FCC TEST REPORT
(Part 90 Subpart Z)

REPORT NO.: RF110811E05

MODEL NO.: OX-350I

FCC ID: W9V-OX350I-GP

RECEIVED: Aug. 12, 2011

TESTED: Sep. 13, 2011

ISSUED: Sep. 23, 2011

APPLICANT: Green Packet Berhad, Taiwan

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ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF110811E05	Original release	Sep. 23, 2011

1 CERTIFICATION

PRODUCT: WiMAX Outdoor CPE
BRAND: Green Packet
MODEL: OX-350I
TEST SAMPLE: ENGINEERING SAMPLE
APPLICANT: Green Packet Berhad, Taiwan
TESTED: Sep. 13, 2011
TEST STANDARDS: **FCC Part 90, Subpart Z**

The above equipment (Model No.: OX-350I) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch,** and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : _____, **DATE:** *Sep. 23, 2011*
(Claire Kuan, Specialist)

APPROVED BY : _____, **DATE:** *Sep. 23, 2011*
(May Chen, Deputy Manager)

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

STANDARD SECTION FCC Part 2& Part 90	TEST TYPE AND LIMIT	RESULT	REMARK
2.1046 90.1321	Maximum Peak Output Power Limit: max. 25Watt / 25MHz EIRP.	PASS	Meet the requirement of limit.
2.1055 90.213	Frequency Stability Stay with the authorized bands of operation	PASS	Meet the requirement of limit.
2.1049 90.1323	Emission Bandwidth	PASS	Meet the requirement of limit.
90.210	Emission masks	PASS	Meet the requirement of limit.
2.1051 90.1323	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 90.1323	Radiated Spurious Emissions	PASS	Meet the requirement of limit.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	30MHz ~ 1000MHz	4 dB
	1GHz ~ 18GHz	2.49 dB
	18GHz ~ 40GHz	2.70 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	WiMAX Outdoor CPE
MODEL NO.	OX-350I
FCC ID	W9V-OX350I-GP
POWER SUPPLY	DC 48V from PoE
MODULATION TYPE	Up-Link： QPSK-1/2,-3/4, 16QAM-1/2,-3/4 64QAM-1/2,-3/4, -2/3, 5/6
	Down-Link： QPSK-1/2,-3/4, 16QAM-1/2,-3/4 64QAM-1/2,-3/4, -2/3, 5/6
MODULATION TECHNOLOGY	OFDMA
MULTIPLE ACCESS METHOD	TDMA
OPERATING FREQUENCY	5MHz: 3652.5 ~ 3697.5MHz 7MHz: 3653.5 ~ 3696.5MHz 10MHz: 3655 ~ 3695MHz
CHANNEL BANDWIDTH	5MHz, 7MHz, 10MHz
MAX. EIRP POWER	38.5dBm
ANTENNA TYPE	Please see note
OPERATION TEMPERATURE RANGE	-40 ~ 60°C
DATA CABLE	RJ-45 cable(unshielded, 2.0m)
I/O PORTS	RJ-45 port x1 < POE / Ethernet (10/100Mbps)>
ACCESSORY DEVICES	POE x 1

NOTE:

1. There is one set antenna provided to this EUT, please refer to the following table:

Brand	Model	Gain (dBi)	Antenna Type	Connecter Type	Frequency range (MHz to MHz)	Diversity Function
Unictron Technologies Corporation	High Gain Patch Array Antenna for WIMAX 3.3~3.8GHz	17.04	Patch Array	MCX	3300~3800	Dual polarization

The antenna is a dual polarization patch antenna, it have two input port for different polarization.

2. The EUT must be supplied with a PoE as following table:

Brand:	MOA TELECOM
Model No.:	MPSE-4803
Input power :	100-240V, 0.4A, 50-60Hz Power cord(shielded, 1.8m)
Output power :	48V, 0.32A

3. The EUT operates in 3650 ~ 3700MHz Bands and support MIMO technology without beam-forming technology.

4. EUT can supports different UL / DL ratio, max transmit ratio is up to 18 (UL): 29 (DL). After pretesting of output power and spurious emission, 18 (UL): 29 (DL) was found to be worst case and was selected for the final test configuration.

5. The above EUT information was declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Three channels had been tested for each channel bandwidth.

CHANNEL BANDWIDTH: 5MHz
Low channel (L): 3652.5MHz
Middle channel (M): 3675MHz
High channel (H): 3697.5MHz
CHANNEL BANDWIDTH: 7MHz
Low channel (L): 3653.5MHz
Middle channel (M): 3675MHz
High channel (H): 3696.5MHz
CHANNEL BANDWIDTH: 10MHz
Low channel (L): 3655MHz
Middle channel (M): 3675MHz
High channel (H): 3695MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO							DESCRIPTION
	OP	FS	EB	EM	CSE	RE<1G	RE≥1G	
-	√	√	√	√	√	√	√	-

Where **OP:** Output power **FS:** Frequency stability
EB: Emission bandwidth **EM:** Emission masks
CSE: Conducted spurious emissions **RE<1G:** Radiated emission below 1GHz
RE≥1G: Radiated emission above 1GHz **NOTE:** "-": Means no effect.

OUTPUT POWER MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, coding rate and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

TESTED CHANNEL	MODULATION TECHNOLOGY	CHANNEL BANDWIDTH	MODULATION TYPE	CODING RATE
L, M, H	OFDMA	5MHz	QPSK	1/2
L, M, H	OFDMA	7MHz	QPSK	1/2
L, M, H	OFDMA	10MHz	QPSK	1/2

FREQUENCY STABILITY MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, coding rate, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

TESTED CHANNEL	MODULATION TECHNOLOGY	CHANNEL BANDWIDTH	MODULATION TYPE
M	OFDMA	5MHz	Unmodulation

EMISSION BANDWIDTH MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, coding rate, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

TESTED CHANNEL	MODULATION TECHNOLOGY	CHANNEL BANDWIDTH	MODULATION TYPE	CODING RATE
L, M, H	OFDMA	5MHz	QPSK	1/2
L, M, H	OFDMA	7MHz	QPSK	1/2
L, M, H	OFDMA	10MHz	QPSK	1/2

EMISSION MASKS MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, coding rate, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

TESTED CHANNEL	MODULATION TECHNOLOGY	CHANNEL BANDWIDTH	MODULATION TYPE	CODING RATE
L, M, H	OFDMA	5MHz	QPSK	1/2
L, M, H	OFDMA	7MHz	QPSK	1/2
L, M, H	OFDMA	10MHz	QPSK	1/2

CONDUCTED SPURIOUS EMISSIONS MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, coding rate, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

TESTED CHANNEL	MODULATION TECHNOLOGY	CHANNEL BANDWIDTH	MODULATION TYPE	CODING RATE
L, M, H	OFDMA	5MHz	QPSK	1/2
L, M, H	OFDMA	7MHz	QPSK	1/2
L, M, H	OFDMA	10MHz	QPSK	1/2

RADIATED EMISSION MEASUREMENT (BELOW 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, coding rate and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

TESTED CHANNEL	MODULATION TECHNOLOGY	CHANNEL BANDWIDTH	MODULATION TYPE	CODING RATE
H	OFDMA	5MHz	QPSK	1/2
L	OFDMA	7MHz	QPSK	1/2
L	OFDMA	10MHz	QPSK	1/2

RADIATED EMISSION MEASUREMENT (ABOVE 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, coding rate and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

TESTED CHANNEL	MODULATION TECHNOLOGY	CHANNEL BANDWIDTH	MODULATION TYPE	CODING RATE
L, M, H	OFDMA	5MHz	QPSK	1/2
L, M, H	OFDMA	7MHz	QPSK	1/2
L, M, H	OFDMA	10MHz	QPSK	1/2

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
OP	25deg°C, 60%RH	120Vac, 60Hz	Wen Yu
FS	25deg°C, 60%RH	120Vac, 60Hz	Wen Yu
EB	25deg°C, 60%RH	120Vac, 60Hz	Wen Yu
EM	25deg°C, 60%RH	120Vac, 60Hz	Wen Yu
CSE	25deg°C, 60%RH	120Vac, 60Hz	Wen Yu
RE < 1G	25deg°C, 60%RH	120Vac, 60Hz	Wen Yu
RE ³ 1G	25deg°C, 60%RH	120Vac, 60Hz	Wen Yu

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 90
965270 D01 Pwr Meas Part 90 Z Equipment v01

ANSI/TIA/EIA-603-C-2004

All test items have been performed and recorded as per the above standards.

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

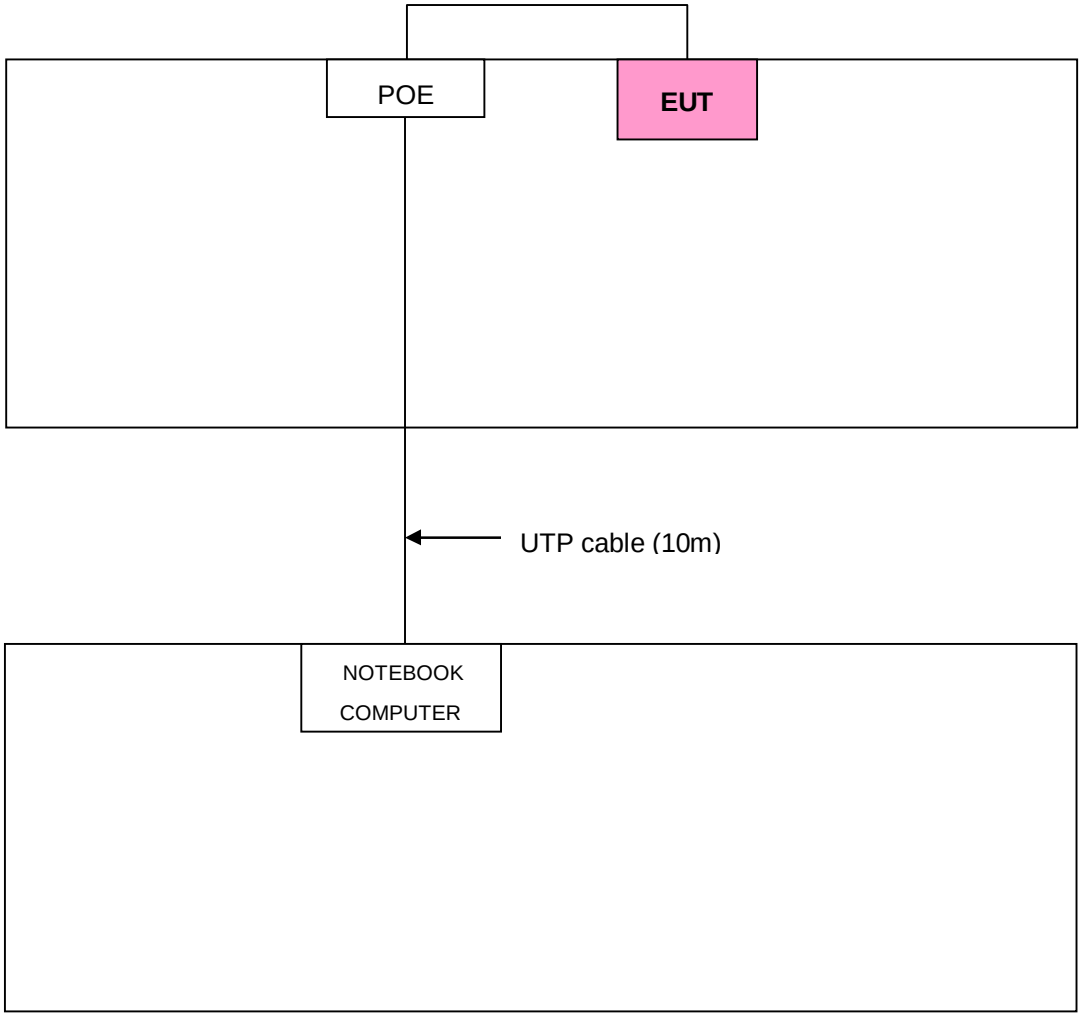
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP19L	CN-OHC416-70166-5CA-0448	PIW632500516610

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10m UTP cable

NOTE: All power cords of the above support units are non shielded (1.8m).

3.4.1 CONFIGURATION OF SYSTEM UNDER TEST



4 TEST TYPES AND RESULTS

4.1 OUTPUT POWER AND POWER DENSITY MEASUREMENT

4.1.1 LIMITS OF OUTPUT POWER AND POWER DENSITY

PER FCC PART 90.1321

BASE AND FIXED STATIONS

Base and fixed stations are limited to 25 Watts/25 MHz equivalent isotropical radiated power (EIRP). In any event, the peak EIRP power density shall not exceed 1 Watt in any one-megahertz slice of spectrum.

MOBILE AND PORTABLE STATIONS

Mobile and portable stations are limited to 1 Watt/25 MHz EIRP. In any event, the peak EIRP density shall not exceed 40 milliWatts in any one-megahertz slice of spectrum.

4.1.2 TEST INSTRUMENTS

Test date: Sep. 13, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
AGILENT SPECTRUM ANALYZER	E4446A	MY46180622	Apr. 25, 2011	Apr. 24, 2012
SUHNER RF cable	SUCOFLEX 102	36442/2	Jan. 27, 2011	Jan. 26, 2012
JFW 10dB attenuation	50HF-010-SMA	NA	NA	NA

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1.3 TEST PROCEDURES

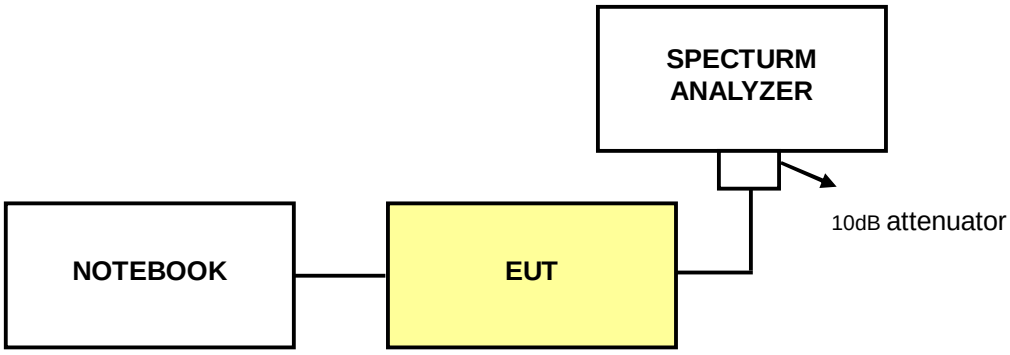
OUTPUT POWER

1. Connect the EUT transmitter output to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.
2. Tune the analyzer to the nominal center frequency of the emission bandwidth (EBW).
3. Set the span to twice the nominal EBW (span = 2 x EBW).
4. Set the resolution bandwidth (RBW) to approximately 1% of EBW.
5. Set the video bandwidth (VBW) to≥ 3 x RBW.
6. Select the average power (RMS) display detector.
7. Set the number of measurement points to ≥ 1001.
8. Use auto-coupled sweep time.
9. Perform measurement over an interval of time when the transmission is continuous and at its maximum power level.
10. Utilize trace averaging over 100 traces in the power averaging mode.
11. Use the Band/Channel Power function to determine the integrated power over the full EBW.
12. Record the band power level.
13. Adjust the recorded level by applying appropriate correction factors for the measurement set-up.
14. Determine the EIRP by adding the effective antenna gain to the adjusted power level.

POWER DENSITY

1. Connect the transmitter to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.
2. Tune the analyzer to the nominal center frequency of the emission bandwidth (EBW).
3. Set the span to twice the nominal EBW (span = 2 x EBW).
4. Set the resolution bandwidth (RBW) to 1 MHz.
5. Set the video bandwidth (VBW) to 3MHz.
6. Select the average power (RMS) display detector.
7. Set the number of measurement points to ≥ 1001.
8. Use auto-coupled sweep time.
9. Perform the measurement over an interval of time when the transmission is continuous and at its maximum power level.
10. Utilize trace averaging over 100 traces in the power averaging mode.
11. Find the maximum trace amplitude (peak search) and record.
12. Adjust the recorded level by applying appropriate correction factors for the measurement set-up.
13. Determine the EIRP by adding the effective antenna gain to the adjusted power level.

4.1.4 TEST SETUP



4.1.5 EUT OPERATING CONDITIONS

a. Placed the EUT on the testing table.
b. Prepared one notebook system outside of testing area to act as a communication partners.
c. The communication partner connected with EUT via a RJ45 UTP cable and run a test program (MTK RFCALTOOL Release v1.6.5) to enable EUT under transmission condition continuously at specific channel frequency.

4.1.6 TEST RESULTS

CHANNEL BANDWIDTH: 5MHz

CONDUCTED POWER					
CHANNEL	FREQUENCY (MHz)	CONDUCTED POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
Low	3652.5	15.0	15.1	64.0	18.1
Middle	3675	15.1	15.0	64.0	18.1
High	3697.5	15.0	15.3	65.5	18.2

EIRP POWER							
CHANNEL	FREQUENCY (MHz)	EIRP (dBm)		ANTENNA GAIN (dBi)	TOTAL POWER (mW)	TOTAL POWER (dBm)	Limit (dBm)
		CHAIN 0	CHAIN 1				
Low	3652.5	32.0	32.1	17.0	3206.7	35.1	37
Middle	3675	32.1	32.0	17.0	3206.7	35.1	37
High	3697.5	32.0	32.3	17.0	3283.1	35.2	37

NOTE:

1. EIRP = Conducted power + Antenna Gain
2. Chain 0: RF output port 0 , Chain 1: RF output port 1.

CONDUCTED POWER DENSITY					
CHANNEL	FREQUENCY (MHz)	CONDUCTED POWER DENSITY (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)
		CHAIN 0	CHAIN 1		
Low	3652.5	9.8	9.7	18.882	12.8
Middle	3675	9.9	9.7	19.105	12.8
High	3697.5	9.9	9.3	18.284	12.6

EIRP POWER DENSITY						
CHANNEL	FREQUENCY (MHz)	EIRP POWER DENSITY (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	Limit (dBm)
		CHAIN 0	CHAIN 1			
Low	3652.5	26.8	26.7	946.4	29.8	30
Middle	3675	26.9	26.7	957.5	29.8	30
High	3697.5	26.9	26.3	916.4	29.6	30

NOTE:

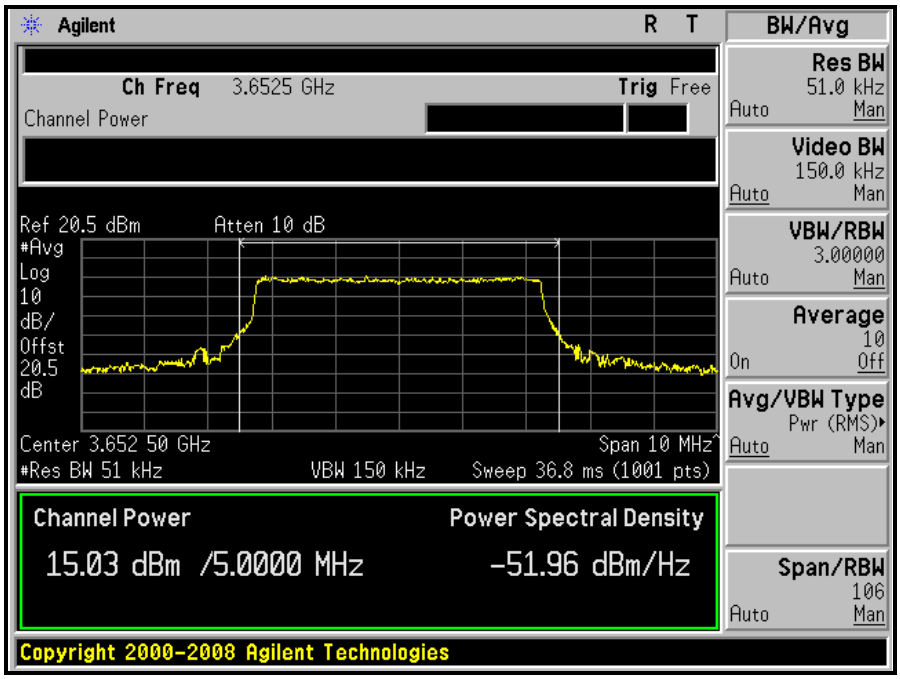
1.EIRP density = Conducted power density + Antenna Gain

2. Chain 0: RF output port 0 , Chain 1: RF output port 1.

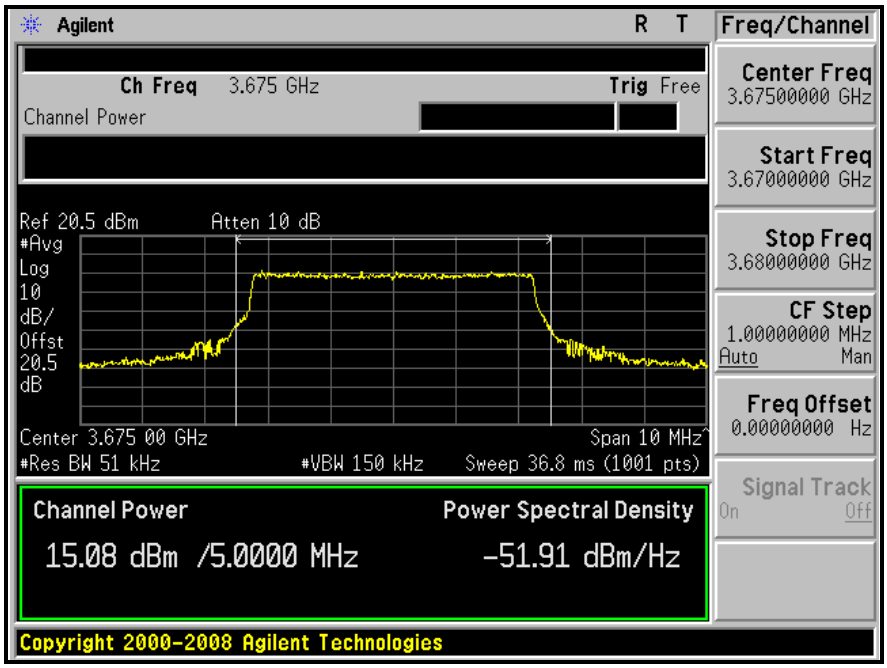
OUTPUT POWER

CHAIN 0

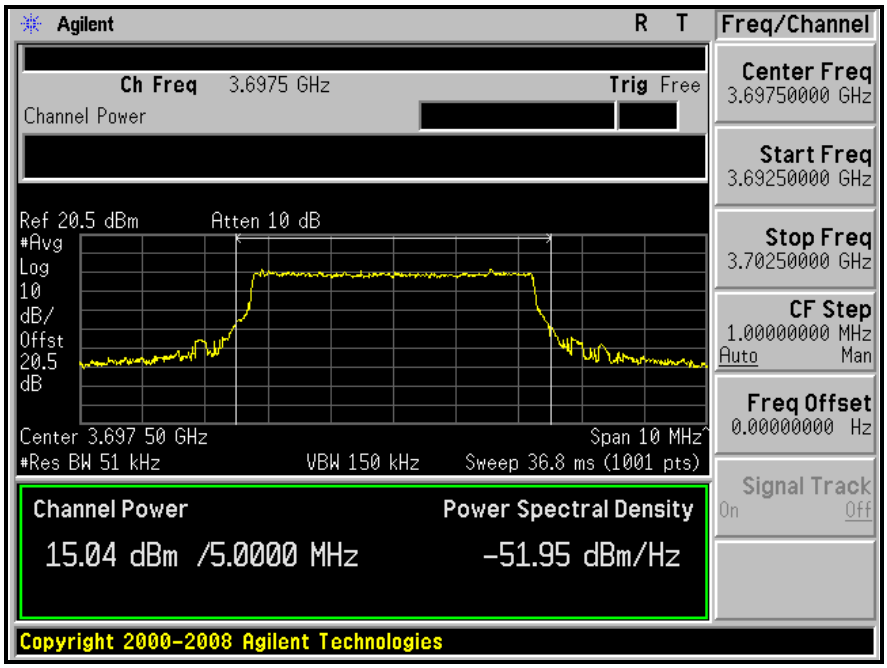
LOW CHANNEL



MIDDLE CHANNEL

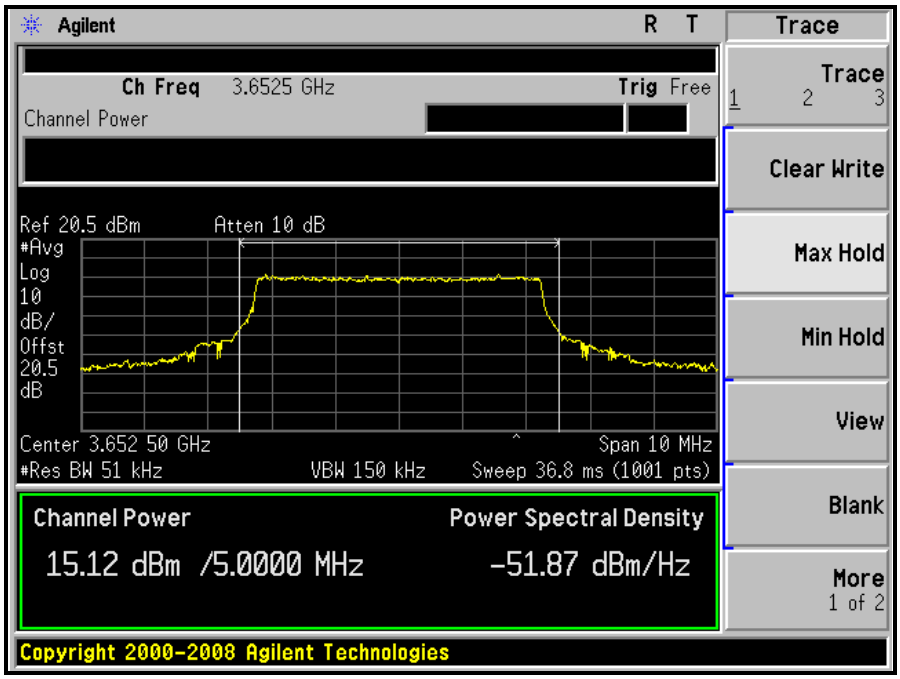


HIGH CHANNEL



CHAIN 1

LOW CHANNEL



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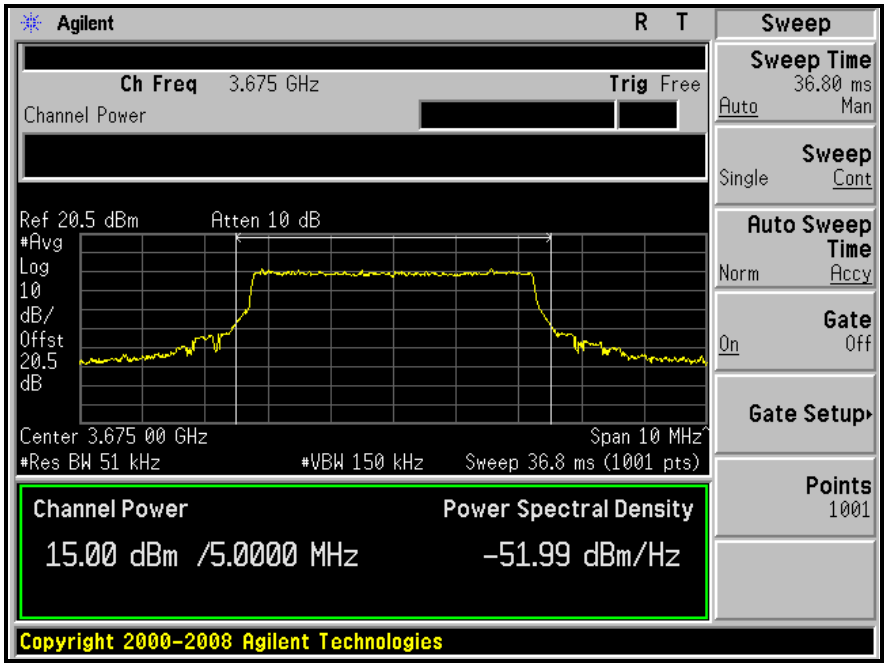
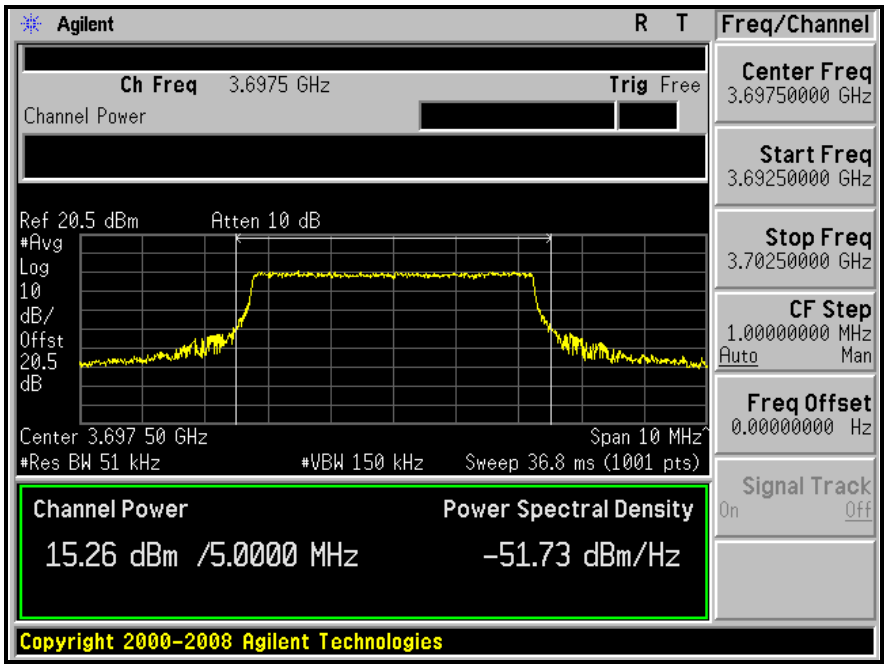


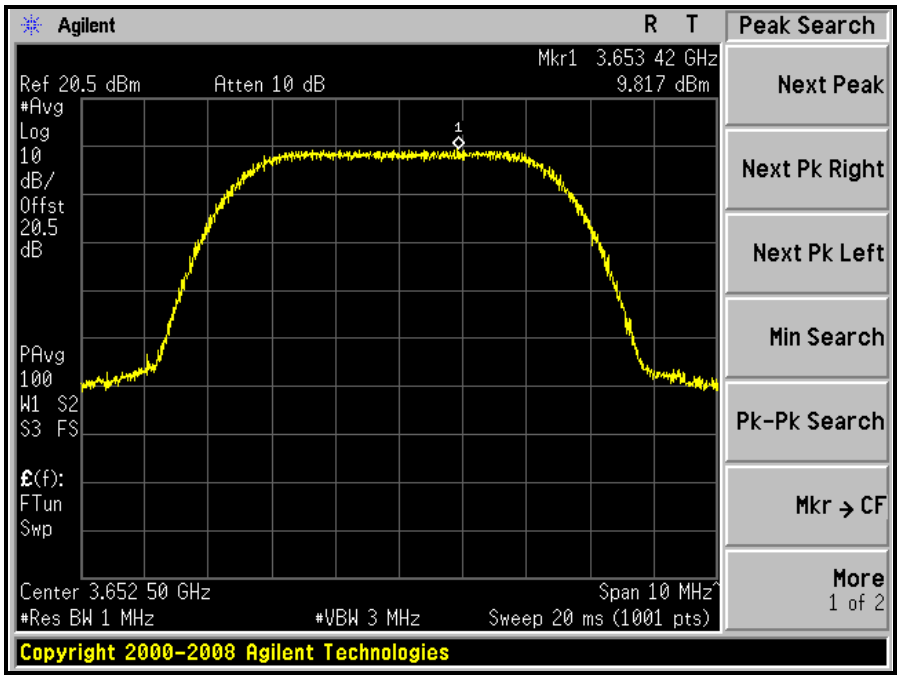
HIGH CHANNEL



POWER DENSITY

CHAIN 0

LOW CHANNEL



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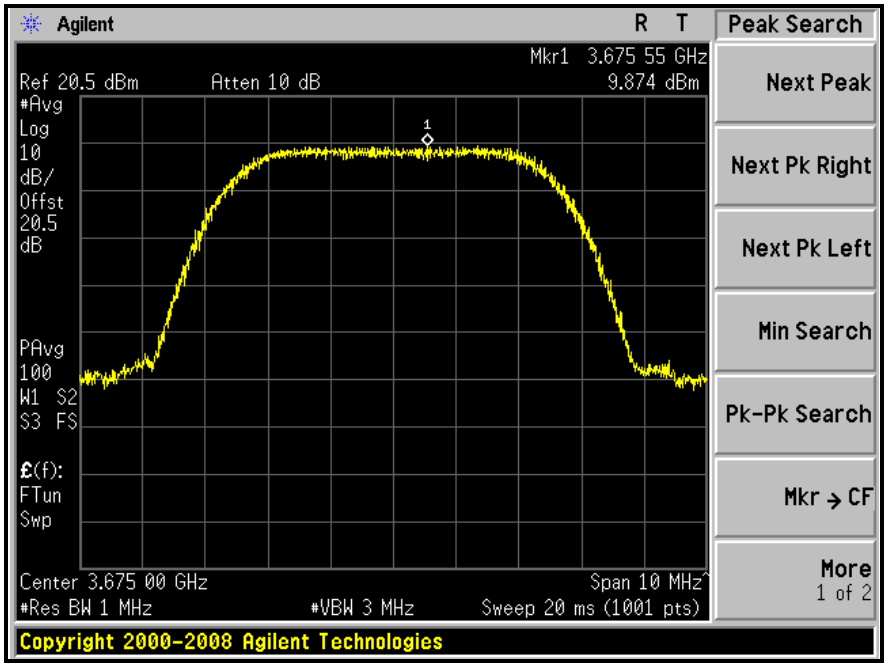
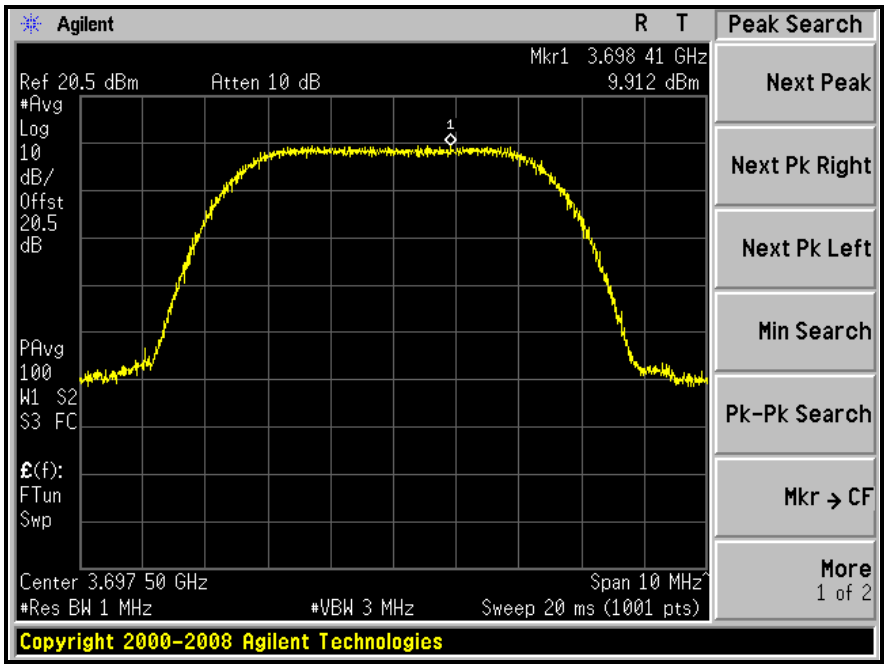
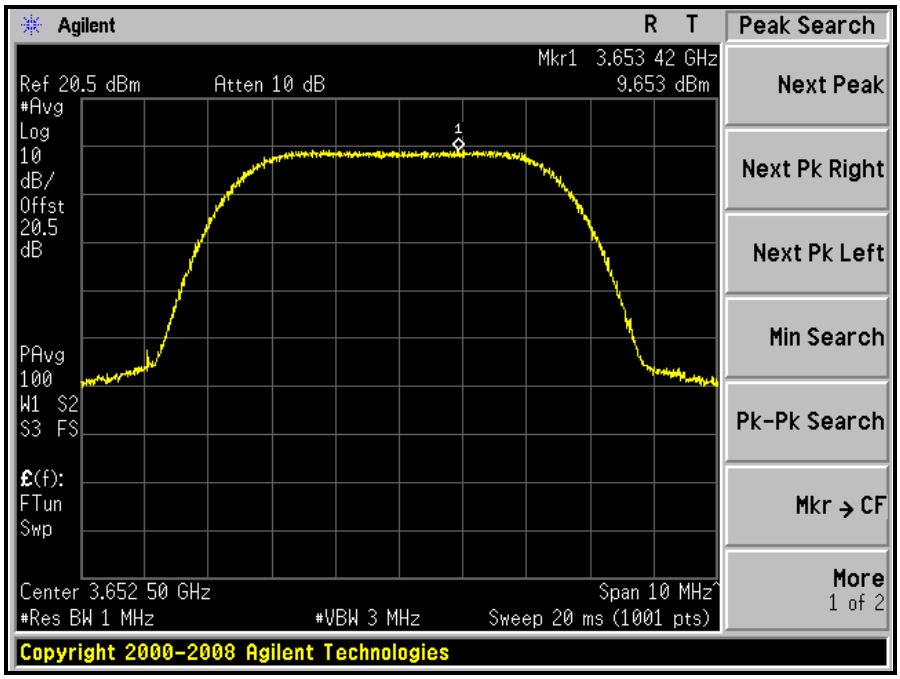


