



FCC&IC RF Test Report

Product Name: LTE Wireless Gateway

Model Number: B890-66

Report No: SYBH(Z-RF)004092012-2002

FCC ID: QISB890

IC: 6369A-B890

Reliability Laboratory of Huawei Technologies Co., Ltd.

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

Tel: +86 755 28780808 Fax: +86 755 89652518

Notice

1. The laboratory has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L0310.
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.
3. The laboratory has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-2.
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Applicant: Huawei Technologies Co., Ltd.
Address: Administration Building, Headquarters of Huawei
Technologies Co., Ltd., Bantian, Longgang District,
Shenzhen, 518129, P.R.C
Date of Receipt Test Item: Aug.24, 2012
Start Date of Test: Aug.27, 2012
End Date of Test: Sept.10, 2012
Test Result: Pass

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

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

Operator Sept.12, 2012 Huang Qiuliang Huang Qiuliang
Date Name Signature



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1 General Information

1.1 Applied Standard	
Applied Rules:	47 CFR FCC Part 2:2011, Subpart J 47 CFR FCC Part 27:2011, Subpart C&L ANSI/TIA 603C:2004 IC RSS-Gen Issue 3 IC RSS-139 Issue 2
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:	20 – 25 °C
Ambient Relative Humidity:	45 – 55 %
Atmospheric Pressure:	101 kPa

2 Summary

Table 1 Summary of results

Test Case	FCC Part No.	Requirements	Result
AWS Band			
Transmitter Output Power	2.1046 & 27.50(d)	Peak EIRP not exceed 1 W Peak-to-average ratio not exceed 13 dB	Pass
Modulation Characteristics	2.1047	Digital modulation	Pass
Occupied Bandwidth	2.1049	(Not specified)	Pass
Band Edges Compliance	2.1051 & 27.53(h)	Below -13 dBm/1%*EBW, in 1 MHz range	Pass
Spurious Emission at Antenna Terminals	2.1051 & 27.53(h)	Below -43 dBm/1 kHz, 9 kHz to 150 kHz Below -33 dBm/10 kHz, 150 kHz to 30 MHz Below -13 dBm/1 MHz, 30 MHz to 10 th harmonics	Pass
Field Strength of Spurious Radiation	2.1053 & 27.53(h)	Below -13 dBm/1 MHz	Pass
Frequency Stability	2.1055 & 27.54	Stay within the authorized bands of operation	Pass

Table 2 Summary of results

Test Case	IC Standard No.	Requirements	Result
AWS Band			
Transmitter Output Power	RSS-Gen, §4.8; RSS-139, §6.4	EIRP not exceed 1 W Peak-to-average ratio not exceed 13 dB	Pass
Modulation Characteristics	RSS-139, §6.2	Digital modulation	Pass
Occupied Bandwidth	RSS-Gen, §4.6	(Not specified)	Pass
Band Edges Compliance	RSS-Gen, §4.9; RSS-139, §6.5	Below -13 dBm/1%*EBW, in 1 MHz range	Pass
Spurious Emission at Antenna Terminals	RSS-Gen, §4.9; RSS-139, §6.5	Below -43 dBm/1 kHz, 9 kHz to 150 kHz Below -33 dBm/10 kHz, 150 kHz to 30 MHz Below -13 dBm/1 MHz, 30 MHz to 5 th harmonics	Pass
Field Strength of Spurious Radiation	RSS-Gen, §4.9; RSS-139, §6.5	Below -13 dBm/1 MHz	Pass
Frequency Stability	RSS-Gen, §4.7; RSS-139, §6.3	Stay within the authorized frequency block	Pass
Receiver Spurious Emissions (Conducted)	RSS-Gen, §4.10; RSS-Gen, §6; RSS-139, §6.6	Below 2 nW/4 kHz (-57 dBm/4 kHz), for 30 MHz - 1000 MHz Below 5 nW/MHz (-53 dBm/MHz), for above 1 GHz	Pass



3 Product Description

3.1 Production Information

3.1.1 General Description

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

3.1.2 Board Information

Table 3 Board Information

LTE Wireless Gateway		
B890-66		
Board and Module		
Hardware Version	Software Version	Description
WL1B890I	V100R001	Board

3.1.3 Adapter Technical Data

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

4 Test Description

4.1 Supported Frequency Range

Characteristics	Description
Uplink	1710 to 1755 MHz
Downlink	2110 to 2155 MHz

4.2 Transmitter / Receiver Characteristics

Characteristics	Description
System Type	UMTS LTE
TX Output Power (per Antenna Port)	UMTS system: 24dBm; LTE system: 23dBm;
Channel Spacing(s) / Bandwidth(s)	UMTS system: 5 MHz LTE system: 1.4MHz,3Mhz,5 MHz,10 MHz,15 MHz,20 MHz
Designation of Emissions	UMTS system: 4M17F9W LTE system: 1M09G7D (1.4MHz ,QPSK modulation), 1M08W7D (1.4 MHz ,16QAM modulation), 2M69G7D (3MHz ,QPSK modulation), 2M68W7D (3 MHz ,16QAM modulation), 4M48G7D (5MHz ,QPSK modulation), 4M48W7D (5 MHz ,16QAM modulation), 8M95G7D (10 MHz QPSK modulation), 8M94W7D (10 MHz 16QAM modulation), 13M5G7D (15 MHz QPSK modulation), 13M5W7D (15 MHz 16QAM modulation), 17M9G7D (20 MHz QPSK modulation), 17M9W7D (20 MHz 16QAM modulation),

4.3 Antenna Gain

Antenna Gain(dBi)	-1
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4.4 Power Supply

Specification	Description
Power Supply Type	Directly Connected to DC /AC Power Supply
Input to EUT (DC power)	DC Voltage Nominal: $\approx$ 12 V DC Voltage Range: $\approx$ 10.8 V to 13.2 V
Input to EUT (AC power)	AC Voltage Nominal: $\sim$ 120 V (50/60 Hz) AC Voltage Range: $\sim$ 100-240V

5 General Test Conditions / Configurations

5.1 RF Channels under Test

Test Mode	TX / RX	RF Channel		
		Bottom (B)	Middle (M)	Top (T)
TM1/TM2/TM3	TX	Channel1312(B)	Channel1412(M)	Channel1513(T)
		1712.4MHz	1732.4MHz	1752.6MHz
	RX	Channel 1537	Channel 1637	Channel 1738
		2112.4 MHz	2132.4 MHz	2152.6 MHz
TM4/TM5	TX(1.4M)	Channel 19957	Channel 20175	Channel 20393
		1710.7MHz	1732.5 MHz	1754.3 MHz
	RX(1.4M)	Channel 1957	Channel 2175	Channel 2393
		2110.7 MHz	2132.5MHz	2154.3 MHz
	TX(3M)	Channel 19965	Channel 20175	Channel 20385
		1711.5 MHz	1732.5 MHz	1753.5 MHz
	RX(3M)	Channel 1965	Channel 2175	Channel 2385
		2111.5 MHz	2132.5MHz	2153.5 MHz
	TX(5M)	Channel 19975	Channel 20175	Channel 20375
		1712.5 MHz	1732.5 MHz	1752.5 MHz
	RX(5M)	Channel 1975	Channel 2175	Channel 2375
		2112.5 MHz	2132.5MHz	2152.5 MHz
	TX(10M)	Channel 20000	Channel 20175	Channel 20350
		1715 MHz	1732.5 MHz	1750 MHz
	RX(10M)	Channel 2000	Channel 2175	Channel 2350

Test Mode	TX / RX	RF Channel		
		Bottom (B)	Middle (M)	Top (T)
		2115 MHz	2132.5MHz	2150 MHz
	TX(15M)	Channel 20025	Channel 20175	Channel 20325
		1717.5 MHz	1732.5 MHz	1747.5 MHz
	RX(15M)	Channel 2025	Channel 2175	Channel 2325
		2117.5 MHz	2132.5MHz	2147.5 MHz
	TX(20M)	Channel 20050	Channel 20175	Channel 20300
		1720 MHz	1732.5 MHz	1745 MHz
	RX(20M)	Channel 2050	Channel 2175	Channel 2300
		2120 MHz	2132.5MHz	2145 MHz

5.2 Test Modes

Test Mode	Test Modes Description
TM1	WCDMA ,QPSK modulation
TM2	HSDPA , QPSK modulation
TM3	HSUPA , QPSK modulation
TM4	LTE , QPSK modulation
TM5	LTE , 16QAM modulation

5.3 Test Environments

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VL	10.8V
	VN	12.0V
	VH	13.2V

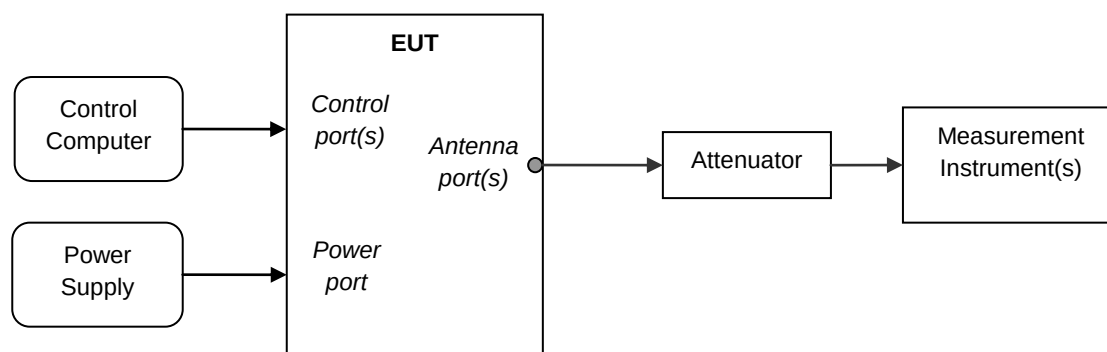
NOTE: VL= lower extreme test voltages
VN= nominal voltage
VH= upper extreme test voltage
TN= normal temperature

5.4 Test Setups

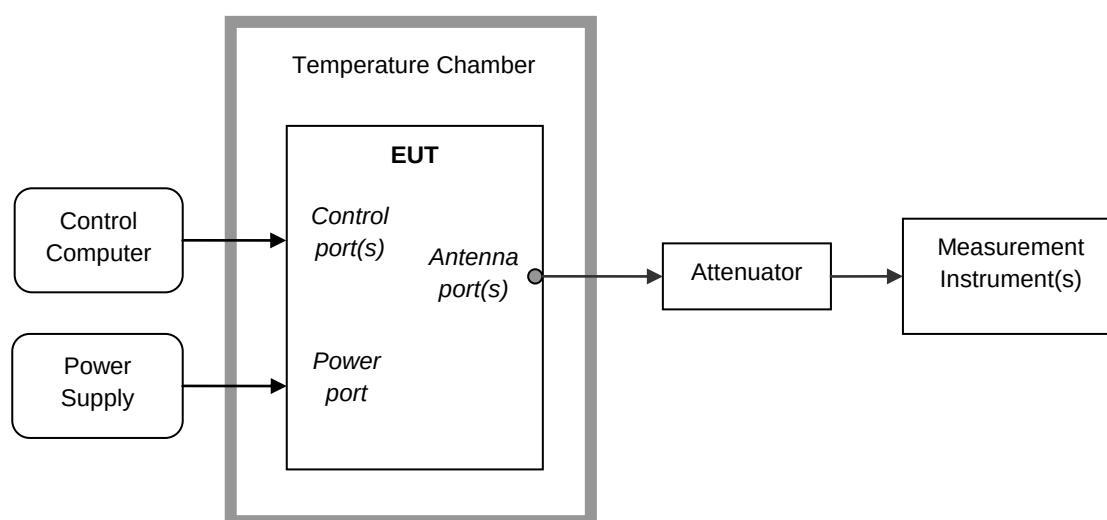
5.4.1 General Test Setup Configurations

Configuration	Description
Test Antenna Ports	Until otherwise declared, all TX tests are ONLY performed at the main Transmitter antenna port (e.g. TRXA, TXA and so on) of the EUT, and all RX tests are ONLY performed at the main Receiver antenna port (e.g. TRXA, RXA and so on) of the EUT.
Multiple RF Sources	Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.

5.4.2 Test Setup 1



5.4.3 Test Setup 2



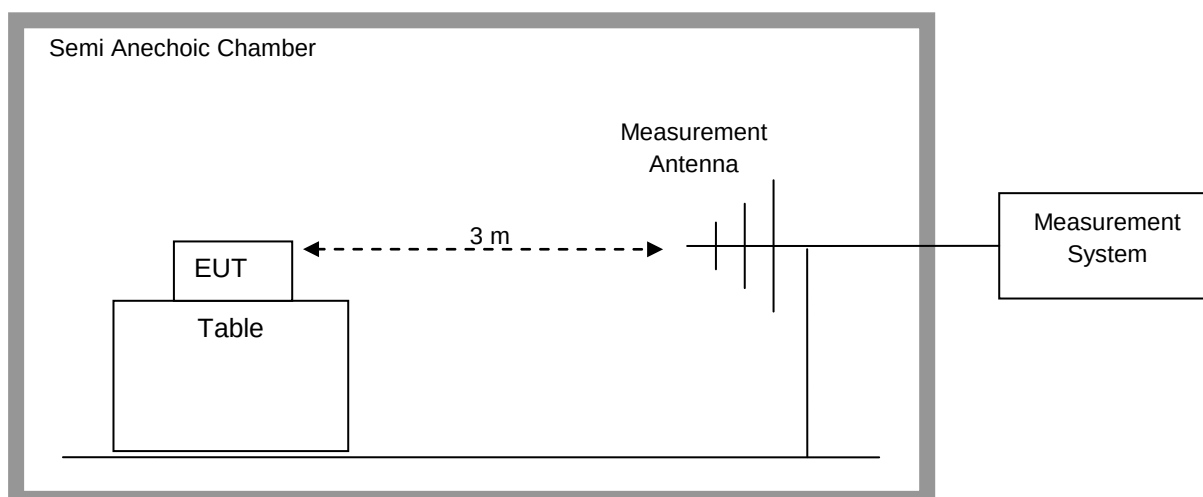
5.4.4 Test Setup 3

NOTE1: Effective radiated power (ERP) or Effective Isotropic radiated power (EIRP) refers to the EUT radiation power output, assuming all emissions are radiated from half-wave dipole antennas or horn antennas.

NOTE2: The EUT was set on insulator 80cm above the Ground Plane. The setup and test methods were according to ANSI-TIA-603C 2004. The measurements were carried through with a Rohde and Schwarz Test Receiver and control software.

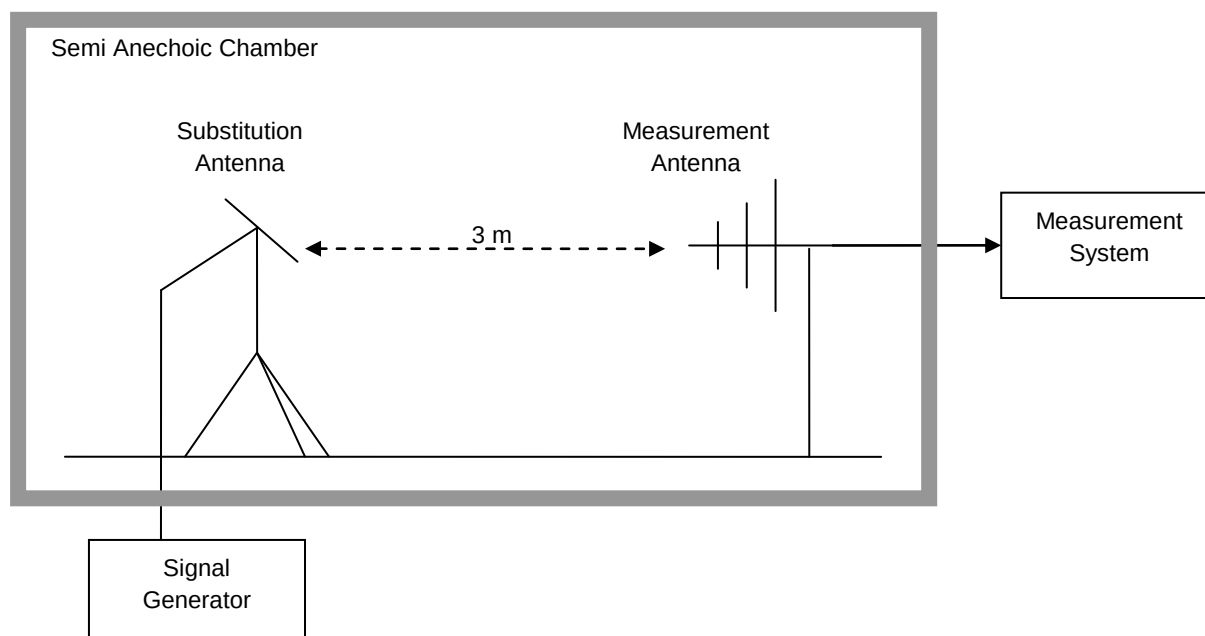
Step 1: Pre-test

1. Connect the test system according to the following figure. EUT is running for 30 minutes before test, and measurement instruments are warming-up for 30 minutes.
2. Set up communication link between Universal radio communication tester and EUT, set EUT working frequency, and control EUT to transmit at maximum power.
3. Set the center frequency of the signal analyzer or receiver to the EUT's operating frequency, the RBW is equal to the emission bandwidth of the signal. Set RMS detector for the test, and the span is equal to 2 times of emission bandwidth, the other settings should remain automatic. Normally, the height range of antenna was 1m to 4m, the azimuth range of turntable was 0° to 360°. The receiver 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 non-metallic 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. Measure the EUT maximum RF power and record the result.
4. Changing EUT working frequency and measuring the RF power at channel T, M, B respectively. Complete the test data.



Step 2: Substitution method to verify the maximum EIRP

1. Measurement setup is according to the following figure. EUT was substituted by antenna, and the polarization is identical with the test antenna; the signal generator was connected to the substitution antenna.
2. The radiated output power, measured by signal analyzer set, is the same as recorded in above. Then this power level is matched by a signal from a calibrated signal generator which is substituted for EUT. The power supplied by the generator is then equal to the ERP or EIRP after corrected by the antenna gain and cable loss.



5.5 Test Conditions

Test Case	Test Conditions	
Transmitter Output Power	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1 & Test Setup 3
	Detector	RMS
	RF Channels (TX)	B, M, T
	Test Mode	TM1/TM2/TM3/TM4/TM5
Modulation Characteristics	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	RF Channels (TX)	M
	Test Mode	TM1/TM4/TM5
Occupied Bandwidth	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	RMS
	RF Channels (TX)	B, M, T
	Test Mode	TM1/TM4/TM5
Band Edges Compliance	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	RMS
	RF Channels (TX)	B, T
	Test Mode	TM1/TM4/TM5
Spurious Emission at Antenna Terminals	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	PK
	RF Channels (TX)	B, M, T
	Test Mode	TM1/TM4/TM5
Field Strength of Spurious Radiation	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 3
	Detector	PK
	RF Channels (TX)	M
	Test Mode	TM1/TM2/TM3/TM4/TM5
Frequency Stability	Test Configuration	(1) -30 °C to +50 °C with step 10 °C at Rated Voltage; (2) VL, VN and VH of Rated Voltage at Ambient Temperature.
	Test Setup	Test Setup 2



Test Case	Test Conditions	
	RF Channels (TX)	M
	Test Mode	TM1/TM4
Receiver Spurious Emissions	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 3
	Detector	QP,PK, AV
	RF Channels (TX)	M
	Test Mode	TM1/TM2/TM3/TM4/TM5

6 Main Test Instruments

Table 4 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Power supply	KEITHLEY	2303	1288003	Sept., 27,2012
Universal Radio Communication Tester	R&S	CMU200	117341	Jan., 12,2013
Universal Radio Communication Tester	Agilent	E5515C	MY50260239	Aug., 30,2013
Spectrum Analyzer	Agilent	E4440A	MY49420179	Jul., 17,2013
Signal Analyzer	Agilent	N9020A	MY52090652	Jul., 17,2013
Signal Analyzer	R&S	FSQ31	200021	Sept., 27,2012
Temperature Chamber	WEISS	WKL64	24600294	Feb.,13,2013
Signal generator	Agilent	E8257D	MY49281095	Jul.,09,2013
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)	SCHWARZB ECK	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
Universal Radio Communication Tester	R & S	CMW500	20347676	Sept., 06, 2013
Universal Radio Communication Tester	Anritsu	MT8820C	6200971028	May, 04, 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 Test Results

No.	Test Item	Test Result
1	Transmitter Output Power	Appendix A
2	Modulation Characteristics	Appendix B
3	Occupied Bandwidth	Appendix C
4	Band Edges Compliance	Appendix D
5	Spurious Emission at Antenna Terminals	Appendix E
6	Field Strength of Spurious Radiation	Appendix F
7	Frequency Stability	Appendix G
8	Receiver Spurious Emissions	Appendix H
9	Photos of Test Setup	Appendix I

NOTE: The Appendix I only photos of test setup for Field Strength of Spurious Radiation and Receiver Spurious Emissions, no test data.

8 Measurement Uncertainty

For a 95% confidence level ($k=2$), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Test Item		Extended Uncertainty
Transmitter Output Power	Power (dBm)	$U=0.39$ dB
Occupied Bandwidth	Magnitude (%)	$U=0.2\%$
Band Edge Compliance	Disturbance Power (dBm)	$U=2.0$ dB
Conducted Spurious Emissions	Disturbance Power (dBm)	$U=2.0$ dB
Field Strength of Spurious Radiation	ERP (dBm)	$U=4.6$ dB (30 MHz – 1GHz) $U=3.0$ dB (above 1 GHz)
Frequency Stability	Frequency Accuracy (ppm)	$U=0.21$ ppm

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



Appendix A

Transmitter Output Power

According to FCC Part 2.1046 & Part 27.50(d) &
RSS-139



Conducted Power of Transmitter

Measurement Results

TEST CONDITIONS		RF Output Power (Conducted)					
		Channel 1312(B)		Channel 1412(M)		Channel 1513(T)	
		1712.4MHz		1732.4MHz		1752.6MHz	
		dBm		dBm		dBm	
T _{nom} / V _{nom}		Measured	Limit	Measured	Limit	Measured	Limit
TM1		21.61	30	22.55	30	22.51	30
TM2	Case1	21.62	30	21.59	30	21.61	30
	Case2	21.42	30	21.32	30	21.32	30
	Case3	21.09	30	20.77	30	20.74	30
	Case4	20.73	30	20.76	30	20.78	30
TM3	Case1	20.83	30	21.63	30	21.57	30
	Case2	18.41	30	18.39	30	18.42	30
	Case3	20.44	30	20.08	30	20.44	30
	Case4	20.96	30	20.46	30	20.93	30
	Case5	21.26	30	21.48	30	21.26	30

Note: RBW > emission bandwidth, VBW > 3 x RBW.

Measurement Results (LTE) BAND 4

TM4 & TM5 RF Output Power(Conducted) BAND 4				
Test Mode	TN/VN			
	Modulation	RB	Measured (dBm)	Limit (dBm)
Channel (B) 1.4MHz(BW)	QPSK	1RB#0	23.04	30
		1RB#max	23.11	30
		3RB#2	23.10	30
		Full	22.03	30
	16QAM	1RB#0	22.15	30
		1RB#max	22.17	30
		3RB#2	21.94	30
		Full	20.89	30
Channel (B)	QPSK	1RB#0	23.04	30



3MHz(BW)		1RB#max	23.08	30
		8RB#4	22.13	30
		Full	22.05	30
	16QAM	1RB#0	22.13	30
		1RB#max	22.17	30
		8RB#4	21.07	30
		Full	21.08	30
Channel (B) 5MHz(BW)	QPSK	1RB#0	23.00	30
		1RB#max	22.99	30
		12RB#6	22.00	30
		Full	21.96	30
	16QAM	1RB#0	22.13	30
		1RB#max	22.10	30
		12RB#6	21.08	30
		Full	20.92	30
Channel (B) 10MHz(BW)	QPSK	1RB#0	23.00	30
		1RB#max	23.00	30
		25RB#13	21.90	30
		Full	21.82	30
	16QAM	1RB#0	22.11	30
		1RB#max	22.20	30
		25RB#13	20.93	30
		Full	20.75	30
Channel (B) 15MHz(BW)	QPSK	1RB#0	23.04	30
		1RB#max	22.98	30
		36RB#18	21.88	30
		Full	21.83	30
	16QAM	1RB#0	22.14	30
		1RB#max	22.09	30
		36RB#18	20.93	30
		Full	20.76	30
Channel (B) 20MHz(BW)	QPSK	1RB#0	23.00	30
		1RB#max	22.99	30
		50RB#25	21.84	30
		Full	21.79	30
	16QAM	1RB#0	22.12	30
		1RB#max	22.15	30
		50RB#25	20.76	30



		Full	20.72	30
Channel (M) 1.4MHz(BW)	QPSK	1RB#0	23.00	30
		1RB#max	22.94	30
		3RB#2	23.10	30
		Full	22.12	30
	16QAM	1RB#0	21.64	30
		1RB#max	21.57	30
		3RB#2	22.29	30
		Full	21.20	30
Channel (M) 3MHz(BW)	QPSK	1RB#0	23.08	30
		1RB#max	22.98	30
		8RB#4	22.05	30
		Full	22.03	30
	16QAM	1RB#0	22.21	30
		1RB#max	22.16	30
		8RB#4	21.04	30
		Full	21.07	30
Channel (M) 5MHz(BW)	QPSK	1RB#0	23.08	30
		1RB#max	22.94	30
		12RB#6	22.12	30
		Full	22.08	30
	16QAM	1RB#0	22.19	30
		1RB#max	22.08	30
		12RB#6	21.11	30
		Full	20.99	30
Channel (M) 10MHz(BW)	QPSK	1RB#0	23.08	30
		1RB#max	23.02	30
		25RB#13	22.05	30
		Full	21.86	30
	16QAM	1RB#0	22.19	30
		1RB#max	22.19	30
		25RB#13	20.95	30
		Full	20.79	30
Channel (M) 15MHz(BW)	QPSK	1RB#0	22.98	30
		1RB#max	22.82	30
		36RB#18	21.93	30
		Full	21.83	30
	16QAM	1RB#0	22.13	30



		1RB#max	22.07	30
		36RB#18	20.87	30
		Full	20.75	30
Channel (M) 20MHz(BW)	QPSK	1RB#0	22.96	30
		1RB#max	22.84	30
		50RB#25	21.90	30
		Full	21.81	30
	16QAM	1RB#0	22.08	30
		1RB#max	22.04	30
		50RB#25	20.82	30
		Full	20.76	30
Channel (T) 1.4MHz(BW)	QPSK	1RB#0	22.79	30
		1RB#max	22.86	30
		3RB#2	22.83	30
		Full	21.88	30
	16QAM	1RB#0	21.97	30
		1RB#max	21.88	30
		3RB#2	21.71	30
		Full	20.64	30
Channel (T) 3MHz(BW)	QPSK	1RB#0	22.94	30
		1RB#max	22.78	30
		8RB#4	21.82	30
		Full	21.70	30
	16QAM	1RB#0	21.95	30
		1RB#max	21.91	30
		8RB#4	20.58	30
		Full	20.75	30
Channel (T) 5MHz(BW)	QPSK	1RB#0	22.84	30
		1RB#max	22.71	30
		12RB#6	21.84	30
		Full	21.81	30
	16QAM	1RB#0	21.99	30
		1RB#max	21.90	30
		12RB#6	20.84	30
		Full	20.70	30
Channel (T) 10MHz(BW)	QPSK	1RB#0	22.87	30
		1RB#max	22.71	30
		25RB#13	21.71	30



	16QAM	Full	21.73	30
		1RB#0	22.04	30
		1RB#max	21.85	30
		25RB#13	20.75	30
		Full	20.64	30
Channel (T) 15MHz(BW)	QPSK	1RB#0	22.84	30
		1RB#max	22.76	30
		36RB#18	21.62	30
		Full	21.66	30
	16QAM	1RB#0	22.03	30
		1RB#max	21.93	30
		36RB#18	20.67	30
		Full	20.58	30
Channel (T) 20MHz(BW)	QPSK	1RB#0	23.01	30
		1RB#max	22.73	30
		50RB#25	21.62	30
		Full	21.69	30
	16QAM	1RB#0	22.10	30
		1RB#max	21.86	30
		50RB#25	20.63	30
		Full	20.64	30

Note: RBW > emission bandwidth, VBW > 3 x RBW.



Peak-to-Average Ratio

Measurement Results (LTE) BAND 4

TEST CONDITIONS		RF Output Power (Conducted)					
		Channel 1312(B)		Channel 1412(M)		Channel 1513(T)	
		1712.4MHz		1732.4MHz		1752.6MHz	
		dB		dB		dB	
T _{nom} / V _{nom}		Measured	Limit	Measured	Limit	Measured	Limit
TM1		3.11	13	3.02	13	3.07	13
TM2	Case1	2.98	13	3.03	13	2.65	13
	Case2	2.65	13	2.72	13	2.49	13
	Case3	2.78	13	2.86	13	2.63	13
	Case4	2.38	13	2.42	13	2.57	13
TM3	Case1	2.87	13	2.96	13	2.19	13
	Case2	2.66	13	2.73	13	2.87	13
	Case3	2.57	13	2.63	13	2.83	13
	Case4	2.84	13	2.92	13	2.74	13
	Case5	2.71	13	2.78	13	2.91	13

Measurement Results (LTE) BAND 4

Peak-to-Average Ratio				
Test Mode	TN/VN			
	Modulation	RB	Measured (dB)	Limit (dB)
Channel (B) 1.4MHz(BW)	QPSK	1RB#0	5.41	13
		1RB#max	5.42	13
		3RB#2	5.40	13
		Full	5.43	13
	16QAM	1RB#0	6.34	13
		1RB#max	6.36	13
		3RB#2	6.31	13
		Full	6.36	13

Channel (B) 3MHz(BW)	QPSK	1RB#0	5.81	13
		1RB#max	5.83	13
		8RB#4	5.78	13
		Full	5.87	13
	16QAM	1RB#0	6.30	13
		1RB#max	6.28	13
		8RB#4	6.27	13
		Full	6.31	13
Channel (B) 5MHz(BW)	QPSK	1RB#0	5.63	13
		1RB#max	5.57	13
		12RB#6	5.61	13
		Full	5.64	13
	16QAM	1RB#0	6.31	13
		1RB#max	6.33	13
		12RB#6	6.32	13
		Full	6.35	13
Channel (B) 10MHz(BW)	QPSK	1RB#0	5.88	13
		1RB#max	5.86	13
		25RB#13	5.79	13
		Full	5.90	13
	16QAM	1RB#0	6.34	13
		1RB#max	6.29	13
		25RB#13	6.30	13
		Full	6.35	13
Channel (B) 15MHz(BW)	QPSK	1RB#0	5.61	13
		1RB#max	5.57	13
		36RB#18	5.62	13
		Full	5.67	13
	16QAM	1RB#0	6.34	13
		1RB#max	6.33	13
		36RB#18	6.36	13
		Full	6.38	13
Channel (B) 20MHz(BW)	QPSK	1RB#0	5.62	13
		1RB#max	5.62	13
		50RB#25	5.61	13
		Full	5.64	13
	16QAM	1RB#0	5.42	13
		1RB#max	5.41	13

		50RB#25	5.40	13
		Full	5.43	13
Channel (M) 1.4MHz(BW)	QPSK	1RB#0	6.32	13
		1RB#max	6.30	13
		3RB#2	6.31	13
		Full	6.34	13
	16QAM	1RB#0	5.82	13
		1RB#max	5.84	13
		3RB#2	5.83	13
		Full	5.88	13
Channel (M) 3MHz(BW)	QPSK	1RB#0	6.28	13
		1RB#max	6.27	13
		8RB#4	6.30	13
		Full	6.31	13
	16QAM	1RB#0	5.59	13
		1RB#max	5.58	13
		8RB#4	5.61	13
		Full	5.63	13
Channel (M) 5MHz(BW)	QPSK	1RB#0	5.60	13
		1RB#max	5.62	13
		12RB#6	5.61	13
		Full	5.65	13
	16QAM	1RB#0	6.45	13
		1RB#max	6.43	13
		12RB#6	6.42	13
		Full	6.50	13
Channel (M) 10MHz(BW)	QPSK	1RB#0	5.65	13
		1RB#max	5.61	13
		25RB#13	5.55	13
		Full	5.67	13
	16QAM	1RB#0	6.38	13
		1RB#max	6.33	13
		25RB#13	6.40	13
		Full	6.41	13
Channel (M) 15MHz(BW)	QPSK	1RB#0	5.74	13
		1RB#max	5.71	13
		36RB#18	5.66	13
		Full	5.78	13



	16QAM	1RB#0	6.55	13
		1RB#max	6.51	13
		36RB#18	6.53	13
		Full	6.61	13
Channel (M) 20MHz(BW)	QPSK	1RB#0	5.86	13
		1RB#max	5.90	13
		50RB#25	5.91	13
		Full	5.92	13
	16QAM	1RB#0	6.55	13
		1RB#max	6.52	13
		50RB#25	6.53	13
		Full	6.57	13
Channel (T) 1.4MHz(BW)	QPSK	1RB#0	5.58	13
		1RB#max	5.61	13
		3RB#2	5.51	13
		Full	5.62	13
	16QAM	1RB#0	6.36	13
		1RB#max	6.35	13
		3RB#2	6.34	13
		Full	6.39	13
Channel (T) 3MHz(BW)	QPSK	1RB#0	5.77	13
		1RB#max	5.73	13
		8RB#4	5.69	13
		Full	5.80	13
	16QAM	1RB#0	6.58	13
		1RB#max	6.54	13
		8RB#4	6.55	13
		Full	6.63	13
Channel (T) 5MHz(BW)	QPSK	1RB#0	5.63	13
		1RB#max	5.59	13
		12RB#6	5.61	13
		Full	5.64	13
	16QAM	1RB#0	6.33	13
		1RB#max	6.31	13
		12RB#6	6.38	13
		Full	6.44	13
Channel (T) 10MHz(BW)	QPSK	1RB#0	5.89	13
		1RB#max	5.95	13



		25RB#13	5.96	13
		Full	5.99	13
	16QAM	1RB#0	6.59	13
		1RB#max	6.54	13
		25RB#13	6.56	13
		Full	6.60	13
Channel (T) 15MHz(BW)	QPSK	1RB#0	5.65	13
		1RB#max	5.61	13
		36RB#18	5.55	13
		Full	5.67	13
	16QAM	1RB#0	6.38	13
		1RB#max	6.33	13
		36RB#18	6.40	13
		Full	6.41	13
Channel (T) 20MHz(BW)	QPSK	1RB#0	5.56	13
		1RB#max	5.59	13
		50RB#25	5.60	13
		Full	5.61	13
	16QAM	1RB#0	6.37	13
		1RB#max	6.35	13
		50RB#25	6.38	13
		Full	6.42	13



Effective Isotropic Radiated Power of Transmitter (EIRP)

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBi]	Cable Loss [dB]	Substitution Level (EIRP) [dBm]	FCC limit [dBm]	Result
TM1	1712.4	20.61	Horn Ant.	17.26	4.5	1	20.76	30	Pass
TM1	1732.4	21.55	Horn Ant.	18.09	4.5	1	21.59	30	Pass
TM1	1752.6	21.51	Horn Ant.	17.51	4.8	1	21.31	30	Pass

Test Mode			Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBi]	Cable Loss [dB]	Substitution Level (EIRP) [dBm]	FCC limit [dBm]	Result
Channel	Modulation	RB								
Channel (B) 1.4MHz(BW)	QPSK	1RB#0	22.04	Horn Ant.	18.39	4.5	1	21.89	30	Pass
		1RB#max	22.11	Horn Ant.	18.46	4.5	1	21.96	30	Pass
		3RB#2	22.10	Horn Ant.	18.45	4.5	1	21.95	30	Pass
		Full	21.03	Horn Ant.	17.38	4.5	1	20.88	30	Pass
	16QAM	1RB#0	21.15	Horn Ant.	17.50	4.5	1	21.00	30	Pass
		1RB#max	21.17	Horn Ant.	17.52	4.5	1	21.02	30	Pass
		3RB#2	20.94	Horn Ant.	17.29	4.5	1	20.79	30	Pass
		Full	19.89	Horn Ant.	16.24	4.5	1	19.74	30	Pass
Channel (B) 3MHz(BW)	QPSK	1RB#0	22.04	Horn Ant.	18.39	4.5	1	21.89	30	Pass
		1RB#max	22.08	Horn Ant.	18.43	4.5	1	21.93	30	Pass



		8RB#4	21.13	Horn Ant.	17.48	4.5	1	20.98	30	Pass
		Full	21.05	Horn Ant.	17.40	4.5	1	20.90	30	Pass
	16QAM	1RB#0	21.13	Horn Ant.	17.48	4.5	1	20.98	30	Pass
		1RB#max	21.17	Horn Ant.	17.52	4.5	1	21.02	30	Pass
		8RB#4	20.07	Horn Ant.	16.42	4.5	1	19.92	30	Pass
		Full	20.08	Horn Ant.	16.43	4.5	1	19.93	30	Pass
	QPSK	1 RB/#0	22.00	Horn Ant.	18.35	4.5	1	21.85	30	Pass
		1 RB/#max	21.99	Horn Ant.	18.34	4.5	1	21.84	30	Pass
		12 RB/#6	21.00	Horn Ant.	17.35	4.5	1	20.85	30	Pass
		Full	20.96	Horn Ant.	17.31	4.5	1	20.81	30	Pass
Channel (B) 5MHz(BW)	16QAM	1 RB/#0	21.13	Horn Ant.	17.48	4.5	1	20.98	30	Pass
		1 RB/#max	21.10	Horn Ant.	17.45	4.5	1	20.95	30	Pass
		12 RB/#6	20.08	Horn Ant.	16.43	4.5	1	19.93	30	Pass
		Full	19.92	Horn Ant.	16.27	4.5	1	19.77	30	Pass
	QPSK	1 RB/#0	22.00	Horn Ant.	18.35	4.5	1	21.85	30	Pass
		1 RB/#max	22.00	Horn Ant.	18.35	4.5	1	21.85	30	Pass
		25 RB/#13	20.90	Horn Ant.	17.25	4.5	1	20.75	30	Pass
		Full	20.82	Horn Ant.	17.17	4.5	1	20.67	30	Pass
Channel (B) 10MHz(BW)	16QAM	1 RB/#0	21.11	Horn Ant.	17.46	4.5	1	20.96	30	Pass



		1 RB/#max	21.20	Horn Ant.	17.55	4.5	1	21.05	30	Pass
		25 RB/#13	19.93	Horn Ant.	16.28	4.5	1	19.78	30	Pass
		Full	19.75	Horn Ant.	16.10	4.5	1	19.60	30	Pass
Channel (B) 15MHz(B W)	QPSK	1 RB/#0	22.04	Horn Ant.	18.39	4.5	1	21.89	30	Pass
		1 RB/#max	21.98	Horn Ant.	18.33	4.5	1	21.83	30	Pass
		36 RB/#18	20.88	Horn Ant.	17.23	4.5	1	20.73	30	Pass
		Full	20.83	Horn Ant.	17.18	4.5	1	20.68	30	Pass
	16QAM	1 RB/#0	21.14	Horn Ant.	17.49	4.5	1	20.99	30	Pass
		1RB/#max	21.09	Horn Ant.	17.44	4.5	1	20.94	30	Pass
		36 RB/#18	19.93	Horn Ant.	16.28	4.5	1	19.78	30	Pass
		Full	19.76	Horn Ant.	16.11	4.5	1	19.61	30	Pass
Channel (B) 20MHz(B W)	QPSK	1 RB/#0	22.00	Horn Ant.	18.35	4.5	1	21.85	30	Pass
		1 RB/#max	21.99	Horn Ant.	18.34	4.5	1	21.84	30	Pass
		50 RB/#25	20.84	Horn Ant.	17.19	4.5	1	20.69	30	Pass
		Full	20.79	Horn Ant.	17.14	4.5	1	20.64	30	Pass
	16QAM	1 RB/#0	21.12	Horn Ant.	17.47	4.5	1	20.97	30	Pass
		1 RB/#max	21.15	Horn Ant.	17.50	4.5	1	21.00	30	Pass
		50 RB/#25	19.76	Horn Ant.	16.11	4.5	1	19.61	30	Pass



		Full	19.72	Horn Ant.	16.07	4.5	1	19.57	30	Pass
Channel (M) 1.4MHz(BW)	QPSK	1RB#0	22.00	Horn Ant.	18.35	4.5	1	21.85	30	Pass
		1RB#max	21.94	Horn Ant.	18.29	4.5	1	21.79	30	Pass
		3RB#2	22.10	Horn Ant.	18.45	4.5	1	21.95	30	Pass
		Full	21.12	Horn Ant.	17.47	4.5	1	20.97	30	Pass
	16QAM	1RB#0	20.64	Horn Ant.	16.99	4.5	1	20.49	30	Pass
		1RB#max	20.57	Horn Ant.	16.92	4.5	1	20.42	30	Pass
		3RB#2	21.29	Horn Ant.	17.64	4.5	1	21.14	30	Pass
		Full	20.20	Horn Ant.	16.55	4.5	1	20.05	30	Pass
Channel (M) 3MHz(BW)	QPSK	1RB#0	22.08	Horn Ant.	18.43	4.5	1	21.93	30	Pass
		1RB#max	21.98	Horn Ant.	18.33	4.5	1	21.83	30	Pass
		8RB#4	21.05	Horn Ant.	17.40	4.5	1	20.90	30	Pass
		Full	21.03	Horn Ant.	17.38	4.5	1	20.88	30	Pass
	16QAM	1RB#0	21.21	Horn Ant.	17.56	4.5	1	21.06	30	Pass
		1RB#max	21.16	Horn Ant.	17.51	4.5	1	21.01	30	Pass
		8RB#4	20.04	Horn Ant.	16.39	4.5	1	19.89	30	Pass
		Full	20.07	Horn Ant.	16.42	4.5	1	19.92	30	Pass
Channel (M) 5MHz(BW)	QPSK	1 RB/#0	22.08	Horn Ant.	18.43	4.5	1	21.93	30	Pass
		1 RB/#max	21.94	Horn Ant.	18.29	4.5	1	21.79	30	Pass



		12 RB/#6	21.12	Horn Ant.	17.47	4.5	1	20.97	30	Pass
		Full	21.08	Horn Ant.	17.43	4.5	1	20.93	30	Pass
	16QAM	1 RB/#0	21.19	Horn Ant.	17.54	4.5	1	21.04	30	Pass
		1 RB/#max	21.08	Horn Ant.	17.43	4.5	1	20.93	30	Pass
		12 RB/#6	20.11	Horn Ant.	16.46	4.5	1	19.96	30	Pass
		Full	19.99	Horn Ant.	16.34	4.5	1	19.84	30	Pass
Channel (M) 10MHz(B W)	QPSK	1 RB/#0	22.08	Horn Ant.	18.43	4.5	1	21.93	30	Pass
		1 RB/#max	22.02	Horn Ant.	18.37	4.5	1	21.87	30	Pass
		25 RB/#13	21.05	Horn Ant.	17.40	4.5	1	20.90	30	Pass
		Full	20.86	Horn Ant.	17.21	4.5	1	20.71	30	Pass
	16QAM	1 RB/#0	21.19	Horn Ant.	17.54	4.5	1	21.04	30	Pass
		1 RB/#max	21.19	Horn Ant.	17.54	4.5	1	21.04	30	Pass
		25 RB/#13	19.95	Horn Ant.	16.30	4.5	1	19.80	30	Pass
		Full	19.79	Horn Ant.	16.14	4.5	1	19.64	30	Pass
Channel (M) 15MHz(B W)	QPSK	1 RB/#0	21.98	Horn Ant.	18.33	4.5	1	21.83	30	Pass
		1 RB/#max	21.82	Horn Ant.	18.17	4.5	1	21.67	30	Pass
		36 RB/#18	20.93	Horn Ant.	17.28	4.5	1	20.78	30	Pass
		Full	20.83	Horn Ant.	17.18	4.5	1	20.68	30	Pass
	16QAM	1 RB/#0	21.13	Horn Ant.	17.48	4.5	1	20.98	30	Pass



		1 RB/#max	21.07	Horn Ant.	17.42	4.5	1	20.92	30	Pass
		36 RB/#18	19.87	Horn Ant.	16.22	4.5	1	19.72	30	Pass
		Full	19.75	Horn Ant.	16.10	4.5	1	19.60	30	Pass
Channel (M) 20MHz(B W)	QPSK	1 RB/#0	21.96	Horn Ant.	18.31	4.5	1	21.81	30	Pass
		1 RB/#max	21.84	Horn Ant.	18.19	4.5	1	21.69	30	Pass
		50 RB/#25	20.90	Horn Ant.	17.25	4.5	1	20.75	30	Pass
		Full	20.81	Horn Ant.	17.16	4.5	1	20.66	30	Pass
	16QAM	1 RB/#0	21.08	Horn Ant.	17.43	4.5	1	20.93	30	Pass
		1 RB/#max	21.04	Horn Ant.	17.39	4.5	1	20.89	30	Pass
		50 RB/#25	19.82	Horn Ant.	16.17	4.5	1	19.67	30	Pass
		Full	19.76	Horn Ant.	16.11	4.5	1	19.61	30	Pass
Channel (T) 1.4MHz(BW)	QPSK	1RB#0	21.79	Horn Ant.	17.84	4.8	1	21.64	30	Pass
		1RB#ma x	21.86	Horn Ant.	17.91	4.8	1	21.71	30	Pass
		3RB#2	21.83	Horn Ant.	17.88	4.8	1	21.68	30	Pass
		Full	20.88	Horn Ant.	16.93	4.8	1	20.73	30	Pass
	16QAM	1RB#0	20.97	Horn Ant.	17.02	4.8	1	20.82	30	Pass
		1RB#ma x	20.88	Horn Ant.	16.93	4.8	1	20.73	30	Pass
		3RB#2	20.71	Horn Ant.	16.76	4.8	1	20.56	30	Pass
		Full	19.64	Horn Ant.	15.69	4.8	1	19.49	30	Pass



Channel (T) 3MHz(B W)	QPSK	1RB#0	21.94	Horn Ant.	17.99	4.8	1	21.79	30	Pass
		1RB#max	21.78	Horn Ant.	17.83	4.8	1	21.63	30	Pass
		8RB#4	20.82	Horn Ant.	16.87	4.8	1	20.67	30	Pass
		Full	20.70	Horn Ant.	16.75	4.8	1	20.55	30	Pass
	16QAM	1RB#0	20.95	Horn Ant.	17.00	4.8	1	20.80	30	Pass
		1RB#max	20.91	Horn Ant.	16.96	4.8	1	20.76	30	Pass
		8RB#4	19.58	Horn Ant.	15.63	4.8	1	19.43	30	Pass
		Full	19.75	Horn Ant.	15.80	4.8	1	19.60	30	Pass
Channel (T) 5MHz(B W)	QPSK	1 RB/#0	21.84	Horn Ant.	17.89	4.8	1	21.69	30	Pass
		1 RB/#max	21.71	Horn Ant.	17.76	4.8	1	21.56	30	Pass
		12 RB/#6	20.84	Horn Ant.	16.89	4.8	1	20.69	30	Pass
		Full	20.81	Horn Ant.	16.86	4.8	1	20.66	30	Pass
	16QAM	1 RB/#0	20.99	Horn Ant.	17.04	4.8	1	20.84	30	Pass
		1 RB/#max	20.90	Horn Ant.	16.95	4.8	1	20.75	30	Pass
		12 RB/#6	19.84	Horn Ant.	15.89	4.8	1	19.69	30	Pass
		Full	19.70	Horn Ant.	15.75	4.8	1	19.55	30	Pass
Channel (T) 10MHz(B W)	QPSK	1 RB/#0	21.87	Horn Ant.	17.92	4.8	1	21.72	30	Pass
		1 RB/#max	21.71	Horn Ant.	17.76	4.8	1	21.56	30	Pass
		25 RB/#13	20.71	Horn Ant.	16.76	4.8	1	20.56	30	Pass



	16QAM	Full	20.73	Horn Ant.	16.78	4.8	1	20.58	30	Pass
		1 RB/#0	21.04	Horn Ant.	17.09	4.8	1	20.89	30	Pass
		1 RB/#max	20.85	Horn Ant.	16.90	4.8	1	20.70	30	Pass
		25 RB/#13	19.75	Horn Ant.	15.80	4.8	1	19.60	30	Pass
		Full	19.64	Horn Ant.	15.69	4.8	1	19.49	30	Pass
Channel (T) 15MHz(BW)	QPSK	1 RB/#0	21.84	Horn Ant.	17.89	4.8	1	21.69	30	Pass
		1 RB/#max	21.76	Horn Ant.	17.81	4.8	1	21.61	30	Pass
		36 RB/#18	20.62	Horn Ant.	16.67	4.8	1	20.47	30	Pass
		Full	20.66	Horn Ant.	16.71	4.8	1	20.51	30	Pass
	16QAM	1 RB/#0	21.03	Horn Ant.	17.08	4.8	1	20.88	30	Pass
		1 RB/#max	20.93	Horn Ant.	16.98	4.8	1	20.78	30	Pass
		36 RB/#18	19.67	Horn Ant.	15.72	4.8	1	19.52	30	Pass
		Full	19.58	Horn Ant.	15.63	4.8	1	19.43	30	Pass
Channel (T) 20MHz(BW)	QPSK	1 RB/#0	22.01	Horn Ant.	18.06	4.8	1	21.86	30	Pass
		1 RB/#max	21.73	Horn Ant.	17.78	4.8	1	21.58	30	Pass
		50 RB/#25	20.62	Horn Ant.	16.67	4.8	1	20.47	30	Pass
		Full	20.69	Horn Ant.	16.74	4.8	1	20.54	30	Pass
	16QAM	1 RB/#0	21.10	Horn Ant.	17.15	4.8	1	20.95	30	Pass
		1 RB/#max	20.86	Horn Ant.	16.91	4.8	1	20.71	30	Pass



		50 RB/#25	19.63	Horn Ant.	15.68	4.8	1	19.48	30	Pass
		Full	19.64	Horn Ant.	15.69	4.8	1	19.49	30	Pass

Note1: a, For getting the EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken to calculate it,

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

b, SGP=Signal Generator Level

Note2: RBW > emission bandwidth, VBW > 3 x RBW.

-----END-----



Appendix B

Modulation Characteristics

According to FCC Part 2.1047 & FCC Part 27. Subpart C&L &
RSS-139



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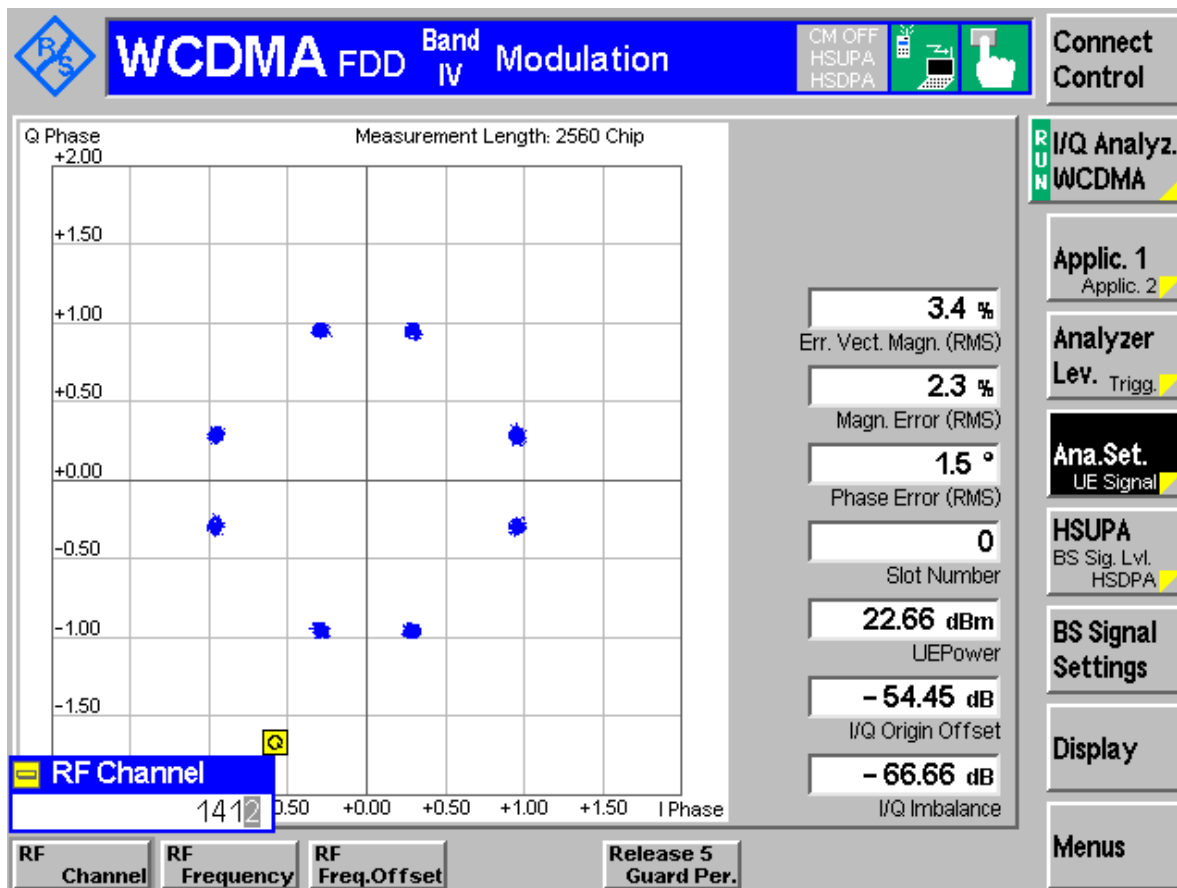
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1 For WCDMA Band 4

