

FCC RF Test Report

**Product Name: HSPA/HSUPA/UMTS/GPRS/GSM/EDGE
Mobile Phone**

Product Model: HUAWEI H867G, H867G

Report Number: SYBH(Z-RF)035112012-2002

FCC ID: QISH867G

Reliability Laboratory of Huawei Technologies Co., Ltd.

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District,
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Notice

1. The laboratory has Passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.
2. The laboratory has Passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.
3. The laboratory has been listed by the US Federal Communications Commission to perform electromagnetic emission measurements. The site recognition number is 97456.
4. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-2.
5. The laboratory has been listed by the VCCI to perform EMC measurements. The accreditation numbers of test site No.1 are R-2364, G-415, C-2583, and T-256, and the accreditation numbers of test site No.2 are R-3760, G-485, C-4210 and T-1237.
6. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
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8. The test report is only valid for the test samples.
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Applicant: Huawei Technologies Co., Ltd.

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

Date of Receipt Sample: 2012-11-30

Start Date of Test: 2012-11-30

End Date of Test: 2012-12-17

Test Result: Pass

Approved by Senior Engineer:	2012-12-19	Dai Linjun	
	Date	Name	Signature

Prepared by:	2012-12-19	Guo Xingxing	
	Date	Name	Signature



Modification Record

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



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1 General Information

1.1 Applied Standard

Applied Rules:	47 CFR FCC Part 2, Subpart J (2011-10-1 Edition) 47 CFR FCC Part 15, Subpart C (2011-10-1 Edition)
Test Method:	FCC PUBLIC NOTICE DA 00-705 Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems (Released March 30, 2000) ANSI C63.4-2003/-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz. ANSI C63.10-2009, American National Standard for Testing Unlicensed Wireless Devices.

1.2 Test Location

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

1.3 Test Environment Condition

Ambient Temperature:	19.5 to 25 °C
Ambient Relative Humidity:	45 to 55 %
Atmospheric Pressure:	Not applicable

2 Test Summary

Test Item	FCC Part No.	IC Standard No.	Requirements	Test Result	Verdict (NOTE)
20dB Emission Bandwidth (EBW)	15.247(a)(1)	RSS-210 A8.1(a)	No limit.	Appendix A	Pass
Carrier Frequency Separation	15.247(a)(1)	RSS-210 A8.1(b)	$\geq \text{MAX} \{25\text{kHz}, \text{IIF}\{\text{output power} \leq 125\text{mW}, 2/3 * 20\text{dB EBW}, 20\text{dB EBW}\}\}$.	Appendix B	Pass
Number of Hopping Channel	15.247(a)(1)(iii)	RSS-210 A8.1(d)	≥ 15 channels.	Appendix C	Pass
Time of Occupancy (Dwell Time)	15.247(a)(1)(iii)	RSS-210 A8.1(d)	$< 0.4\text{s}$ within a period of $(0.4\text{s} * \text{hopping number})$.	Appendix D	Pass
Maximum Peak Conducted Output Power	15.247(b)(1)	RSS-210 A8.4(2)	$< 1\text{ W}$ if using ≥ 75 non-overlapping channels.	Appendix E	Pass
Band edge spurious emission	15.247(d)	RSS-210, A8.5	$< -20\text{ dB}/100\text{ kHz}$ if total peak power \leq power limit.	Appendix F	Pass
Conducted RF Spurious Emission				Appendix G	Pass
Radiated Emissions in the Restricted Bands	15.247(d) 15.209	RSS-210, A8.5 RSS-210, 2.2 RSS-Gen, 7.2.2 RSS-Gen, 7.2.5	FCC Part 15.209 field strength limit; RSS-Gen 7.2.5 field strength limit.	Appendix H	Pass
AC Power Line Conducted Emissions	15.207	RSS-Gen, 7.2.4	FCC Part 15.207 conducted limit; RSS-Gen, 7.2.4 conducted limit.	Appendix I	Pass
NOTE: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					

3 Description of the Equipment under Test (EUT)

3.1 General Description

HUAWEI H867G, H867G is subscriber equipment in the WCDMA/GSM system. The HSPA/UMTS frequency band is Band I, Band II, Band IV, and Band V. The Mobile Phone implements such functions as RF signal receiving/transmitting, HSPA/UMTS and GSM/GPRS/EDGE protocol processing, voice, video MMS service, GPS, AGPS, Bluetooth and WIFI etc. Externally it provides micro SD card interface, earphone port(to provide voice service) and USIM card interface. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

3.2 EUT Identity

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

3.2.1 Board

Board		
SN	Hardware Version	Description
C9F01A92B1000526	HD1H867GM	Main board of Mobile Phone

3.2.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
AC/DC Adapter	HW-050055U1W	Huawei Technologies Co., Ltd.	Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V  550mA Rate power: 2.75W

3.3 Technical Description

Characteristics	Description	
TX/RX Operating Range	2400-2483.5 MHz band	$f_c = 2402 \text{ MHz} + N * 1 \text{ MHz}$, where: - f_c = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 0 to 78.
	Carrier	Frequency Hopping Spread Spectrum (FHSS)
Modulation Type	Digital	GFSK, $\pi/4$ -DQPSK, 8DPSK
	Emission Designator	GFSK: 1M02GXD $\pi/4$ -DQPSK: 1M34GXD 8DPSK: 1M31GXD
Bluetooth Power Class	Class 1,	

4 General Test Conditions / Configurations

4.1 EUT Configurations

4.1.1 General Configurations

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

4.1.2 Customized Configurations

# EUT Conf.	Signal Description	Operating Frequency
TM1_DH5_Hop	GFSK modulation, package type DH5, hopping on.	---
TM1_DH5_Ch0	GFSK modulation, package type DH5, hopping off.	Ch No. 0 / 2402 MHz
TM1_DH5_Ch39	GFSK modulation, package type DH5, hopping off.	Ch No. 39 / 2441 MHz
TM1_DH5_Ch78	GFSK modulation, package type DH5, hopping off.	Ch No. 78 / 2480 MHz
TM2_2DH5_Hop	$\pi/4$ -DQPSK modulation, package type 2DH5, hopping on.	---
TM2_2DH5_Ch0	$\pi/4$ -DQPSK modulation, package type 2DH5, hopping off.	Ch No. 0 / 2402 MHz
TM2_2DH5_Ch39	$\pi/4$ -DQPSK modulation, package type 2DH5, hopping off.	Ch No. 39 / 2441 MHz
TM2_2DH5_Ch78	$\pi/4$ -DQPSK modulation, package type 2DH5, hopping off.	Ch No. 78 / 2480 MHz
TM3_3DH5_Hop	8DPSK modulation, package type 3DH5, hopping on.	---
TM3_3DH5_Ch0	8DPSK modulation, package type 3DH5, hopping off.	Ch No. 0 / 2402 MHz
TM3_3DH5_Ch39	8DPSK modulation, package type 3DH5, hopping off.	Ch No. 39 / 2441 MHz
TM3_3DH5_Ch78	8DPSK modulation, package type 3DH5, hopping off.	Ch No. 78 / 2480 MHz
RX	Receiver Continues Receiving mode.	Ch No. 39 / 2441 MHz



4.2 Test Environments

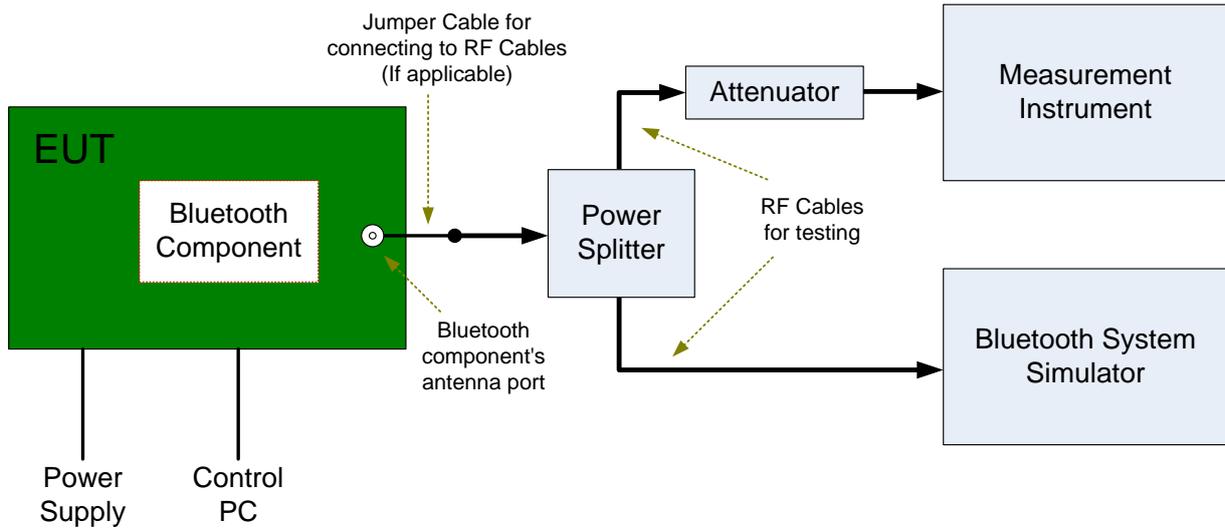
NOTE: The values used in the test report may be stringent than the declared.

Environment Parameter	Selected Values During Tests		
	Temperature	Voltage	Relative Humidity
NTNV	Ambient	3.7 VDC	Ambient

4.3 Test Setups

4.3.1 Test Setup 1

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

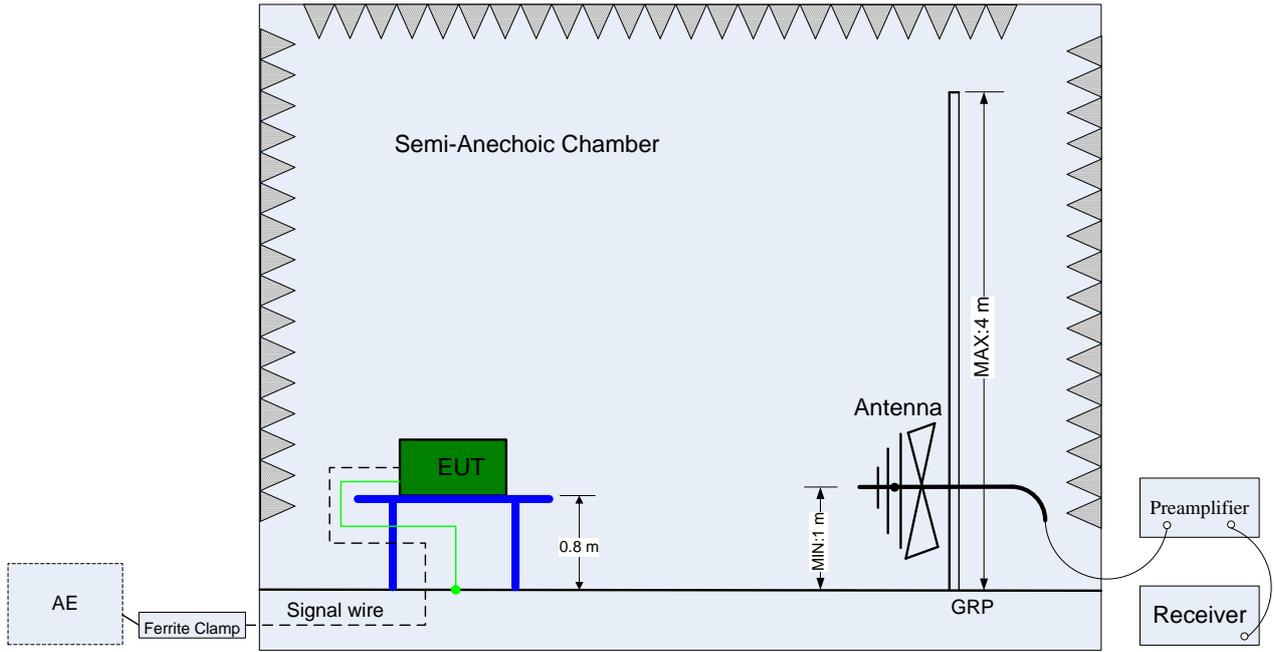


4.3.2 Test Setup 2

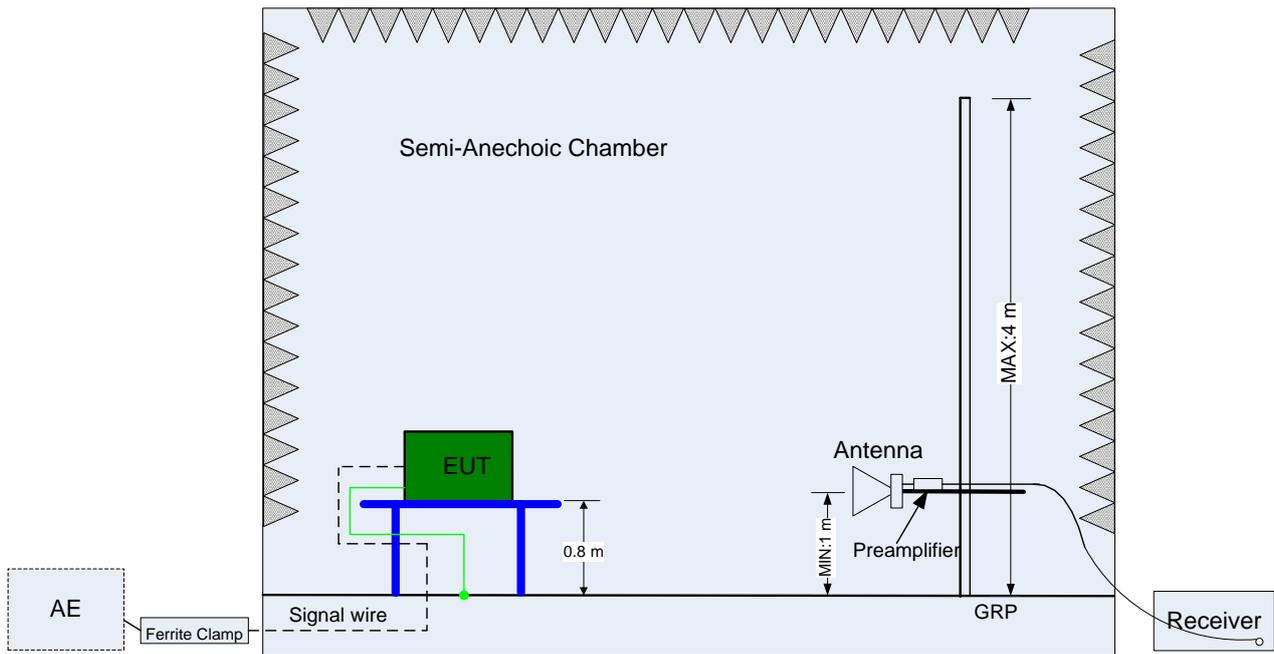
The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.4. The test distance is 3m. The setup is according to ANSI C63.4 and CAN/CSA-CEI/IEC CISPR 22.

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

A portable or small unlicensed wireless device shall be placed on a non-metallic test fixture or other nonmetallic support during testing. The supporting fixture shall permit orientation of the EUT in each of three orthogonal (x, y, z) axis positions such that emissions from the EUT are maximized.



(Below 1 GHz)



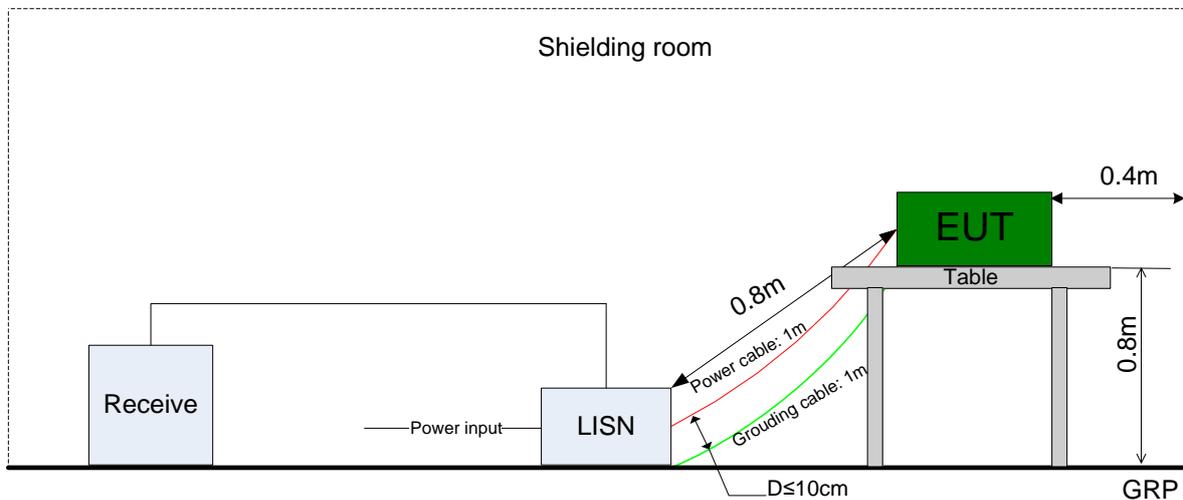
(Above 1 GHz)

4.3.3 Test Setup 3

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

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

The test voltage is voltage is 120V/60Hz



4.4 Test Conditions

Test Case	Test Conditions	
	Configuration	Description
20dB Emission Bandwidth (EBW)	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78, TM2_2DH5_Ch0, TM2_2DH5_Ch39, TM2_2DH5_Ch78, TM3_3DH5_Ch0, TM3_3DH5_Ch39, TM3_3DH5_Ch78.
Carrier Frequency Separation	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Hop, TM2_2DH5_Hop, TM3_3DH5_Hop.
Number of Hopping Channel	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Hop, TM2_2DH5_Hop, TM3_3DH5_Hop.
Time of Occupancy (Dwell Time)	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Ch39, TM2_2DH5_Ch39, TM3_3DH5_Ch39.
Maximum Peak Conducted Output Power	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78, TM2_2DH5_Ch0, TM2_2DH5_Ch39, TM2_2DH5_Ch78, TM3_3DH5_Ch0, TM3_3DH5_Ch39, TM3_3DH5_Ch78.
Band edge spurious emission	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Ch0, TM1_DH5_Ch78, TM2_2DH5_Ch0, TM2_2DH5_Ch78, TM3_3DH5_Ch0, TM3_3DH5_Ch78.
Conducted RF Spurious Emission	Meas. Method	DA 00-705
	Test Env.	NTNV

Test Case	Test Conditions		
	Configuration	Description	
	Test Setup	Test Setup 1	
	EUT Conf.	TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78, TM2_2DH5_Ch0, TM2_2DH5_Ch39, TM2_2DH5_Ch78, TM3_3DH5_Ch0, TM3_3DH5_Ch39, TM3_3DH5_Ch78.	
	Meas. Method	DA 00-705, C63.4, C63.10. (1) 30 MHz to 1 GHz: Pre: RBW = 100 kHz; VBW = 300 kHz; Det. = Peak. Final: RBW = 120 kHz; Det. = CISPR Quasi-Peak. (2) 1 GHz to 26.5 GHz: Average: RBW = 1 MHz; VBW = 10 Hz; Det. = Peak; Sweep-time = Auto; Trace = Single. Peak: RBW = 1 MHz; VBW = 3 MHz; Det. = Peak; Sweep-time = Auto; Trace ≥ Max Hold * 100.	
	Test Env.	NTNV	
Radiated Emissions in the Restricted Bands	Test Setup	Test Setup 2	
	EUT Conf.	30 MHz -1 GHz	TM1_DH5_Ch0 (Worst Conf.).
		1-3 GHz	TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78, TM2_2DH5_Ch0, TM2_2DH5_Ch39, TM2_2DH5_Ch78, TM3_3DH5_Ch0, TM3_3DH5_Ch39, TM3_3DH5_Ch78.
		3-18 GHz	TM1_DH5_Ch0 (Worse Conf.), TM1_DH5_Ch39 (Worse Conf.), TM1_DH5_Ch78 (Worse Conf.).
		18-26.5 GHz	TM1_DH5_Ch0 (Worst Conf.).
Receiver Spurious Emissions	Meas. Method	<input type="checkbox"/> Antenna-conducted, <input type="checkbox"/> Radiated. NOTE: If the receiver has a detachable antenna of known impedance, antenna conducted spurious emissions measurement is permitted as an alternative to radiated measurement. However, the radiated method is recommended. The antenna conducted test shall be performed with the antenna disconnected and the receiver antenna terminals connected to a measuring instrument having equal impedance to that specified for the antenna. (1) 30 MHz to 1 GHz: Pre: RBW = 100 kHz; VBW = 300 kHz; Det. = Peak. Final: RBW = 120 kHz; Det. = CISPR Quasi-Peak. (2) 1 GHz to 8 GHz: Pre: RBW = 1 MHz; VBW = 3 MHz; Det. = Peak. Final: RBW = 1 MHz; Det. = Average.	
	Test Env.	NTNV	
	Test Setup	Test Setup 2	
	EUT Conf.	RX.	



Test Case	Test Conditions	
	Configuration	Description
AC Power Line Conducted Emissions	Meas. Method	AC mains conducted. Pre: RBW = 10 kHz; Det. = Peak. Final: RBW = 9 kHz; Det. = CISPR Quasi-Peak & Average.
	Test Env.	NTNV
	Test Setup	Test Setup 3
	EUT Conf.	TM1_DH5_Ch39.

5 Main Test Instruments

NOTE: Unless otherwise specified, the calibration intervals for test instruments were Annual (per year). The other intervals, if applicable, are marked with (##y), which denotes ## years calibration interval.

6 Main Test Instruments

Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal. Due
Power supply	KEITHLEY	2303	1288003	2012-11-09	2013-11-08
Wireless Communication Test set	Agilent	N4010A	MY49081592	2012-11-09	2013-11-08
Spectrum Analyzer	Agilent	E4440A	MY48250119	2012-07-18	2013-07-17
Signal Analyzer	R&S	FSQ31	200021	2012-11-09	2013-11-08
Spectrum Analyzer	Agilent	N9030A	MY49431698	2012-11-09	2013-11-08
Temperature Chamber	WEISS	WKL64	24600294	2012-02-14	2013-02-13
Signal generator	Agilent	E8257D	MY49281095	2012-07-10	2013-07-09
Test receiver	R&S	ESU26	100150	2012-09-30	2013-09-29
Spectrum analyzer	R&S	FSU3	200474	2012-03-06	2013-03-05
Spectrum analyzer	R&S	FSU43	100144	2012-04-06	2013-04-05
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100304	2012-04-06	2013-04-05
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100391	2012-07-18	2013-07-17
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBECK	VULB 9163	9163-521	2012-02-28	2013-02-27
Pyramidal Horn Antenna(26GHz-40GHz)	ETS-Lindgren	3160-10	00123940	2012-02-28	2013-02-27
Pyramidal Horn Antenna(18GHz-26.5GHz)	ETS-Lindgren	3160-09	00125912	2012-02-28	2013-02-27
EMI Test receiver	R&S	ESCI	101163	2012-03-06	2013-03-05
Artificial Mains Network	R&S	ENV216	100382	2012-03-22	2013-03-21
LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100263	2012-3-11	2013-3-10

END



Appendix A: 20dB Emission Bandwidth (EBW)

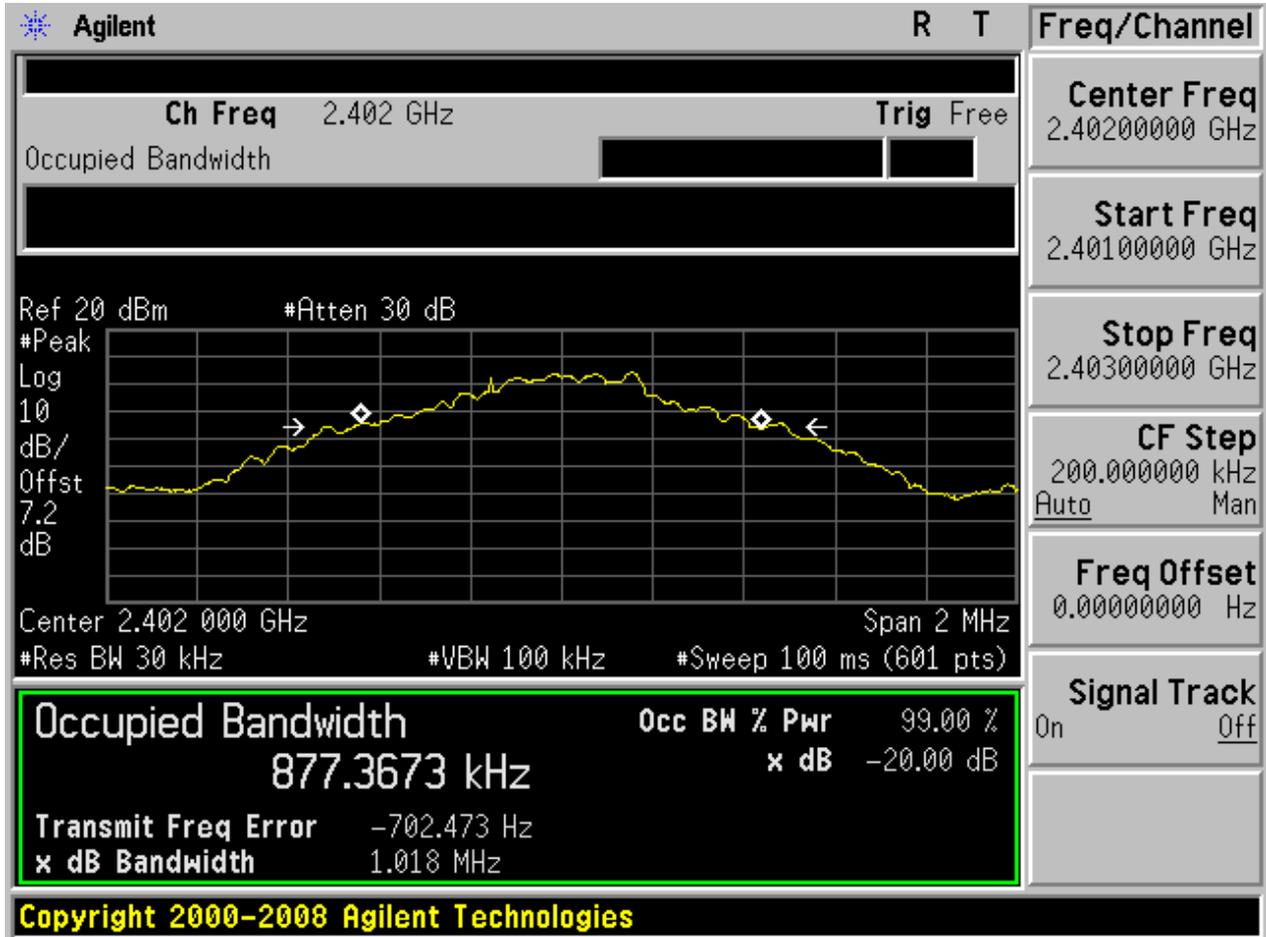


1 Result Table

EUT Conf.	EBW [MHz]	Verdict
TM1_DH5_Ch0	1.018	Pass
TM1_DH5_Ch39	1.017	Pass
TM1_DH5_Ch78	1.017	Pass
TM2_2DH5_Ch0	1.334	Pass
TM2_2DH5_Ch39	1.333	Pass
TM2_2DH5_Ch78	1.336	Pass
TM3_3DH5_Ch0	1.310	Pass
TM3_3DH5_Ch39	1.311	Pass
TM3_3DH5_Ch78	1.310	Pass

2 Test Plot

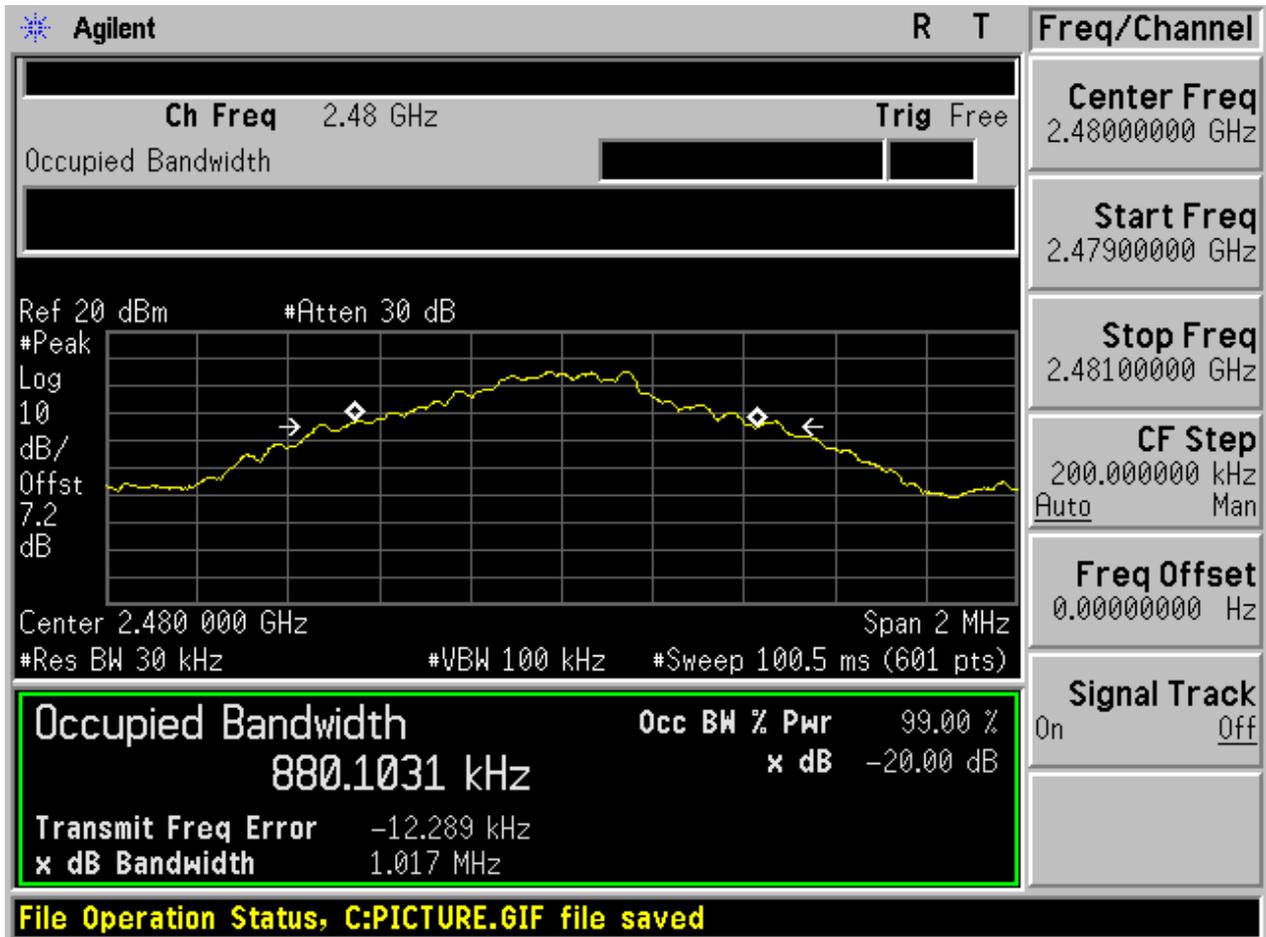
2.1 TM1_DH5_Ch0



2.2 TM1_DH5_Ch39



2.3 TM1_DH5_Ch78



2.4 TM2_2DH5_Ch0



2.5 TM2_2DH5_Ch39



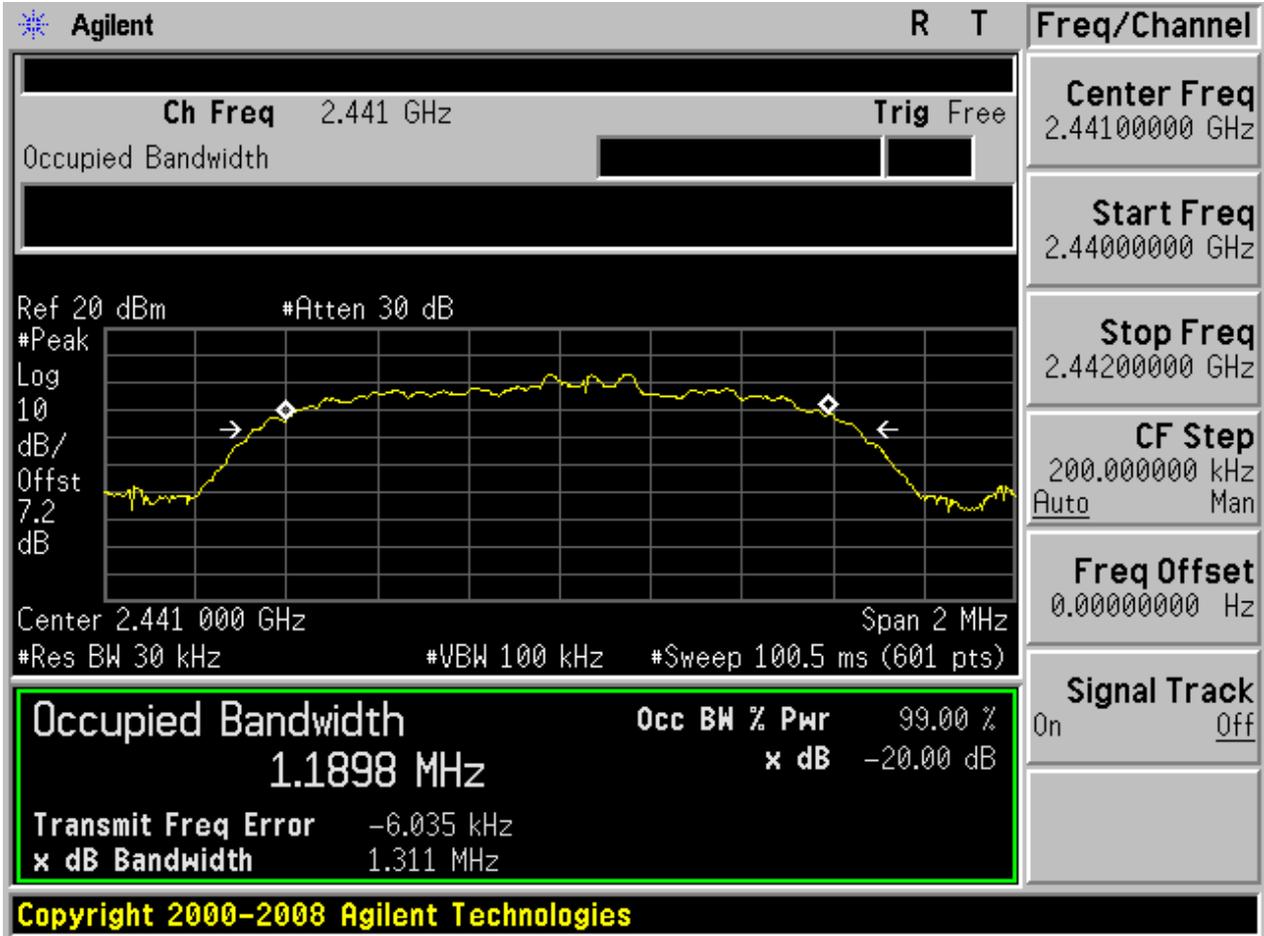
2.6 TM2_2DH5_Ch78



2.7 TM3_3DH5_Ch0



2.8 TM3_3DH5_Ch39





2.9 TM3_3DH5_Ch78

Agilent		R	T	Freq/Channel
Ch Freq 2.48 GHz		Trig Free		Center Freq 2.48000000 GHz
Occupied Bandwidth				Start Freq 2.47900000 GHz
Ref 20 dBm #Atten 30 dB #Peak Log 10 dB/ Offst 7.2 dB 				Stop Freq 2.48100000 GHz
Center 2.480 000 GHz		Span 2 MHz		CF Step 200.000000 kHz Auto Man
#Res BW 30 kHz		#VBW 100 kHz #Sweep 100.5 ms (601 pts)		Freq Offset 0.00000000 Hz
Occupied Bandwidth 1.1883 MHz		Occ BW % Pwr 99.00 % x dB -20.00 dB		Signal Track On Off
Transmit Freq Error -11.714 kHz x dB Bandwidth 1.310 MHz				
File Operation Status, C:PICTURE.GIF file saved				



Appendix B: Carrier Frequency Separation

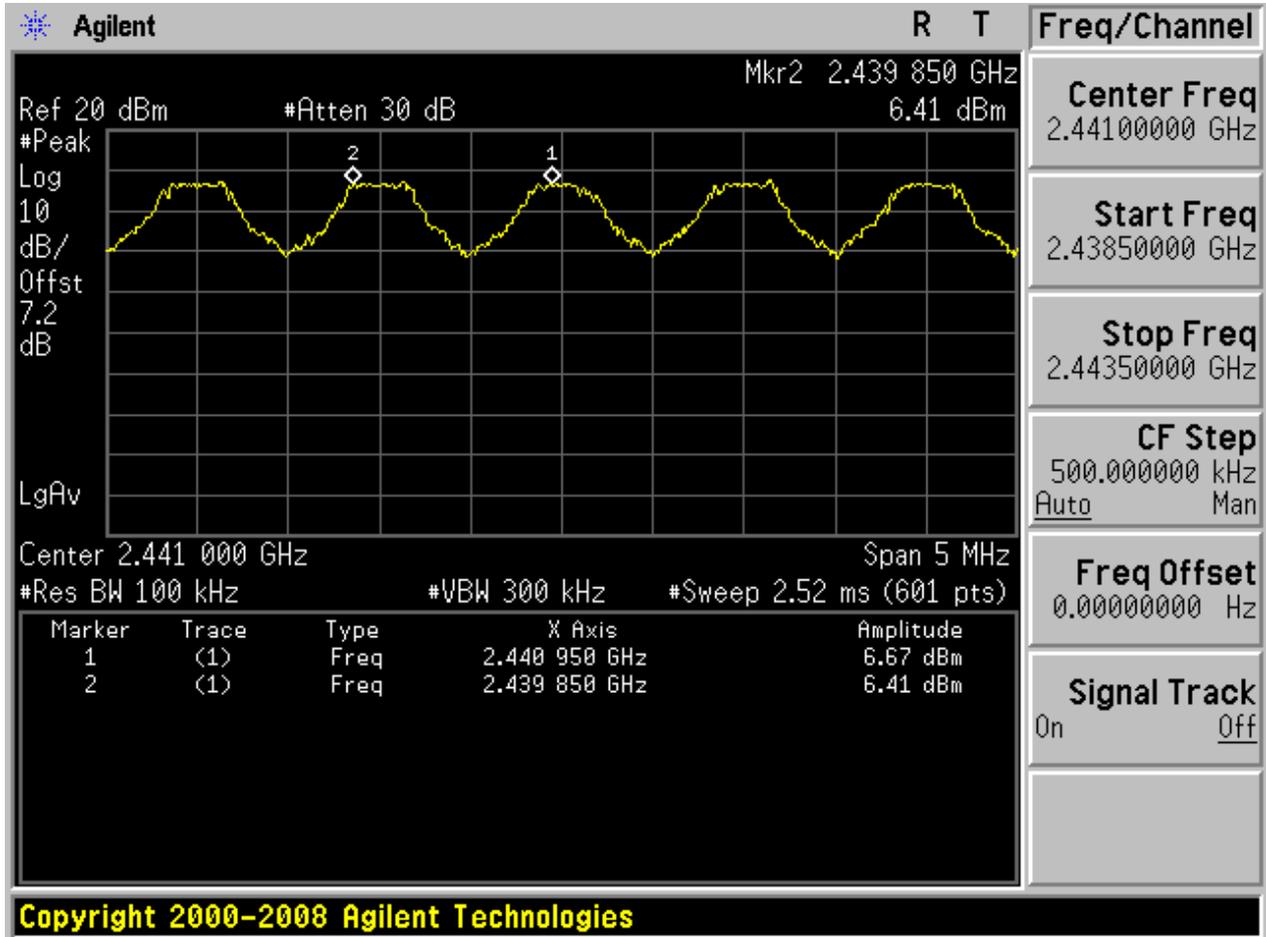


1 Result Table

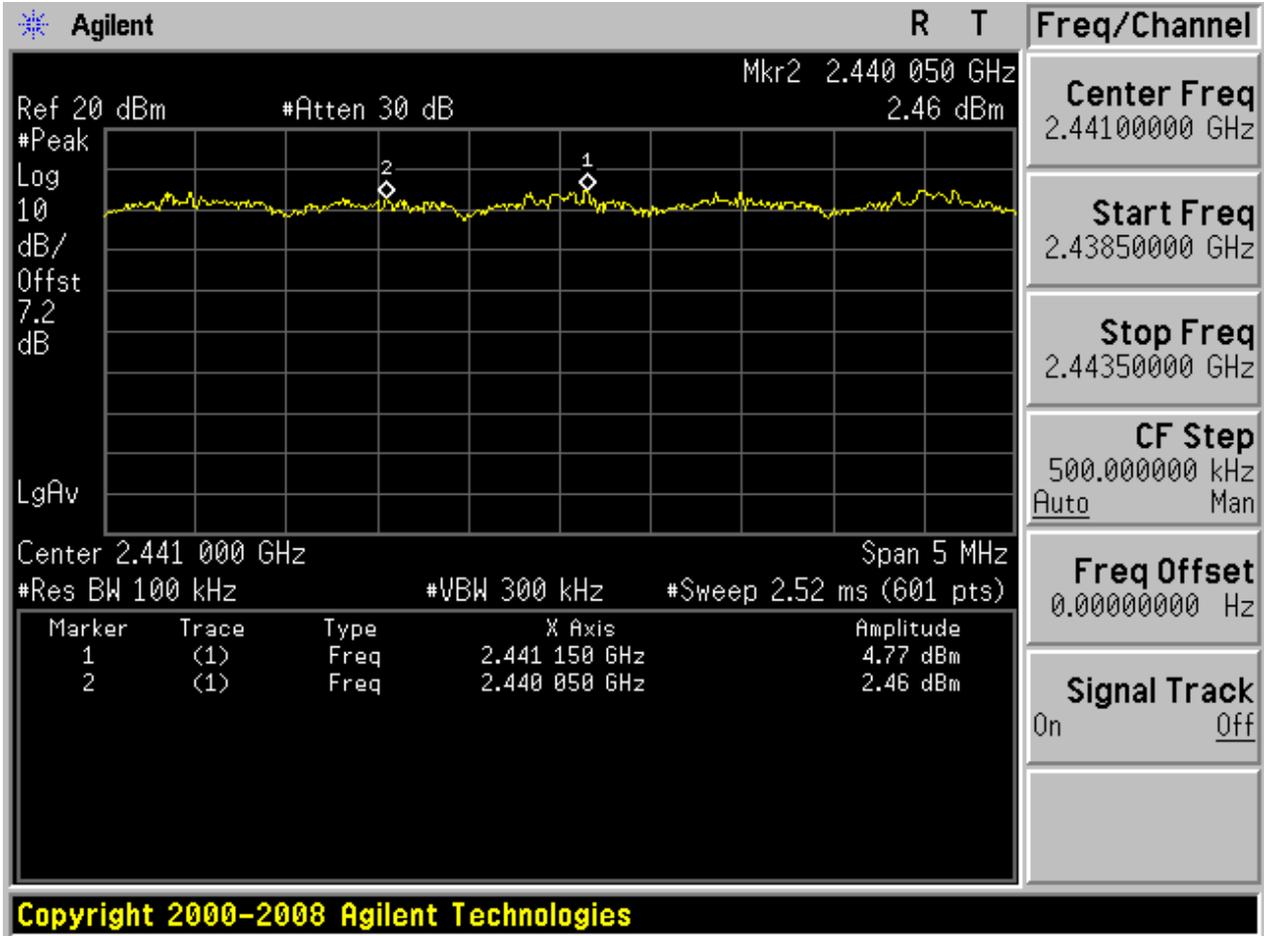
EUT Conf.	Carrier Frequency Separation [MHz]	Verdict
TM1_DH5_Hop	1.100	Pass
TM2_2DH5_Hop	1.100	Pass
TM3_3DH5_Hop	1.150	Pass

2 Test Plot

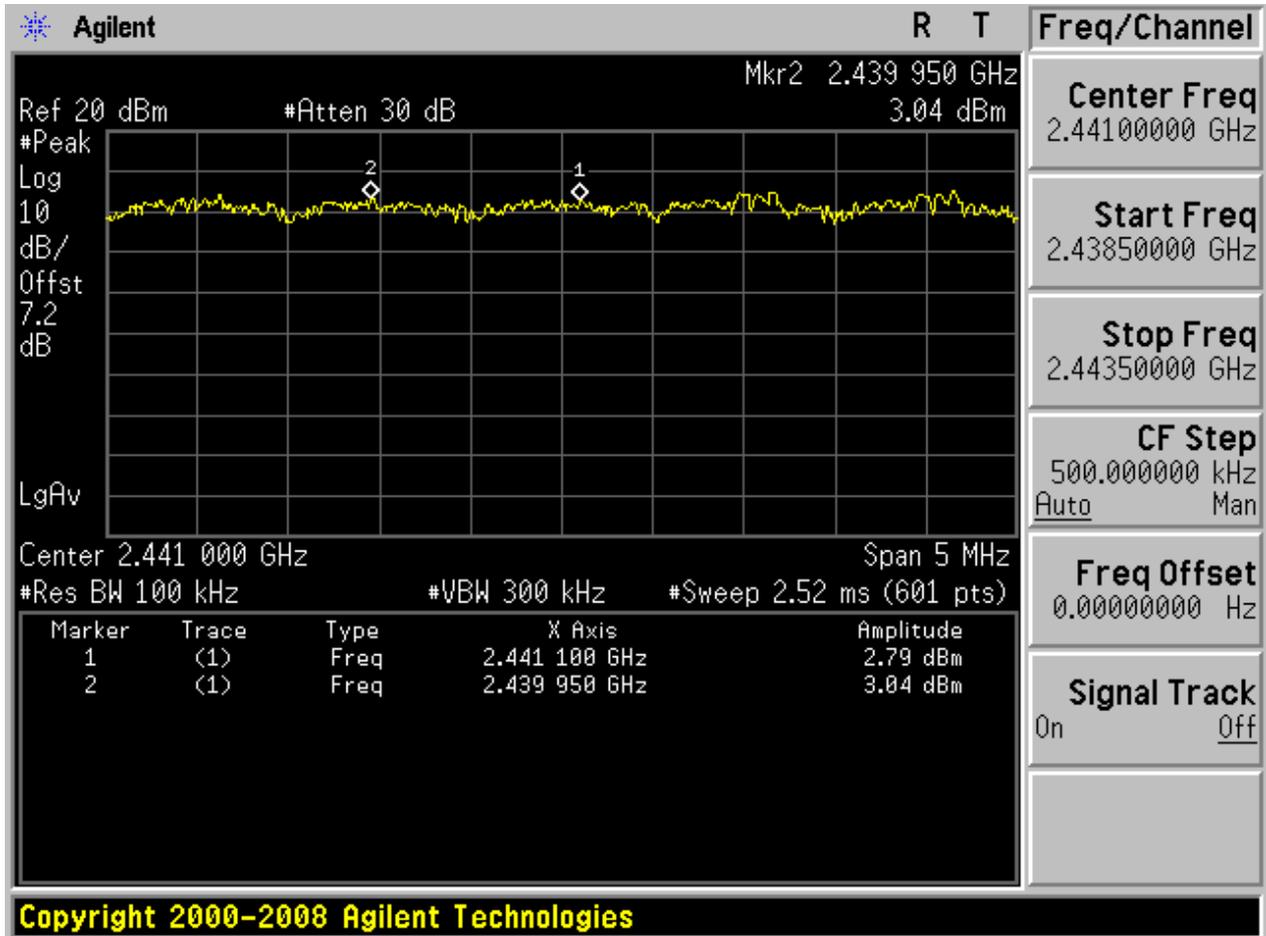
2.1 TM1_DH5_Hop



2.2 TM2_2DH5_Hop



2.3 TM3_3DH5_Hop





Appendix C: Number of Hopping Channel

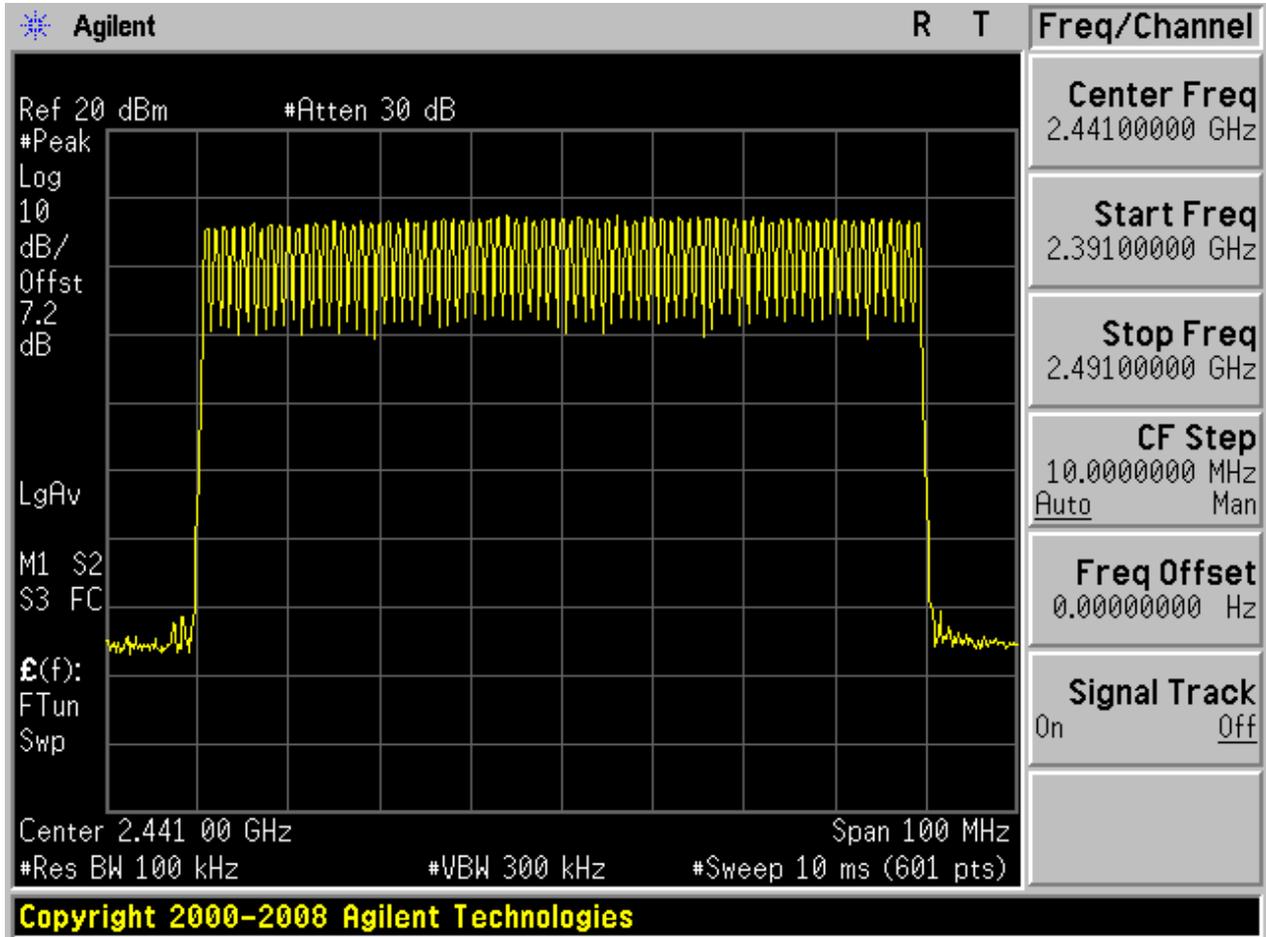


1 Result Table

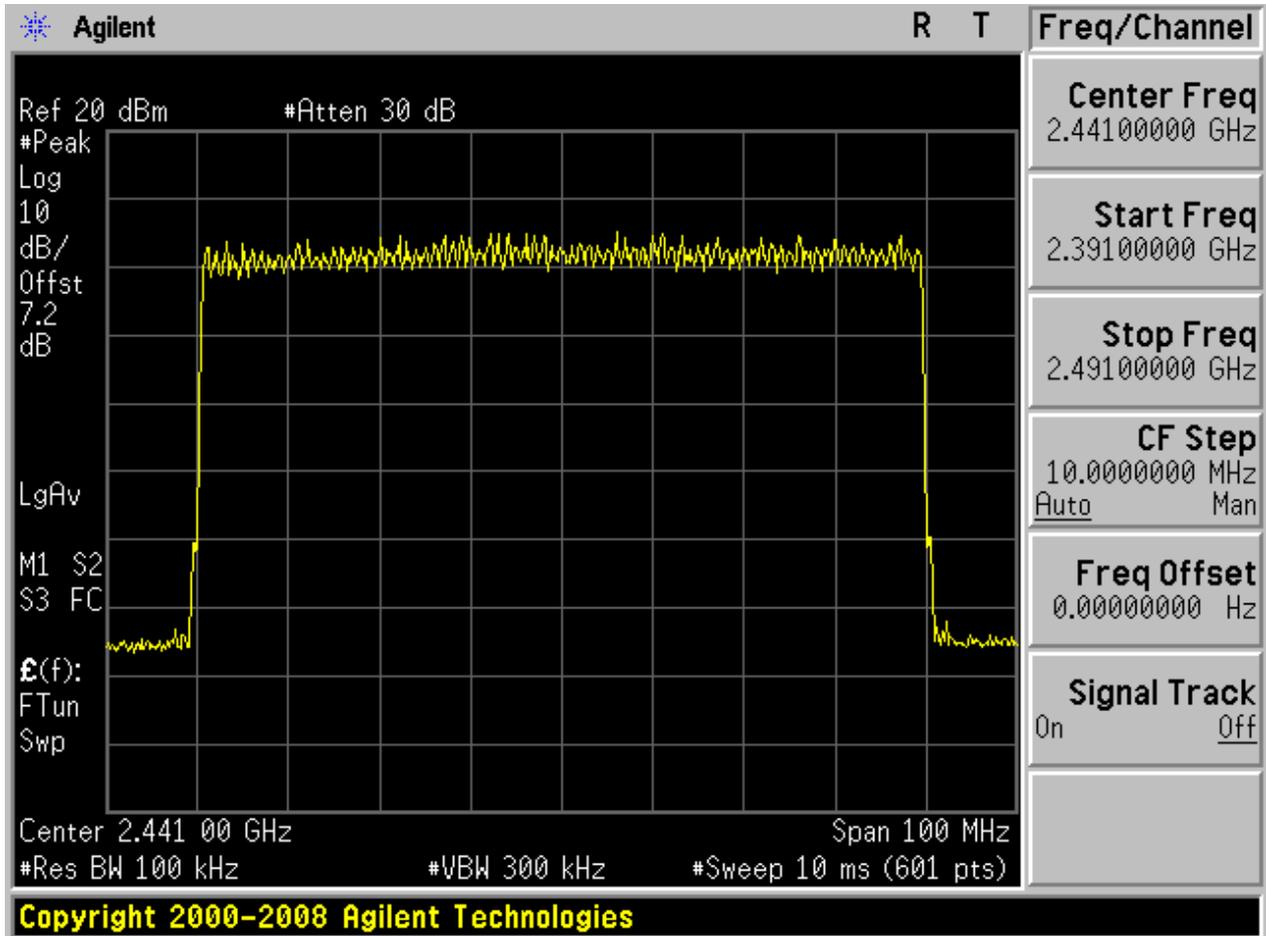
EUT Conf.	Number of Hopping Channel	Verdict
TM1_DH5_Hop	79	Pass
TM2_2DH5_Hop	79	Pass
TM3_3DH5_Hop	79	Pass