HIGH CHANNEL

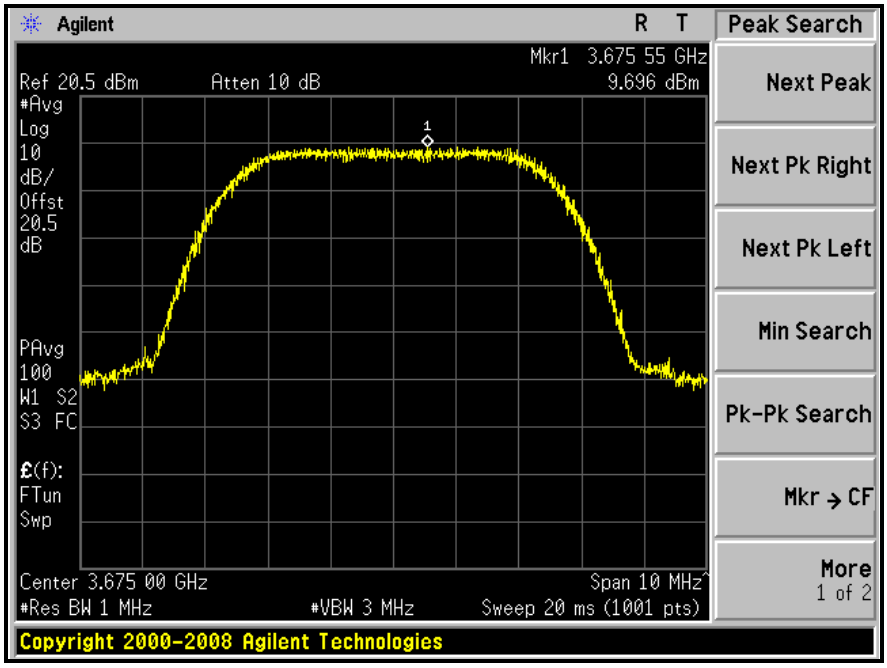


CHAIN 1

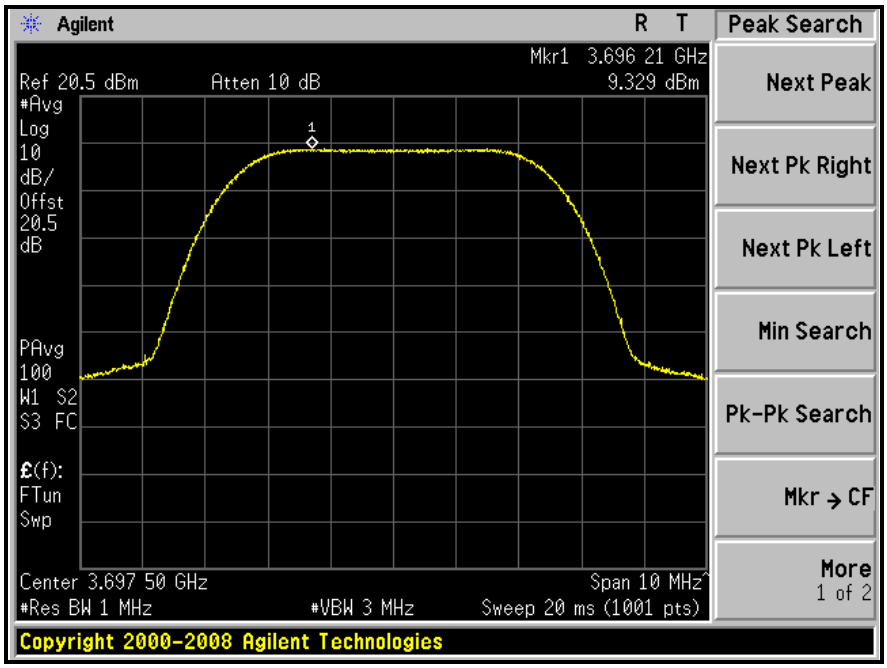
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL



CHANNEL BANDWIDTH: 7MHz

CONDUCTED POWER					
CHANNEL	FREQUENCY (MHz)	CONDUCTED POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
Low	3653.5	16.7	16.5	91.4	19.6
Middle	3675	16.5	16.5	89.3	19.5
High	3696.5	16.6	16.5	90.4	19.6

EIRP POWER							
CHANNEL	FREQUENCY (MHz)	EIRP (dBm)		ANTENNA GAIN (dBi)	TOTAL POWER (mW)	TOTAL POWER (dBm)	Limit (dBm)
		CHAIN 0	CHAIN 1				
Low	3653.5	33.7	33.5	17.0	4583.0	36.6	38.5
Middle	3675	33.5	33.5	17.0	4477.4	36.5	38.5
High	3696.5	33.6	33.5	17.0	4529.6	36.6	38.5

NOTE:

1. EIRP = Conducted power + Antenna Gain
2. Chain 0: RF output port 0 , Chain 1: RF output port 1.

CONDUCTED POWER DENSITY					
CHANNEL	FREQUENCY (MHz)	CONDUCTED POWER DENSITY (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)
		CHAIN 0	CHAIN 1		
Low	3653.5	9.9	9.8	19.322	12.9
Middle	3675	9.5	10.0	18.913	12.8
High	3696.5	10.0	9.7	19.333	12.9

EIRP POWER DENSITY						
CHANNEL	FREQUENCY (MHz)	EIRP POWER DENSITY (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	Limit (dBm)
		CHAIN 0	CHAIN 1			
Low	3653.5	26.9	26.8	968.4	29.9	30
Middle	3675	26.5	27.0	947.9	29.8	30
High	3696.5	27.0	26.7	968.9	29.9	30

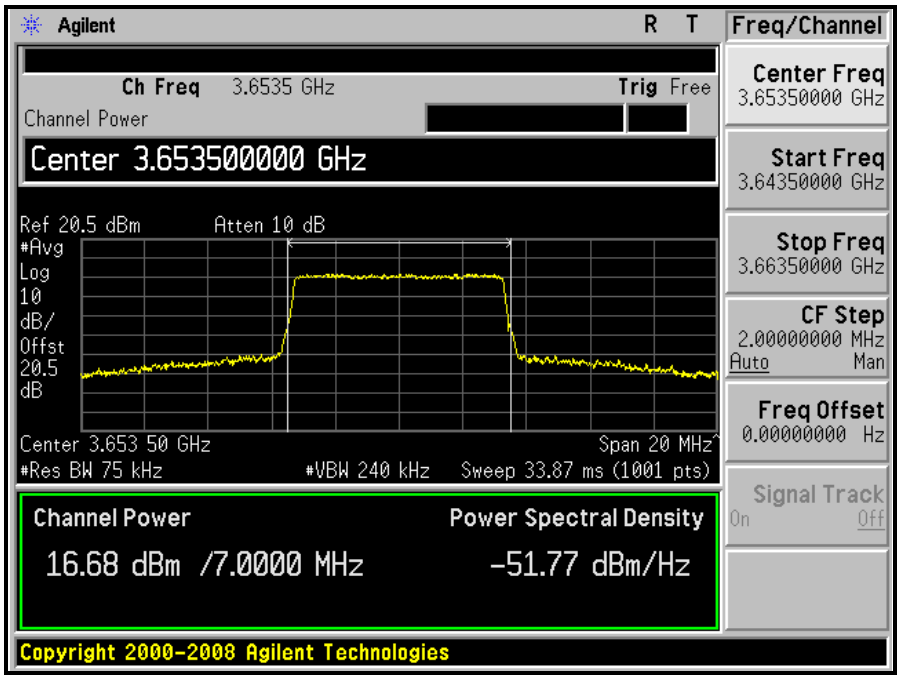
NOTE:

1. EIRP density = Conducted power density + Antenna Gain
2. Chain 0: RF output port 0 , Chain 1: RF output port 1.

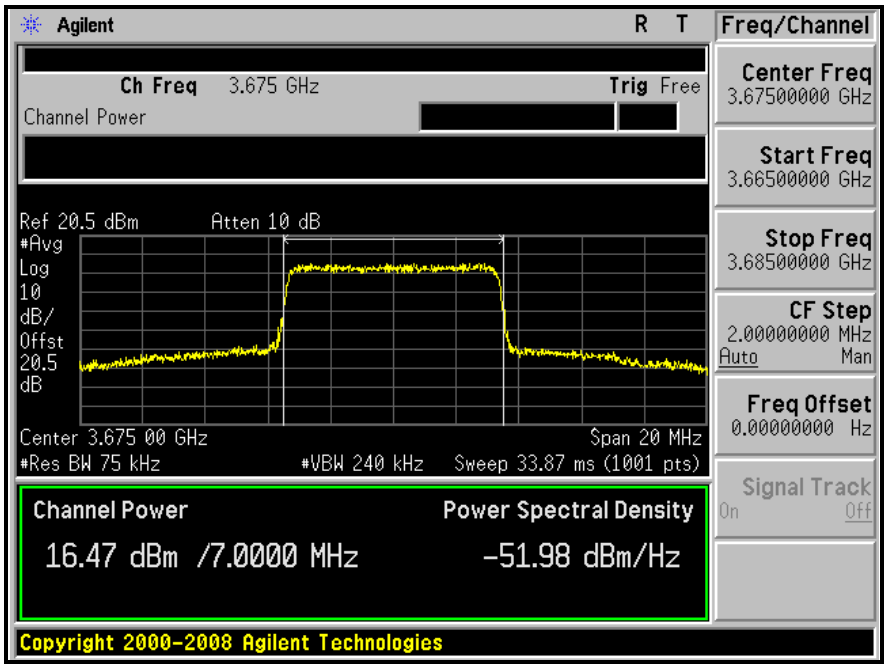
OUTPUT POWER

CHAIN 0

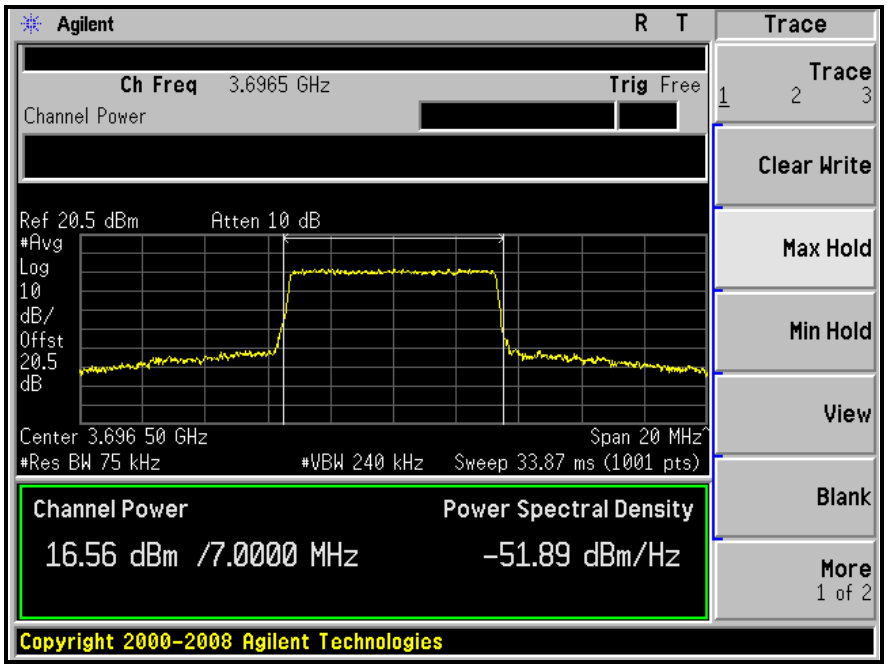
LOW CHANNEL



MIDDLE CHANNEL

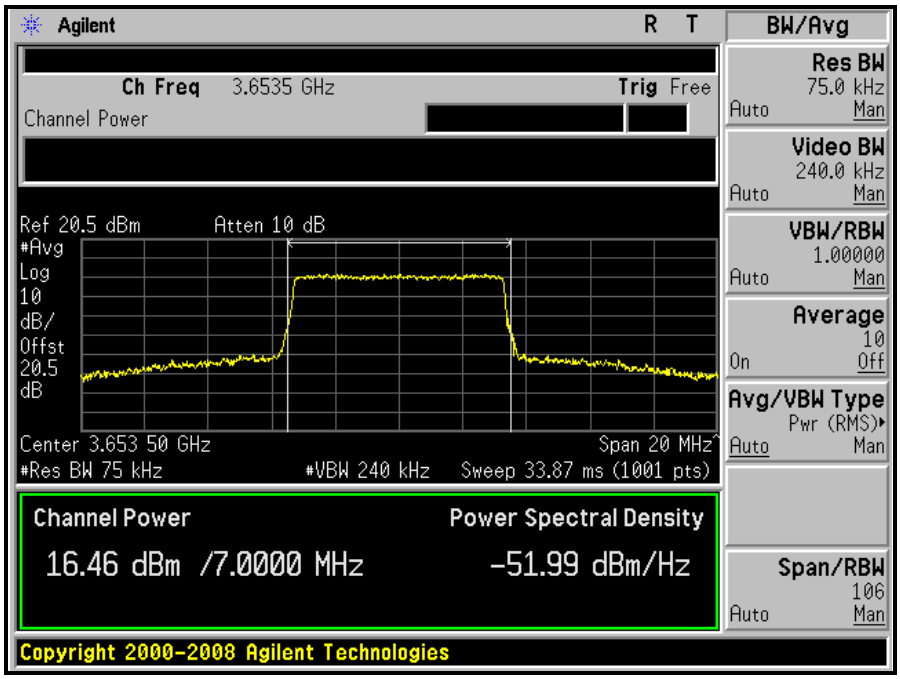


HIGH CHANNEL

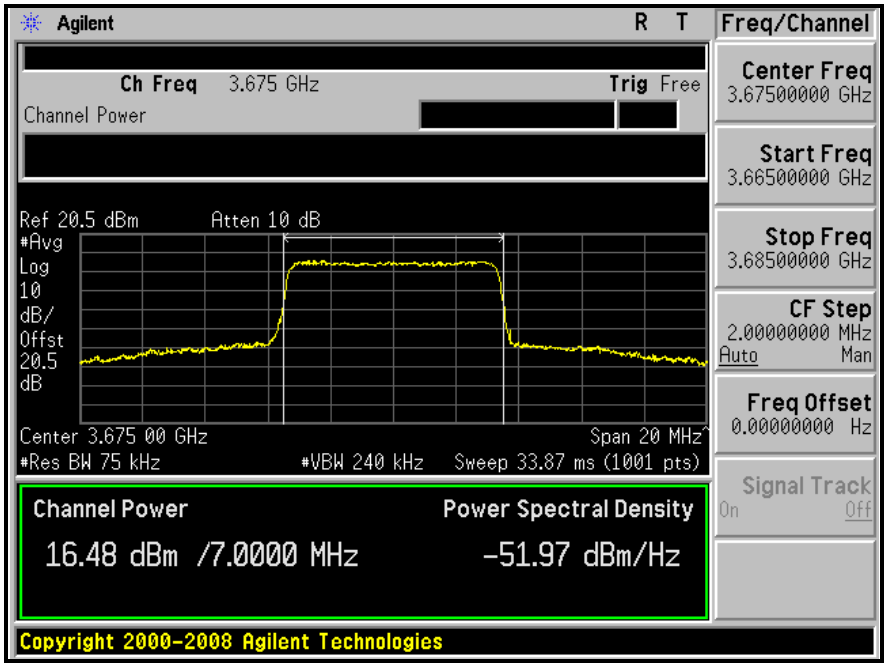


CHAIN 1

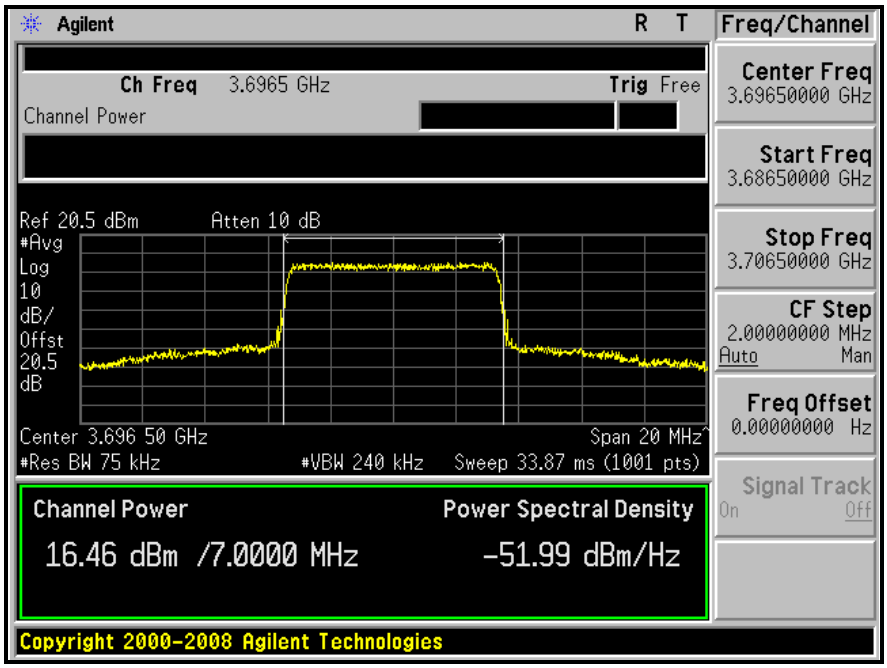
LOW CHANNEL



MIDDLE CHANNEL



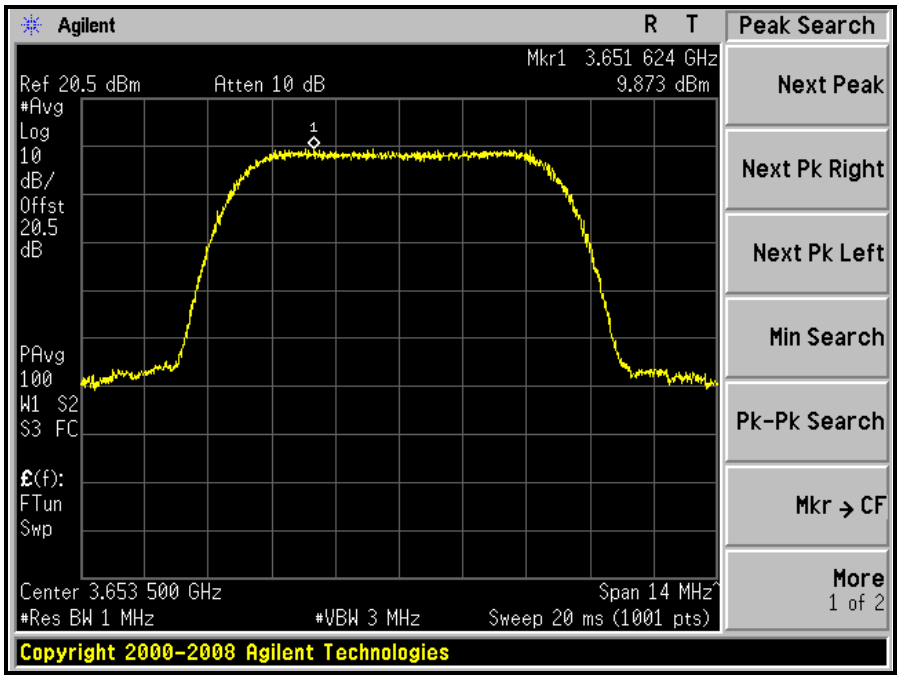
HIGH CHANNEL



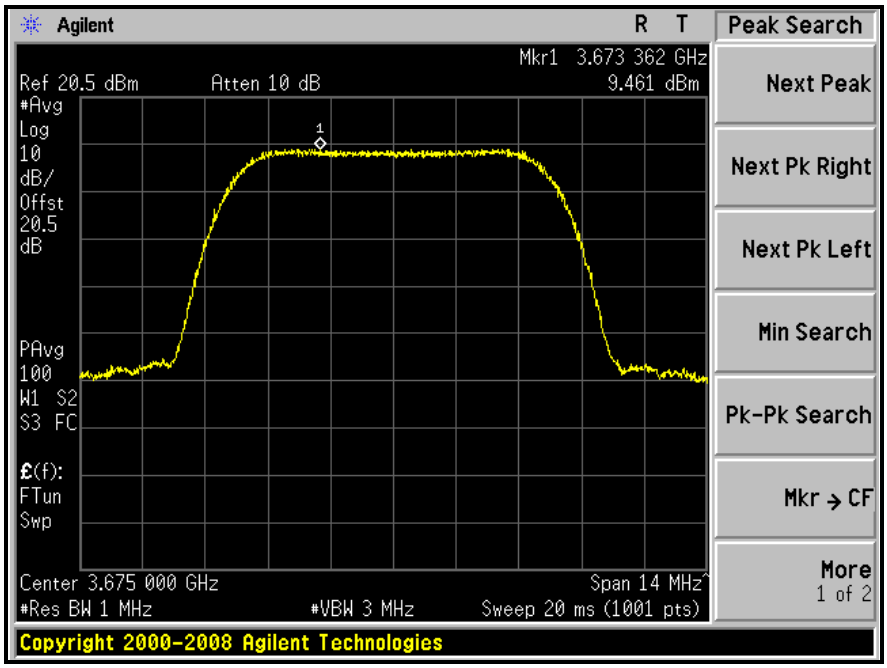
POWER DENSITY

CHAIN 0

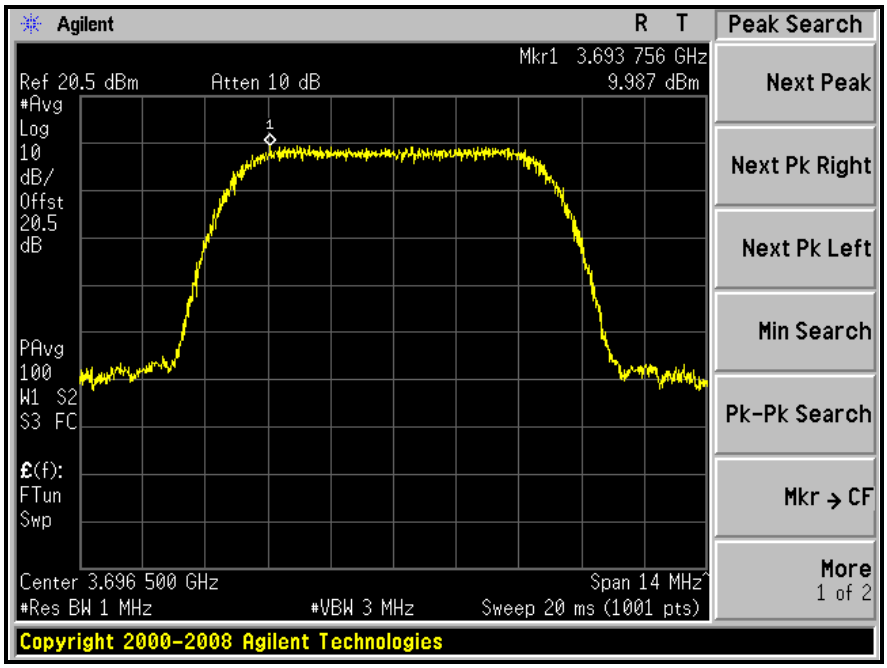
LOW CHANNEL



MIDDLE CHANNEL

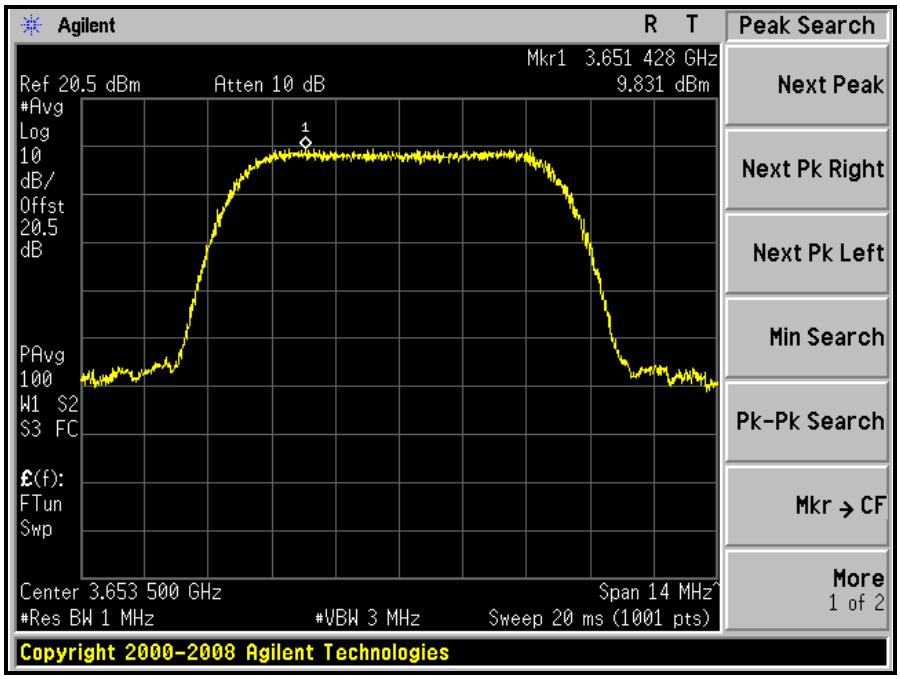


HIGH CHANNEL

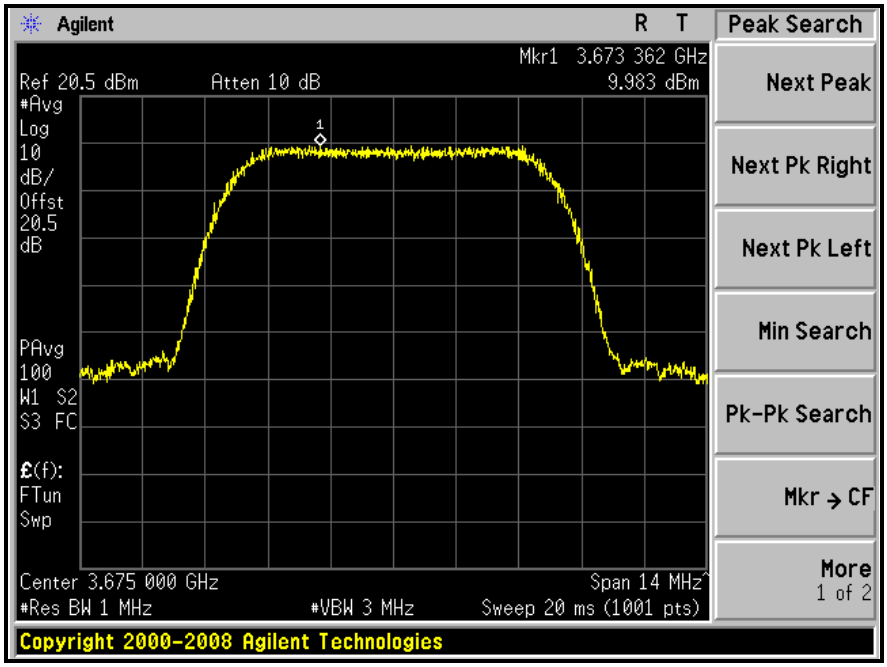


CHAIN 1

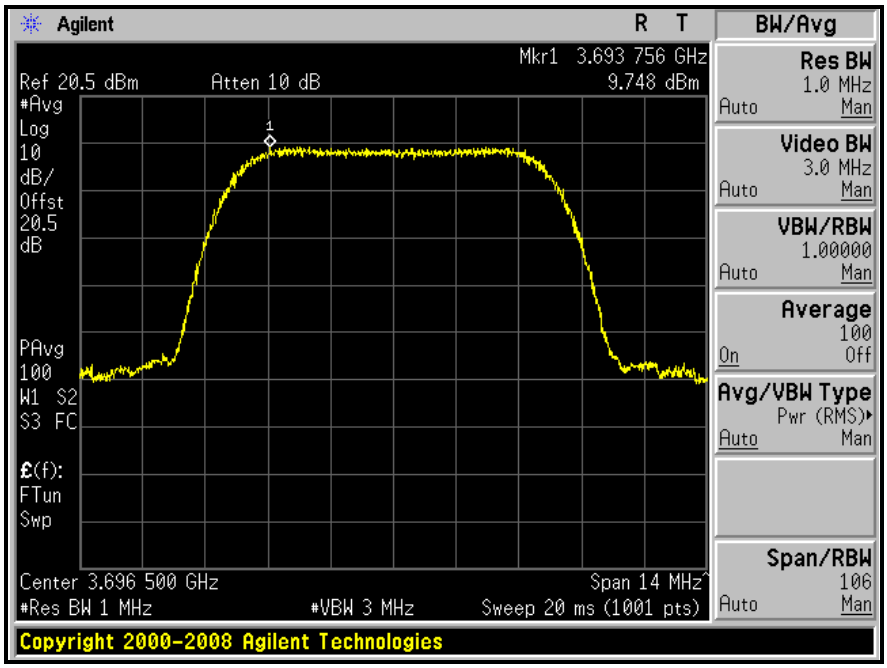
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL



CHANNEL BANDWIDTH: 10MHz

CONDUCTED POWER					
CHANNEL	FREQUENCY (MHz)	CONDUCTED POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
Low	3655	18.5	18.5	141.6	21.5
Middle	3675	18.4	18.6	141.6	21.5
High	3695	18.2	18.2	132.1	21.2

EIRP POWER							
CHANNEL	FREQUENCY (MHz)	EIRP (dBm)		ANTENNA GAIN (dBi)	TOTAL POWER (mW)	TOTAL POWER (dBm)	Limit (dBm)
		CHAIN 0	CHAIN 1				
Low	3655	35.5	35.5	17.0	7096.3	38.5	40
Middle	3675	35.4	35.6	17.0	7098.2	38.5	40
High	3695	35.2	35.2	17.0	6622.6	38.2	40

NOTE:

1. EIRP = Conducted power + Antenna Gain
2. Chain 0: RF output port 0 , Chain 1: RF output port 1.

CONDUCTED POWER DENSITY					
CHANNEL	FREQUENCY (MHz)	CONDUCTED POWER DENSITY (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)
		CHAIN 0	CHAIN 1		
Low	3655	9.6	9.8	18.670	12.7
Middle	3675	9.6	9.7	18.453	12.7
High	3695	9.9	9.5	18.685	12.7

EIRP POWER DENSITY						
CHANNEL	FREQUENCY (MHz)	EIRP POWER DENSITY (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	Limit (dBm)
		CHAIN 0	CHAIN 1			
Low	3655	26.6	26.8	935.7	29.7	30
Middle	3675	26.6	26.7	924.8	29.7	30
High	3695	26.9	26.5	936.5	29.7	30

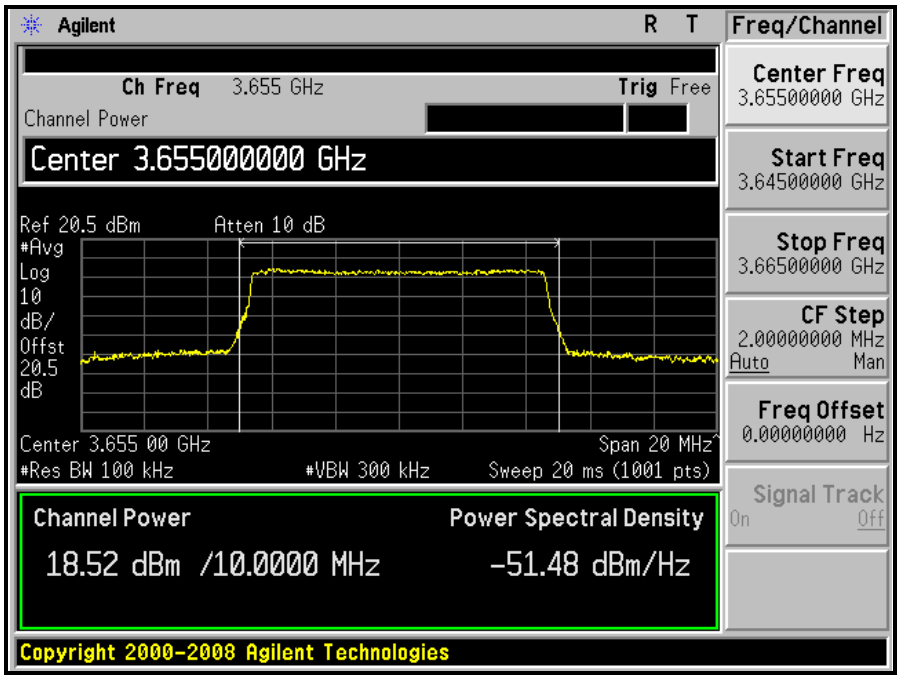
NOTE:

1. EIRP density = Conducted power density + Antenna Gain
2. Chain 0: RF output port 0 , Chain 1: RF output port 1.

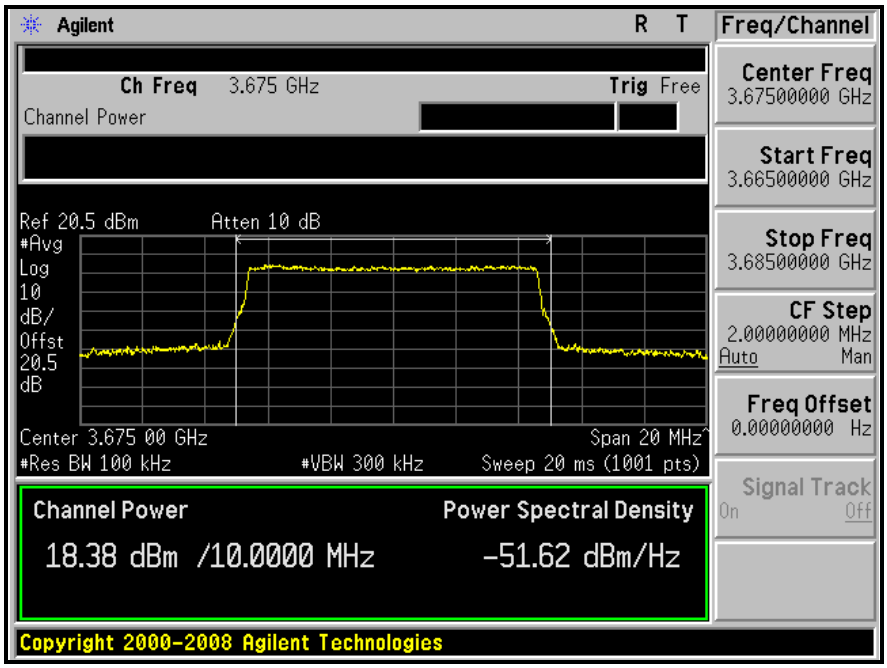
OUTPUT POWER

CHAIN 0

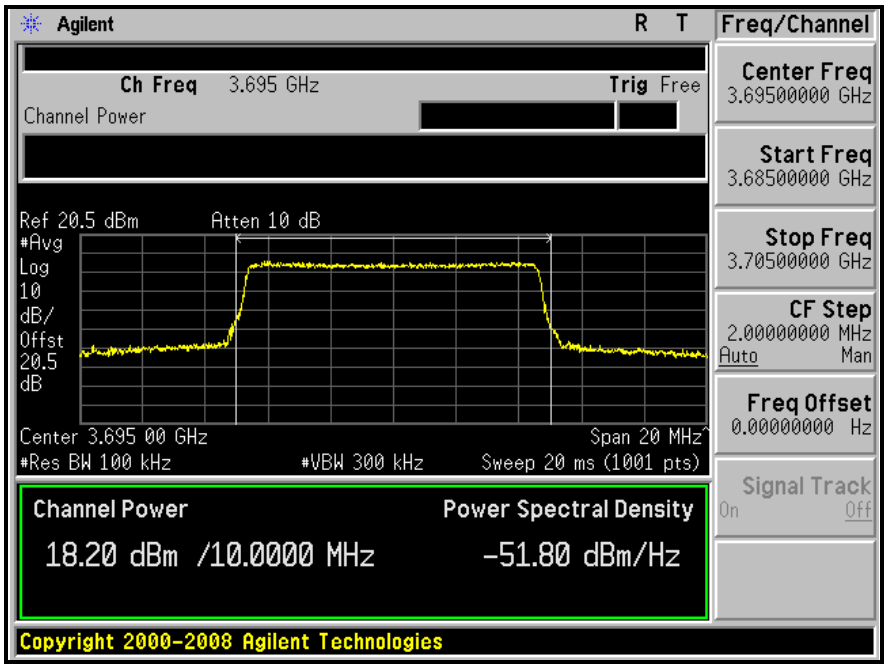
LOW CHANNEL



MIDDLE CHANNEL

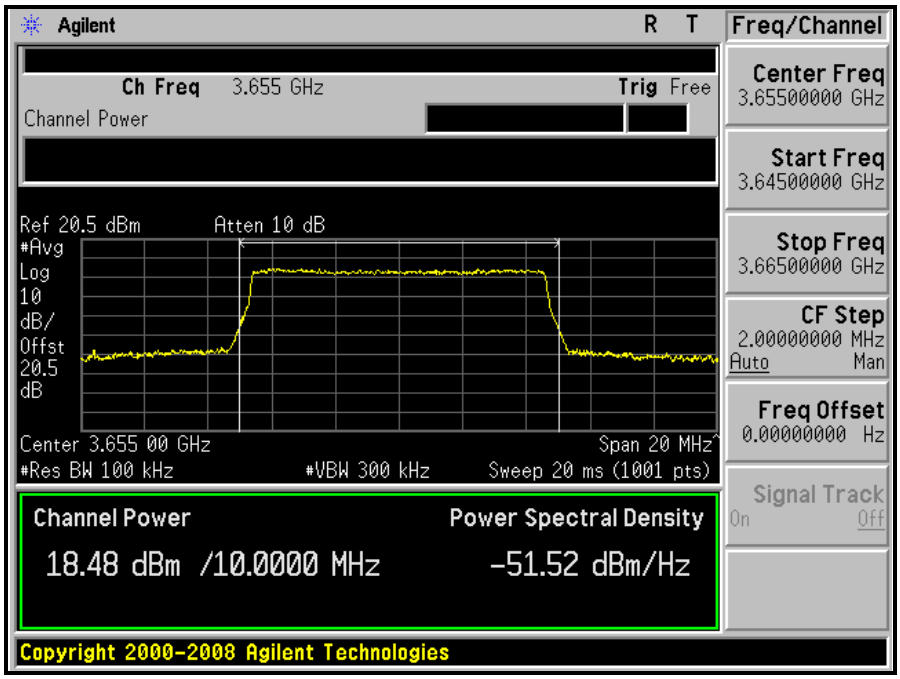


HIGH CHANNEL

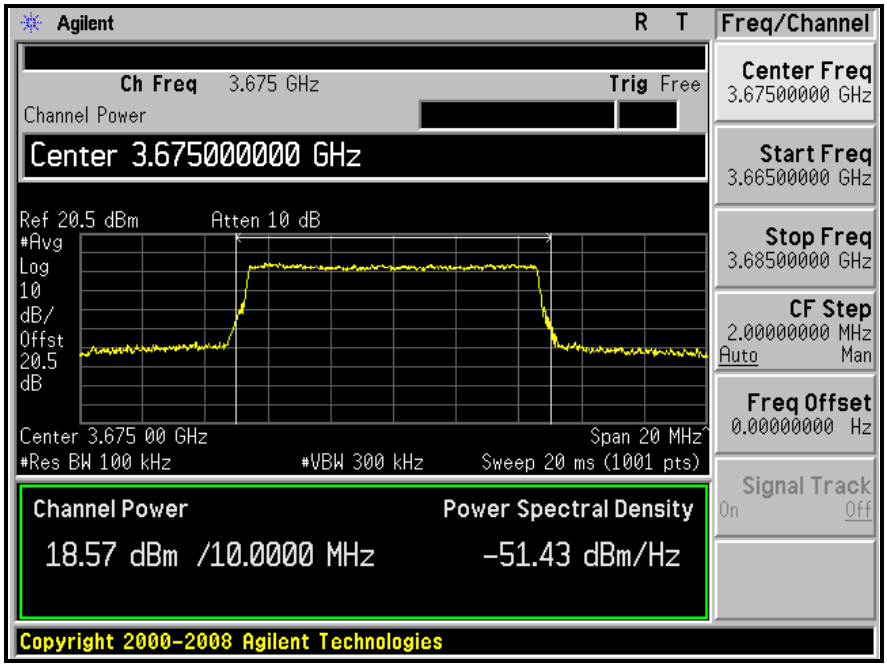


CHAIN 1

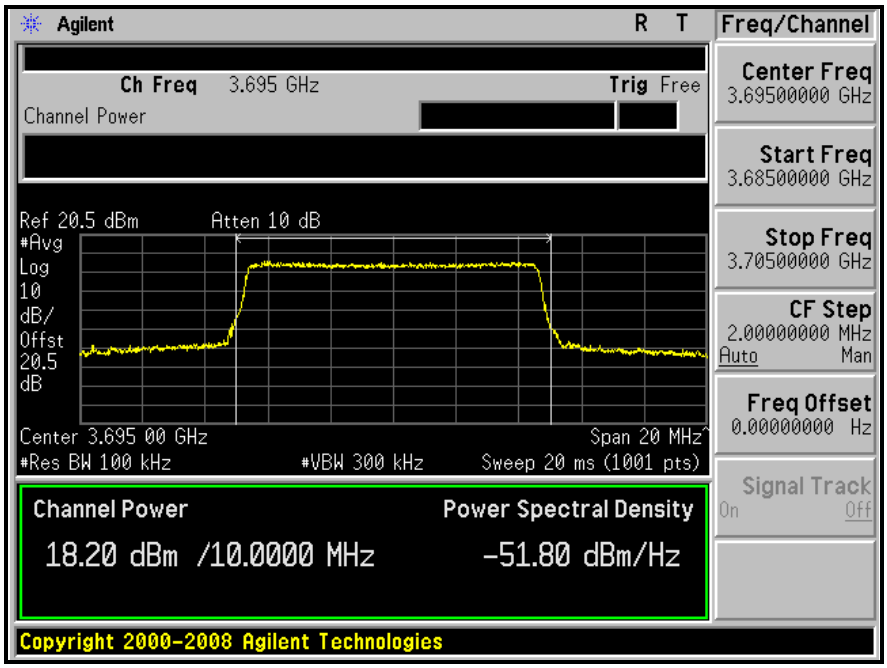
LOW CHANNEL



MIDDLE CHANNEL



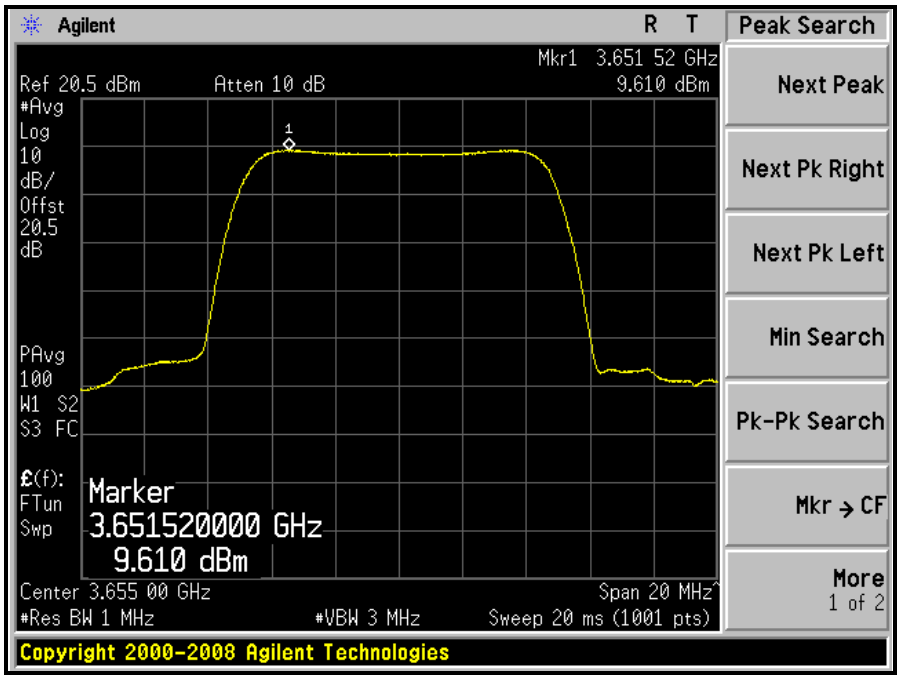
HIGH CHANNEL



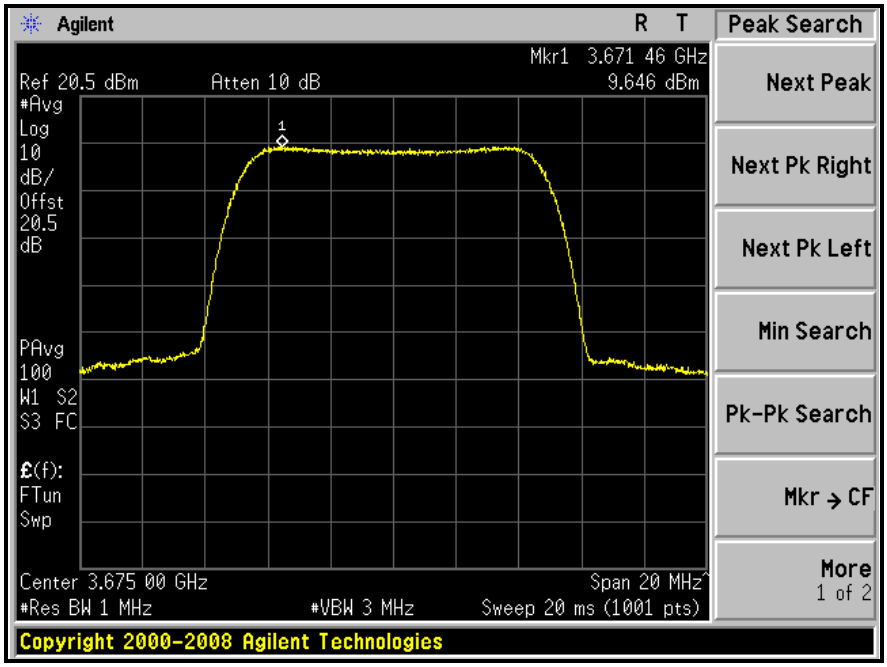
POWER DENSITY

CHAIN 0

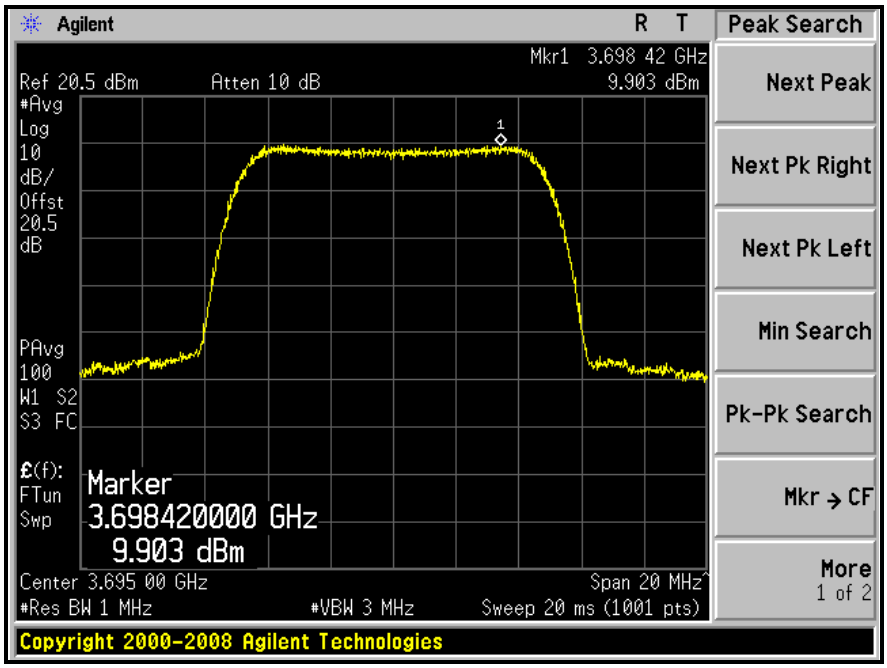
LOW CHANNEL



MIDDLE CHANNEL

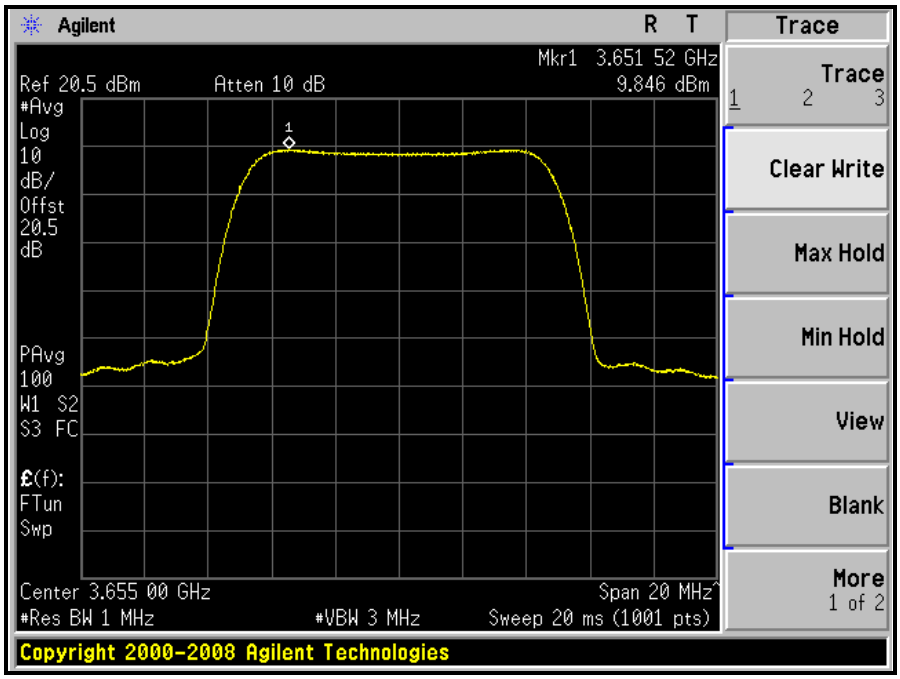


HIGH CHANNEL

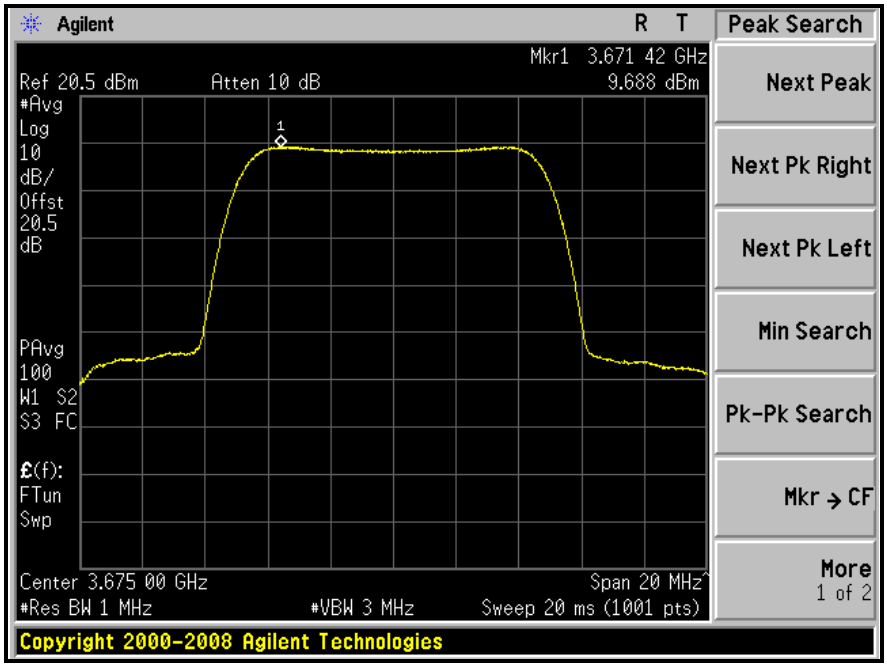


CHAIN 1

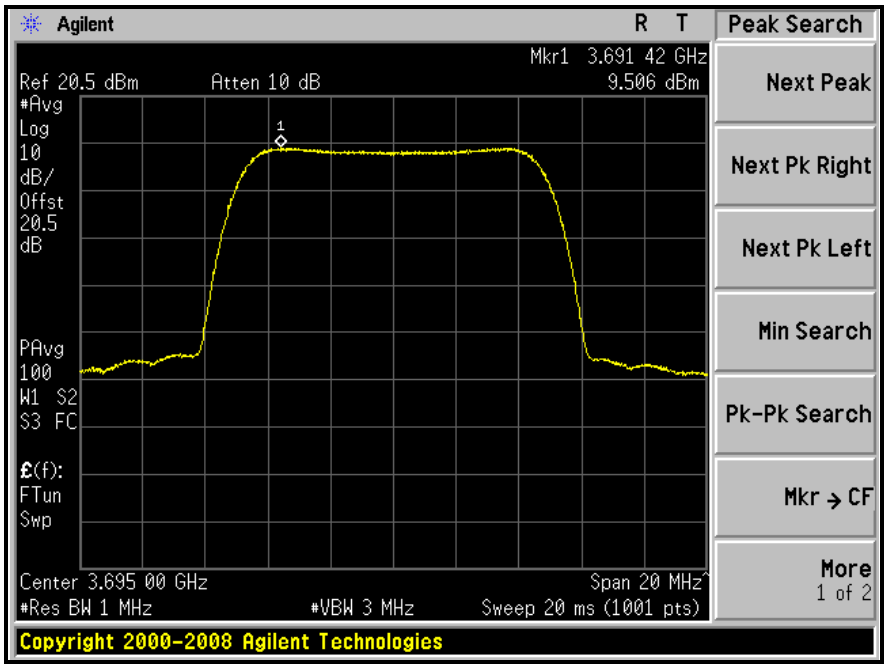
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL



4.2 FREQUENCY STABILITY MEASUREMENT

4.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

According to the FCC part 2.1055 shall be tested the frequency stability. The rule is defined that" The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with specification of EUT -30°C ~ 50°C.

4.2.2 TEST INSTRUMENTS

Test date: Sep. 13, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
AGILENT SPECTRUM ANALYZER	E4446A	MY46180622	Apr. 25, 2011	Apr. 24, 2012
SUHNER RF cable	SUCOFLEX 102	36442/2	Jan. 27, 2011	Jan. 26, 2012
JFW 10dB attenuation	50HF-010-SMA	N/A	NA	NA
OVEN	MHU-225AU	911033	Dec. 17, 2010	Dec. 16, 2011
Electronics AC Power Source	6502	1140503	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.2.3 TEST PROCEDURE

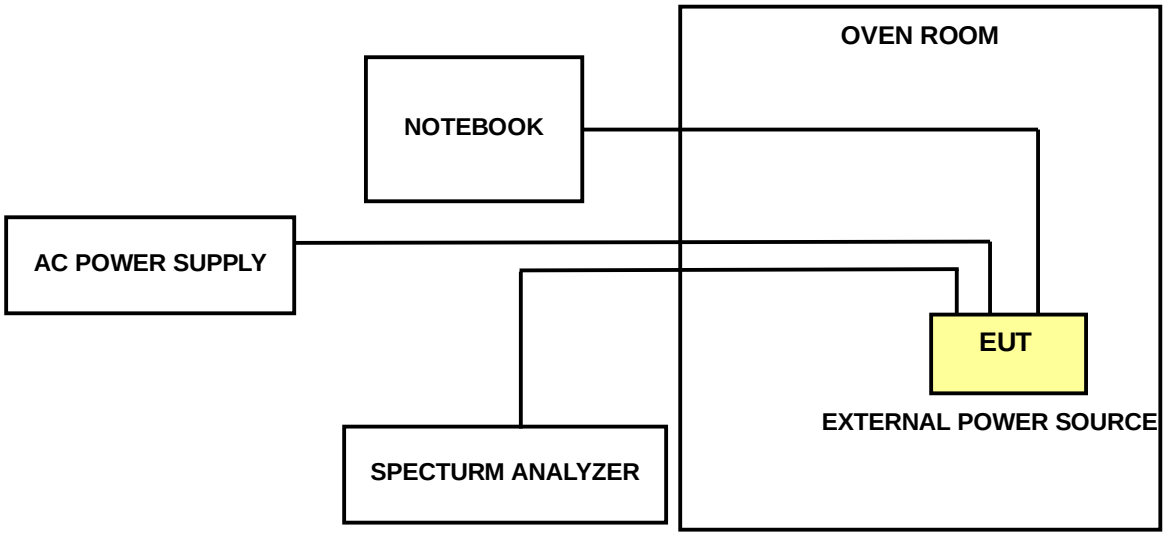
a. Power must be removed when changing from one temperature to another or one voltage to another voltage. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the AC input power. The various Volts from the minimum 102 Volts to 138 Volts. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing.

d. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

4.2.4 TEST SETUP



4.2.5 EUT OPERATING CONDITIONS

The EUT connected to the notebook. Use software to control the EUT channel and transmit a single tone.

4.2.6 TEST RESULTS

AFC FREQUENCY ERROR VS. VOLTAGE								
VOLTAGE (Volts)	0Minutes		2Minutes		5Minutes		10Minutes	
	FREQUENCY (MHz)	PPM (%)	FREQUENCY (MHz)	PPM (%)	FREQUENCY (MHz)	PPM (%)	FREQUENCY (MHz)	PPM (%)
138	3674.9963	-1.007	3674.9961	-1.061	3674.9971	-0.789	3674.9951	-1.333
120	3674.9954	-1.252	3674.9963	-1.007	3674.9966	-0.925	3674.9956	-1.197
102	3674.9952	-1.306	3674.9968	-0.871	3674.9965	-0.952	3674.9951	-1.333

AFC FREQUENCY ERROR VS. TEMP								
TEMP (℃)	0Minutes		2Minutes		5Minutes		10Minutes	
	FREQUENCY (MHz)	PPM (%)	FREQUENCY (MHz)	PPM (%)	FREQUENCY (MHz)	PPM (%)	FREQUENCY (MHz)	PPM (%)
50	3675.0058	1.578	3675.003	0.816	3675.0046	1.252	3675.0022	0.599
40	3675.0004	0.109	3675.0023	0.626	3675.0009	0.245	3674.999	-0.272
30	3674.9927	-1.986	3674.993	-1.905	3674.9948	-1.415	3674.9914	-2.340
20	3674.9954	-1.252	3674.9963	-1.007	3674.9966	-0.925	3674.9956	-1.197
10	3674.9924	-2.068	3674.9956	-1.197	3674.9929	-1.932	3674.9955	-1.224
0	3674.9995	-0.136	3674.9984	-0.435	3674.9956	-1.197	3674.9972	-0.762
-10	3675.005	1.361	3675.0085	2.313	3675.0065	1.769	3675.0086	2.340
-20	3675.012	3.265	3675.0126	3.429	3675.016	4.354	3675.015	4.082
-30	3674.9944	-1.524	3674.9908	-2.503	3674.987	-3.537	3674.9859	-3.837

4.3 EMISSION BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF EMISSION BANDWIDTH MEASUREMENT

According to FCC 90.1323 specified that emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

4.3.2 TEST INSTRUMENTS

Test date: Sep. 13, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY46180622	Apr. 25, 2011	Apr. 24, 2012
HUBER+SUHNER	SUCOFLEX104	222689/4	May 17, 2011	May 16, 2012
JFW 10dB attenuation	50HF-010-SMA	N/A	NA	NA

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW = 51kHz (5MHz bandwidth), 75kHz (7MHz bandwidth), 100kHz (10MHz bandwidth), VBW = 150kHz (5MHz bandwidth), 240kHz (7MHz bandwidth), 300kHz (10MHz bandwidth). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

4.3.4 TEST SETUP

Same as 4.1.4

4.3.5 EUT OPERATING CONDITIONS

Same as 4.1.5

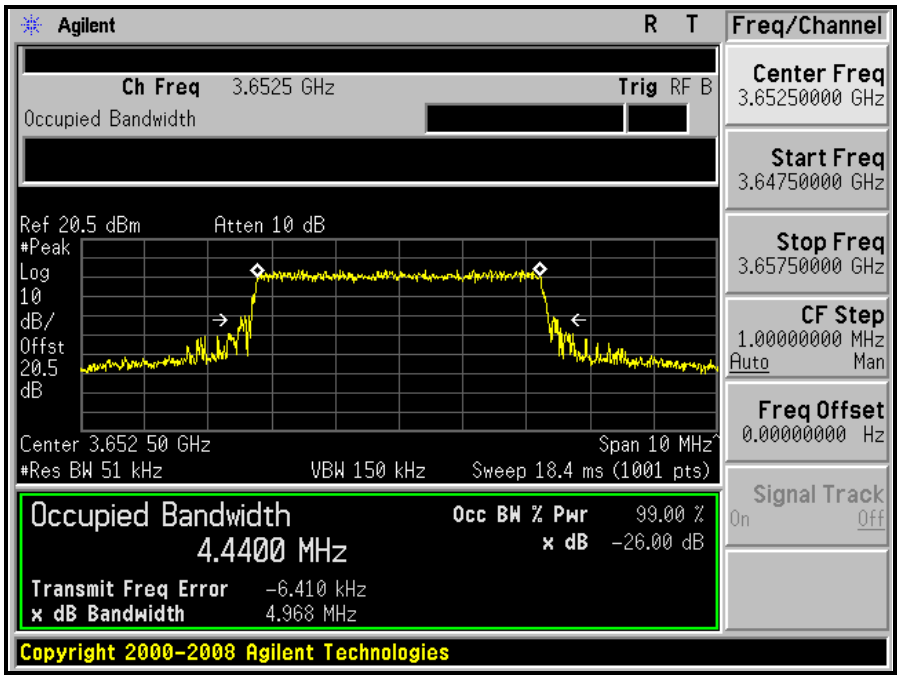
4.3.6 TEST RESULTS

CHANNEL BANDWIDTH: 5MHz

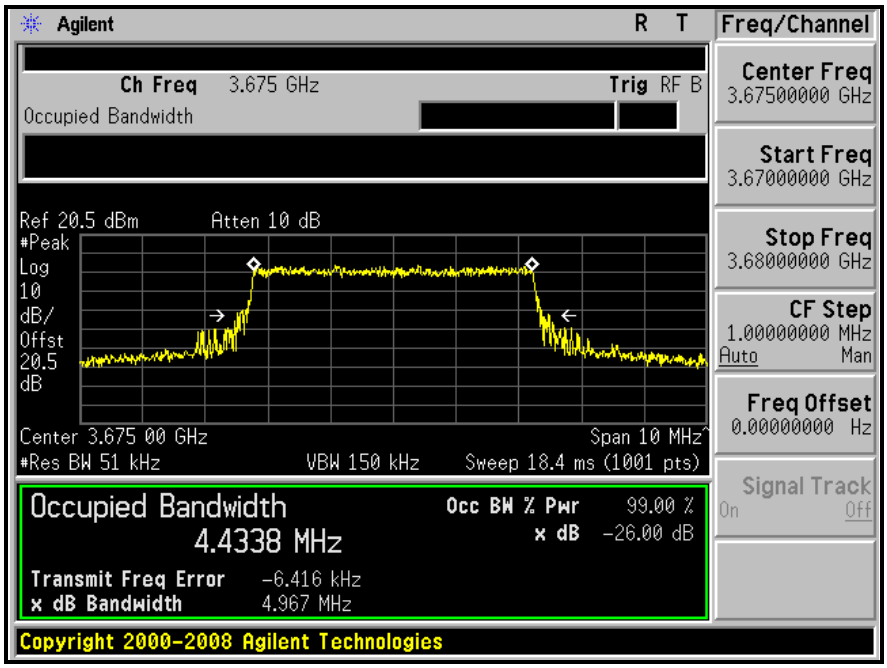
CHANNEL	-26dBc BANDWIDTH (MHz)	
	CHAIN 0	CHAIN 1
Low	4.96	4.86
Middle	4.96	4.96
High	4.96	4.84

CHAIN 0

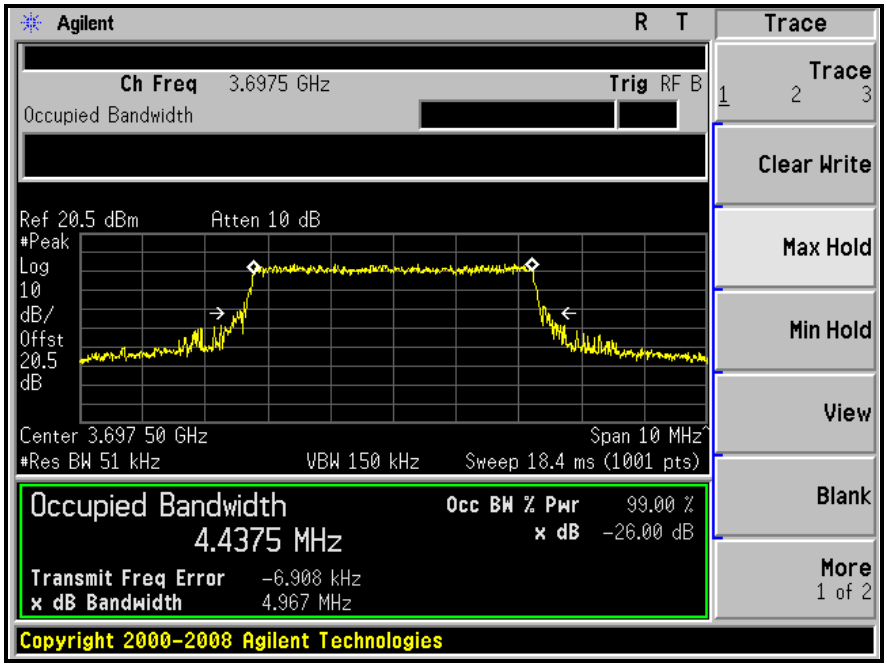
LOW CHANNEL



MIDDLE CHANNEL

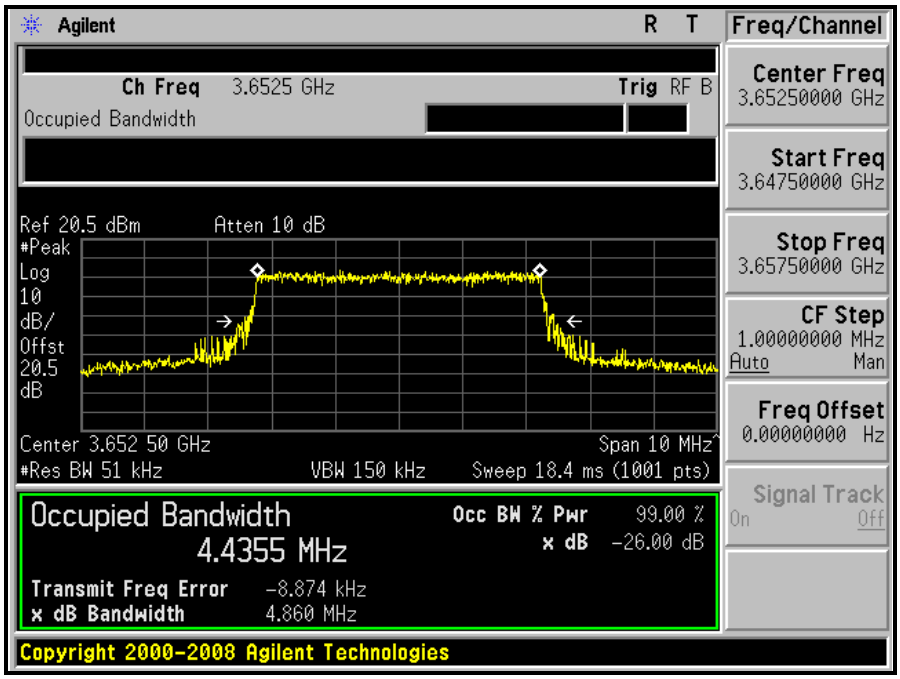


HIGH CHANNEL

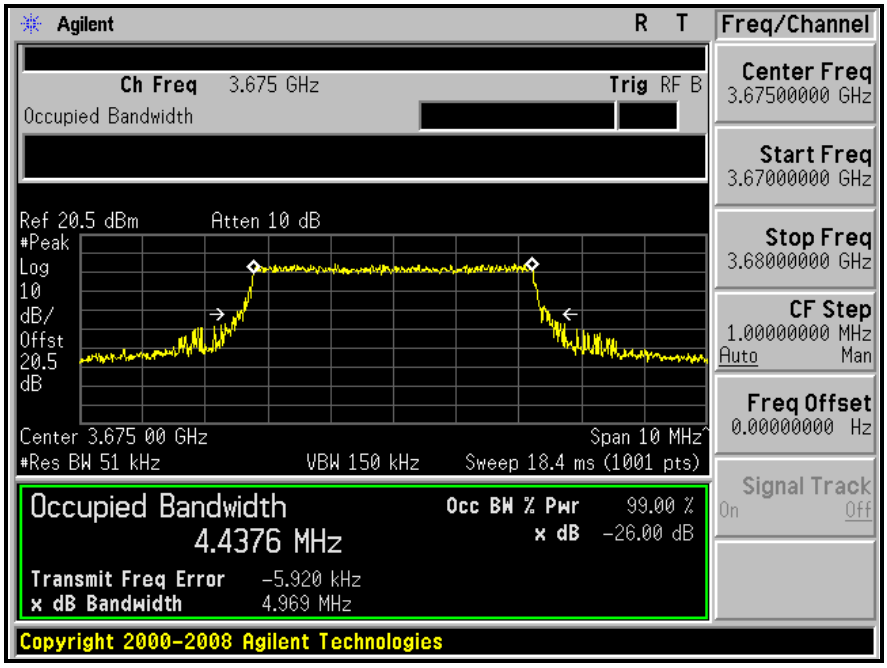


CHAIN 1

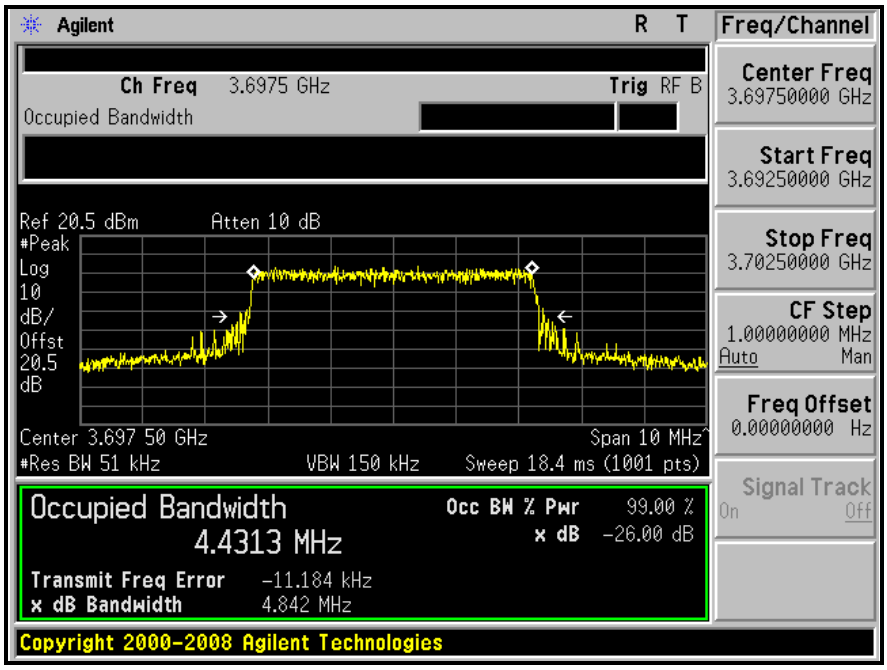
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL

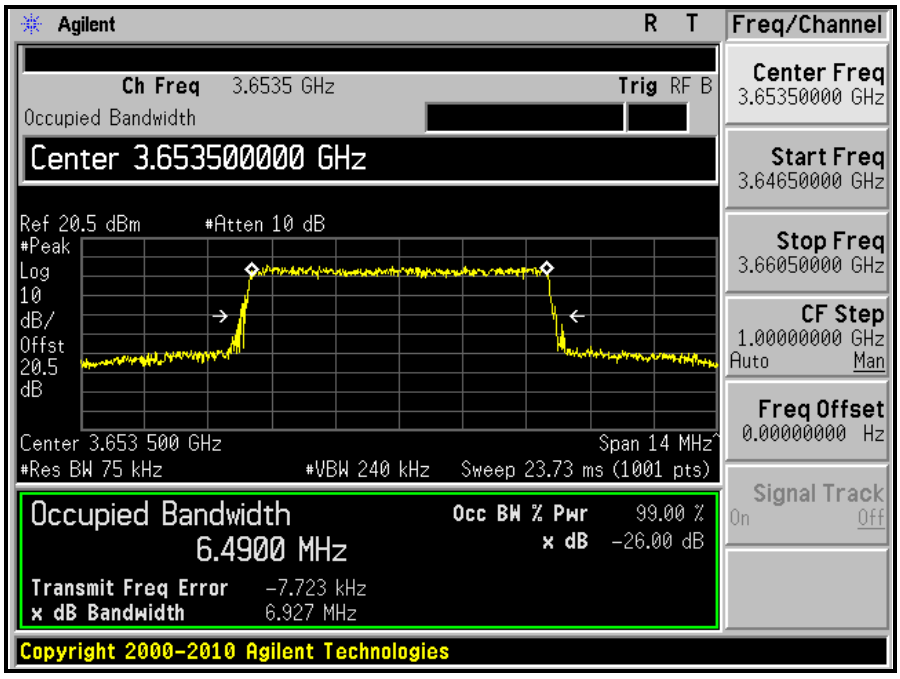


CHANNEL BANDWIDTH: 7MHz

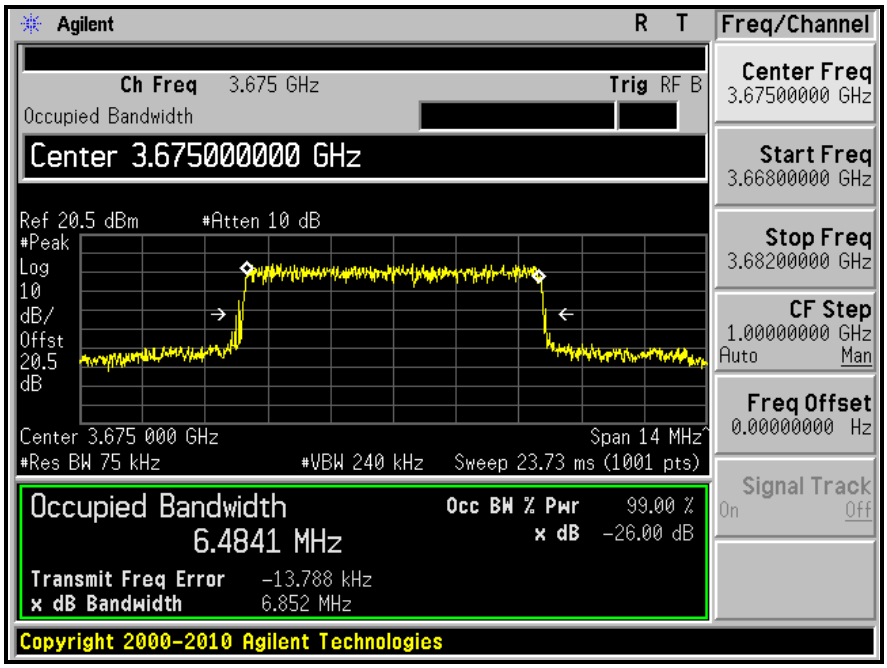
CHANNEL	-26dBc BANDWIDTH (MHz)	
	CHAIN 0	CHAIN 1
Low	6.92	6.86
Middle	6.85	6.94
High	6.88	6.87

CHAIN 0

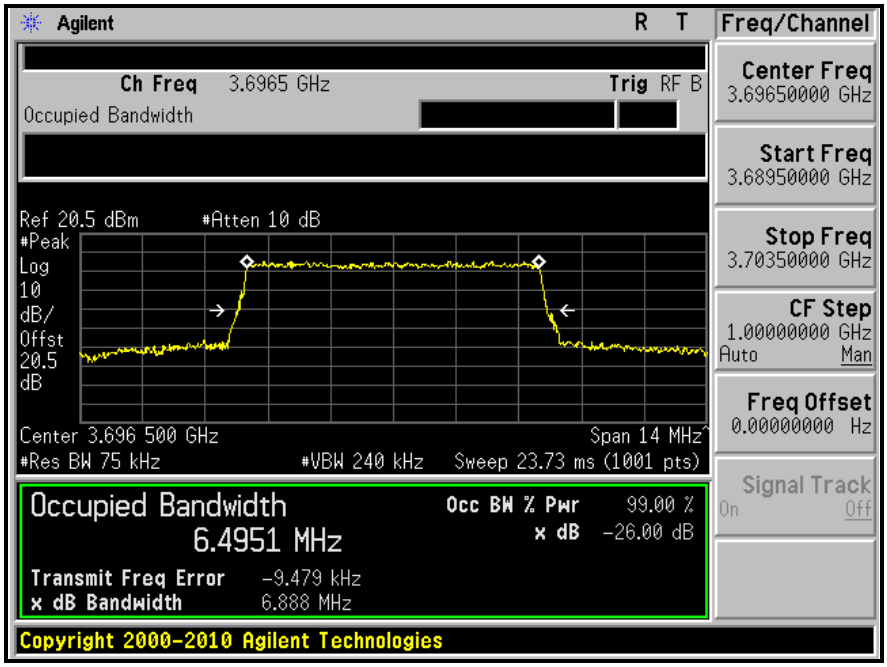
LOW CHANNEL



MIDDLE CHANNEL

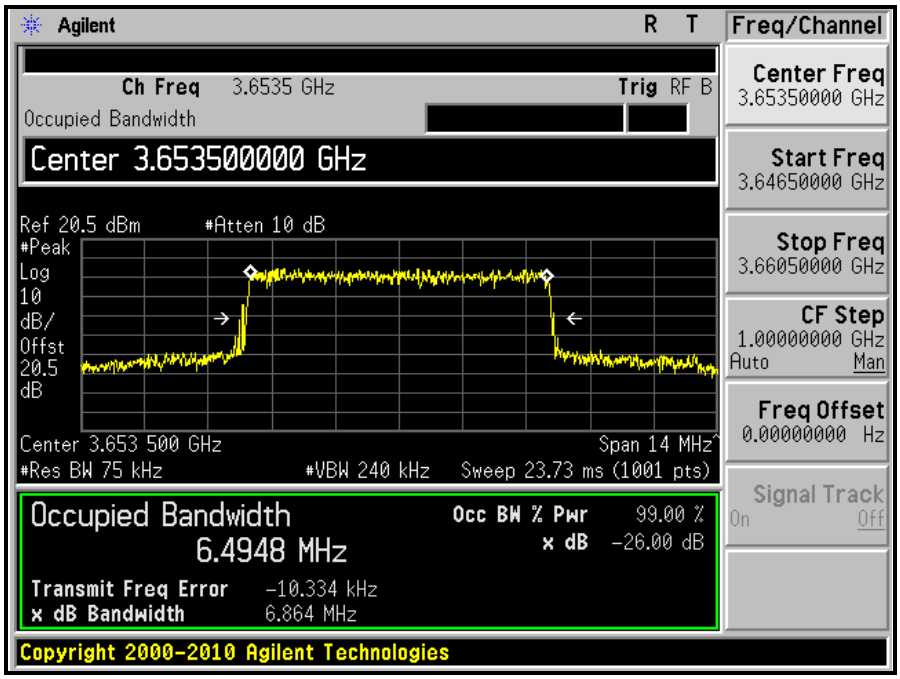


HIGH CHANNEL

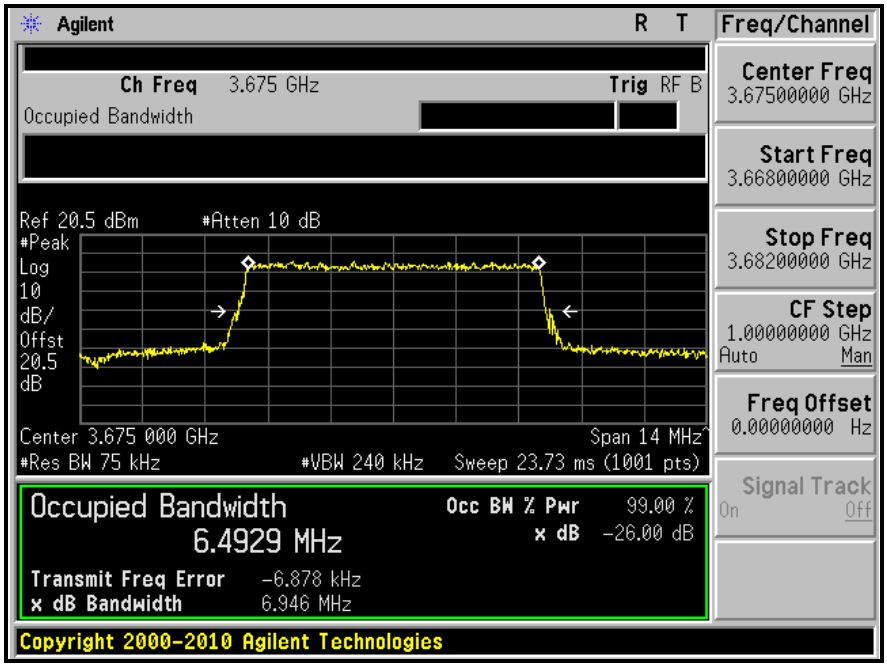


CHAIN 1

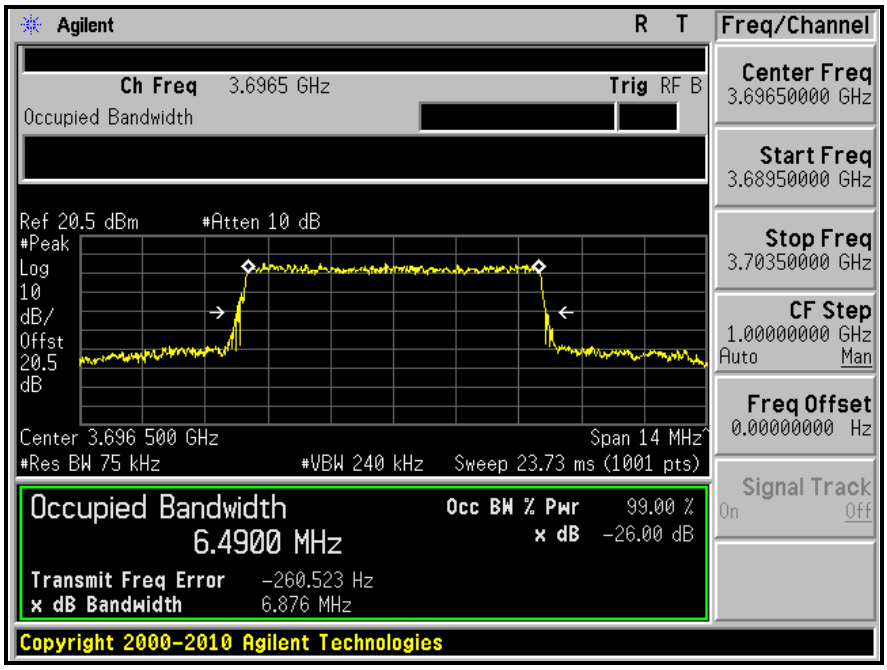
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL

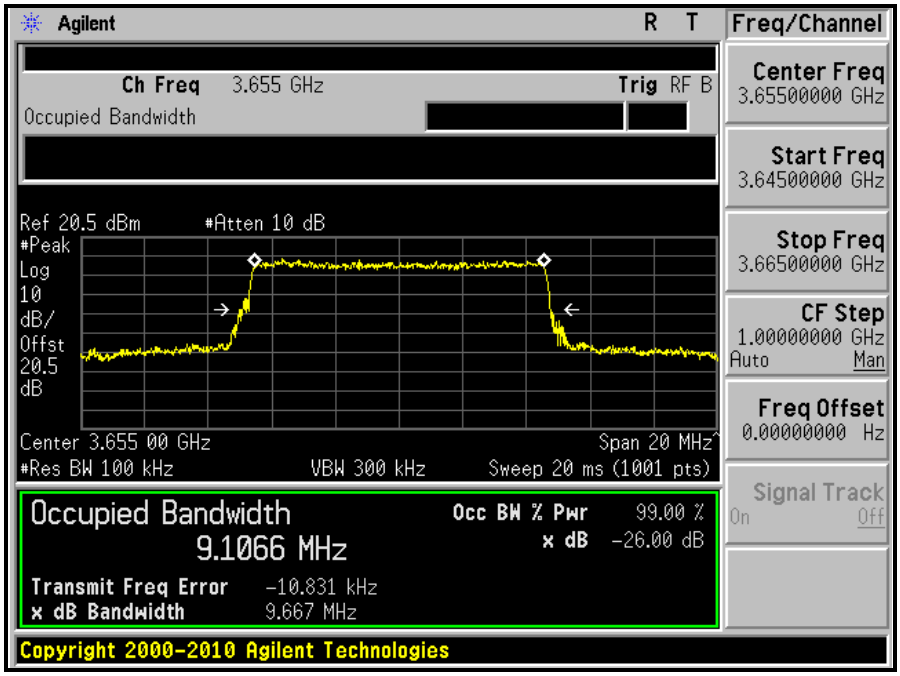


CHANNEL BANDWIDTH: 10MHz

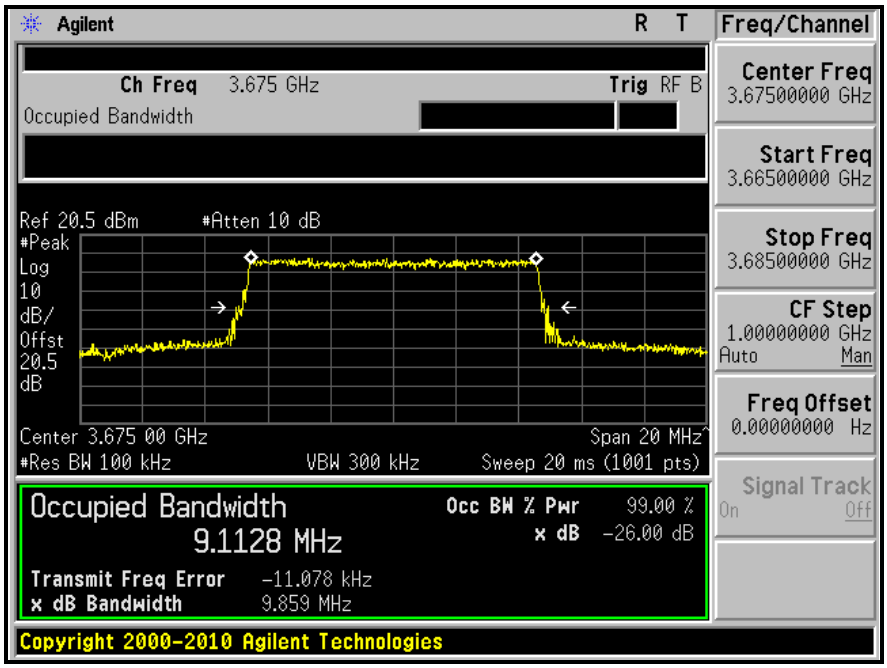
CHANNEL	-26dBc BANDWIDTH (MHz)	
	CHAIN 0	CHAIN 1
Low	9.66	9.80
Middle	9.85	9.65
High	9.56	9.72

CHAIN 0

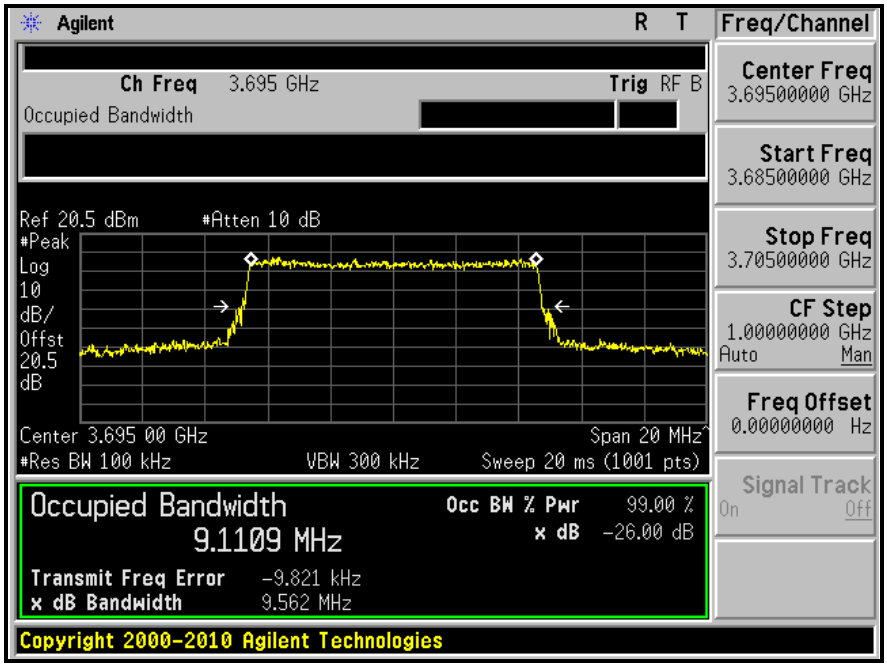
LOW CHANNEL



MIDDLE CHANNEL

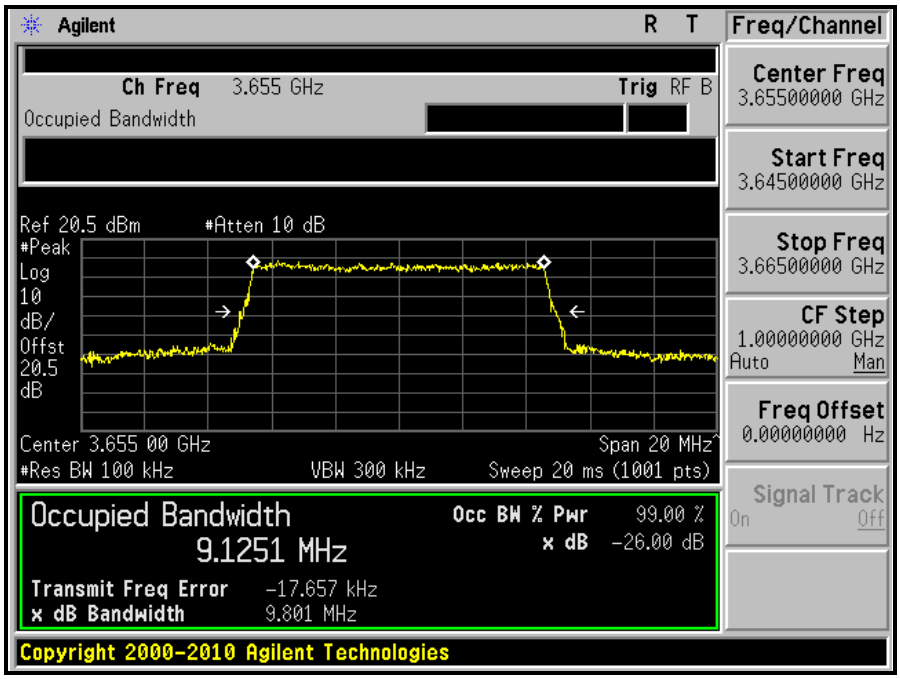


HIGH CHANNEL

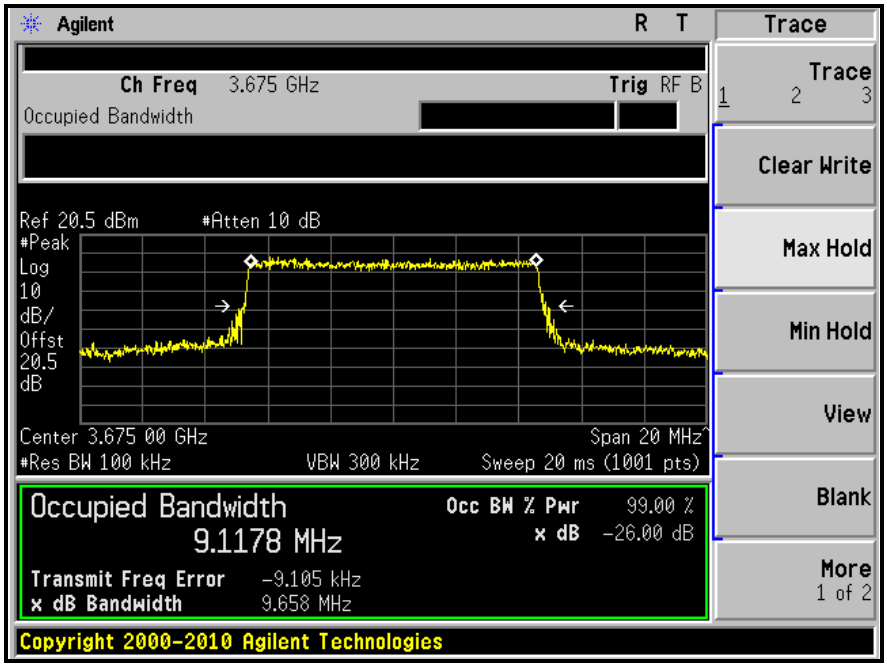


CHAIN 1

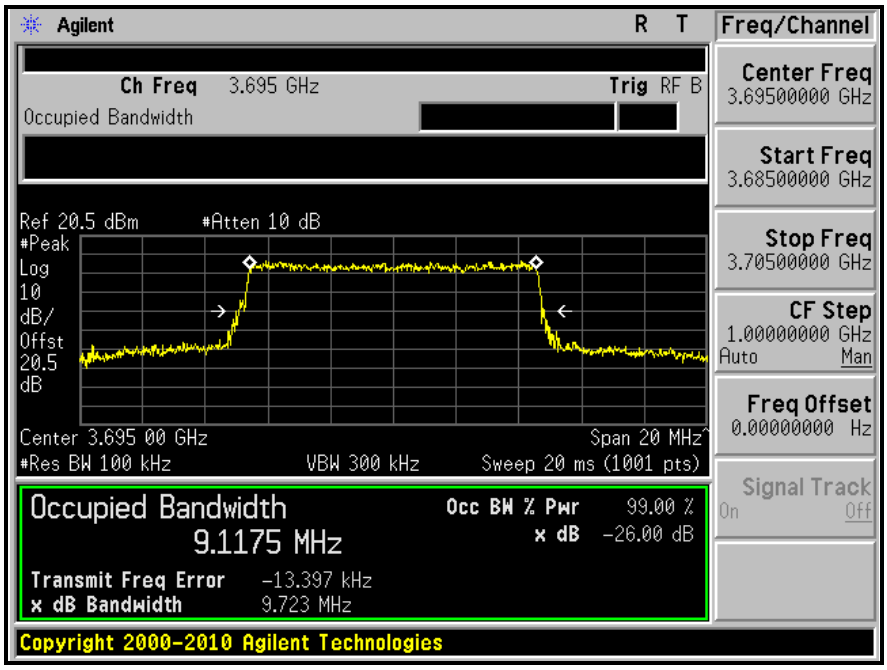
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL



4.4 EMISSION MASKS

4.4.1 LIMITS OF EMISSION MASKS

For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.

(2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10log (P) dB.

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
AGILENT SPECTRUM ANALYZER	E4446A	MY46180622	Apr. 25, 2011	Apr. 24, 2012
SUHNER RF cable	SUCOFLEX 102	36442/2	Jan. 27, 2011	Jan. 26, 2012
JFW 10dB attenuation	50HF-010-SMA	N/A	NA	NA

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST SETUP

Same as 4.1.4

4.4.4 TEST PROCEDURES

a. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW = 51kHz (5MHz bandwidth), 75kHz (7MHz bandwidth), 100kHz (10MHz bandwidth), VBW = 150kHz (5MHz bandwidth), 240kHz (7MHz bandwidth), 300kHz (10MHz bandwidth).
b. Set EUT to transmit signal at un-modulation mode to get reference level, $R_{L.}$
c. According R_L and Channel bandwidth to define Emission Mask range.
d. Set EUT to transmit signal at modulation mode to check signal can comply with Emission Mask or not.

