Applicant:	Daniels Electronics Ltd. 43 Erie St Victoria, BC V8V 1P8
Equipment Under Test:	AMP-2/150 30 Watt VHF Power Amplifier Family 136-174 MHz
FCC ID:	**H4JVT-30**
In Accordance With:	47 CFR Parts 22, 80 & 90
Tested By:	Daniels Electronics Ltd. 43 Erie St Victoria, BC, V8V 1P8 And Acme Testing Co. 2002 Valley Highway Acme, WA, 98220-0003
FCC Registration Number	90420
Authorized By:	 Dale Reitsma, B.Eng., D&D Manager
Testing Verified By:	 Michael J. Cyr, B.Eng., Communication System Designer
Date:	27 September 2004
Total Number of Pages:	36

Table of Contents

1. Summary of Test Data

Name of Test	Para No.	Result
RF Power Output	2.1046	Complies
Occupied Bandwidth	2.1049	Complies
Spurious Emissions at Antenna Terminals	2.1051	Complies
Field Strength of Spurious Emissions	2.1053	Complies
Frequency Stability	2.1055	N/A (3)

Notes:

1) This Test Report is submitted in support of a Class II Permissive Change to the Daniels Electronics Ltd. **AMP-2/150 30 Watt VHF Power Amplifier Family**, operating in the 136-174 MHz frequency band of the Land Mobile Services and approved by the FCC under FCC ID: **H4JVT-30** for emission designator F3E/G3E. This Class II Permissive Change application will specifically add emission designators F1E, F1D and F3D and will acknowledge a change in equipment identification from VT-30 to AMP-2/1xx-30 (Note: IAW 47 CFR §2.933 and §2.924, this latter change in itself does not warrant a submission to the FCC; it is mentioned here as a courtesy to the reviewer).

2) The AMP-2/150 Family is composed of the following three models:

a. AMP-2/145-30 136-150 MHz
b. AMP-2/155-30 150-162 MHz
c. AMP-2/170-30 162-174 MHz

All models are identical in physical and electrical construction, with the exception that each is optimized via a limited number of select tuning components for operation in its respective frequency sub-band. As such, a single model, the AMP-2/155-30, was chosen to serve as representative of the AMP-2/150 Family for verification of performance for all tests except the 'Field Strength of Spurious Emissions' test. For this latter test, a representative unit from each model was tested, in order to verify spurious emissions compliance over the entire frequency band (136-174 MHz).

3) The AMP-2/150 Family of amplifiers operate on a single channel only, with RF input provided via coaxial connection from an FCC approved exciter. The RF input frequency is not translated; therefore frequency stability tests are not applicable.

General

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Parts 22, 80, & 90. All measurements are traceable to national standards.

Test Conditions:

Indoor Temperature: 23°C
Humidity: 30%

2. General Equipment Specifications

Manufacturer:	Daniels Electronics Ltd.	
Family Number:	AMP-2/150-30	
Model Numbers:	AMP-2/145-30	(136-150 MHz)
	AMP-2/155-30	(150-162 MHz)
	AMP-2/170-30	(162-174 MHz)
Serial Numbers of EUTs:	11653	(AMP-2/145-30)
	R&D 10002	(AMP-2/155-30)
	R&D 10003	(AMP-2/170-30)
Starting Date of Testing:	26 July 2004	
Frequency Range:	136-150 MHz	(AMP-2/145-30)
	150-162 MHz	(AMP-2/155-30)
	162-174 MHz	(AMP-2/170-30)
Rated RF Output:	10-30W	
Amplifier Gain (Rated):	10dB	
Emission Designators:	F1D, F1E, F3D, F3E	

3. RF Output Power (47 CFR §2.1046)

Test Results: Complies

Each individual frequency is factory set for 30W (44.8dBm). All three frequencies, center and band edges (150, 156, 162 MHz), were therefore within ± 1dB of the manufacturer's rating.

EUT Model #: AMP-2/155-30

Measurement Data: Rated Power = 30W (44.8dBm)

Frequency (MHz)	Rated Power (dBm)	Measured Power (dBm)
150	44.8	44.8
156	44.8	44.8
162	44.8	44.8