2 Test Plot

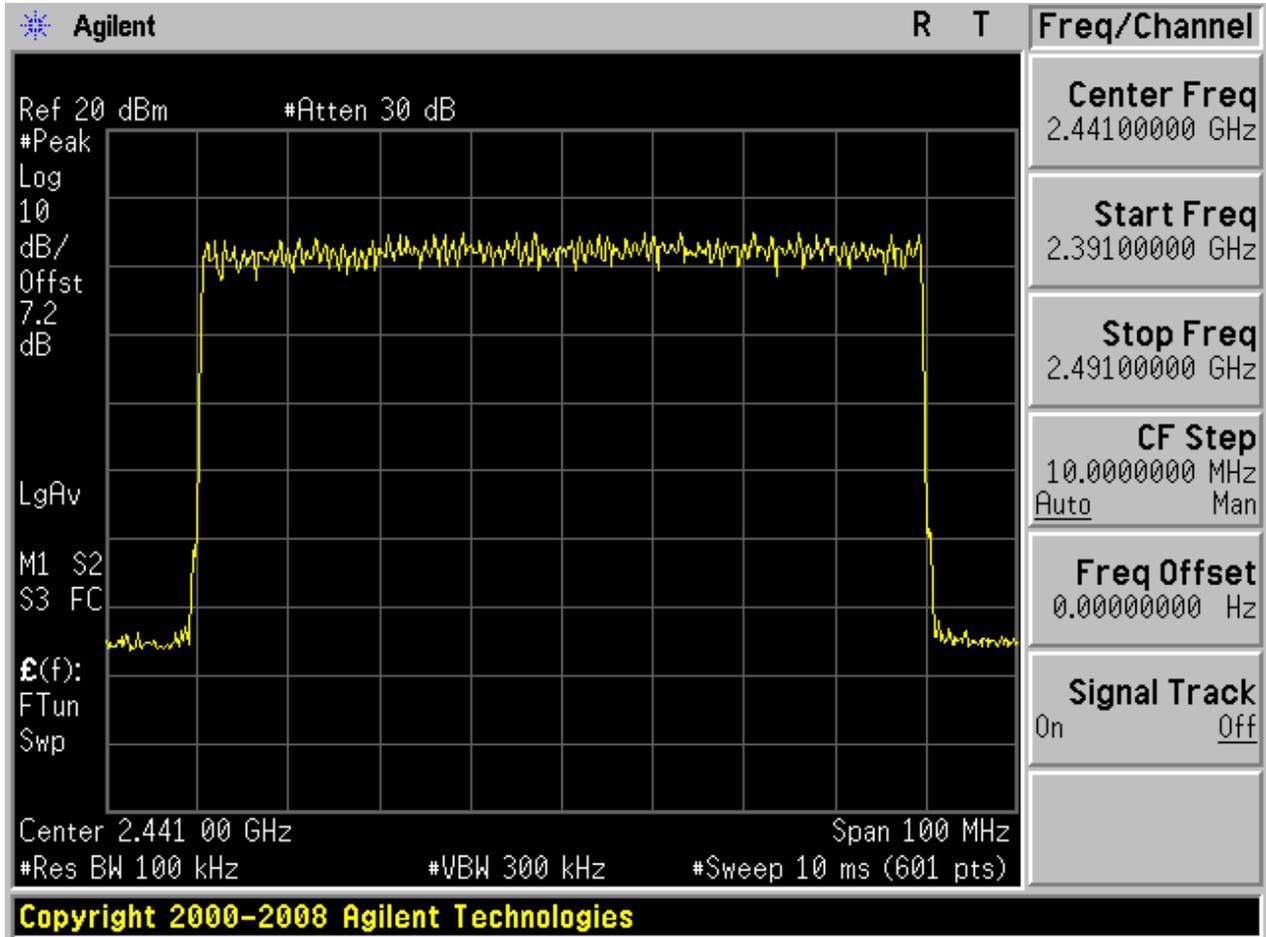
2.1 TM1_DH5_Hop



2.2 TM2_2DH5_Hop



2.3 TM3_3DH5_Hop





Appendix D: Time of Occupancy (Dwell Time)

1 Result Table

The Dwell Time = Burst Width * Total Hops. The detailed calculations are showed as follows:

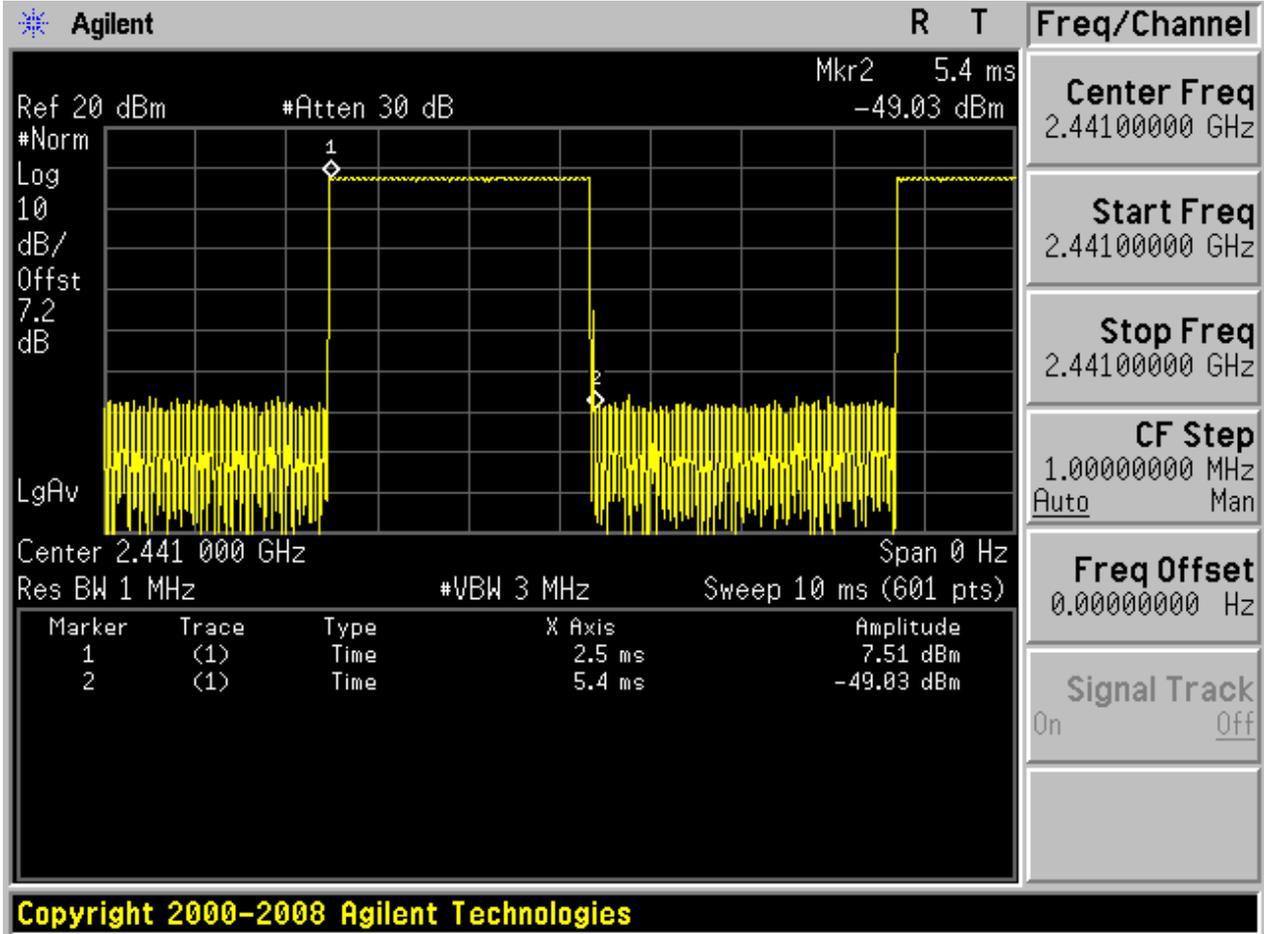
- The duration for dwell time calculation: $0.4 \text{ [s]} * \text{hopping number} = 0.4 \text{ [s]} * 79 \text{ [ch]} = 31.6 \text{ [s*ch]}$;
- The burst width [ms/hop/ch], which is directly measured, refers to the duration on one channel hop.
- The hops per second for all channels: The selected EUT Conf uses a slot type of 5-Tx&1-Rx and a hopping rate of 1600 [ch*hop/s] for all channels. So the final hopping rate for all channels is $1600 / 6 = 266.67 \text{ [ch*hop/s]}$;
- The hops per second on one channel: $266.67 \text{ [ch*hop/s]} / 79 \text{ [ch]} = 3.38 \text{ [hop/s]}$;
- The total hops for all channels within the dwell time calculation duration: $3.38 \text{ [hop/s]} * 31.6 \text{ [s*ch]} = 106.67 \text{ [hop*ch]}$;
- The dwell time for all channels hopping: $106.67 \text{ [hop*ch]} * \text{Burst Width [ms/hop/ch]}$.

EUT Conf.	Burst Width [ms/hop/ch]	Total Hops [hop*ch]	Dwell Time [ms]	Verdict
TM1_DH5_Ch39	2.9	106.67	0.309	Pass
TM2_2DH5_Ch39	2.9	106.67	0.309	Pass
TM3_3DH5_Ch39	2.9	106.67	0.309	Pass

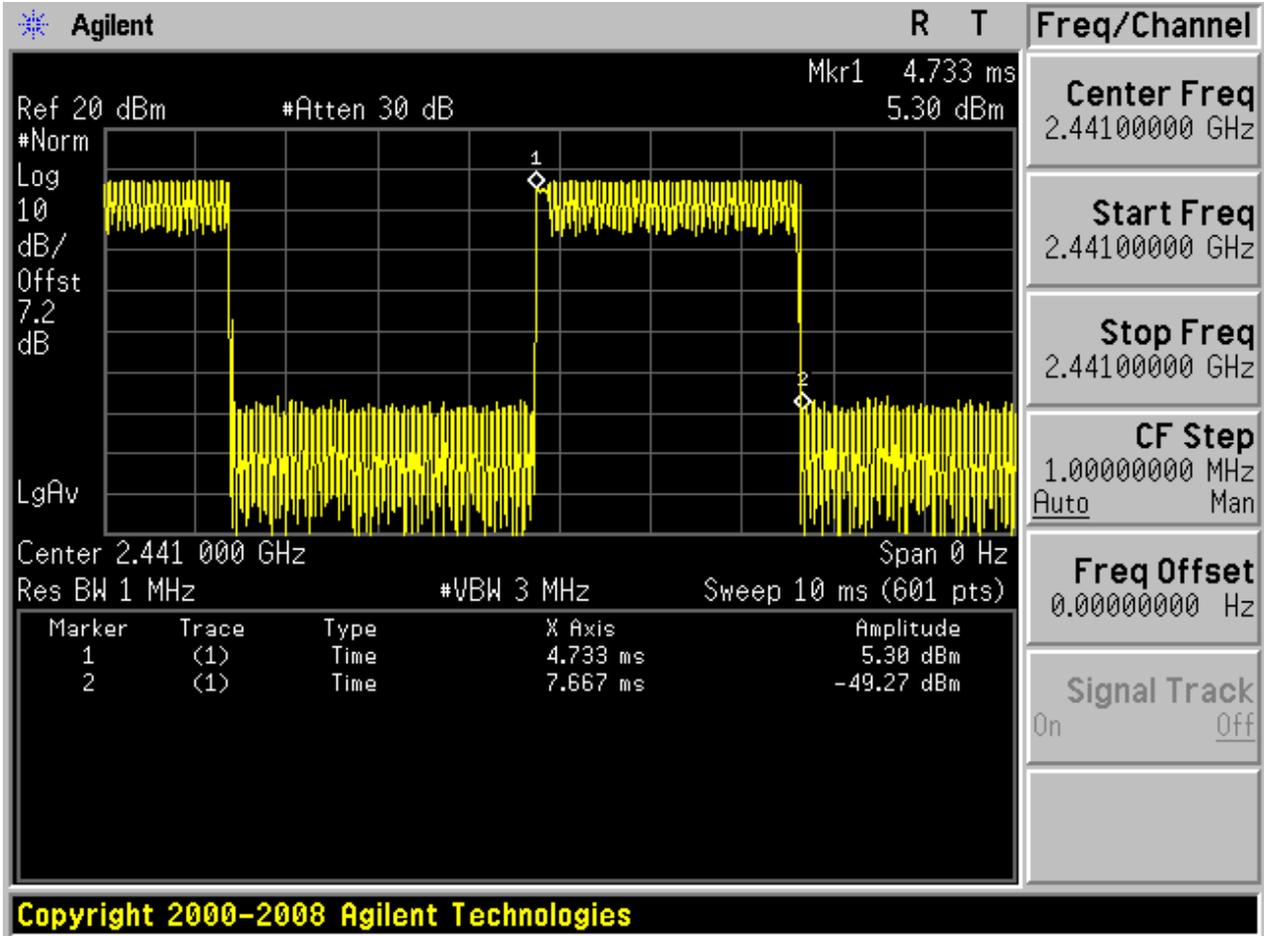
2 Test Plot

NOTE: The test plots are only for Burst Width measurements.

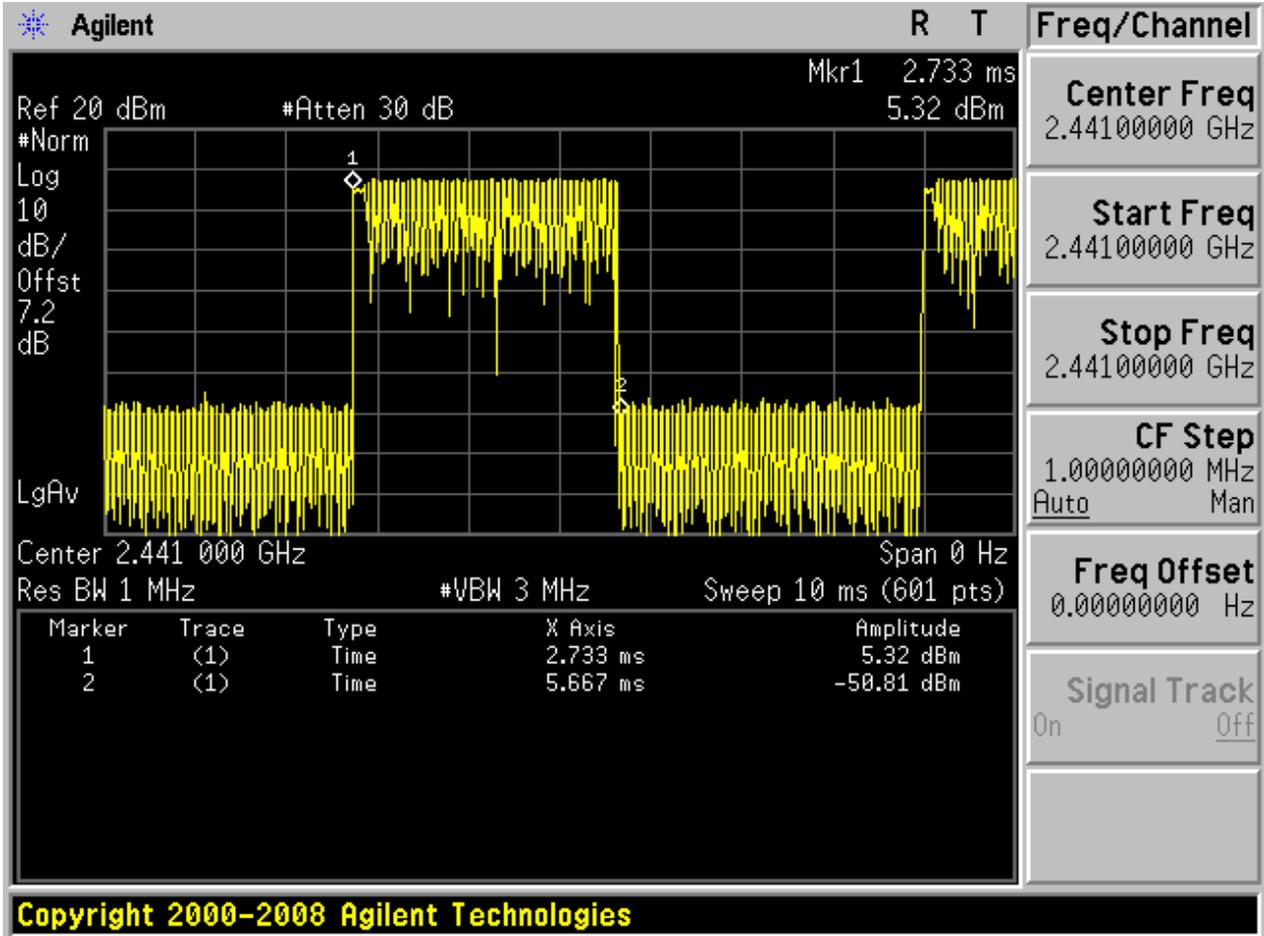
2.1 TM1_DH5_Ch39



2.2 TM2_2DH5_Ch39



2.3 TM3_3DH5_Ch39





Appendix E: Maximum Peak Conducted Output Power



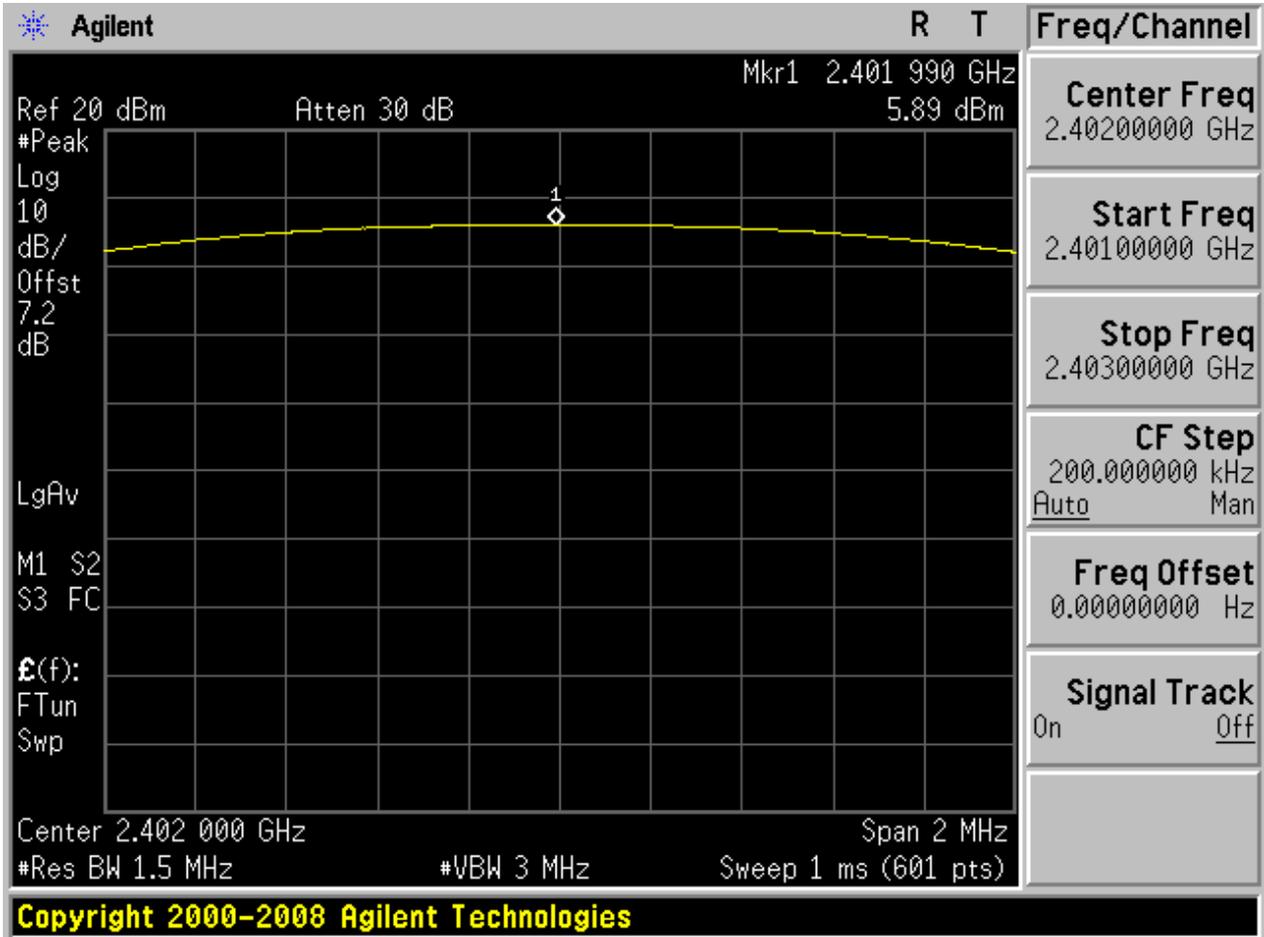
3 Result Table

EUT Conf.	Max. Peak Power [dBm]	Verdict
TM1_DH5_Ch0	5.89	Pass
TM1_DH5_Ch39	7.95	Pass
TM1_DH5_Ch78	7.34	Pass
TM2_2DH5_Ch0	6.54	Pass
TM2_2DH5_Ch39	8.07	Pass
TM2_2DH5_Ch78	7.67	Pass
TM3_3DH5_Ch0	6.99	Pass
TM3_3DH5_Ch39	8.49	Pass
TM3_3DH5_Ch78	8.10	Pass