1.1 Test Mode=TM1

1.1.1 Channel =M



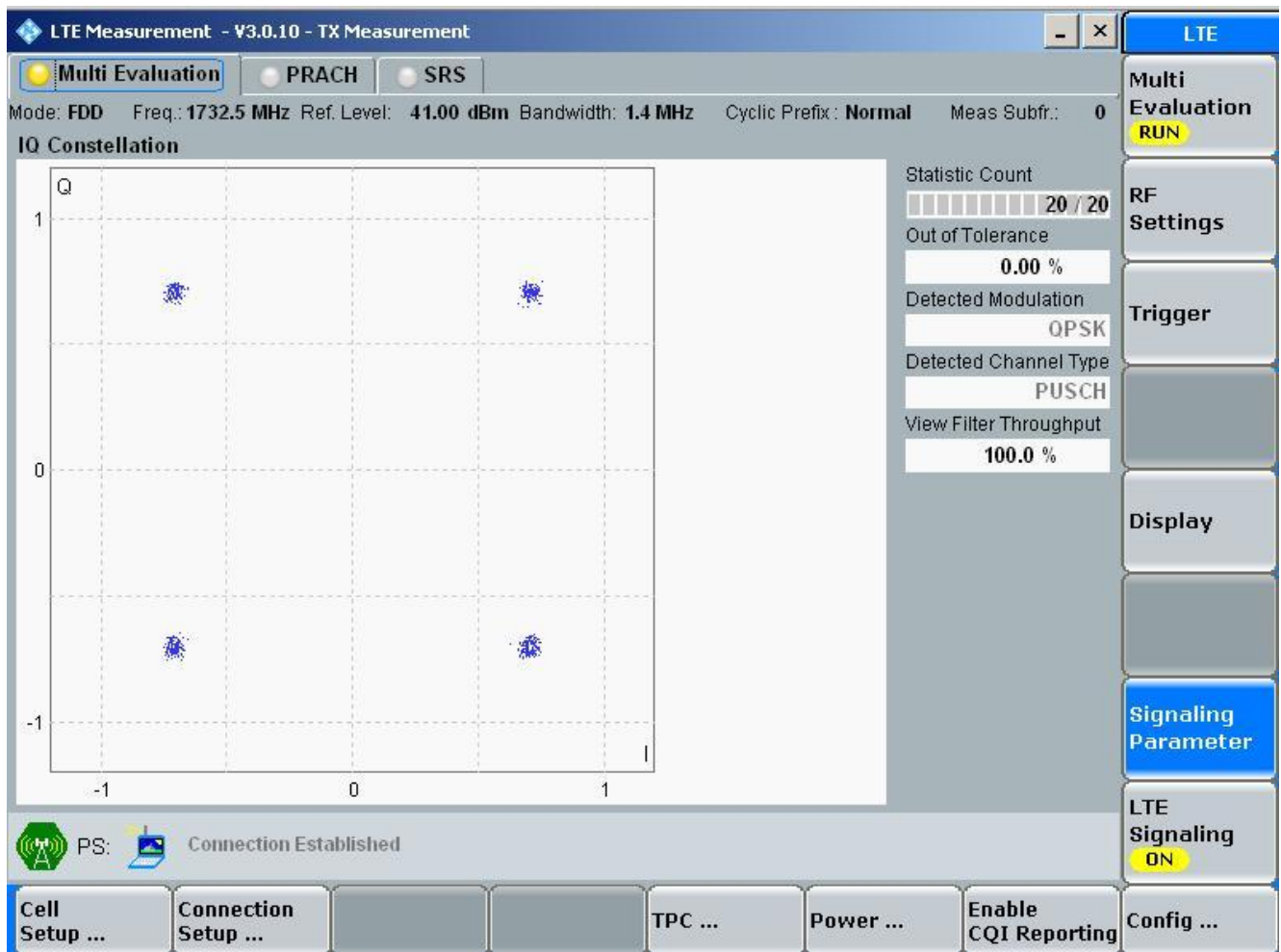
2 For LTE Band 4

2.1 Test Mode=TM4

2.1.1 Channel Bandwidth = 1.4 MHz

2.1.1.1 Channel =M

2.1.1.1.1 QPSK/full RBs

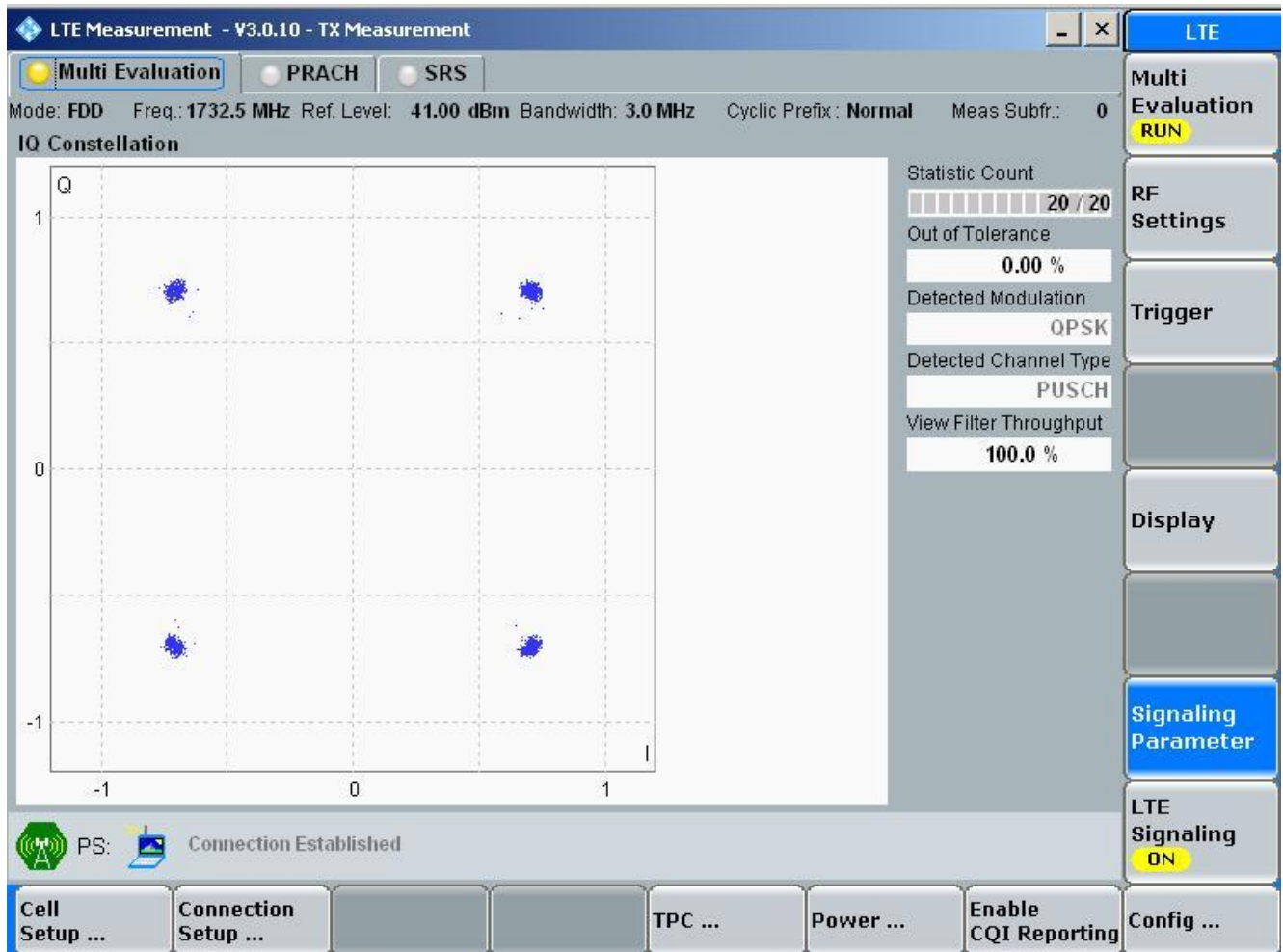




2.1.2 Channel Bandwidth = 3 MHz

2.1.2.1 Channel =M

2.1.2.1.1 QPSK/full RBs

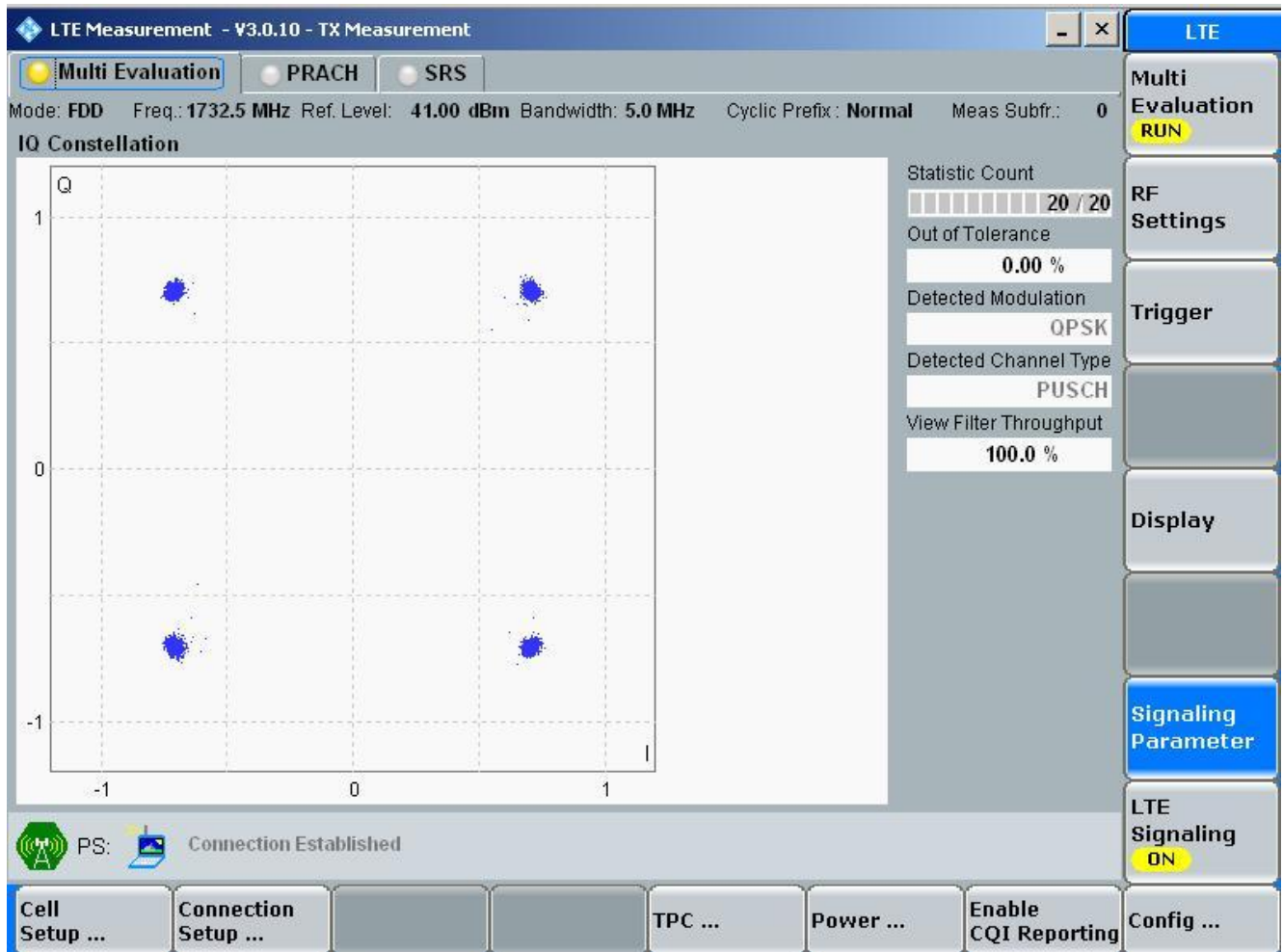




2.1.3 Channel Bandwidth = 5 MHz

2.1.3.1 Channel =M

2.1.3.1.1 QPSK/full RBs

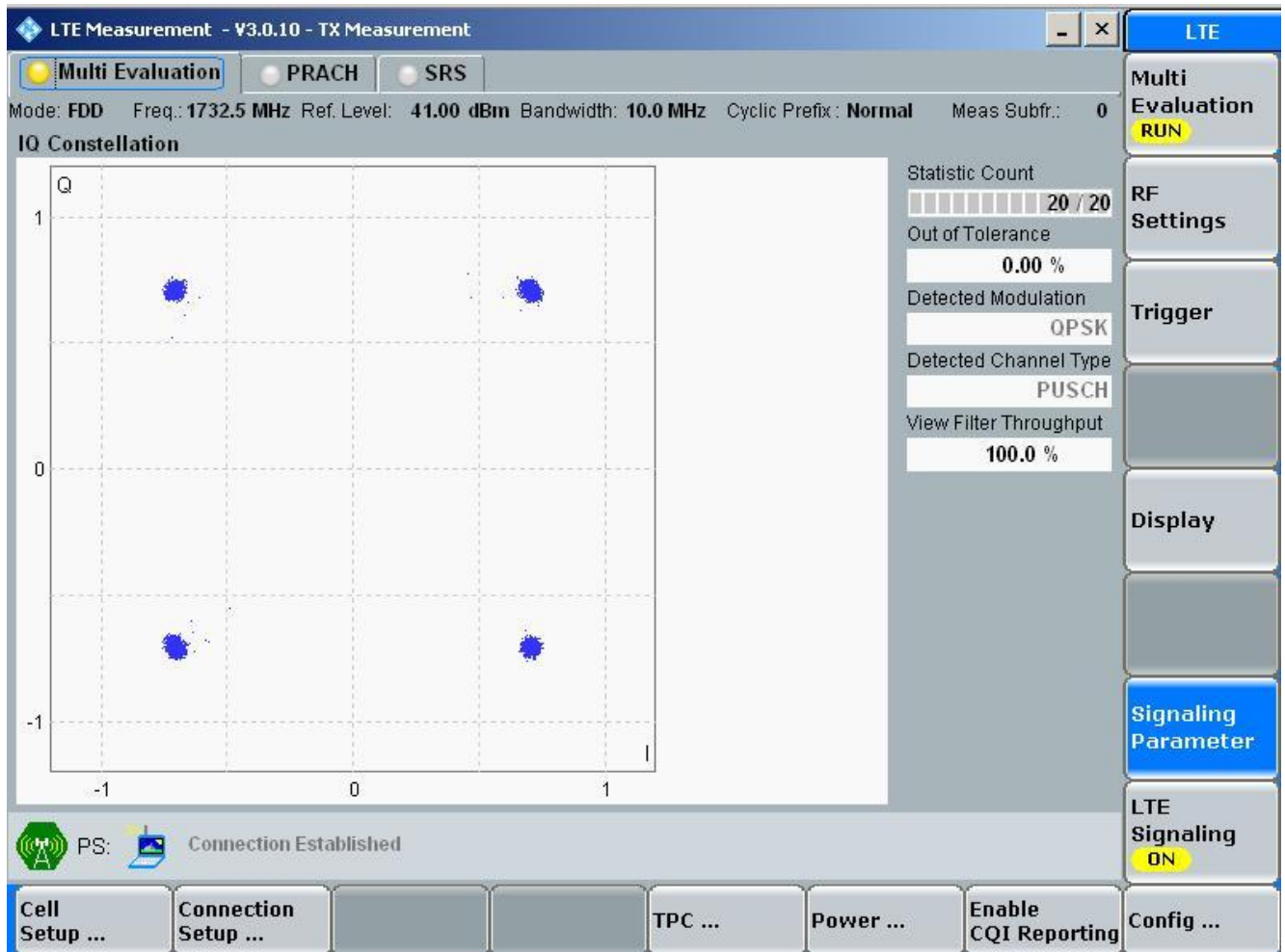




2.1.4 Channel Bandwidth = 10 MHz

2.1.4.1 Channel =M

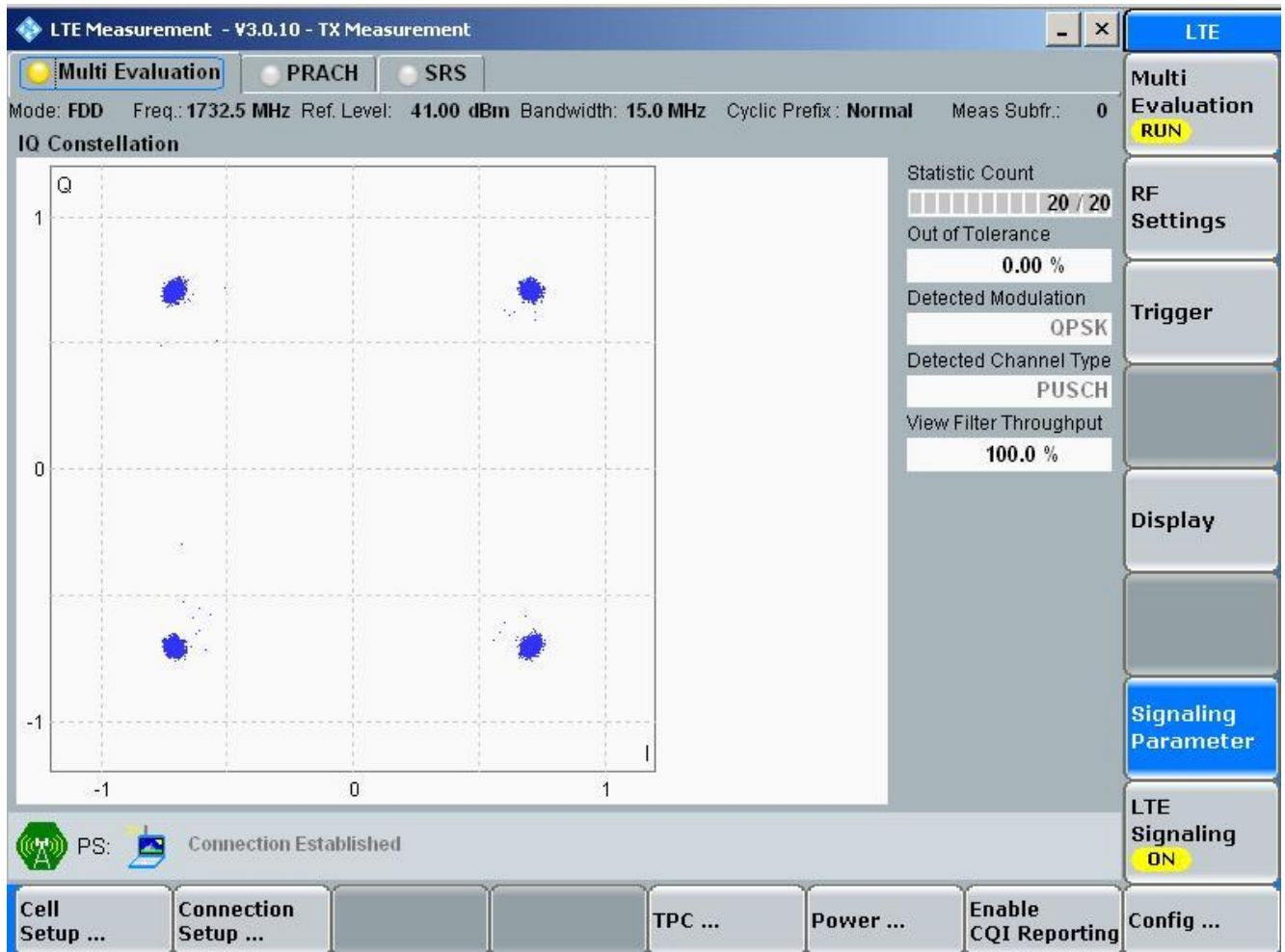
2.1.4.1.1 QPSK/full RBs



2.1.5 Channel Bandwidth = 15 MHz

2.1.5.1 Channel =M

2.1.5.1.1 QPSK/full RBs

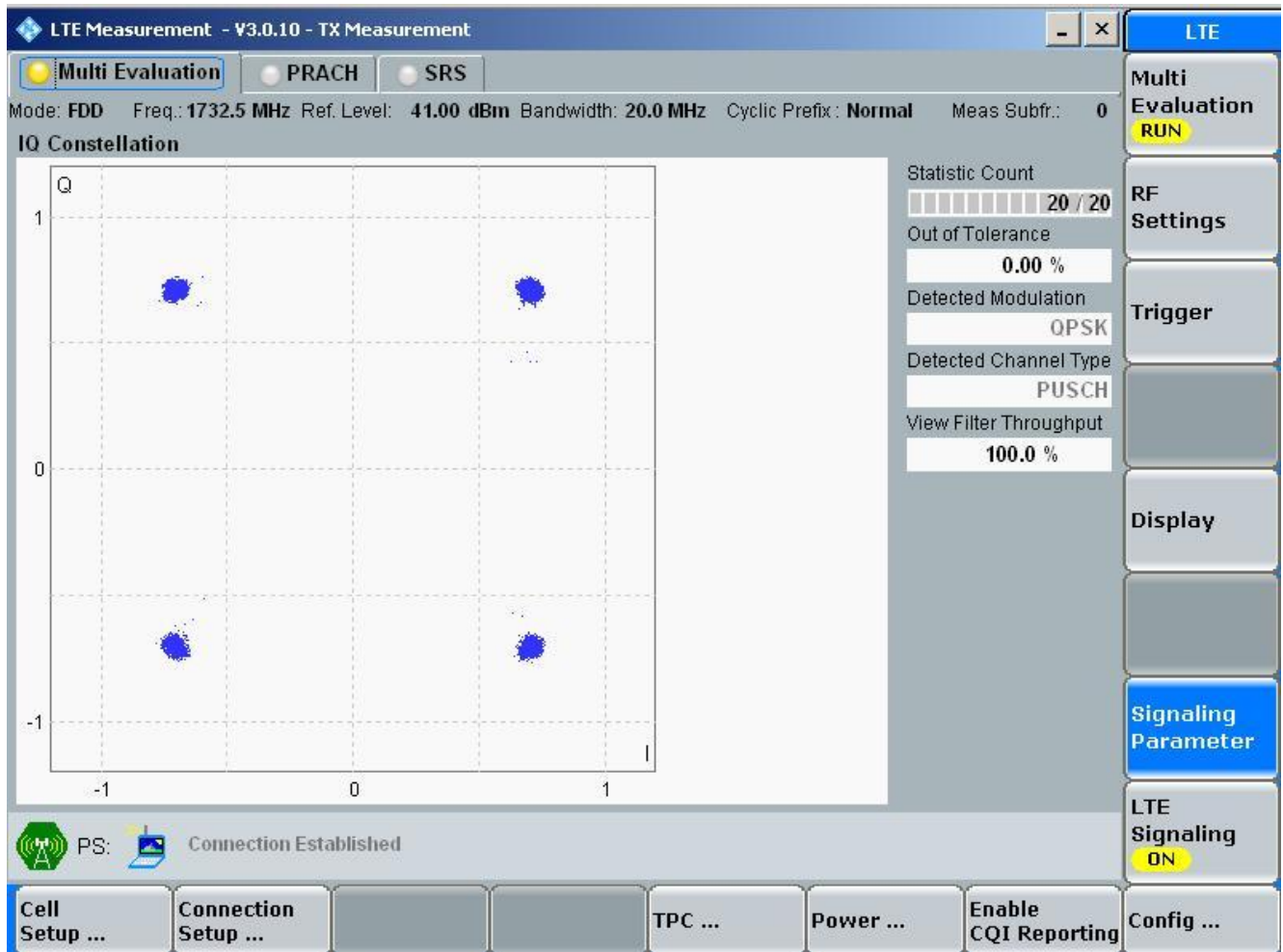




2.1.6 Channel Bandwidth = 20 MHz

2.1.6.1 Channel =M

2.1.6.1.1 QPSK/full RBs

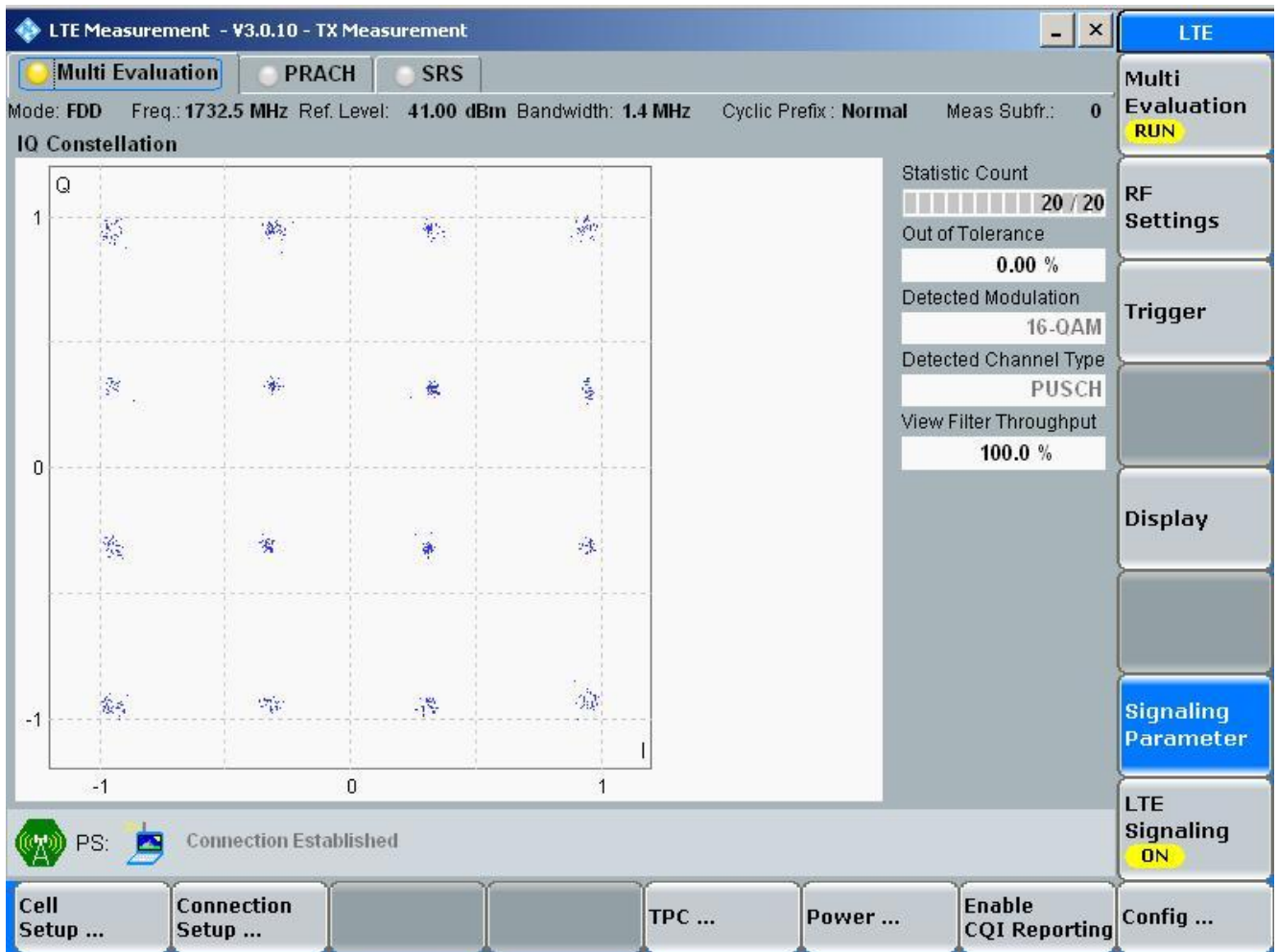


2.2 Test Mode=TM5

2.2.1 Channel Bandwidth = 1.4 MHz

2.2.1.1 Channel =M

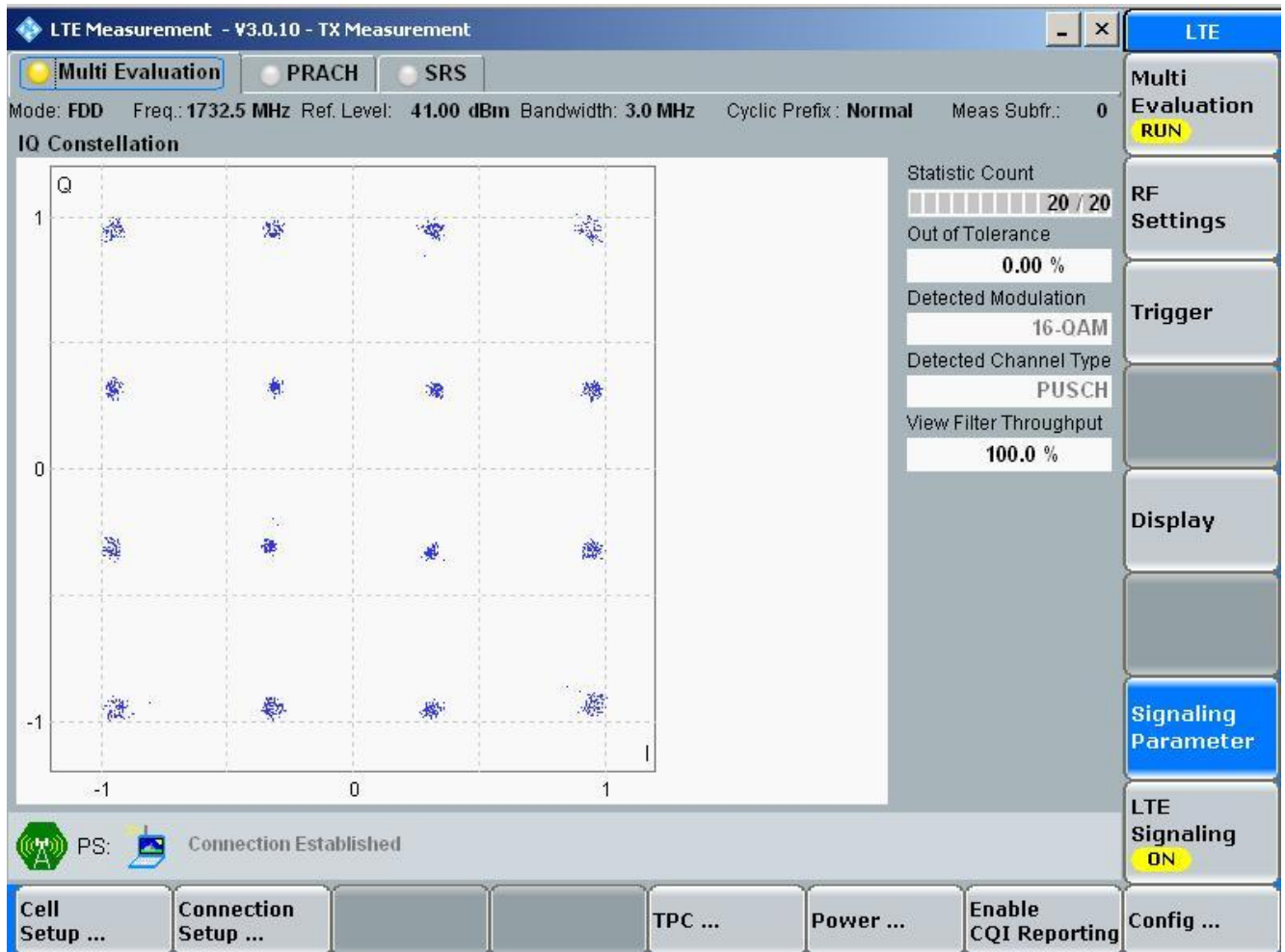
2.2.1.1.1 16QAM/full RBs



2.2.2 Channel Bandwidth = 3 MHz

2.2.2.1 Channel =M

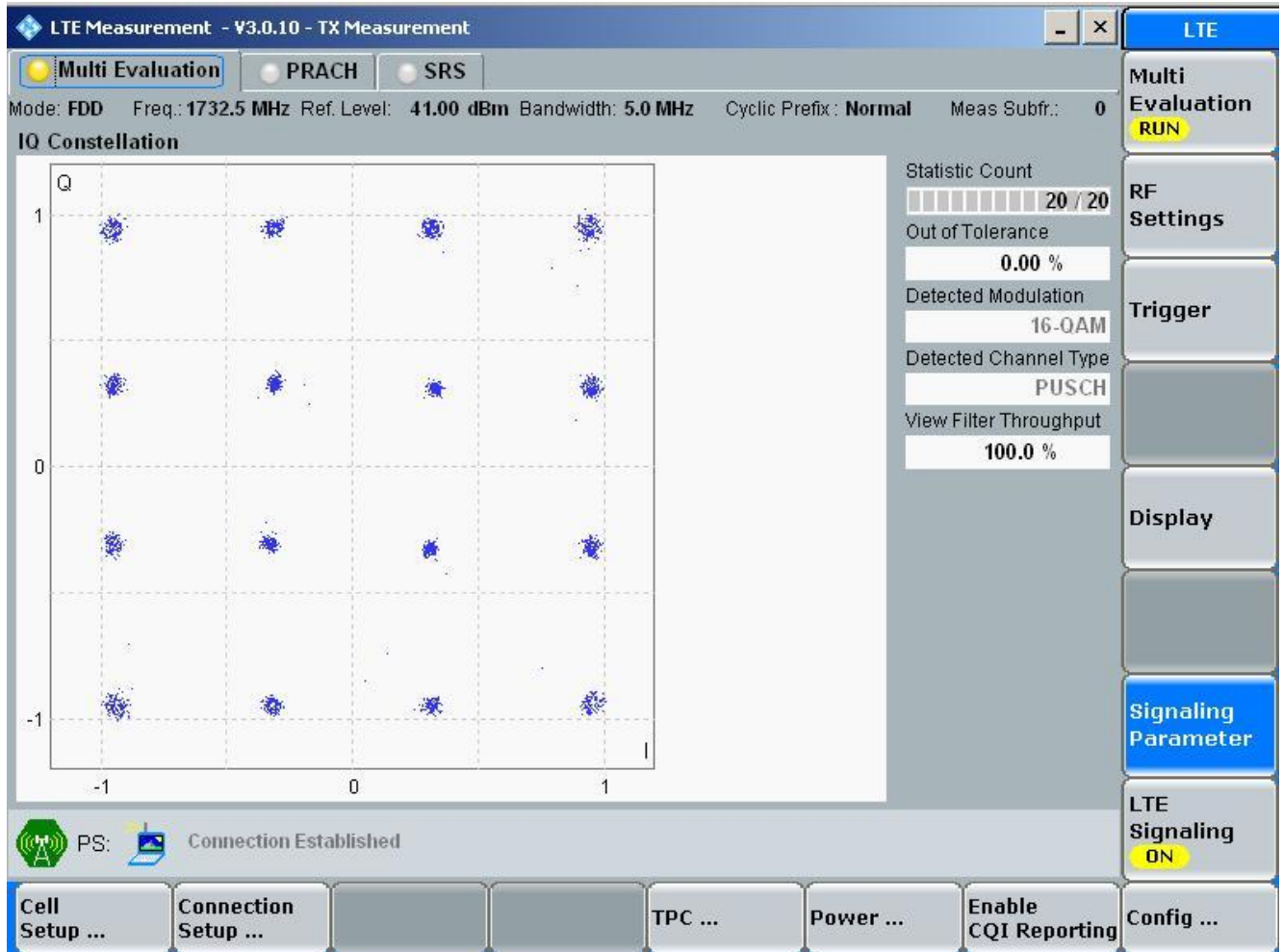
2.2.2.1.1 16QAM/full RBs



2.2.3 Channel Bandwidth = 5 MHz

2.2.3.1 Channel =M

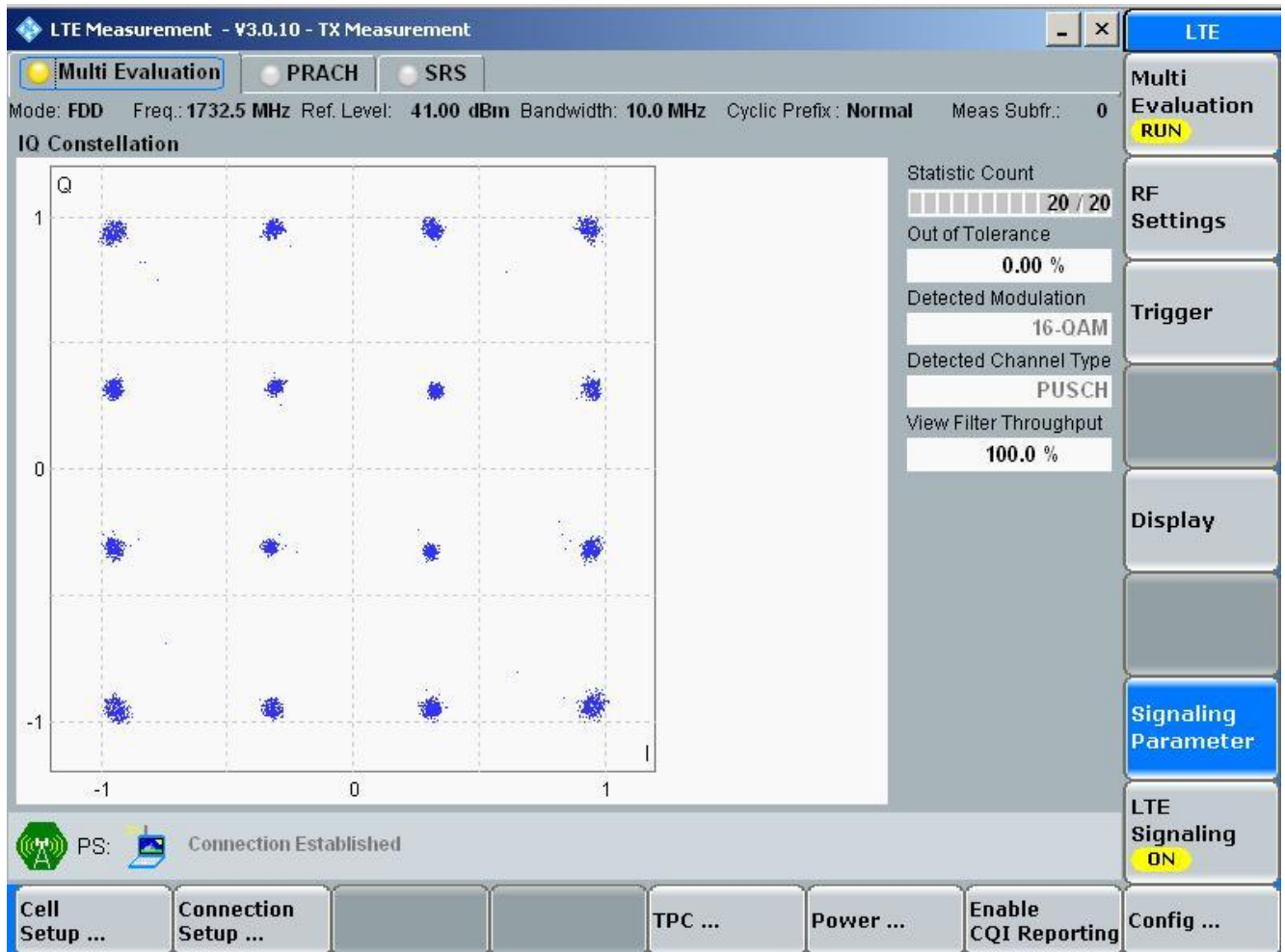
2.2.3.1.1 16QAM/full RBs



2.2.4 Channel Bandwidth = 10 MHz

2.2.4.1 Channel = M

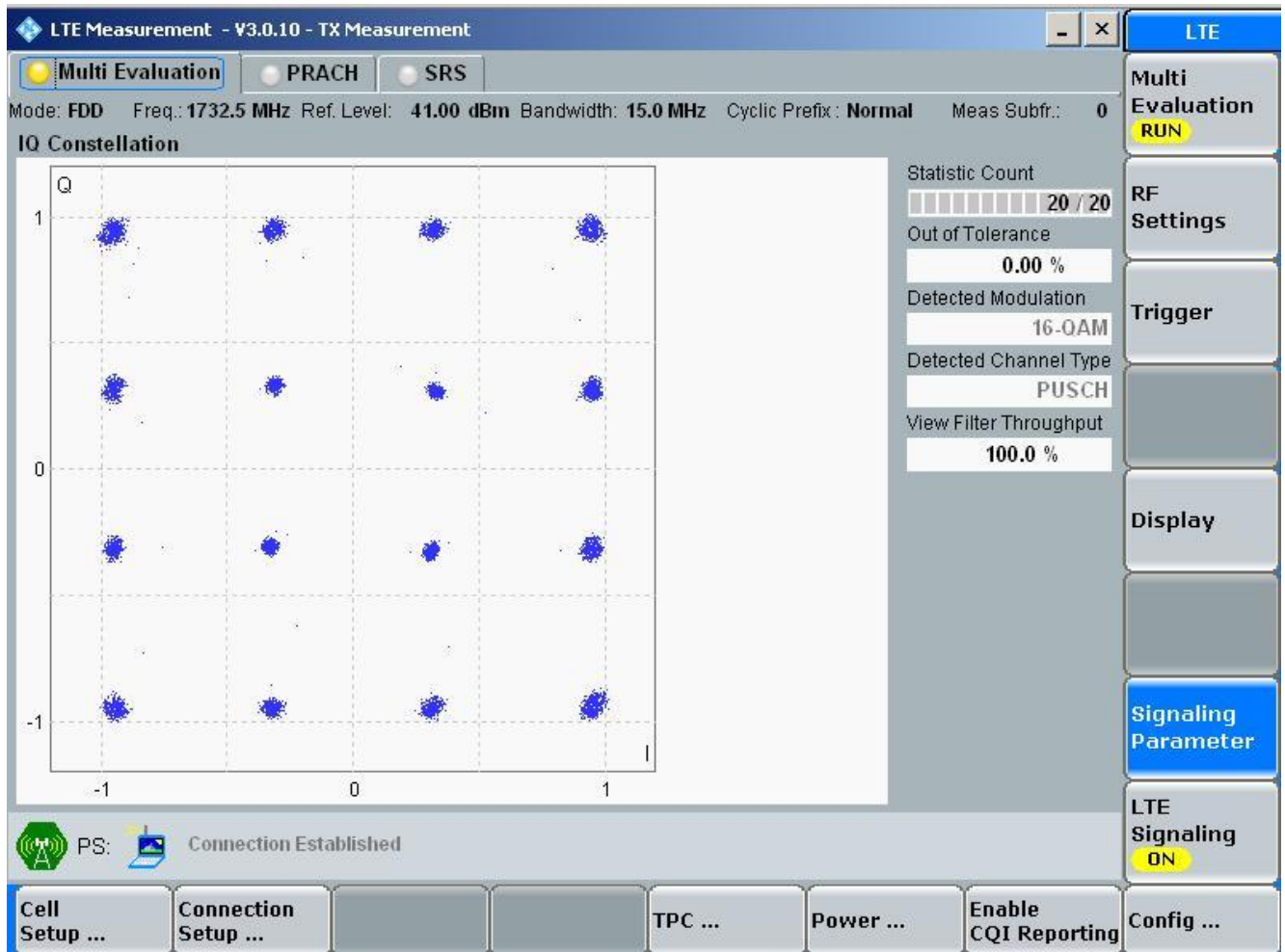
2.2.4.1.1 16QAM/full RBs



2.2.5 Channel Bandwidth = 15 MHz

2.2.5.1 Channel =M

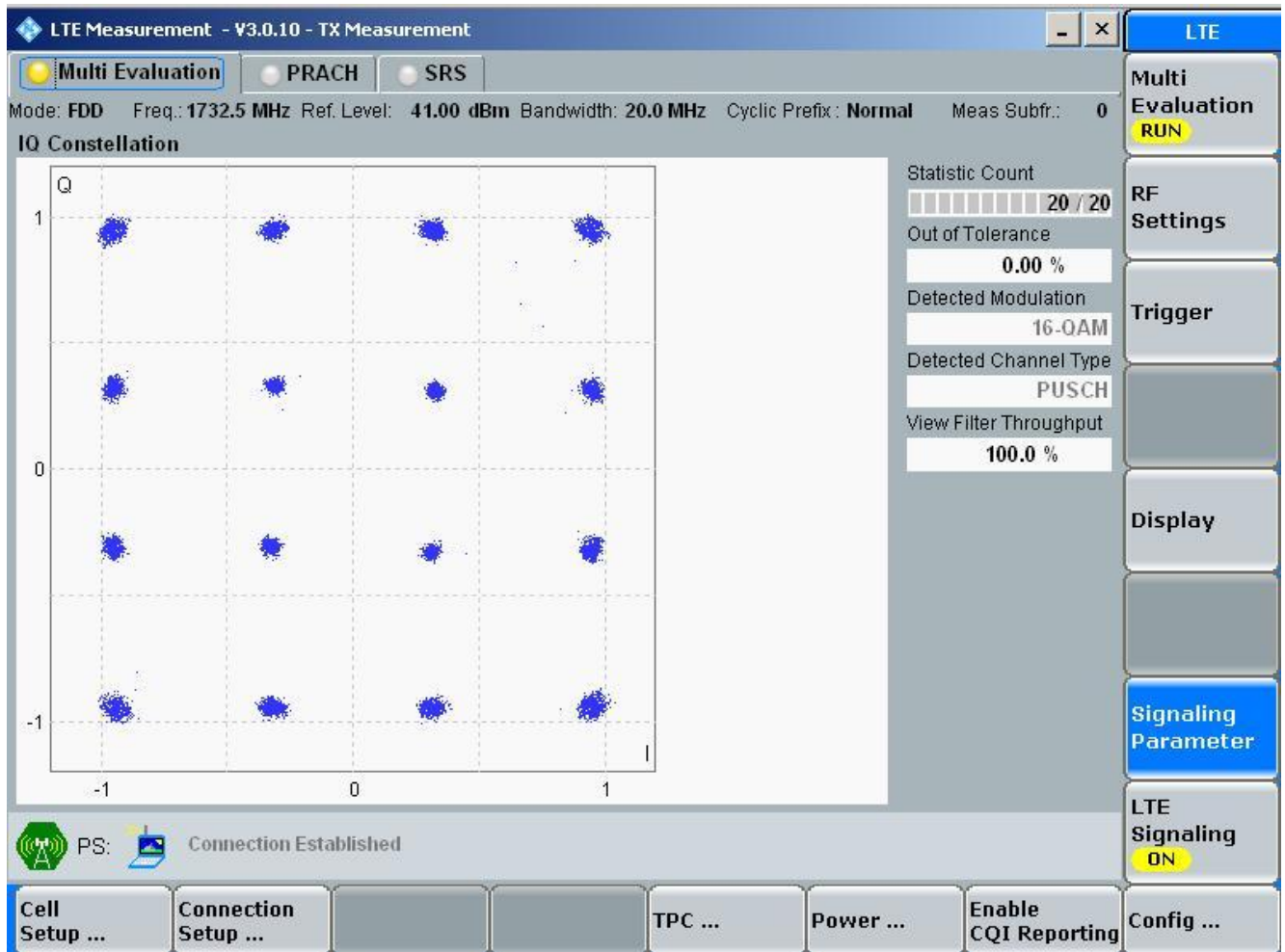
2.2.5.1.1 16QAM/full RBs



2.2.6 Channel Bandwidth = 20 MHz

2.2.6.1 Channel = M

2.2.6.1.1 16QAM/full RBs



-----END-----



Appendix C

Occupied Bandwidth

According to FCC part 2.1049 & FCC Part 27. Subpart C&L &
RSS-139



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Result Table

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

Table 1 Measurement Results BAND 4

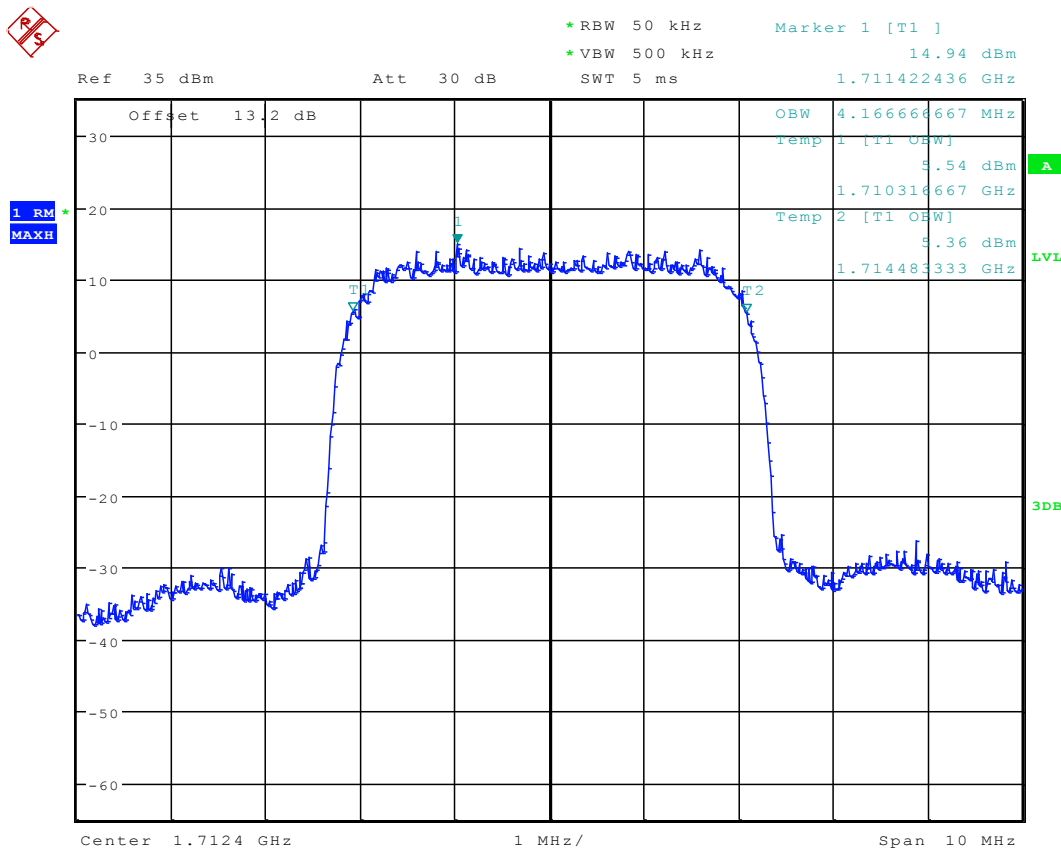
Test Mode	RF Ch. RF Channel		Occupied Bandwidth [MHz]	Verdict
TM1	B		4.1667	Pass
	M		4.1667	Pass
	T		4.1667	Pass
Test Mode	Carrier Conf.	RF Ch.	Occupied Bandwidth [MHz]	Verdict
TM4	1.4 MHz	B	1.0842	Pass
		M	1.0853	Pass
		T	1.0798	Pass
	3 MHz	B	2.6867	Pass
		M	2.6893	Pass
		T	2.6876	Pass
	5 MHz	B	4.4701	Pass
		M	4.4656	Pass
		T	4.4724	Pass
	10 MHz	B	8.9411	Pass
		M	8.9369	Pass
		T	8.9479	Pass
	15 MHz	B	13.3820	Pass
		M	13.4145	Pass
		T	13.4137	Pass
TM5	1.4 MHz	B	17.8662	Pass
		M	17.8570	Pass
		T	17.8383	Pass
	1.4 MHz	B	1.0785	Pass
		M	1.0780	Pass
		T	1.0771	Pass
	3 MHz	B	2.6771	Pass
		M	2.6728	Pass
		T	2.6794	Pass
	5 MHz	B	4.4719	Pass
		M	4.4723	Pass
		T	4.4747	Pass
	10 MHz	B	8.9296	Pass
		M	8.9331	Pass
		T	8.9341	Pass
	15 MHz	B	13.4103	Pass
		M	13.4076	Pass
		T	13.4346	Pass
	20 MHz	B	17.8451	Pass
		M	17.8271	Pass
		T	17.8307	Pass



