



FCC&IC

FCC Test Report

Product Name: LTE Wireless Gateway

Model Number: B890-66

Report No: SYBH(Z-RF)004092012-2008
FCC ID: QISB890
IC:6369A-B890

Reliability Laboratory of Huawei Technologies Co., Ltd.

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District,
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2. The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
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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 Test Item: Aug.24, 2012
Start Date of Test: Aug.27, 2012
End Date of Test: Sept.10, 2012
Test Result: Pass

Approved By Senior Engineer Sept.12, 2012 Dai Linjun
Date Name Signature

Reviewed By Sept.12, 2012 Cousy Xu
Date Name Signature

Operated By Sept.12, 2012 Huang Qiuliang
Date Name Signature



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1 GENERAL INFORMATION

1.1 Applied Standard

Applied Rules:	47 CFR FCC Part 2, Subpart J (2011) 47 CFR FCC Part 15, Subpart C (2011) IC RSS-Gen (Issue 3, December 2010) IC RSS-210 (Issue 8, December 2010)
Test Method:	FCC KDB 558074 D01 DTS Meas Guidance v01 FCC KDB 662911 D01 Multiple Transmitter Output v01

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 Summary

The table below summarizes the measurements and results for the EUT. Detailed results and descriptions are shown in the following pages.

Table 1 Summary of results

FCC Measurement Specification	Description	Result
15.247 (a) (2)	6dB bandwidth measurement	PASS
15.247 (b) (3)	Conducted Peak output power	PASS
15.247 (d)	Band edge compliance measurement	PASS
15.247 (d)	Conducted RF spurious	PASS
15.247 (e)	Power spectral density	PASS
15.247 (d) / 15.205 & 15.209	Radiated spurious emission & Radiated restricted band measurement	PASS
15.207	Conducted emission test for power port	PASS

Table 2 Summary of results

RSS-210 Issue	Description	Result
Annex 2 & Annex 8	Bandwidth measurement	PASS
Annex 1 & Annex 2 & Annex 6	Carrier frequency separation measurement	PASS
Annex 8	Number of hopping channel	PASS
Annex 8	Time of occupancy	PASS
Annex 4& Annex 13	Peak output power	PASS
Annex 2 & Annex 8	Band edge compliance measurement	PASS
Annex 13	Conducted RF spurious	PASS
Annex 7	Radiated spurious emission & Radiated restricted band measurement	PASS
Annex 6	Receiver Spurious Emissions (Radiated)	PASS



Annex 13	Conducted emission test for power port	PASS
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3 Product Description

3.1 Product Information

3.1.1 General Description

HUAWEI LTE Wireless Gateway–B890-66 is subscriber equipment in the WCDMA/LTE system, also supports wireless Internet accessing function, routing function, network address translation (NAT) function. The HSPA+/WCDMA frequency band is Band 2/4/5. The LTE frequency band includes Band 2/4/5/7/12/13/17. And the TX/RX band is 2400MHz~2483MHz for WLAN. B890-66 implements such functions as RF signal receiving/sending, WCDMA and LTE protocol processing, voice and data service etc. Externally it provides USB port interface, SIM card interface, four auto-sensing Ethernet interfaces and external antenna interface.

Note: Only WIFI function was considered in this report.

3.1.2 Supporting function and Service

The EUT support the function and service as follows:

Table 3 Service and Test mode List

Service Name	mode	Characteristic
Data	11b	IEEE 802.11b with data rate of 11 Mbps
Data	11g	IEEE 802.11g with data rate of 54 Mbps
Data	11n20	IEEE 802.11n with 20 MHz bandwidth and data rate of MCS-7, not using MIMO
Data	11n40	IEEE 802.11n with 40 MHz bandwidth and data rate of MCS-7, not using MIMO
Data	11n20-mimo	IEEE 802.11n with 20 MHz bandwidth and data rate of MCS-15, using MIMO
Data	11n40-mimo	IEEE 802.11n with 40 MHz bandwidth and data rate of MCS-15, using MIMO

3.2 Modification Information

For original equipment, following table is not application.

Table 4 Modification Information

Model Number	Board/Module	Original Version	New Version	Modify Information
Not applicable!				



3.3 Technical Characteristics

3.3.1 Frequency Range

Table 5 Frequency Range

Uplink band:	2400 to 2483.5 MHz	
Downlink band:	2400 to 2483.5 MHz	
Hop frequency support:	☐ YES	☒ NO

3.3.2 Channel Spacing / Separation

Table 6 Channel Spacing / raster of 20 MHz bandwidth

Channel spacing:	22 MHz
Channel raster:	5 MHz

Table 7 Channel Spacing / raster of 40 MHz bandwidth

Channel spacing:	40 MHz
Channel raster:	5 MHz

3.3.3 Antenna Information

Table 8 Antenna Information

Type:	Integrated / Internal
Maximum Gain(dBi):	-1 (from 2400MHz to 2500MHz)

3.3.4 Environmental Requirements

Table 9 Environmental Requirements

Minimum temperature:	- 10 °C
Maximum temperature:	+ 55 °C
Relative Humidity:	5%-95%



3.3.5 Tune-up Procedure

According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (9).

Please reference the document Tune-up Procedure in TCF.

3.4 EUT Identification List

3.4.1 Board Information

Table 10 Board Information

LTE Wireless Gateway		
B890-66		
Board and Module		
Hardware Version	Hardware Version	Hardware Version
WL1B890I	WL1B890I	WL1B890I

3.4.2 Adapter Technical Data

AC/DCAdapter Model	HW-120200U6W
Input Voltage	~100-240V 50/60Hz
Output Voltage	12V  2A
Rated Power	24W



4 Test Site Description

The test site of:

Huawei Technologies Co. Ltd.

P.O. Box 518129

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

5 Test Modes

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

Test Mode	Test Modes Description
TM1	IEEE 802.11b with data rate of 11 Mbps
TM2	IEEE 802.11g with data rate of 54 Mbps
TM3	IEEE 802.11n with 20 MHz bandwidth and data rate of MCS-7, not using MIMO
TM4	IEEE 802.11n with 40 MHz bandwidth and data rate of MCS-7, not using MIMO
TM5	IEEE 802.11n with 20 MHz bandwidth and data rate of MCS-15, using MIMO
TM6	IEEE 802.11n with 40 MHz bandwidth and data rate of MCS-15, using MIMO

NOTE: All relevant operation modes have been tested, and the worst case data is included in this report.

6 Main Test Instruments

Table 11 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Power supply	KEITHLEY	2303	1288003	Sep.27,2012
Spectrum Analyzer	Agilent	E4440A	MY48250119	Jul.17,2013
Signal Analyzer	R&S	FSQ31	200021	Sep.27,2012
Temperature Chamber	WEISS	WKL64	24600294	Feb.13,2013
Signal generator	Agilent	E8257D	MY49281095	Jul.09,2013
Test receiver	R&S	ESU26	100150	May.29,2013
Tunable Dipole	Schwarzbeck	D69250- UHAP/D69250- VHAP	919/1009	Jan.29,2013
Tunable Dipole	Schwarzbeck	D69250- UHAP/D69250- VHAP	979/917	Jan.29,2013
Horn Antenna	R & S	HF906	100683	May.15,2013
Horn Antenna	R & S	HF906	100684	Jul.01,2013
Broadband Antenna	Schwarzbeck	VULB 9163	9163-357	May.15,2013
Broadband Antenna	Schwarzbeck	VULB 9163	9163-356	May.15,2013

Note: All the equipments are calibrated once a year.



7 Transmitter Measurements

7.1 Bandwidth measurement

7.1.1 Test Conditions

Table 12 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1/TM2/TM3/TM4/TM5/TM6 at channel No. L, M, H

7.1.2 Test Specifications and Limits

7.1.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (2) and KDB 558074

7.1.2.2 Supporting Standards

Table 13 Supporting Standards:

ANSI C63.10-2009	American National Standard for Testing Unlicensed Wireless Devices
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7.1.2.3 Limits

Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Table 14 Limits

Limits	≥ 500kHz
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7.1.3 Test Method and Setup

(a) Connect test port of EUT to spectrum analyzer.



- (b) Set the EUT to transmit maximum output power at 2.4GHz, then set the measured frequency number and test the bandwidth with spectrum analyzer.

Test setup

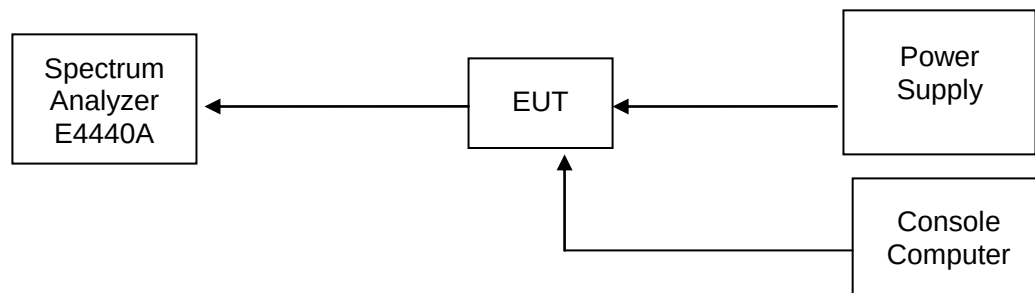


Figure 1. Test Set-up

7.1.4 Measurement Results

Table 15 Measurement Results

Test condition	Chain	Channel Position	Channel Number	Frequency [MHz]	Bandwidth Type	Measured Bandwidth [MHz]	Result
TM1	1	L	1	2412	6dB	8.155	Pass
					99%	10.441	Pass
		M	6	2437	6dB	8.190	Pass
					99%	10.441	Pass
		H	11	2462	6dB	8.096	Pass
					99%	10.386	Pass
TM2	1	L	1	2412	6dB	16.290	Pass
					99%	16.529	Pass
		M	6	2437	6dB	16.643	Pass
					99%	16.589	Pass
		H	11	2462	6dB	16.493	Pass
					99%	16.578	Pass
	2	L	1	2412	6dB	16.629	Pass
					99%	16.688	Pass
		M	6	2437	6dB	16.609	Pass
					99%	16.667	Pass
		H	11	2462	6dB	16.578	Pass
					99%	16.689	Pass
TM3	1	L	3	2412	6dB	17.534	Pass
					99%	17.634	Pass
		M	6	2437	6dB	17.775	Pass
					99%	17.725	Pass
		H	9	2462	6dB	17.610	Pass
					99%	17.664	Pass
	2	L	3	2412	6dB	17.759	Pass
					99%	17.714	Pass
		M	6	2437	6dB	17.818	Pass
					99%	17.710	Pass
		H	9	2462	6dB	17.819	Pass
					99%	17.819	Pass

Test condition	Chain	Channel Position	Channel Number	Frequency [MHz]	Bandwidth Type	Measured Bandwidth [MHz]	Result
					99%	17.734	Pass
TM4	1	L	3	2422	6dB	36.244	Pass
					99%	35.970	Pass
		M	6	2437	6dB	36.287	Pass
					99%	36.079	Pass
		H	9	2452	6dB	36.246	Pass
					99%	35.999	Pass
	2	L	3	2422	6dB	36.044	Pass
					99%	35.993	Pass
		M	6	2437	6dB	36.137	Pass
					99%	35.949	Pass
TM5	1	L	1	2412	6dB	17.792	Pass
					99%	17.722	Pass
		M	6	2437	6dB	17.832	Pass
					99%	17.734	Pass
		H	11	2462	6dB	17.657	Pass
					99%	17.706	Pass
	2	L	1	2412	6dB	17.793	Pass
					99%	17.788	Pass
		M	6	2437	6dB	17.759	Pass
					99%	17.756	Pass
TM6	1	L	3	2422	6dB	36.139	Pass
					99%	36.039	Pass
		M	6	2437	6dB	36.287	Pass
					99%	36.079	Pass
		H	9	2452	6dB	35.964	Pass
					99%	36.023	Pass
	2	L	3	2422	6dB	36.162	Pass
					99%	36.207	Pass
		M	6	2437	6dB	36.312	Pass
					99%	36.110	Pass
		H	9	2452	6dB	36.369	Pass
					99%	36.175	Pass

7.1.5 Conclusion

The equipment **PASSED** the requirement of this clause.
For the measurement results refer to appendix A.



7.2 Peak output power

7.2.1 Test Conditions

Table 16 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1/TM2/TM3/TM4/TM5/TM6 at channel No. L, M, H

7.2.2 Test Specifications and Limits

7.2.2.1 Specification

CFR 47 (FCC) part 15.247 (b) (3) and KDB 558074

7.2.2.2 Supporting Standards

Table 17 Supporting Standards:

ANSI C63.10-2009	American National Standard for Testing Unlicensed Wireless Devices
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7.2.2.3 Limits

Comply with part 15.247 (b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level.

Table 18 Limits

2.4GHz and 5.8GHz system using digital modulation	1 Watt / 30 dBm
---	-----------------

7.2.3 Test Method and Setup

(a) Connect test port of EUT to spectrum analyzer.

- (b) Set the EUT to transmit maximum output power.
(c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted output power separately.

Test setup

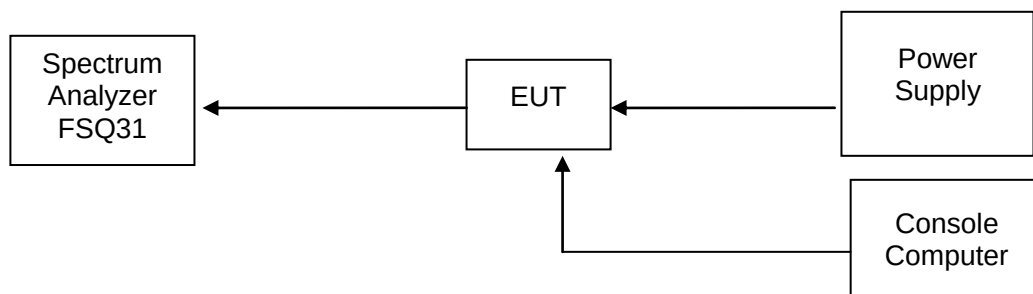


Figure 2. Test Set-up

7.2.4 Measurement Results

Table 19 Measurement Results

Test condition	Chain	Channel Position	Channel Number	Frequency [MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
TM1	1	L	1	2412	25.45	< 30	Pass
		M	6	2437	26.00	< 30	Pass
		H	11	2462	25.70	< 30	Pass
TM2	1	L	1	2412	26.45	< 30	Pass
		M	6	2437	27.37	< 30	Pass
		H	11	2462	26.54	< 30	Pass
	2	L	1	2412	25.57	< 30	Pass
		M	6	2437	26.41	< 30	Pass
		H	11	2462	25.63	< 30	Pass
TM3	1	L	1	2412	26.14	< 30	Pass
		M	6	2437	26.88	< 30	Pass
		H	11	2462	26.35	< 30	Pass
	2	L	1	2412	25.30	< 30	Pass
		M	6	2437	26.26	< 30	Pass
		H	11	2462	25.39	< 30	Pass
TM4	1	L	3	2422	25.91	< 30	Pass
		M	6	2437	25.93	< 30	Pass
		H	9	2452	25.56	< 30	Pass
	2	L	3	2422	24.73	< 30	Pass
		M	6	2437	25.07	< 30	Pass
		H	9	2452	24.64	< 30	Pass
TM5	1	L	1	2412	24.33	---	---
		M	6	2437	25.22	---	---
		H	11	2462	24.31	---	---



Test condition	Chain	Channel Position	Channel Number	Frequency [MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
	2	L	1	2412	23.78	---	---
		L	6	2437	24.49	---	---
		M	11	2462	23.99	---	---
	1+2	H	1	2412	27.07	< 30	Pass
		L	6	2437	27.88	< 30	Pass
		M	11	2462	27.16	< 30	Pass
TM6	1	H	3	2422	23.98	---	---
		L	6	2437	23.99	---	---
		M	9	2452	23.67	---	---
	2	H	3	2422	23.50	---	---
		L	6	2437	23.76	---	---
		M	9	2452	23.42	---	---
	1+2	H	3	2422	26.76	< 30	Pass
		L	6	2437	26.89	< 30	Pass
		M	9	2452	26.56	< 30	Pass

7.2.5 Conclusion

The equipment **PASSED** the requirement of this clause.
For the measurement results refer to appendix B.



7.3 Band edge spurious emission

7.3.1 Test Conditions

Table 20 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1/TM2/TM3/TM4/TM5/TM6 at channel No. B, T

7.3.2 Test Specifications and Limits

7.3.2.1 Specification

CFR 47 (FCC) part 15.247(d) and KDB 558074

7.3.2.2 Supporting Standards

Table 21 Supporting Standards:

ANSI C63.10-2009	American National Standard for Testing Unlicensed Wireless Devices
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7.3.2.3 Limits

Comply with part 15.247 (d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

Table 22 Limits

Band edge spurious:	20 dBc/100kHz
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7.3.3 Test Method and Setup

- (a) Connect test port of EUT to spectrum analyzer
- (b) Set the EUT to transmit maximum output power at 2.4GHz
- (c) Then set the EUT to transmit at high, low frequency and measure the conducted band edge spurious separately.

Test setup

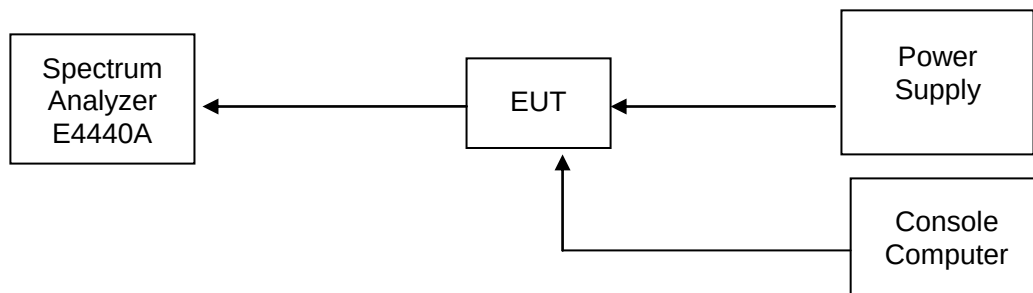


Figure 3. Test Set-up

7.3.4 Measurement Results

Table 23 Measurement Results

Test condition	Chain	Channel Position	Channel Number	Frequency [MHz]	Carrier Power [dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Result
TM1	1	Low Edge	1	2412	10.67	-35.51	-9.3	Pass
		High Edge	11	2462	11.50	-31.43	-8.5	Pass
TM2	1	Low Edge	1	2412	5.84	-26.58	-14.2	Pass
		High Edge	11	2462	5.89	-20.23	-14.1	Pass
	2	Low Edge	1	2412	4.75	-25.96	-15.2	Pass
		High Edge	11	2462	4.72	-20.55	-15.3	Pass
TM3	1	Low Edge	1	2412	5.24	-26.37	-14.8	Pass
		High Edge	11	2462	5.41	-20.75	-14.6	Pass
	2	Low Edge	1	2412	4.20	-26.43	-15.8	Pass
		High Edge	11	2462	4.50	-21.01	-15.5	Pass
TM4	1	Low Edge	3	2422	2.32	-26.18	-17.7	Pass
		High Edge	9	2452	2.49	-24.40	-17.5	Pass
	2	Low Edge	3	2422	0.95	-25.20	-19.0	Pass
		High Edge	9	2452	1.69	-24.46	-18.3	Pass
TM5	1	Low Edge	1	2412	3.90	-29.01	-16.1	Pass
		High Edge	11	2462	3.66	-22.13	-16.3	Pass
	2	Low Edge	1	2412	3.21	-27.90	-16.8	Pass
		High Edge	11	2462	2.74	-22.56	-17.3	Pass
TM6	1	Low Edge	3	2422	0.69	-27.83	-19.3	Pass
		High Edge	9	2452	0.99	-27.67	-19.0	Pass
	2	Low Edge	3	2422	0.12	-25.99	-19.9	Pass
		High Edge	9	2452	0.25	-25.14	-19.8	Pass

7.3.5 Conclusion

The equipment **PASSED** the requirement of this clause.
For the measurement results refer to appendix C.



7.4 Conducted RF spurious

7.4.1 Test Conditions

Table 24 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1/TM2/TM3/TM4/TM5/TM6 at channel No. L, M, H

7.4.2 Test Specifications and Limits

7.4.2.1 Specification

CFR 47 (FCC) part 15.247 (d) and KDB 558074

7.4.2.2 Supporting Standards

Table 25 Supporting Standards:

ANSI C63.10-2009	American National Standard for Testing Unlicensed Wireless Devices
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7.4.2.3 Limits

Comply with part 15.247 (d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

Table 26 Limits

Band edge spurious:	20 dBc/100kHz
---------------------	---------------



7.4.3 Test Method and Setup

- (a) Connect test port of EUT to spectrum analyzer
- (b) Set the EUT to transmit maximum output power at 2.4GHz .
- (c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted band edge spurious separately.

Test setup

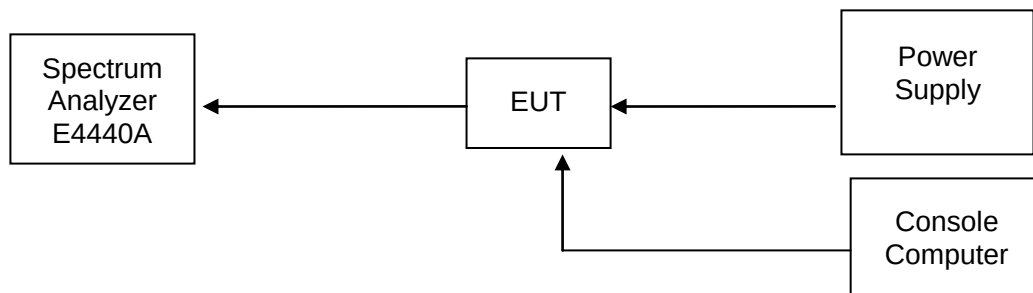


Figure 4. Test Set-up

7.4.4 Measurement Results

Table 27 Measurement Results

Test condition	Chain	Test Frequency Range	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Result
TM1	1	9KHz-26GHz	1	2412	11.96	-33.40	-3.2	Pass
		9KHz-26GHz	6	2437	15.87	-34.22	-2.2	Pass
		9KHz-26GHz	11	2462	16.80	-33.23	-2.8	Pass
TM2	1	9KHz-26GHz	1	2412	13.54	-44.31	-6.5	Pass
		9KHz-26GHz	6	2437	12.85	-33.59	-5.7	Pass
		9KHz-26GHz	11	2462	13.37	-33.10	-5.9	Pass
	2	9KHz-26GHz	1	2412	12.42	-43.04	-7.1	Pass
		9KHz-26GHz	6	2437	12.48	-43.81	-7.3	Pass
		9KHz-26GHz	11	2462	11.92	-42.85	-6.7	Pass
TM3	1	9KHz-26GHz	1	2412	13.06	-42.99	-6.9	Pass
		9KHz-26GHz	6	2437	12.96	-33.35	-5.3	Pass
		9KHz-26GHz	11	2462	14.71	-33.56	-5.6	Pass
	2	9KHz-26GHz	1	2412	10.55	-33.10	-8.4	Pass
		9KHz-26GHz	6	2437	11.87	-33.19	-6.9	Pass
		9KHz-26GHz	11	2462	10.75	-34.50	-7.7	Pass
TM4	1	9KHz-26GHz	3	2422	8.79	-44.46	-9.1	Pass
		9KHz-26GHz	6	2437	8.47	-43.91	-9.4	Pass
		9KHz-26GHz	9	2452	8.86	-44.29	-9.8	Pass
	2	9KHz-26GHz	3	2422	7.93	-44.03	-10.1	Pass
		9KHz-26GHz	6	2437	8.84	-43.30	-8.1	Pass
		9KHz-26GHz	9	2452	8.40	-42.37	-9.4	Pass
TM5	1	9KHz-26GHz	1	2412	9.93	-42.65	-8.8	Pass
		9KHz-26GHz	6	2437	12.10	-42.39	-8.2	Pass
		9KHz-26GHz	11	2462	11.70	-44.54	-11.9	Pass
	2	9KHz-26GHz	1	2412	9.18	-43.83	-7.9	Pass
		9KHz-26GHz	6	2437	10.35	-45.06	-7.9	Pass
		9KHz-26GHz	11	2462	10.28	-44.89	-11.9	Pass



Test condition	Chain	Test Frequency Range	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Result
TM6	1	9KHz-26GHz	3	2422	9.06	-43.98	-11.9	Pass
		9KHz-26GHz	6	2437	4.83	-42.88	-11.6	Pass
		9KHz-26GHz	9	2452	5.28	-44.31	-10.8	Pass
	2	9KHz-26GHz	3	2422	6.72	-43.14	-11.1	Pass
		9KHz-26GHz	6	2437	8.14	-47.26	-11.9	Pass
		9KHz-26GHz	9	2452	5.33	-44.02	-11.4	Pass

7.4.5 Conclusion

The equipment **PASSED** the requirement of this clause.
For the measurement results refer to appendix D.



7.5 Power spectral density

7.5.1 Test Conditions

Table 28 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1/TM2/TM3/TM4/TM5/TM6 at channel No. L, M, H

7.5.2 Test Specifications and Limits

7.5.2.1 Specification

CFR 47 (FCC) part 15.247 (e) and KDB 558074

7.5.2.2 Supporting Standards

Table 29 Supporting Standards:

ANSI C63.10-2009	American National Standard for Testing Unlicensed Wireless Devices
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7.5.2.3 Limits

Comply with part 15.247 (e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. The same method of determining the conducted output power shall be used to determine the power spectral density.

Table 30 Limits

Band edge spurious:	8 dBm/3kHz
---------------------	------------

7.5.3 Test Method and Setup

- Connect test port of EUT to spectrum analyzer
- Set the EUT to transmit maximum output power at 2.4GHz.
- Then set the EUT to transmit at high, middle and low frequency and measure the conducted band edge spurious separately.

Test setup

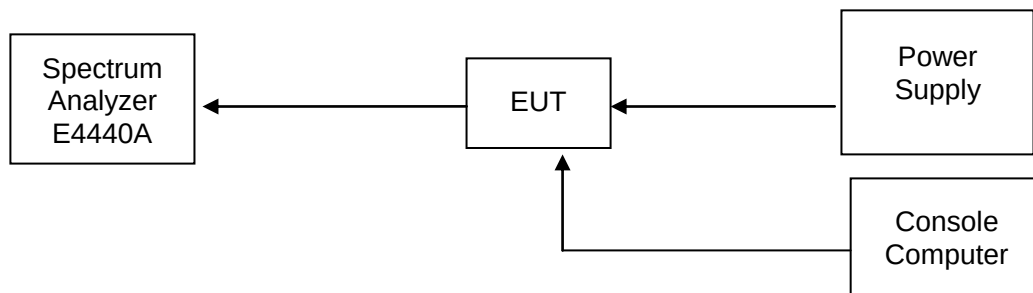


Figure 5. Test Set-up

7.5.4 Measurement Results

Table 31 Measurement Results

Test condition	Chain	Channel Position	Channel Number	Frequency [MHz]	Measured Power spectral density [dBm]	Limit [dBm]	Result
TM1	1	L	1	2412	-3.13	< 8	Pass
		M	6	2437	-2.11	< 8	Pass
		H	11	2462	-2.21	< 8	Pass
TM2	1	L	1	2412	-8.16	< 8	Pass
		M	6	2437	-7.01	< 8	Pass
		H	11	2462	-7.50	< 8	Pass
	2	L	1	2412	-8.68	< 8	Pass
		M	6	2437	-9.33	< 8	Pass
		H	11	2462	-9.14	< 8	Pass
TM3	1	L	1	2412	-10.08	< 8	Pass
		M	6	2437	-9.33	< 8	Pass
		H	11	2462	-9.53	< 8	Pass
	2	L	1	2412	-10.67	< 8	Pass
		M	6	2437	-10.92	< 8	Pass
		H	11	2462	-13.24	< 8	Pass
TM4	1	L	3	2422	-14.35	< 8	Pass
		M	6	2437	-14.63	< 8	Pass
		H	9	2452	-14.60	< 8	Pass
	2	L	3	2422	-15.50	< 8	Pass
		M	6	2437	-15.09	< 8	Pass
		H	9	2452	-15.32	< 8	Pass
TM5	1	L	1	2412	-12.14	---	---
		M	6	2437	-11.52	---	---
		H	11	2462	-12.18	---	---
	2	L	1	2412	-12.38	---	---
		M	6	2437	-11.56	---	---
		H	11	2462	-12.54	---	---



Test condition	Chain	Channel Position	Channel Number	Frequency [MHz]	Measured Power spectral density [dBm]	Limit [dBm]	Result
	1+2	L	1	2412	-9.25	< 8	Pass
		M	6	2437	-8.53	< 8	Pass
		H	11	2462	-9.35	< 8	Pass
TM6	1	L	3	2422	-16.59	---	---
		M	6	2437	-16.91	---	---
		H	9	2452	-16.62	---	---
	2	L	3	2422	-18.37	---	---
		M	6	2437	-20.26	---	---
		H	9	2452	-18.17	---	---
	1+2	L	3	2422	-14.38	< 8	Pass
		M	6	2437	-15.26	< 8	Pass
		H	9	2452	-14.32	< 8	Pass

7.5.5 Conclusion

The equipment **PASSED** the requirement of this clause.
For the measurement results refer to appendix E.



7.6 Radiated spurious emission & spurious in restricted band

7.6.1 Test Conditions

Table 32 Test Conditions

Preconditioning:	0.5 hour
Measured at:	enclosure
Ambient temperature:	25. °C
Relative humidity:	55%
Test Configurations:	TM1/TM2/TM3/TM4/TM5/TM6 at channel No. L, M, H

7.6.2 Test Specifications and Limits

7.6.2.1 Specification

CFR 47 (FCC) part 15.247 (d), 15.205 & 15.209 and KDB 558074

7.6.2.2 Supporting Standards

Table 33 Supporting Standards:

ANSI C63.10-2009	American National Standard for Testing Unlicensed Wireless Devices
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7.6.2.3 Limits

According to part 15.247 (d) / 15.205 & 15.209, all spurious emission in the frequency range from 30MHz to 10th harmonics of carrier frequency should be meet the requirement of following table.

Table 34 Limits

Frequency (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance (meters)	Detector
0.009 - 0.490	2400/F(kHz)	20*lg(2400/F(kHz))	300	QP
0.490 - 1.705	24000/F(kHz)	20*lg(24000/F(kHz))	30	QP
1.705 - 30	30	29.5	30	QP
30 – 88	100	40	3	QP
88 – 216	150	43.5	3	QP
216 – 960	200	46	3	QP
960 -1000	500	54	3	QP
Above 1000	500	54	3	AV
Above 1000	500	74	3	PK

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table 42).

7.6.3 Test Method and Setup

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.10 (2009). The EUT was set-up on insulator 80cm above the Ground Plane. The set-up and test methods were according to ANSI C63.10. The Radiated Disturbance measurements were made using a Rohde and Schwarz Test Receiver and control software.

A preliminary scan and a final scan of the emissions were made by using test script of software; the emissions were measured using a Quasi-Peak Detector below 1GHz, and AV detector above 1GHz. The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m, and the azimuth range of turntable was 0° to 360°. The receive antenna has two polarizations V and 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.

The EUT communicates with the BTS simulator through Air interface. The EUT operated on the typical channel.

Measurement bandwidth: 30 MHz – 1000 MHz: 120 kHz

Measurement bandwidth: 1000 MHz – 10th Carrier Frequency: 1 MHz

Test set up

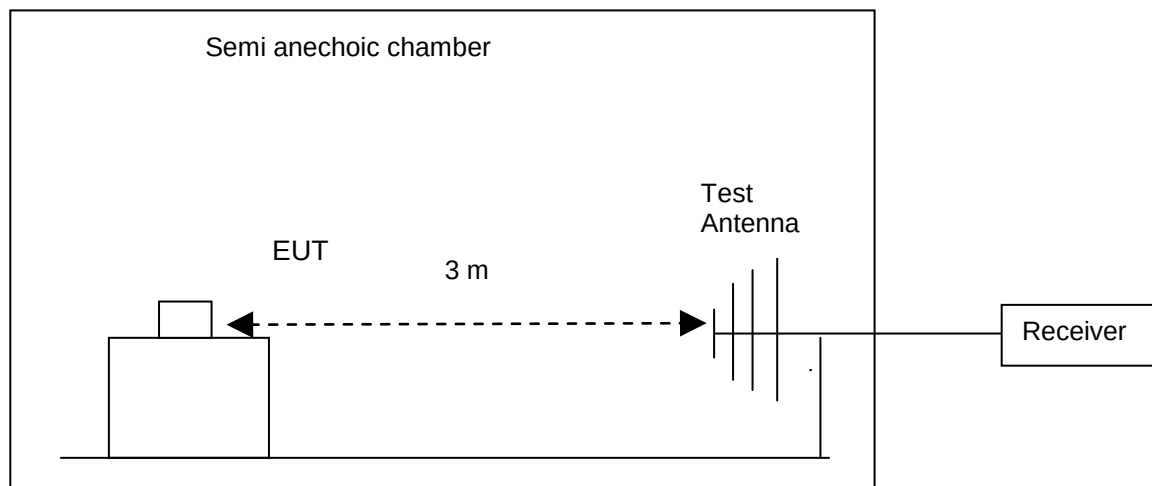


Figure 6. Test Set up

7.6.4 Measurement Results

Note 1: The following measurement results exceed the limit line is the carrier frequency.

Note 2: This test was carried out in all test modes, here only the worst test result was shown.

Test condition	Channel No.	Carrier Frequency [MHz]	Measured	Result
TM1	1	2412	Refer to Appendix F	Pass
	6	2437	Refer to Appendix F	Pass



	11	2462	Refer to Appendix F	Pass
TM2	1	2412	Refer to Appendix F	Pass
	6	2437	Refer to Appendix F	Pass
	11	2462	Refer to Appendix F	Pass
TM3	1	2412	Refer to Appendix F	Pass
	6	2437	Refer to Appendix F	Pass
	11	2462	Refer to Appendix F	Pass
TM4	3	2422	Refer to Appendix F	Pass
	6	2437	Refer to Appendix F	Pass
	9	2452	Refer to Appendix F	Pass
TM5	1	2412	Refer to Appendix F	Pass
	6	2437	Refer to Appendix F	Pass
	11	2462	Refer to Appendix F	Pass
TM6	3	2422	Refer to Appendix F	Pass
	6	2437	Refer to Appendix F	Pass
	9	2452	Refer to Appendix F	Pass

7.6.5 Conclusion

The equipment **PASSED** the requirement of this clause.
For the measurement results refer to appendix F.



7.7 Conducted Emission at Power Port

7.7.1 Test Conditions

Table 35 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Power port
Ambient temperature:	25. °C
Relative humidity:	55%
Test Configurations:	TM1 at channel No. M

7.7.2 Test Specifications and Limits

7.7.2.1 Specification

CFR 47 (FCC) part 15.207 and KDB 558074

7.7.2.2 Supporting Standards

Table 36 Supporting Standards:

ANSI C63.10-2009	American National Standard for Testing Unlicensed Wireless Devices
------------------	--

7.7.2.3 Limits

Comply with part15.207, conducted emission must meet the requirement of following table.

Table 37 Limits

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

Note: * Decreases with the logarithm of the frequency.

7.7.3 Test Method and Setup

The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT

was 80cm from LISN. The set-up and test methods were according to ANSI C63.10: 2009.

Conducted Disturbance at AC Port measurements were undertaken on the Land N Lines. The emissions were measured using a Quasi-Peak Detector and Average Detector.

The EUT communicates with the BTS simulator through Air interface, the BTS simulator controls the Wireless Modem to transmitter the maximum power which defined in specification of product. The Wireless Modem operated on the typical channel.

Measurement bandwidth (RBW) for 150kHz to 30 MHz: 9 kHz;

Test Set-up

The EUT was set in the screened chamber and operated under nominal conditions.

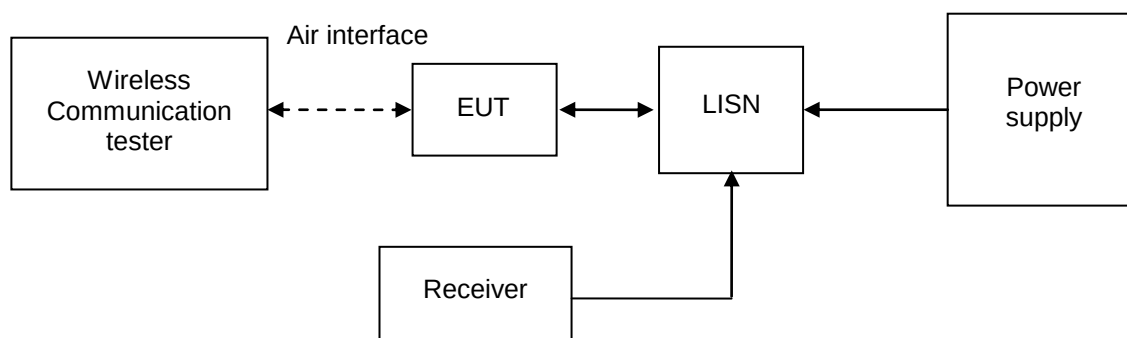


Figure 7. Test Set-up

7.7.4 Measurement Results

Table 38 MEASUREMENT RESULT:QP DECTER

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.173953	51.1	9.7	64.8	13.7	L1	FLO
0.437820	44.4	9.7	57.1	12.7	L1	FLO
2.203324	37.8	9.7	56.0	18.2	N	FLO
8.865570	40.2	9.9	60.0	19.8	N	FLO
16.227348	38.9	10.0	60.0	21.1	L1	FLO
23.128856	38.4	10.2	60.0	21.6	N	FLO

Table 39 MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.169120	40.1	9.7	55.0	14.9	L1	FLO
0.435256	35.5	9.7	47.2	11.7	L1	FLO
2.208416	26.5	9.7	46.0	19.5	L1	FLO
9.014655	35.1	9.9	50.0	14.9	N	FLO
16.472333	31.1	10.1	50.0	18.9	L1	FLO
23.130608	34.1	10.2	50.0	15.9	L1	FLO



7.7.5 Conclusion

The equipment **PASSED** the requirement of this clause.
For the measurement results refer to appendix G.



8 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Table 40 System Measurement Uncertainty

Items		Extended Uncertainty
Bandwidth measurement	Magnitude (%)	U=0.2%; k=2
Peak output power	Power(dBm)	U=0.39dB; k=2
Band edge compliance measurement	Disturbance Power(dBm)	U=2.0dB; k=2
Conducted RF spurious	Disturbance Power(dBm)	U=0.4dB; k=2
Power spectral density	Disturbance Power(dBm)	U=0.4dB; k=2
Radiated spurious emission & Radiated restricted band measurement	Field strength (dBμV/m)	U=4.1dB; k=2
		U=4.1dB; k=2
Conducted emission test for power port	Disturbance Voltage(dBμV)	U=3.4dB; k=2



9 Appendices

Appendix A	Measurement Results Bandwidth measurement
Appendix B	Measurement Results Peak output power
Appendix C	Measurement Results Band edge compliance measurement
Appendix D	Measurement Results Conducted RF spurious
Appendix E	Measurement Results Power spectral density
Appendix F	Measurement Results Radiated spurious emission
Appendix G	Measurement Results Receiver Spurious Emissions
Appendix H	Measurement Results Conducted emission test for power port
Appendix I	Photos of Test Setup

-----The END-----



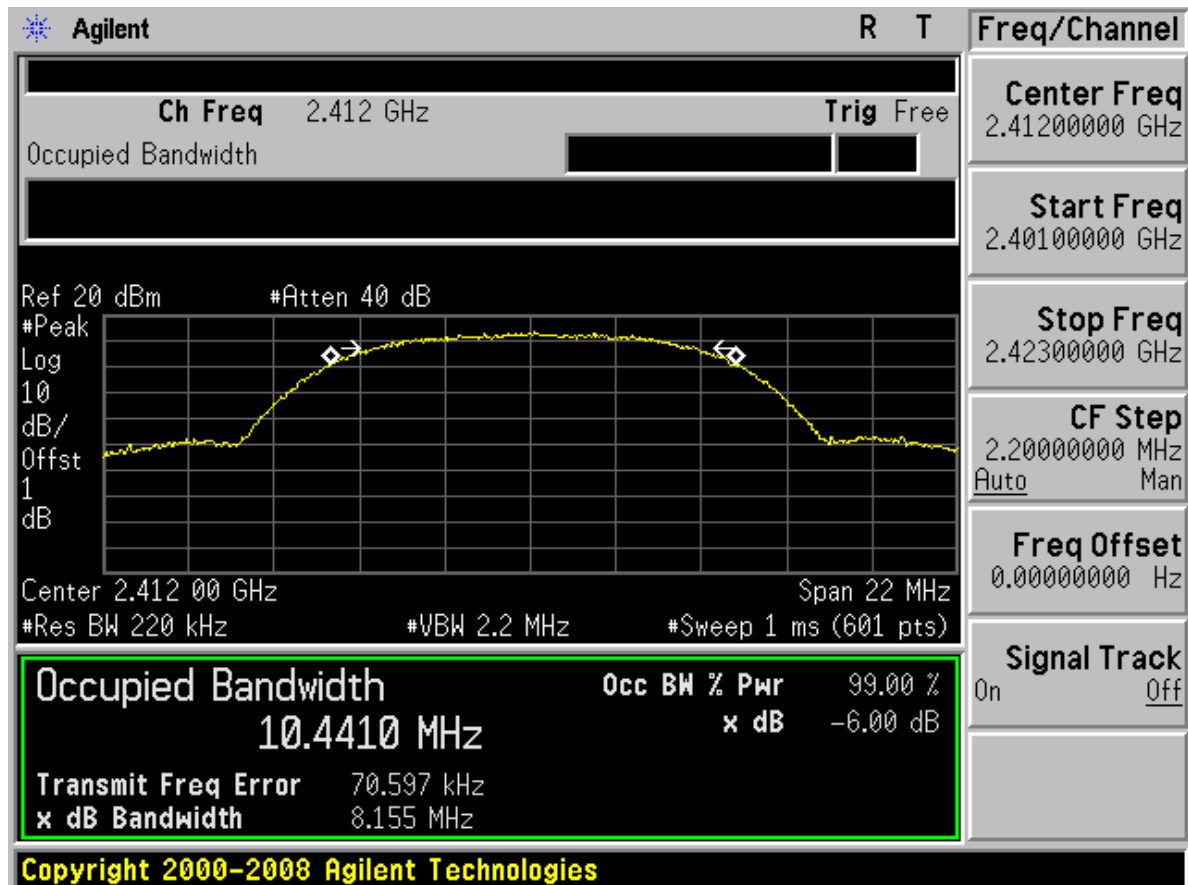
Appendix A

Bandwidth measurement

According to FCC Part 15.247 (a) (2) & RSS-210

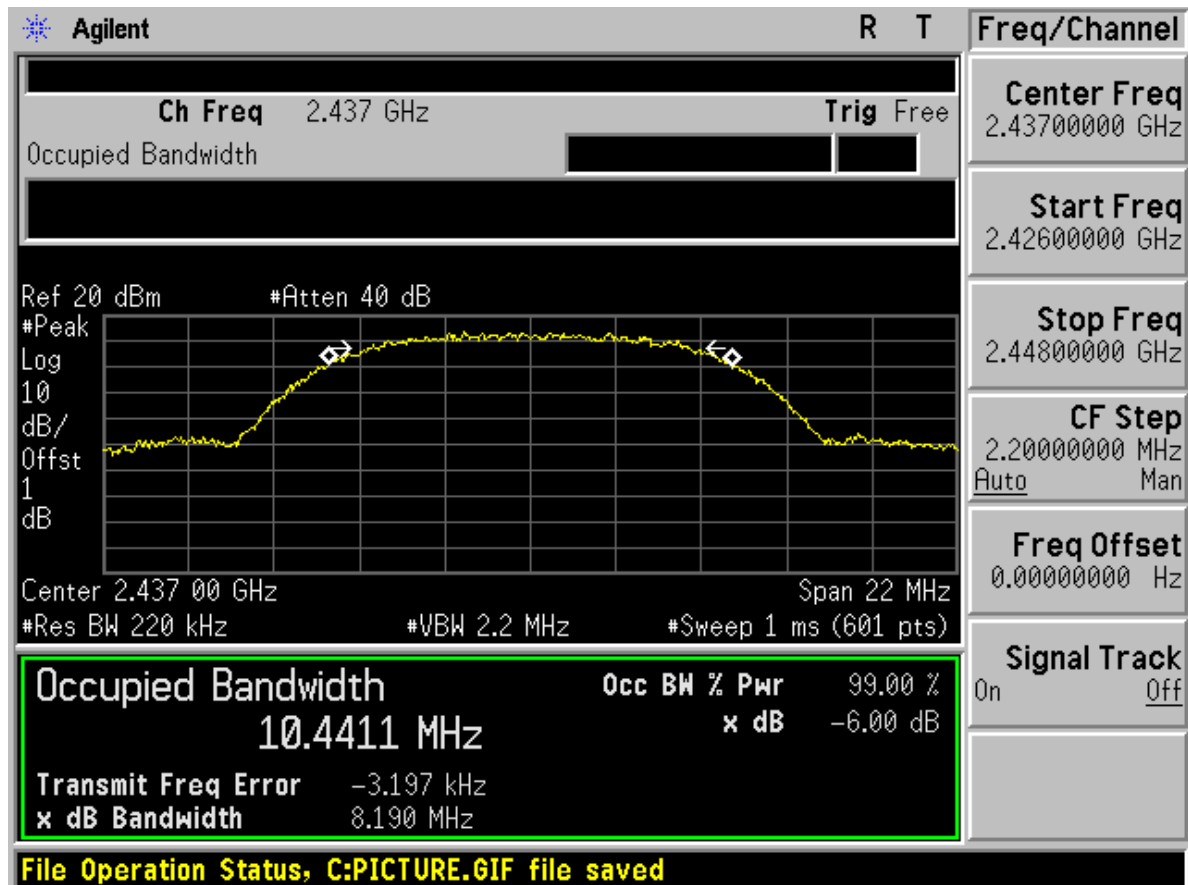


TM1 Chain 1 Channel 01



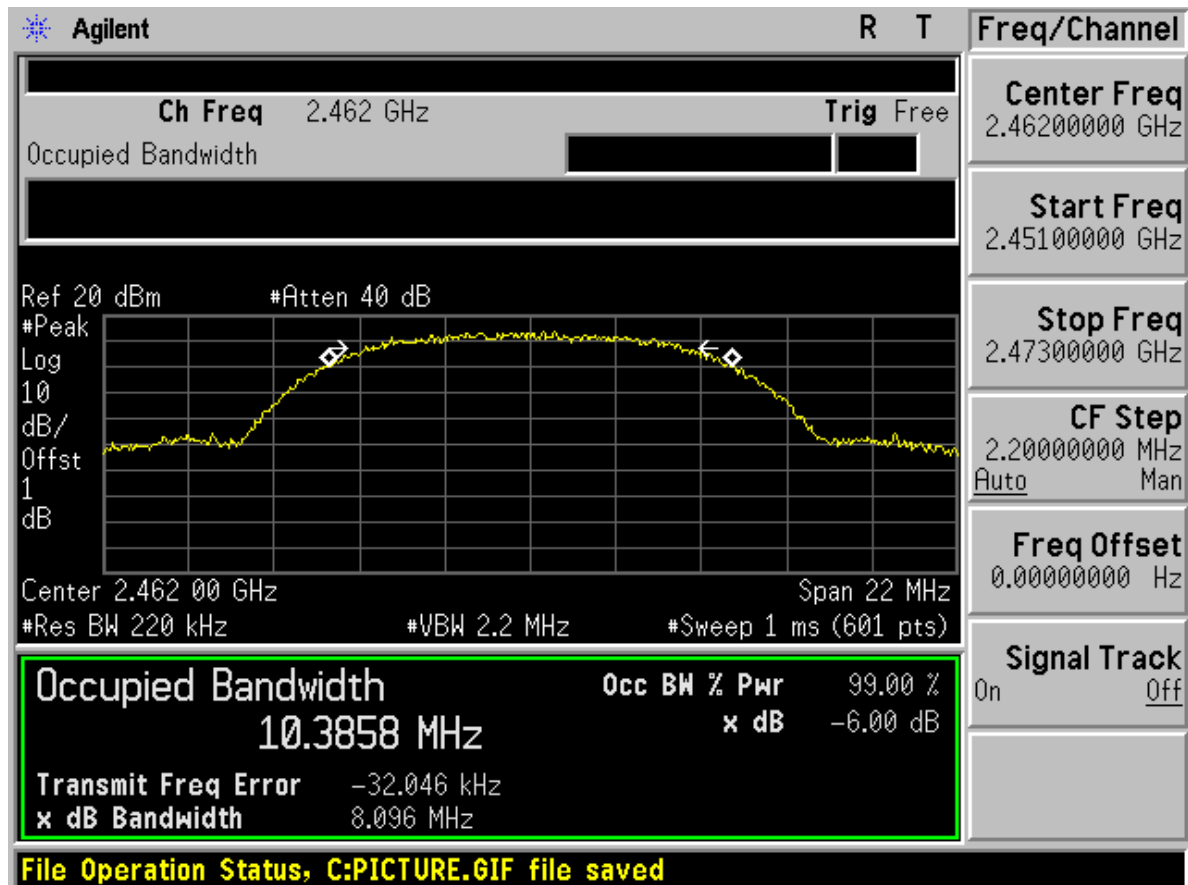


Channel 06



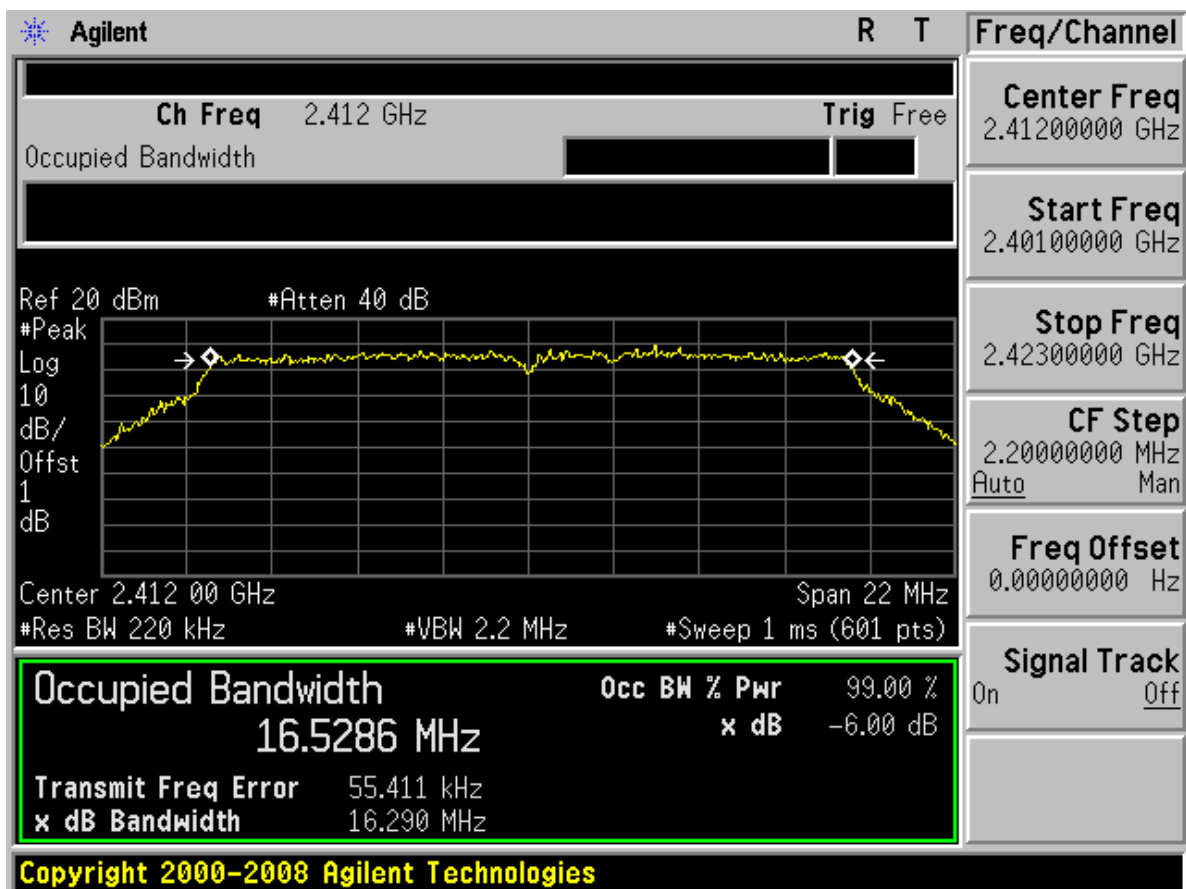


Channel 11



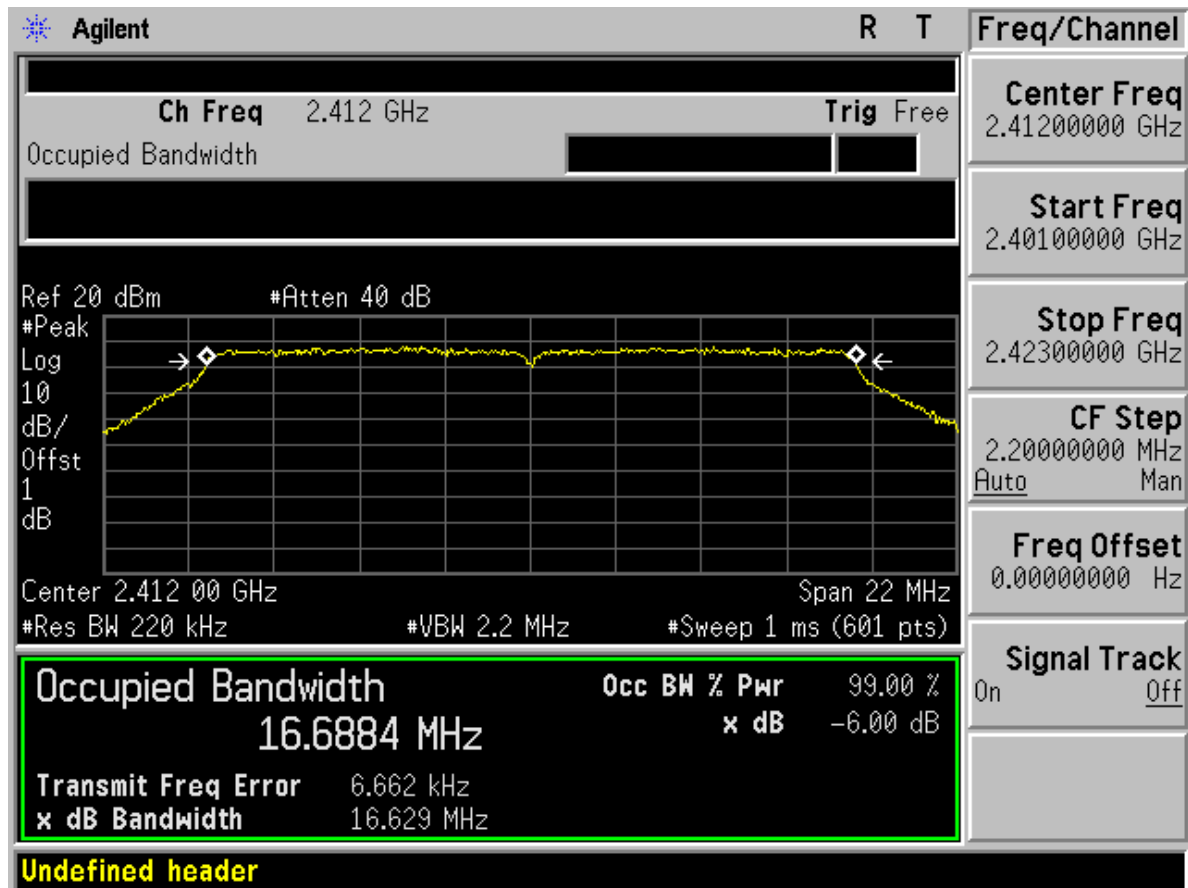


TM2 Chain 1&2 Channel 01 Chain 1



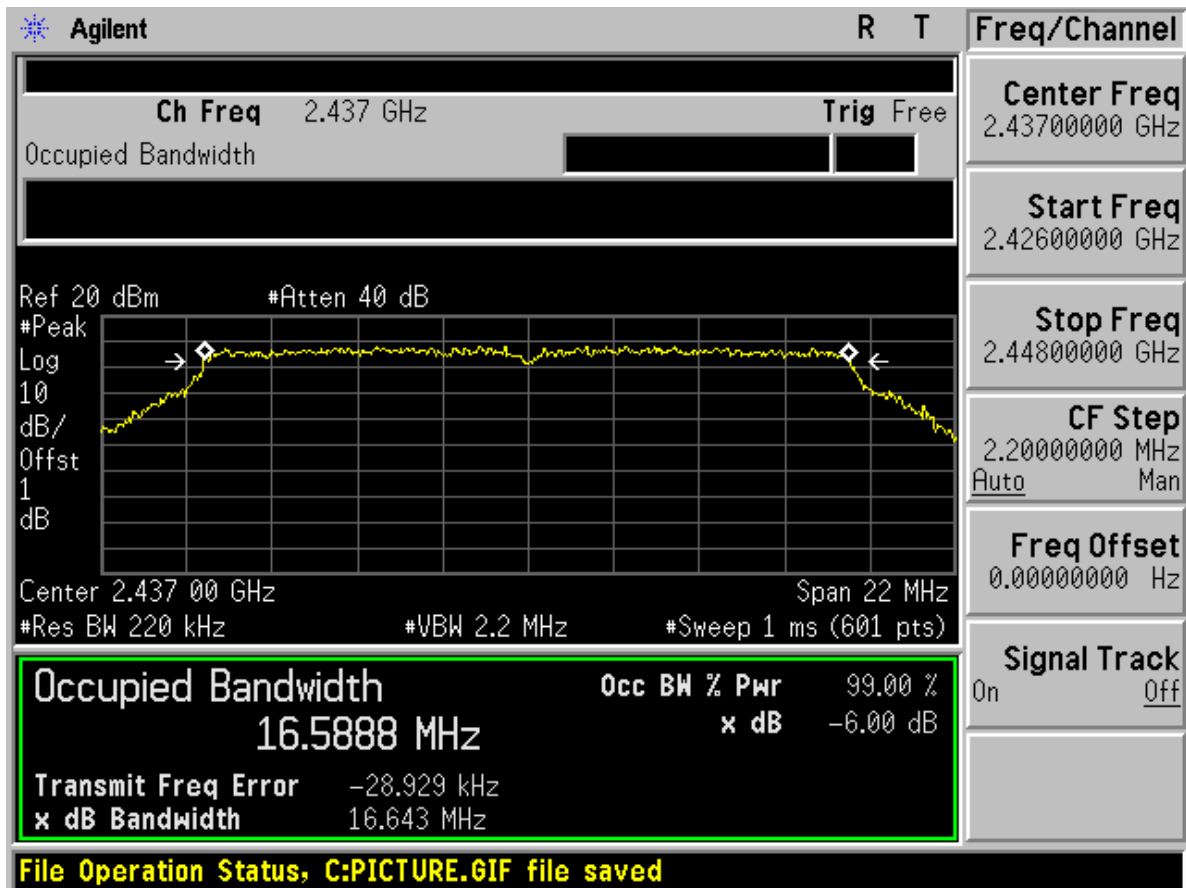


Chain 2



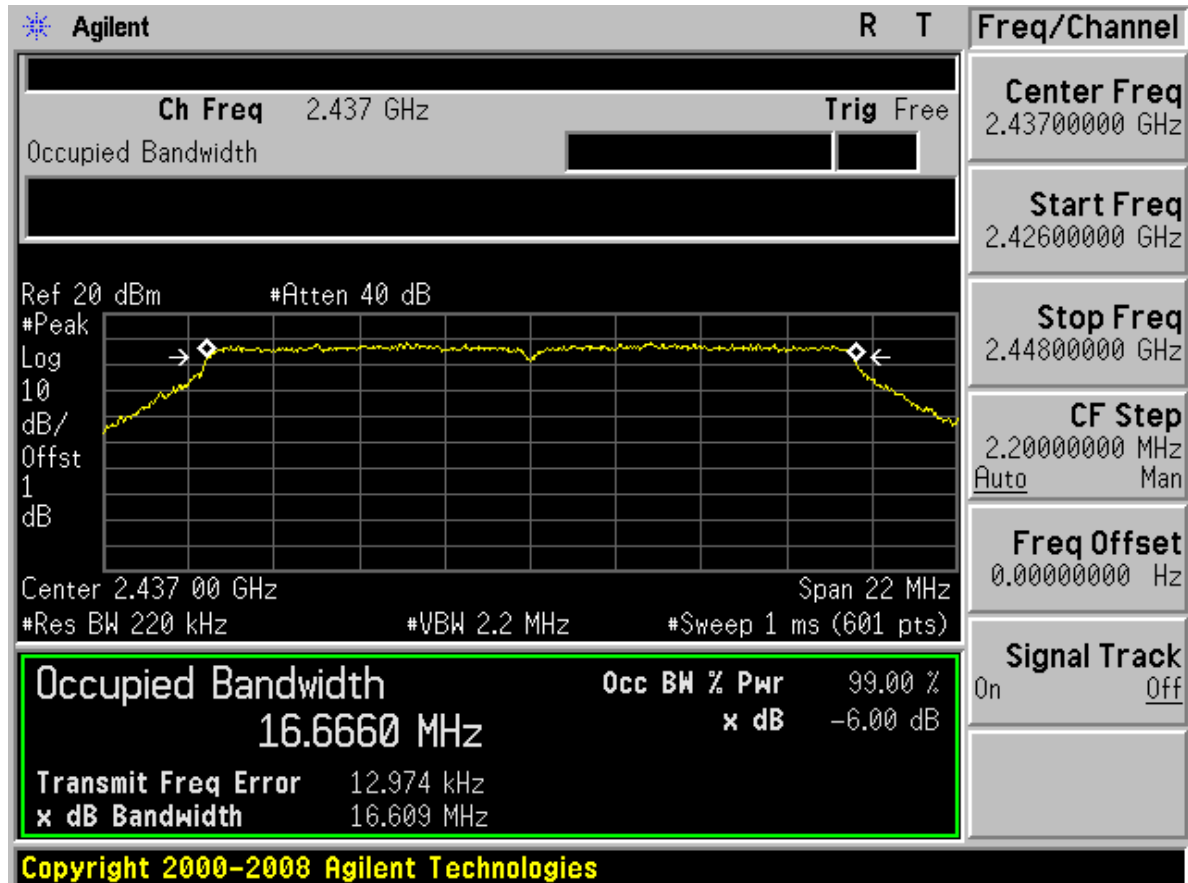


Channel 06 Chain 1



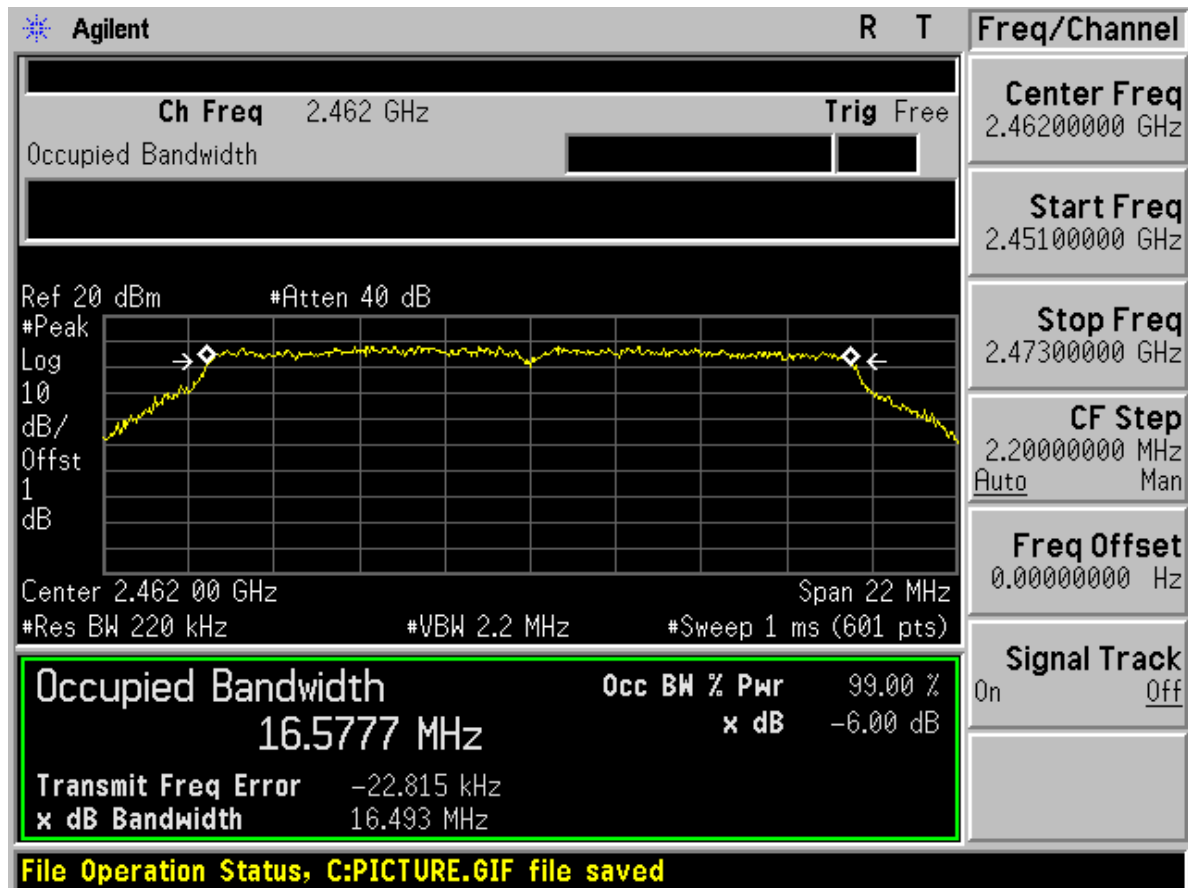


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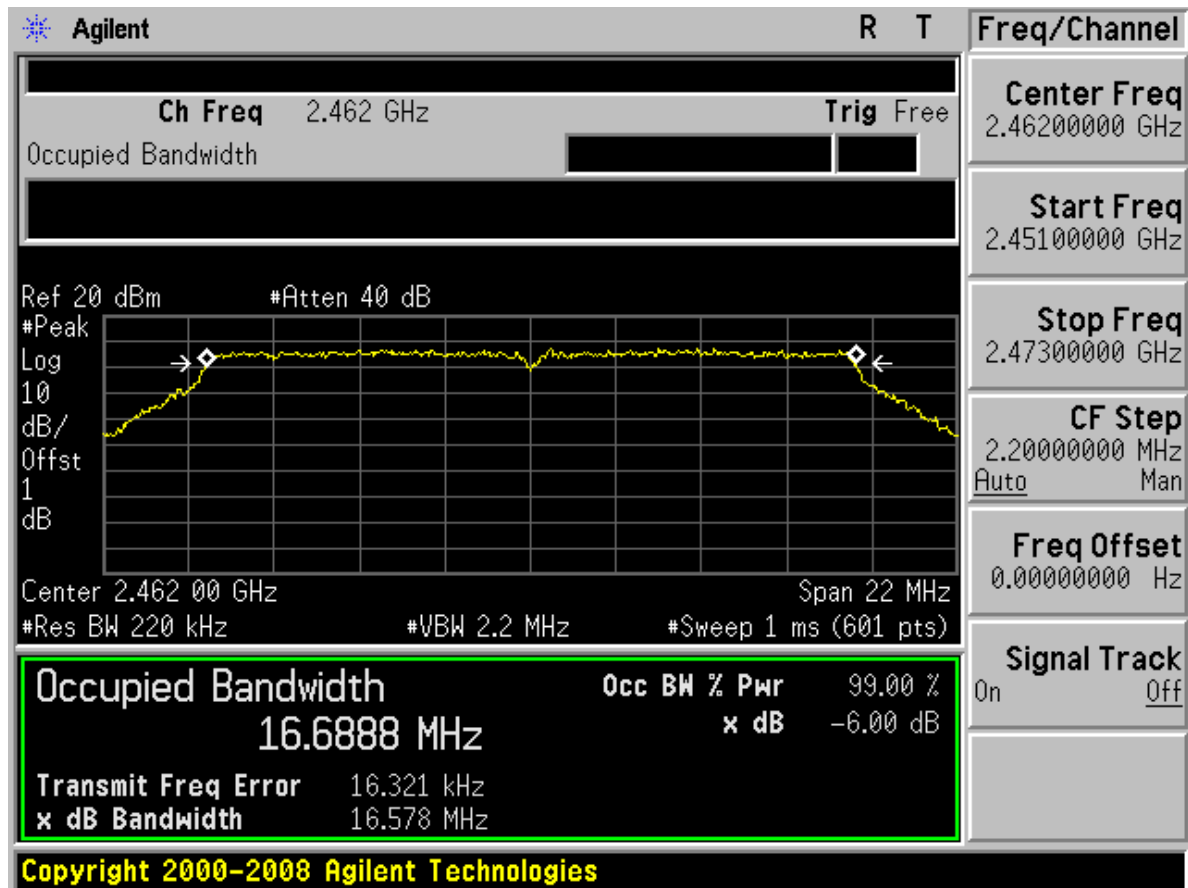


Channel 11 Chain 1



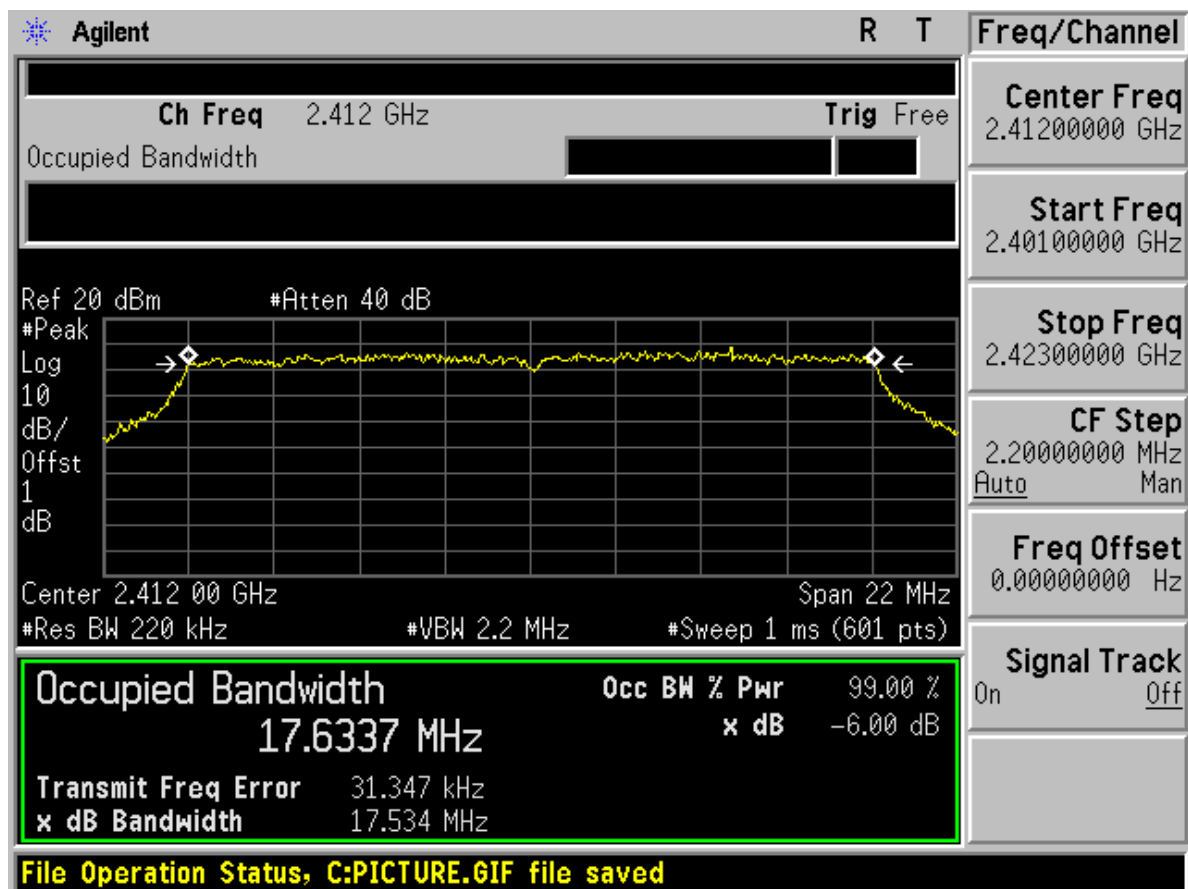


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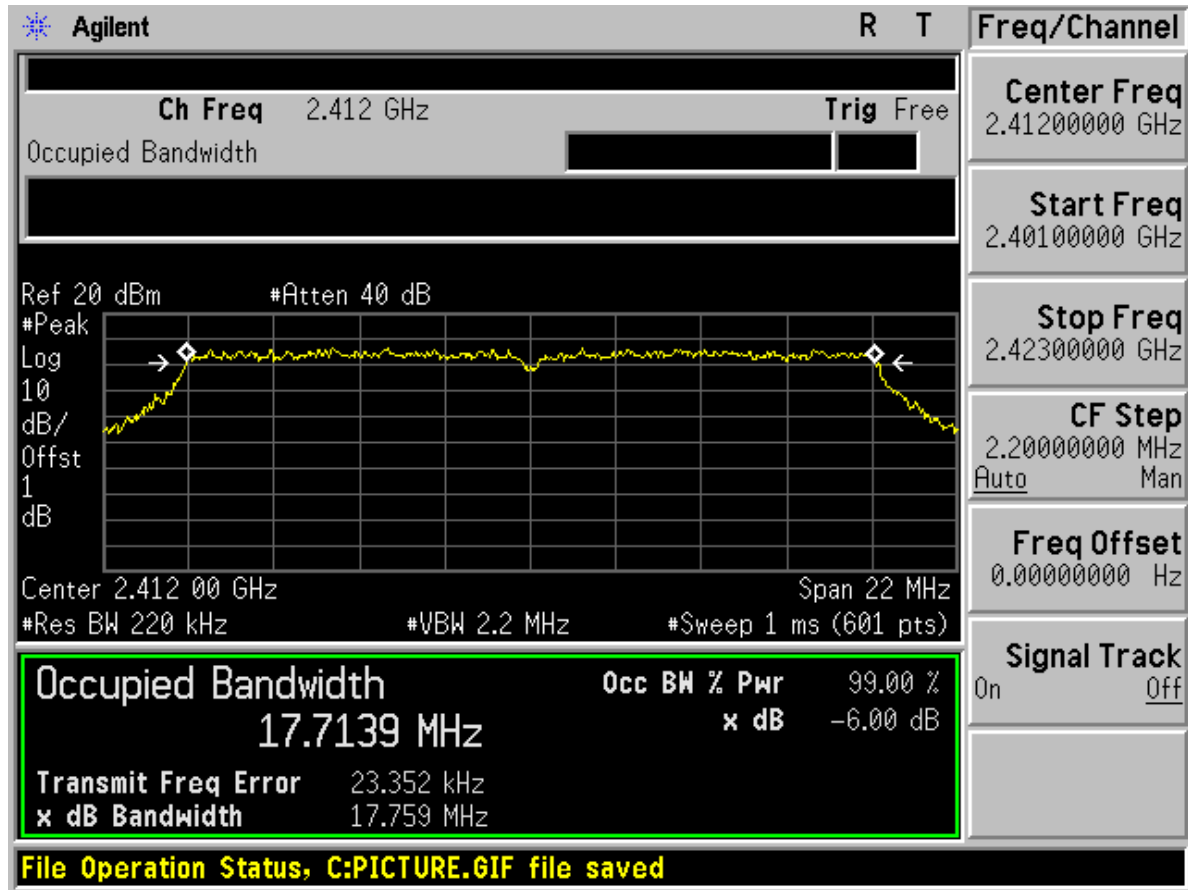


TM3 Chain 1&2 Channel 01 Chain 1





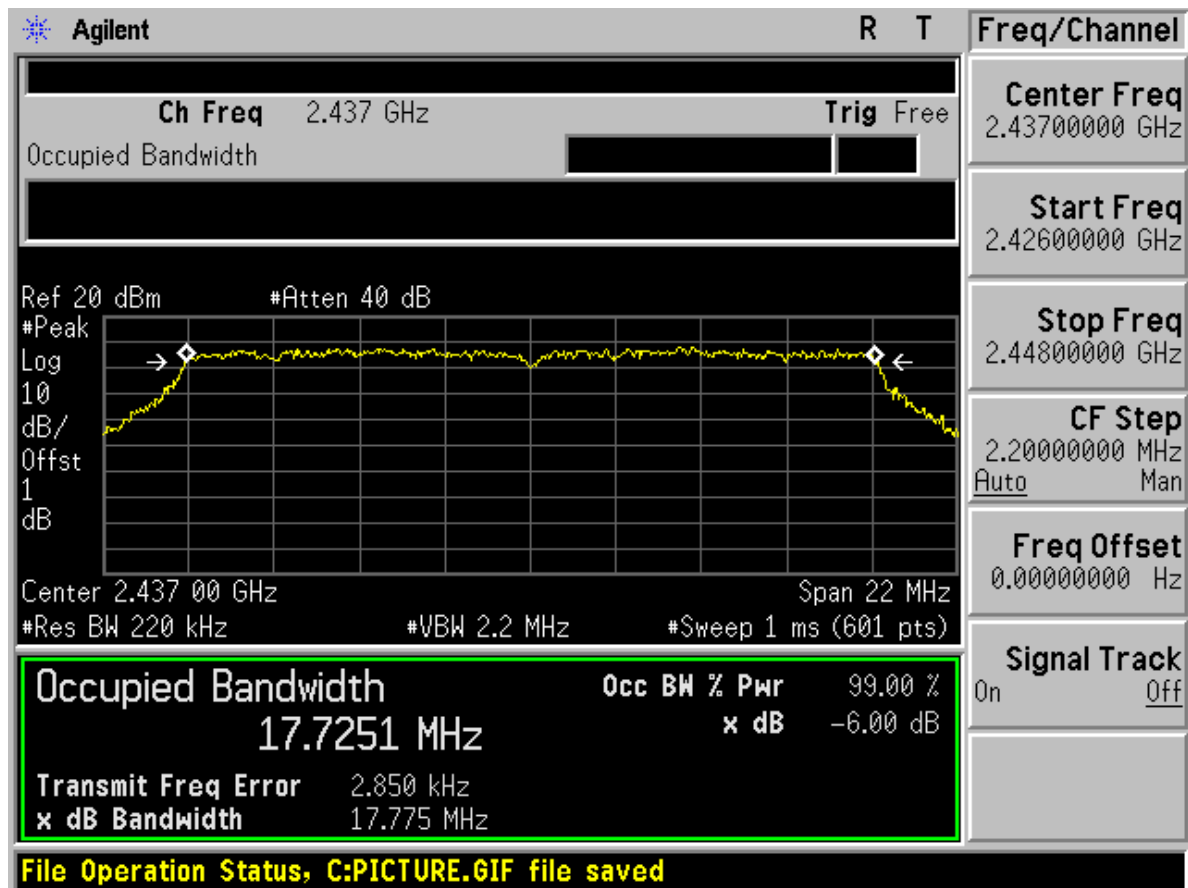
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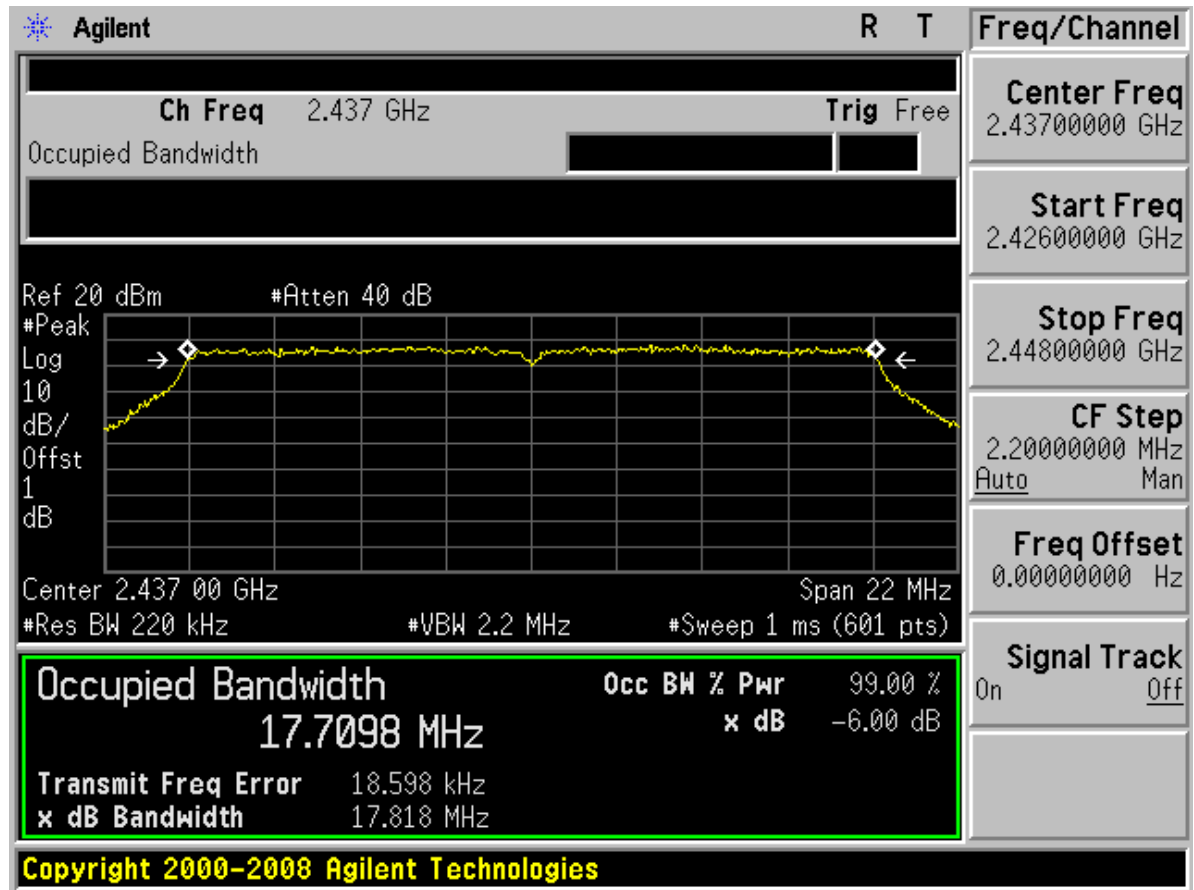
Channel 06

Chain 1





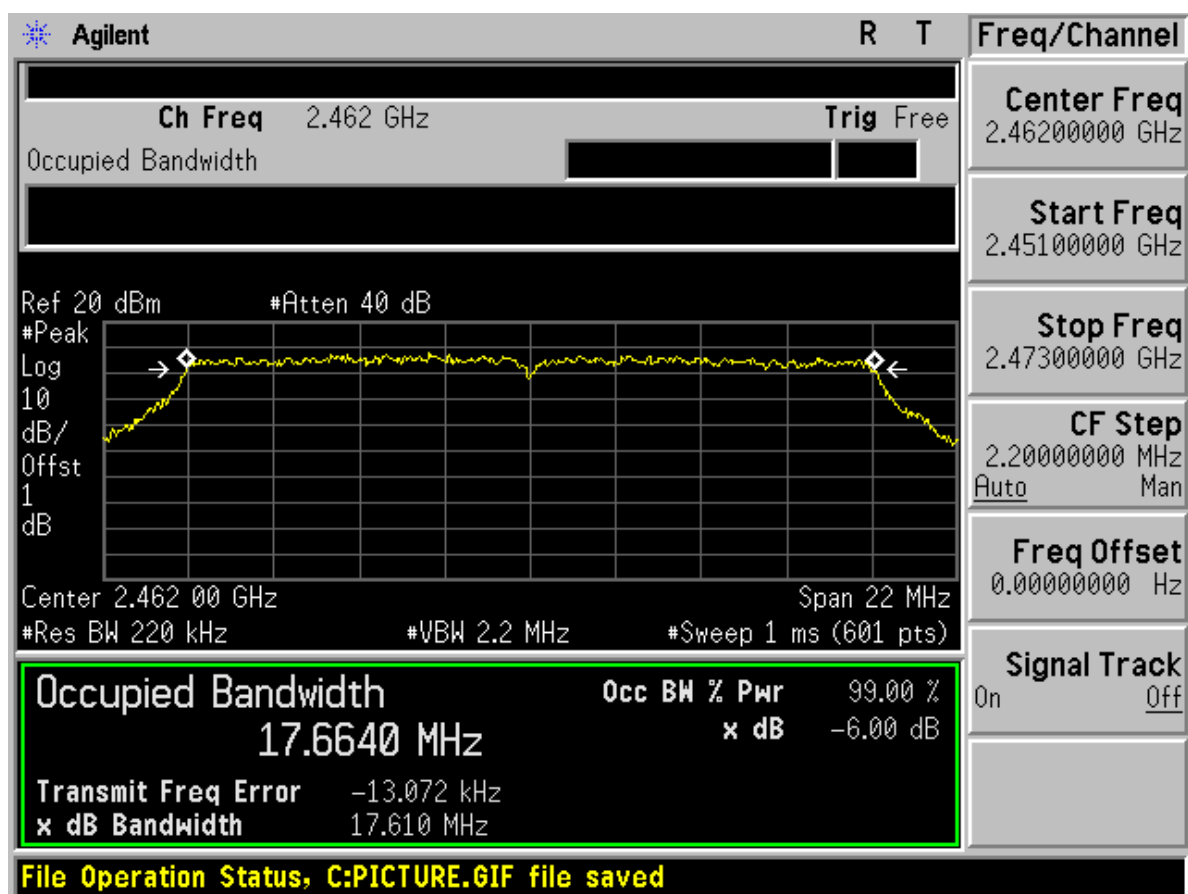
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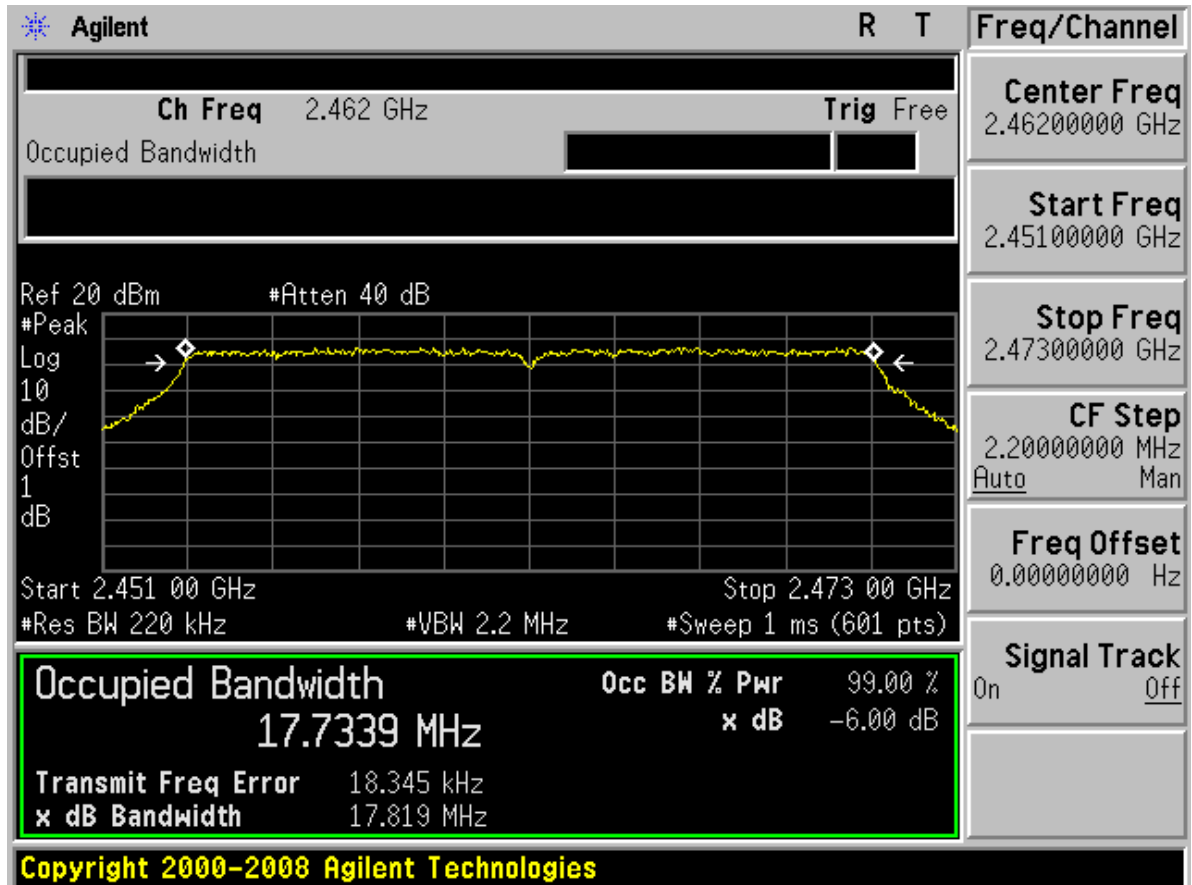
Channel 11