4. Occupied Bandwidth (47 CFR §2.1049)

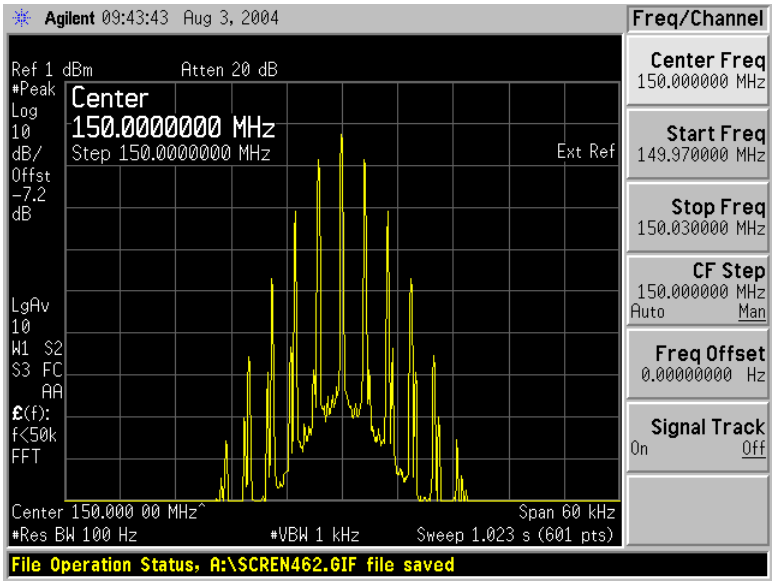
Test Results: Complies

The occupied bandwidth was measured by comparing the input and output signals to each other. This determined if PA amplification degraded the signal in any way.

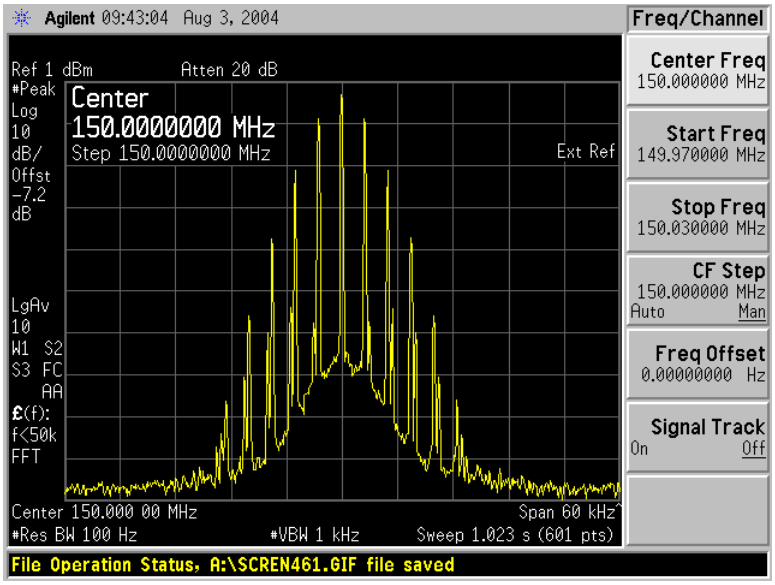
Note: When transmitting in Digital mode, signal characteristics of the exciter's C4FM RF output are identical for both F1D and F1E modulation formats. Therefore for purposes of brevity, test results for F1D modulation are included as representative of both modulation formats in this report.

EUT Model #: AMP-2/155-30

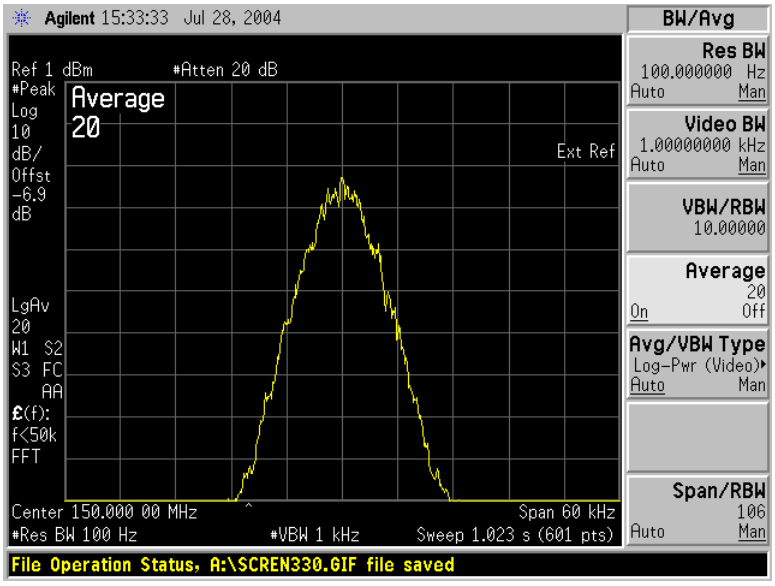
Test Data: See following graphs:



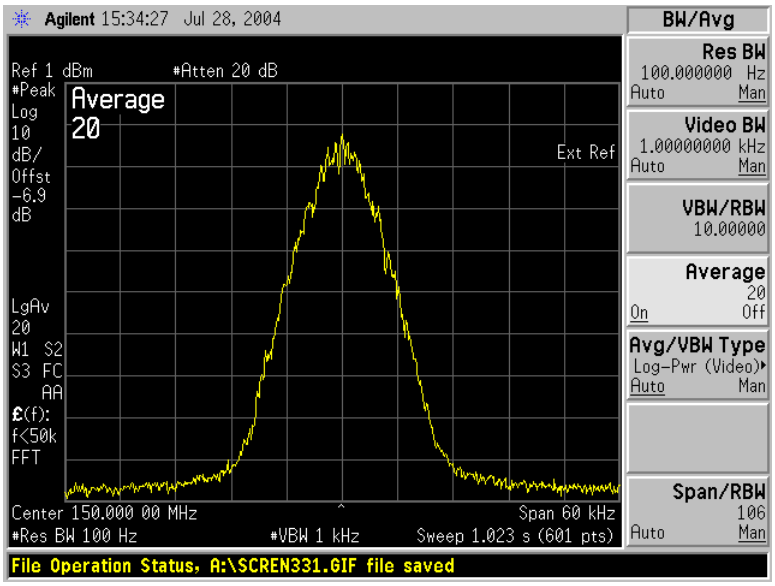
Exciter Output (Amplifier Input)
150 MHz
F3E Modulation



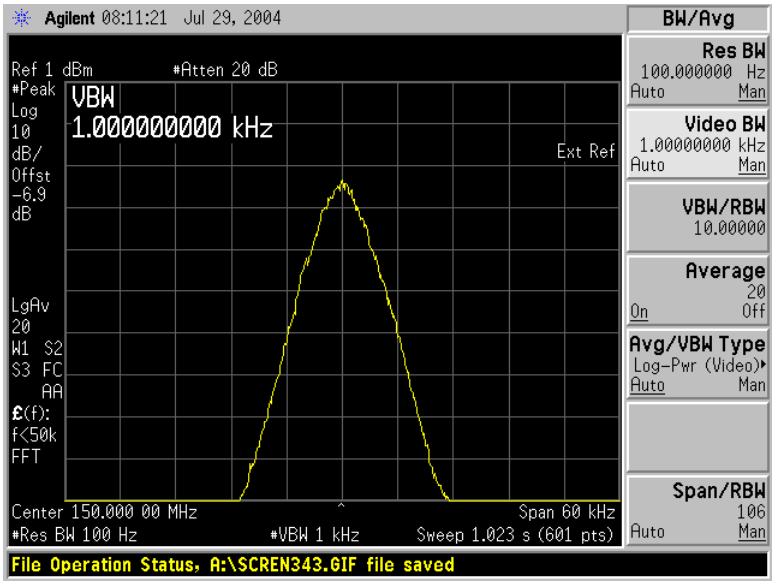
Amplifier Output
150 MHz
F3E Modulation Input



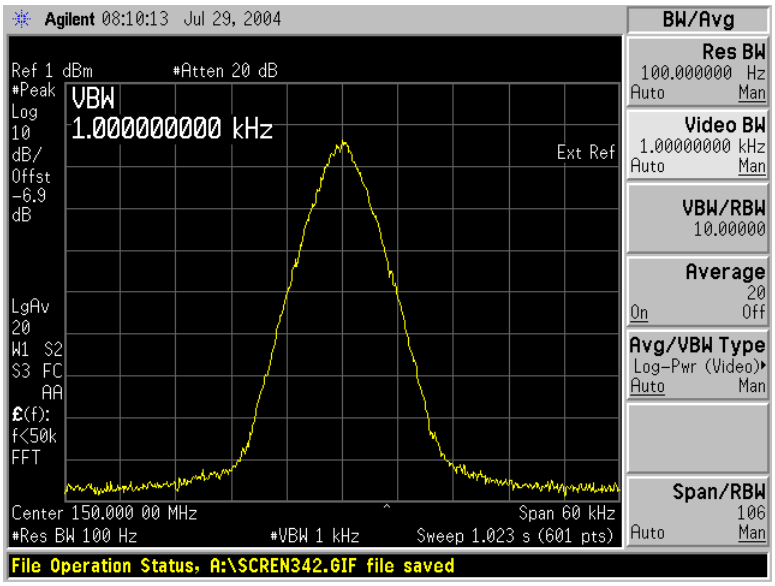
Exciter Output (Amplifier Input)
150 MHz
F1D Modulation



