FCC Test Report

Product Name: Mobile WiFi

Model Number: E586Bs-6

Report No: SYBH(Z-RF)019072011-2003

FCC ID: QISE586BS-6

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REPORT ON **FCC 47CFR part 15 subpart C test of Mobile WiFi；**

REGULATION **FCC CFR47 Part 2: Subpart J;**

FCC CFR47 Part 15: Subpart C;

CONCLUSION **PASS**

Approved By	Jul.30, 2011	Chen Xiaohong	Chen Xiaohong
	Date	Name	Signature
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Contents

1 Summary **5**

2 Product Description **6**

2.1 PRODUCTION INFORMATION 6
2.2 MODIFICATION INFORMATION 6

3 Test Site Description **7**

3.1 TESTING PERIOD 7
3.2 GENERAL SET UP DESCRIPTION 7

4 Product Description **8**

4.1 TECHNICAL CHARACTERISTICS 8
4.2 EUT IDENTIFICATION LIST 10

5 Main Test Instruments **11**

6 Transmitter Measurements **12**

6.1 6DB BANDWIDTH MEASUREMENT 12
6.2 PEAK OUTPUT POWER 14
6.3 BAND EDGE SPURIOUS EMISSION 16
6.4 CONDUCTED RF SPURIOUS 18
6.5 POWER SPECTRAL DENSITY 20
6.6 RADIATED SPURIOUS EMISSION & SPURIOUS IN RESTRICTED BAND 22
6.7 CONDUCTED EMISSION AT POWER PORT 26

7 System Measurement Uncertainty **28**

8 Appendices **29**

1 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

2 Product Description

2.1 Production Information

2.1.1 General Description

E586Bs-6 is a UMTS/GSM Mobile WiFi It can be used as a WiFi Access Point, Max to 5 WiFi stations can be associating with E586Bs-6 simultaneity. It also can be used as a USB modem by connecting with PC via USB cable. It supports wireless internet accessing function. The data service rate is HSUPA 5.75Mbps, and HSDPA 21Mbps. The WCDMA frequency is BAND I, BAND II, BAND V. The GPRS/EDGE frequency is 850/900/1800/1900 MHz, but only WiFi test data included in this report. The WiFi frequency is 2.4G.

2.1.2 Support function and Service

The EUT support the function and service as follows:

Table 2 Service and Test mode List

Service Name	mode	Characteristic	Corresponding Test Mode	Note
Data	DSSS	Modulation: QPSK	TM1	
Data	OFDM	Modulation: 64QAM	TM2	
Data	OFDM	Modulation: 64QAM 16QAM,BPSK,QPSK	TM3	

2.2 Modification Information

For original equipment, following table is not application.

Table 3 Modification Information

Model Number	Board/Module	Original Version	New Version	Modify Information

Not applicable!

3 Test Site Description

The test site of:

Huawei Technologies Co. Ltd.
P.O. Box 518129
Huawei base, bantian,
Longgang District, Shenzhen, China

3.1 Testing Period

The test have been performed during the period of
Jul.26, 2011 –Jul.28, 2011

3.2 General Set up Description

The WLAN digitally modulated systems of the EUT can Support 2.4GHz Band. For compliance with FCC regulation 47CFR part15 subpart C, we set the EUT as following test modes to do all compliance tests.

WLAN MODE:

TM1: DSSS mode ,QPSK Modulation,11Mbps data rate
TM2: OFDM mode,64QAM Modulation,54 Mbps data rate
TM3: OFDM mode,64QAM Modulation,65 Mbps data rate

4 Product Description

4.1 Technical Characteristics

4.1.1 Frequency Range

Table 4 Frequency Range

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

4.1.2 Channel Spacing / Separation

Table 5 Channel Spacing / raster

Channel spacing:	22 MHz
Channel raster:	5 MHz

4.1.3 Type of Emission

Table 6 Type of Emission

Emission Designation:	-

According to CFR 47 (FCC) part 2, subpart C, section 2.201 and 2.202

4.1.4 Antenna Information

Table 7 Antenna Information

Type:	Integrated / Internal
Maximum Gain(dBi):	2.8 (from 2400MHz to 2500MHz)

4.1.5 Environmental Requirements

Table 8 Environmental Requirements

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

4.1.6 Power Source

Table 9 Power Source

AC voltage nominal:	~120V
AC voltage range	~100V-240V
AC current maximal:	1A

4.1.7 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.

4.1.8 Applied DC Voltages and Currents

According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (8).

The voltage and current in the final RF stage is:

Table 10 Applied RF module DC Voltages and Currents

Voltage:	⎓ +3.7V
Current:	1A According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (8)

4.2 EUT Identification List

4.2.1 Board Information

Table 11 Board Information

Mobile WiFi		
E586Bs-6		
Board and Module		
Hardware Version	Software Version	Serial Number
CH1E586M	21.321.03.00.00	C9H2A11162700089

4.2.2 Adapter

Name	Manufacture	Serials number	Description
Adapter	TECH-POWER INTERNATIONAL CO.,LTD	TPAA62900079	Model: HW-050100U1W voltage nominal: ~230V Input Voltage : 100-240V ~50/60Hz, 0.2A Output Voltage: ⎓ 5.0V 1.0A

4.2.3 Battery

Name	Manufacture	Serials number	Description
Rechargeable Li-ion	Huawei Technologies Co., Ltd.	SCC9815HI3316028	Battery Model: HB4F1 Rated capacity: 1500mAh Nominal Voltage: ⎓ +3.7V Charging Voltage: ⎓ +4.2V

4.2.4 FCC Identification

Grantee Code: **QIS**
Product Code: **E586Bs-6**
FCC Identification: **QISE586BS-6**

5 Main Test Instruments

Table 12 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Power supply	KEITHLEY	2303	1288003	Sep.27,2011
Universal Radio Communication Tester	R&S	CMU200	105822	Oct.24,2011
Wireless Communication Test set	Agilent	N4010A	MY49081592	Dec.14,2011
Universal Radio Communication Tester	Agilent	E5515C	MY50260239	Aug.04,2011
Signal Analyzer	R&S	FSQ31	200021	Sep.27,2011
Temperature Chamber	WEISS	WKL64	24600294	Jan.25,2012
Signal generator	Agilent	E8257D	MY49281095	Jul.09,2012
Vector Signal Generator	R&S	SMU200A	104162	Sep.07,2011
Test receiver	R&S	ESU26	36090302083	Jun.24,2012
EMI Test receiver	R&S	FSQ43	100048	Jun.23,2012
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	919/1009	Dec.13,2011
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	979/917	Dec.13,2011
Horn Antenna	R & S	HF906	359287/005	May.07, 2012
Horn Antenna	R & S	HF906	359287/006	Apr.27, 2012
Horn Antenna	R & S	HF906	100684	Jun.28,2012
Broadband Antenna	SCHAFFNER	CBL 6112B	2536	Sep.21, 2011
Broadband Antenna	SCHAFFNER	CBL 6112B	2941	Jun.20, 2012
Broadband Antenna	SCHAFFNER	VULB 9163	9163-357	Sep.28,2011
Horn Antenna	ETS-LINDGREN	3160	60008	Sep.20,2011
Horn Antenna	ETS-LINDGREN	3160	91989	Sep.28,2011

6 Transmitter Measurements

6.1 6dB bandwidth measurement

6.1.1 Test Conditions

Table 13 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1/TM2/TM3 at channel No.1, 6, 11

6.1.2 Test Specifications and Limits

6.1.2.1 Specification

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

6.1.2.2 Supporting Standards

Table 14 Supporting Standards:

ANSI/TIA-603-C:2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

6.1.2.3 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 15 Limits

Limits	≥ 500kHz

6.1.3 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 6dB bandwidth with spectrum analyzer.

Test setup

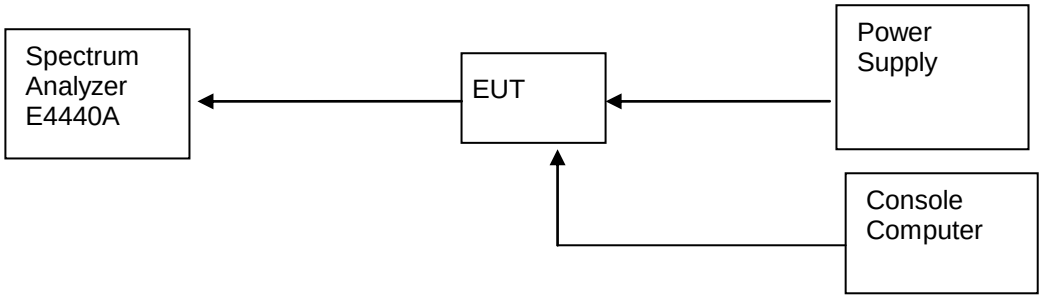


Figure 1. Test Set-up

6.1.4 Measurement Results

Table 16 Measurement Results

Test condition	Channel Position	Bandwidth Type	Channel Number	Frequency [GHz]	Measured Bandwidth [MHz]	Result
TM1	B	6dB Bandwidth	1	2.412	10.255	Pass
	M	6dB Bandwidth	6	2.437	10.162	Pass
	T	6dB Bandwidth	11	2.462	10.257	Pass
TM2	B	6dB Bandwidth	1	2.412	16.536	Pass
	M	6dB Bandwidth	6	2.437	16.491	Pass
	T	6dB Bandwidth	11	2.462	16.509	Pass
TM3	B	6dB Bandwidth	1	2.412	16.485	Pass
	M	6dB Bandwidth	6	2.437	16.421	Pass
	T	6dB Bandwidth	11	2.462	16.462	Pass

6.1.5 Conclusion

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

6.2 Peak output power

6.2.1 Test Conditions

Table 17 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1/TM2/TM3 at channel No.1, 6, 11

6.2.2 Test Specifications and Limits

6.2.2.1 Specification

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

6.2.2.2 Supporting Standards

Table 18 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

6.2.2.3 Limits

Compliance 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 19 Limits

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

6.2.3 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

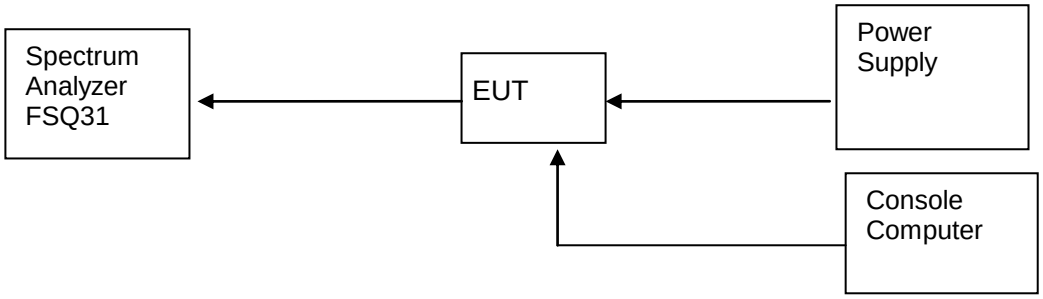


Figure 2. Test Set-up

6.2.4 Measurement Results

Table 20 Measurement Results

Test condition	Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
TM1	Bottom	1	2412	18.42	< 30	Pass
	Middle	6	2437	19.43	< 30	Pass
	Top	11	2462	20.56	< 30	Pass
TM2	Bottom	1	2412	18.32	< 30	Pass
	Middle	6	2437	18.54	< 30	Pass
	Top	11	2462	19.22	< 30	Pass
TM3	Bottom	1	2412	15.11	< 30	Pass
	Middle	6	2437	16.00	< 30	Pass
	Top	11	2462	17.29	< 30	Pass

6.2.5 Conclusion

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

6.3 Band edge spurious emission

6.3.1 Test Conditions

Table 21 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1/TM2/TM3 at channel No. 1, 11

6.3.2 Test Specifications and Limits

6.3.2.1 Specification

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

6.3.2.2 Supporting Standards

Table 22 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

6.3.2.3 Limits

Compliance 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 23 Limits

Band edge spurious:	20 dBc/100kHz

6.3.3 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

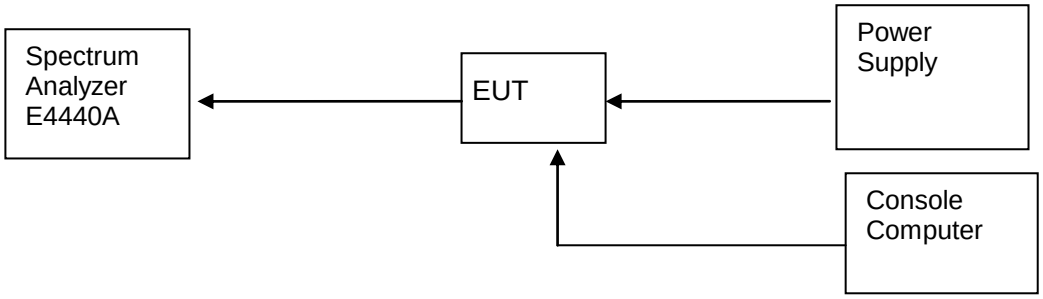


Figure 3. Test Set-up

6.3.4 Measurement Results

Table 24 Measurement Results

Test condition		Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Result
TM1	Low Edge	1	2412	2.17	-35.47	<-17.83	Pass
	High Edge	11	2462	4.89	-34.65	<-15.11	Pass
TM2	Low Edge	1	2412	-1.06	-29.04	<-21.06	Pass
	High Edge	11	2462	-0.28	-28.78	<-20.28	Pass
TM3	Low Edge	1	2412	-4.24	-36.81	<-24.24	Pass
	High Edge	11	2462	-1.73	-30.86	<-21.73	Pass

6.3.5 Conclusion

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

6.4 Conducted RF spurious

6.4.1 Test Conditions

Table 25 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1/TM2/TM3 at channel No.1, 6, 11

6.4.2 Test Specifications and Limits

6.4.2.1 Specification

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

6.4.2.2 Supporting Standards

Table 26 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

6.4.2.3 Limits

Compliance 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 27 Limits

Band edge spurious:	20 dBc/100kHz

6.4.3 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 and.
(c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted band edge spurious separately.

Test setup

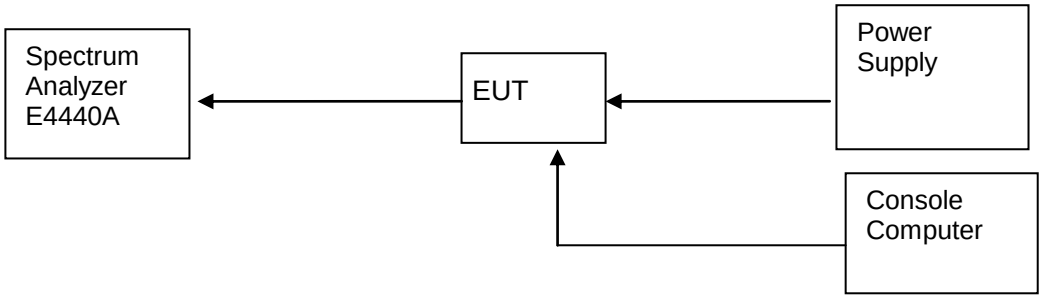


Figure 4. Test Set-up

6.4.4 Measurement Results

Table 28 Measurement Results

Test condition	Test Frequency Range	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Result
TM1	9kHz-26GHz	1	2412	8.06	-42.33	<-11.94	Pass
	9kHz-26GHz	6	2437	2.60	-42.12	<-17.40	Pass
	9kHz-26GHz	11	2462	10.68	-42.91	<-9.32	Pass
TM2	9kHz-26GHz	1	2412	7.19	-42.65	<-12.81	Pass
	9kHz-26GHz	6	2437	6.59	-42.74	<-13.41	Pass
	9kHz-26GHz	11	2462	7.15	-42.80	<-12.85	Pass
TM3	9kHz-26GHz	1	2412	2.58	-42.13	<-17.42	Pass
	9kHz-26GHz	6	2437	4.72	-42.89	<-15.28	Pass
	9kHz-26GHz	11	2462	5.04	-42.39	<-14.96	Pass

6.4.5 Conclusion

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

6.5 Power spectral density

6.5.1 Test Conditions

Table 29 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1/TM2/TM3 at channel No.1, 6, 11

6.5.2 Test Specifications and Limits

6.5.2.1 Specification

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

6.5.2.2 Supporting Standards

Table 30 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

6.5.2.3 Limits

Compliance 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 31 Limits

Band edge spurious:	8 dBm/3kHz

6.5.3 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 and.
(c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted band edge spurious separately.

Test setup

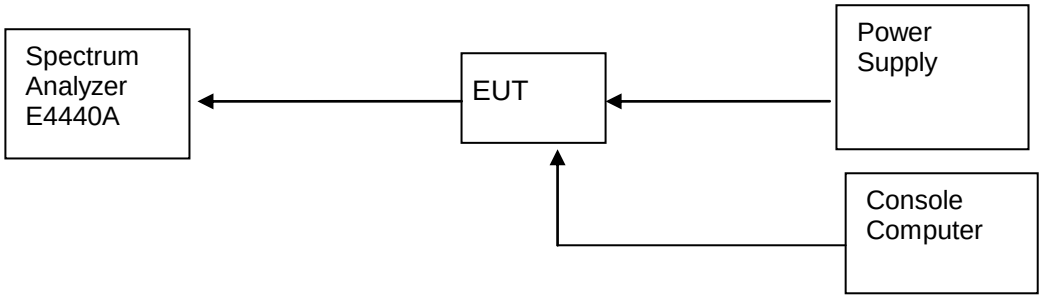


Figure 5. Test Set-up

6.5.4 Measurement Results

Table 32 Measurement Results

Test condition	Channel No.	Carrier Frequency [MHz]	Measured Power spectral density [dBm]	Limit [dBm]	Result
TM1	1	2412	-12.01	<8	Pass
	6	2437	-10.25	<8	Pass
	11	2462	-9.31	<8	Pass
TM2	1	2412	-15.82	<8	Pass
	6	2437	-14.21	<8	Pass
	11	2462	-14.86	<8	Pass
TM3	1	2412	-19.55	<8	Pass
	6	2437	-17.89	<8	Pass
	11	2462	-16.74	<8	Pass

6.5.5 Conclusion

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

6.6 Radiated spurious emission & spurious in restricted band

6.6.1 Test Conditions

Table 33 Test Conditions

Preconditioning:	0.5 hour
Measured at:	enclosure
Ambient temperature:	25 °C
Relative humidity:	55%
Test Configurations:	TM1/TM2/TM3 at channel No.1, 6, 11

6.6.2 Test Specifications and Limits

6.6.2.1 Specification

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

6.6.2.2 Supporting Standards

Table 34 Supporting Standards:

ANSI/TIA-603-C: 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
ANSI C63.4: 2003	Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

6.6.2.3 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 35 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).

6.6.3 Test Method and Setup

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4 (2003). The EUT was set-up on insulator 80cm above the Ground Plane. The

set-up and test methods were according to ANSI C63.4.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&PK 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, the azimuth range of turntable was 0°to 360°, The receive antenna has two polarizations V and H.

The EUT was communicated 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

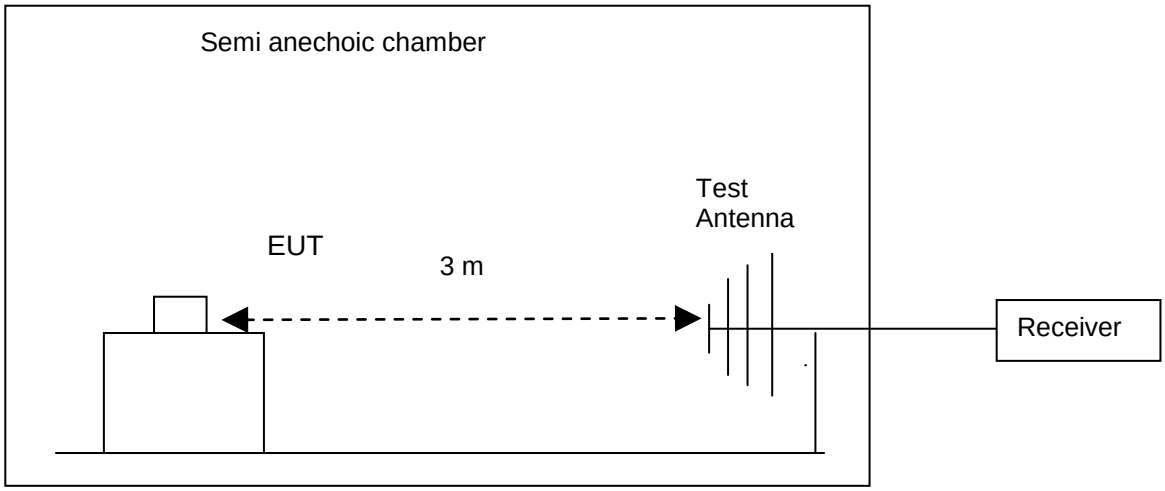


Figure 6. Test Set up

6.6.4 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 the test modes, here only the worst test result was shown.

Measured Result of channel: 1 (2412MHz)

Table 36 MEASUREMENT RESULT(30 MHz – 1000 MHz)

Frequency (MHz)	Level (dBµV/m)	Transd (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
60.780000	27.20	12.0	40.0	12.8	103.0	127.00	VERTICAL
208.260000	33.00	12.5	43.5	10.5	146.0	118.00	HORIZONTAL
338.880000	31.60	16.8	46.0	14.4	100.0	338.00	HORIZONTAL
499.980000	29.40	20.2	46.0	16.6	103.0	170.00	VERTICAL
663.780000	36.80	23.0	46.0	9.2	103.0	360.00	VERTICAL
996.060000	35.90	27.1	54.0	18.1	103.0	110.00	VERTICAL

Table 37 MEASUREMENT RESULT: PK Detector(Above1000 MHz)

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization

5957.500000	40.30	-0.9	74.0	33.7	135.0	83.00	VERTICAL
9405.500000	44.20	5.7	74.0	29.8	172.0	254.00	VERTICAL
17684.000000	51.60	18.8	74.0	22.4	200.0	249.00	HORIZONTAL
2310.000000	58.70	33.3	74.0	15.3	175.0	357.00	VERTICAL
2390.000000	66.30	33.5	74.0	7.7	100.0	65.00	VERTICAL
2483.500000	59.30	33.7	74.0	14.7	183.0	182.00	VERTICAL
2500.000000	59.30	33.8	74.0	14.7	136.0	1.00	HORIZONTAL

Table 38 MEASUREMENT RESULT: AVDetector(Above1000 MHz)

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
4824.000000	29.30	-3.6	54.0	24.7	100.0	158.00	VERTICAL
14519.500000	36.20	14.9	54.0	17.8	200.0	205.00	VERTICAL
17694.000000	38.00	18.9	54.0	16.0	154.0	335.00	VERTICAL
2310.000000	45.40	33.3	54.0	8.6	176.0	169.00	HORIZONTAL
2390.000000	49.90	33.5	54.0	4.1	100.0	66.00	VERTICAL
2483.500000	46.40	33.7	54.0	7.6	182.0	238.00	HORIZONTAL
2500.000000	46.50	33.8	54.0	7.5	111.0	73.00	VERTICAL

Measured Result of channel: 6 (2437MHz)

Table 39 MEASUREMENT RESULT(30 MHz – 1000 MHz)

Frequency (MHz)	Level (dBµV/m)	Transd (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
83.940000	24.60	9.8	40.0	15.4	100.0	112.00	VERTICAL
153.840000	29.30	9.2	43.5	14.2	100.0	130.00	VERTICAL
398.580000	26.40	18.1	46.0	19.6	193.0	271.00	HORIZONTAL
497.760000	35.20	20.1	46.0	10.8	200.0	185.00	VERTICAL
664.080000	36.10	23.0	46.0	9.9	100.0	357.00	VERTICAL
930.900000	31.50	26.5	46.0	14.5	100.0	112.00	VERTICAL

Table 40 MEASUREMENT RESULT: PK Detector(Above1000 MHz)

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
4883.500000	44.60	-3.7	74.0	29.4	100.0	43.00	VERTICAL
10078.000000	44.30	6.1	74.0	29.7	100.0	220.00	VERTICAL
16611.000000	48.80	15.9	74.0	25.2	127.0	95.00	HORIZONTAL

Table 41 MEASUREMENT RESULT: AVDetector(Above1000 MHz)

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
4883.500000	34.30	-3.7	54.0	19.7	101.0	36.00	VERTICAL
14520.500000	36.20	14.9	54.0	17.8	200.0	0.00	HORIZONTAL
18000.000000	38.50	19.5	54.0	15.5	100.0	0.00	HORIZONTAL

Measured Result of channel: 11 (2462MHz)

Table 42 MEASUREMENT RESULT(30 MHz – 1000 MHz)

Frequency (MHz)	Level (dBµV/m)	Transd (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
78.120000	26.20	8.1	40.0	13.8	156.0	72.00	VERTICAL
150.000000	26.90	8.9	43.5	16.6	100.0	119.00	VERTICAL
231.720000	28.60	13.6	46.0	17.4	112.0	98.00	HORIZONTAL
397.500000	27.50	18.1	46.0	18.5	100.0	29.00	HORIZONTAL
497.760000	35.80	20.1	46.0	10.2	200.0	184.00	VERTICAL
663.780000	36.60	23.0	46.0	9.4	100.0	360.00	VERTICAL

Table 43 MEASUREMENT RESULT: PK Detector(Above1000 MHz)

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
8498.000000	42.70	3.4	74.0	31.3	190.0	353.00	VERTICAL
11570.000000	44.50	7.1	74.0	29.5	196.0	311.00	HORIZONTAL
17996.000000	51.60	19.4	74.0	22.4	146.0	359.00	HORIZONTAL
2310.000000	58.60	33.3	74.0	15.4	128.0	303.00	VERTICAL
2390.000000	59.90	33.5	74.0	14.1	100.0	331.00	HORIZONTAL
2483.500000	59.40	33.8	74.0	14.6	124.0	227.00	VERTICAL
2500.000000	59.10	33.8	74.0	14.9	100.0	186.00	VERTICAL

Table 44 MEASUREMENT RESULT: AVDetector(Above1000 MHz)

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
5410.500000	27.60	-2.0	54.0	26.4	200.0	181.00	VERTICAL
14512.000000	36.30	14.8	54.0	17.7	200.0	245.00	HORIZONTAL
17999.500000	38.70	19.5	54.0	15.3	191.0	214.00	VERTICAL
2310.000000	45.40	33.3	54.0	8.6	148.0	206.00	VERTICAL
2390.000000	46.30	33.5	54.0	7.7	153.0	21.00	VERTICAL
2483.500000	46.40	33.7	54.0	7.6	119.0	183.00	HORIZONTAL
2500.000000	46.50	33.8	54.0	7.5	118.0	107.00	VERTICAL

6.6.5 Conclusion

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

6.7 Conducted Emission at Power Port

6.7.1 Test Conditions

Table 45 Test Conditions

Preconditioning:	0.5 hour
Measured at:	Power port
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1 at channel No. 6

6.7.2 Test Specifications and Limits

6.7.2.1 Specification

CFR 47 (FCC) part 15.207 and KDB 558074

6.7.2.2 Supporting Standards

Table 46 Supporting Standards:

ANSI C63.4: 2003	Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

6.7.2.3 Limits

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

Table 47 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.

6.7.3 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 C63.4: 2003.

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

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

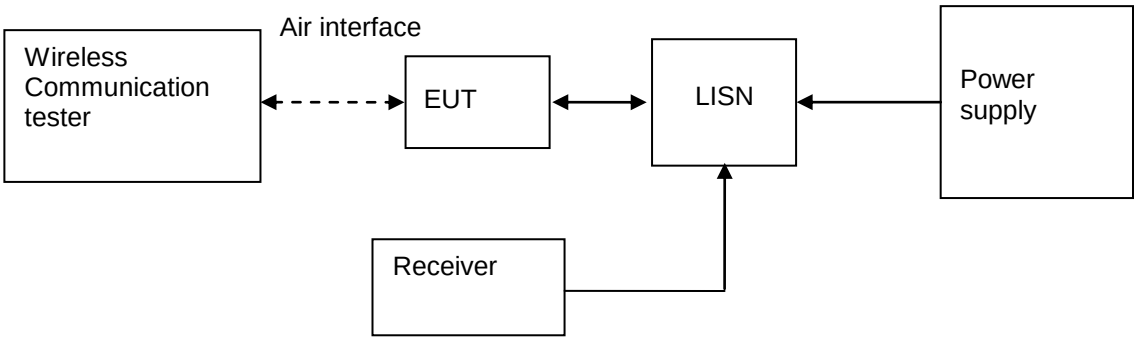


Figure 7. Test Set-up

6.7.4 Measurement Results

Table 48 MEASUREMENT RESULT:QP DECTER

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.222000	45.10	10.0	63	17.9	N	FLO
0.672000	44.70	10.1	56	11.3	N	FLO
2.056000	39.20	10.1	56	16.8	N	FLO
3.414000	39.80	10.2	56	16.2	N	FLO
5.176000	34.30	10.2	60	25.7	L1	FLO
17.240000	30.50	10.3	60	29.5	L1	FLO

Table 49 MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.276000	31.60	10.0	51	19.4	N	FLO
0.672000	35.20	10.1	46	10.8	N	FLO
2.088000	30.60	10.1	46	15.4	N	FLO
3.356000	32.00	10.2	46	14.0	N	FLO
5.174000	27.90	10.2	50	22.1	N	FLO
17.114000	24.20	10.3	50	25.8	L1	FLO

6.7.5 Conclusion

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

7 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 50 System Measurement Uncertainty

Items		Extended Uncertainty
20dB 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

8 Appendices

Appendix A	Measurement Results 6dB 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 Conducted emission test for power port
Appendix H	Photos of Test Setup

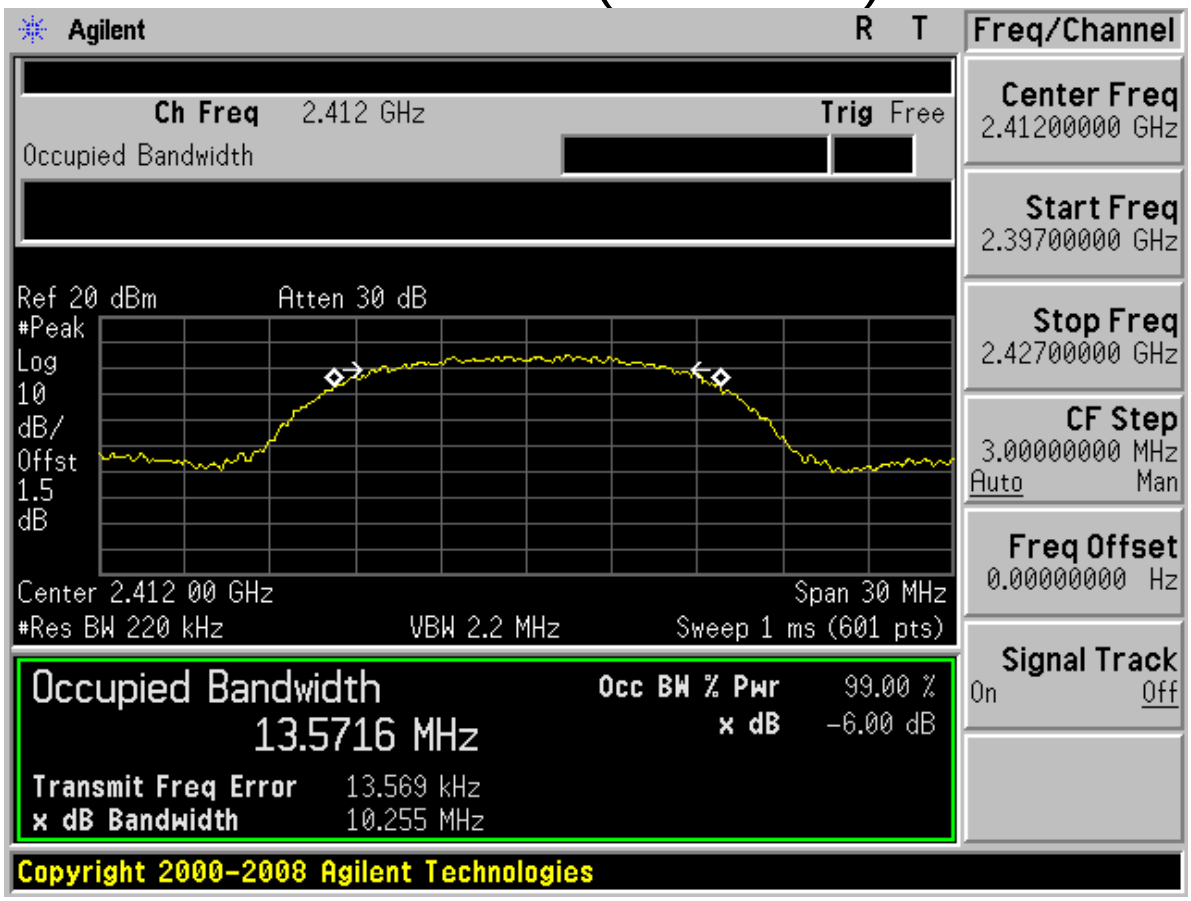
(END OF REPORT)