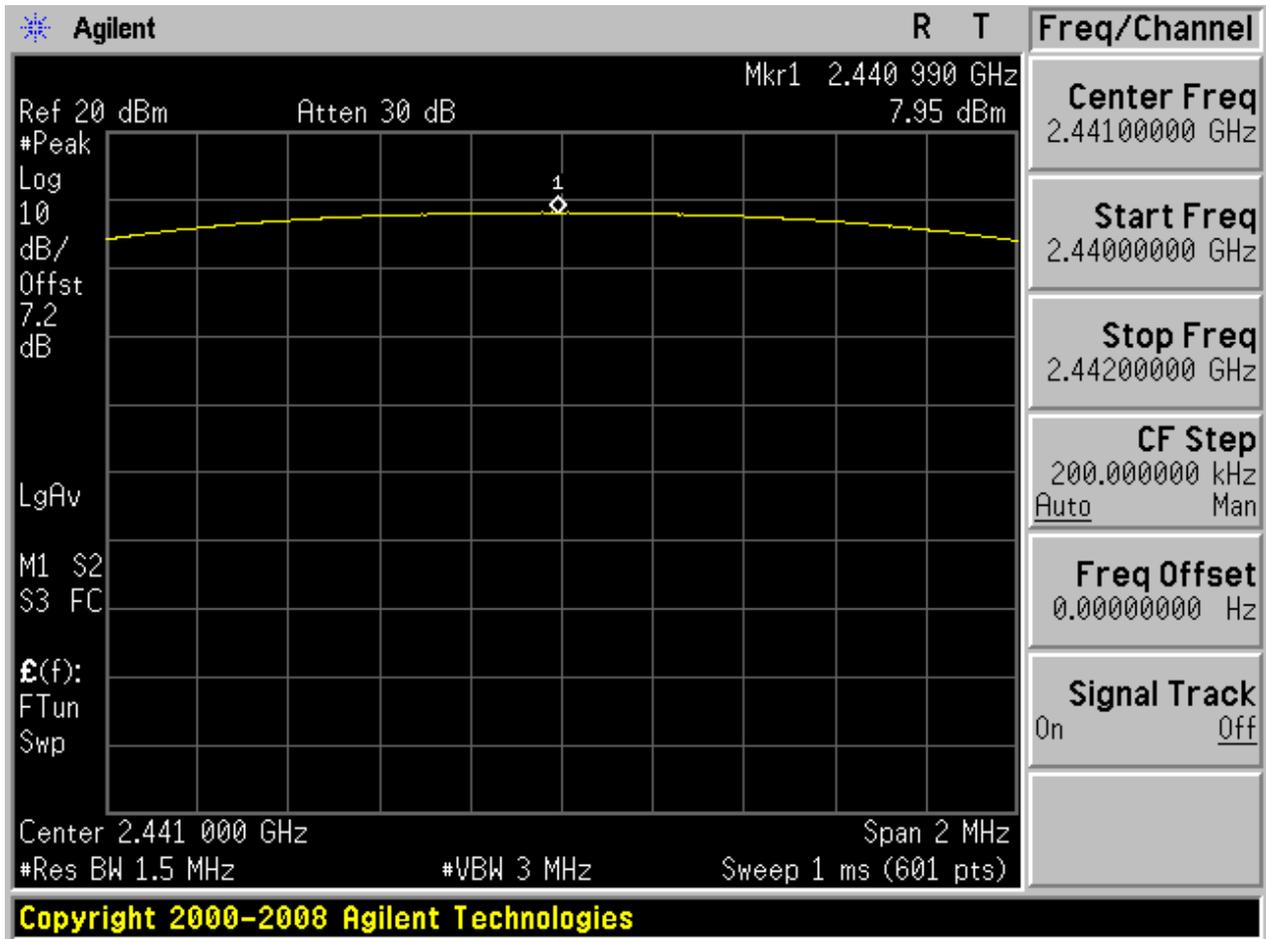
4 Test Plot

4.1 TM1_DH5_Ch0

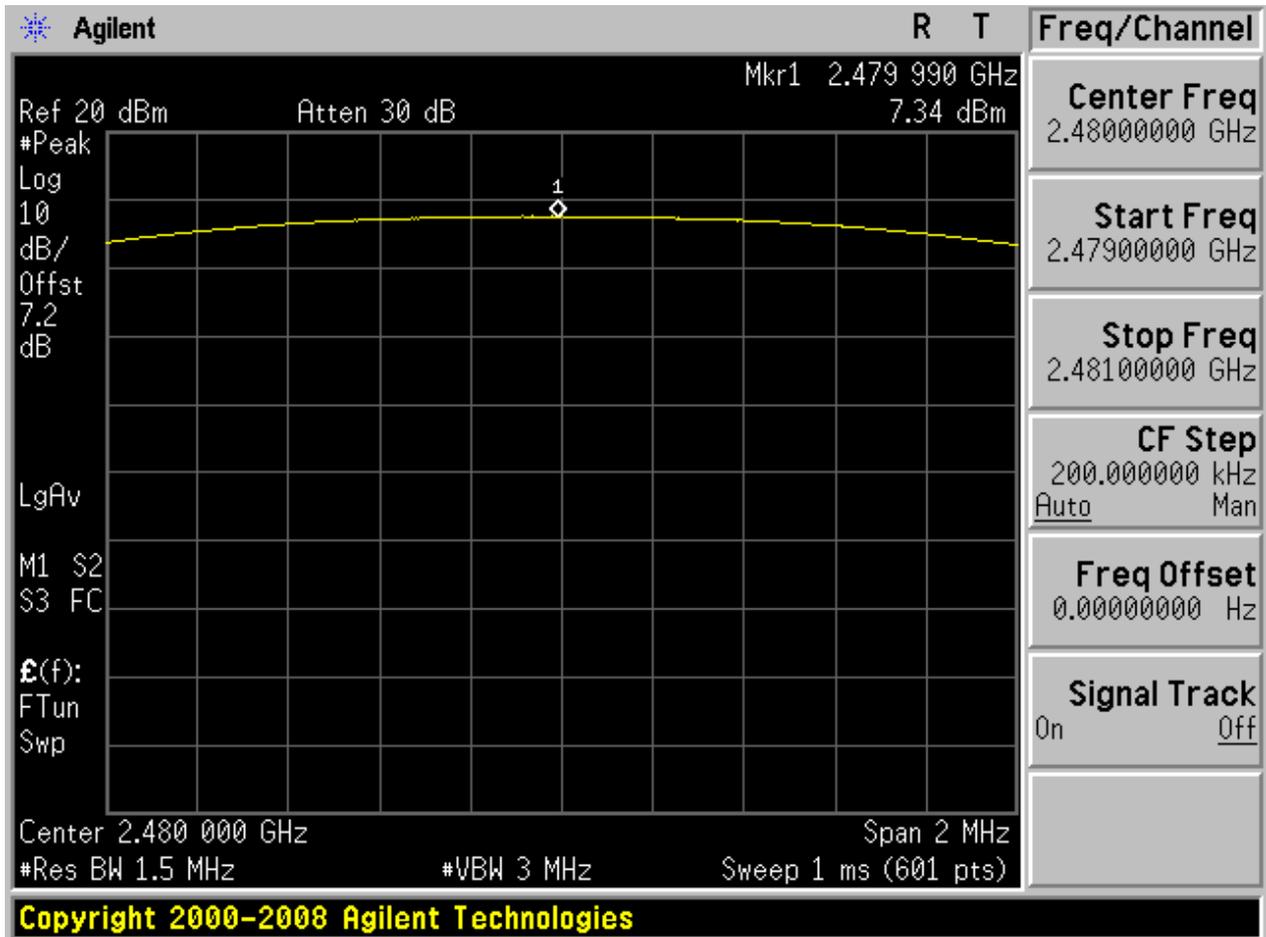




4.2 TM1_DH5_Ch39

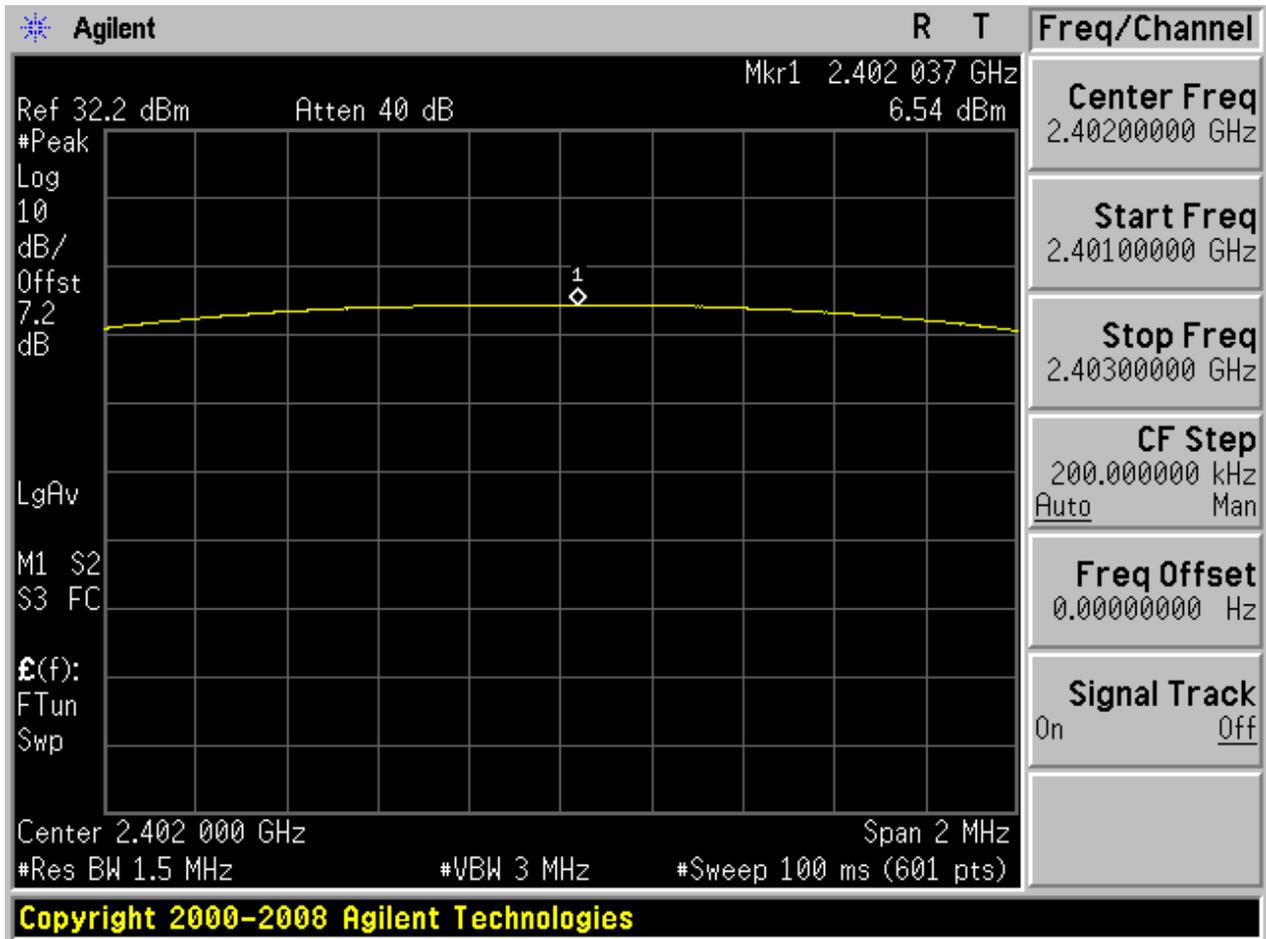


4.3 TM1_DH5_Ch78



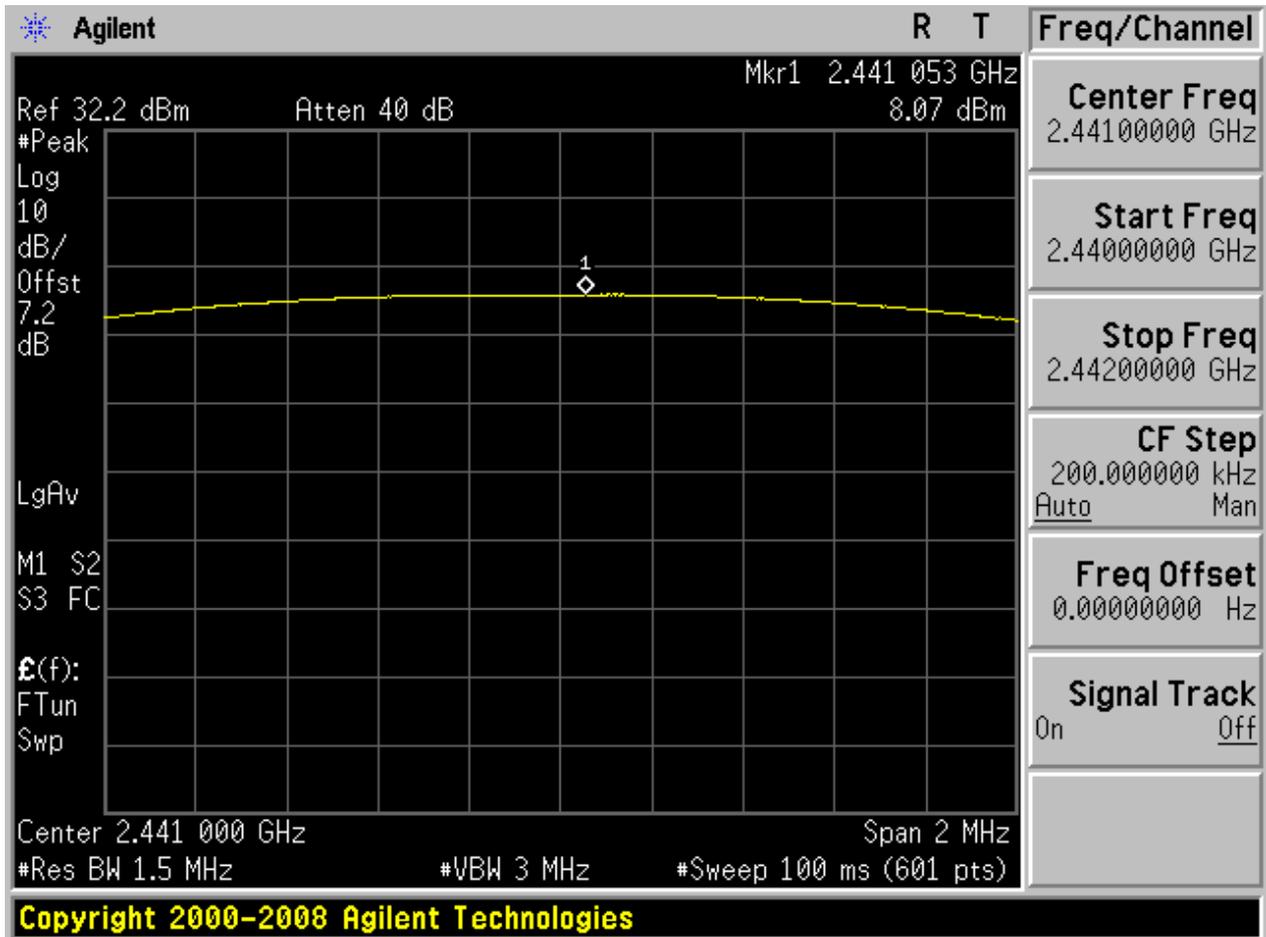


4.4 TM2_2DH5_Ch0

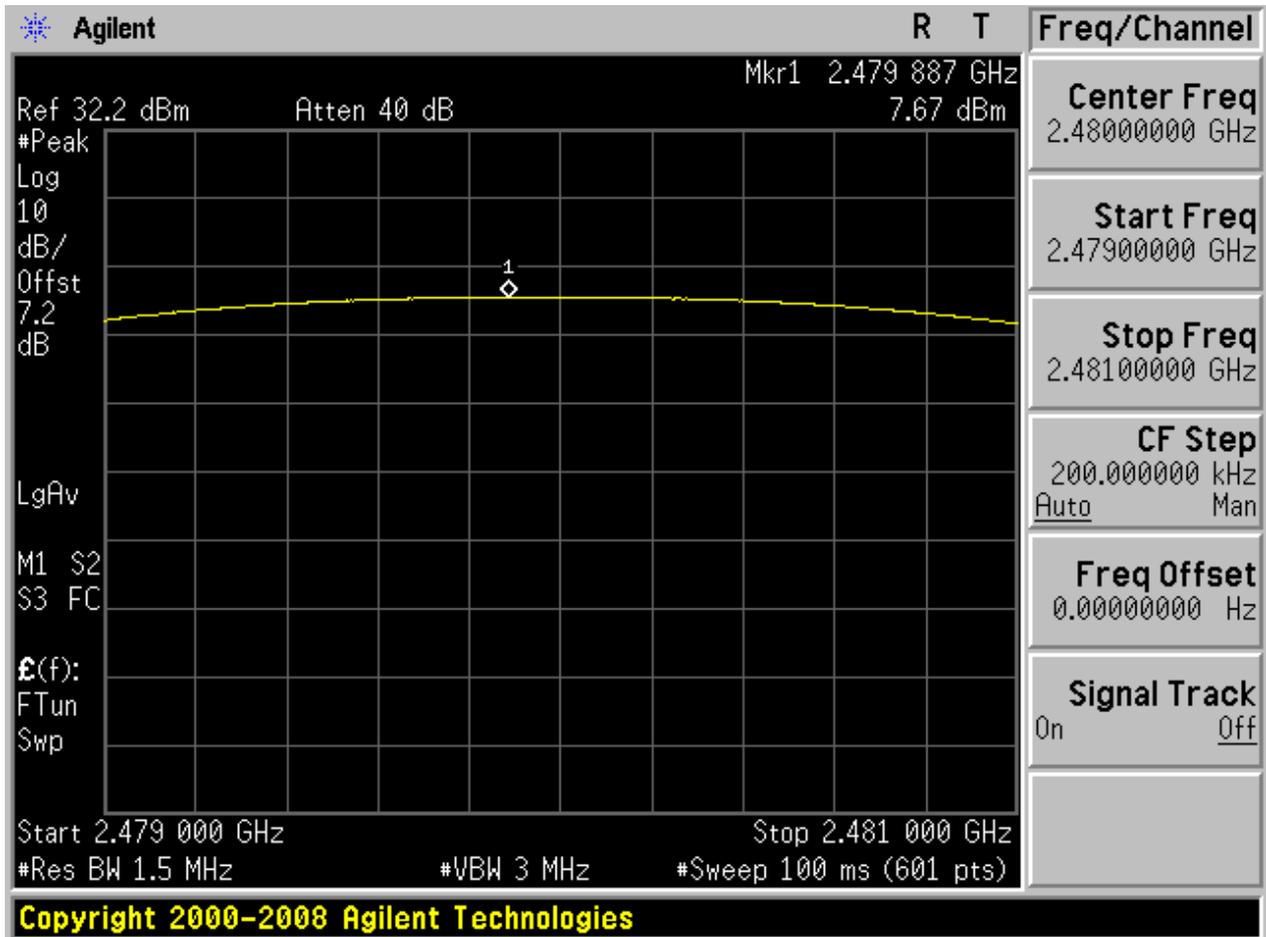




4.5 TM2_2DH5_Ch39

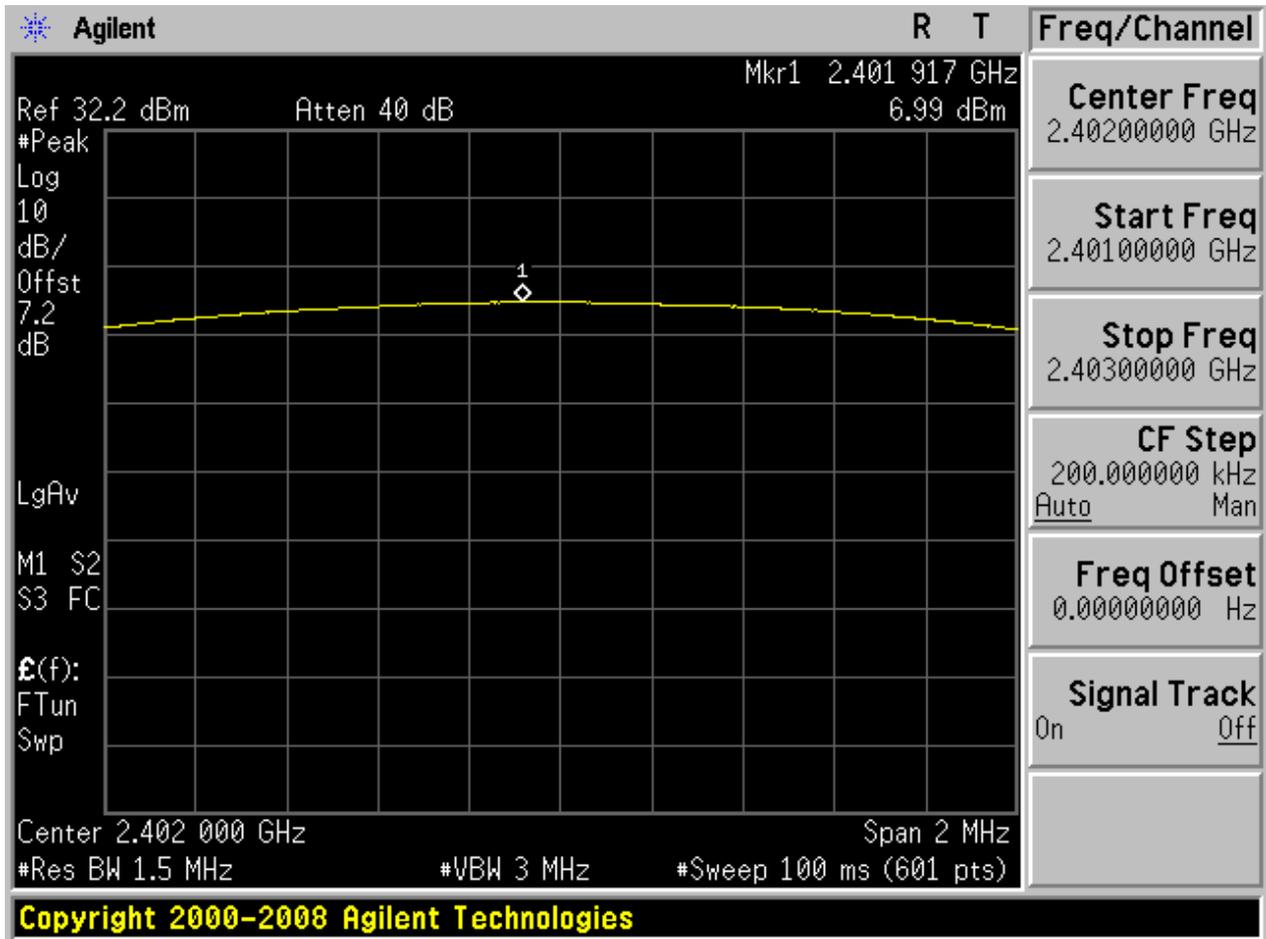


4.6 TM2_2DH5_Ch78



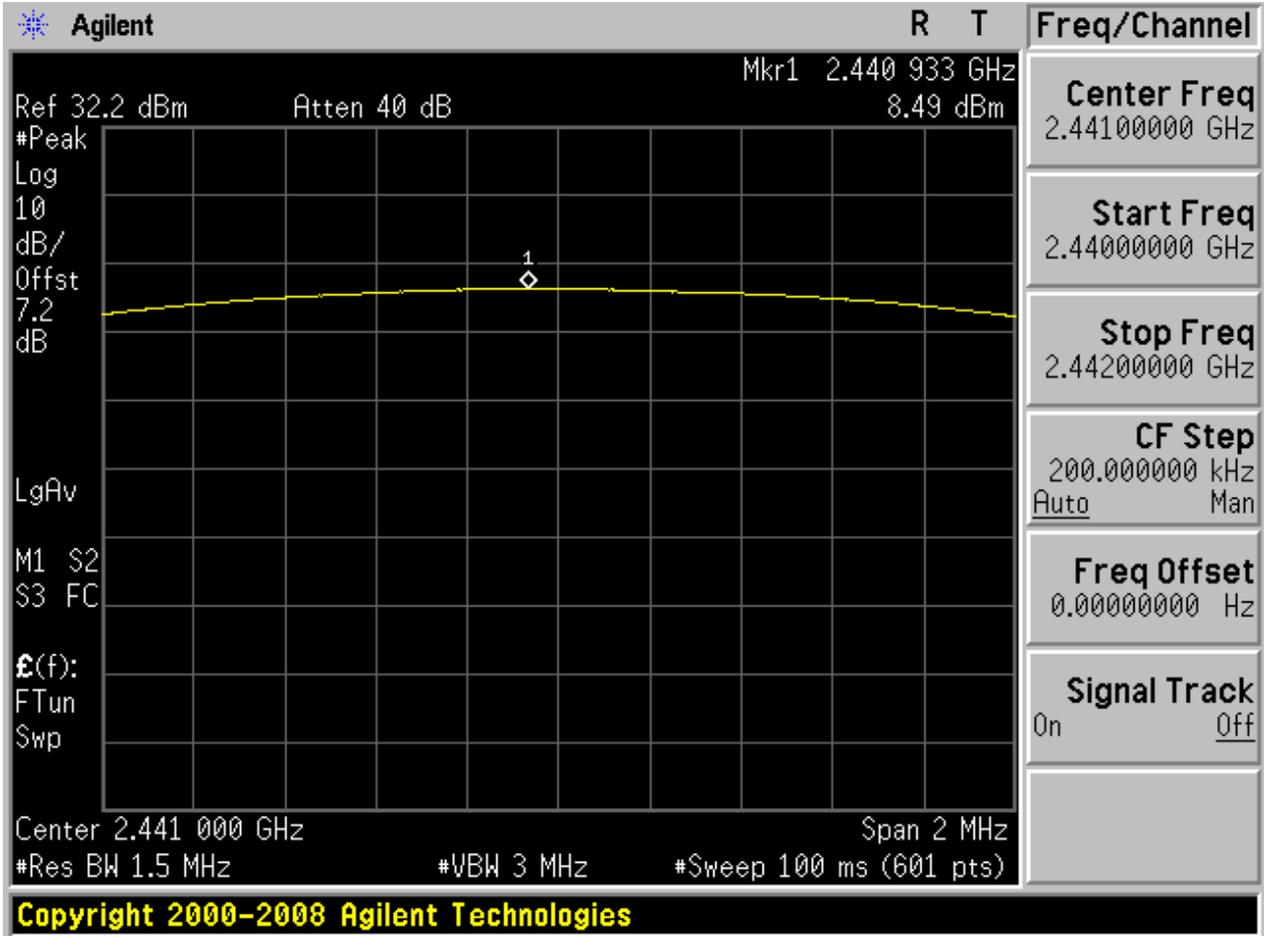


4.7 TM3_3DH5_Ch0



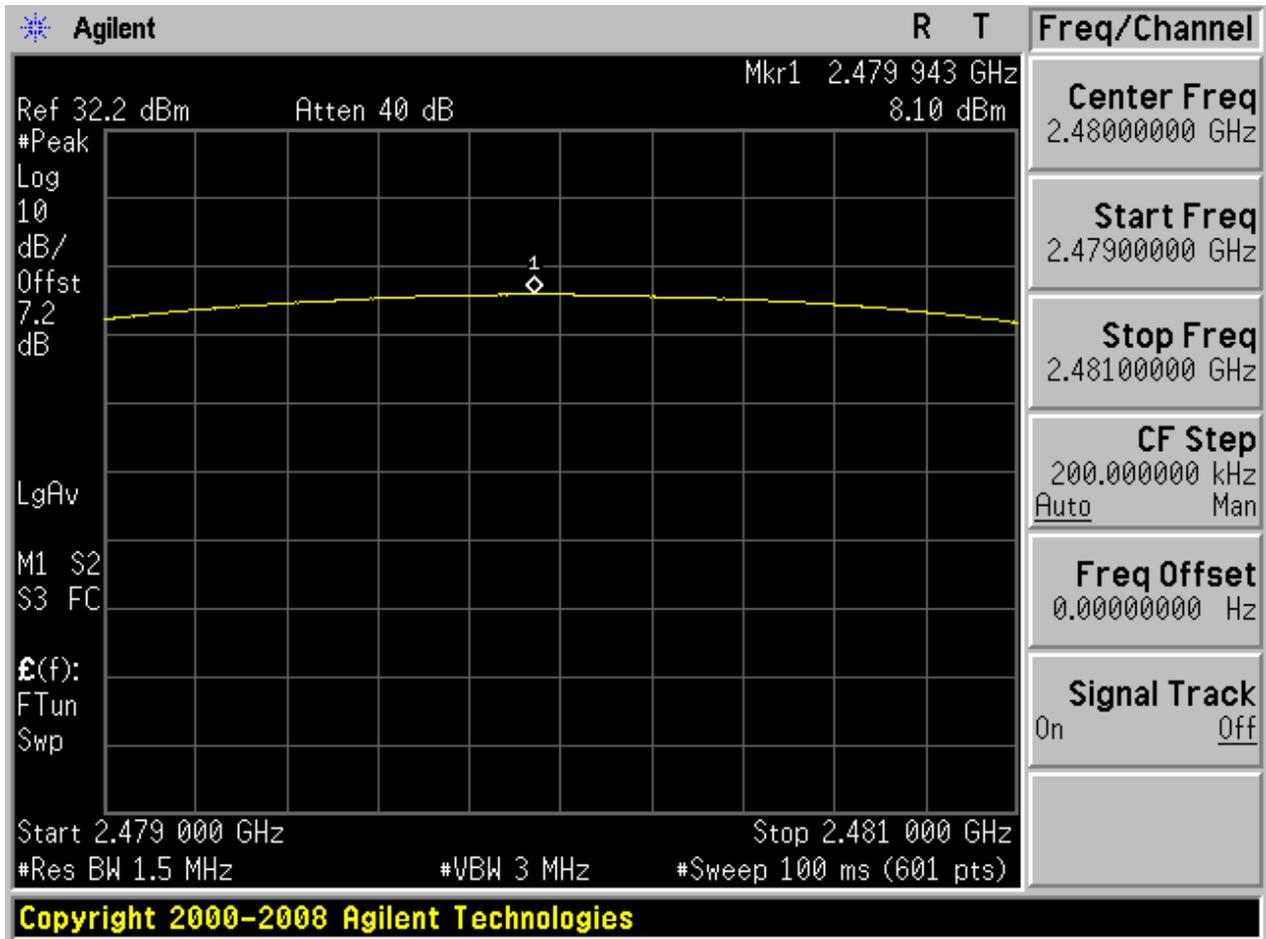


4.8 TM3_3DH5_Ch39





4.9 TM3_3DH5_Ch78





Appendix F: Band edge spurious emission



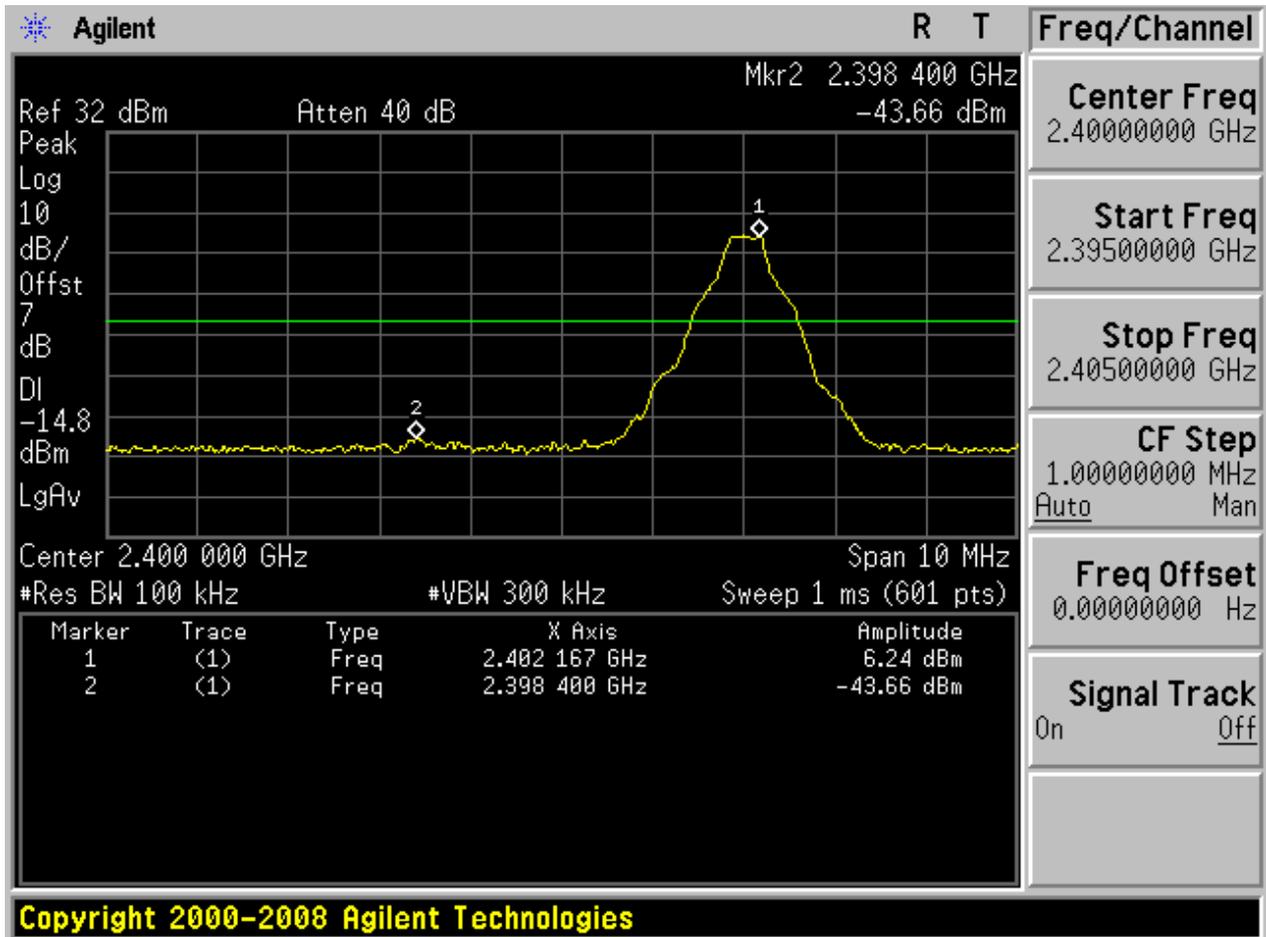
1 Result Table

EUT Conf.	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
TM1_DH5_ Ch0	0	2402	6.24	Off	-43.66	-14.8	Pass
	-	-	6.05	On	-44.48	-14.0	Pass
TM1_DH5_ Ch78	78	2480	7.39	Off	-45.37	-12.7	Pass
	-	-	6.80	On	-44.43	-13.2	Pass
TM2_2DH5_ Ch0	0	2402	3.89	Off	-44.13	-16.2	Pass
	-	-	1.78	On	-45.18	-18.3	Pass
TM2_2DH5_ Ch78	78	2480	4.86	Off	-45.24	-15.2	Pass
	-	-	4.34	On	-44.78	-15.7	Pass
TM3_3DH5_ Ch0	0	2402	3.87	Off	-45.73	-16.2	Pass
	-	-	3.76	On	-45.55	-16.3	Pass
TM3_3DH5_ Ch78	78	2480	4.85	Off	-43.89	-15.3	Pass
	-	-	4.43	On	-44.54	-15.6	Pass

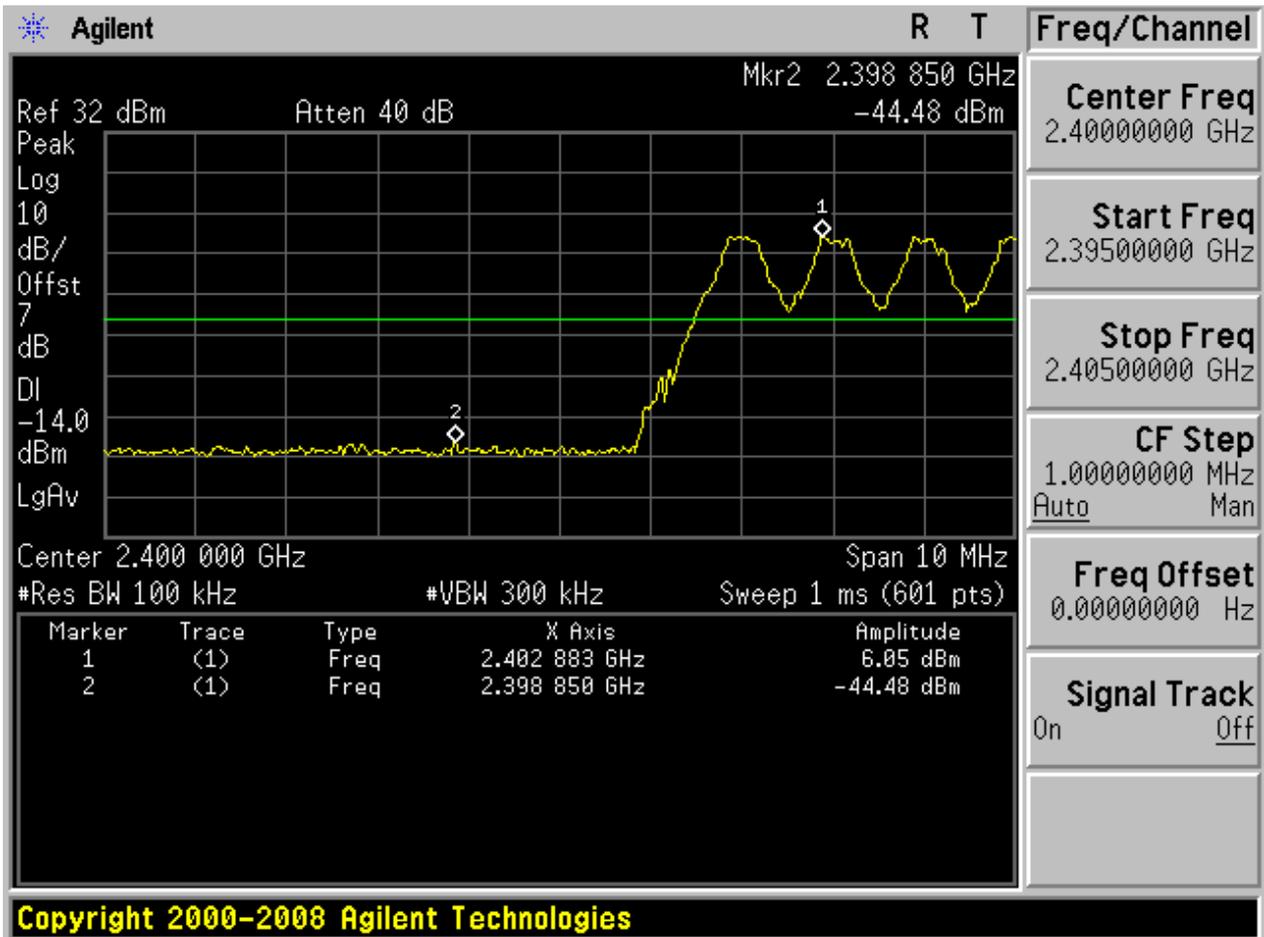
2 Test Plot

2.1 TM1_DH5_Ch0

No hopping

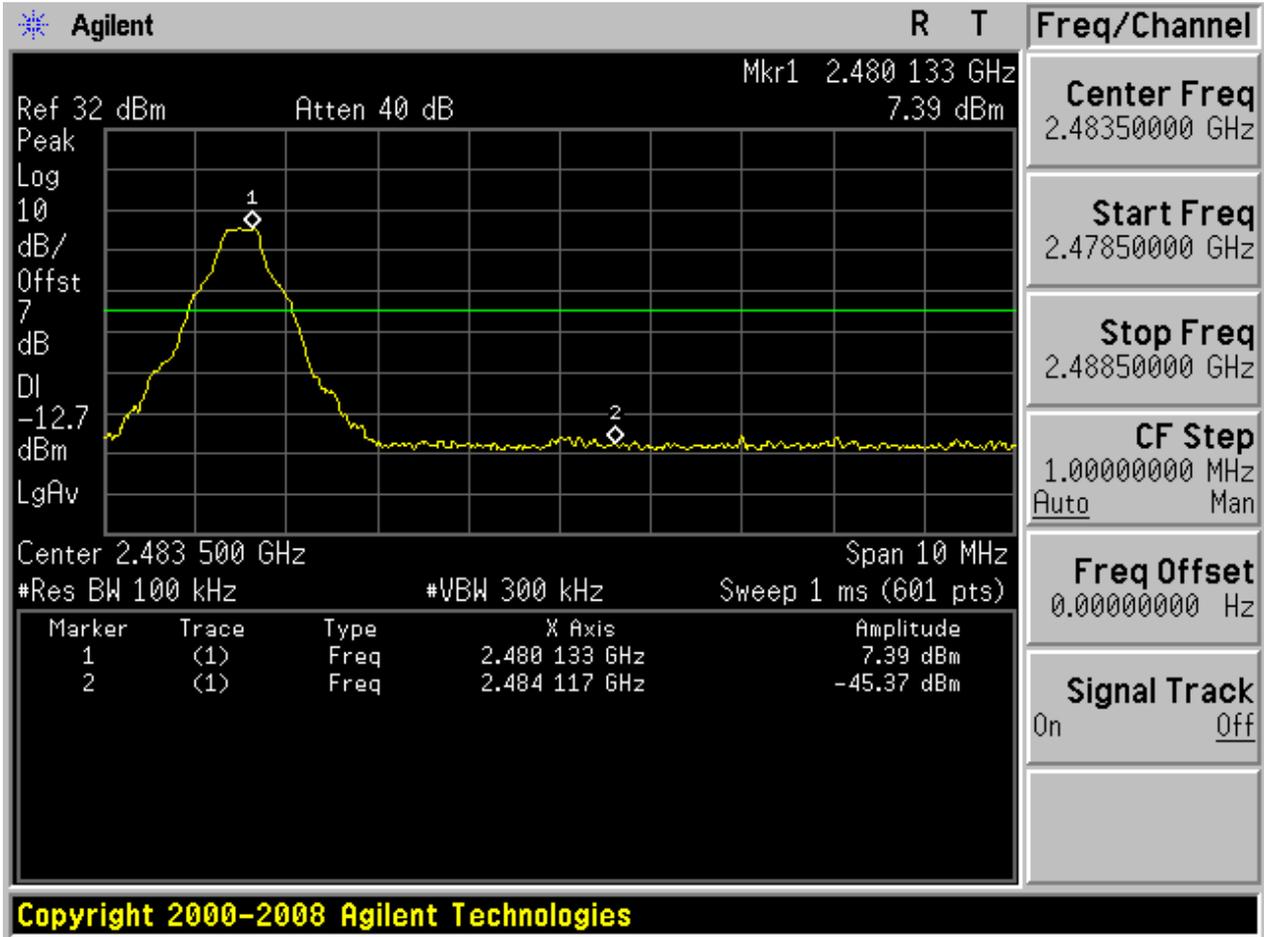


With hopping

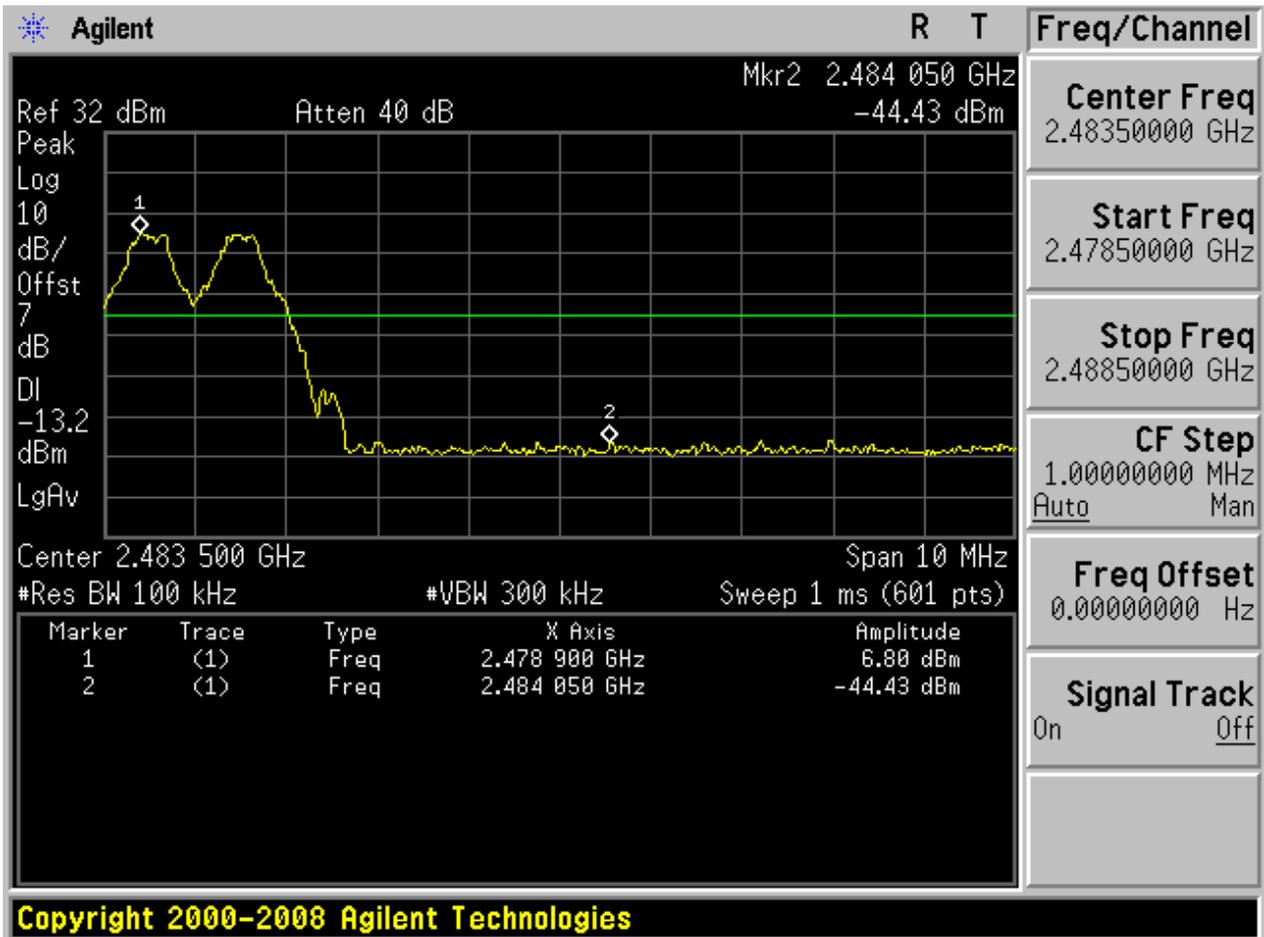


2.2 TM1_DH5_Ch78

No hopping

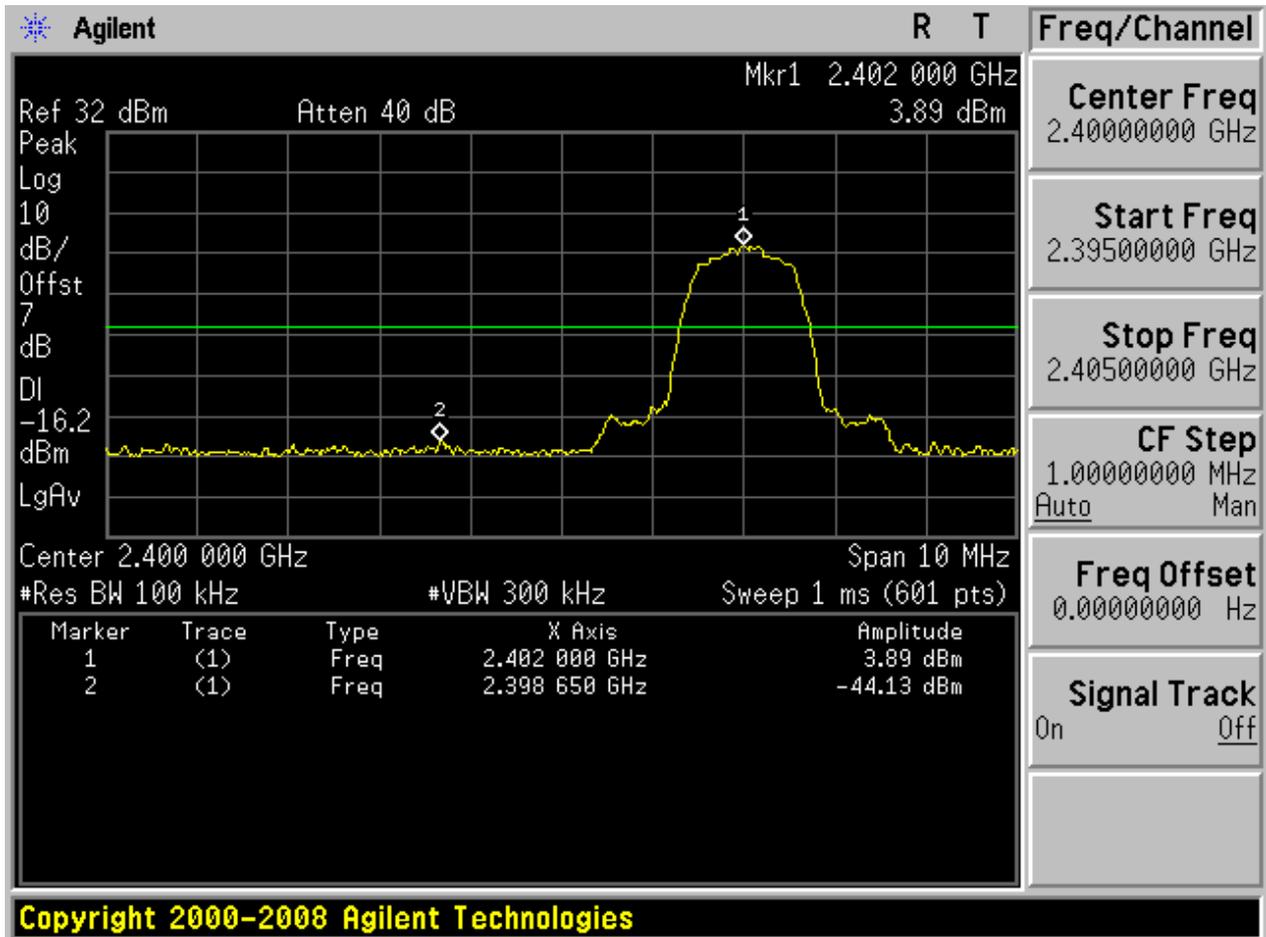


With hopping

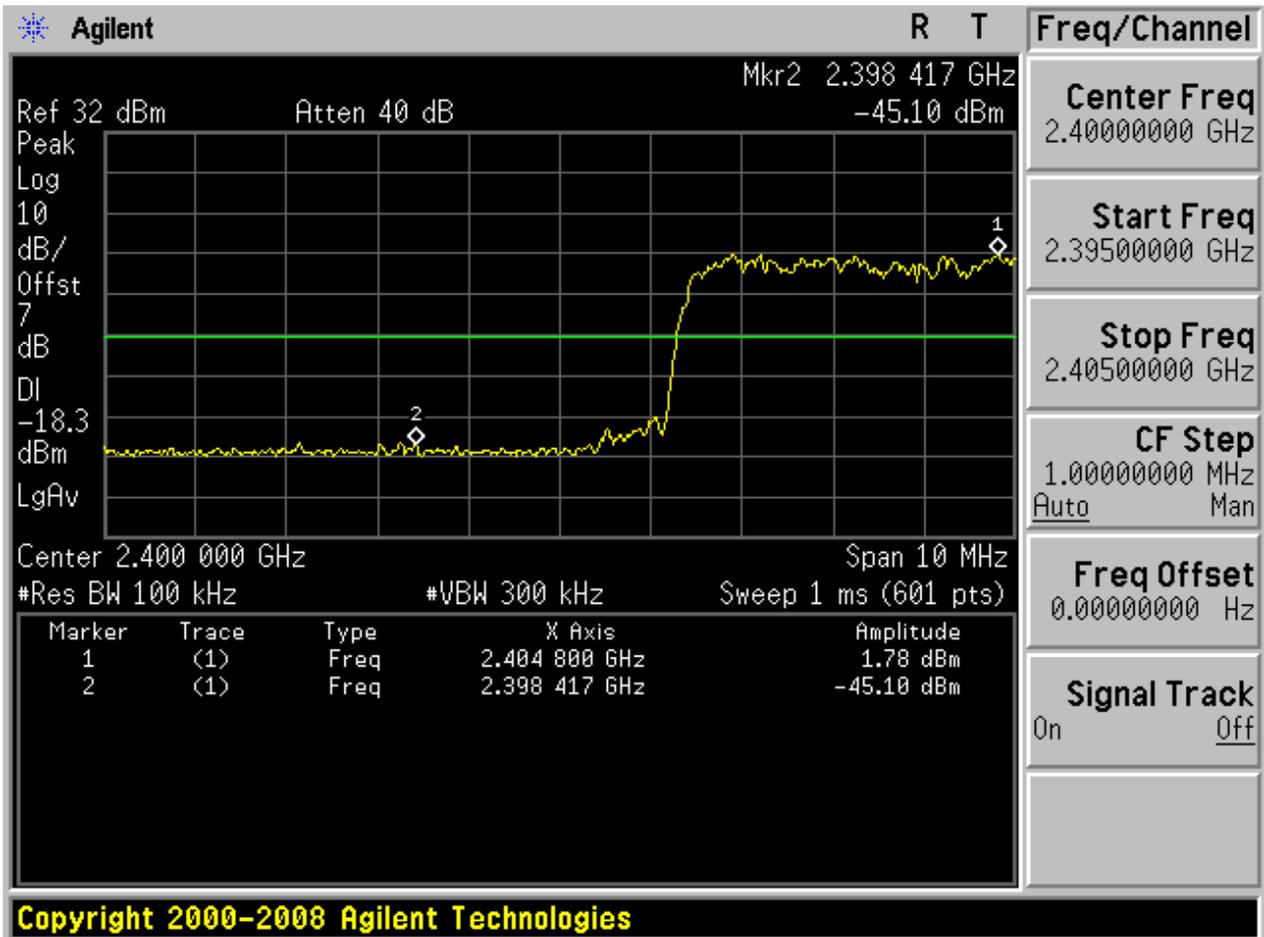


2.3 TM2_2DH5_Ch0

No hopping



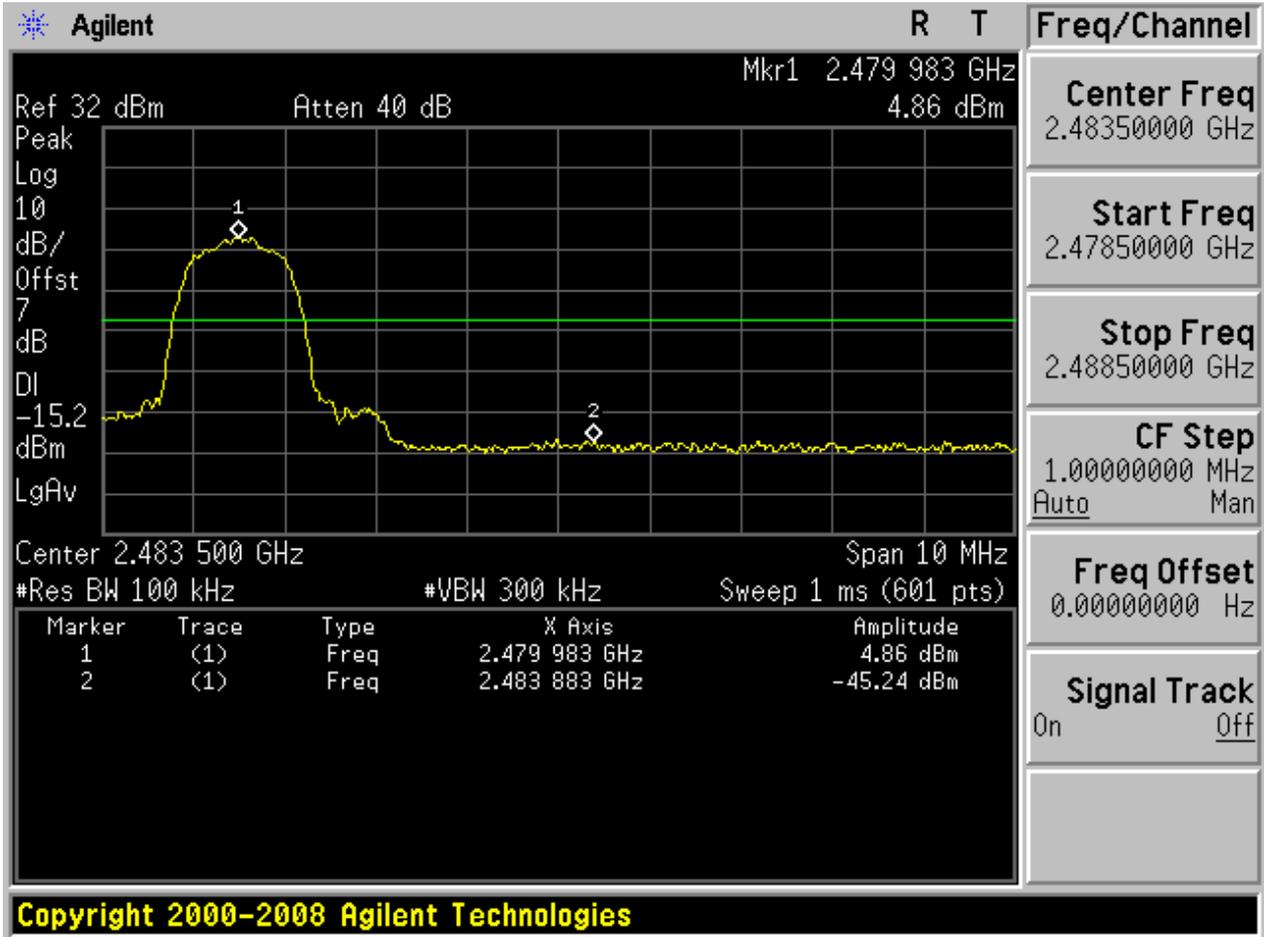
With hopping



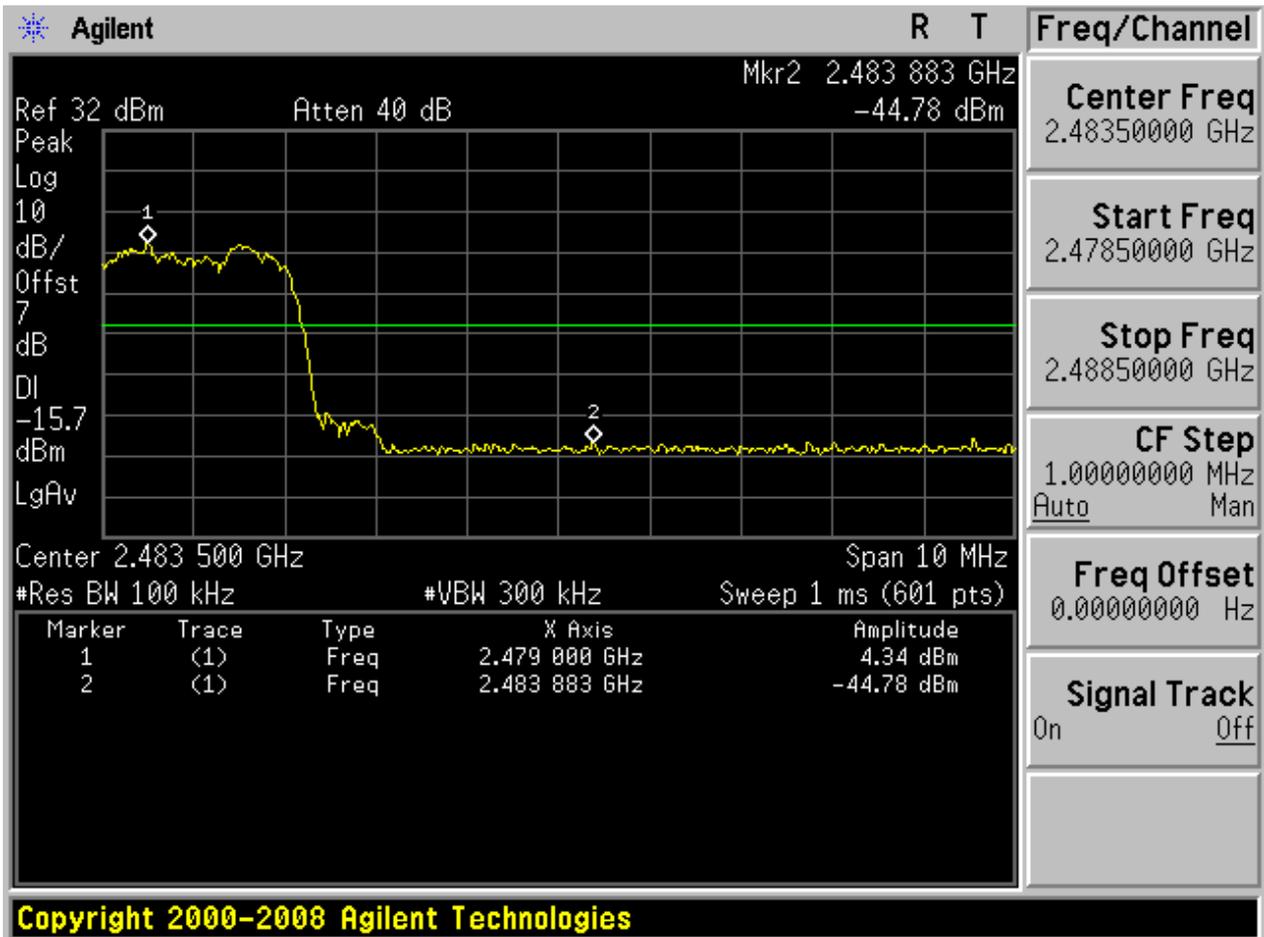


2.4 TM2_2DH5_Ch78

No hopping

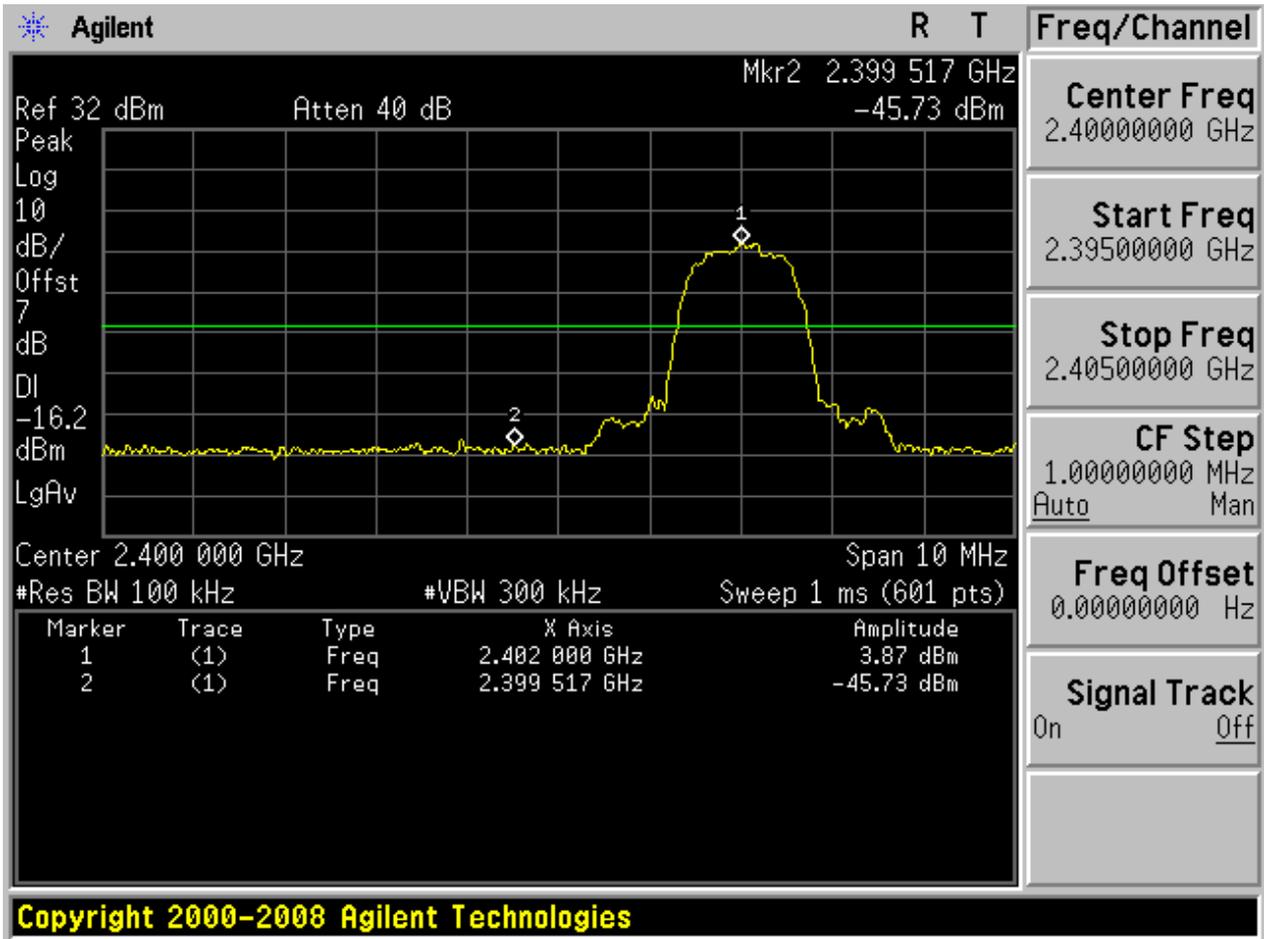


With hopping

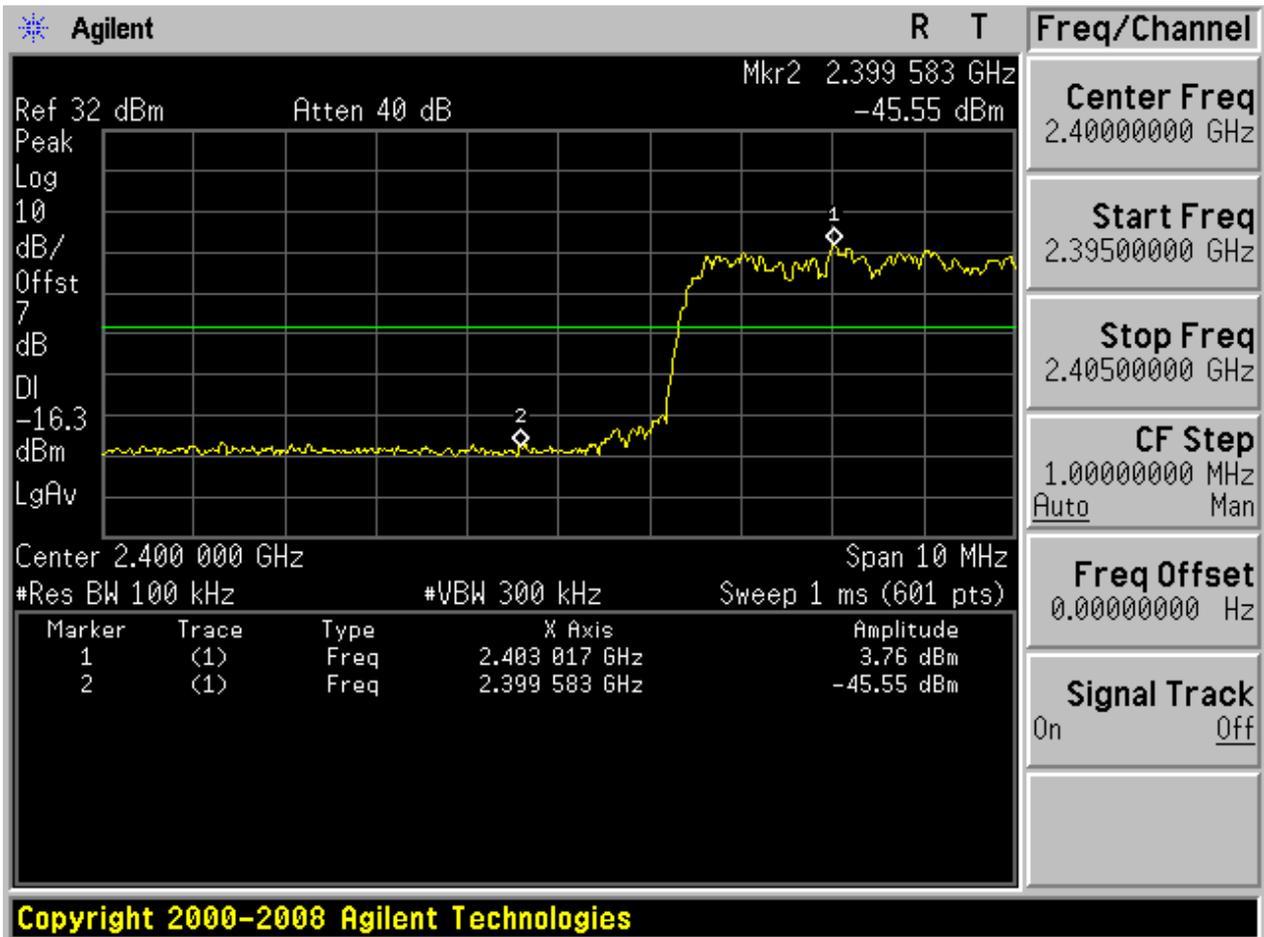


2.5 TM3_3DH5_Ch0

No hopping

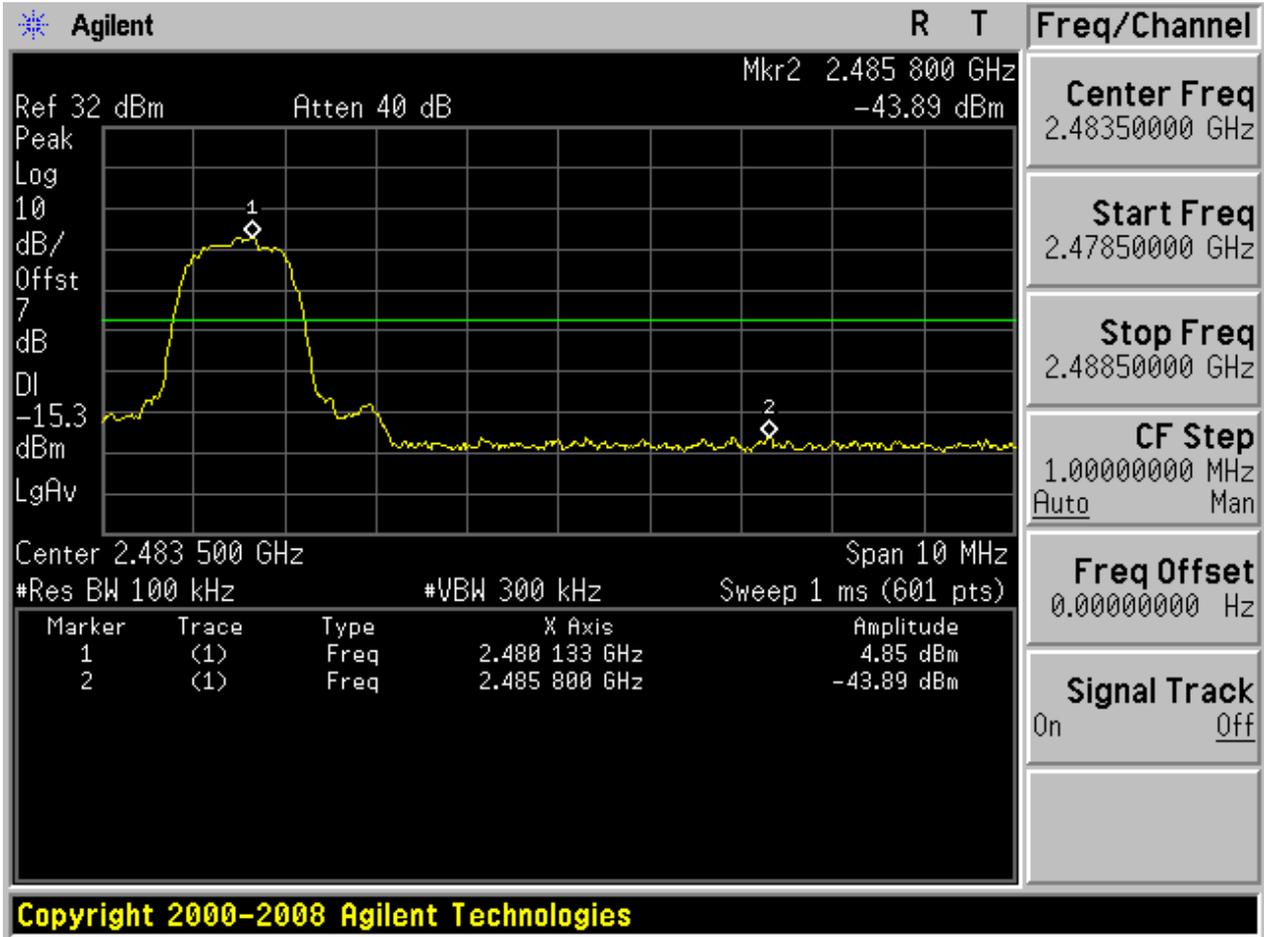


With hopping



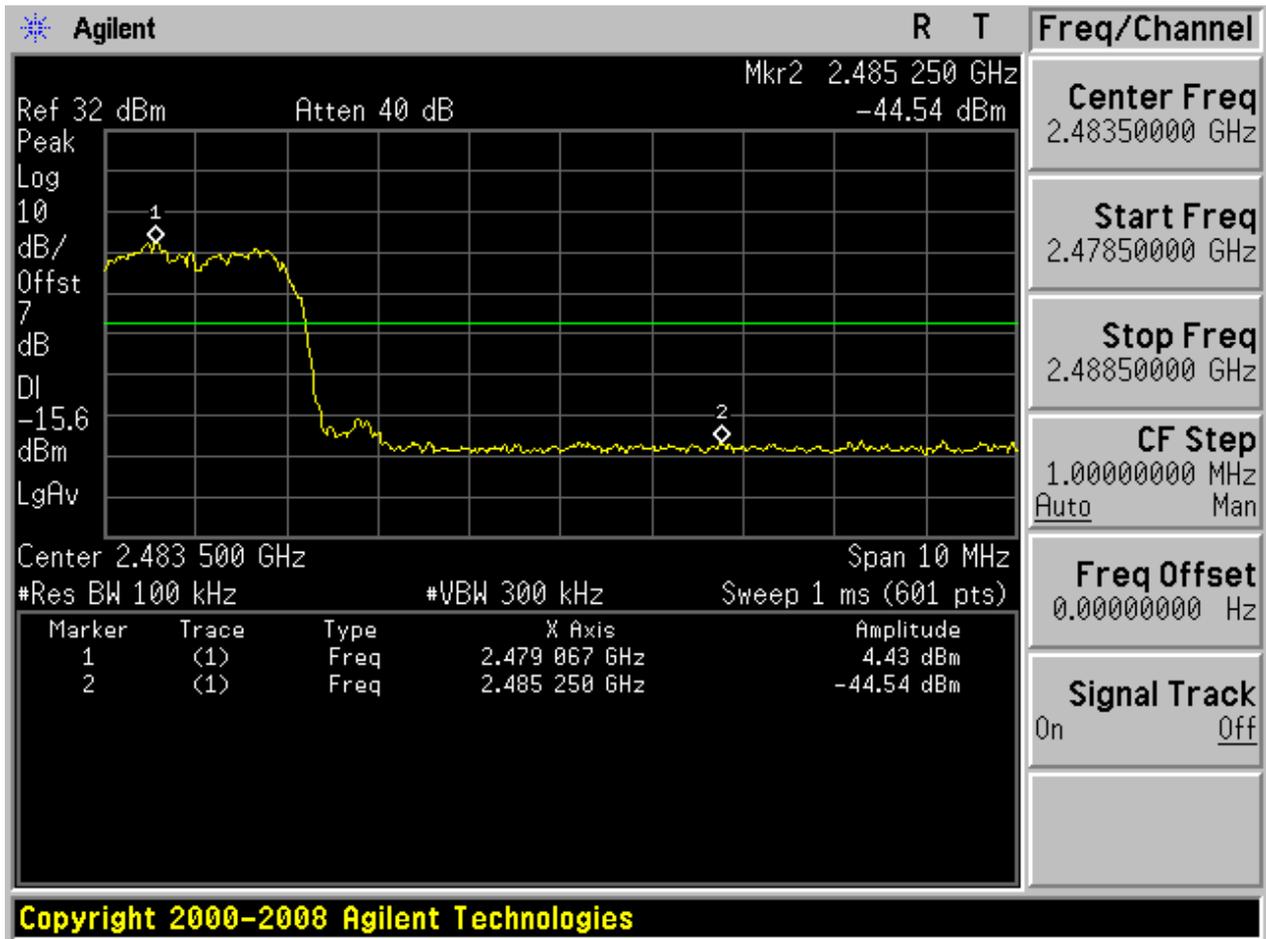
2.6 TM3_3DH5_Ch78

No hopping





With hopping





Appendix G: Conducted RF Spurious Emission

1 Result Table

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

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

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

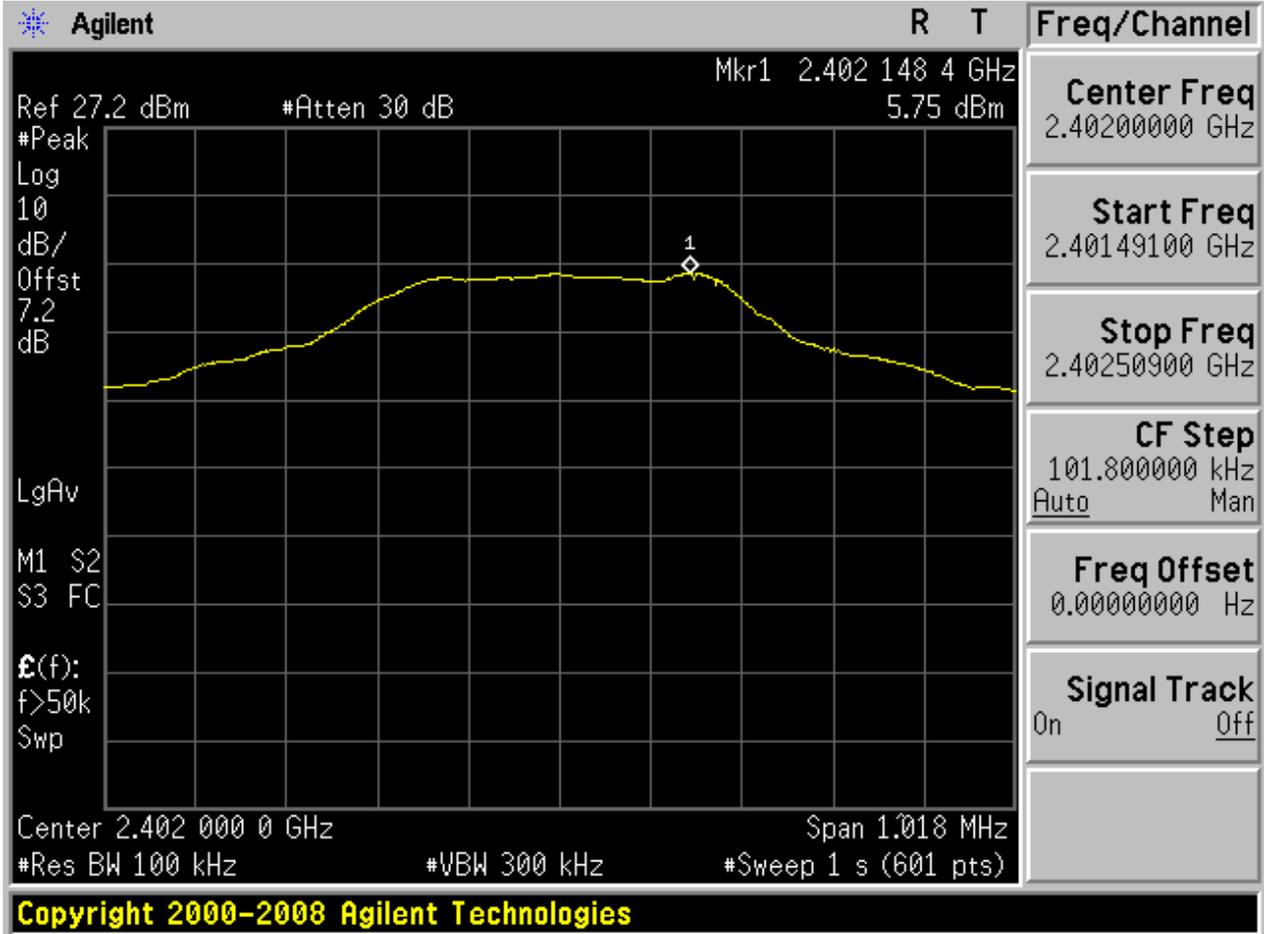
EUT Conf.	Pref [dBm/100 kHz]	Puw [dBm/100 kHz]	Verdict
TM1_DH5_Ch0	5.75	< Limit	Pass
TM1_DH5_Ch39	7.31	< Limit	Pass
TM1_DH5_Ch78	7.03	< Limit	Pass
TM2_2DH5_Ch0	3.33	< Limit	Pass
TM2_2DH5_Ch39	4.88	< Limit	Pass
TM2_2DH5_Ch78	4.50	< Limit	Pass
TM3_3DH5_Ch0	3.40	< Limit	Pass
TM3_3DH5_Ch39	4.91	< Limit	Pass
TM3_3DH5_Ch78	4.53	< Limit	Pass



