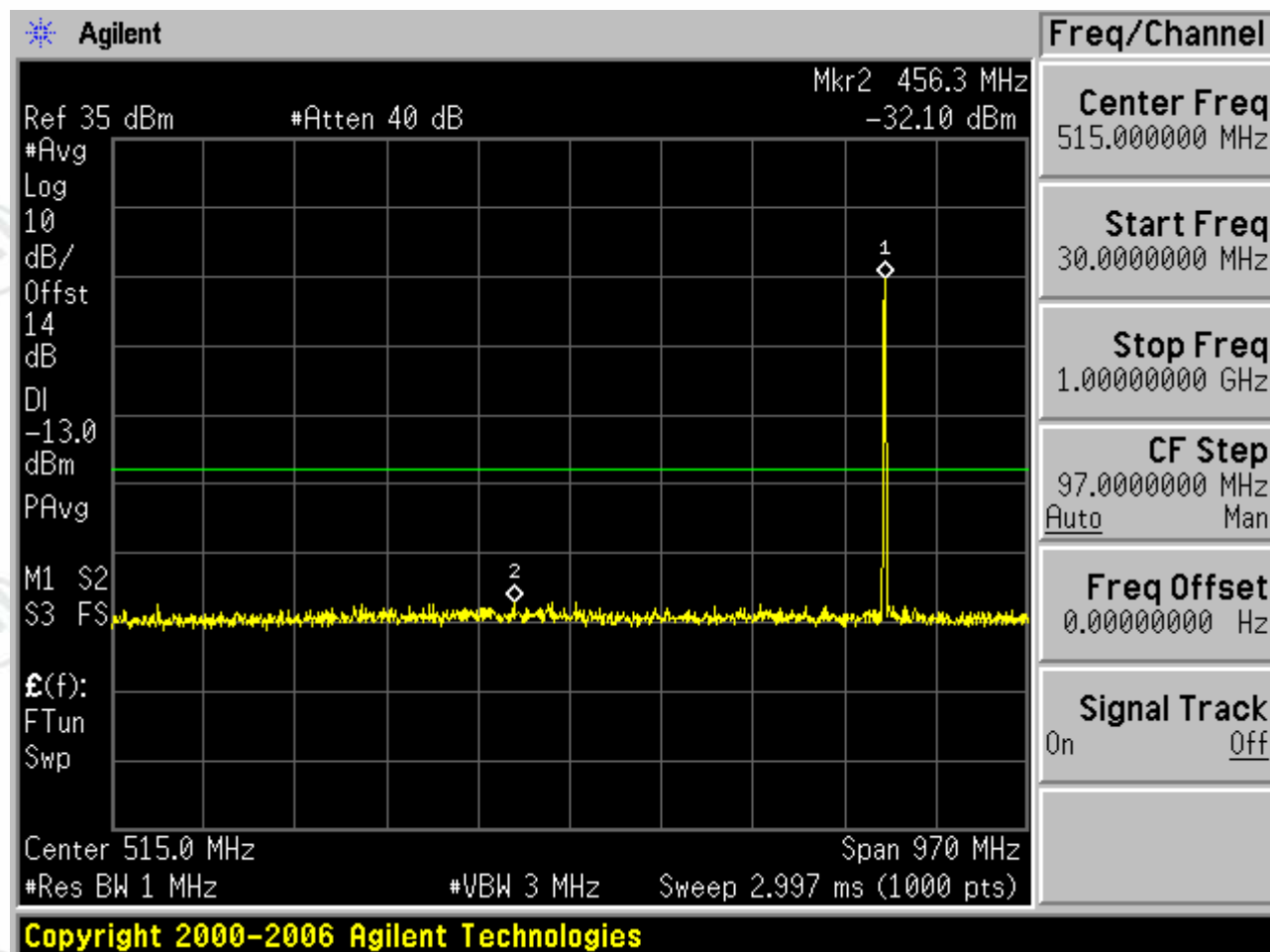


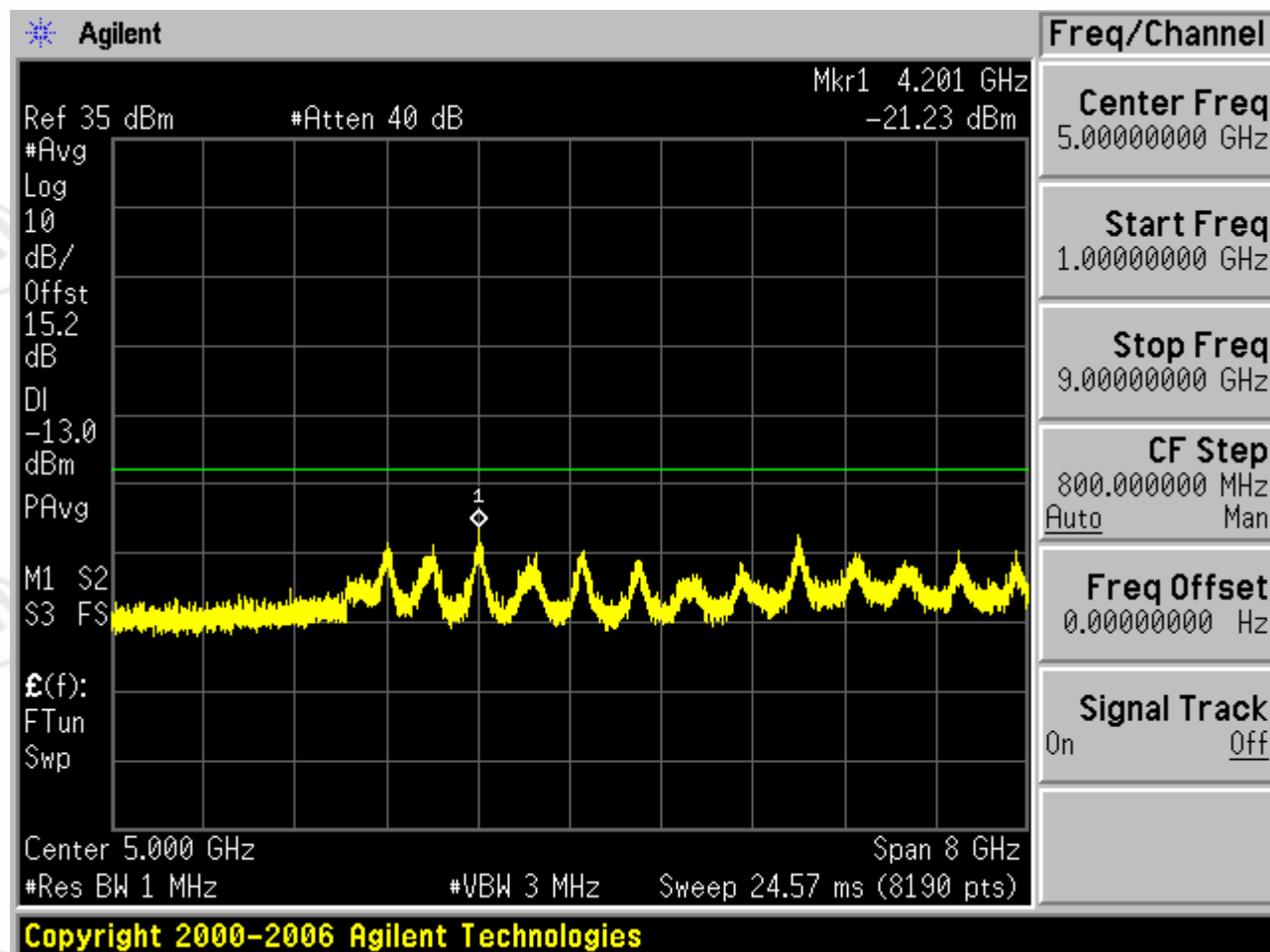


1.1.3.3 Test Channel=HCH





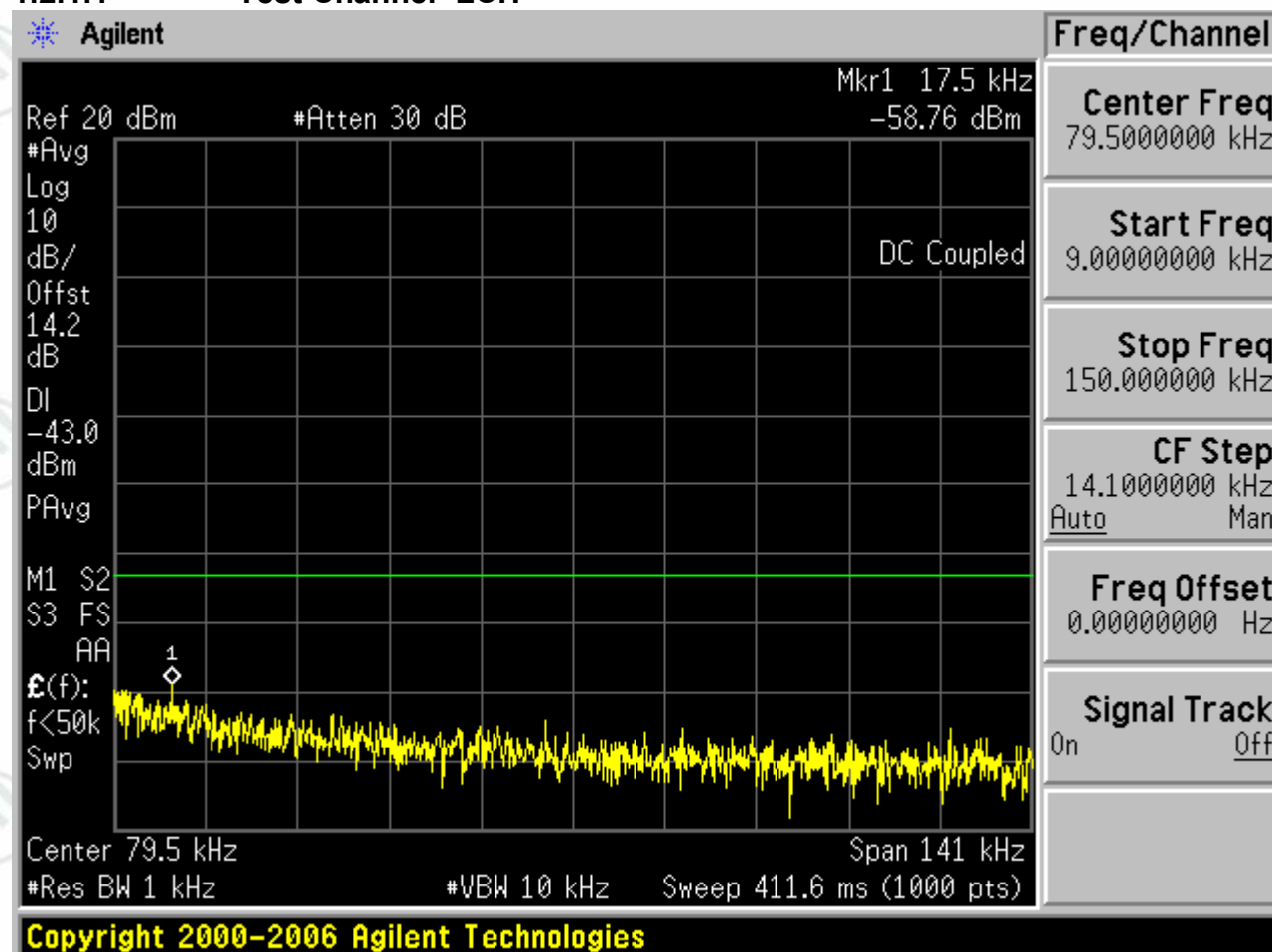


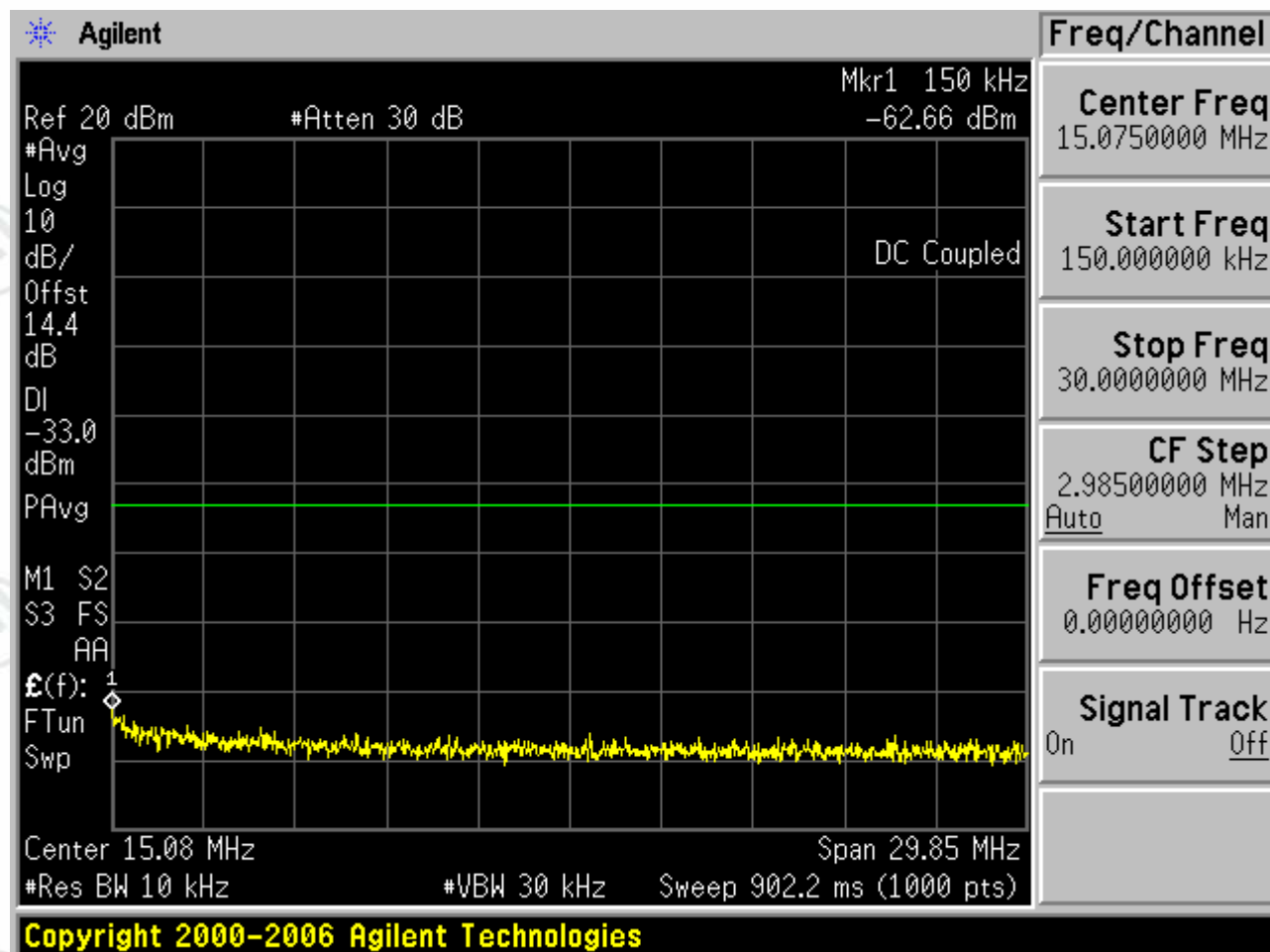


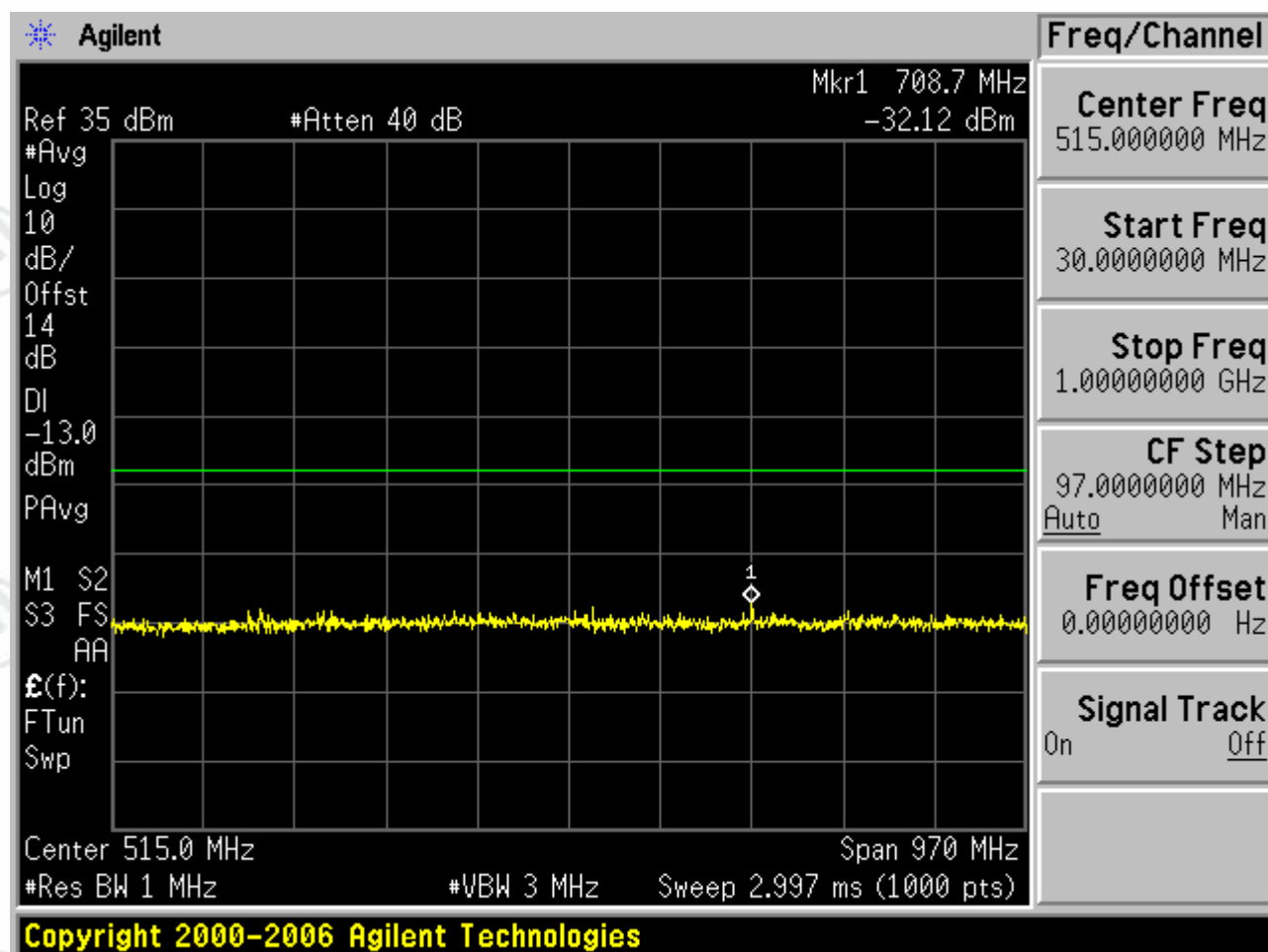
1.2 Test Band=GSM1900

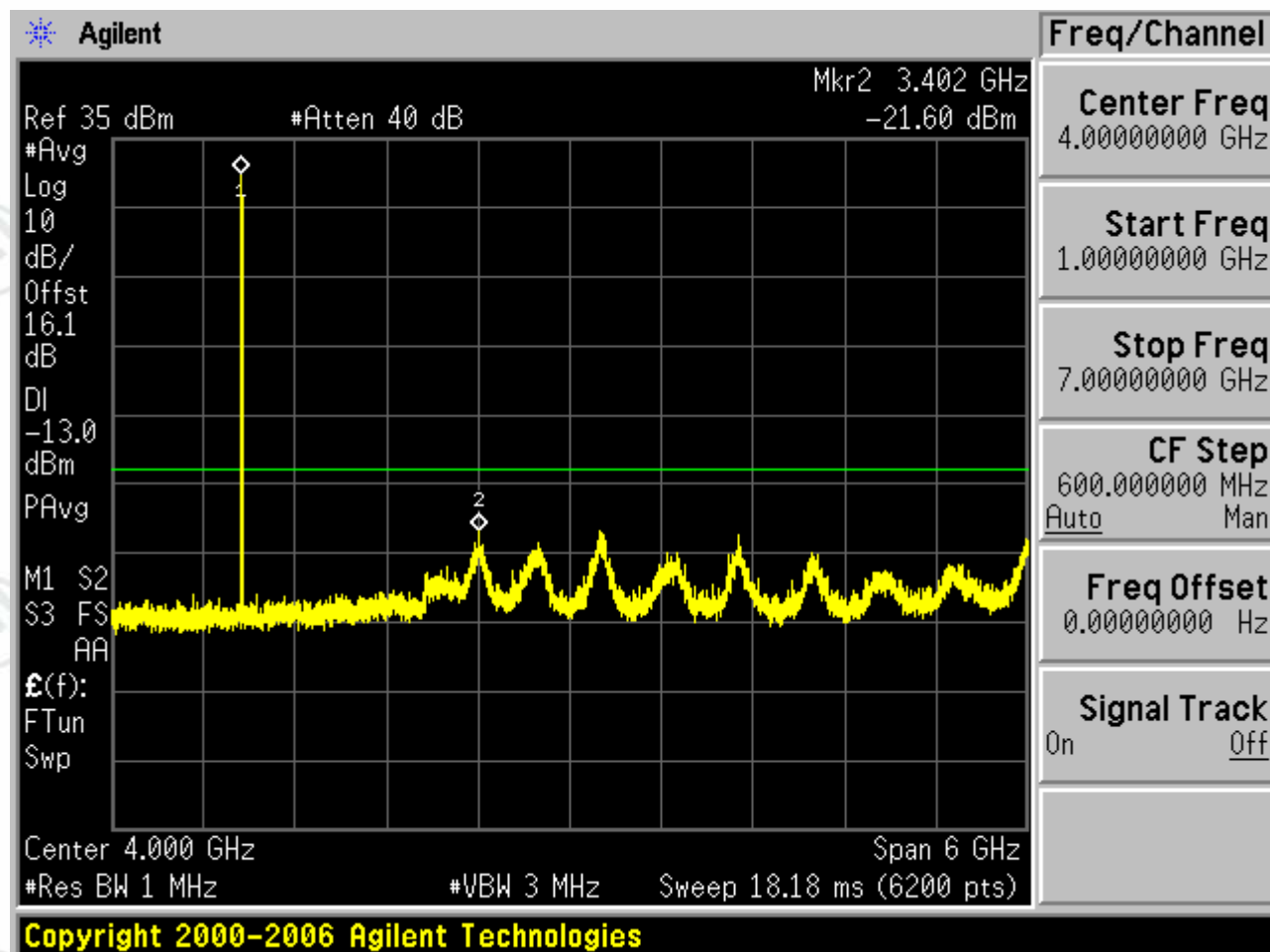
1.2.1 Test Mode=GSM/TM1

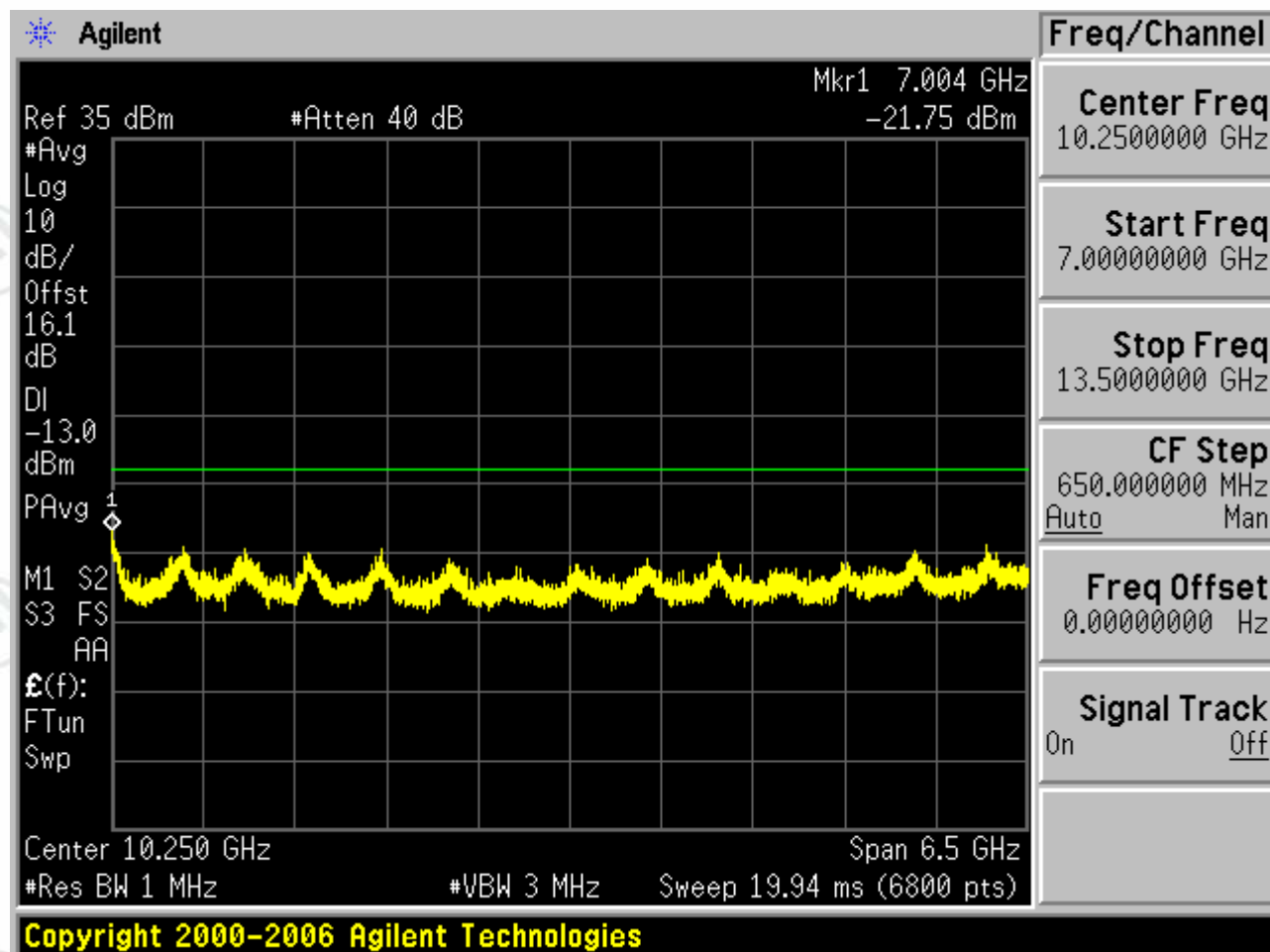
1.2.1.1 Test Channel=LCH

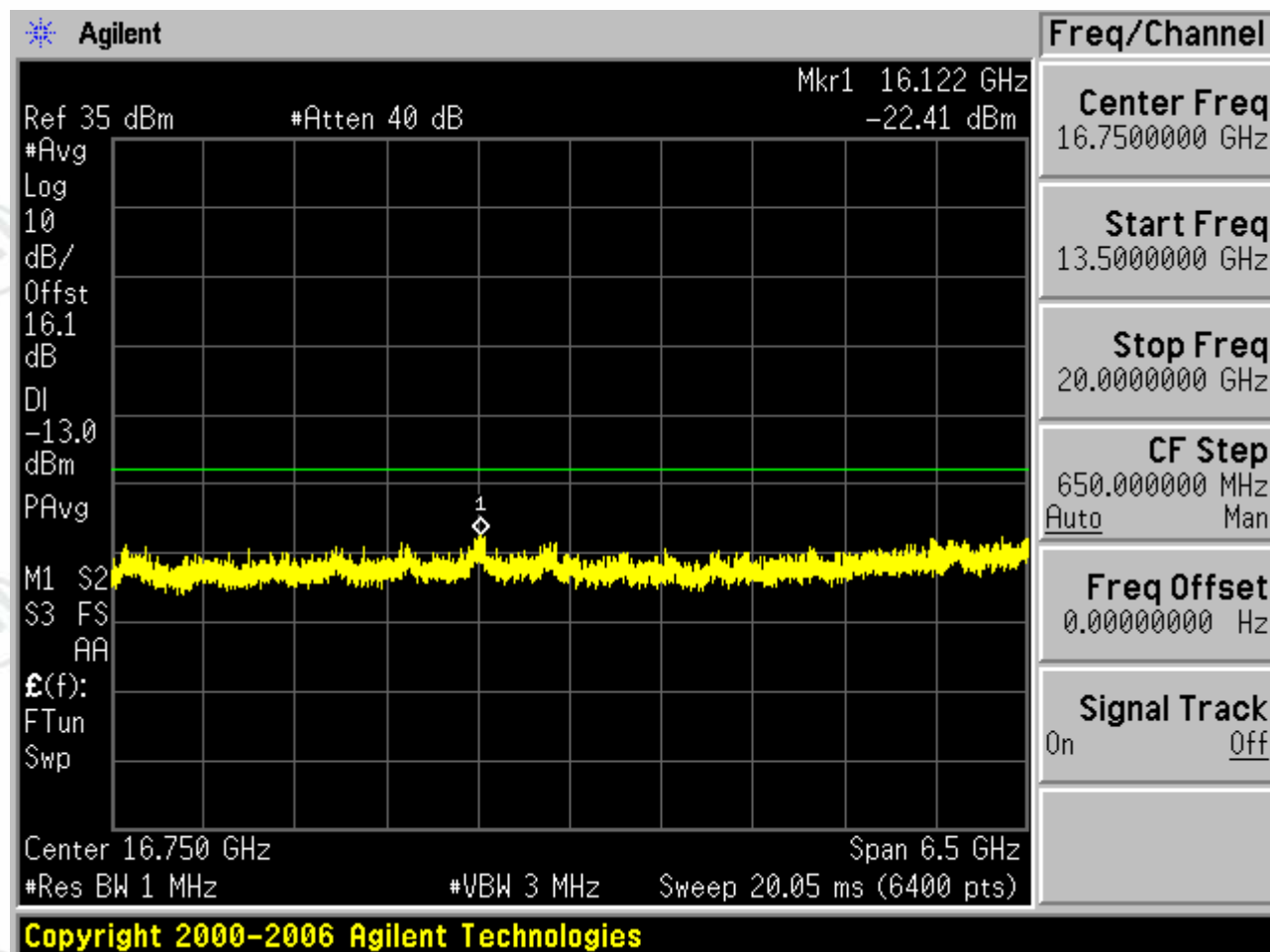




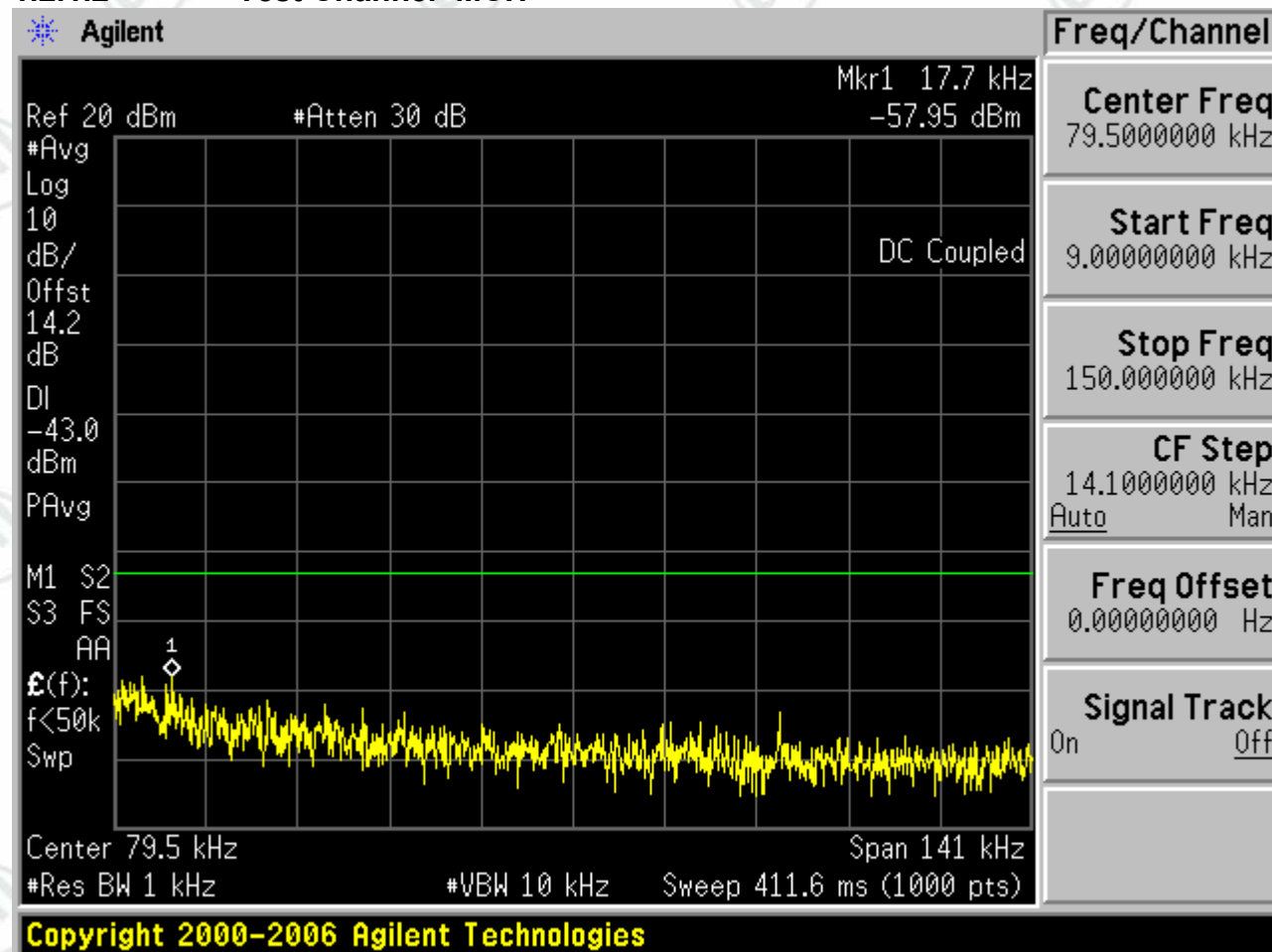


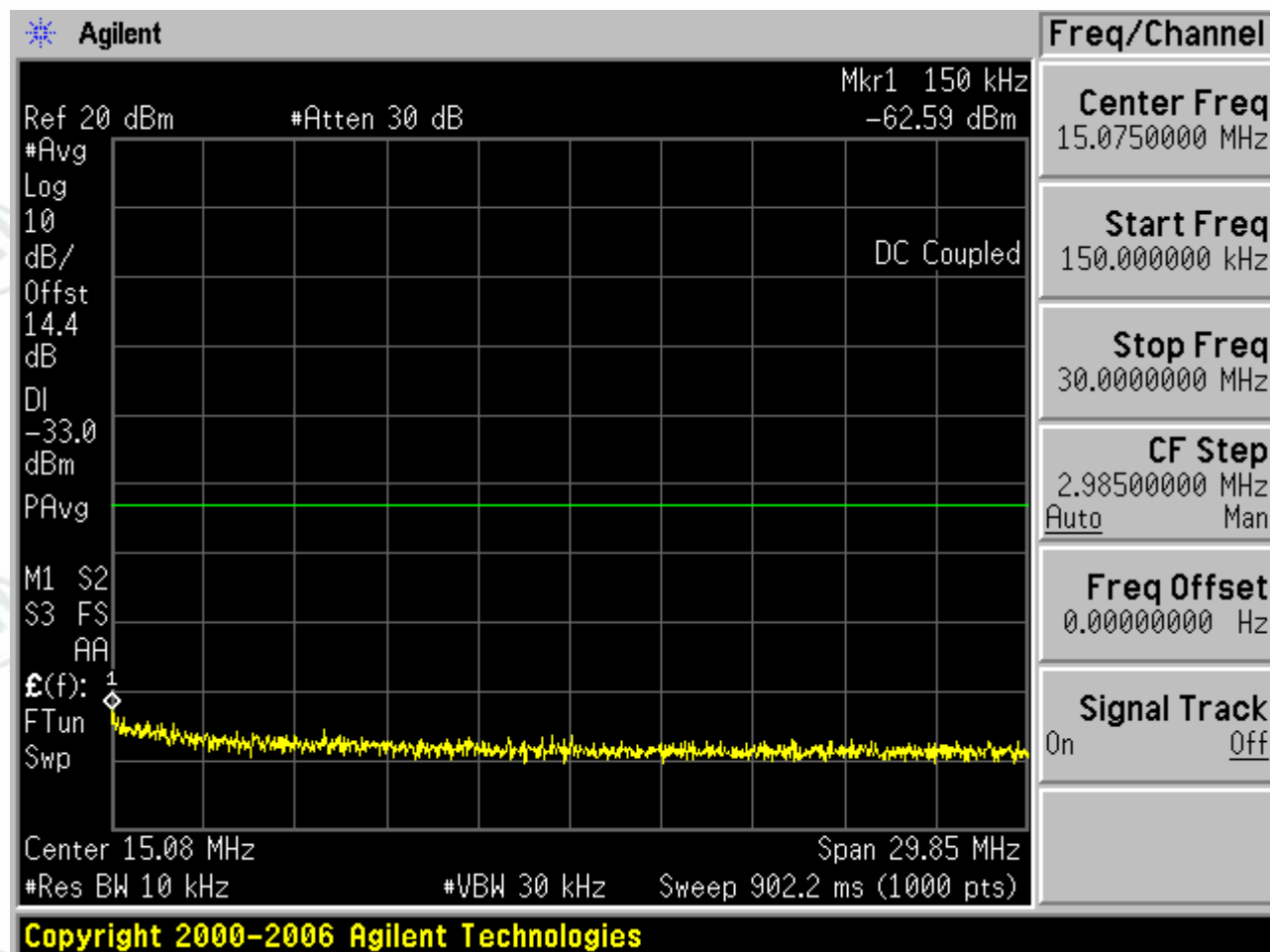


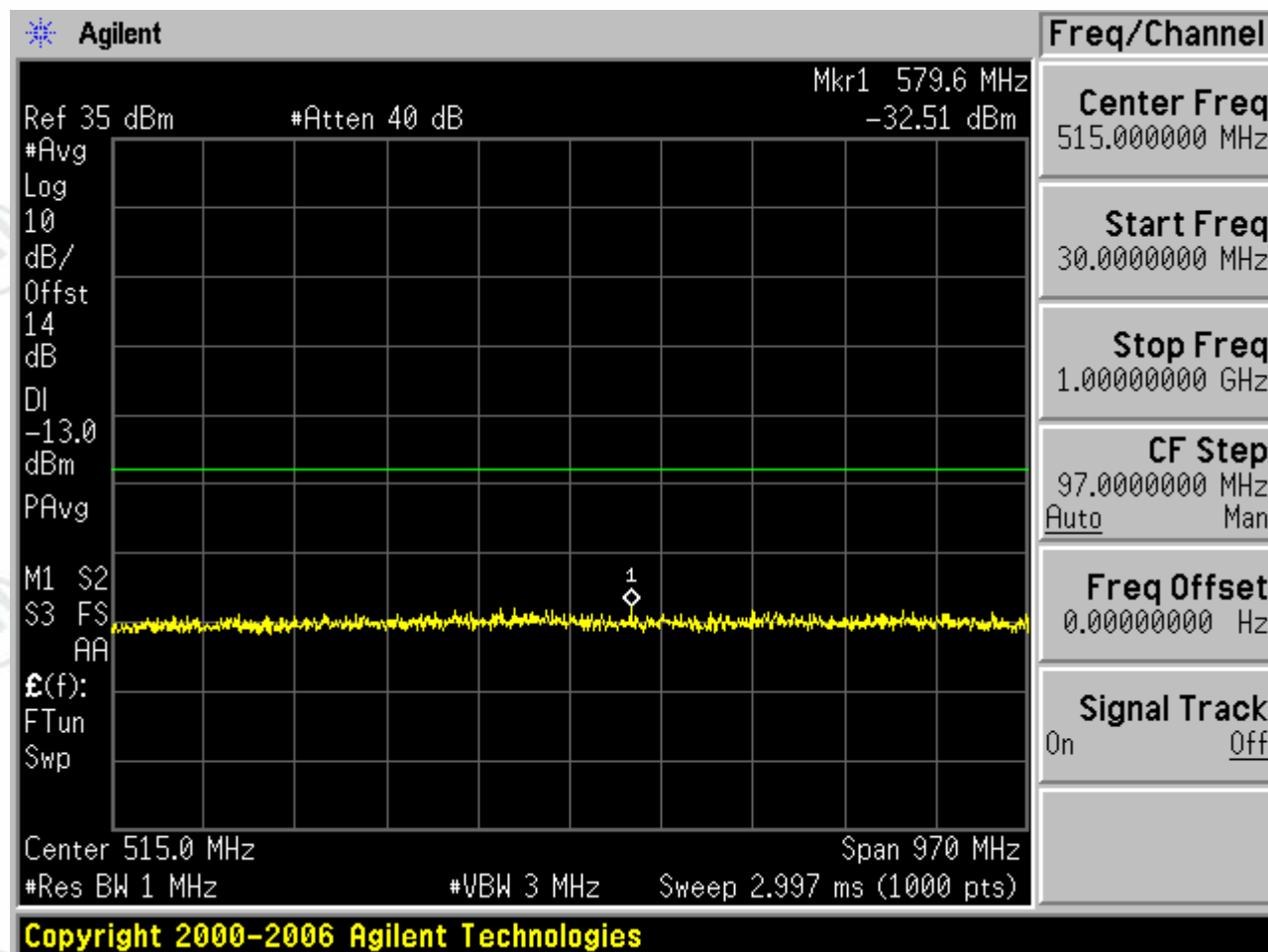


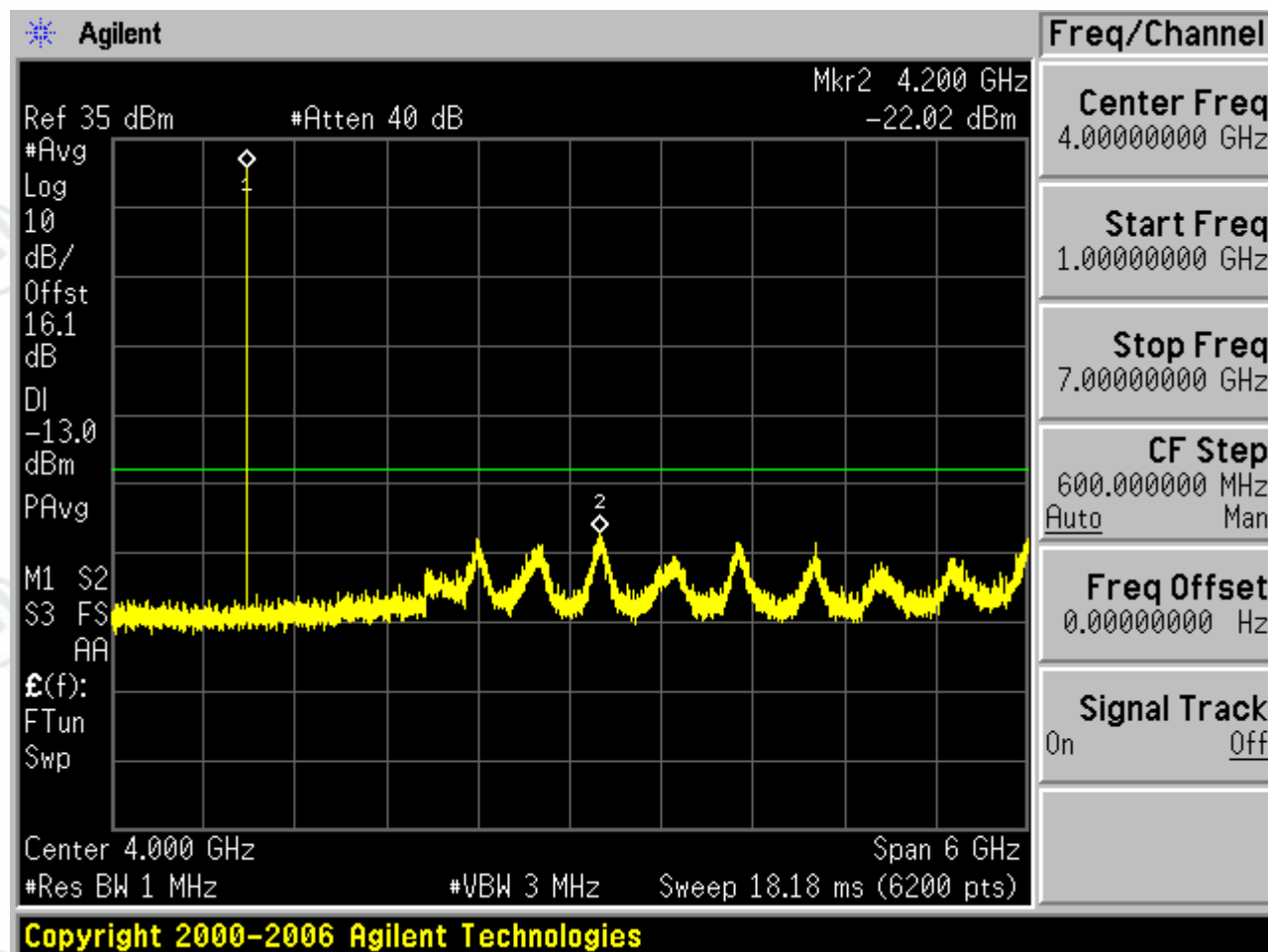


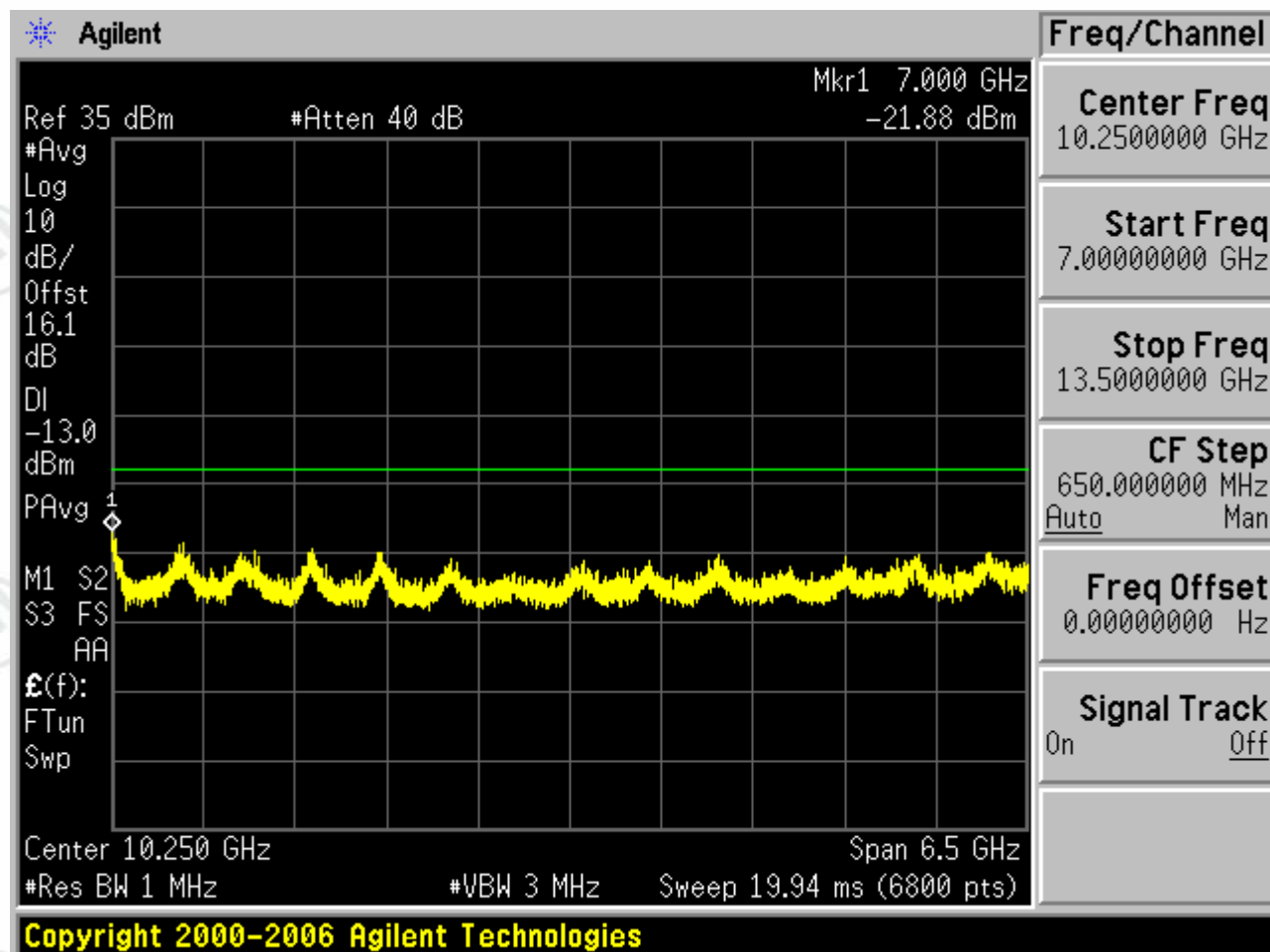
1.2.1.2 Test Channel=MCH

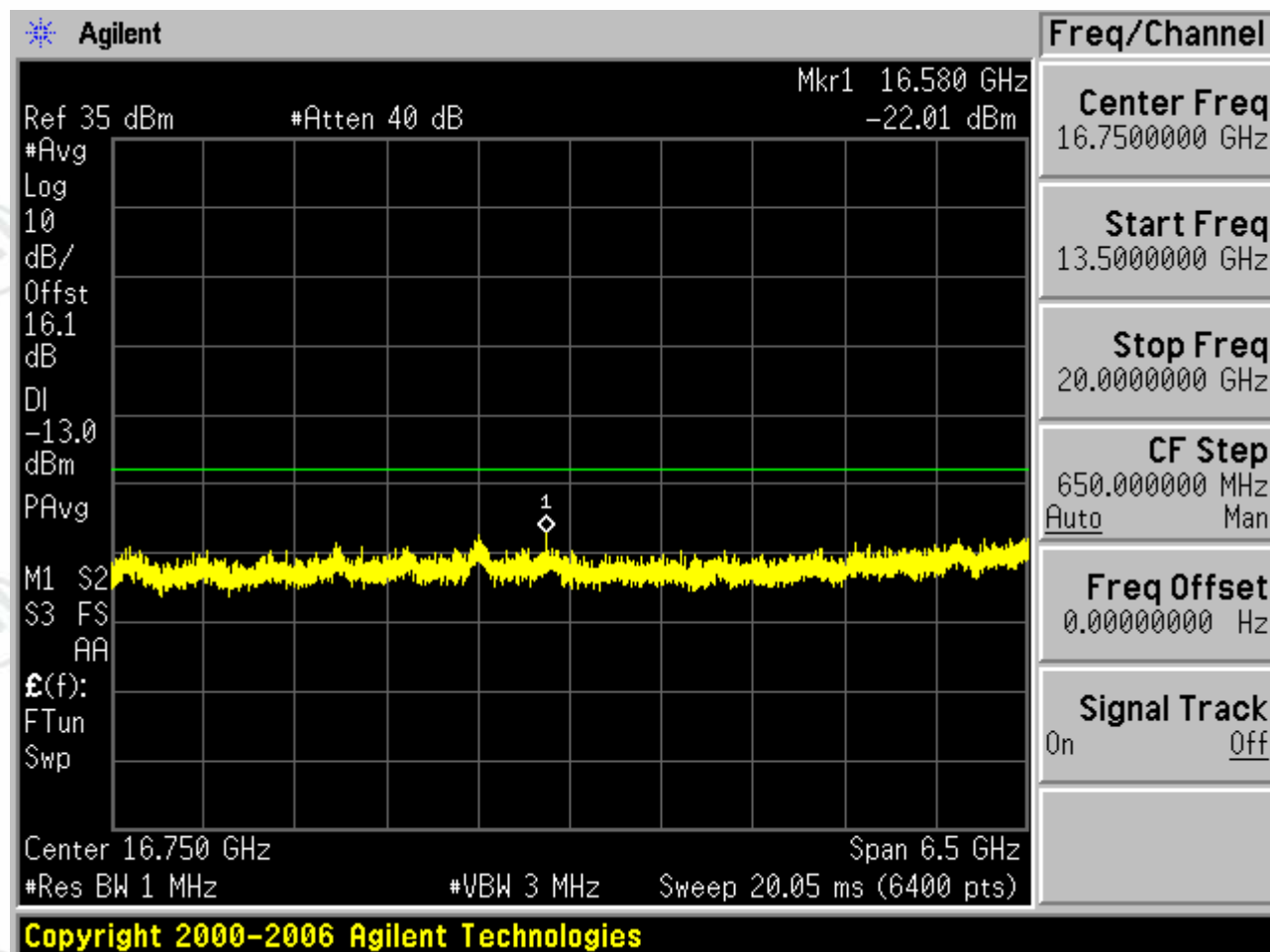




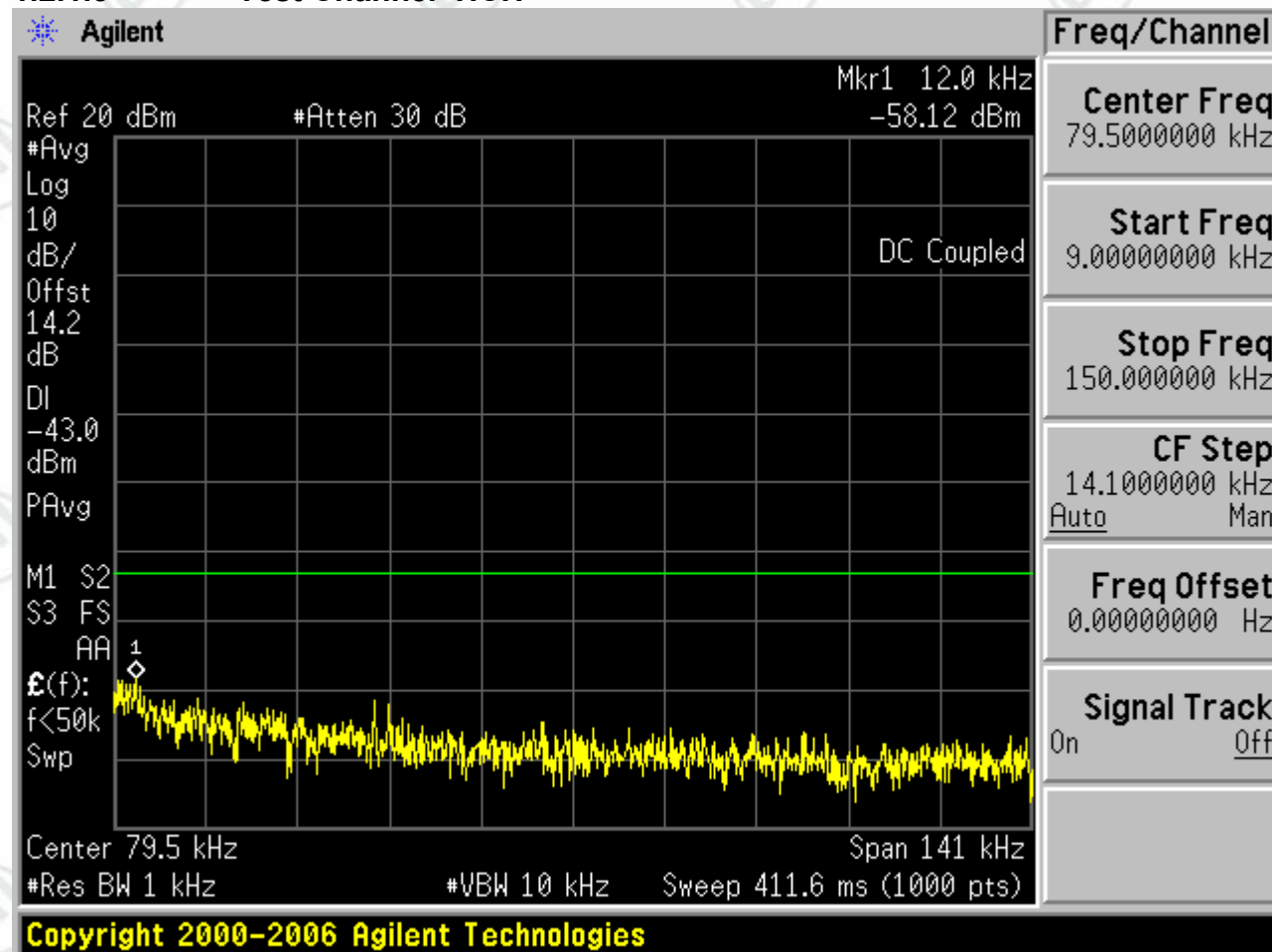


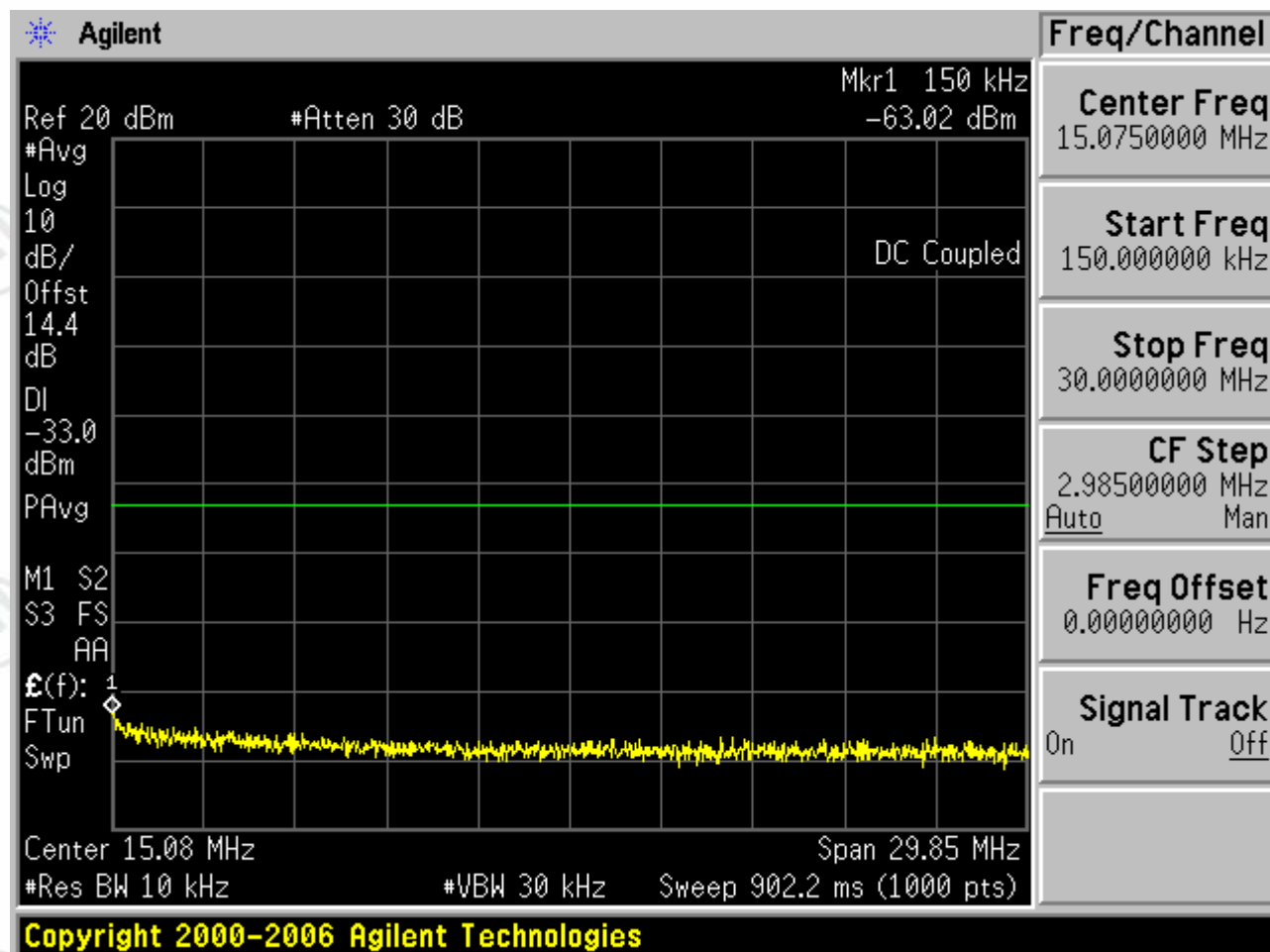


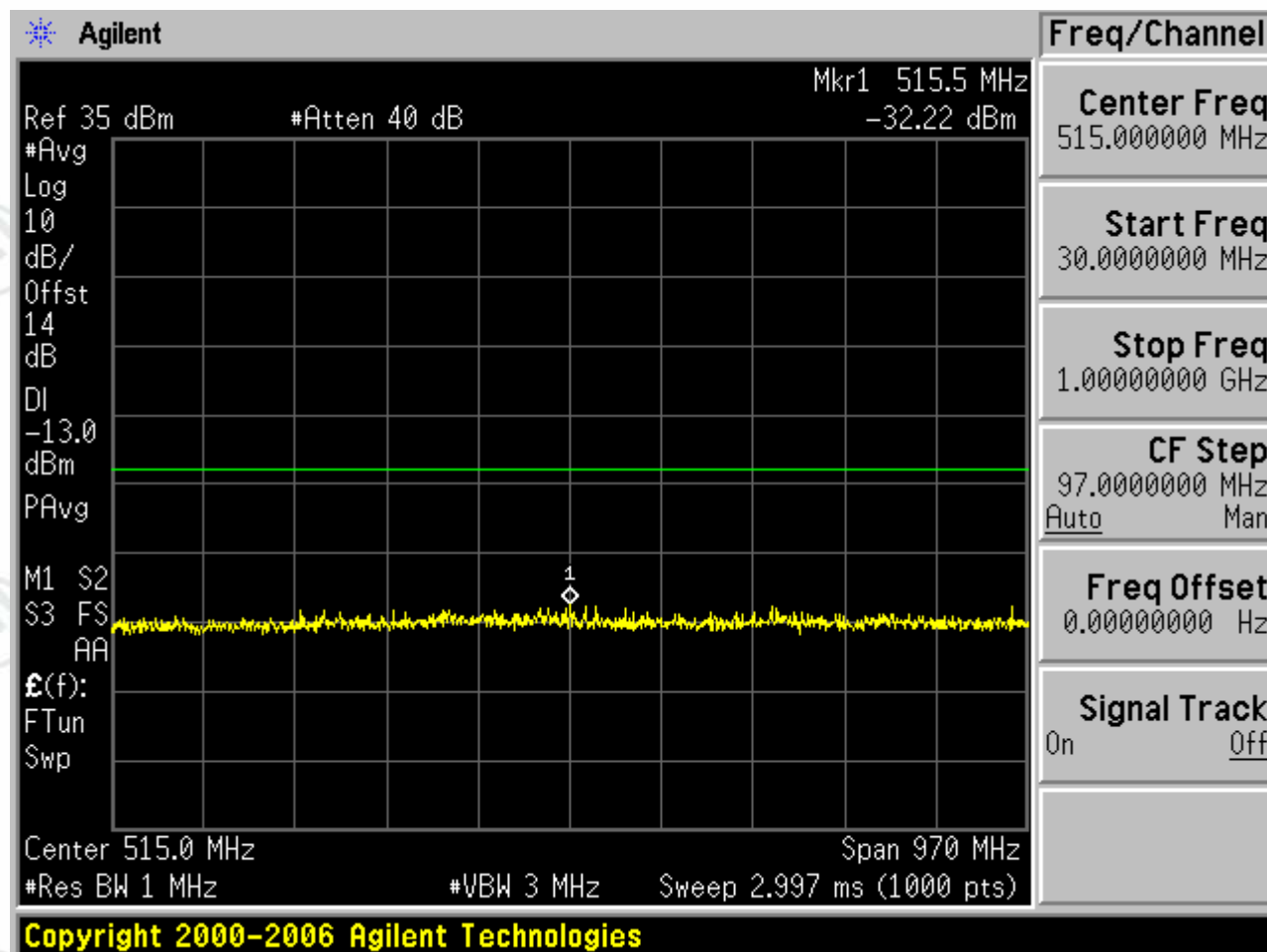


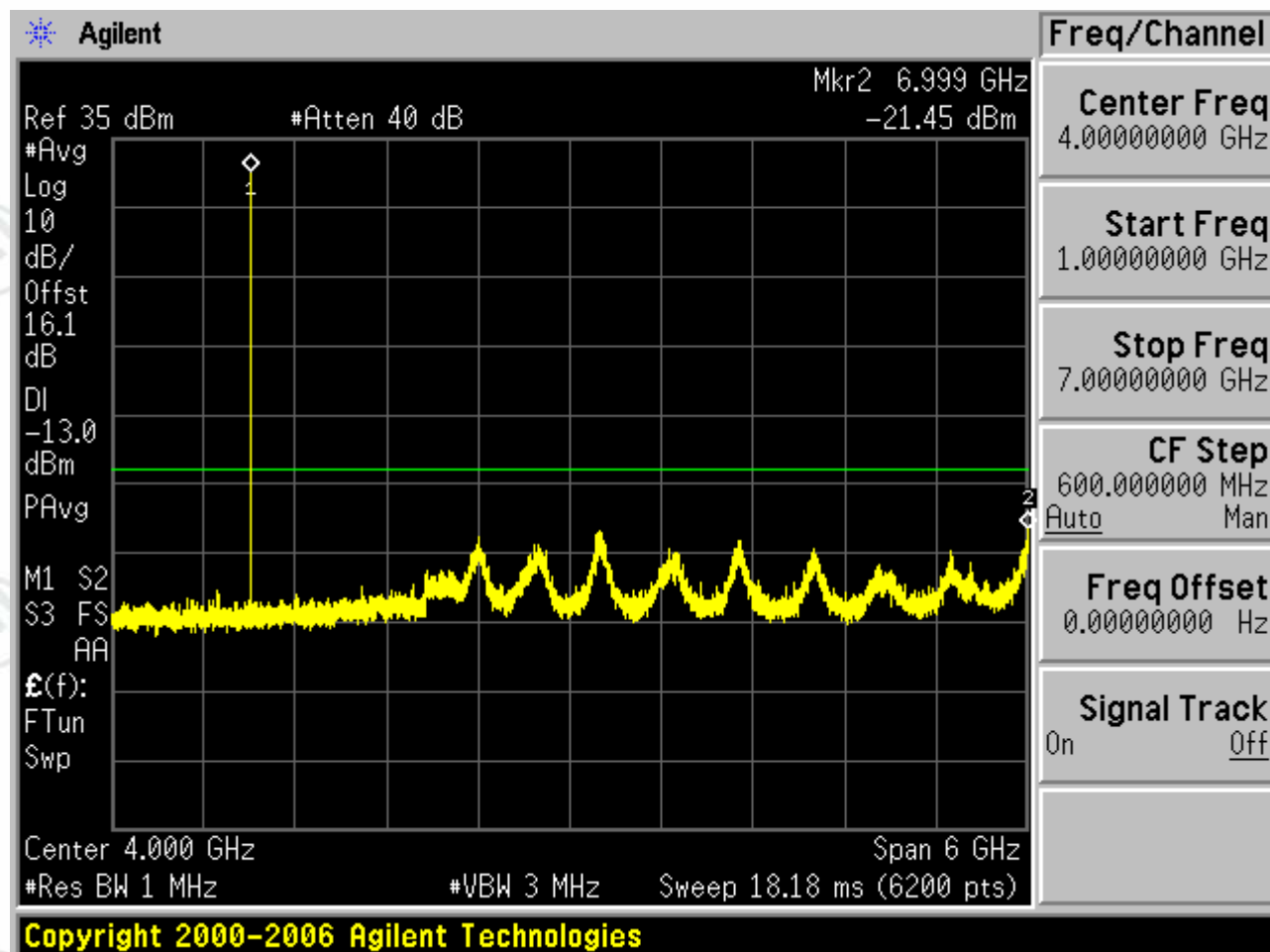


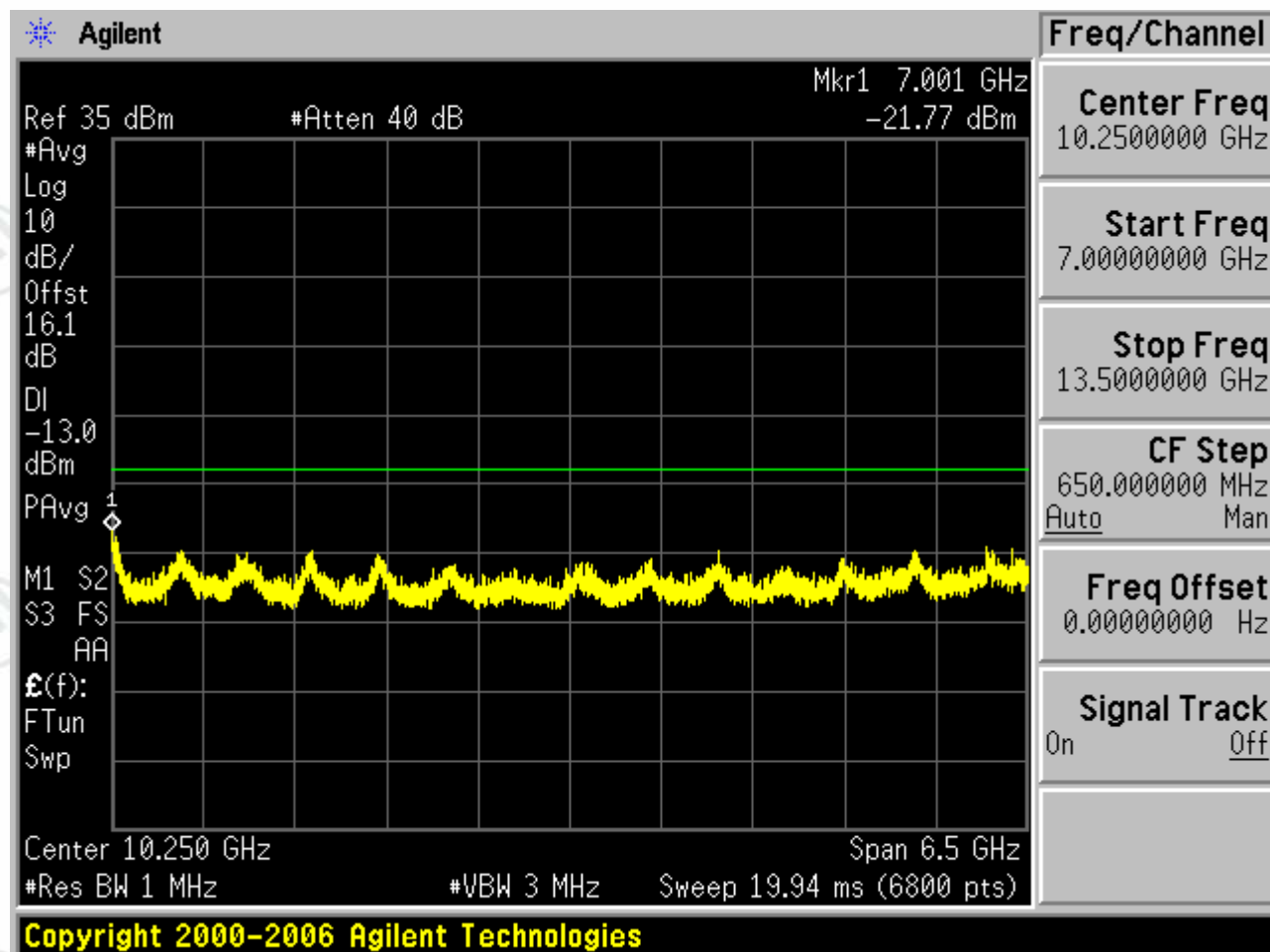
1.2.1.3 Test Channel=HCH

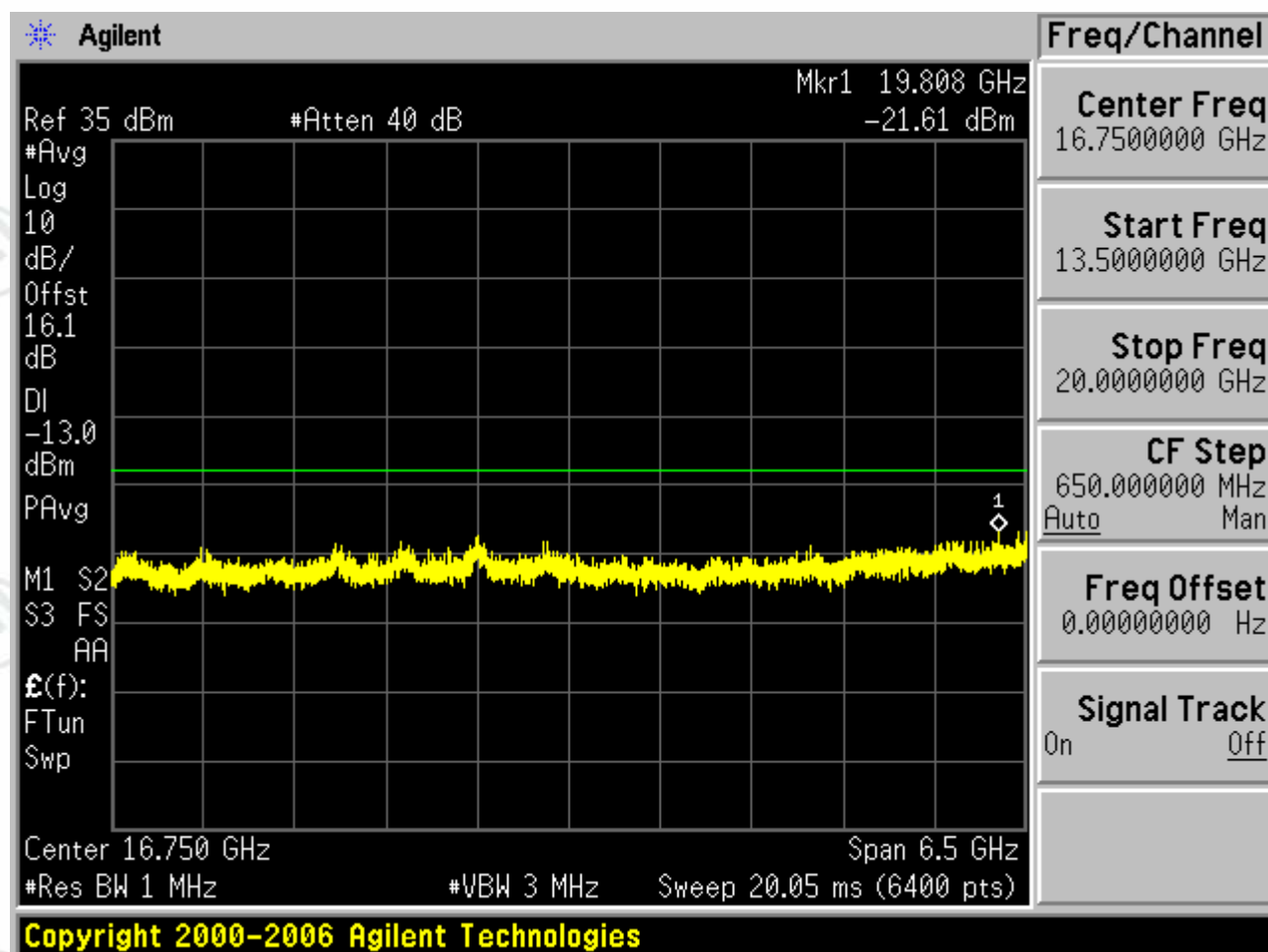






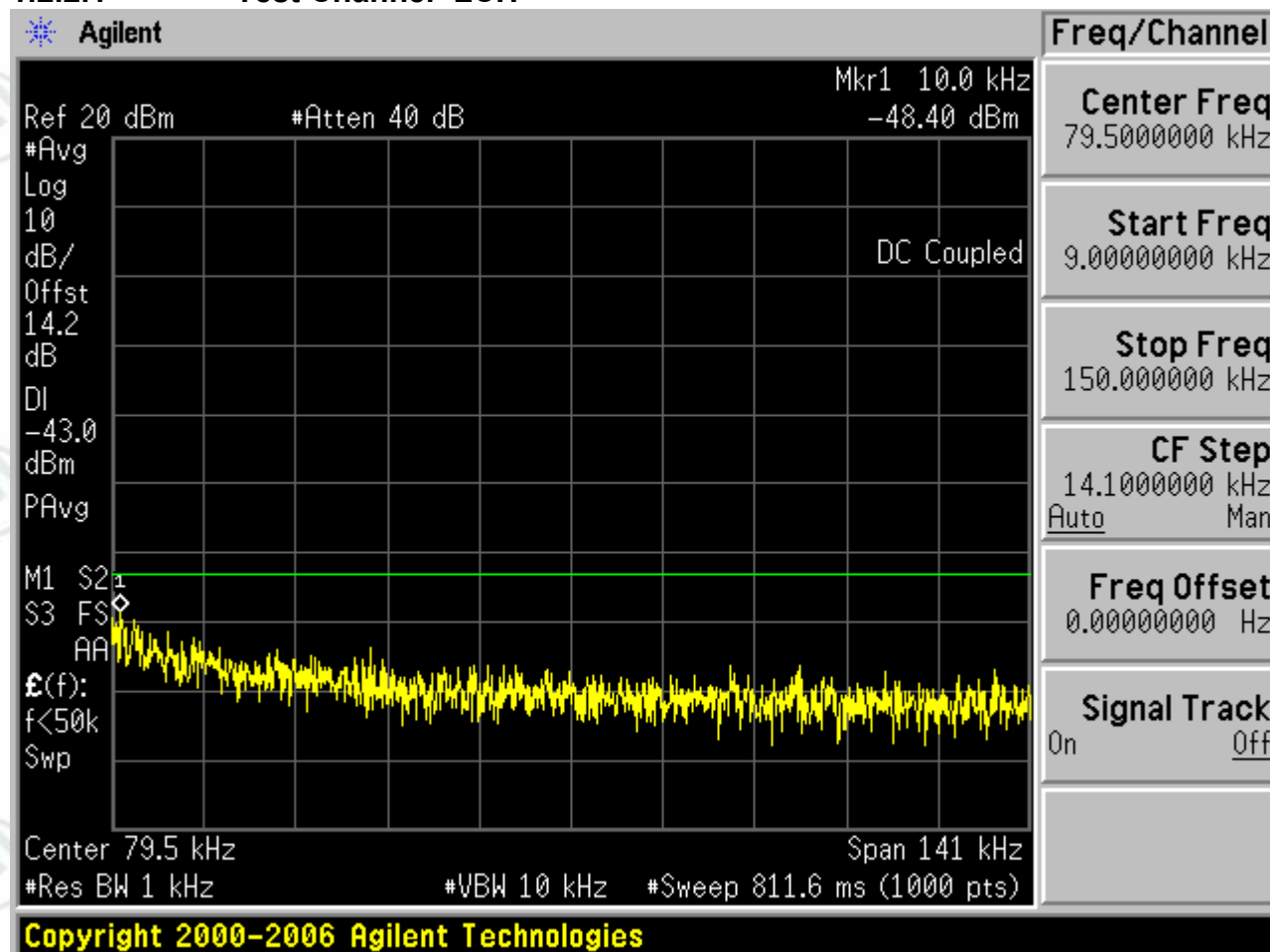


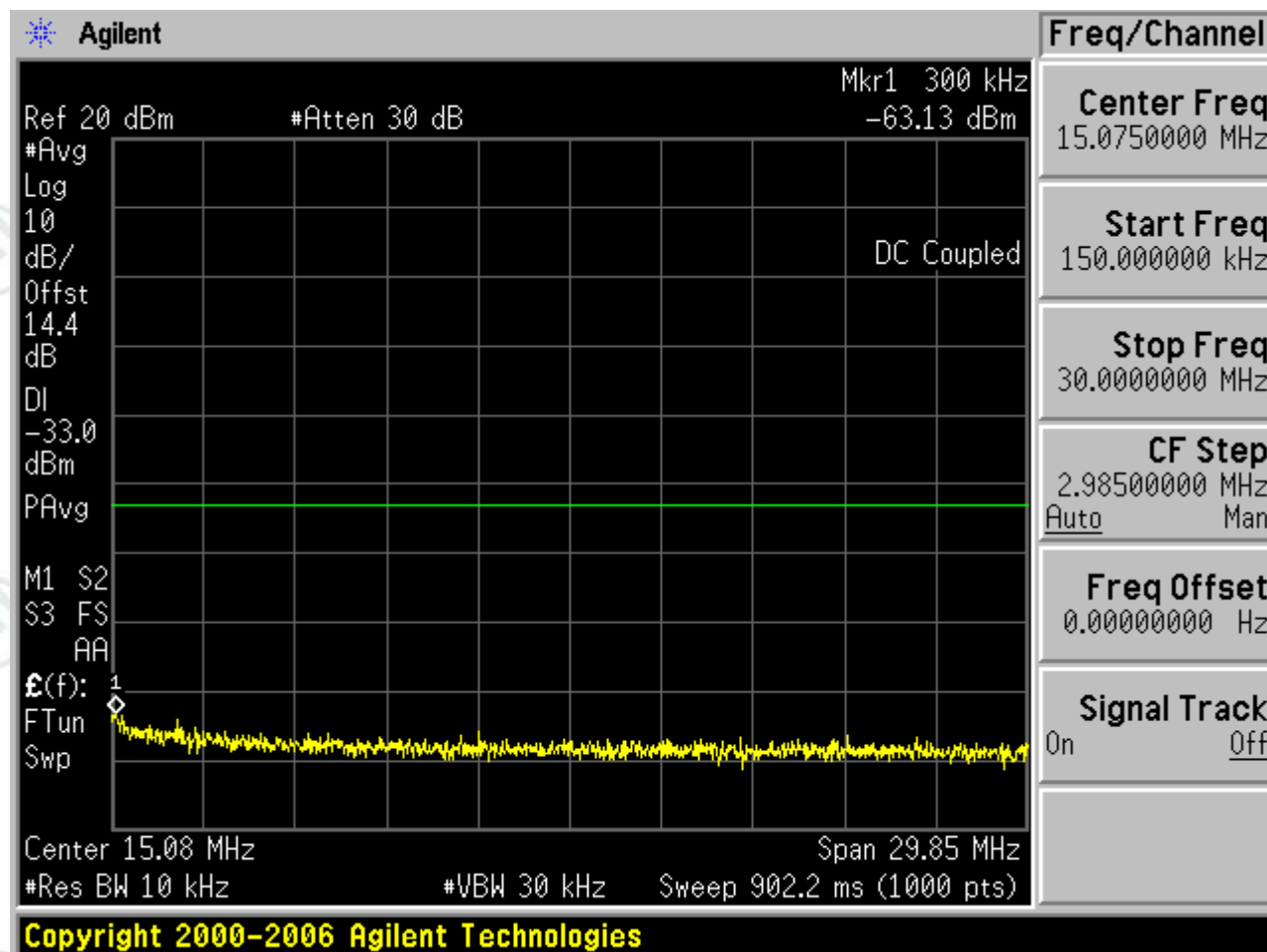


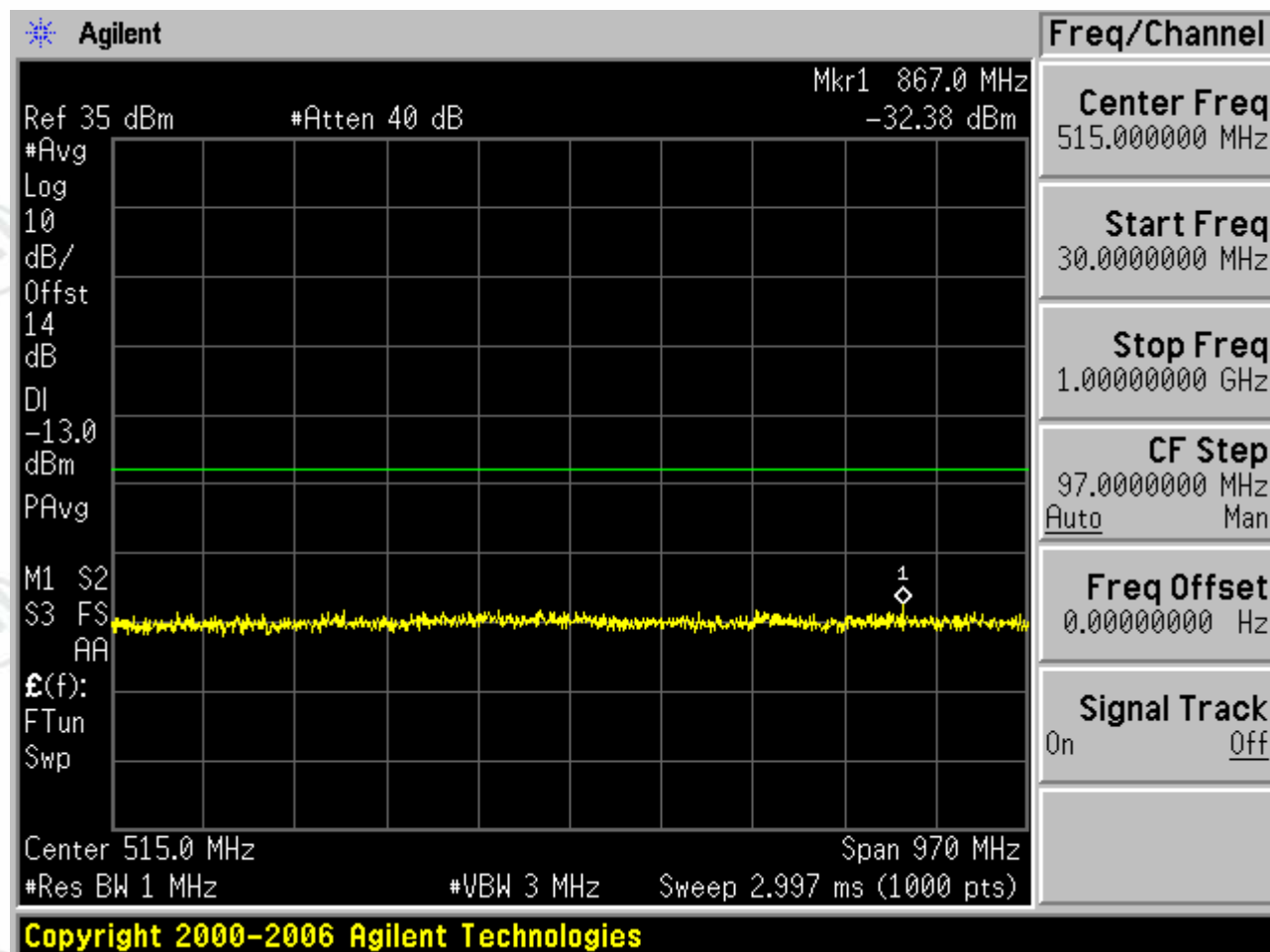


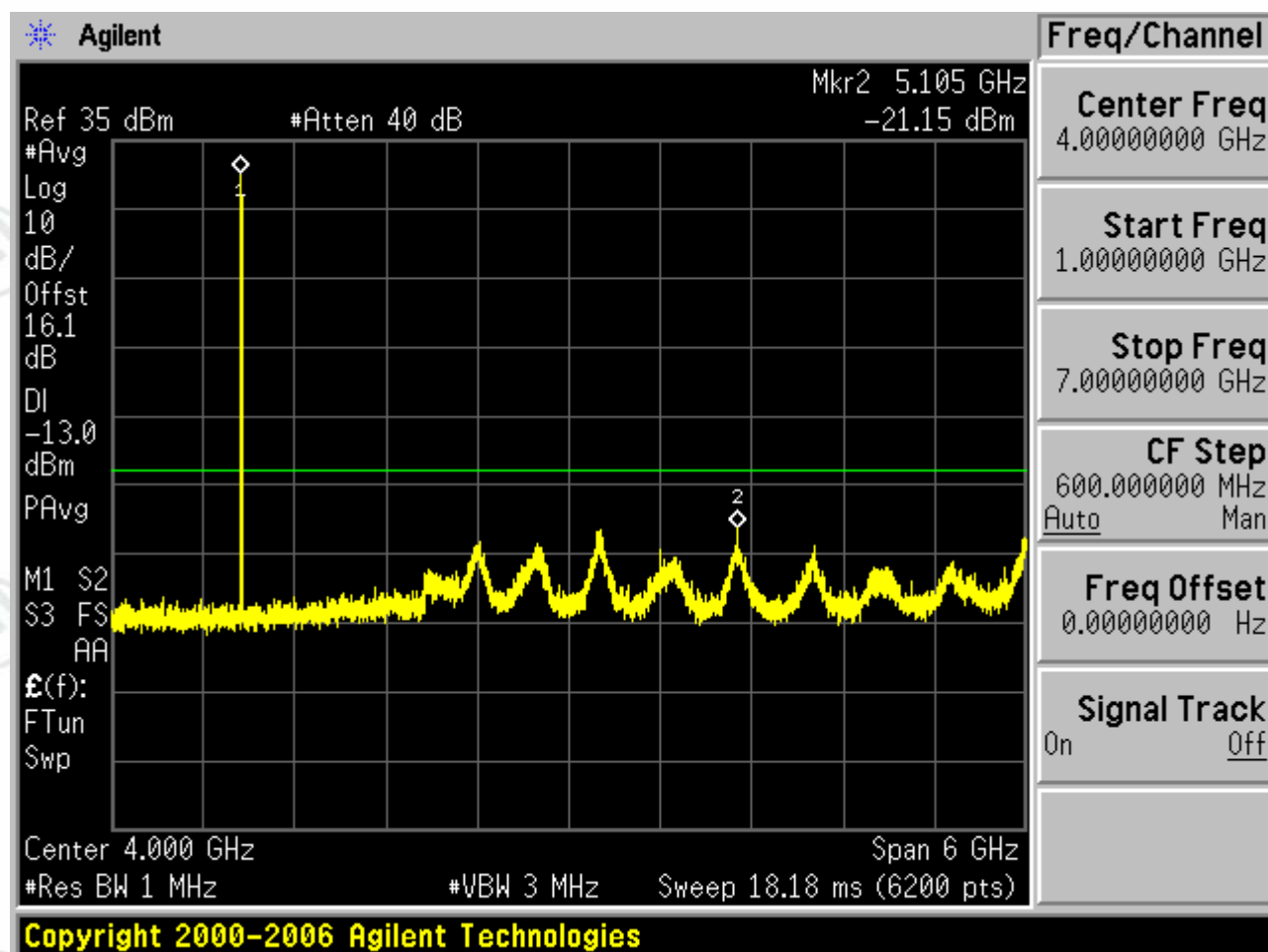
1.2.2 Test Mode=GSM/TM2

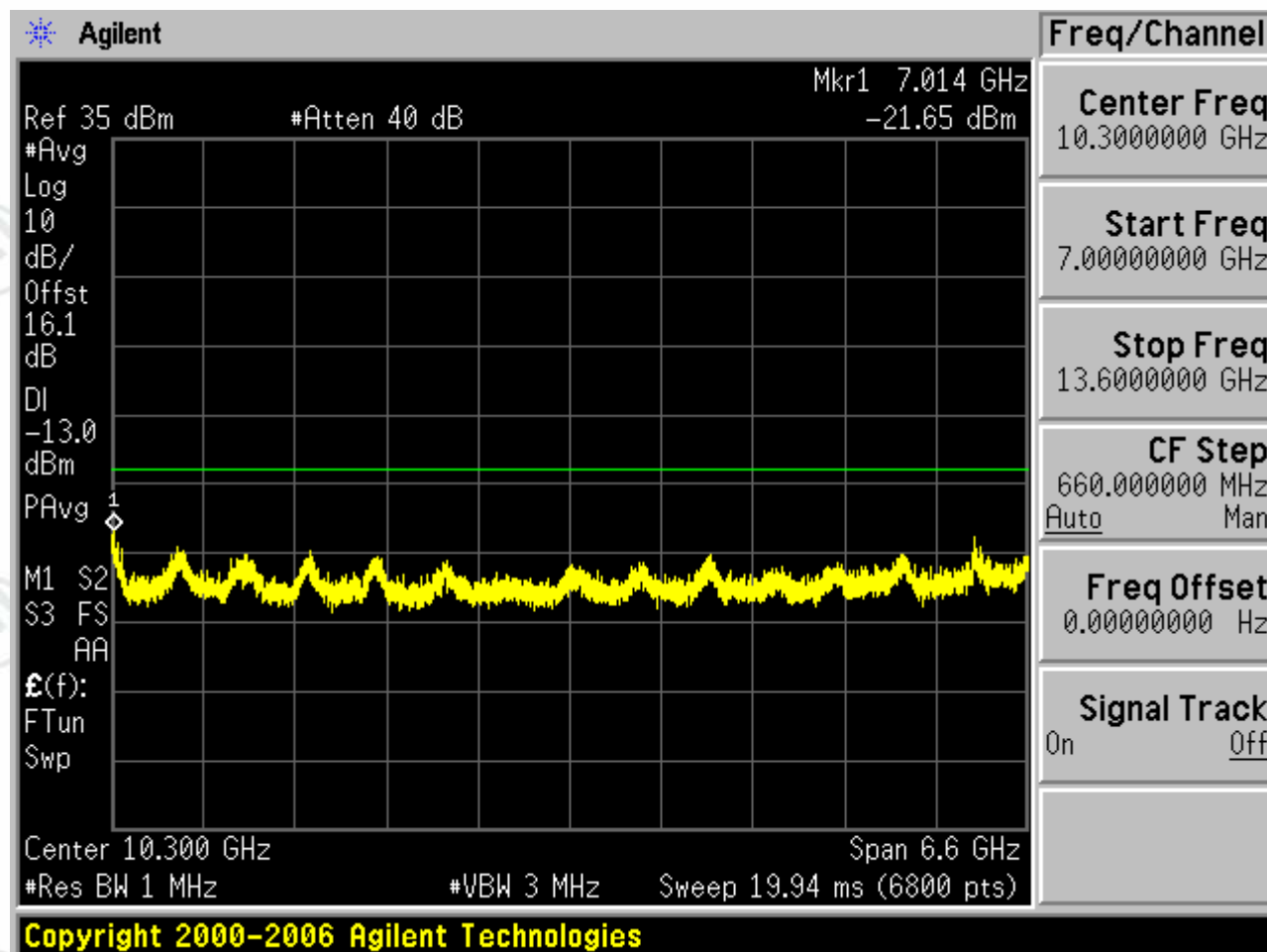
1.2.2.1 Test Channel=LCH

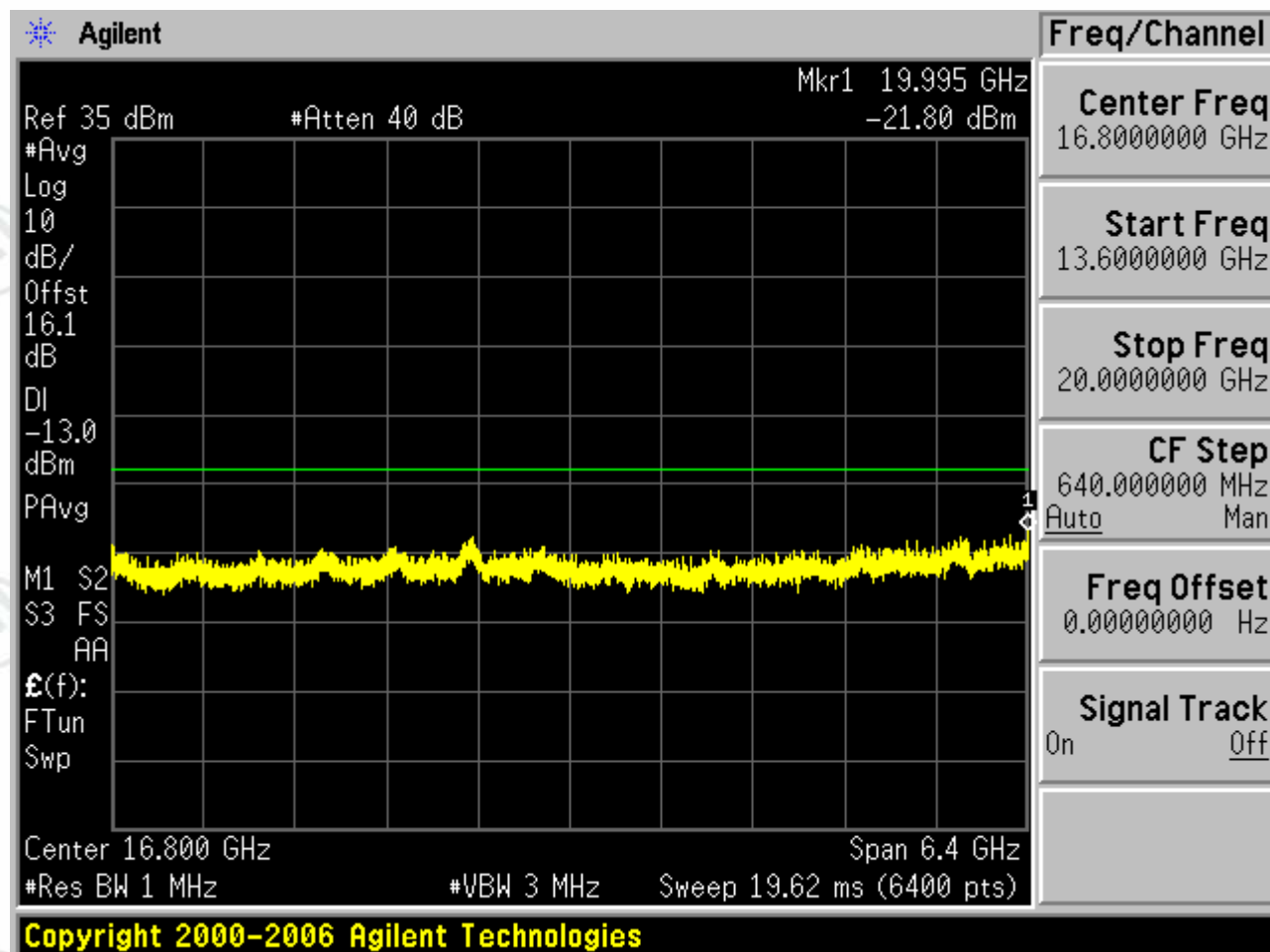




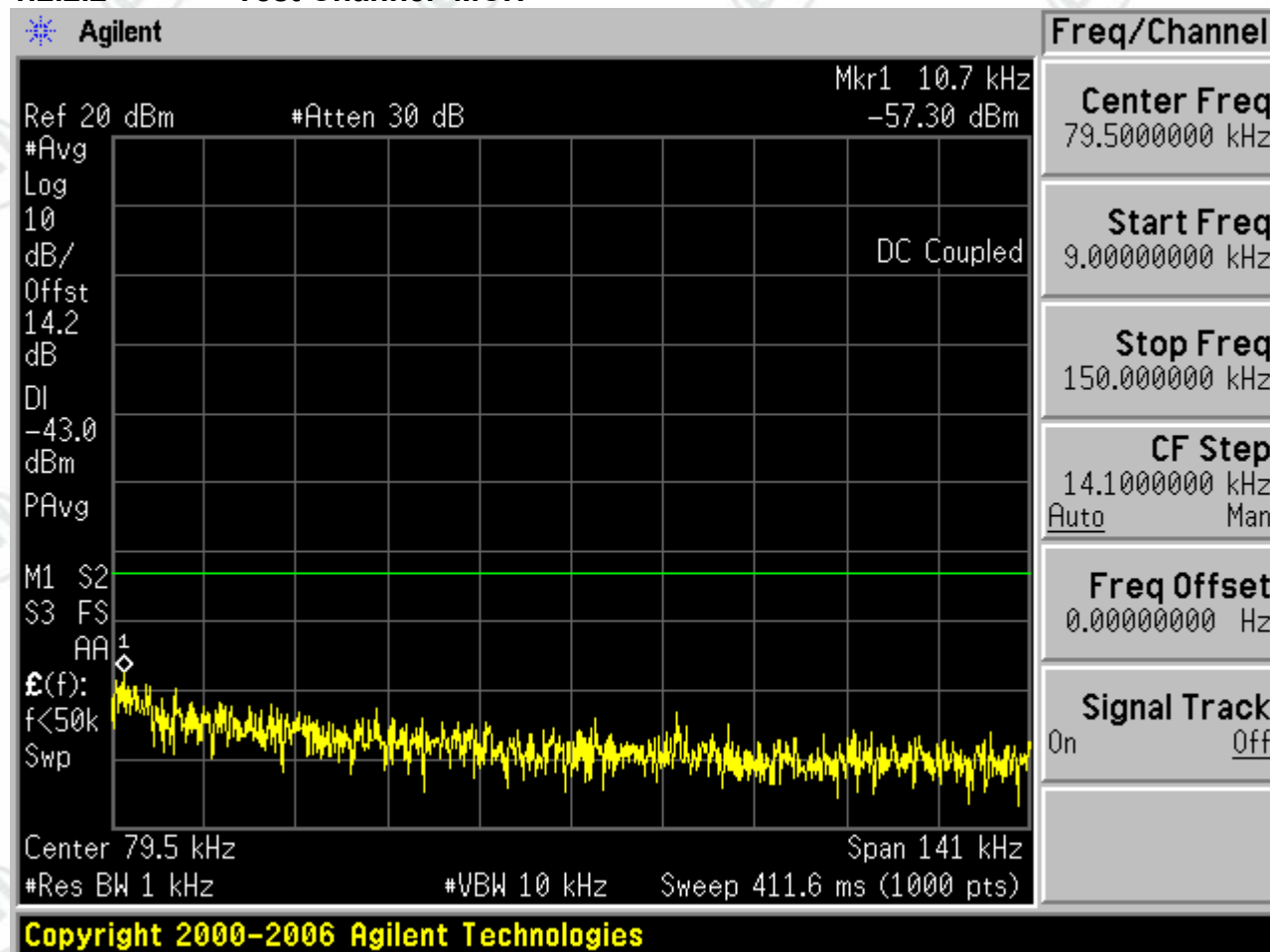


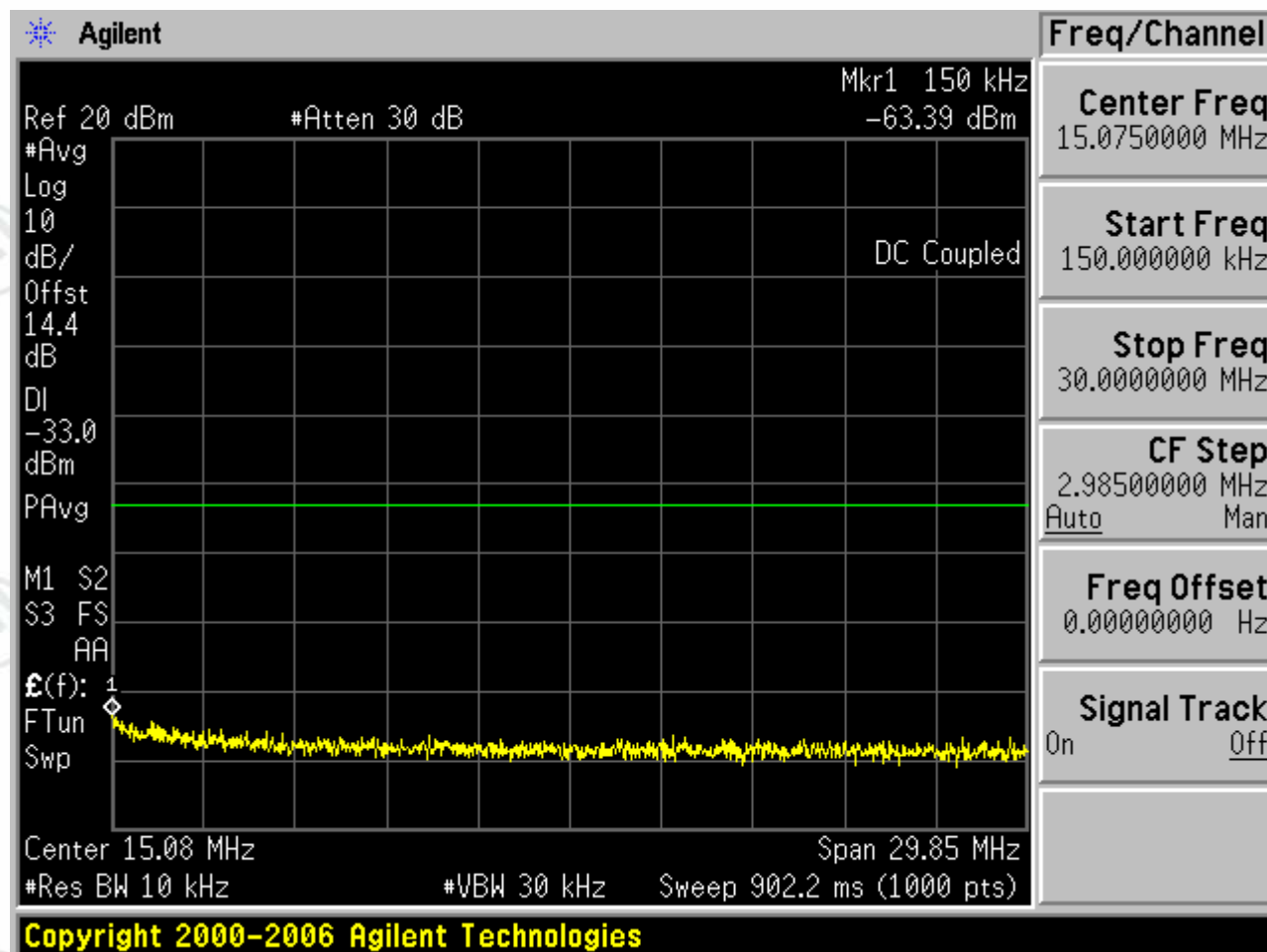


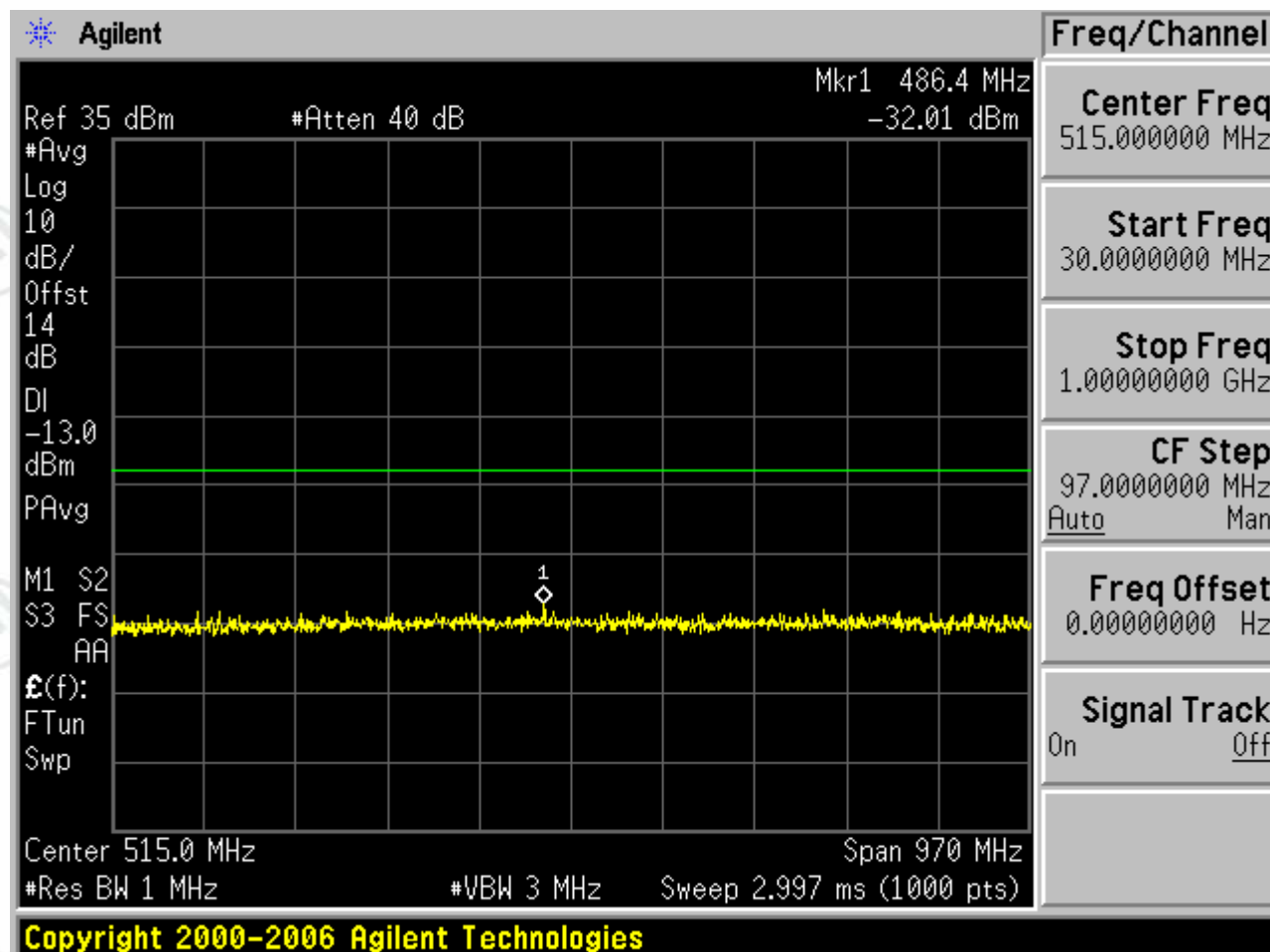


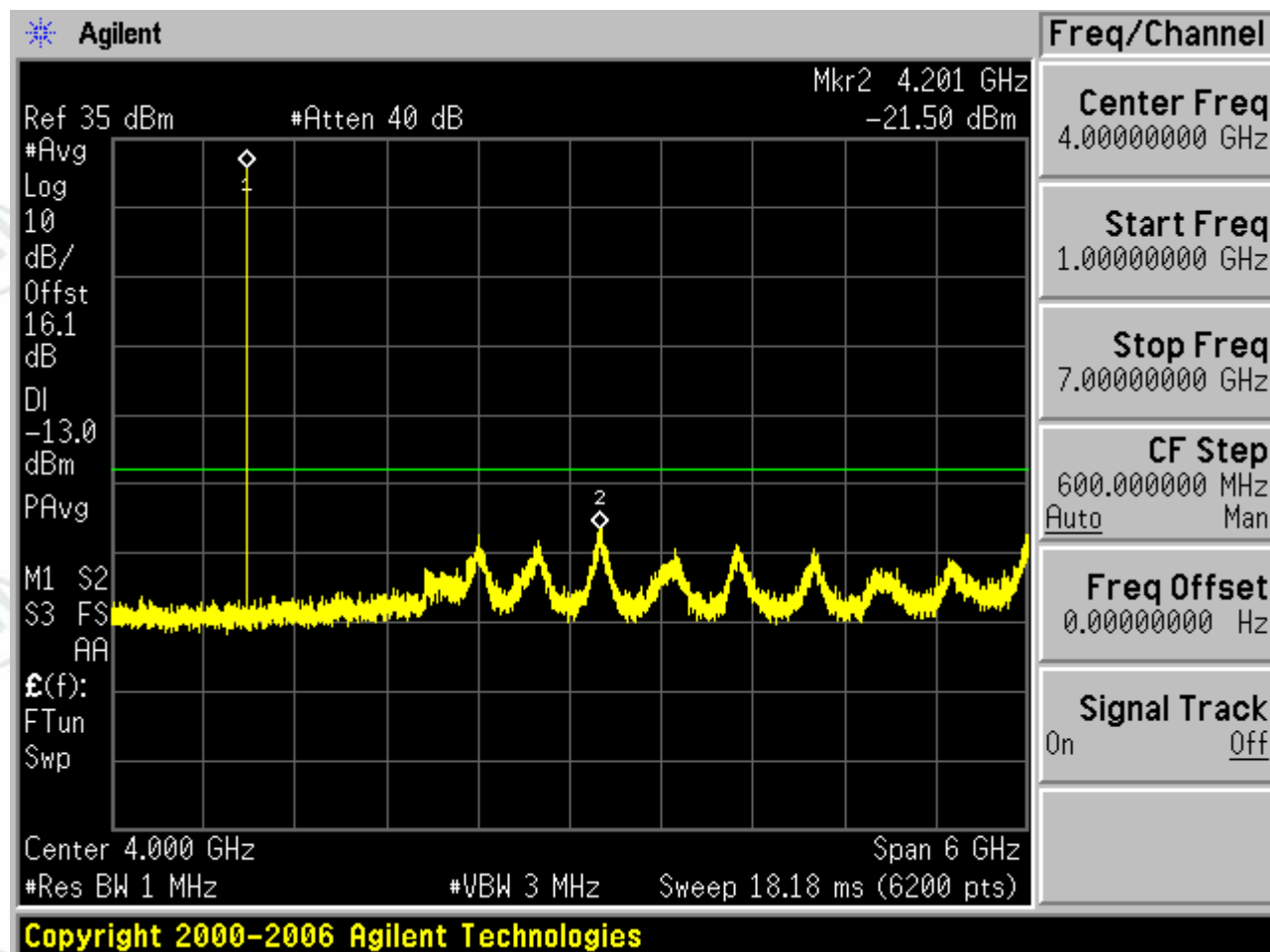


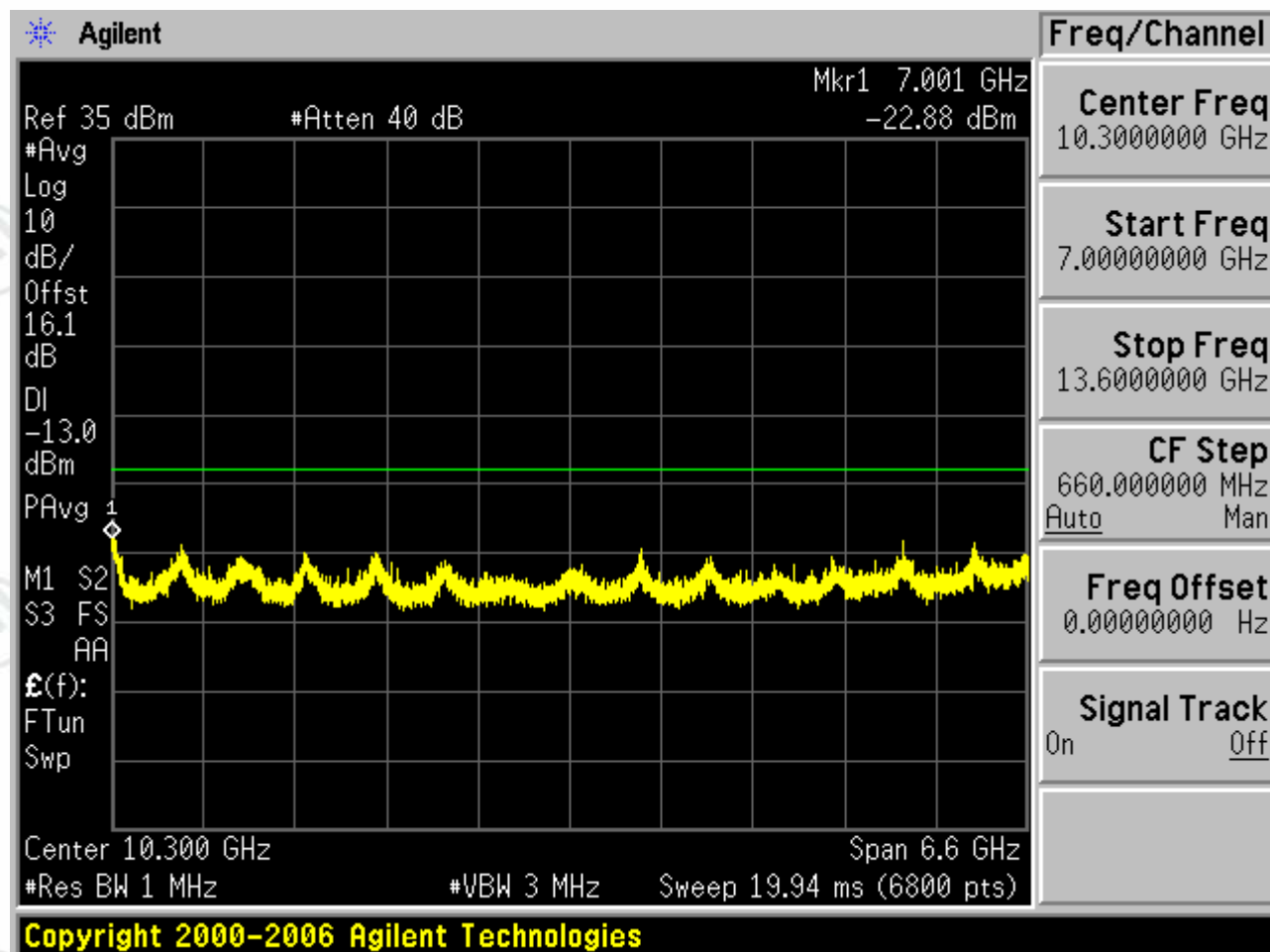
1.2.2.2 Test Channel=MCH

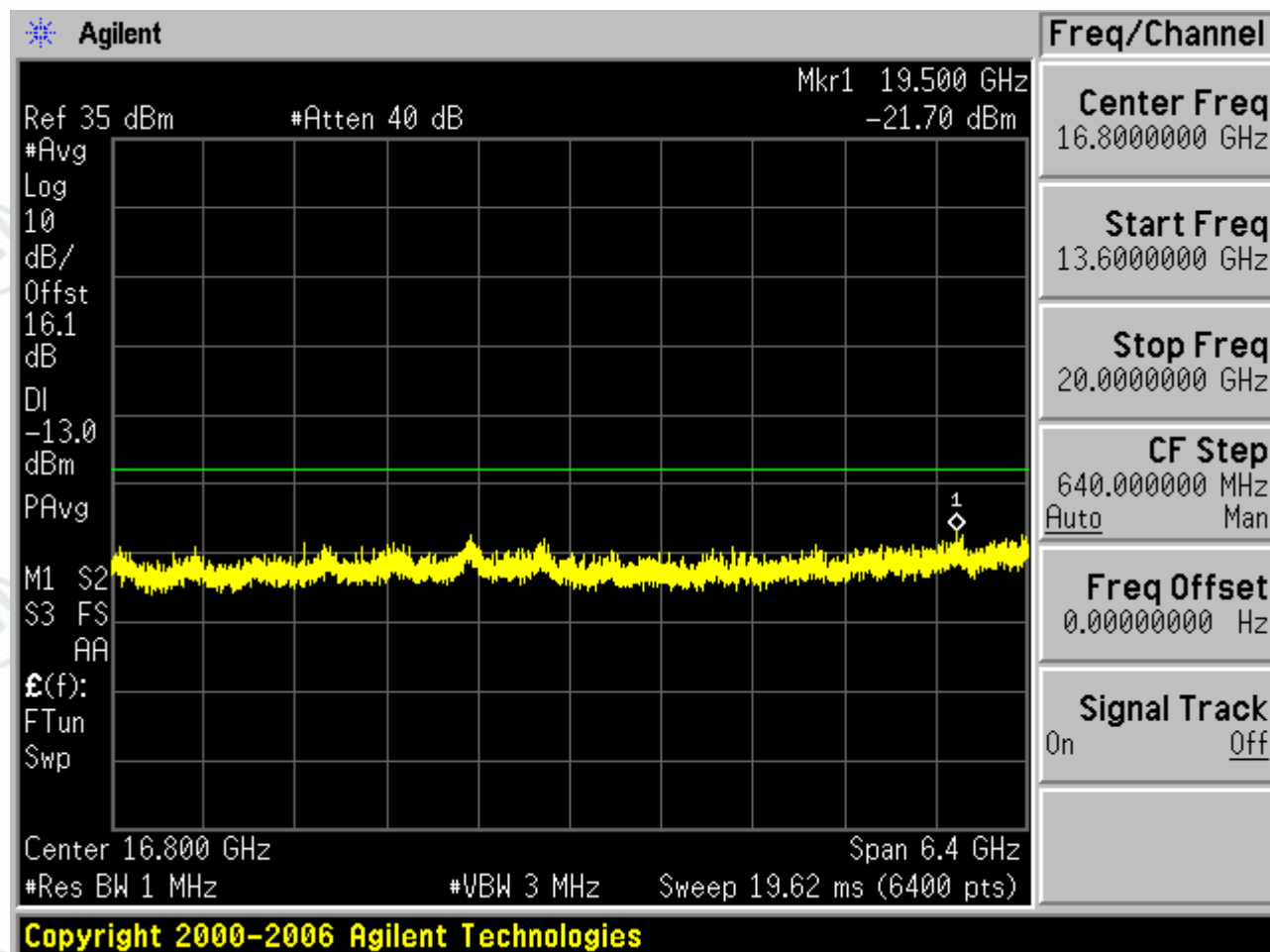




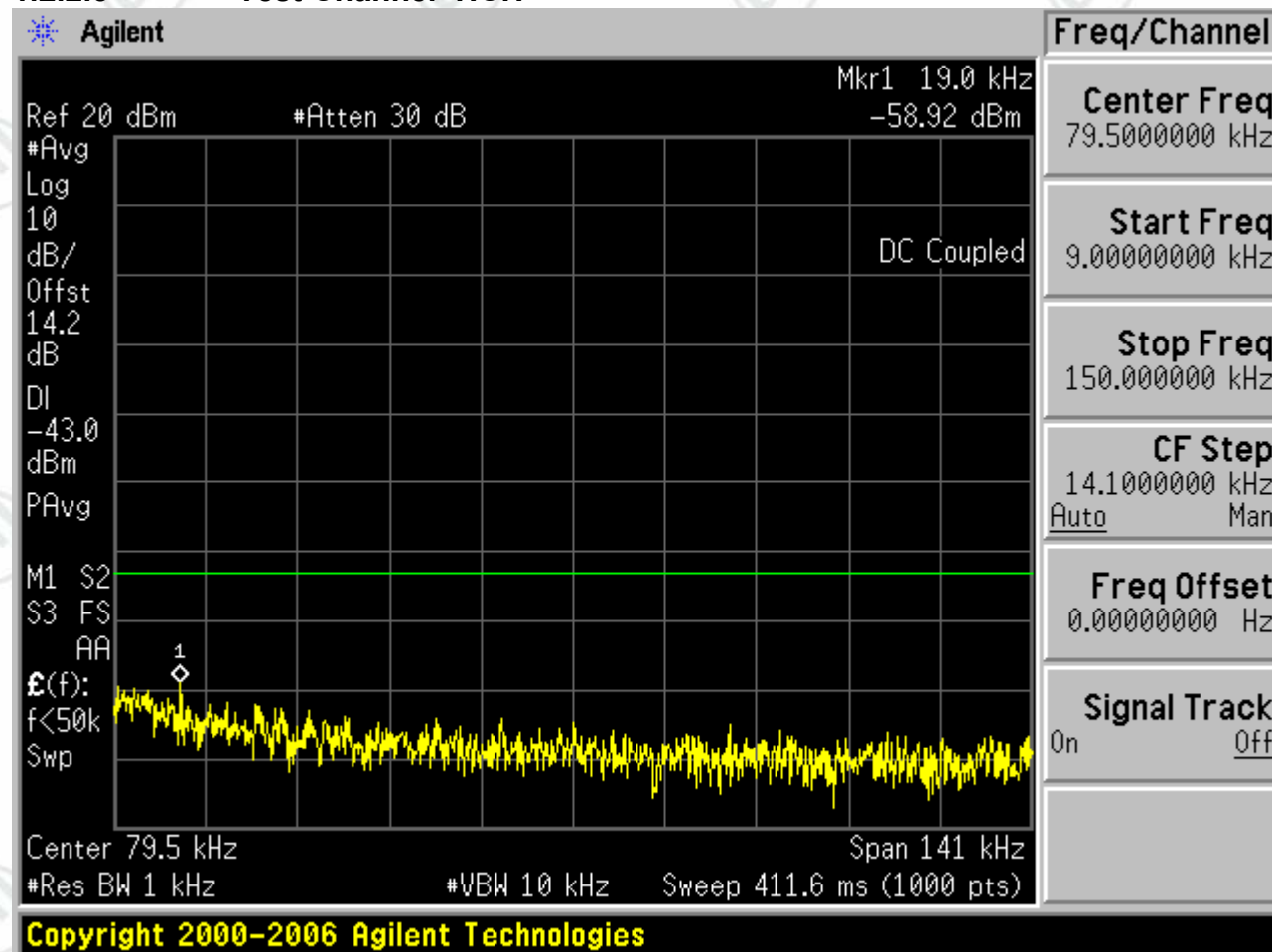


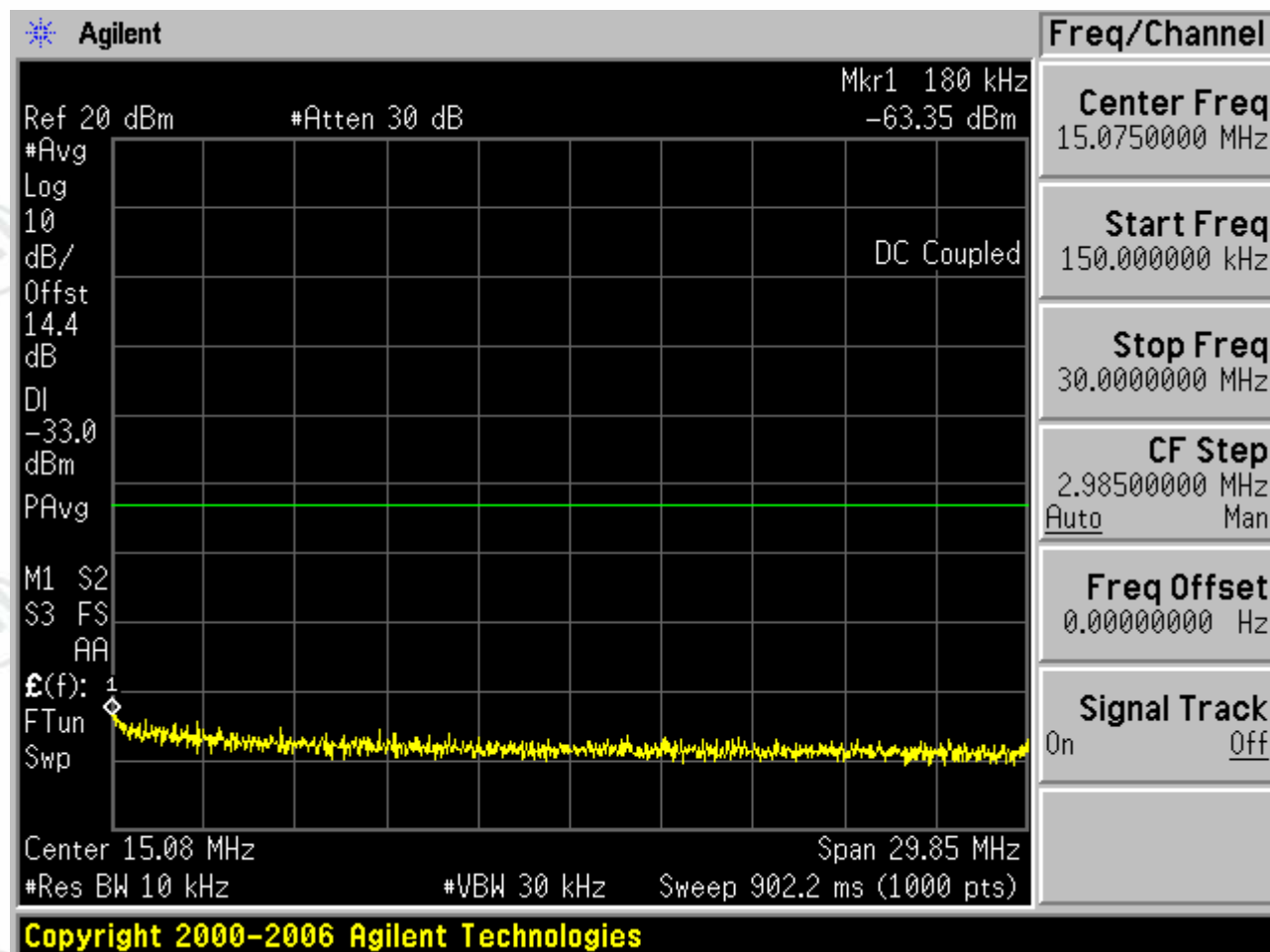


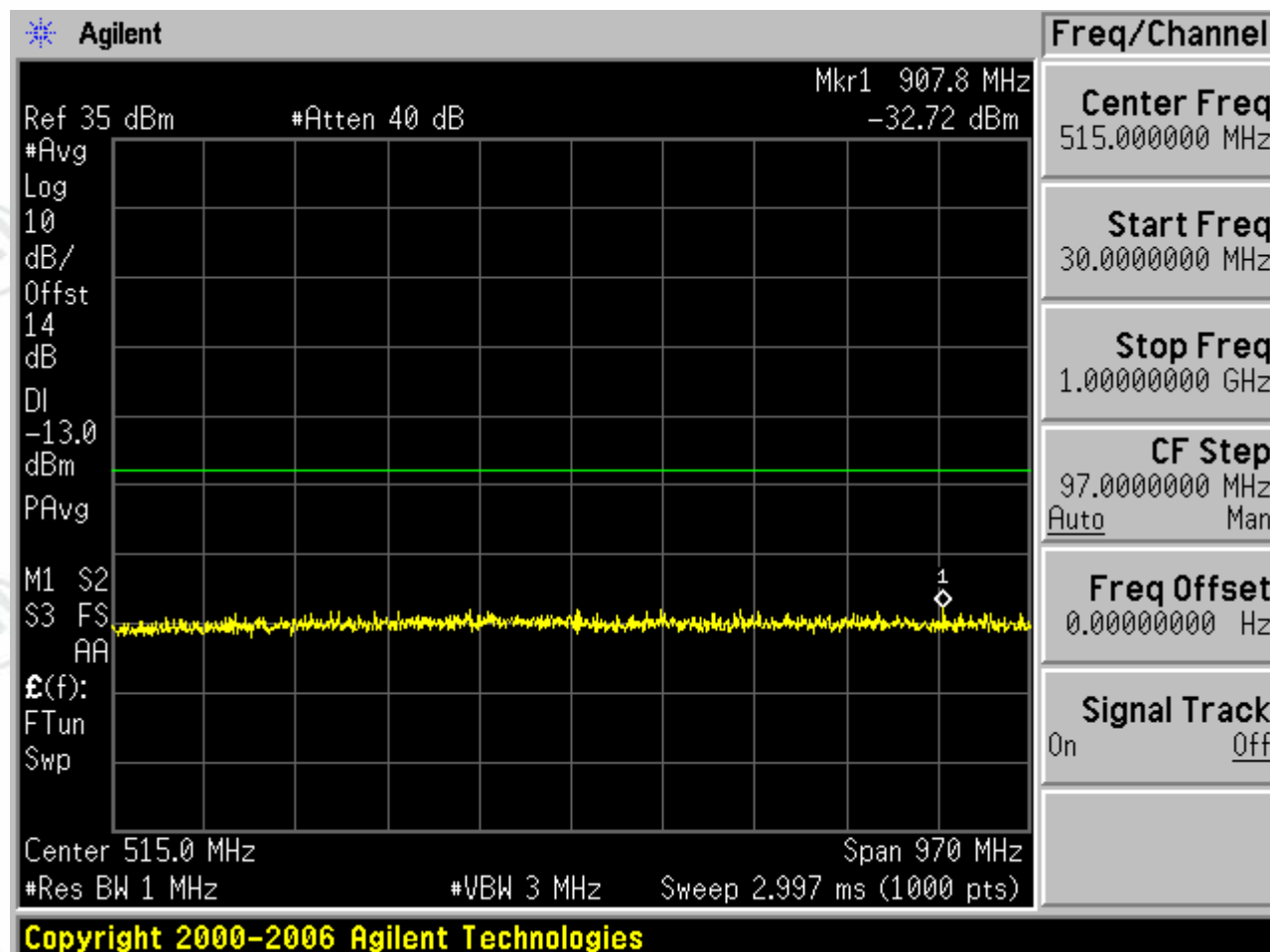


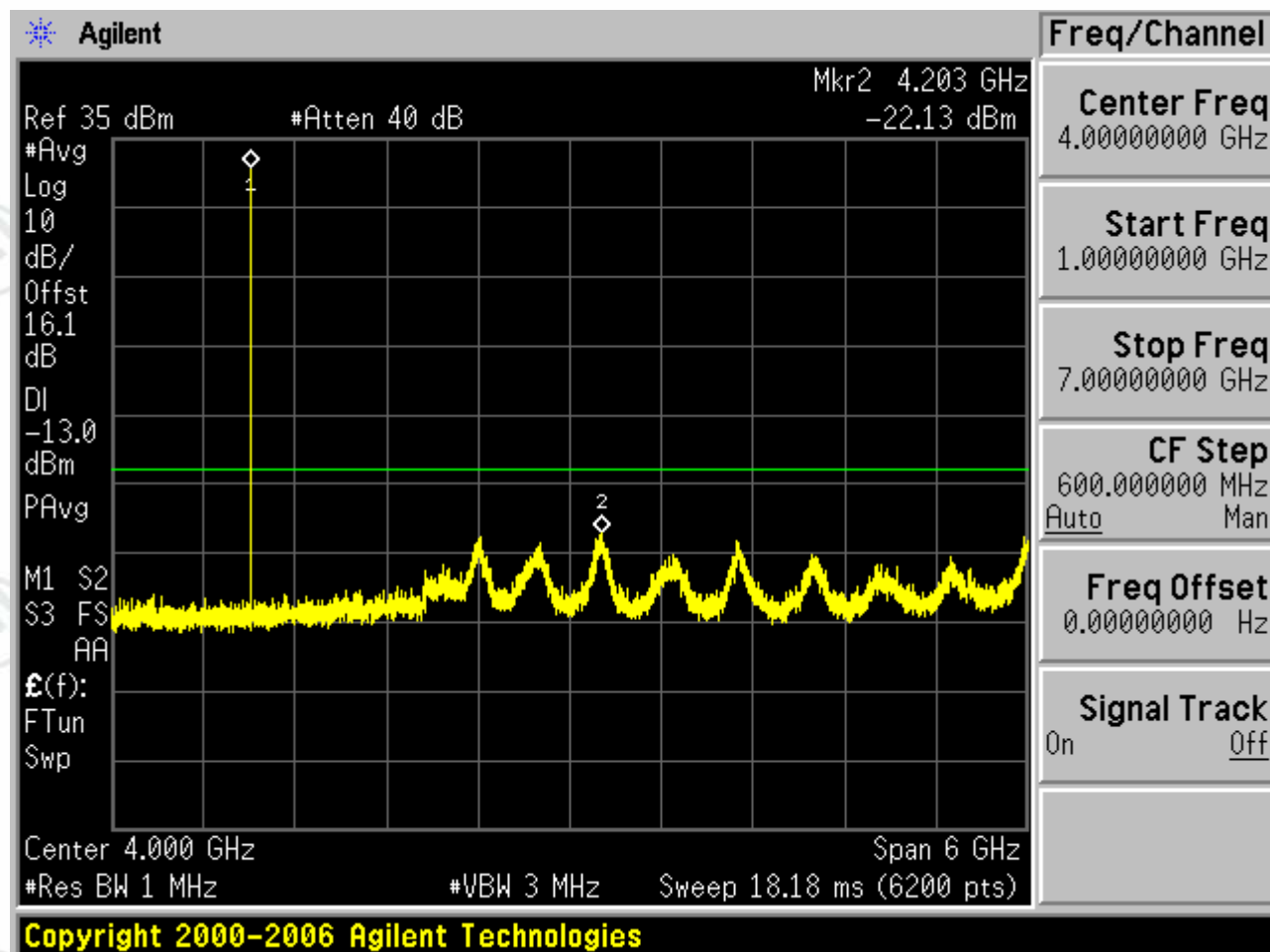


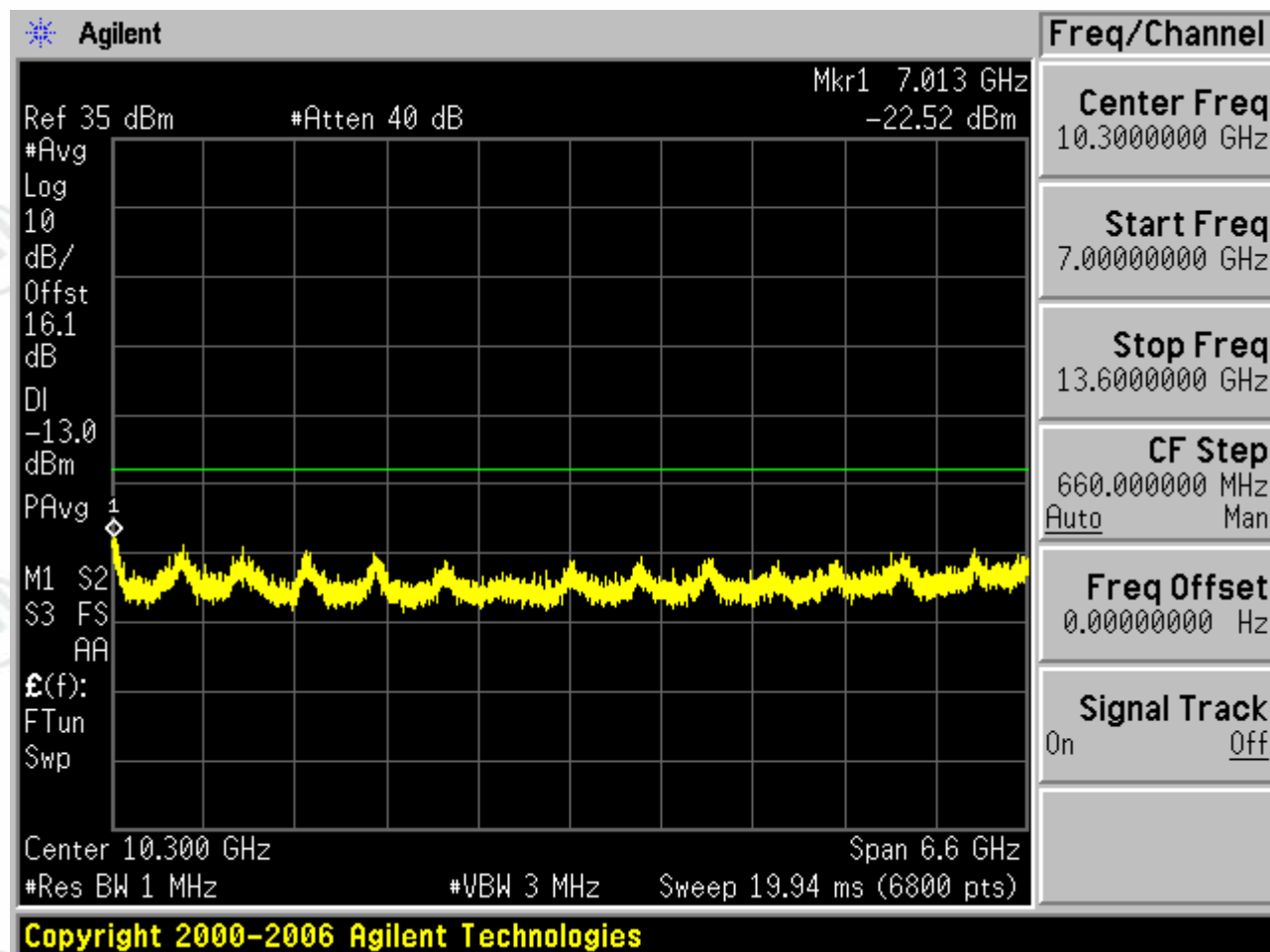
1.2.2.3 Test Channel=HCH

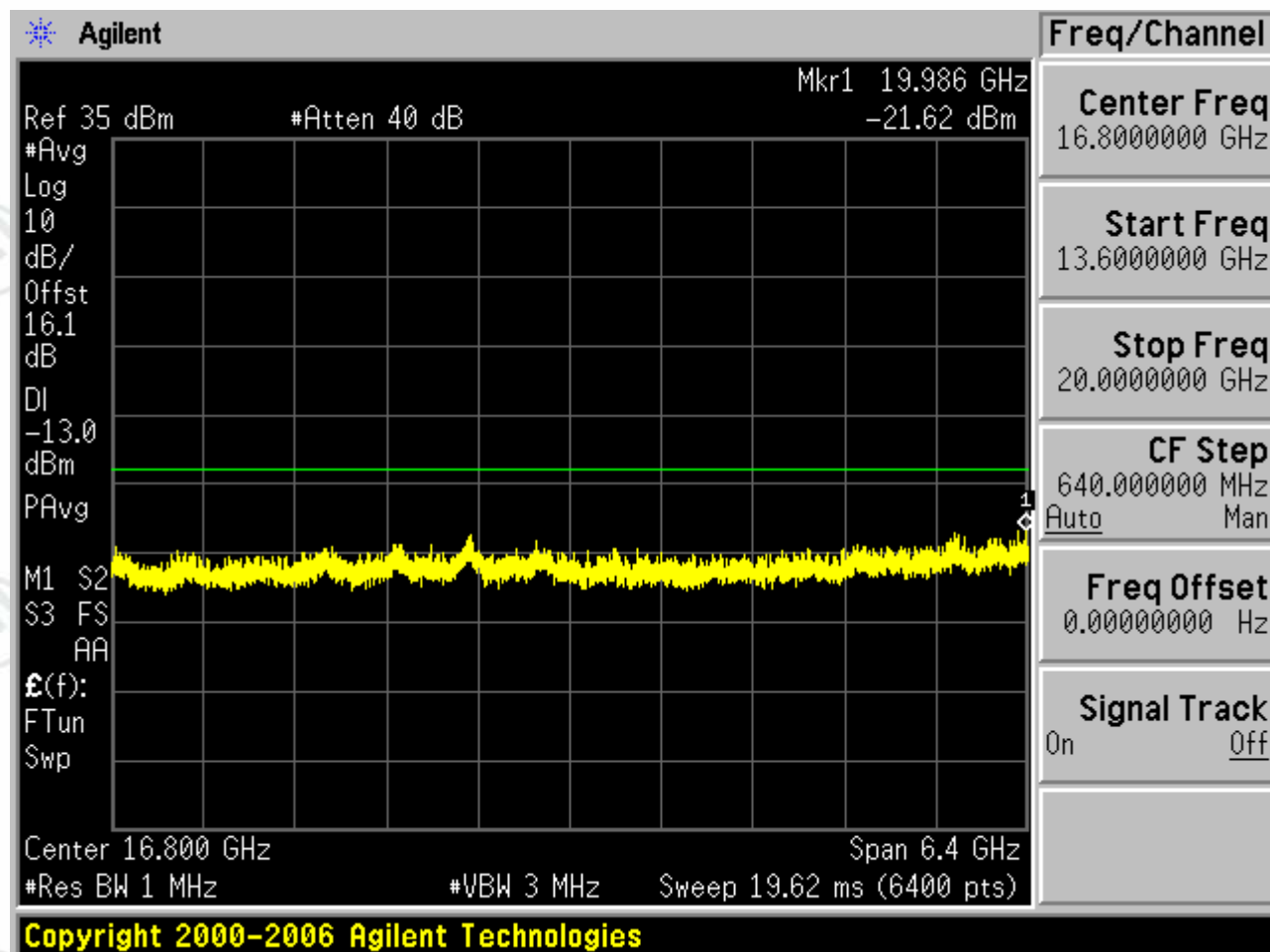






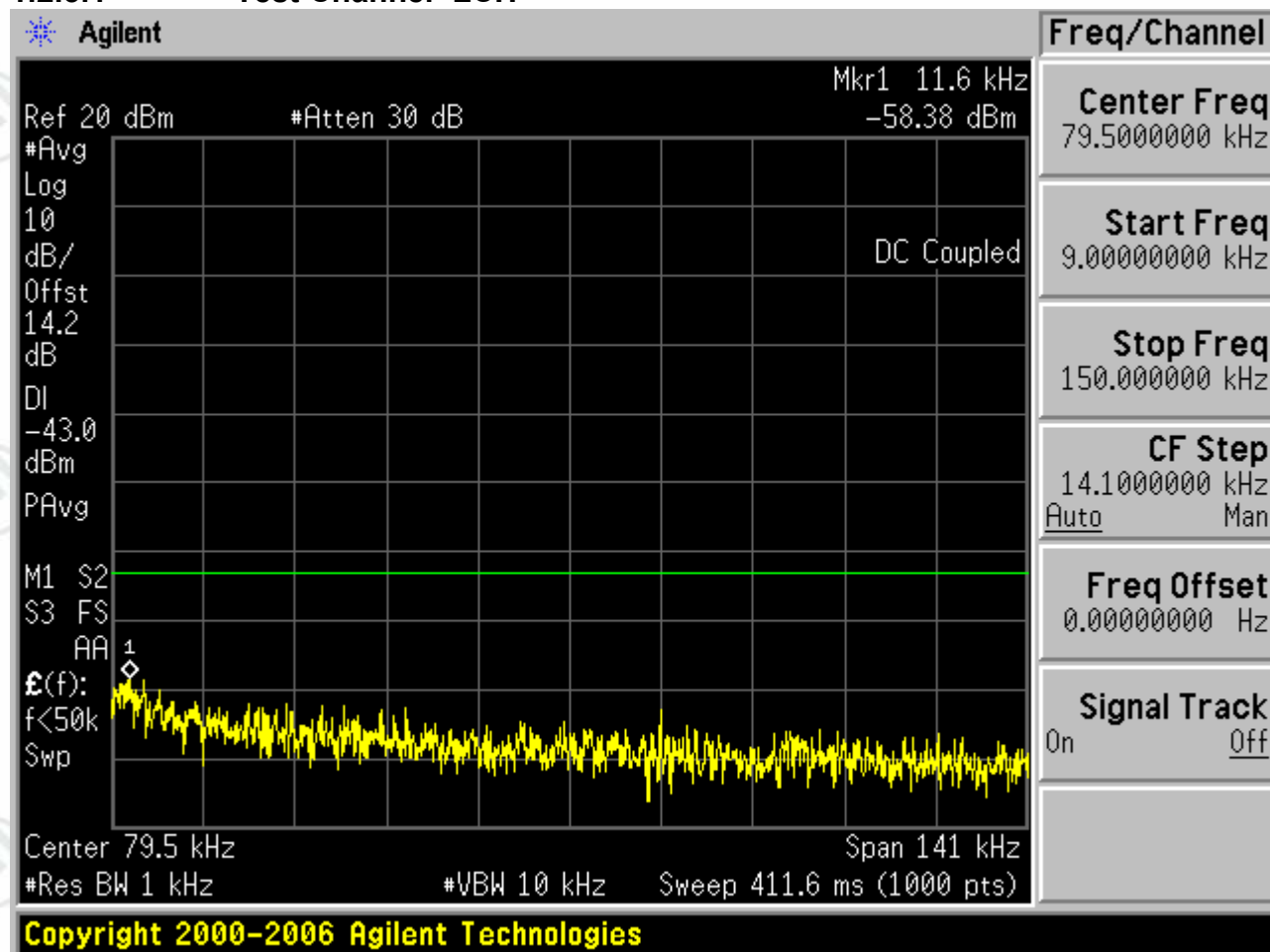


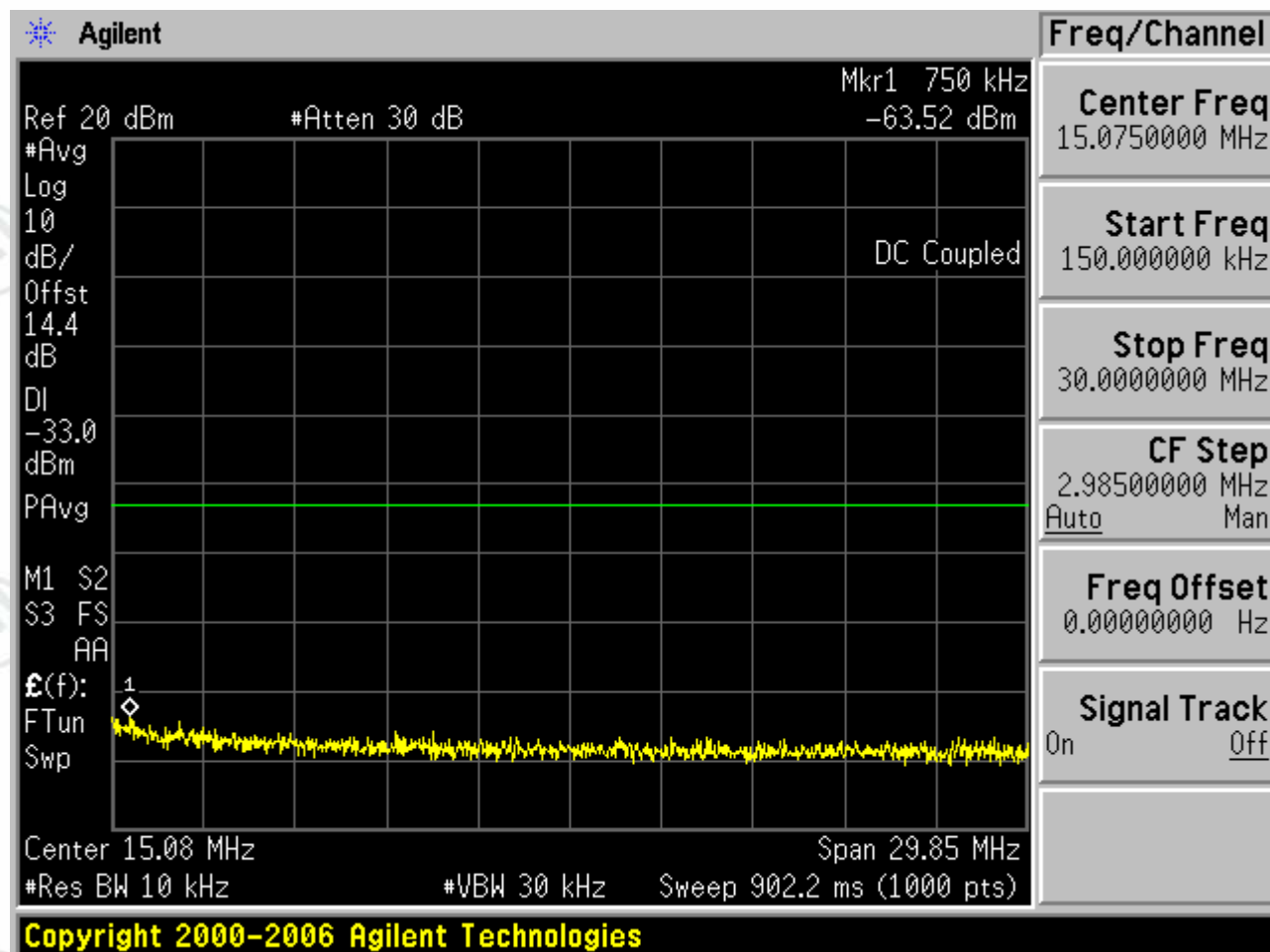


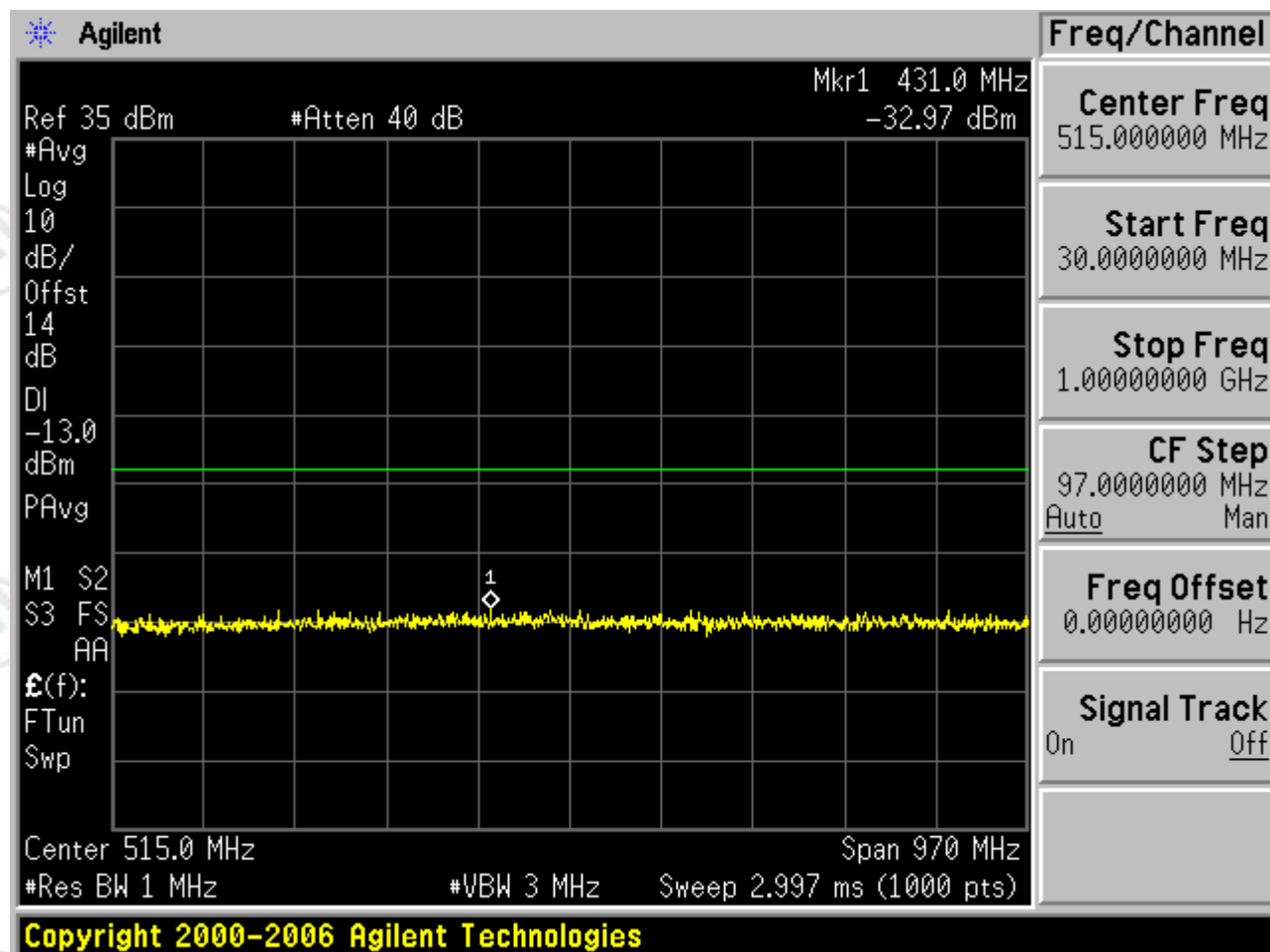


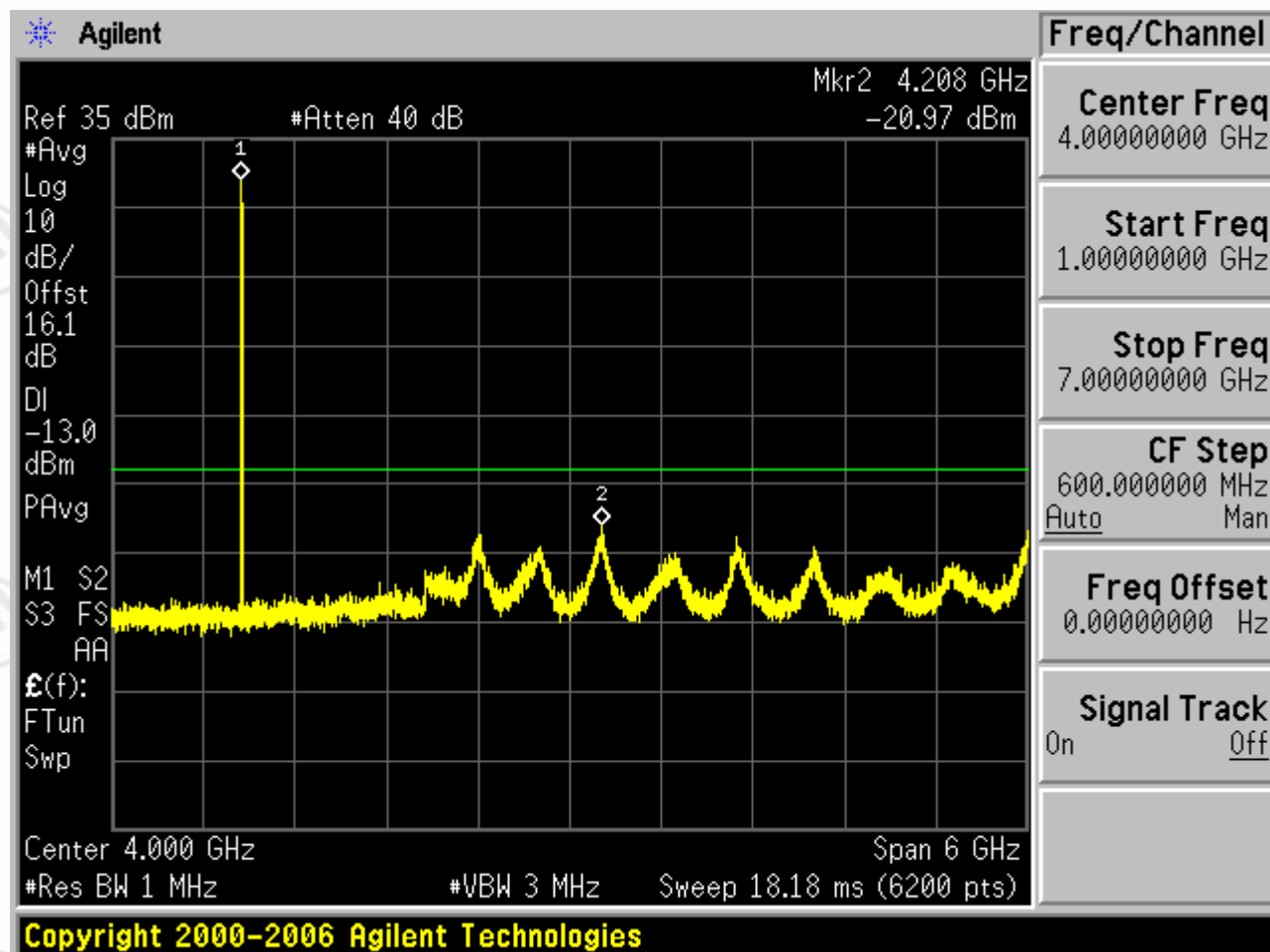
1.2.3 Test Mode=GSM/TM3

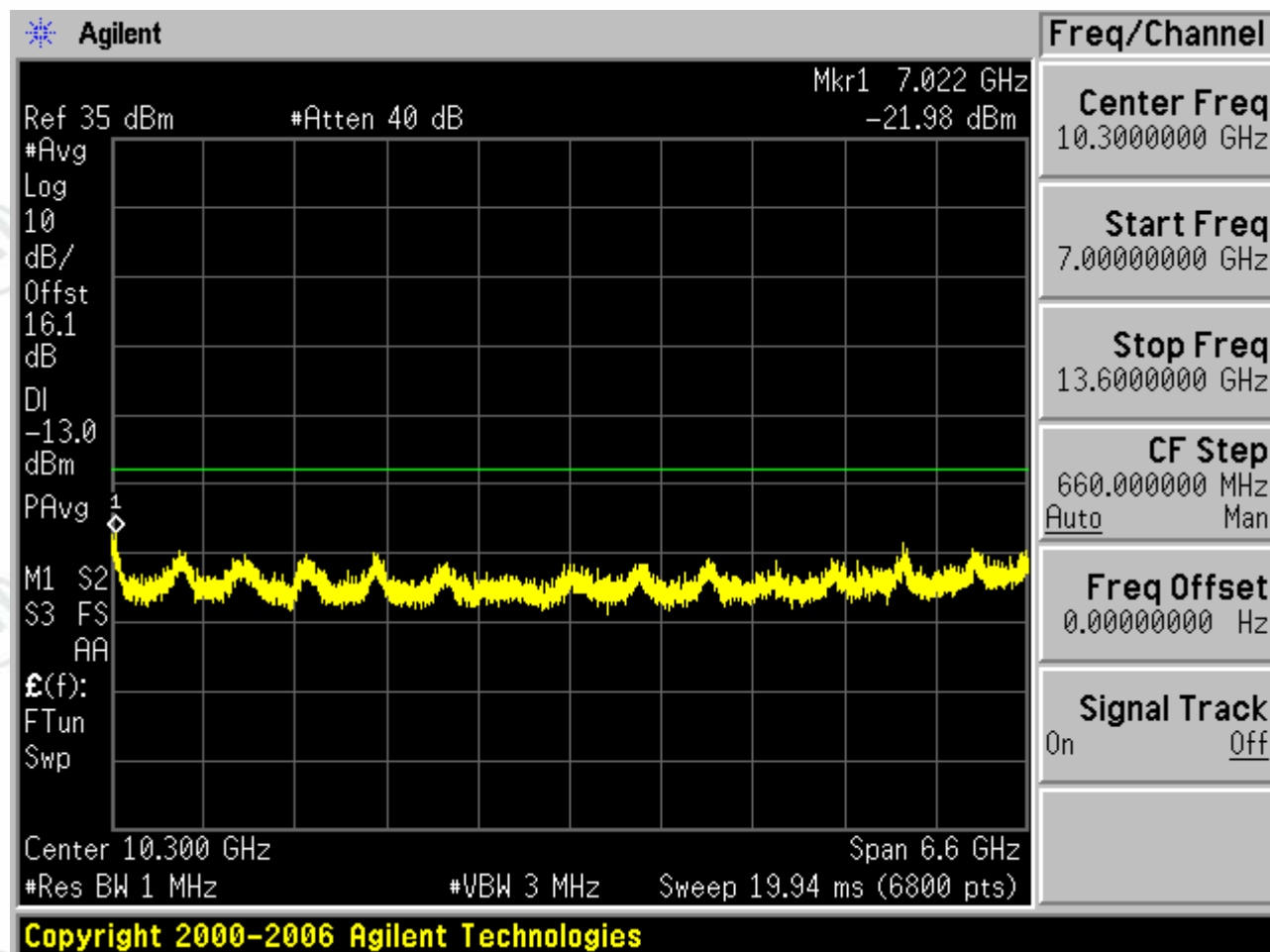
1.2.3.1 Test Channel=LCH

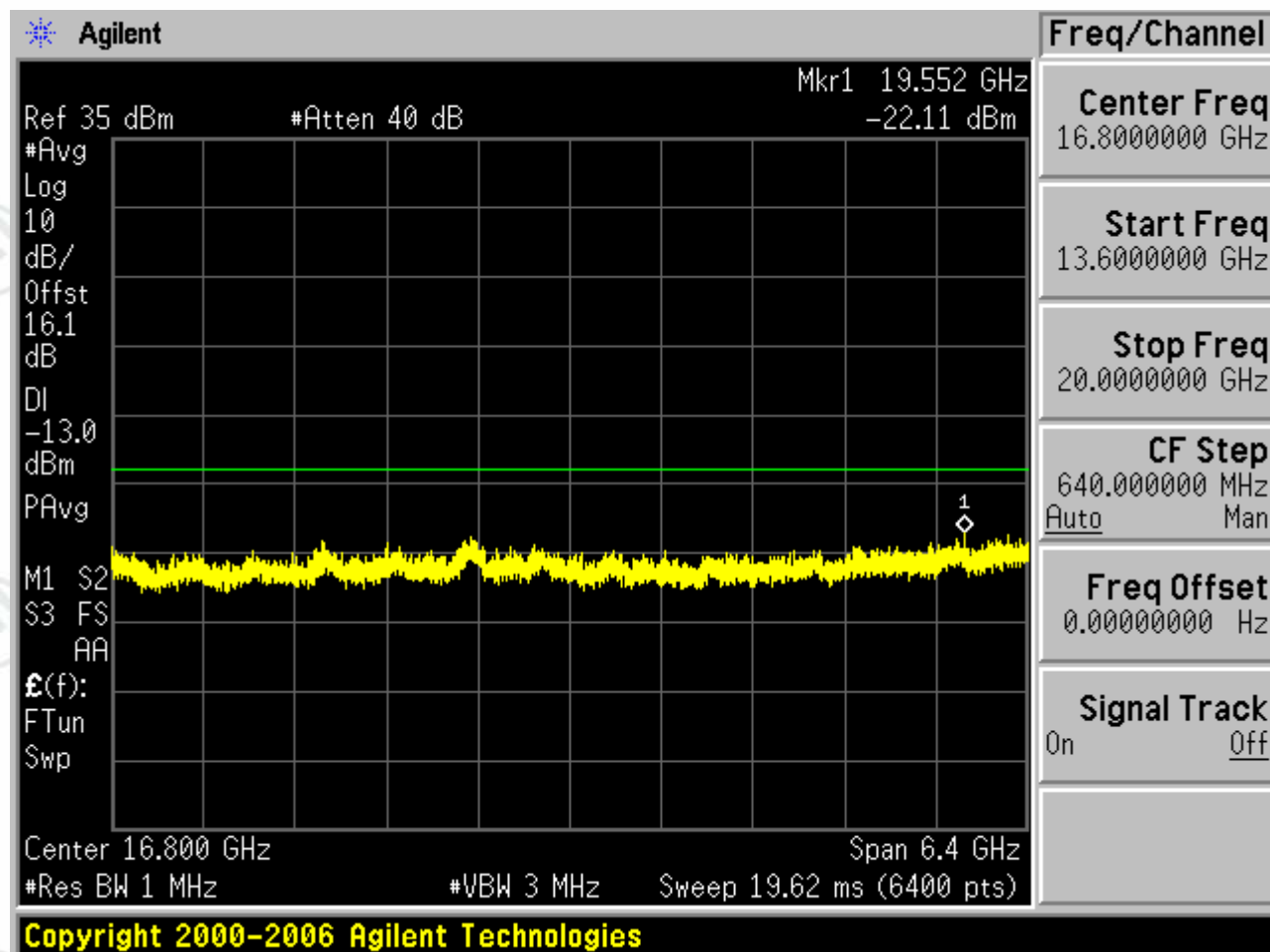