Appendix A

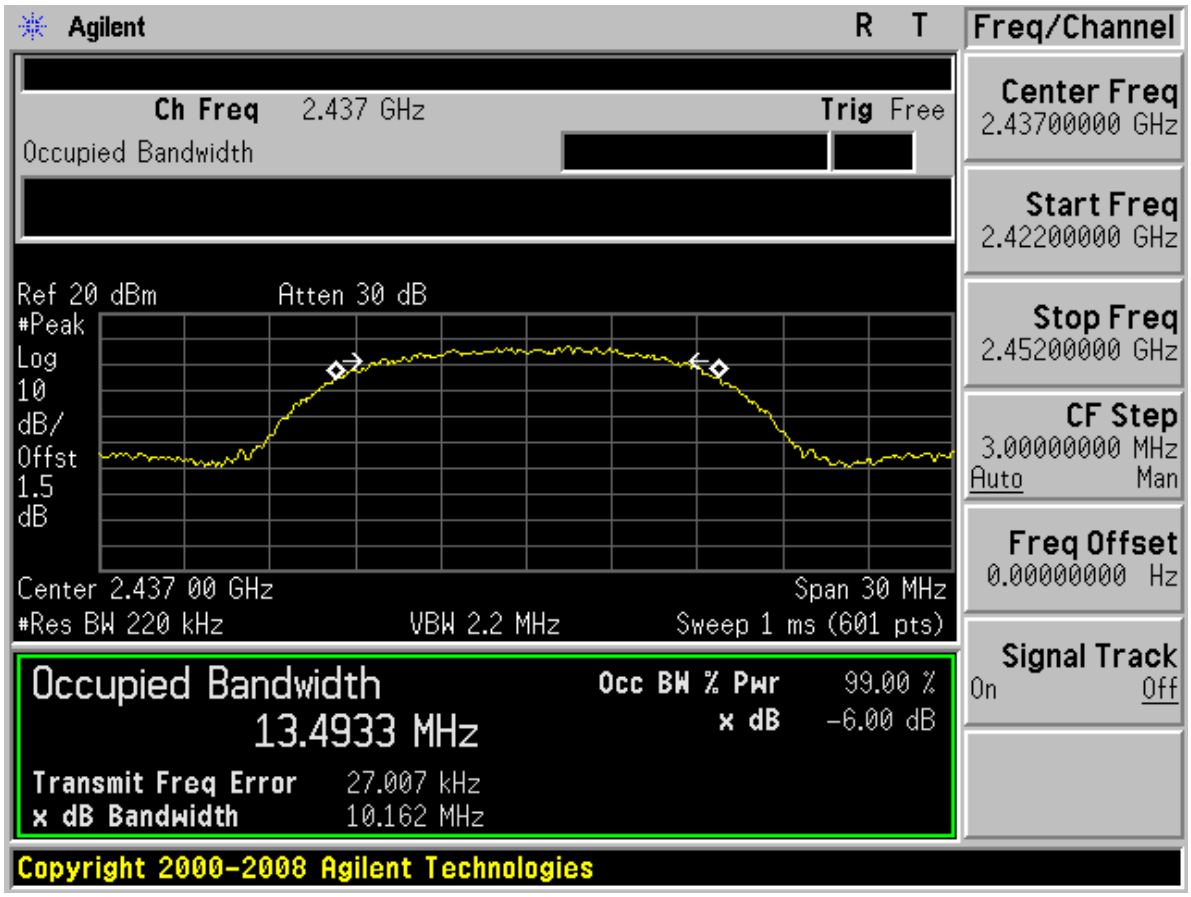
6dB bandwidth measurement

According to FCC Part 15.247 (a) (2)

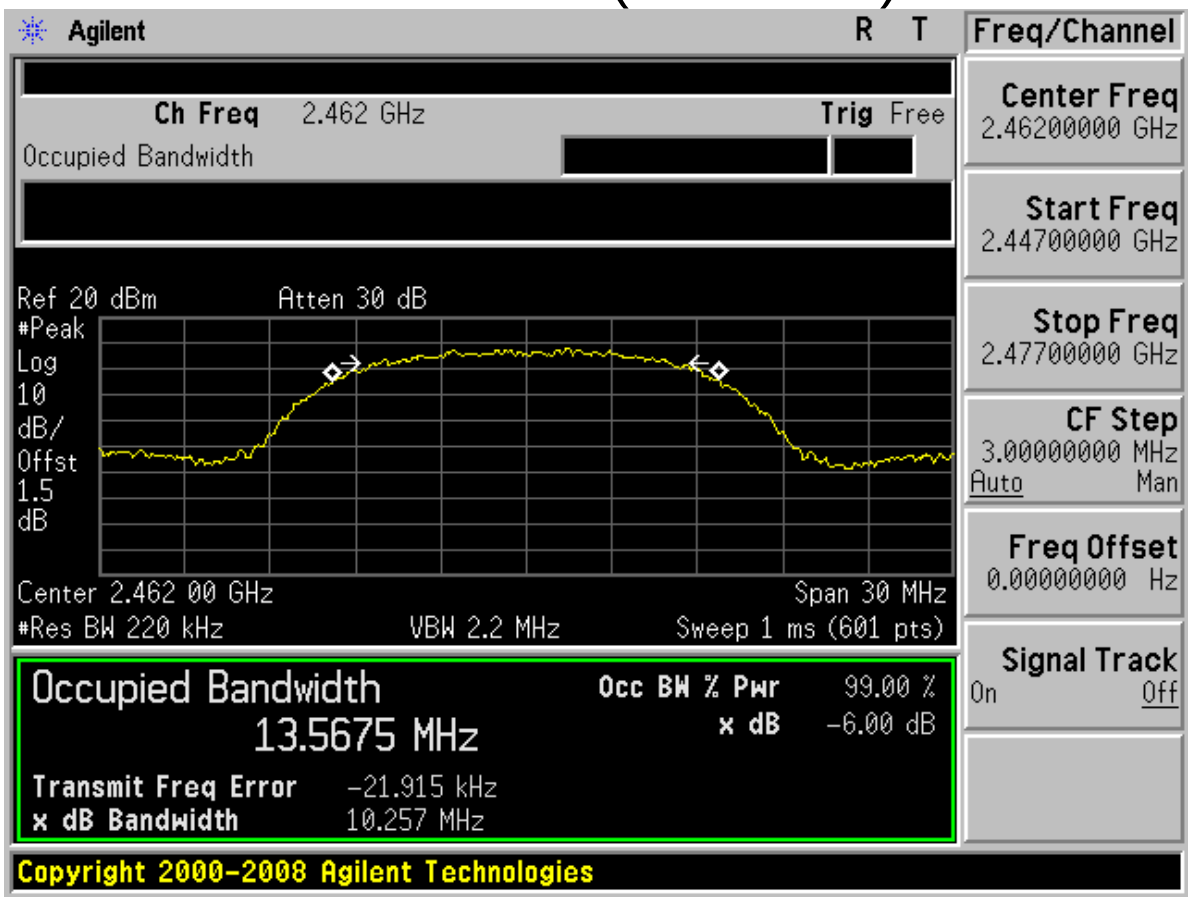
TM1
Channel 1 (2412MHz)



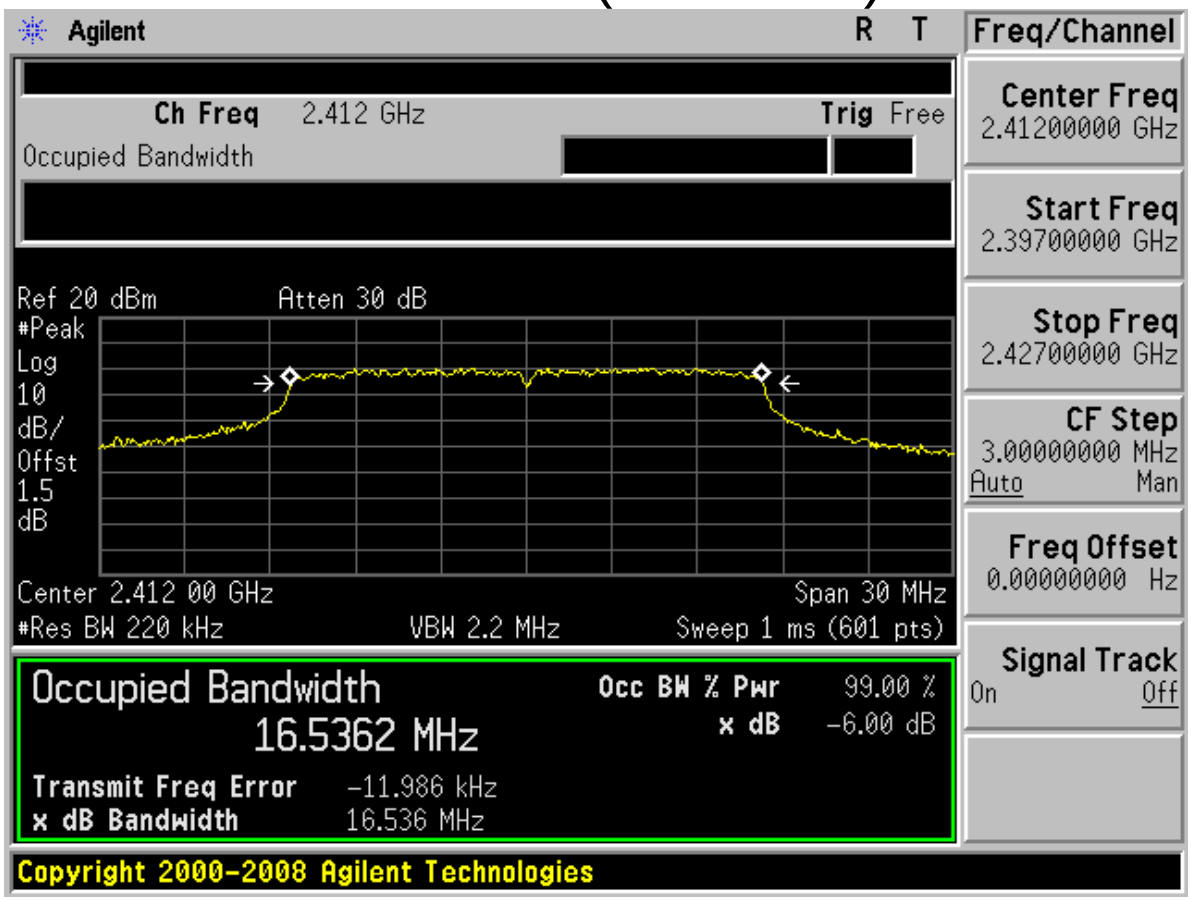
Channel 6 (2437MHz)



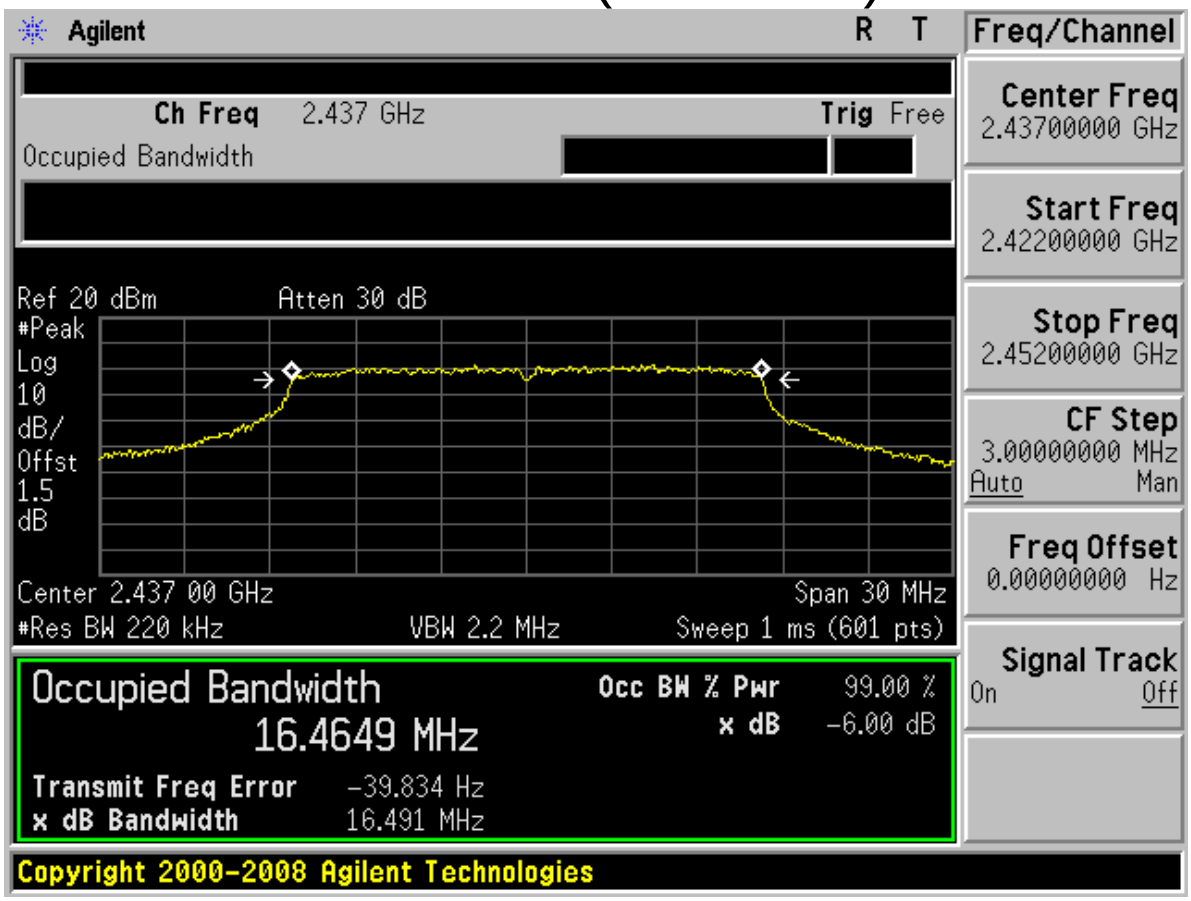
Channel 11 (2462MHz)



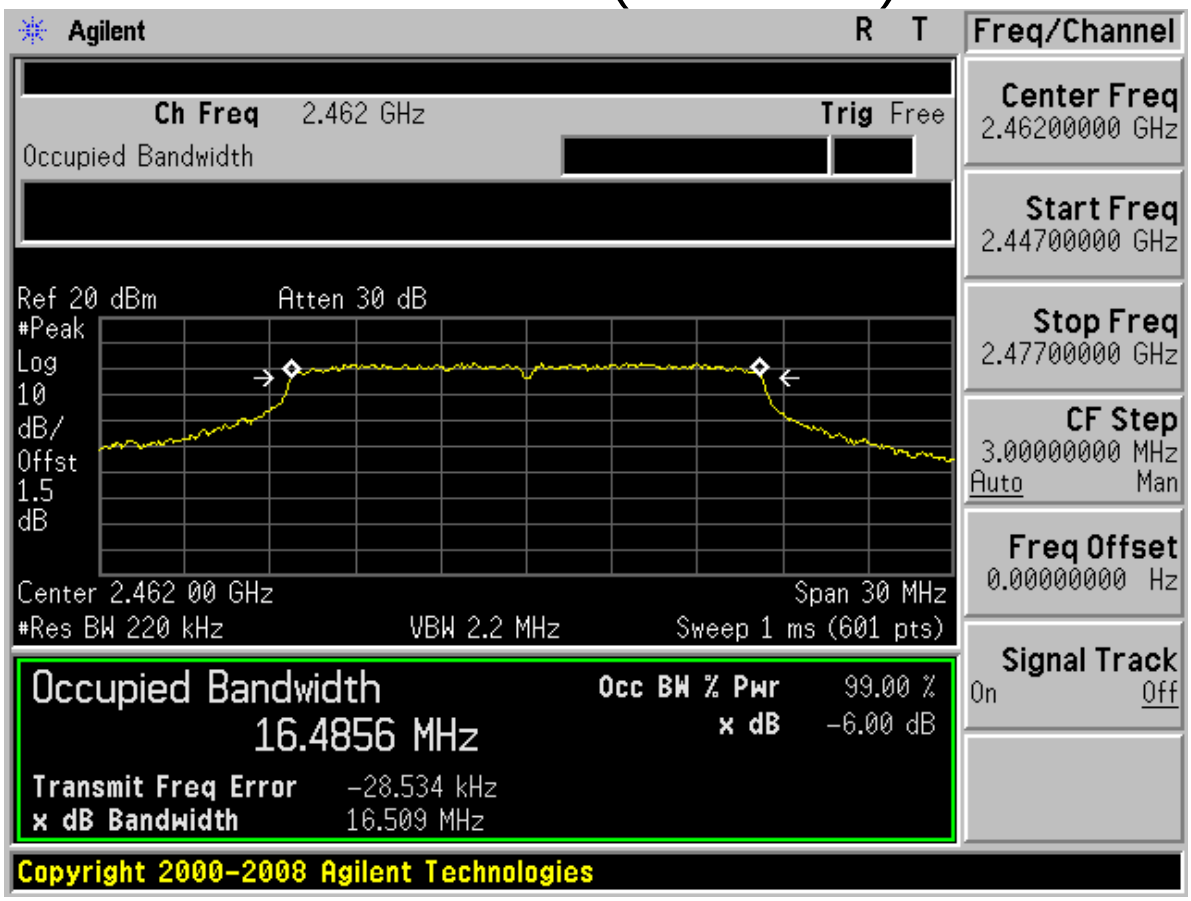
TM2
Channel 1 (2412MHz)



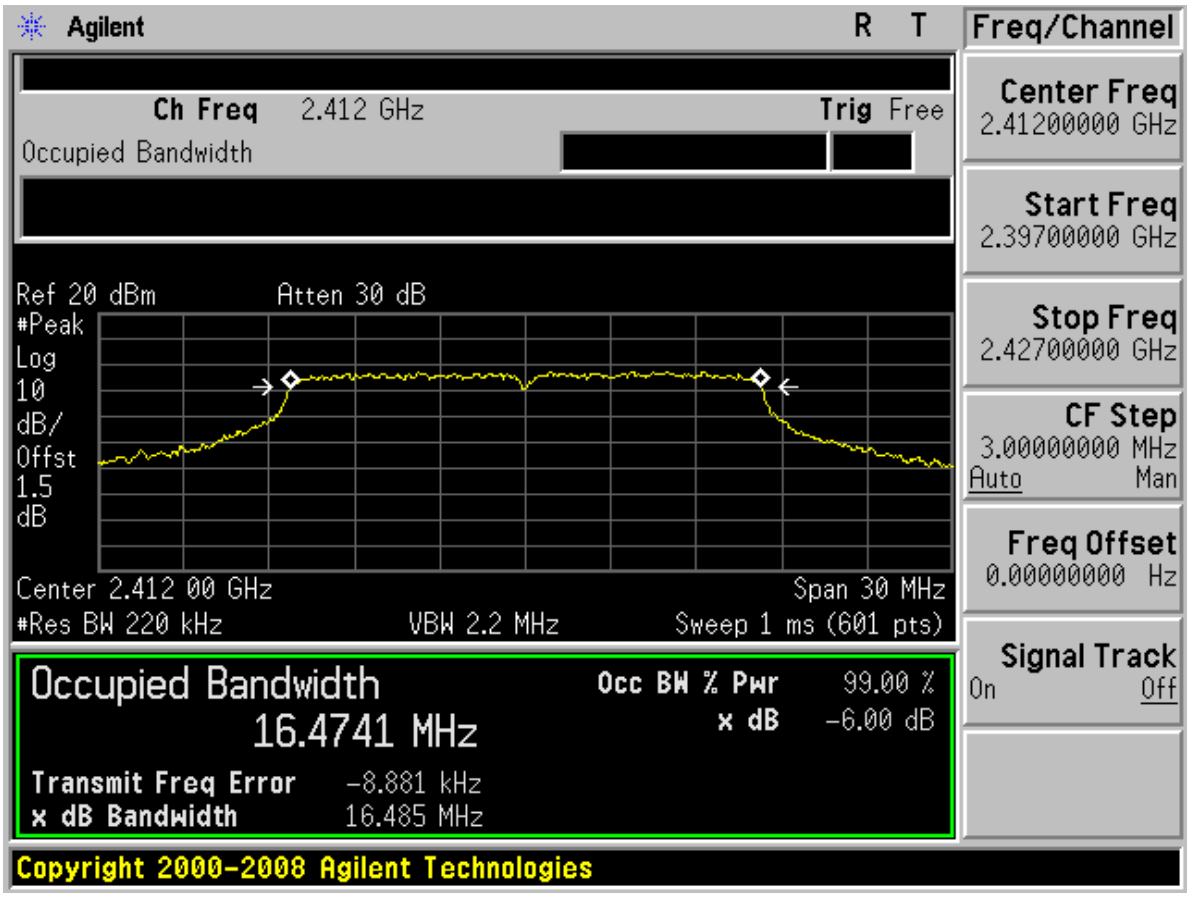
Channel 6 (2437MHz)



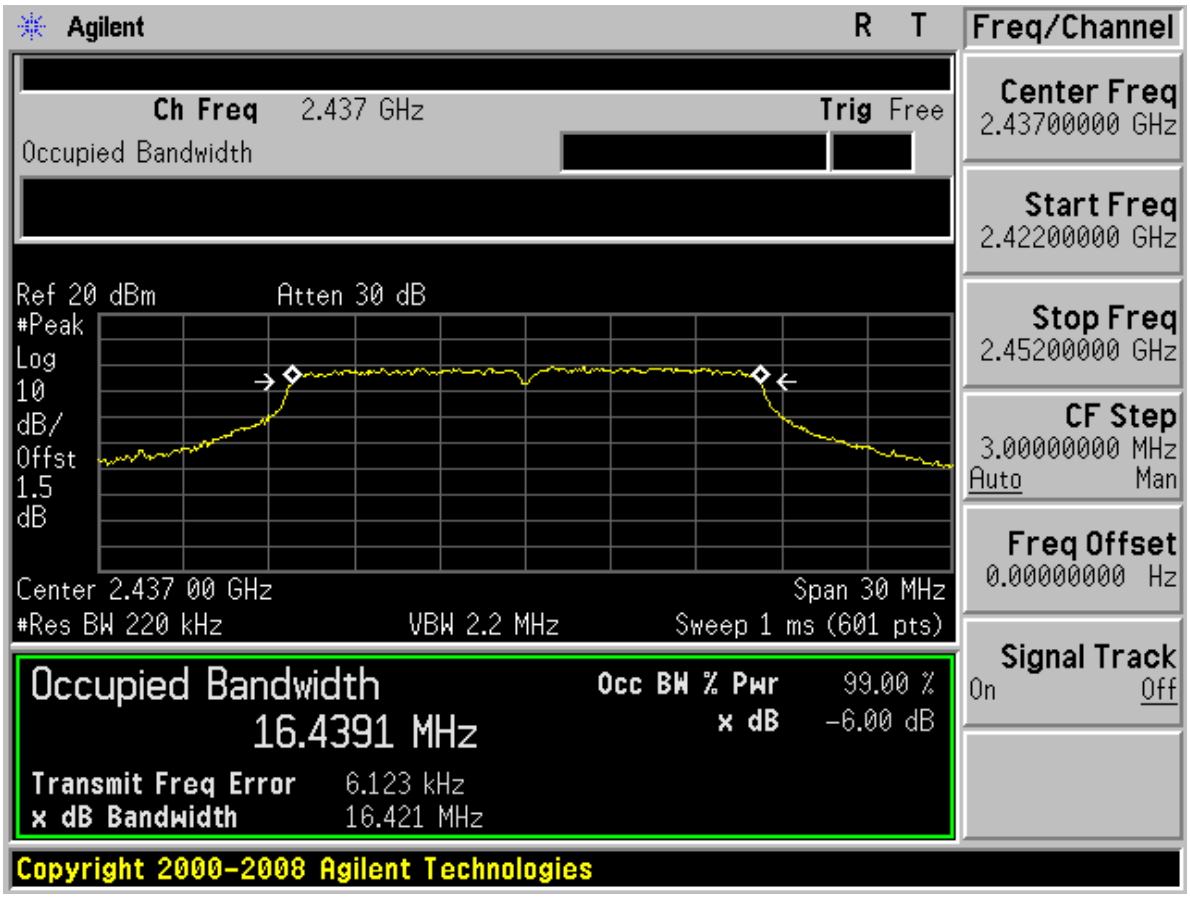
Channel 11 (2462MHz)



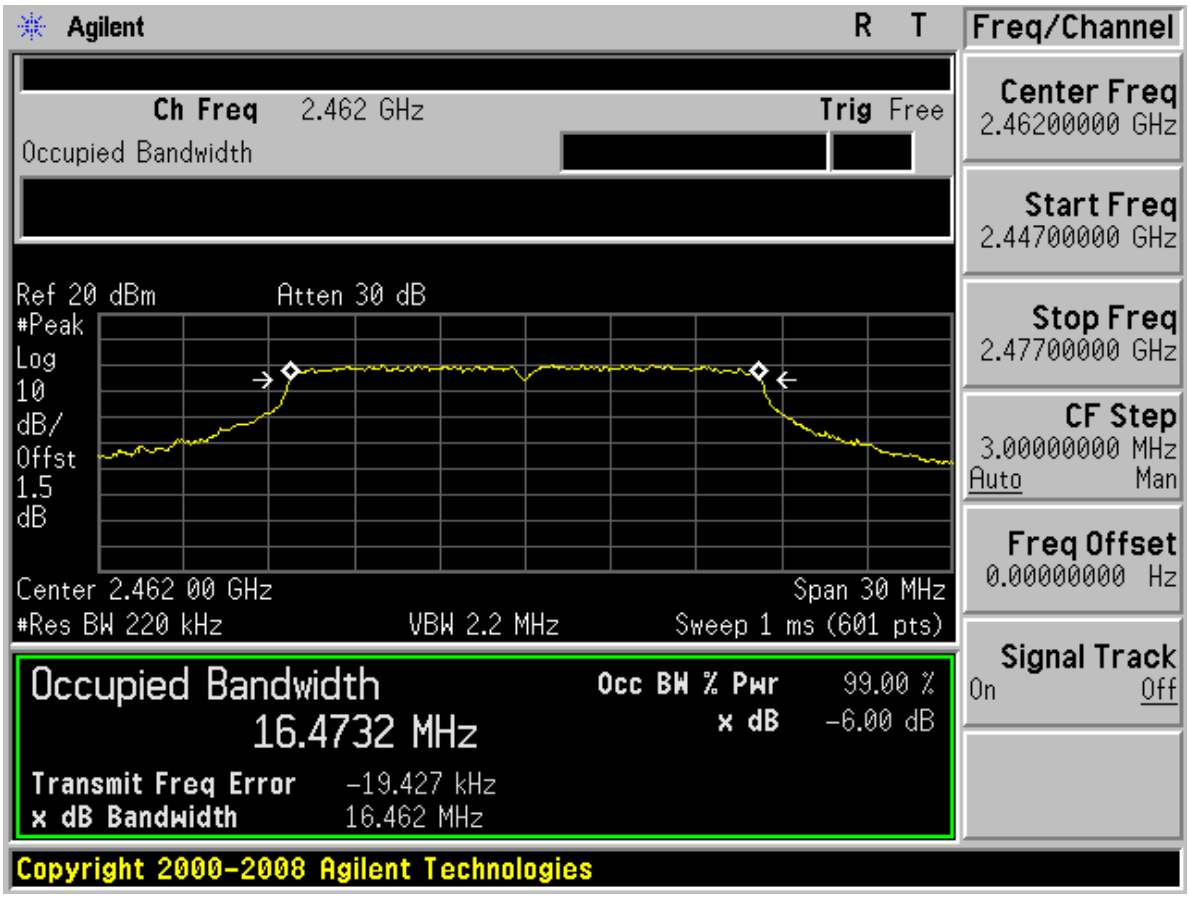
TM3
Channel 1 (2412MHz)



Channel 6 (2437MHz)



Channel 11 (2462MHz)

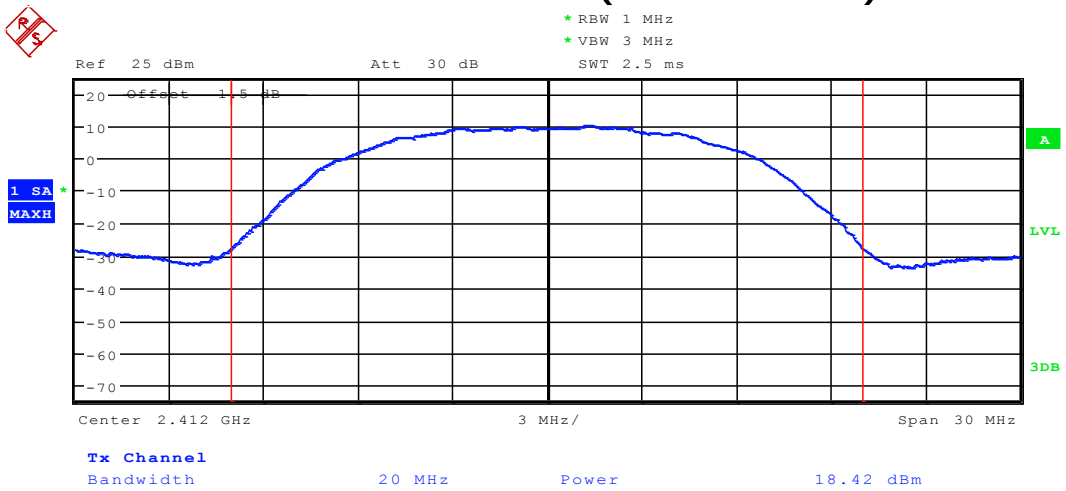


Appendix B

Conducted Peak output power

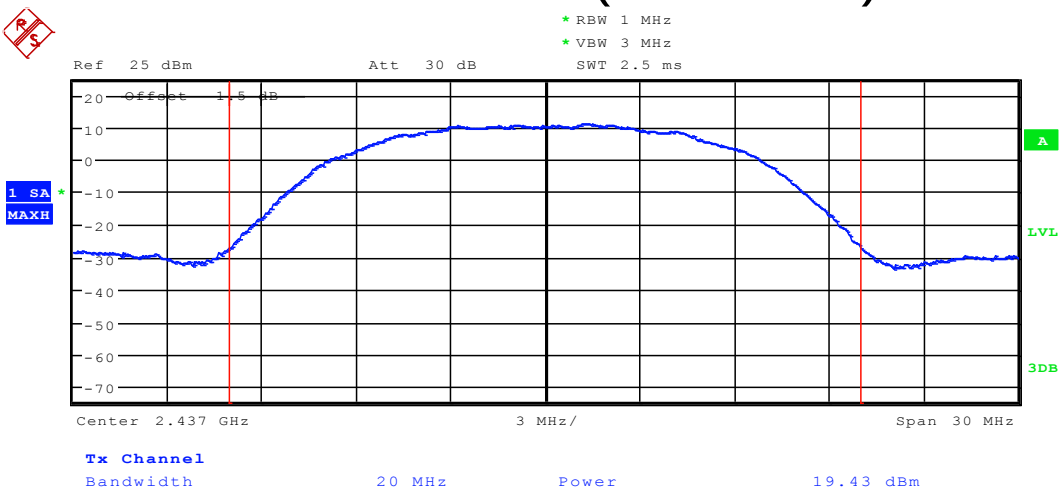
According to FCC Part 15.247 (b) (3)

TM1
Channel 1 (2412MHz)



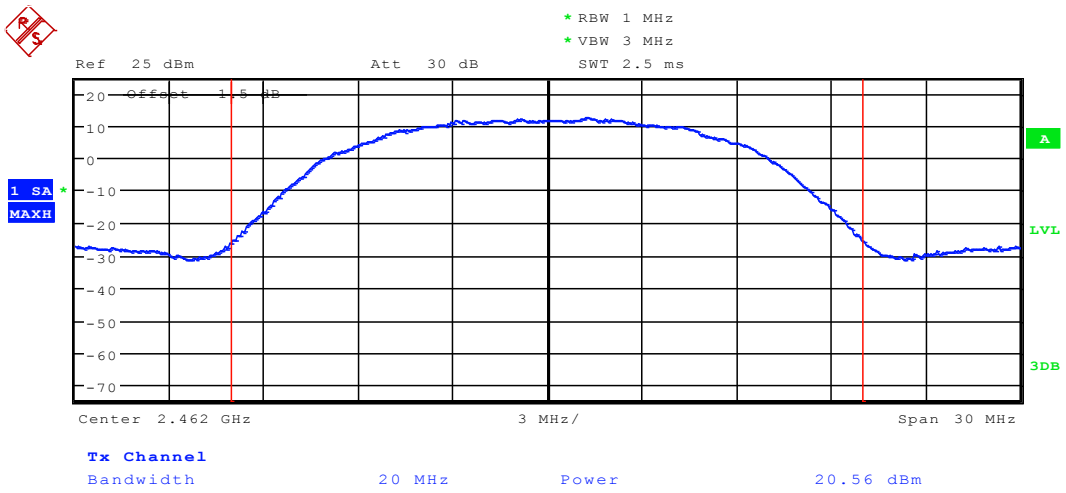
Date: 26.JUL.2011 17:05:43

Channel 6 (2437MHz)



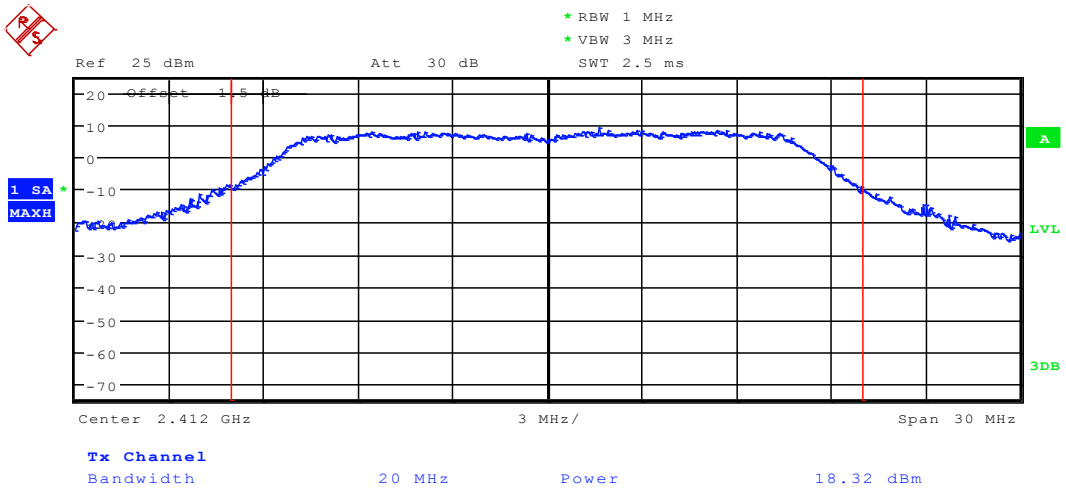
Date: 26.JUL.2011 17:03:09

Channel 11 (2462MHz)



