FCC Test Report - EDR

Product Name: HSPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth; HUAWEI Ascend Y300

Model Number: HUAWEI Y300-0151, Y300-0151

Report No: SYBHZ(R)028112012-2004
FCC ID：QISY300-0151

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REGULATION	**FCC CFR47 Part 2:2011: Subpart J;**
	FCC CFR47 Part 15:2011: Subpart C;
	ANSI C63.10:2009
START OF TEST	**Nov., 26, 2012**
END OF TEST	**Dec., 03, 2012**
Final Judgement:	**Pass**

Approved By Senior Engineer	Dec., 07, 2012	Dai Linjun	Dai Linjun
	Date	Name	Signature
Reviewed By	Dec., 07, 2012	Cousy Xu	Cousy XU
	Date	Name	Signature
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1 Summary

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

Summary of results

FCC Measurement Specification	Description	Result
15.247 (a) (1)	Bandwidth measurement	PASS
15.247 (a) (1)	Carrier frequency separation measurement	PASS
15.247 (a) (1) III	Number of hopping channel	PASS
15.247 (a) (1) III	Time of occupancy	PASS
15.247 (b) (1)	Peak output power	PASS
15.247 (d)	Band edge compliance measurement	PASS
15.247 (d)	Conducted RF spurious	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

HUAWEI Y300-0151, Y300-0151 is subscriber equipment in the WCDMA/GSM system. The HSPA/UMTS frequency band is Band I and Band II and Band V. The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900. The Mobile Phone implements such functions as RF signal receiving/transmitting, HSPA/UMTS and GSM/GPRS/EDGE protocol processing, voice, video MMS service, GPS, AGPS 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 the Bluetooth test data included in this report.

2.1.2 Support function and Service

The EUT support the Bluetooth's function and service as follows:

Service and Test mode List

Service Name	Characteristic	Corresponding Test Mode	Note
Data and Voice	Modulation: π /4-DQPSK	TM1	/
Data and Voice	Modulation: 8DPSK	TM2	/

2.2 Modification Information

For original equipment, following table is not application.

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

4 General Setup Description

The Bluetooth hopping frequency system of EUT can Support 2.4GHz Band. For compliance with FCC regulation 47CFR part15 subpart C, we set the EUT as in the following test mode to do all compliance tests.

Bluetooth MODE:

TM1:π /4-DQPSK Modulation
TM2: 8DPSK Modulation

5 Product Description

5.1 Technical Characteristics

5.1.1 Frequency Range

Frequency Range

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

5.1.2 Channel Spacing / Separation

Channel Spacing / Separation

Channel spacing:	1 MHz
Channel separation:	1 MHz

5.1.3 Antenna Information

Antenna Information

Type:	Integrated / Internal
Maximum Gain(dBi):	-0.5 (from 2400MHz to 2500MHz)

5.1.4 Environmental Requirements

Environmental Requirements

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

5.1.5 Power Source

Power Source

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

5.1.6 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.

5.2 EUT Identification List

5.2.1 Board Information

Board Information

HSPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth; HUAWEI Ascend Y300		
HUAWEI Y300-0151,Y300-0151		
Board and Module		
Equipment Designation / Description	Serial Number	Remarks
MAINBOARD	D9R01A92A2900212	HD1U8833M

5.2.2 Adapter Technical Data

Adapter	Brand: HUAWEI Model: HW-050100E1W Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V ⎓ 1A Rated Power: 5W S/N: TPACA1888490; S/N: HKAC90246945
Adapter	Brand: HUAWEI Model: HW-050100U1W Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V ⎓ 1A Rated Power: 5W S/N: TPACA1539915; S/N: HKAC12756687
Adapter	Brand: HUAWEI Model: HW-050100B1W Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V ⎓ 1A Rated Power: 5W S/N: HKABB1374473
Adapter	Brand: HUAWEI Model: HW-050055B1W Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V ⎓ 550mA Rated Power: 2.75W S/N: HKAC60404581,S/N:TPABC1468816
Adapter	Brand: HUAWEI Model: HW-050055E1W Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V ⎓ 550mA Rated Power: 2.75W S/N: HKABB2075917,S/N:TPABC1722475

Note: The test results and plot for “HW-050100U1W” showed as below is the WORST case for all Test Modes and Channels.

5.2.3 Battery Technical Data

Name	Qty.	Manufacture	Description
Rechargeable Li-ion	1	Huawei Technologies Co., Ltd.	Battery Model: HB5V1HV Rated capacity: 1950mAh Nominal Voltage: ⎓ +3.7V Charging Voltage: ⎓ +4.2V

Name	Qty.	Manufacture	Description
Rechargeable Li-ion	1	Huawei Technologies Co., Ltd.	Battery Model: HB5V1 Rated capacity: 1730mAh Nominal Voltage: ⎓ +3.7V Charging Voltage: ⎓ +4.2V

Note: The test results and plot for “HB5V1HV ” showed as below is the WORST case for all Test Modes and Channels.

6 Main Test Instruments

Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Power supply	KEITHLEY	2303	1288003	Sept., 27, 2013
Wireless Communication Test set	Agilent	N4010A	MY49081592	Nov., 26, 2013
Spectrum Analyzer	Agilent	E4440A	MY48250119	Jul., 17, 2013
Signal Analyzer	R&S	FSQ31	200021	Sept., 27, 2013
Spectrum Analyzer	Agilent	N9030A	MY49431698	Oct., 16, 2013
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
EMI Test receiver	R&S	ESCI	101163	Mar. 05, 2013
Artificial Mains Network	R&S	ENV216	100382	Mar.21, 2013
LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100263	Mar.10, 2013

Note: All the equipments are calibrated once a year. When it's almost due, we will arrange calibration again before the calibration deadline.

7 Transmitter Measurements

7.1 Bandwidth measurement

7.1.1 Test Conditions

Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	55%
Test Configurations:	TM1/TM2 at channel No.0, 40, 78

7.1.2 Test Specifications and Limits

7.1.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (1) and DA 00-705

7.1.2.2 Supporting Standards

Supporting Standards:

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

7.1.2.3 Limits

Not Applicable.

7.1.3 Test Method and Setup

(a) Connect EUT test port to universal communication tester.
(b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function, then set the measured frequency number and test the bandwidth with universal communication tester.

Test setup

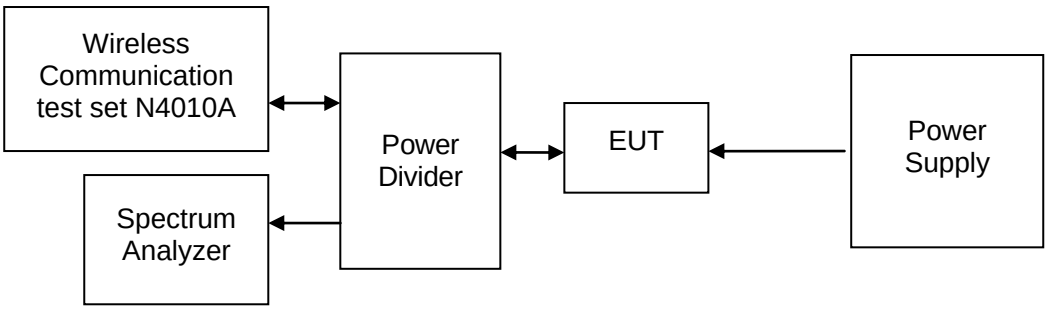


Figure 1. Test Set-up

7.1.4 Measurement Results

Measurement Results TM1（Modulation: π /4-DQPSK）

Channel Position	Channel Number	Frequency [MHz]	Bandwidth Type	Measured Bandwidth [MHz]	Result
L	0	2402	20dB	1.277	Pass
			99%	1.181	Pass
M	40	2442	20dB	1.306	Pass
			99%	1.185	Pass
H	78	2480	20dB	1.326	Pass
			99%	1.183	Pass

Measurement Results TM2（Modulation: 8DPSK）

Channel Position	Channel Number	Frequency [MHz]	Bandwidth Type	Measured Bandwidth [MHz]	Result
L	0	2402	20dB	1.278	Pass
			99%	1.188	Pass
M	40	2442	20dB	1.284	Pass
			99%	1.179	Pass
H	78	2480	20dB	1.290	Pass
			99%	1.189	Pass

7.1.5 Conclusion

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

7.2 Carrier frequency separation measurement

7.2.1 Test Conditions

Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	55%
Test Configurations:	TM1/TM2 at channel No.39, 40, 41

7.2.2 Test Specifications and Limits

7.2.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (1) and DA 00-705

7.2.2.2 Supporting Standards

Supporting Standards:

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

7.2.2.3 Limits

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Limits TM1（Modulation: π/4-DQPSK）

Regulation:	≥ 0.025 or 2/3 of the 20 dB bandwidth
Limit:	≥ 2/3 × 1.326M = 0.884 MHz

Limits TM2（Modulation: 8DPSK）

Regulation:	≥ 0.025 or 2/3 of the 20 dB bandwidth
Limit:	≥ 2/3 × 1.290M = 0.860 MHz

7.2.3 Test Method and Setup

(a) Connect EUT test port to spectrum analyzer and universal communication tester.
(b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function, then set the measured frequency number to two adjacent channels separately and test the carrier frequency separation with spectrum analyzer.

Test setup

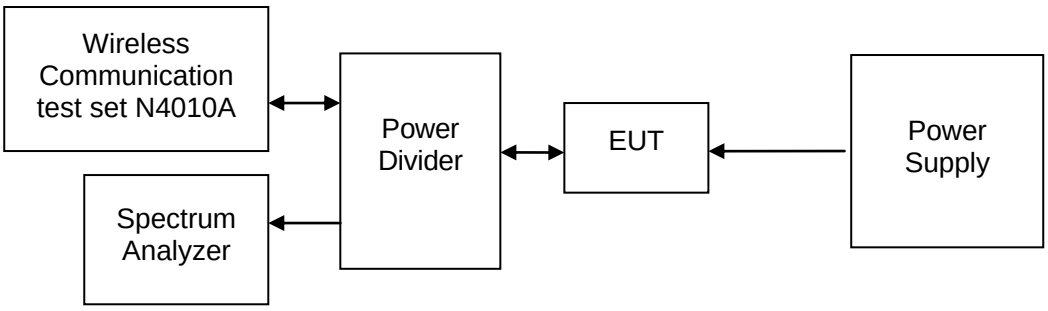


Figure 2. Test Set-up

7.2.4 Measurement Results

Measurement Results TM1（Modulation: π /4-DQPSK）

Channel No.	Frequency [MHz]	Channel No.	Frequency [MHz]	Measured frequency separation [MHz]	Limit [MHz]	Result
40	2442	39	2441	1.009	≥0.884	Pass
40	2442	41	2443	0.969	≥0.884	Pass

Measurement Results TM2（Modulation: 8DPSK）

Channel No.	Frequency [MHz]	Channel No.	Frequency [MHz]	Measured frequency separation [MHz]	Limit [MHz]	Result
40	2442	39	2441	1.000	≥0.860	Pass
40	2442	41	2443	1.050	≥0.860	Pass

7.2.5 Conclusion

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

7.3 Number of hopping channel

7.3.1 Test Conditions

Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	55%
Test Configurations:	TM1/TM2 at hopping frequency state

7.3.2 Test Specifications and Limits

7.3.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (1) iii and DA 00-705

7.3.2.2 Supporting Standards

Supporting Standards:

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

7.3.2.3 Limits

Number of hopping channel should be compliance with the requirements in part15.247 (a) (1) iii.

Limits

Limits	≥ 15 hopping frequency channel

7.3.3 Test Method and Setup

(a) Connect EUT test port to spectrum analyzer and universal communication tester.
(b) Set the EUT to transmit maximum output power at 2.4GHz and switch on frequency hopping function, then set enough count time (larger than 5000 times) to get all the hopping frequency channel displayed on the screen of spectrum analyzer.
(c) Count the quantity of peaks to get the number of hopping channels.

Test setup

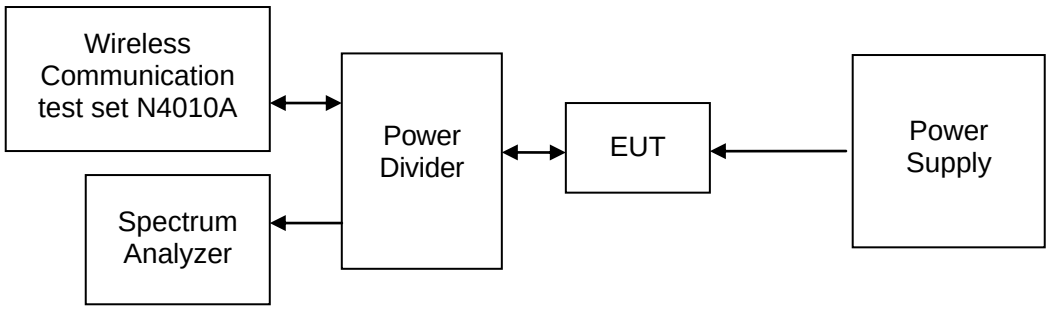


Figure 3. Test Set-up

7.3.4 Measurement Results

Measurement Results TM1（Modulation: π /4-DQPSK）

Measured frequency range [MHz]	Channel No. range	Measured Channel No.	Limit	Result
2400 to 2483.5	0-78	79	≥ 15	Pass

Measurement Results TM2（Modulation: 8-DPSK）

Measured frequency range [MHz]	Channel No. range	Measured Channel No.	Limit	Result
2400 to 2483.5	0-78	79	≥ 15	Pass

7.3.5 Conclusion

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

7.4 Time of occupancy

7.4.1 Test Conditions

Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1/TM2 at hopping frequency state

7.4.2 Test Specifications and Limits

7.4.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (1) iii and DA 00-705

7.4.2.2 Supporting Standards

Supporting Standards:

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

7.4.2.3 Limits

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Limits

Limits for time of occupancy	≤ 0.4s

7.4.3 Test Method and Setup

(a) Connect EUT test port to spectrum analyzer and universal communication tester.
(b) Set the EUT to transmit maximum output power at 2.4GHz and switch on frequency hopping function.
(c) Set the span of spectrum analyzer to 0 Hz, and set the resolution bandwidth to1 MHz and the video bandwidth to 1 MHz, then get the time domain measured diagram. Set sweep time to 2 times of one burst occupancy time, and measure the time of occupancy of one burst.
(d) Set the resolution bandwidth to1 MHz and the video bandwidth to 3 MHz, and set the sweep time to a period (0.4 seconds multiplied by the number of hopping channels employed), and count the number of the bursts.
(e) Calculate the time of occupancy in a period with time occupancy of a burst and quantity of bursts.

Test setup

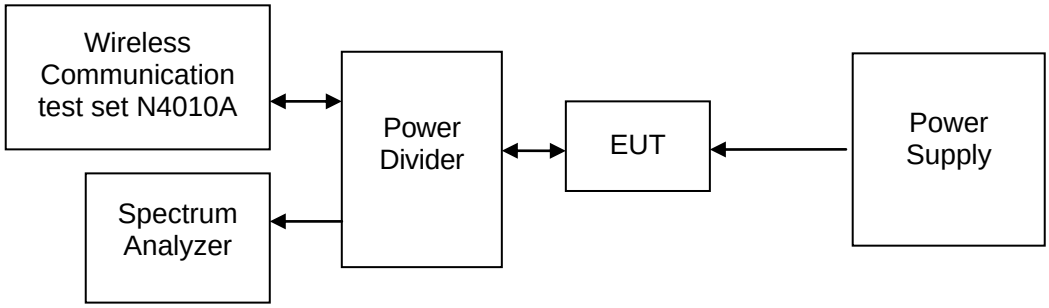


Figure 4. Test Set-up

7.4.4 Measurement Results

Measurement Results TM1（Modulation: π /4-DQPSK）

Time of Single Slot [ms]	Numbers of slots in a period	Time of occupied in a period [s]	Limit [s]	Result
2.9	106.7	0.30943	≤ 0.4	Pass

Measurement Results TM2（Modulation: 8DPSK）

Time of Single Slot [ms]	Numbers of slots in a period	Time of occupied in a period [s]	Limit [s]	Result
2.9	106.7	0.30943	≤ 0.4	Pass

Note: The result is measured at 2-DH5\3-DH5 mode in π /4-DQPSK\8DPSK modulation, which has the longest time in one transmission burst.

7.4.5 Conclusion

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

7.5 Peak output power

7.5.1 Test Conditions

Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	55%
Test Configurations:	TM1/TM2 at channel No.0, 40, 78

7.5.2 Test Specifications and Limits

7.5.2.1 Specification

CFR 47 (FCC) part 15.247 (b) (1) and DA 00-705

7.5.2.2 Supporting Standards

Supporting Standards:

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

7.5.2.3 Limits

Comply with part 15.247 (b) (1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watt.

Limits

2.4GHz and 5.8GHz hopping frequency system	1 Watt (=30 dBm)

7.5.3 Test Method and Setup

(a) Connect EUT test port to universal communication tester.
(b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
(c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted output power separately.

Test setup

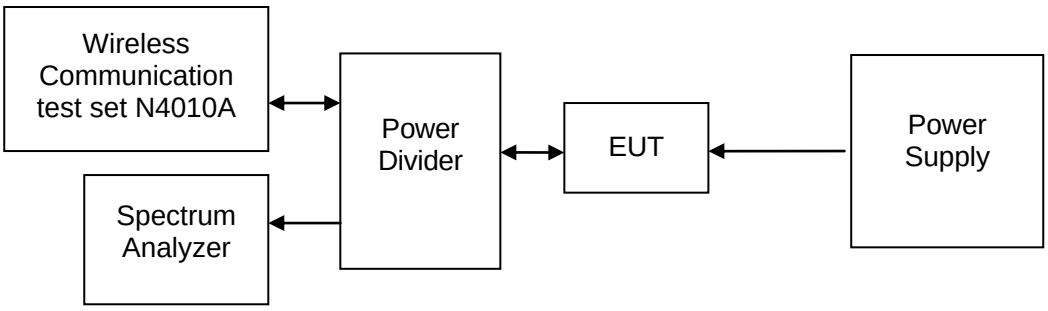


Figure 5. Test Set-up

7.5.4 Measurement Results

Measurement Results TM1（Modulation: π /4-DQPSK）

Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
L	0	2402	8.80	< 30	Pass
M	40	2442	9.61	< 30	Pass
H	78	2480	8.93	< 30	Pass

Measurement Results TM2（Modulation: 8DPSK）

Channel	Channel No.	Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
L	0	2402	9.13	< 30	Pass
M	40	2442	9.92	< 30	Pass
H	78	2480	9.20	< 30	Pass

7.5.5 Conclusion

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

7.6 Band edge spurious emission

7.6.1 Test Conditions

Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25°C
Relative humidity:	55%
Test Configurations:	TM1/TM2 at channel No. 0, 78 and frequency hopping state

7.6.2 Test Specifications and Limits

7.6.2.1 Specification

CFR 47 (FCC) part 15.247 (d) and DA 00-705

7.6.2.2 Supporting Standards

Supporting Standards:

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

7.6.2.3 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.
.

Limits

Band edge spurious:	20 dBc/100kHz

7.6.3 Test Method and Setup

(a) Connect EUT test port to spectrum analyzer and universal communication tester
(b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
(c) Then set the EUT to transmit at high, low frequency and measure the conducted band edge spurious separately.
(d) Switch on the frequency hopping function, and repeat above measurement.

Test setup

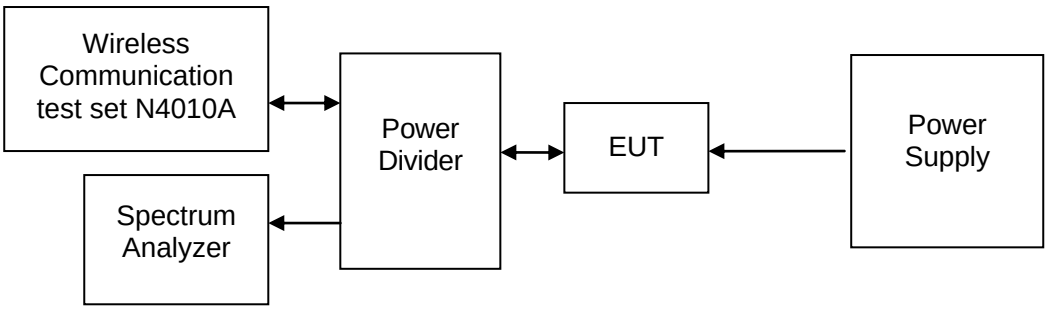


Figure 6. Test Set-up

7.6.4 Measurement Results

Measurement Results for Band Edge immediately outside the 2.4GHz Band

TM1（Modulation: π /4-DQPSK）

	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
Low Edge	0	2402	6.80	Off	-50.65	-13.2	Pass
	-	-	5.64	On	-53.90	-14.4	Pass
High Edge	78	2480	7.92	Off	-53.87	-12.1	Pass
	-	-	6.71	On	-52.85	-13.3	Pass

Measurement Results for Band Edge immediately outside the 2.4GHz Band

TM2（Modulation: 8DPSK）

	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
Low Edge	0	2402	6.73	Off	-50.73	-13.3	Pass
	-	-	6.59	On	-51.95	-13.4	Pass
High Edge	78	2480	7.94	Off	-54.03	-12.1	Pass
	-	-	7.44	On	-53.81	-12.6	Pass

7.6.5 Conclusion

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

7.7 Conducted RF Spurious

7.7.1 Test Conditions

Test Conditions

Preconditioning:	0.5 hour
Measured at:	Antenna connector
Ambient temperature:	25 °C
Relative humidity:	55%
Test Configurations:	TM1/TM2 at channel No.0, 40, 78

7.7.2 Test Specifications and Limits

7.7.2.1 Specification

CFR 47 (FCC) part 15.247 (d) and DA 00-705

7.7.2.2 Supporting Standards

Supporting Standards:

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

7.7.2.3 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.
.

Limits

Band edge spurious:	20 dBc/100kHz

7.7.3 Test Method and Setup

(a) Connect EUT test port to spectrum analyzer and universal communication tester
(b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
(c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted band edge spurious separately.
(d) Switch on the frequency hopping function, and repeat the above measurement.

Test setup

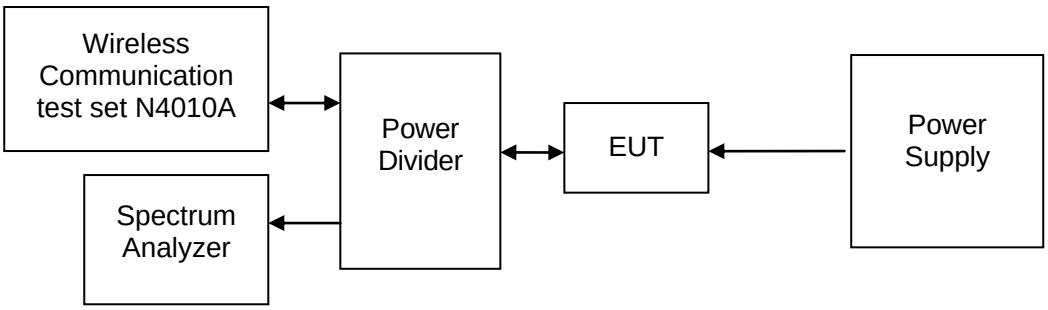


Figure 7. Test Set-up

7.7.4 Measurement Results

Measurement Results TM1（Modulation：π /4-DQPSK）

Test Frequency Range	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
9kHz-25GHz	0	2402	3.70	Off	-42.35	-16.3	Pass
9kHz-25GHz	40	2442	6.51	Off	-46.60	-13.5	Pass
9kHz-25GHz	78	2480	6.44	Off	-47.05	-13.6	Pass

Measurement Results TM2 （Modulation：8DPSK）

Test Frequency Range	Channel No.	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max. Spurious Level [dBm]	Limit [dBm]	Result
9kHz-25GHz	0	2402	6.28	Off	-42.00	-13.7	Pass
9kHz-25GHz	40	2442	6.58	Off	-46.78	-13.4	Pass
9kHz-25GHz	78	2480	7.54	Off	-46.77	-12.5	Pass

7.7.5 Conclusion

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

7.8 Radiated spurious emission & spurious in restricted band

7.8.1 Test Conditions

Test Conditions

Preconditioning:	0.5 hour
Measured at:	Enclosure
Ambient temperature:	25 °C
Relative humidity:	55 %
Test Configurations:	TM1/TM2 at channel No.0, 40, 78

7.8.2 Test Specifications and Limits

7.8.2.1 Specification

CFR 47 (FCC) part 15.247 (d), 15.205 & 15.209 and DA 00-705

7.8.2.2 Supporting Standards

Supporting Standards:

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

7.8.2.3 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.

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) (see above table).

7.8.3 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 transmits maximum output power at 2.4GHz and switch off frequency hopping function.

Measurement bandwidth: 30 MHz - 1000 MHz: 120 kHz
Measurement bandwidth: 1000 MHz - 10th Carrier Frequency: 1 MHz

Test set up

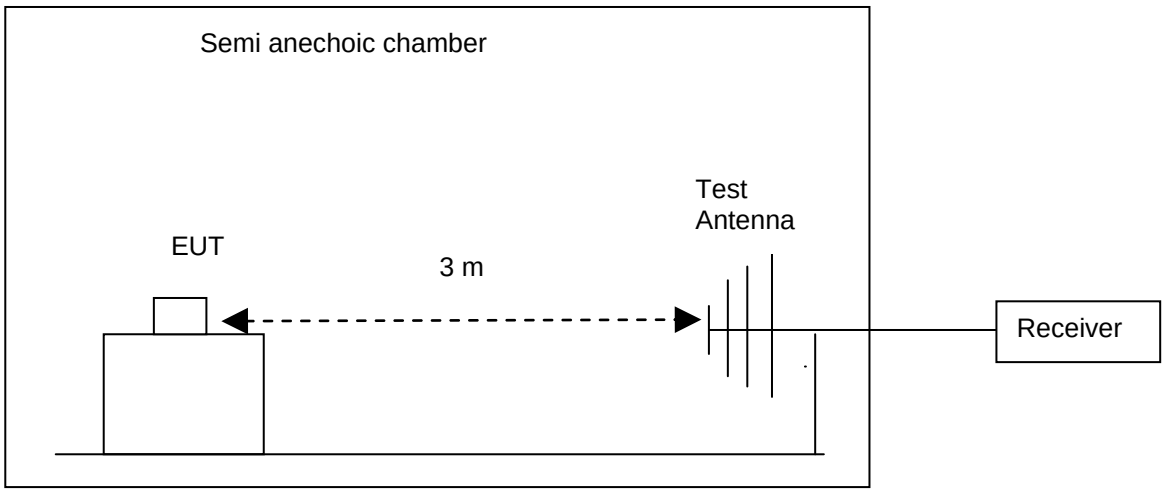


Figure 8. Test Set up

7.8.4 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 Frequency Range	Channel No.	Carrier Frequency [MHz]	Measured	Result
30MHz-26.5GHz	0	2402	Refer to Appendix H	Pass
30MHz-26.5GHz	40	2442	Refer to Appendix H	Pass
30MHz-26.5GHz	78	2480	Refer to Appendix H	Pass

7.8.5 Conclusion

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

7.9 Conducted Emission at Power Port

7.9.1 Test Conditions

Test Conditions

Preconditioning:	0.5 hour
Measured at:	Power port
Ambient temperature:	25°C
Relative humidity:	55 %
Test Configurations:	TM1/TM2 at channel No. 40

7.9.2 Test Specifications and Limits

7.9.2.1 Specification

CFR 47 (FCC) part 15.207 and DA 00-705

7.9.2.2 Supporting Standards

Supporting Standards:

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

7.9.2.3 Limits

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

Limits

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

Note: * Decreases with the logarithm of the frequency.