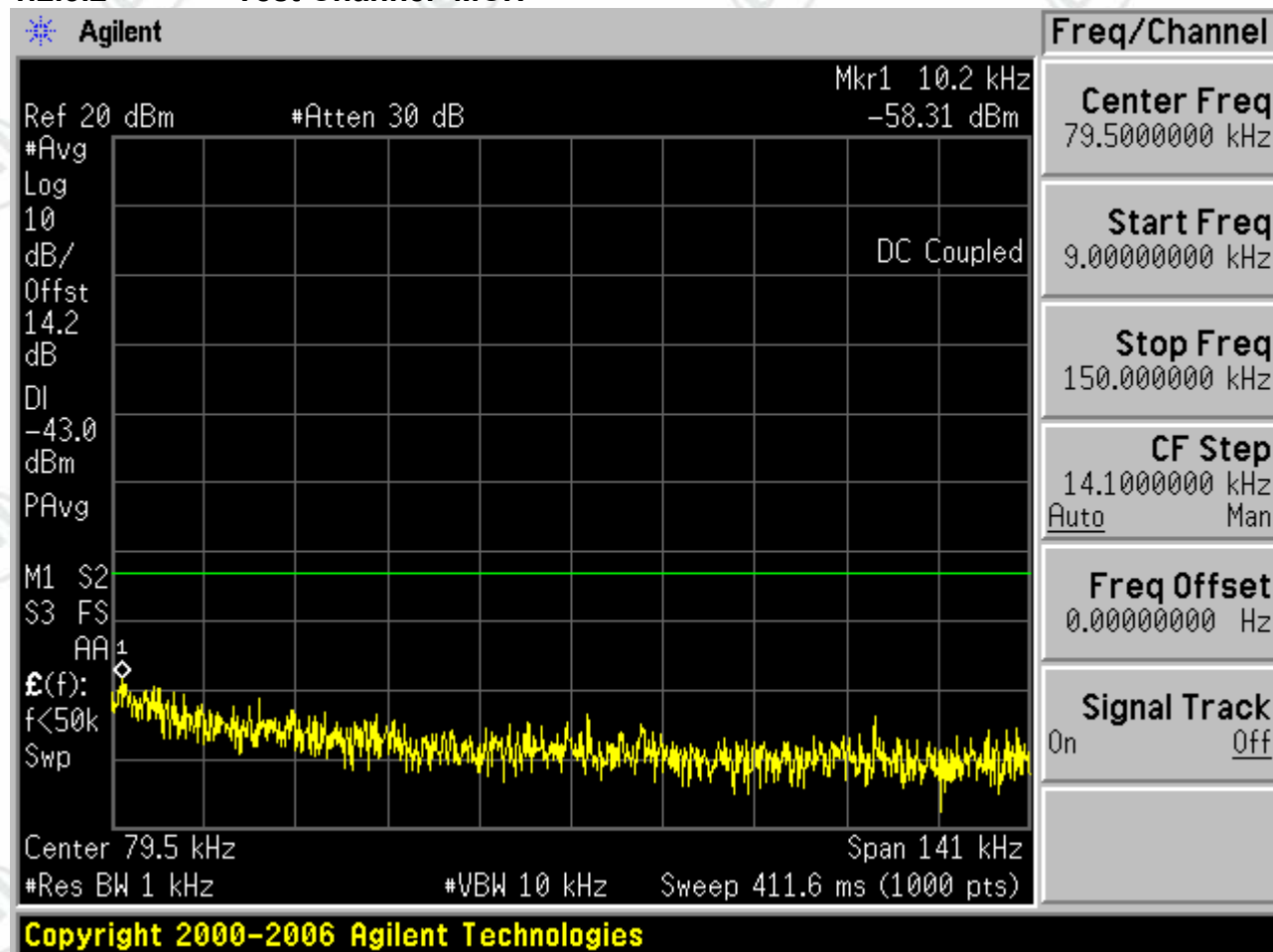


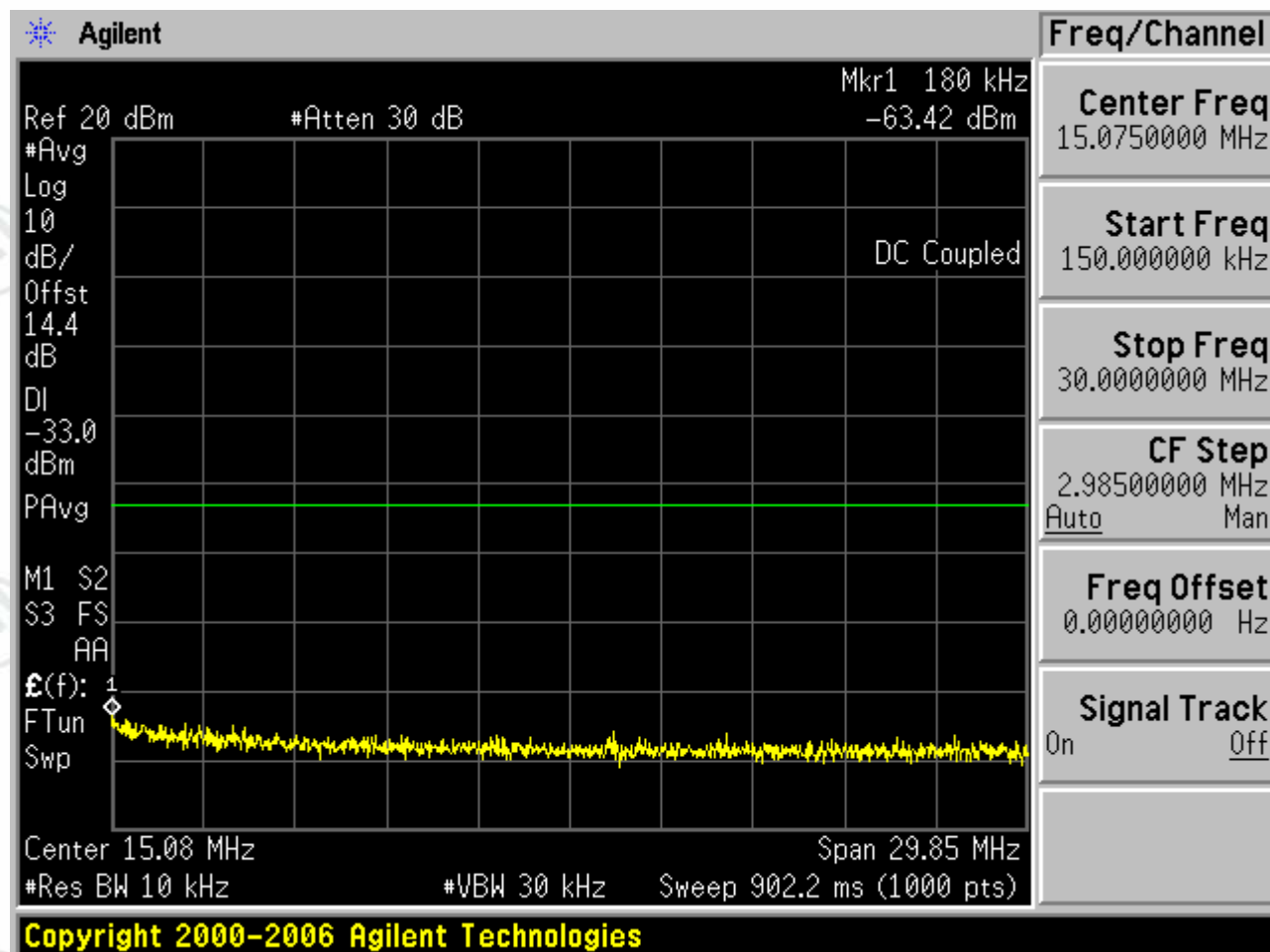


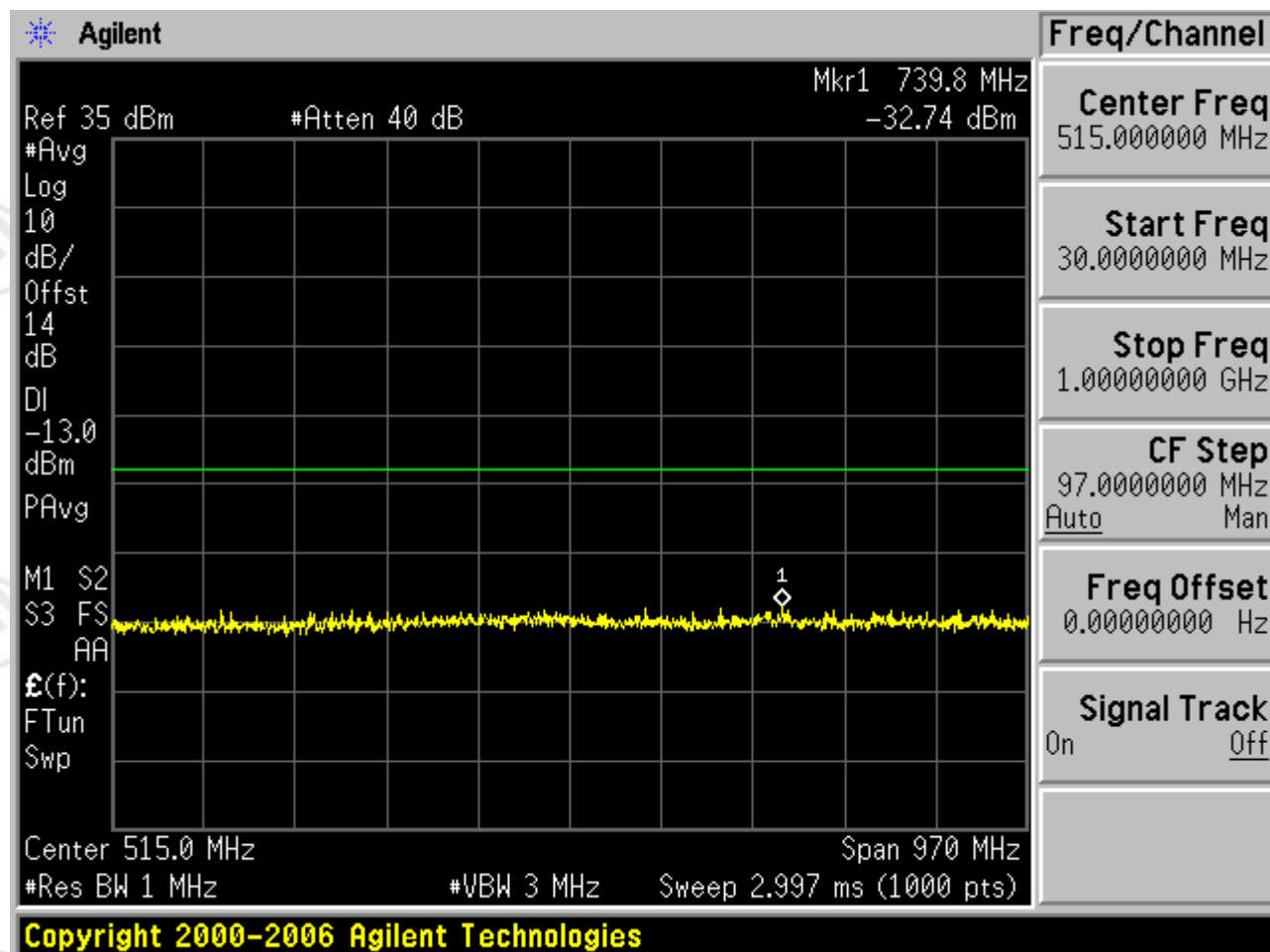


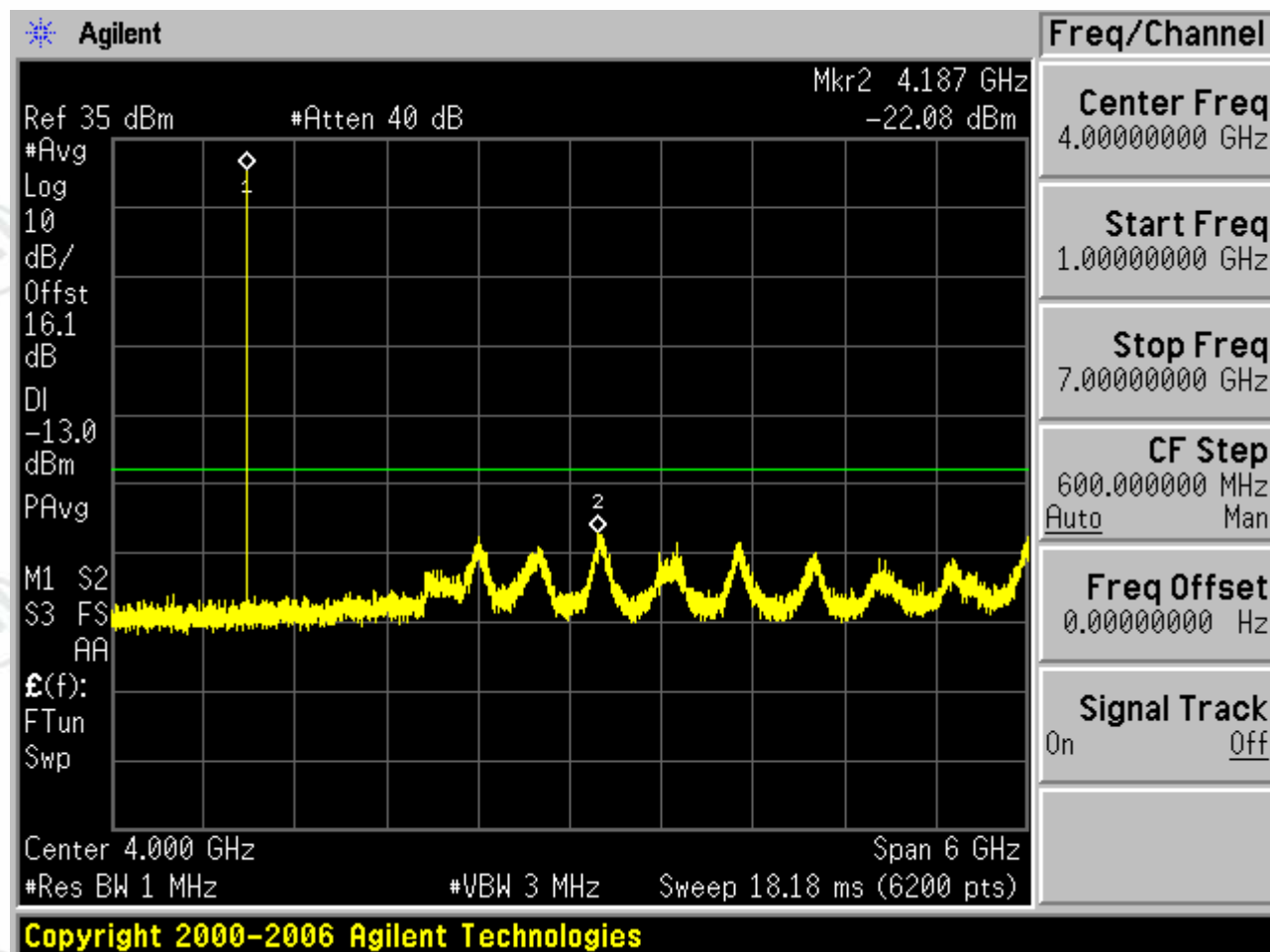


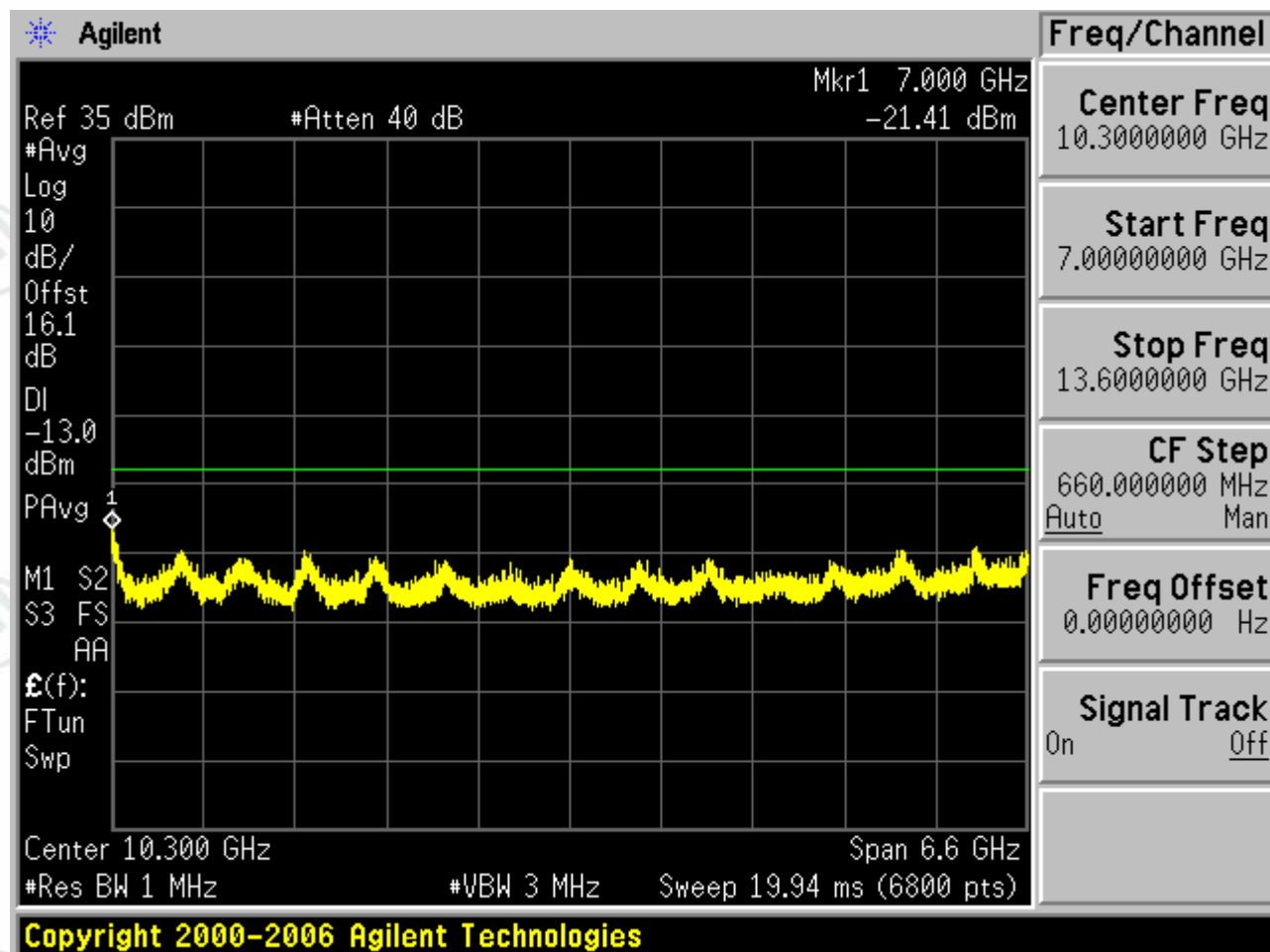
1.2.3.2 Test Channel=MCH

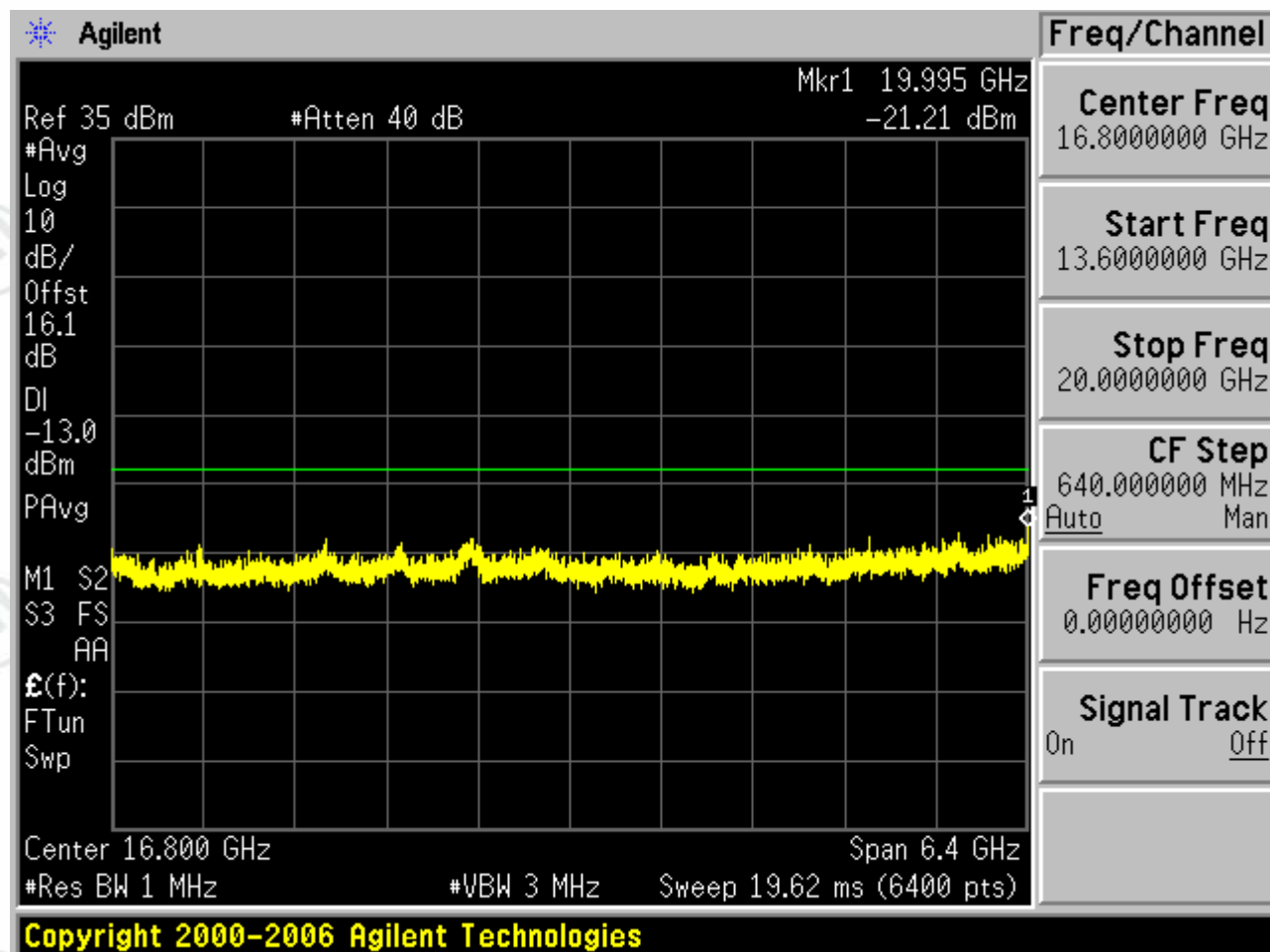




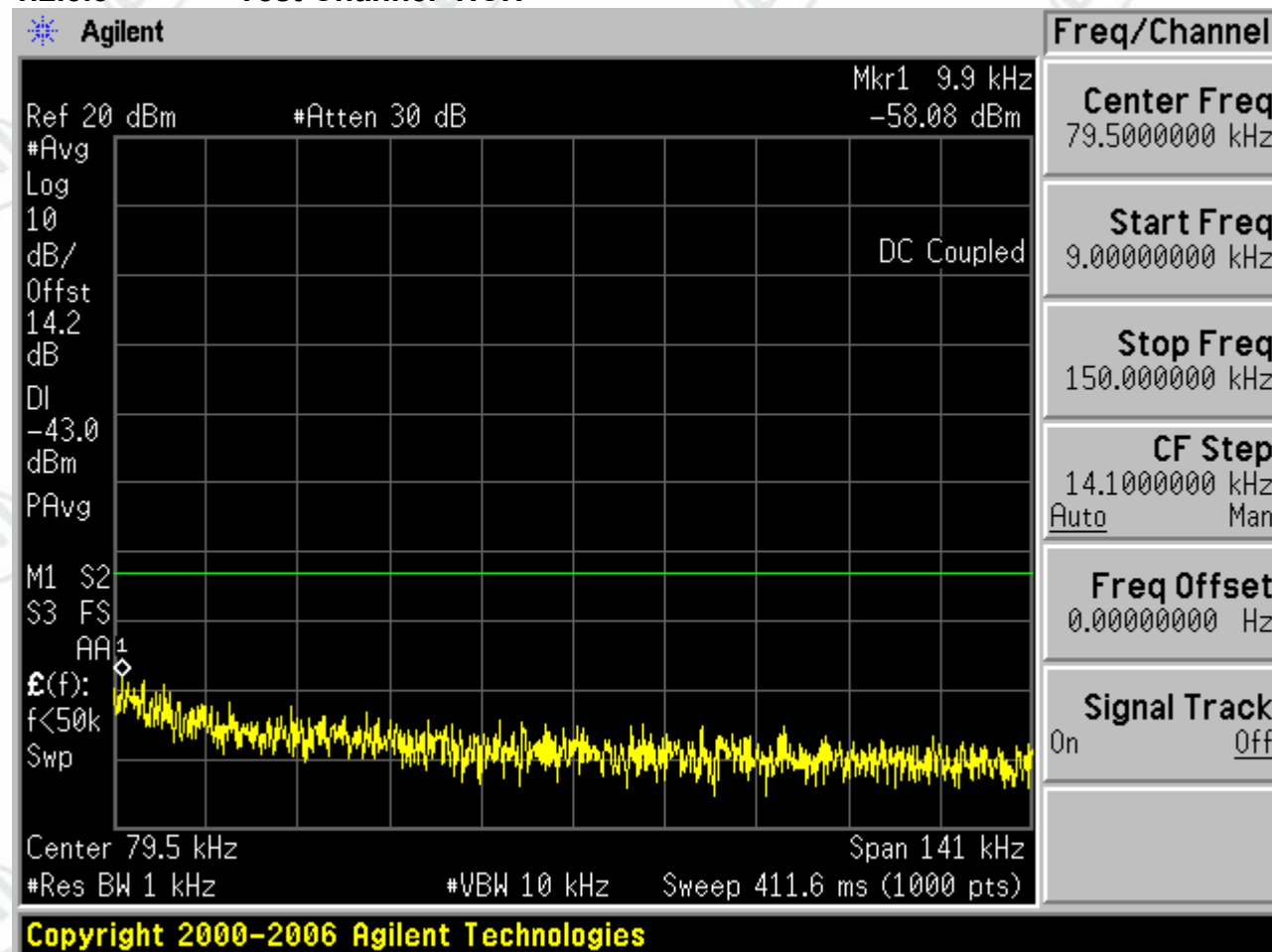


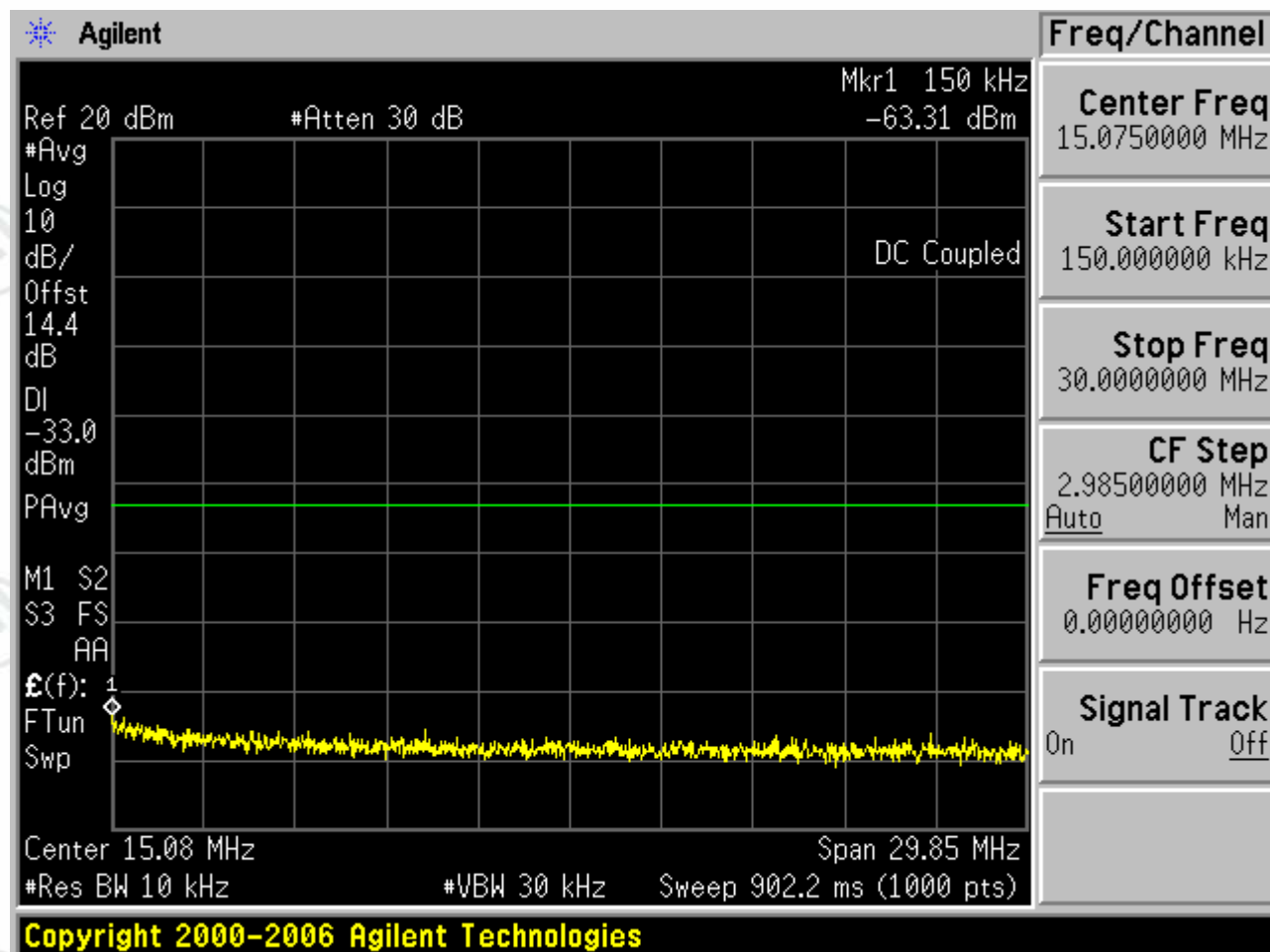


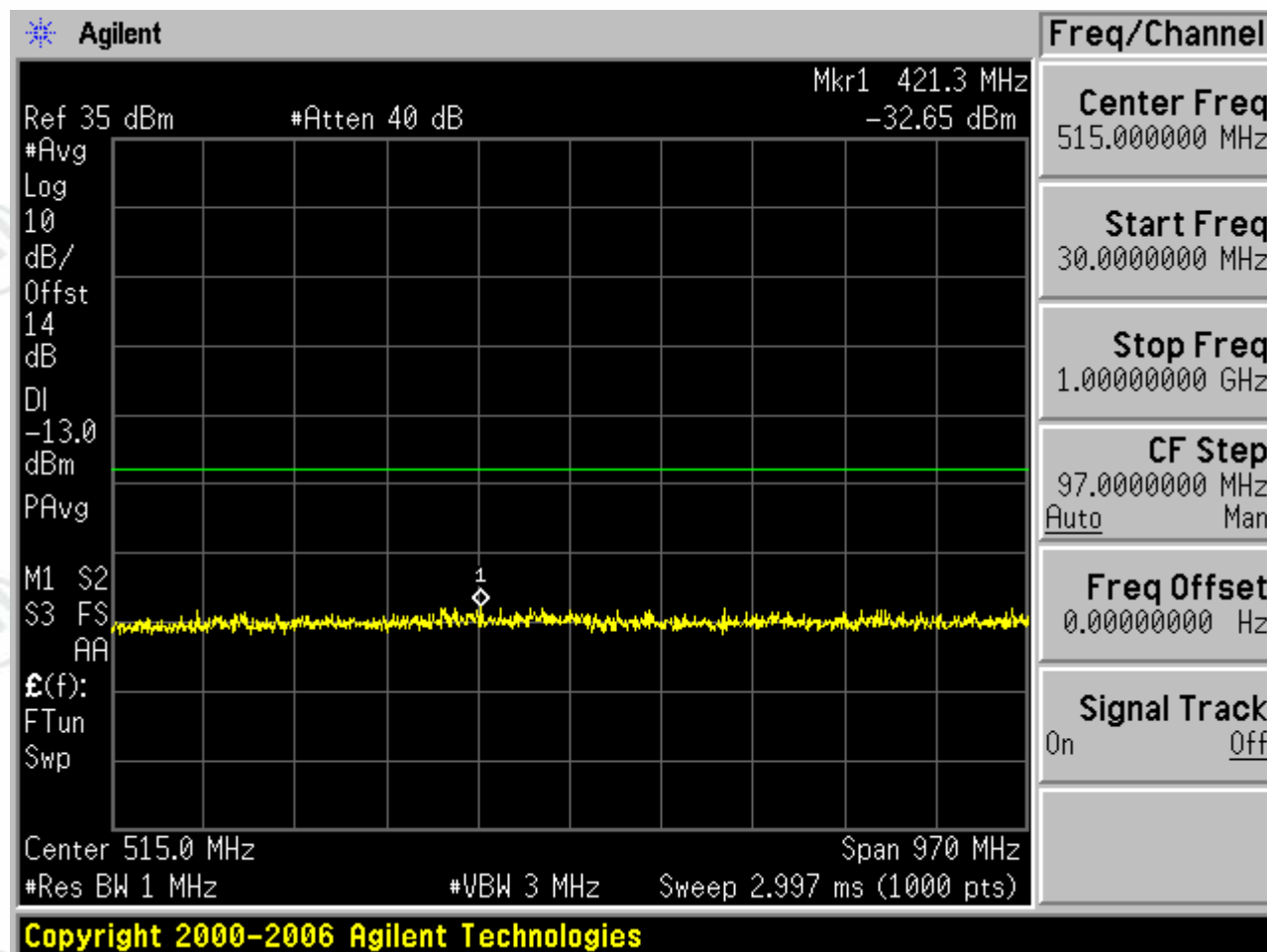


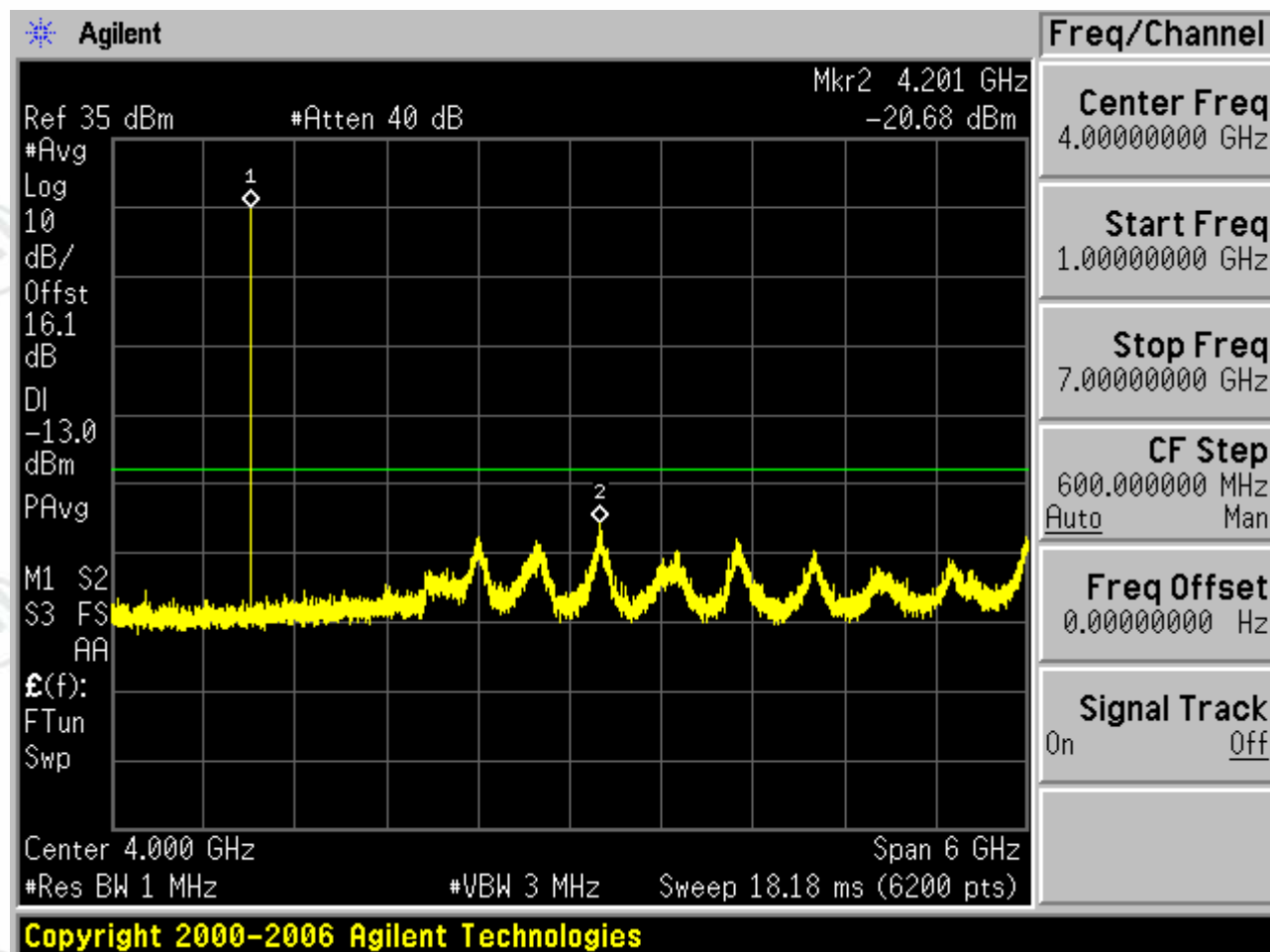


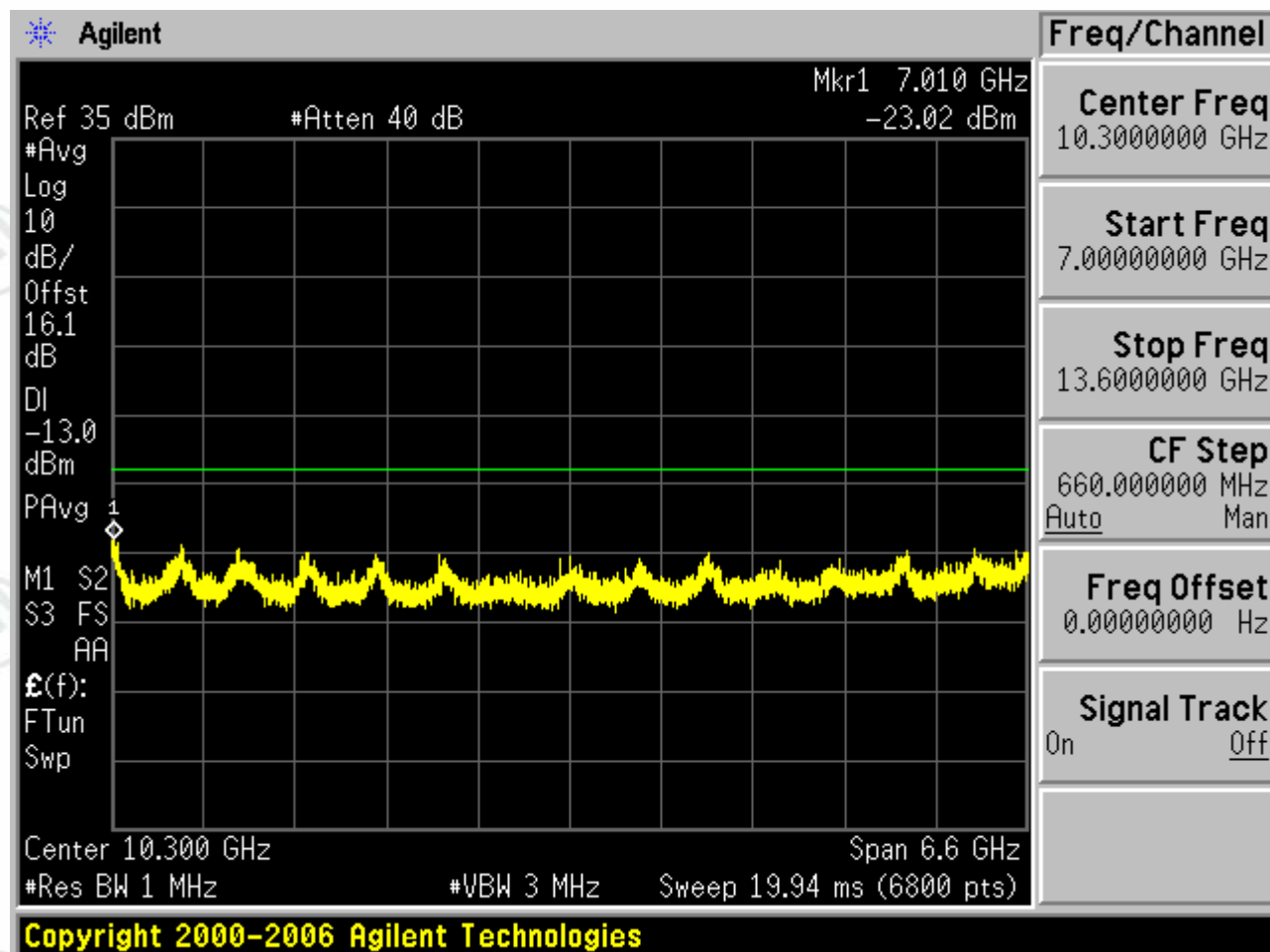
1.2.3.3 Test Channel=HCH

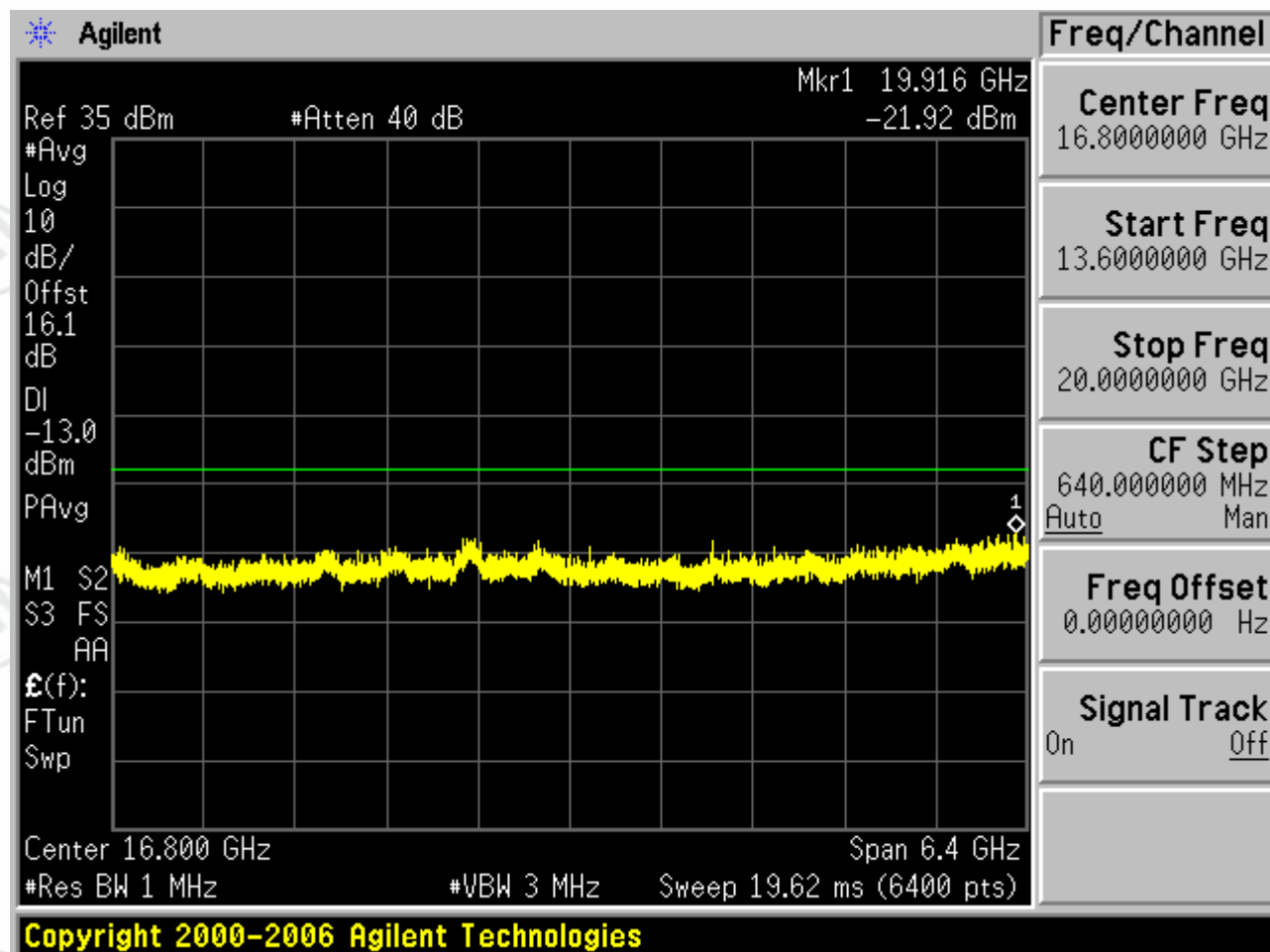












Appendix F) Frequency Stability

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	VN	-2.45	-0.002973	±2.5	PASS
			TN	End point	-1.68	-0.002038	±2.5	PASS
		MCH	TN	VN	1.03	0.001231	±2.5	PASS
			TN	End point	0.19	0.000227	±2.5	PASS
		HCH	TN	VN	2.39	0.002816	±2.5	PASS
			TN	End point	-1.55	-0.001826	±2.5	PASS

Note: End point =3.5V,VN=3.7V

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM850	TM2	LCH	TN	VN	-1.61	-0.001953	±2.5	PASS
			TN	End point	-2.71	-0.003288	±2.5	PASS
		MCH	TN	VN	-0.71	-0.000849	±2.5	PASS
			TN	End point	-2.00	-0.002391	±2.5	PASS
		HCH	TN	VN	-1.74	-0.002050	±2.5	PASS
			TN	End point	-1.03	-0.001213	±2.5	PASS

Note: End point =3.5V,VN=3.7V

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM850	TM3	LCH	TN	VN	4.26	0.005169	±2.5	PASS
			TN	End point	4.84	0.005872	±2.5	PASS
		MCH	TN	VN	4.88	0.005833	±2.5	PASS
			TN	End point	4.78	0.005714	±2.5	PASS
		HCH	TN	VN	5.07	0.005973	±2.5	PASS
			TN	End point	5.33	0.006279	±2.5	PASS

Note: End point =3.5V,VN=3.7V

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM1900	TM1	LCH	TN	VN	1.36	0.000735	±2.5	PASS
			TN	End point	5.49	0.002967	±2.5	PASS
		MCH	TN	VN	3.36	0.001787	±2.5	PASS
			TN	End point	6.07	0.003229	±2.5	PASS
		HCH	TN	VN	2.32	0.001215	±2.5	PASS
			TN	End point	0.97	0.000508	±2.5	PASS

Note: End point =3.5V,VN=3.7V

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM1900	TM2	LCH	TN	VN	2.65	0.001432	±2.5	PASS
			TN	End point	3.75	0.002027	±2.5	PASS
		MCH	TN	VN	-1.16	-0.000617	±2.5	PASS
			TN	End point	-0.77	-0.000410	±2.5	PASS
		HCH	TN	VN	1.36	0.000712	±2.5	PASS
			TN	End point	3.94	0.002063	±2.5	PASS