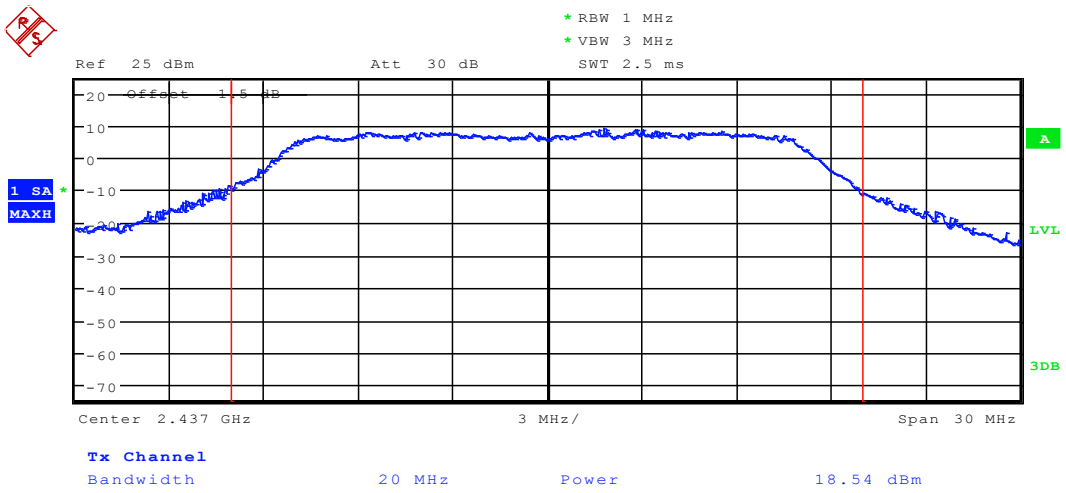
Date: 26.JUL.2011 17:04:11

TM2
Channel 1 (2412MHz)



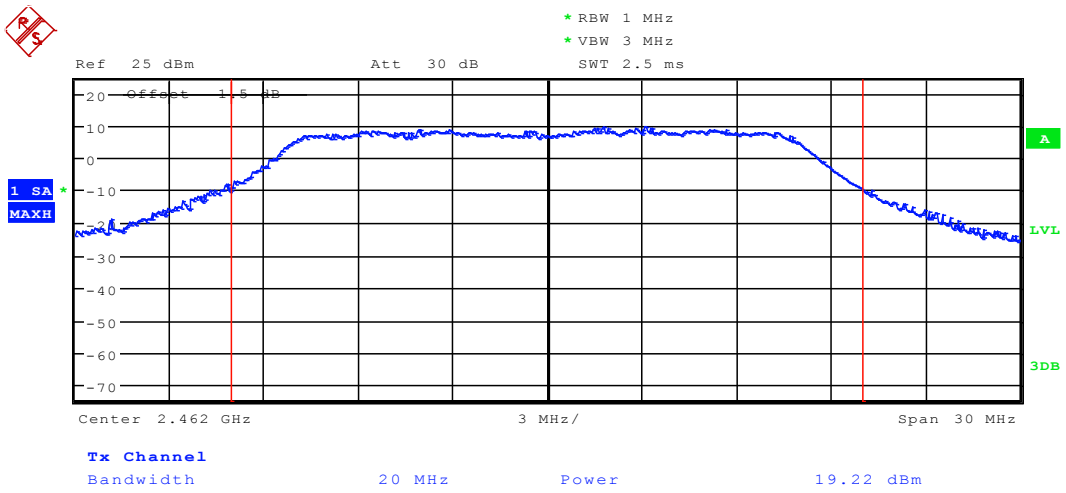
Date: 26.JUL.2011 17:11:46

Channel 6 (2437MHz)



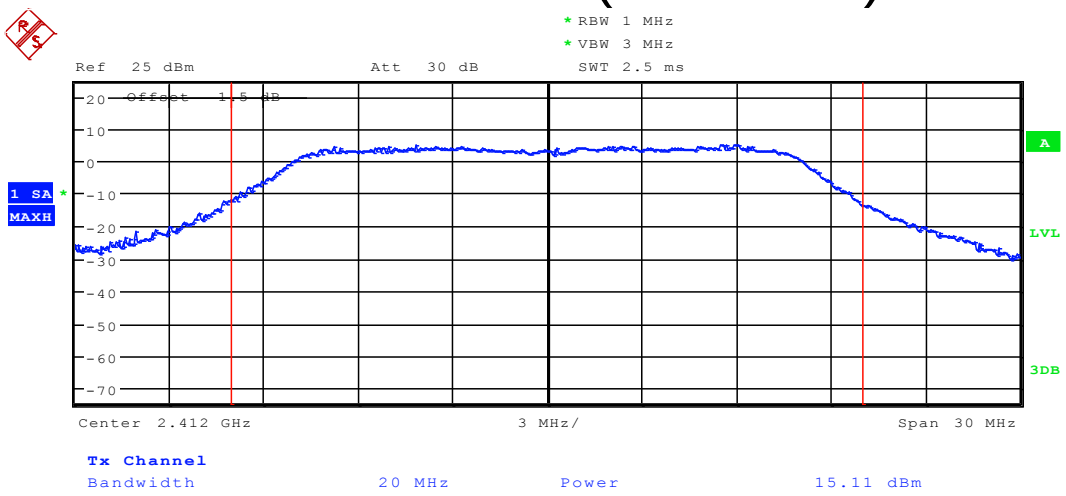
Date: 26.JUL.2011 17:13:29

Channel 11 (2462MHz)



Date: 26.JUL.2011 17:14:32

TM3
Channel 1 (2412MHz)



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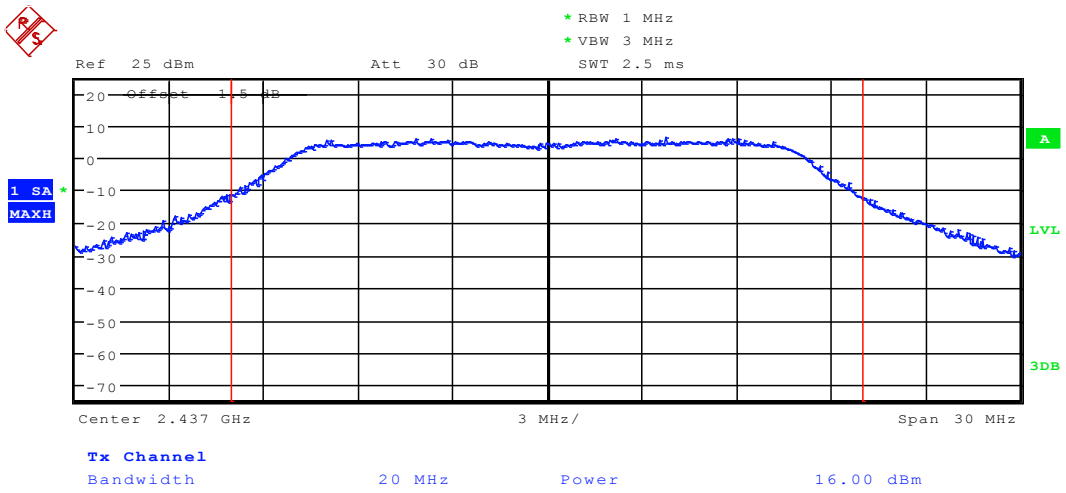
Channel 6 (2437MHz)



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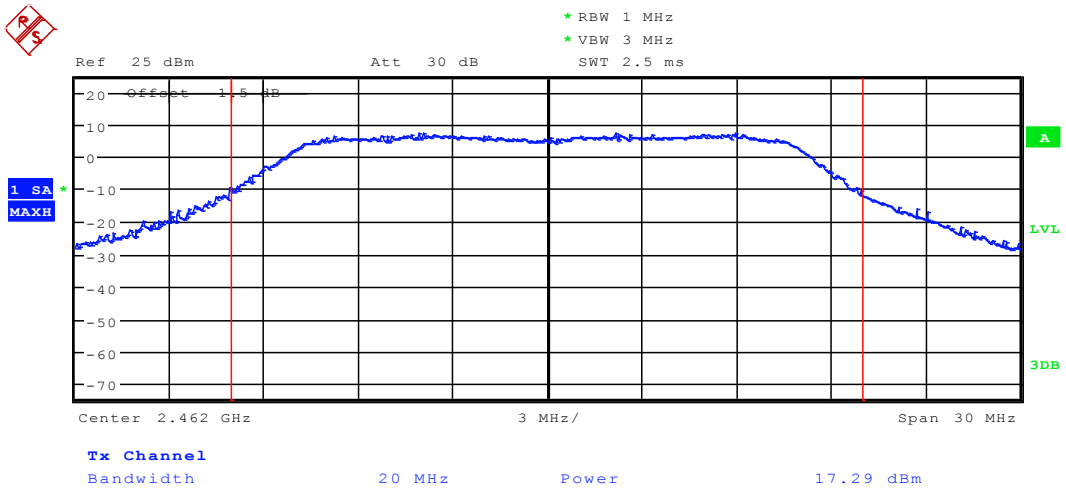
Channel 11 (2462MHz)



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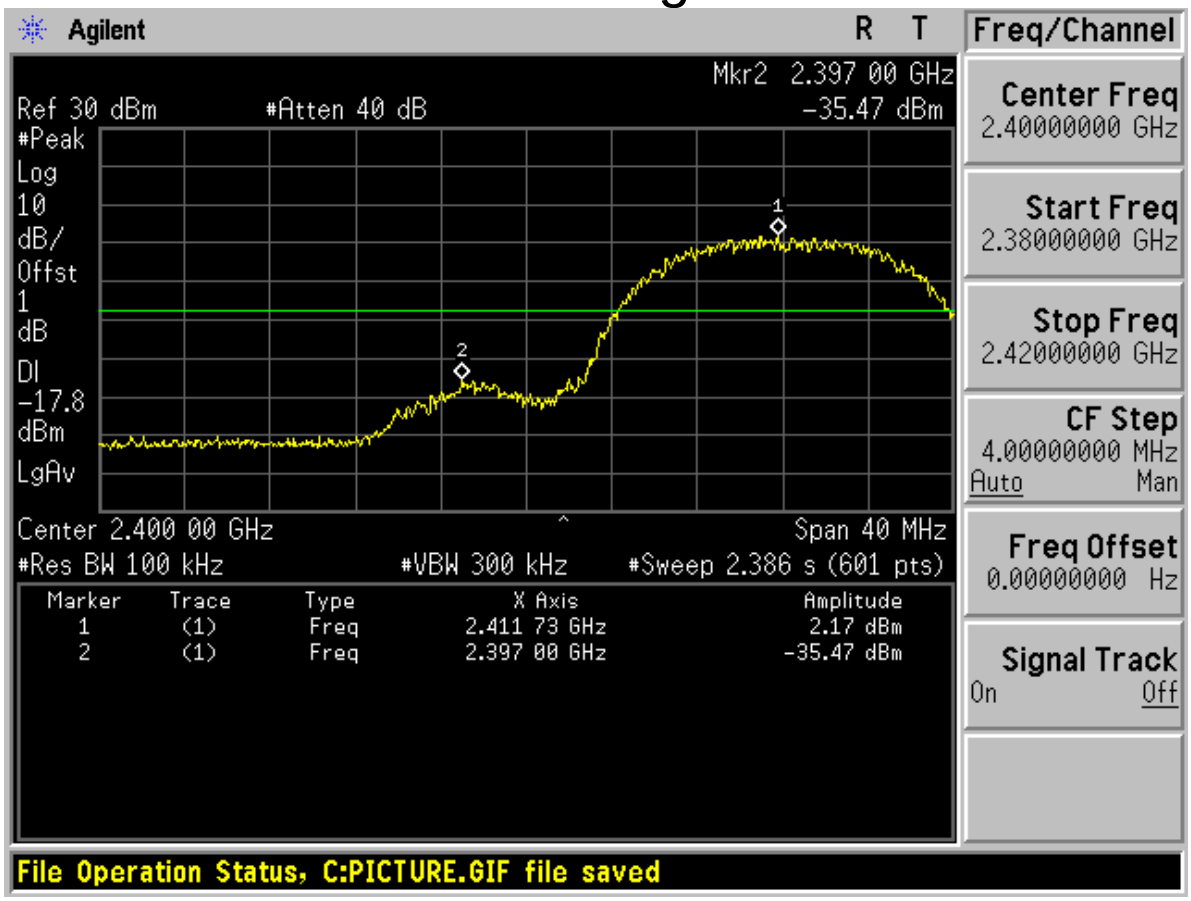
Appendix C

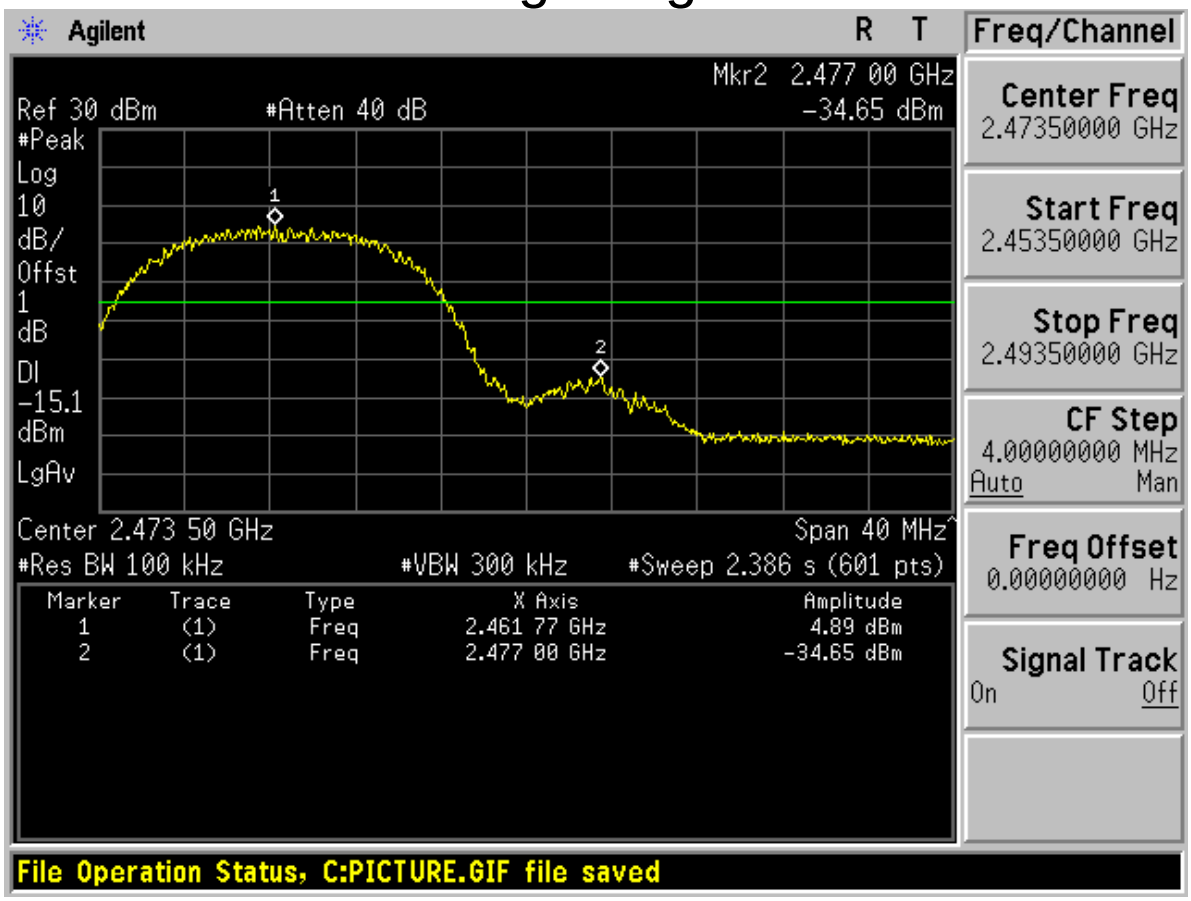
Band edge spurious emission

According to FCC Part 15.247 (d)

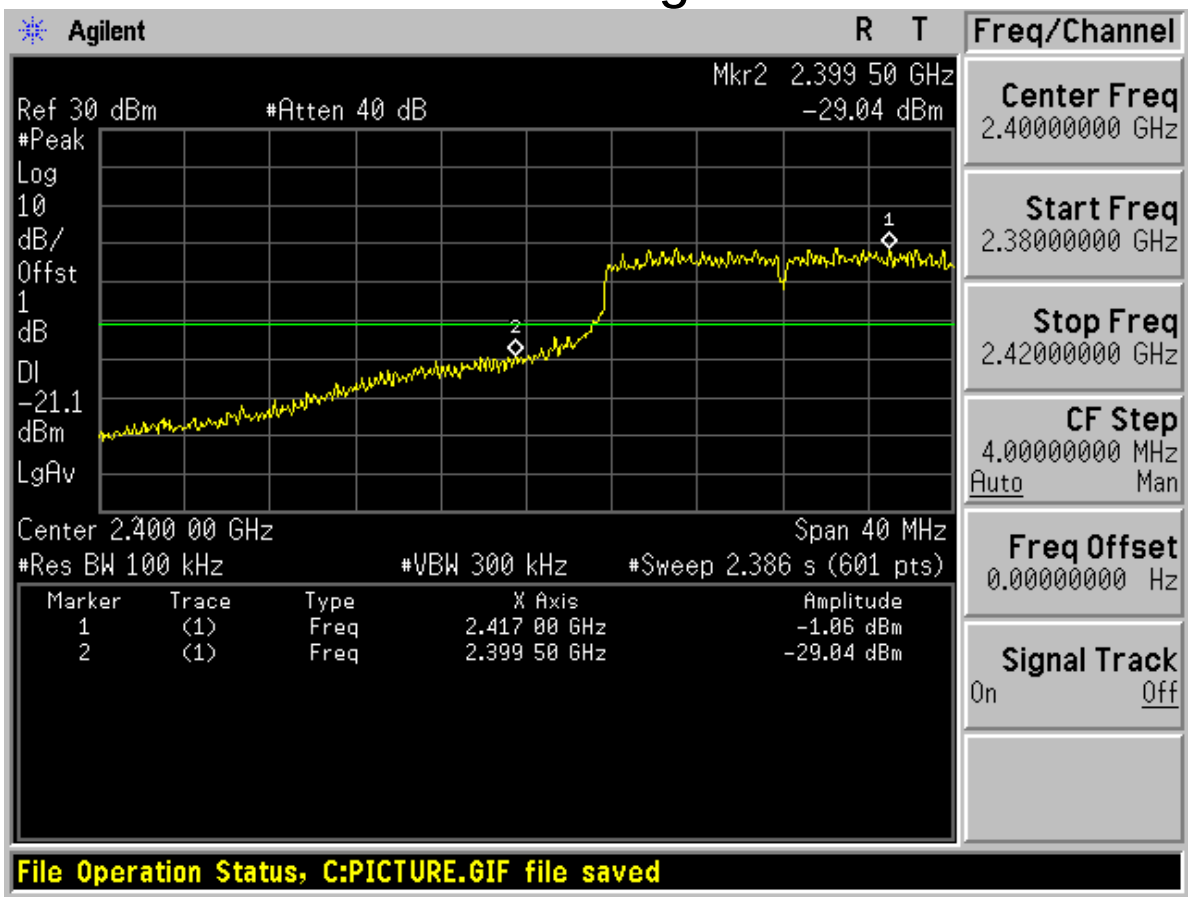
TM1
Low edge


Agilent
R T
Freq/Channel
Mkr2 2.397 00 GHz
Ref 30 dBm
#Atten 40 dB
-35.47 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-17.8
dBm
LgAv
1
2
Center 2.400 00 GHz
Span 40 MHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 2.386 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.411 73 GHz 2.17 dBm
2 (1) Freq 2.397 00 GHz -35.47 dBm
Center Freq
2.40000000 GHz
Start Freq
2.38000000 GHz
Stop Freq
2.42000000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, C:PICTURE.GIF file saved

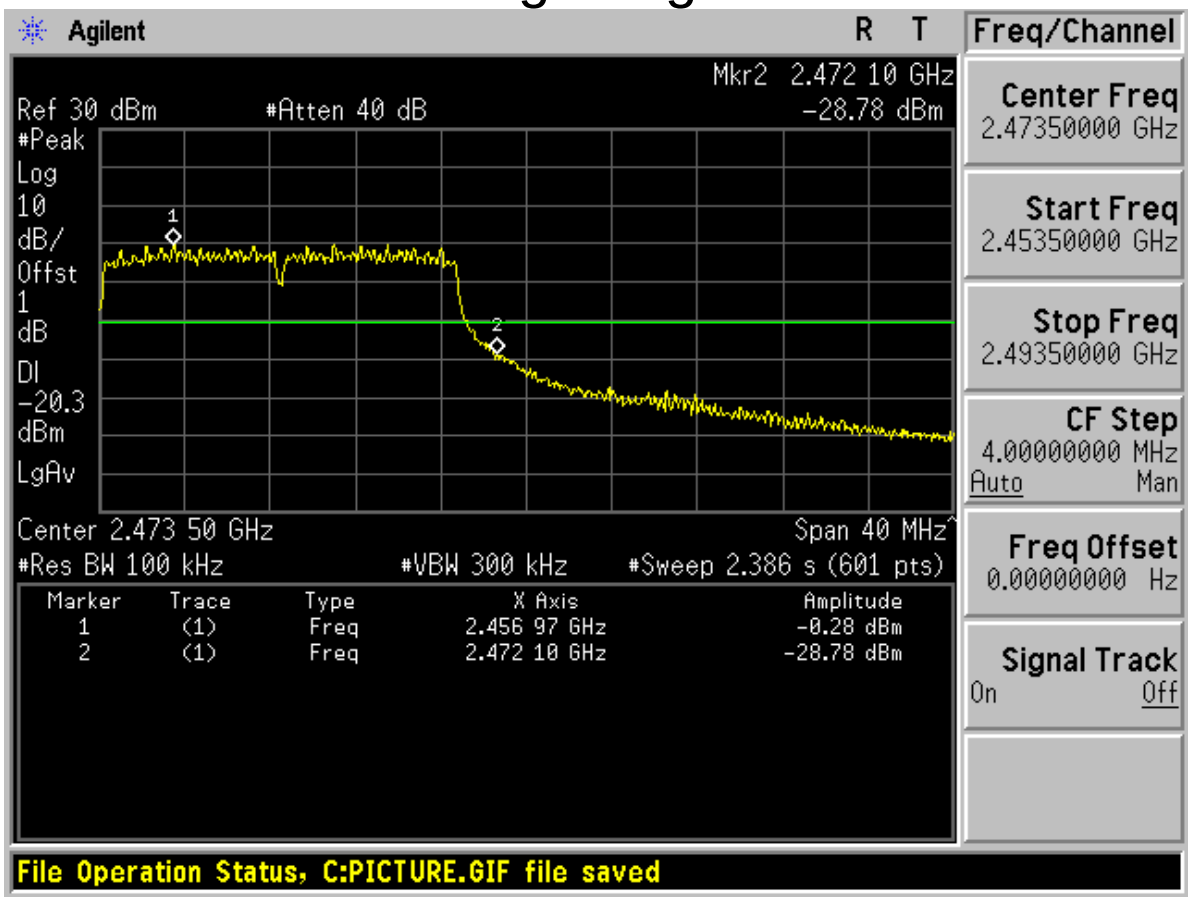
High edge


Agilent
R T
Freq/Channel
Mkr2 2.477 00 GHz
Ref 30 dBm
#Atten 40 dB
-34.65 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-15.1
dBm
LgAv
1
2
Center 2.473 50 GHz
Span 40 MHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 2.386 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.461 77 GHz 4.89 dBm
2 (1) Freq 2.477 00 GHz -34.65 dBm
Center Freq
2.47350000 GHz
Start Freq
2.45350000 GHz
Stop Freq
2.49350000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, C:PICTURE.GIF file saved

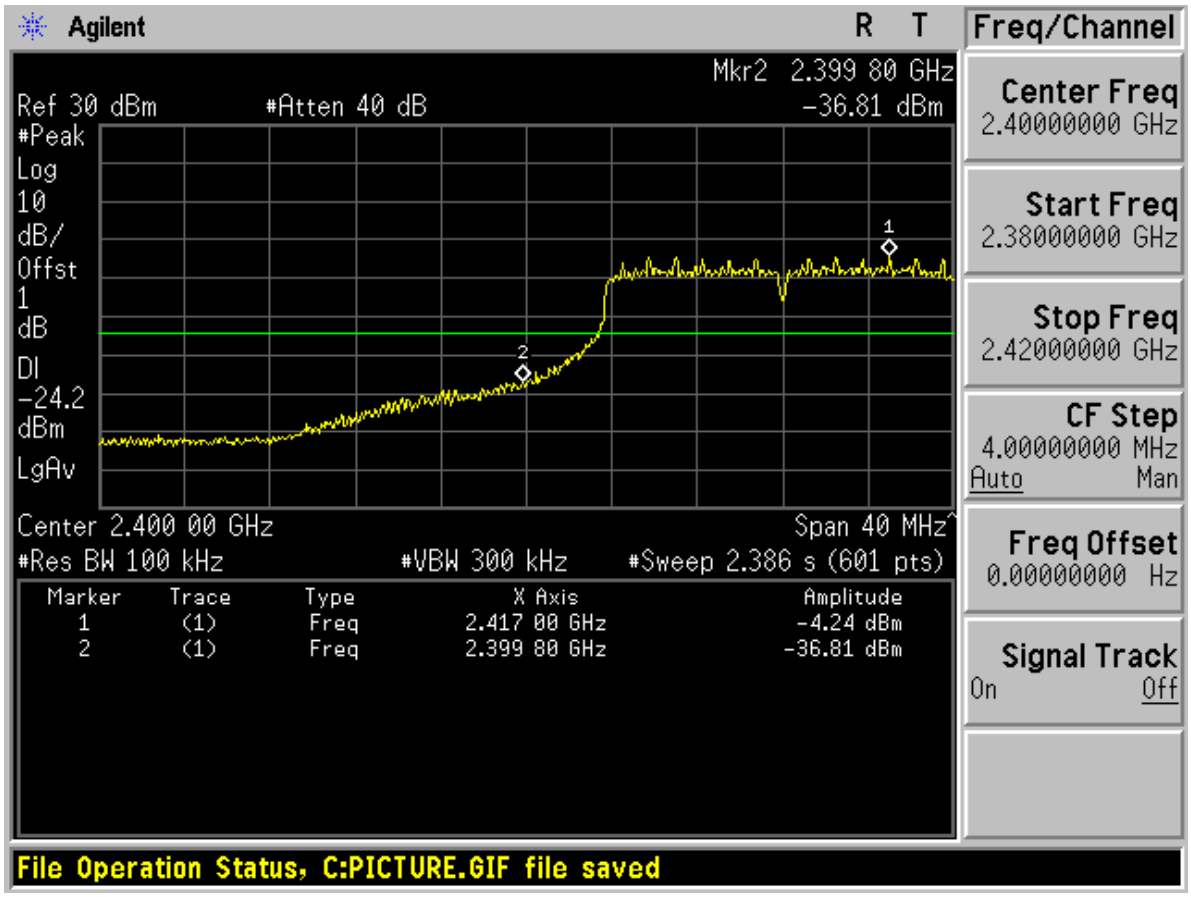
TM2
Low edge


Agilent
R T
Freq/Channel
Mkr2 2.399 50 GHz
Ref 30 dBm
#Atten 40 dB
-29.04 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-21.1
dBm
LgAv
1
2
Center 2.400 00 GHz
Span 40 MHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 2.386 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.417 00 GHz -1.06 dBm
2 (1) Freq 2.399 50 GHz -29.04 dBm
Center Freq
2.40000000 GHz
Start Freq
2.38000000 GHz
Stop Freq
2.42000000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, C:PICTURE.GIF file saved

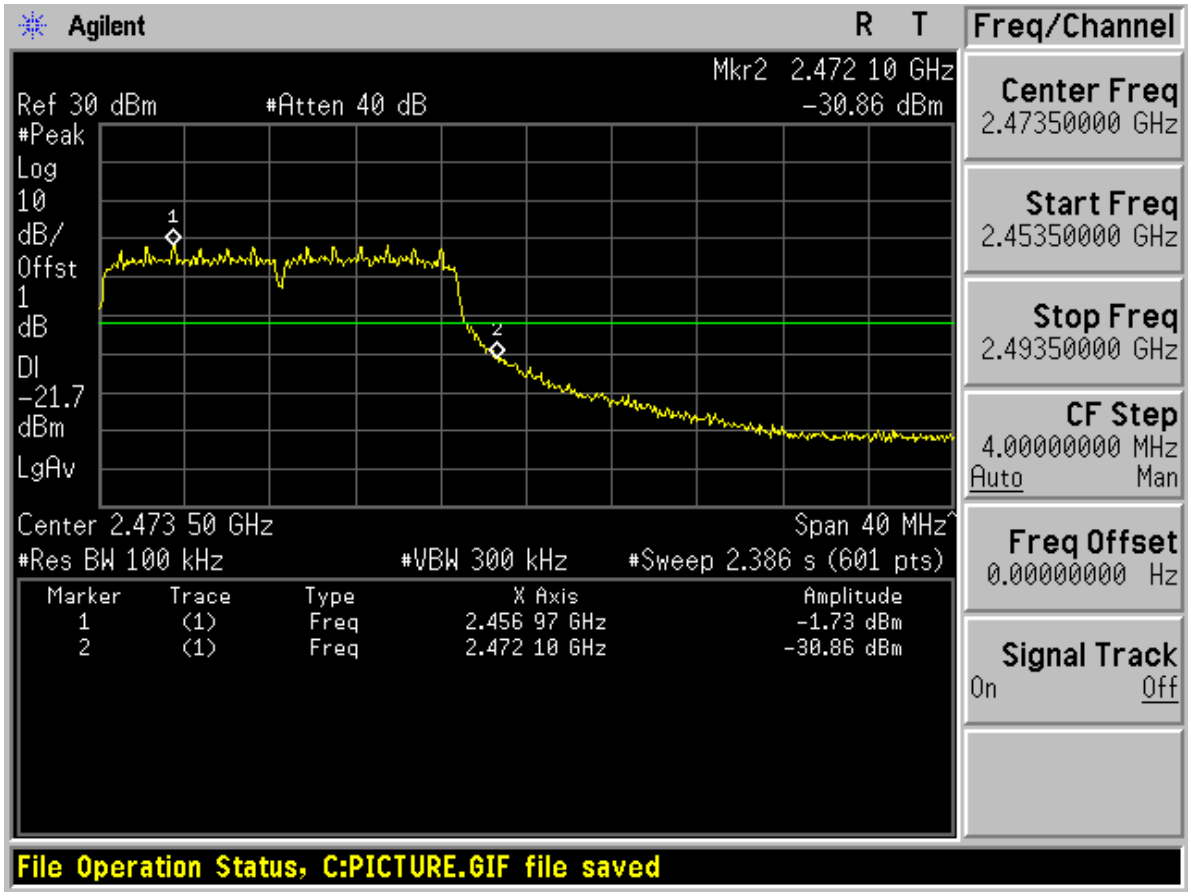
High edge


Agilent
R T
Freq/Channel
Mkr2 2.472 10 GHz
Ref 30 dBm
#Atten 40 dB
-28.78 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-20.3
dBm
LgAv
Center 2.473 50 GHz
Span 40 MHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 2.386 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.456 97 GHz -0.28 dBm
2 (1) Freq 2.472 10 GHz -28.78 dBm
Center Freq
2.47350000 GHz
Start Freq
2.45350000 GHz
Stop Freq
2.49350000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, C:PICTURE.GIF file saved

TM3
Low edge


Agilent
R T
Freq/Channel
Mkr2 2.399 80 GHz
Ref 30 dBm
#Atten 40 dB
-36.81 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-24.2
dBm
LgAv
1
2
Center 2.400 00 GHz
Span 40 MHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 2.386 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.417 00 GHz -4.24 dBm
2 (1) Freq 2.399 80 GHz -36.81 dBm
Center Freq
2.40000000 GHz
Start Freq
2.38000000 GHz
Stop Freq
2.42000000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, C:PICTURE.GIF file saved

High edge

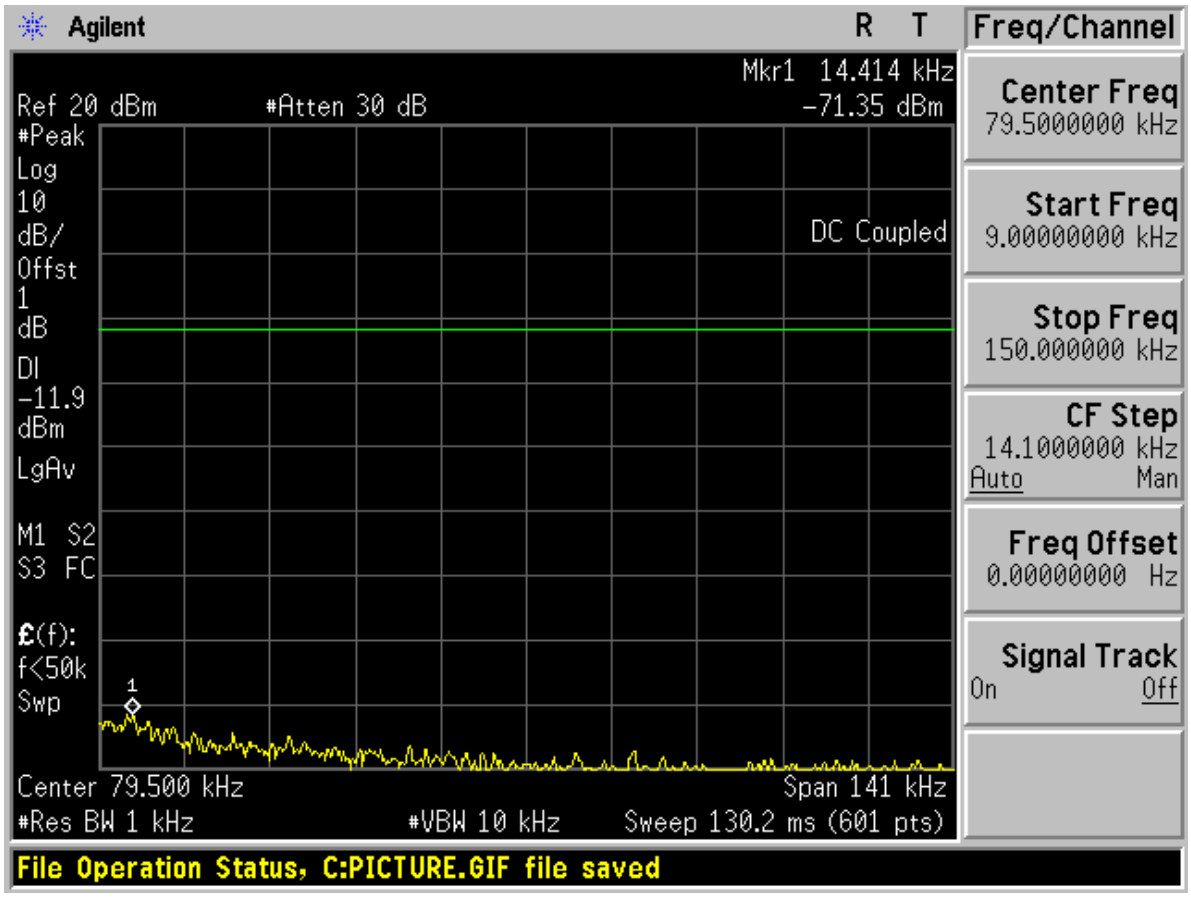

Agilent
R T
Freq/Channel
Mkr2 2.472 10 GHz
Ref 30 dBm
#Atten 40 dB
-30.86 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-21.7
dBm
LgAv
Center 2.473 50 GHz
Span 40 MHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 2.386 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.456 97 GHz -1.73 dBm
2 (1) Freq 2.472 10 GHz -30.86 dBm
Center Freq
2.47350000 GHz
Start Freq
2.45350000 GHz
Stop Freq
2.49350000 GHz
CF Step
4.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, C:PICTURE.GIF file saved