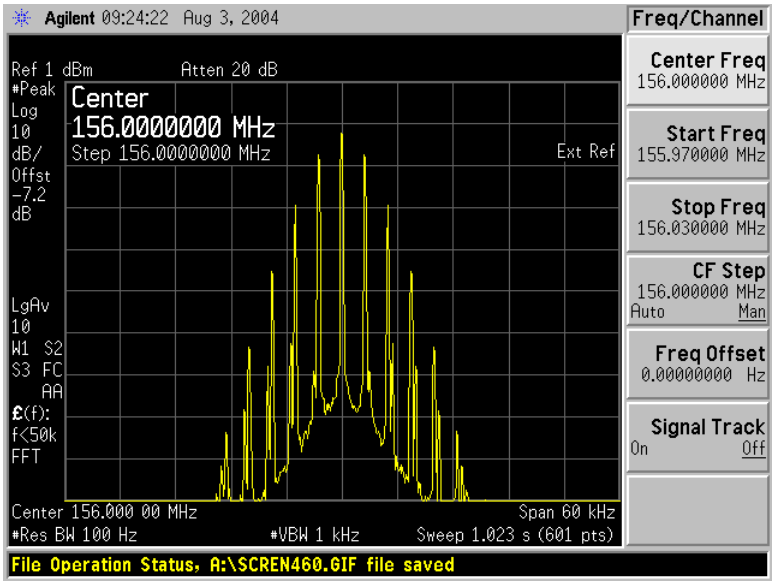
Amplifier Output
150 MHz
F1D Modulation Input



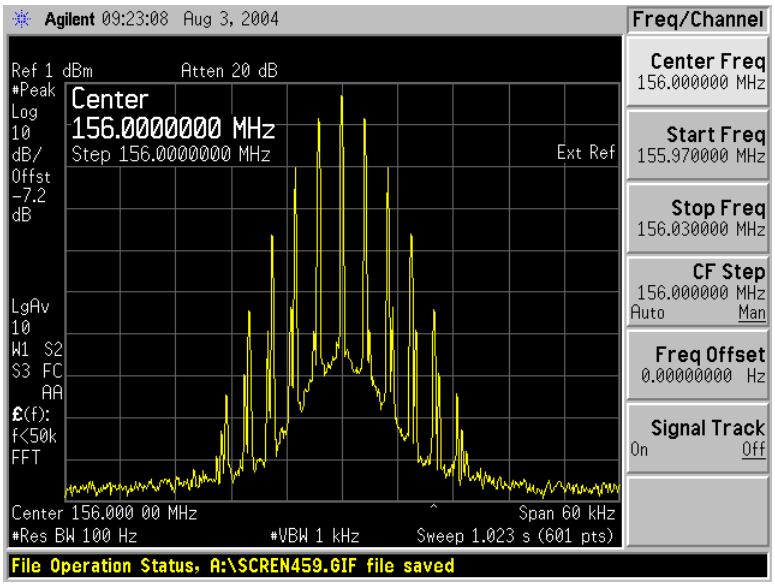
Exciter Output (Amplifier Input)
150 MHz
F3D Modulation



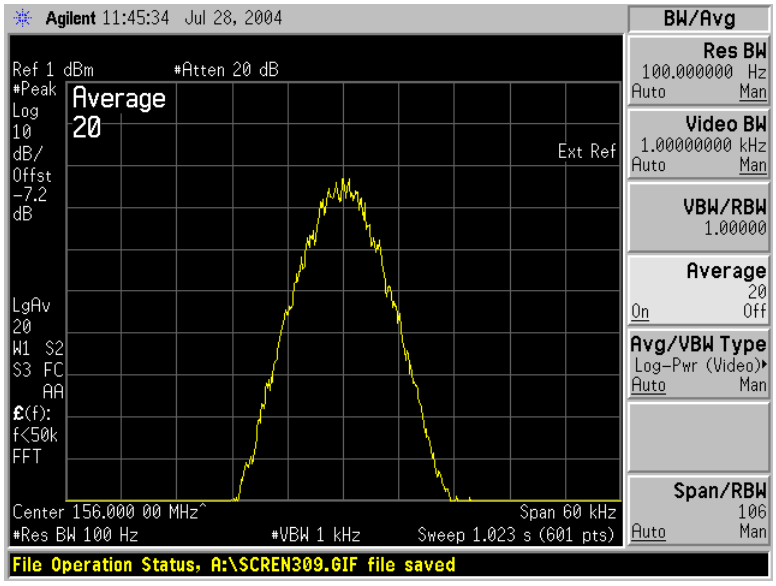
Amplifier Output
150 MHz
F3D Modulation Input