Chain 1





Chain 2

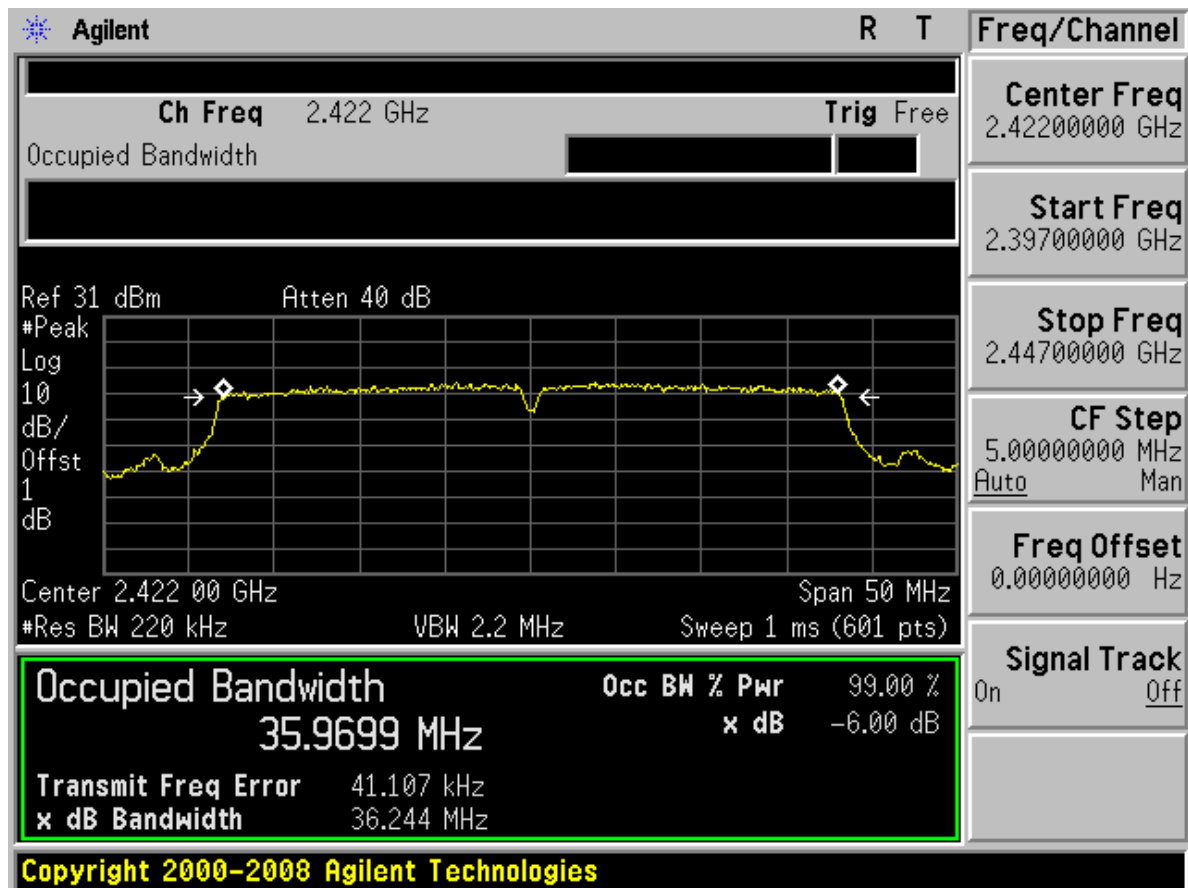




TM4 Chain 1&2

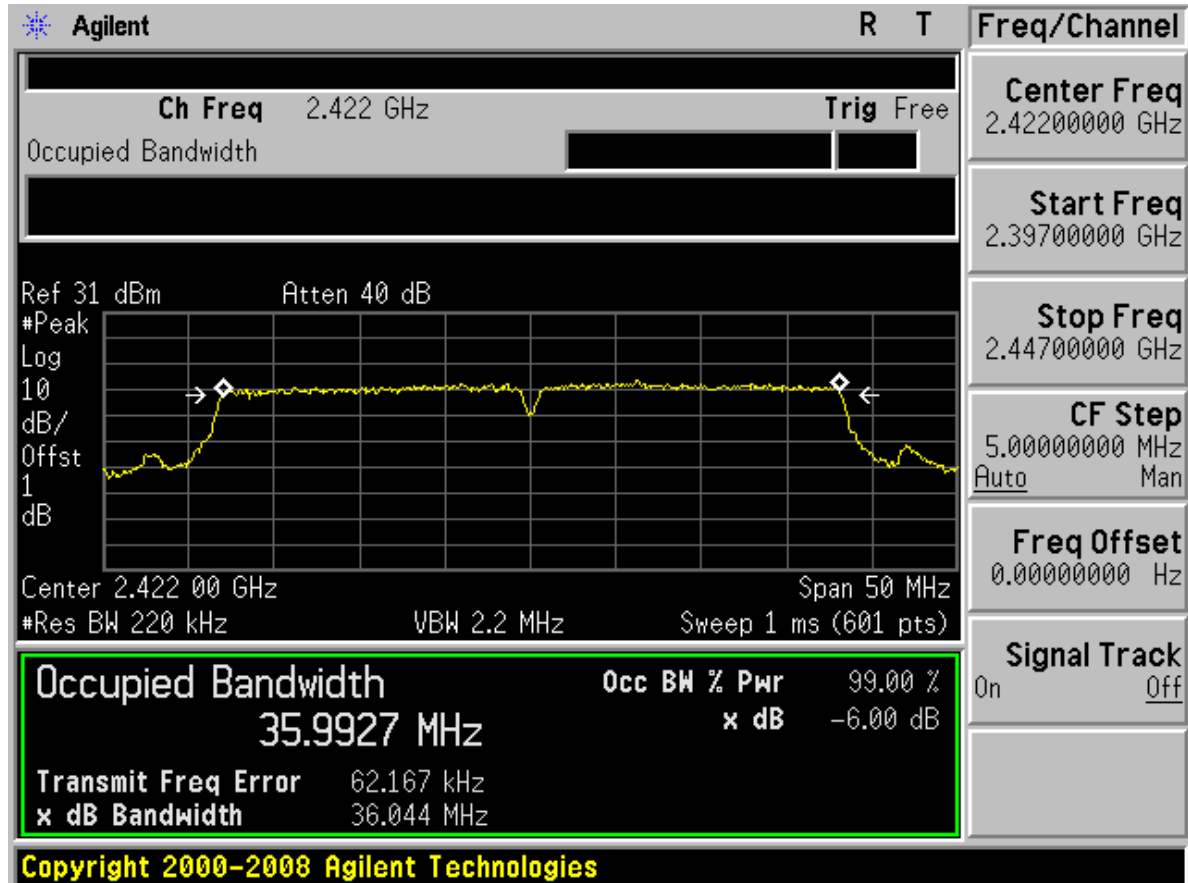
Channel 03

Chain 1





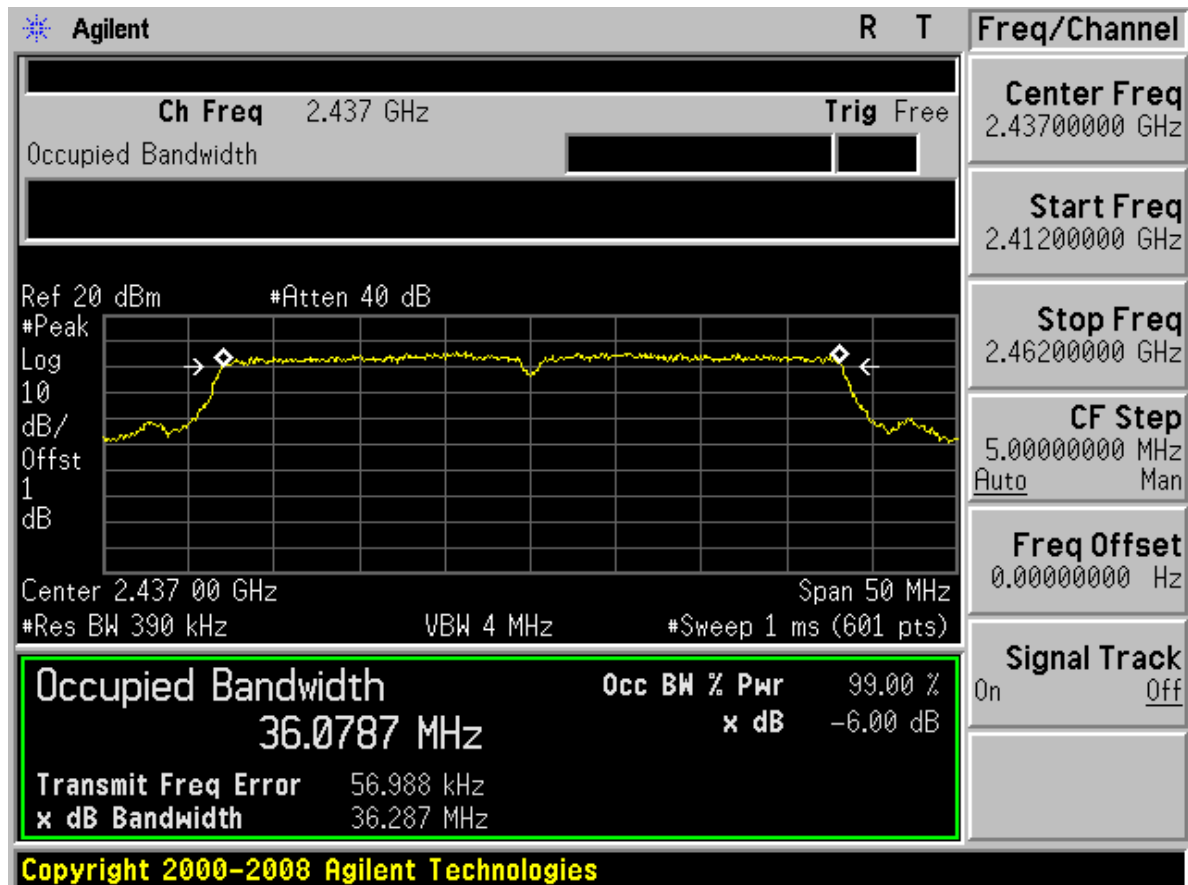
Chain 2





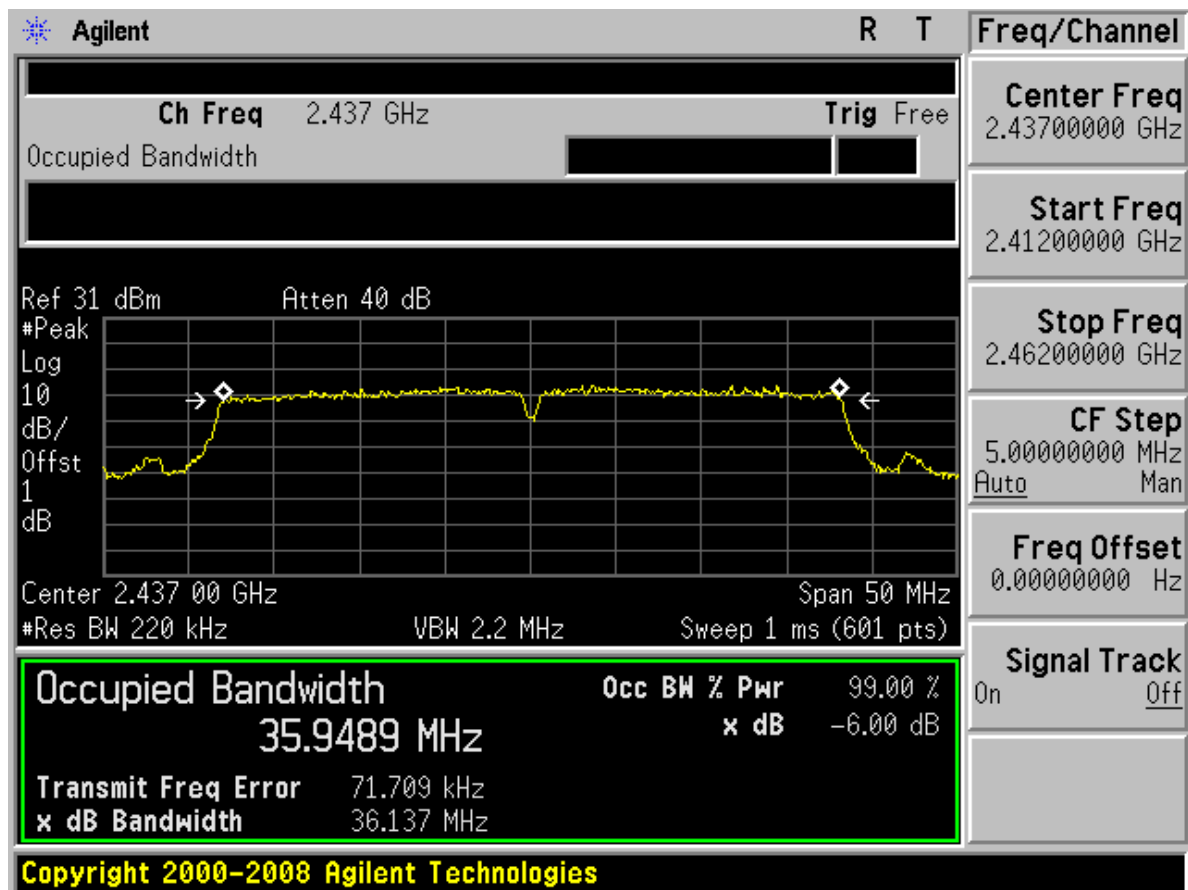
Channel 06

Chain 1





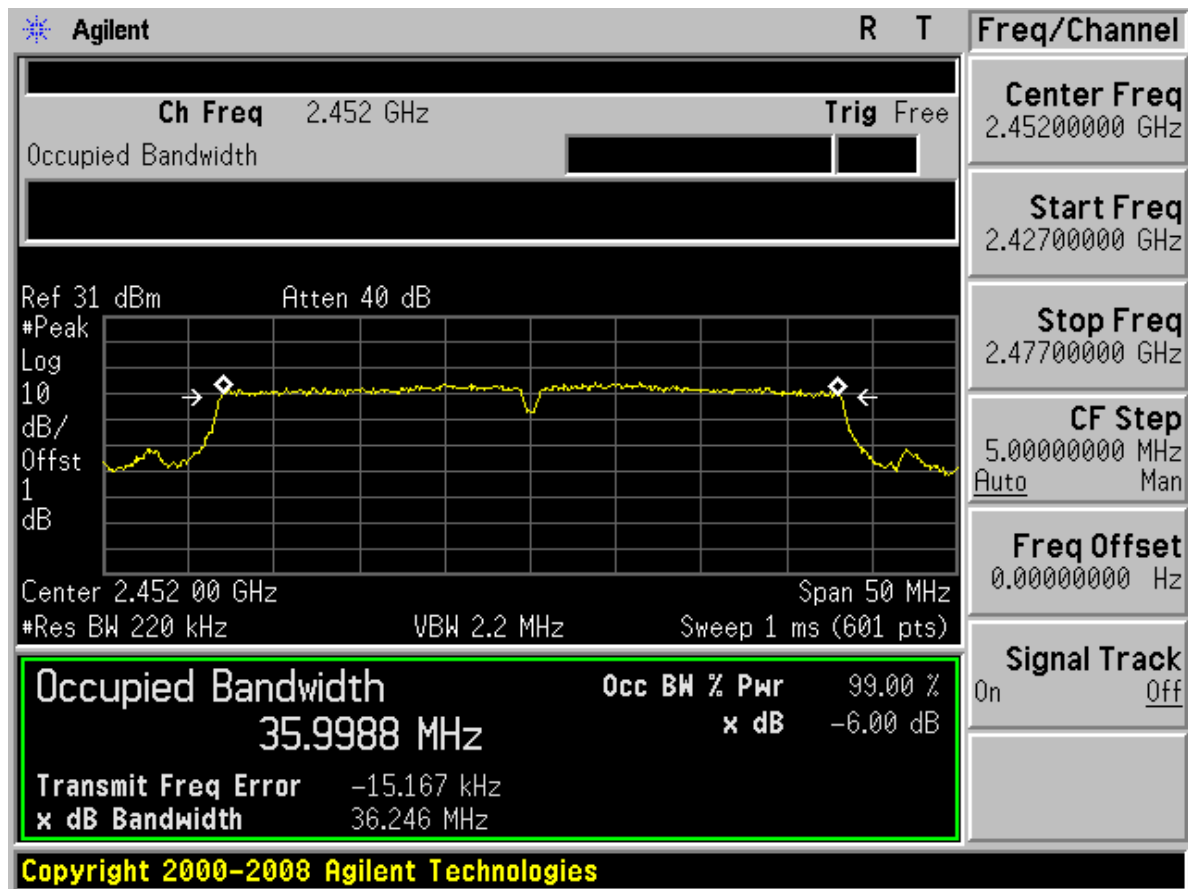
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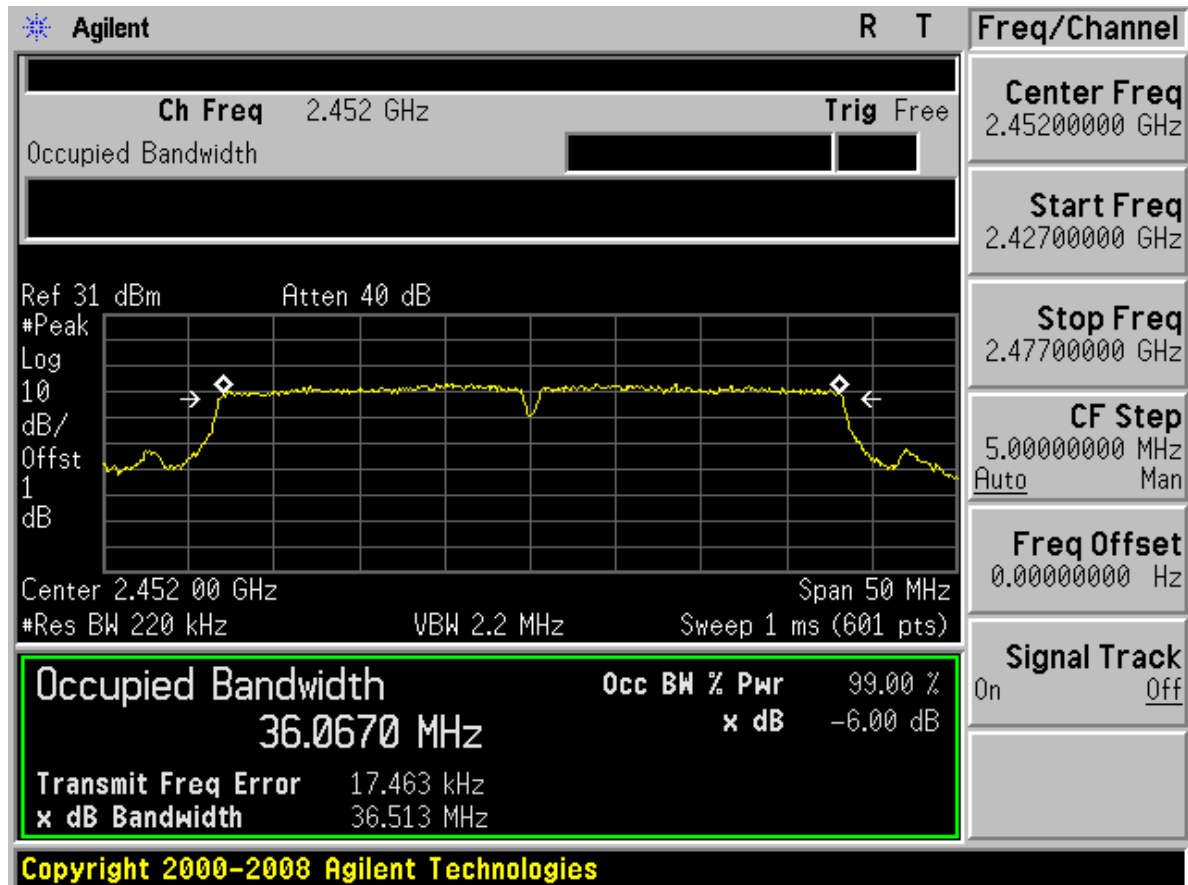
Channel 09

Chain 1





Chain 2

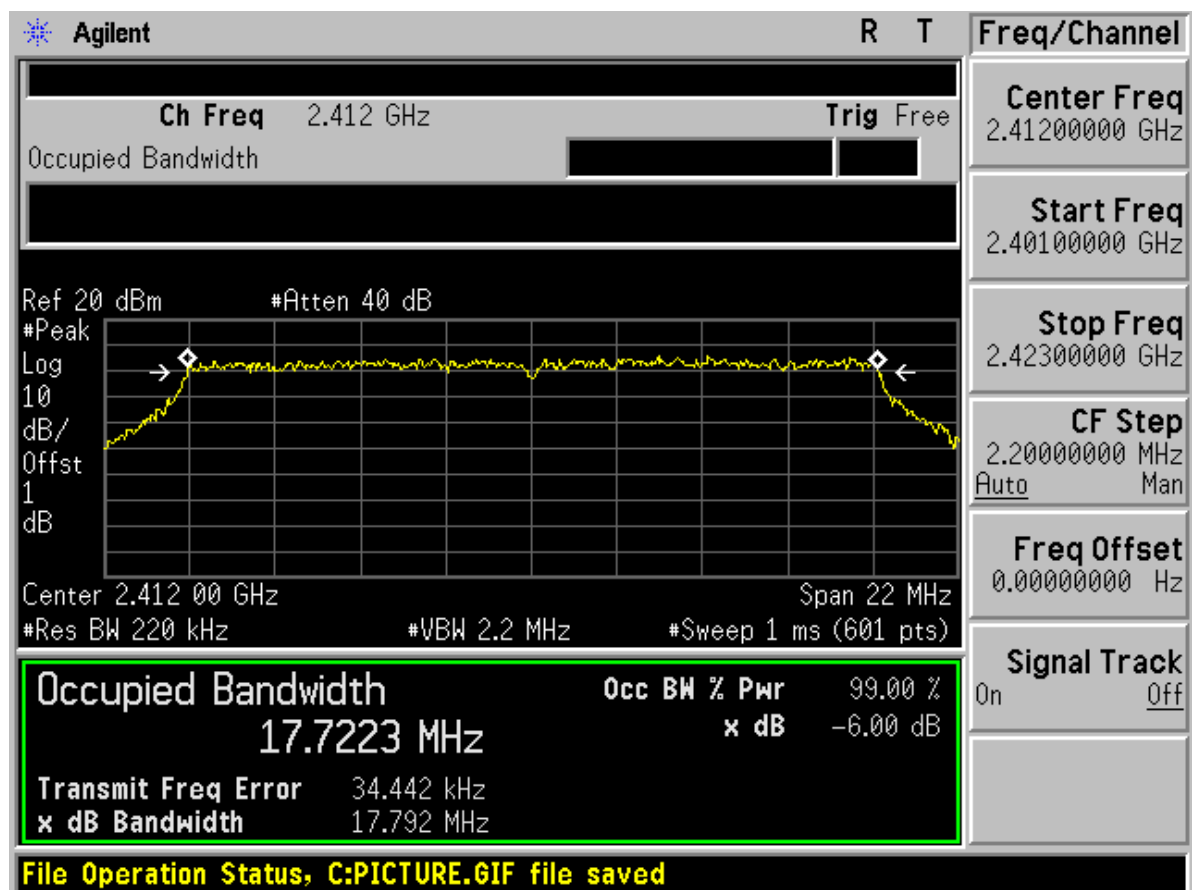




TM5 Chain 1&2

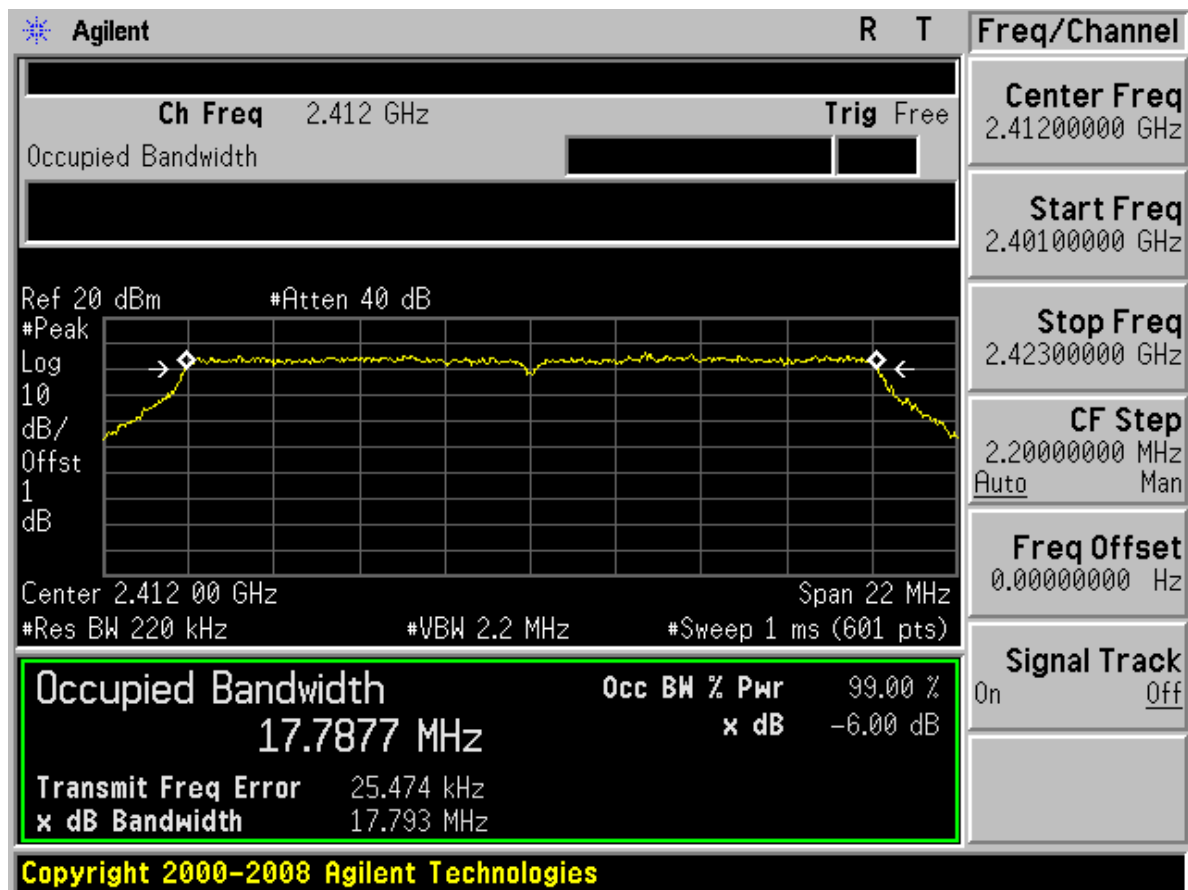
Channel 01

Chain 1





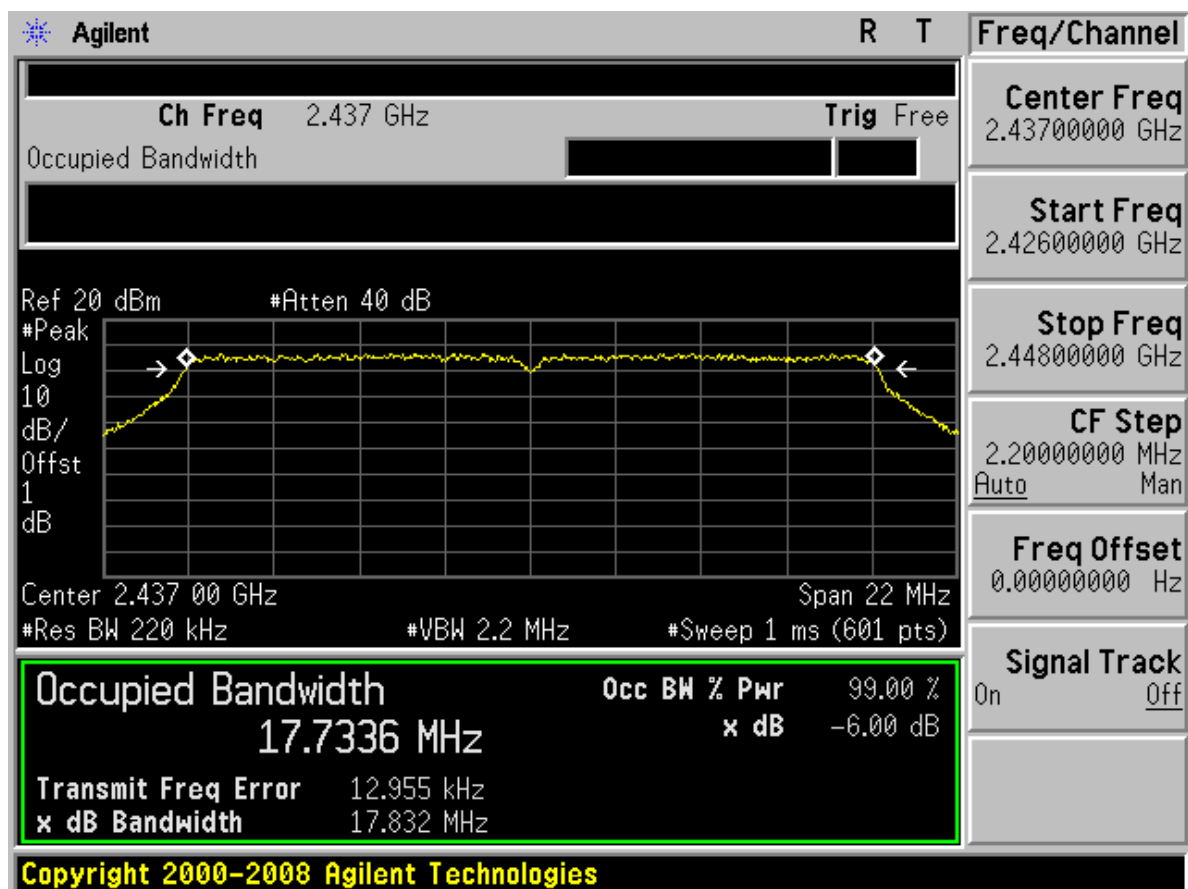
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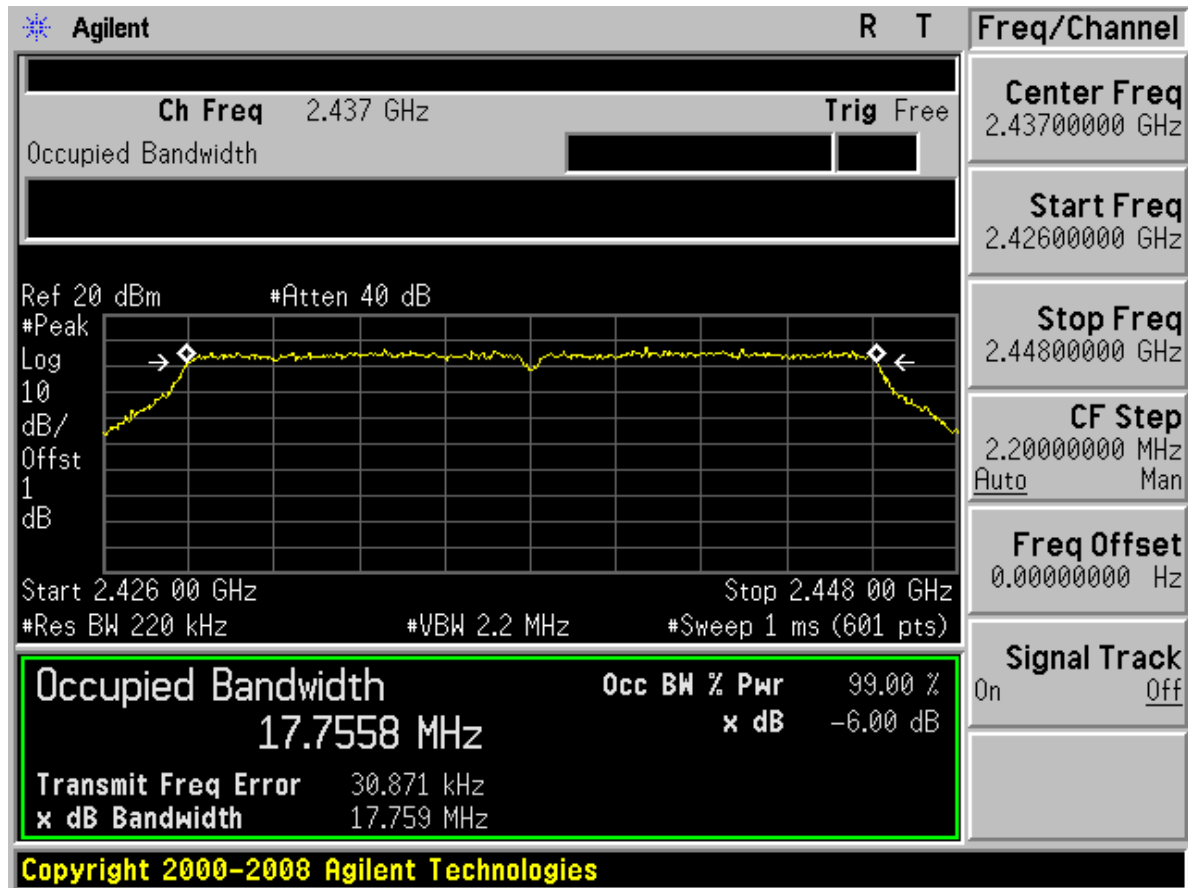
Channel 06

Chain 1





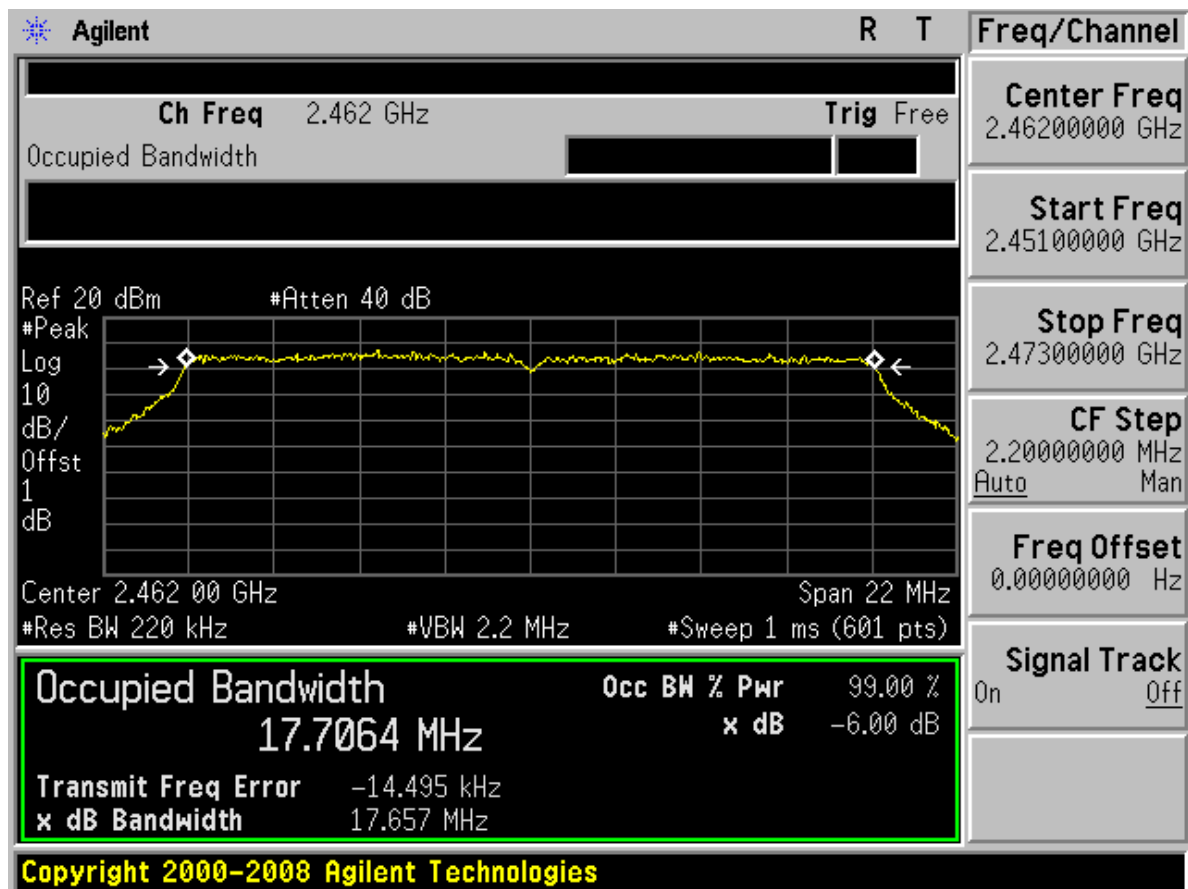
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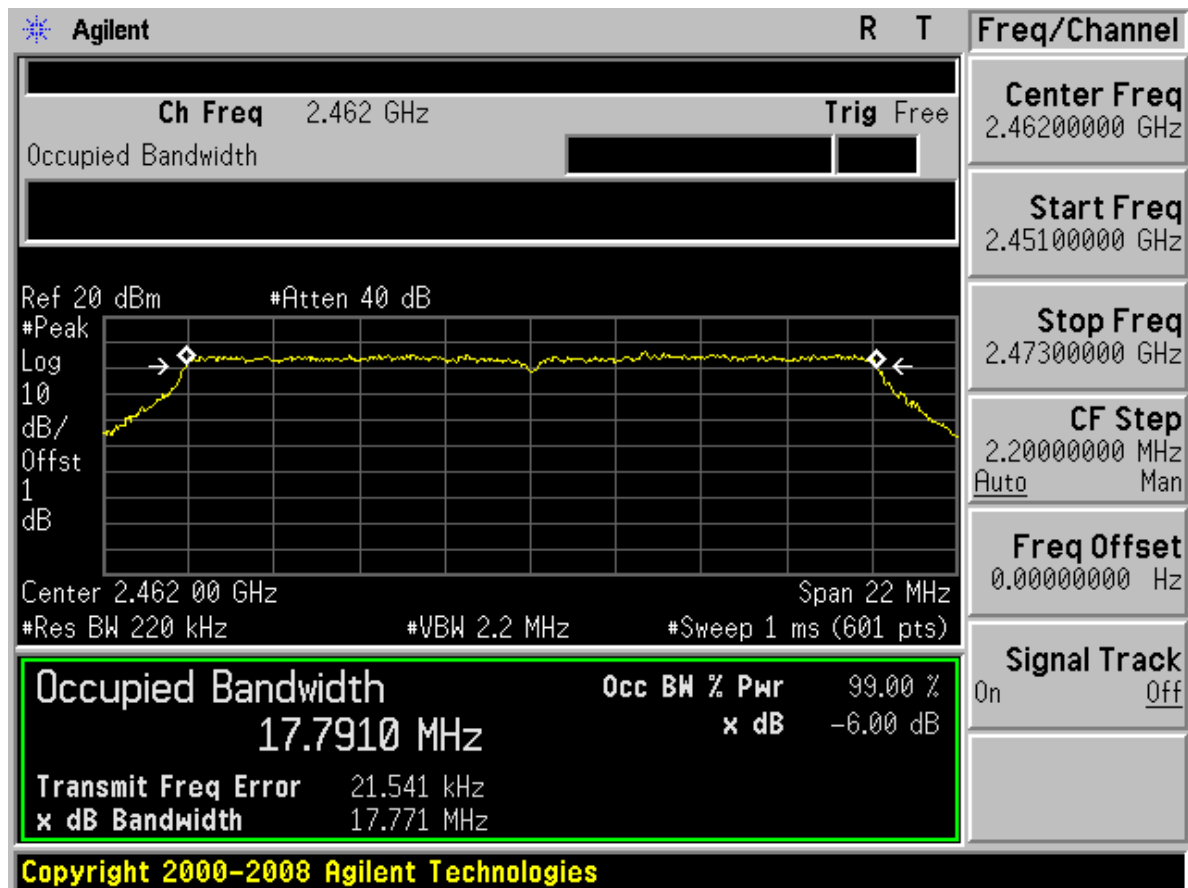
Channel 11

Chain 1





Chain 2

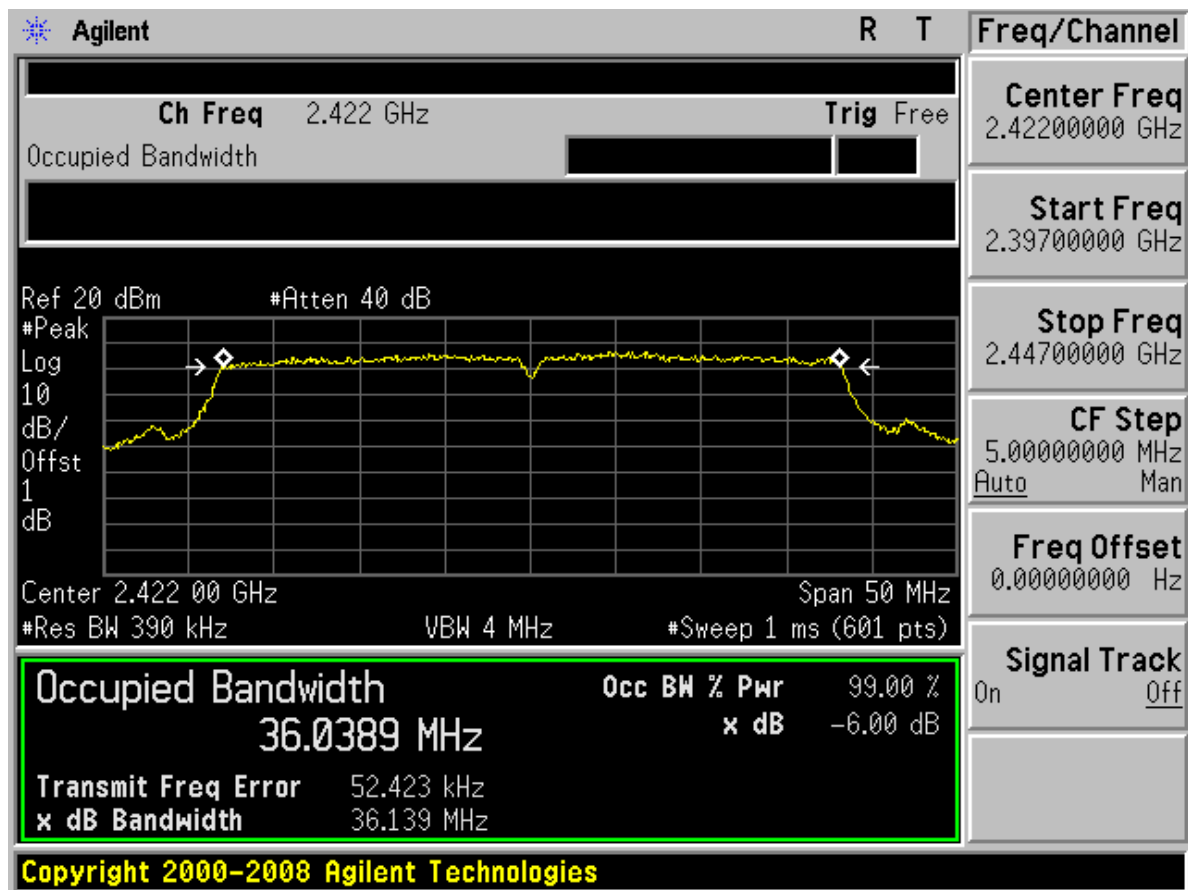




TM6 Chain 1&2

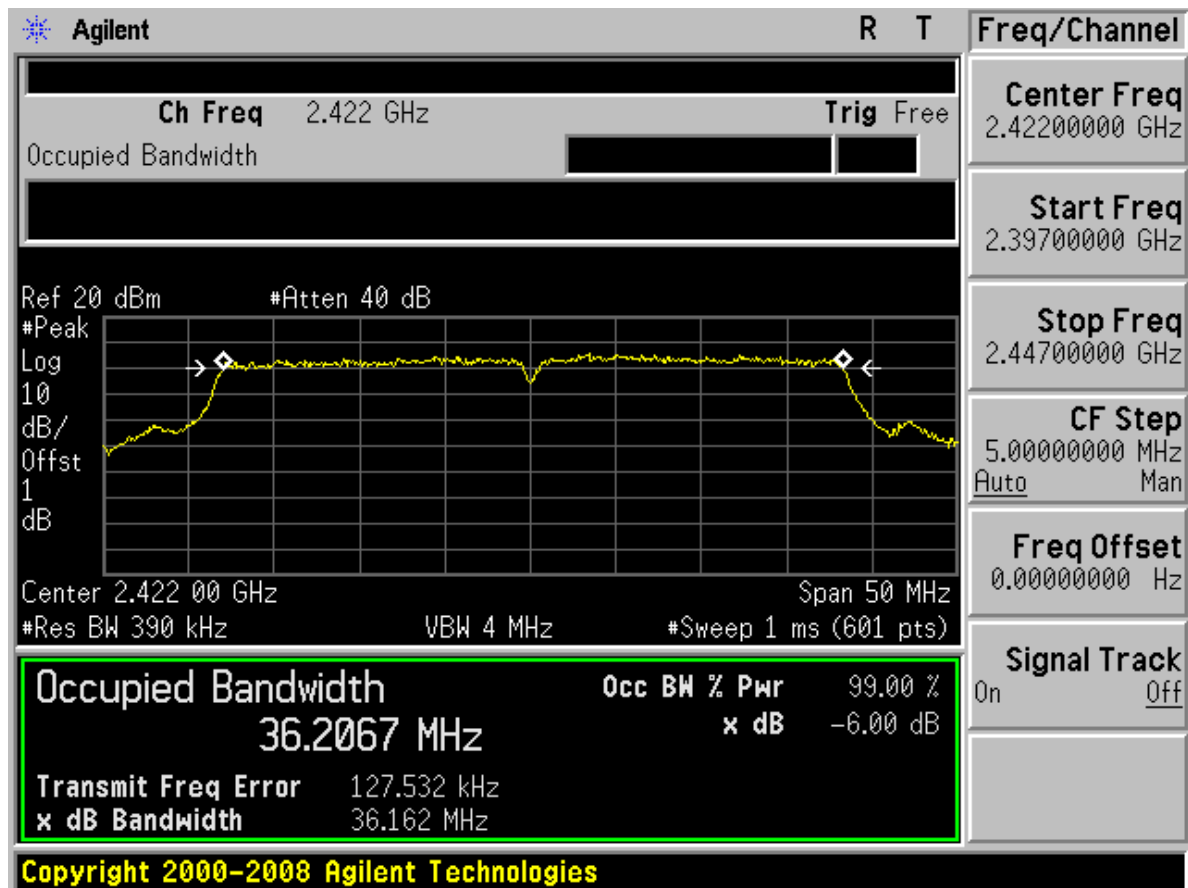
Channel 03

Chain 1





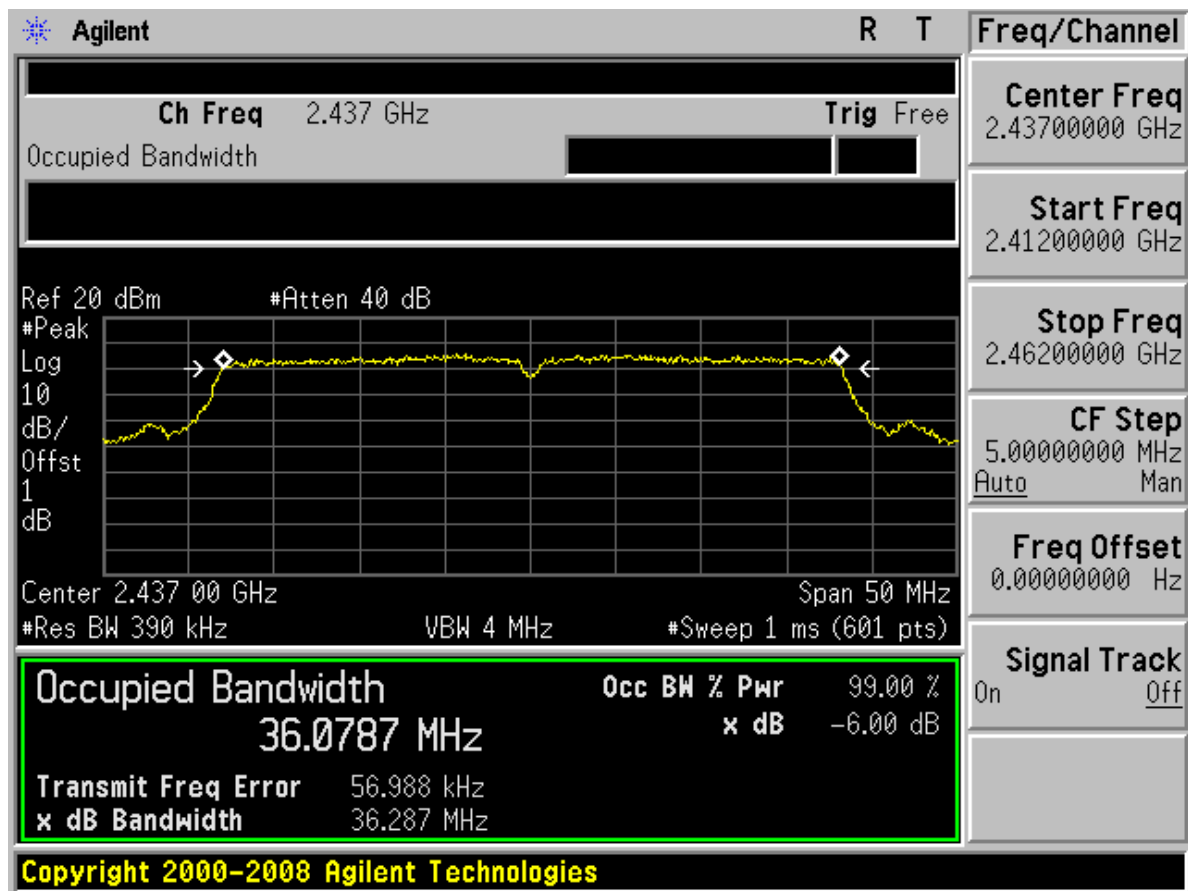
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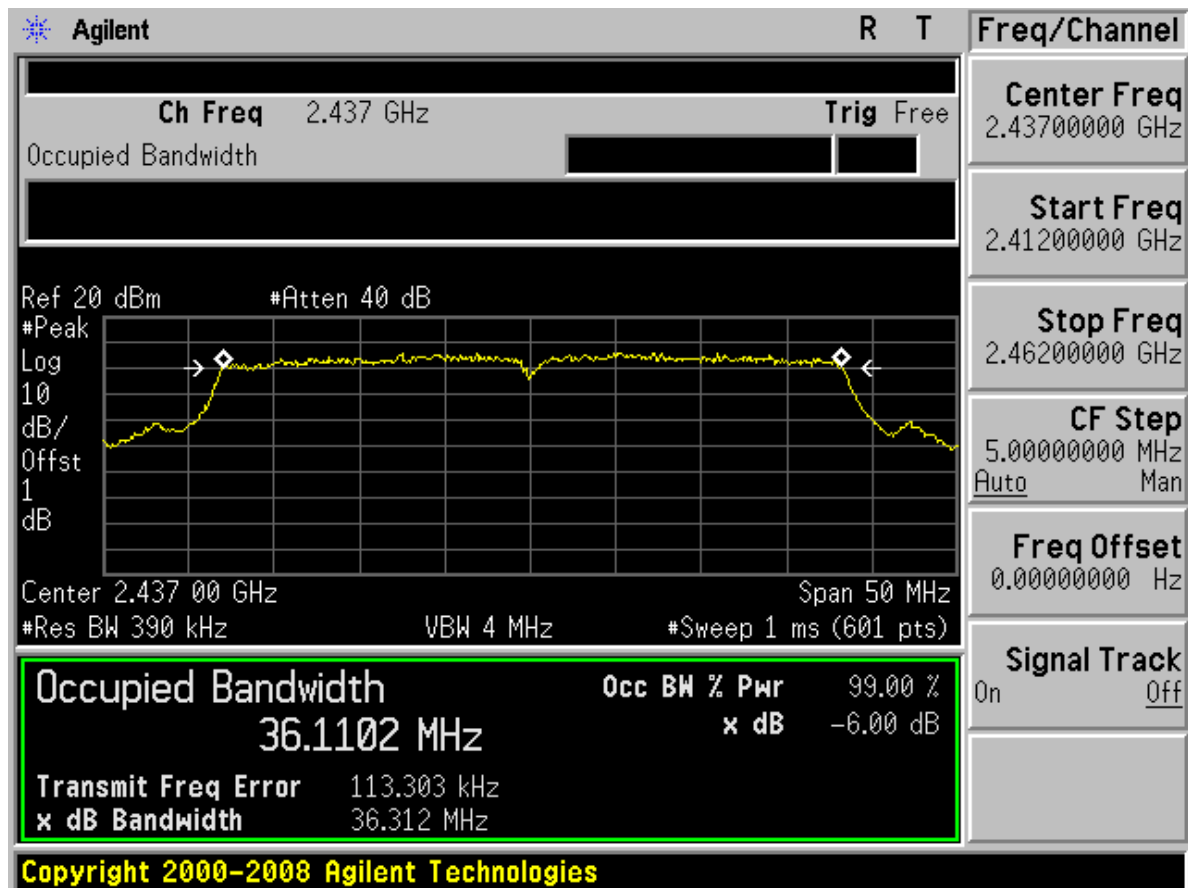
Channel 06

Chain 1





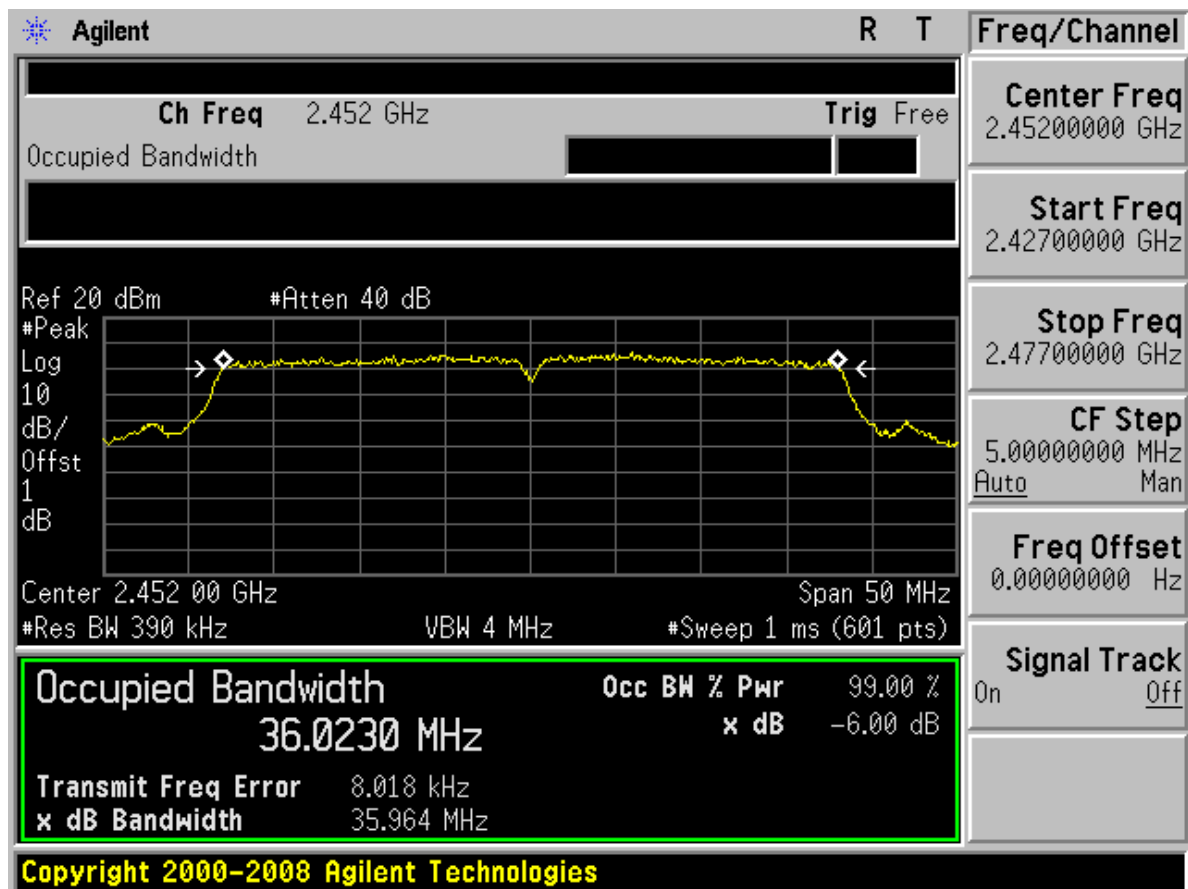
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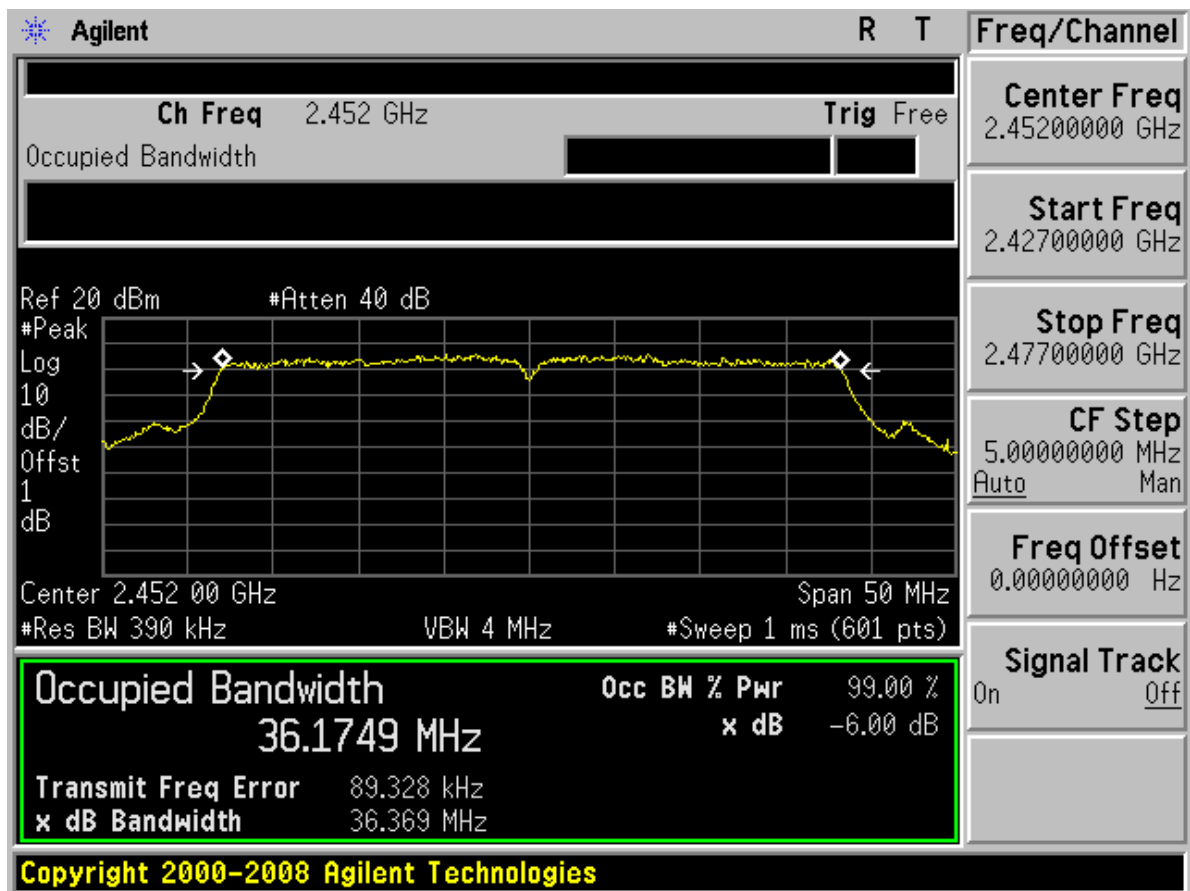
Channel 09

Chain 1





Chain 2



-----The END-----



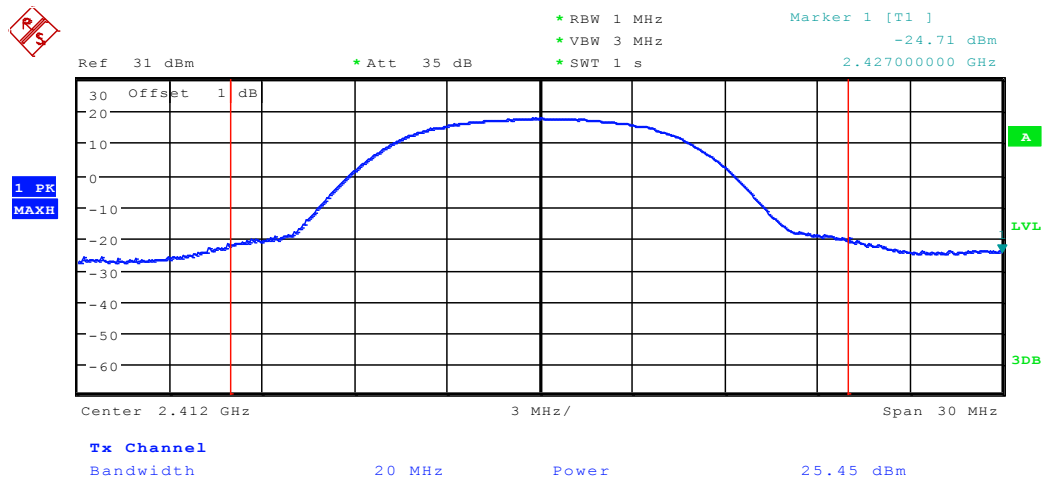
Appendix B

Conducted Peak output power

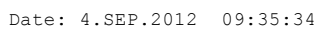
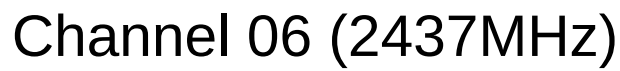
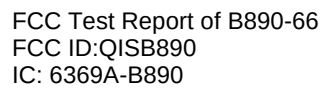
According to FCC Part 15.247 (b) (3) & RSS-210



TM1 Chain 1 Channel 01 (2412MHz)

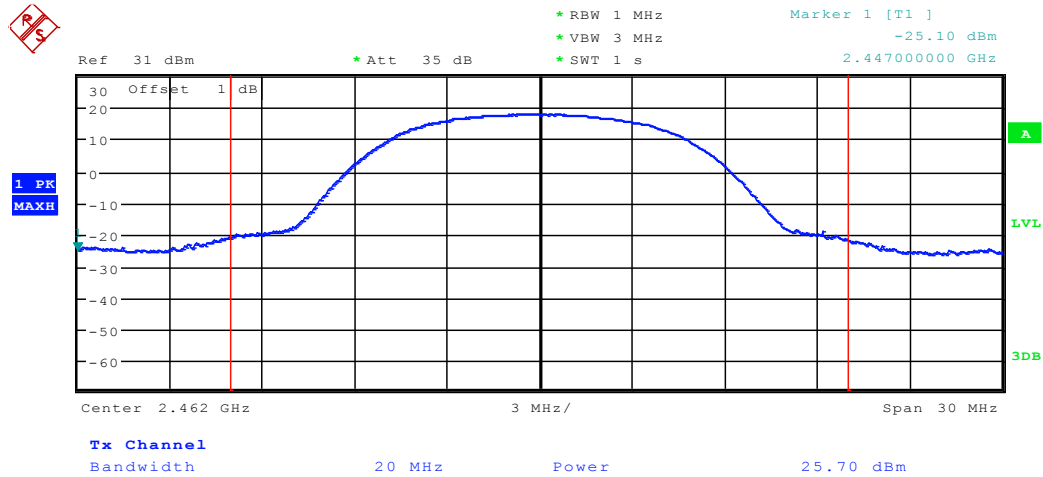


Date: 4.SEP.2012 09:34:06





Channel 11 (2462MHz)

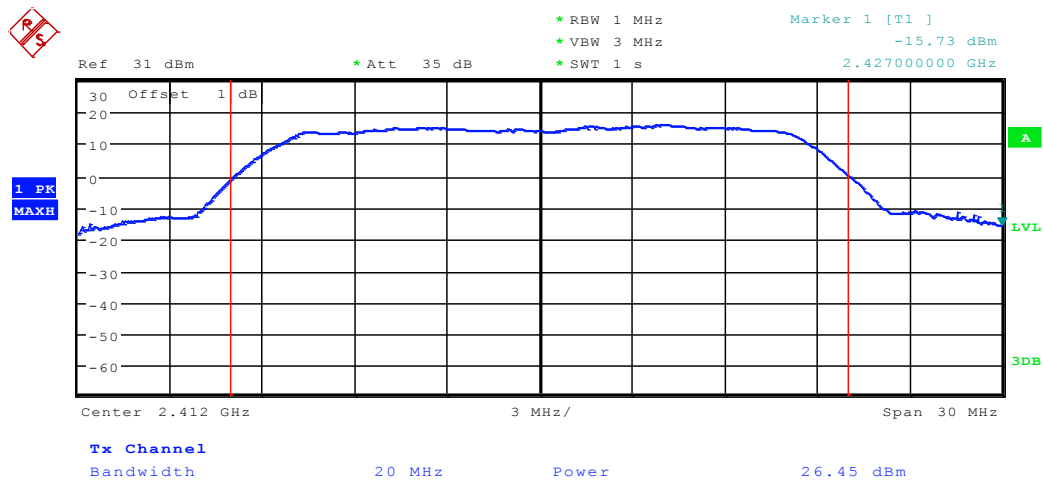


Date: 4.SEP.2012 09:36:24



TM2 Chain 1&2 Channel 01 (2412MHz)

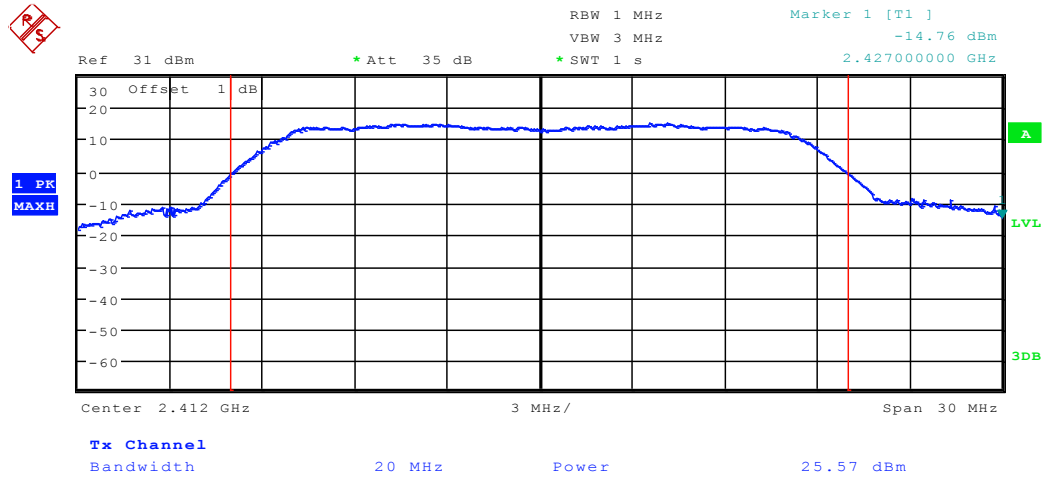
Chain 1



Date: 4.SEP.2012 09:37:56



Chain 2

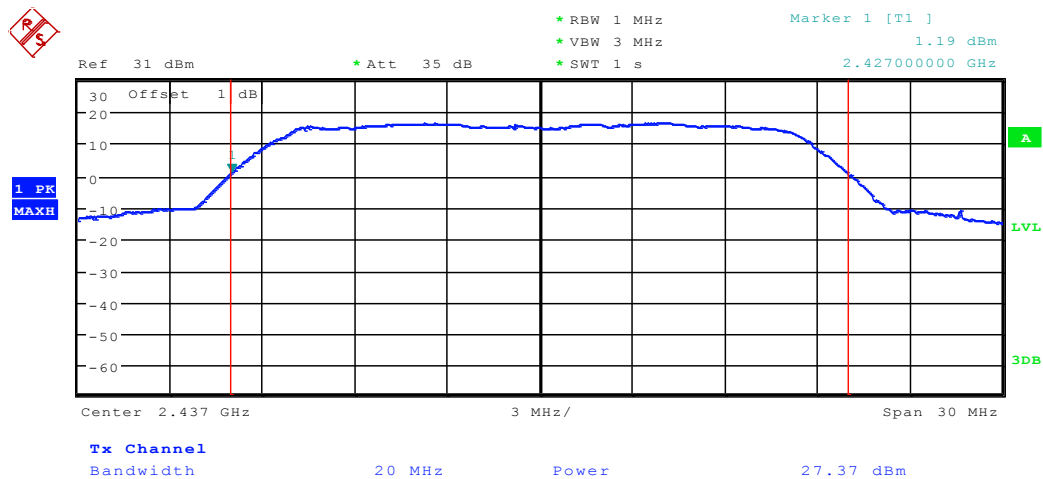


Date: 7.SEP.2012 09:12:41



Channel 06 (2437MHz)

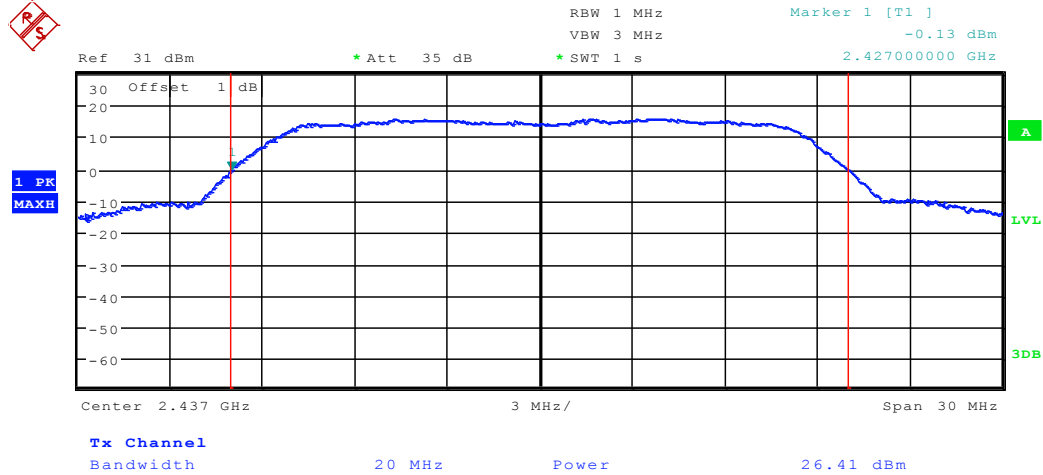
Chain 1



Date: 4.SEP.2012 09:39:03



Chain 2

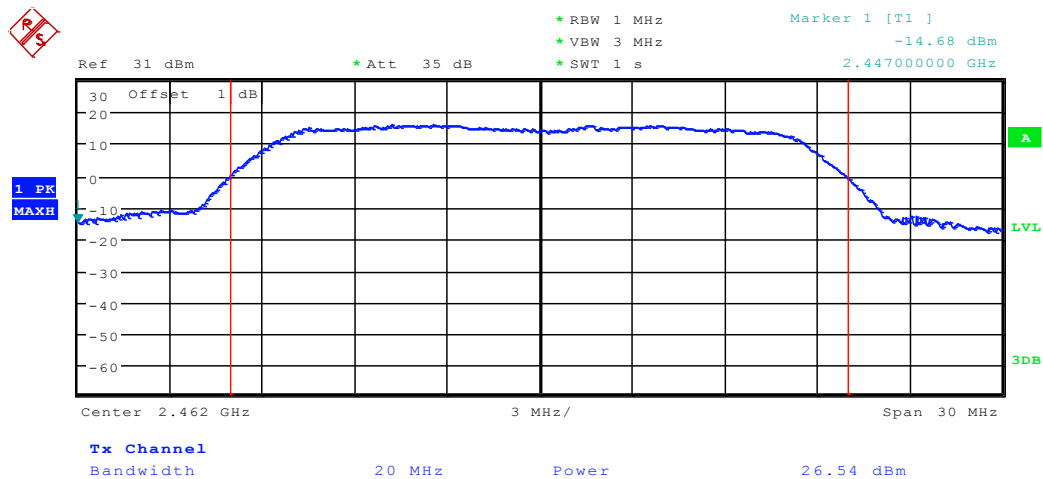


Date: 7.SEP.2012 09:13:29



Channel 11 (2462MHz)

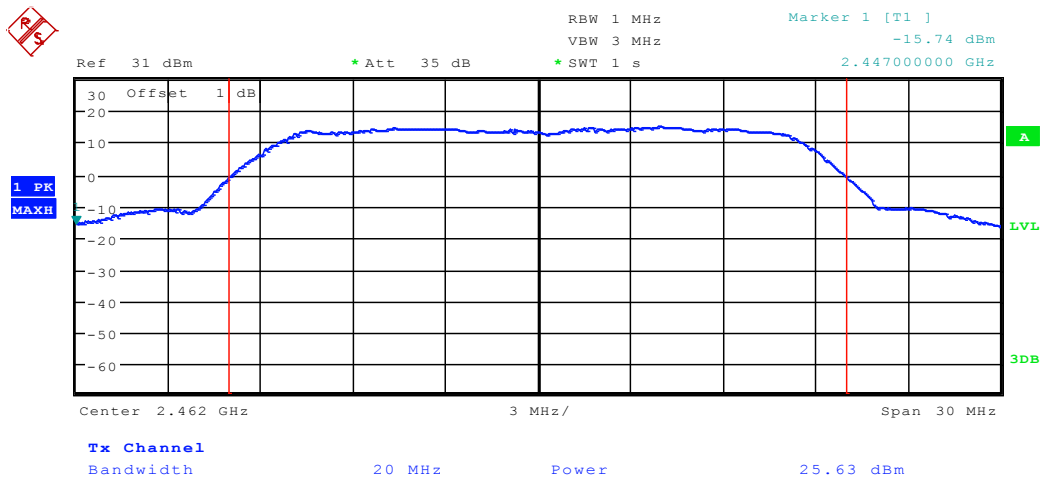
Chain 1



Date: 4.SEP.2012 09:39:45



Chin 2

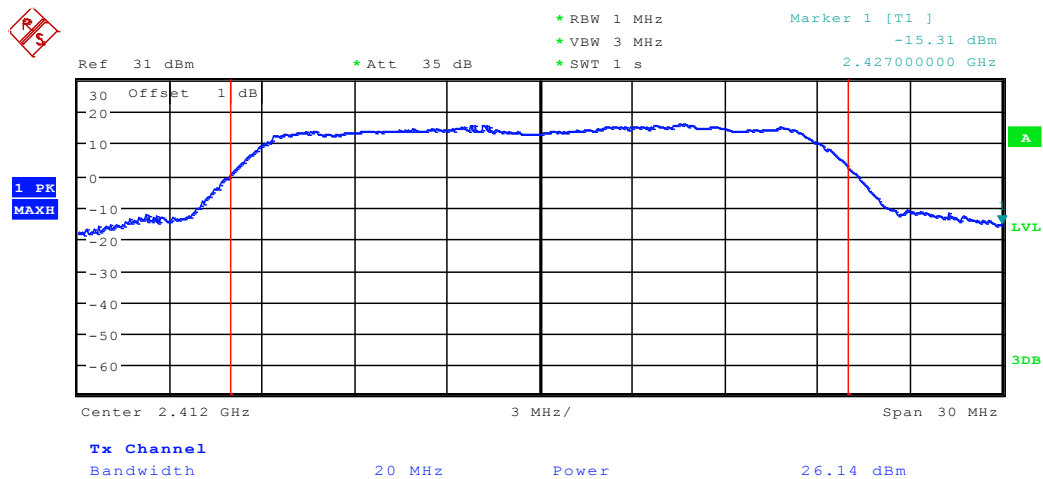


Date: 7.SEP.2012 09:17:43



TM3 Chain 1&2 Channel 01 (2412MHz)

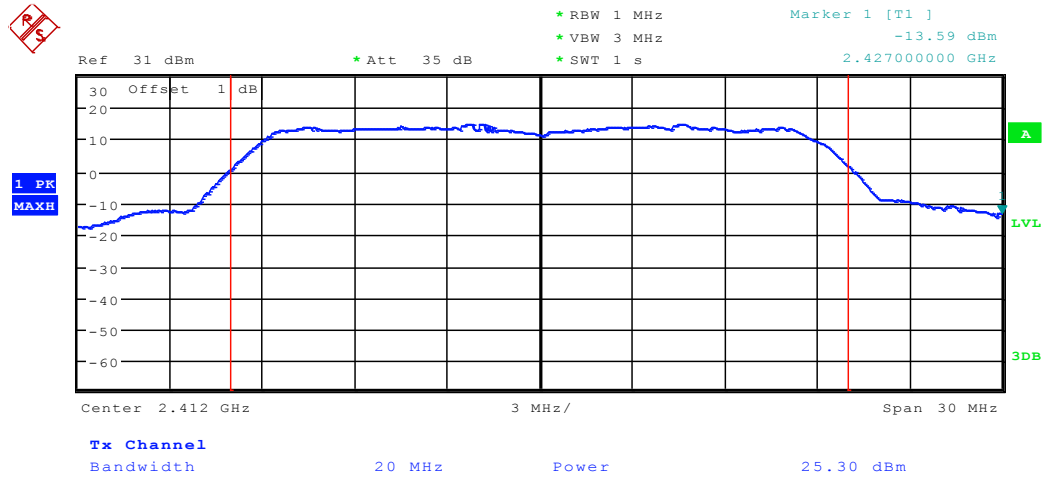
Chain 1



Date: 4.SEP.2012 09:40:43



Chain 2

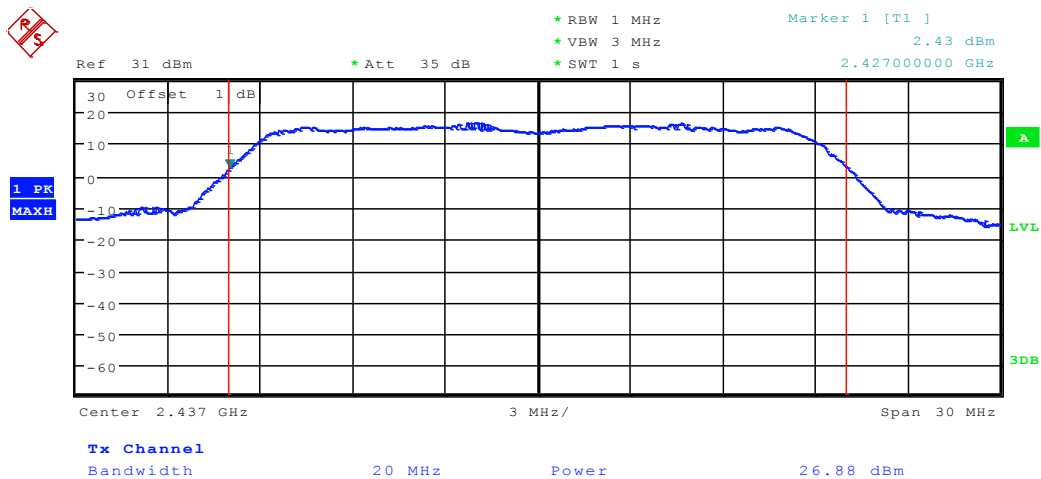


Date: 4.SEP.2012 09:43:48



Channel 06 (2437MHz)

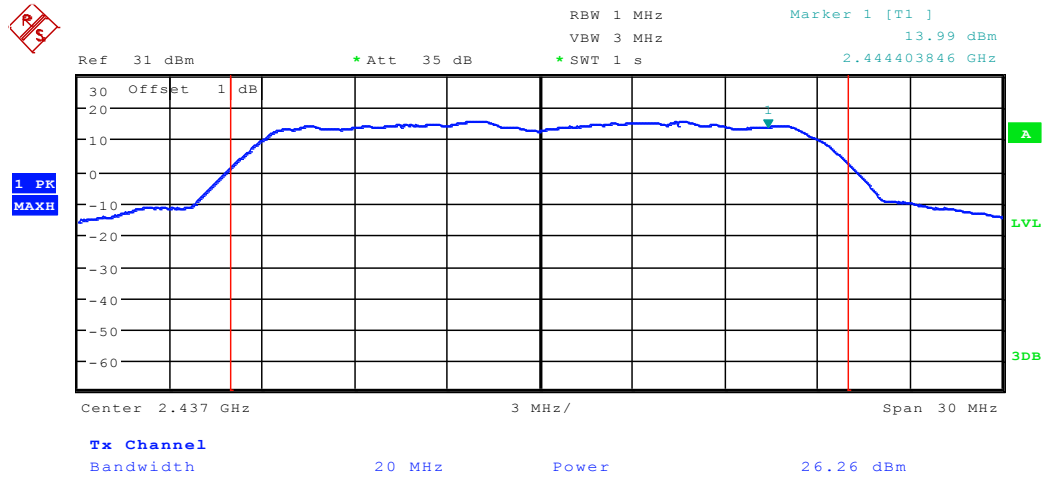
Chain 1



Date: 4.SEP.2012 09:41:28



Chain 2

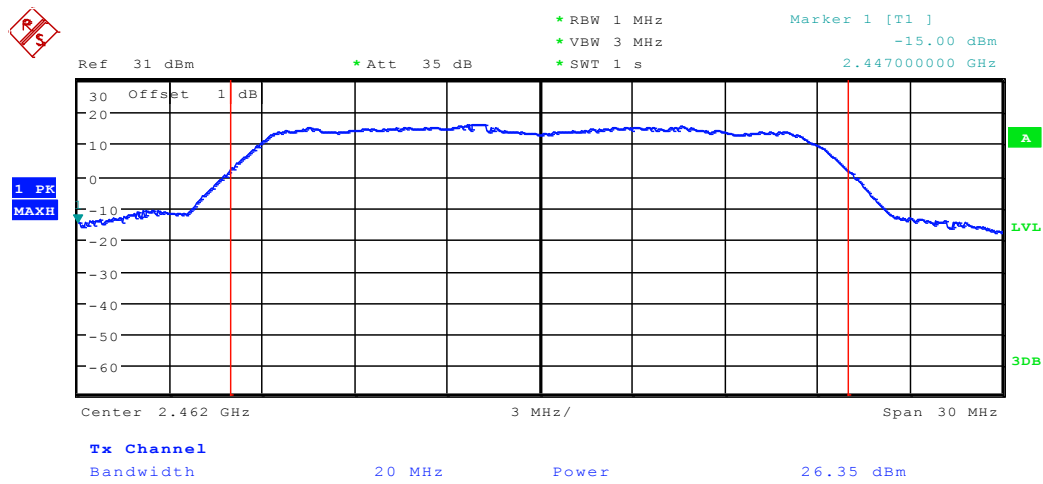


Date: 7.SEP.2012 09:10:44

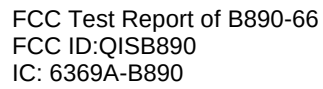


Channel 11 (2462MHz)

Chain 1



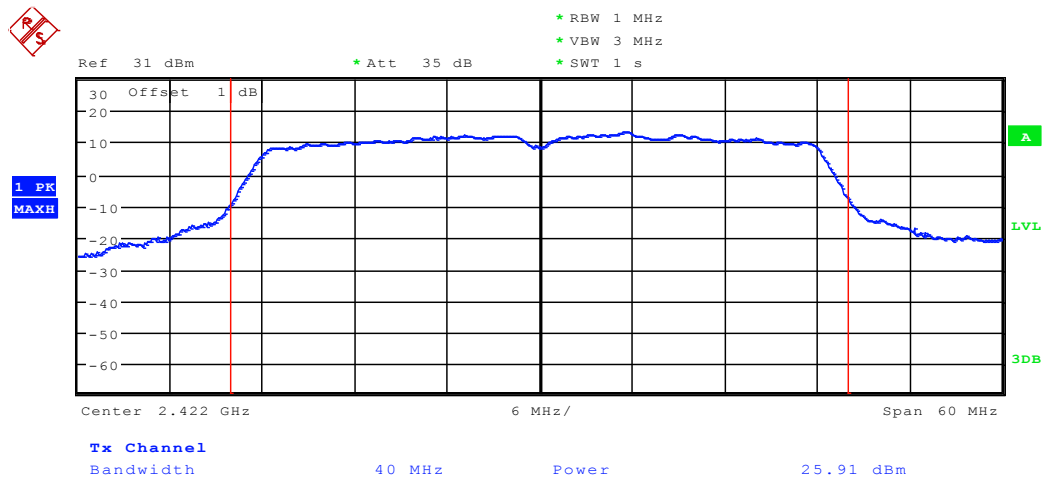
Date: 4.SEP.2012 09:42:39





TM4 Chain 1&2 Channel 03 (2422MHz)

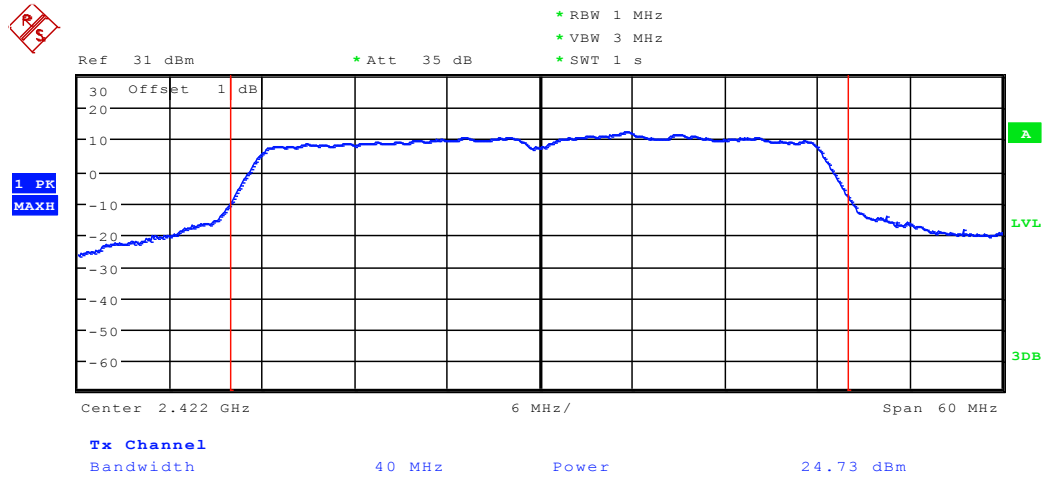
Chain 1



Date: 4.SEP.2012 09:54:34



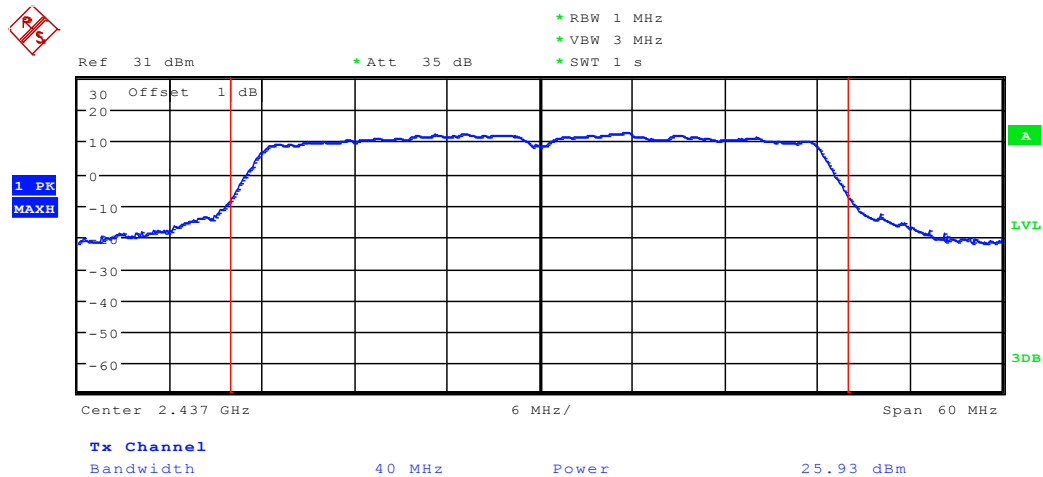
Chain 2



Date: 4.SEP.2012 09:51:24



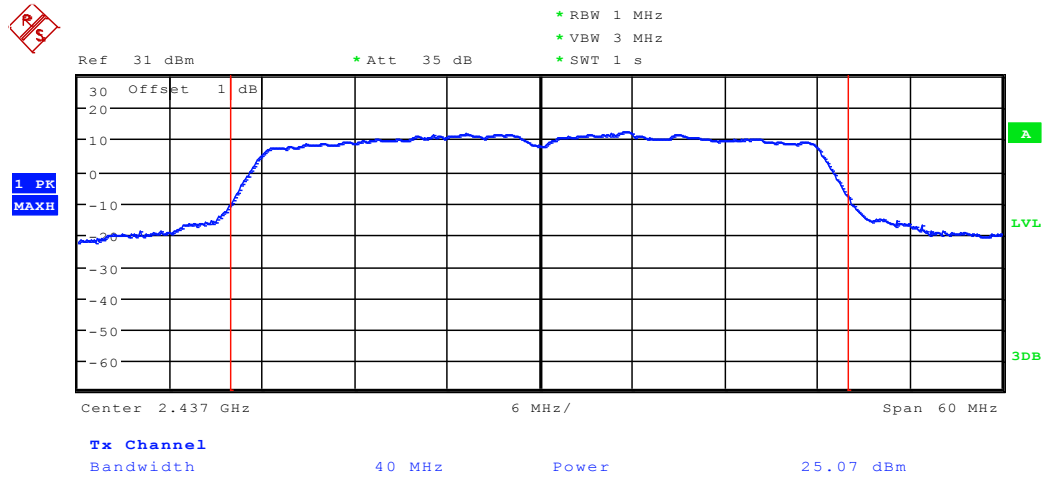
Channel 06 (2437MHz) Chain 1



Date: 4.SEP.2012 09:55:56



Chain 2

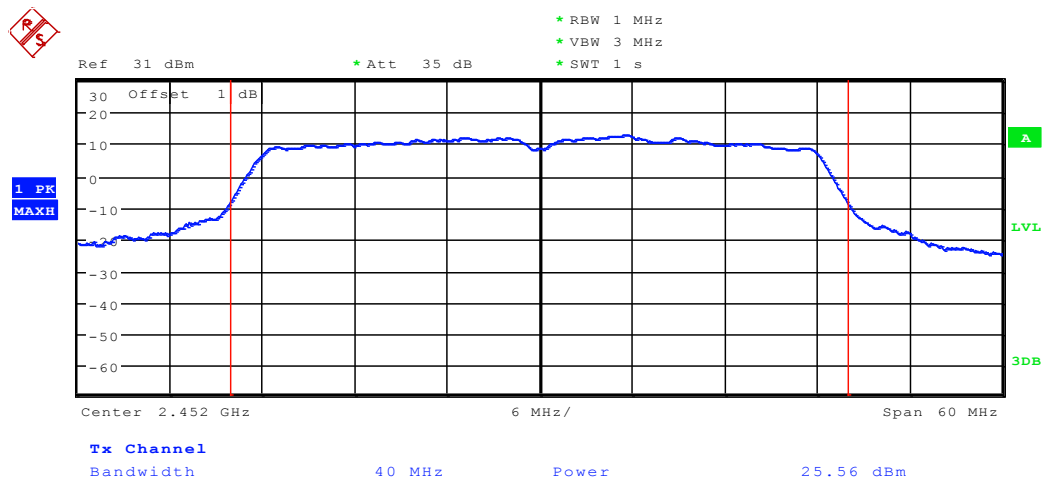


Date: 4.SEP.2012 09:50:16



Channel 09(2452MHz)

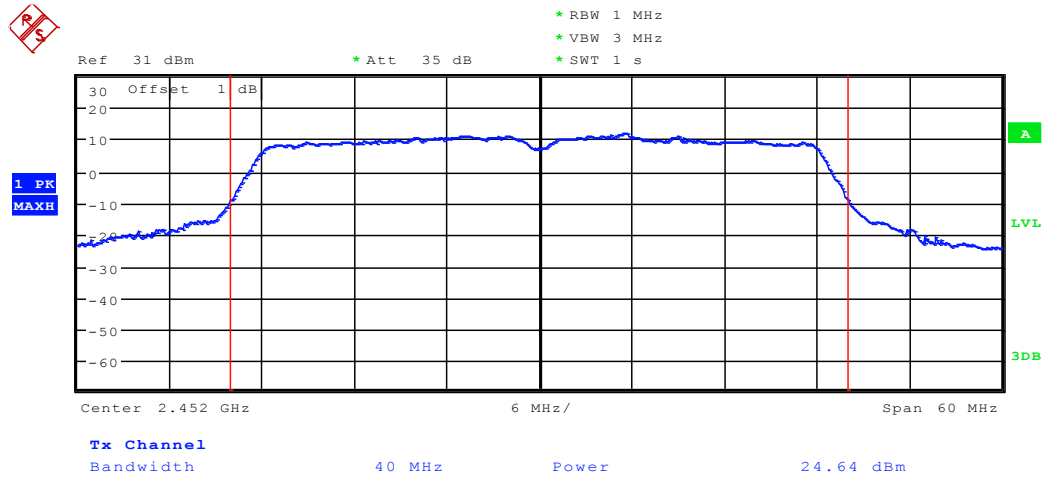
Chain 1



Date: 4.SEP.2012 09:57:47



Chain 2



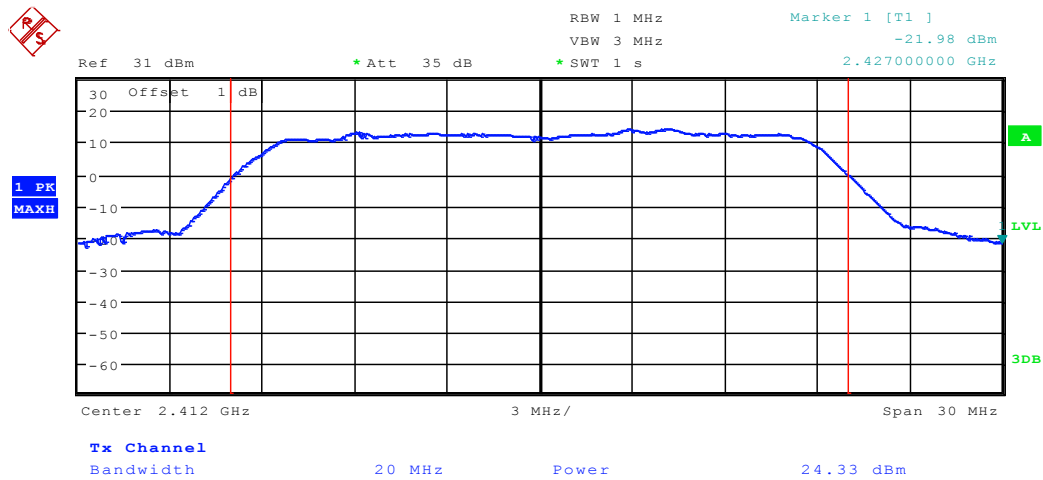
Date: 4.SEP.2012 09:53:21



TM5 Chain 1&2

Channel 01(2412MHz)

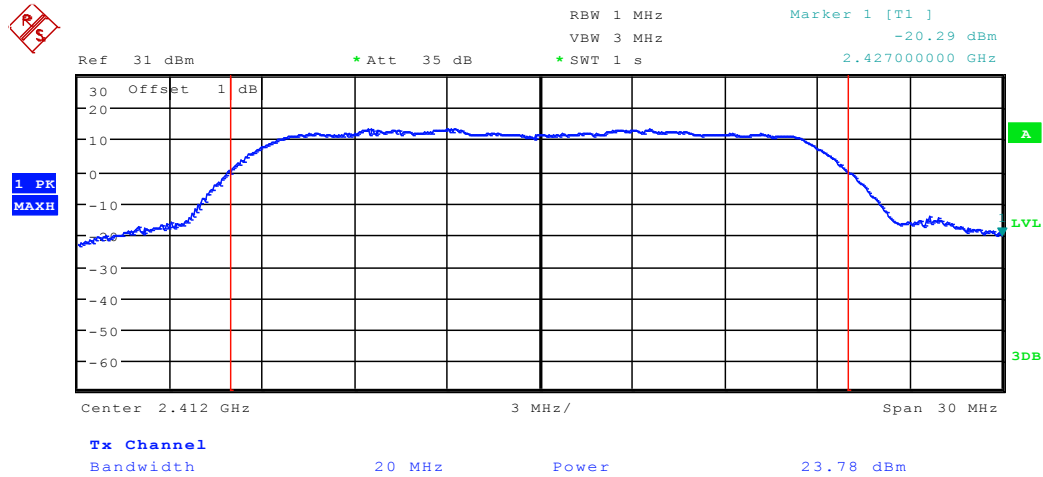
Chain 1



Date: 7.SEP.2012 09:20:28



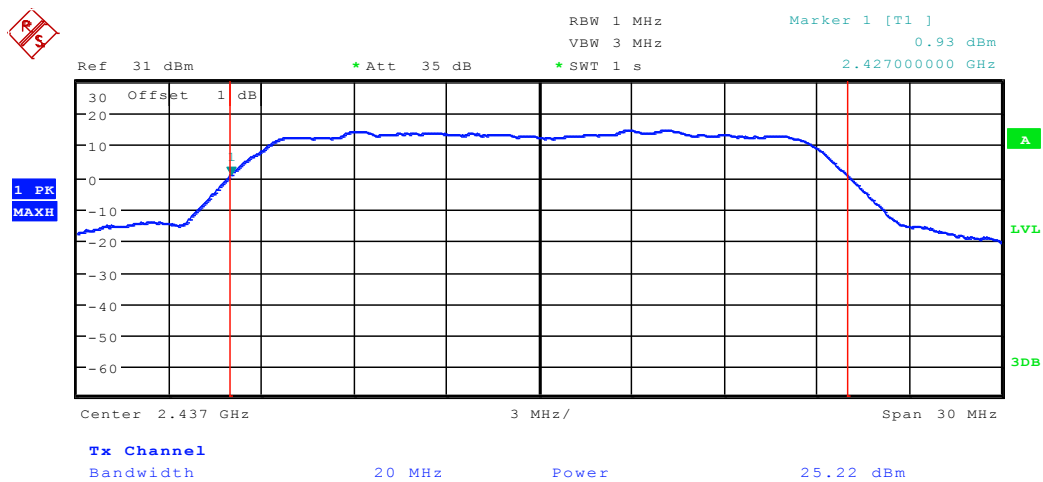
Chain 2



Date: 7.SEP.2012 09:21:20



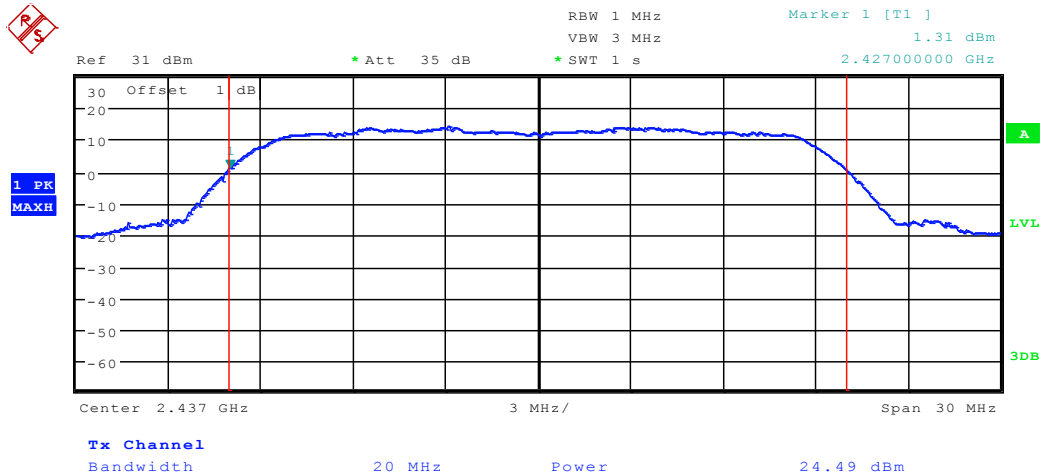
Channel 06(2437MHz) Chain 1



Date: 7.SEP.2012 09:23:34



Chain 2

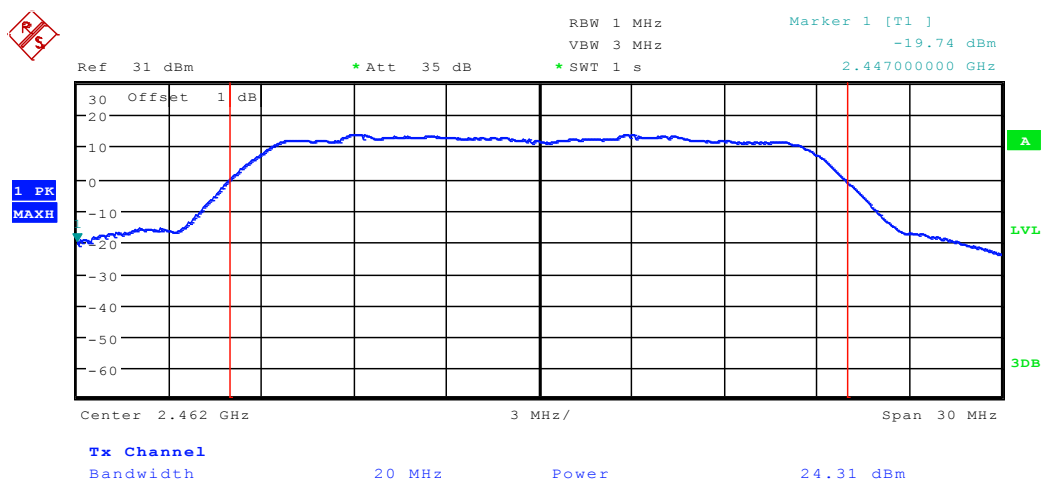


Date: 7.SEP.2012 09:24:37



Channel 11(2462MHz)