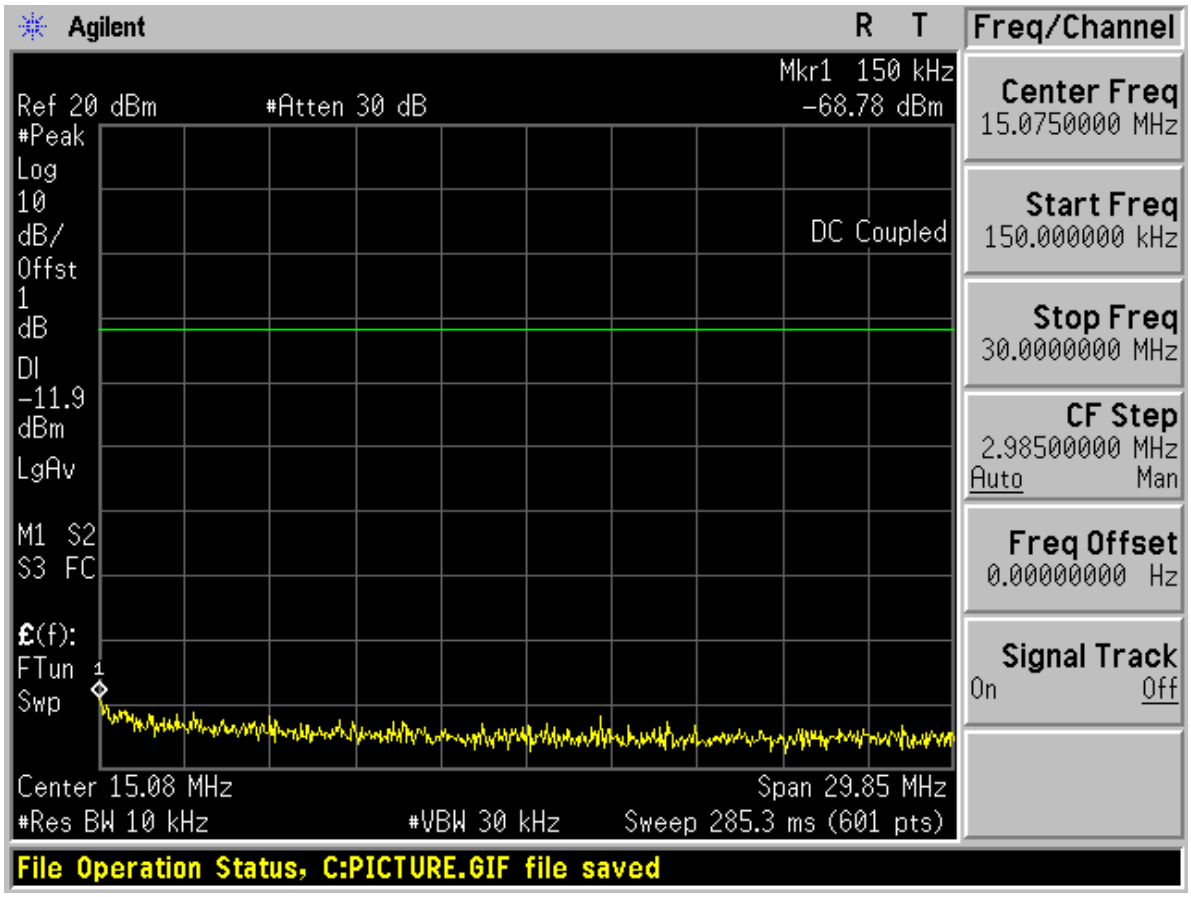
Appendix D

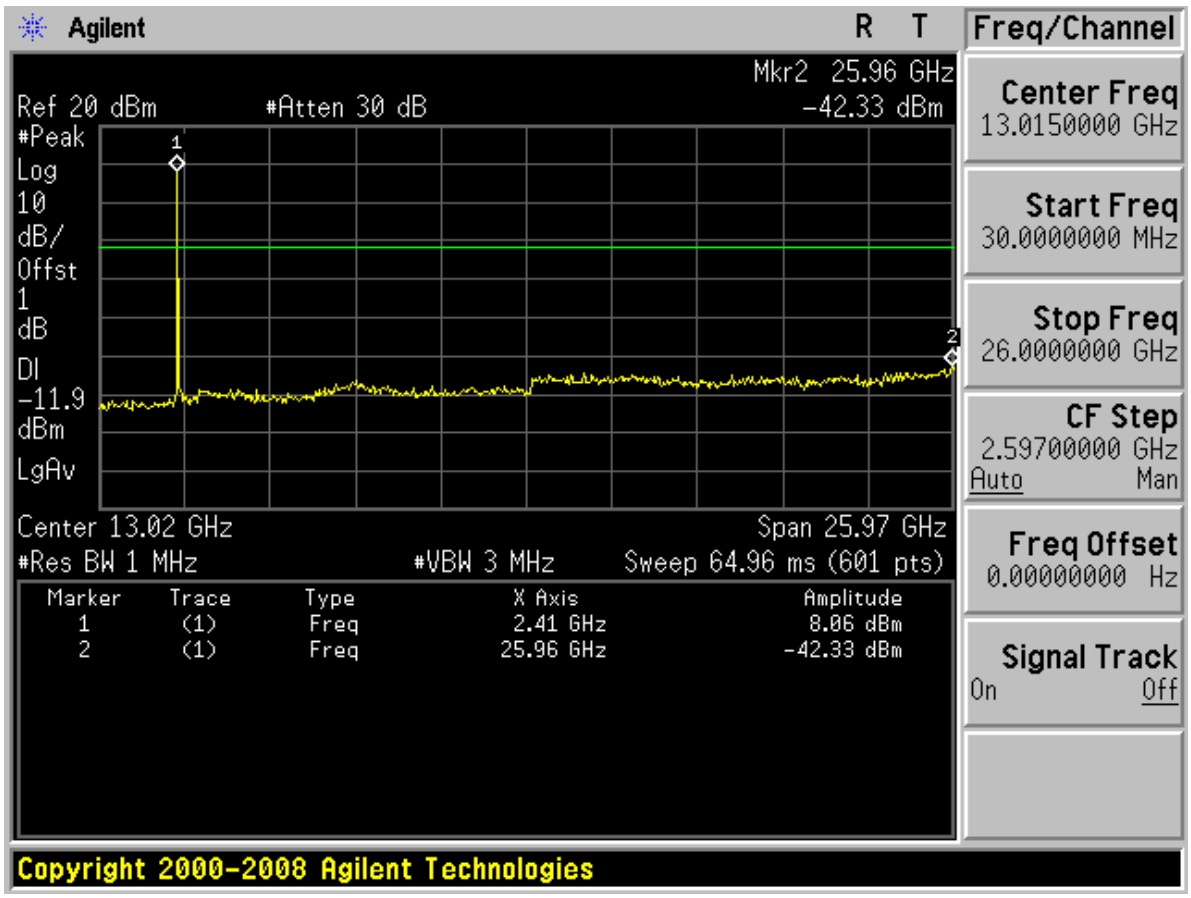
Conducted RF spurious

According to FCC Part 15.247 (d)

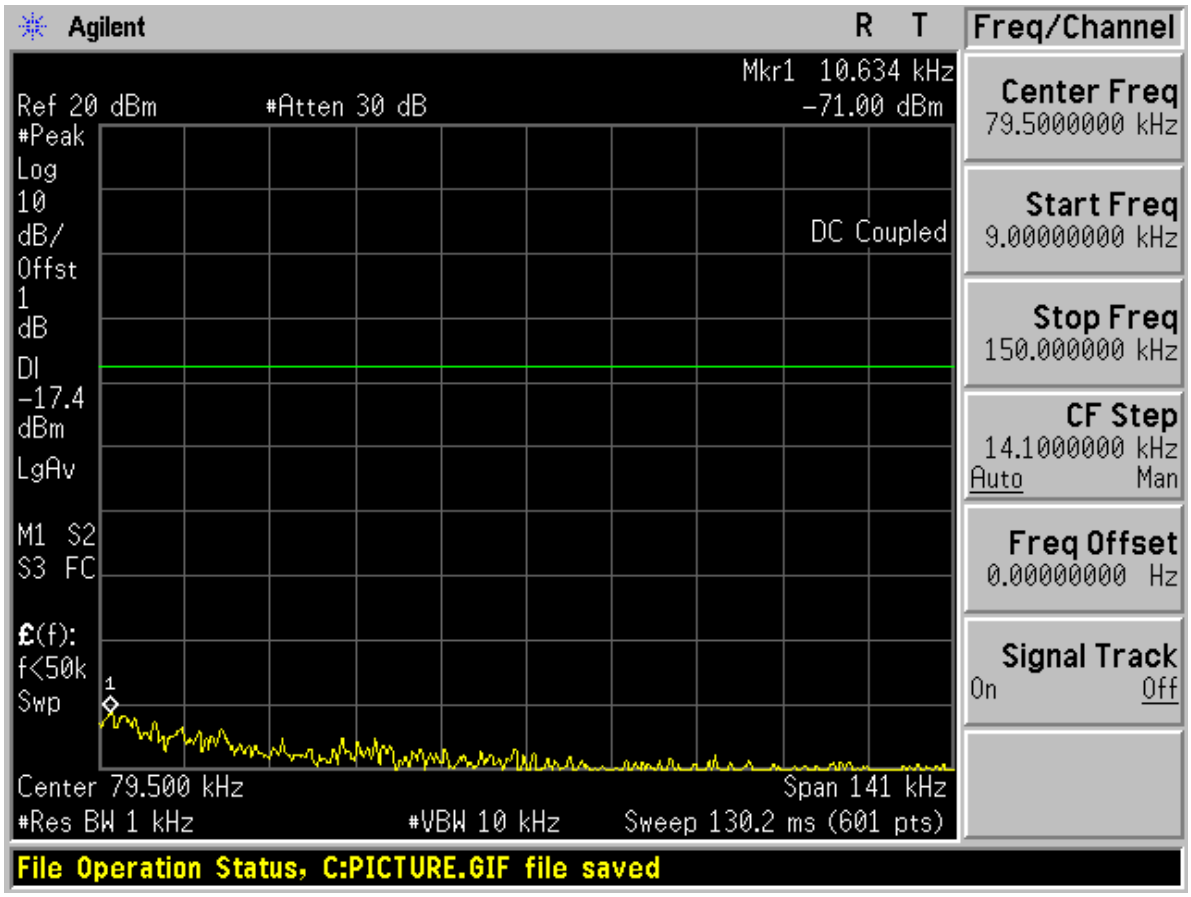
TM1
Channel 1

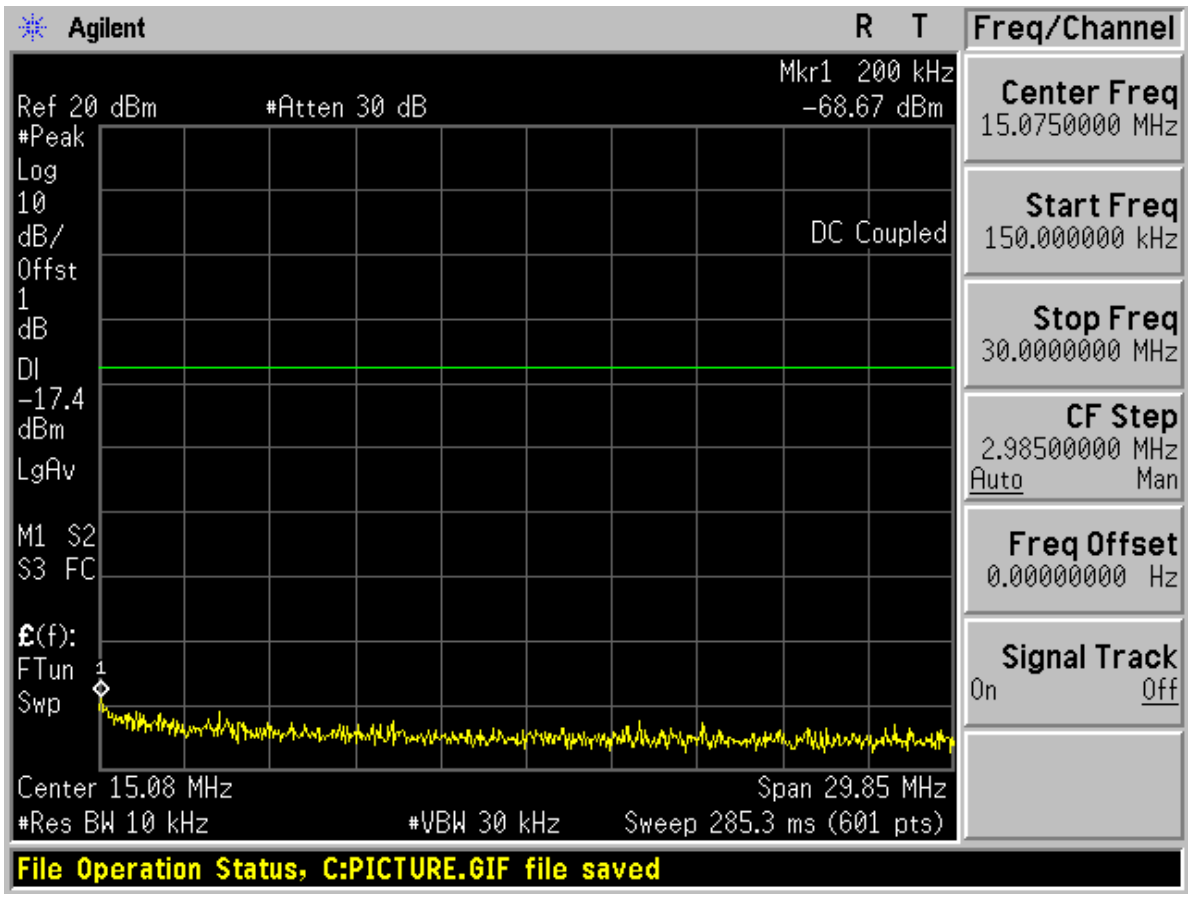


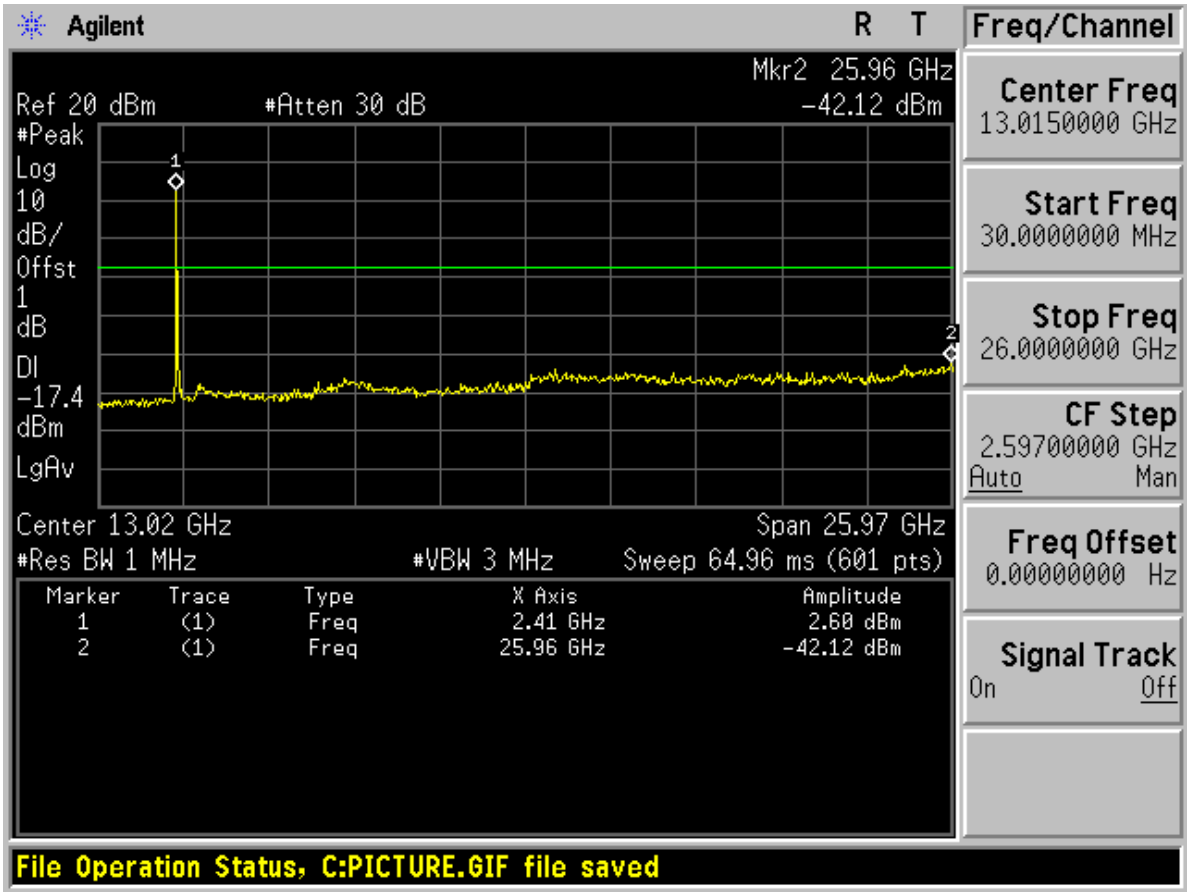

Agilent
R T
Freq/Channel
Mkr1 150 kHz
Ref 20 dBm
#Atten 30 dB
-68.78 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-11.9
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 15.08 MHz
Span 29.85 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 285.3 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved


Agilent
R T
Freq/Channel
Mkr2 25.96 GHz
Ref 20 dBm
#Atten 30 dB
-42.33 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-11.9
dBm
LgAv
Center 13.02 GHz
Span 25.97 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 64.96 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.41 GHz 8.06 dBm
2 (1) Freq 25.96 GHz -42.33 dBm
Center Freq
13.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
26.0000000 GHz
CF Step
2.59700000 GHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Copyright 2000-2008 Agilent Technologies

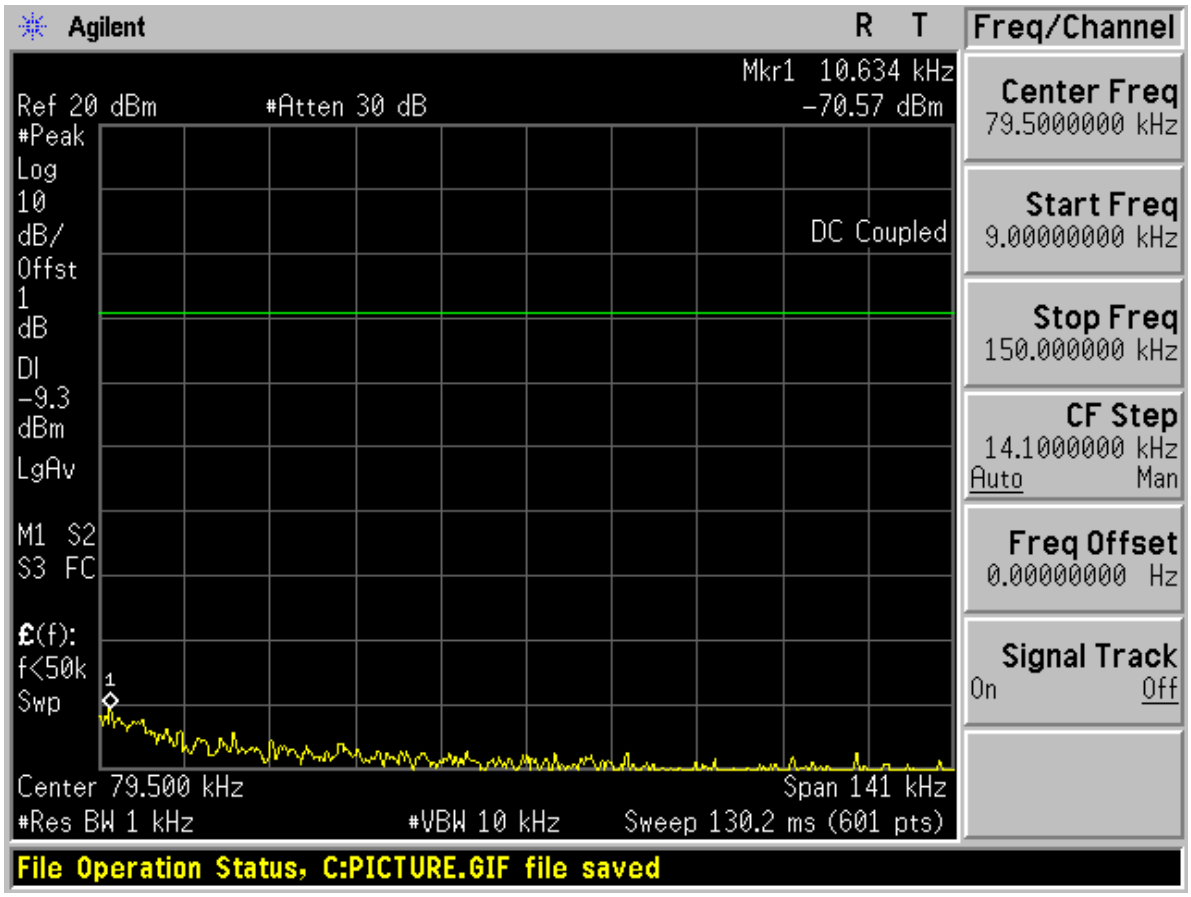
Channel 6

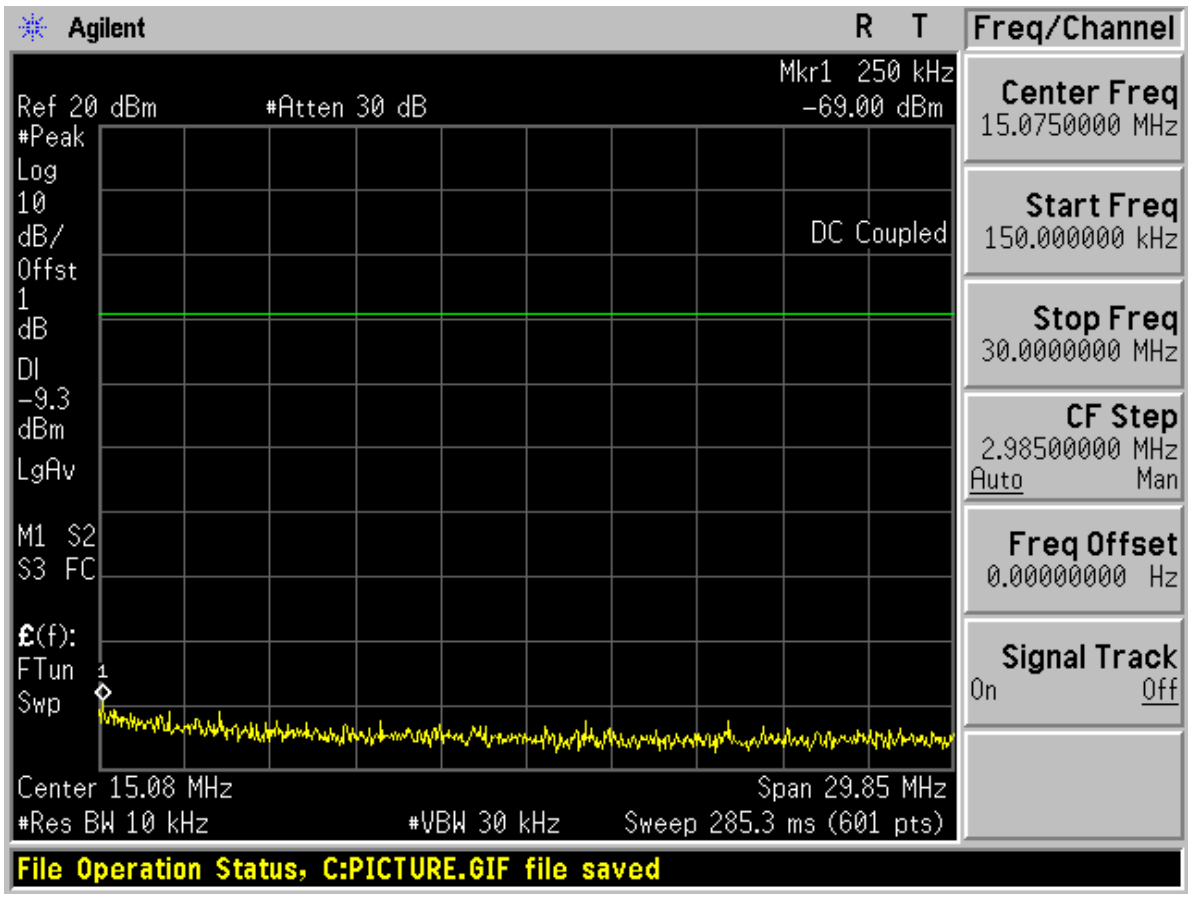

Agilent
R T
Freq/Channel
Mkr1 10.634 kHz
Ref 20 dBm
#Atten 30 dB
-71.00 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-17.4
dBm
LgAv
M1 S2
S3 FC
£(f):
f<50k
Swp
DC Coupled
Center Freq
79.5000000 kHz
Start Freq
9.00000000 kHz
Stop Freq
150.000000 kHz
CF Step
14.1000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 79.500 kHz
Span 141 kHz
#Res BW 1 kHz
#VBW 10 kHz
Sweep 130.2 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved

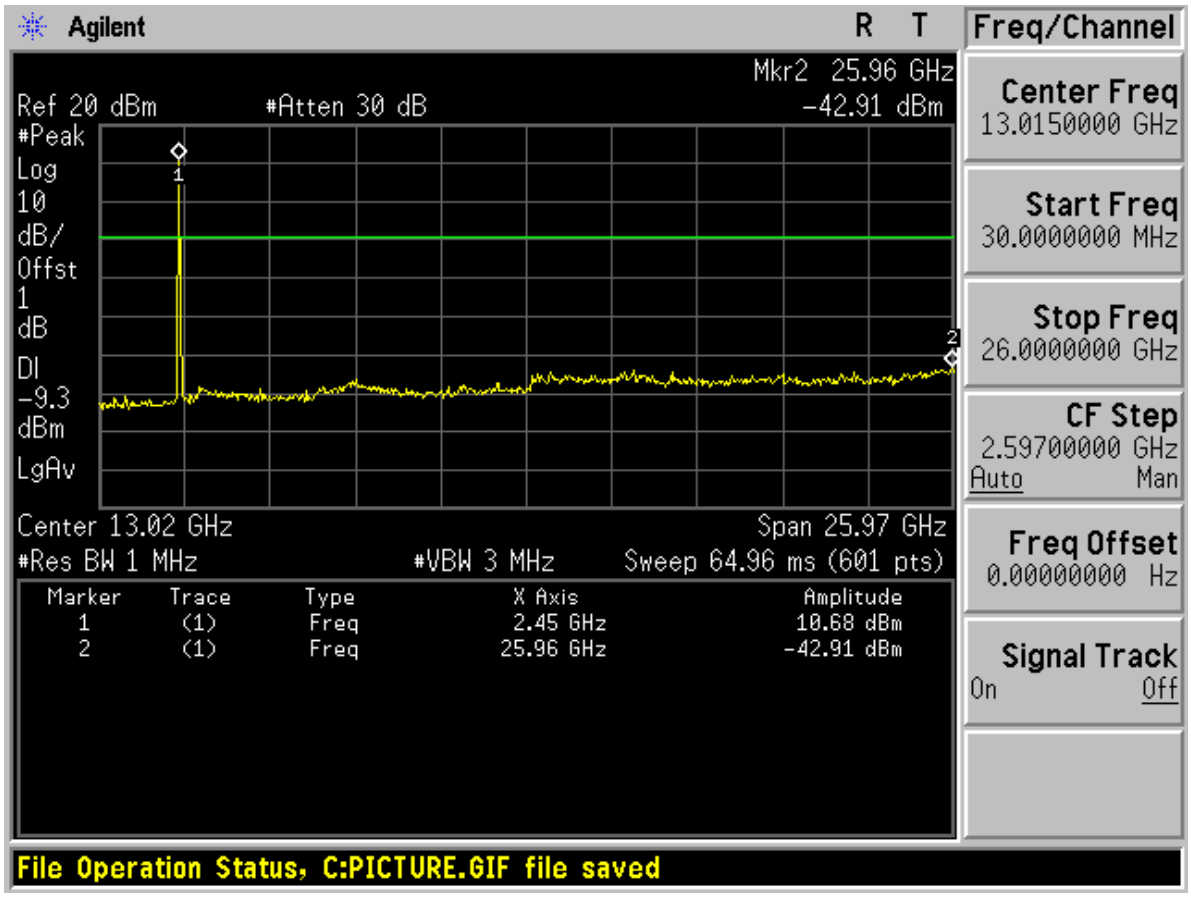

Agilent
R T
Freq/Channel
Mkr1 200 kHz
Ref 20 dBm
#Atten 30 dB
-68.67 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-17.4
dBm
LgAv
DC Coupled
M1 S2
S3 FC
£(f):
FTun
Swp
Center 15.08 MHz
Span 29.85 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 285.3 ms (601 pts)
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved


Agilent
R T
Freq/Channel
Mkr2 25.96 GHz
Ref 20 dBm
#Atten 30 dB
-42.12 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-17.4
dBm
LgAv
Center Freq
13.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
26.0000000 GHz
CF Step
2.59700000 GHz
Auto
Man
Center 13.02 GHz
Span 25.97 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 64.96 ms (601 pts)
Freq Offset
0.00000000 Hz
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.41 GHz 2.60 dBm
2 (1) Freq 25.96 GHz -42.12 dBm
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

