FCC PART 15.407
TEST AND MEASUREMENT REPORT

For

Mimosa Networks

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Cambell, CA 95008, USA

FCC ID: 2ABZJ-100-00001

Report Type:	Product Type:
Original Report	Point-to-Point Device

Prepared By: Cipher Chu

Report Number: R1402141-407 W53 W56

Report Date: 2014-07-25

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1402141-407 W53 W56	Original Report	2014-07-25

1 General Description

1.1 Product Description for Equipment under Test (EUT)

This test and measurement report was prepared on behalf of *Mimosa Networks,* and their product model: *B5, FCC ID: 2ABZJ-100-00001* which will henceforth be referred to as the "EUT" (Equipment under Test) in this report. The EUT is a point-to-point device.

1.2 Mechanical Description of EUT

The EUT measures approximately 17.3 cm (L) x 17.3 cm (W) x 7.3 cm (H) and weighs 3.2kg.

The test data gathered are from typical production sample, serial number: 1346101000019 assigned by manufacturer.

1.3 Objective

This report is prepared on behalf of *Mimosa Networks, in* accordance with FCC CFR47 §15.407

The objective is to determine compliance with FCC rules for Antenna Requirments, AC Line Conducted Emissions, Occupied Bandwidth, Maximum Peak Output Power, Power Spectral Density, Radiated and Conducted Spurious Emissions, and Band Edge.

1.4 Related Submittal(s)/Grant(s)

N/A

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz and FCC KDB 789033 D02 General UNII Test Procedures v01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR16-4-2: 2011, The Treatment of Uncertainty in EMC Measurements, the values ranging from $\pm$2.0 dB for Conducted Emissions tests and $\pm$4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

1.7 Test Facility

Bay area compliance Laboratories Corp. (BACL) is:
1- An independent Commercial Test Laboratory accredited to **ISO 17025: 2005** by **A2LA**, in the fields of: Electromagnetic Compatibility & Telecommunications covering Emissions, Immunity, Radio, RF Exposure, Safety and Telecom. This includes NEBS (Network Equipment Building System), Wireless RF, Telecommunications Terminal Equipment (TTE); Network Equipment; Information Technology Equipment (ITE); Medical Electrical Equipment; Industrial, Commercial, and Medical Test Equipment; Professional Audio and Video Equipment; Electronic (Digital) Products; Industrial and Scientific Instruments; Cabled Distribution Systems and Energy Efficiency Lighting.

2- An ENERGY STAR Recognized Laboratory, for the LM80 Testing, a wide variety of Luminares and Computers.

3- A NIST Designated Phase-I and Phase-II CAB including: ACMA (Australian Communication and Media Authority), BSMI (Bureau of Standards, Metrology and Inspection of Taiwan), IDA (Infocomm Development Authority of Singapore), IC(Industry Canada), Korea (Ministry of Communications Radio Research Laboratory), NCC (Formerly DGT; Directorate General of Telecommunication of Chinese Taipei) OFTA (Office of the Telecommunications Authority of Hong Kong), Vietnam, VCCI - Voluntary Control Council for Interference of Japan and a designated EU CAB (Conformity Assessment Body) (Notified Body) for the EMC and R&TTE Directives.

4- A Product Certification Body accredited to **ISO Guide 65:1996** by **A2LA** to certify:

1- Unlicensed, Licensed radio frequency devices and Telephone Terminal Equipment for the FCC. Scope A1, A2, A3, A4, B1, B2, B3, B4 & C.
2. Radio Standards Specifications (RSS) in the Category I Equipment Standards List and All Broadcasting Technical Standards (BETS) in Category I Equipment Standards List for Industry Canada.
3. Radio Communication Equipment for Singapore.
4. Radio Equipment Specifications, GMDSS Marine Radio Equipment Specifications, and Fixed Network Equipment Specifications for Hong Kong.
5. Japan MIC Telecommunication Business Law (A1, A2) and Radio Law (B1, B2 and B3).
6. Audio/Video, Battery Charging Systems, Computers, Displays, Enterprise Servers, Imaging Equipment, Set-Top Boxes, Telephony, Televisions, Ceiling Fans, CFLs (Including GU24s),Decorative Light Strings, Integral LED Lamps, Luminaires, Residential Ventilating Fans.

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997, and Article 8 of the VCCI regulations on December 25, 1997. The test site also complies with the test methods and procedures set forth in CISPR 22:2008 §10.4 for measurements below 1 GHz and §10.6 for measurements above 1 GHz as well as ANSI C63.4-2009, ANSI C63.4-2009, TIA/EIA-603 & CISPR 24:2010.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: A-0027. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL Corp. is an American Association for Laboratory Accreditation (A2LA) accredited laboratory (Lab Code 3297-02). The current scope of accreditations can be found at

http://www.a2la.org/scopepdf/3297-02.pdf?CFID=1132286&CFTOKEN=e42a3240dac3f6ba-6DE17DCB-1851-9E57-477422F667031258&jsessionid=8430d44f1f47cf2996124343c704b367816b

2 EUT Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.4-2009 and FCC KDB 789033 D02 General UNII Test Procedures v01

The EUT was tested in a testing mode to represent worst-case results during the final qualification test.

The worst-case data rates are determined to be as follows for each mode based upon investigation by measuring the average power, peak power and PPSD across all data rates bandwidths, and modulations.

2.2 EUT Exercise Software

The test utility used version was 00.10.00-5was provided by Mimosa Networks., and was verified Cipher Chu to comply with the standard requirements being tested against.

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 Special Accessories

There were no special accessories were required, included, or intended for use with EUT during these tests.

2.5 Local Support Equipment

Manufacturers	Description	Models	Serial Number
Lenovo	Laptop	T530	PK-0XD9H

2.6 Interface Ports and Cabling

Cable Description	Length (M)	From	To
RF Cable	>1.0	PSA	Antenna

2.7 Power Supply and Line Filters

Manufacturer	Description	Model Number	Serial Number
Fortune Power	AC/DC Adaptor of POE	GRT 480125A	130669328

2.8 EUT Internal Configurations

Manufacturers	Descriptions	Models	Serial Numbers
Mimosa Networks	Main PCB Board	B5	1346101000017

3 Summary of Test Results

FCC Rules	Description of Test	Result
§15.407(f), §2.1091	RF Exposure	Calculation
§15.203	Antenna Requirement	Compliant
§15.207	AC Power Line Conducted Emissions	Compliant
§15.209, 15.407(b)	Spurious Radiated Emissions	Compliant
§15.407(a)	Emission Bandwidth	Compliant
§407(a)(1)	Peak Output Power Measurement	Compliant
§2.1051, §15.407(b)	Band Edges	Compliant
§15.407(a)(1)	Power Spectral Density	Compliant
§15.407(h)	Dynamic Frequency Selection	Compliant*

Note *: *Please refer to DFS report, Report number: R1402141-DFS.*

4 FCC §15.407(f) & §2.1091 - RF Exposure

4.1 Applicable Standard

According to FCC §15.407(f) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	* (100)	30
1.34-30	824/f	2.19/f	* ($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

4.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

4.3 MPE Results

5.3 GHz Band

Maximum peak output power at antenna input terminal (dBm):	4.29
Maximum peak output power at antenna input terminal (mW):	2.685
Prediction distance (cm):	20
Prediction frequency (MHz):	5260
Maximum Antenna Gain, typical (dBi):	25
Maximum Antenna Gain (numeric):	316.227
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.1689
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

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5.6 GHz Band

Maximum peak output power at antenna input terminal (dBm):	4.97
Maximum peak output power at antenna input terminal (mW):	3.141
Prediction distance (cm):	20
Prediction frequency (MHz):	5700
Maximum Antenna Gain, typical (dBi):	25
Maximum Antenna Gain (numeric):	316.227
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.1975
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

Beamforming

5.3 GHz Band

Maximum peak output power at antenna input terminal (dBm):	0.623
Maximum peak output power at antenna input terminal (mW):	1.1542
Prediction distance (cm):	20
Prediction frequency (MHz):	5295
Maximum Antenna Gain, typical (dBi):	25
Maximum Antenna Gain (numeric):	316.227
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.0726
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

5.6 GHz Band

Maximum peak output power at antenna input terminal (dBm):	1.43
Maximum peak output power at antenna input terminal (mW):	1.3899
Prediction distance (cm):	20
Prediction frequency (MHz):	5530
Maximum Antenna Gain, typical (dBi):	25
Maximum Antenna Gain (numeric):	316.227
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.0874
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

The device meets FCC MPE requirement for uncontrolled exposure environment at 20 cm distance.

5 FCC §15.203 - Antenna Requirements

5.1 Applicable Standard

According to FCC §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

And according to FCC §15.407 (a)(1) and (2), If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

And according to FCC §15.407 (a)(1) (iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

And according to FCC §15.407 (a)(3) , However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

5.2 Antenna List

P/NO	Antenna Gain (dBi)
Center Fed Reflector/Pencil Beam	25

Note: This product shall be professional installation. The client provided the installation instruction to meet the FCC §15.203 requirment.

6 FCC §15.207 - AC Power Line Conducted Emissions

6.1 Applicable Standards

As per FCC §15.207 Conducted limits:

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

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

**Decreases with the logarithm of the frequency.*

6.2 Test Setup

The measurement was performed at shield room, using the setup per ANSI C63.4-2009 measurement procedure. The specification used was FCC §15.207 limits.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The AC/DC power adapter of the EUT was connected with LISN-1 which provided 120 V / 60 Hz AC power.

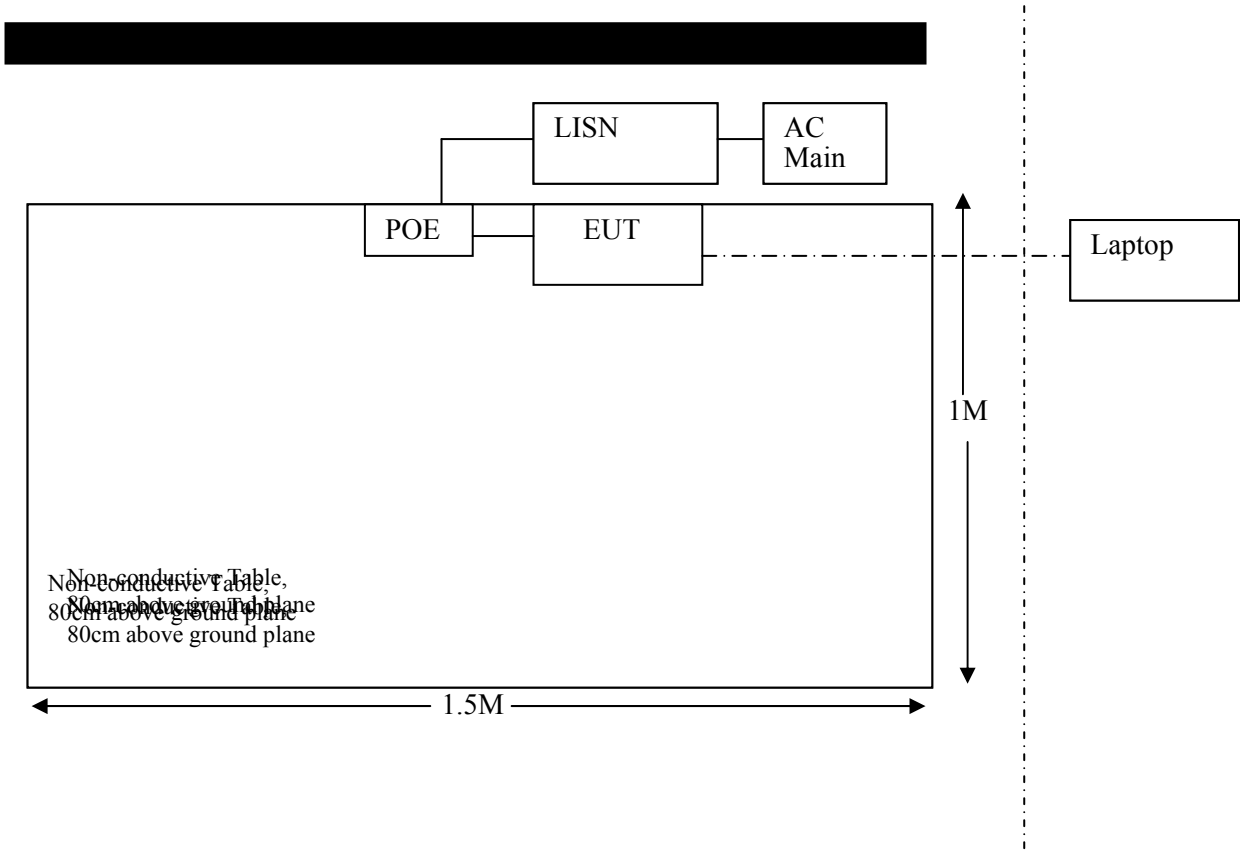
6.3 Test Procedure

During the conducted emissions test, the power cord of the EUT host system was connected to the mains outlet of the LISN-1.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the peak detection mode, quasi-peak and average. Quasi-Peak readings are distinguished with a “QP.” Average readings are distinguished with an “Ave”.

6.4 Test Setup Block Diagram



6.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Cable Loss (CL), the Attenuator Factor (Atten) to indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + CL + Atten

For example, a corrected amplitude of 46.2 dBuV = Indicated Reading (32.5 dBuV) + Cable Loss (3.7 dB) + Attenuator (10 dB)

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Corrected Amplitude - Limit

6.6 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2013-09-28	1 year
Solar Electronics	LISN	9252-R-24-BNC	511205	2013-10-25	1 year
TTE	Filter, High Pass	H985-150k-50-720N	M1149	2013-10-30	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

6.7 Test Environmental Conditions

Temperature:	21-23° C
Relative Humidity:	43-48 %
ATM Pressure:	101.1-101.3 kPa

The testing was performed by Cipher Chu on 2014-03-06 to 2014-03-14 at the 10m chamber 1.

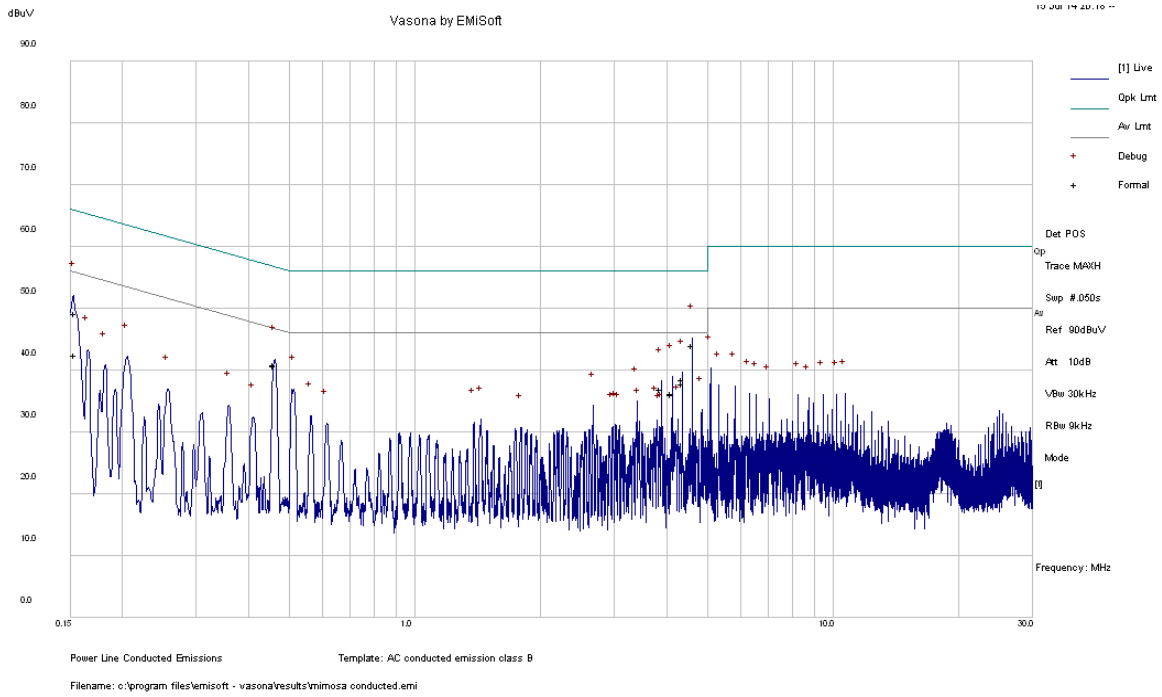
6.8 Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC standard's conducted emissions limits, with the margin reading of:

Connection: Connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Line/Neutral)**	**Range (MHz)**
-1.76	4.602941	Neutral	0.15-30

6.9 Conducted Emissions Test Plots and Data

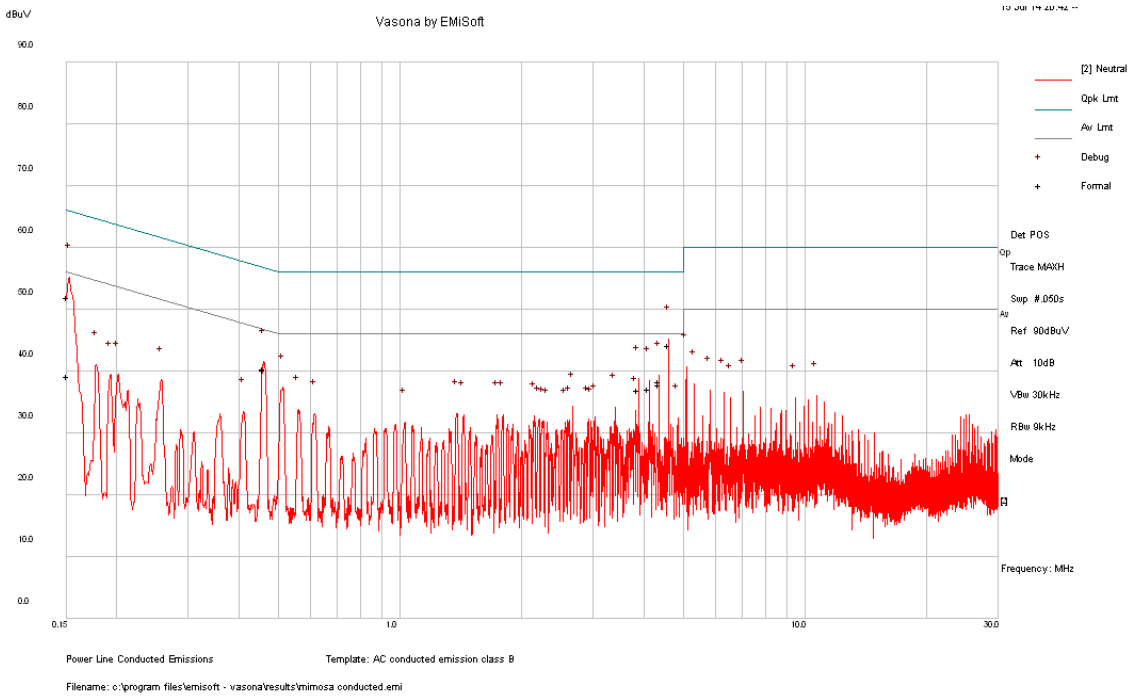
120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
4.603229	44.14	Line	56	-11.86	QP
0.153699	49.3	Line	65.8	-16.5	QP
0.462288	40.91	Line	56.65	-15.74	QP
4.361672	38.55	Line	56	-17.45	QP
4.120808	36.16	Line	56	-19.84	QP
3.876734	37.05	Line	56	-18.95	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
4.603229	44.1	Line	46	-1.9	Ave.
0.153699	42.47	Line	55.8	-13.33	Ave.
0.462288	40.86	Line	46.65	-5.79	Ave.
4.361672	37.79	Line	46	-8.21	Ave.
4.120808	36.27	Line	46	-9.73	Ave.
3.876734	37.03	Line	46	-8.97	Ave.

120 V, 60 Hz – Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.151341	51.94	Neutral	65.93	-13.98	QP
4.602941	44.27	Neutral	56	-11.73	QP
0.462237	40.51	Neutral	56.65	-16.15	QP
4.361102	38.41	Neutral	56	-17.59	QP
3.877033	37.04	Neutral	56	-18.96	QP
4.119182	37.22	Neutral	56	-18.78	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
0.151341	39.28	Neutral	55.93	-16.64	Ave.
4.602941	44.24	Neutral	46	-1.76	Ave.
0.462237	40.31	Neutral	46.65	-6.34	Ave.
4.361102	37.81	Neutral	46	-8.19	Ave.
3.877033	36.95	Neutral	46	-9.05	Ave.
4.119182	37.2	Neutral	46	-8.8	Ave.

7 FCC §15.209 & §15.407(b) - Spurious Radiated Emissions And Out of Band Emissions

7.1 Applicable Standard

According to FCC §15.407(b)

For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table

Frequency (MHz)	Field Strength (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

As Per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110 0.495 – 0.505 2.1735 – 2.1905 4.125 – 4.128 4.17725 – 4.17775 4.20725 – 4.20775 6.215 – 6.218 6.26775 – 6.26825 6.31175 – 6.31225 8.291 – 8.294 8.362 – 8.366 8.37625 – 8.38675 8.41425 – 8.41475 12.29 – 12.293 12.51975 – 12.52025 12.57675 – 12.57725 13.36 – 13.41	16.42 – 16.423 16.69475 – 16.69525 25.5 – 25.67 37.5 – 38.25 73 – 74.6 74.8 – 75.2 108 – 121.94 123 – 138 149.9 – 150.05 156.52475 – 156.52525 156.7 – 156.9 162.0125 –167.17 167.72 – 173.2 240 – 285 322 – 335.4 399.9 – 410 608 – 614	960 – 1240 1300 – 1427 1435 – 1626.5 1645.5 – 1646.5 1660 – 1710 1718.8 – 1722.2 2200 – 2300 2310 – 2390 2483.5 – 2500 2690 – 2900 3260 – 3267 3.332 – 3.339 3 3458 – 3 358 3.600 – 4.400	4. 5 – 5. 15 5. 35 – 5. 46 7.25 – 7.75 8.025 – 8.5 9.0 – 9.2 9.3 – 9.5 10.6 – 12.7 13.25 – 13.4 14.47 – 14.5 15.35 – 16.2 17.7 – 21.4 22.01 – 23.12 23.6 – 24.0 31.2 – 31.8 36.43 – 36.5 Above 38.6

7.2 Test Setup

The radiated emissions tests were performed in the 10-meter Chamber, using the setup in accordance with ANSI C63.4-2009. The specification used was the FCC 15 Subpart E limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

7.3 Test Procedure

The measurements are base on FCC KDB 789033 D02 General UNII Test Procedures v01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E Section H: Unwanted emissions measurement as well as ANSI C63.4: 2009 as described below:

For the radiated emissions test, the EUT host, and all support equipment power cords was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT is set 10 meter away from the testing antenna, which is varied from 1-4 meter, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

The spectrum analyzer or receiver is set as:

Below 1000 MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000 MHz:

(1) Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
(2) Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

7.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + AF + CL + Atten – Ga

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Corrected Amplitude - Limit

7.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4440A	MY44303352	2013-10-16	1 year
EMCO	Antenna, Horn	3115	9511-4627	2013-10-17	1 year
Mini-Circuits	Pre-amplifier	ZVA-183-S	570400946	2013-05-09	1 year
Rohde & Schwarz	Receiver, EMI Test	ESCI 1166.5950K03	100337	2013-03-28	1 year
Sunol Sciences	Antenna, Biconi-Log	JB3	A020106-2	2013-08-12	1 year
HP	Pre-amplifier	8447D	2944A06639	2013-06-09	1 year
Sunol Science Corp	System Controller	SC99V	122303-1	N/R	N/R

Statement of Traceability: BACL attests that all calibrations have been performed per the A2LA requirements, traceable to NIST.

7.6 Test Environmental Conditions

Temperature:	21-23 °C
Relative Humidity:	43-48 %
ATM Pressure:	101.1-101.3 kPa

The testing was performed by Cipher Chu on 2014-03-06 to 2014-03-14 at the 5m chamber 1.

7.7 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Title 47, Part 15E standard's radiated emissions limits, and had the worst margin of:

30-1000 MHz:

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode, Channel**
-1.83	125.00375	Vertical	20 MHz Bandwidth, Low

1–40 GHz:

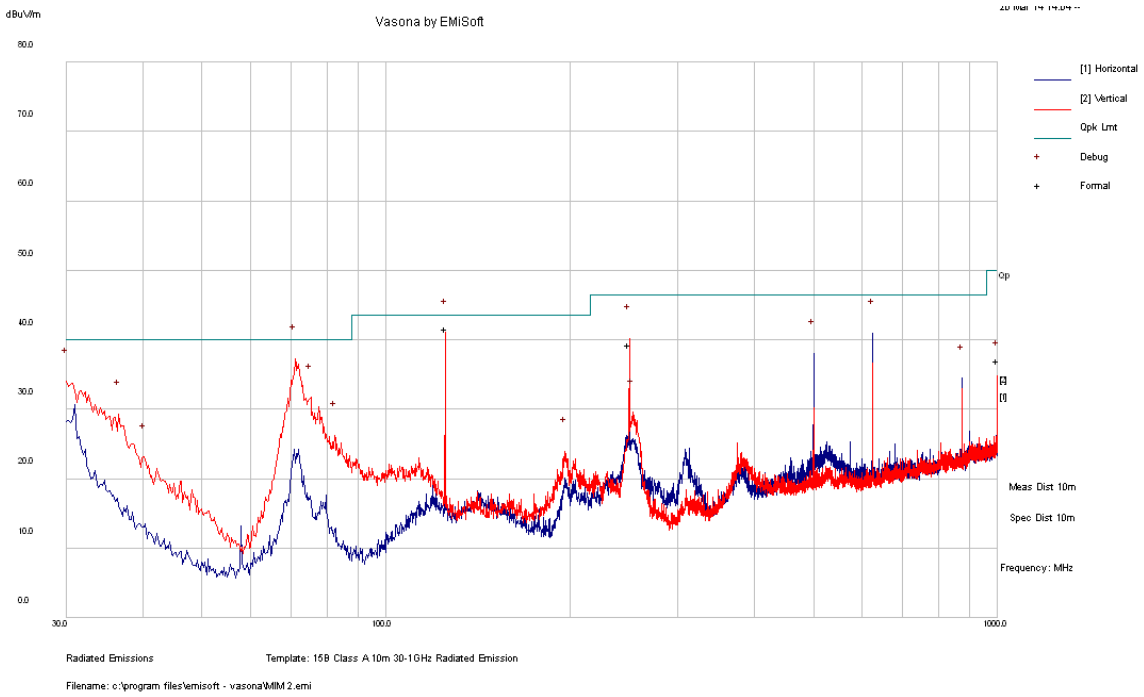
Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode, Channel**
-0.525	5350	Vertical	80 MHz Bandwidth, Low

Please refer to the following table and plots for specific test result details.

7.8 Radiated Emissions Test Data and Plots

1) 30 MHz–1 GHz, Measured at 3 meters, Quasi-Peak Measurements

(Note: for all the emissions from 30 MHz to 1 GHz, they all below -27 dBm EIRP limit.)



20 MHz Bandwidth, Low Channel

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
125.00375	41.67	99	V	146	43.5	-1.83
250.00025	39.28	100	V	-4	46	-6.72
1000	36.98	153	V	202	54	-17.02

Note: Only digital emissions present from 30MHz to 1GHz, therefore only the middle channel was tested.

2) 1–40 GHz, Measured at 3 meters

5.3 GHz Band

20 MHz Bandwidth

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5260 MHz											
5260	109.51	0	135	V	33.835	4.56	0	147.905	-	-	Peak/ Fund
5260	109.75	0	120	H	33.835	4.56	0	148.145	-	-	Peak/ Fund
5260	96.59	0	135	V	33.835	4.56	0	134.985	-	-	Ave/ Fund
5260	98.49	0	120	H	33.835	4.56	0	136.885	-	-	Ave/ Fund
10520	34.27	0	100	V	38.214	6.2	27.7	50.984	74	-23.016	Peak
10520	33.14	0	100	H	38.214	6.2	27.7	49.854	74	-24.146	Peak
10520	19.01	0	100	V	38.214	6.2	27.7	35.724	54	-18.276	Ave
10520	18.3	0	100	H	38.214	6.2	27.7	35.014	54	-18.986	Ave
15780	32.72	0	100	V	37.943	8.31	27.58	51.393	74	-22.607	Peak
15780	32.9	0	100	H	37.943	8.31	27.58	51.573	74	-22.427	Peak
15780	18.63	0	100	V	37.943	8.31	27.58	37.303	54	-16.697	Ave
15780	18.66	0	100	H	37.943	8.31	27.58	37.333	54	-16.667	Ave
21040	32.37	0	100	V	49.67	9.74	27.06	64.72	74	-9.28	Peak
21040	31.73	0	100	H	49.67	9.74	27.06	64.08	74	-9.92	Peak
21040	18.33	0	100	V	49.67	9.74	27.06	50.68	54	-3.32	Ave
21040	18.26	0	100	H	49.67	9.74	27.06	50.61	54	-3.39	Ave
Middle Channel 5295 MHz											
5295	109.53	0	135	V	33.835	4.56	0	147.925	-	-	Peak/ Fund
5295	109.64	0	120	H	33.835	4.56	0	148.035	-	-	Peak/ Fund
5295	97.52	0	135	V	33.835	4.56	0	135.915	-	-	Ave/ Fund
5295	98.17	0	120	H	33.835	4.56	0	136.565	-	-	Ave/ Fund
10590	32.82	0	100	V	38.214	6.2	27.7	49.534	74	-24.466	Peak
10590	32.84	0	100	H	38.214	6.2	27.7	49.554	74	-24.446	Peak
10590	18.32	0	100	V	38.214	6.2	27.7	35.034	54	-18.966	Ave
10590	18.22	0	100	H	38.214	6.2	27.7	34.934	54	-19.066	Ave
15885	33.3	0	100	V	37.943	8.31	27.58	51.973	74	-22.027	Peak
15885	33.23	0	100	H	37.943	8.31	27.58	51.903	74	-22.097	Peak
15885	19.03	0	100	V	37.943	8.31	27.58	37.703	54	-16.297	Ave
15885	19.13	0	100	H	37.943	8.31	27.58	37.803	54	-16.197	Ave
21180	32.94	0	100	V	49.67	9.74	27.06	65.29	74	-8.71	Peak
21180	33.09	0	100	H	49.67	9.74	27.06	65.44	74	-8.56	Peak
21180	18.89	0	100	V	49.67	9.74	27.06	51.24	54	-2.76	Ave
21180	18.92	0	100	H	49.67	9.74	27.06	51.27	54	-2.73	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5320 MHz											
5320	109.3	0	135	V	33.835	4.56	0	147.695	-	-	Peak/ Fund
5320	108.96	0	120	H	33.835	4.56	0	147.355	-	-	Peak/ Fund
5320	96.75	0	135	V	33.835	4.56	0	135.145	-	-	Ave/ Fund
5320	97.59	0	120	H	33.835	4.56	0	135.985	-	-	Ave/ Fund
10640	32.81	0	100	V	38.214	6.2	27.7	49.524	74	-24.476	Peak
10640	31.91	0	100	H	38.214	6.2	27.7	48.624	74	-25.376	Peak
10640	18.15	0	100	V	38.214	6.2	27.7	34.864	54	-19.136	Ave
10640	18.12	0	100	H	38.214	6.2	27.7	34.834	54	-19.166	Ave
15960	33.04	0	100	V	37.943	8.31	27.58	51.713	74	-22.287	Peak
15960	33.09	0	100	H	37.943	8.31	27.58	51.763	74	-22.237	Peak
15960	18.68	0	100	V	37.943	8.31	27.58	37.353	54	-16.647	Ave
15960	18.72	0	100	H	37.943	8.31	27.58	37.393	54	-16.607	Ave
21280	32.29	0	100	V	49.67	9.74	27.06	64.64	74	-9.36	Peak
21280	32.91	0	100	H	49.67	9.74	27.06	65.26	74	-8.74	Peak
21280	18.19	0	100	V	49.67	9.74	27.06	50.54	54	-3.46	Ave
21280	18.22	0	100	H	49.67	9.74	27.06	50.57	54	-3.43	Ave

40 MHz Bandwidth

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5270 MHz											
5270	106.05	0	135	V	33.835	4.56	0	144.445	-	-	Peak/ Fund
5270	106.08	0	120	H	33.835	4.56	0	144.475	-	-	Peak/ Fund
5270	94.12	0	135	V	33.835	4.56	0	132.515	-	-	Ave/ Fund
5270	95.09	0	120	H	33.835	4.56	0	133.485	-	-	Ave/ Fund
10540	32.85	0	100	V	38.214	6.2	27.7	49.564	74	-24.436	Peak
10540	32.47	0	100	H	38.214	6.2	27.7	49.184	74	-24.816	Peak
10540	18.73	0	100	V	38.214	6.2	27.7	35.444	54	-18.556	Ave
10540	18.41	0	100	H	38.214	6.2	27.7	35.124	54	-18.876	Ave
15810	33.96	0	100	V	37.943	8.31	27.58	52.633	74	-21.367	Peak
15810	32.72	0	100	H	37.943	8.31	27.58	51.393	74	-22.607	Peak
15810	18.96	0	100	V	37.943	8.31	27.58	37.633	54	-16.367	Ave
15810	18.87	0	100	H	37.943	8.31	27.58	37.543	54	-16.457	Ave
21080	32.54	0	100	V	49.67	9.74	27.06	64.89	74	-9.11	Peak
21080	33.56	0	100	H	49.67	9.74	27.06	65.91	74	-8.09	Peak
21080	18.38	0	100	V	49.67	9.74	27.06	50.73	54	-3.27	Ave
21080	18.31	0	100	H	49.67	9.74	27.06	50.66	54	-3.34	Ave
Middle Channel 5290 MHz											
5290	106.05	0	135	V	33.835	4.56	0	144.445	-	-	Peak/ Fund
5290	106.37	0	120	H	33.835	4.56	0	144.765	-	-	Peak/ Fund
5290	94.02	0	135	V	33.835	4.56	0	132.415	-	-	Ave/ Fund
5290	95.13	0	120	H	33.835	4.56	0	133.525	-	-	Ave/ Fund
10580	33.98	0	100	V	38.214	6.2	27.7	50.694	74	-23.306	Peak
10580	32.52	0	100	H	38.214	6.2	27.7	49.234	74	-24.766	Peak
10580	17.66	0	100	V	38.214	6.2	27.7	34.374	54	-19.626	Ave
10580	17.88	0	100	H	38.214	6.2	27.7	34.594	54	-19.406	Ave
15870	32.46	0	100	V	37.943	8.31	27.58	51.133	74	-22.867	Peak
15870	32.81	0	100	H	37.943	8.31	27.58	51.483	74	-22.517	Peak
15870	18.37	0	100	V	37.943	8.31	27.58	37.043	54	-16.957	Ave
15870	18.72	0	100	H	37.943	8.31	27.58	37.393	54	-16.607	Ave
21160	33.39	0	100	V	49.67	9.74	27.06	65.74	74	-8.26	Peak
21160	32.91	0	100	H	49.67	9.74	27.06	65.26	74	-8.74	Peak
21160	18.52	0	100	V	49.67	9.74	27.06	50.87	54	-3.13	Ave
21160	18.55	0	100	H	49.67	9.74	27.06	50.9	54	-3.1	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5310 MHz											
5310	105.32	0	135	V	33.835	4.56	0	143.715	-	-	Peak/ Fund
5310	106.21	0	120	H	33.835	4.56	0	144.605	-	-	Peak/ Fund
5310	93.86	0	135	V	33.835	4.56	0	132.255	-	-	Ave/ Fund
5310	95.14	0	120	H	33.835	4.56	0	133.535	-	-	Ave/ Fund
10620	32.82	0	100	V	38.214	6.2	27.7	49.534	74	-24.466	Peak
10620	32.21	0	100	H	38.214	6.2	27.7	48.924	74	-25.076	Peak
10620	17.71	0	100	V	38.214	6.2	27.7	34.424	54	-19.576	Ave
10620	17.65	0	100	H	38.214	6.2	27.7	34.364	54	-19.636	Ave
15930	32.86	0	100	V	37.943	8.31	27.58	51.533	74	-22.467	Peak
15930	33.49	0	100	H	37.943	8.31	27.58	52.163	74	-21.837	Peak
15930	18.87	0	100	V	37.943	8.31	27.58	37.543	54	-16.457	Ave
15930	18.69	0	100	H	37.943	8.31	27.58	37.363	54	-16.637	Ave
21240	32.53	0	100	V	49.67	9.74	27.06	64.88	74	-9.12	Peak
21240	32.25	0	100	H	49.67	9.74	27.06	64.6	74	-9.4	Peak
21240	18.35	0	100	V	49.67	9.74	27.06	50.7	54	-3.3	Ave
21240	18.27	0	100	H	49.67	9.74	27.06	50.62	54	-3.38	Ave