Note: End point =3.5V,VN=3.7V

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM1900	TM3	LCH	TN	VN	6.78	0.003664	±2.5	PASS
			TN	End point	7.49	0.004048	±2.5	PASS
		MCH	TN	VN	6.55	0.003484	±2.5	PASS
			TN	End point	6.20	0.003298	±2.5	PASS
		HCH	TN	VN	1.74	0.000911	±2.5	PASS
			TN	End point	2.07	0.001084	±2.5	PASS

Note: End point =3.5V,VN=3.7V

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	-0.19	-0.000231	±2.5	PASS
			VN	-20	-0.26	-0.000315	±2.5	PASS
			VN	-10	0.00	0.000000	±2.5	PASS
			VN	0	-2.20	-0.002669	±2.5	PASS
			VN	10	-1.10	-0.001335	±2.5	PASS
			VN	20	-0.06	-0.000073	±2.5	PASS
			VN	30	-1.16	-0.001407	±2.5	PASS
			VN	40	0.77	0.000934	±2.5	PASS
			VN	50	-0.39	-0.000473	±2.5	PASS
GSM850	TM1	MCH	VN	-30	-1.10	-0.001315	±2.5	PASS
			VN	-20	0.52	0.000622	±2.5	PASS
			VN	-10	-1.55	-0.001853	±2.5	PASS
			VN	0	0.39	0.000466	±2.5	PASS
			VN	10	-0.13	-0.000155	±2.5	PASS
			VN	20	0.45	0.000538	±2.5	PASS
			VN	30	0.13	0.000155	±2.5	PASS
			VN	40	-1.03	-0.001231	±2.5	PASS
			VN	50	-0.06	-0.000072	±2.5	PASS
GSM850	TM1	HCH	VN	-30	0.26	0.000306	±2.5	PASS
			VN	-20	2.91	0.003428	±2.5	PASS
			VN	-10	0.77	0.000907	±2.5	PASS
			VN	0	1.42	0.001673	±2.5	PASS
			VN	10	1.42	0.001673	±2.5	PASS
			VN	20	3.03	0.003570	±2.5	PASS
			VN	30	0.52	0.000613	±2.5	PASS
			VN	40	1.94	0.002286	±2.5	PASS
			VN	50	2.32	0.002733	±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	-2.45	-0.002973	±2.5	PASS
			VN	-20	-6.78	-0.008226	±2.5	PASS
			VN	-10	-5.75	-0.006976	±2.5	PASS
			VN	0	-9.81	-0.011902	±2.5	PASS
			VN	10	-8.07	-0.009791	±2.5	PASS
			VN	20	-4.84	-0.005872	±2.5	PASS
			VN	30	-5.42	-0.006576	±2.5	PASS
			VN	40	-6.13	-0.007438	±2.5	PASS
			VN	50	-6.72	-0.008153	±2.5	PASS
GSM850	TM2	MCH	VN	-30	-2.32	-0.002773	±2.5	PASS
			VN	-20	-8.78	-0.010495	±2.5	PASS
			VN	-10	-6.13	-0.007327	±2.5	PASS
			VN	0	-6.33	-0.007566	±2.5	PASS
			VN	10	-6.78	-0.008104	±2.5	PASS
			VN	20	-6.52	-0.007793	±2.5	PASS
			VN	30	-7.81	-0.009335	±2.5	PASS
			VN	40	-7.23	-0.008642	±2.5	PASS
			VN	50	-7.55	-0.009025	±2.5	PASS
GSM850	TM2	HCH	VN	-30	-2.71	-0.003193	±2.5	PASS
			VN	-20	-3.23	-0.003805	±2.5	PASS
			VN	-10	-8.33	-0.009814	±2.5	PASS
			VN	0	-3.81	-0.004489	±2.5	PASS
			VN	10	-8.65	-0.010191	±2.5	PASS