7.9.3 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 EUT to transmitter the maximum power which defined in specification of product. The EUT operated on the typical channel.

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

The test voltage is voltage is 120V/60Hz.

Test Set-up

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

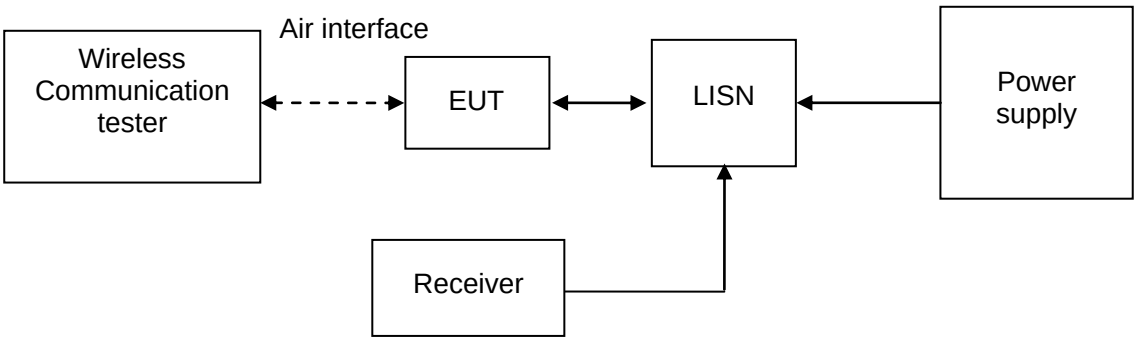


Figure 9. Test Set-up

7.9.4 Measurement Results

MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.274278	44.0	9.7	61.0	17.0	N	FLO
0.667298	45.6	9.7	56.0	10.4	N	FLO
0.804281	42.9	9.7	56.0	13.1	N	FLO
1.378954	41.2	9.7	56.0	14.8	N	FLO
1.881866	41.3	9.7	56.0	14.7	N	FLO
2.506306	41.6	9.7	56.0	14.4	N	FLO
6.224567	38.3	9.8	60	21.7	L1	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.346526	34.3	9.7	49.0	14.7	N	FLO
0.683190	37.9	9.7	46.0	8.1	N	FLO
1.375129	33.0	9.7	46.0	13.0	N	FLO
1.959851	31.7	9.7	46.0	14.3	N	FLO
3.100728	31.2	9.7	46.0	14.8	N	FLO
4.230330	32.6	9.8	46.0	13.4	L1	FLO

7.9.5 Conclusion

The equipment **PASSED** the requirement of this clause.

For the measurement results refer to appendix I.

8 System Measurement Uncertainty

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

System Measurement Uncertainty

Items		Extended Uncertainty
Bandwidth measurement	Magnitude (%)	U＝0.2%; k=2
Carrier frequency separation measurement	Magnitude (%)	U＝0.2%; k=2
Time of occupancy	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＝2.0dB; k=2
Radiated spurious emission & Radiated restricted band measurement	Field strength (dBμV/m)	U=2.2dB; k=2 U=5dB; k=2
Conducted emission test for power port	Disturbance Voltage(dBμV)	U=4dB; k=2

9 Appendices List

Appendix A	Measurement Results Bandwidth measurement
Appendix B	Measurement Results Carrier frequency separation measurement
Appendix C	Measurement Results Number of hopping channel
Appendix D	Measurement Results Time of occupancy
Appendix E	Measurement Results Peak output power
Appendix F	Measurement Results Band edge compliance measurement
Appendix G	Measurement Results Conducted RF spurious
Appendix H	Measurement Results Radiated spurious emission
Appendix I	Measurement Results Conducted emission test for power port
Appendix J	Photos of Test Setup

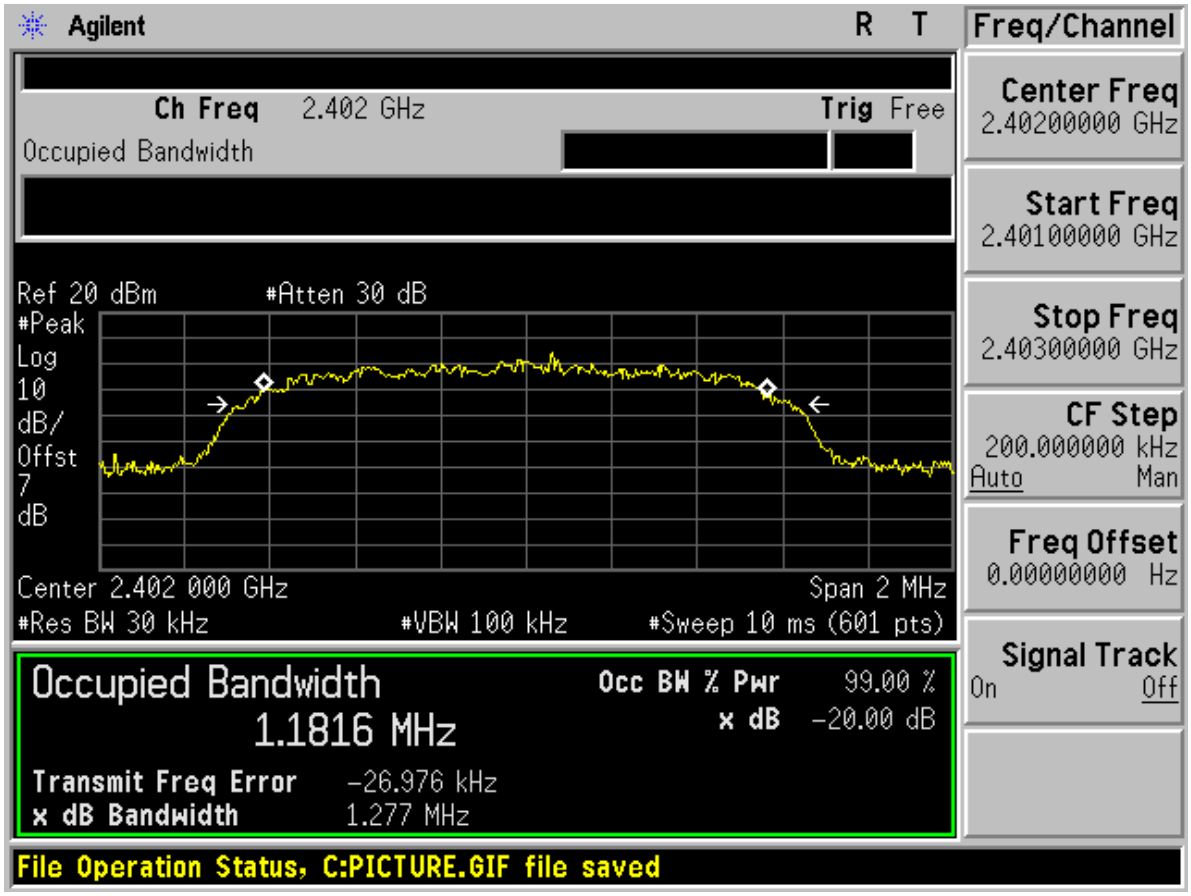
----------The END----------

Appendix A

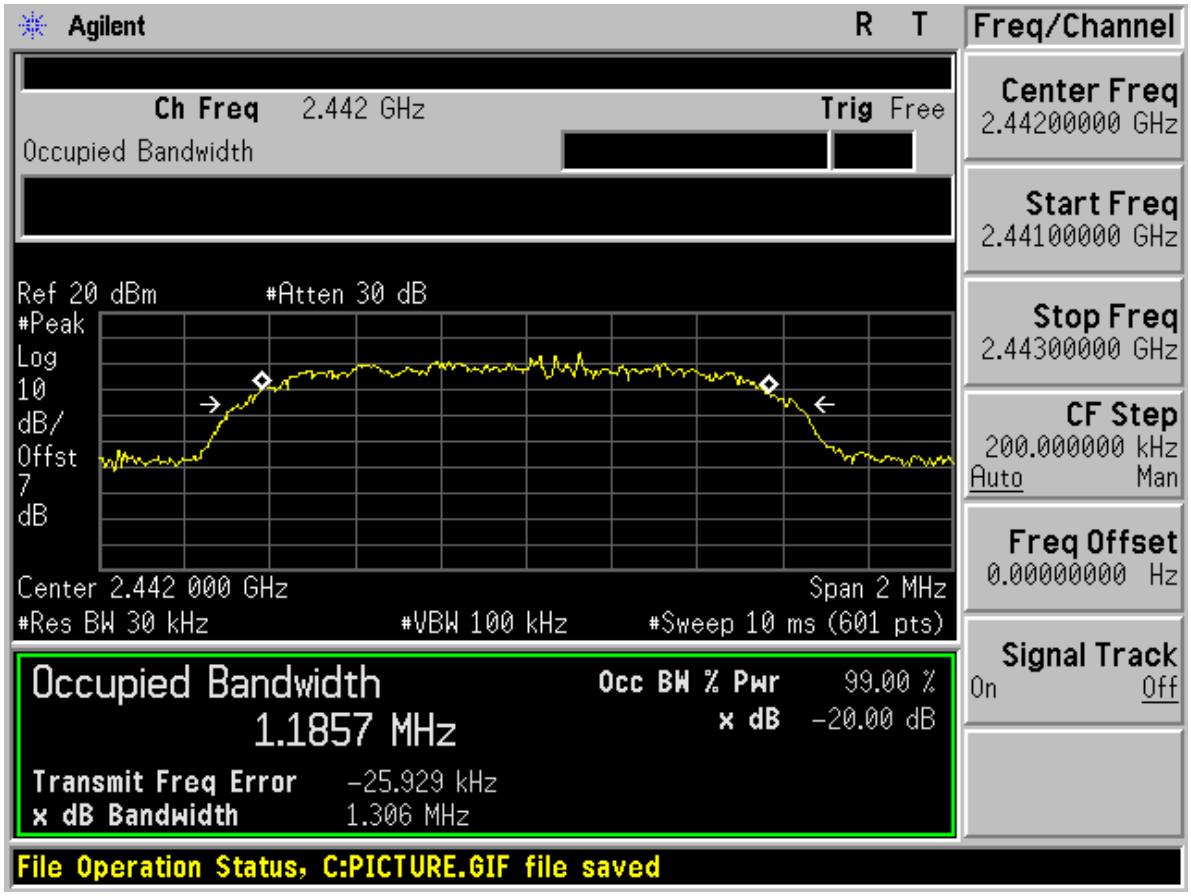
Bandwidth measurement

According to FCC Part 15.247 (a) (1)

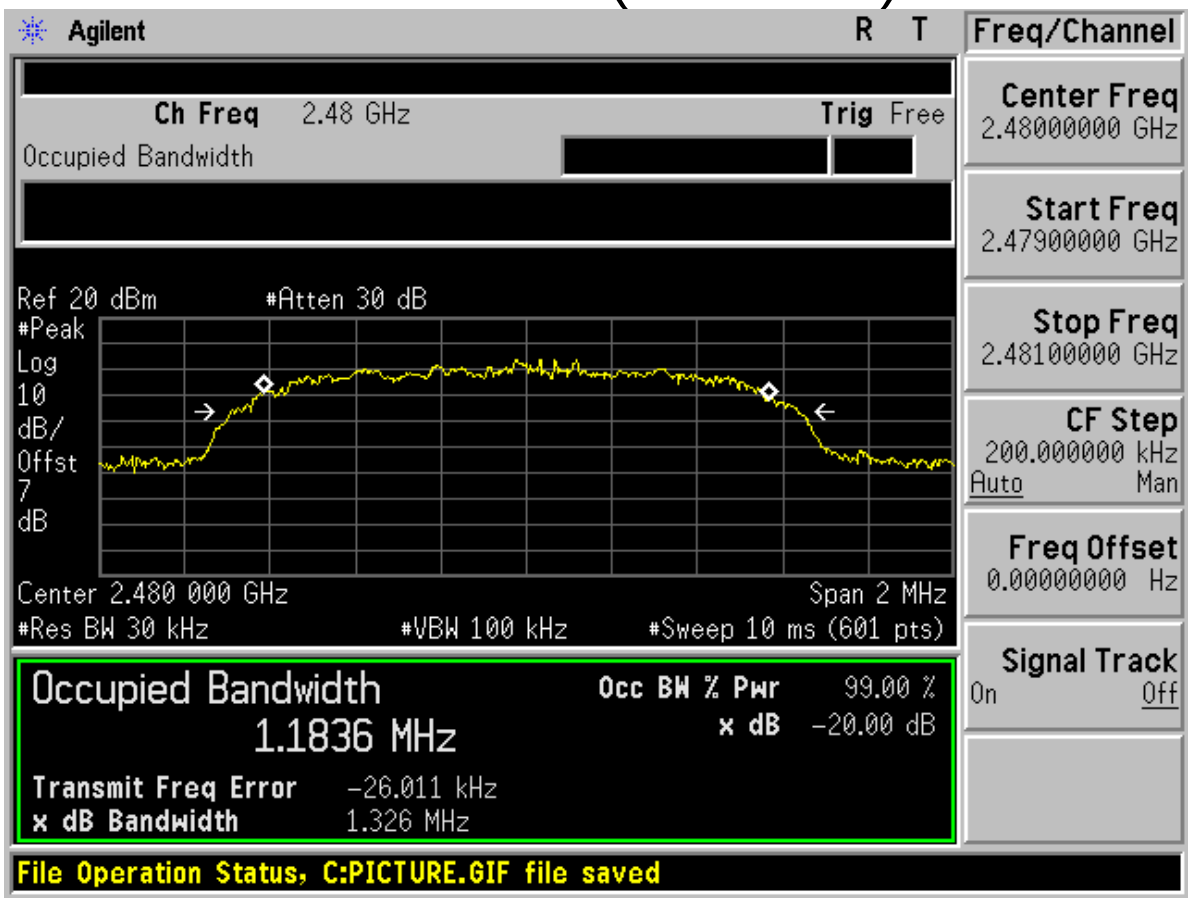
Modulation:π/4-DQPSK
Channel 0 (2402MHz)



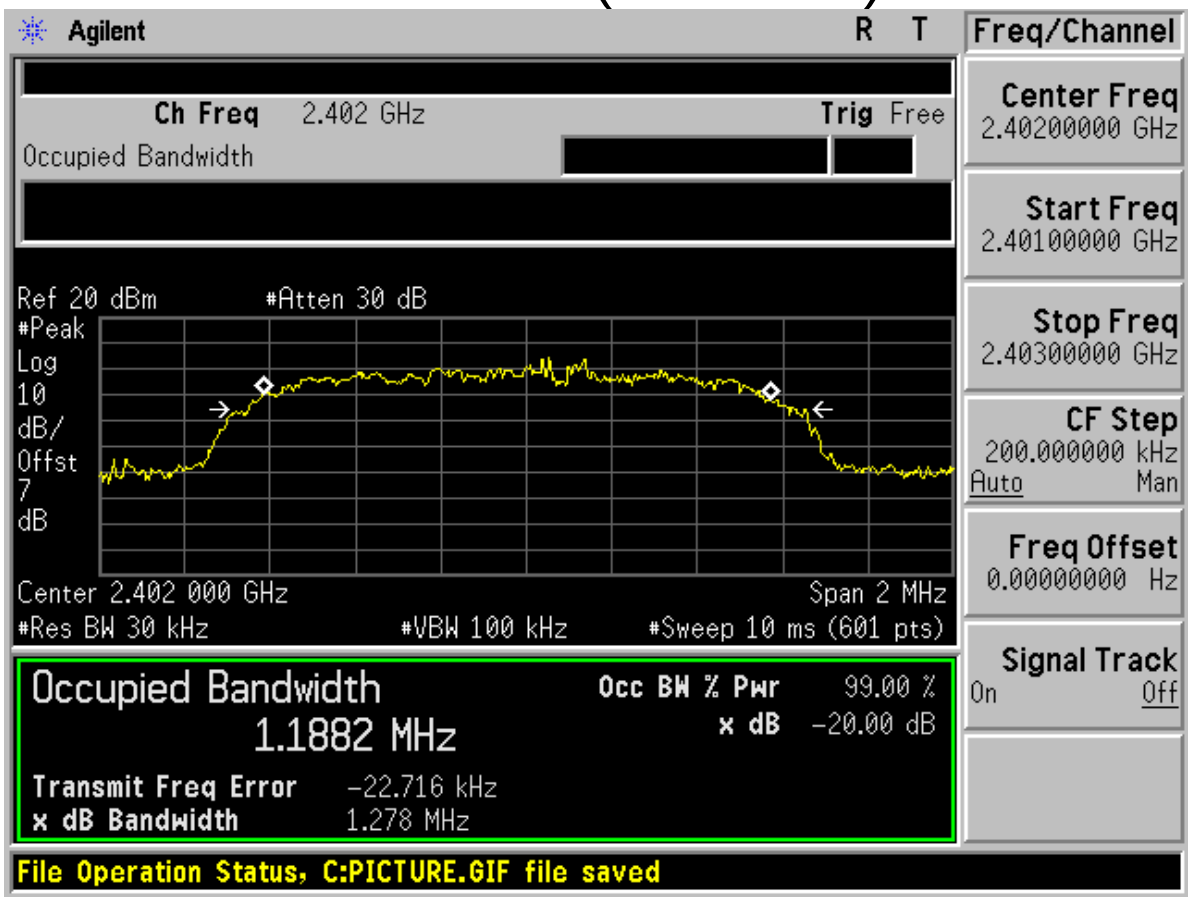
Channel 40 (2442MHz)



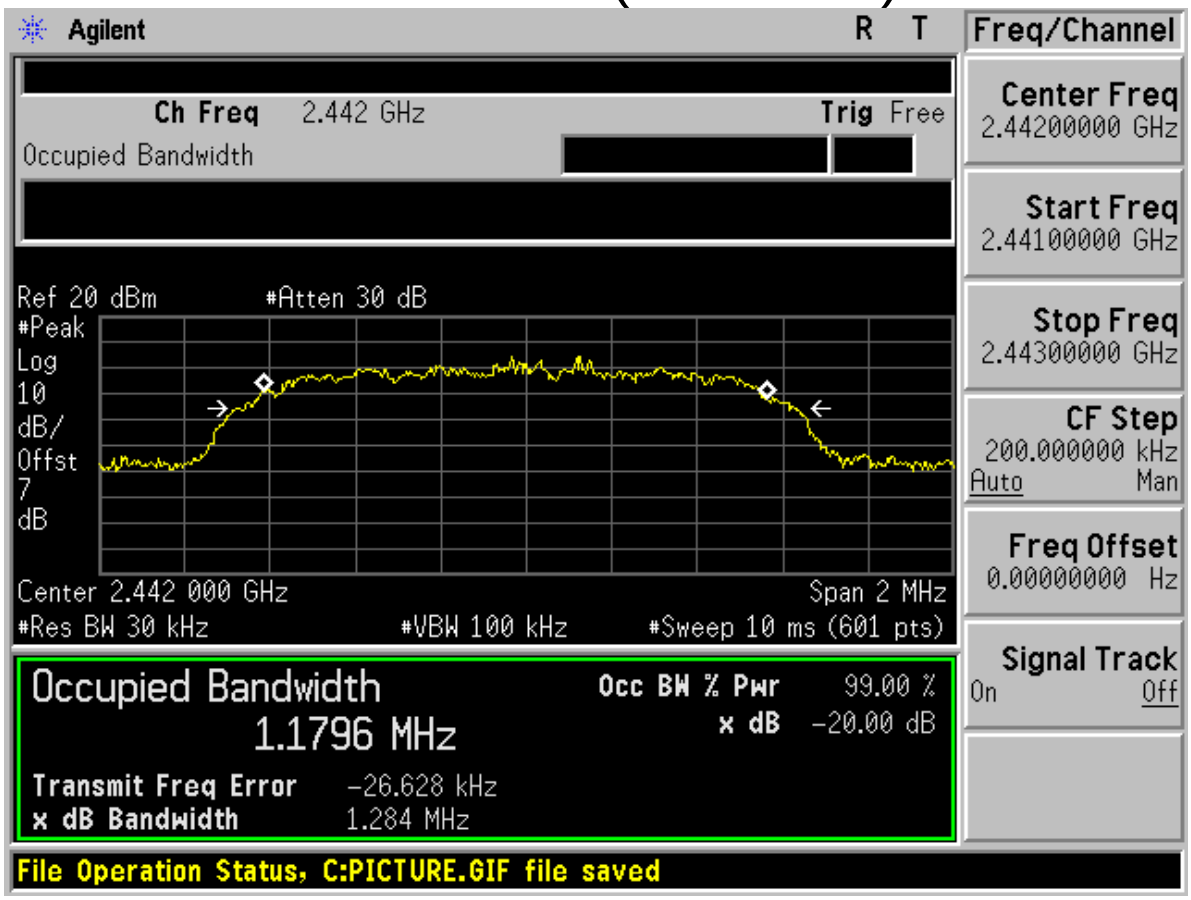
Channel 78 (2480MHz)



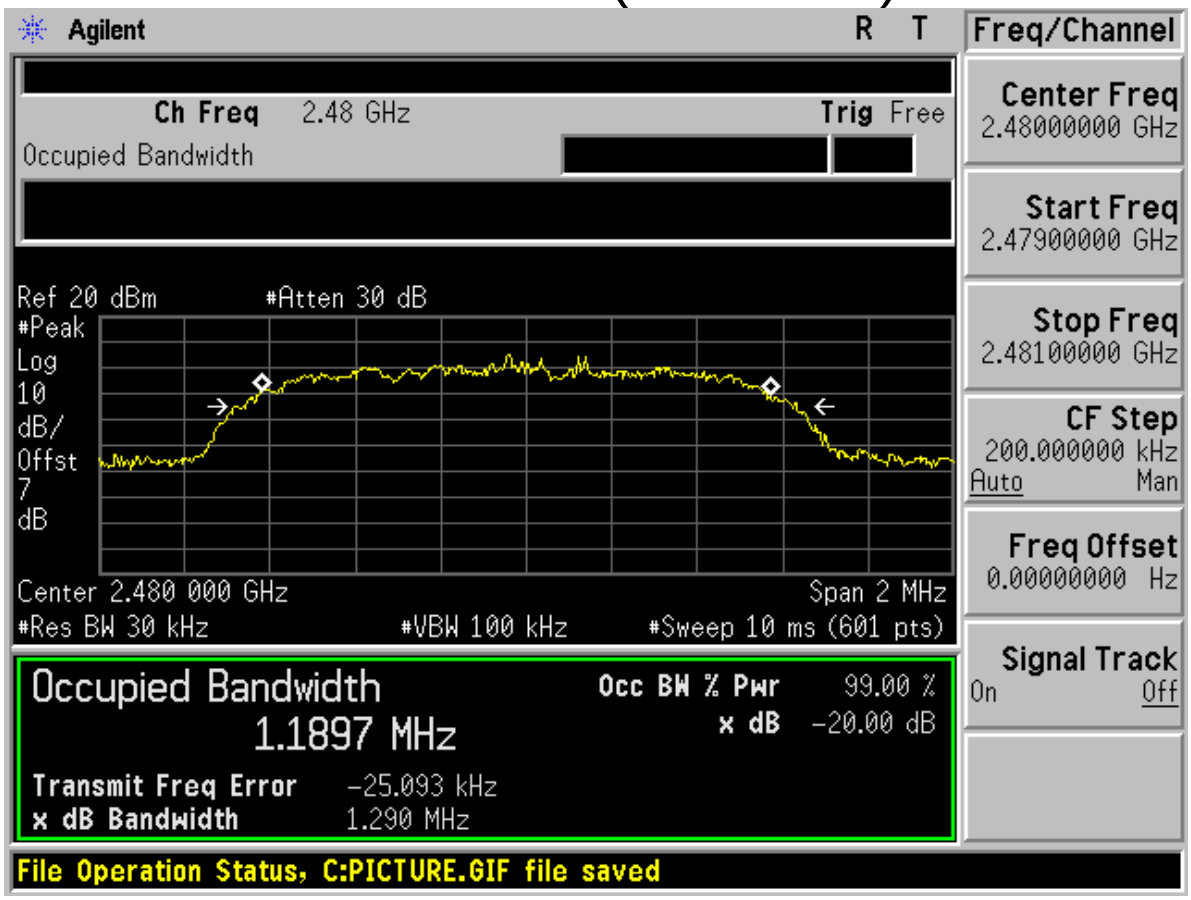
Modulation:8DPSK
Channel 0 (2402MHz)



Channel 40 (2442MHz)



Channel 78 (2480MHz)