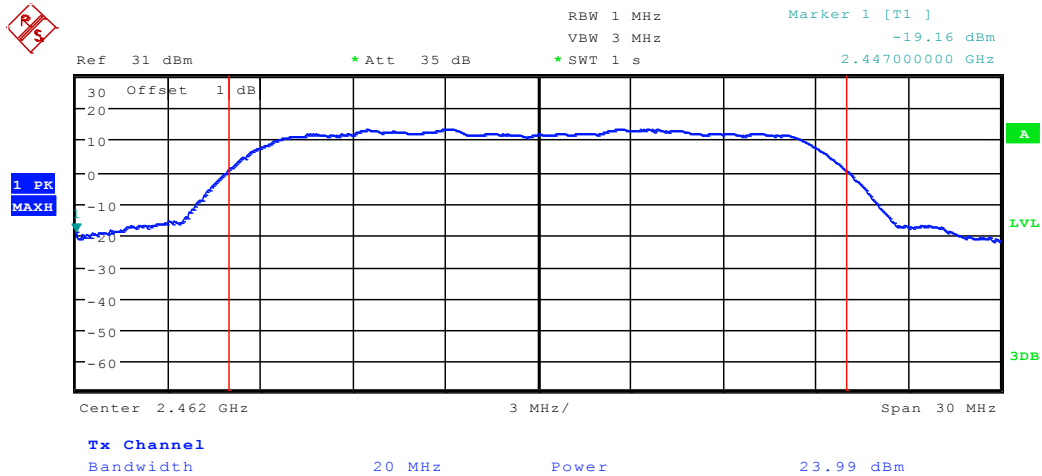
Chain 1



Date: 7.SEP.2012 09:27:21



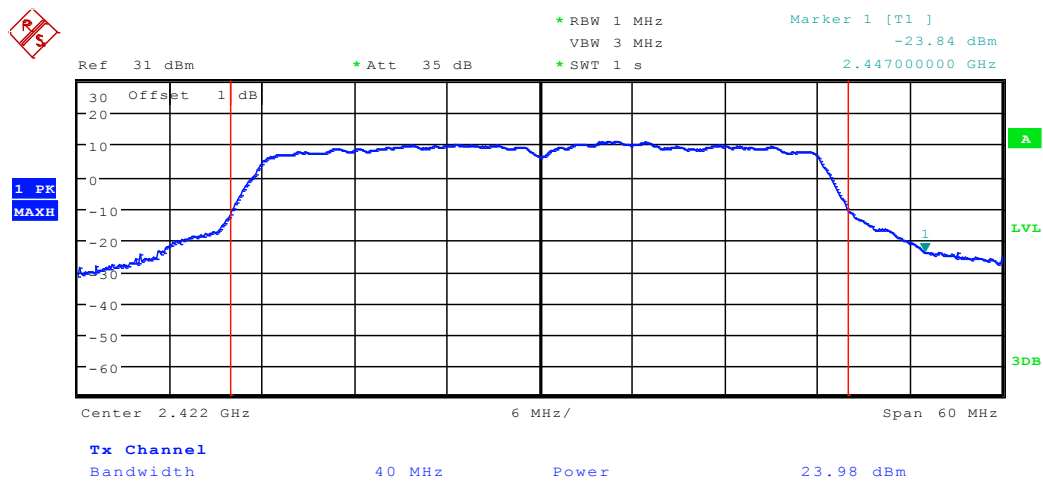
Chain 2



Date: 7.SEP.2012 09:26:28



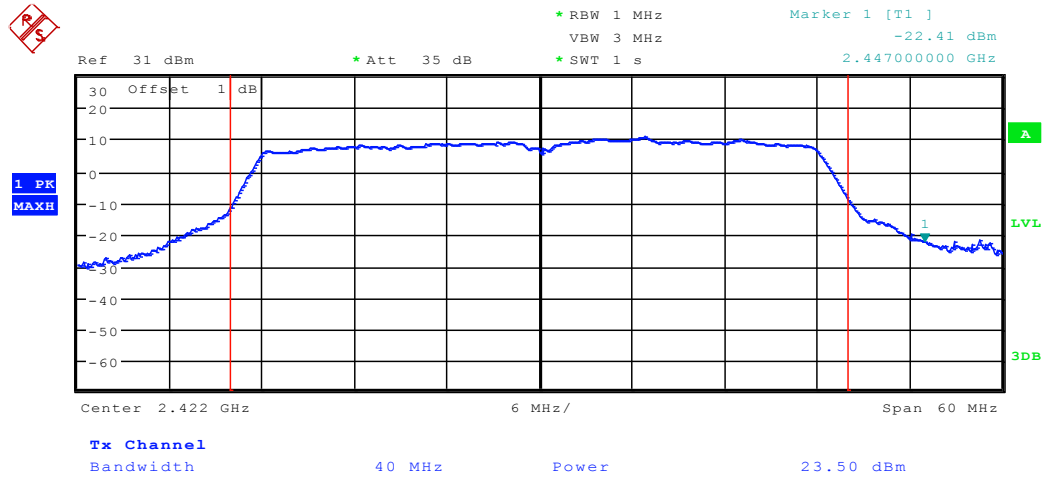
TM6 Chain 1&2 Channel 03(2422MHz) Chain 1