			VN	20	-8.52	-0.010038	±2.5	PASS
			VN	30	-4.33	-0.005101	±2.5	PASS
			VN	40	-8.65	-0.010191	±2.5	PASS
			VN	50	-4.07	-0.004795	±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	3.52	0.004271	±2.5	PASS
			VN	-20	3.10	0.003761	±2.5	PASS
			VN	-10	2.55	0.003094	±2.5	PASS
			VN	0	5.81	0.007049	±2.5	PASS
			VN	10	4.52	0.005484	±2.5	PASS
			VN	20	4.71	0.005715	±2.5	PASS
			VN	30	4.26	0.005169	±2.5	PASS
			VN	40	4.33	0.005254	±2.5	PASS
			VN	50	3.10	0.003761	±2.5	PASS
GSM850	TM3	MCH	VN	-30	4.75	0.005678	±2.5	PASS
			VN	-20	4.68	0.005594	±2.5	PASS
			VN	-10	1.90	0.002271	±2.5	PASS
			VN	0	4.26	0.005092	±2.5	PASS
			VN	10	4.04	0.004829	±2.5	PASS
			VN	20	3.78	0.004518	±2.5	PASS
			VN	30	4.33	0.005176	±2.5	PASS
			VN	40	4.36	0.005212	±2.5	PASS
			VN	50	3.81	0.004554	±2.5	PASS
GSM850	TM3	HCH	VN	-30	4.91	0.005785	±2.5	PASS
			VN	-20	4.49	0.005290	±2.5	PASS
			VN	-10	4.46	0.005254	±2.5	PASS
			VN	0	4.13	0.004866	±2.5	PASS
			VN	10	7.23	0.008518	±2.5	PASS
			VN	20	4.33	0.005101	±2.5	PASS
			VN	30	7.52	0.008860	±2.5	PASS
			VN	40	4.55	0.005361	±2.5	PASS
			VN	50	7.01	0.008259	±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	2.58	0.001394	±2.5	PASS
			VN	-20	5.94	0.003210	±2.5	PASS
			VN	-10	1.55	0.000838	±2.5	PASS
			VN	0	3.23	0.001746	±2.5	PASS
			VN	10	7.04	0.003805	±2.5	PASS
			VN	20	5.94	0.003210	±2.5	PASS
			VN	30	6.07	0.003281	±2.5	PASS
			VN	40	2.97	0.001605	±2.5	PASS
			VN	50	-1.16	-0.000627	±2.5	PASS
GSM1900	TM1	MCH	VN	-30	7.62	0.004053	±2.5	PASS
			VN	-20	8.01	0.004261	±2.5	PASS
			VN	-10	5.55	0.002952	±2.5	PASS
			VN	0	6.59	0.003505	±2.5	PASS
			VN	10	5.55	0.002952	±2.5	PASS
			VN	20	6.59	0.003505	±2.5	PASS
			VN	30	2.97	0.001580	±2.5	PASS
			VN	40	2.91	0.001548	±2.5	PASS
			VN	50	4.52	0.002404	±2.5	PASS
GSM1900	TM1	HCH	VN	-30	1.16	0.000607	±2.5	PASS
			VN	-20	1.55	0.000812	±2.5	PASS
			VN	-10	2.00	0.001047	±2.5	PASS
			VN	0	1.81	0.000948	±2.5	PASS
			VN	10	1.94	0.001016	±2.5	PASS
			VN	20	2.39	0.001251	±2.5	PASS
			VN	30	1.87	0.000979	±2.5	PASS
			VN	40	3.10	0.001623	±2.5	PASS
			VN	50	3.16	0.001655	±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	1.03	0.000557	±2.5	PASS
			VN	-20	-2.39	-0.001292	±2.5	PASS
			VN	-10	-2.97	-0.001605	±2.5	PASS