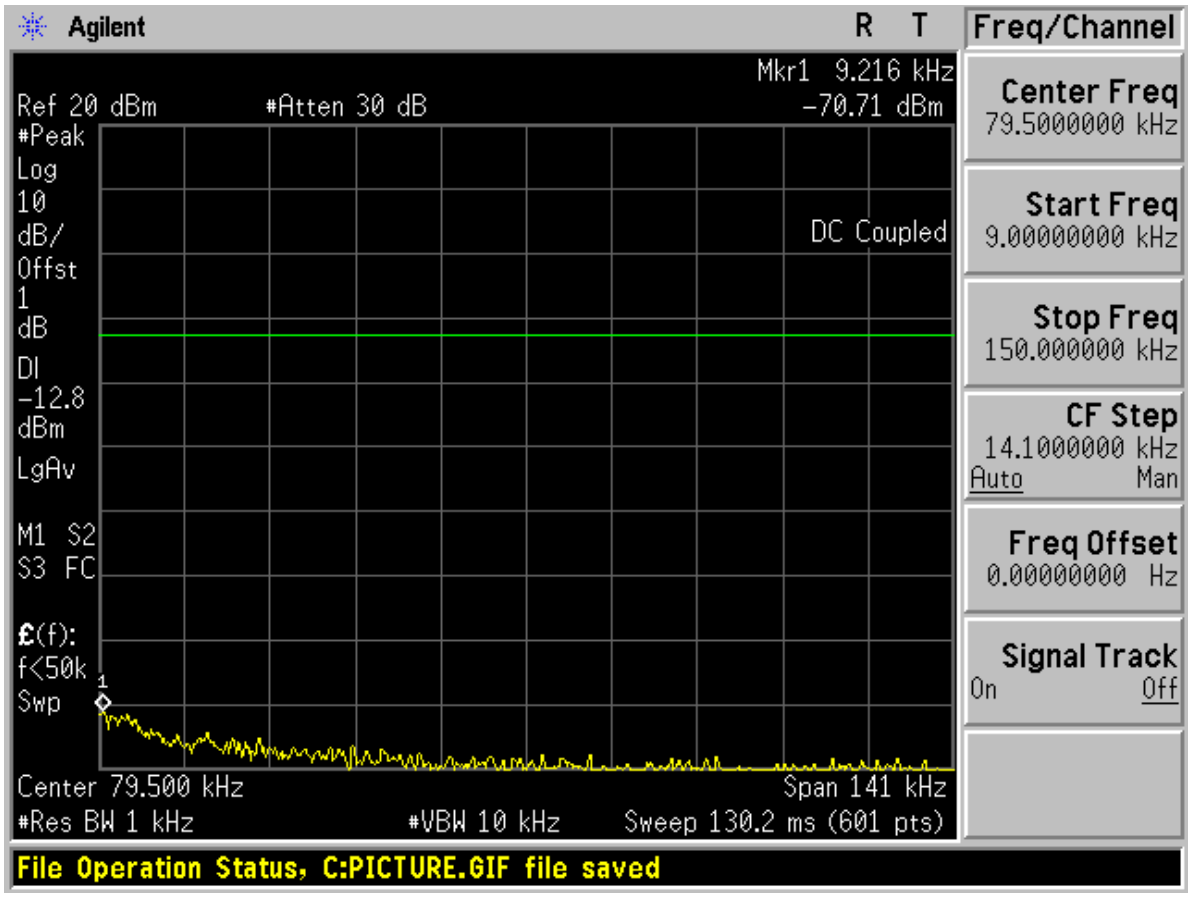
Channel 11

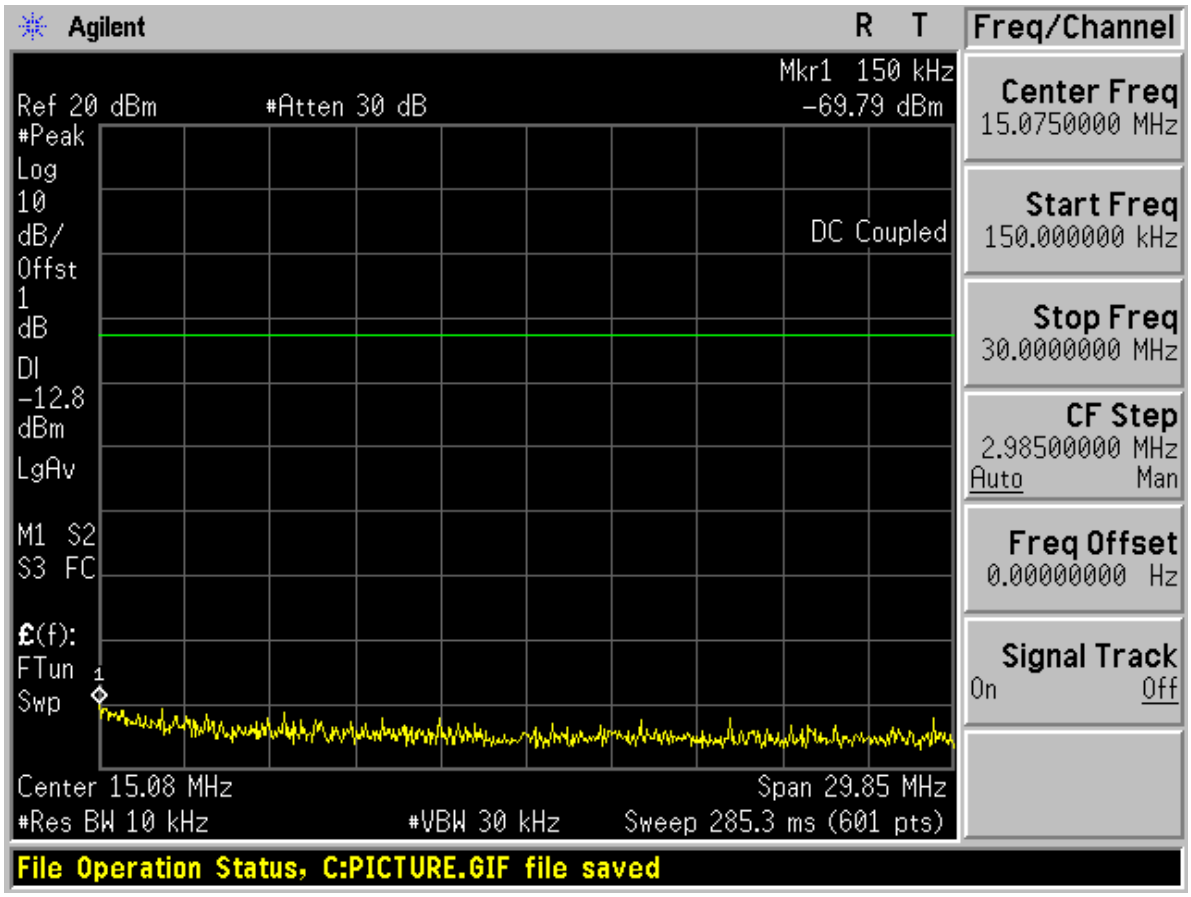

Agilent
R T
Freq/Channel
Mkr1 10.634 kHz
Ref 20 dBm
#Atten 30 dB
-70.57 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-9.3
dBm
LgAv
M1 S2
S3 FC
£(f):
f<50k
Swp
DC Coupled
Center Freq
79.5000000 kHz
Start Freq
9.00000000 kHz
Stop Freq
150.000000 kHz
CF Step
14.1000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 79.500 kHz
Span 141 kHz
#Res BW 1 kHz
#VBW 10 kHz
Sweep 130.2 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved

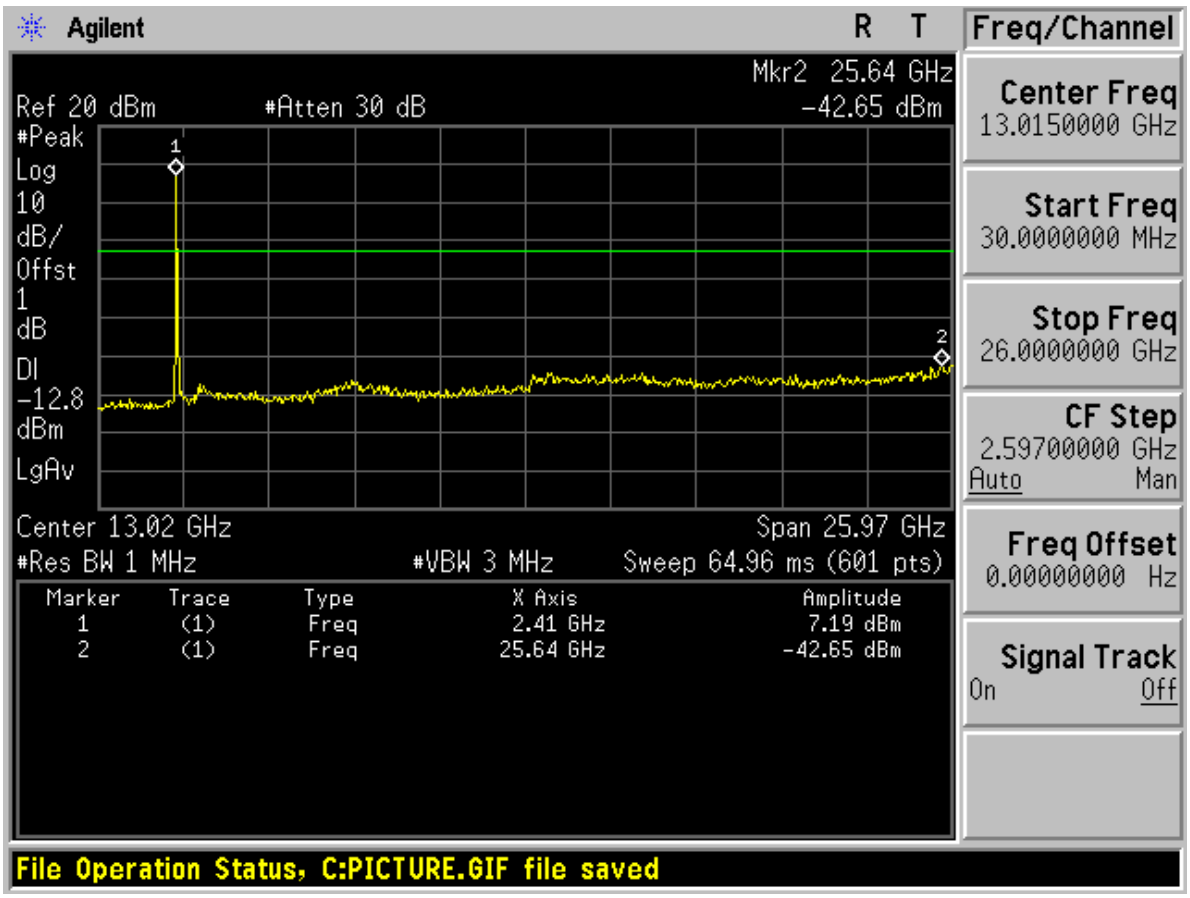

Agilent
R T
Freq/Channel
Mkr1 250 kHz
Ref 20 dBm
#Atten 30 dB
-69.00 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-9.3
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 15.08 MHz
Span 29.85 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 285.3 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved


Agilent
R T
Freq/Channel
Mkr2 25.96 GHz
Ref 20 dBm
#Atten 30 dB
-42.91 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-9.3
dBm
LgAv
Center Freq
13.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
26.0000000 GHz
CF Step
2.59700000 GHz
Auto
Man
Center 13.02 GHz
Span 25.97 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 64.96 ms (601 pts)
Freq Offset
0.00000000 Hz
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.45 GHz 10.68 dBm
2 (1) Freq 25.96 GHz -42.91 dBm
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

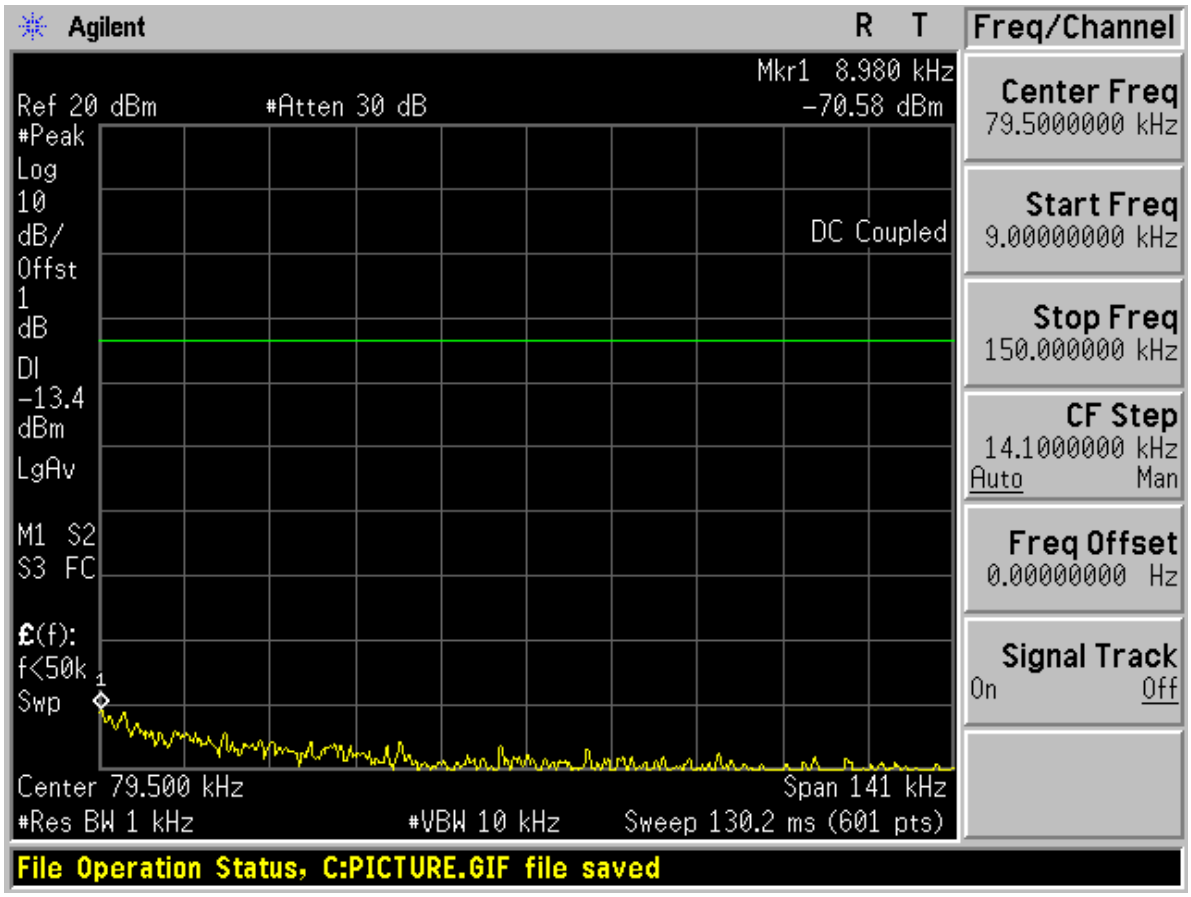
TM2
Channel 1

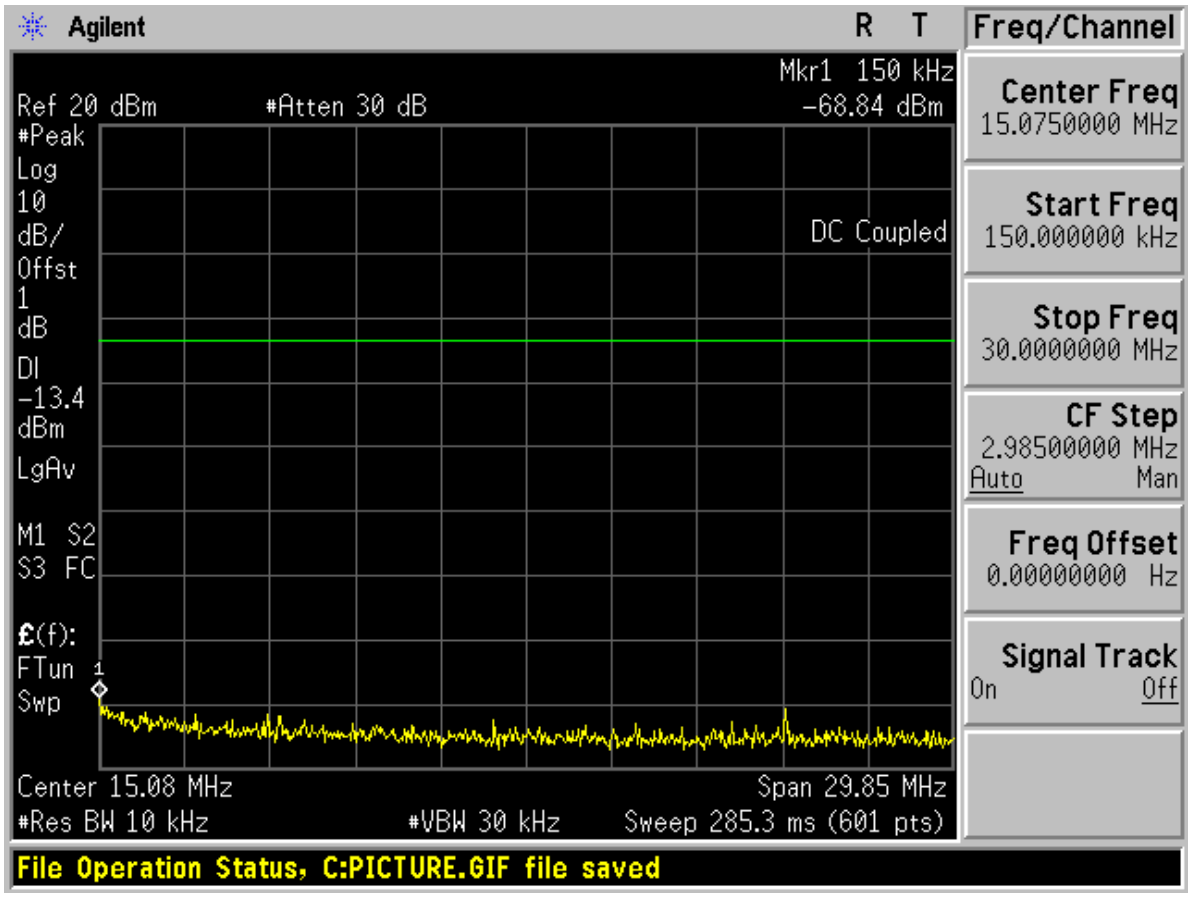


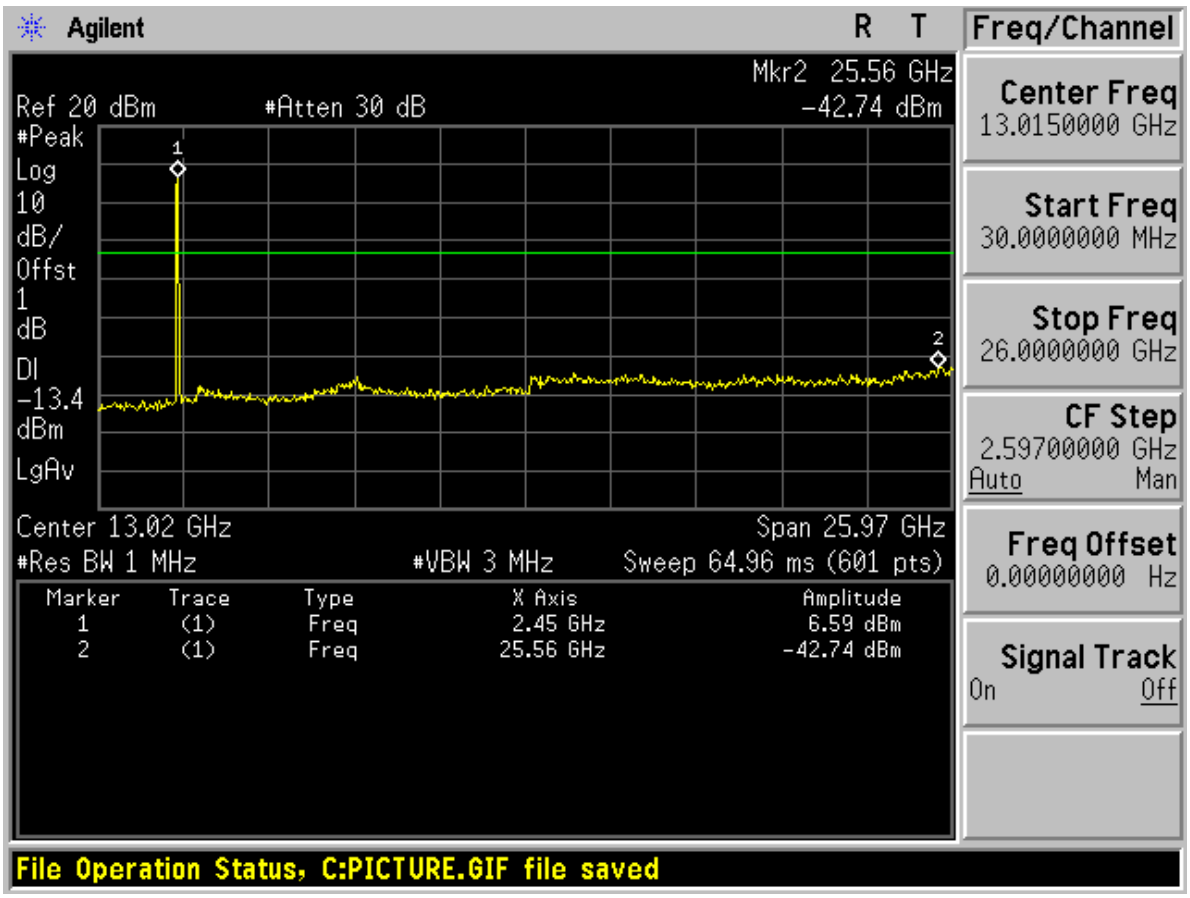

Agilent
R T
Freq/Channel
Mkr1 150 kHz
Ref 20 dBm
#Atten 30 dB
-69.79 dBm
#Peak
Log
10
dB/
Offst
1
dB
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Dl
-12.8
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Center 15.08 MHz
Span 29.85 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 285.3 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved


Agilent
R T
Freq/Channel
Mkr2 25.64 GHz
Ref 20 dBm
#Atten 30 dB
-42.65 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-12.8
dBm
LgAv
Center Freq
13.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
26.0000000 GHz
CF Step
2.59700000 GHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 13.02 GHz
Span 25.97 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 64.96 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.41 GHz 7.19 dBm
2 (1) Freq 25.64 GHz -42.65 dBm
File Operation Status, C:PICTURE.GIF file saved

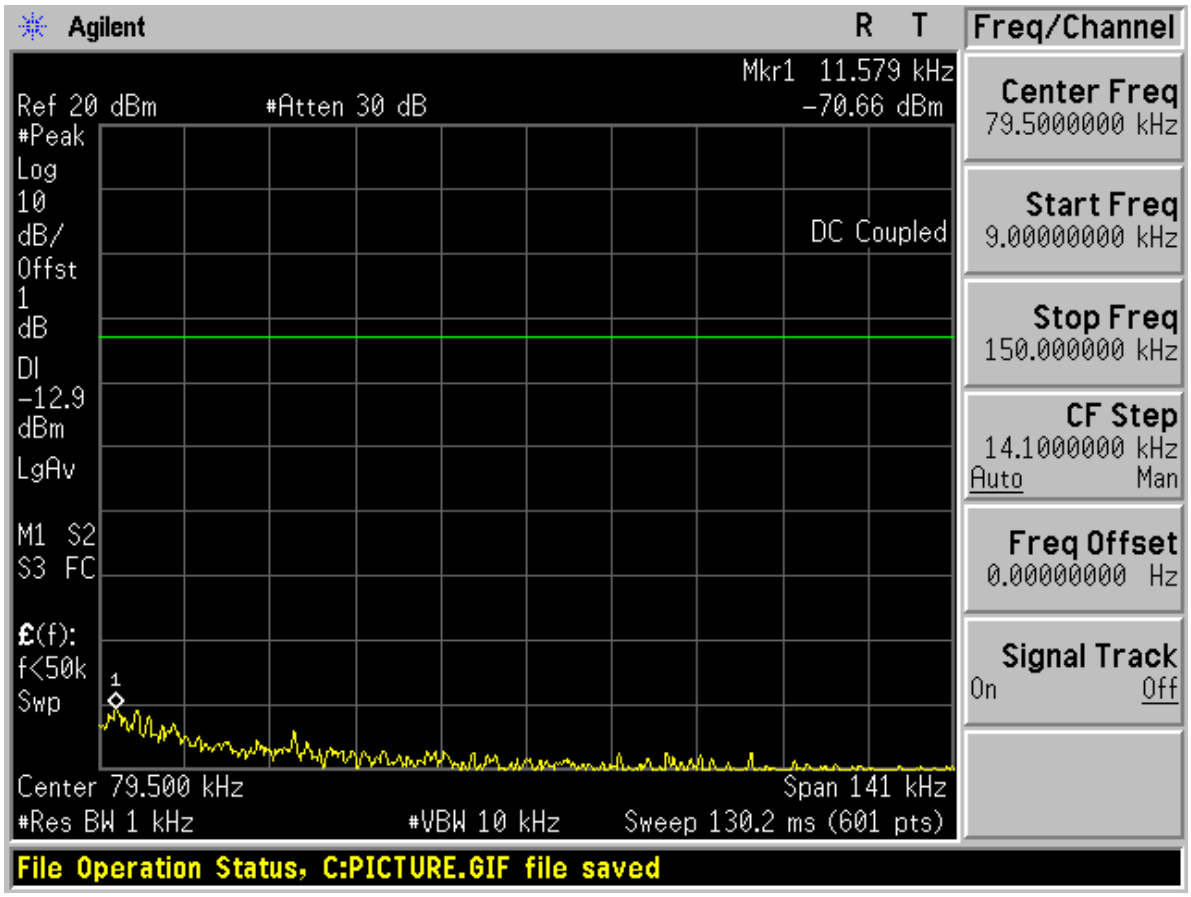
Channel 6

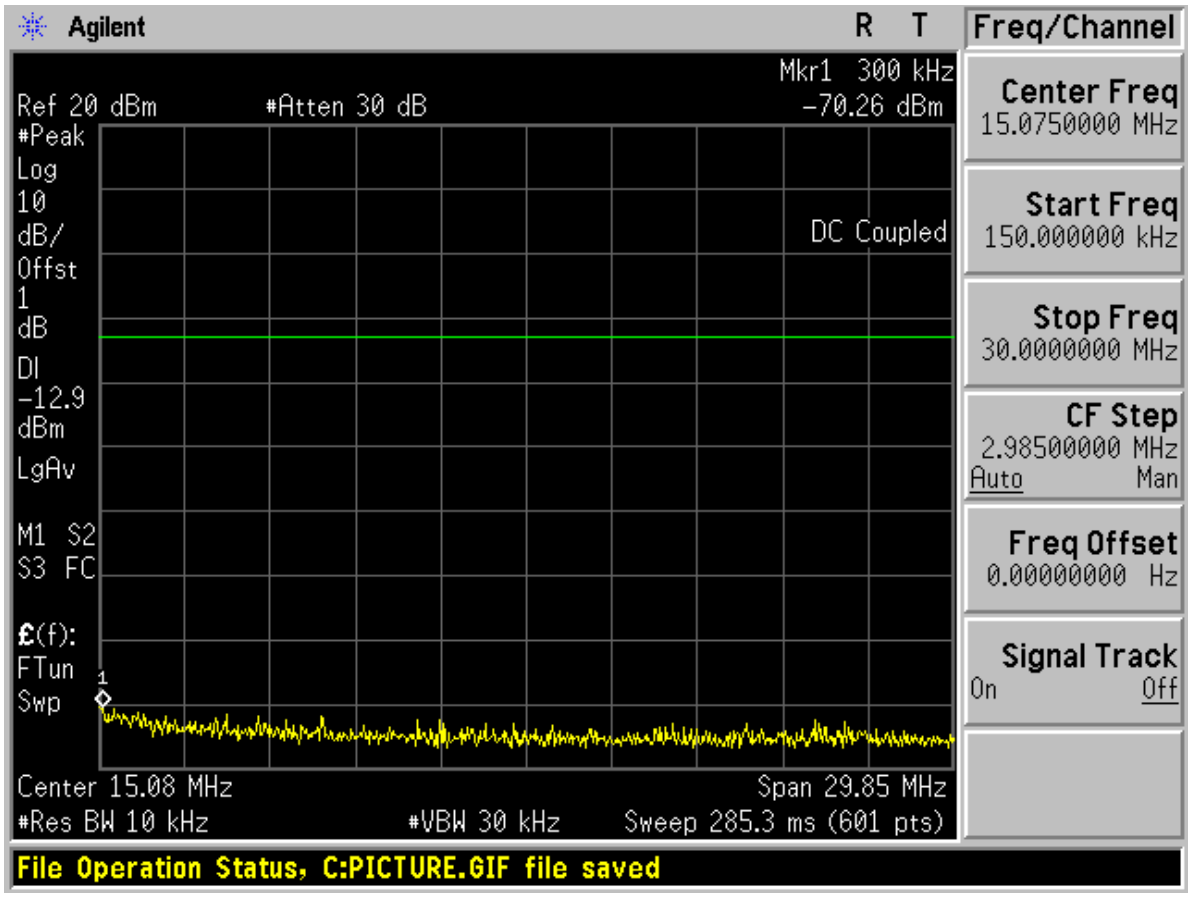

Agilent
R T
Freq/Channel
Mkr1 8.980 kHz
Ref 20 dBm
#Atten 30 dB
-70.58 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-13.4
dBm
LgAv
M1 S2
S3 FC
£(f):
f<50k
Swp
DC Coupled
Center 79.500 kHz
Span 141 kHz
#Res BW 1 kHz
#VBW 10 kHz
Sweep 130.2 ms (601 pts)
Center Freq
79.5000000 kHz
Start Freq
9.00000000 kHz
Stop Freq
150.000000 kHz
CF Step
14.1000000 kHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

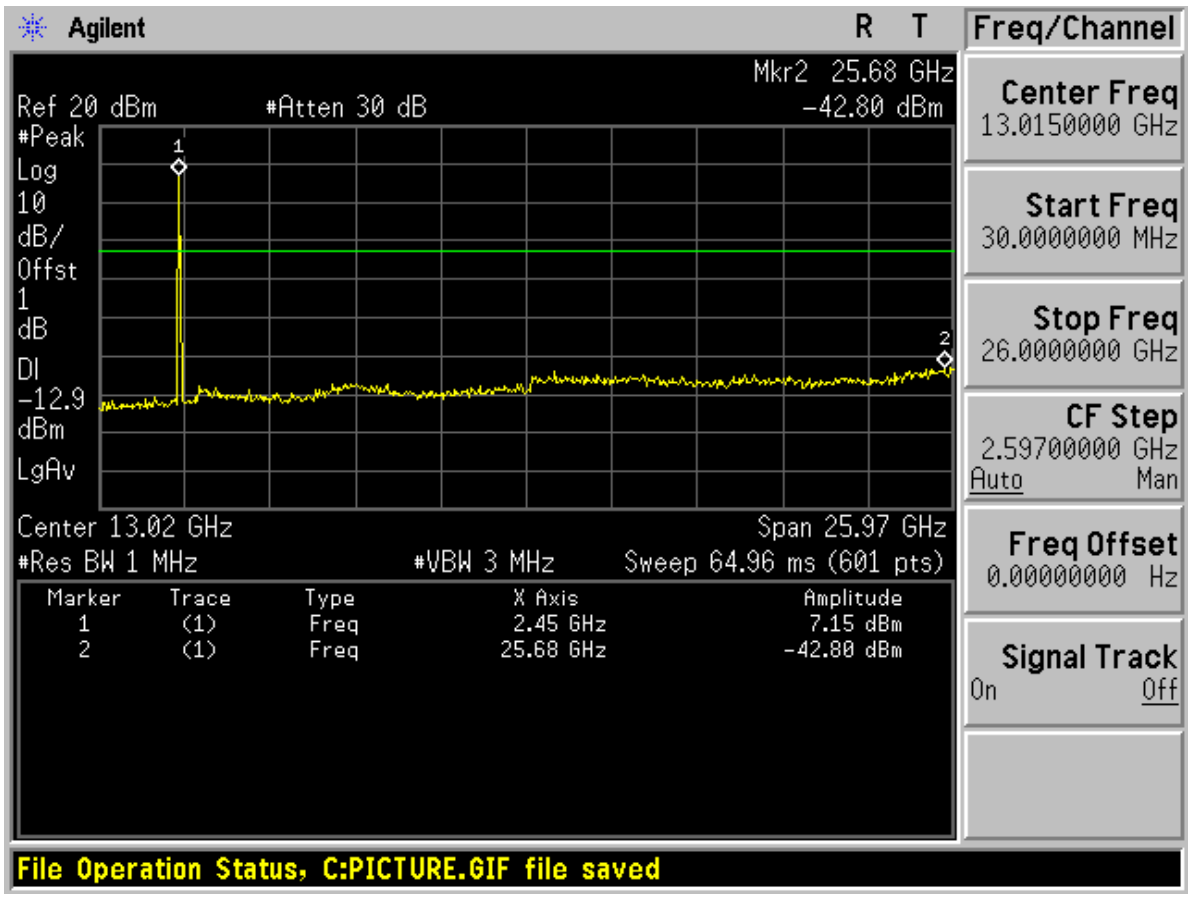

Agilent
R T
Freq/Channel
Mkr1 150 kHz
Ref 20 dBm
#Atten 30 dB
-68.84 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-13.4
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 15.08 MHz
Span 29.85 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 285.3 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved


Agilent
R T
Freq/Channel
Mkr2 25.56 GHz
Ref 20 dBm
#Atten 30 dB
-42.74 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-13.4
dBm
LgAv
Center Freq
13.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
26.0000000 GHz
CF Step
2.59700000 GHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 13.02 GHz
Span 25.97 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 64.96 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.45 GHz 6.59 dBm
2 (1) Freq 25.56 GHz -42.74 dBm
File Operation Status, C:PICTURE.GIF file saved