80 MHz Bandwidth

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Channel 5290 MHz											
5290	103.37	0	135	V	33.835	4.56	0	141.765	-	-	Peak/ Fund
5290	104.68	0	120	H	33.835	4.56	0	143.075	-	-	Peak/ Fund
5290	89.65	0	135	V	33.835	4.56	0	128.045	-	-	Ave/ Fund
5290	91.56	0	120	H	33.835	4.56	0	129.955	-	-	Ave/ Fund
10580	32.49	0	100	V	38.214	6.2	27.7	49.204	74	-24.796	Peak
10580	32.15	0	100	H	38.214	6.2	27.7	48.864	74	-25.136	Peak
10580	18.55	0	100	V	38.214	6.2	27.7	35.264	54	-18.736	Ave
10580	18.47	0	100	H	38.214	6.2	27.7	35.184	54	-18.816	Ave
15870	33.92	0	100	V	37.943	8.31	27.58	52.593	74	-21.407	Peak
15870	32.99	0	100	H	37.943	8.31	27.58	51.663	74	-22.337	Peak
15870	19.19	0	100	V	37.943	8.31	27.58	37.863	54	-16.137	Ave
15870	19.21	0	100	H	37.943	8.31	27.58	37.883	54	-16.117	Ave
21160	32.93	0	100	V	49.67	9.74	27.06	65.28	74	-8.72	Peak
21160	32.57	0	100	H	49.67	9.74	27.06	64.92	74	-9.08	Peak
21160	19.02	0	100	V	49.67	9.74	27.06	51.37	54	-2.63	Ave
21160	18.89	0	100	H	49.67	9.74	27.06	51.24	54	-2.76	Ave

5.6 GHz Band

20 MHz Bandwidth

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5500 MHz											
5500	109.81	0	135	V	33.977	4.59	0	148.377	-	-	Peak/ Fund
5500	108.02	0	120	H	33.977	4.59	0	146.587	-	-	Peak/ Fund
5500	97.36	0	135	V	33.977	4.59	0	135.927	-	-	Ave/ Fund
5500	96.66	0	120	H	33.977	4.59	0	135.227	-	-	Ave/ Fund
11000	32.17	0	100	V	38.827	6.2	27.7	49.497	74	-24.503	Peak
11000	32.37	0	100	H	38.827	6.2	27.7	49.697	74	-24.303	Peak
11000	17.79	0	100	V	38.827	6.2	27.7	35.117	54	-18.883	Ave
11000	17.96	0	100	H	38.827	6.2	27.7	35.287	54	-18.713	Ave
16500	32.19	0	100	V	43.239	8.31	27.58	56.159	74	-17.841	Peak
16500	32.26	0	100	H	43.239	8.31	27.58	56.229	74	-17.771	Peak
16500	18.32	0	100	V	43.239	8.31	27.58	42.289	54	-11.711	Ave
16500	18.13	0	100	H	43.239	8.31	27.58	42.099	54	-11.901	Ave
22000	32.11	0	100	V	49.854	9.74	27.06	64.644	74	-9.356	Peak
22000	33.12	0	100	H	49.854	9.74	27.06	65.654	74	-8.346	Peak
22000	17.93	0	100	V	49.854	9.74	27.06	50.464	54	-3.536	Ave
22000	18.18	0	100	H	49.854	9.74	27.06	50.714	54	-3.286	Ave
Middle Channel 5590 MHz											
5590	108.92	0	135	V	33.977	4.59	0	147.487	-	-	Peak/ Fund
5590	106.48	0	120	H	33.977	4.59	0	145.047	-	-	Peak/ Fund
5590	96.48	0	135	V	33.977	4.59	0	135.047	-	-	Ave/ Fund
5590	95.09	0	120	H	33.977	4.59	0	133.657	-	-	Ave/ Fund
11180	31.77	0	100	V	38.827	6.2	27.7	49.097	74	-24.903	Peak
11180	32.08	0	100	H	38.827	6.2	27.7	49.407	74	-24.593	Peak
11180	17.39	0	100	V	38.827	6.2	27.7	34.717	54	-19.283	Ave
11180	17.59	0	100	H	38.827	6.2	27.7	34.917	54	-19.083	Ave
16770	32.84	0	100	V	43.239	8.31	27.58	56.809	74	-17.191	Peak
16770	32.18	0	100	H	43.239	8.31	27.58	56.149	74	-17.851	Peak
16770	18.25	0	100	V	43.239	8.31	27.58	42.219	54	-11.781	Ave
16770	18.28	0	100	H	43.239	8.31	27.58	42.249	54	-11.751	Ave
22360	31.91	0	100	V	49.854	9.74	27.06	64.444	74	-9.556	Peak
22360	31.38	0	100	H	49.854	9.74	27.06	63.914	74	-10.086	Peak
22360	17.74	0	100	V	49.854	9.74	27.06	50.274	54	-3.726	Ave
22360	17.62	0	100	H	49.854	9.74	27.06	50.154	54	-3.846	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5700 MHz											
5700	109.04	0	135	V	33.977	4.59	0	147.607	-	-	Peak/ Fund
5700	108.73	0	120	H	33.977	4.59	0	147.297	-	-	Peak/ Fund
5700	96.5	0	135	V	33.977	4.59	0	135.067	-	-	Ave/ Fund
5700	96.76	0	120	H	33.977	4.59	0	135.327	-	-	Ave/ Fund
11400	31.72	0	100	V	38.827	6.2	27.7	49.047	74	-24.953	Peak
11400	31.43	0	100	H	38.827	6.2	27.7	48.757	74	-25.243	Peak
11400	17.31	0	100	V	38.827	6.2	27.7	34.637	54	-19.363	Ave
11400	17.41	0	100	H	38.827	6.2	27.7	34.737	54	-19.263	Ave
17100	31.79	0	100	V	43.239	8.31	27.58	55.759	74	-18.241	Peak
17100	32.52	0	100	H	43.239	8.31	27.58	56.489	74	-17.511	Peak
17100	17.98	0	100	V	43.239	8.31	27.58	41.949	54	-12.051	Ave
17100	17.91	0	100	H	43.239	8.31	27.58	41.879	54	-12.121	Ave
22800	32.94	0	100	V	49.854	9.74	27.06	65.474	74	-8.526	Peak
22800	31.35	0	100	H	49.854	9.74	27.06	63.884	74	-10.116	Peak
22800	17.75	0	100	V	49.854	9.74	27.06	50.284	54	-3.716	Ave
22800	17.73	0	100	H	49.854	9.74	27.06	50.264	54	-3.736	Ave

40 MHz Bandwidth

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5510 MHz											
5510	106.76	0	135	V	33.977	4.59	0	145.327	-	-	Peak/ Fund
5510	104.85	0	120	H	33.977	4.59	0	143.417	-	-	Peak/ Fund
5510	94.45	0	135	V	33.977	4.59	0	133.017	-	-	Ave/ Fund
5510	93.35	0	120	H	33.977	4.59	0	131.917	-	-	Ave/ Fund
11020	31.27	0	100	V	38.827	6.2	27.7	48.597	74	-25.403	Peak
11020	31.68	0	100	H	38.827	6.2	27.7	49.007	74	-24.993	Peak
11020	18	0	100	V	38.827	6.2	27.7	35.327	54	-18.673	Ave
11020	18.13	0	100	H	38.827	6.2	27.7	35.457	54	-18.543	Ave
16530	32.42	0	100	V	43.239	8.31	27.58	56.389	74	-17.611	Peak
16530	31.75	0	100	H	43.239	8.31	27.58	55.719	74	-18.281	Peak
16530	18.93	0	100	V	43.239	8.31	27.58	42.899	54	-11.101	Ave
16530	18.88	0	100	H	43.239	8.31	27.58	42.849	54	-11.151	Ave
22040	31.75	0	100	V	49.854	9.74	27.06	64.284	74	-9.716	Peak
22040	32.18	0	100	H	49.854	9.74	27.06	64.714	74	-9.286	Peak
22040	18.64	0	100	V	49.854	9.74	27.06	51.174	54	-2.826	Ave
22040	18.62	0	100	H	49.854	9.74	27.06	51.154	54	-2.846	Ave
Middle Channel 5555 MHz											
5555	106.22	0	135	V	33.977	4.59	0	144.787	-	-	Peak/ Fund
5555	104.8	0	120	H	33.977	4.59	0	143.367	-	-	Peak/ Fund
5555	94.05	0	135	V	33.977	4.59	0	132.617	-	-	Ave/ Fund
5555	93.33	0	120	H	33.977	4.59	0	131.897	-	-	Ave/ Fund
11110	32.07	0	100	V	38.827	6.2	27.7	49.397	74	-24.603	Peak
11110	32.54	0	100	H	38.827	6.2	27.7	49.867	74	-24.133	Peak
11110	18.41	0	100	V	38.827	6.2	27.7	35.737	54	-18.263	Ave
11110	18.67	0	100	H	38.827	6.2	27.7	35.997	54	-18.003	Ave
16665	32.35	0	100	V	43.239	8.31	27.58	56.319	74	-17.681	Peak
16665	31.86	0	100	H	43.239	8.31	27.58	55.829	74	-18.171	Peak
16665	18.7	0	100	V	43.239	8.31	27.58	42.669	54	-11.331	Ave
16665	18.15	0	100	H	43.239	8.31	27.58	42.119	54	-11.881	Ave
22220	32.22	0	100	V	49.854	9.74	27.06	64.754	74	-9.246	Peak
22220	32.57	0	100	H	49.854	9.74	27.06	65.104	74	-8.896	Peak
22220	18.36	0	100	V	49.854	9.74	27.06	50.894	54	-3.106	Ave
22220	18.39	0	100	H	49.854	9.74	27.06	50.924	54	-3.076	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5690 MHz											
5690	105.56	0	135	V	33.977	4.59	0	144.127	-	-	Peak/ Fund
5690	104.95	0	120	H	33.977	4.59	0	143.517	-	-	Peak/ Fund
5690	93.82	0	135	V	33.977	4.59	0	132.387	-	-	Ave/ Fund
5690	93.52	0	120	H	33.977	4.59	0	132.087	-	-	Ave/ Fund
11380	33.23	0	100	V	38.827	6.2	27.7	50.557	74	-23.443	Peak
11380	31.82	0	100	H	38.827	6.2	27.7	49.147	74	-24.853	Peak
11380	17.67	0	100	V	38.827	6.2	27.7	34.997	54	-19.003	Ave
11380	17.8	0	100	H	38.827	6.2	27.7	35.127	54	-18.873	Ave
17070	32.51	0	100	V	43.239	8.31	27.58	56.479	74	-17.521	Peak
17070	31.92	0	100	H	43.239	8.31	27.58	55.889	74	-18.111	Peak
17070	17.99	0	100	V	43.239	8.31	27.58	41.959	54	-12.041	Ave
17070	17.83	0	100	H	43.239	8.31	27.58	41.799	54	-12.201	Ave
22760	31.74	0	100	V	49.854	9.74	27.06	64.274	74	-9.726	Peak
22760	32.19	0	100	H	49.854	9.74	27.06	64.724	74	-9.276	Peak
22760	17.36	0	100	V	49.854	9.74	27.06	49.894	54	-4.106	Ave
22760	17.71	0	100	H	49.854	9.74	27.06	50.244	54	-3.756	Ave

80 MHz Bandwidth

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5530 MHz											
5530	103.82	0	135	V	33.977	4.59	0	142.387	-	-	Peak/ Fund
5530	102.67	0	120	H	33.977	4.59	0	141.237	-	-	Peak/ Fund
5530	89.63	0	135	V	33.977	4.59	0	128.197	-	-	Ave/ Fund
5530	89.6	0	120	H	33.977	4.59	0	128.167	-	-	Ave/ Fund
11060	32.54	0	100	V	38.827	6.2	27.7	49.867	74	-24.133	Peak
11060	31.92	0	100	H	38.827	6.2	27.7	49.247	74	-24.753	Peak
11060	18.39	0	100	V	38.827	6.2	27.7	35.717	54	-18.283	Ave
11060	18.43	0	100	H	38.827	6.2	27.7	35.757	54	-18.243	Ave
16590	32.66	0	100	V	43.239	8.31	27.58	56.629	74	-17.371	Peak
16590	31.76	0	100	H	43.239	8.31	27.58	55.729	74	-18.271	Peak
16590	18.68	0	100	V	43.239	8.31	27.58	42.649	54	-11.351	Ave
16590	18.51	0	100	H	43.239	8.31	27.58	42.479	54	-11.521	Ave
22120	32.53	0	100	V	49.854	9.74	27.06	65.064	74	-8.936	Peak
22120	32.32	0	100	H	49.854	9.74	27.06	64.854	74	-9.146	Peak
22120	18.77	0	100	V	49.854	9.74	27.06	51.304	54	-2.696	Ave
22120	18.68	0	100	H	49.854	9.74	27.06	51.214	54	-2.786	Ave
Middle Channel 5545 MHz											
5545	104.58	0	135	V	33.977	4.59	0	143.147	-	-	Peak/ Fund
5545	103.09	0	120	H	33.977	4.59	0	141.657	-	-	Peak/ Fund
5545	88.94	0	135	V	33.977	4.59	0	127.507	-	-	Ave/ Fund
5545	89.37	0	120	H	33.977	4.59	0	127.937	-	-	Ave/ Fund
11090	32.38	0	100	V	38.827	6.2	27.7	49.707	74	-24.293	Peak
11090	32.68	0	100	H	38.827	6.2	27.7	50.007	74	-23.993	Peak
11090	18.16	0	100	V	38.827	6.2	27.7	35.487	54	-18.513	Ave
11090	17.79	0	100	H	38.827	6.2	27.7	35.117	54	-18.883	Ave
16635	32.91	0	100	V	43.239	8.31	27.58	56.879	74	-17.121	Peak
16635	32.26	0	100	H	43.239	8.31	27.58	56.229	74	-17.771	Peak
16635	18.83	0	100	V	43.239	8.31	27.58	42.799	54	-11.201	Ave
16635	18.65	0	100	H	43.239	8.31	27.58	42.619	54	-11.381	Ave
22180	33.02	0	100	V	49.854	9.74	27.06	65.554	74	-8.446	Peak
22180	31.98	0	100	H	49.854	9.74	27.06	64.514	74	-9.486	Peak
22180	18.96	0	100	V	49.854	9.74	27.06	51.494	54	-2.506	Ave
22180	18.67	0	100	H	49.854	9.74	27.06	51.204	54	-2.796	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5560 MHz											
5560	104.34	0	135	V	33.977	4.59	0	142.907	-	-	Peak/ Fund
5560	103.29	0	120	H	33.977	4.59	0	141.857	-	-	Peak/ Fund
5560	89.84	0	135	V	33.977	4.59	0	128.407	-	-	Ave/ Fund
5560	89.38	0	120	H	33.977	4.59	0	127.947	-	-	Ave/ Fund
11120	32.02	0	100	V	38.827	6.2	27.7	49.347	74	-24.653	Peak
11120	31.52	0	100	H	38.827	6.2	27.7	48.847	74	-25.153	Peak
11120	18.52	0	100	V	38.827	6.2	27.7	35.847	54	-18.153	Ave
11120	19.16	0	100	H	38.827	6.2	27.7	36.487	54	-17.513	Ave
16680	32.45	0	100	V	43.239	8.31	27.58	56.419	74	-17.581	Peak
16680	32.44	0	100	H	43.239	8.31	27.58	56.409	74	-17.591	Peak
16680	18.63	0	100	V	43.239	8.31	27.58	42.599	54	-11.401	Ave
16680	18.65	0	100	H	43.239	8.31	27.58	42.619	54	-11.381	Ave
22240	31.71	0	100	V	49.854	9.74	27.06	64.244	74	-9.756	Peak
22240	32.64	0	100	H	49.854	9.74	27.06	65.174	74	-8.826	Peak
22240	18.74	0	100	V	49.854	9.74	27.06	51.274	54	-2.726	Ave
22240	18.67	0	100	H	49.854	9.74	27.06	51.204	54	-2.796	Ave

3) Restricted Band, Measured at 3 meters

5.3 GHz Band

20 MHz Bandwidth

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5260 MHz											
4500	26.21	0	135	V	33.835	4.56	0	64.605	74	-9.395	Peak
4500	24.07	0	120	H	33.835	4.56	0	62.465	74	-11.535	Peak
4500	12.62	0	135	V	33.835	4.56	0	51.015	54	-2.985	Ave
4500	10.55	0	120	H	33.835	4.56	0	48.945	54	-5.055	Ave
High Channel 5320 MHz											
5350	31.66	0	135	V	33.835	4.56	0	70.055	74	-3.945	Peak
5350	29.73	0	120	H	33.835	4.56	0	68.125	74	-5.875	Peak
5350	14.58	0	135	V	33.835	4.56	0	52.975	54	-1.025	Ave
5350	14.09	0	120	H	33.835	4.56	0	52.485	54	-1.515	Ave

40 MHz Bandwidth

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5270 MHz											
4500	26.3	0	135	V	33.835	4.56	0	64.695	74	-9.305	Peak
4500	23.66	0	120	H	33.835	4.56	0	62.055	74	-11.945	Peak
4500	12.38	0	135	V	33.835	4.56	0	50.775	54	-3.225	Ave
4500	11.7	0	120	H	33.835	4.56	0	50.095	54	-3.905	Ave
High Channel 5310 MHz											
5350	31.71	0	135	V	33.835	4.56	0	70.105	74	-3.895	Peak
5350	31.35	0	120	H	33.835	4.56	0	69.745	74	-4.255	Peak
5350	14.94	0	135	V	33.835	4.56	0	53.335	54	-0.665	Ave
5350	13.73	0	120	H	33.835	4.56	0	52.125	54	-1.875	Ave

80 MHz Bandwidth

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Channel 5290 MHz											
4500	25.95	0	135	V	33.835	4.56	0	64.345	74	-9.655	Peak
4500	24.42	0	120	H	33.835	4.56	0	62.815	74	-11.185	Peak
4500	12.09	0	135	V	33.835	4.56	0	50.485	54	-3.515	Ave
4500	11.18	0	120	H	33.835	4.56	0	49.575	54	-4.425	Ave
5350	31.12	0	135	V	33.835	4.56	0	69.515	74	-4.485	Peak
5350	32.15	0	120	H	33.835	4.56	0	70.545	74	-3.455	Peak
5350	15.08	0	135	V	33.835	4.56	0	53.475	54	-0.525	Ave
5350	14.81	0	120	H	33.835	4.56	0	53.205	54	-0.795	Ave

5.6 GHz Band

20 MHz Bandwidth

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5745 MHz											
5350	24.74	0	135	V	33.977	4.59	0	63.307	74	-10.693	Peak
5350	24.16	0	120	H	33.977	4.59	0	62.727	74	-11.273	Peak
5350	10.48	0	135	V	33.977	4.59	0	49.047	54	-4.953	Ave
5350	10.52	0	120	H	33.977	4.59	0	49.087	54	-4.913	Ave

40 MHz Bandwidth

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5745 MHz											
5350	24.19	0	135	V	33.977	4.59	0	62.757	74	-11.243	Peak
5350	24.44	0	120	H	33.977	4.59	0	63.007	74	-10.993	Peak
5350	11.15	0	135	V	33.977	4.59	0	49.717	54	-4.283	Ave
5350	11.36	0	120	H	33.977	4.59	0	49.927	54	-4.073	Ave

80 MHz Bandwidth

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5745 MHz											
5350	24.51	0	135	V	33.977	4.59	0	63.077	74	-10.923	Peak
5350	23.64	0	120	H	33.977	4.59	0	62.207	74	-11.793	Peak
5350	10.71	0	135	V	33.977	4.59	0	49.277	54	-4.723	Ave
5350	10.87	0	120	H	33.977	4.59	0	49.437	54	-4.563	Ave

8 FCC §15.407(a) - Emission Bandwidth

8.1 Applicable Standard

FCC §15.407(a)

8.2 Measurement Procedure

The measurements are base on FCC KDB 789033 D02 General UNII Test Procedures v01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section C: Emission bandwidth and section D: 99 Percent Occupied Bandwidth

8.3 Test Equipment List and Details

Manufacturers	Description	Models	Serial Numbers	Calibration Dates	Calibration Interval
Agilent	Spectrum Analyzer	E4440A	US42221851	2013-02-28	1 year
EMCO	Antenna, Horn	3115	9511-4627	2013-10-17	1 year
Mini-Circuits	Pre-amplifier	ZVA-183-S	570400946	2013-05-09	1 year
Sunol Science Corp	System Controller	SC99V	122303-1	N/R	N/R

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.*

8.4 Test Environmental Conditions

Temperature:	21-23° C
Relative Humidity:	43-48 %
ATM Pressure:	101.1-101.3 kPa

The testing was performed by Cipher Chu on 2014-03-06 to 2014-03-14 at the 10m chamber 1.

8.5 Test Results

5.3 GHz Band

TX Chain	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
20 MHz Bandwidth				
C1	Low	5260	18.4462	25.114
	Middle	5295	18.425	25.215
	High	5320	18.4365	25.249
C2	Low	5260	18.446	25.622
	Middle	5295	18.436	25.158
	High	5320	18.4494	25.397
C3	Low	5260	19.4803	26.502
	Middle	5295	19.4443	26.379
	High	5320	19.464	26.596
C4	Low	5260	18.1269	24.293
	Middle	5295	18.0799	23.999
	High	5320	18.07	23.988
40 MHz Bandwidth				
C1	Low	5270	36.3897	42.635
	Middle	5290	36.3539	42.345
	High	5310	36.3739	42.518
C2	Low	5270	36.3364	42.368
	Middle	5290	36.2855	42.362
	High	5310	36.302	42.295
C3	Low	5270	37.0484	44.455
	Middle	5290	36.9308	44.272
	High	5310	36.9734	44.069
C4	Low	5270	36.7327	43.348
	Middle	5290	36.6942	43.288
	High	5310	36.6622	43.322
80 MHz Bandwidth				
C1	/	5290	75.4534	83.114
C2	/	5290	75.1712	80.272
C3	/	5290	75.5835	82.792
C4	/	5290	75.5465	82.222

5.6 GHz Band

TX Chain	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
20 MHz Bandwidth				
C1	Low	5500	18.4717	25.338
	Middle	5590	18.5296	25.284
	High	5700	18.4934	25.627
C2	Low	5500	18.4139	25.376
	Middle	5590	18.4947	25.175
	High	5700	18.388	25.044
C3	Low	5500	19.4423	26.662
	Middle	5590	19.4873	26.704
	High	5700	19.4036	26.27
C4	Low	5500	18.0885	24.025
	Middle	5590	18.1362	24.313
	High	5700	18.1077	23.817
40 MHz Bandwidth				
C1	Low	5510	36.3836	42.58
	Middle	5555	36.4412	42.549
	High	5690	36.4115	42.425
C2	Low	5510	36.3215	42.479
	Middle	5555	36.3595	42.607
	High	5690	36.3165	42.686
C3	Low	5510	37.0035	44.832
	Middle	5555	37.0204	44.629
	High	5690	36.9637	44.429
C4	Low	5510	36.6994	43.465
	Middle	5555	36.7412	43.238
	High	5690	36.7354	43.478
80 MHz Bandwidth				
C1	Low	5530	75.4654	82.608
	Middle	5545	75.427	82.668
	High	5560	75.427	82.863
C2	Low	5530	75.2156	80.248
	Middle	5545	75.1787	80.102
	High	5560	75.1311	80.243
C3	Low	5530	75.6738	83.415
	Middle	5545	75.6005	82.786
	High	5560	75.6079	83.153
C4	Low	5530	75.5222	82.205
	Middle	5545	75.597	81.562
	High	5560	75.5363	82.072

Beamforming

5.3 GHz Band

TX Chain	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
20 MHz Bandwidth				
H	Low	5260	18.0658	24.482
	Middle	5295	17.9792	22.792
	High	5320	17.9586	23.416
V	Low	5260	18.1286	24.457
	Middle	5295	17.9713	22.786
	High	5320	18.0031	24.472
40 MHz Bandwidth				
H	Low	5270	36.4444	41.424
	Middle	5290	36.2649	42.047
	High	5310	36.2895	41.448
V	Low	5270	36.4156	41.954
	Middle	5290	36.303	44.71
	High	5310	36.382	41.983
80 MHz Bandwidth				
H	/	5290	75.0588	80.928
V	/	5290	75.0411	79.924

5.6 GHz Band

TX Chain	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
20 MHz Bandwidth				
H	Low	5500	18.0709	24.439
	Middle	5590	18.0089	23.886
	High	5700	17.9822	22.657
V	Low	5500	17.9479	23.46
	Middle	5590	18.0229	23.902
	High	5700	17.9993	23.082
40 MHz Bandwidth				
H	Low	5510	36.3331	41.17
	Middle	5555	36.221	41.197
	High	5690	36.3382	42.213
V	Low	5510	36.2696	40.958
	Middle	5555	36.2943	41.003
	High	5690	36.3544	42.265
80 MHz Bandwidth				
H	5530	75.3232	81.012	5530
	5545	75.3245	81.734	5545
	5560	75.26	82.15	5560
V	5530	75.3565	80.736	5530
	5545	75.3923	80.627	5545
	5560	75.1126	79.919	5560

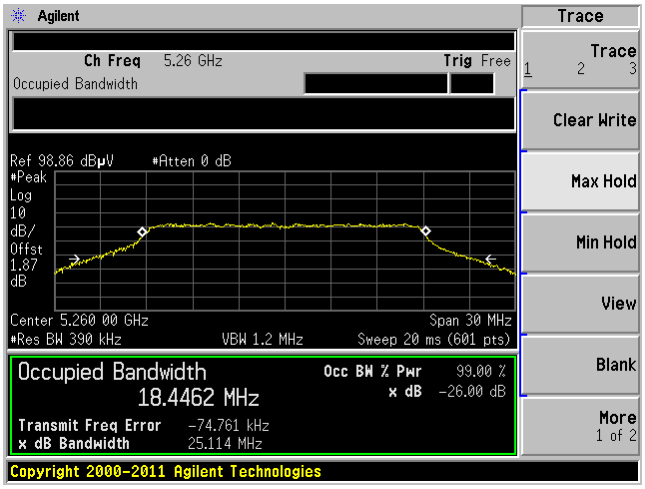
Note: (1) Chain1 and Chain 4 is Vertical, and Chain 2 and Chain 3 is Horizontal
(2) C1, C2, C3 and C4 stands for TX Chain1, Chain2, Chain3 and Chain4.