1 For WCDMA Band 4

1.1 Test Mode=TM1

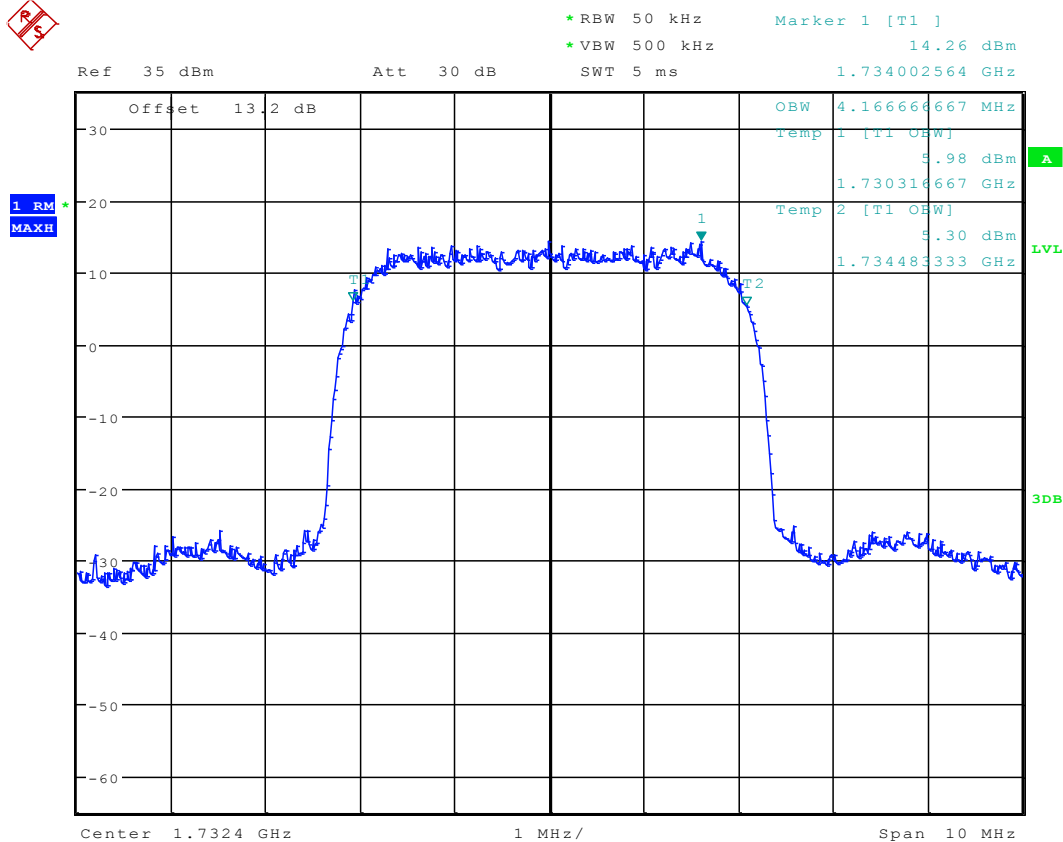
1.1.1 Channel = B



Date: 18.SEP.2012 16:20:50



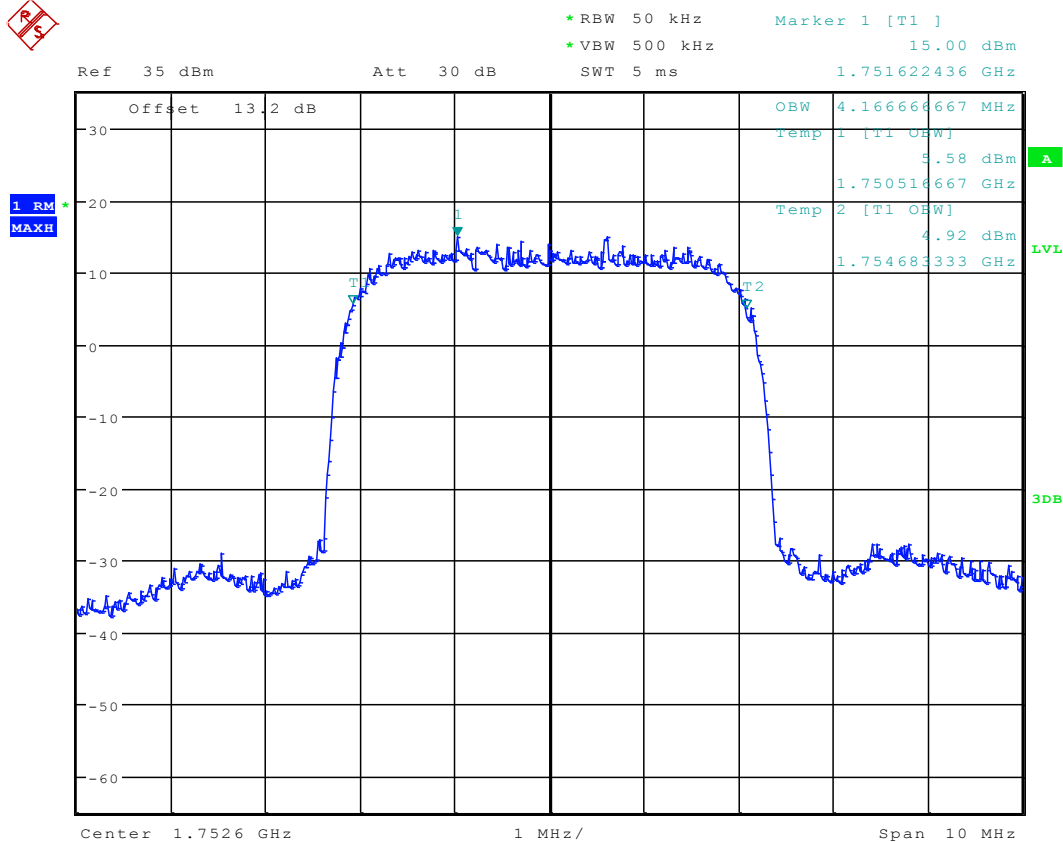
1.1.2 Channel = M



Date: 18.SEP.2012 16:21:04



1.1.3 Channel = T



Date: 18.SEP.2012 16:21:17



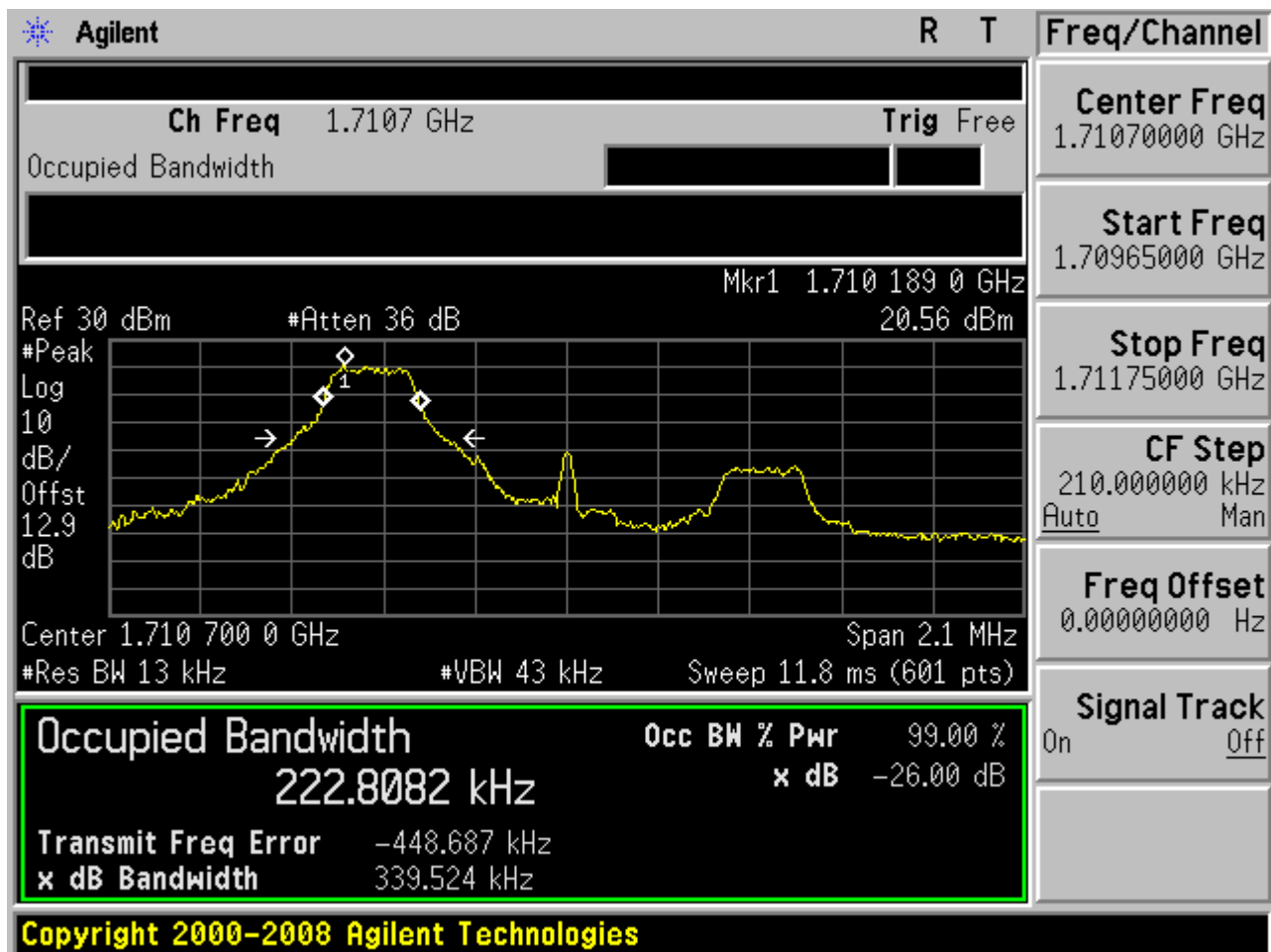
2 For LTE Band 4

2.1 Test Mode=TM4

2.1.1 Channel Bandwidth = 1.4 MHz

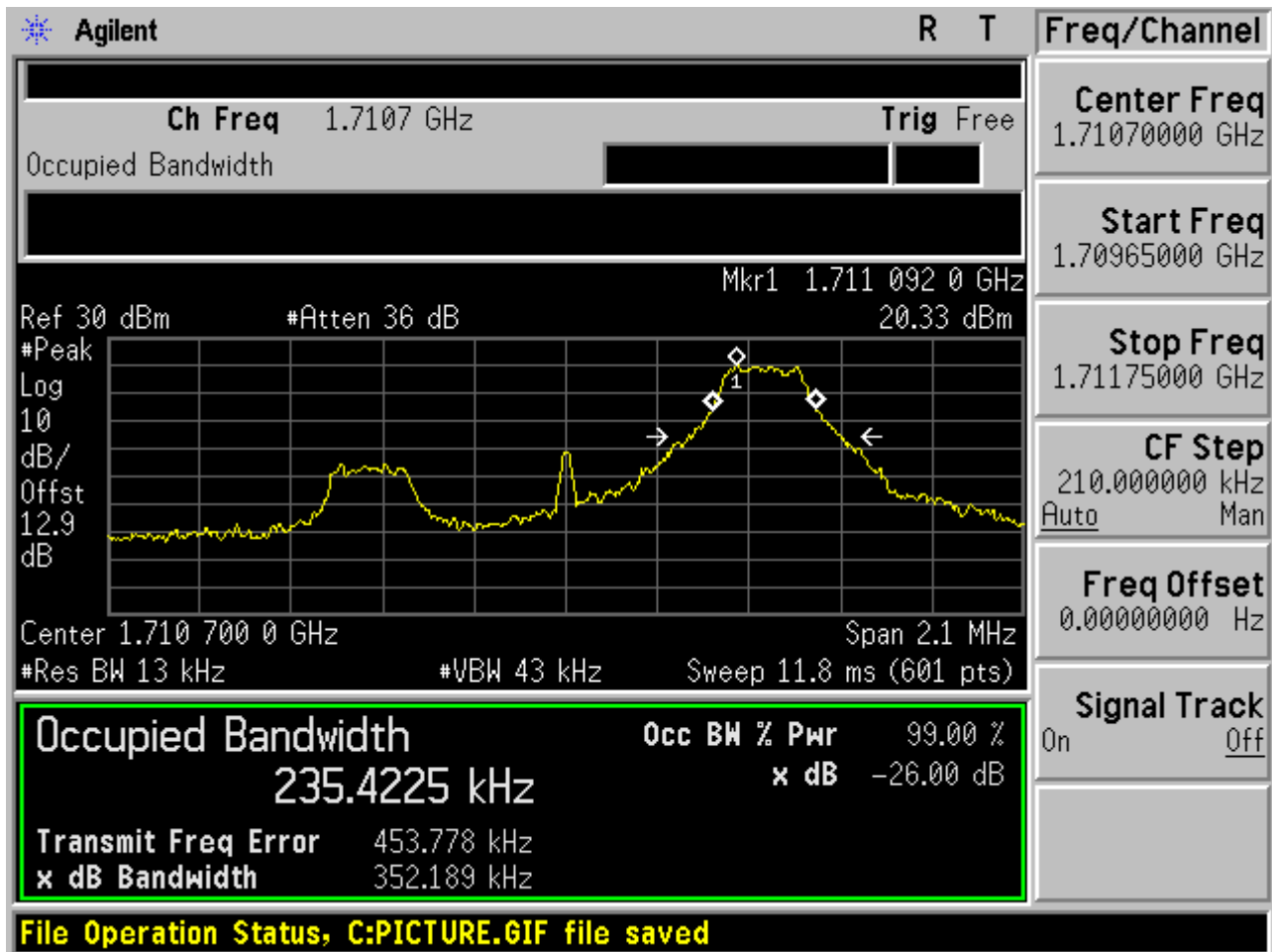
2.1.1.1 Channel = B

2.1.1.1.1 QPSK/1RB # 0



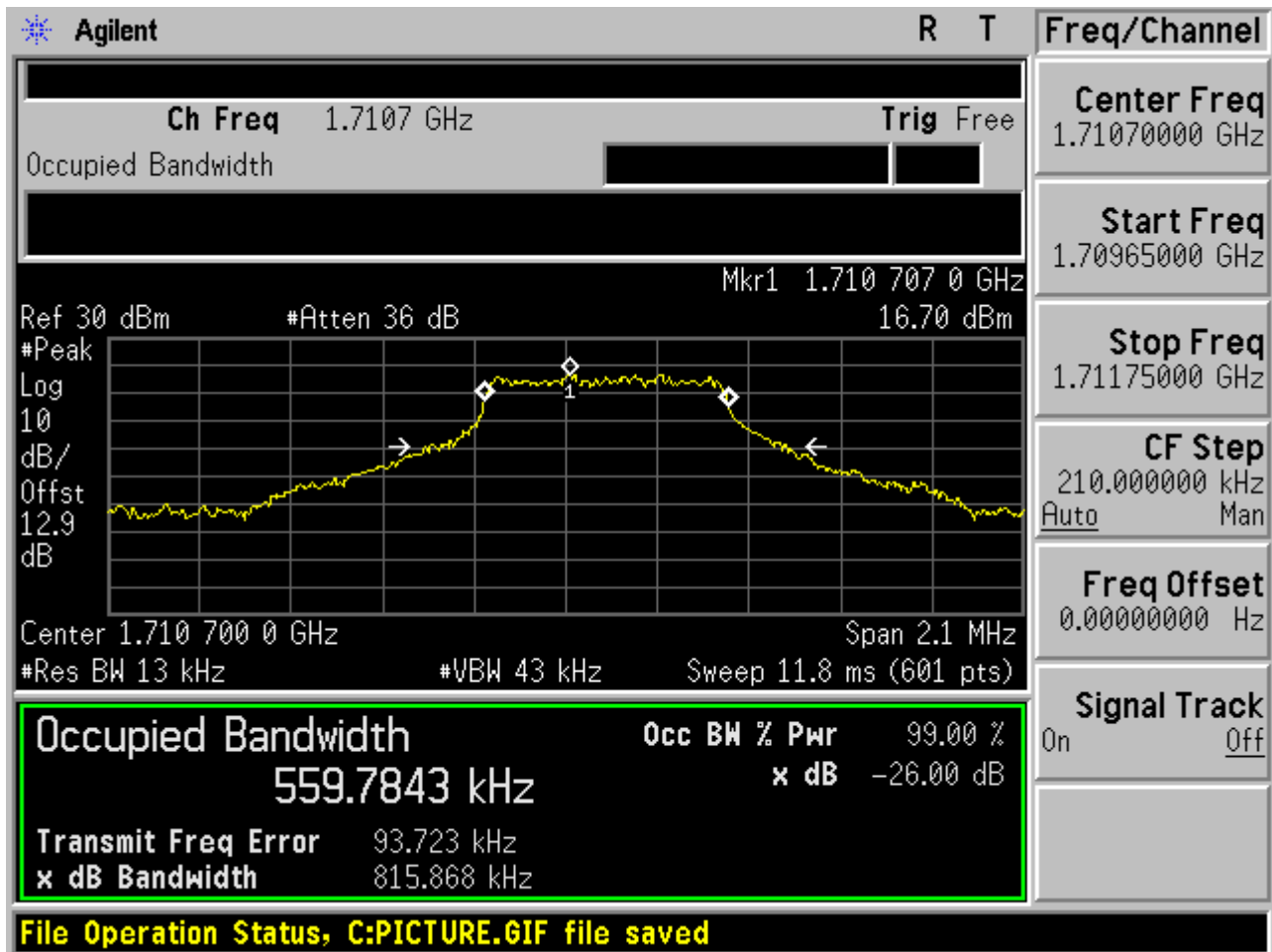


2.1.1.1.2 QPSK/1RB # max



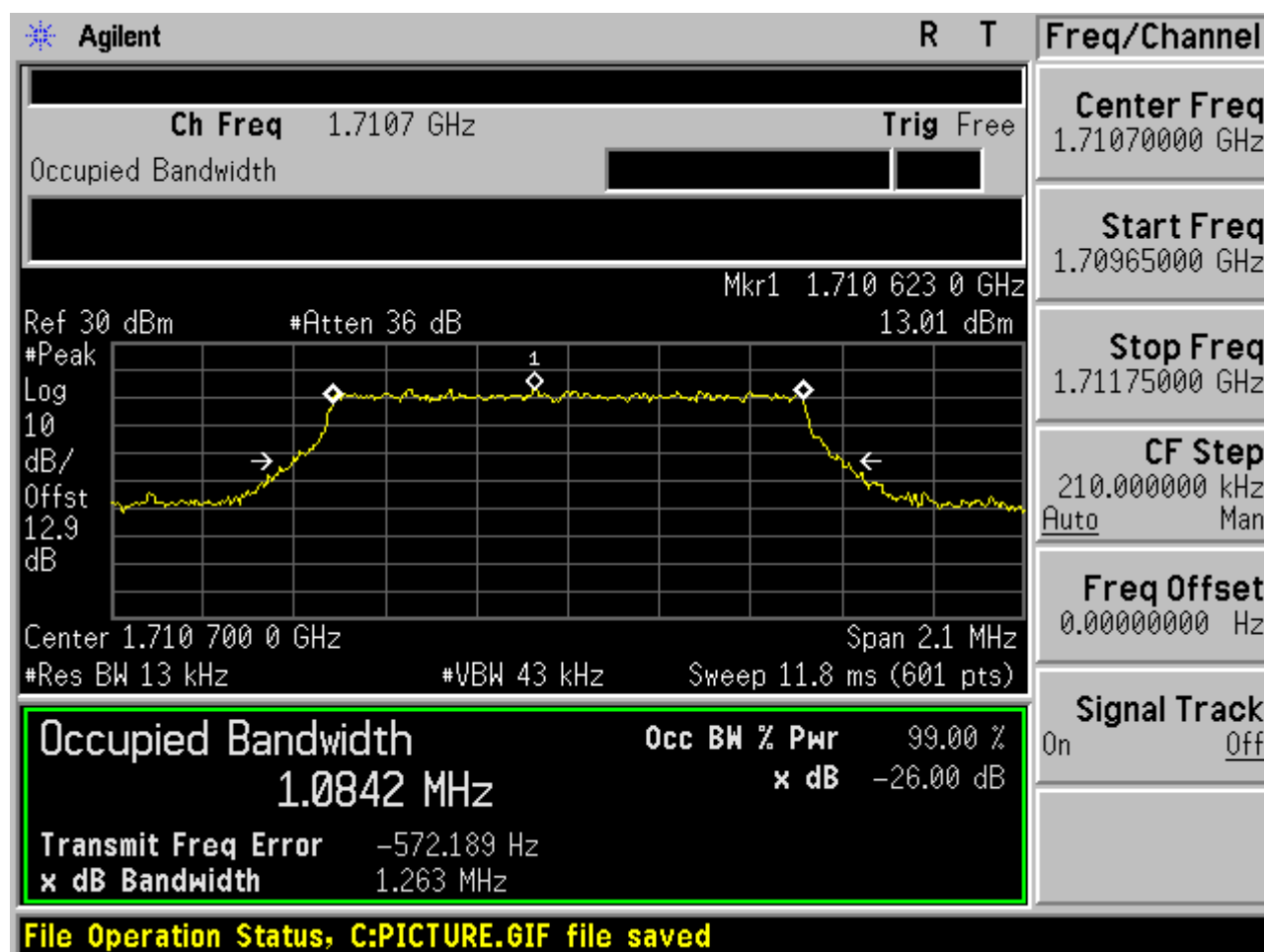


2.1.1.1.3 QPSK/non-1RB #mid/2





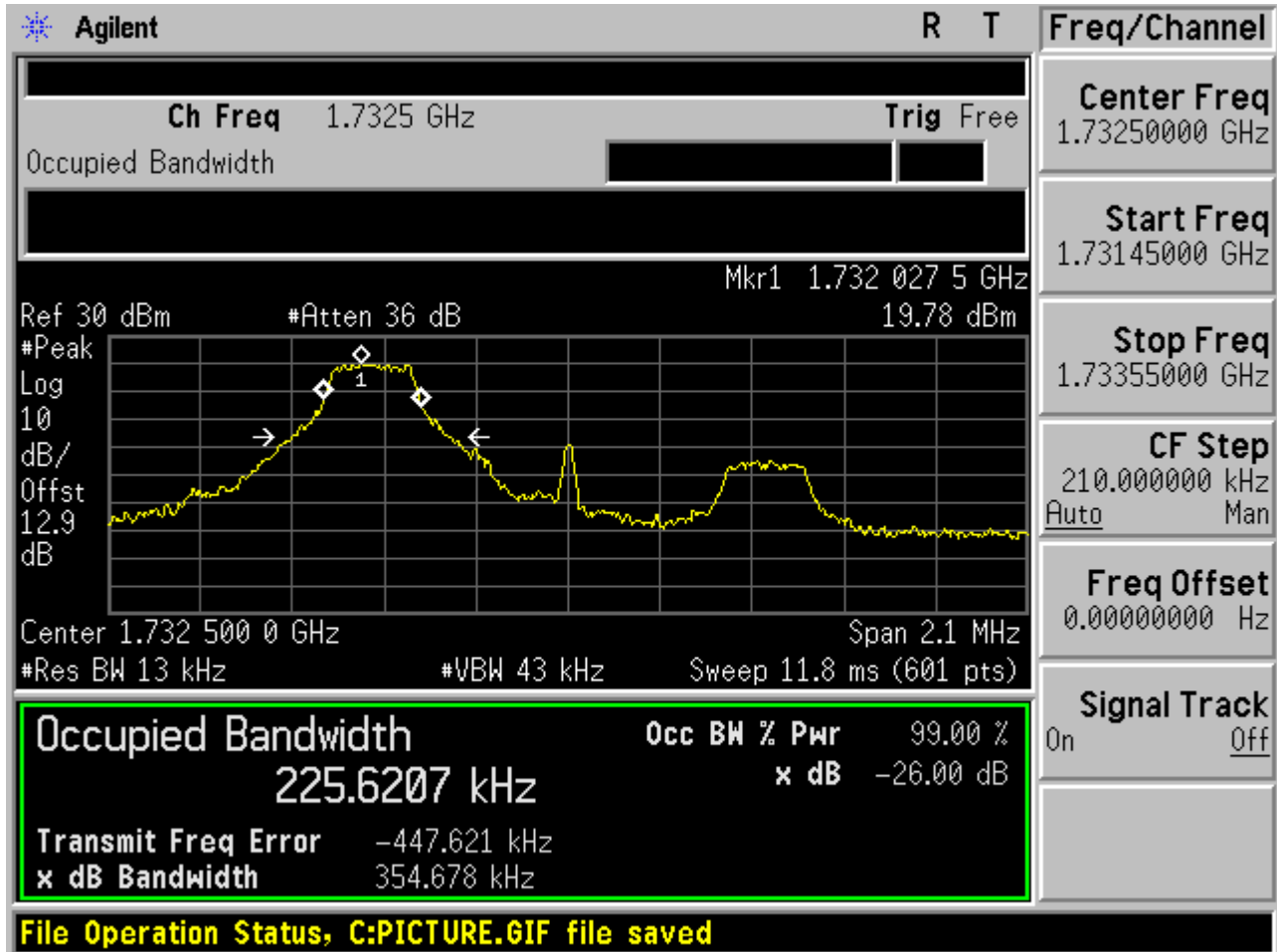
2.1.1.1.4 QPSK/full RBs





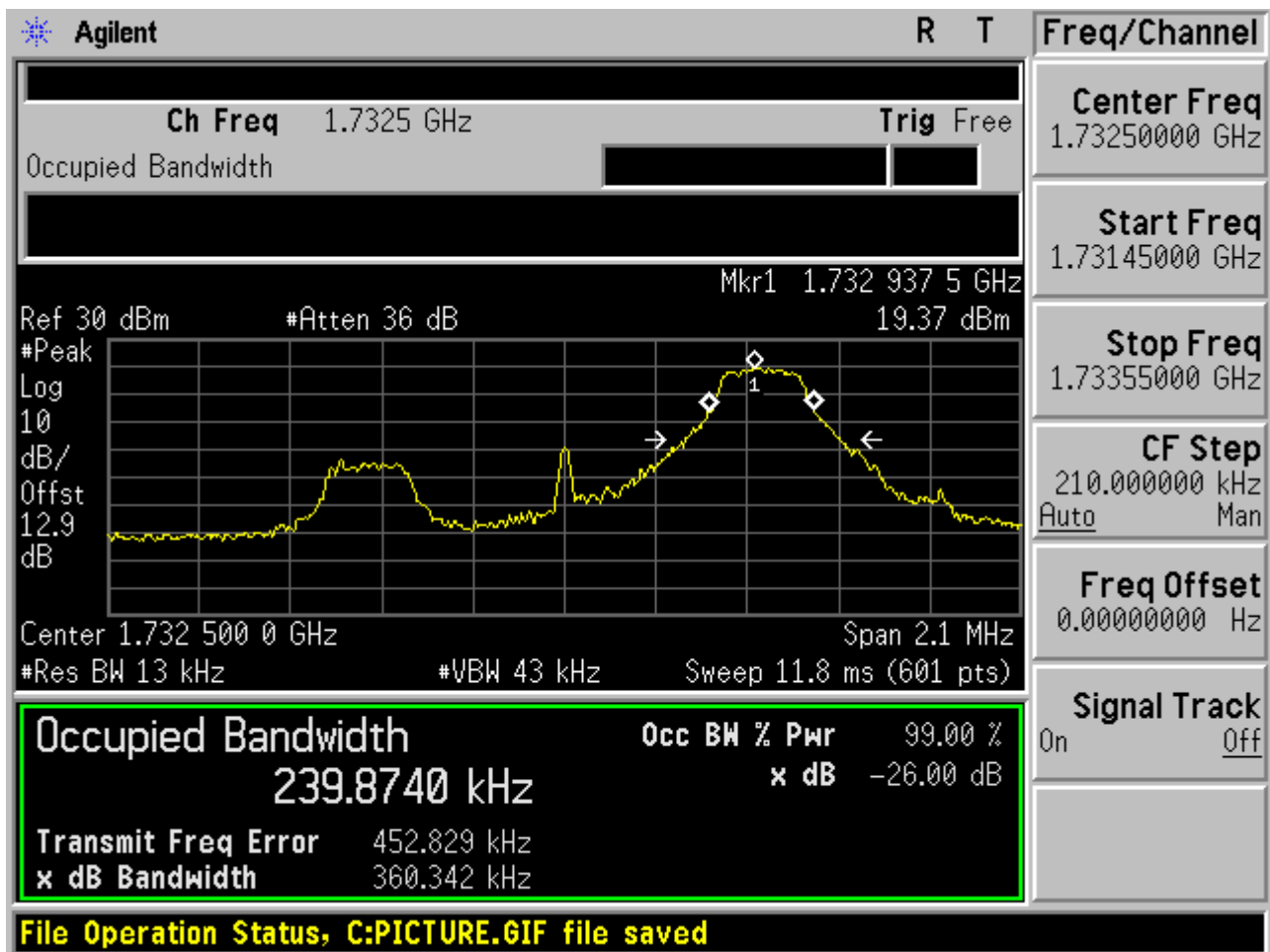
2.1.1.2 Channel =M

2.1.1.2.1 QPSK/1RB # 0



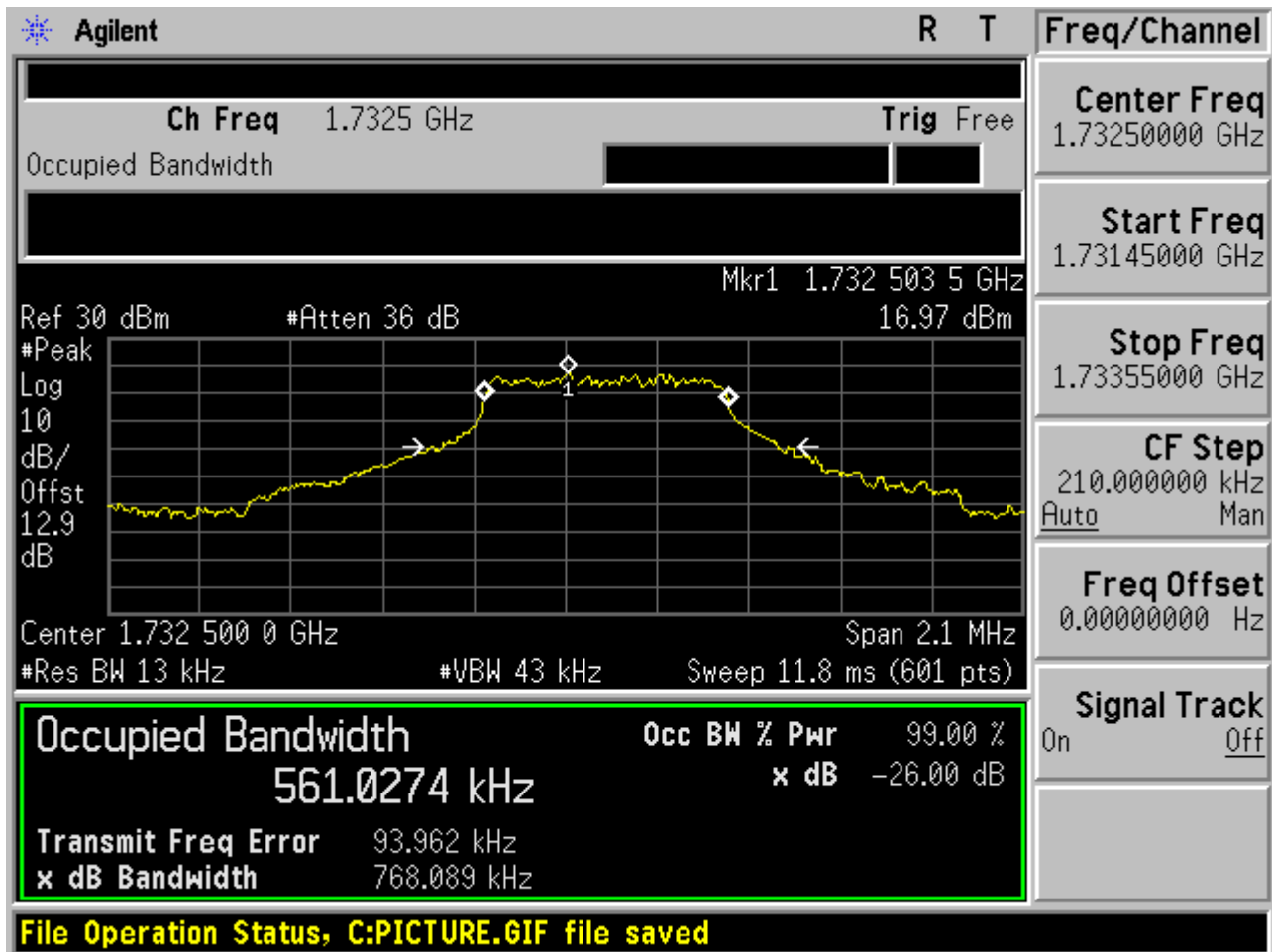


2.1.1.2.2 QPSK/1RB # max



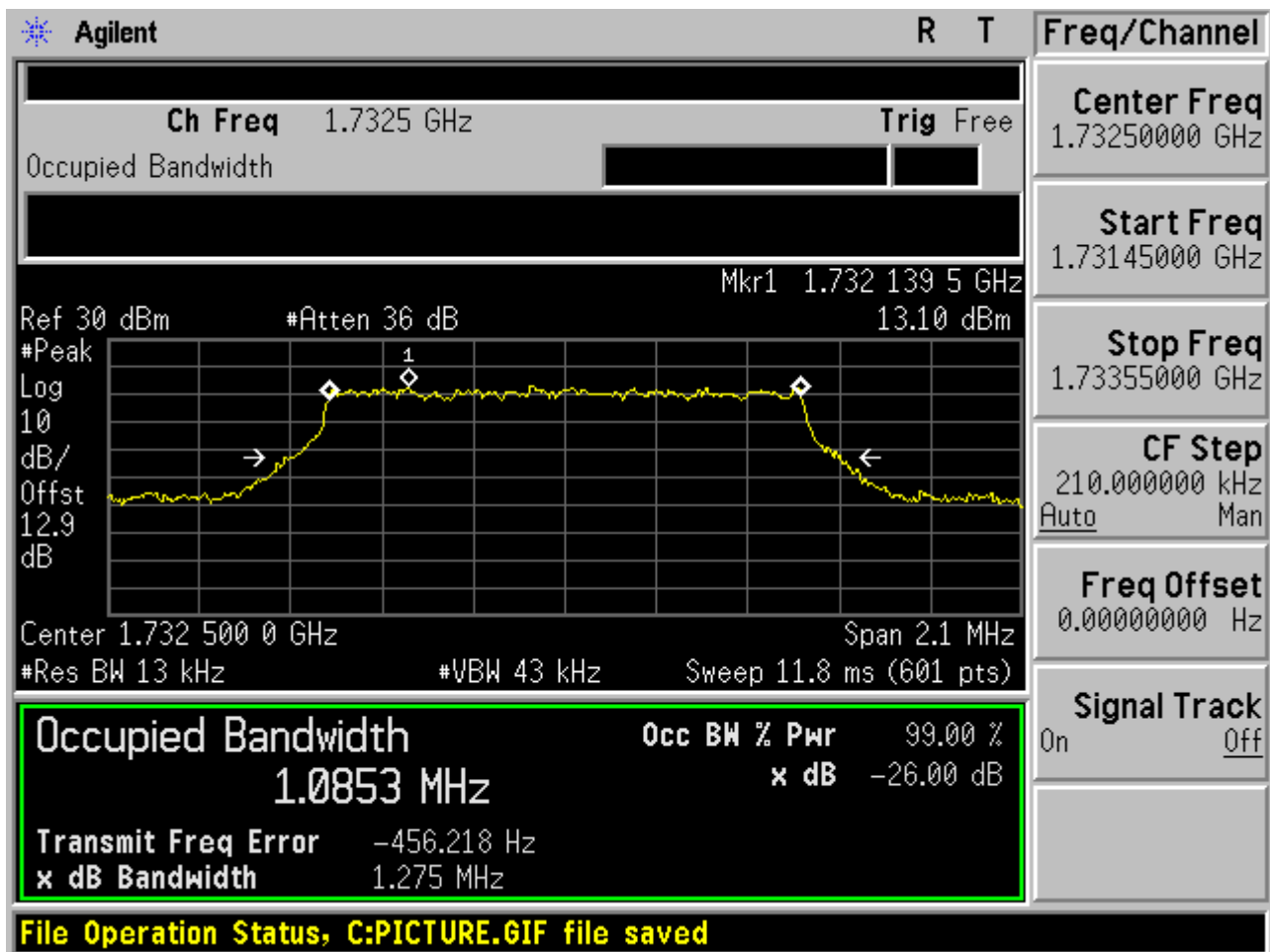


2.1.1.2.3 QPSK/non-1RB #mid/2





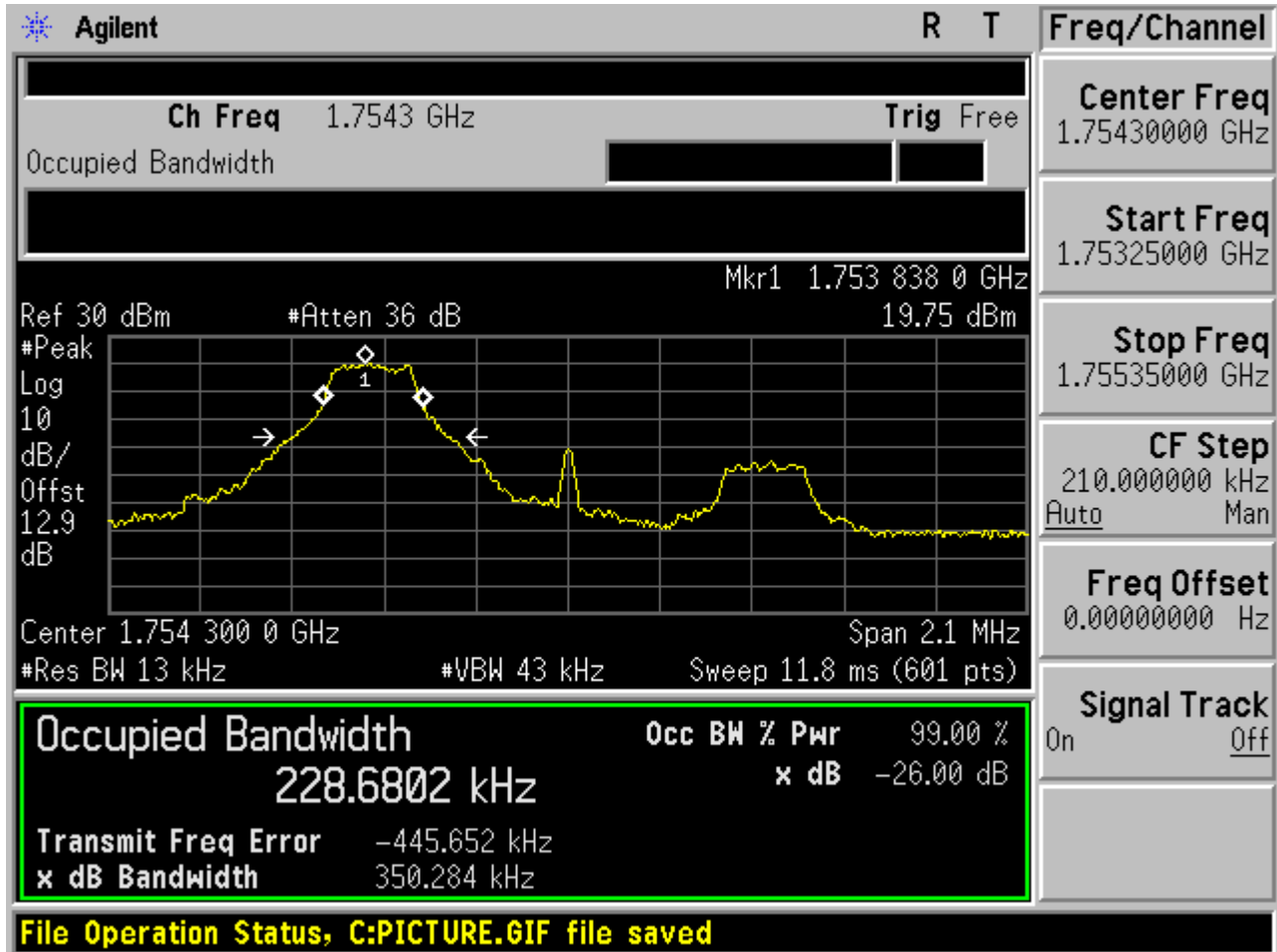
2.1.1.2.4 QPSK/full RBs





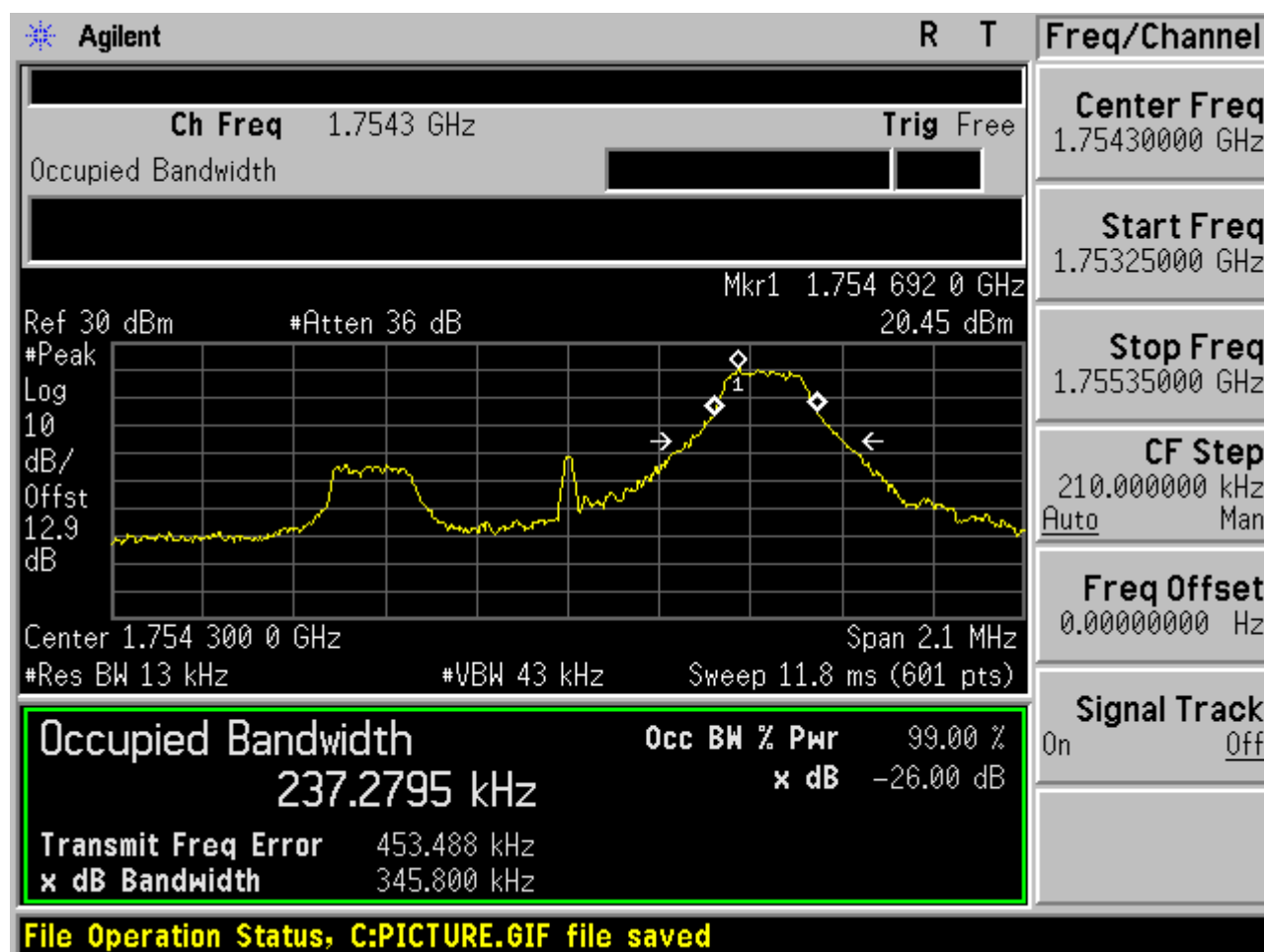
2.1.1.3 Channel =T

2.1.1.3.1 QPSK/1RB # 0



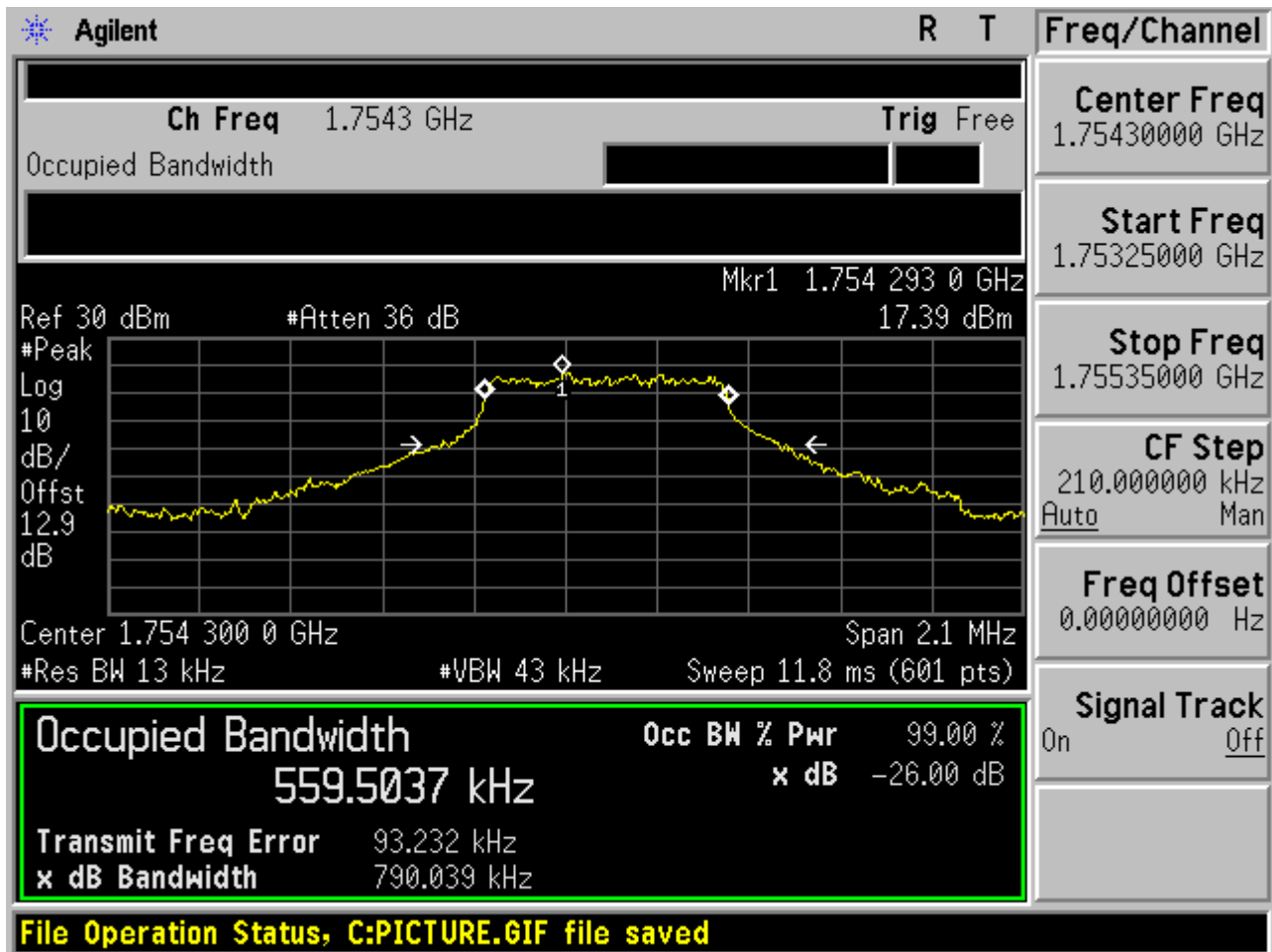


2.1.1.3.2 QPSK/1RB # max



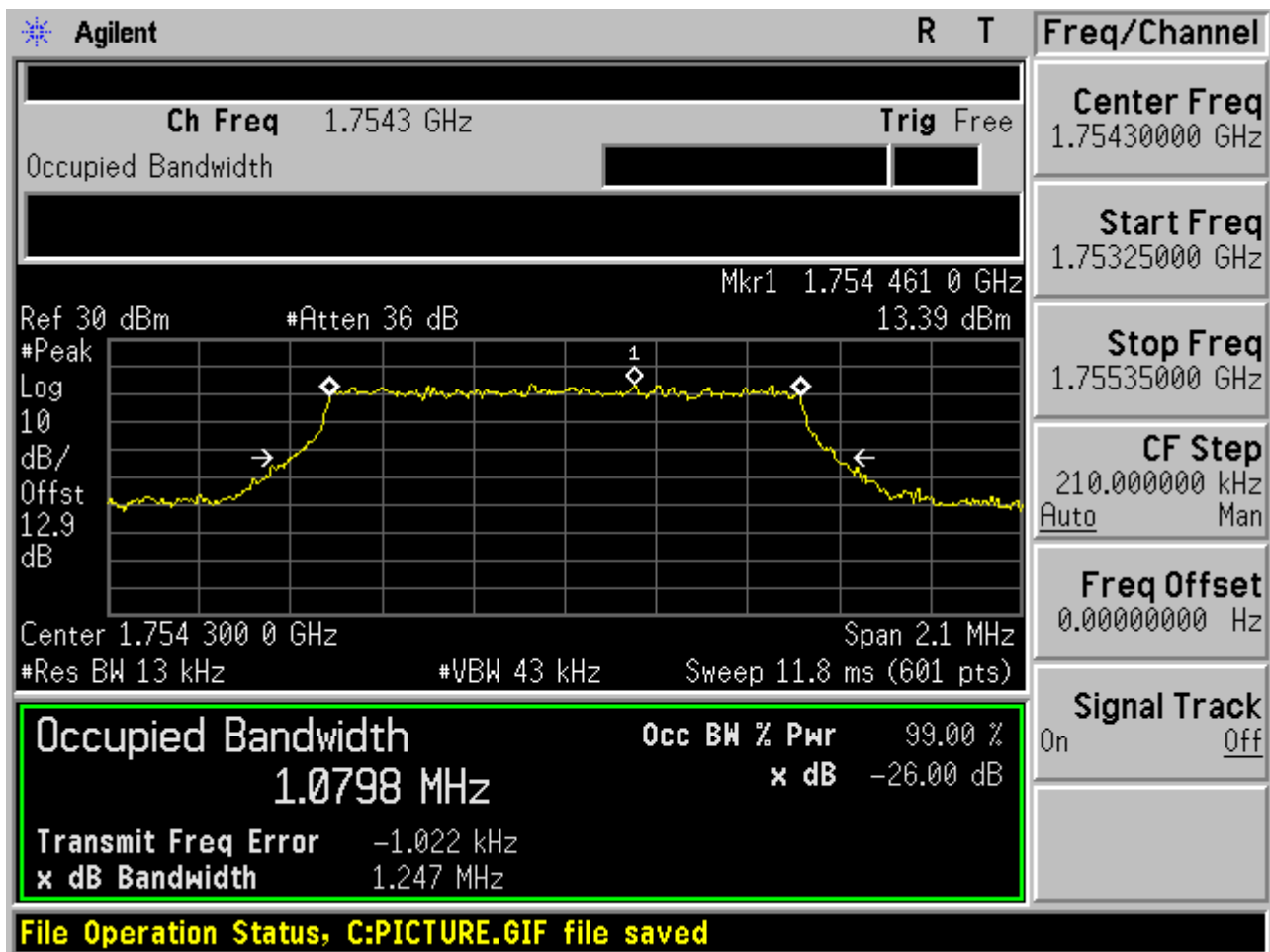


2.1.1.3.3 QPSK/non-1RB #mid/2





2.1.1.3.4 QPSK/full RBs

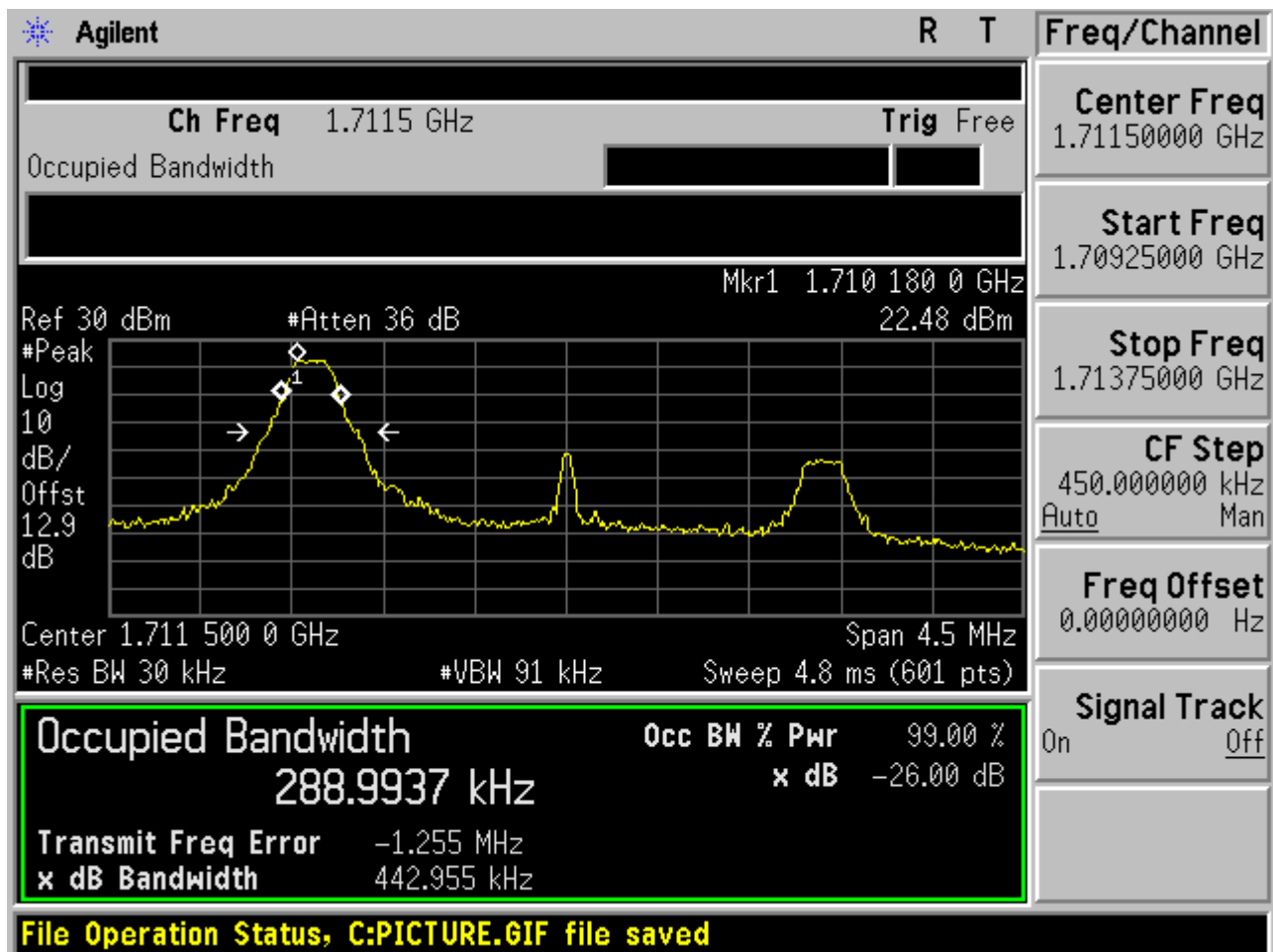




2.1.2 Channel Bandwidth = 3 MHz

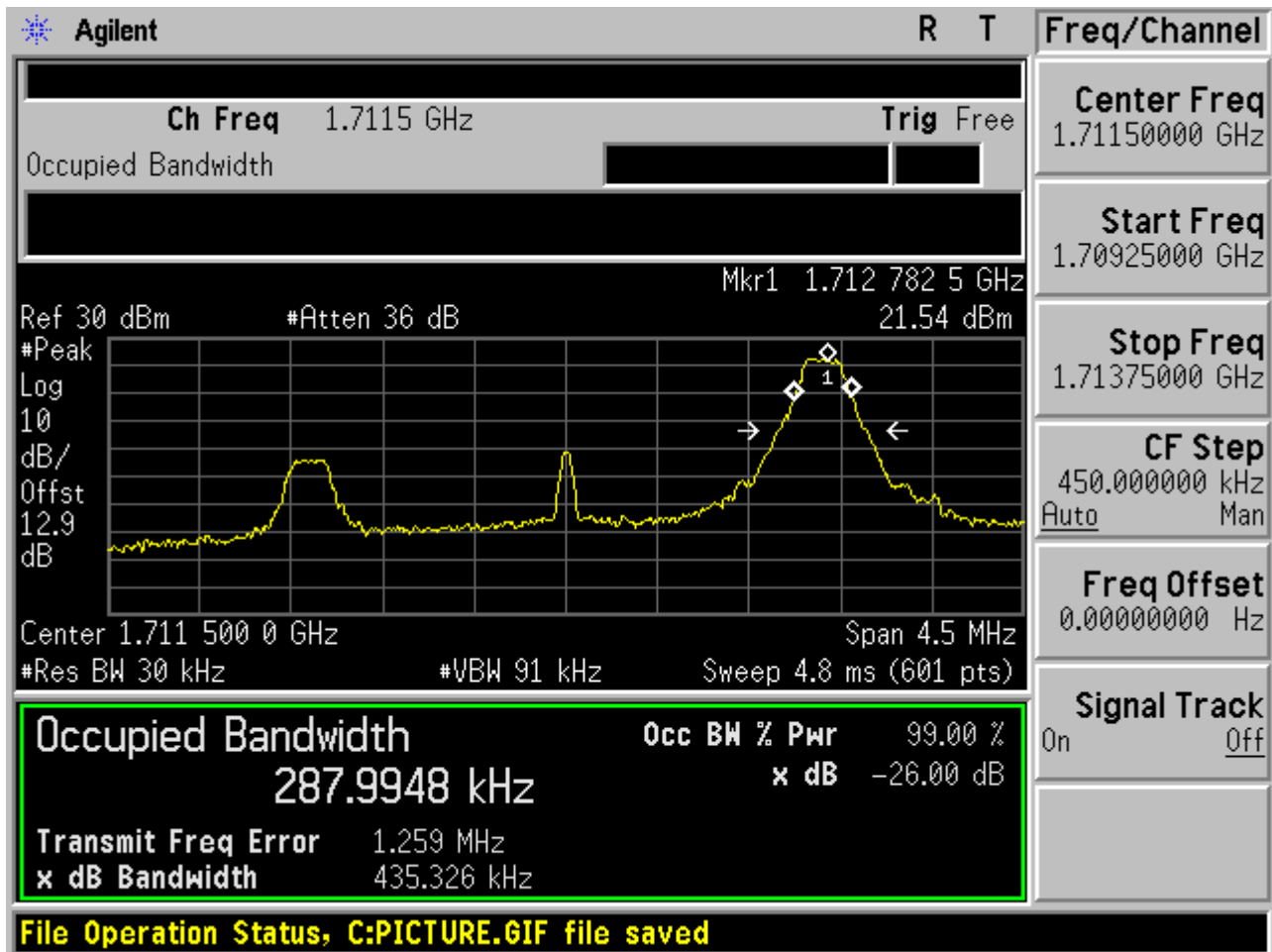
2.1.2.1 Channel = B

2.1.2.1.1 QPSK/1RB # 0



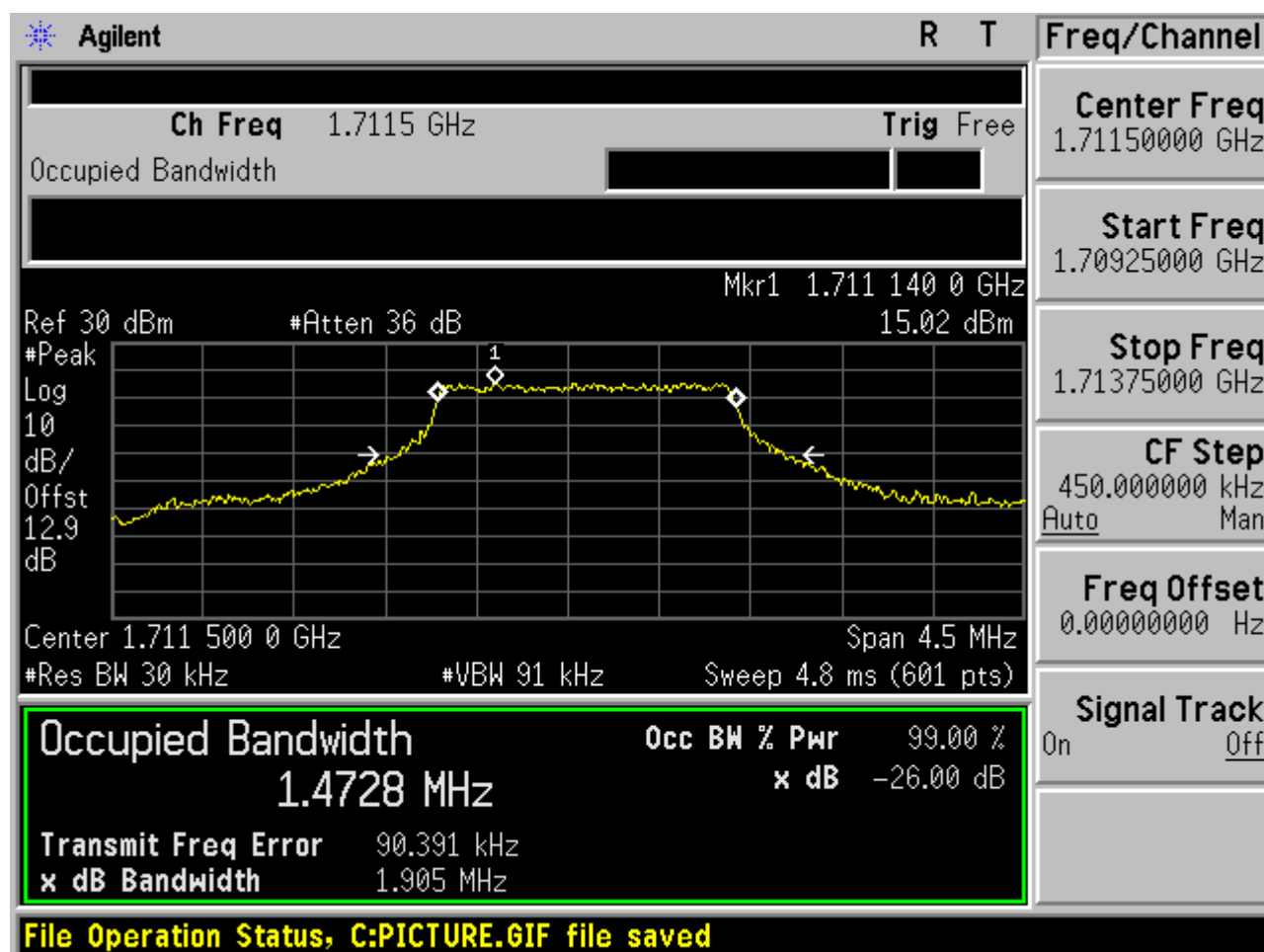


2.1.2.1.2 QPSK/1RB # max



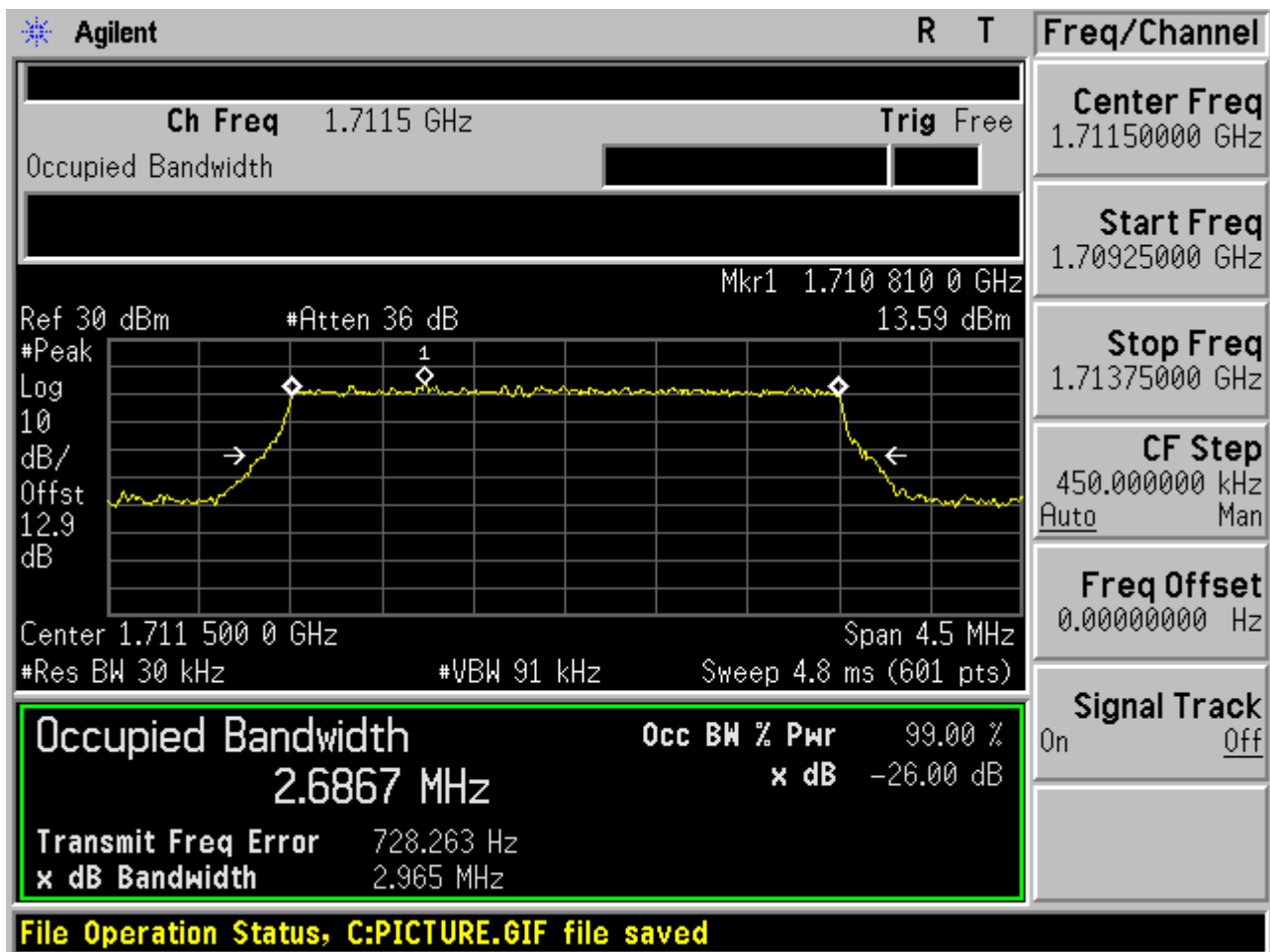


2.1.2.1.3 QPSK/non-1RB #mid/2





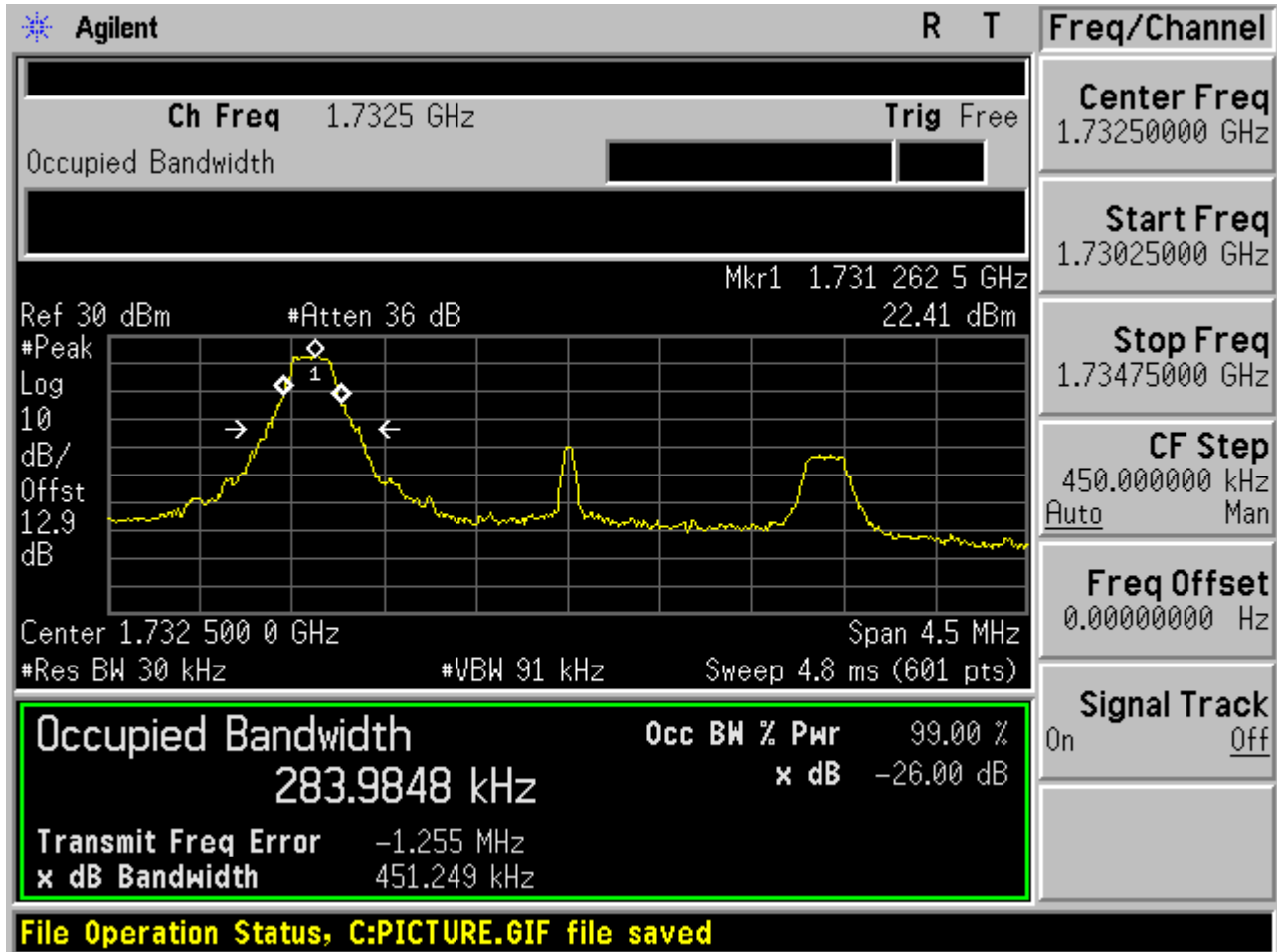
2.1.2.1.4 QPSK/full RBs





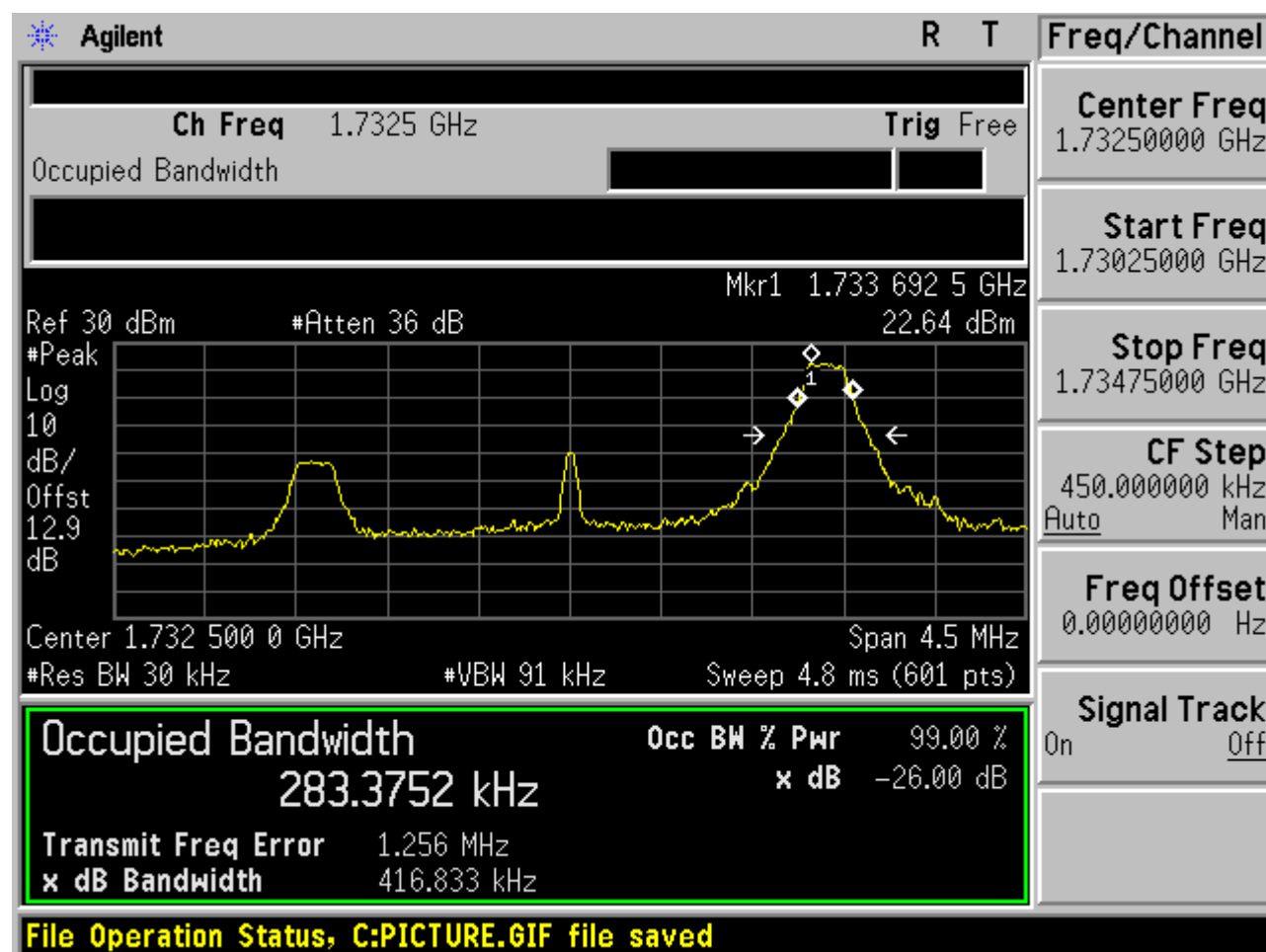
2.1.2.2 Channel =M

2.1.2.2.1 QPSK/1RB # 0



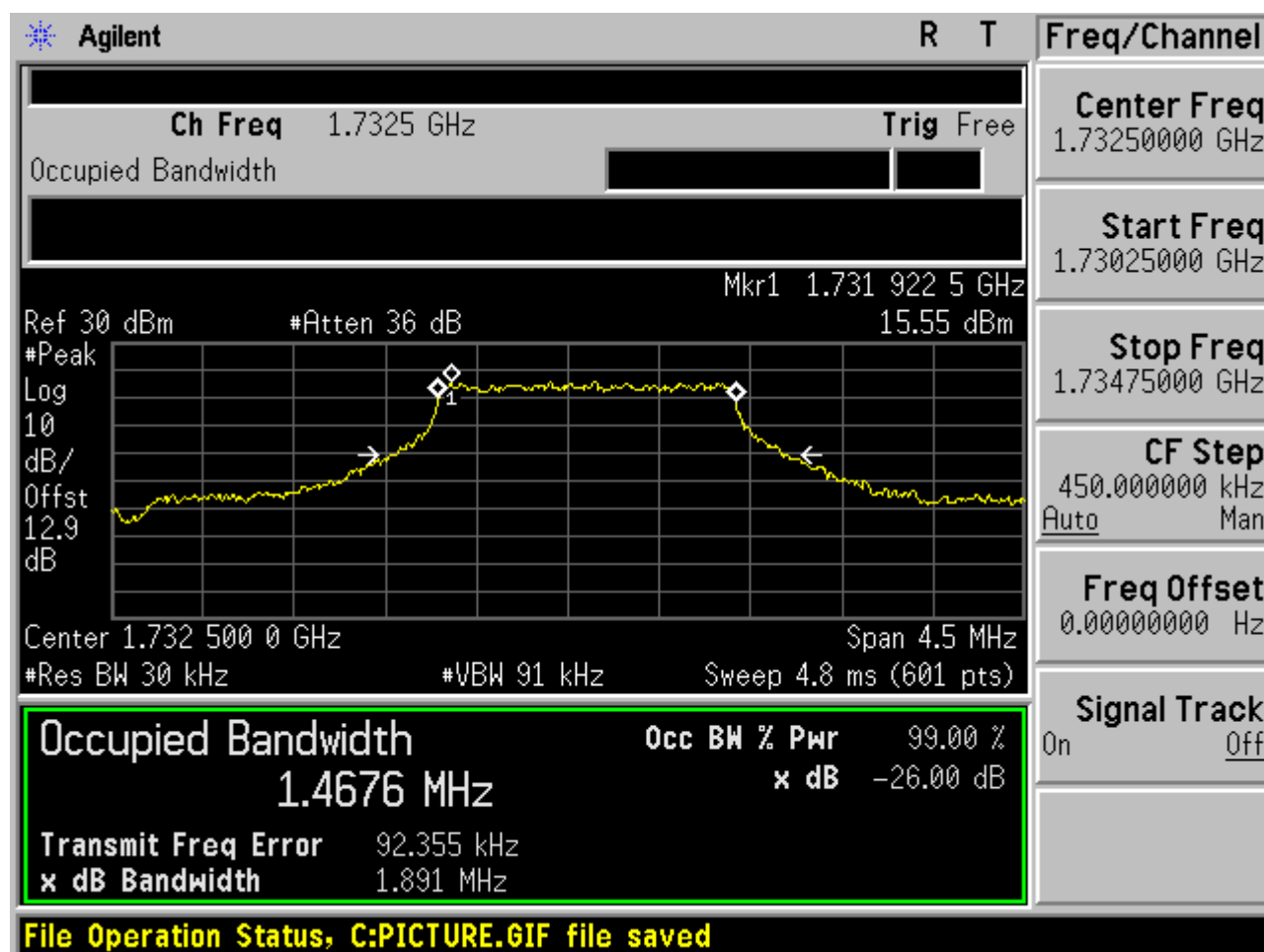


2.1.2.2.2 QPSK/1RB # max



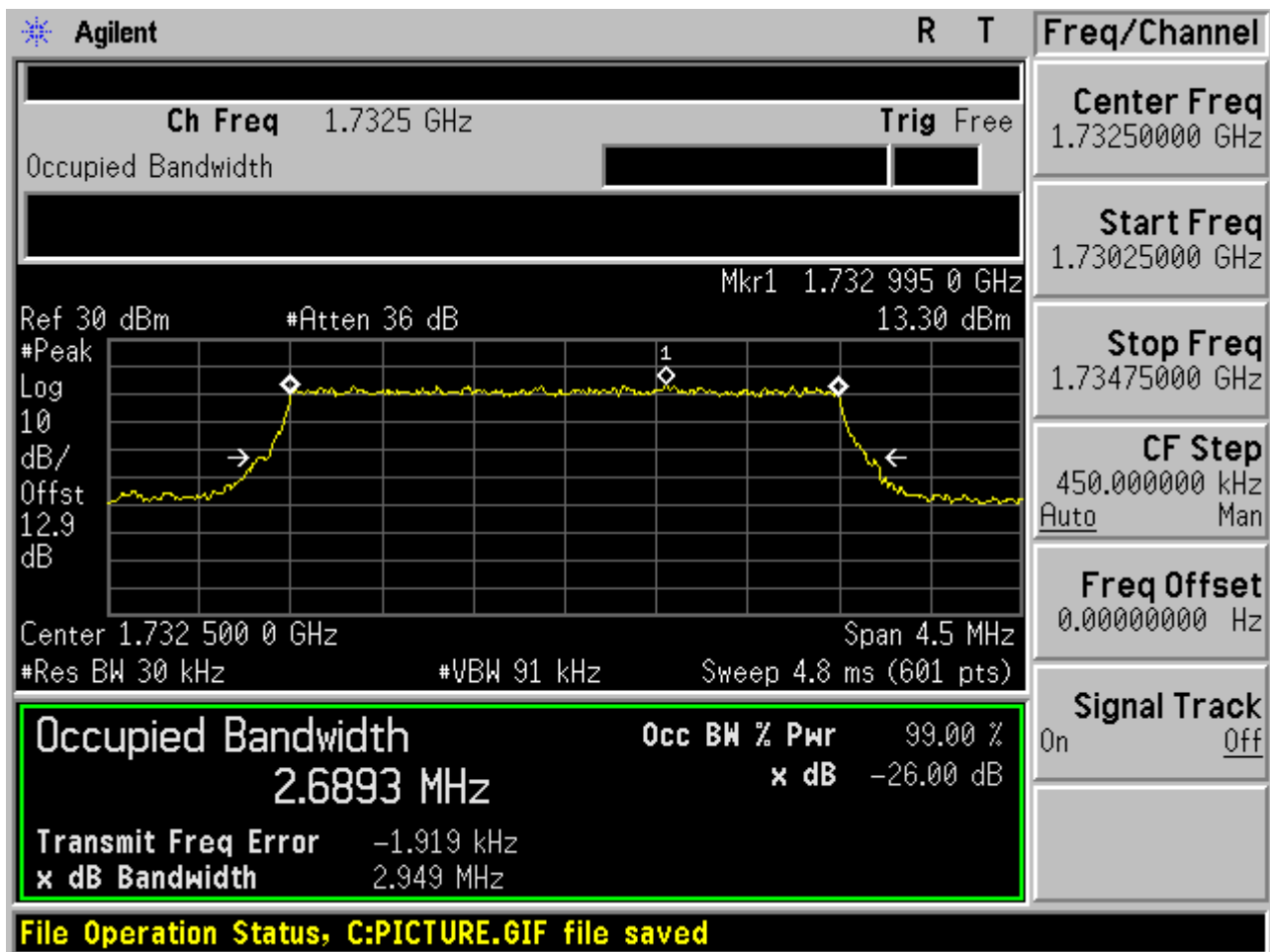


2.1.2.2.3 QPSK/non-1RB #mid/2





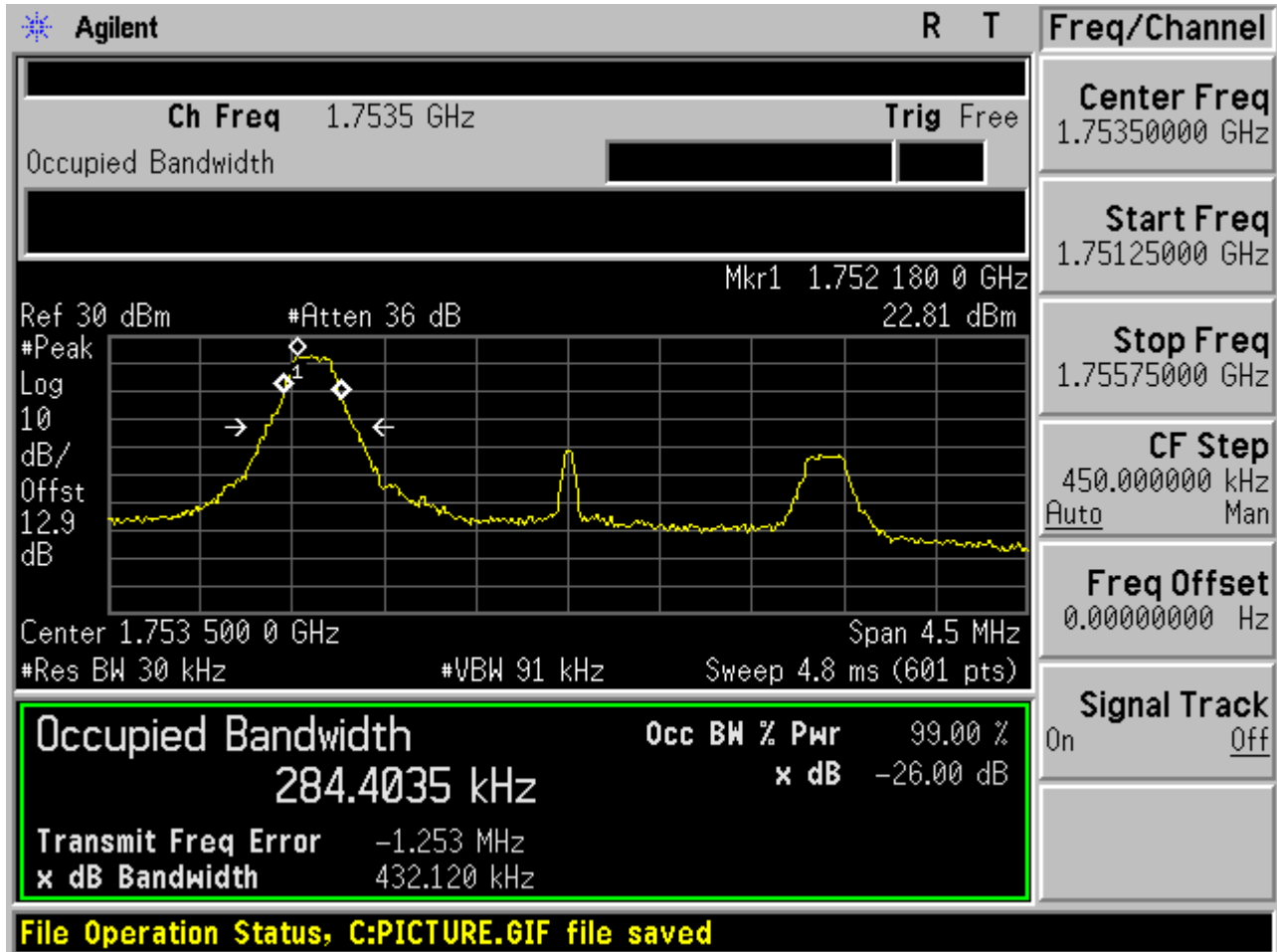
