FCC
RF Test Report

Product Name:
LTE/HSPA+/HSUPA/HSDPA/UMTS/GSM/GPRS/EDGE Mobile Phone with Bluetooth

Model Number: HUAWEI U9202L-3, U9202L-3

Report No: SYBH(Z-RF)016082012-2005
FCC ID:QISU9202L-3
IC : 6369A-U9202L3

Reliability Laboratory of Huawei Technologies Co., Ltd.

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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 Sample: **Aug.09, 2012**

Start Date of Test: **Aug.09, 2012**

End Date of Test: **Aug.29, 2012**

Test Result: Pass

Approved By Senior Engineer	Sept.,19, 2012	Dai Linjun	Dai Linjun
	Date	Name	Signature
Reviewed By	Sept.,19, 2012	Cousy Xu	Cousy XU
	Date	Name	Signature
Operated By	Sept.,19, 2012	Huang Qiuliang	Huang Qiuliang
	Date	Name	Signature

Contents

1 GENERAL INFORMATION 5

1.1 APPLIED STANDARD 5
1.2 TEST LOCATION 5
1.3 TEST ENVIRONMENT CONDITION 5

2 Summary 6

3 Product Description 7

3.1 PRODUCTION INFORMATION 7
3.2 TECHNICAL CHARACTERISTICS 8
3.3 EUT IDENTIFICATION LIST 10
3.4 MODIFICATION INFORMATION 11

4 Test Modes 12

5 Main Test Instruments 13

6 Transmitter Measurements 14

6.1 BANDWIDTH MEASUREMENT 14
6.2 PEAK OUTPUT POWER 16
6.3 BAND EDGE SPURIOUS EMISSION 18
6.4 CONDUCTED RF SPURIOUS 20
6.5 POWER SPECTRAL DENSITY 22
6.6 RADIATED SPURIOUS EMISSION & SPURIOUS IN RESTRICTED BAND 24
6.7 CONDUCTED EMISSION AT POWER PORT 27

7 System Measurement Uncertainty 29

8 Appendices 30

1 GENERAL INFORMATION

1.1 Applied Standard

Applied Rules:	47 CFR FCC Part 2, Subpart J (10-1-10 Edition) 47 CFR FCC Part 15, Subpart C (10-1-10 Edition) 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)	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

3 Product Description

3.1 Production Information

3.1.1 General Description

HUAWEI U9202L-3, U9202L-3 is subscriber equipment in the LTE/UMTS/GSM system. The LTE frequency band is Band IV and Band XVII. The HSPA+/HSUPA/HSDPA/UMTS frequency band is Band I, Band II, Band IV and Band V. The GSM/GPRS/EDGE frequency band includes GSM850 and DCS1800 and PCS1900. The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/UMTS/GSM protocol processing, voice, video, MMS service, GPS, AGPS and WIFI etc. Externally it provides micro SD card interface, earphone port (to provide voice service) and USIM card interface. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

Note: Only WIFI function was considered in this report.

3.1.2 Support function and Service

The EUT support the function and service as follows:

Characteristics	Description	
TX/RX Operating Band	2412 MHz to 2462 MHz	
IEEE 802.11 WLAN Mode Supported	802.11b: 802.11g: 802.11n :	Supported Supported Supported
Channel Bandwidth	802.11b: 802.11g: 802.11n:	20 MHz 20 MHz 20 MHz,
TX Power Control (TPC)	Supported	
Type of Modulation	802.11b: 802.11g: 802.11n:	DSSS OFDM OFDM

3.2 Technical Characteristics

3.2.1 Frequency Range

Table 3 Frequency Range

Uplink band:	2412 to 2462 MHz	
Downlink band:	2412 to 2462 MHz	
Hop frequency support:	☐ YES	☒ NO

3.2.2 Channel Spacing / Separation

Table 4 Channel Spacing / raster

Channel spacing:	22 MHz
Channel raster:	5 MHz

3.2.3 Antenna Information

Table 5 Antenna Information

Type:	Integrated / Internal
Maximum Gain(dBi):	-0.3

3.2.4 Environmental Requirements

Table 6 Environmental Requirements

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

3.2.5 Power Source

Table 7 Power Source

AC voltage nominal:	~120V
AC voltage range	~100V-240V

3.2.6 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.

3.3 EUT Identification List

3.3.1 Board Information

Table 8 Board Information

LTE/HSPA+/HSUPA/HSDPA/UMTS/GSM/GPRS/EDGE Mobile Phone with Bluetooth		
HUAWEI U9202L-3, U9202L-3		
Board and Module		
Hardware Version	Software Version	Description
Ver.B	U9202L-3V100R001C00B116	Main board of Mobile Phone

3.3.2 Adapter Technical Data

AC/DCAdapter Model	HW-050100U3W
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V ⎓ 1A
Rated Power	5W

3.3.3 Battery Technical Data

Name	Manufacture	Description
Rechargeable Li-ion	Huawei Technologies Co., Ltd.	Battery Model: HB5R1H Rated capacity: 1930mAh Nominal Voltage: ⎓ +3.7V Charging Voltage: ⎓ +4.2V

3.4 Modification Information

For original equipment, following table is not application.

Table 9 Modification Information

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

4 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
TM2	IEEE 802.11g
TM3	IEEE 802.11n of 20 MHz, using SISO mode

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

5 Main Test Instruments

Table 10 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Power supply	KEITHLEY	2303	1288003	Sept., 27, 2012
Wireless Communication Test set	Agilent	N4010A	MY49081592	Nov., 26, 2012
Spectrum Analyzer	Agilent	E4440A	MY48250119	Jul., 17, 2013
Signal Analyzer	R&S	FSQ31	200021	Sept., 27, 2012
Spectrum Analyzer	Agilent	N9030A	MY49431698	Oct., 16, 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
Spectrum analyzer	R&S	FSU3	200474	Mar., 05, 2013
Spectrum analyzer	R&S	FSU43	100144	Mar., 05, 2013
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100304	Apr., 05, 2013
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100391	Apr., 05, 2013
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBECK	VULB 9163	9163-521	Jul., 07, 2013
Pyramidal Horn Antenna(26GHz-40GHz)	ETS-Lindgren	3160-10	00123940	Feb., 27, 2013
Pyramidal Horn Antenna(18GHz-26.5GHz)	ETS-Lindgren	3160-09	00125912	Feb.,27, 2013

6 Transmitter Measurements

6.1 Bandwidth measurement

6.1.1 Test Conditions

Table 11 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 12 Supporting Standards:

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

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 13 Limits

Limits	≥ 500kHz

6.1.3 Test Method and Setup

(a) Connect EUT test port 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

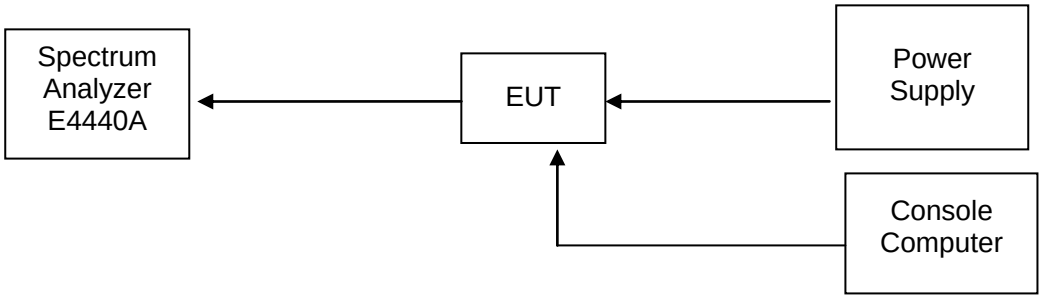


Figure 1. Test Set-up

6.1.4 Measurement Results

Table 14 Measurement Results

Test Conditions	Channel Position	Channel Number	Frequency [GHz]	Bandwidth Type	Measured Bandwidth [MHz]	Result
TM1	L	1	2.412	6dB	8.818	Pass
				99%	13.116	Pass
	M	6	2.437	6dB	8.178	Pass
				99%	13.125	Pass
	H	11	2.462	6dB	8.800	Pass
				99%	13.093	Pass
TM2	L	1	2.412	6dB	16.611	Pass
				99%	16.685	Pass
	M	6	2.437	6dB	16.533	Pass
				99%	16.700	Pass
	H	11	2.462	6dB	16.492	Pass
				99%	16.754	Pass
TM3	L	1	2.412	6dB	17.729	Pass
				99%	17.754	Pass
	M	6	2.437	6dB	17.725	Pass
				99%	17.789	Pass
	H	11	2.462	6dB	17.825	Pass
				99%	17.775	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 15 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 16 Supporting Standards:

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

6.2.2.3 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 17 Limits

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

6.2.3 Test Method and Setup

(a) Connect EUT test port 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 output power separately.

Test setup

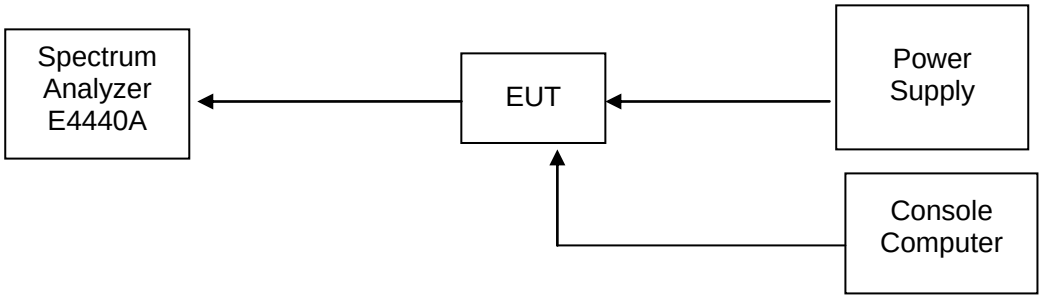


Figure 2. Test Set-up

6.2.4 Measurement Results

Table 18 Measurement Results

Test Conditions	Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
TM1	L	1	2412	25.26	< 30	Pass
	M	6	2437	24.64	< 30	Pass
	H	11	2462	24.10	< 30	Pass
TM2	L	1	2412	26.61	< 30	Pass
	M	6	2437	26.59	< 30	Pass
	H	11	2462	25.82	< 30	Pass
TM3	L	1	2412	24.89	< 30	Pass
	M	6	2437	24.52	< 30	Pass
	H	11	2462	24.10	< 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 19 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 20 Supporting Standards:

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

6.3.2.3 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 21 Limits

Band edge spurious:	20 dBc/100kHz

6.3.3 Test Method and Setup

(a) Connect EUT test port 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

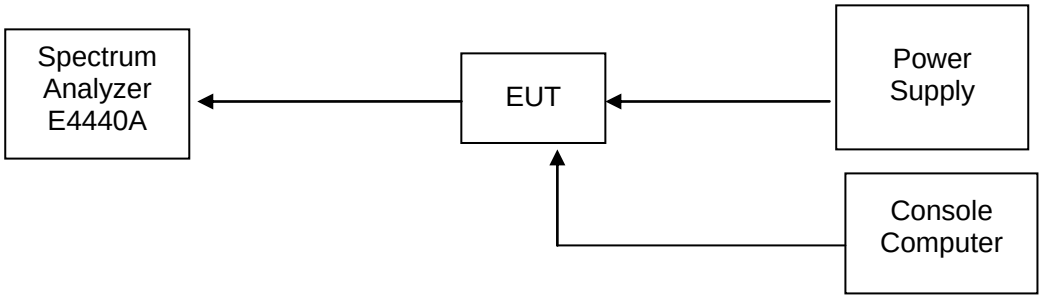


Figure 3. Test Set-up

6.3.4 Measurement Results

Table 22 Measurement Results

Test Conditions		Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Result
TM1	Low Edge	1	2412	10.98	-29.15	-9.0	Pass
	High Edge	11	2462	10.02	-30.07	-10.0	Pass
TM2	Low Edge	1	2412	7.29	-17.63	-12.7	Pass
	High Edge	11	2462	6.72	-17.99	-13.3	Pass
TM3	Low Edge	1	2412	4.92	-23.50	-15.1	Pass
	High Edge	11	2462	4.45	-20.31	-15.6	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 23 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 24 Supporting Standards:

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

6.4.2.3 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 25 Limits

Band edge spurious:	20 dBc/100kHz

6.4.3 Test Method and Setup

(a) Connect EUT test port 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

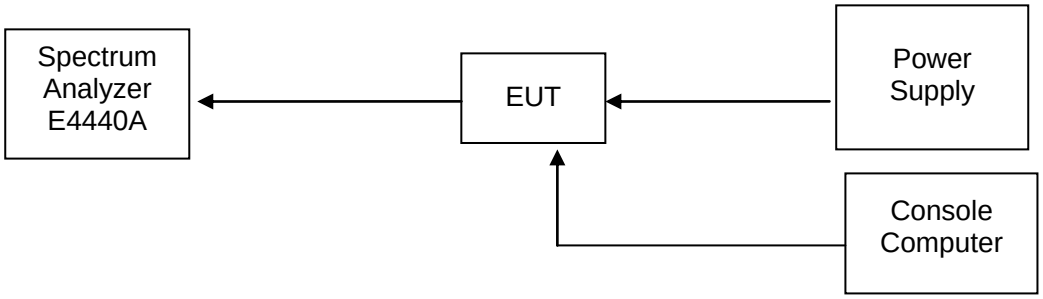


Figure 4. Test Set-up

6.4.4 Measurement Results

Table 26 Measurement Results

Test Conditions	Test Frequency Range	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Result
TM1	9KHz-26GHz	1	2412	16.36	-40.39	-3.6	Pass
	9KHz-26GHz	6	2437	16.24	-41.35	-3.8	Pass
	9KHz-26GHz	11	2462	15.56	-42.57	-4.4	Pass
TM2	9KHz-26GHz	1	2412	14.33	-41.62	-5.7	Pass
	9KHz-26GHz	6	2437	13.69	-42.37	-6.3	Pass
	9KHz-26GHz	11	2462	12.51	-41.08	-7.50	Pass
TM3	9KHz-26GHz	1	2412	12.10	-42.30	-7.9	Pass
	9KHz-26GHz	6	2437	11.52	-42.68	-8.50	Pass
	9KHz-26GHz	11	2462	10.77	-42.38	-9.2	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 27 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 28 Supporting Standards:

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

6.5.2.3 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 29 Limits

Band edge spurious:	8 dBm/3kHz

6.5.3 Test Method and Setup

(a) Connect EUT test port 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

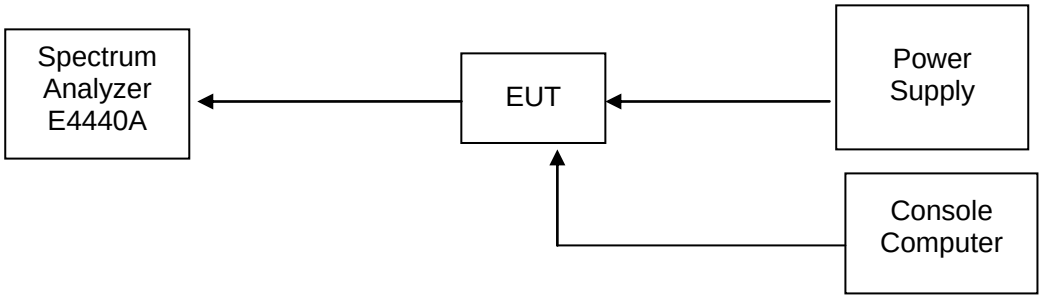


Figure 5. Test Set-up

6.5.4 Measurement Results

Table 30 Measurement Results

Test Conditions	Channel No.	Carrier Frequency [MHz]	Measured Power spectral density [dBm]	Limit [dBm]	Result
TM1	1	2412	-2.65	<8	Pass
	6	2437	-2.75	<8	Pass
	11	2462	-3.65	<8	Pass
TM2	1	2412	-7.29	<8	Pass
	6	2437	-8.53	<8	Pass
	11	2462	-8.98	<8	Pass
TM3	1	2412	-9.75	<8	Pass
	6	2437	-10.41	<8	Pass
	11	2462	-11.56	<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 31 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 32 Supporting Standards:

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

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 33 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 C63.10 (2009). The EUT was set-up on insulator 80cm above the Ground Plane. The set-up and test methods were according to ANSI C63.10:2009.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, Peak Detector 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

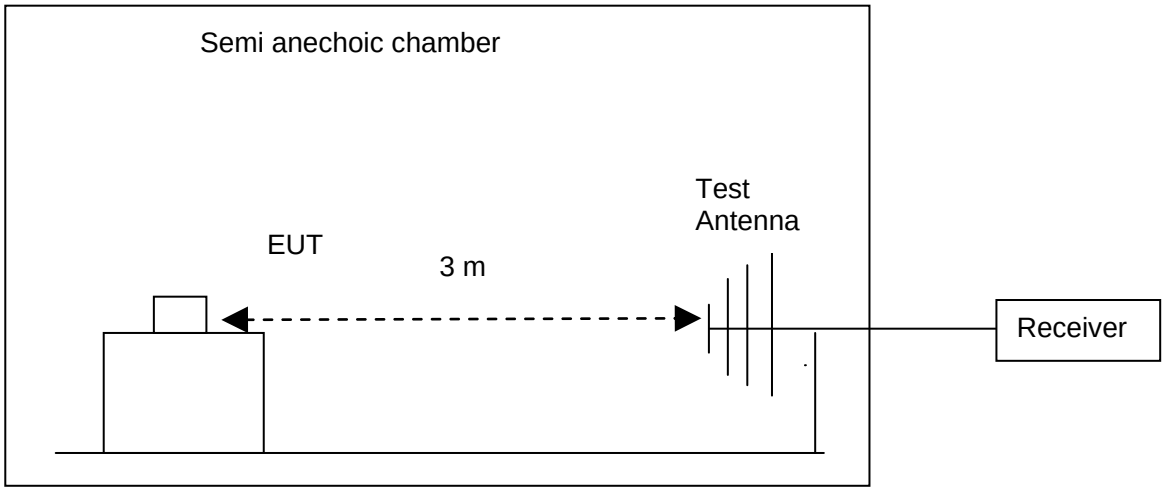


Figure 6. Test Set up

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

Test Conditions	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

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 34 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 35 Supporting Standards:

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

6.7.2.3 Limits

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

Table 36 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 C63.10: 2009.

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 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.

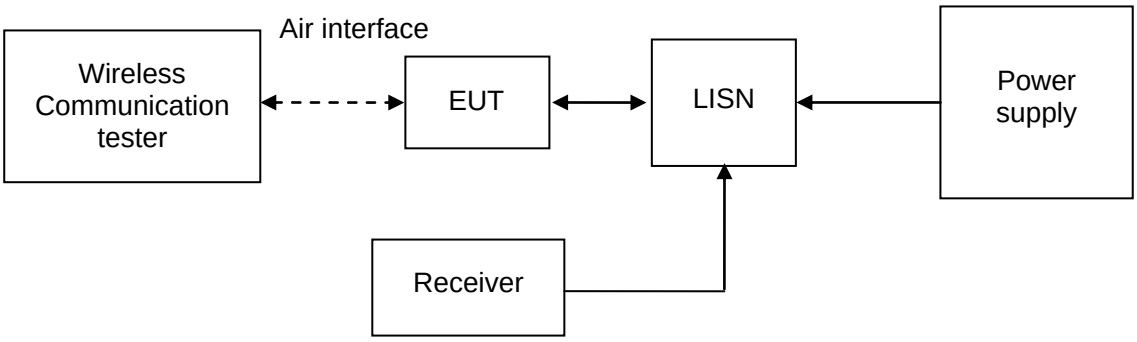


Figure 7. Test Set-up

6.7.4 Measurement Results

Table 37 MEASUREMENT RESULT:QP DECTER

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.202647	48.6	9.7	63.5	14.9	L1	FLO
0.254632	44.1	9.7	61.6	17.5	L1	FLO
0.406612	39.6	9.7	57.7	18.1	L1	FLO
2.340465	34.0	9.7	56.0	22.0	L1	FLO
4.776420	34.9	9.8	56.0	21.1	N	FLO
9.503146	34.5	9.9	60.0	25.5	N	FLO

Table 38 MEASUREMENT RESULT:AV DECTER

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.191400	28.4	9.7	54.0	25.6	L1	FLO
0.270585	32.3	9.7	51.1	18.8	L1	FLO
0.472819	32.0	9.7	46.5	14.5	L1	FLO
2.246572	27.7	9.7	46.0	18.3	L1	FLO
4.943794	23.8	9.8	46.0	22.2	L1	FLO
9.477202	24.3	9.9	50.0	25.7	N	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 39 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

8 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 Conducted emission test for power port
Appendix H	Measurement Results Radiated Receiver Spurious Emissions
Appendix I	Photos of Test Setup

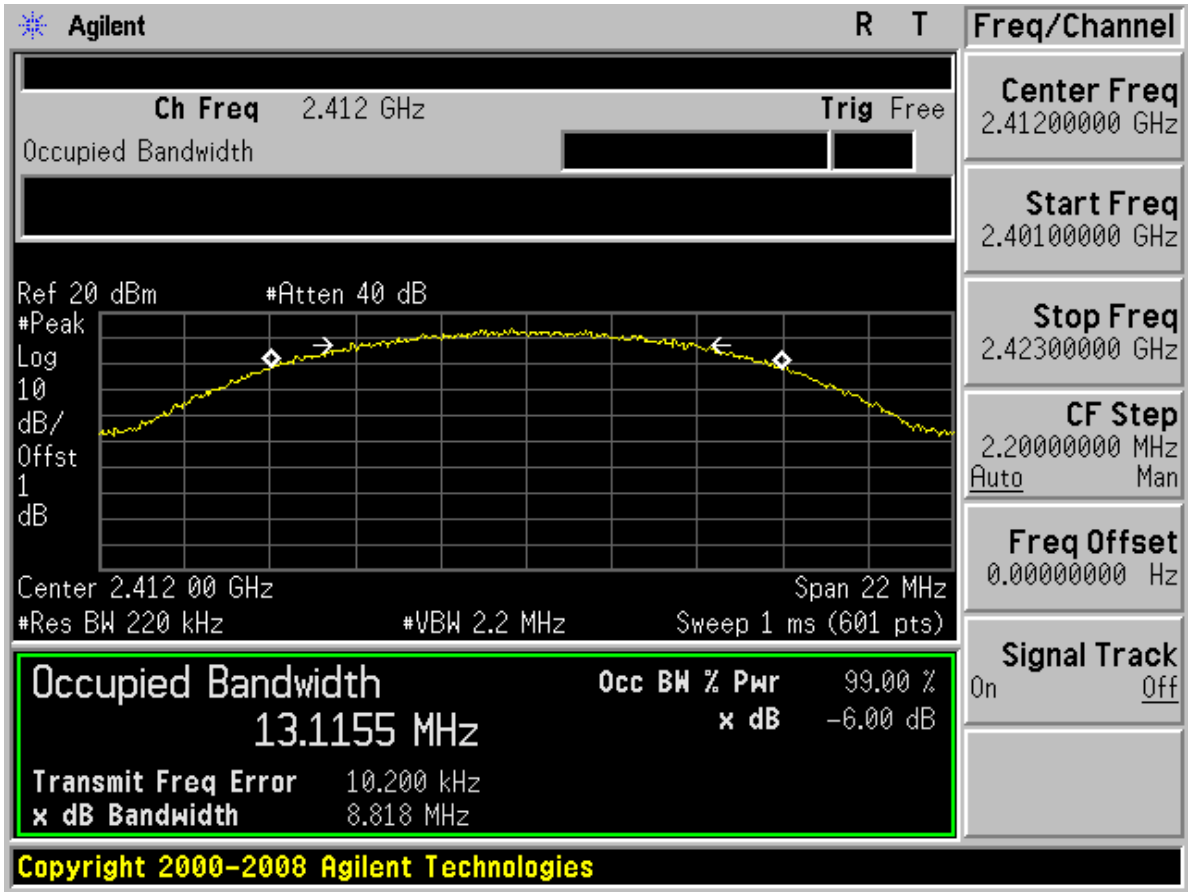
----------The END----------

Appendix A

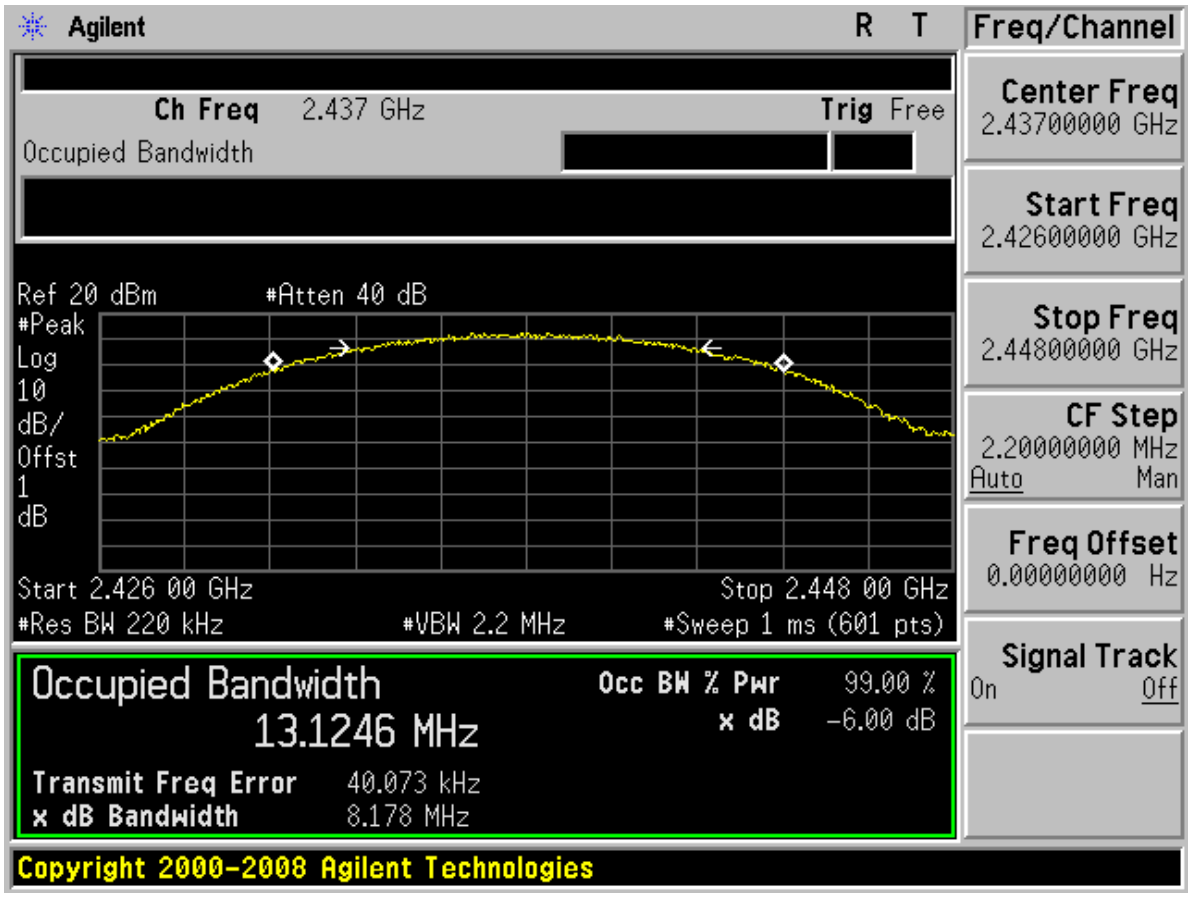
Bandwidth measurement

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

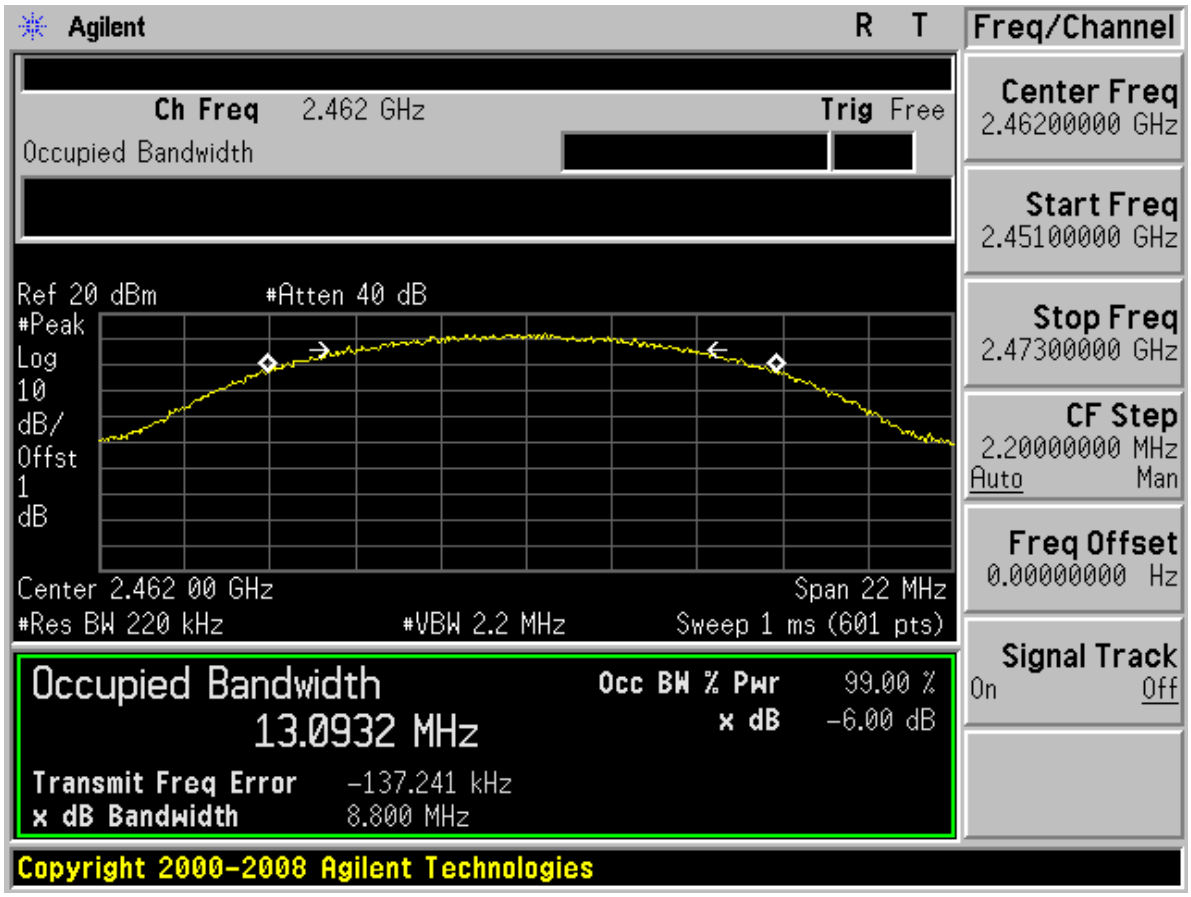
TM1
Channel 1 (2412MHz)