Please refer to the following plots for detailed test results

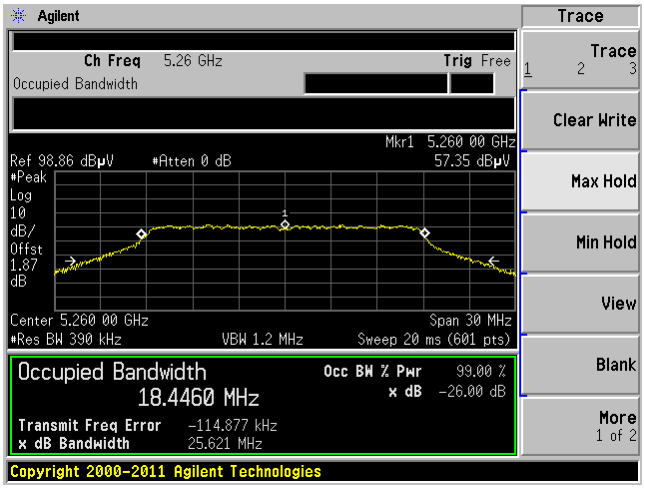
5.3 GHz Band

20 MHz Bandwidth, Low Channel, 5260 MHz

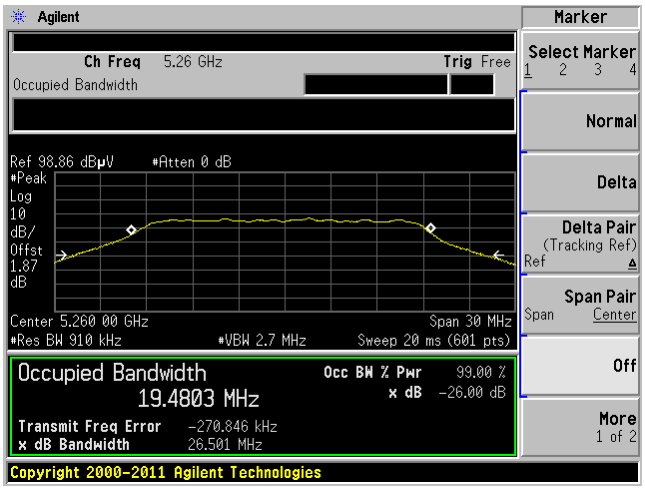
C1



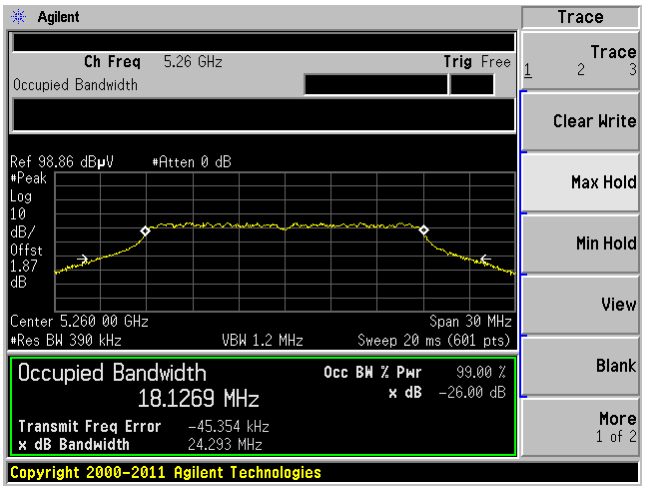
C2



C3

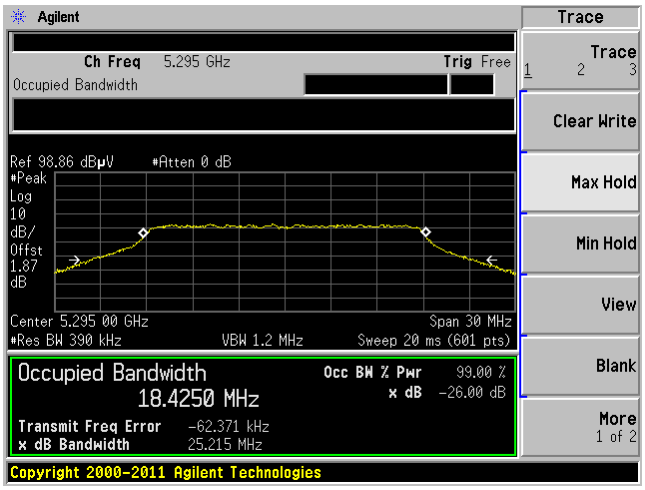


C4

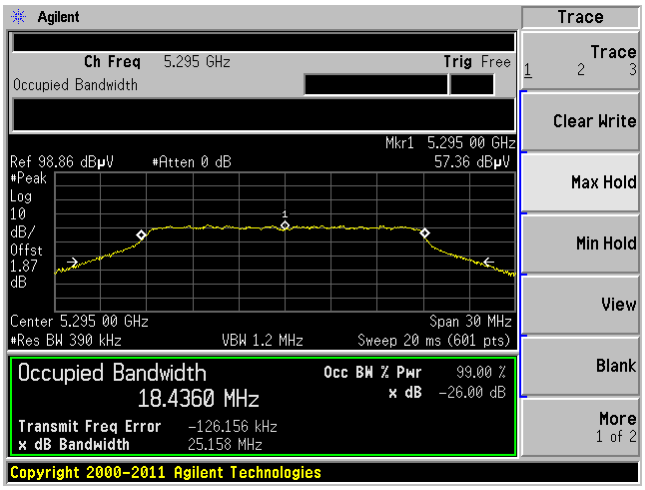


20 MHz Bandwidth, Middle Channel, 5295 MHz

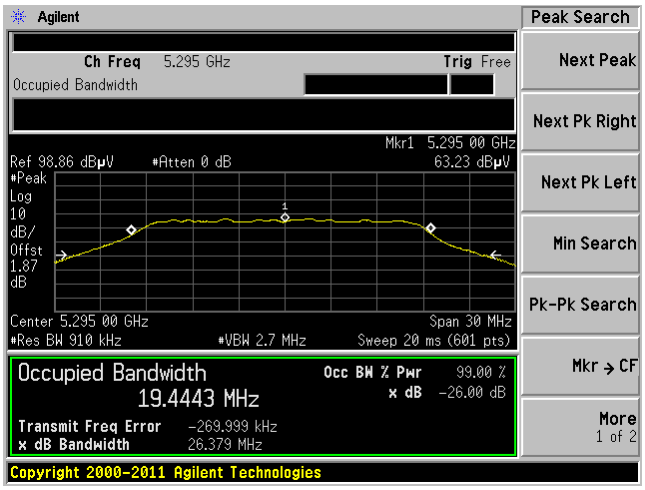
C1



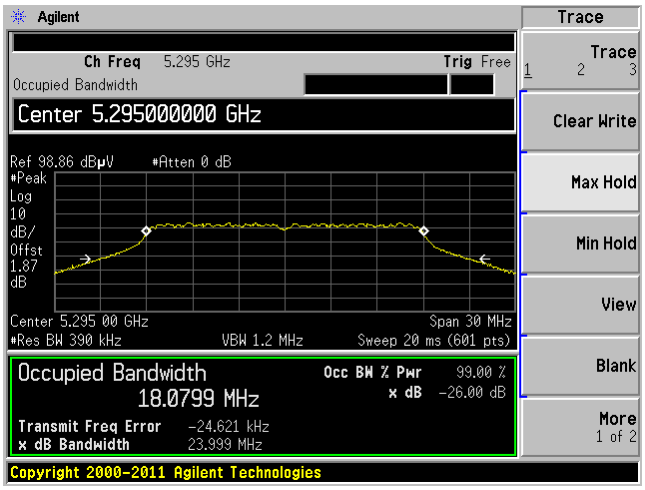
C2



C3

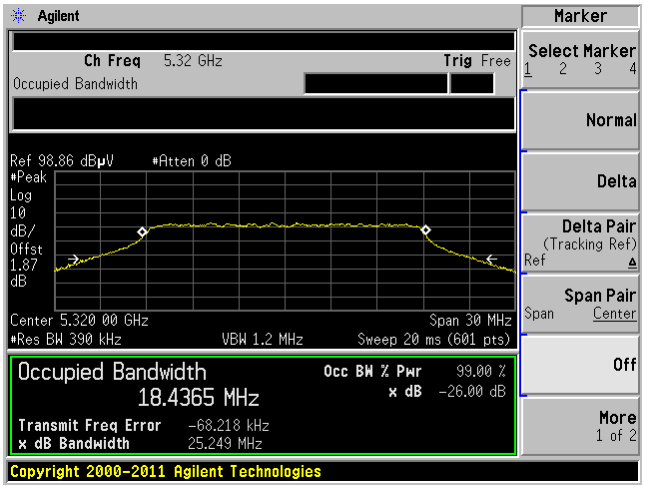


C4

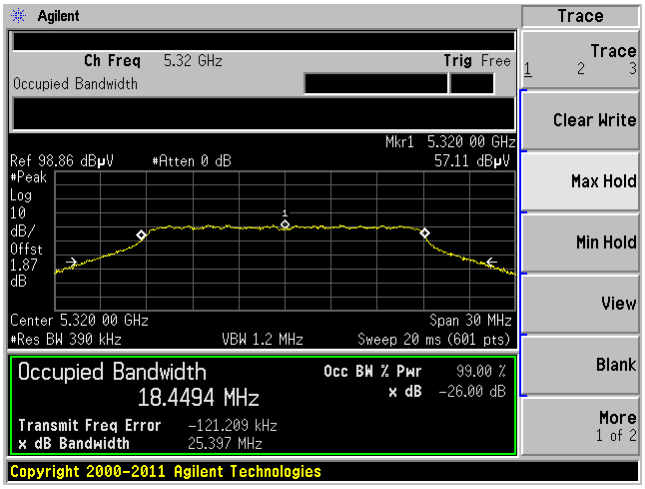


20 MHz Bandwidth, High Channel, 5320 MHz

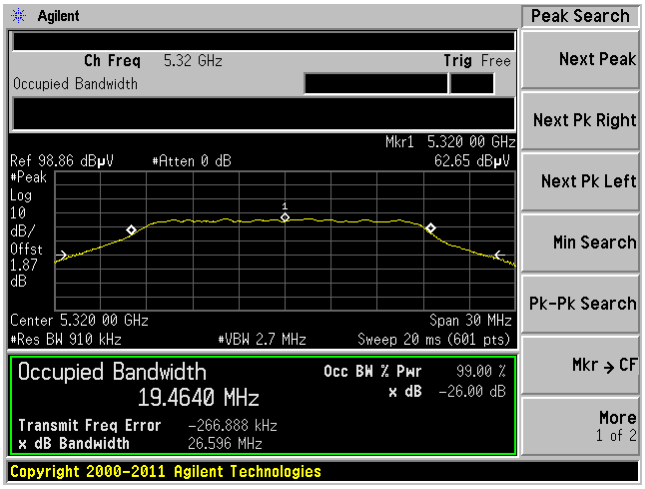
C1



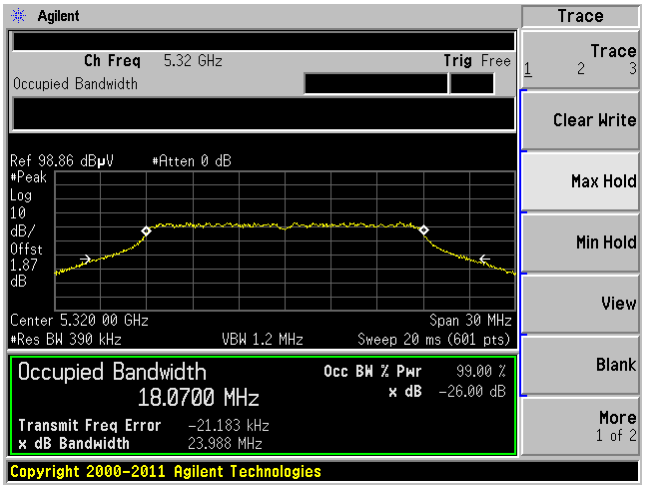
C2



C3

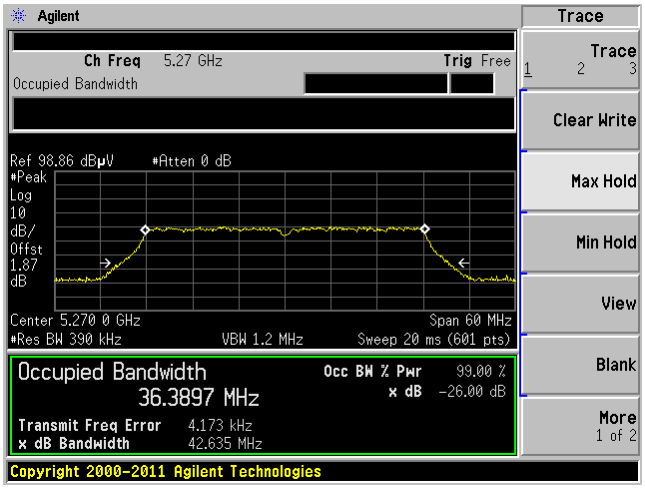


C4

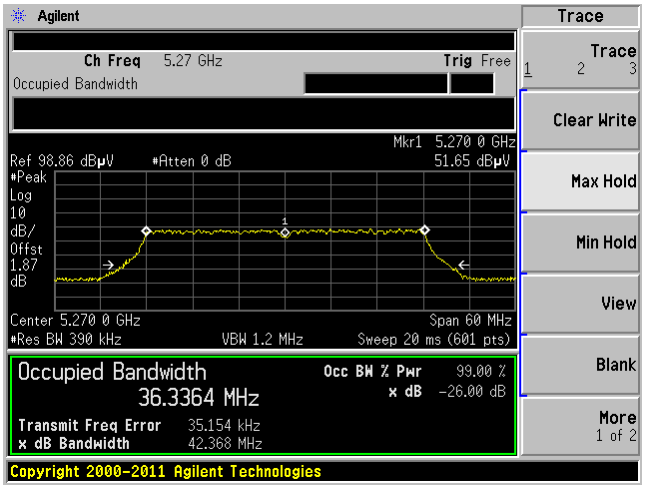


40 MHz Bandwidth, Low Channel, 5270 MHz

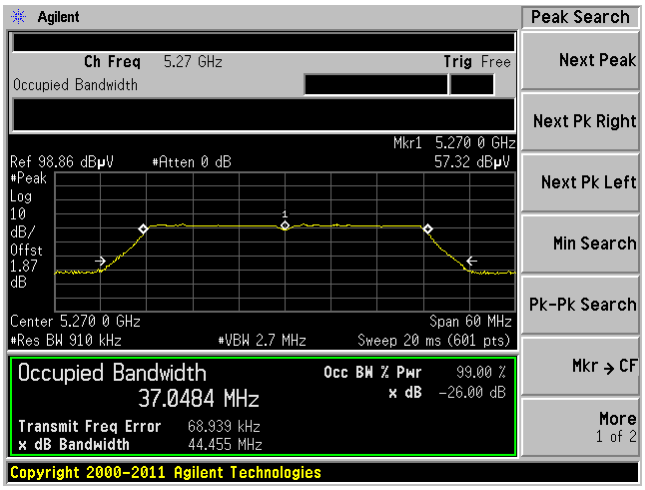
C1



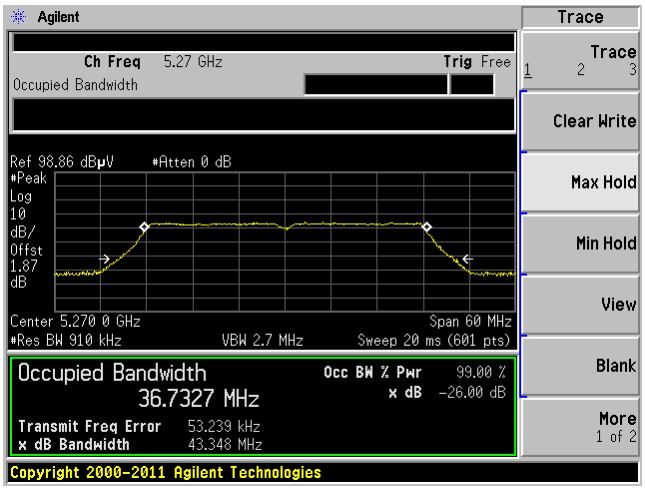
C2



C3

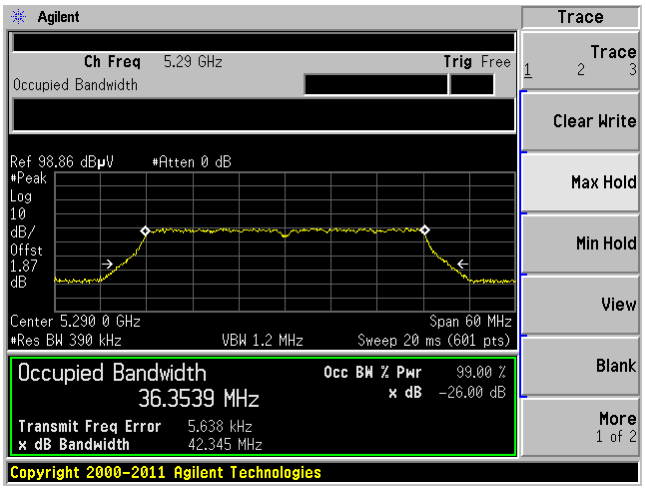


C4

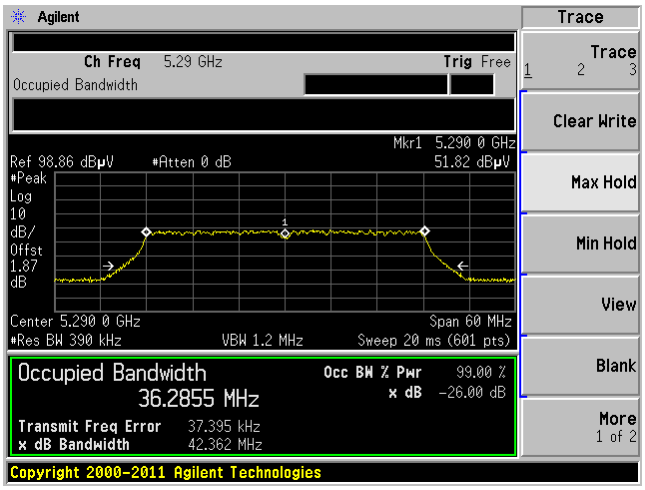


40 MHz Bandwidth, Middle Channel, 5290 MHz

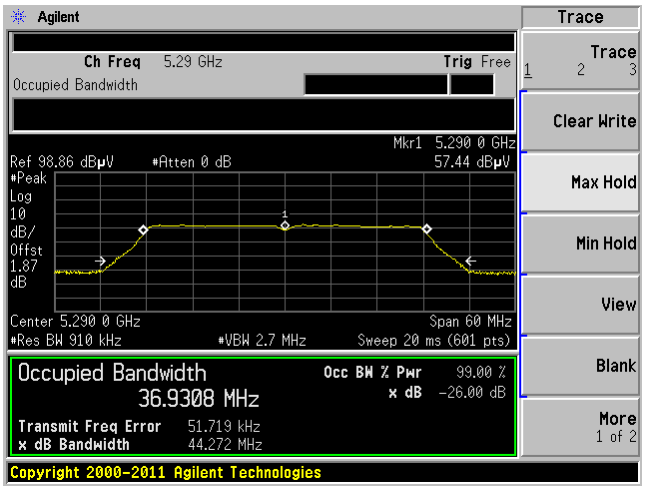
C1



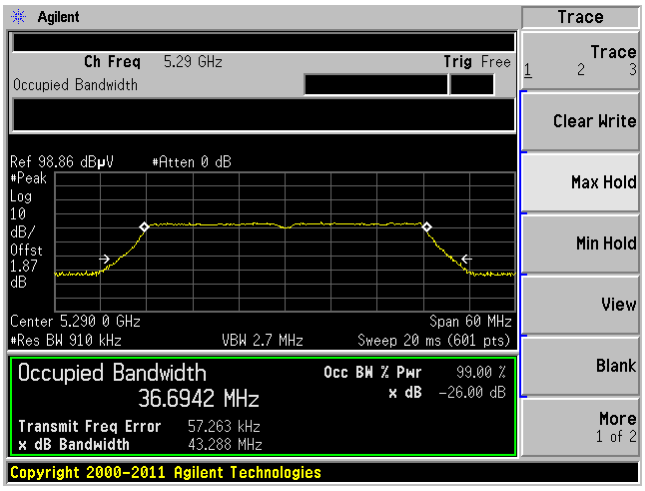
C2



C3

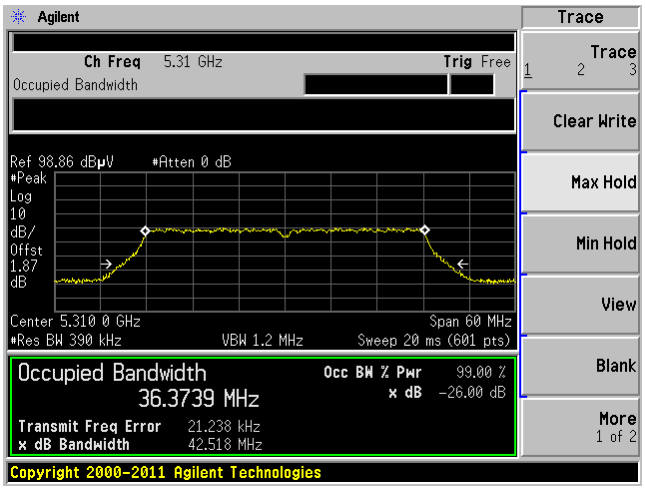


C4

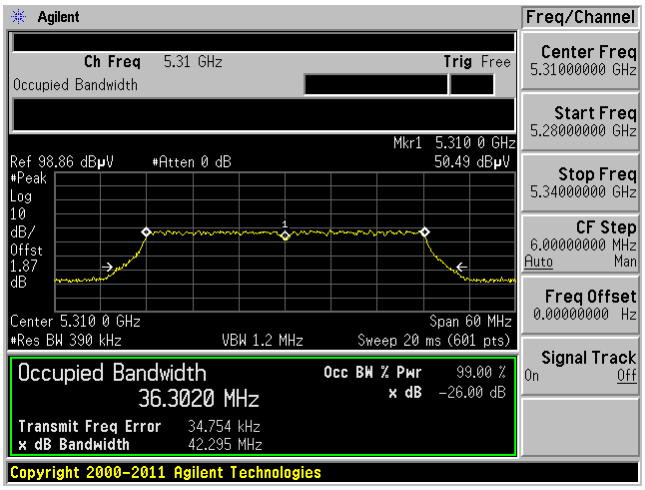


40 MHz Bandwidth, High Channel, 5310 MHz

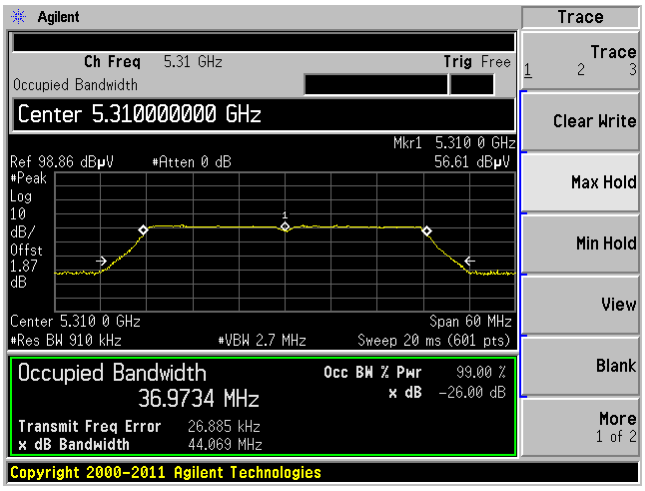
C1



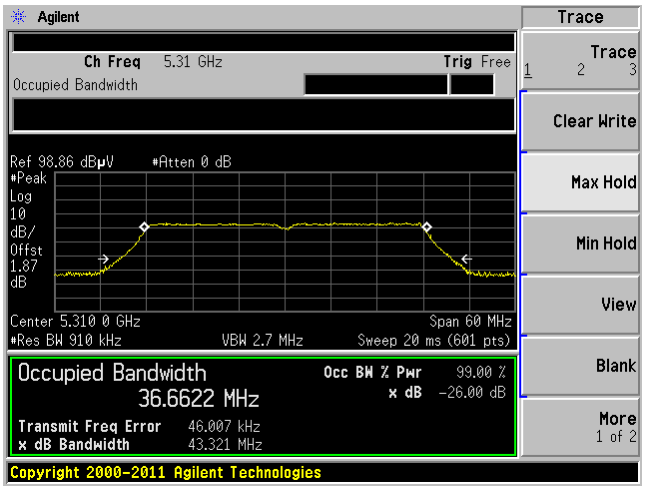
C2



C3

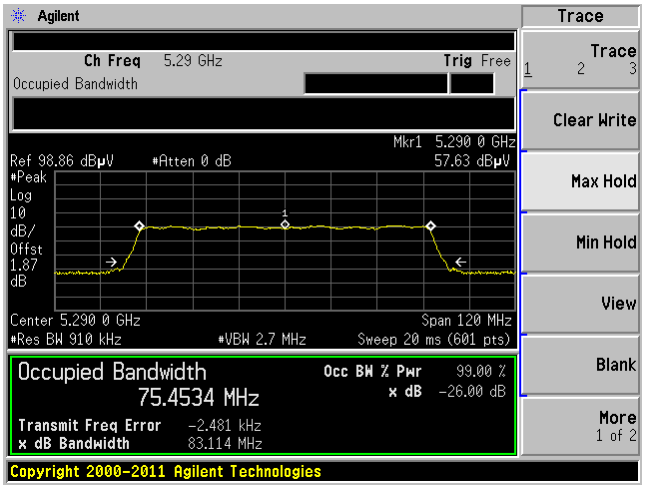


C4

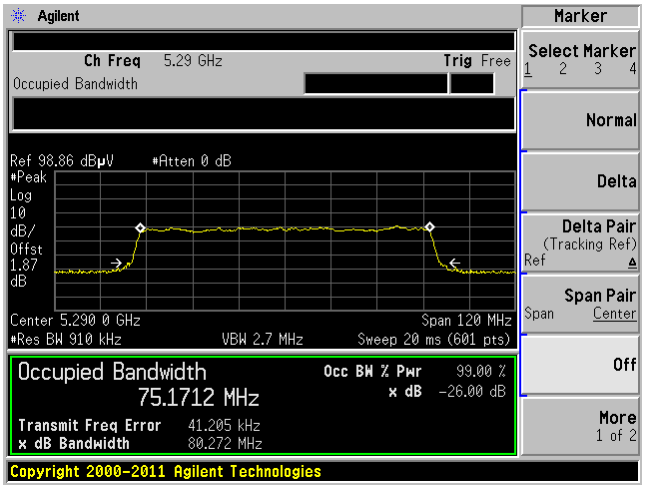


80 MHz Bandwidth, Channel, 5290 MHz

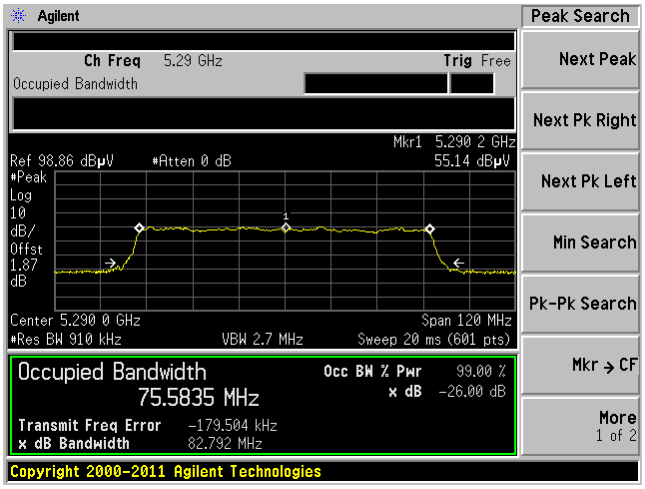
C1



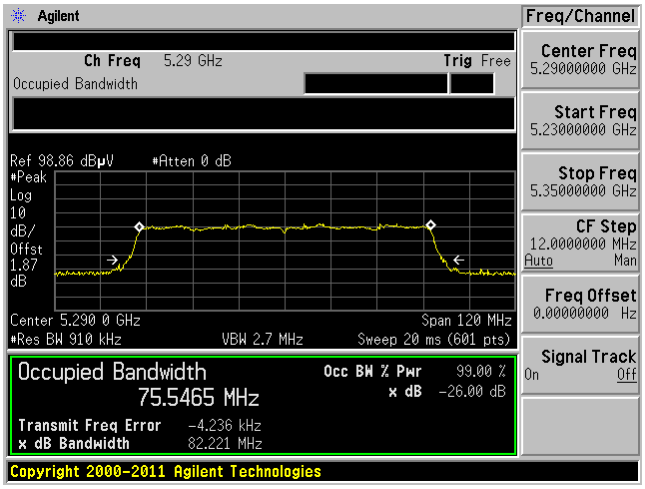
C2



C3



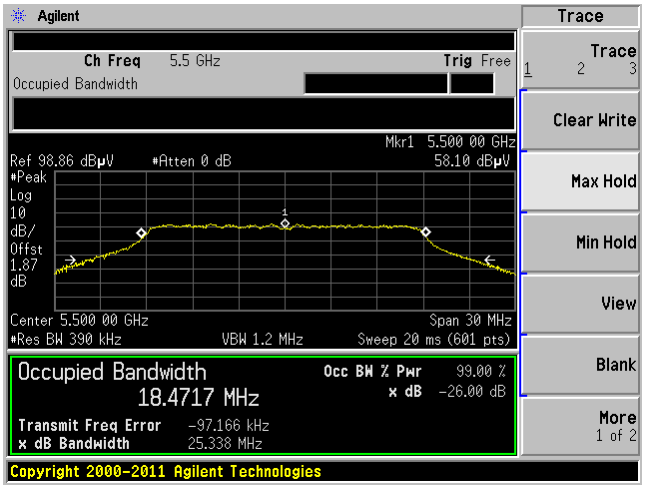
C4



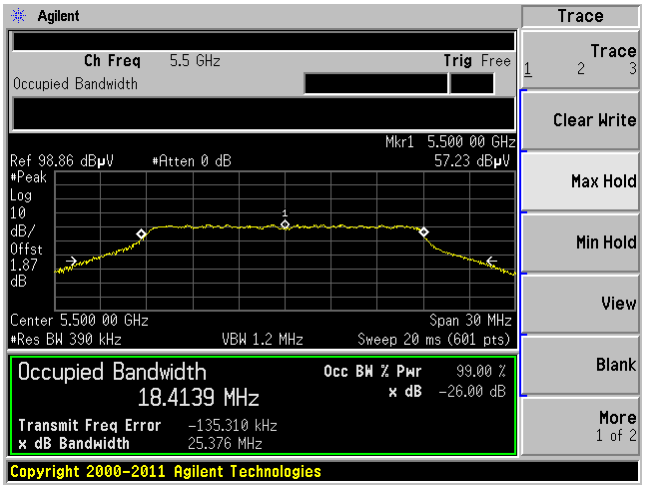
5.6 GHz Band

20 MHz Bandwidth, Low Channel, 5500 MHz

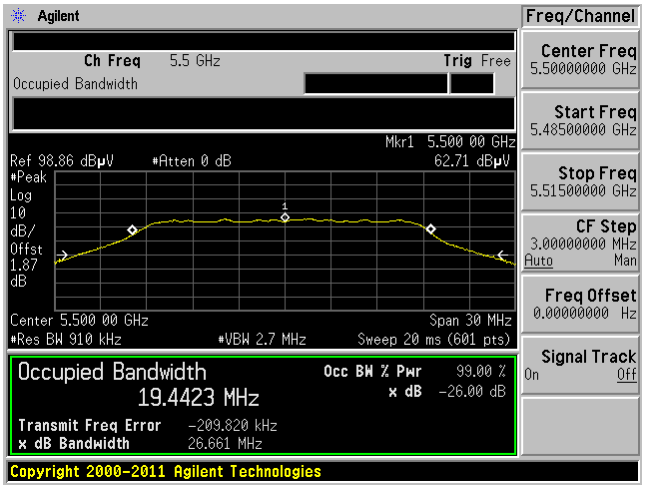
C1



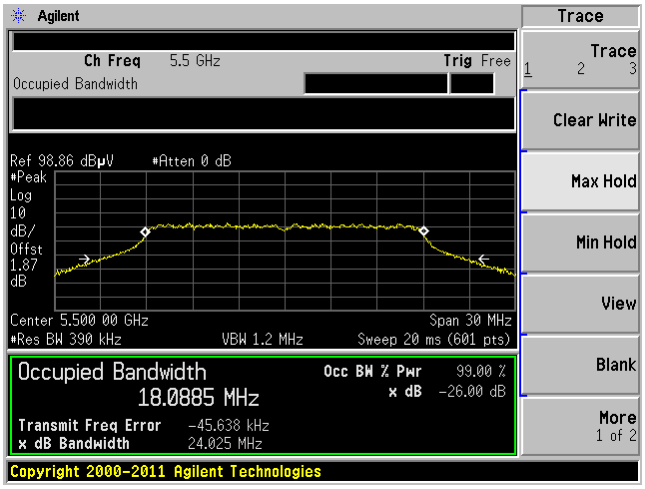
C2



C3

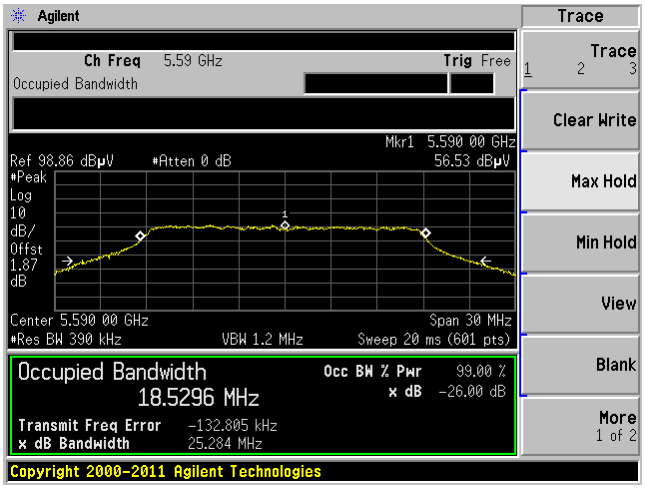


C4

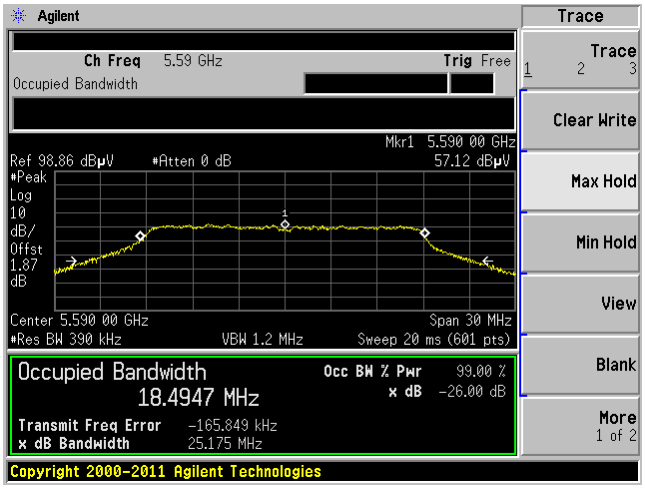


20 MHz Bandwidth, Middle Channel, 5590 MHz

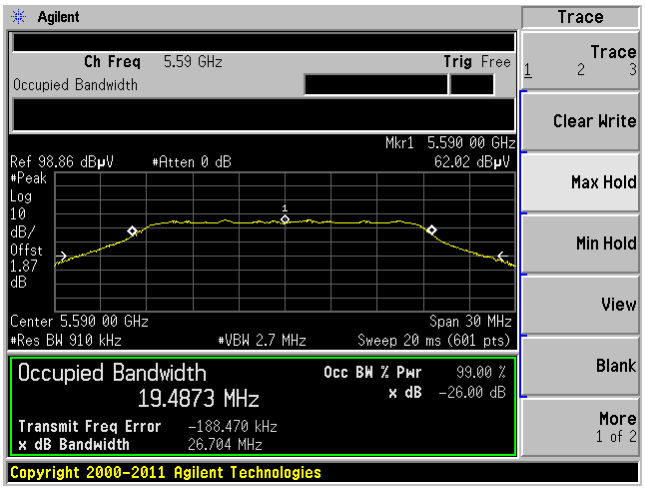
C1



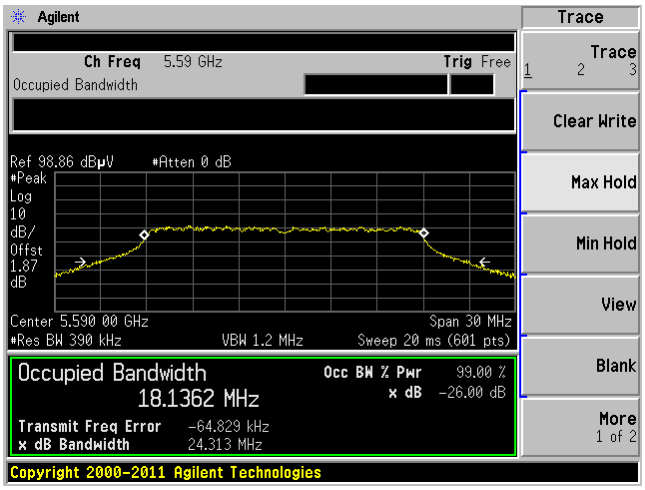
C2



C3

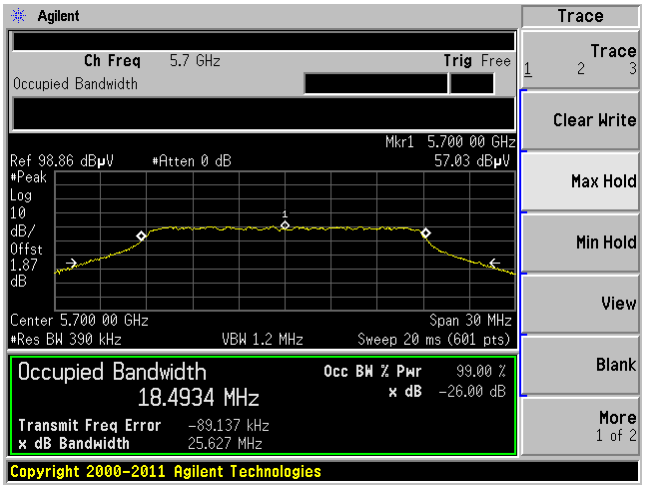


C4

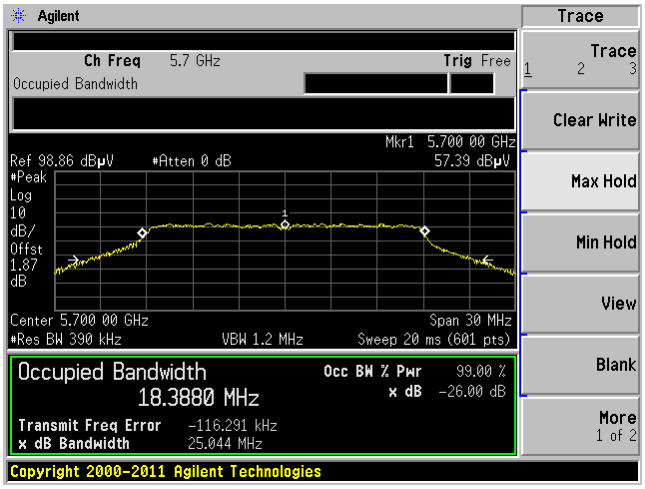


20 MHz Bandwidth, High Channel, 5700 MHz

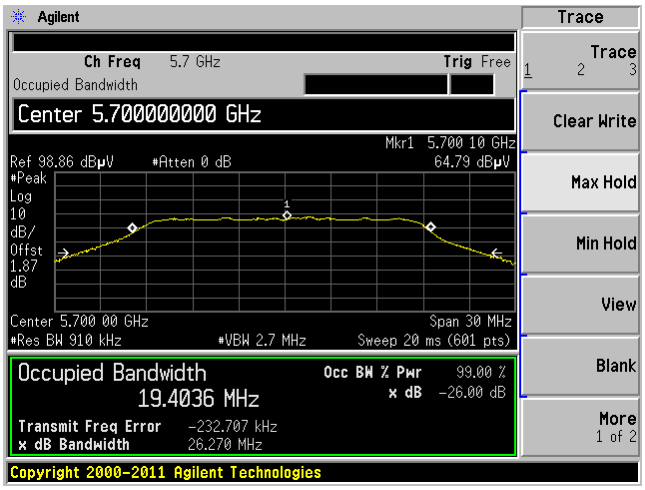
C1



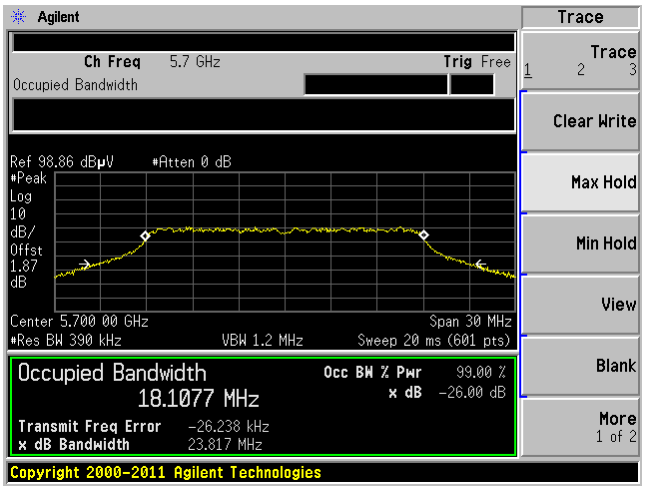
C2



C3

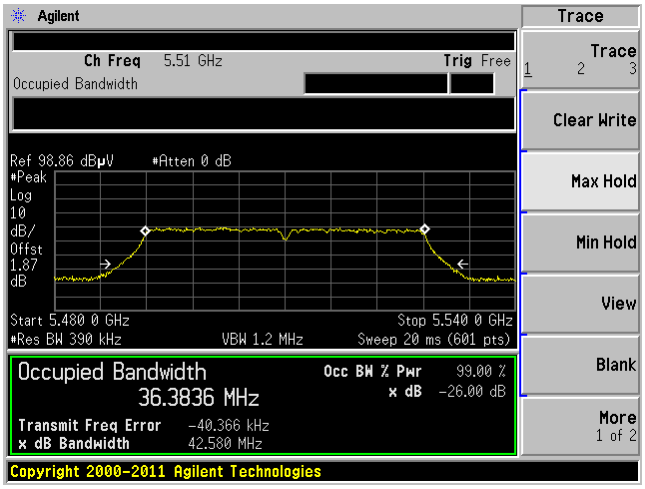


C4

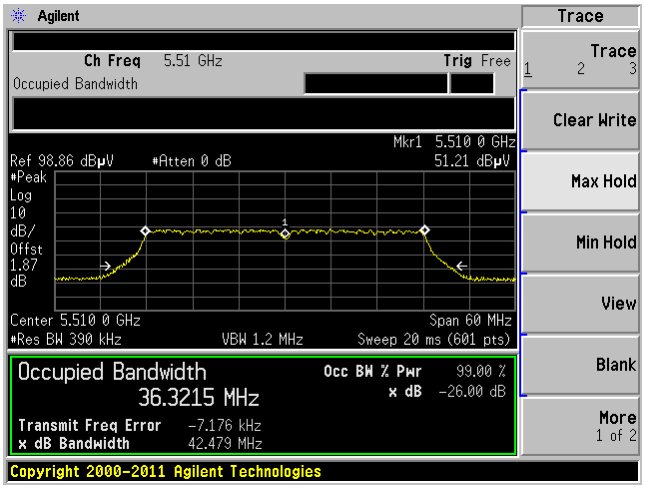


40 MHz Bandwidth, Low Channel, 5510 MHz

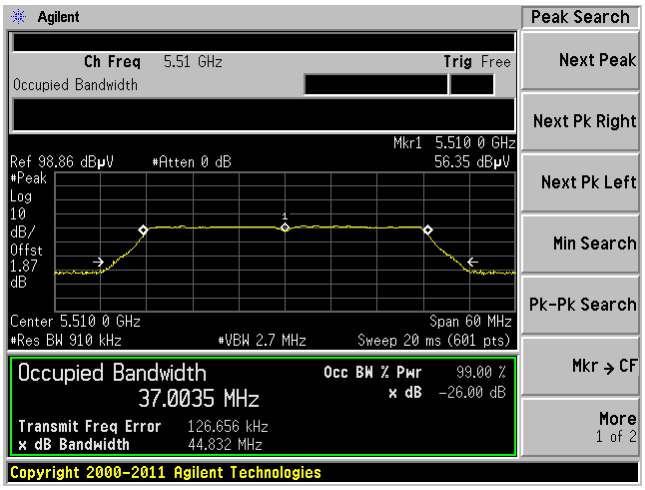
C1



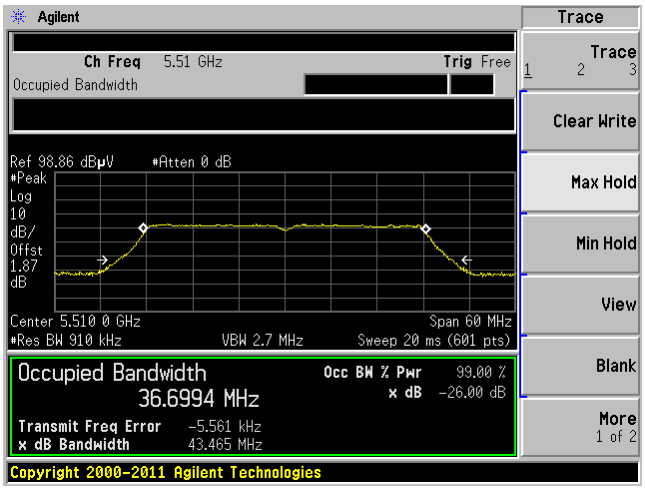
C2



C3

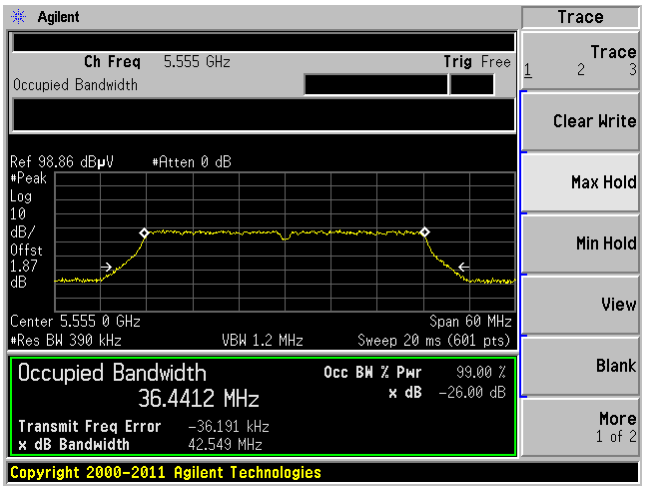


C4

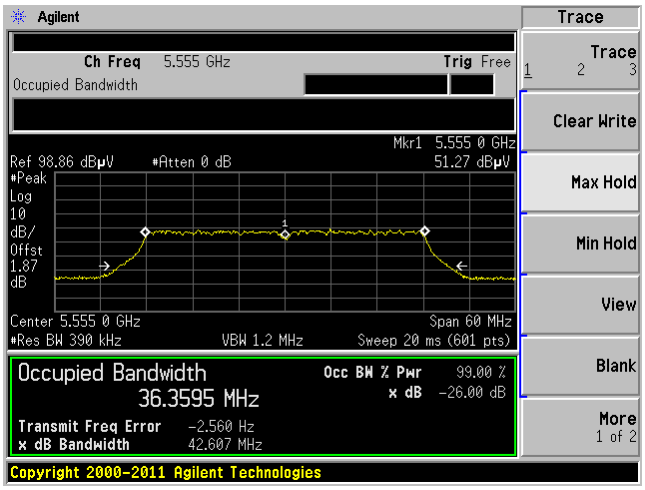


40 MHz Bandwidth, Middle Channel, 5555 MHz

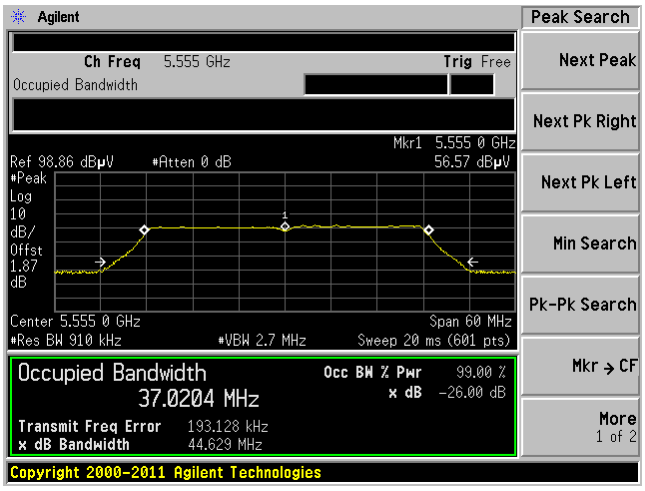
C1



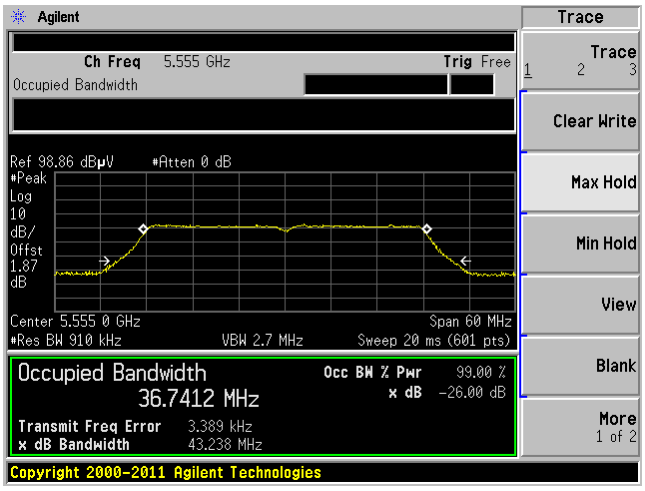