			VN	0	-3.36	-0.001816	±2.5	PASS
			VN	10	4.97	0.002686	±2.5	PASS
			VN	20	-4.71	-0.002546	±2.5	PASS
			VN	30	3.62	0.001957	±2.5	PASS
			VN	40	-0.71	-0.000384	±2.5	PASS
			VN	50	-5.88	-0.003178	±2.5	PASS
GSM1900	TM2	MCH	VN	-30	-2.20	-0.001170	±2.5	PASS
			VN	-20	-1.74	-0.000926	±2.5	PASS
			VN	-10	-1.94	-0.001032	±2.5	PASS
			VN	0	-7.49	-0.003984	±2.5	PASS
			VN	10	-2.65	-0.001410	±2.5	PASS
			VN	20	-2.45	-0.001303	±2.5	PASS
			VN	30	-8.01	-0.004261	±2.5	PASS
			VN	40	-2.78	-0.001479	±2.5	PASS
			VN	50	-3.16	-0.001681	±2.5	PASS
GSM1900	TM2	HCH	VN	-30	1.23	0.000644	±2.5	PASS
			VN	-20	-7.36	-0.003854	±2.5	PASS
			VN	-10	2.39	0.001251	±2.5	PASS
			VN	0	-6.84	-0.003582	±2.5	PASS
			VN	10	-5.88	-0.003079	±2.5	PASS
			VN	20	2.78	0.001456	±2.5	PASS
			VN	30	-7.04	-0.003686	±2.5	PASS
			VN	40	2.45	0.001283	±2.5	PASS
			VN	50	2.39	0.001251	±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	2.87	0.001551	±2.5	PASS
			VN	-20	1.84	0.000994	±2.5	PASS
			VN	-10	10.11	0.005464	±2.5	PASS
			VN	0	9.17	0.004956	±2.5	PASS
			VN	10	7.68	0.004151	±2.5	PASS
			VN	20	6.55	0.003540	±2.5	PASS
			VN	30	5.20	0.002811	±2.5	PASS
			VN	40	5.84	0.003156	±2.5	PASS
			VN	50	6.62	0.003578	±2.5	PASS
GSM1900	TM3	MCH	VN	-30	6.84	0.003638	±2.5	PASS
			VN	-20	6.78	0.003606	±2.5	PASS
			VN	-10	7.30	0.003883	±2.5	PASS
			VN	0	6.62	0.003521	±2.5	PASS
			VN	10	6.33	0.003367	±2.5	PASS
			VN	20	7.46	0.003968	±2.5	PASS
			VN	30	7.17	0.003814	±2.5	PASS
			VN	40	7.88	0.004191	±2.5	PASS
			VN	50	7.68	0.004085	±2.5	PASS
GSM1900	TM3	HCH	VN	-30	7.72	0.004042	±2.5	PASS
			VN	-20	5.00	0.002618	±2.5	PASS
			VN	-10	-0.74	-0.000387	±2.5	PASS
			VN	0	-0.97	-0.000508	±2.5	PASS
			VN	10	0.71	0.000372	±2.5	PASS
			VN	20	0.03	0.000016	±2.5	PASS
			VN	30	9.62	0.005037	±2.5	PASS
			VN	40	0.81	0.000424	±2.5	PASS
			VN	50	10.30	0.005393	±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>GSM 850</td><td>GSM 1900</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	GSM 850	GSM 1900	Frequency	824 – 849MHz	1850 – 1910MHz	Limit	38.45dBm (7W)	33.01dBm (2W)						
Mode	GSM 850	GSM 1900																		
Frequency	824 – 849MHz	1850 – 1910MHz																		
Limit	38.45dBm (7W)	33.01dBm (2W)																		