Date: 7.SEP.2012 09:31:44



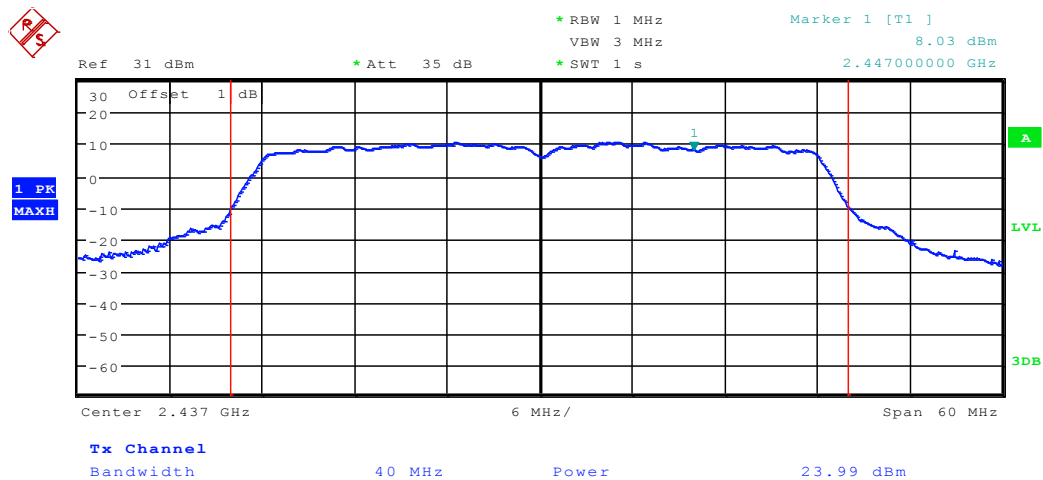
Chain 2



Date: 7.SEP.2012 09:32:48



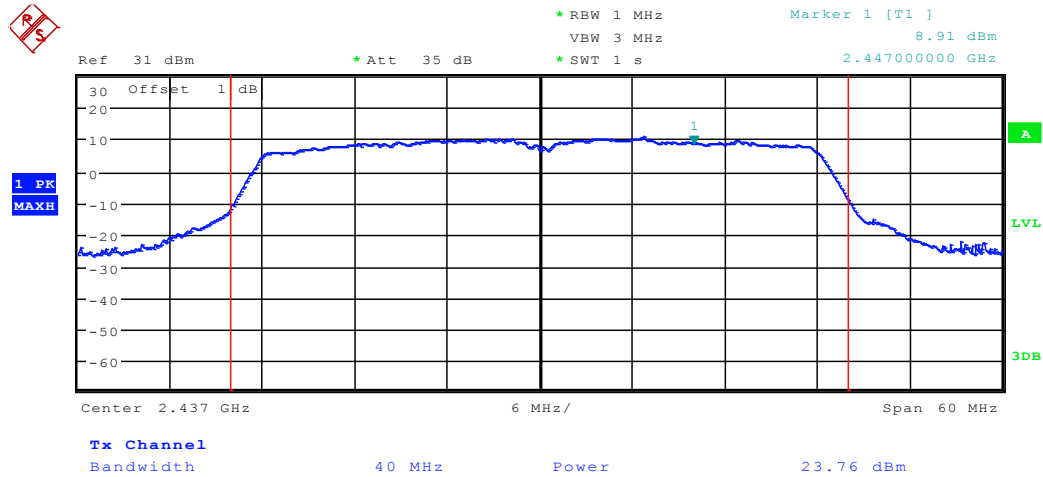
Channel 06(2437MHz) Chain 1



Date: 7.SEP.2012 09:34:29



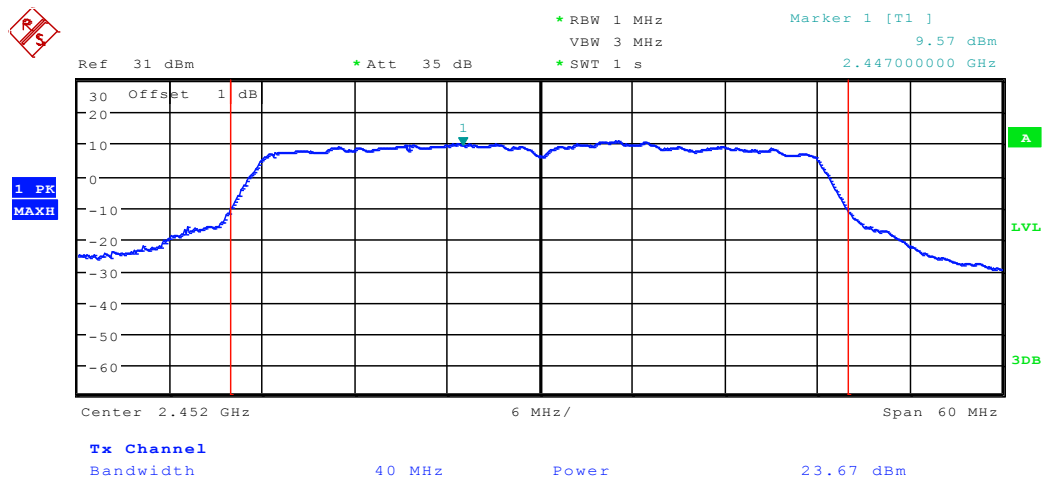
Chain 2



Date: 7.SEP.2012 09:33:41



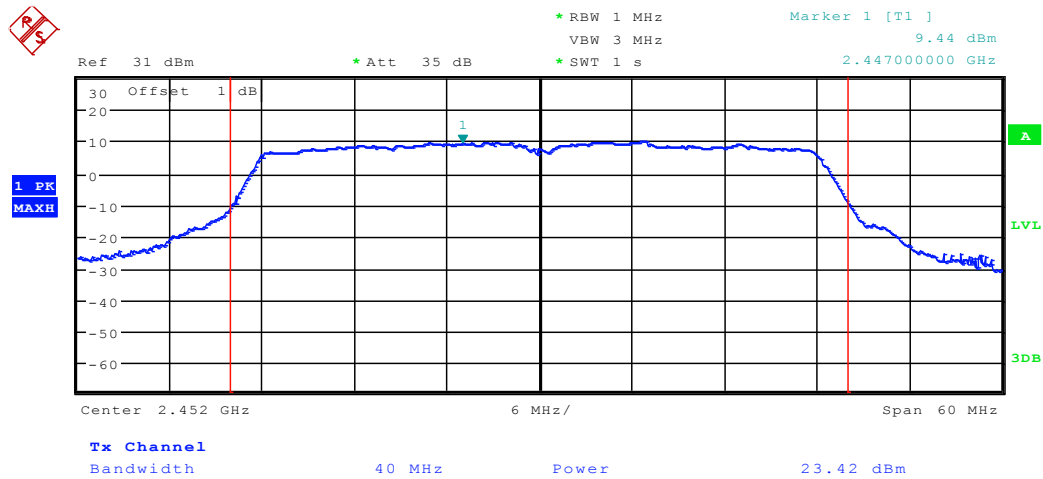
Channel 09(2452MHz) Chain 1



Date: 7.SEP.2012 09:35:21



Chain 2



Date: 7.SEP.2012 09:35:57

-----The END-----



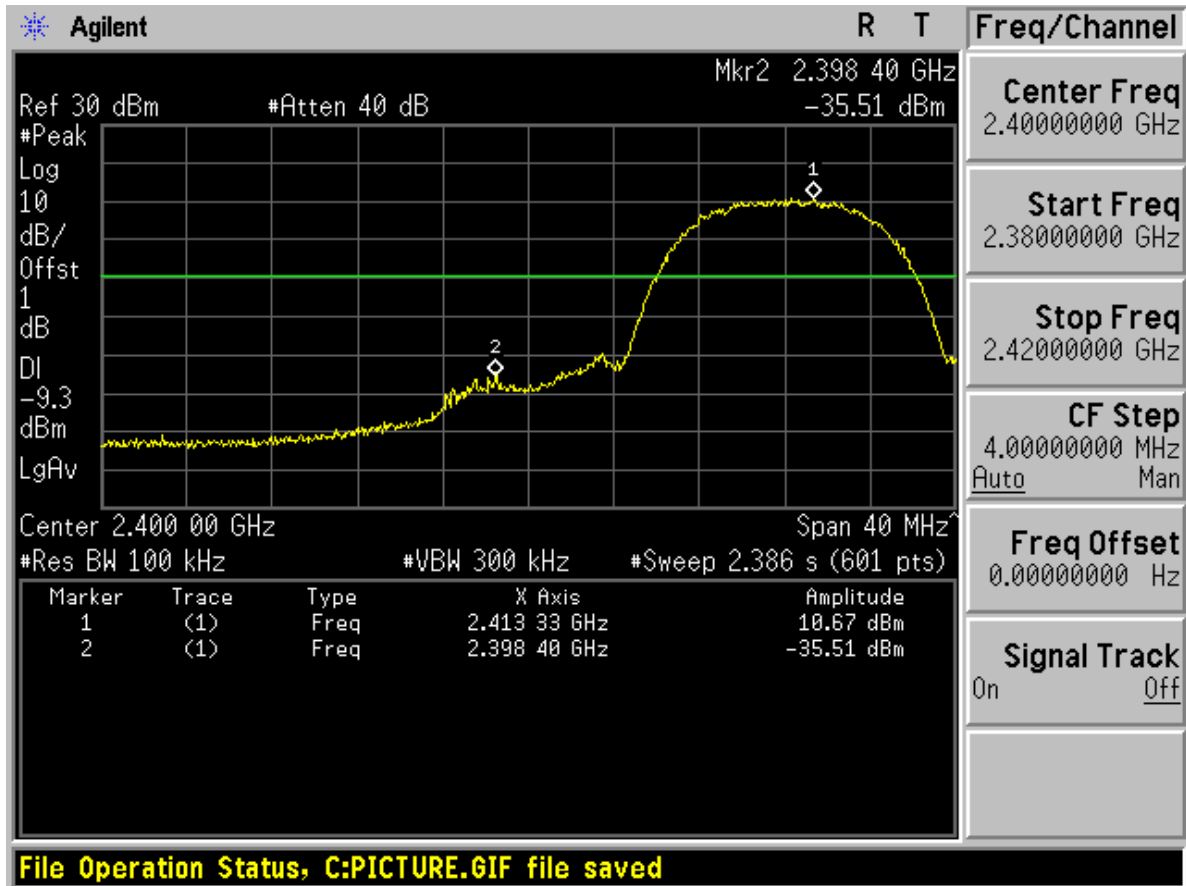
Appendix C

Band Edges Compliance

According to FCC Part 15.247 (d) & RSS-210

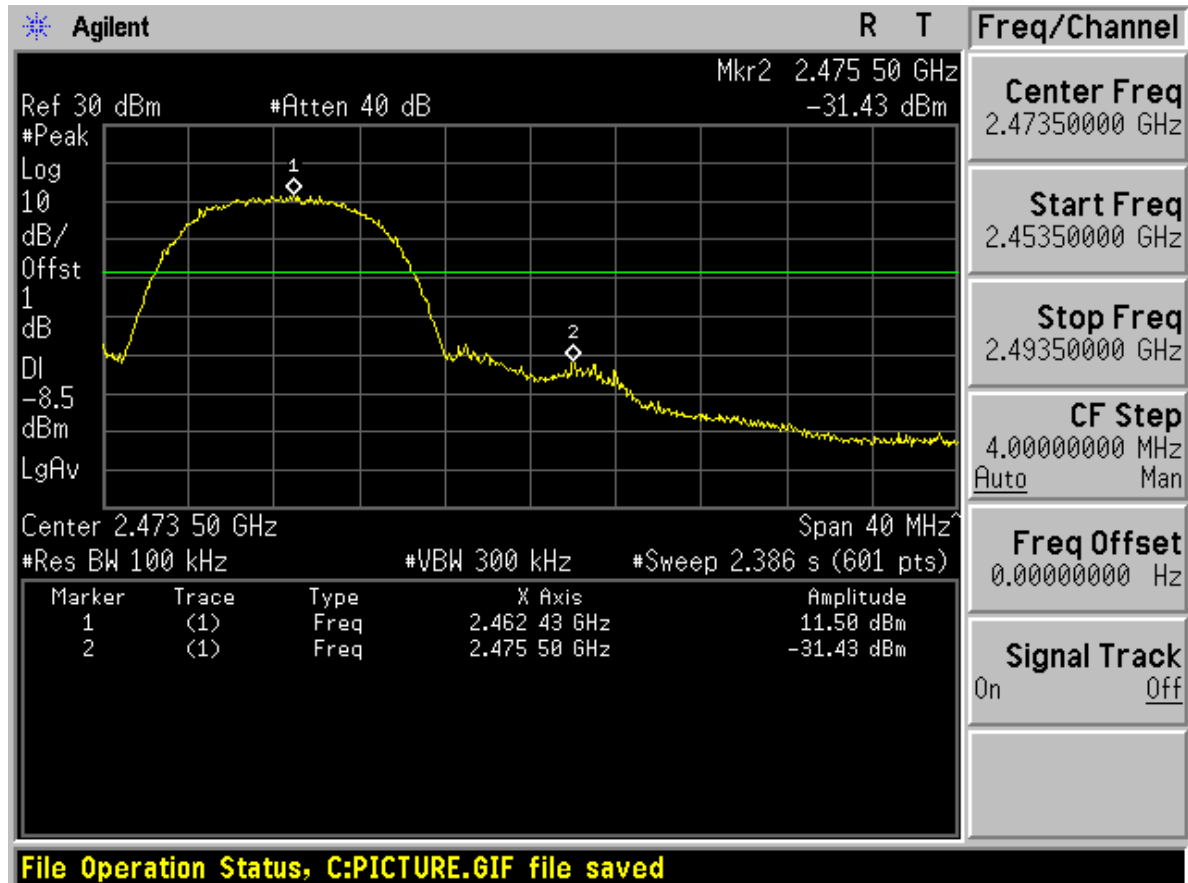


TM1 Chain 1 Low edge





High edge

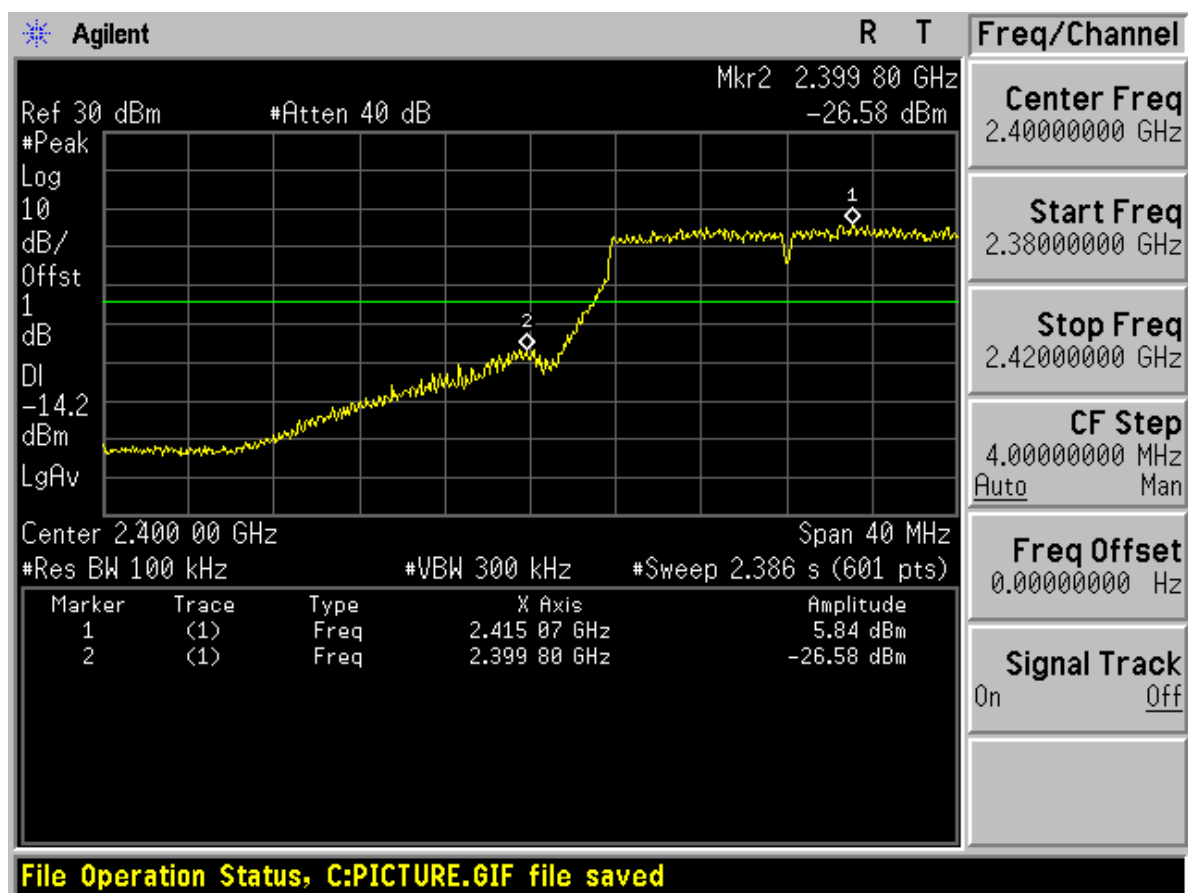




TM2 Chain 1&2

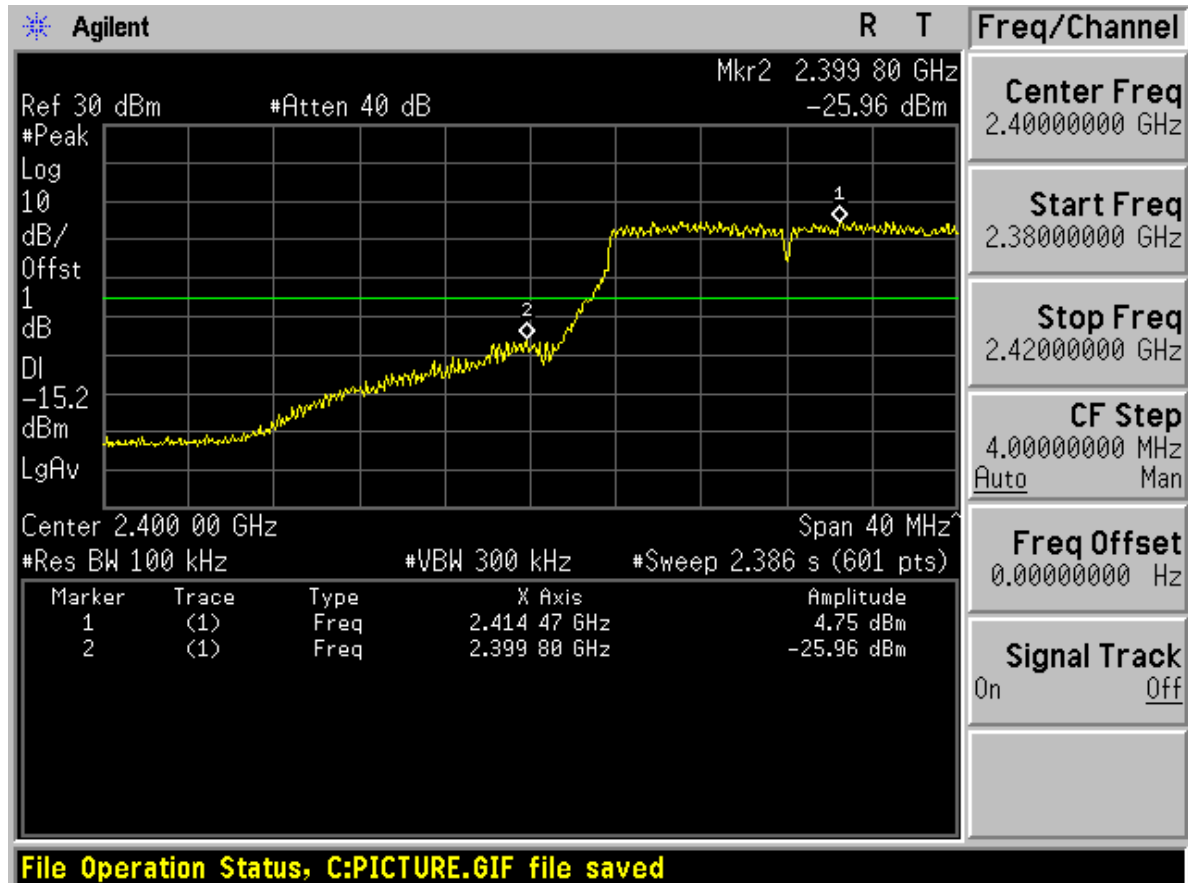
Low edge

Chain 1





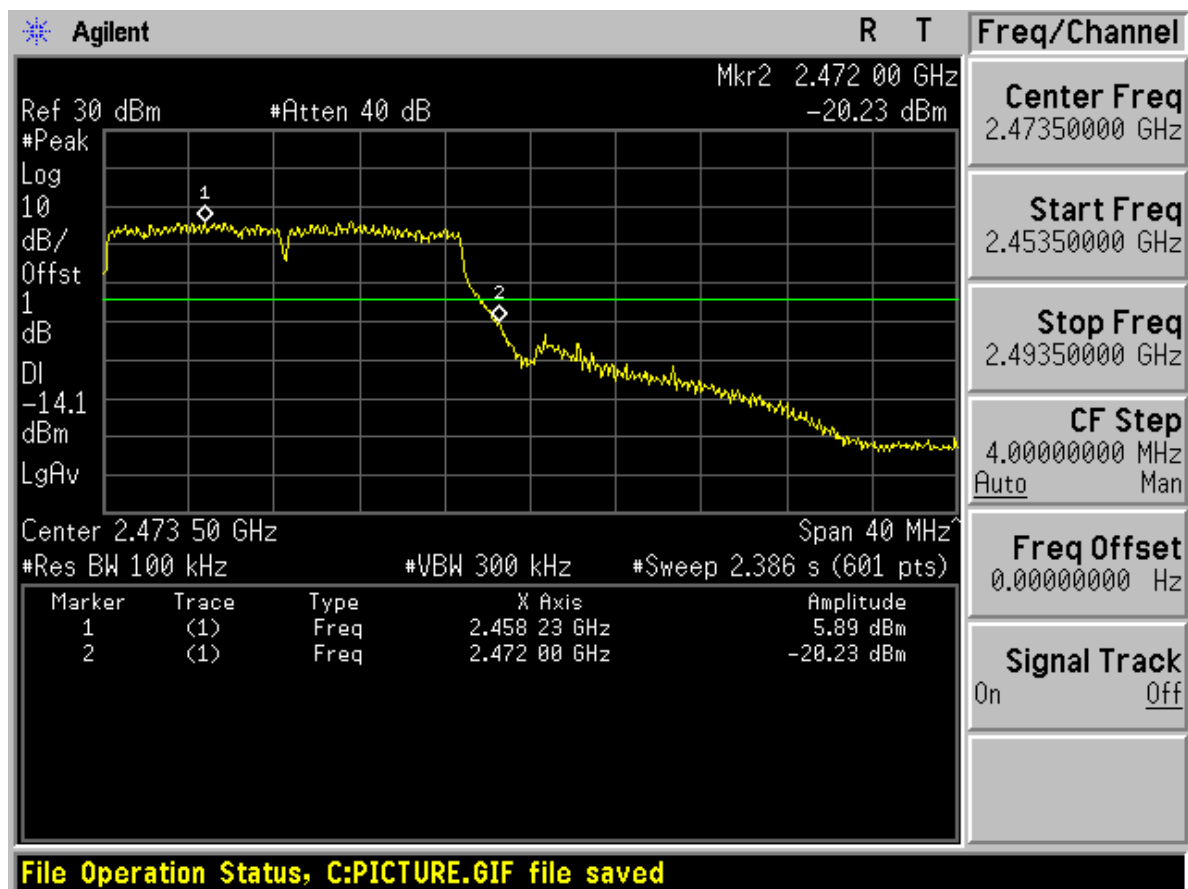
Chain 2





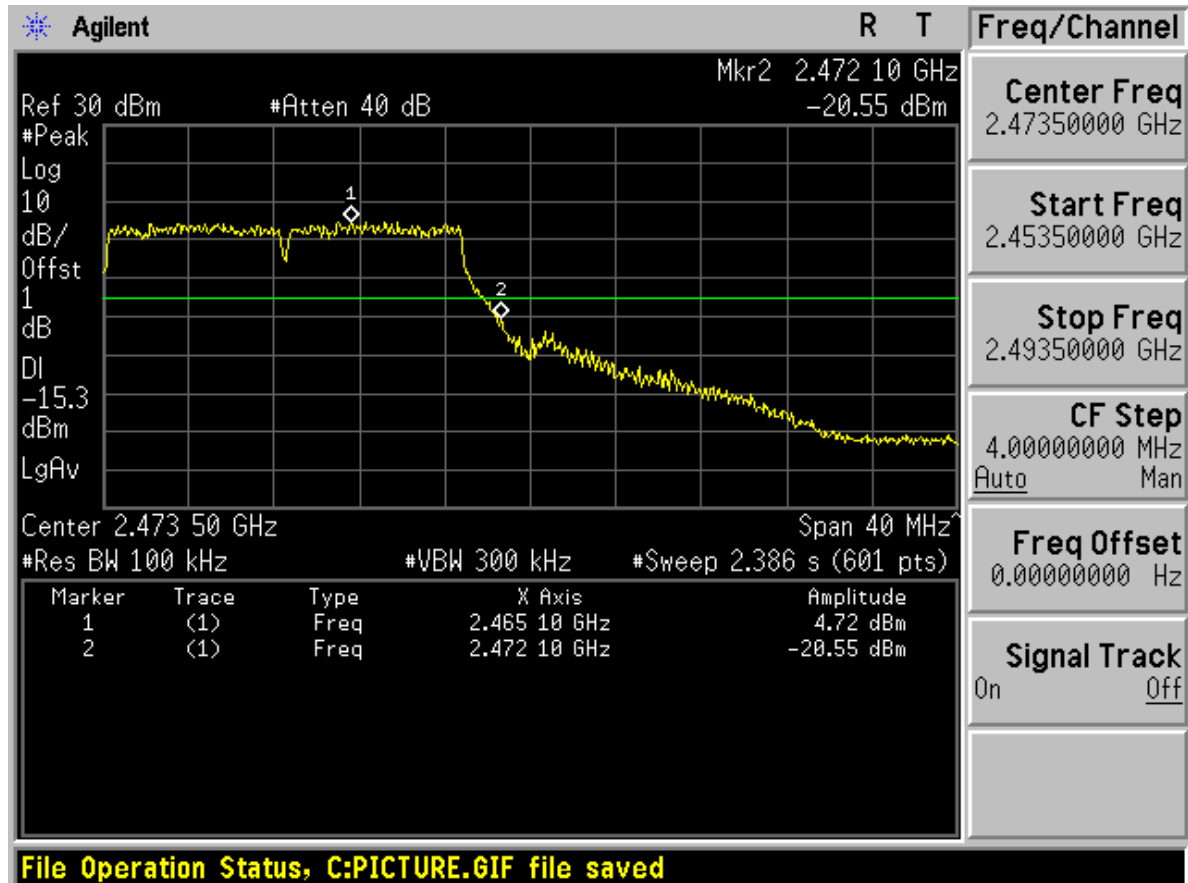
High edge

Chain 1





Chain 2

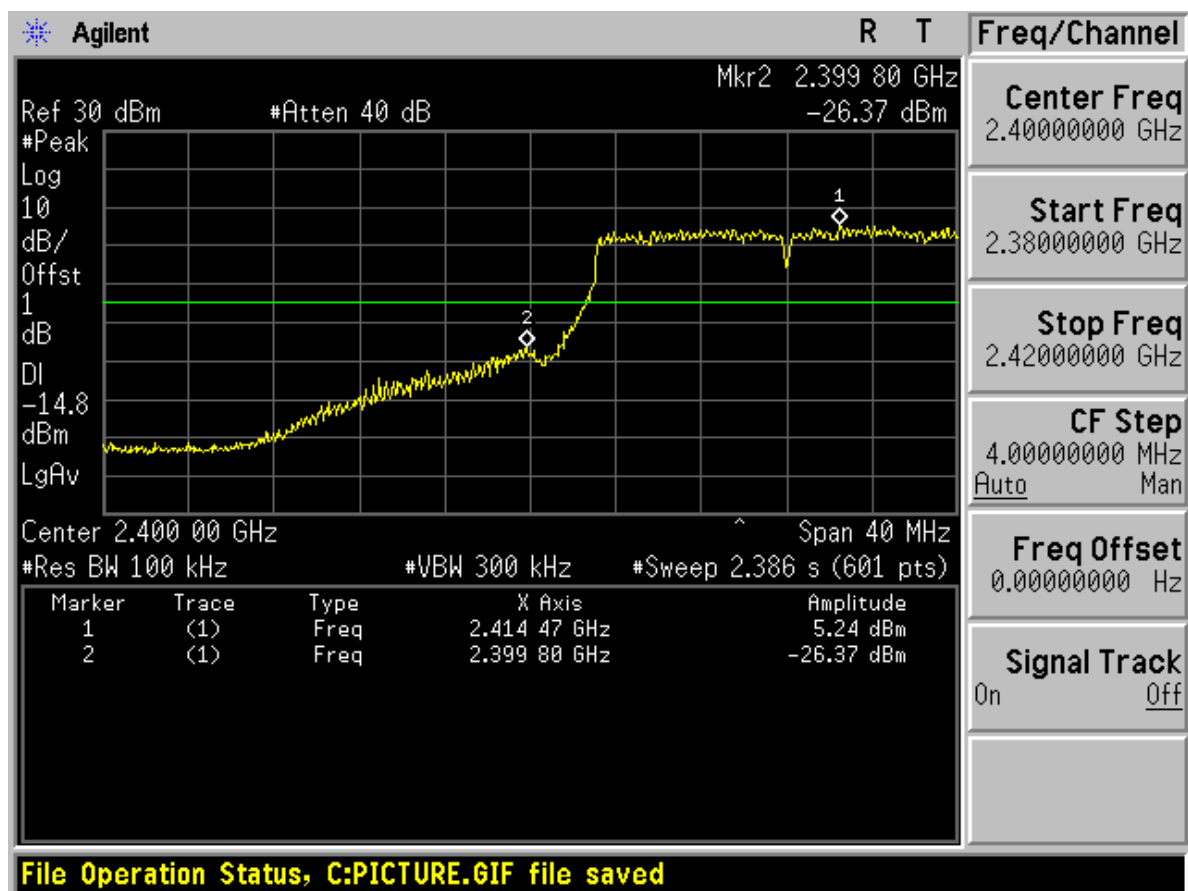




TM3 Chain 1

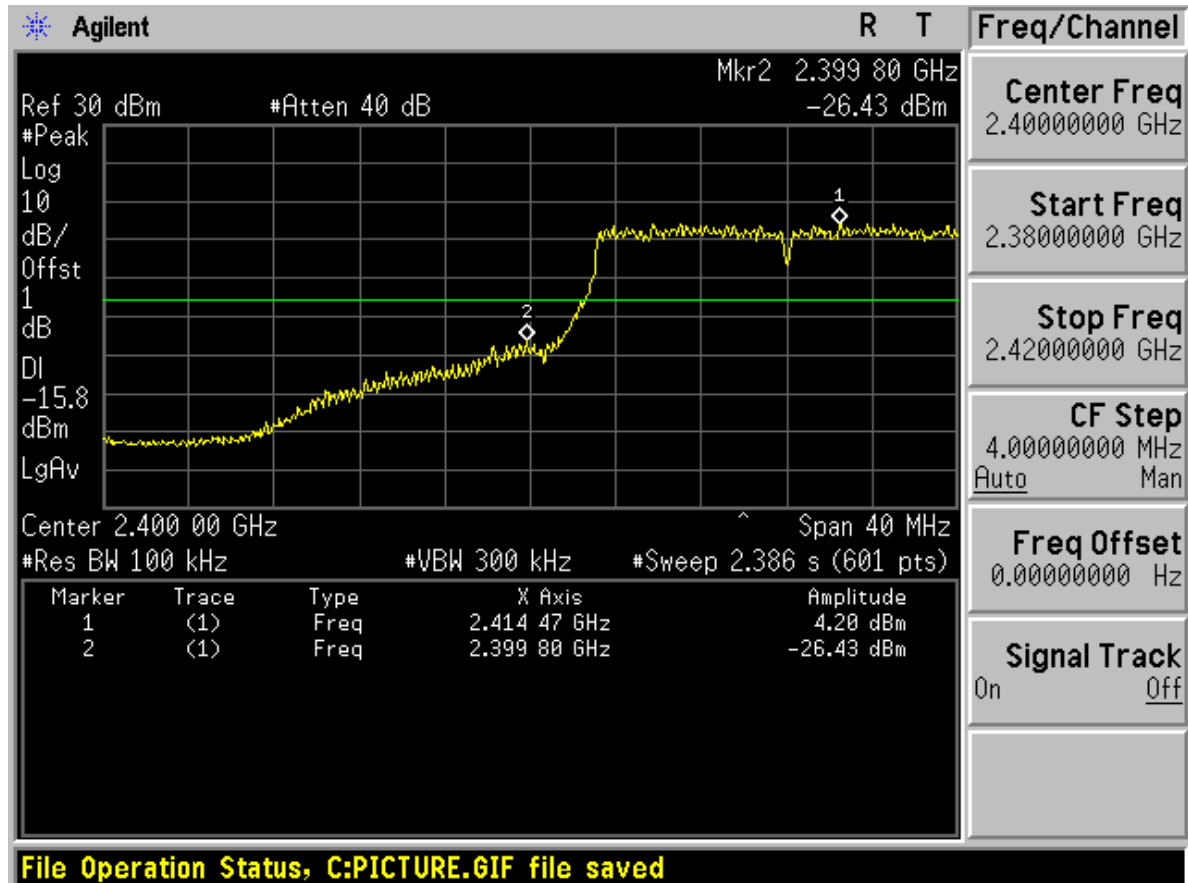
Low edge

Chain 1





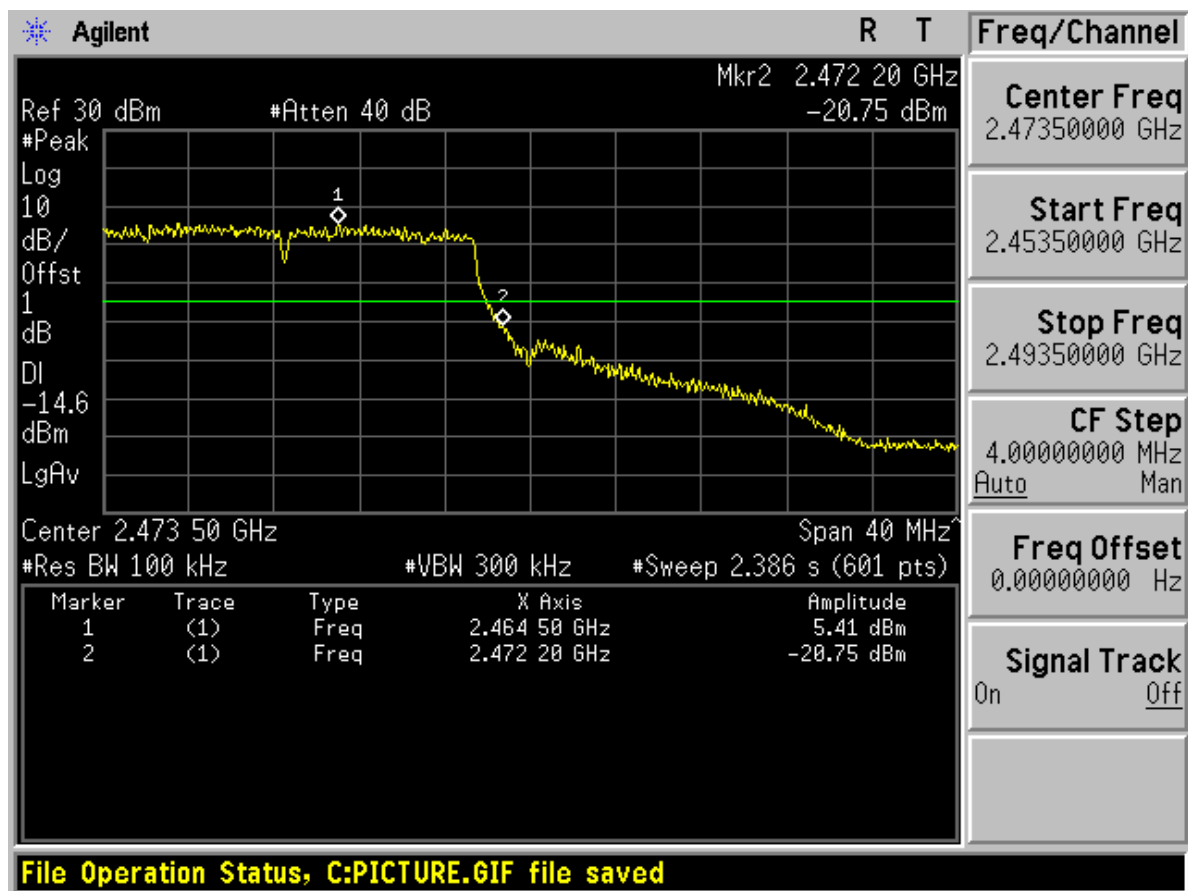
Chain 2





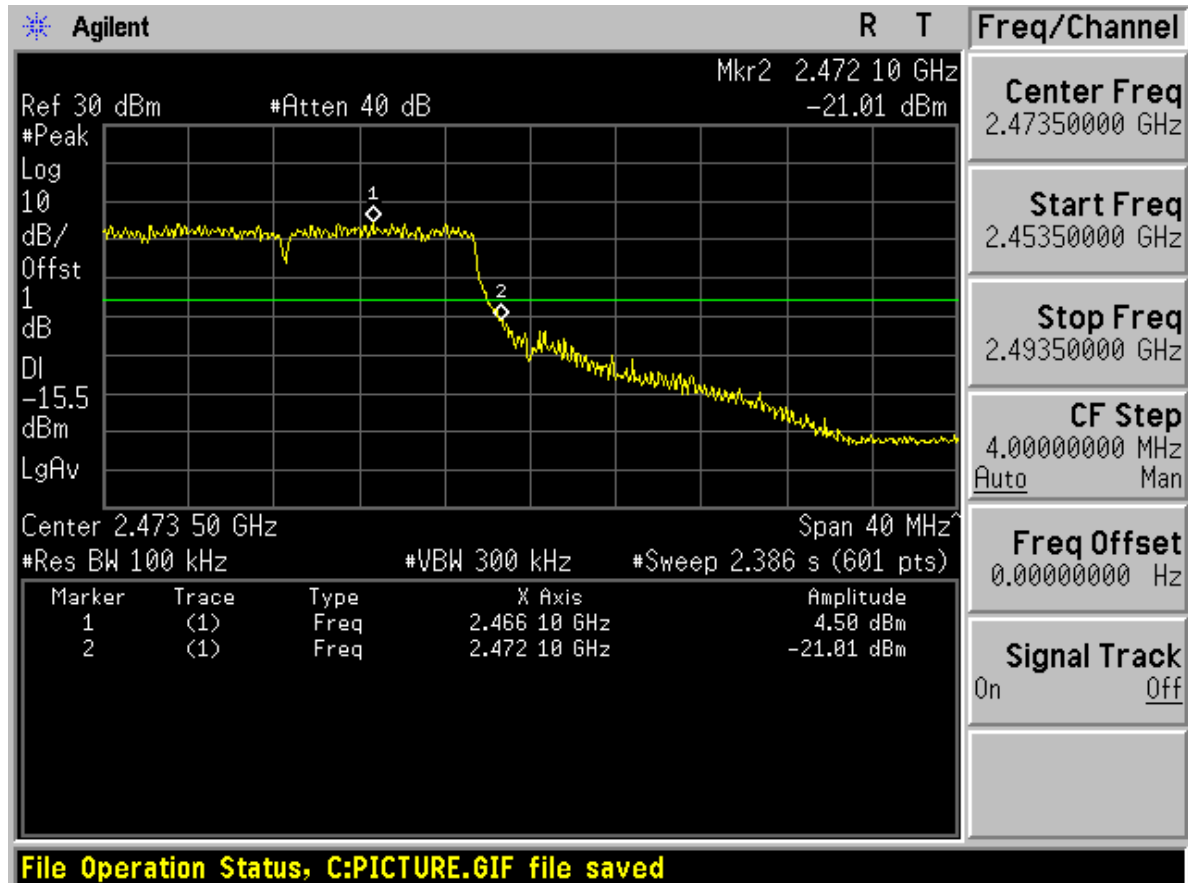
High edge

Chain 1





Chain 2

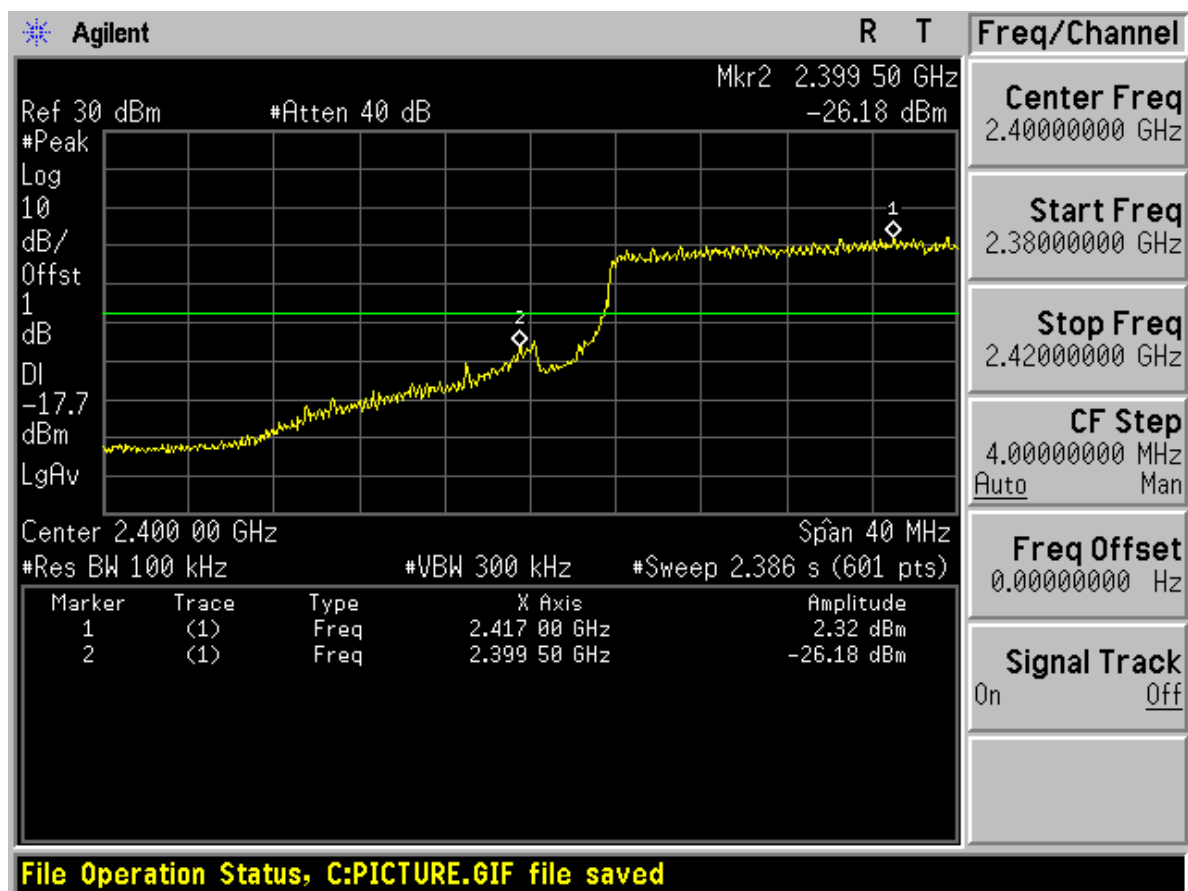




TM4 Chain 1&2

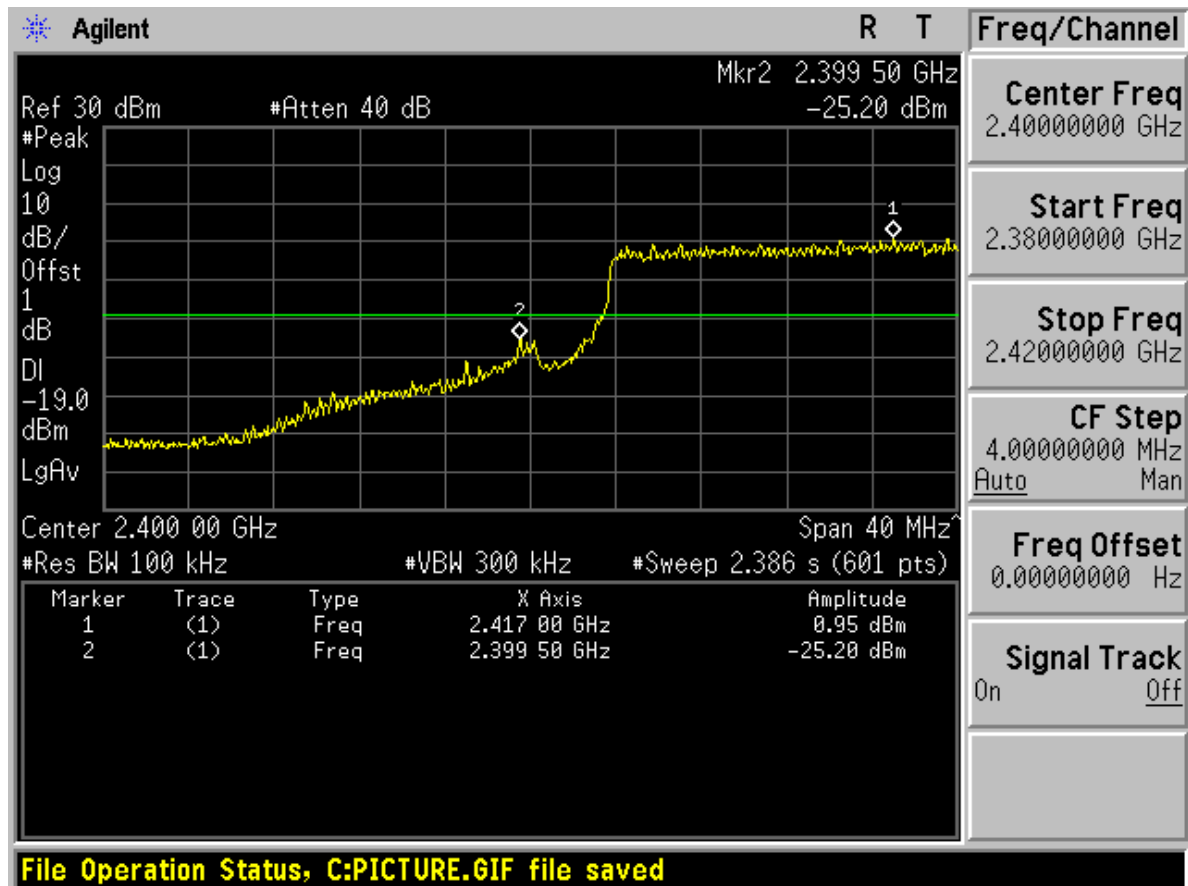
Low edge

Chain 1





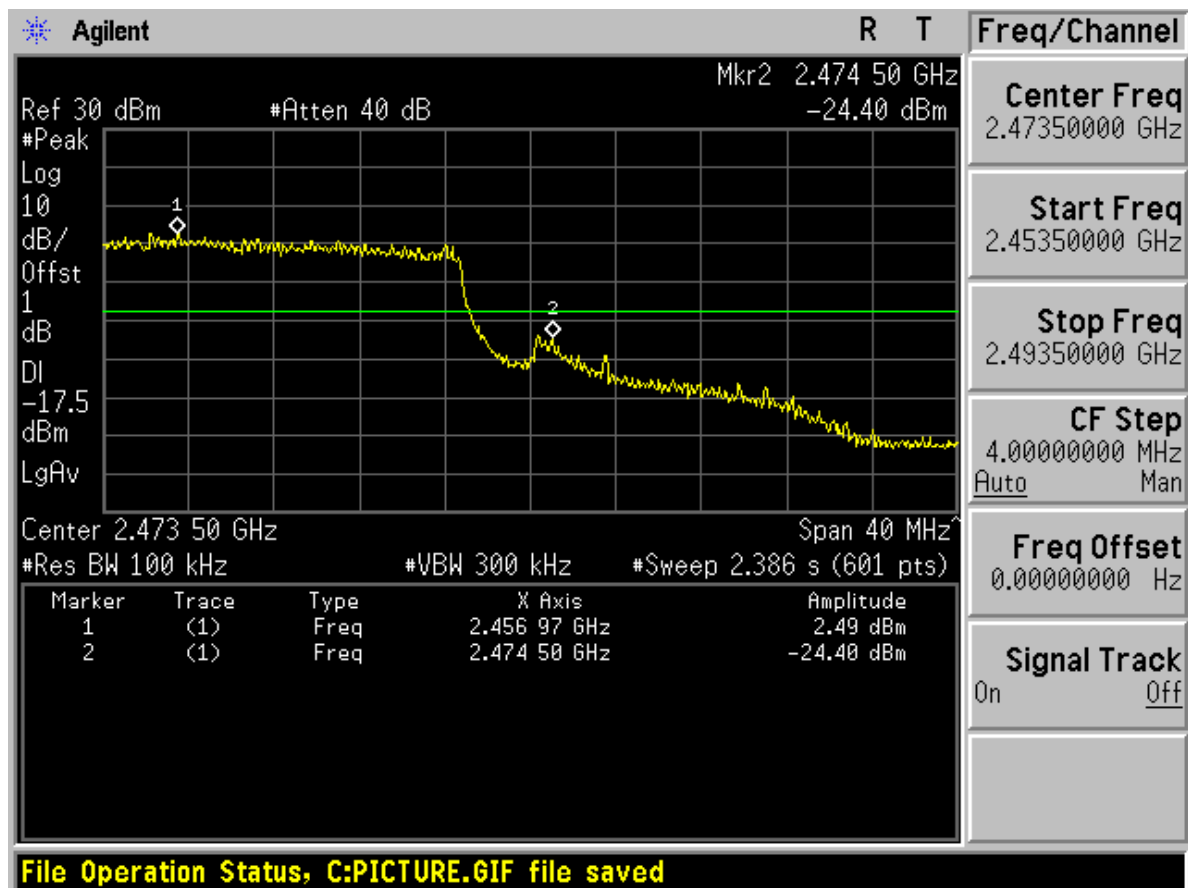
Chain 2





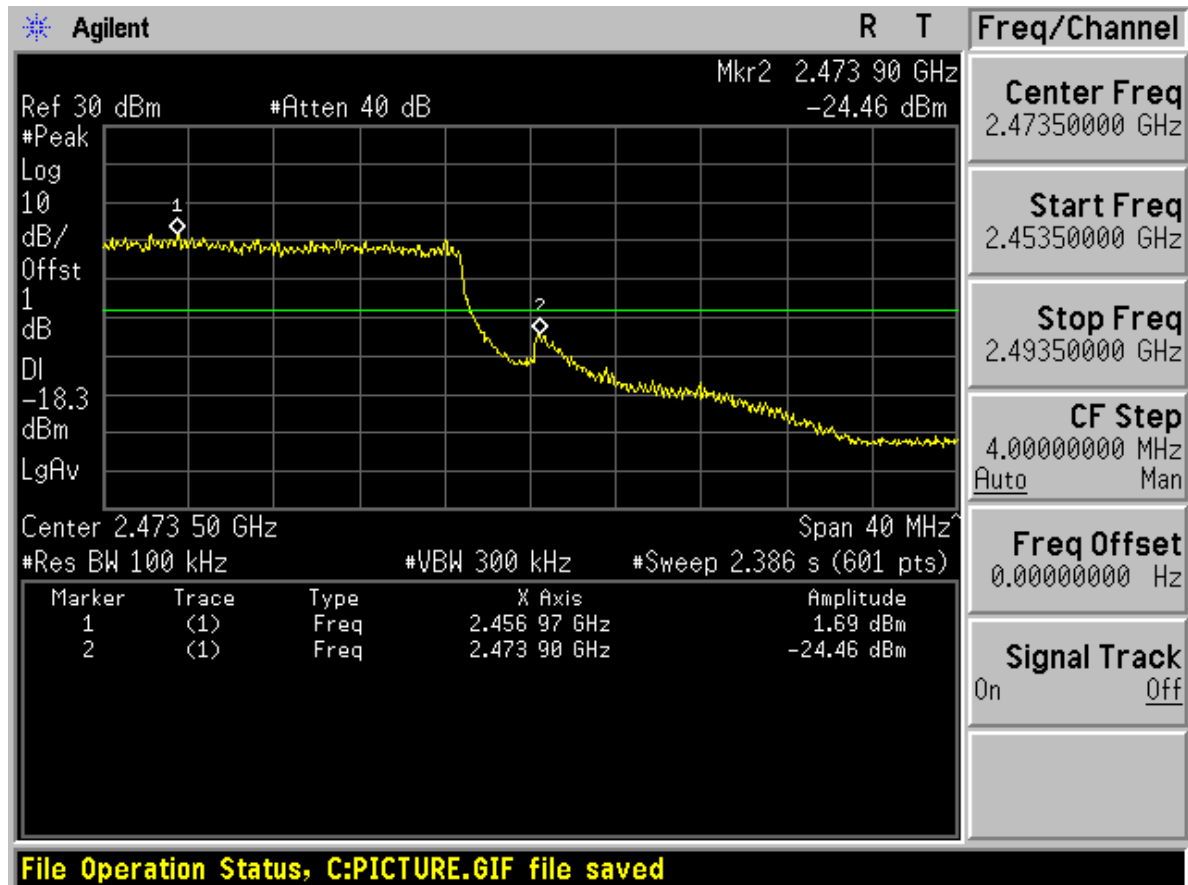
High edge

Chain 1





Chain 2

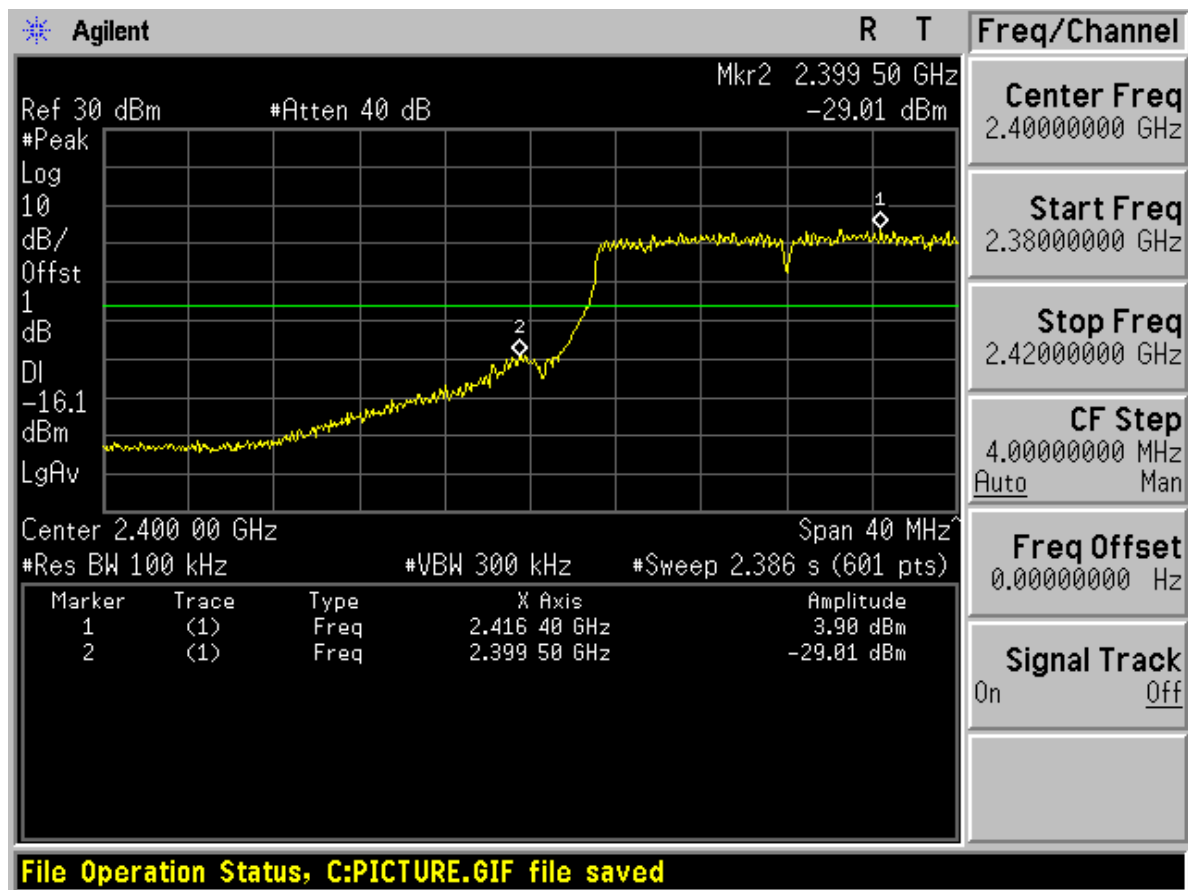




TM5 Chain 1&2

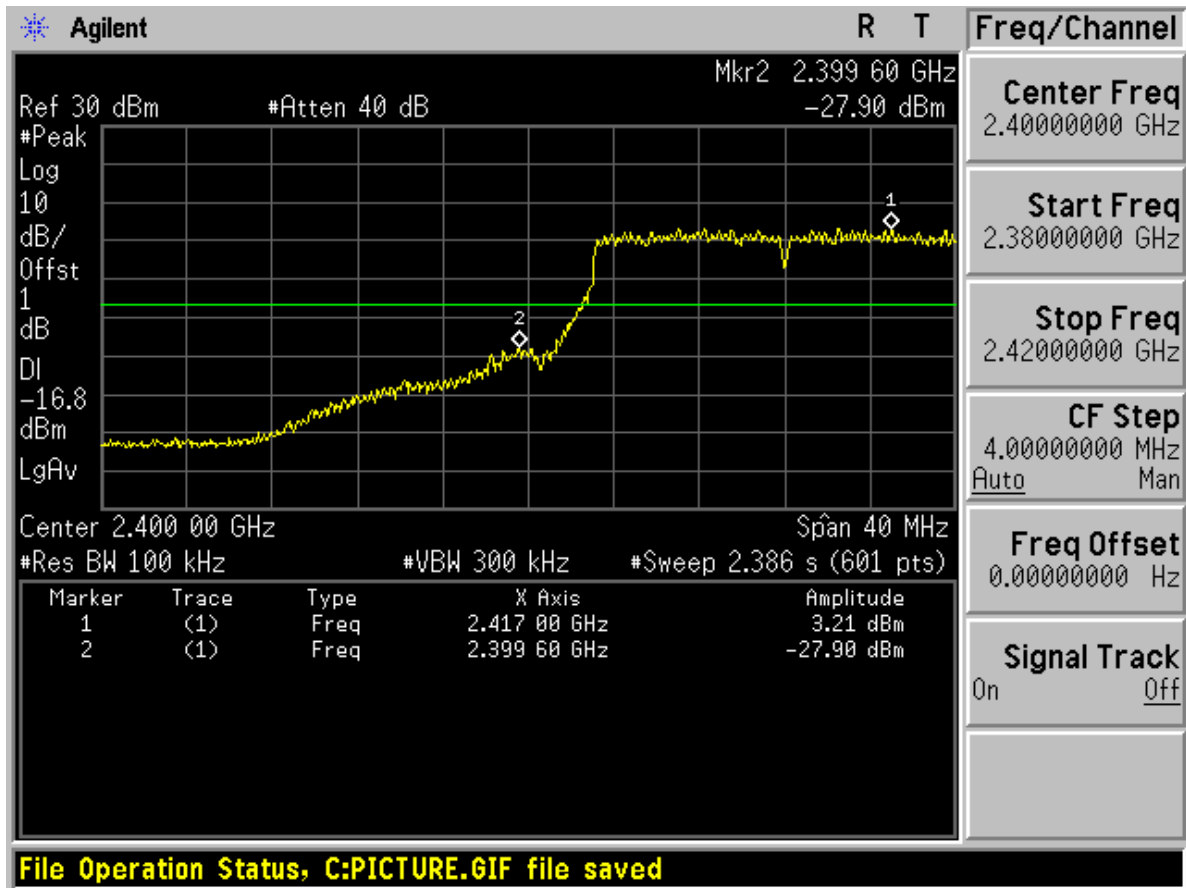
Low edge

Chain 1





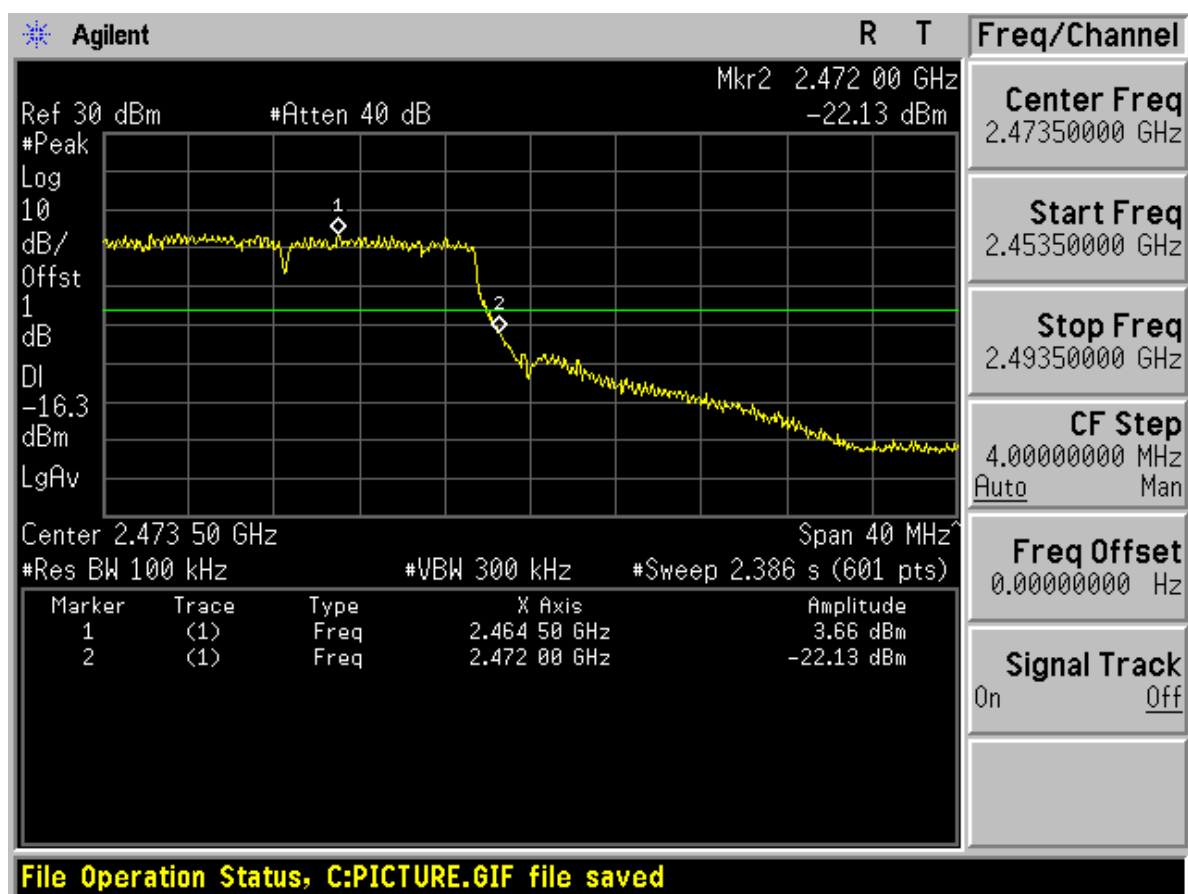
Chain 2





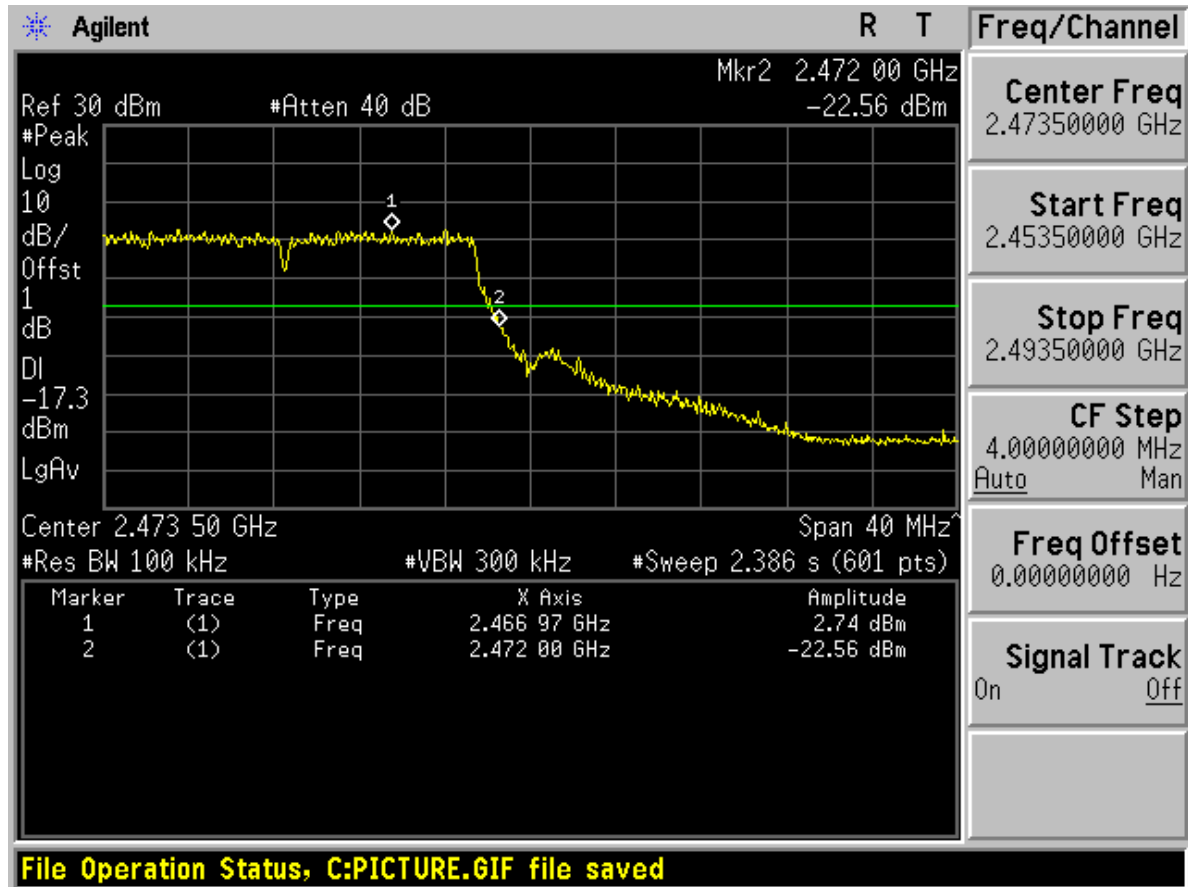
High edge

Chain 1





Chain 2

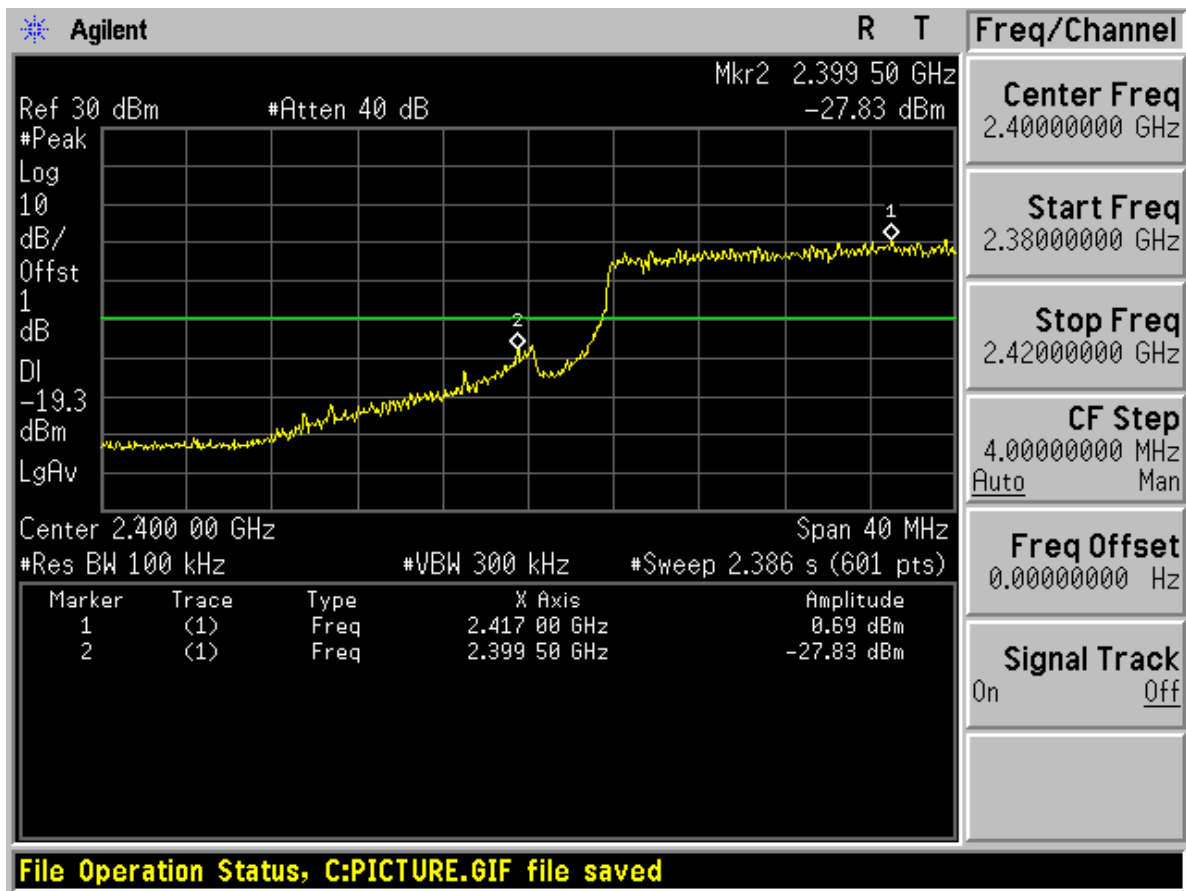




TM6 Chain 1&2

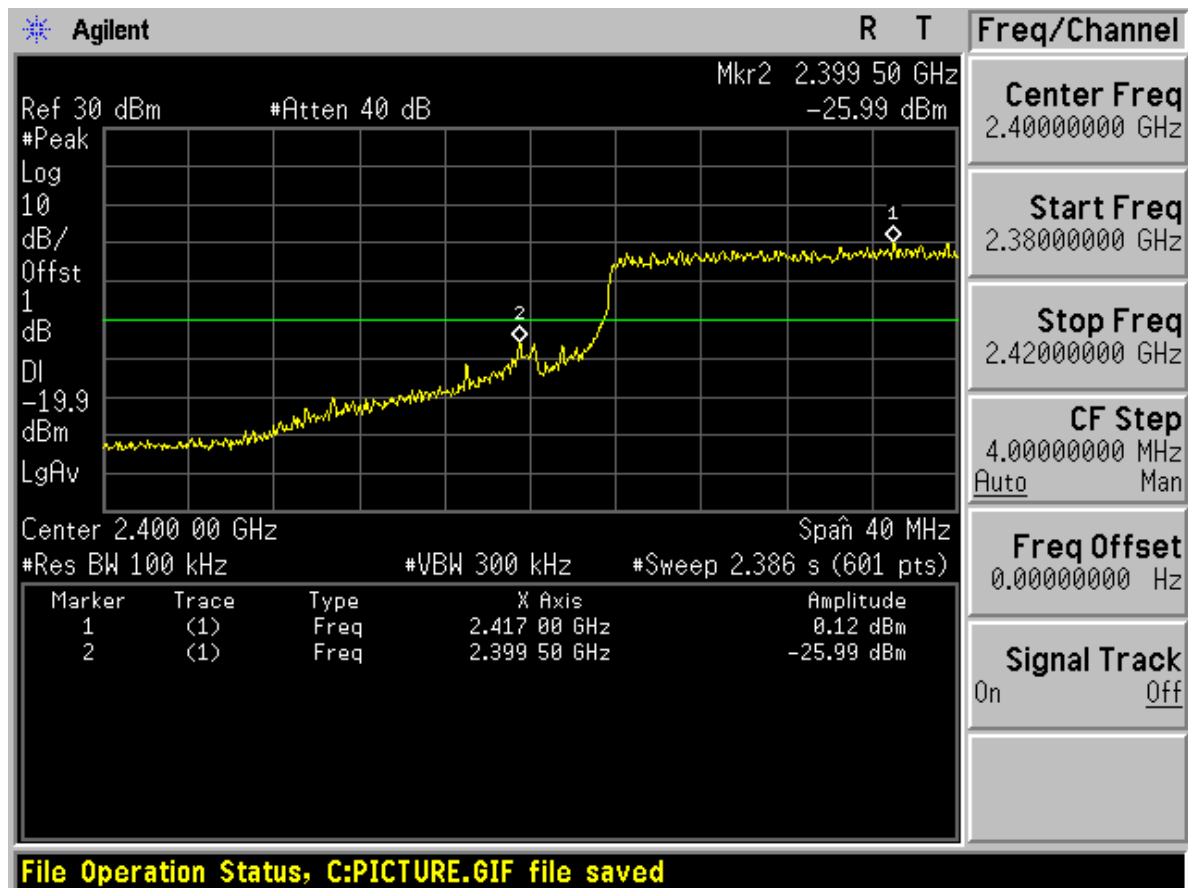
Low edge

Chain 1





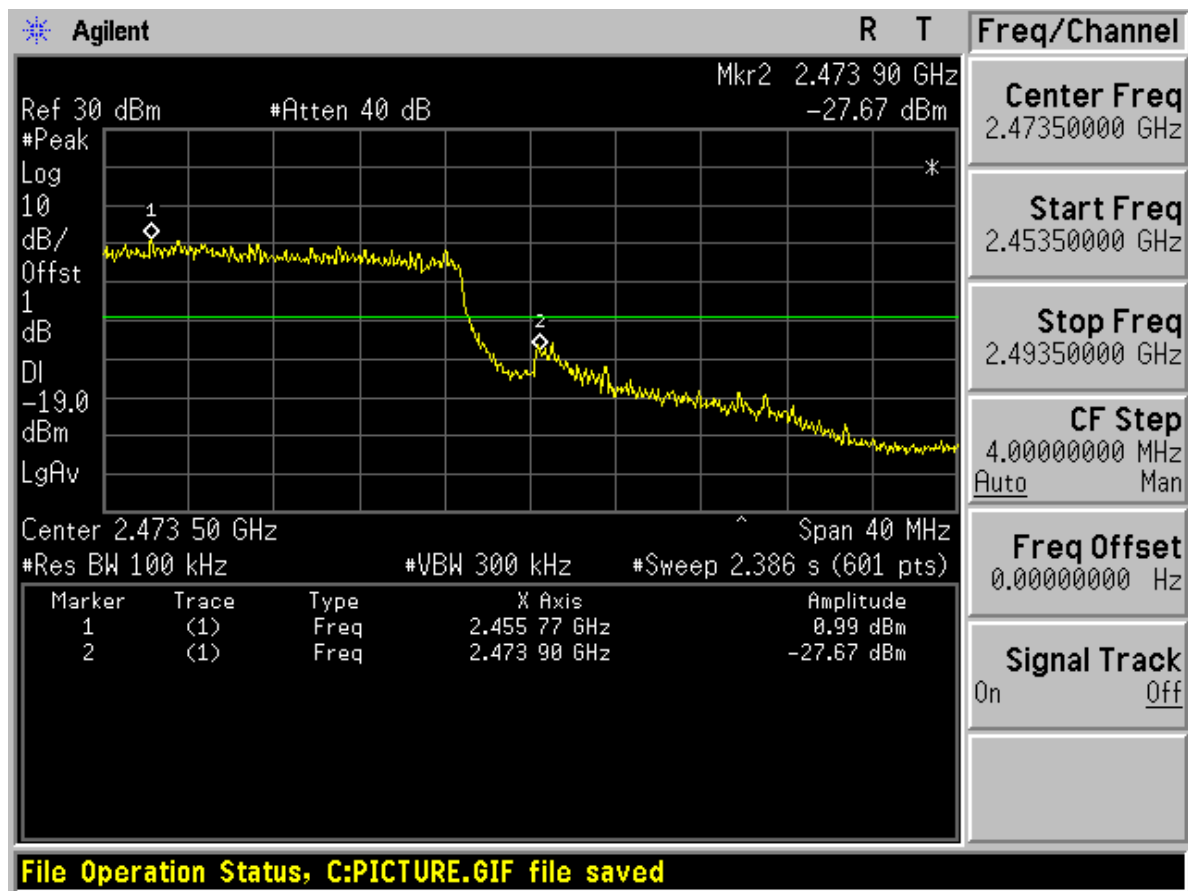
Chain 2





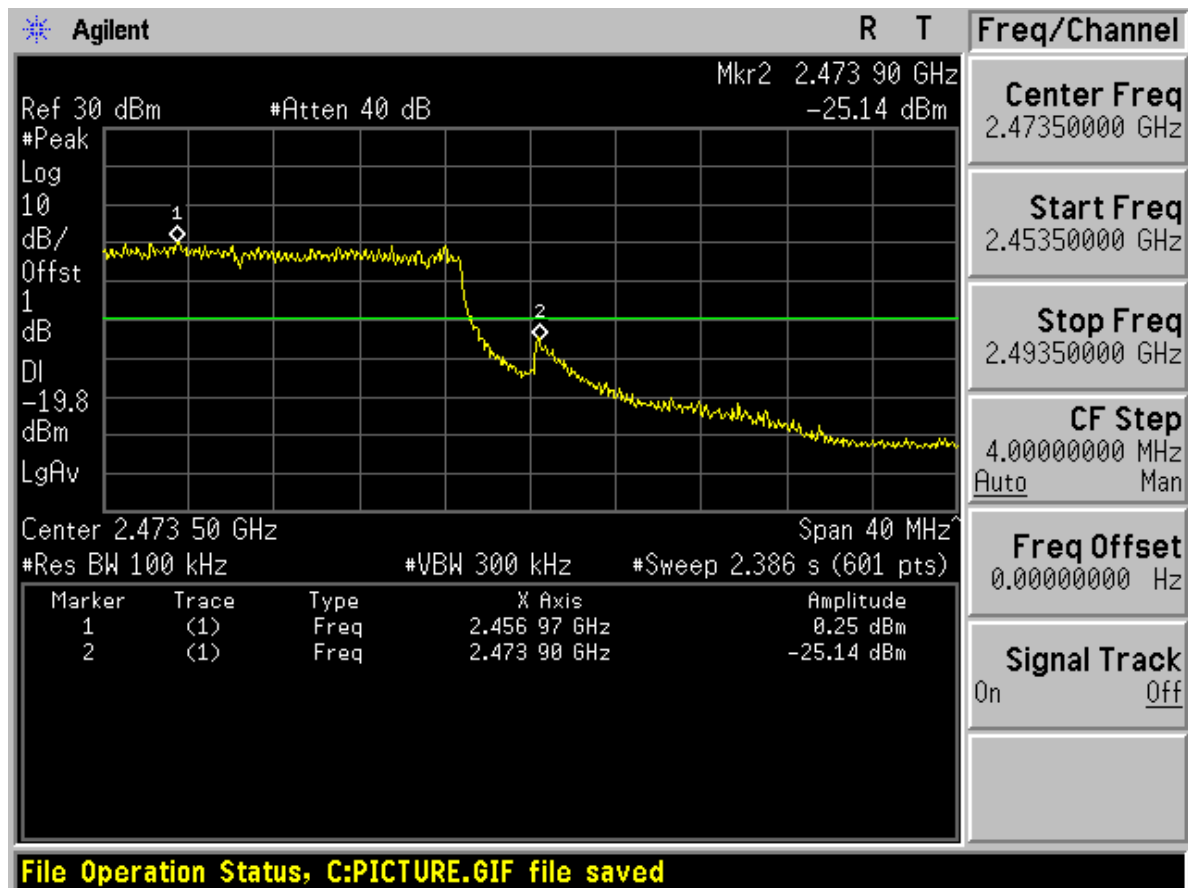
High edge

Chain 1





Chain 2



-----The END-----



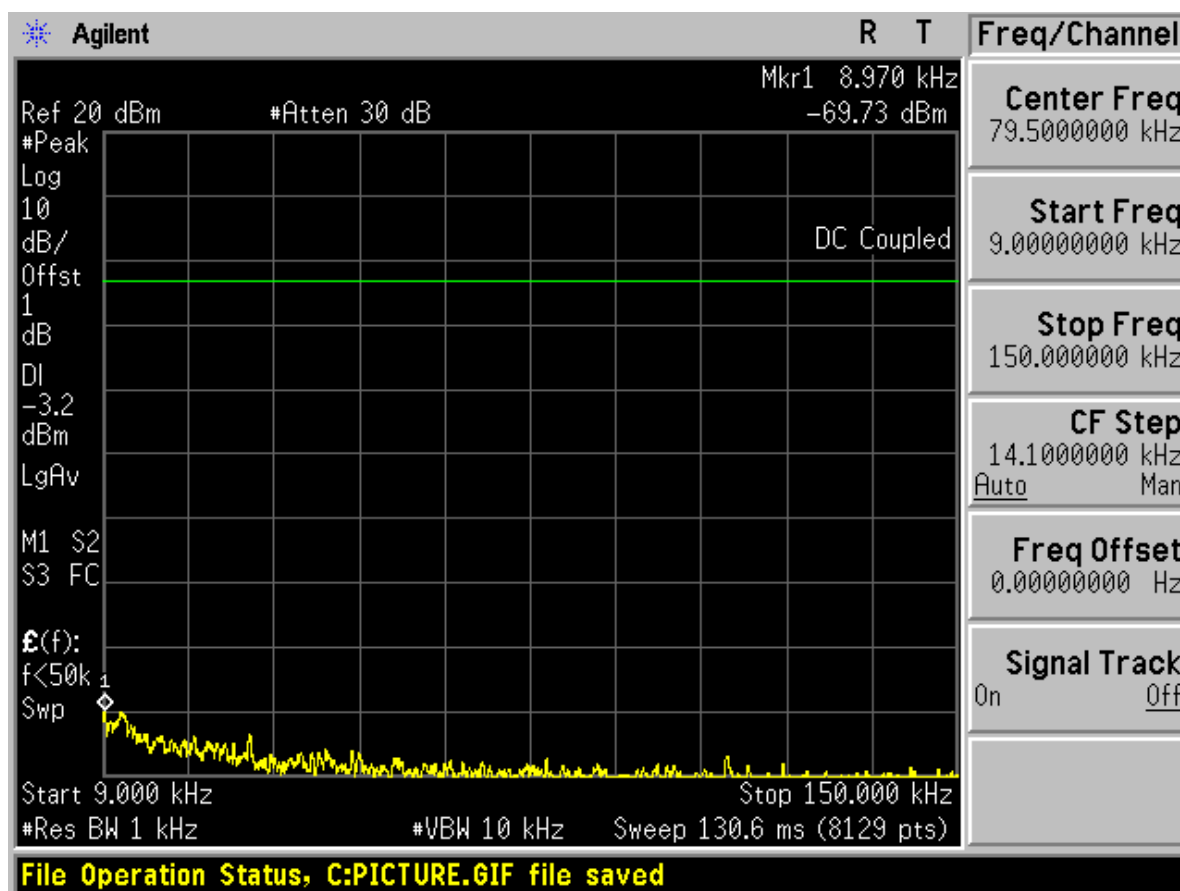
Appendix D

Conducted RF spurious

According to FCC Part 15.247 (d) & RSS-210

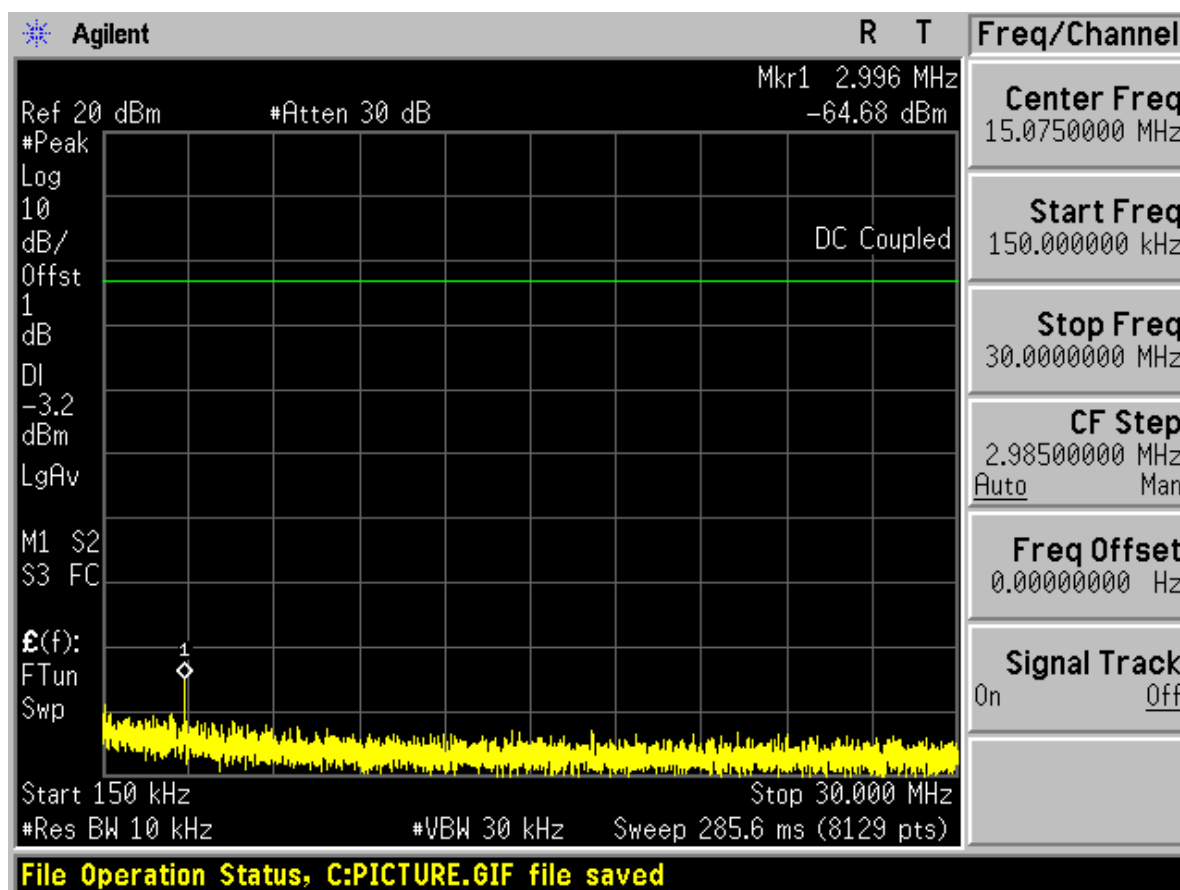


TM1 Chain 1 Channel 1 9K~150K TM1_01



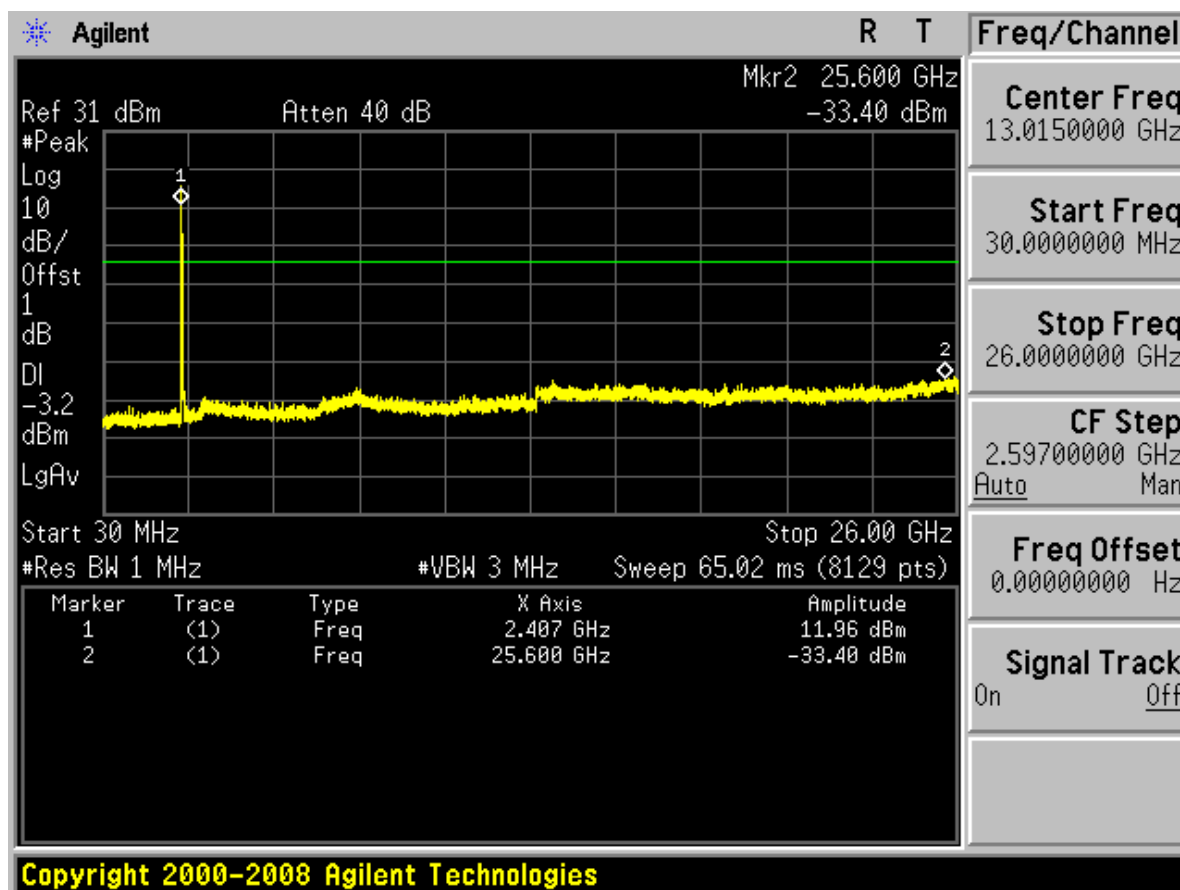


150K~30M TM1_01





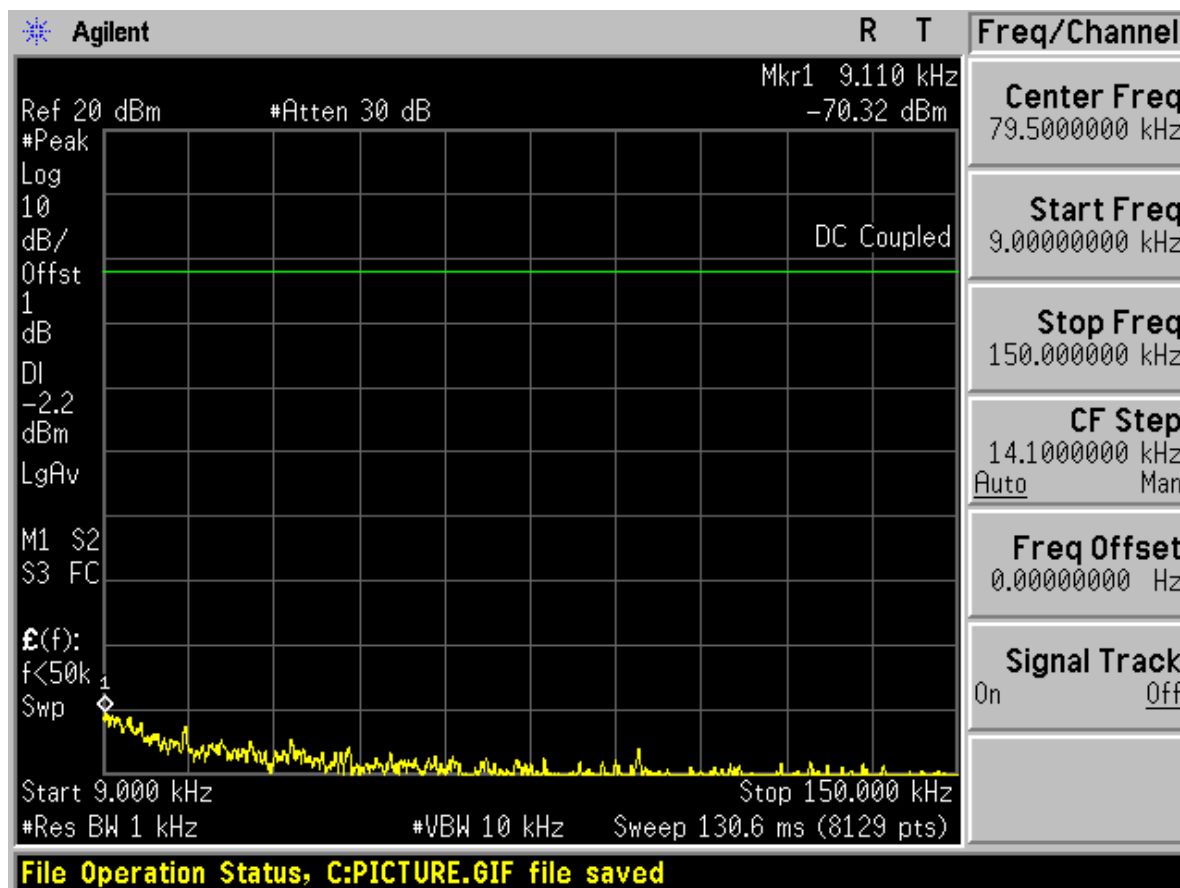
30M~26G TM1_01





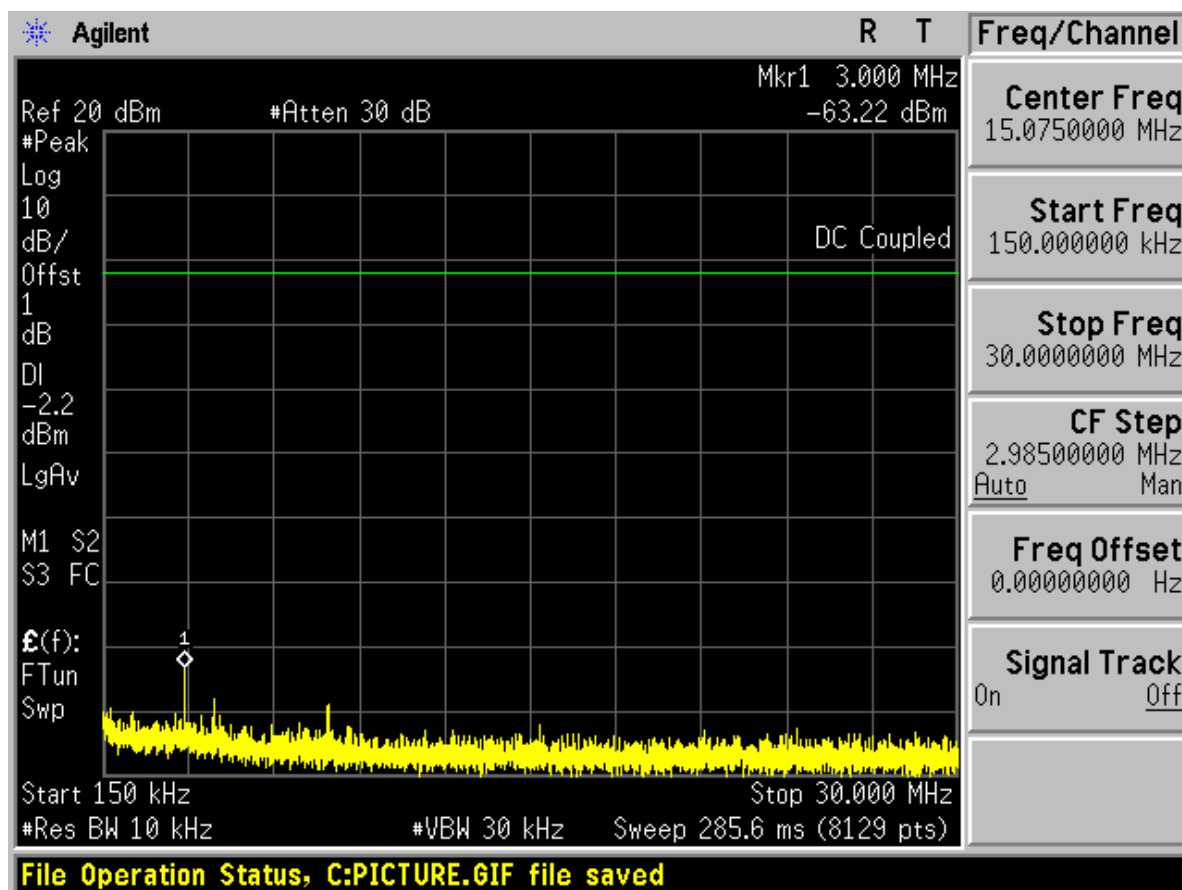
Channel 6

9K~150K TM1_06



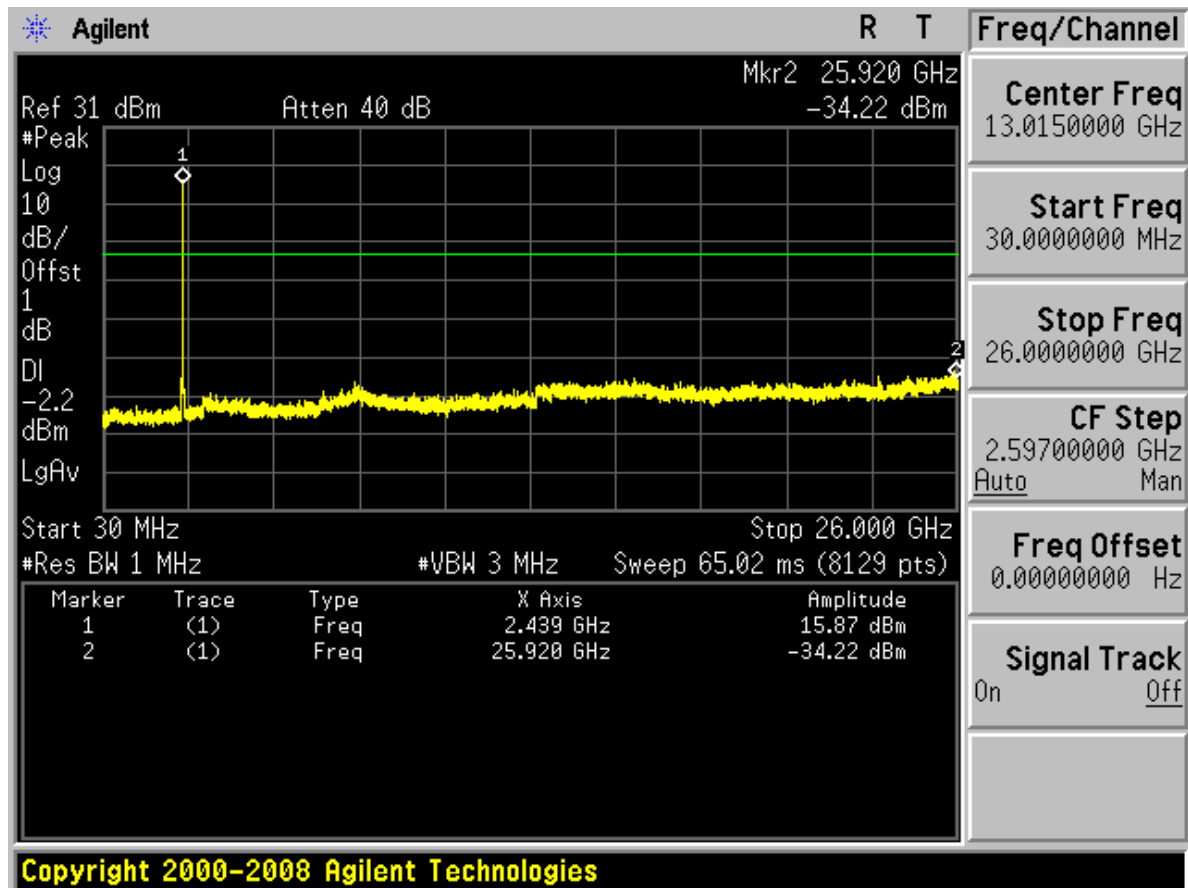


150K~30M TM1_06





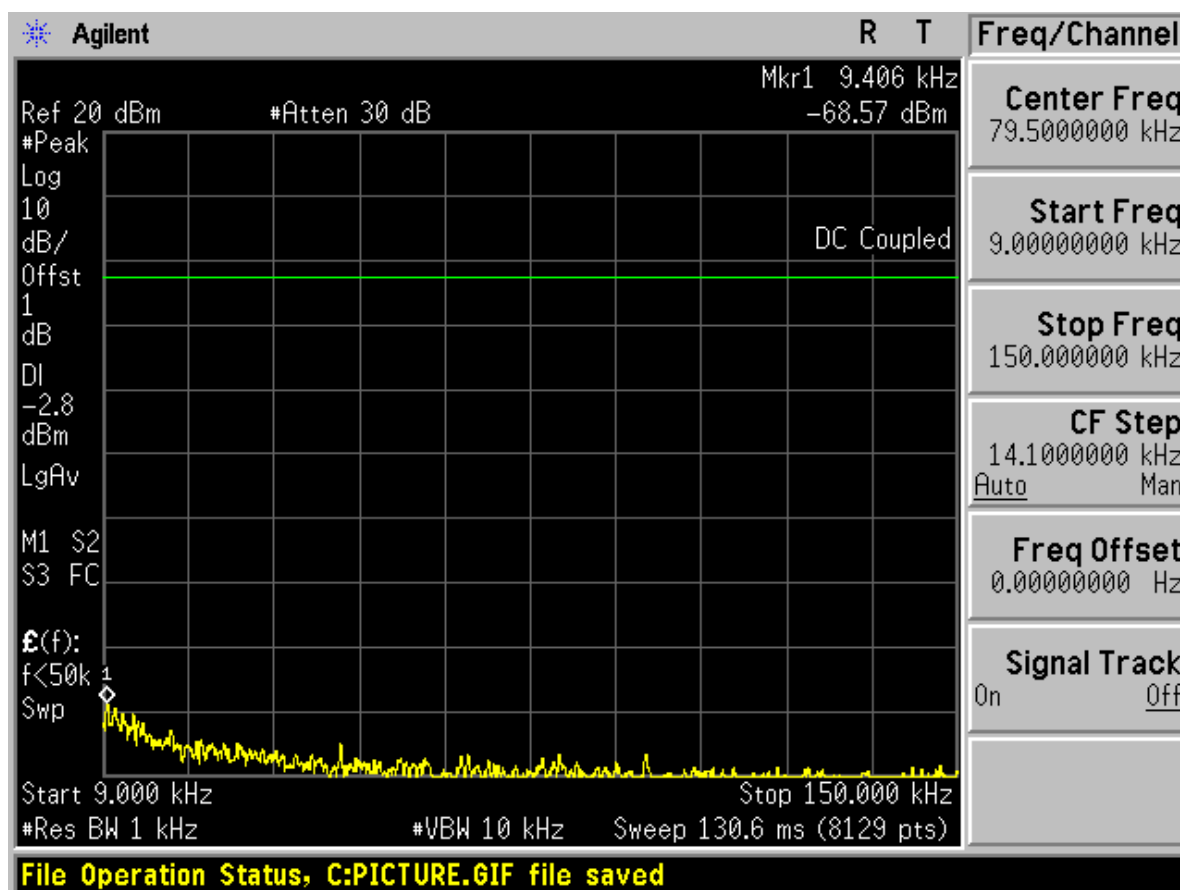
30M~26G TM1_06





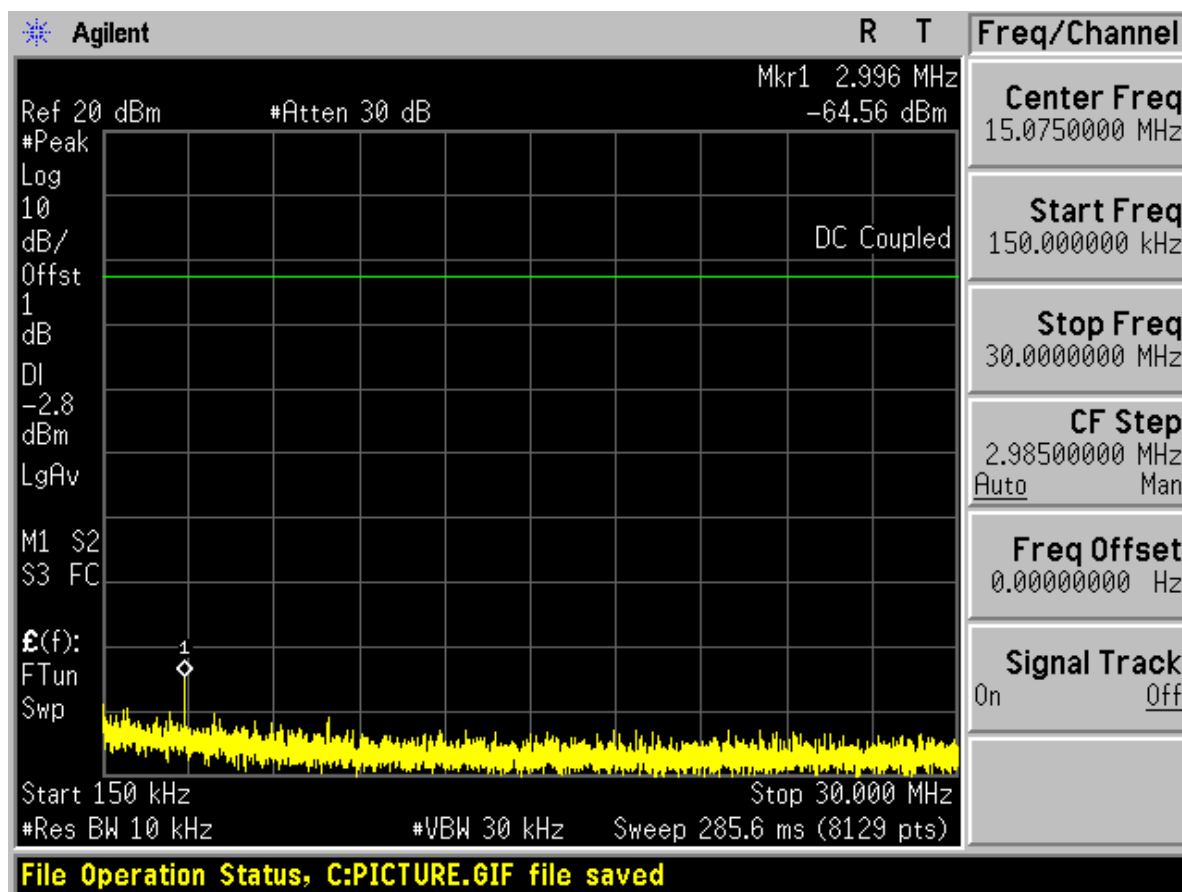
Channel 11

9K~150K TM1_11



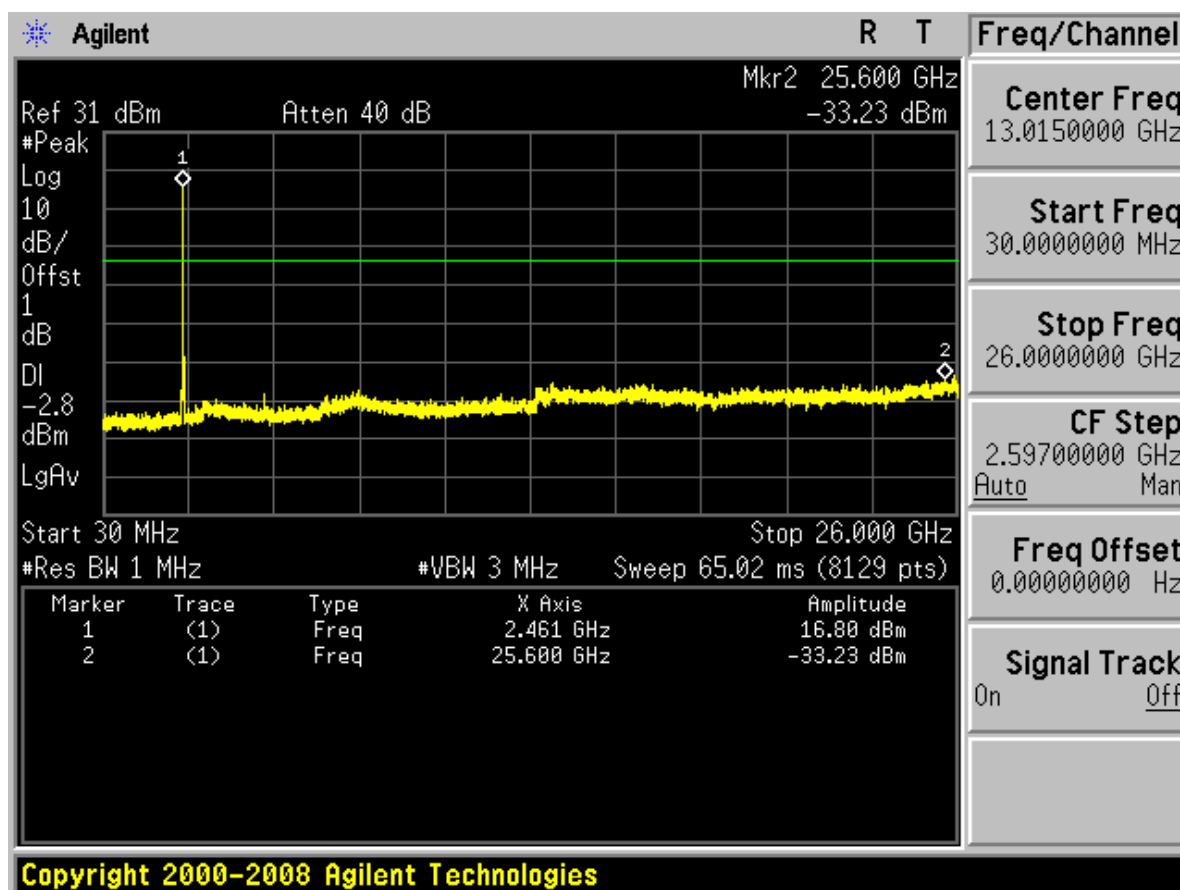


150K~30M TM1_11





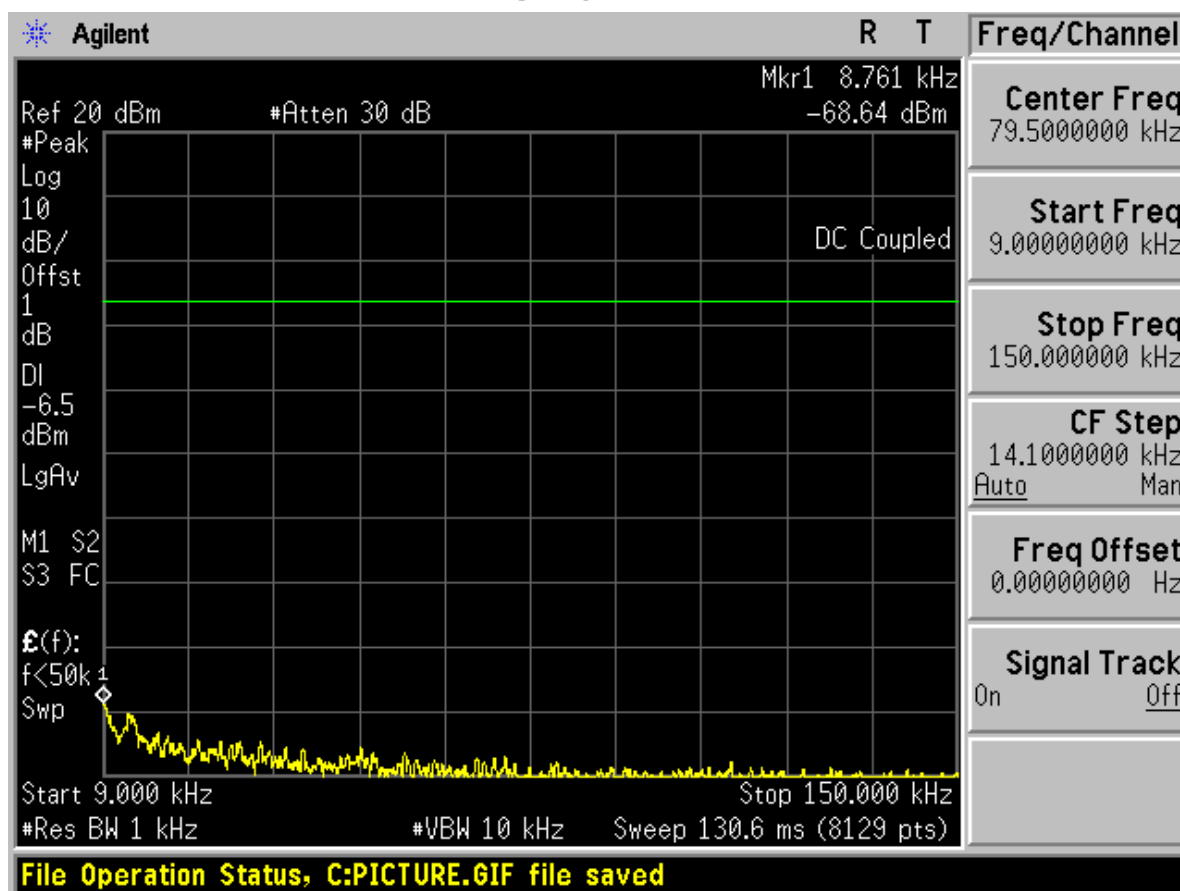
30M~26G TM1_11





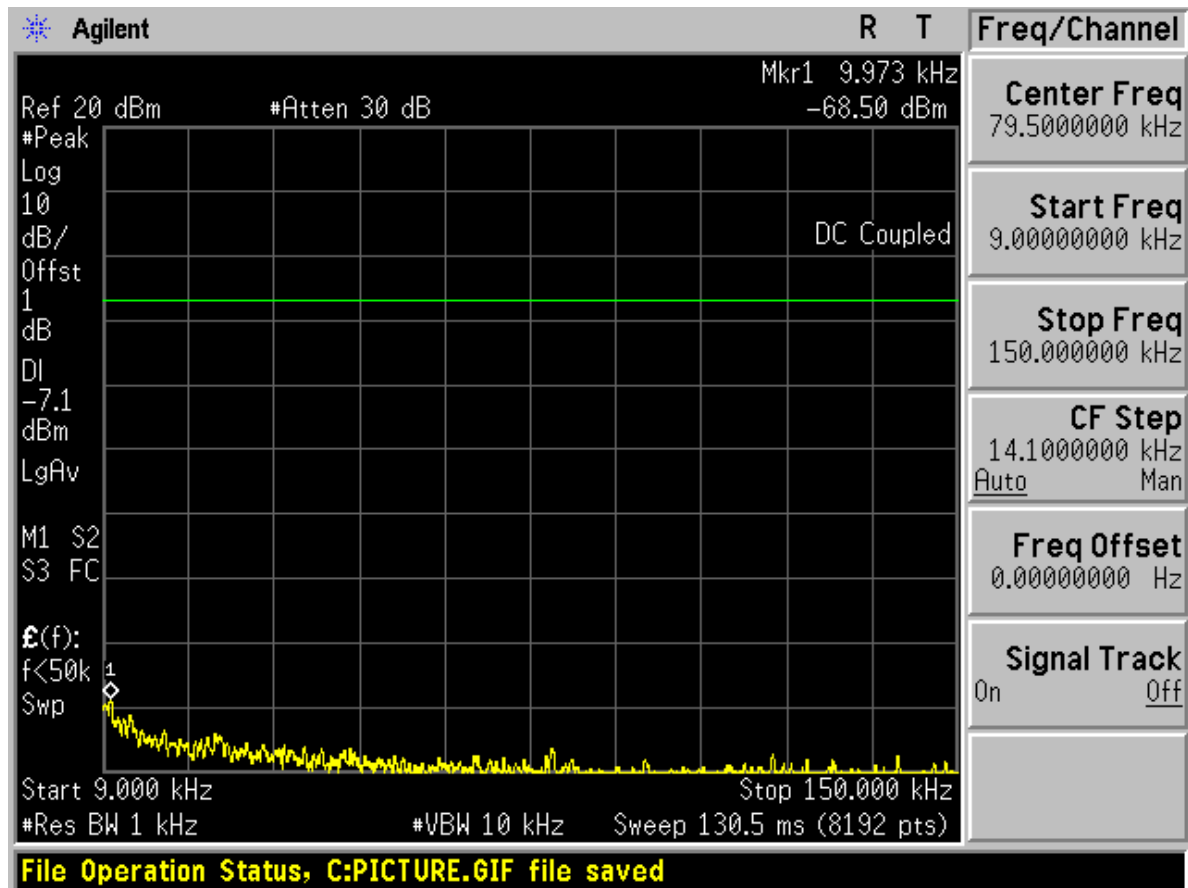
TM2 Chain 1&2 Channel 1 9K~150K TM2_01

Chain 1





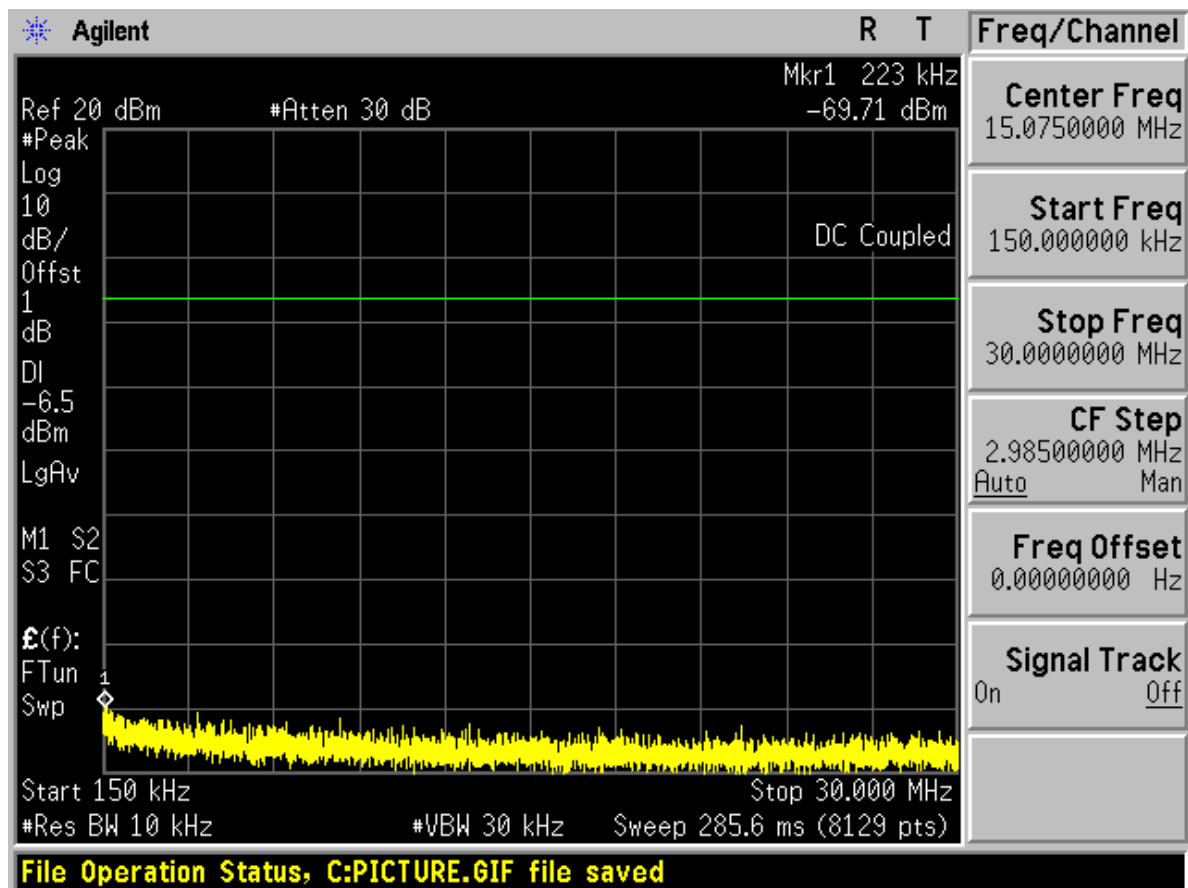
Chain2





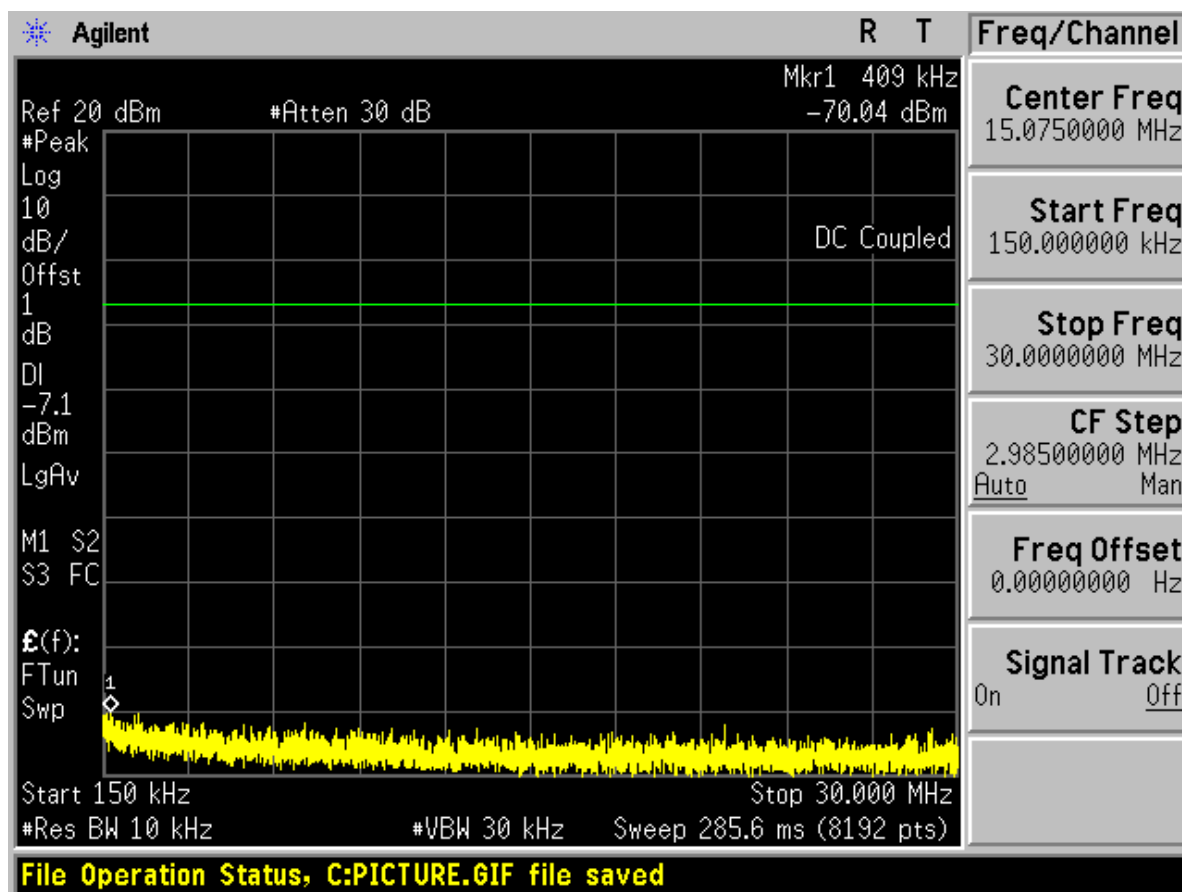
150K~30M TM2_01

Chain 1





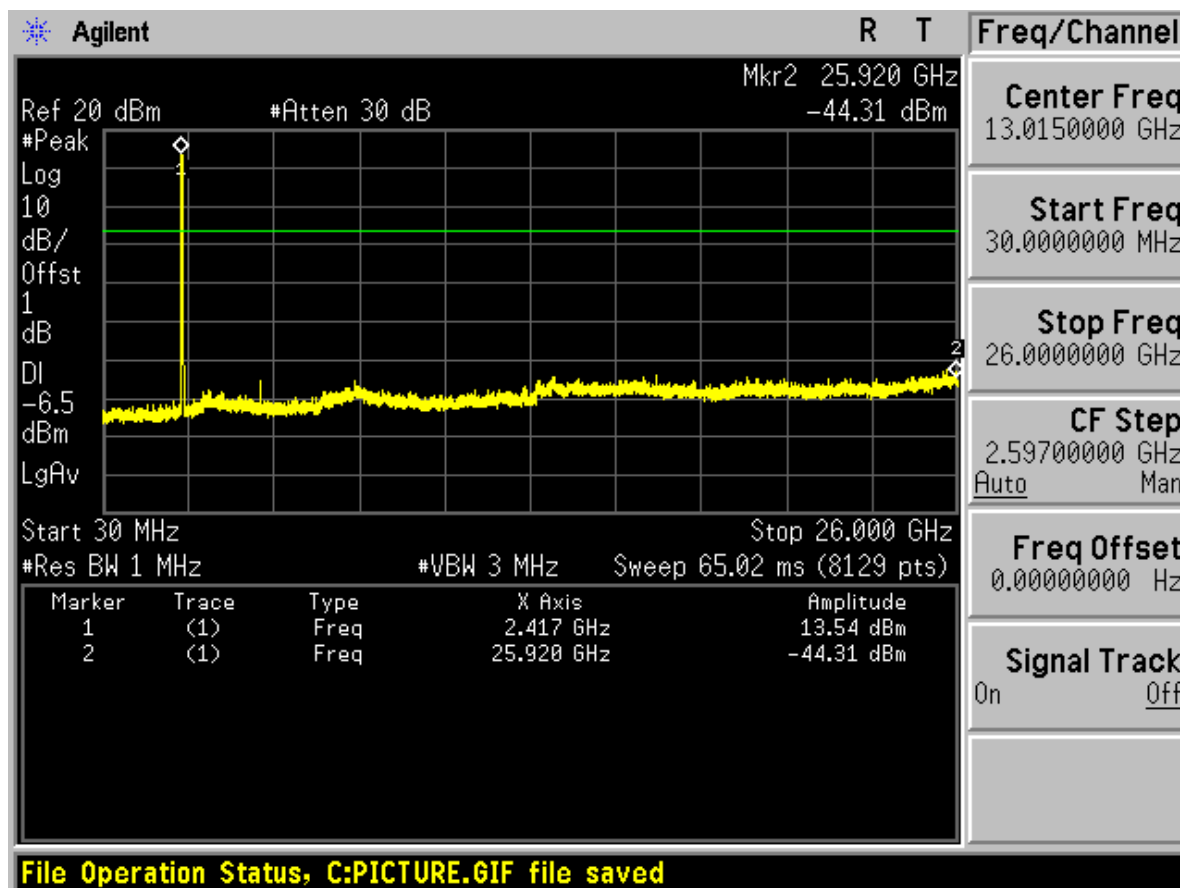
Chain2





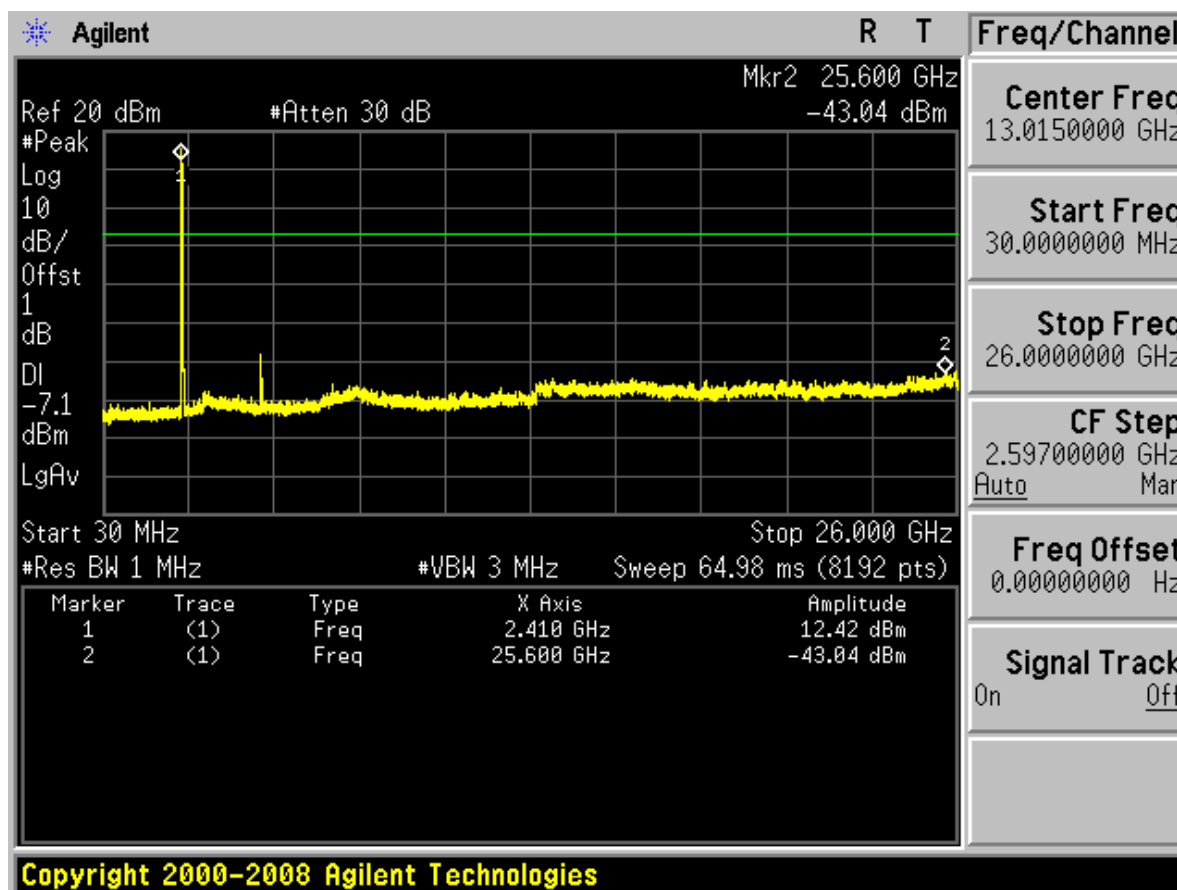
30M~26G TM2_01

Chain 1





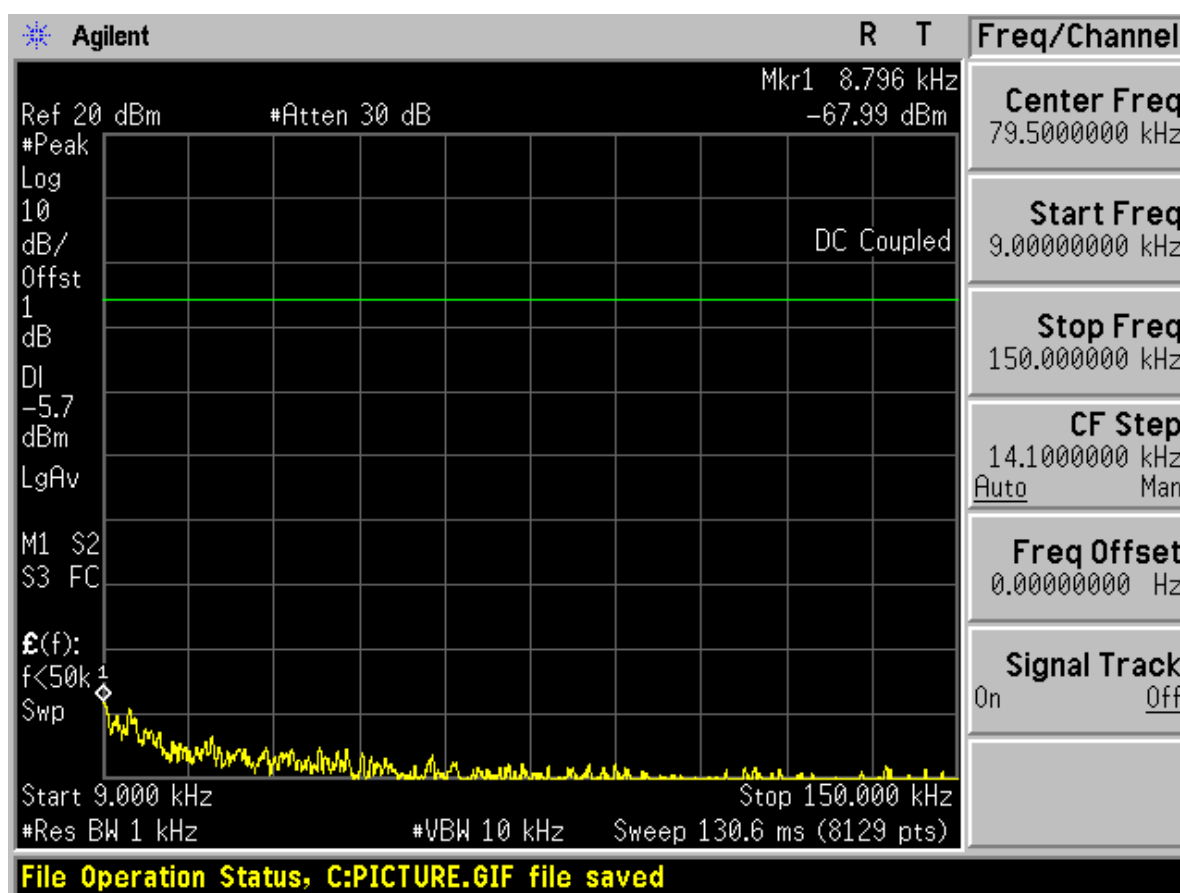
Chain2





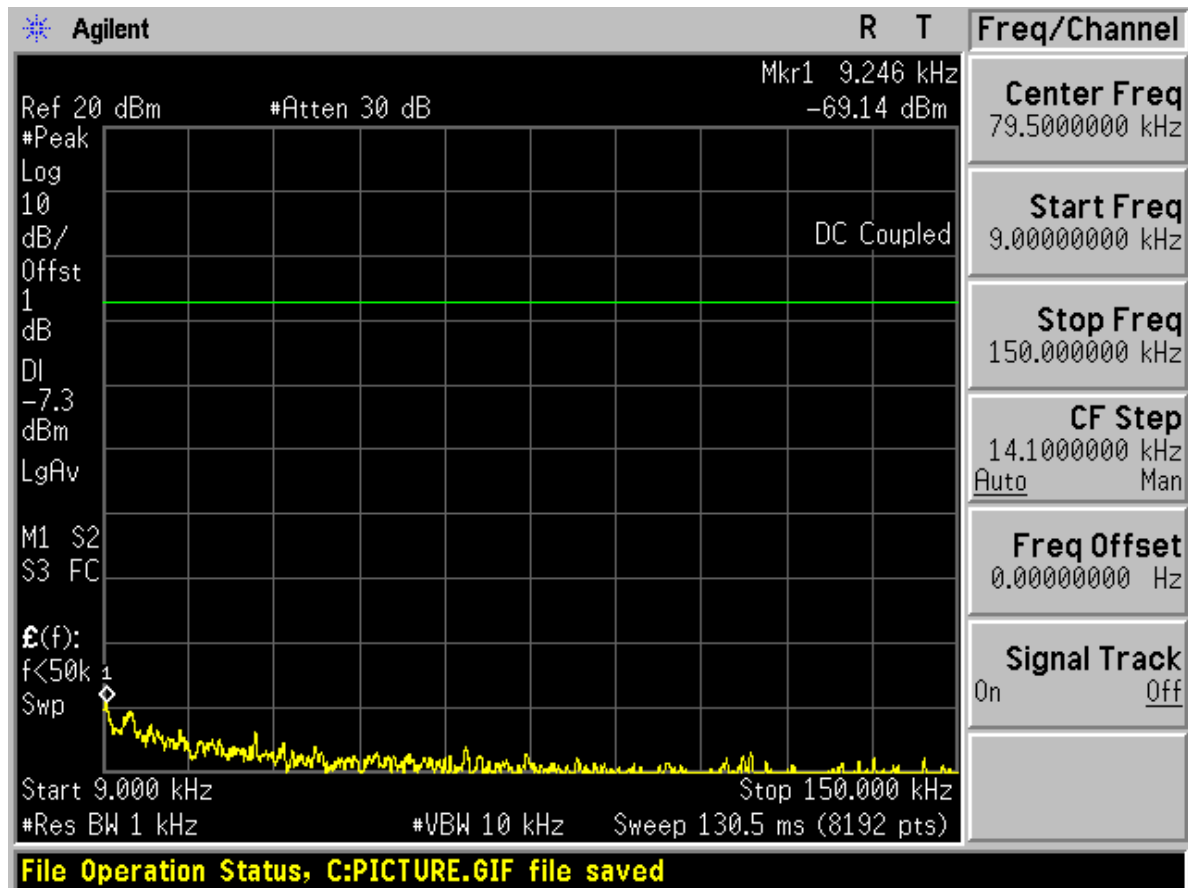
Channel 6 9K~150K TM2_06

Chain 1





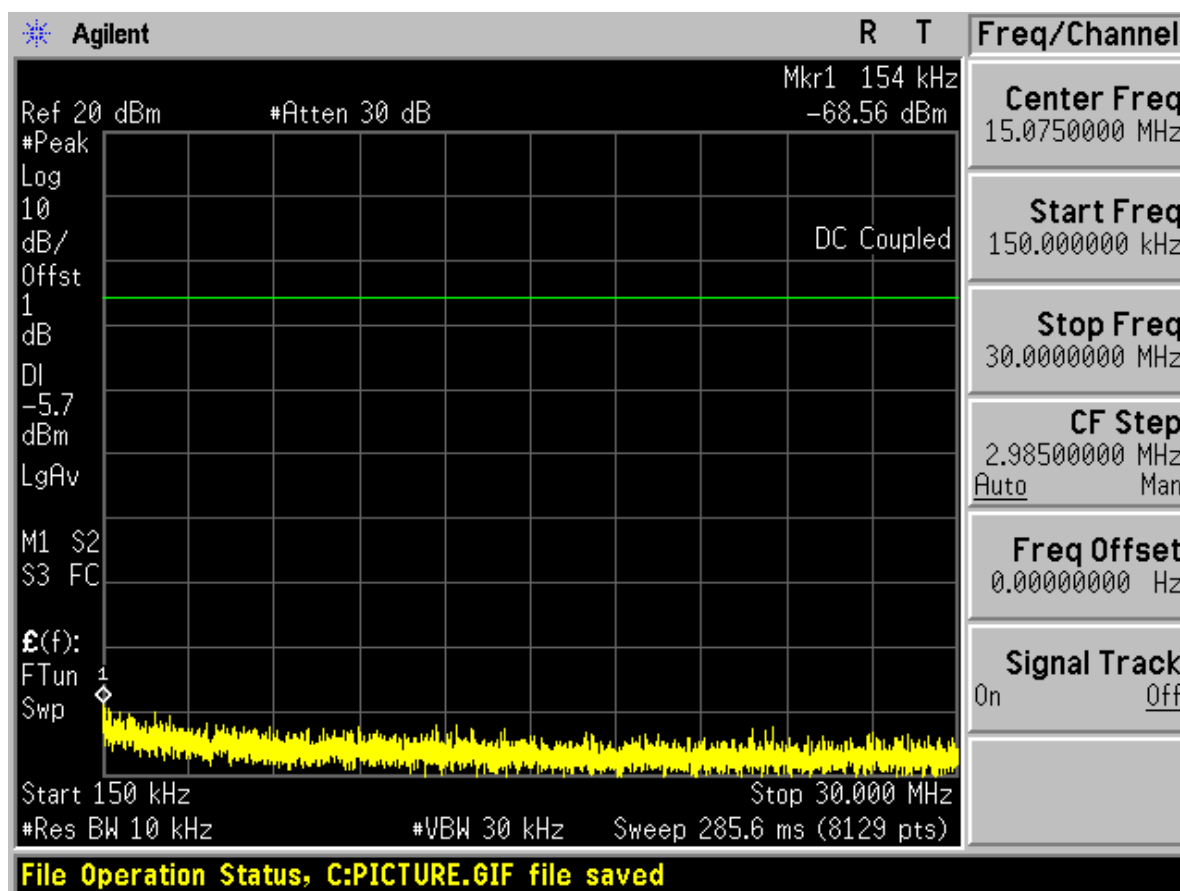
Chain2





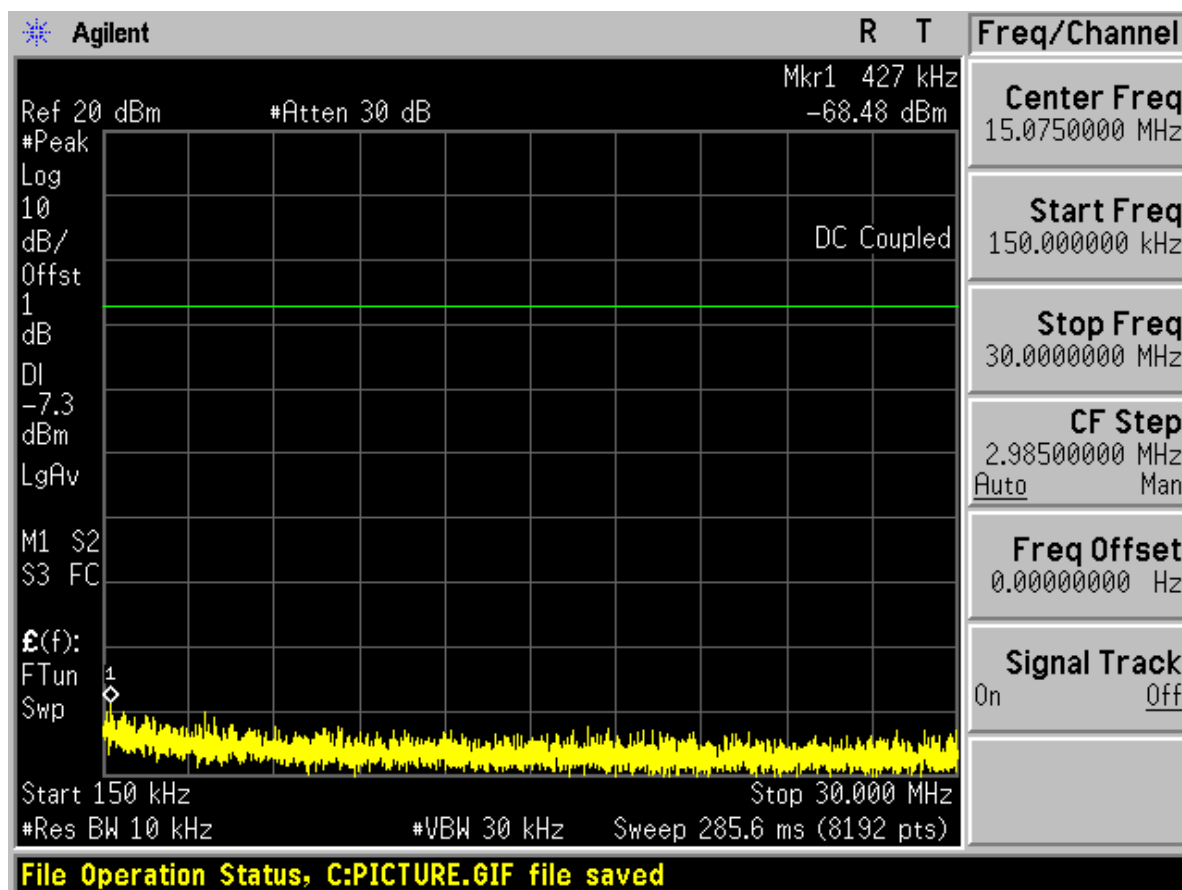
150K~30M TM2_06

Chain 1





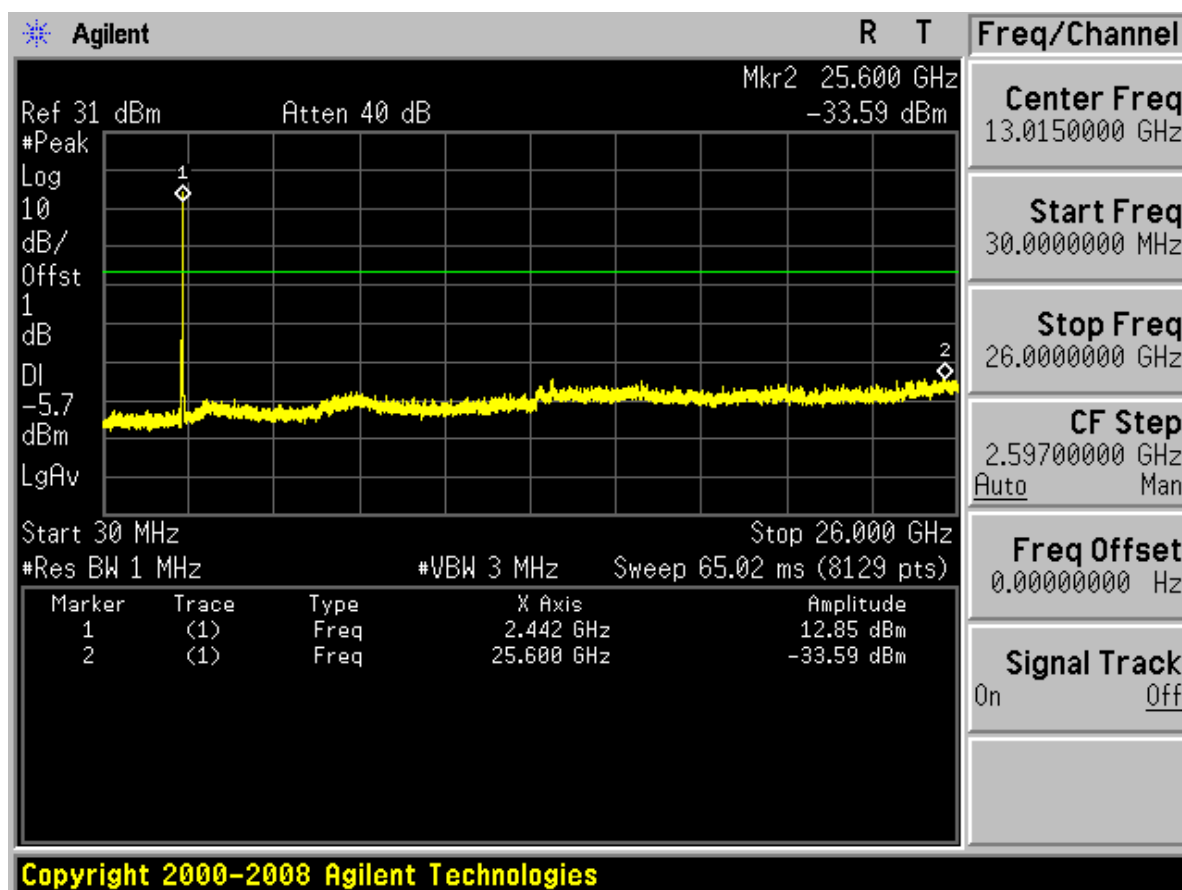
Chain2





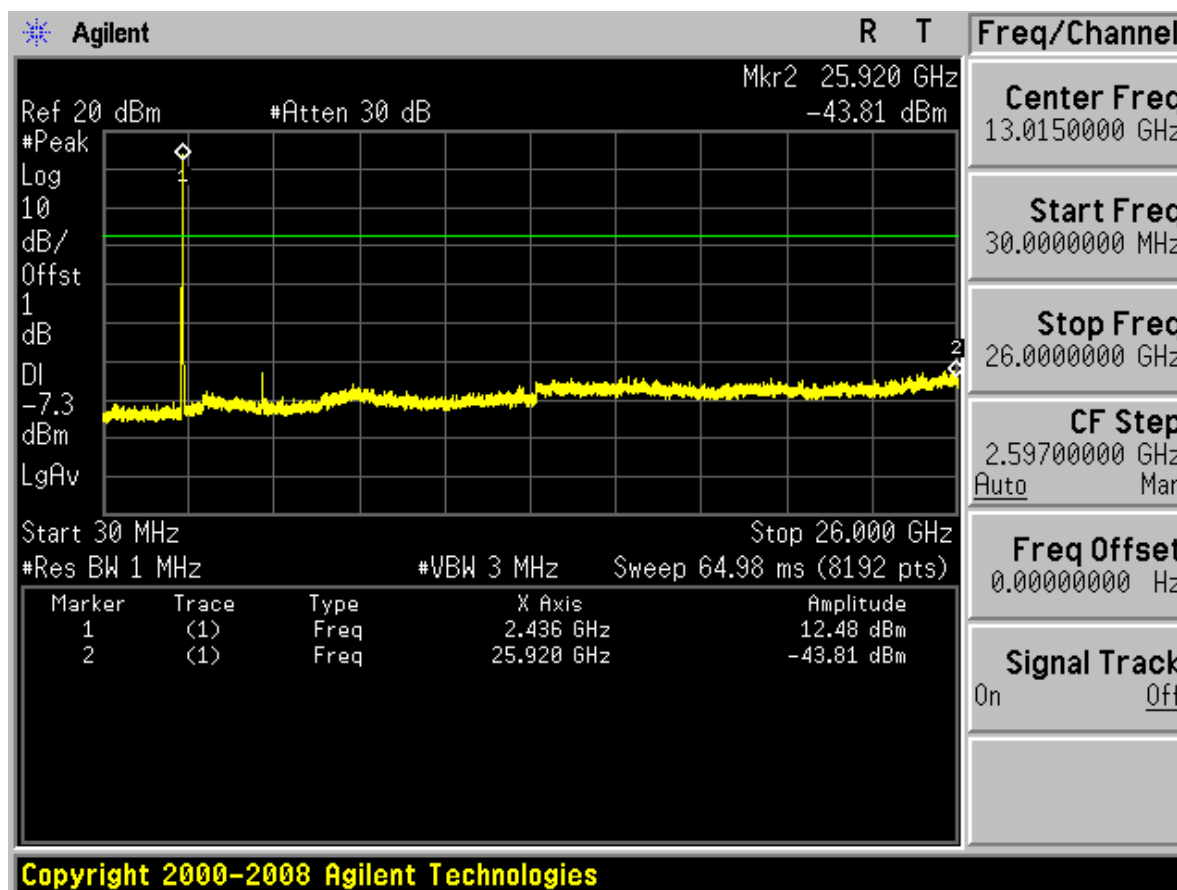
30M~26G TM2_06

Chain 1





Chain2

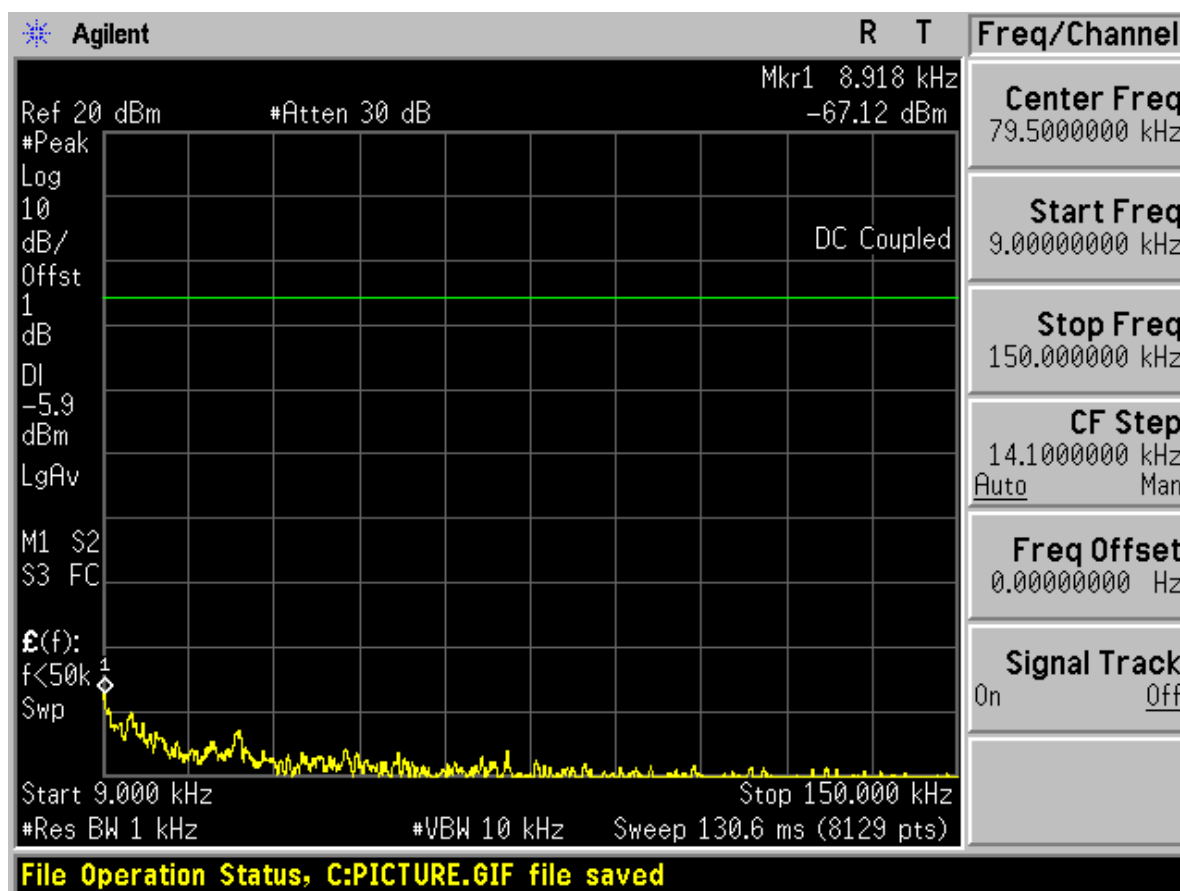




Channel 11

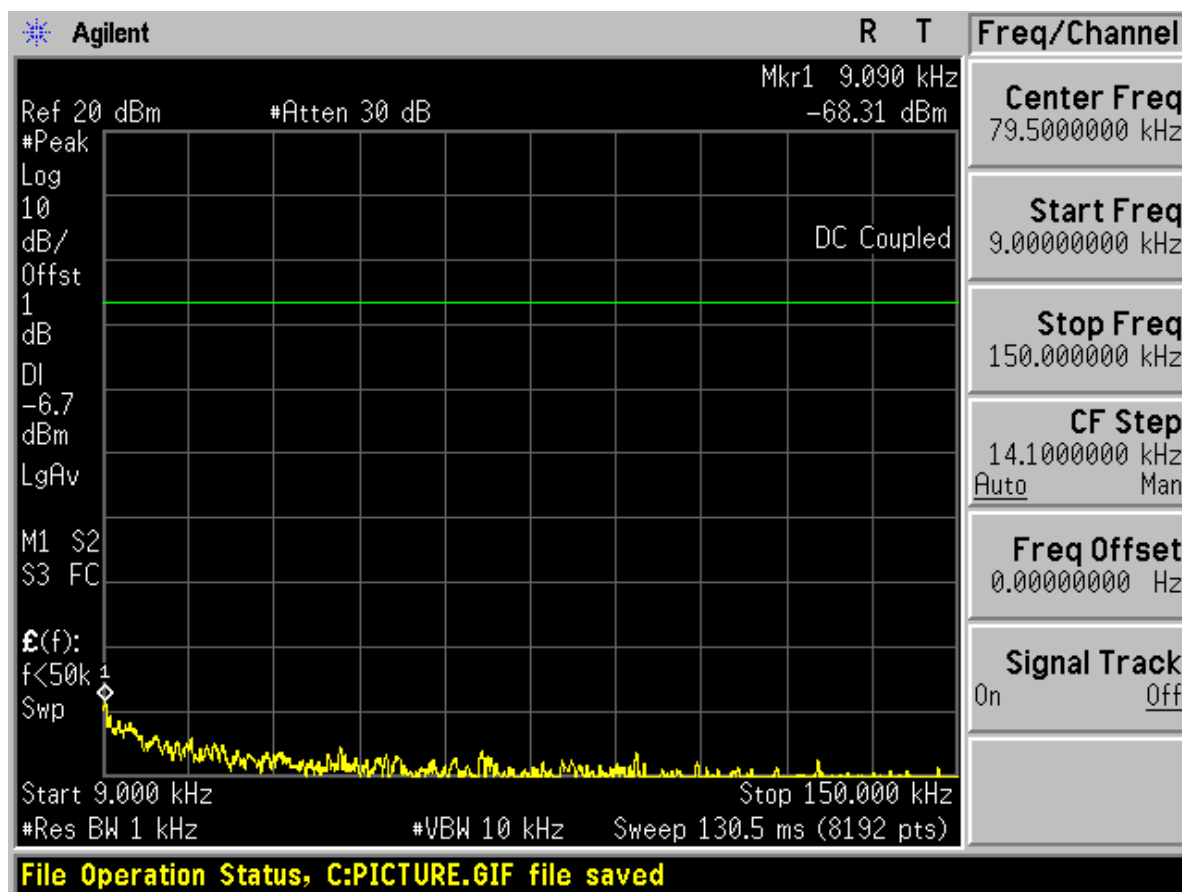
9K~150K TM2_11

Chain 1





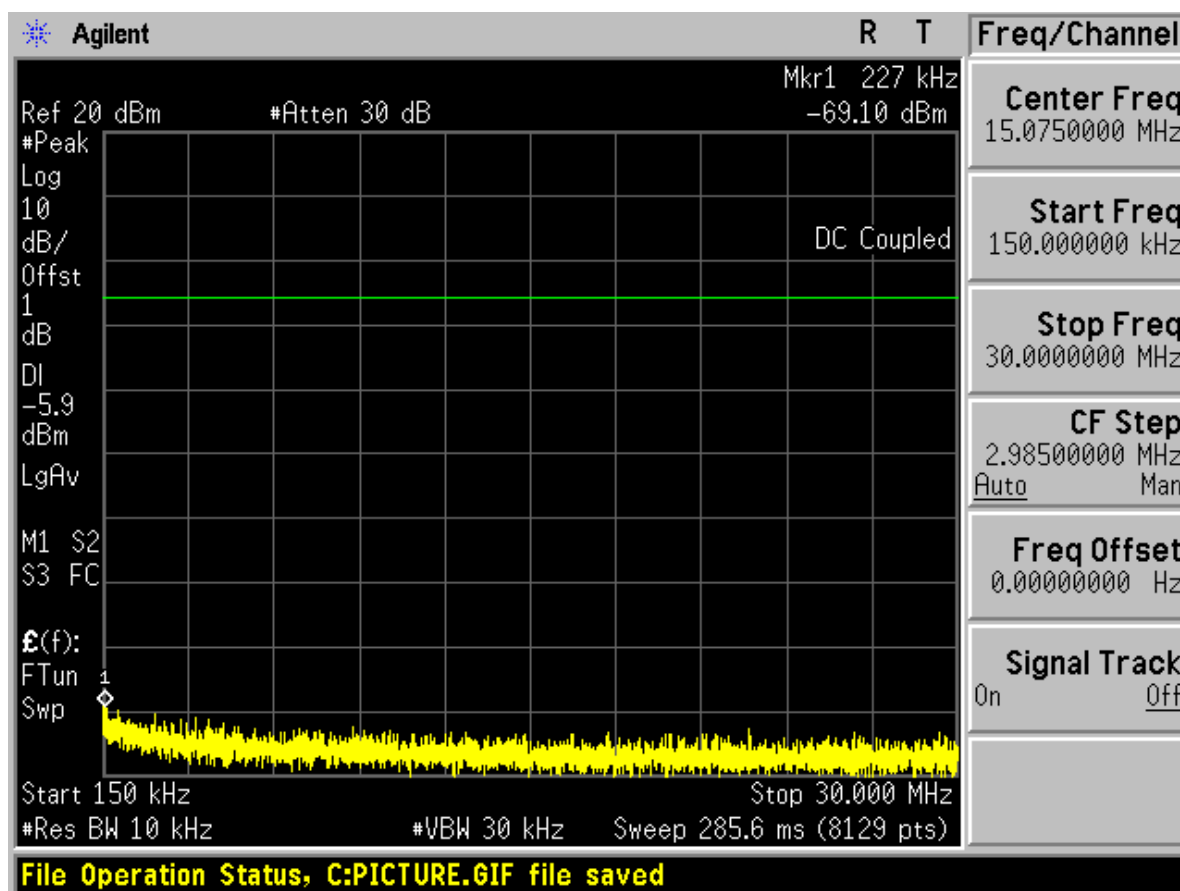
Chain2