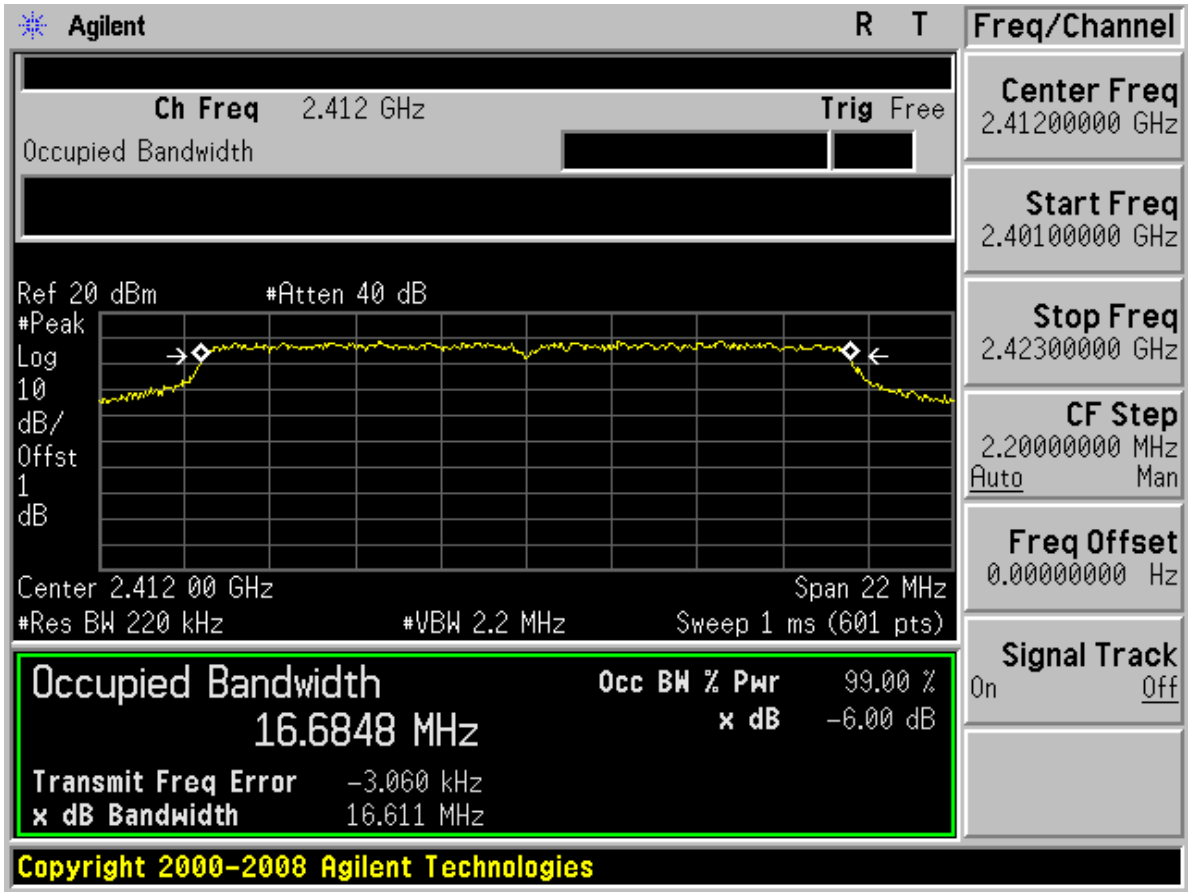
Channel 6 (2437MHz)



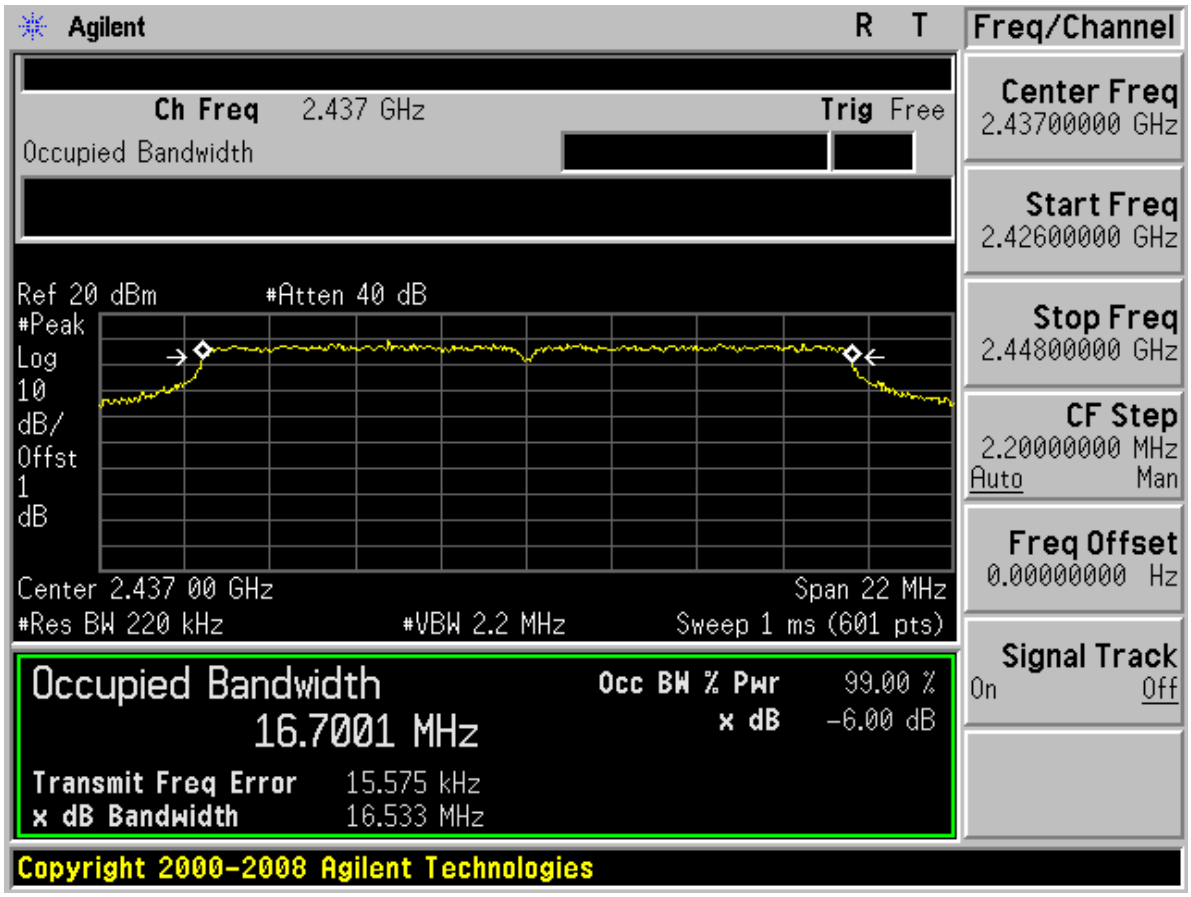
Channel 11 (2462MHz)



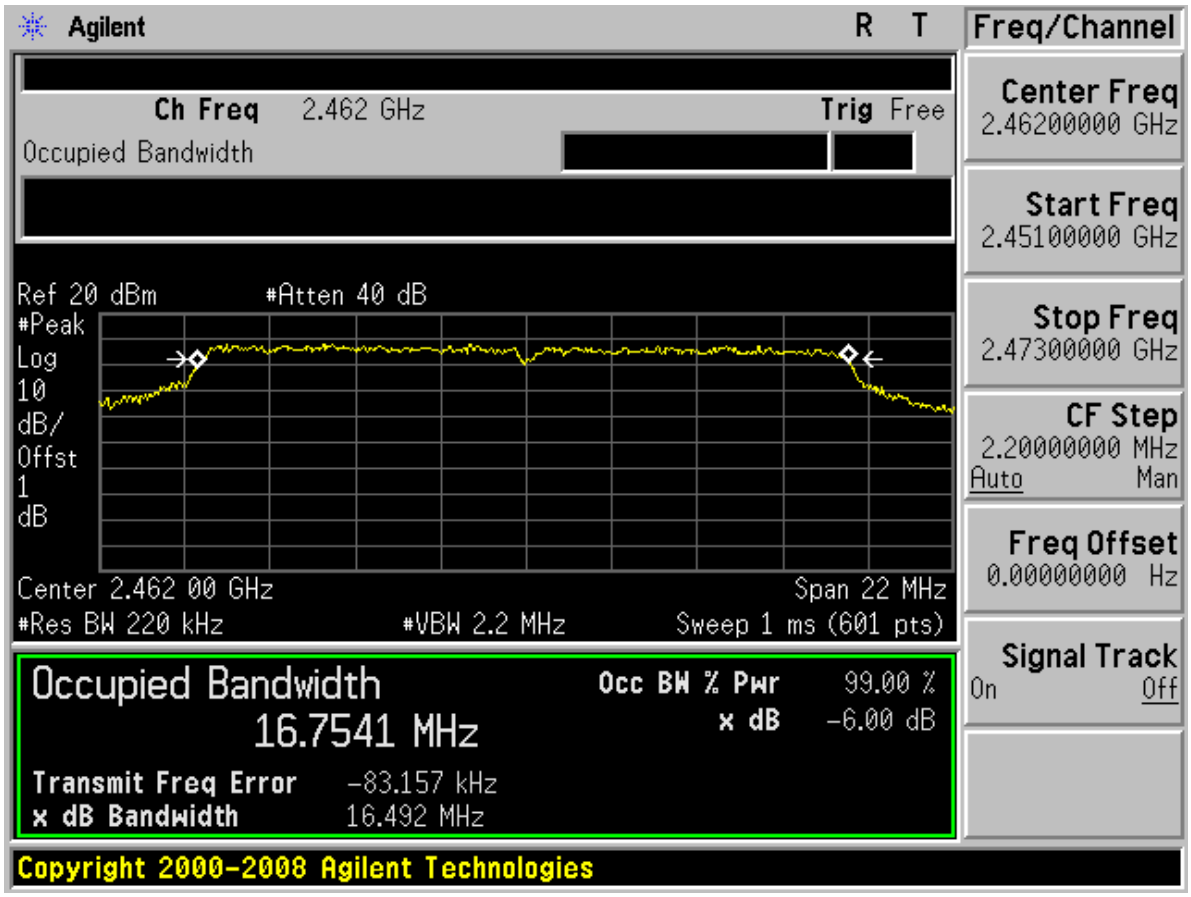
TM2
Channel 1 (2412MHz)



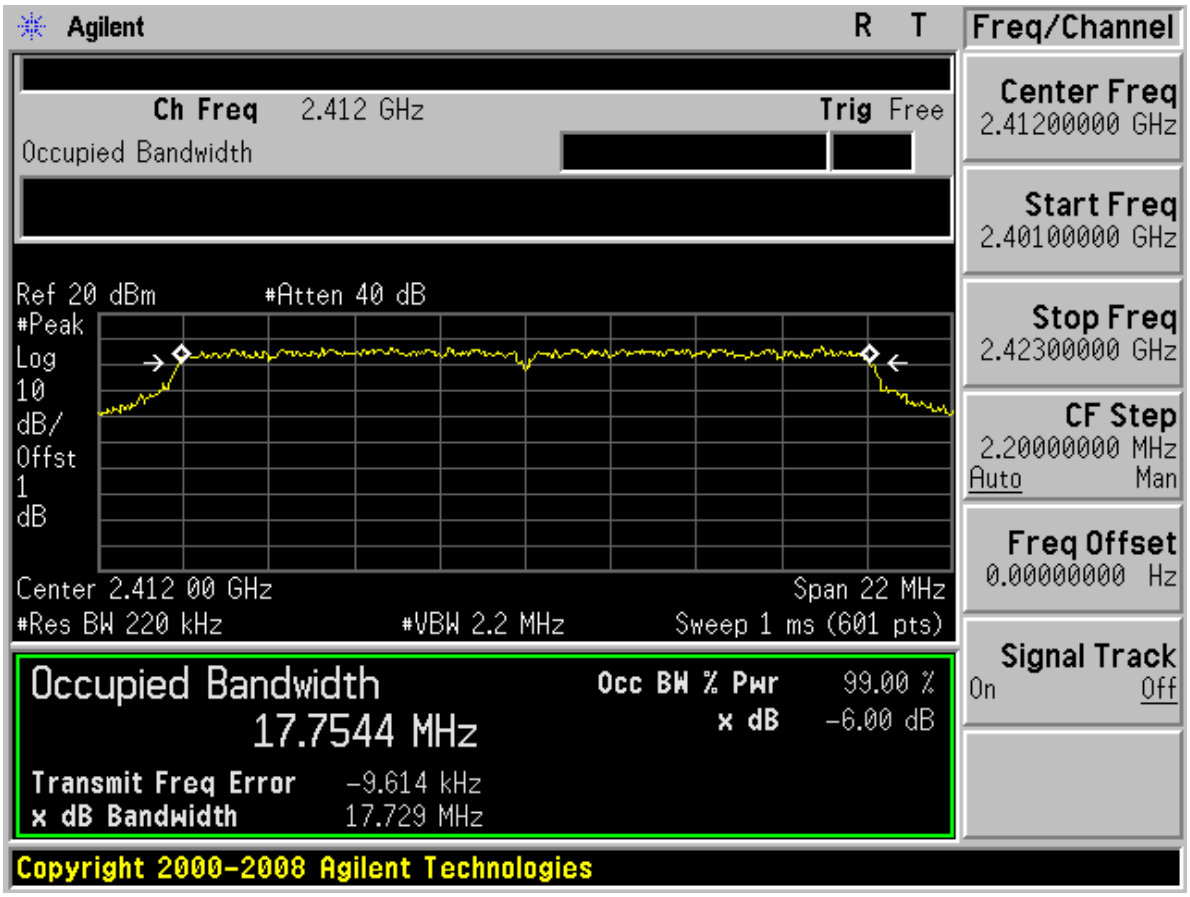
Channel 6 (2437MHz)



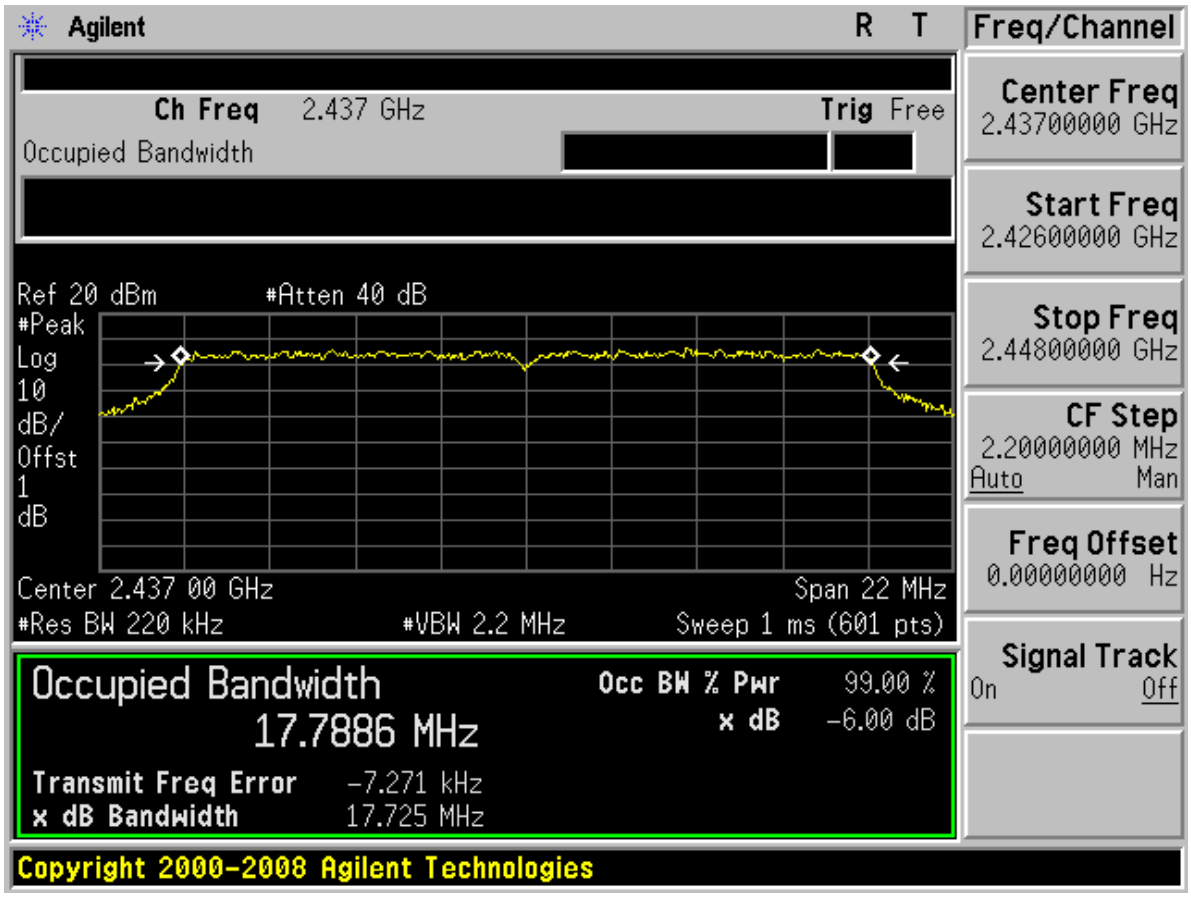
Channel 11 (2462MHz)



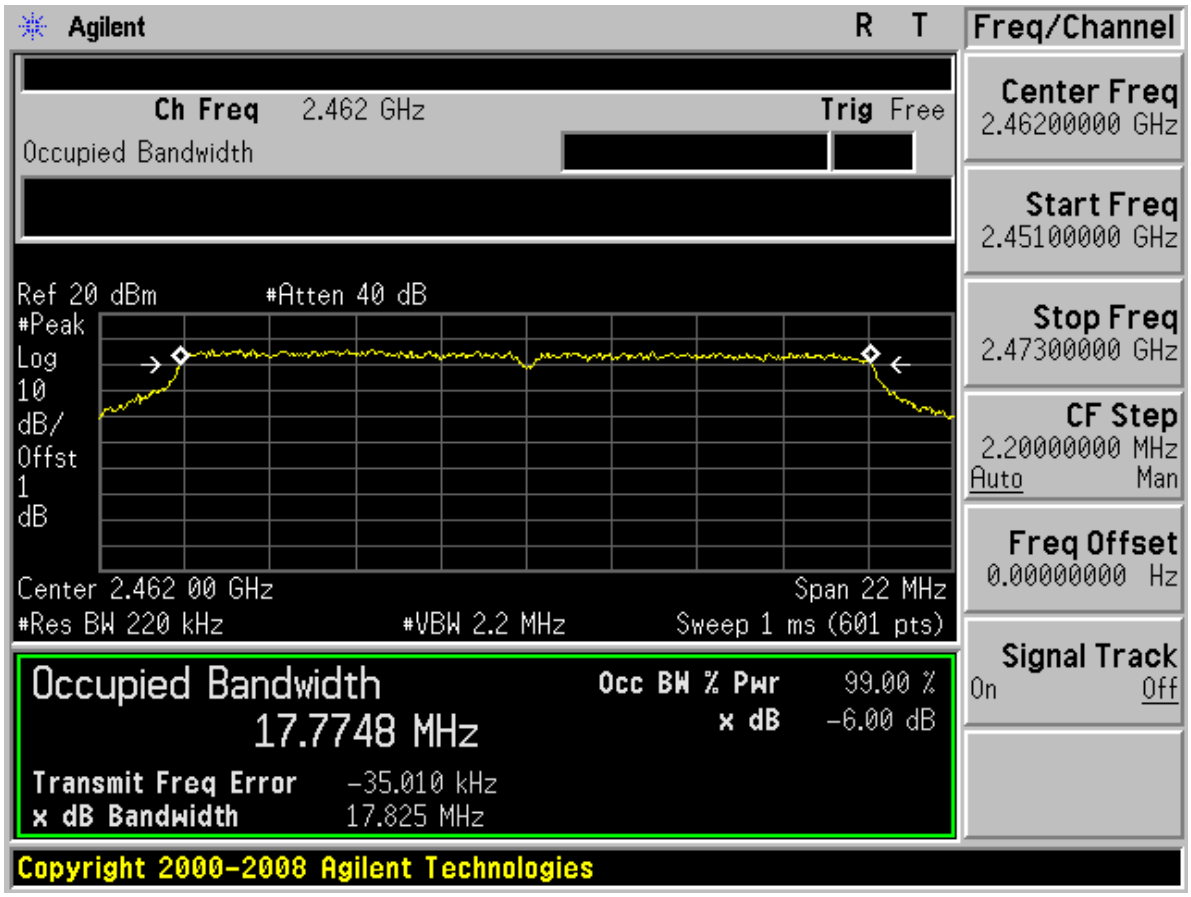
TM3
Channel 1 (2412MHz)



Channel 6 (2437MHz)



Channel 11 (2462MHz)



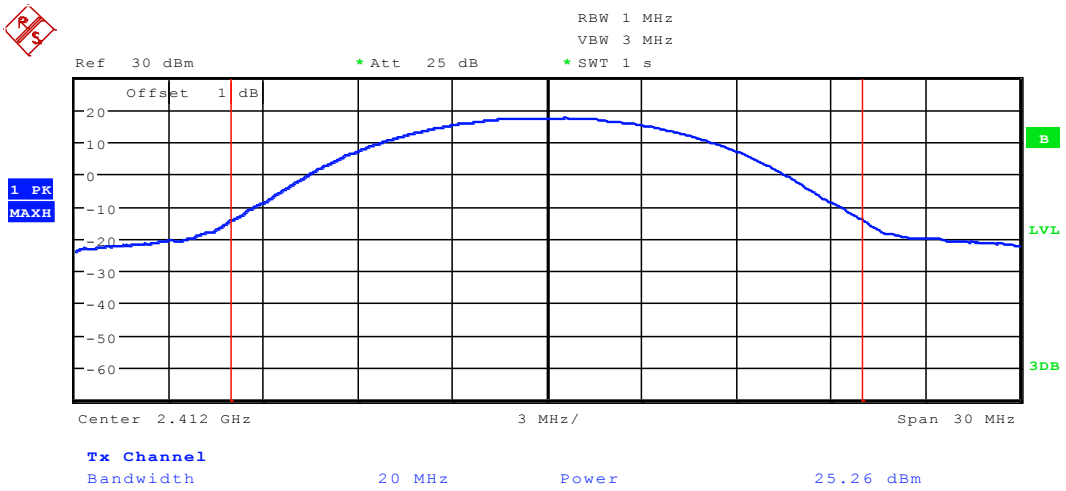
----------The END----------

Appendix B

Conducted Peak output power

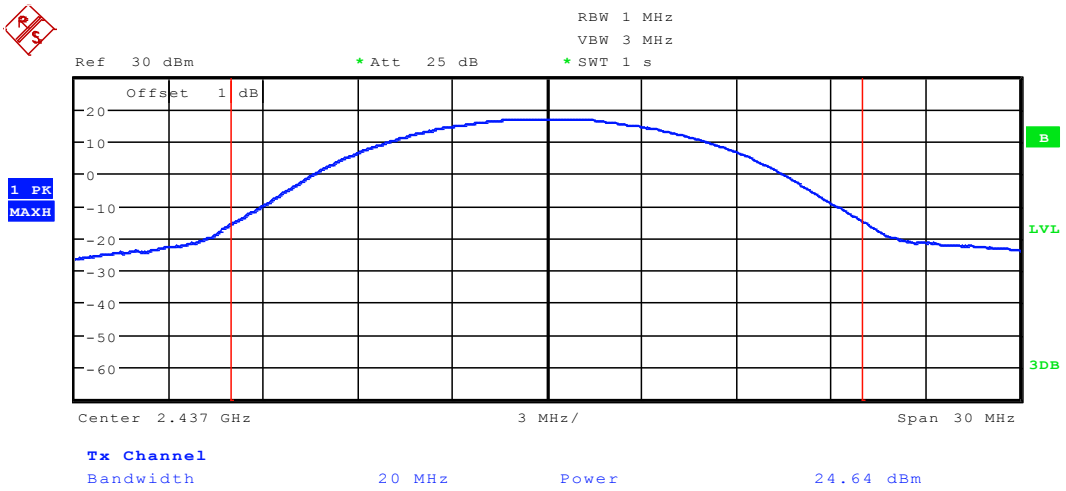
According to FCC Part 15.247 (b) (3) & RSS-210

TM1
Channel 1 (2412MHz)



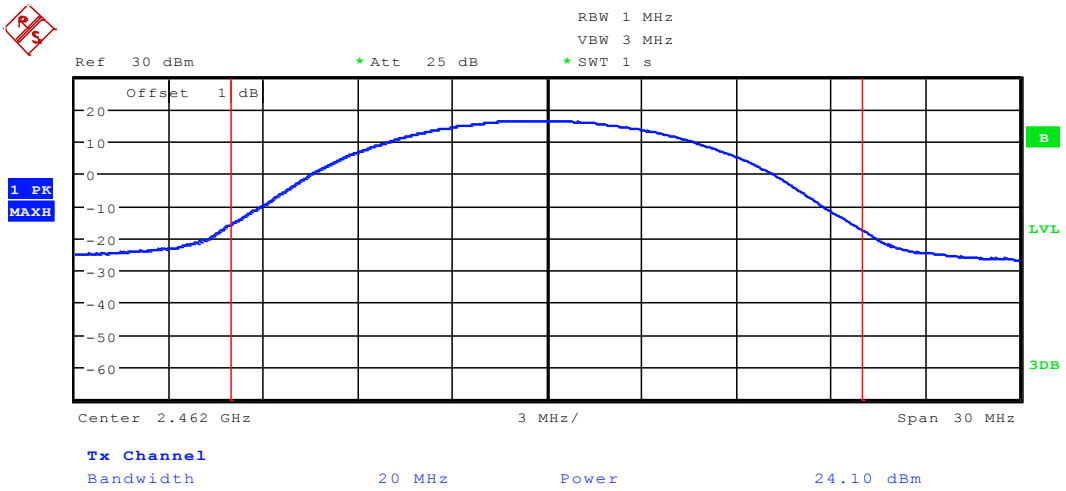
Date: 17.JUL.2012 16:29:16

Channel 6 (2437MHz)



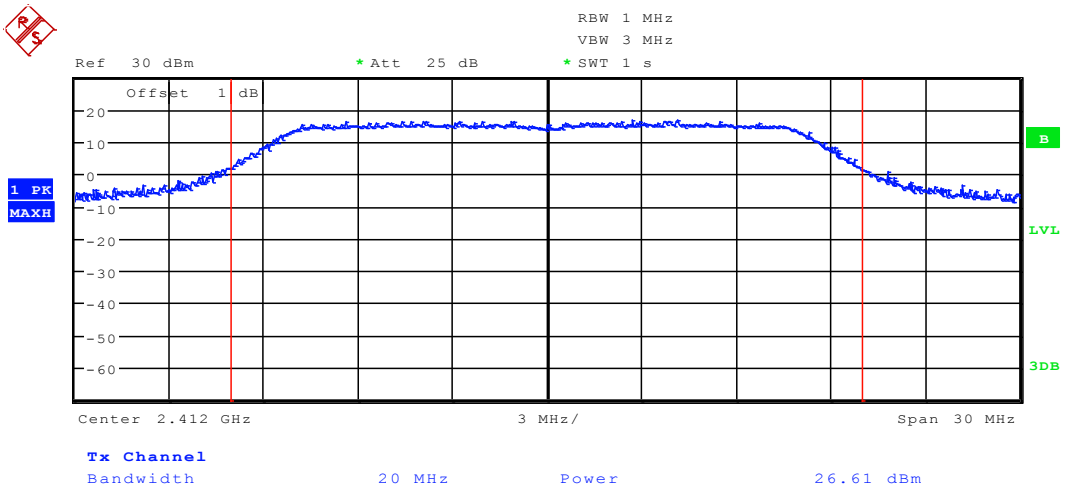
Date: 17.JUL.2012 16:31:46

Channel 11 (2462MHz)



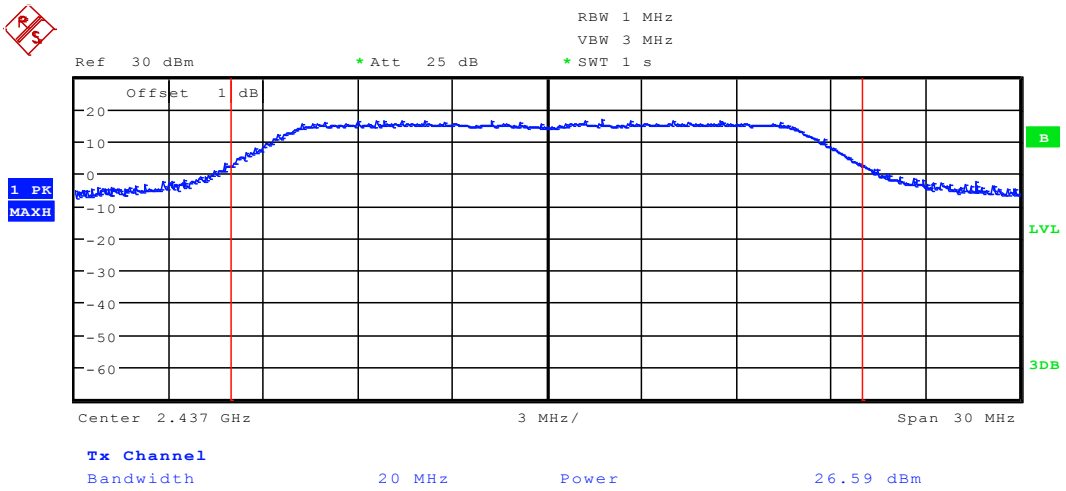
Date: 17.JUL.2012 16:37:58

TM2
Channel 1 (2412MHz)



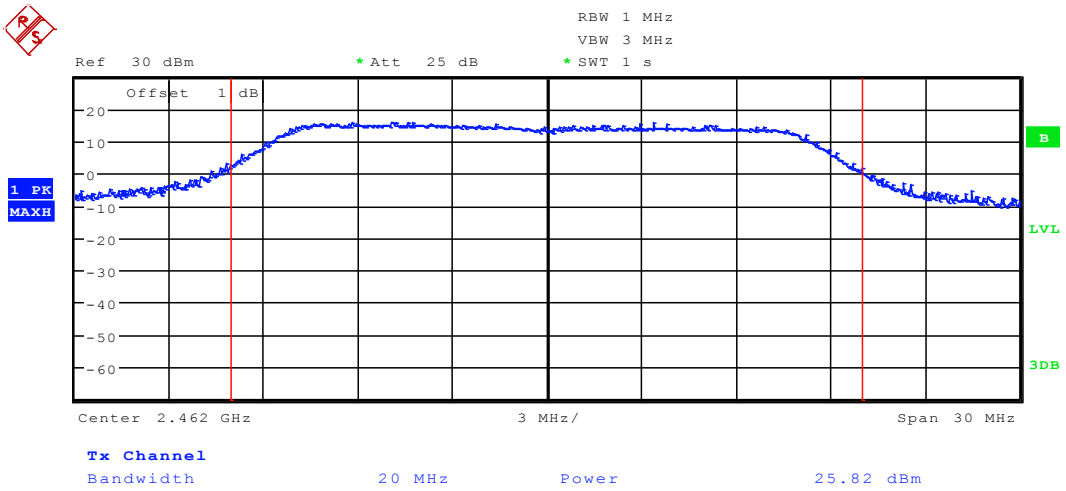
Date: 17.JUL.2012 16:41:56

Channel 6 (2437MHz)



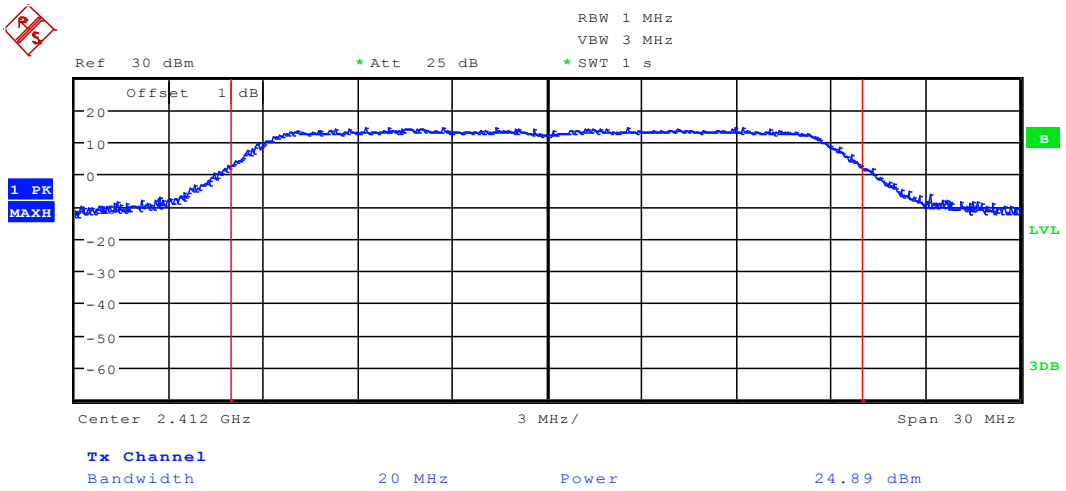
Date: 17.JUL.2012 16:43:59

Channel 11 (2462MHz)