2.1.2.2.4 QPSK/full RBs





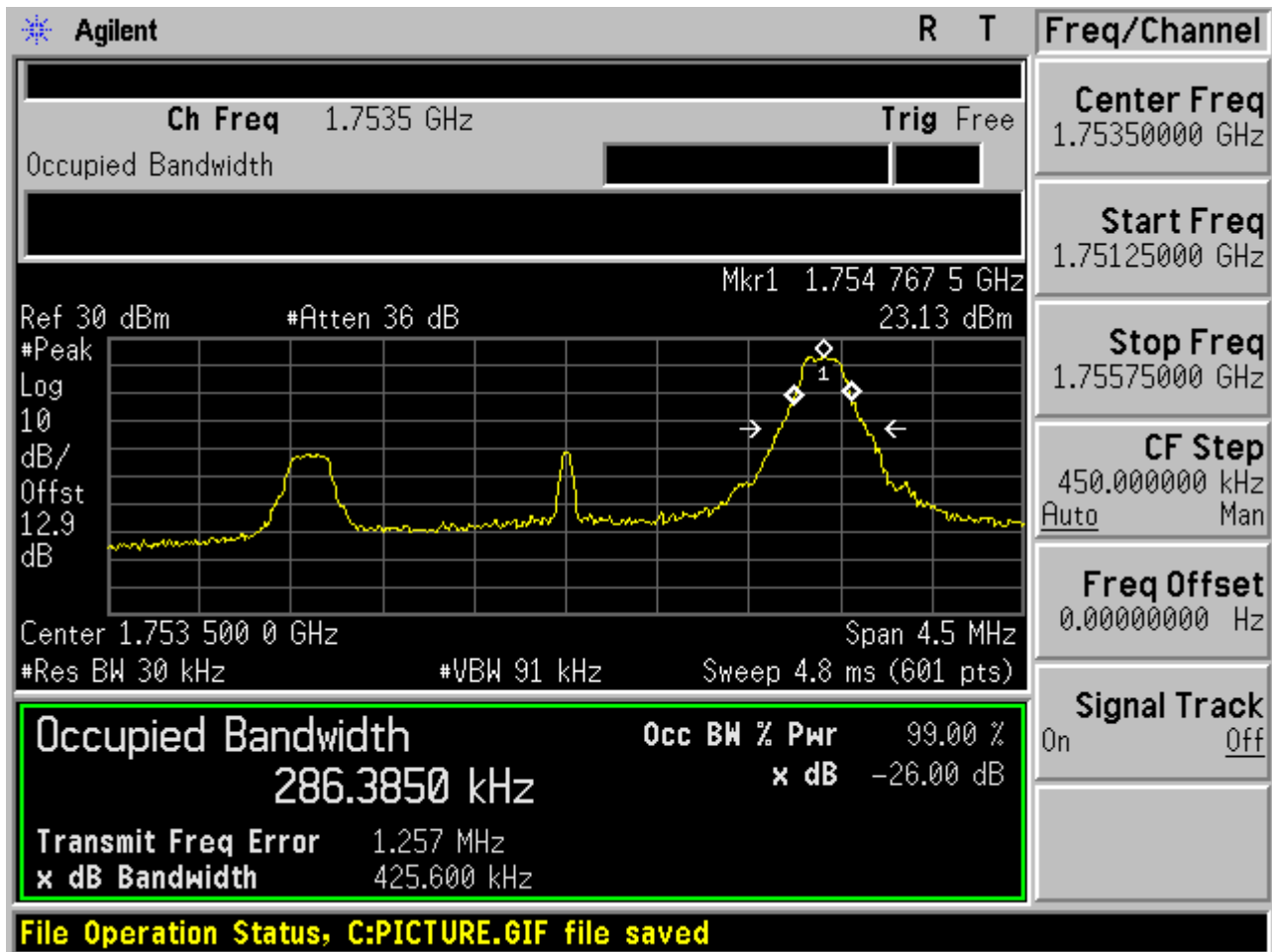
2.1.2.3 Channel =T

2.1.2.3.1 QPSK/1RB # 0



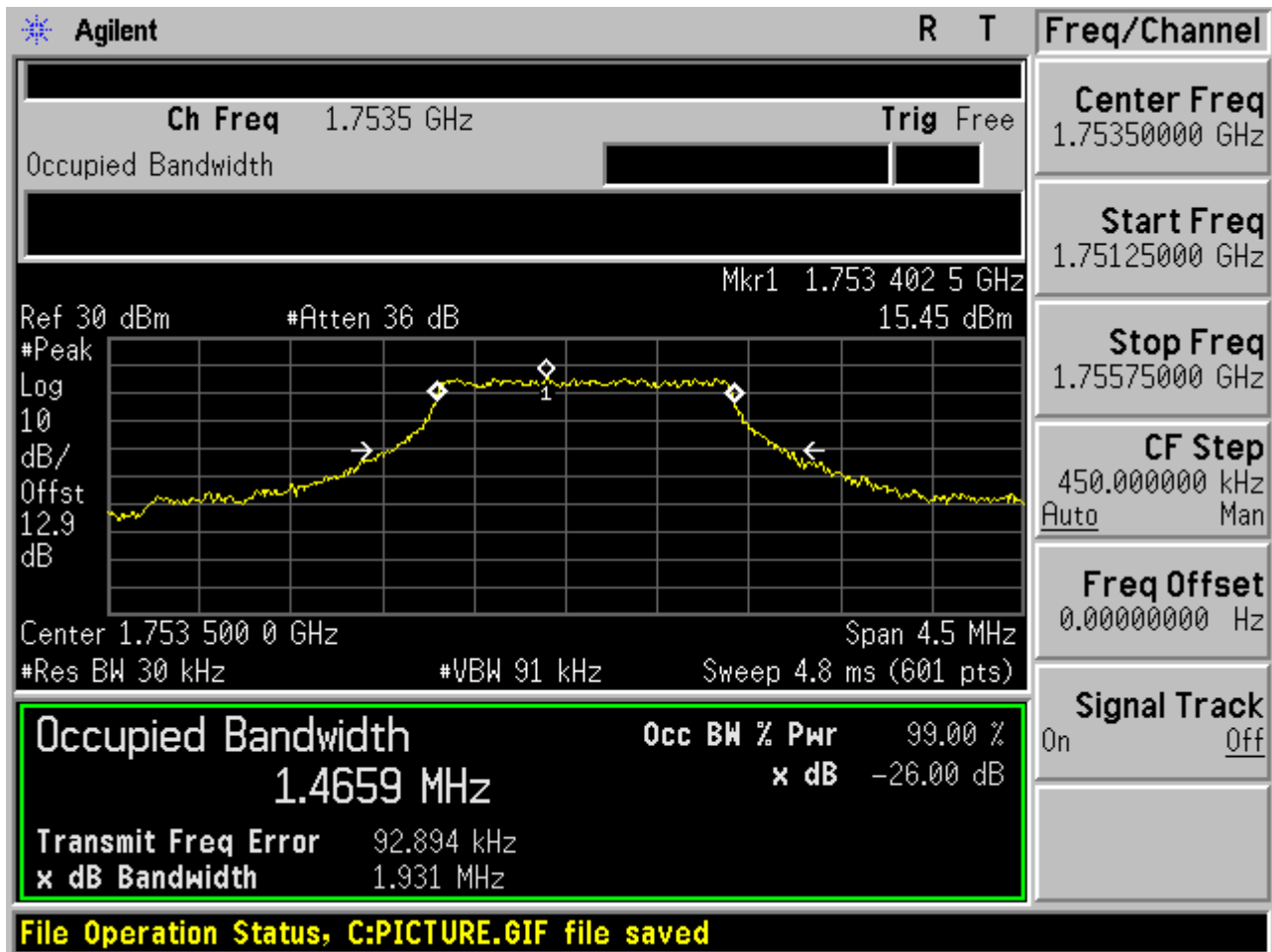


2.1.2.3.2 QPSK/1RB # max



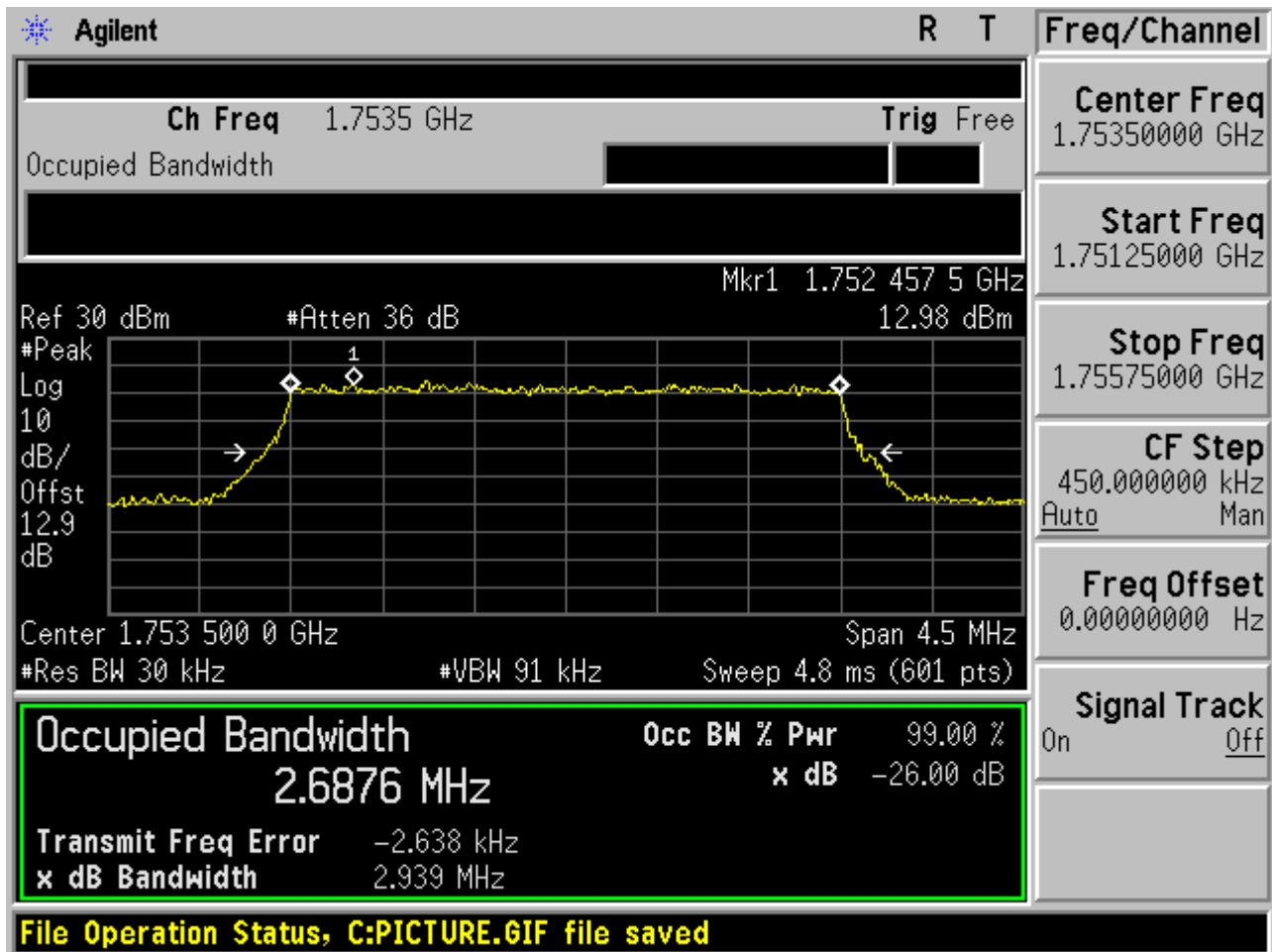


2.1.2.3.3 QPSK/non-1RB #mid/2





2.1.2.3.4 QPSK/full RBs

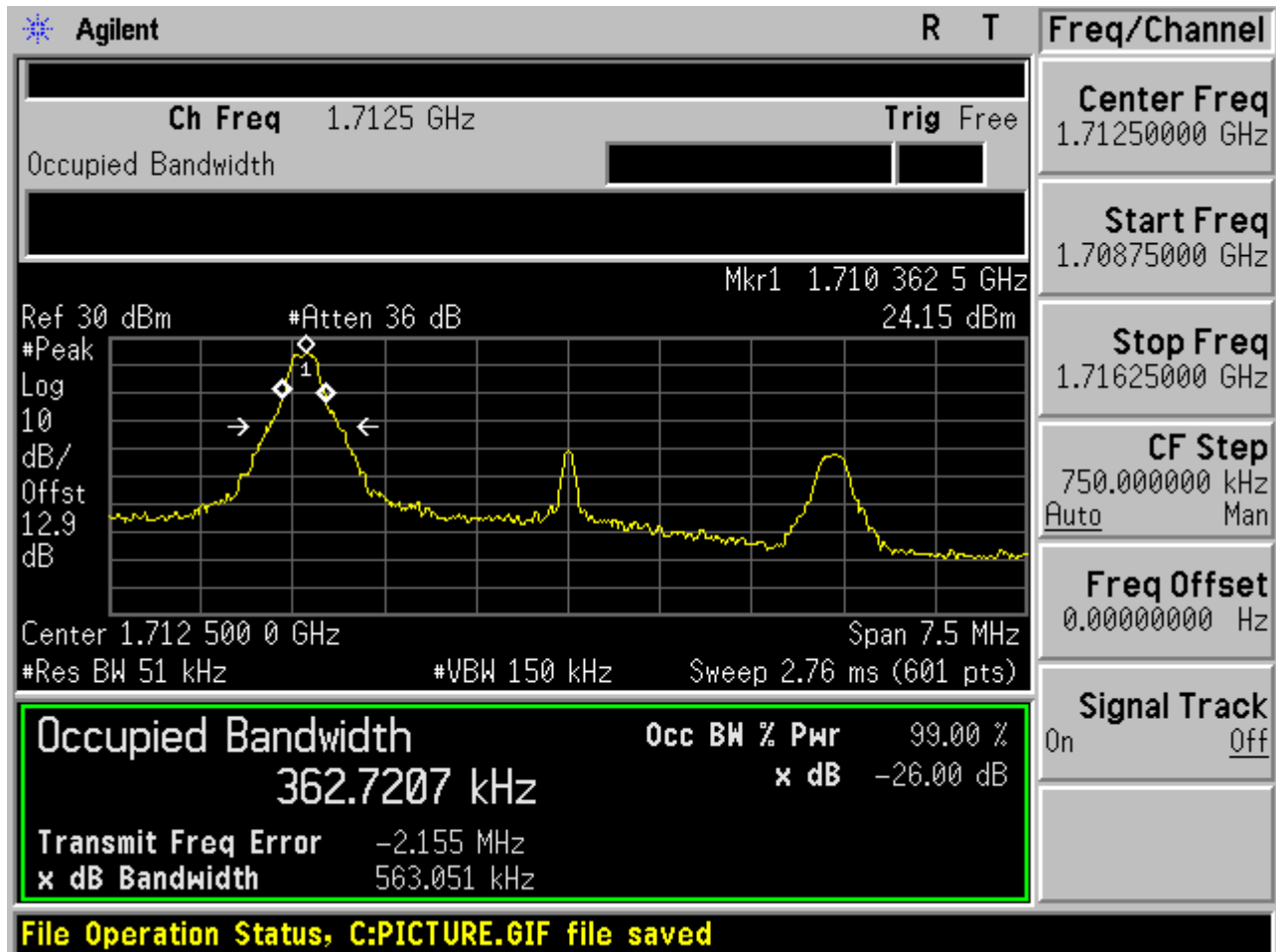




2.1.3 Channel Bandwidth = 5 MHz

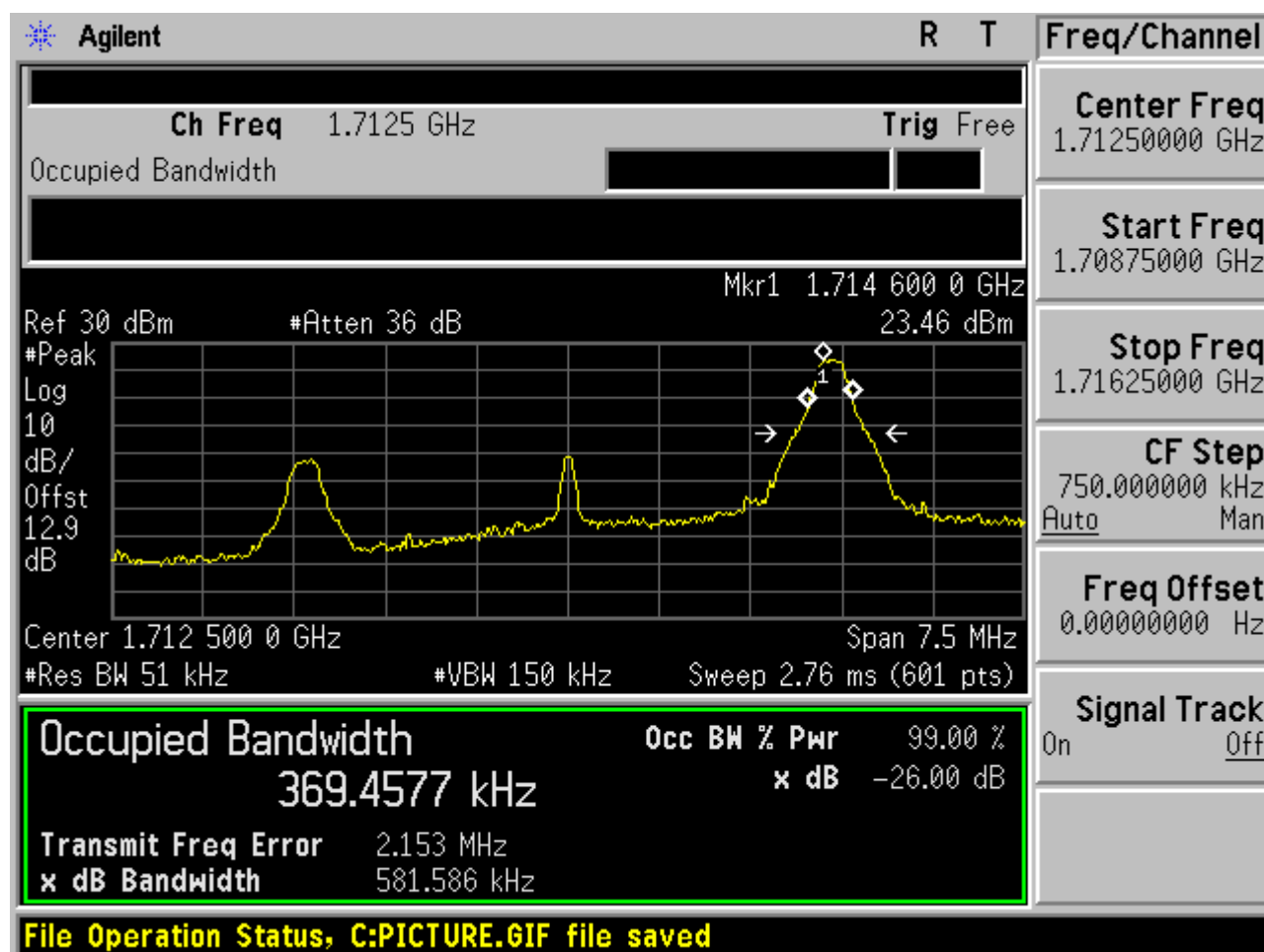
2.1.3.1 Channel = B

2.1.3.1.1 QPSK/1RB # 0



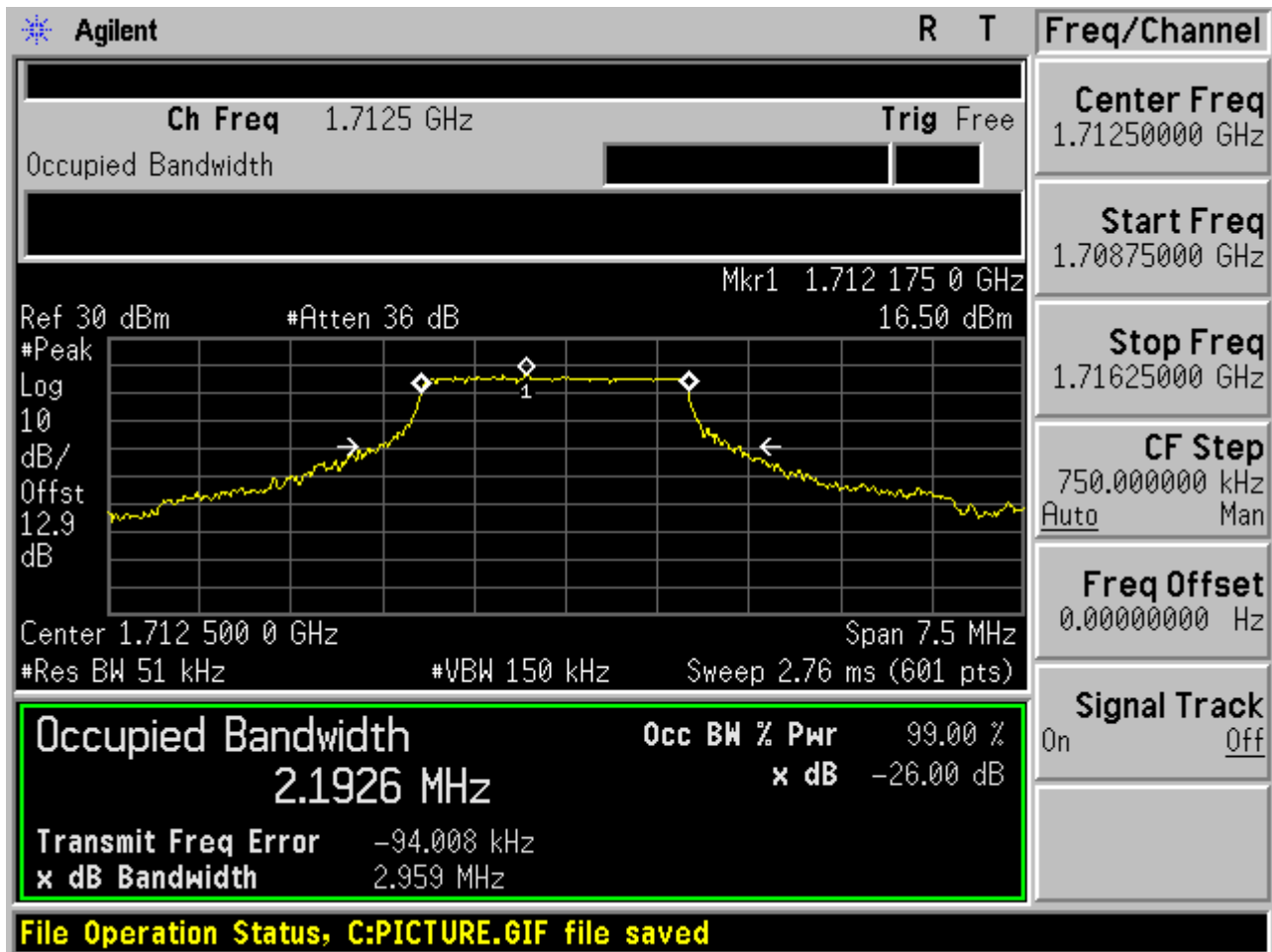


2.1.3.1.2 QPSK/1RB # max



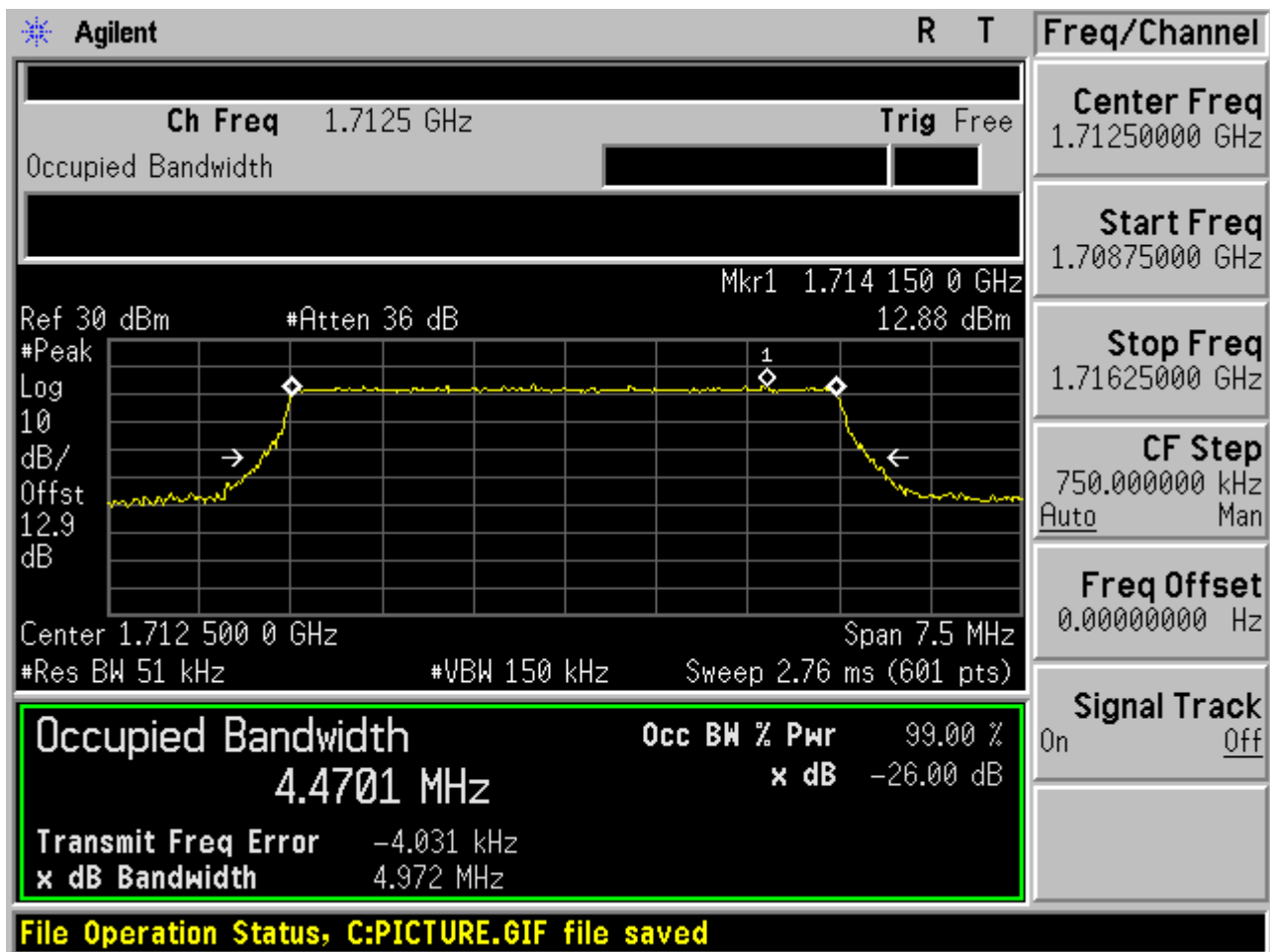


2.1.3.1.3 QPSK/non-1RB #mid/2





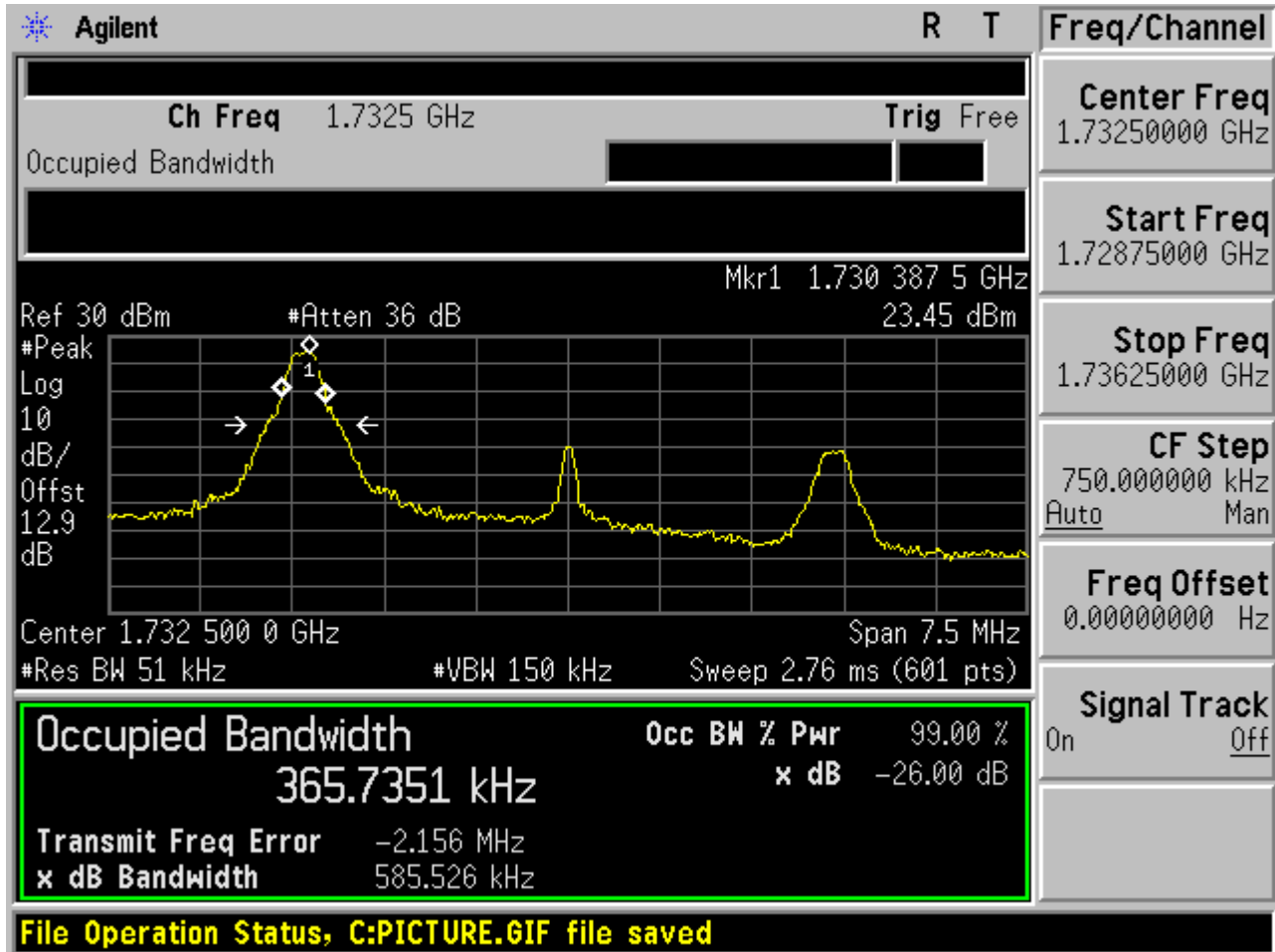
2.1.3.1.4 QPSK/full RBs





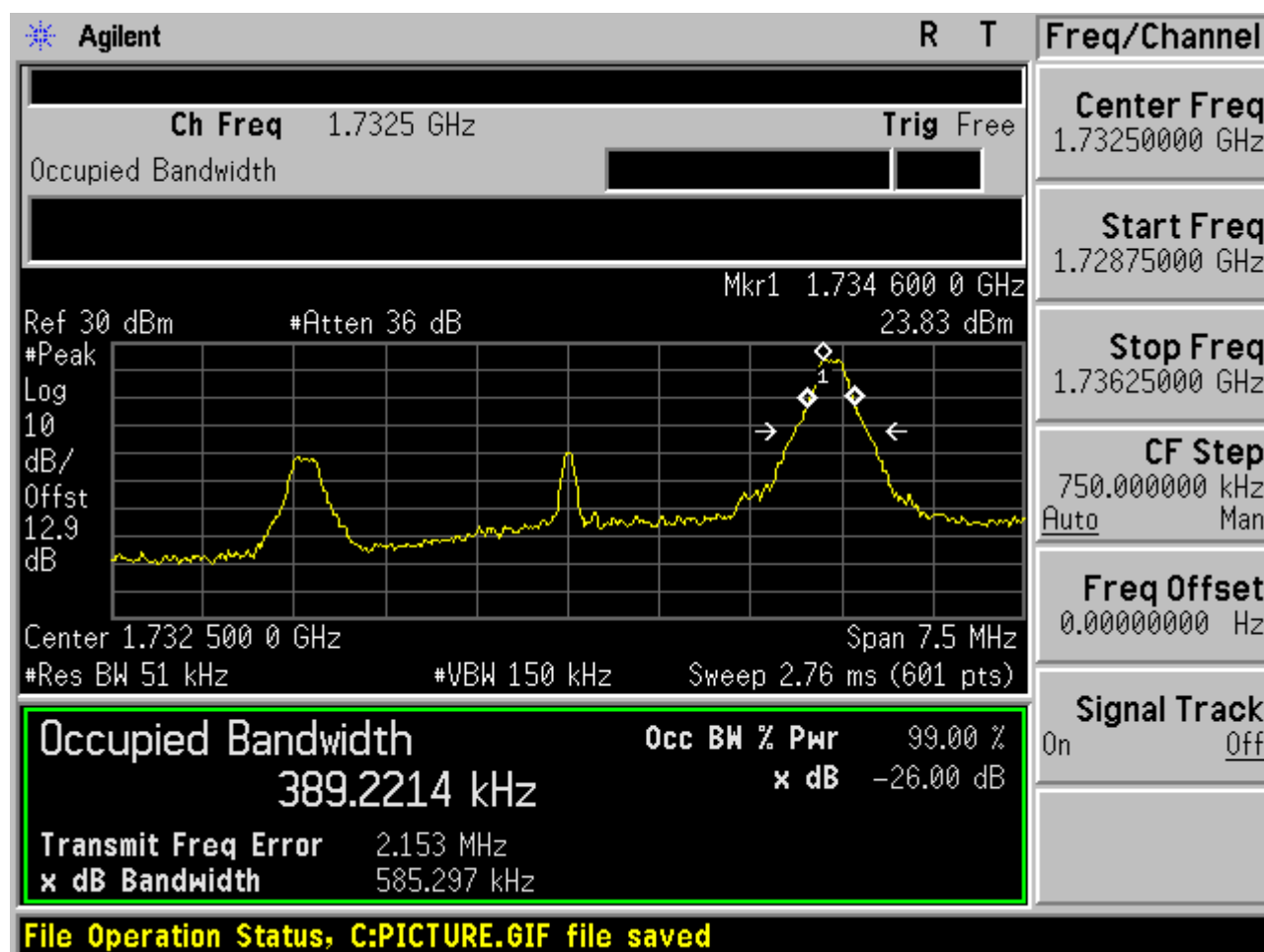
2.1.3.2 Channel =M

2.1.3.2.1 QPSK/1RB # 0



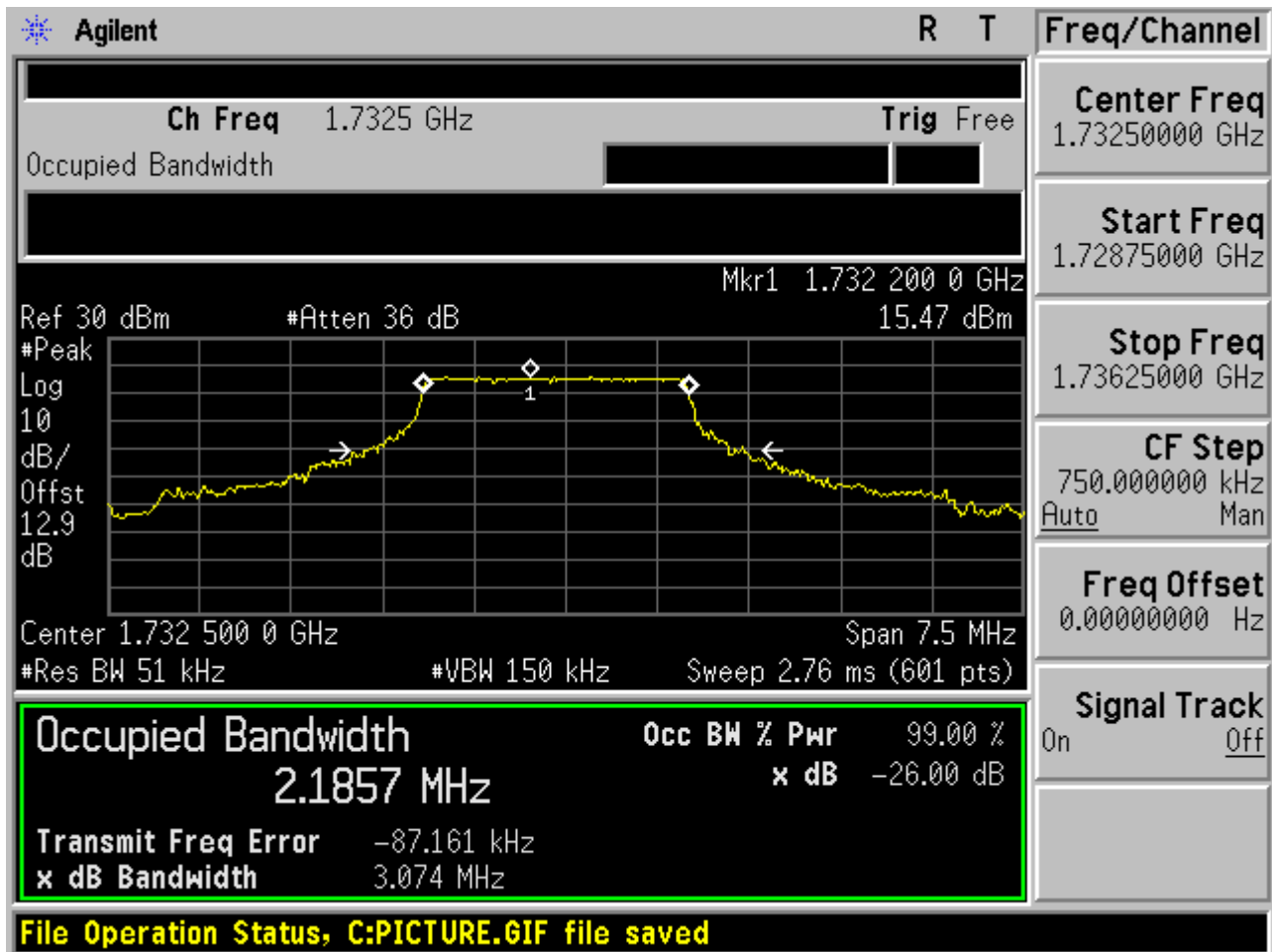


2.1.3.2.2 QPSK/1RB # max



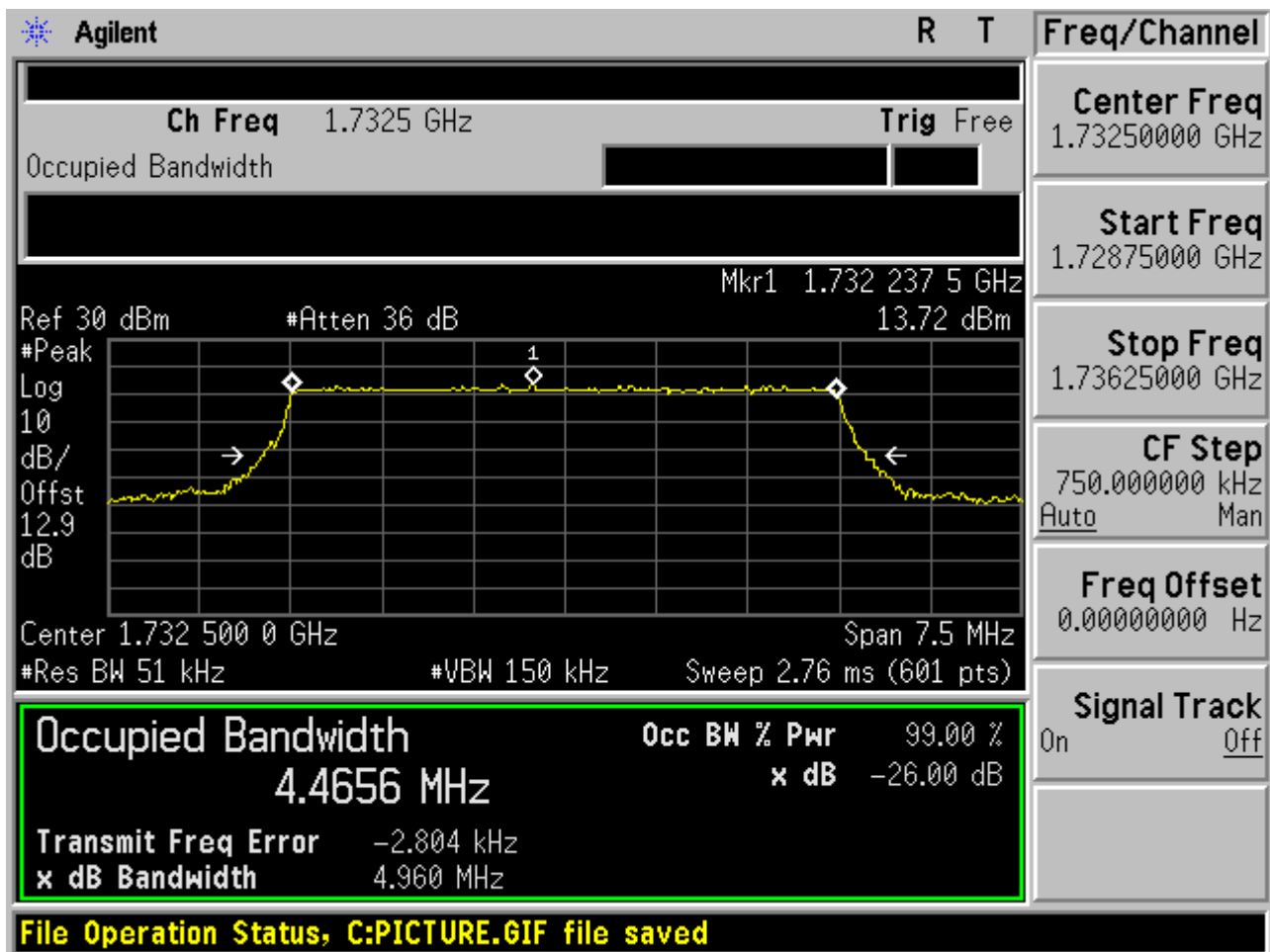


2.1.3.2.3 QPSK/non-1RB #mid/2





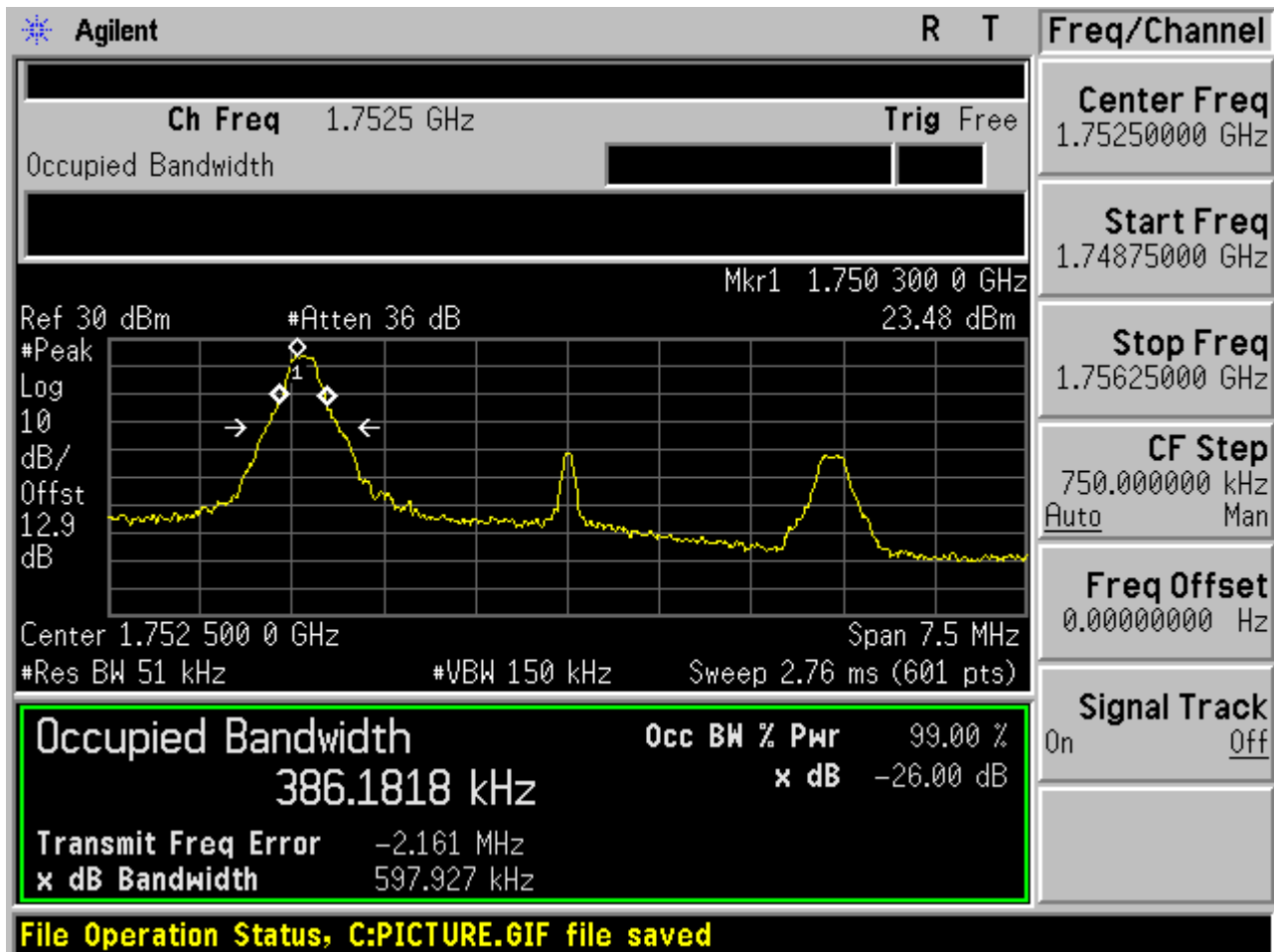
2.1.3.2.4 QPSK/full RBs





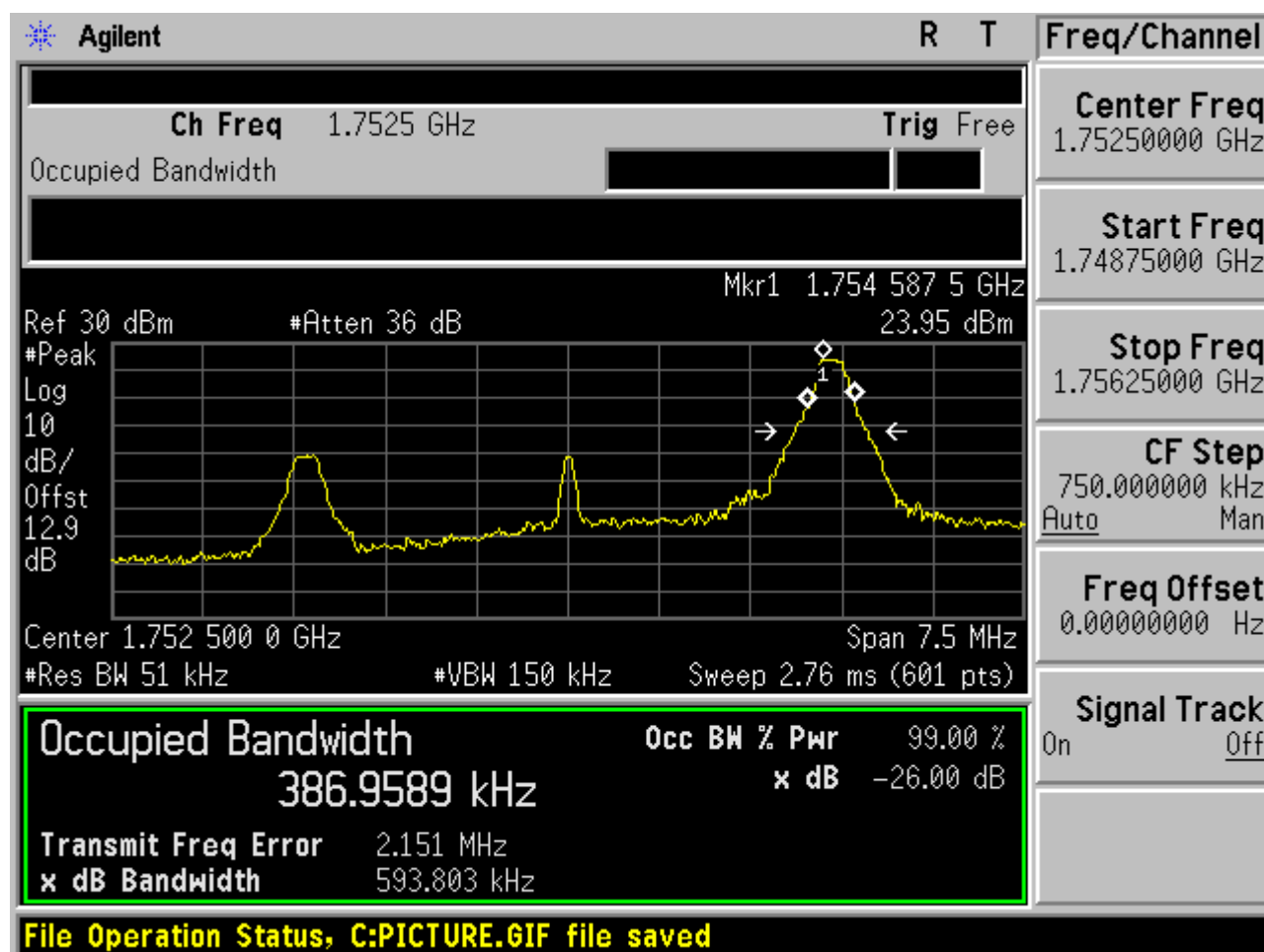
2.1.3.3 Channel =T

2.1.3.3.1 QPSK/1RB # 0



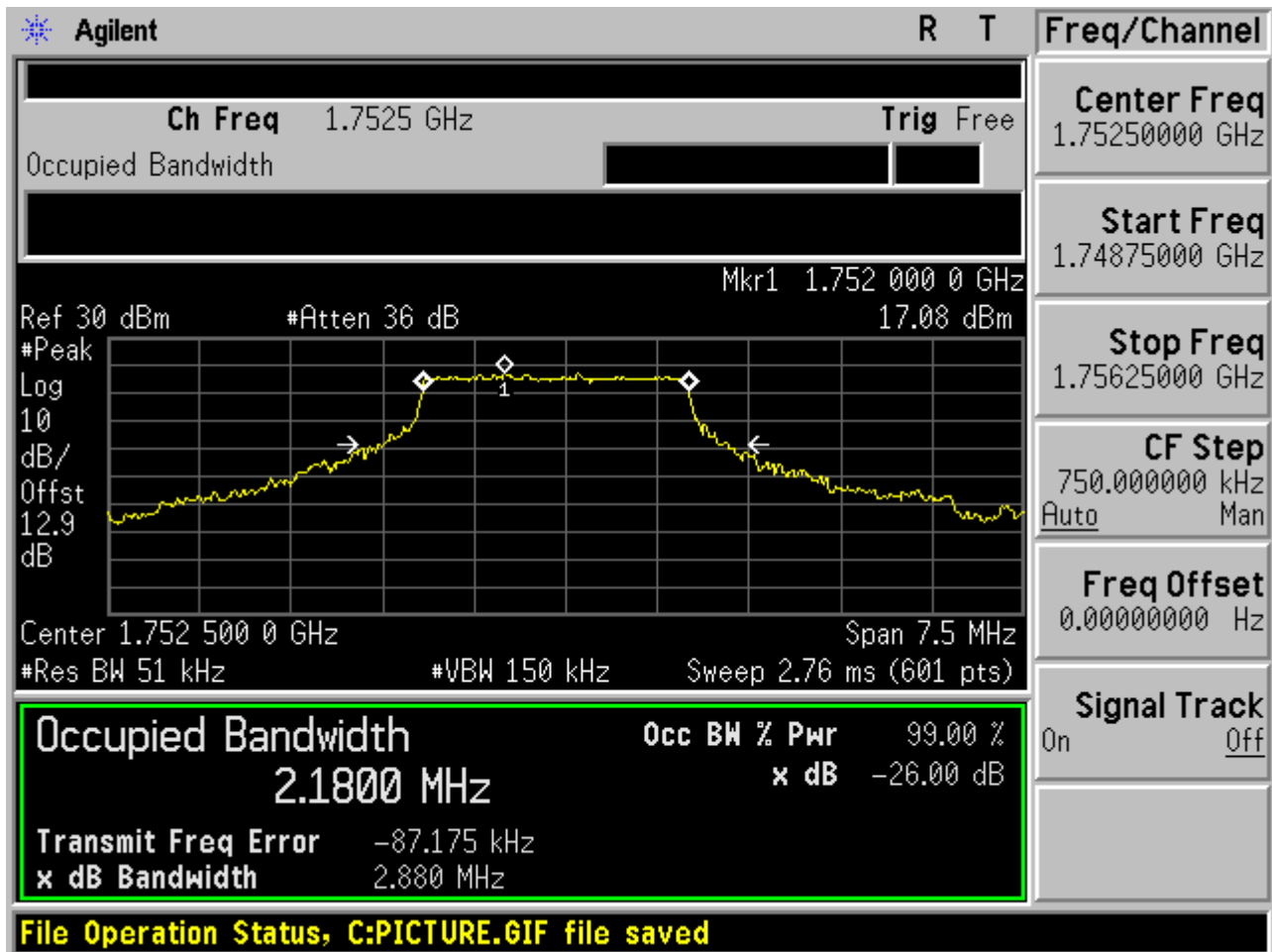


2.1.3.3.2 QPSK/1RB # max



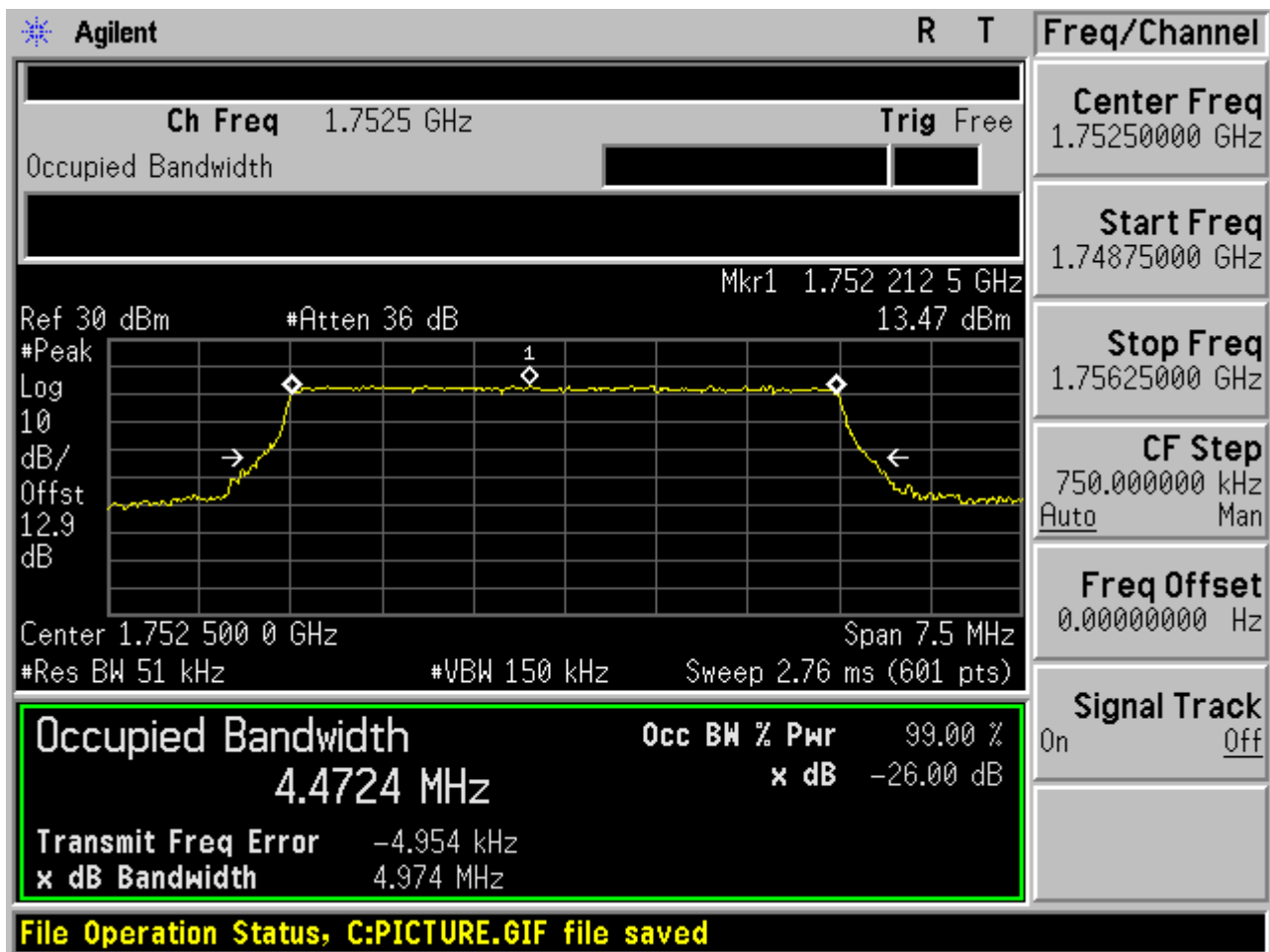


2.1.3.3.3 QPSK/non-1RB #mid/2





2.1.3.3.4 QPSK/full RBs

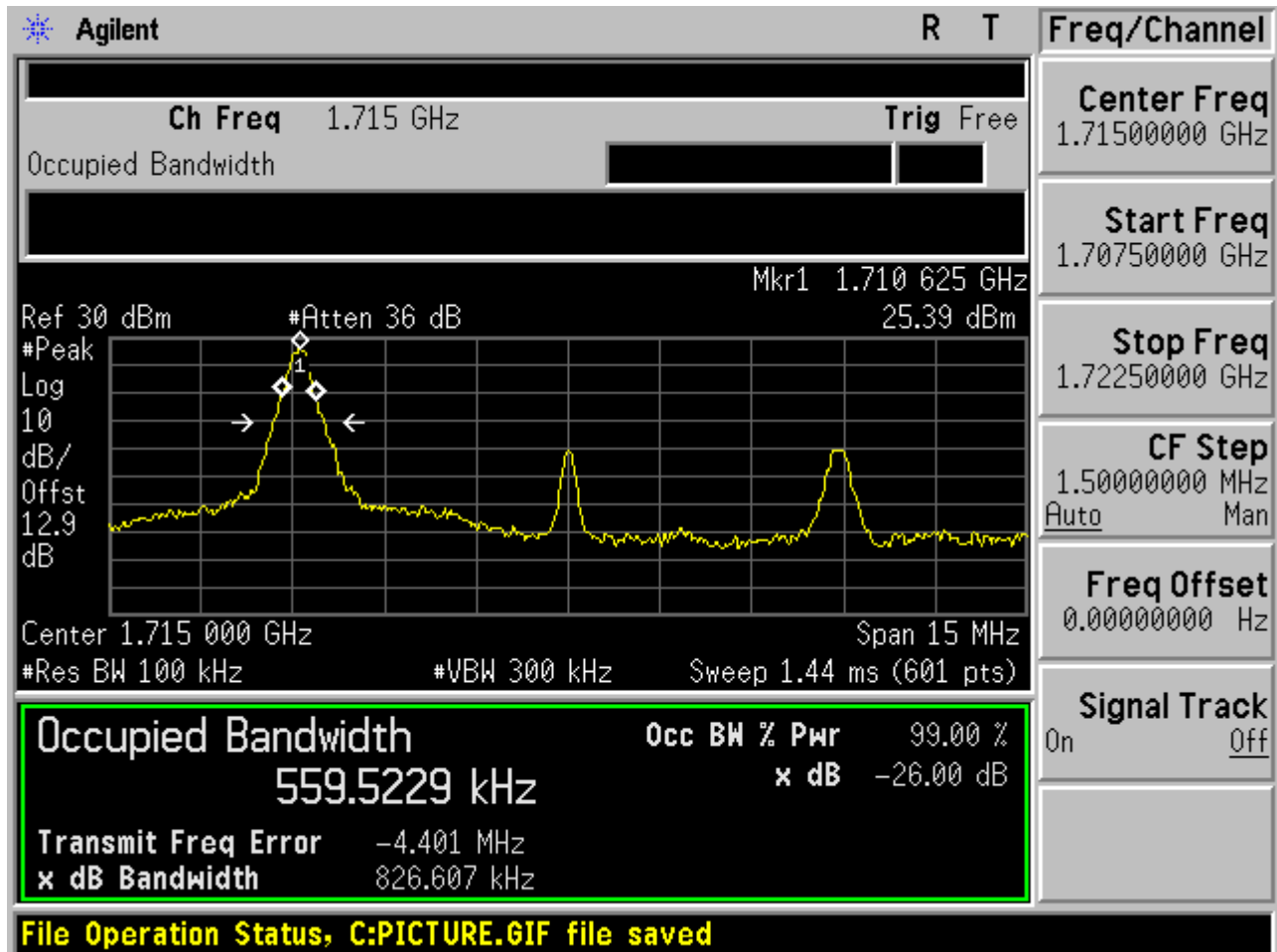




2.1.4 Channel Bandwidth = 10 MHz

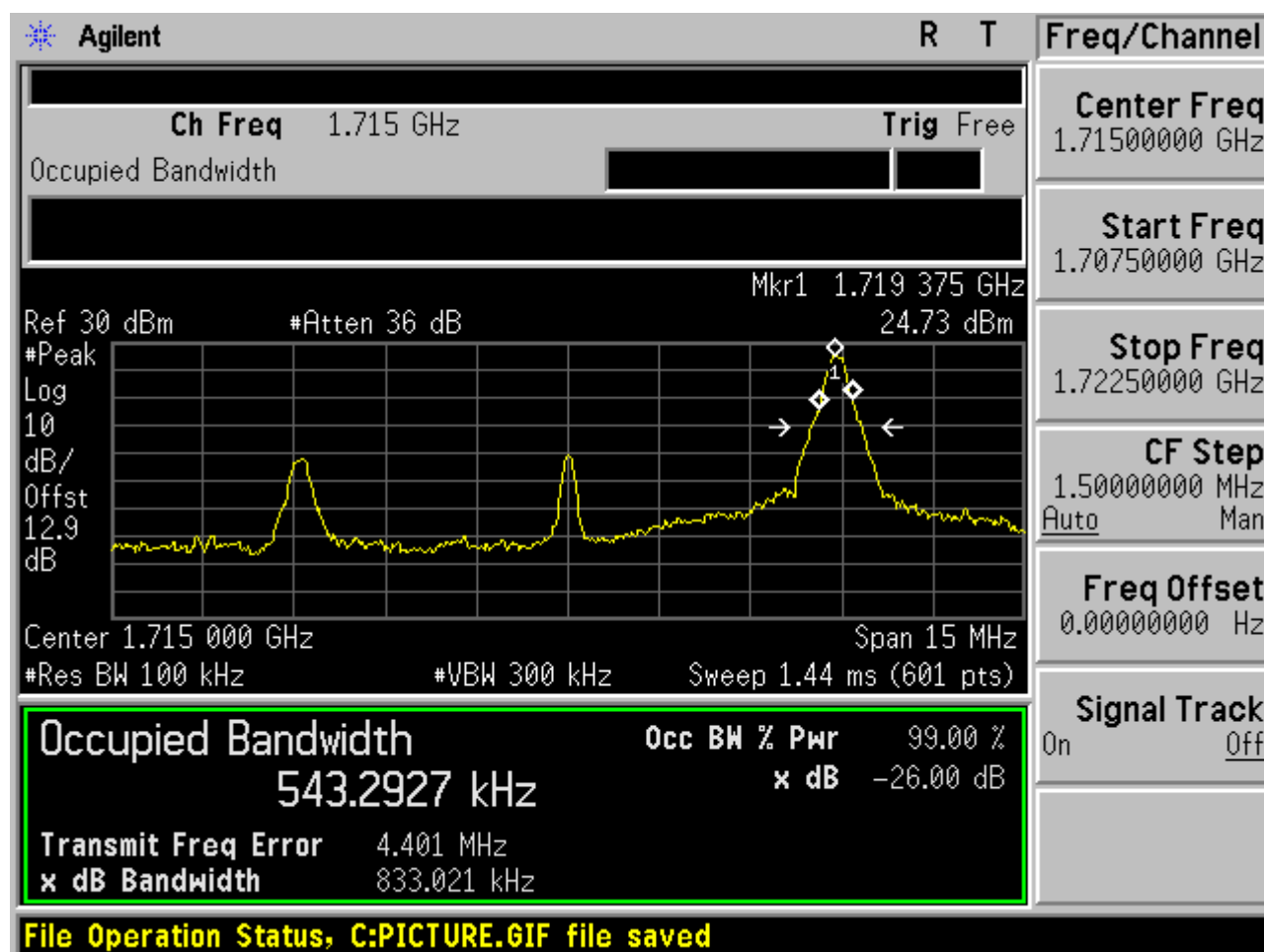
2.1.4.1 Channel = B

2.1.4.1.1 QPSK/1RB # 0



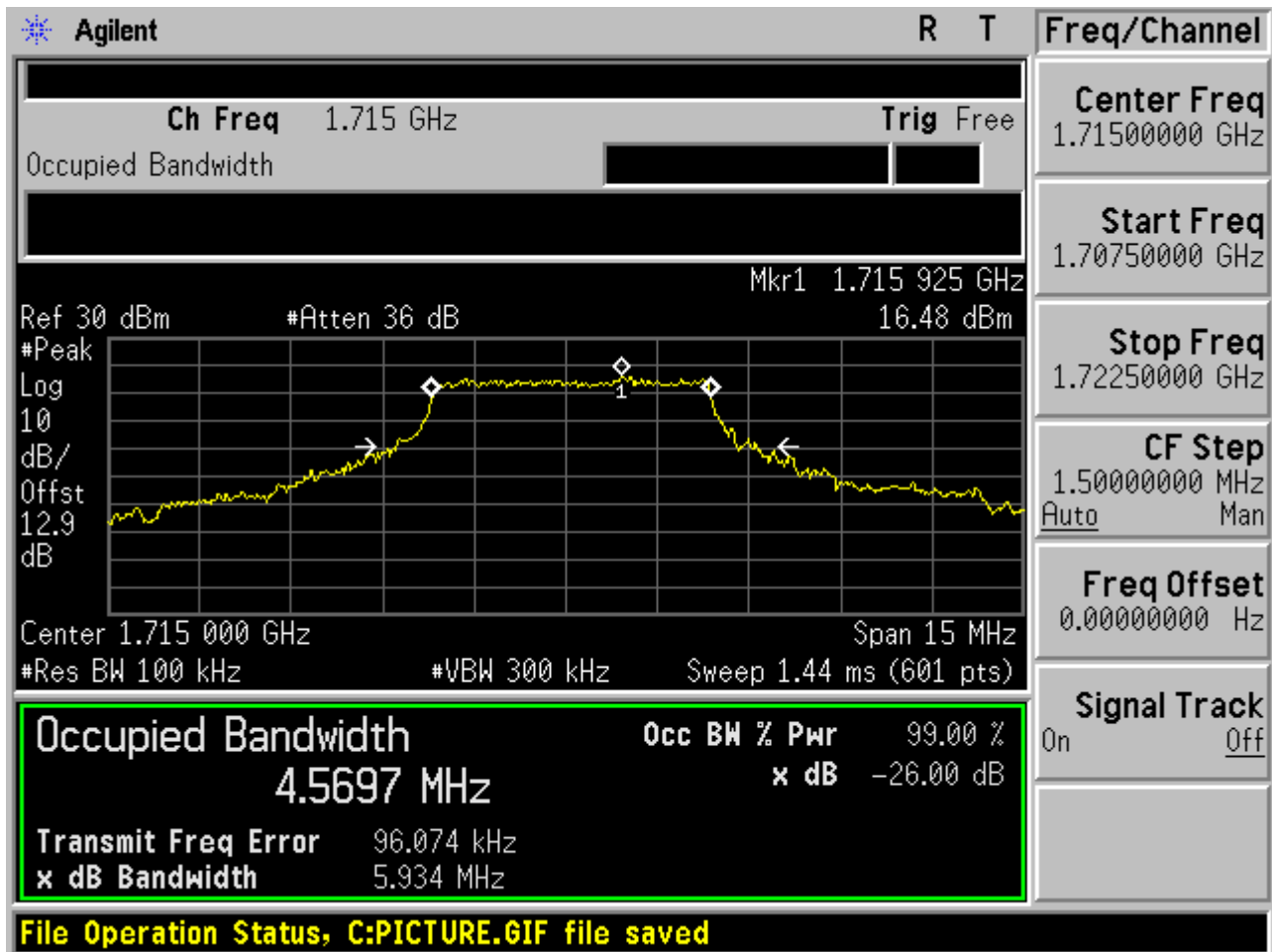


2.1.4.1.2 QPSK/1RB # max



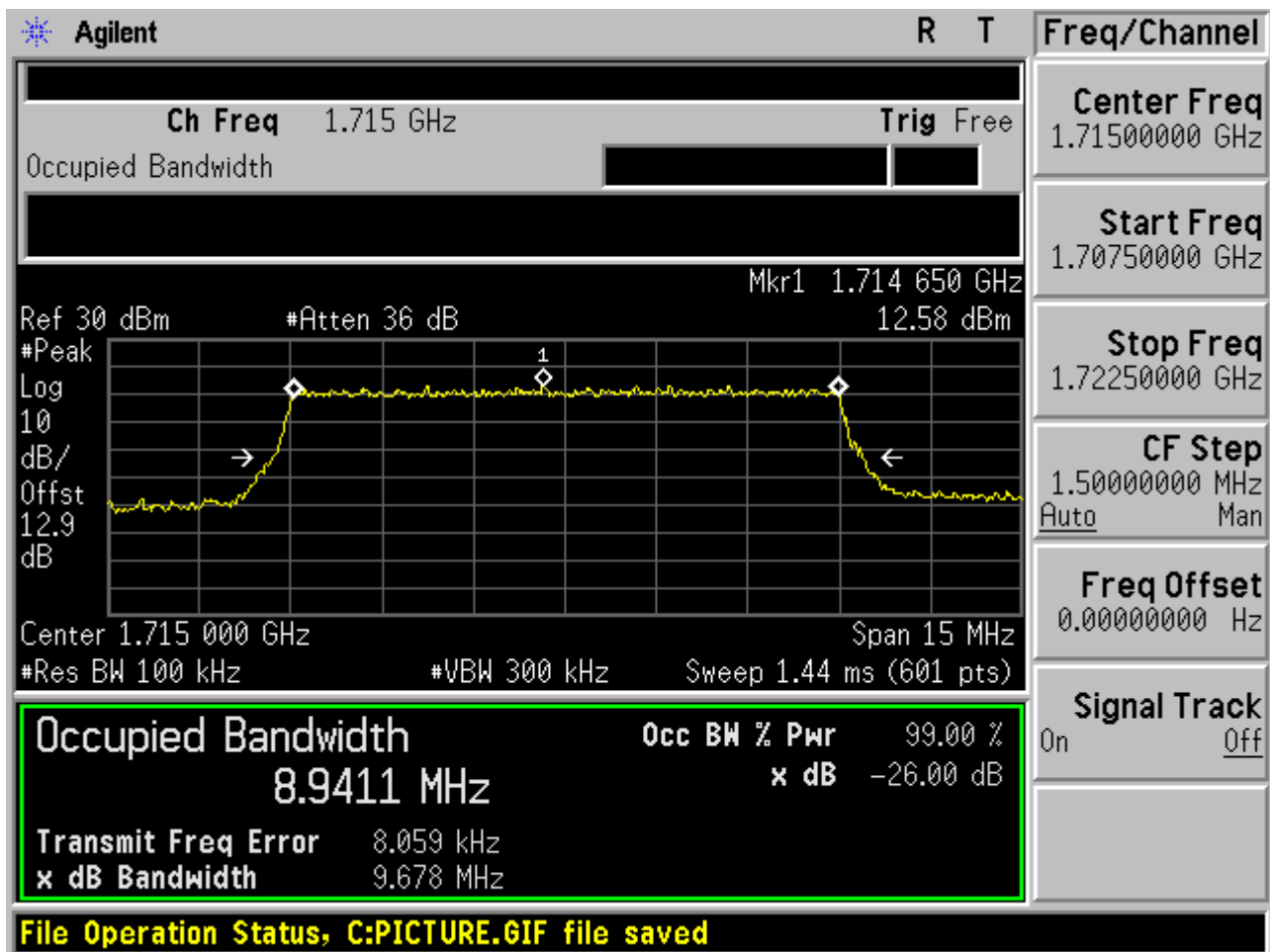


2.1.4.1.3 QPSK/non-1RB #mid/2





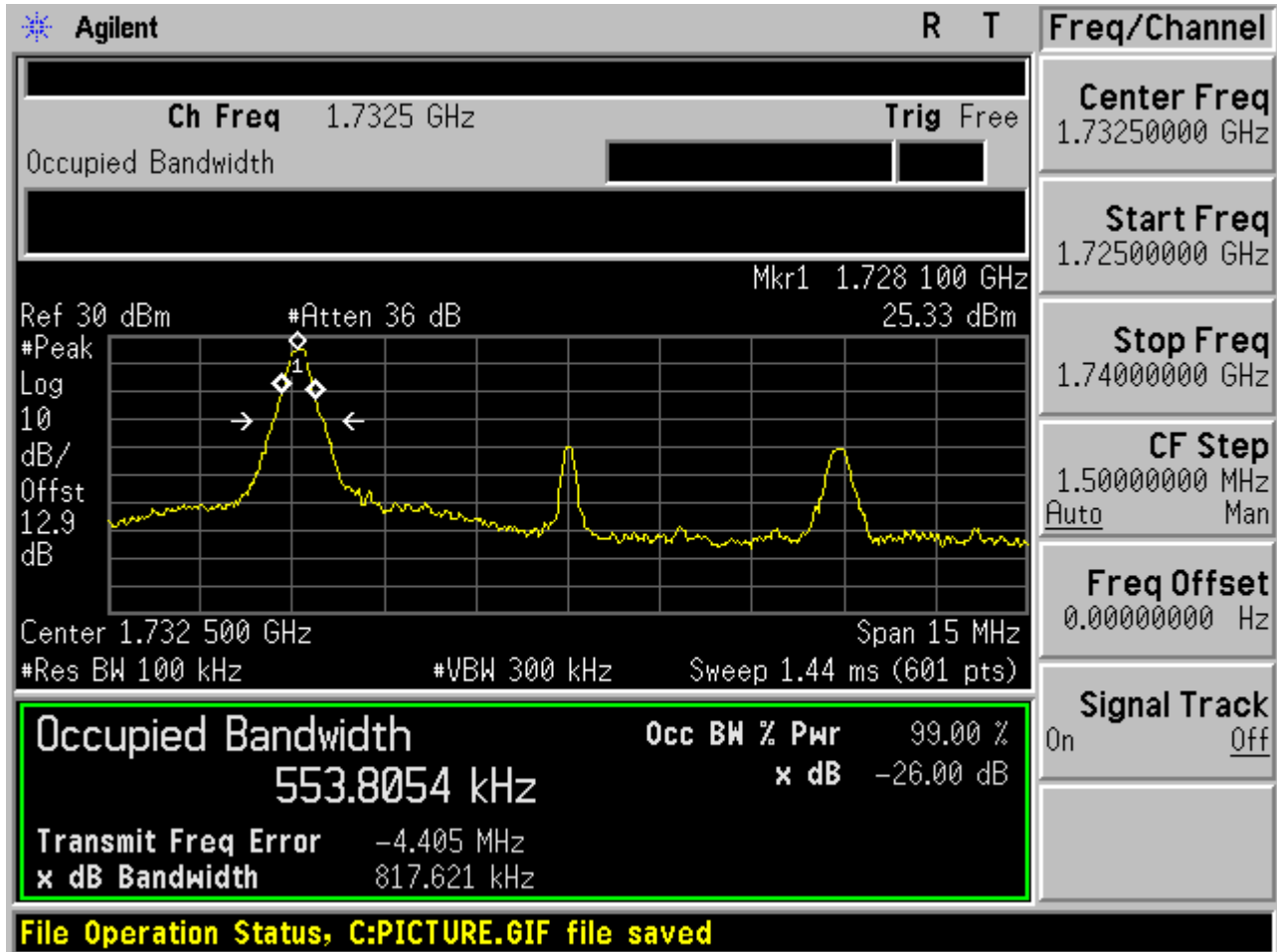
2.1.4.1.4 QPSK/full RBs





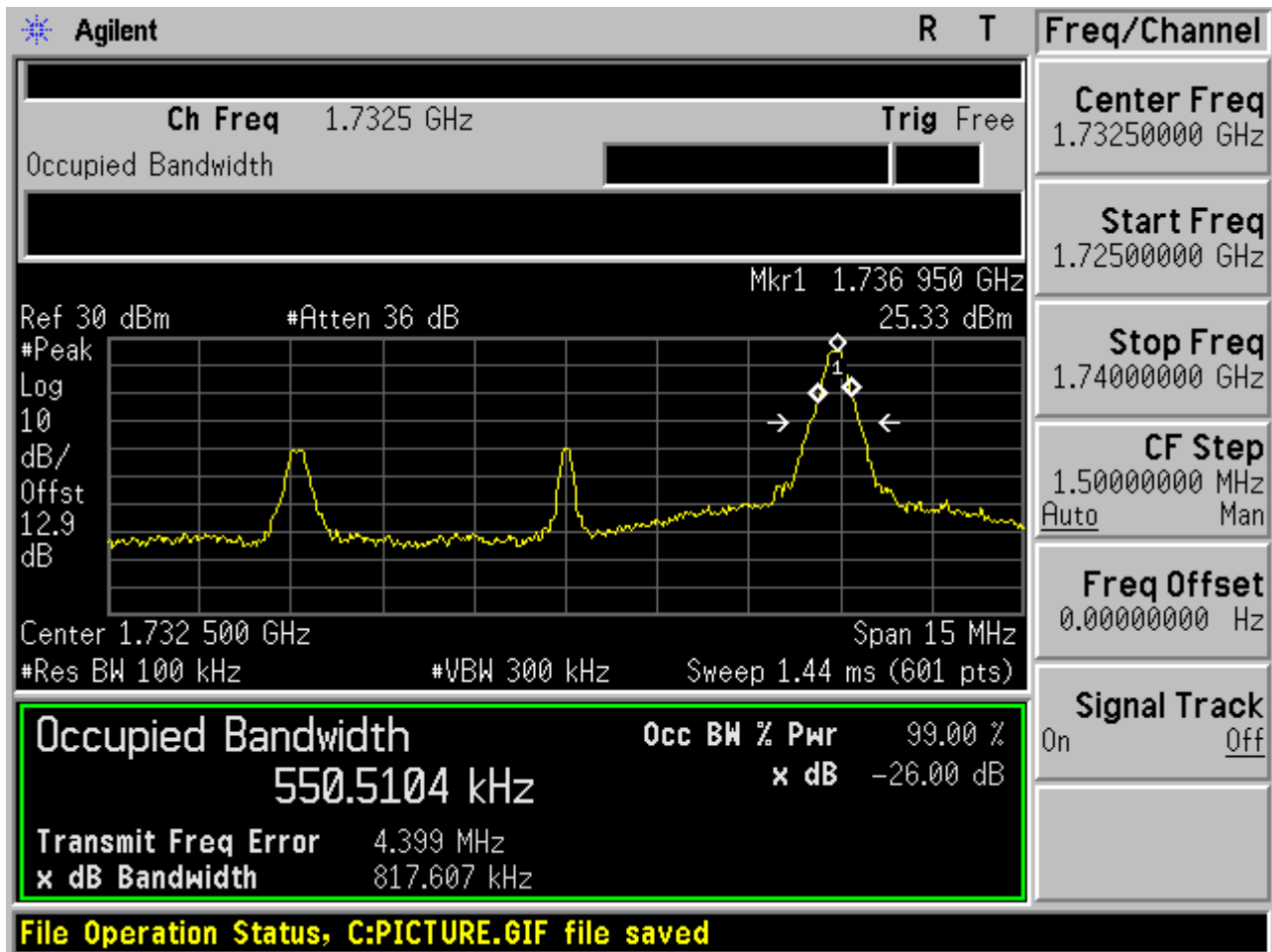
2.1.4.2 Channel =M

2.1.4.2.1 QPSK/1RB # 0



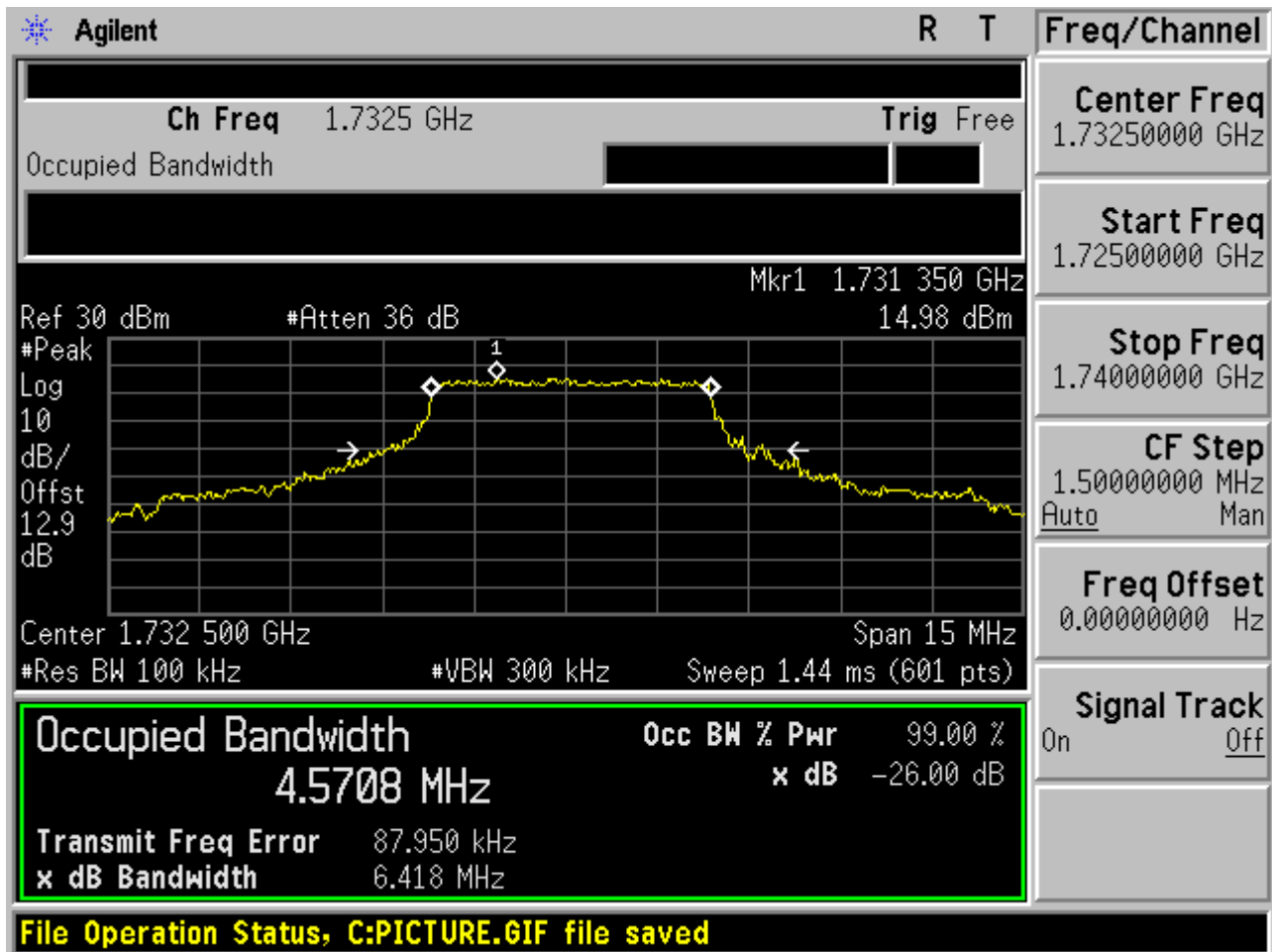


2.1.4.2.2 QPSK/1RB # max



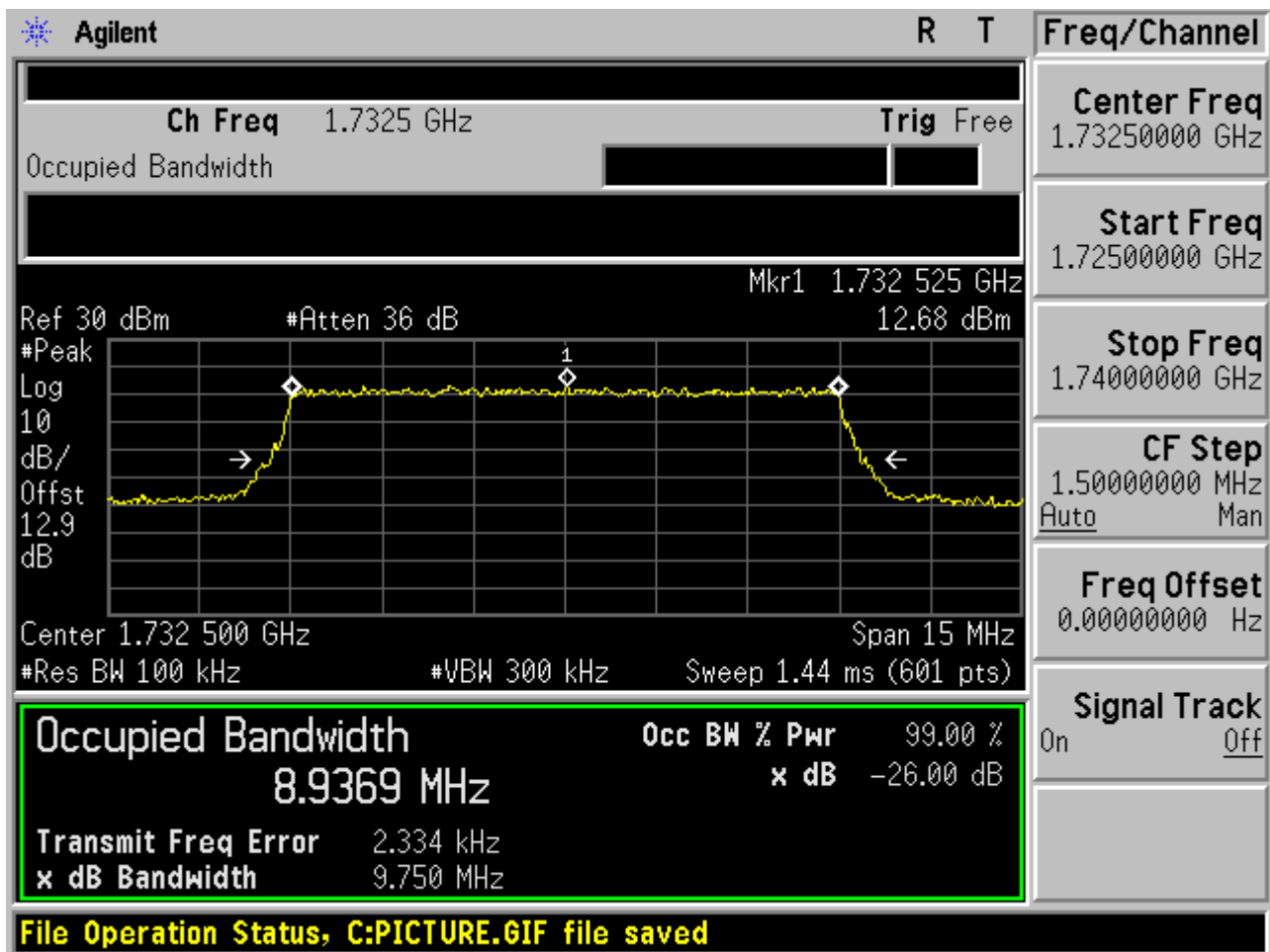


2.1.4.2.3 QPSK/non-1RB #mid/2





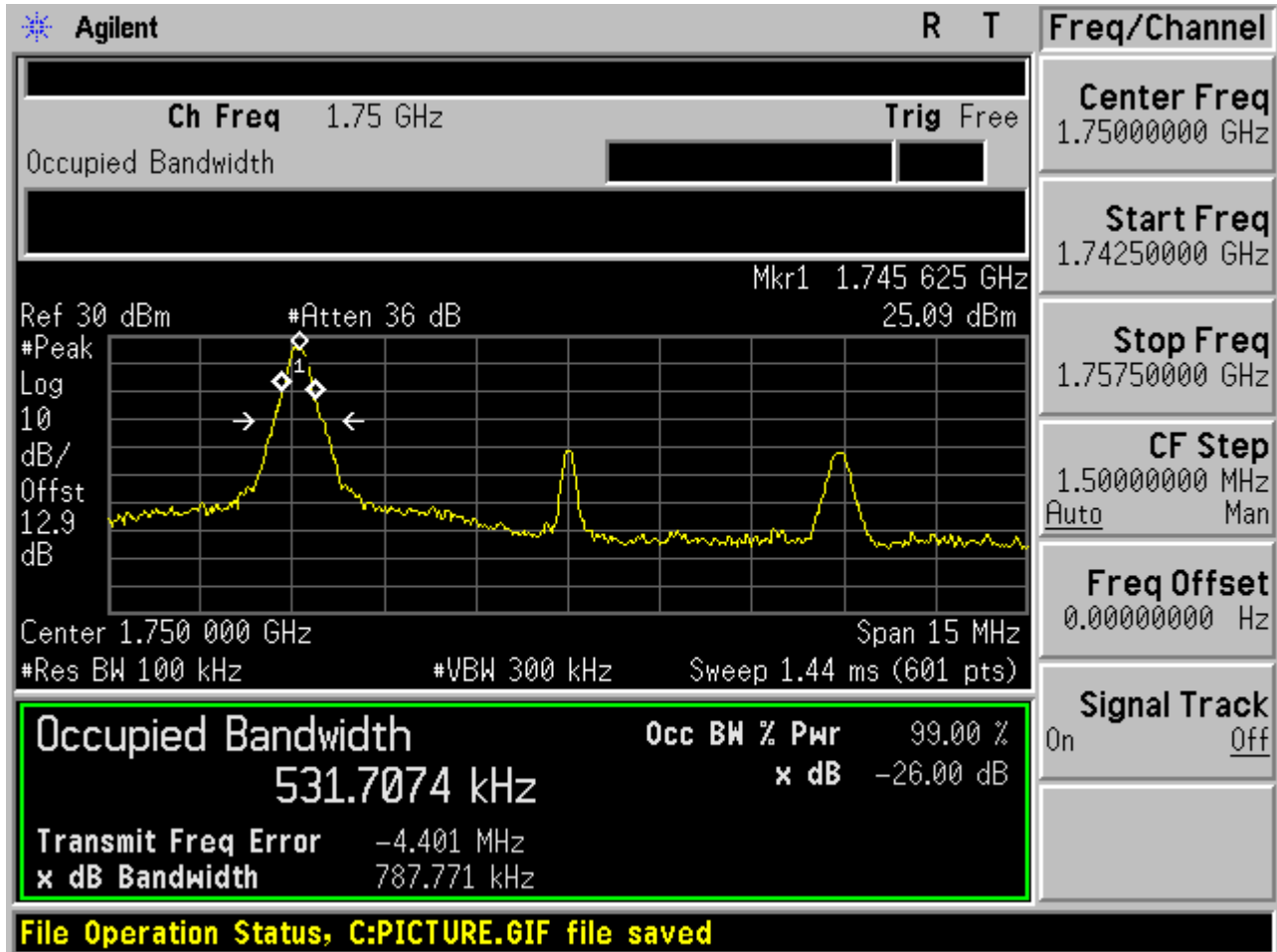