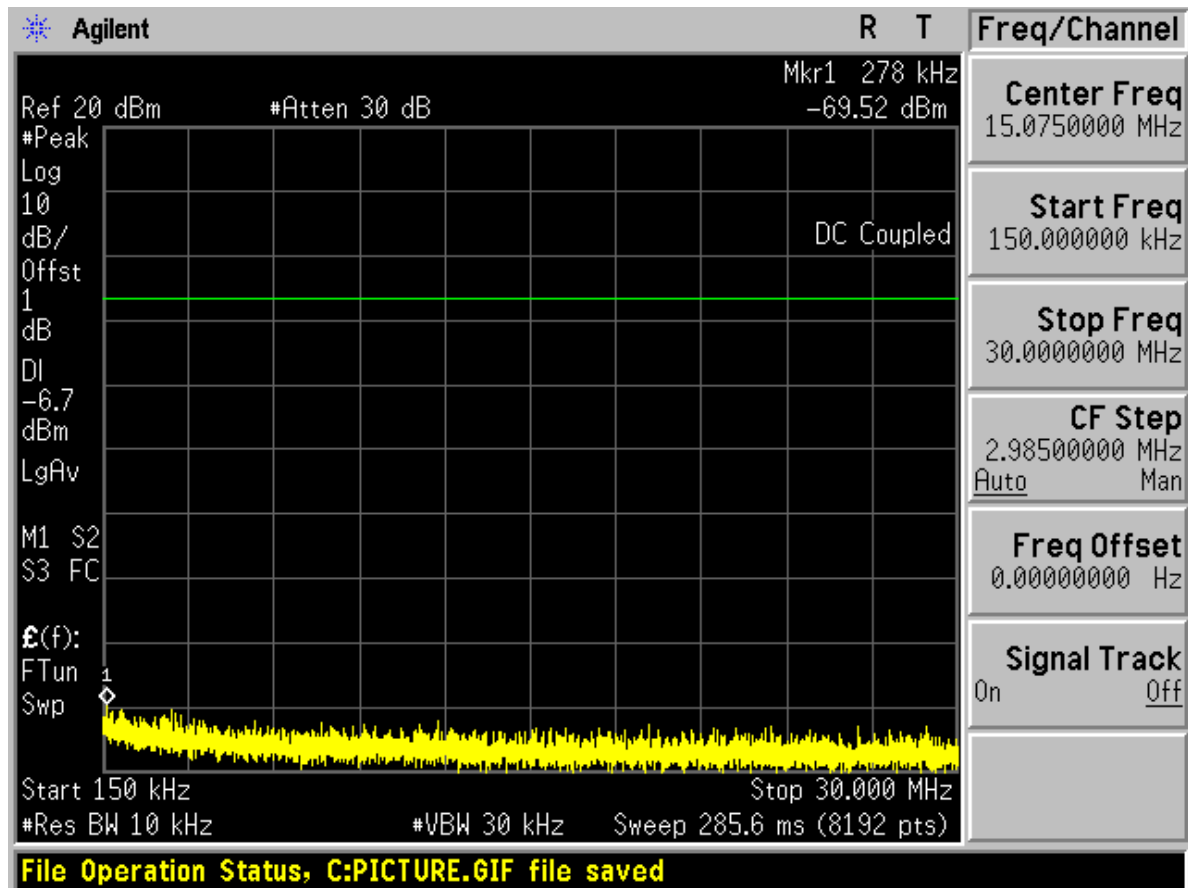
150K~30M TM2_11

Chain 1





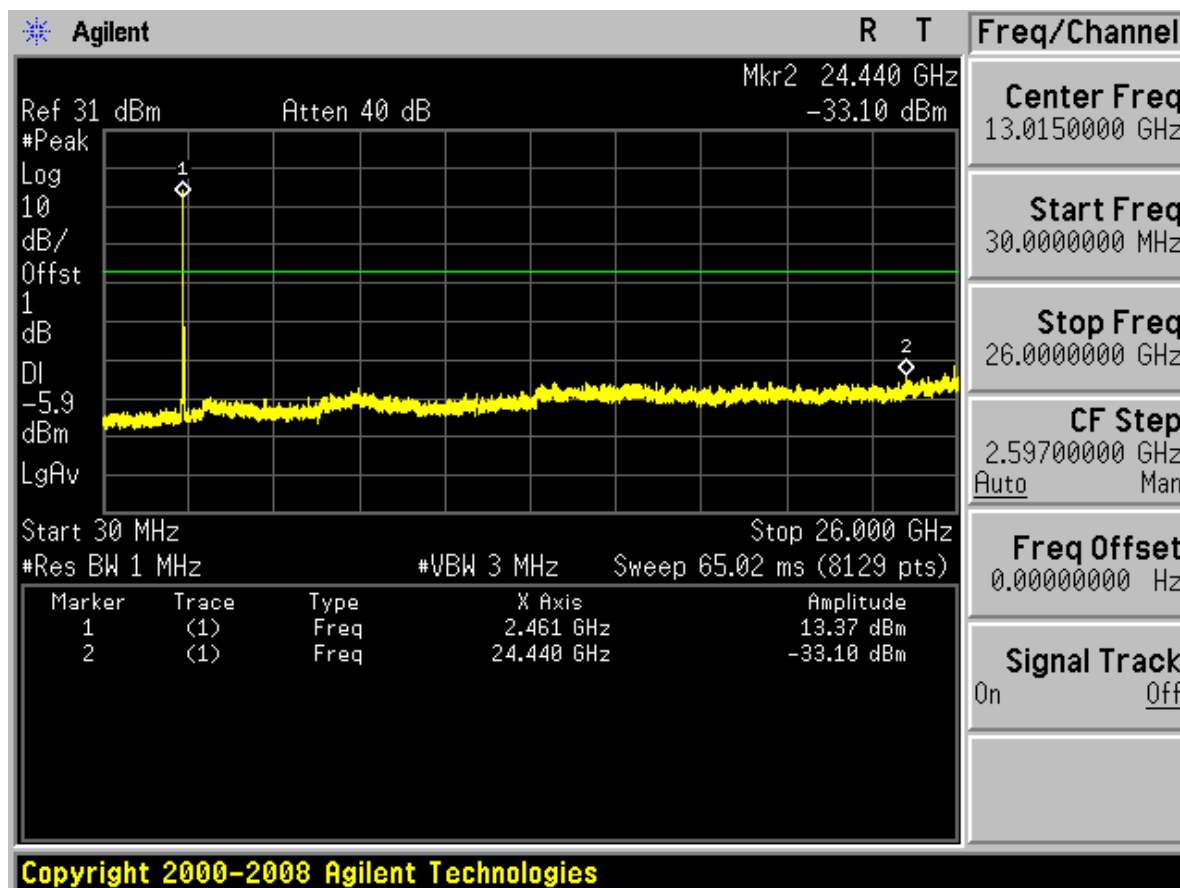
Chain2





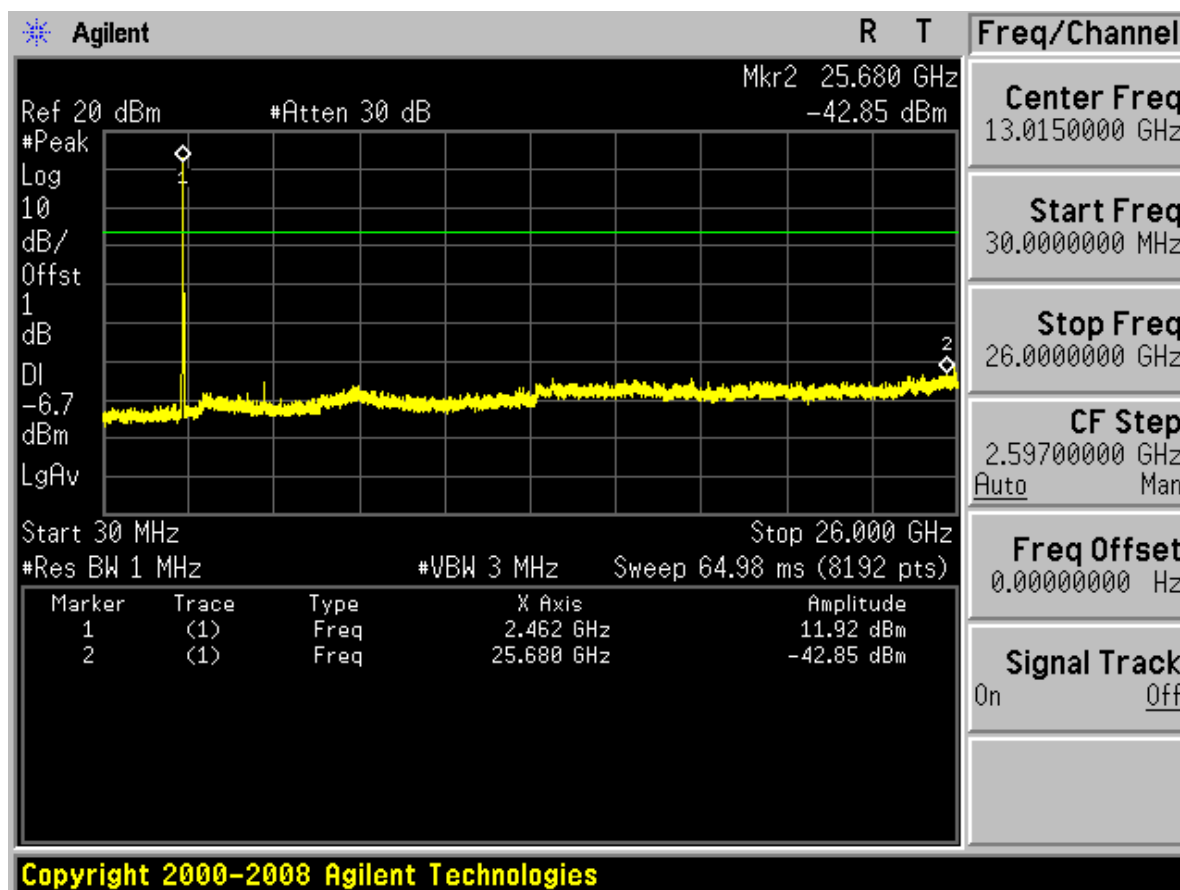
30M~26G TM2_11

Chain 1





Chain2



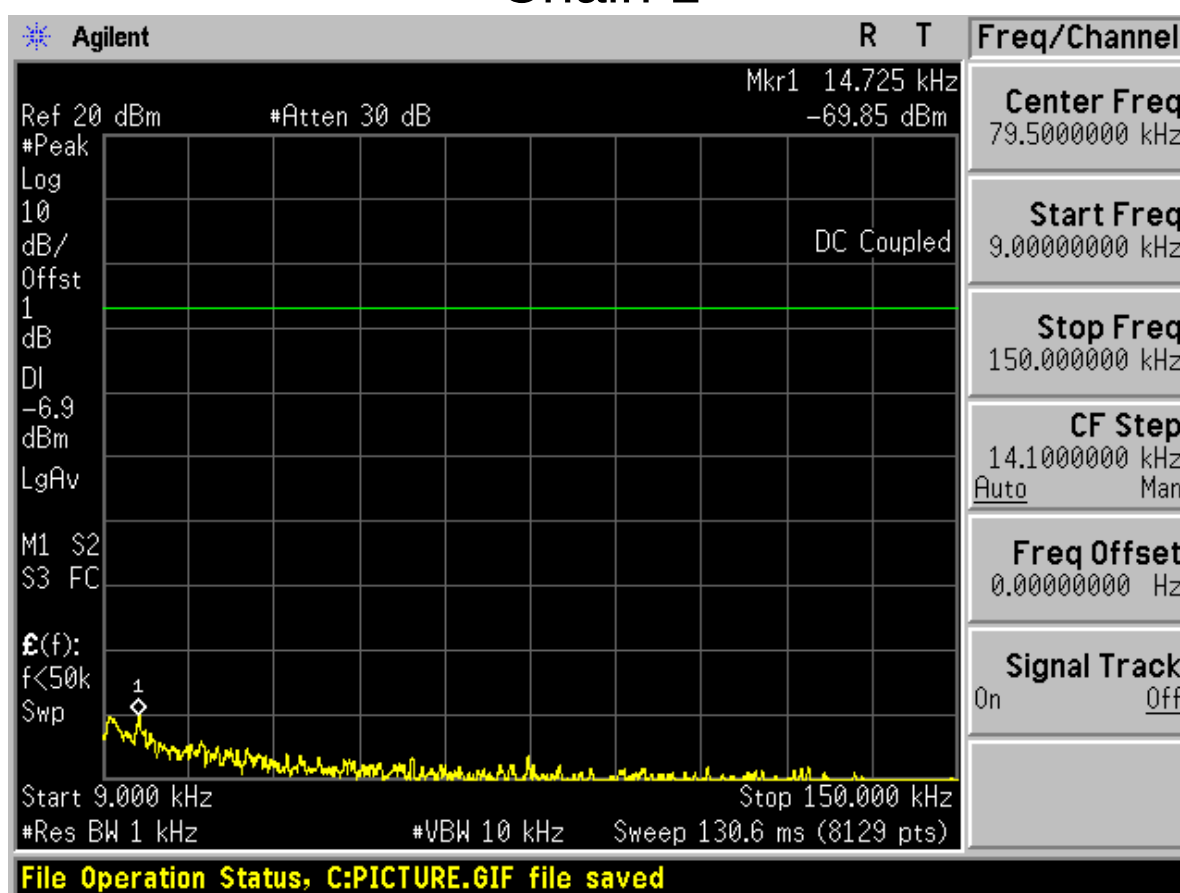


TM3 Chain 1&2

Channel 1

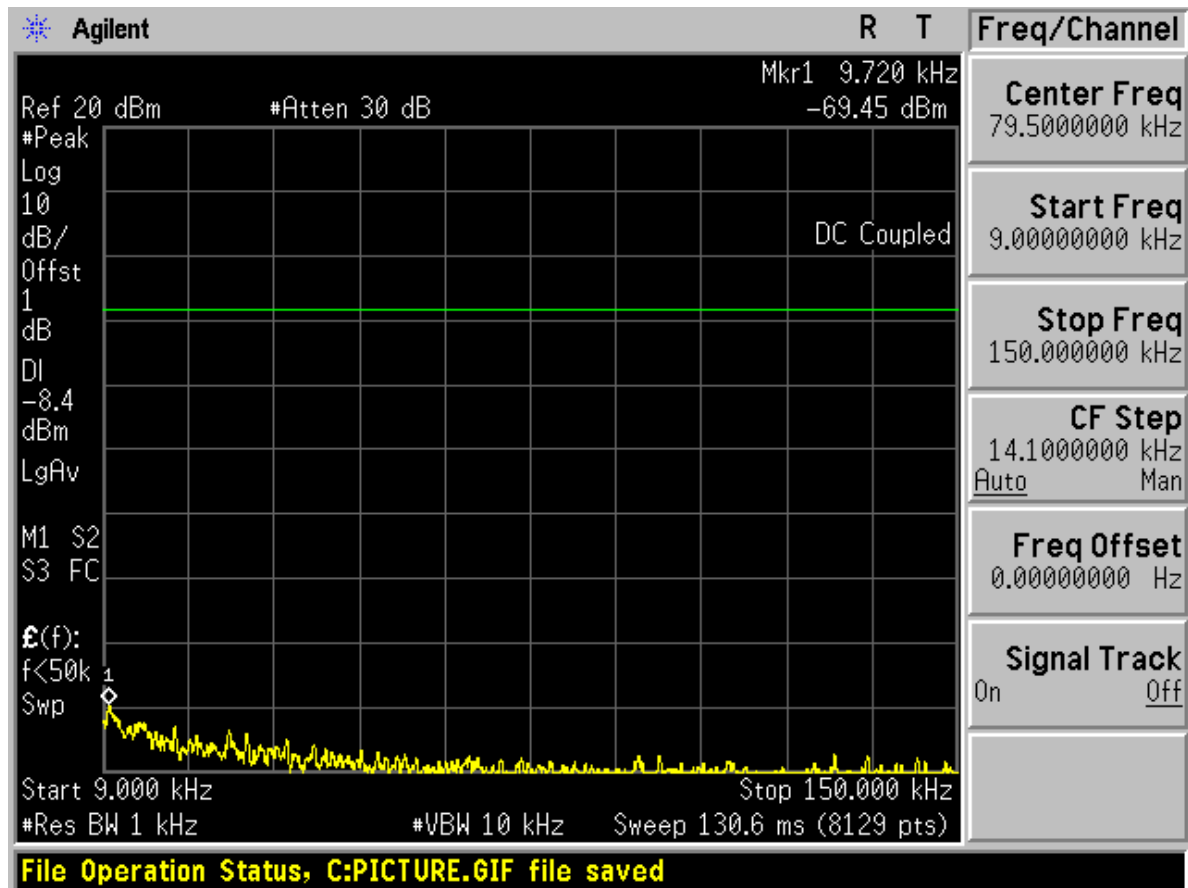
9K~150K TM3_01

Chain 1





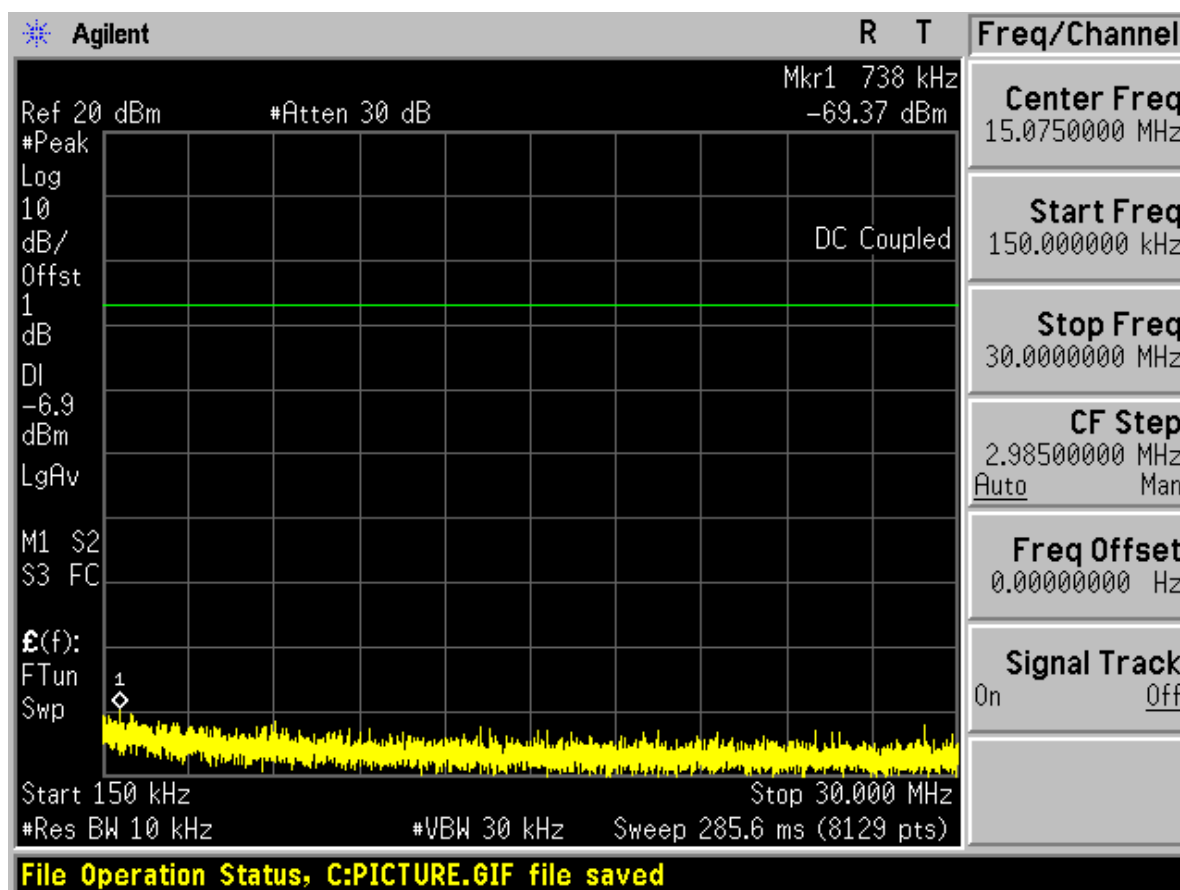
Chain2





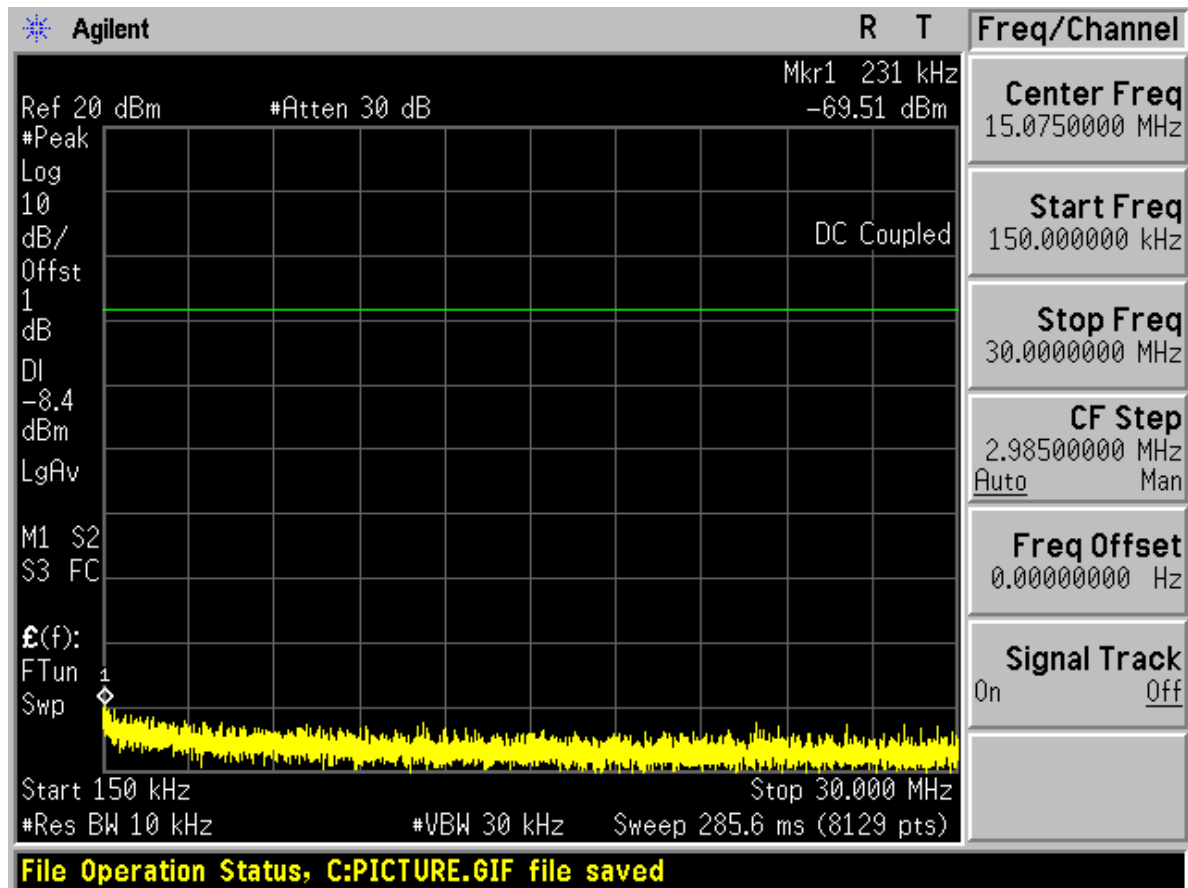
150K~30M TM3_01

Chain 1





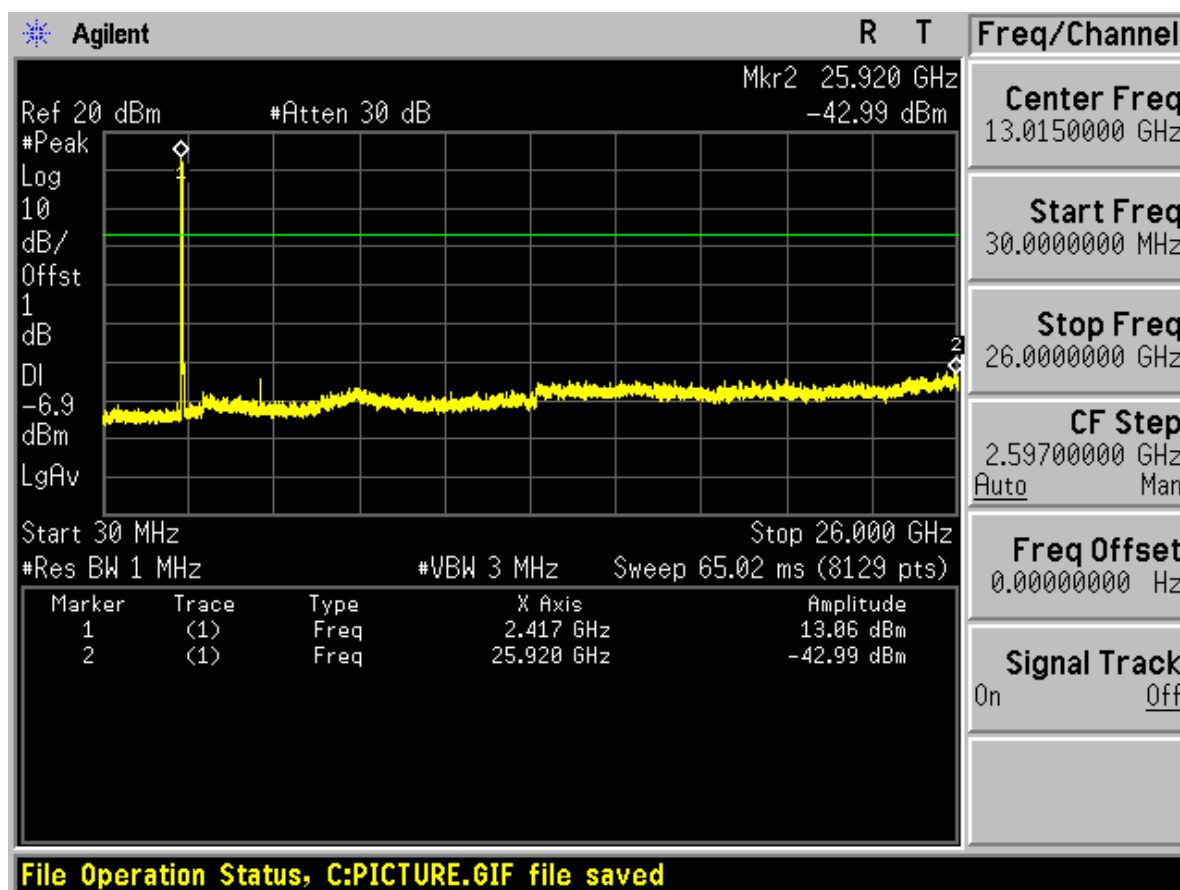
Chain2





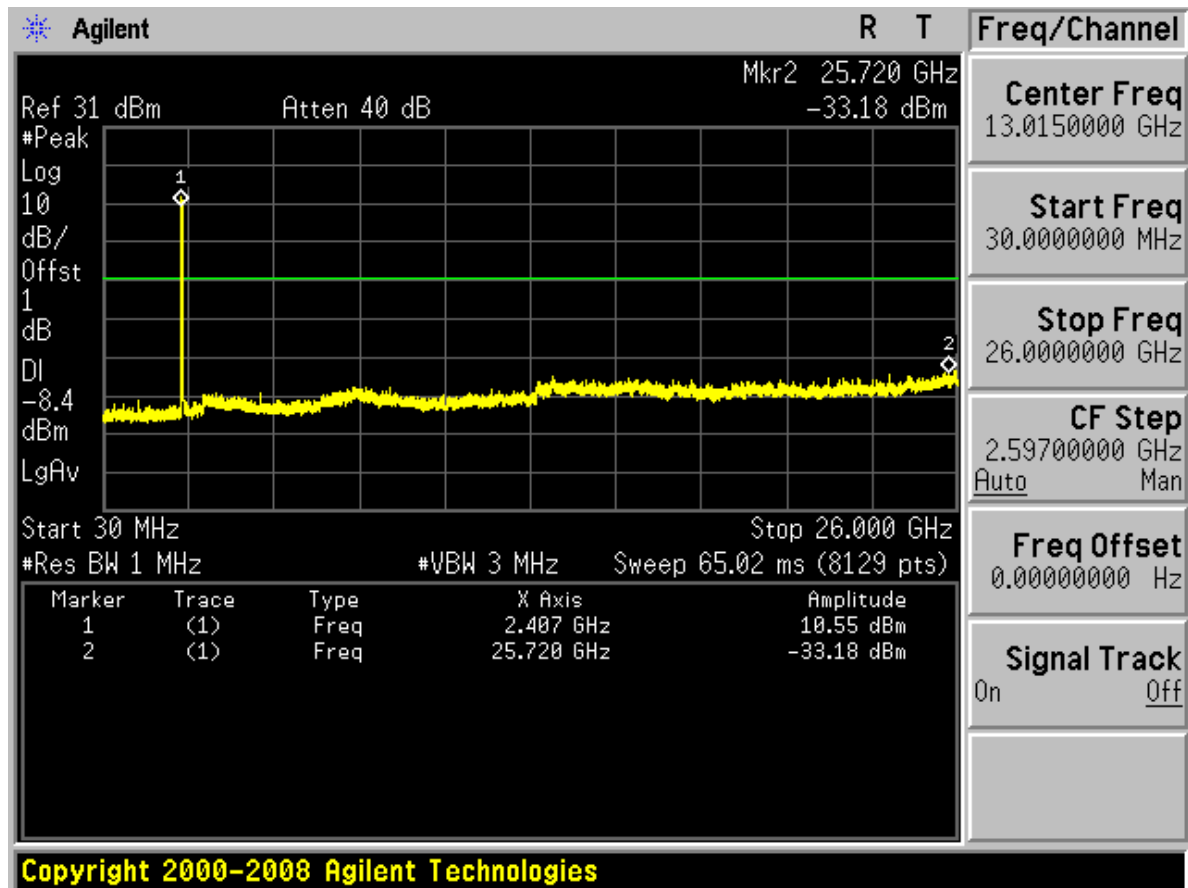
30M~26G TM3_01

Chain 1





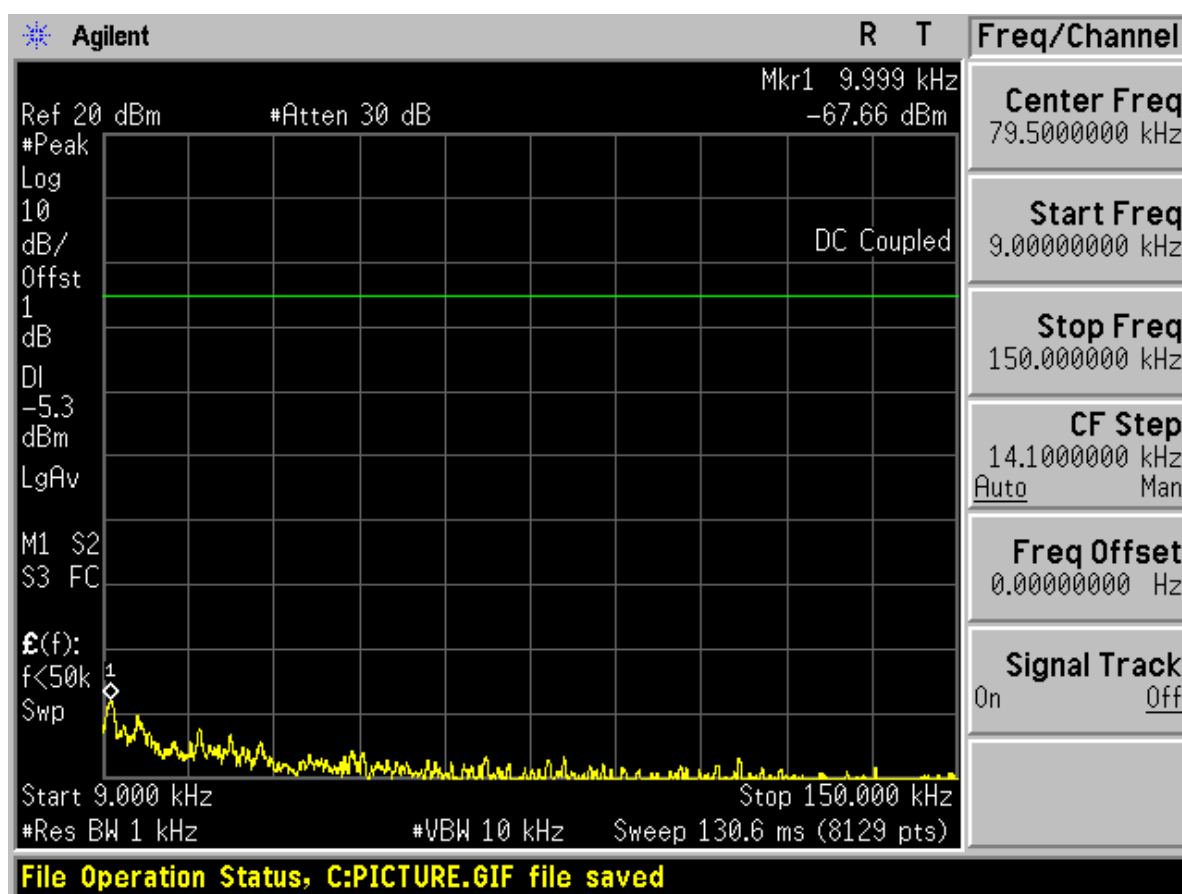
Chain2





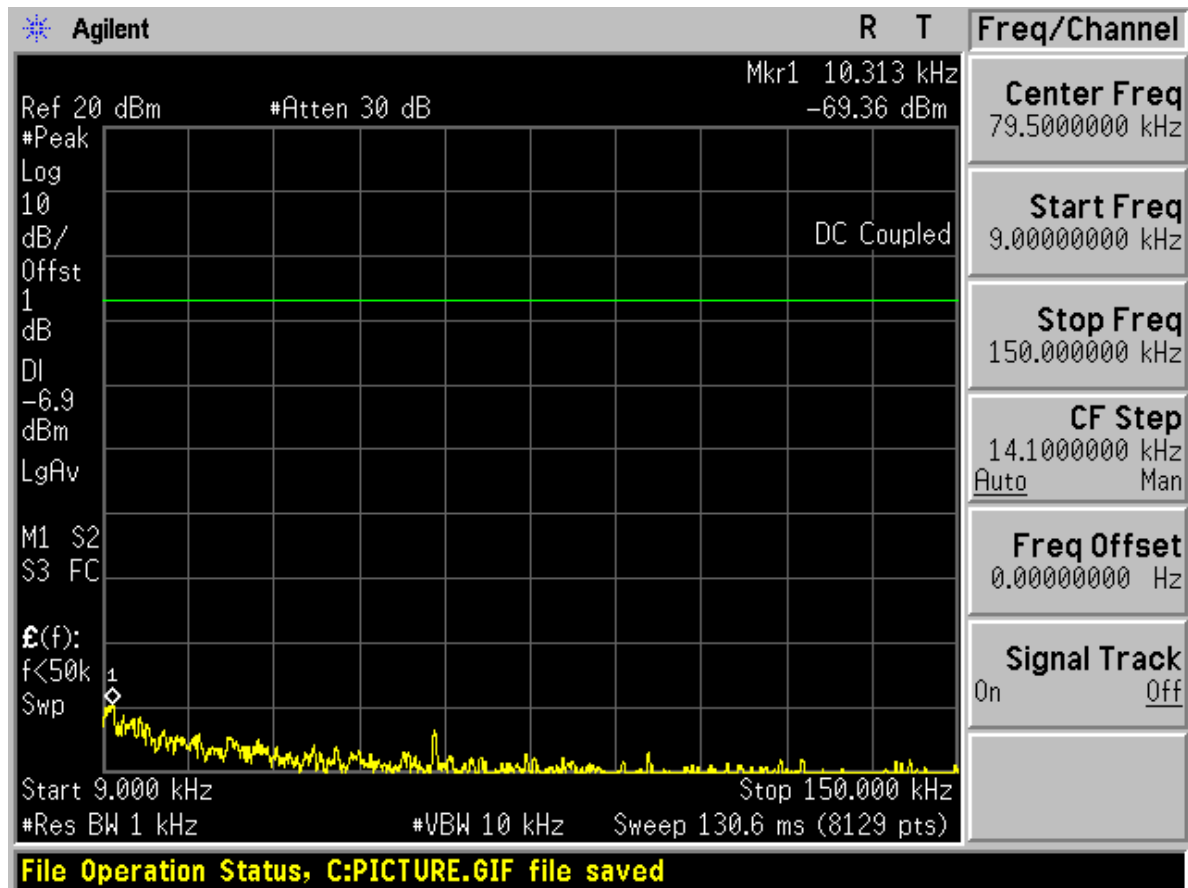
Channel 6 9K~150K TM3_06

Chain 1





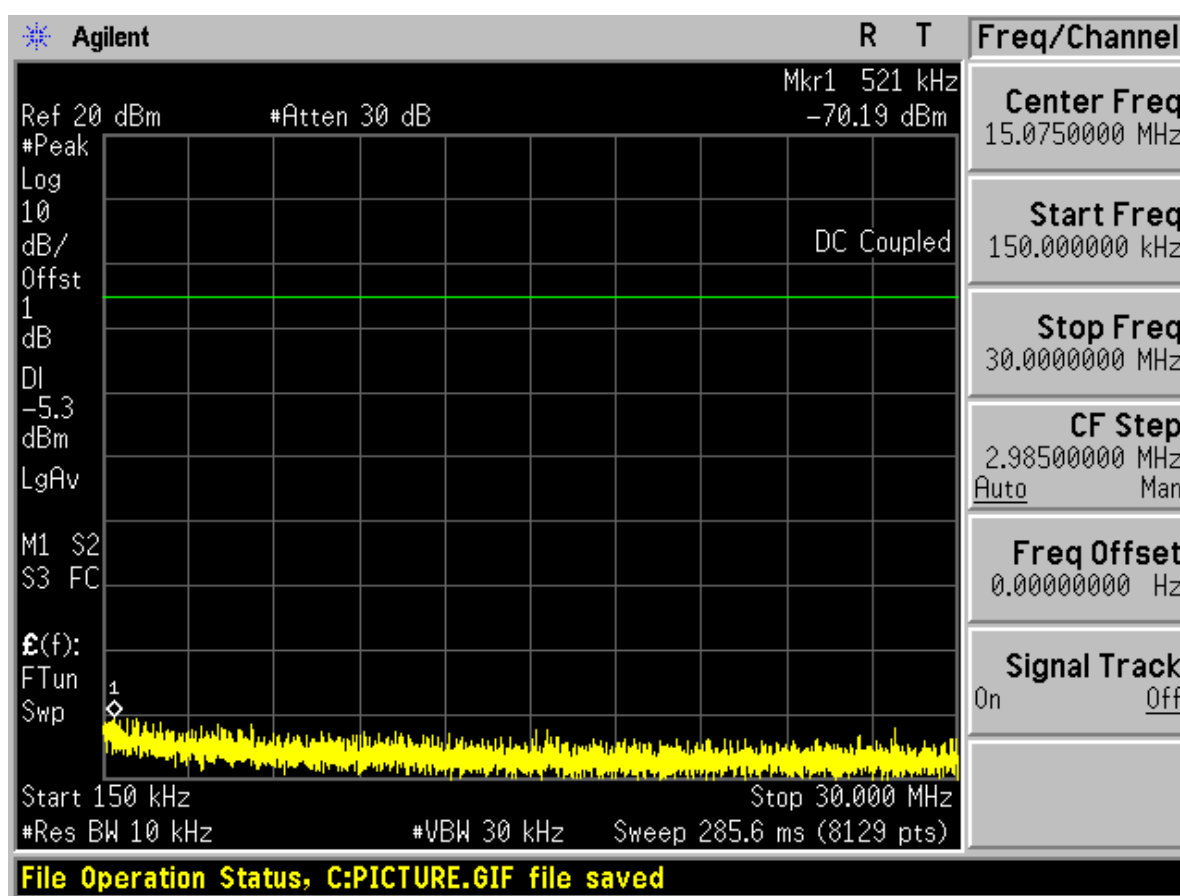
Chain2





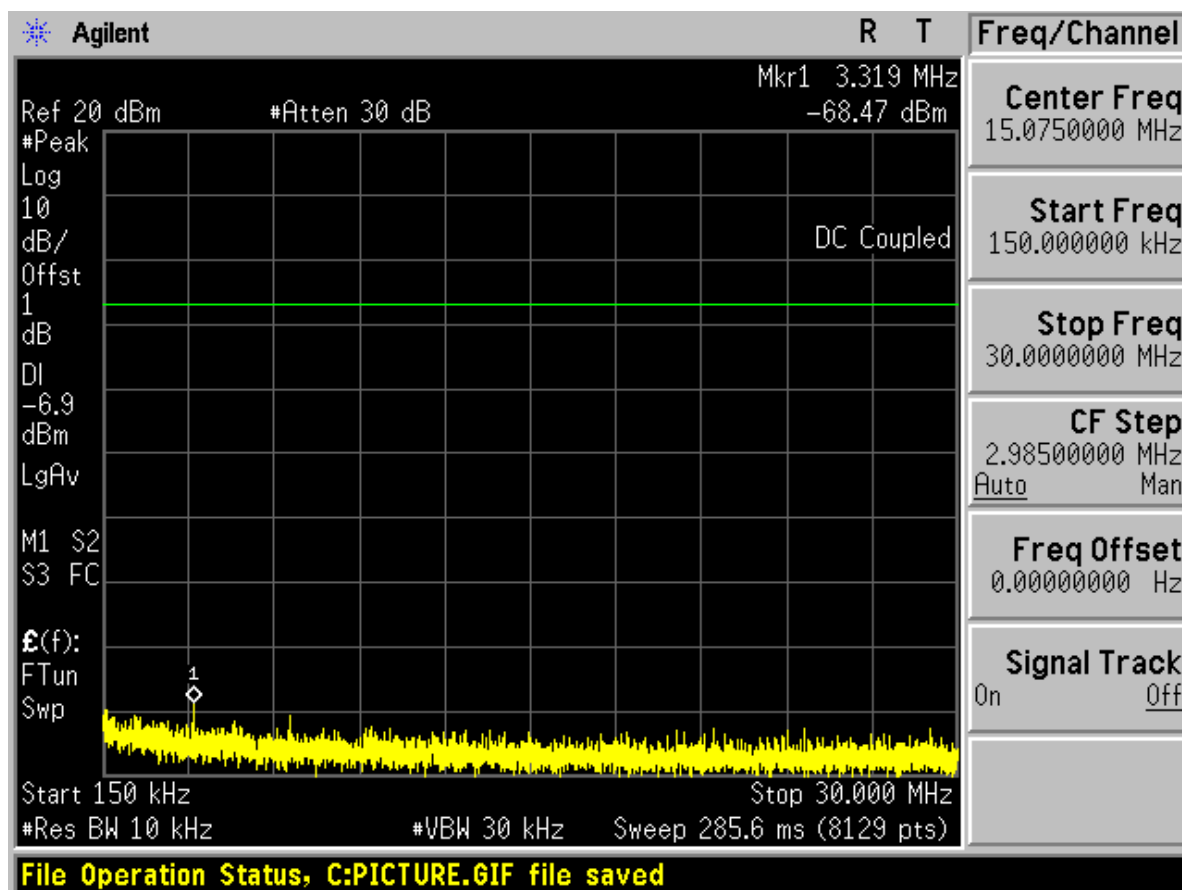
150K~30M TM3_06

Chain 1





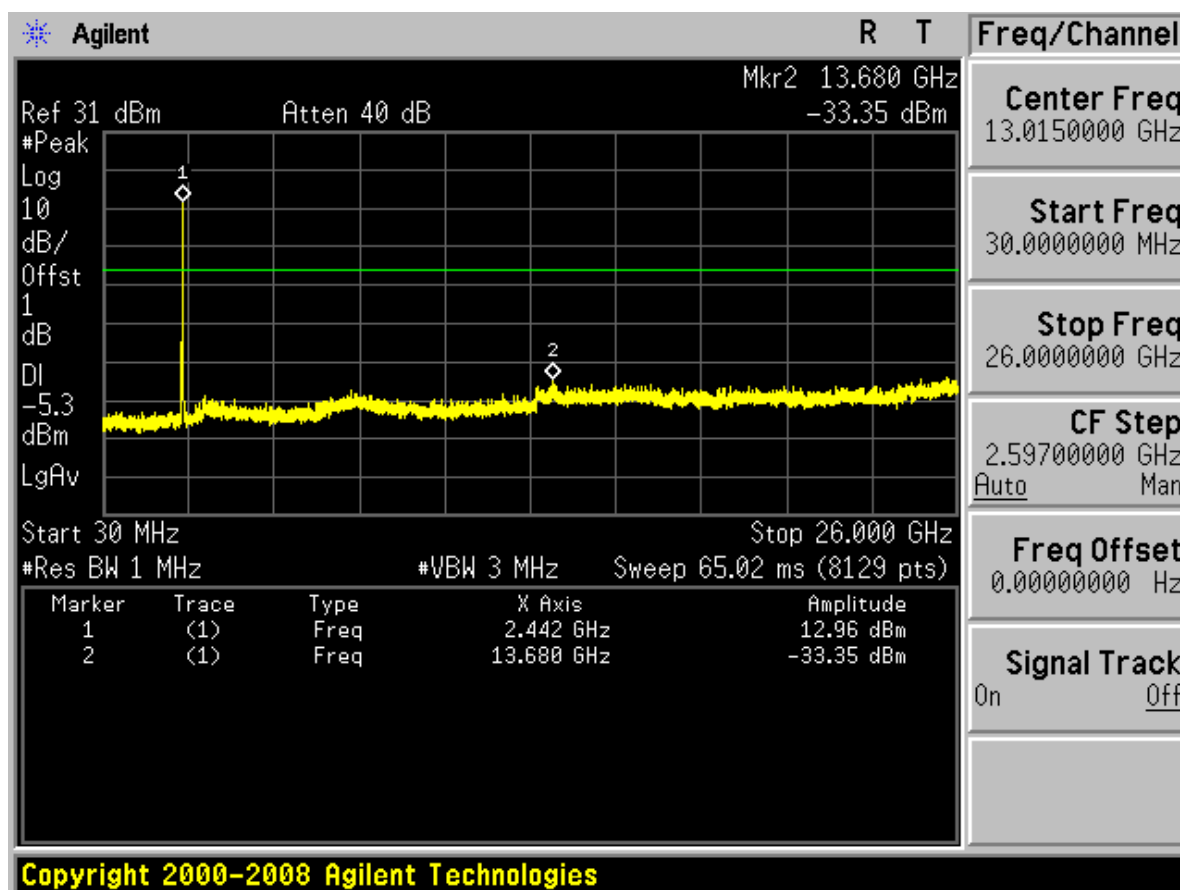
Chain2





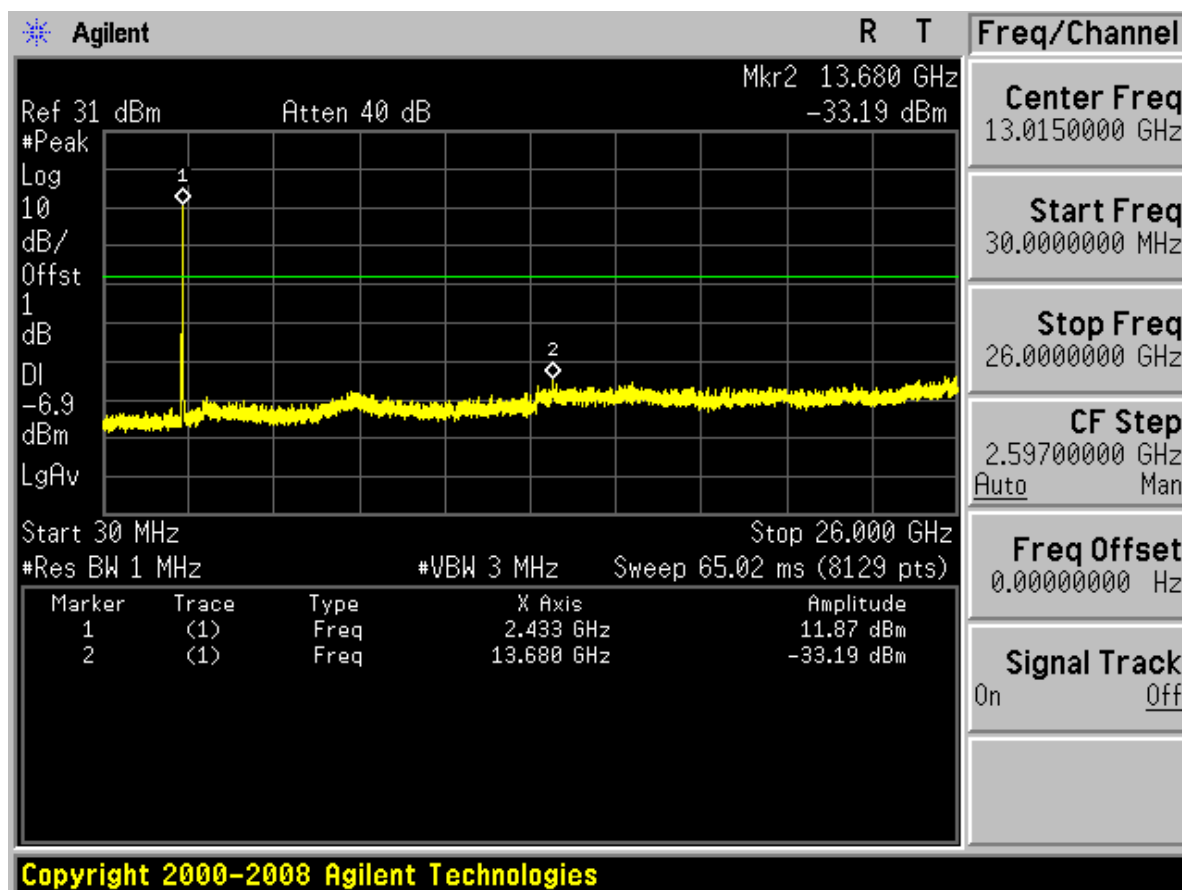
30M~26G TM3_06

Chain 1





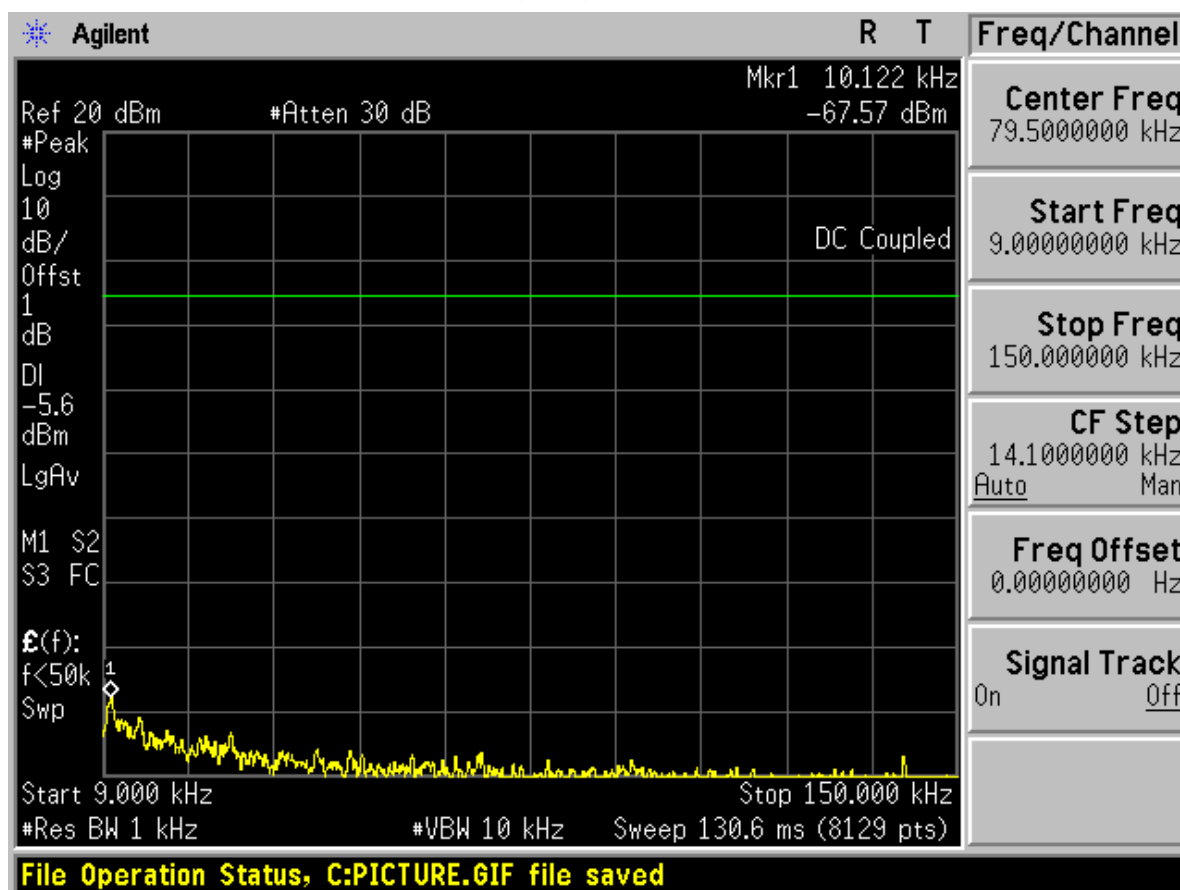
Chain2





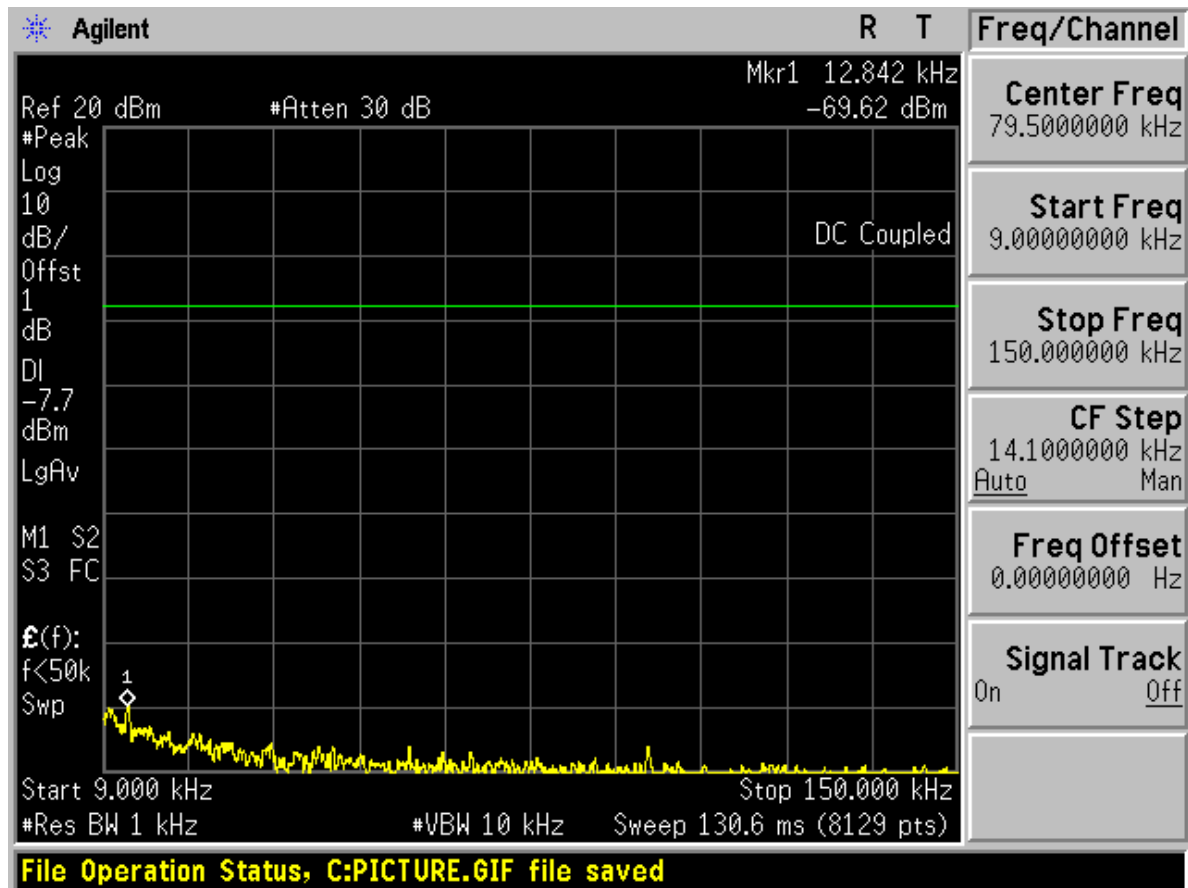
Channel 11

9K~150K TM3_11 Chain 1





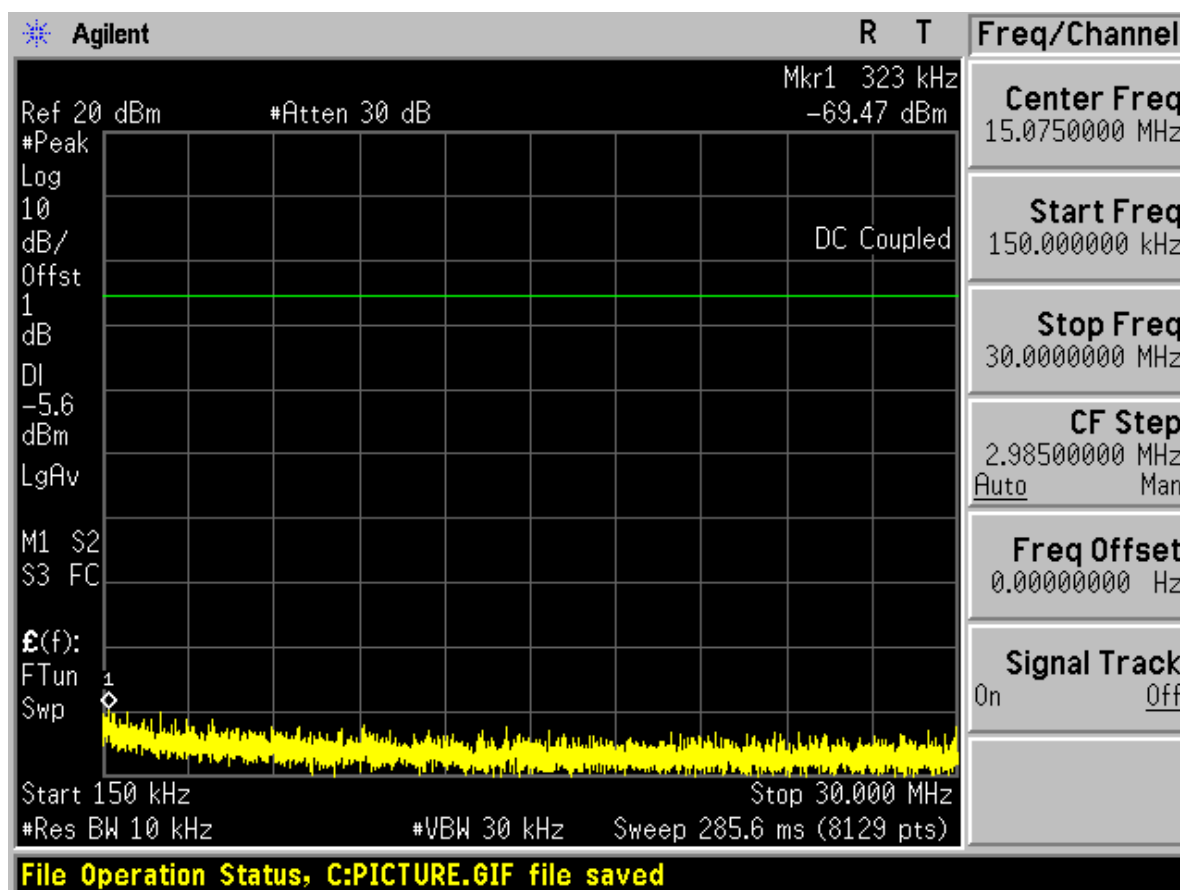
Chain2





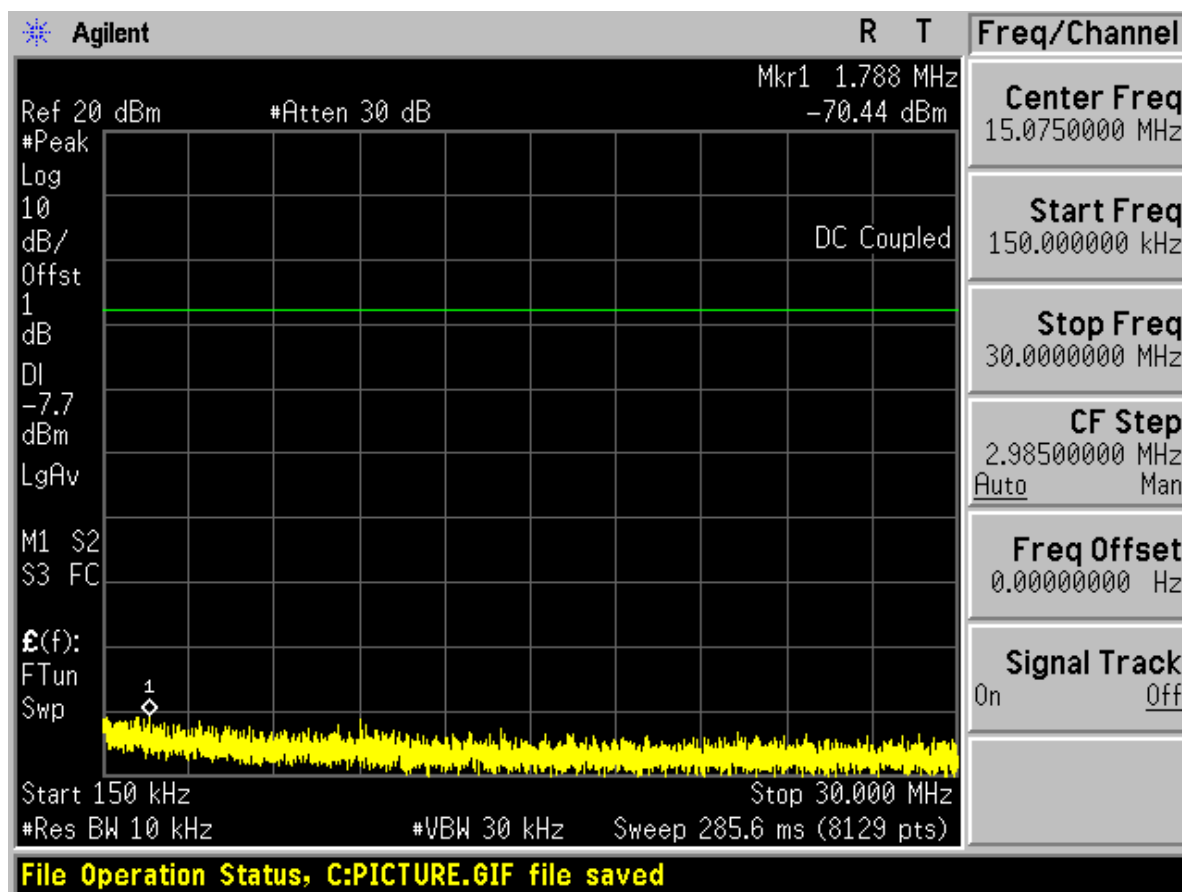
150K~30M TM3_11

Chain 1





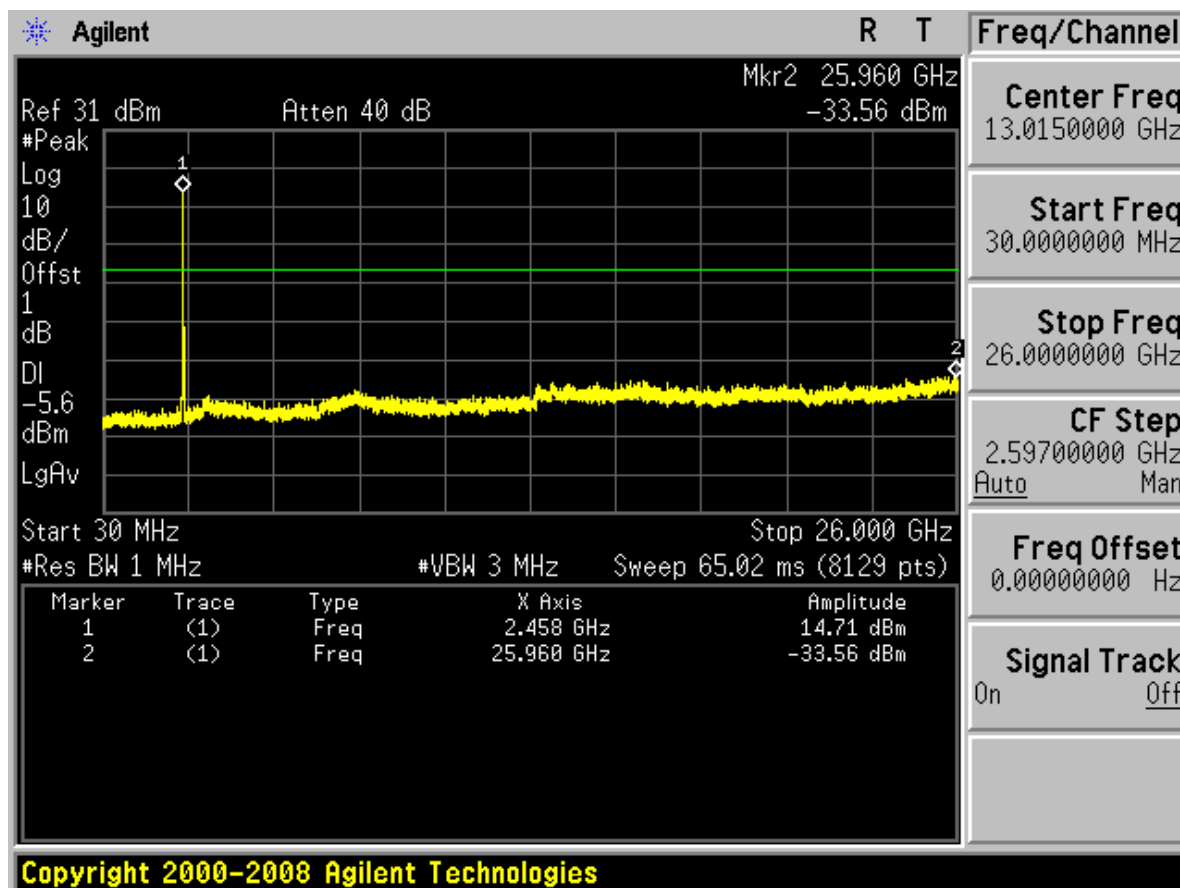
Chain2





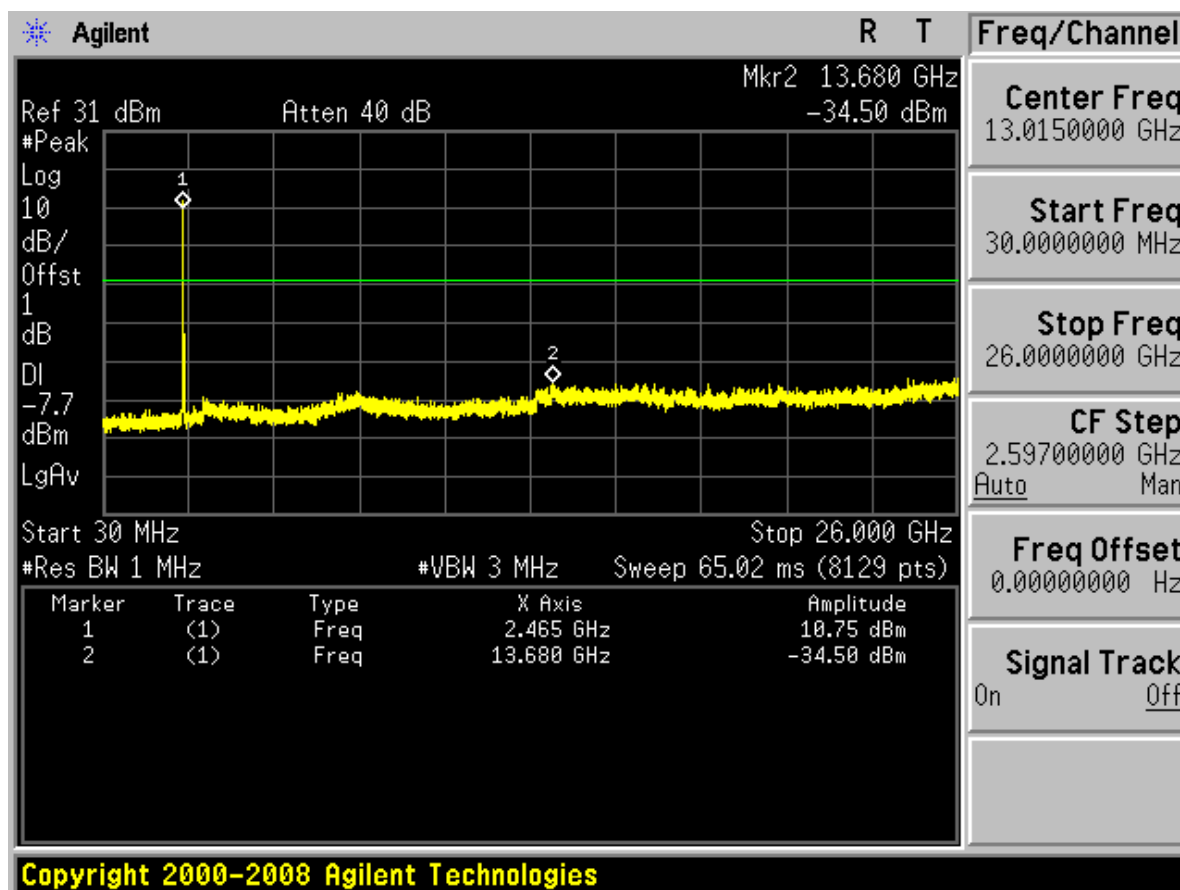
30M~26G TM3_11

Chain 1



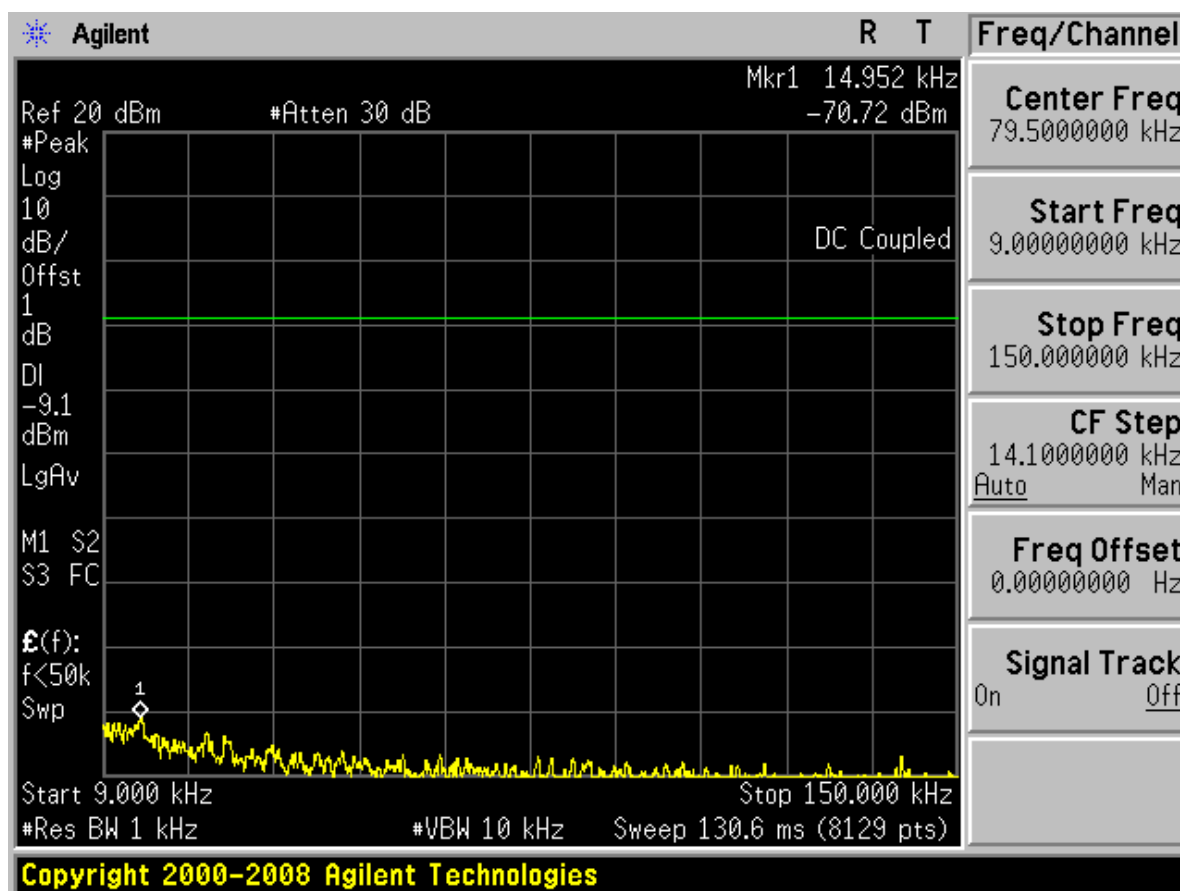


Chain2



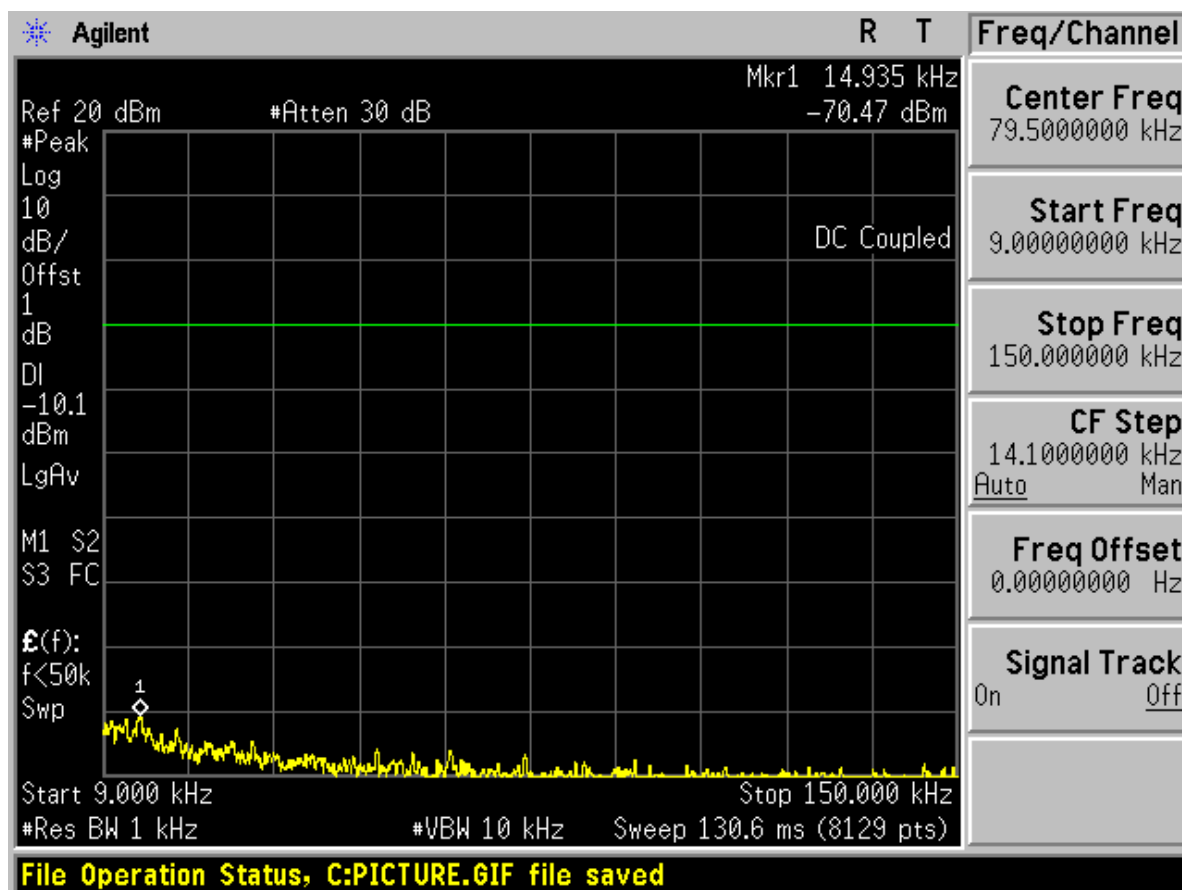


TM4 Chain 1&2 Channel 03 9K~150K TM4_03 Chain 1



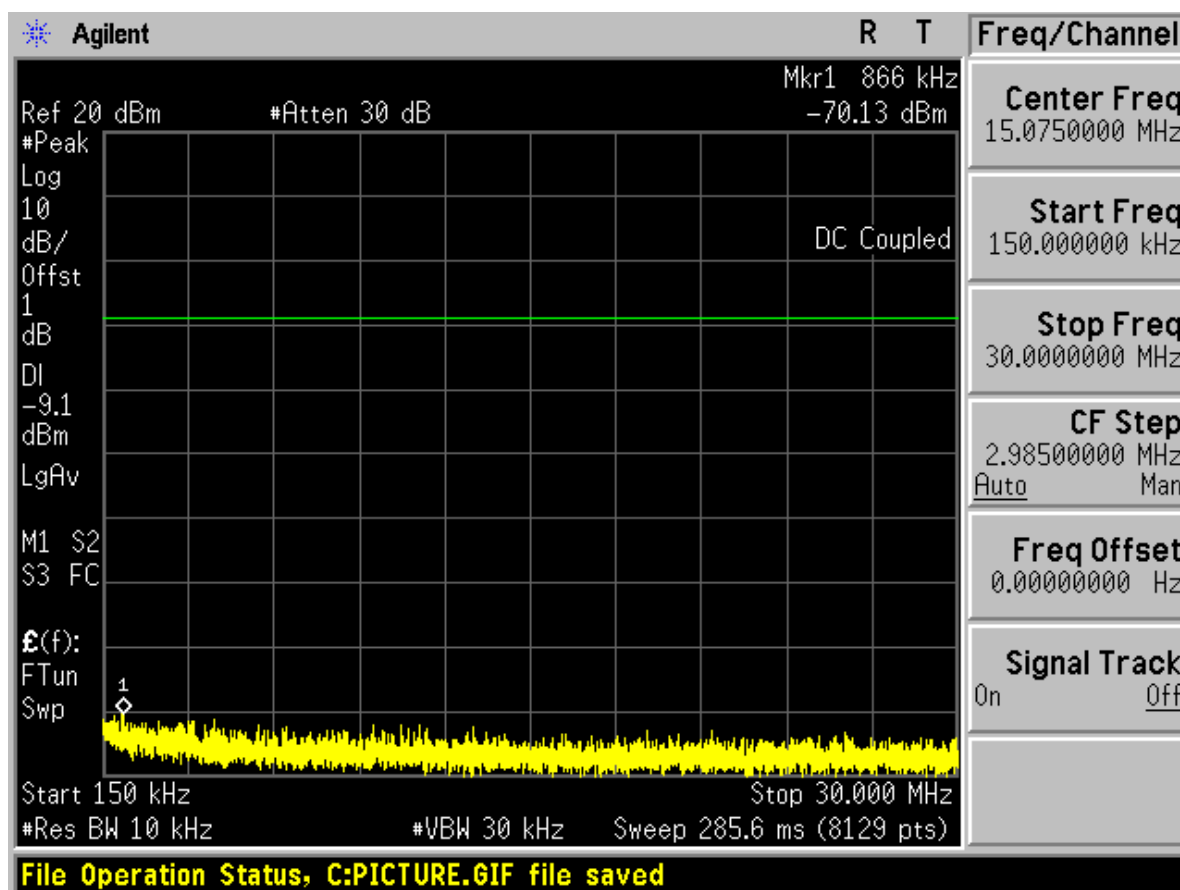


Chain 2



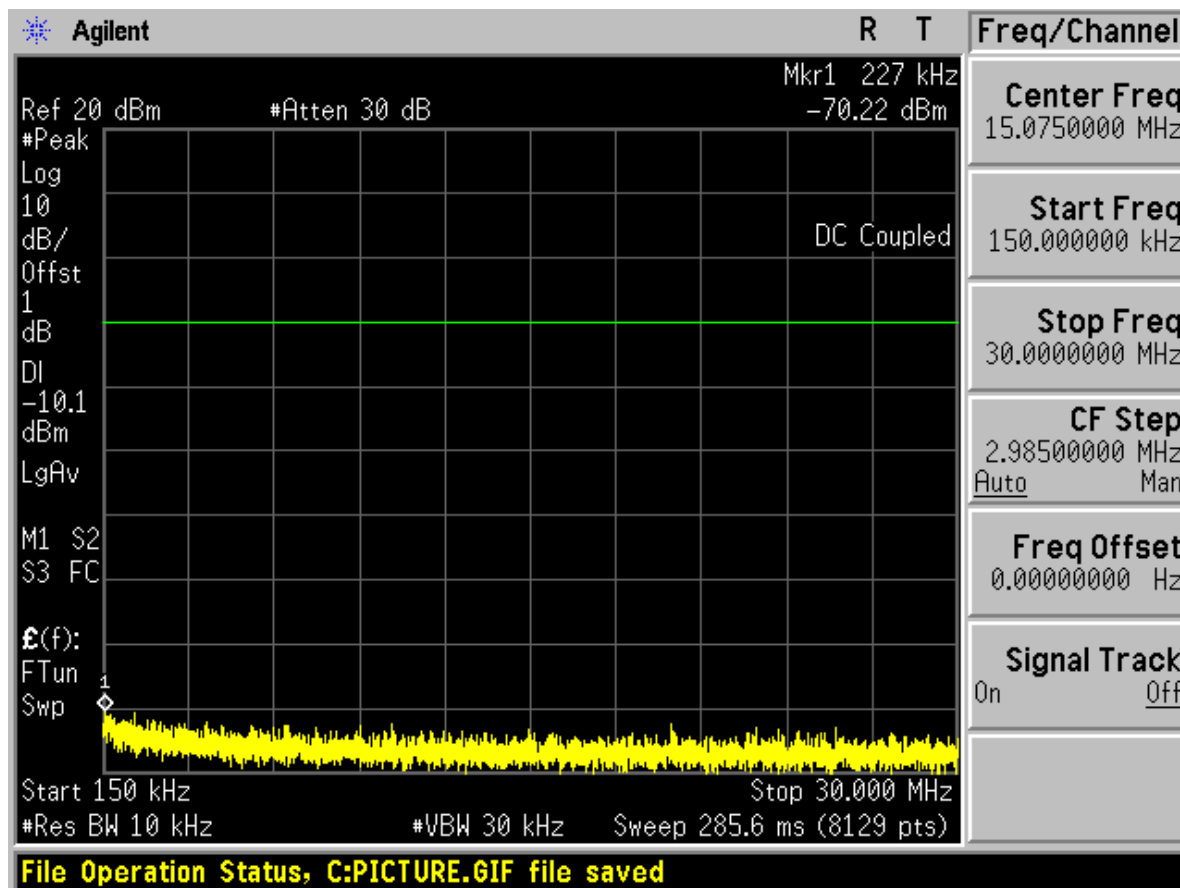


150K~30M TM4_03 Chain 1



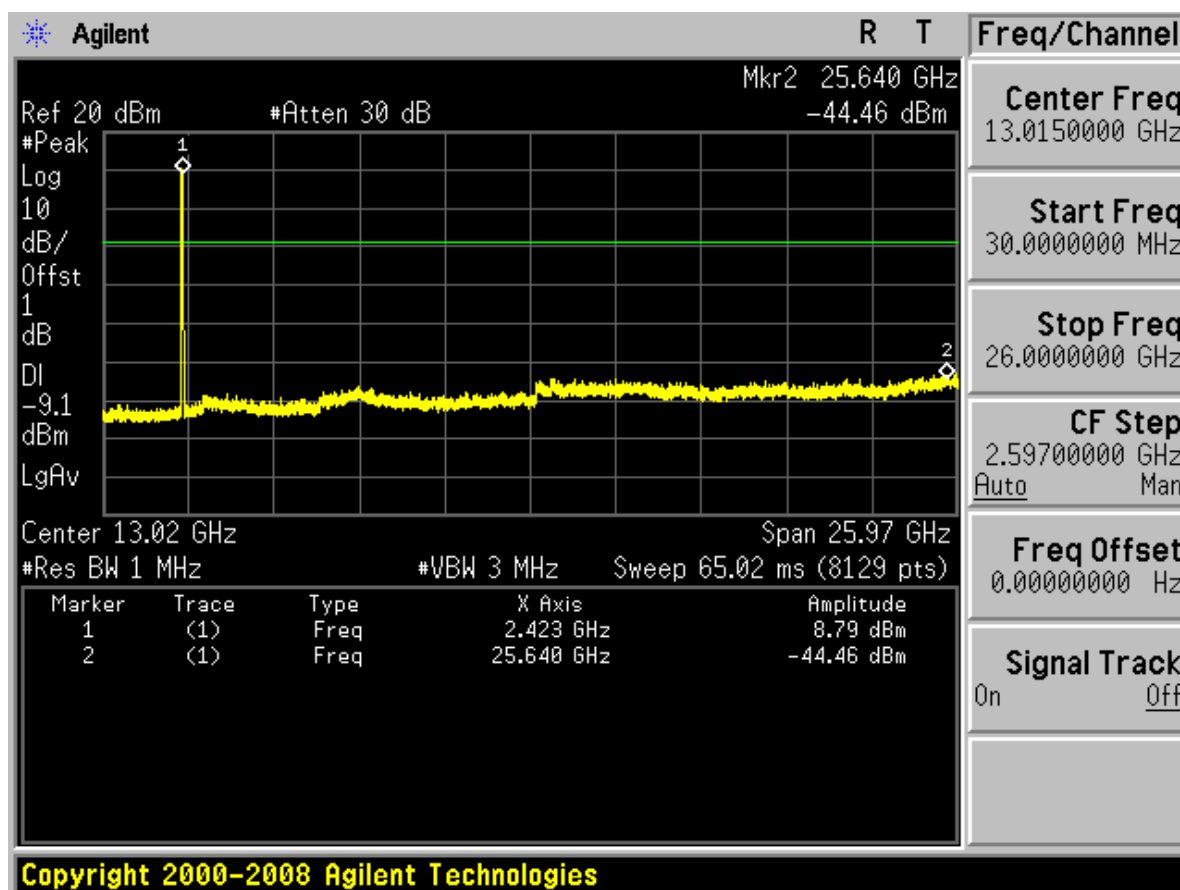


Chain 2



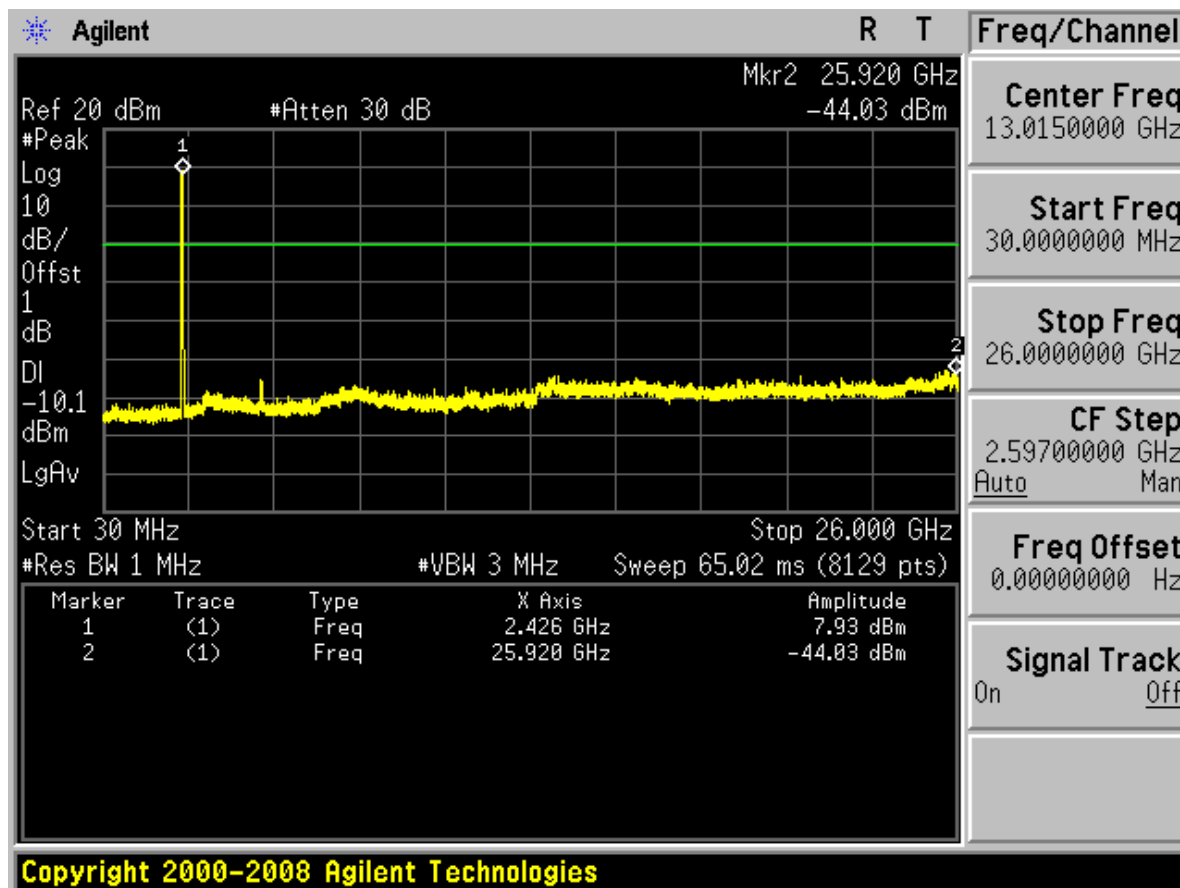


30M~26G TM4_03 Chain 1





Chain 2

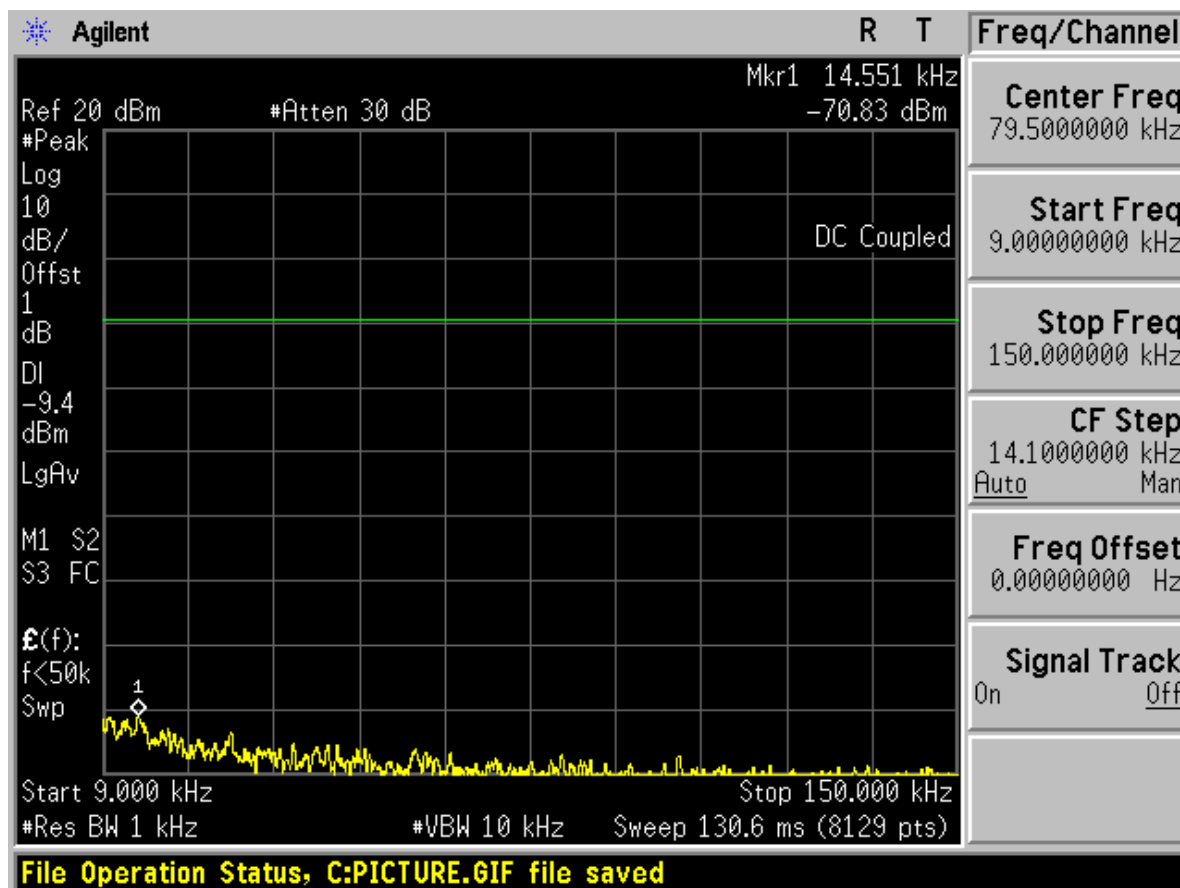




Channel 06

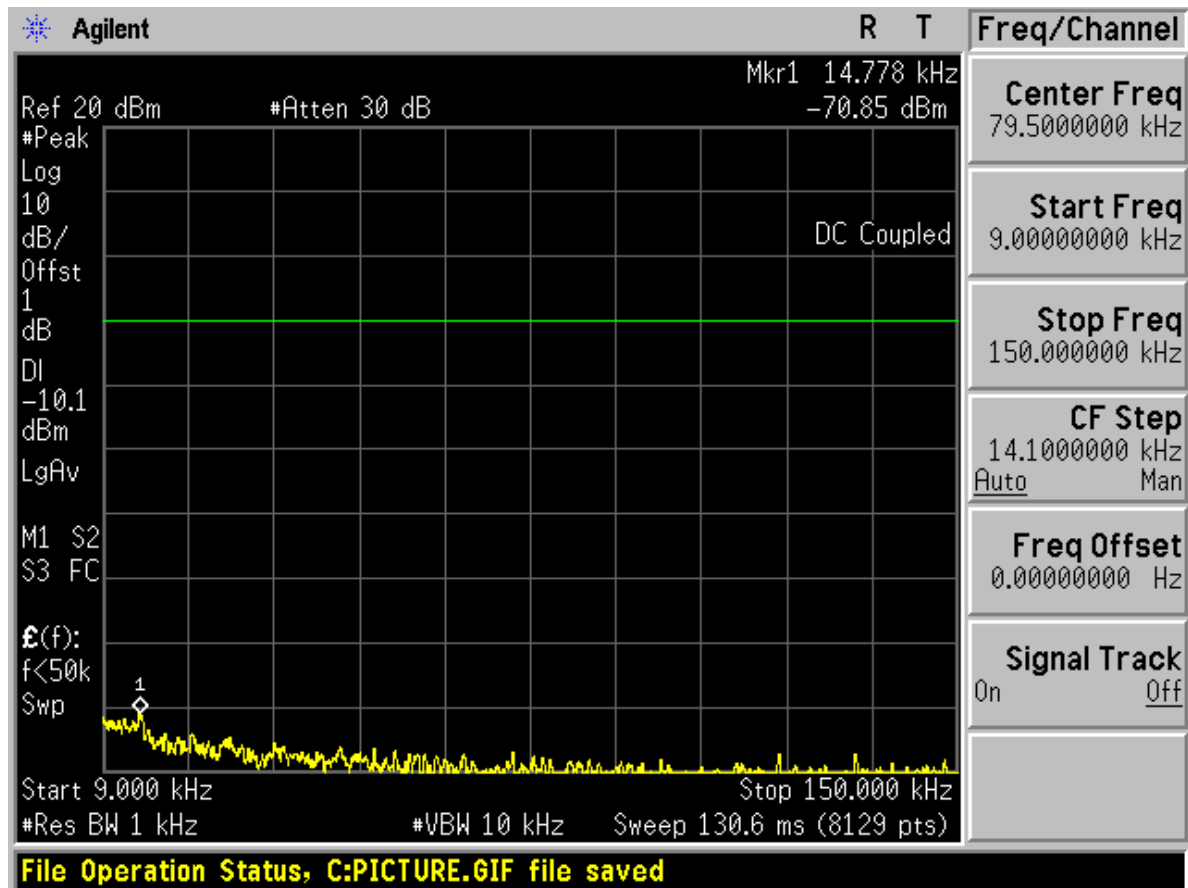
9K~150K TM4_06

Chain 1





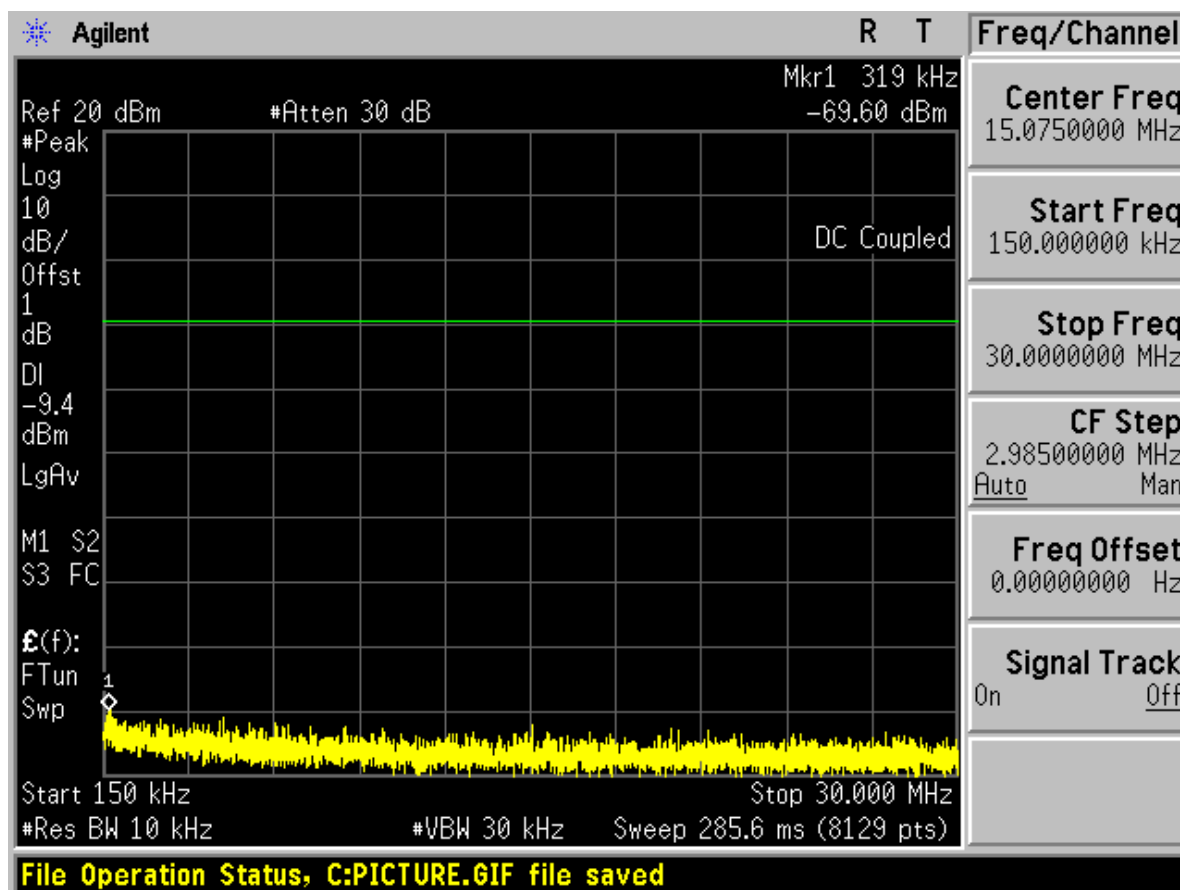
Chain 2





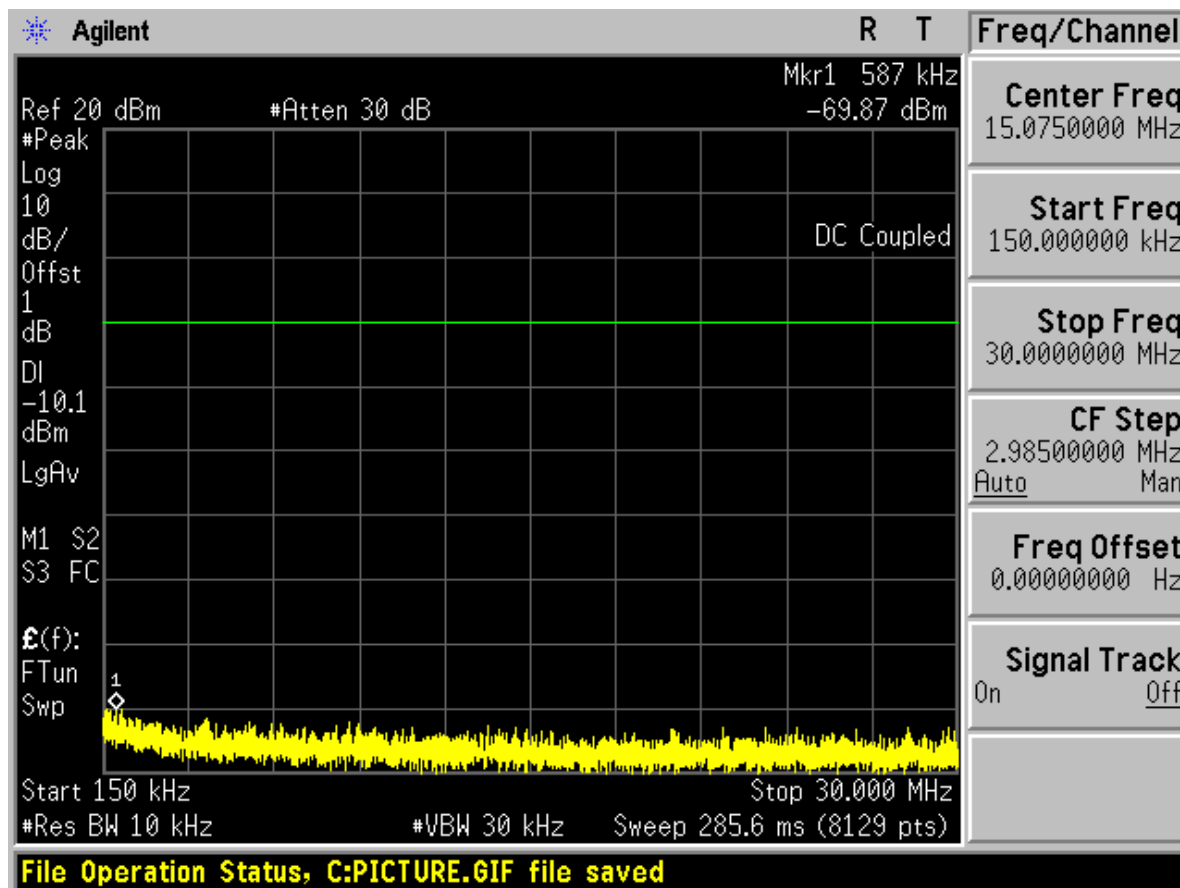
150K~30M TM4_06

Chain 1



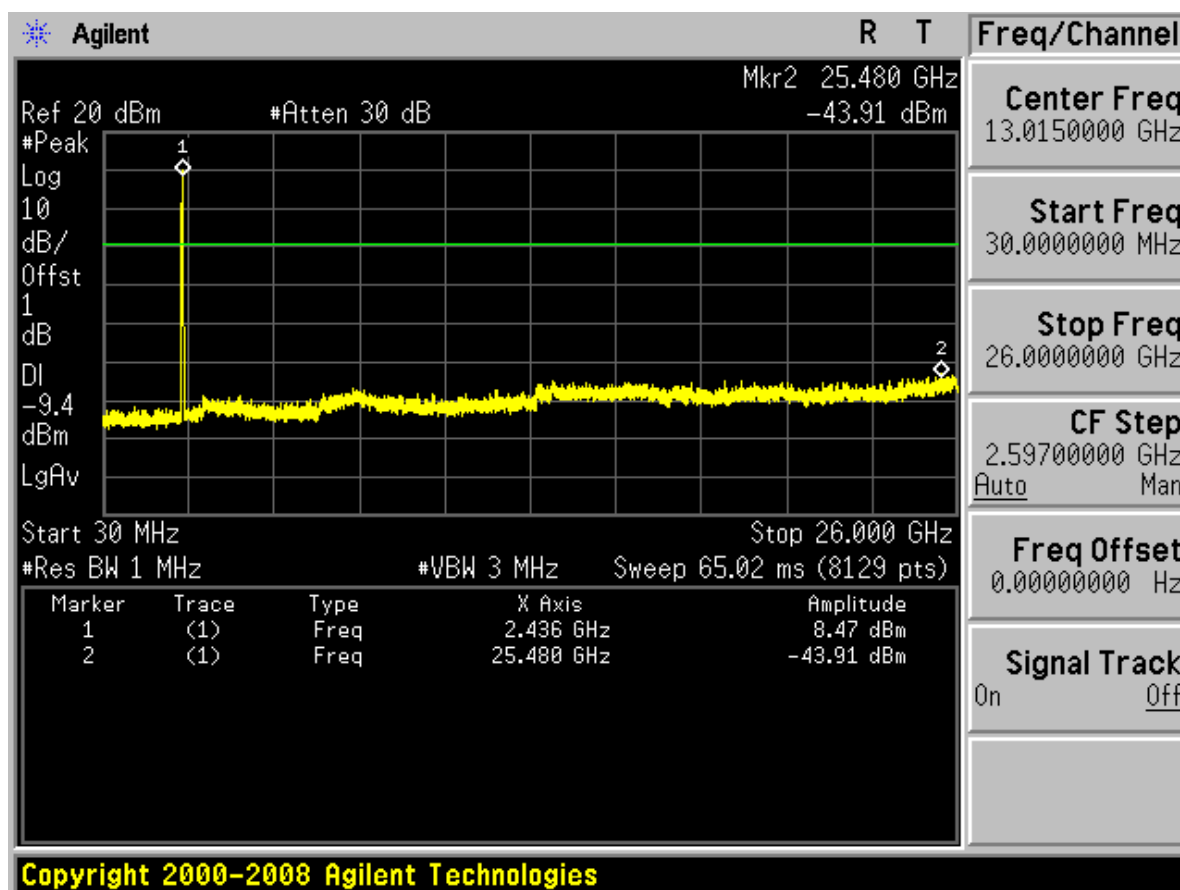


Chain 2



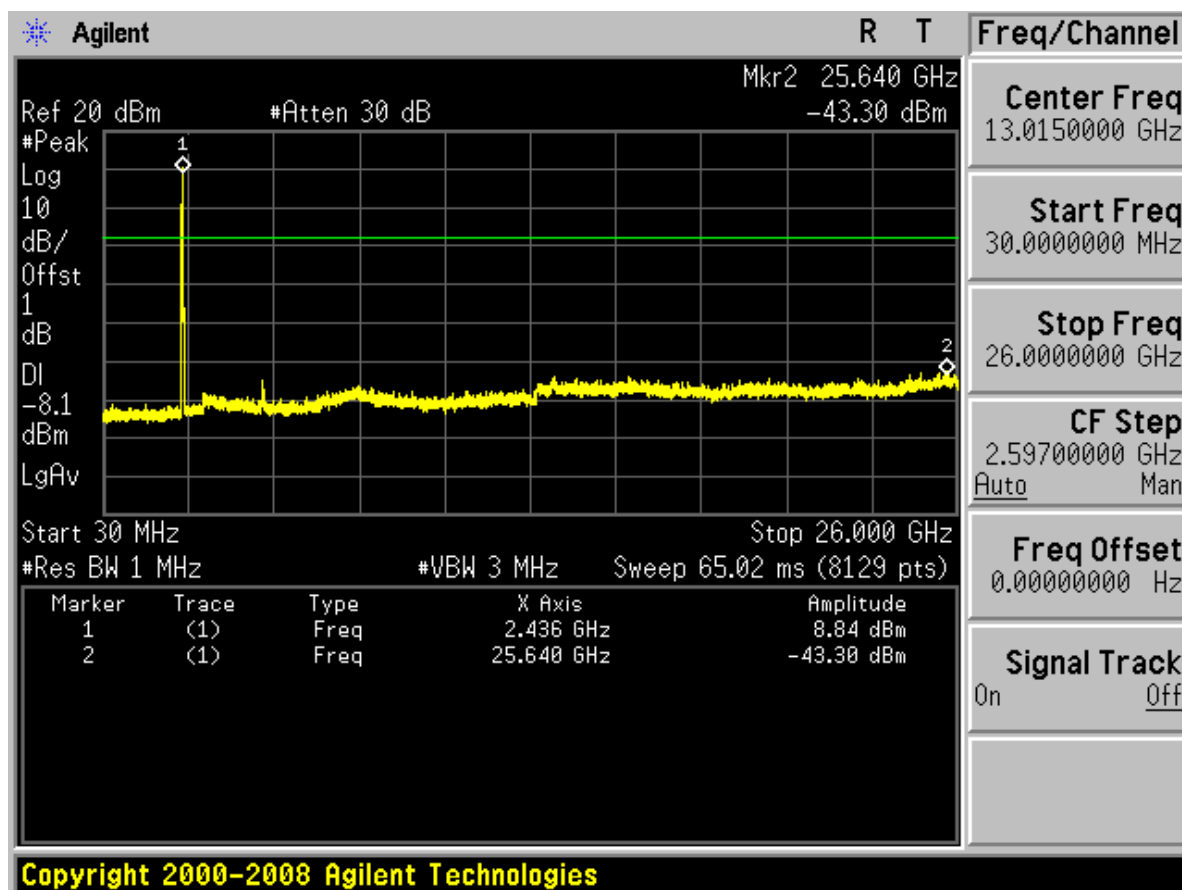


30M~26G TM4_06 Chain 1





Chain 2

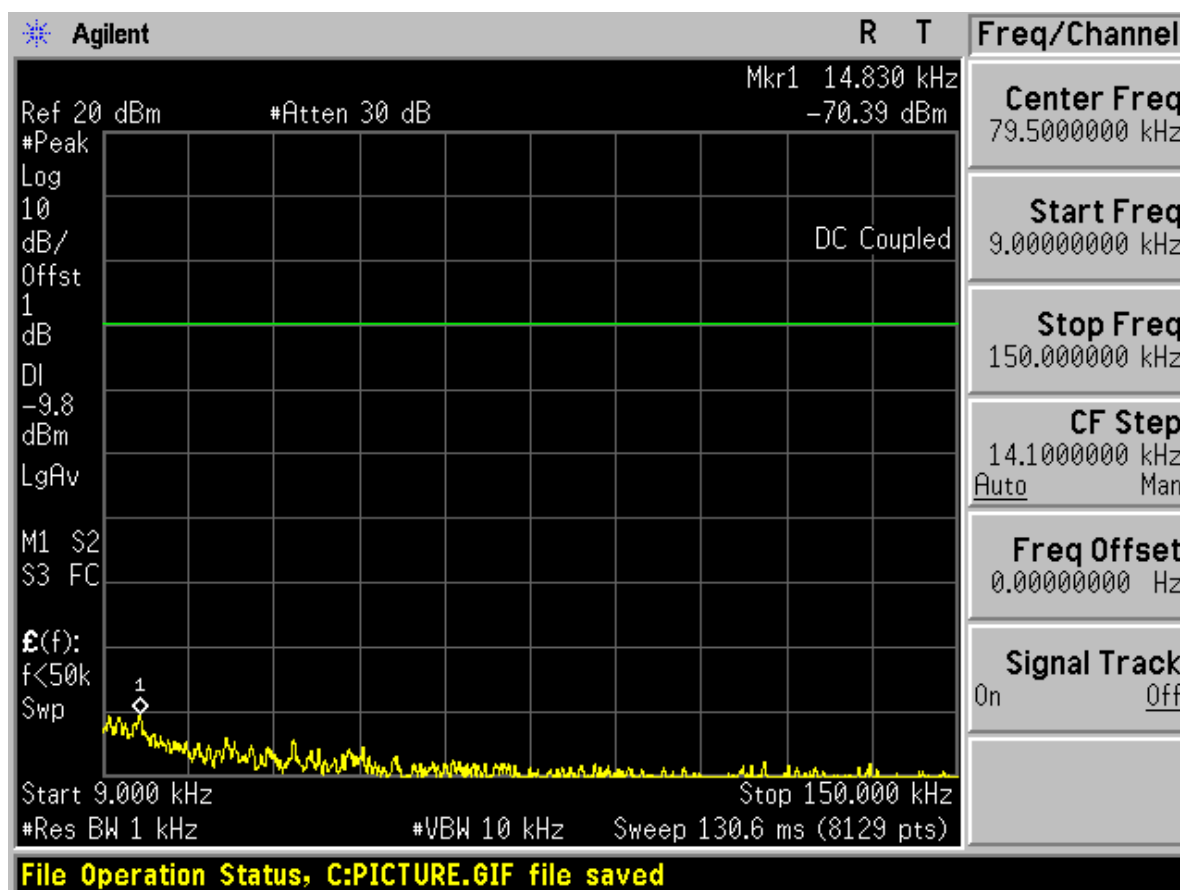




Channel 09

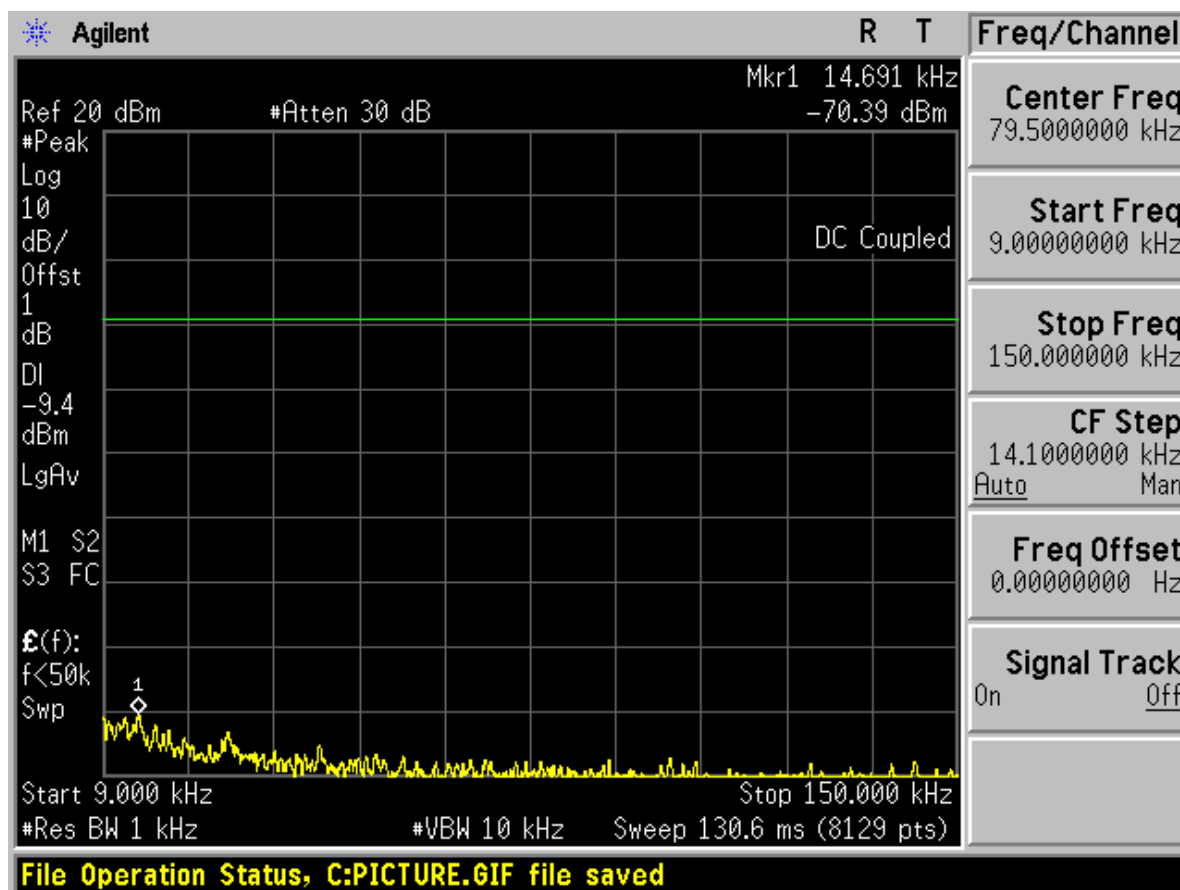
9K~150K TM4_09

Chain 1





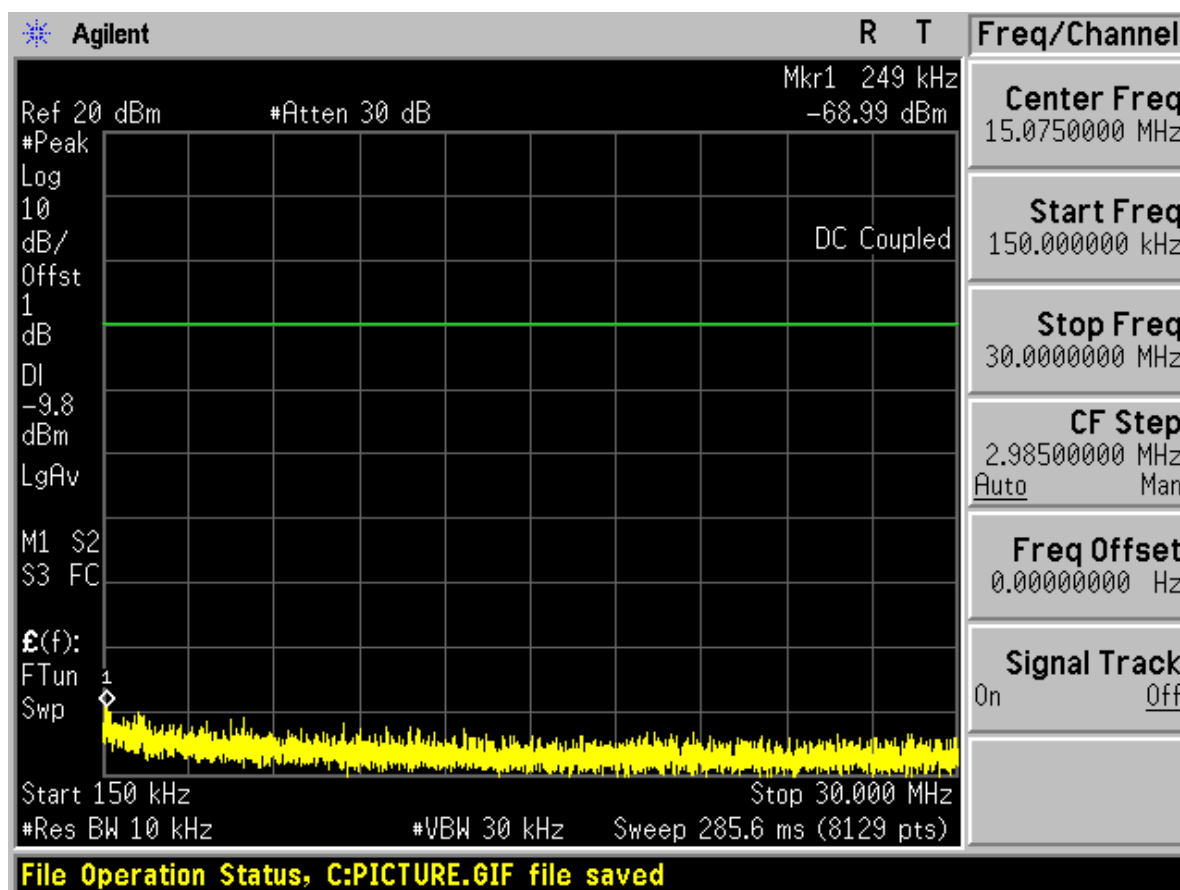
Chain 2





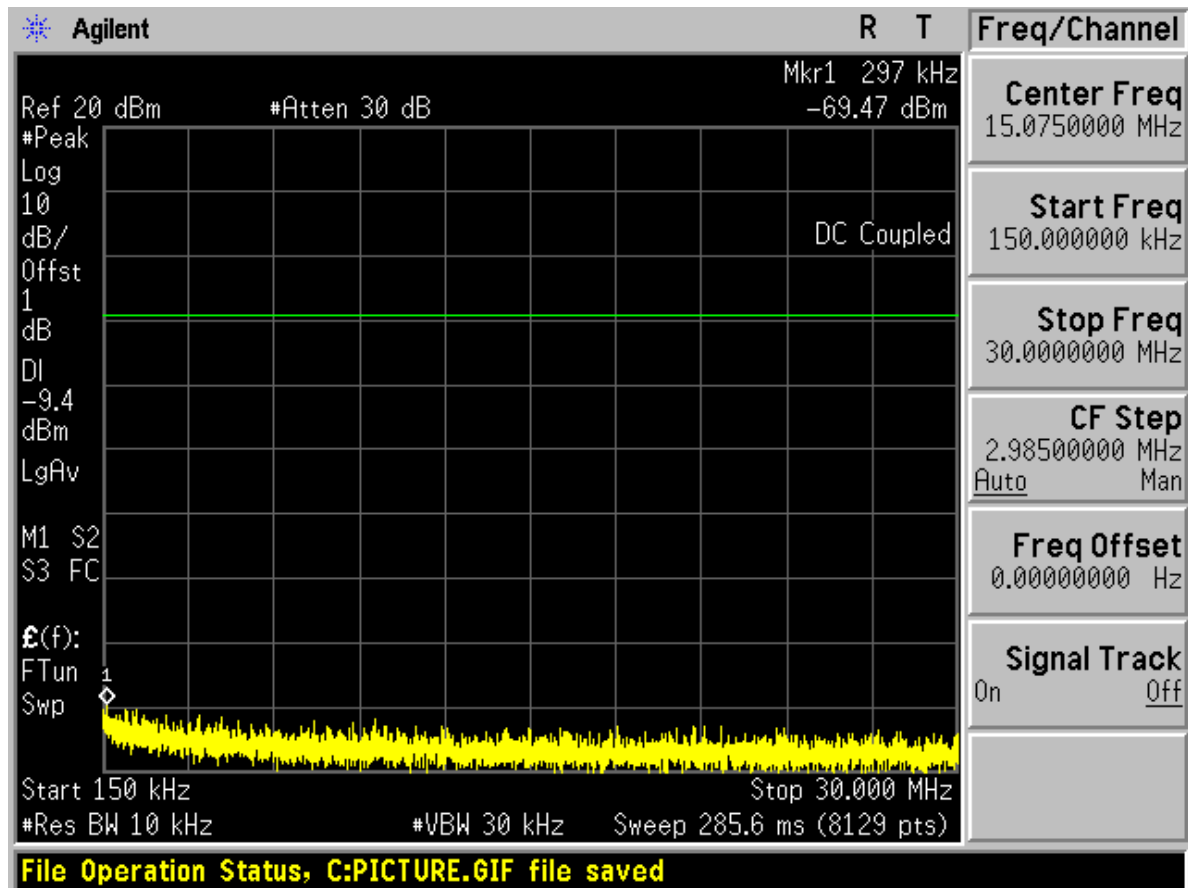
150K~30M TM4_09

Chain 1



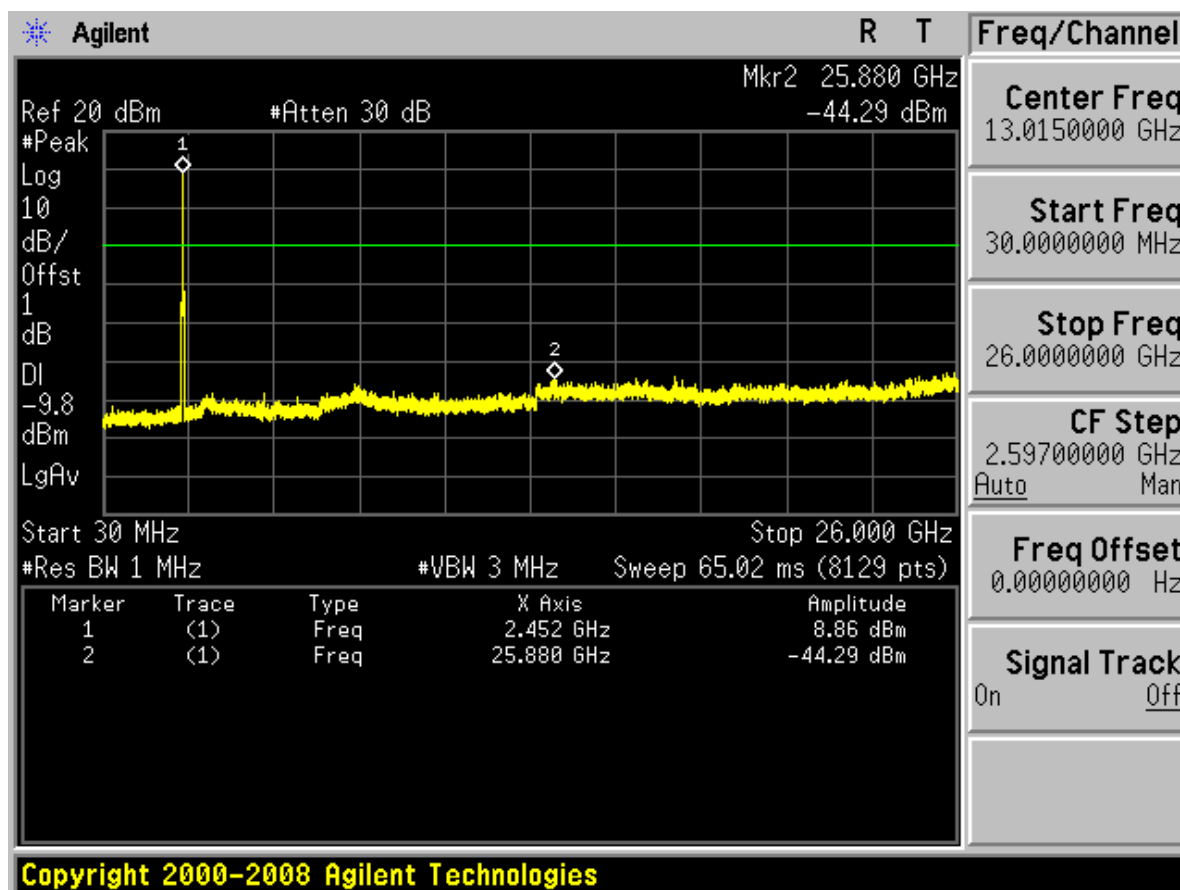


Chain 2



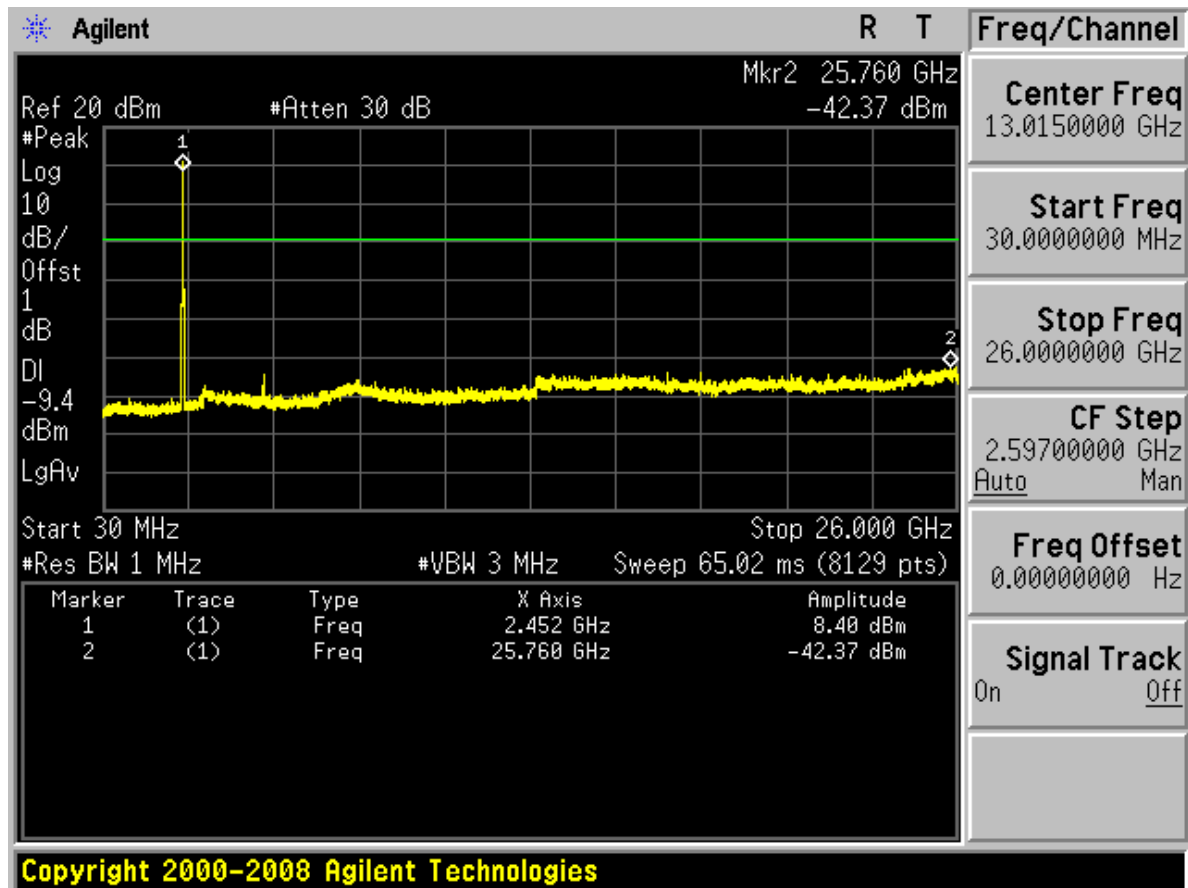


30M~26G TM4_09 Chain 1



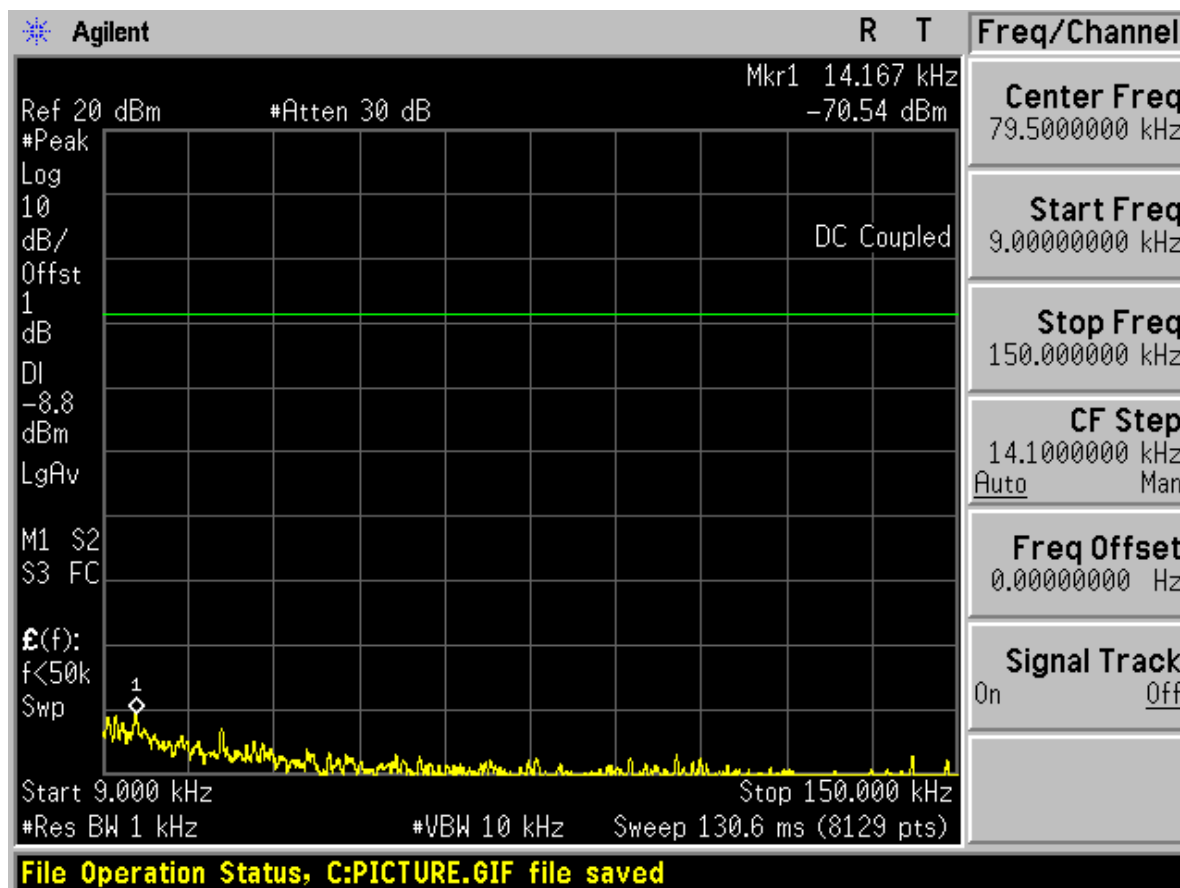


Chain 2



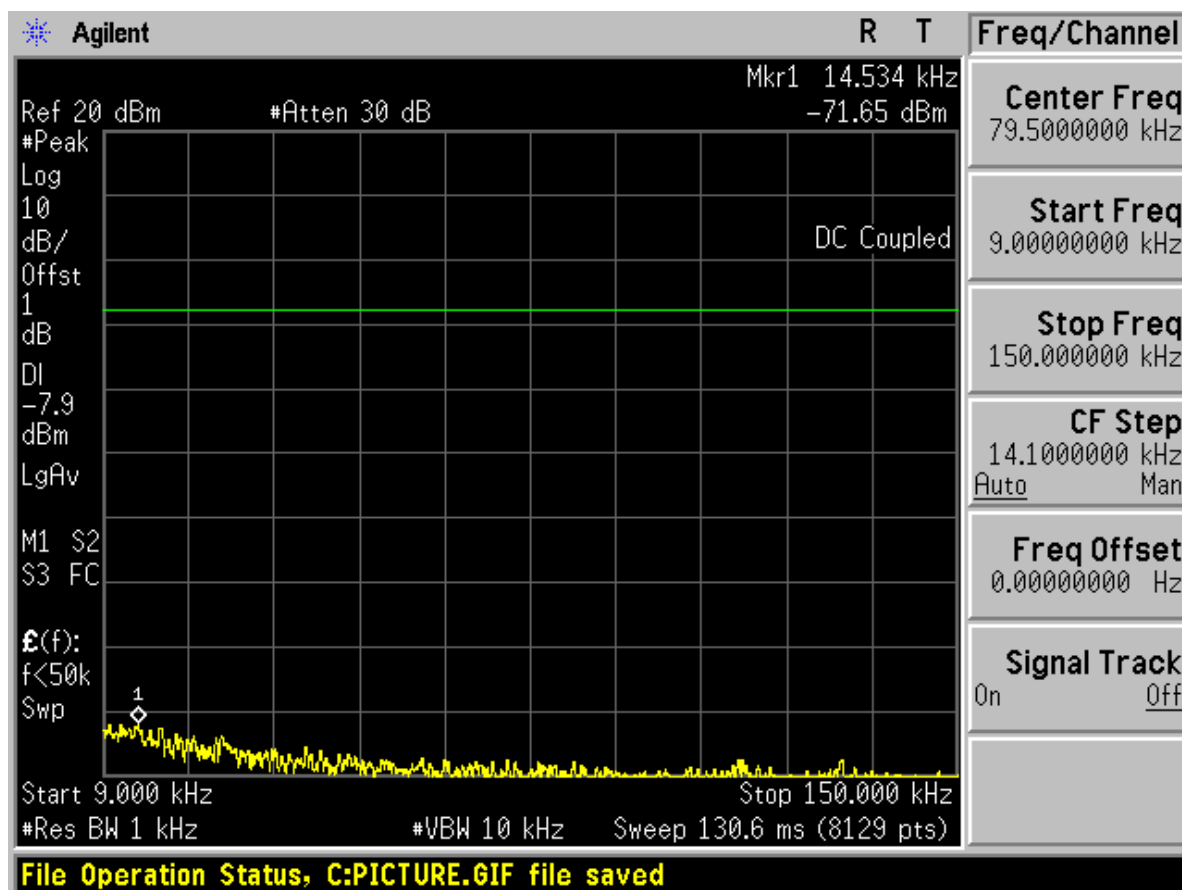


TM5 Chain 1&2 Channel 01 9K~150K TM5_01 Chain 1





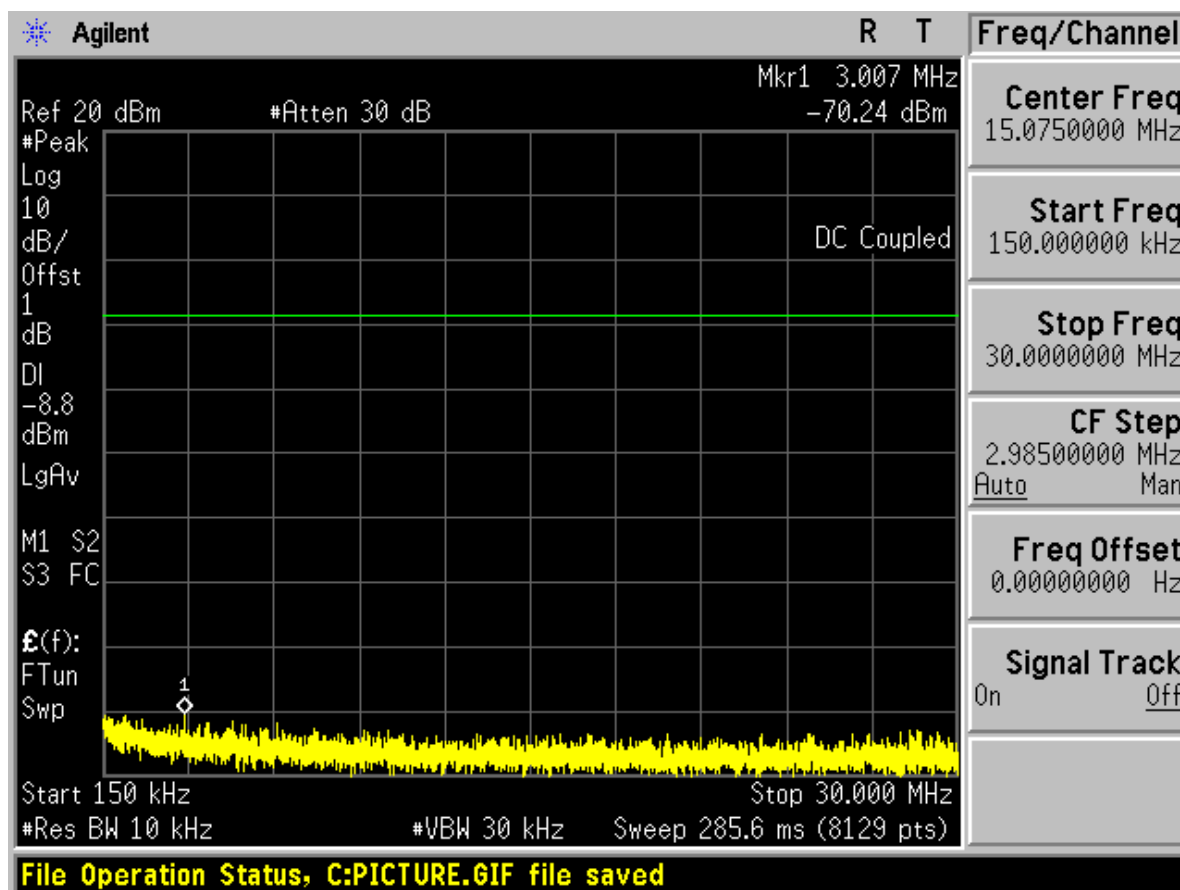
Chain 2





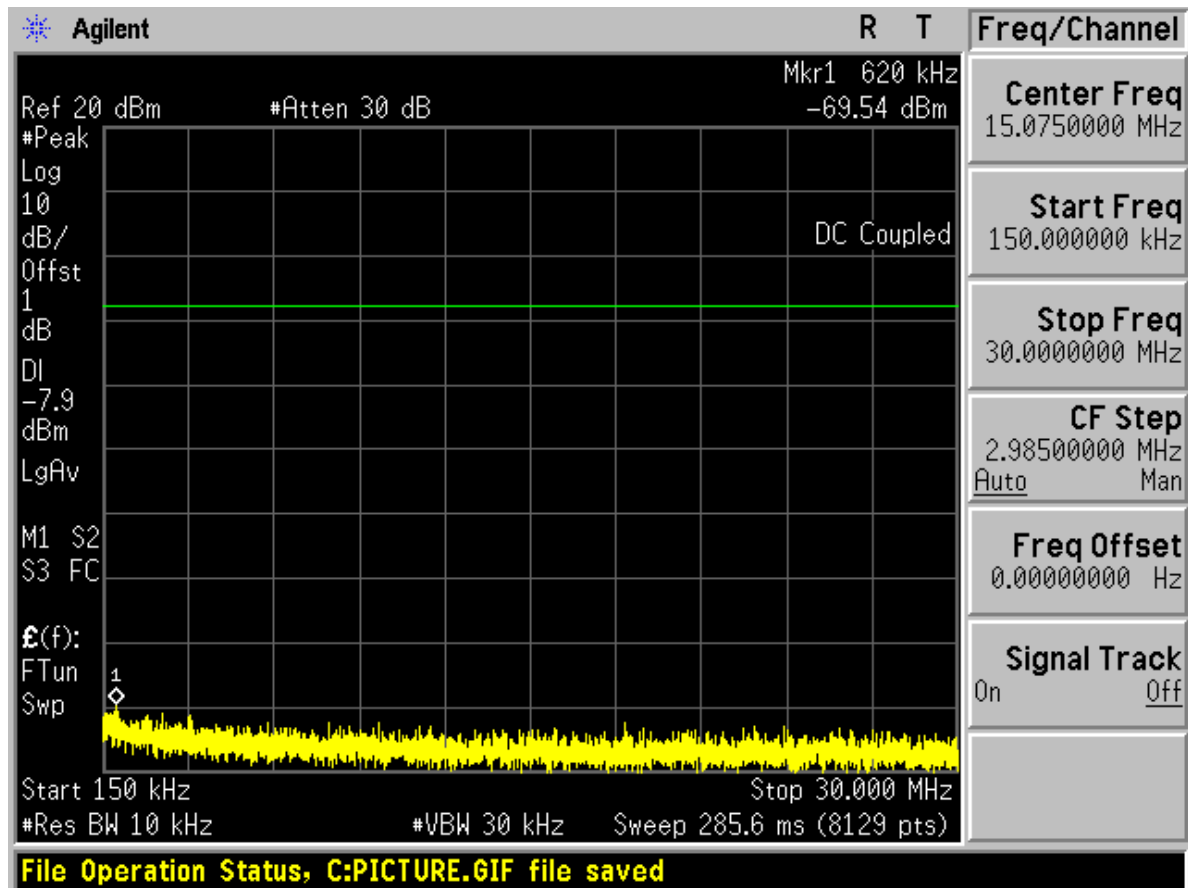
150K~30M TM5_01

Chain 1



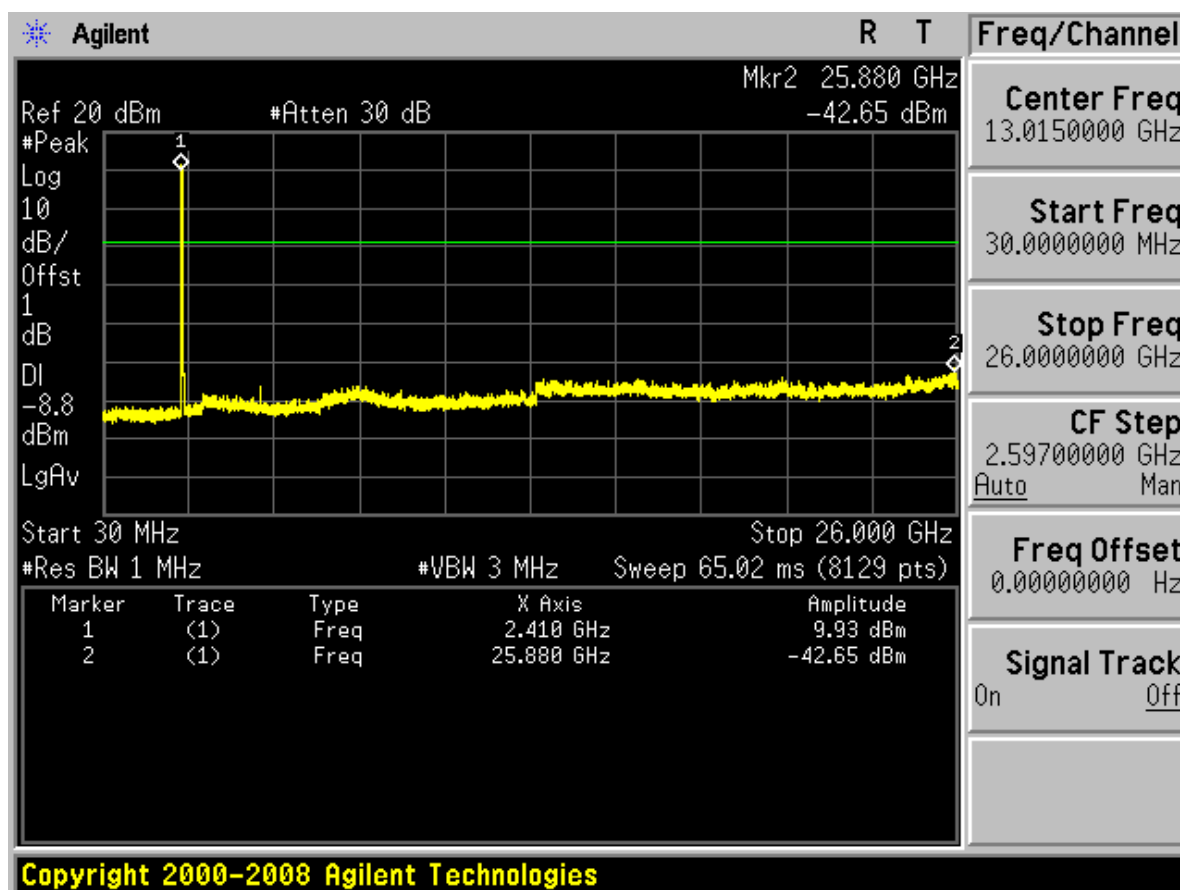


Chain 2



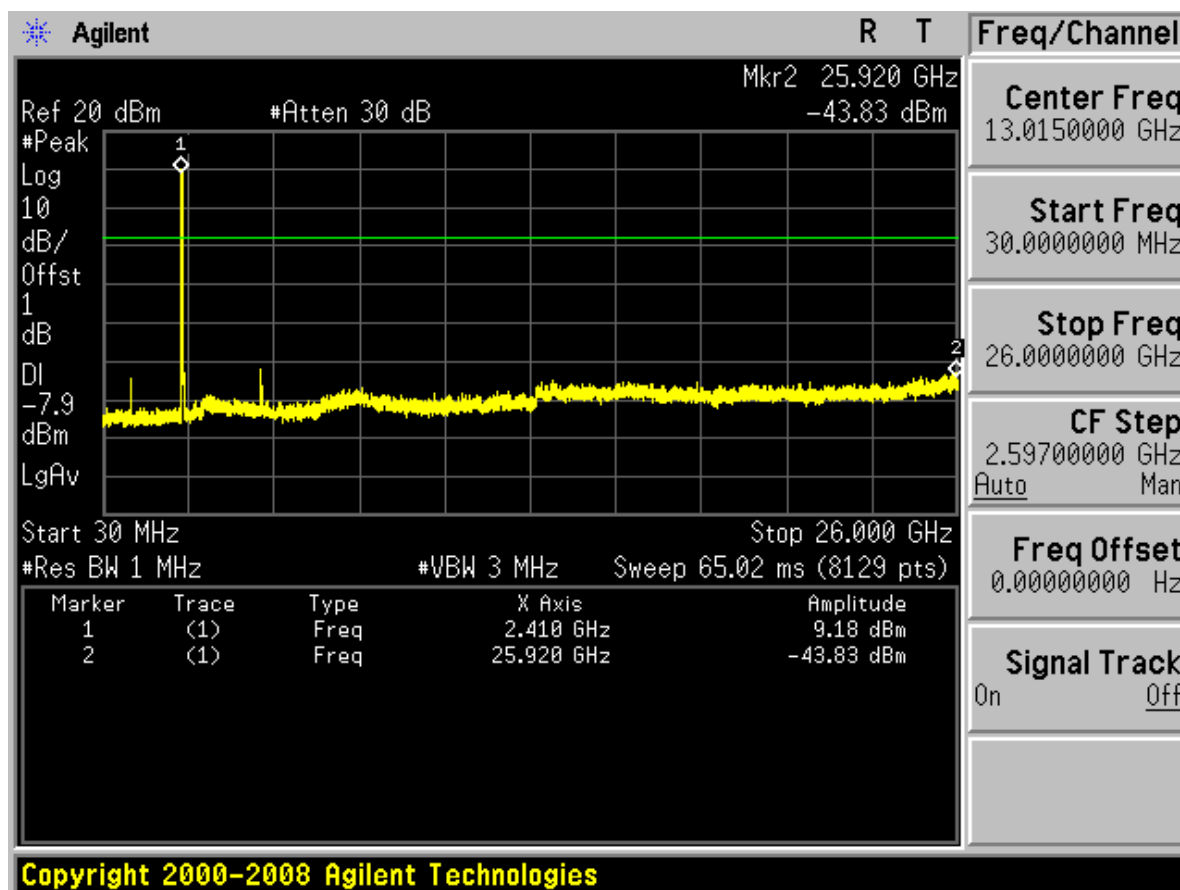


30M~26G TM5_01 Chain 1





Chain 2

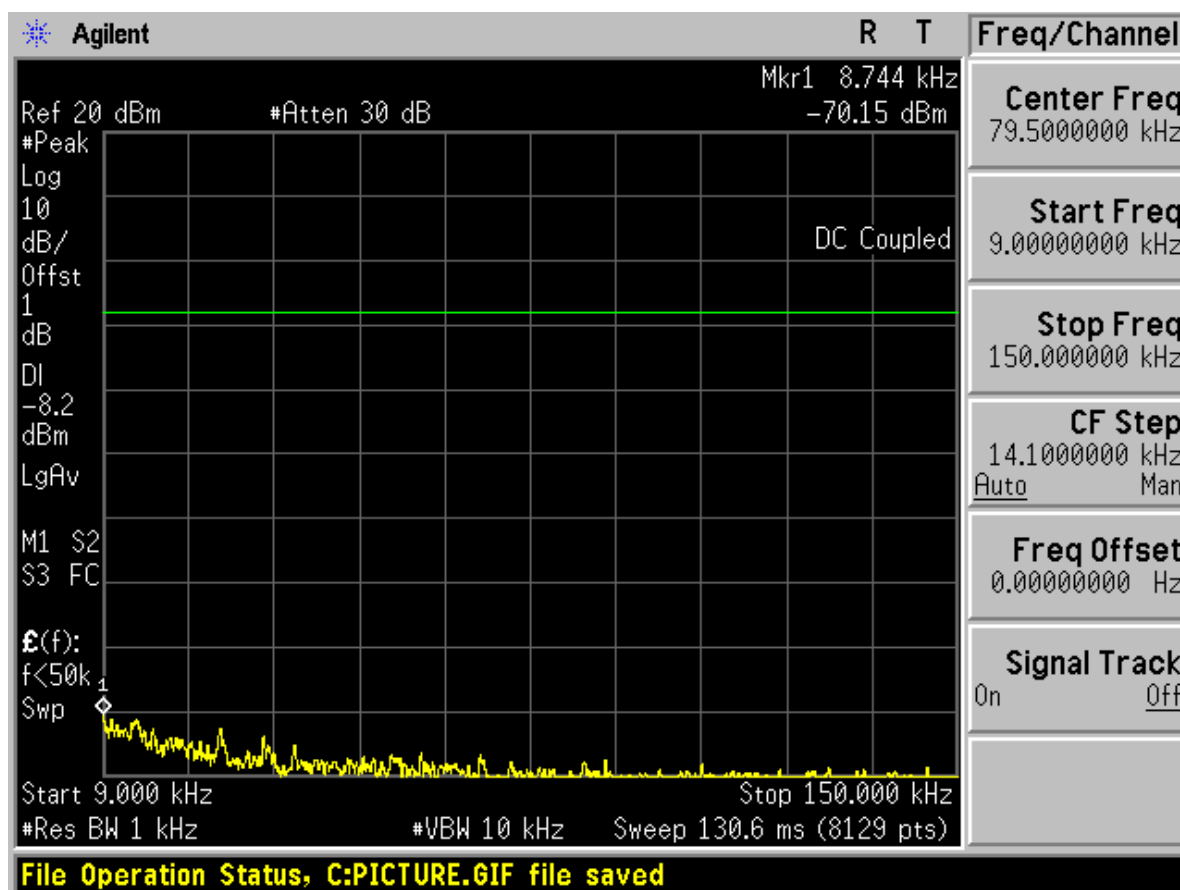




Channel 06

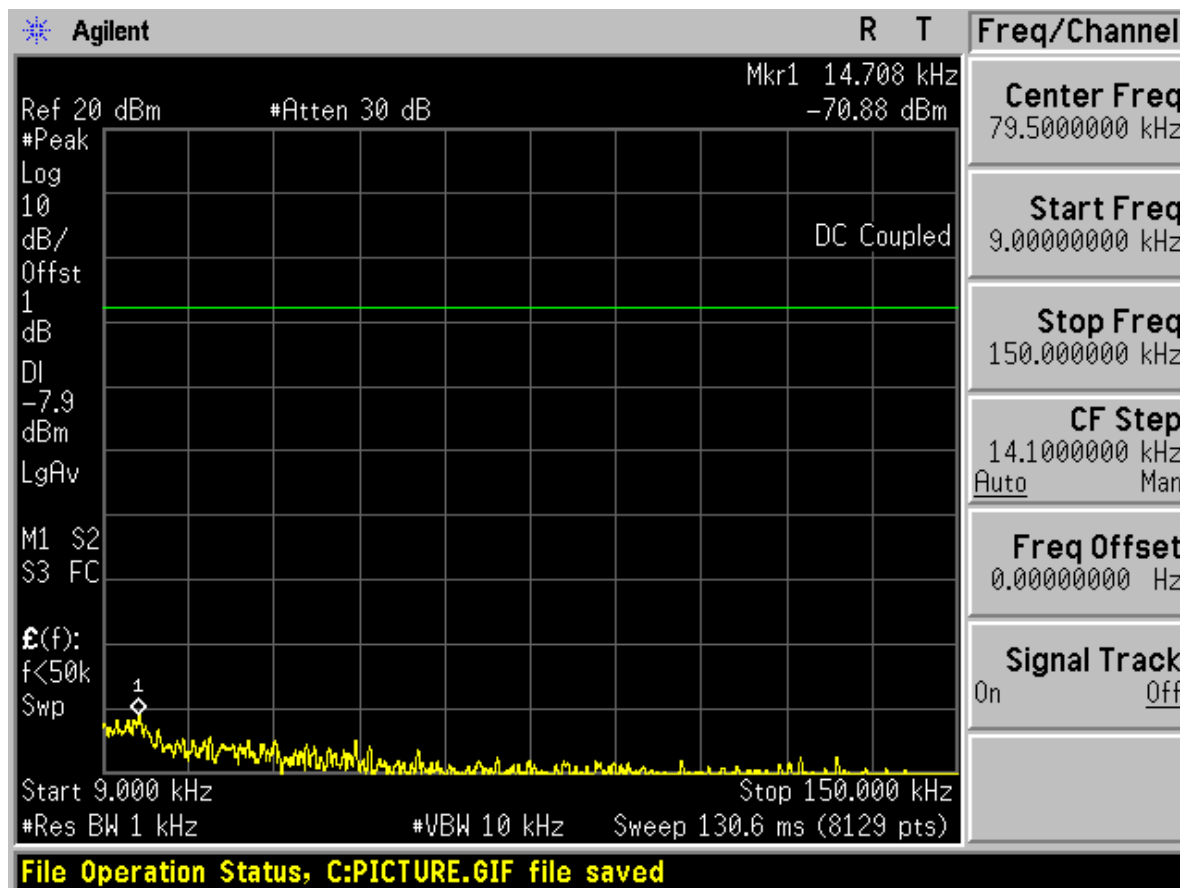
9K~150K TM5_06

Chain 1





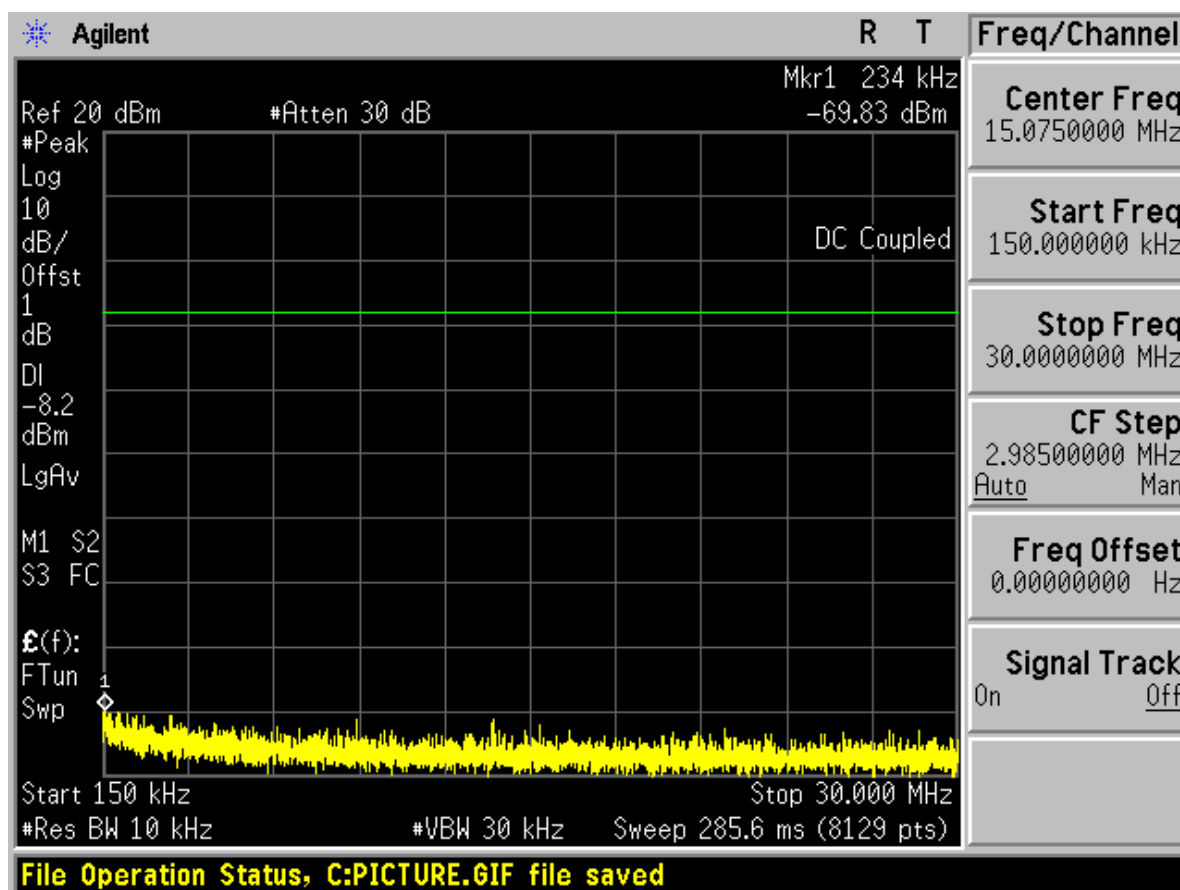
Chain 2





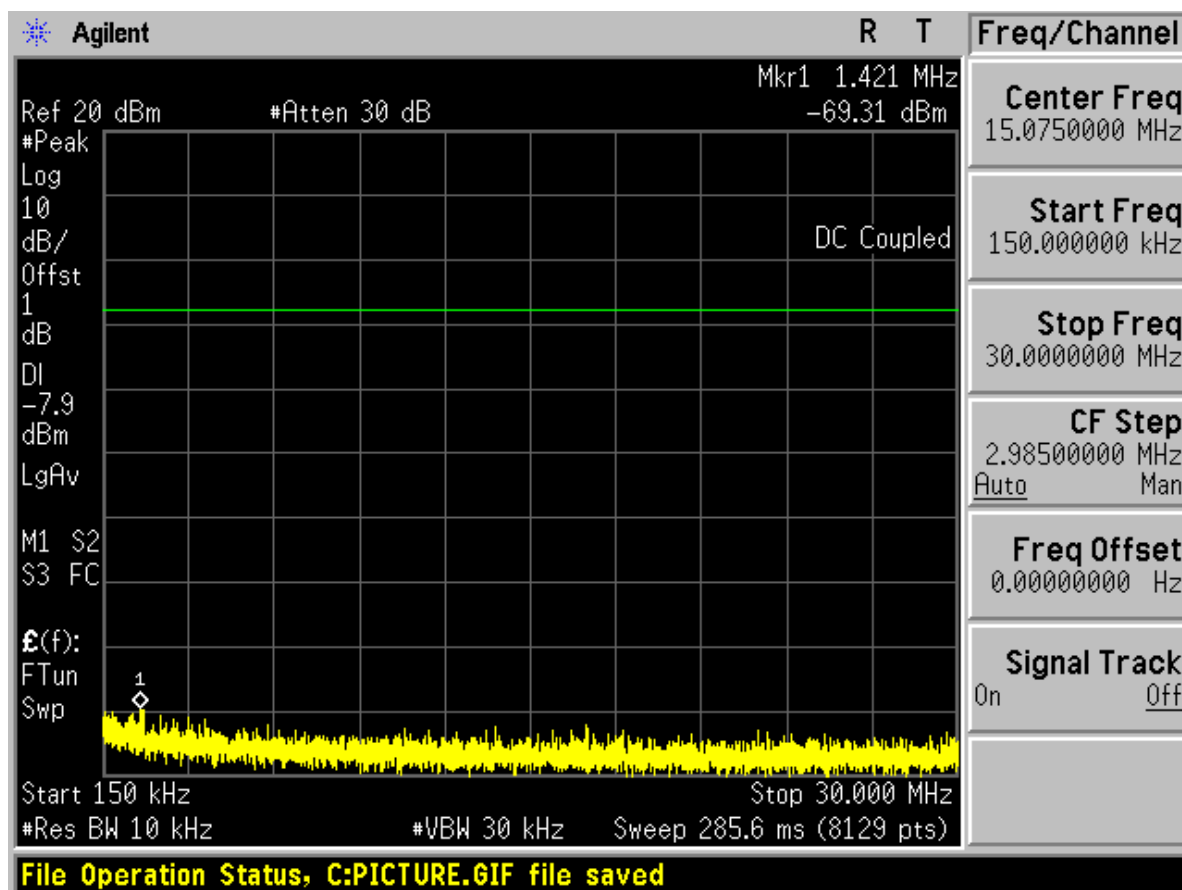
150K~30M TM5_06

Chain 1



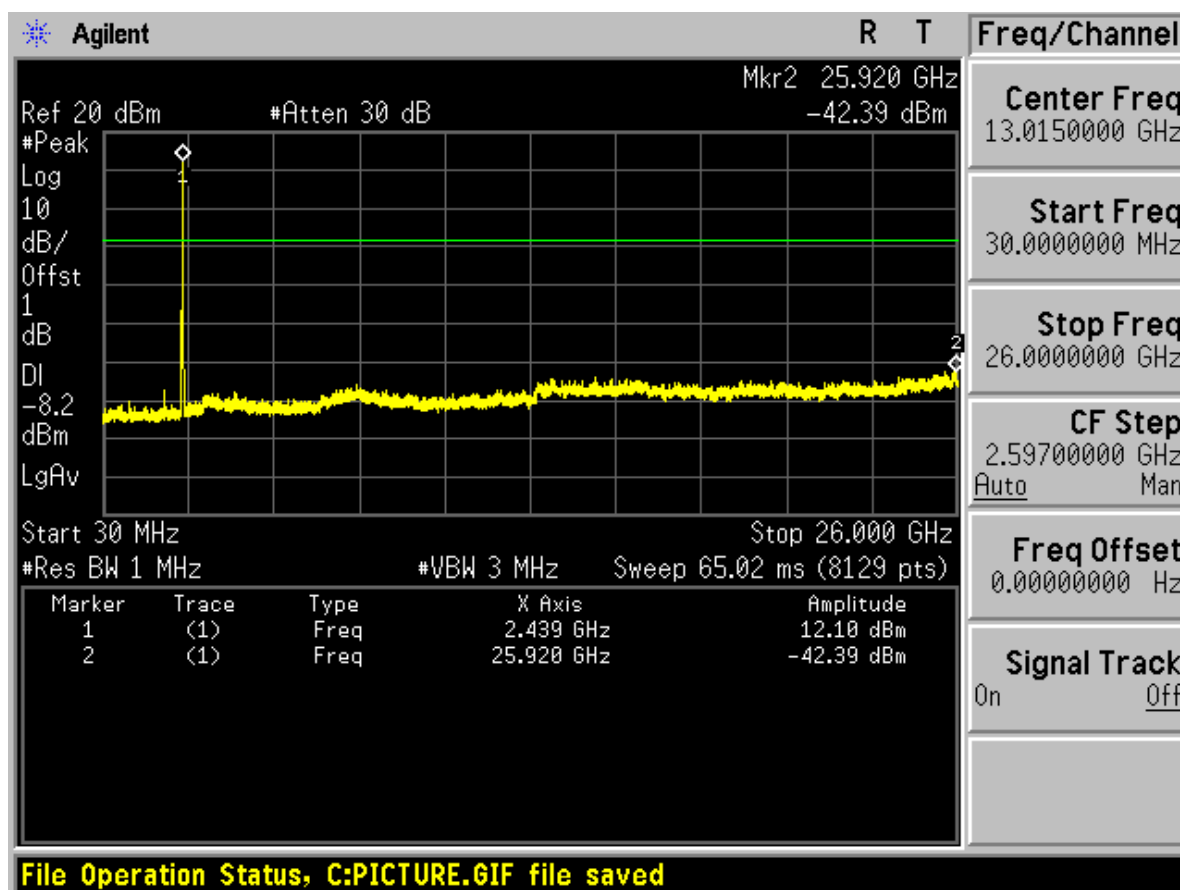


Chain 2



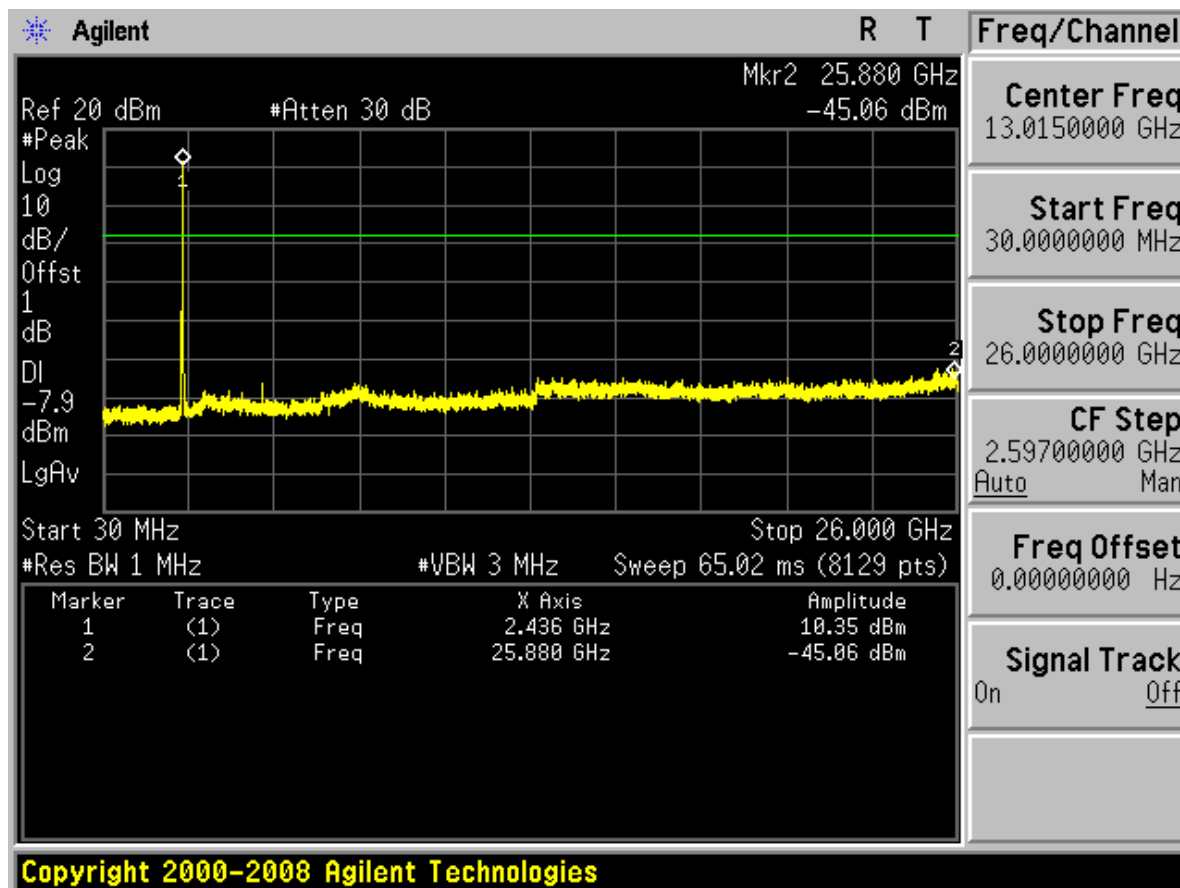


30M~26G TM5_06 Chain 1





Chain 2

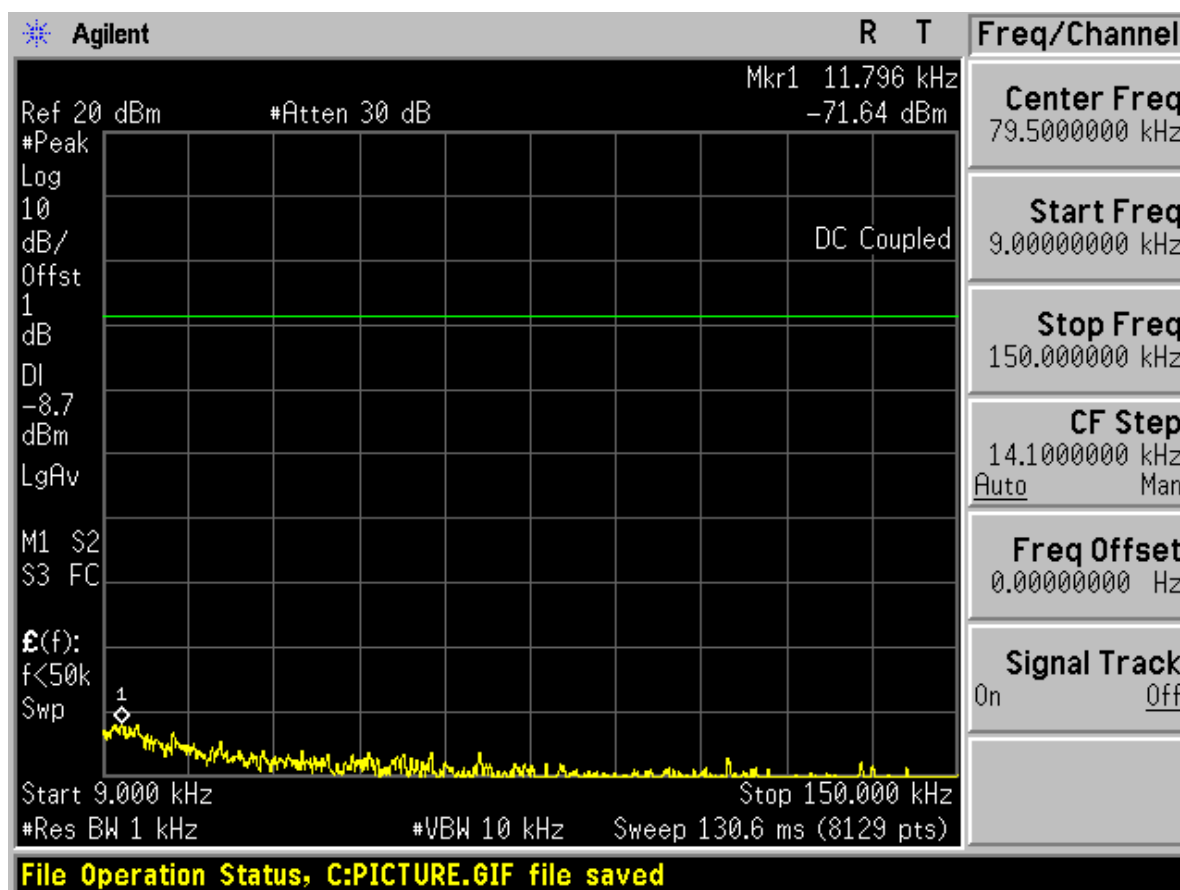




Channel 11

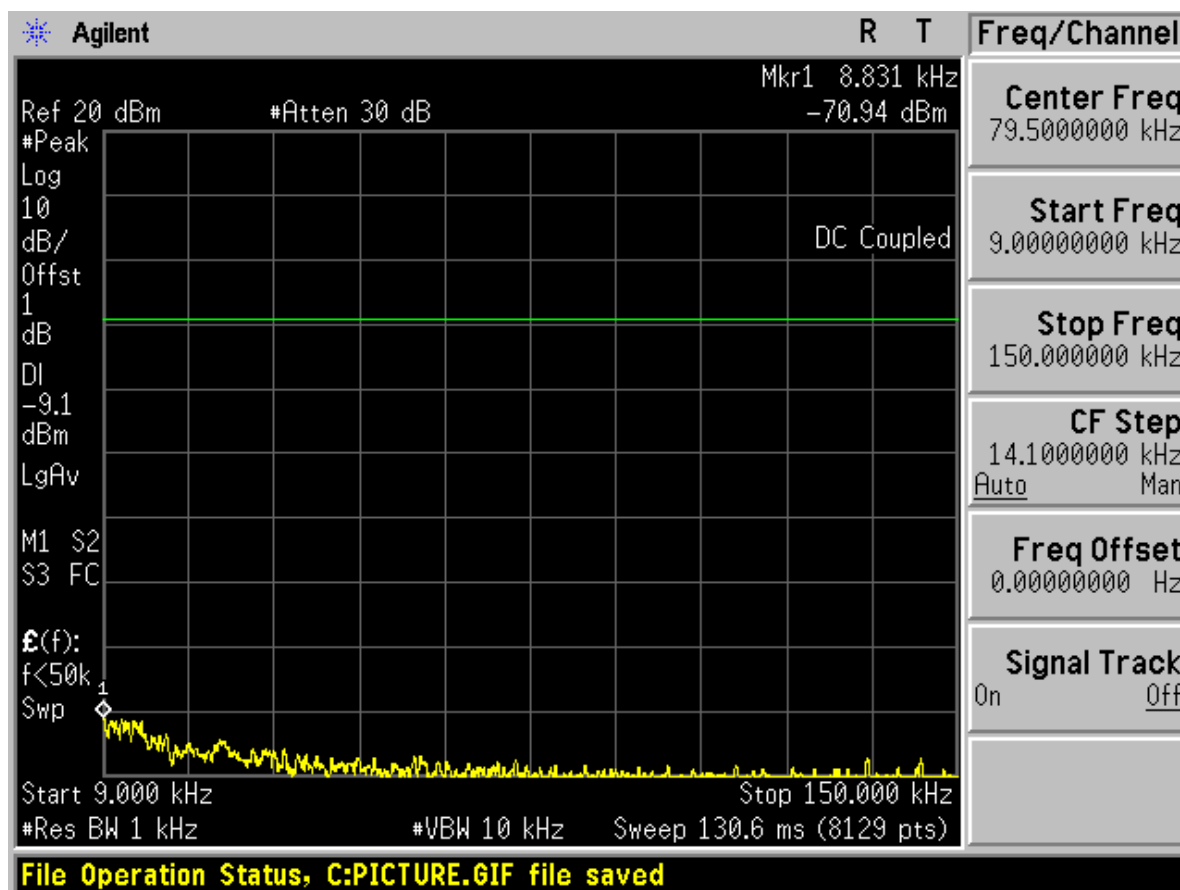
9K~150K TM5_11

Chain 1





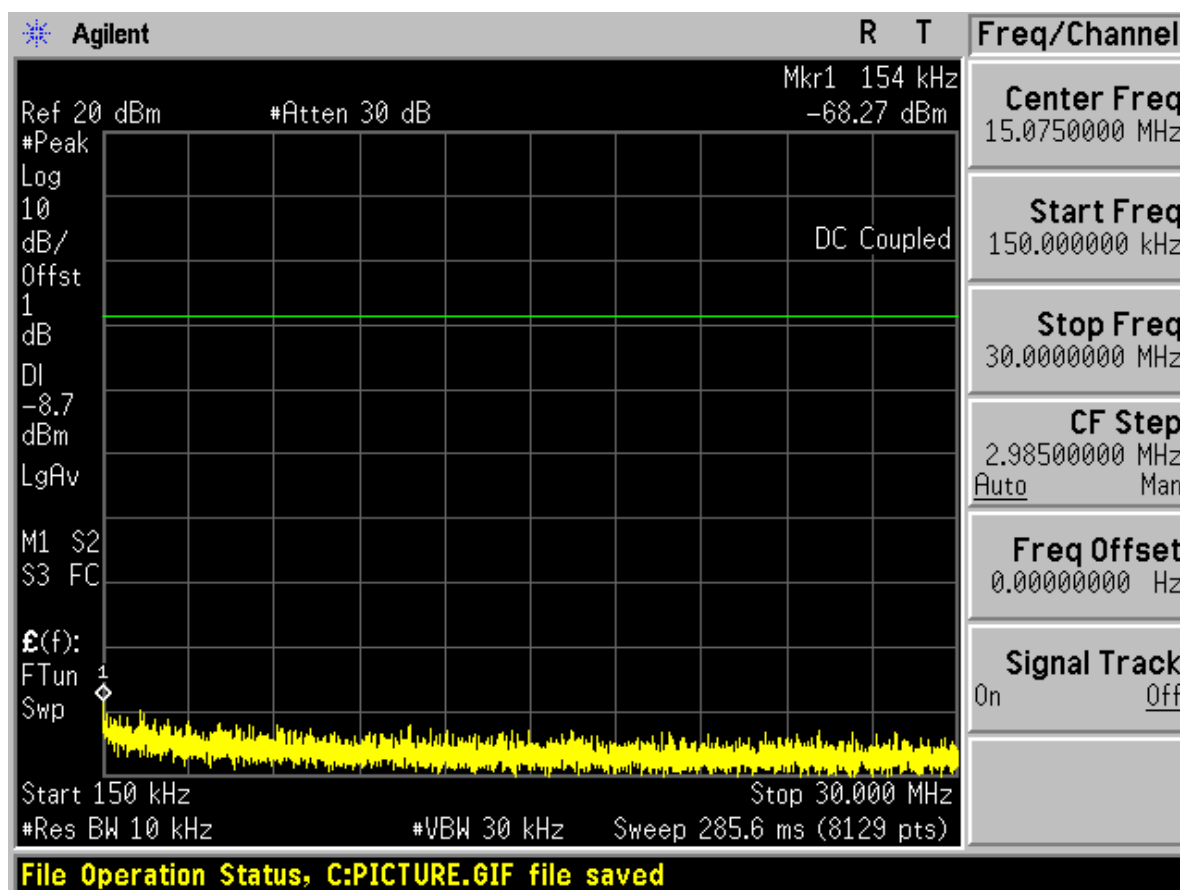
Chain 2





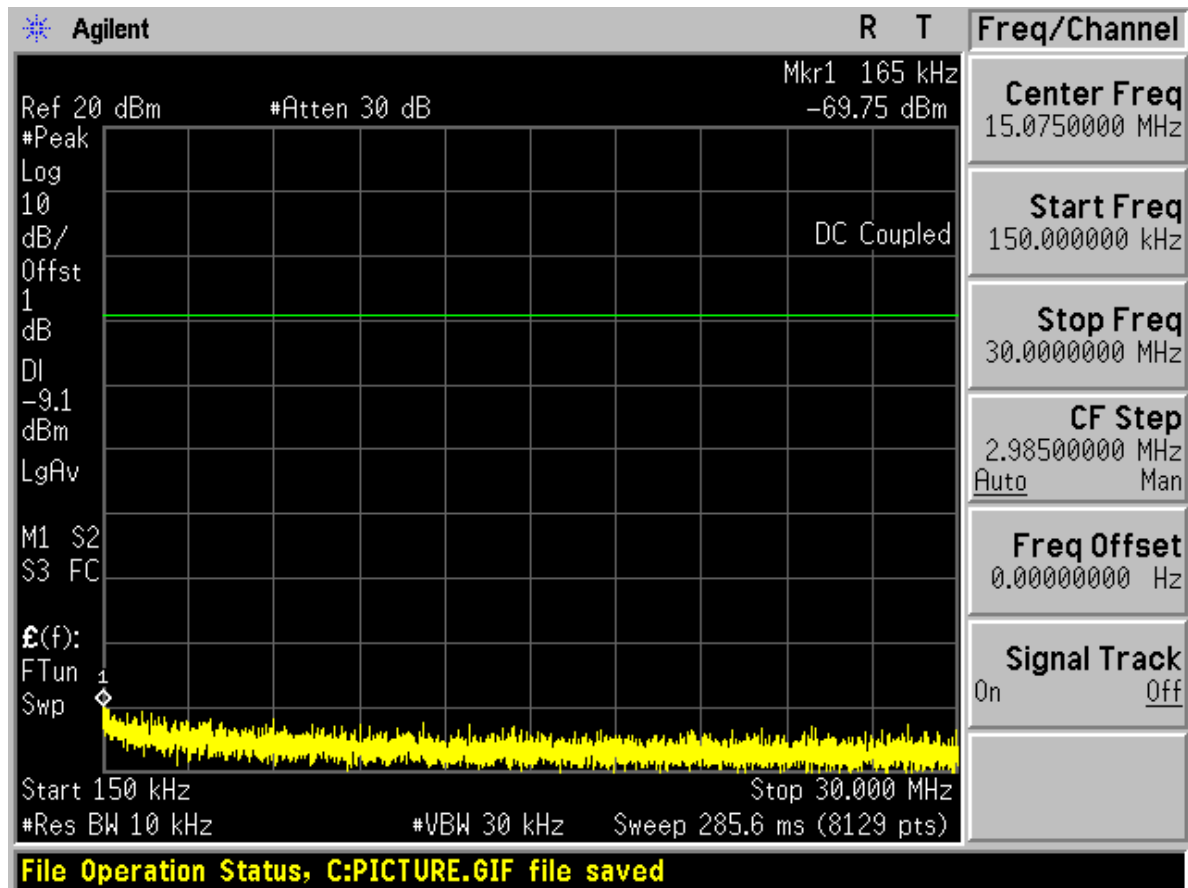
150K~30M TM5_11

Chain 1



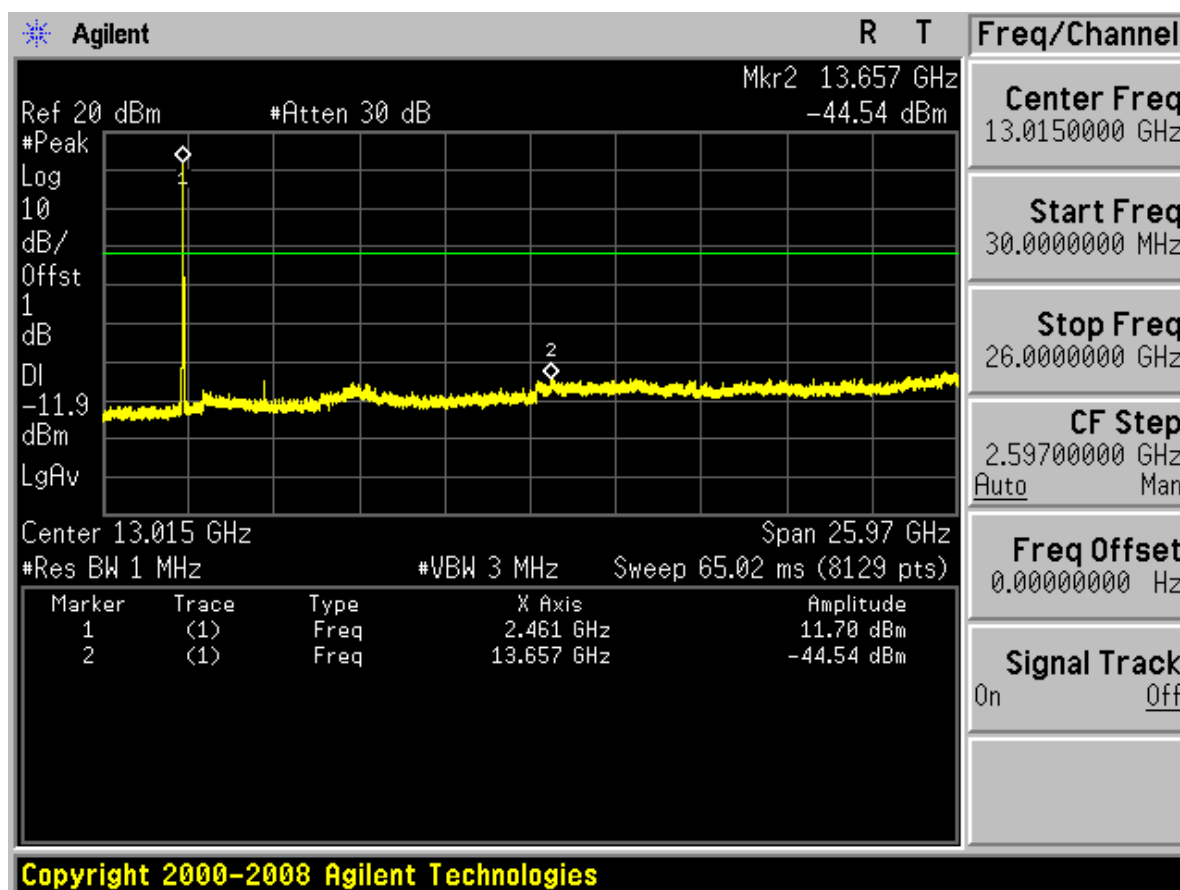