C2



C3

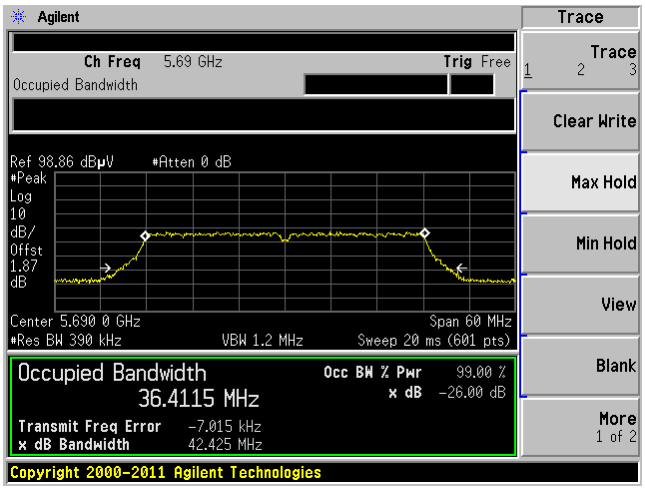


C4

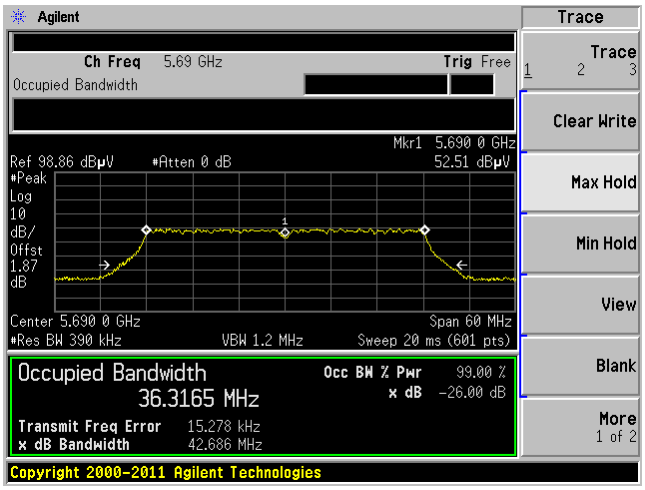


40 MHz Bandwidth, High Channel, 5690 MHz

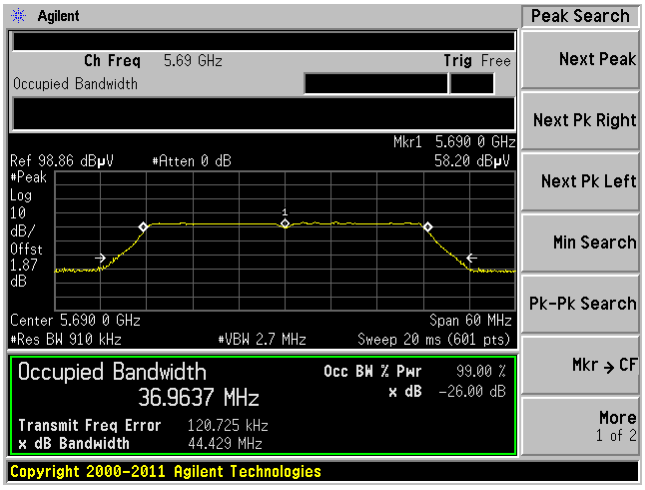
C1



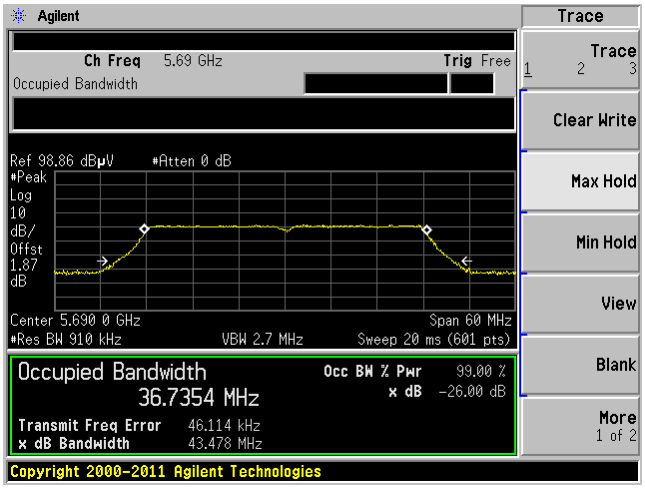
C2



C3

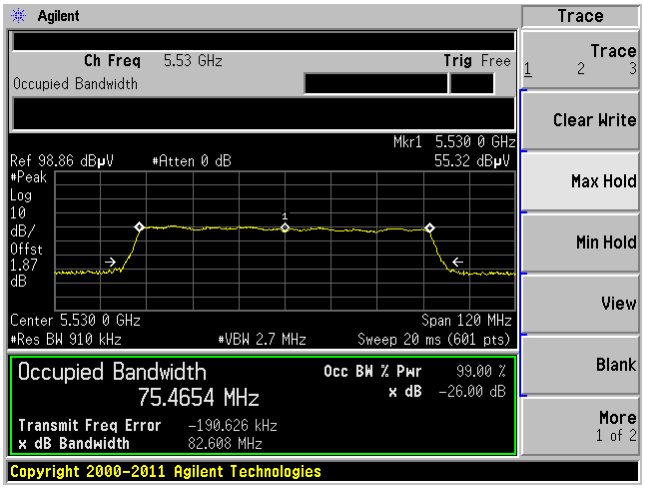


C4

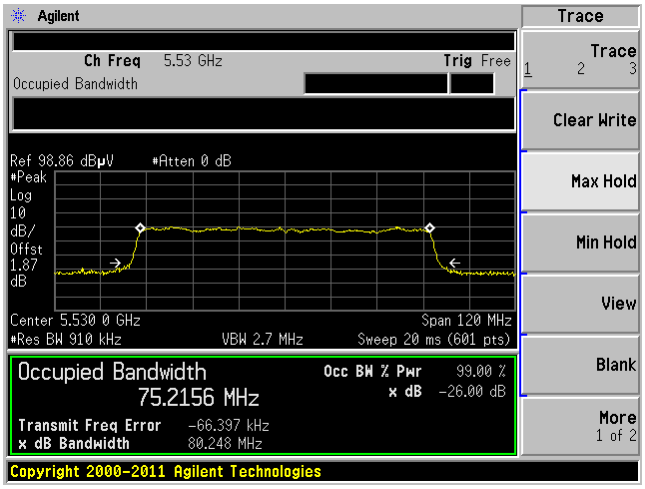


80 MHz Bandwidth, Low Channel, 5530 MHz

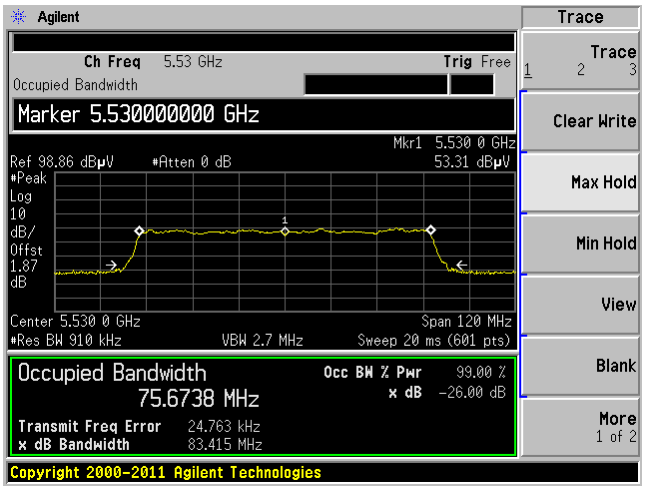
C1



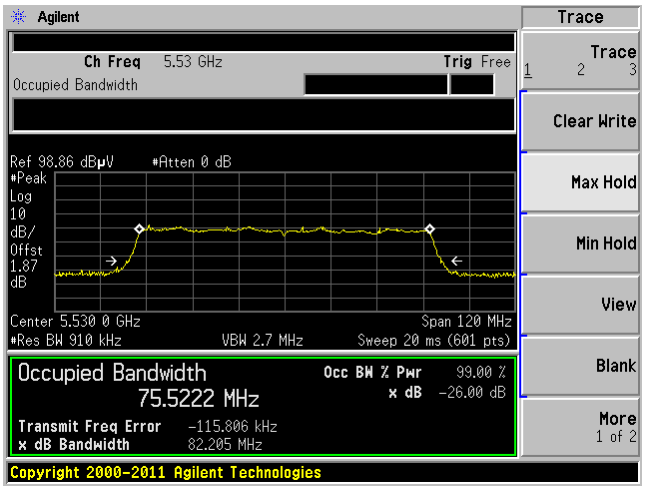
C2



C3

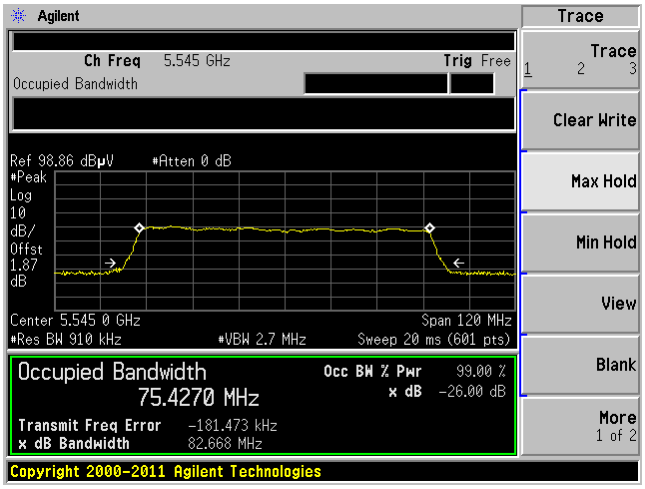


C4

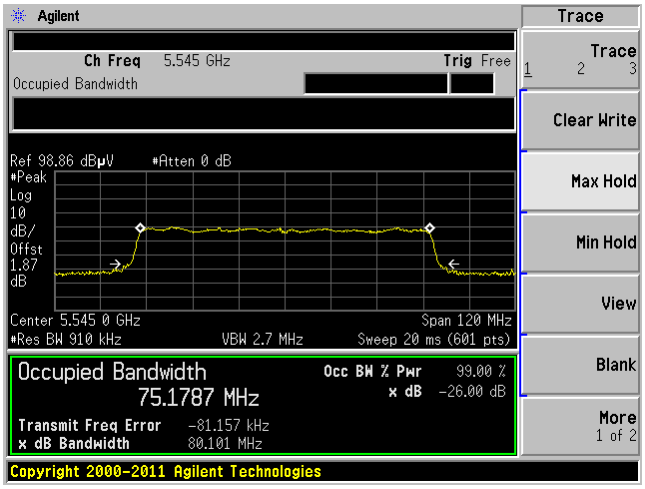


80 MHz Bandwidth, Middle Channel, 5545 MHz

C1



C2



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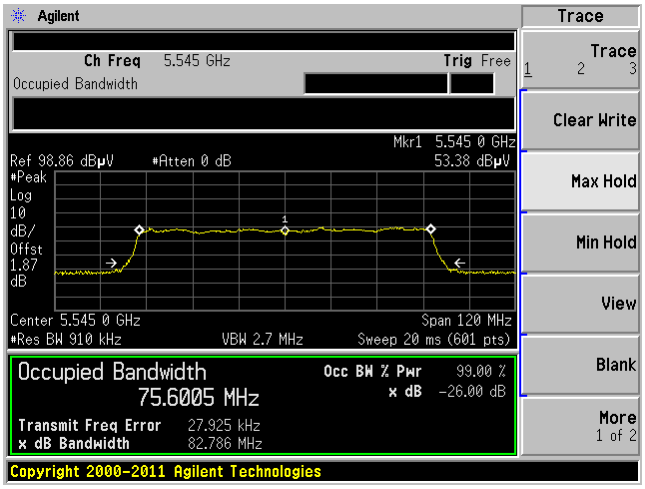

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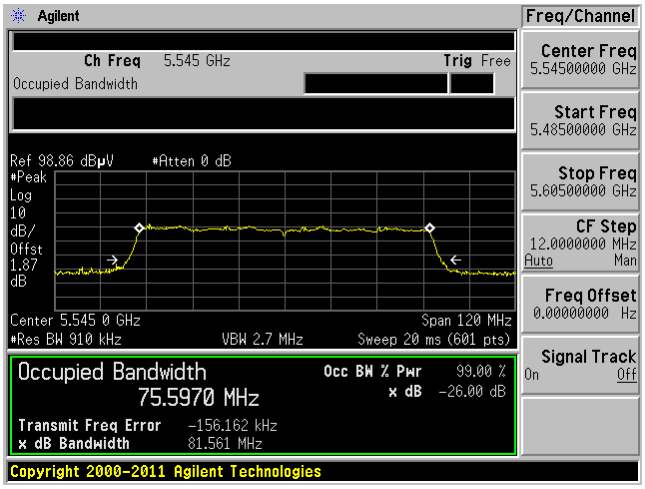
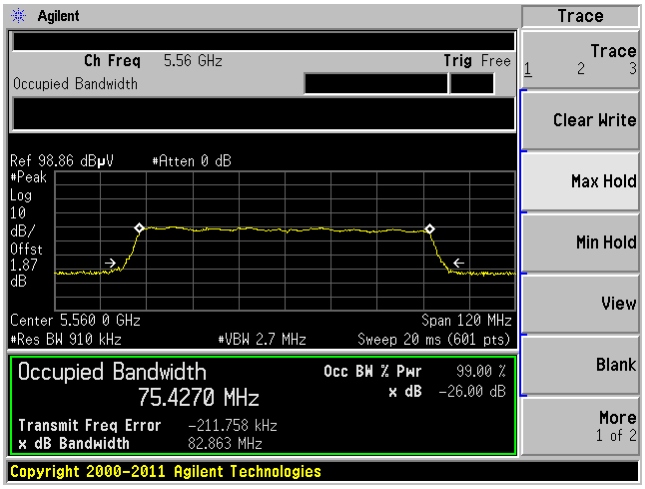


80 MHz Bandwidth, High Channel, 5560 MHz

C1



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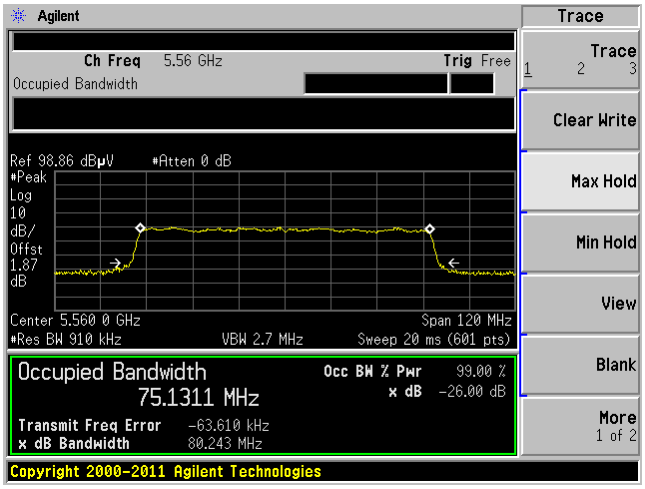

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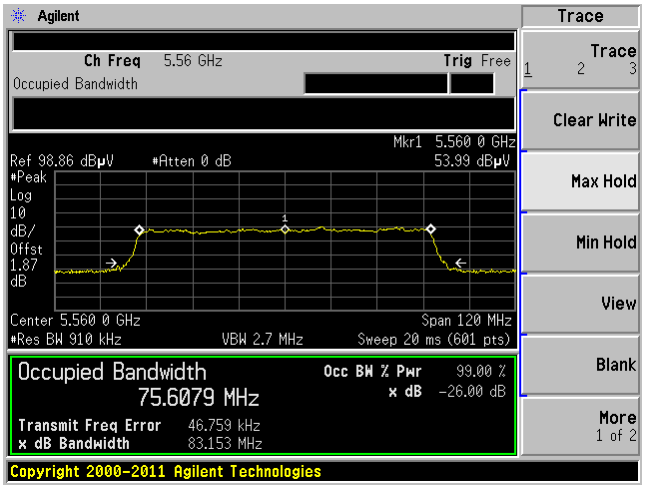

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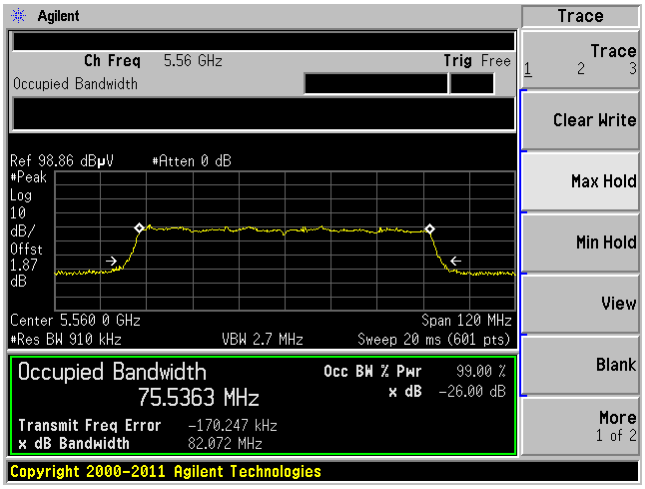
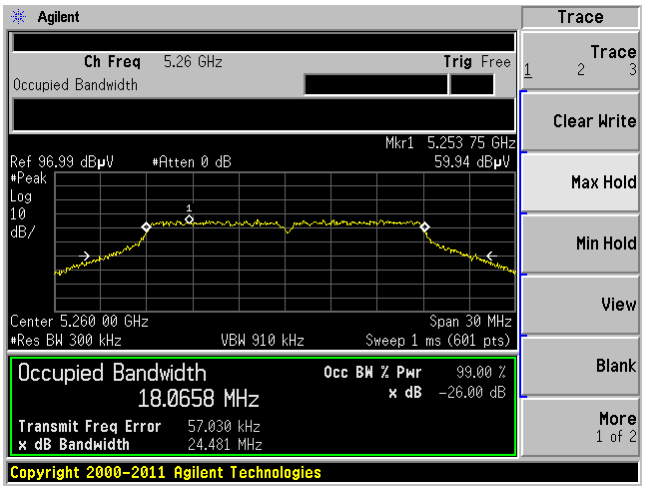


Beamforming

5.3 GHz Band

20 MHz Bandwidth, Low Channel, 5260 MHz

H



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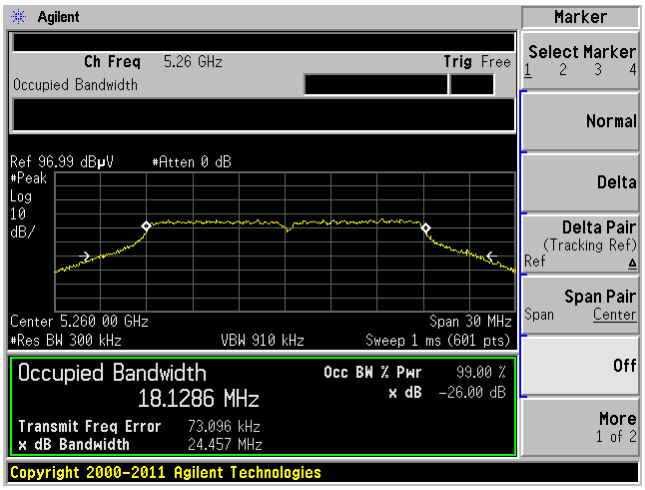

20 MHz Bandwidth, Middle Channel, 5295 MHz

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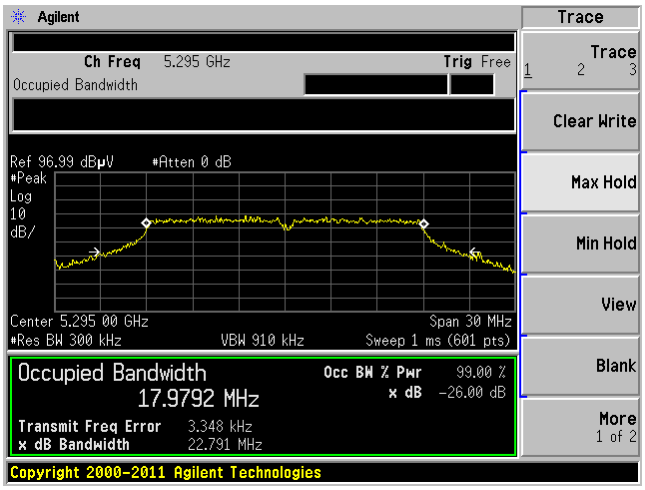

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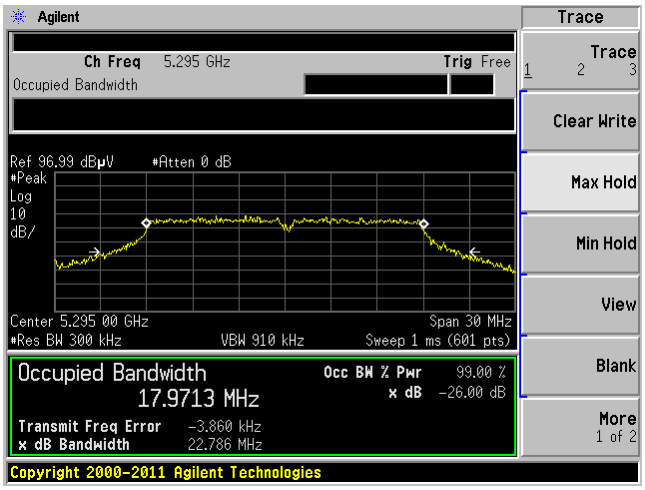
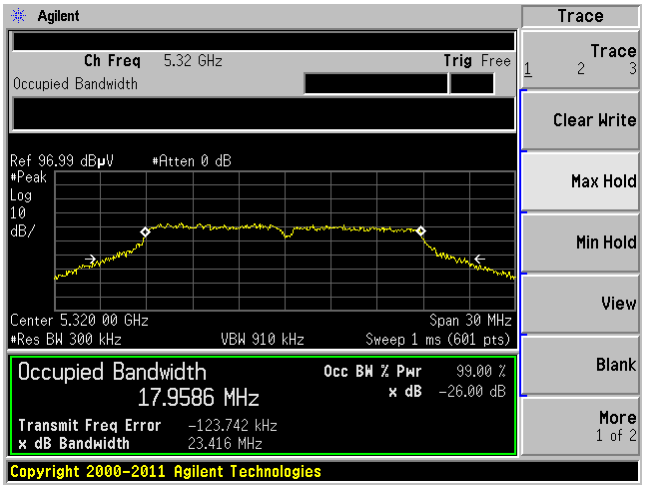


20 MHz Bandwidth, High Channel, 5320 MHz

H



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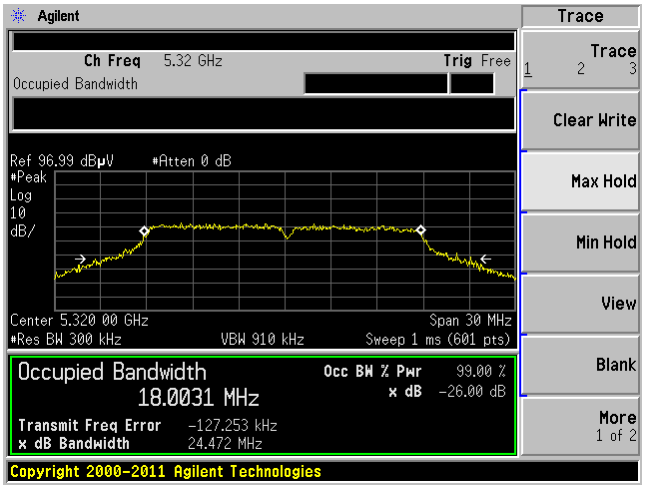
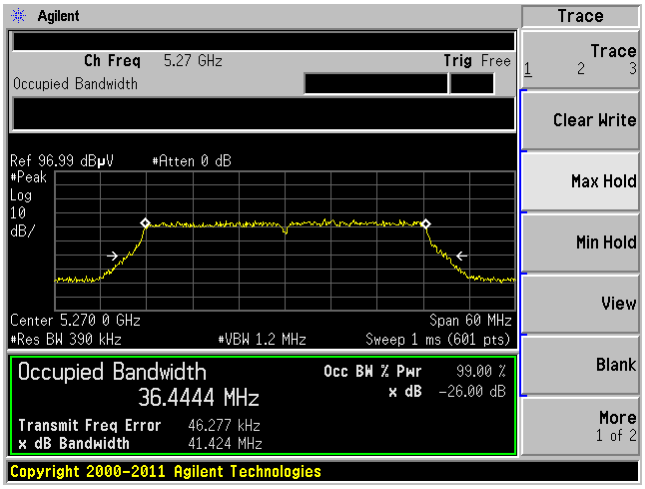


40 MHz Bandwidth, Low Channel, 5270 MHz

H



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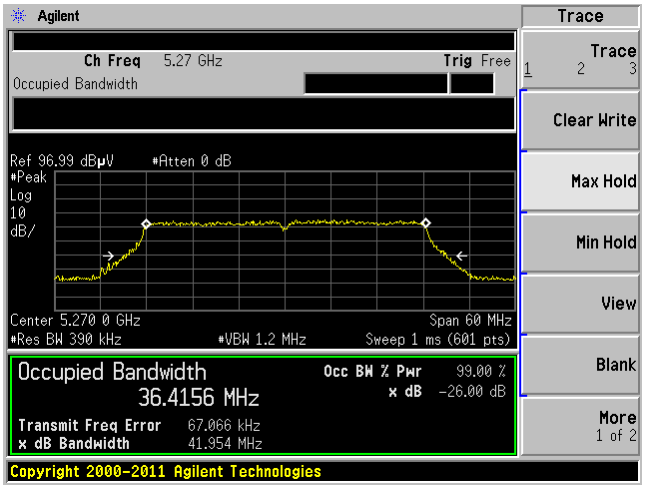
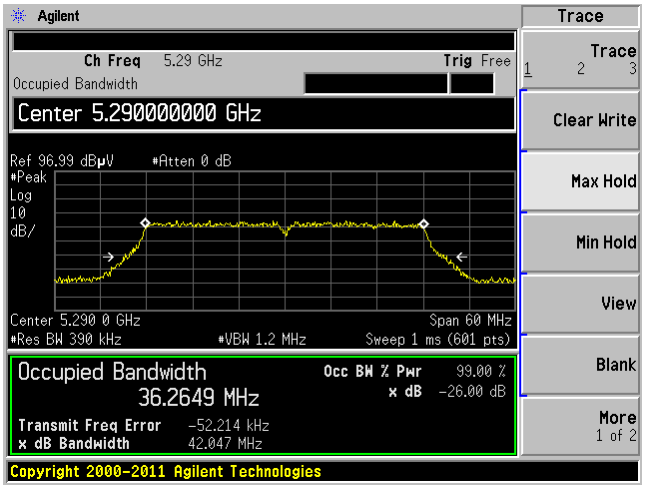


40 MHz Bandwidth, Middle Channel, 5290 MHz

H



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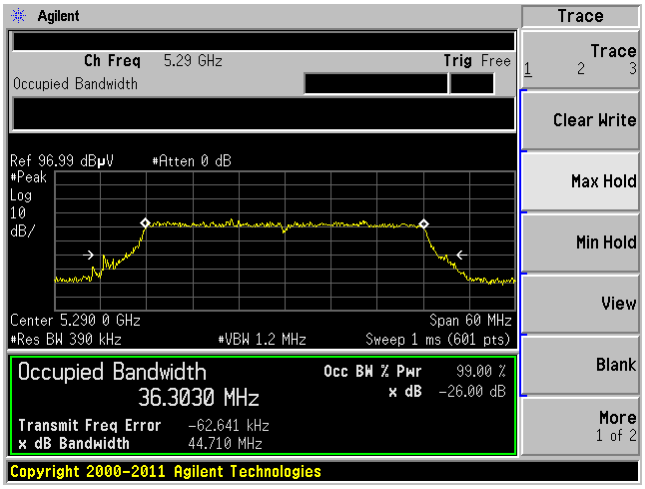
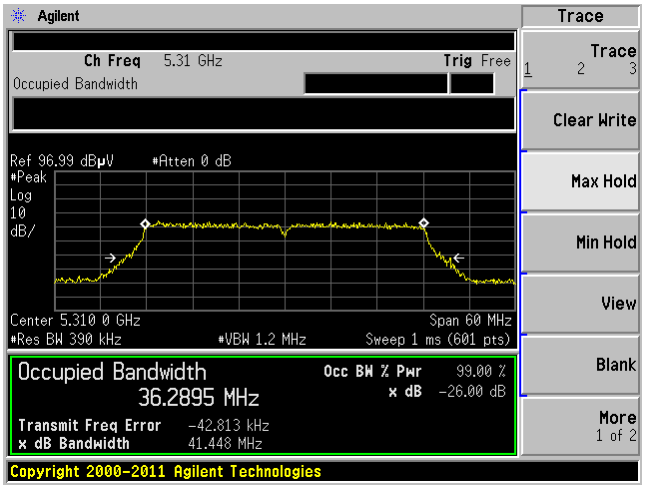


40 MHz Bandwidth, High Channel, 5310 MHz

H



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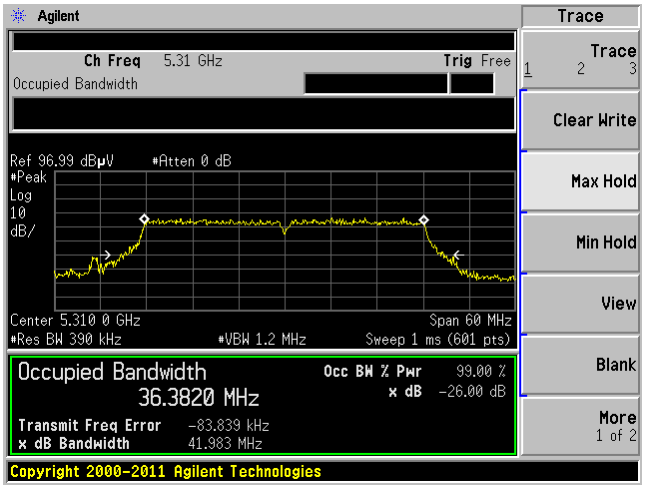
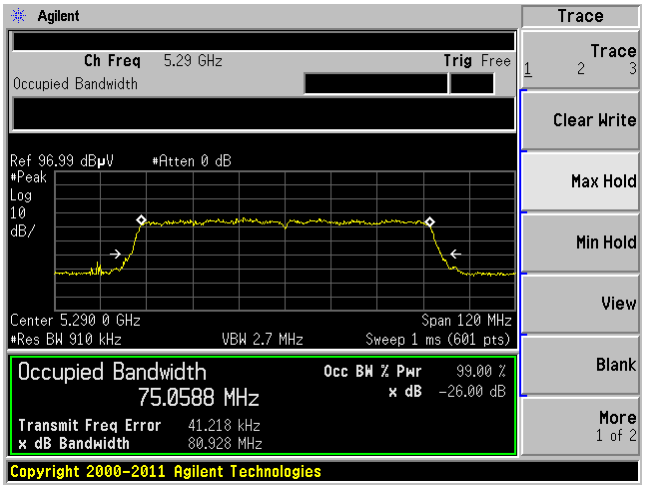


80 MHz Bandwidth, 5290 MHz

H



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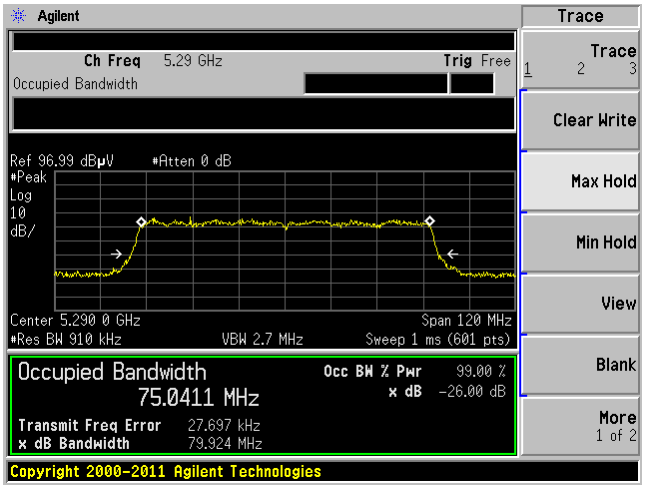
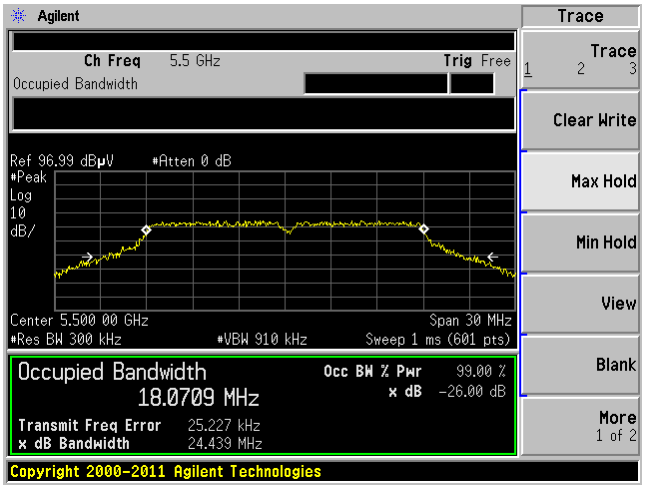


5.6 GHz Band

20 MHz Bandwidth, Low Channel, 5500 MHz

H



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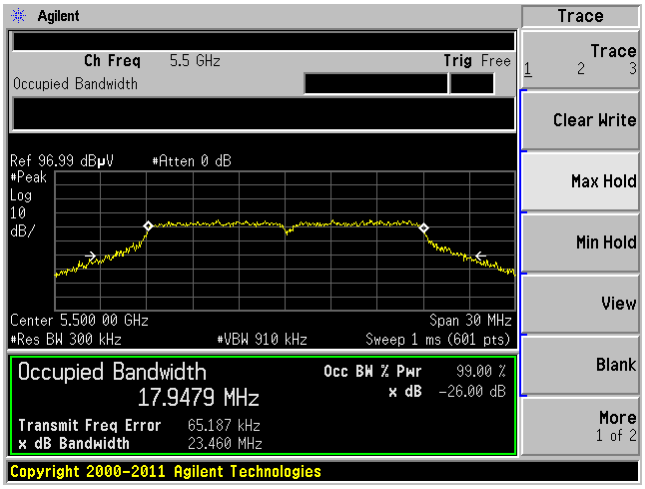
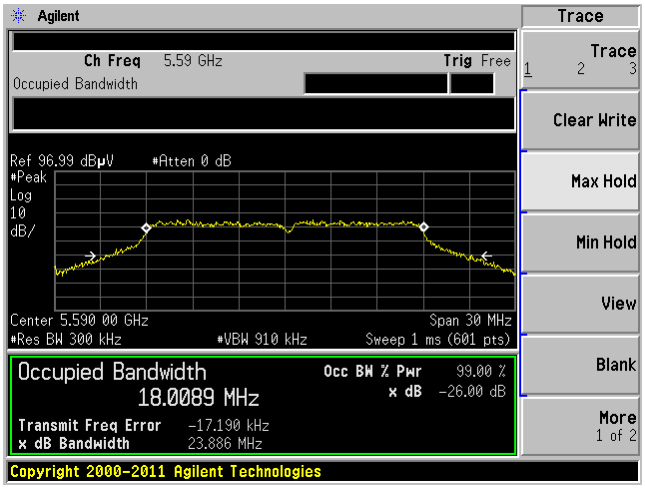