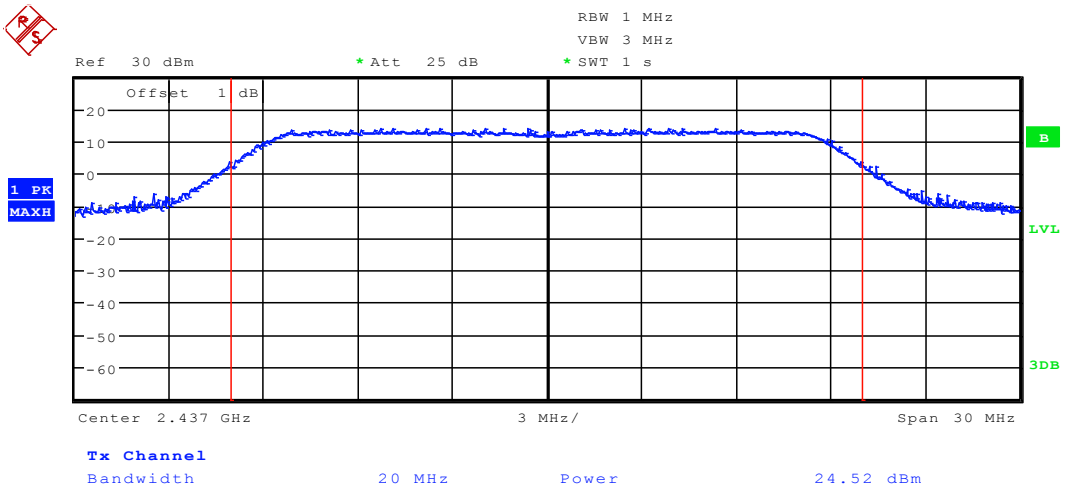
Date: 17.JUL.2012 16:44:56

TM3
Channel 1 (2412MHz)



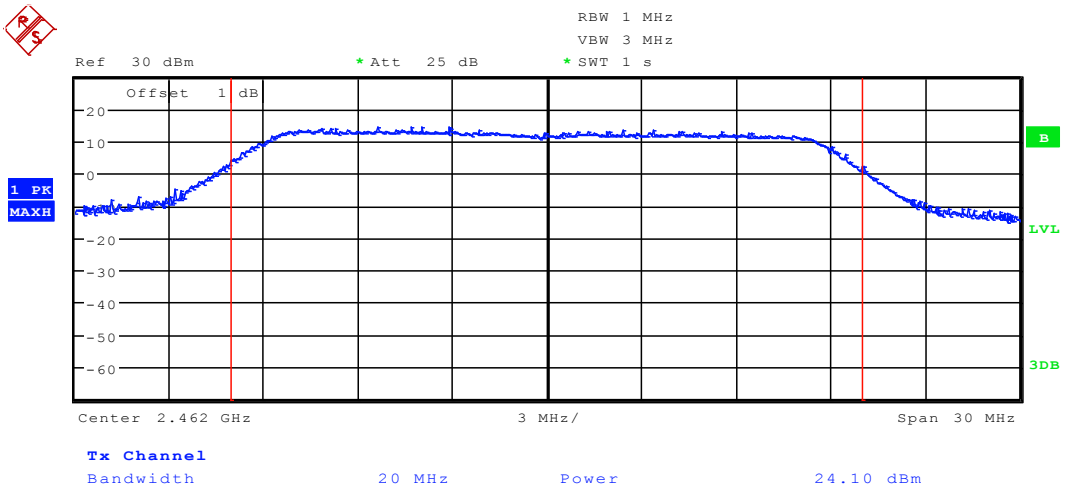
Date: 17.JUL.2012 16:51:13

Channel 6 (2437MHz)



Date: 17.JUL.2012 16:50:03

Channel 11 (2462MHz)



Date: 17.JUL.2012 16:48:35

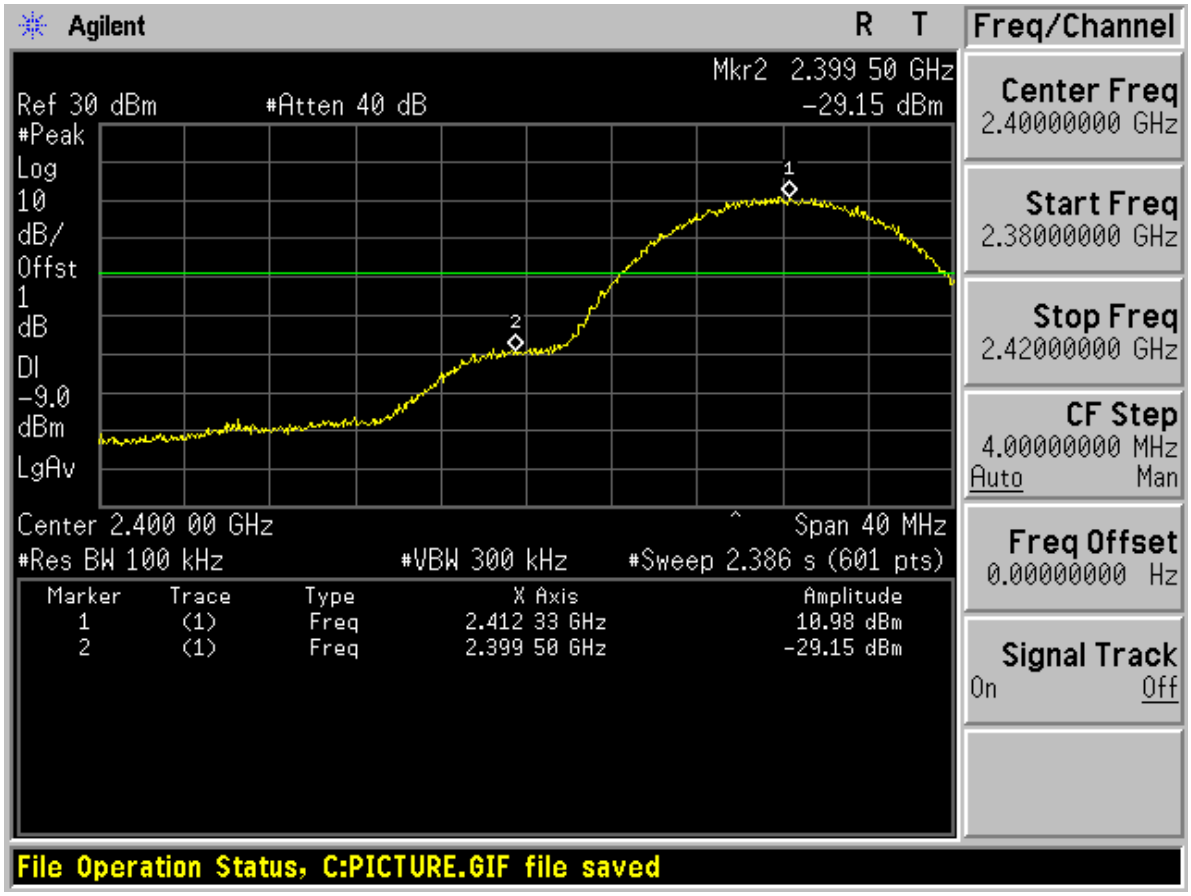
----------The END----------

Appendix C

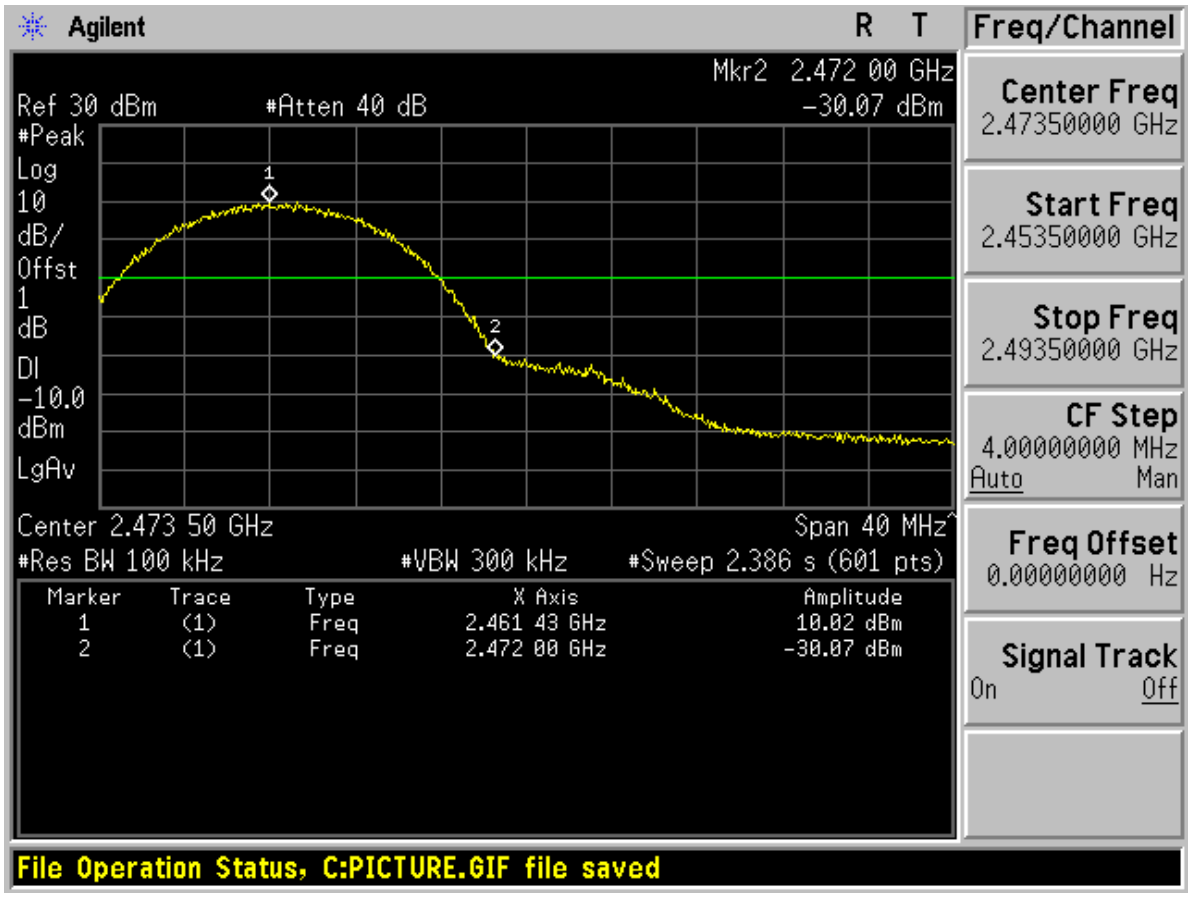
Band edge spurious emission

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

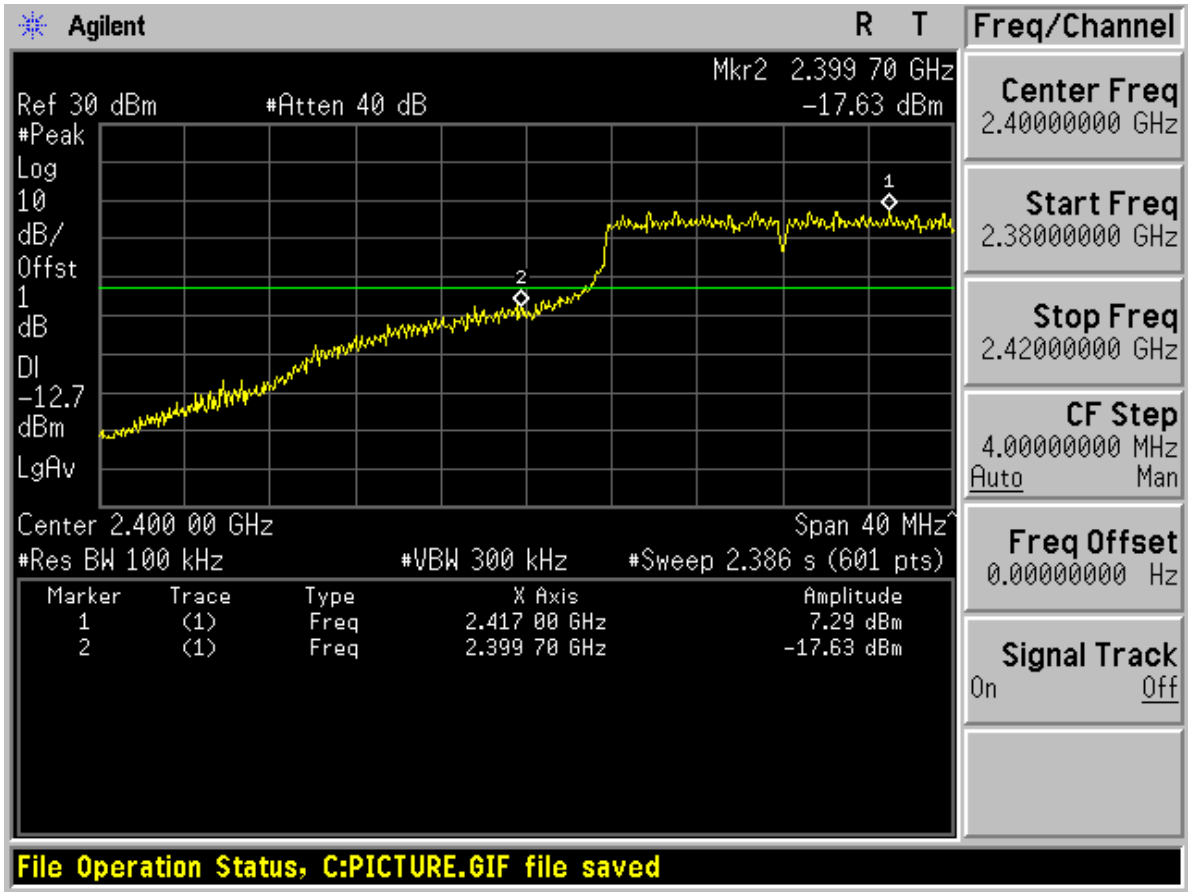
TM1
Low edge


Agilent
R T
Freq/Channel
Mkr2 2.399 50 GHz
Ref 30 dBm
#Atten 40 dB
-29.15 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-9.0
dBm
LgAv
Center Freq
2.40000000 GHz
Start Freq
2.38000000 GHz
Stop Freq
2.42000000 GHz
CF Step
4.00000000 MHz
Auto
Man
Center 2.400 00 GHz
Span 40 MHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 2.386 s (601 pts)
Freq Offset
0.00000000 Hz
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.412 33 GHz 10.98 dBm
2 (1) Freq 2.399 50 GHz -29.15 dBm
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

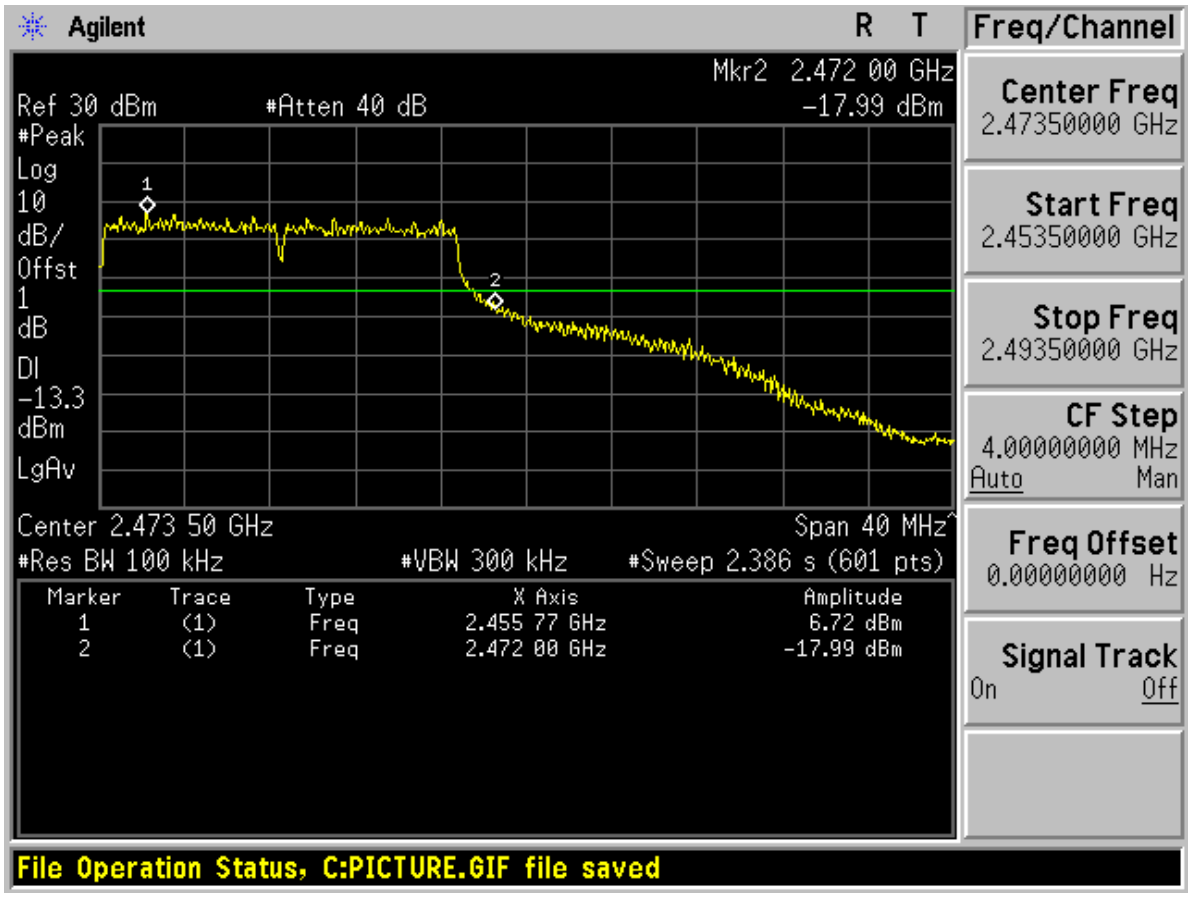
High edge


Agilent
R T
Freq/Channel
Mkr2 2.472 00 GHz
Ref 30 dBm
#Atten 40 dB
-30.07 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-10.0
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 2.461 43 GHz 10.02 dBm
2 (1) Freq 2.472 00 GHz -30.07 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

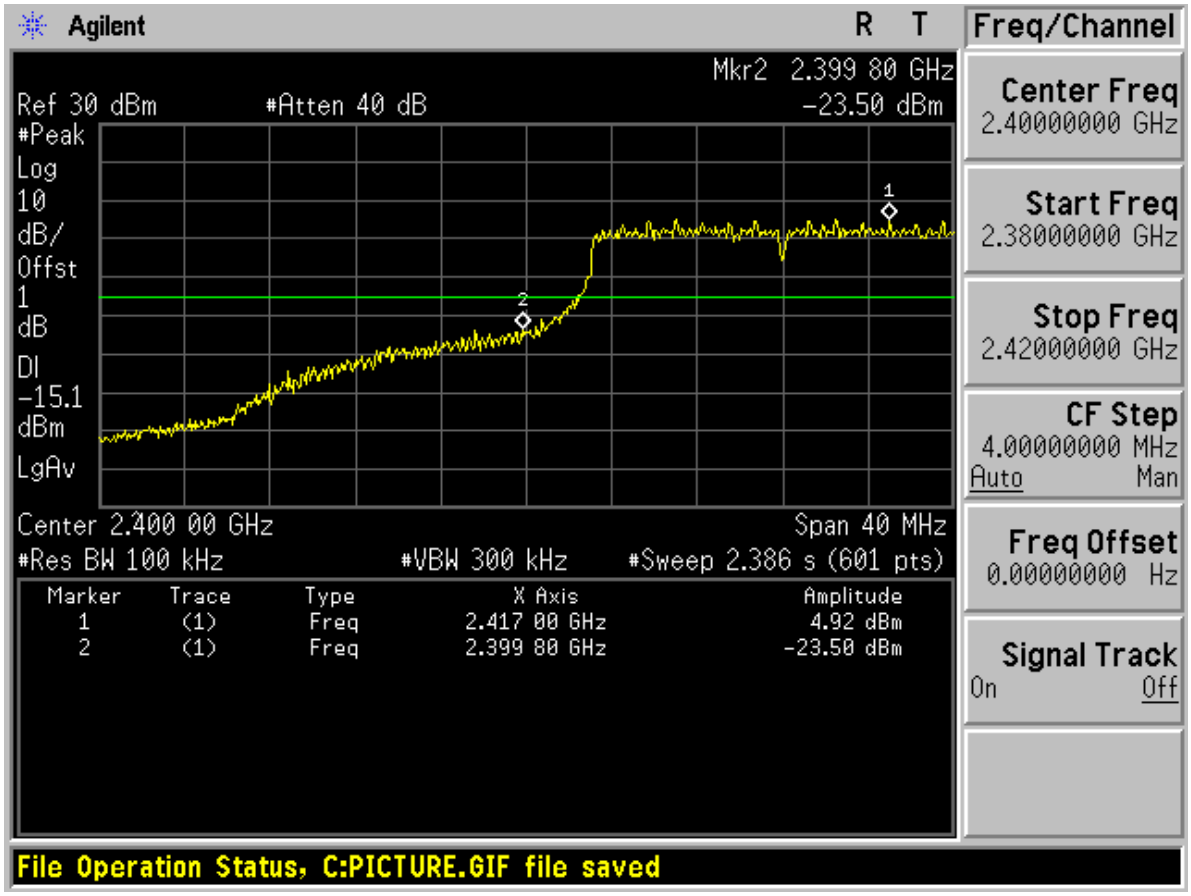
TM2
Low edge


Agilent
R T
Freq/Channel
Mkr2 2.399 70 GHz
Ref 30 dBm
#Atten 40 dB
-17.63 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-12.7
dBm
LgAv
1
2
Center Freq
2.40000000 GHz
Start Freq
2.38000000 GHz
Stop Freq
2.42000000 GHz
CF Step
4.00000000 MHz
Auto
Man
Center 2.400 00 GHz
Span 40 MHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 2.386 s (601 pts)
Freq Offset
0.00000000 Hz
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.417 00 GHz 7.29 dBm
2 (1) Freq 2.399 70 GHz -17.63 dBm
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

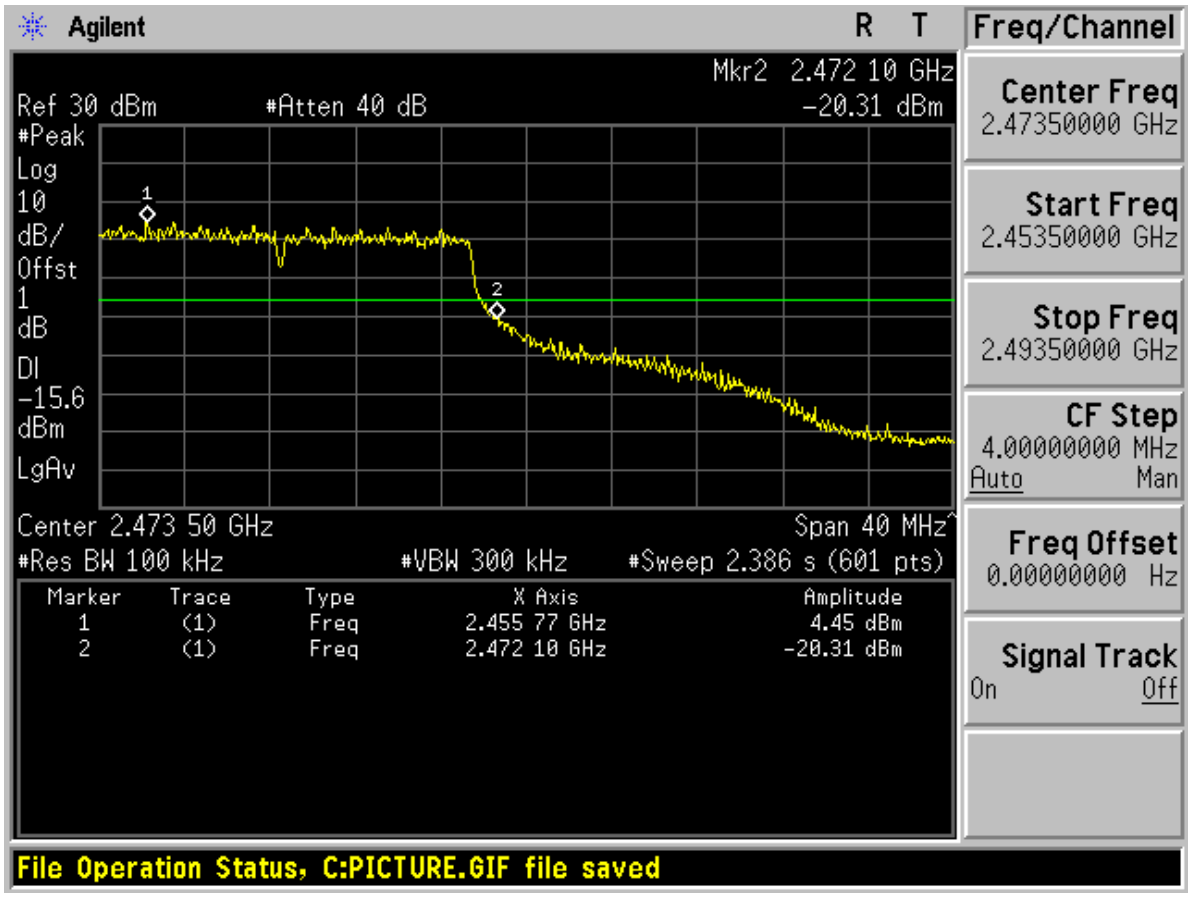
High edge


Agilent
R T
Freq/Channel
Mkr2 2.472 00 GHz
Ref 30 dBm
#Atten 40 dB
-17.99 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-13.3
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 2.455 77 GHz 6.72 dBm
2 (1) Freq 2.472 00 GHz -17.99 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
-23.50 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-15.1
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 4.92 dBm
2 (1) Freq 2.399 80 GHz -23.50 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