Chain 2



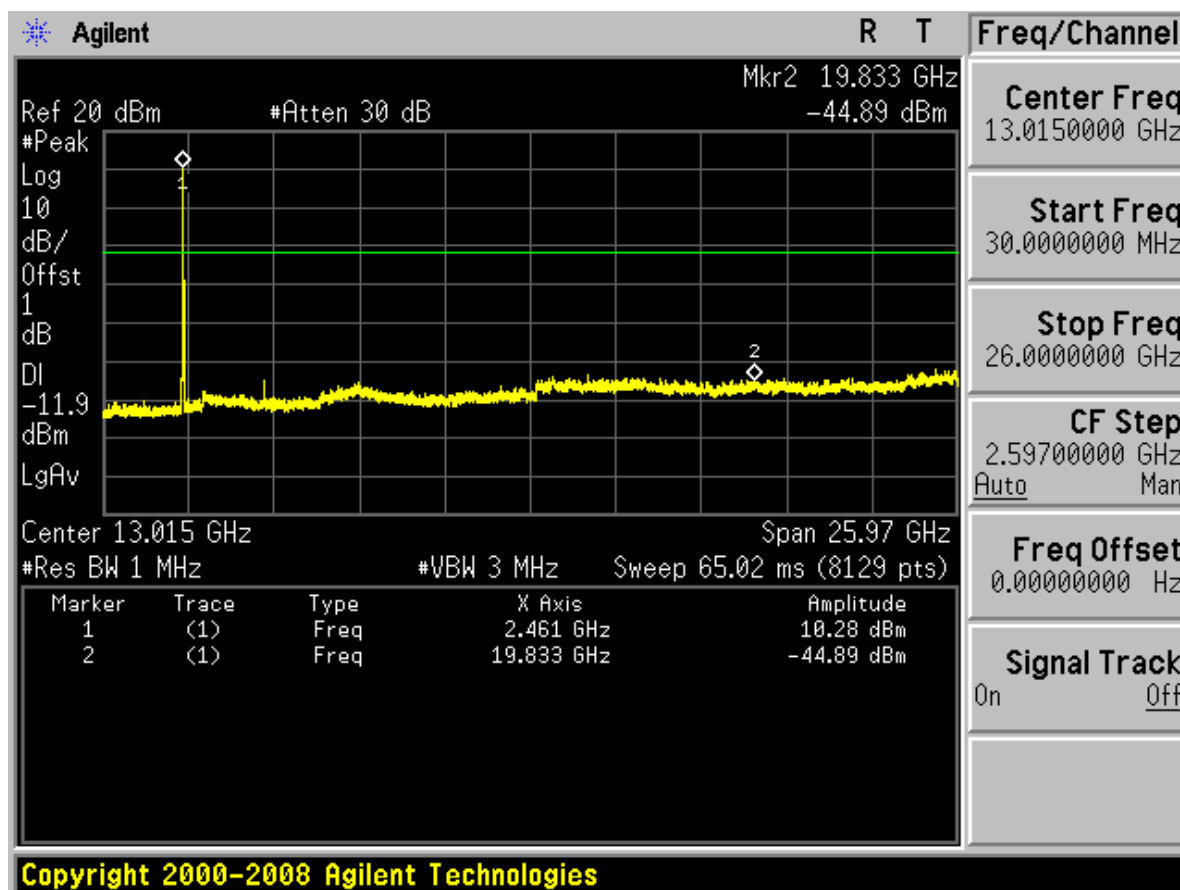


30M~26G TM5_11 Chain 1



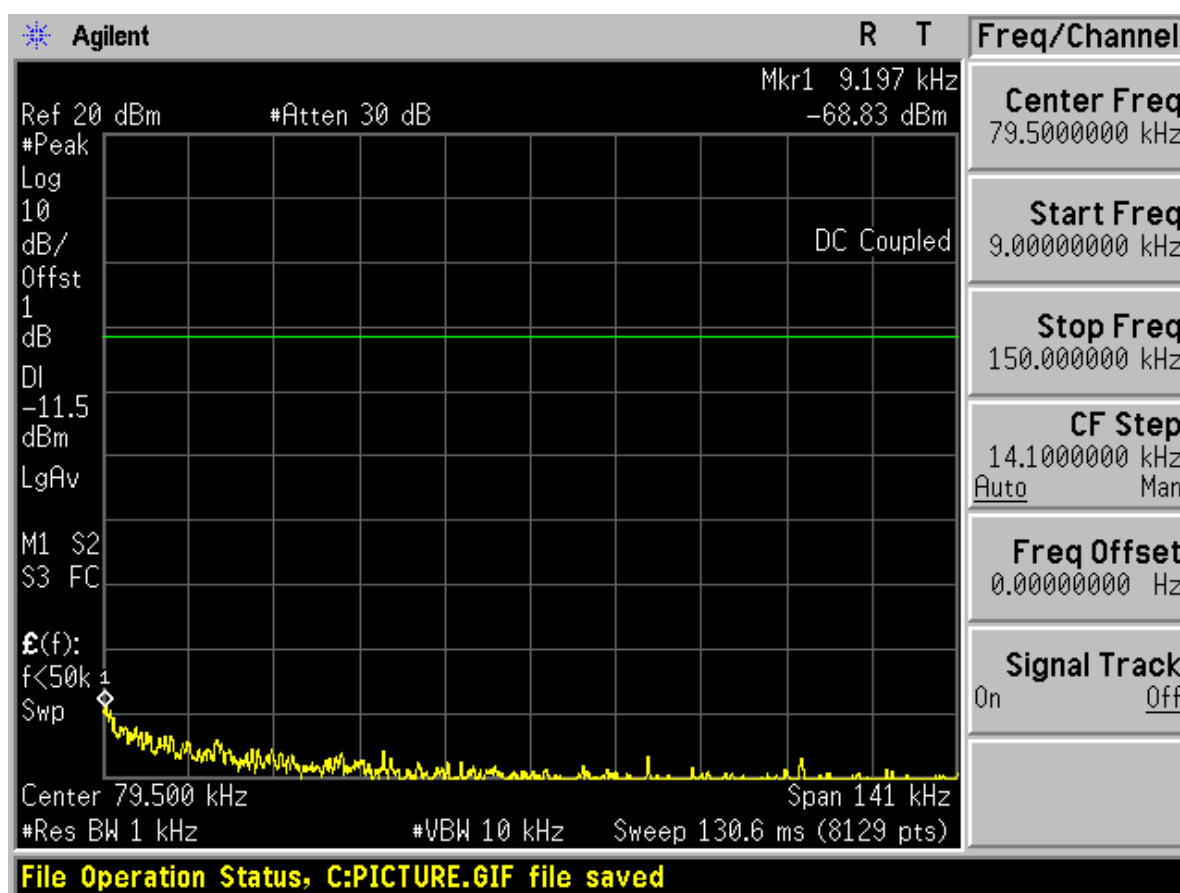


Chain 2



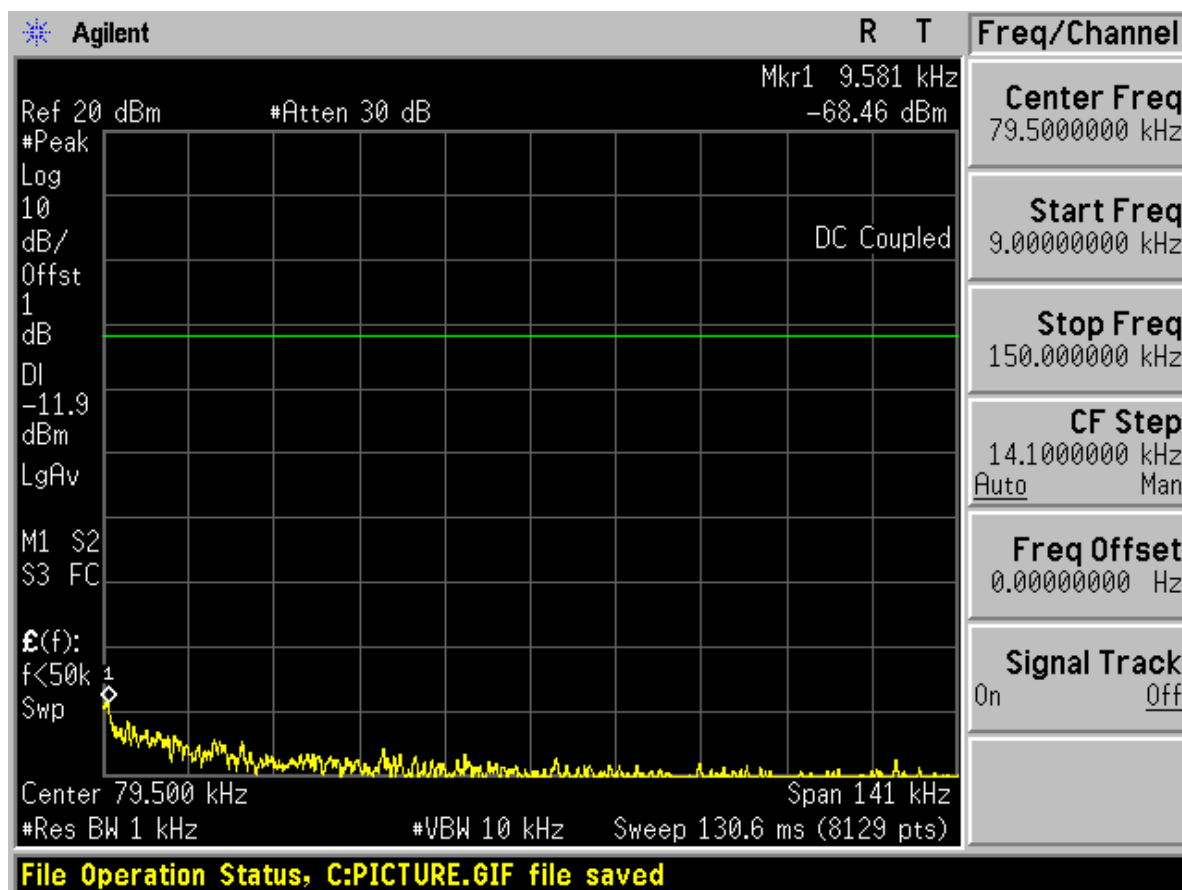


TM6 Chain1&2 Channel 03 9K~150K TM6_03 Chain 1



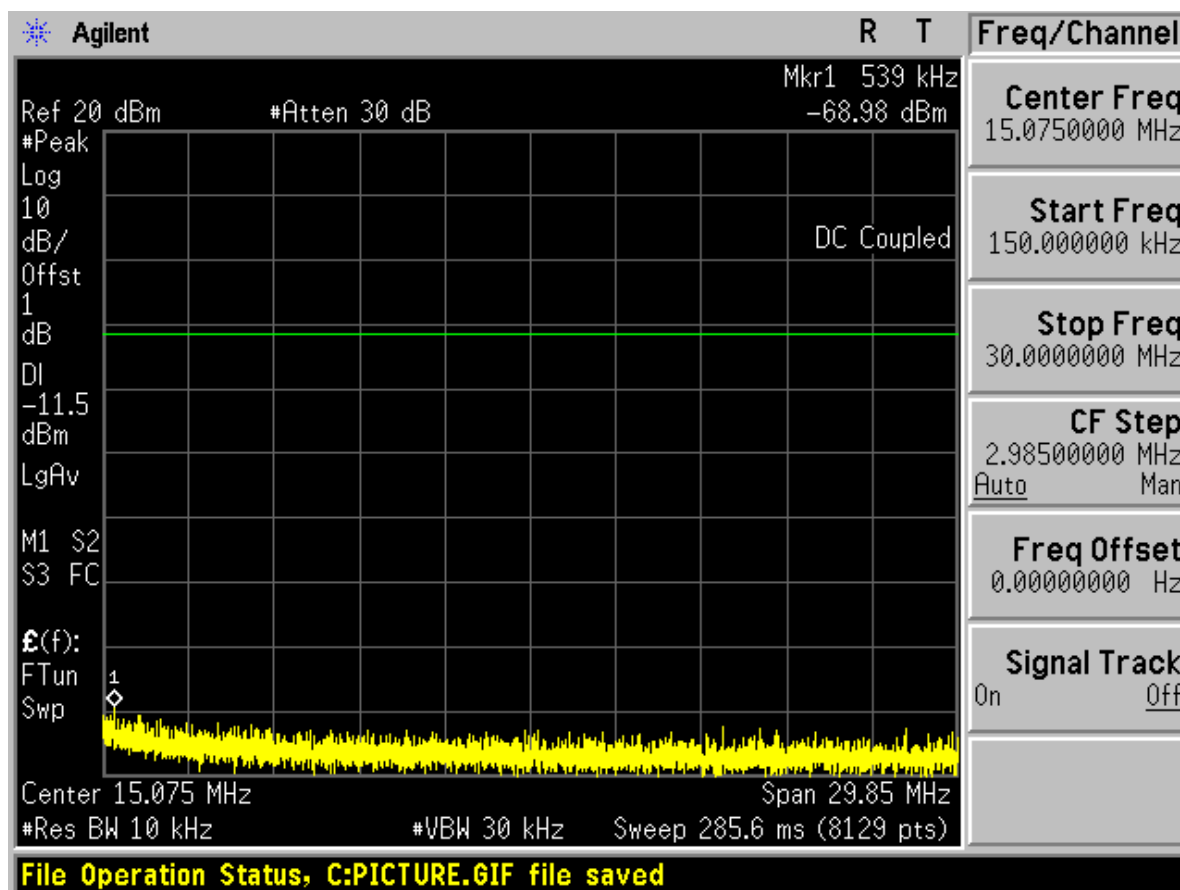


Chain 2



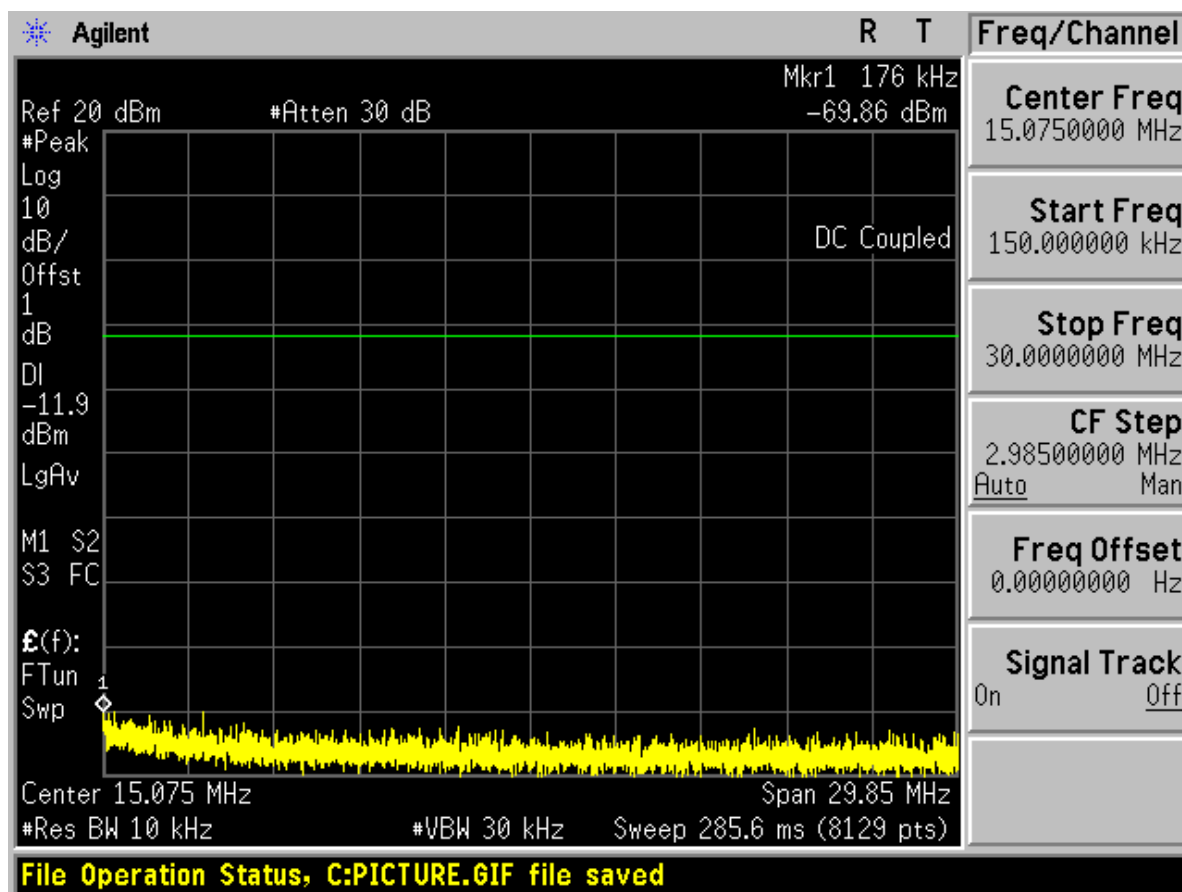


150K~30M TM6_03 Chain 1





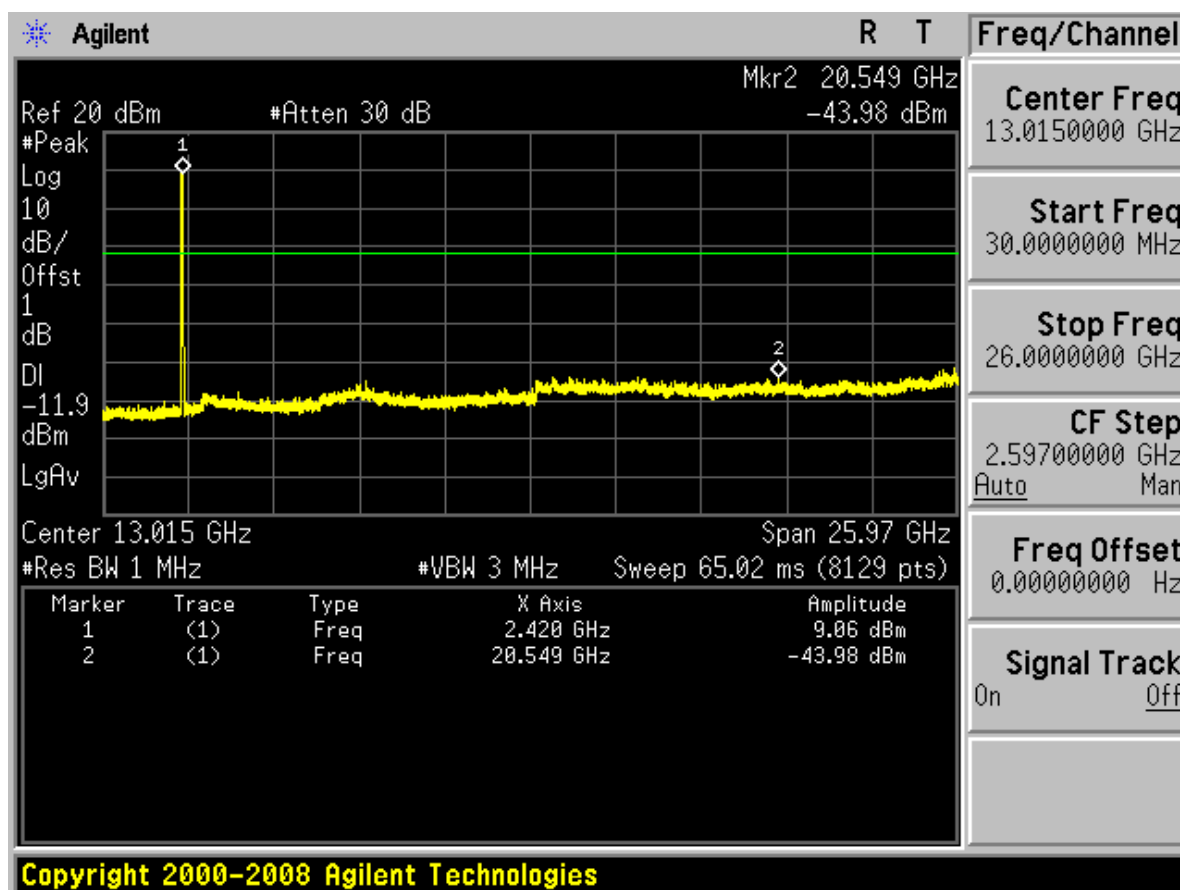
Chain 2





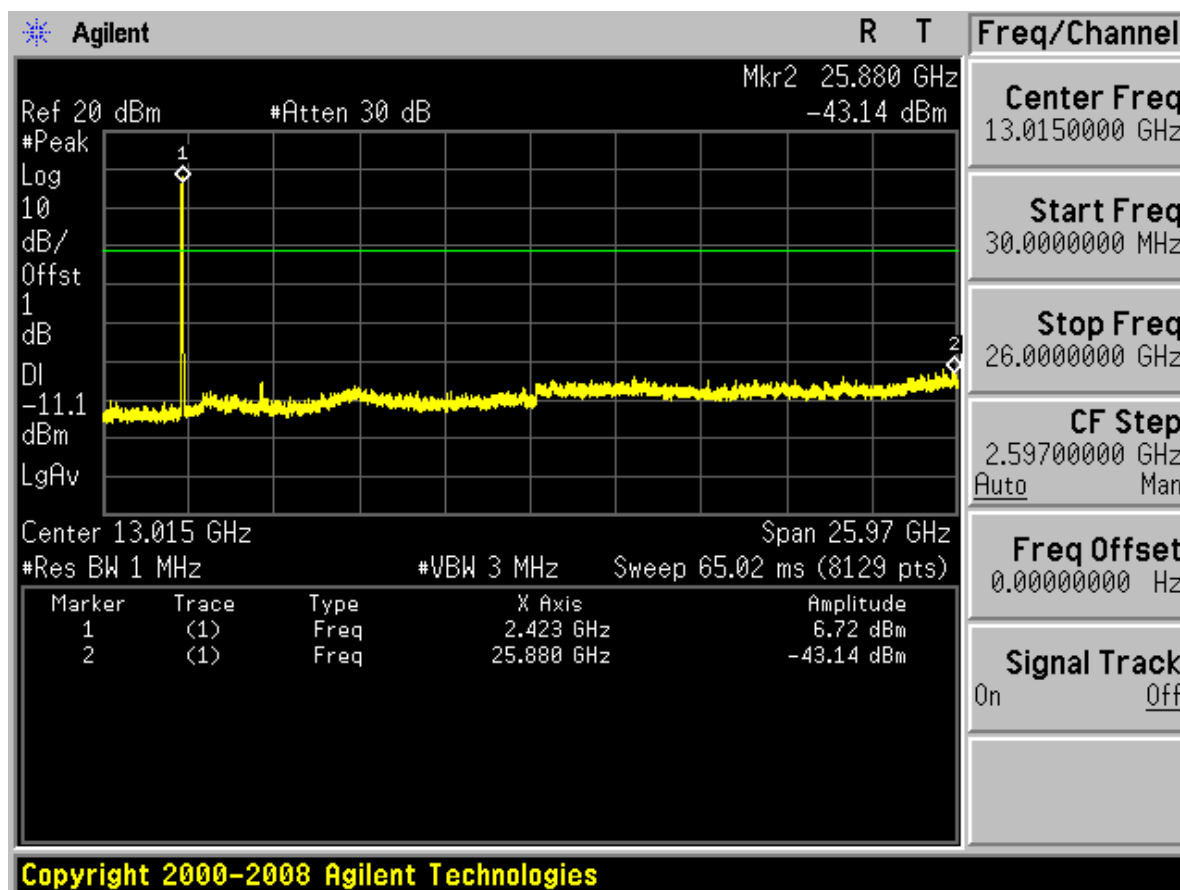
30M~26G TM6_03

Chain 1



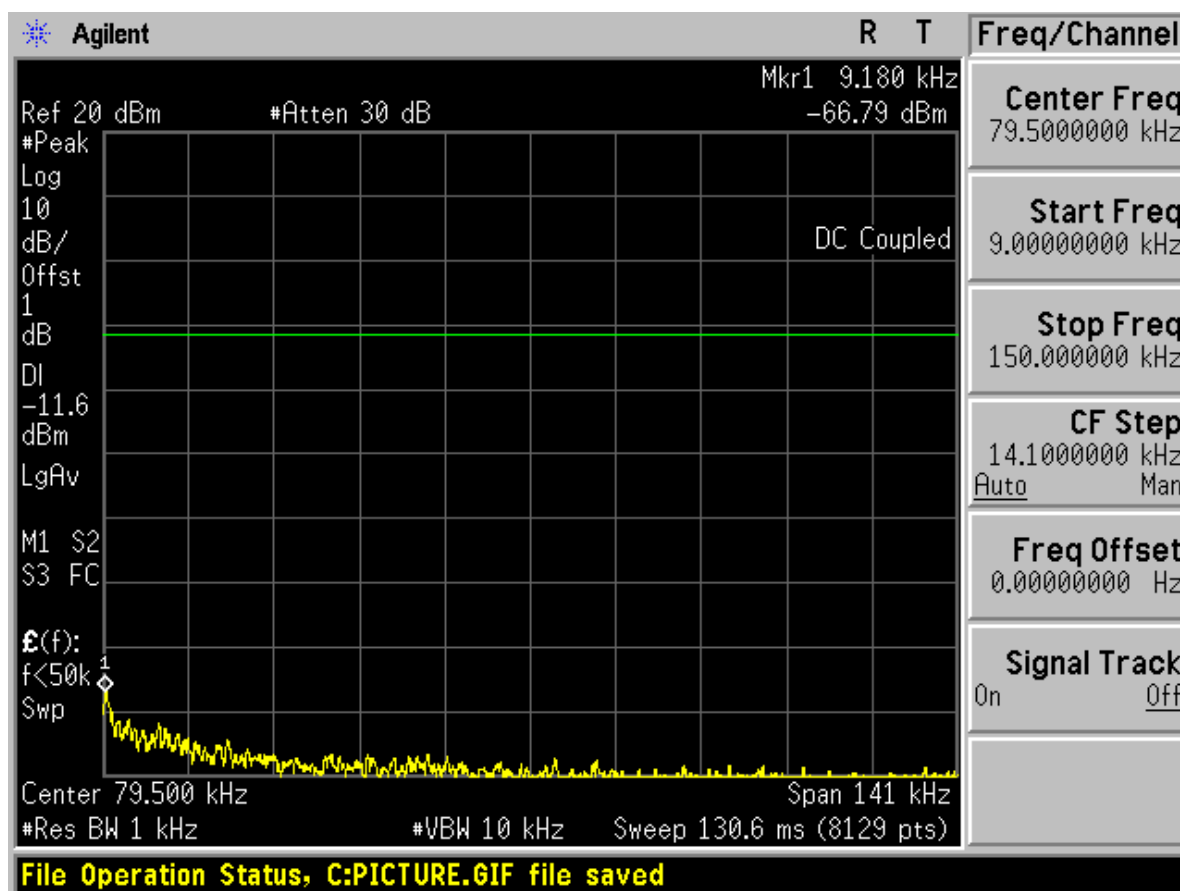


Chain 2



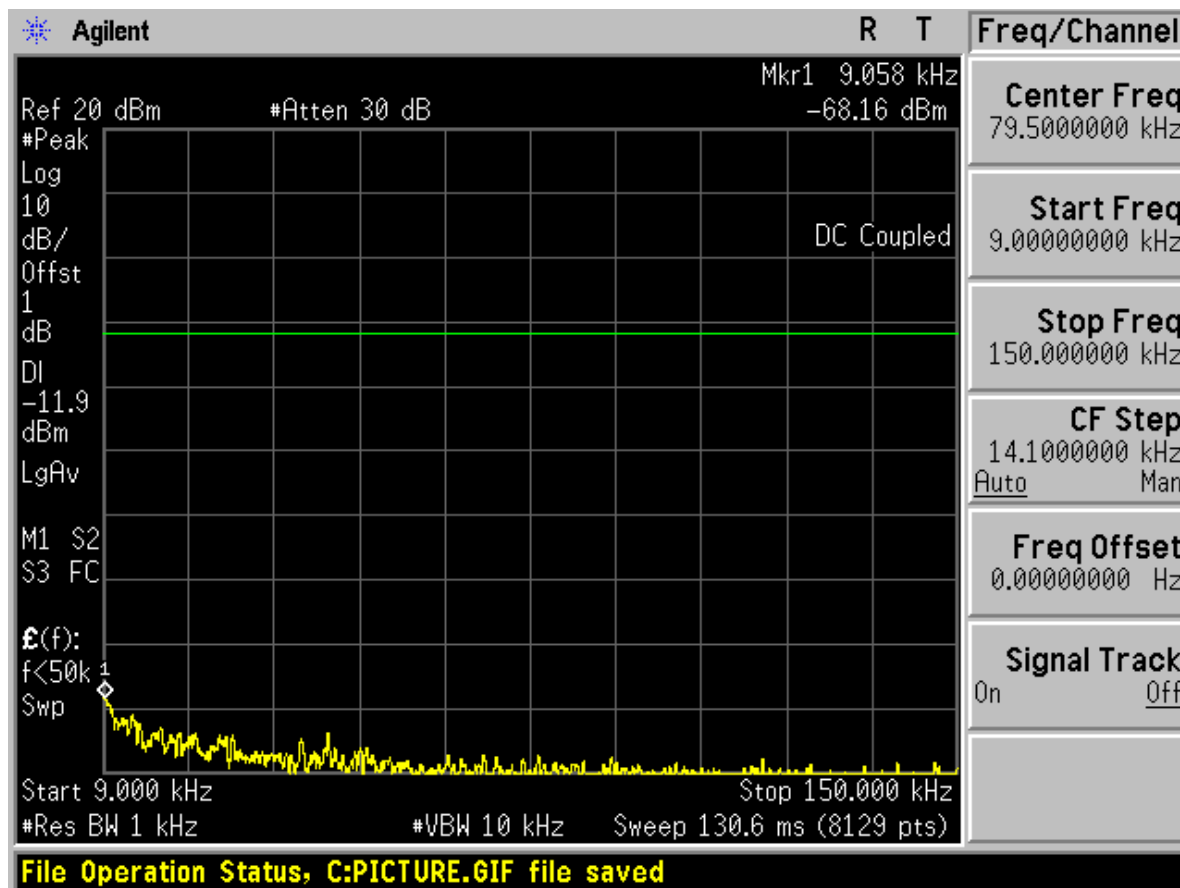


Channel 06 9K~150K TM6_06 Chain 1





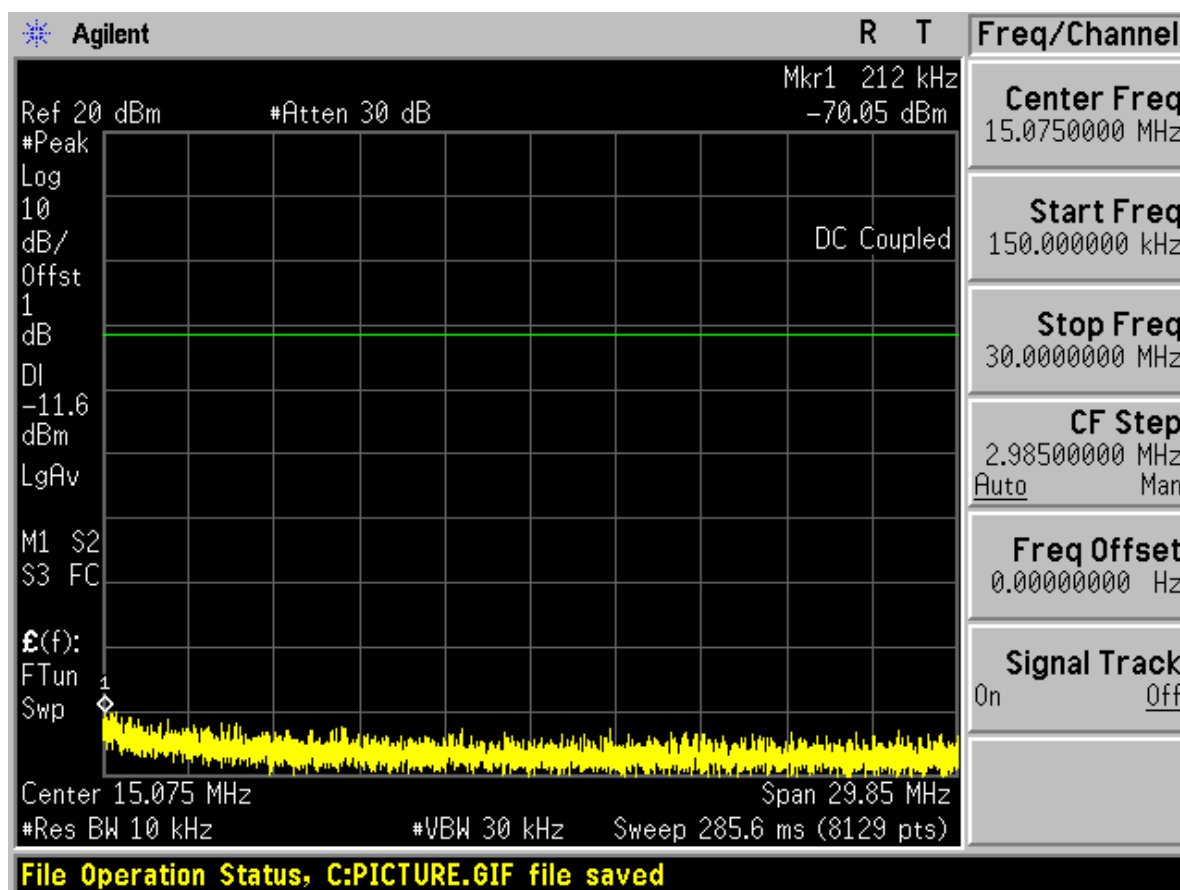
Chain 2





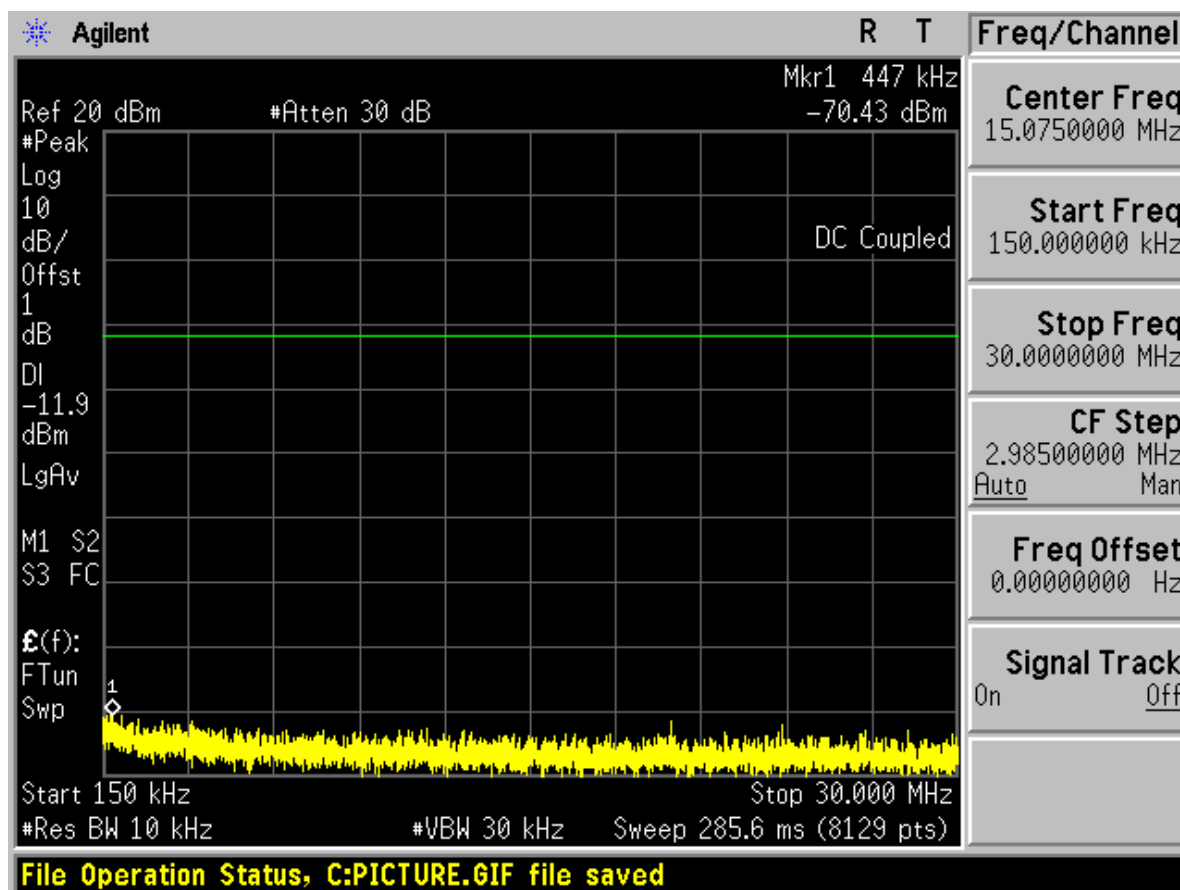
150K~30M TM6_06

Chain 1



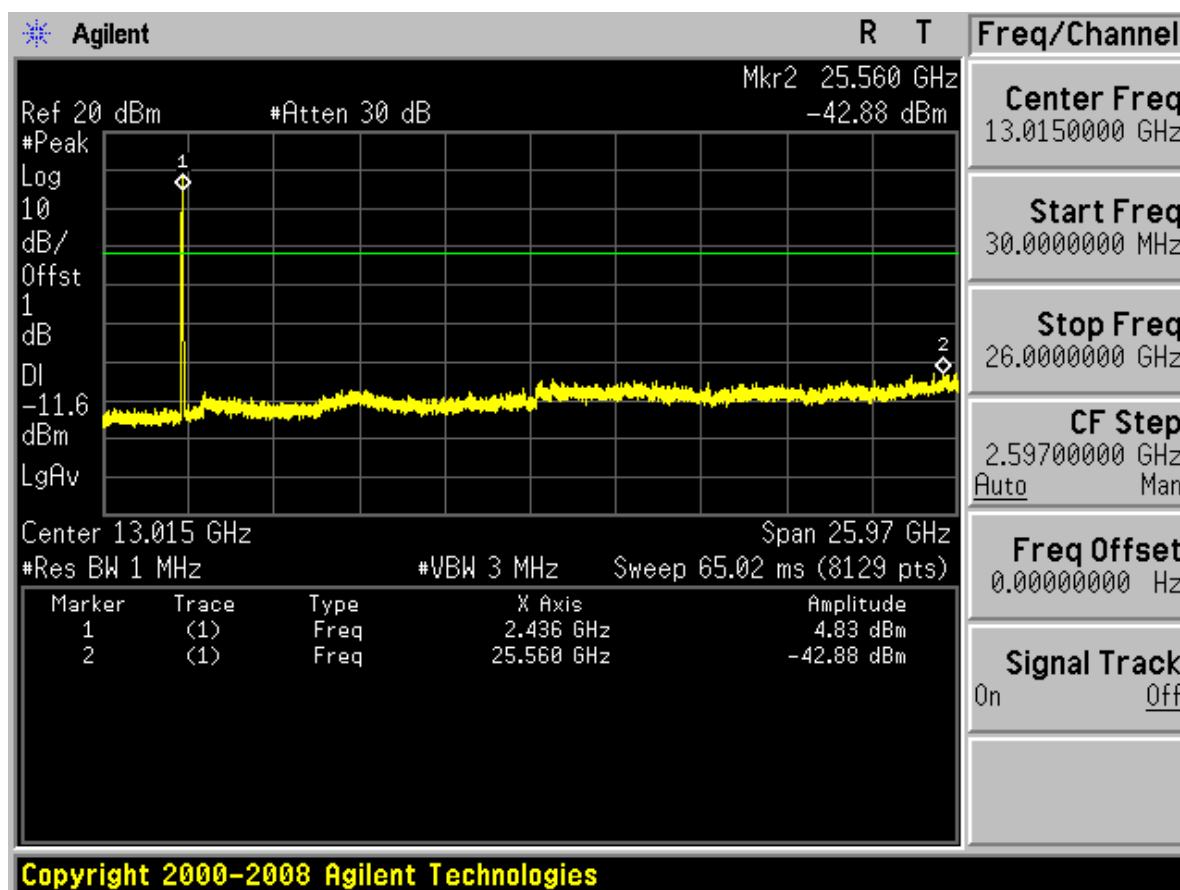


Chain 2



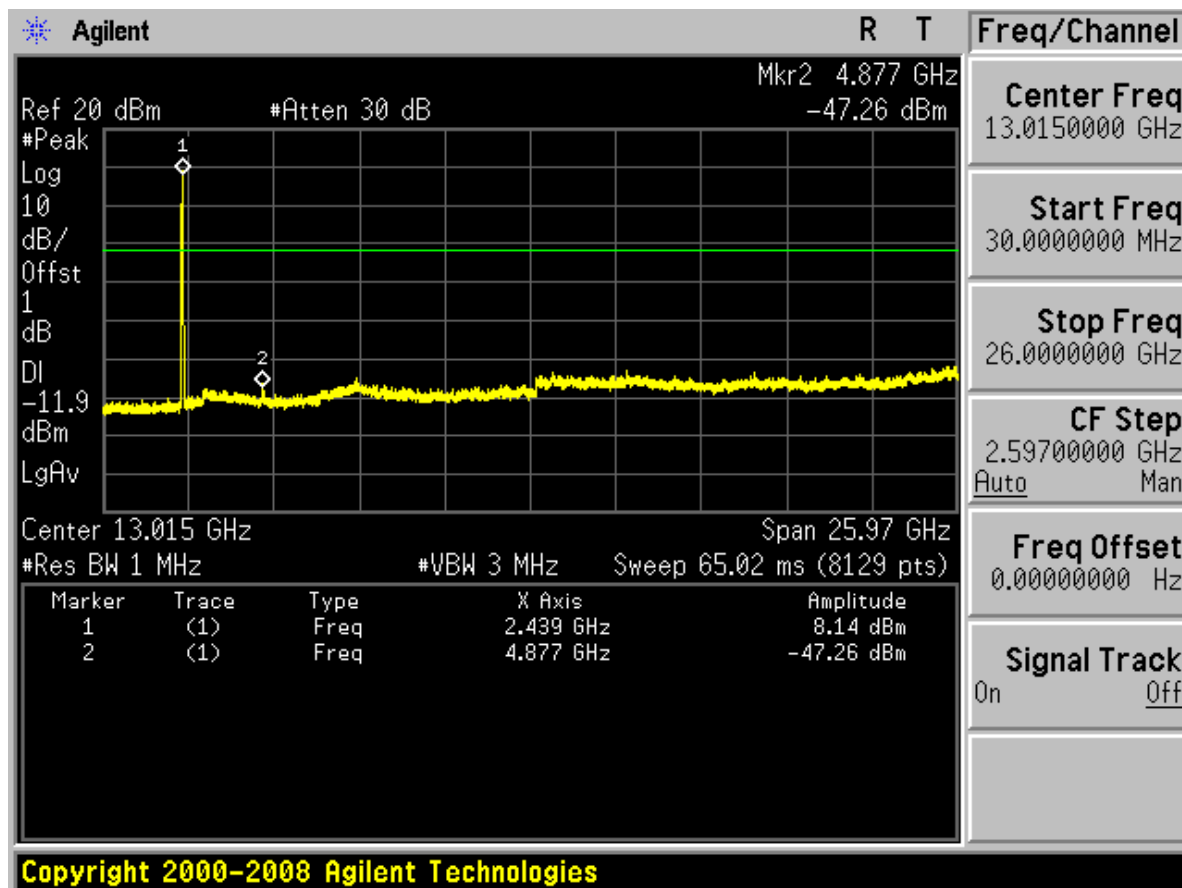


30M~26G TM6_06 Chain 1





Chain 2

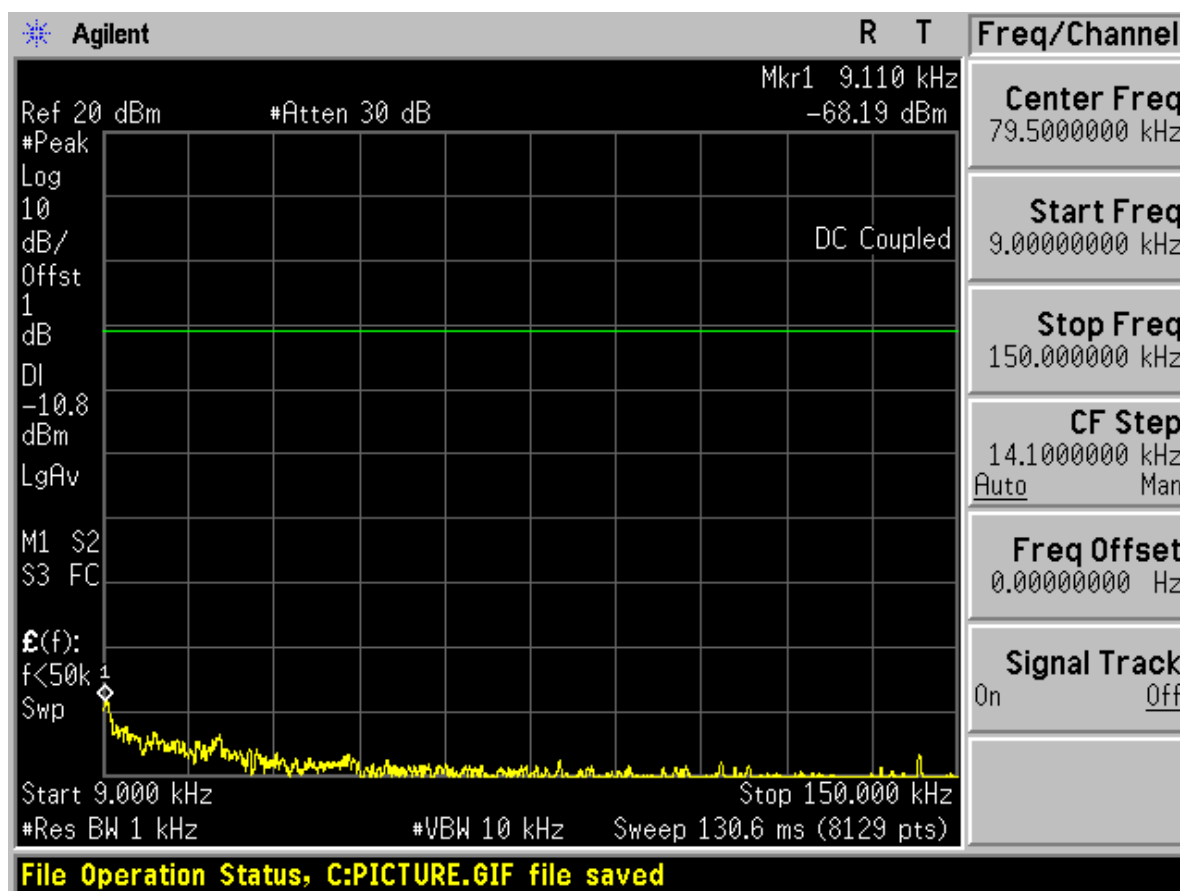




Channel 09

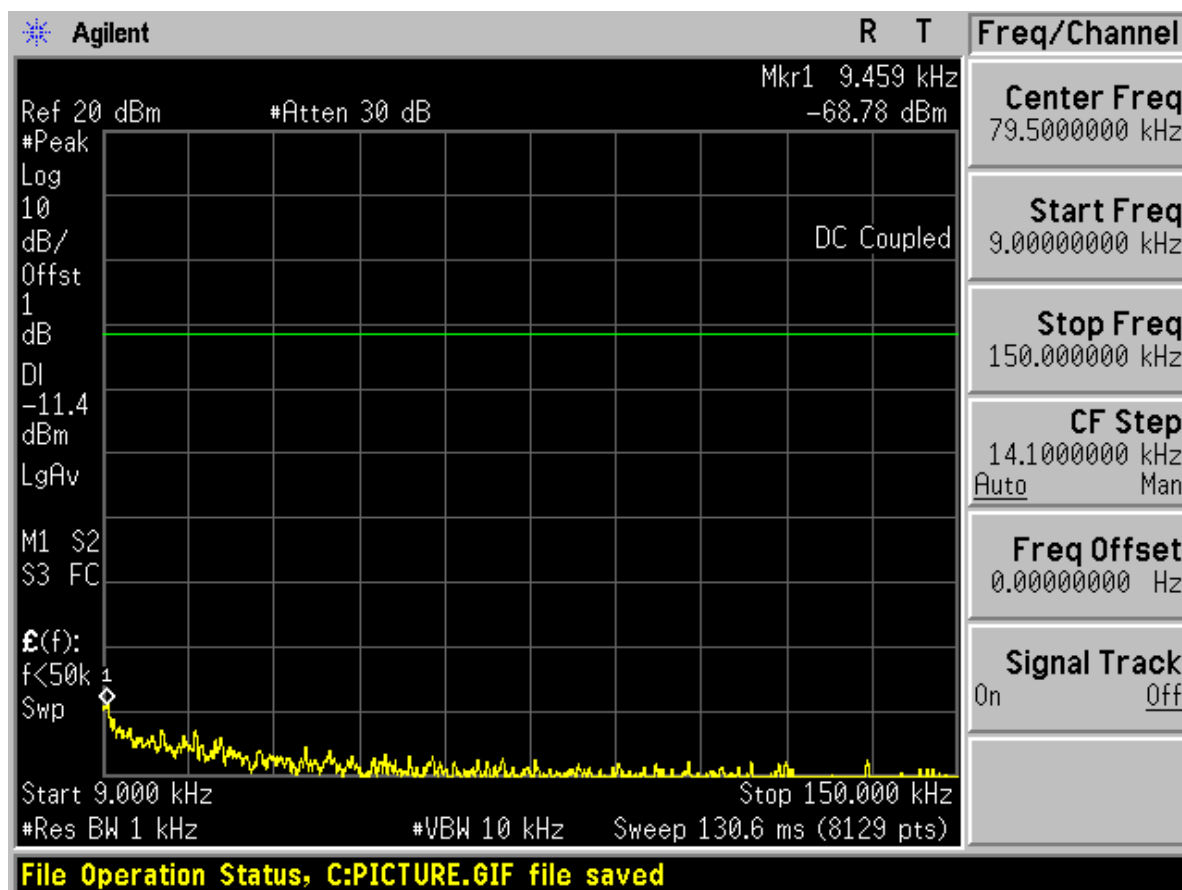
9K~150K TM6_09

Chain 1





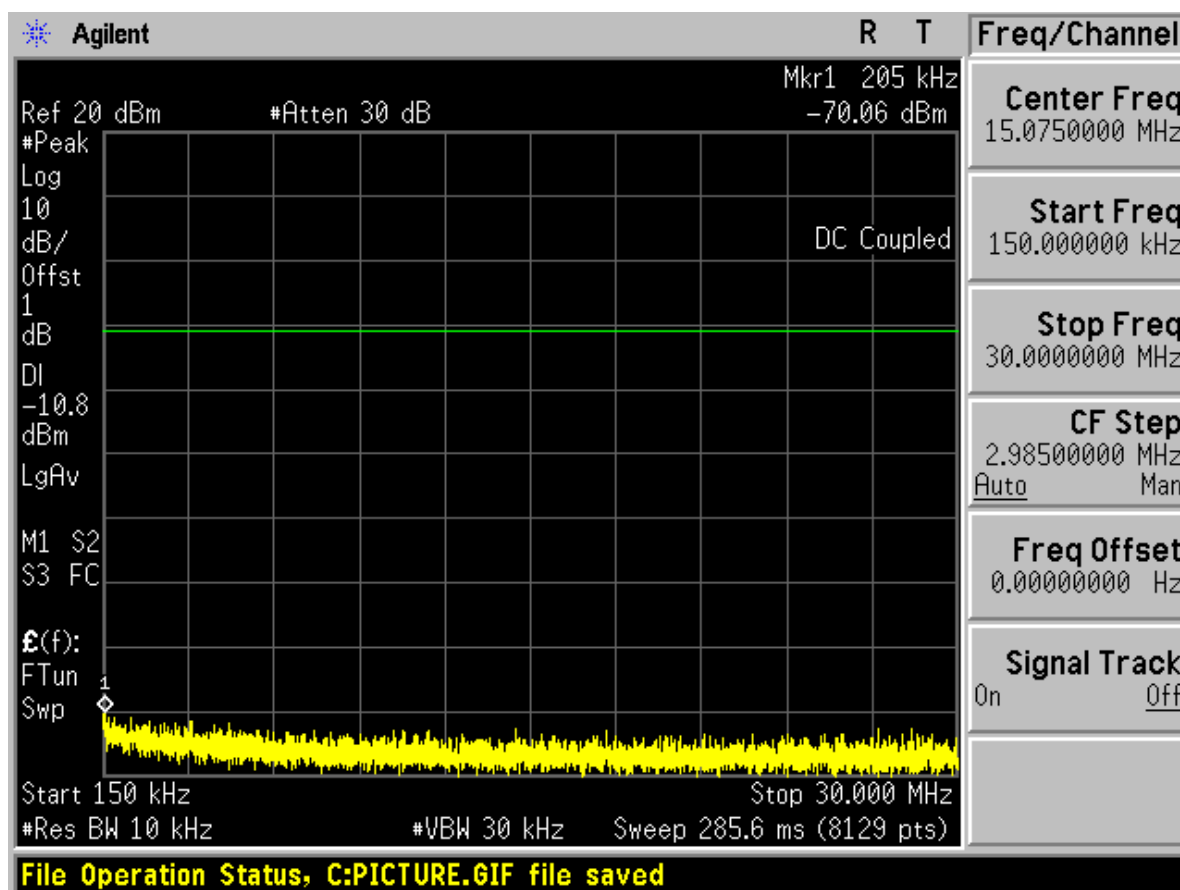
Chain 2





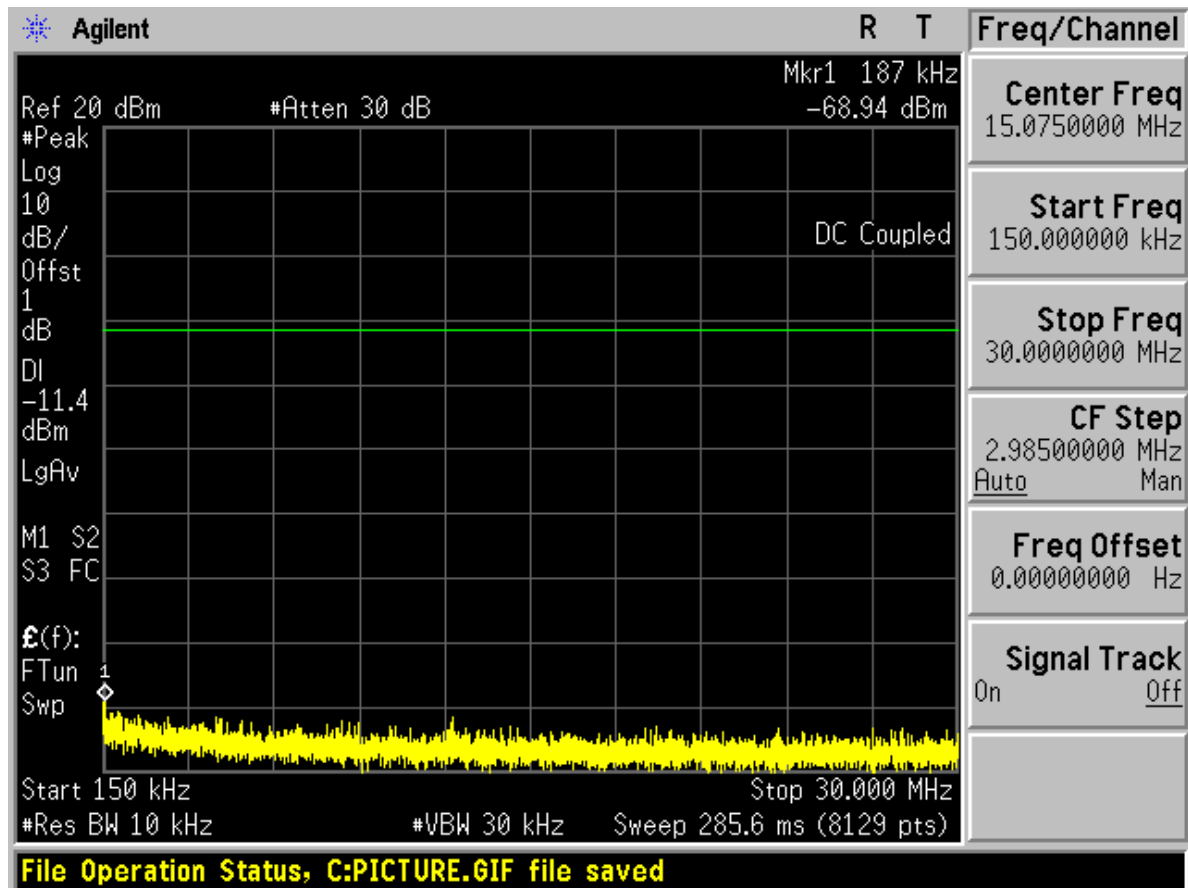
150K~30M TM6_09

Chain 1





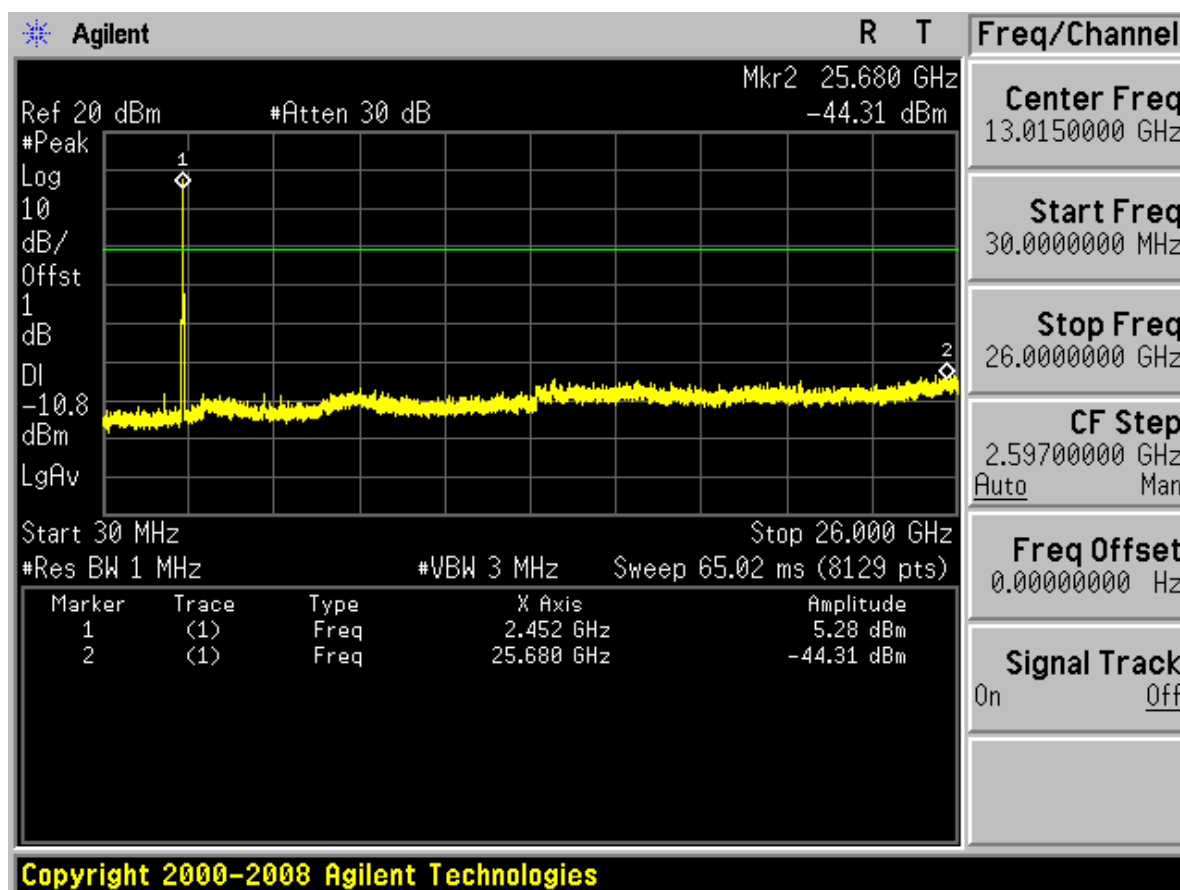
Chain 2





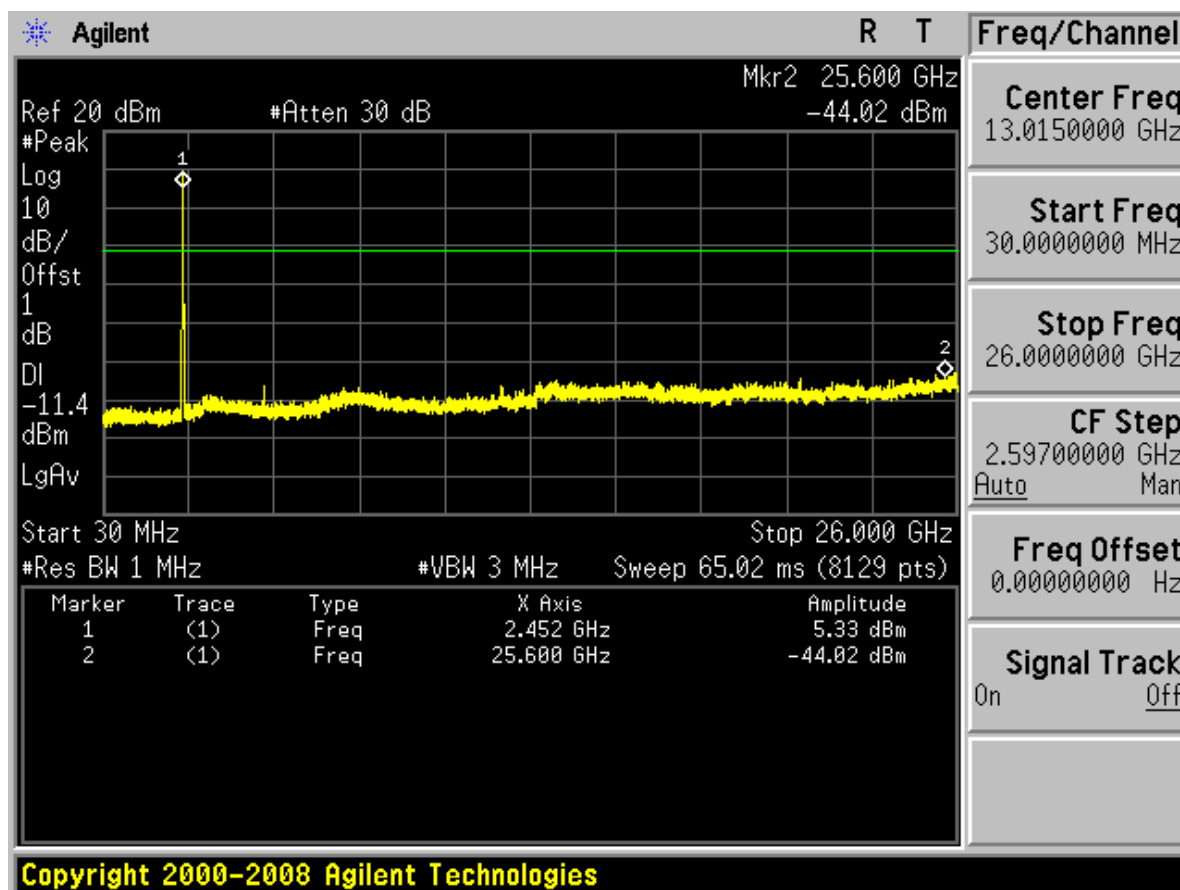
30M~26G TM6_09

Chain 1





Chain 2



-----The END-----



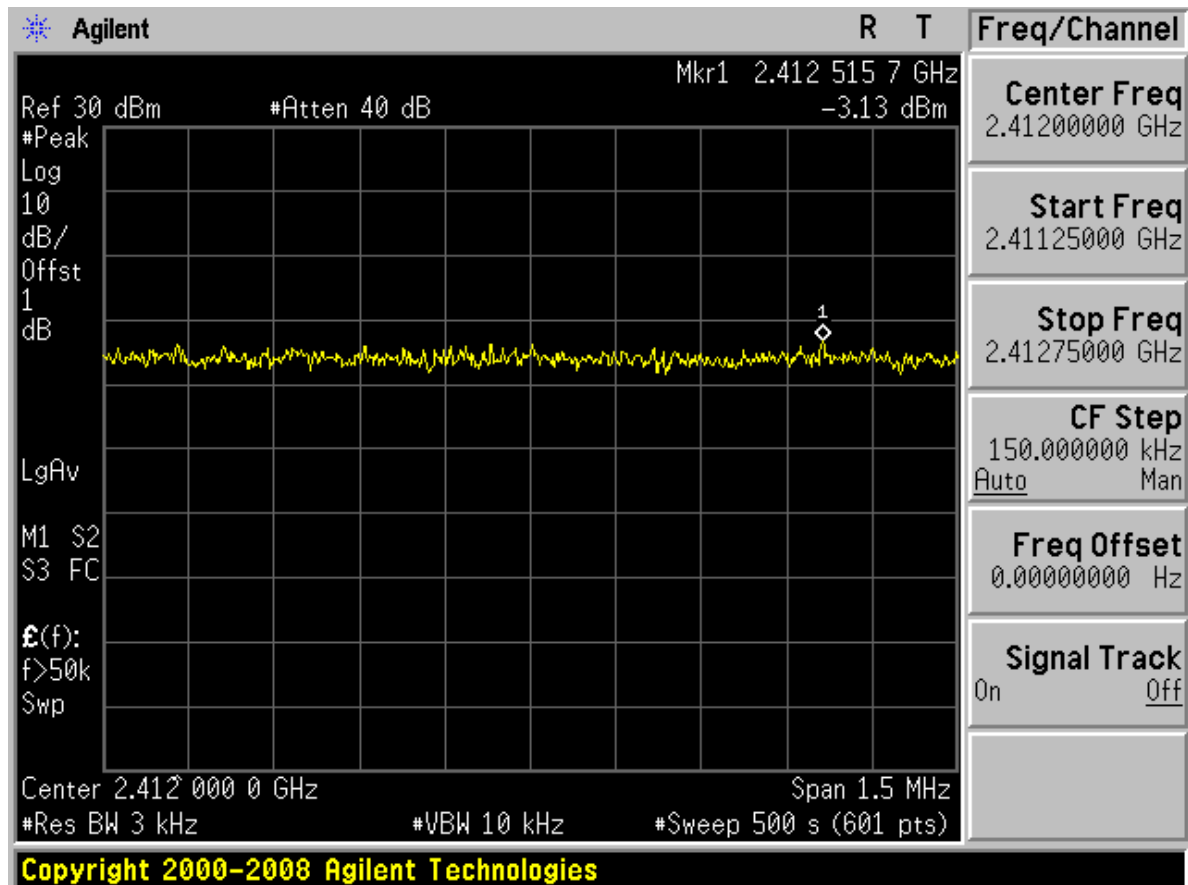
Appendix E

Power spectral density

According to FCC Part 15.247 (e) & RSS-210

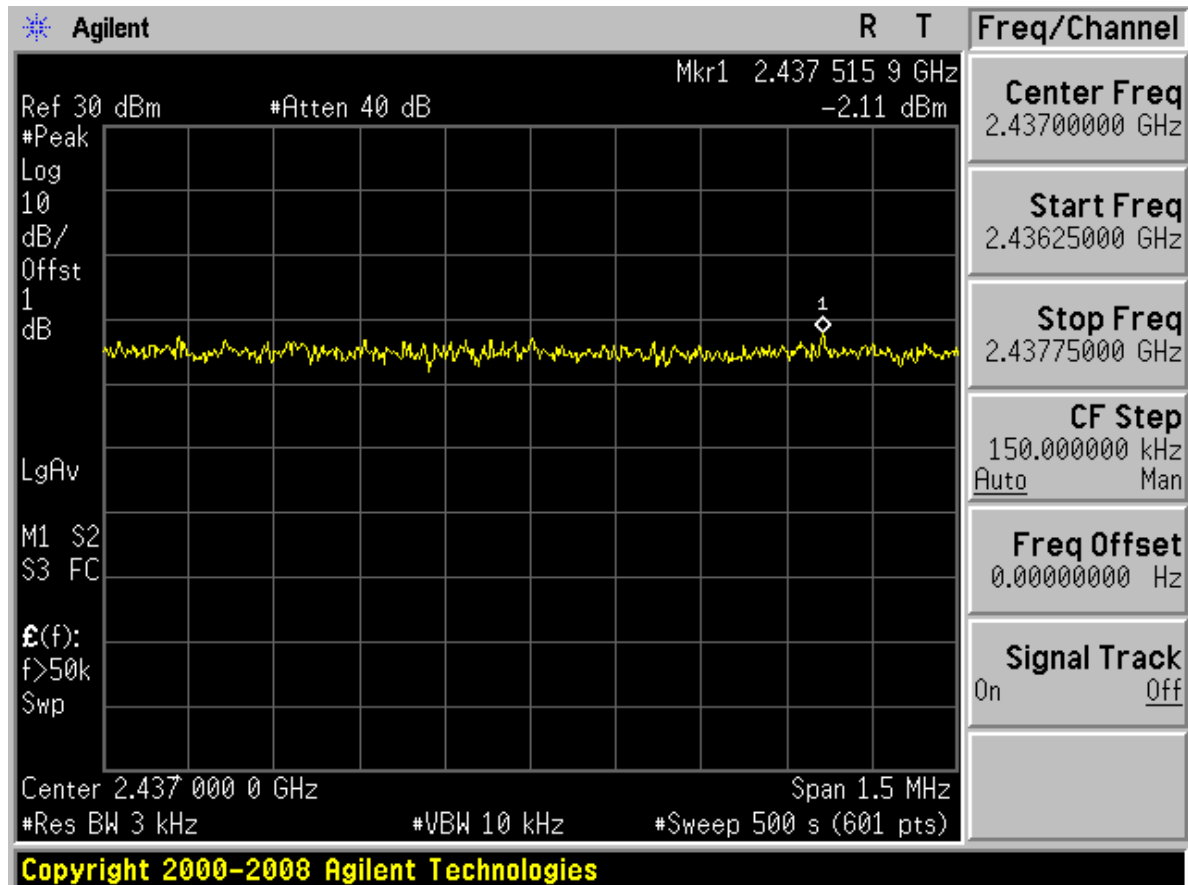


TM1 Chain 1 Channel 01



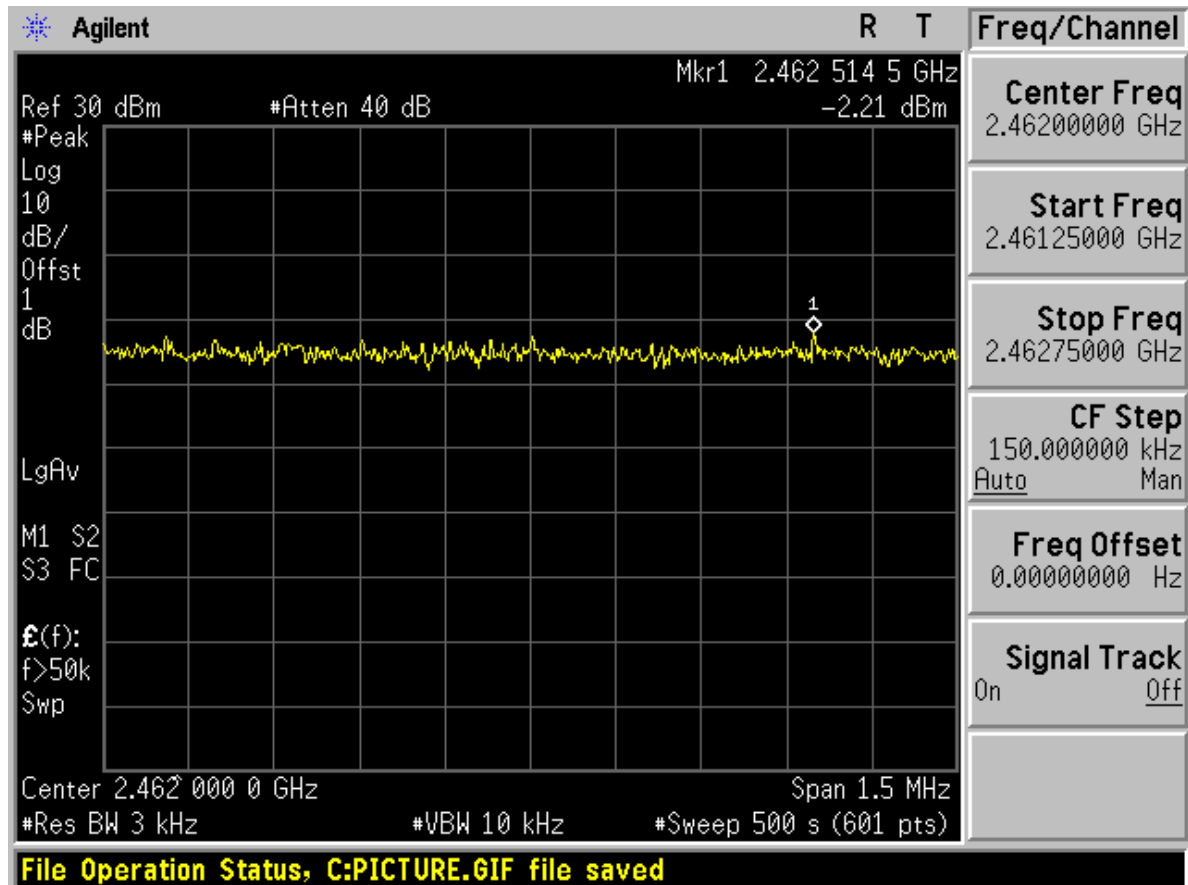


Channel 06



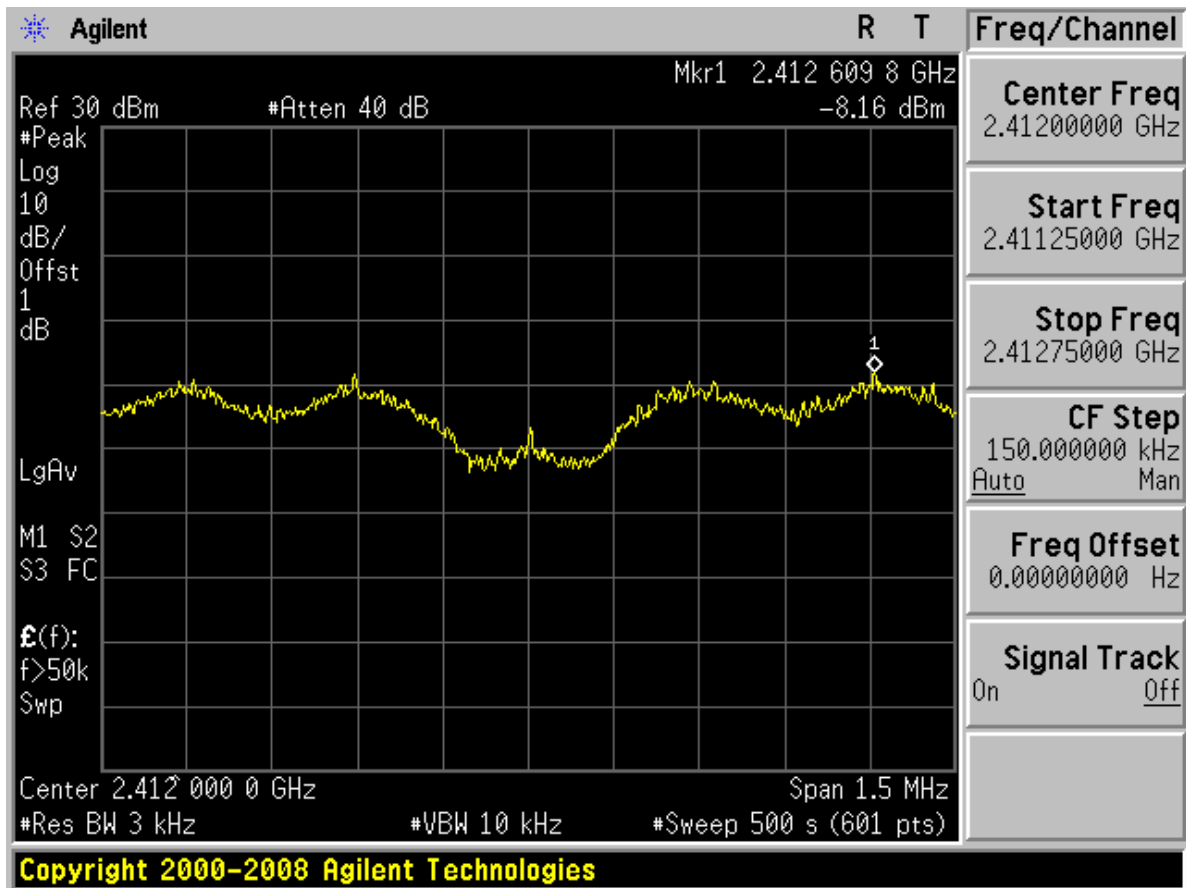


Channel 11



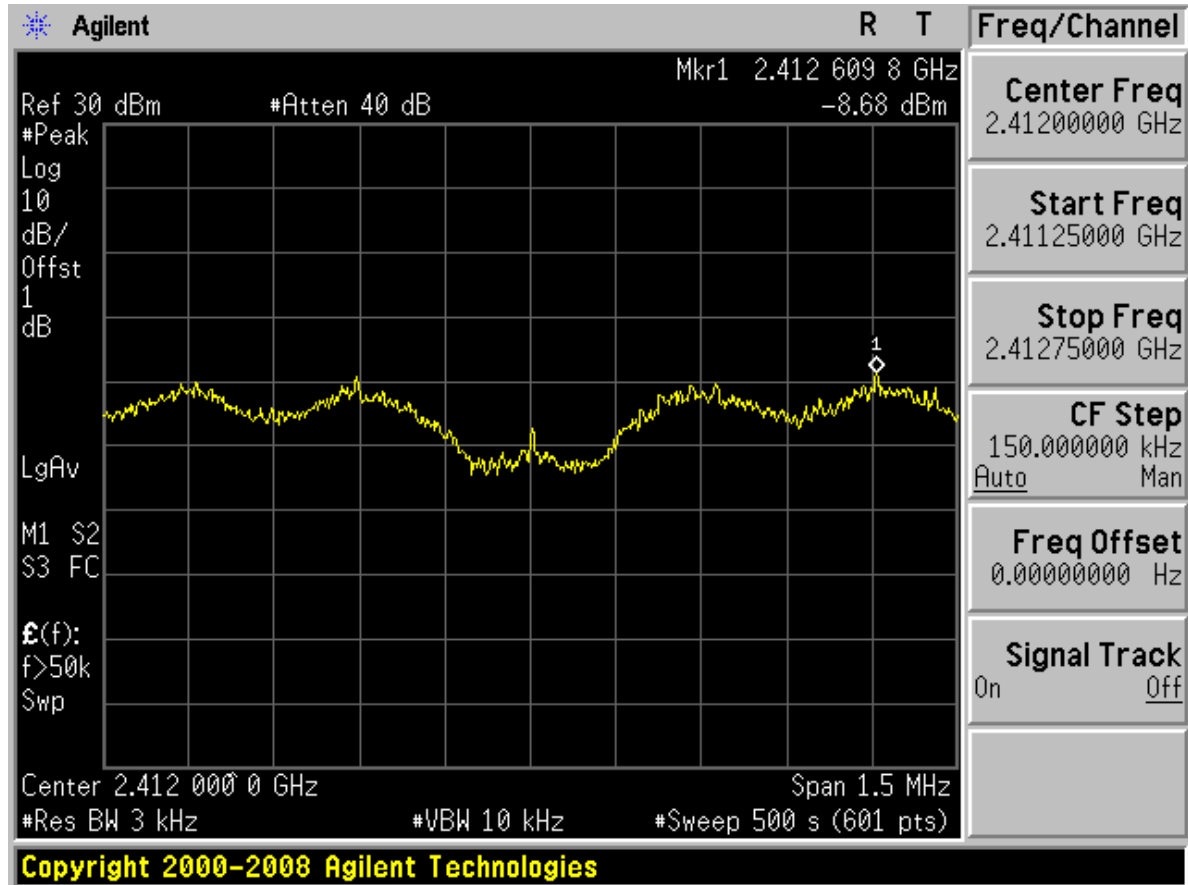


TM2 Chain 1&2 Channel 01 Chain 1





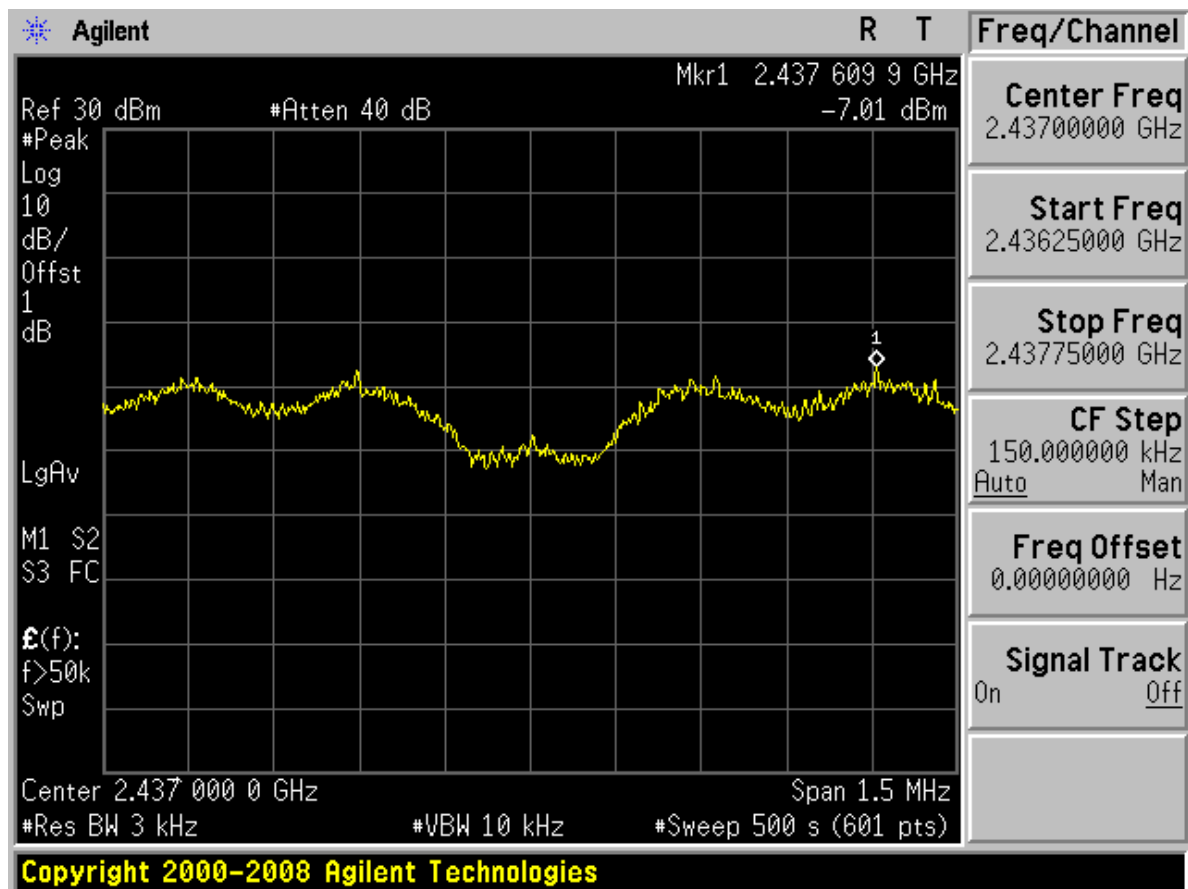
Chain 2





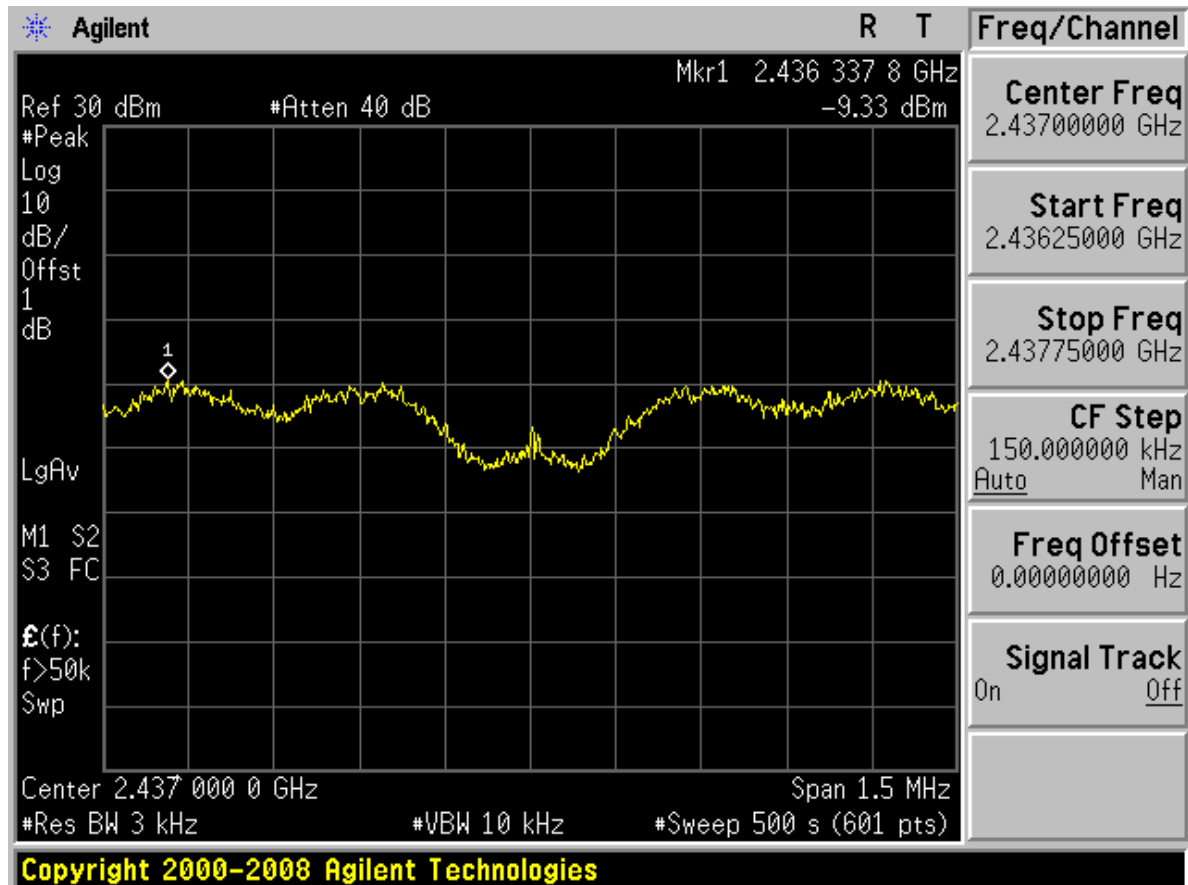
Channel 06

Chain 1





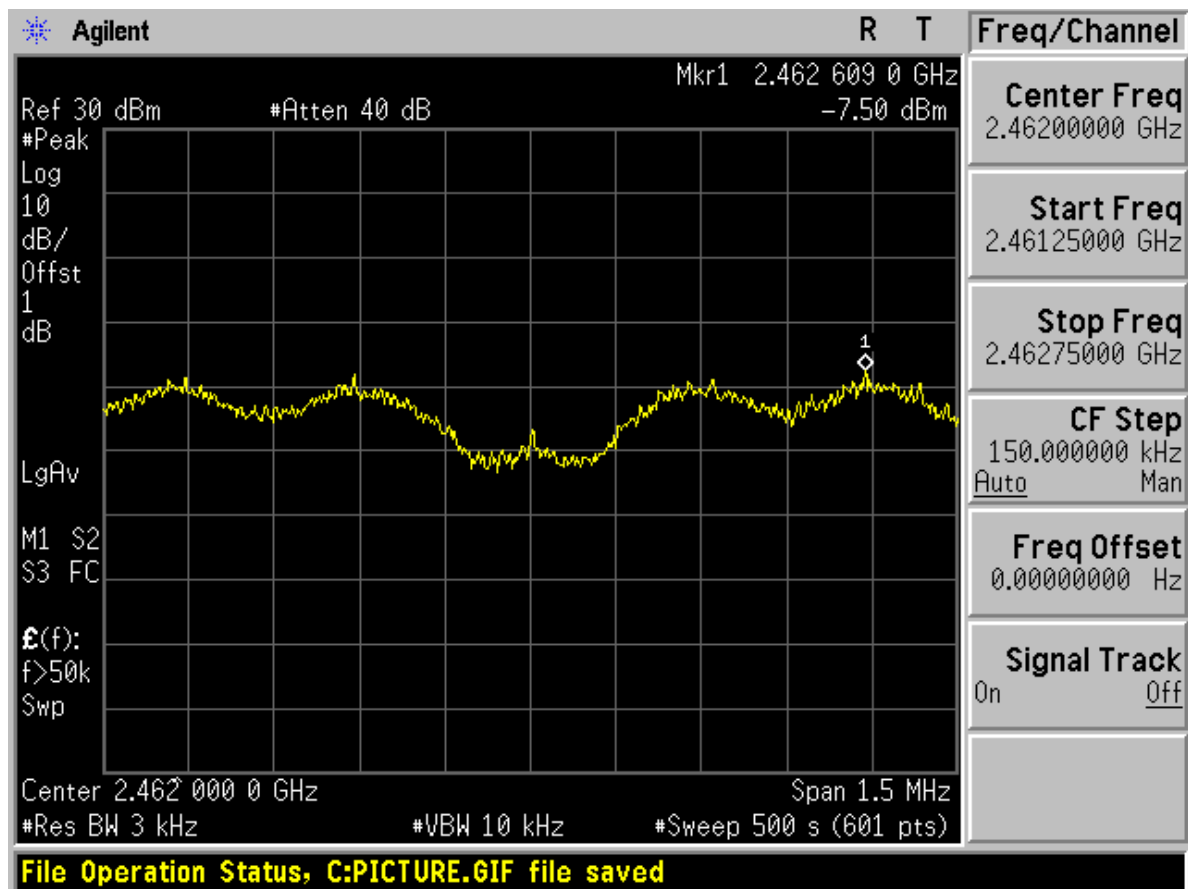
Chain 2





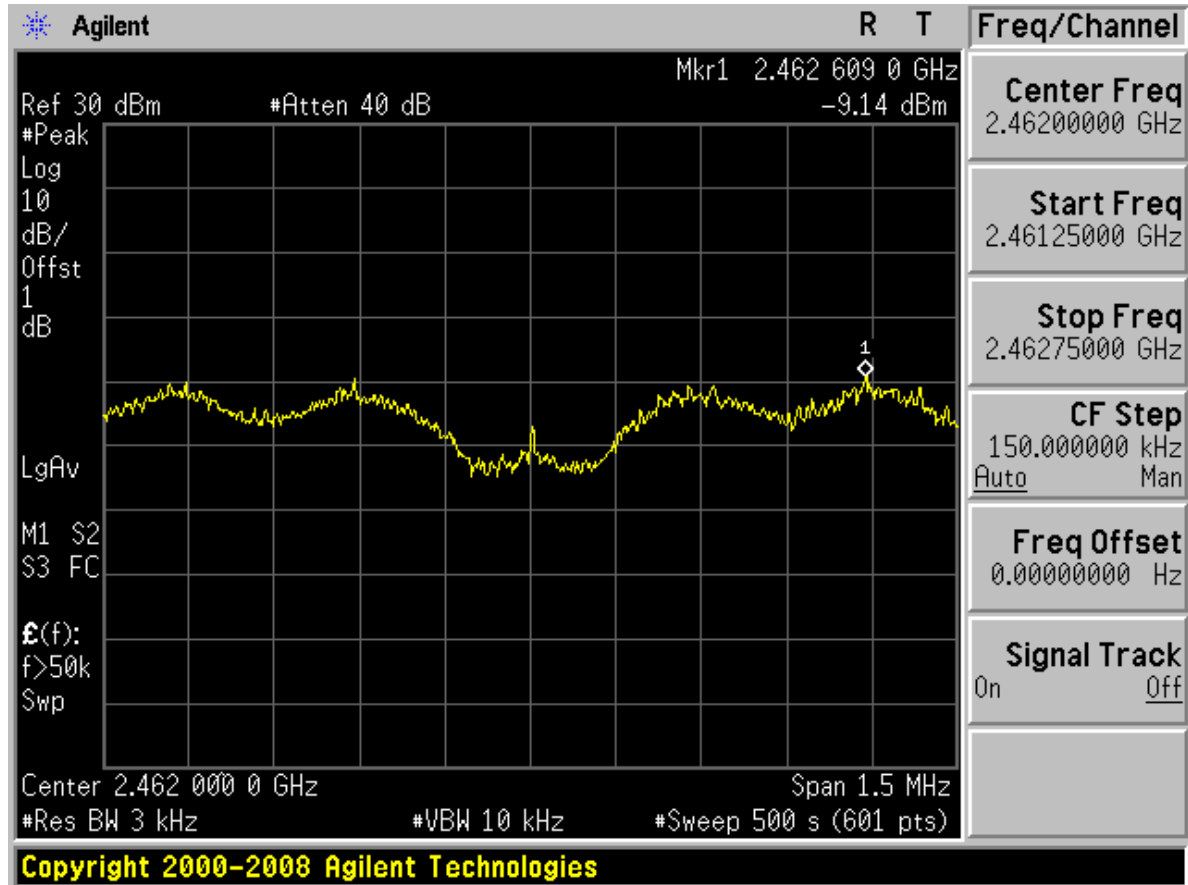
Channel 11

Chain 1



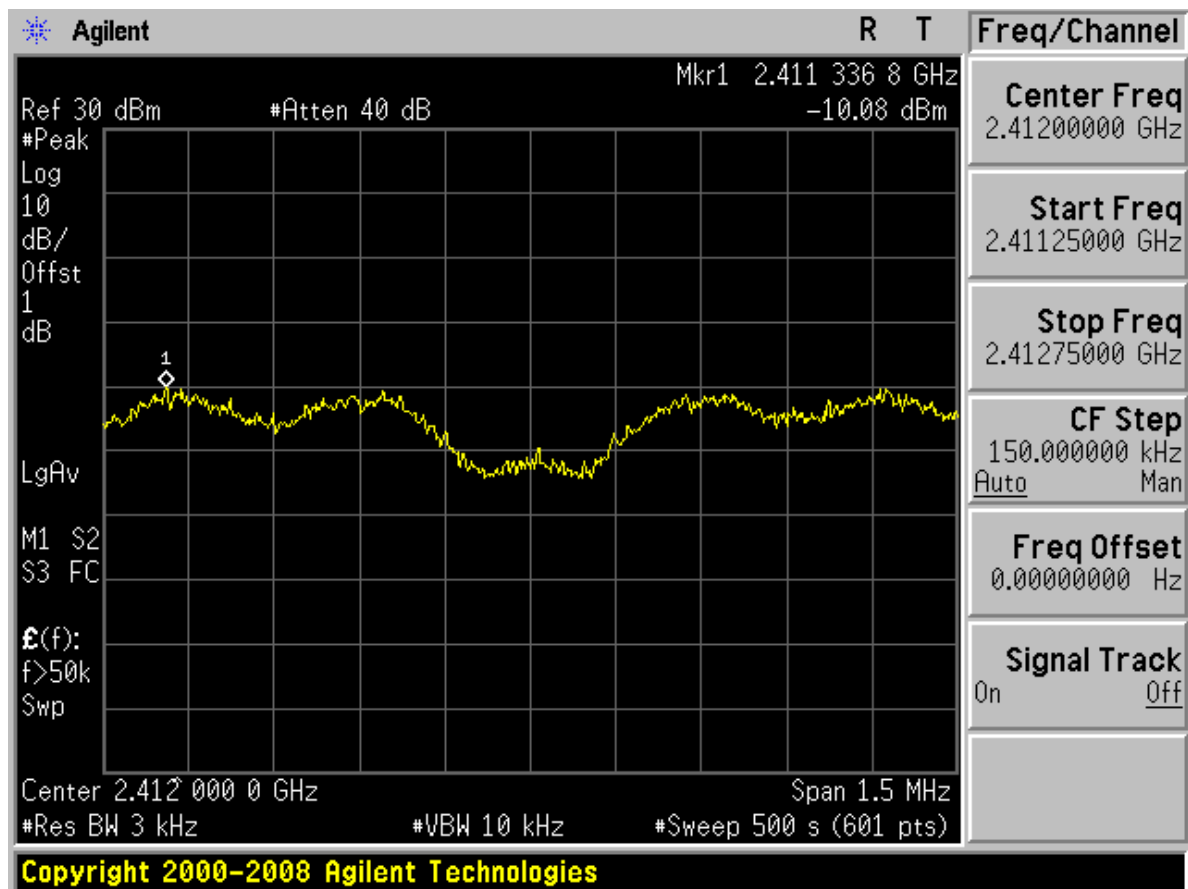


Chain 2



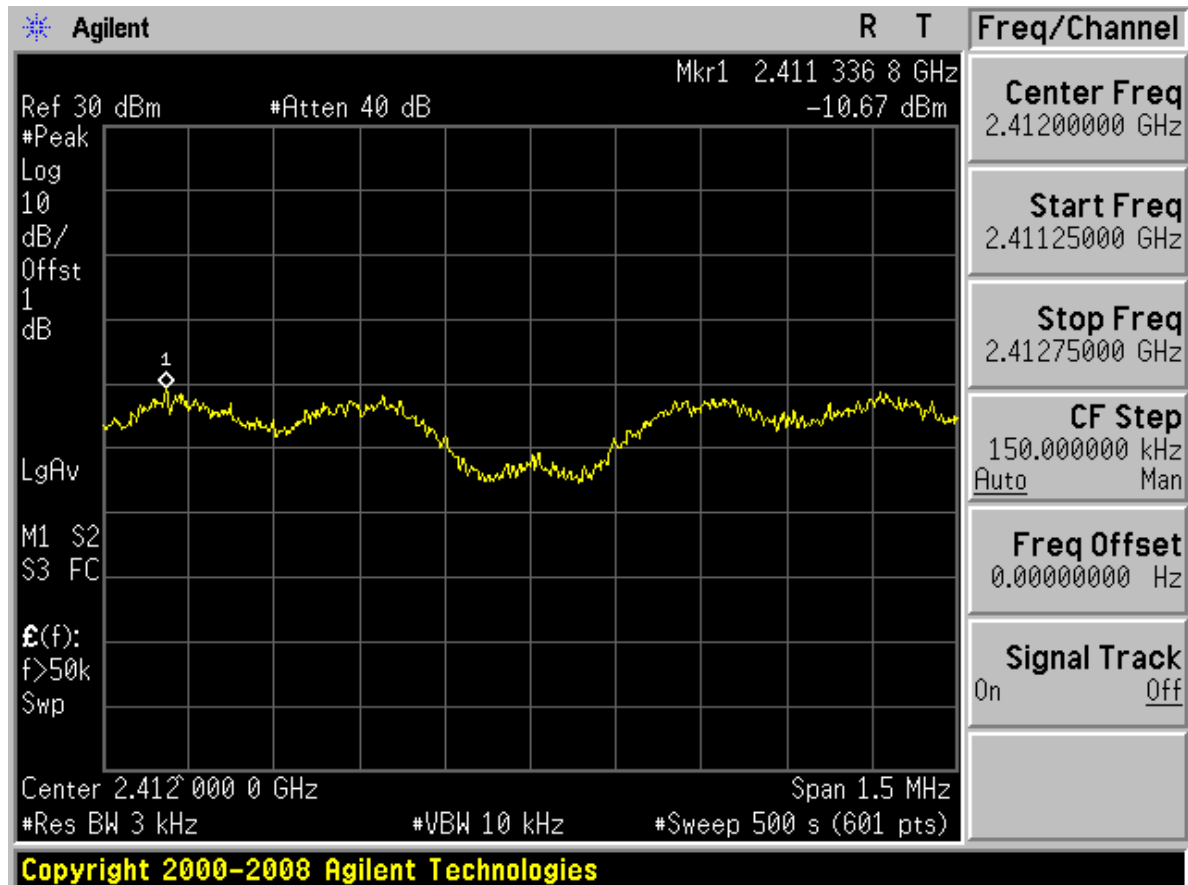


TM3 Chain 1&2 Channel 01 Chain 1



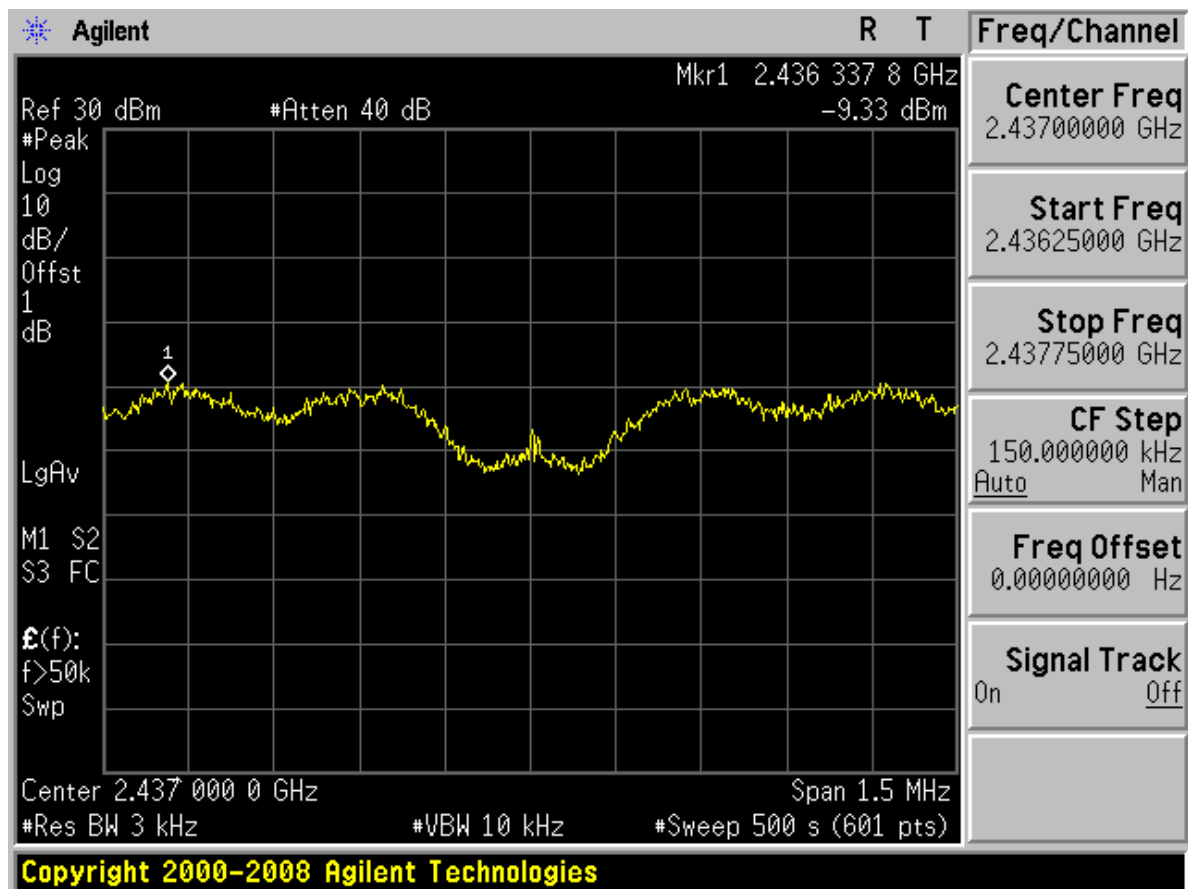


Chain 2



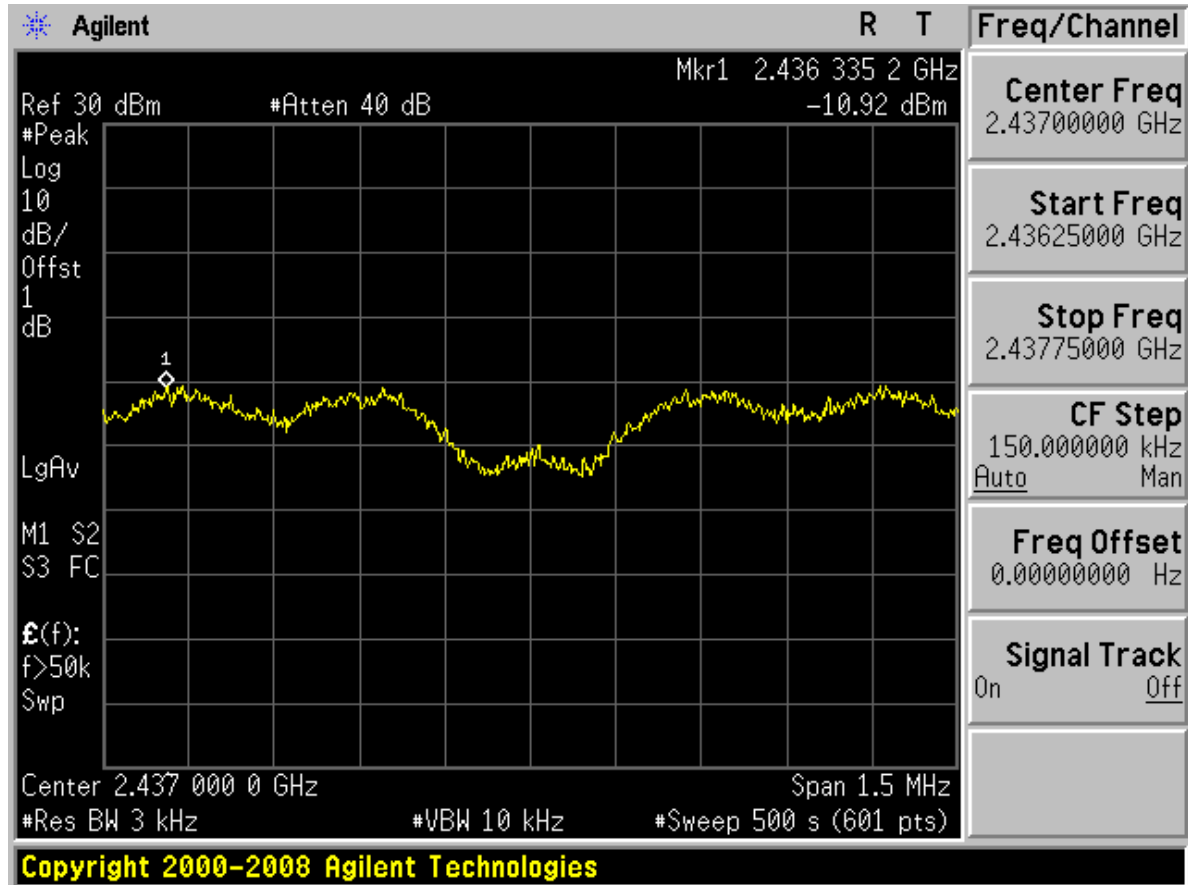


Channel 06 Chain 1



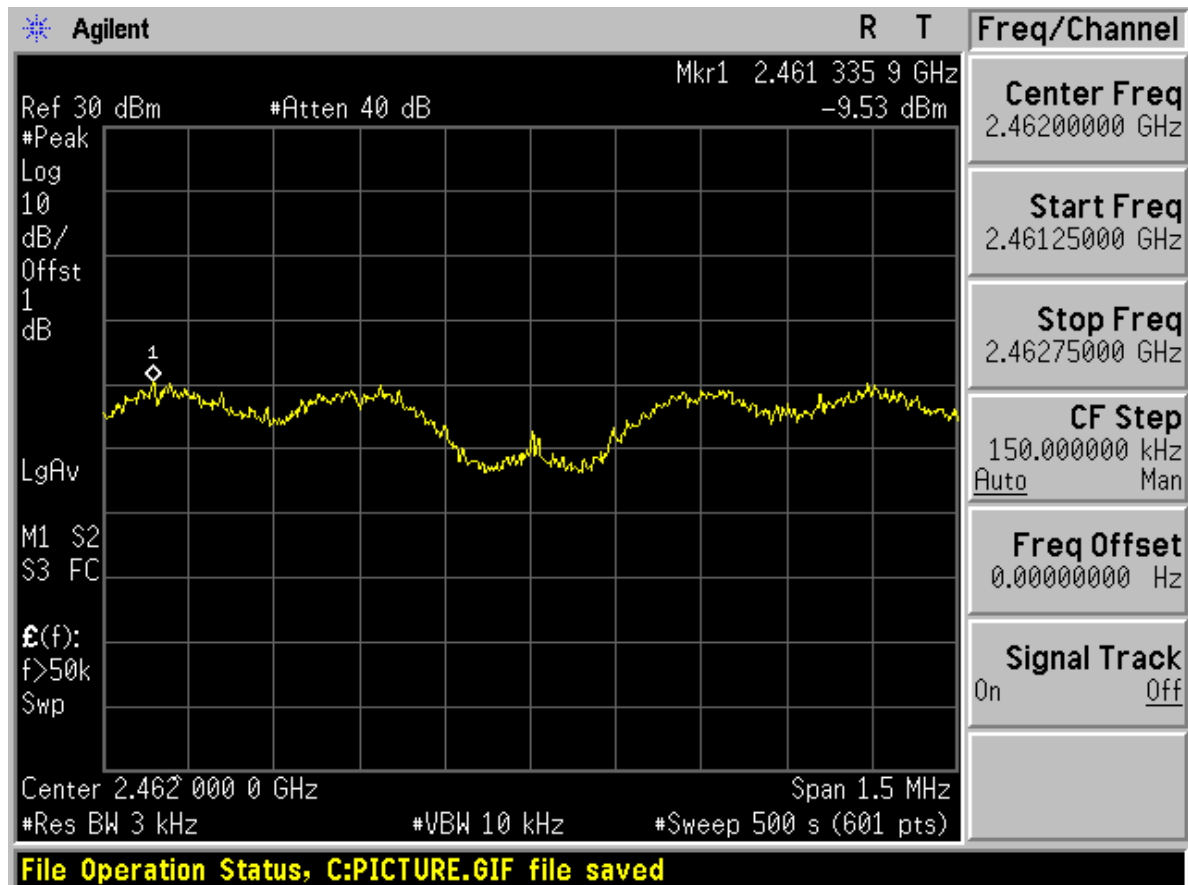


Chain 2



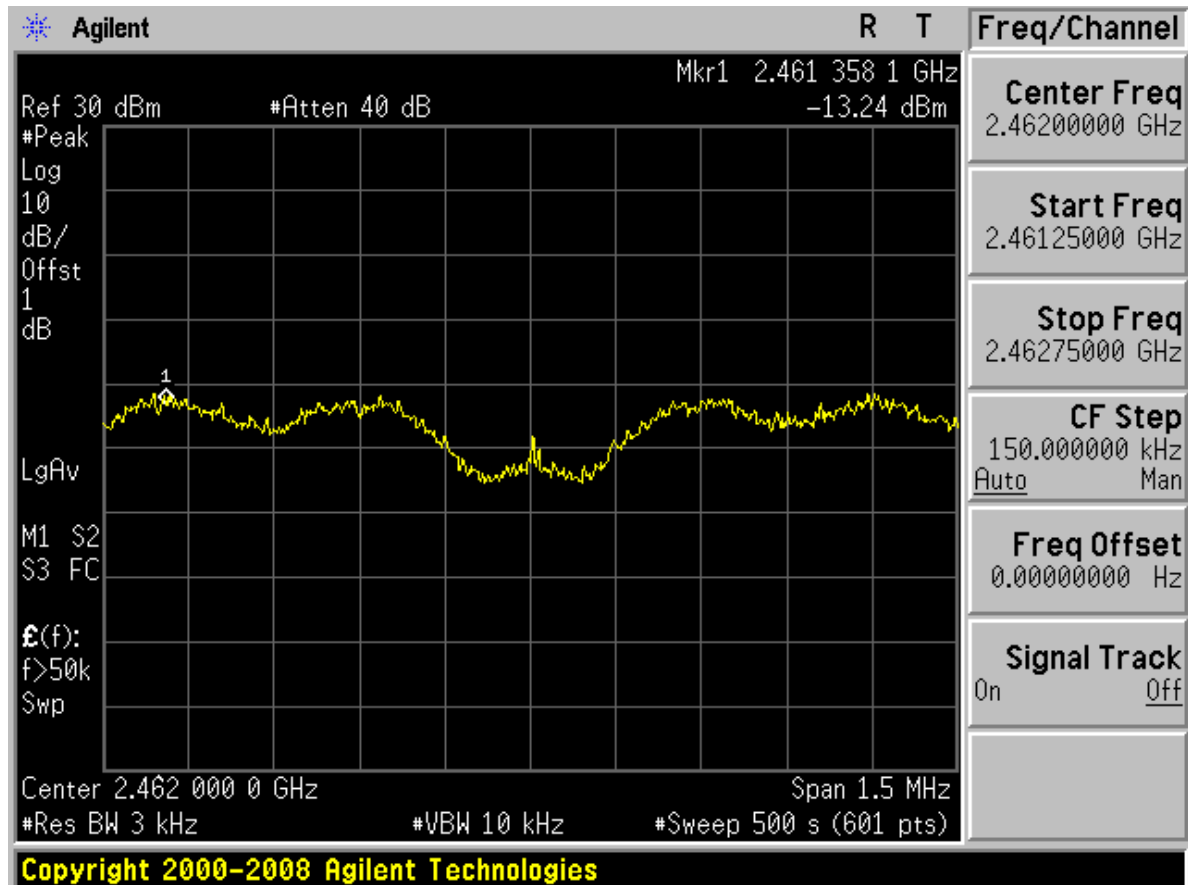


Channel 11 Chain 1





Chain 2

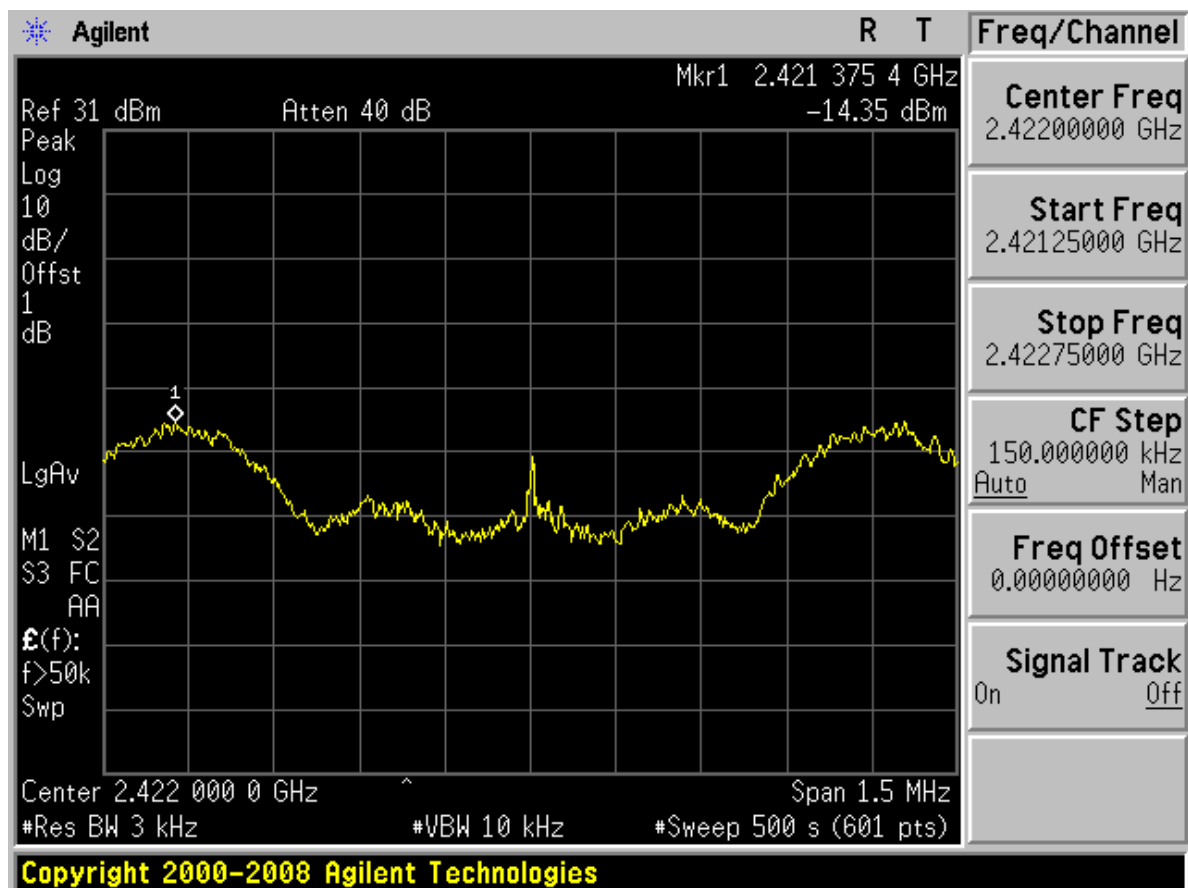




TM4 Chain 1&2

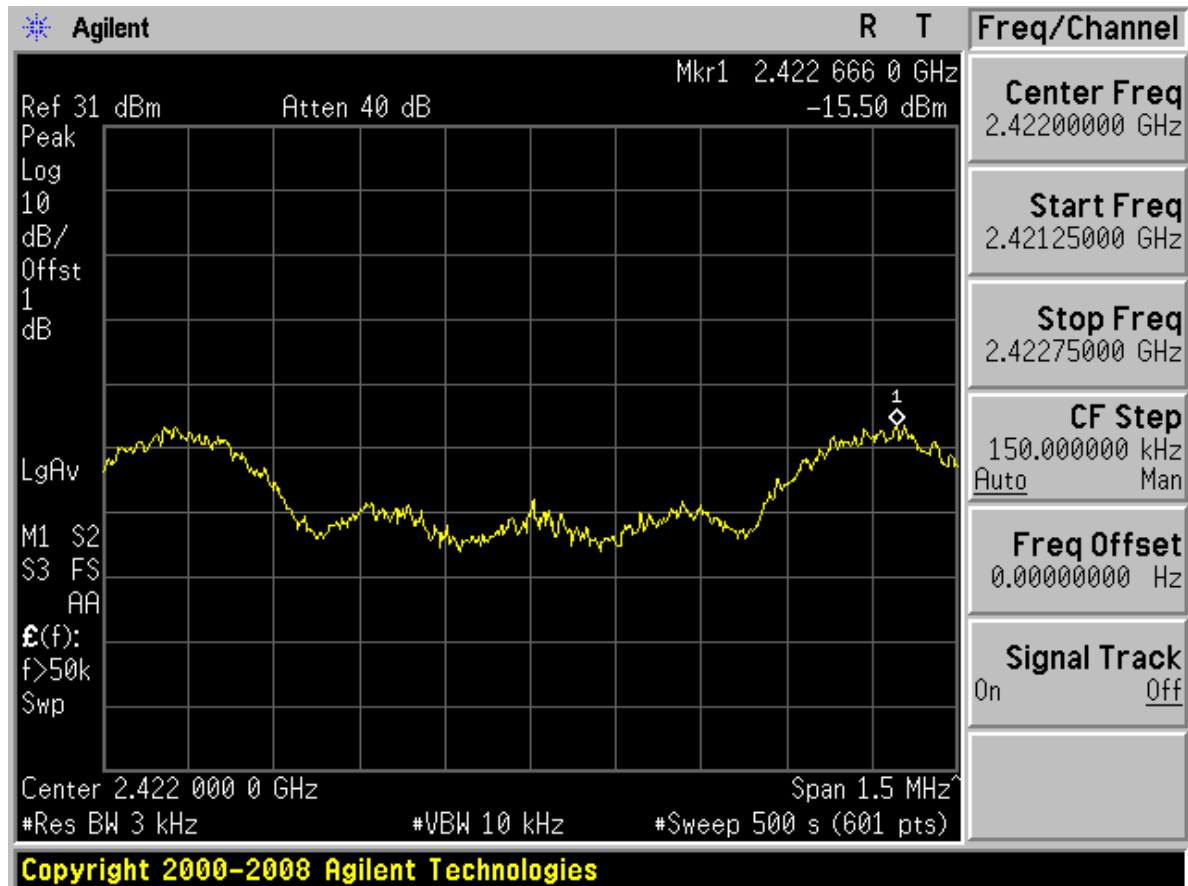
Channel 03

Chain 1





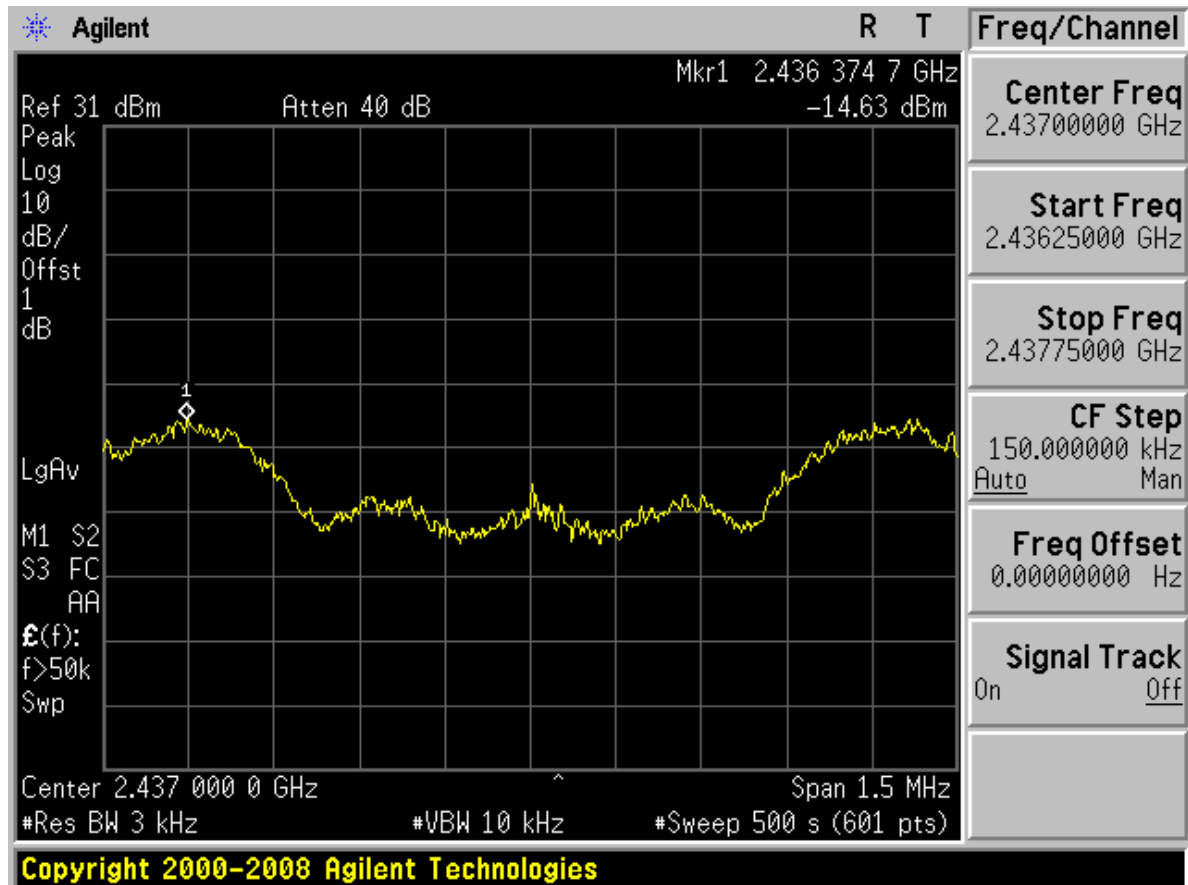
Chain 2





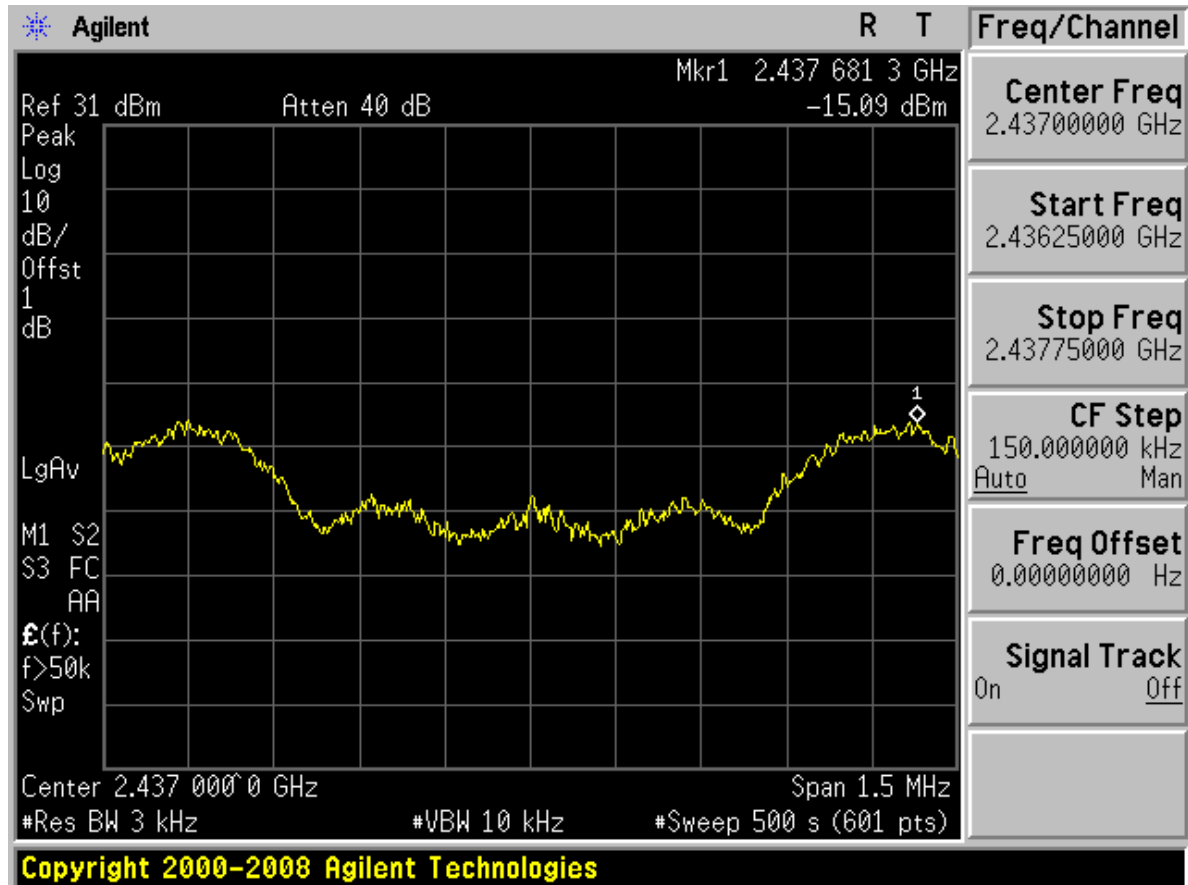
Channel 06

Chain 1





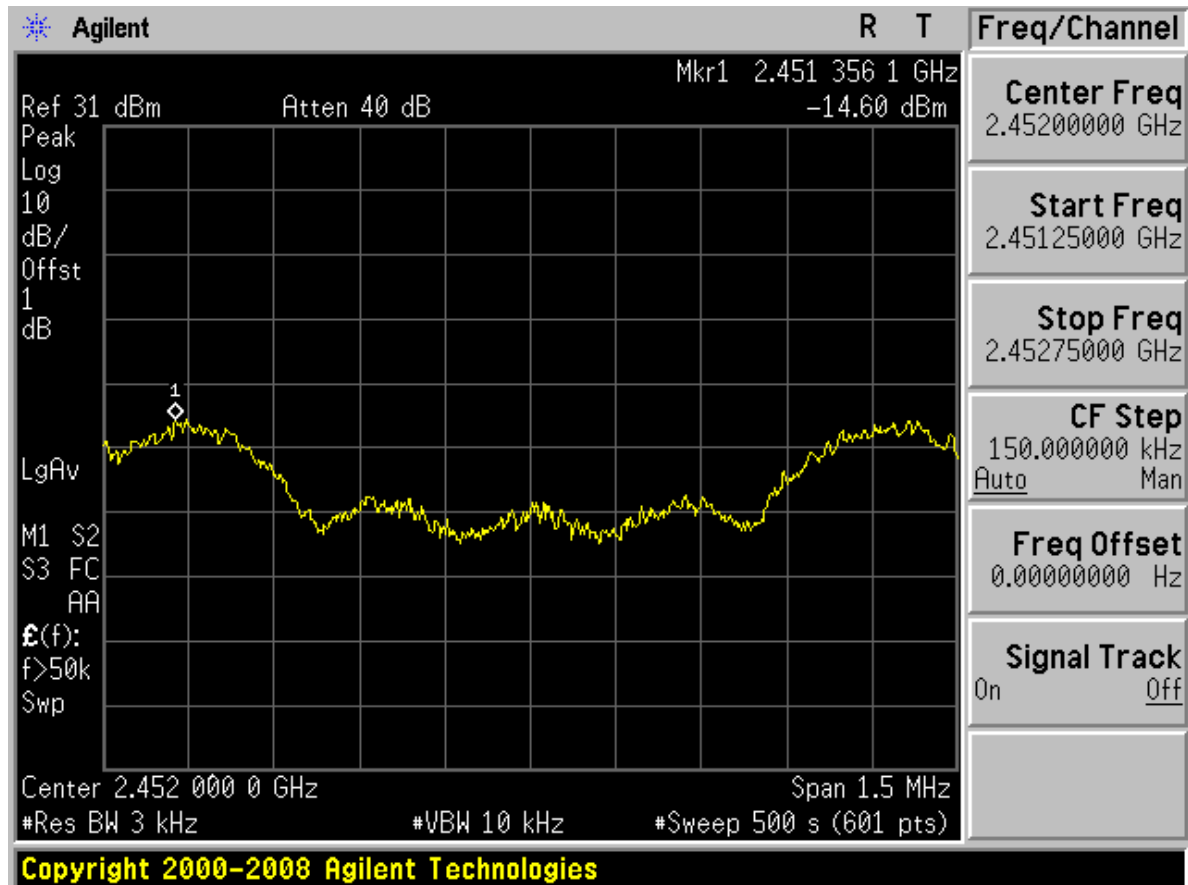
Chain 2





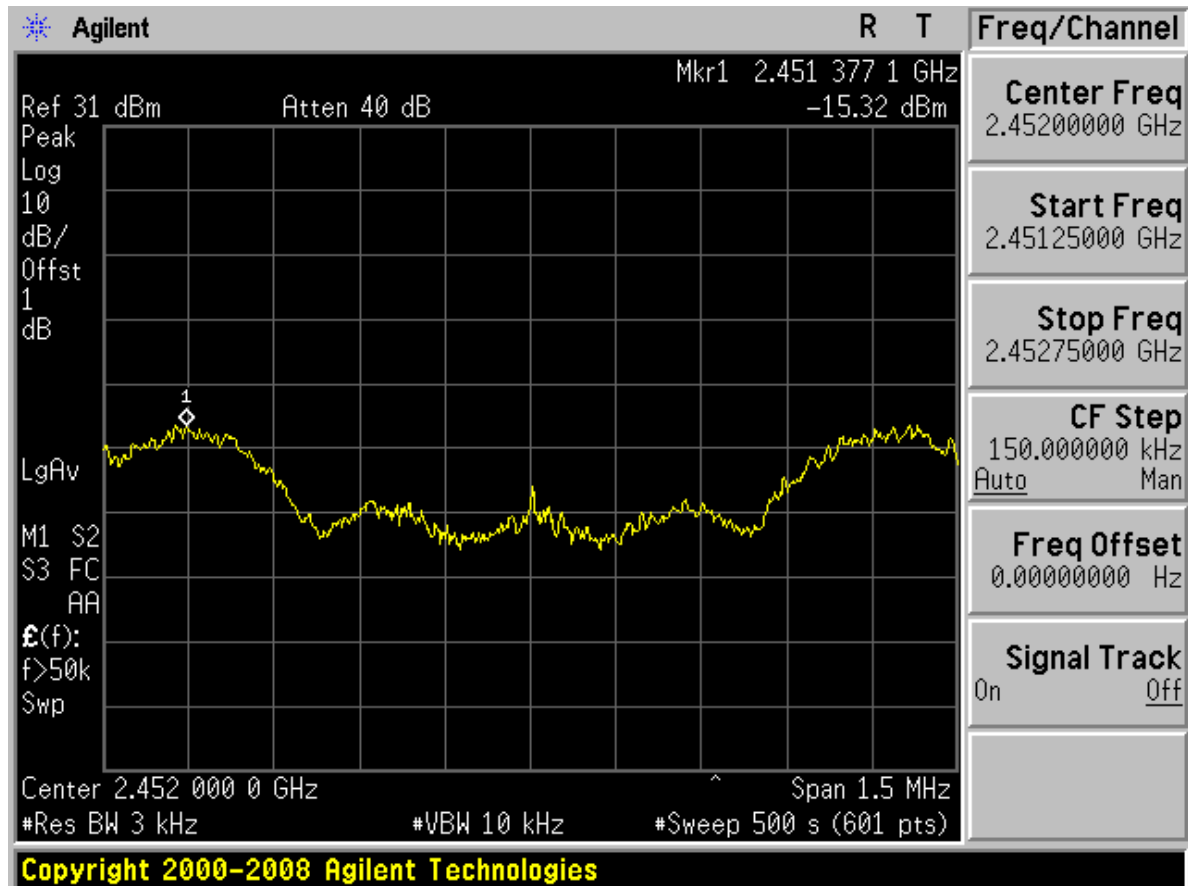
Channel 09

Chain 1



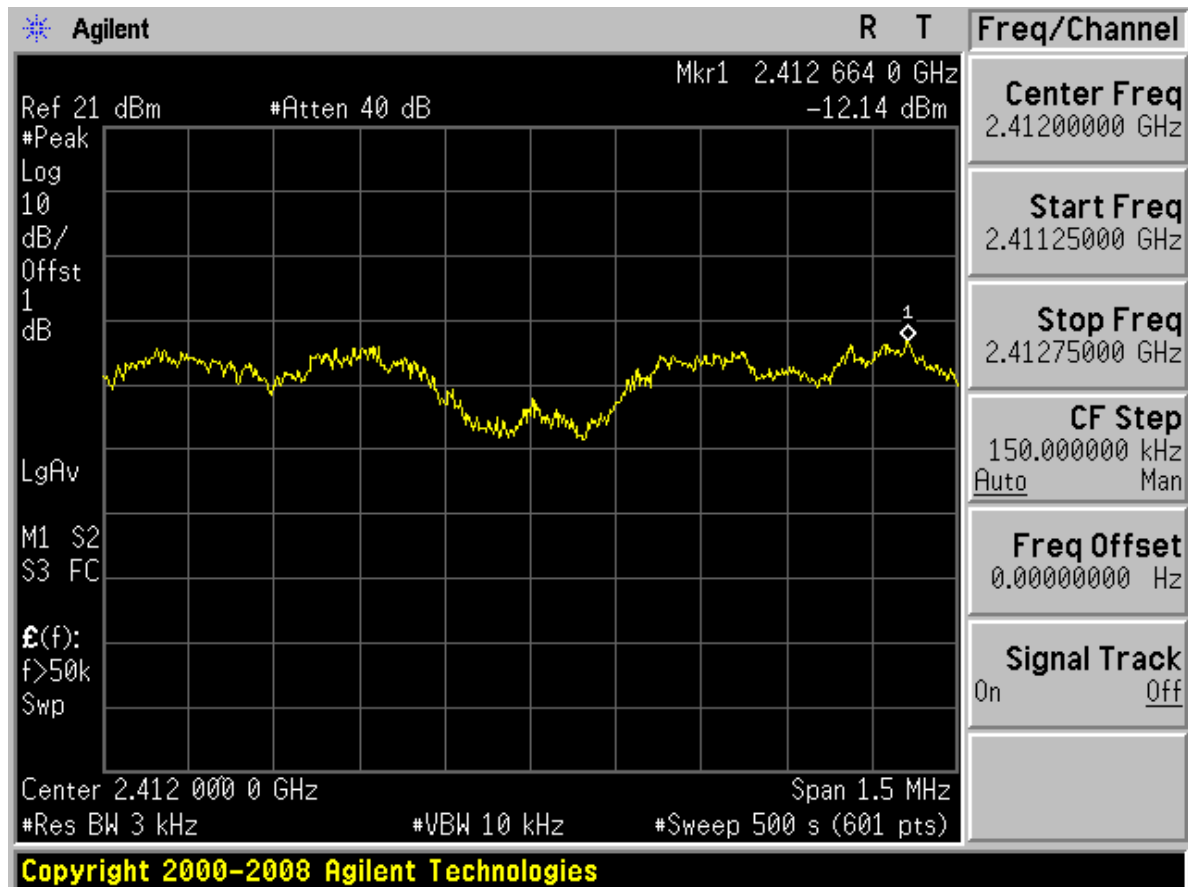


Chain 2



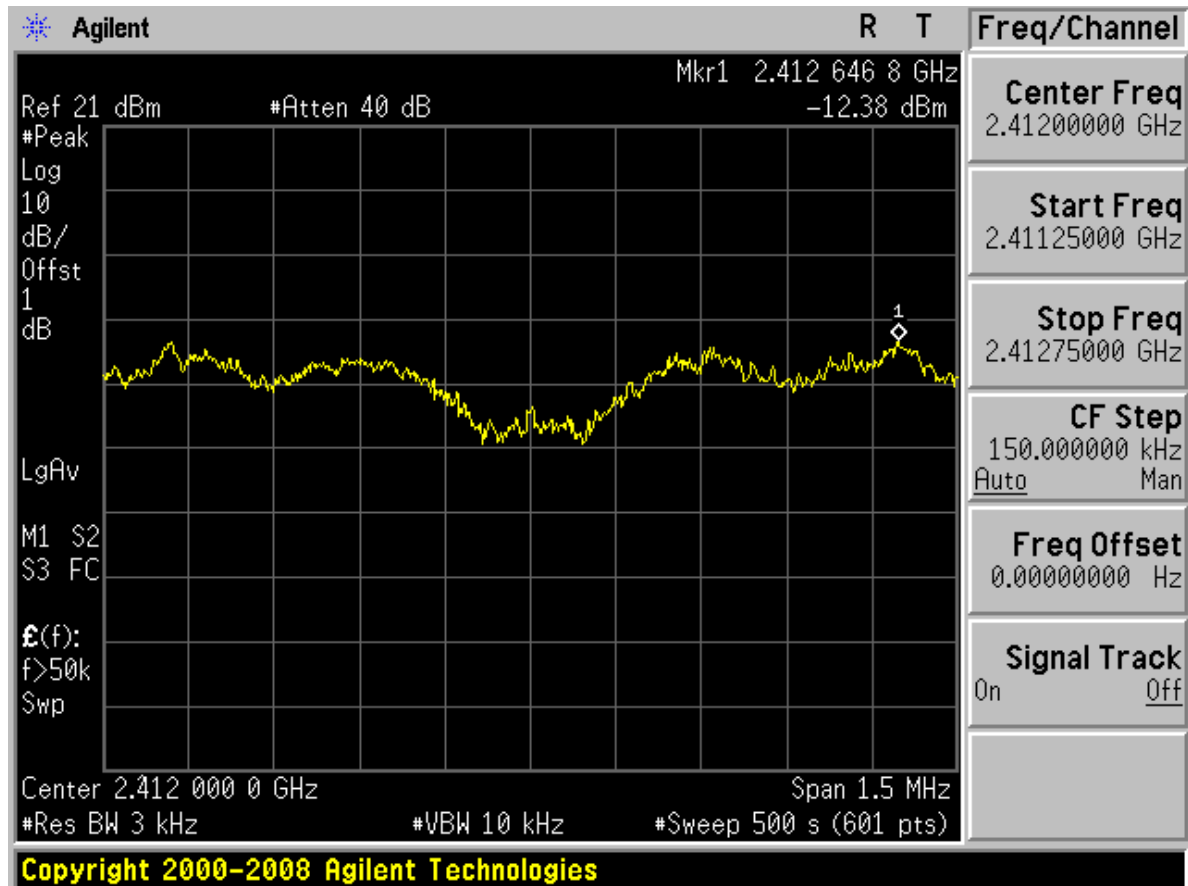


TM5 Chain 1&2 Channel 01 Chain 1



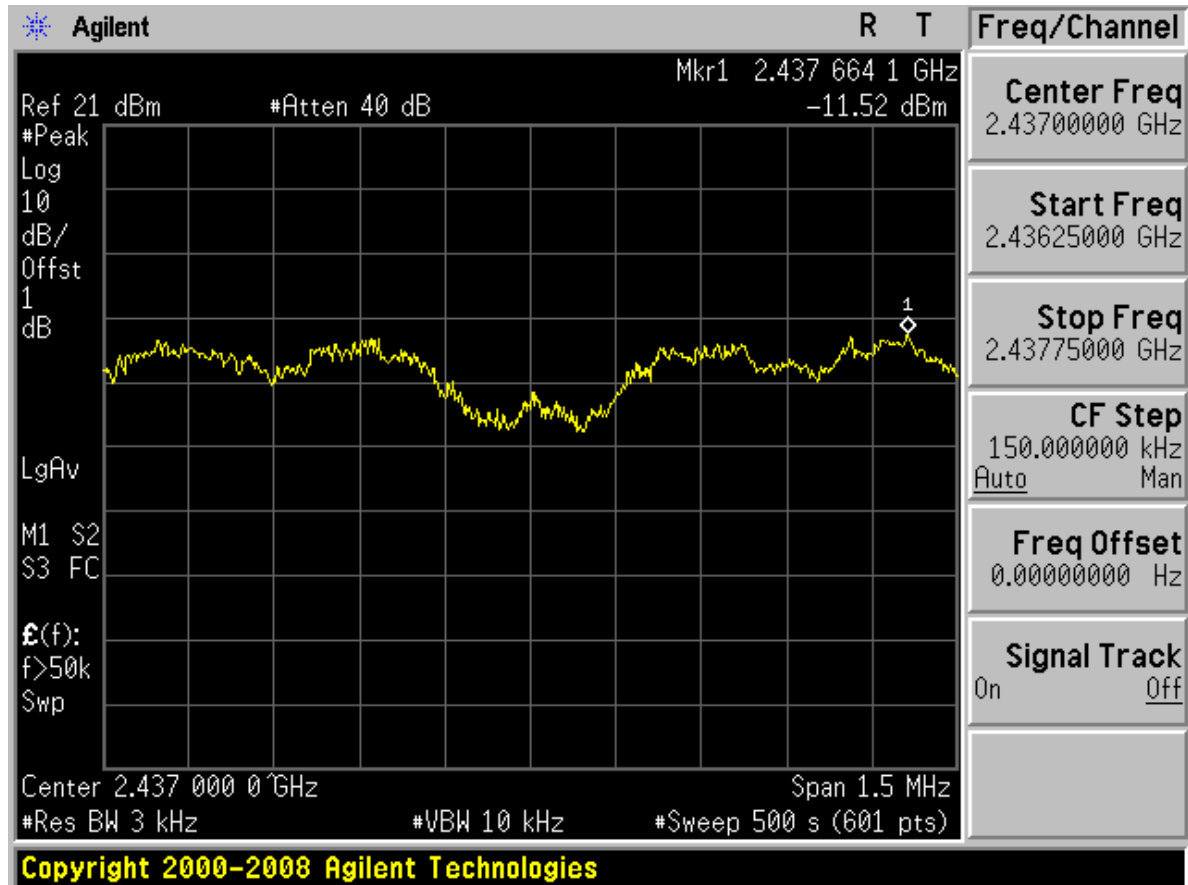


Chain 2



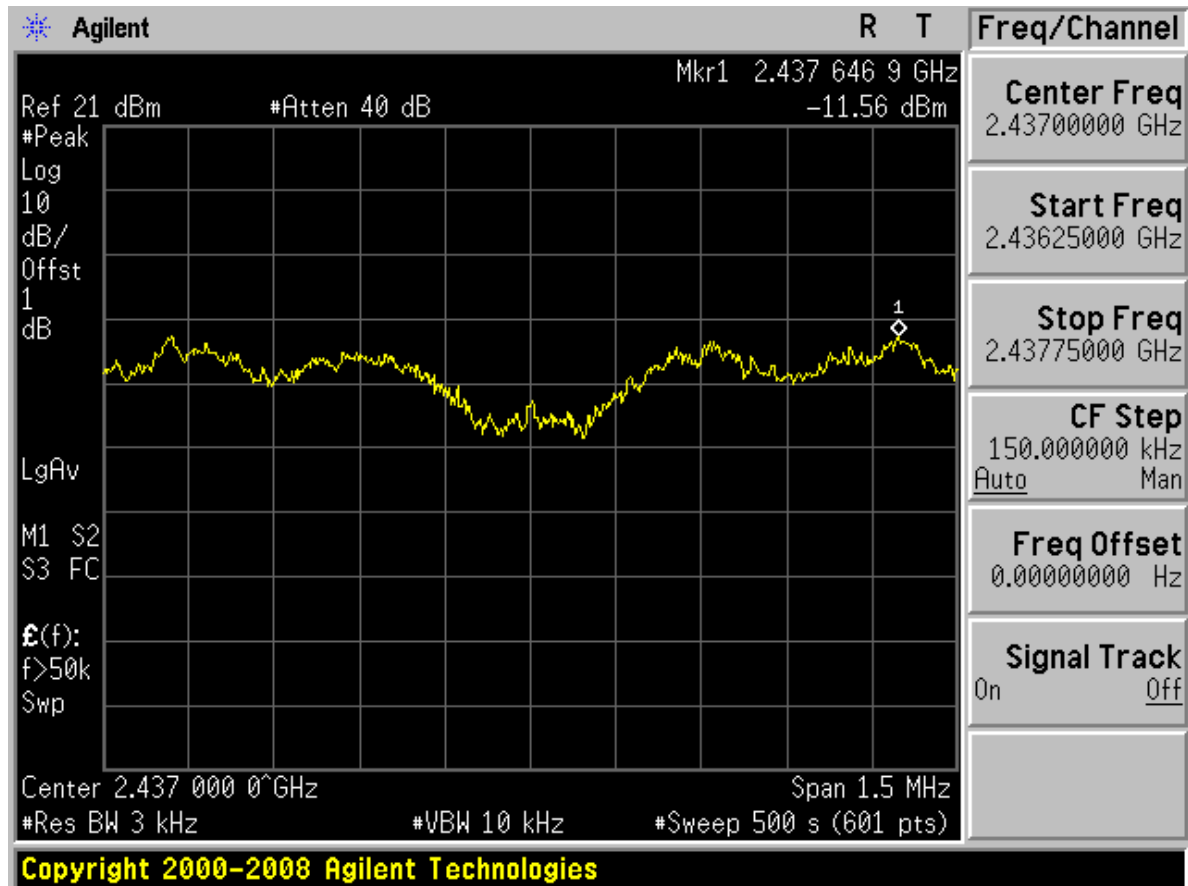


Channel 06 Chain 1



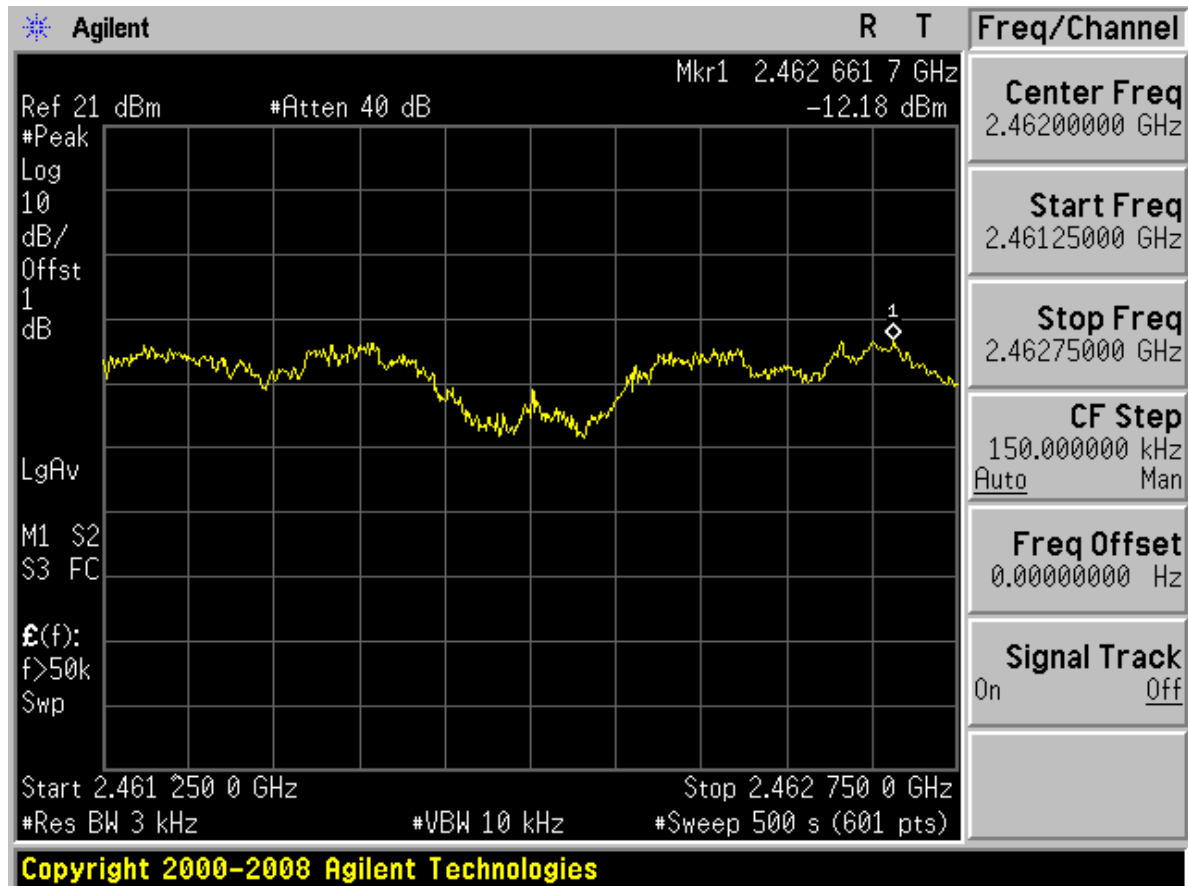


Chain 2



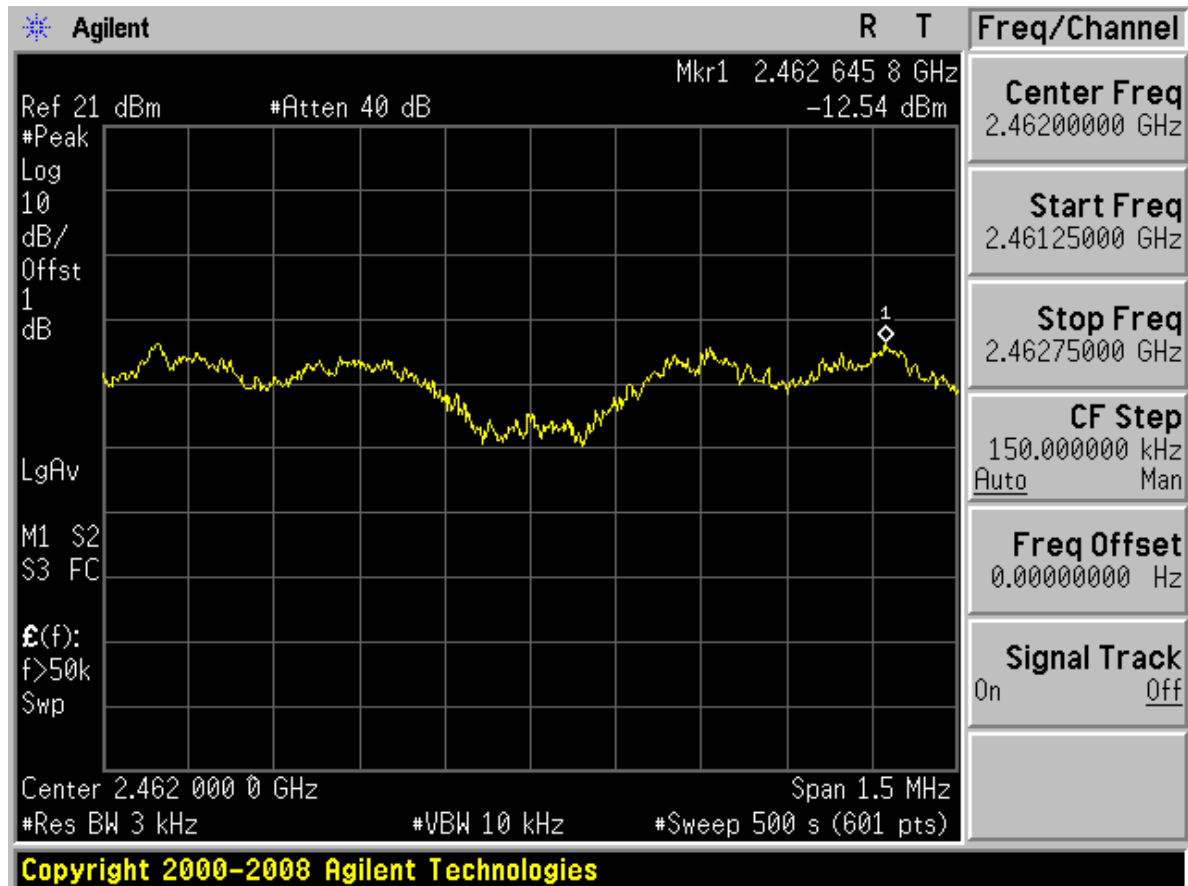


Channel 11 Chain 1



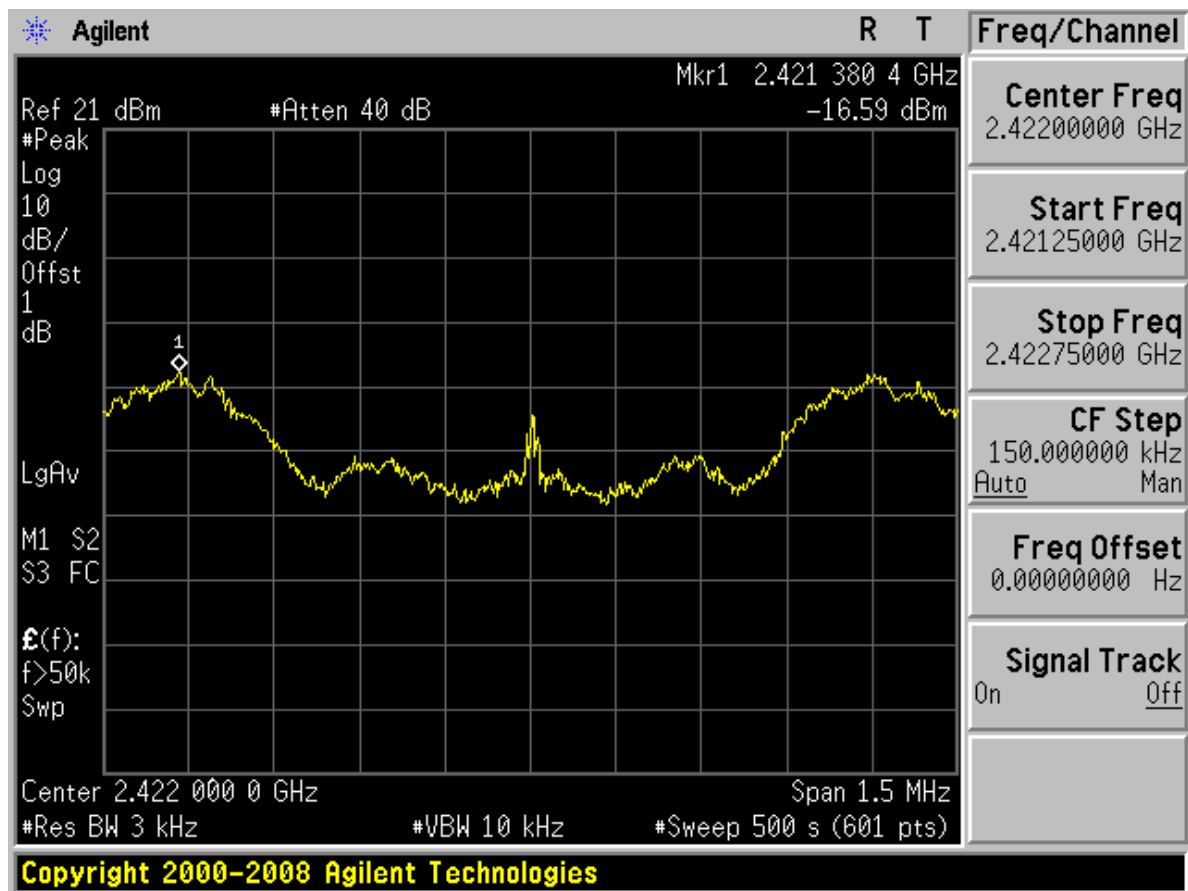


Chain 2



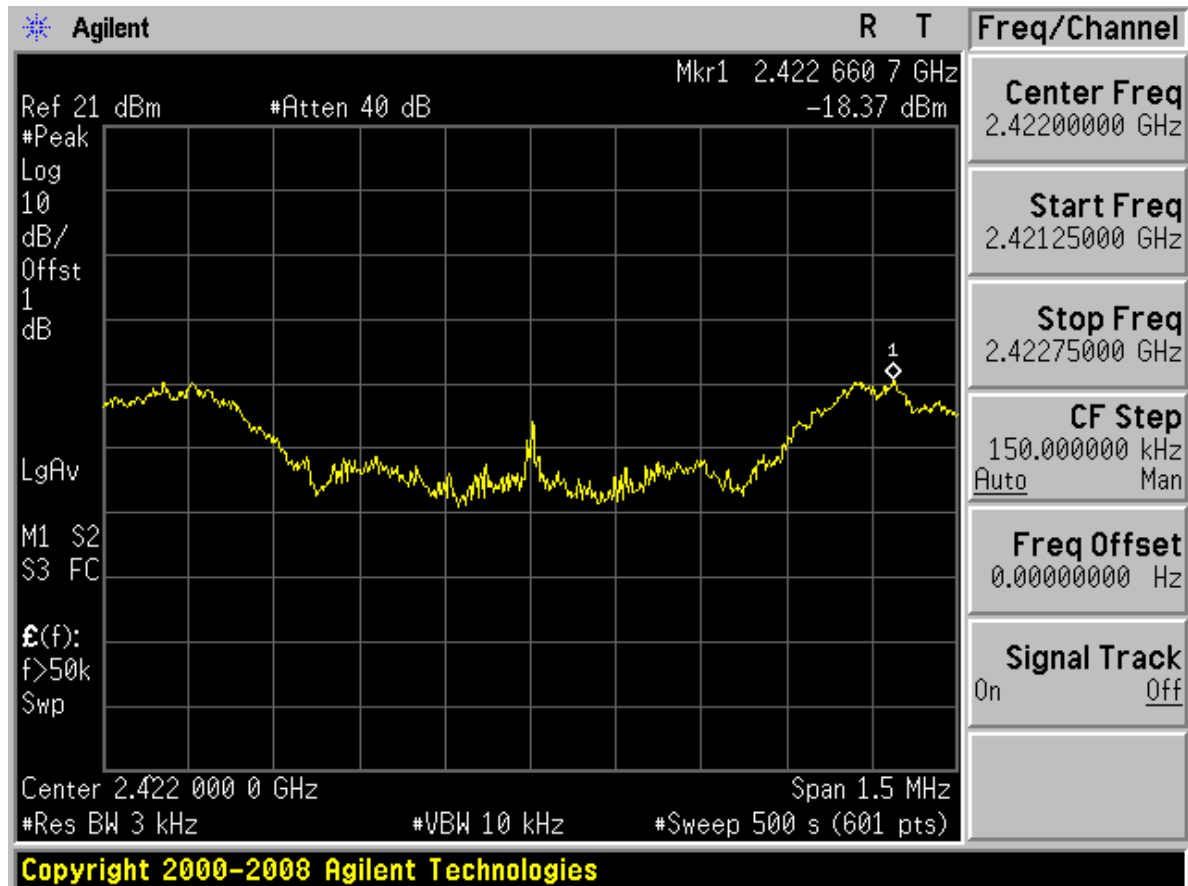


TM6 Chain 1&2 Channel 03 Chain 1



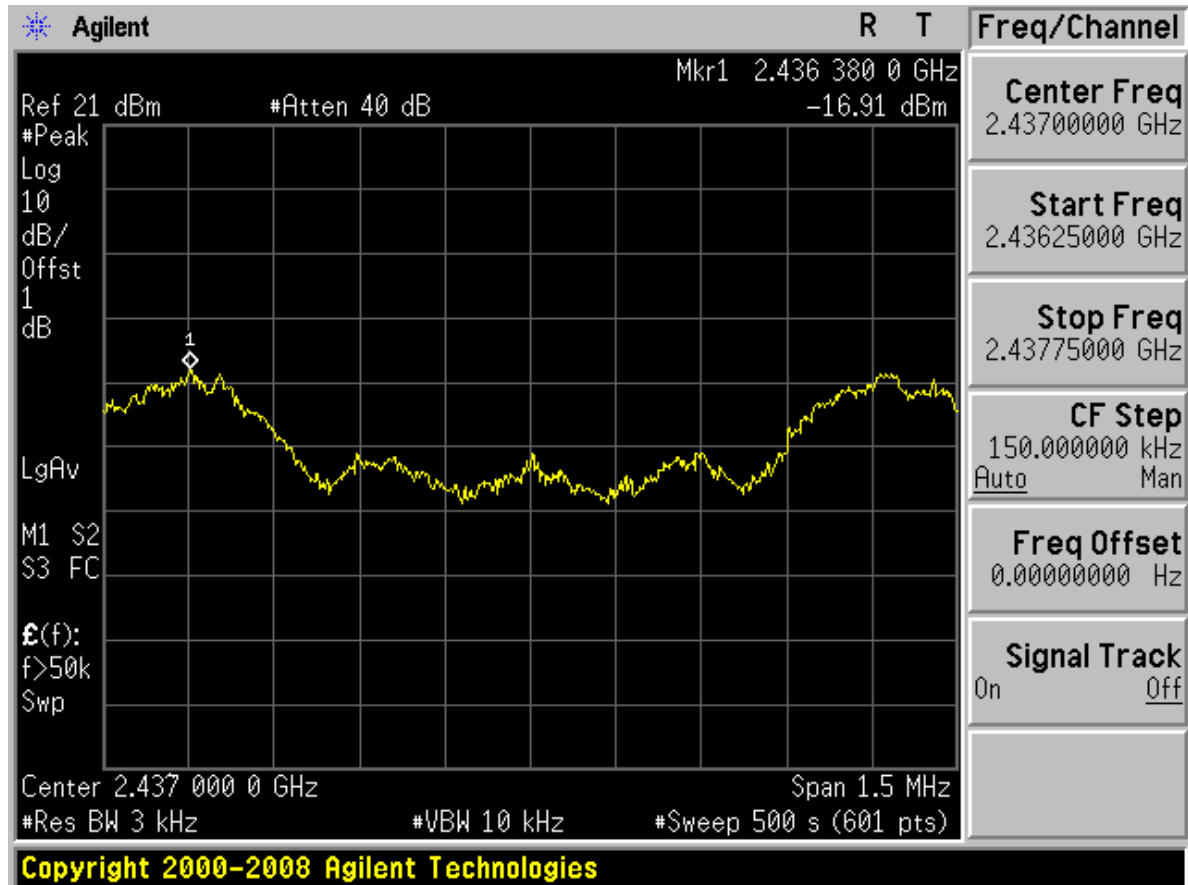


Chain 2



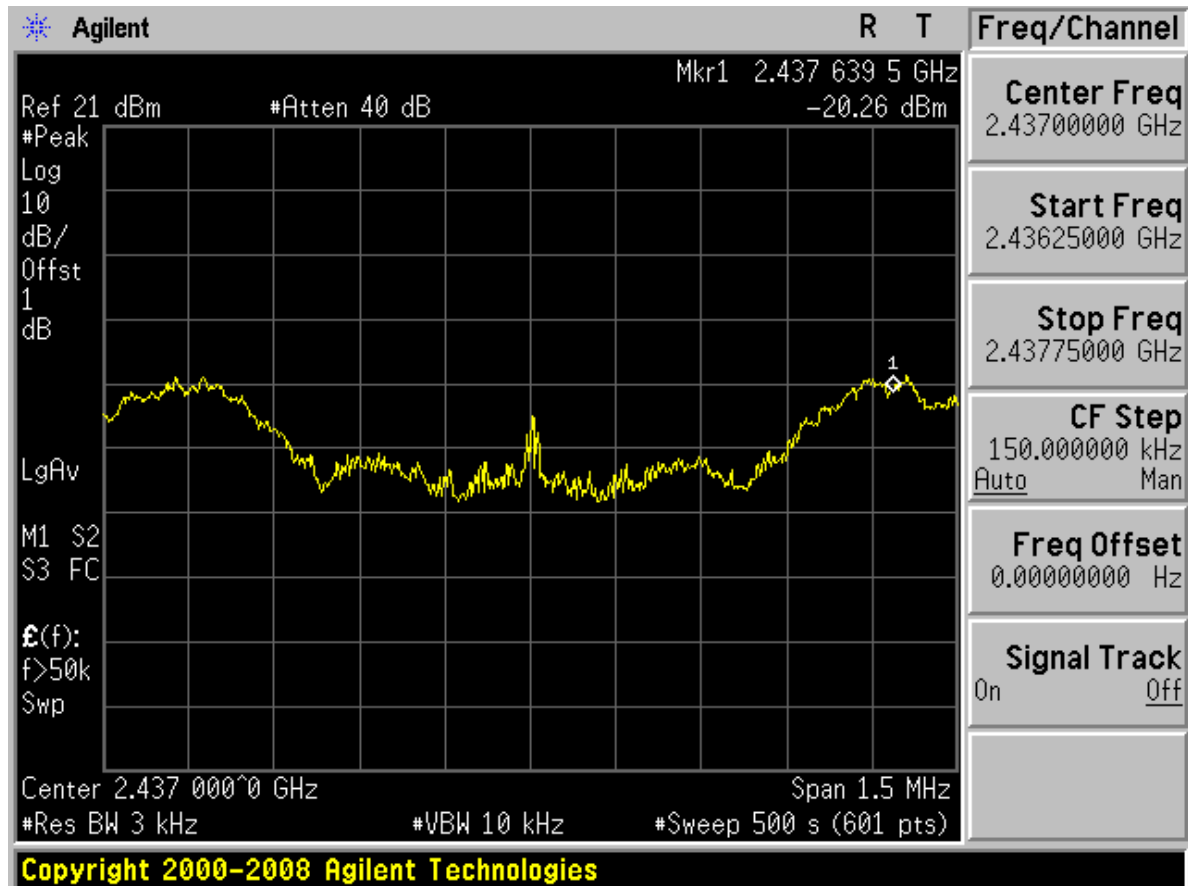


Channel 06 Chain 1



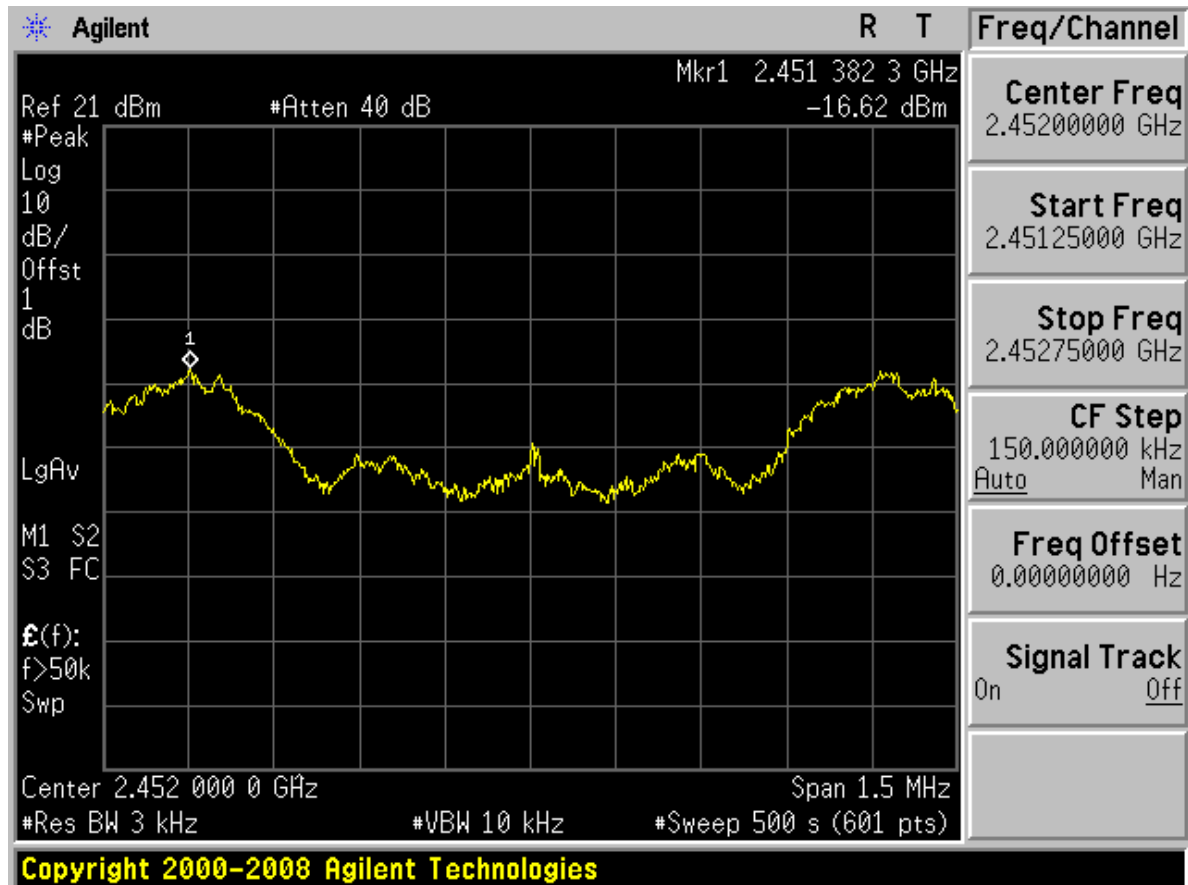


Chain 2



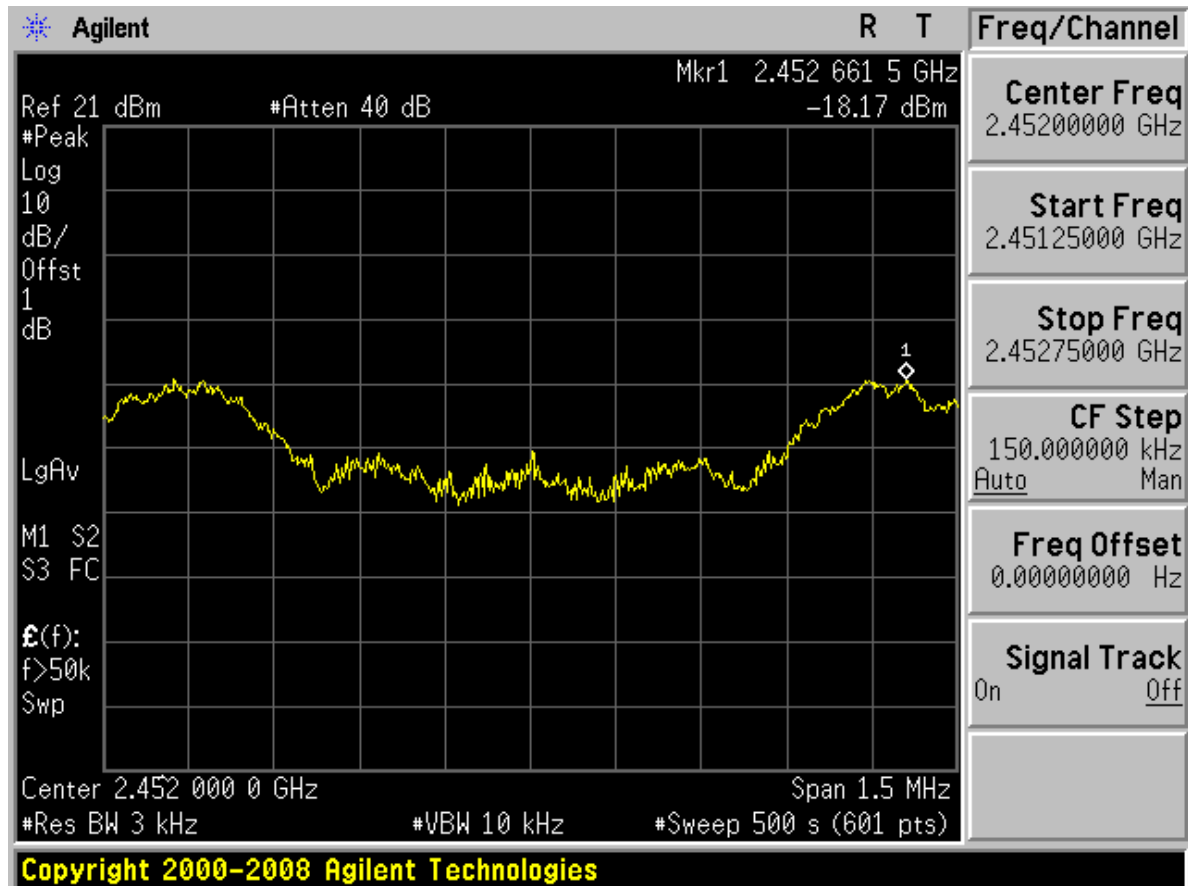


Channel 09 Chain 1





Chain 2



-----The END-----



Appendix F

Radiated Spurious Emission & Spurious in Restricted Band

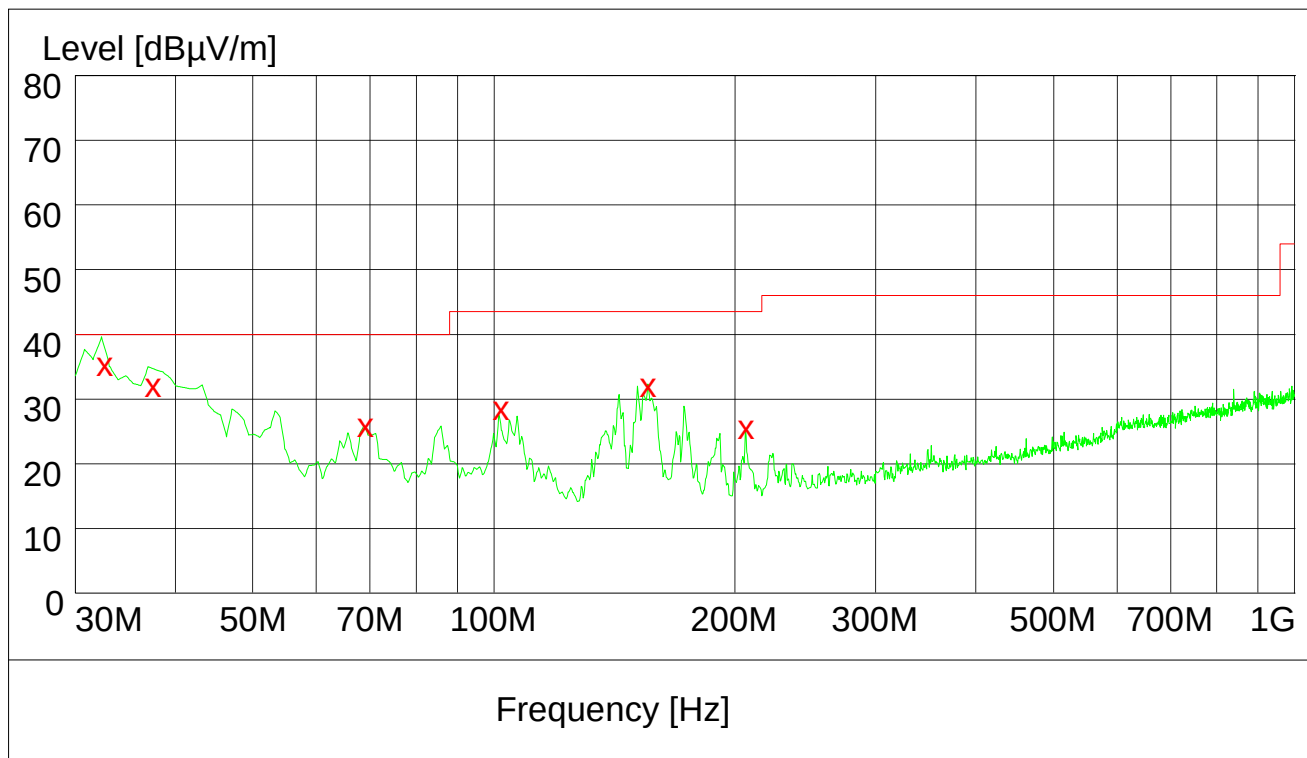