2.1.4.2.4 QPSK/full RBs





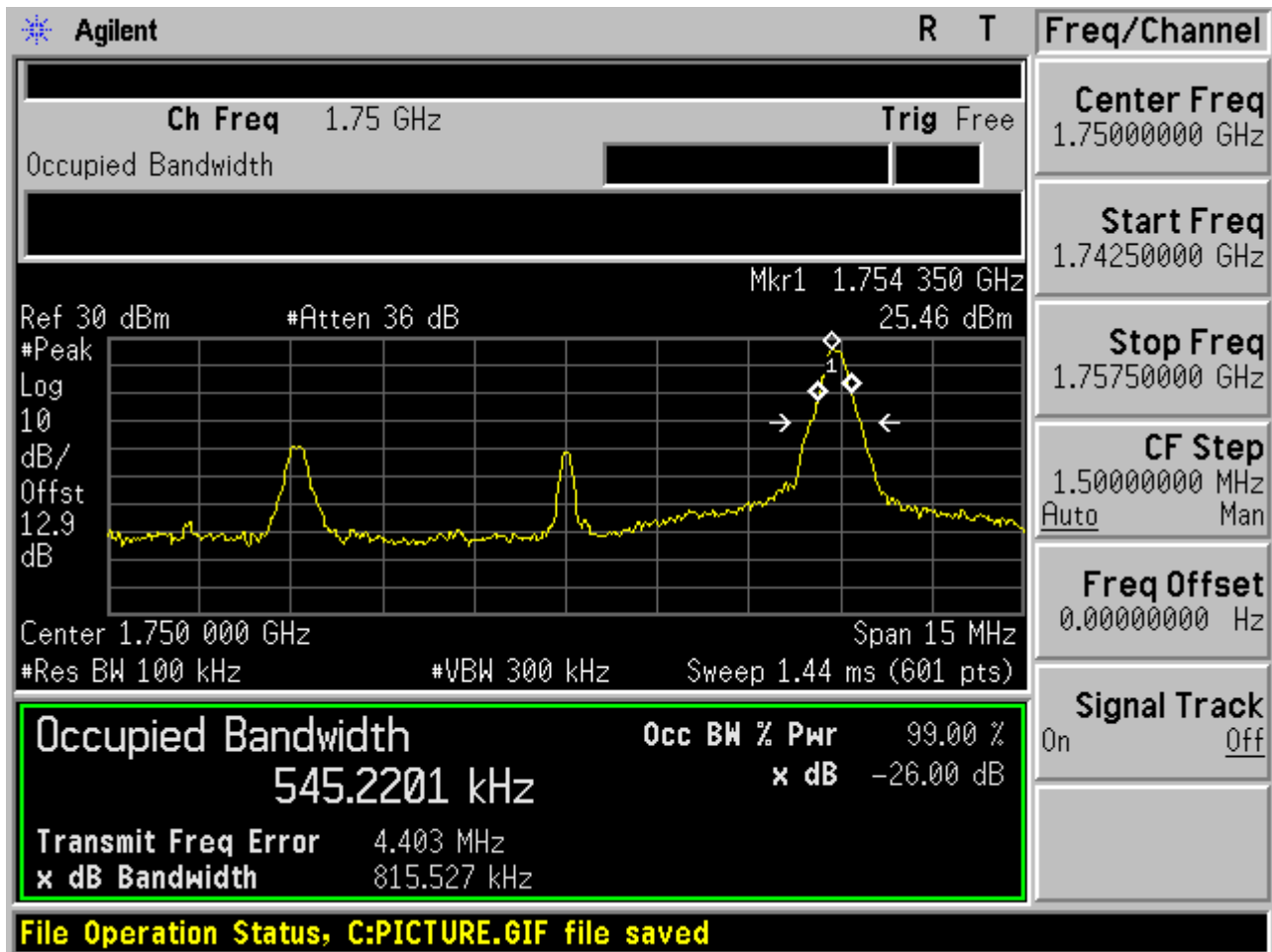
2.1.4.3 Channel =T

2.1.4.3.1 QPSK/1RB # 0



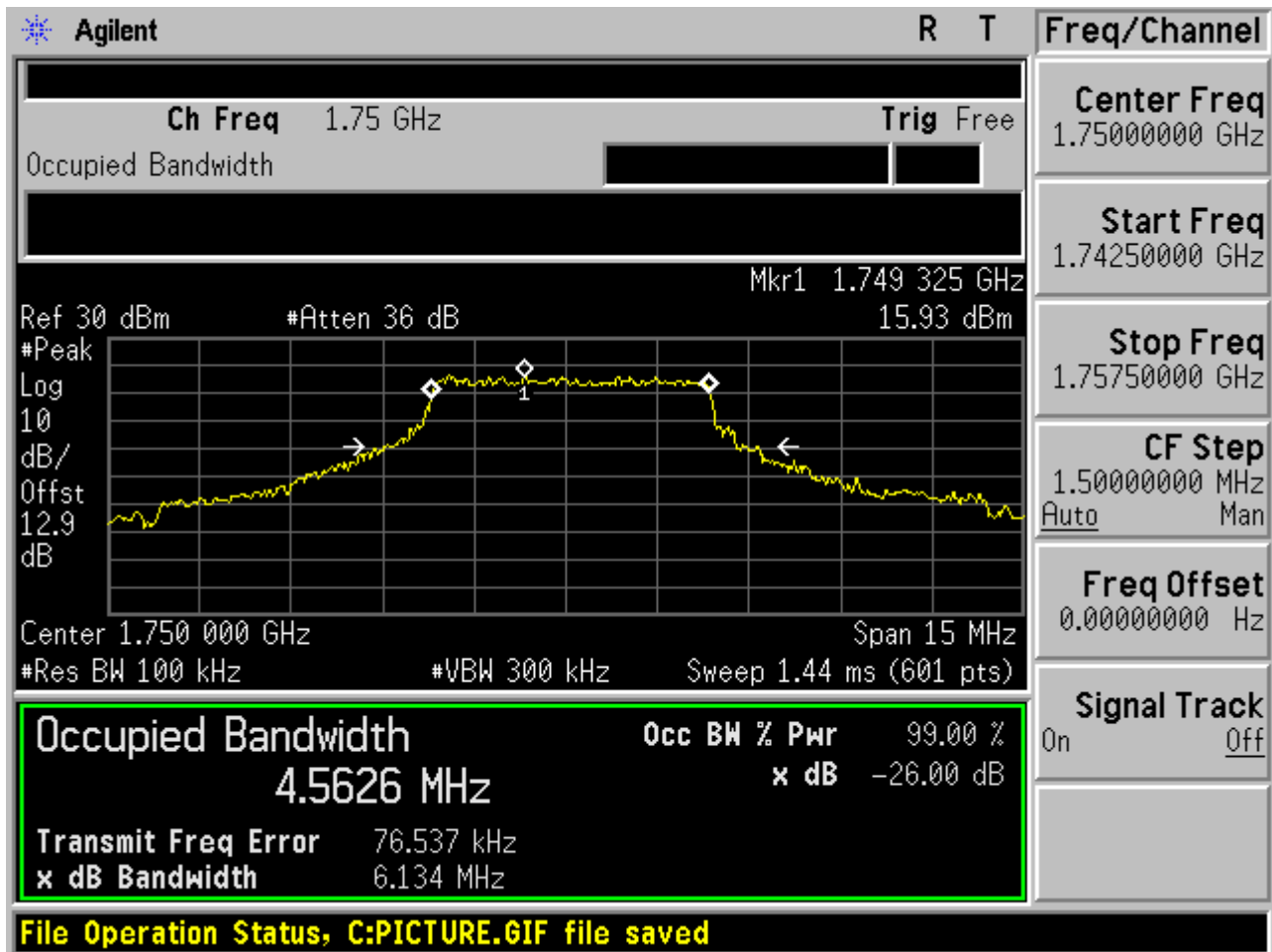


2.1.4.3.2 QPSK/1RB # max



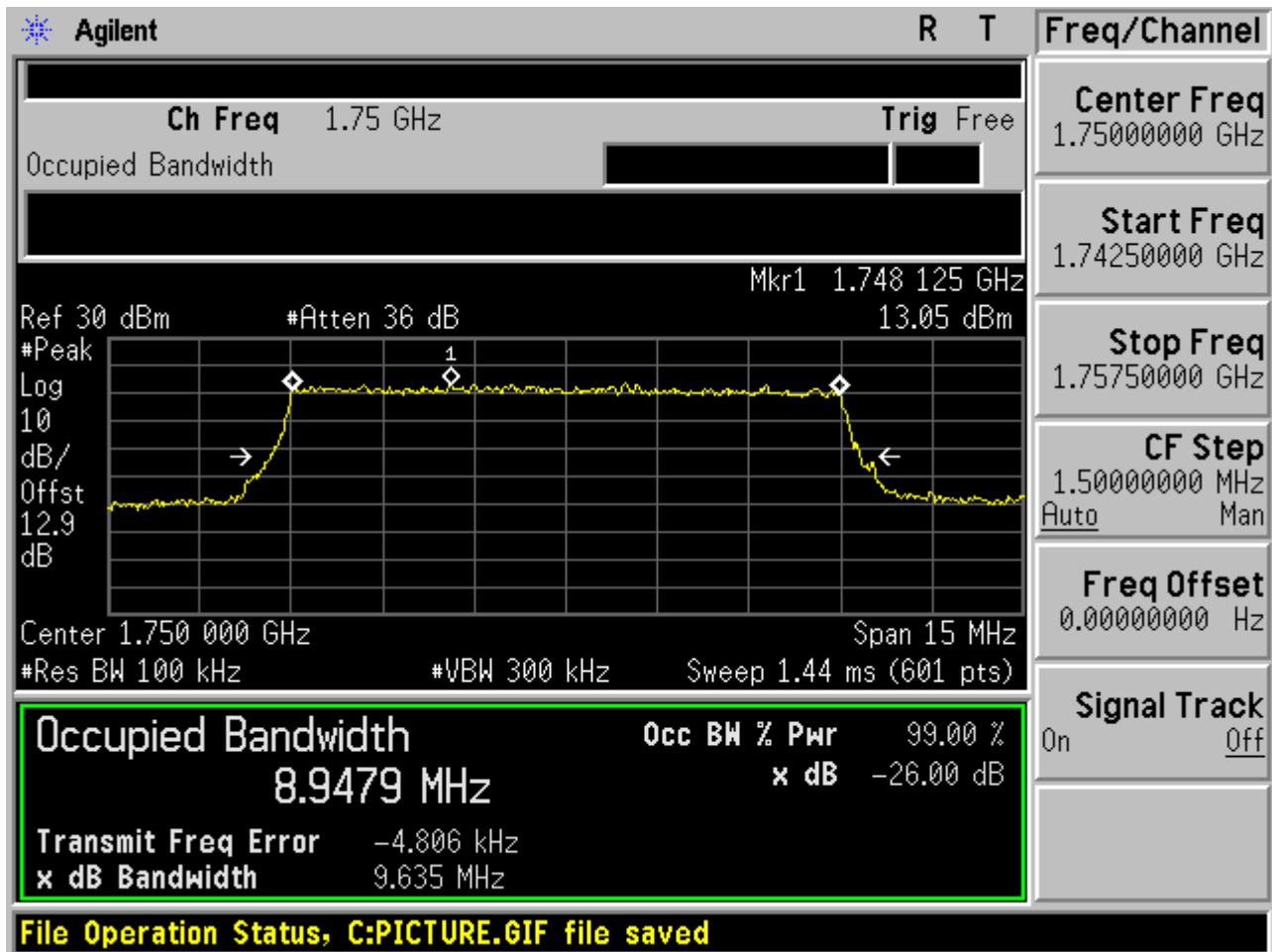


2.1.4.3.3 QPSK/non-1RB #mid/2





2.1.4.3.4 QPSK/full RBs

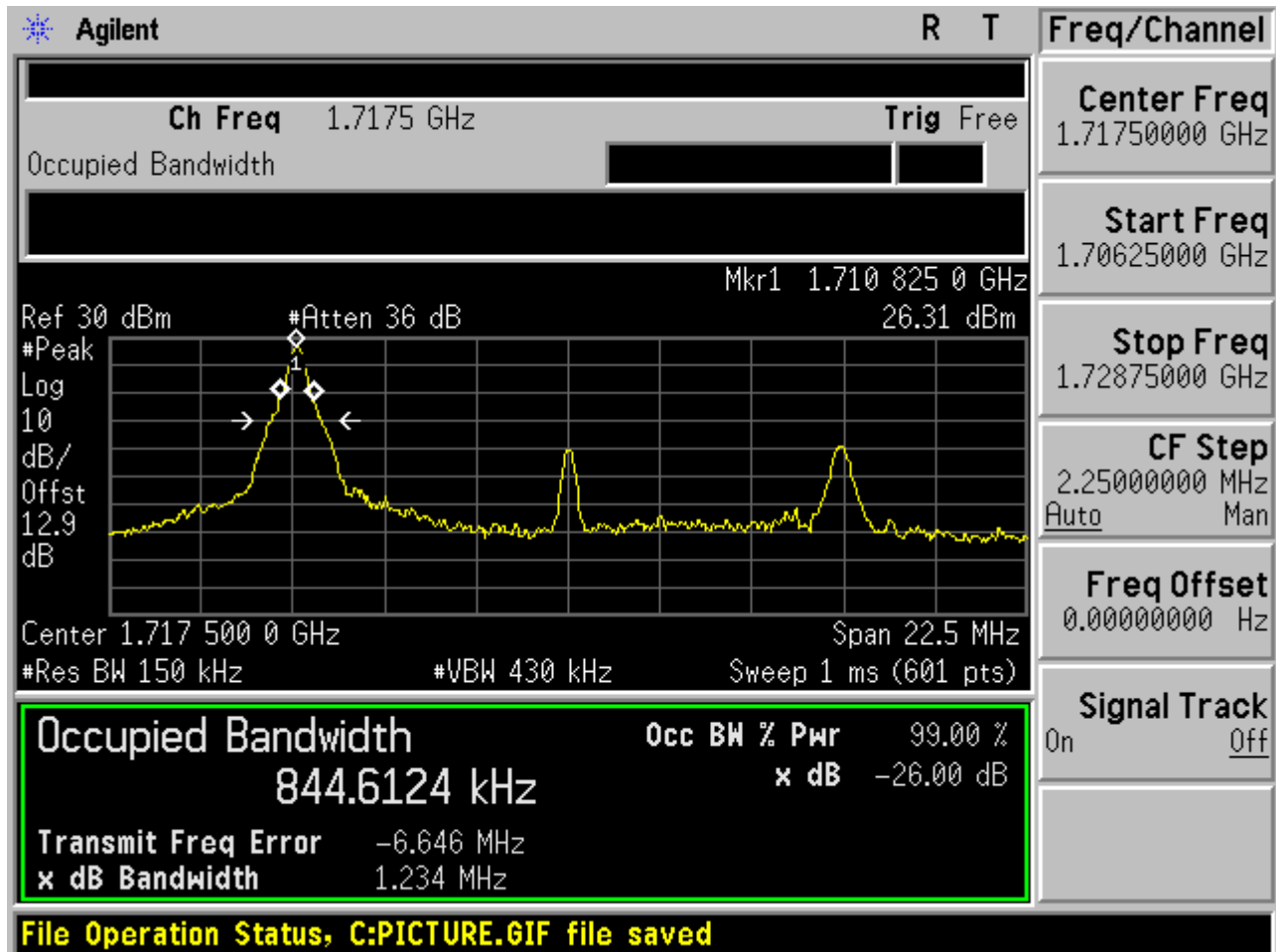




2.1.5 Channel Bandwidth = 15 MHz

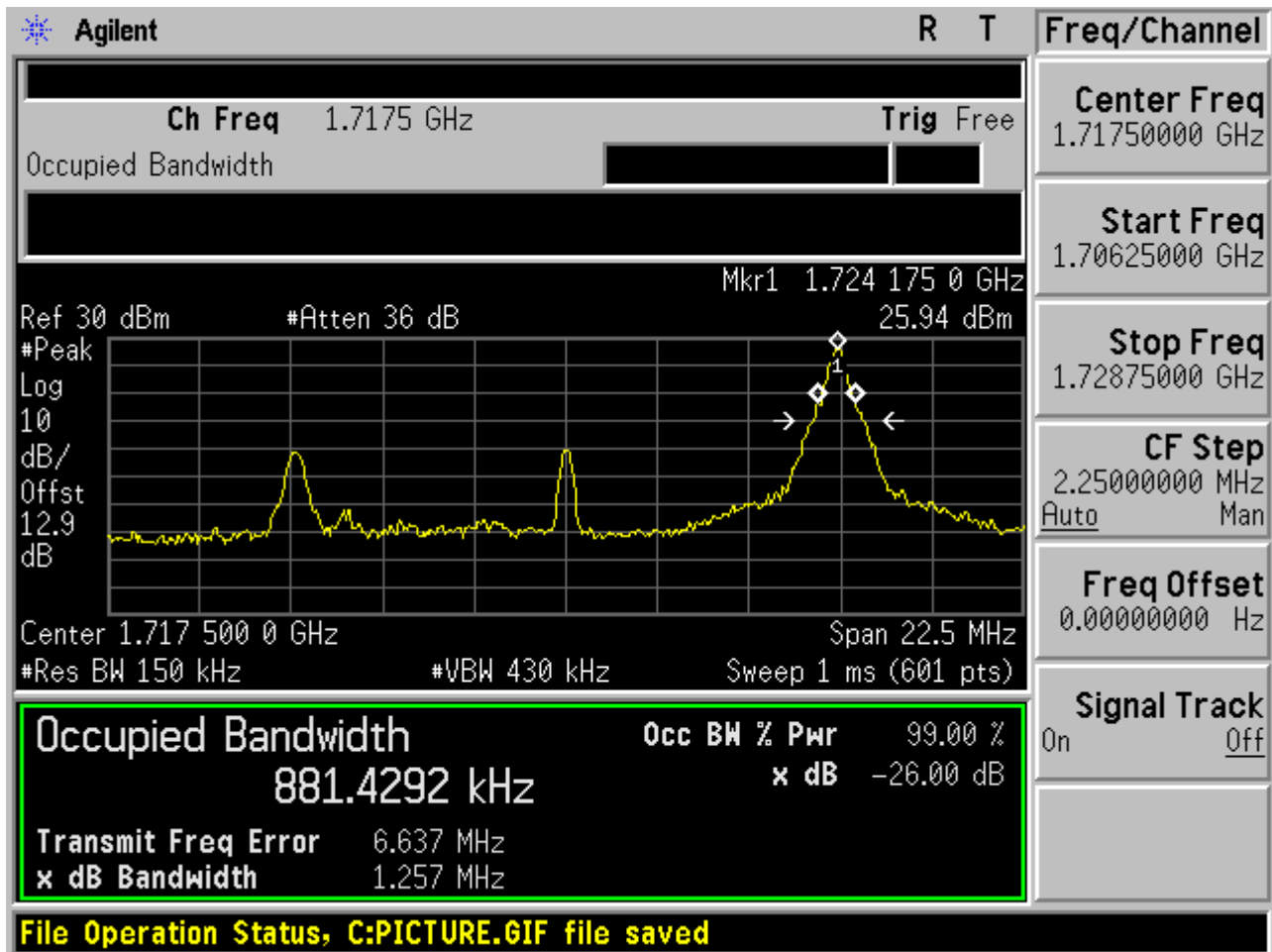
2.1.5.1 Channel = B

2.1.5.1.1 QPSK/1RB # 0



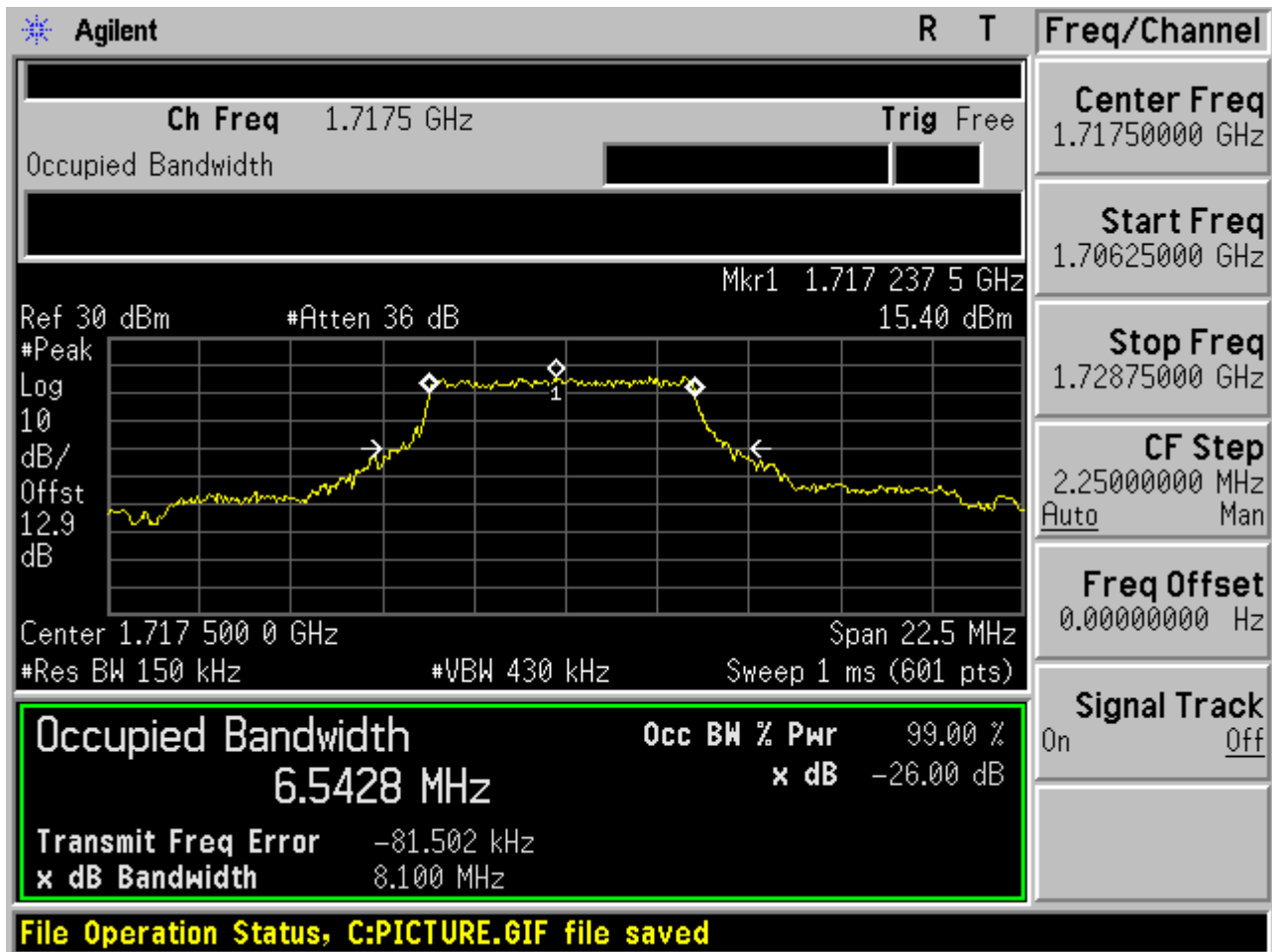


2.1.5.1.2 QPSK/1RB # max



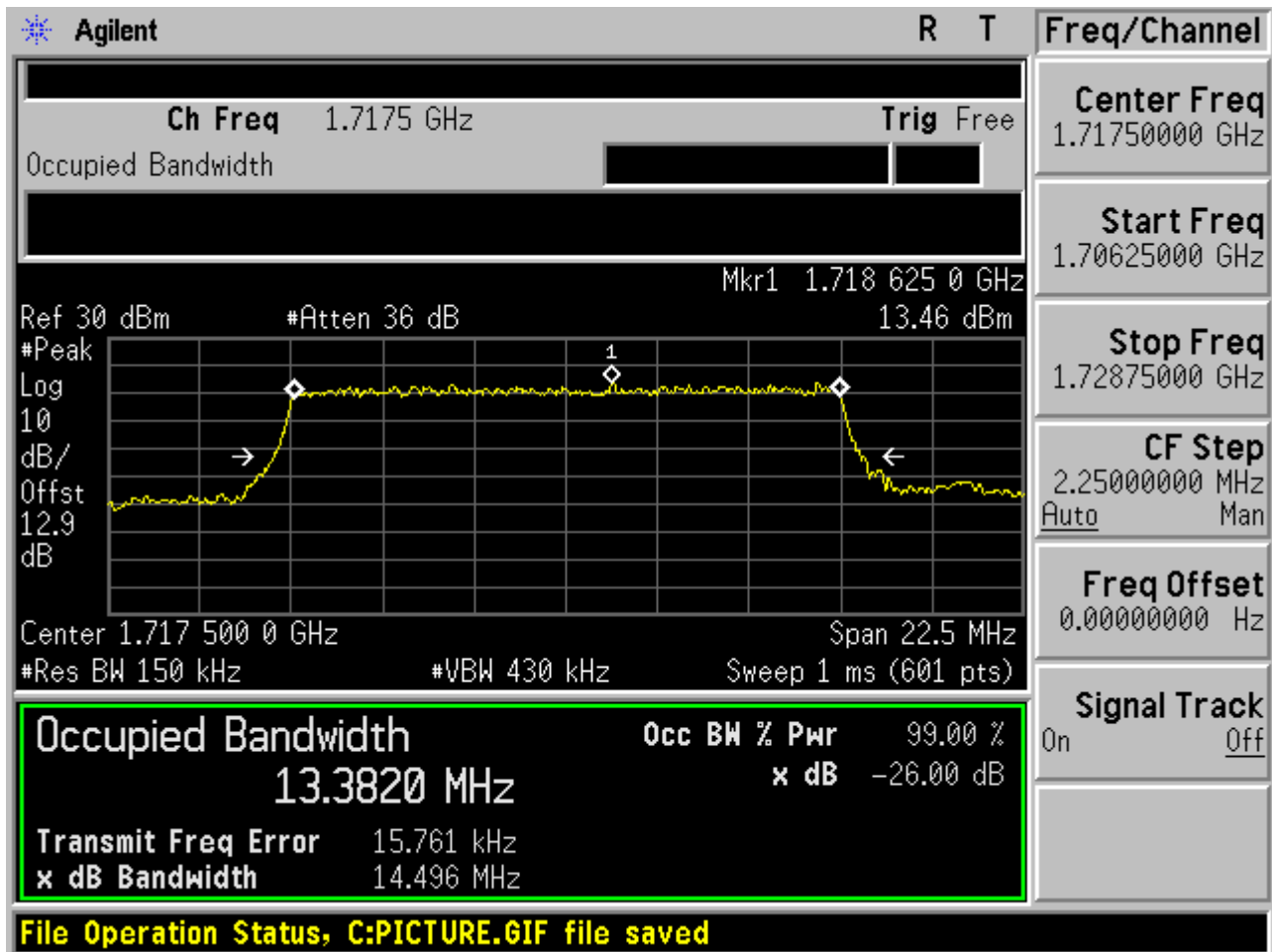


2.1.5.1.3 QPSK/non-1RB #mid/2





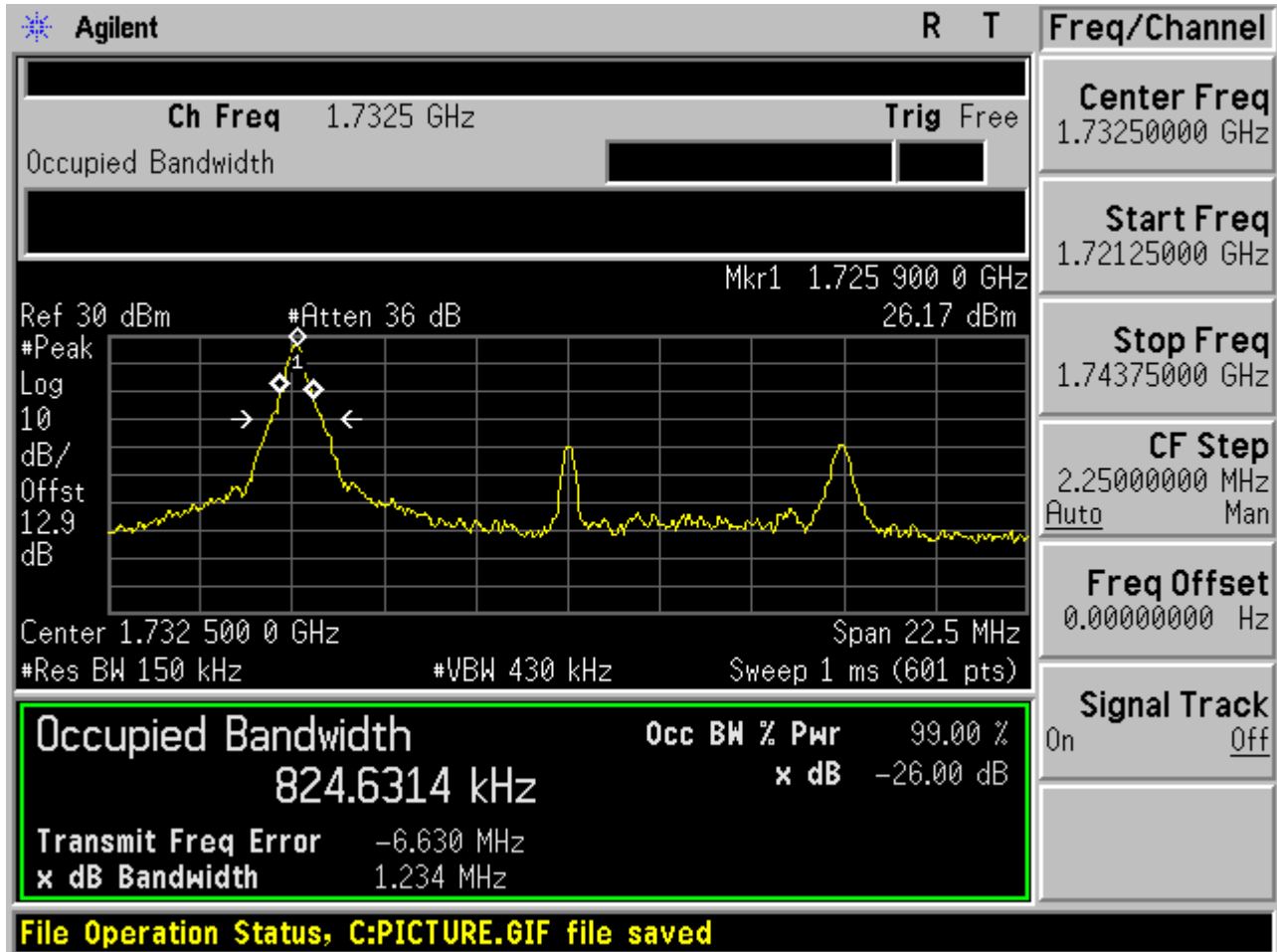
2.1.5.1.4 QPSK/full RBs





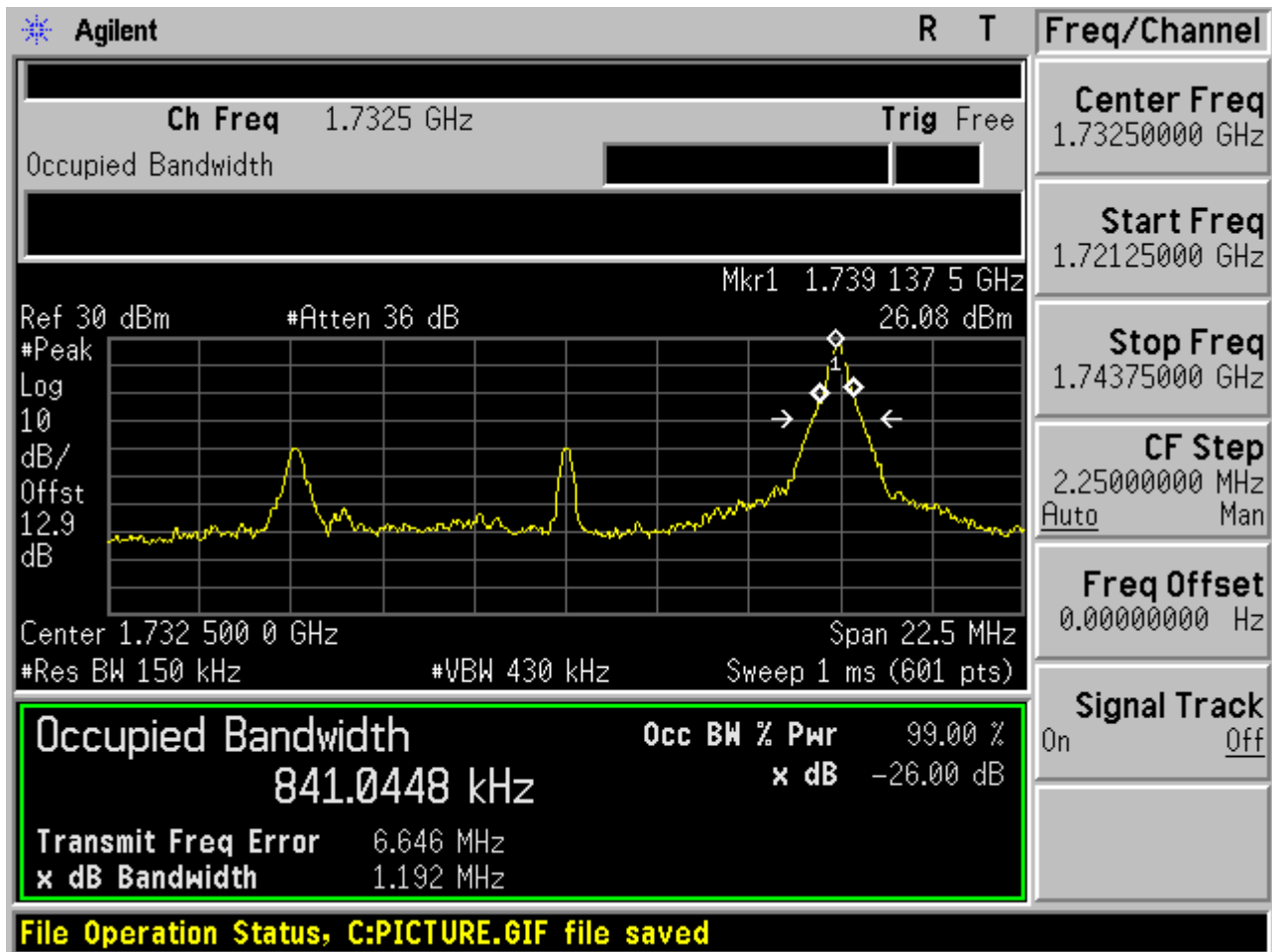
2.1.5.2 Channel =M

2.1.5.2.1 QPSK/1RB # 0



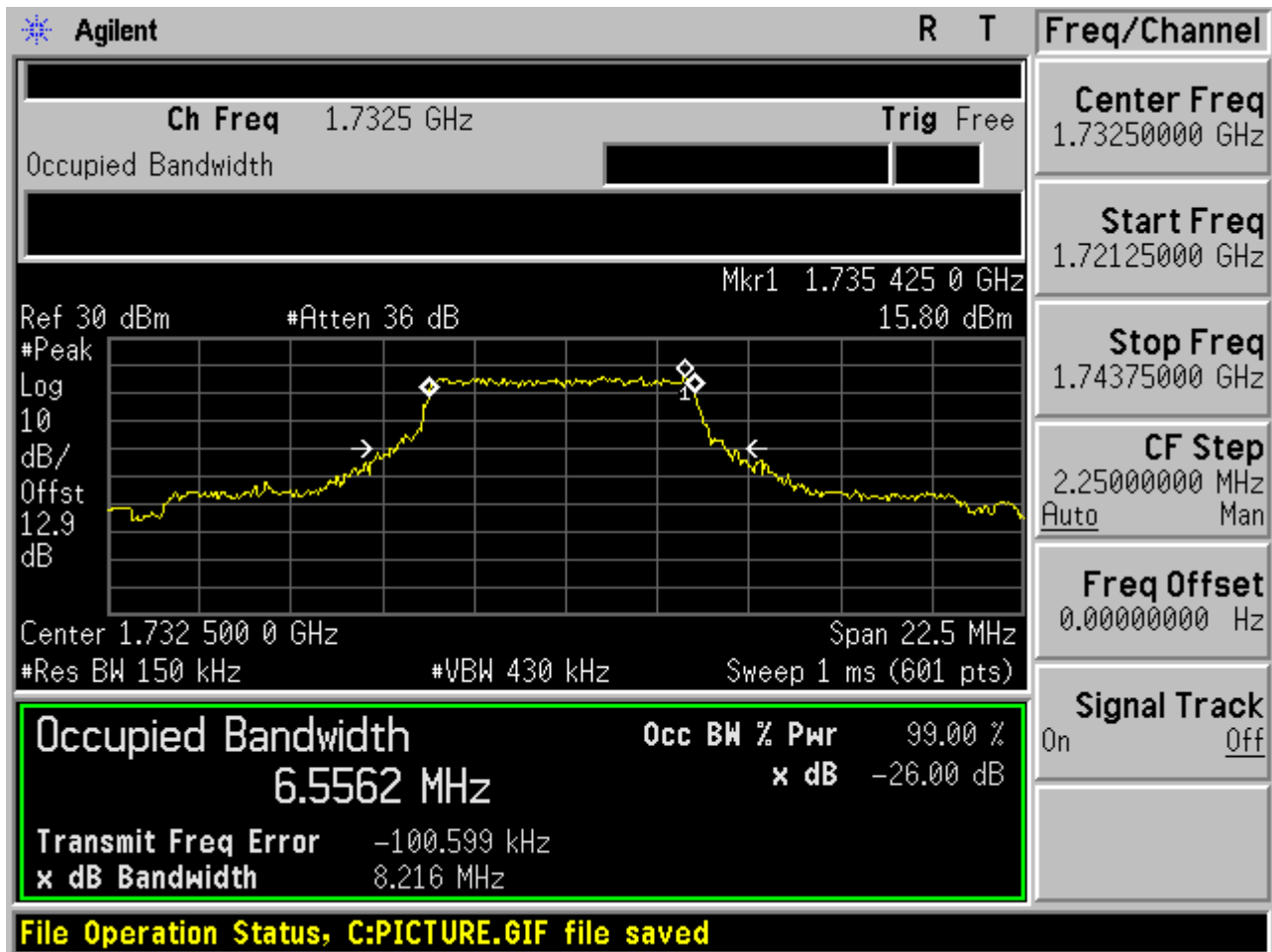


2.1.5.2.2 QPSK/1RB # max



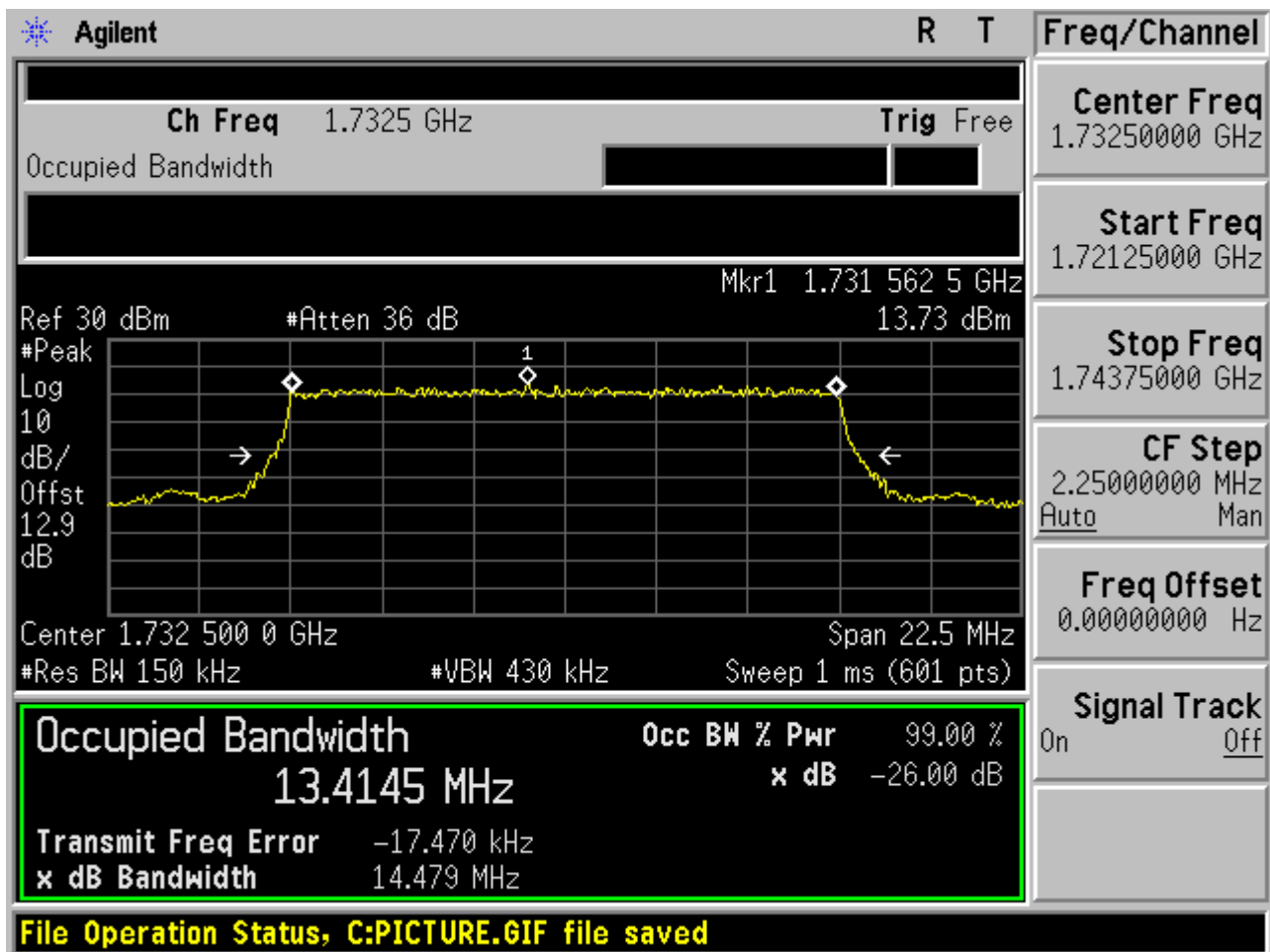


2.1.5.2.3 QPSK/non-1RB #mid/2





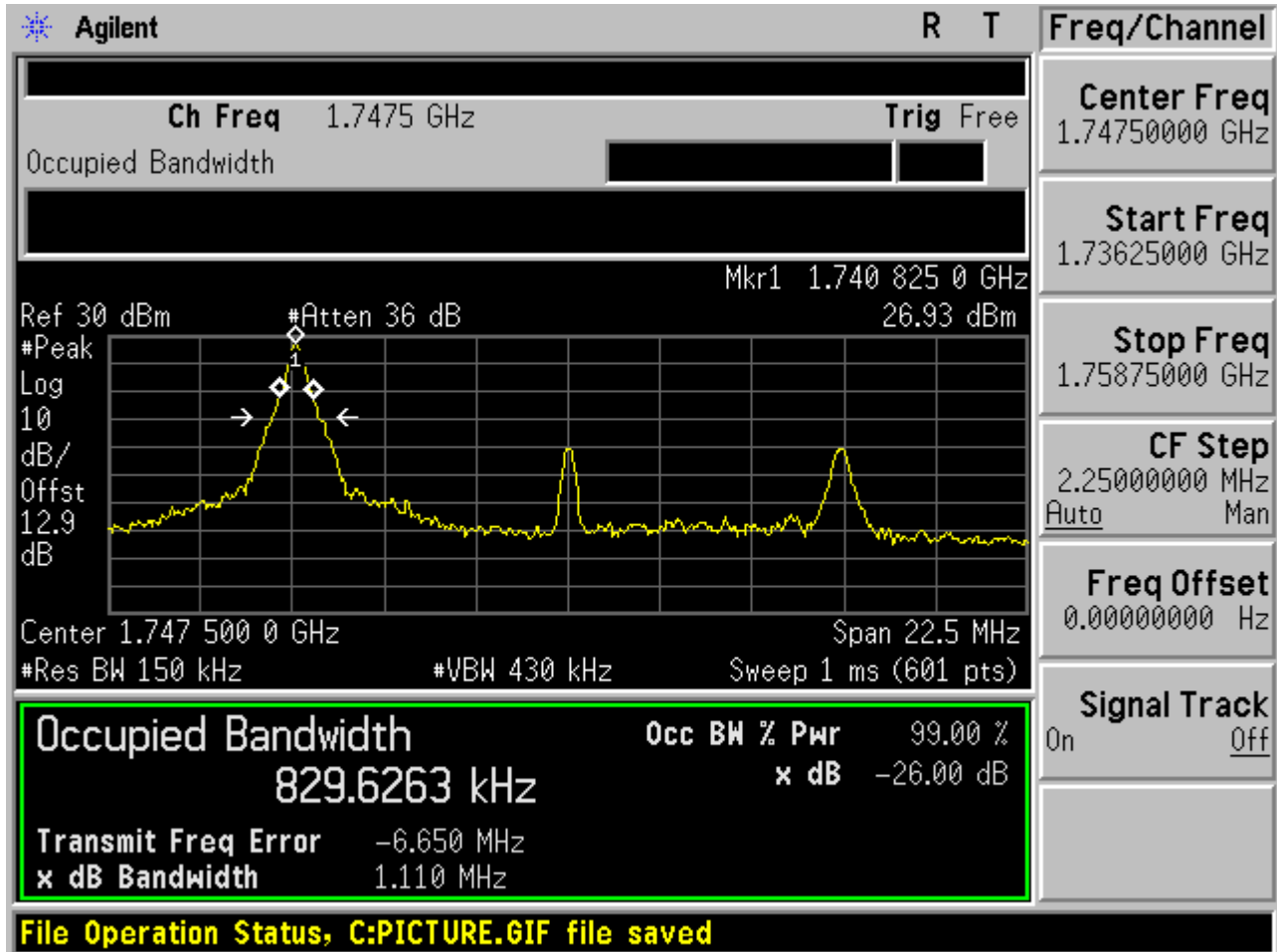
2.1.5.2.4 QPSK/full RBs





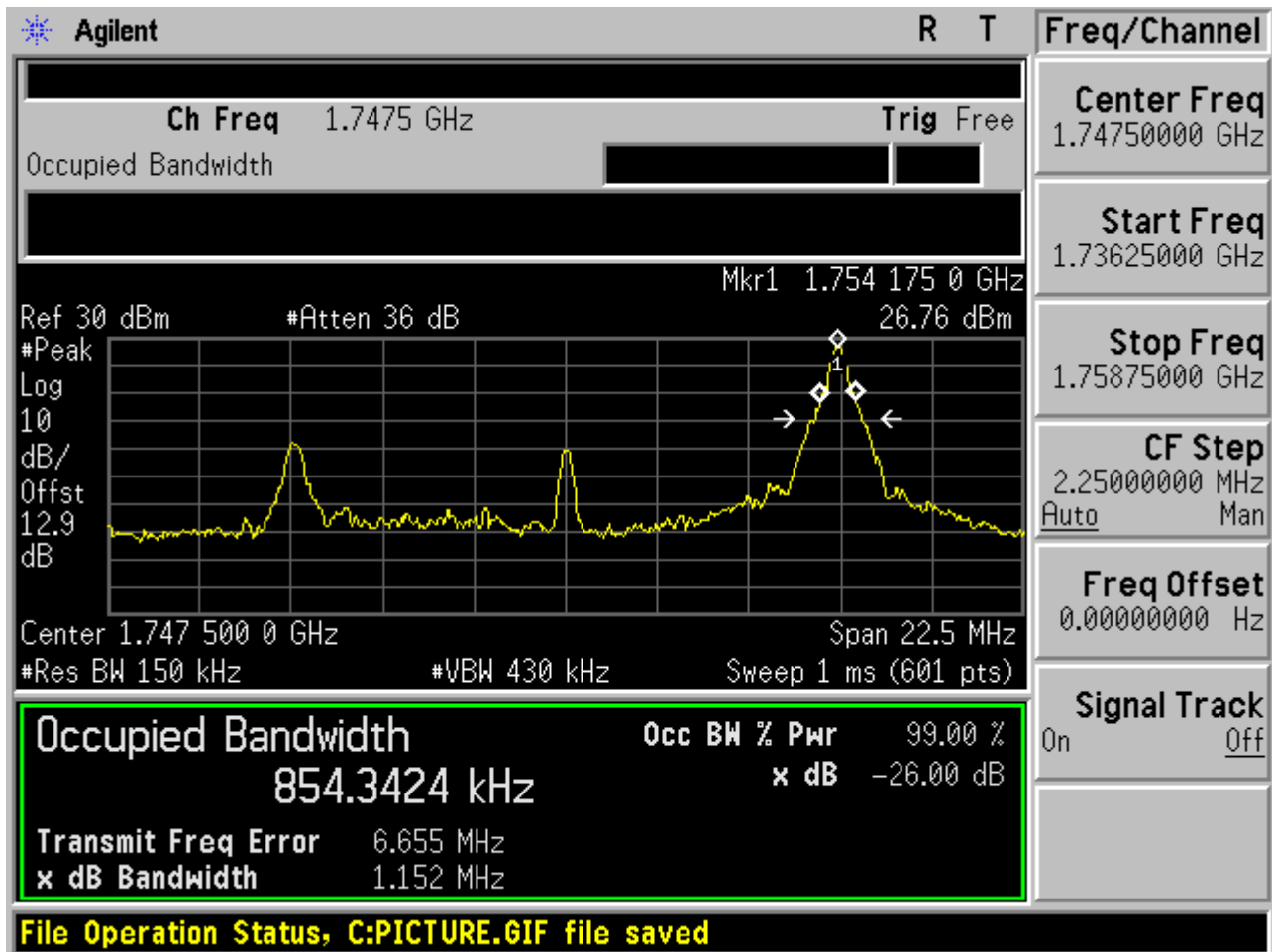
2.1.5.3 Channel =T

2.1.5.3.1 QPSK/1RB # 0



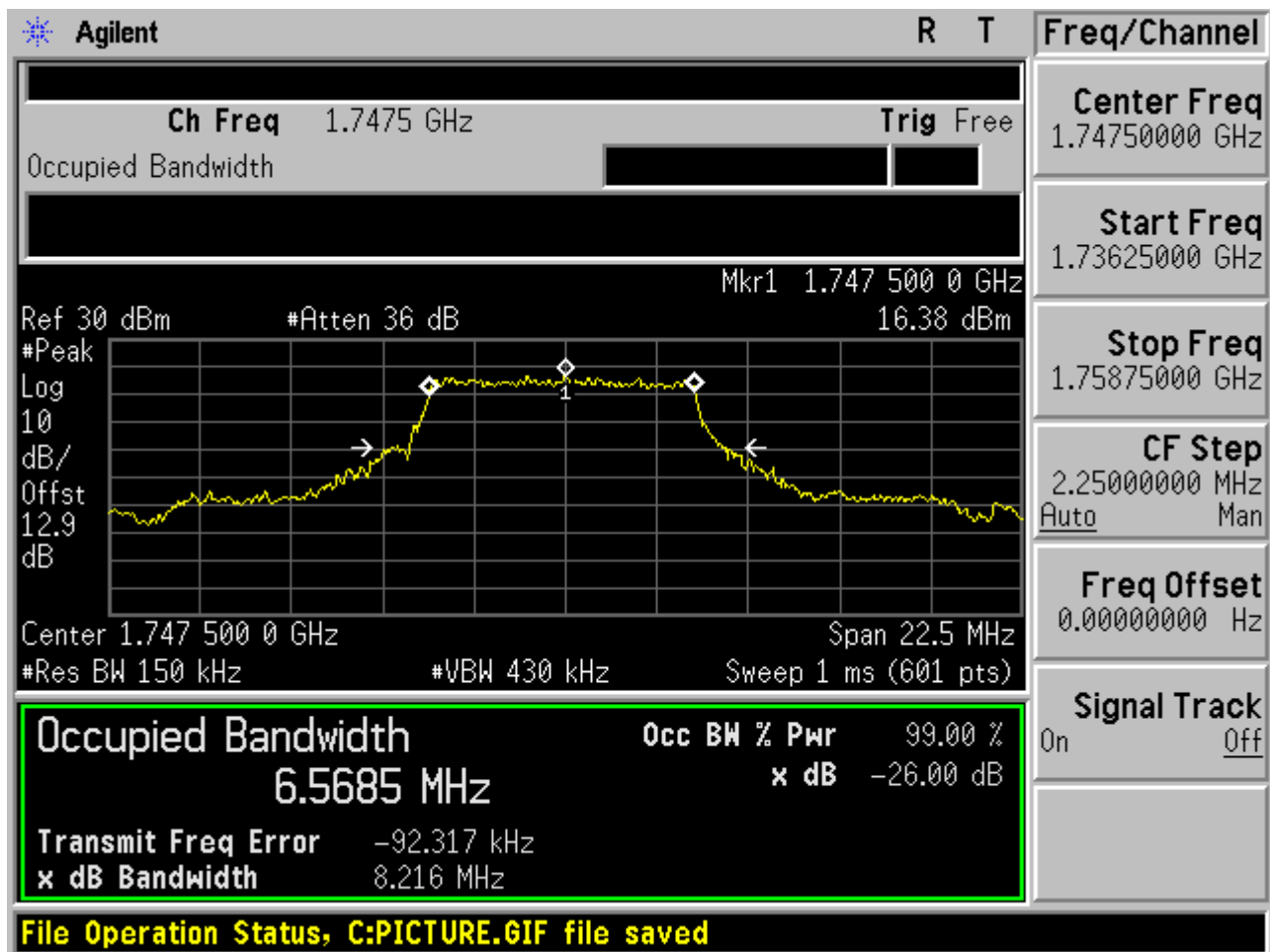


2.1.5.3.2 QPSK/1RB # max



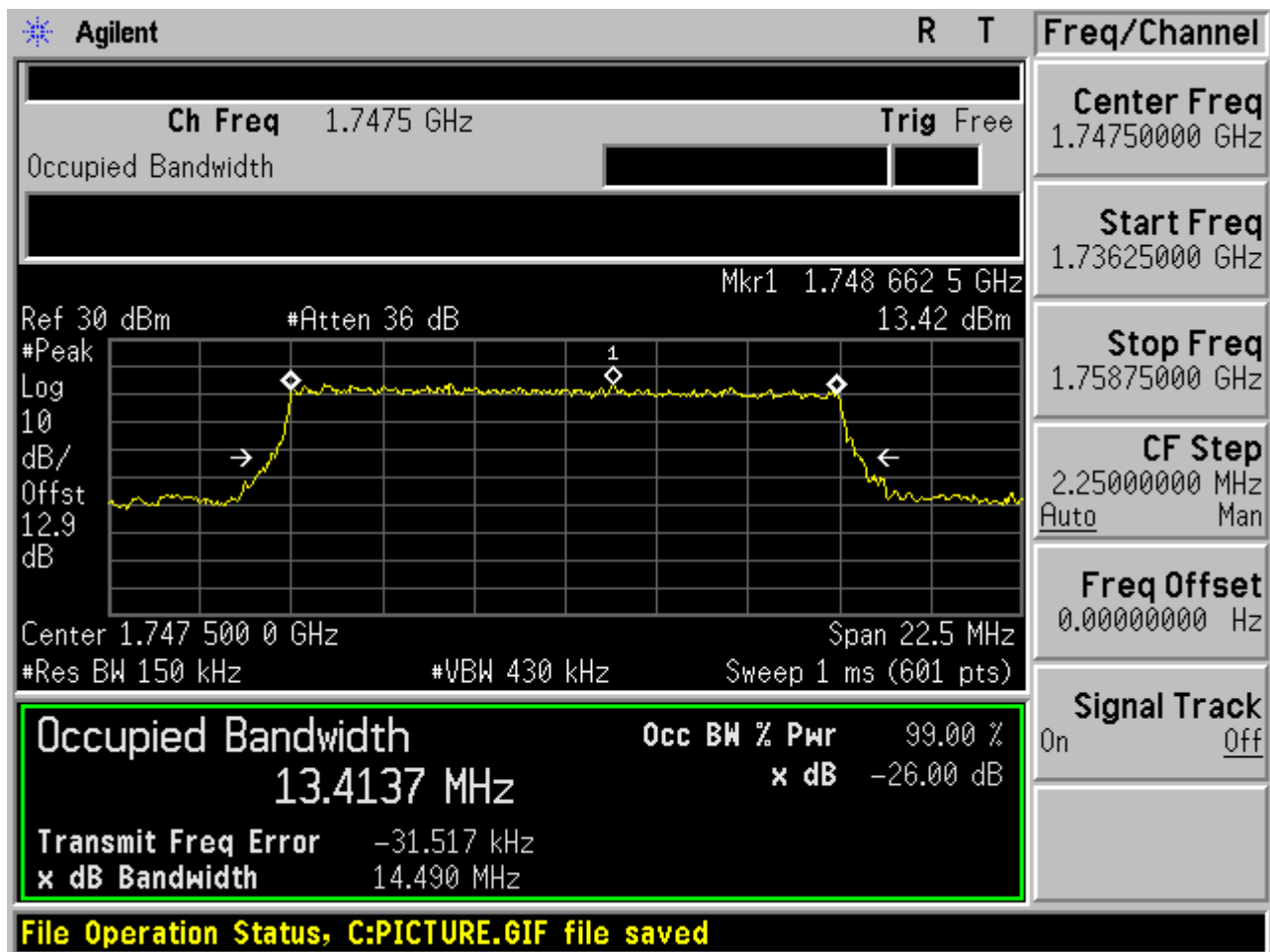


2.1.5.3.3 QPSK/non-1RB #mid/2





2.1.5.3.4 QPSK/full RBs

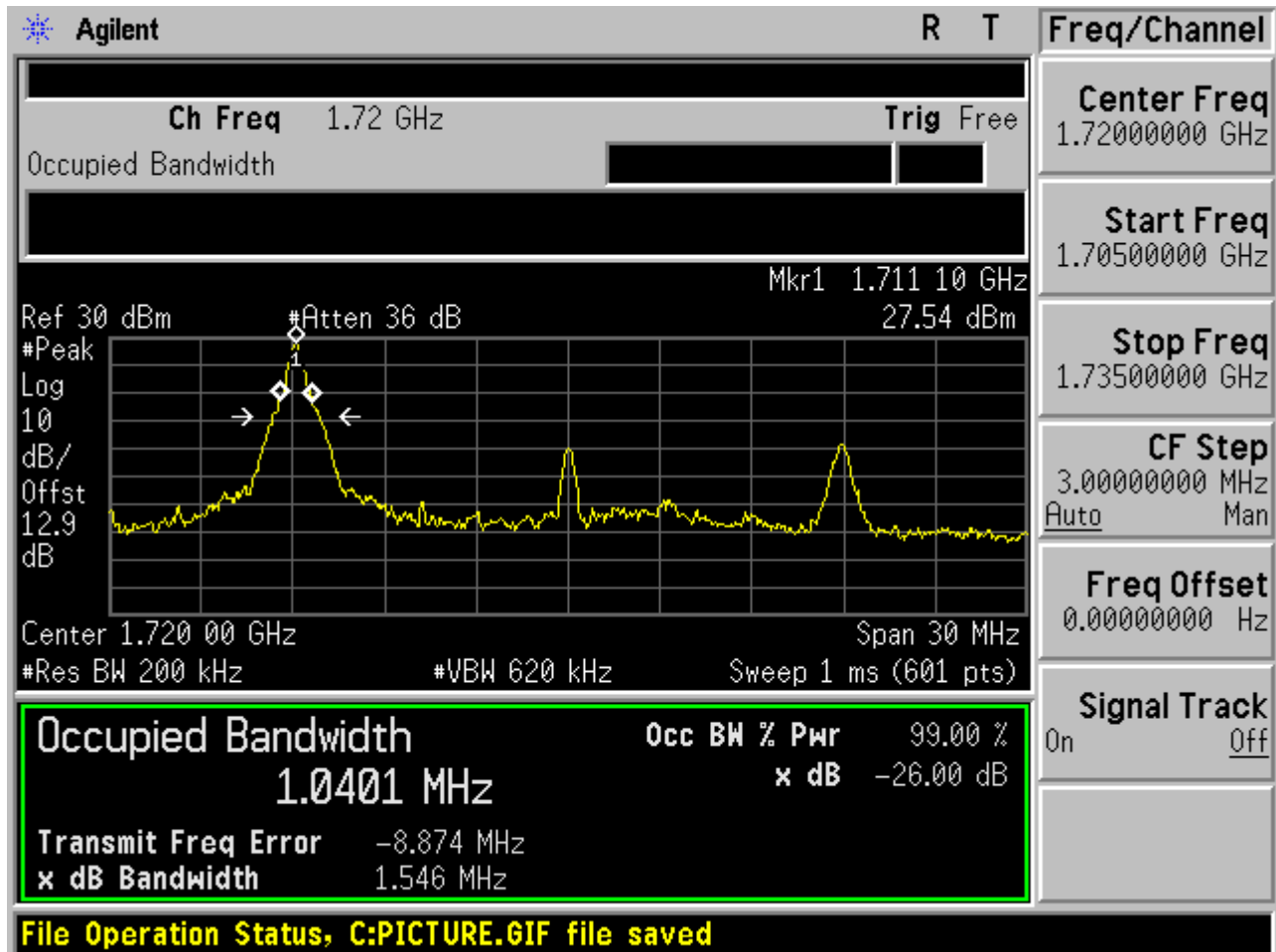




2.1.6 Channel Bandwidth = 20 MHz

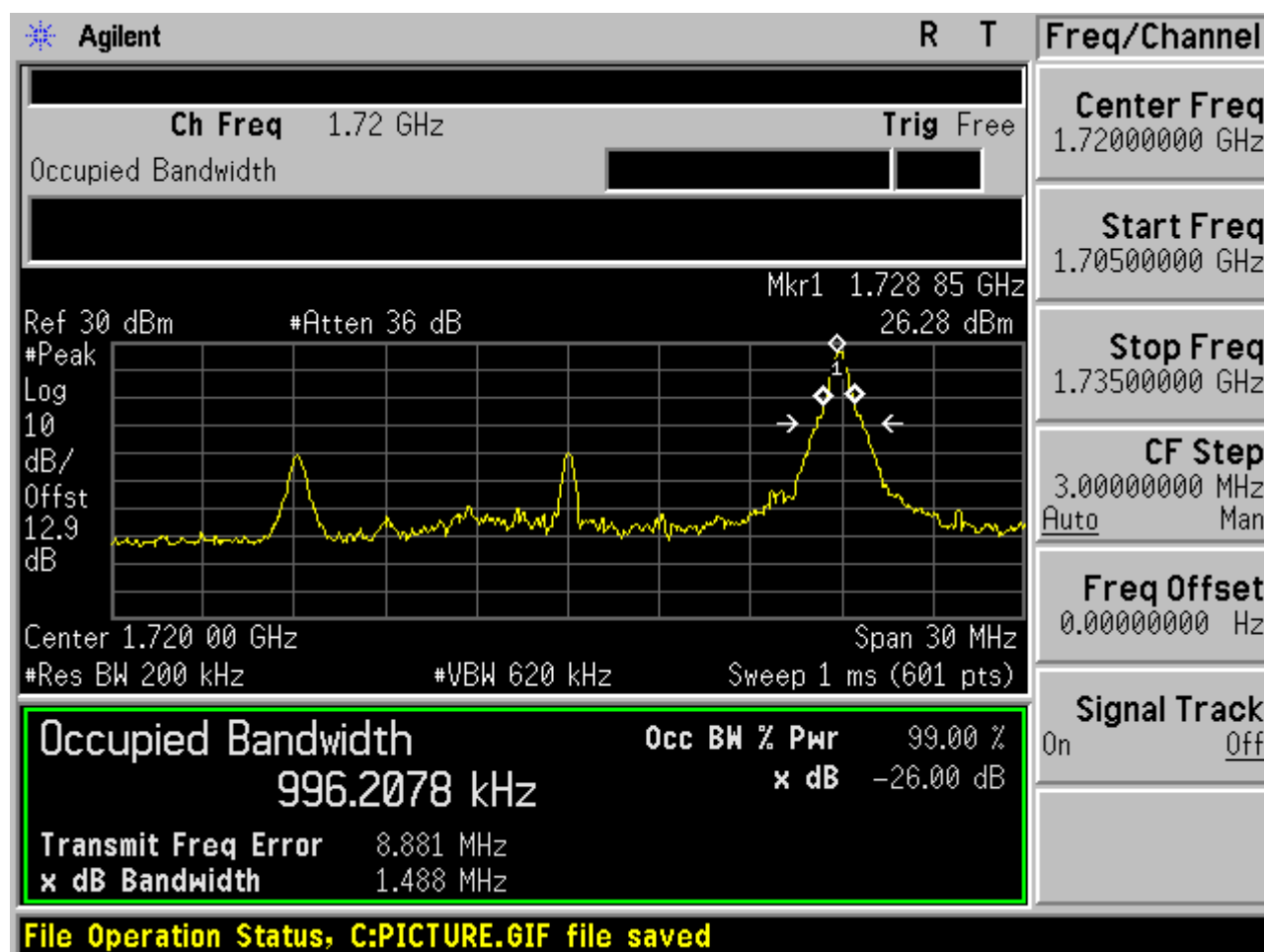
2.1.6.1 Channel = B

2.1.6.1.1 QPSK/1RB # 0



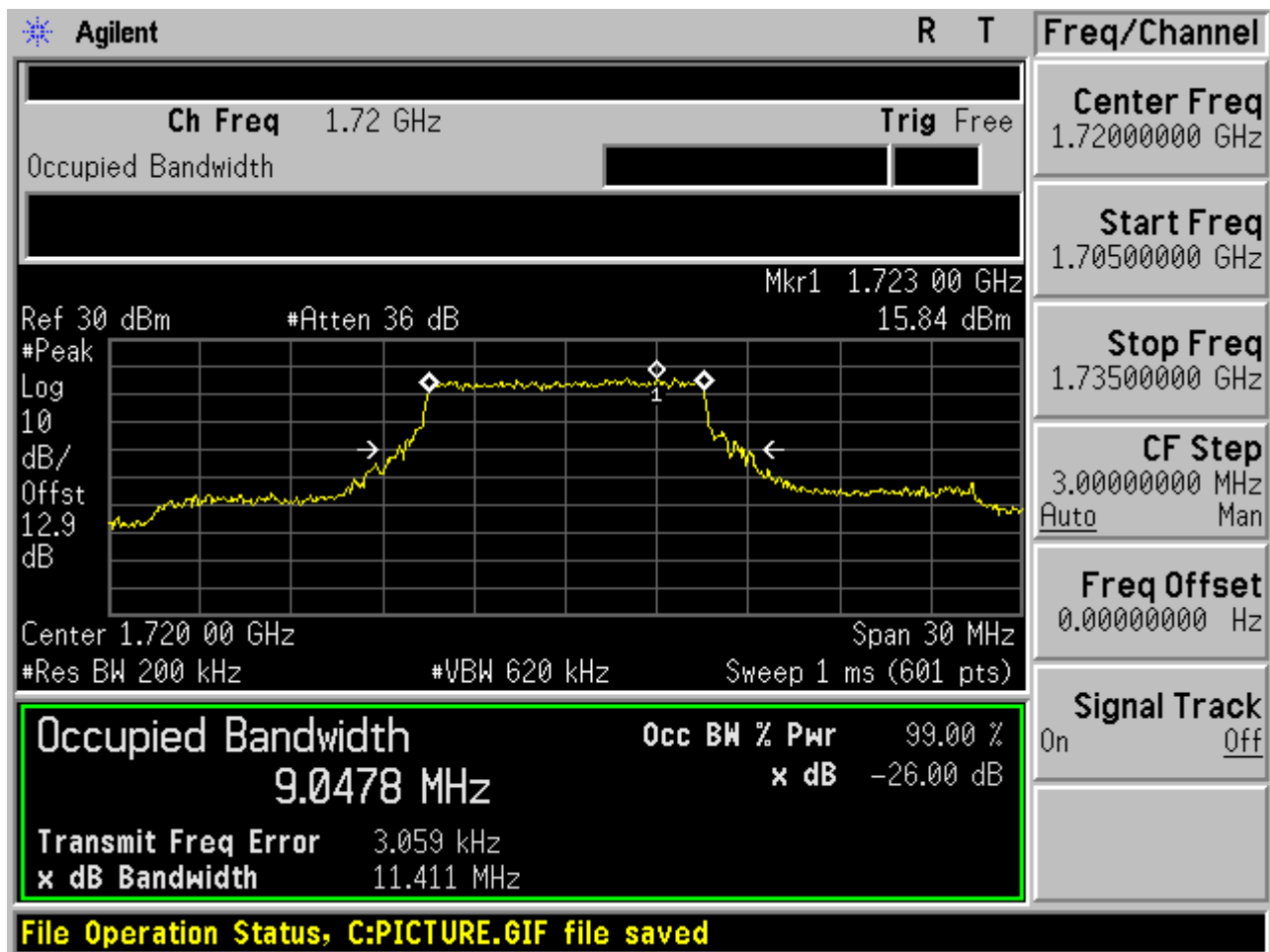


2.1.6.1.2 QPSK/1RB # max



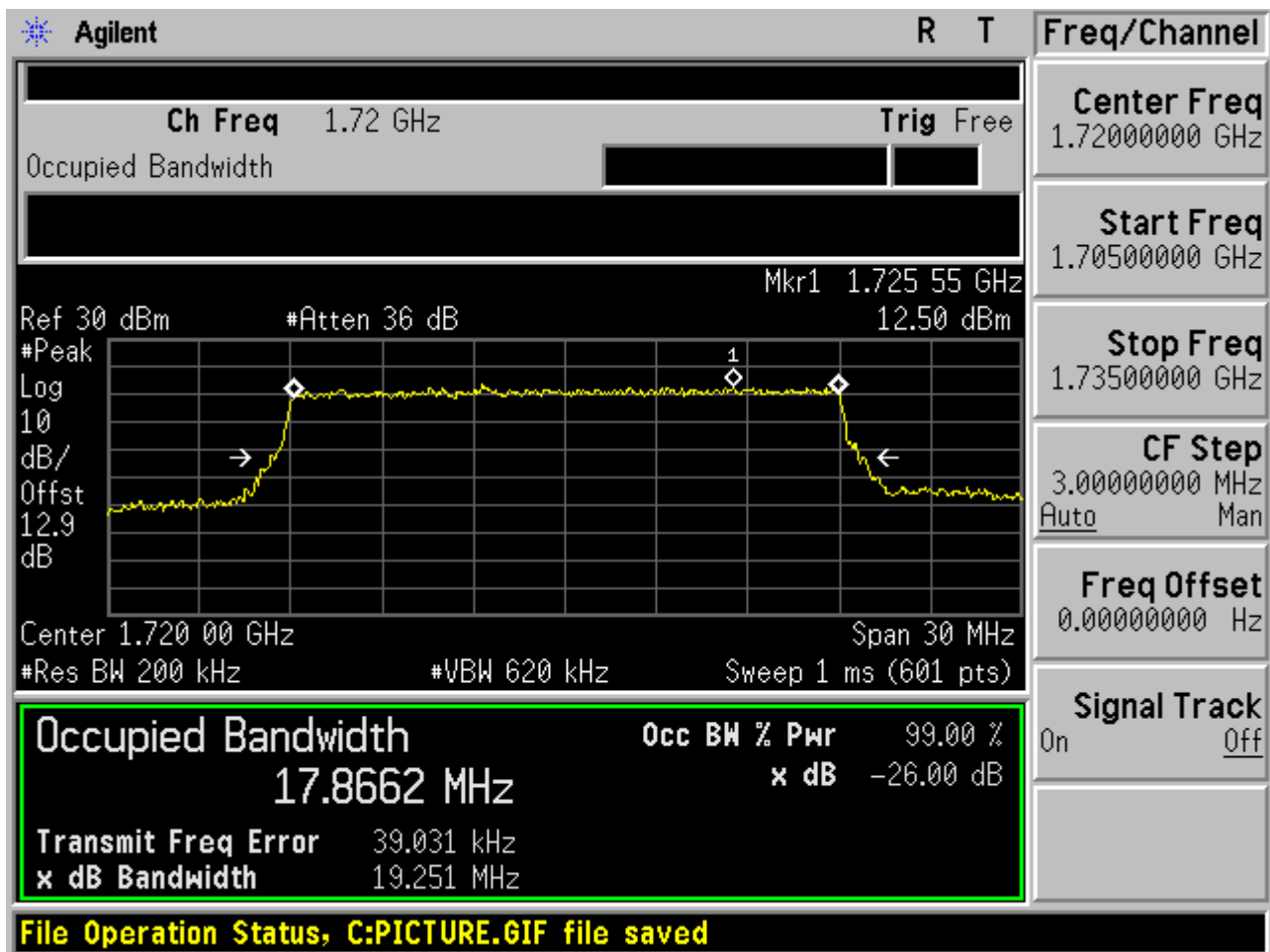


2.1.6.1.3 QPSK/non-1RB #mid/2





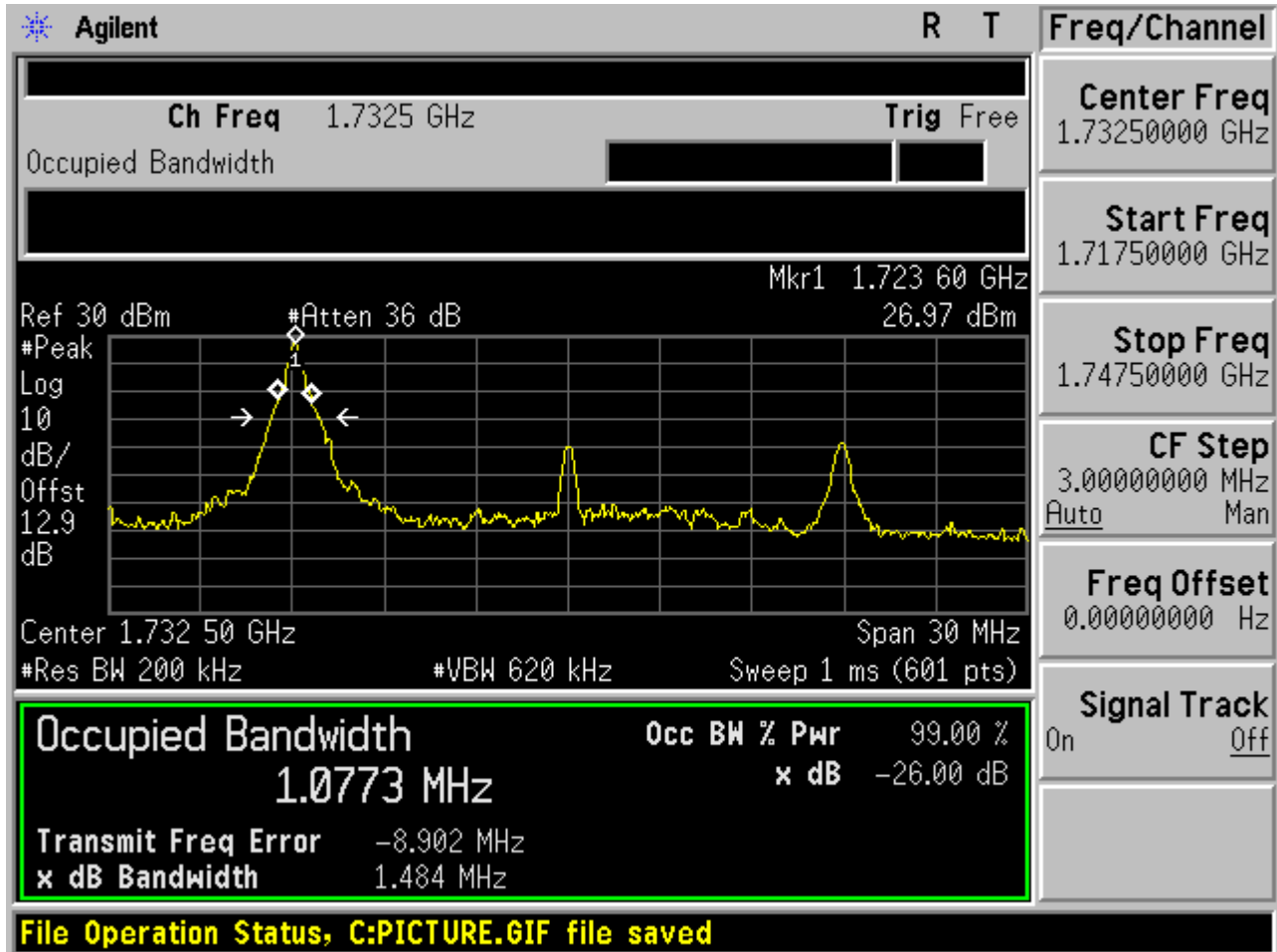
2.1.6.1.4 QPSK/full RBs





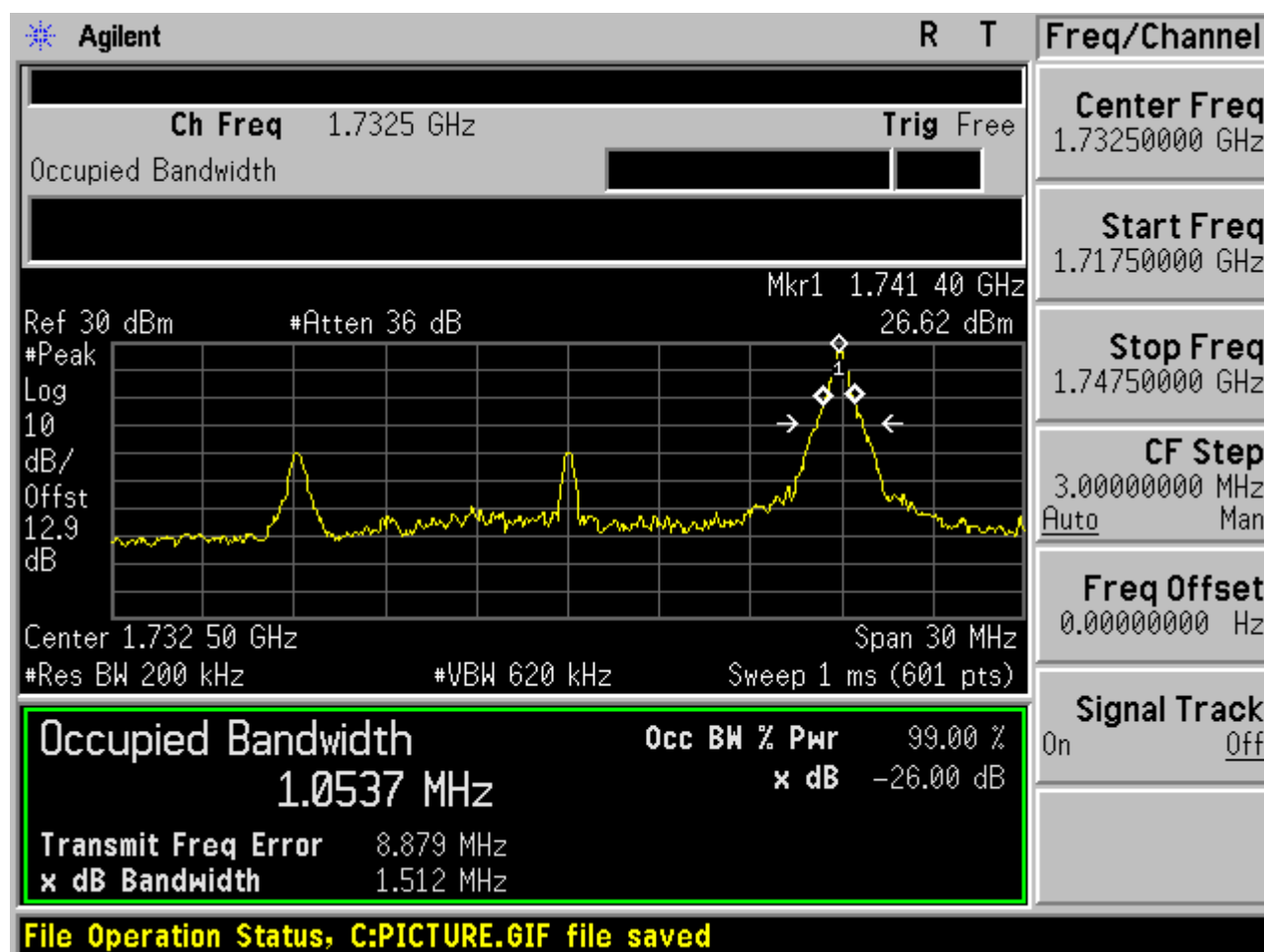
2.1.6.2 Channel =M

2.1.6.2.1 QPSK/1RB # 0



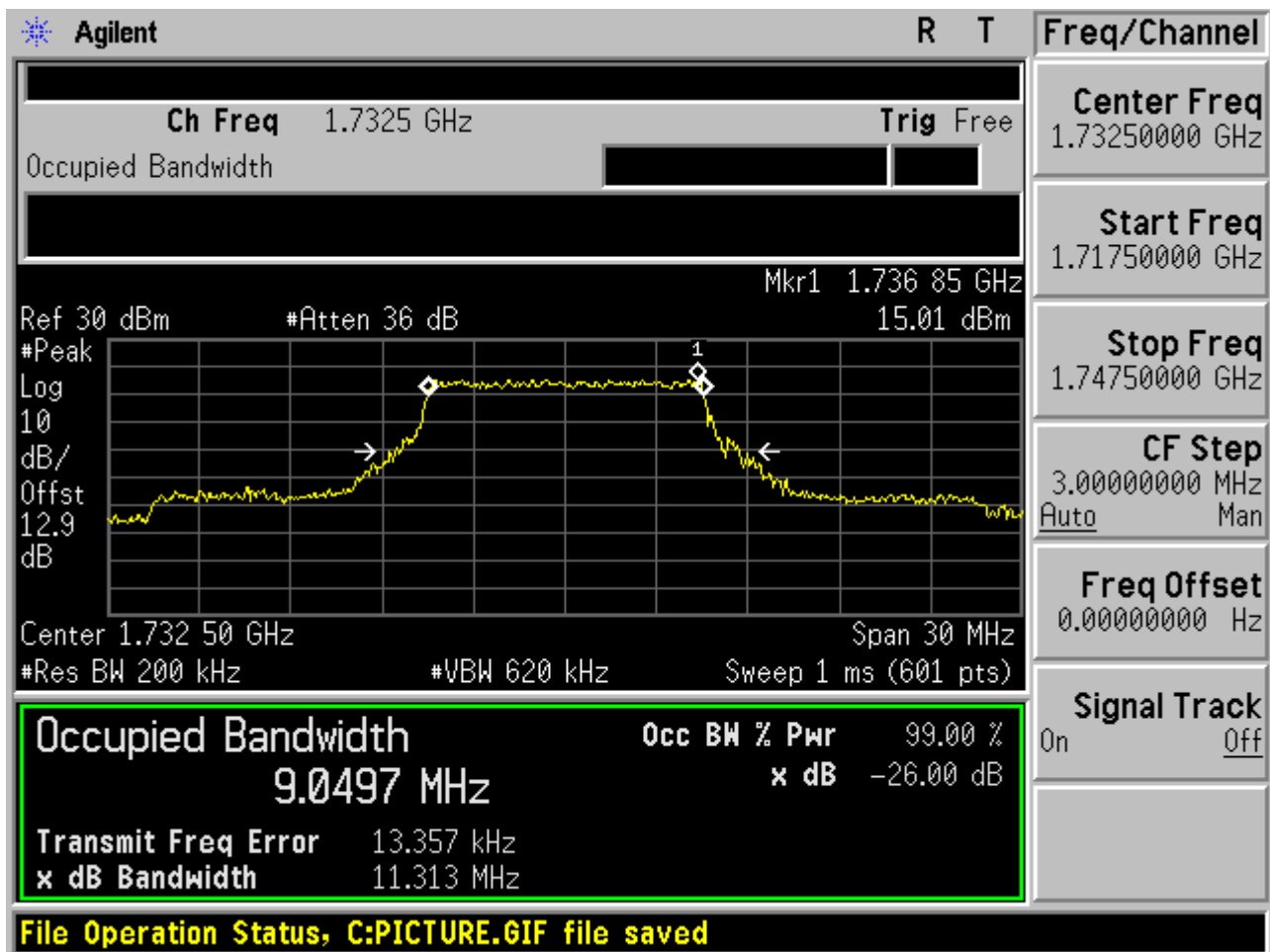


2.1.6.2.2 QPSK/1RB # max



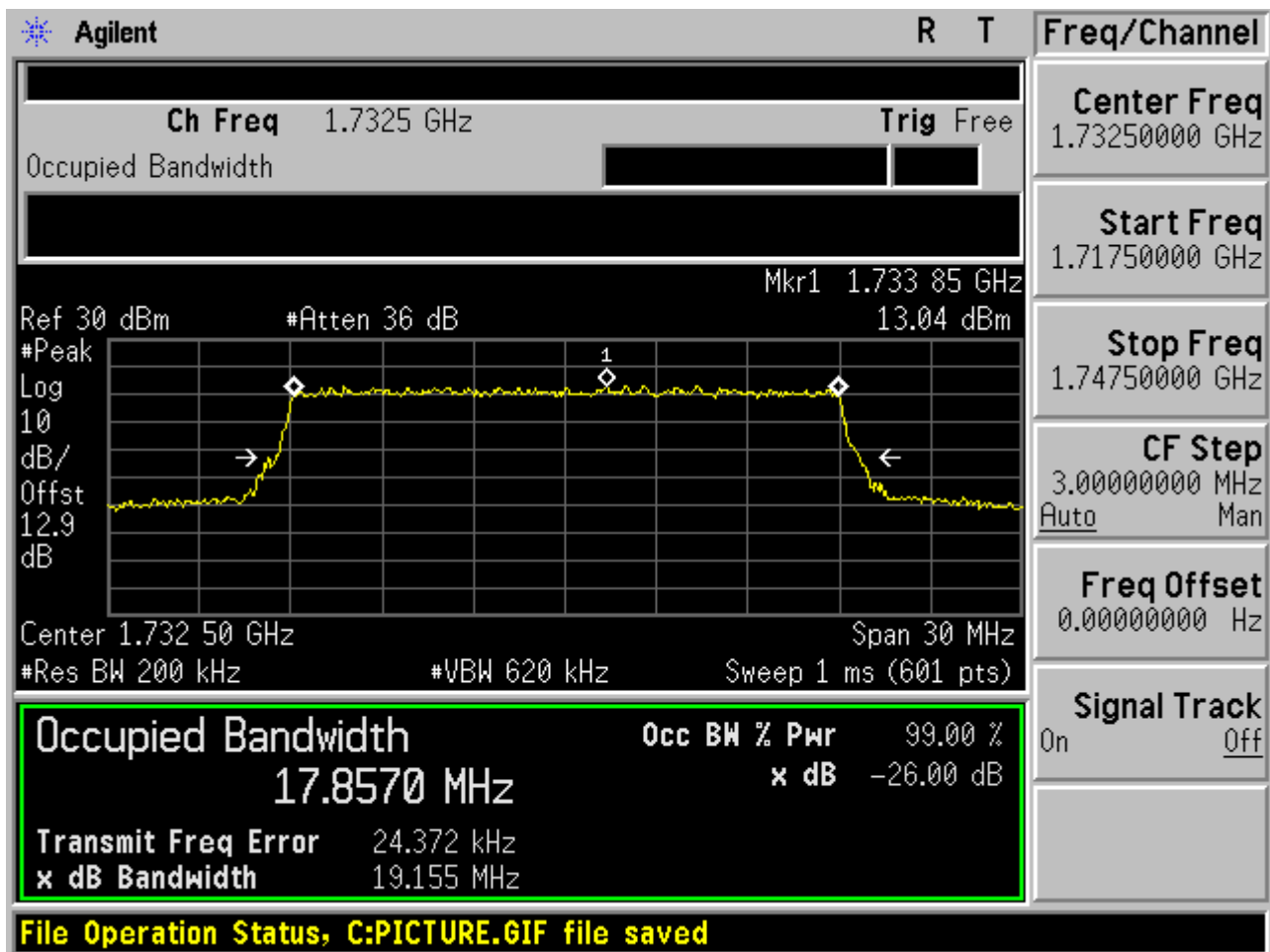


2.1.6.2.3 QPSK/non-1RB #mid/2





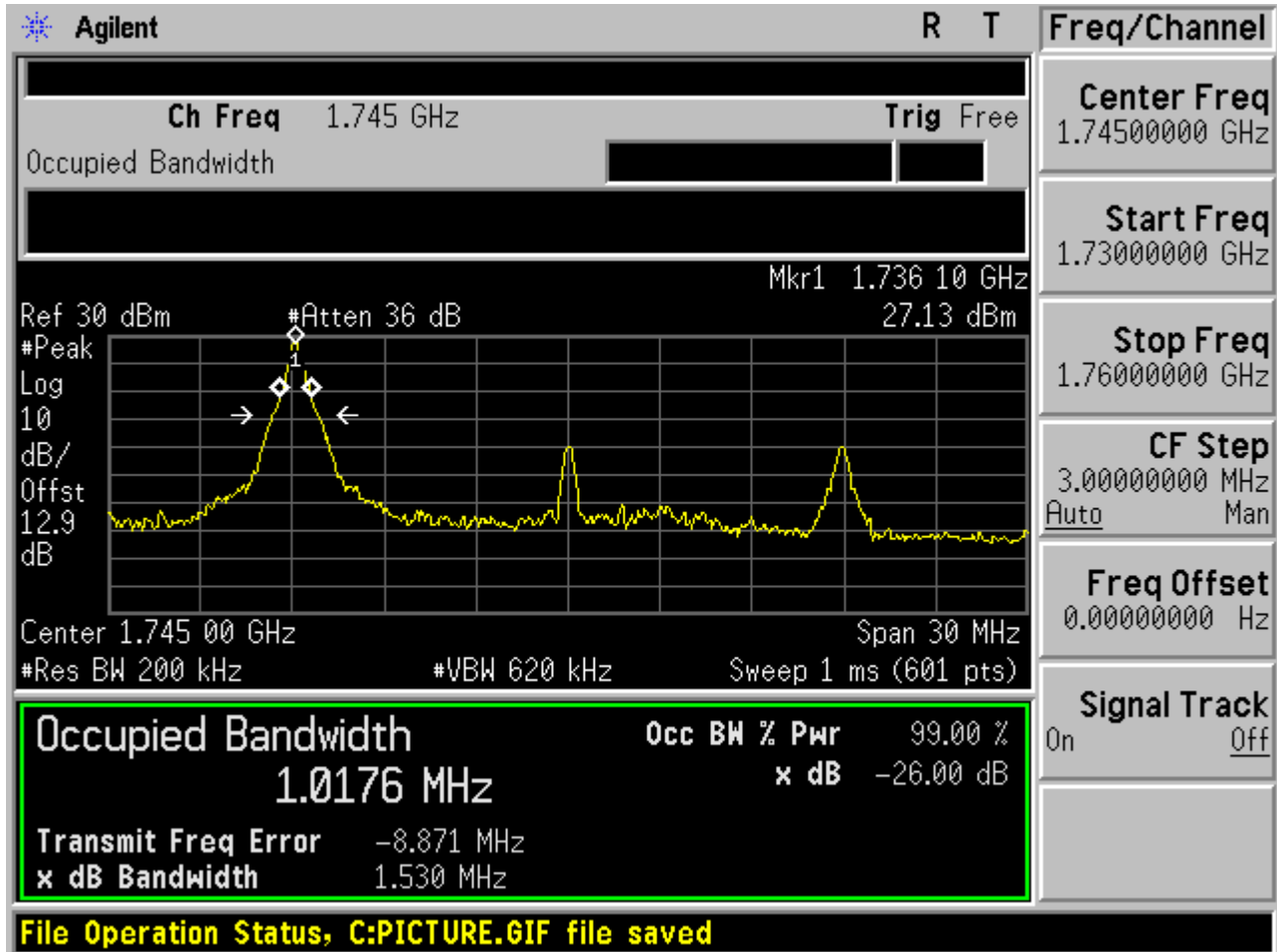