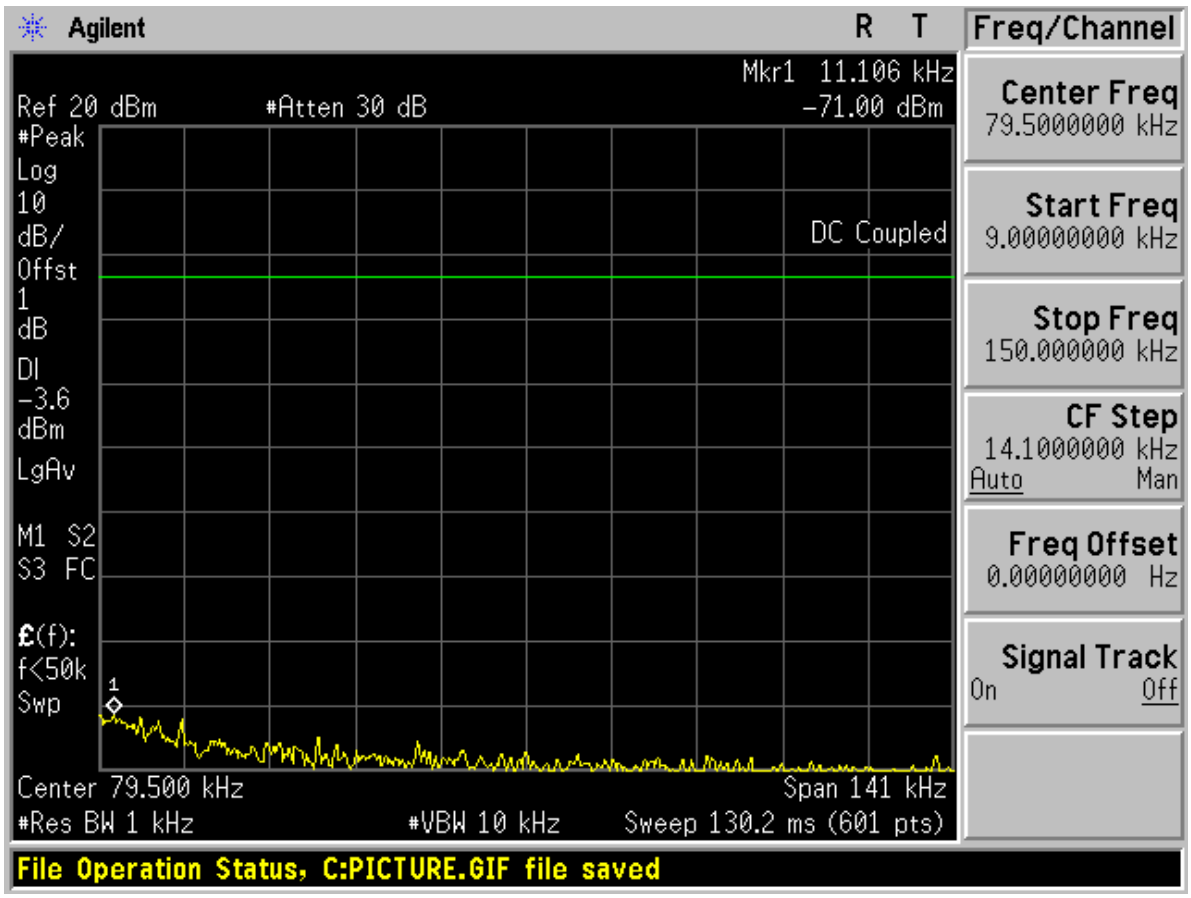
----------The END----------

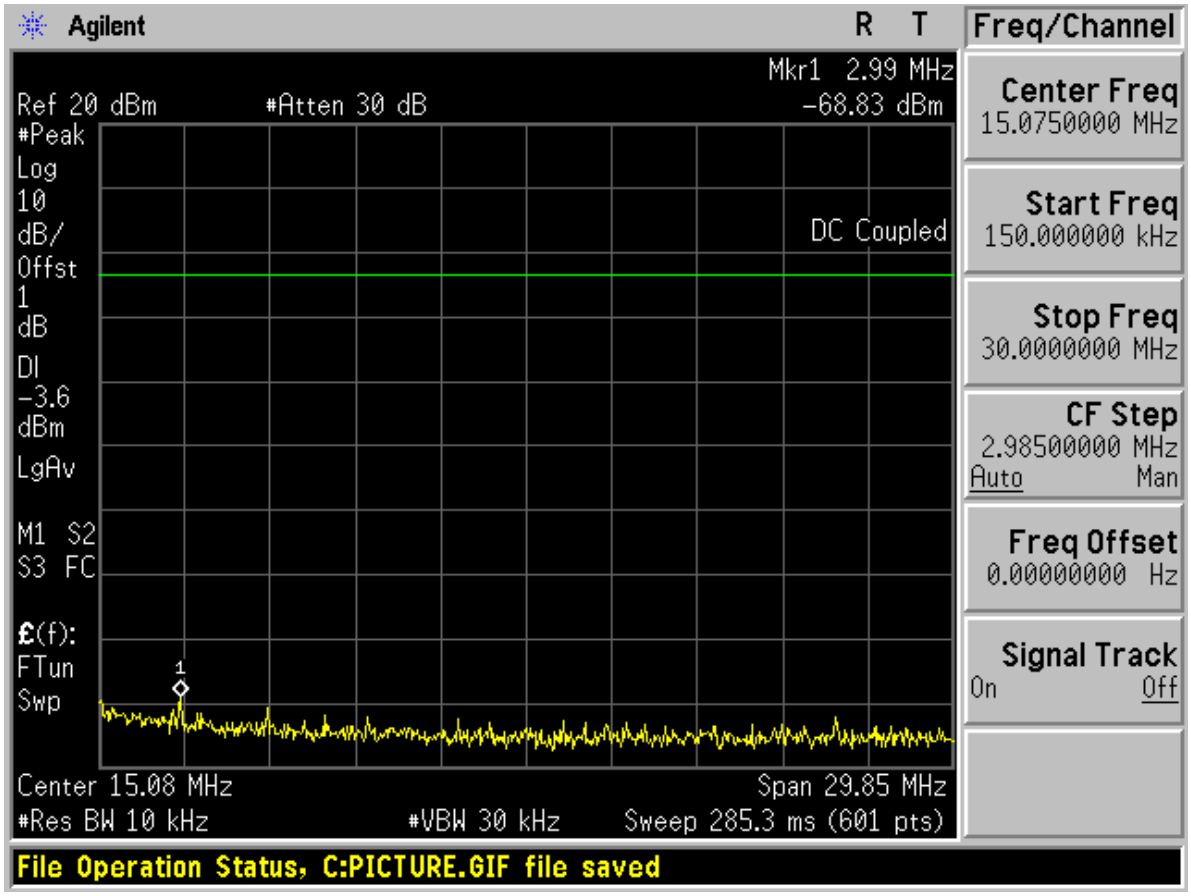
Appendix D

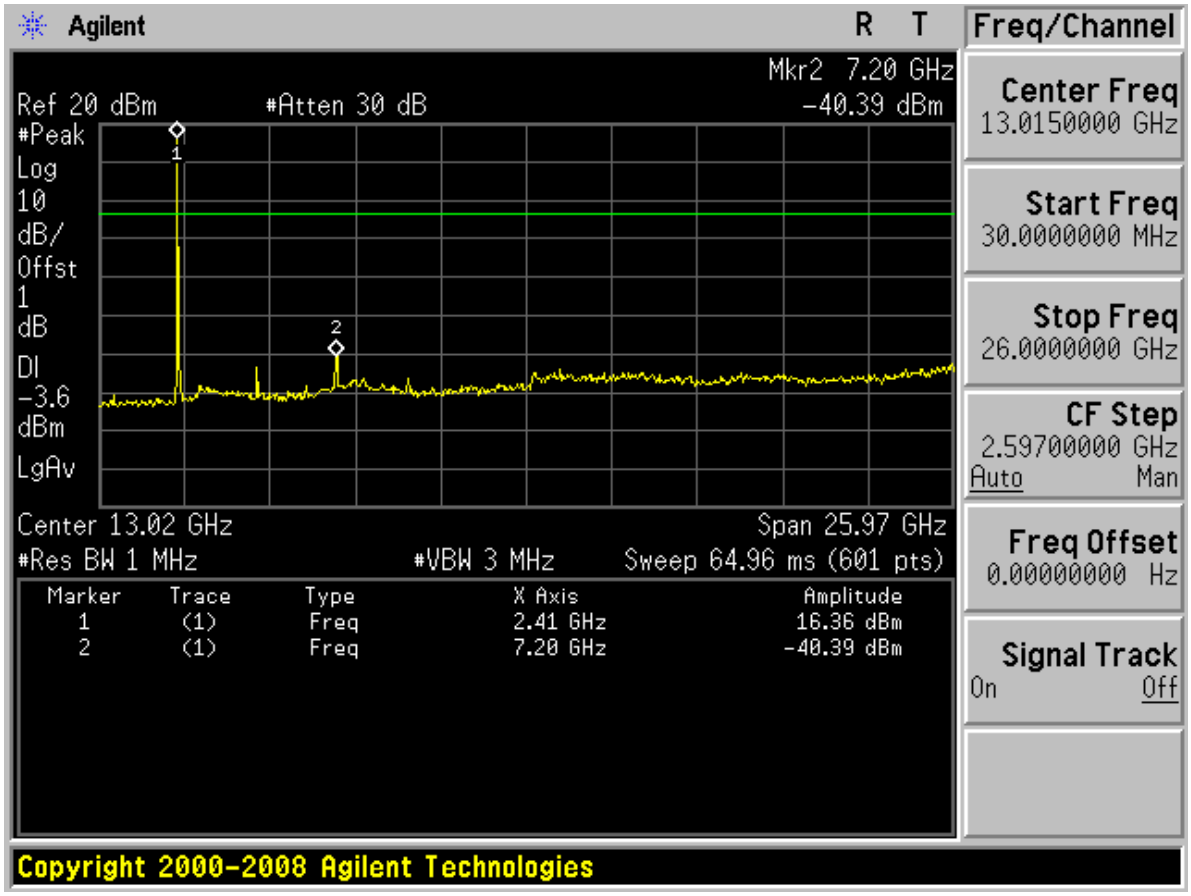
Conducted RF spurious

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

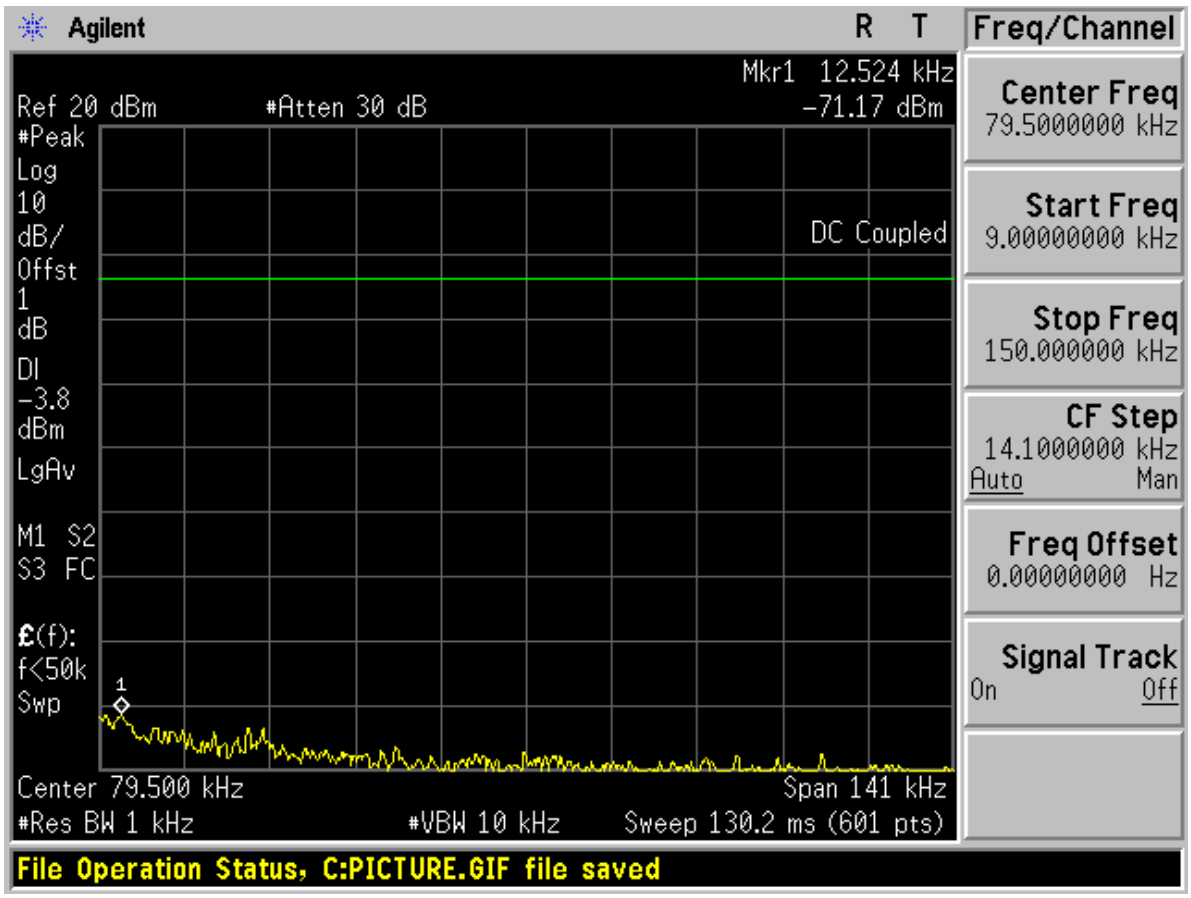
TM1
Channel 1

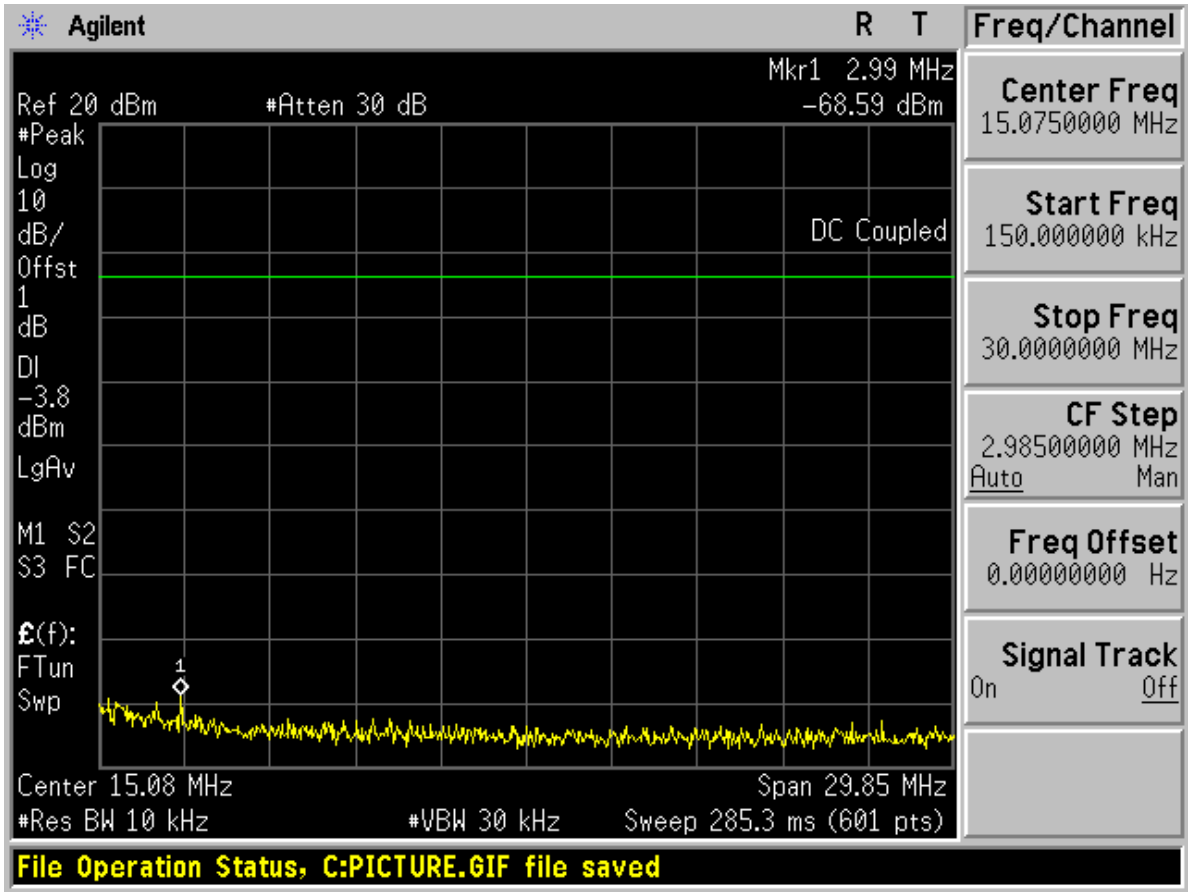


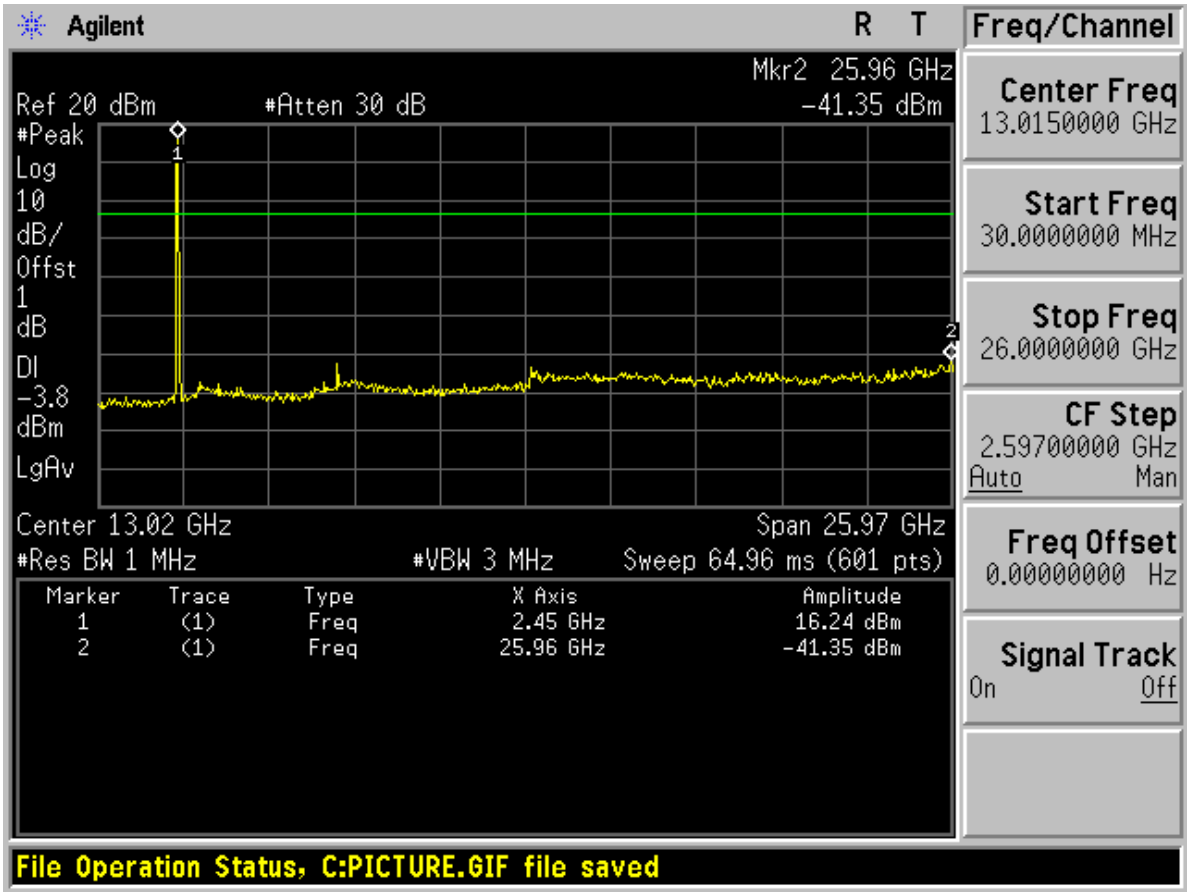

Agilent
R T
Freq/Channel
Mkr1 2.99 MHz
Ref 20 dBm
#Atten 30 dB
-68.83 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-3.6
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
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 7.20 GHz
Ref 20 dBm
#Atten 30 dB
-40.39 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-3.6
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 16.36 dBm
2 (1) Freq 7.20 GHz -40.39 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
Copyright 2000-2008 Agilent Technologies

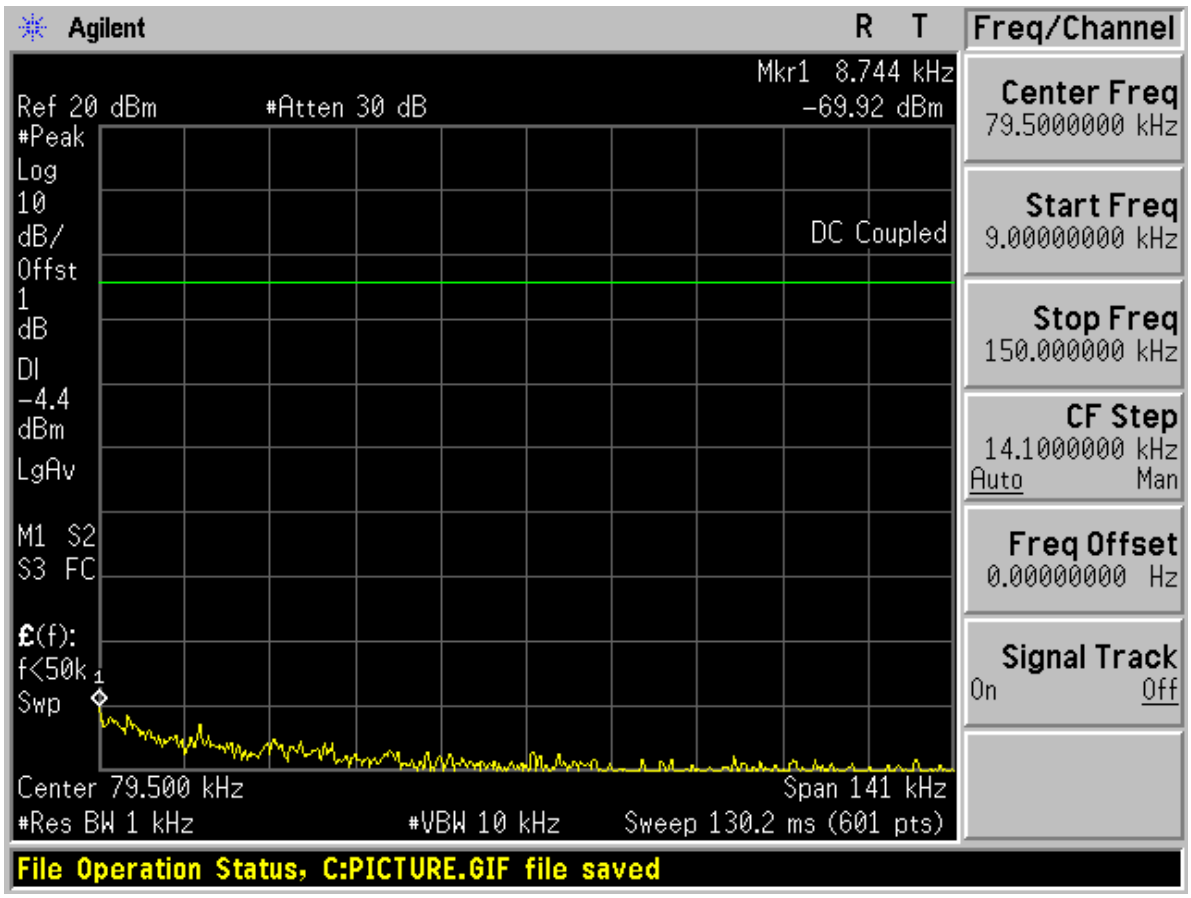
Channel 6

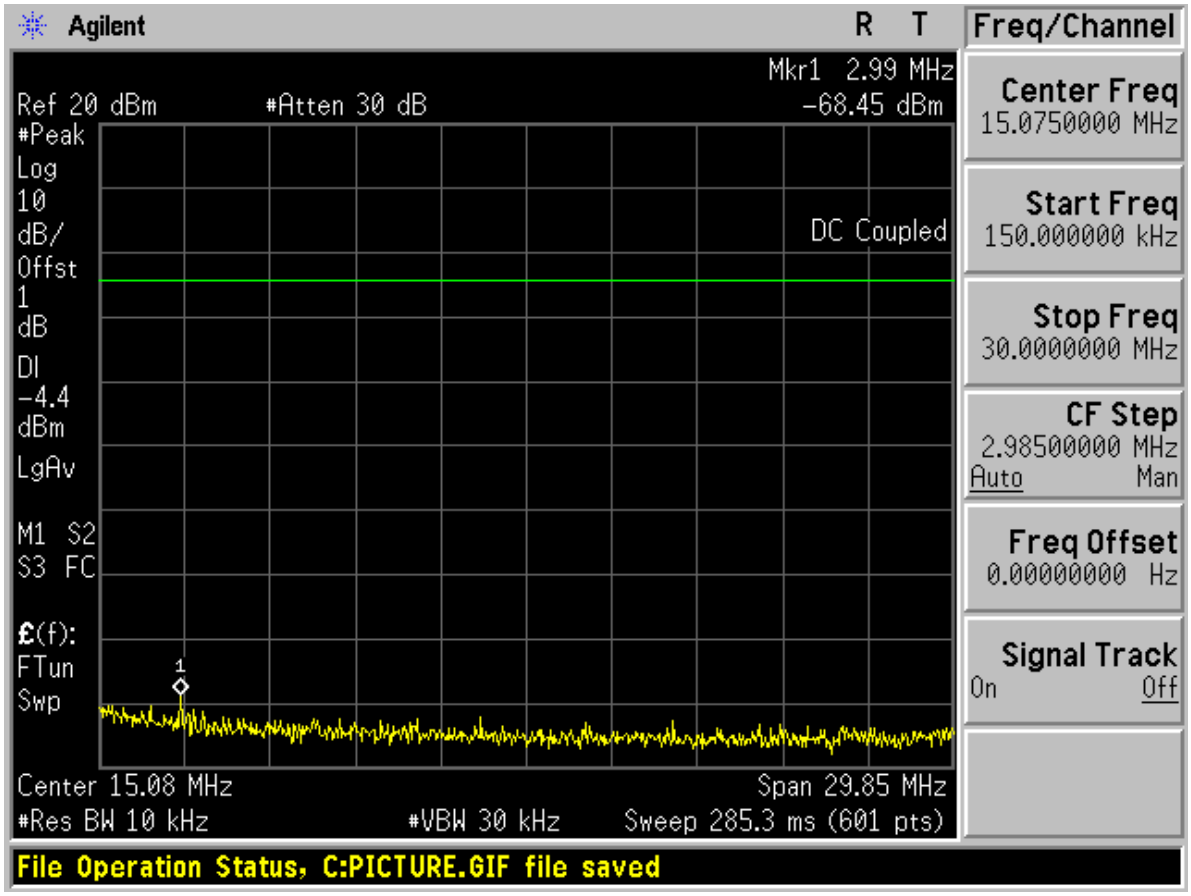

Agilent
R T
Freq/Channel
Mkr1 12.524 kHz
Ref 20 dBm
#Atten 30 dB
-71.17 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-3.8
dBm
LgAv
M1 S2
S3 FC
£(f):
f<50k
Swp
DC Coupled
Center Freq
79.5000000 kHz
Start Freq
9.00000000 kHz
Stop Freq
150.000000 kHz
CF Step
14.1000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal 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

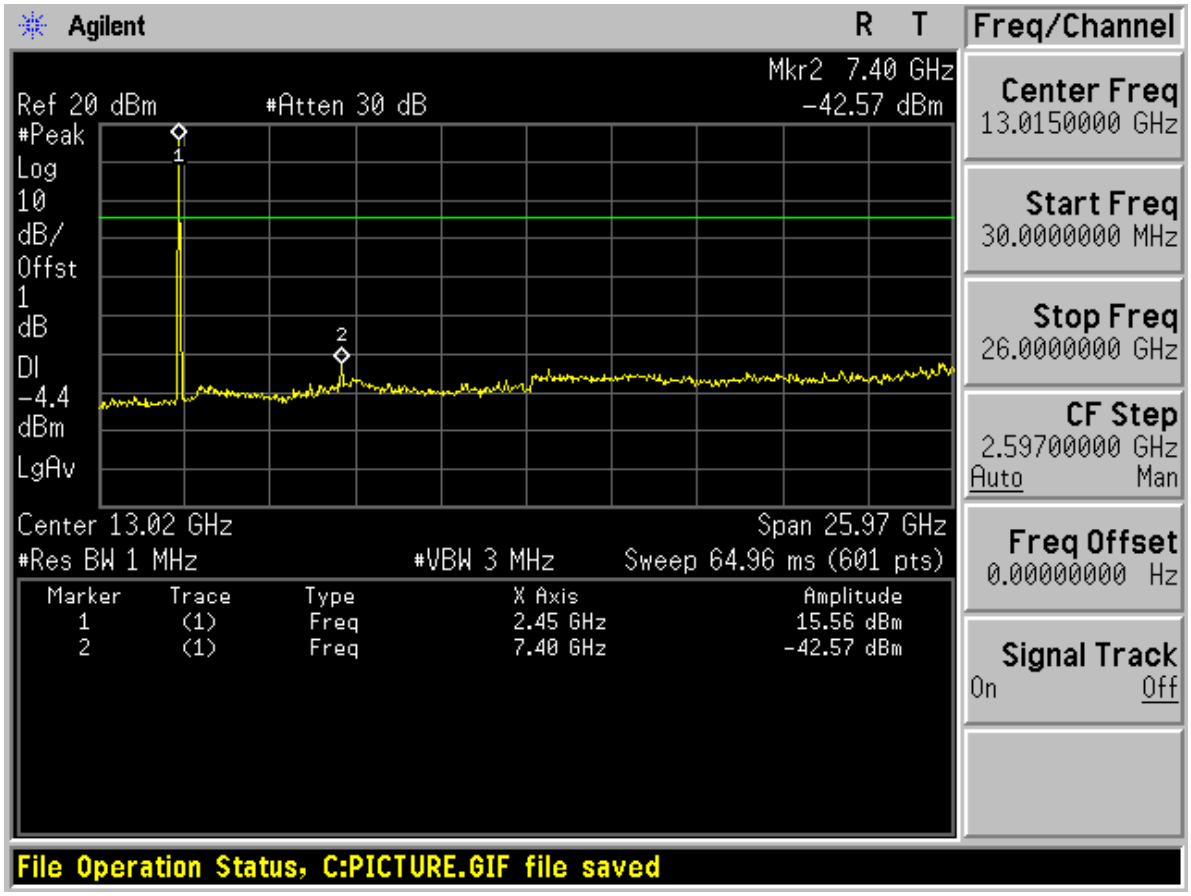

Agilent
R T
Freq/Channel
Mkr1 2.99 MHz
Ref 20 dBm
#Atten 30 dB
-68.59 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-3.8
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
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
-41.35 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-3.8
dBm
LgAv
Center Freq
13.0150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
26.0000000 GHz
CF Step
2.59700000 GHz
Auto
Man
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 16.24 dBm
2 (1) Freq 25.96 GHz -41.35 dBm
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

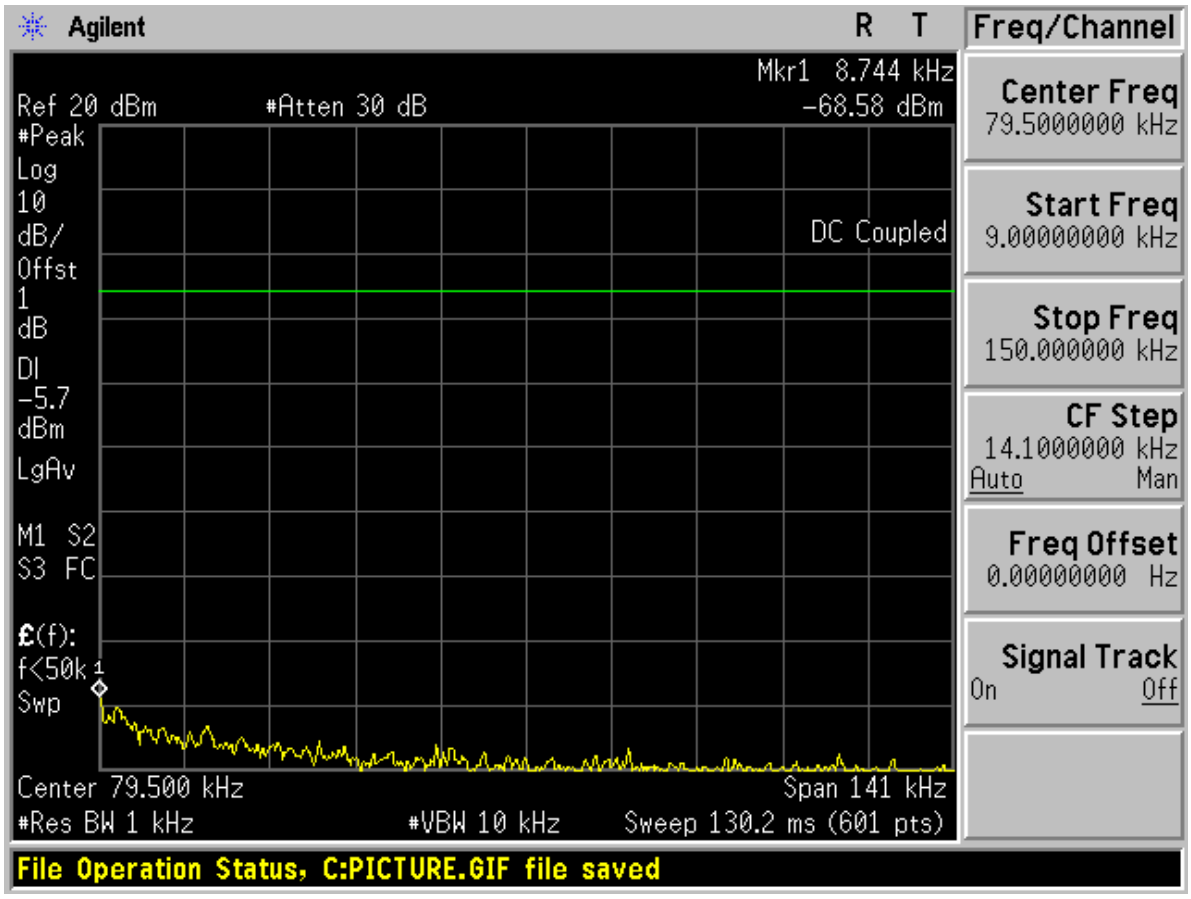
Channel 11

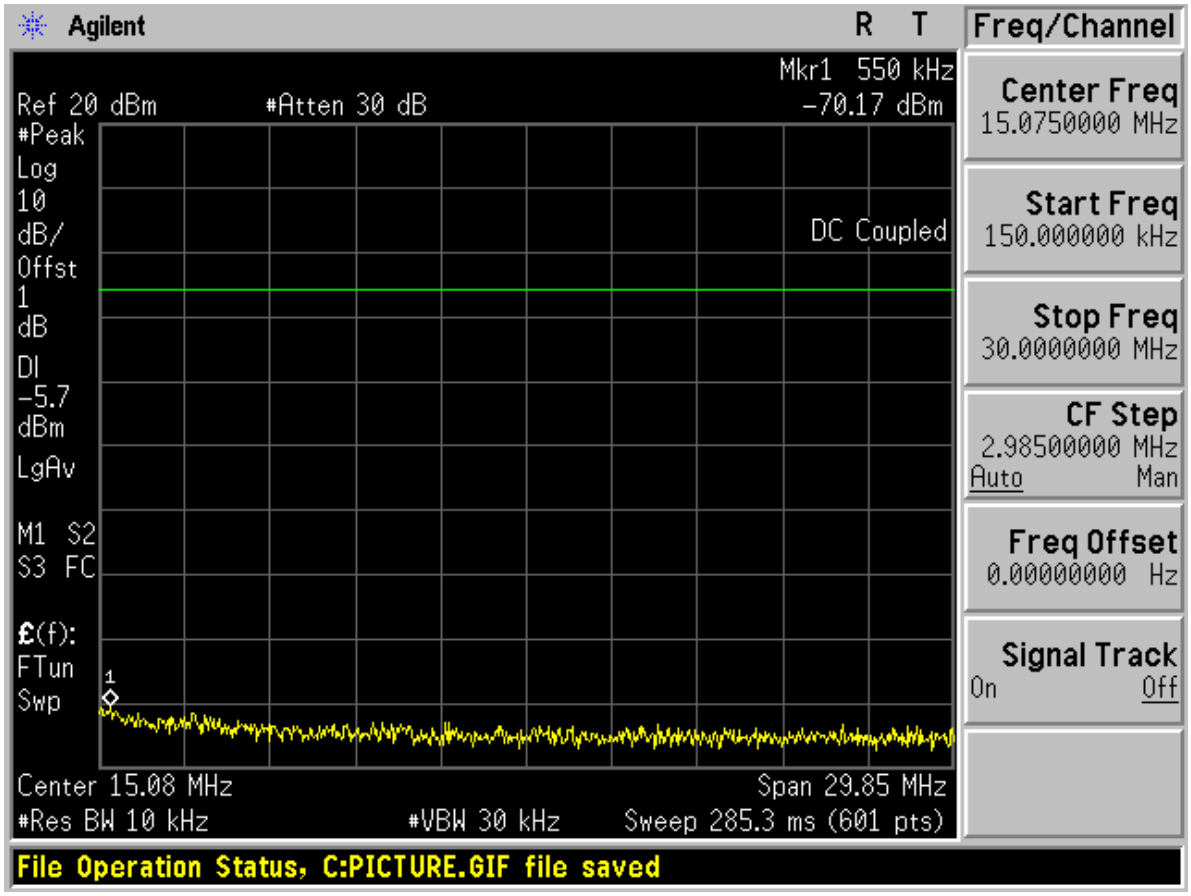

Agilent
R T
Freq/Channel
Mkr1 8.744 kHz
Ref 20 dBm
#Atten 30 dB
-69.92 dBm
#Peak
Log
10
dB/
Offst
1
dB
DI
-4.4
dBm
LgAv
M1 S2
S3 FC
£(f):
f<50k
Swp
DC Coupled
Center 79.500 kHz
Span 141 kHz
#Res BW 1 kHz
#VBW 10 kHz
Sweep 130.2 ms (601 pts)
Center Freq
79.5000000 kHz
Start Freq
9.00000000 kHz
Stop Freq
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