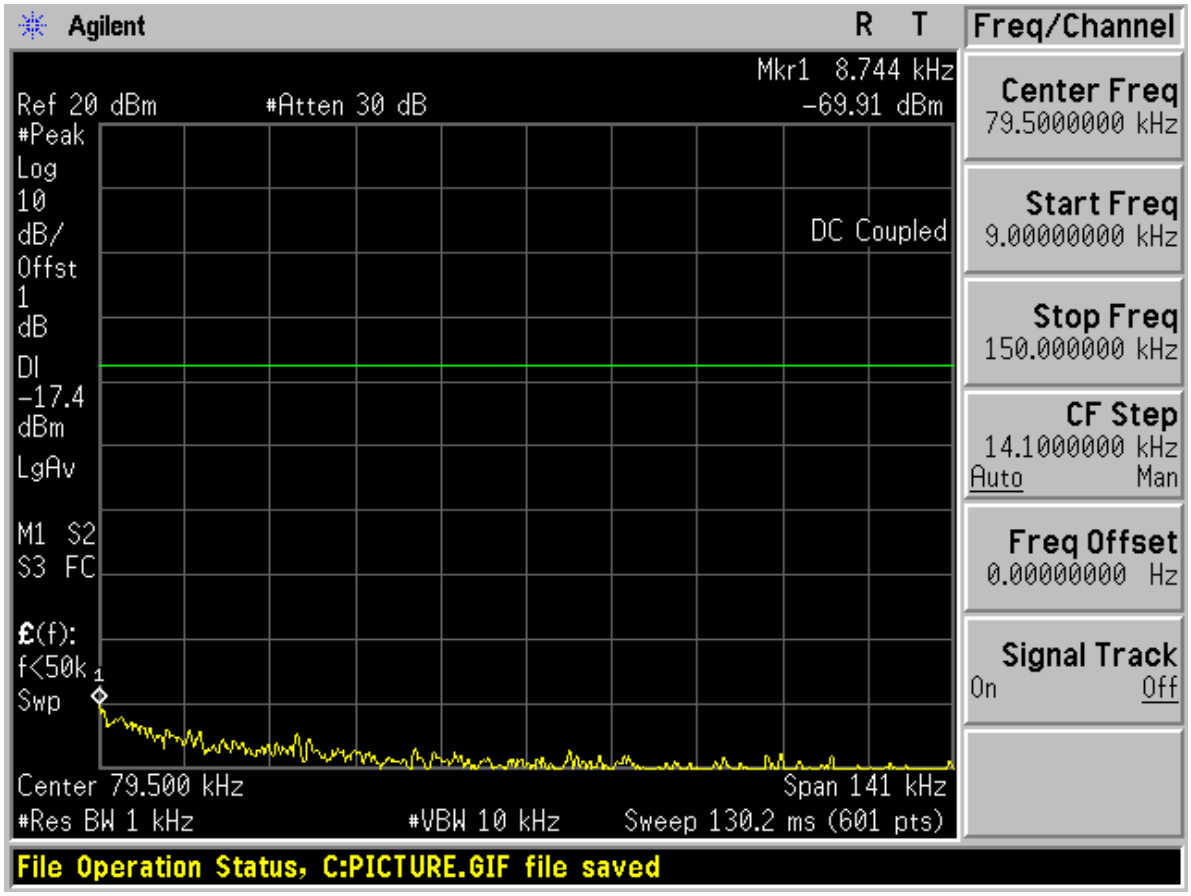
Channel 11

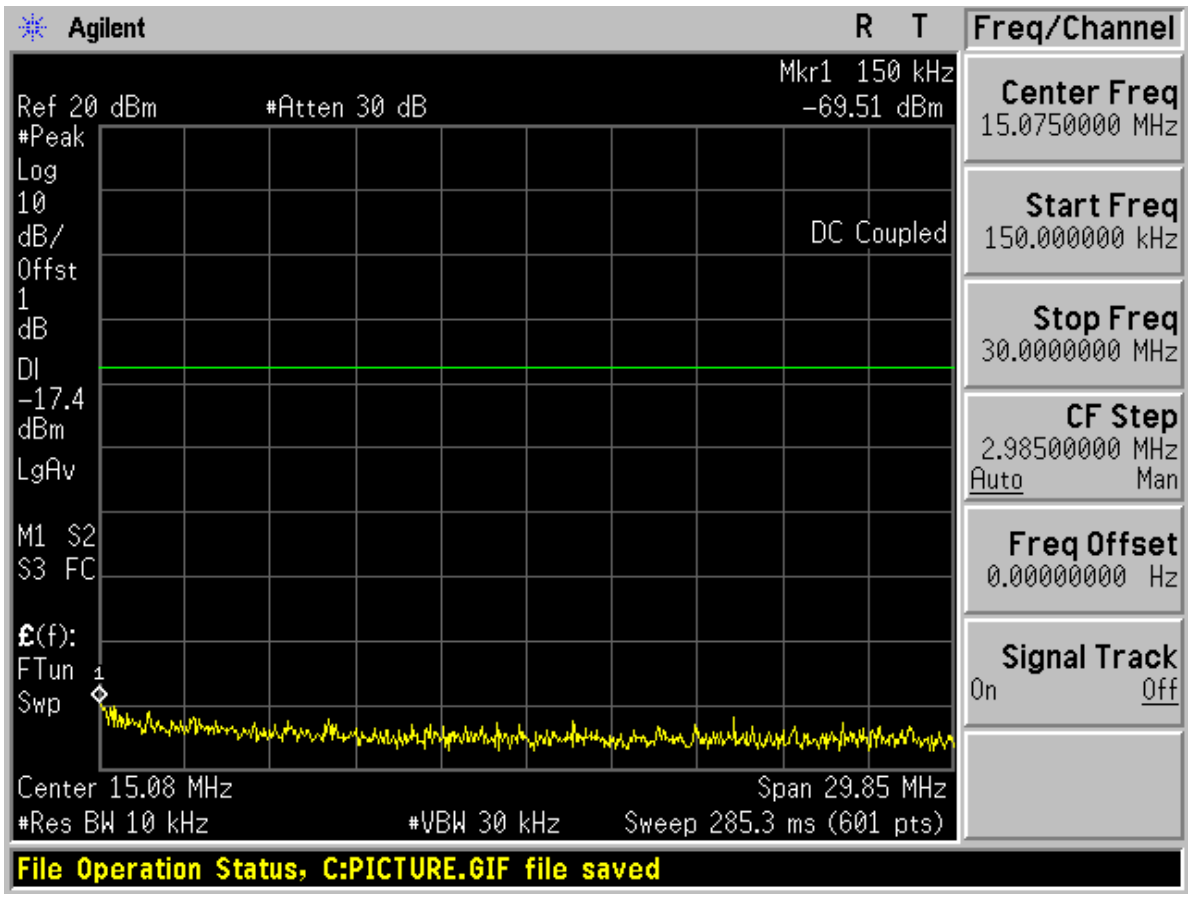

Agilent
R T
Freq/Channel
Mkr1 11.579 kHz
Ref 20 dBm
#Atten 30 dB
-70.66 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-12.9
dBm
LgAv
M1 S2
S3 FC
£(f):
f<50k
Swp
DC Coupled
Center Freq
79.5000000 kHz
Start Freq
9.00000000 kHz
Stop Freq
150.000000 kHz
CF Step
14.1000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 79.500 kHz
Span 141 kHz
#Res BW 1 kHz
#VBW 10 kHz
Sweep 130.2 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved

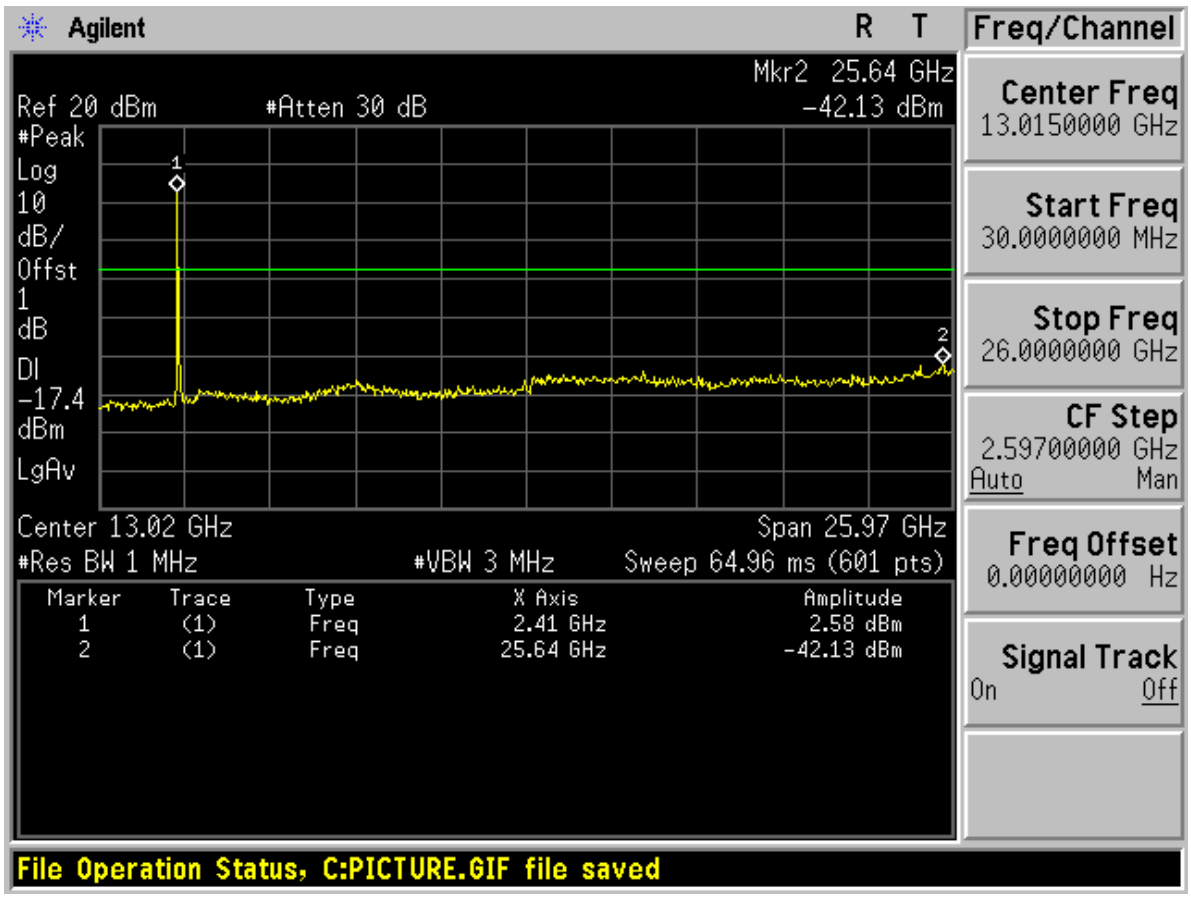

Agilent
R T
Freq/Channel
Mkr1 300 kHz
Ref 20 dBm
#Atten 30 dB
-70.26 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-12.9
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 15.08 MHz
Span 29.85 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 285.3 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved


Agilent
R T
Freq/Channel
Mkr2 25.68 GHz
Ref 20 dBm
#Atten 30 dB
-42.80 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-12.9
dBm
LgAv
Center Freq
13.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
26.0000000 GHz
CF Step
2.59700000 GHz
Auto
Man
Center 13.02 GHz
Span 25.97 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 64.96 ms (601 pts)
Freq Offset
0.00000000 Hz
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.45 GHz 7.15 dBm
2 (1) Freq 25.68 GHz -42.80 dBm
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

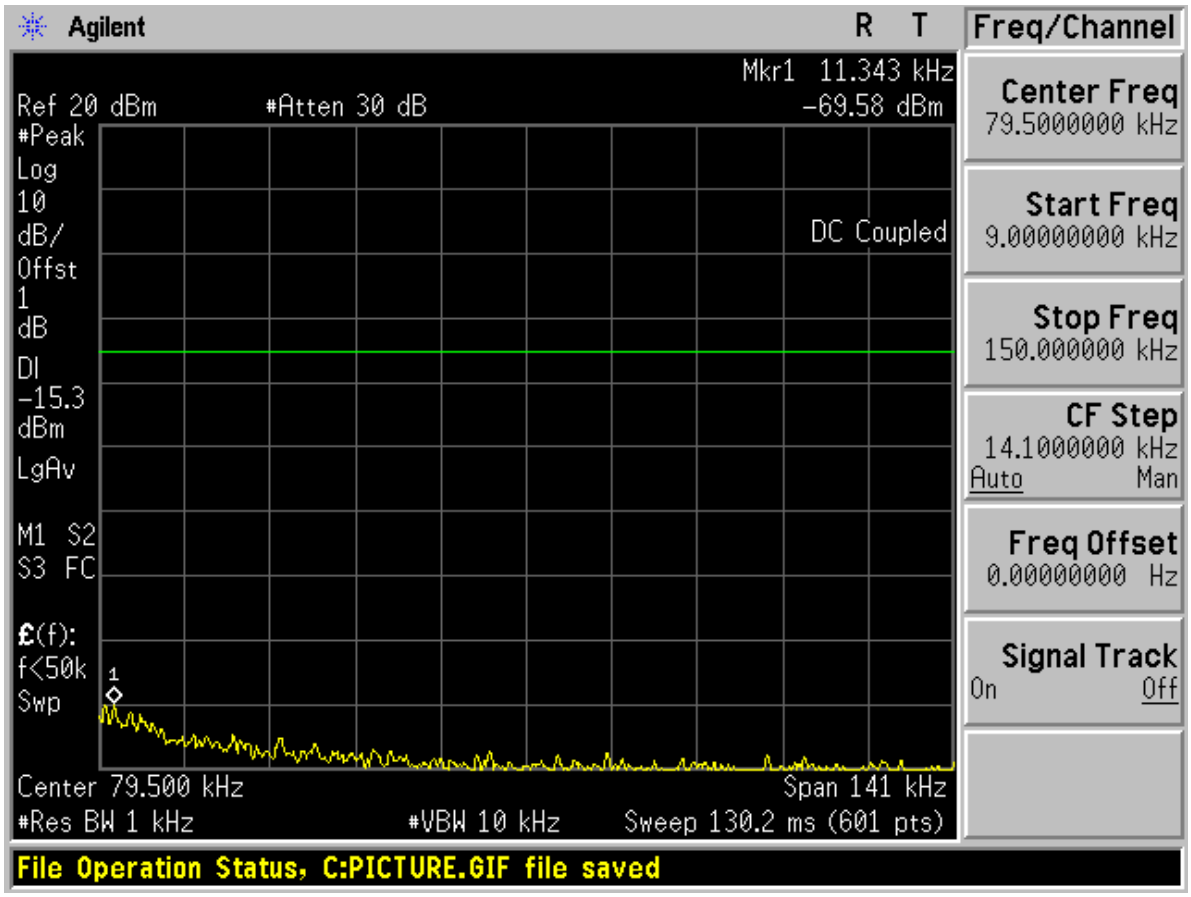
TM3
Channel 1

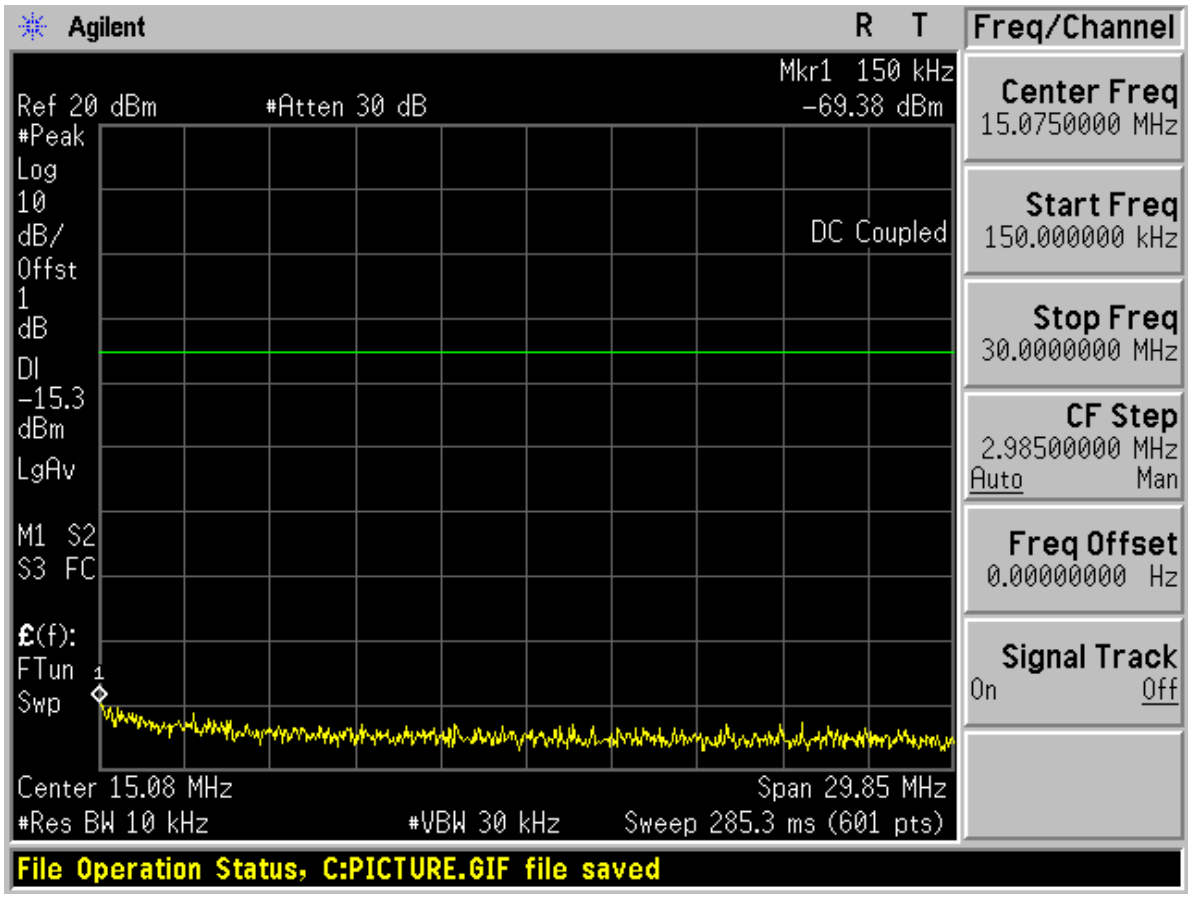


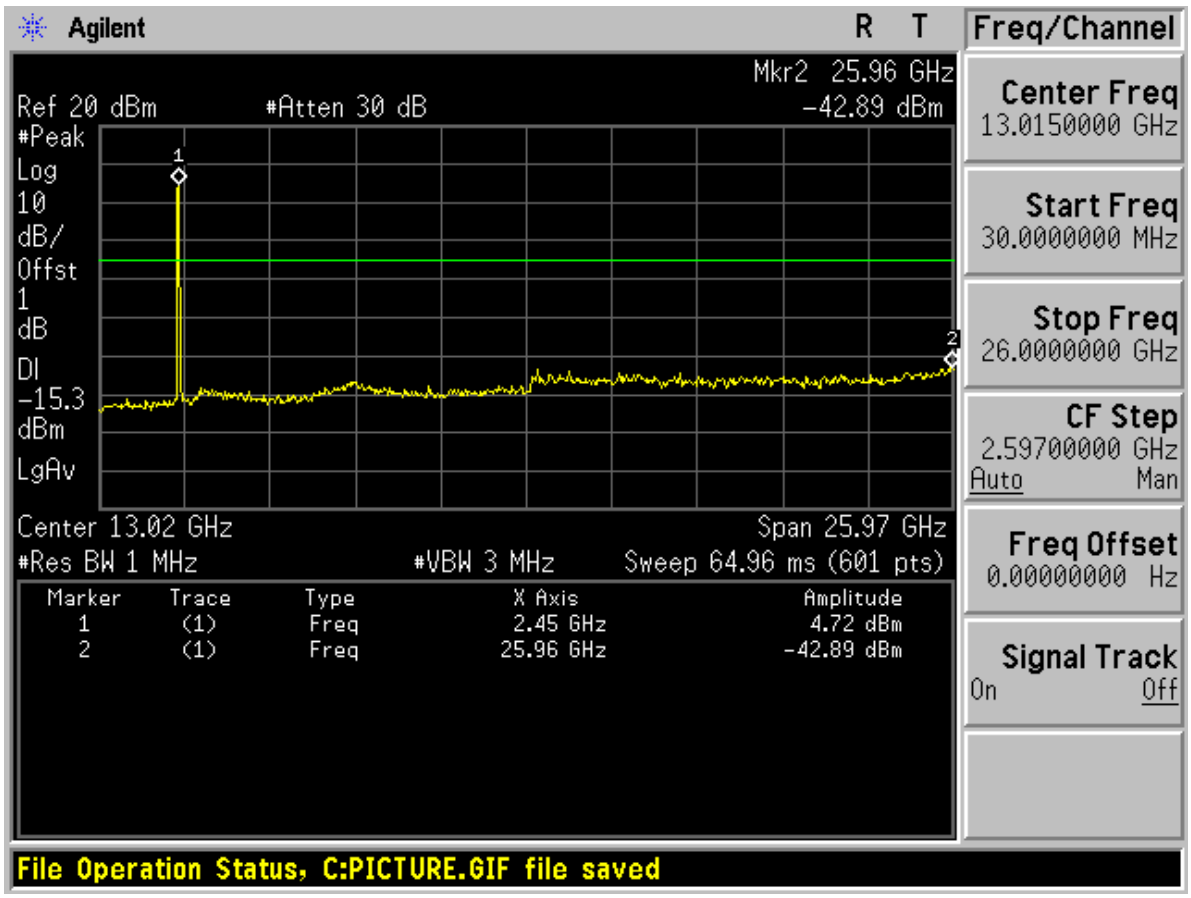

Agilent
R T
Freq/Channel
Mkr1 150 kHz
Ref 20 dBm
#Atten 30 dB
-69.51 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-17.4
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 15.08 MHz
Span 29.85 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 285.3 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved


Agilent
R T
Freq/Channel
Mkr2 25.64 GHz
Ref 20 dBm
#Atten 30 dB
-42.13 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-17.4
dBm
LgAv
Center 13.02 GHz
Span 25.97 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 64.96 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.41 GHz 2.58 dBm
2 (1) Freq 25.64 GHz -42.13 dBm
Center Freq
13.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
26.0000000 GHz
CF Step
2.59700000 GHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, C:PICTURE.GIF file saved

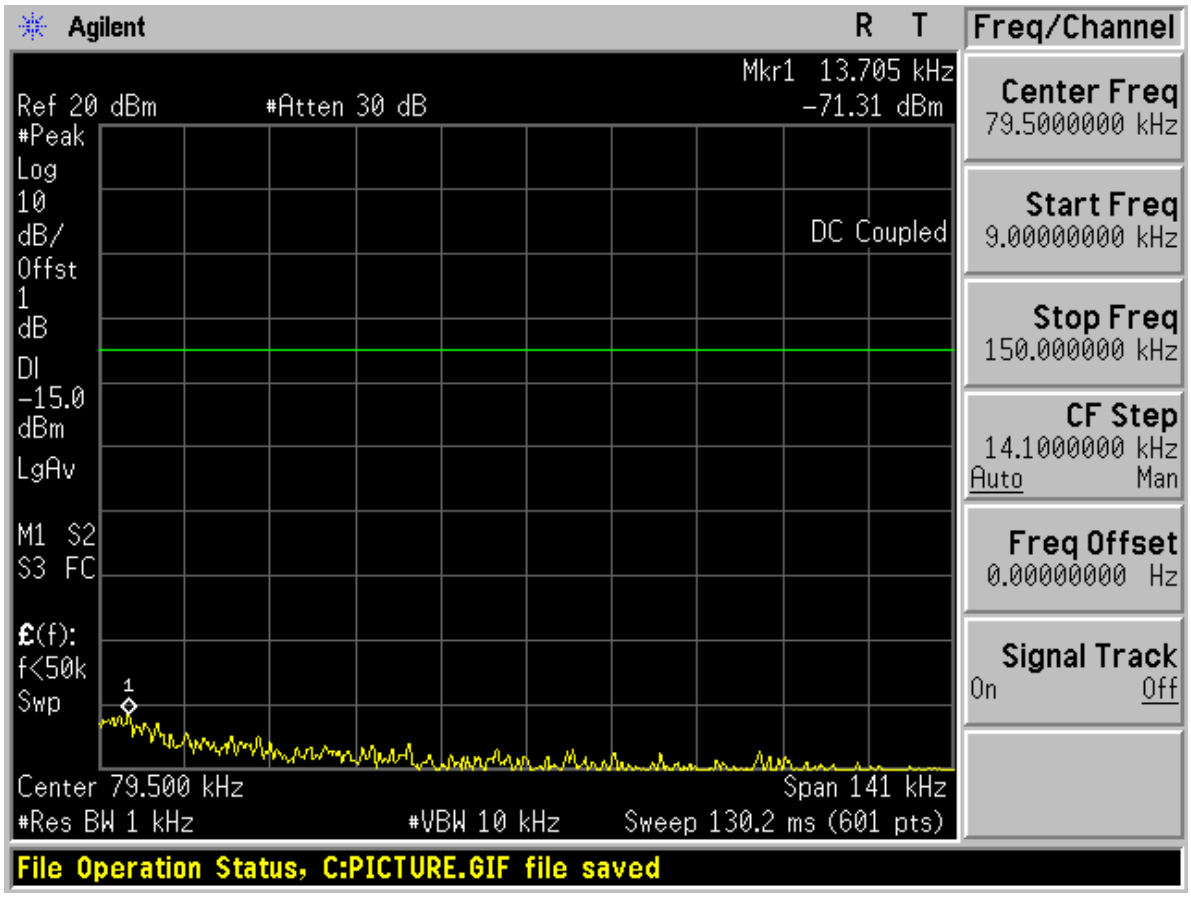
Channel 6

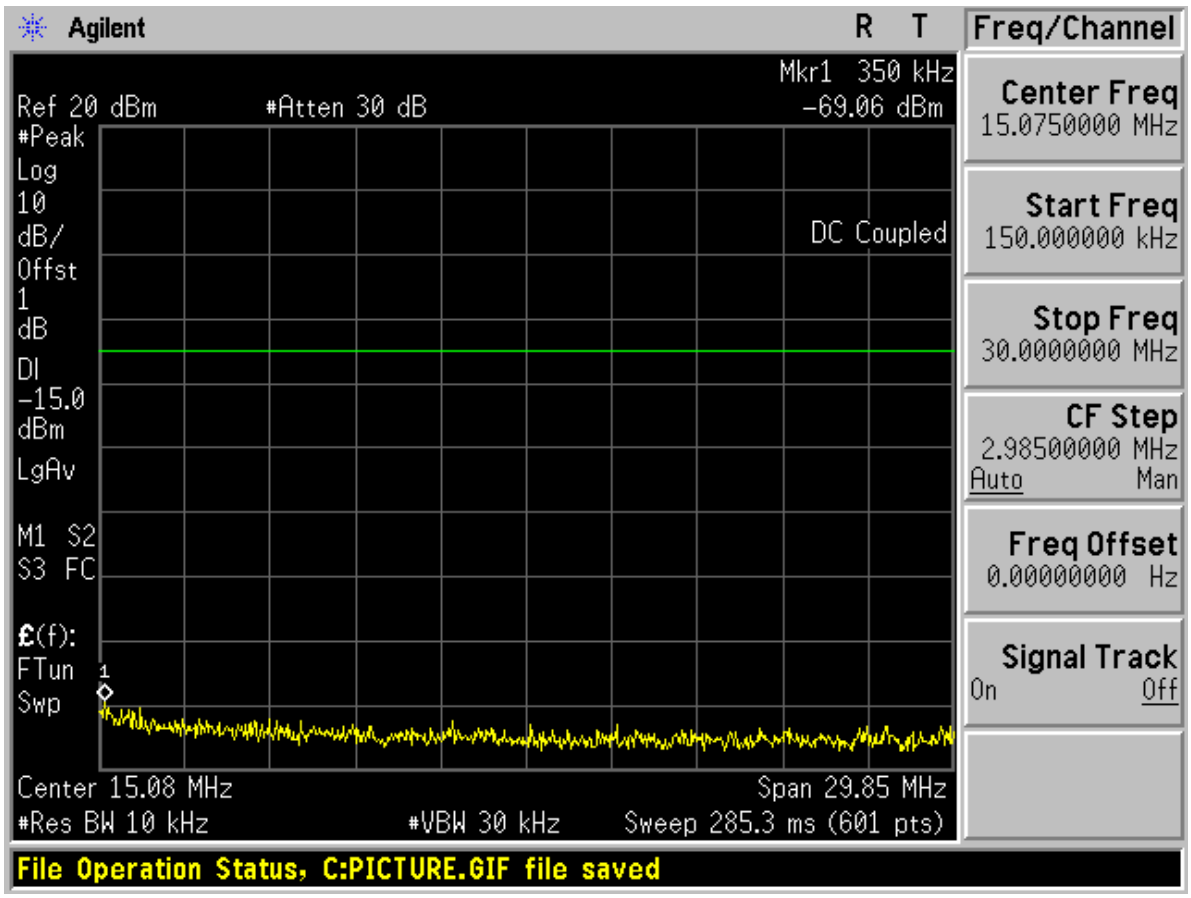

Agilent
R T
Freq/Channel
Mkr1 11.343 kHz
Ref 20 dBm
#Atten 30 dB
-69.58 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-15.3
dBm
LgAv
M1 S2
S3 FC
£(f):
f<50k
Swp
DC Coupled
Center Freq
79.5000000 kHz
Start Freq
9.00000000 kHz
Stop Freq
150.000000 kHz
CF Step
14.1000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 79.500 kHz
Span 141 kHz
#Res BW 1 kHz
#VBW 10 kHz
Sweep 130.2 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved

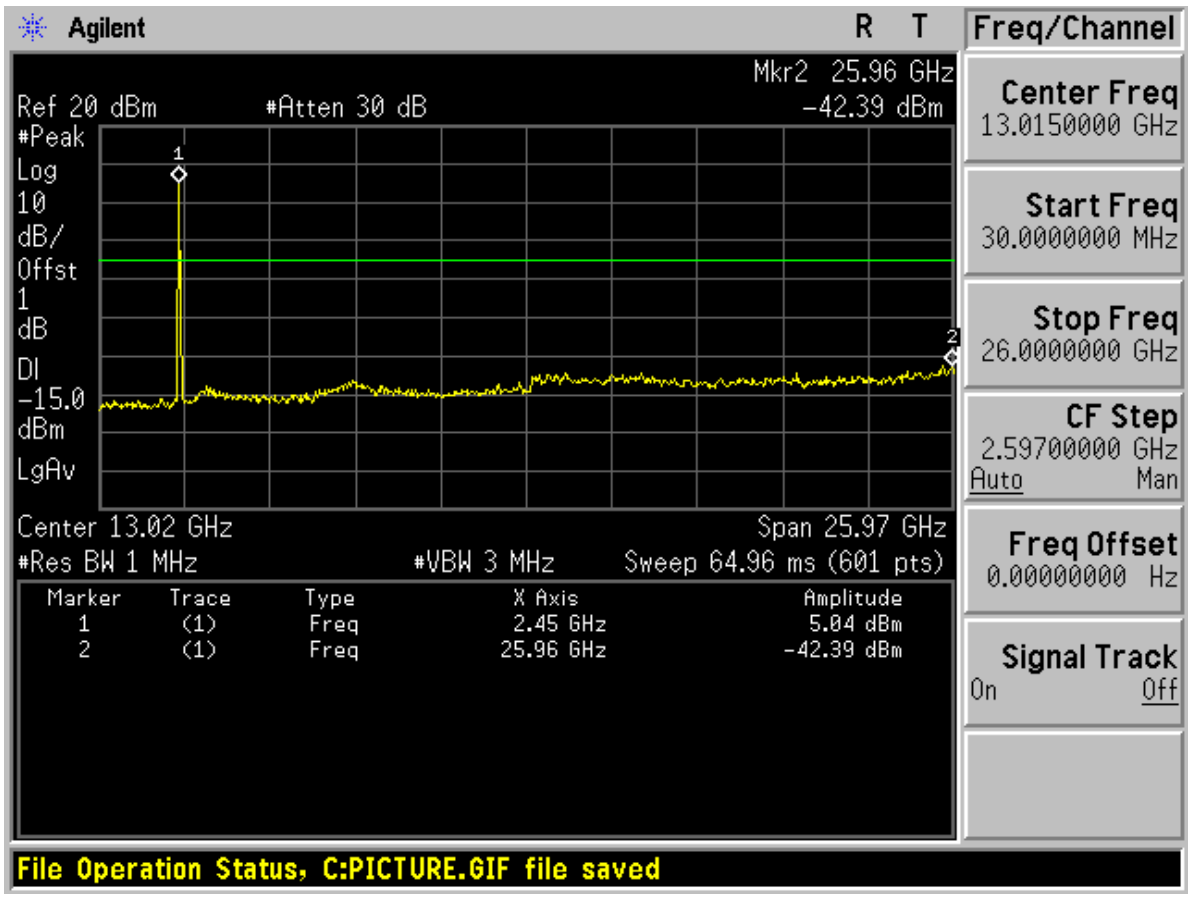

Agilent
R T
Freq/Channel
Mkr1 150 kHz
Ref 20 dBm
#Atten 30 dB
-69.38 dBm
#Peak
Log
10
dB/
Offst
1
dB
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Dl
-15.3
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Center 15.08 MHz
Span 29.85 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 285.3 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved


Agilent
R T
Freq/Channel
Mkr2 25.96 GHz
Ref 20 dBm
#Atten 30 dB
-42.89 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-15.3
dBm
LgAv
Center 13.02 GHz
Span 25.97 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 64.96 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.45 GHz 4.72 dBm
2 (1) Freq 25.96 GHz -42.89 dBm
Center Freq
13.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
26.0000000 GHz
CF Step
2.59700000 GHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, C:PICTURE.GIF file saved

Channel 11


Agilent
R T
Freq/Channel
Mkr1 13.705 kHz
Ref 20 dBm
#Atten 30 dB
-71.31 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-15.0
dBm
LgAv
M1 S2
S3 FC
£(f):
f<50k
Swp
DC Coupled
Center Freq
79.5000000 kHz
Start Freq
9.00000000 kHz
Stop Freq
150.000000 kHz
CF Step
14.1000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 79.500 kHz
Span 141 kHz
#Res BW 1 kHz
#VBW 10 kHz
Sweep 130.2 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved


Agilent
R T
Freq/Channel
Mkr1 350 kHz
Ref 20 dBm
#Atten 30 dB
-69.06 dBm
#Peak
Log
10
dB/
Offst
1
dB
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Dl
-15.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Center 15.08 MHz
Span 29.85 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 285.3 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved

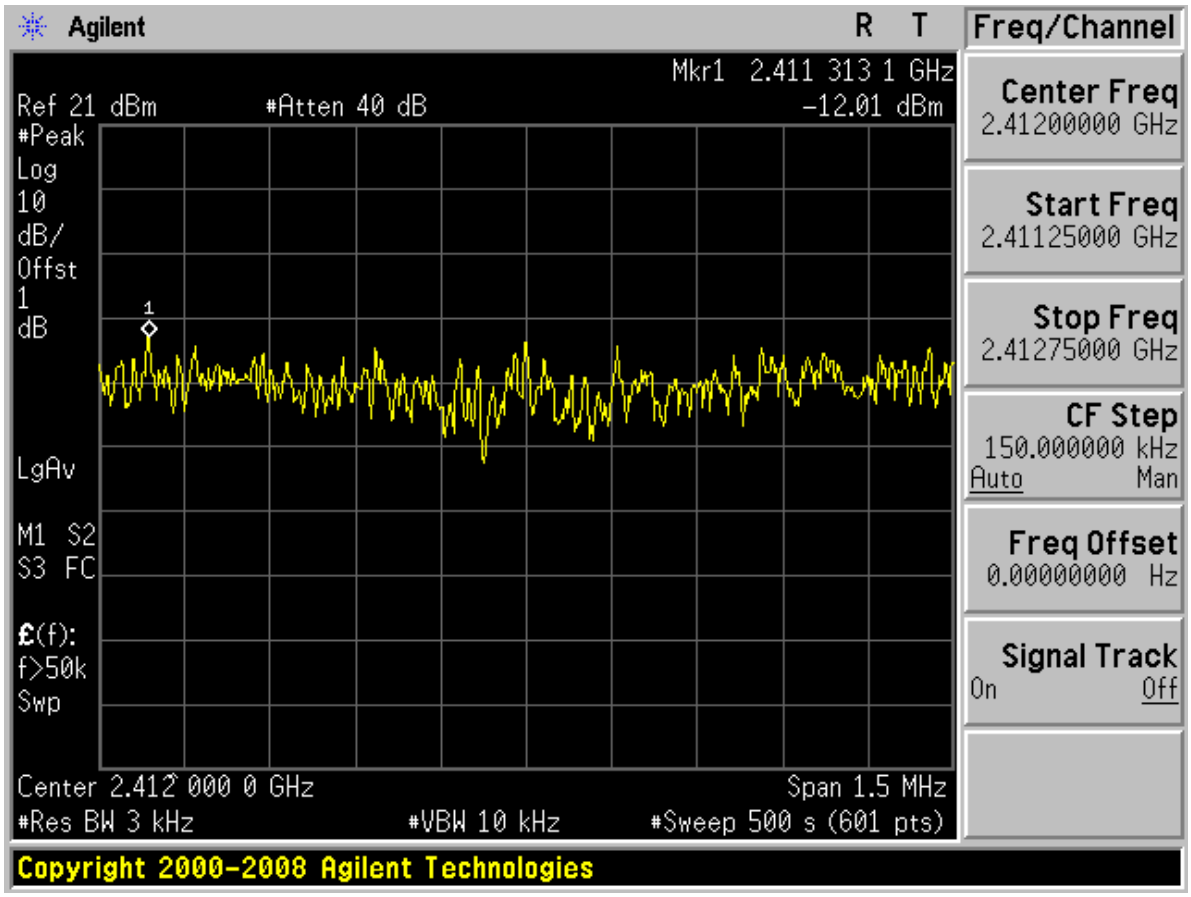

Agilent
R T
Freq/Channel
Mkr2 25.96 GHz
Ref 20 dBm
#Atten 30 dB
-42.39 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-15.0
dBm
LgAv
Center 13.02 GHz
Span 25.97 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 64.96 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.45 GHz 5.04 dBm
2 (1) Freq 25.96 GHz -42.39 dBm
Center Freq
13.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
26.0000000 GHz
CF Step
2.59700000 GHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, C:PICTURE.GIF file saved