2.1.6.2.4 QPSK/full RBs





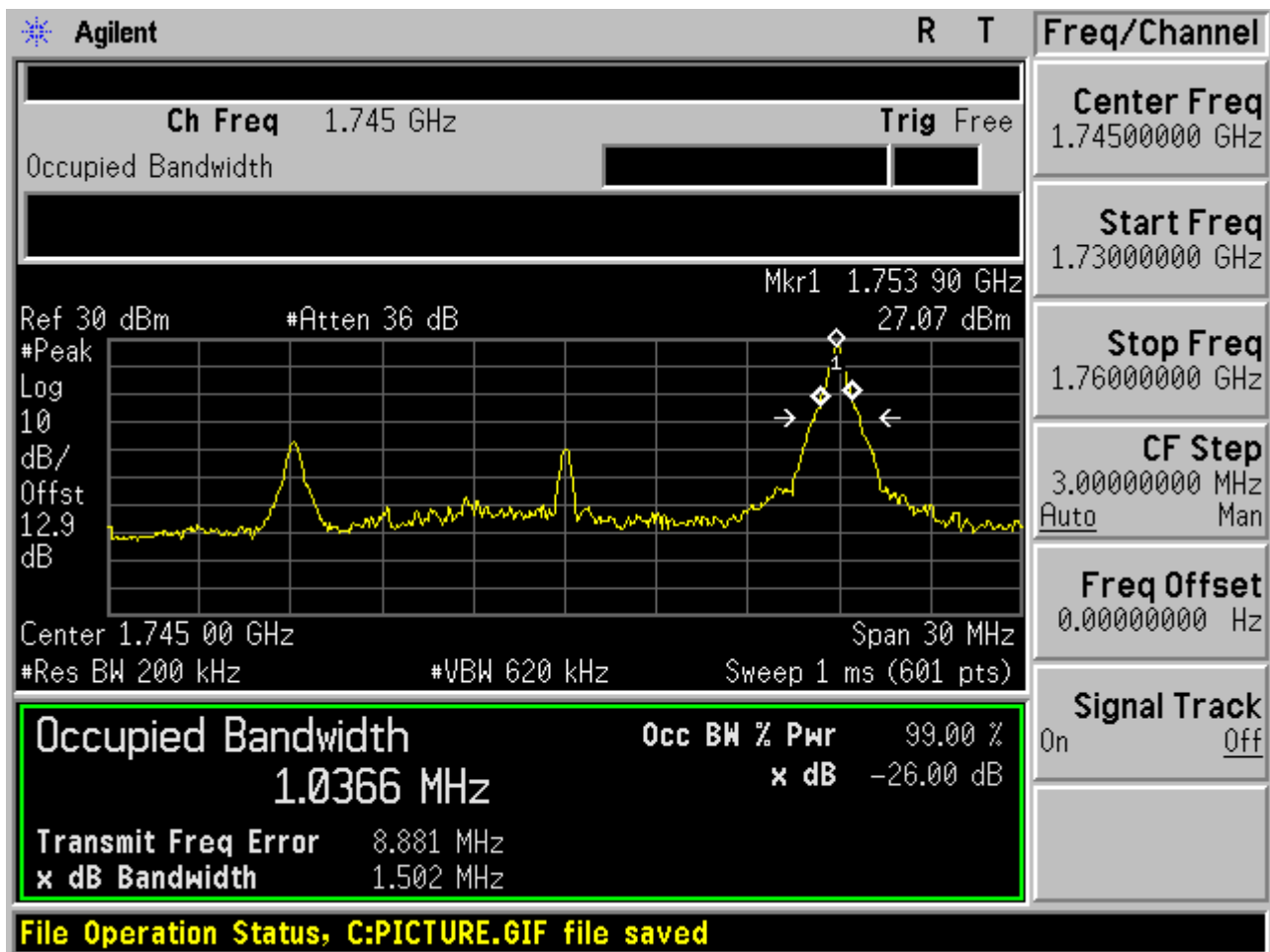
2.1.6.3 Channel =T

2.1.6.3.1 QPSK/1RB # 0



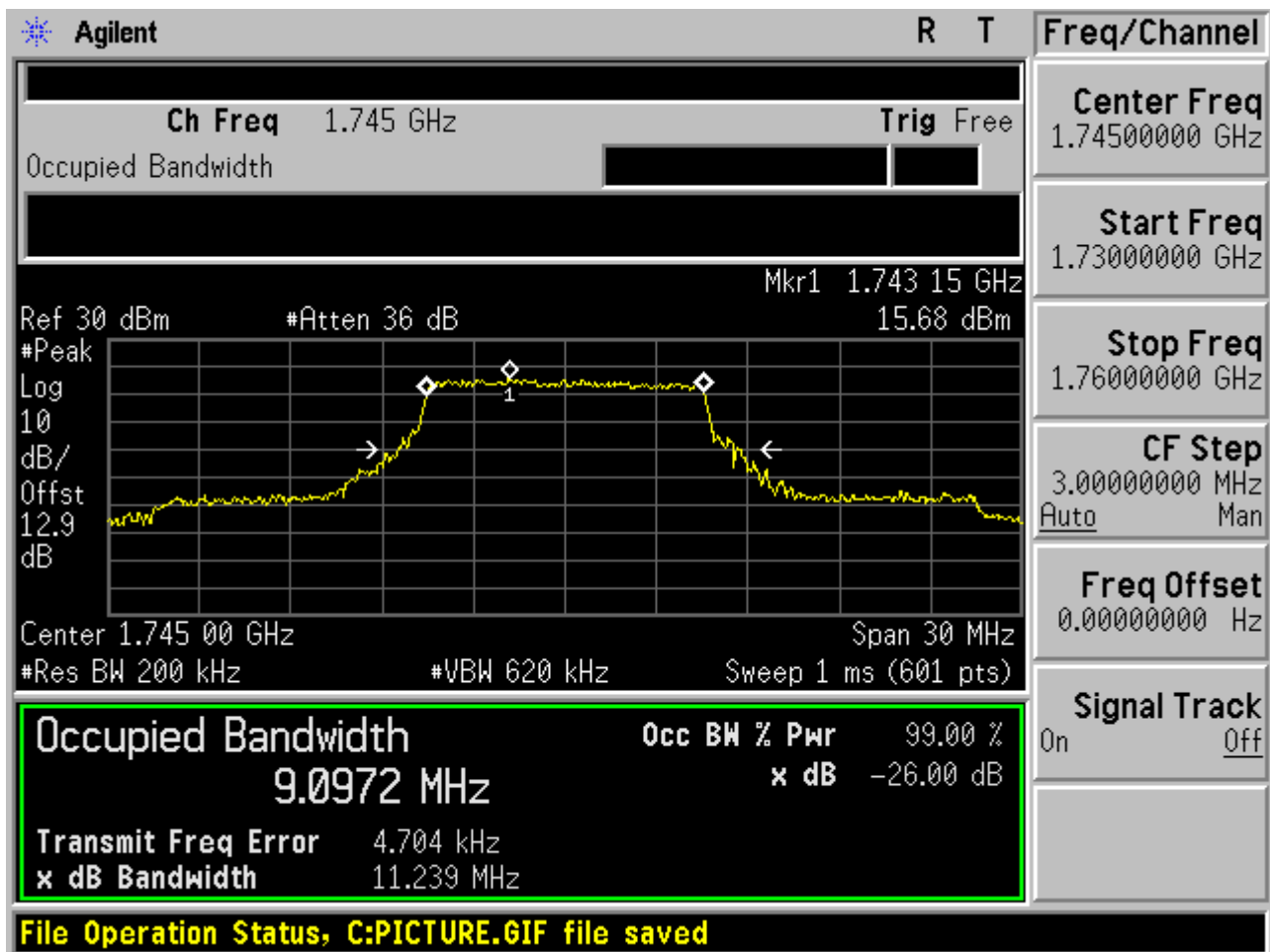


2.1.6.3.2 QPSK/1RB # max



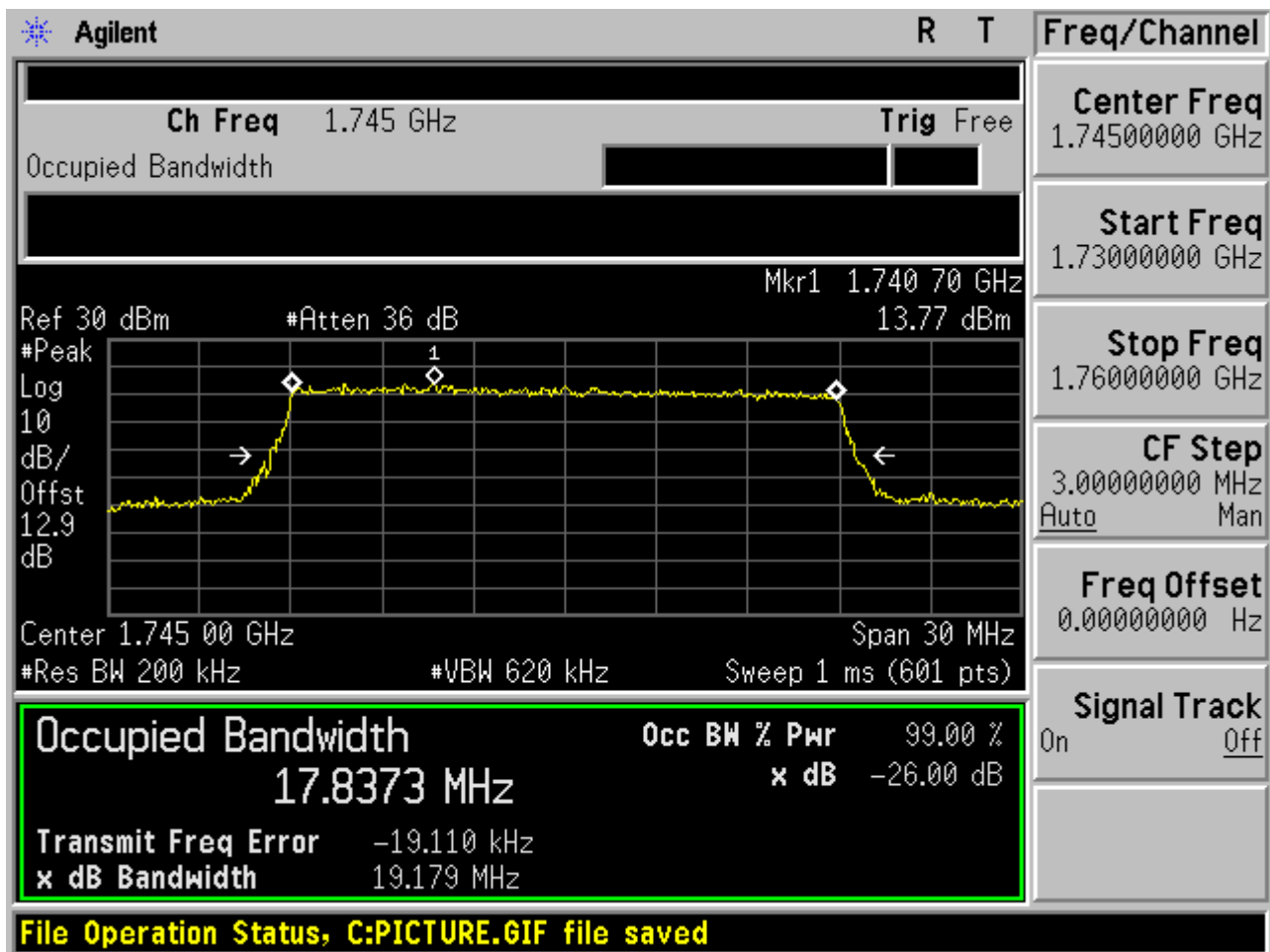


2.1.6.3.3 QPSK/non-1RB #mid/2





2.1.6.3.4 QPSK/full RBs



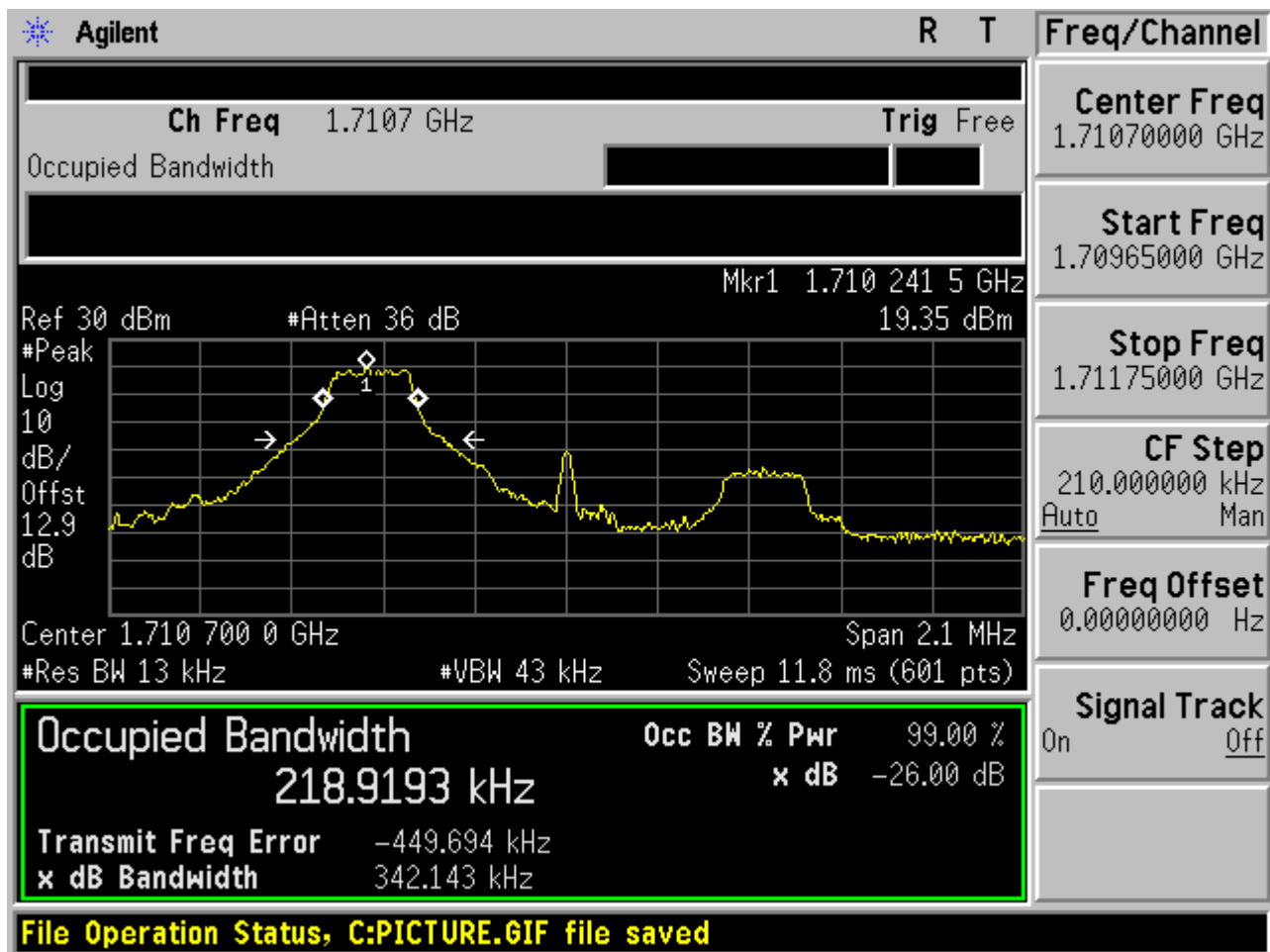


2.2 Test Mode=TM5

2.2.1 Channel Bandwidth = 1.4 MHz

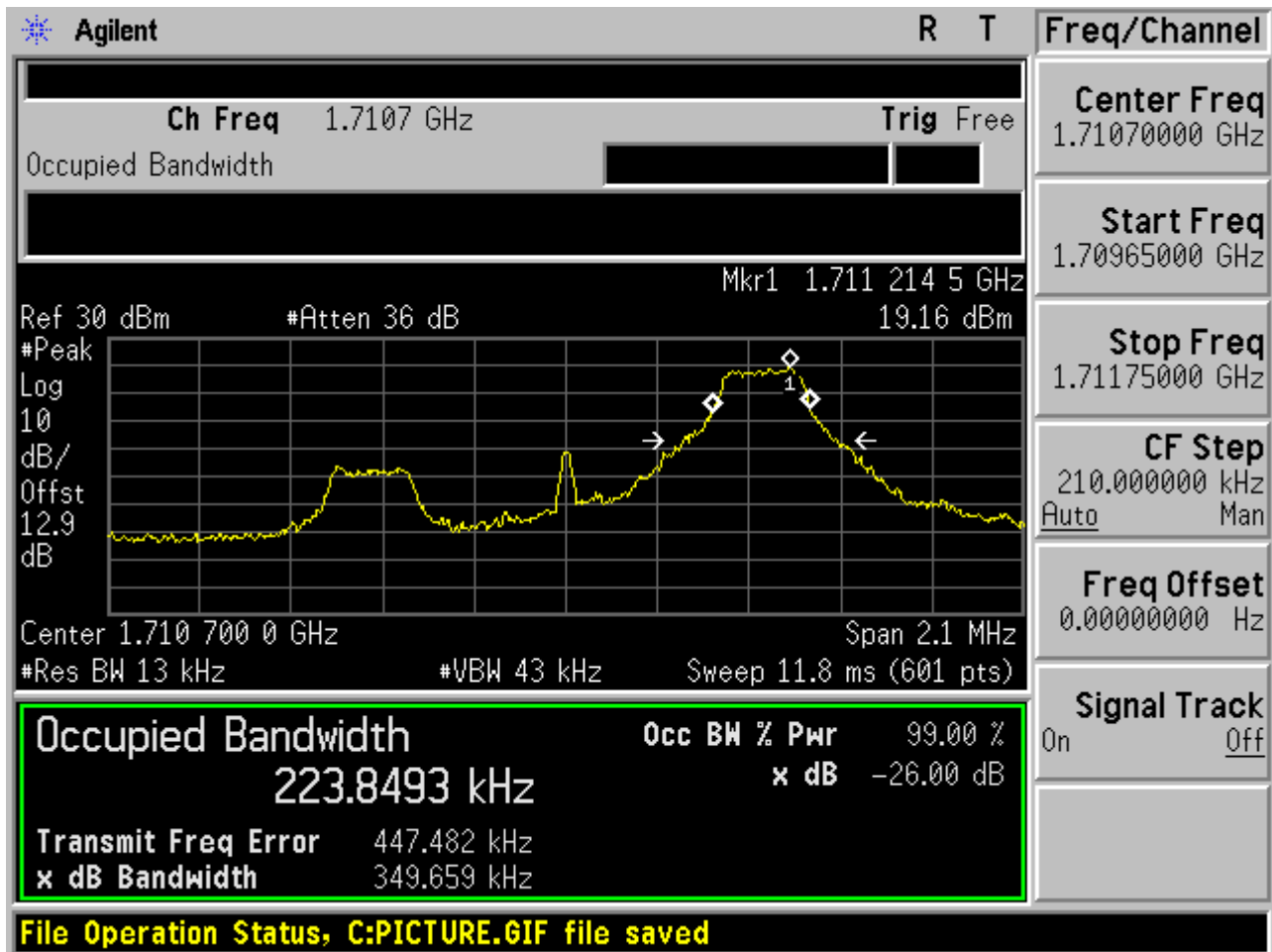
2.2.1.1 Channel =B

2.2.1.1.1 16QAM/1RB # 0



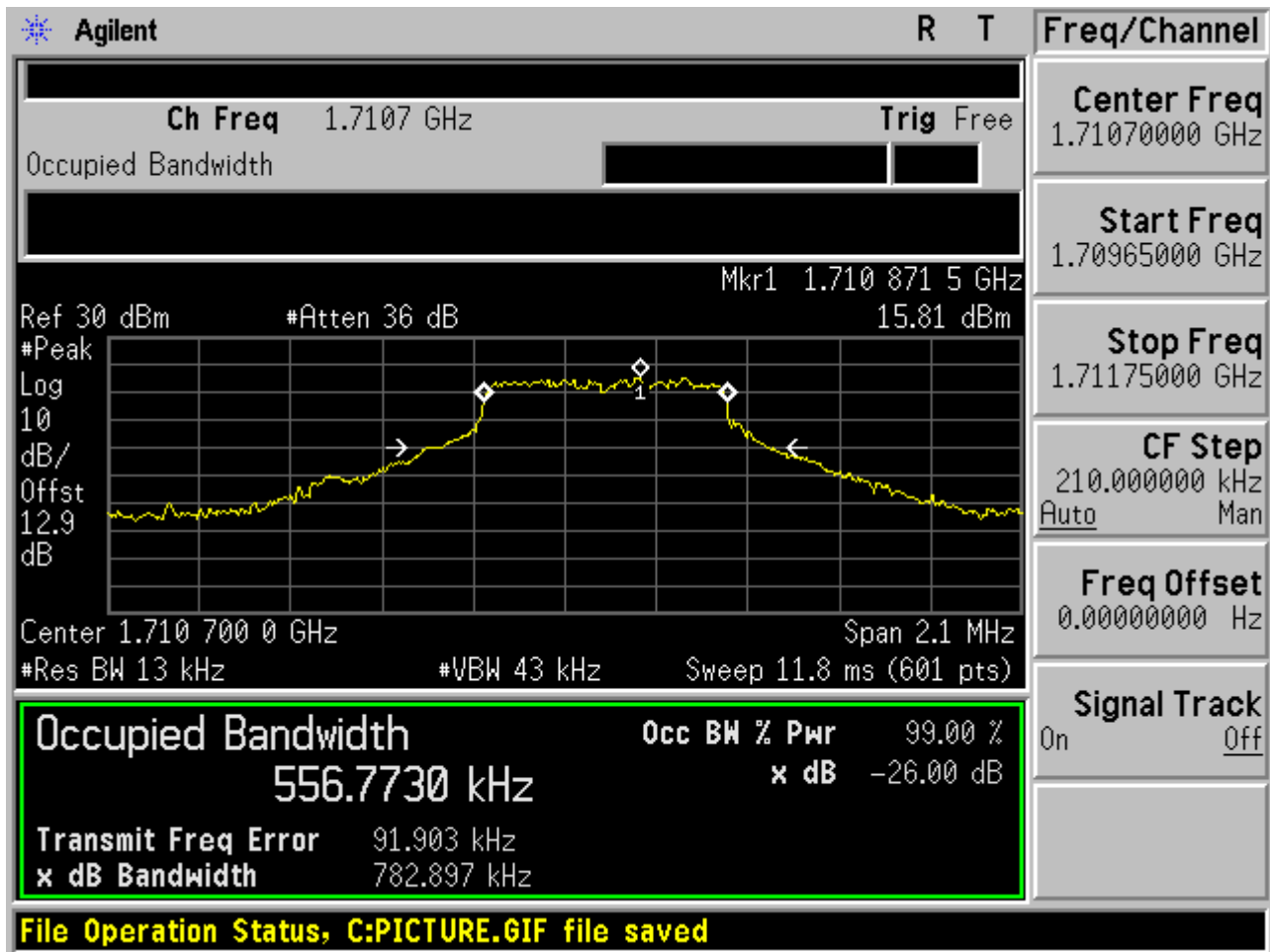


2.2.1.1.2 16QAM /1RB # max



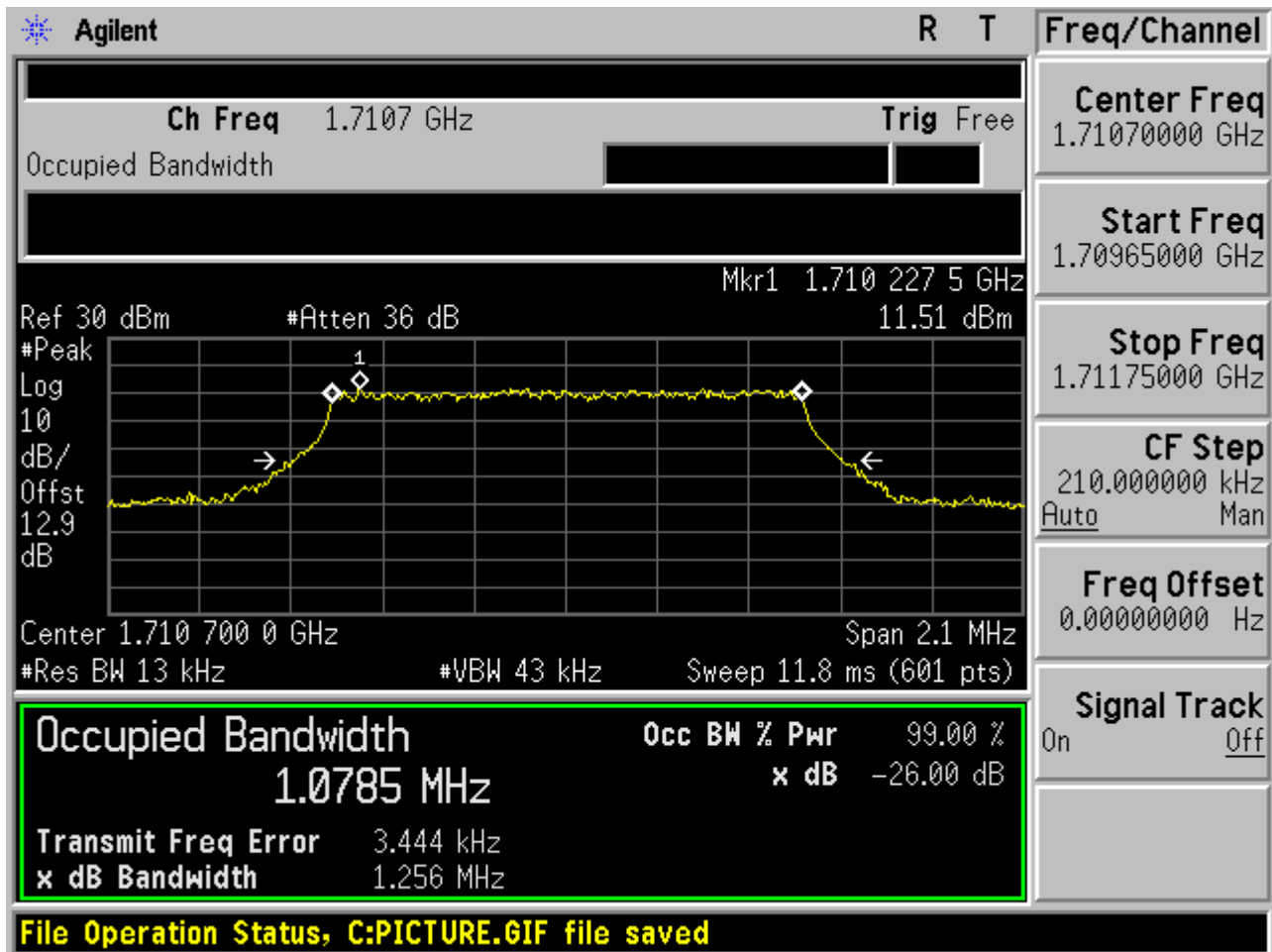


2.2.1.1.3 16QAM /non-1RB #mid/2





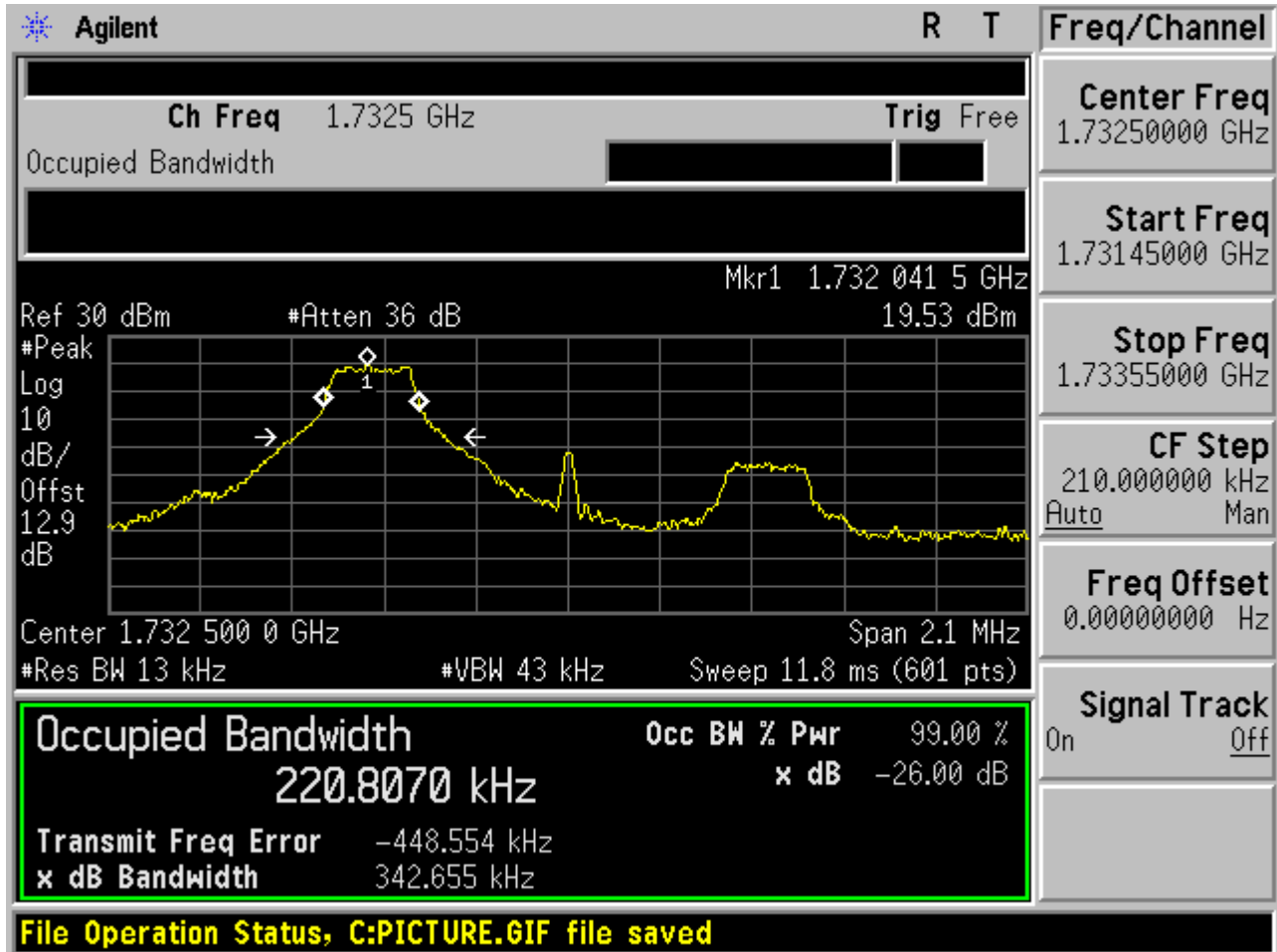
2.2.1.1.4 16QAM /full RBs





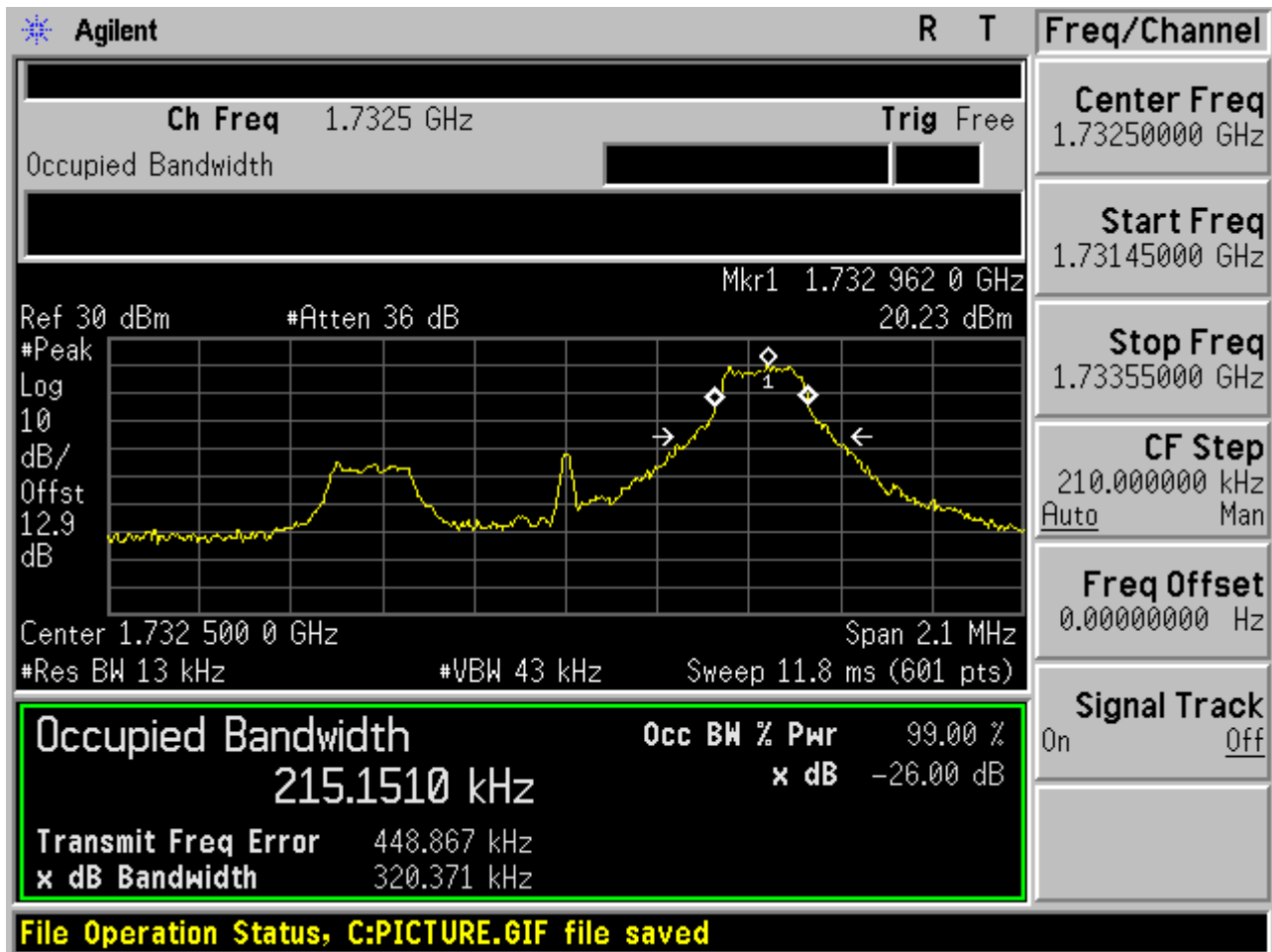
2.2.1.2 Channel =M

2.2.1.2.1 16QAM/1RB # 0



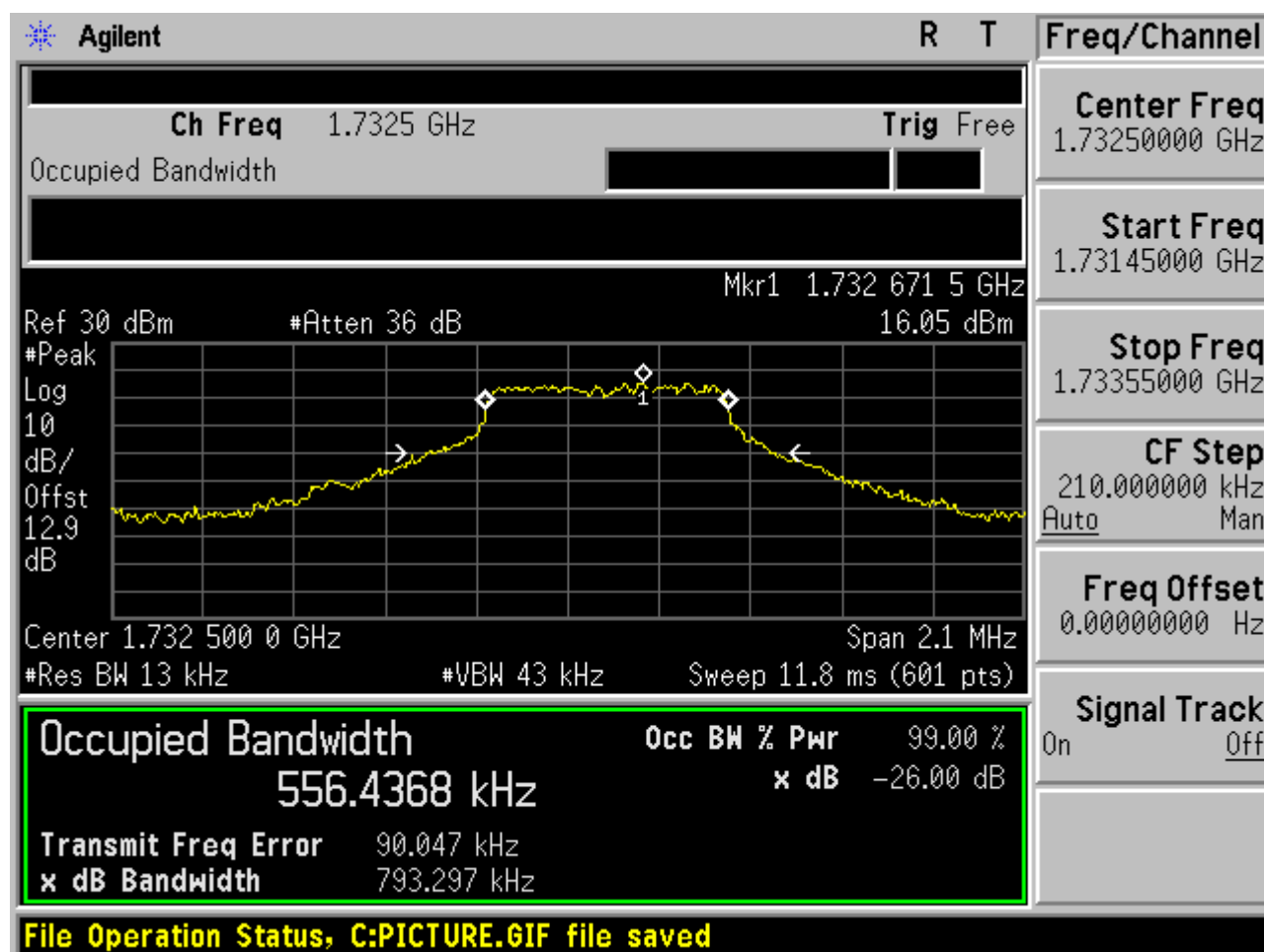


2.2.1.2.2 16QAM /1RB # max



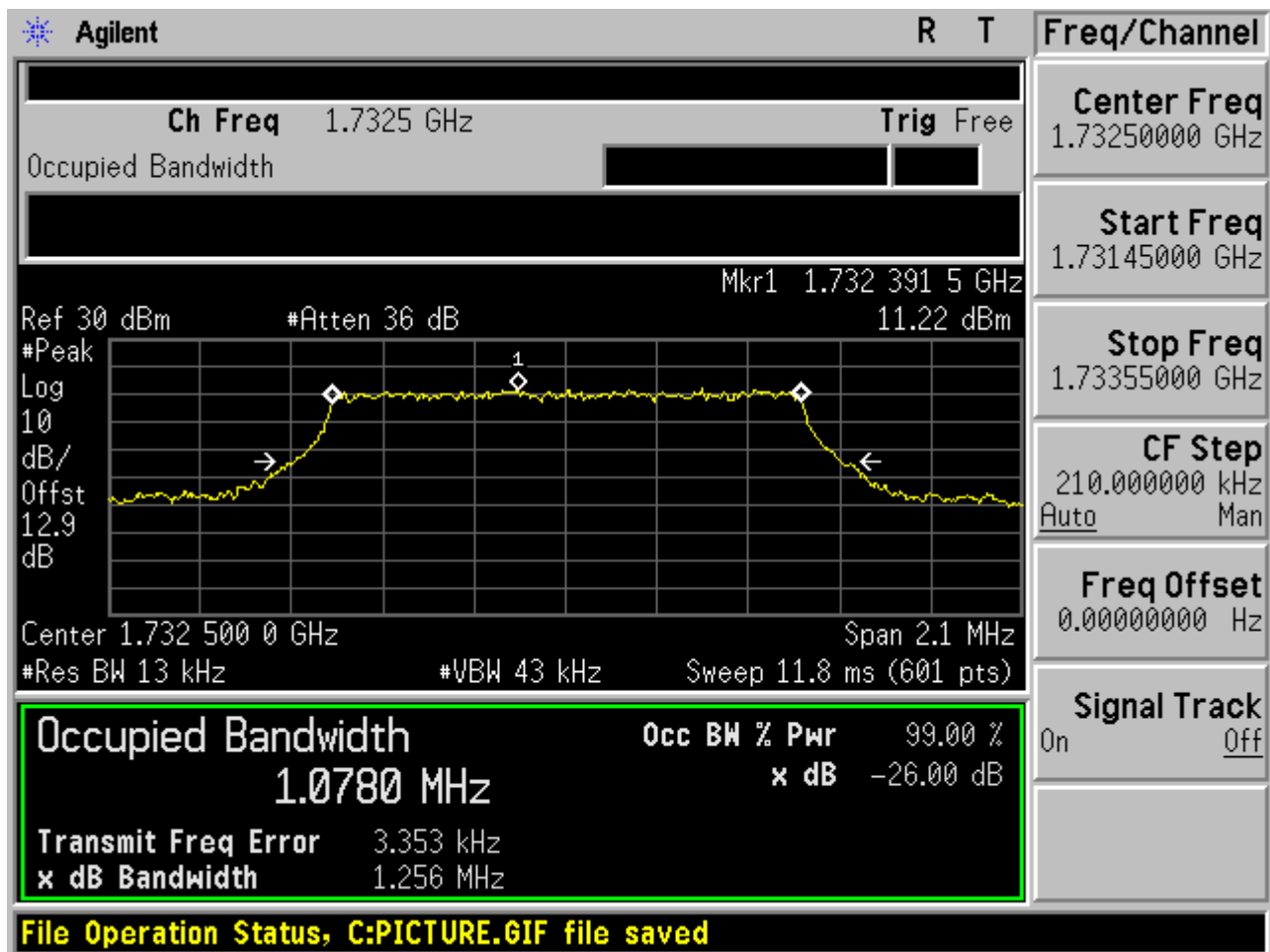


2.2.1.2.3 16QAM /non-1RB #mid/2





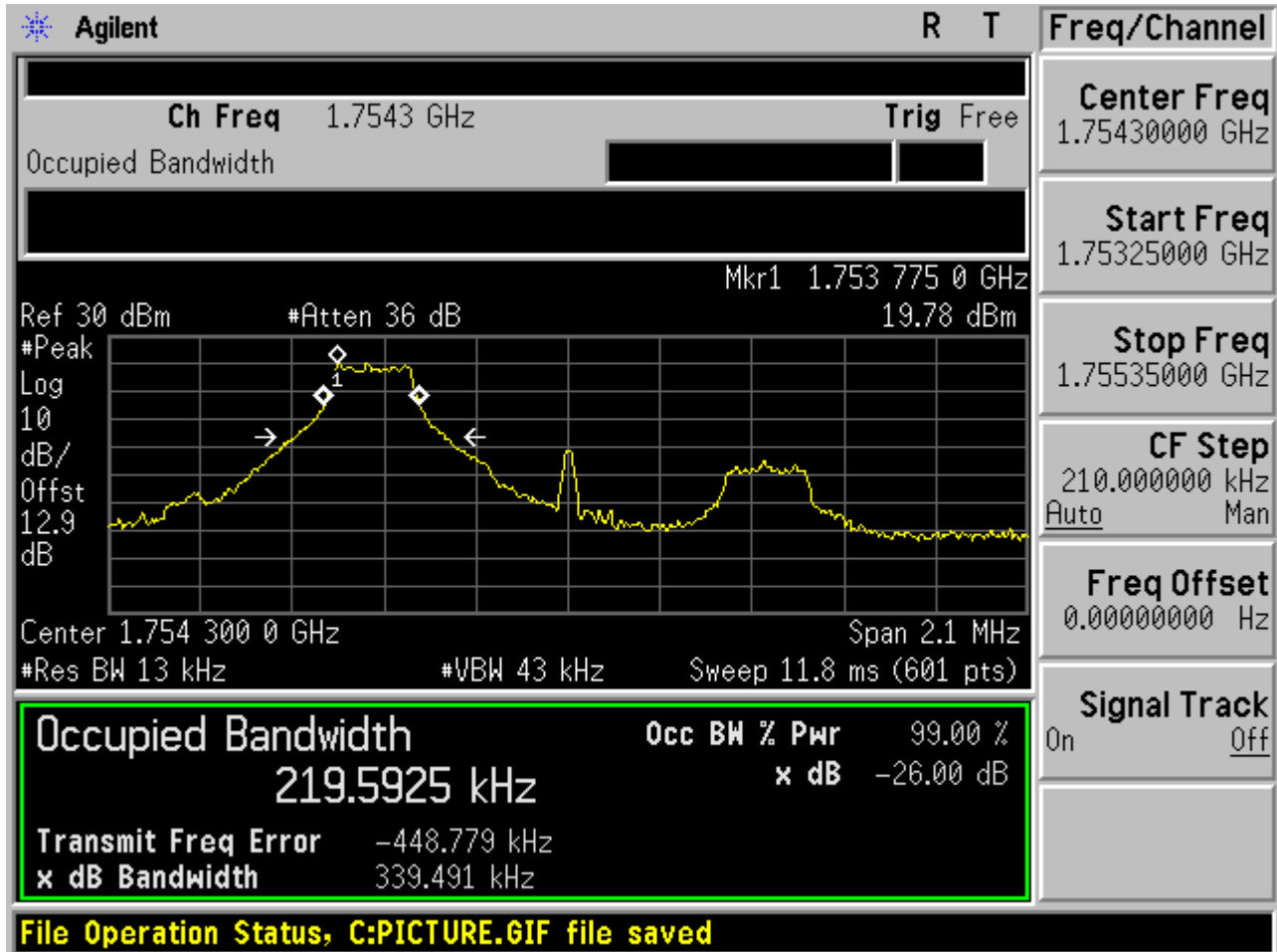
2.2.1.2.4 16QAM /full RBs





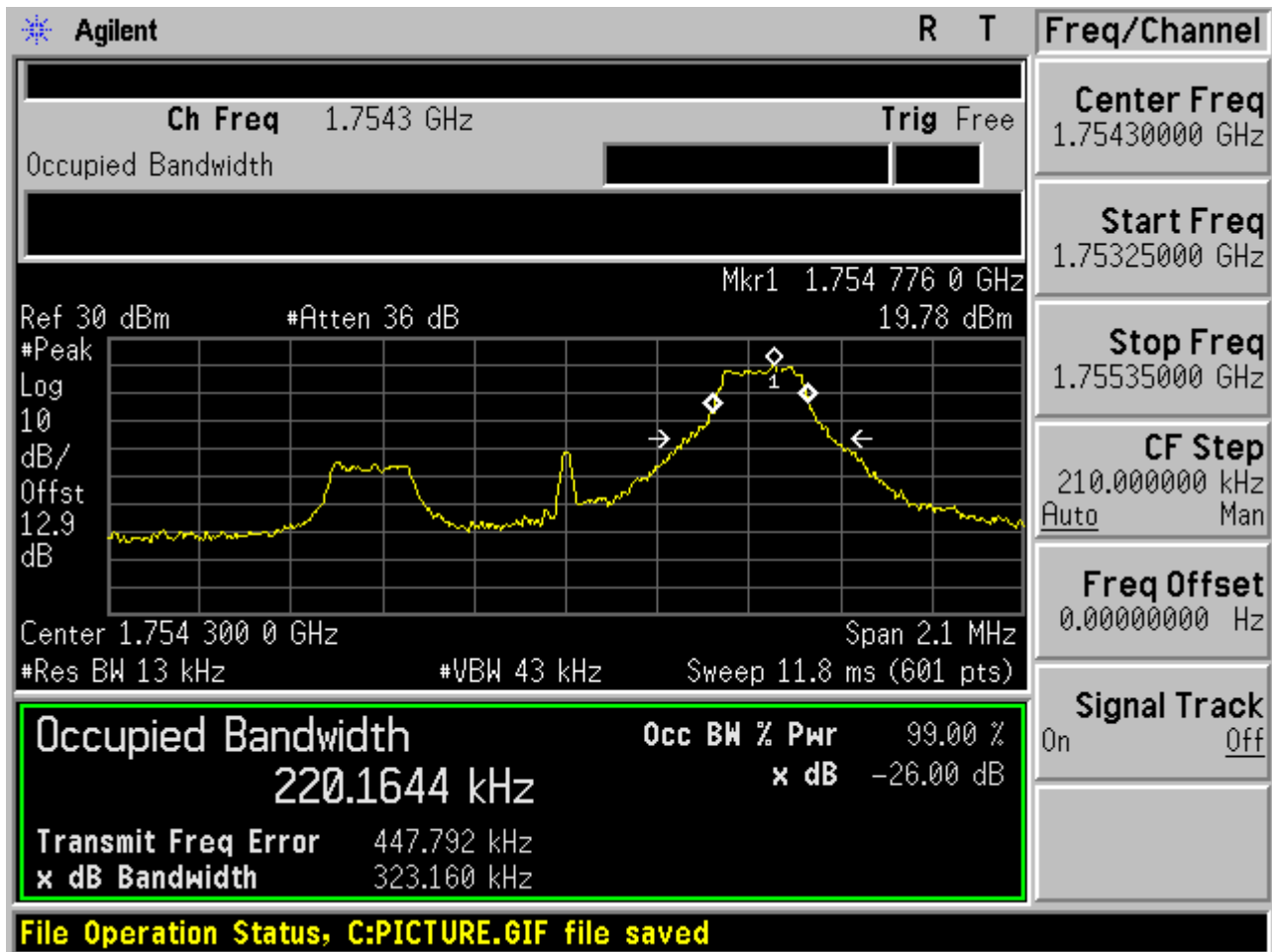
2.2.1.3 Channel =T

2.2.1.3.1 16QAM/1RB # 0



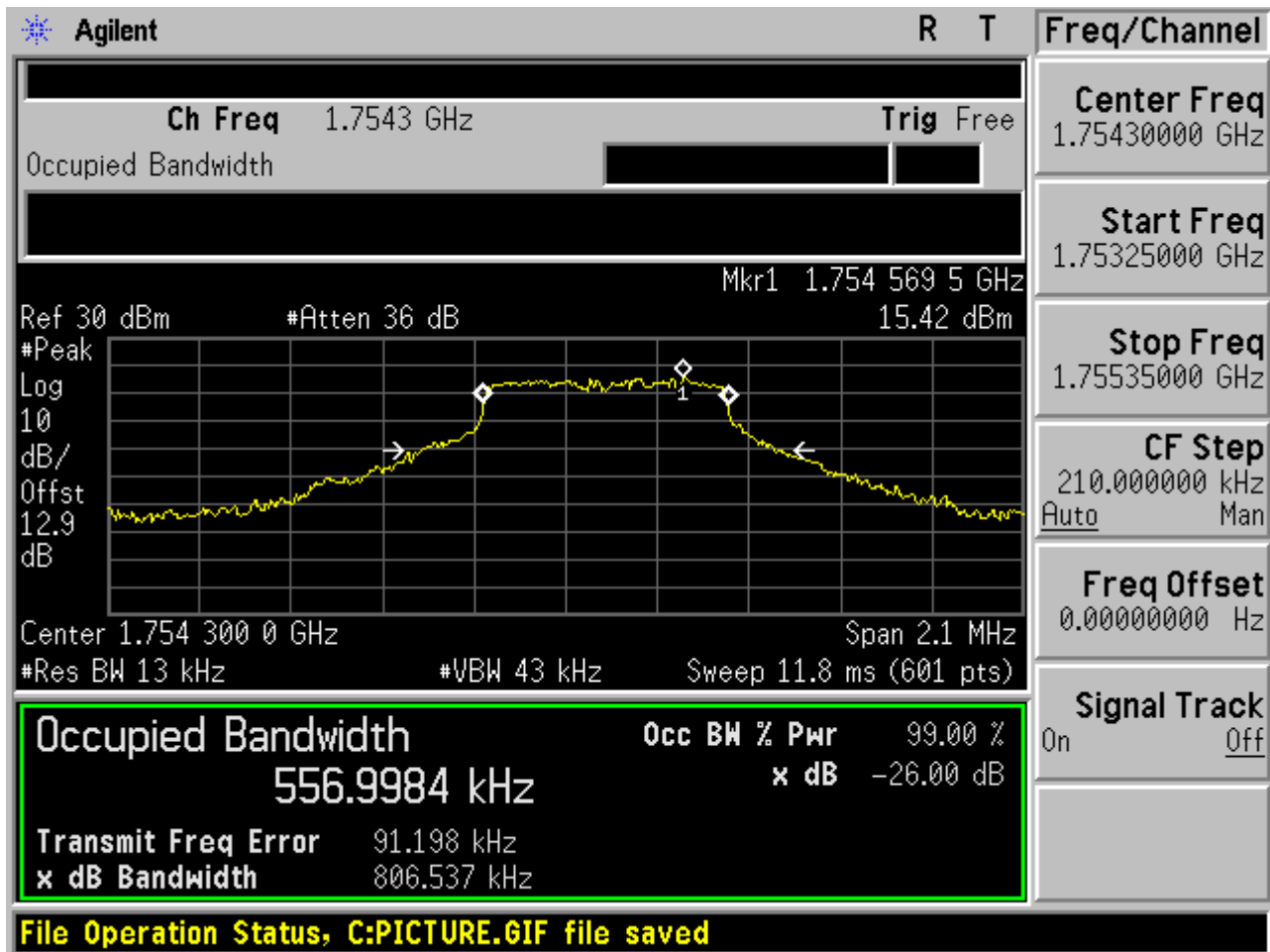


2.2.1.3.2 16QAM /1RB # max



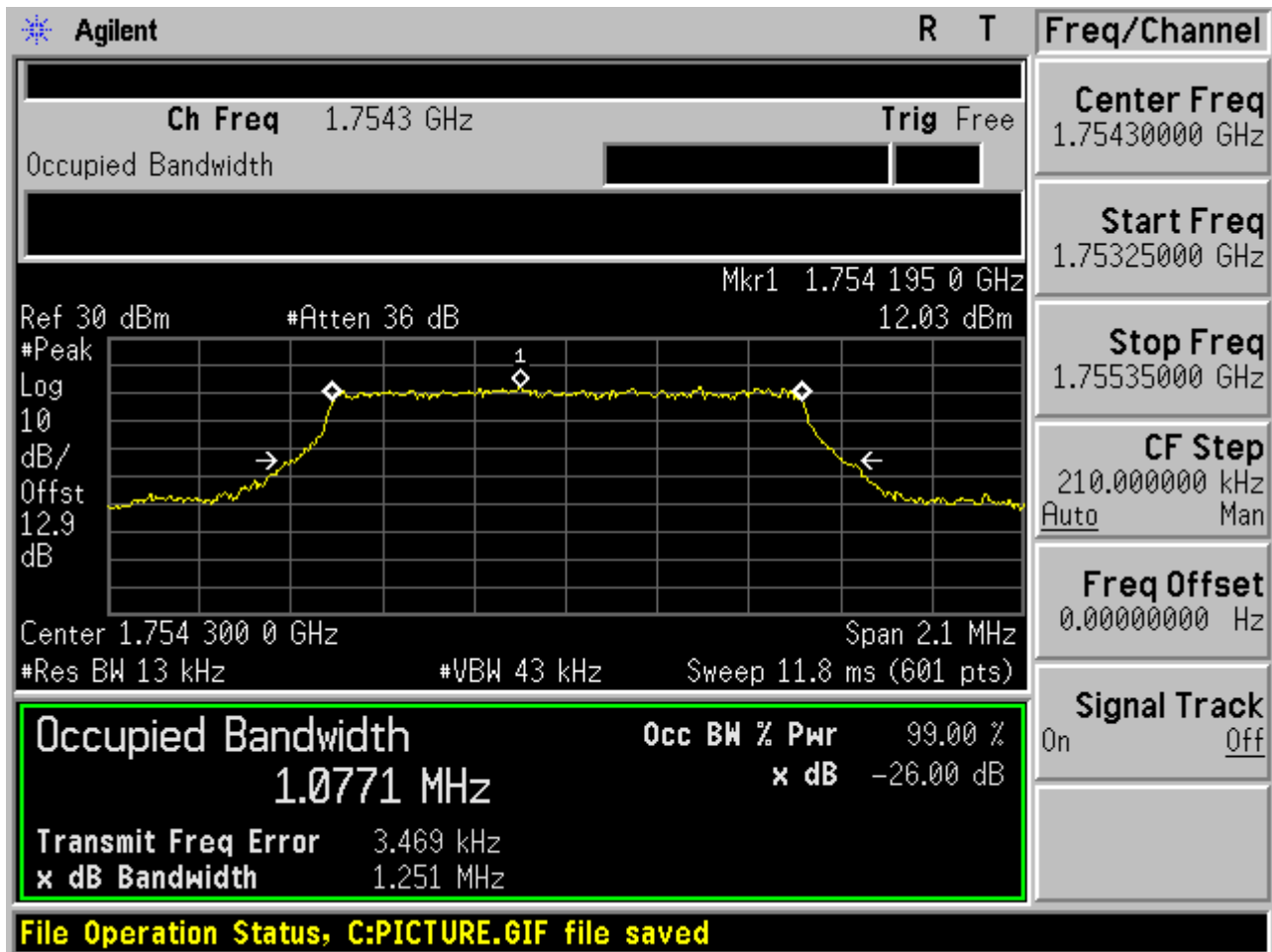


2.2.1.3.3 16QAM /non-1RB #mid/2





2.2.1.3.4 16QAM /full RBs

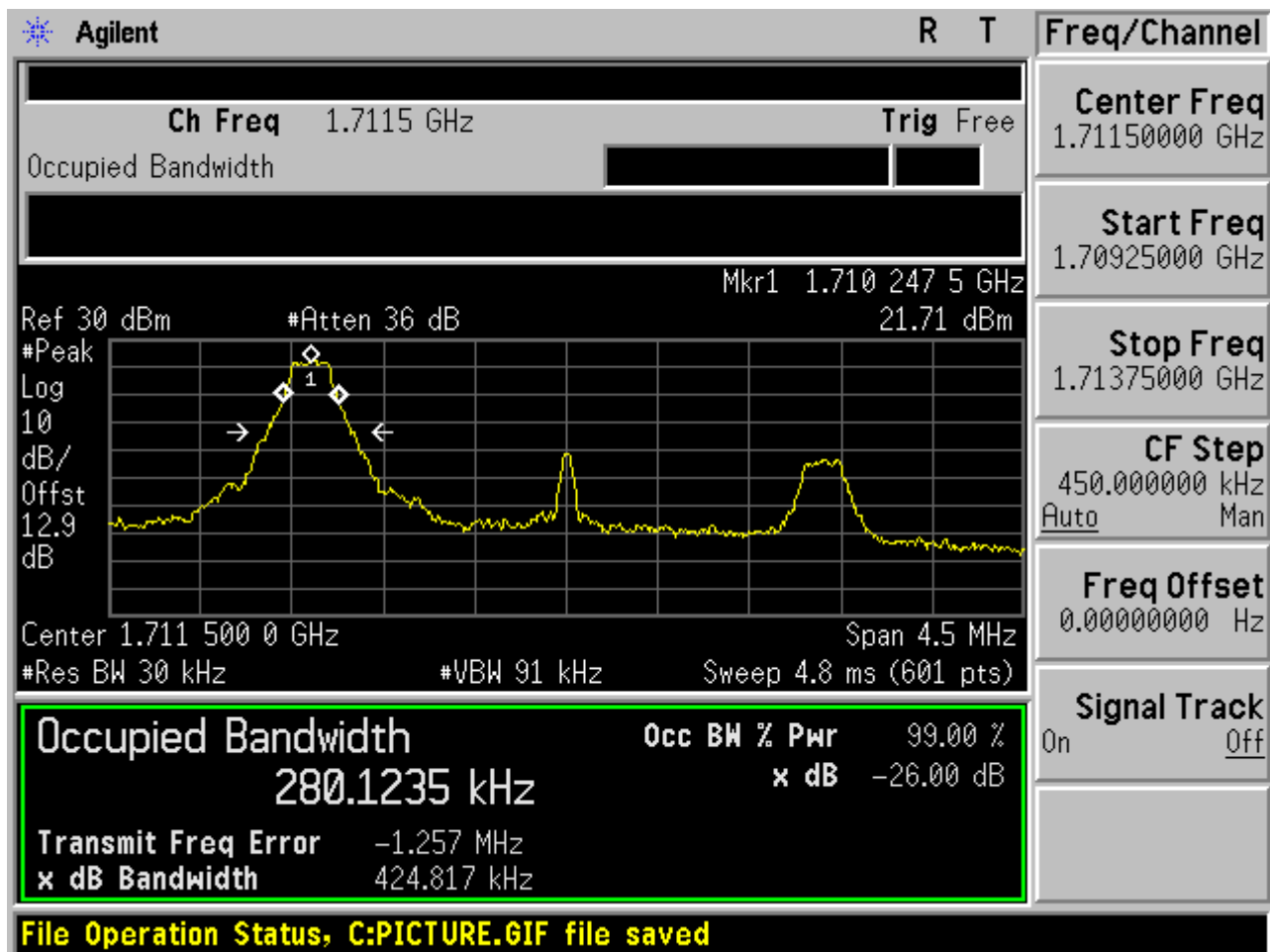




2.2.2 Channel Bandwidth = 3 MHz

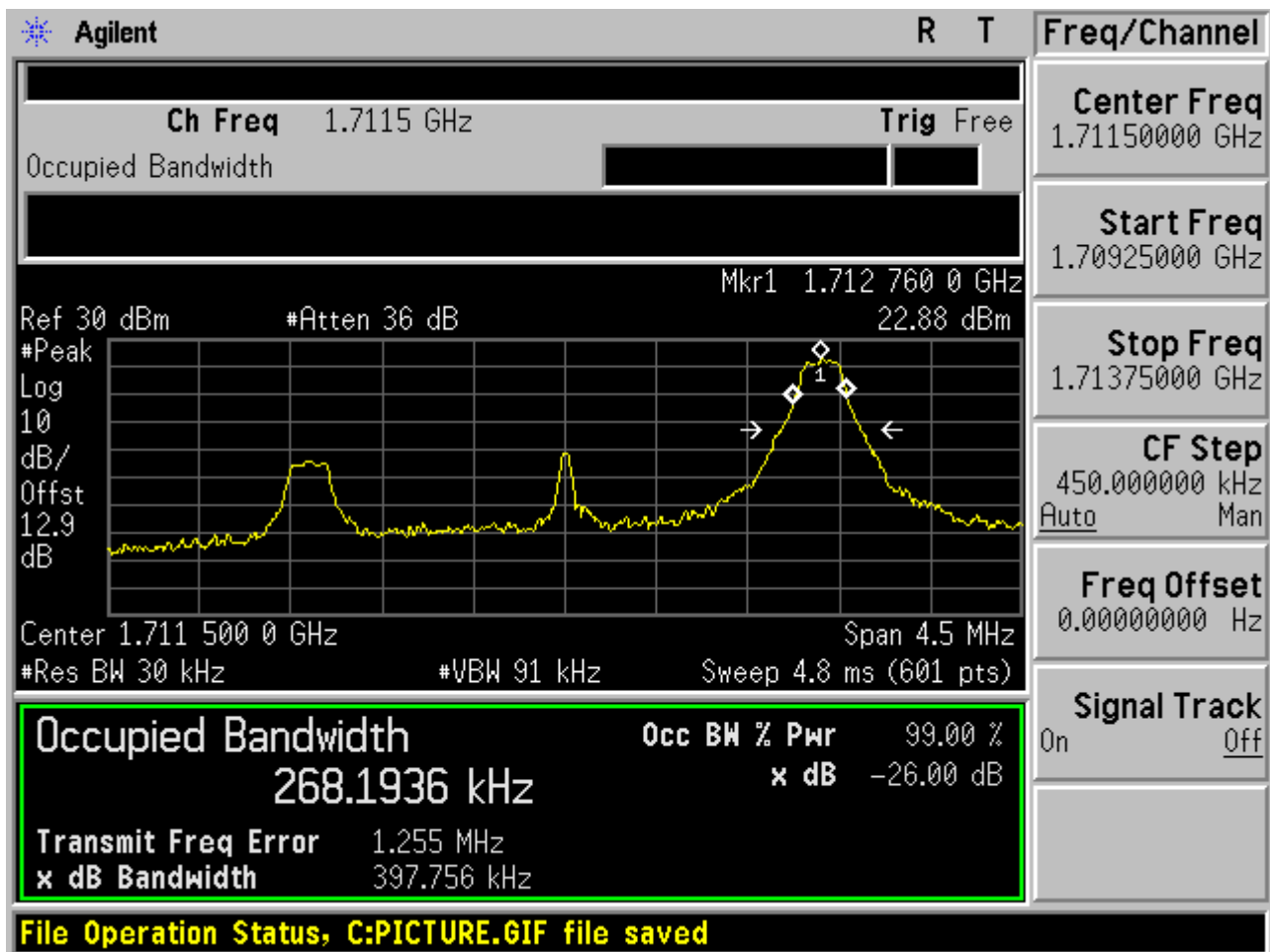
2.2.2.1 Channel =B

2.2.2.1.1 16QAM/1RB # 0



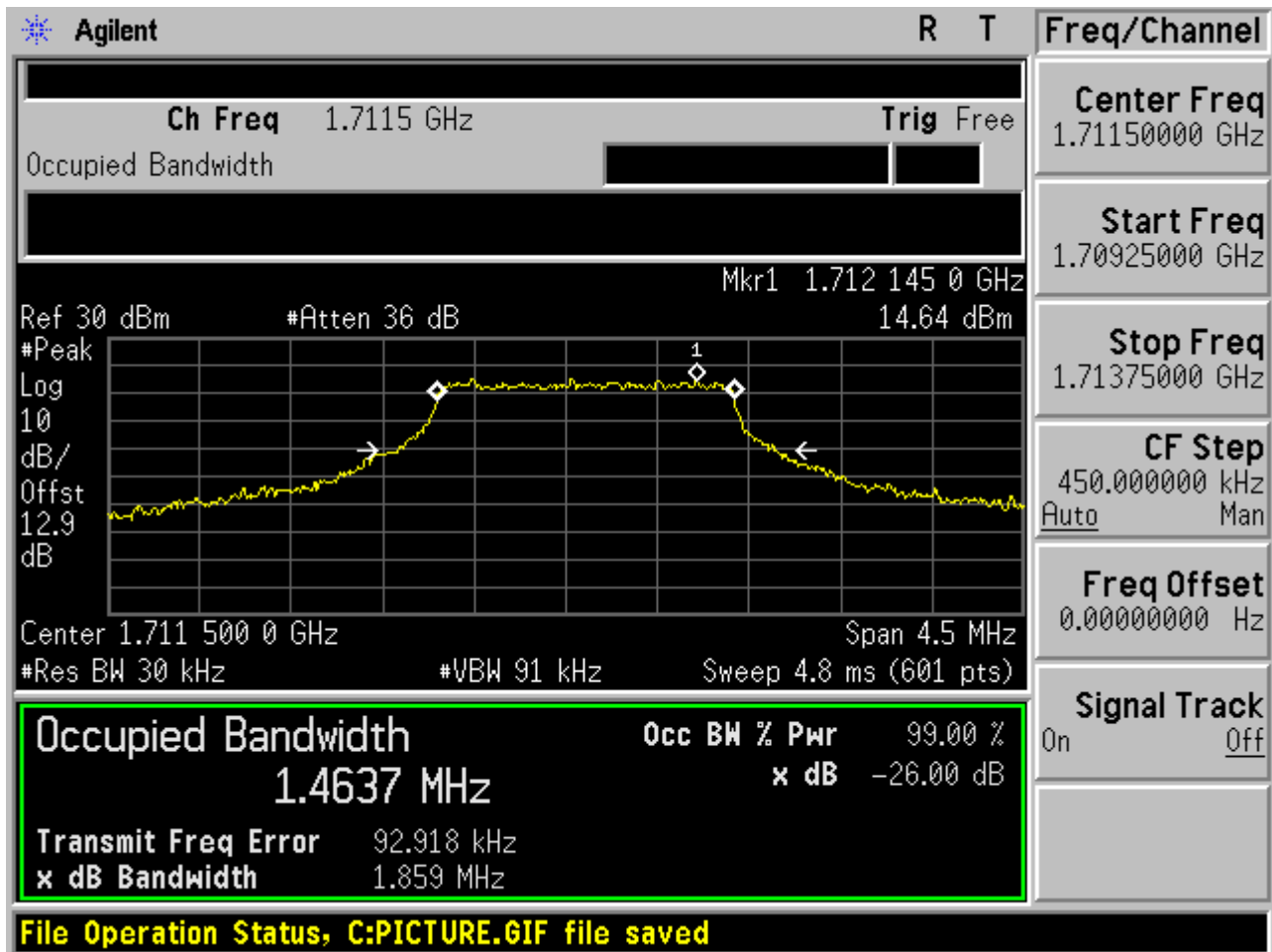


2.2.2.1.2 16QAM /1RB # max



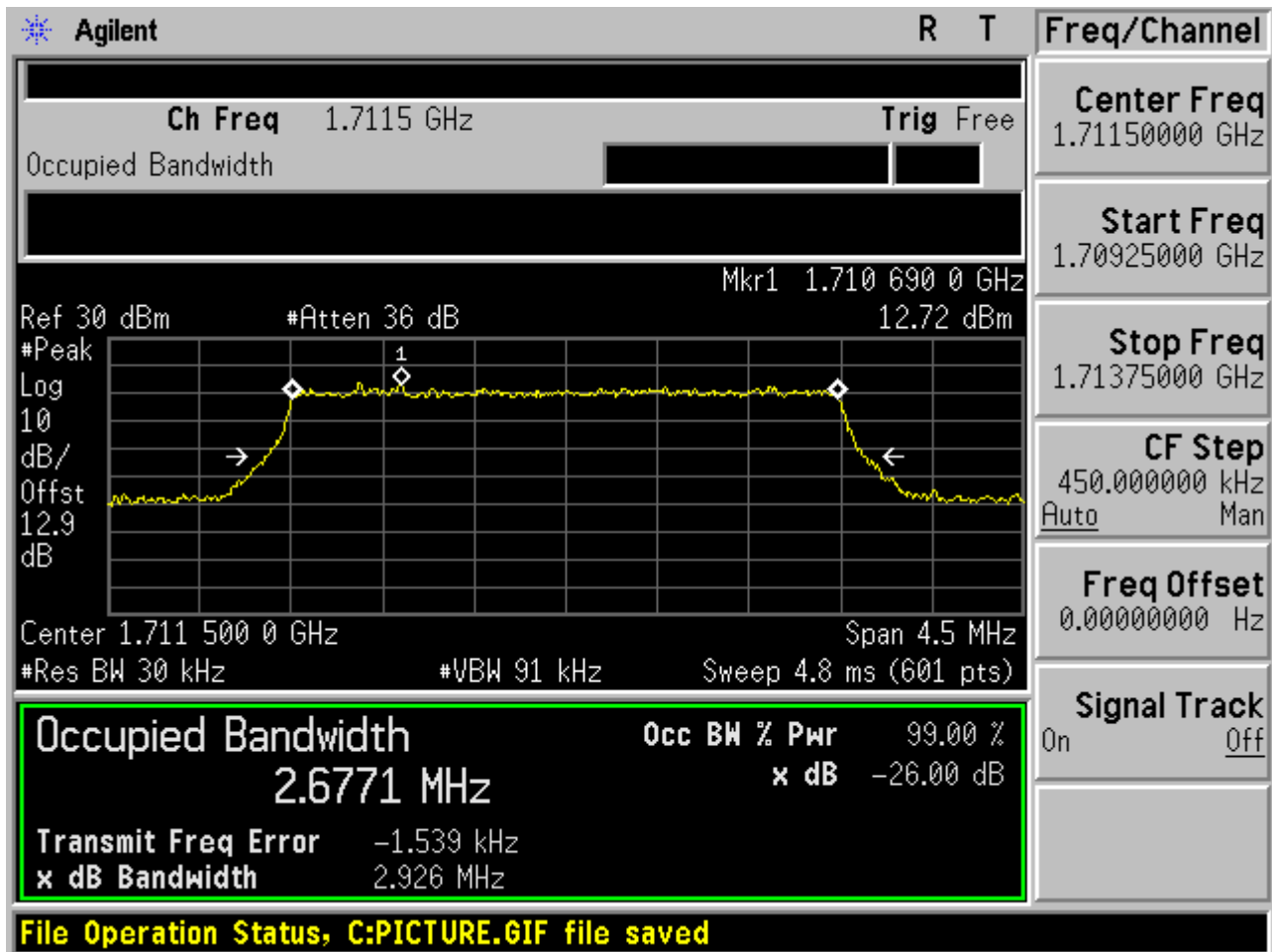


2.2.2.1.3 16QAM /non-1RB #mid/2





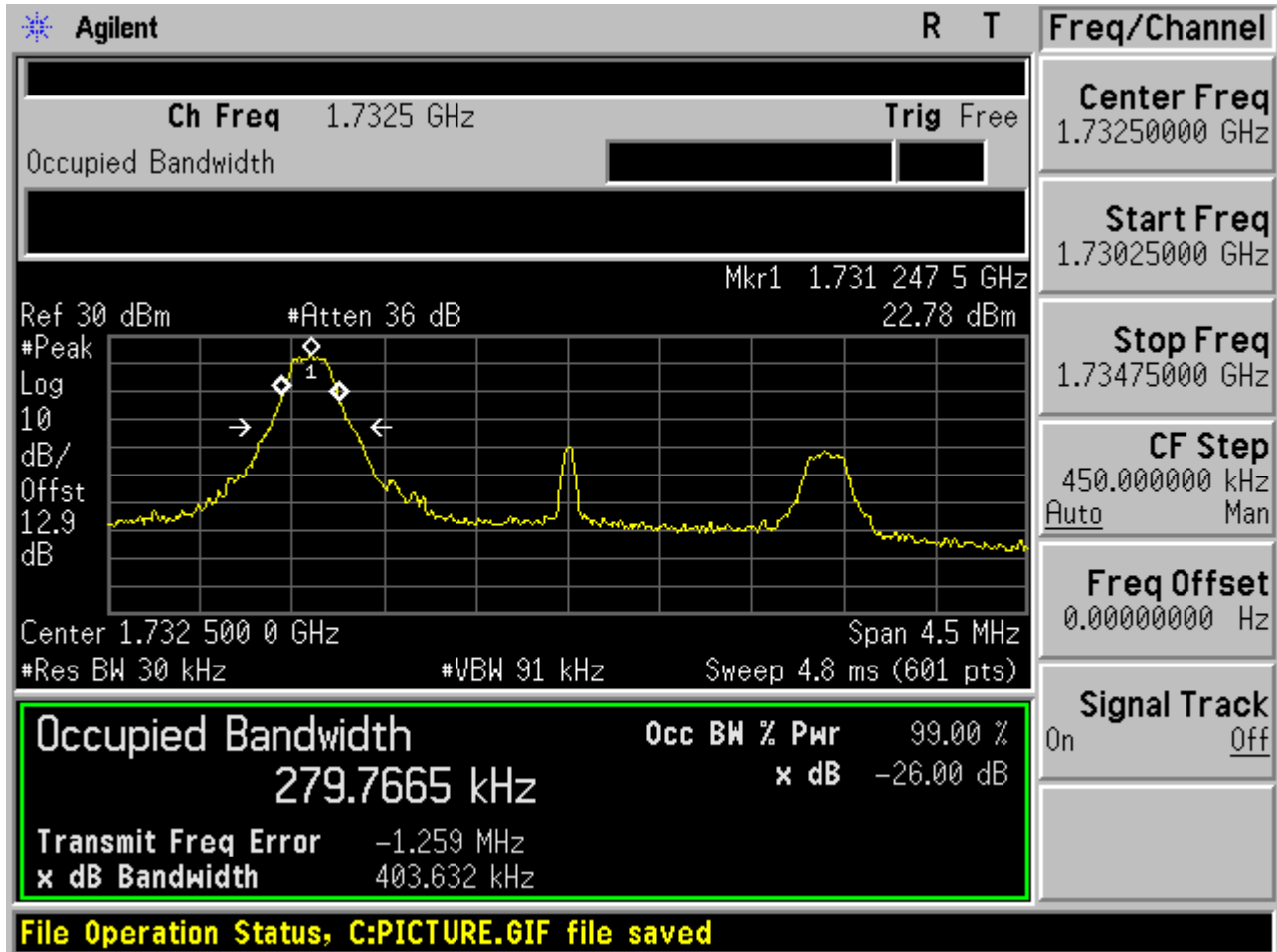
2.2.2.1.4 16QAM /full RBs





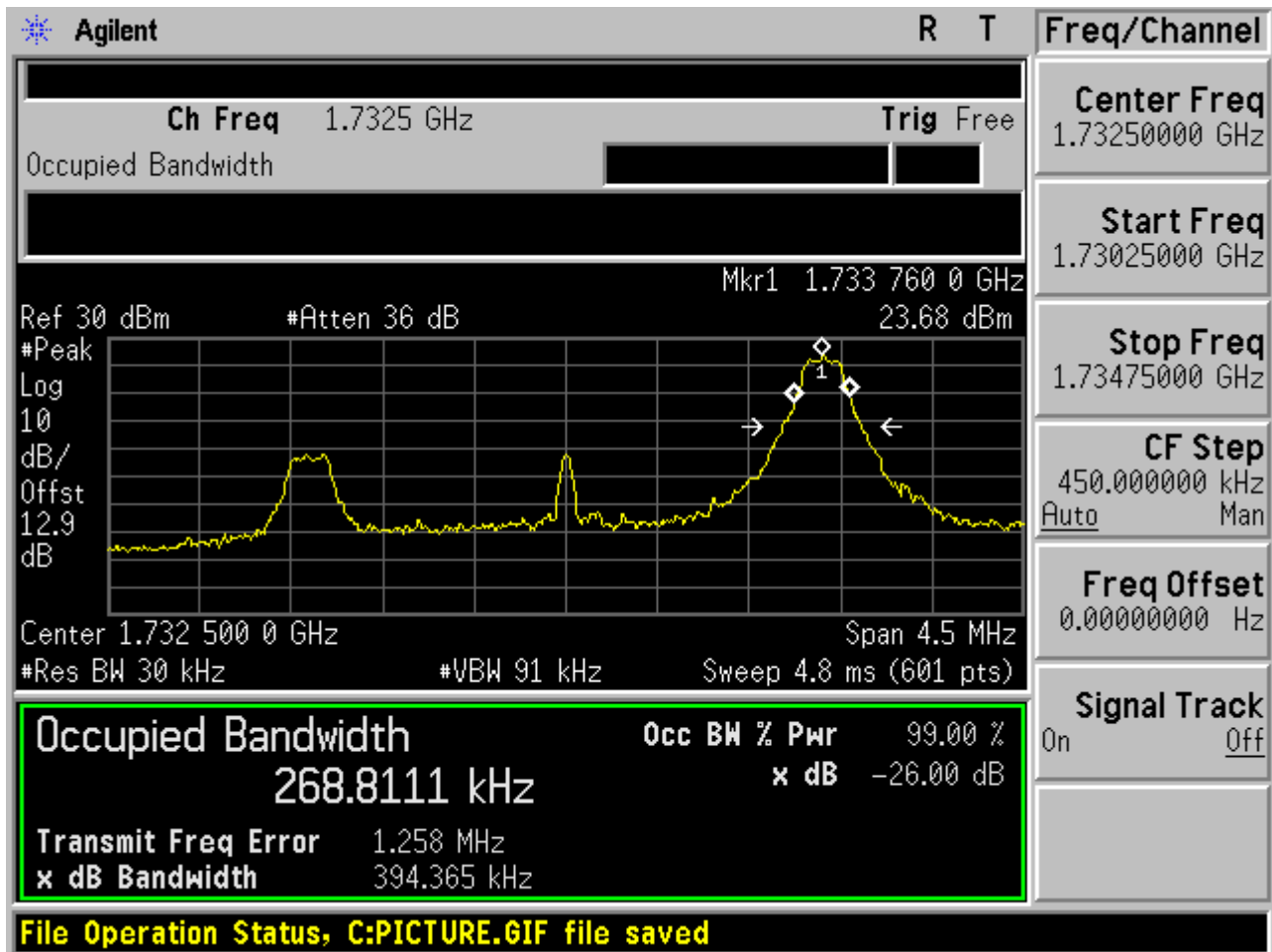
2.2.2.2 Channel =M

2.2.2.2.1 16QAM/1RB # 0



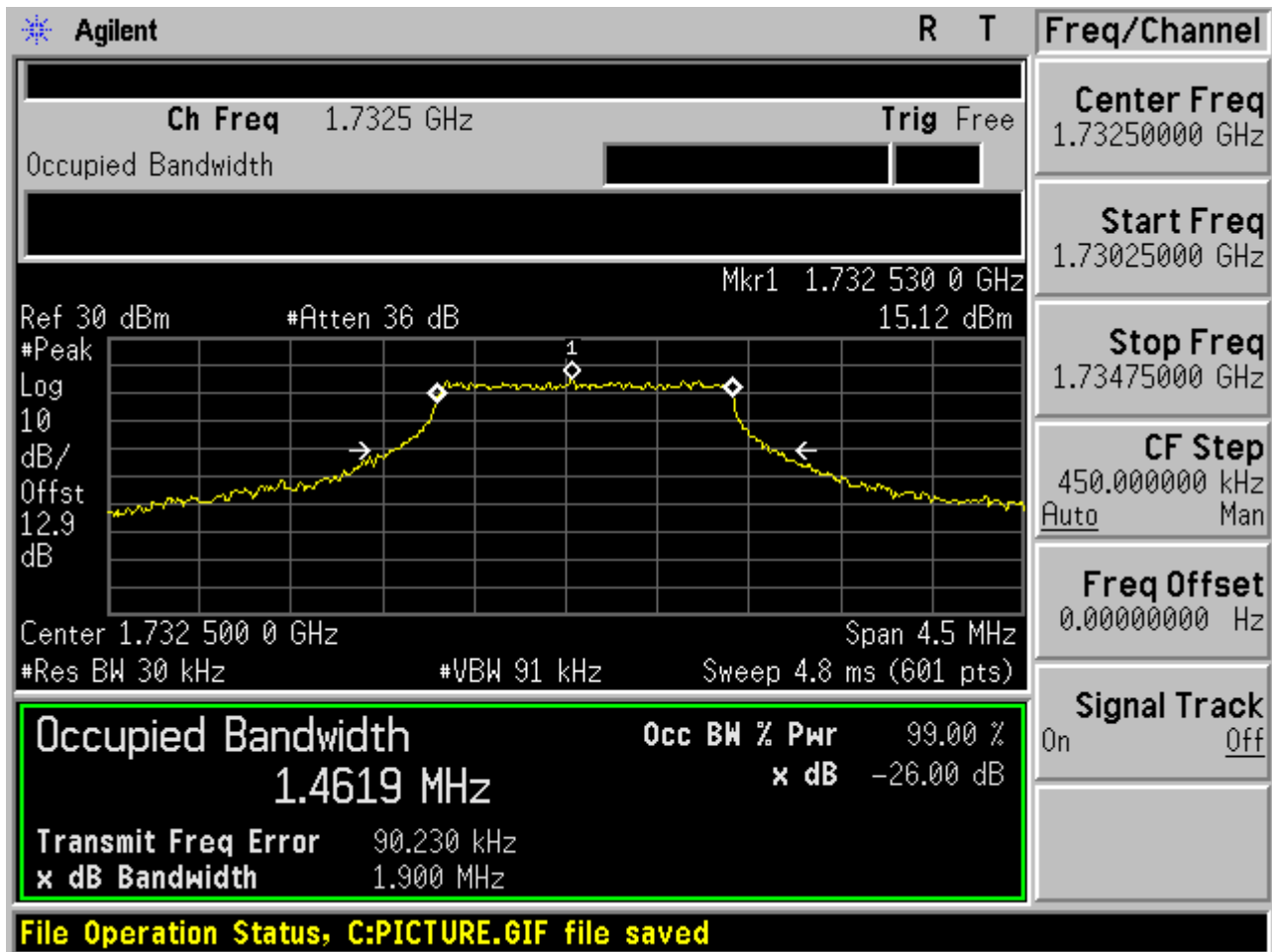


2.2.2.2.2 16QAM /1RB # max



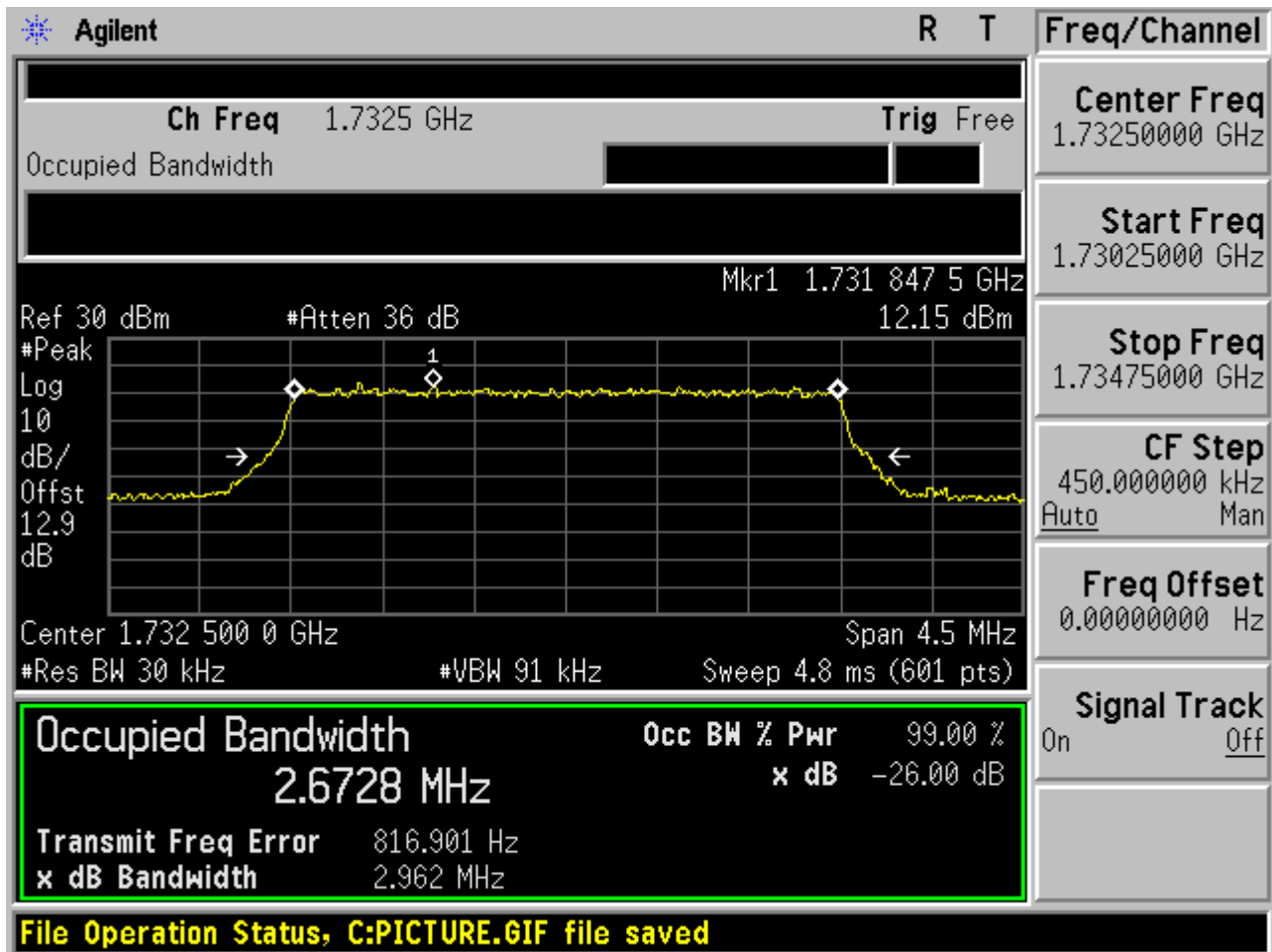


2.2.2.2.3 16QAM /non-1RB #mid/2