----------The End ----------

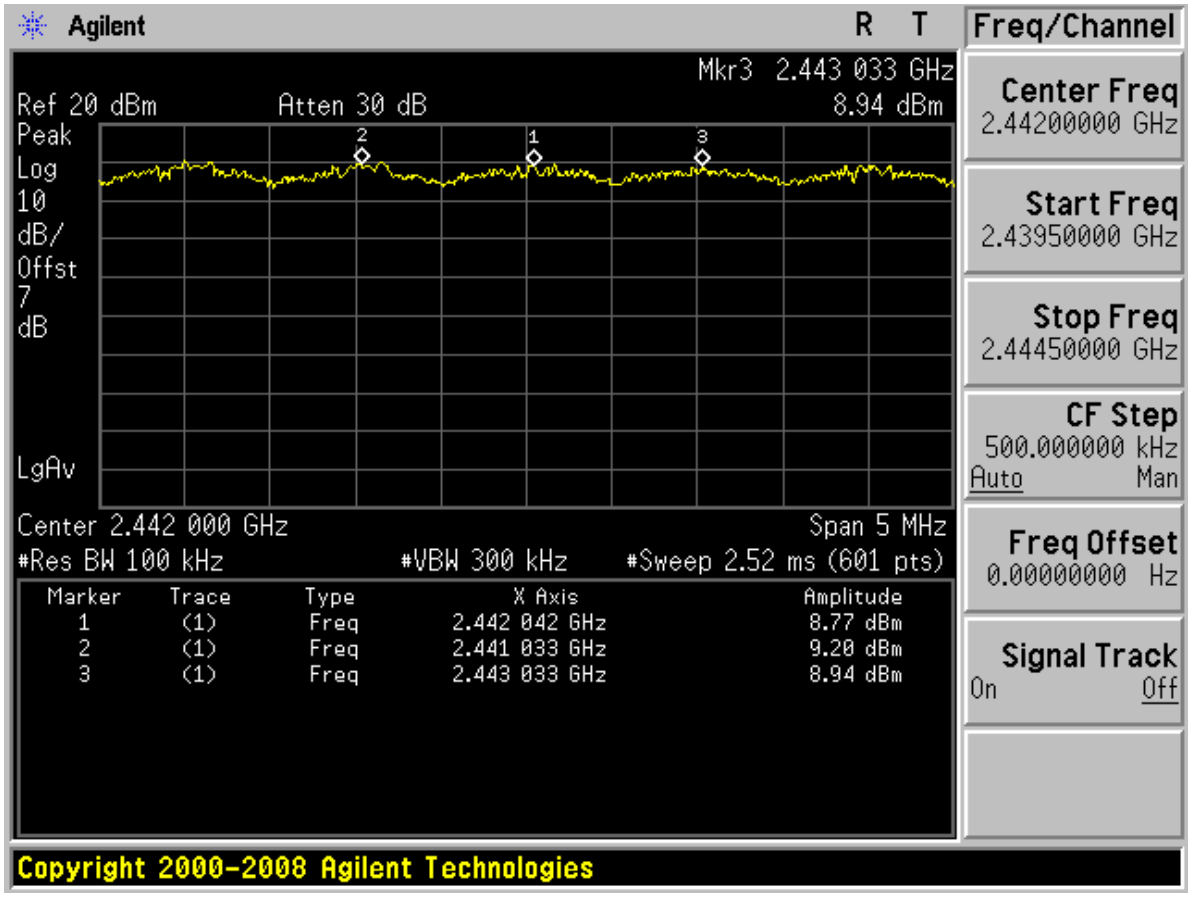
Appendix B

Carrier frequency separation measurement

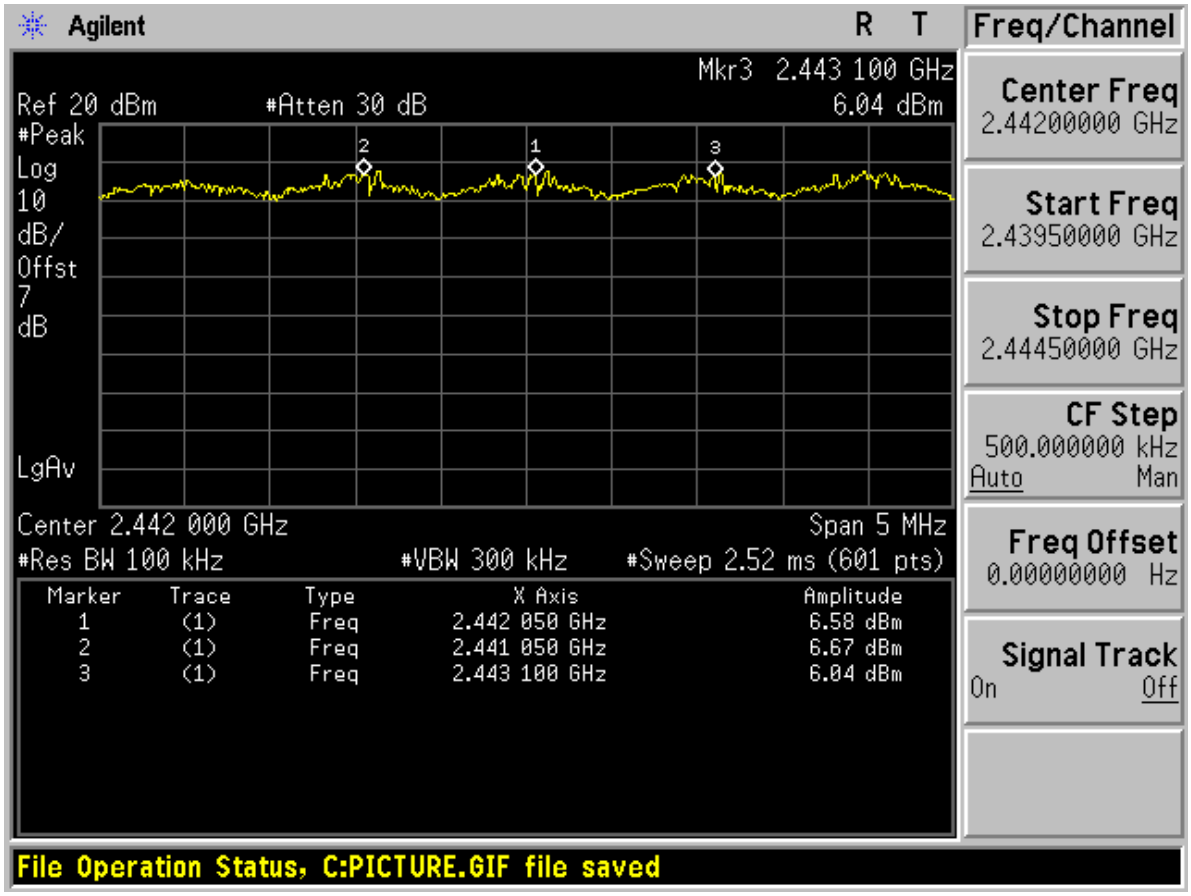
According to FCC Part 15.247 (a) (1)

Modulation:π/4-DQPSK

Centred at Channel 40



Modulation: 8DPSK
Centred at Channel 40



----------The End ----------

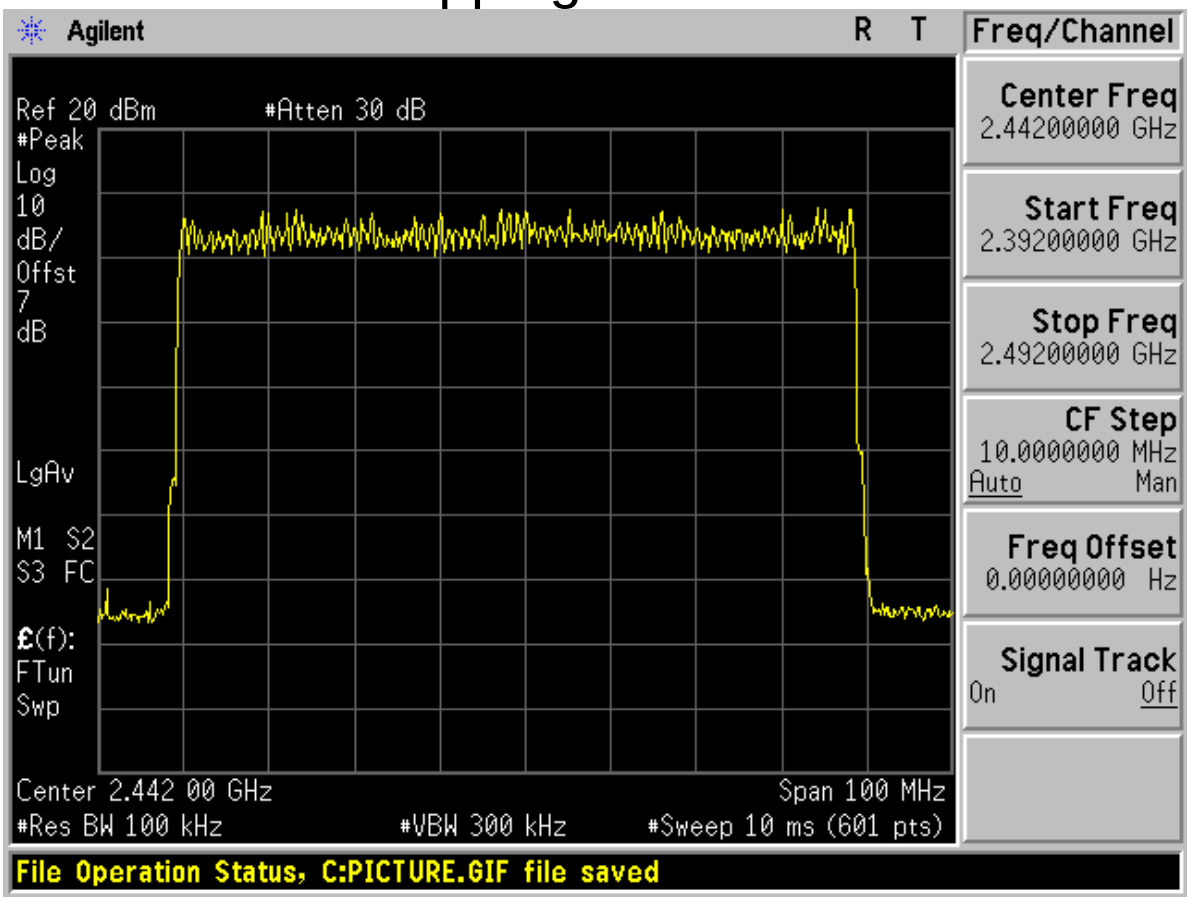
Appendix C

Number of hopping channel

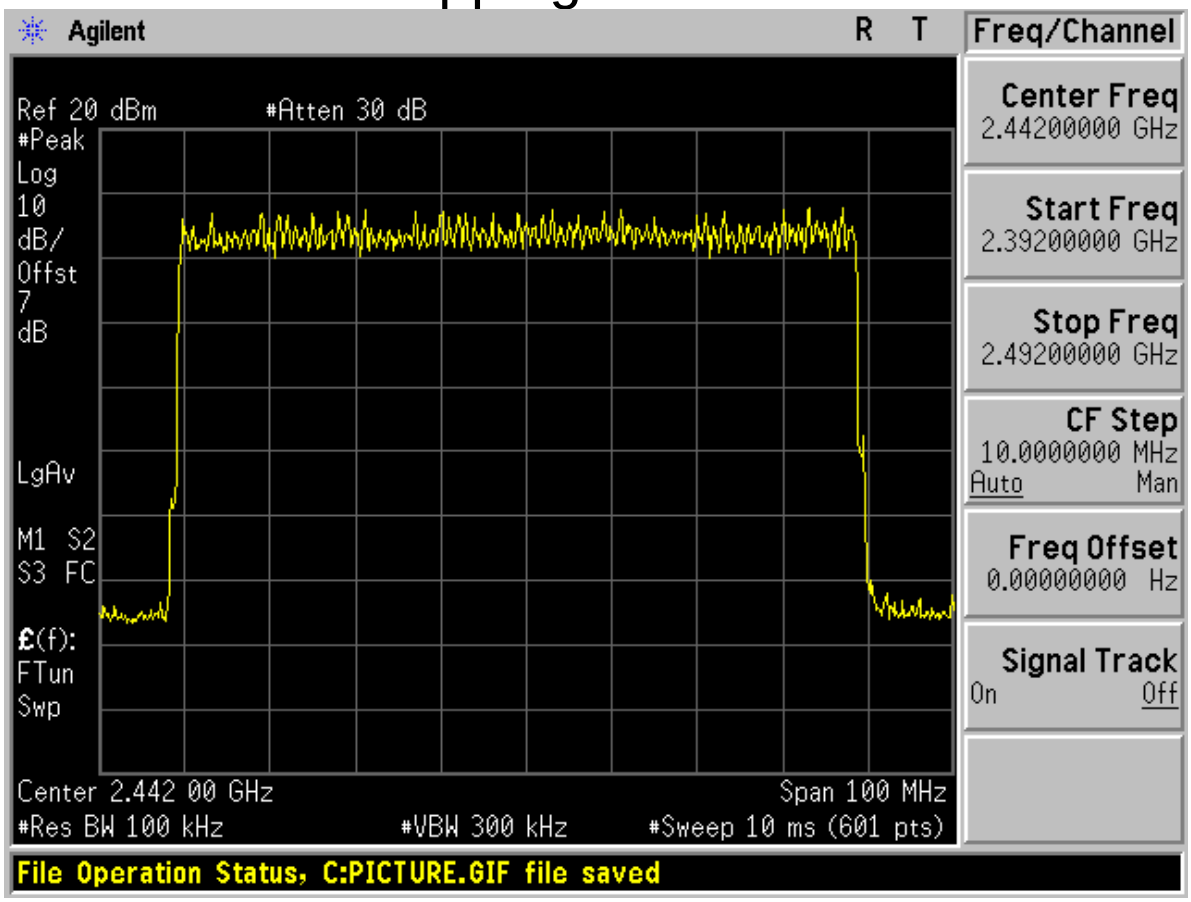
According to FCC Part 15.247 (a) (1) iii

Modulation:π/4-DQPSK

Total hopping channels = 79



Modulation:8DPSK
Total hopping channels = 79



----------The End ----------

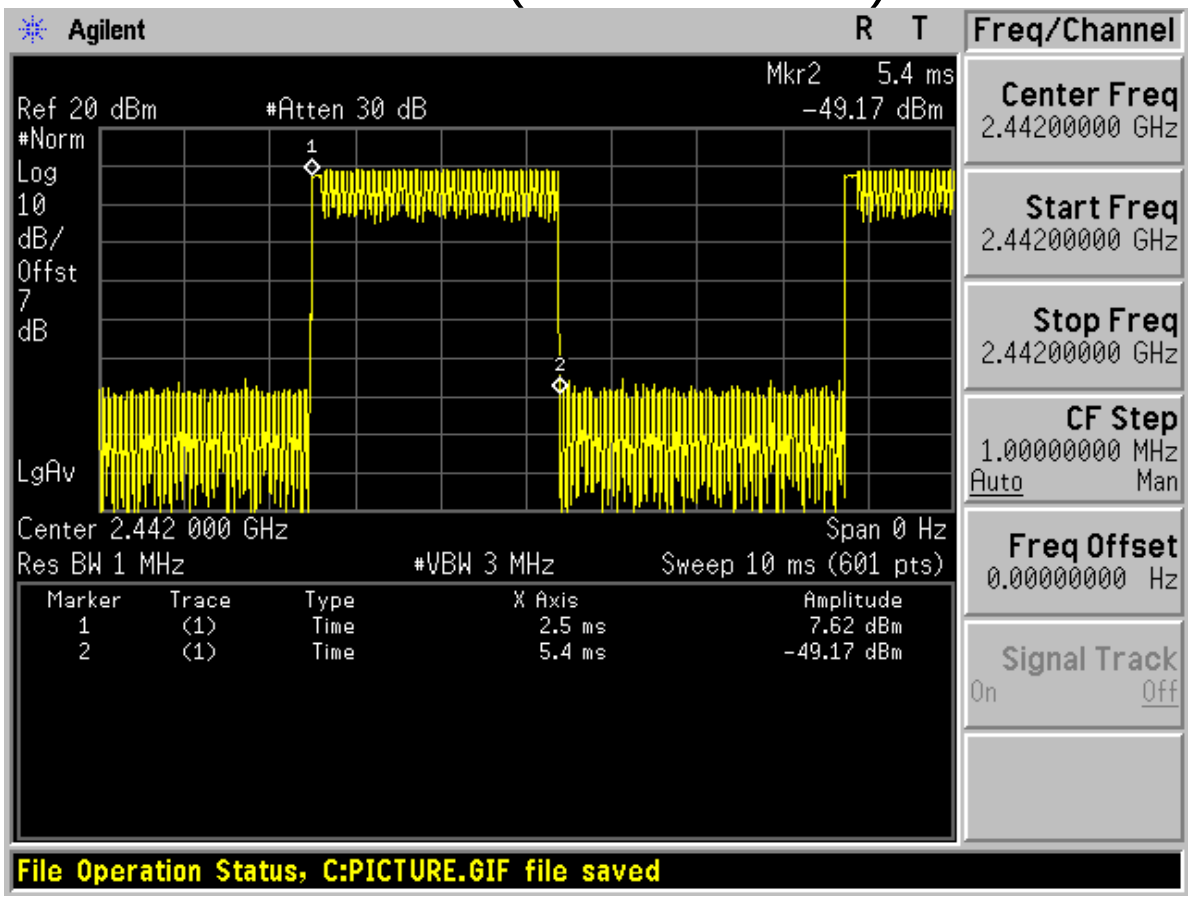
Appendix D

Time of occupancy

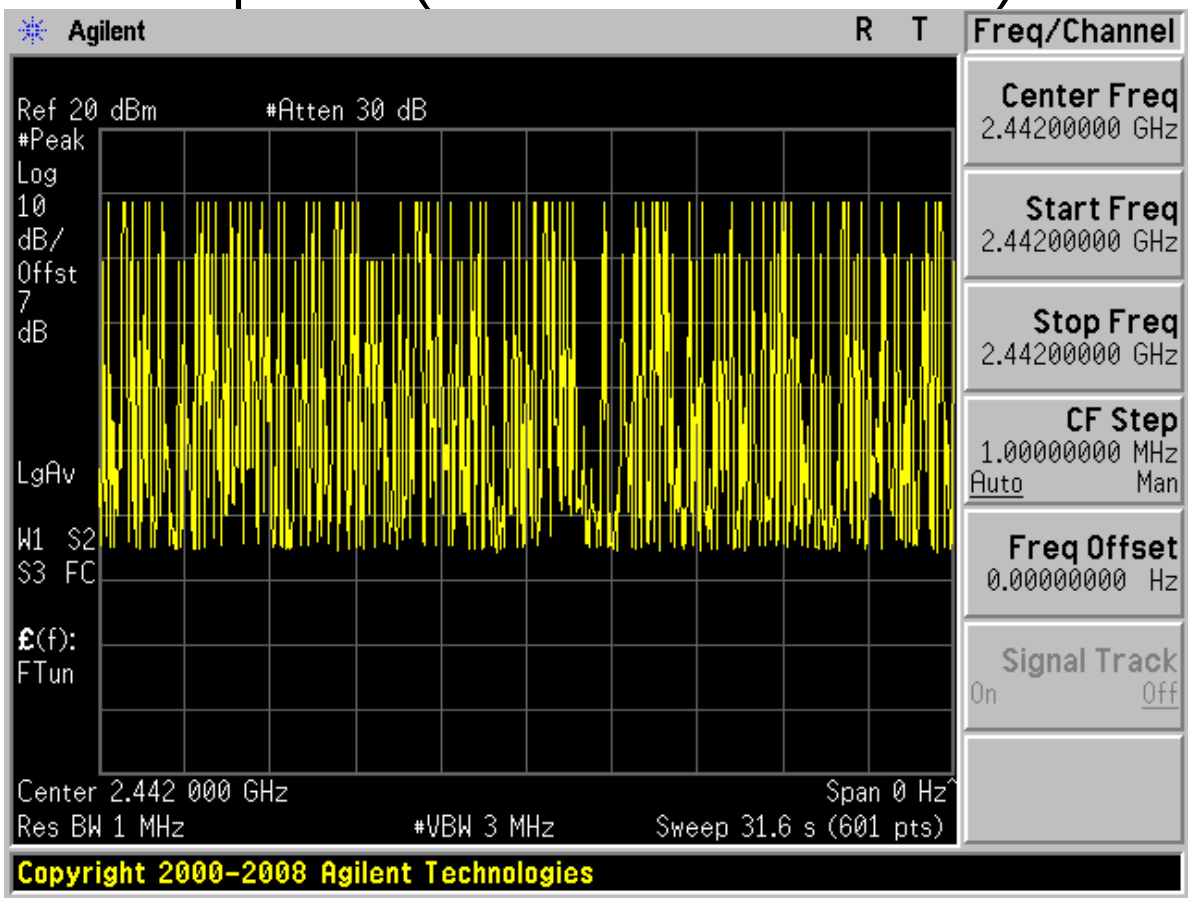
According to FCC Part 15.247 (a) (1) iii

Modulation: π/4-DQPSK

A burst (One time slot)

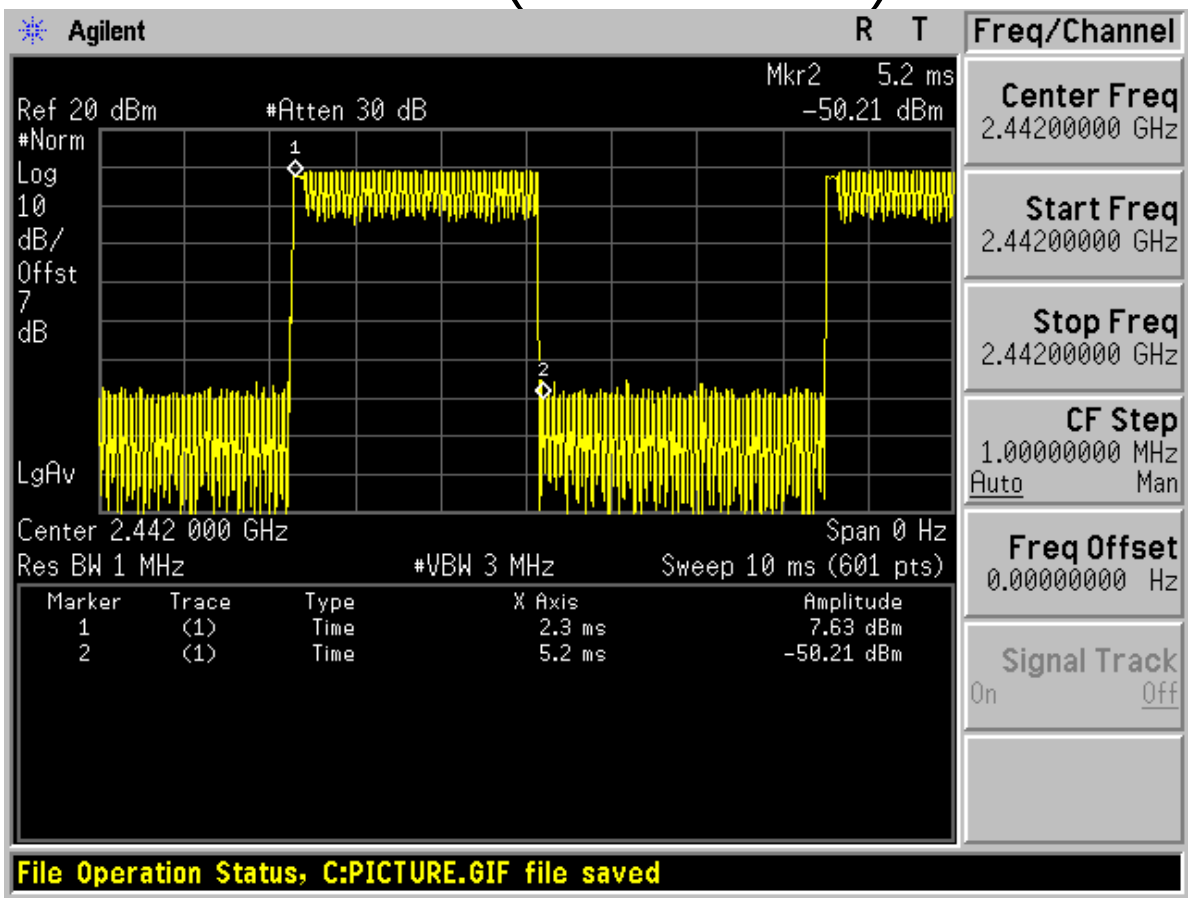


A period (Less than 106.7 burst)

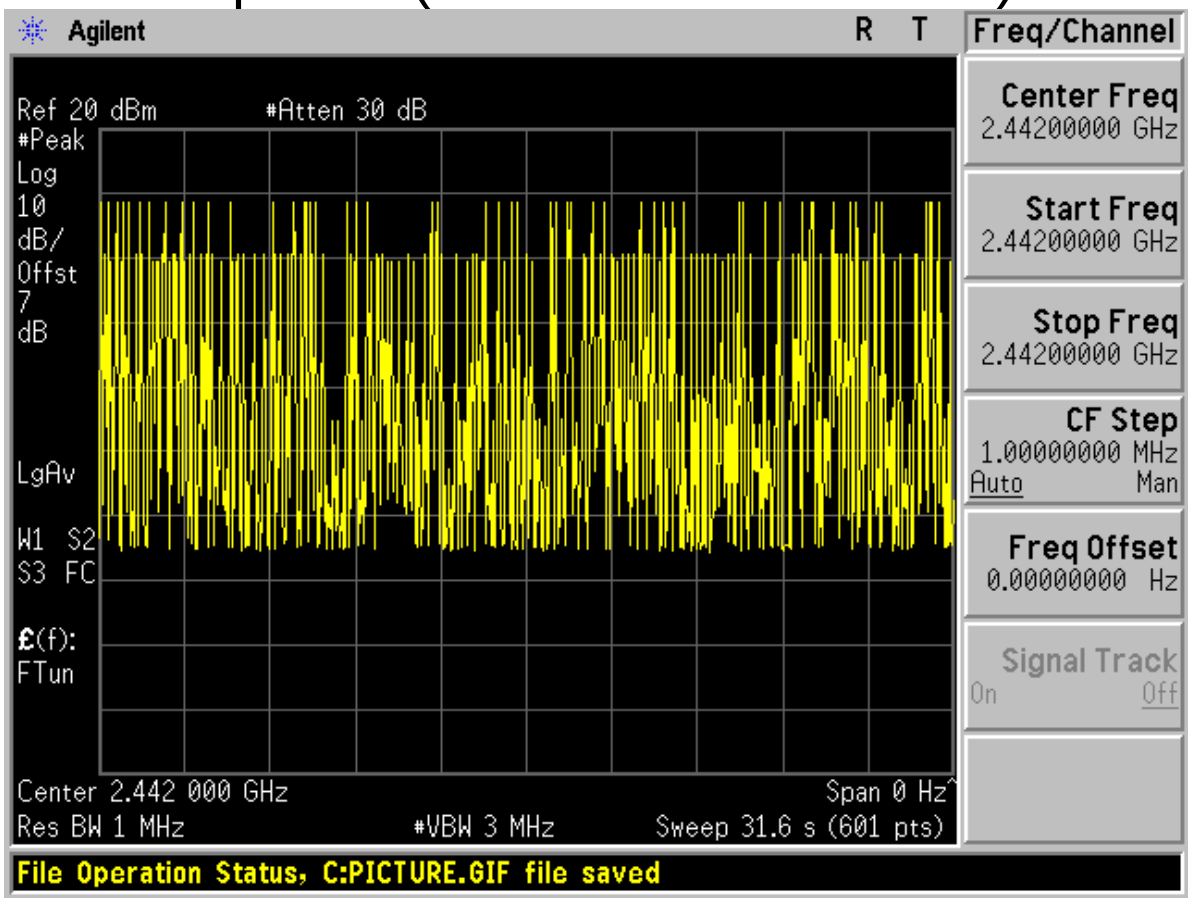


Modulation: 8DPSK

A burst (One time slot)



A period (Less than 106.7 burst)