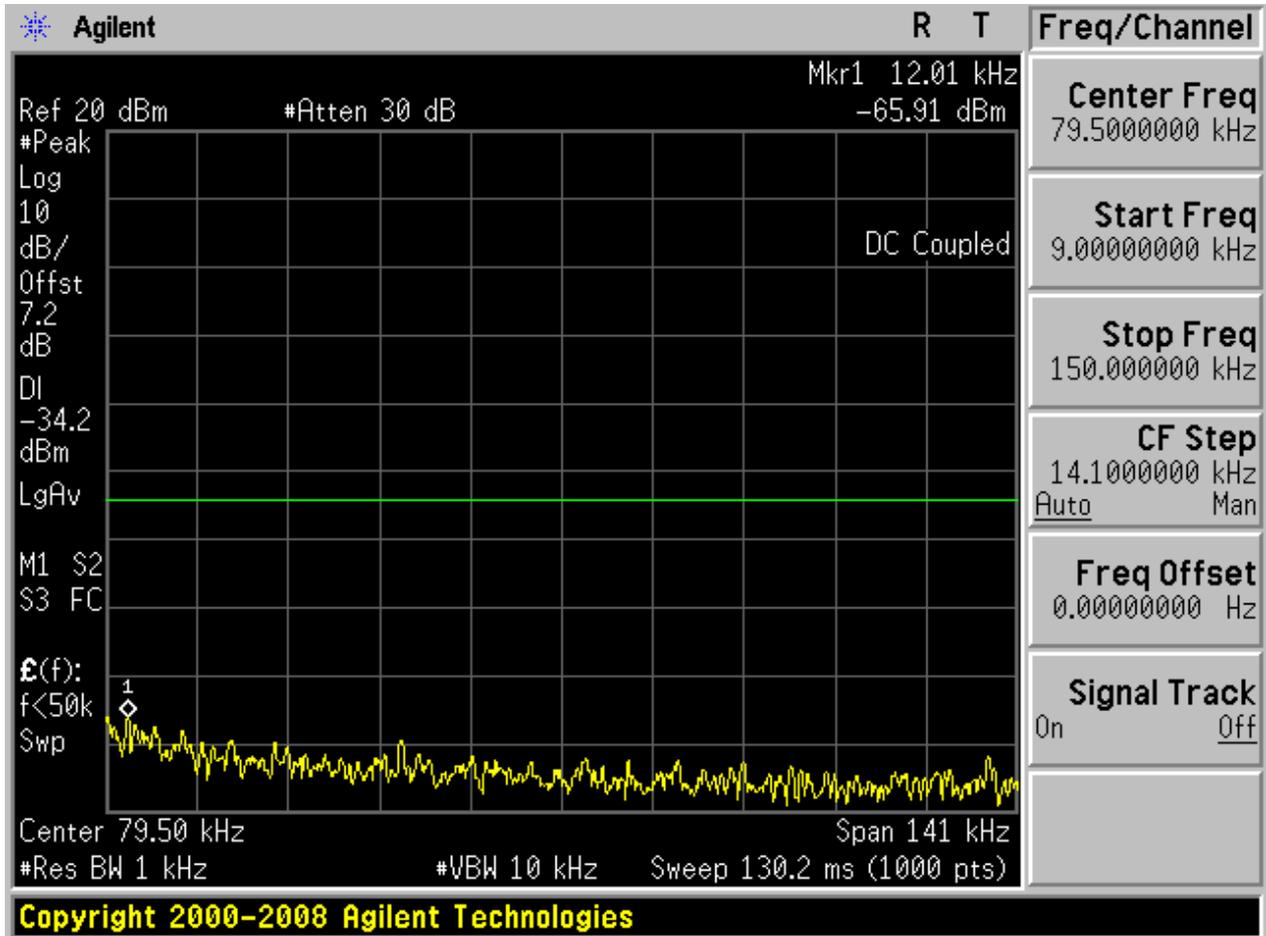
2 Test Plot

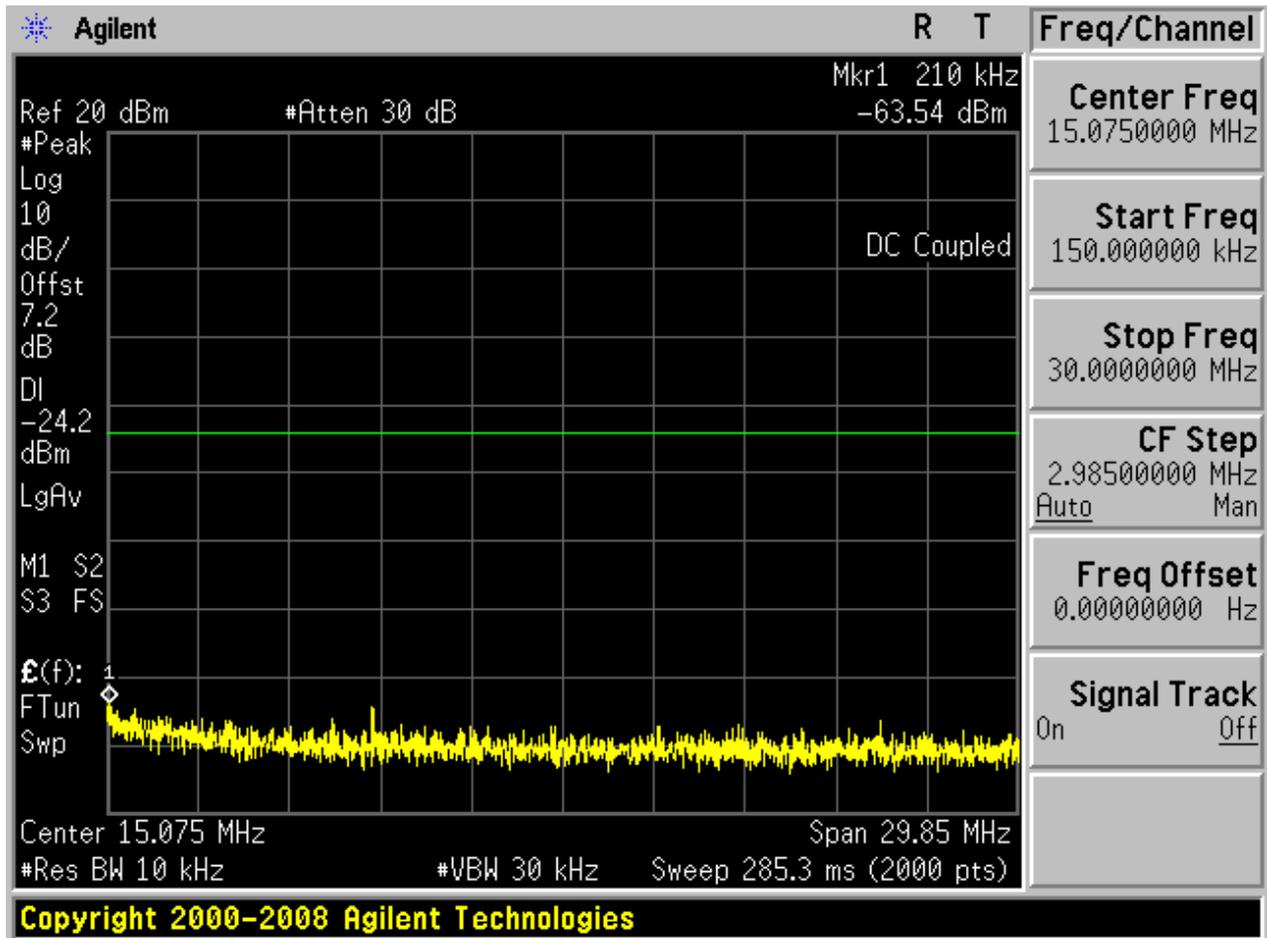
2.1 TM1_DH5_Ch0

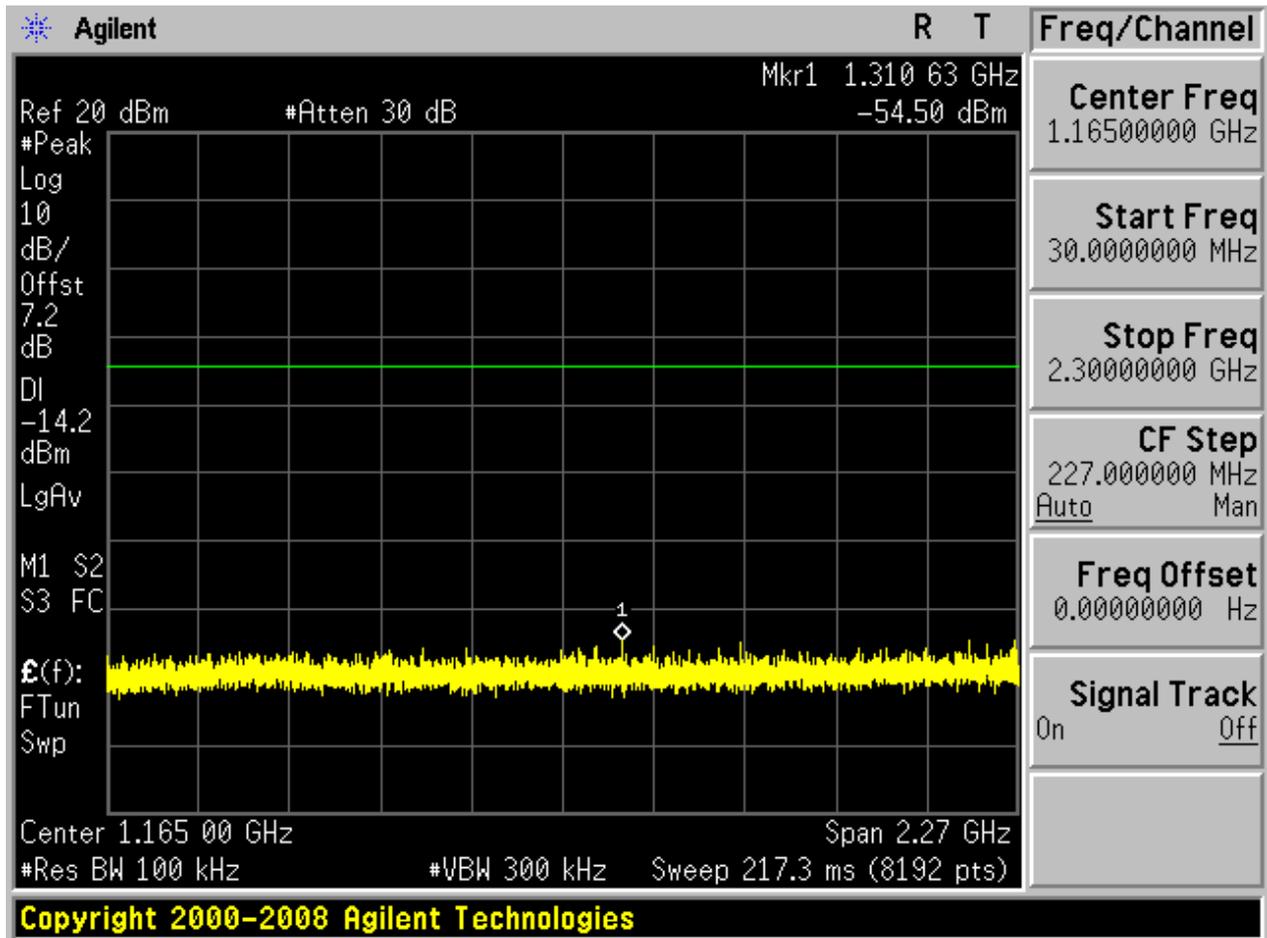
2.1.1 Pref

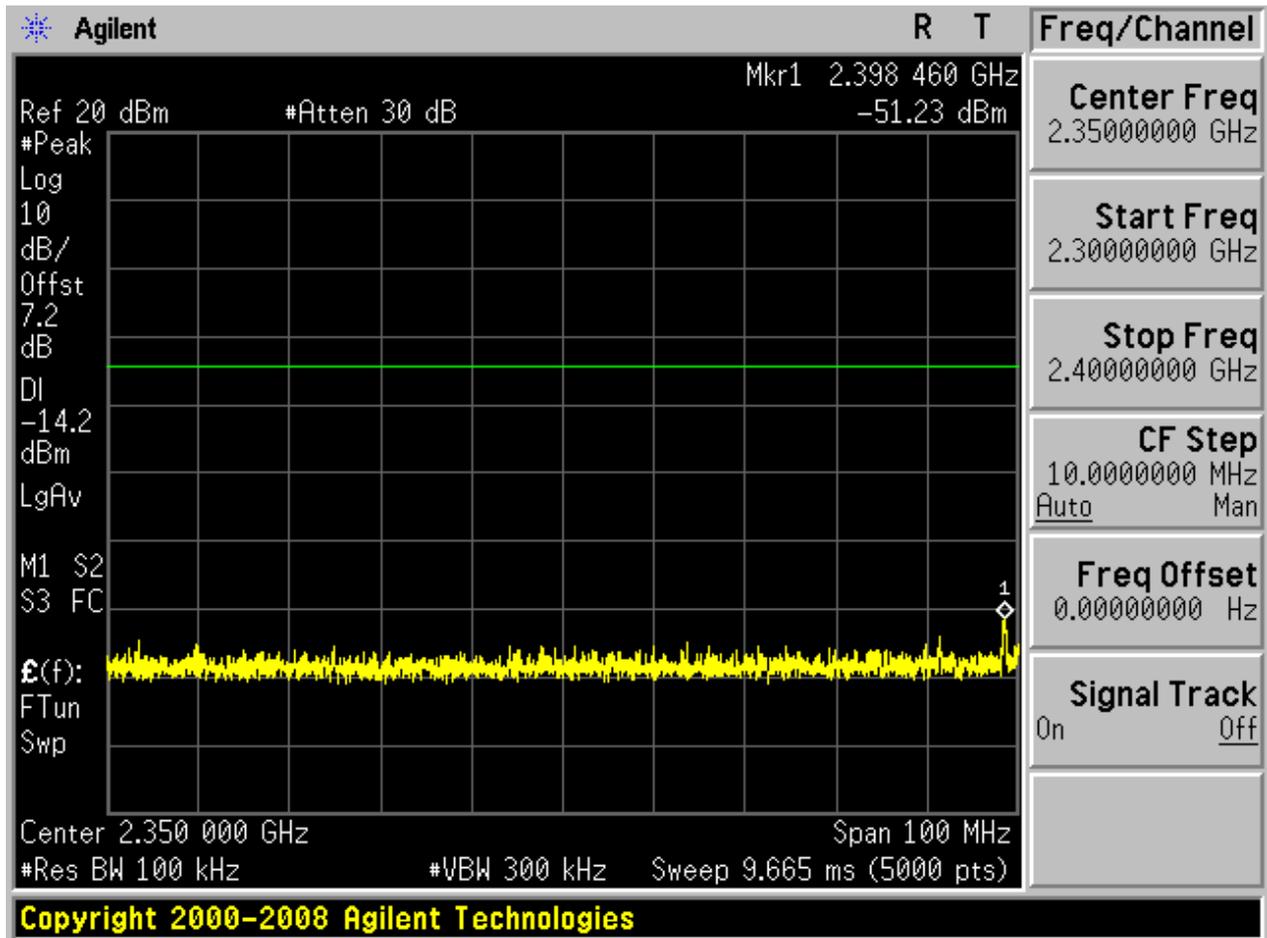


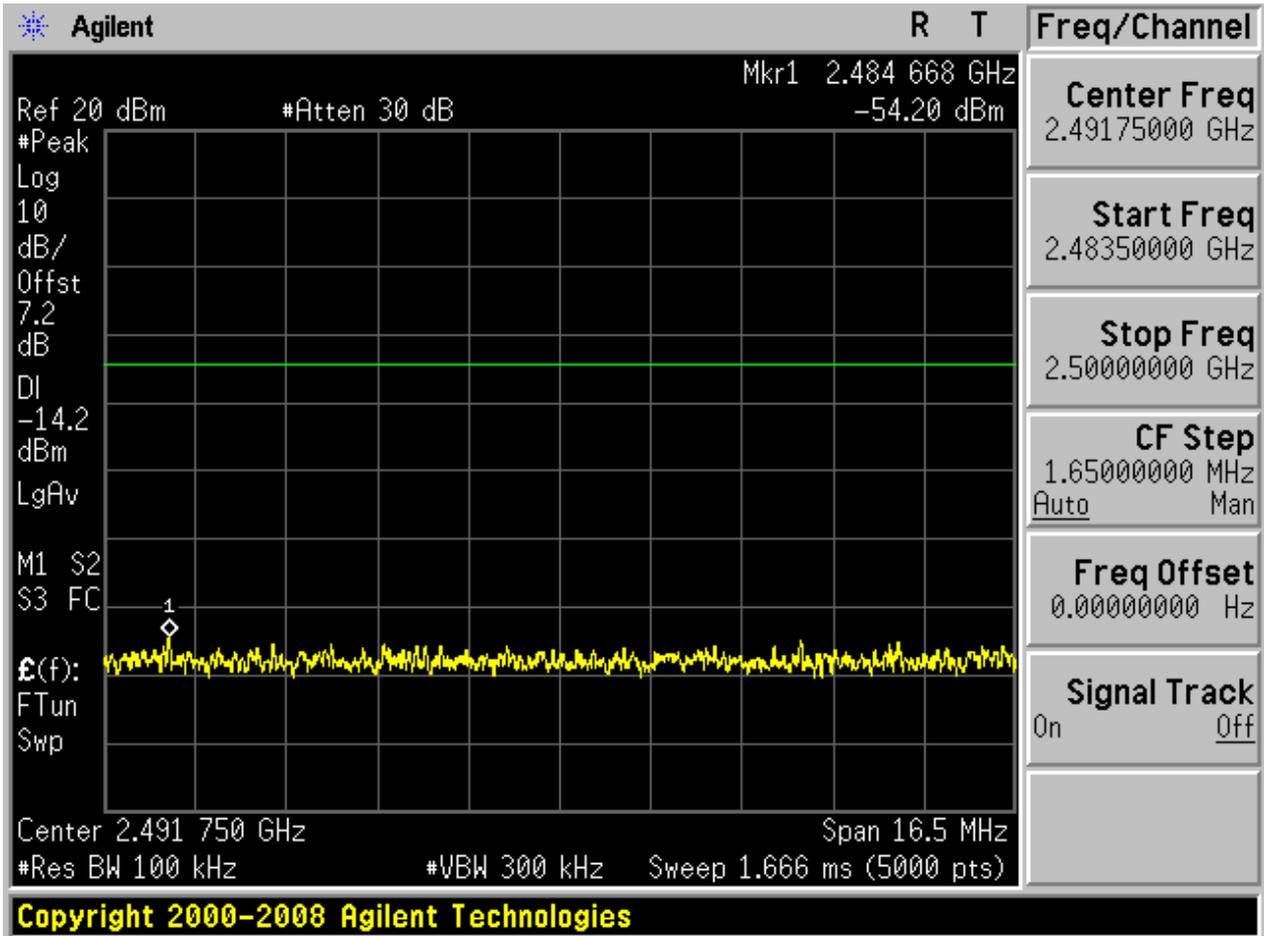
2.1.2 Puw

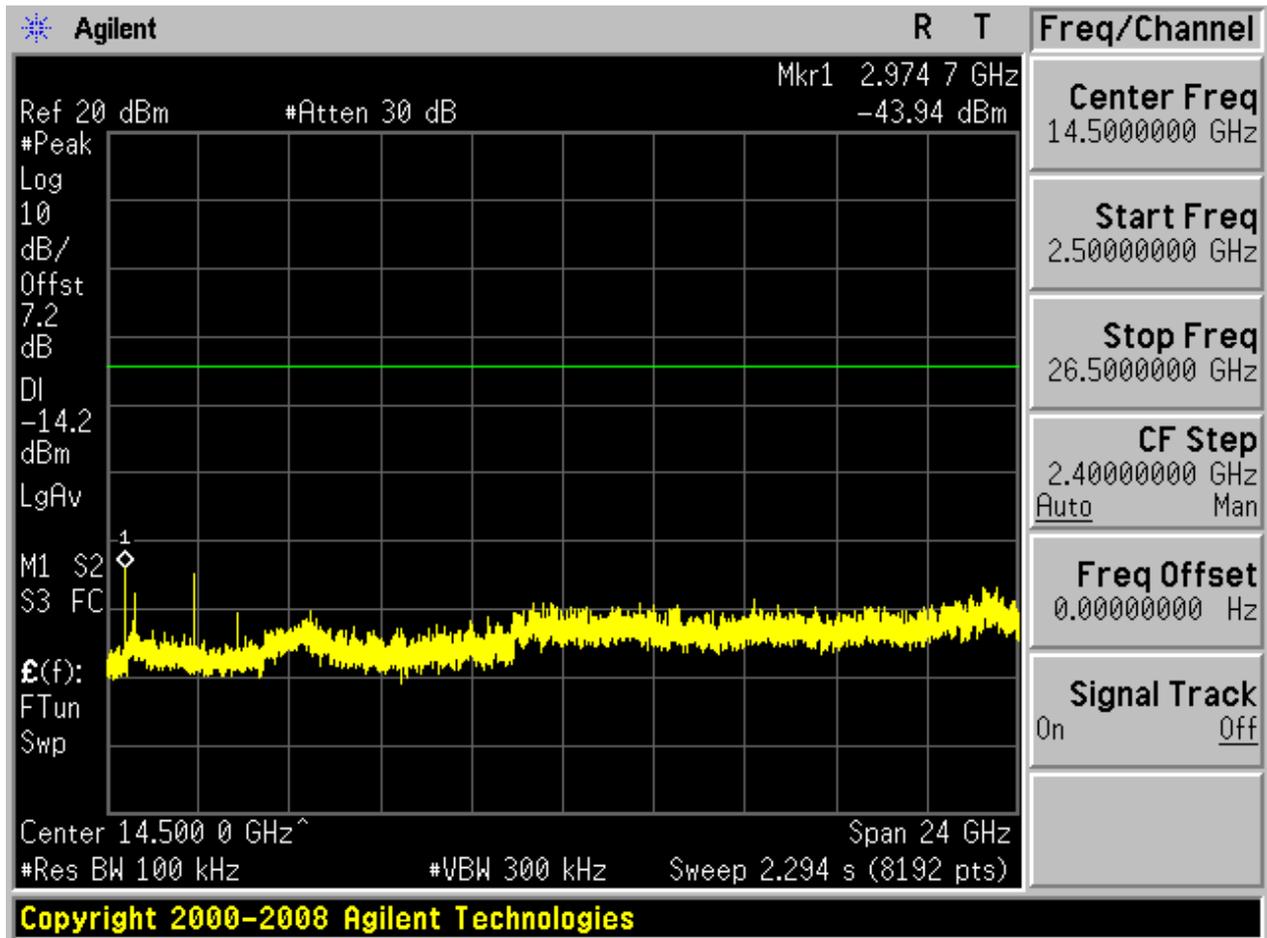






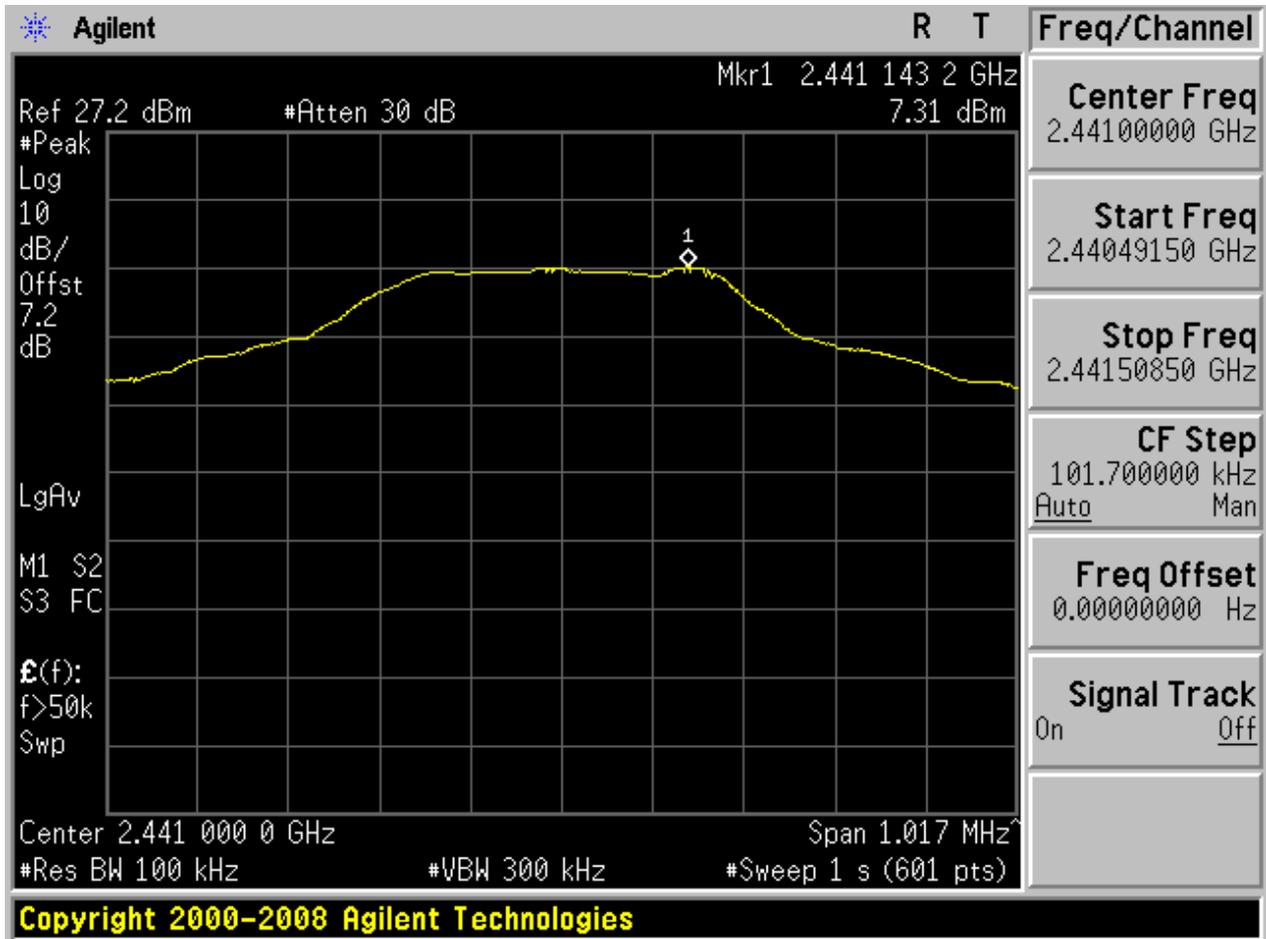






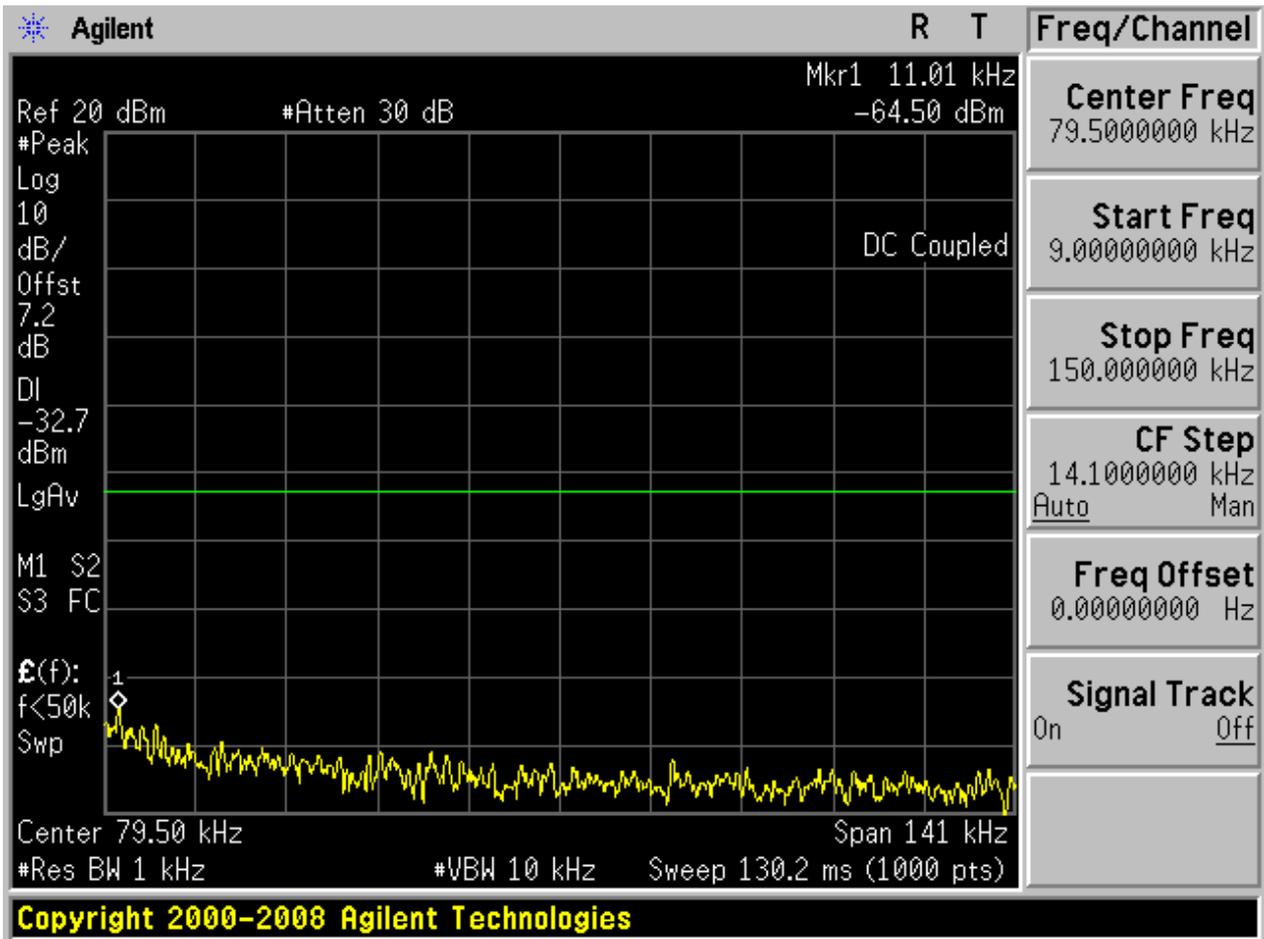
2.2 TM1_DH5_Ch39

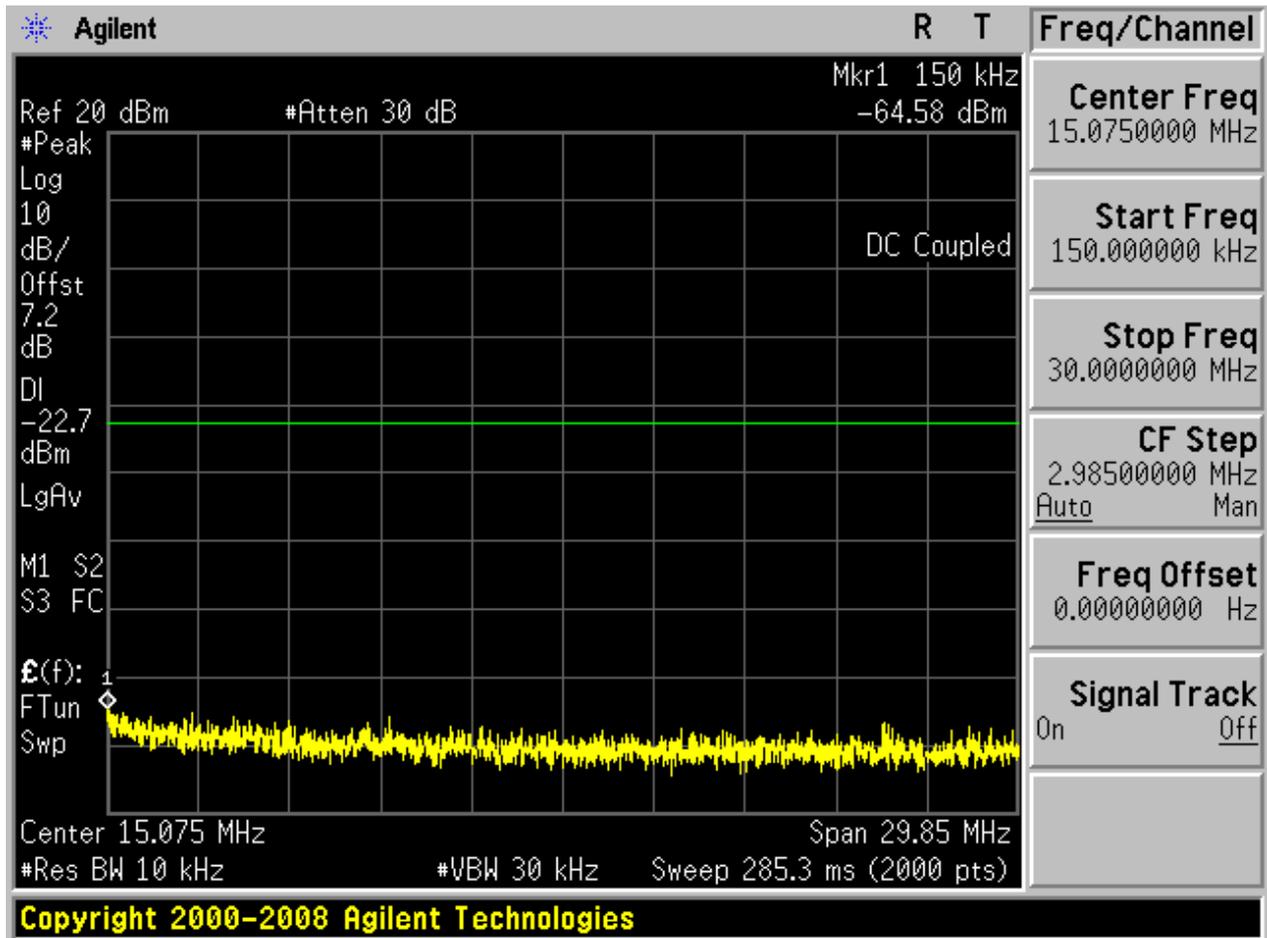
2.2.1 Pref

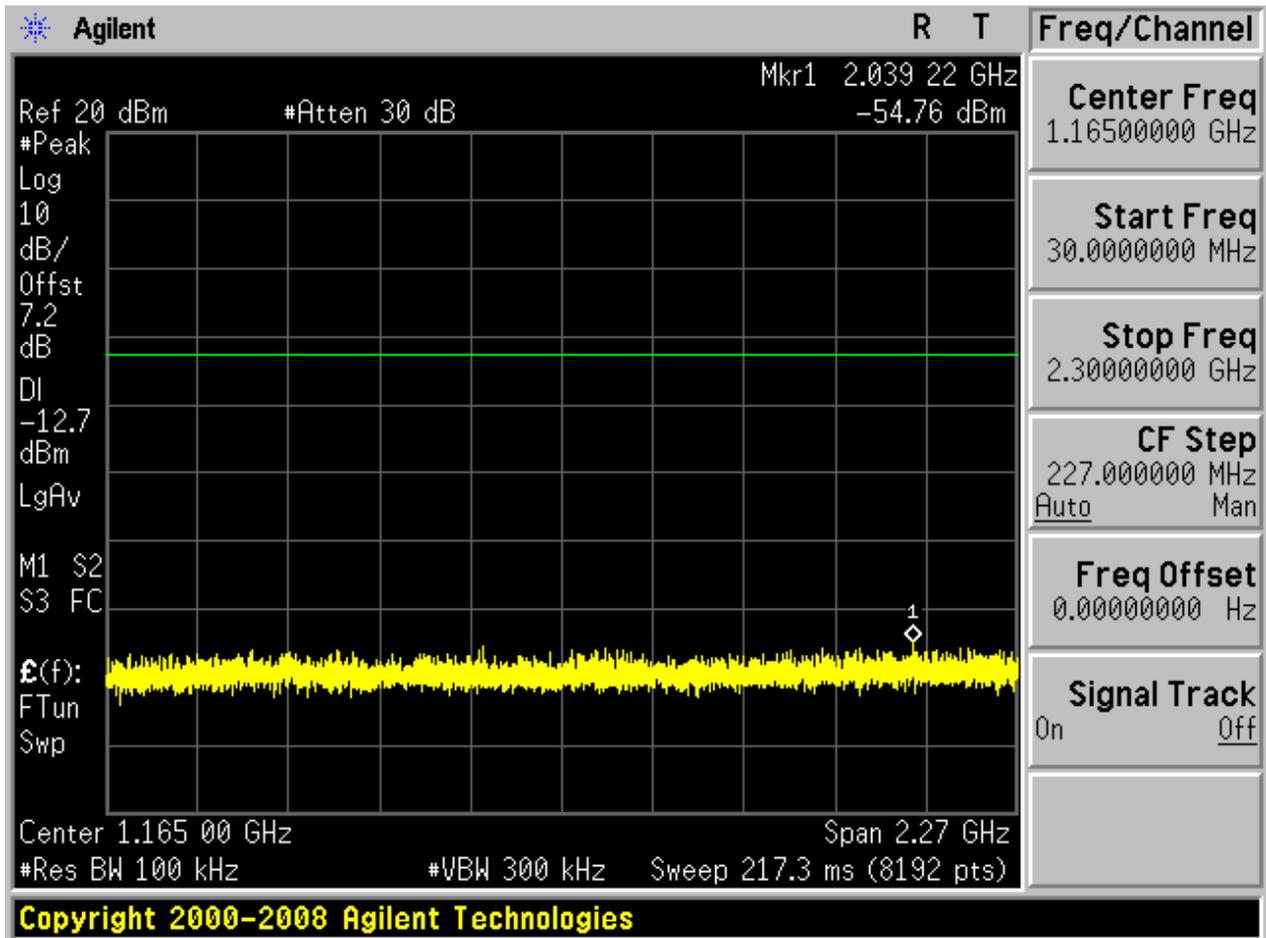


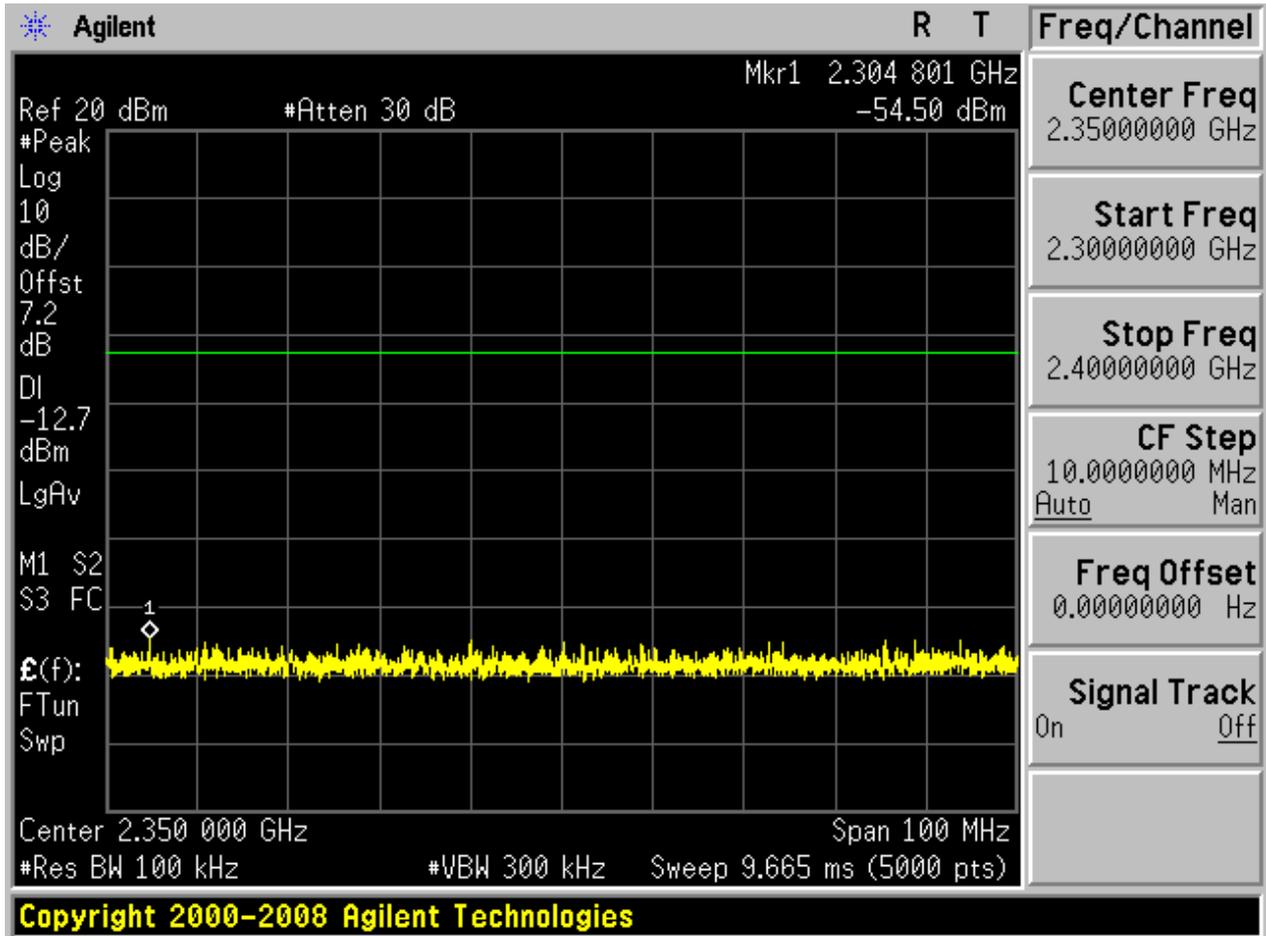


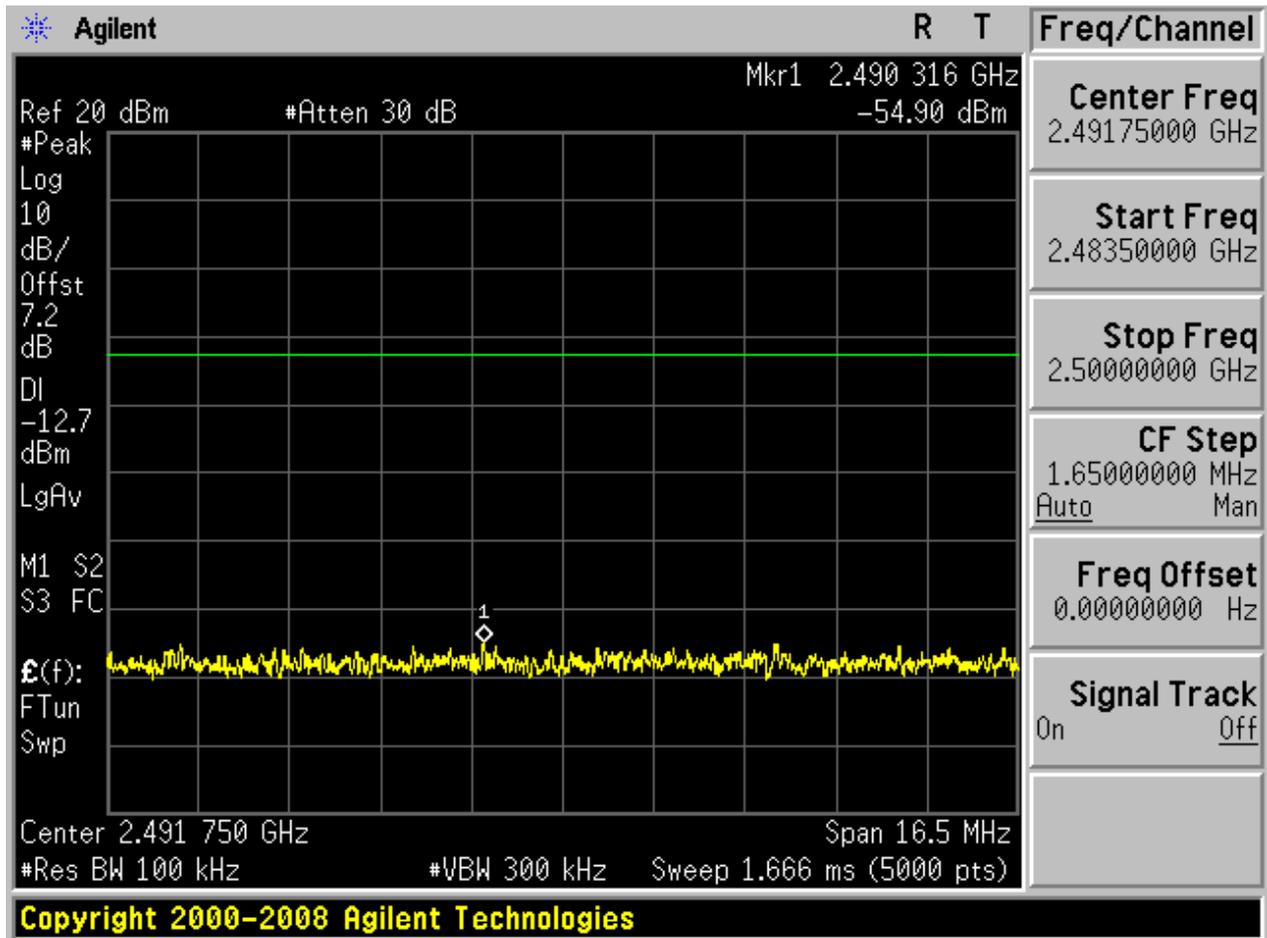
2.2.2 Puw

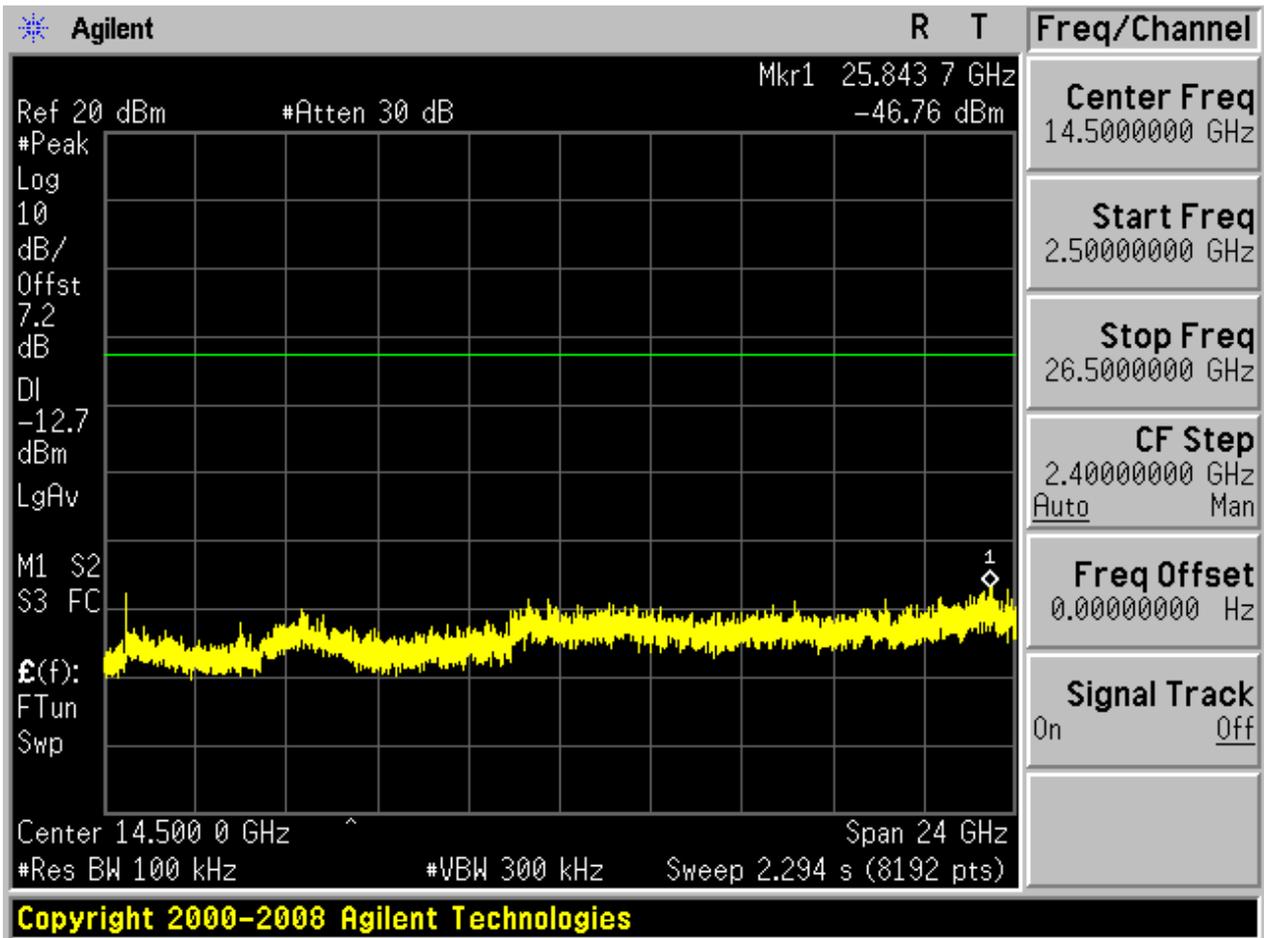








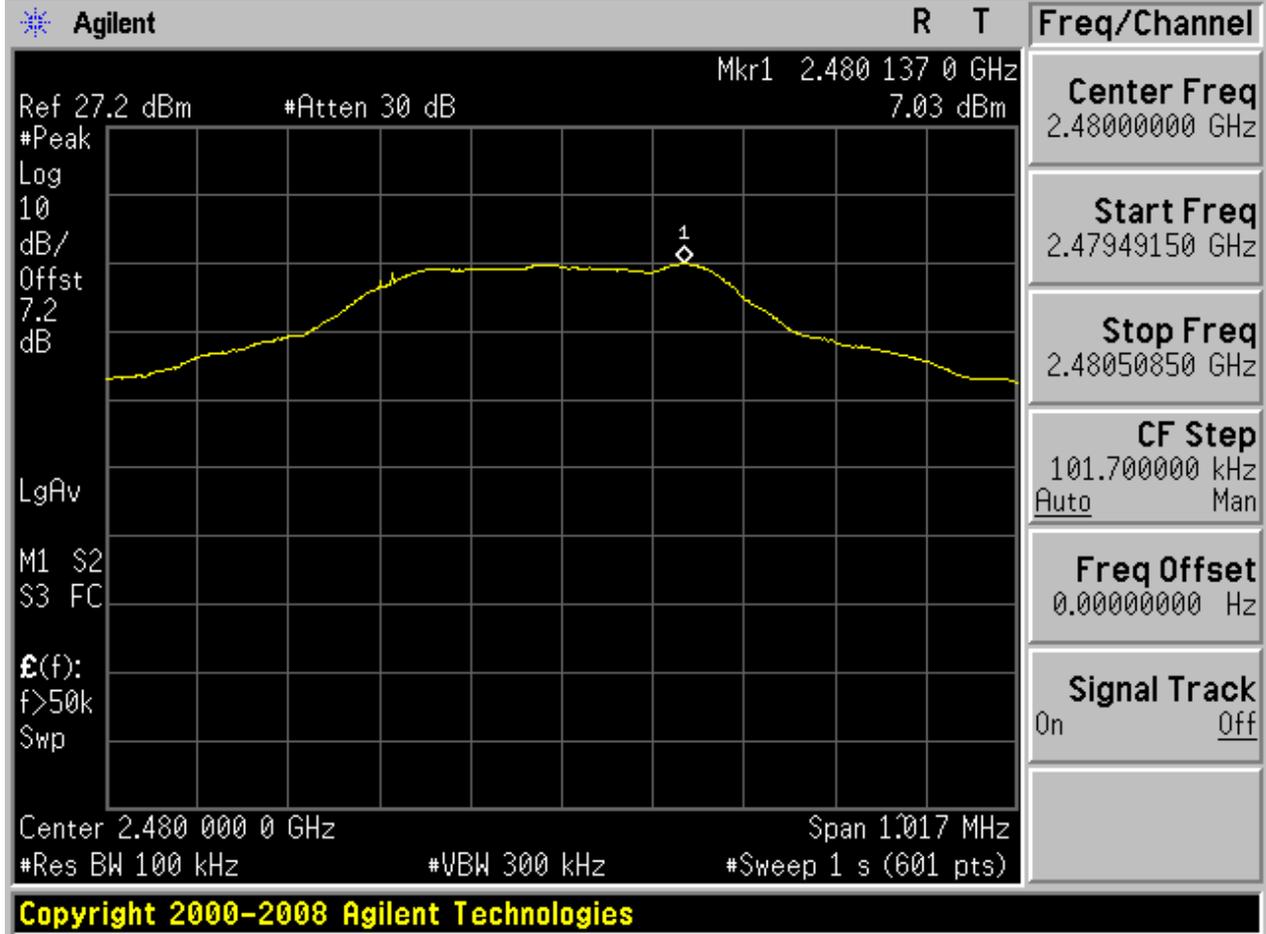




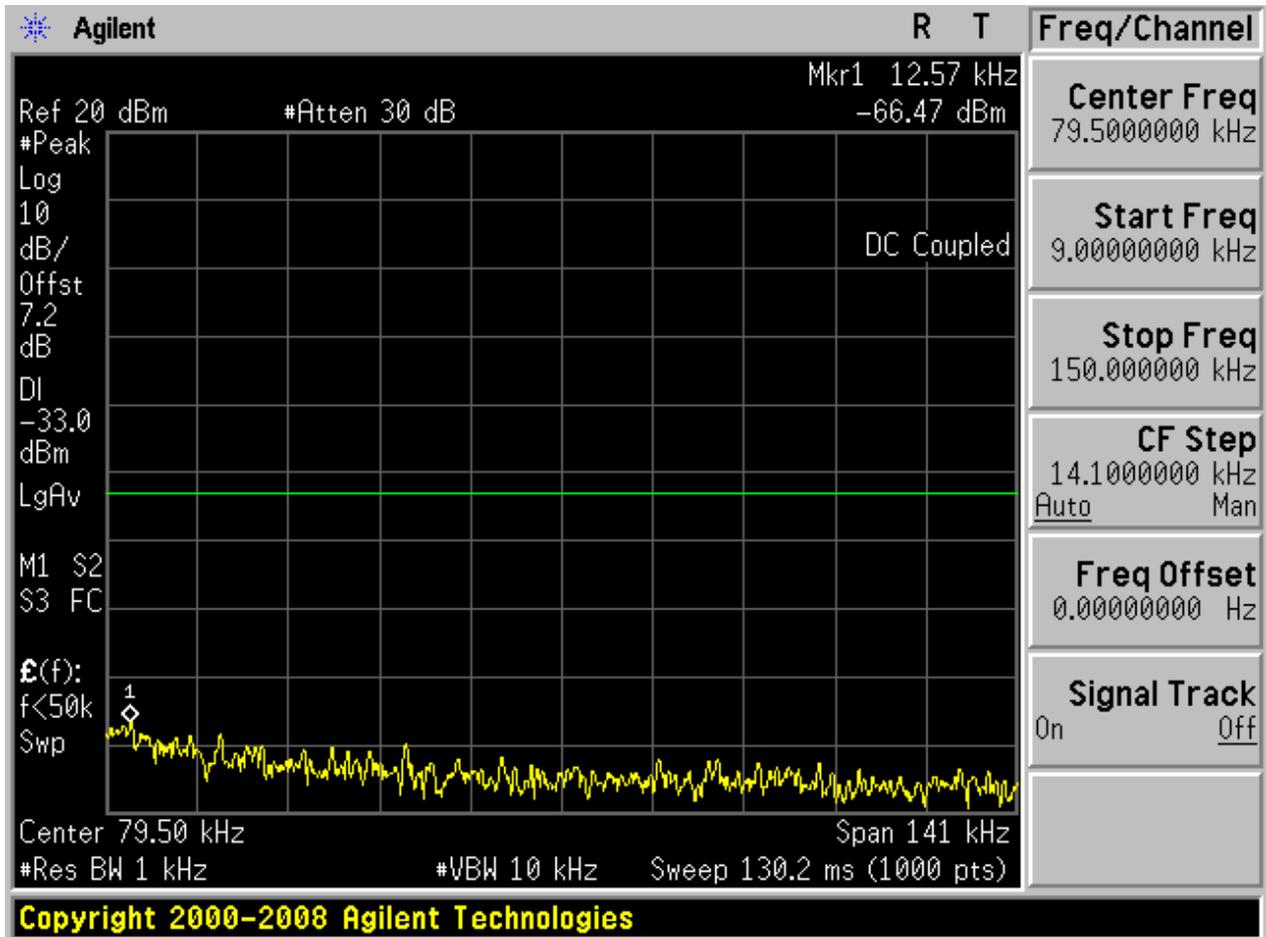


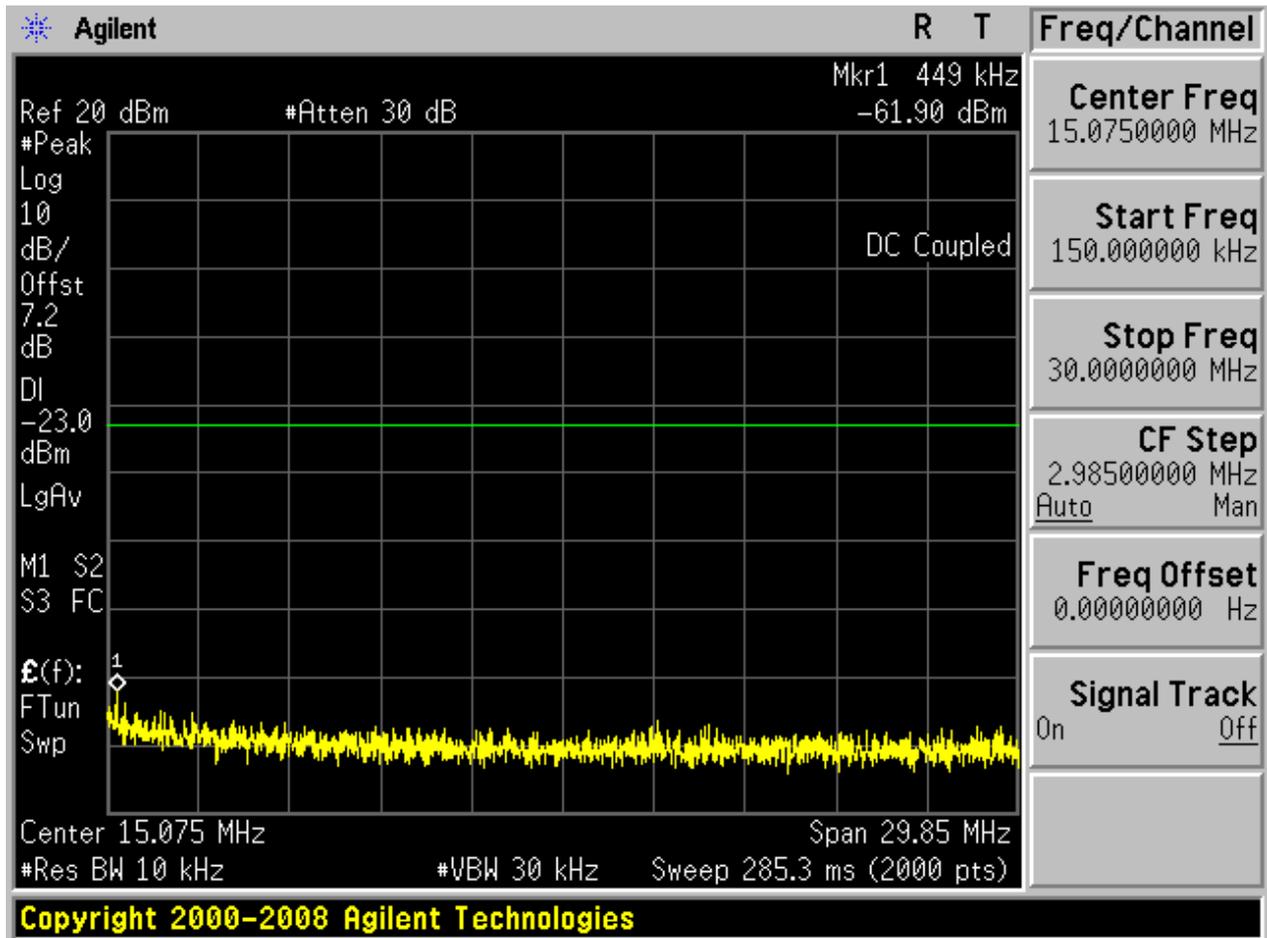
2.3 TM1_DH5_Ch78

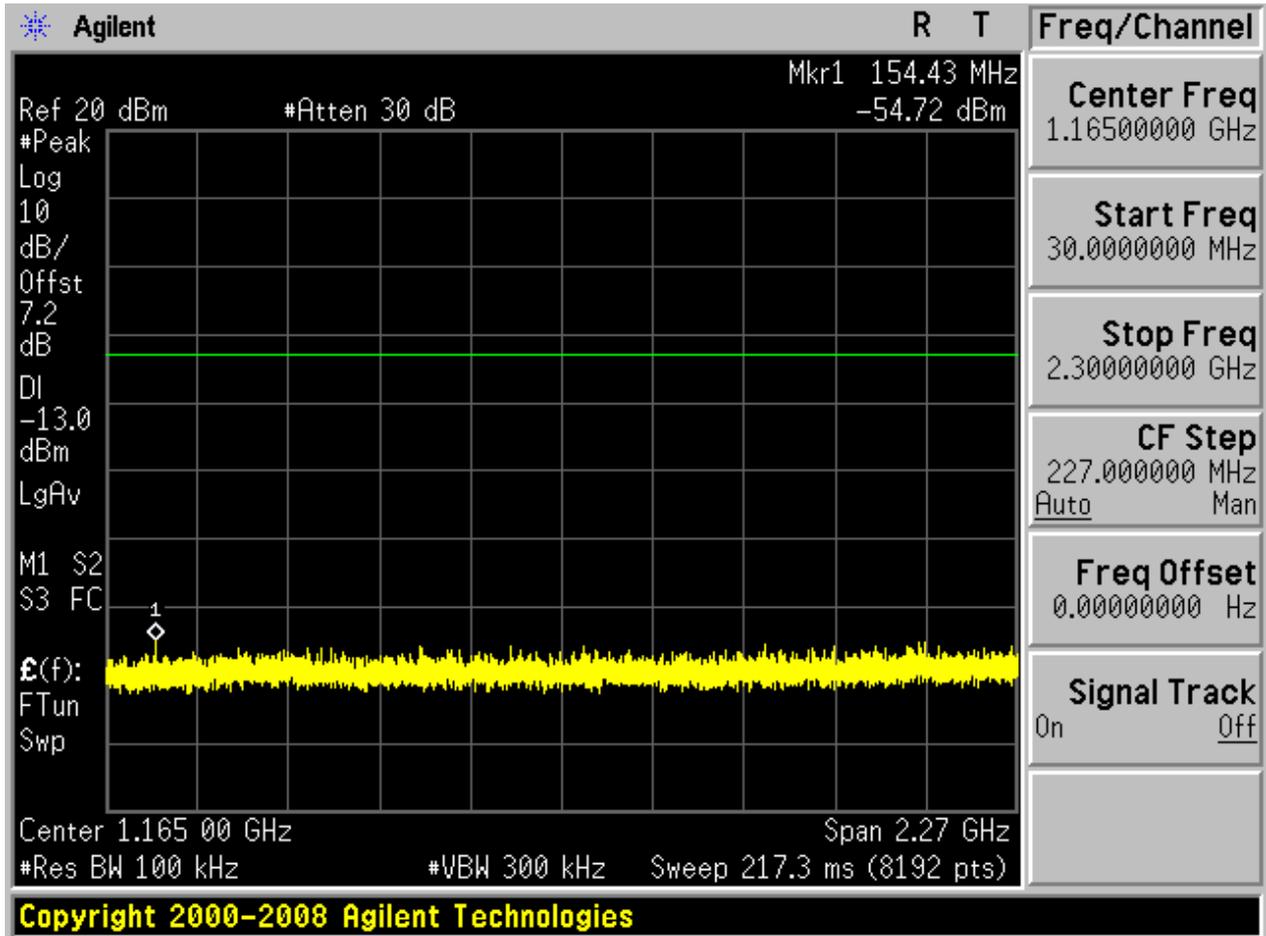
2.3.1 Pref

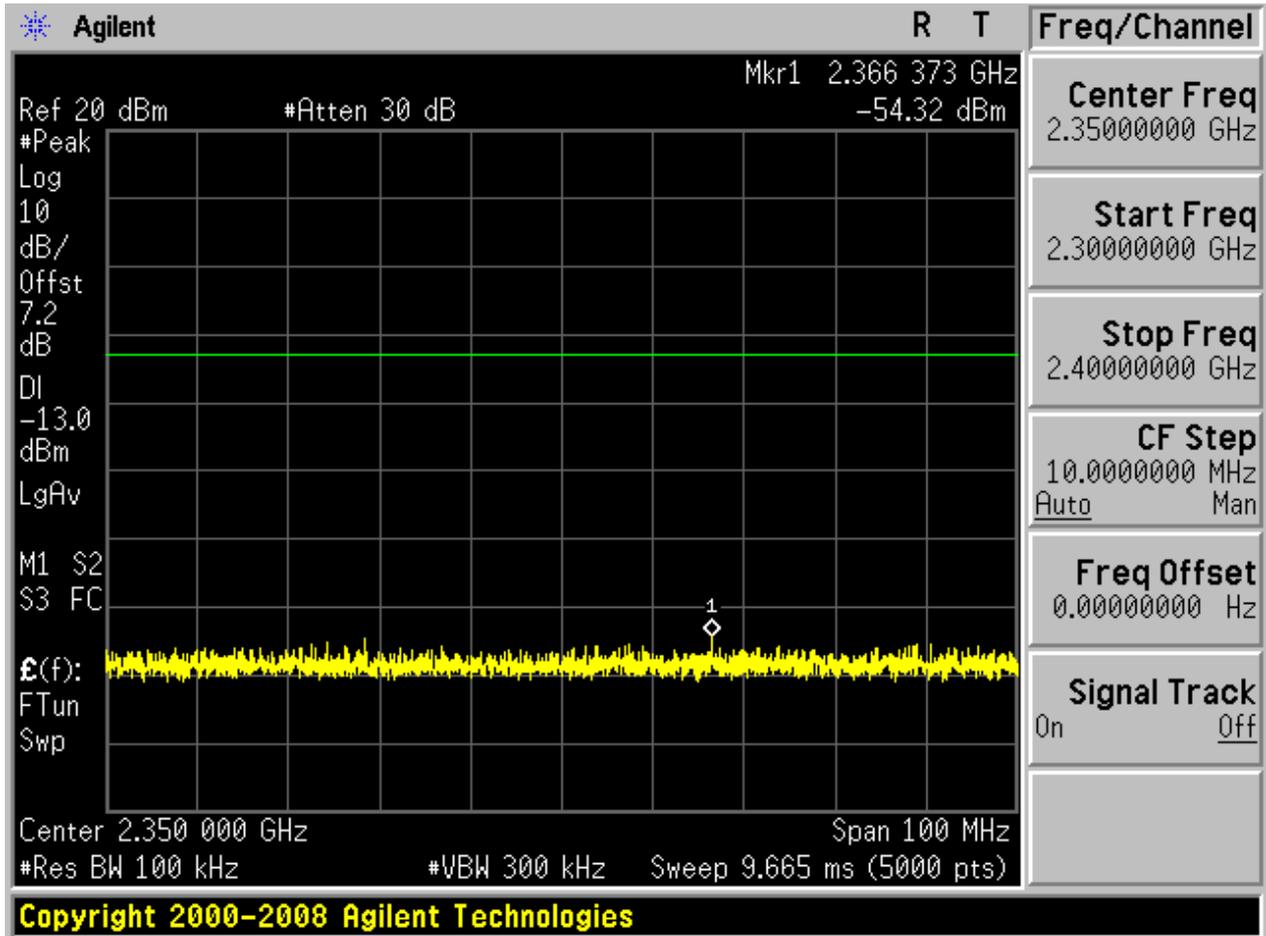


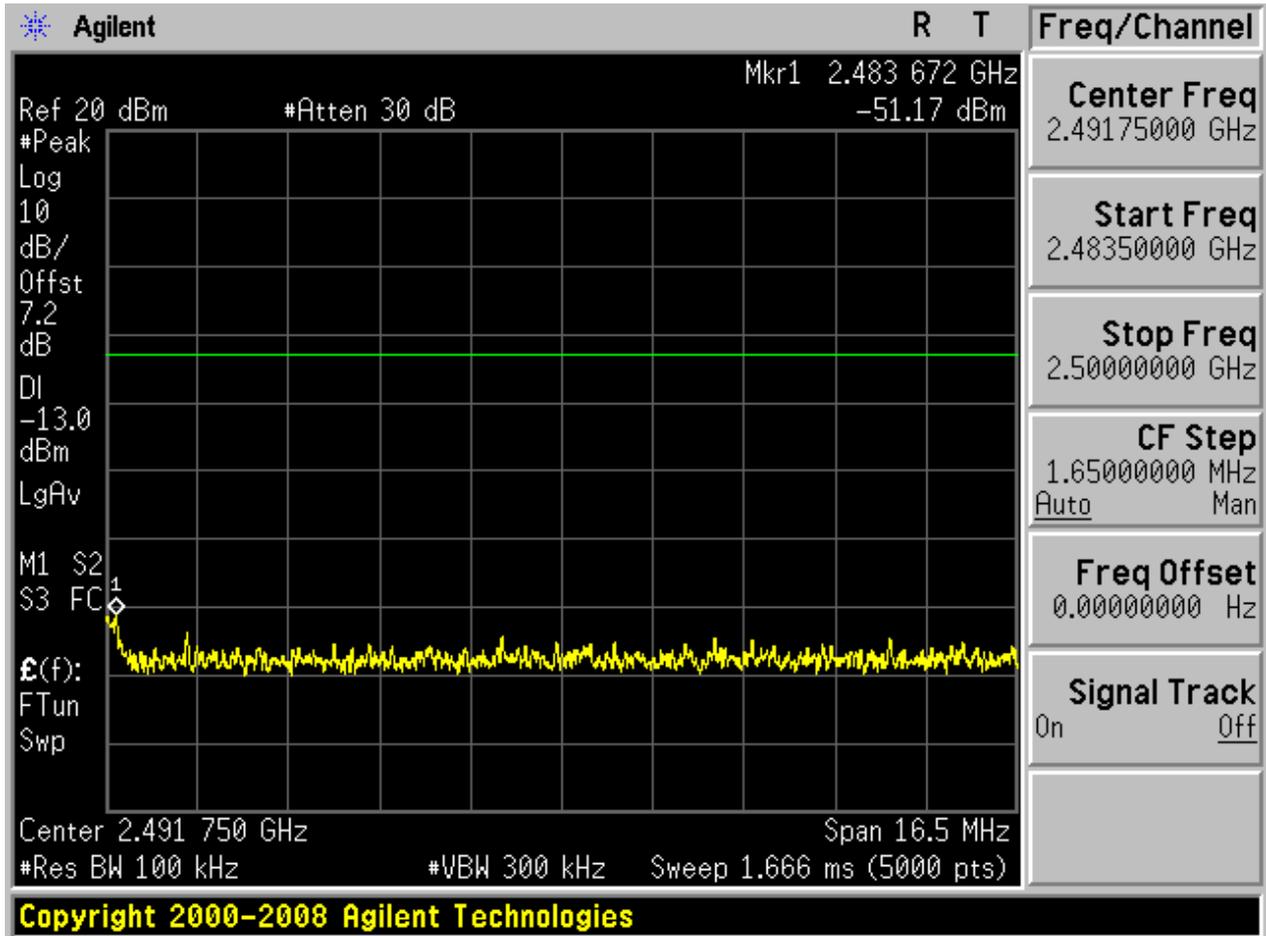
2.3.2 Puw

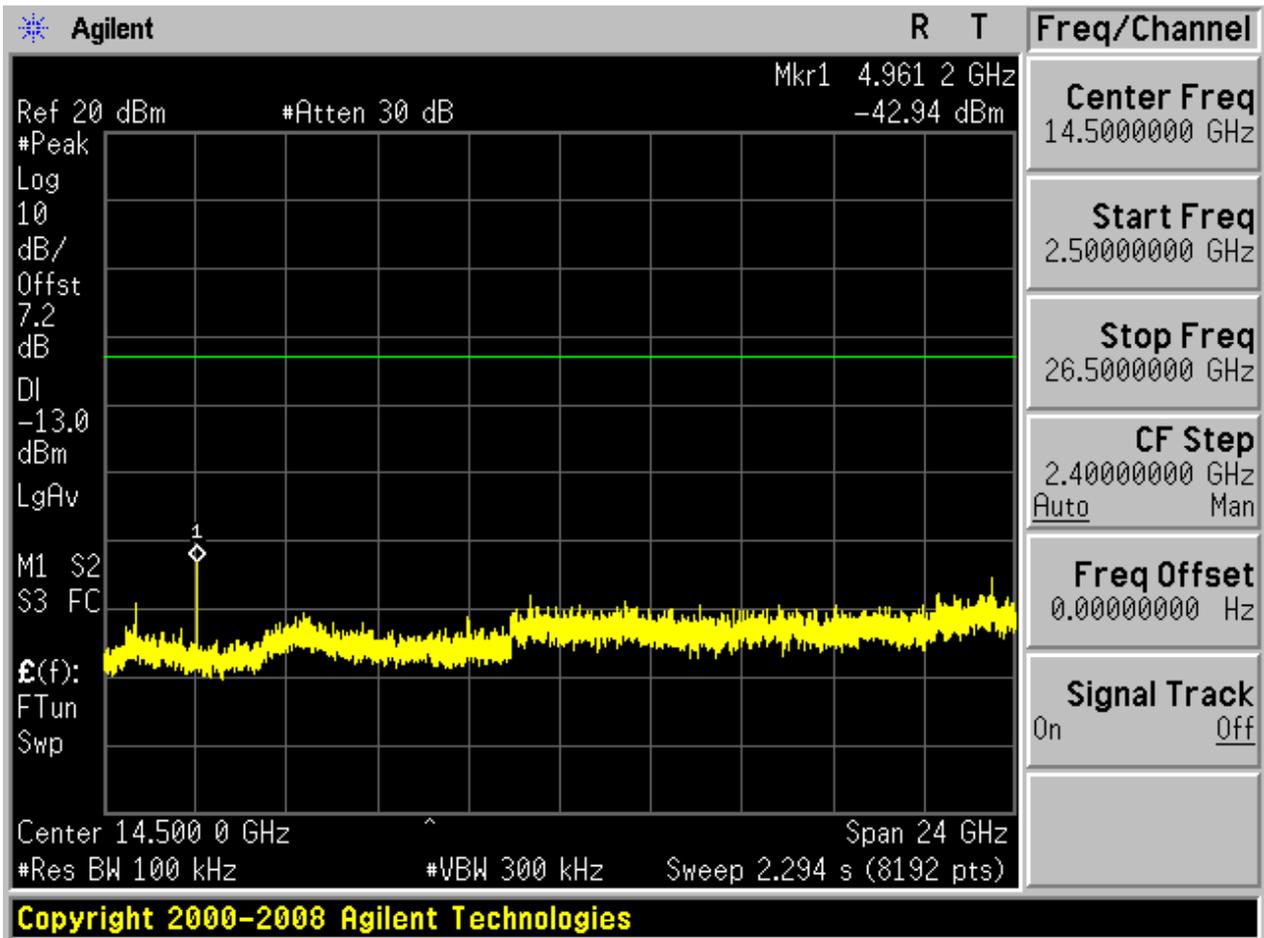






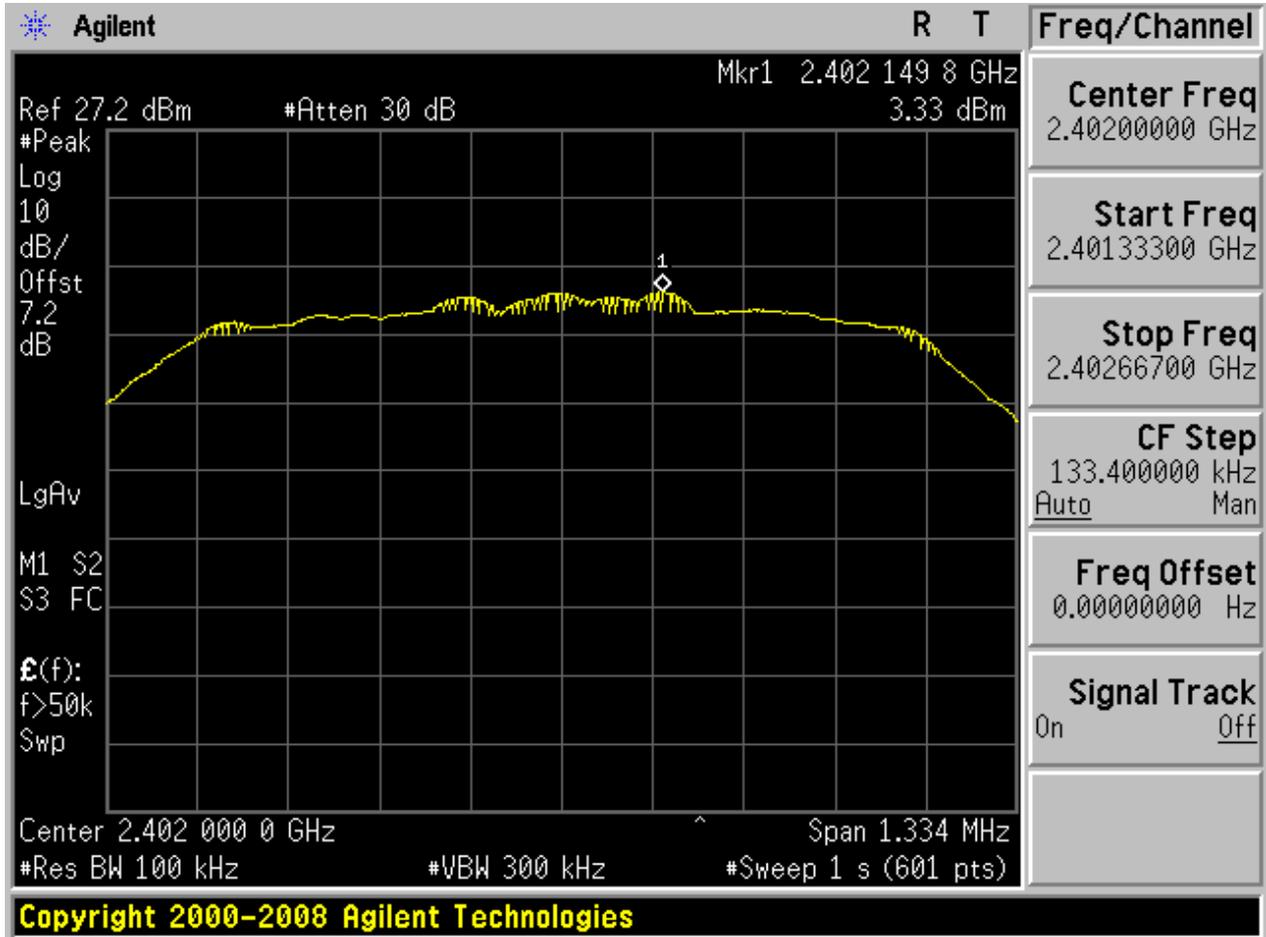




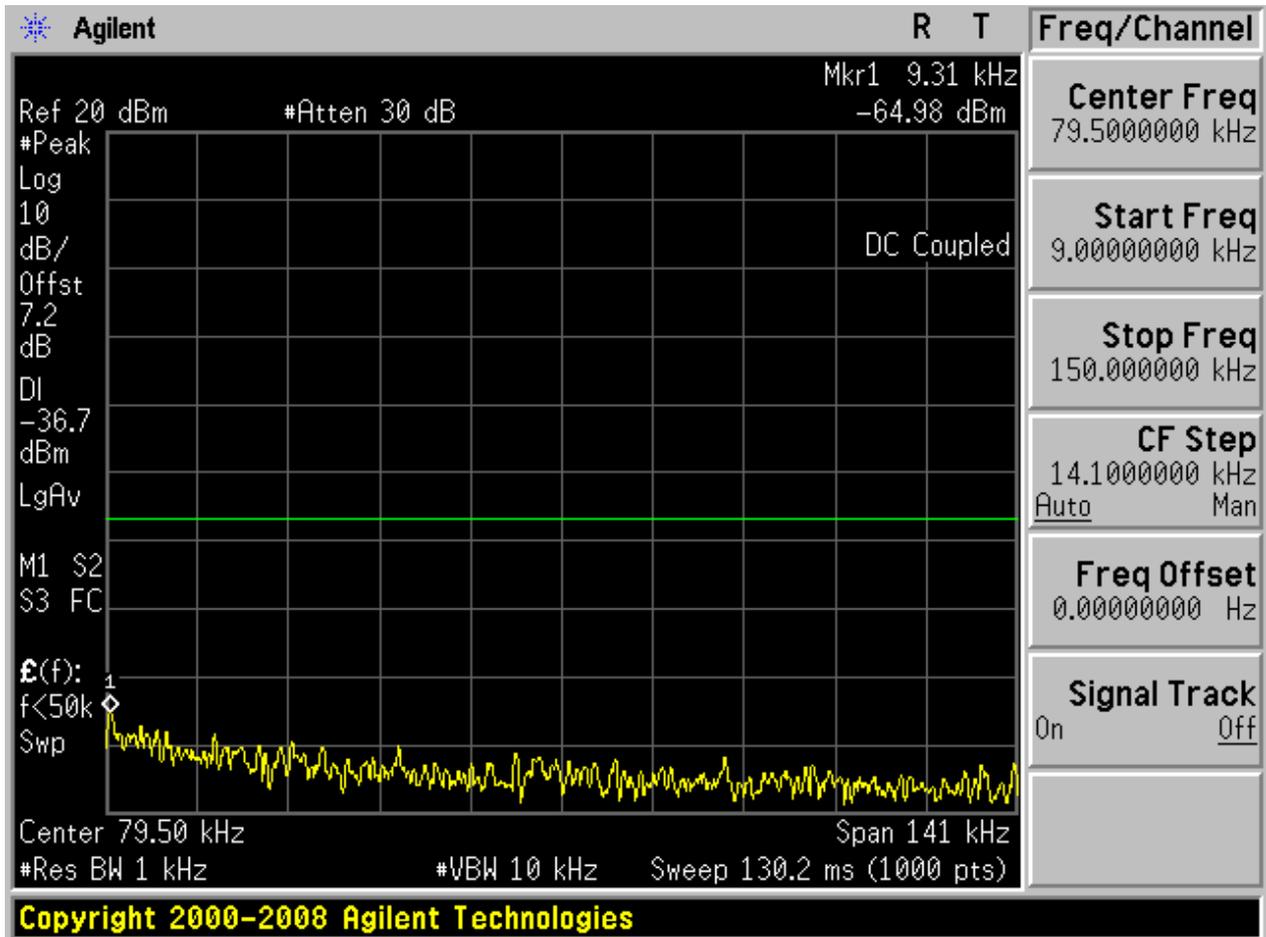


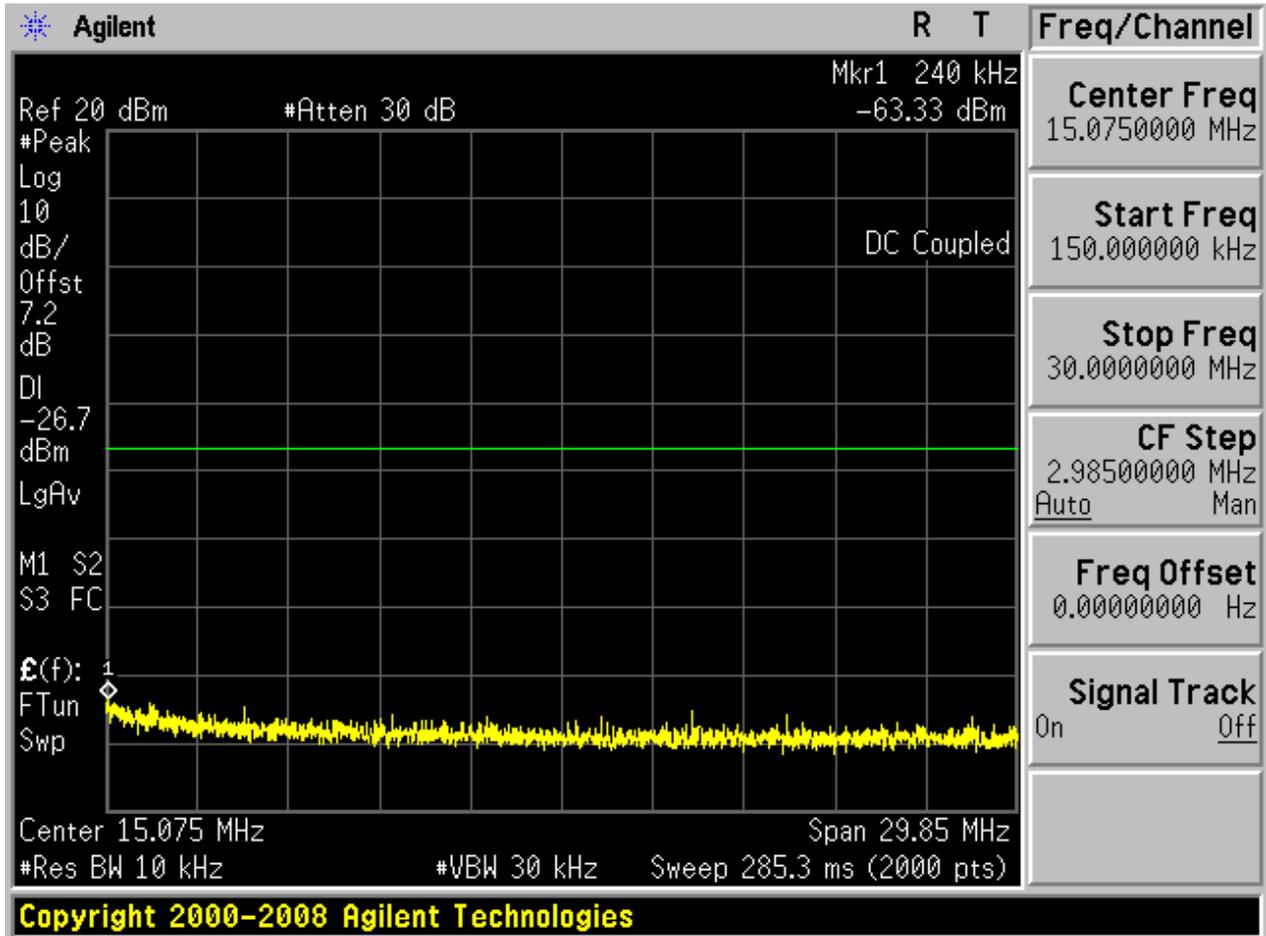
2.4 TM2_2DH5_Ch0

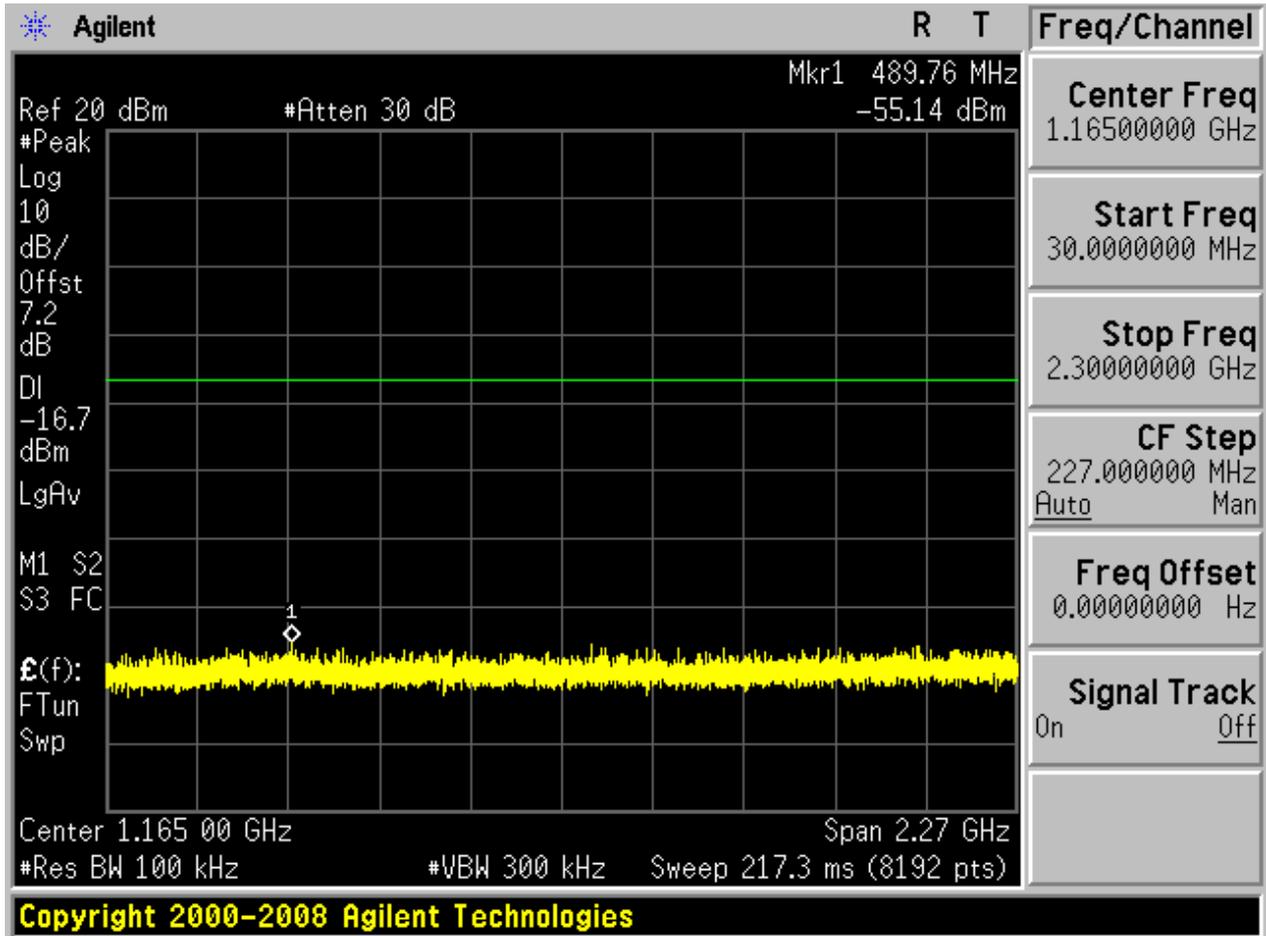
2.4.1 Pref

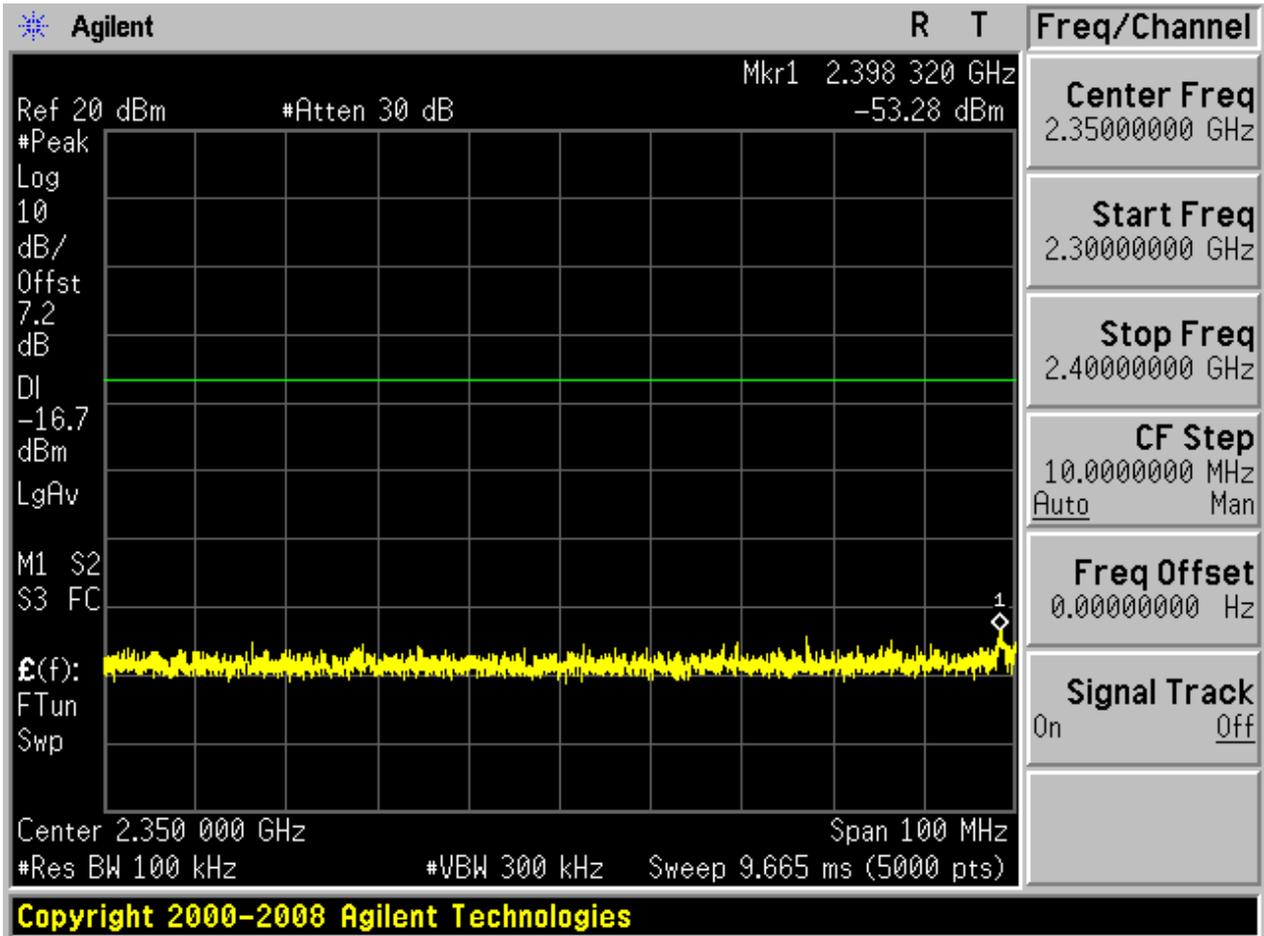


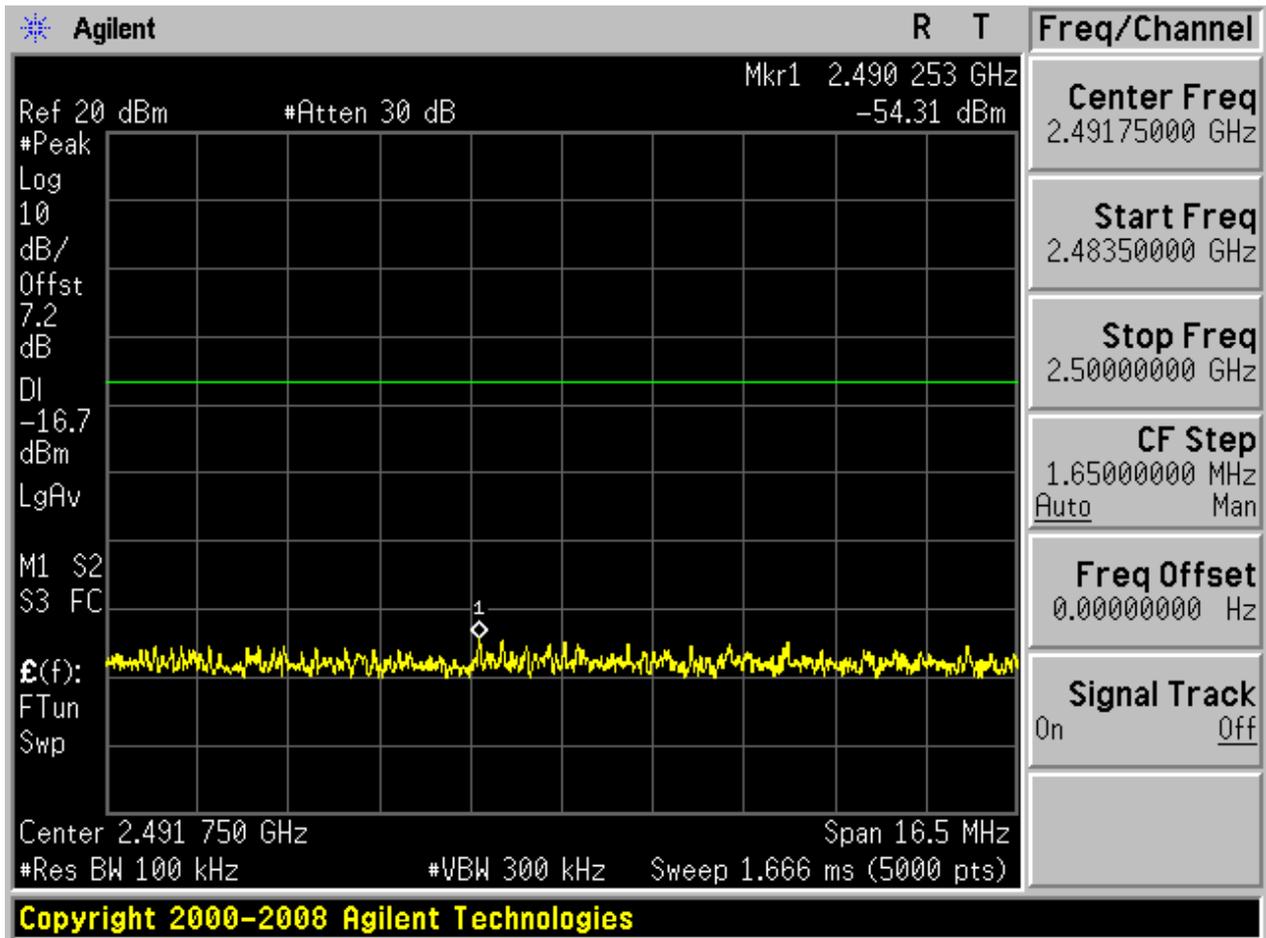
2.4.2 P_{uw}

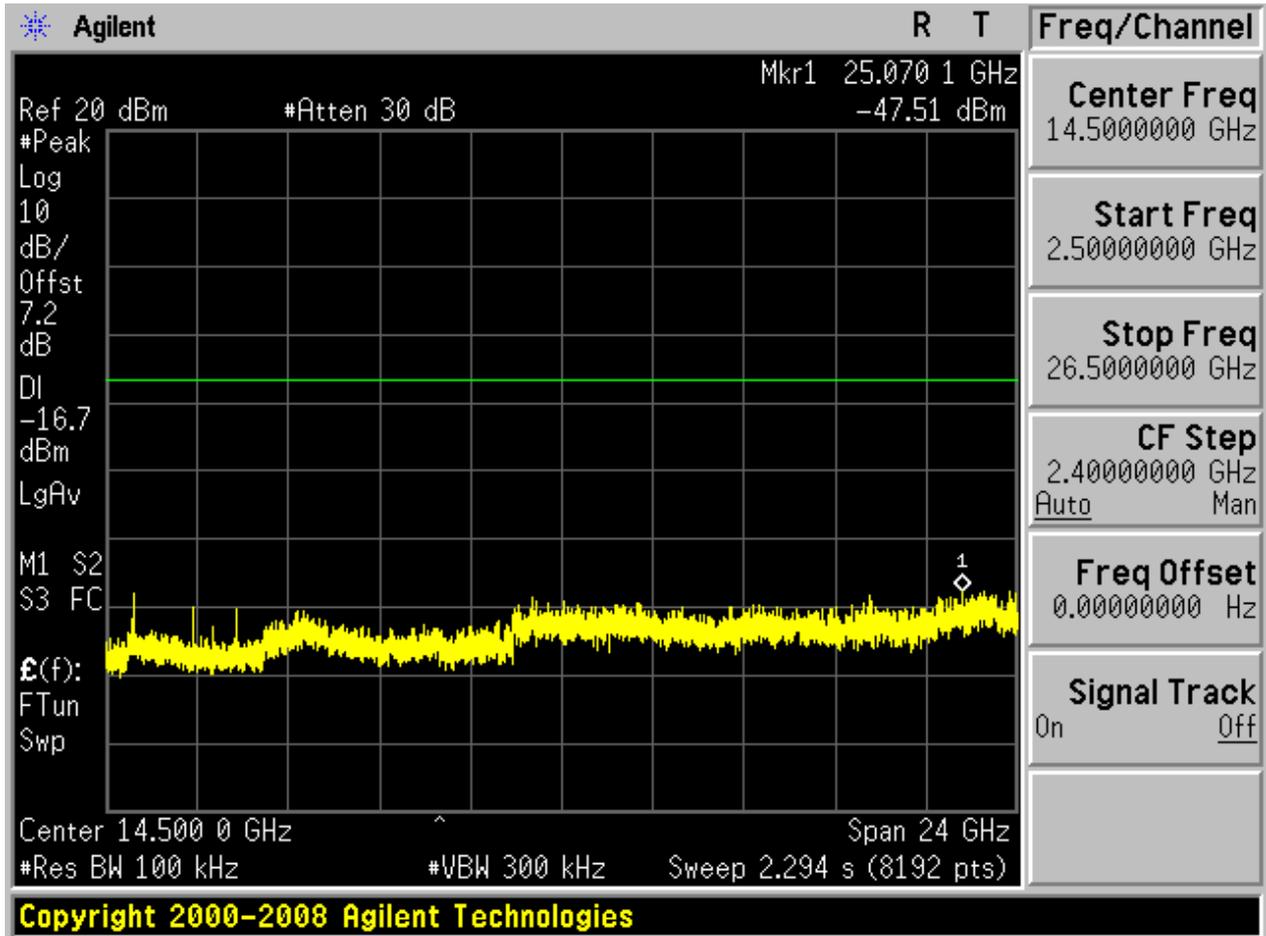