Appendix E

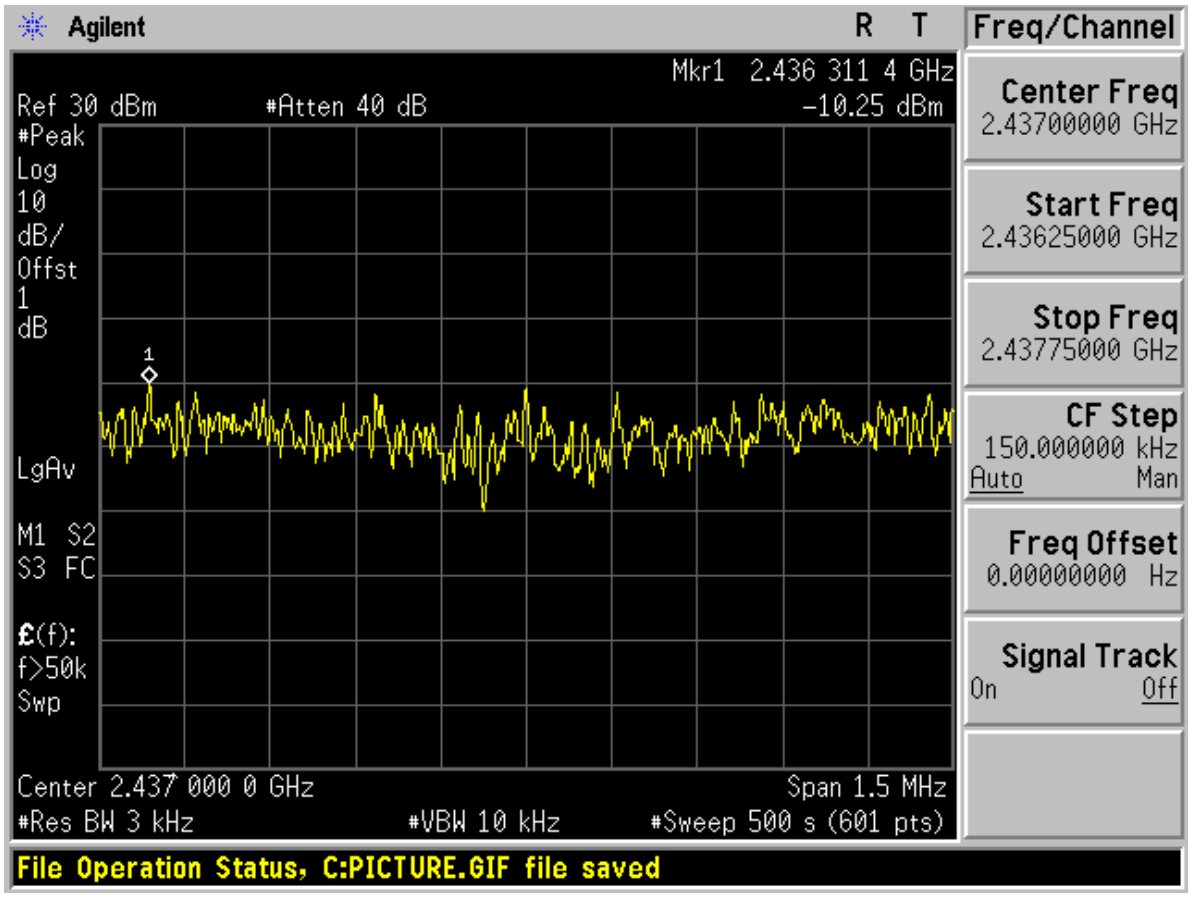
Power spectral density

According to FCC Part 15.247 (e)

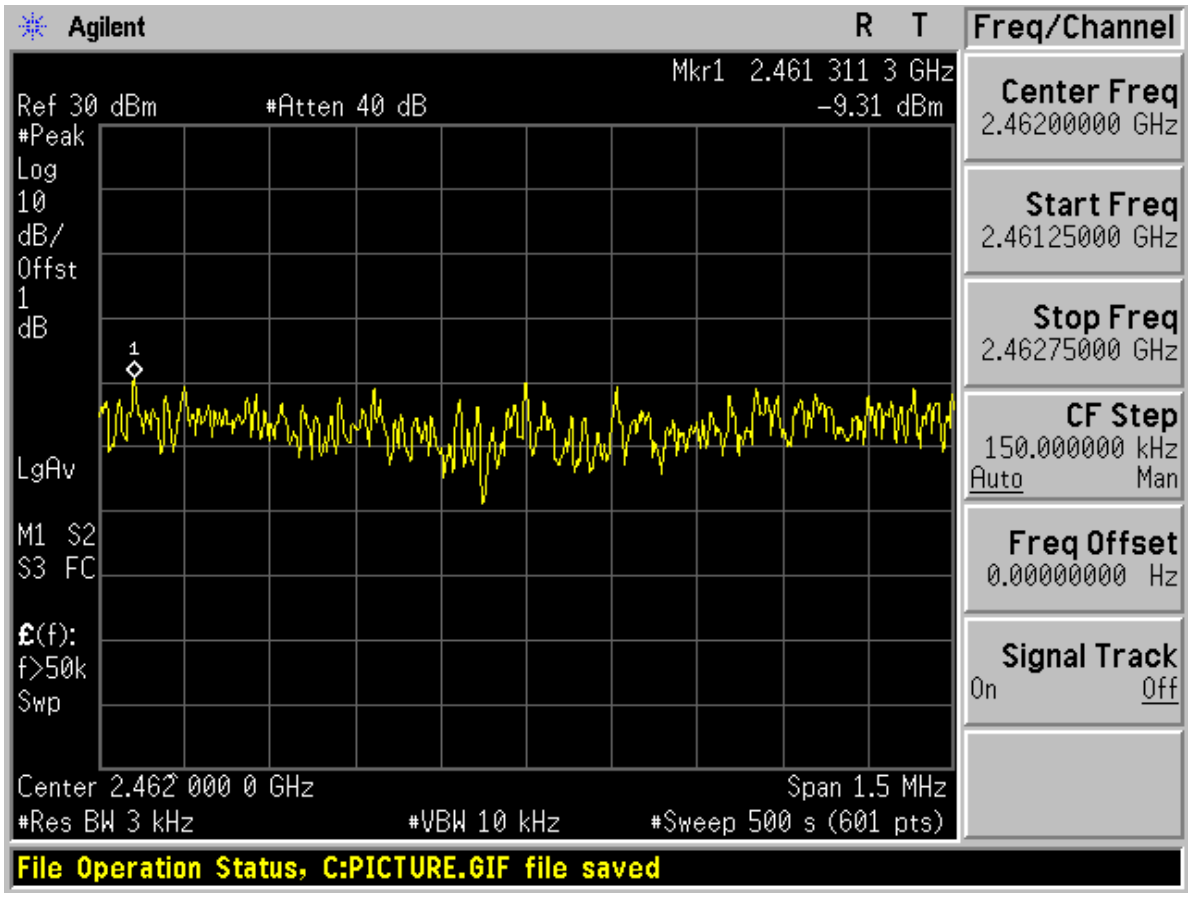
TM1
Channel 1



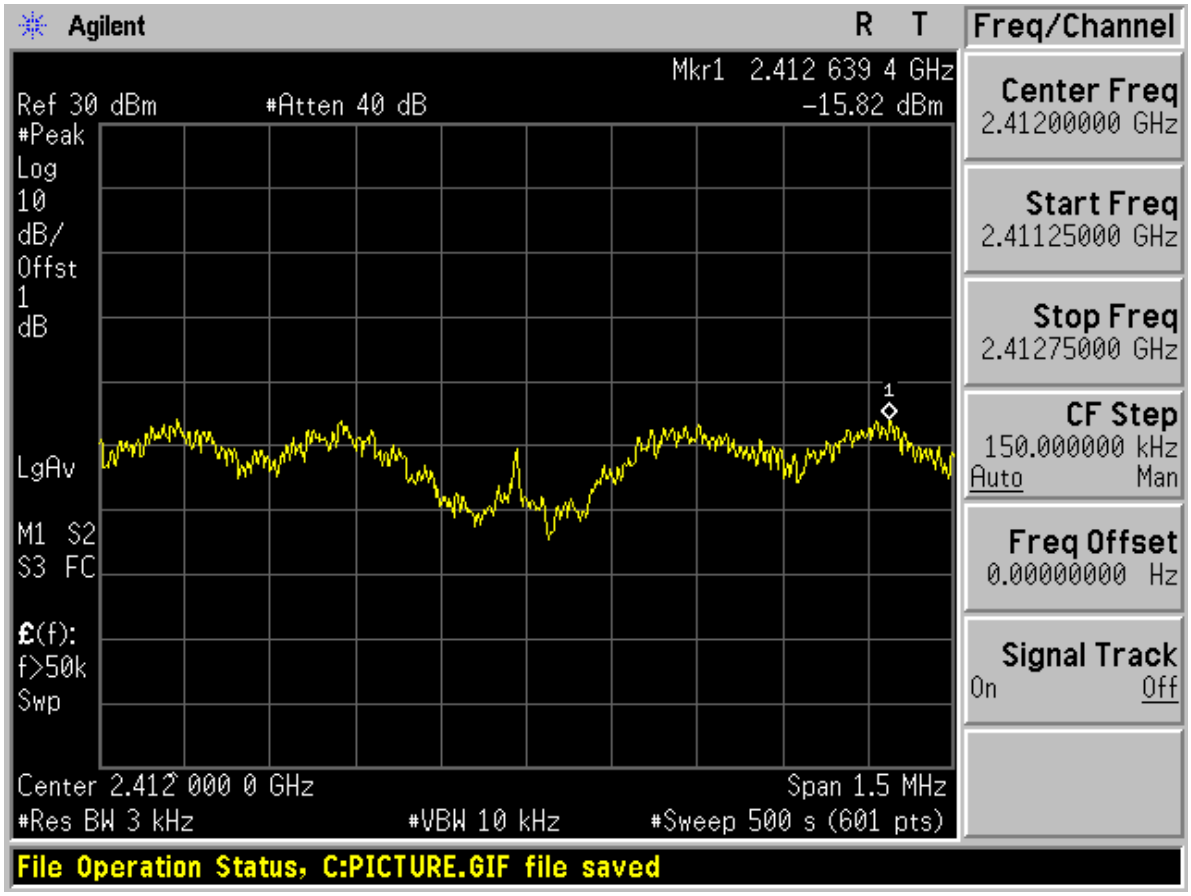
Channel 6


Agilent
R T
Freq/Channel
Mkr1 2.436 311 4 GHz
Ref 30 dBm
#Atten 40 dB
-10.25 dBm
#Peak
Log
10
dB/
Offst
1
dB
1
LgAv
M1 S2
S3 FC
£(f):
f>50k
Swp
Center 2.437 000 0 GHz
Span 1.5 MHz
#Res BW 3 kHz
#VBW 10 kHz
#Sweep 500 s (601 pts)
Center Freq
2.43700000 GHz
Start Freq
2.43625000 GHz
Stop Freq
2.43775000 GHz
CF Step
150.000000 kHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

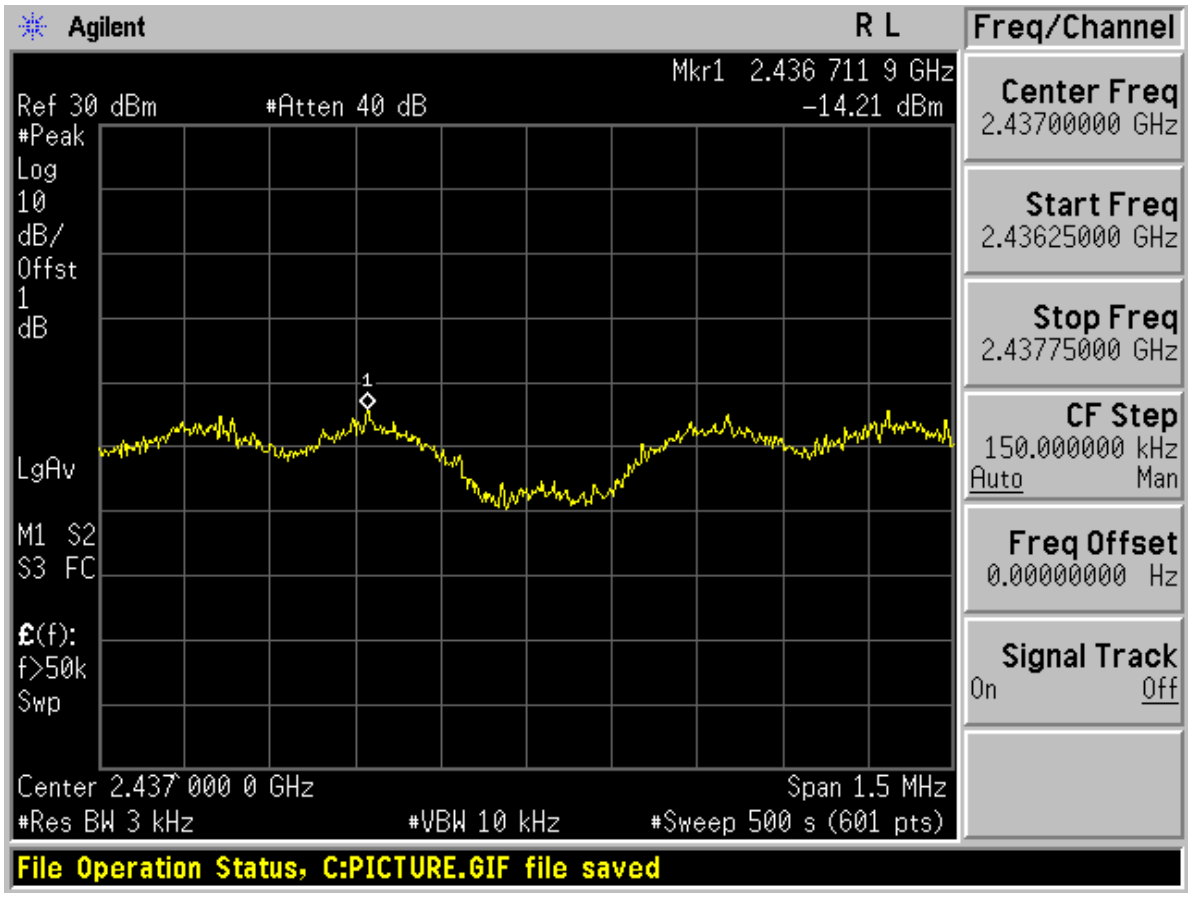
Channel 11


Agilent
R T
Freq/Channel
Mkr1 2.461 311 3 GHz
Ref 30 dBm
#Atten 40 dB
-9.31 dBm
#Peak
Log
10
dB/
Offst
1
dB
1
LgAv
M1 S2
S3 FC
£(f):
f>50k
Swp
Center 2.462 000 0 GHz
Span 1.5 MHz
#Res BW 3 kHz
#VBW 10 kHz
#Sweep 500 s (601 pts)
Center Freq
2.46200000 GHz
Start Freq
2.46125000 GHz
Stop Freq
2.46275000 GHz
CF Step
150.000000 kHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

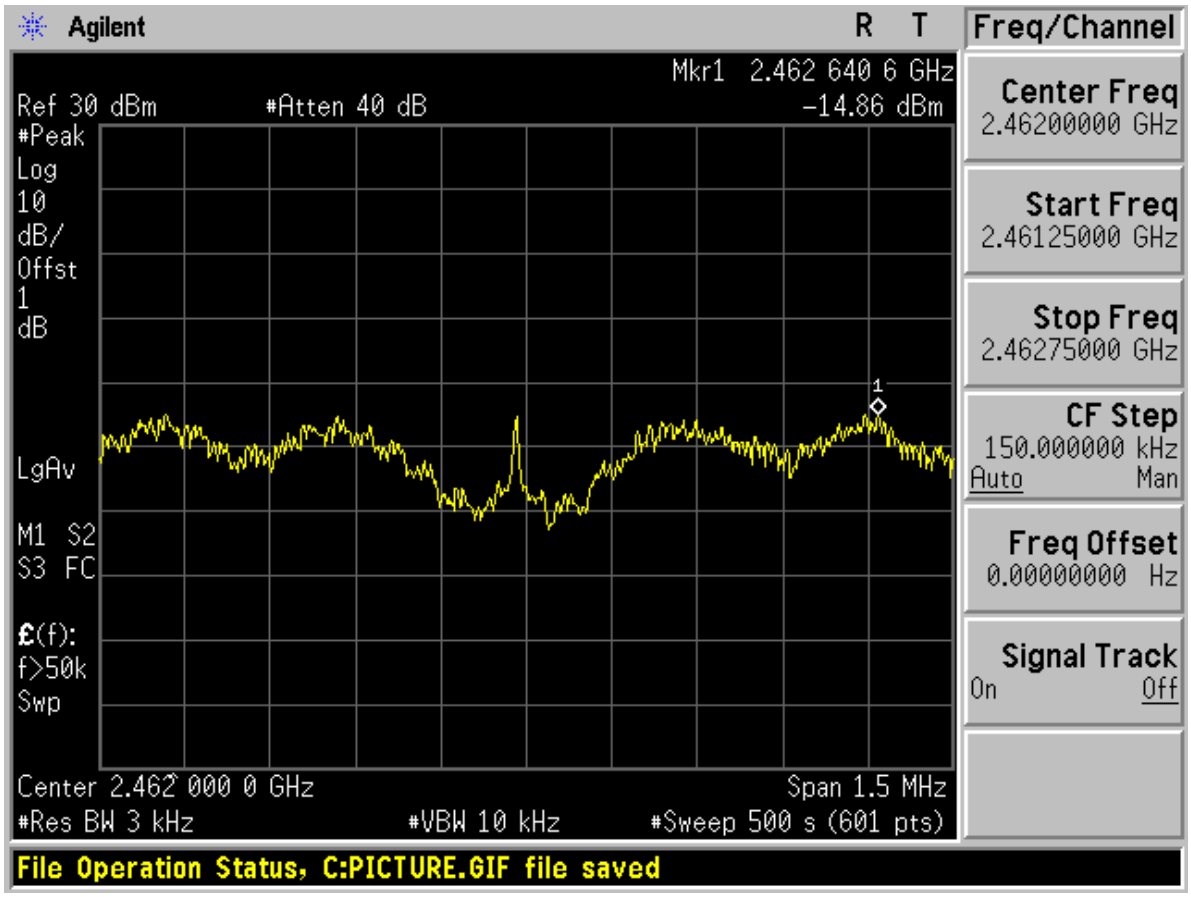
TM2
Channel 1



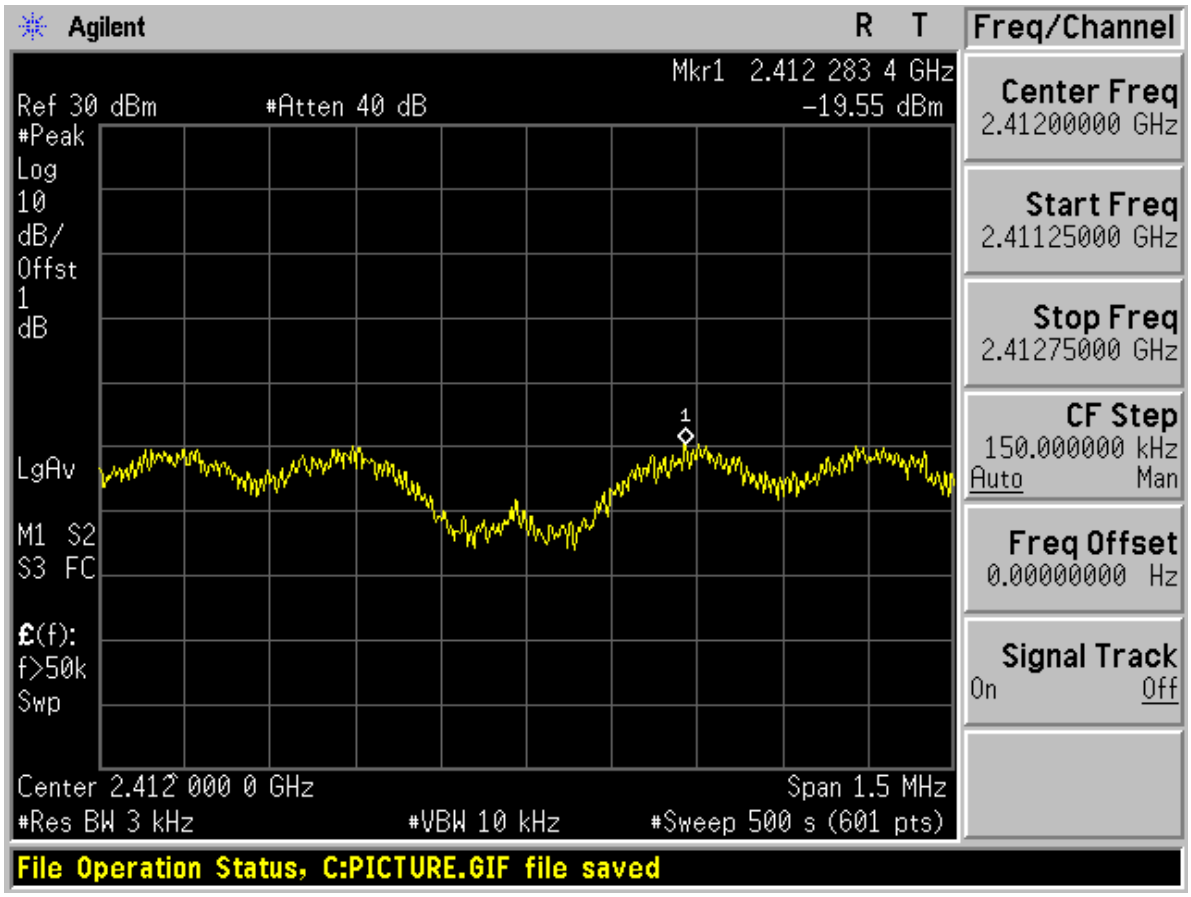
Channel 6


Agilent
R L
Freq/Channel
Mkr1 2.436 711 9 GHz
Ref 30 dBm
#Atten 40 dB
-14.21 dBm
#Peak
Log
10
dB/
Offst
1
dB
1
LgAv
M1 S2
S3 FC
£(f):
f>50k
Swp
Center 2.437 000 0 GHz
Span 1.5 MHz
#Res BW 3 kHz
#VBW 10 kHz
#Sweep 500 s (601 pts)
Center Freq
2.43700000 GHz
Start Freq
2.43625000 GHz
Stop Freq
2.43775000 GHz
CF Step
150.000000 kHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

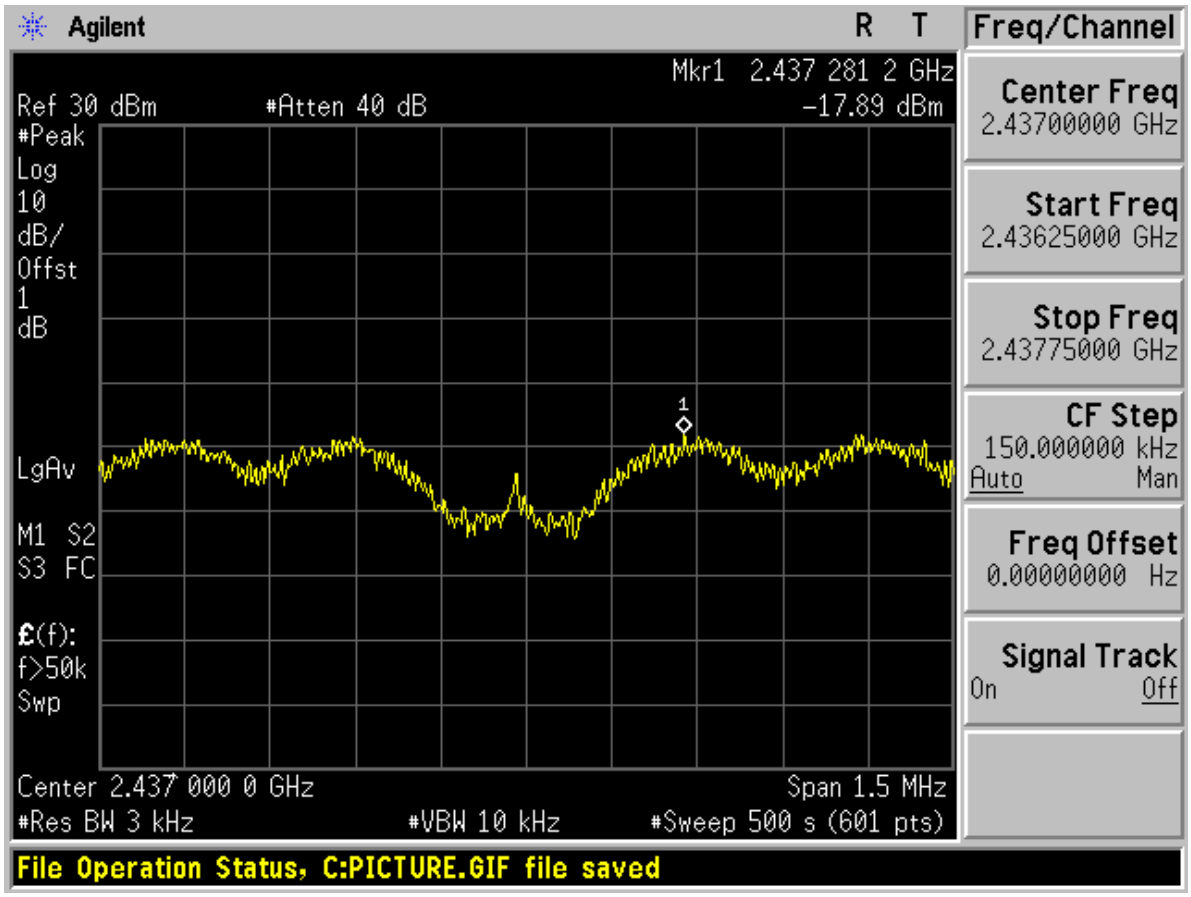
Channel 11


Agilent
R T
Freq/Channel
Mkr1 2.462 640 6 GHz
Ref 30 dBm
#Atten 40 dB
-14.86 dBm
#Peak
Log
10
dB/
Offst
1
dB
LgAv
M1 S2
S3 FC
£(f):
f>50k
Swp
Center 2.462 000 0 GHz
Span 1.5 MHz
#Res BW 3 kHz
#VBW 10 kHz
#Sweep 500 s (601 pts)
Center Freq
2.46200000 GHz
Start Freq
2.46125000 GHz
Stop Freq
2.46275000 GHz
CF Step
150.000000 kHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

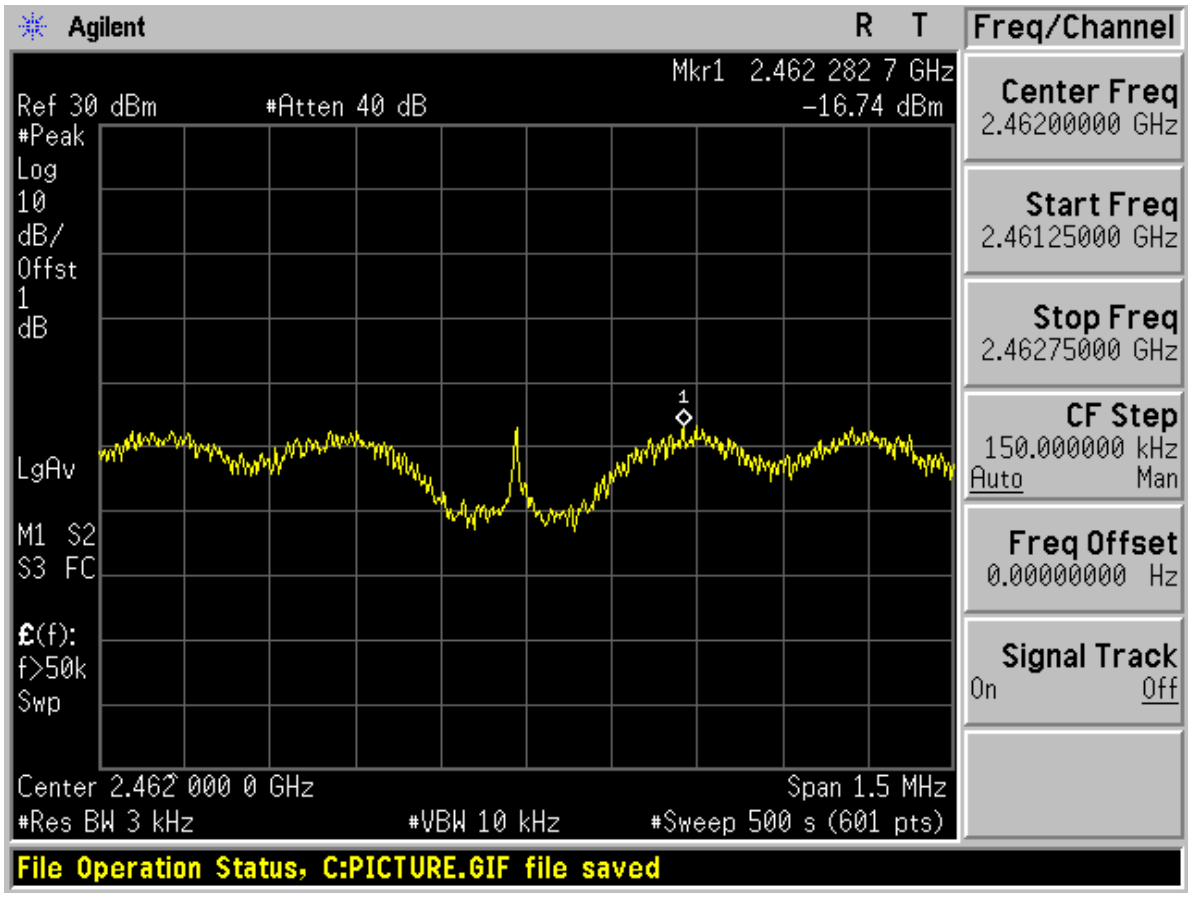
TM3
Channel 1



Channel 6


Agilent
R T
Freq/Channel
Mkr1 2.437 281 2 GHz
Ref 30 dBm
#Atten 40 dB
-17.89 dBm
#Peak
Log
10
dB/
Offst
1
dB
LgAv
M1 S2
S3 FC
£(f):
f>50k
Swp
Center 2.437 000 0 GHz
Span 1.5 MHz
#Res BW 3 kHz
#VBW 10 kHz
#Sweep 500 s (601 pts)
Center Freq
2.43700000 GHz
Start Freq
2.43625000 GHz
Stop Freq
2.43775000 GHz
CF Step
150.000000 kHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

Channel 11


Agilent
R T
Freq/Channel
Mkr1 2.462 282 7 GHz
Ref 30 dBm
#Atten 40 dB
-16.74 dBm
#Peak
Log
10
dB/
Offst
1
dB
LgAv
M1 S2
S3 FC
£(f):
f>50k
Swp
Center 2.462 000 0 GHz
Span 1.5 MHz
#Res BW 3 kHz
#VBW 10 kHz
#Sweep 500 s (601 pts)
Center Freq
2.46200000 GHz
Start Freq
2.46125000 GHz
Stop Freq
2.46275000 GHz
CF Step
150.000000 kHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