----------The End ----------

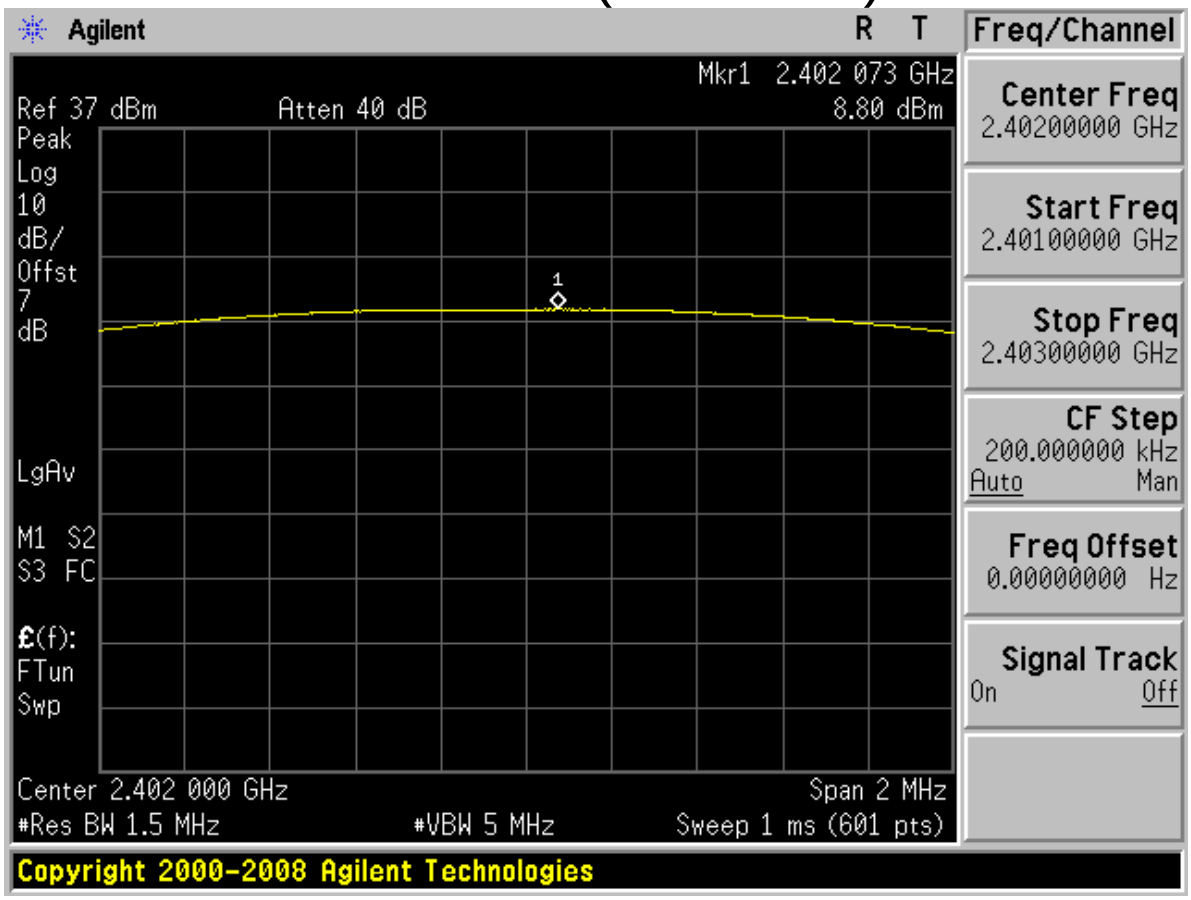
Appendix E

Peak output power

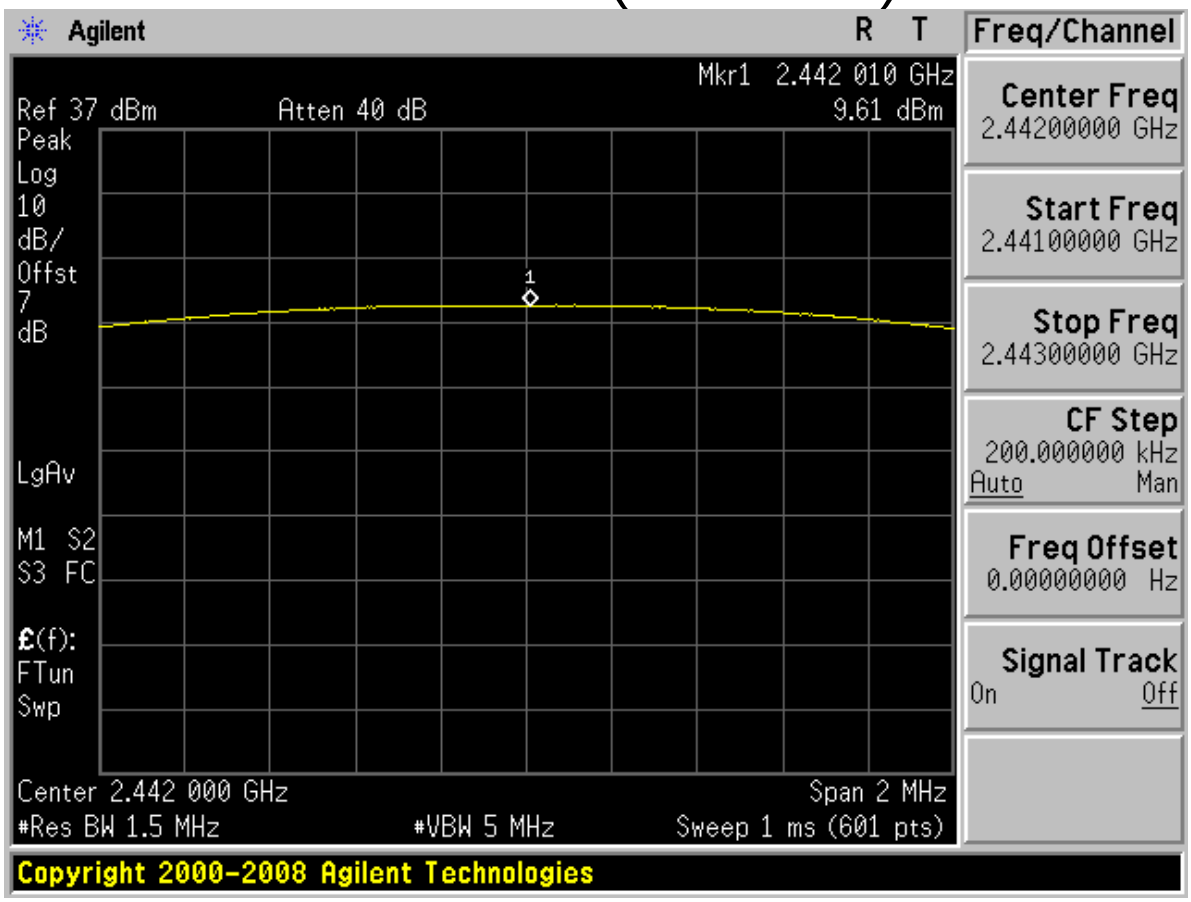
According to FCC Part 15.247 (b) (1)

Modulation:π/4-DQPSK

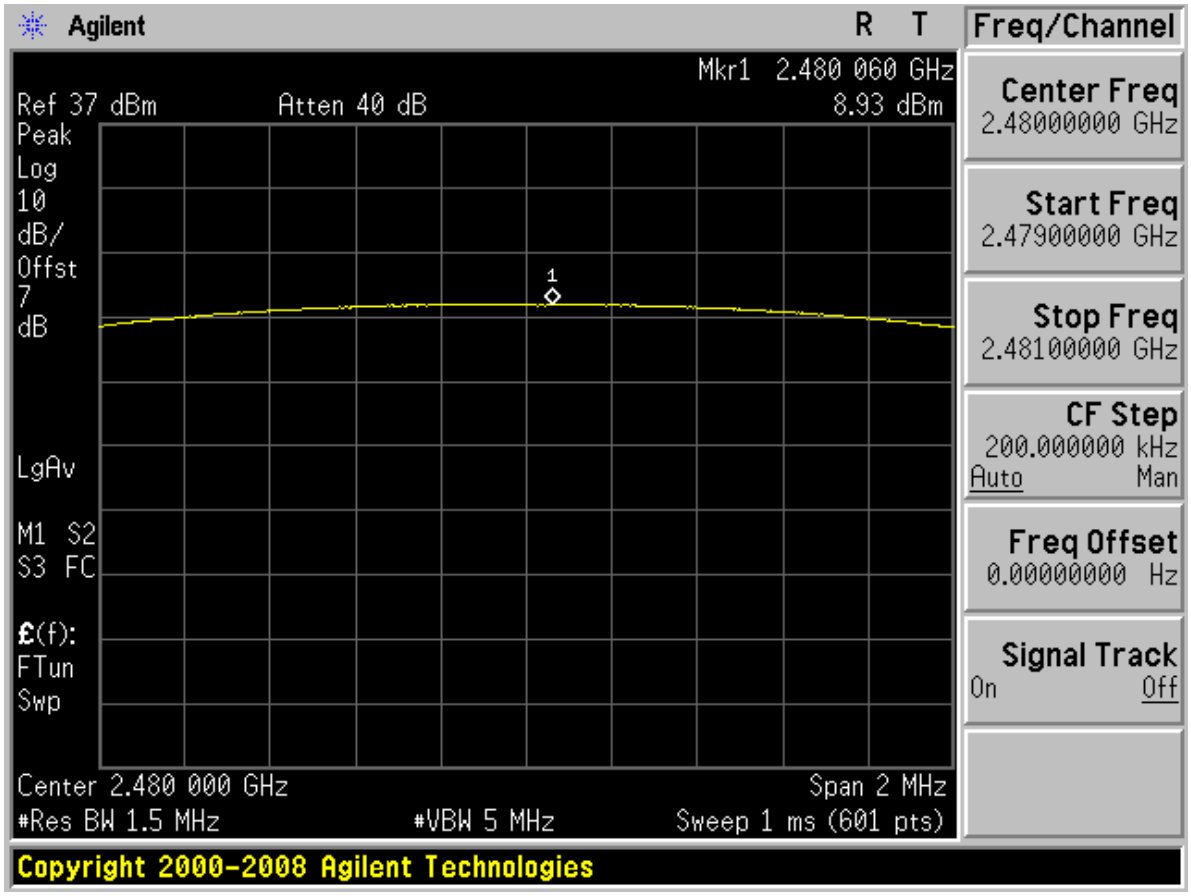
Channel 0 (2402MHz)



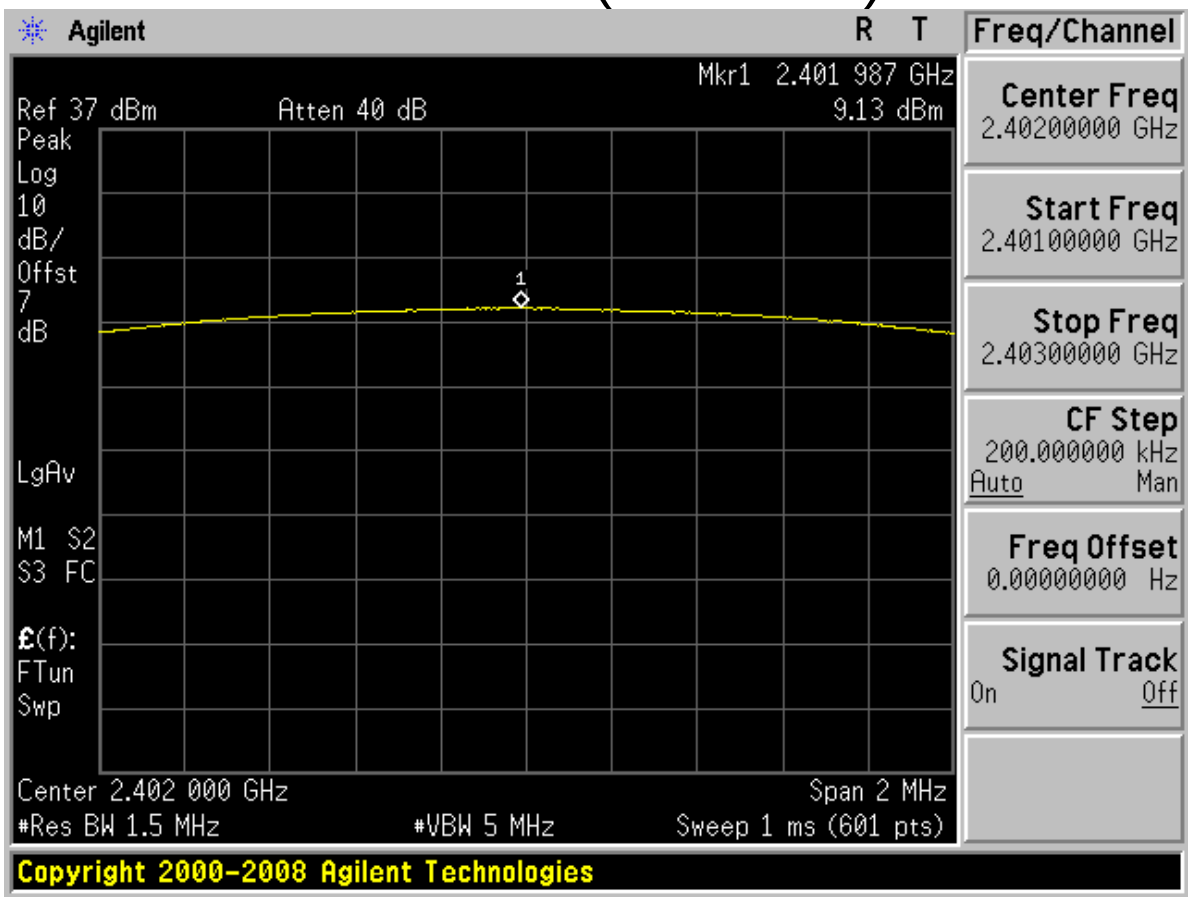
Channel 40 (2442MHz)



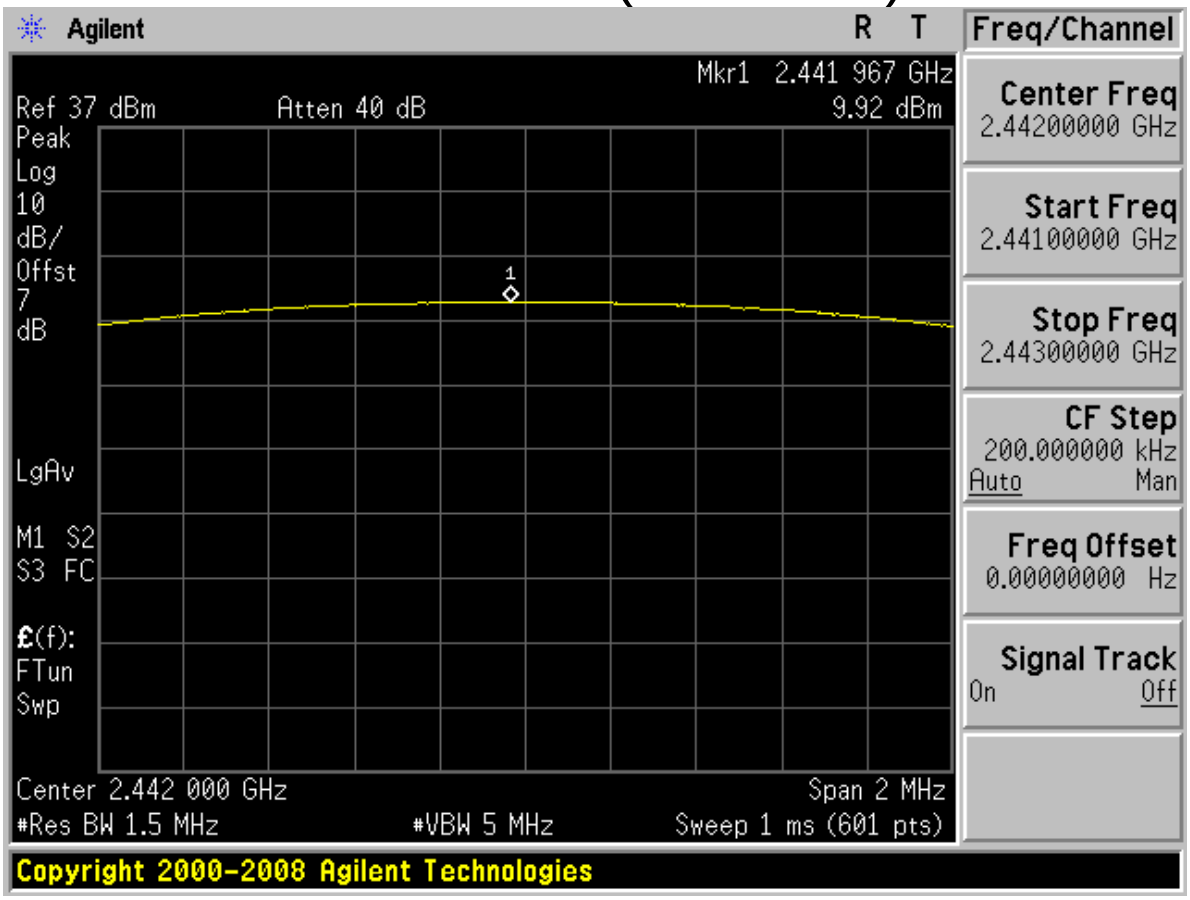
Channel 78 (2480MHz)



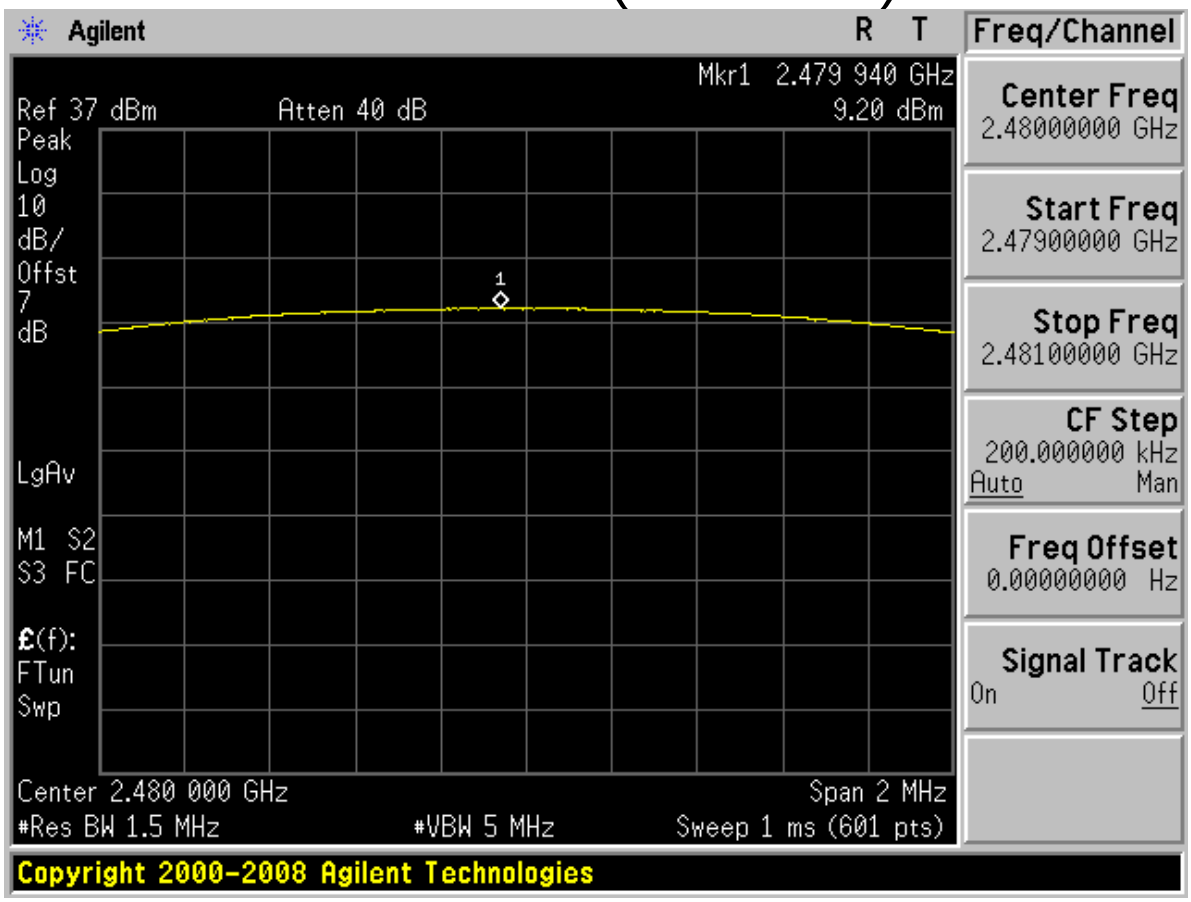
Modulation: 8DPSK
Channel 0 (2402MHz)



Channel 40 (2442MHz)



Channel 78 (2480MHz)



----------The End ----------

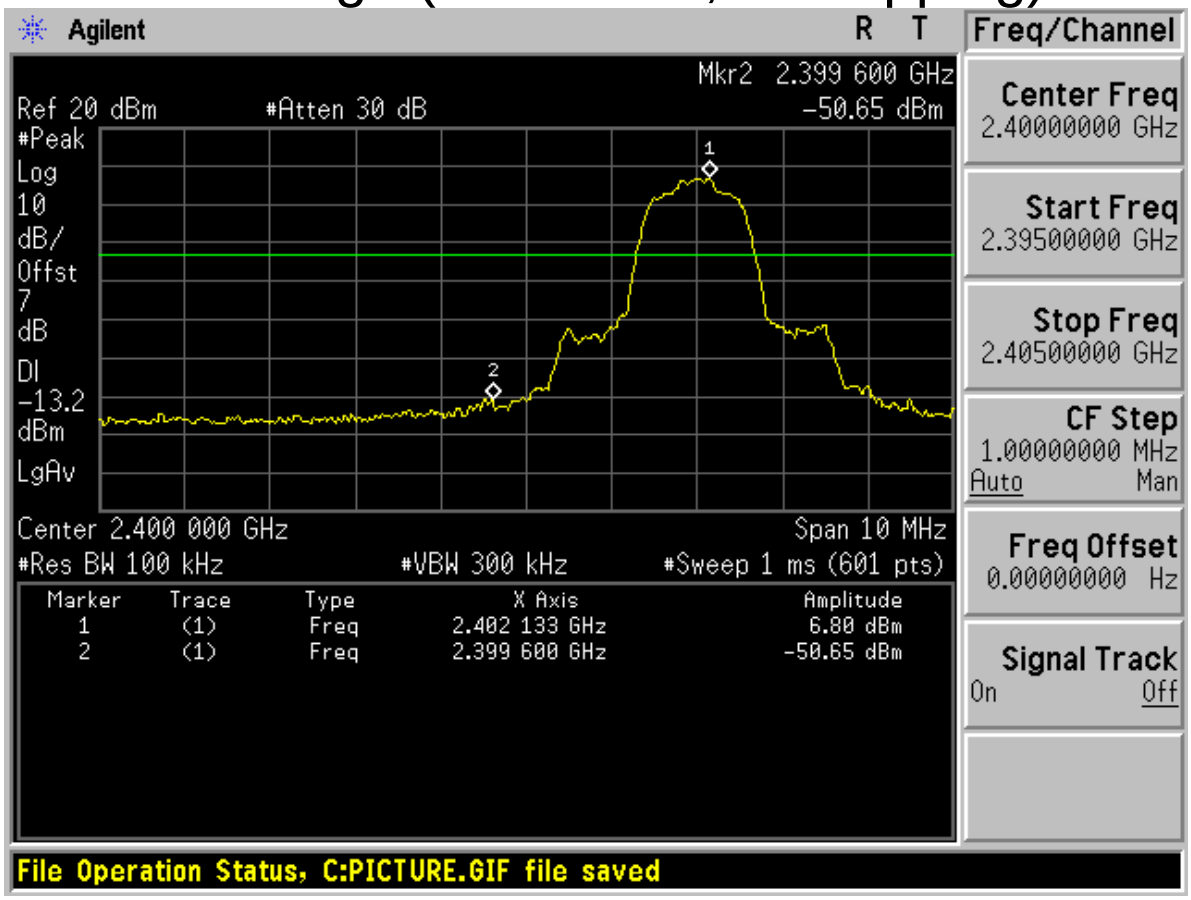
Appendix F

Band edge spurious emission

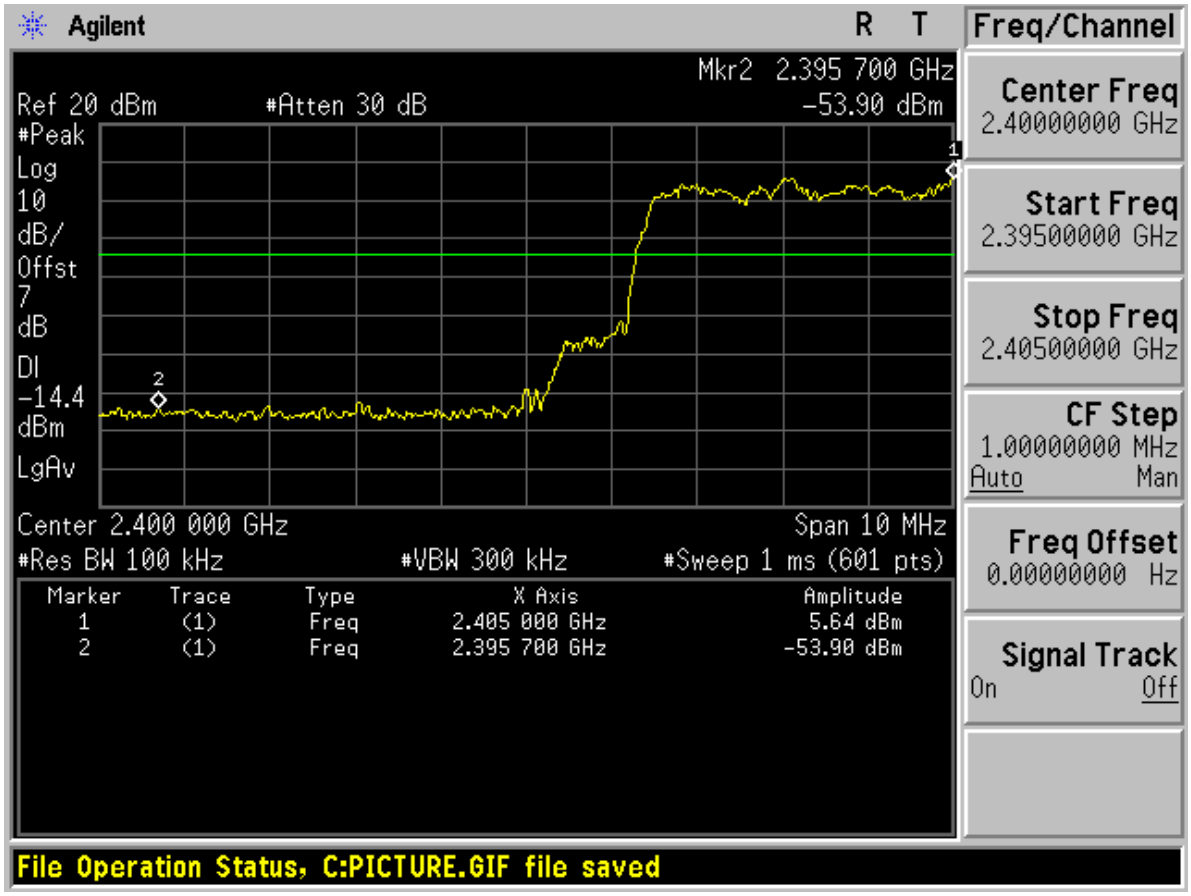
According to FCC Part 15.247 (d)