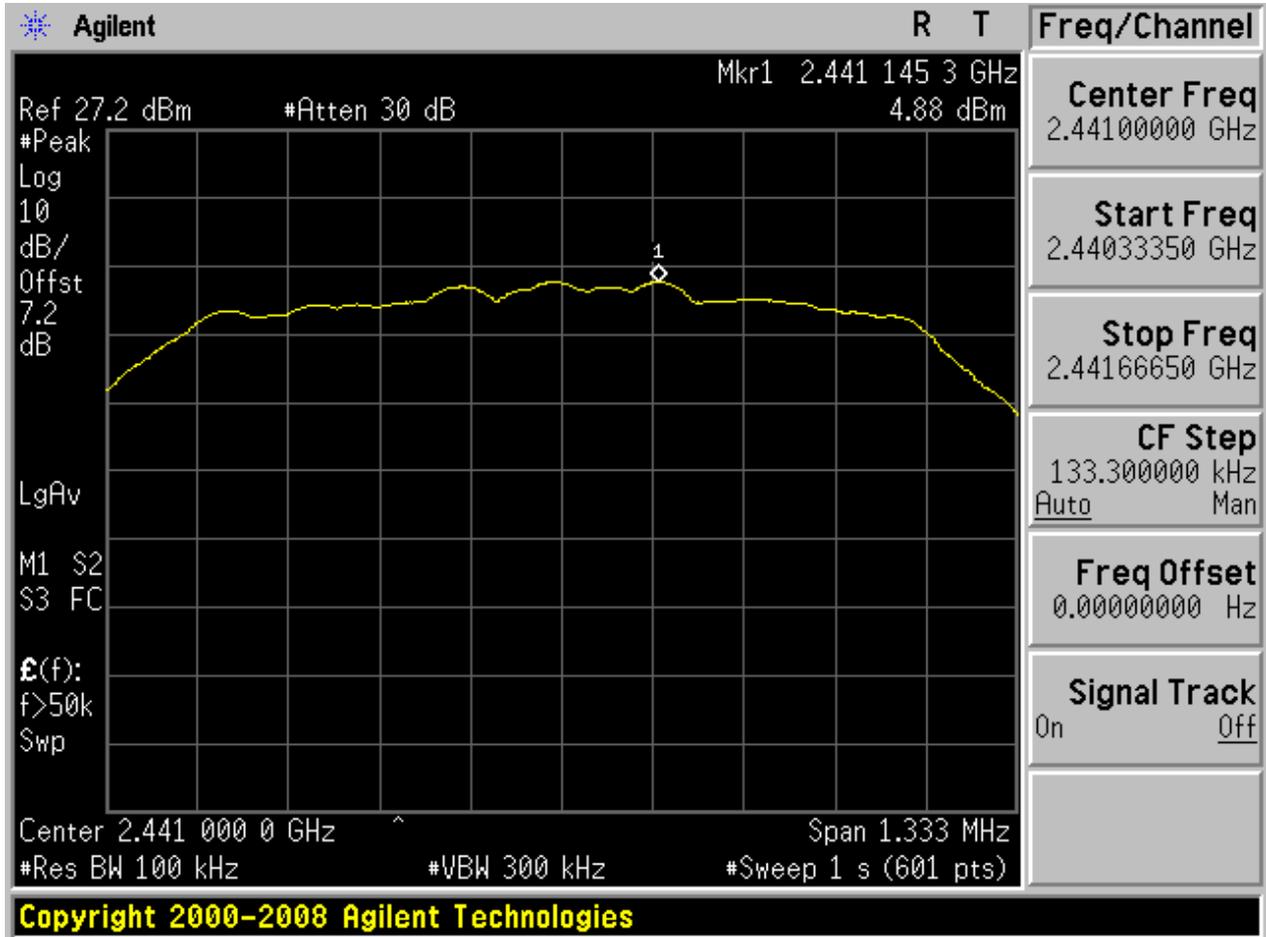




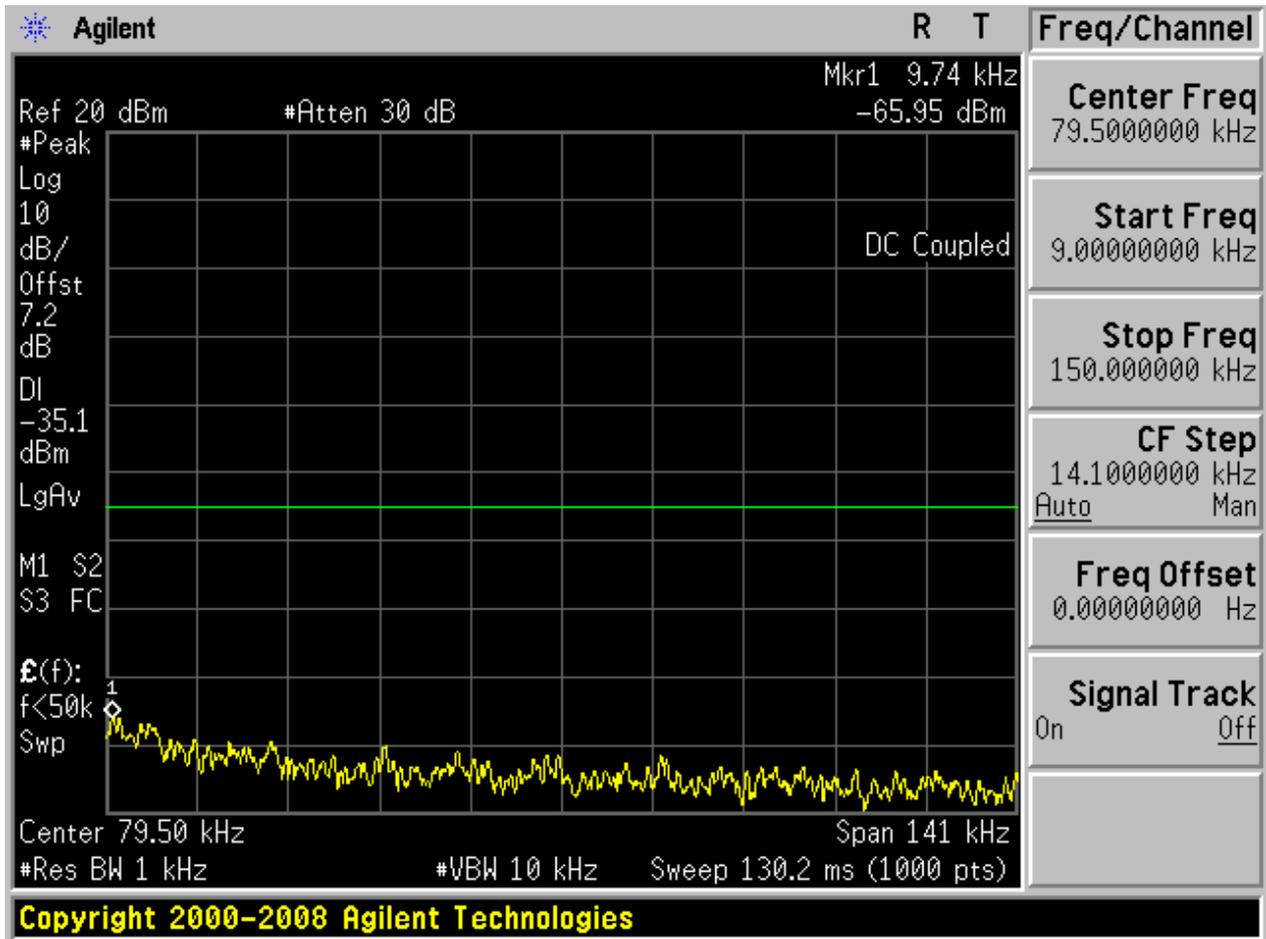


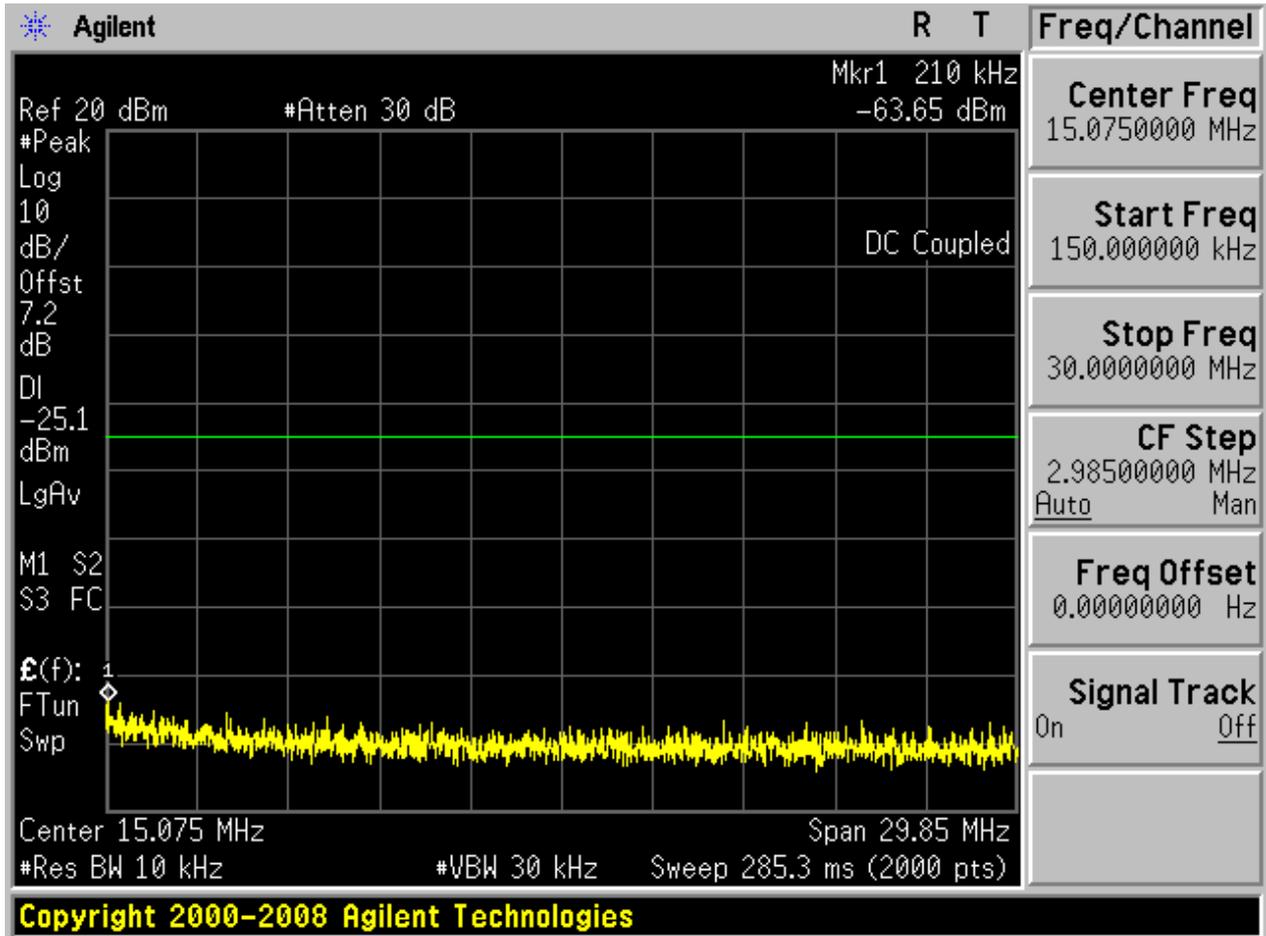
2.5 TM2_2DH5_Ch39

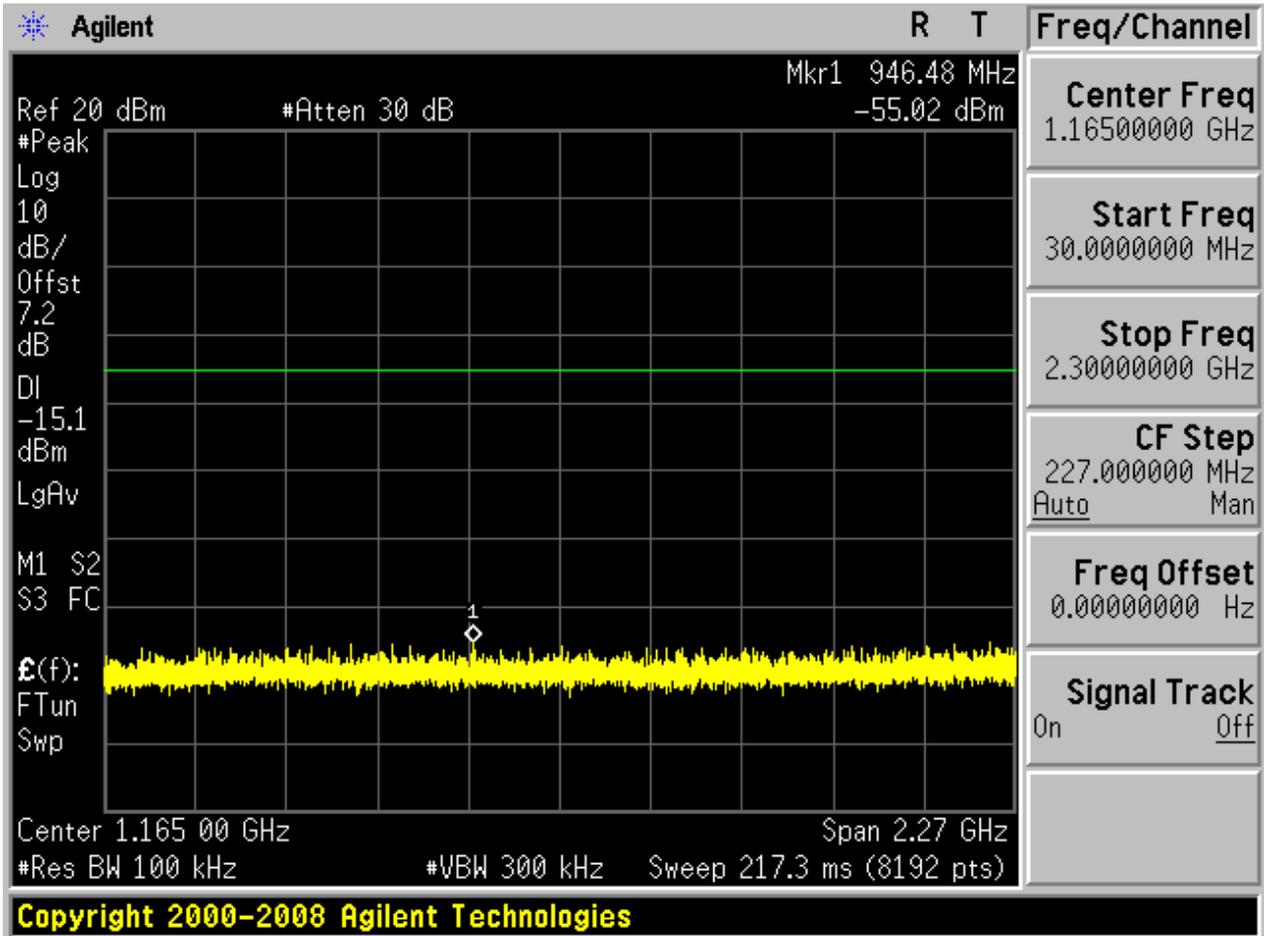
2.5.1 Pref

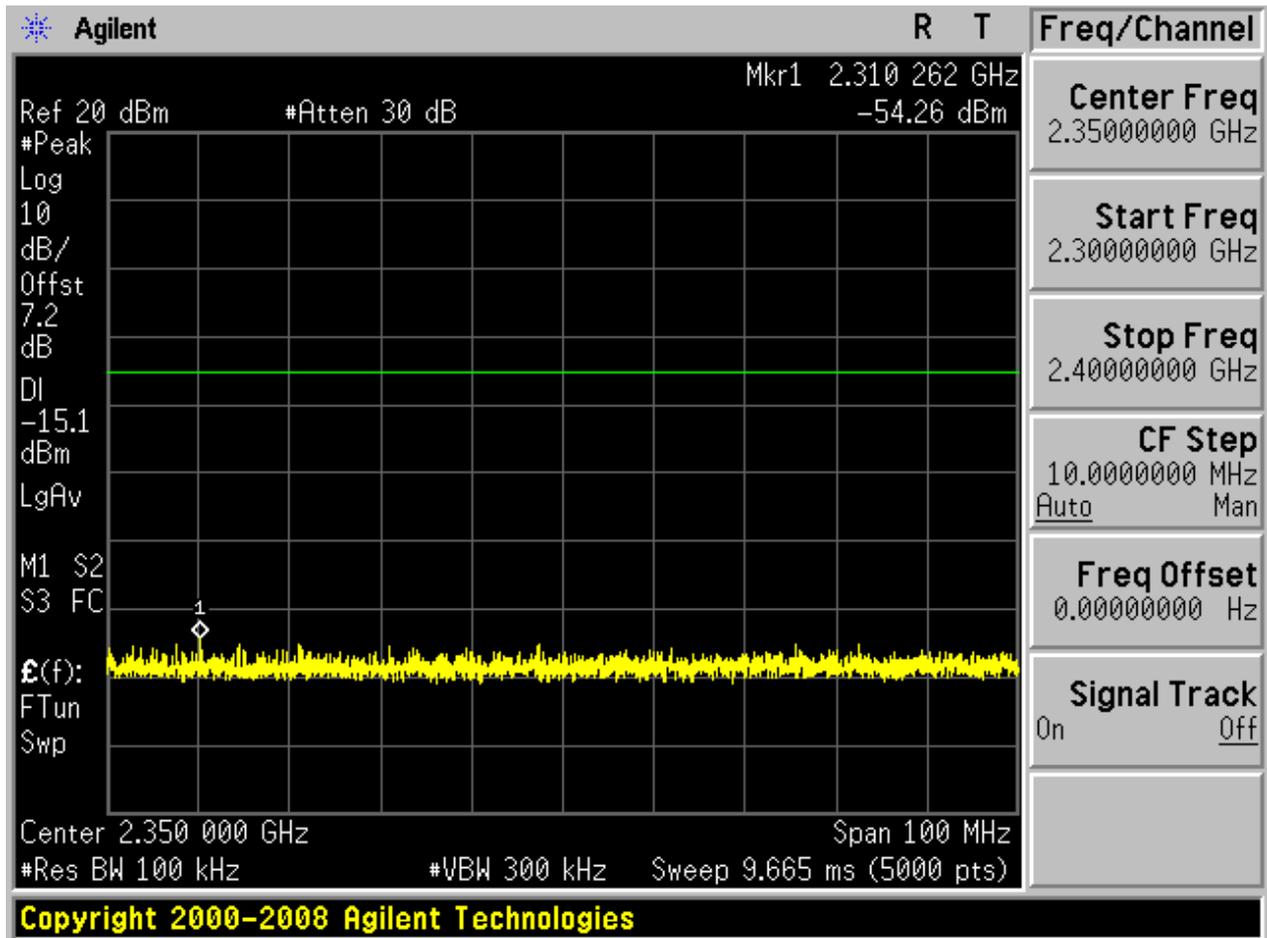


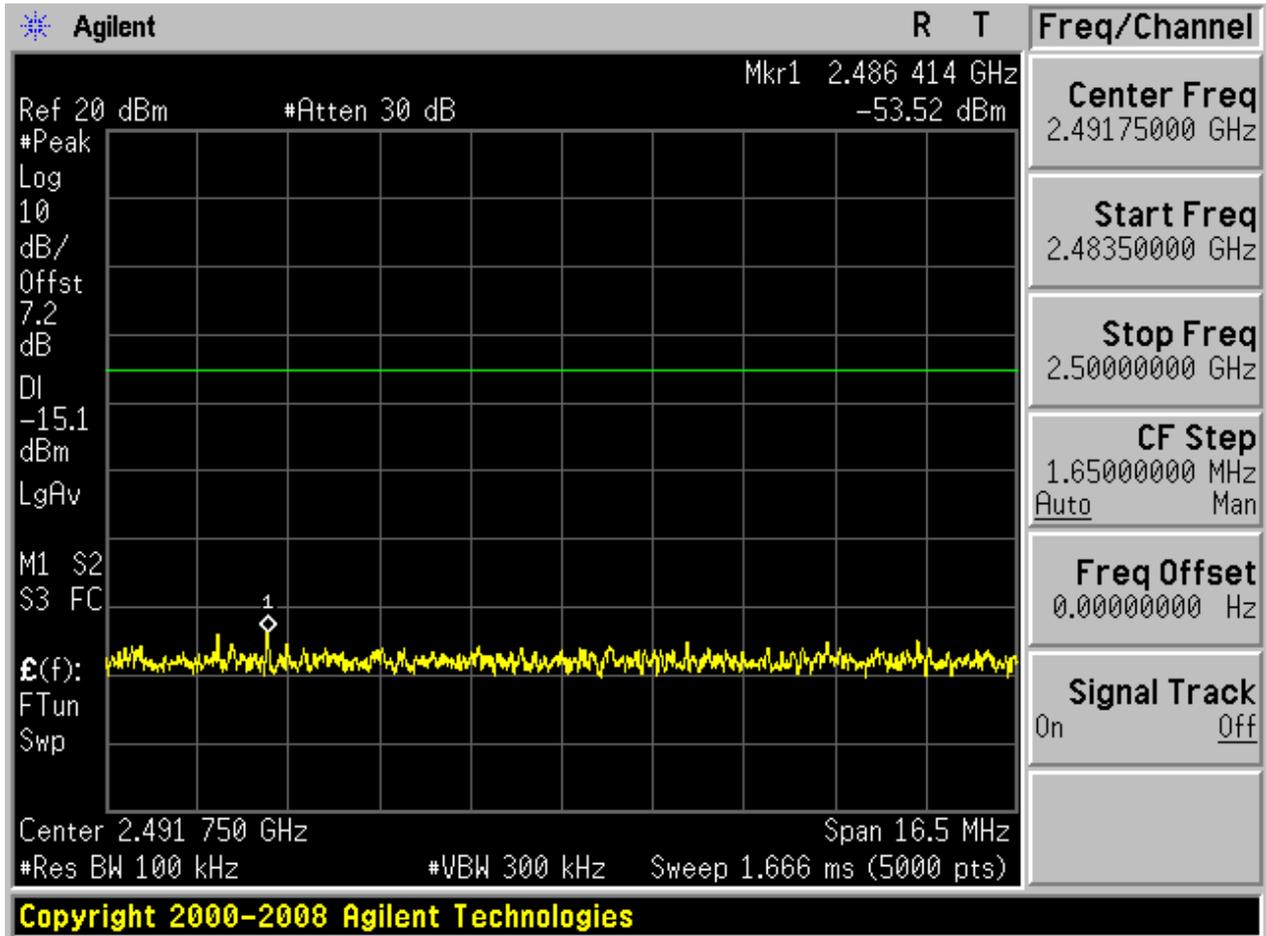
2.5.2 Puw

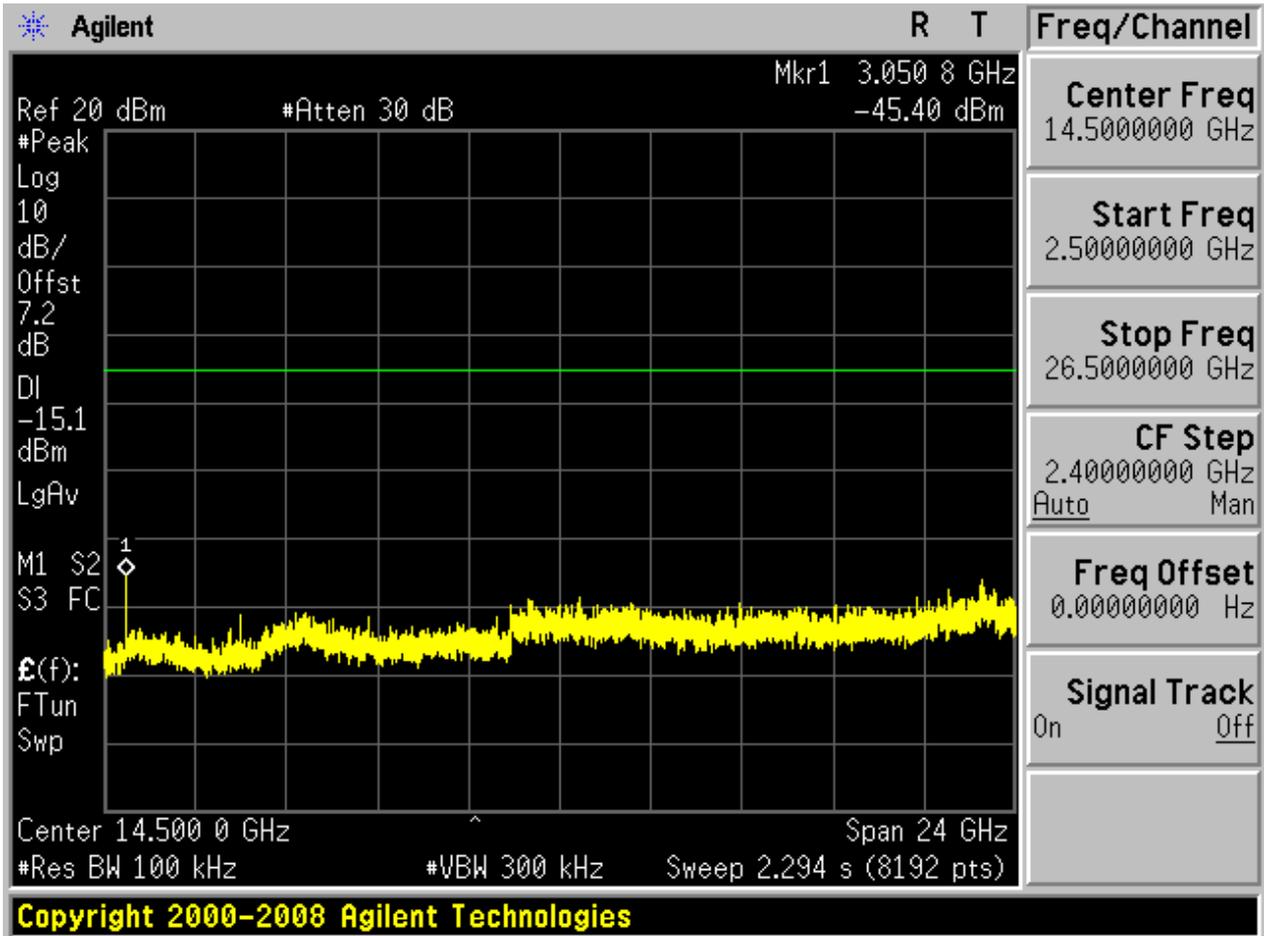






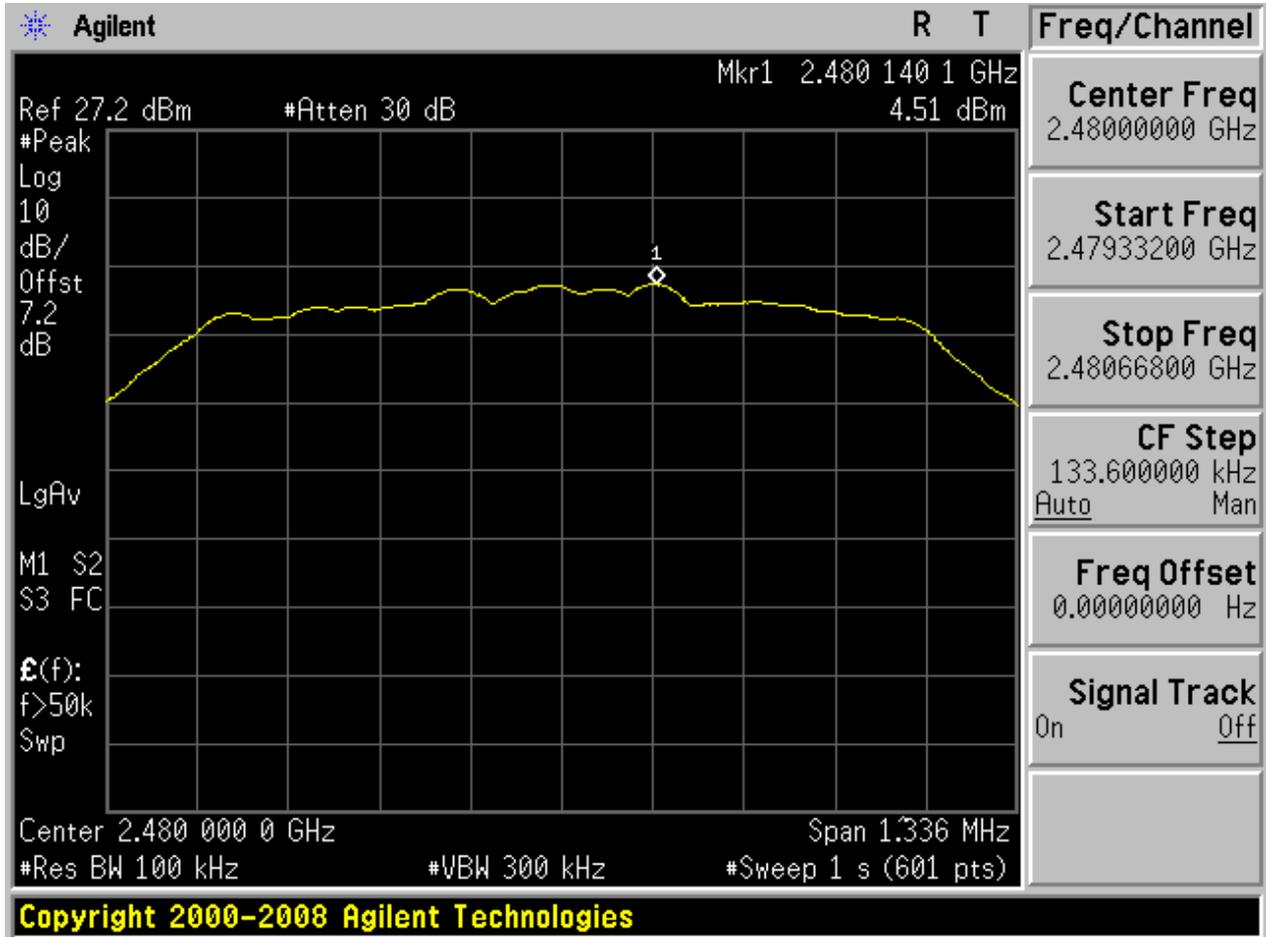






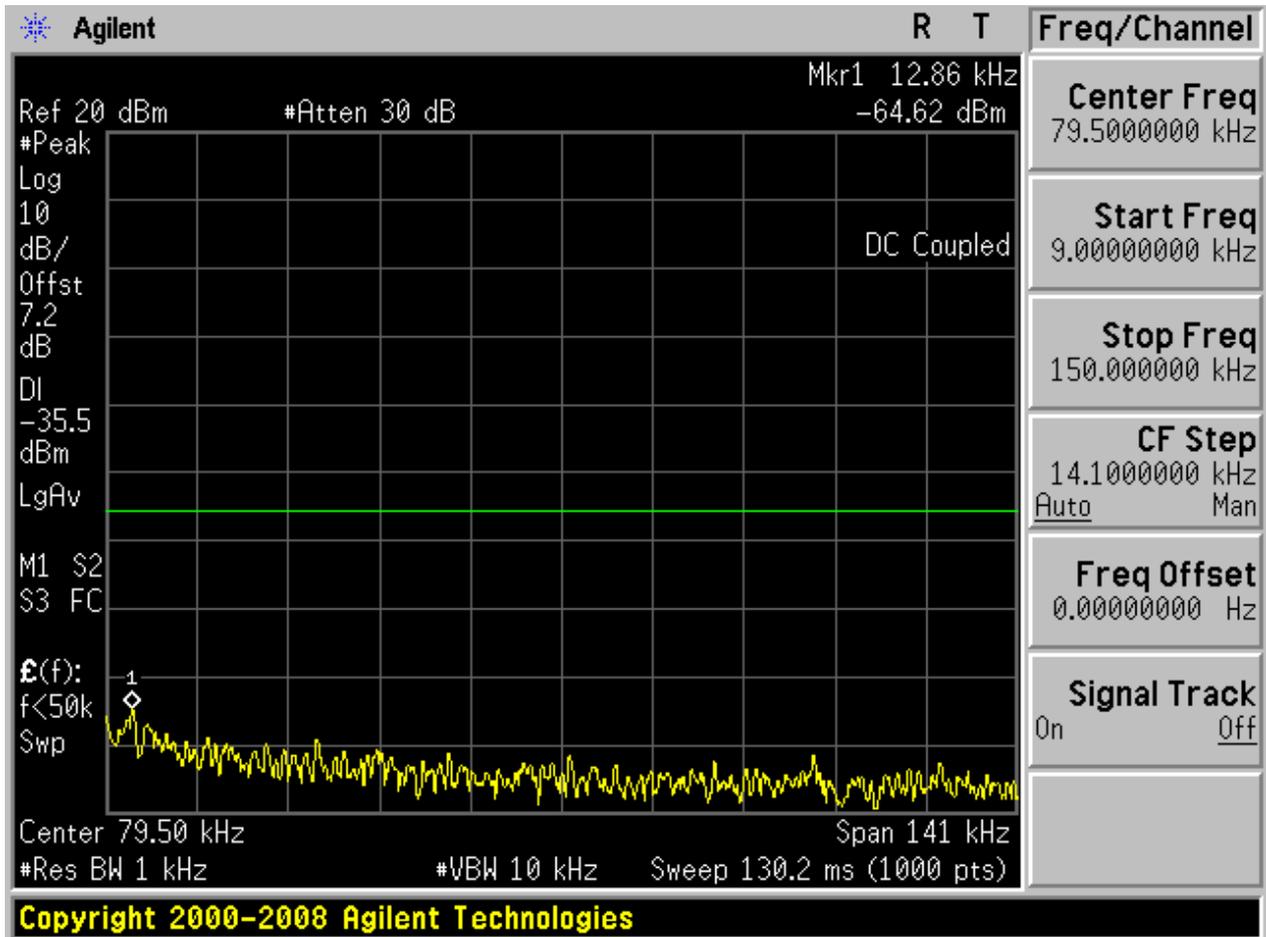
2.6 TM2_2DH5_Ch78

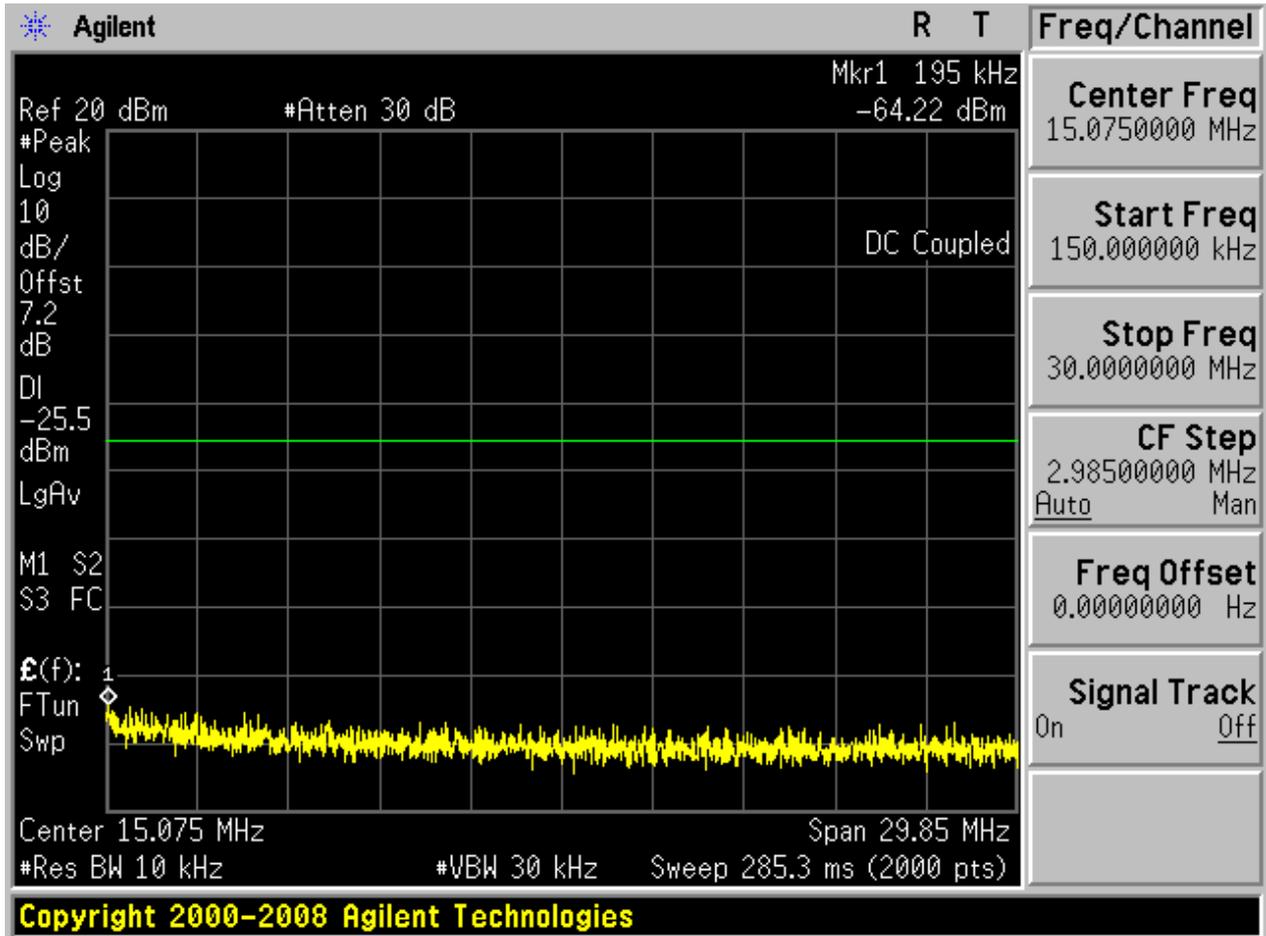
2.6.1 Pref

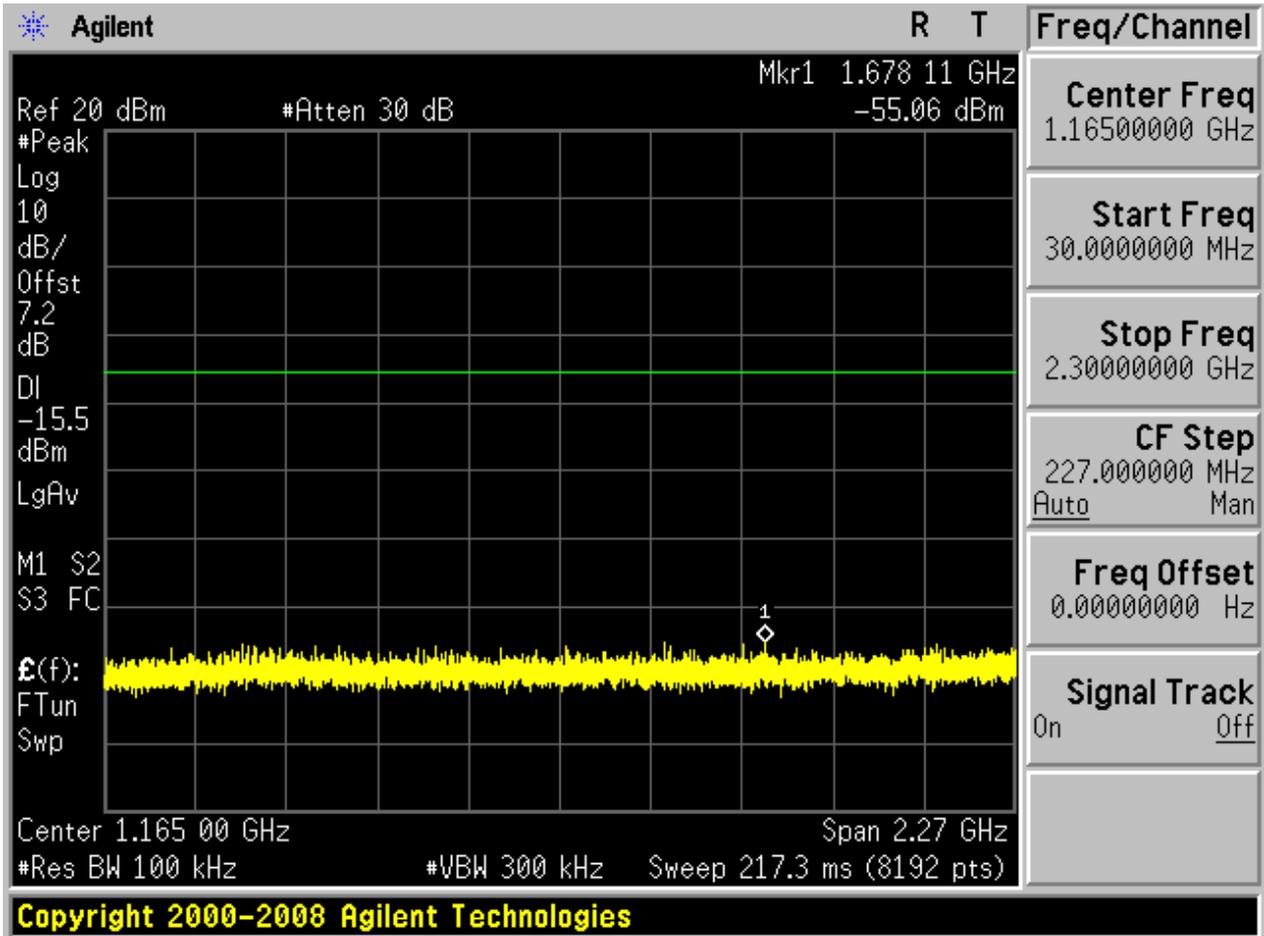


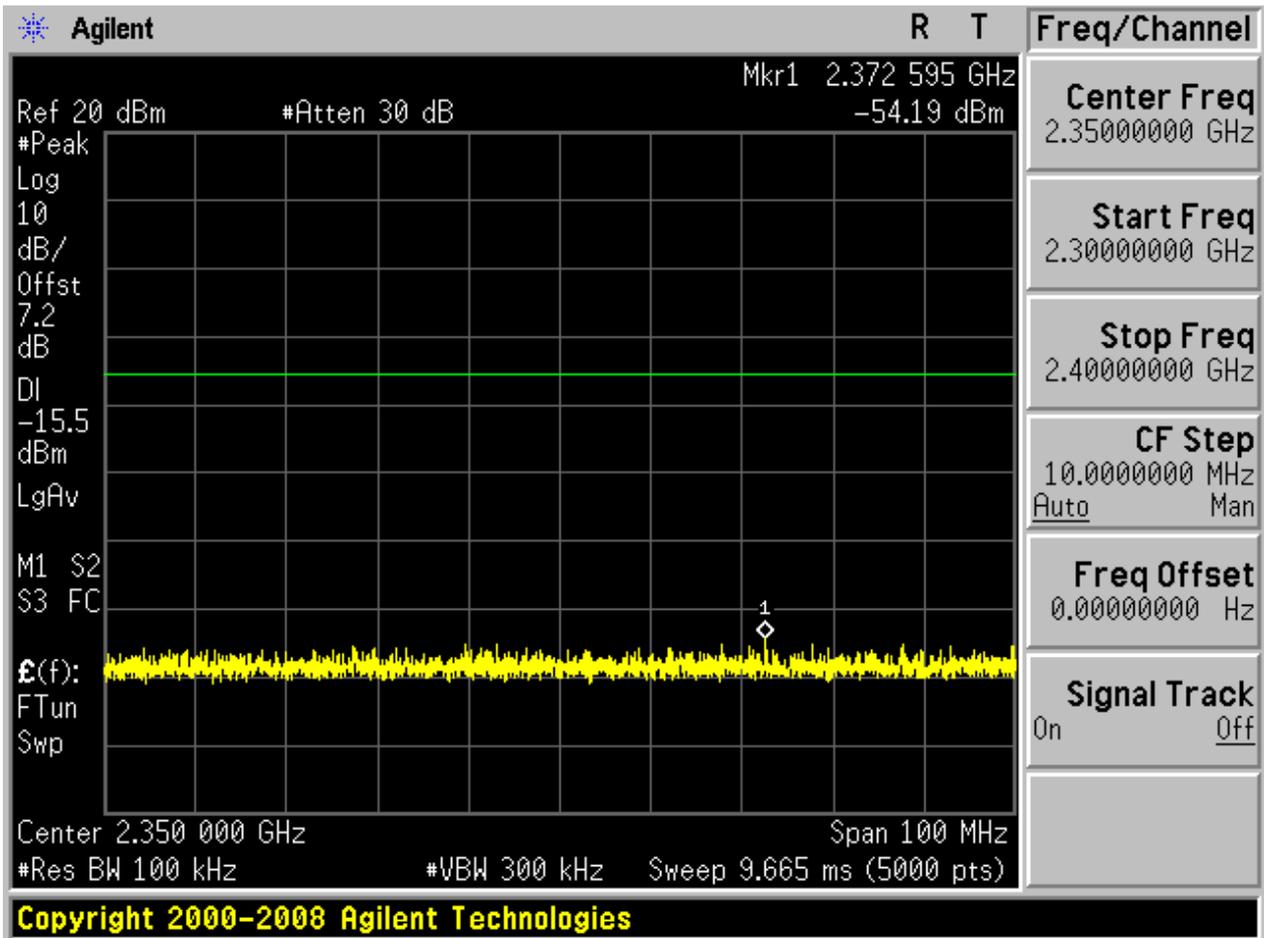


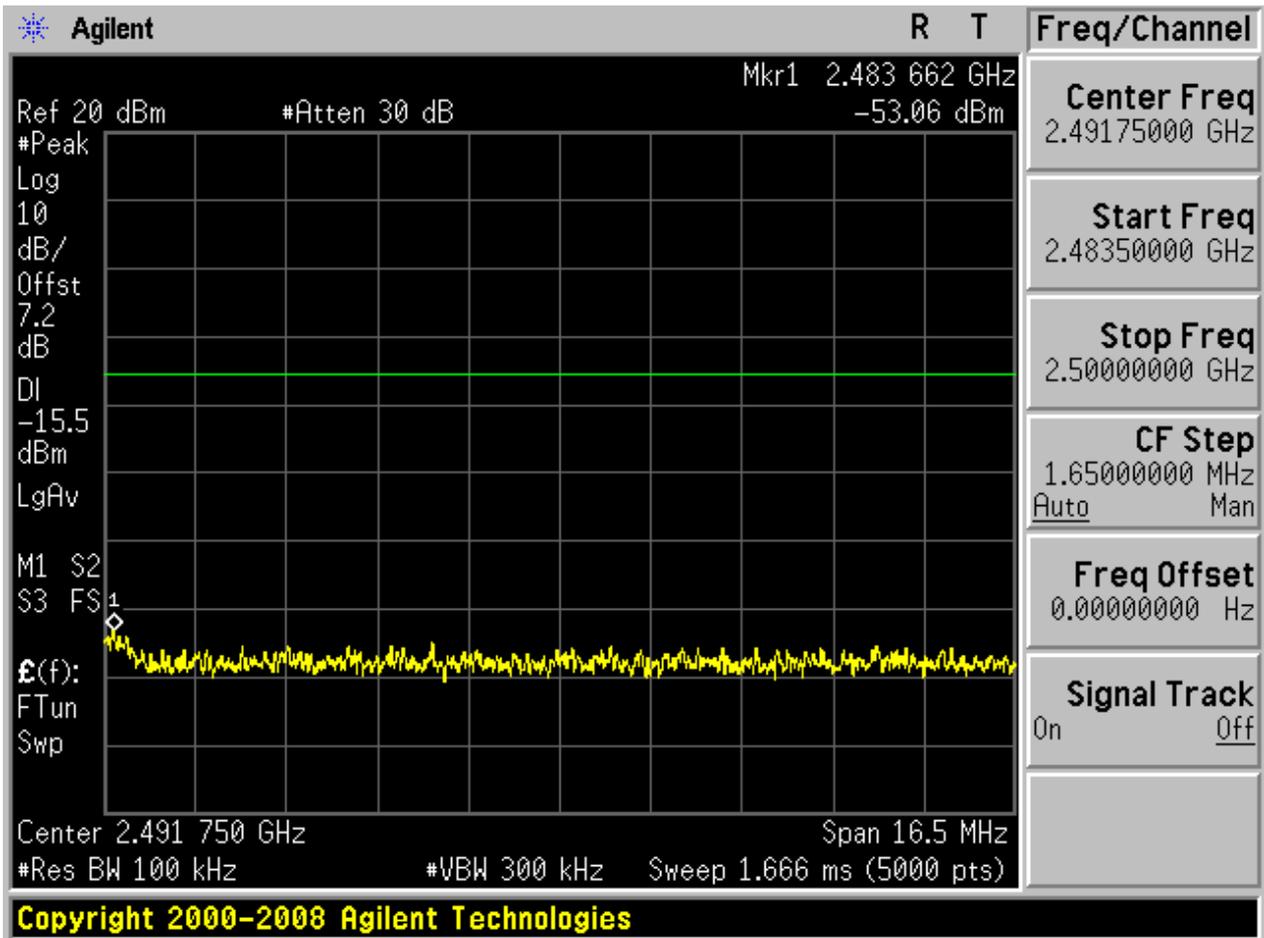
2.6.2 Puw

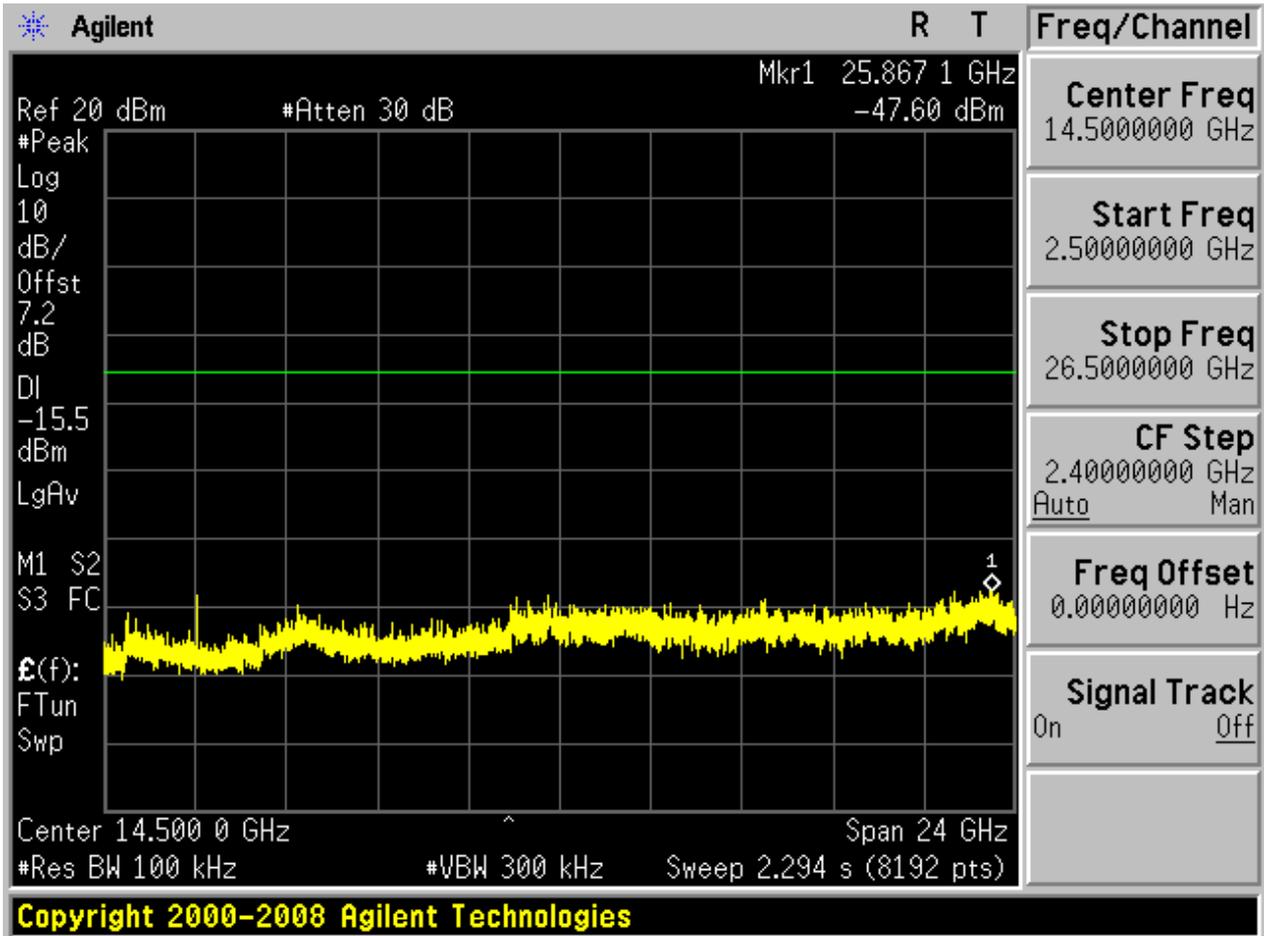






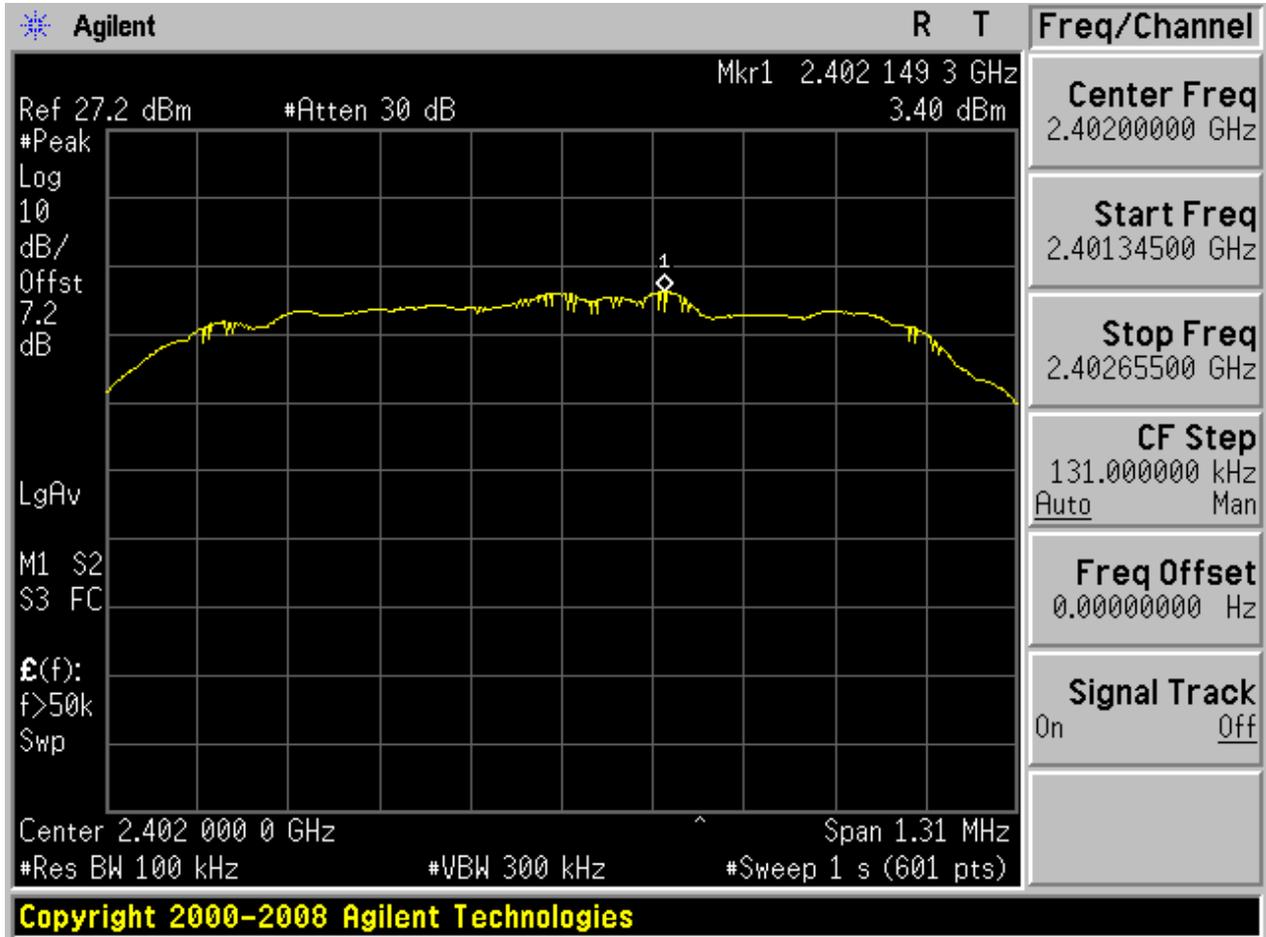






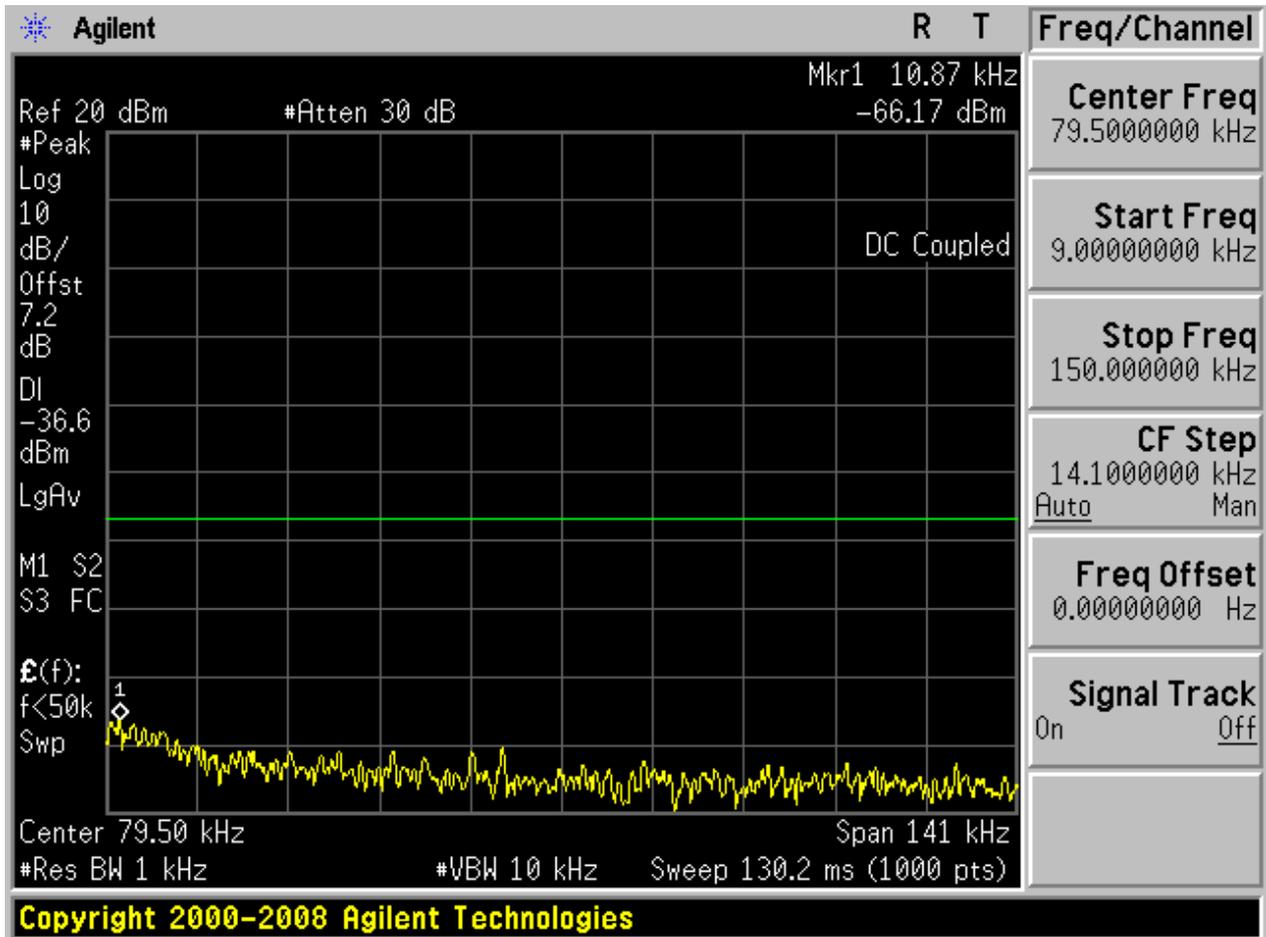
2.7 TM3_3DH5_Ch0

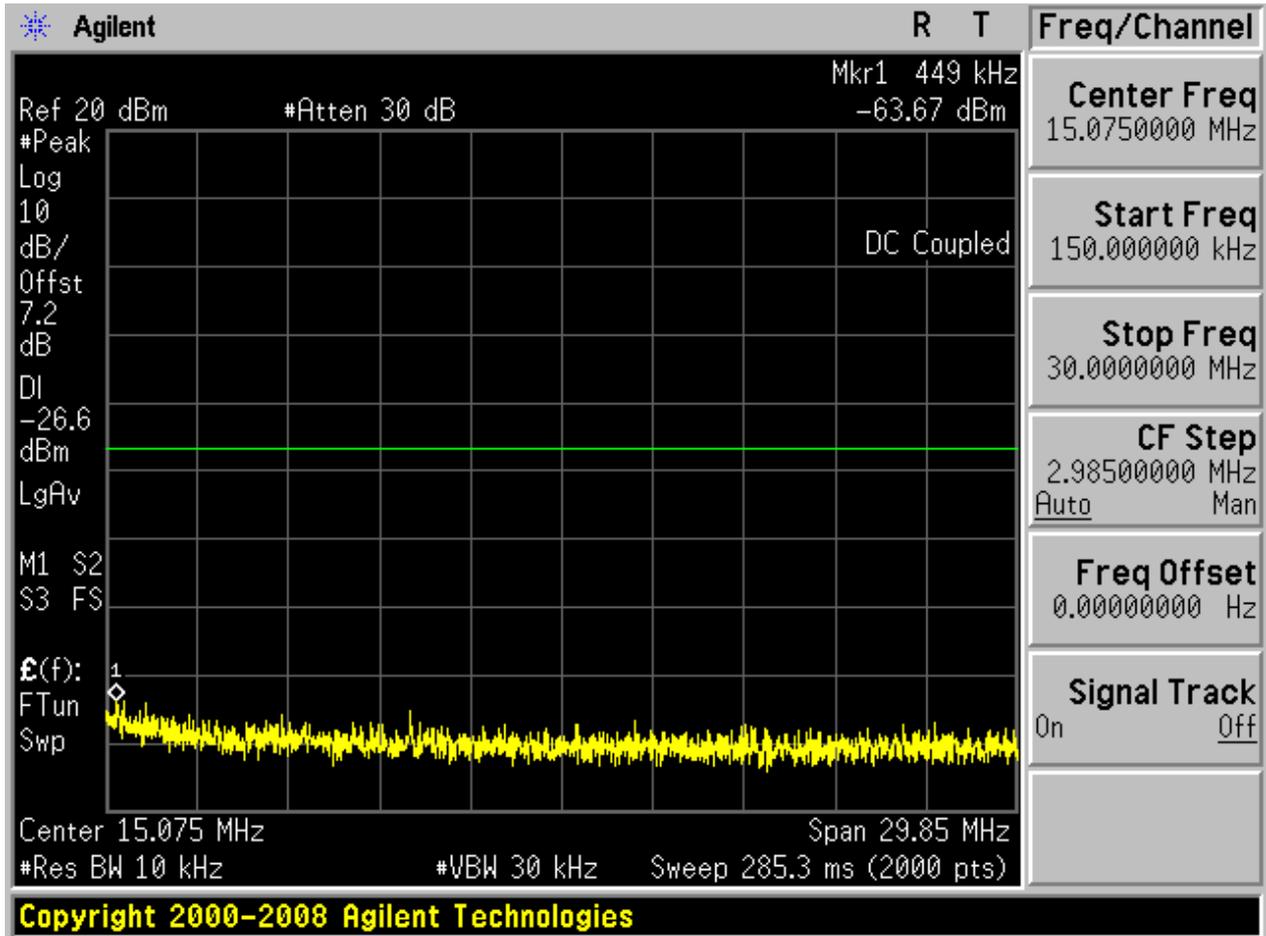
2.7.1 Pref

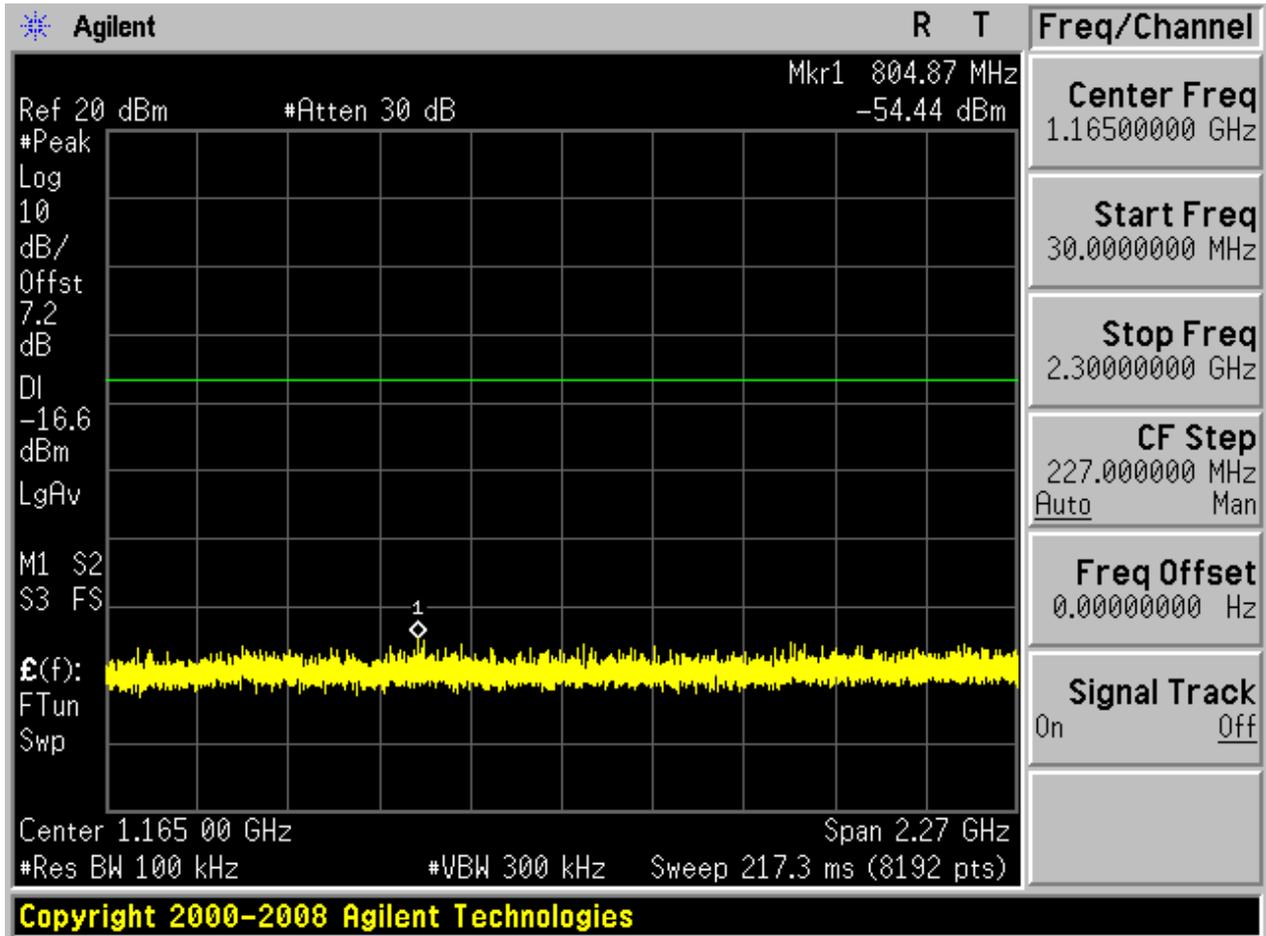


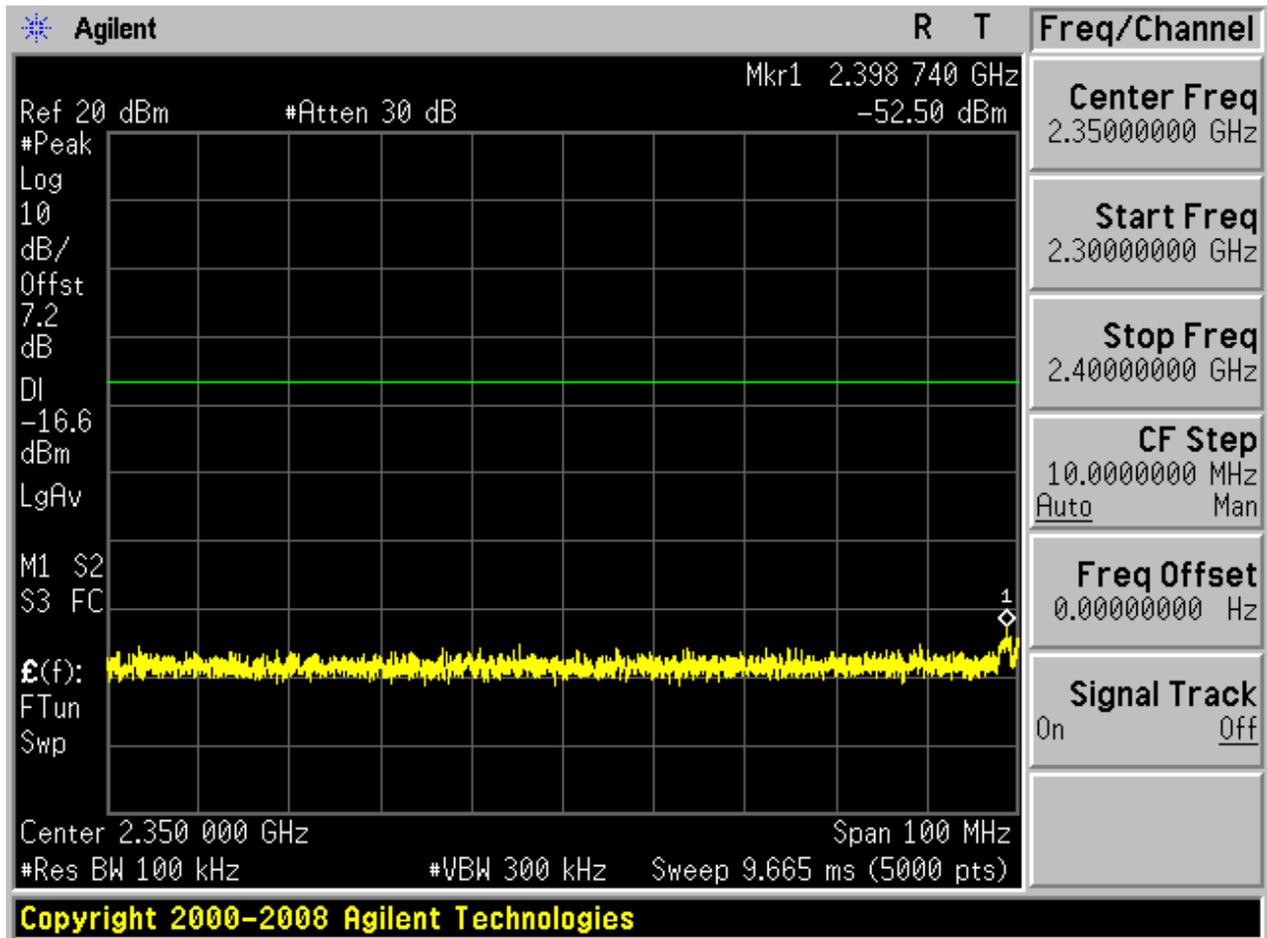


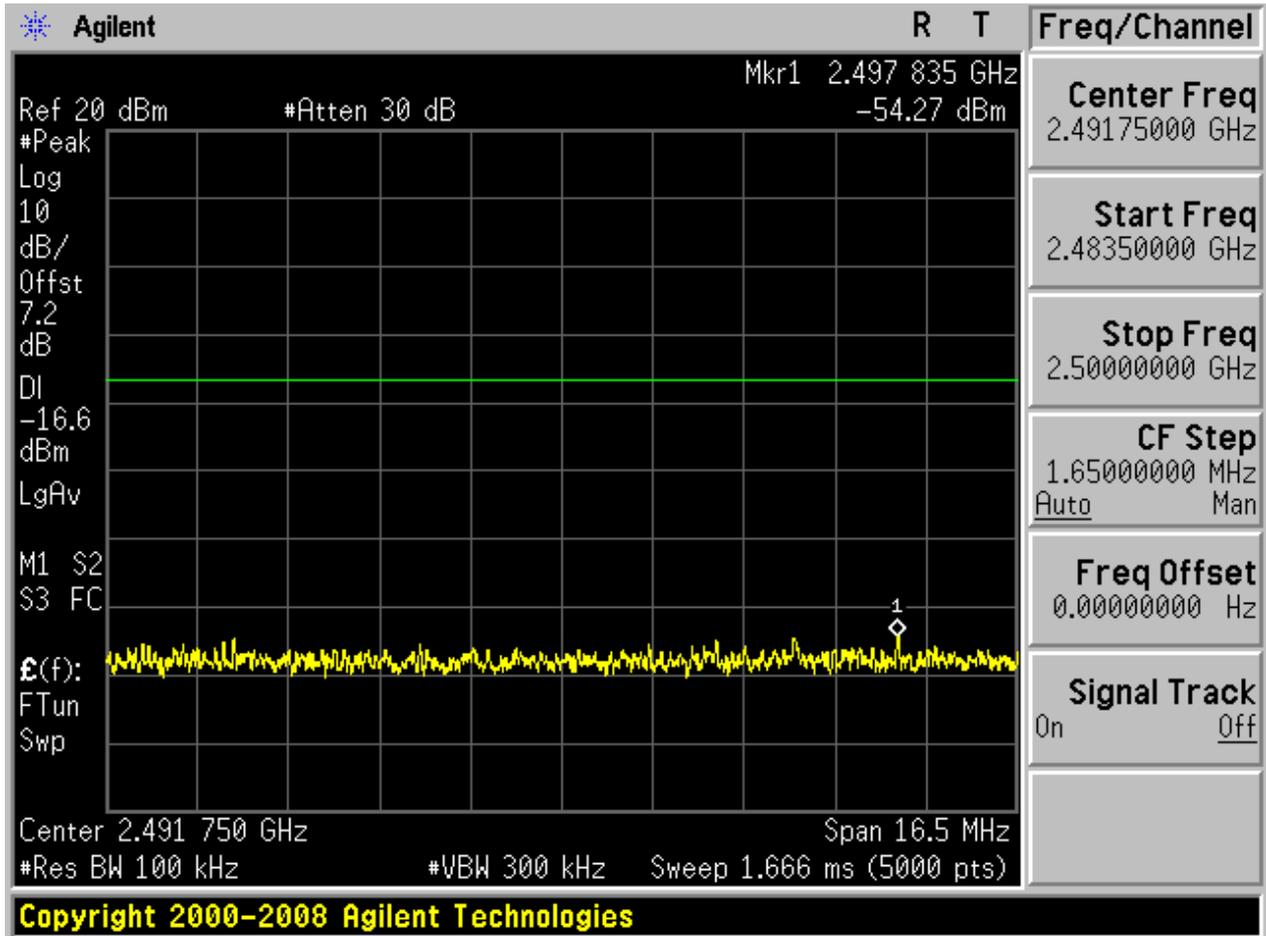
2.7.2 Puw

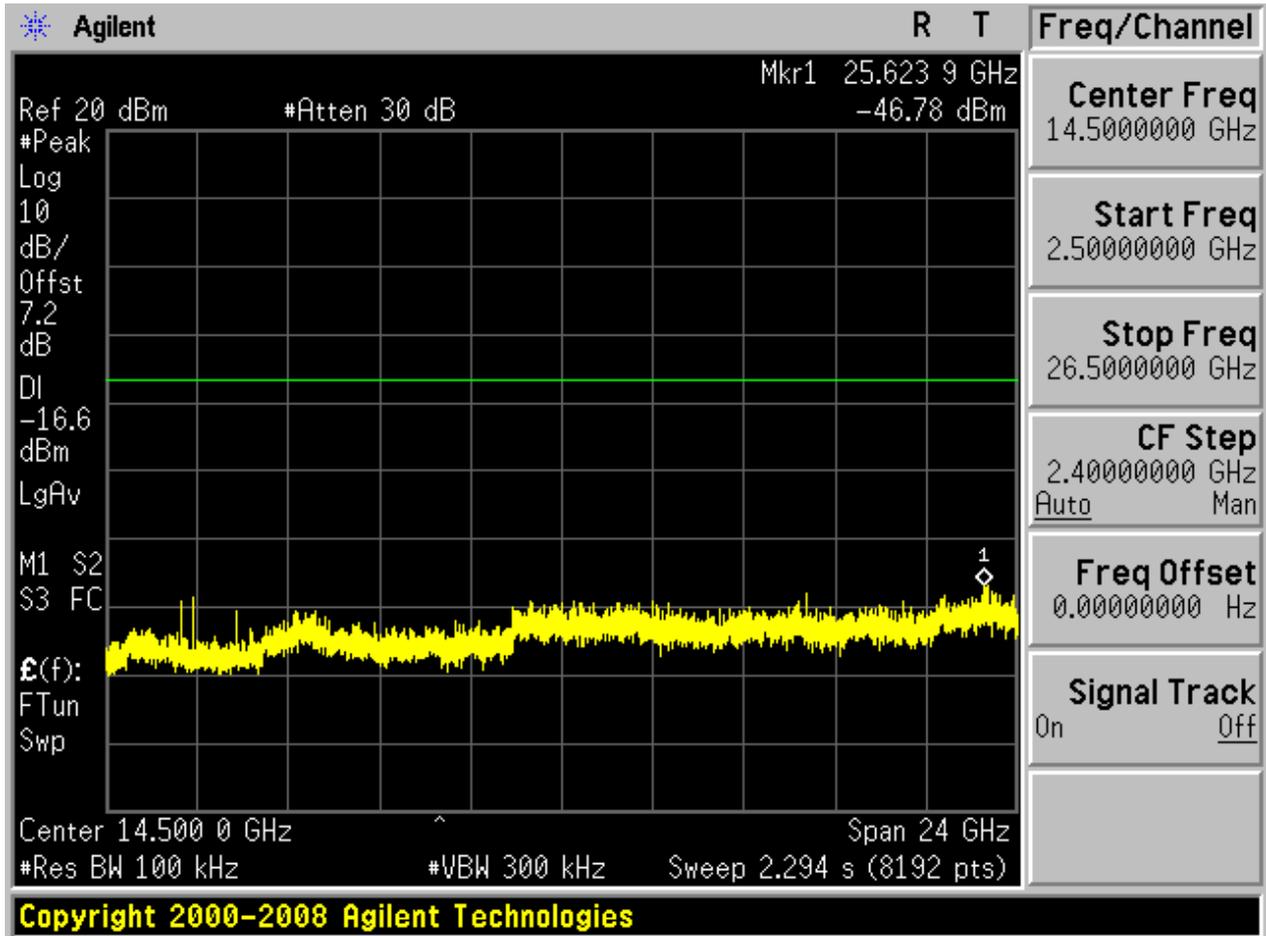






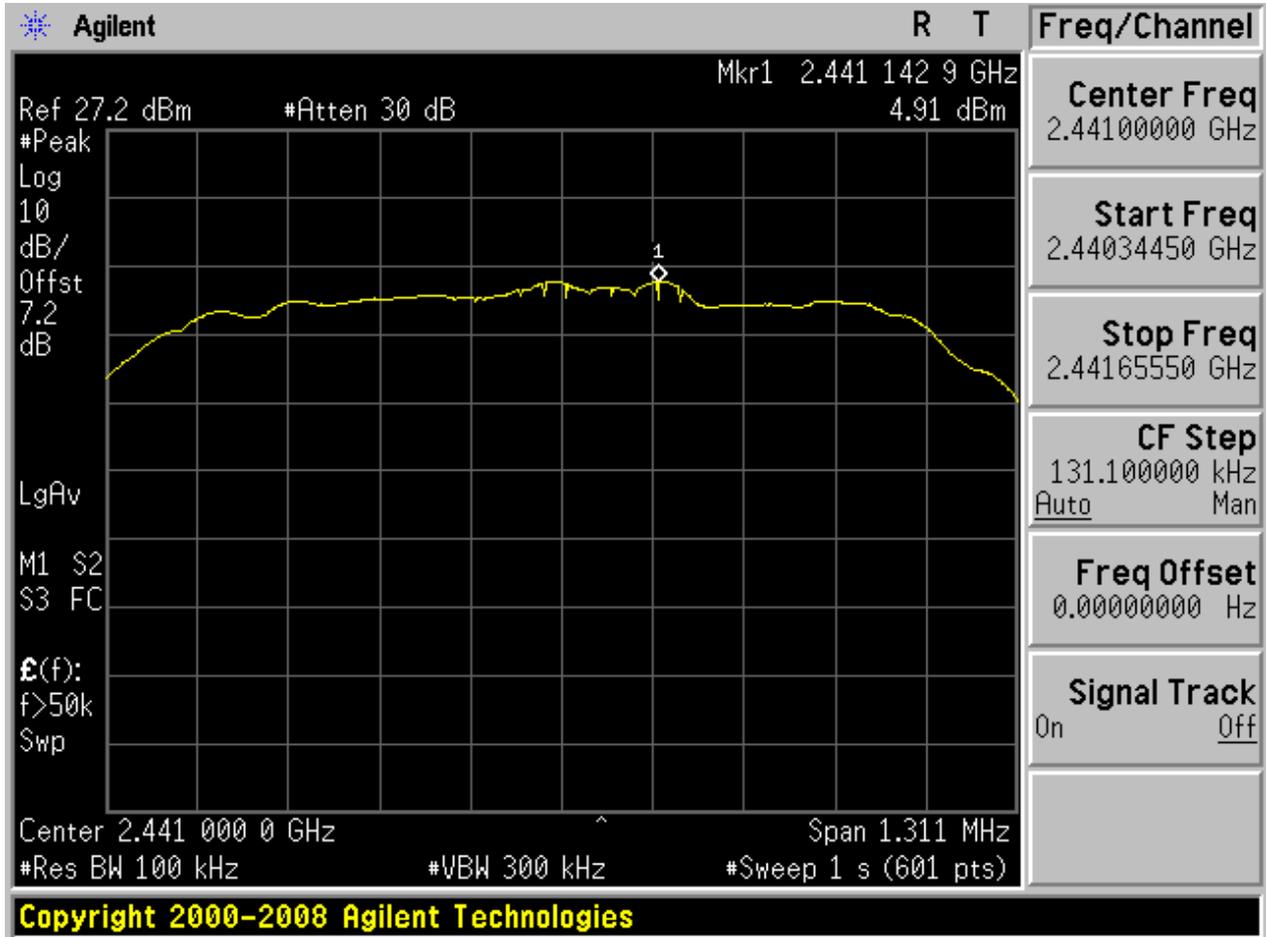






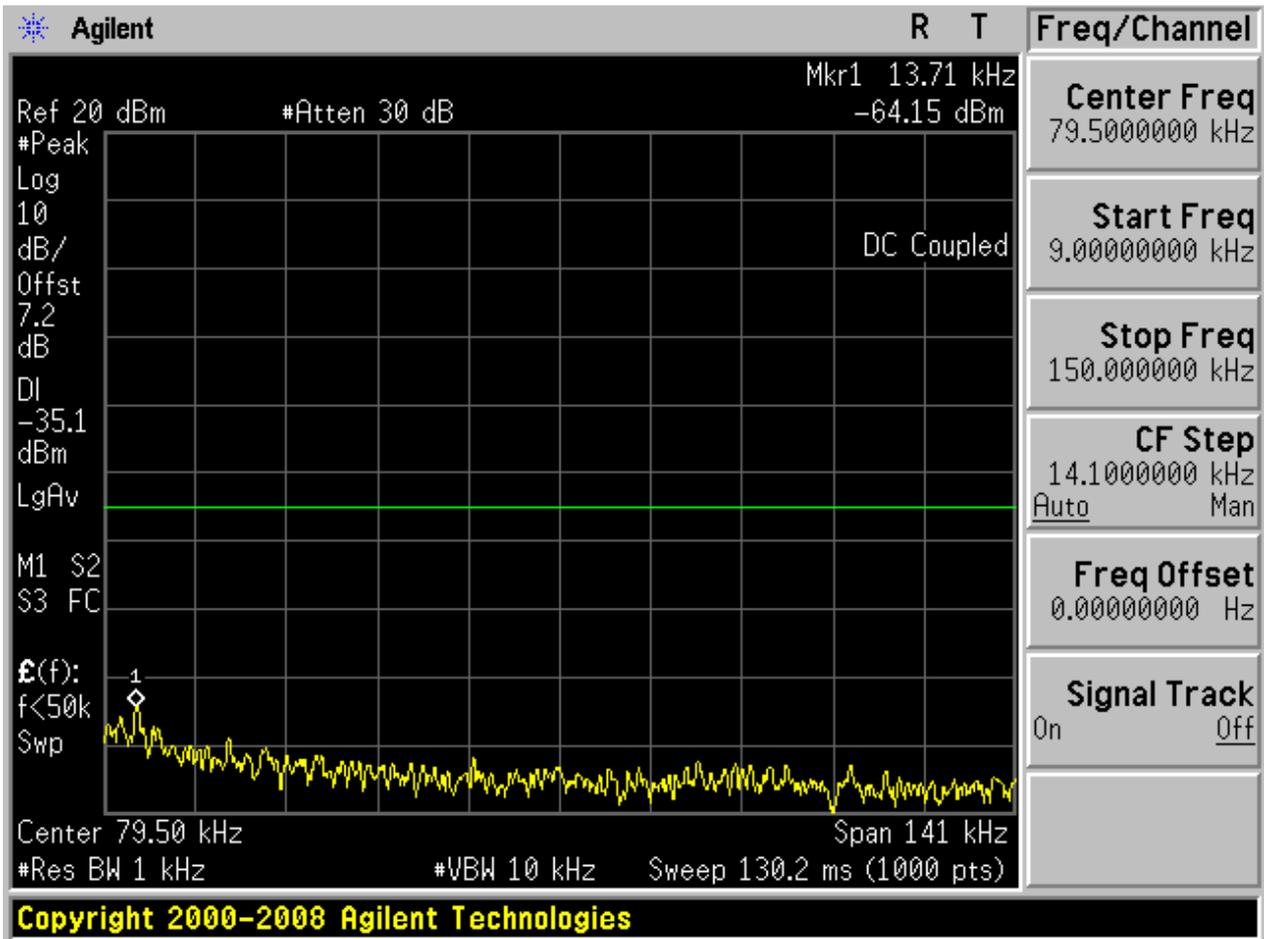
2.8 TM3_3DH5_Ch39

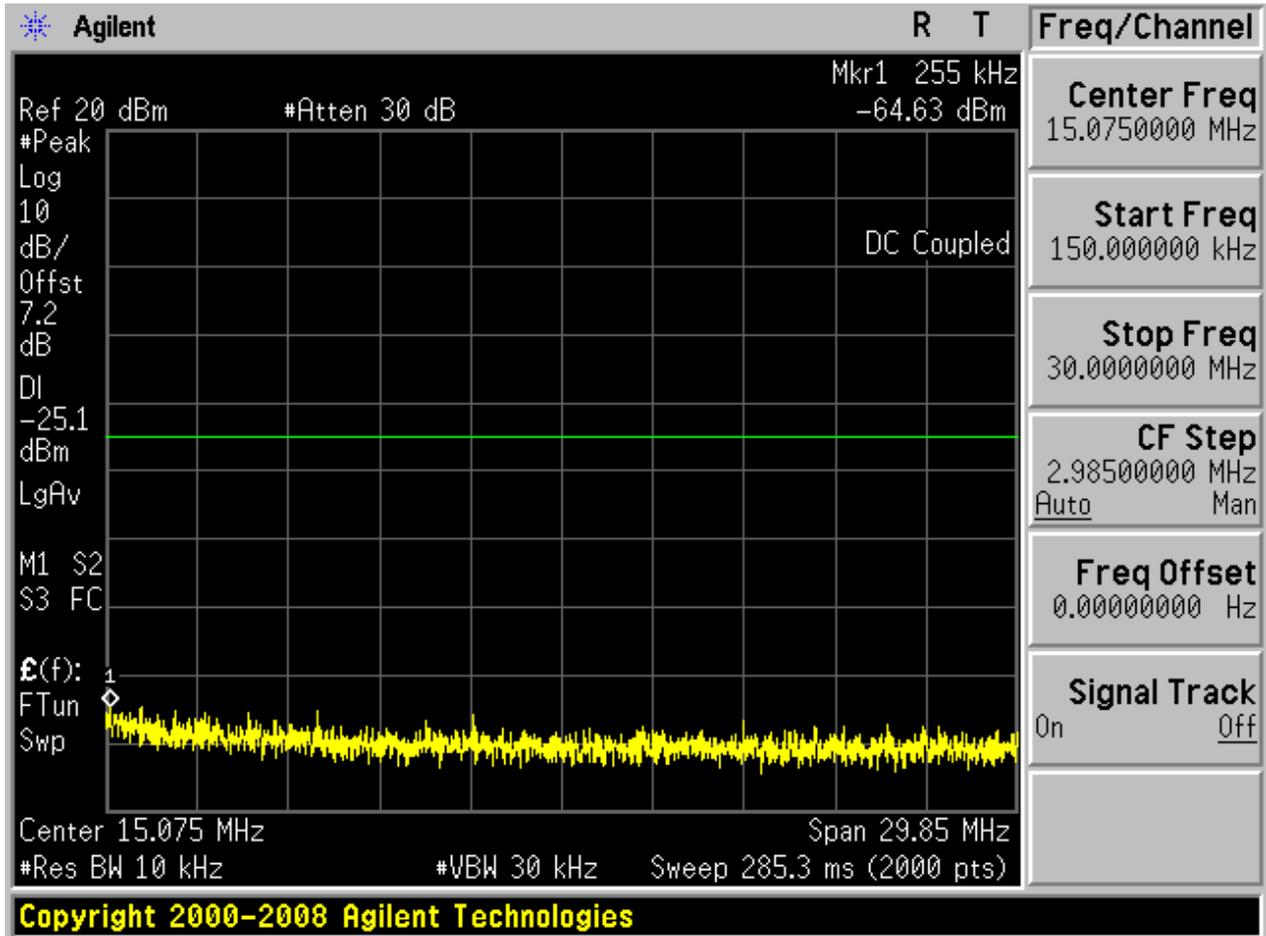
2.8.1 Pref

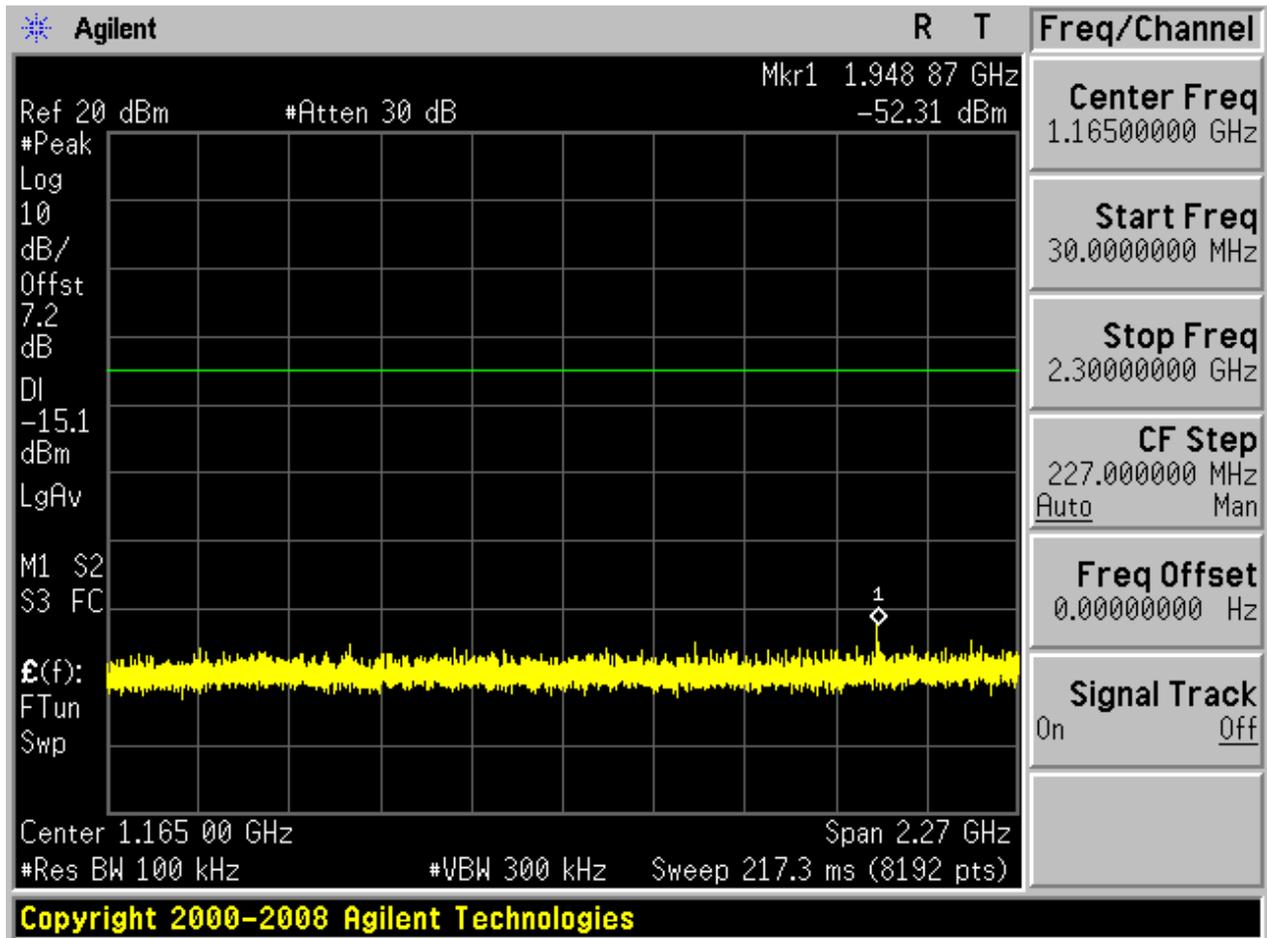


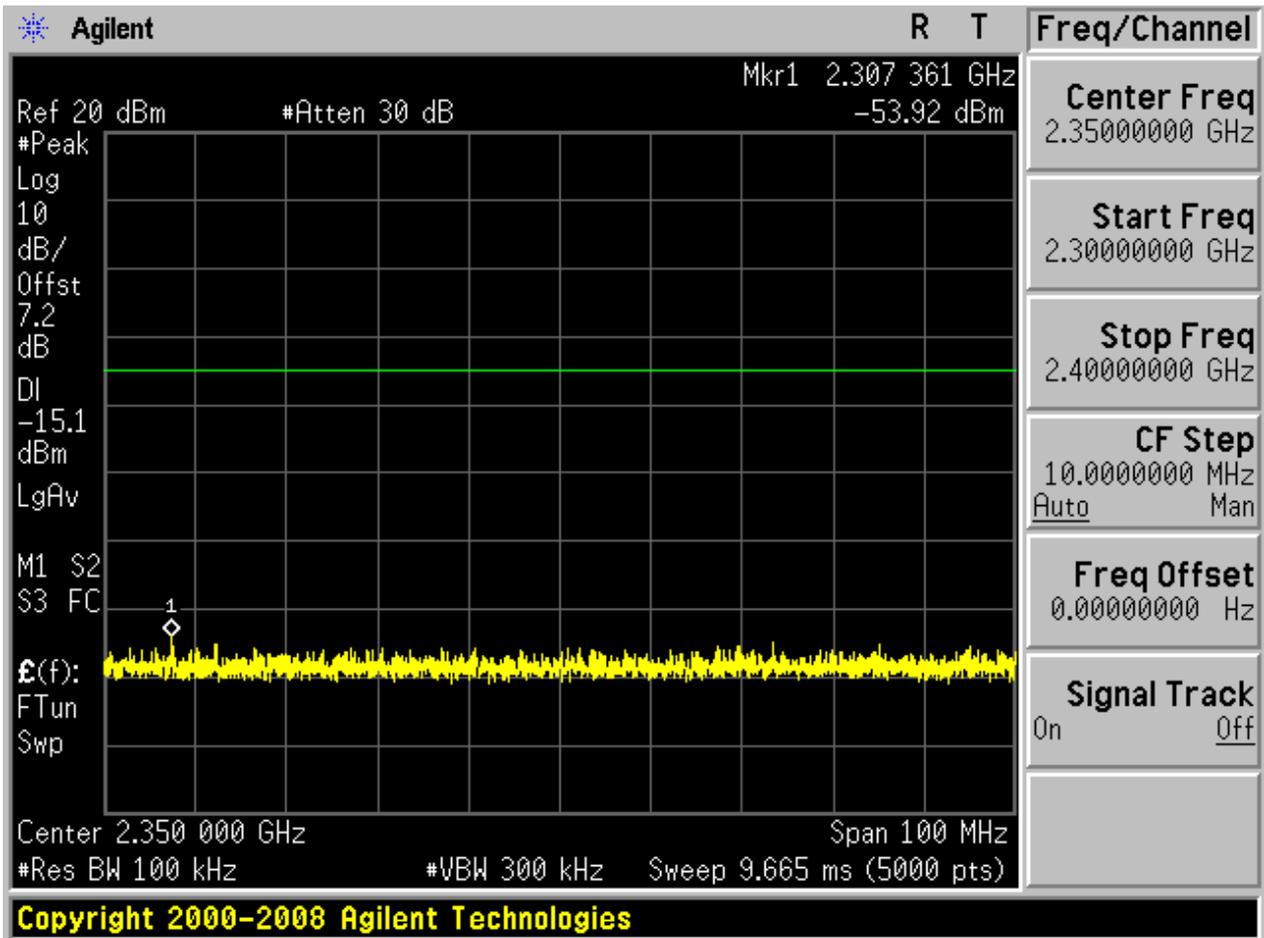


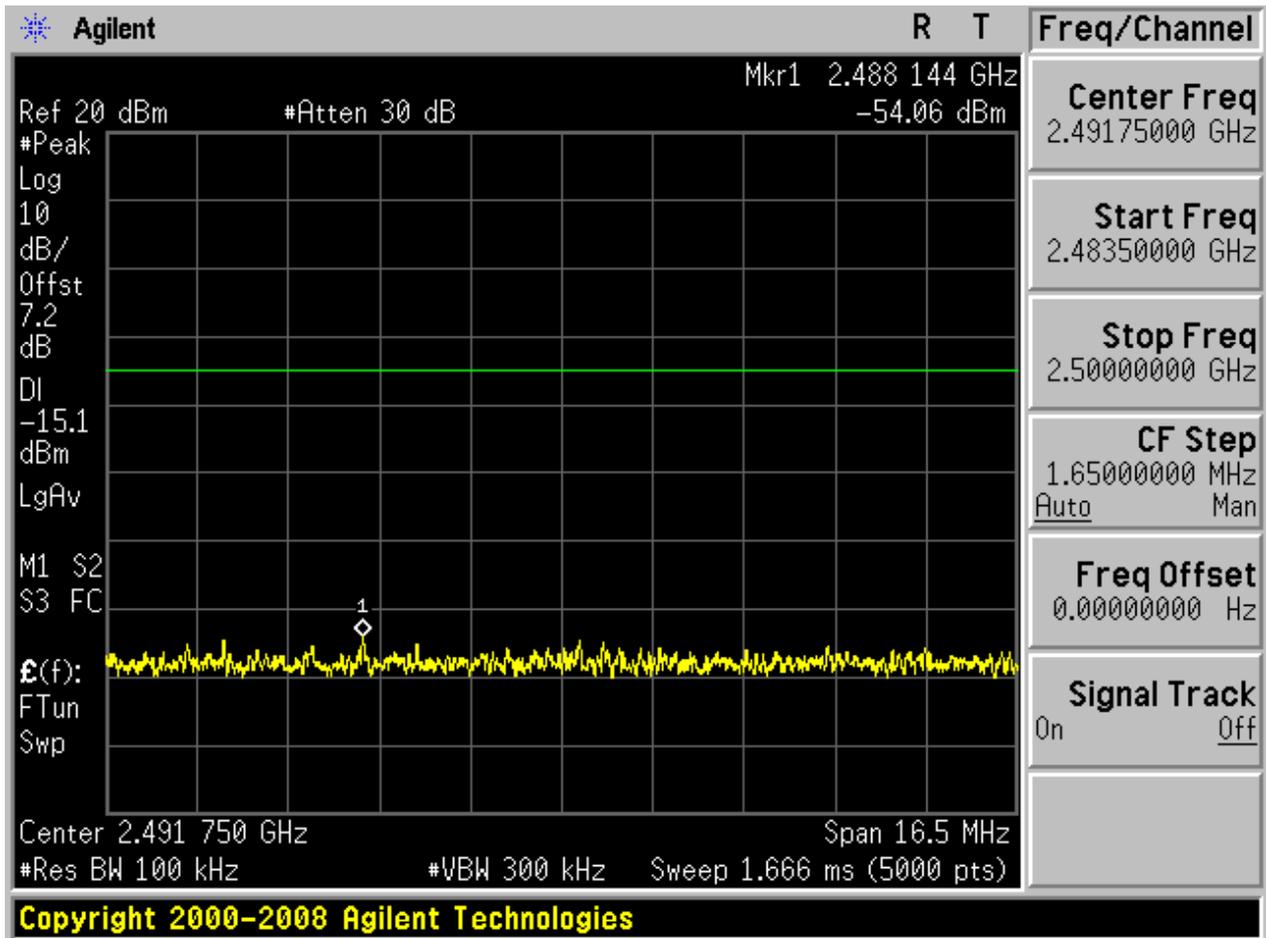
2.8.2 Puw