20 MHz Bandwidth, Middle Channel, 5590 MHz

H



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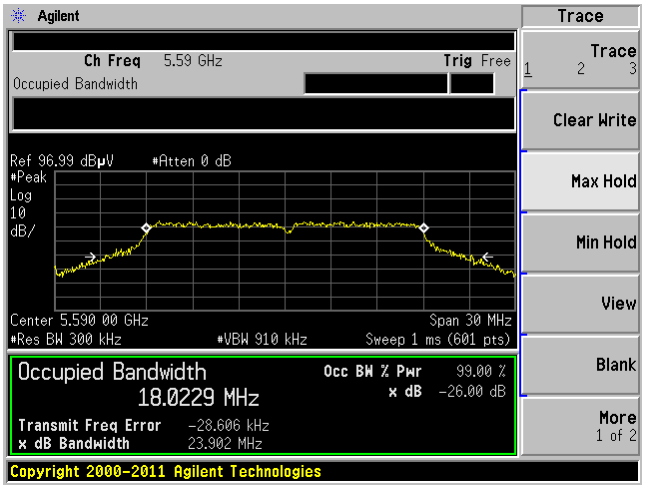
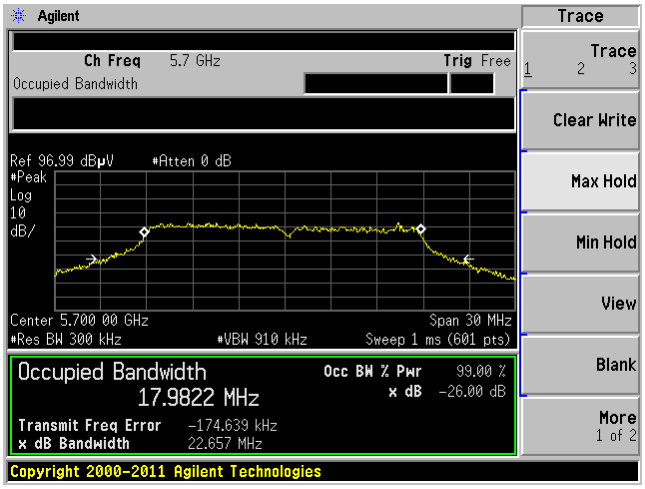


20 MHz Bandwidth, High Channel, 5700 MHz

H



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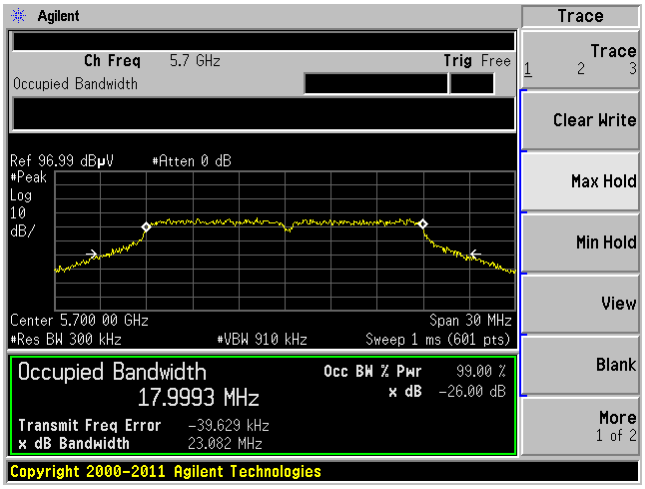
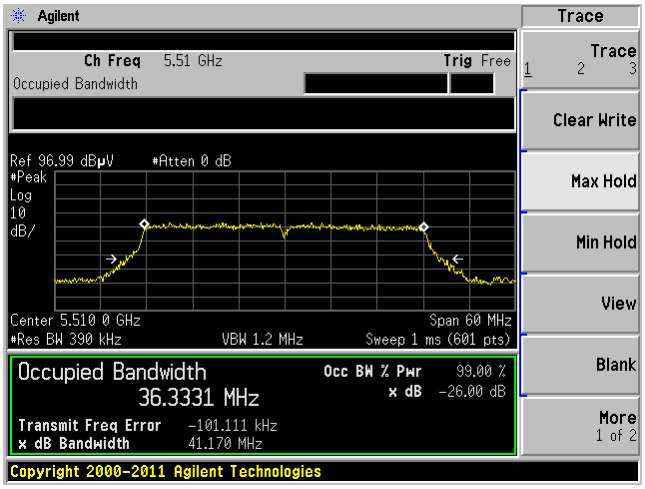


40 MHz Bandwidth, Low Channel, 5510 MHz

H



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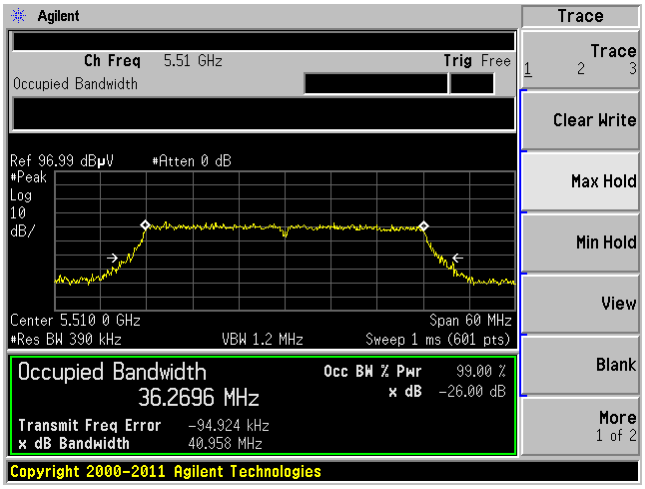
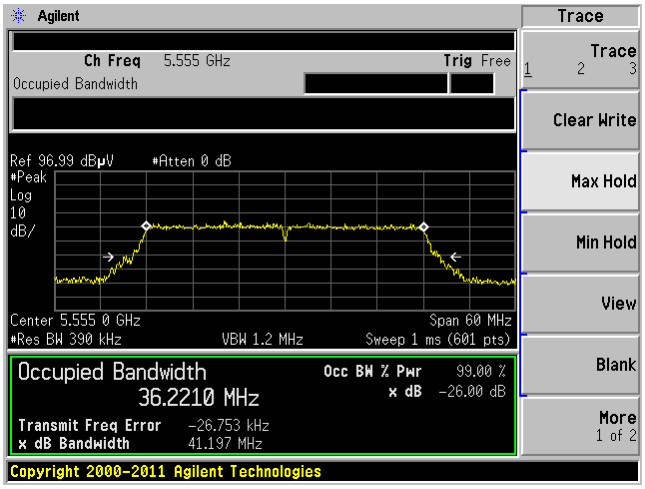


40 MHz Bandwidth, Middle Channel, 5555 MHz

H



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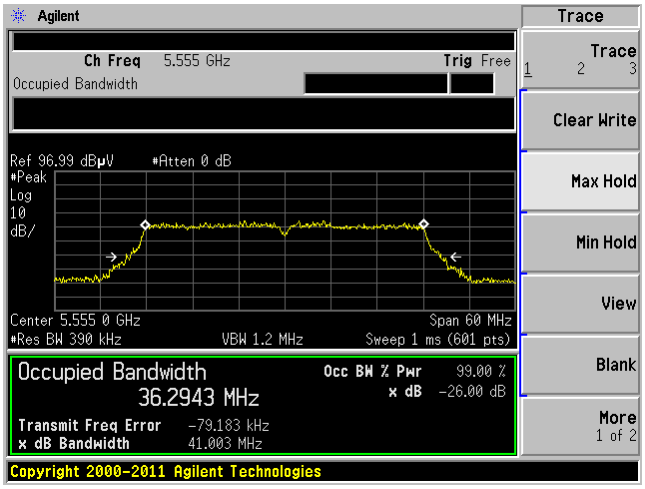
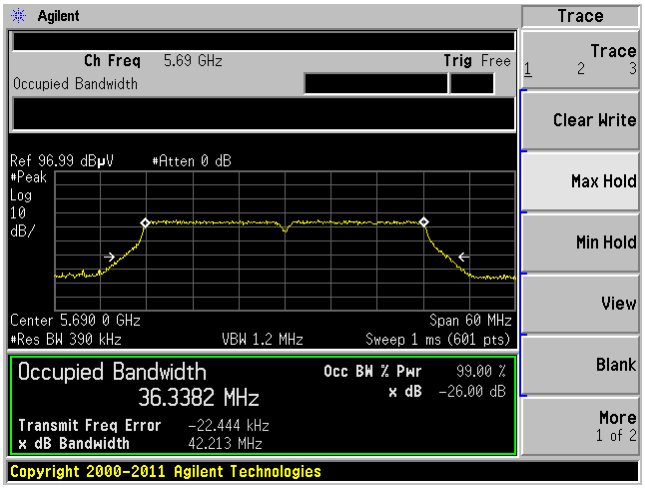


40 MHz Bandwidth, High Channel, 5690 MHz

H



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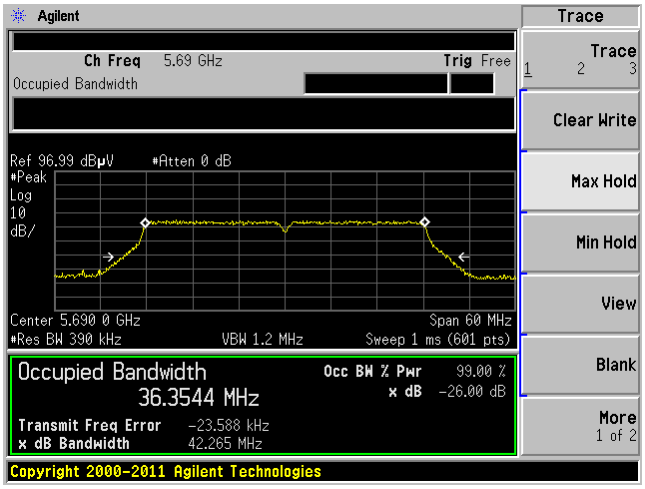
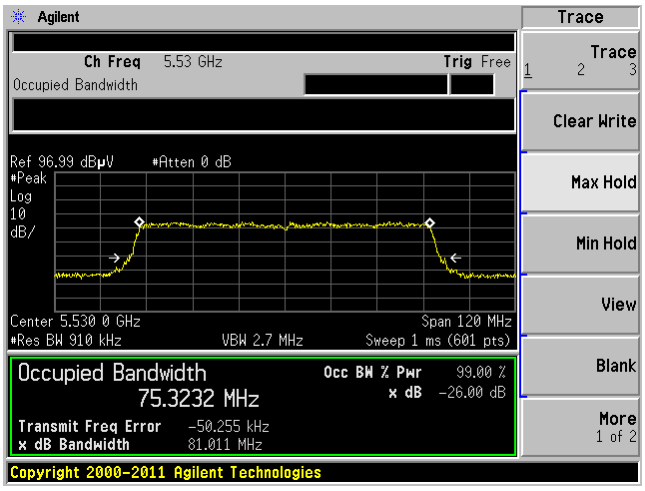


80 MHz Bandwidth, Low Channel, 5530 MHz

H



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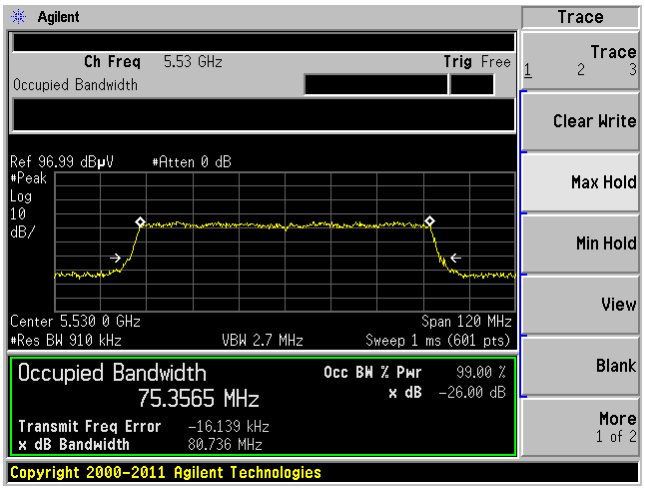
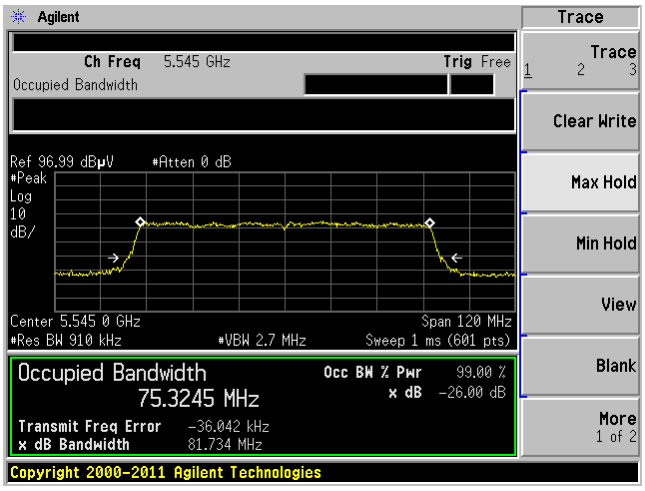


80 MHz Bandwidth, Middle Channel, 5545 MHz

H



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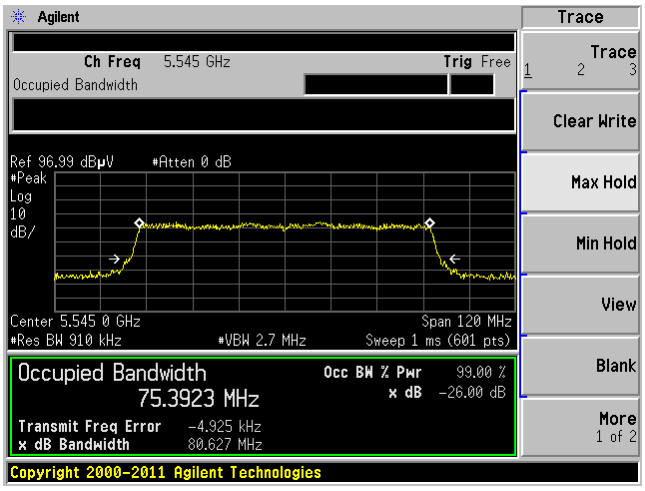
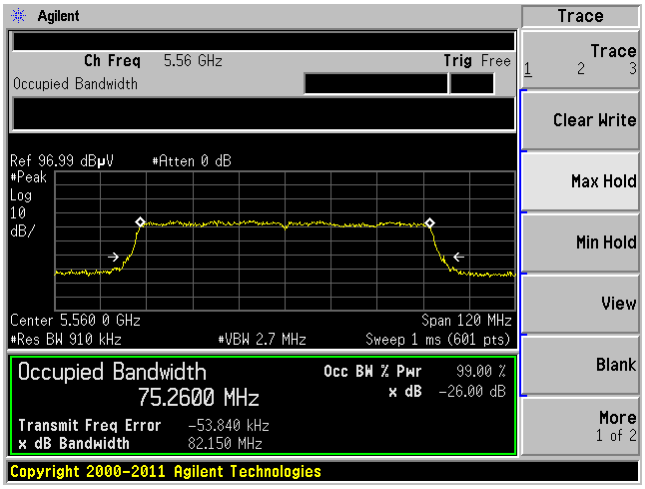


80 MHz Bandwidth, High Channel, 5560 MHz

H



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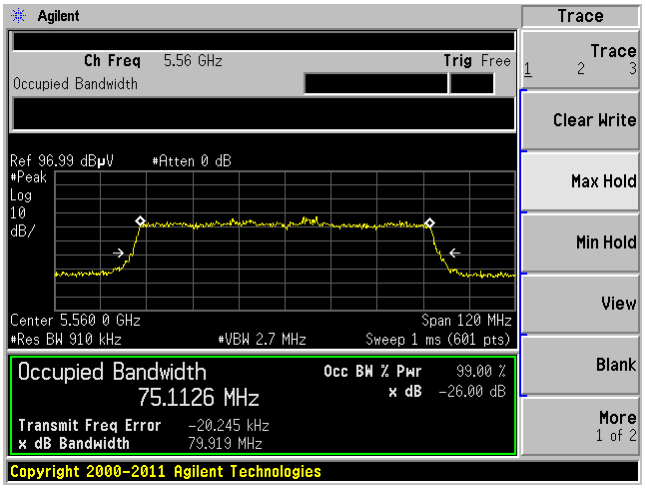


9 FCC §407(a)(2) - Output Power

9.1 Applicable Standard

According to FCC §15.407(a)(2)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB Emission Bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

9.2 Measurement Procedure

The measurements are base on FCC KDB 789033 D02 General UNII Test Procedures v01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section E: Maximum conducted output power

9.3 Test Equipment List and Details

Manufacturers	Description	Models	Serial Numbers	Calibration Dates	Calibration Interval
Agilent	Spectrum Analyzer	E4440A	US42221851	2014-02-28	1 year
EMCO	Antenna, Horn	3115	9511-4627	2013-10-17	1 year
Mini-Circuits	Pre-amplifier	ZVA-183-S	570400946	2013-05-09	1 year
Sunol Science Corp	System Controller	SC99V	122303-1	N/R	N/R

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.*

9.4 Test Environmental Conditions

Temperature:	21-23 °C
Relative Humidity:	43-48 %
ATM Pressure:	101.1-101.3 kPa

The testing was performed by Cipher Chu on 2014-03-06 to 2014-03-14 at the 10m chamber 1.

9.5 Test Results

Note: Chain1 and Chain 4 is Vertical, and Chain 2 and Chain 3 is Horizontal
Note: C1, C2, C3 and C4 stands for Chain 1, Chain 2, Chain 3 and Chain 4.

The Calculated Conducted Output Power (dBm) was calculated from the following formula:

Conducted Output Power = EIRP – Antenna Gain = E[dBuV/m] + 20 log(d[meters]) - 104.77 - 25 dBi

5.3 GHz Band

20 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Calculated Conducted Output Power (dBm)
5260	51.32	V(chain 1)	33.835	20	4.56	25	-0.05
5260	52.05	H(chain 2)	33.835	20	4.56	25	0.67
5260	52.37	V(chain 4)	33.835	20	4.56	25	0.99
5260	52.93	H(chain 3)	33.835	20	4.56	25	1.55
5295	51.07	V(chain 1)	33.835	20	4.56	25	-0.30
5295	52.53	H(chain 2)	33.835	20	4.56	25	1.15
5295	51.87	V(chain 4)	33.835	20	4.56	25	0.49
5295	53.09	H(chain 3)	33.835	20	4.56	25	1.71
5320	50.13	V(chain 1)	33.835	20	4.56	25	-1.24
5320	52.68	H(chain 2)	33.835	20	4.56	25	1.30
5320	51.58	V(chain 4)	33.835	20	4.56	25	0.20
5320	52.97	H(chain 3)	33.835	20	4.56	25	1.59

40 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Calculated Conducted Output Power (dBm)
5270	48.35	V(chain 1)	33.835	20	4.56	25	-3.02
5270	49.51	H(chain 2)	33.835	20	4.56	25	-1.86
5270	48.48	V(chain 4)	33.835	20	4.56	25	-2.89
5270	49.13	H(chain 3)	33.835	20	4.56	25	-2.24
5290	48.06	V(chain 1)	33.835	20	4.56	25	-3.31
5290	49.5	H(chain 2)	33.835	20	4.56	25	-1.87
5290	48.69	V(chain 4)	33.835	20	4.56	25	-2.68
5290	49.01	H(chain 3)	33.835	20	4.56	25	-2.36
5310	47.75	V(chain 1)	33.835	20	4.56	25	-3.62
5310	49.51	H(chain 2)	33.835	20	4.56	25	-1.86
5310	47.9	V(chain 4)	33.835	20	4.56	25	-3.47
5310	49.12	H(chain 3)	33.835	20	4.56	25	-2.25

80 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Calculated Conducted Output Power (dBm)
5290	45.69	V(chain 1)	33.835	20	4.56	25	-5.68
5290	48.51	H(chain 2)	33.835	20	4.56	25	-2.86
5290	47.13	V(chain 4)	33.835	20	4.56	25	-4.24
5290	48.5	H(chain 3)	33.835	20	4.56	25	-2.87

5.6 GHz Band

20 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Calculated Conducted Output Power (dBm)
5500	49.61	V(chain 1)	33.977	20	4.59	25	-1.59
5500	53.16	H(chain 2)	33.977	20	4.59	25	1.95
5500	50.37	V(chain 4)	33.977	20	4.59	25	-0.83
5500	53.15	H(chain 3)	33.977	20	4.59	25	1.94
5590	49.83	V(chain 1)	33.977	20	4.59	25	-1.37
5590	52.95	H(chain 2)	33.977	20	4.59	25	1.74
5590	50.35	V(chain 4)	33.977	20	4.59	25	-0.85
5590	53.32	H(chain 3)	33.977	20	4.59	25	2.11
5700	52.02	V(chain 1)	33.977	20	4.59	25	0.81
5700	53.22	H(chain 2)	33.977	20	4.59	25	2.01
5700	52.81	V(chain 4)	33.977	20	4.59	25	1.60
5700	53.49	H(chain 3)	33.977	20	4.59	25	2.28

40 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Calculated Conducted Output Power (dBm)
5510	47.18	V(chain 1)	33.977	20	4.59	25	-4.02
5510	50.29	H(chain 2)	33.977	20	4.59	25	-0.91
5510	47.41	V(chain 4)	33.977	20	4.59	25	-3.79
5510	49.08	H(chain 3)	33.977	20	4.59	25	-2.12
5555	46.8	V(chain 1)	33.977	20	4.59	25	-4.40
5555	50.12	H(chain 2)	33.977	20	4.59	25	-1.08
5555	46.89	V(chain 4)	33.977	20	4.59	25	-4.31
5555	49.33	H(chain 3)	33.977	20	4.59	25	-1.87
5690	48.41	V(chain 1)	33.977	20	4.59	25	-2.79
5690	49.95	H(chain 2)	33.977	20	4.59	25	-1.25
5690	49.43	V(chain 4)	33.977	20	4.59	25	-1.77
5690	49.64	H(chain 3)	33.977	20	4.59	25	-1.56

80 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m)	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Calculated Conducted Output Power (dBm)
5530	44.66	V(chain 1)	33.977	20	4.59	25	-6.54
5530	48.23	H(chain 2)	33.977	20	4.59	25	-2.97
5530	46.14	V(chain 4)	33.977	20	4.59	25	-5.06
5530	47.75	H(chain 3)	33.977	20	4.59	25	-3.45
5545	44.77	V(chain 1)	33.977	20	4.59	25	-6.43
5545	47.84	H(chain 2)	33.977	20	4.59	25	-3.36
5545	46.36	V(chain 4)	33.977	20	4.59	25	-4.84
5545	47.64	H(chain 3)	33.977	20	4.59	25	-3.56
5560	44.62	V(chain 1)	33.977	20	4.59	25	-6.58
5560	48.03	H(chain 2)	33.977	20	4.59	25	-3.17
5560	45.8	V(chain 4)	33.977	20	4.59	25	-5.40
5560	48.09	H(chain 3)	33.977	20	4.59	25	-3.11

Beamforming

5.3 GHz Band

20 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Calculated Conducted Output Power (dBm)
5260	68.88	V	33.835	0	4.56	25	-2.49
5260	68.11	H	33.835	0	4.56	25	-3.26
5295	69.15	V	33.835	0	4.56	25	-2.22
5295	68.82	H	33.835	0	4.56	25	-2.55
5320	68.04	V	33.835	0	4.56	25	-3.33
5320	68.59	H	33.835	0	4.56	25	-2.78

40 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Calculated Conducted Output Power (dBm)
5270	68.67	V	33.835	0	4.56	25	-2.70
5270	67.87	H	33.835	0	4.56	25	-3.50
5290	67.19	V	33.835	0	4.56	25	-4.18
5290	67.77	H	33.835	0	4.56	25	-3.60
5310	66.76	V	33.835	0	4.56	25	-4.61
5310	67.38	H	33.835	0	4.56	25	-3.99

80 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Calculated Conducted Output Power (dBm)
5290	64.07	V	33.835	0	4.56	25	-7.30
5290	64.91	H	33.835	0	4.56	25	-6.46

5.6 GHz Band

20 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Calculated Conducted Output Power (dBm)
5500	68.43	V	33.977	0	4.59	25	-2.77
5500	67.81	H	33.977	0	4.59	25	-3.39
5590	67.77	V	33.977	0	4.59	25	-3.43
5590	67.87	H	33.977	0	4.59	25	-3.33
5700	69.35	V	33.977	0	4.59	25	-1.85
5700	68.75	H	33.977	0	4.59	25	-2.45

40 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Calculated Conducted Output Power (dBm)
5510	68.25	V	33.977	0	4.59	25	-2.95
5510	67.67	H	33.977	0	4.59	25	-3.53
5555	65.27	V	33.977	0	4.59	25	-5.93
5555	65.34	H	33.977	0	4.59	25	-5.86
5690	66.68	V	33.977	0	4.59	25	-4.52
5690	66.21	H	33.977	0	4.59	25	-4.99

80 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Calculated Conducted Output Power (dBm)
5530	69.65	V	33.977	0	4.59	25	-1.55
5530	69.59	H	33.977	0	4.59	25	-1.61
5545	60.42	V	33.977	0	4.59	25	-10.78
5545	59.82	H	33.977	0	4.59	25	-11.38
5560	63.74	V	33.977	0	4.59	25	-7.46
5560	63.69	H	33.977	0	4.59	25	-7.51

Combined Output Power:

5.3 GHz Band

20 MHz Bandwidth

Channel	Frequency (MHz)	Conducted Output Power C1/C2 (dBm)	Conducted Output Power C3/C4 (dBm)	Total Output Power C1, C2 (dBm)	Total Output Power C3, C4 (dBm)	Limit (dBm)
Low	5260	-0.05/0.67	1.55/0.99	3.34	**4.29**	5
Middle	5295	-0.30/1.15	1.71/0.49	3.50	4.16	5
High	5320	-1.24/1.30	1.59/0.20	3.22	3.97	5

40 MHz Bandwidth

Channel	Frequency (MHz)	Conducted Output Power C1/C2 (dBm)	Conducted Output Power C3/C4 (dBm)	Total Output Power C1, C2 (dBm)	Total Output Power C3, C4 (dBm)	Limit (dBm)
Low	5270	-3.02/-1.86	-2.24/-2.89	0.60	0.45	5
Middle	5290	-3.31/-1.87	-2.36/-2.68	0.47	**0.49**	5
High	5310	-3.62/-1.86	-2.25/-3.47	0.35	0.19	5

80 MHz Bandwidth

Channel	Frequency (MHz)	Conducted Output Power C1/C2 (dBm)	Conducted Output Power C3/C4 (dBm)	Total Output Power C1, C2 (dBm)	Total Output Power C3, C4 (dBm)	Limit (dBm)
High	5290	-5.68/-2.86	-2.87/-4.24	-1.04	**-0.50**	5

Note: Antenna gan of EUT is 25 dBi which is over 19 dB of 6 dBi allowed by FCC Part 15.407 (a)(2), a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 6 dBi

5.6 GHz Band

20 MHz Bandwidth

Channel	Frequency (MHz)	Conducted Output Power C1/C2 (dBm)	Conducted Output Power C3/C4 (dBm)	Total Output Power C1, C2 (dBm)	Total Output Power C3, C4 (dBm)	Limit (dBm)
Low	5500	-1.59/1.95	1.94/-0.83	3.55	3.79	5
Middle	5590	-1.37/1.74	2.11/-0.85	3.47	3.89	5
High	5700	0.81/2.01	2.28/1.60	4.47	**4.97**	5

40 MHz Bandwidth

Channel	Frequency (MHz)	Conducted Output Power C1/C2 (dBm)	Conducted Output Power C3/C4 (dBm)	Total Output Power C1, C2 (dBm)	Total Output Power C3, C4 (dBm)	Limit (dBm)
Low	5510	-4.02/-0.91	-2.12/-3.79	0.81	0.13	5
Middle	5555	-4.40/-1.08	-1.87/-4.31	0.58	0.09	5
High	5690	-2.79/-1.25	-1.56/-1.77	1.06	**1.34**	5

80 MHz Bandwidth

Channel	Frequency (MHz)	Conducted Output Power C1/C2 (dBm)	Conducted Output Power C3/C4 (dBm)	Total Output Power C1, C2 (dBm)	Total Output Power C3, C4 (dBm)	Limit (dBm)
Low	5530	-6.54/-2.97	-3.45/-5.06	-1.39	-1.17	5
Middle	5545	-6.43/-3.36	-3.56/-4.84	-1.62	-1.15	5
High	5560	-6.58/-3.17	-3.11/-5.40	-1.54	**-1.10**	5

Note: Antenna gan of EUT is 25 dBi which is over 19 dB of 6 dBi allowed by FCC Part 15.407 (a)(2), a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 6 dBi

Beamforming

5.3 GHz Band

20 MHz Bandwidth

Channel	Frequency (MHz)	Conducted Output Power @ V (dBm)	Conducted Output Power @ H (dBm)	Limit (dBm)
Low	5260	-2.49	-3.26	5
Middle	5295	-2.22	-2.55	5
High	5320	-3.33	-2.78	5

40 MHz Bandwidth

Channel	Frequency (MHz)	Conducted Output Power @ V (dBm)	Conducted Output Power @ H (dBm)	Limit (dBm)
Low	5270	-2.70	-3.50	5
Middle	5290	-4.18	-3.60	5
High	5310	-4.61	-3.99	5

80 MHz Bandwidth

Channel	Frequency (MHz)	Conducted Output Power @ V (dBm)	Conducted Output Power @ H (dBm)	Limit (dBm)
/	5290	-7.30	-6.46	5

Note: Antenna gan of EUT is 25 dBi which is over 19 dB of 6 dBi allowed by FCC Part 15.407 (a)(2), a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 6 dBi

5.6 GHz Band

20 MHz Bandwidth

Channel	Frequency (MHz)	Conducted Output Power @ V (dBm)	Conducted Output Power @ H (dBm)	Limit (dBm)
Low	5500	-2.77	-3.39	5
Middle	5590	-3.43	-3.33	5
High	5700	-1.85	-2.45	5

40 MHz Bandwidth

Channel	Frequency (MHz)	Conducted Output Power @ V (dBm)	Conducted Output Power @ H (dBm)	Limit (dBm)
Low	5510	-2.95	-3.53	5
Middle	5555	-5.93	-5.86	5
High	5690	-4.52	-4.99	5

80 MHz Bandwidth

Channel	Frequency (MHz)	Conducted Output Power @ V (dBm)	Conducted Output Power @ H (dBm)	Limit (dBm)
Low	5530	-1.55	-1.61	5
Middle	5545	-10.78	-11.38	5
High	5560	-7.46	-7.51	5

Note: Antenna gan of EUT is 25 dBi which is over 19 dB of 6 dBi allowed by FCC Part 15.407 (a)(2), a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 6 dBi

10 FCC §15.407(a)(2) - Power Spectral Density

10.1 Applicable Standard

According to FCC §15.407(a)(2)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 226 dB Emission Bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

10.2 Measurement Procedure

The measurements are base on FCC KDB 789033 D02 General UNII Test Procedures v01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section F:
Peak power spectral density (PPSD)

10.3 Test Equipment List and Details

Manufacturers	Description	Models	Serial Numbers	Calibration Dates	Calibration Interval
Agilent	Spectrum Analyzer	E4440A	US42221851	2013-02-28	1 year
EMCO	Antenna, Horn	3115	9511-4627	2013-10-17	1 year
Mini-Circuits	Pre-amplifier	ZVA-183-S	570400946	2013-05-09	1 year
Sunol Science Corp	System Controller	SC99V	122303-1	N/R	N/R

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.*

10.4 Test Environmental Conditions

Temperature:	21-23 °C
Relative Humidity:	43-48 %
ATM Pressure:	101.1-101.3 kPa

The testing was performed by Cipher Chu on 2014-03-06 to 2014-03-14 at the 10m chamber 1.

10.5 Test Results

Note: Chain1 and Chain 4 is Vertical, and Chain 2 and Chain 3 is Horizontal
Note: C1, C2, C3 and C4 stands for Chain 1, Chain 2, Chain 3 and Chain 4.