Modulation:π/4-DQPSK

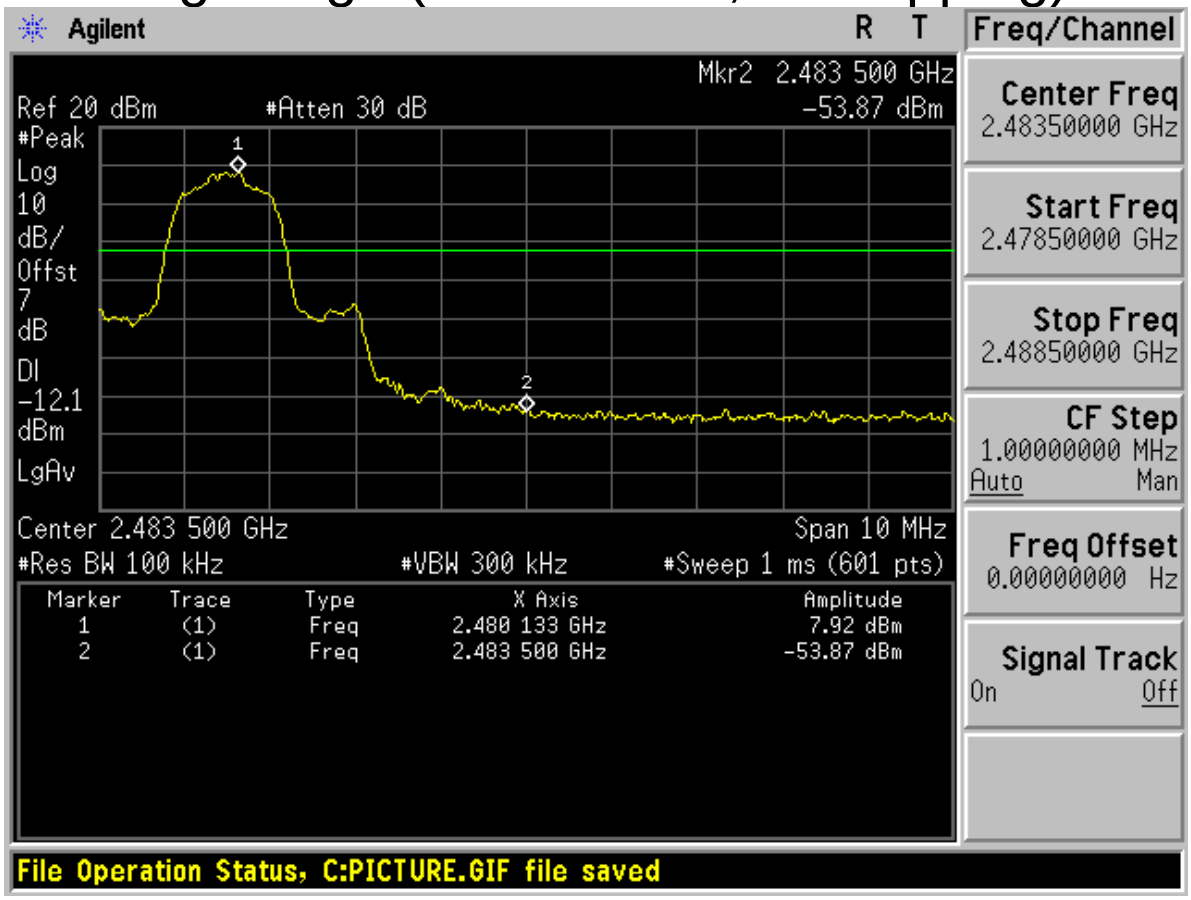
Low edge (Channel 0, no hopping)



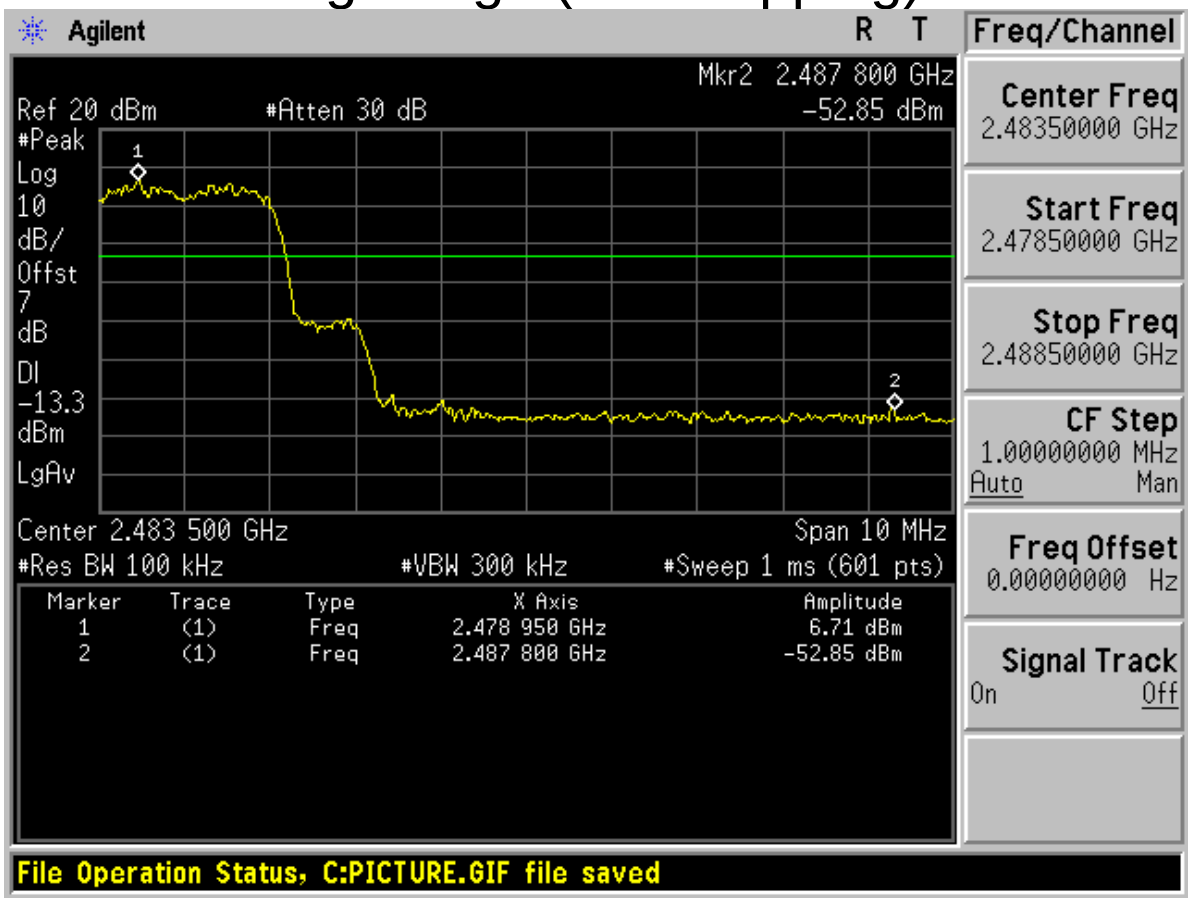
Low edge (with hopping)



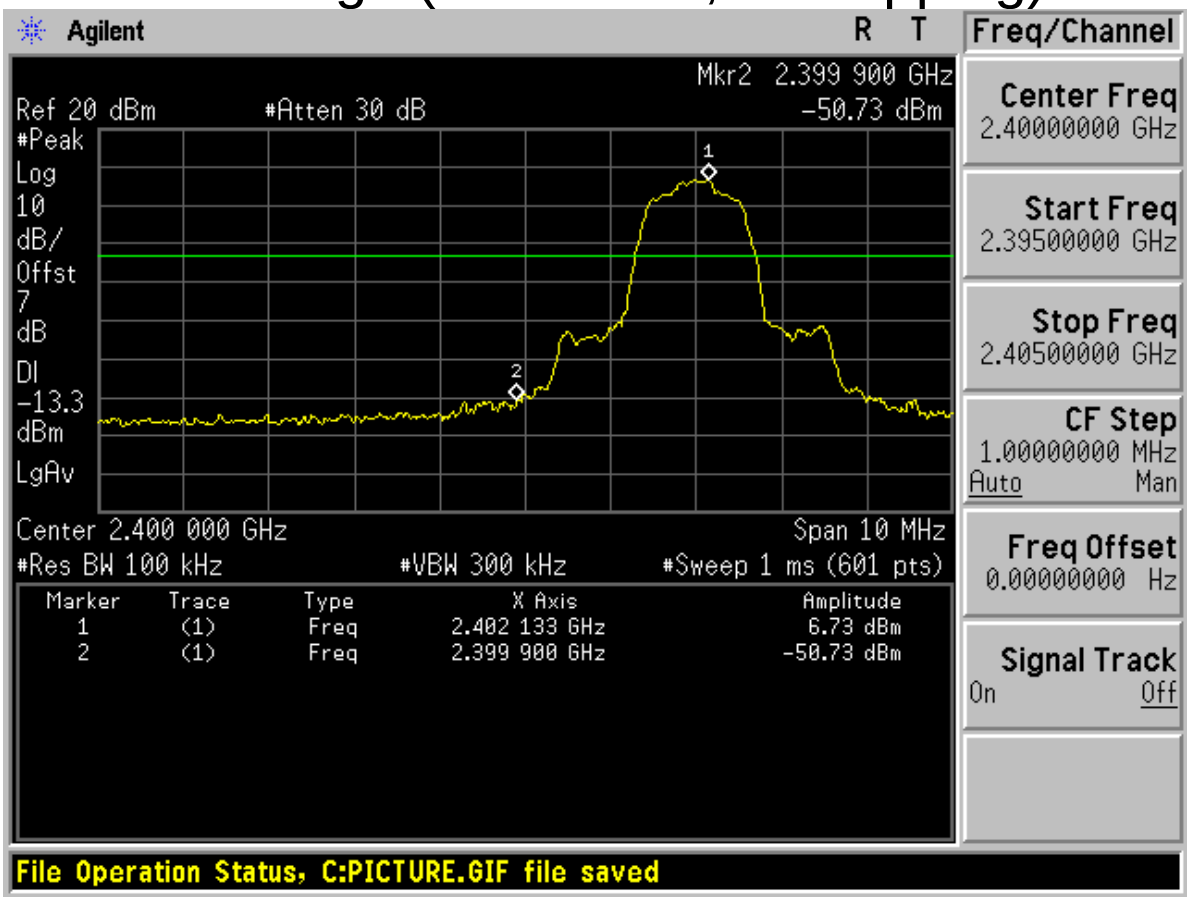
High edge (Channel 78, no hopping)



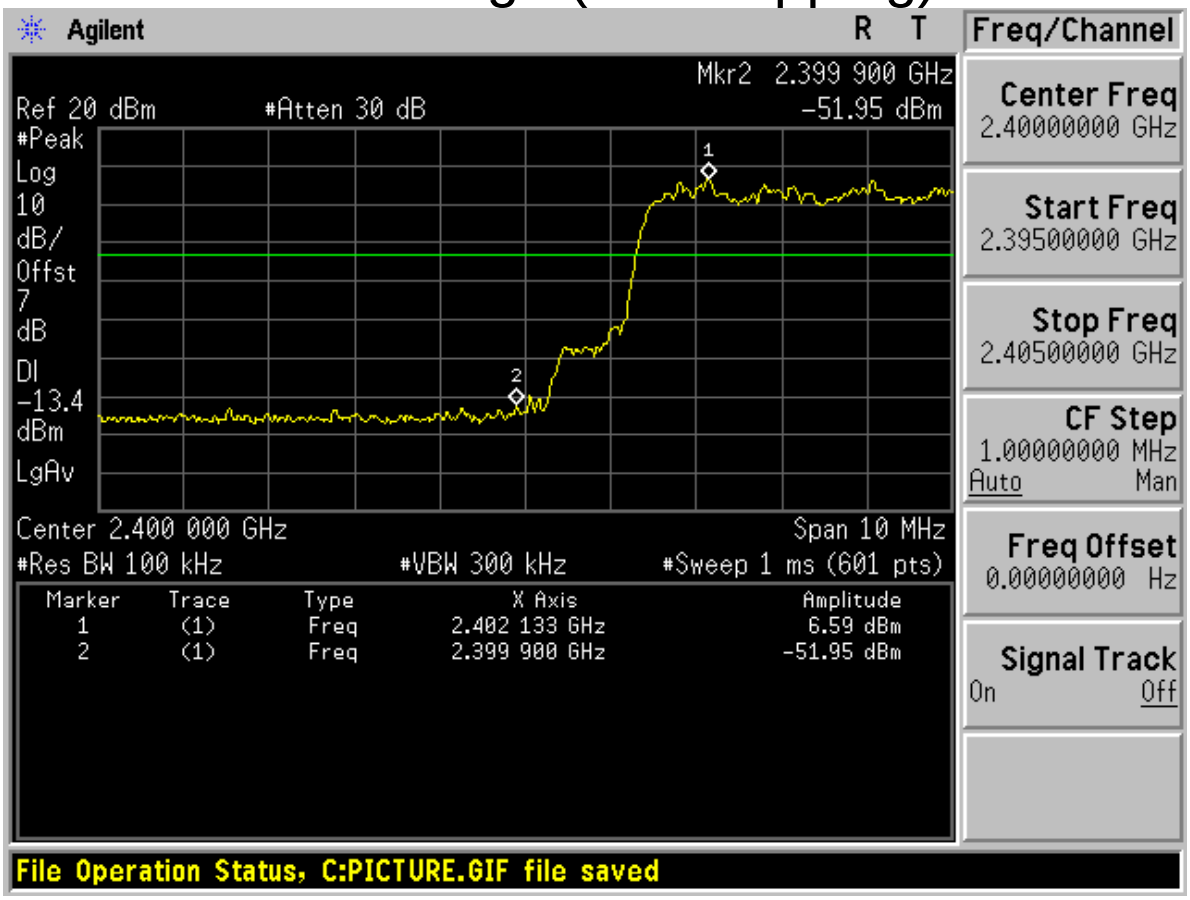
High edge (with hopping)



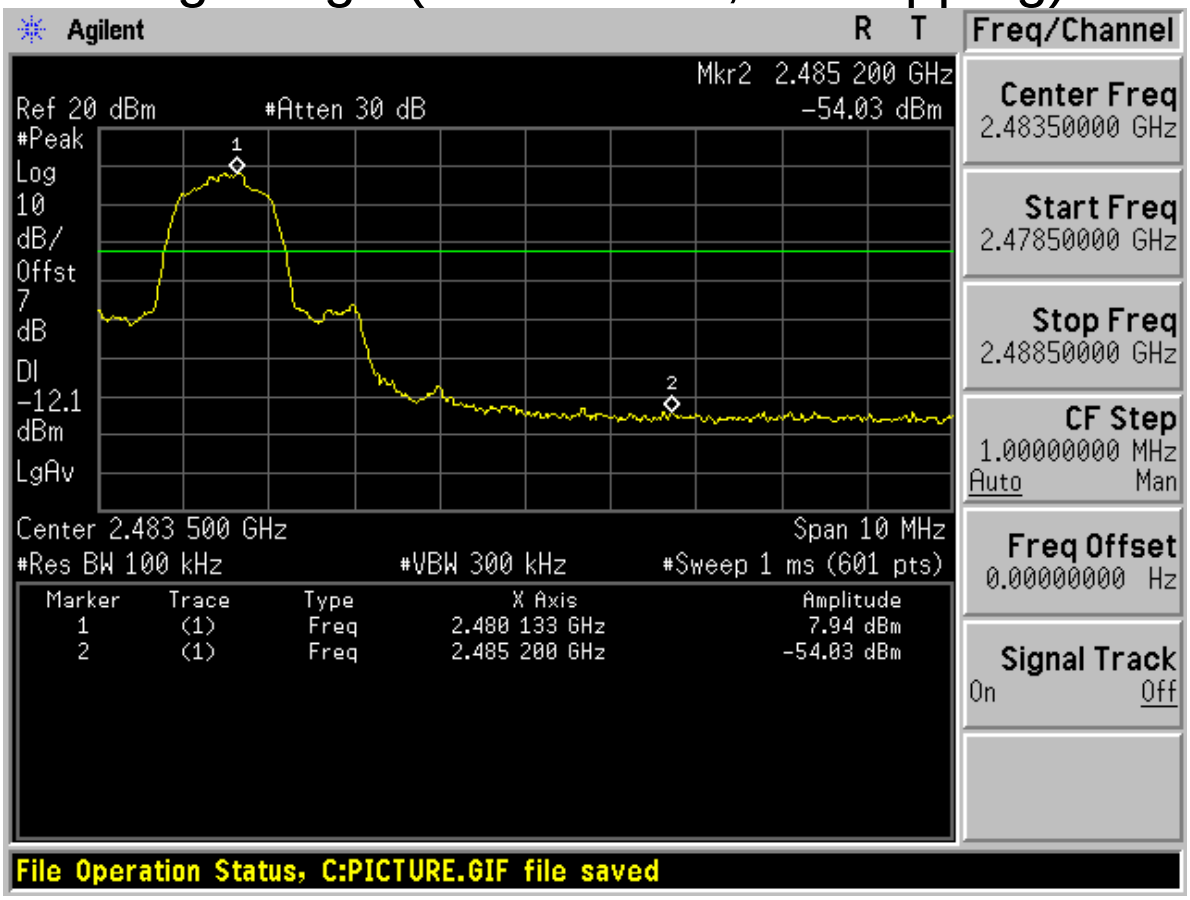
Modulation: 8DPSK
Low edge (Channel 0, no hopping)



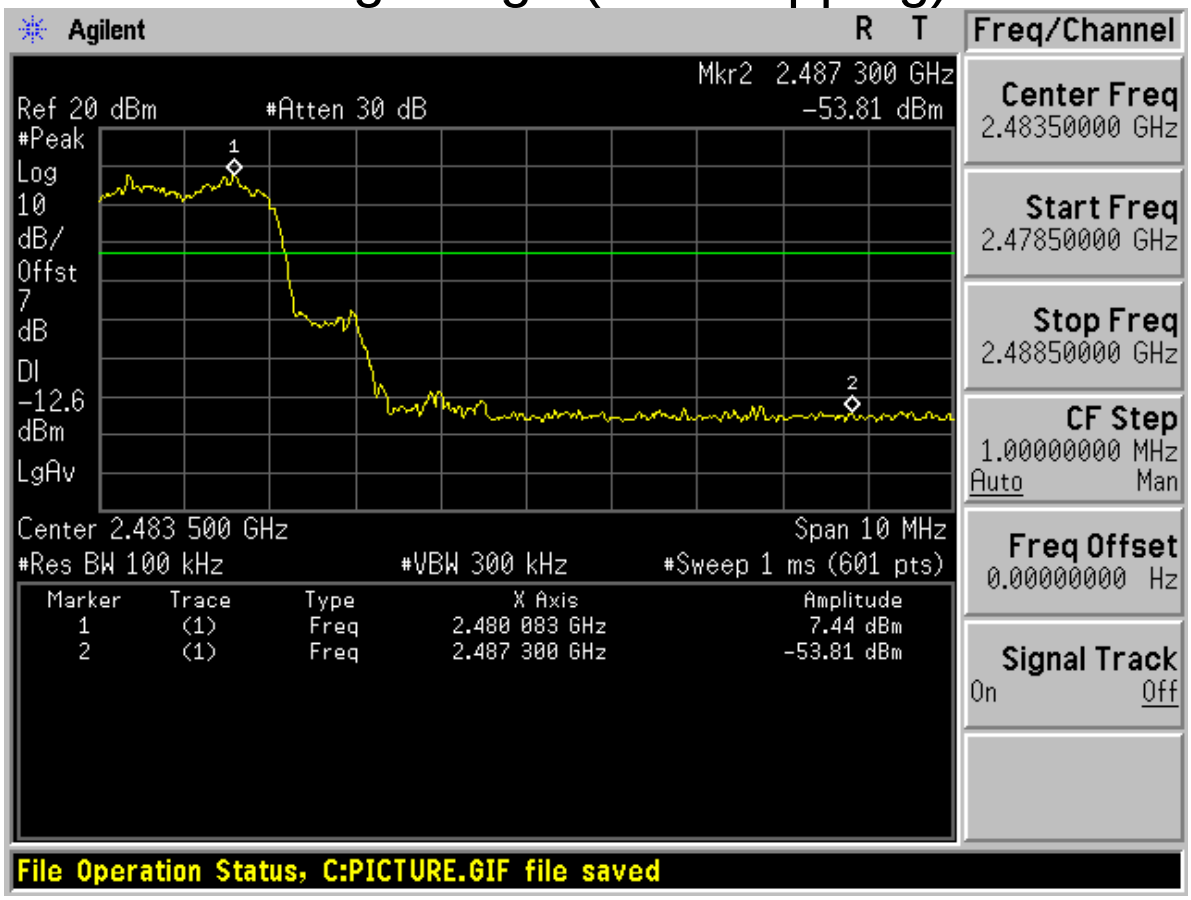
Low edge (with hopping)



High edge (Channel 78, no hopping)



High edge (with hopping)



----------The End ----------

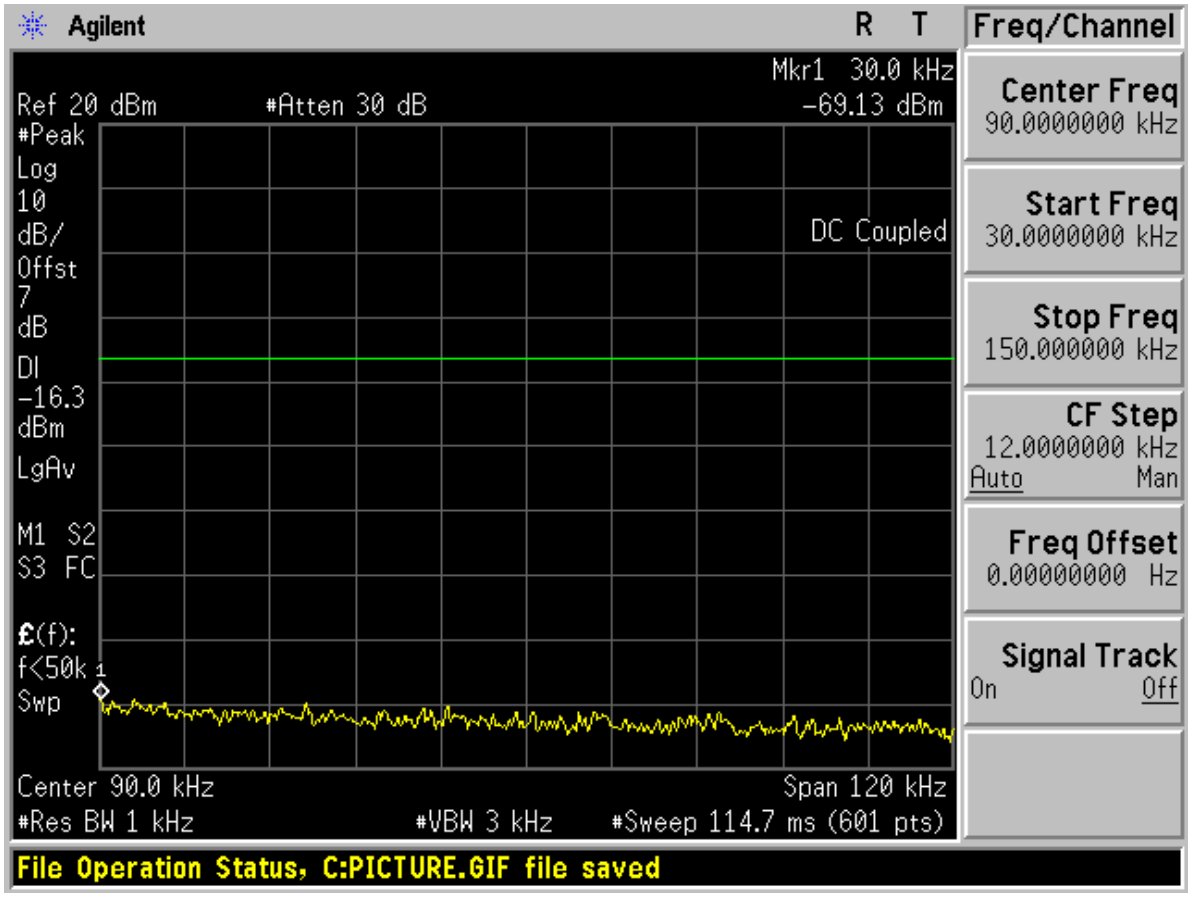
Appendix G

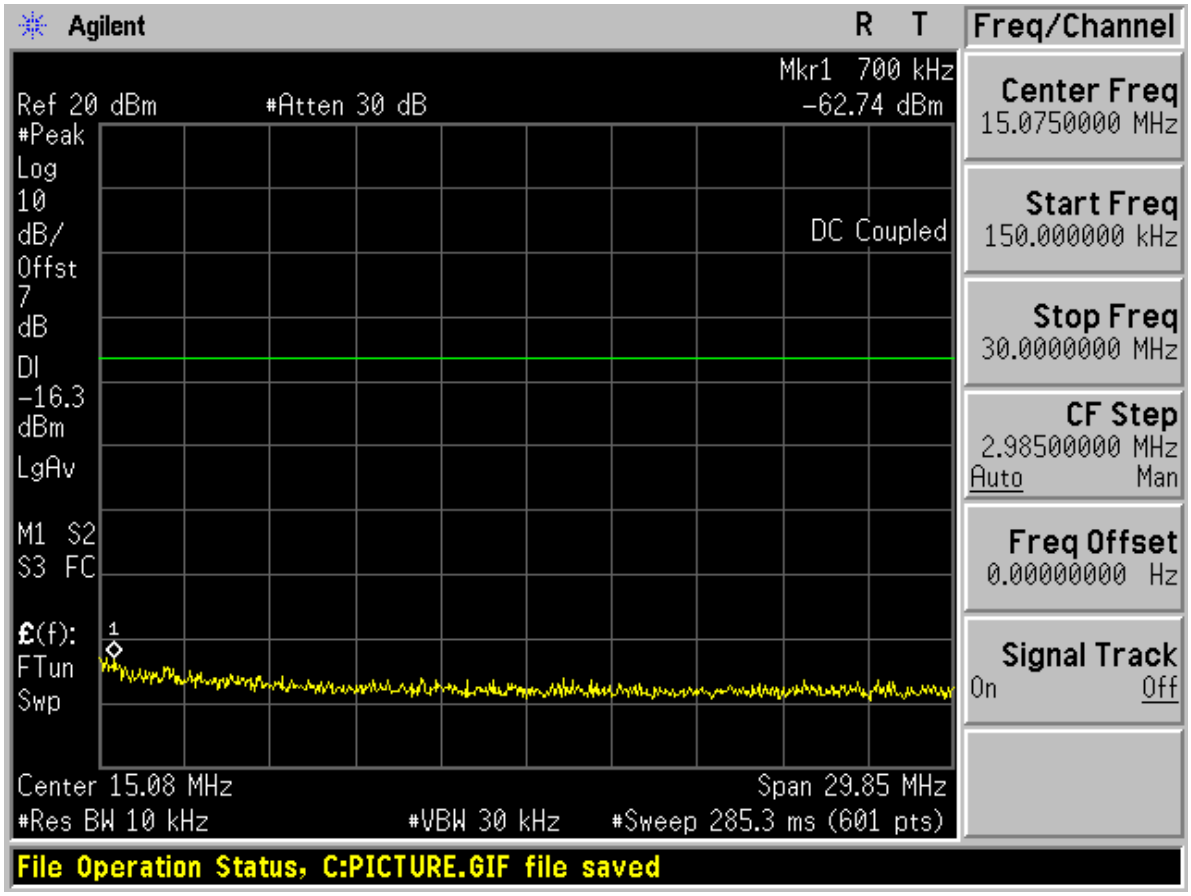
Conducted RF spurious

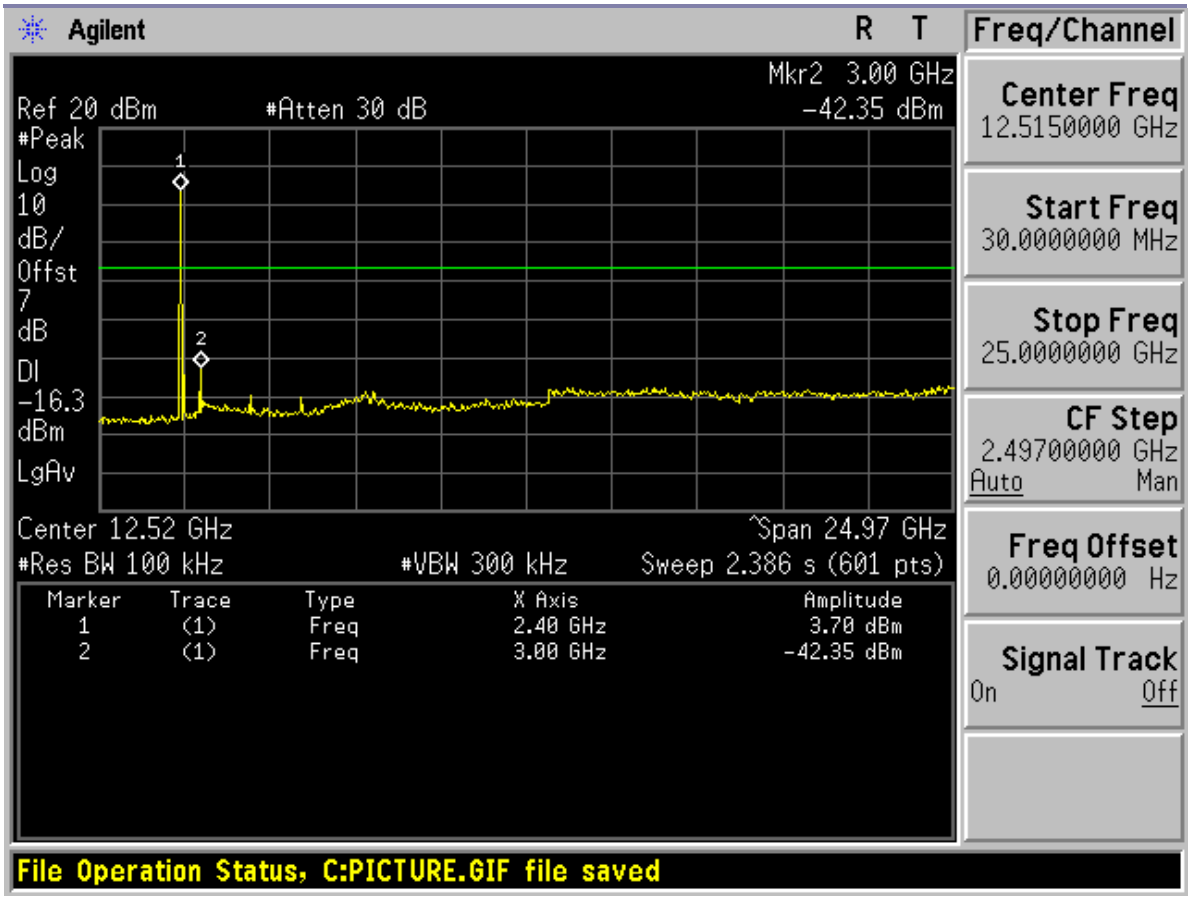
According to FCC Part 15.247 (d)