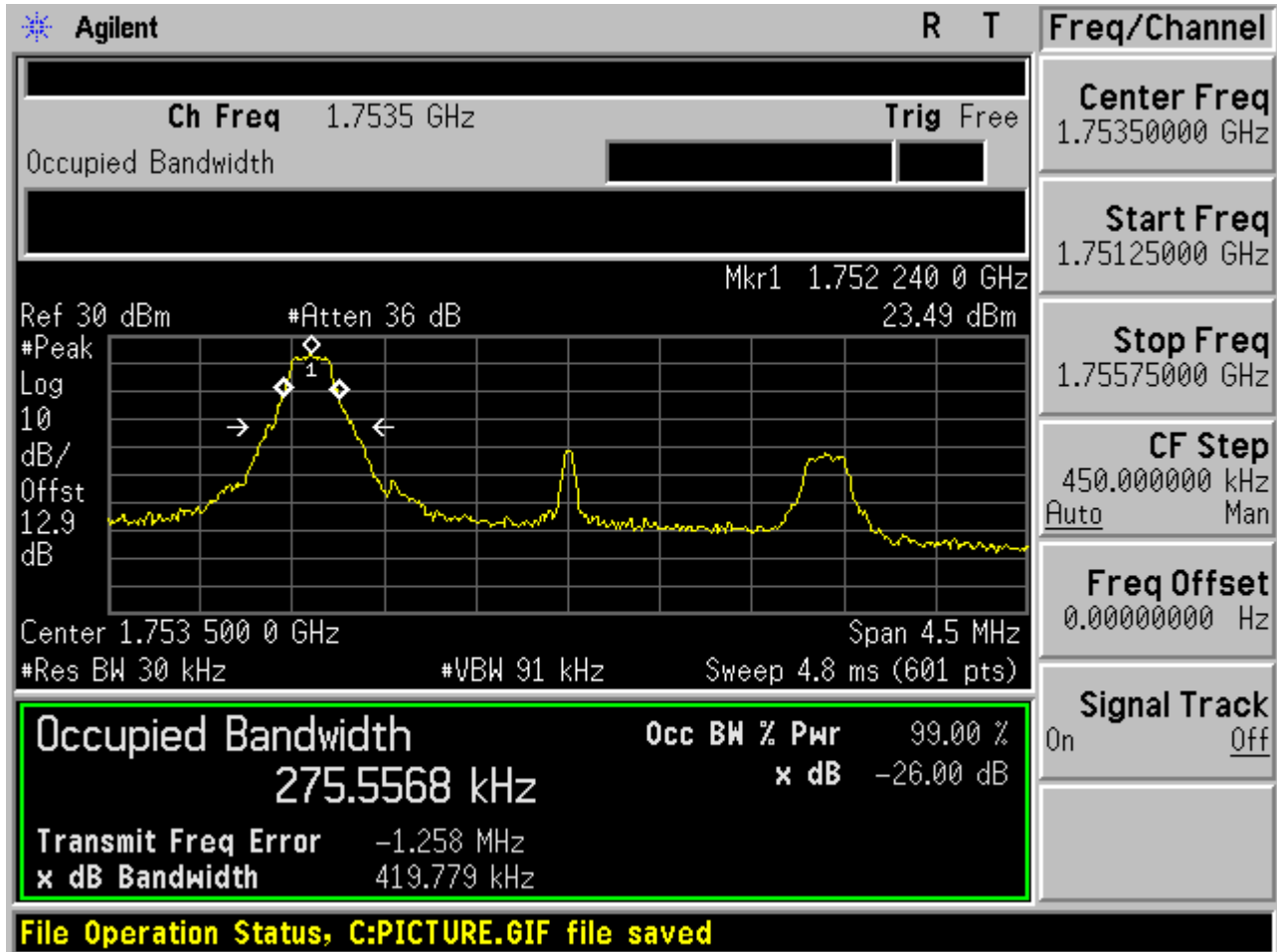
2.2.2.2.4 16QAM /full RBs





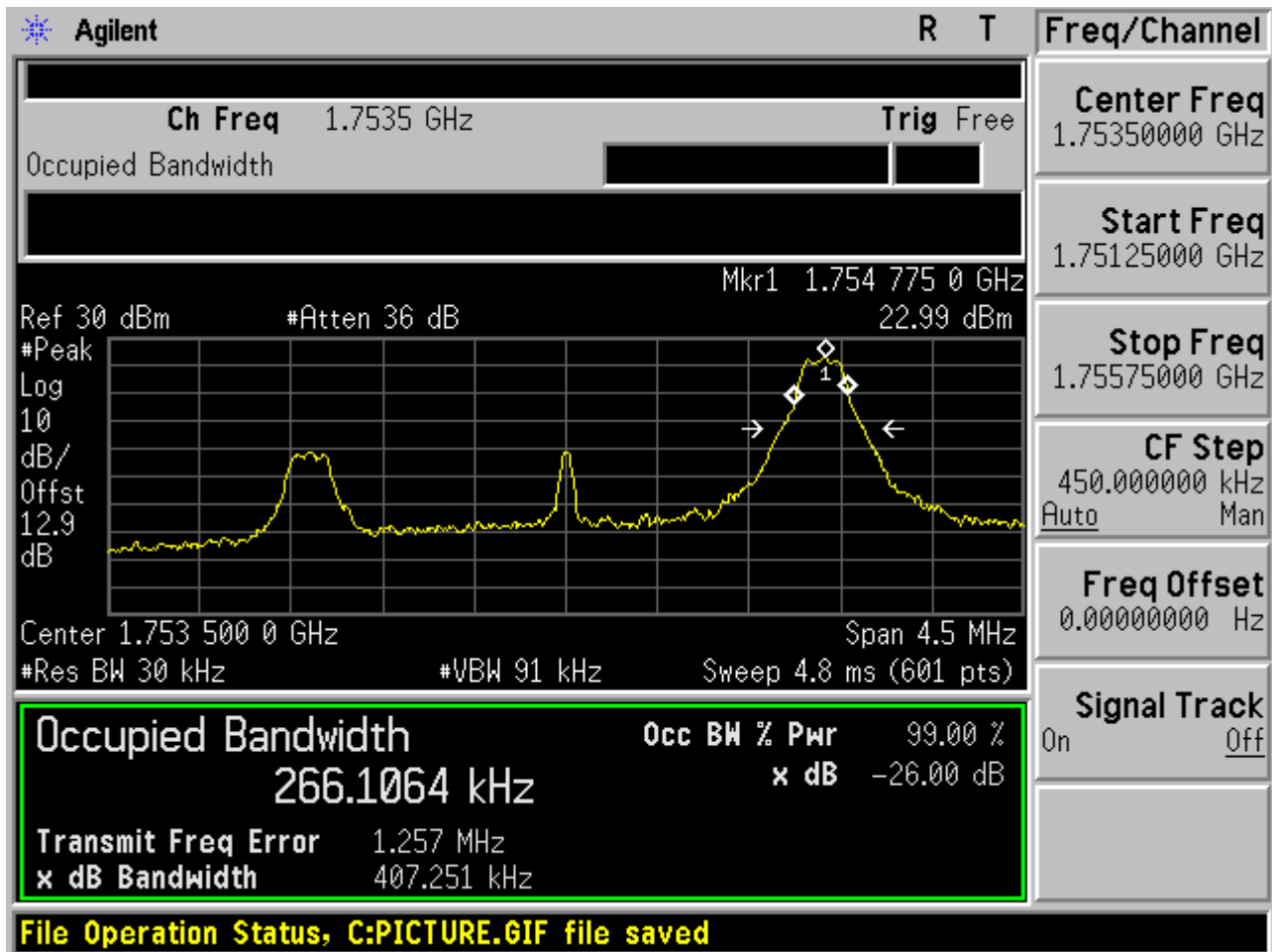
2.2.2.3 Channel =T

2.2.2.3.1 16QAM/1RB # 0



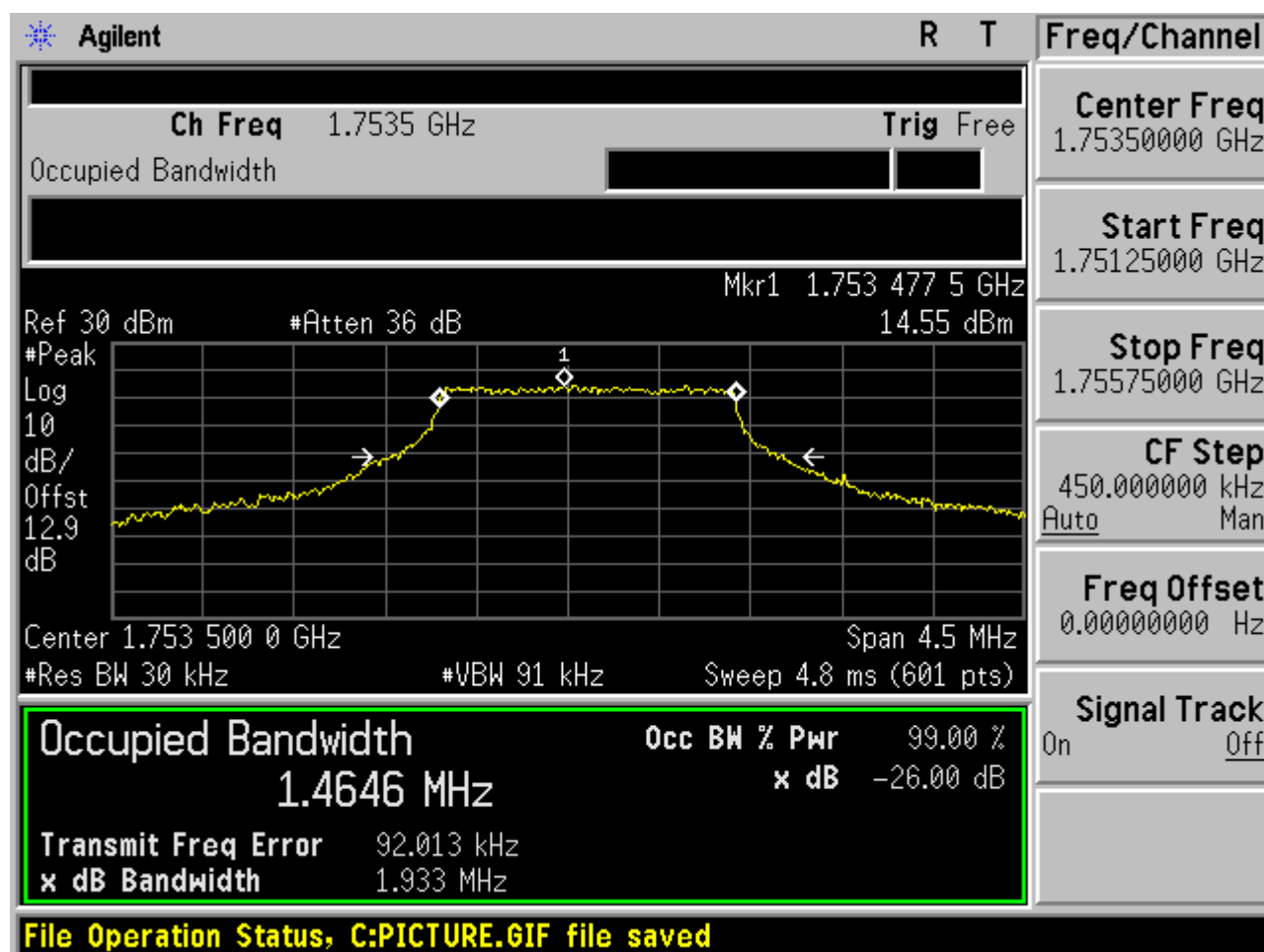


2.2.2.3.2 16QAM /1RB # max



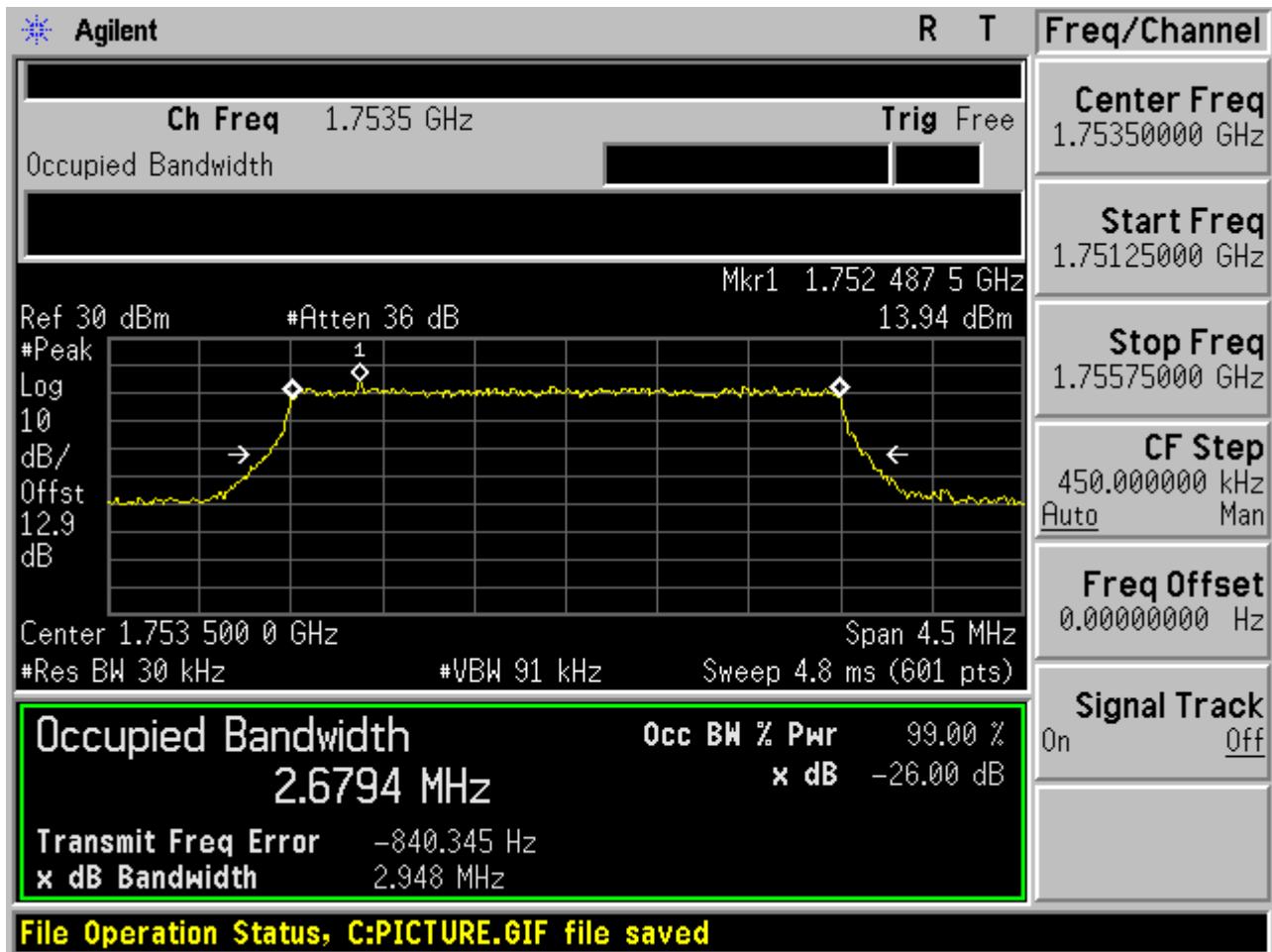


2.2.2.3.3 16QAM /non-1RB #mid/2





2.2.2.3.4 16QAM /full RBs

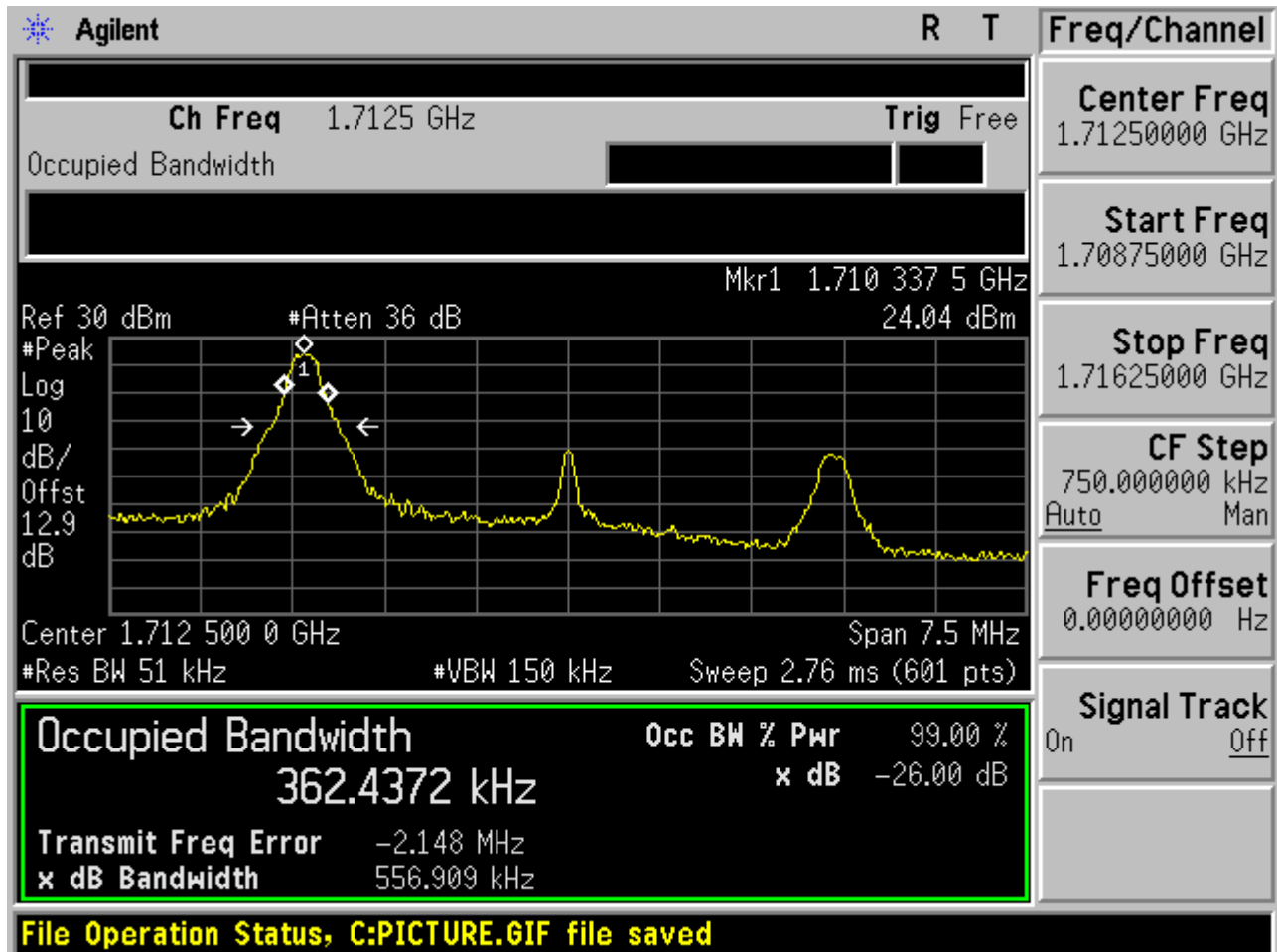




2.2.3 Channel Bandwidth = 5 MHz

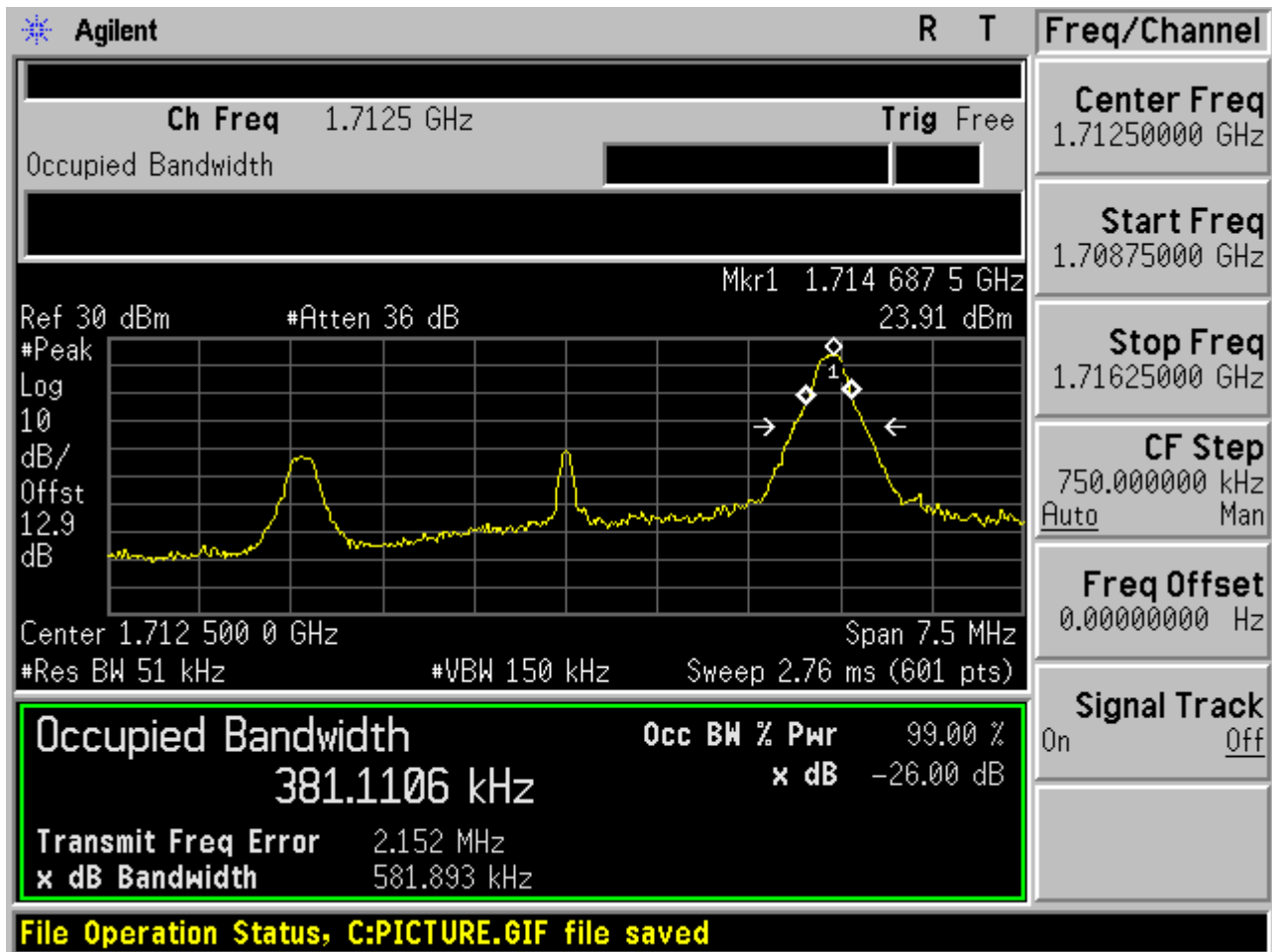
2.2.3.1 Channel =B

2.2.3.1.1 16QAM/1RB # 0



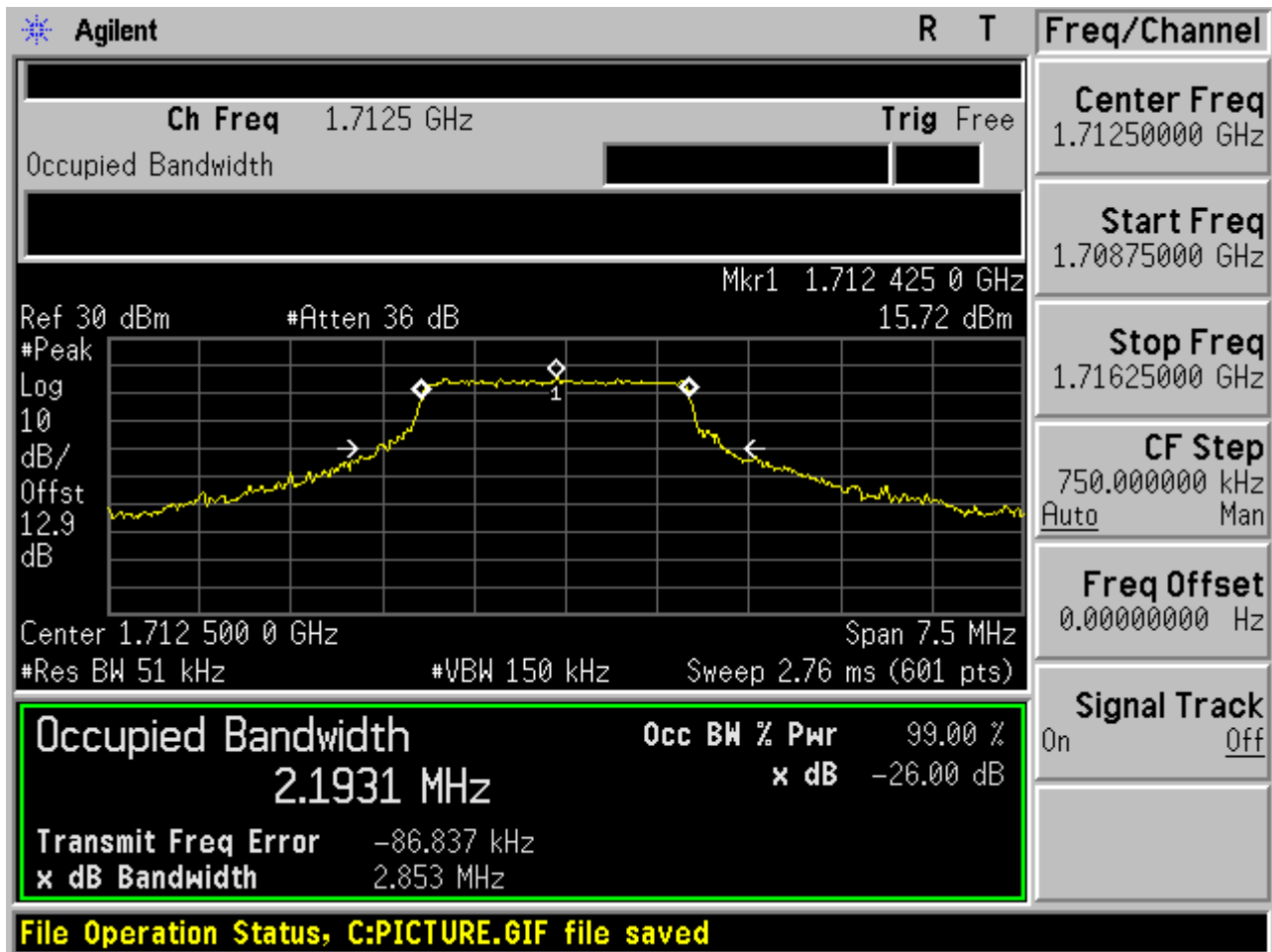


2.2.3.1.2 16QAM /1RB # max



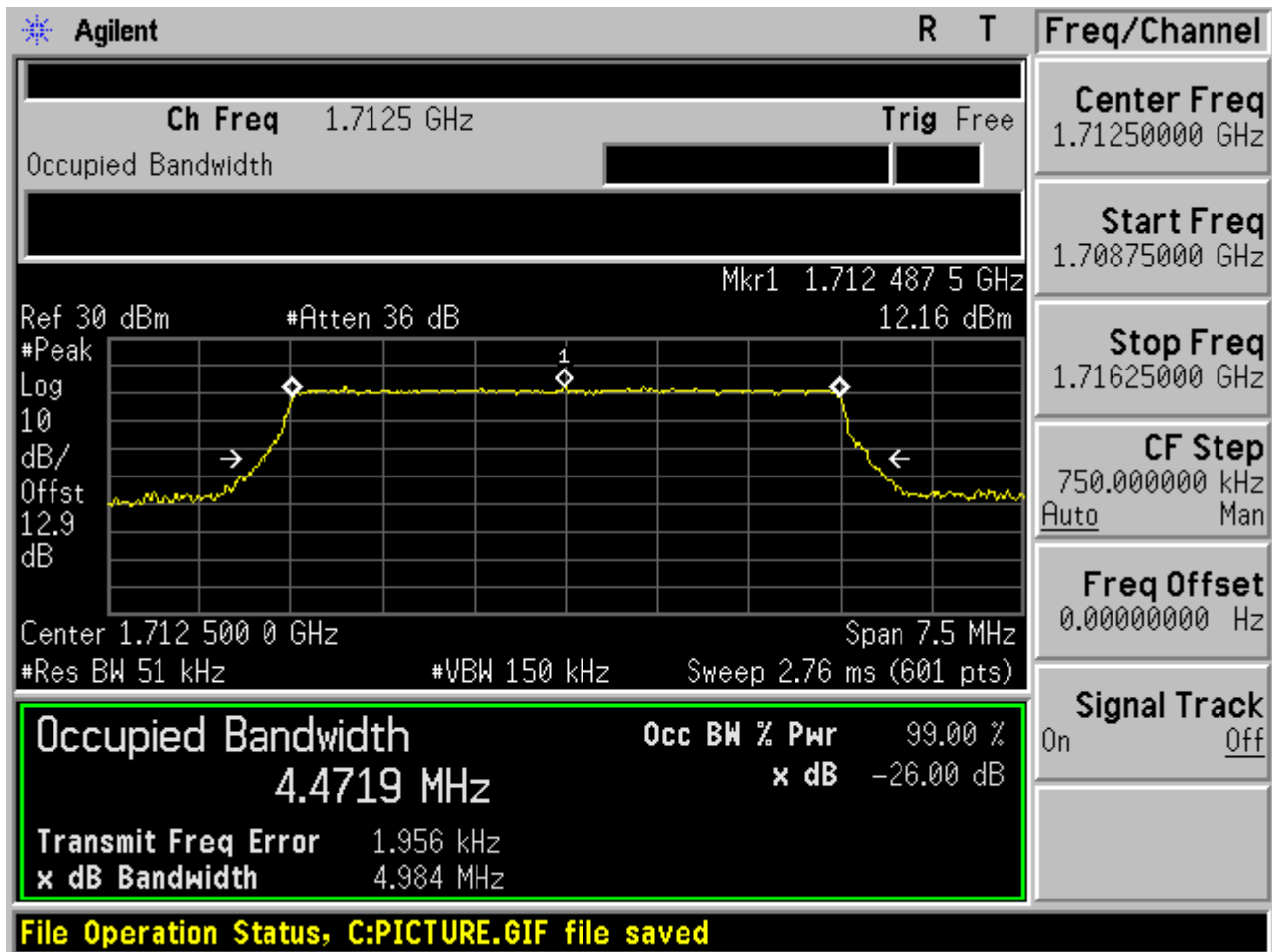


2.2.3.1.3 16QAM /non-1RB #mid/2





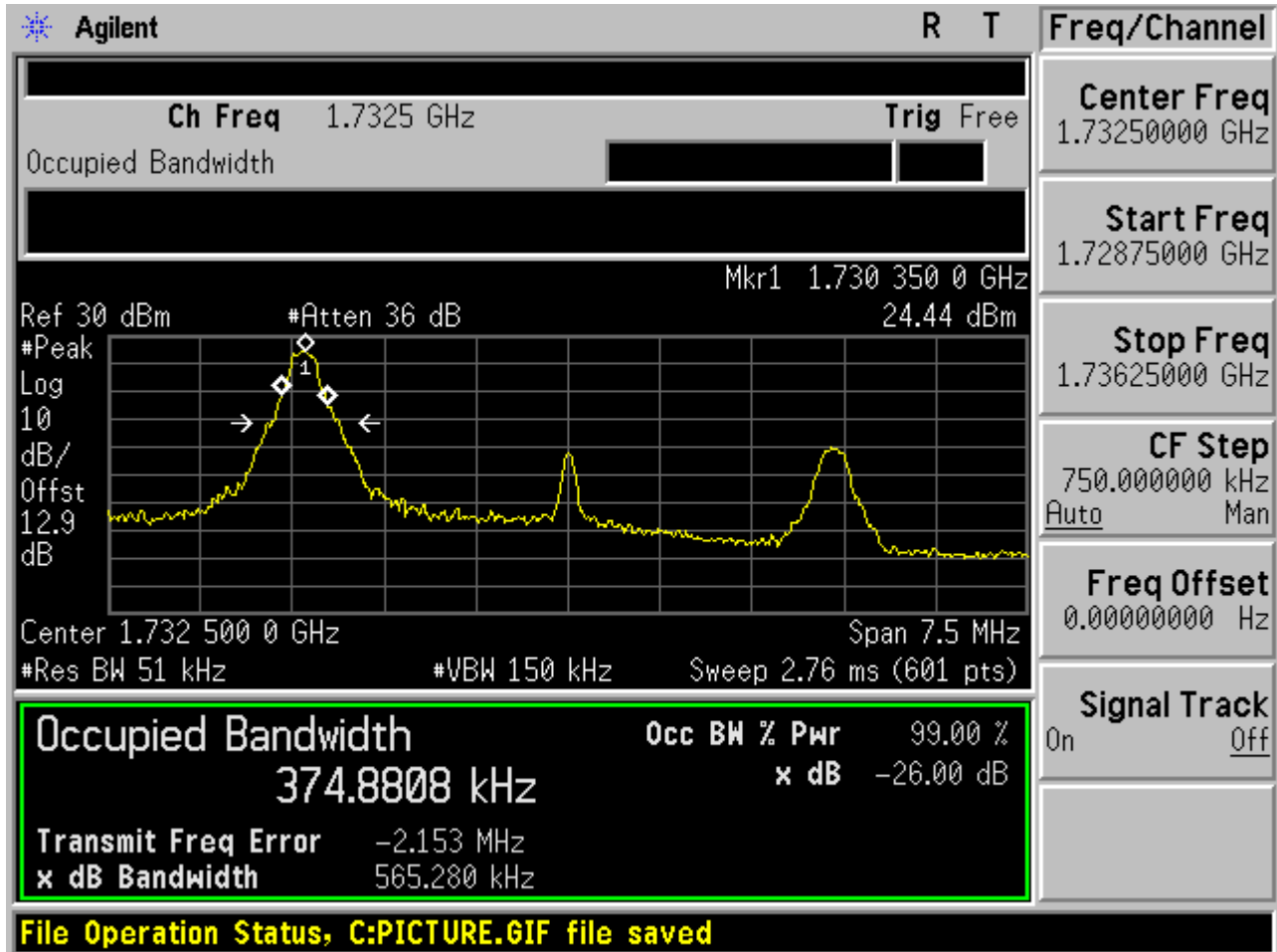
2.2.3.1.4 16QAM /full RBs





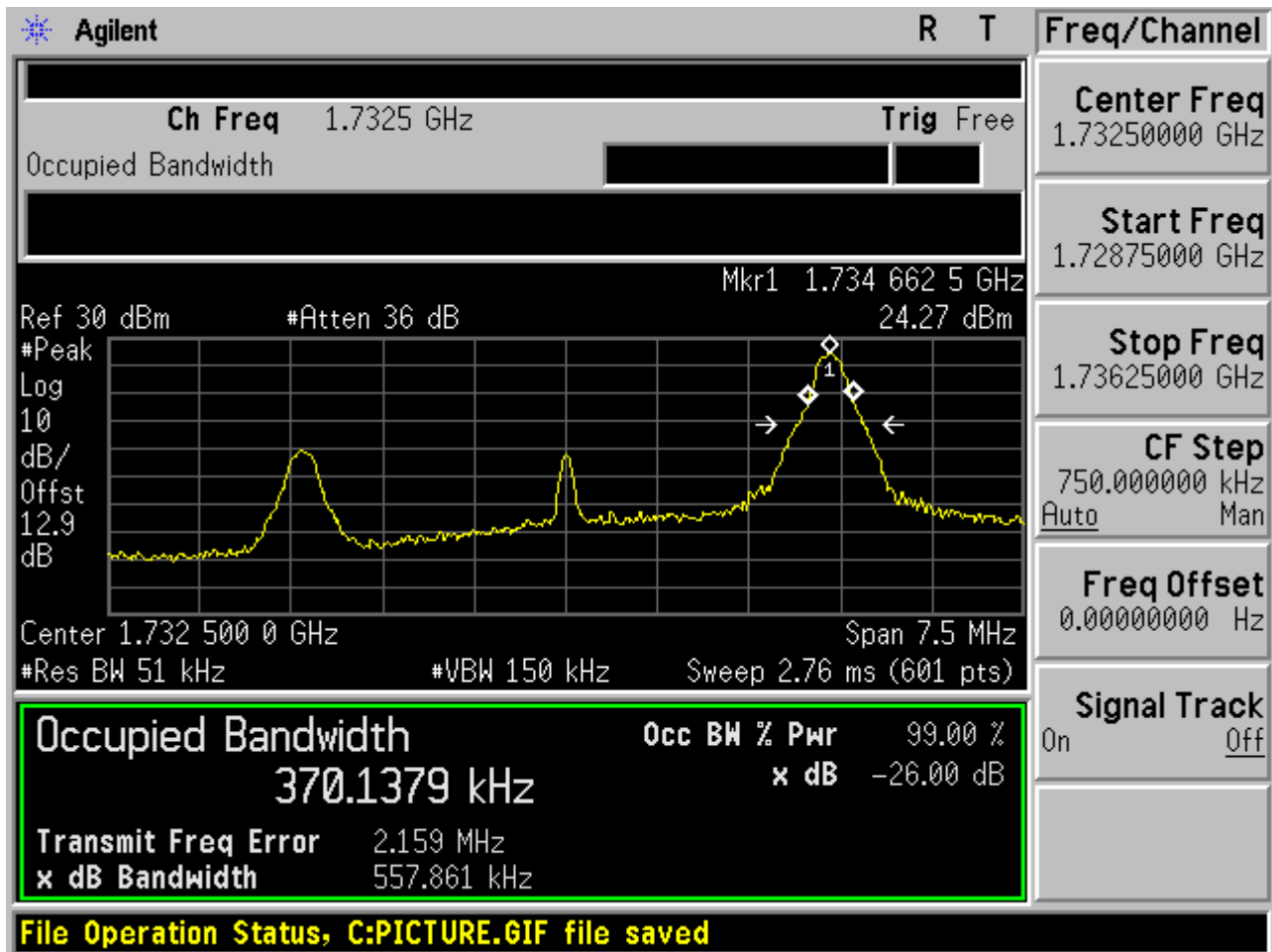
2.2.3.2 Channel =M

2.2.3.2.1 16QAM/1RB # 0



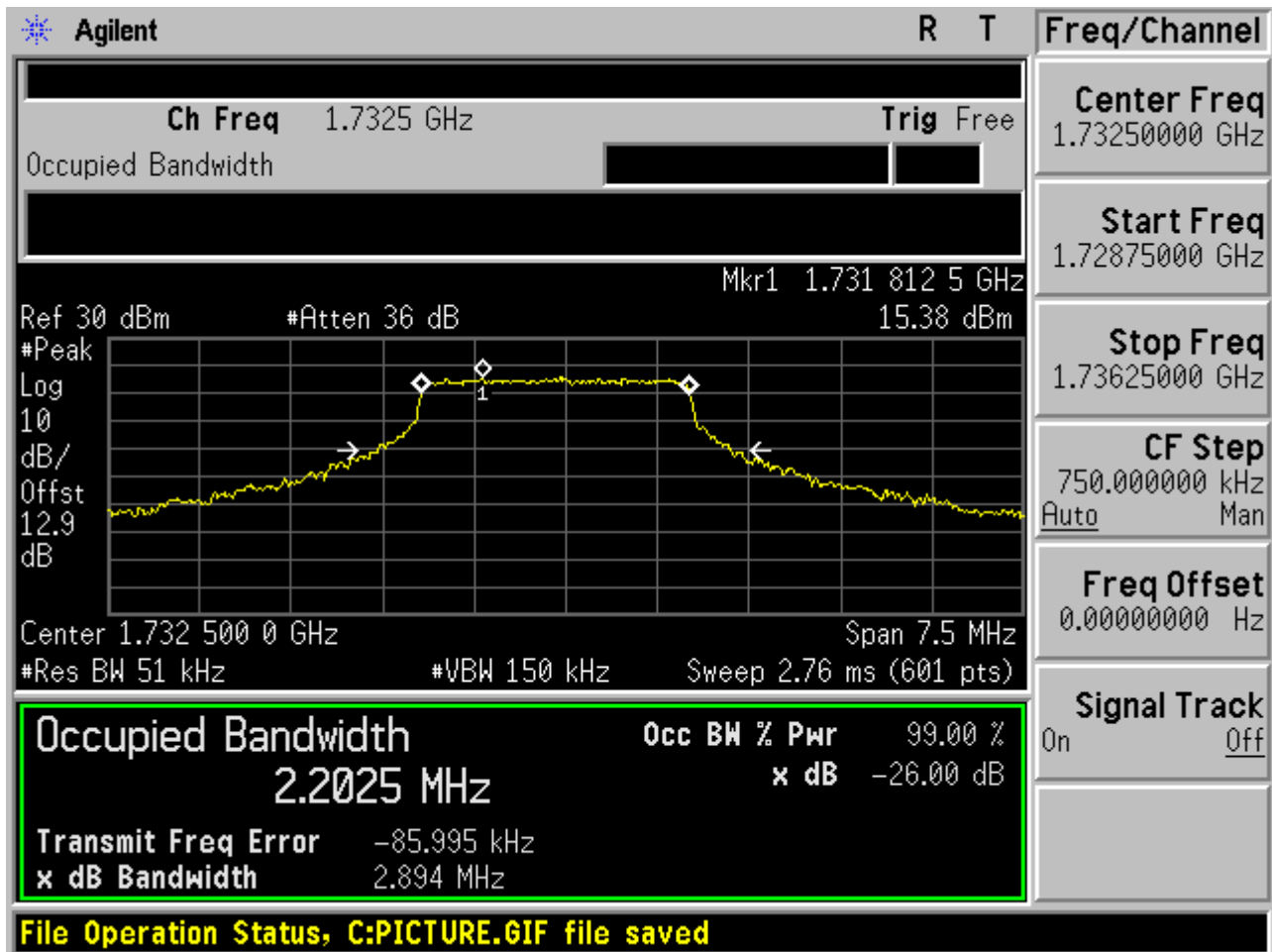


2.2.3.2.2 16QAM /1RB # max



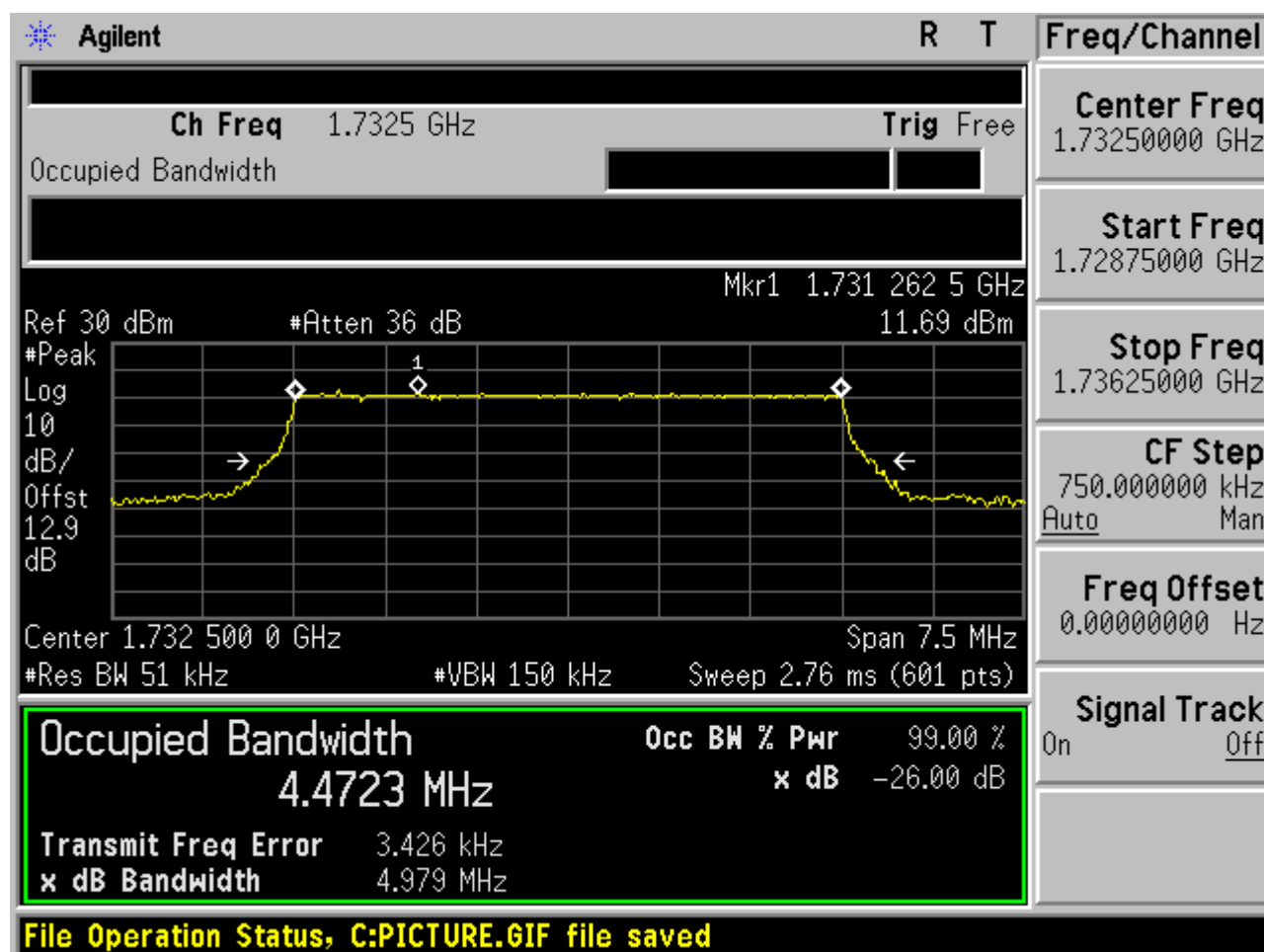


2.2.3.2.3 16QAM /non-1RB #mid/2





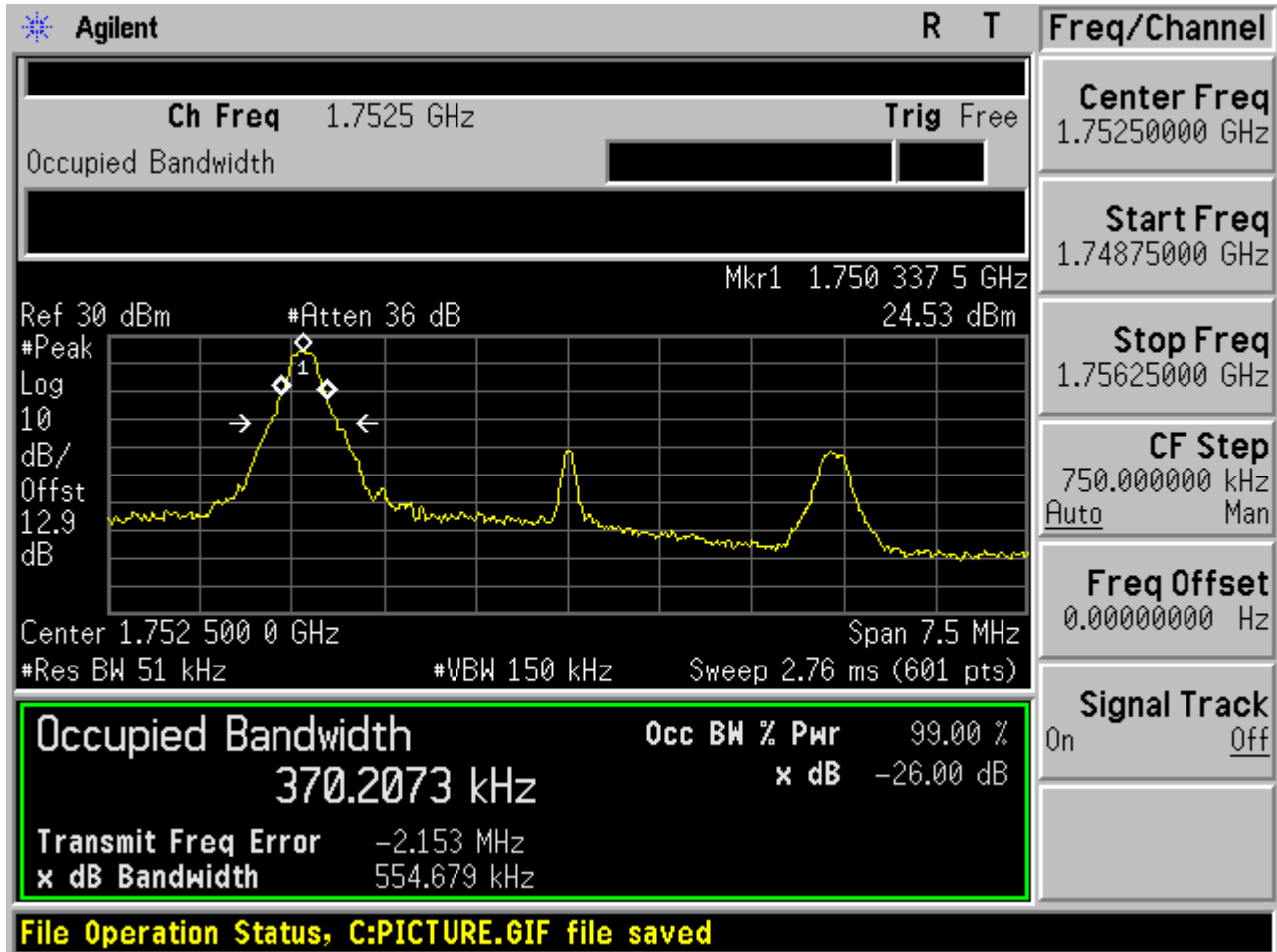
2.2.3.2.4 16QAM /full RBs





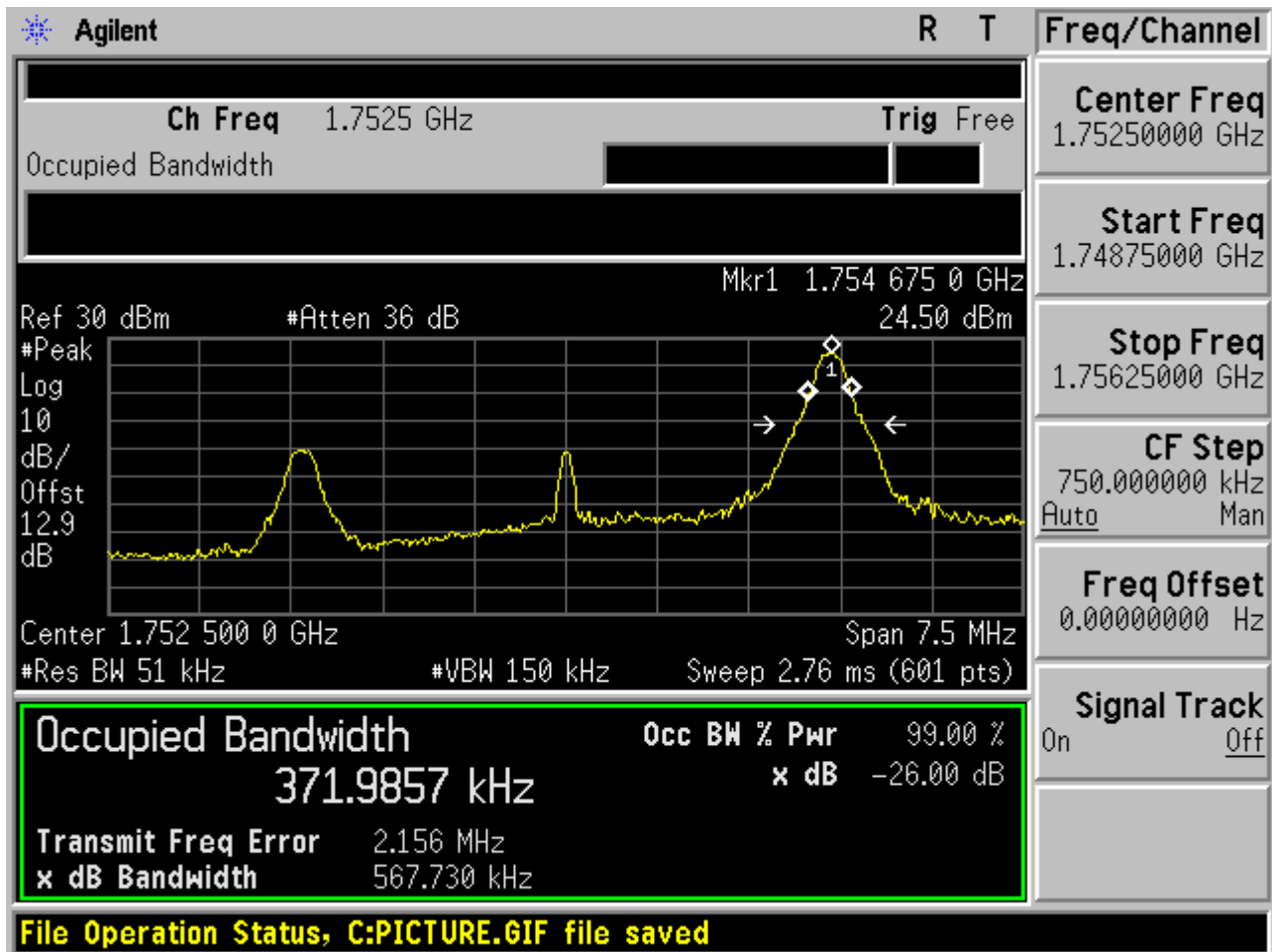
2.2.3.3 Channel =T

2.2.3.3.1 16QAM/1RB # 0



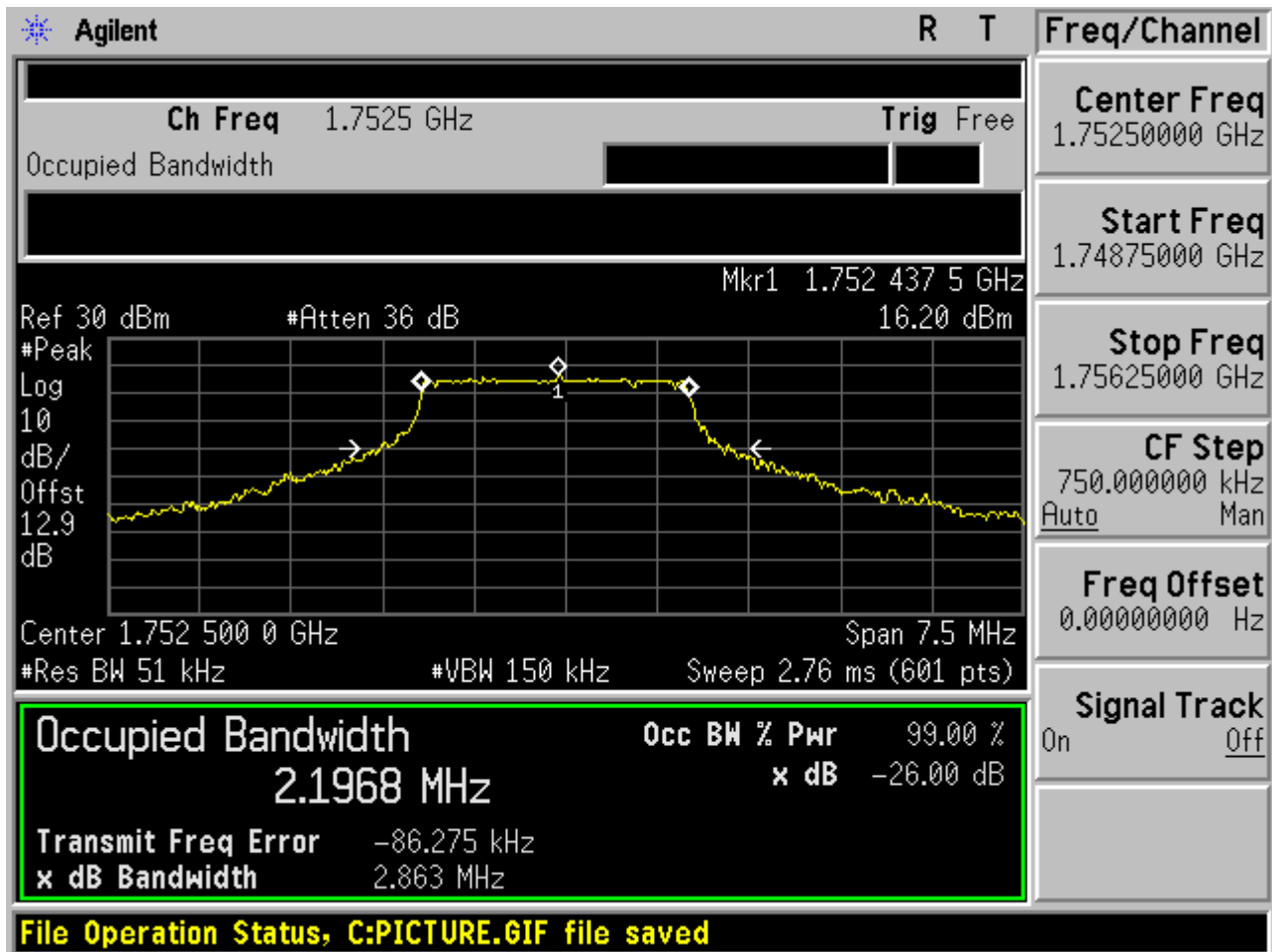


2.2.3.3.2 16QAM /1RB # max



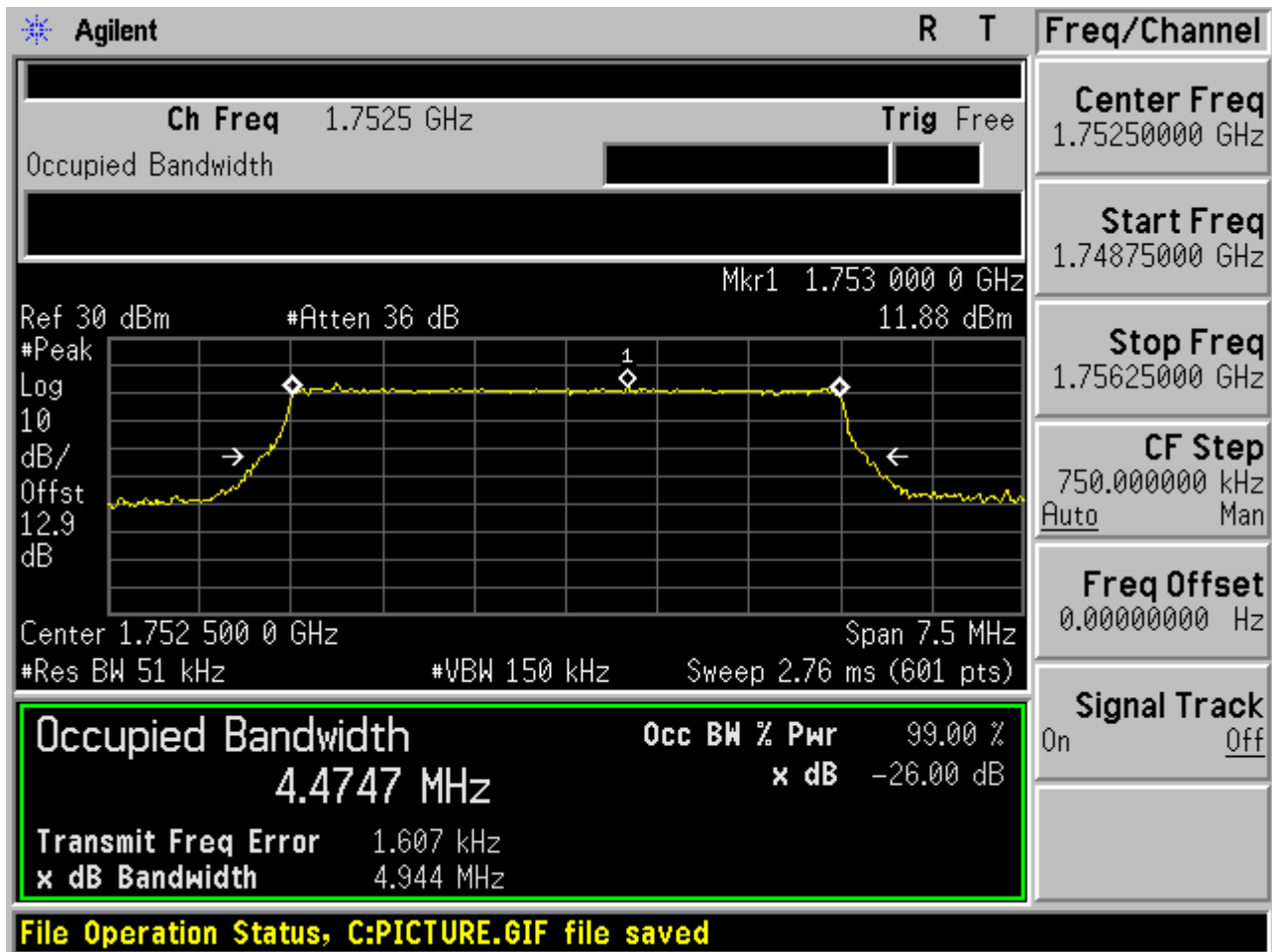


2.2.3.3.3 16QAM /non-1RB #mid/2





2.2.3.3.4 16QAM /full RBs

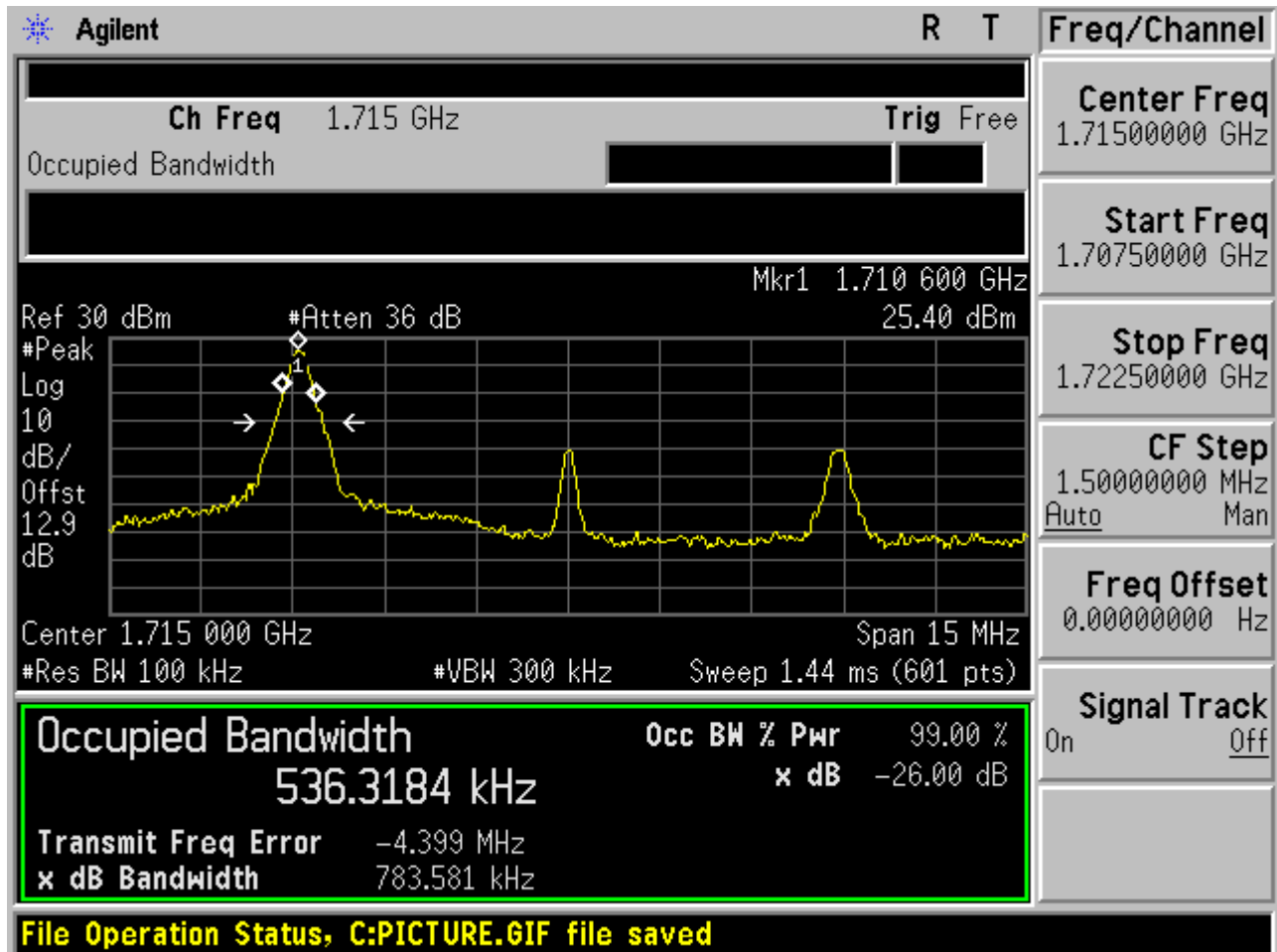




2.2.4 Channel Bandwidth = 10 MHz

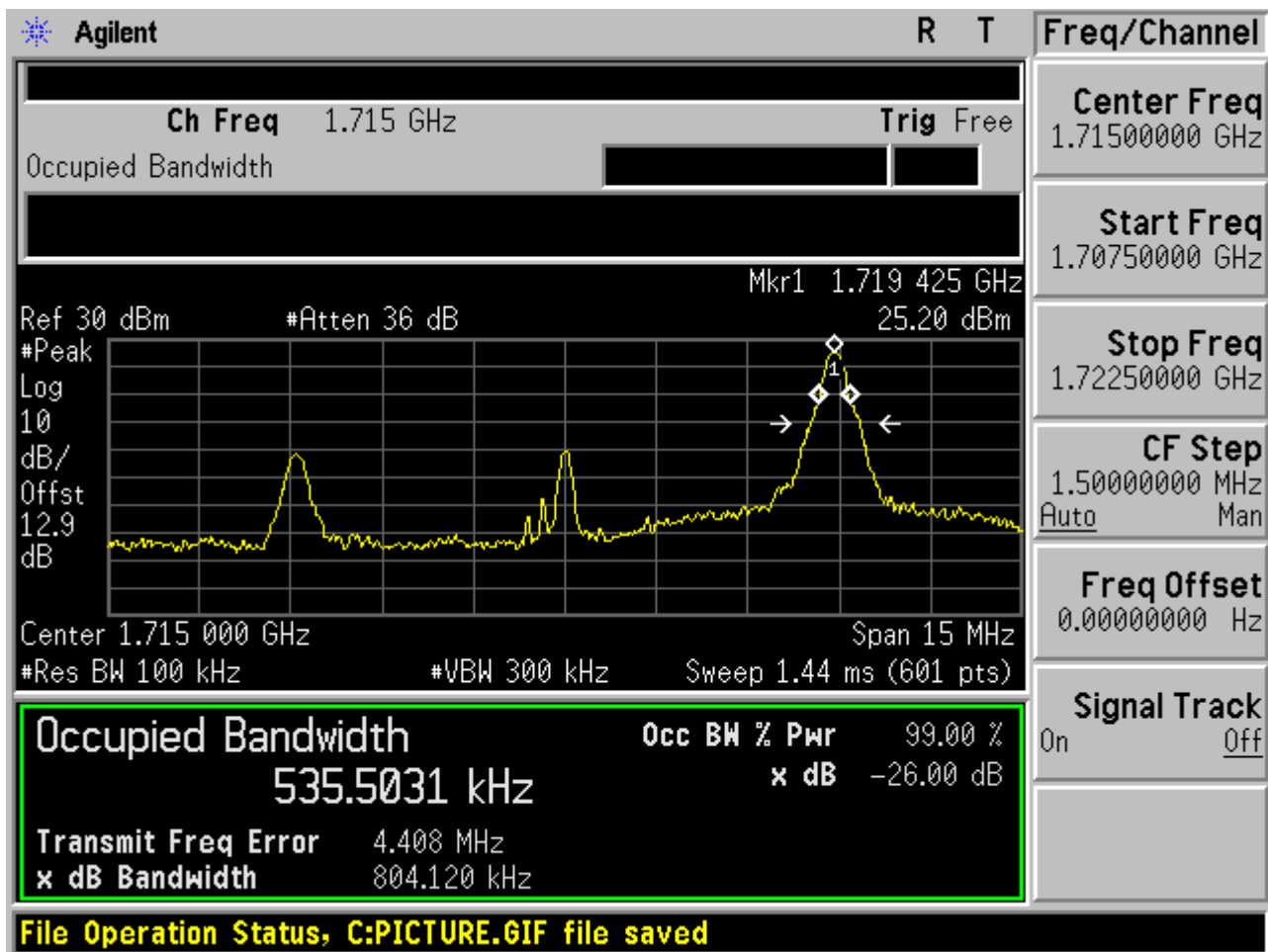
2.2.4.1 Channel =B

2.2.4.1.1 16QAM/1RB # 0



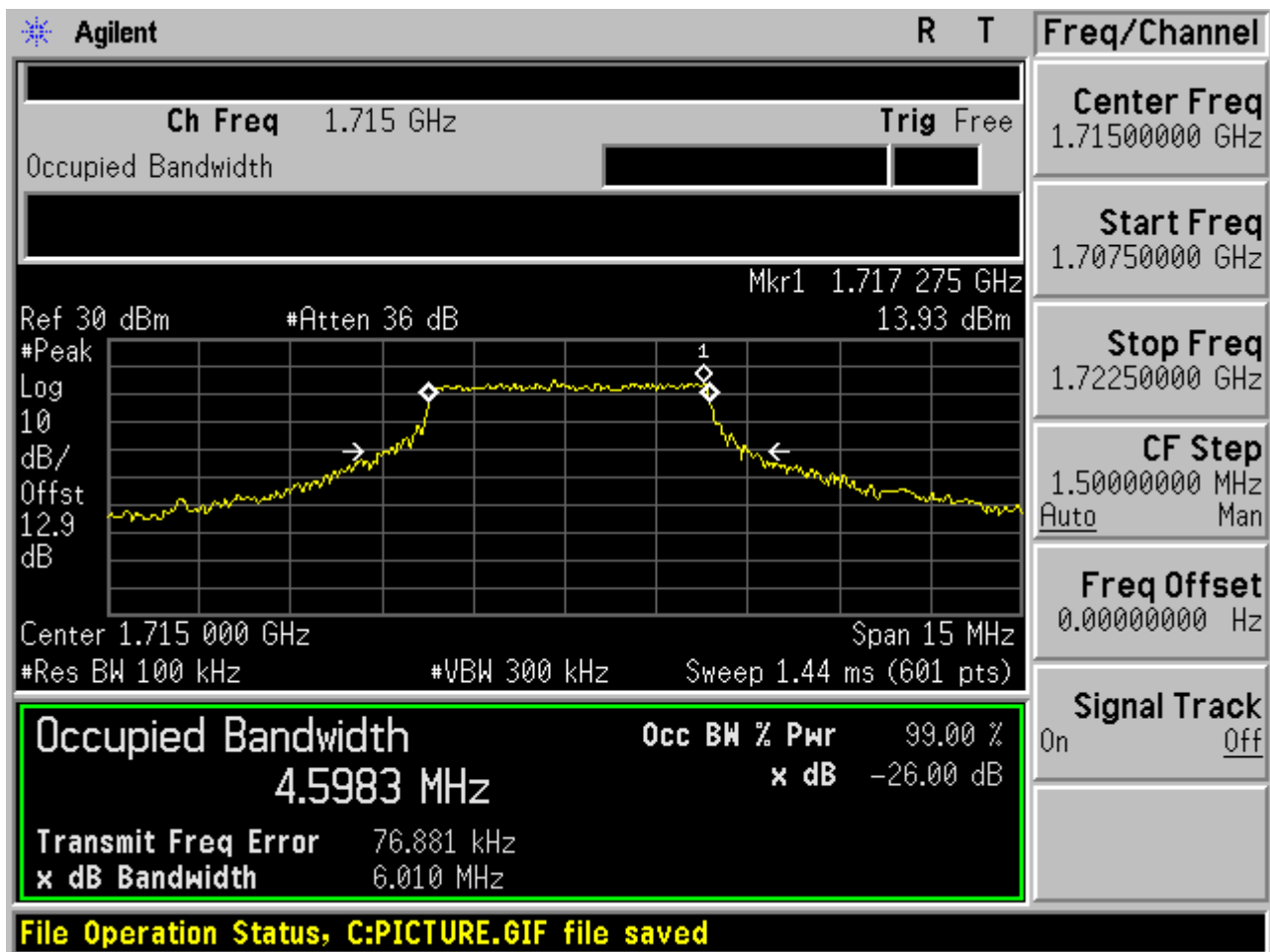


2.2.4.1.2 16QAM /1RB # max



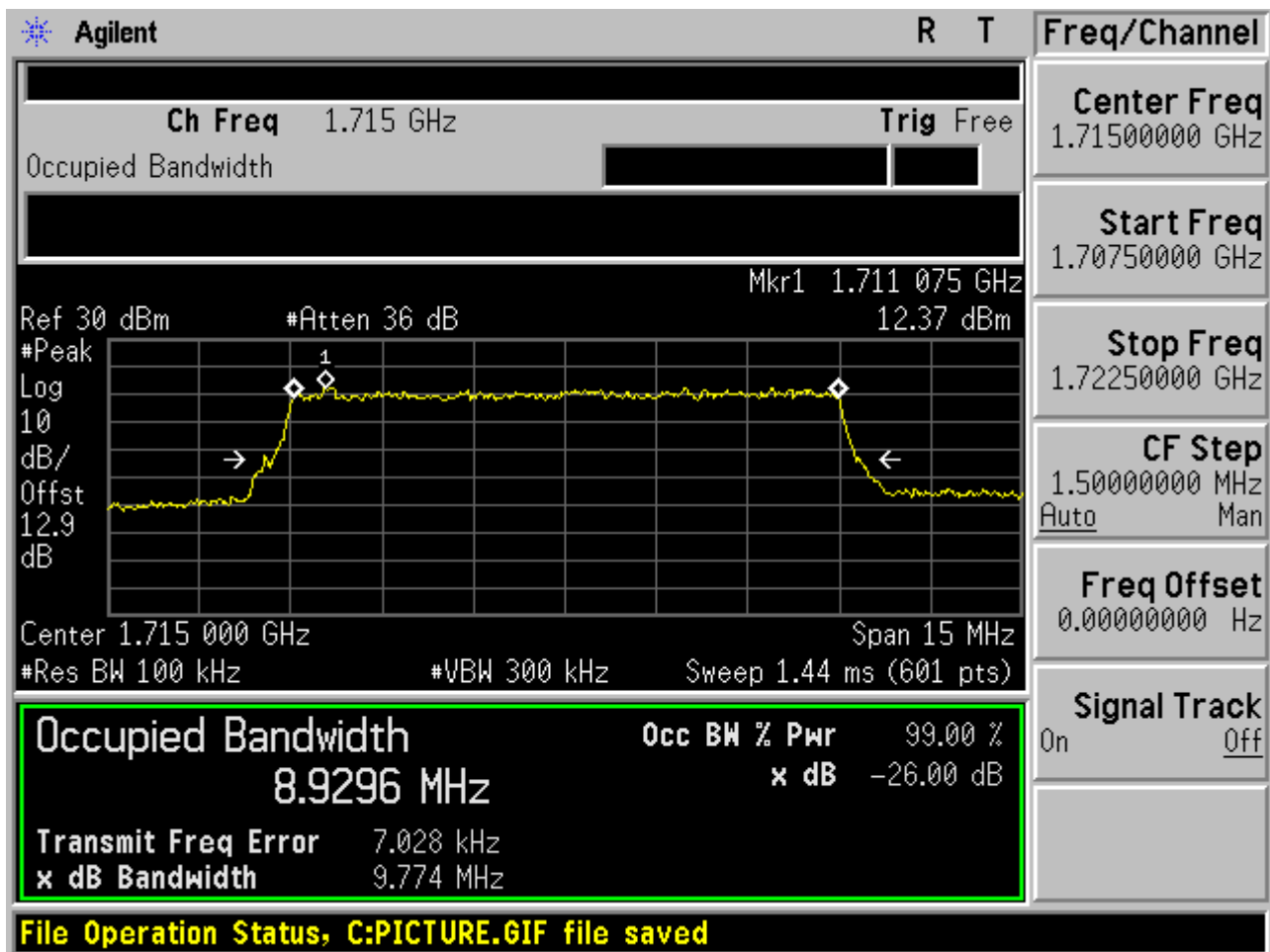


2.2.4.1.3 16QAM /non-1RB #mid/2





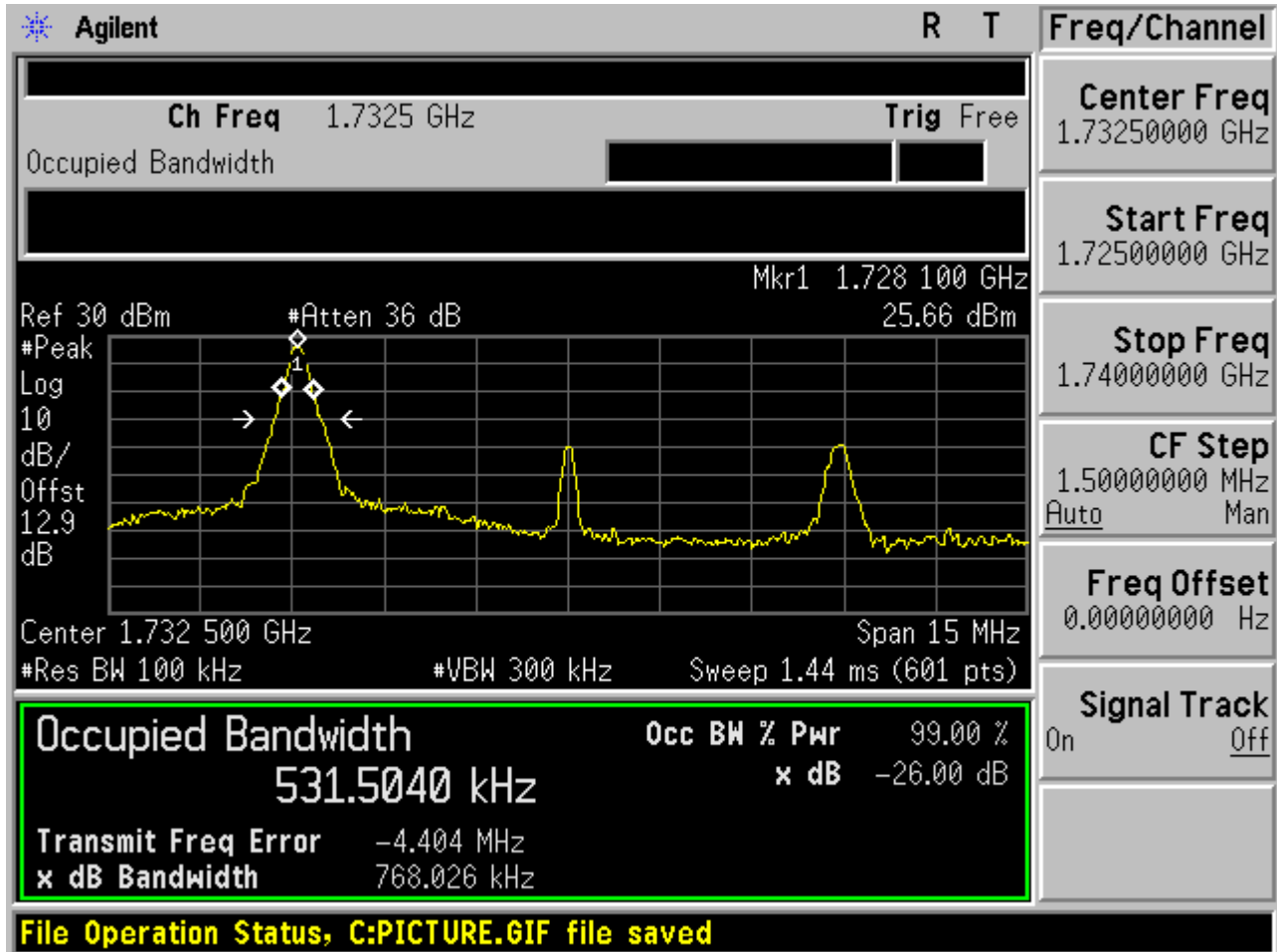
2.2.4.1.4 16QAM /full RBs





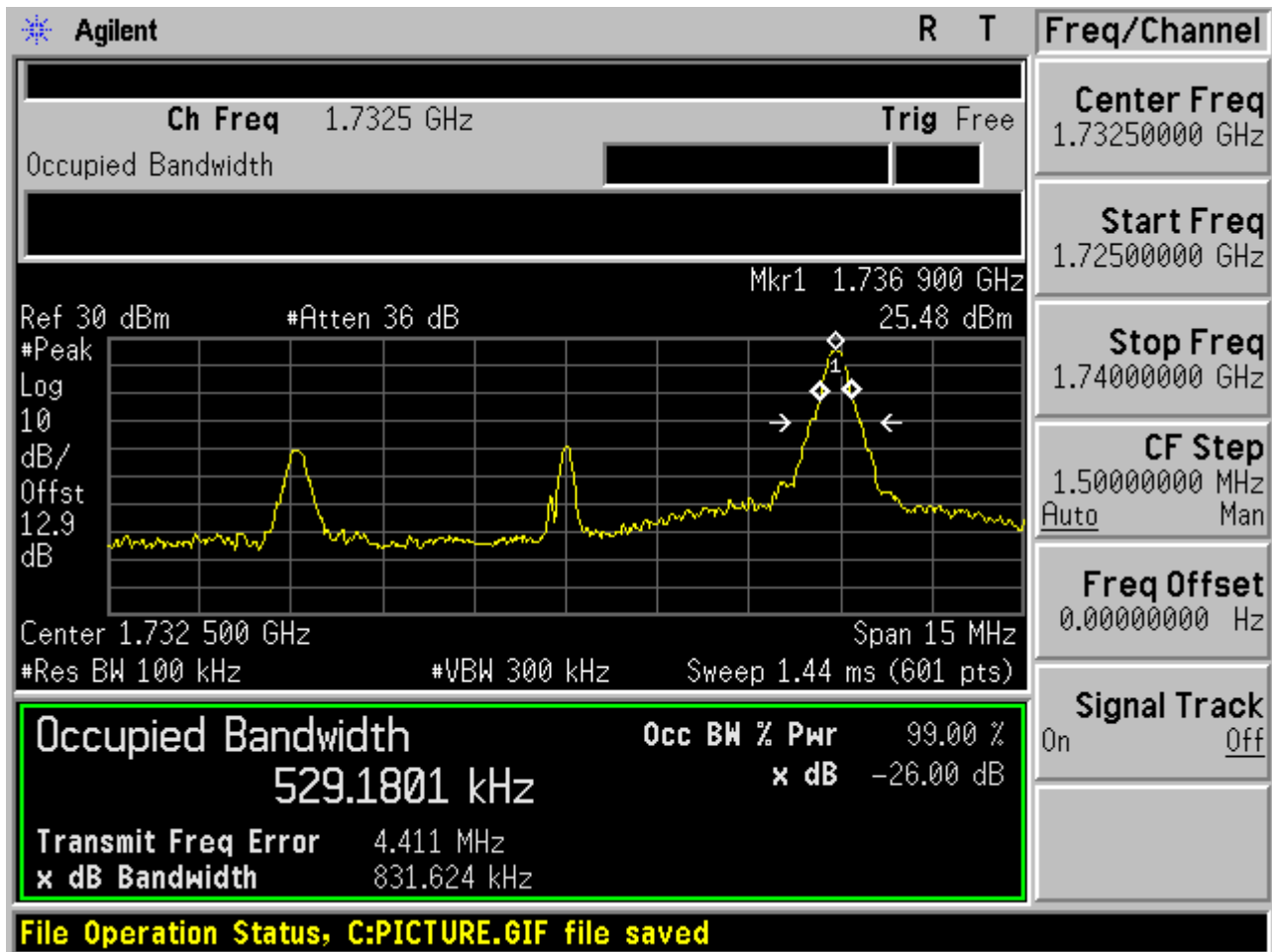
2.2.4.2 Channel =M

2.2.4.2.1 16QAM/1RB # 0



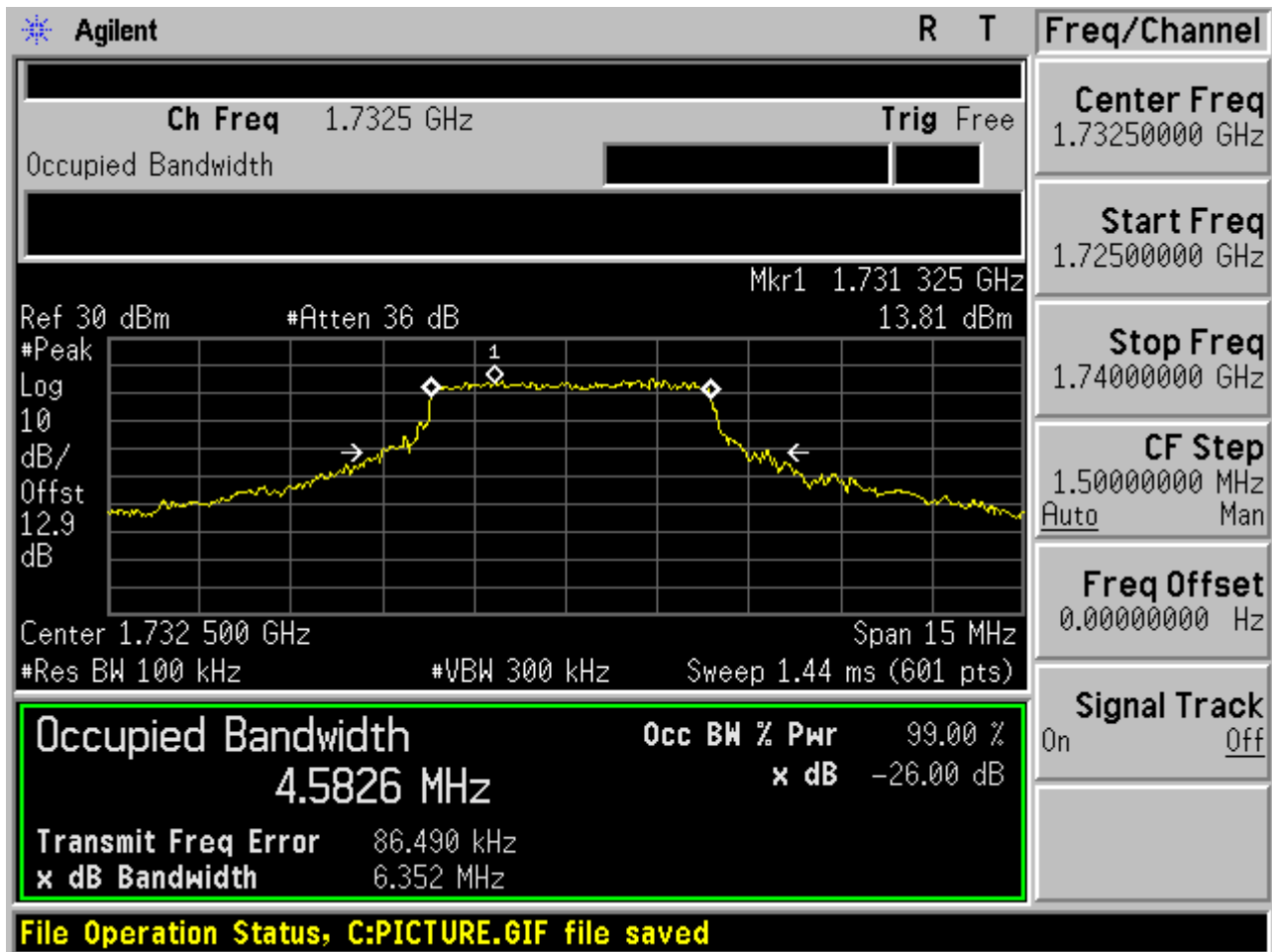


2.2.4.2.2 16QAM /1RB # max



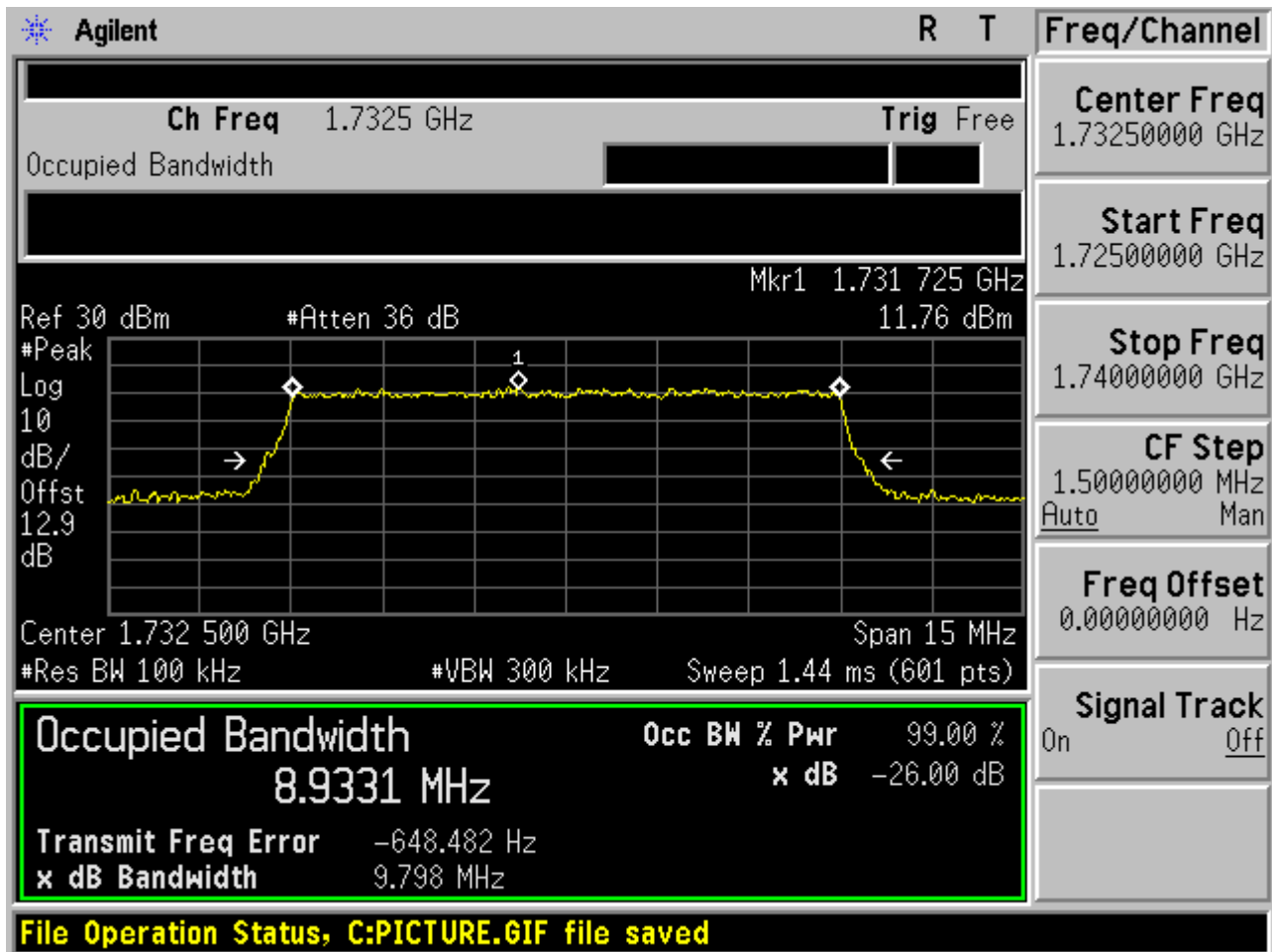