The Calculated PSD (dBm) was calculated from the following formula:

Corrected PSD = EIRP – Antenna Gain = E[dBuV/m] + 20 log(d[meters]) - 104.77 - 25 dBi

Where d=10 meters

5.3 GHz Band

20 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Corrected PSD (dBm)
5260	49.183	V(chain 1)	33.835	10	4.56	25	-12.19
5260	49.114	H(chain 2)	33.835	10	4.56	25	-12.26
5260	49.565	V(chain 4)	33.835	10	4.56	25	-11.81
5260	48.34	H(chain 3)	33.835	10	4.56	25	-13.03
5295	49.431	V(chain 1)	33.835	10	4.56	25	-11.94
5295	48.12	H(chain 2)	33.835	10	4.56	25	-13.25
5295	49.48	V(chain 4)	33.835	10	4.56	25	-11.89
5295	48.799	H(chain 3)	33.835	10	4.56	25	-12.57
5320	49.642	V(chain 1)	33.835	10	4.56	25	-11.73
5320	47.605	H(chain 2)	33.835	10	4.56	25	-13.77
5320	49.591	V(chain 4)	33.835	10	4.56	25	-11.78
5320	48.289	H(chain 3)	33.835	10	4.56	25	-13.08

40 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Corrected PSD (dBm)
5270	49.453	V(chain 1)	33.835	10	4.56	25	-11.92
5270	45.458	H(chain 2)	33.835	10	4.56	25	-15.91
5270	49.256	V(chain 4)	33.835	10	4.56	25	-12.11
5270	48.115	H(chain 3)	33.835	10	4.56	25	-13.26
5290	49.327	V(chain 1)	33.835	10	4.56	25	-12.04
5290	45.265	H(chain 2)	33.835	10	4.56	25	-16.11
5290	49.271	V(chain 4)	33.835	10	4.56	25	-12.10
5290	48.083	H(chain 3)	33.835	10	4.56	25	-13.29
5310	49.421	V(chain 1)	33.835	10	4.56	25	-11.95
5310	44.317	H(chain 2)	33.835	10	4.56	25	-17.05
5310	49.271	V(chain 4)	33.835	10	4.56	25	-12.10
5310	47.508	H(chain 3)	33.835	10	4.56	25	-13.86

80 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Corrected PSD (dBm)
5290	47.453	V(chain 1)	33.835	10	4.56	25	-13.92
5290	42.728	H(chain 2)	33.835	10	4.56	25	-18.64
5290	49.328	V(chain 4)	33.835	10	4.56	25	-12.04
5290	47.352	H(chain 3)	33.835	10	4.56	25	-14.02

5.6 GHz Band

20 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Corrected PSD (dBm)
5500	48.283	V(chain 1)	33.977	10	4.59	25	-12.92
5500	47.167	H(chain 2)	33.977	10	4.59	25	-14.03
5500	49.602	V(chain 4)	33.977	10	4.59	25	-11.60
5500	48.068	H(chain 3)	33.977	10	4.59	25	-13.13
5590	46.557	V(chain 1)	33.977	10	4.59	25	-14.64
5590	47.437	H(chain 2)	33.977	10	4.59	25	-13.76
5590	48.68	V(chain 4)	33.977	10	4.59	25	-12.52
5590	49.579	H(chain 3)	33.977	10	4.59	25	-11.62
5700	45.813	V(chain 1)	33.977	10	4.59	25	-15.39
5700	47.843	H(chain 2)	33.977	10	4.59	25	-13.36
5700	48.798	V(chain 4)	33.977	10	4.59	25	-12.40
5700	49.575	H(chain 3)	33.977	10	4.59	25	-11.62

40 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Corrected PSD (dBm)
5510	49.026	V(chain 1)	33.977	10	4.59	25	-12.17
5510	44.236	H(chain 2)	33.977	10	4.59	25	-16.96
5510	49.127	V(chain 4)	33.977	10	4.59	25	-12.07
5510	47.617	H(chain 3)	33.977	10	4.59	25	-13.58
5555	47.856	V(chain 1)	33.977	10	4.59	25	-13.34
5555	44.011	H(chain 2)	33.977	10	4.59	25	-17.19
5555	48.145	V(chain 4)	33.977	10	4.59	25	-13.05
5555	46.084	H(chain 3)	33.977	10	4.59	25	-15.11
5690	44.4	V(chain 1)	33.977	10	4.59	25	-16.80
5690	45.082	H(chain 2)	33.977	10	4.59	25	-16.12
5690	48.282	V(chain 4)	33.977	10	4.59	25	-12.92
5690	48.115	H(chain 3)	33.977	10	4.59	25	-13.08

80 MHz Bandwidth

Frequency (MHz)	Radiated Reading dBµV @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Corrected PSD (dBm)
5530	46.841	V(chain 1)	33.977	10	4.59	25	-14.36
5530	49.394	H(chain 2)	33.977	10	4.59	25	-11.80
5530	49.366	V(chain 4)	33.977	10	4.59	25	-11.83
5530	48.073	H(chain 3)	33.977	10	4.59	25	-13.13
5545	46.558	V(chain 1)	33.977	10	4.59	25	-14.64
5545	49.363	H(chain 2)	33.977	10	4.59	25	-11.84
5545	49.052	V(chain 4)	33.977	10	4.59	25	-12.15
5545	48.031	H(chain 3)	33.977	10	4.59	25	-13.17
5560	45.423	V(chain 1)	33.977	10	4.59	25	-15.78
5560	48.871	H(chain 2)	33.977	10	4.59	25	-12.33
5560	48.701	V(chain 4)	33.977	10	4.59	25	-12.50
5560	48.446	H(chain 3)	33.977	10	4.59	25	-12.75

Beamforming

5.3 GHz Band

20 MHz Bandwidth

Frequency (MHz)	Radiated Reading (dBµV/m @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Corrected PSD (dBm)
5260	58.721	V	33.835	0	4.56	25	-12.88
5260	58.554	H	33.835	0	4.56	25	-12.56
5295	58.858	V	33.835	0	4.56	25	-13.53
5295	58.144	H	33.835	0	4.56	25	-13.39
5320	58.133	V	33.835	0	4.56	25	-12.34
5320	58.181	H	33.835	0	4.56	25	-12.42

40 MHz Bandwidth

Frequency (MHz)	Radiated Reading (dBµV/m @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Corrected PSD (dBm)
5270	57.823	V	33.835	0	4.56	25	-13.55
5270	58.053	H	33.835	0	4.56	25	-13.32
5290	57.547	V	33.835	0	4.56	25	-13.82
5290	57.653	H	33.835	0	4.56	25	-13.72
5310	56.337	V	33.835	0	4.56	25	-15.03
5310	56.858	H	33.835	0	4.56	25	-14.517

80 MHz Bandwidth

Frequency (MHz)	Radiated Reading (dBµV/m @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Corrected PSD (dBm)
5290	54.103	V	33.835	0	4.56	25	-17.27
5290	54.209	H	33.835	0	4.56	25	-17.16

5.6 GHz Band

20 MHz Bandwidth

Frequency (MHz)	Radiated Reading (dBµV/m @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Corrected PSD (dBm)
5500	58.316	V	33.977	0	4.59	25	-12.88
5500	58.637	H	33.977	0	4.59	25	-12.56
5590	57.668	V	33.977	0	4.59	25	-13.53
5590	57.805	H	33.977	0	4.59	25	-13.39
5700	58.855	V	33.977	0	4.59	25	-12.34
5700	58.775	H	33.977	0	4.59	25	-12.42

40 MHz Bandwidth

Frequency (MHz)	Radiated Reading (dBµV/m @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Corrected PSD (dBm)
5510	55.064	V	33.977	0	4.59	25	-16.13
5510	55.181	H	33.977	0	4.59	25	-16.02
5555	55.047	V	33.977	0	4.59	25	-16.15
5555	55.351	H	33.977	0	4.59	25	-15.85
5690	55.094	V	33.977	0	4.59	25	-16.10
5690	55.132	H	33.977	0	4.59	25	-16.07

80 MHz Bandwidth

Frequency (MHz)	Radiated Reading (dBµV/m @ 10m	Antenna Polarity (H/V)	Antenna Factor (dB/m)	Attenuator Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Corrected PSD (dBm)
5530	52.668	V	33.977	0	4.59	25	-18.53
5530	52.381	H	33.977	0	4.59	25	-18.82
5545	52.462	V	33.977	0	4.59	25	-18.74
5545	52.398	H	33.977	0	4.59	25	-18.80
5560	51.39	V	33.977	0	4.59	25	-19.81
5560	51.603	H	33.977	0	4.59	25	-19.6

Combined PSD:

5.3 GHz Band

20 MHz Bandwidth

Channel	Frequency (MHz)	Conducted PSD C1/C2 (dBm)	Conducted PSD C3/C4 (dBm)	Total PSD C1,C2 (dBm)	Total PSD C3,C4 (dBm)	Limit (dBm)
Low	5260	-12.19/-12.26	-13.03/-11.81	-9.22	-9.37	-8
Middle	5295	-11.94/-13.25	-12.57/-11.89	-9.54	-9.21	-8
High	5320	-11.72/-13.77	-13.08/-11.78	-9.62	-9.38	-8

40 MHz Bandwidth

Channel	Frequency (MHz)	Conducted PSD C1/C2 (dBm)	Conducted PSD C3/C4 (dBm)	Total PSD C1,C2 (dBm)	Total PSD C3,C4 (dBm)	Limit (dBm)
Low	5270	-11.92/-15.91	-13.26/-12.11	-10.47	-9.64	-8
Middle	5290	-12.04/-16.11	-13.29/-12.10	-10.61	-9.65	-8
High	5310	-11.95/-17.05	-13.86/-12.10	-10.79	-9.89	-8

80 MHz Bandwidth

Channel	Frequency (MHz)	Conducted PSD C1/C2 (dBm)	Conducted PSD C3/C4 (dBm)	Total PSD C1,C2 (dBm)	Total PSD C3,C4 (dBm)	Limit (dBm)
	5290	-13.92/-18.64	-14.02/-12.04	-12.66	-9.91	-8

Note: Antenna gan of EUT is 25 dBi which is over 2 dB of 6 dBi allowed by FCC Part 15.407 (a)(2), a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 6 dBi

5.6 GHz Band

20 MHz Bandwidth

Channel	Frequency (MHz)	Conducted PSD C1/C2 (dBm)	Conducted PSD C3/C4 (dBm)	Total PSD C1,C2 (dBm)	Total PSD C3,C4 (dBm)	Limit (dBm)
Low	5500	-12.92/-14.03	-13.13/-11.60	-10.43	-9.29	-8
Middle	5590	-14.64/-13.76	-11.62/-12.52	-11.17	-9.04	-8
High	5700	-15.39/-13.36	-11.62/-12.40	-11.25	-8.99	-8

40 MHz Bandwidth

Channel	Frequency (MHz)	Conducted PSD C1/C2 (dBm)	Conducted PSD C3/C4 (dBm)	Total PSD C1,C2 (dBm)	Total PSD C3,C4 (dBm)	Limit (dBm)
Low	5510	-12.17/-16.96	-13.58/-12.07	-10.93	-9.76	-8
Middle	5555	-13.34/-17.19	-15.11/-13.05	-11.85	-10.96	-8
High	5690	-16.80/-16.12	-13.08/-12.92	-13.44	-9.99	-8

80 MHz Bandwidth

Channel	Frequency (MHz)	Conducted PSD C1/C2 (dBm)	Conducted PSD C3/C4 (dBm)	Total PSD C1,C2 (dBm)	Total PSD C3,C4 (dBm)	Limit (dBm)
Low	5530	-14.36/-11.80	-13.13/-11.83	-9.89	-9.43	-8
Middle	5545	-14.64/-11.84	-13.17/-12.15	-10.01	-9.62	-8
High	5560	-15.78/-12.33	-12.75/-12.50	-10.71	-9.62	-8

Note: Antenna gan of EUT is 25 dBi which is over 2 dB of 6 dBi allowed by FCC Part 15.407 (a)(2), a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 6 dBi

Beamforming

5.3 GHz Band

20 MHz Bandwidth

Channel	Frequency (MHz)	Conducted PSD H (dBm)	Conducted PSD V (dBm)	Limit (dBm)
Low	5260	-12.82	-12.65	-8
Middle	5295	-13.23	-12.51	-8
High	5320	-13.19	-13.24	-8

40 MHz Bandwidth

Channel	Frequency (MHz)	Conducted PSD H (dBm)	Conducted PSD V (dBm)	Limit (dBm)
Low	5270	-13.32	-13.55	-8
Middle	5290	-13.72	-13.82	-8
High	5310	-14.51	-15.03	-8

80 MHz Bandwidth

Channel	Frequency (MHz)	Conducted PSD H (dBm)	Conducted PSD V (dBm)	Limit (dBm)
High	5290	-17.16	-17.27	-8

Note: Antenna gan of EUT is 25 dBi which is over 2 dB of 6 dBi allowed by FCC Part 15.407 (a)(2), a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 6 dBi

5.6 GHz Band

20 MHz Bandwidth

Channel	Frequency (MHz)	Conducted PSD H (dBm)	Conducted PSD V (dBm)	Limit (dBm)
Low	5500	-12.566	-12.887	-8
Middle	5590	-13.398	-13.535	-8
High	5700	-12.428	-12.348	-8

40 MHz Bandwidth

Channel	Frequency (MHz)	Conducted PSD H (dBm)	Conducted PSD V (dBm)	Limit (dBm)
Low	5510	-16.022	-16.139	-8
Middle	5555	-15.852	-16.156	-8
High	5690	-16.071	-16.109	-8

80 MHz Bandwidth

Channel	Frequency (MHz)	Conducted PSD H (dBm)	Conducted PSD V (dBm)	Limit (dBm)
Low	5530	-18.822	-18.535	-8
Middle	5545	-18.805	-18.741	-8
High	5560	-19.600	-19.813	-8

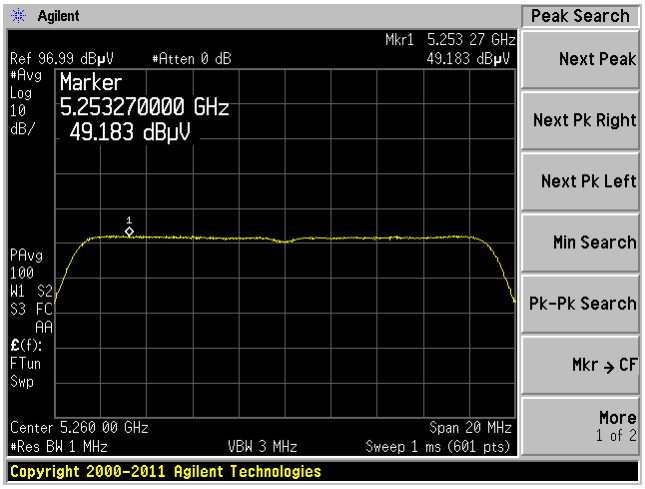
Note: Antenna gan of EUT is 25 dBi which is over 2 dB of 6 dBi allowed by FCC Part 15.407 (a)(2), a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 6 dBi

Please refer to the following plots.

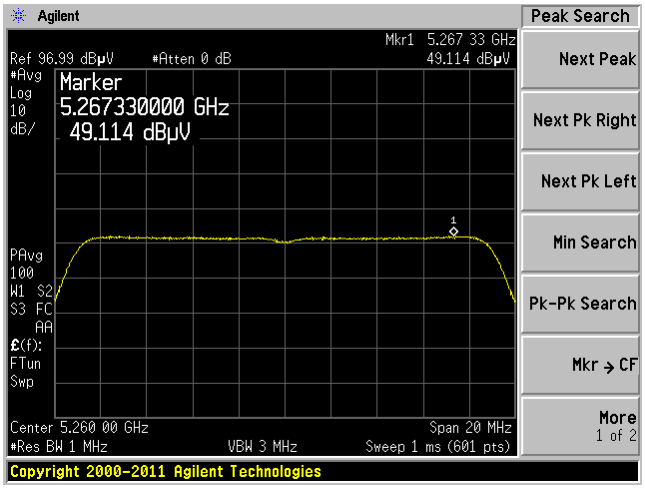
5.3 GHz Band

20 MHz Bandwidth, Low Channel, 5260 MHz

C1



C2



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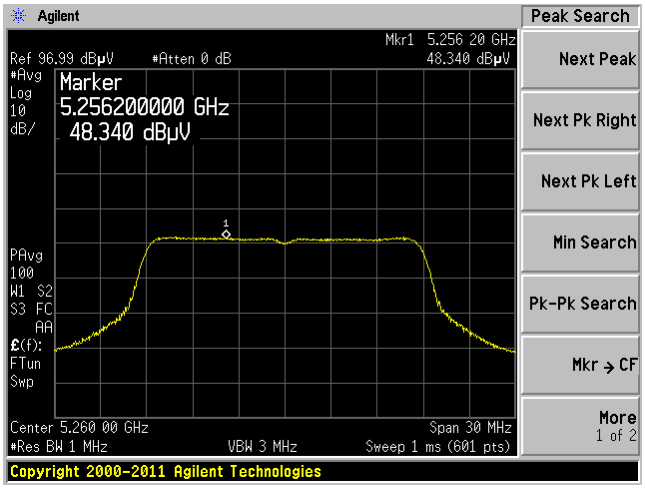
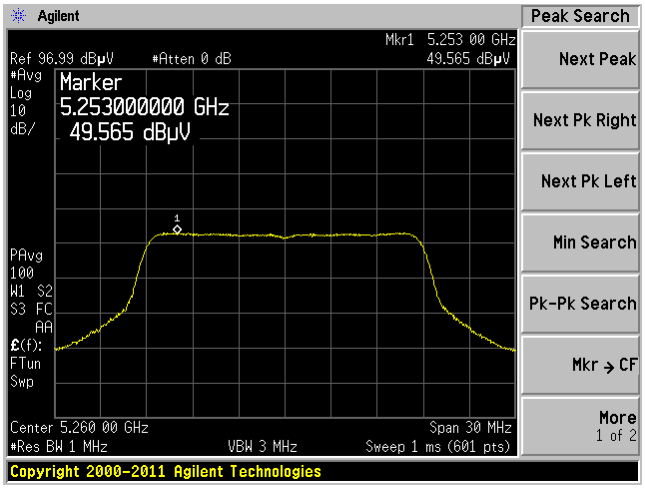
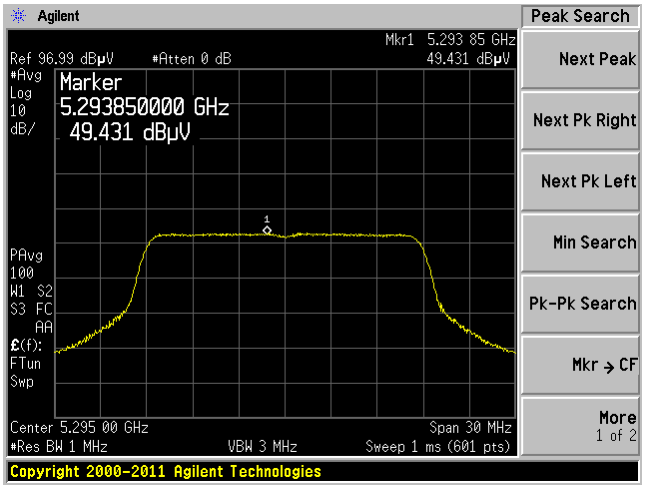


C4

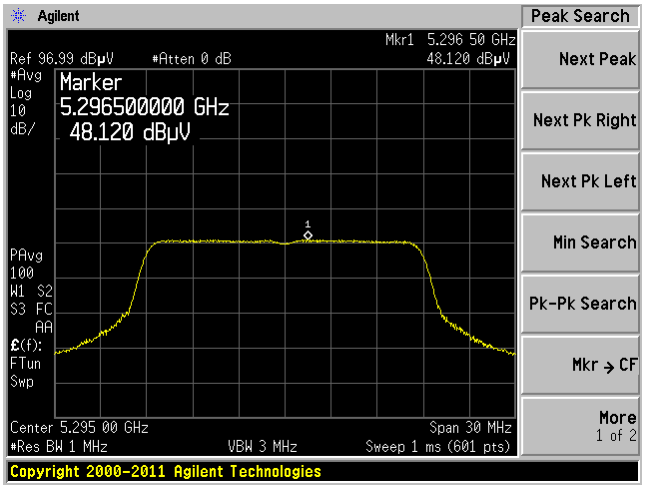


20 MHz Bandwidth, Middle Channel, 5295 MHz

C1



C2



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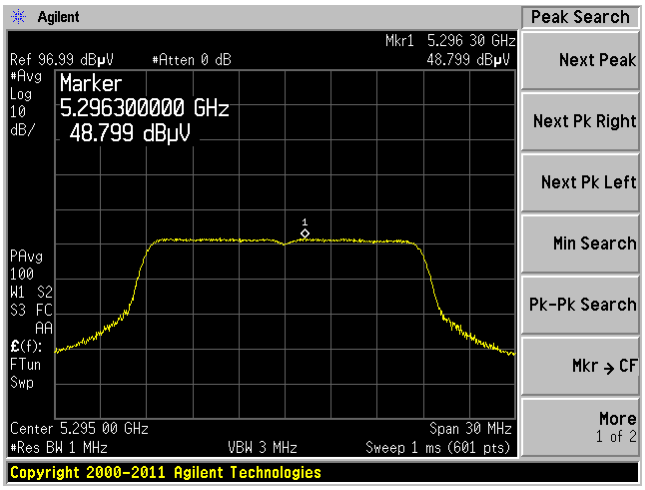
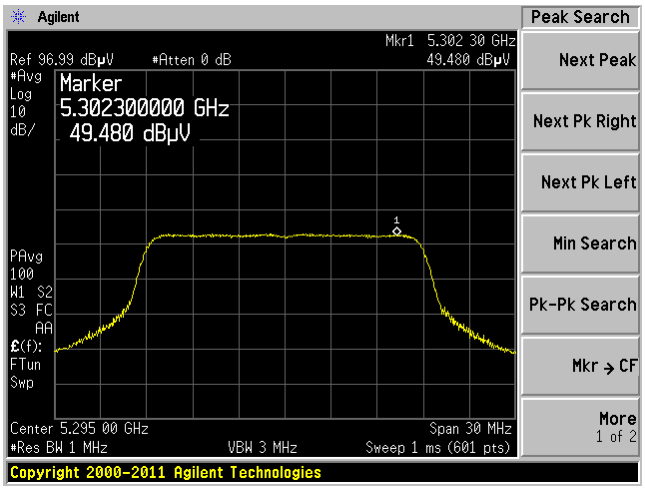
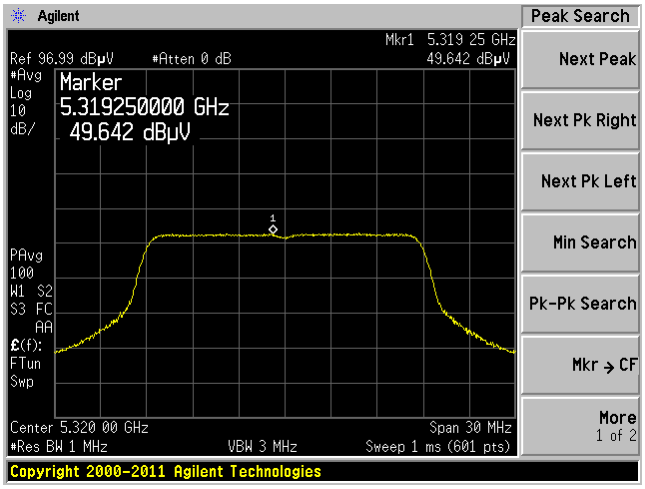


C4

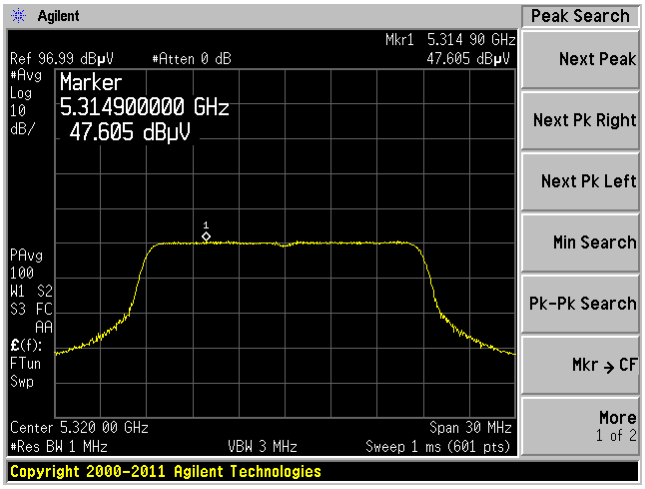


20 MHz Bandwidth, High Channel, 5320 MHz

C1



C2



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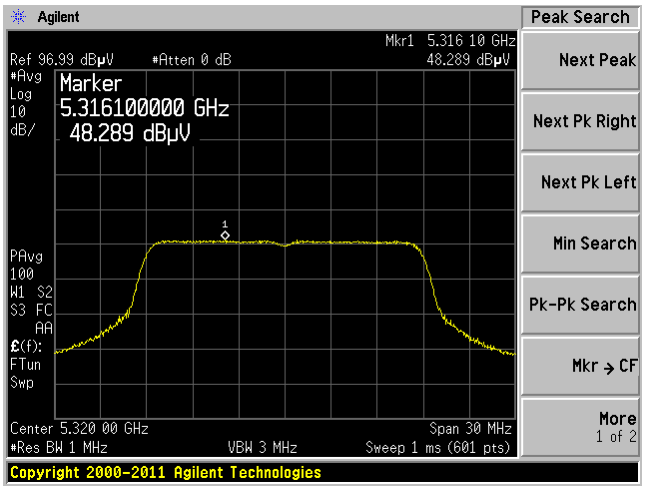
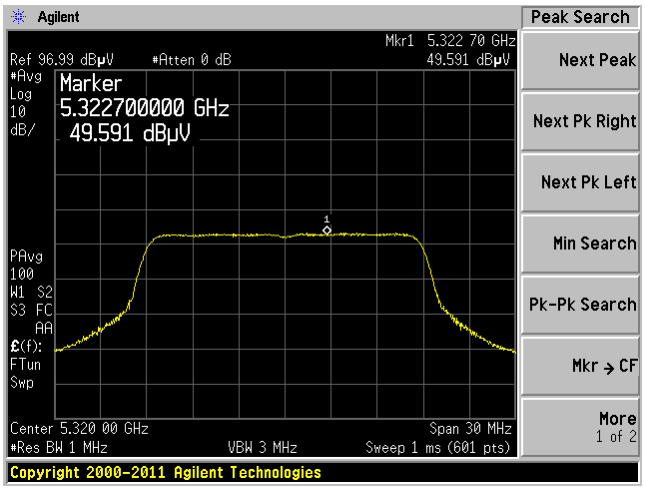
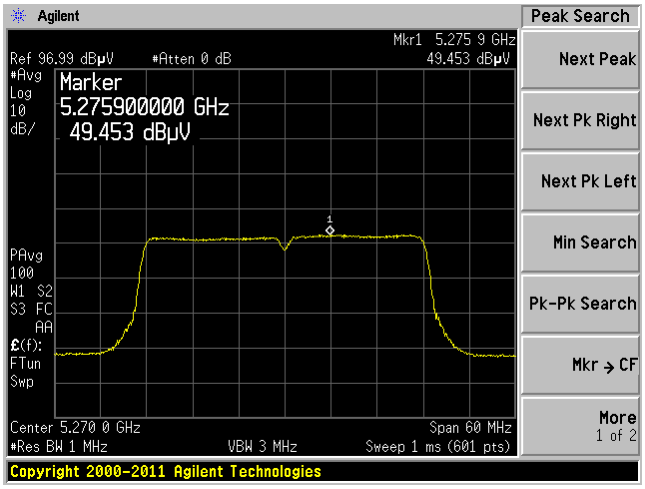


C4

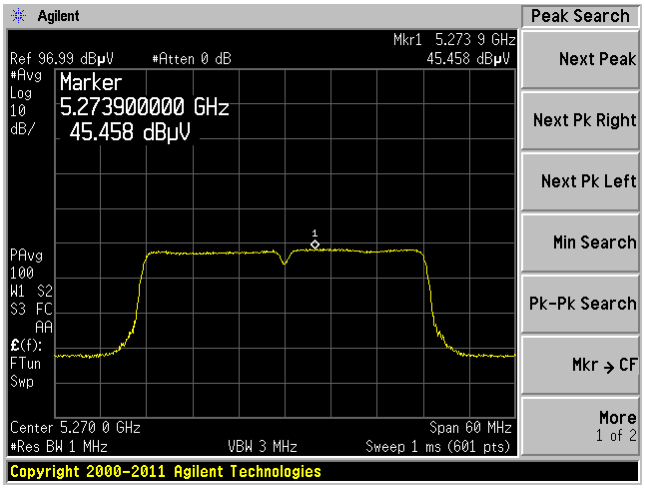


40 MHz Bandwidth, Low Channel, 5270 MHz

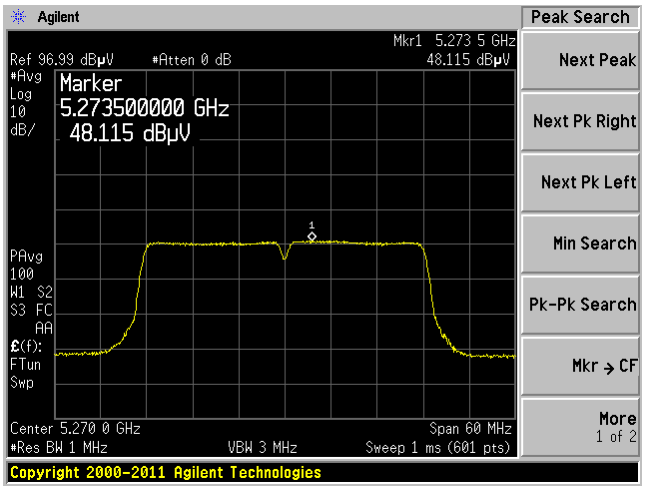
C1



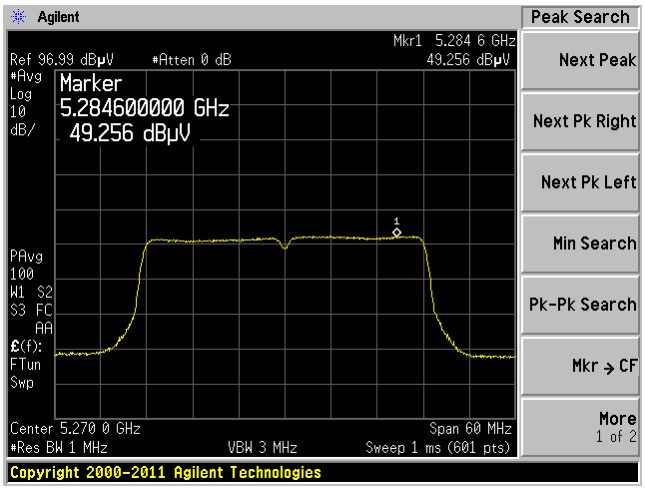
C2



C3

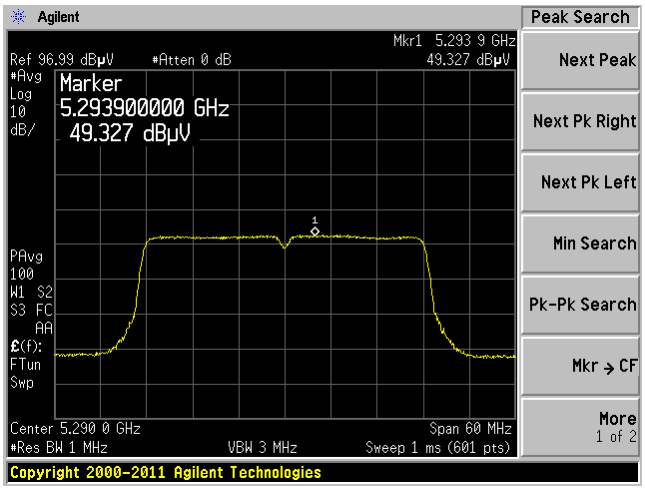


C4

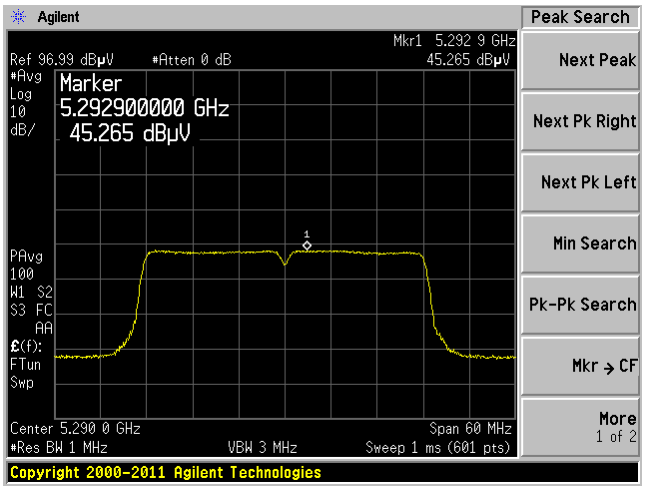


40 MHz Bandwidth, Middle Channel, 5290 MHz

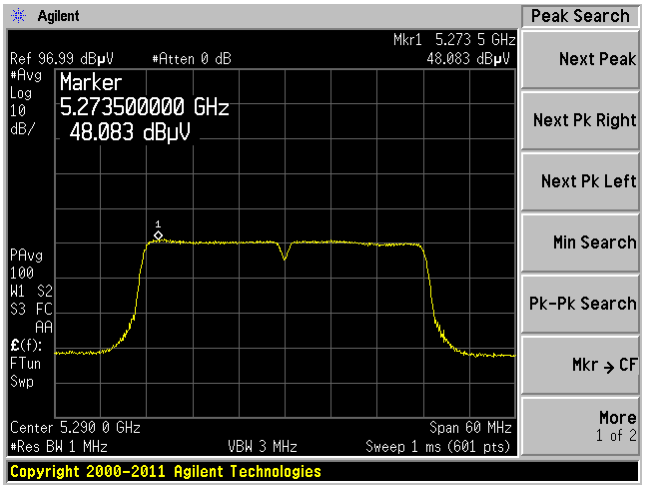
C1



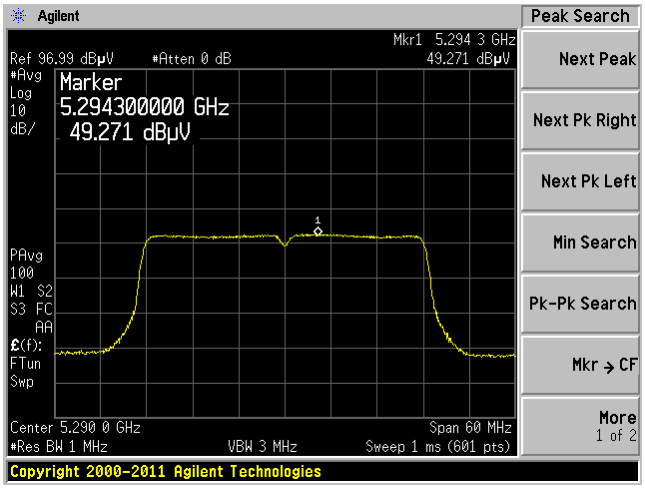
C2



C3

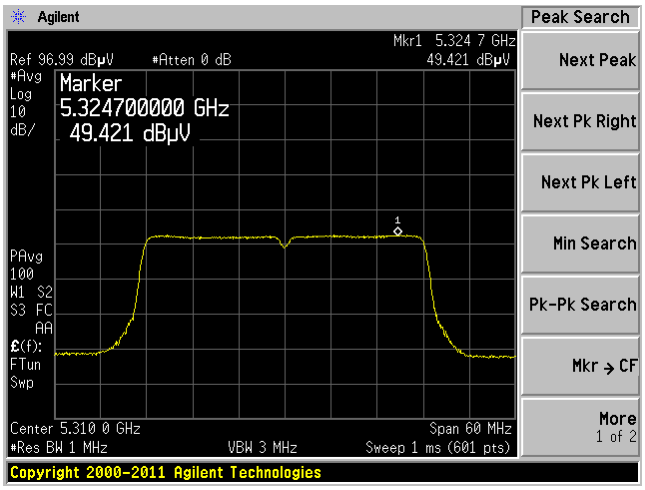


C4

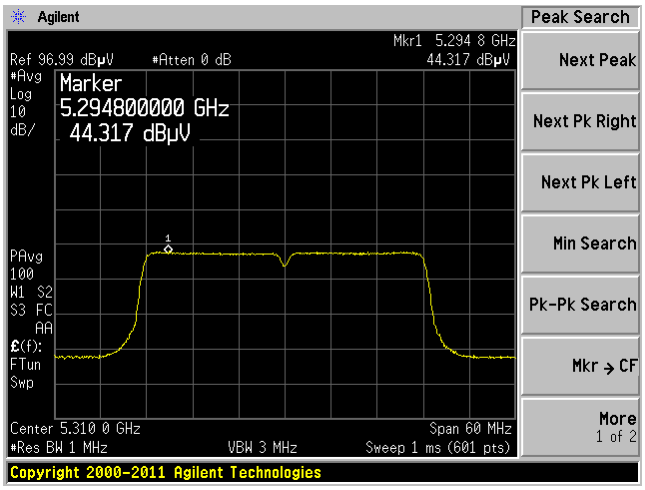


40 MHz Bandwidth, High Channel, 5310 MHz

C1



C2



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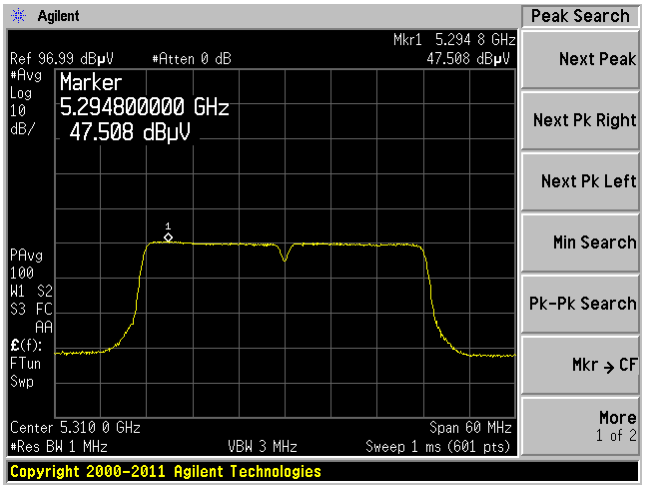
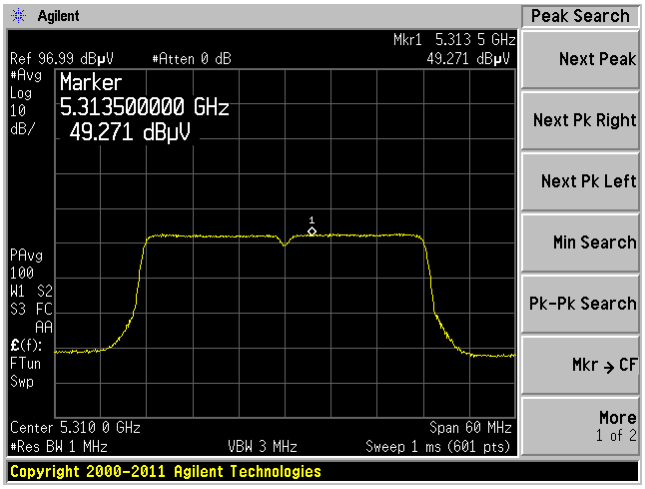
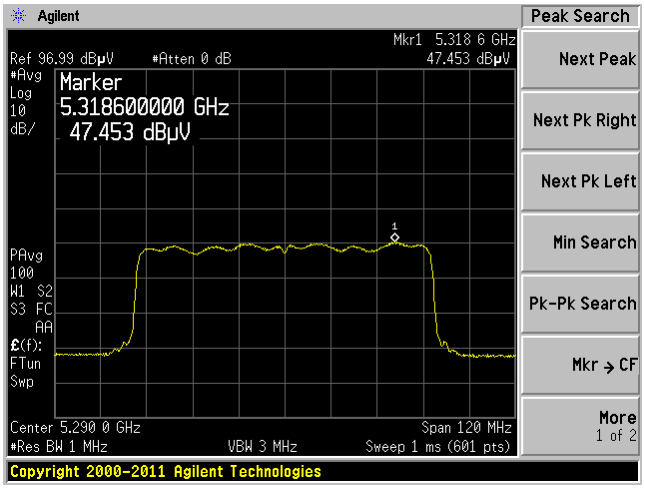