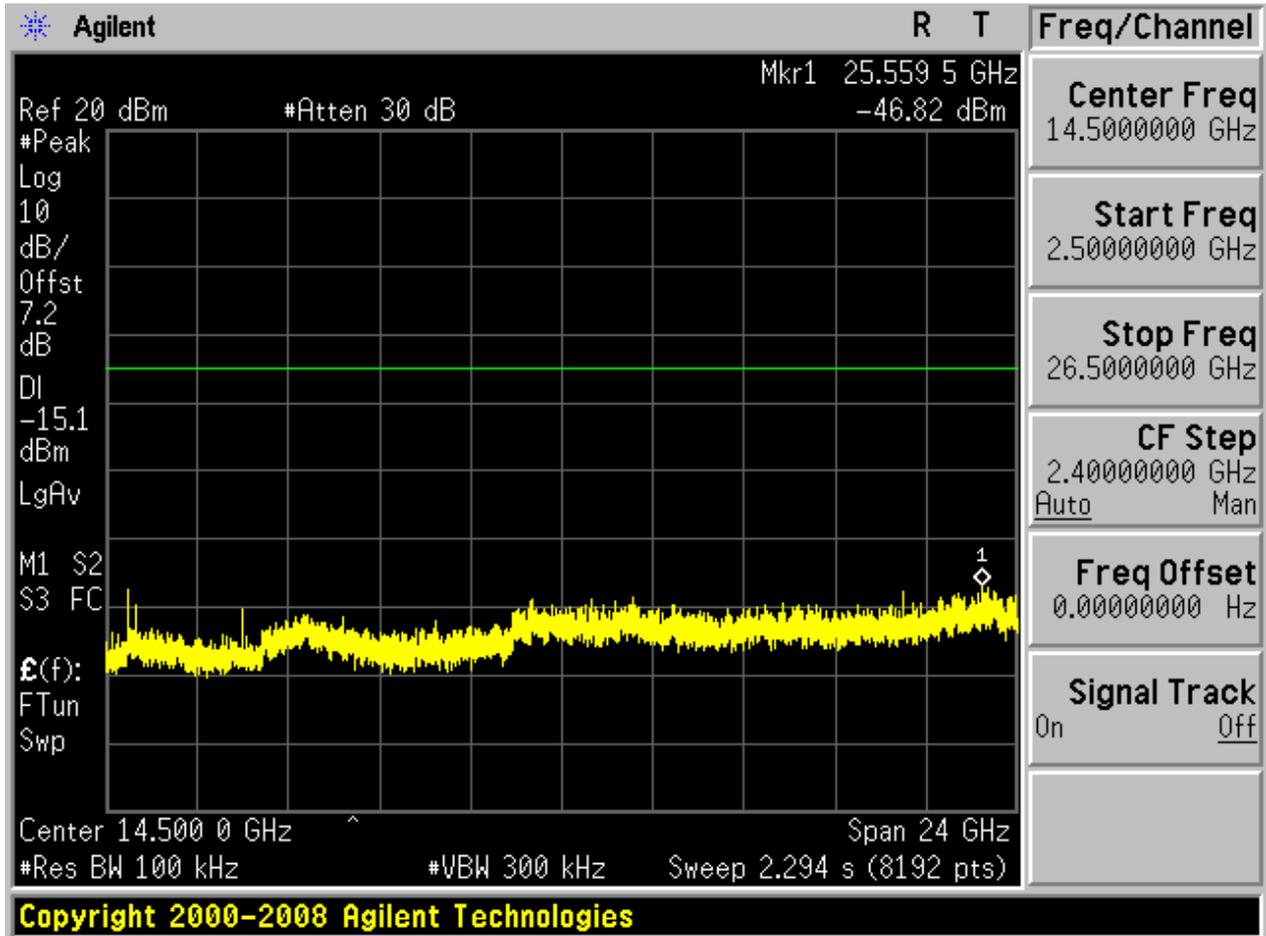






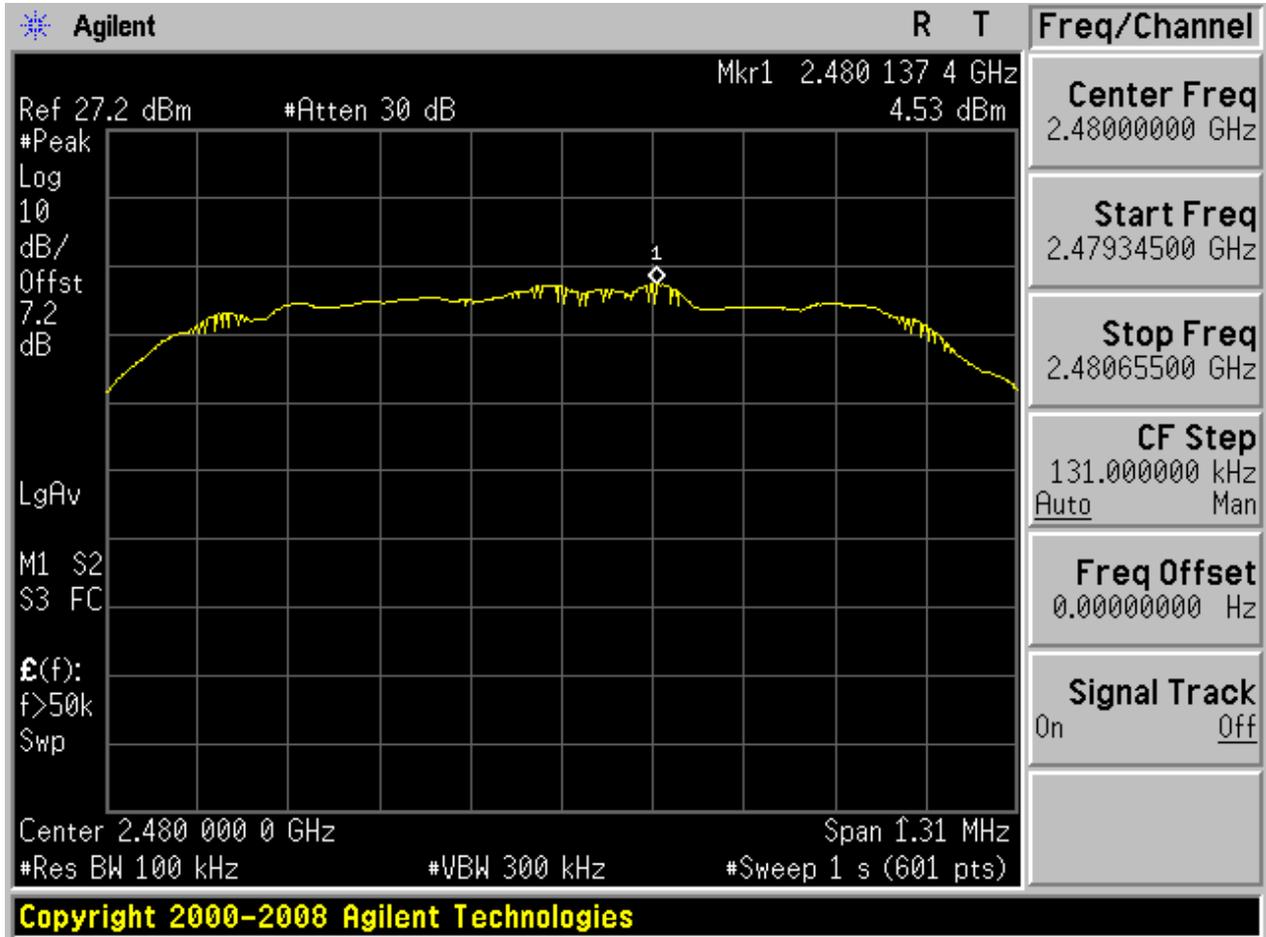




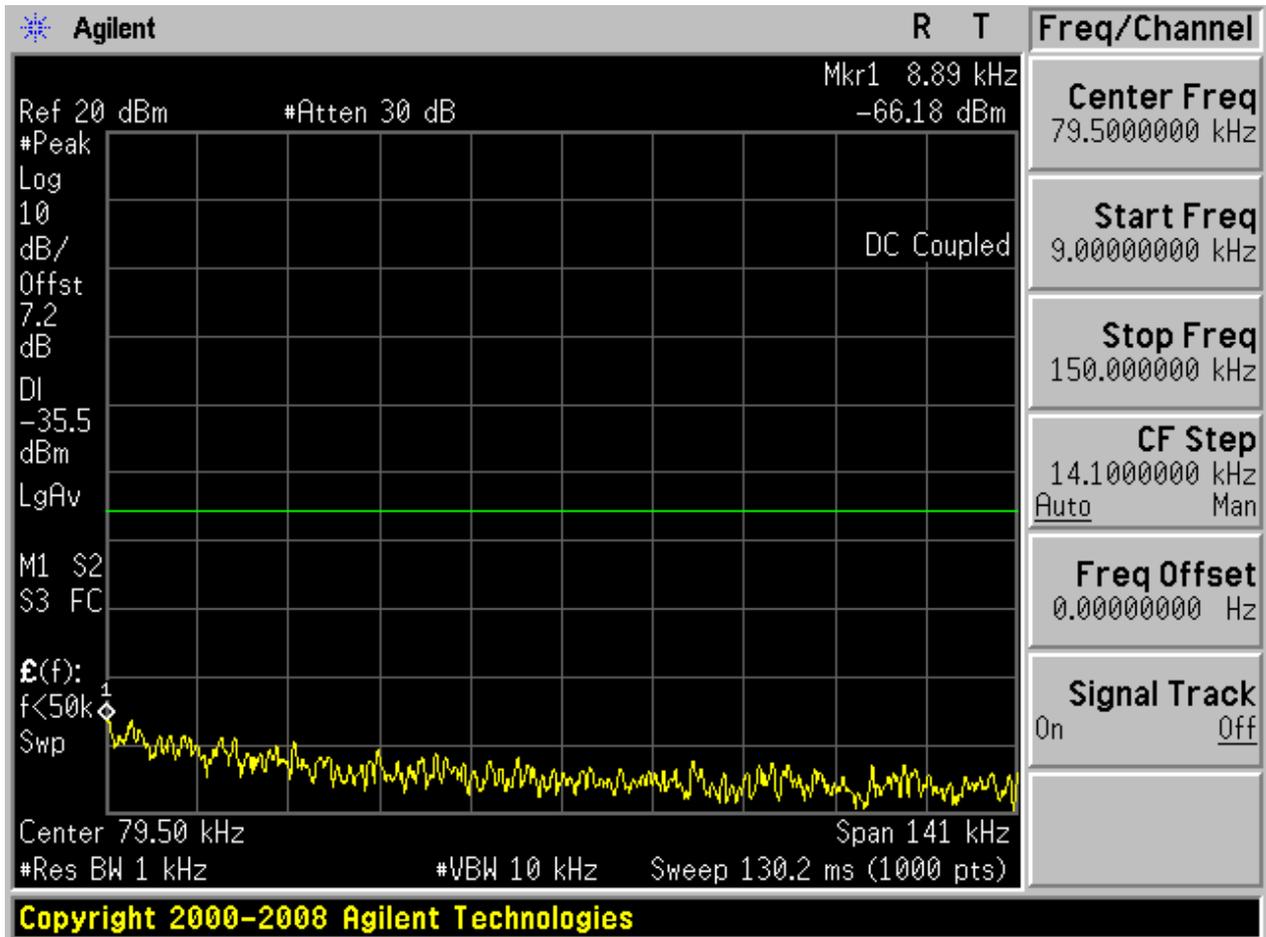


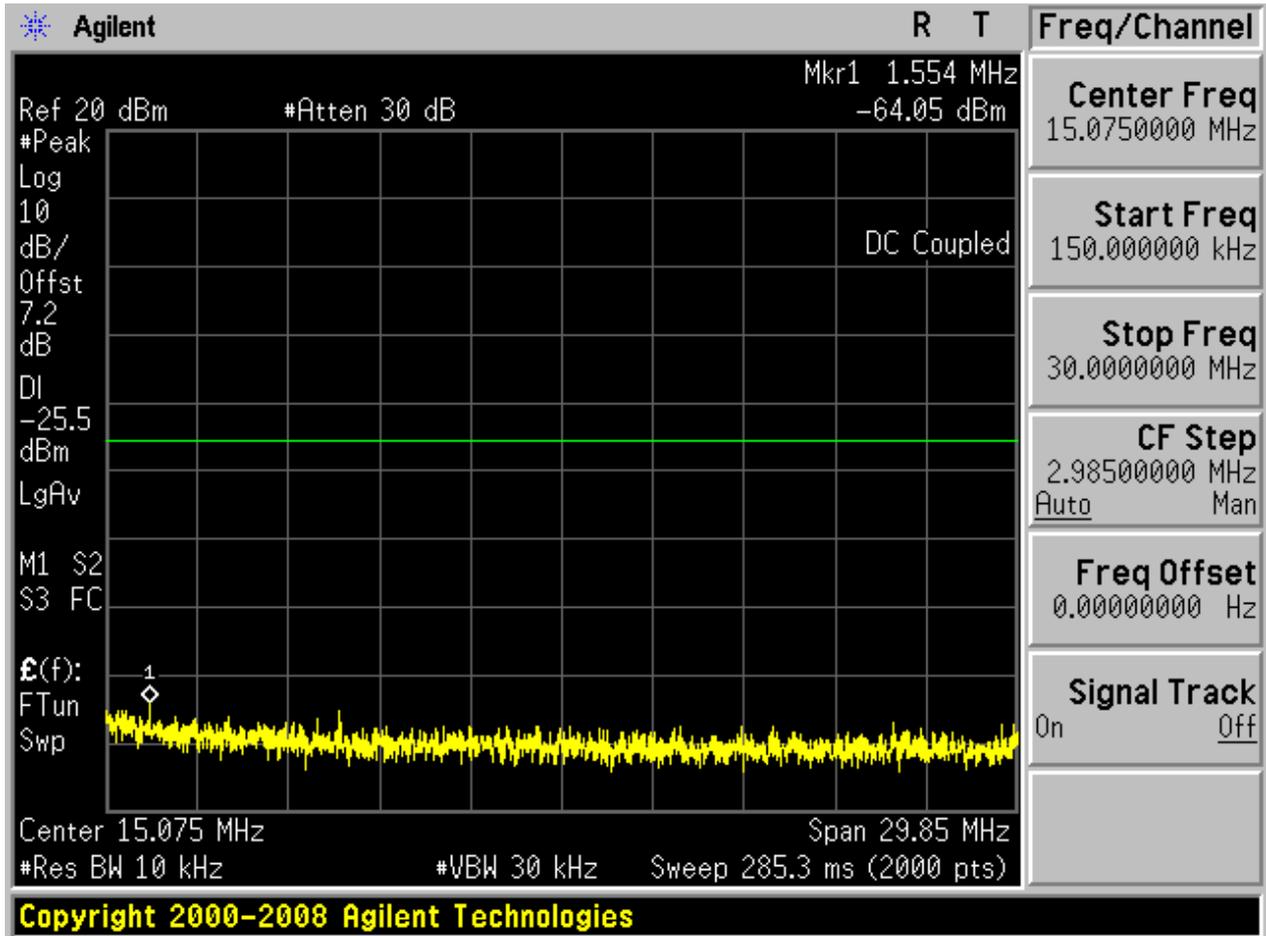
2.9 TM3_3DH5_Ch78

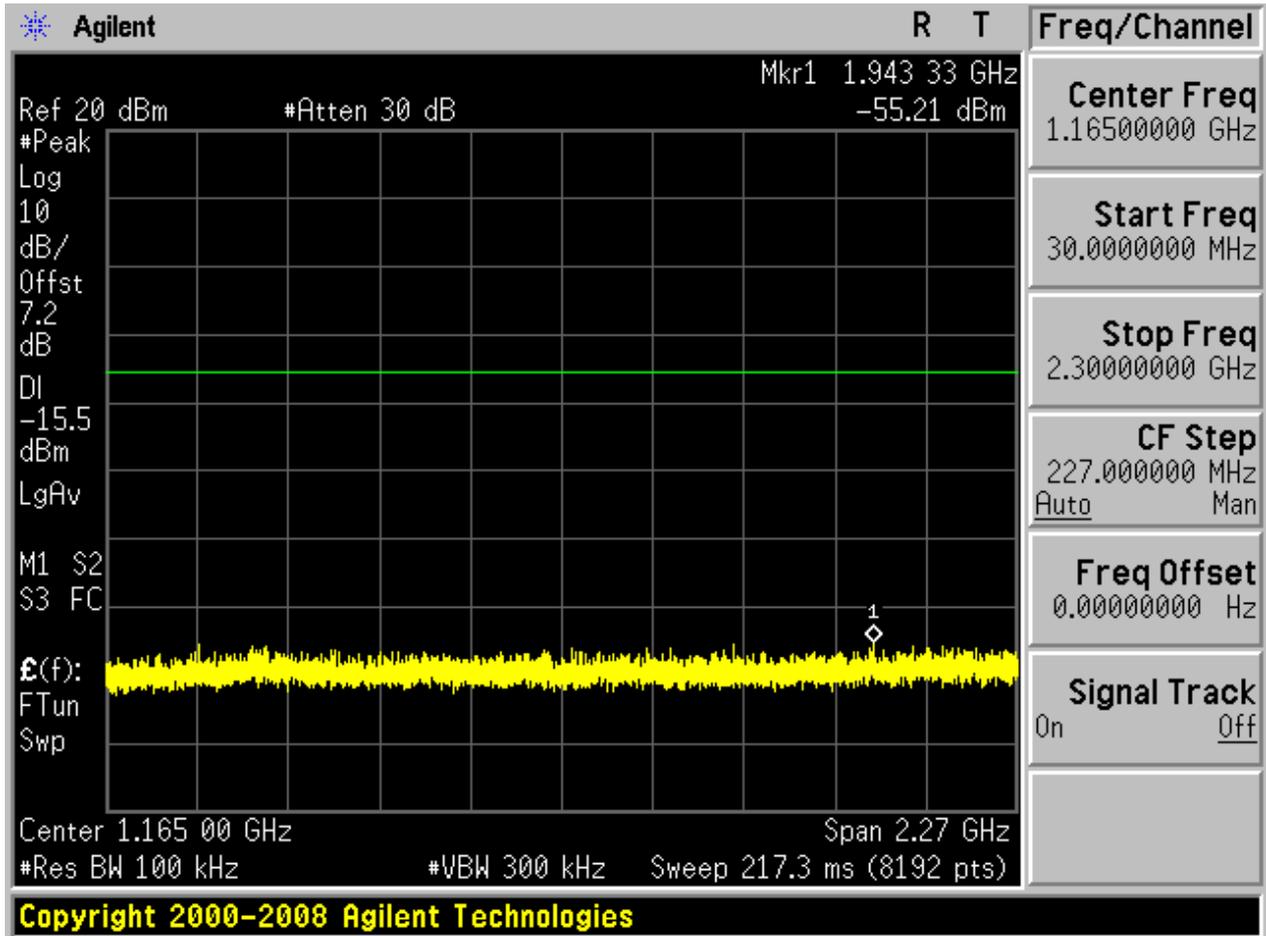
2.9.1 Pref

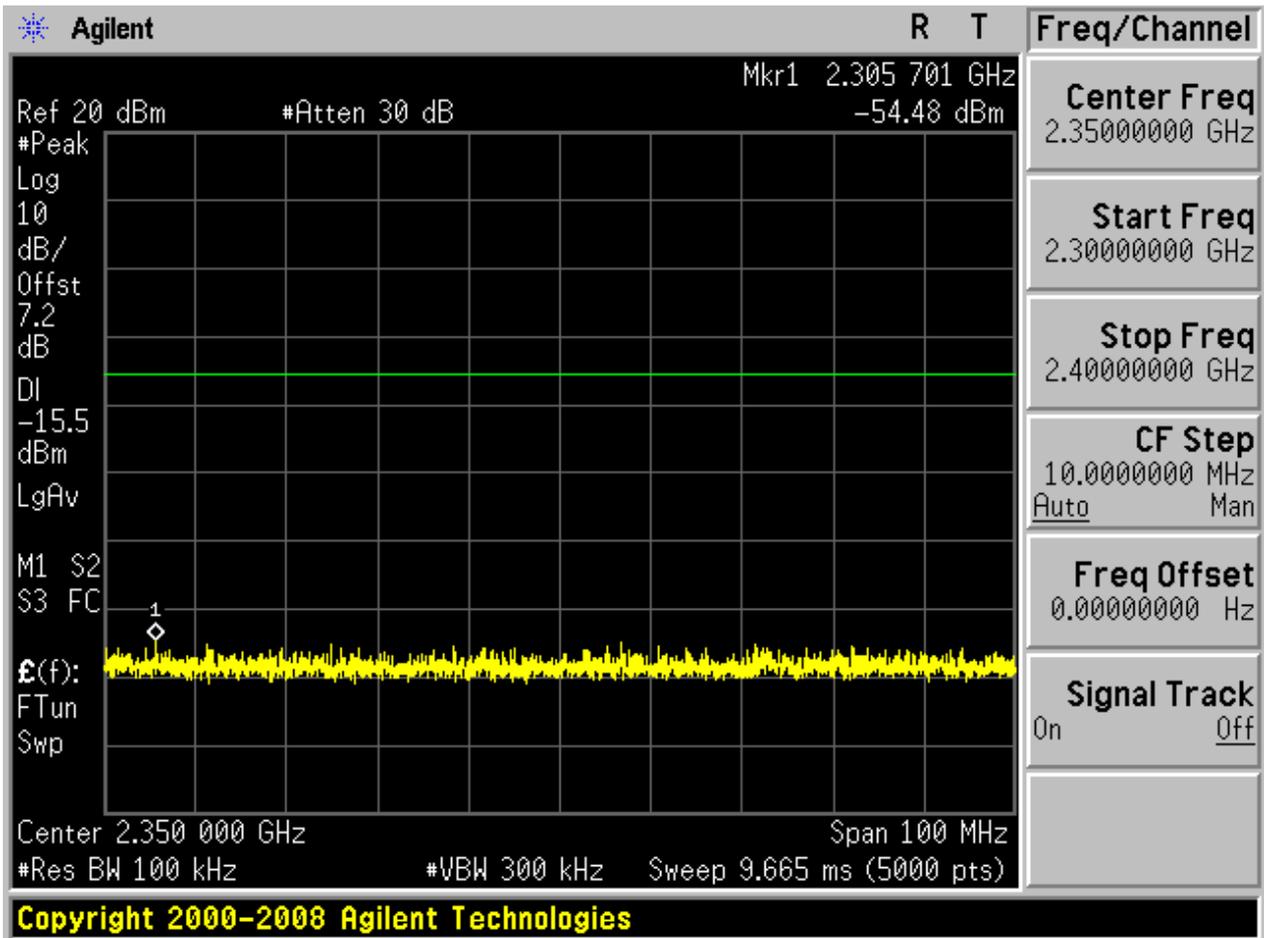


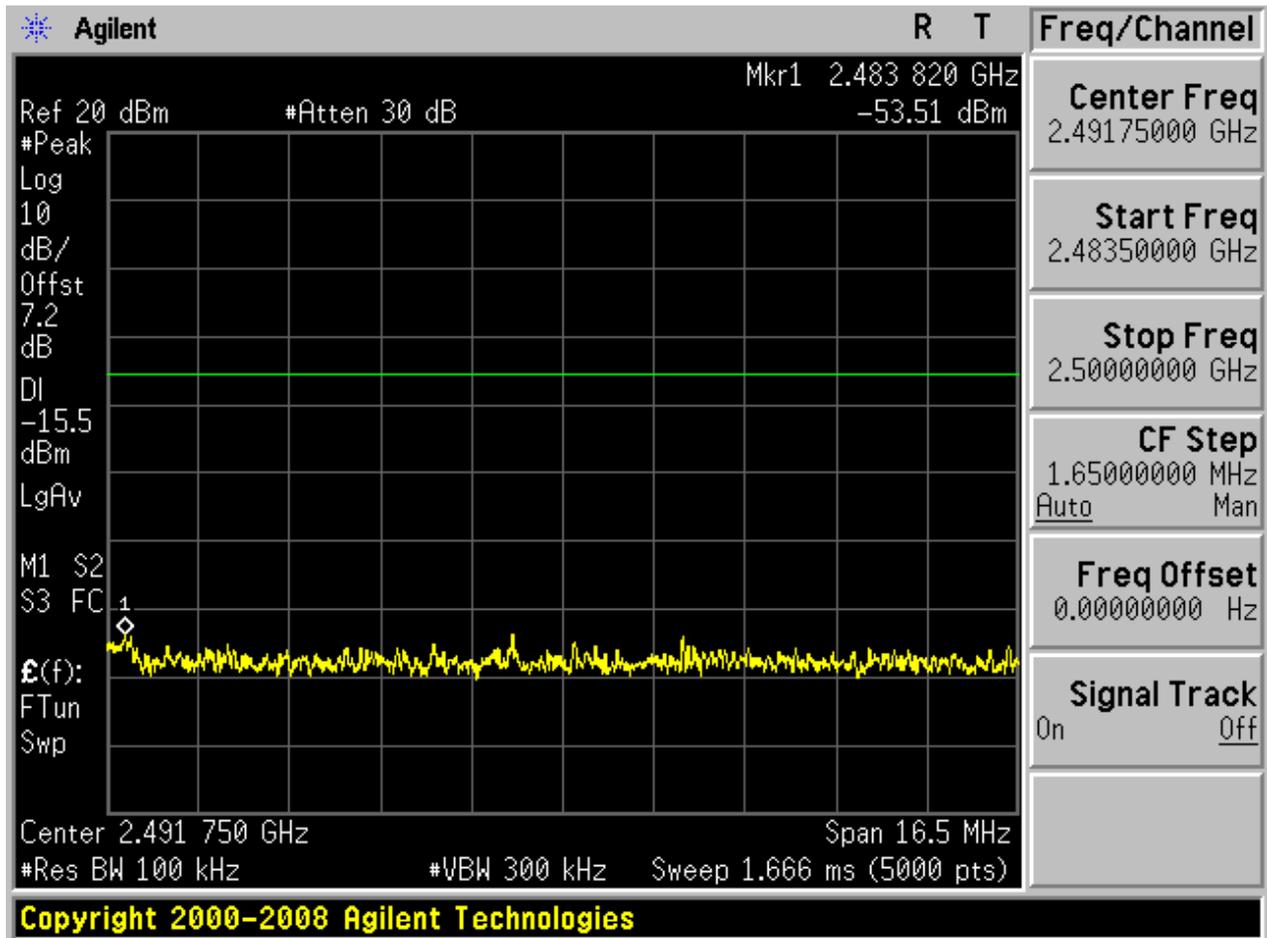
2.9.2 P_{uw}

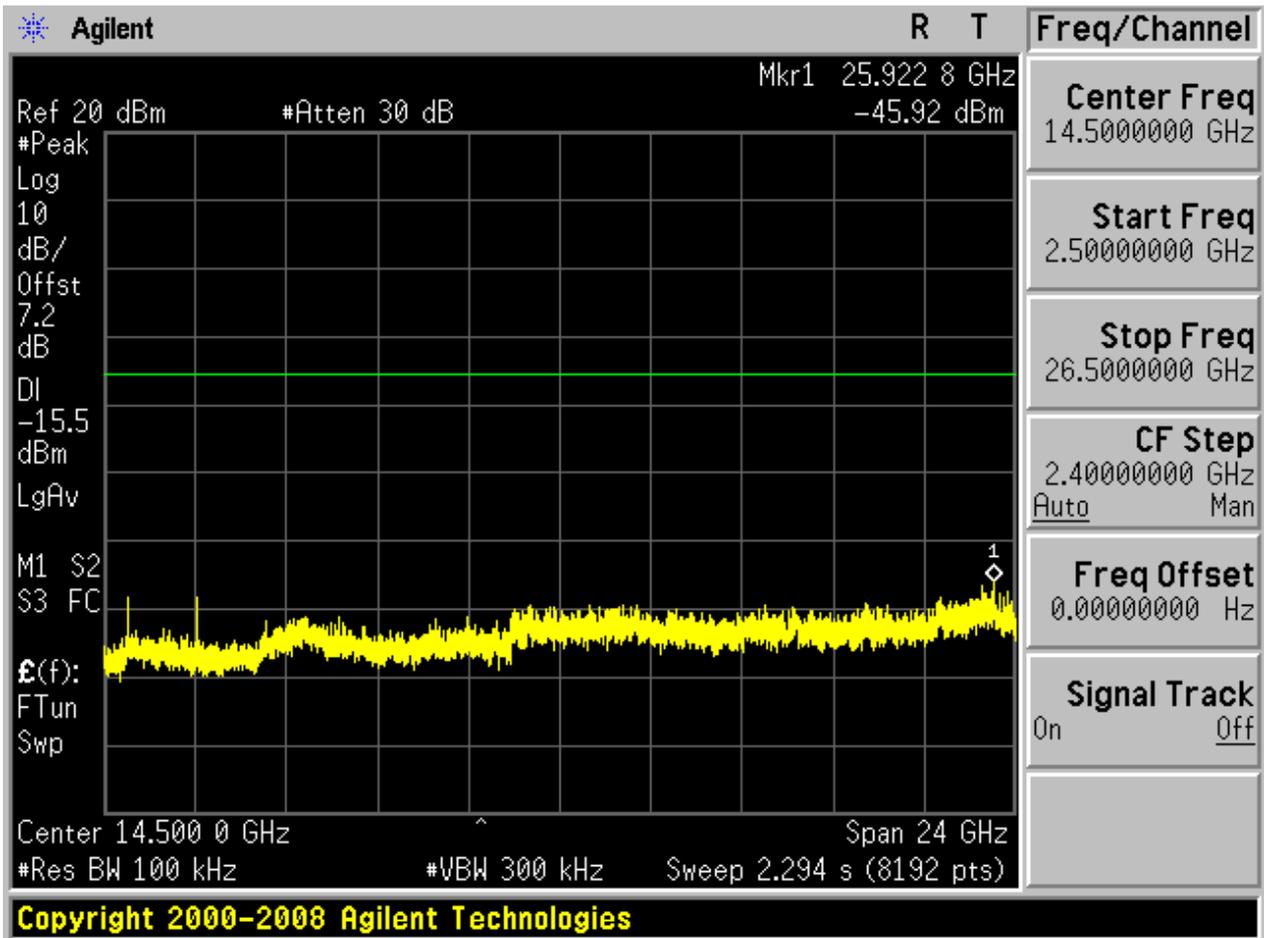








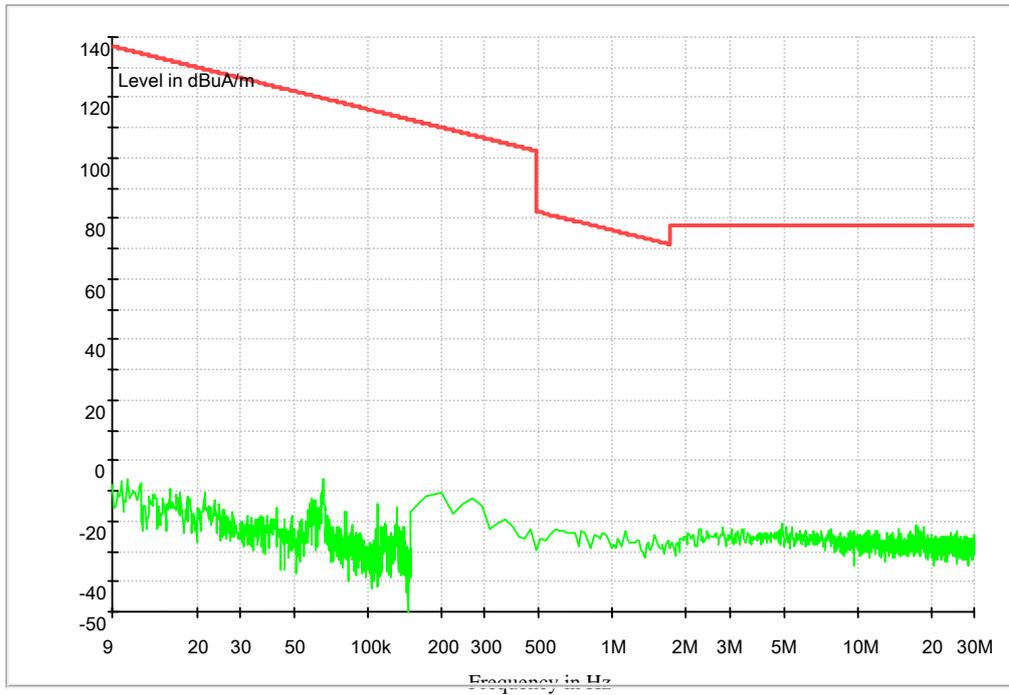






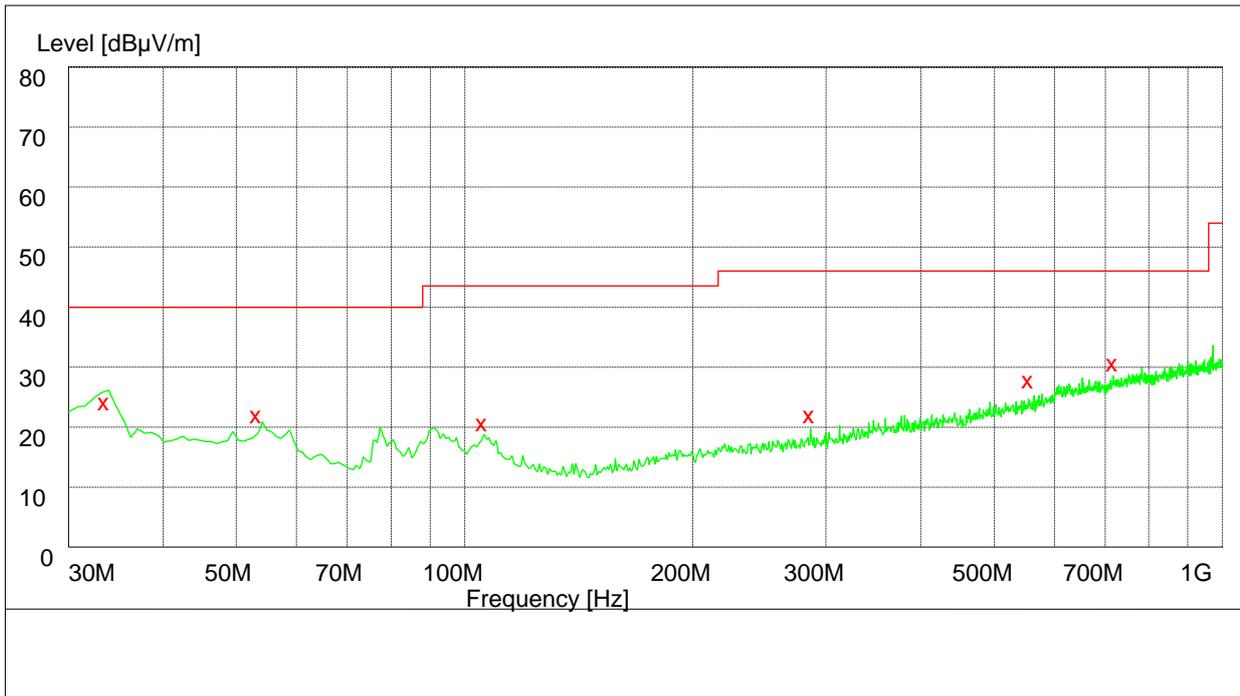
Appendix H: Radiated Emissions in the Restricted Bands

Part 1: Testing Range of “9 KHz to 30 MHz”



Part 2: Testing Range of “30 MHz to 1 GHz”

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

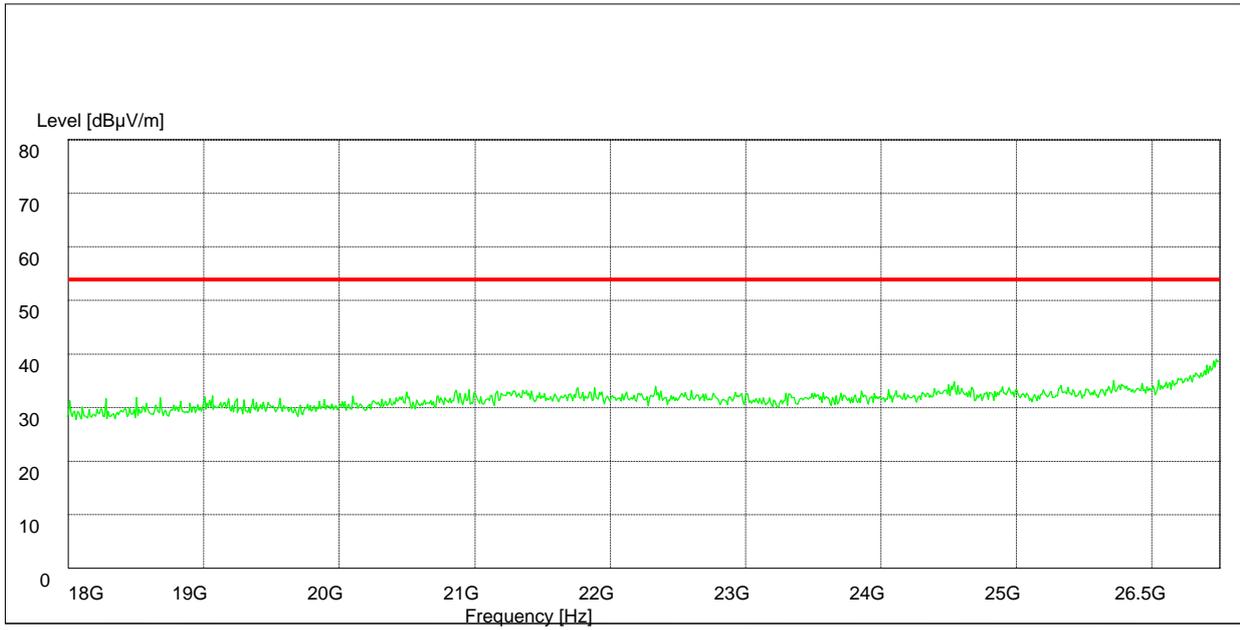




Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Plarization
33.540000	24.00	14.9	40.0	16.0	100.0	113.00	VERTICAL
53.280000	21.70	14.8	40.0	18.3	100.0	329.00	VERTICAL
105.600000	20.50	13.5	43.5	23.0	103.0	129.00	VERTICAL
286.260000	21.70	14.9	46.0	24.3	135.0	42.00	HORIZONTAL
555.420000	27.60	20.1	46.0	18.4	150.0	249.00	VERTICAL
718.380000	30.50	22.7	46.0	15.5	100.0	317.00	HORIZONTAL

Part 3: Testing Range of “18 GHz to 26.5 GHz”

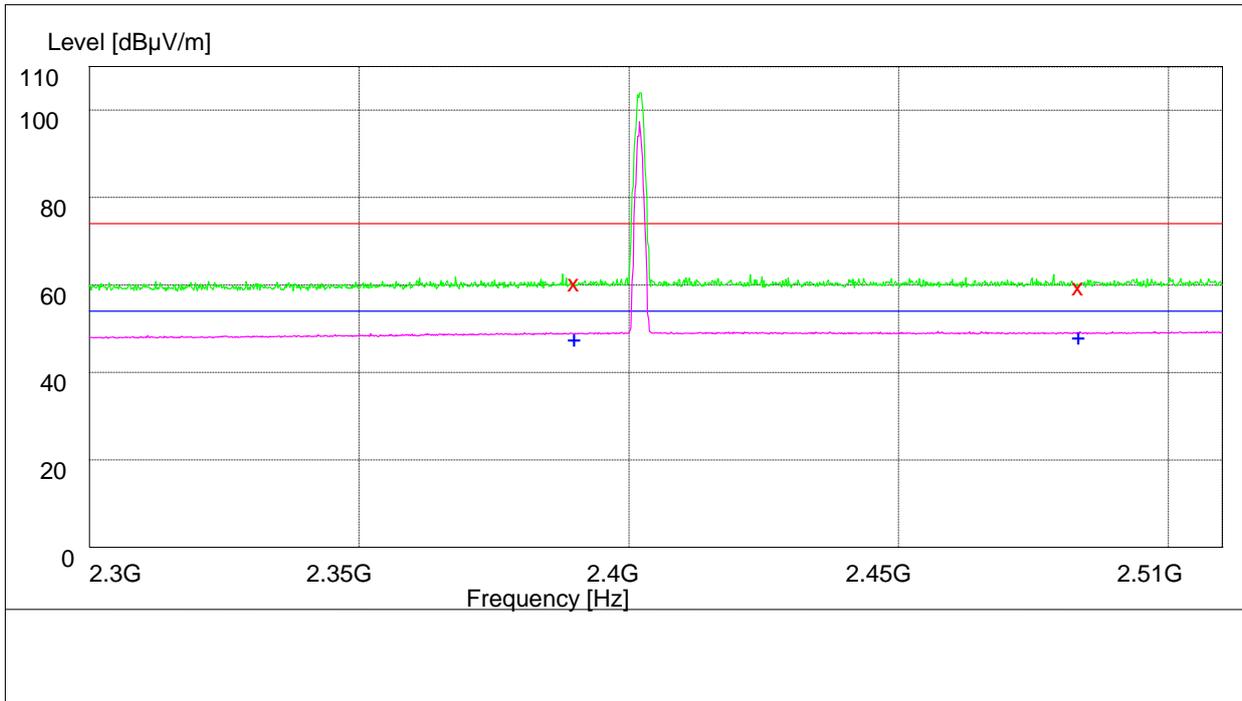
Note: No peak found in pre- test.



Part 4: Testing Range of “2.3GHz to 2.5GHz”