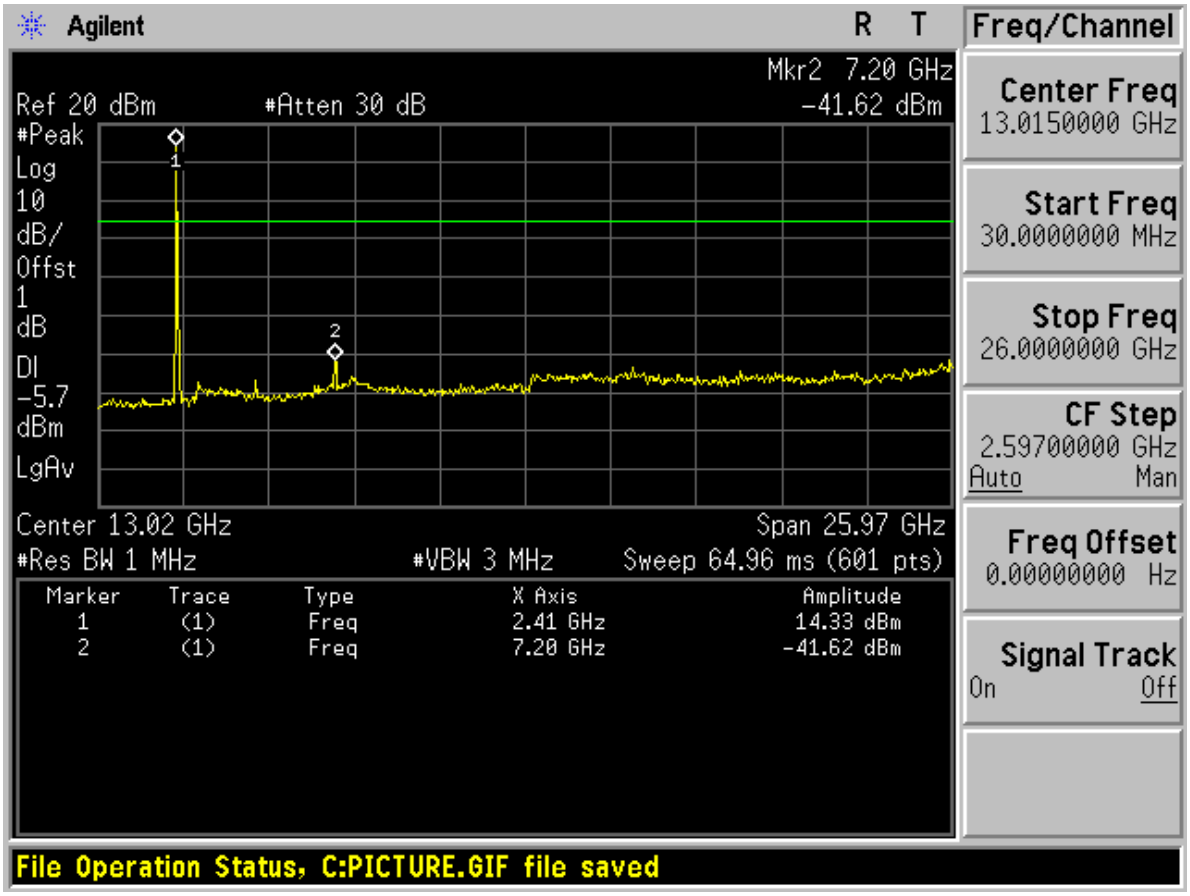

Agilent
R T
Freq/Channel
Mkr1 2.99 MHz
Ref 20 dBm
#Atten 30 dB
-68.45 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-4.4
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
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 7.40 GHz
Ref 20 dBm
#Atten 30 dB
-42.57 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-4.4
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 2.45 GHz 15.56 dBm
2 (1) Freq 7.40 GHz -42.57 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

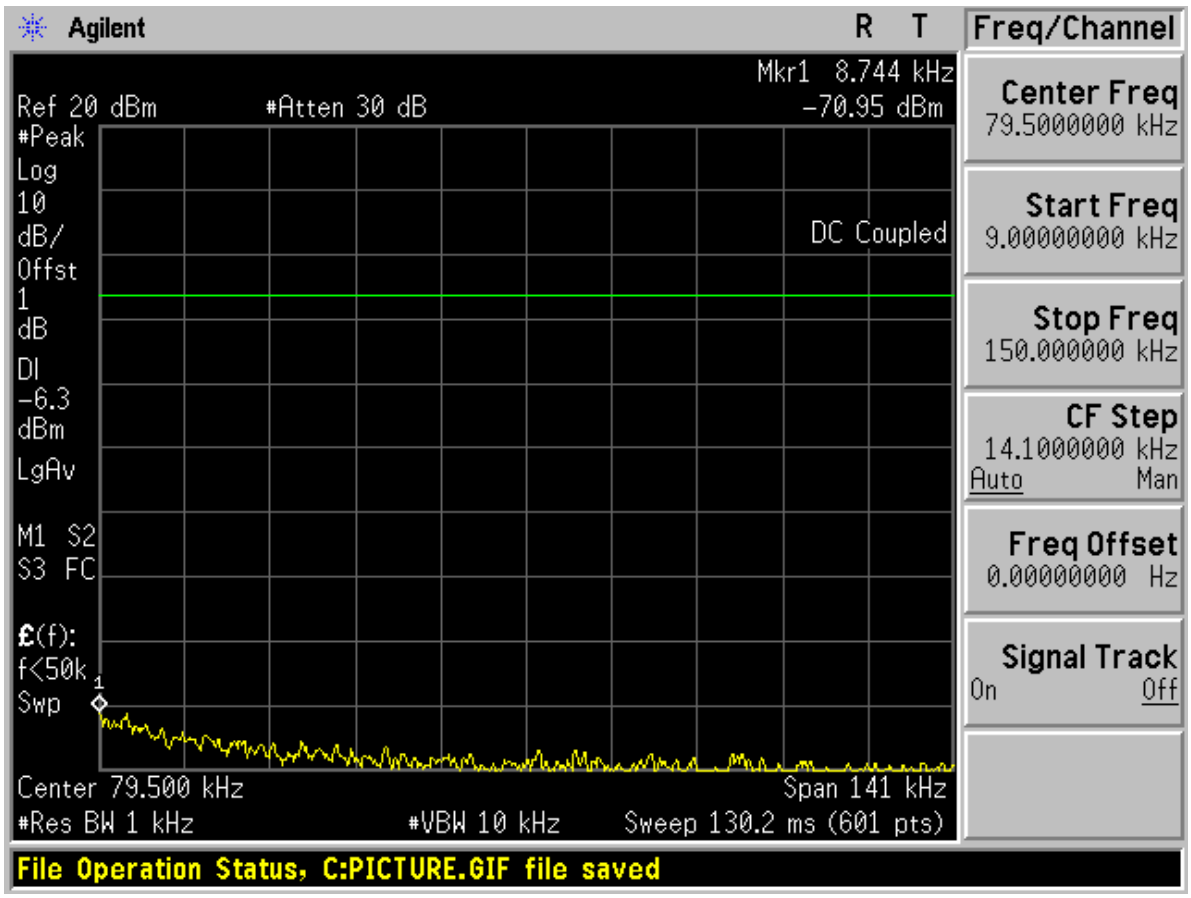
TM2
Channel 1

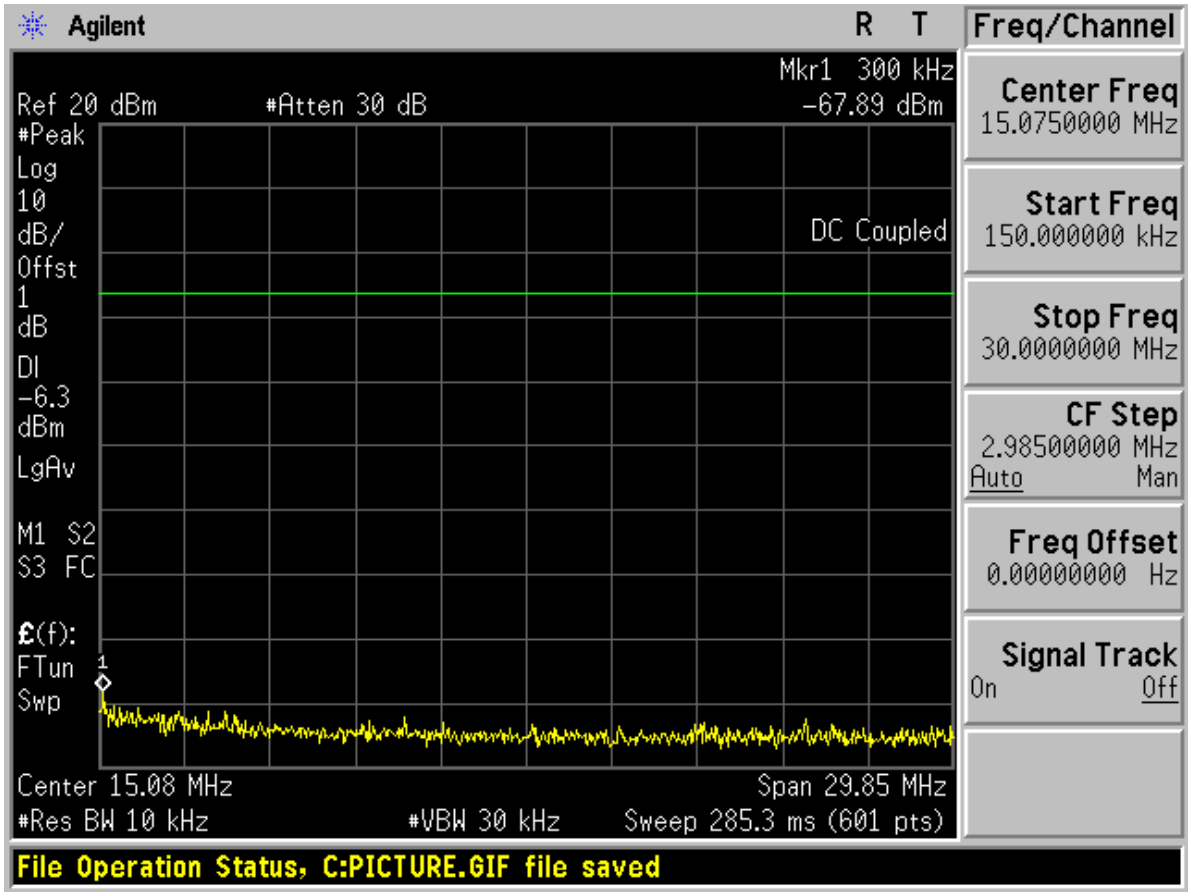


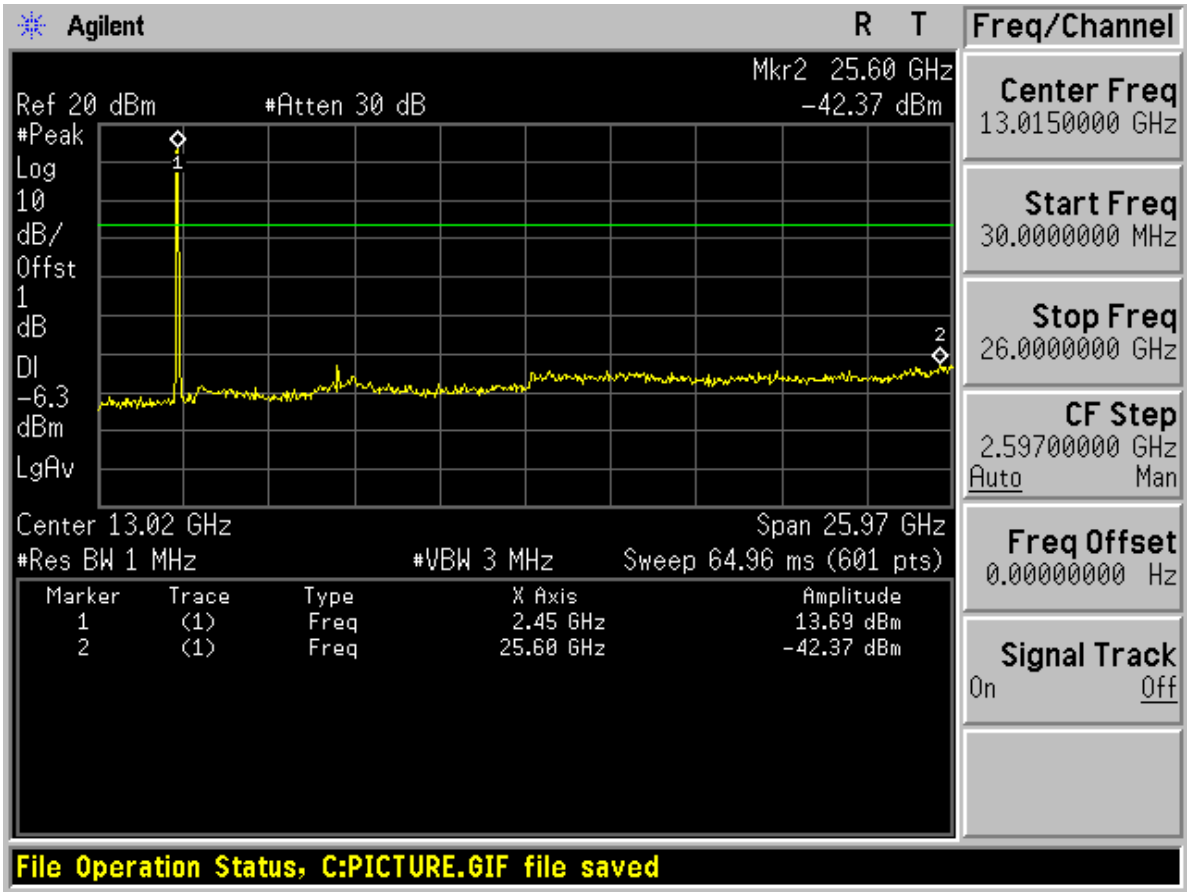

Agilent
R T
Freq/Channel
Mkr1 550 kHz
Ref 20 dBm
#Atten 30 dB
-70.17 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-5.7
dBm
LgAv
DC Coupled
M1 S2
S3 FC
£(f):
FTun
Swp
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
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 7.20 GHz
Ref 20 dBm
#Atten 30 dB
-41.62 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-5.7
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 14.33 dBm
2 (1) Freq 7.20 GHz -41.62 dBm
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

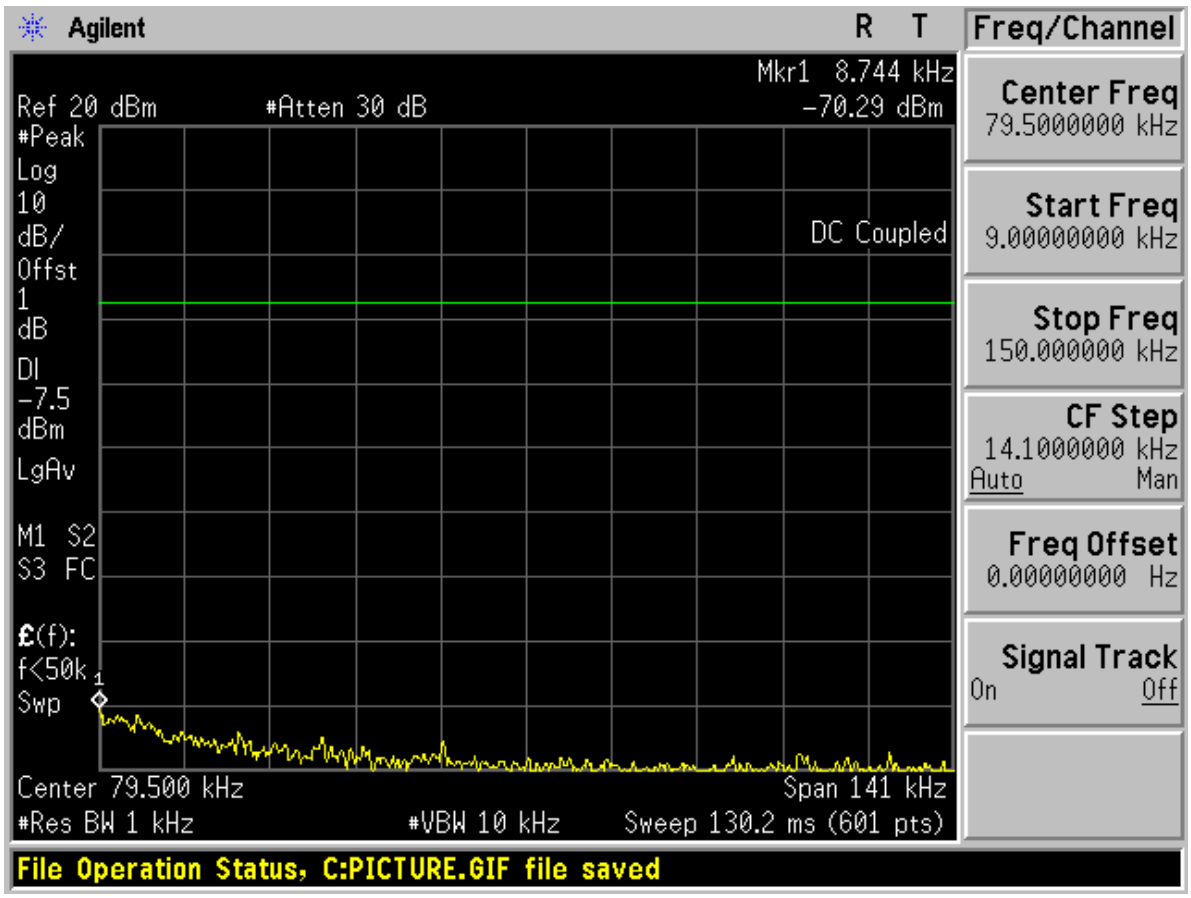
Channel 6

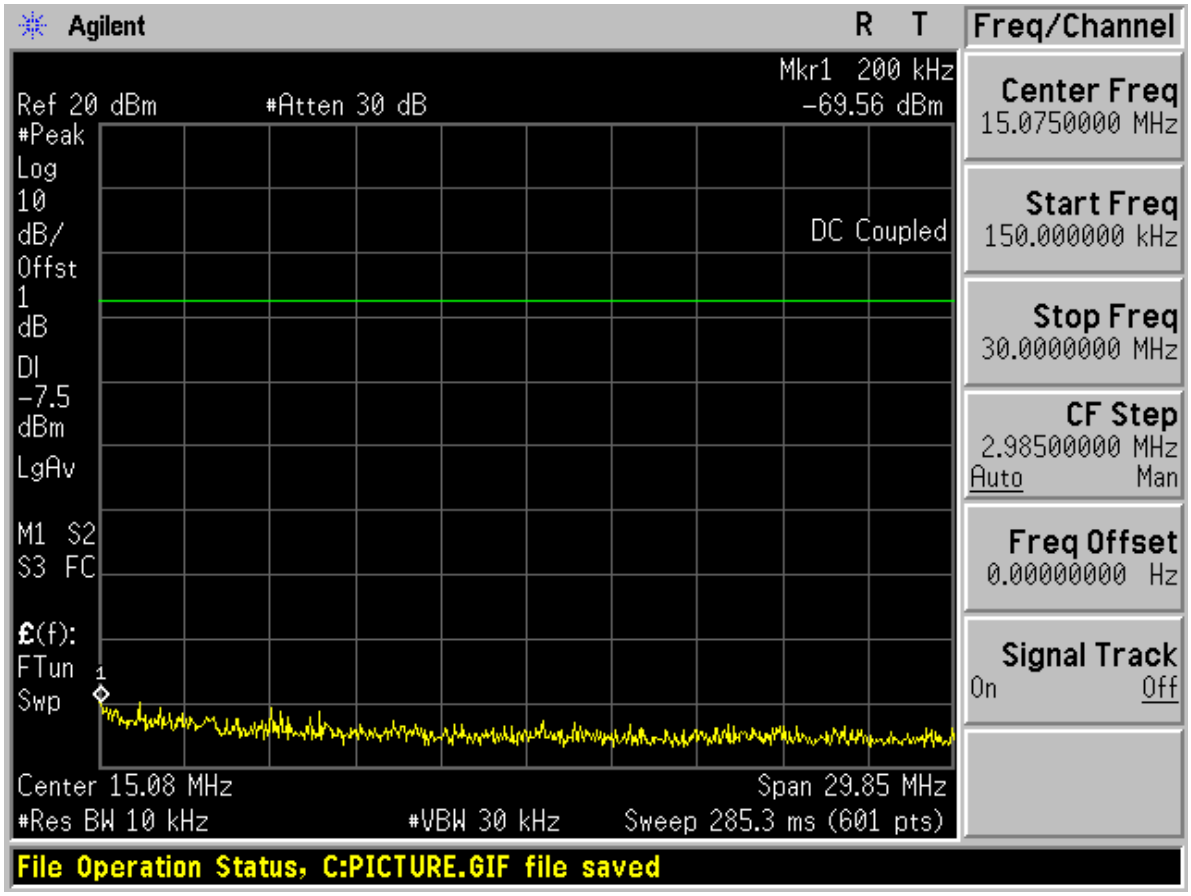

Agilent
R T
Freq/Channel
Mkr1 8.744 kHz
Ref 20 dBm
#Atten 30 dB
-70.95 dBm
#Peak
Log
10
dB/
Offst
1
dB
DC Coupled
Center Freq
79.5000000 kHz
Start Freq
9.00000000 kHz
Stop Freq
150.000000 kHz
CF Step
14.1000000 kHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Dl
-6.3
dBm
LgAv
M1 S2
S3 FC
£(f):
f<50k
Swp
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

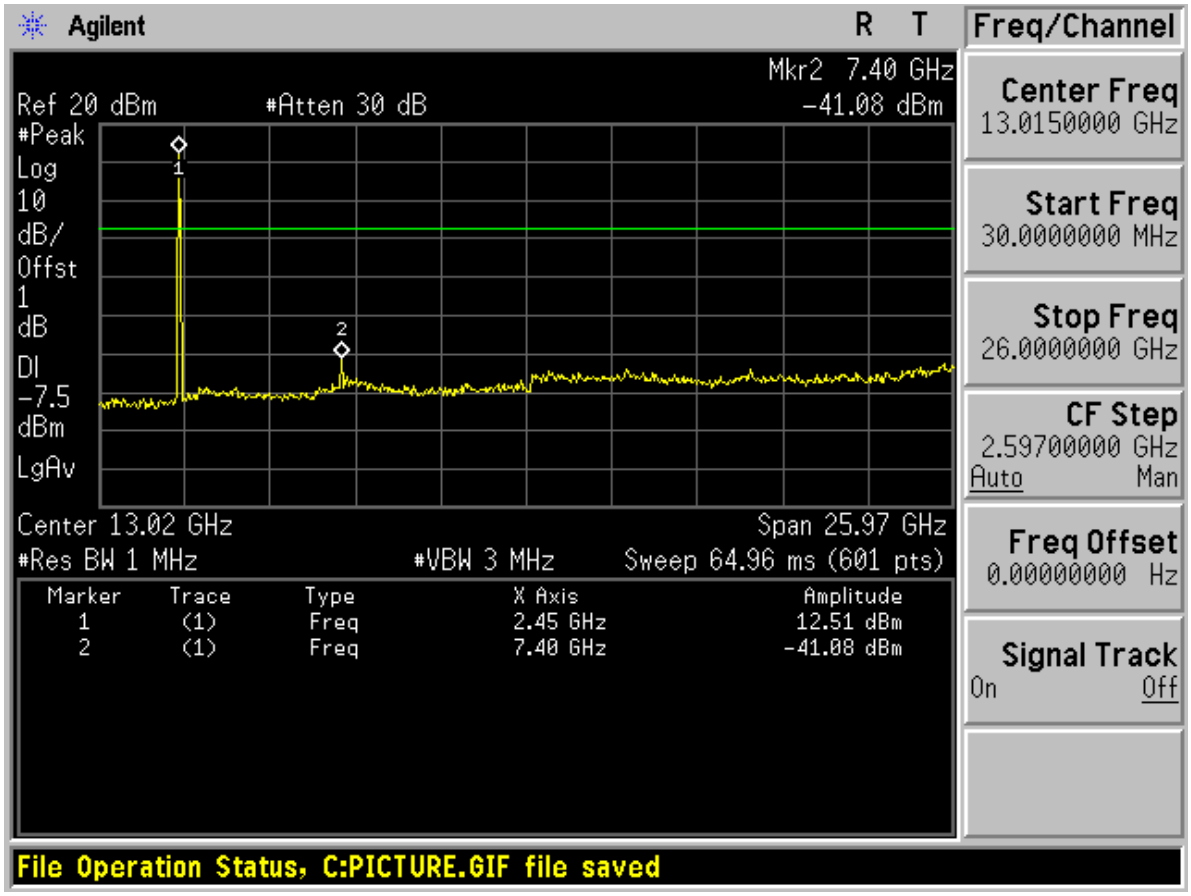

Agilent
R T
Freq/Channel
Mkr1 300 kHz
Ref 20 dBm
#Atten 30 dB
-67.89 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-6.3
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
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 25.60 GHz
Ref 20 dBm
#Atten 30 dB
-42.37 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-6.3
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 13.69 dBm
2 (1) Freq 25.60 GHz -42.37 dBm
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

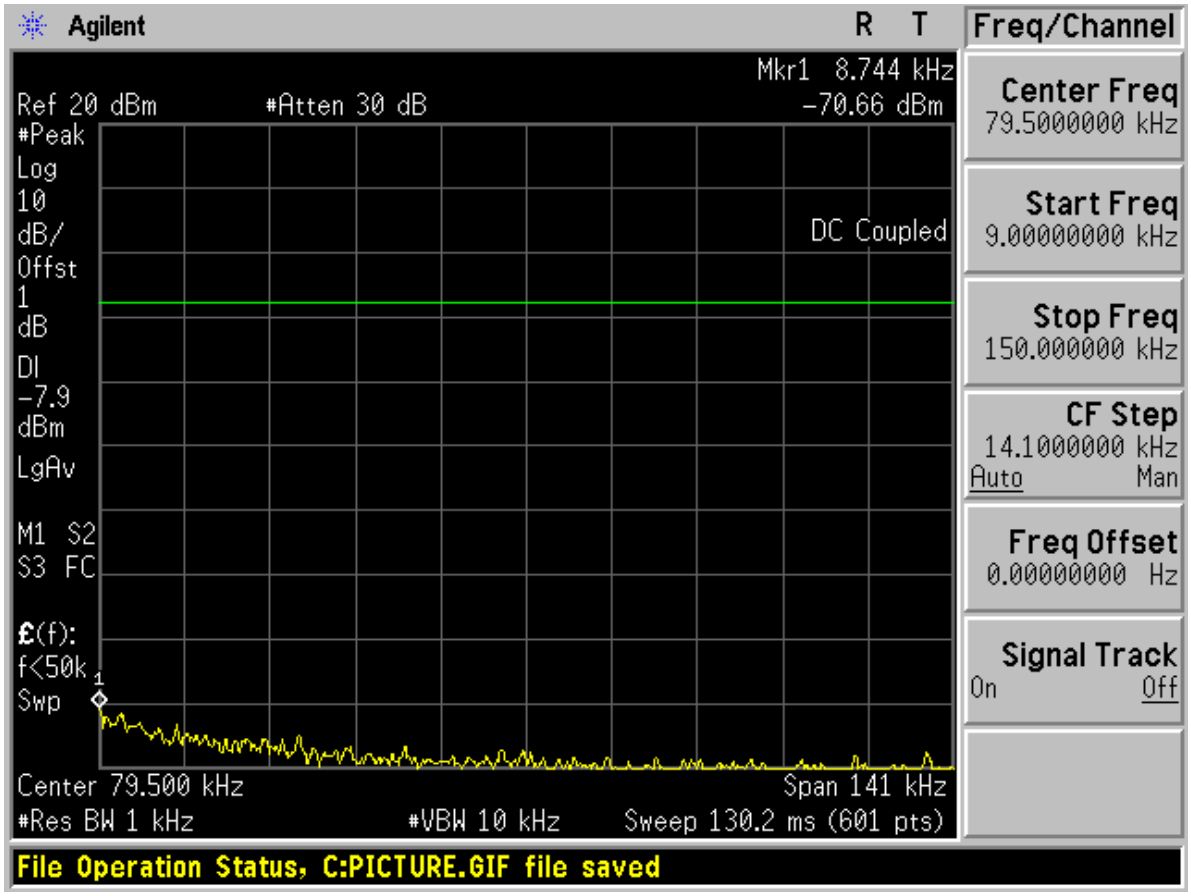
Channel 11

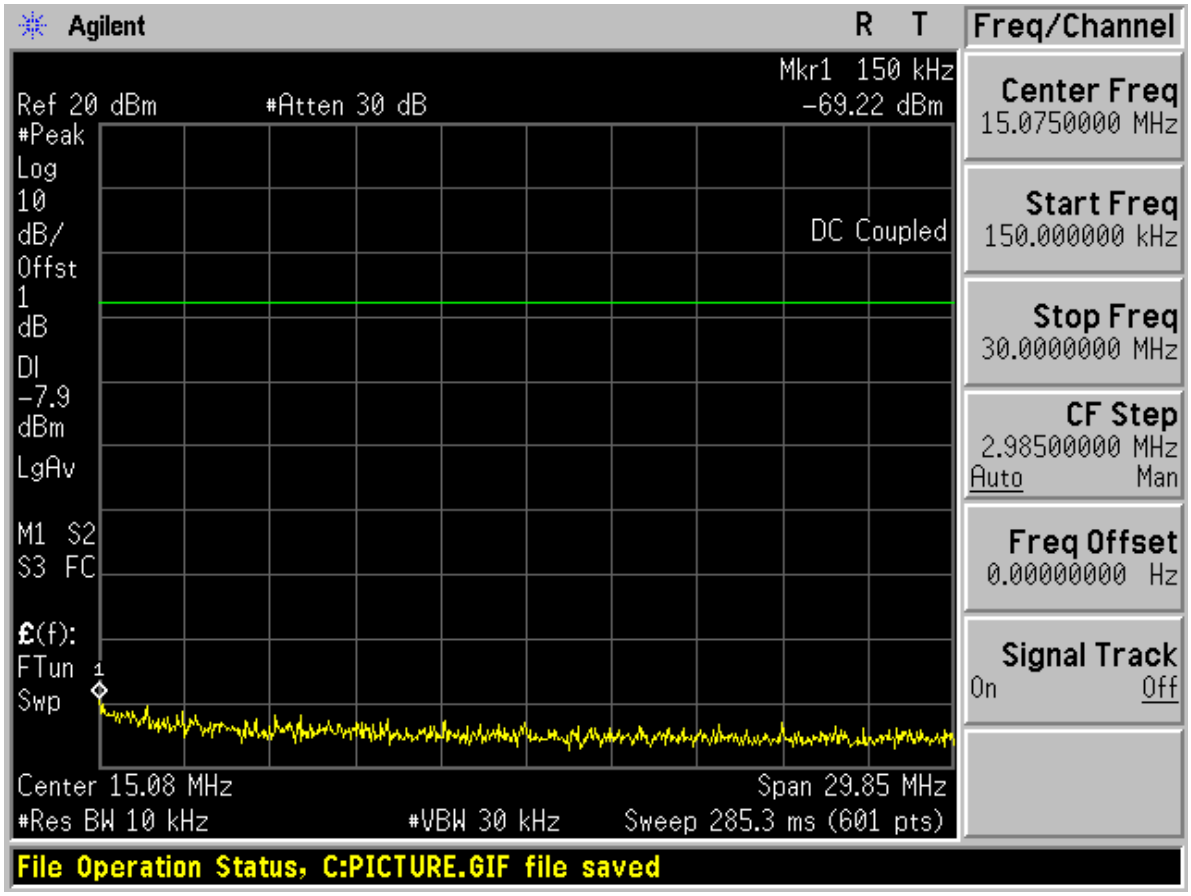

Agilent
R T
Freq/Channel
Mkr1 8.744 kHz
Ref 20 dBm
#Atten 30 dB
-70.29 dBm
#Peak
Log
10
dB/
Offst
1
dB
DC Coupled
Center Freq
79.5000000 kHz
Start Freq
9.00000000 kHz
Stop Freq
150.000000 kHz
CF Step
14.1000000 kHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Dl
-7.5
dBm
LgAv
M1 S2
S3 FC
£(f):
f<50k
Swp
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