C4

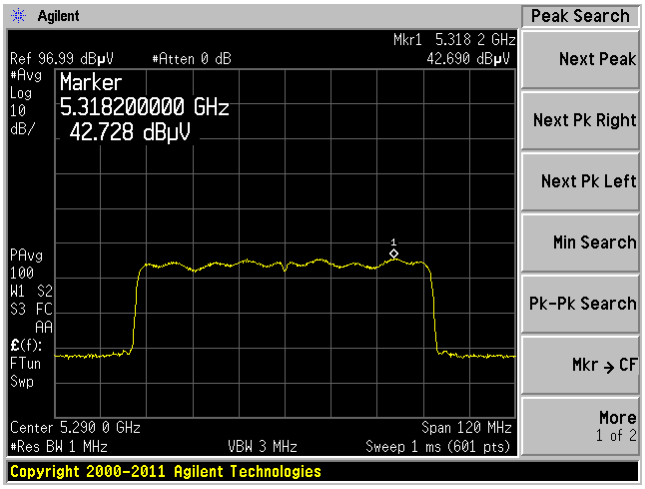


80 MHz Bandwidth, Channel, 5290 MHz

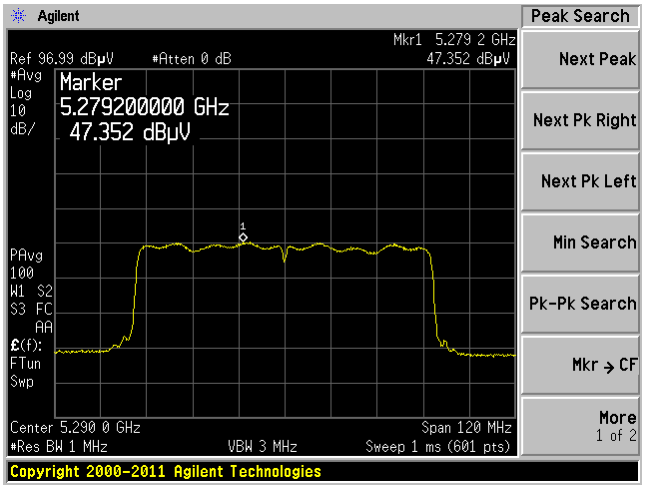
C1



C2



C3



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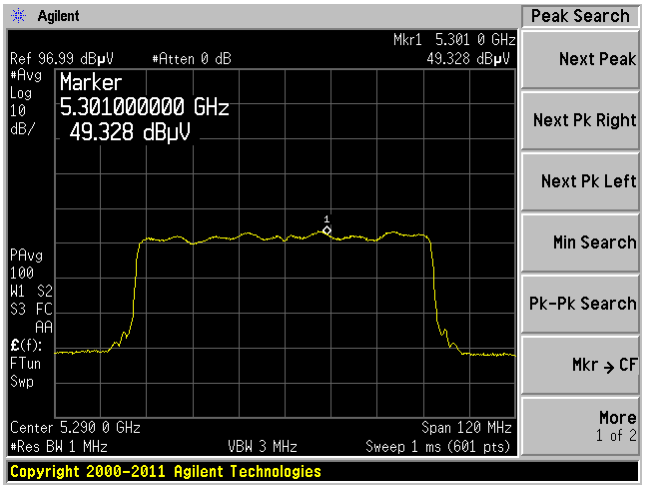
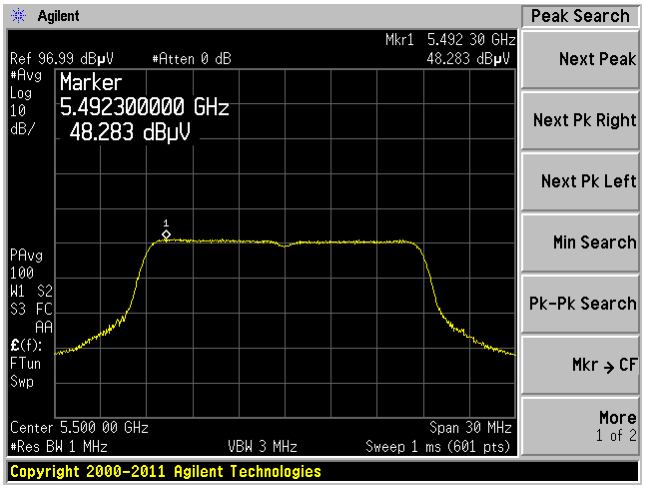


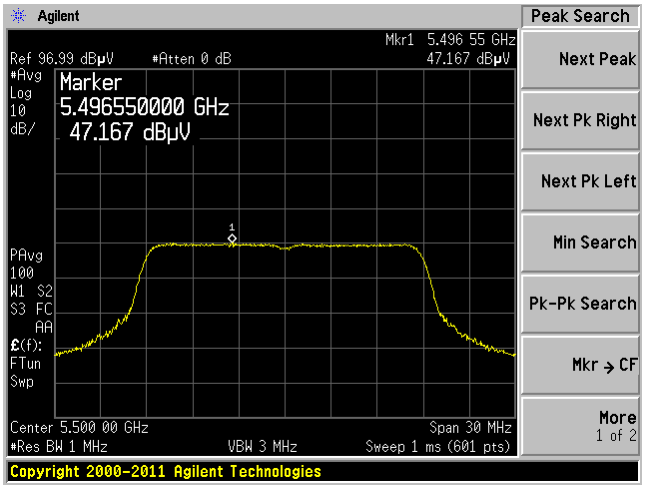
5.6 GHz Band

20 MHz Bandwidth, Low Channel, 5500 MHz

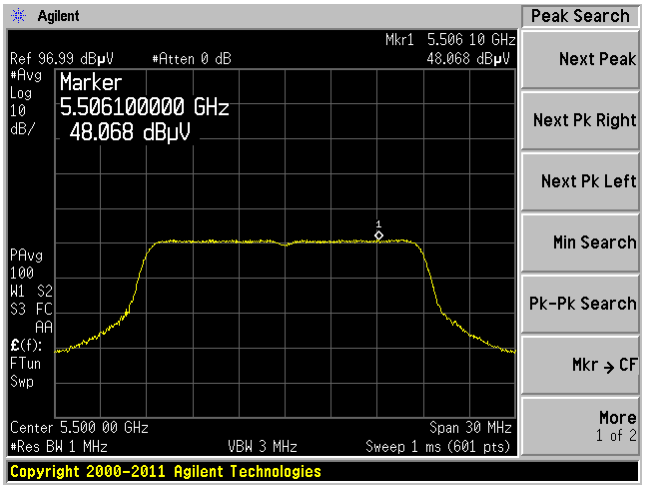
C1



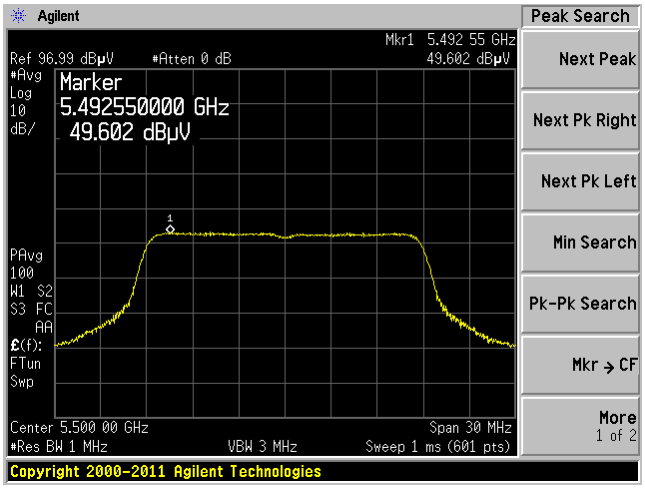
C2



C3

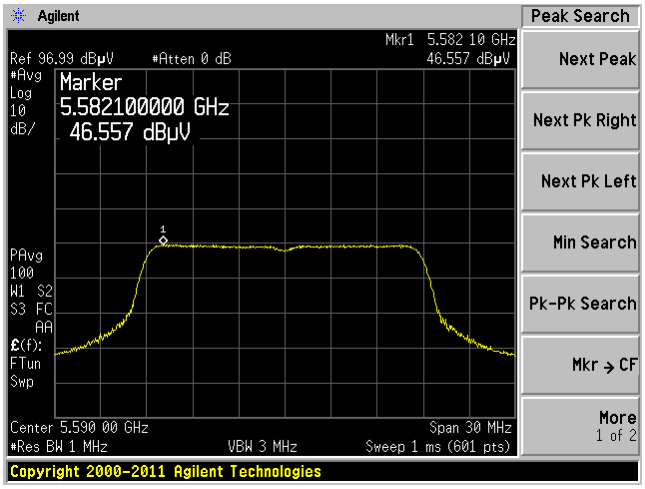


C4



20 MHz Bandwidth, Middle Channel, 5590 MHz

C1



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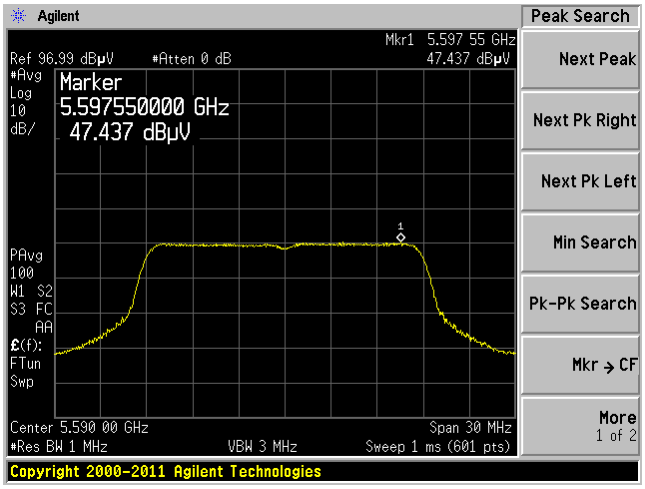

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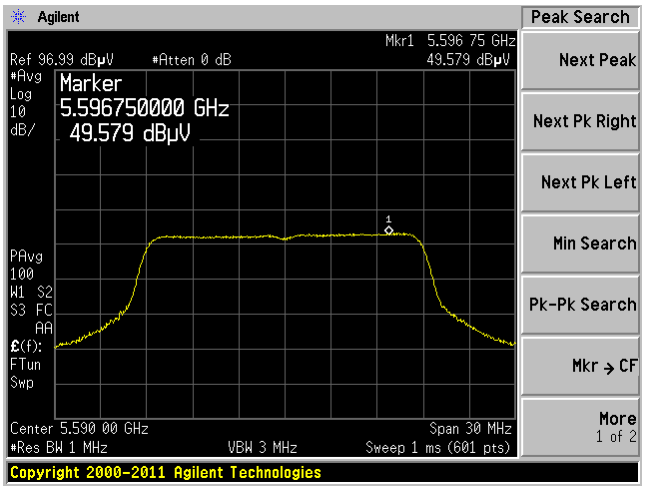

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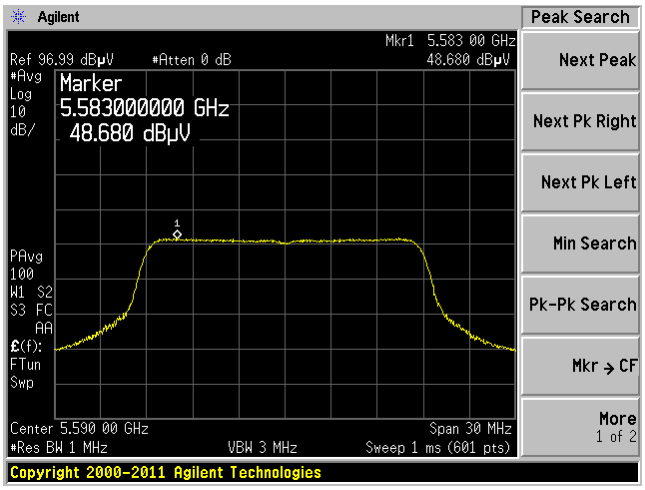
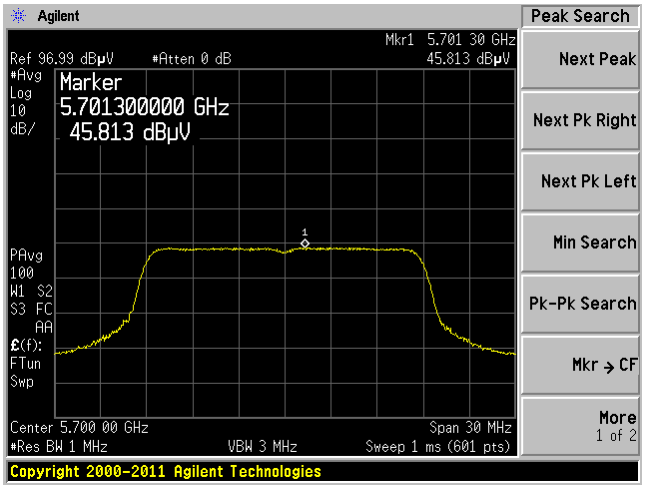
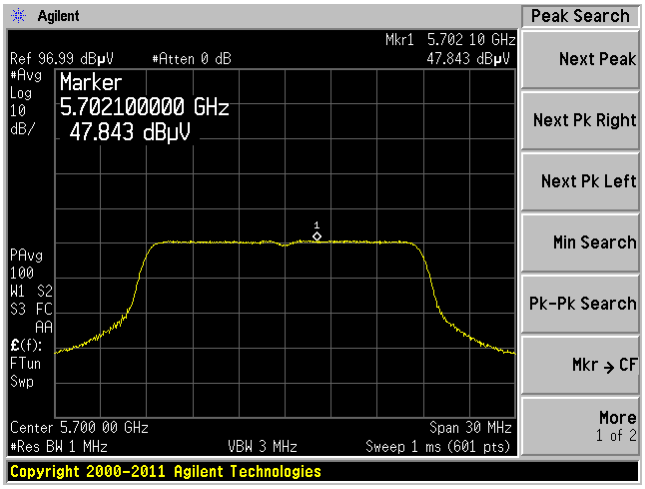


20 MHz Bandwidth, High Channel, 5700 MHz

C1



C2



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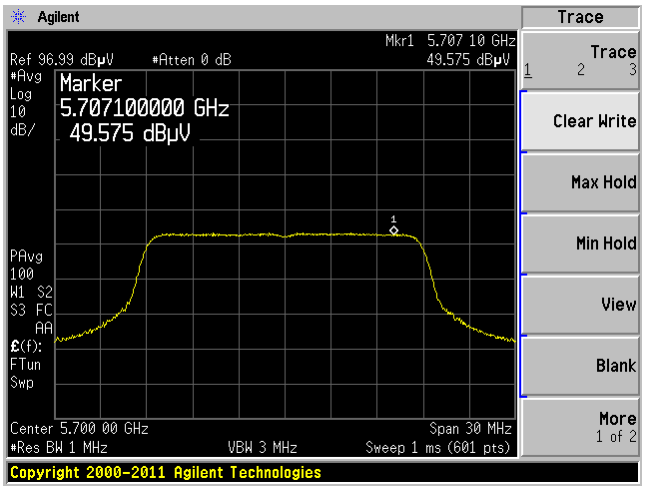

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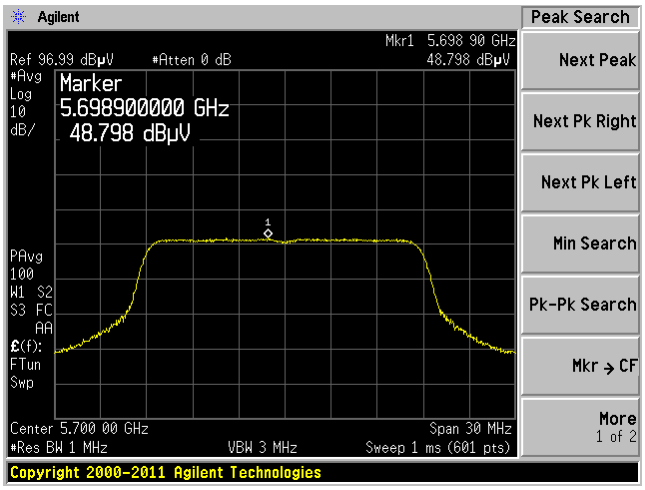
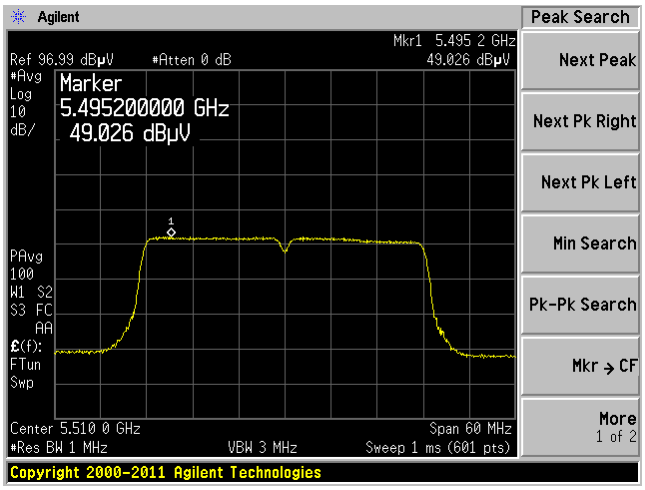
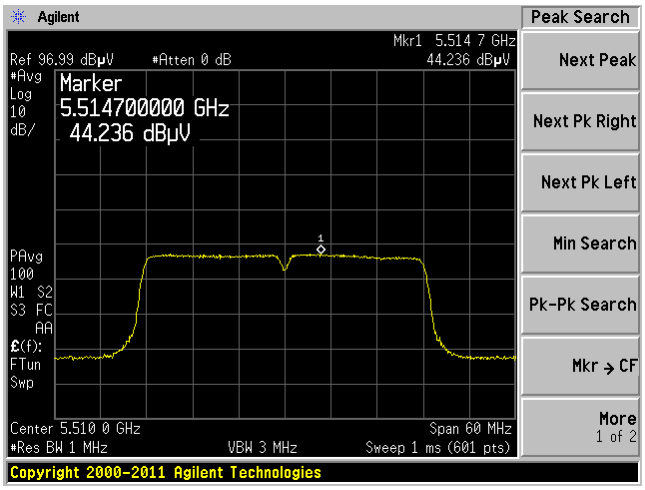


40 MHz Bandwidth, Low Channel, 5510 MHz

C1



C2



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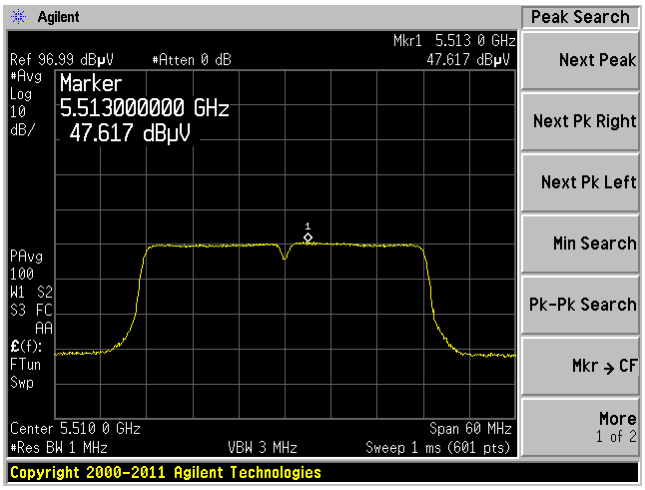
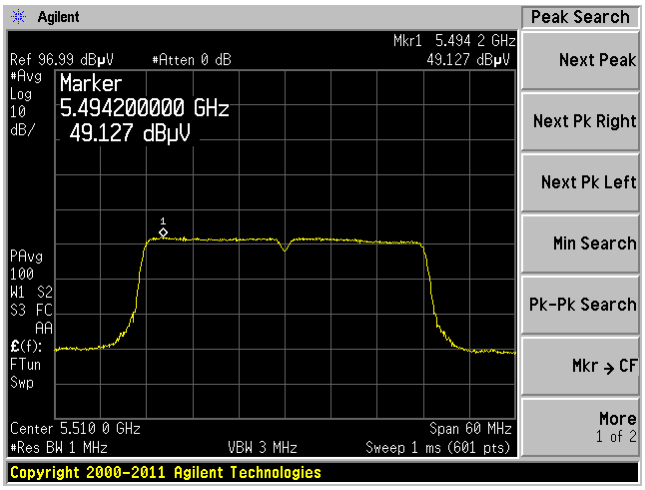
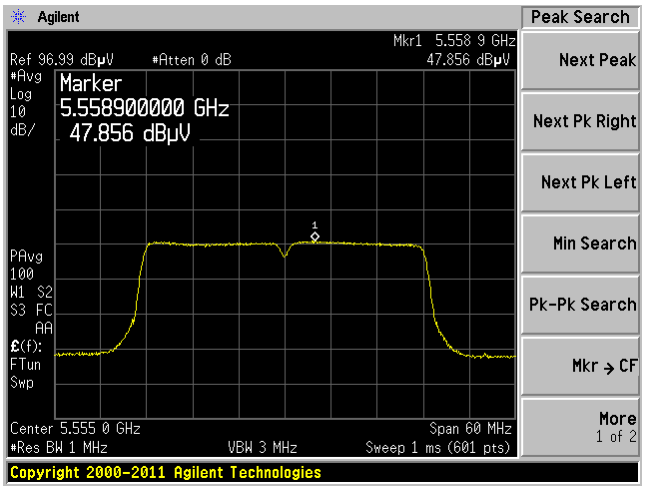