According to FCC Part 15.247(d) & 15.205 & 15.209
& RSS-210



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

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

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



Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Plarization
32.640000	35.80	14.7	40.0	4.2	100.0	359.00	VERTICAL
37.500000	32.50	15.2	40.0	7.5	114.0	341.00	VERTICAL
69.120000	26.60	11.1	40.0	13.4	136.0	85.00	VERTICAL
101.880000	28.00	13.4	43.5	15.5	109.0	263.00	VERTICAL
155.640000	31.90	10.0	43.5	11.6	100.0	84.00	VERTICAL
206.220000	26.30	12.4	43.5	17.2	163.0	326.00	HORIZONTAL



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

Note: No peak found in pre- test.

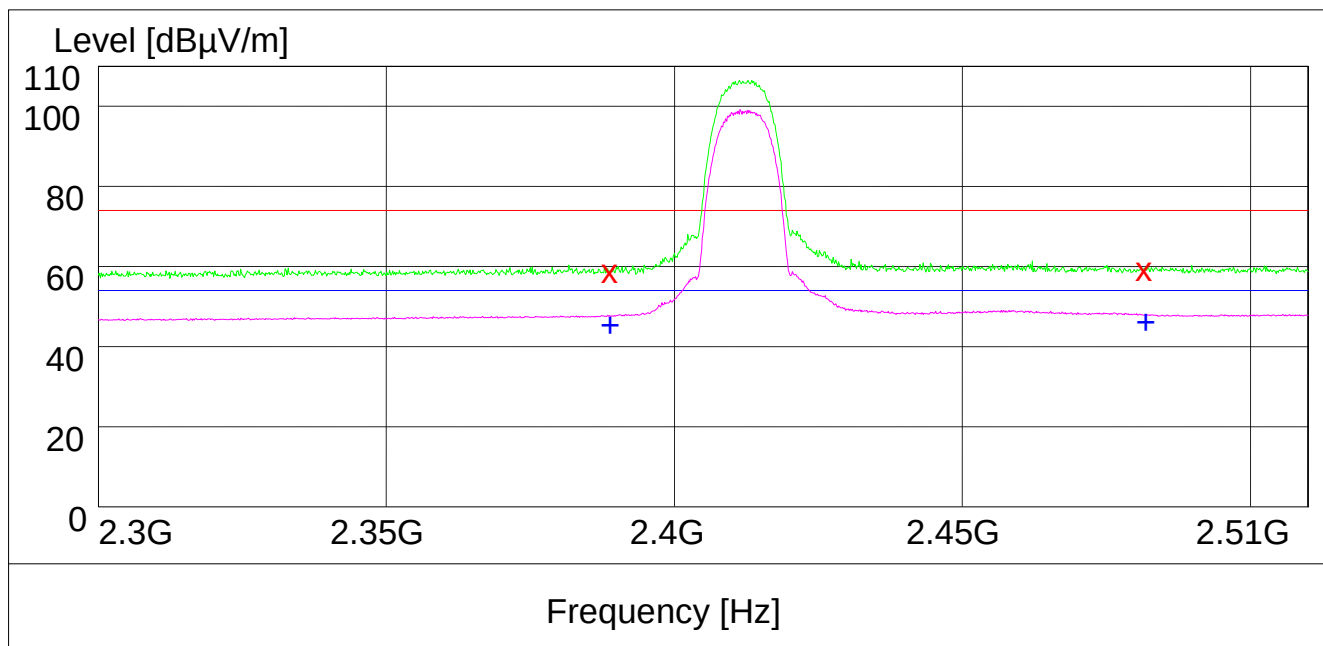


Part 3: Testing Range of “2.3GHz to 2.5GHz”

- 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 dBμV/m) and Average Limit (54 dBμV/m).
- Note 3: The peak spike exceeds the limit line is EUT’s operating frequency.

1 Test Mode: 11b / Chain 1

1.1 Channel 01



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

MEASUREMENT RESULT: PK Detector

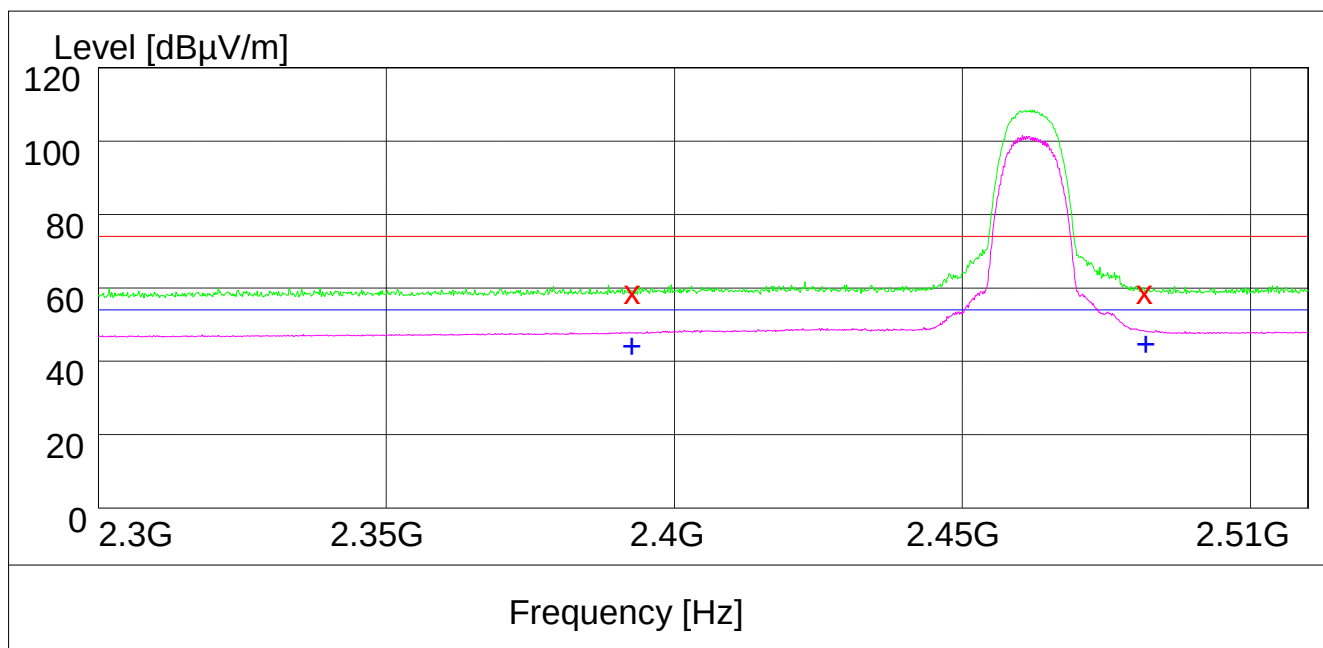
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	59.40	33.5	74.0	14.6	199.0	82.00	HORIZONTAL
2483.500000	59.80	33.7	74.0	14.2	100.0	300.00	VERTICAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	46.80	33.5	54.0	7.2	107.0	95.00	VERTICAL
2483.500000	47.10	33.7	54.0	6.9	126.0	301.00	HORIZONTAL



1.2 Channel 11



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

MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	59.70	33.5	74.0	14.3	186.0	352.00	HORIZONTAL
2483.500000	59.30	33.7	74.0	14.7	139.0	350.00	HORIZONTAL

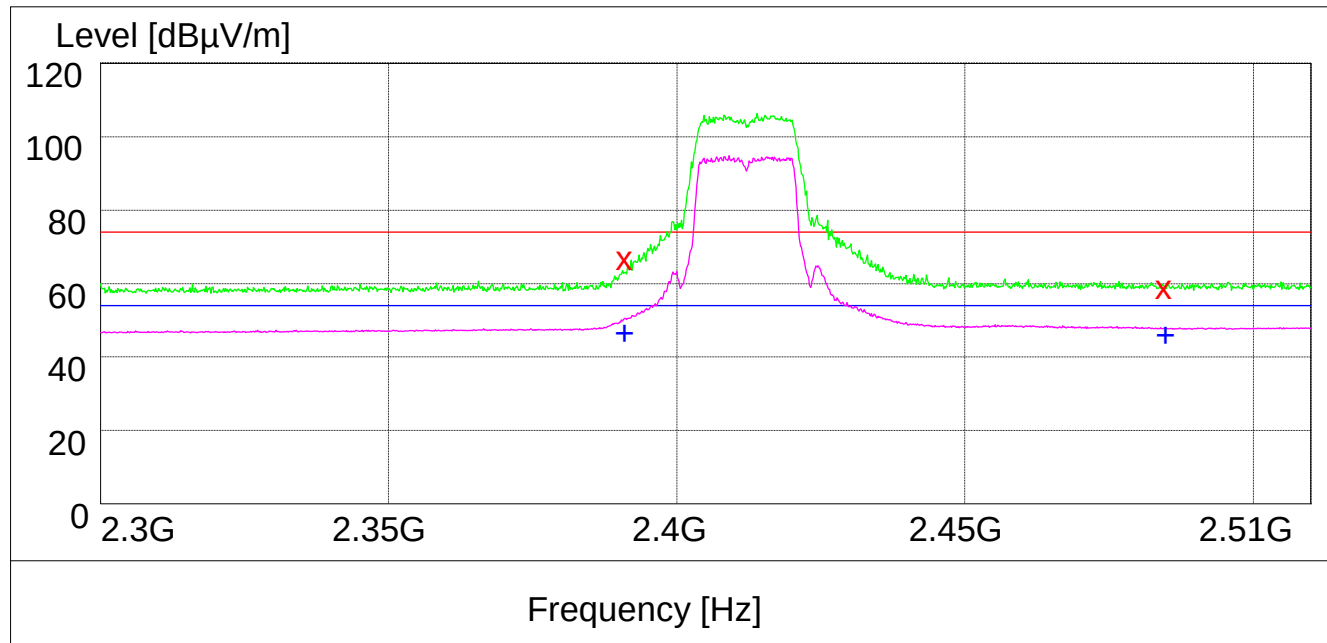
MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	46.90	33.5	54.0	7.1	109.0	42.00	VERTICAL
2483.500000	47.50	33.7	54.0	6.5	100.0	310.00	HORIZONTAL



2 Test Mode: 11g / Chain 1

2.1 Channel 01



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

MEASUREMENT RESULT: PK Detector

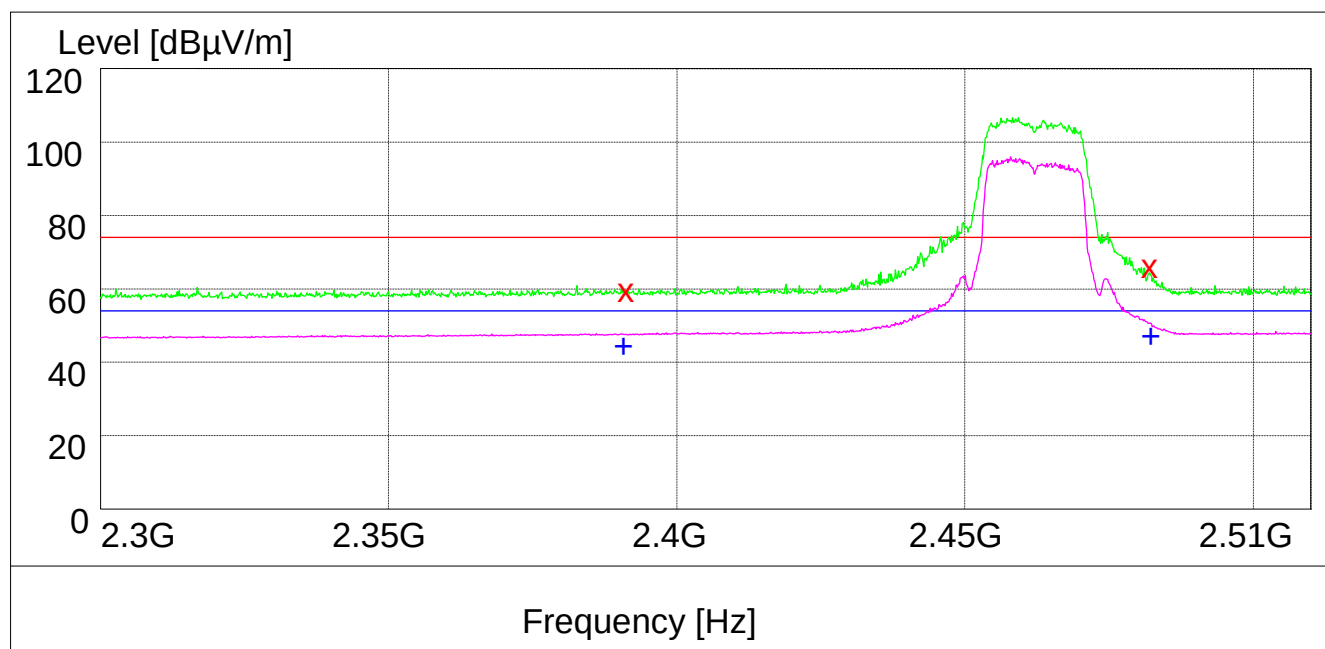
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	69.00	33.5	74.0	5.0	105.0	359.00	HORIZONTAL
2483.500000	59.40	33.7	74.0	14.6	100.0	195.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	48.80	33.5	54.0	5.2	105.0	353.00	HORIZONTAL
2483.500000	46.60	33.7	54.0	7.4	153.0	254.00	HORIZONTAL



2.2 Channel 11



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

MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	59.60	33.5	74.0	14.4	199.0	103.00	HORIZONTAL
2483.500000	66.30	33.7	74.0	7.7	105.0	70.00	VERTICAL

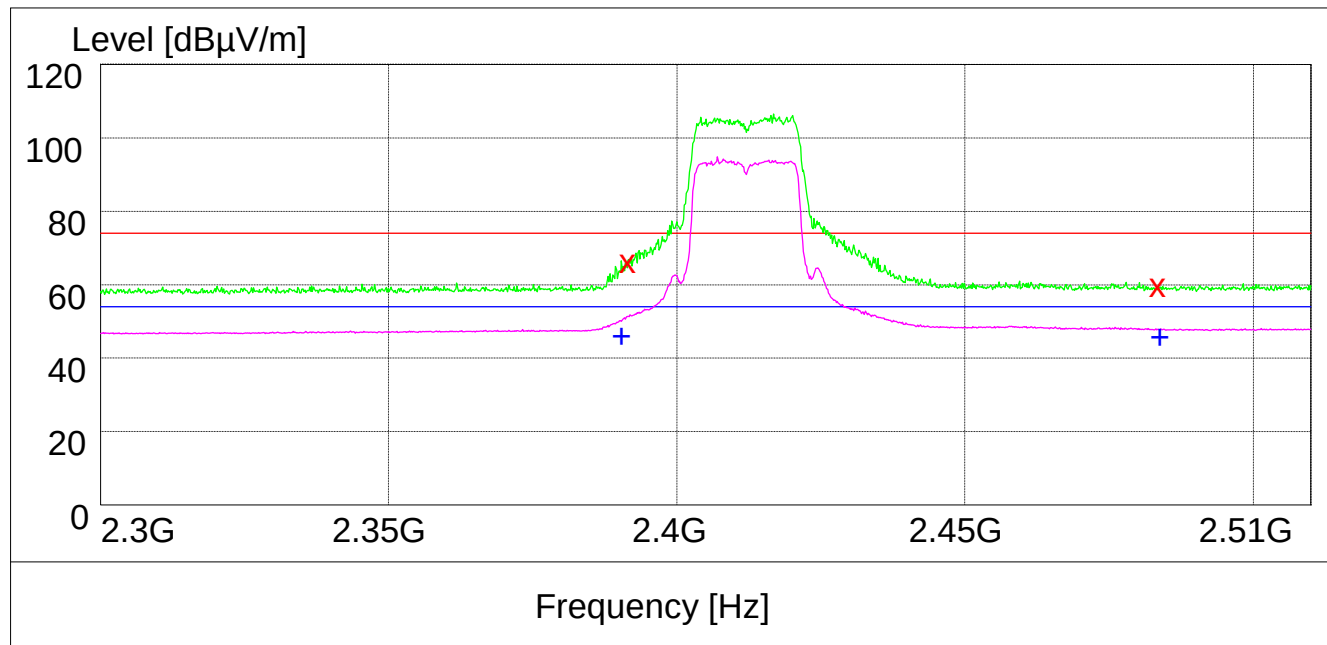
MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	46.60	33.5	54.0	7.4	102.0	358.00	HORIZONTAL
2483.500000	40.20	33.7	54.0	4.8	102.0	310.00	HORIZONTAL



3 Test Mode: 11n20 / Chain 1

3.1 Channel 01



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

MEASUREMENT RESULT: PK Detector

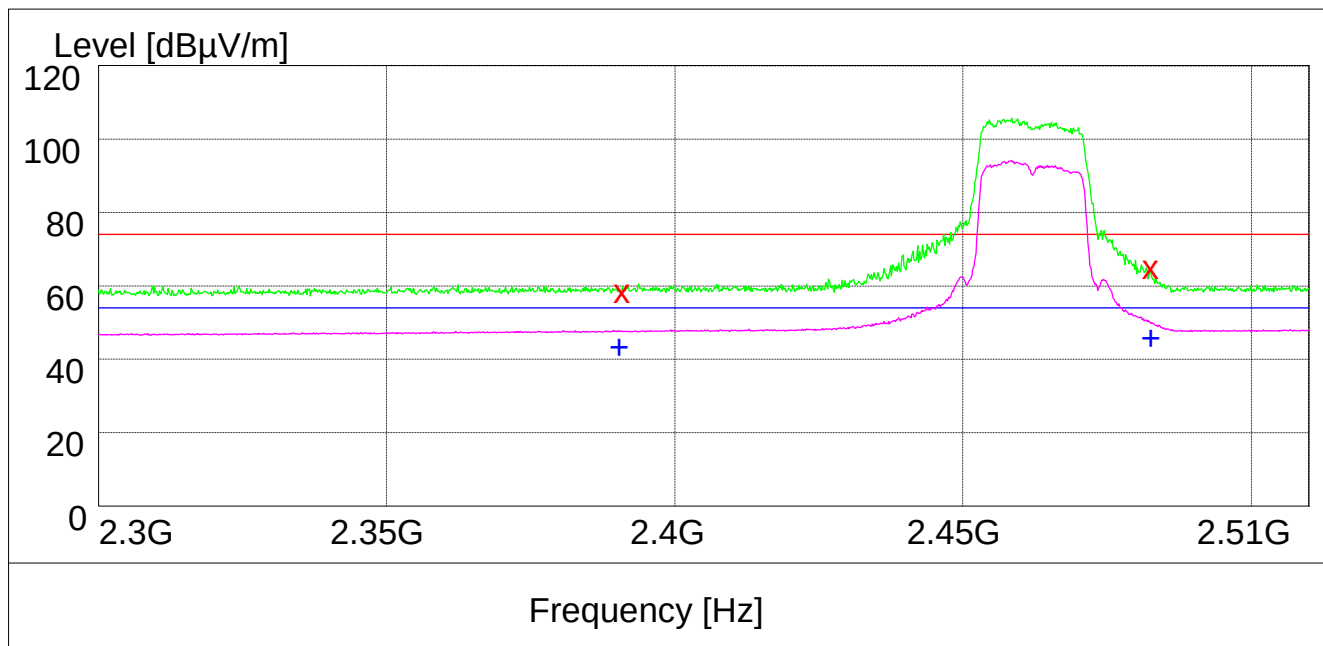
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	69.90	33.5	74.0	4.1	104.0	354.00	HORIZONTAL
2483.500000	59.90	33.7	74.0	14.1	171.0	237.00	VERTICAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	48.10	33.5	54.0	5.9	106.0	353.00	HORIZONTAL
2483.500000	46.80	33.7	54.0	7.2	110.0	11.00	VERTICAL



3.2 Channel 11



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

MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	59.10	33.5	74.0	14.9	163.0	351.00	HORIZONTAL
2483.500000	65.10	33.7	74.0	8.9	104.0	76.00	VERTICAL

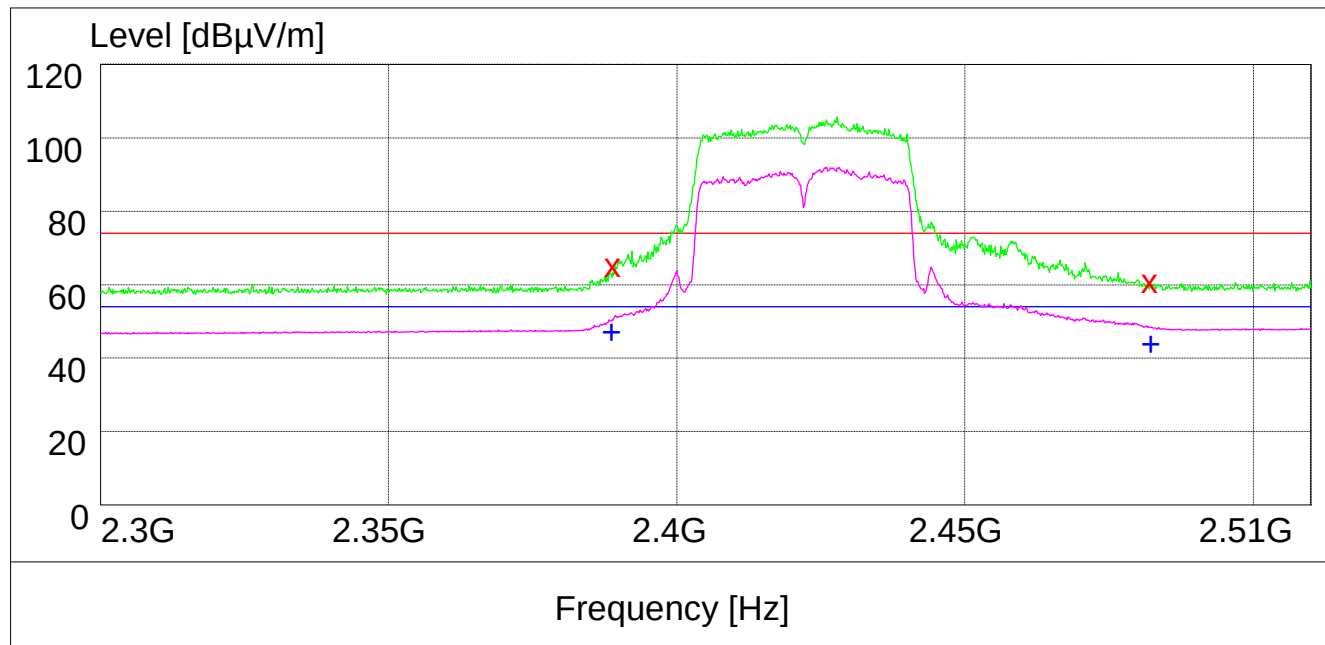
MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	46.50	33.5	54.0	7.5	102.0	86.00	HORIZONTAL