Measurement Data

GPRS 850						
Channel/fc (MHz)	Azimuth (deg)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
128/824.2	52	18.06	38.45	-14.95	Pass	H
	35	23.17	38.45	-9.84	Pass	V
190/836.6	60	16.8	38.45	-16.21	Pass	H
	11	23.33	38.45	-9.68	Pass	V
251/848.8	317	17.02	38.45	-15.99	Pass	H
	35	22.57	38.45	-10.44	Pass	V

EDGE 850						
Channel/fc (MHz)	Azimuth (deg)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
128/824.2	66	18.11	38.45	-14.90	Pass	H
	38	23.25	38.45	-9.76	Pass	V
190/836.6	306	16.88	38.45	-16.13	Pass	H
	360	23.39	38.45	-9.62	Pass	V
251/848.8	313	16.91	38.45	-16.10	Pass	H
	360	22.61	38.45	-10.40	Pass	V

GPRS 1900						
Channel/fc (MHz)	Azimuth (deg)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
512/1850.2	309	16.28	33.01	-16.73	Pass	H
	332	16.70	33.01	-16.31	Pass	V
661/1880.0	285	16.07	33.01	-16.94	Pass	H
	220	16.88	33.01	-16.13	Pass	V
810/1909.8	293	16.29	33.01	-16.72	Pass	H
	235	17.16	33.01	-15.85	Pass	V

EDGE1900						
Channel/fc (MHz)	Azimuth (deg)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
512/1850.2	309	16.26	33.01	-16.75	Pass	H
	220	16.68	33.01	-16.33	Pass	V
661/1880.0	285	16.05	33.01	-16.96	Pass	H
	220	16.85	33.01	-16.16	Pass	V
810/1909.8	284	16.27	33.01	-16.74	Pass	H
	236	17.14	33.01	-15.87	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: $\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBi)}$ $\text{EIRP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBi)}$ $\text{EIRP} = \text{ERP} + 2.15\text{dB}$ 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:

Mode:		GPRS Traffic						
Band:		850			Channel:		190	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	48.6277	150	358	-77.69	-13.00	64.69	Pass	Horizontal
2	53.8668	150	49	-78.14	-13.00	65.14	Pass	Horizontal
3	95.0030	150	142	-74.95	-13.00	61.95	Pass	Horizontal
4	324.9390	150	284	-78.51	-13.00	65.51	Pass	Horizontal
5	625.1170	150	246	-72.38	-13.00	59.38	Pass	Horizontal
6	750.0780	150	330	-70.90	-13.00	57.90	Pass	Horizontal
7	1393.6394	150	264	-52.36	-13.00	39.36	Pass	Horizontal
8	1673.0673	150	284	-50.57	-13.00	37.57	Pass	Horizontal
9	2230.9231	150	180	-50.04	-13.00	37.04	Pass	Horizontal
10	3093.7547	150	285	-49.09	-13.00	36.09	Pass	Horizontal