Modulation:π/4-DQPSK

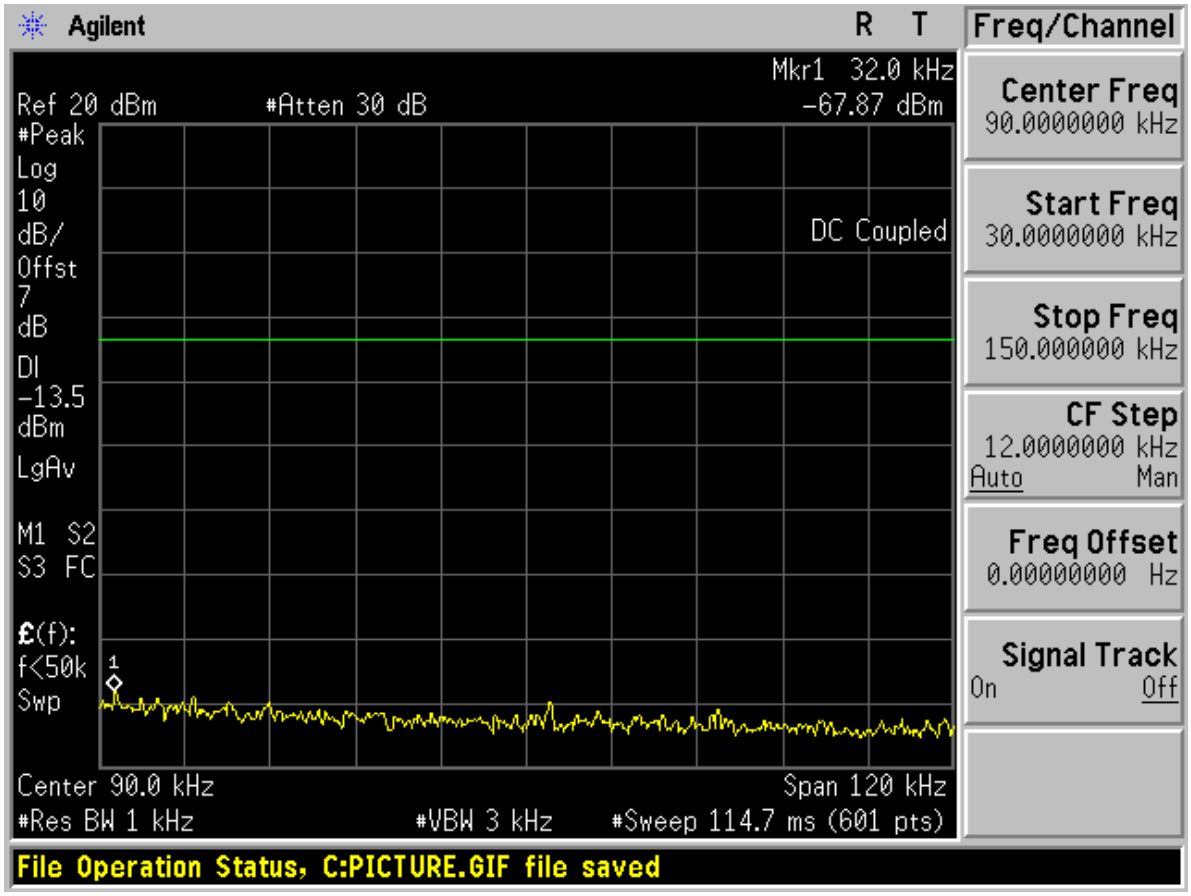
Channel 0

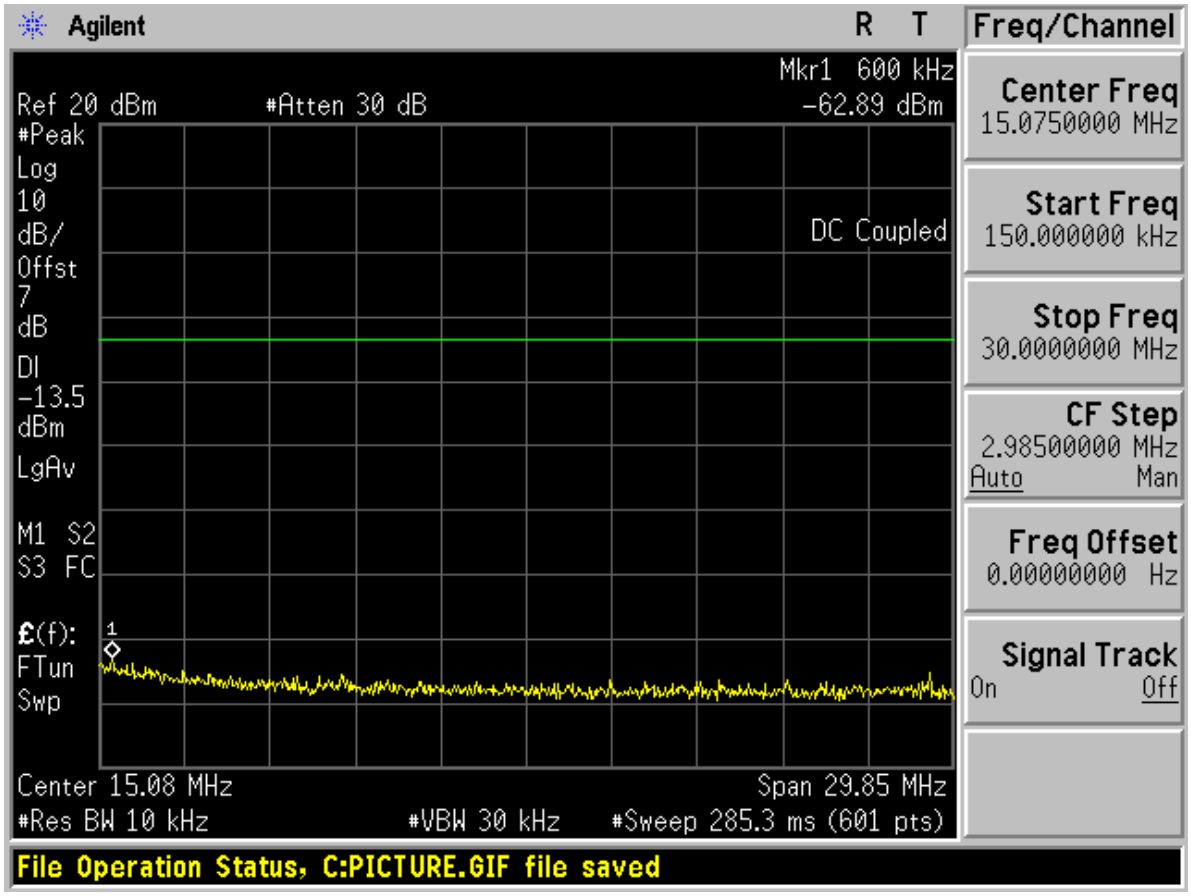


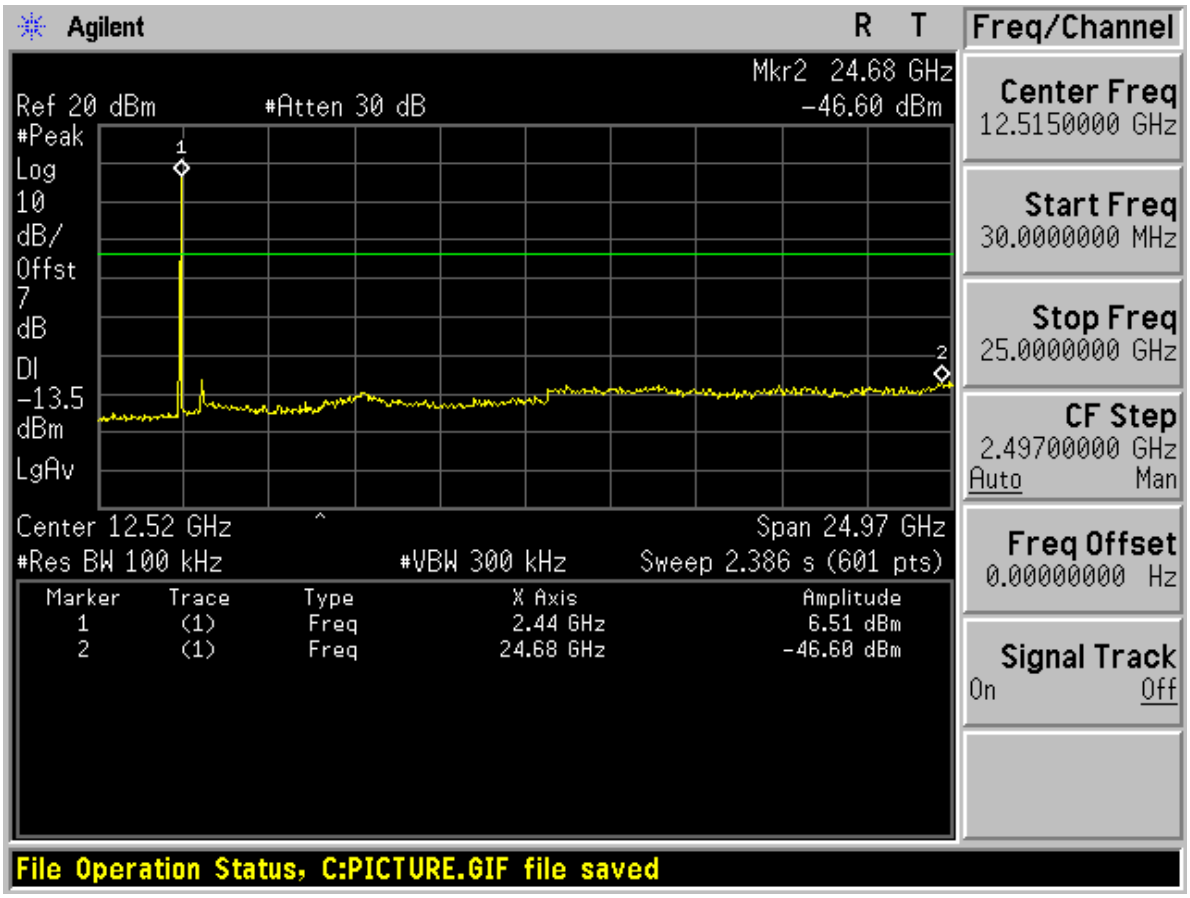

Agilent
R T
Freq/Channel
Mkr1 700 kHz
Ref 20 dBm
#Atten 30 dB
-62.74 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-16.3
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
DC Coupled
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
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 3.00 GHz
Ref 20 dBm
#Atten 30 dB
-42.35 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-16.3
dBm
LgAv
1
2
Center 12.52 GHz
^Span 24.97 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.386 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.40 GHz 3.70 dBm
2 (1) Freq 3.00 GHz -42.35 dBm
Center Freq
12.5150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
25.0000000 GHz
CF Step
2.49700000 GHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, C:PICTURE.GIF file saved

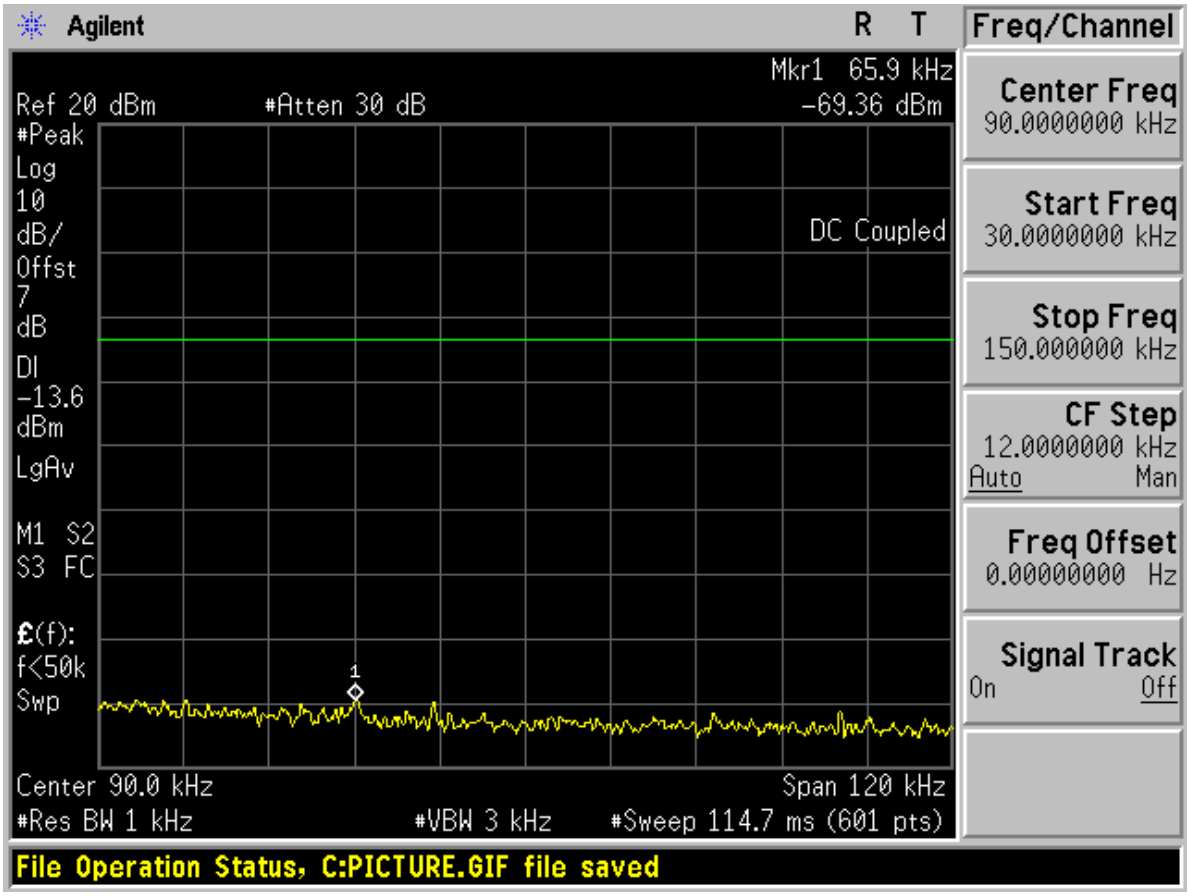
Channel 40

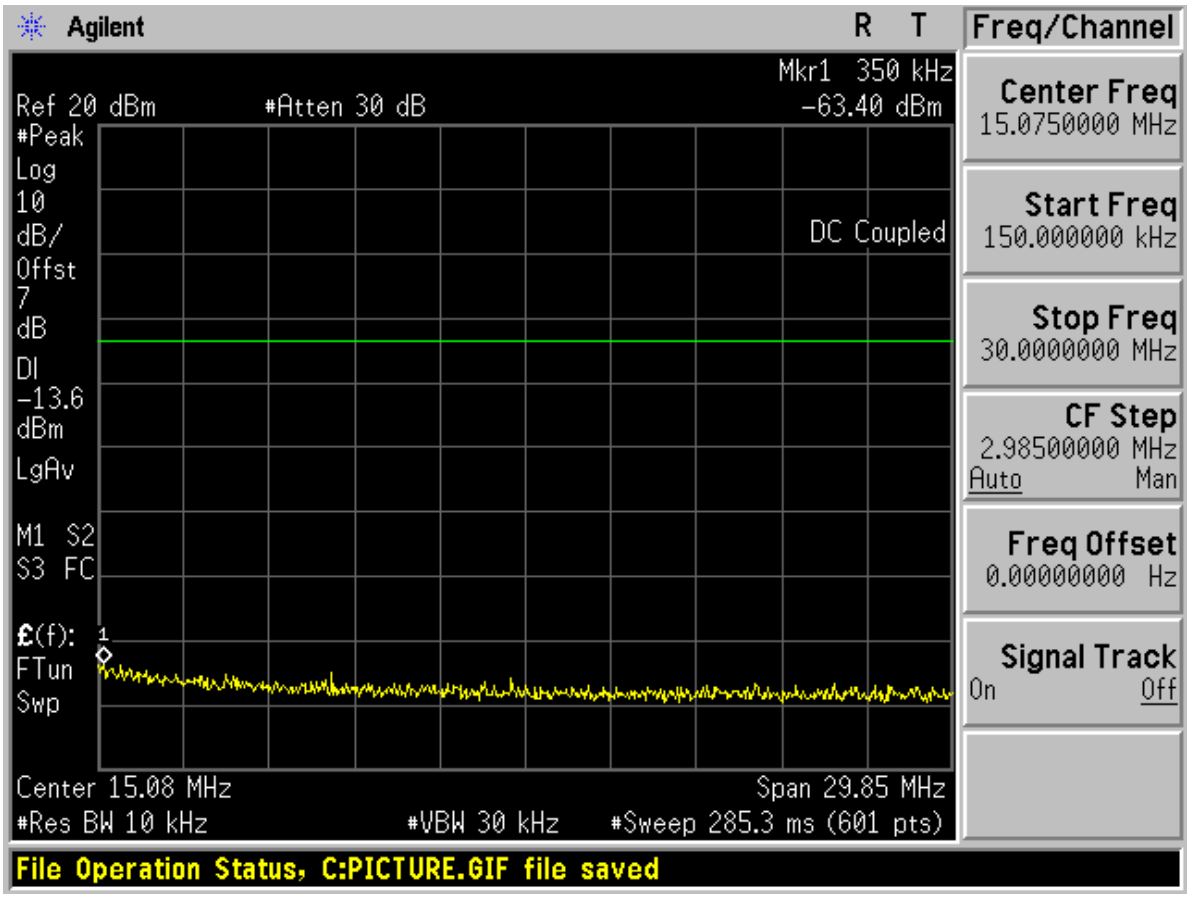

Agilent
R T
Freq/Channel
Mkr1 32.0 kHz
Ref 20 dBm
#Atten 30 dB
-67.87 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-13.5
dBm
LgAv
DC Coupled
M1 S2
S3 FC
£(f):
f<50k
Swp
Center Freq
90.0000000 kHz
Start Freq
30.0000000 kHz
Stop Freq
150.000000 kHz
CF Step
12.0000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 90.0 kHz
Span 120 kHz
#Res BW 1 kHz
#VBW 3 kHz
#Sweep 114.7 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved

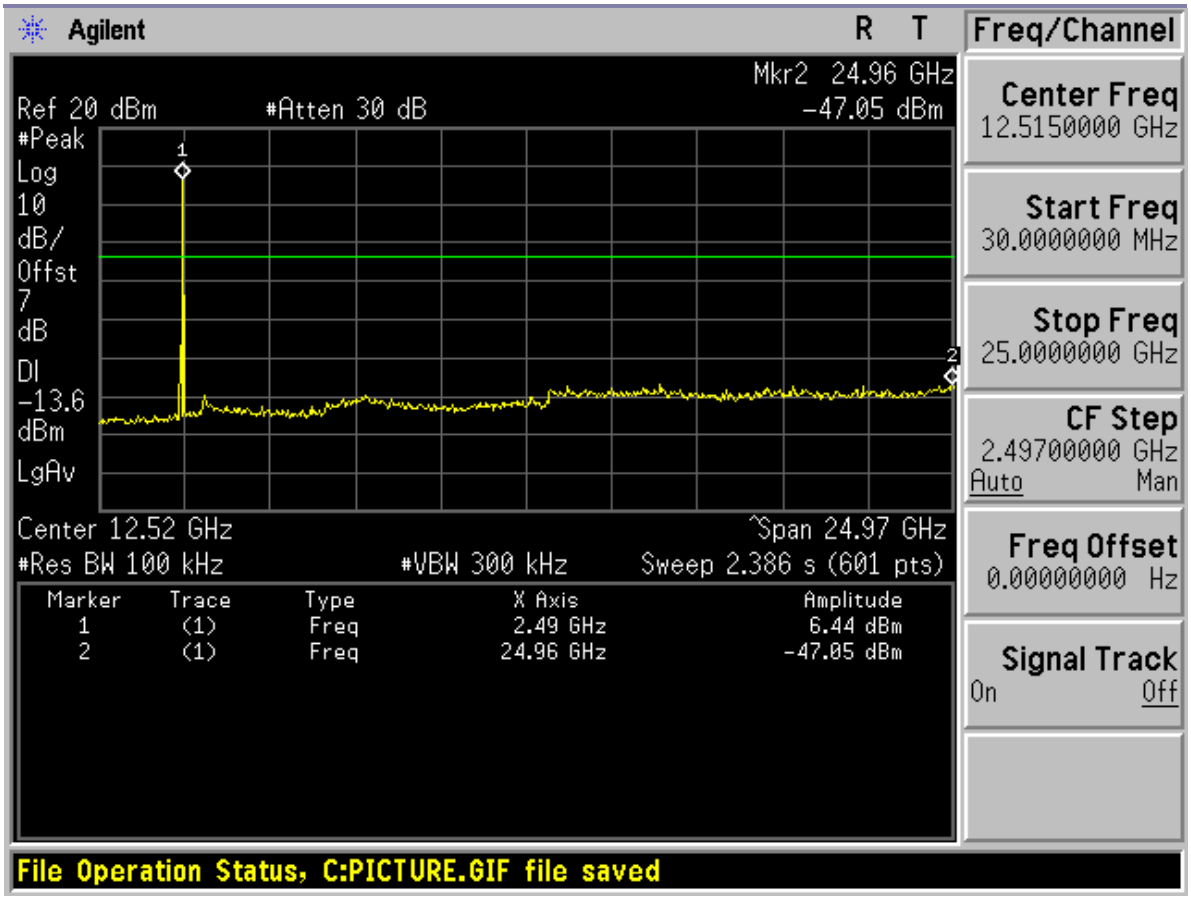

Agilent
R T
Freq/Channel
Mkr1 600 kHz
Ref 20 dBm
#Atten 30 dB
-62.89 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-13.5
dBm
LgAv
DC Coupled
M1 S2
S3 FC
£(f):
FTun
Swp
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
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 24.68 GHz
Ref 20 dBm
#Atten 30 dB
-46.60 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-13.5
dBm
LgAv
1
2
Center 12.52 GHz
Span 24.97 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.386 s (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.44 GHz 6.51 dBm
2 (1) Freq 24.68 GHz -46.60 dBm
Center Freq
12.5150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
25.0000000 GHz
CF Step
2.49700000 GHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
File Operation Status, C:PICTURE.GIF file saved