2483.500000	49.30	33.7	54.0	4.7	107.0	73.00	VERTICAL



4 Test Mode: 11n40 / Chain 3

4.1 Channel 01



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

MEASUREMENT RESULT: PK Detector

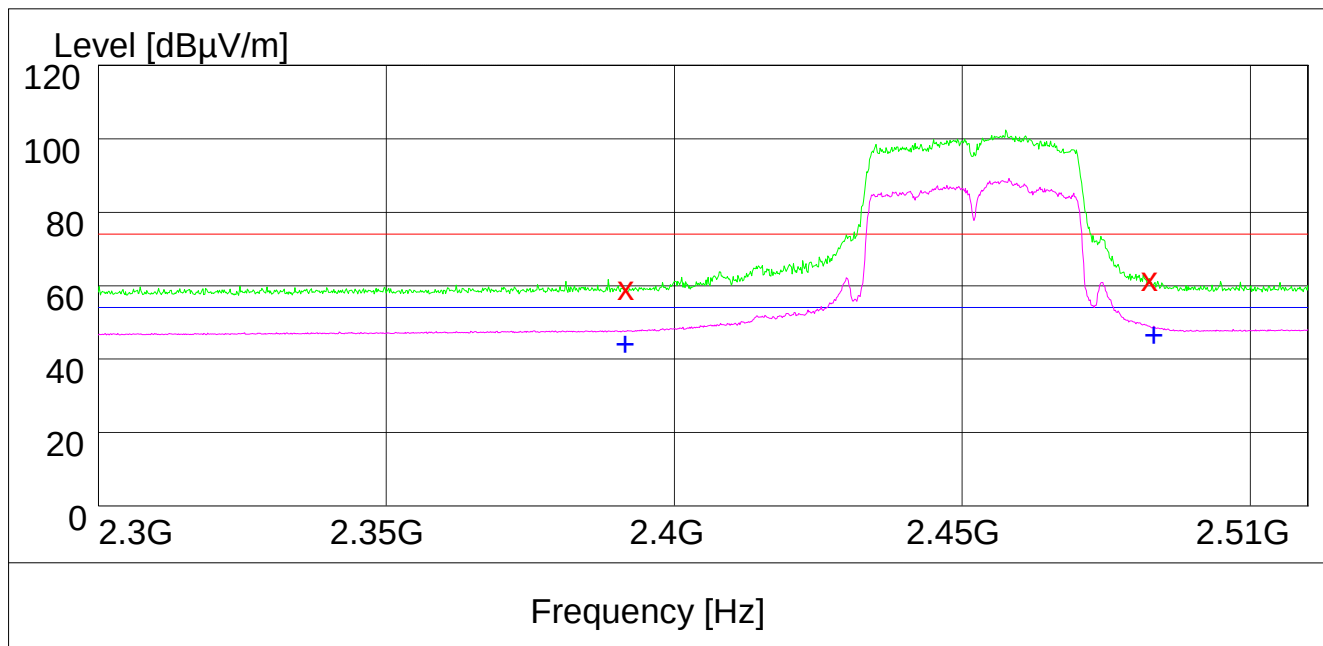
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	69.20	33.5	74.0	4.8	108.0	353.00	HORIZONTAL
2483.500000	61.10	33.7	74.0	12.9	102.0	305.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	49.50	33.5	54.0	4.5	132.0	308.00	HORIZONTAL
2483.500000	47.60	33.7	54.0	6.4	128.0	310.00	HORIZONTAL



4.2 Channel 11



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

MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	60.40	33.5	74.0	13.6	148.0	133.00	HORIZONTAL
2483.500000	64.10	33.7	74.0	9.9	102.0	313.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector

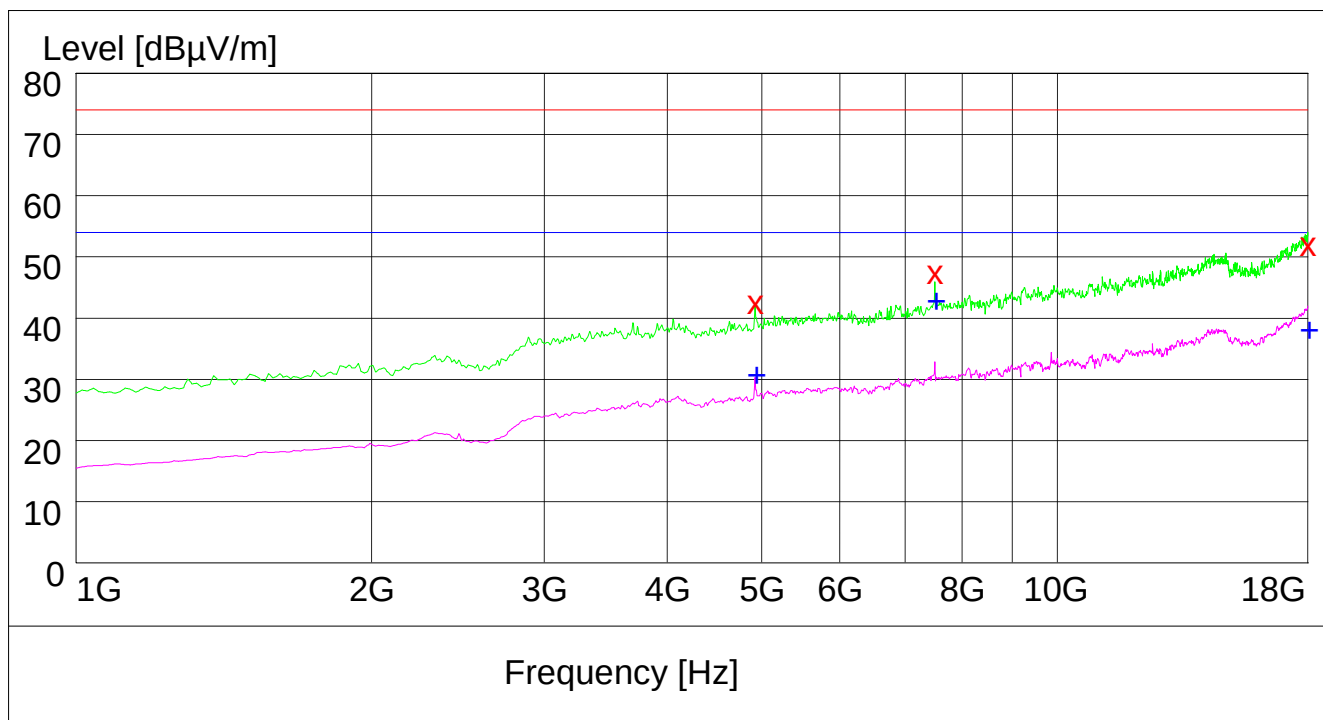
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	46.80	33.5	54.0	7.2	158.0	302.00	HORIZONTAL
2483.500000	49.10	33.7	54.0	4.9	106.0	314.00	HORIZONTAL



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

Note 1: 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 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).



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
4923.800000	42.80	-2.5	74.0	31.2	100.0	46.00	VERTICAL
7500.300000	48.00	3.7	74.0	26.0	100.0	318.00	HORIZONTAL
17992.400000	52.00	19.4	74.0	22.0	100.0	280.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarization
4923.800000	31.20	-2.5	54.0	22.8	100.0	24.00	VERTICAL
7500.300000	43.60	3.7	54.0	10.4	100.0	316.00	HORIZONTAL
17993.500000	38.20	19.4	54.0	15.8	100.0	216.00	VERTICAL



FCC Test Report of B890-66
FCC ID: QISB890
IC: 6369A-B890



Appendix G

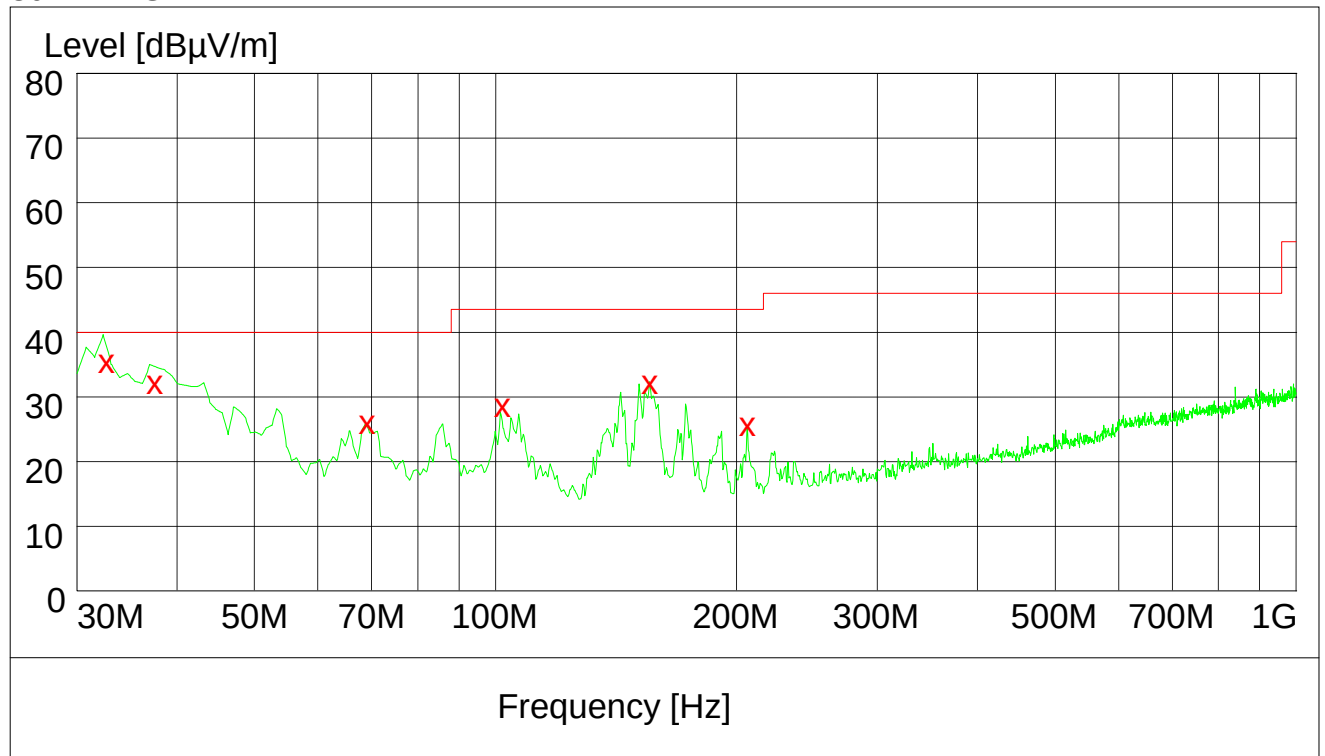
Receiver Spurious Emissions

According to RSS-210



This test was carried out in all the test modes, Here only the worst test result was shown.

30MHz-1GHz

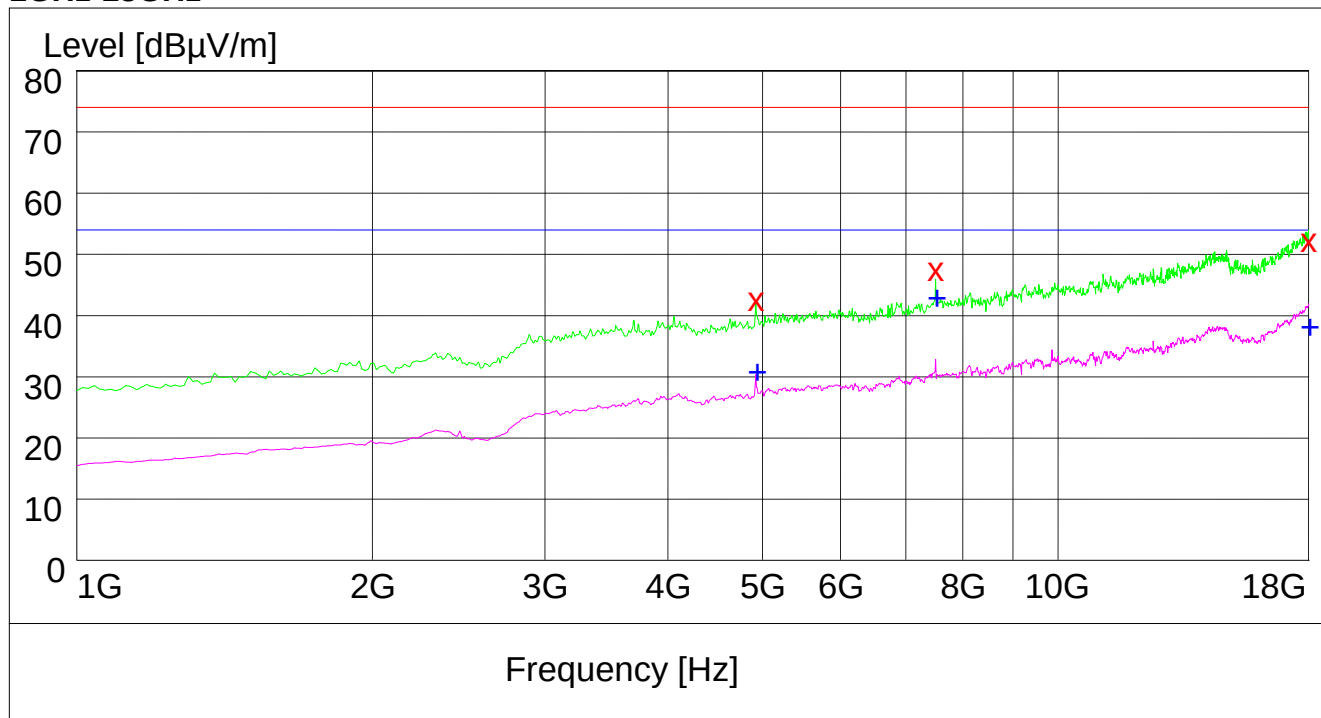


MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
32.640000	35.80	14.7	40.0	4.2	100.0	359.00	VERTICAL
37.500000	32.50	15.2	40.0	7.5	114.0	341.00	VERTICAL
69.120000	26.60	11.1	40.0	13.4	136.0	85.00	VERTICAL
101.880000	28.00	13.4	43.5	15.5	109.0	263.00	VERTICAL
155.640000	31.90	10.0	43.5	11.6	100.0	84.00	VERTICAL
206.220000	26.30	12.4	43.5	17.2	163.0	326.00	HORIZONTAL



1GHz-18GHz



MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
4923.800000	42.80	-2.5	74.0	31.2	100.0	46.00	VERTICAL
7500.300000	48.00	3.7	74.0	26.0	100.0	318.00	HORIZONTAL
17992.400000	52.00	19.4	74.0	22.0	100.0	280.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
4923.800000	31.20	-2.5	54.0	22.8	100.0	24.00	VERTICAL
7500.300000	43.60	3.7	54.0	10.4	100.0	316.00	HORIZONTAL
17993.500000	38.20	19.4	54.0	15.8	100.0	216.00	VERTICAL

-----END-----



FCC Test Report of B890-66
FCC ID:QISB890
IC : 6369A-B890

FCC Test Report of B890-66
FCC ID:QISB890

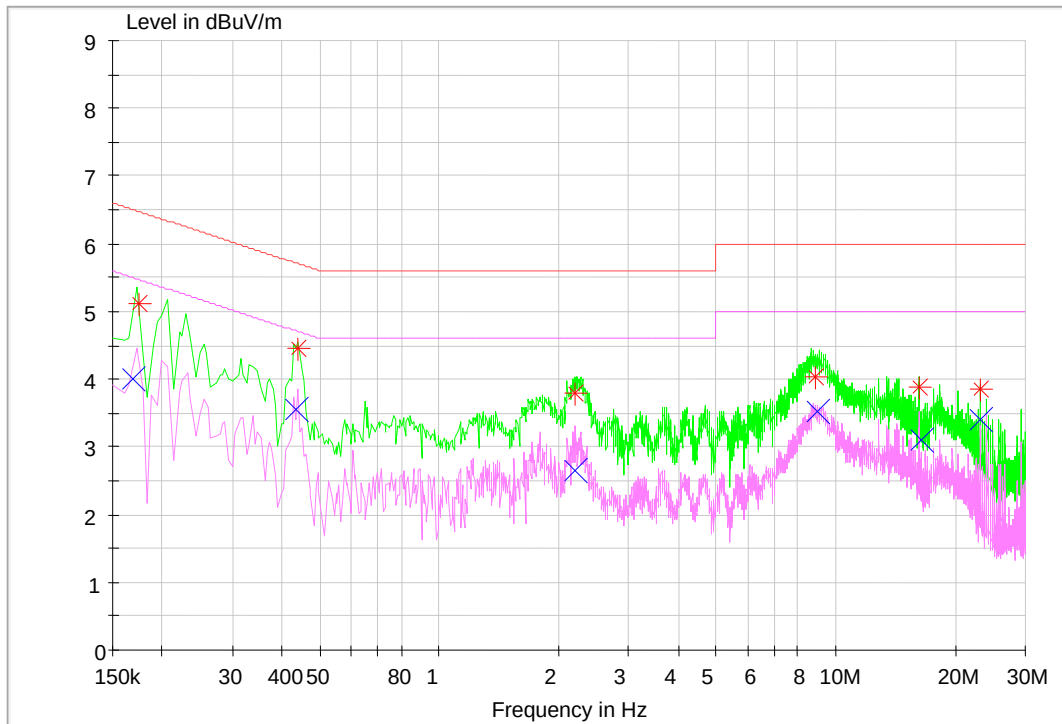
Appendix H

Conducted Emission at Power Port

According to FCC Part 15.207 & RSS-210



Channel 7



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.173953	51.1	9.7	64.8	13.7	L1	FLO
0.437820	44.4	9.7	57.1	12.7	L1	FLO
2.203324	37.8	9.7	56.0	18.2	N	FLO
8.865570	40.2	9.9	60.0	19.8	N	FLO
16.227348	38.9	10.0	60.0	21.1	L1	FLO
23.128856	38.4	10.2	60.0	21.6	N	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.169120	40.1	9.7	55.0	14.9	L1	FLO
0.435256	35.5	9.7	47.2	11.7	L1	FLO
2.208416	26.5	9.7	46.0	19.5	L1	FLO
9.014655	35.1	9.9	50.0	14.9	N	FLO
16.472333	31.1	10.1	50.0	18.9	L1	FLO
23.130608	34.1	10.2	50.0	15.9	L1	FLO