11	5099.3550	150	344	-49.26	-13.00	36.26	Pass	Horizontal
12	14328.5664	150	114	-40.24	-13.00	27.24	Pass	Horizontal
13	48.6277	150	246	-65.85	-13.00	52.85	Pass	Vertical
14	53.4787	150	237	-65.49	-13.00	52.49	Pass	Vertical
15	69.5839	150	86	-68.76	-13.00	55.76	Pass	Vertical
16	208.9038	150	255	-66.44	-13.00	53.44	Pass	Vertical
17	625.1170	150	104	-69.64	-13.00	56.64	Pass	Vertical
18	726.5993	150	284	-69.88	-13.00	56.88	Pass	Vertical
19	1673.8674	150	86	-49.80	-13.00	36.80	Pass	Vertical
20	3004.5002	150	38	-48.91	-13.00	35.91	Pass	Vertical
21	5062.6031	150	207	-49.76	-13.00	36.76	Pass	Vertical
22	8183.5092	150	8	-44.96	-13.00	31.96	Pass	Vertical
23	14335.3168	150	223	-40.63	-13.00	27.63	Pass	Vertical
24	17558.9779	150	316	-39.19	-13.00	26.19	Pass	Vertical

Mode:		GPRS Traffic						
Band:		850			Channel:		128	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	48.6277	150	38	-78.46	-13.00	65.46	Pass	Horizontal
2	71.9124	150	20	-78.11	-13.00	65.11	Pass	Horizontal
3	95.0030	150	261	-76.70	-13.00	63.70	Pass	Horizontal
4	120.0340	150	271	-76.85	-13.00	63.85	Pass	Horizontal
5	625.1170	150	298	-71.53	-13.00	58.53	Pass	Horizontal
6	687.5975	150	29	-70.10	-13.00	57.10	Pass	Horizontal
7	1290.0290	150	38	-52.90	-13.00	39.90	Pass	Horizontal
8	1648.2648	150	298	-50.92	-13.00	37.92	Pass	Horizontal
9	3072.0036	150	22	-48.56	-13.00	35.56	Pass	Horizontal
10	4540.5770	150	8	-49.29	-13.00	36.29	Pass	Horizontal
11	9567.3284	150	53	-42.80	-13.00	29.80	Pass	Horizontal
12	17453.9727	150	162	-37.93	-13.00	24.93	Pass	Horizontal
13	48.8218	150	187	-65.58	-13.00	52.58	Pass	Vertical
14	53.6727	150	280	-65.15	-13.00	52.15	Pass	Vertical
15	69.5839	150	29	-69.18	-13.00	56.18	Pass	Vertical
16	208.9038	150	11	-66.89	-13.00	53.89	Pass	Vertical
17	625.1170	150	206	-69.74	-13.00	56.74	Pass	Vertical
18	725.8232	150	66	-68.26	-13.00	55.26	Pass	Vertical
19	1306.6307	150	234	-52.49	-13.00	39.49	Pass	Vertical
20	3069.7535	150	254	-48.91	-13.00	35.91	Pass	Vertical
21	5028.1014	150	269	-49.45	-13.00	36.45	Pass	Vertical
22	9121.8061	150	345	-44.59	-13.00	31.59	Pass	Vertical
23	13650.5325	150	238	-40.59	-13.00	27.59	Pass	Vertical
24	17534.2267	150	207	-40.05	-13.00	27.05	Pass	Vertical