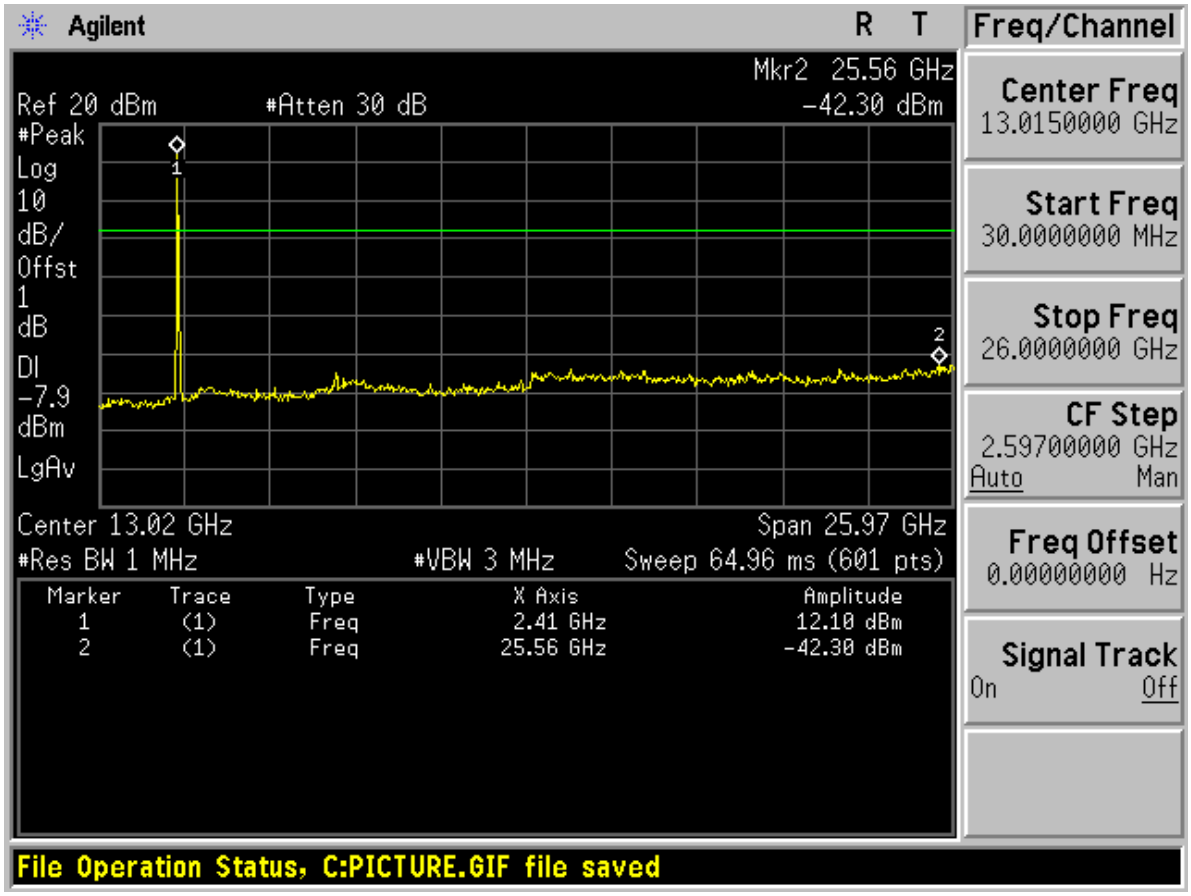

Agilent
R T
Freq/Channel
Mkr1 200 kHz
Ref 20 dBm
#Atten 30 dB
-69.56 dBm
#Peak
Log
10
dB/
Offst
1
dB
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Center 15.08 MHz
Span 29.85 MHz
#Res 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 7.40 GHz
Ref 20 dBm
#Atten 30 dB
-41.08 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-7.5
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 12.51 dBm
2 (1) Freq 7.40 GHz -41.08 dBm
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

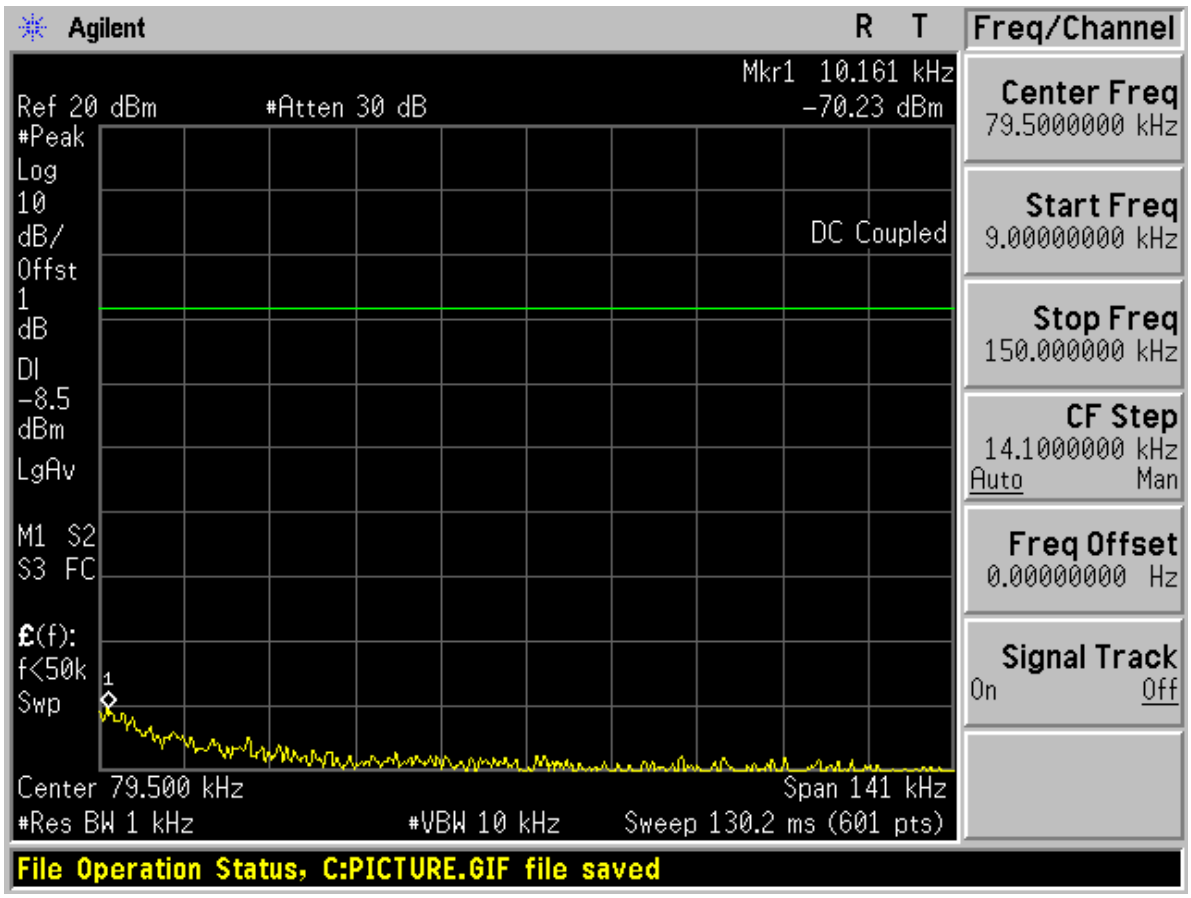
TM3
Channel 1

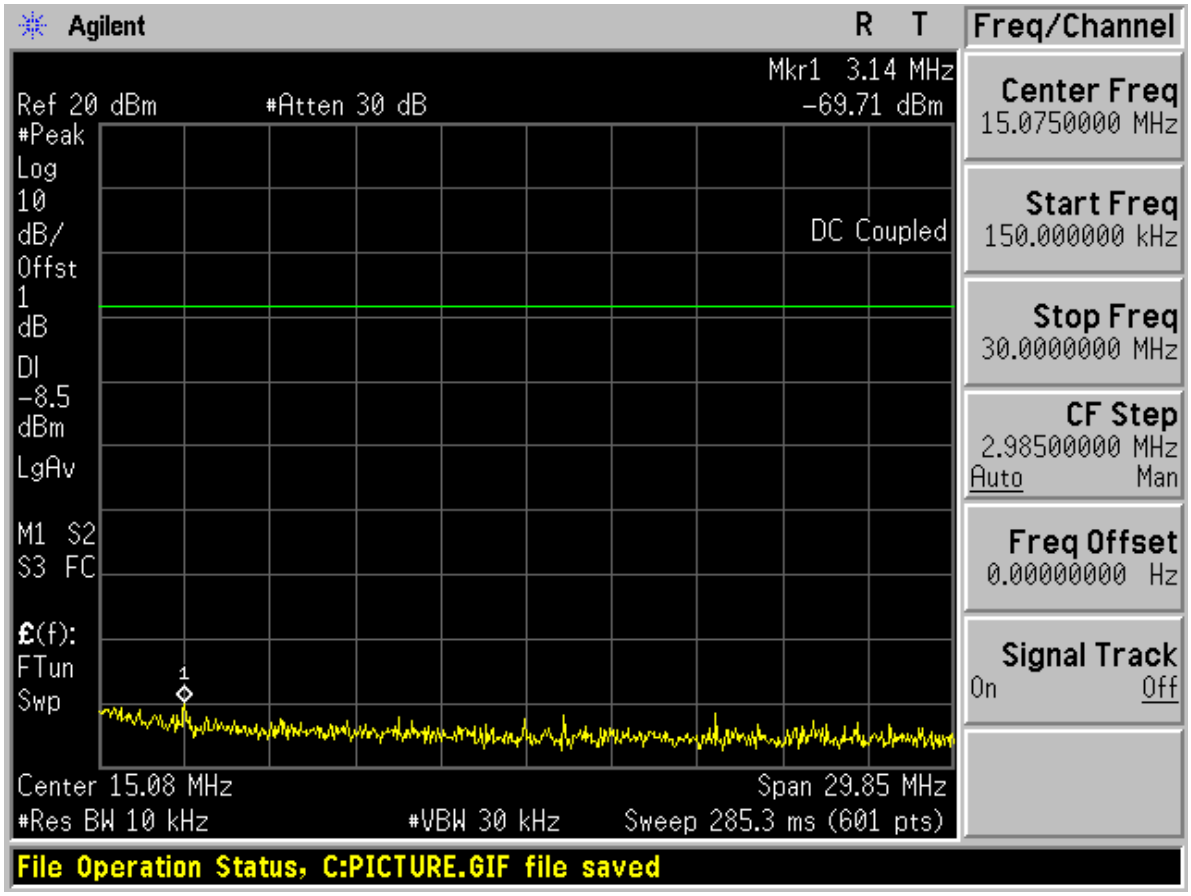


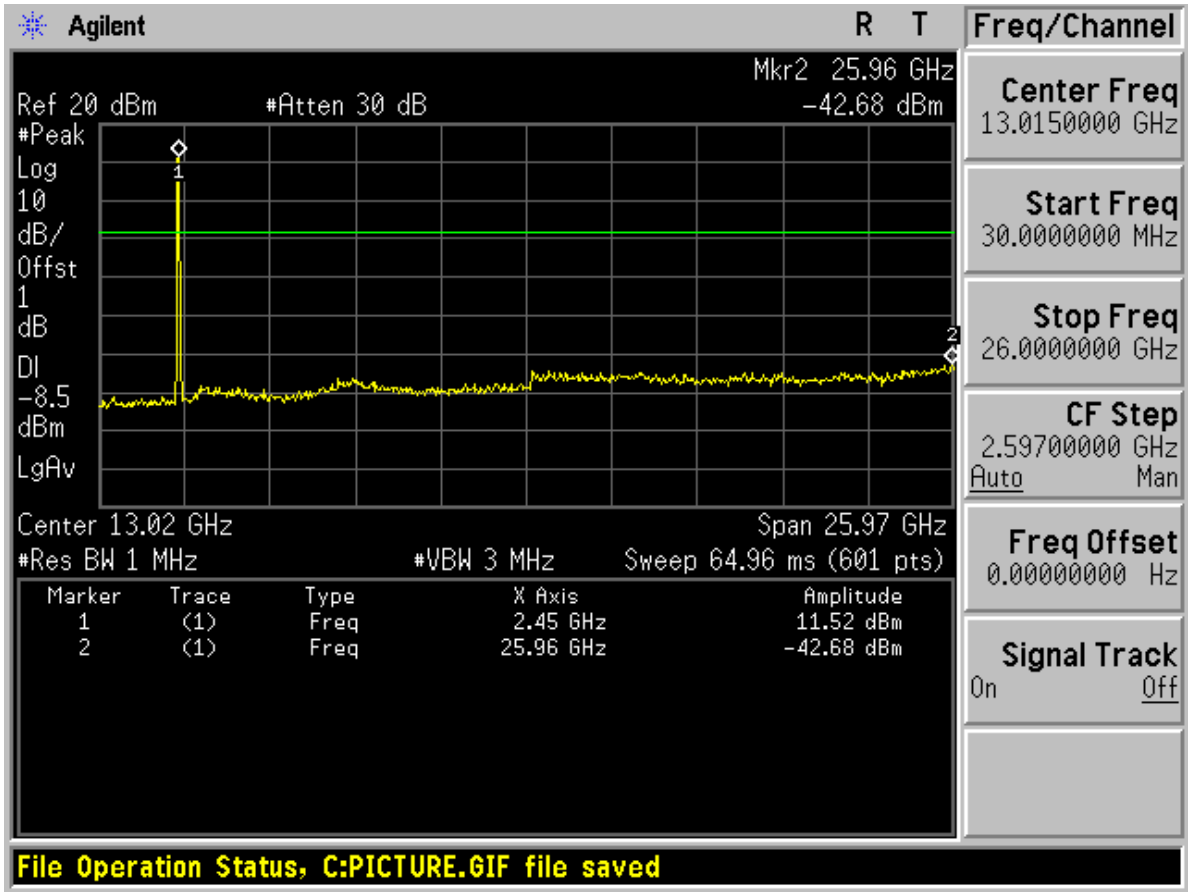

Agilent
R T
Freq/Channel
Mkr1 150 kHz
Ref 20 dBm
#Atten 30 dB
-69.22 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-7.9
dBm
LgAv
DC Coupled
M1 S2
S3 FC
£(f):
FTun
Swp
Center 15.08 MHz
Span 29.85 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 285.3 ms (601 pts)
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
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 25.56 GHz
Ref 20 dBm
#Atten 30 dB
-42.30 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-7.9
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 12.10 dBm
2 (1) Freq 25.56 GHz -42.30 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

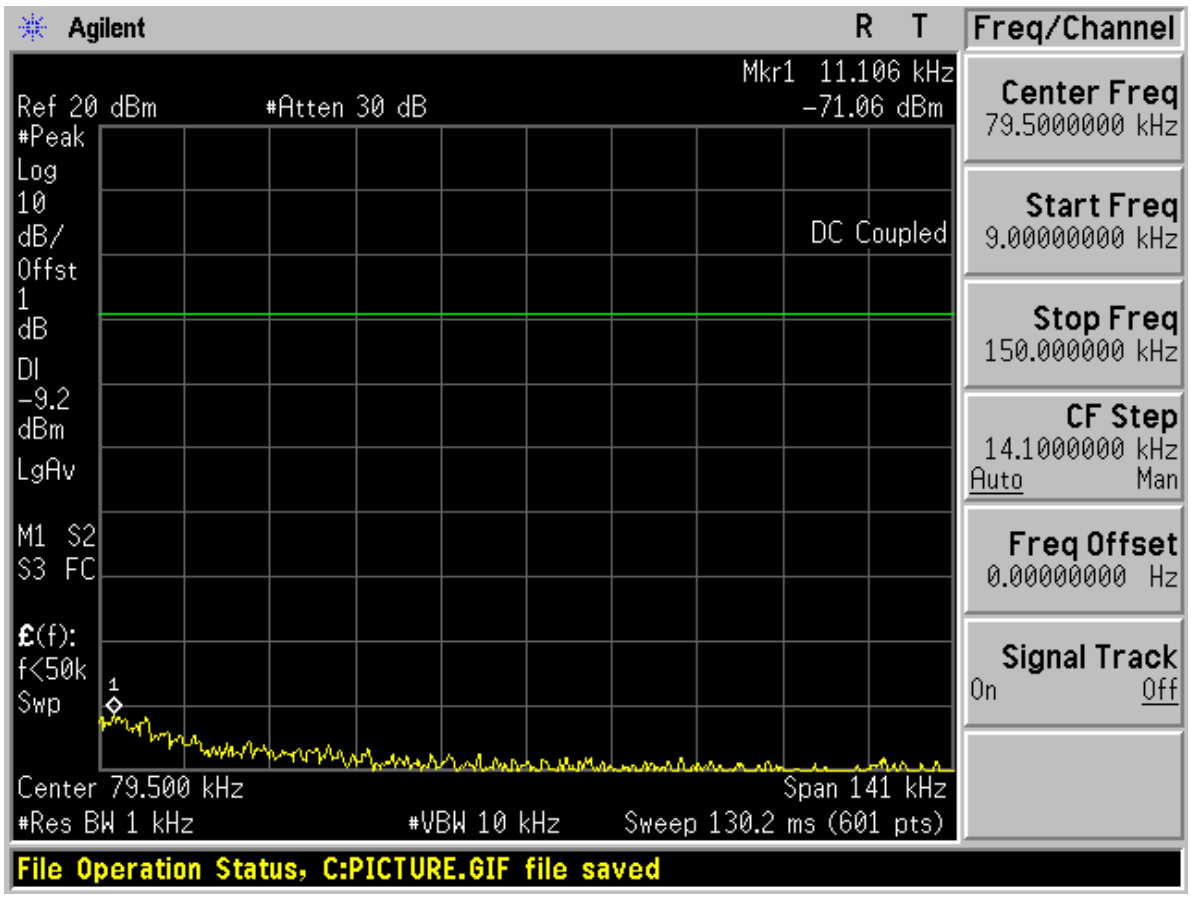
Channel 6

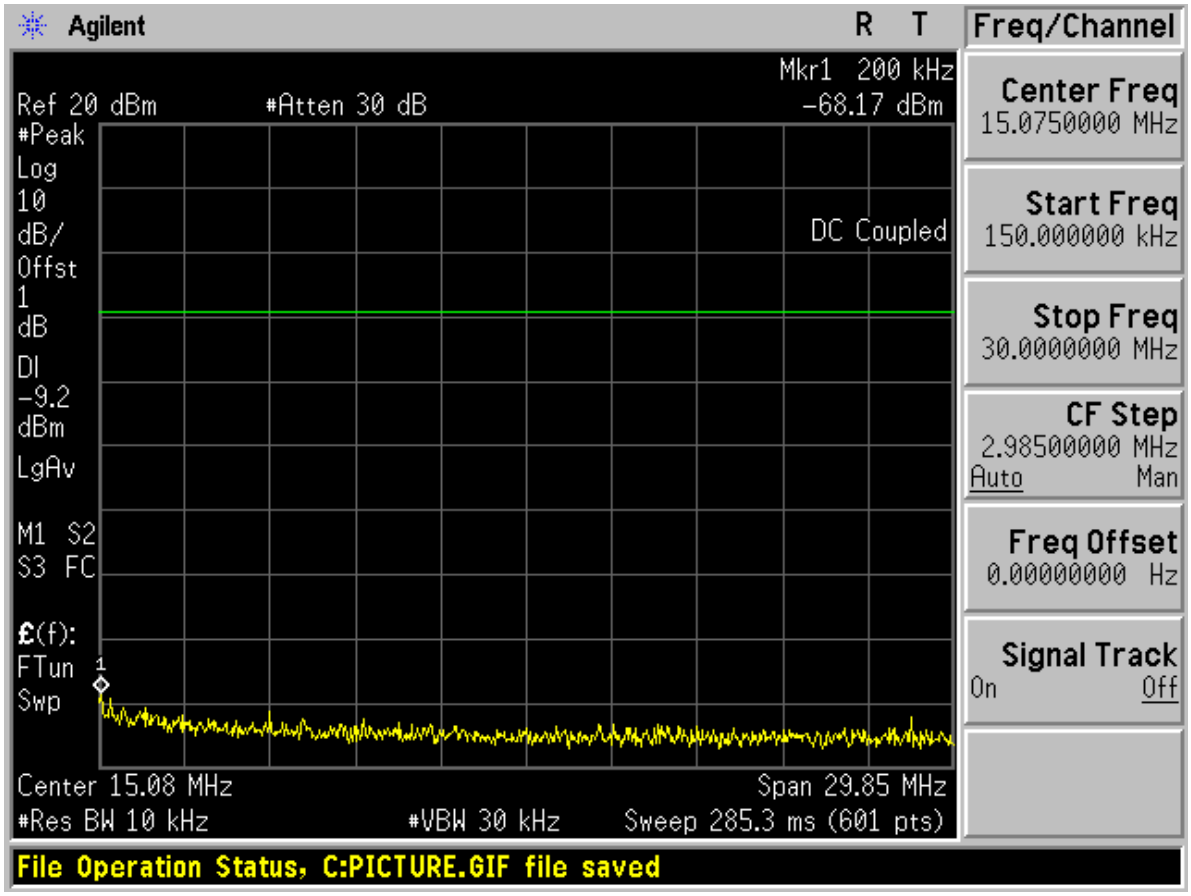

Agilent
R T
Freq/Channel
Mkr1 10.161 kHz
Ref 20 dBm
#Atten 30 dB
-70.23 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-8.5
dBm
LgAv
M1 S2
S3 FC
£(f):
f<50k
Swp
DC Coupled
Center 79.500 kHz
Span 141 kHz
#Res BW 1 kHz
#VBW 10 kHz
Sweep 130.2 ms (601 pts)
Center Freq
79.5000000 kHz
Start Freq
9.00000000 kHz
Stop Freq
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

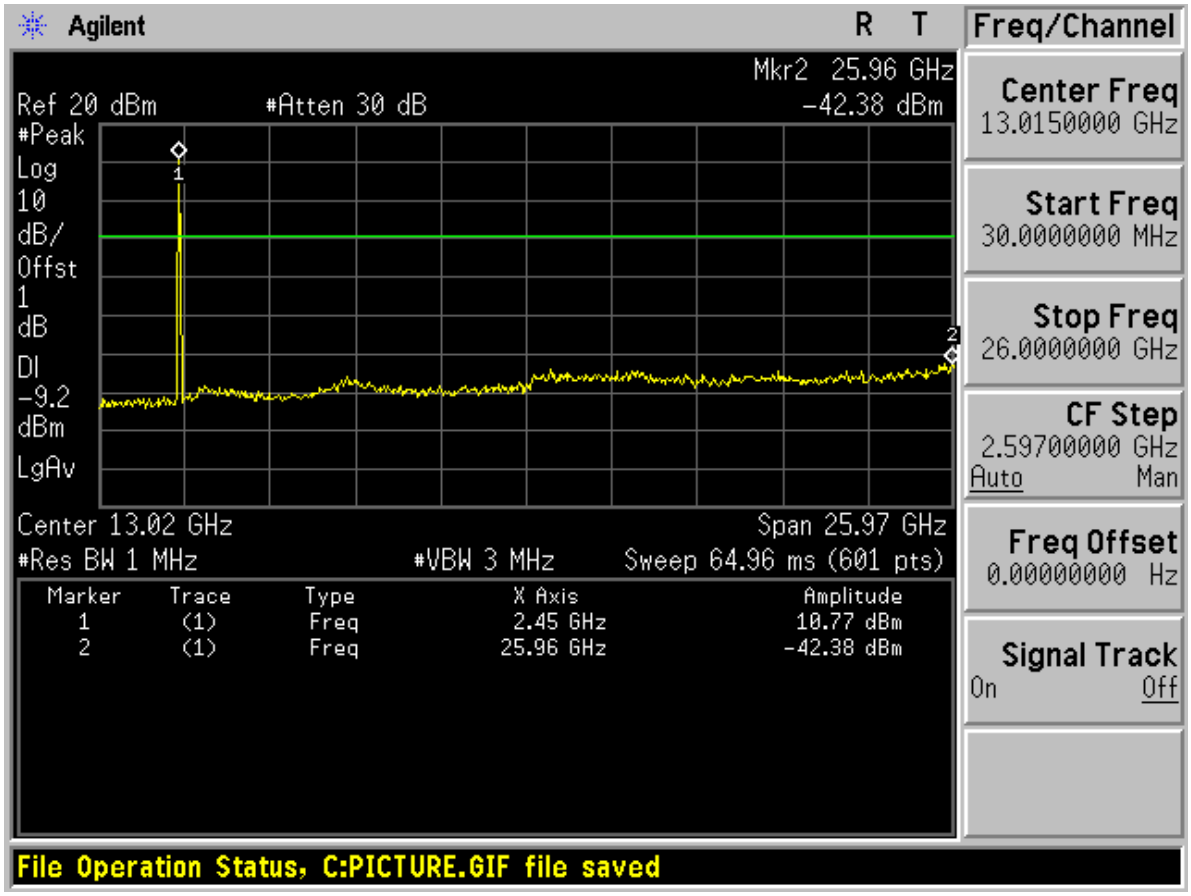

Agilent
R T
Freq/Channel
Mkr1 3.14 MHz
Ref 20 dBm
#Atten 30 dB
-69.71 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-8.5
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
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
-42.68 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-8.5
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 11.52 dBm
2 (1) Freq 25.96 GHz -42.68 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 11.106 kHz
Ref 20 dBm
#Atten 30 dB
-71.06 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-9.2
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
-68.17 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-9.2
dBm
LgAv
DC Coupled
M1 S2
S3 FC
£(f):
FTun
Swp
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
-42.38 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-9.2
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 10.77 dBm
2 (1) Freq 25.96 GHz -42.38 dBm
Signal Track
On
Off
File Operation Status, C:PICTURE.GIF file saved