C4

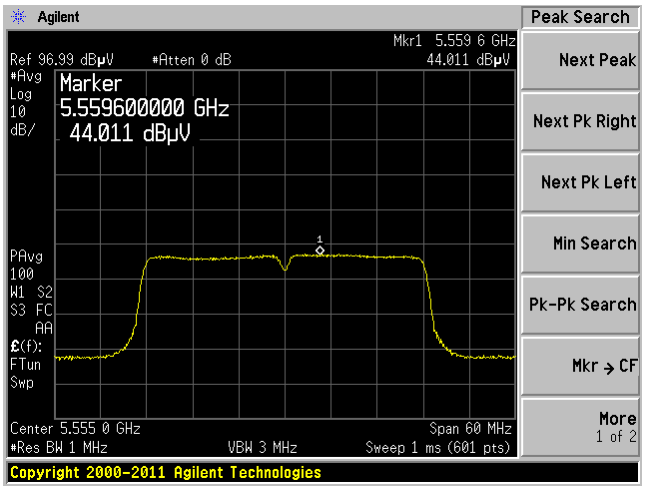


40 MHz Bandwidth, Middle Channel, 5555 MHz

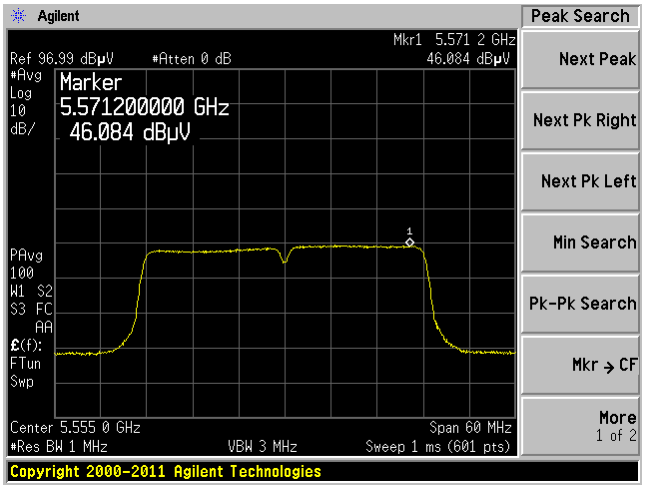
C1



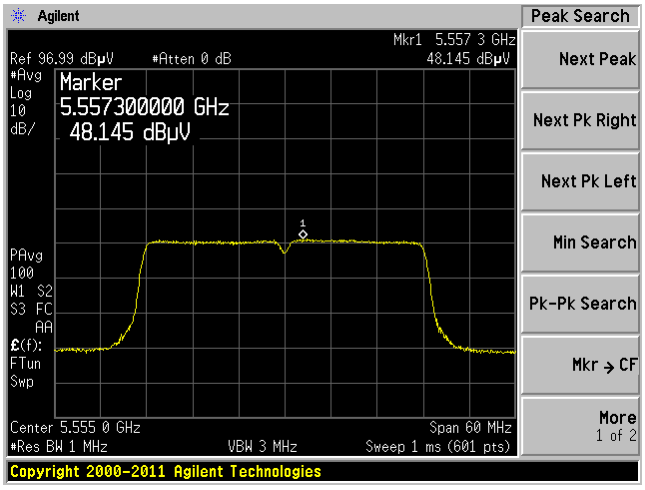
C2



C3

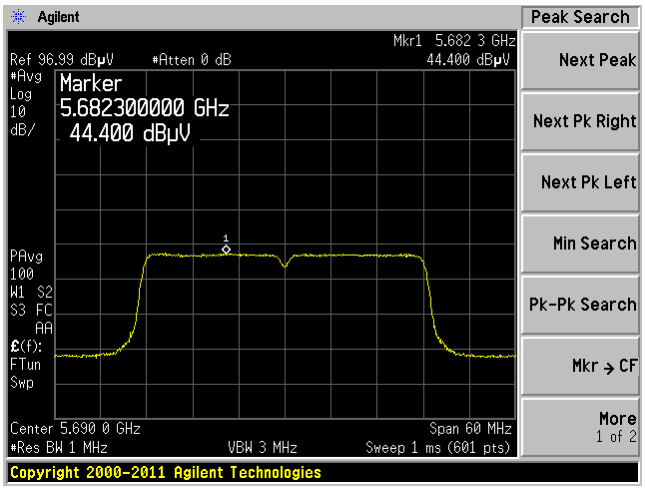


C4

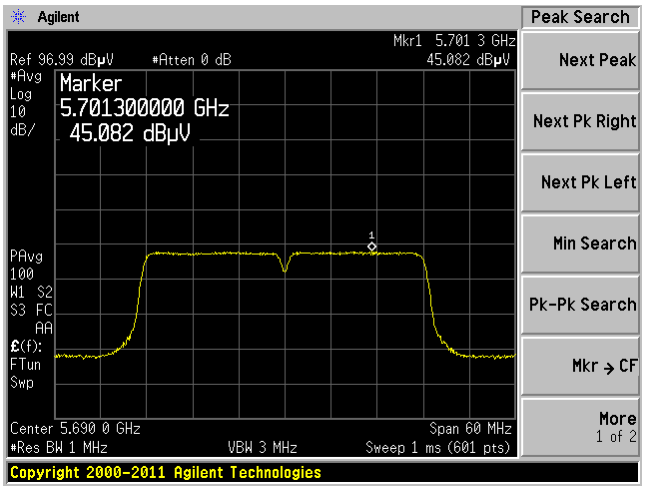


40 MHz Bandwidth, High Channel, 5690 MHz

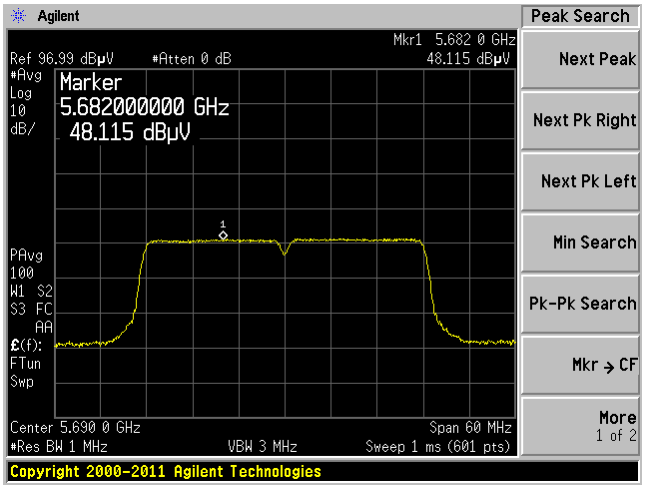
C1



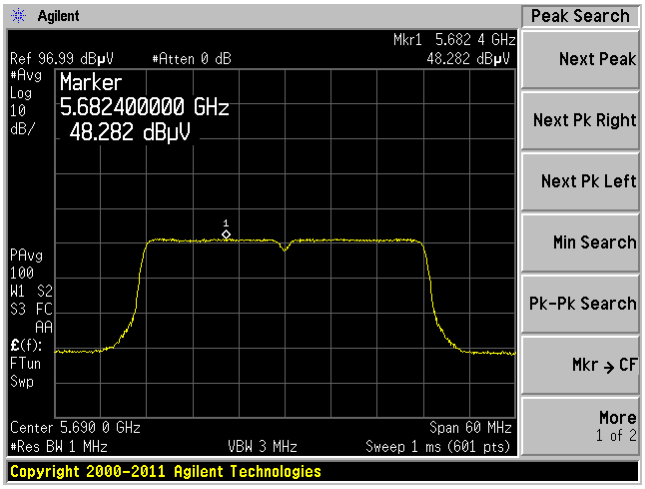
C2



C3

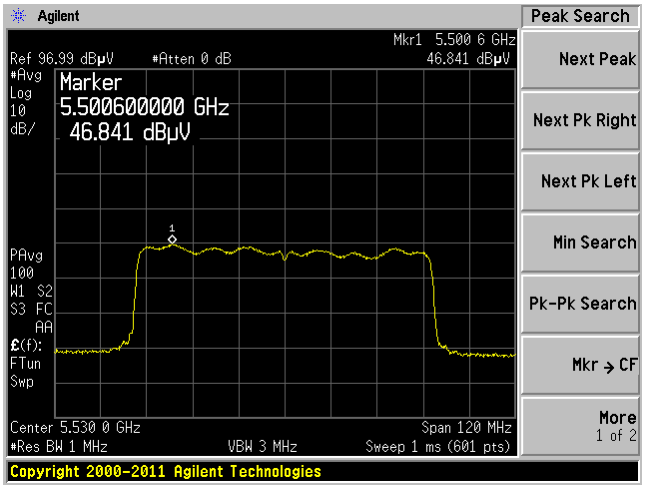


C4

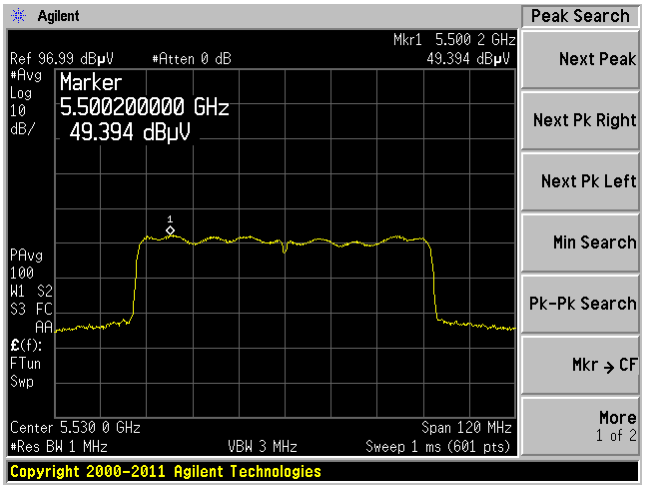


80 MHz Bandwidth, Low Channel, 5530 MHz

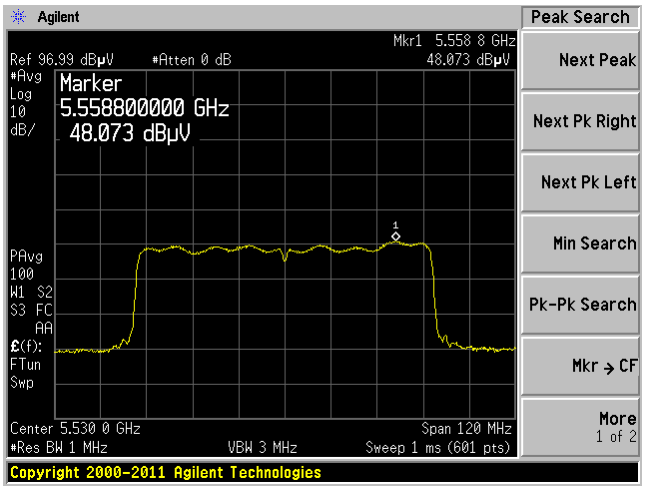
C1



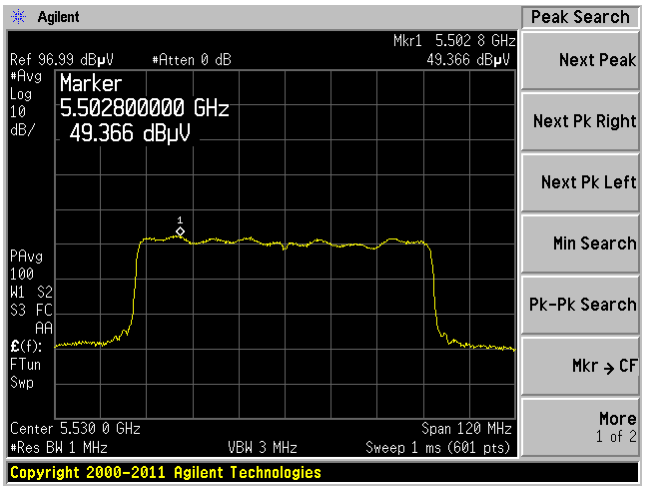
C2



C3

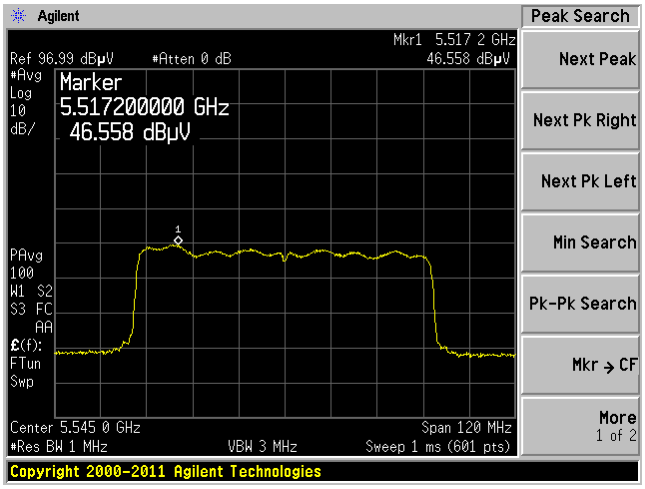


C4

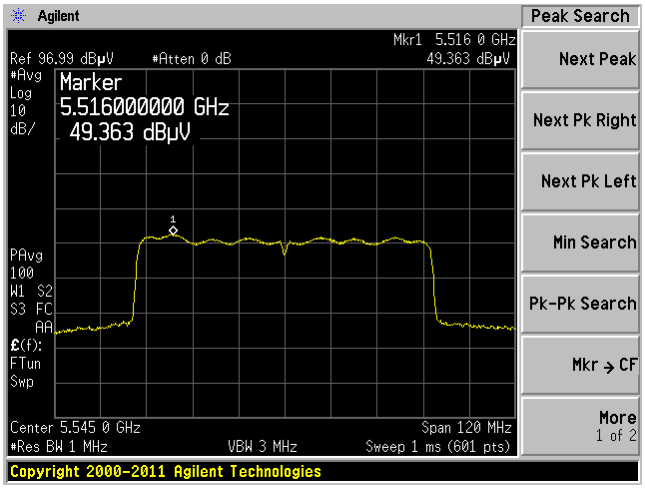


80 MHz Bandwidth, Middle Channel, 5545 MHz

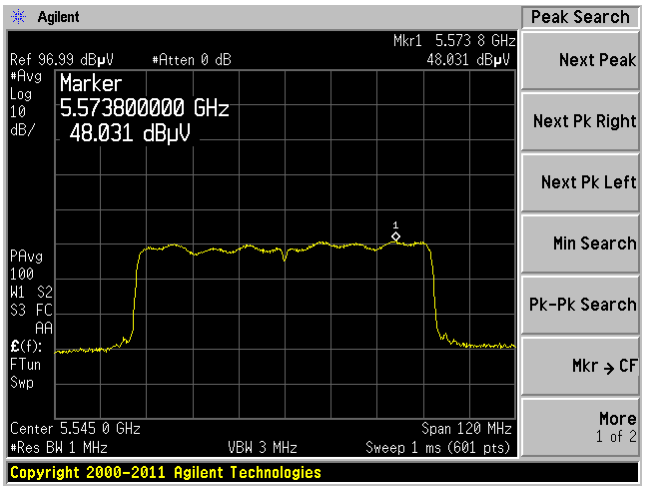
C1



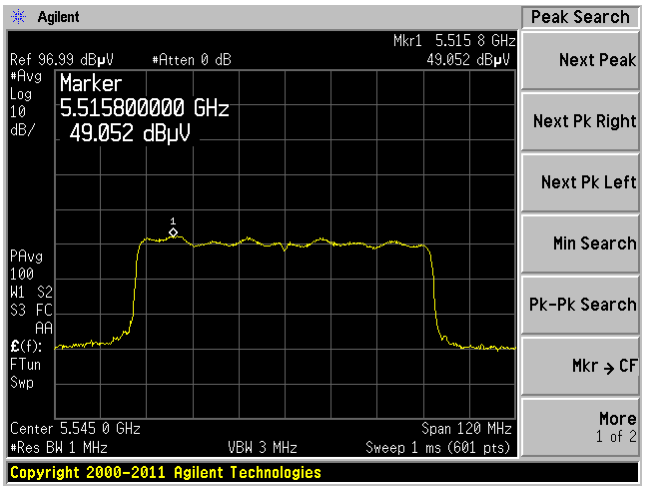
C2



C3

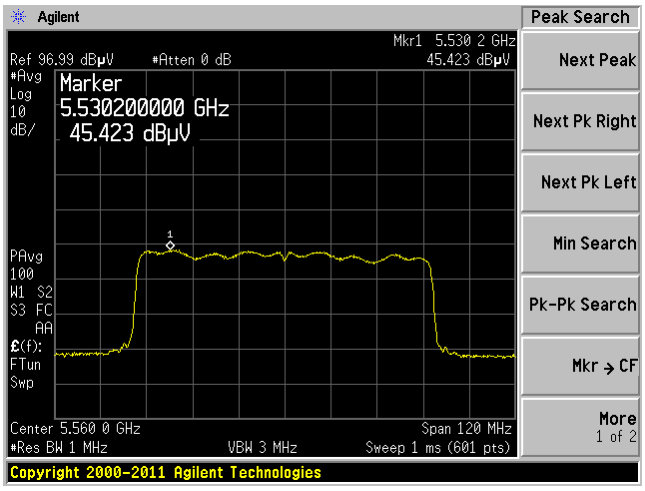


C4

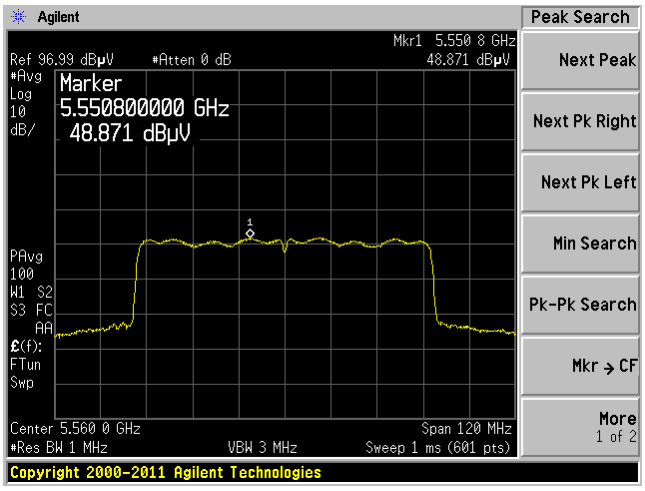


80 MHz Bandwidth, High Channel, 5560 MHz

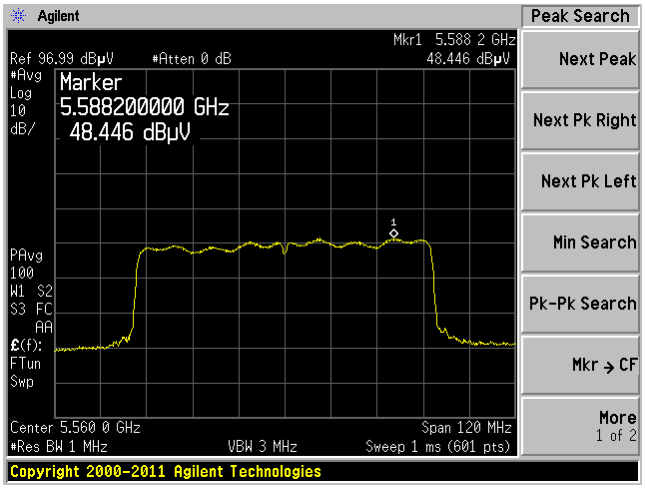
C1



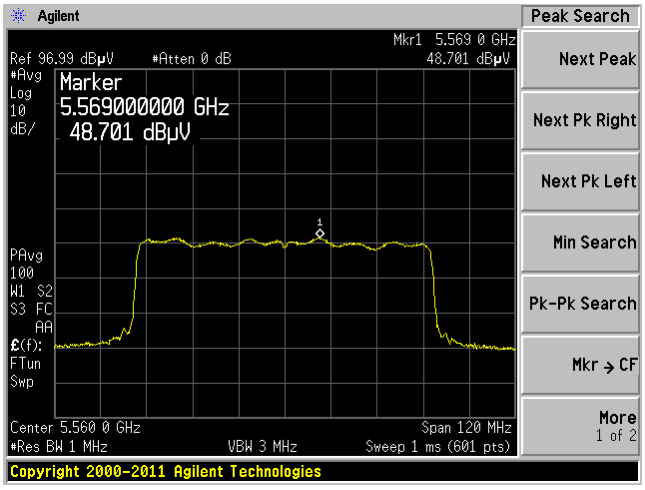
C2



C3



C4

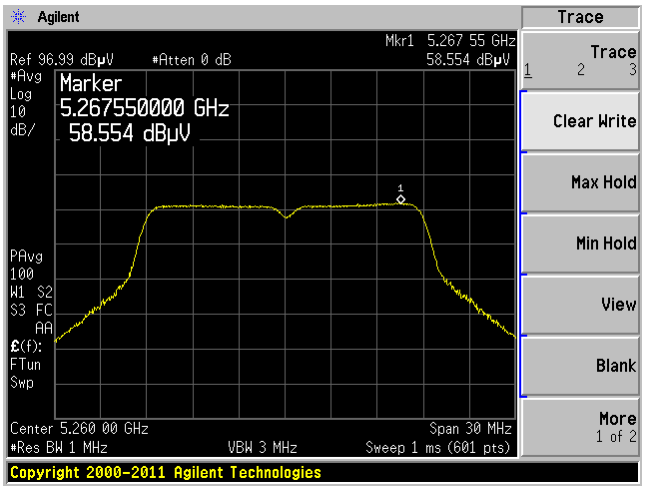


Beamforming

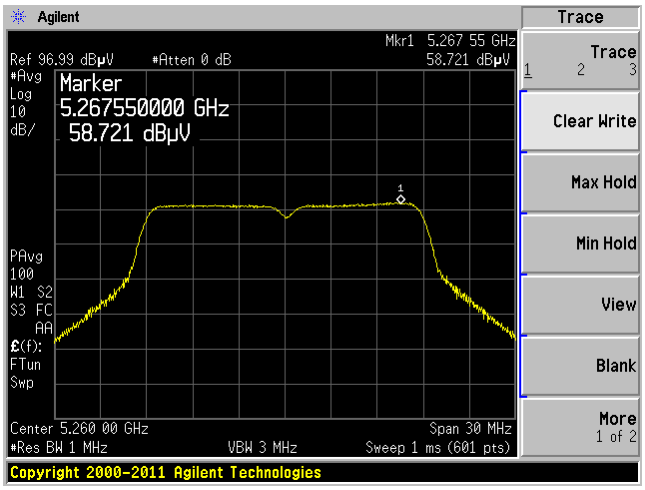
5.3 GHz Band

20 MHz Bandwidth, Low Channel, 5260 MHz

H

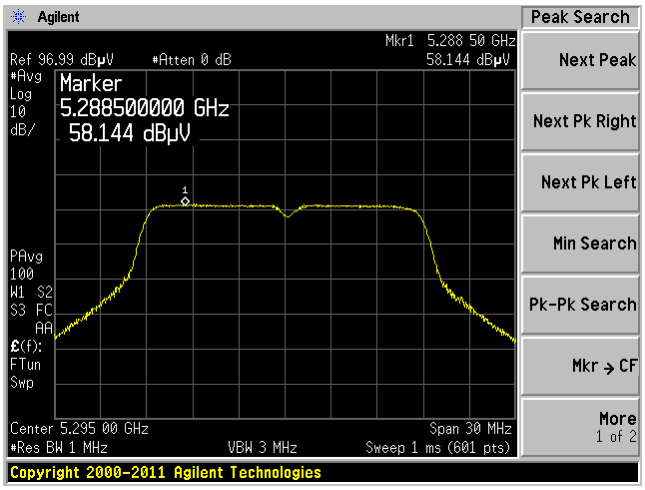


V

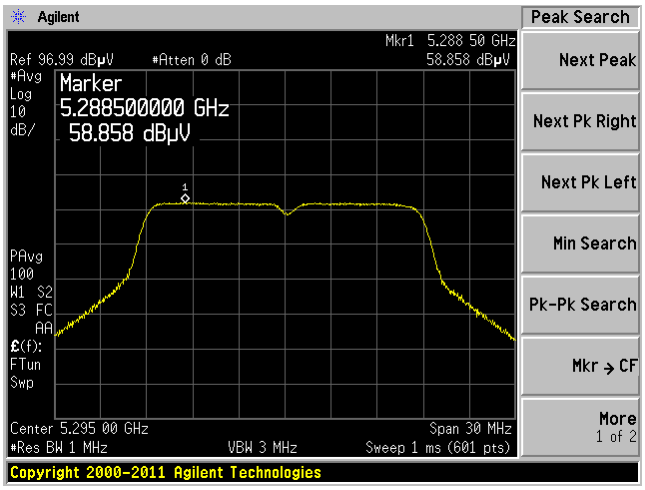


20 MHz Bandwidth, Middle Channel, 5295 MHz

H

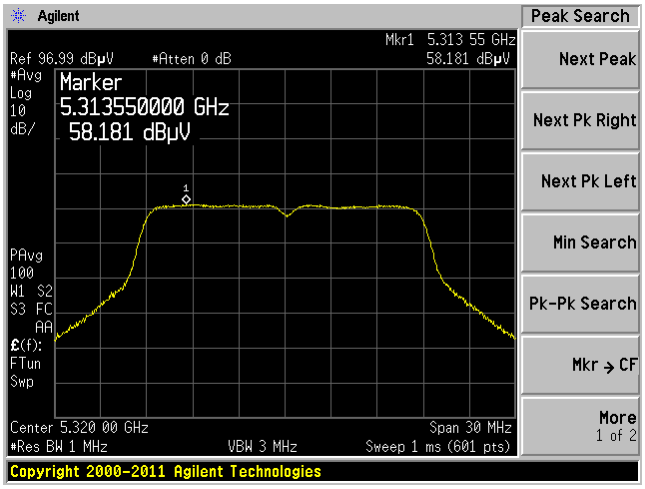


V

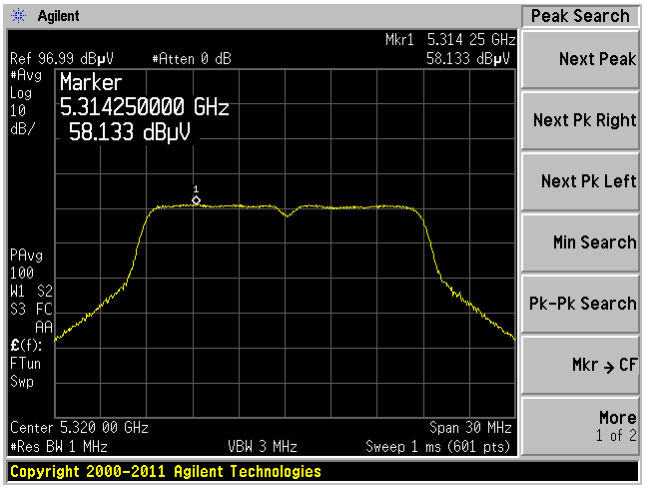


20 MHz Bandwidth, High Channel, 5320 MHz

H

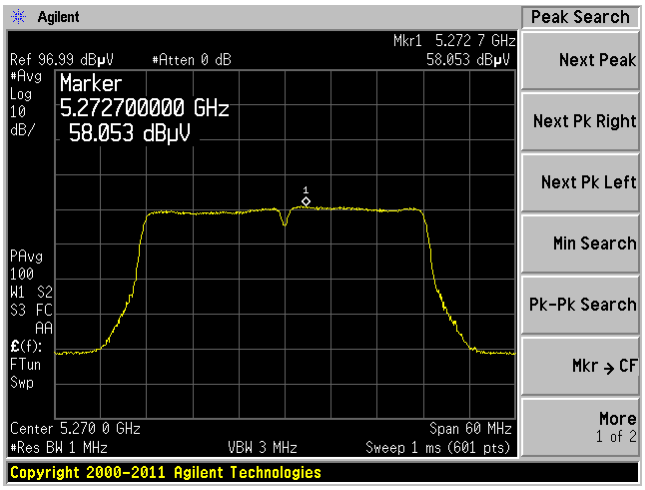


V

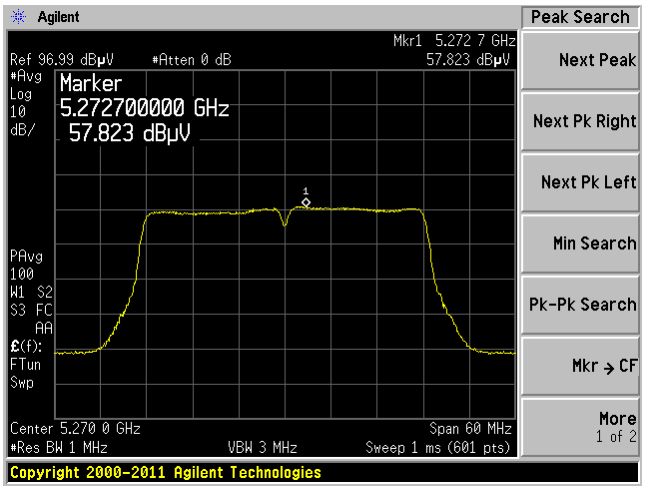


40 MHz Bandwidth, Low Channel, 5270 MHz

H

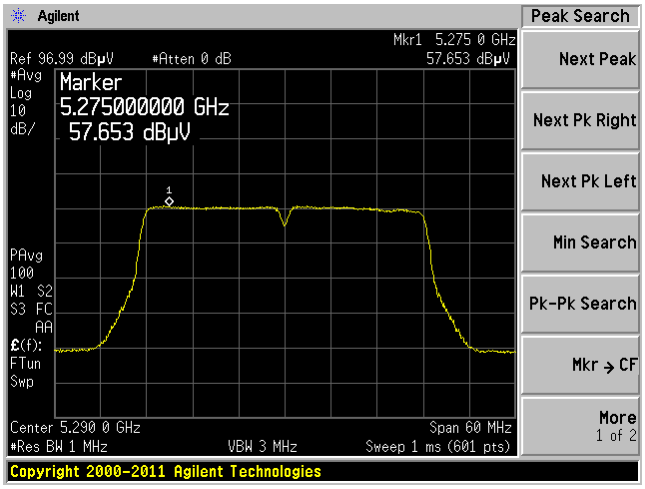


V

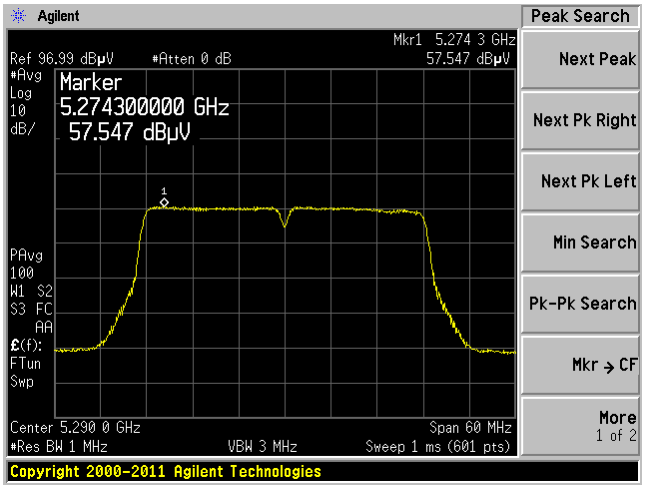


40 MHz Bandwidth, Middle Channel, 5290 MHz

H

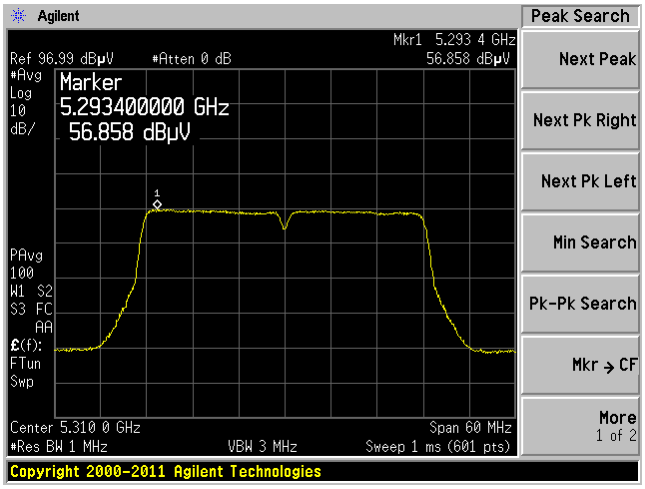


V

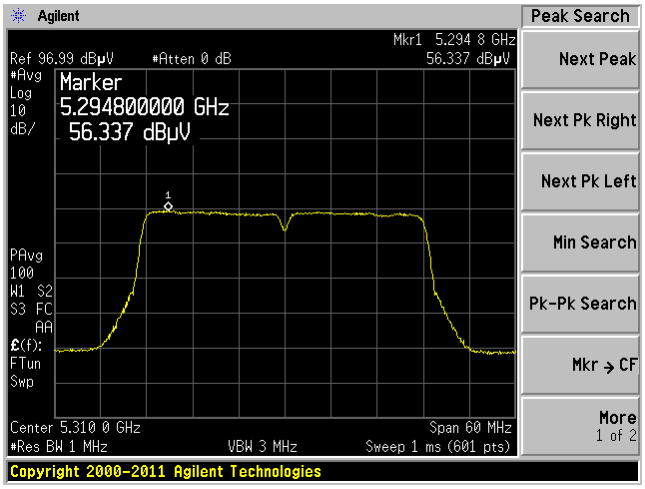


40 MHz Bandwidth, High Channel, 5310 MHz

H

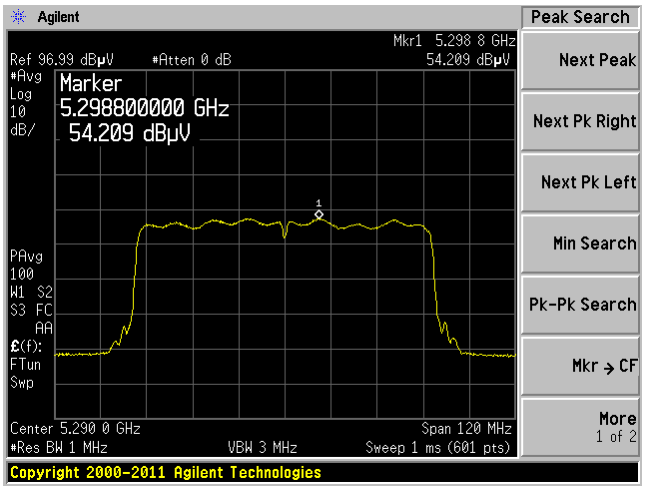


V

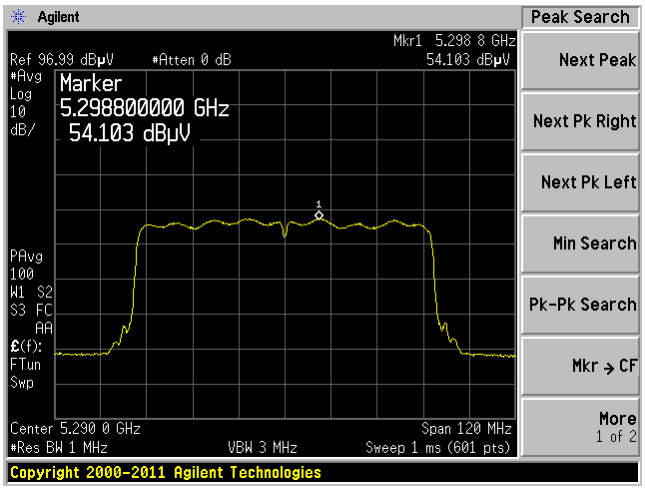


80 MHz Bandwidth, Channel, 5290 MHz

H



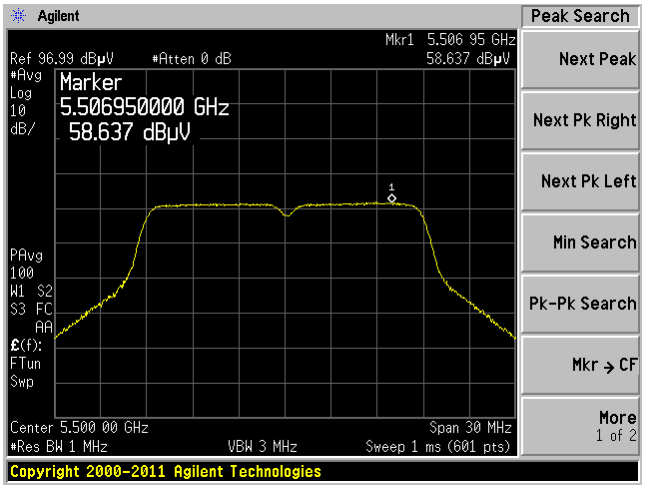
V



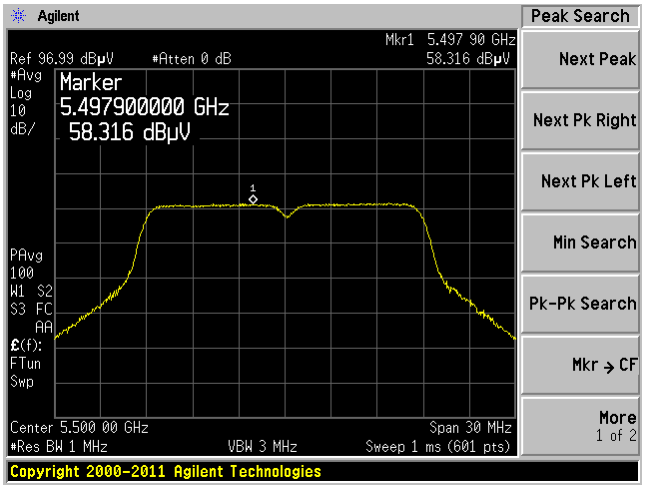
5.6 GHz Band

20 MHz Bandwidth, Low Channel, 5500 MHz

H

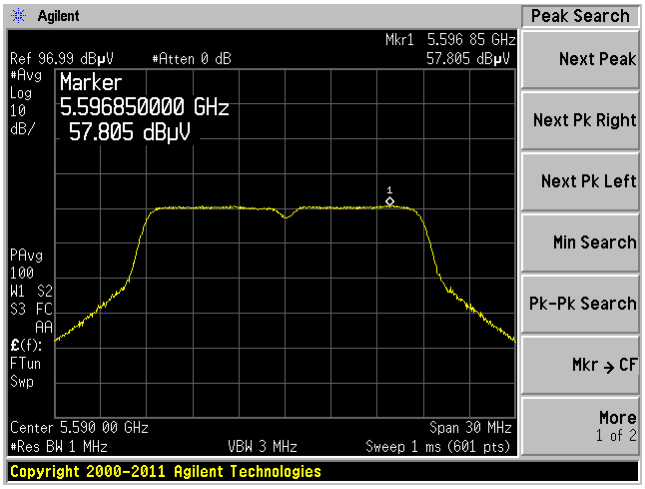


V

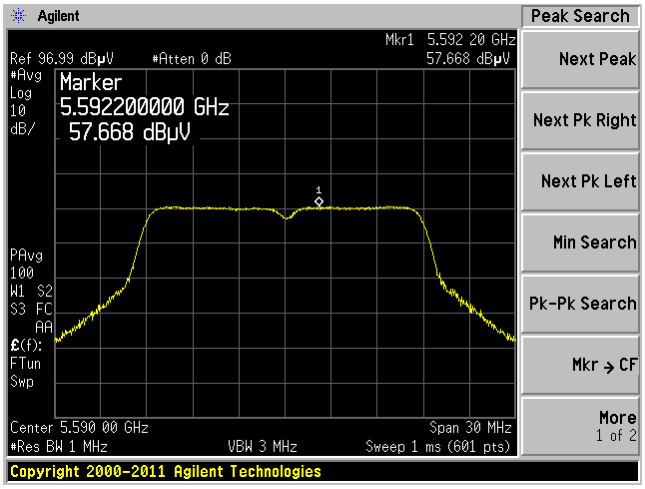


20 MHz Bandwidth, Middle Channel, 5590 MHz

H

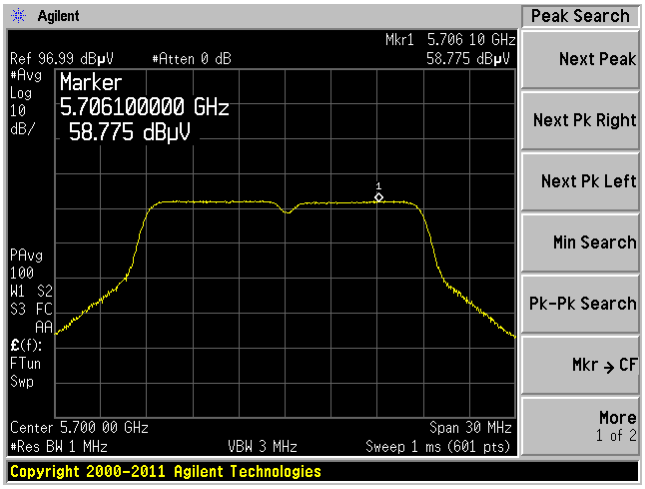


V

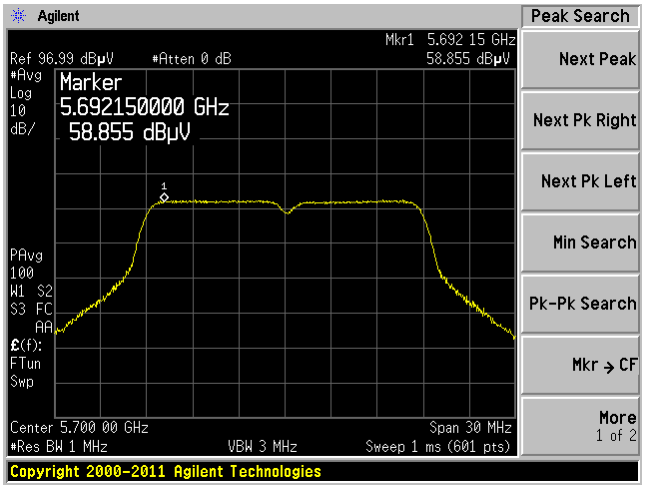


20 MHz Bandwidth, High Channel, 5700 MHz

H

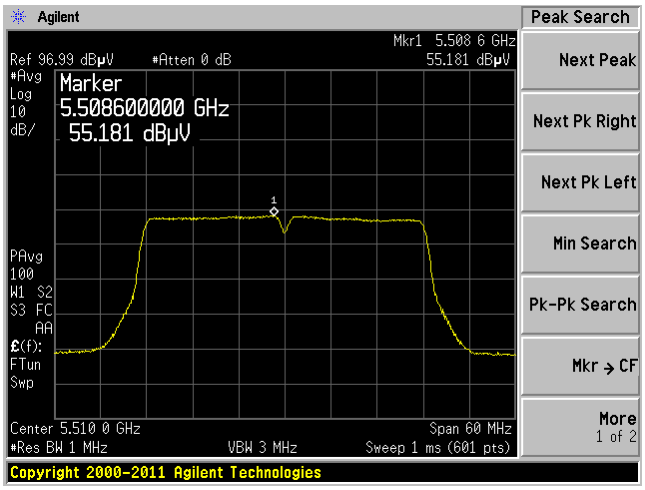


V

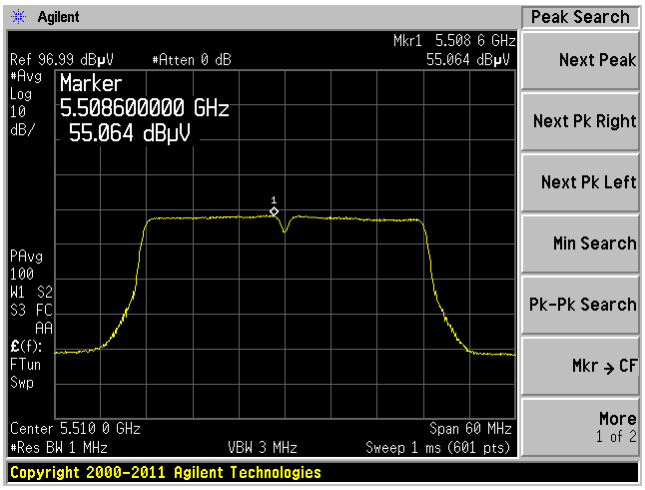


40 MHz Bandwidth, Low Channel, 5510 MHz

H

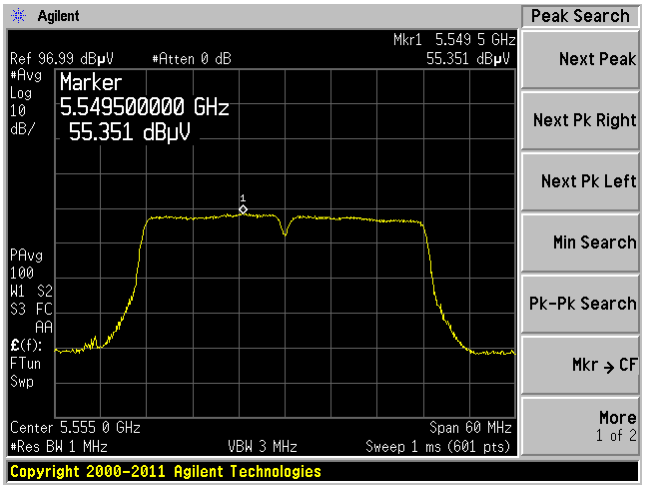


V

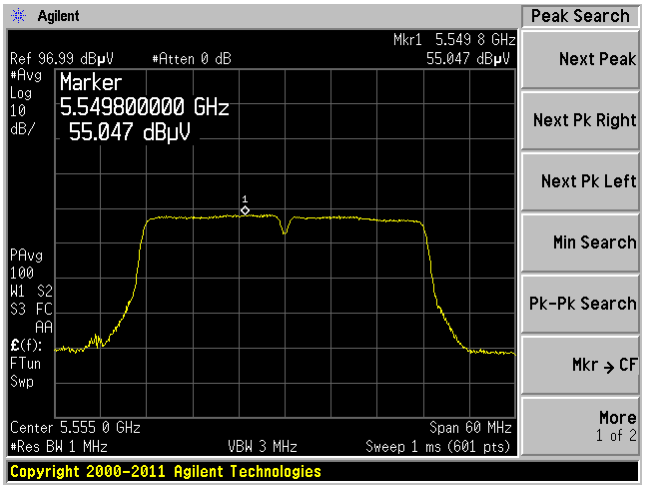


40 MHz Bandwidth, Middle Channel, 5555 MHz

H

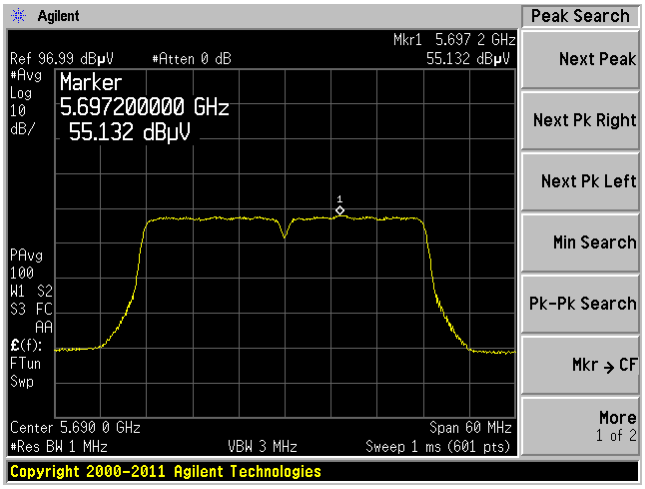


V

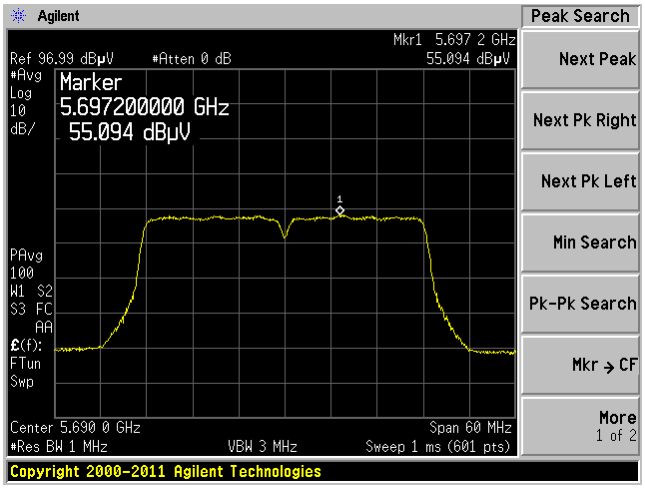


40 MHz Bandwidth, High Channel, 5690 MHz

H

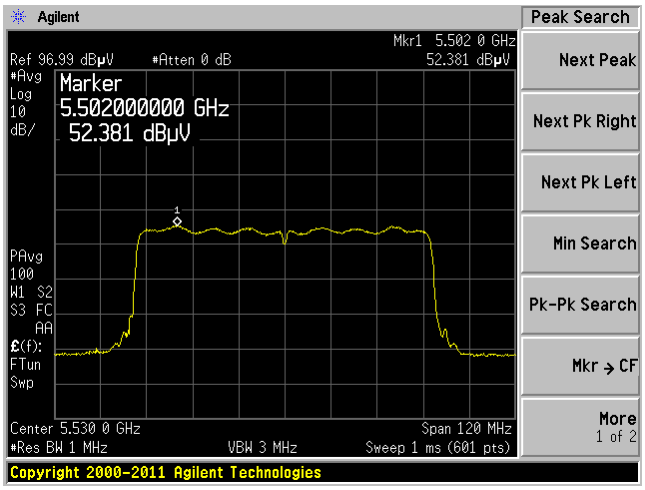


V

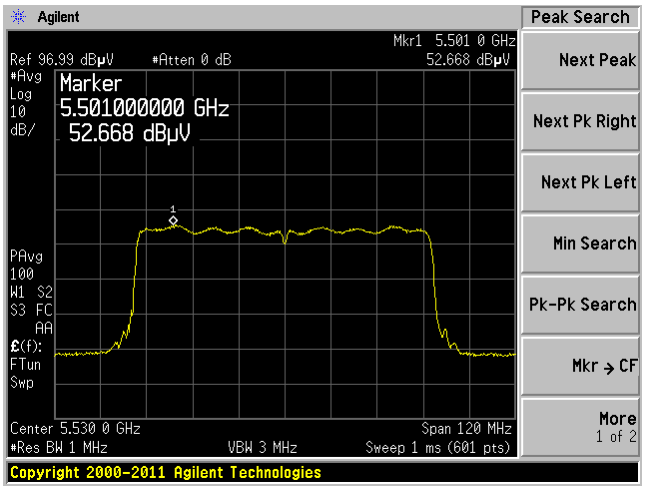


80 MHz Bandwidth, Low Channel, 5530 MHz

H

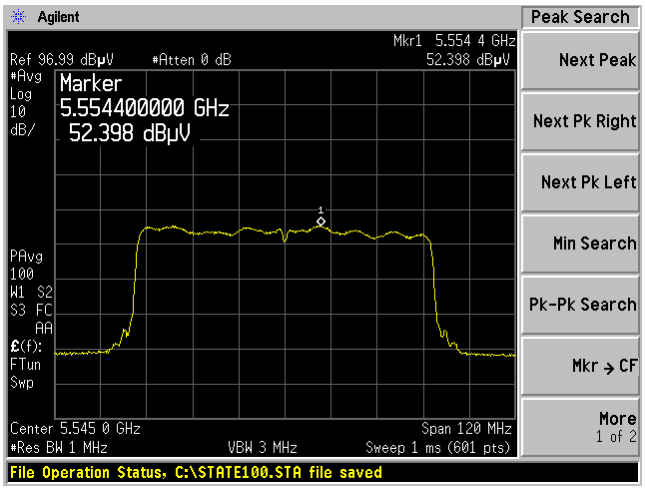


V

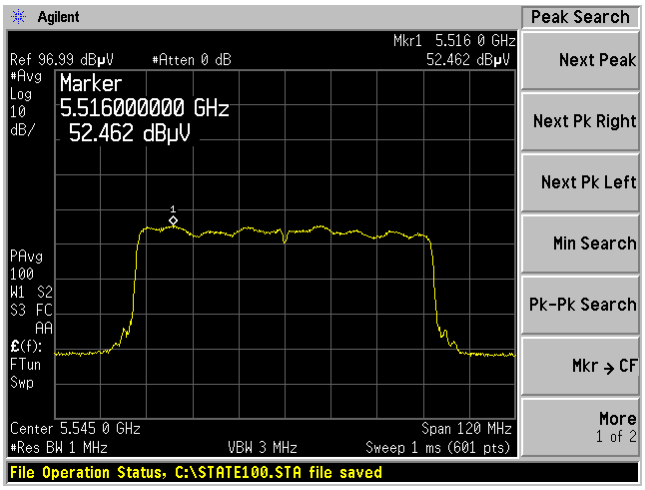


80 MHz Bandwidth, Middle Channel, 5545 MHz

H

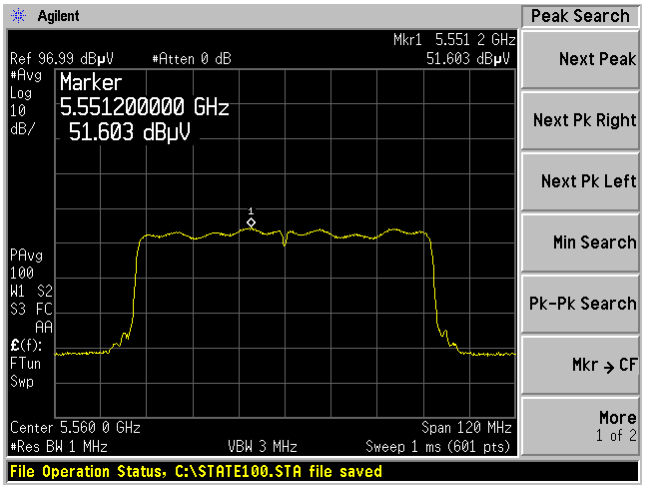


V



80 MHz Bandwidth, High Channel, 5560 MHz

H



V