- Note 1: The testing range of “2.3 GHz to 2.5 GHz” is for checking radiated emissions located in restricted bands near the EUT operating bands.
- Note 2: Two limits are required in the testing range above 1 GHz, that is Peak limit (74 dB μ V/m) and Average Limit (54 dB μ V/m).
- Note 3: The peak spike exceeds the limit line is EUT’s operating frequency.

Test Mode:
Channel 00



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

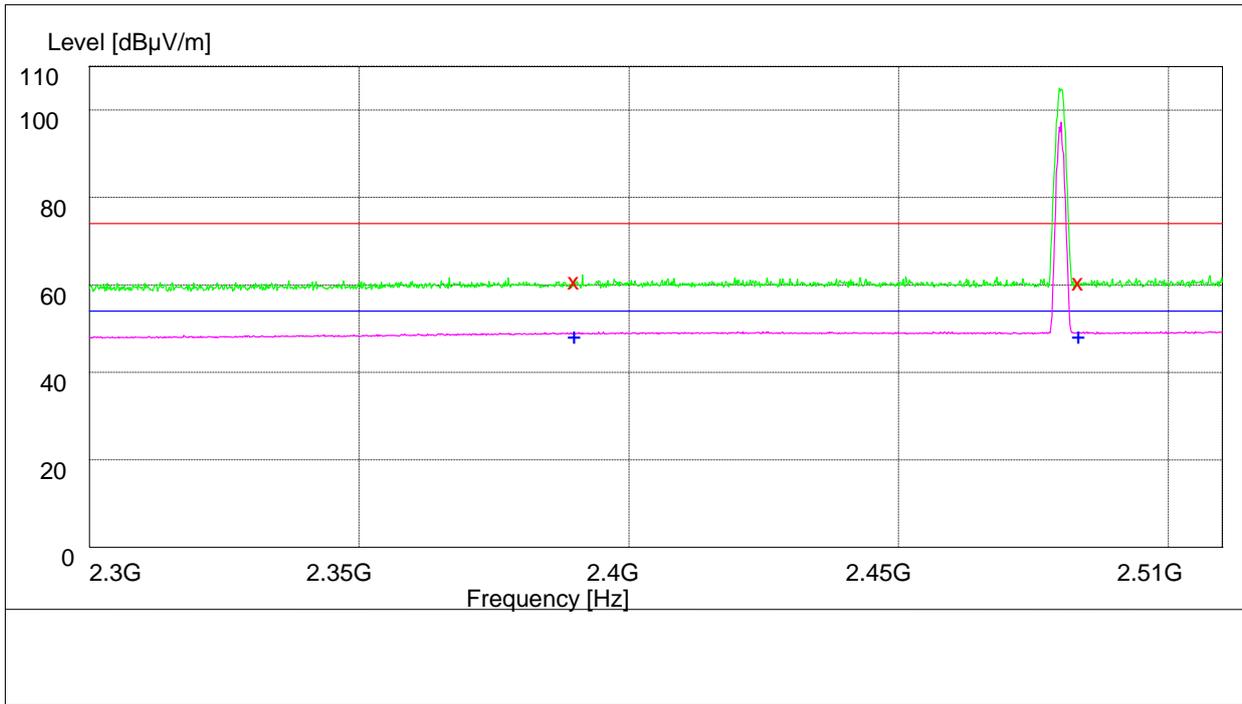
MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	61.00	34.8	74.0	13.0	148.0	299.00	VERTICAL
2483.500000	60.00	35.1	74.0	14.0	150.0	340.00	VERTICAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	48.00	34.8	54.0	6.0	100.0	238.00	HORIZONTAL
2483.500000	48.50	35.1	54.0	5.5	150.0	30.00	HORIZONTAL

Channel 78



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

MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	61.30	34.8	74.0	12.7	123.0	340.00	VERTICAL
2483.500000	61.00	35.1	74.0	13.0	100.0	245.00	HORIZONTAL

MEASUREMENT RESULT: AVDetector

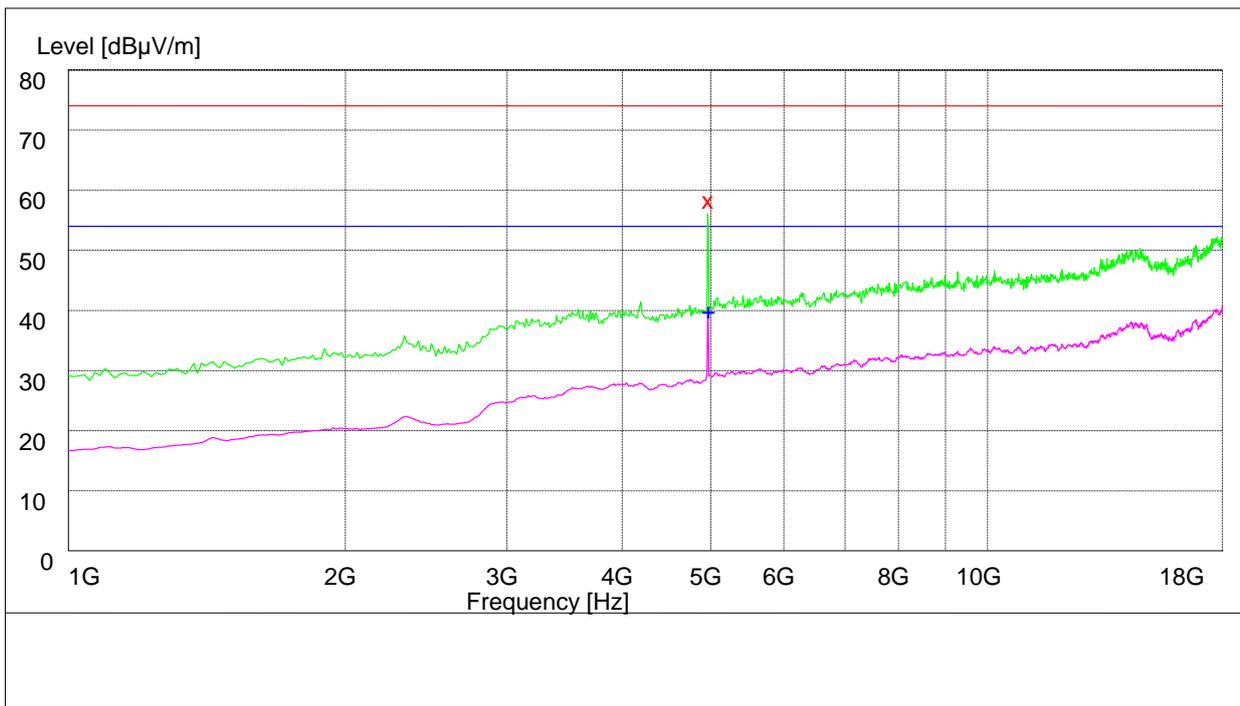
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	48.80	34.8	54.0	5.2	144.0	30.00	HORIZONTAL
2483.500000	48.70	35.1	54.0	5.3	140.0	359.00	HORIZONTAL

Part 5: Testing Range of “1 GHz to 18 GHz”