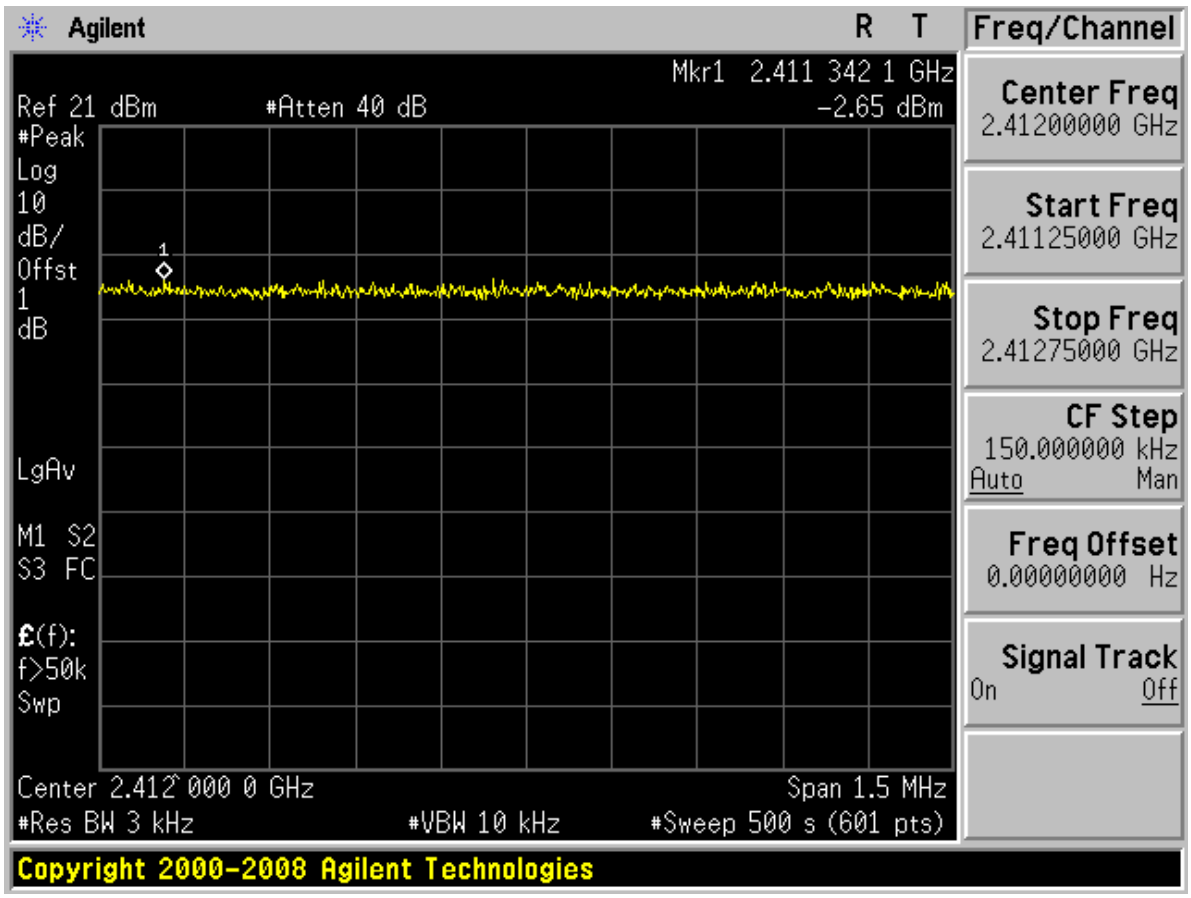
----------The END----------

Appendix E

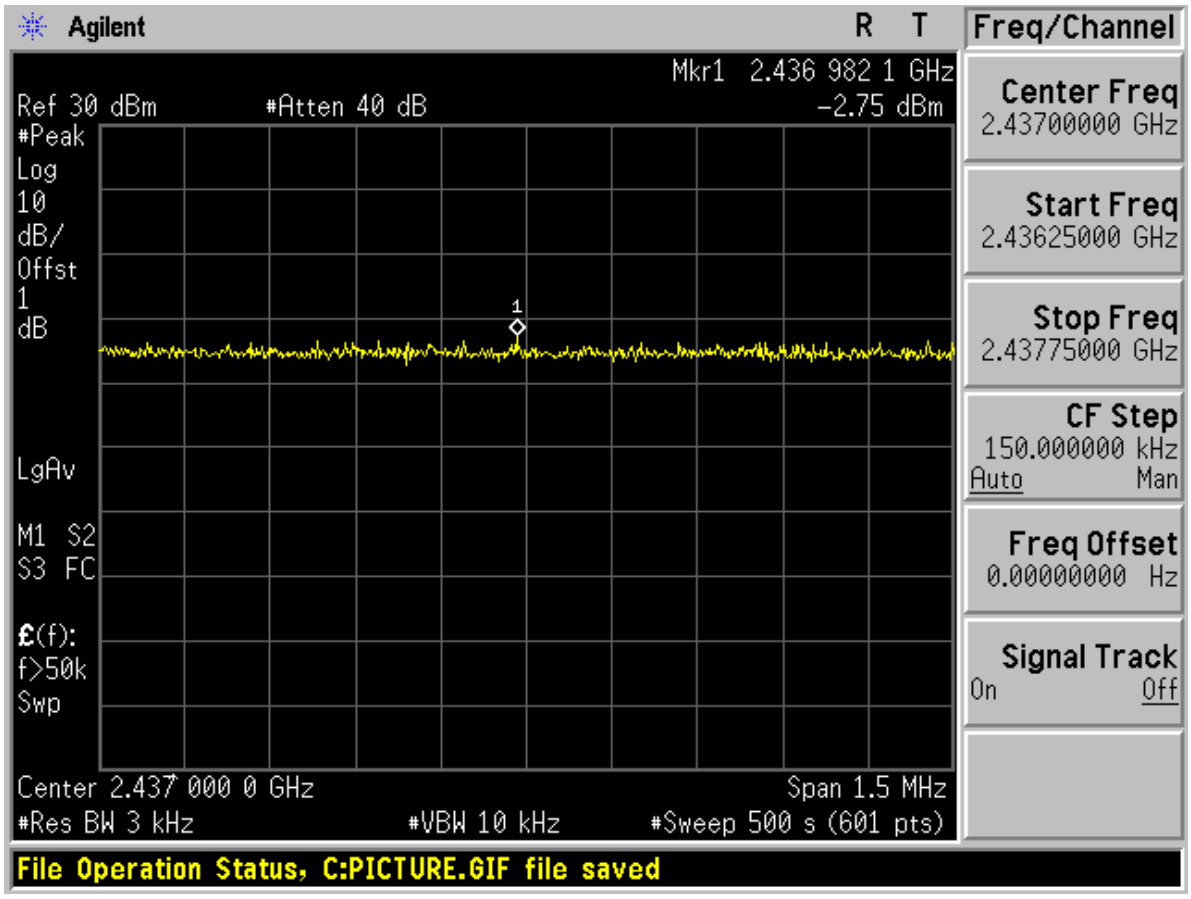
Power spectral density

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

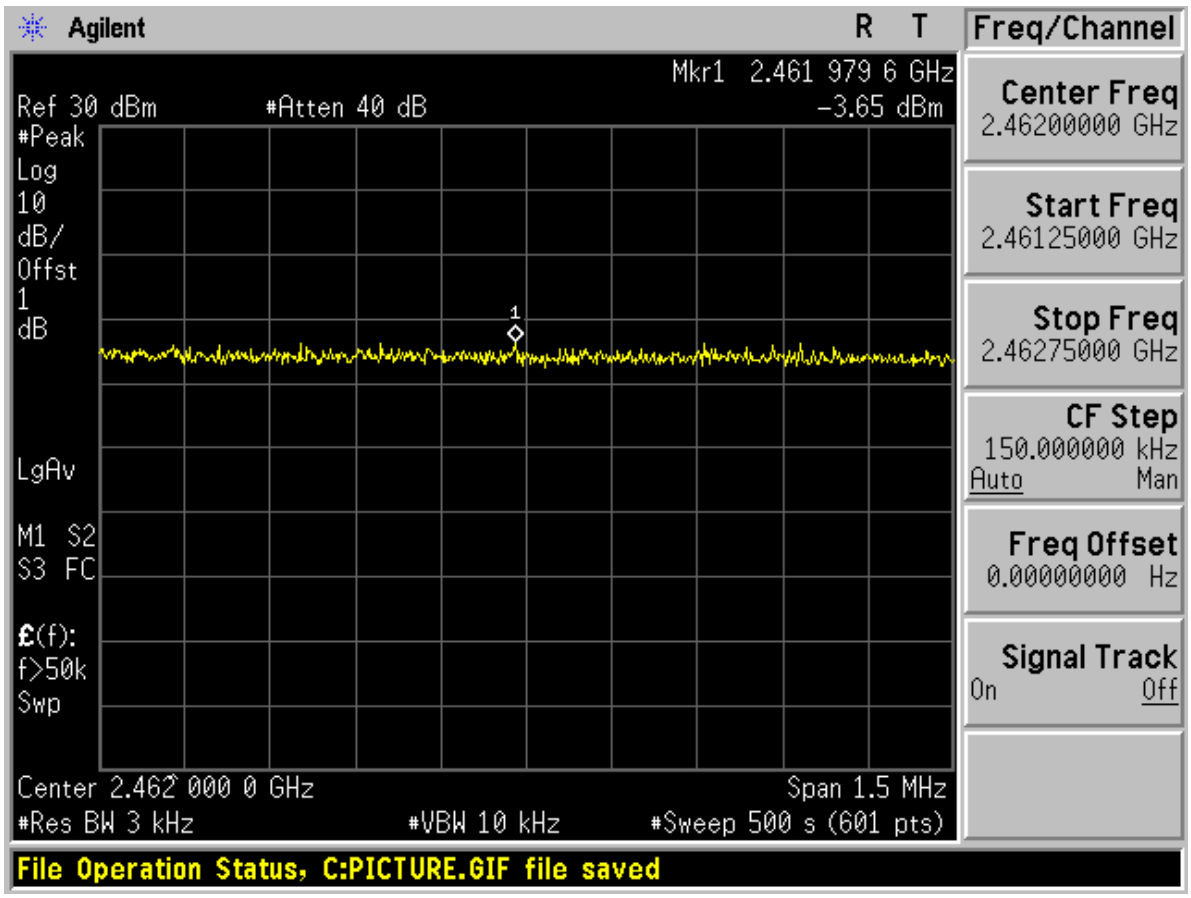
TM1
Channel 1



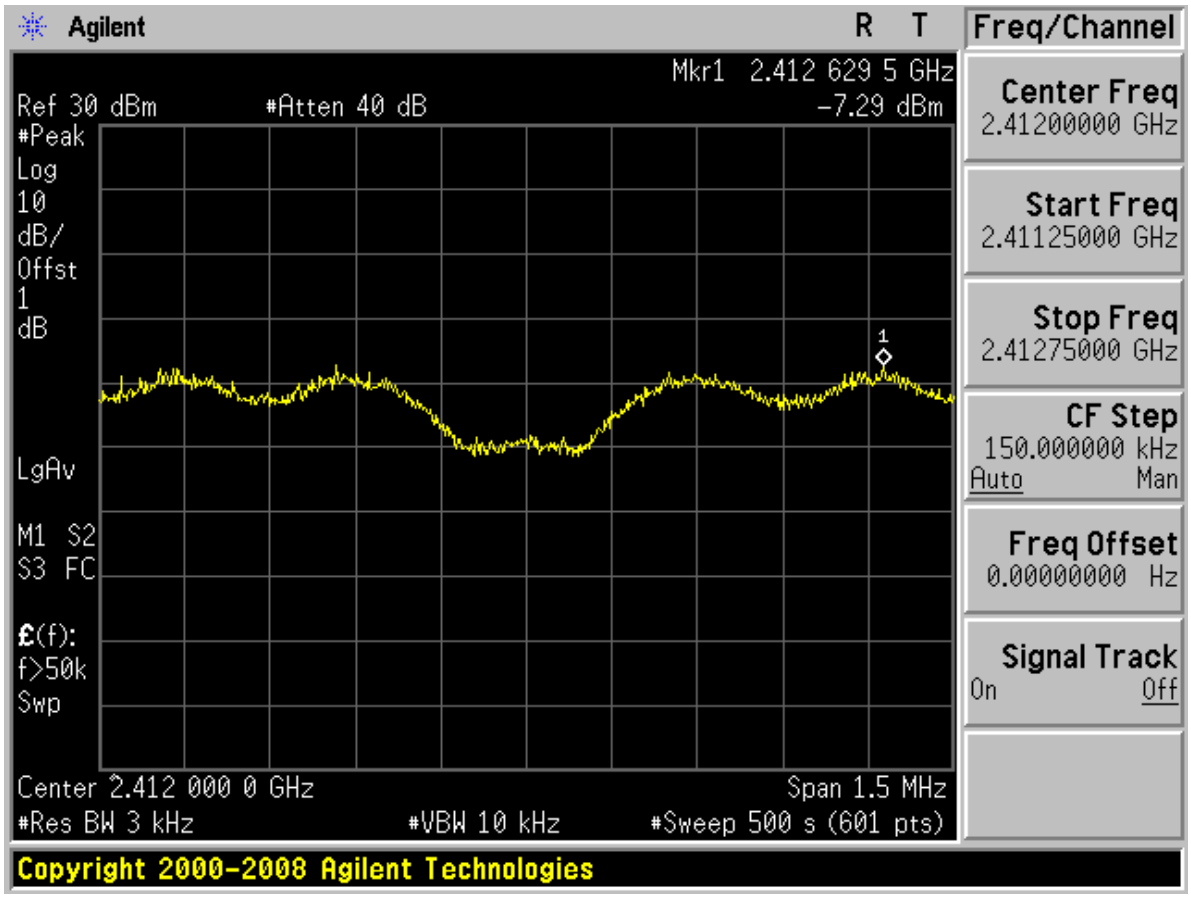
Channel 6


Agilent
R T
Freq/Channel
Mkr1 2.436 982 1 GHz
Ref 30 dBm
#Atten 40 dB
-2.75 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

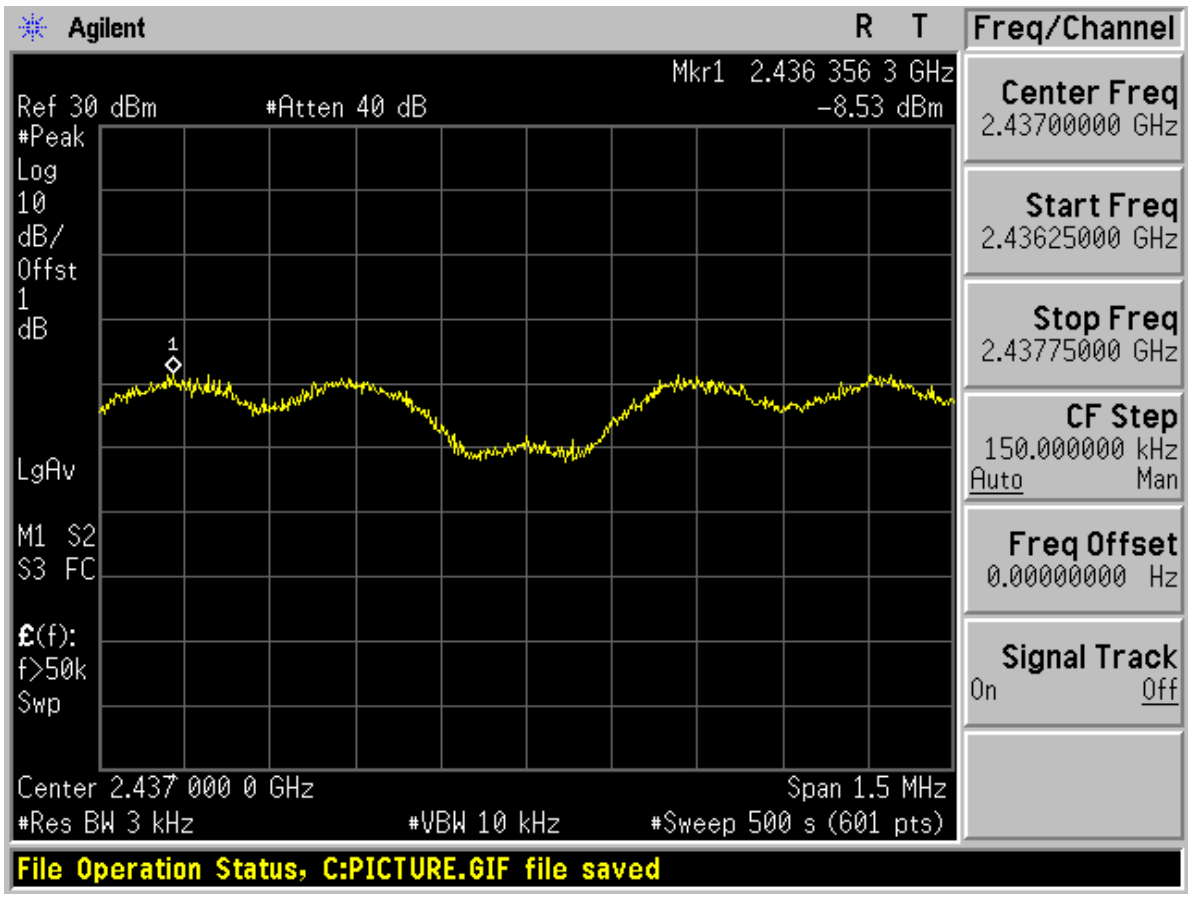
Channel 11


Agilent
R T
Freq/Channel
Mkr1 2.461 979 6 GHz
Ref 30 dBm
#Atten 40 dB
-3.65 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

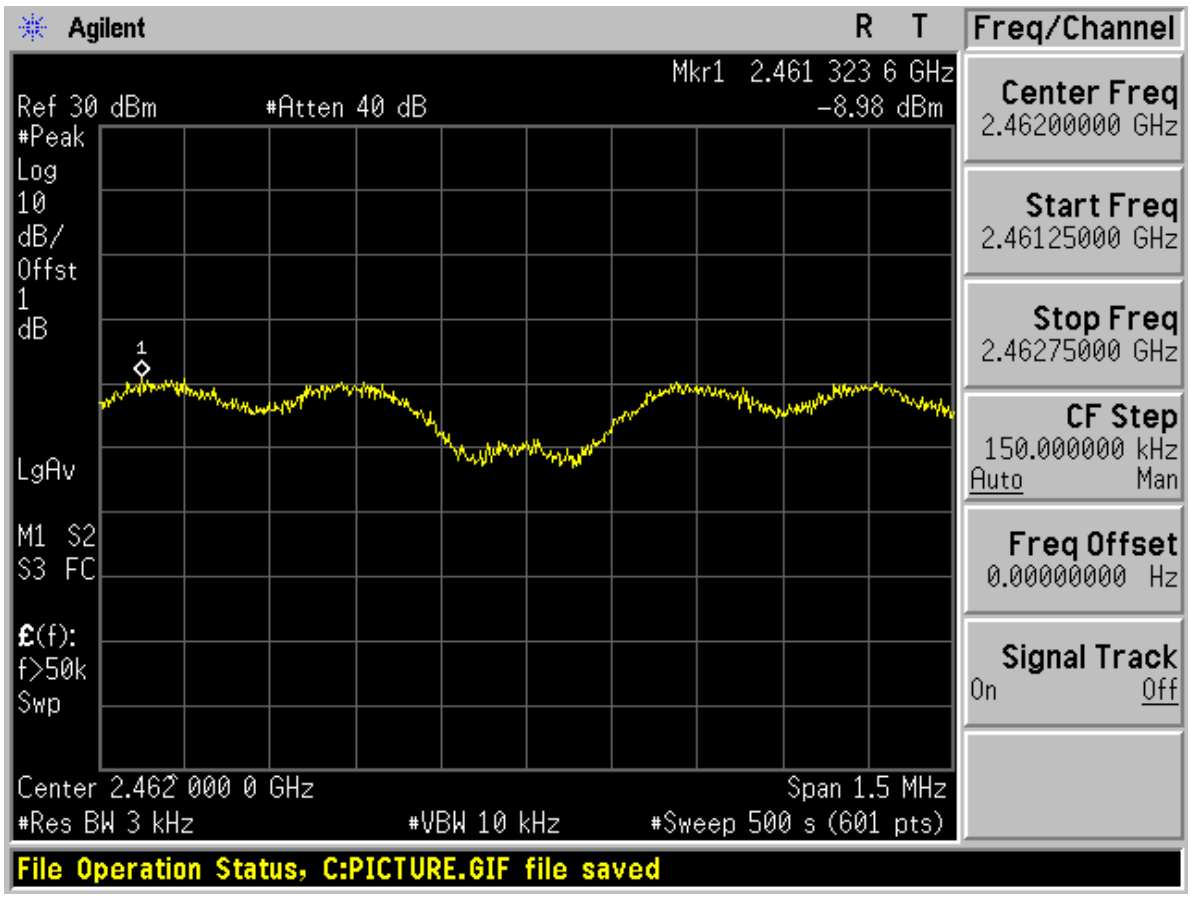
TM2
Channel 1



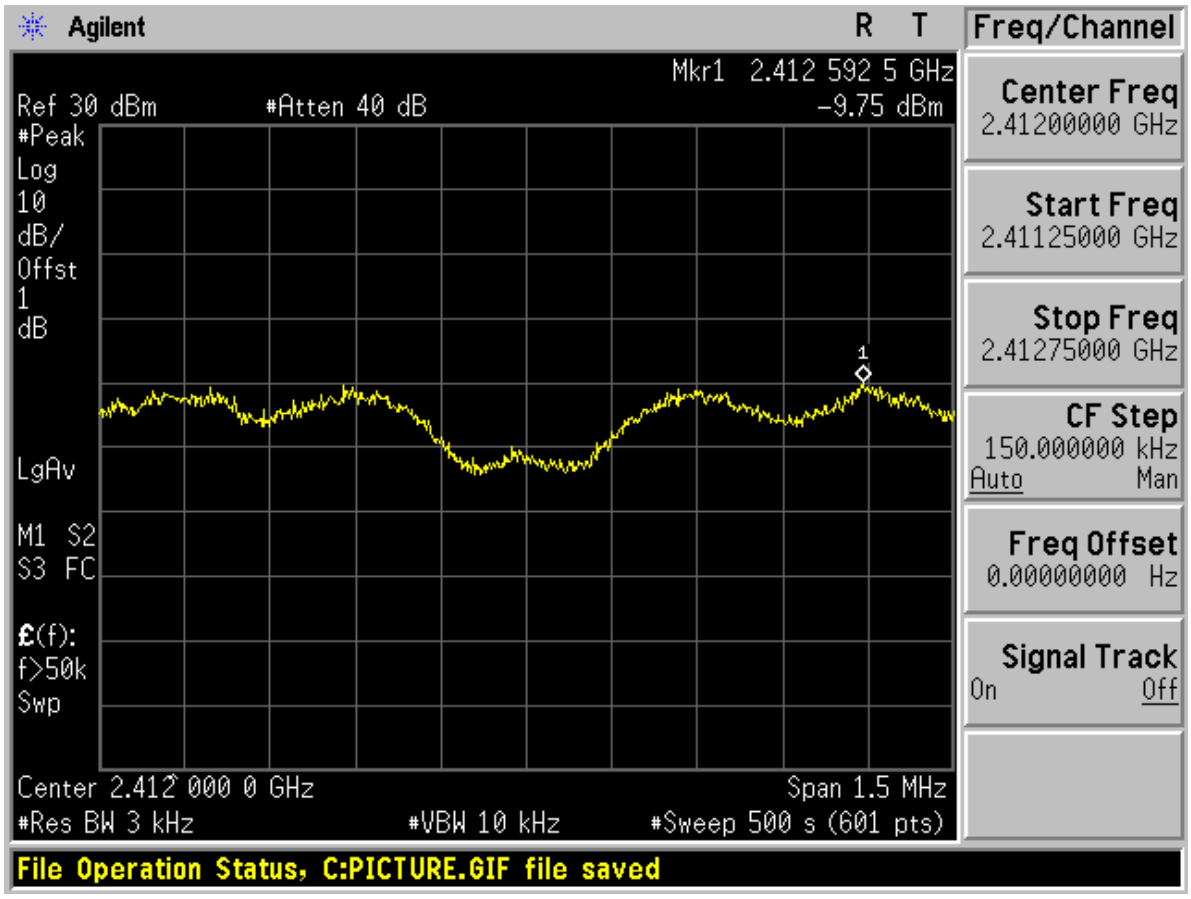
Channel 6


Agilent
R T
Freq/Channel
Mkr1 2.436 356 3 GHz
Ref 30 dBm
#Atten 40 dB
-8.53 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

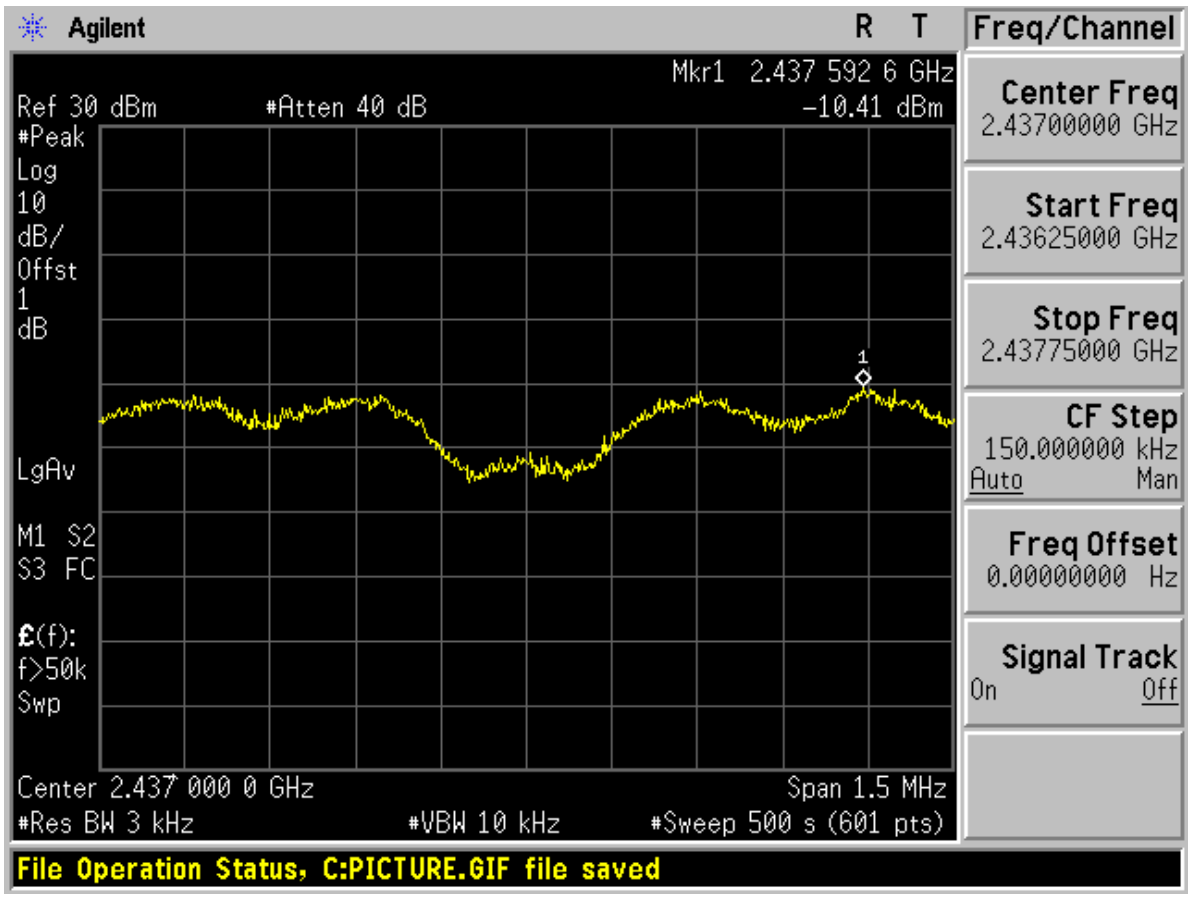
Channel 11


Agilent
R T
Freq/Channel
Mkr1 2.461 323 6 GHz
Ref 30 dBm
#Atten 40 dB
-8.98 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

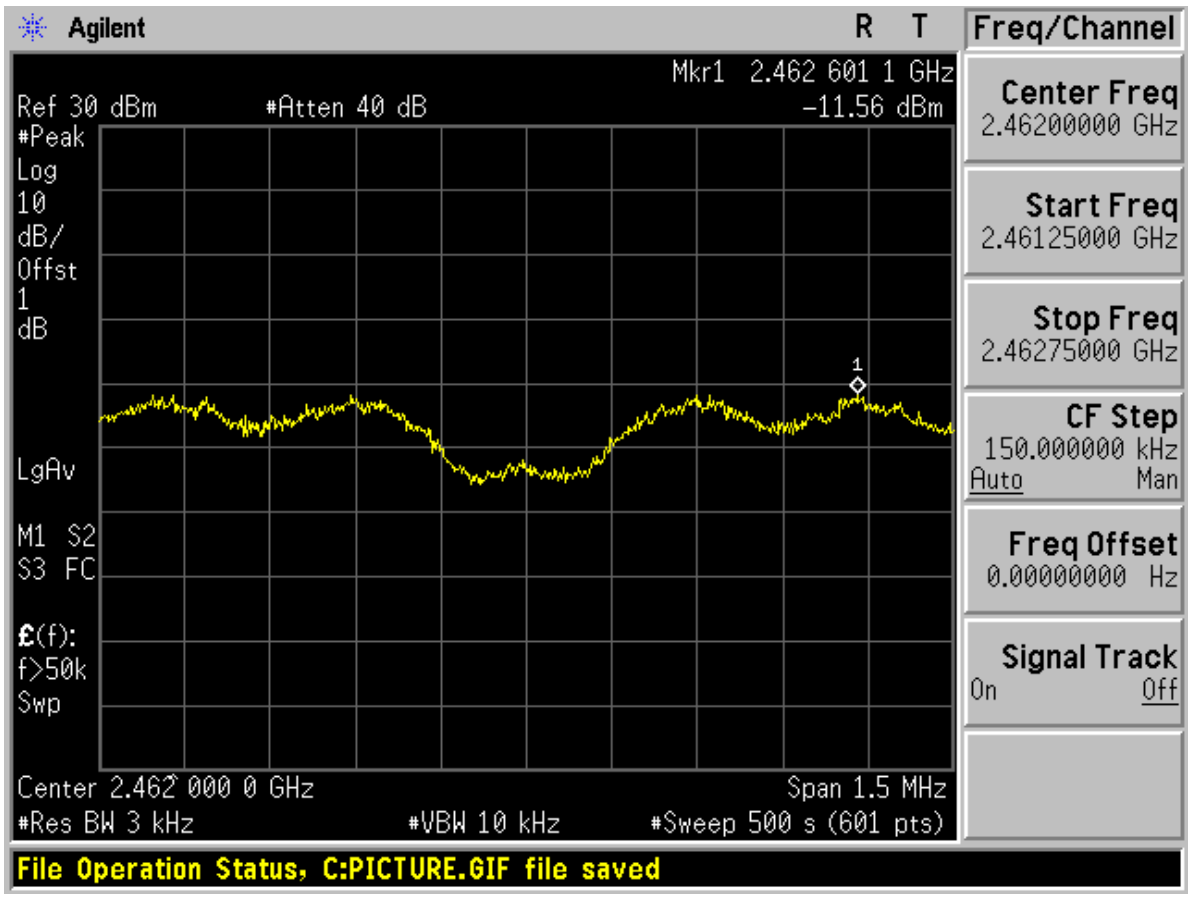
TM3
Channel 1



Channel 6


Agilent
R T
Freq/Channel
Mkr1 2.437 592 6 GHz
Ref 30 dBm
#Atten 40 dB
-10.41 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



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

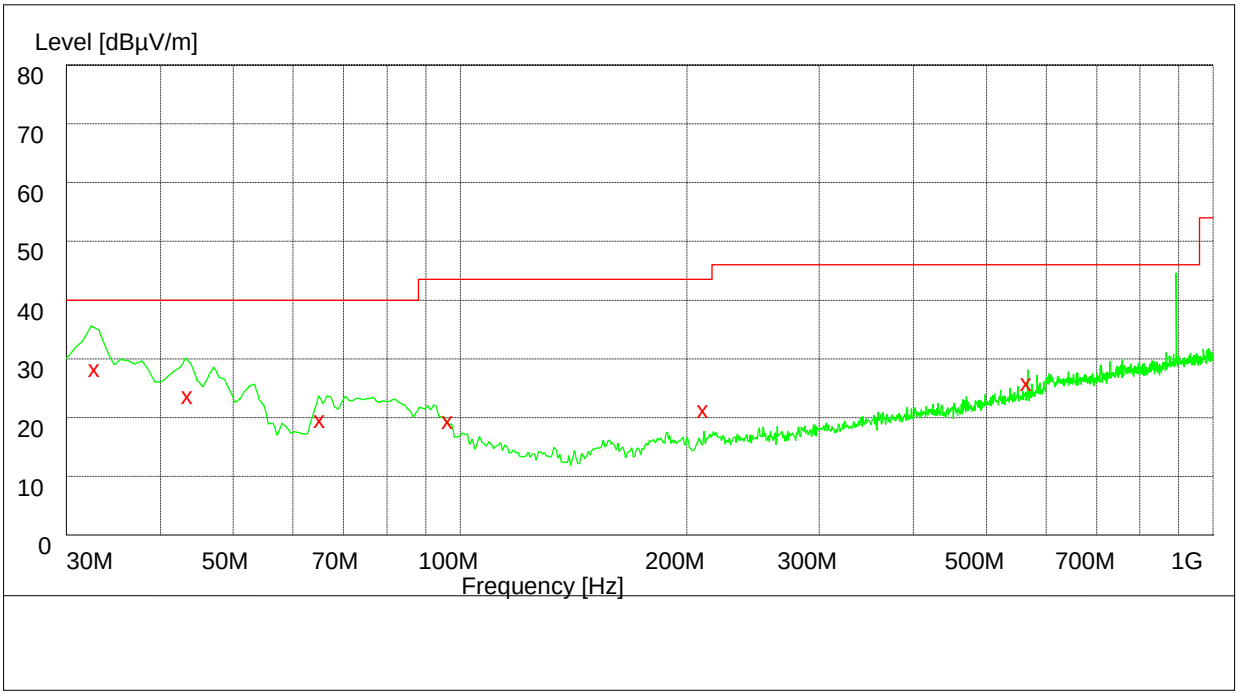
Appendix F

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.