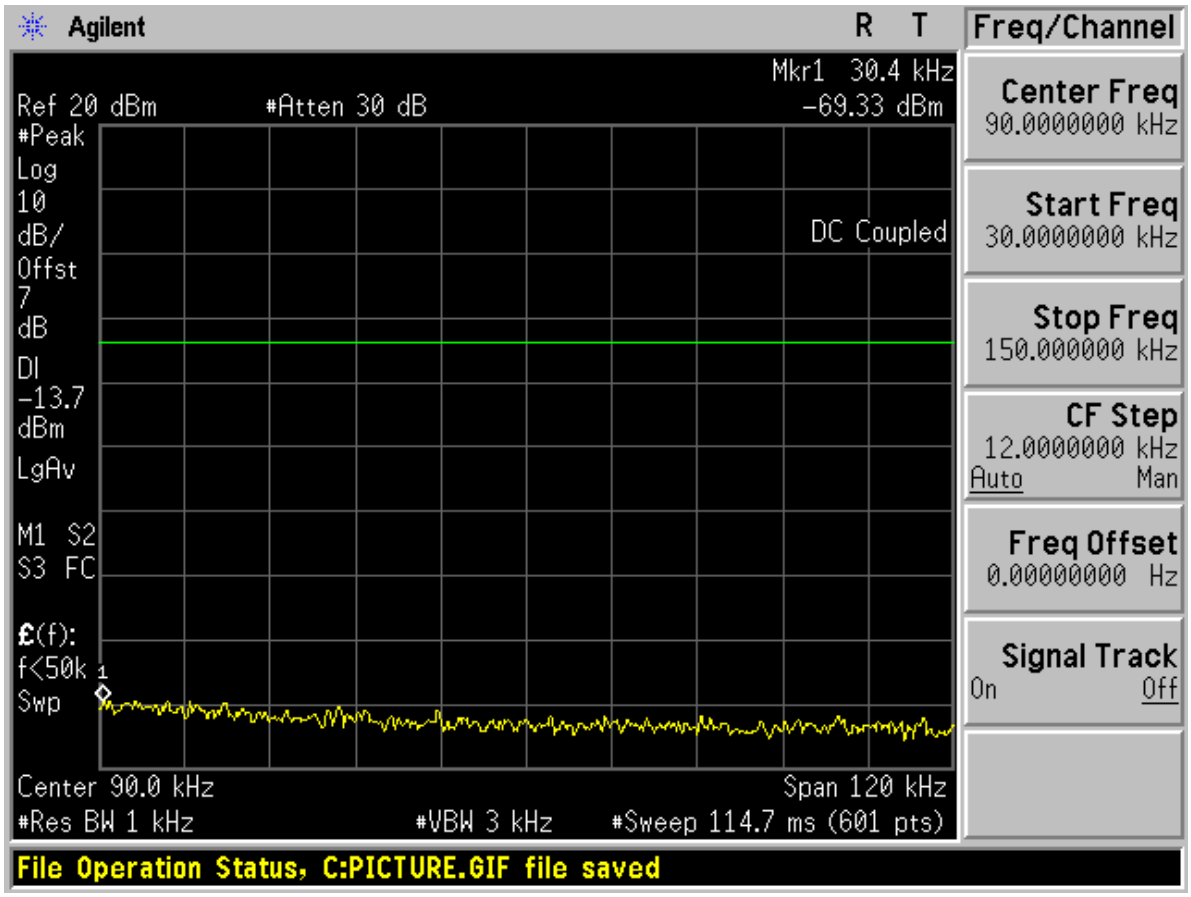
Channel 78

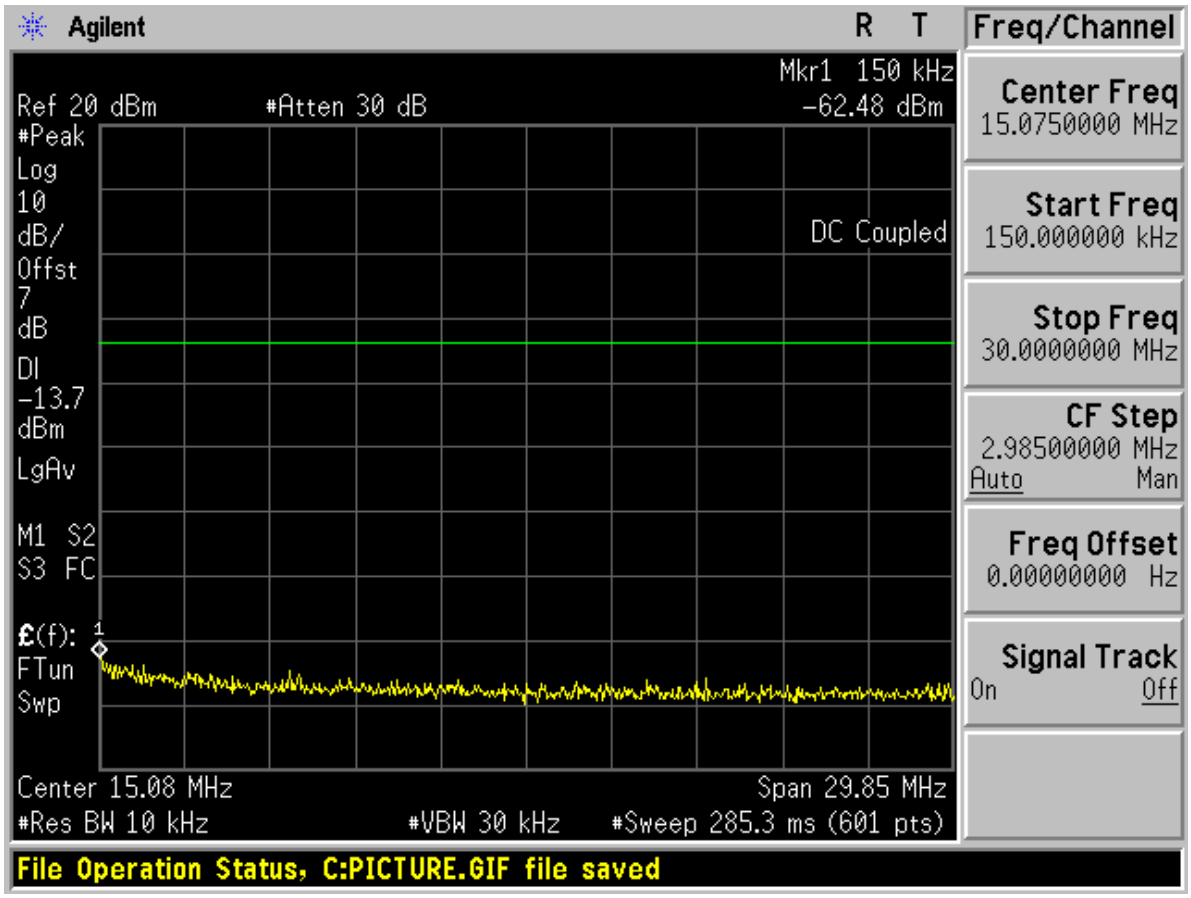

Agilent
R T
Freq/Channel
Mkr1 65.9 kHz
Ref 20 dBm
#Atten 30 dB
-69.36 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-13.6
dBm
LgAv
M1 S2
S3 FC
£(f):
f<50k
Swp
DC Coupled
Center Freq
90.0000000 kHz
Start Freq
30.0000000 kHz
Stop Freq
150.000000 kHz
CF Step
12.0000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 90.0 kHz
Span 120 kHz
#Res BW 1 kHz
#VBW 3 kHz
#Sweep 114.7 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved

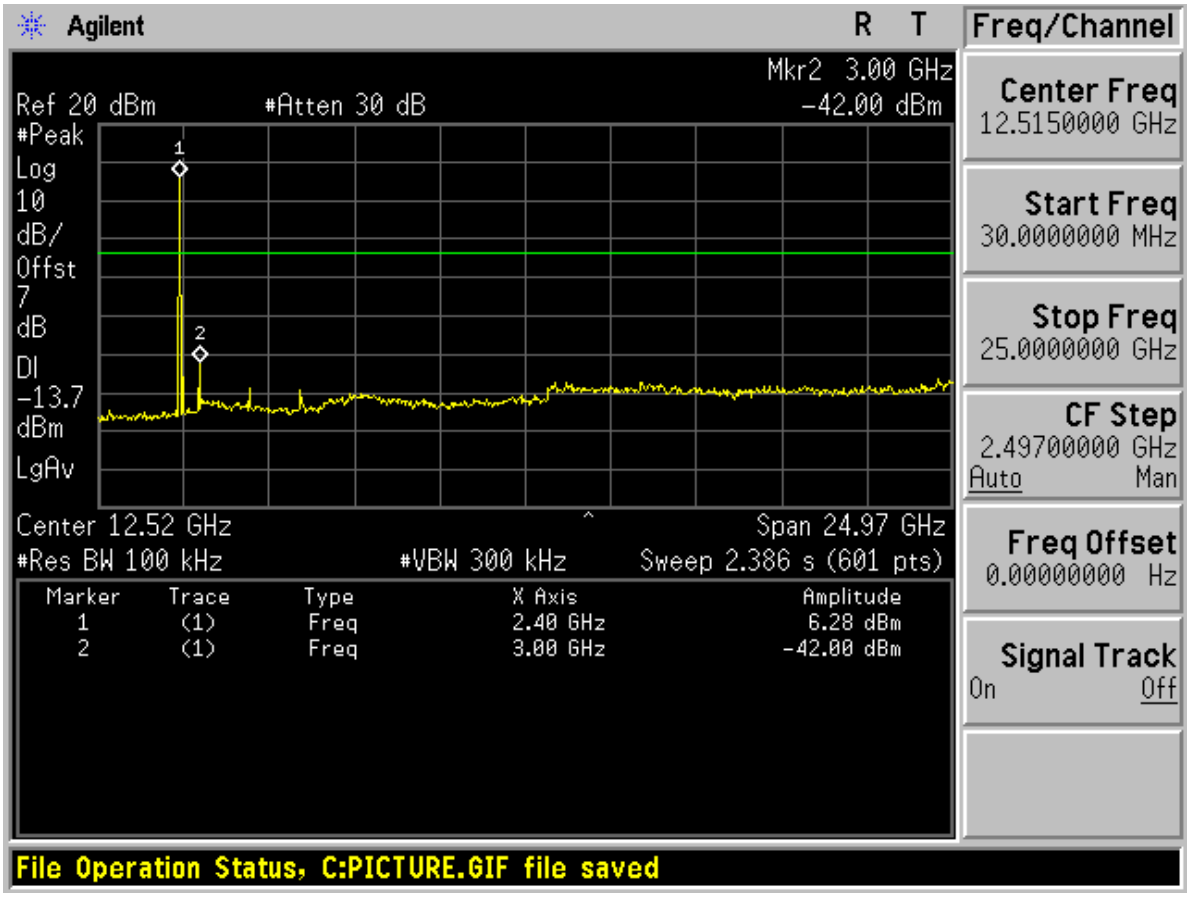

Agilent
R T
Freq/Channel
Mkr1 350 kHz
Ref 20 dBm
#Atten 30 dB
-63.40 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-13.6
dBm
LgAv
DC Coupled
M1 S2
S3 FC
£(f):
FTun
Swp
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
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 24.96 GHz
Ref 20 dBm
#Atten 30 dB
-47.05 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-13.6
dBm
LgAv
Center Freq
12.5150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
25.0000000 GHz
CF Step
2.49700000 GHz
Auto Man
Center 12.52 GHz
^Span 24.97 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.386 s (601 pts)
Freq Offset
0.00000000 Hz
Signal Track
On Off
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.49 GHz 6.44 dBm
2 (1) Freq 24.96 GHz -47.05 dBm
File Operation Status, C:PICTURE.GIF file saved

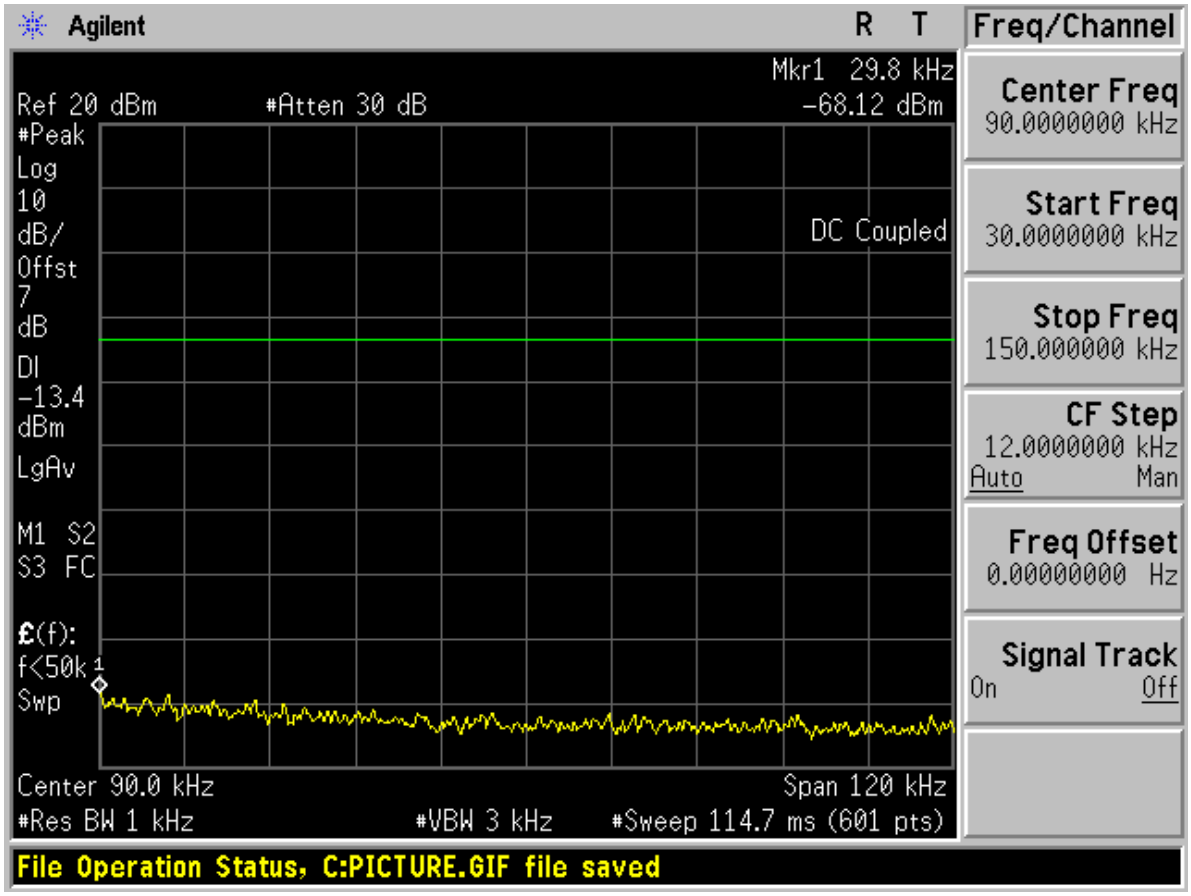
Modulation:8DPSK
Channel 0

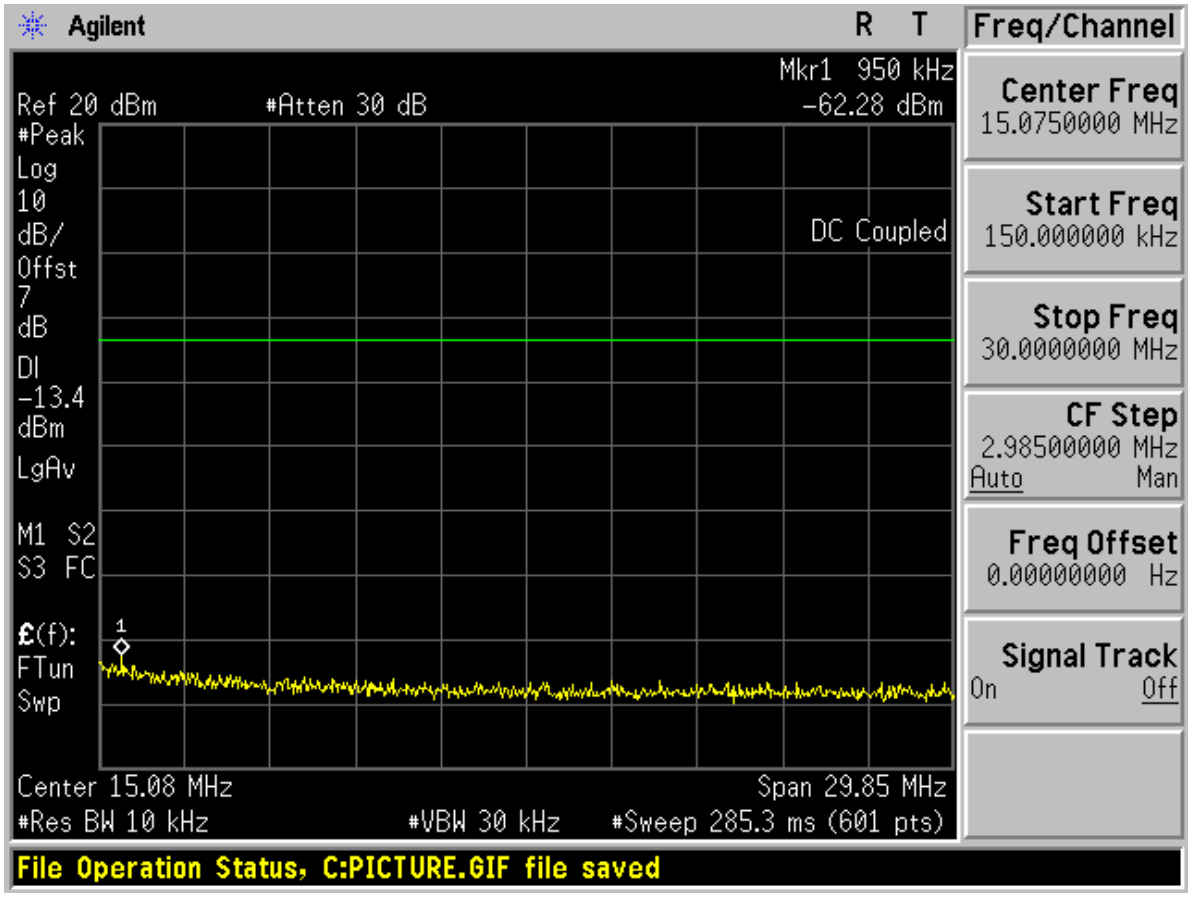


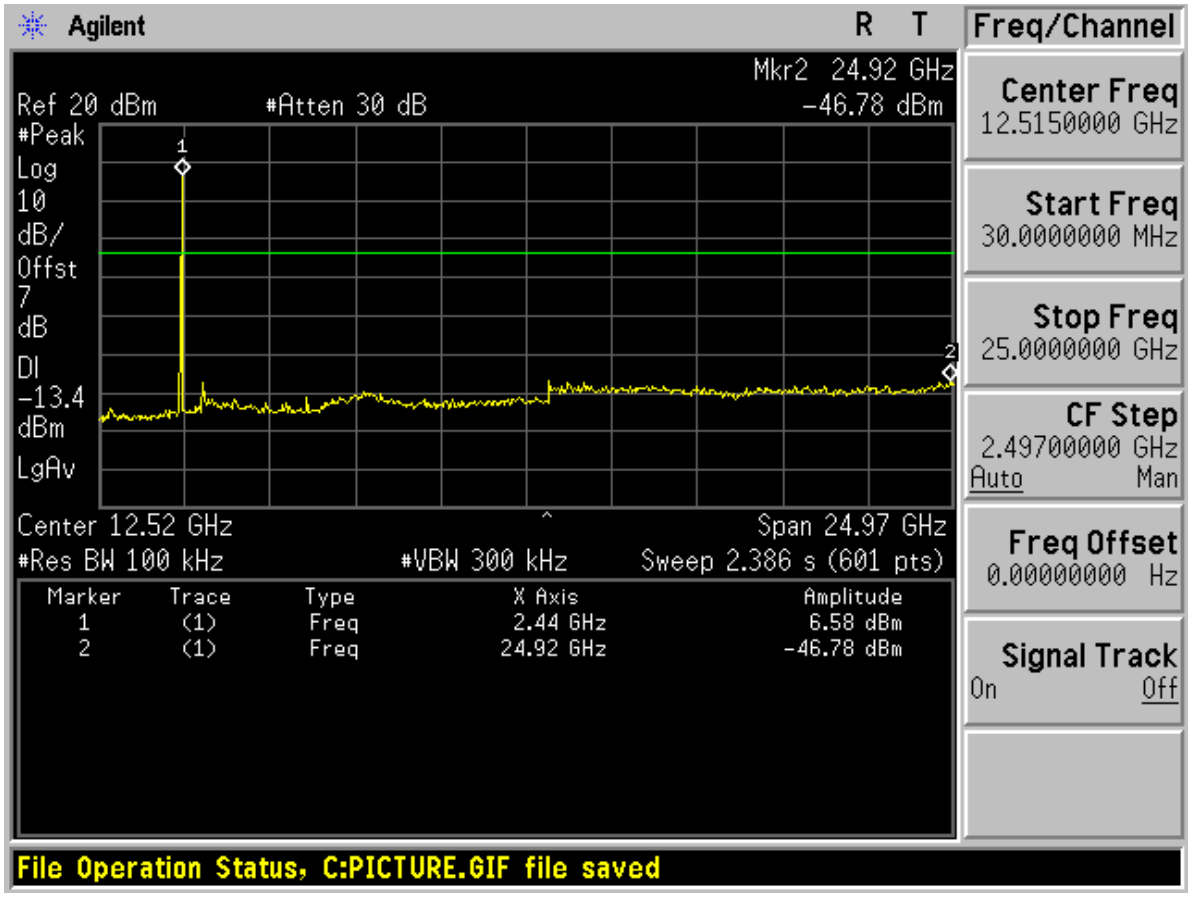

Agilent
R T
Freq/Channel
Mkr1 150 kHz
Ref 20 dBm
#Atten 30 dB
-62.48 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-13.7
dBm
LgAv
DC Coupled
M1 S2
S3 FC
£(f):
FTun
Swp
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
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 3.00 GHz
Ref 20 dBm
#Atten 30 dB
-42.00 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-13.7
dBm
LgAv
Center Freq
12.5150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
25.0000000 GHz
CF Step
2.49700000 GHz
Auto
Man
Center 12.52 GHz
Span 24.97 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.386 s (601 pts)
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.40 GHz 6.28 dBm
2 (1) Freq 3.00 GHz -42.00 dBm
File Operation Status, C:PICTURE.GIF file saved

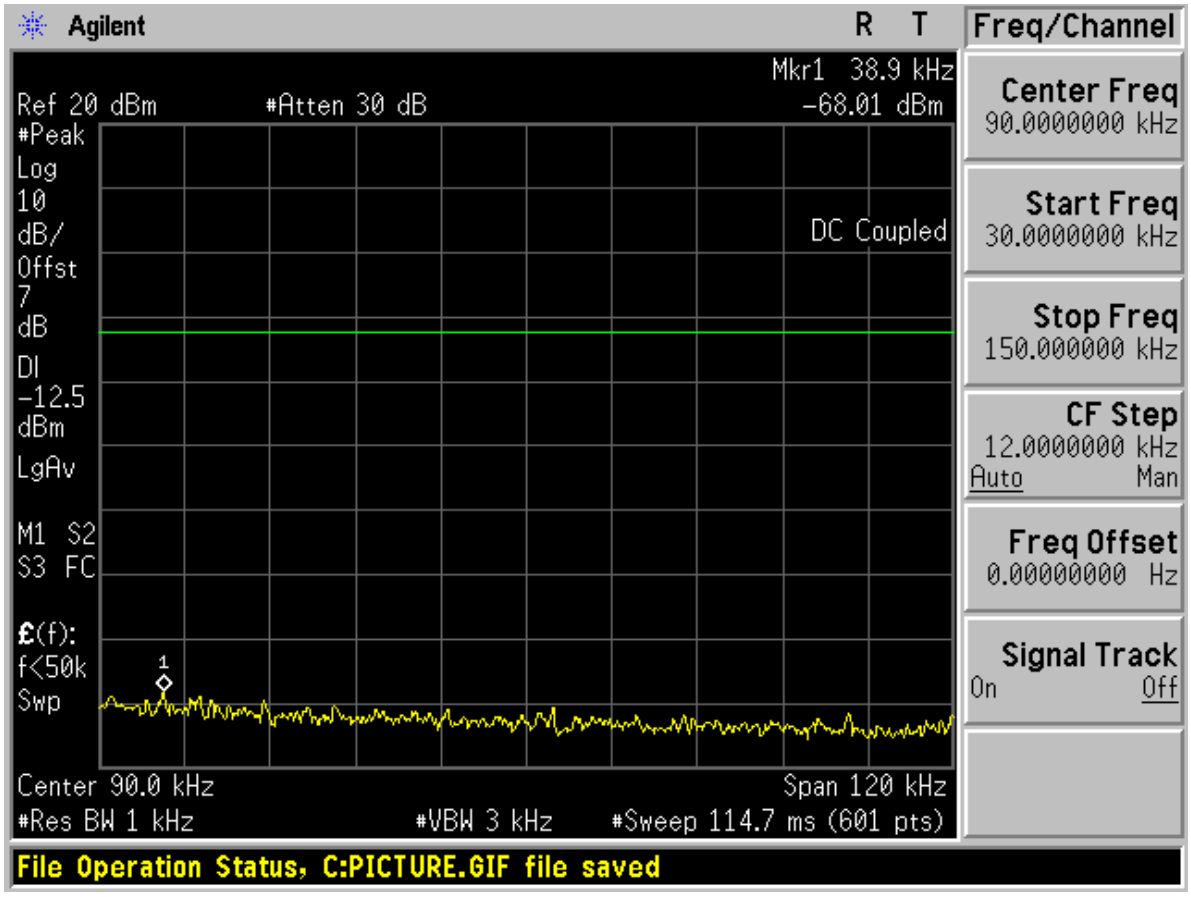
Channel 40

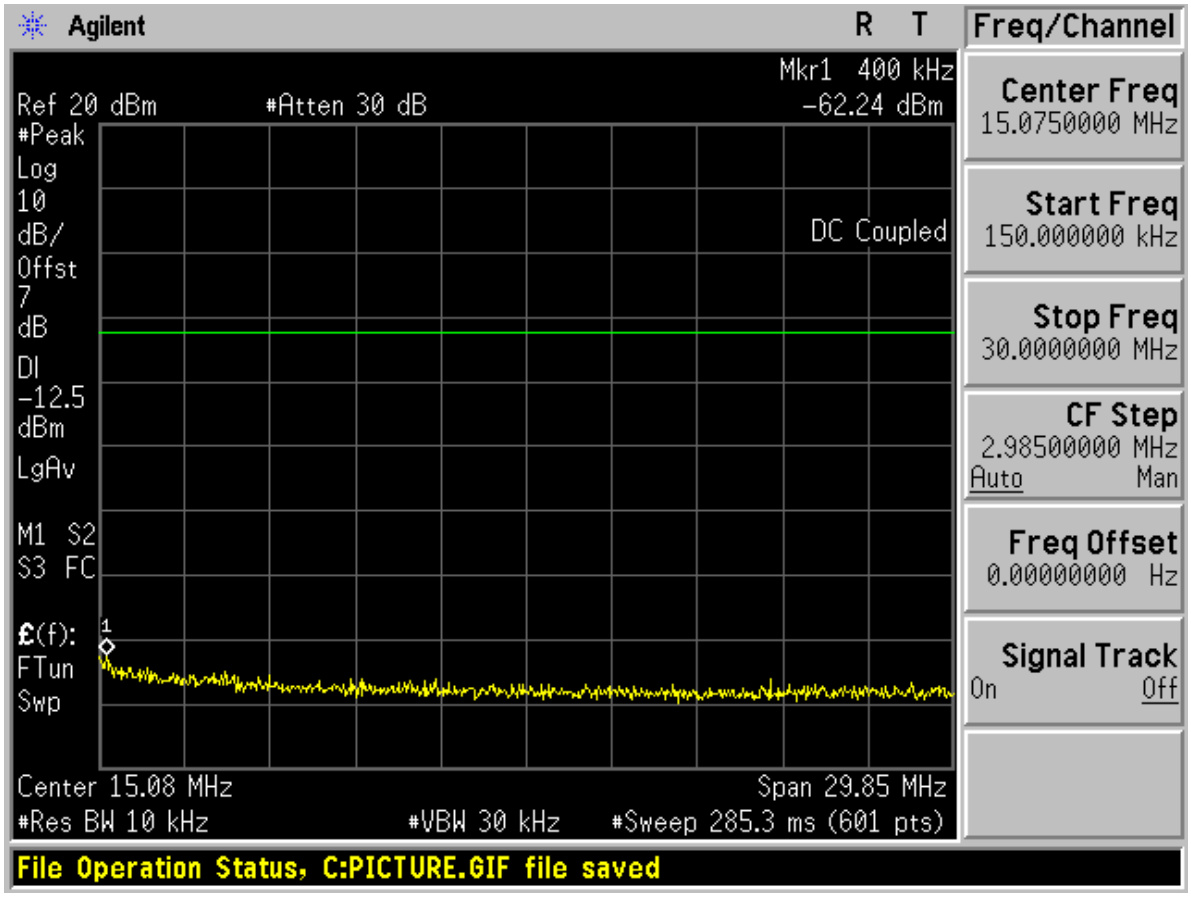

Agilent
R T
Freq/Channel
Mkr1 29.8 kHz
Ref 20 dBm
#Atten 30 dB
-68.12 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-13.4
dBm
LgAv
DC Coupled
M1 S2
S3 FC
£(f):
f<50k
Swp
Center Freq
90.0000000 kHz
Start Freq
30.0000000 kHz
Stop Freq
150.000000 kHz
CF Step
12.0000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Center 90.0 kHz
Span 120 kHz
#Res BW 1 kHz
#VBW 3 kHz
#Sweep 114.7 ms (601 pts)
File Operation Status, C:PICTURE.GIF file saved