4.4.5 EUT OPERATING CONDITION

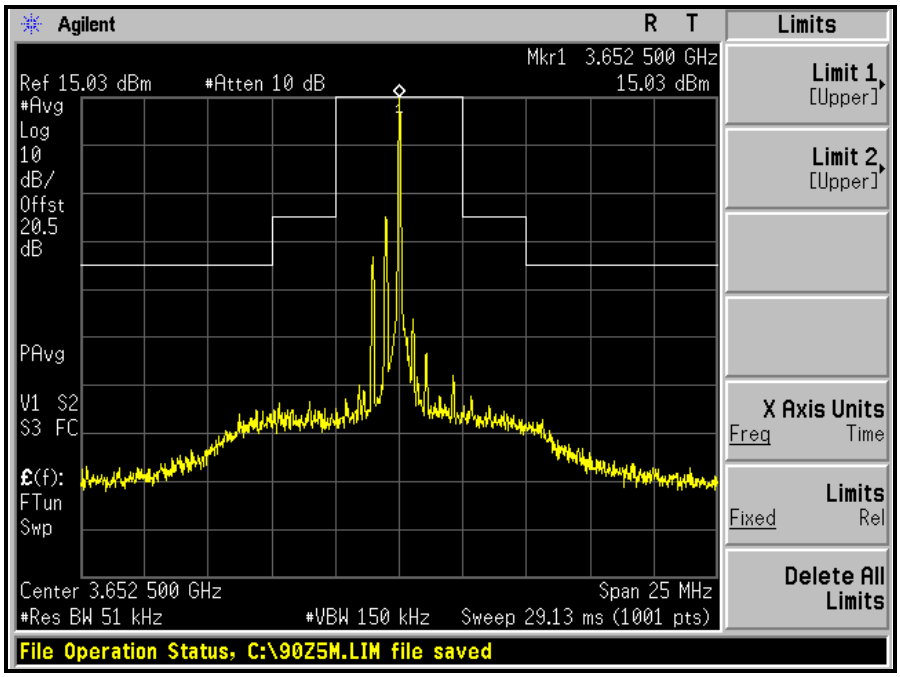
Same as 4.1.5

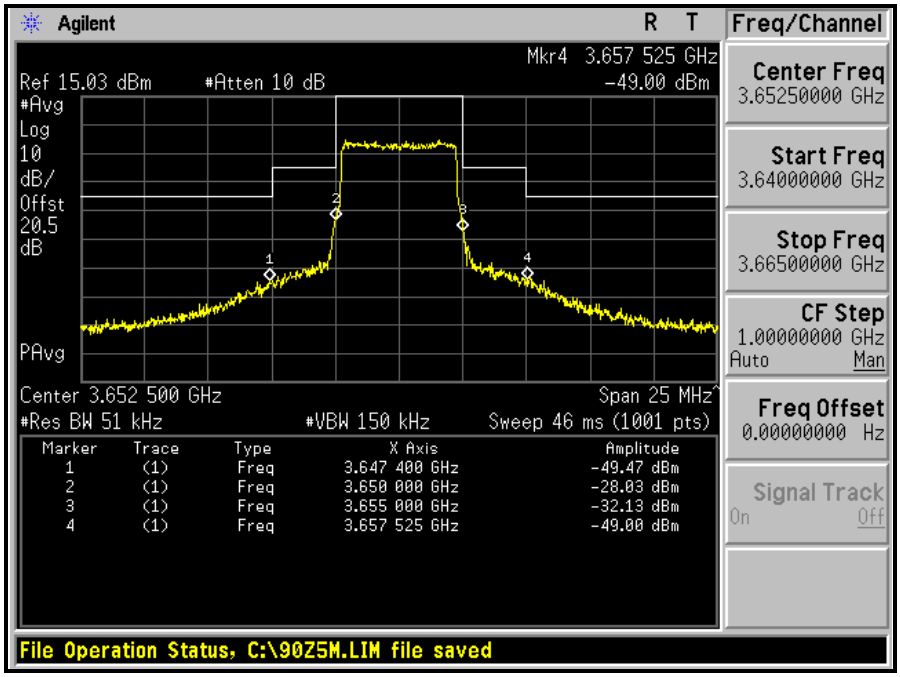
4.4.6 TEST RESULTS

CHANNEL BANDWIDTH: 5MHz

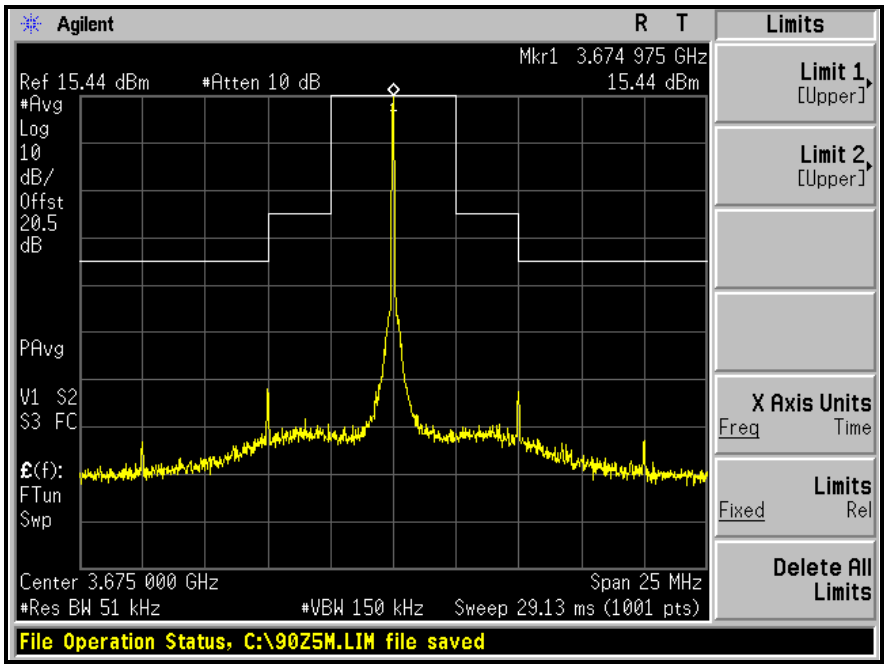
CHAIN 0

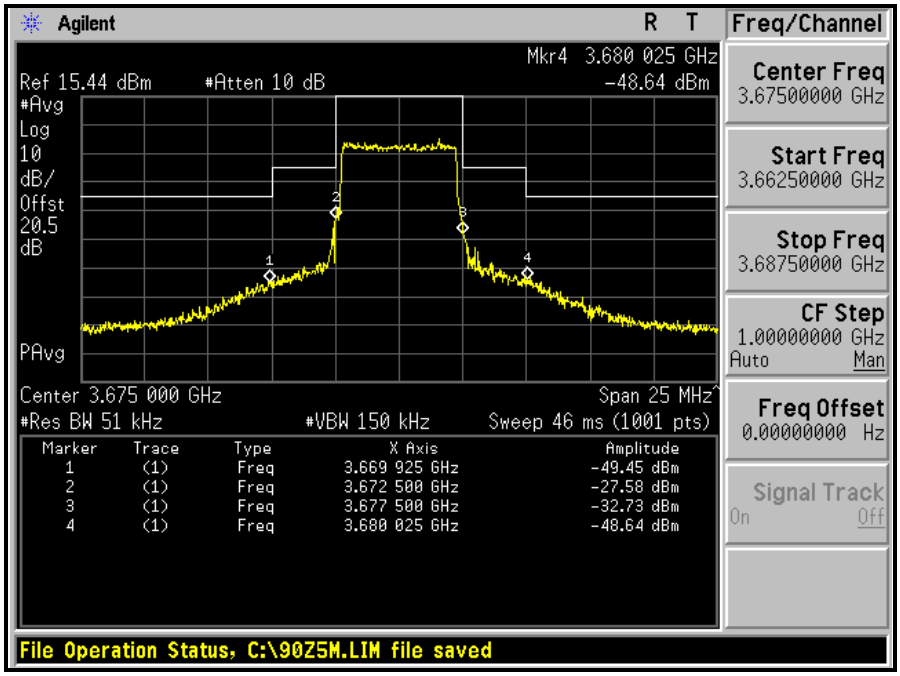
LOW CHANNEL



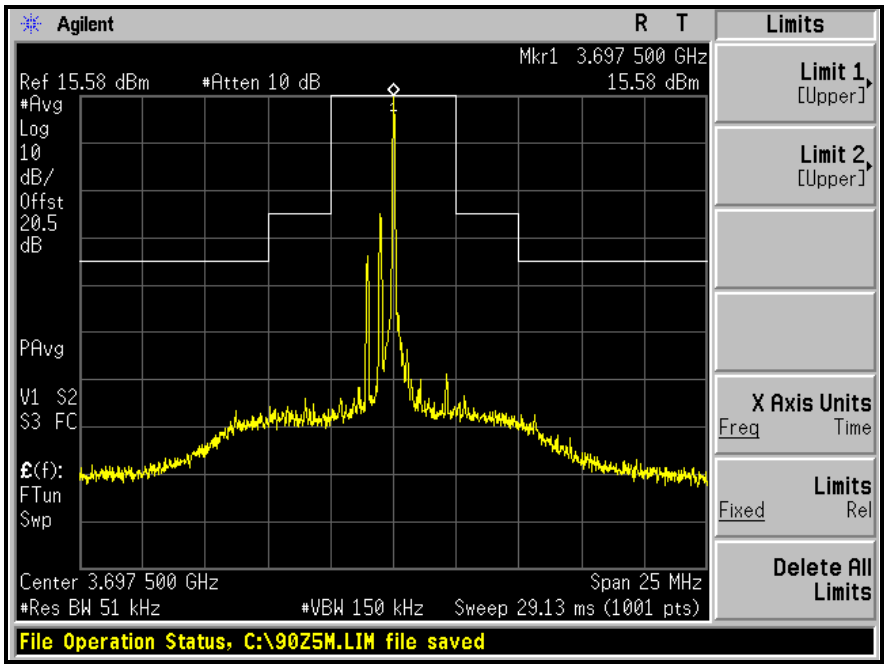


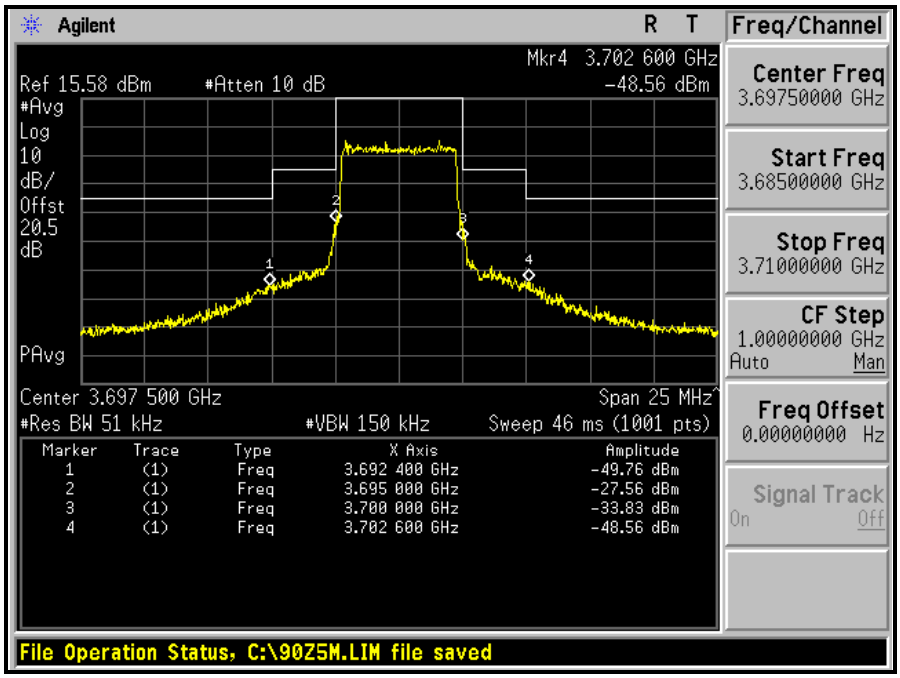
MIDDLE CHANNEL





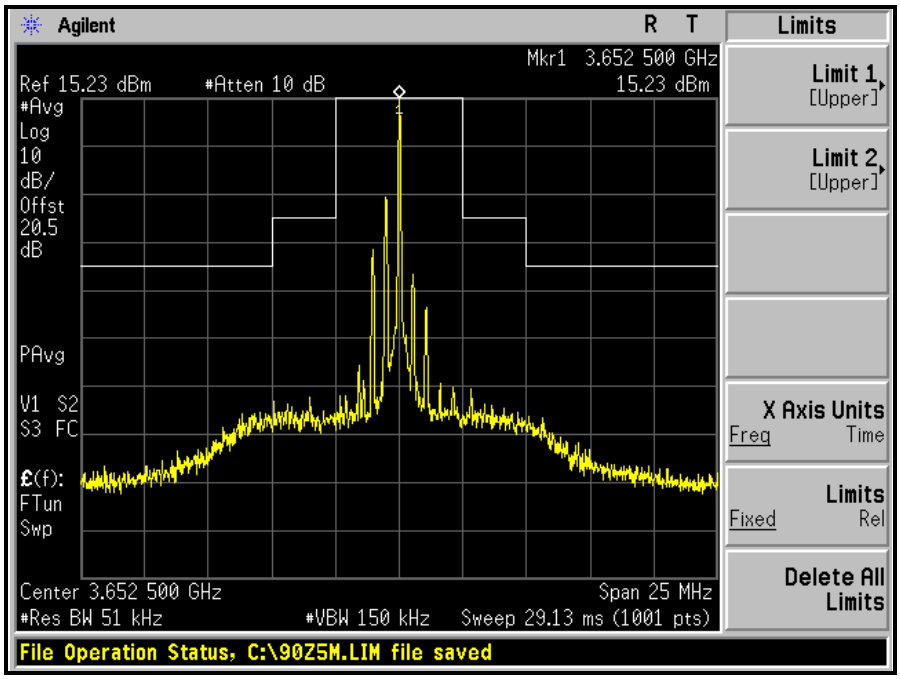
HIGH CHANNEL

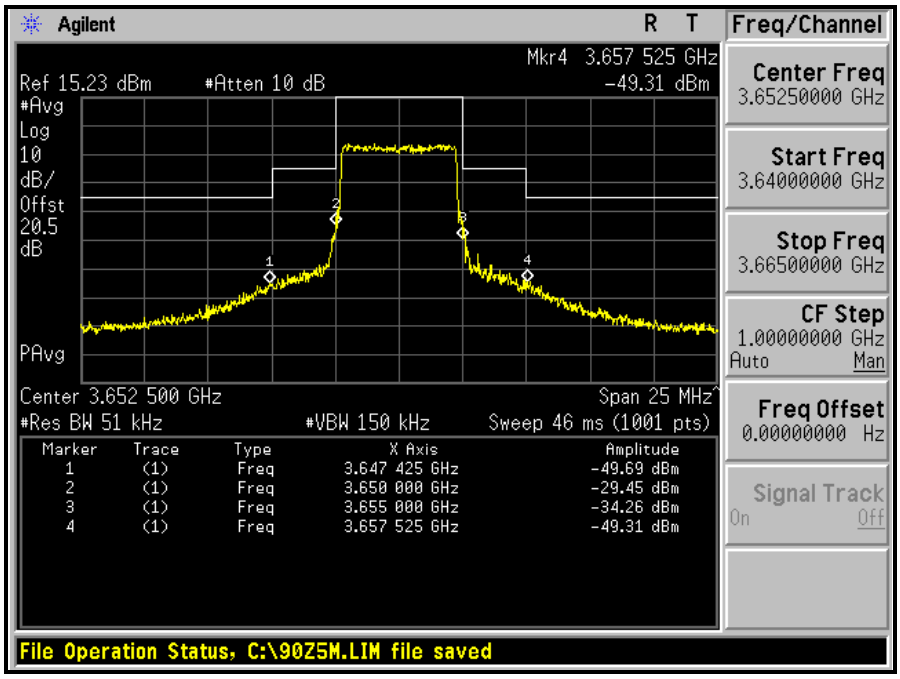




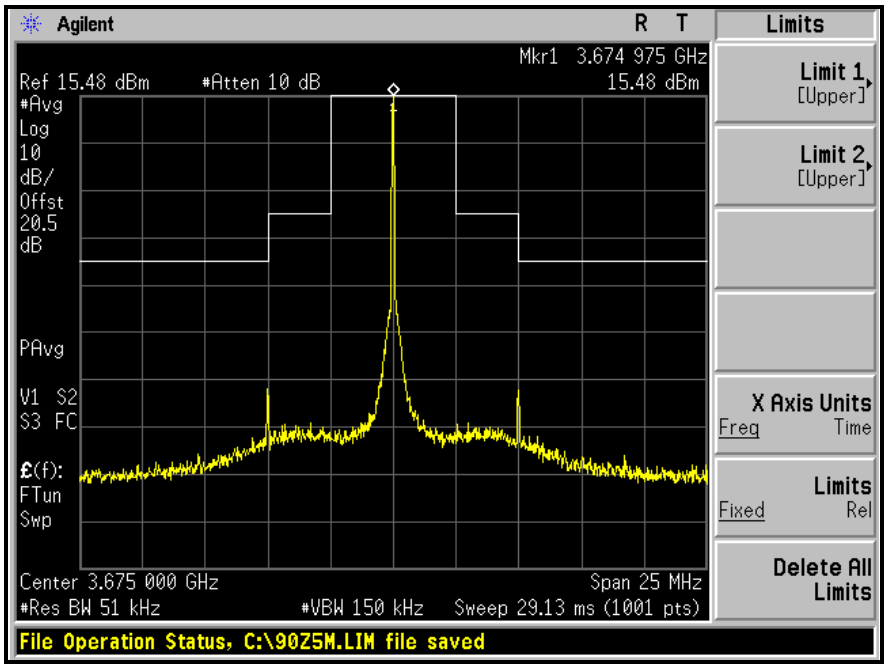
CHAIN 1

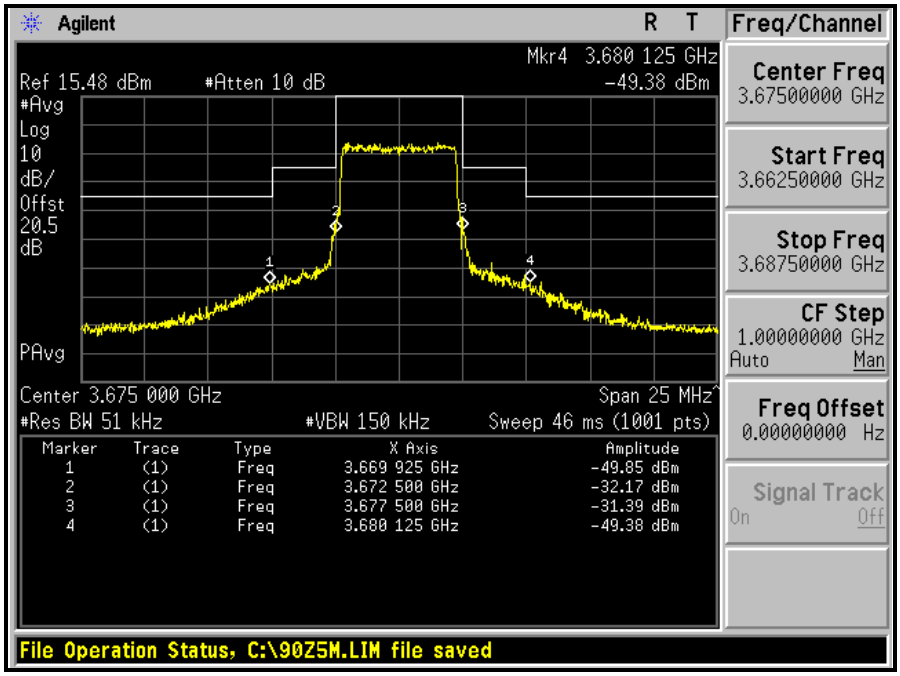
LOW CHANNEL



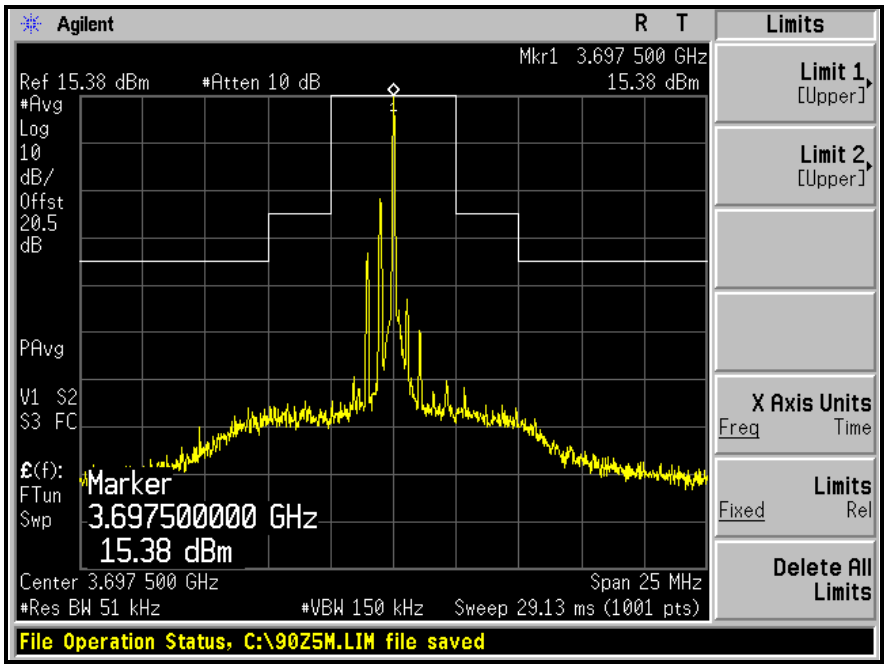


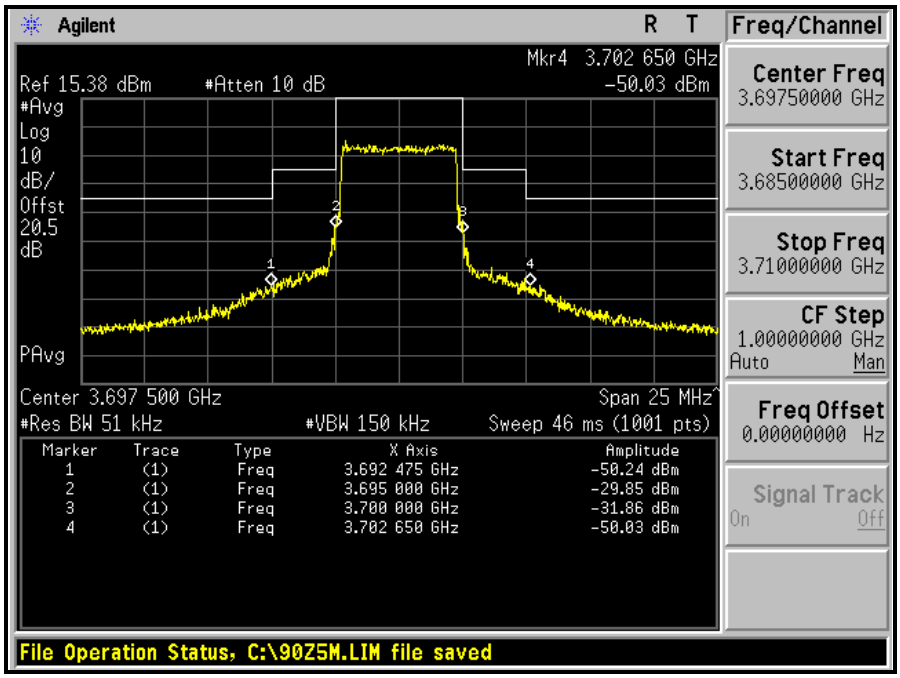
MIDDLE CHANNEL





HIGH CHANNEL

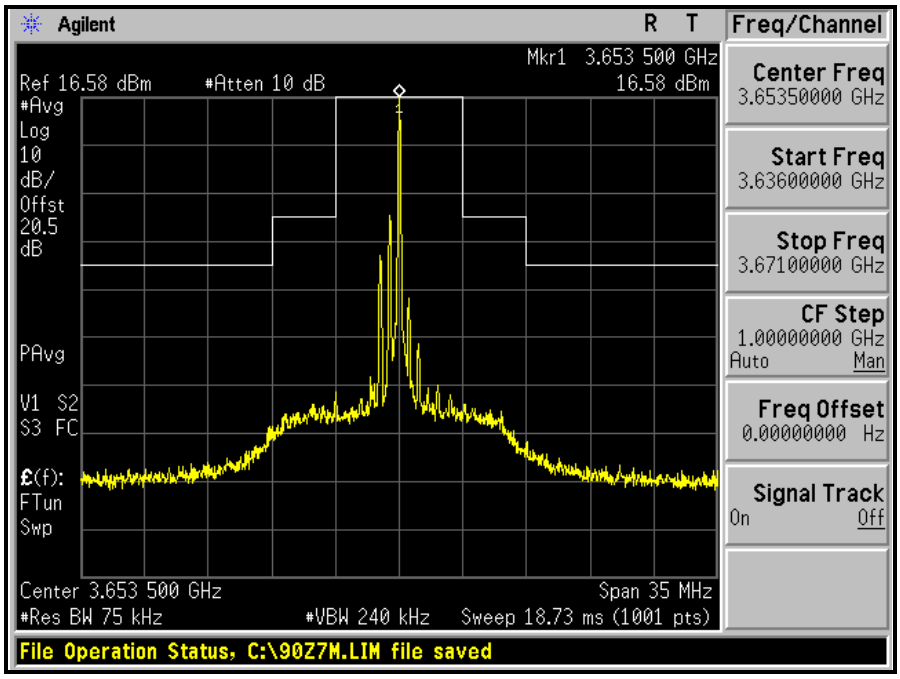


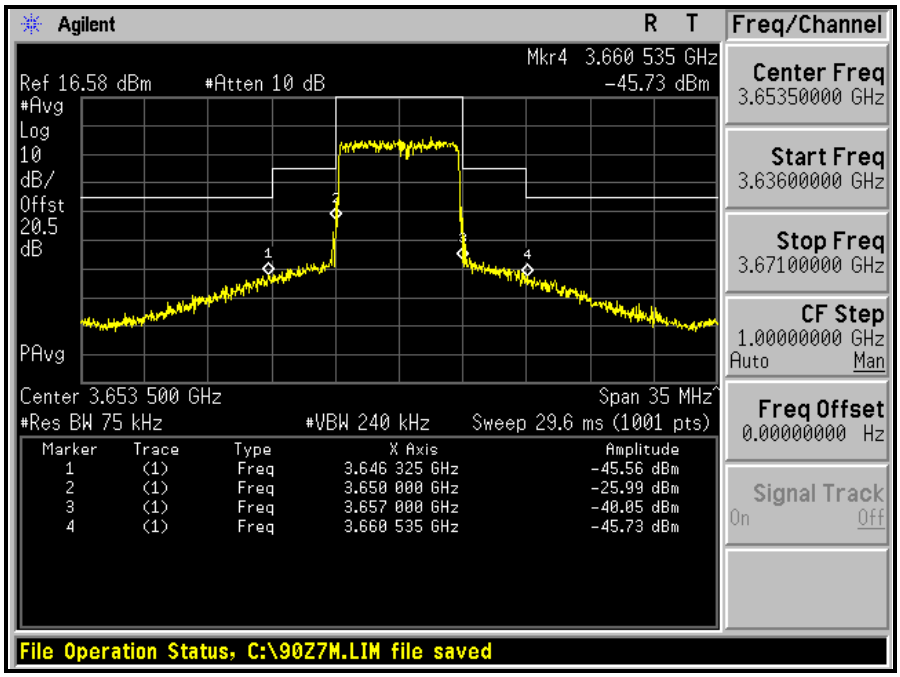


CHANNEL BANDWIDTH: 7MHz

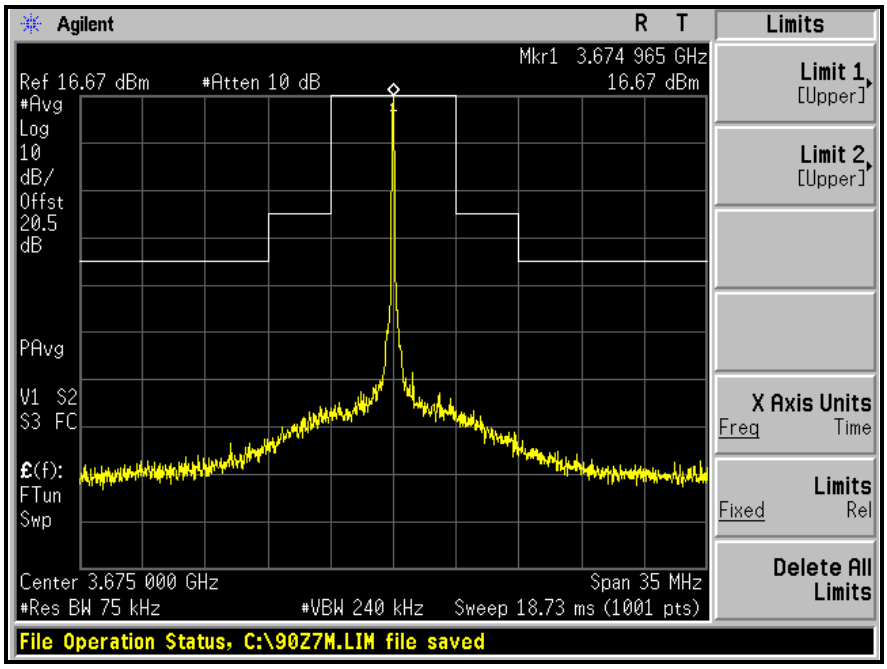
CHAIN 0

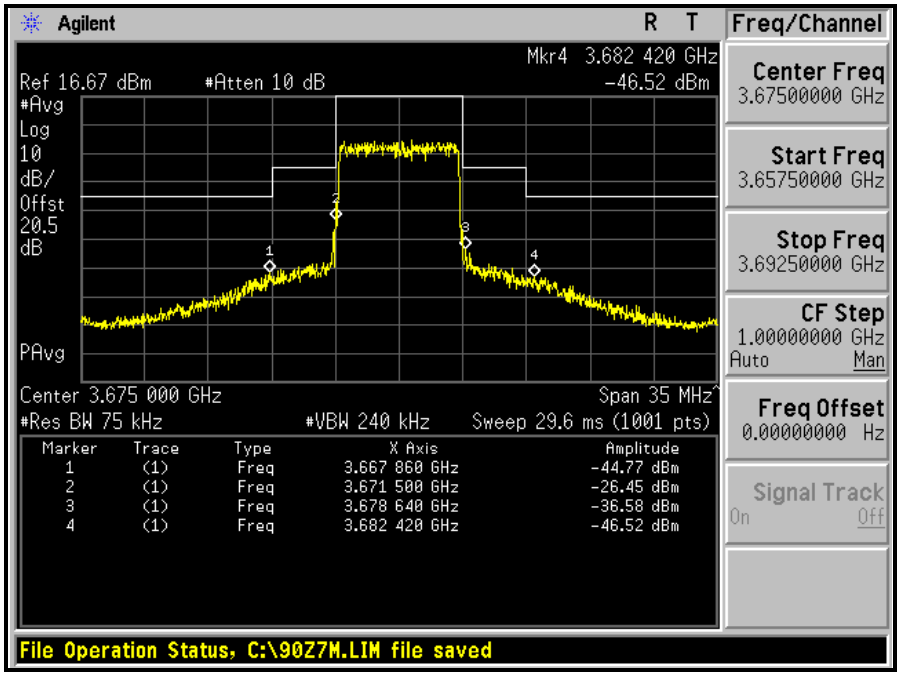
LOW CHANNEL



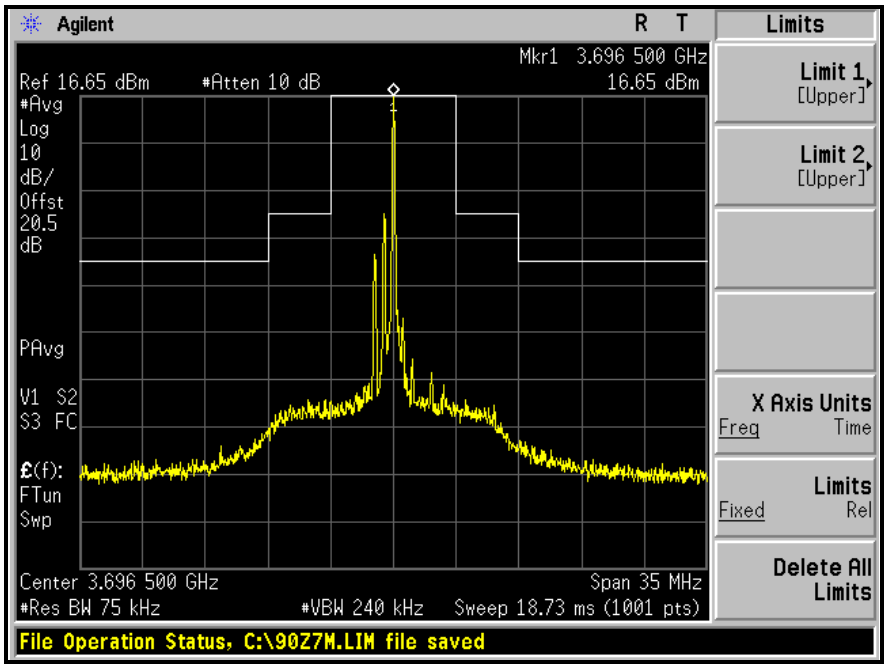


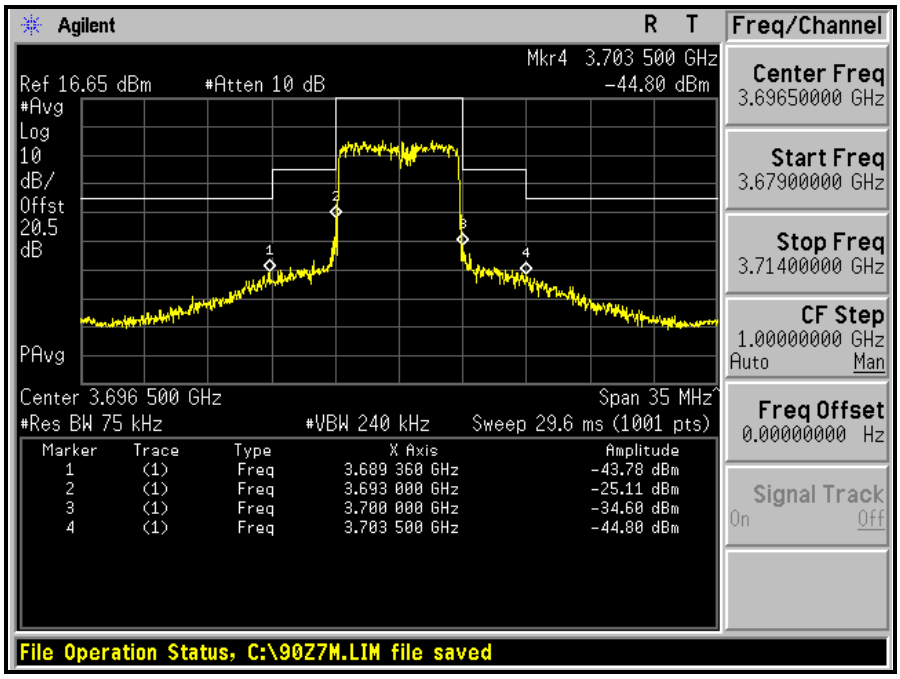
MIDDLE CHANNEL





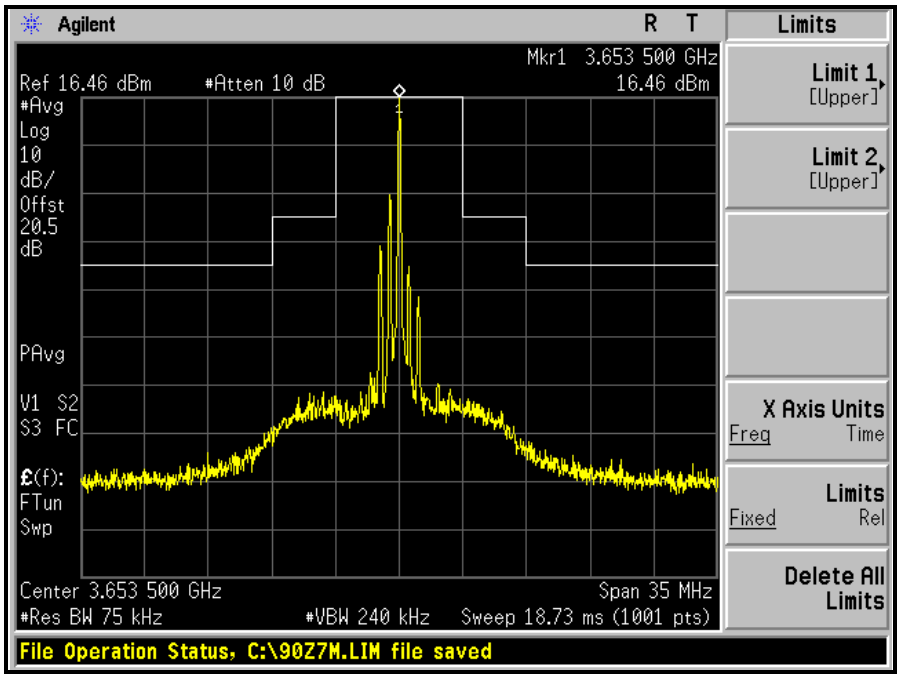
HIGH CHANNEL

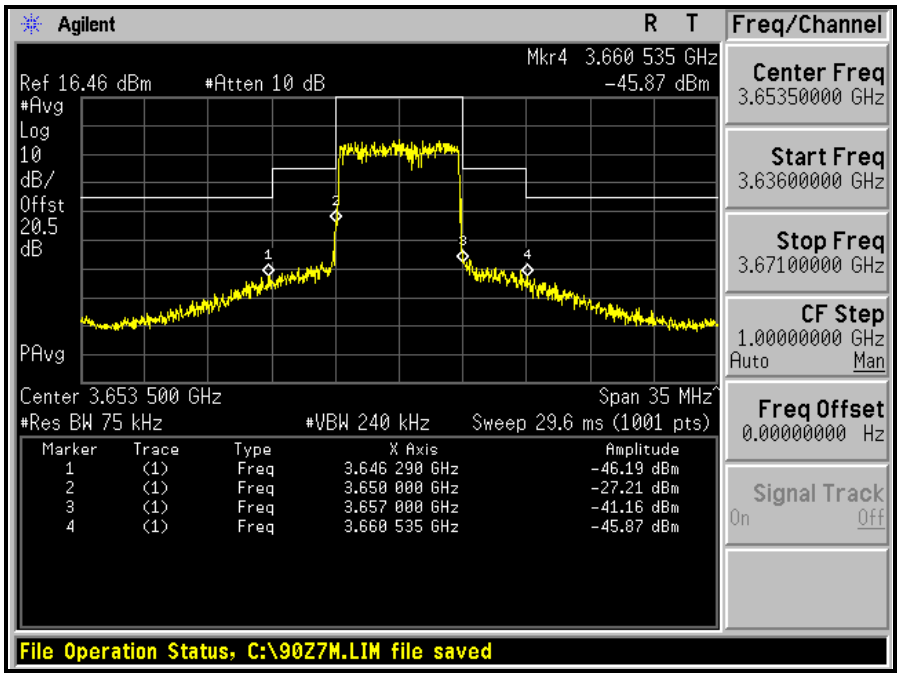




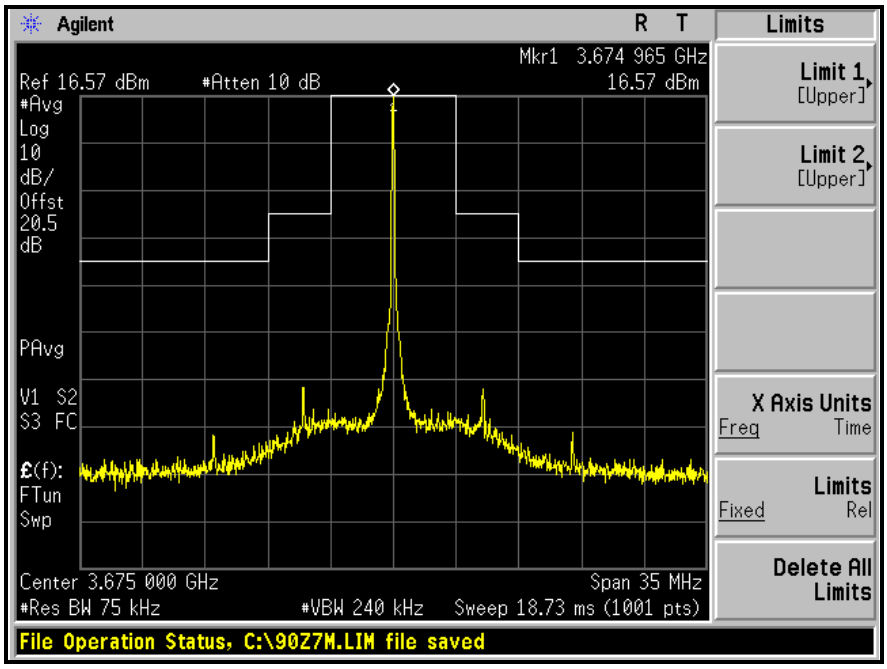
CHAIN 1

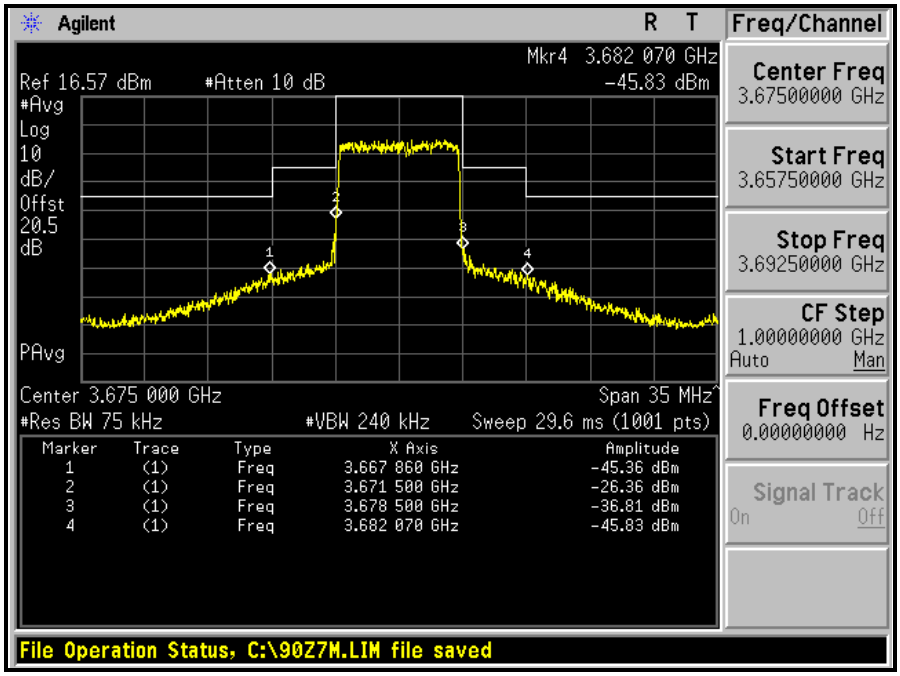
LOW CHANNEL



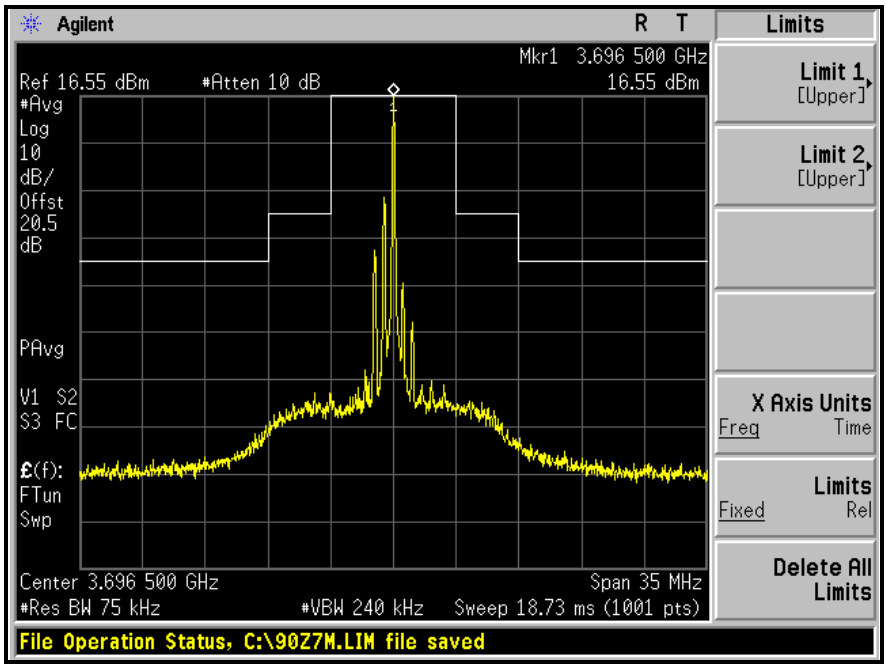


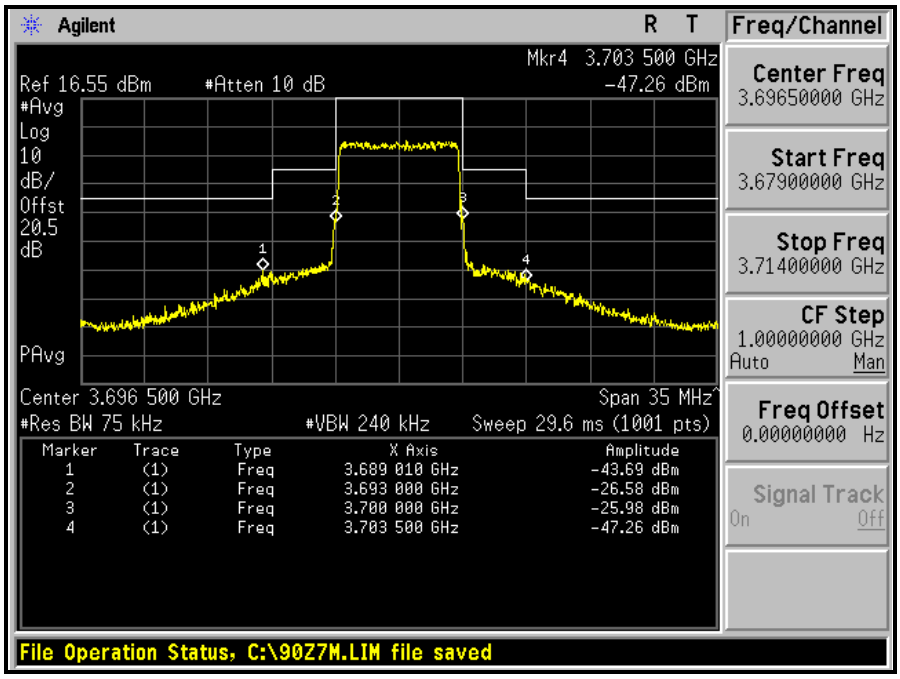
MIDDLE CHANNEL





HIGH CHANNEL

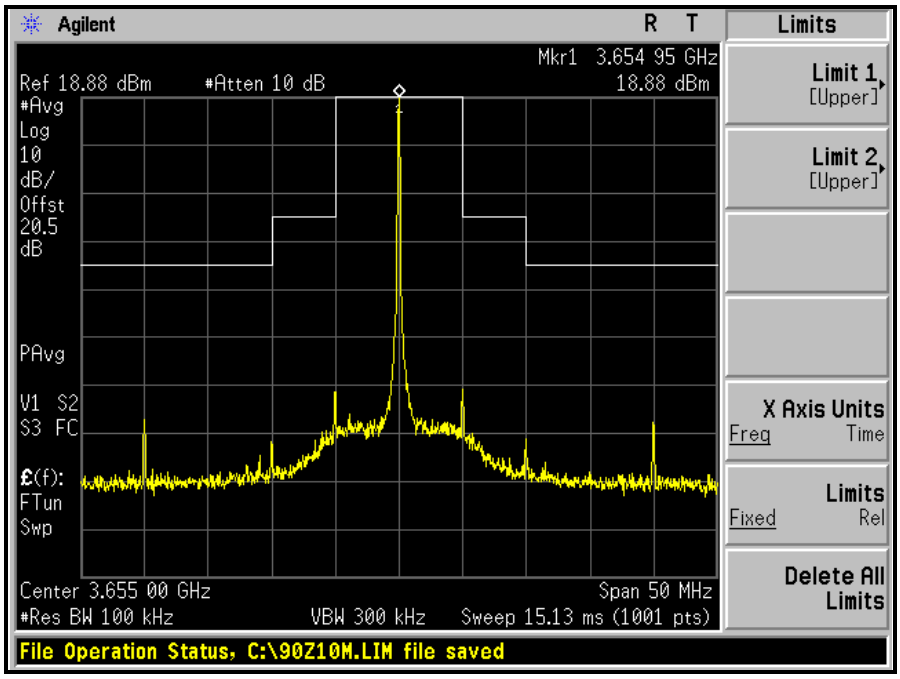


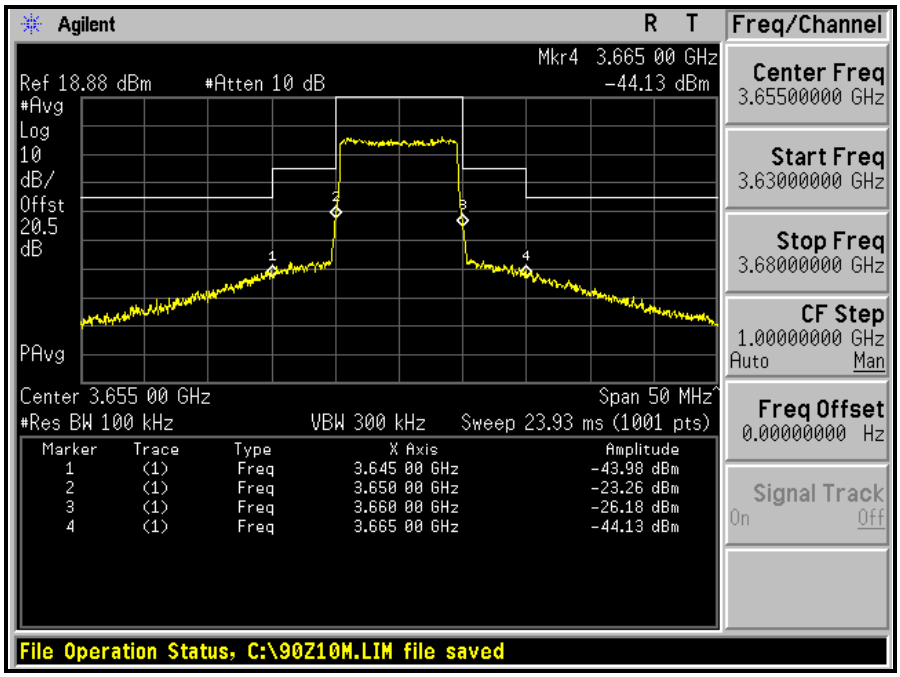


CHANNEL BANDWIDTH: 10MHz

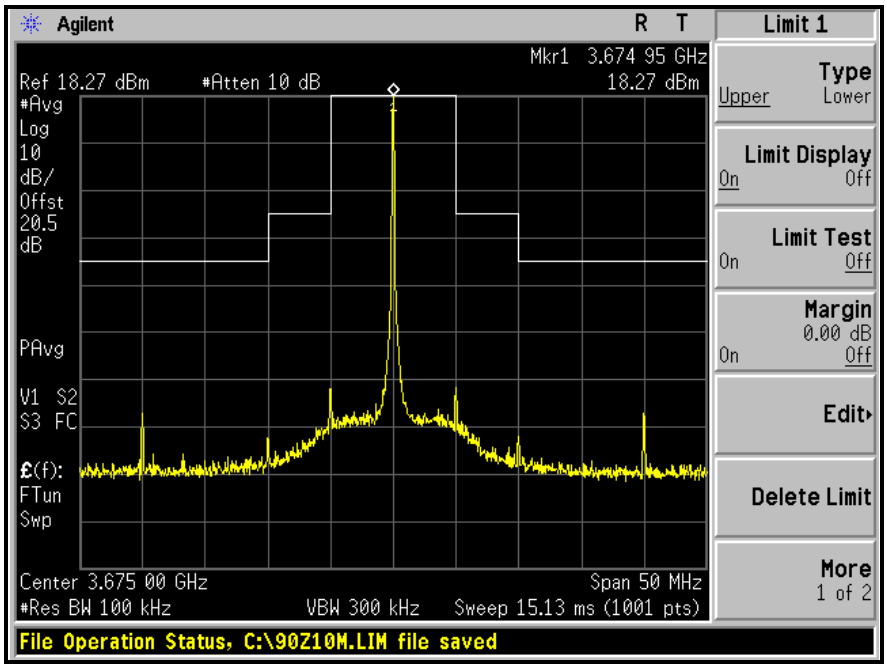
CHAIN 0

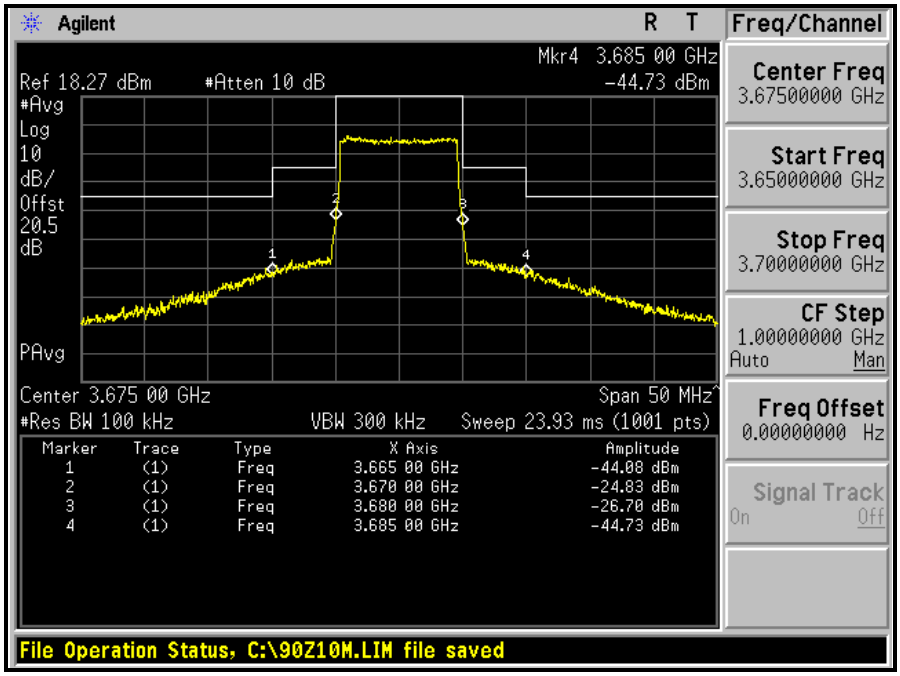
LOW CHANNEL



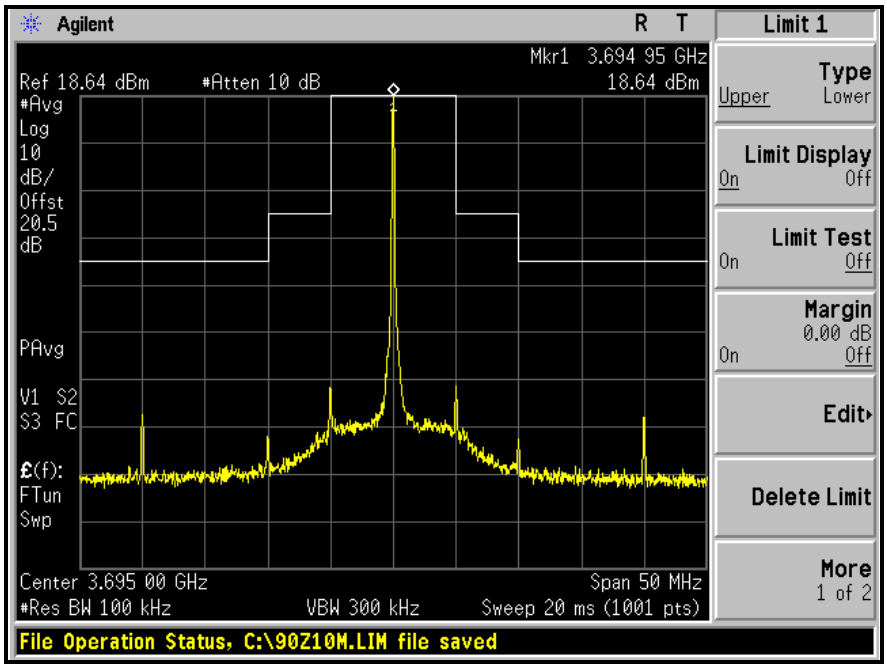


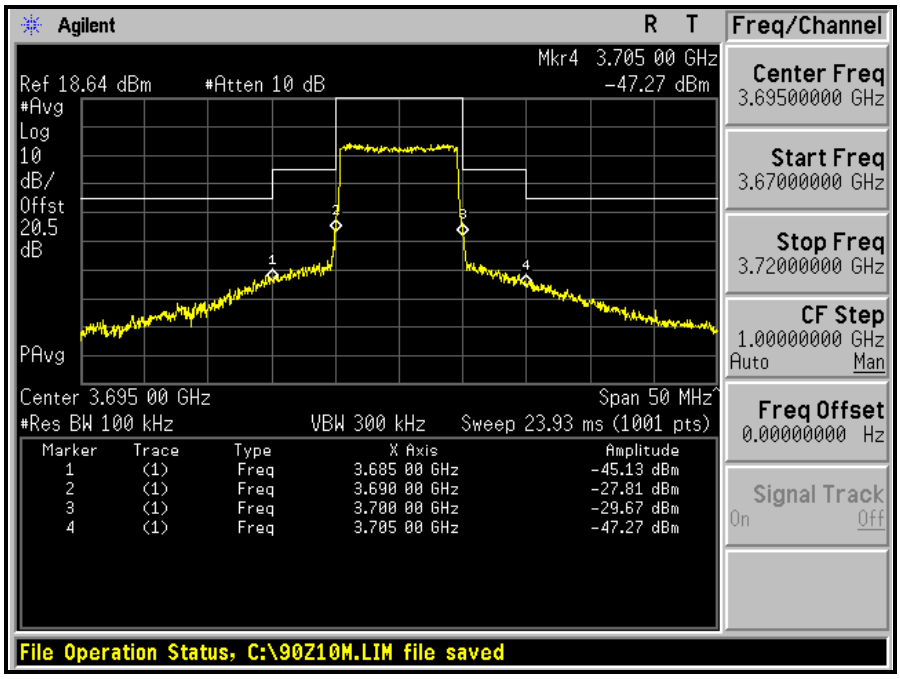
MIDDLE CHANNEL





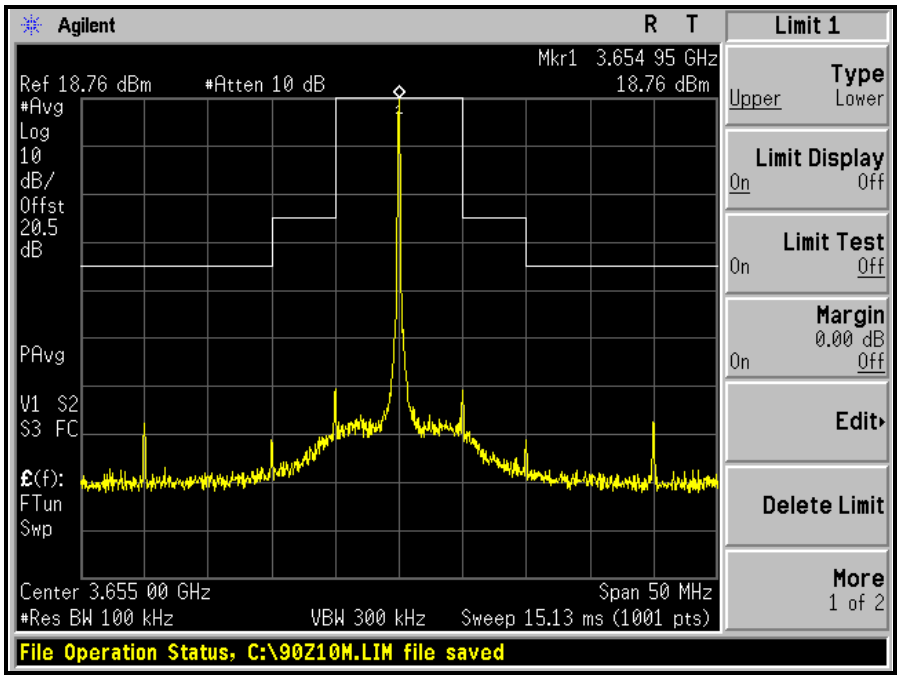
HIGH CHANNEL

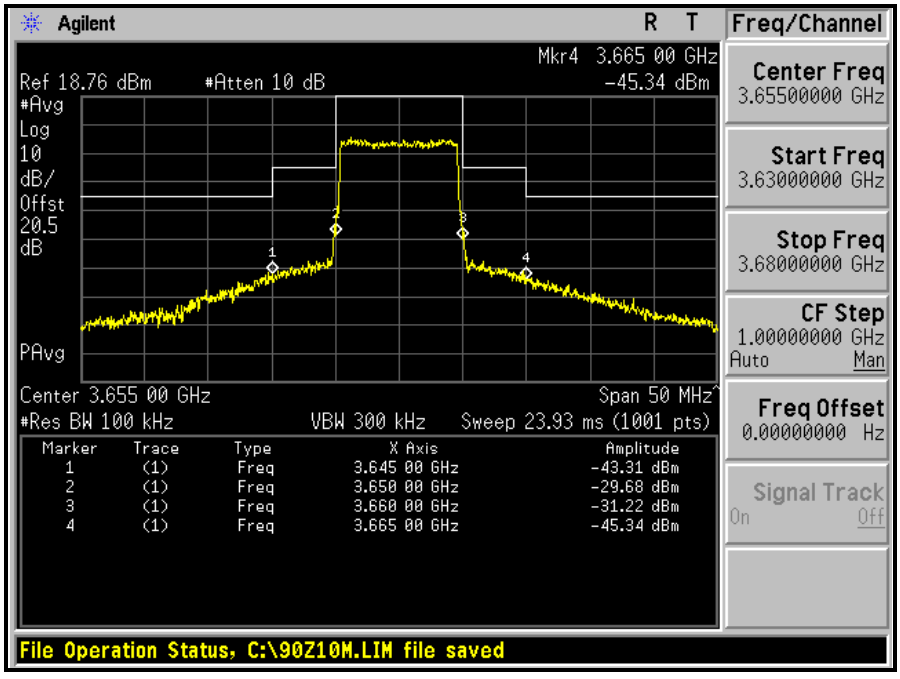




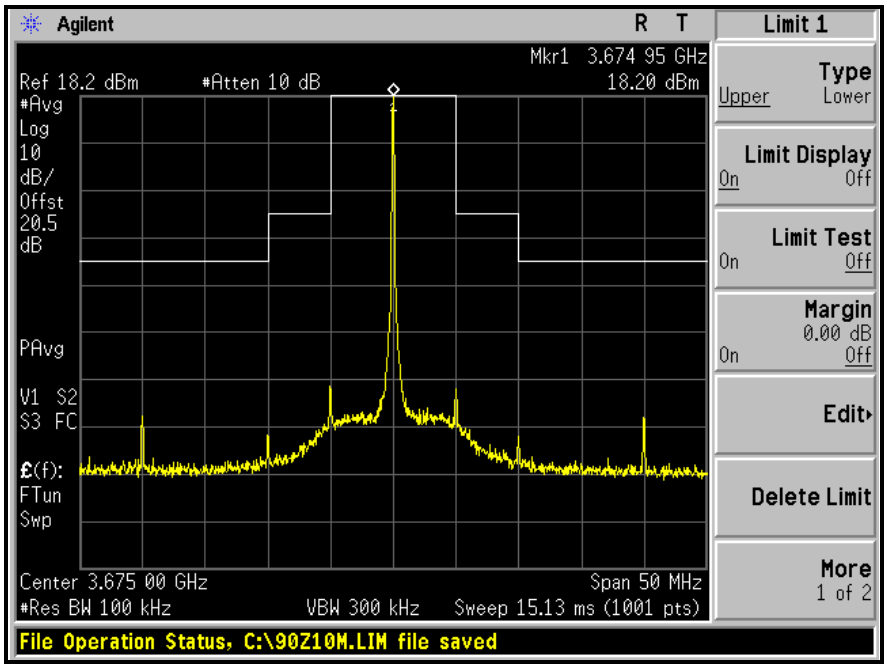
CHAIN 1

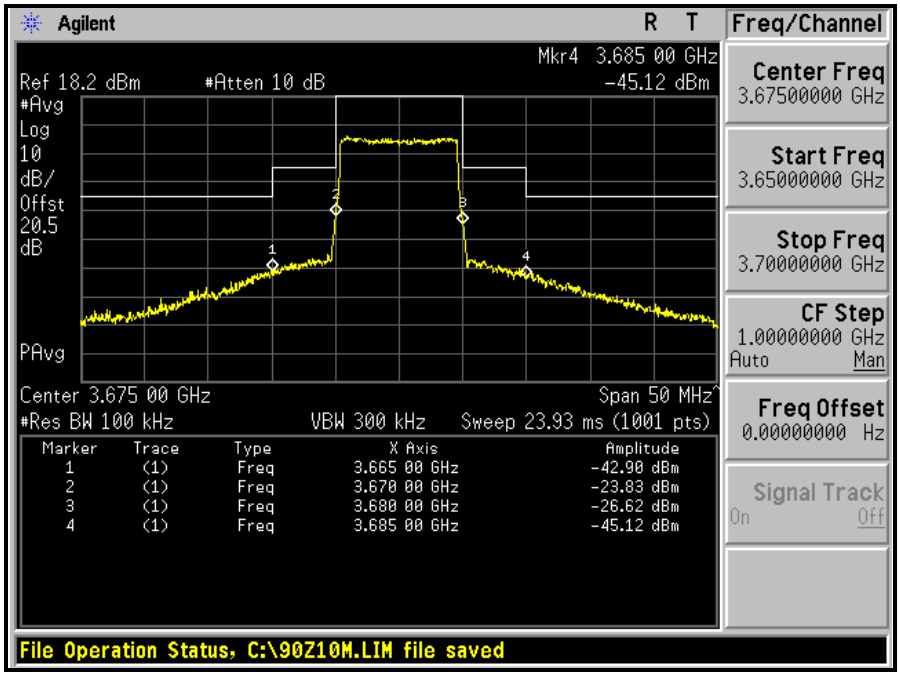
LOW CHANNEL



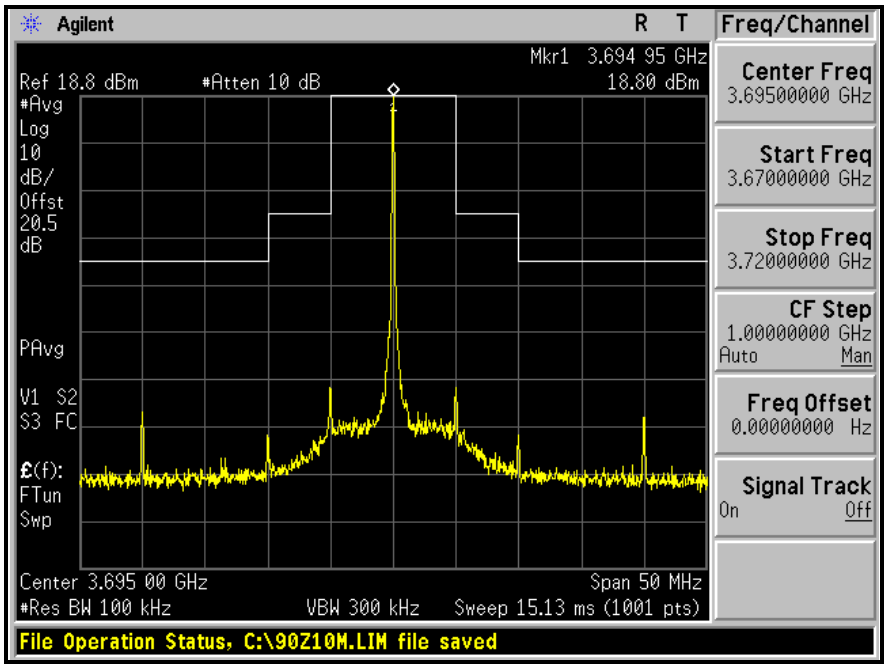


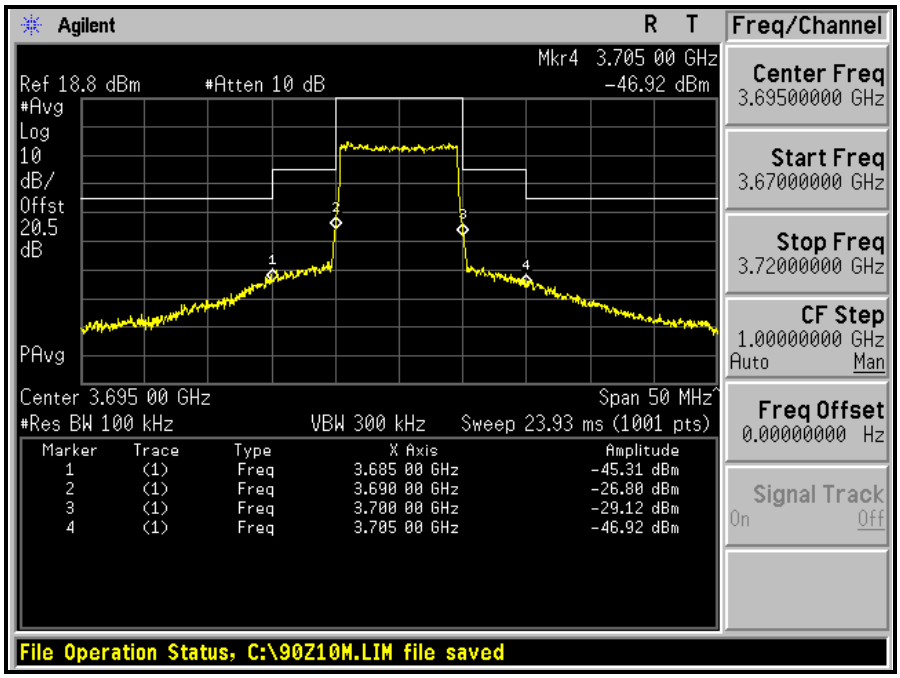
MIDDLE CHANNEL





HIGH CHANNEL





4.5 CONDUCTED SPURIOUS EMISSIONS

4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

According to FCC 90.1323 specified that the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in Watts, by at least 43 + 10 log (P) dB. The limit of emission equal to –13dBm Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or less, but at least one percent of the emission bandwidth of the fundamental emission of the transmitter, provided the measured energy is integrated over a 1 MHz bandwidth