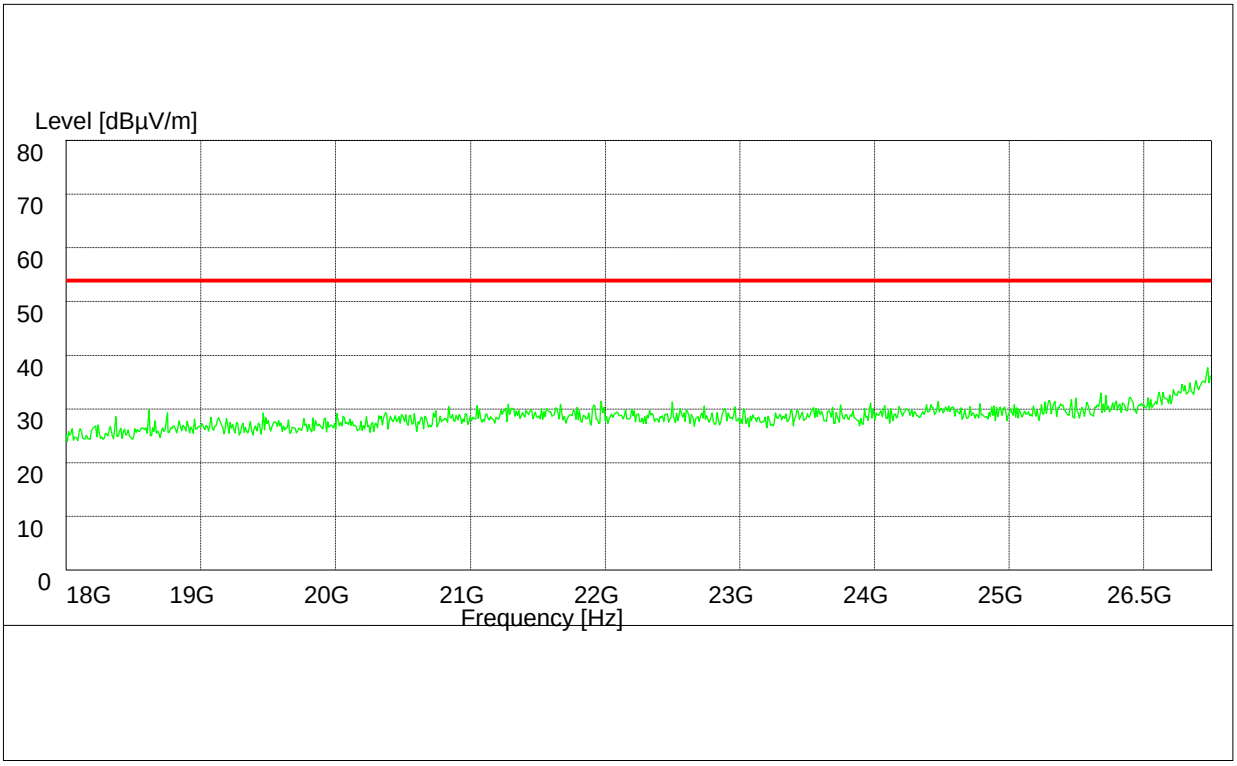
Note 2: **The emissions in this range are mainly from the Platform Device (Notepad PC and its ancillary components).**



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Plarization
32.820000	30.20	14.8	40.0	9.8	100.0	120.00	VERTICAL
43.620000	25.60	15.1	40.0	14.4	108.0	352.00	VERTICAL
65.400000	21.50	11.7	40.0	18.5	100.0	93.00	VERTICAL
96.660000	21.30	13.1	43.5	22.2	100.0	18.00	VERTICAL
211.200000	23.20	12.5	43.5	20.3	104.0	359.00	VERTICAL
567.660000	27.90	20.3	46.0	18.1	179.0	171.00	VERTICAL

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"

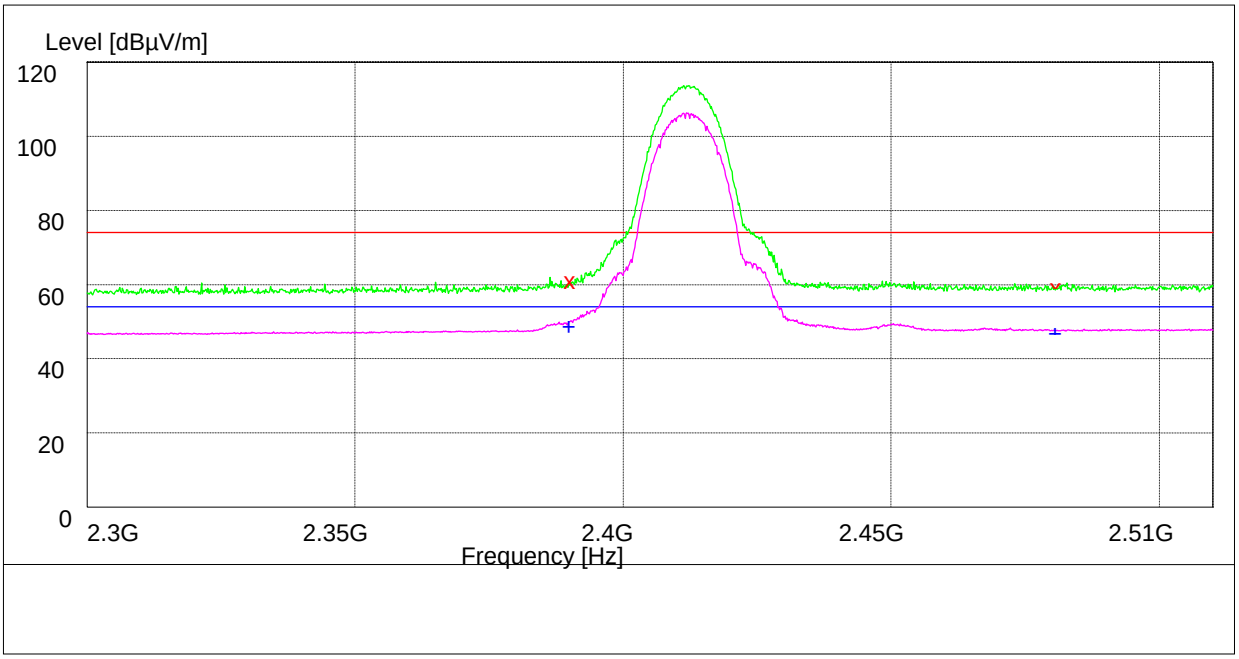
Note 1: The testing range of "2.3 GHz to 2.5 GHz" is for checking radiated emissions located in restricted bands near the EUT operating bands.

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

1.1 Channel 01



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

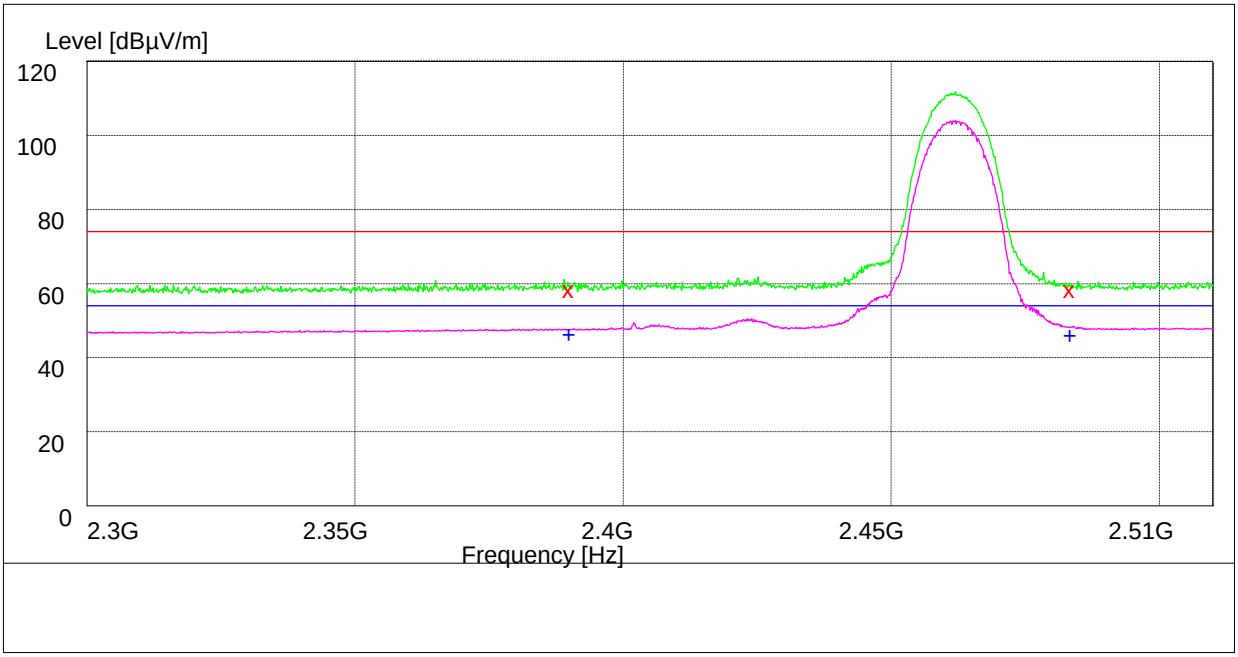
MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	61.10	33.5	74.0	12.9	100.0	205.00	HORIZONTAL
2483.500000	59.80	33.8	74.0	14.2	100.0	148.00	HORIZONTAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	49.10	33.5	54.0	4.9	100.0	226.00	HORIZONTAL
2483.500000	47.70	33.8	54.0	6.3	107.0	59.00	VERTICAL

1.2 Channel 11



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

MEASUREMENT RESULT: PK Detector

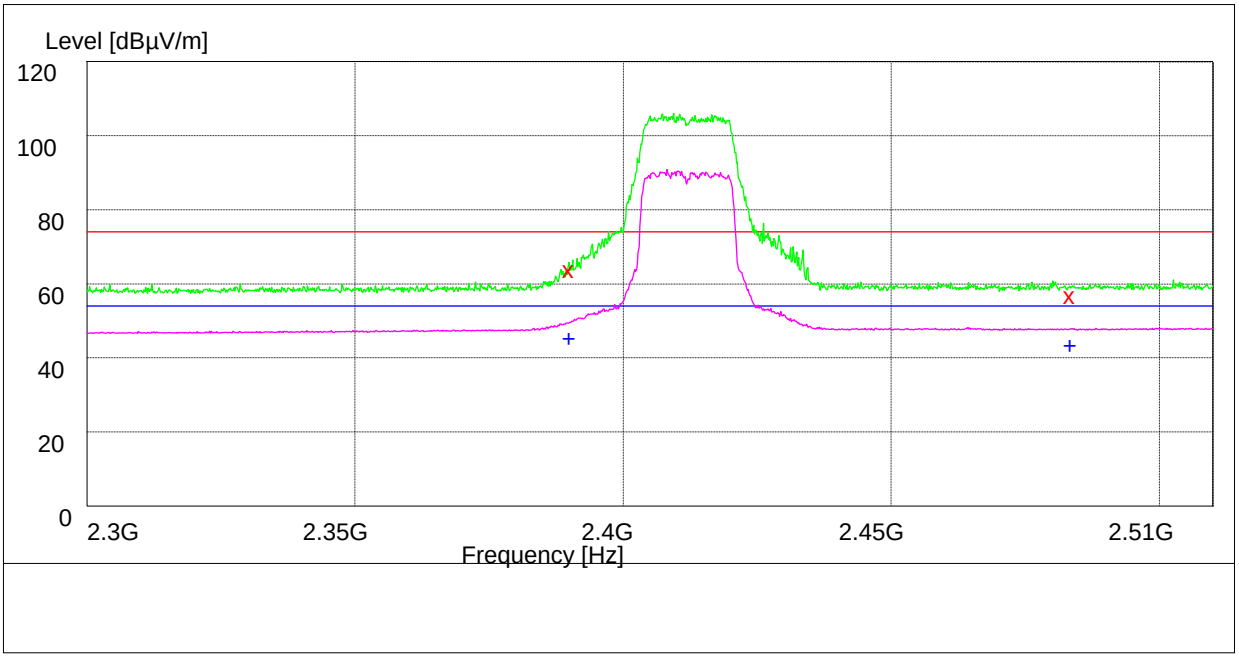
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	59.60	33.5	74.0	14.4	112.0	47.00	VERTICAL
2483.500000	59.80	33.8	74.0	14.2	194.0	136.00	VERTICAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	47.60	33.5	54.0	6.4	100.0	34.00	VERTICAL
2483.500000	47.40	33.8	54.0	6.6	100.0	221.00	HORIZONTAL

2 Test Mode: 11g

2.1 Channel 01



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

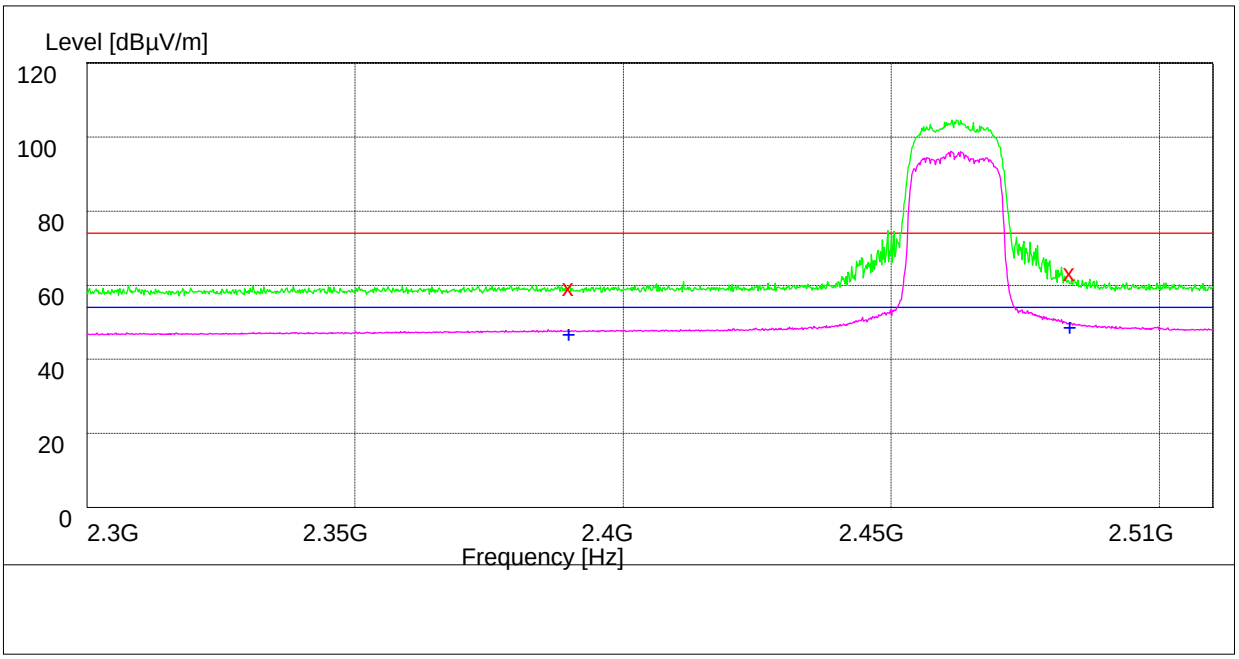
MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	67.00	33.5	74.0	7.0	126.0	98.00	HORIZONTAL
2483.500000	60.00	33.8	74.0	14.0	123.0	29.00	HORIZONTAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	48.30	33.5	54.0	5.7	100.0	146.00	HORIZONTAL
2483.500000	46.50	33.8	54.0	7.5	142.0	253.00	VERTICAL

2.2 Channel 11



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

MEASUREMENT RESULT: PK Detector

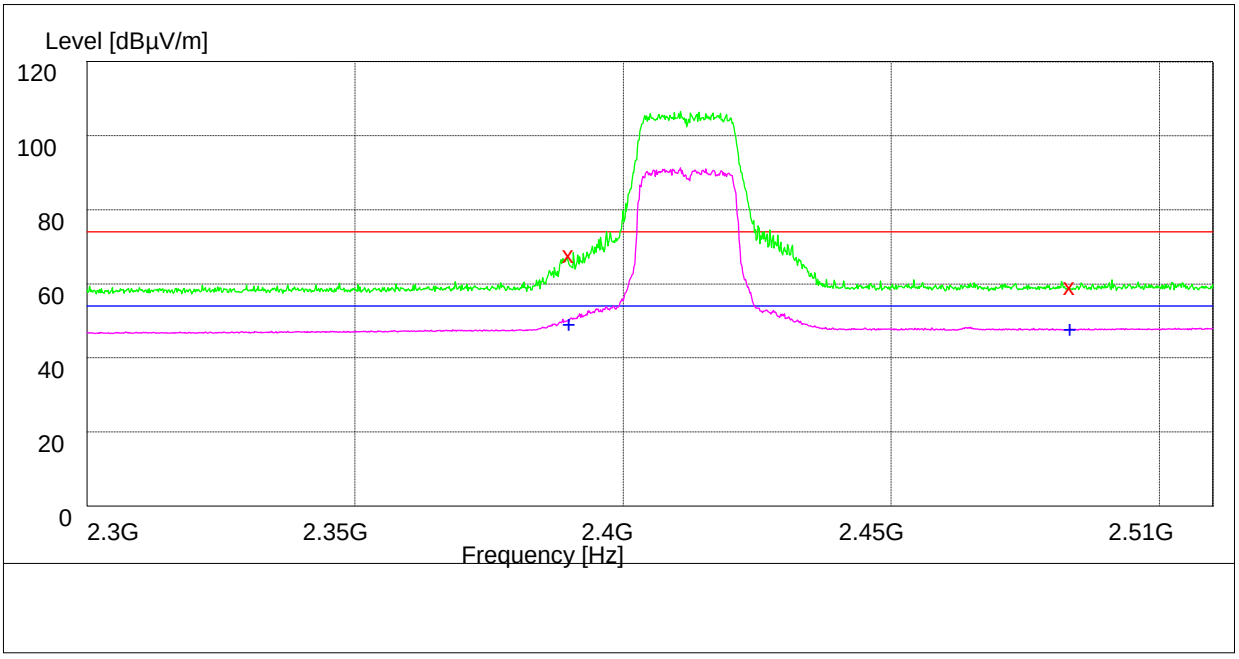
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	58.80	33.5	74.0	15.2	180.0	160.00	HORIZONTAL
2483.500000	63.20	33.7	74.0	10.8	100.0	341.00	VERTICAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	46.40	33.5	54.0	7.6	100.0	359.00	VERTICAL
2483.500000	48.20	33.7	54.0	5.8	100.0	244.00	HORIZONTAL

3 Test Mode: 11n

3.1 Channel 01



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

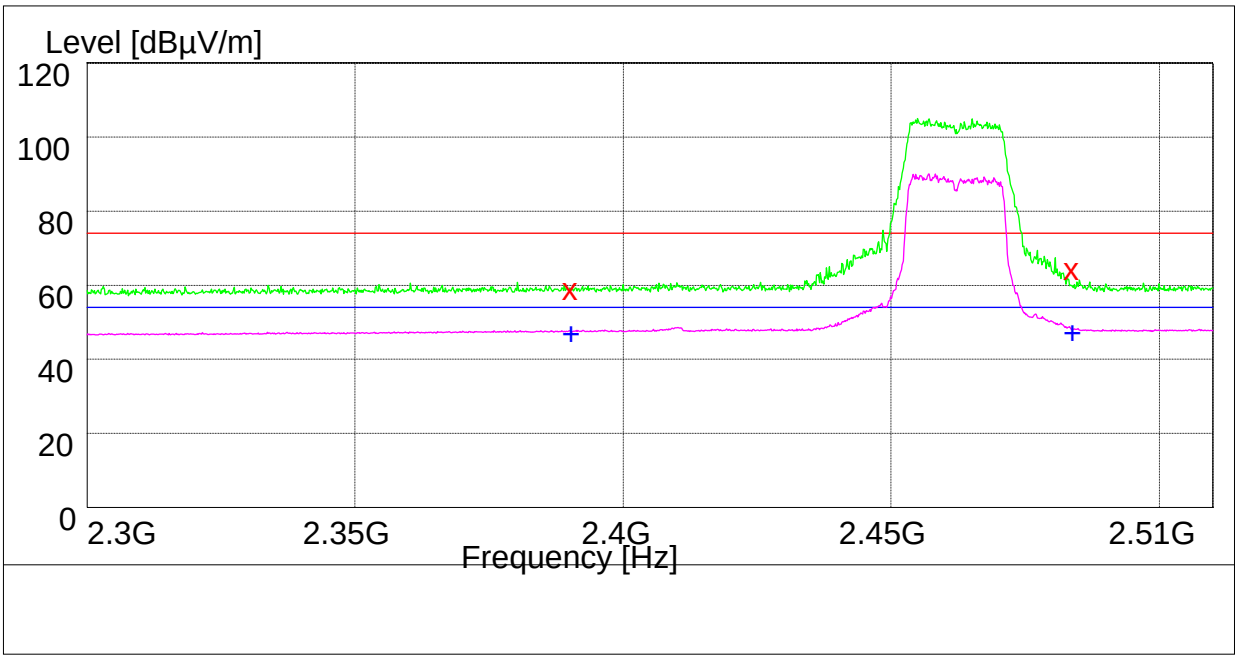
MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	68.50	33.5	74.0	5.5	101.0	217.00	HORIZONTAL
2483.500000	59.70	33.8	74.0	14.3	101.0	302.00	VERTICAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	49.60	33.5	54.0	4.4	101.0	218.00	HORIZONTAL
2483.500000	48.10	33.8	54.0	5.9	109.0	40.00	HORIZONTAL

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	59.60	33.5	74.0	14.4	114.0	67.00	HORIZONTAL
2483.500000	65.10	33.8	74.0	8.9	101.0	221.00	HORIZONTAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	47.30	33.5	54.0	6.7	106.0	39.00	VERTICAL
2483.500000	47.70	33.8	54.0	6.3	101.0	222.00	HORIZONTAL

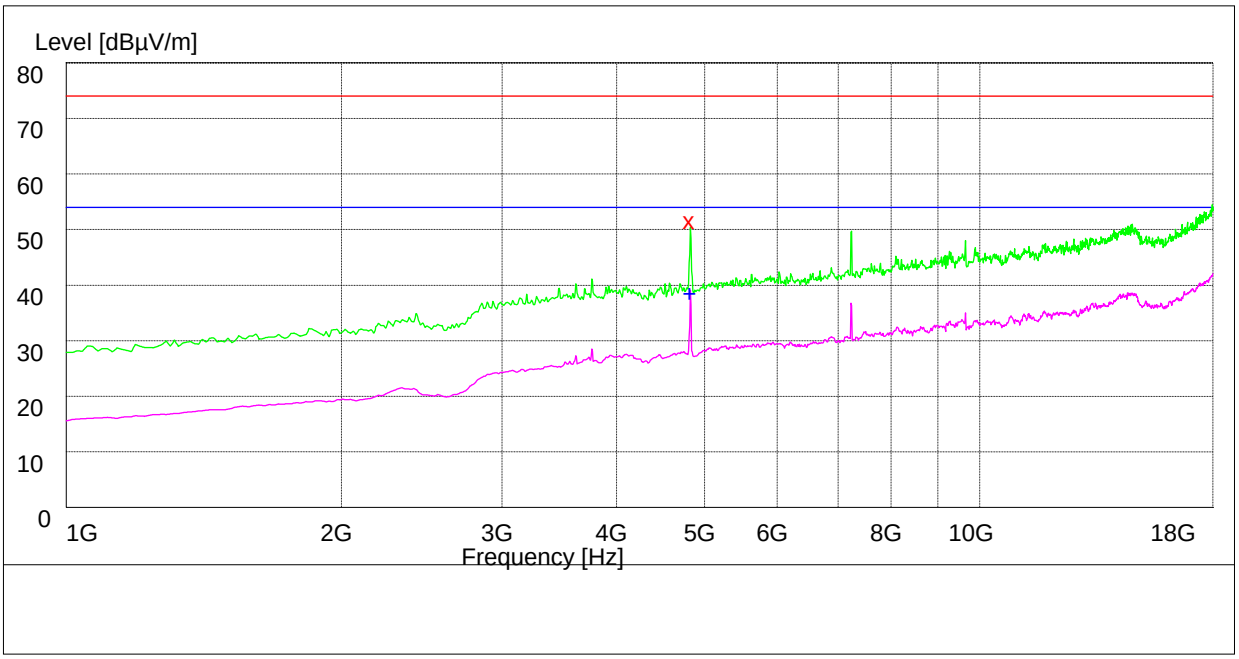
3.3

Part 4: Testing Range of "1 GHz to 18 GHz"

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

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

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



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
4824.100000	53.80	-2.6	74.0	20.2	100.0	72.00	HORIZONTAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
4824.100000	40.60	-2.6	54.0	13.4	100.0	72.00	HORIZONTAL

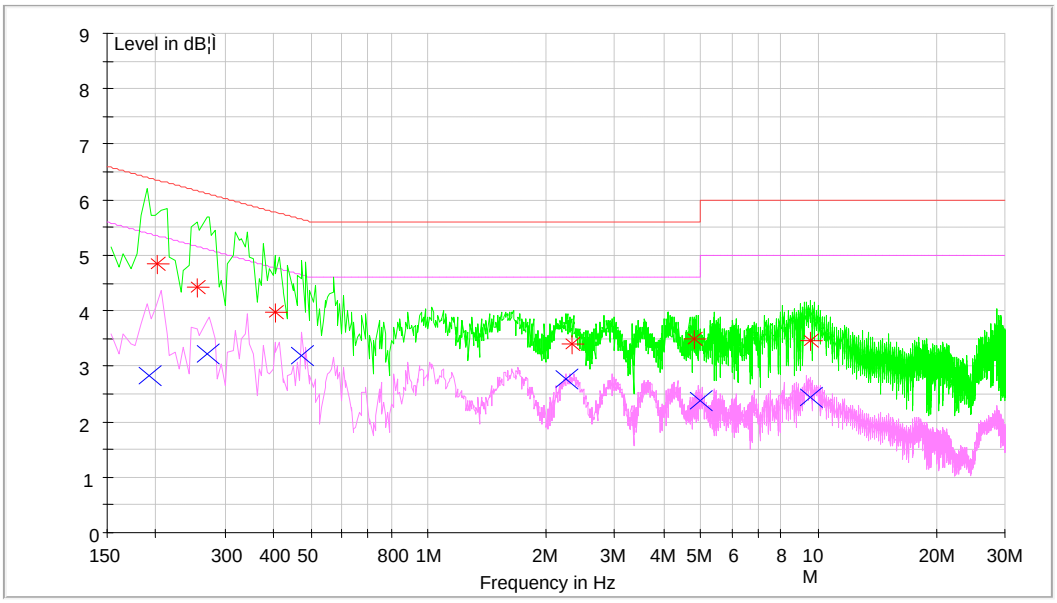
----------END----------

Appendix G

Conducted Emission at Power Port

According to FCC Part 15.207& RSS-210

Channel 6



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.202647	48.6	9.7	63.5	14.9	L1	FLO
0.254632	44.1	9.7	61.6	17.5	L1	FLO
0.406612	39.6	9.7	57.7	18.1	L1	FLO
2.340465	34.0	9.7	56.0	22.0	L1	FLO
4.776420	34.9	9.8	56.0	21.1	N	FLO
9.503146	34.5	9.9	60.0	25.5	N	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.191400	28.4	9.7	54.0	25.6	L1	FLO
0.270585	32.3	9.7	51.1	18.8	L1	FLO
0.472819	32.0	9.7	46.5	14.5	L1	FLO
2.246572	27.7	9.7	46.0	18.3	L1	FLO
4.943794	23.8	9.8	46.0	22.2	L1	FLO
9.477202	24.3	9.9	50.0	25.7	N	FLO

----------END----------

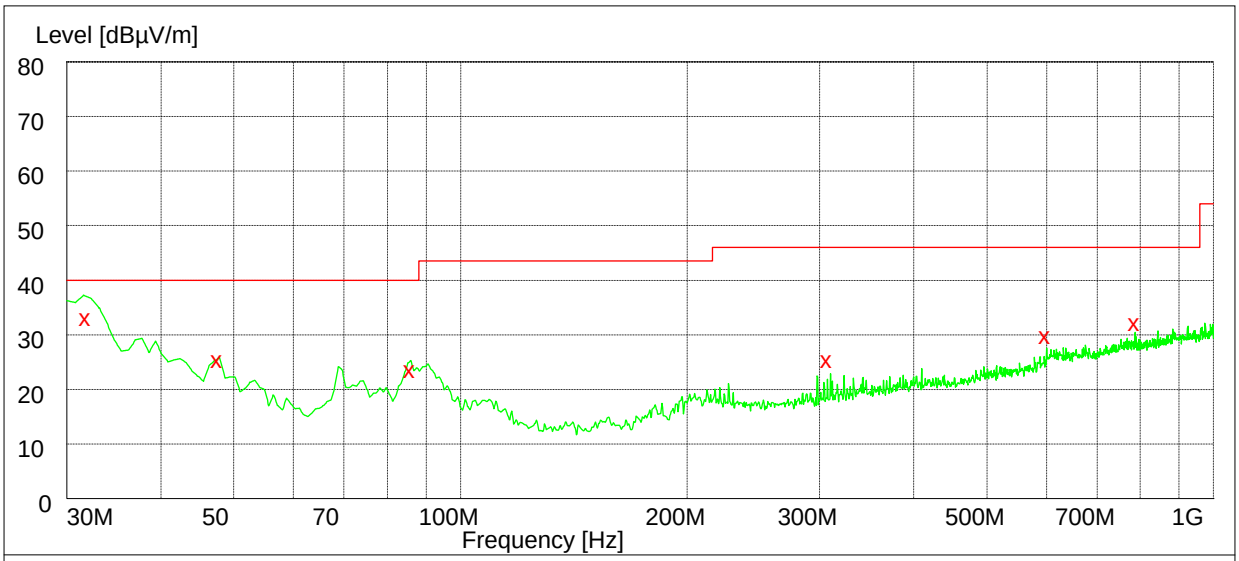
Appendix H

Receiver Spurious Emissions

According to RSS-Gen

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

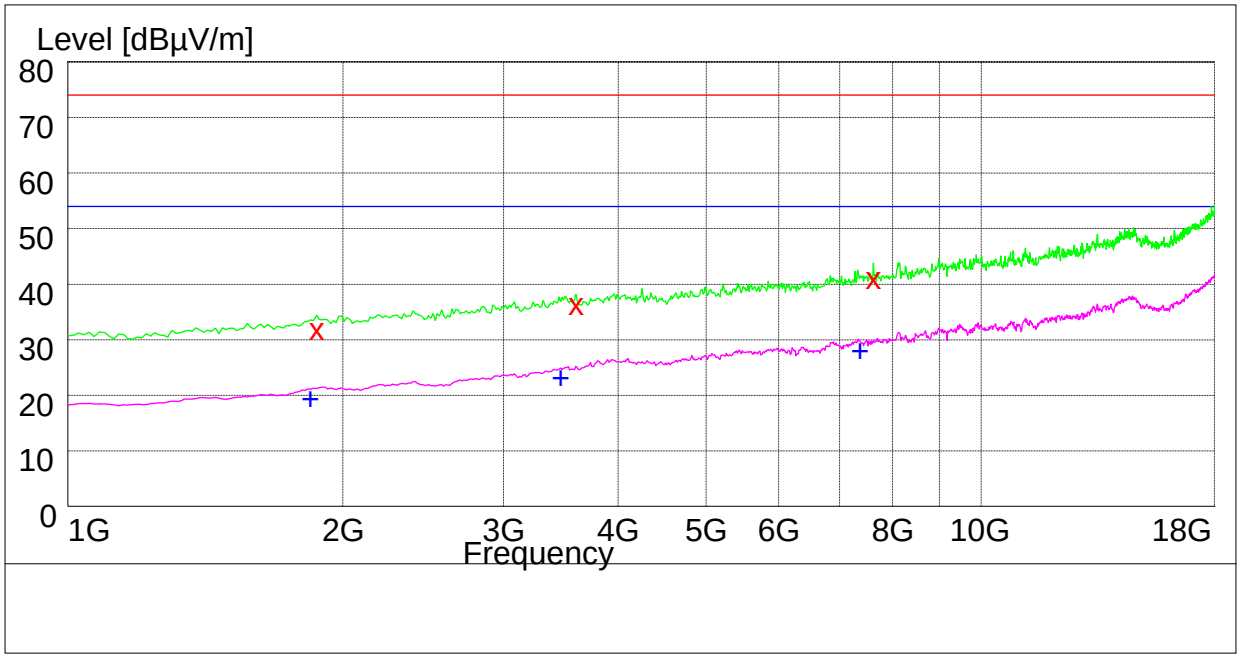
30MHz-1GHz



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
31.860000	32.40	14.6	40.0	7.6	100.0	318.00	VERTICAL
47.700000	24.60	15	40.0	15.4	100.0	72.00	VERTICAL
85.920000	22.90	11.2	40.0	17.1	146.0	115.00	VERTICAL
307.200000	24.60	15.2	46.0	21.4	100.0	276.00	HORIZONTAL
599.700000	29.10	21.3	46.0	16.9	147.0	357.00	VERTICAL
786.840000	31.40	23.4	46.0	14.6	100.0	346.00	VERTICAL

1GHz-18GHz



MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
1874.900000	31.90	-12.3	74.0	42.1	100.0	104.00	HORIZONTAL
3602.600000	36.40	-5.6	74.0	37.6	100.0	261.00	VERTICAL
7624.200000	41.20	4.2	74.0	32.8	100.0	133.00	VERTICAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
1836.100000	19.40	-12.6	54.0	34.6	100.0	262.00	VERTICAL
3454.100000	23.10	-6.2	54.0	30.9	100.0	4.00	VERTICAL
7343.700000	28.00	3.1	54.0	26.0	100.0	229.00	VERTICAL

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