2.2.4.2.3 16QAM /non-1RB #mid/2





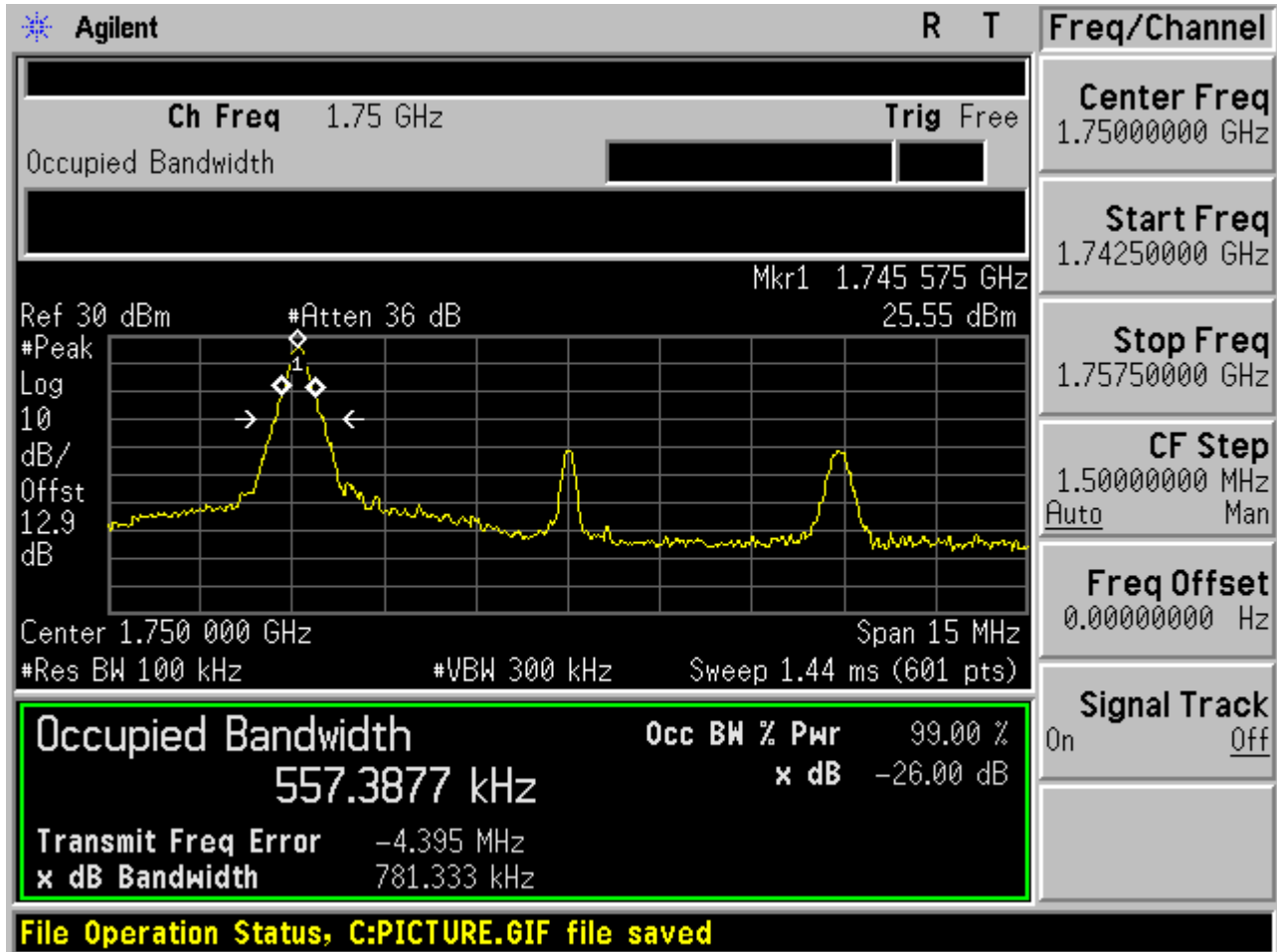
2.2.4.2.4 16QAM /full RBs





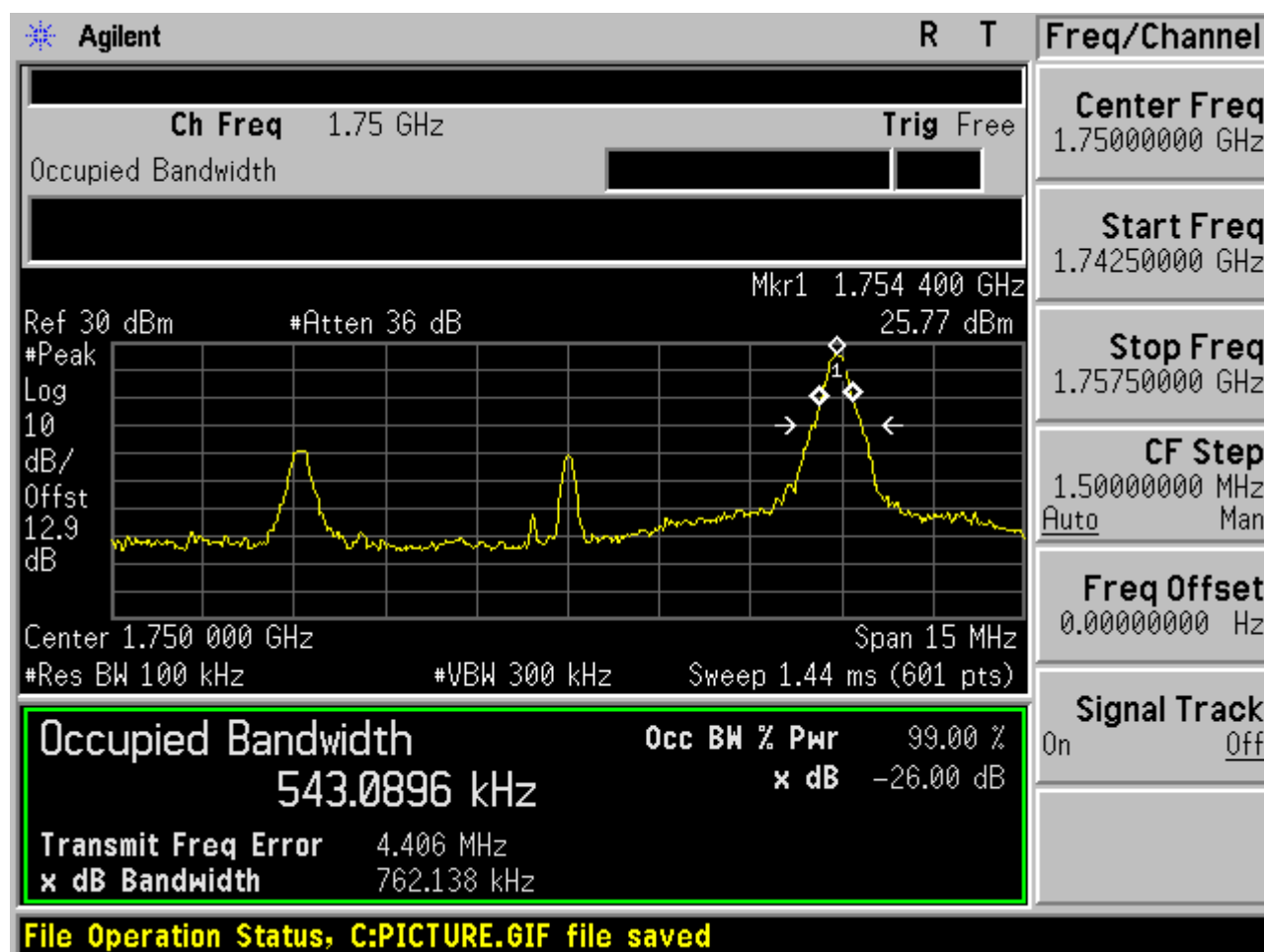
2.2.4.3 Channel =T

2.2.4.3.1 16QAM/1RB # 0



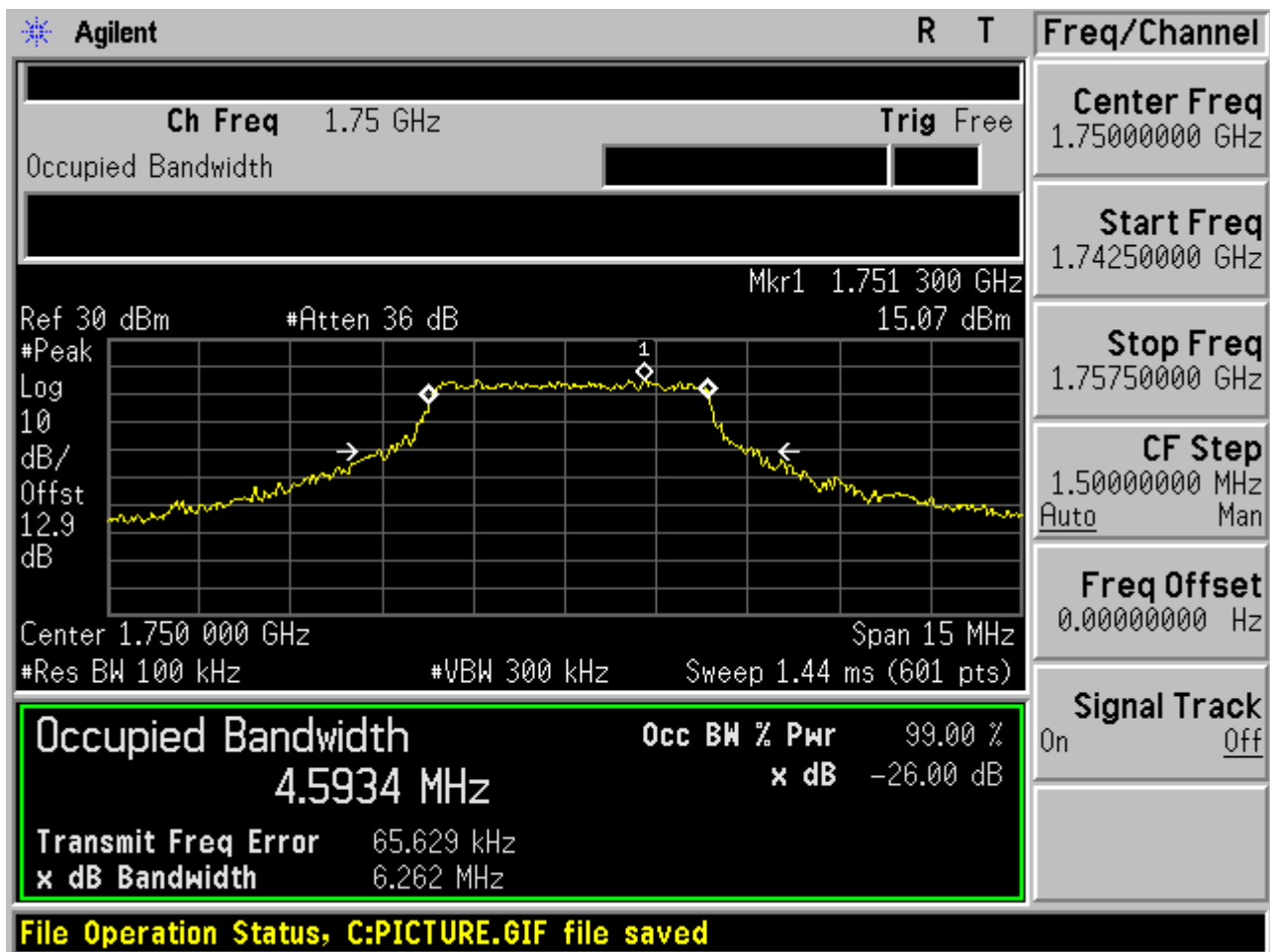


2.2.4.3.2 16QAM /1RB # max



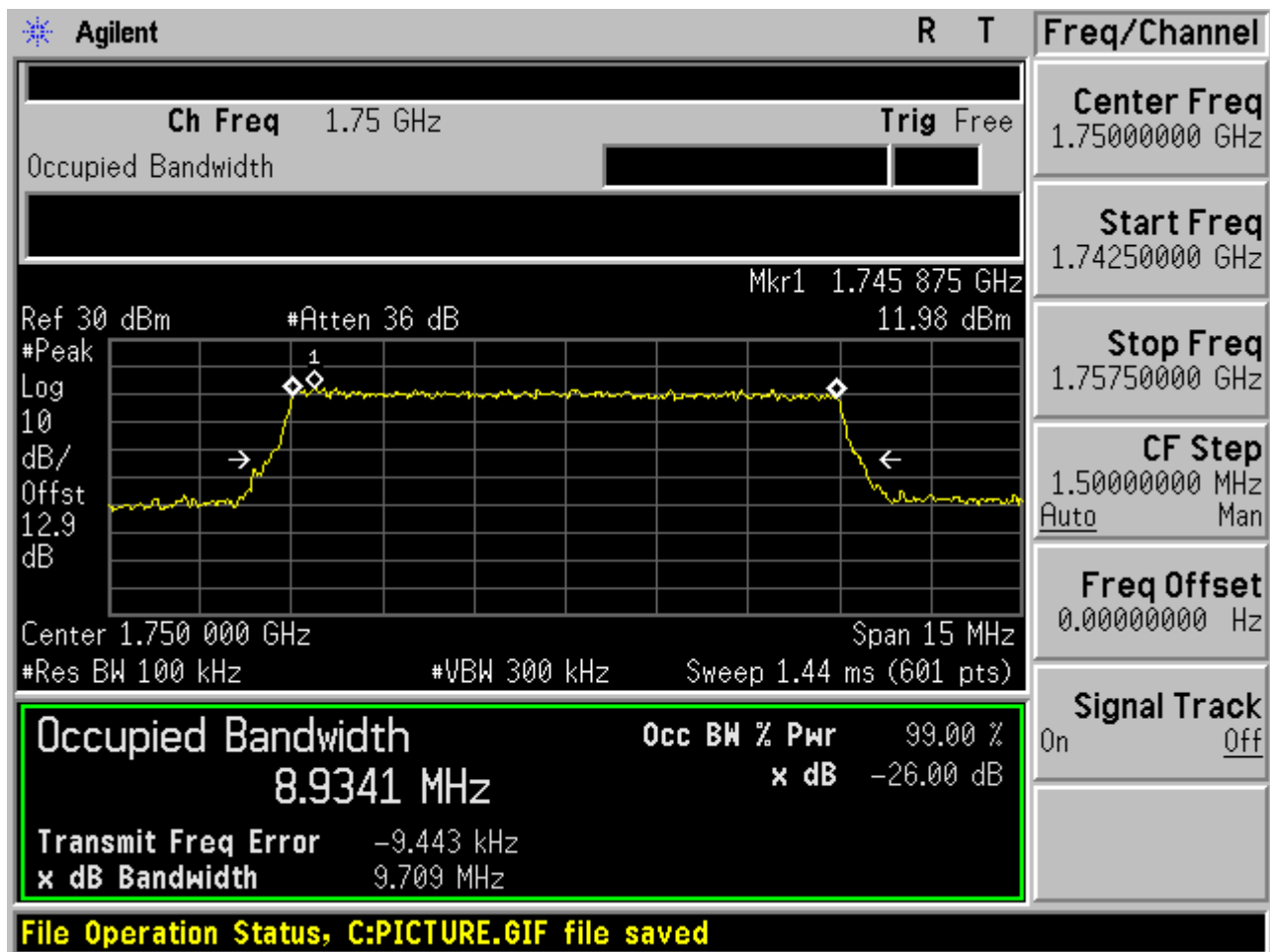


2.2.4.3.3 16QAM /non-1RB #mid/2





2.2.4.3.4 16QAM /full RBs

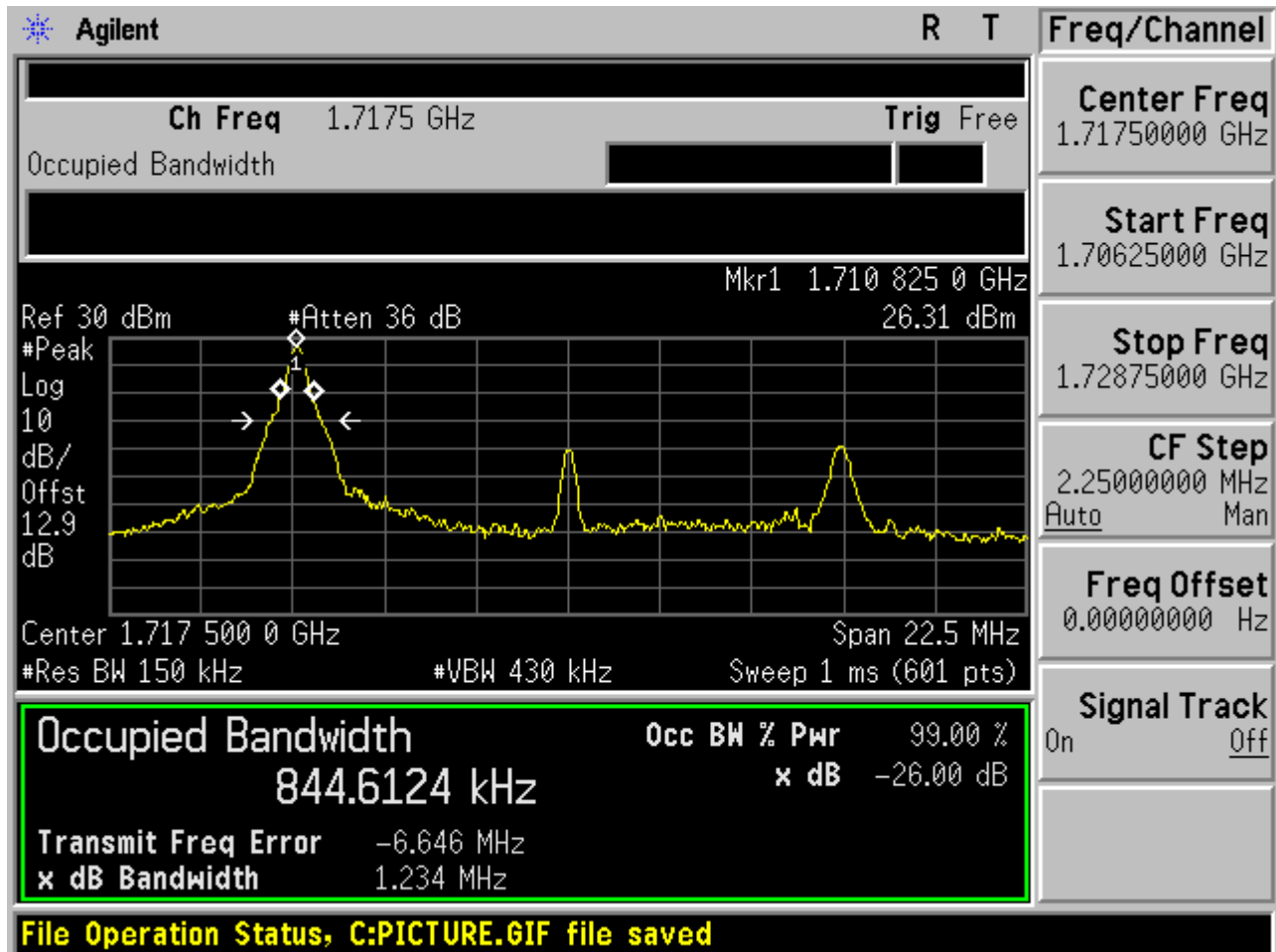




2.2.5 Channel Bandwidth = 15 MHz

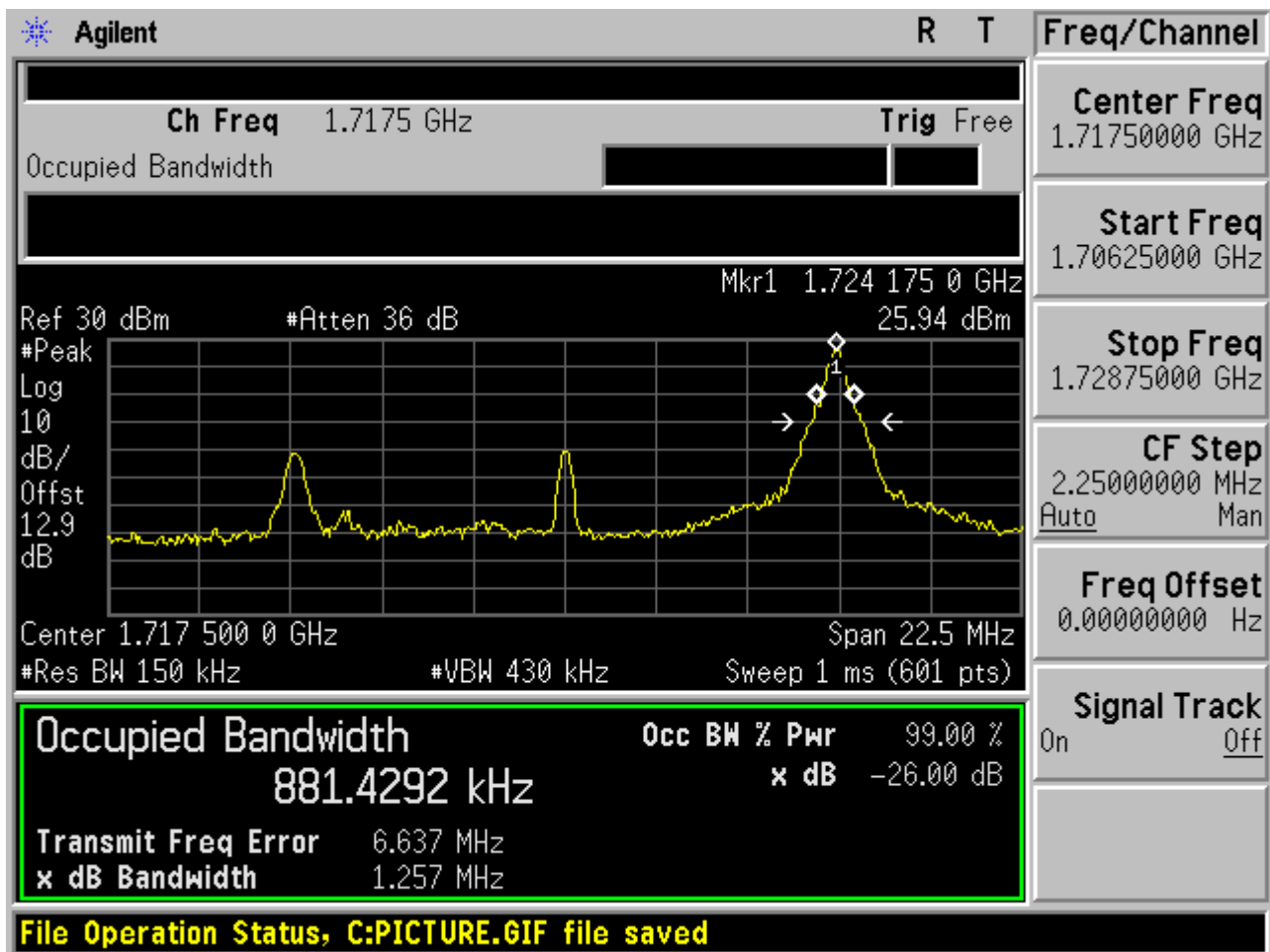
2.2.5.1 Channel =B

2.2.5.1.1 16QAM/1RB # 0



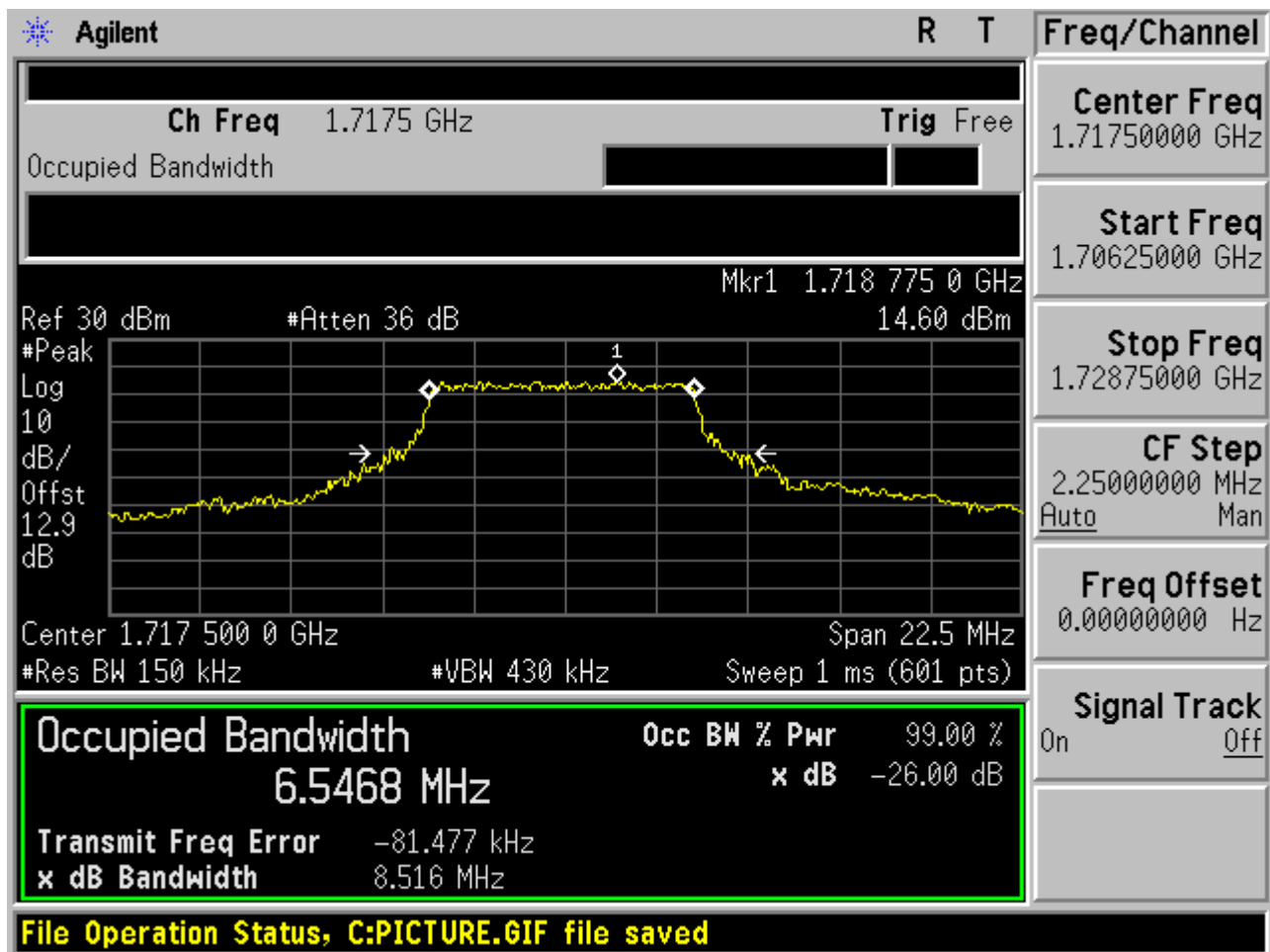


2.2.5.1.2 16QAM /1RB # max



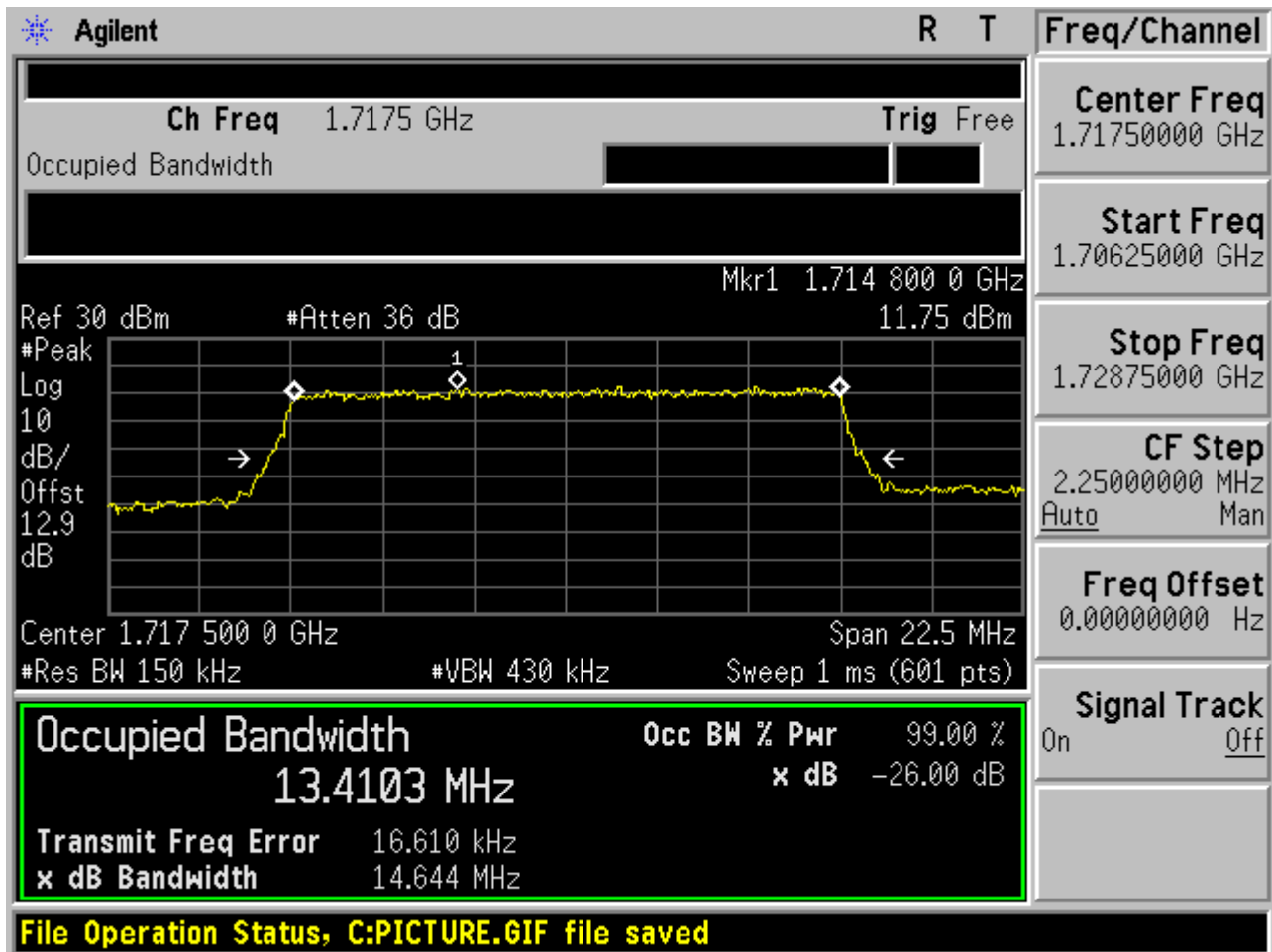


2.2.5.1.3 16QAM /non-1RB #mid/2





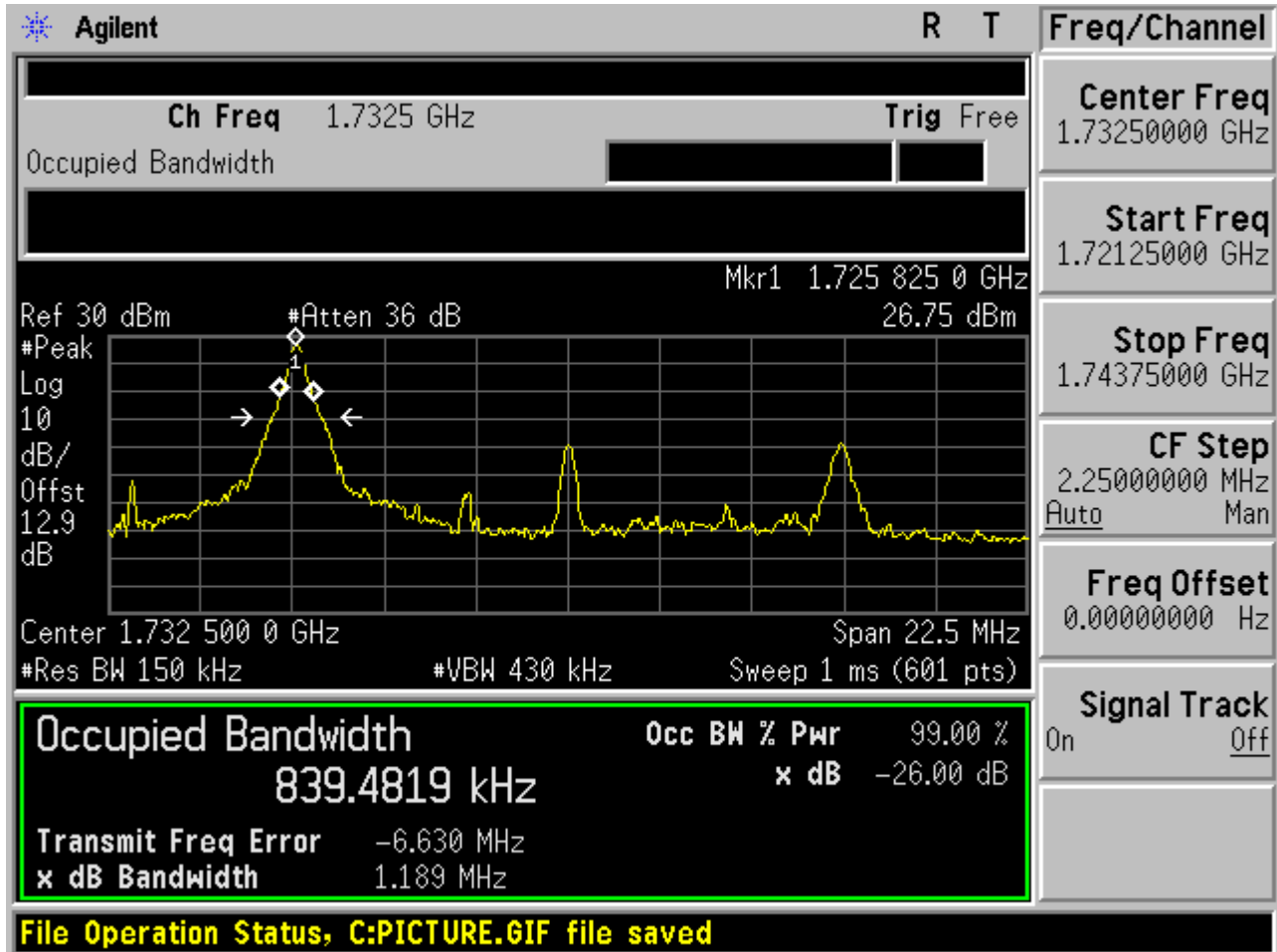
2.2.5.1.4 16QAM /full RBs





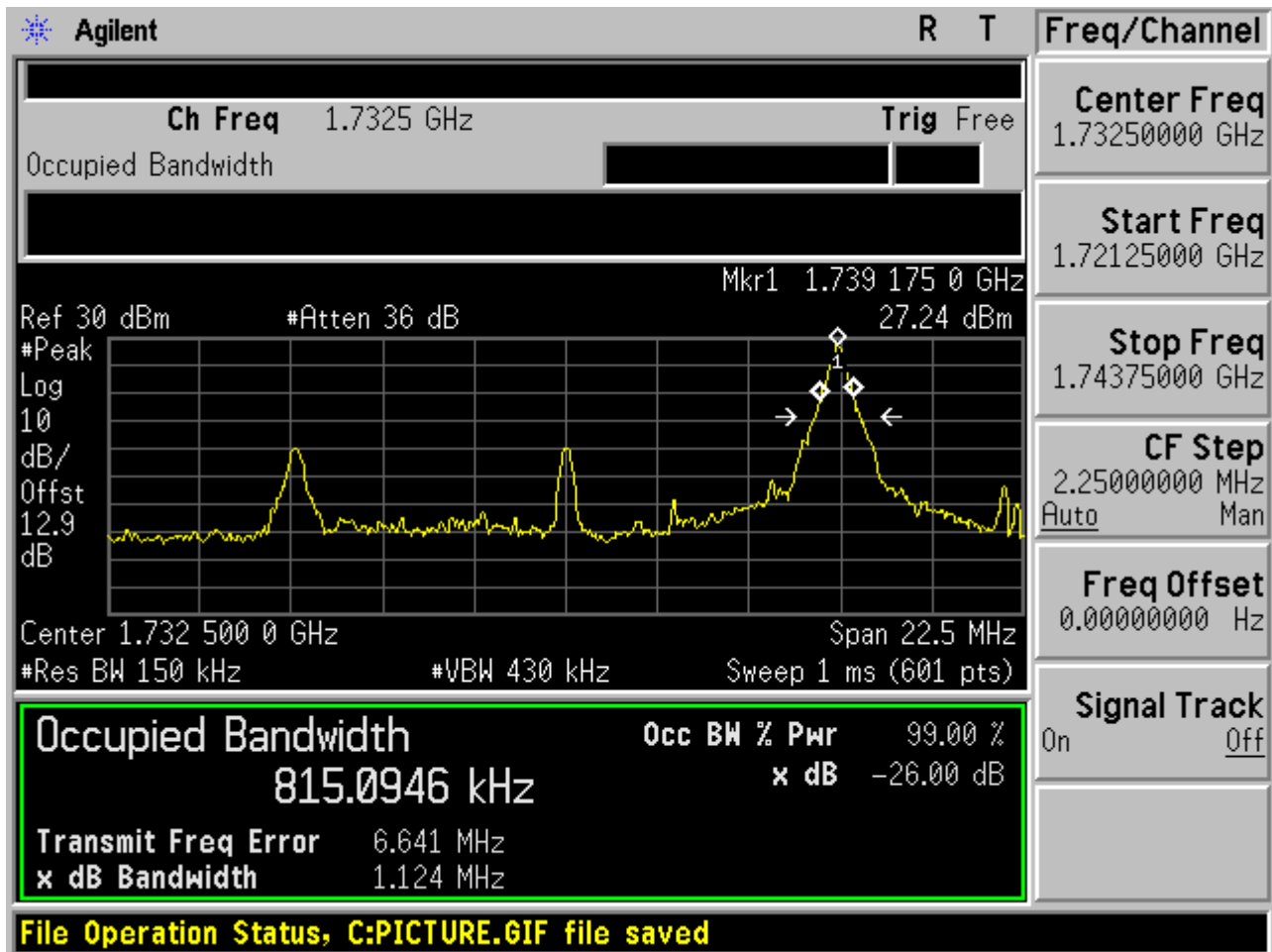
2.2.5.2 Channel =M

2.2.5.2.1 16QAM/1RB # 0



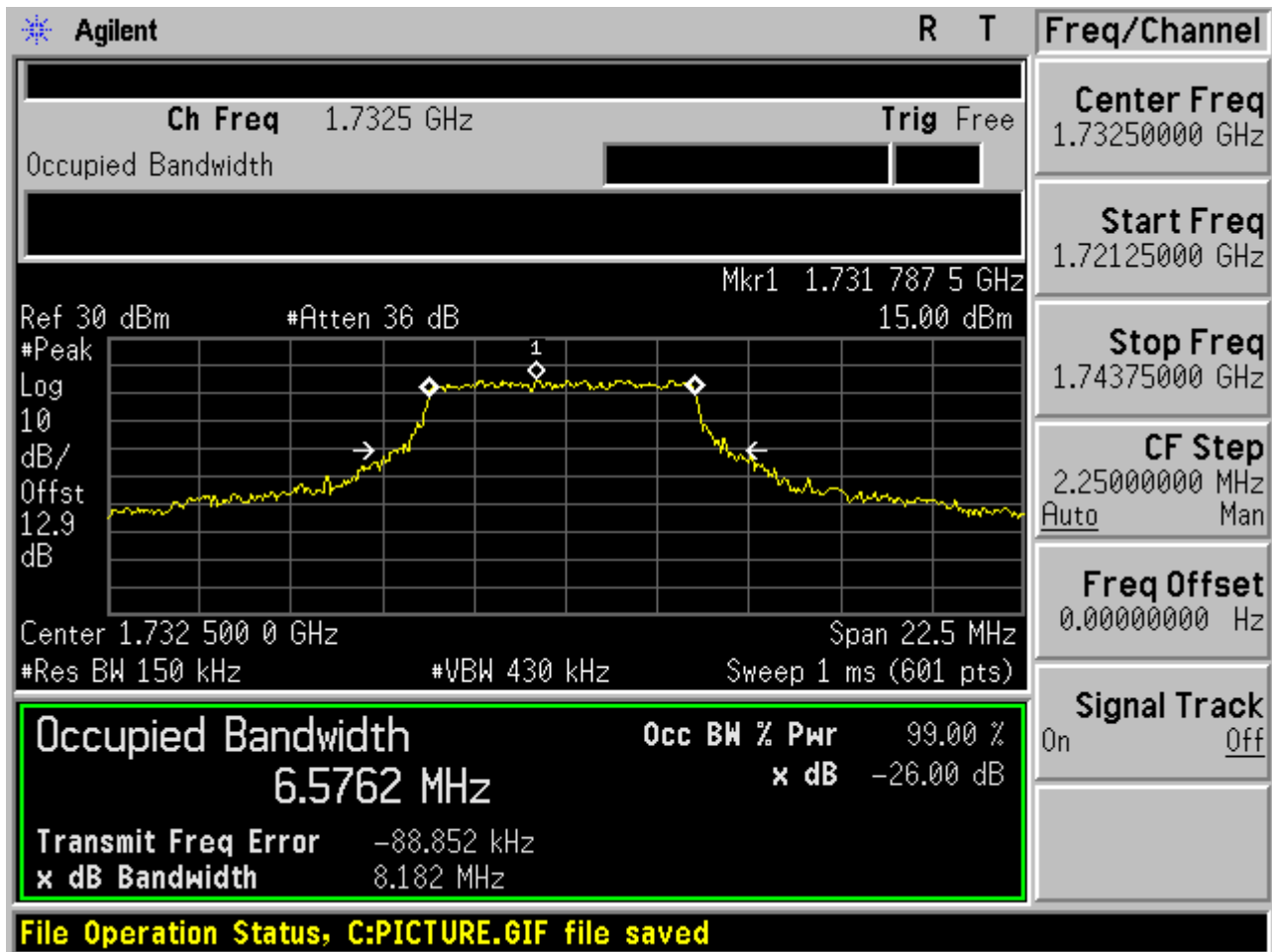


2.2.5.2.2 16QAM /1RB # max



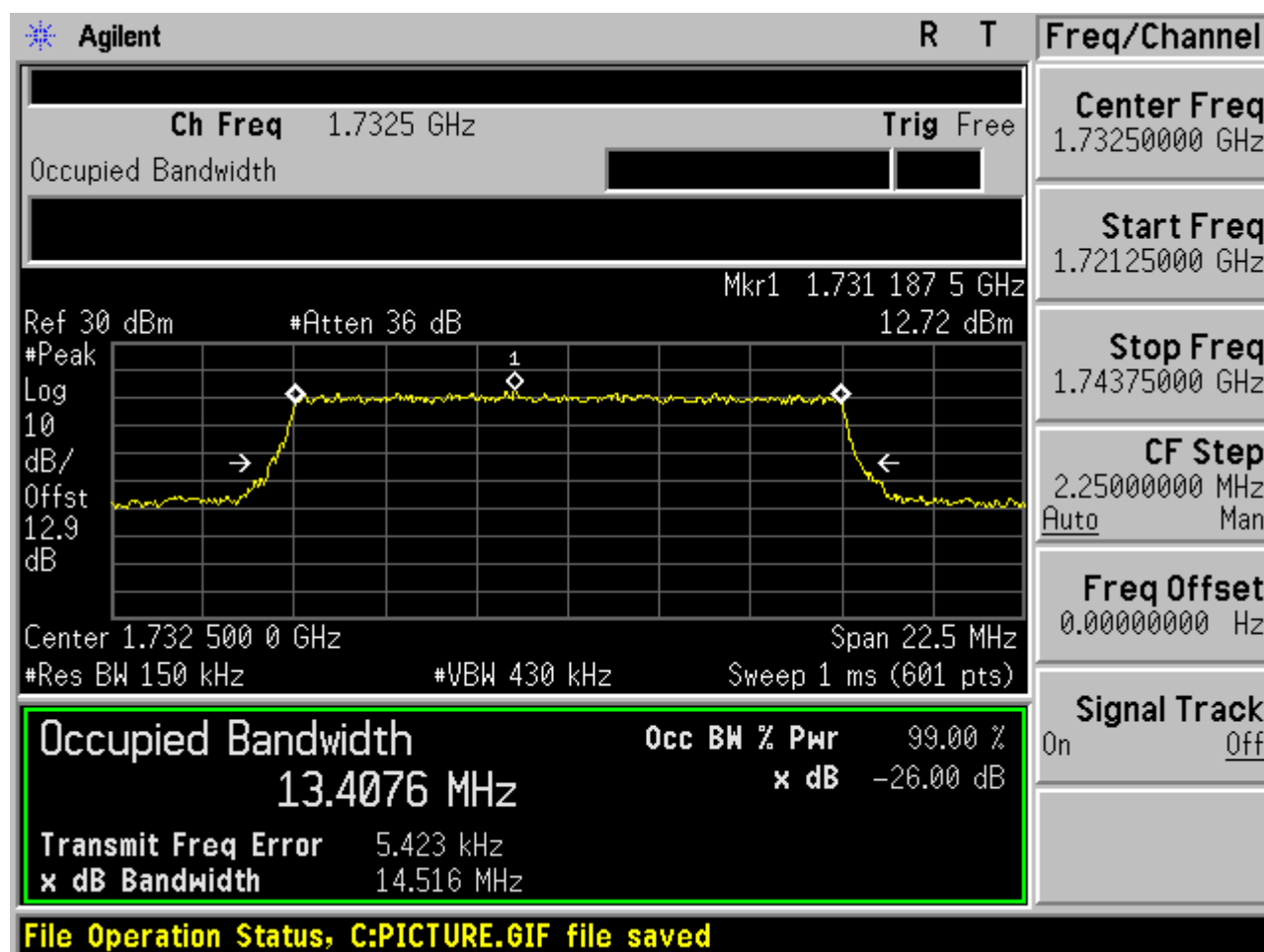


2.2.5.2.3 16QAM /non-1RB #mid/2





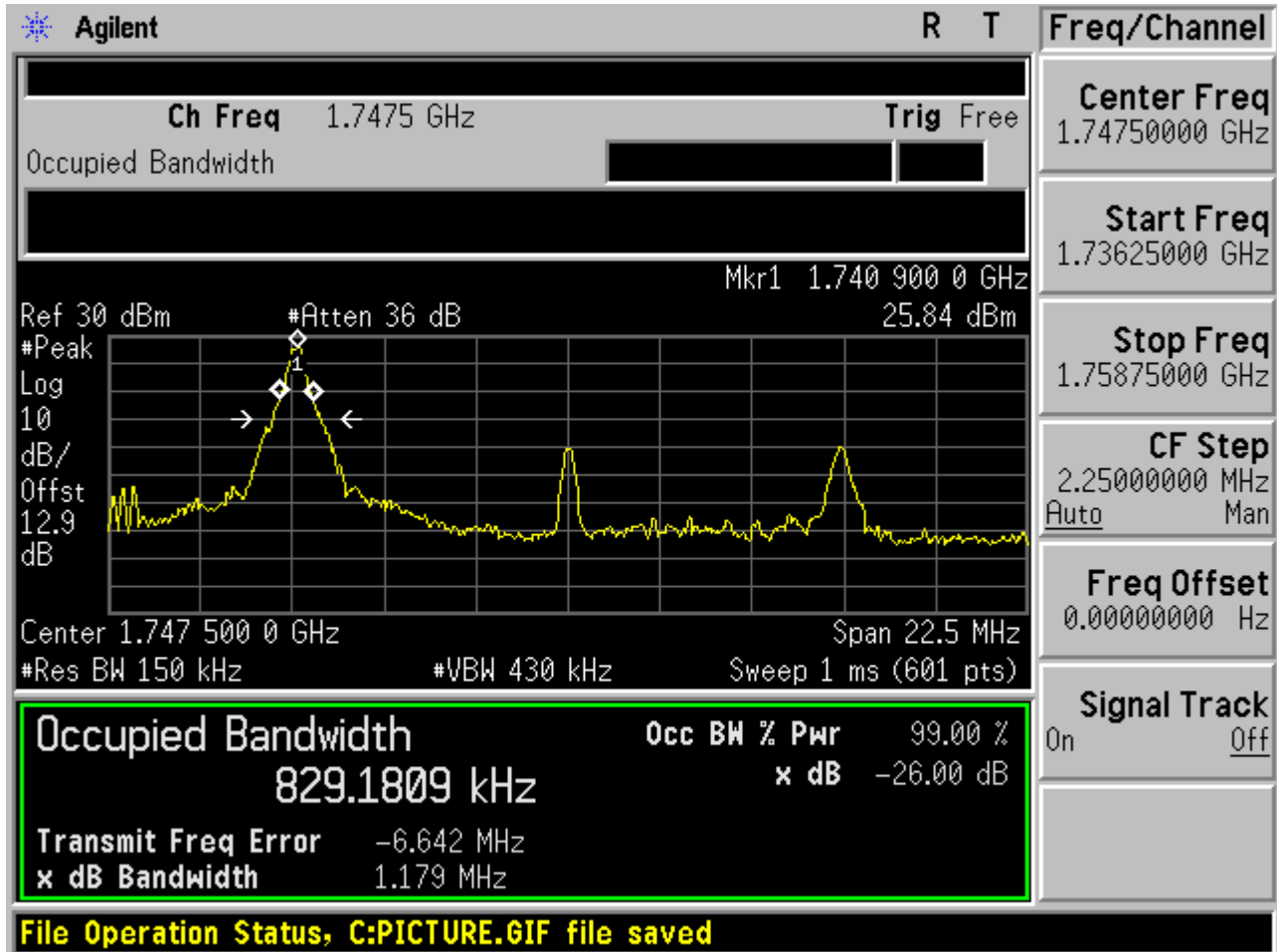
2.2.5.2.4 16QAM /full RBs





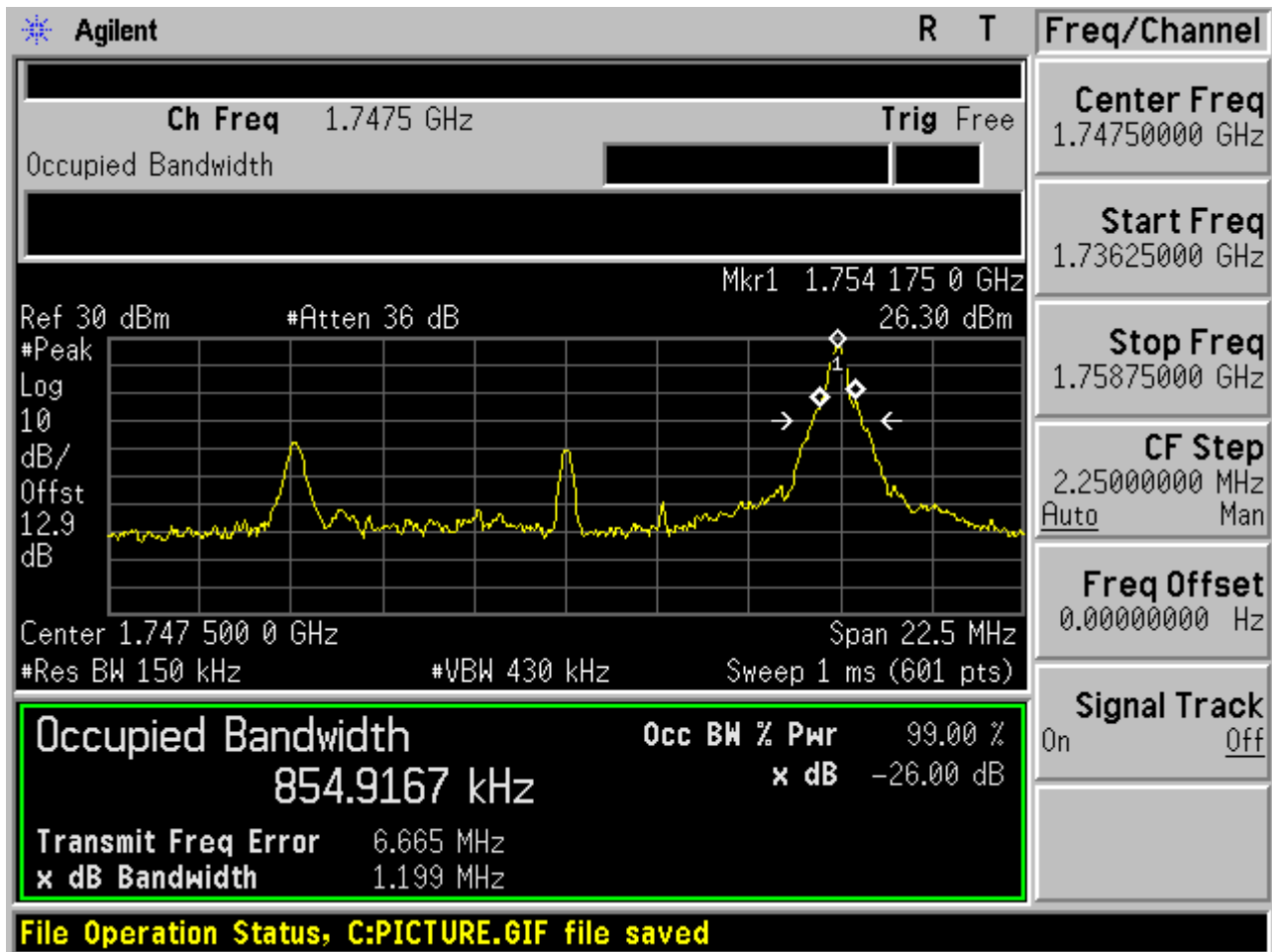
2.2.5.3 Channel =T

2.2.5.3.1 16QAM/1RB # 0



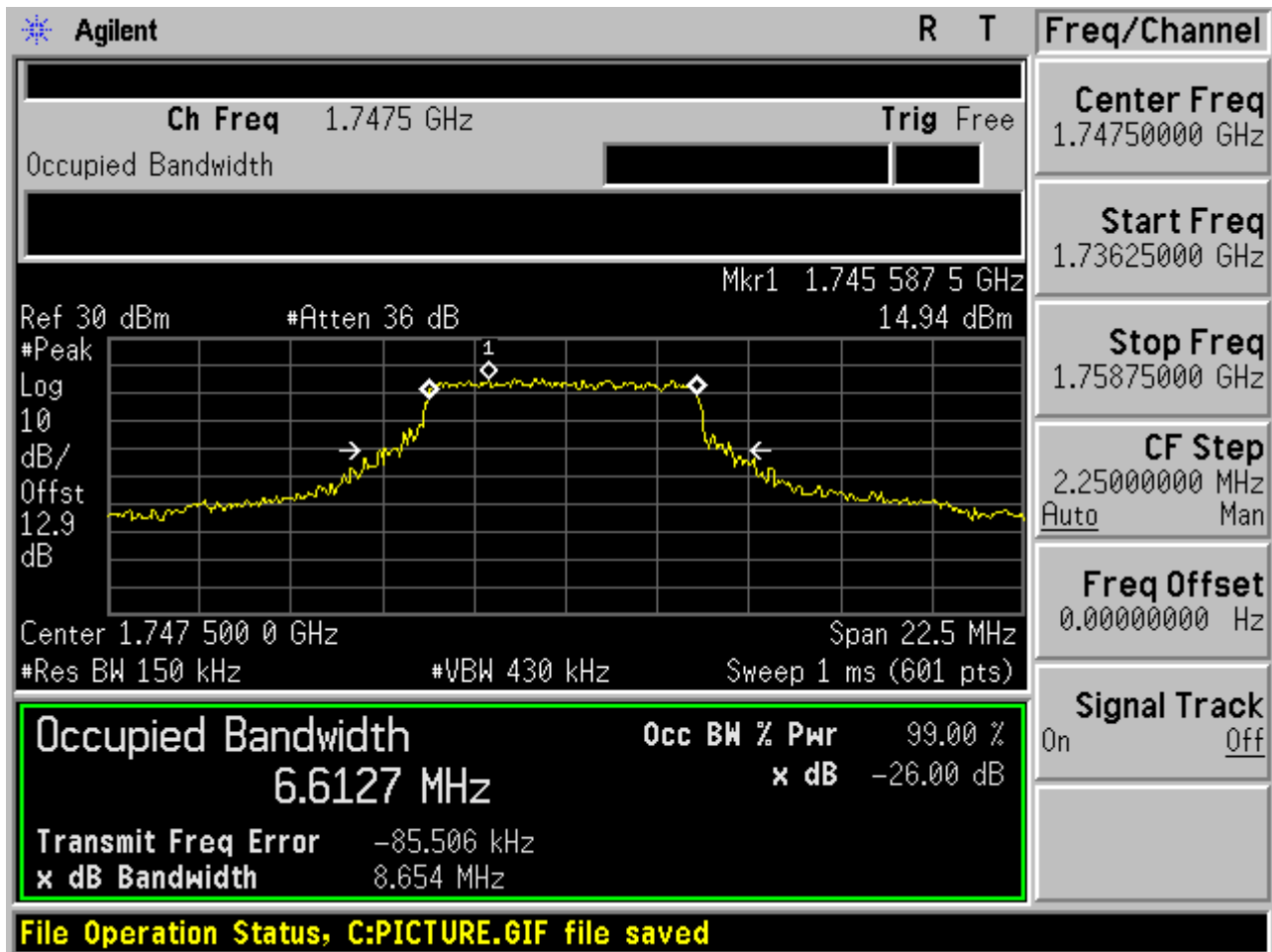


2.2.5.3.2 16QAM /1RB # max



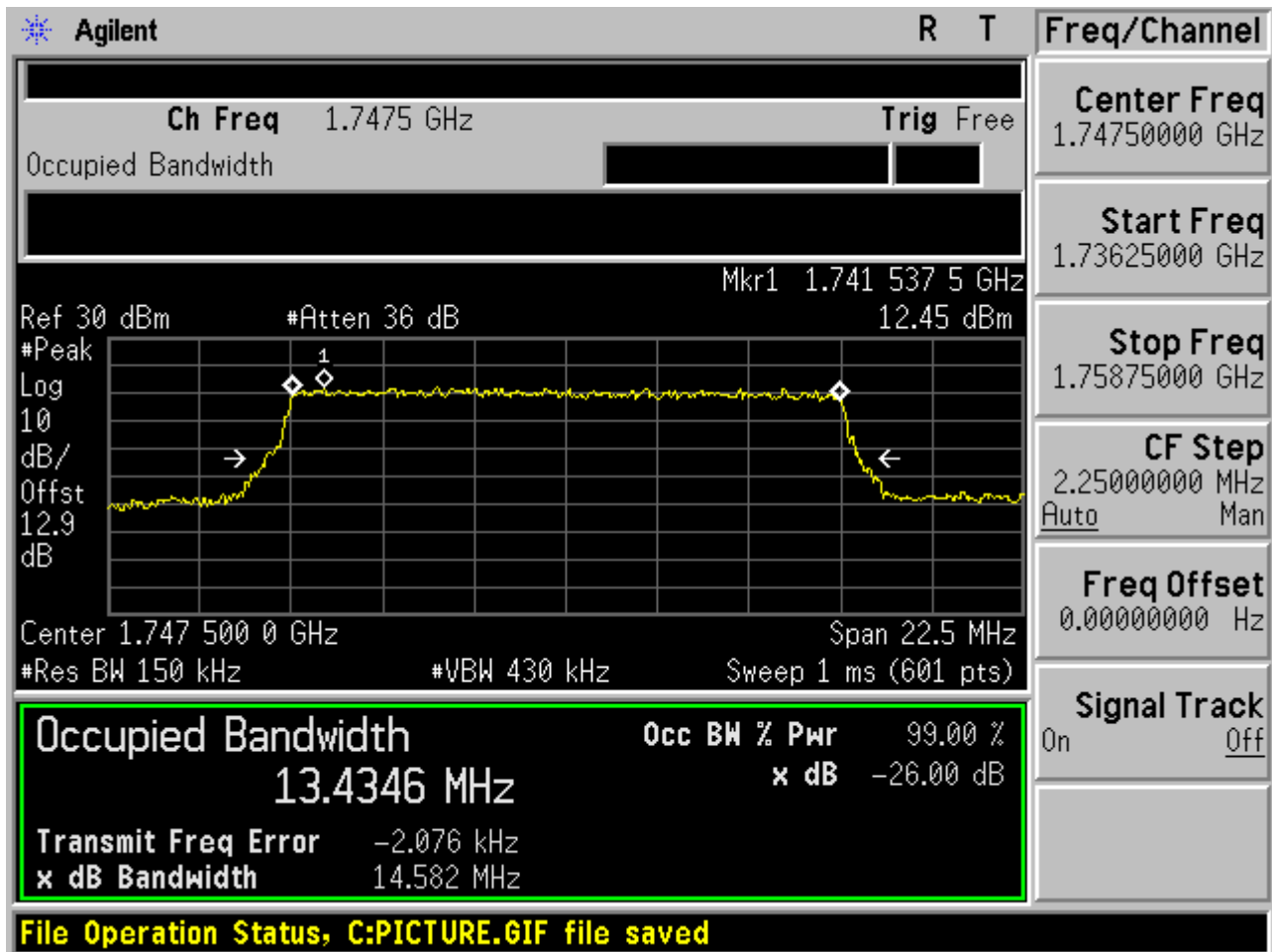


2.2.5.3.3 16QAM /non-1RB #mid/2





2.2.5.3.4 16QAM /full RBs

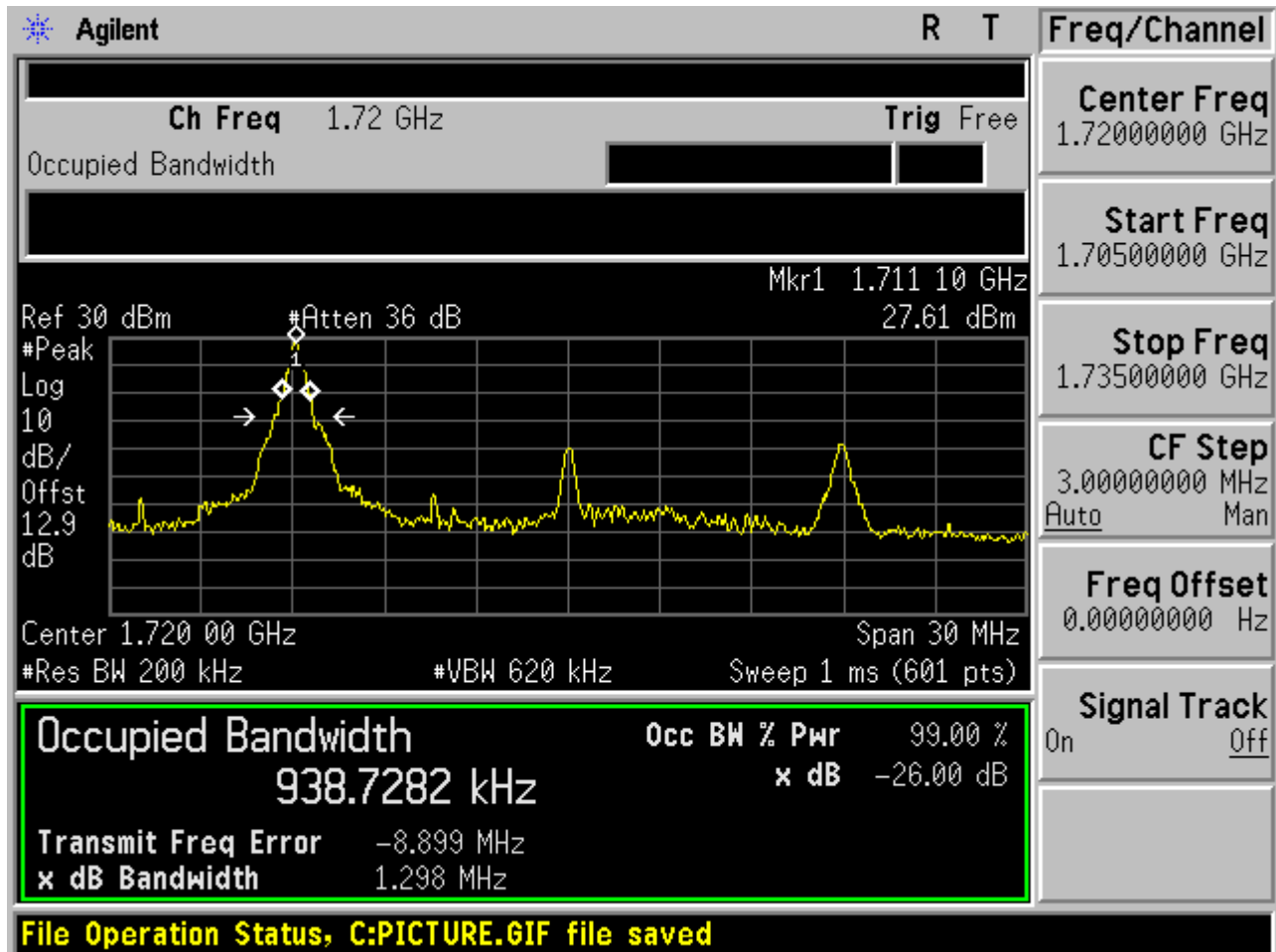




2.2.6 Channel Bandwidth = 20 MHz

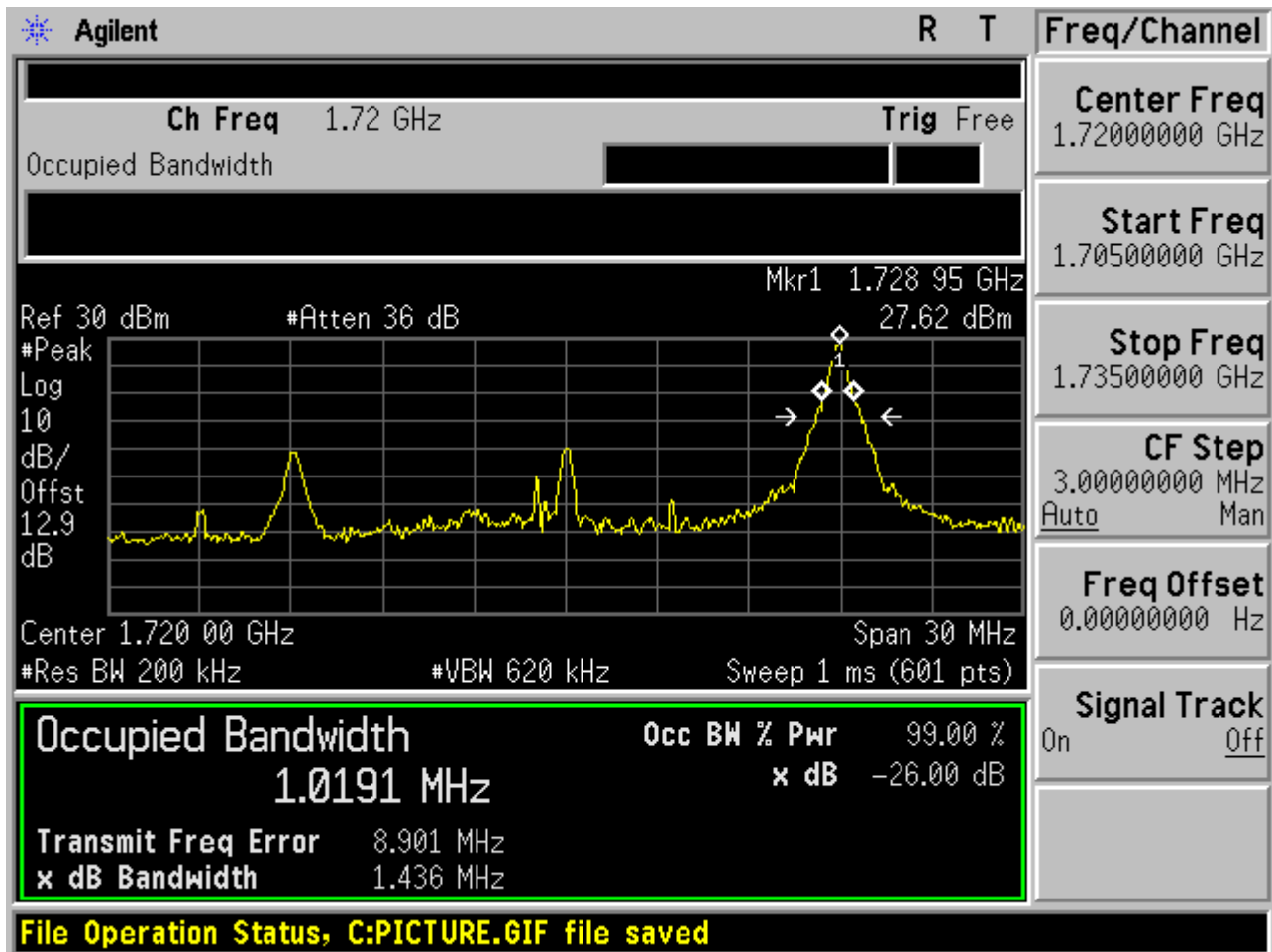
2.2.6.1 Channel =B

2.2.6.1.1 16QAM/1RB # 0



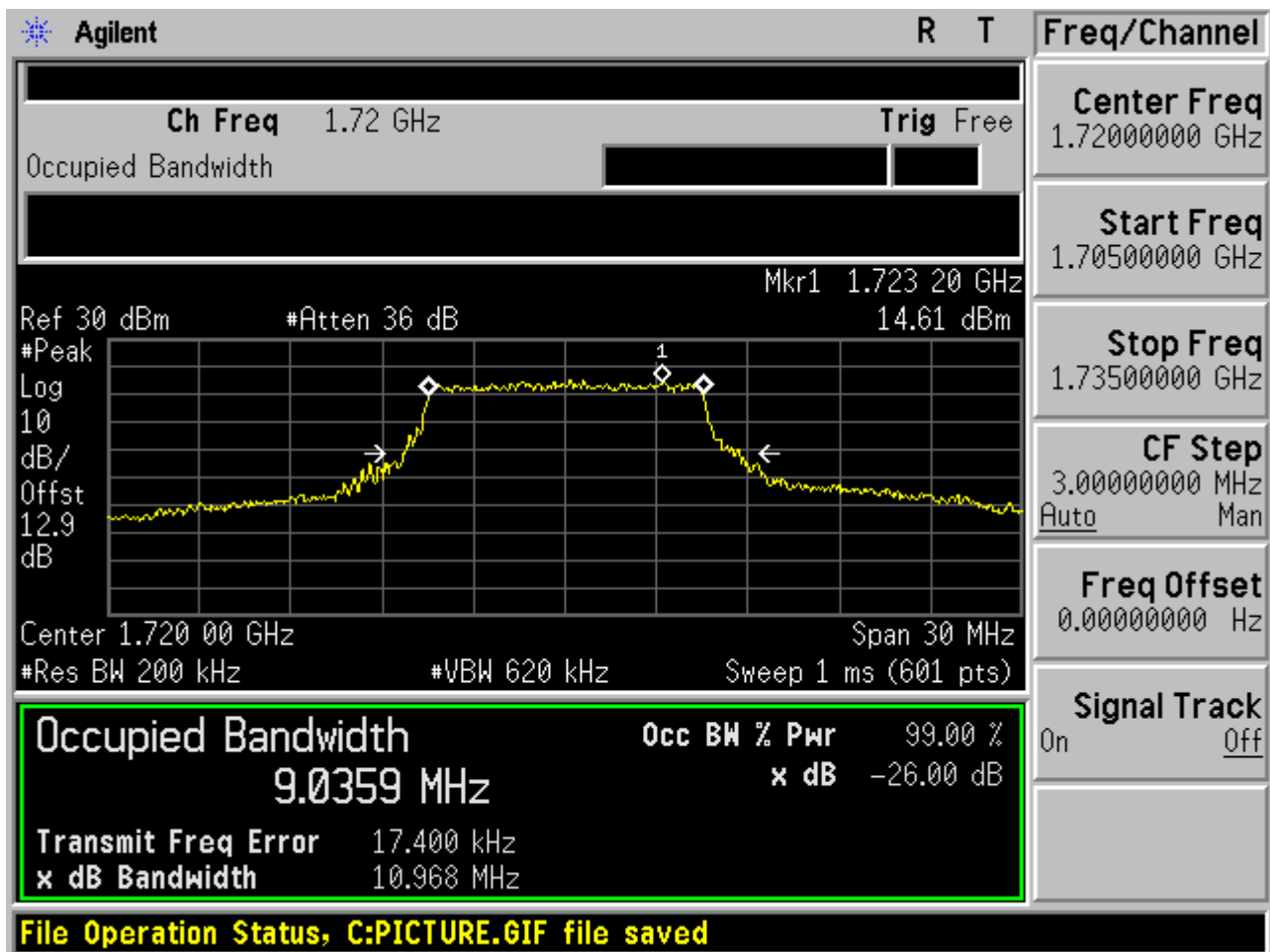


2.2.6.1.2 16QAM /1RB # max



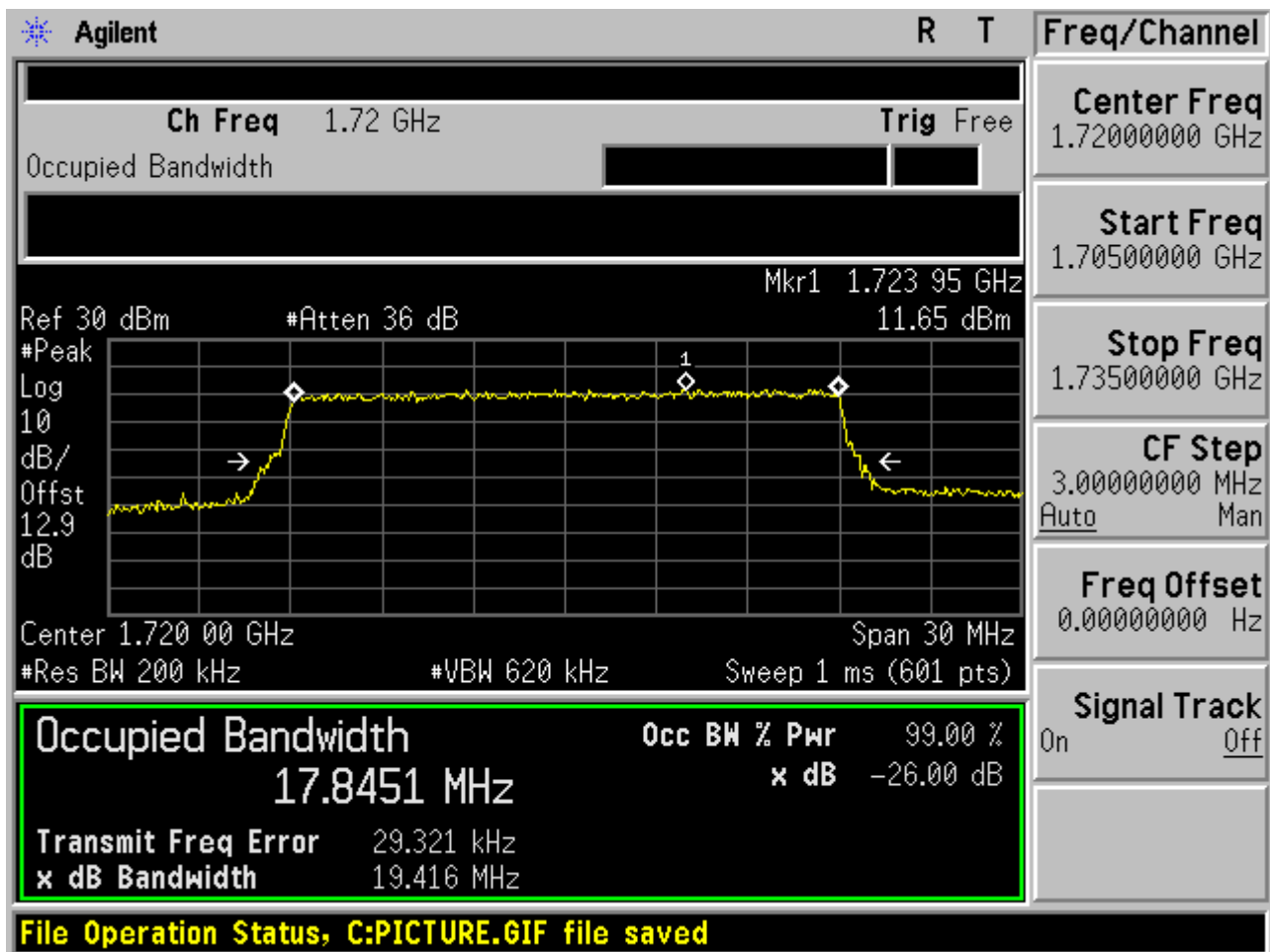


2.2.6.1.3 16QAM /non-1RB #mid/2





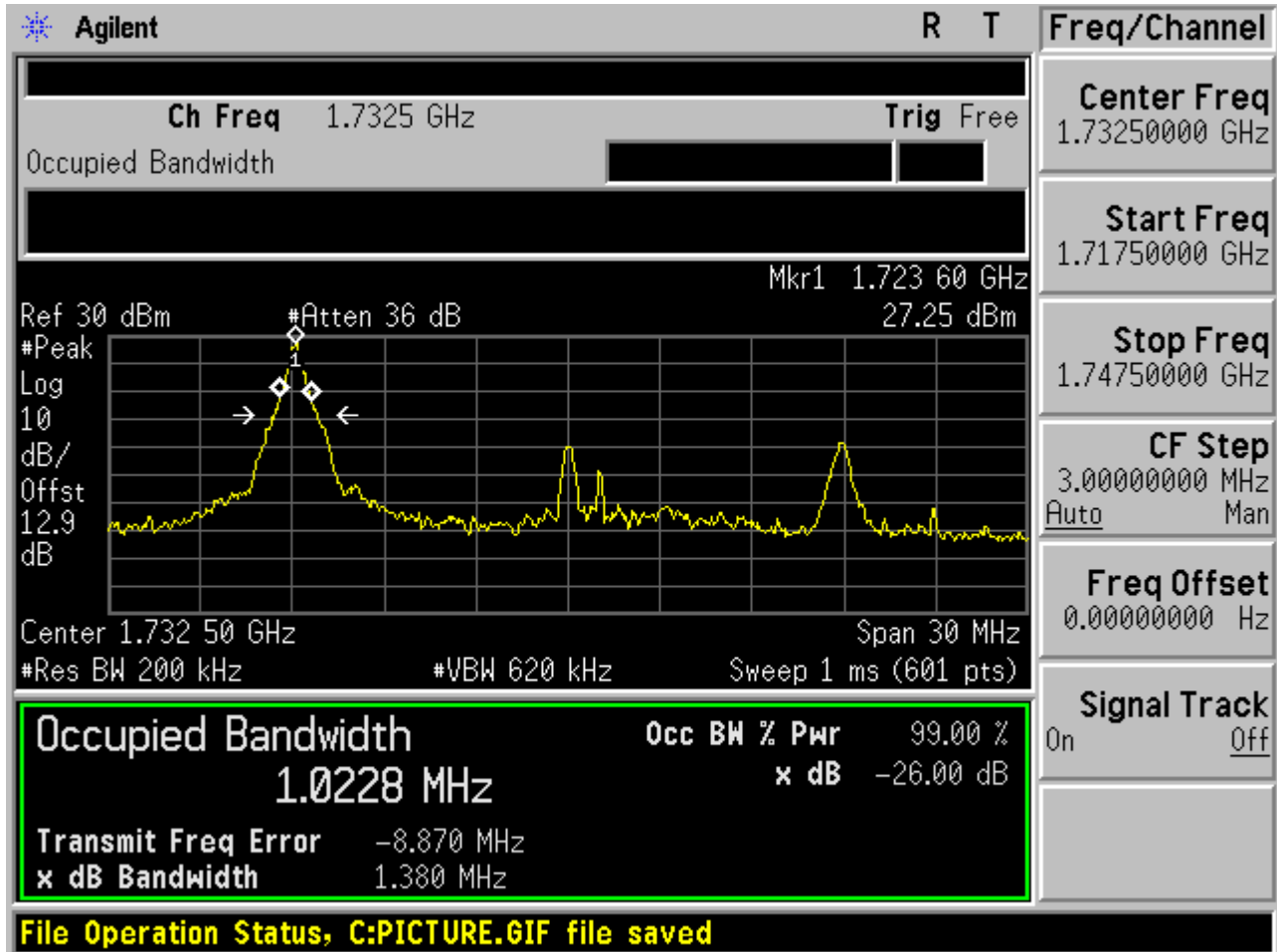
2.2.6.1.4 16QAM /full RBs





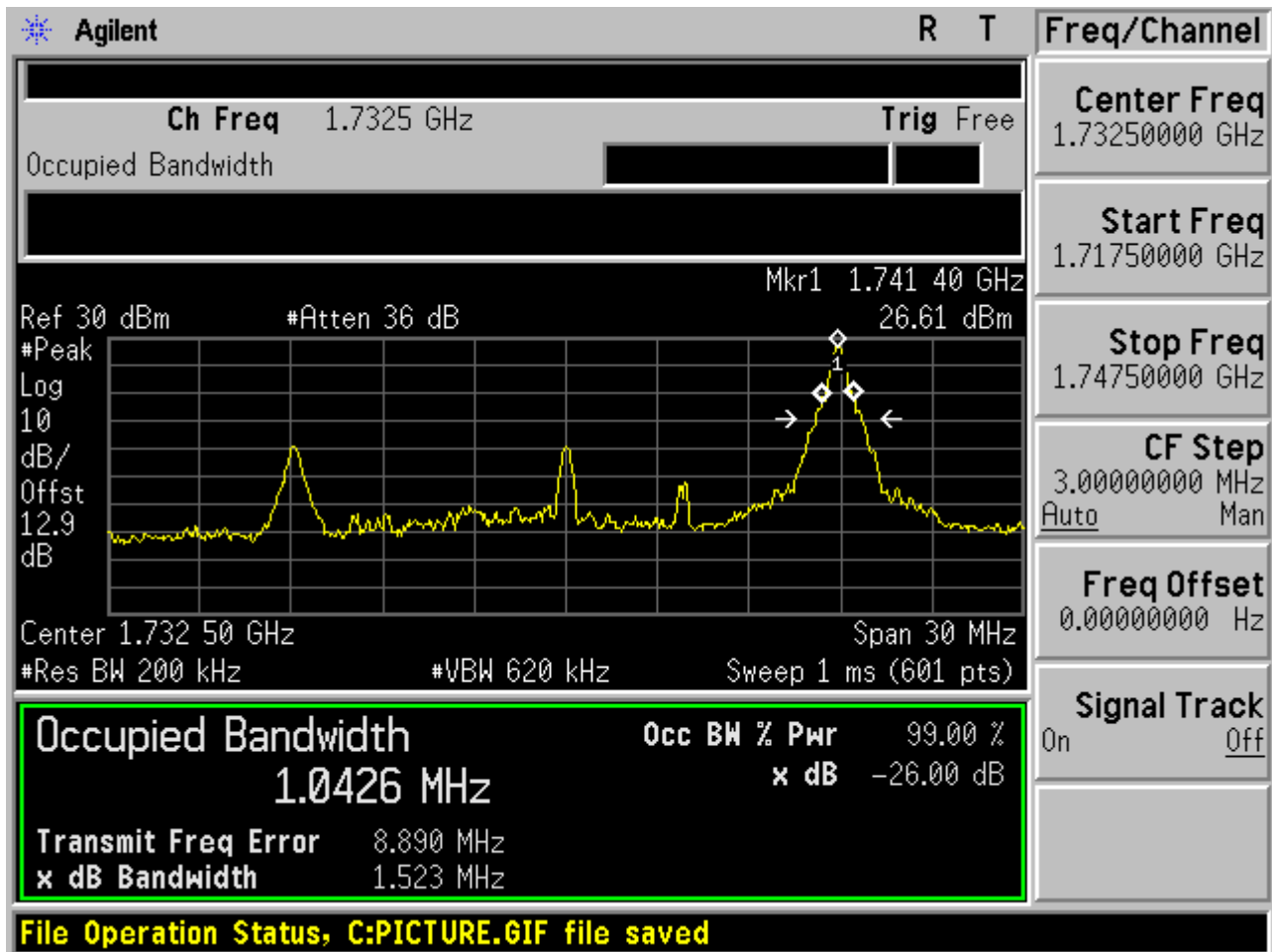
2.2.6.2 Channel =M

2.2.6.2.1 16QAM/1RB # 0





2.2.6.2.2 16QAM /1RB # max





2.2.6.2.3 16QAM /non-1RB #mid/2