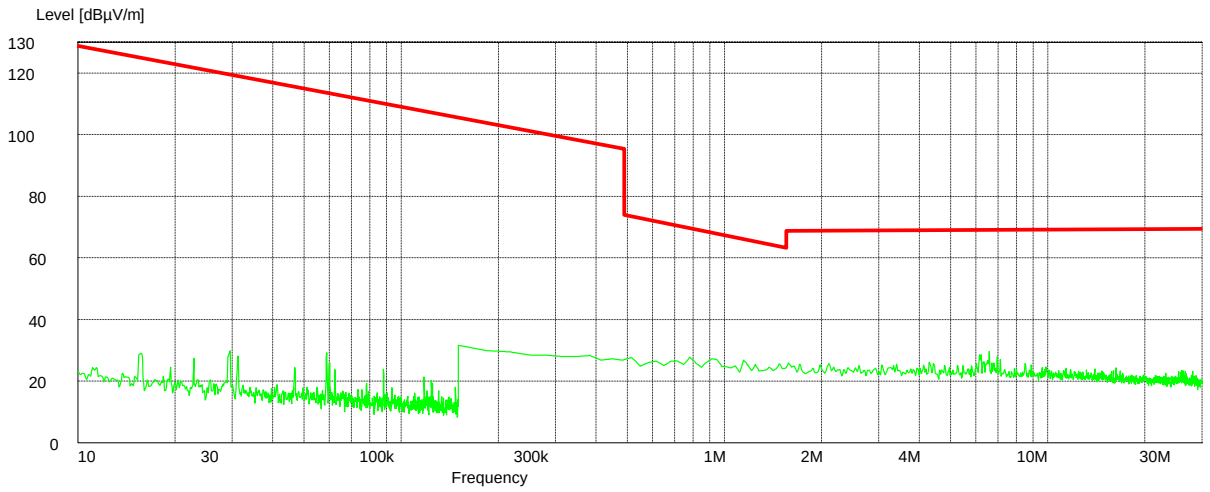
Appendix F

Radiated spurious emission & spurious in restricted band

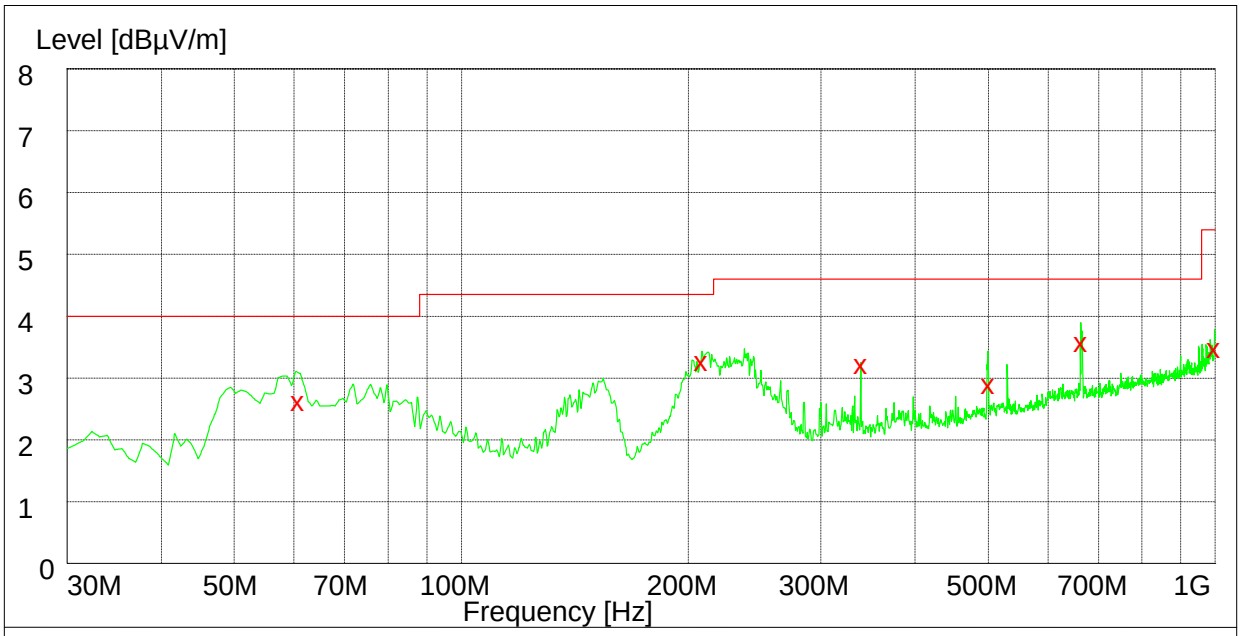
According to FCC Part 15.247 (d) & 15.205 & 15.209

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

Channel 1
10kHz to 30MHz

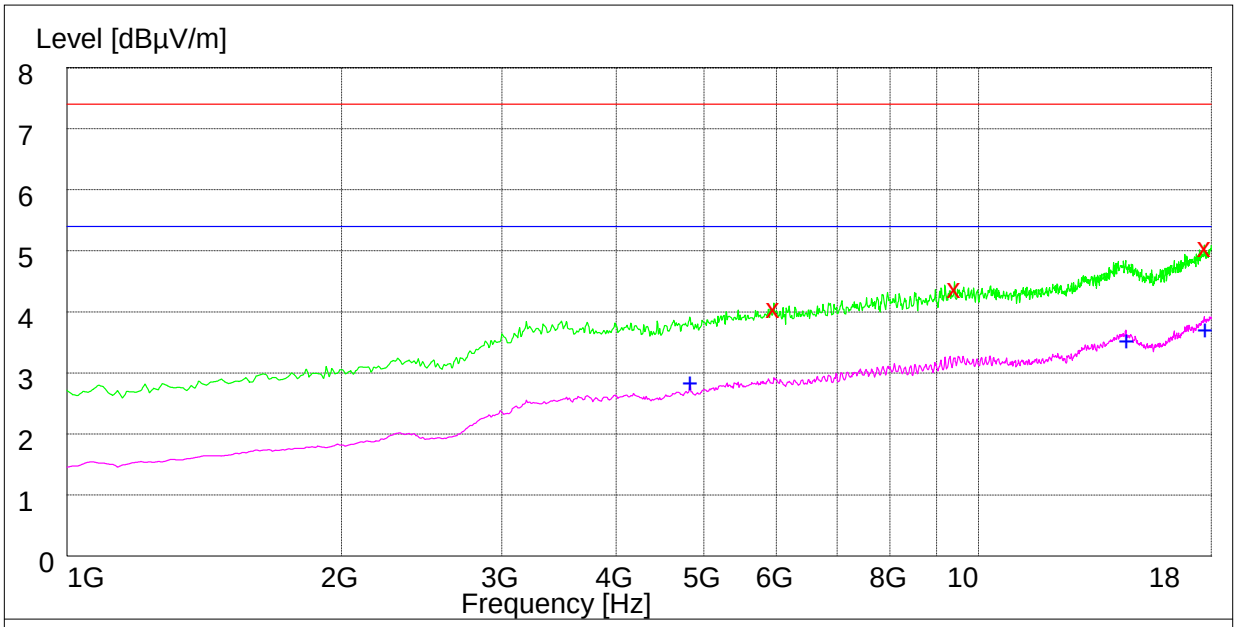


30MHz to 1GHz



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Plarization
60.780000	27.20	12.0	40.0	12.8	103.0	127.00	VERTICAL
208.260000	33.00	12.5	43.5	10.5	146.0	118.00	HORIZONTAL
338.880000	31.60	16.8	46.0	14.4	100.0	338.00	HORIZONTAL
499.980000	29.40	20.2	46.0	16.6	103.0	170.00	VERTICAL
663.780000	36.80	23.0	46.0	9.2	103.0	360.00	VERTICAL
996.060000	35.90	27.1	54.0	18.1	103.0	110.00	VERTICAL

1GHz to 18GHz



Note: Signal suppressed with a 2.4 GHz band rejection filter

MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
5957.500000	40.30	-0.9	74.0	33.7	135.0	83.00	VERTICAL
9405.500000	44.20	5.7	74.0	29.8	172.0	254.00	VERTICAL
17684.000000	51.60	18.8	74.0	22.4	200.0	249.00	HORIZONTAL

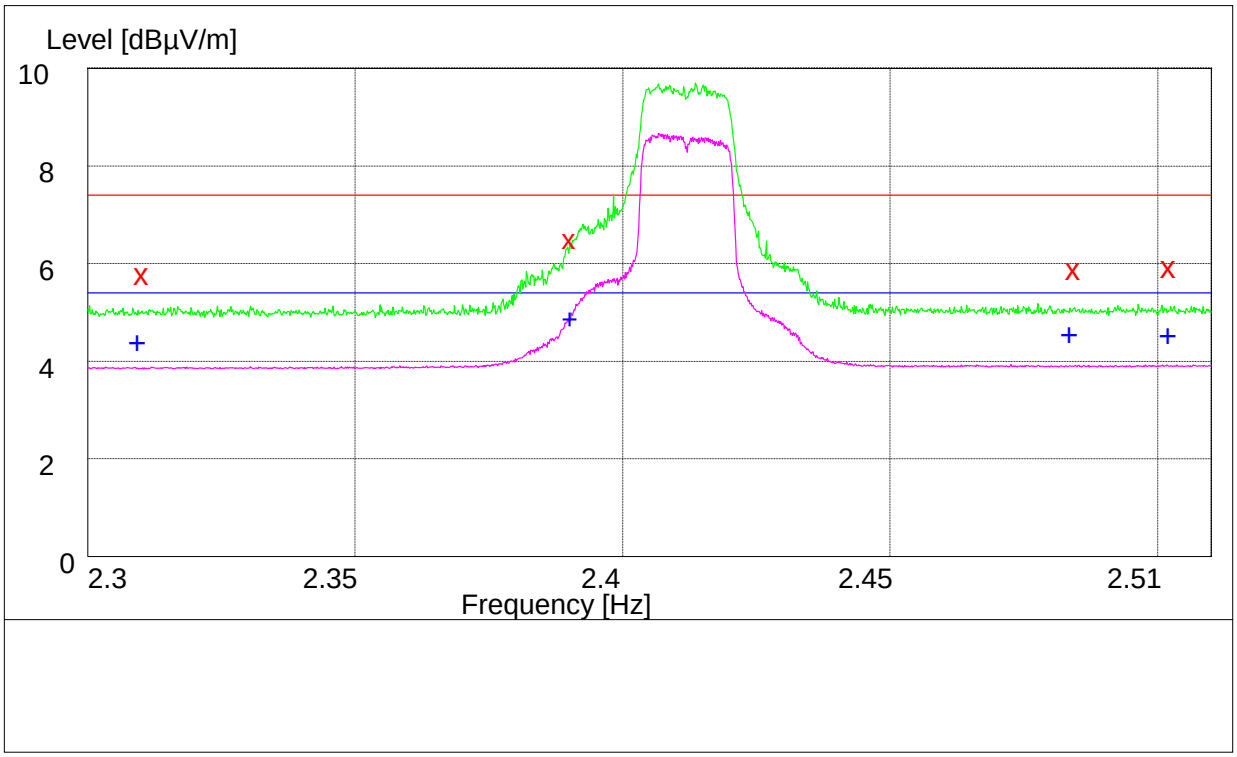
MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
4824.000000	29.30	-3.6	54.0	24.7	100.0	158.00	VERTICAL
14519.500000	36.20	14.9	54.0	17.8	200.0	205.00	VERTICAL
17694.000000	38.00	18.9	54.0	16.0	154.0	335.00	VERTICAL

18GHz to 26GHz

Note: No peak found in pre- test.

2.30GHz to 2.51GHz



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

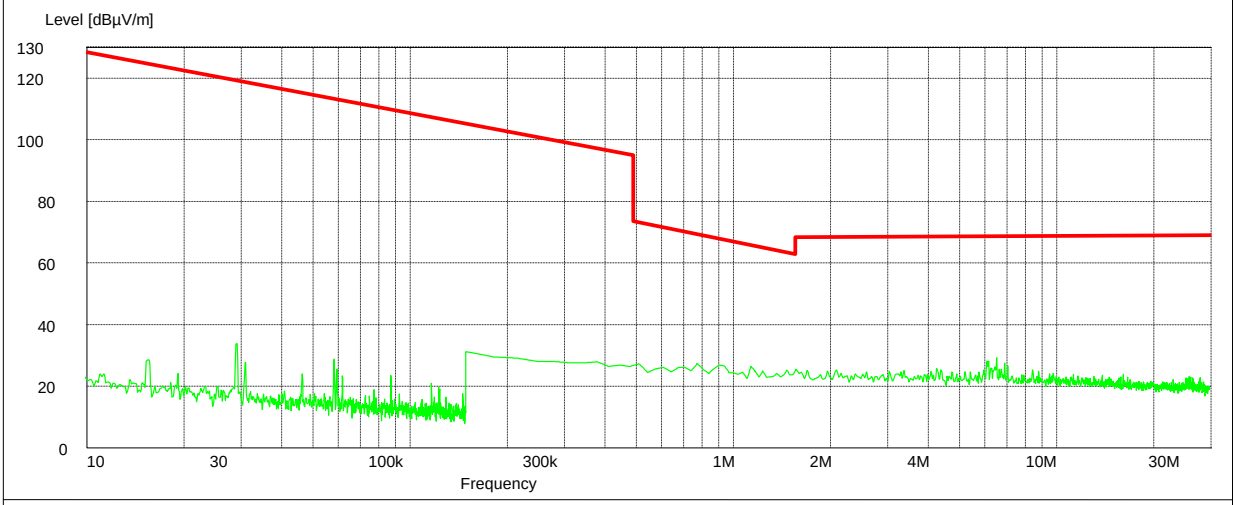
MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2310.000000	58.70	33.3	74.0	15.3	175.0	357.00	VERTICAL
2390.000000	66.30	33.5	74.0	7.7	100.0	65.00	VERTICAL
2483.500000	59.30	33.7	74.0	14.7	183.0	182.00	VERTICAL
2500.000000	59.30	33.8	74.0	14.7	136.0	1.00	HORIZONTAL

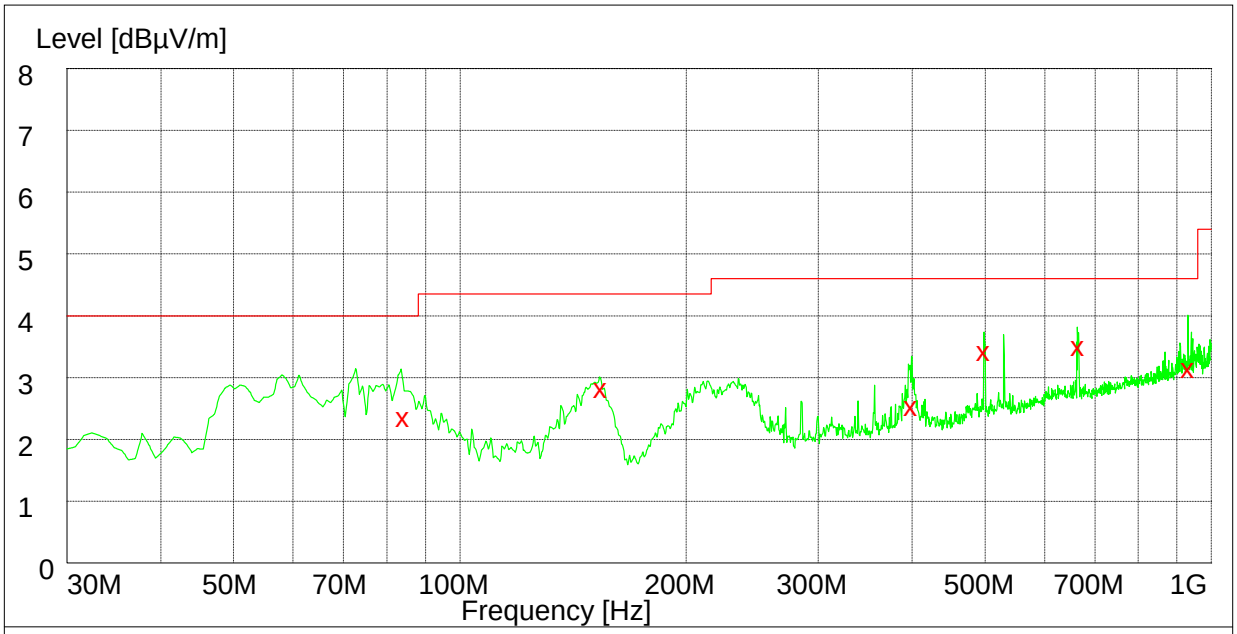
MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2310.000000	45.40	33.3	54.0	8.6	176.0	169.00	HORIZONTAL
2390.000000	49.90	33.5	54.0	4.1	100.0	66.00	VERTICAL
2483.500000	46.40	33.7	54.0	7.6	182.0	238.00	HORIZONTAL
2500.000000	46.50	33.8	54.0	7.5	111.0	73.00	VERTICAL

Channel 6
10 kHz to 30MHz

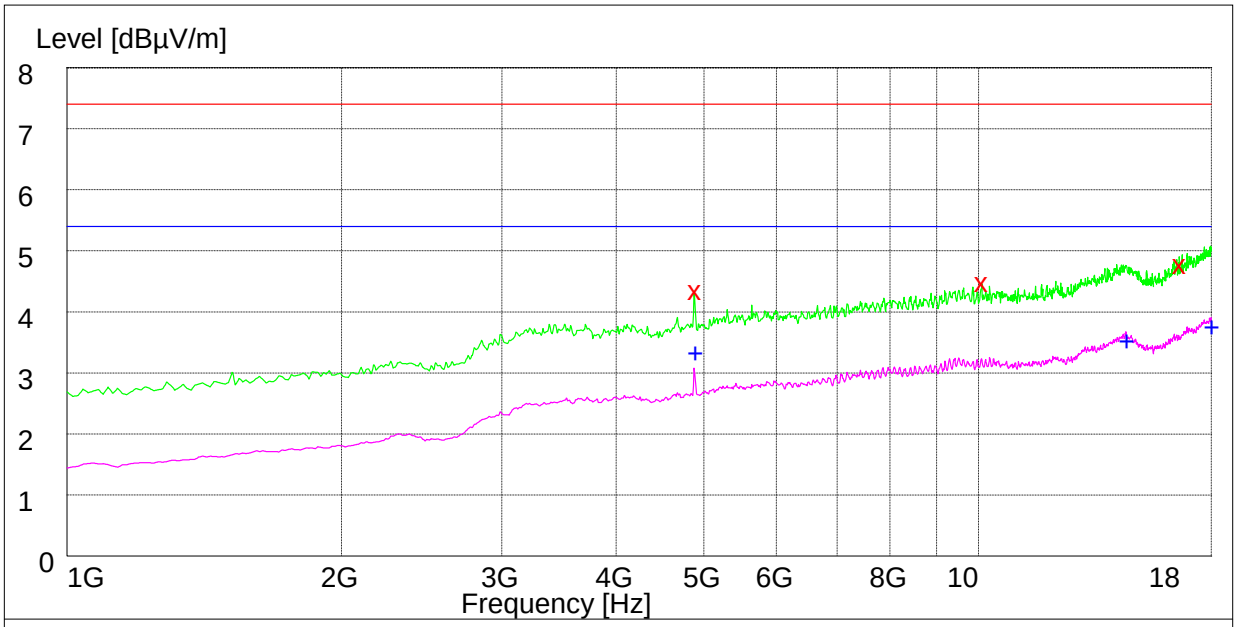


30MHz to 1GHz



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
83.940000	24.60	9.8	40.0	15.4	100.0	112.00	VERTICAL
153.840000	29.30	9.2	43.5	14.2	100.0	130.00	VERTICAL
398.580000	26.40	18.1	46.0	19.6	193.0	271.00	HORIZONTAL
497.760000	35.20	20.1	46.0	10.8	200.0	185.00	VERTICAL
664.080000	36.10	23.0	46.0	9.9	100.0	357.00	VERTICAL
930.900000	31.50	26.5	46.0	14.5	100.0	112.00	VERTICAL

1GHz to 18GHz



Note: Signal suppressed with a 2.4 GHz band rejection filter

MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
4883.500000	44.60	-3.7	74.0	29.4	100.0	43.00	VERTICAL
10078.000000	44.30	6.1	74.0	29.7	100.0	220.00	VERTICAL
16611.000000	48.80	15.9	74.0	25.2	127.0	95.00	HORIZONTAL

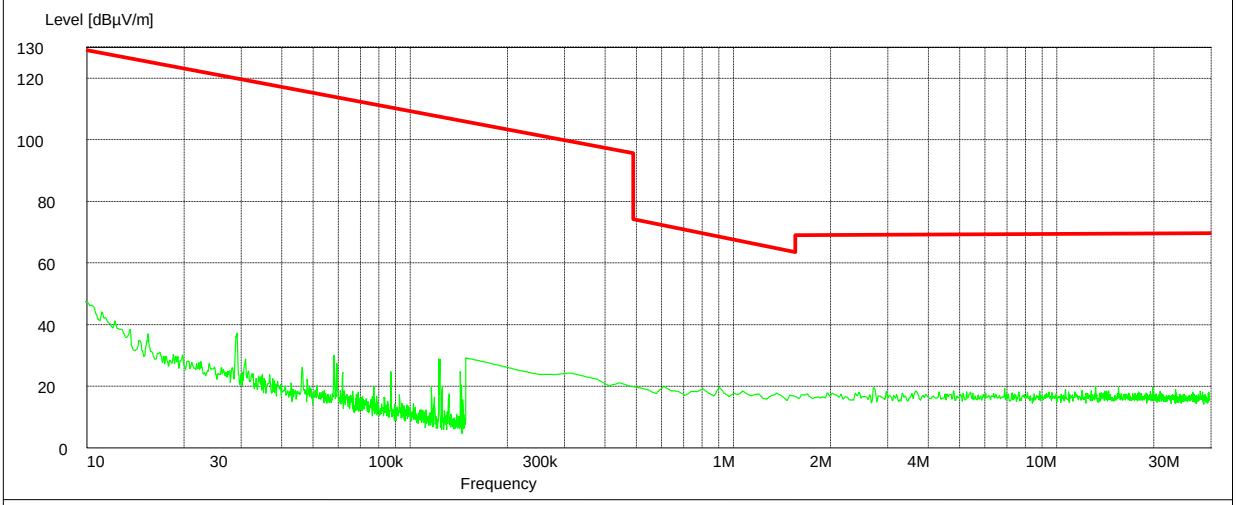
MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
4883.500000	34.30	-3.7	54.0	19.7	101.0	36.00	VERTICAL
14520.500000	36.20	14.9	54.0	17.8	200.0	0.00	HORIZONTAL
18000.000000	38.50	19.5	54.0	15.5	100.0	0.00	HORIZONTAL

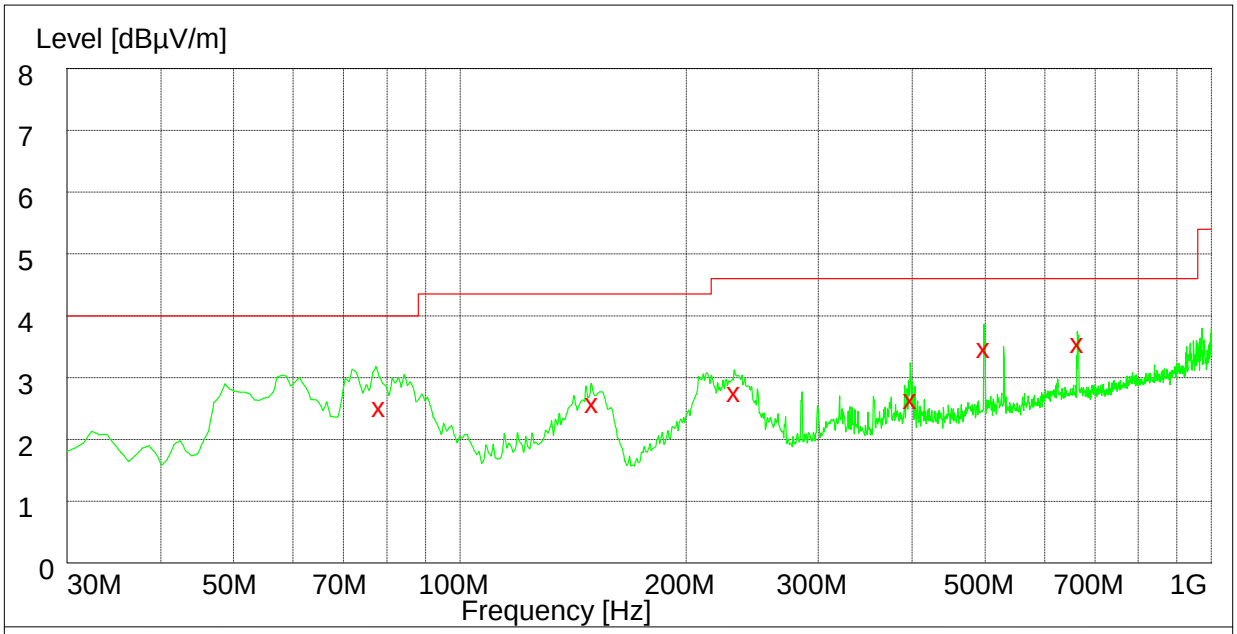
18GHz to 26GHz

Note: No peak found in pre- test.

Channel 11
10 kHz to 30 MHz

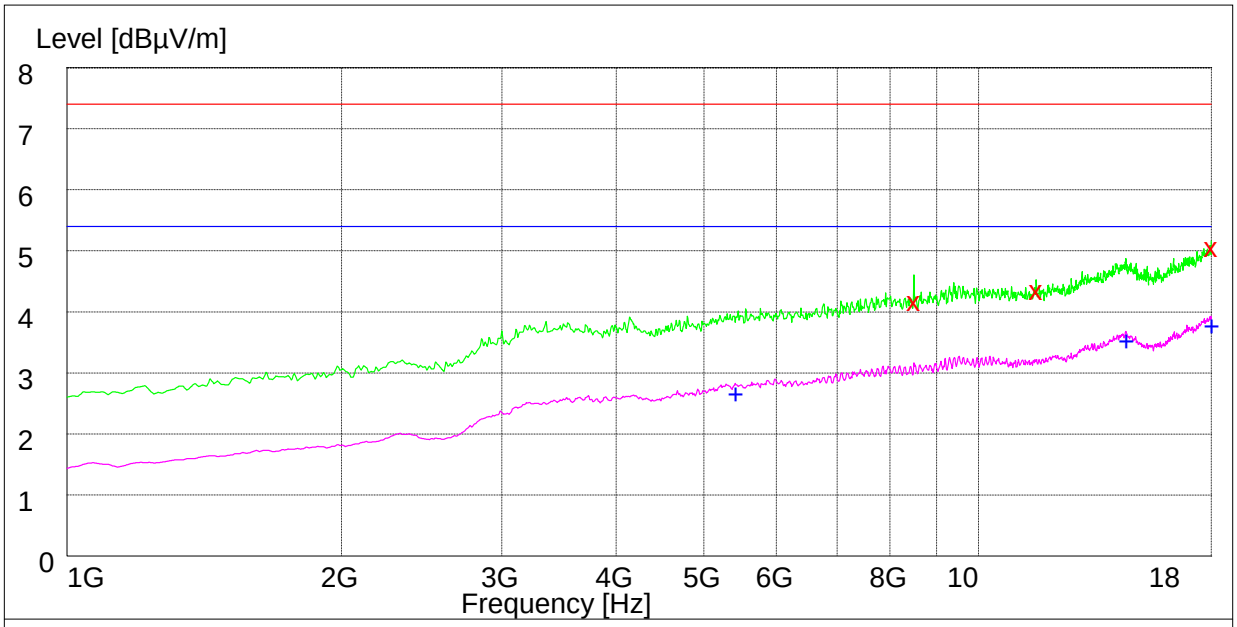


30MHz to 1GHz



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
78.120000	26.20	8.1	40.0	13.8	156.0	72.00	VERTICAL
150.000000	26.90	8.9	43.5	16.6	100.0	119.00	VERTICAL
231.720000	28.60	13.6	46.0	17.4	112.0	98.00	HORIZONTAL
397.500000	27.50	18.1	46.0	18.5	100.0	29.00	HORIZONTAL
497.760000	35.80	20.1	46.0	10.2	200.0	184.00	VERTICAL
663.780000	36.60	23.0	46.0	9.4	100.0	360.00	VERTICAL

1GHz to 18GHz



Note: Signal suppressed with a 2.4 GHz band rejection filter

MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
8498.000000	42.70	3.4	74.0	31.3	190.0	353.00	VERTICAL
11570.000000	44.50	7.1	74.0	29.5	196.0	311.00	HORIZONTAL
17996.000000	51.60	19.4	74.0	22.4	146.0	359.00	HORIZONTAL

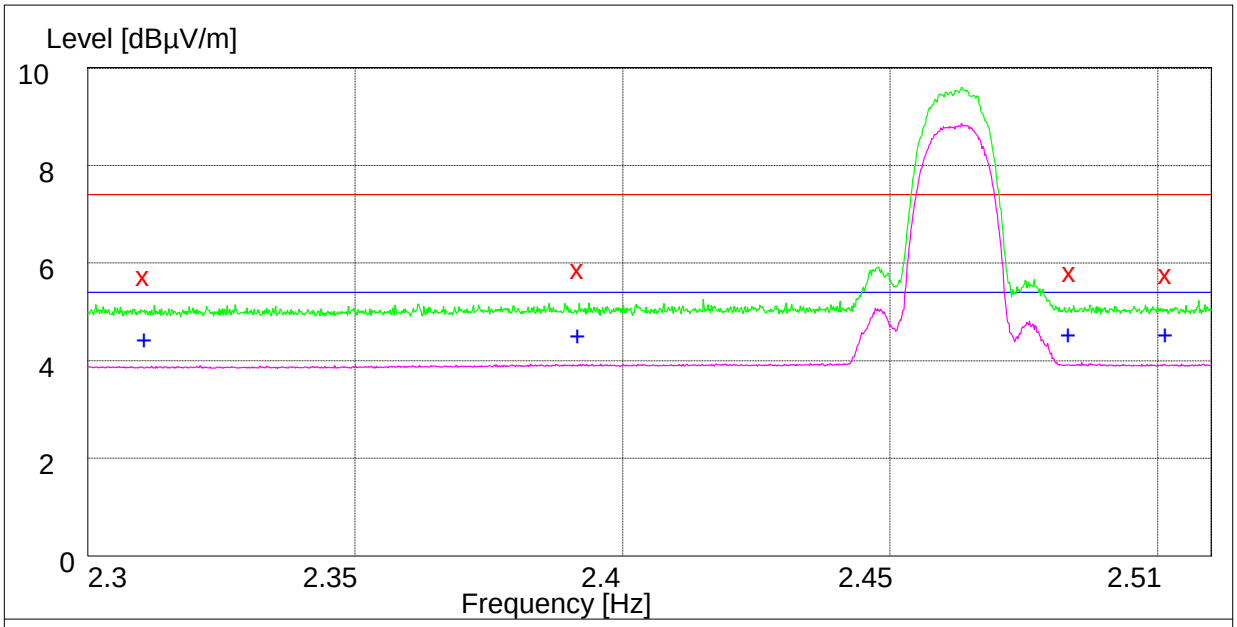
MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
5410.500000	27.60	-2.0	54.0	26.4	200.0	181.00	VERTICAL
14512.000000	36.30	14.8	54.0	17.7	200.0	245.00	HORIZONTAL
17999.500000	38.70	19.5	54.0	15.3	191.0	214.00	VERTICAL

18GHz to 26GHz

Note: No peak found in pre- test.

2.30GHz to 2.51GHz



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
2310.000000	58.60	33.3	74.0	15.4	128.0	303.00	VERTICAL
2390.000000	59.90	33.5	74.0	14.1	100.0	331.00	HORIZONTAL
2483.500000	59.40	33.8	74.0	14.6	124.0	227.00	VERTICAL
2500.000000	59.10	33.8	74.0	14.9	100.0	186.00	VERTICAL

MEASUREMENT RESULT: AVDetector

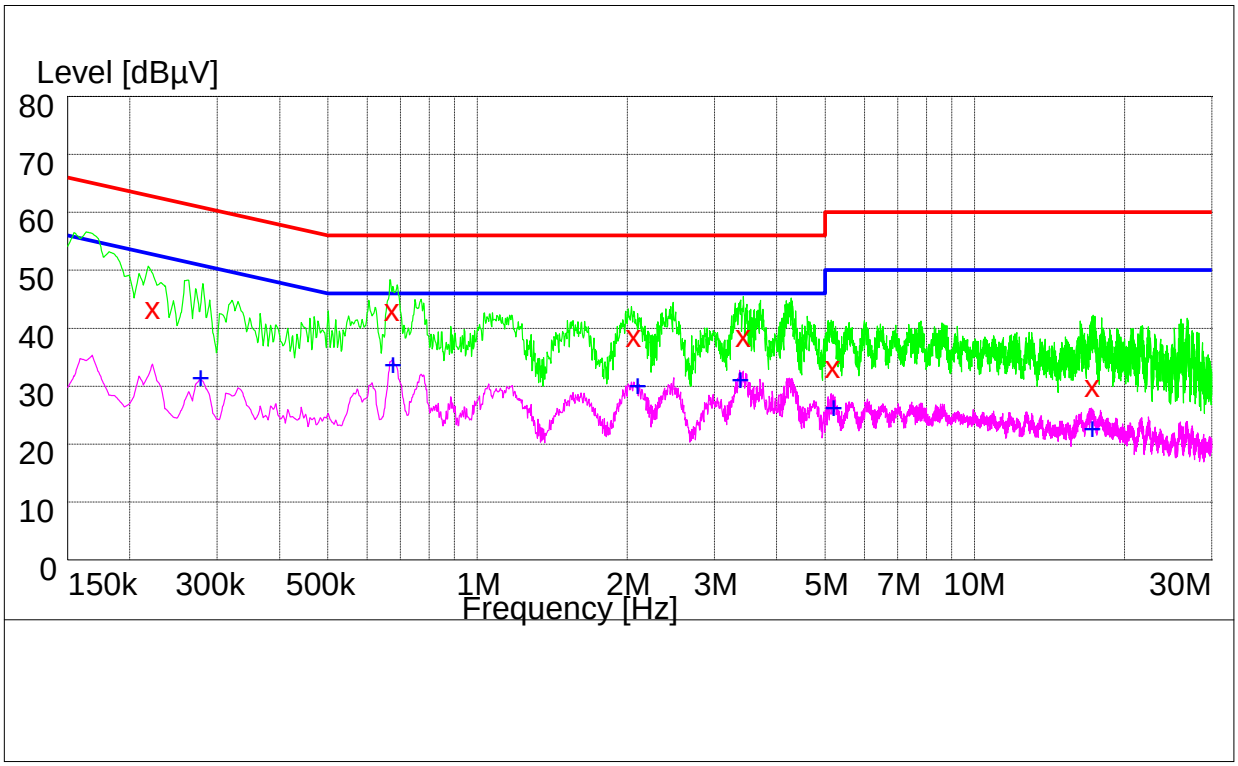
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2310.000000	45.40	33.3	54.0	8.6	148.0	206.00	VERTICAL
2390.000000	46.30	33.5	54.0	7.7	153.0	21.00	VERTICAL
2483.500000	46.40	33.7	54.0	7.6	119.0	183.00	HORIZONTAL
2500.000000	46.50	33.8	54.0	7.5	118.0	107.00	VERTICAL

Appendix G

Conducted Emission at Power Port

According to FCC Part 15.207

Channel 6



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.222000	45.10	10.0	63	17.9	N	FLO
0.672000	44.70	10.1	56	11.3	N	FLO
2.056000	39.20	10.1	56	16.8	N	FLO
3.414000	39.80	10.2	56	16.2	N	FLO
5.176000	34.30	10.2	60	25.7	L1	FLO
17.240000	30.50	10.3	60	29.5	L1	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.276000	31.60	10.0	51	19.4	N	FLO
0.672000	35.20	10.1	46	10.8	N	FLO
2.088000	30.60	10.1	46	15.4	N	FLO
3.356000	32.00	10.2	46	14.0	N	FLO
5.174000	27.90	10.2	50	22.1	N	FLO
17.114000	24.20	10.3	50	25.8	L1	FLO