Note 1: The test results and plot for testing range of “1 GHz to 18 GHz” showed as below is the WORST case for all Test Modes and Channels. This range will not be presented for each Test Mode and each Channel.

Note 2: The testing range of “1 GHz to 18 GHz” is for checking radiated emissions located in restricted bands faraway from the EUT operating bands.

Note 3: Two limits are required in the testing range above 1 GHz, that is Peak limit (74 dB μ V/m) and Average Limit (54 dB μ V/m).



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

MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarization
4959.600000	58.4	-1.8	74.0	15.6	103.0	337.00	VERTICAL

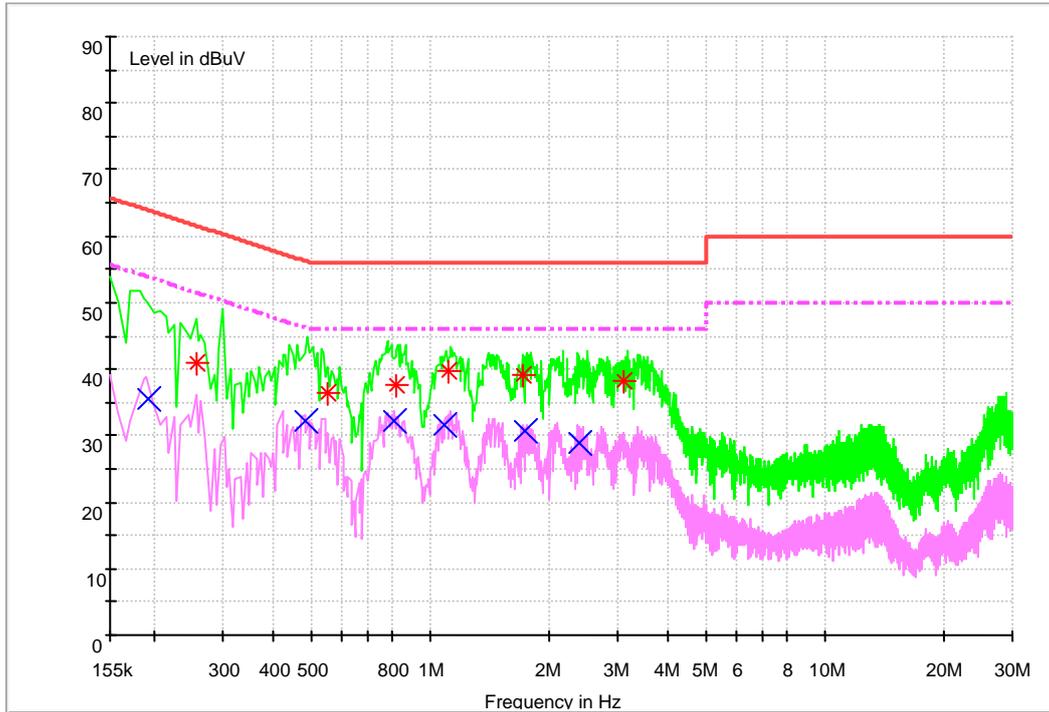
MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarization
4960.100000	40.00	-1.8	54.0	14.0	103.0	338.00	VERTICAL



Appendix I: Conducted Emission at Power Port

Channel 40



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.257586	41.1	9.7	61.5	20.4	L1	FLO
0.552406	36.3	9.7	56.0	19.7	L1	FLO
0.823501	37.5	9.7	56.0	18.5	L1	FLO
1.114284	39.7	9.7	56.0	16.3	N	FLO
1.728682	39.2	9.7	56.0	16.8	N	FLO
3.120922	38.1	9.7	56.0	17.9	L1	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.192974	35.5	9.7	53.9	18.4	N	FLO
0.484130	32.1	9.7	46.3	14.2	N	FLO
0.813904	32.3	9.7	46.0	13.7	N	FLO
1.088670	31.7	9.7	46.0	14.3	N	FLO
1.753043	30.8	9.7	46.0	15.2	N	FLO
2.392488	28.9	9.7	46.0	17.1	N	FLO
3.521453	26.7	9.7	46.0	19.3	L	FLO

END