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
AGILENT SPECTRUM ANALYZER	E4446A	MY46180622	Apr. 25, 2011	Apr. 24, 2012
SUHNER RF cable	SUCOFLEX 102	36442/2	Jan. 27, 2011	Jan. 26, 2012
JFW 10dB attenuation	50HF-010-SMA	N/A	NA	NA

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

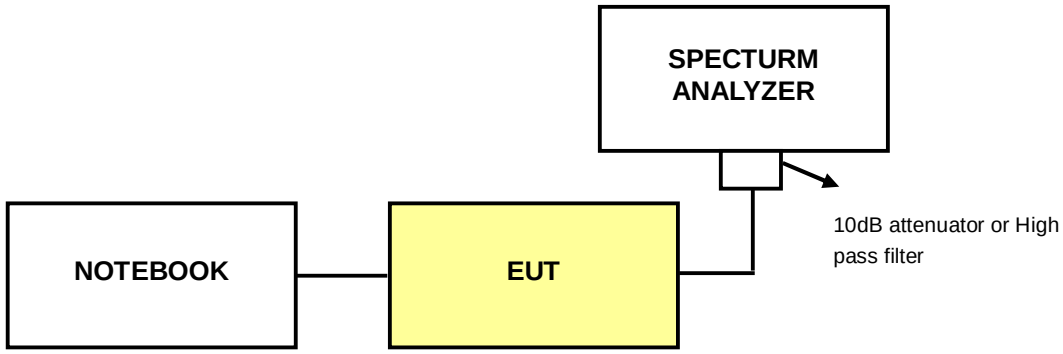
4.5.3 TEST PROCEDURE

a. All measurements were done at 3 channels: low, middle and high operational frequency range.

b. When the spectrum scanned from 30MHz to 4.5GHz, it shall be connected to the 10dB pad attenuated the carried frequency. The spectrum set RB = 1MHz, VB = 3MHz.

c. When the spectrum scanned from 4.5GHz to 40GHz, it shall be connected to the high pass filter attenuated the carried frequency. The spectrum set RB = 1MHz, VB = 3MHz.

4.5.4 TEST SETUP



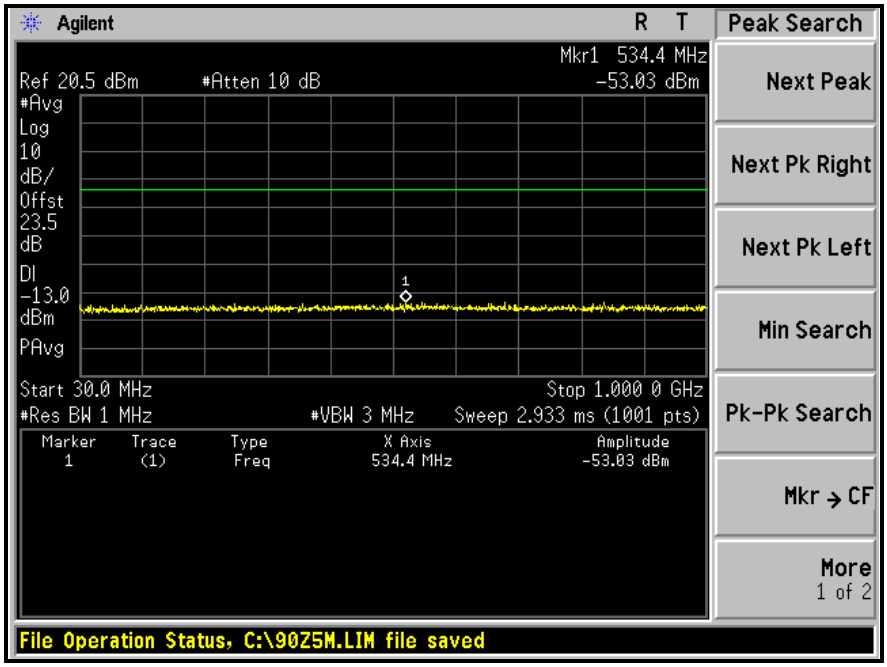
4.5.5 EUT OPERATING CONDITIONS

Same as 4.1.5

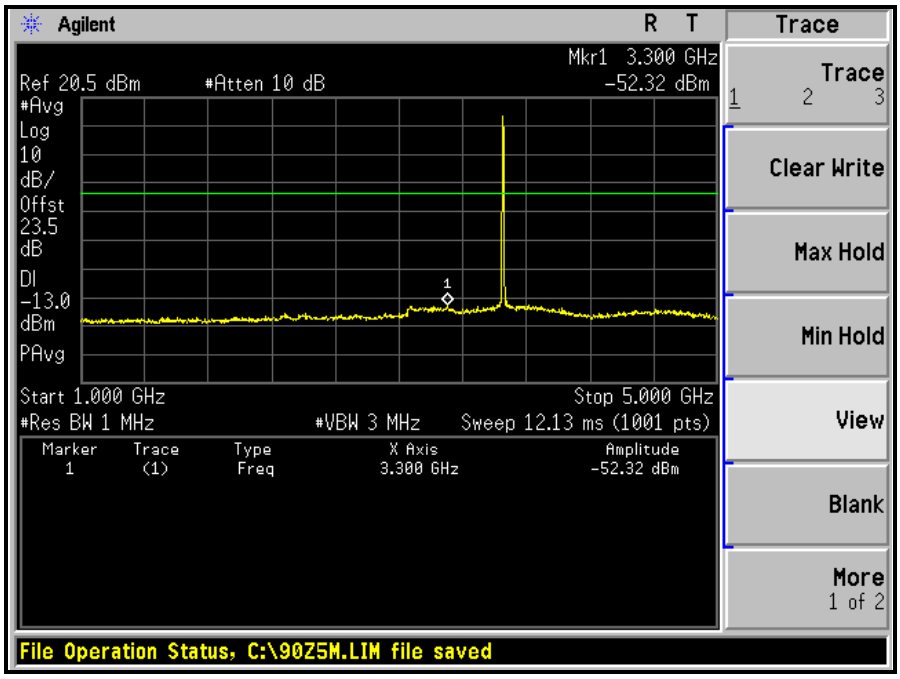
4.5.6 TEST RESULTS

CHANNEL BANDWIDTH: 5MHz

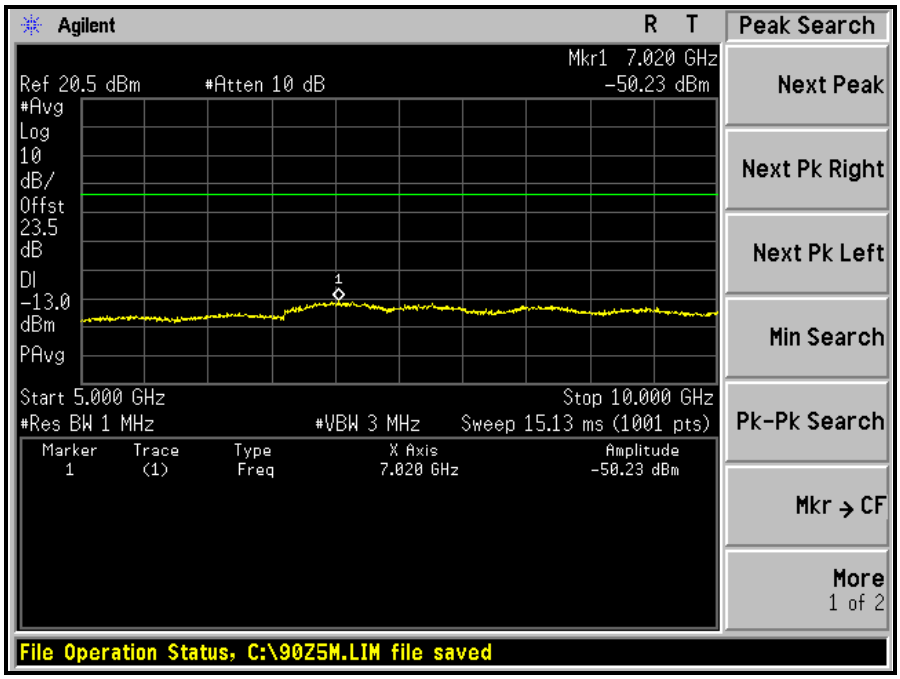
LOW CHANNEL: 30MHz ~ 1GHz:



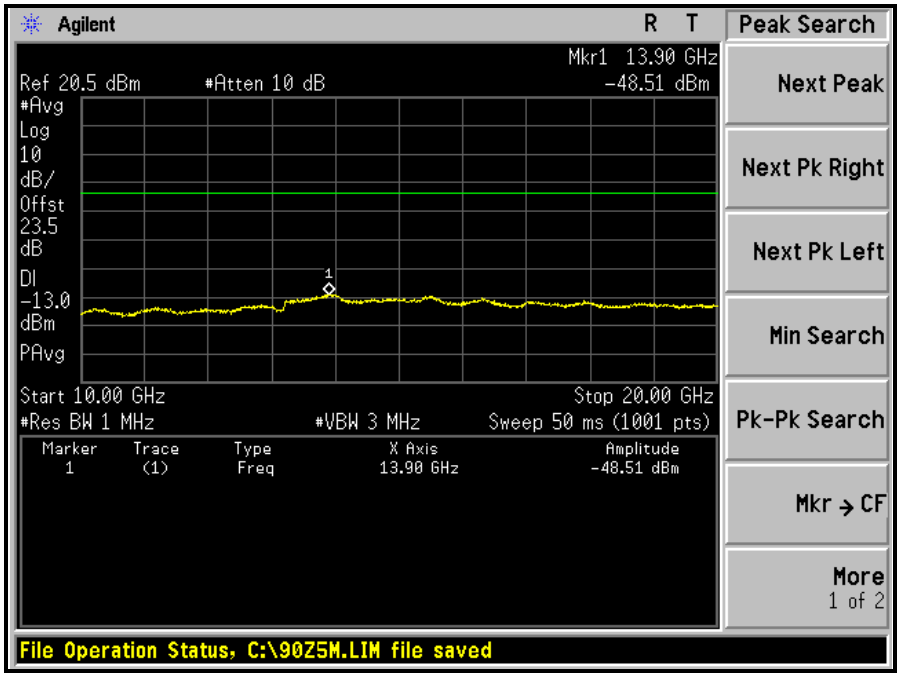
1GHz ~ 5GHz:



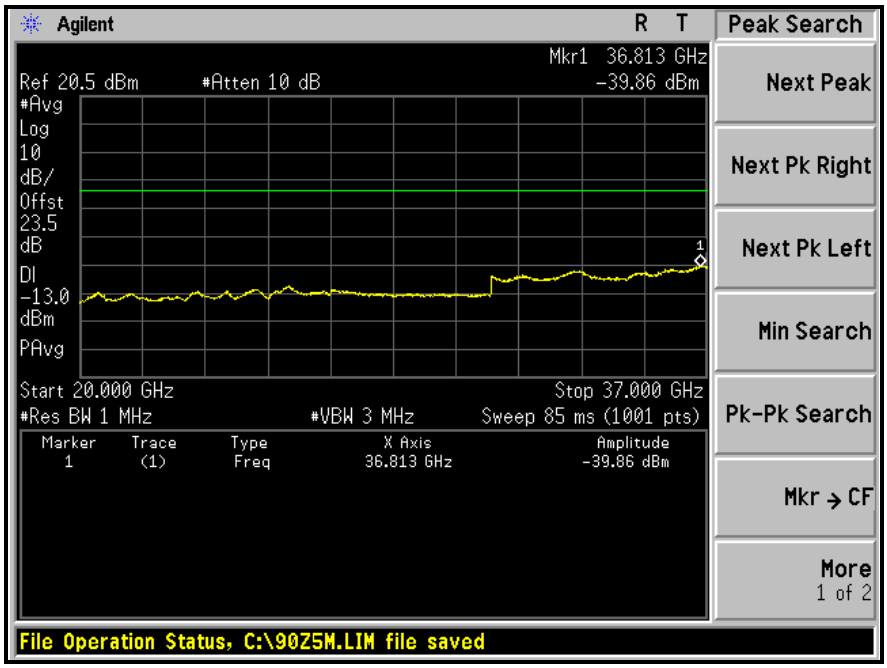
5GHz ~ 10GHz:



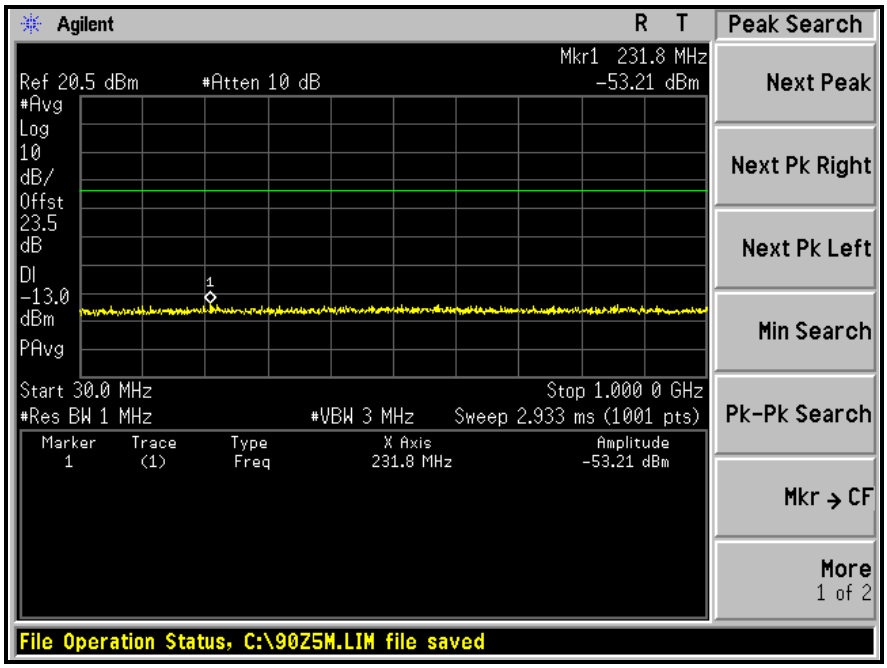
10GHz ~ 20GHz:



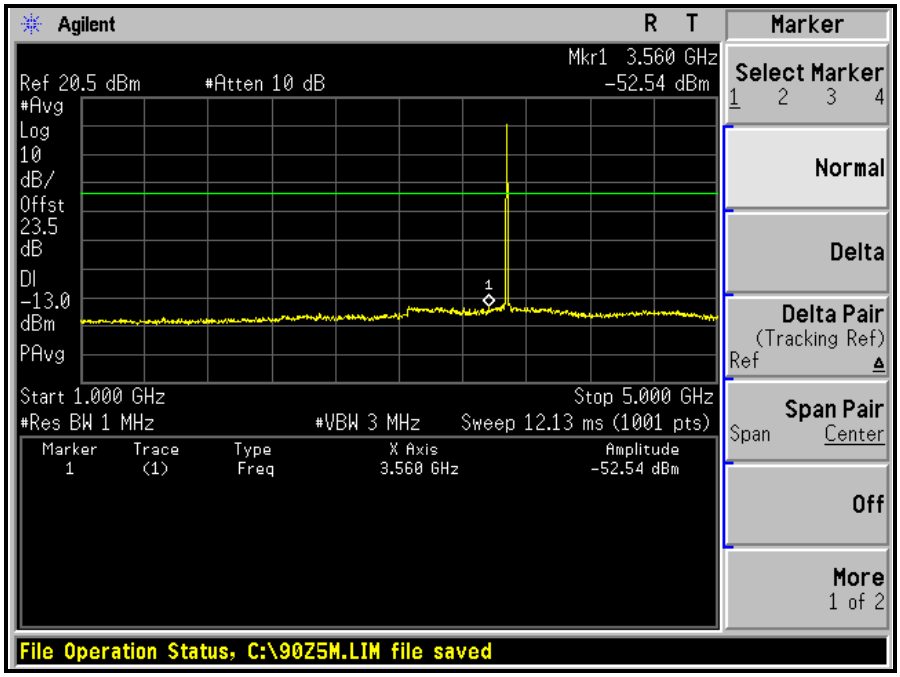
20GHz ~ 37GHz:


Agilent
R T
Peak Search
Mkr1 36.813 GHz
Ref 20.5 dBm
#Atten 10 dB
-39.86 dBm
Next Peak
#Avg
Log
10
dB/
Offst
23.5
dB
Next Pk Right
Dl
-13.0
dBm
Next Pk Left
PAvg
Min Search
Start 20.000 GHz
Stop 37.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 85 ms (1001 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 36.813 GHz -39.86 dBm
Mkr → CF
More
1 of 2
File Operation Status, C:\90Z5M.LIM file saved

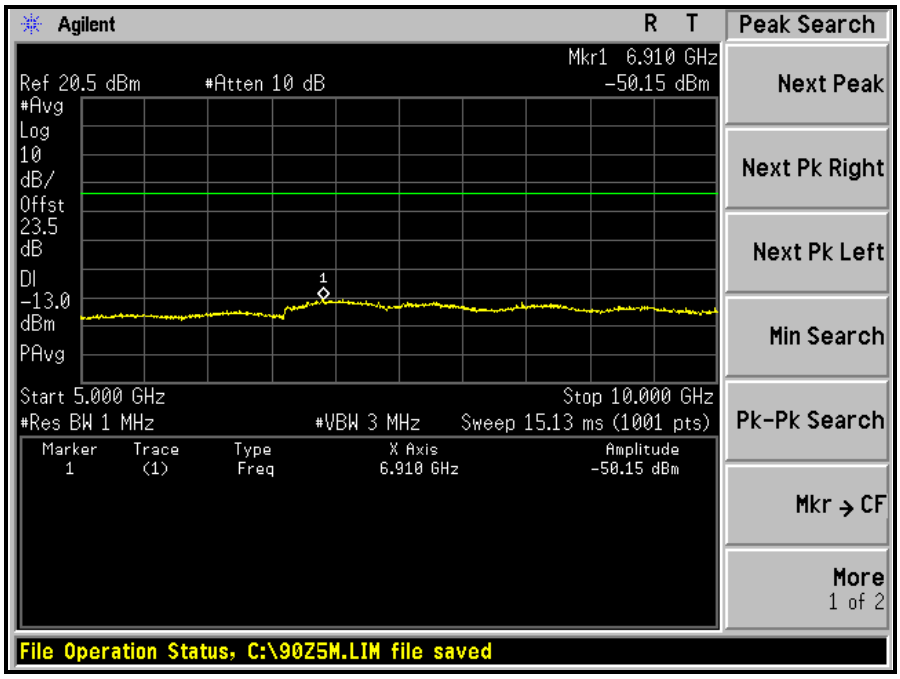
MIDDLE CHANNEL: 30MHz ~ 1GHz:



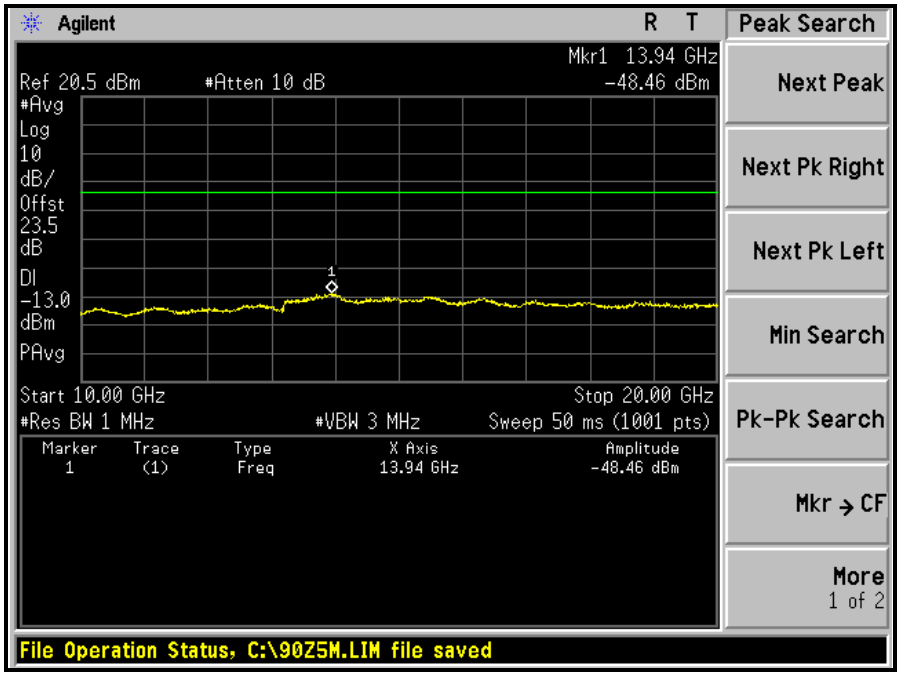
1GHz ~ 5GHz:



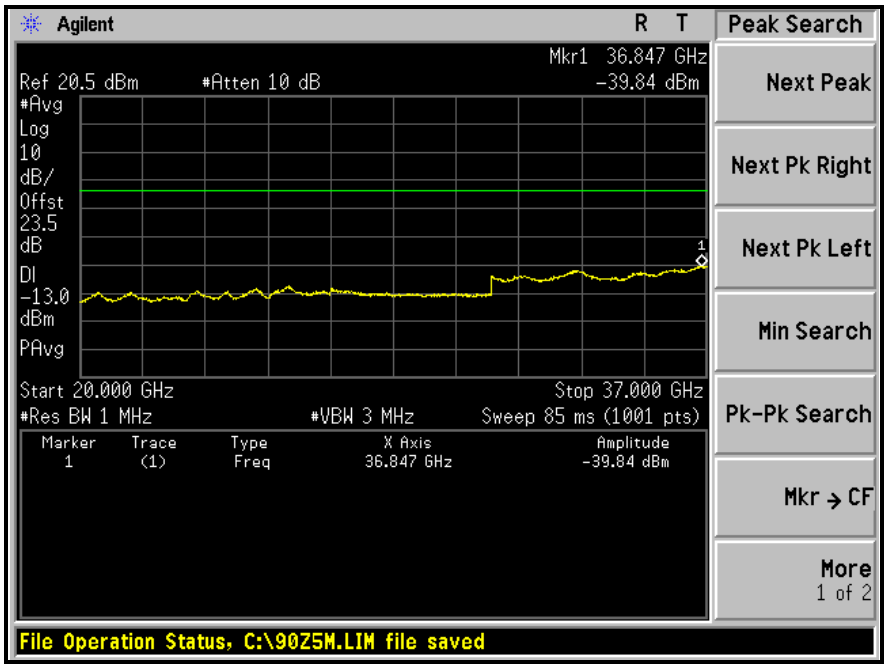
5GHz ~ 10GHz:



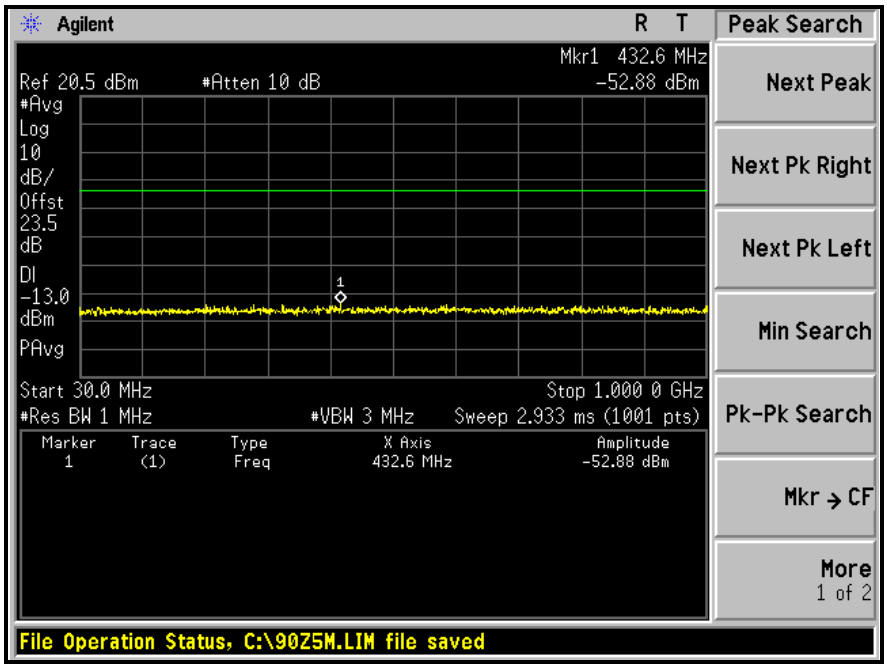
10GHz ~ 20GHz:



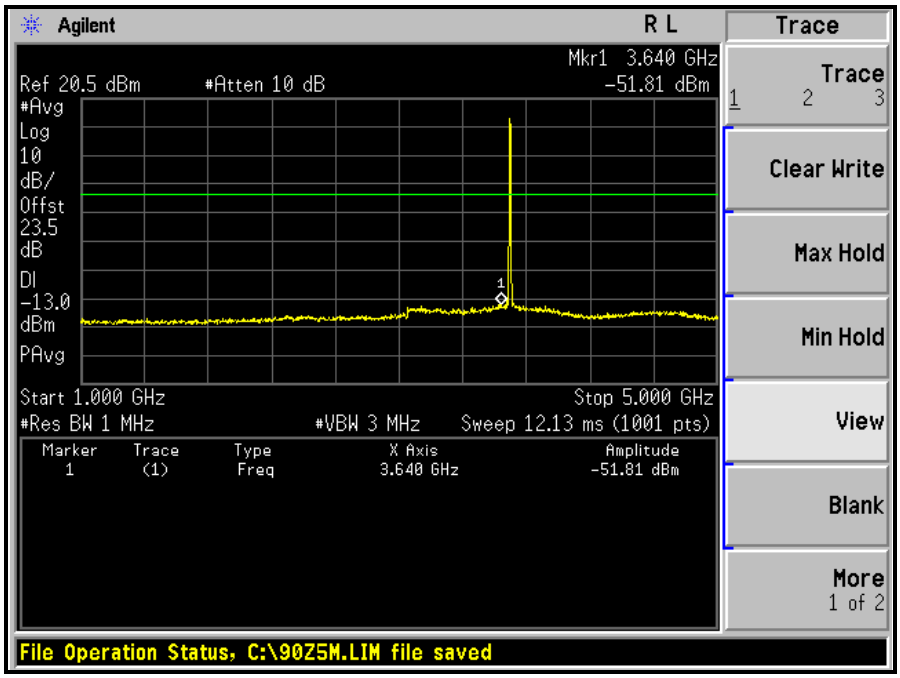
20GHz ~ 37GHz:


Agilent
R T
Peak Search
Mkr1 36.847 GHz
Ref 20.5 dBm
#Atten 10 dB
-39.84 dBm
Next Peak
#Avg
Log
10
dB/
Offst
23.5
dB
Next Pk Right
Dl
-13.0
dBm
Next Pk Left
PAvg
Min Search
Start 20.000 GHz
Stop 37.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 85 ms (1001 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 36.847 GHz -39.84 dBm
Mkr → CF
More
1 of 2
File Operation Status, C:\90Z5M.LIM file saved

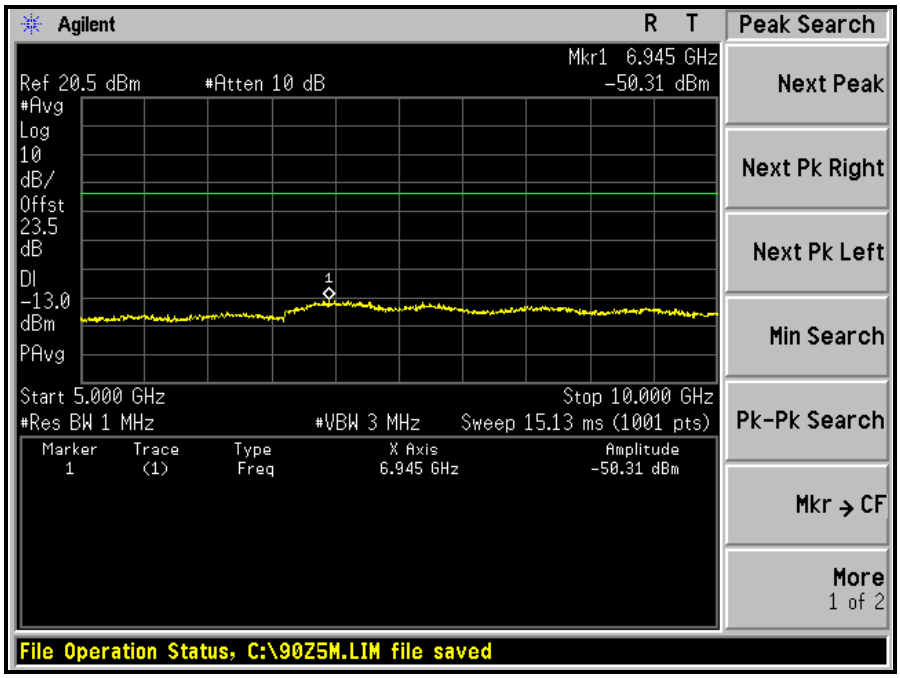
HIGH CHANNEL: 30MHz ~ 1GHz:



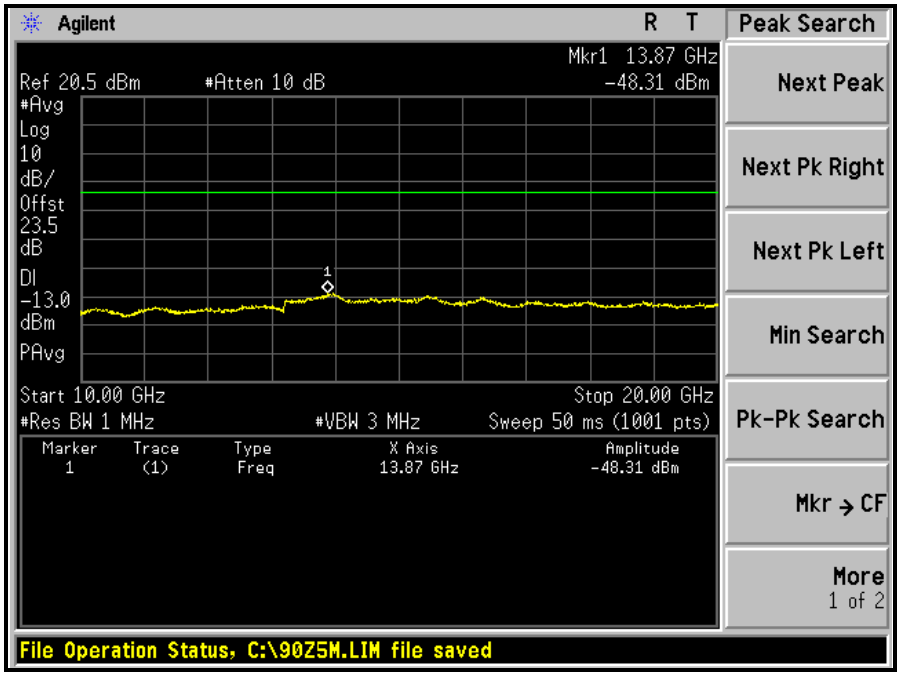
1GHz ~ 5GHz:



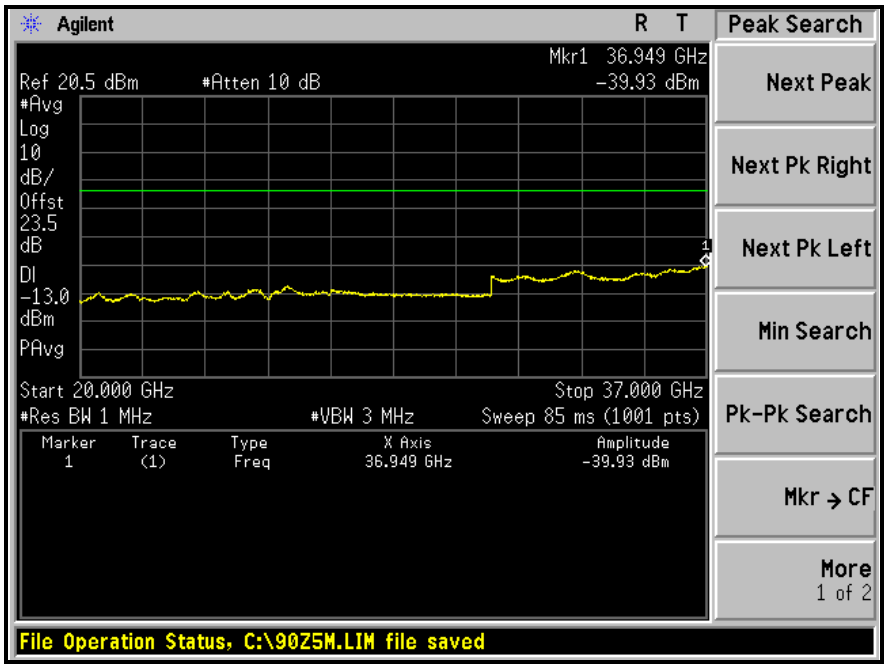
5GHz ~ 10GHz:



10GHz ~ 20GHz:

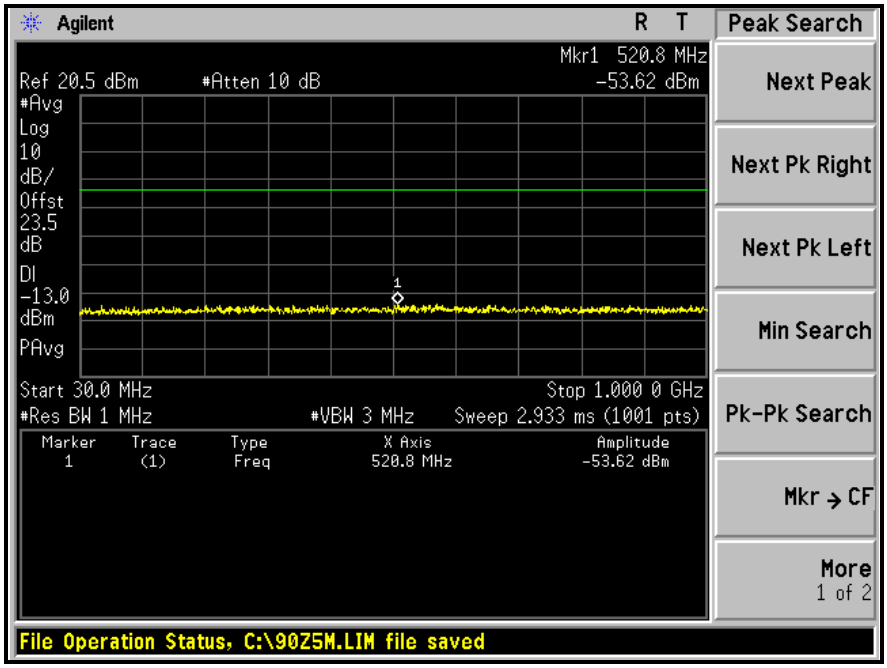


20GHz ~ 37GHz:

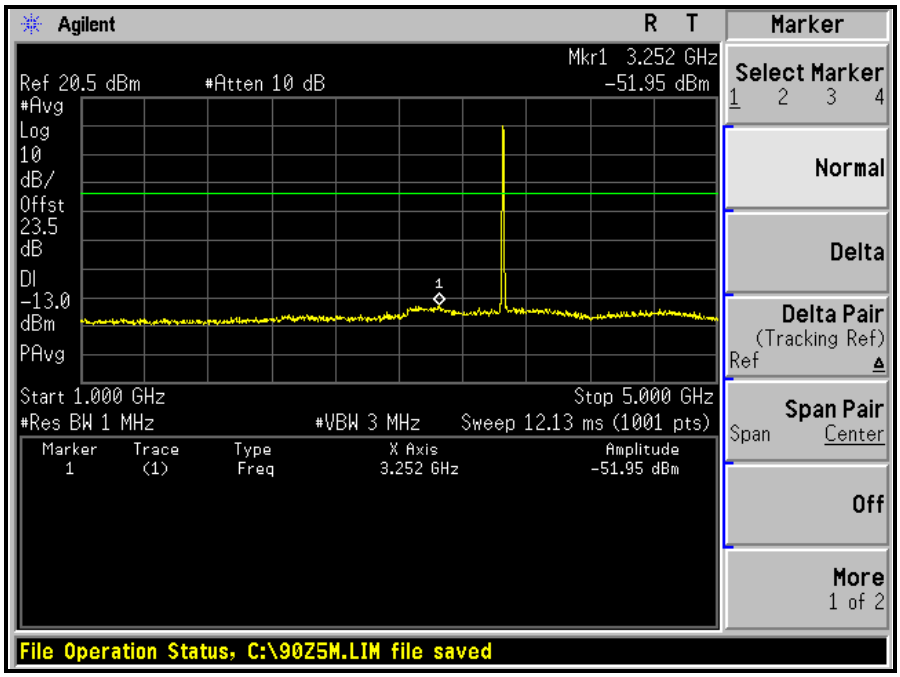

Agilent
R T
Peak Search
Mkr1 36.949 GHz
Ref 20.5 dBm
#Atten 10 dB
-39.93 dBm
Next Peak
#Avg
Log
10
dB/
Offst
23.5
dB
Dl
-13.0
dBm
PAvg
Next Pk Right
Next Pk Left
Min Search
Start 20.000 GHz
Stop 37.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 85 ms (1001 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 36.949 GHz -39.93 dBm
Mkr → CF
More
1 of 2
File Operation Status, C:\90Z5M.LIM file saved

CHANNEL BANDWIDTH: 7MHz

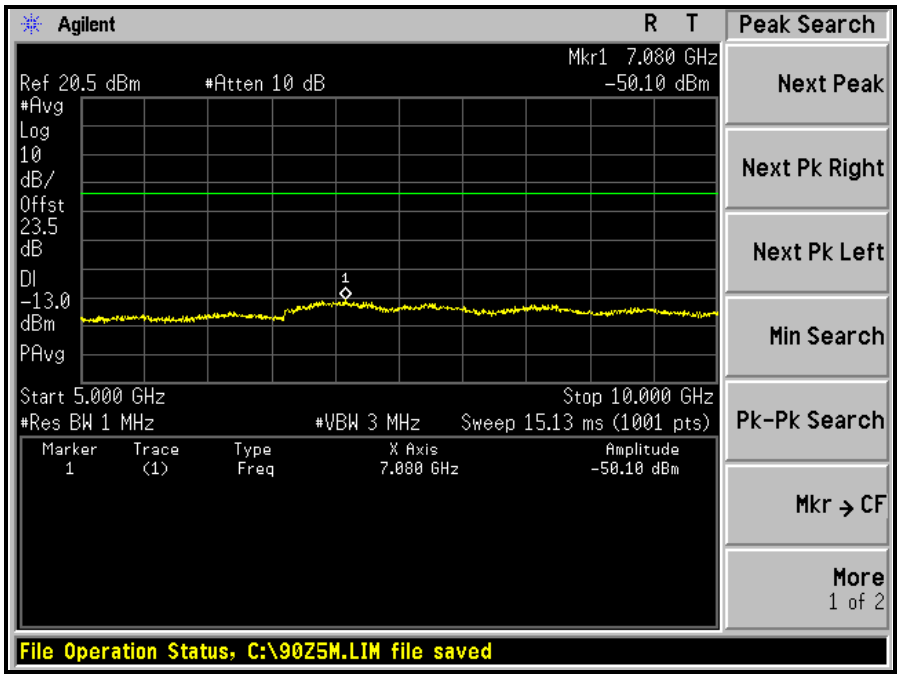
LOW CHANNEL: 30MHz ~ 1GHz:



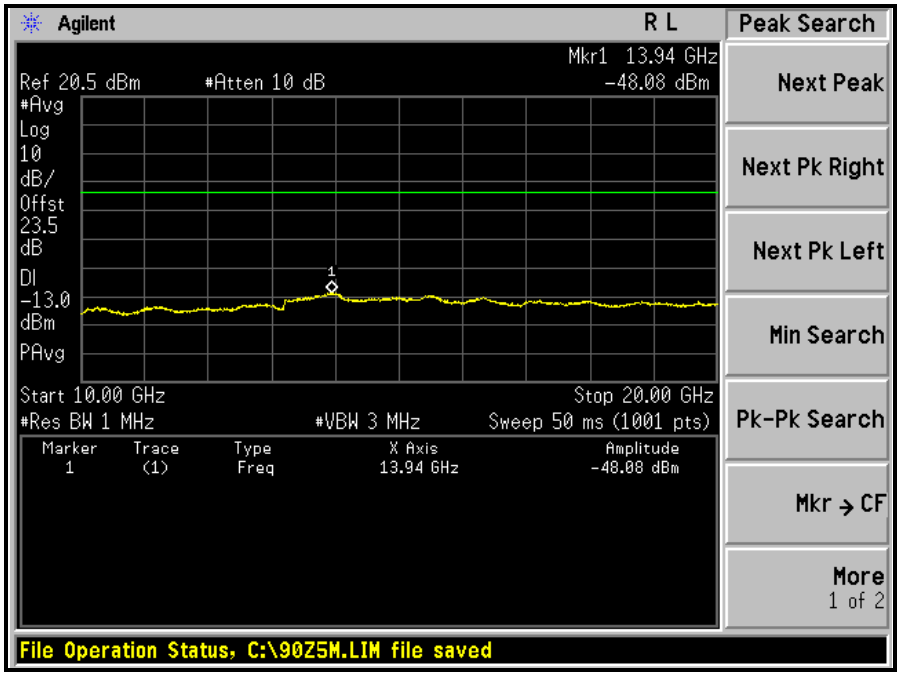
1GHz ~ 5GHz:



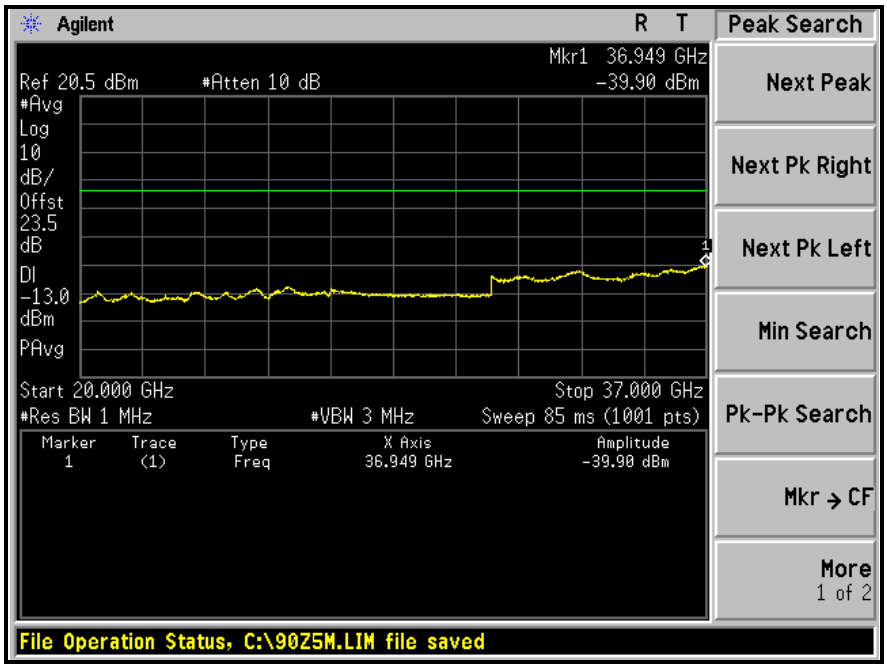
5GHz ~ 10GHz:



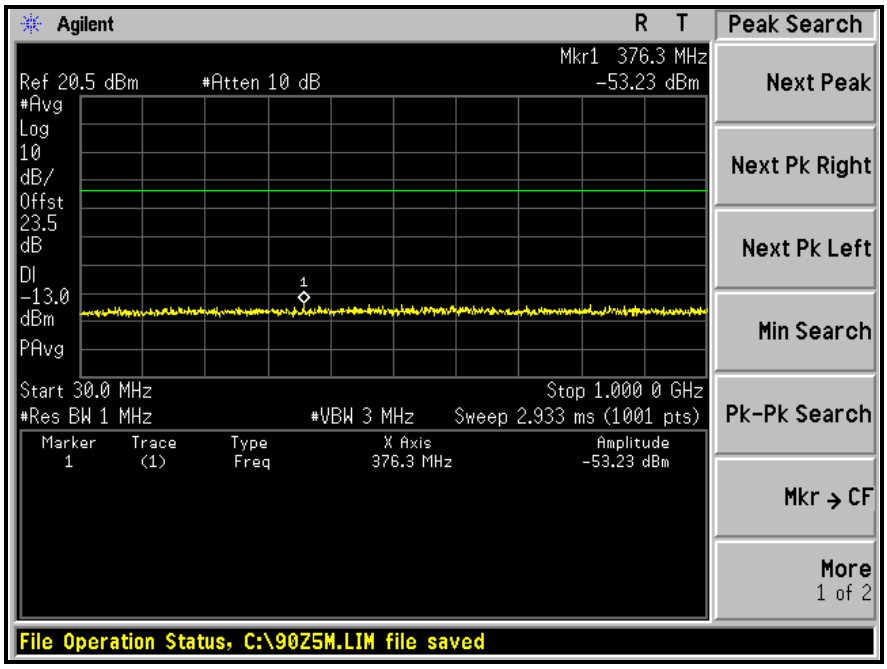
10GHz ~ 20GHz:



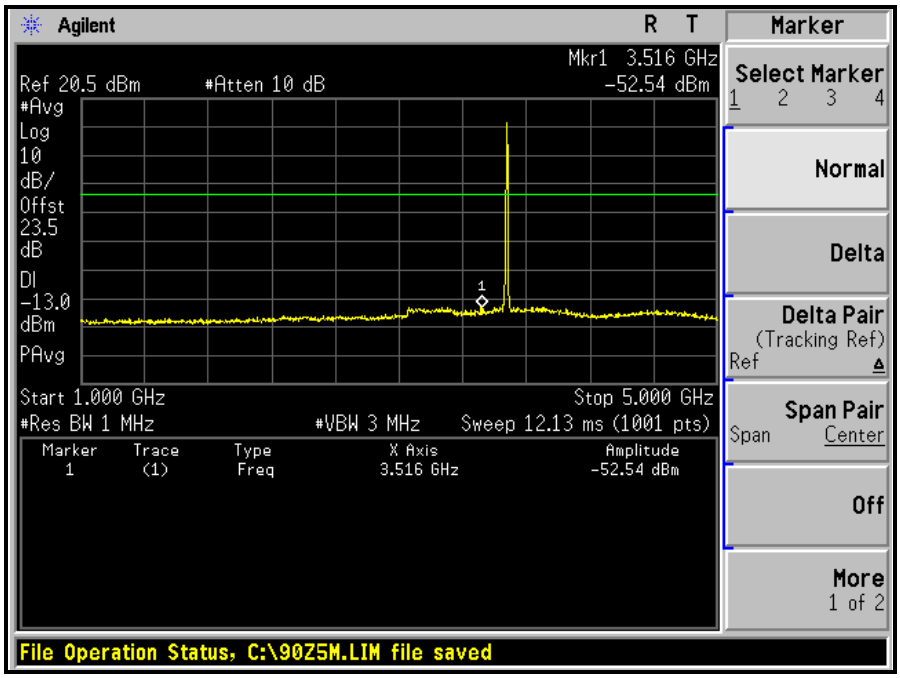
20GHz ~ 37GHz:


Agilent
R T
Peak Search
Mkr1 36.949 GHz
Ref 20.5 dBm
#Atten 10 dB
-39.90 dBm
Next Peak
#Avg
Log
10
dB/
Offst
23.5
dB
Next Pk Right
Dl
-13.0
dBm
Next Pk Left
PAvg
Min Search
Start 20.000 GHz
Stop 37.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 85 ms (1001 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 36.949 GHz -39.90 dBm
Mkr → CF
More
1 of 2
File Operation Status, C:\90Z5M.LIM file saved

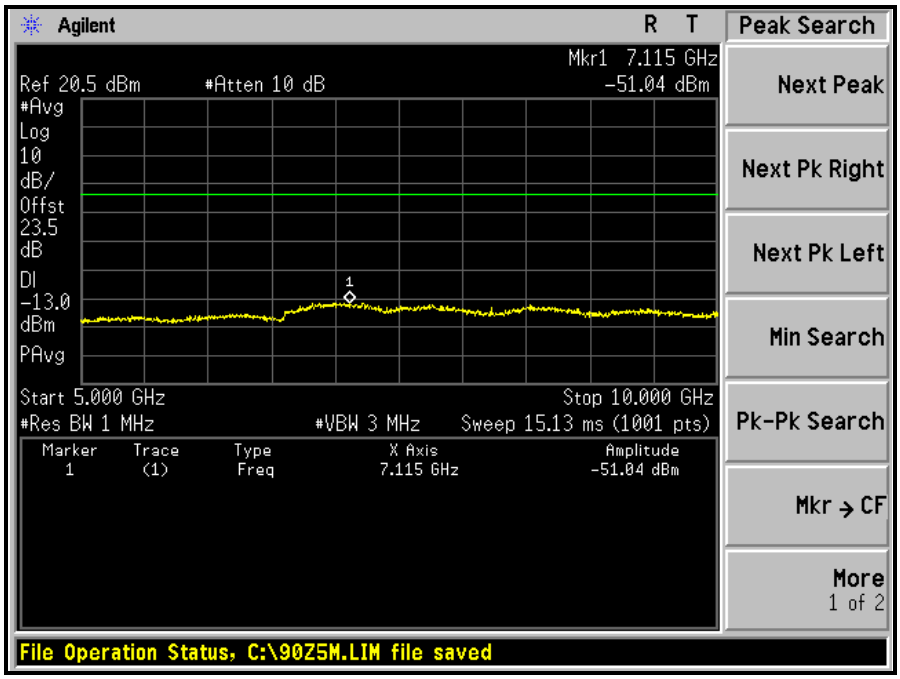
MIDDLE CHANNEL: 30MHz ~ 1GHz:



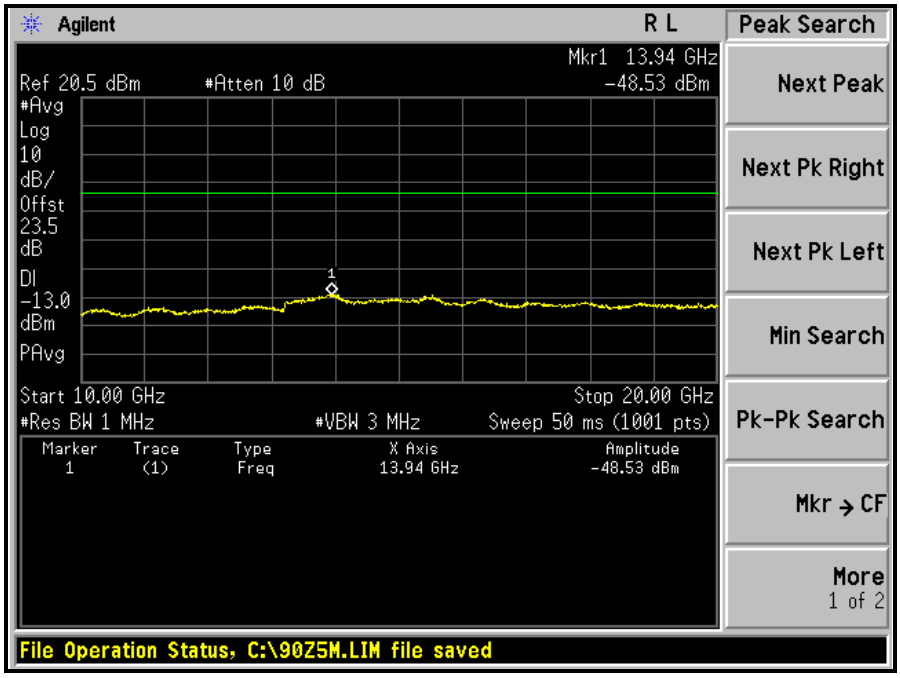
1GHz ~ 5GHz:



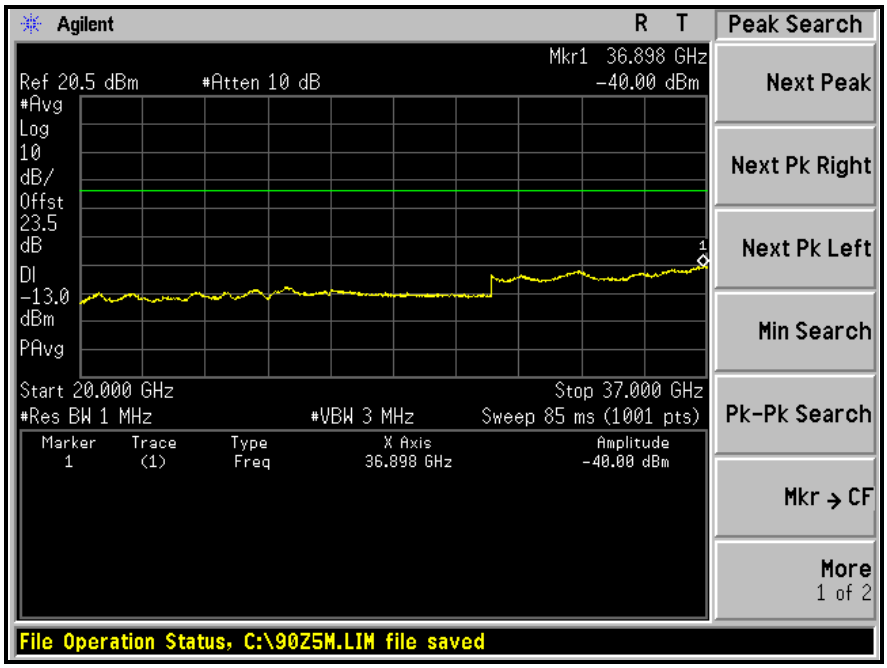
5GHz ~ 10GHz:



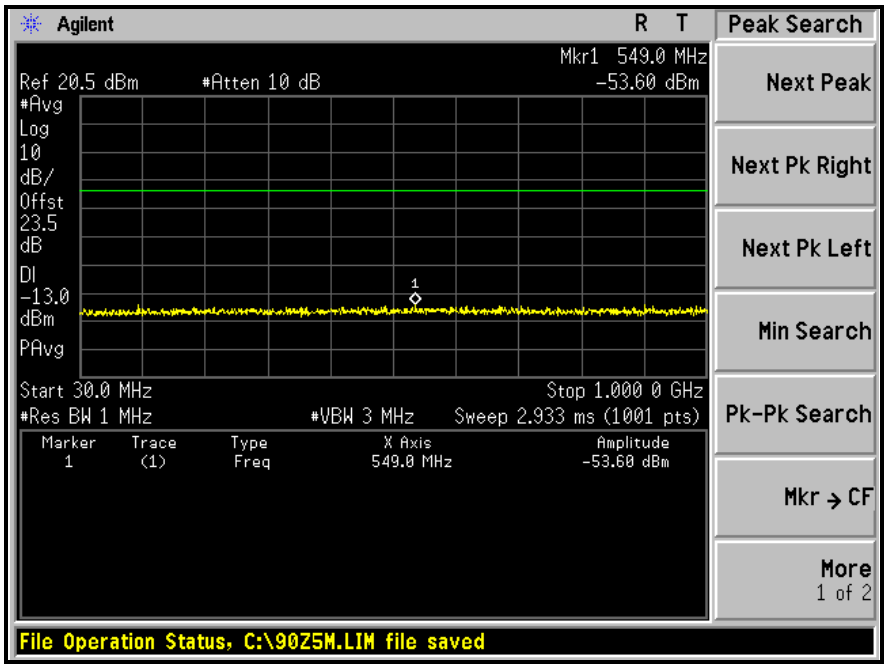
10GHz ~ 20GHz:



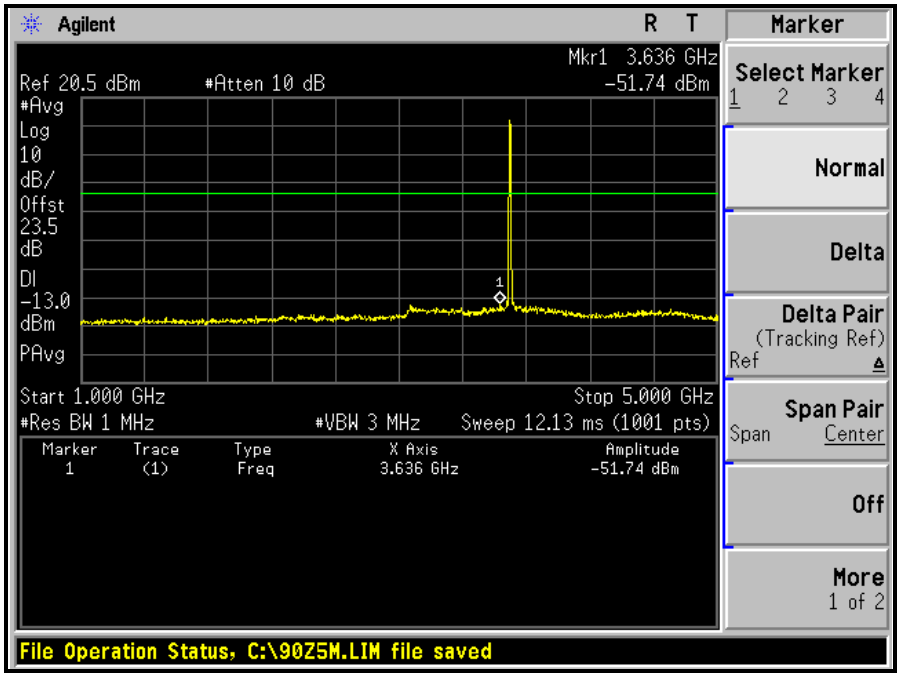
20GHz ~ 37GHz:


Agilent
R T
Peak Search
Mkr1 36.898 GHz
Ref 20.5 dBm
#Atten 10 dB
-40.00 dBm
Next Peak
#Avg
Log
10
dB/
Offst
23.5
dB
Next Pk Right
Dl
-13.0
dBm
Next Pk Left
PAvg
Min Search
Start 20.000 GHz
Stop 37.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 85 ms (1001 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 36.898 GHz -40.00 dBm
Mkr → CF
More
1 of 2
File Operation Status, C:\90Z5M.LIM file saved

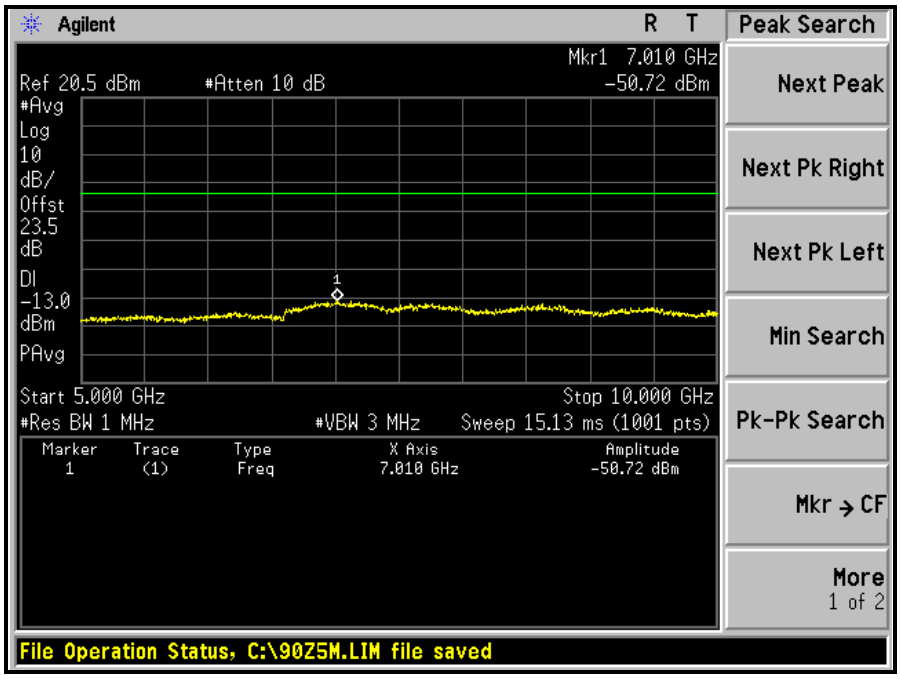
HIGH CHANNEL: 30MHz ~ 1GHz:



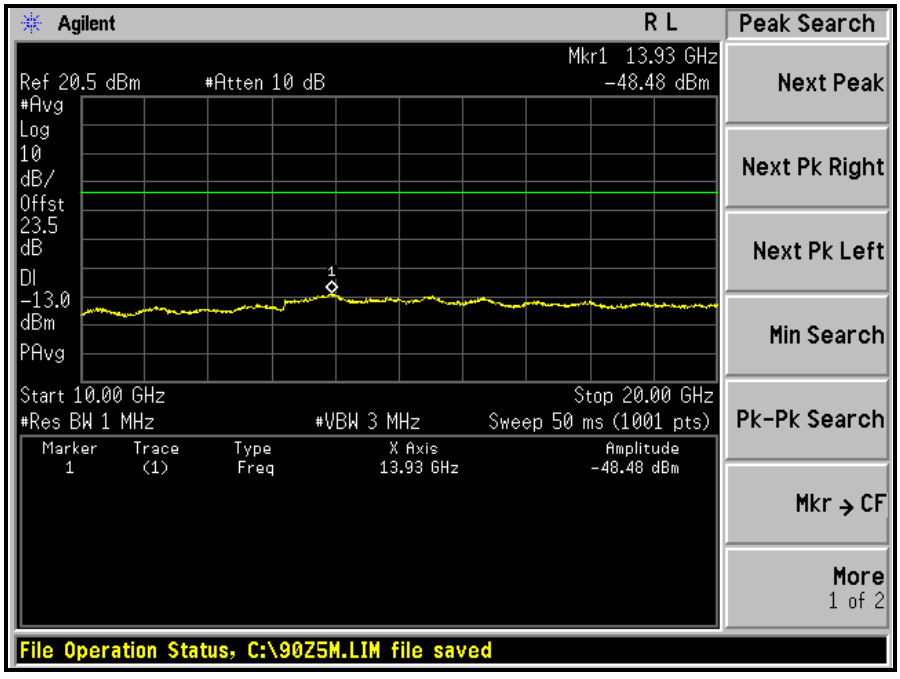
1GHz ~ 5GHz:



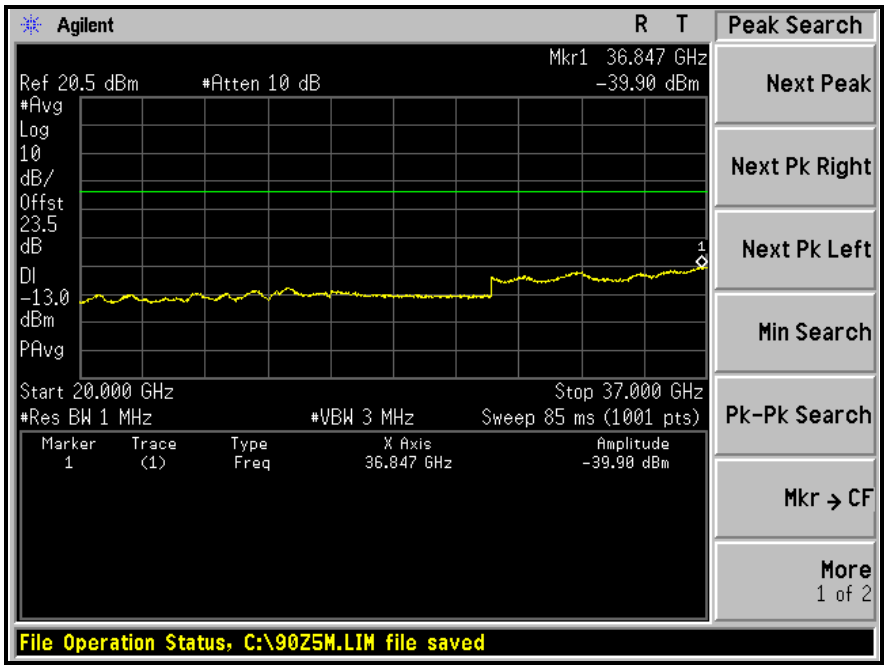
5GHz ~ 10GHz:



10GHz ~ 20GHz:

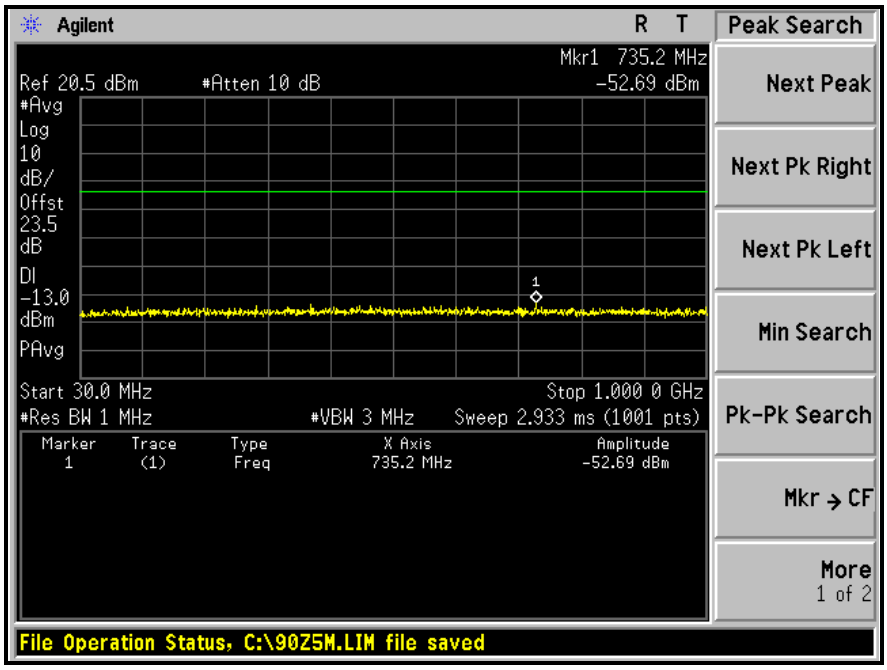


20GHz ~ 37GHz:

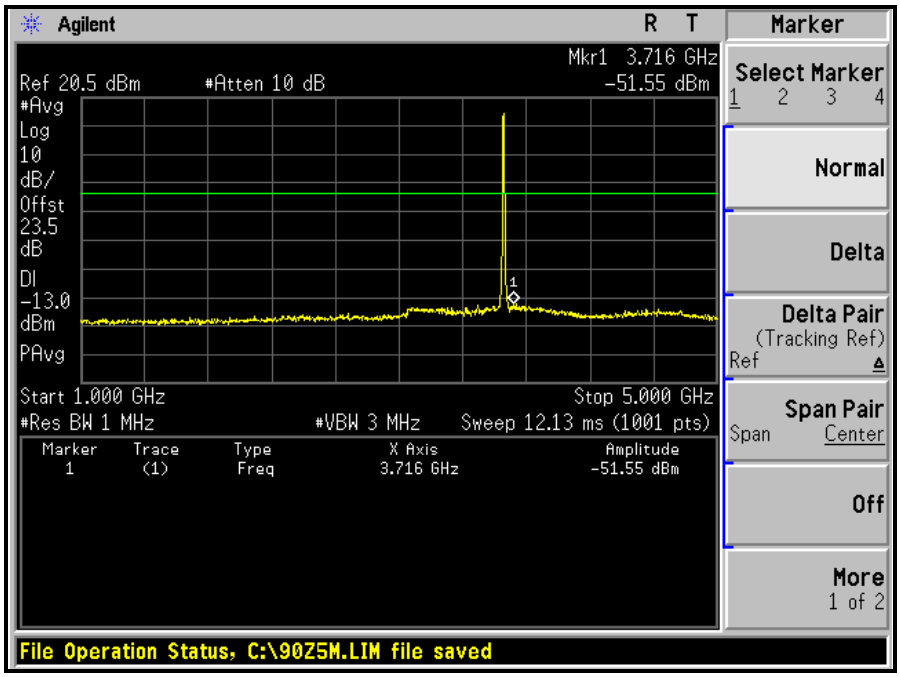

Agilent
R T
Peak Search
Mkr1 36.847 GHz
Ref 20.5 dBm
#Atten 10 dB
-39.90 dBm
Next Peak
#Avg
Log
10
dB/
Offst
23.5
dB
Next Pk Right
Next Pk Left
Dl
-13.0
dBm
PAvg
Min Search
Start 20.000 GHz
Stop 37.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 85 ms (1001 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 36.847 GHz -39.90 dBm
Mkr → CF
More
1 of 2
File Operation Status, C:\90Z5M.LIM file saved

CHANNEL BANDWIDTH: 10MHz

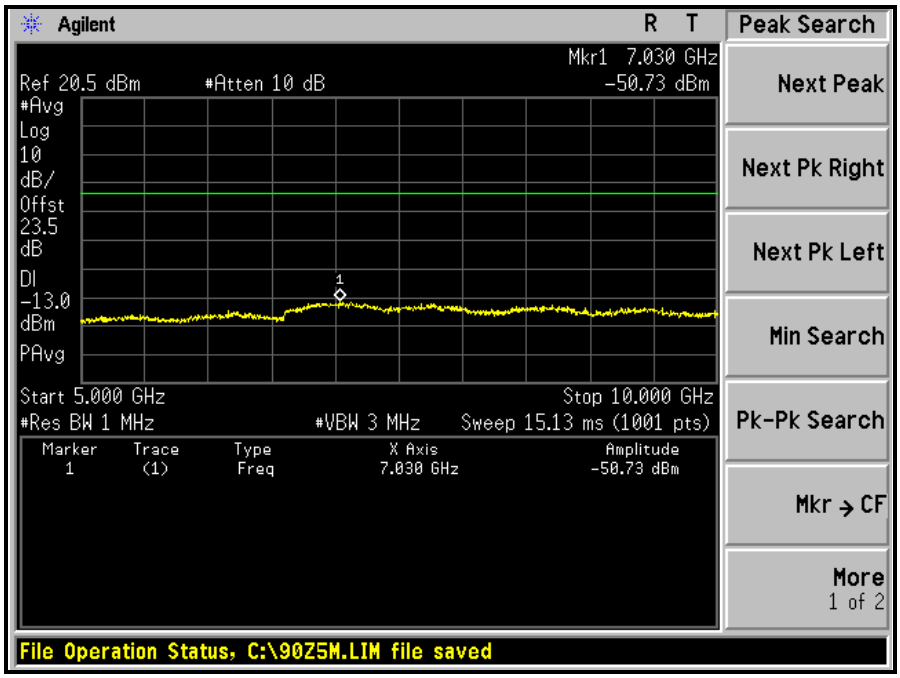
LOW CHANNEL: 30MHz ~ 1GHz:



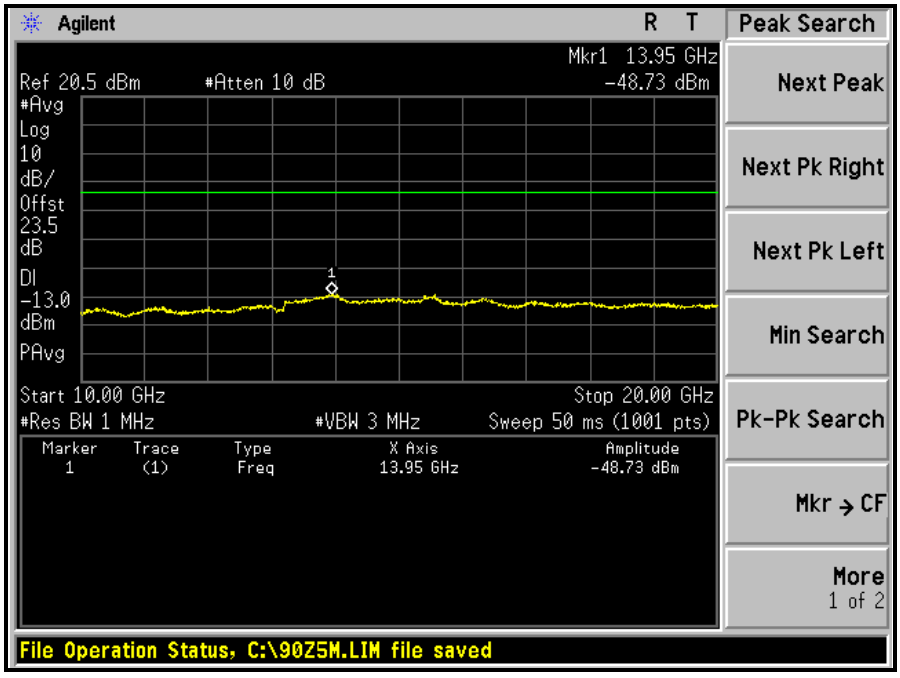
1GHz ~ 5GHz:



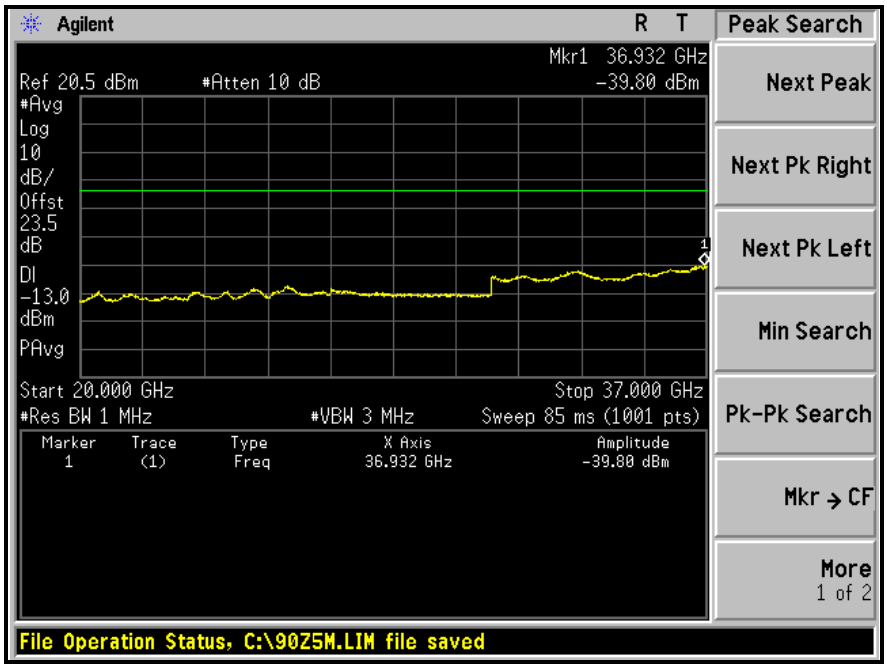
5GHz ~ 10GHz:



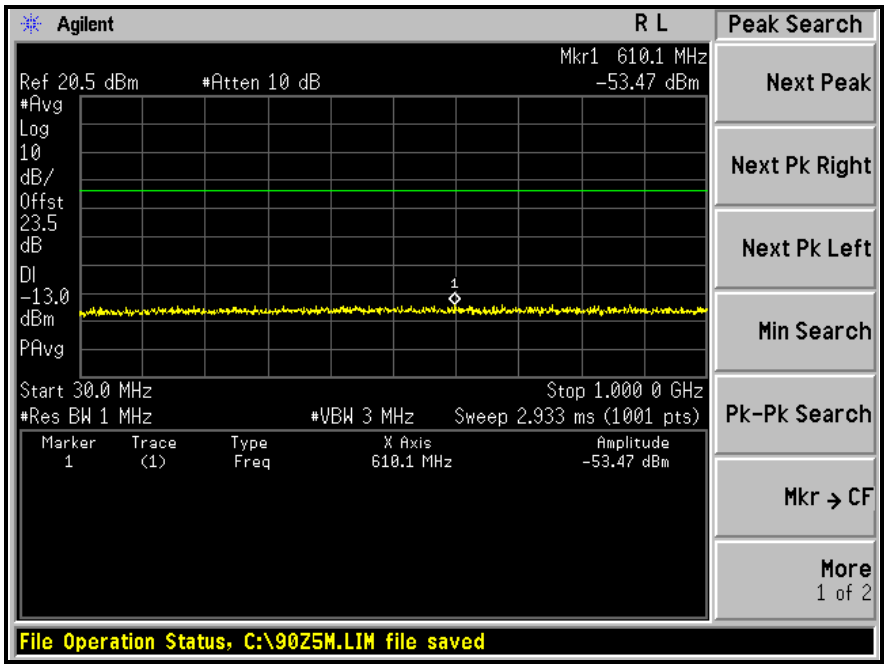
10GHz ~ 20GHz:



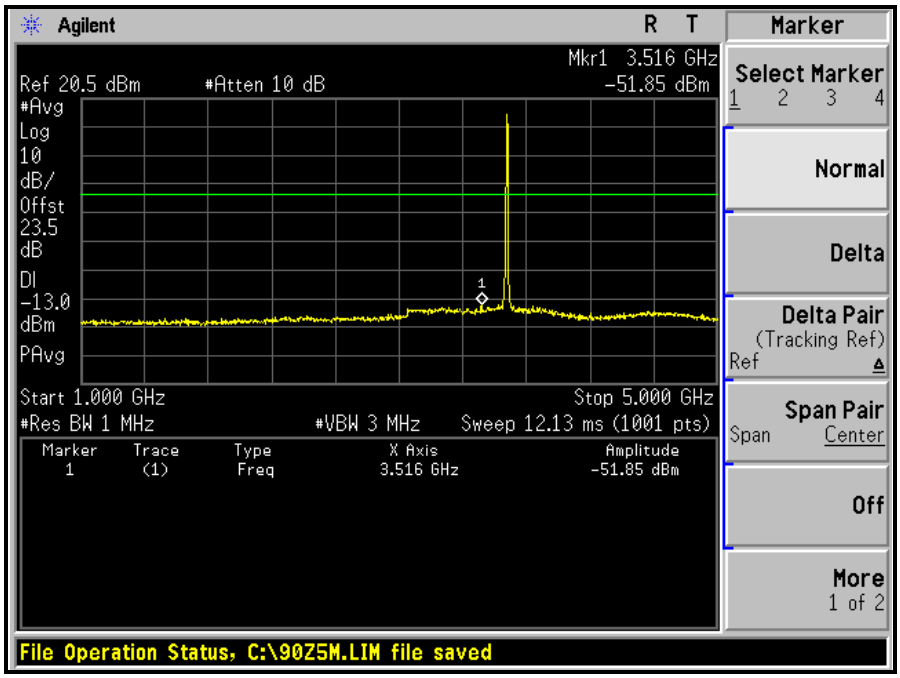
20GHz ~ 37GHz:


Agilent
R T
Peak Search
Mkr1 36.932 GHz
Ref 20.5 dBm
#Atten 10 dB
-39.80 dBm
Next Peak
#Avg
Log
10
dB/
Offst
23.5
dB
Next Pk Right
Dl
-13.0
dBm
Next Pk Left
PAvg
Min Search
Start 20.000 GHz
Stop 37.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 85 ms (1001 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 36.932 GHz -39.80 dBm
Mkr → CF
More
1 of 2
File Operation Status, C:\90Z5M.LIM file saved

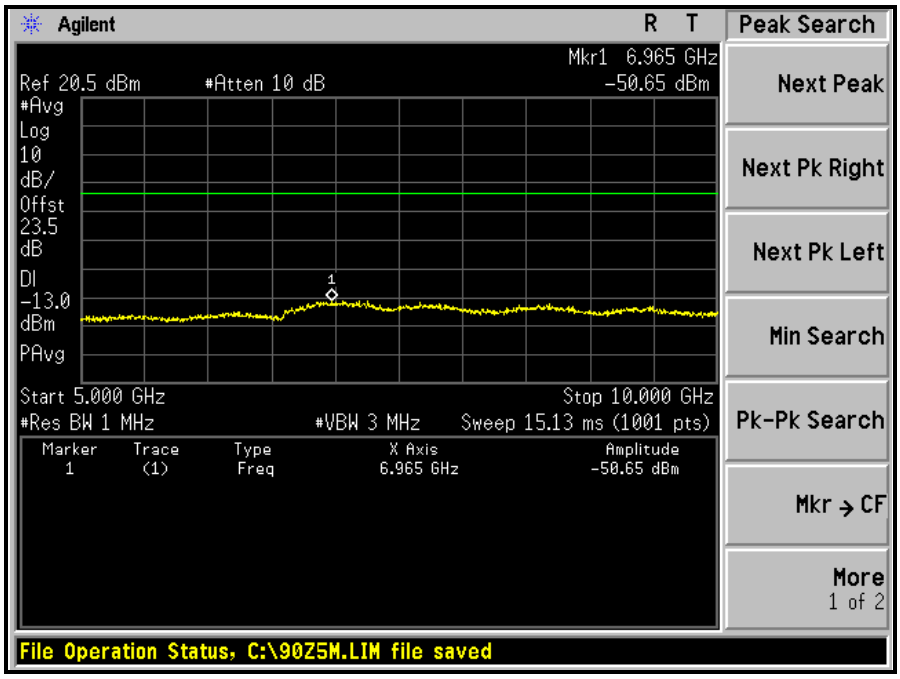
MIDDLE CHANNEL: 30MHz ~ 1GHz:



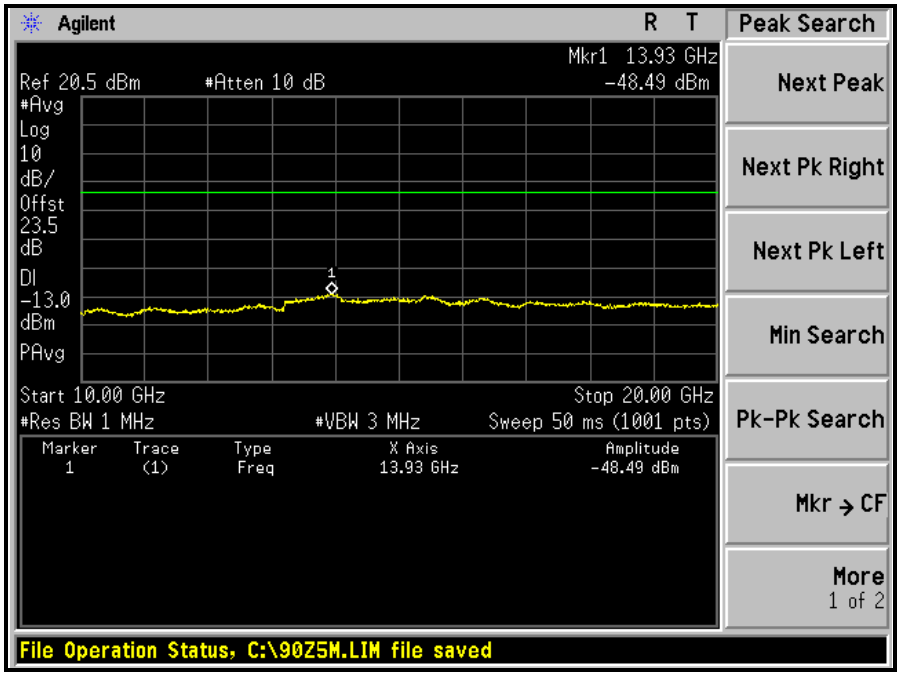
1GHz ~ 5GHz:



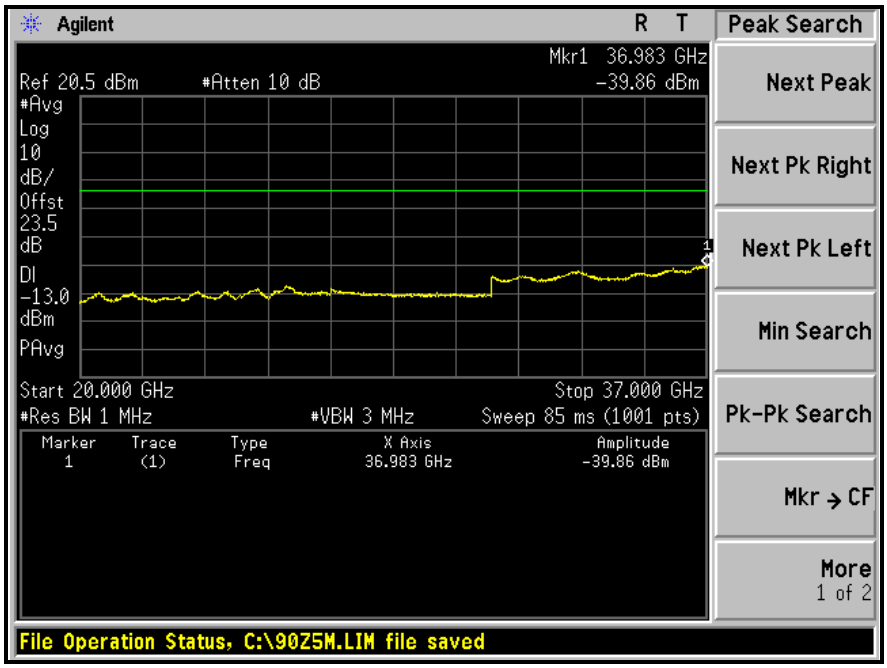
5GHz ~ 10GHz:



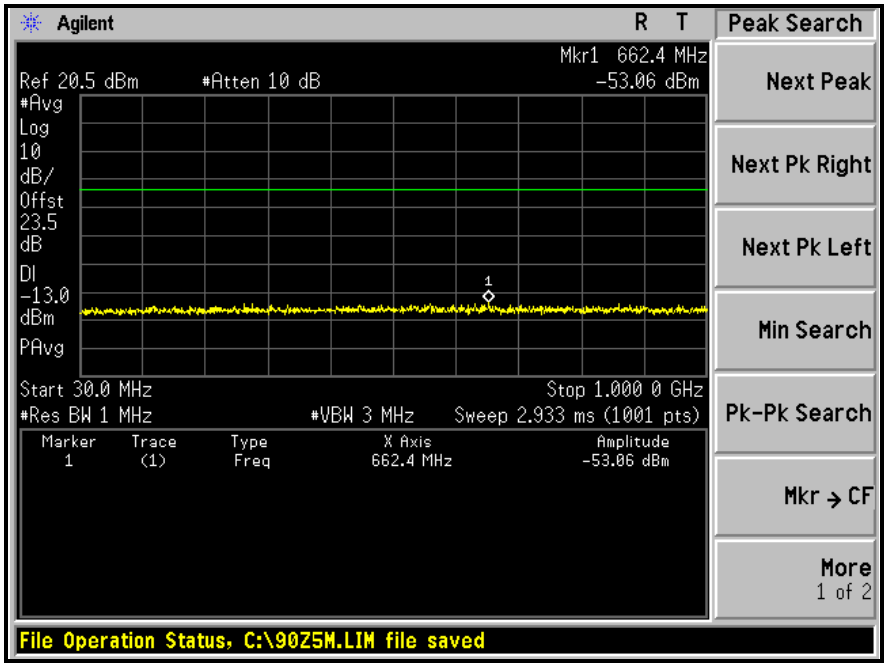
10GHz ~ 20GHz:



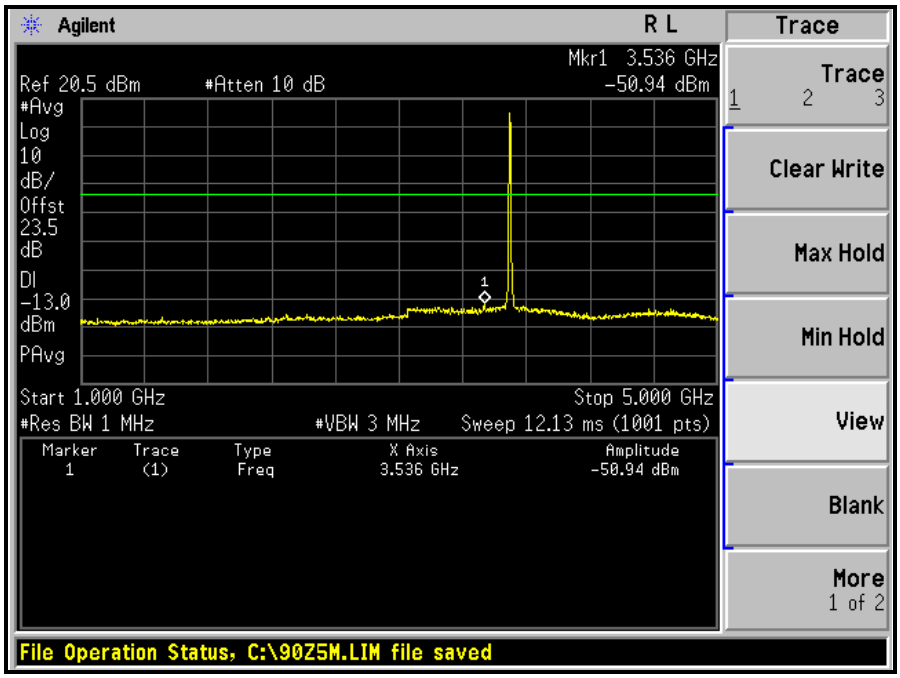
20GHz ~ 37GHz:


Agilent
R T
Peak Search
Mkr1 36.983 GHz
Ref 20.5 dBm
#Atten 10 dB
-39.86 dBm
Next Peak
#Avg
Log
10
dB/
Offst
23.5
dB
Next Pk Right
Dl
-13.0
dBm
Next Pk Left
PAvg
Min Search
Start 20.000 GHz
Stop 37.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 85 ms (1001 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 36.983 GHz -39.86 dBm
Mkr → CF
More
1 of 2
File Operation Status, C:\90Z5M.LIM file saved

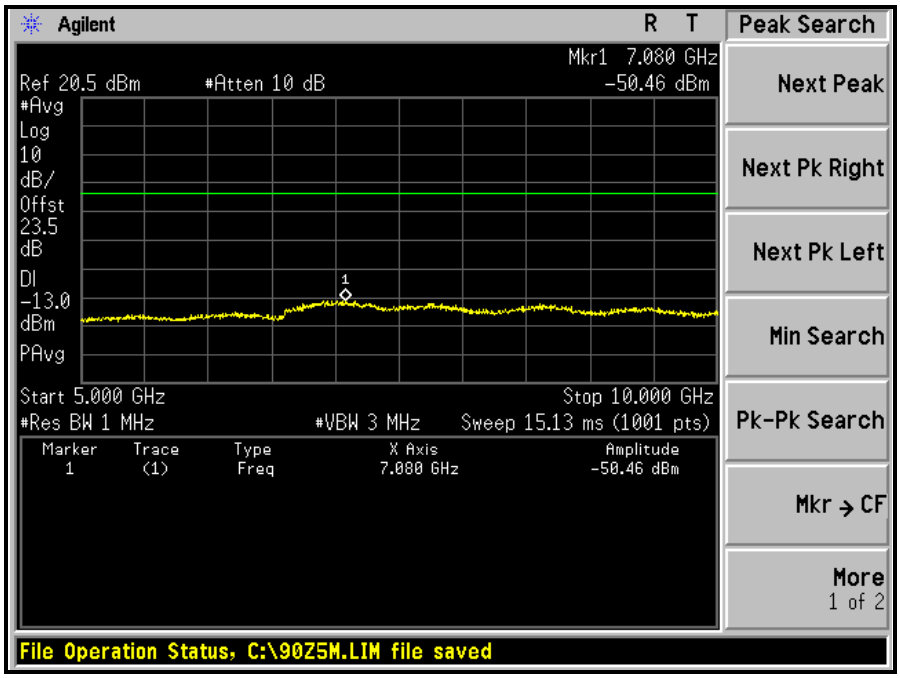
HIGH CHANNEL: 30MHz ~ 1GHz:



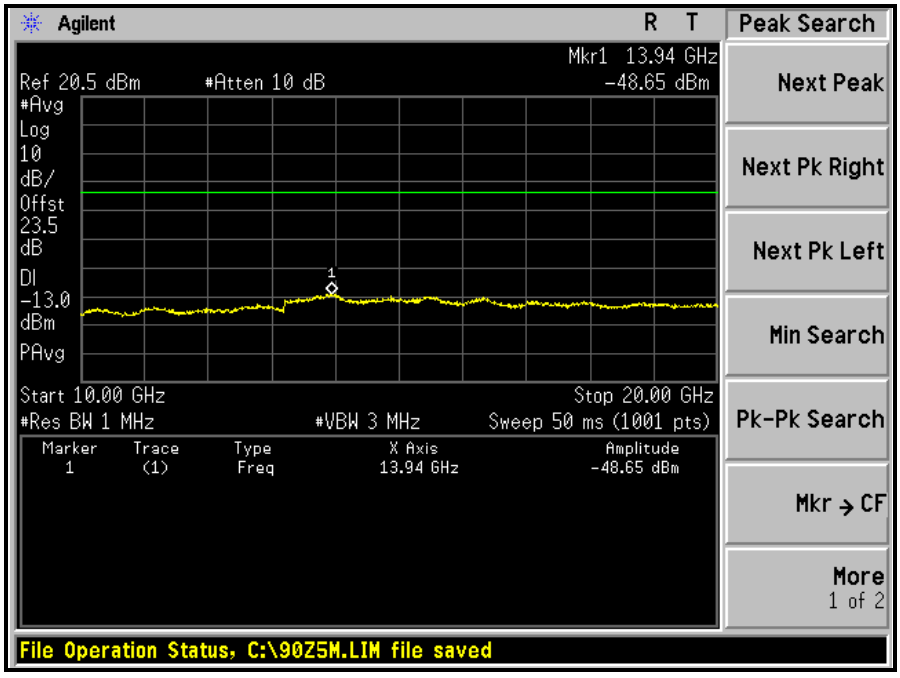
1GHz ~ 5GHz:



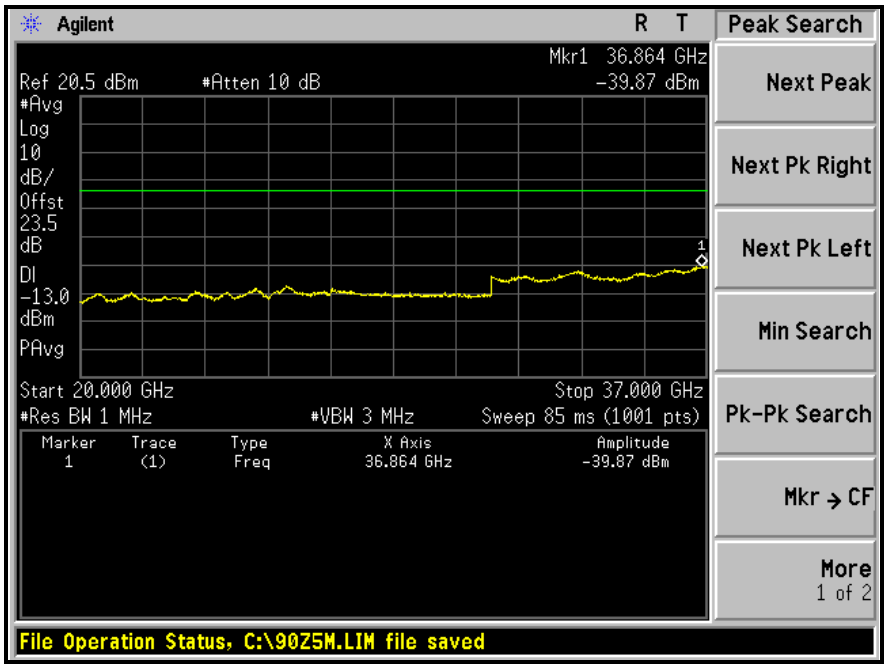
5GHz ~ 10GHz:



10GHz ~ 20GHz:



20GHz ~ 37GHz:


Agilent
R T
Peak Search
Mkr1 36.864 GHz
Ref 20.5 dBm
#Atten 10 dB
-39.87 dBm
Next Peak
#Avg
Log
10
dB/
Offst
23.5
dB
Next Pk Right
Dl
-13.0
dBm
Next Pk Left
PAvg
Min Search
Start 20.000 GHz
Stop 37.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 85 ms (1001 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 36.864 GHz -39.87 dBm
Mkr → CF
More
1 of 2
File Operation Status, C:\90Z5M.LIM file saved

4.6 RADIATED EMISSION MEASUREMENT (BELOW 1GHz)

4.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

According to FCC 90.1323 specified that the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in Watts, by at least 43 + 10 log (P) dB. The limit of emission equal to –13dBm Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or less, but at least one percent of the emission bandwidth of the fundamental emission of the transmitter, provided the measured energy is integrated over a 1 MHz bandwidth.

4.6.2 TEST INSTRUMENTS

Test date: Sep. 13, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 2011
Agilent PSA Spectrum Analyzer	E4446A	MY48250113	Nov. 30 , 2010	Nov. 29 , 2011
HP Pre_Amplifier	8449B	300801923	Nov. 01, 2010	Oct. 31, 2011
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 02, 2011	Sep. 01, 2012
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	Apr. 14, 2011	Apr. 13, 2012
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 17, 2010	Dec. 16, 2011
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 17, 2011	Jan. 16, 2012
R&S Loop Antenna	HFH2-Z2	100070	Feb. 3, 2010	Feb. 2, 2012
RF Switches	EMH-011	1001	Sep. 25, 2010	Sep. 24, 2011
RF CABLE (Chaintek)	Sucoflex 106	RF106-102	Jan. 27, 2011	Jan. 26, 2012
RF Cable	8DFB	STCCAB-30M-1GHz	Sep. 25, 2010	Sep. 24, 2011
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-3.

4.6.3 TEST PROCEDURES

a. Substitution method is used for EIRP measurement. The EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

b. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G

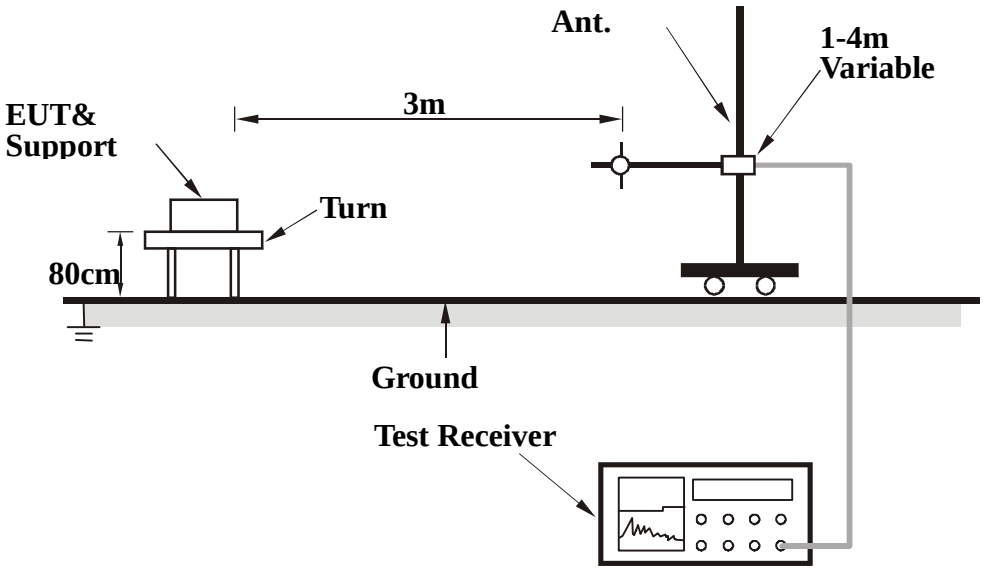
   EIRP = Output power level of S.G – TX cable loss + Antenna gain of Substitution antenna

NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.6.6 EUT OPERATING CONDITIONS

Same as 4.1.5.

4.6.7 TEST RESULTS

MODE	Low channel	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg°C, 60%RH
TESTED BY	Wen Yu	CHANNEL BANDWIDTH	5MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	73.31	15.81	-13	-74.29	-3.72	-78.01
2	194.45	9.43	-13	-85.59	3.74	-81.85
3	202.86	19.97	-13	-75.51	4.31	-71.21
4	255.92	21.44	-13	-73.29	3.94	-69.35
5	450	11.97	-13	-86.29	2.81	-83.48
6	699.25	27.9	-13	-68.42	1.62	-66.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	37.5	31.98	-13	-42.00	-13.07	-55.07
2	204.75	20.83	-13	-74.65	4.28	-70.37
3	368.17	24.59	-13	-73.27	3.50	-69.77
4	400.83	22.29	-13	-75.56	3.32	-72.24
5	699.25	37.18	-13	-59.14	1.62	-57.52
6	875.67	34.83	-13	-61.92	0.76	-61.16

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Low channel	**FREQUENCY RANGE**	Below 1000MHz
INPUT POWER	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg°C, 60%RH
TESTED BY	Wen Yu	**CHANNEL BANDWIDTH**	7MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV)**	**LIMIT (dBm)**	**S.G POWER VALUE (dBm)**	**CORRECTION FACTOR (dB)**	**POWER VALUE (dBm)**
1	73.54	16.45	-13	-73.79	-3.65	-77.44
2	194.45	9.76	-13	-85.26	3.74	-81.52
3	202.86	20.54	-13	-74.94	4.31	-70.64
4	255.92	21.11	-13	-73.62	3.94	-69.68
5	450	11.57	-13	-86.69	2.81	-83.88
6	699.25	27.1	-13	-69.22	1.62	-67.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBm)**	**S.G POWER VALUE (dBm)**	**CORRECTION FACTOR (dB)**	**POWER VALUE (dBm)**
1	37.5	31.6	-13	-42.38	-13.07	-55.45
2	204.5	22.02	-13	-73.46	4.28	-69.17
3	368.45	23.88	-13	-73.98	3.50	-70.48
4	401.44	21.69	-13	-76.16	3.32	-72.85
5	699.72	36.61	-13	-59.72	1.62	-58.10
6	875.67	35.45	-13	-61.30	0.76	-60.54

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Low channel	**FREQUENCY RANGE**	Below 1000MHz
INPUT POWER	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg^{o}C, 60%RH
TESTED BY	Wen Yu	**CHANNEL BANDWIDTH**	10MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV)**	**LIMIT (dBm)**	**S.G POWER VALUE (dBm)**	**CORRECTION FACTOR (dB)**	**POWER VALUE (dBm)**
1	73.28	16.45	-13	-70.48	-4.34	-74.82
2	194.55	9.49	-13	-85.54	3.75	-81.79
3	202.86	20.87	-13	-74.61	4.31	-70.31
4	256.34	20.79	-13	-73.93	3.94	-69.98
5	449.57	11.57	-13	-86.68	2.81	-83.87
6	699.25	27.36	-13	-68.96	1.62	-67.34
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBm)**	**S.G POWER VALUE (dBm)**	**CORRECTION FACTOR (dB)**	**POWER VALUE (dBm)**
1	37.43	31.27	-13	-42.68	-13.09	-55.77
2	205.16	20.83	-13	-74.65	4.27	-70.37
3	368.17	25.14	-13	-72.72	3.50	-69.22
4	399.77	22.29	-13	-75.55	3.34	-72.22
5	699.25	36.43	-13	-59.89	1.62	-58.27
6	875.67	34.83	-13	-61.92	0.76	-61.16

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

4.7 RADIATED EMISSION MEASUREMENT (ABOVE 1GHz)

4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

According to FCC 90.1323 specified that the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in Watts, by at least 43 + 10 log (P) dB. The limit of emission equal to –13dBm Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or less, but at least one percent of the emission bandwidth of the fundamental emission of the transmitter, provided the measured energy is integrated over a 1 MHz bandwidth.

4.7.2 TEST INSTRUMENTS

Same as 4.6.2.

4.7.3 TEST PROCEDURES

Same as 4.6.3.

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP

Same as 4.6.5.

4.7.6 EUT OPERATING CONDITIONS

Same as 4.1.5

4.7.7 TEST RESULTS

MODE	Low channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg°C, 60%RH
TESTED BY	Wen Yu	CHANNEL BANDWIDTH	5MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	7305	72.8	-13	-29.63	4.68	-24.95
2	10957.5	78.8	-13	-22.80	3.13	-19.67
3	14610	73.9	-13	-24.05	3.13	-20.92
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	7305	73.9	-13	-28.53	4.68	-23.85
2	10957.5	77.8	-13	-23.80	3.13	-20.67
3	14610	75.7	-13	-22.25	3.13	-19.12

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Middle channel	**FREQUENCY RANGE**	Above 1000MHz
INPUT POWER	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg°C, 60%RH
TESTED BY	Wen Yu	**CHANNEL BANDWIDTH**	5MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV)**	**LIMIT (dBm)**	**S.G POWER VALUE (dBm)**	**CORRECTION FACTOR (dB)**	**POWER VALUE (dBm)**
1	7350	76.5	-13	-25.93	4.68	-21.25
2	11025	81.1	-13	-20.45	3.13	-17.32
3	14700	74.5	-13	-23.31	3.26	-20.05
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBm)**	**S.G POWER VALUE (dBm)**	**CORRECTION FACTOR (dB)**	**POWER VALUE (dBm)**
1	7350	75.4	-13	-27.03	4.68	-22.35
2	11025	76.1	-13	-25.45	3.13	-22.32
3	14700	75.8	-13	-22.01	3.26	-18.75

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	High channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg°C, 60%RH
TESTED BY	Wen Yu	CHANNEL BANDWIDTH	5MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	7395	75.8	-13	-26.63	4.68	-21.95
2	11092.5	80.7	-13	-20.83	3.22	-17.61
3	14790	74.6	-13	-23.07	3.39	-19.68
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	7395	75.3	-13	-27.13	4.68	-22.45
2	11092.5	76.5	-13	-25.03	3.22	-21.81
3	14790	75.4	-13	-22.27	3.39	-18.88

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Low channel	**FREQUENCY RANGE**	Above 1000MHz
INPUT POWER	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg°C, 60%RH
TESTED BY	Wen Yu	**CHANNEL BANDWIDTH**	7MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV)**	**LIMIT (dBm)**	**S.G POWER VALUE (dBm)**	**CORRECTION FACTOR (dB)**	**POWER VALUE (dBm)**
1	7307	72.7	-13	-29.73	4.68	-25.05
2	10960.5	78.7	-13	-22.90	3.13	-19.77
3	14614	74.9	-13	-23.04	3.14	-19.91
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBm)**	**S.G POWER VALUE (dBm)**	**CORRECTION FACTOR (dB)**	**POWER VALUE (dBm)**
1	7307	73.5	-13	-28.93	4.68	-24.25
2	10960.5	76.9	-13	-24.70	3.13	-21.57
3	14614	74.8	-13	-23.14	3.14	-20.01

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Middle channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg°C, 60%RH
TESTED BY	Wen Yu	CHANNEL BANDWIDTH	7MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	7350	74.3	-13	-28.13	4.68	-23.45
2	11025	79.5	-13	-22.05	3.13	-18.92
3	14700	76.4	-13	-21.41	3.26	-18.15
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	7350	74.5	-13	-27.93	4.68	-23.25
2	11025	75.4	-13	-26.15	3.13	-23.02
3	14700	70.8	-13	-27.01	3.26	-23.75

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	High channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg°C, 60%RH
TESTED BY	Wen Yu	CHANNEL BANDWIDTH	7MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	7393	72.5	-13	-29.93	4.68	-25.25
2	11089.5	72.1	-13	-29.43	3.22	-26.22
3	14786	72.6	-13	-25.08	3.39	-21.69
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	7393	70.2	-13	-32.23	4.68	-27.55
2	11089.5	71.6	-13	-29.93	3.22	-26.72
3	14786	71.5	-13	-26.18	3.39	-22.79

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Low channel	**FREQUENCY RANGE**	Above 1000MHz
INPUT POWER	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg°C, 60%RH
TESTED BY	Wen Yu	**CHANNEL BANDWIDTH**	10MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV)**	**LIMIT (dBm)**	**S.G POWER VALUE (dBm)**	**CORRECTION FACTOR (dB)**	**POWER VALUE (dBm)**
1	7310	70.7	-13	-31.73	4.68	-27.05
2	10965	71.8	-13	-29.79	3.12	-26.67
3	14620	65.2	-13	-32.74	3.14	-29.59
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBm)**	**S.G POWER VALUE (dBm)**	**CORRECTION FACTOR (dB)**	**POWER VALUE (dBm)**
1	7310	69.7	-13	-32.73	4.68	-28.05
2	10965	72	-13	-29.59	3.12	-26.47
3	14620	71.7	-13	-26.24	3.14	-23.09

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Middle channel	**FREQUENCY RANGE**	Above 1000MHz
INPUT POWER	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg°C, 60%RH
TESTED BY	Wen Yu	**CHANNEL BANDWIDTH**	10MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV)**	**LIMIT (dBm)**	**S.G POWER VALUE (dBm)**	**CORRECTION FACTOR (dB)**	**POWER VALUE (dBm)**
1	7350	71.2	-13	-31.23	4.68	-26.55
2	11025	71.4	-13	-30.15	3.13	-27.02
3	14700	65.8	-13	-32.01	3.26	-28.75
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBm)**	**S.G POWER VALUE (dBm)**	**CORRECTION FACTOR (dB)**	**POWER VALUE (dBm)**
1	7350	70.1	-13	-32.33	4.68	-27.65
2	11025	72.9	-13	-28.65	3.13	-25.52
3	14700	72.7	-13	-25.11	3.26	-21.85

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	High channel	**FREQUENCY RANGE**	Above 1000MHz
INPUT POWER	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg°C, 60%RH
TESTED BY	Wen Yu	**CHANNEL BANDWIDTH**	10MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV)**	**LIMIT (dBm)**	**S.G POWER VALUE (dBm)**	**CORRECTION FACTOR (dB)**	**POWER VALUE (dBm)**
1	7390	72.5	-13	-29.93	4.68	-25.25
2	11085	71.8	-13	-29.73	3.21	-26.52
3	14780	71.3	-13	-26.39	3.38	-23.01
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBm)**	**S.G POWER VALUE (dBm)**	**CORRECTION FACTOR (dB)**	**POWER VALUE (dBm)**
1	7390	71.5	-13	-30.93	4.68	-26.25
2	11085	72.3	-13	-29.23	3.21	-26.02
3	14780	72.5	-13	-25.19	3.38	-21.81

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

6 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5.phtml.
If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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