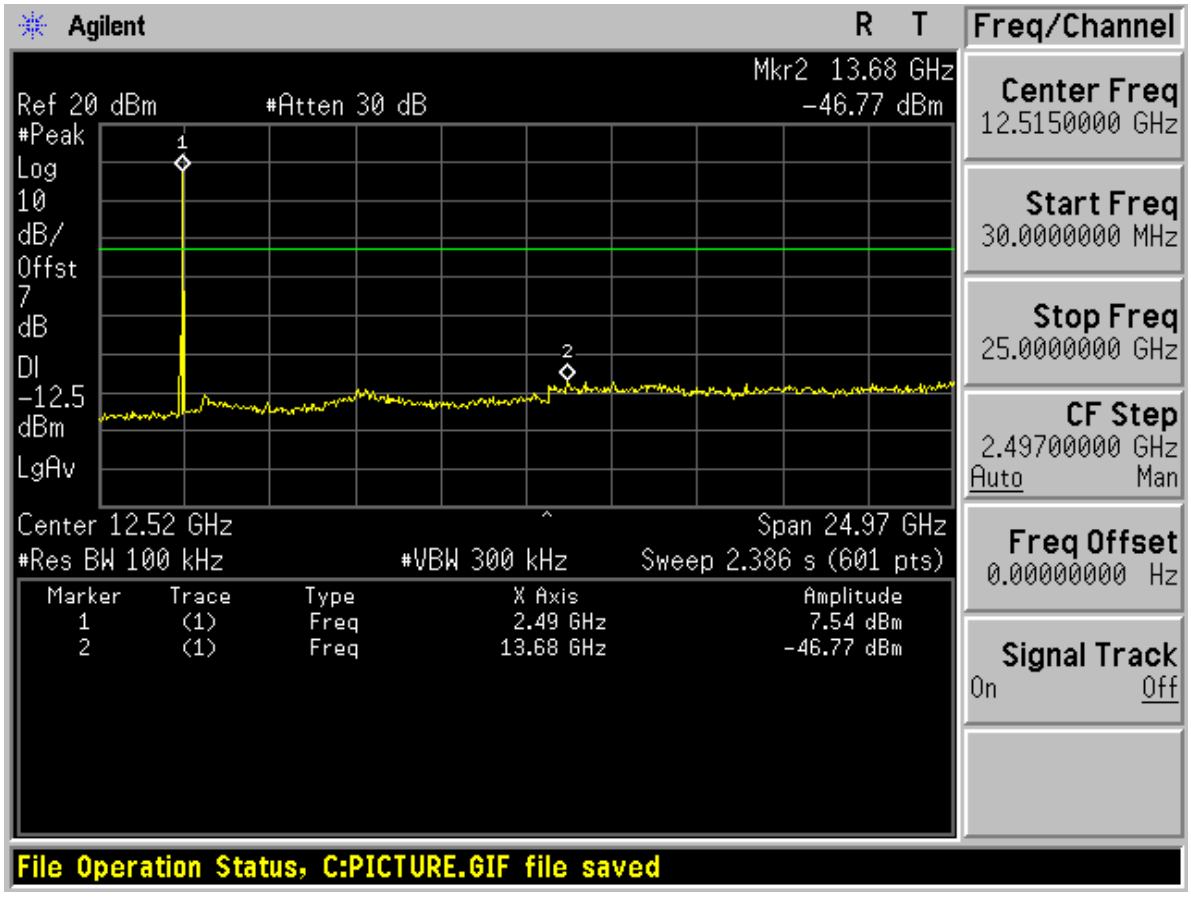

Agilent
R T
Freq/Channel
Mkr1 950 kHz
Ref 20 dBm
#Atten 30 dB
-62.28 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-13.4
dBm
LgAv
DC Coupled
M1 S2
S3 FC
£(f):
FTun
Swp
Center Freq
15.0750000 MHz
Start Freq
150.000000 kHz
Stop Freq
30.0000000 MHz
CF Step
2.98500000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
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 24.92 GHz
Ref 20 dBm
#Atten 30 dB
-46.78 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-13.4
dBm
LgAv
Center Freq
12.5150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
25.0000000 GHz
CF Step
2.49700000 GHz
Auto Man
Center 12.52 GHz
Span 24.97 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.386 s (601 pts)
Freq Offset
0.00000000 Hz
Signal Track
On Off
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.44 GHz 6.58 dBm
2 (1) Freq 24.92 GHz -46.78 dBm
File Operation Status, C:PICTURE.GIF file saved

Channel 78


Agilent
R T
Freq/Channel
Mkr1 38.9 kHz
Ref 20 dBm
#Atten 30 dB
-68.01 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-12.5
dBm
LgAv
M1 S2
S3 FC
£(f):
f<50k
Swp
DC Coupled
1
Center 90.0 kHz
Span 120 kHz
#Res BW 1 kHz
#VBW 3 kHz
#Sweep 114.7 ms (601 pts)
Center Freq
90.0000000 kHz
Start Freq
30.0000000 kHz
Stop Freq
150.000000 kHz
CF Step
12.0000000 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 400 kHz
Ref 20 dBm
#Atten 30 dB
-62.24 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-12.5
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 13.68 GHz
Ref 20 dBm
#Atten 30 dB
-46.77 dBm
#Peak
Log
10
dB/
Offst
7
dB
Dl
-12.5
dBm
LgAv
Center Freq
12.5150000 GHz
Start Freq
30.0000000 MHz
Stop Freq
25.0000000 GHz
CF Step
2.49700000 GHz
Auto Man
Center 12.52 GHz
Span 24.97 GHz
#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 2.49 GHz 7.54 dBm
2 (1) Freq 13.68 GHz -46.77 dBm
Signal Track
On Off
File Operation Status, C:PICTURE.GIF file saved

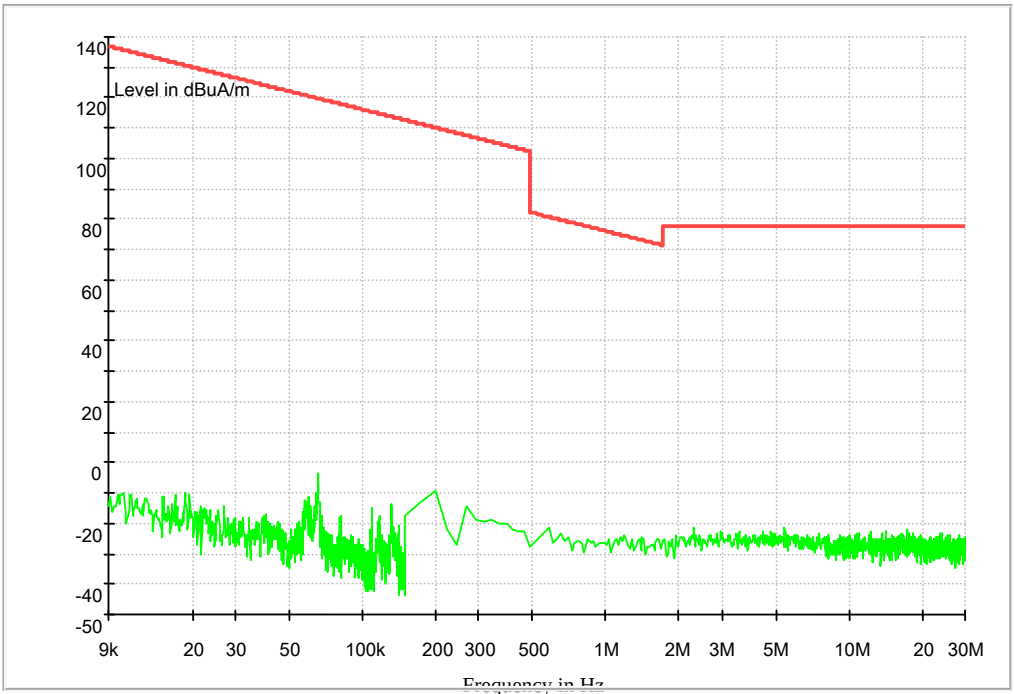
----------The End ----------

Appendix H

Radiated spurious emission

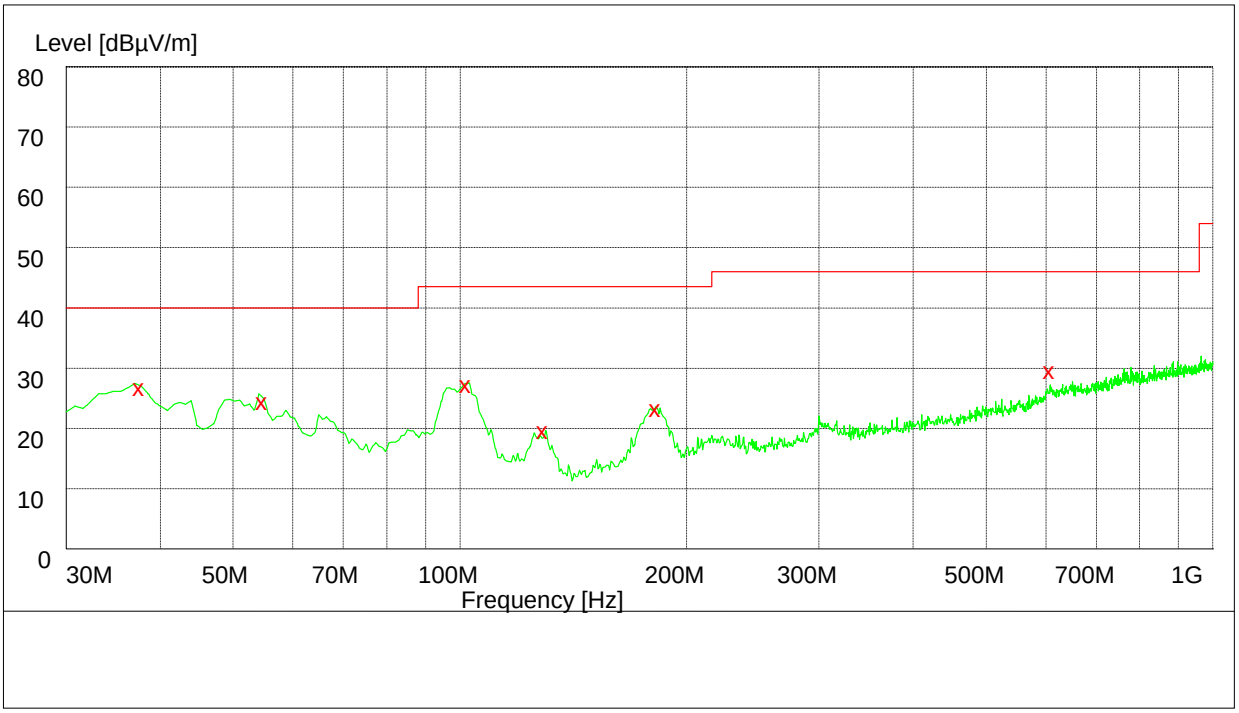
According to FCC Part 15.247 (d) & 15.205 & 15.209

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



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

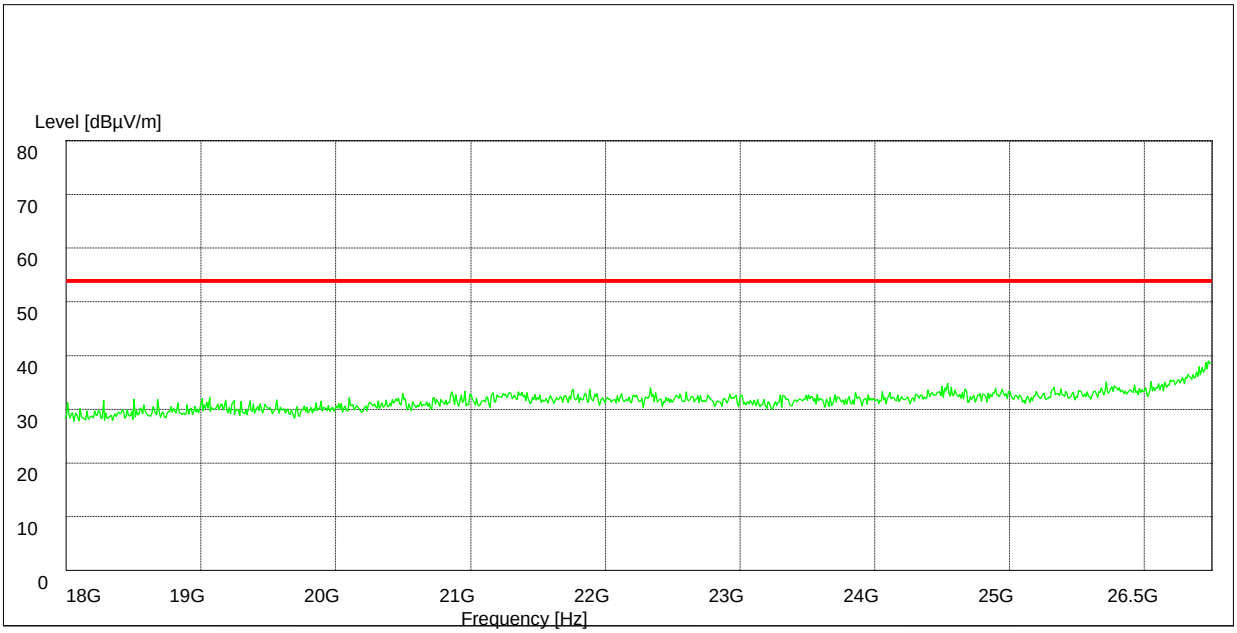
Note 1: The test results and plot for testing range of “30 MHz to 1 GHz” showed as below is the WORST case for all Test Modes and Channels. This range will not be presented for each Test Mode and each Channel.



Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Plarization
37.620000	26.50	15.2	40.0	13.5	101.0	321.00	VERTICAL
54.780000	24.20	14.6	40.0	15.8	108.0	260.00	HORIZONTAL
102.180000	27.00	13.5	43.5	16.5	100.0	154.00	VERTICAL
129.300000	19.30	10.5	43.5	24.2	100.0	135.00	VERTICAL
182.280000	23.00	11.5	43.5	20.5	102.0	324.00	VERTICAL
608.640000	29.40	21.6	46.0	16.6	131.0	264.00	HORIZONTAL

Part 3: Testing Range of "18 GHz to 26.5 GHz"

Note: No peak found in pre- test.



Part 4: Testing Range of "2.3GHz to 2.5GHz"

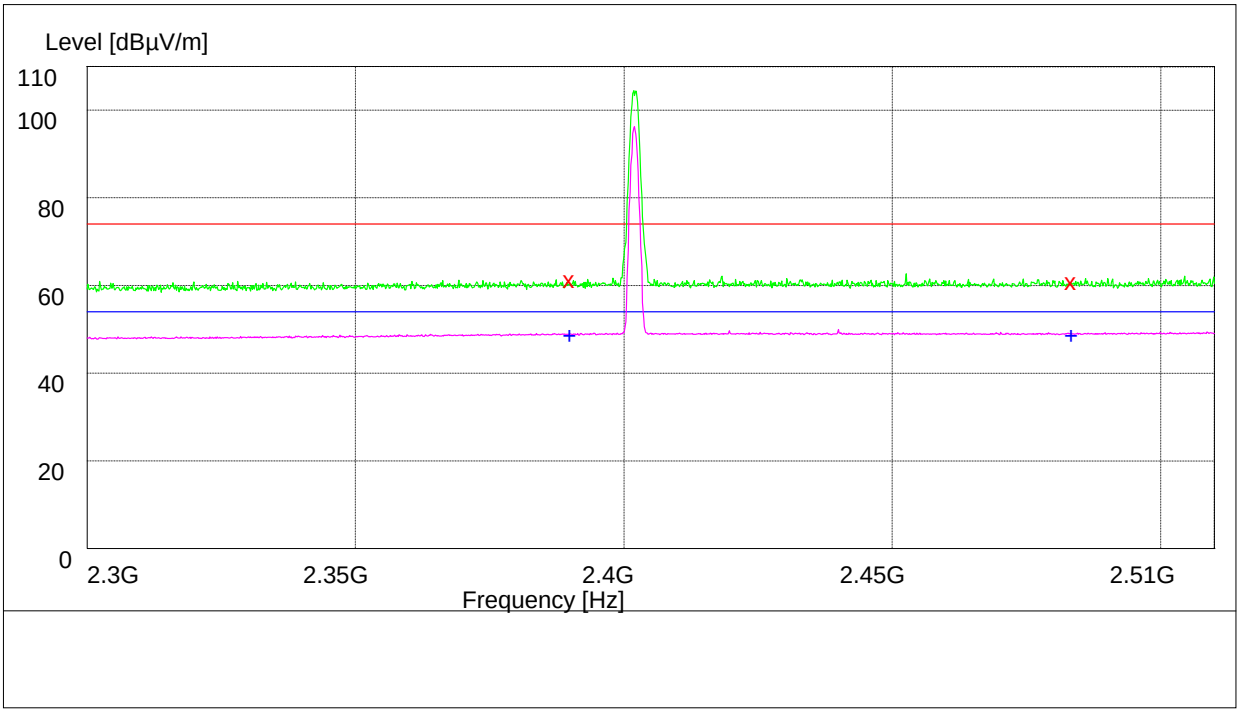
Note 1: The testing range of "2.3 GHz to 2.5 GHz" is for checking radiated emissions located in restricted bands near the EUT operating bands.

Note 2: Two limits are required in the testing range above 1 GHz, that is Peak limit (74 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:

1.1 Channel 00



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

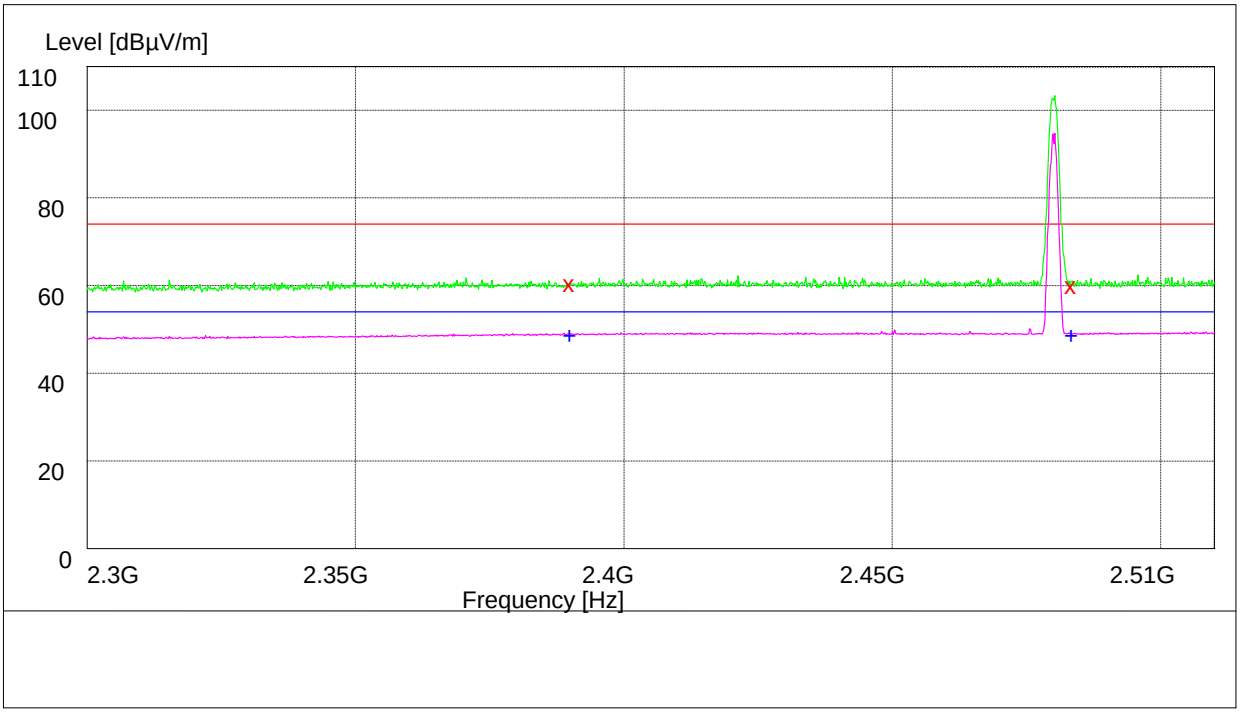
MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	61.50	34.8	74.0	12.5	150.0	235.00	HORIZONTAL
2483.500000	61.10	35.1	74.0	12.9	150.0	144.00	HORIZONTAL

MEASUREMENT RESULT: AVDetector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	48.80	34.8	54.0	5.2	135.0	358.00	VERTICAL
2483.500000	48.60	35.1	54.0	5.4	138.0	114.00	VERTICAL

1.2 Channel 78



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

MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	60.50	34.8	74.0	13.5	150.0	162.00	HORIZONTAL
2483.500000	60.10	35.1	74.0	21.6	148.0	121.00	VERTICAL

MEASUREMENT RESULT: AVDetector

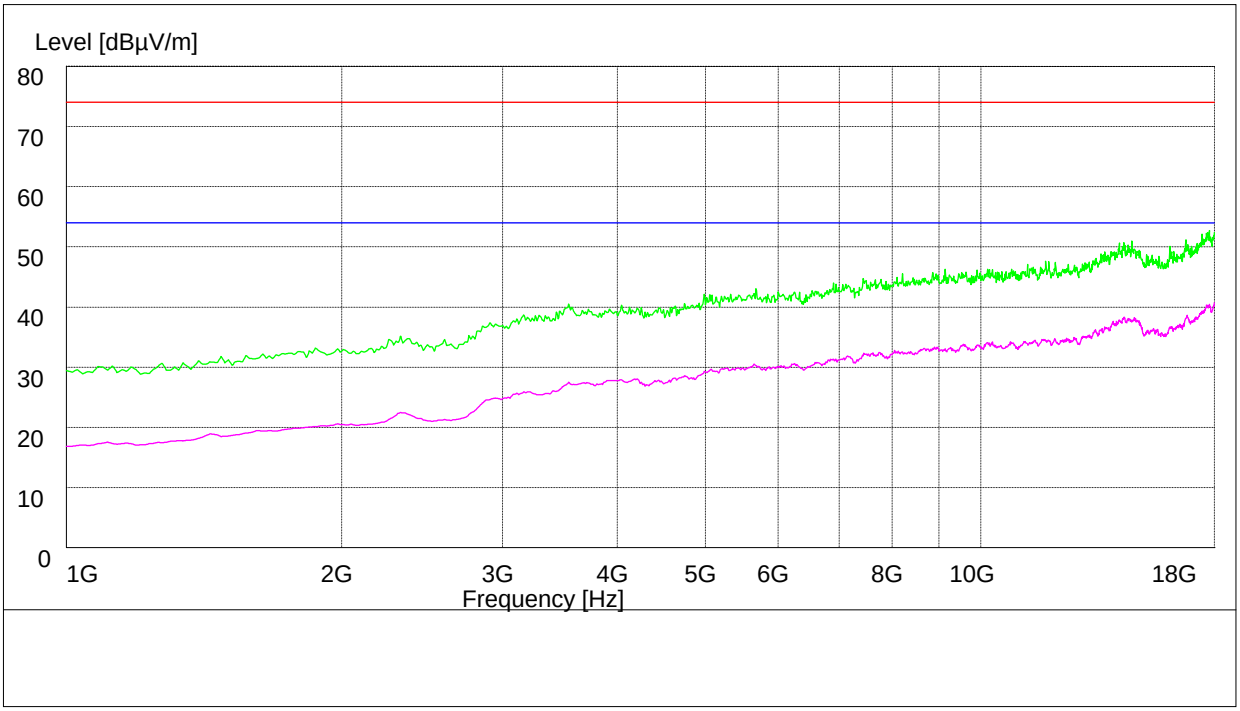
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
2390.000000	48.80	34.8	54.0	5.2	146.0	265.00	VERTICAL
2483.500000	48.70	35.1	54.0	5.3	145.0	71.00	VERTICAL

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

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

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

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



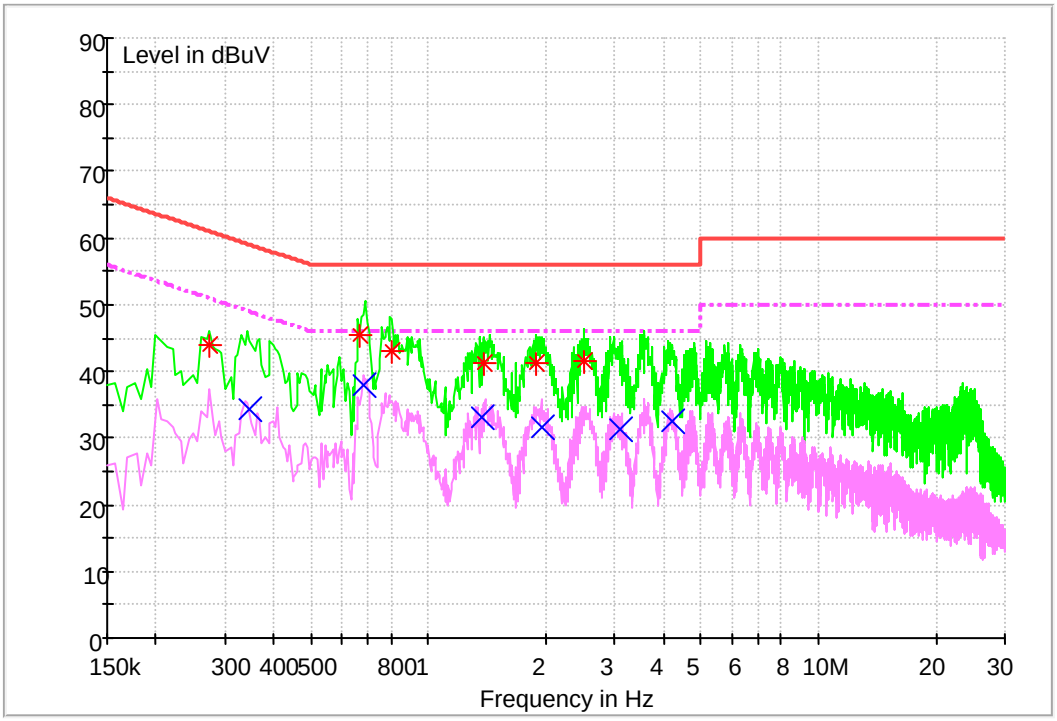
---------- End of Report ----------

Appendix I

Conducted Emission at Power Port

According to FCC Part 15.207

Channel 40



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.274278	44.0	9.7	61.0	17.0	N	FLO
0.667298	45.6	9.7	56.0	10.4	N	FLO
0.804281	42.9	9.7	56.0	13.1	N	FLO
1.378954	41.2	9.7	56.0	14.8	N	FLO
1.881866	41.3	9.7	56.0	14.7	N	FLO
2.506306	41.6	9.7	56.0	14.4	N	FLO
6.224567	38.3	9.8	60	21.7	L1	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.346526	34.3	9.7	49.0	14.7	N	FLO
0.683190	37.9	9.7	46.0	8.1	N	FLO

1.375129	33.0	9.7	46.0	13.0	N	FLO
1.959851	31.7	9.7	46.0	14.3	N	FLO
3.100728	31.2	9.7	46.0	14.8	N	FLO
4.230330	32.6	9.8	46.0	13.4	L1	FLO

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