Mode:		GPRS Traffic						
Band:		850			Channel:		251	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	48.8218	150	272	-78.57	-13.00	65.57	Pass	Horizontal
2	71.5243	150	355	-78.67	-13.00	65.67	Pass	Horizontal
3	95.0030	150	197	-78.60	-13.00	65.60	Pass	Horizontal
4	120.0340	150	244	-76.89	-13.00	63.89	Pass	Horizontal
5	600.0860	150	1	-71.91	-13.00	58.91	Pass	Horizontal
6	687.5975	150	309	-71.14	-13.00	58.14	Pass	Horizontal
7	1235.2235	150	360	-52.87	-13.00	39.87	Pass	Horizontal
8	3141.7571	150	254	-48.79	-13.00	35.79	Pass	Horizontal
9	5059.6030	150	53	-48.79	-13.00	35.79	Pass	Horizontal
10	10045.1023	150	359	-43.49	-13.00	30.49	Pass	Horizontal
11	14010.5505	150	254	-40.21	-13.00	27.21	Pass	Horizontal
12	17558.2279	150	8	-39.19	-13.00	26.19	Pass	Horizontal
13	49.0158	150	48	-66.63	-13.00	53.63	Pass	Vertical
14	55.2250	150	38	-64.39	-13.00	51.39	Pass	Vertical
15	69.7780	150	271	-68.72	-13.00	55.72	Pass	Vertical
16	208.9038	150	187	-66.55	-13.00	53.55	Pass	Vertical
17	625.1170	150	75	-69.42	-13.00	56.42	Pass	Vertical
18	731.0622	150	360	-68.84	-13.00	55.84	Pass	Vertical
19	1439.8440	150	234	-52.85	-13.00	39.85	Pass	Vertical
20	1698.0698	150	57	-49.14	-13.00	36.14	Pass	Vertical
21	3051.7526	150	192	-48.59	-13.00	35.59	Pass	Vertical
22	5160.8580	150	84	-49.18	-13.00	36.18	Pass	Vertical
23	9100.8050	150	22	-44.17	-13.00	31.17	Pass	Vertical
24	13704.5352	150	192	-39.93	-13.00	26.93	Pass	Vertical

Mode:		GSM Traffic						
Band:		850			Channel:		251	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	48.6277	150	318	-77.85	-13.00	64.85	Pass	Horizontal
2	71.7183	150	38	-79.00	-13.00	66.00	Pass	Horizontal
3	95.0030	150	327	-78.00	-13.00	65.00	Pass	Horizontal
4	120.0340	150	309	-77.20	-13.00	64.20	Pass	Horizontal
5	270.0260	150	11	-79.30	-13.00	66.30	Pass	Horizontal
6	625.1170	150	309	-71.56	-13.00	58.56	Pass	Horizontal
7	1697.8698	150	141	-29.13	-13.00	16.13	Pass	Horizontal
8	2546.5547	150	198	-37.27	-13.00	24.27	Pass	Horizontal
9	3395.2698	150	34	-38.82	-13.00	25.82	Pass	Horizontal
10	4243.5622	150	238	-47.07	-13.00	34.07	Pass	Horizontal
11	14210.8105	150	18	-39.86	-13.00	26.86	Pass	Horizontal
12	17567.2284	150	114	-38.10	-13.00	25.10	Pass	Horizontal
13	48.8218	150	113	-65.96	-13.00	52.96	Pass	Vertical
14	55.2250	150	104	-65.23	-13.00	52.23	Pass	Vertical
15	69.7780	150	289	-68.90	-13.00	55.90	Pass	Vertical
16	89.9580	150	29	-75.21	-13.00	62.21	Pass	Vertical
17	208.9038	150	169	-66.72	-13.00	53.72	Pass	Vertical
18	625.1170	150	271	-68.69	-13.00	55.69	Pass	Vertical
19	1697.4697	150	298	-24.60	-13.00	11.60	Pass	Vertical
20	2545.9546	150	197	-34.27	-13.00	21.27	Pass	Vertical
21	3395.2698	150	147	-40.44	-13.00	27.44	Pass	Vertical
22	8159.5080	150	0	-45.31	-13.00	32.31	Pass	Vertical
23	14227.3114	150	11	-40.74	-13.00	27.74	Pass	Vertical
24	17955.7478	150	41	-40.00	-13.00	27.00	Pass	Vertical

Mode:		GSM Traffic						
Band:		850			Channel:		190	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	53.2847	150	327	-78.38	-13.00	65.38	Pass	Horizontal
2	71.3303	150	49	-77.73	-13.00	64.73	Pass	Horizontal
3	95.0030	150	20	-76.93	-13.00	63.93	Pass	Horizontal
4	120.0340	150	336	-77.35	-13.00	64.35	Pass	Horizontal
5	625.1170	150	309	-72.02	-13.00	59.02	Pass	Horizontal
6	687.5975	150	309	-71.20	-13.00	58.20	Pass	Horizontal
7	1673.0673	150	132	-22.81	-13.00	9.81	Pass	Horizontal
8	2509.9510	150	253	-36.39	-13.00	23.39	Pass	Horizontal
9	3346.5173	150	22	-38.80	-13.00	25.80	Pass	Horizontal
10	4182.8091	150	53	-47.24	-13.00	34.24	Pass	Horizontal
11	14486.0743	150	207	-40.24	-13.00	27.24	Pass	Horizontal
12	17561.2281	150	285	-39.39	-13.00	26.39	Pass	Horizontal
13	48.8218	150	271	-67.05	-13.00	54.05	Pass	Vertical
14	53.4787	150	326	-65.38	-13.00	52.38	Pass	Vertical
15	69.9720	150	178	-67.91	-13.00	54.91	Pass	Vertical
16	208.9038	150	169	-66.73	-13.00	53.73	Pass	Vertical
17	625.1170	150	123	-69.96	-13.00	56.96	Pass	Vertical
18	731.6443	150	150	-69.09	-13.00	56.09	Pass	Vertical
19	1673.2673	150	317	-21.43	-13.00	8.43	Pass	Vertical
20	2509.5510	150	206	-32.48	-13.00	19.48	Pass	Vertical
21	3345.7673	150	265	-40.25	-13.00	27.25	Pass	Vertical
22	4182.8091	150	265	-44.97	-13.00	31.97	Pass	Vertical
23	14078.0539	150	1	-40.34	-13.00	27.34	Pass	Vertical
24	16894.4447	150	125	-39.94	-13.00	26.94	Pass	Vertical

Mode:		GSM Traffic						
Band:		850			Channel:		128	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	53.2847	150	150	-78.82	-13.00	65.82	Pass	Horizontal
2	71.5243	150	243	-78.51	-13.00	65.51	Pass	Horizontal
3	95.0030	150	150	-77.50	-13.00	64.50	Pass	Horizontal
4	120.0340	150	86	-77.33	-13.00	64.33	Pass	Horizontal
5	625.1170	150	76	-71.87	-13.00	58.87	Pass	Horizontal
6	687.5975	150	289	-71.53	-13.00	58.53	Pass	Horizontal
7	1648.2648	150	261	-24.65	-13.00	11.65	Pass	Horizontal
8	2472.7473	150	252	-32.09	-13.00	19.09	Pass	Horizontal
9	3297.0149	150	84	-34.02	-13.00	21.02	Pass	Horizontal
10	4121.3061	150	8	-43.80	-13.00	30.80	Pass	Horizontal
11	14867.8434	150	8	-39.32	-13.00	26.32	Pass	Horizontal
12	17560.4780	150	254	-39.23	-13.00	26.23	Pass	Horizontal
13	48.8218	150	75	-67.24	-13.00	54.24	Pass	Vertical
14	55.2250	150	57	-65.46	-13.00	52.46	Pass	Vertical
15	69.7780	150	48	-68.79	-13.00	55.79	Pass	Vertical
16	208.9038	150	255	-66.29	-13.00	53.29	Pass	Vertical
17	625.1170	150	255	-68.55	-13.00	55.55	Pass	Vertical
18	746.1972	150	208	-68.58	-13.00	55.58	Pass	Vertical
19	1648.2648	150	293	-21.42	-13.00	8.42	Pass	Vertical
20	2472.1472	150	228	-32.17	-13.00	19.17	Pass	Vertical
21	3297.0149	150	42	-35.07	-13.00	22.07	Pass	Vertical
22	4121.3061	150	300	-43.50	-13.00	30.50	Pass	Vertical
23	13996.2998	150	147	-40.32	-13.00	27.32	Pass	Vertical
24	17579.2290	150	72	-39.81	-13.00	26.81	Pass	Vertical

Mode:		EGPRS Traffic						
Band:		850			Channel:		128	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	85.4951	150	92	-69.37	-13.00	56.37	Pass	Horizontal
2	95.7792	150	349	-69.32	-13.00	56.32	Pass	Horizontal
3	164.6629	150	92	-68.87	-13.00	55.87	Pass	Horizontal
4	195.7091	150	222	-70.55	-13.00	57.55	Pass	Horizontal
5	316.0132	150	151	-71.94	-13.00	58.94	Pass	Horizontal
6	750.0780	150	222	-71.93	-13.00	58.93	Pass	Horizontal
7	1348.2348	150	209	-53.12	-13.00	40.12	Pass	Horizontal
8	2434.3434	150	257	-50.71	-13.00	37.71	Pass	Horizontal
9	3191.2596	150	226	-49.06	-13.00	36.06	Pass	Horizontal
10	10162.8581	150	226	-43.14	-13.00	30.14	Pass	Horizontal
11	14910.5955	150	71	-39.70	-13.00	26.70	Pass	Horizontal
12	17550.7275	150	0	-39.59	-13.00	26.59	Pass	Horizontal
13	53.4787	150	295	-65.38	-13.00	52.38	Pass	Vertical
14	69.3899	150	295	-69.60	-13.00	56.60	Pass	Vertical
15	100.4361	150	12	-70.16	-13.00	57.16	Pass	Vertical
16	208.9038	150	118	-66.82	-13.00	53.82	Pass	Vertical
17	625.1170	150	106	-69.06	-13.00	56.06	Pass	Vertical
18	720.5841	150	341	-70.41	-13.00	57.41	Pass	Vertical
19	1325.4325	150	165	-52.17	-13.00	39.17	Pass	Vertical
20	3056.2528	150	247	-48.72	-13.00	35.72	Pass	Vertical
21	5061.8531	150	0	-49.67	-13.00	36.67	Pass	Vertical
22	7203.9602	150	149	-45.43	-13.00	32.43	Pass	Vertical
23	14231.0616	150	16	-40.32	-13.00	27.32	Pass	Vertical
24	17558.2279	150	342	-39.88	-13.00	26.88	Pass	Vertical

Mode:		EGPRS Traffic						
Band:		850			Channel:		190	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	85.1070	150	94	-68.55	-13.00	55.55	Pass	Horizontal
2	97.1374	150	339	-68.64	-13.00	55.64	Pass	Horizontal
3	177.6635	150	280	-71.22	-13.00	58.22	Pass	Horizontal
4	233.9348	150	223	-72.33	-13.00	59.33	Pass	Horizontal
5	299.7139	150	129	-72.99	-13.00	59.99	Pass	Horizontal
6	625.1170	150	141	-71.51	-13.00	58.51	Pass	Horizontal
7	1321.4321	150	129	-52.44	-13.00	39.44	Pass	Horizontal
8	3089.2545	150	210	-48.55	-13.00	35.55	Pass	Horizontal
9	5079.1040	150	1	-49.55	-13.00	36.55	Pass	Horizontal
10	8243.5122	150	57	-45.31	-13.00	32.31	Pass	Horizontal
11	14550.5775	150	304	-40.33	-13.00	27.33	Pass	Horizontal
12	17543.2272	150	286	-39.61	-13.00	26.61	Pass	Horizontal
13	48.6277	150	359	-66.68	-13.00	53.68	Pass	Vertical
14	53.4787	150	327	-64.66	-13.00	51.66	Pass	Vertical
15	69.1958	150	280	-69.93	-13.00	56.93	Pass	Vertical
16	208.9038	150	24	-66.43	-13.00	53.43	Pass	Vertical
17	625.1170	150	269	-68.68	-13.00	55.68	Pass	Vertical
18	734.3609	150	234	-69.25	-13.00	56.25	Pass	Vertical
19	1313.0313	150	59	-52.40	-13.00	39.40	Pass	Vertical
20	3079.5040	150	75	-48.72	-13.00	35.72	Pass	Vertical
21	4714.5857	150	228	-49.69	-13.00	36.69	Pass	Vertical
22	9206.5603	150	75	-43.44	-13.00	30.44	Pass	Vertical
23	14323.3162	150	248	-40.28	-13.00	27.28	Pass	Vertical
24	17564.2282	150	210	-39.53	-13.00	26.53	Pass	Vertical

Mode:		EGPRS Traffic						
Band:		850			Channel:		251	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	89.3759	150	308	-69.94	-13.00	56.94	Pass	Horizontal
2	108.9738	150	13	-68.99	-13.00	55.99	Pass	Horizontal
3	182.7085	150	71	-70.86	-13.00	57.86	Pass	Horizontal
4	199.2018	150	201	-72.04	-13.00	59.04	Pass	Horizontal
5	304.1768	150	142	-72.39	-13.00	59.39	Pass	Horizontal
6	687.5975	150	190	-71.29	-13.00	58.29	Pass	Horizontal
7	1148.4148	150	213	-52.47	-13.00	39.47	Pass	Horizontal
8	3508.5254	150	67	-48.41	-13.00	35.41	Pass	Horizontal
9	5094.8547	150	89	-49.55	-13.00	36.55	Pass	Horizontal
10	8583.2792	150	146	-44.91	-13.00	31.91	Pass	Horizontal
11	15098.1049	150	284	-40.36	-13.00	27.36	Pass	Horizontal
12	17560.4780	150	284	-39.68	-13.00	26.68	Pass	Horizontal
13	49.0158	150	25	-66.75	-13.00	53.75	Pass	Vertical
14	53.4787	150	166	-66.05	-13.00	53.05	Pass	Vertical
15	69.3899	150	353	-69.27	-13.00	56.27	Pass	Vertical
16	208.9038	150	2	-66.89	-13.00	53.89	Pass	Vertical
17	625.1170	150	190	-69.04	-13.00	56.04	Pass	Vertical
18	687.5975	150	36	-69.72	-13.00	56.72	Pass	Vertical
19	1311.8312	150	272	-51.66	-13.00	38.66	Pass	Vertical
20	2213.7214	150	248	-50.67	-13.00	37.67	Pass	Vertical
21	3207.0104	150	342	-48.33	-13.00	35.33	Pass	Vertical
22	9078.3039	150	90	-44.07	-13.00	31.07	Pass	Vertical
23	13700.7850	150	147	-40.58	-13.00	27.58	Pass	Vertical
24	17558.9779	150	225	-39.43	-13.00	26.43	Pass	Vertical

Mode:		GSM Traffic						
Band:		1900			Channel:		512	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	51.1502	150	305	-78.48	-13.00	65.48	Pass	Horizontal
2	92.2865	150	211	-78.23	-13.00	65.23	Pass	Horizontal
3	120.0340	150	83	-77.76	-13.00	64.76	Pass	Horizontal
4	324.9390	150	48	-78.92	-13.00	65.92	Pass	Horizontal
5	600.0860	150	188	-72.85	-13.00	59.85	Pass	Horizontal
6	750.0780	150	329	-72.06	-13.00	59.06	Pass	Horizontal
7	1336.8337	150	13	-52.36	-13.00	39.36	Pass	Horizontal
8	2680.7681	150	153	-48.13	-13.00	35.13	Pass	Horizontal
9	5146.6073	150	150	-49.96	-13.00	36.96	Pass	Horizontal
10	10105.1053	150	342	-42.70	-13.00	29.70	Pass	Horizontal
11	14911.3456	150	265	-39.52	-13.00	26.52	Pass	Horizontal
12	17566.4783	150	188	-39.42	-13.00	26.42	Pass	Horizontal
13	48.6277	150	235	-68.12	-13.00	55.12	Pass	Vertical
14	53.4787	150	316	-64.57	-13.00	51.57	Pass	Vertical
15	69.5839	150	35	-69.11	-13.00	56.11	Pass	Vertical
16	208.9038	150	94	-66.75	-13.00	53.75	Pass	Vertical
17	625.1170	150	360	-69.65	-13.00	56.65	Pass	Vertical
18	958.4757	150	2	-69.53	-13.00	56.53	Pass	Vertical
19	1281.8282	150	259	-51.55	-13.00	38.55	Pass	Vertical
20	2706.7707	150	270	-47.40	-13.00	34.40	Pass	Vertical
21	4752.0876	150	220	-49.64	-13.00	36.64	Pass	Vertical
22	8153.5077	150	143	-45.24	-13.00	32.24	Pass	Vertical
23	13675.2838	150	241	-39.80	-13.00	26.80	Pass	Vertical
24	17559.7280	150	143	-39.11	-13.00	26.11	Pass	Vertical

Mode:		GSM Traffic						
Band:		1900			Channel:		661	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	50.7622	150	306	-79.03	-13.00	66.03	Pass	Horizontal
2	95.0030	150	94	-78.76	-13.00	65.76	Pass	Horizontal
3	120.0340	150	24	-77.19	-13.00	64.19	Pass	Horizontal
4	270.0260	150	130	-79.42	-13.00	66.42	Pass	Horizontal
5	600.0860	150	235	-71.85	-13.00	58.85	Pass	Horizontal
6	687.5975	150	329	-71.58	-13.00	58.58	Pass	Horizontal
7	1313.2313	150	176	-52.15	-13.00	39.15	Pass	Horizontal
8	2889.1889	150	360	-47.89	-13.00	34.89	Pass	Horizontal
9	5403.8702	150	247	-49.81	-13.00	36.81	Pass	Horizontal
10	8485.0243	150	358	-45.02	-13.00	32.02	Pass	Horizontal
11	12568.9784	150	110	-42.42	-13.00	29.42	Pass	Horizontal
12	14943.5972	150	342	-40.05	-13.00	27.05	Pass	Horizontal
13	48.8218	150	106	-67.78	-13.00	54.78	Pass	Vertical
14	53.8668	150	130	-64.90	-13.00	51.90	Pass	Vertical
15	69.7780	150	70	-69.30	-13.00	56.30	Pass	Vertical
16	208.9038	150	70	-66.93	-13.00	53.93	Pass	Vertical
17	625.1170	150	13	-70.55	-13.00	57.55	Pass	Vertical
18	912.4885	150	353	-70.85	-13.00	57.85	Pass	Vertical
19	1291.0291	150	306	-52.11	-13.00	39.11	Pass	Vertical
20	2698.9699	150	224	-47.88	-13.00	34.88	Pass	Vertical
21	8153.5077	150	170	-45.41	-13.00	32.41	Pass	Vertical
22	11792.6896	150	16	-41.35	-13.00	28.35	Pass	Vertical
23	13996.2998	150	0	-40.52	-13.00	27.52	Pass	Vertical
24	17555.2278	150	342	-39.77	-13.00	26.77	Pass	Vertical

Mode:		GSM Traffic						
Band:		1900			Channel:		810	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	52.5085	150	200	-78.94	-13.00	65.94	Pass	Horizontal
2	71.1362	150	59	-78.71	-13.00	65.71	Pass	Horizontal
3	95.0030	150	177	-77.65	-13.00	64.65	Pass	Horizontal
4	270.0260	150	2	-79.27	-13.00	66.27	Pass	Horizontal
5	600.0860	150	119	-72.16	-13.00	59.16	Pass	Horizontal
6	874.0688	150	48	-73.04	-13.00	60.04	Pass	Horizontal
7	1318.4318	150	24	-52.37	-13.00	39.37	Pass	Horizontal
8	2937.1937	150	106	-48.68	-13.00	35.68	Pass	Horizontal
9	5370.8685	150	72	-49.37	-13.00	36.37	Pass	Horizontal
10	8566.7783	150	149	-45.56	-13.00	32.56	Pass	Horizontal
11	11677.1839	150	188	-41.15	-13.00	28.15	Pass	Horizontal
12	14276.8138	150	132	-40.10	-13.00	27.10	Pass	Horizontal
13	48.6277	150	294	-68.17	-13.00	55.17	Pass	Vertical
14	53.4787	150	271	-64.54	-13.00	51.54	Pass	Vertical
15	69.5839	150	200	-70.00	-13.00	57.00	Pass	Vertical
16	208.9038	150	1	-66.72	-13.00	53.72	Pass	Vertical
17	625.1170	150	282	-69.42	-13.00	56.42	Pass	Vertical
18	726.4053	150	35	-70.30	-13.00	57.30	Pass	Vertical
19	1397.0397	150	59	-51.45	-13.00	38.45	Pass	Vertical
20	2829.5830	150	200	-47.63	-13.00	34.63	Pass	Vertical
21	5480.3740	150	0	-50.02	-13.00	37.02	Pass	Vertical
22	8585.5293	150	33	-45.36	-13.00	32.36	Pass	Vertical
23	14194.3097	150	342	-40.09	-13.00	27.09	Pass	Vertical
24	17569.4785	150	131	-40.18	-13.00	27.18	Pass	Vertical

Mode:		GPRS Traffic						
Band:		1900			Channel:		512	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	55.0310	150	360	-79.53	-13.00	66.53	Pass	Horizontal
2	95.0030	150	38	-78.66	-13.00	65.66	Pass	Horizontal
3	120.0340	150	302	-77.89	-13.00	64.89	Pass	Horizontal
4	324.9390	150	178	-77.39	-13.00	64.39	Pass	Horizontal
5	687.5975	150	125	-72.09	-13.00	59.09	Pass	Horizontal
6	830.6041	150	178	-59.25	-13.00	46.25	Pass	Horizontal
7	1281.6282	150	98	-51.74	-13.00	38.74	Pass	Horizontal
8	2951.7952	150	85	-48.23	-13.00	35.23	Pass	Horizontal
9	5025.8513	150	25	-49.63	-13.00	36.63	Pass	Horizontal
10	8476.7738	150	315	-45.01	-13.00	32.01	Pass	Horizontal
11	14241.5621	150	65	-40.39	-13.00	27.39	Pass	Horizontal
12	17550.7275	150	194	-39.34	-13.00	26.34	Pass	Horizontal
13	48.6277	150	338	-68.15	-13.00	55.15	Pass	Vertical
14	53.6727	150	86	-64.56	-13.00	51.56	Pass	Vertical
15	69.5839	150	86	-69.61	-13.00	56.61	Pass	Vertical
16	208.9038	150	146	-67.00	-13.00	54.00	Pass	Vertical
17	625.1170	150	360	-69.99	-13.00	56.99	Pass	Vertical
18	958.4757	150	217	-69.69	-13.00	56.69	Pass	Vertical
19	1330.2330	150	32	-52.19	-13.00	39.19	Pass	Vertical
20	2960.9961	150	232	-48.29	-13.00	35.29	Pass	Vertical
21	8572.7786	150	263	-44.89	-13.00	31.89	Pass	Vertical
22	12233.7117	150	354	-41.91	-13.00	28.91	Pass	Vertical
23	14163.5582	150	126	-40.77	-13.00	27.77	Pass	Vertical
24	17573.9787	150	149	-39.70	-13.00	26.70	Pass	Vertical

Mode:		GPRS Traffic						
Band:		1900			Channel:		661	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	53.4787	150	360	-78.48	-13.00	65.48	Pass	Horizontal
2	71.5243	150	360	-78.88	-13.00	65.88	Pass	Horizontal
3	92.4805	150	284	-78.15	-13.00	65.15	Pass	Horizontal
4	120.0340	150	123	-77.56	-13.00	64.56	Pass	Horizontal
5	600.0860	150	15	-72.77	-13.00	59.77	Pass	Horizontal
6	687.5975	150	213	-71.48	-13.00	58.48	Pass	Horizontal
7	1300.8301	150	284	-52.10	-13.00	39.10	Pass	Horizontal
8	2709.5710	150	251	-48.21	-13.00	35.21	Pass	Horizontal
9	4989.0995	150	112	-49.81	-13.00	36.81	Pass	Horizontal
10	9622.0811	150	112	-44.03	-13.00	31.03	Pass	Horizontal
11	14780.8390	150	261	-40.40	-13.00	27.40	Pass	Horizontal
12	17555.2278	150	0	-40.04	-13.00	27.04	Pass	Horizontal
13	48.6277	150	321	-67.84	-13.00	54.84	Pass	Vertical
14	53.4787	150	231	-65.06	-13.00	52.06	Pass	Vertical
15	69.5839	150	359	-69.94	-13.00	56.94	Pass	Vertical
16	208.9038	150	321	-66.87	-13.00	53.87	Pass	Vertical
17	625.1170	150	321	-69.92	-13.00	56.92	Pass	Vertical
18	894.2489	150	231	-65.37	-13.00	52.37	Pass	Vertical
19	1314.0314	150	253	-51.19	-13.00	38.19	Pass	Vertical
20	2985.1985	150	15	-47.69	-13.00	34.69	Pass	Vertical
21	5052.8526	150	130	-49.90	-13.00	36.90	Pass	Vertical
22	8156.5078	150	130	-45.38	-13.00	32.38	Pass	Vertical
23	13576.2788	150	130	-39.95	-13.00	26.95	Pass	Vertical
24	17550.7275	150	315	-40.14	-13.00	27.14	Pass	Vertical

Mode:		GPRS Traffic						
Band:		1900			Channel:		810	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	46.4933	150	349	-79.01	-13.00	66.01	Pass	Horizontal
2	71.5243	150	260	-79.34	-13.00	66.34	Pass	Horizontal
3	95.0030	150	5	-78.96	-13.00	65.96	Pass	Horizontal
4	120.0340	150	277	-77.70	-13.00	64.70	Pass	Horizontal
5	600.0860	150	149	-72.60	-13.00	59.60	Pass	Horizontal
6	750.0780	150	110	-72.50	-13.00	59.50	Pass	Horizontal
7	1301.6302	150	82	-52.19	-13.00	39.19	Pass	Horizontal
8	2962.1962	150	20	-48.59	-13.00	35.59	Pass	Horizontal
9	4955.3478	150	260	-49.98	-13.00	36.98	Pass	Horizontal
10	8710.7855	150	2	-45.05	-13.00	32.05	Pass	Horizontal
11	13639.2820	150	159	-40.43	-13.00	27.43	Pass	Horizontal
12	17549.9775	150	213	-39.74	-13.00	26.74	Pass	Horizontal
13	49.0158	150	207	-67.88	-13.00	54.88	Pass	Vertical
14	53.6727	150	346	-63.28	-13.00	50.28	Pass	Vertical
15	69.5839	150	145	-69.76	-13.00	56.76	Pass	Vertical
16	208.9038	150	285	-66.80	-13.00	53.80	Pass	Vertical
17	625.1170	150	304	-69.65	-13.00	56.65	Pass	Vertical
18	732.0324	150	253	-70.05	-13.00	57.05	Pass	Vertical
19	1383.0383	150	40	-51.40	-13.00	38.40	Pass	Vertical
20	2963.9964	150	175	-48.00	-13.00	35.00	Pass	Vertical
21	4963.5982	150	32	-49.70	-13.00	36.70	Pass	Vertical
22	8138.5069	150	215	-46.17	-13.00	33.17	Pass	Vertical
23	13934.7967	150	102	-40.17	-13.00	27.17	Pass	Vertical
24	17557.4779	150	321	-39.31	-13.00	26.31	Pass	Vertical

Mode:		EGPRS Traffic						
Band:		1900			Channel:		512	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	53.0906	150	291	-79.48	-13.00	66.48	Pass	Horizontal
2	71.1362	150	328	-79.49	-13.00	66.49	Pass	Horizontal
3	120.0340	150	317	-77.97	-13.00	64.97	Pass	Horizontal
4	324.9390	150	251	-77.37	-13.00	64.37	Pass	Horizontal
5	687.5975	150	328	-71.37	-13.00	58.37	Pass	Horizontal
6	891.5323	150	175	-67.92	-13.00	54.92	Pass	Horizontal
7	1310.2310	150	146	-52.26	-13.00	39.26	Pass	Horizontal
8	2973.7974	150	119	-48.59	-13.00	35.59	Pass	Horizontal
9	4801.5901	150	268	-49.62	-13.00	36.62	Pass	Horizontal
10	8103.2552	150	31	-45.43	-13.00	32.43	Pass	Horizontal
11	11770.9385	150	243	-42.37	-13.00	29.37	Pass	Horizontal
12	14868.5934	150	268	-39.65	-13.00	26.65	Pass	Horizontal
13	48.8218	150	298	-66.92	-13.00	53.92	Pass	Vertical
14	55.0310	150	348	-63.63	-13.00	50.63	Pass	Vertical
15	69.7780	150	271	-69.73	-13.00	56.73	Pass	Vertical
16	208.9038	150	28	-66.67	-13.00	53.67	Pass	Vertical
17	625.1170	150	125	-69.62	-13.00	56.62	Pass	Vertical
18	729.5099	150	224	-70.31	-13.00	57.31	Pass	Vertical
19	1413.4413	150	358	-51.83	-13.00	38.83	Pass	Vertical
20	2705.5706	150	311	-48.23	-13.00	35.23	Pass	Vertical
21	5112.1056	150	218	-49.65	-13.00	36.65	Pass	Vertical
22	8097.2549	150	110	-44.98	-13.00	31.98	Pass	Vertical
23	14134.3067	150	218	-39.89	-13.00	26.89	Pass	Vertical
24	17579.9790	150	218	-40.26	-13.00	27.26	Pass	Vertical

Mode:		EGPRS Traffic						
Band:		1900			Channel:		661	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	53.4787	150	82	-78.43	-13.00	65.43	Pass	Horizontal
2	95.0030	150	111	-78.42	-13.00	65.42	Pass	Horizontal
3	120.0340	150	82	-77.57	-13.00	64.57	Pass	Horizontal
4	270.0260	150	179	-79.36	-13.00	66.36	Pass	Horizontal
5	600.0860	150	11	-73.06	-13.00	60.06	Pass	Horizontal
6	974.9690	150	314	-70.28	-13.00	57.28	Pass	Horizontal
7	1286.6287	150	11	-52.08	-13.00	39.08	Pass	Horizontal
8	2887.9888	150	211	-48.33	-13.00	35.33	Pass	Horizontal
9	5178.8589	150	191	-49.66	-13.00	36.66	Pass	Horizontal
10	8106.2553	150	84	-45.50	-13.00	32.50	Pass	Horizontal
11	15002.8501	150	191	-40.46	-13.00	27.46	Pass	Horizontal
12	17566.4783	150	123	-38.93	-13.00	25.93	Pass	Horizontal
13	48.8218	150	330	-67.00	-13.00	54.00	Pass	Vertical
14	55.0310	150	65	-64.80	-13.00	51.80	Pass	Vertical
15	69.5839	150	138	-69.26	-13.00	56.26	Pass	Vertical
16	208.9038	150	284	-66.98	-13.00	53.98	Pass	Vertical
17	625.1170	150	245	-70.53	-13.00	57.53	Pass	Vertical
18	687.5975	150	284	-70.88	-13.00	57.88	Pass	Vertical
19	1431.6432	150	51	-51.90	-13.00	38.90	Pass	Vertical
20	2726.5727	150	169	-47.86	-13.00	34.86	Pass	Vertical
21	5019.8510	150	348	-49.60	-13.00	36.60	Pass	Vertical
22	9049.0525	150	182	-44.61	-13.00	31.61	Pass	Vertical
23	14947.3474	150	221	-39.95	-13.00	26.95	Pass	Vertical
24	17575.4788	150	75	-39.53	-13.00	26.53	Pass	Vertical

Mode:		EGPRS Traffic						
Band:		1900			Channel:		810	
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	53.6727	150	345	-78.80	-13.00	65.80	Pass	Horizontal
2	95.0030	150	345	-78.88	-13.00	65.88	Pass	Horizontal
3	120.0340	150	249	-77.59	-13.00	64.59	Pass	Horizontal
4	324.9390	150	42	-78.62	-13.00	65.62	Pass	Horizontal
5	600.0860	150	238	-72.40	-13.00	59.40	Pass	Horizontal
6	913.0706	150	128	-72.73	-13.00	59.73	Pass	Horizontal
7	1331.2331	150	238	-51.68	-13.00	38.68	Pass	Horizontal
8	2899.7900	150	292	-48.20	-13.00	35.20	Pass	Horizontal
9	5039.3520	150	235	-49.85	-13.00	36.85	Pass	Horizontal
10	9334.8167	150	169	-43.91	-13.00	30.91	Pass	Horizontal
11	14349.5675	150	79	-40.29	-13.00	27.29	Pass	Horizontal
12	17549.9775	150	100	-39.03	-13.00	26.03	Pass	Horizontal
13	48.6277	150	356	-68.02	-13.00	55.02	Pass	Vertical
14	53.4787	150	269	-64.39	-13.00	51.39	Pass	Vertical
15	67.6435	150	129	-69.88	-13.00	56.88	Pass	Vertical
16	208.9038	150	172	-66.63	-13.00	53.63	Pass	Vertical
17	625.1170	150	316	-69.71	-13.00	56.71	Pass	Vertical
18	721.7484	150	160	-70.08	-13.00	57.08	Pass	Vertical
19	1317.6318	150	105	-52.14	-13.00	39.14	Pass	Vertical
20	2972.3972	150	184	-47.57	-13.00	34.57	Pass	Vertical
21	5163.8582	150	196	-49.88	-13.00	36.88	Pass	Vertical
22	8189.5095	150	259	-45.26	-13.00	32.26	Pass	Vertical
23	12792.4896	150	217	-41.29	-13.00	28.29	Pass	Vertical
24	17550.7275	150	235	-40.13	-13.00	27.13	Pass	Vertical

Note:

1) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No. EED32L00018301 for EUT external and internal photos.

*** End of Report ***

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