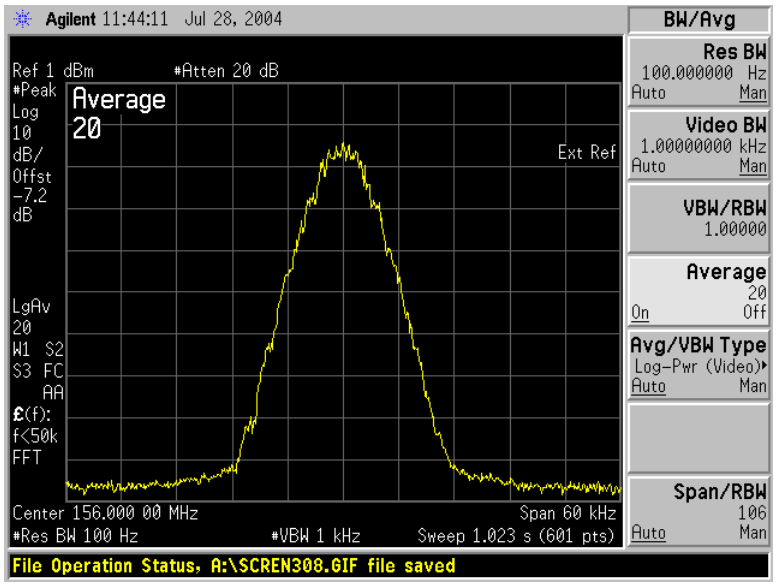
Exciter Output (Amplifier Input)
156 MHz
F3E Modulation



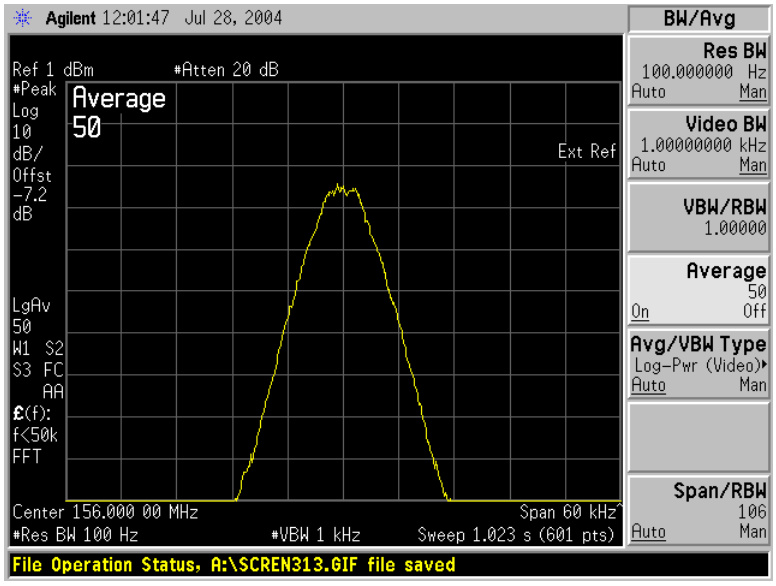
Amplifier Output
156 MHz
F3E Modulation Input



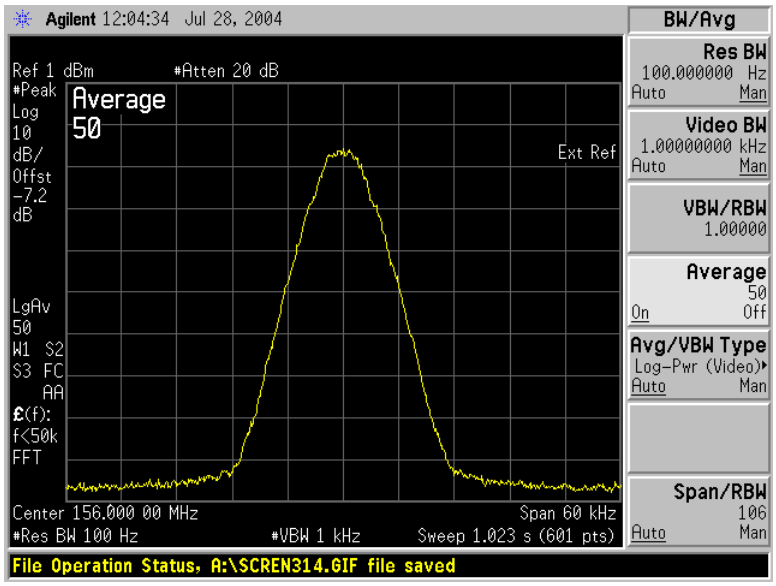
Exciter Output (Amplifier Input)
156 MHz
F1D Modulation



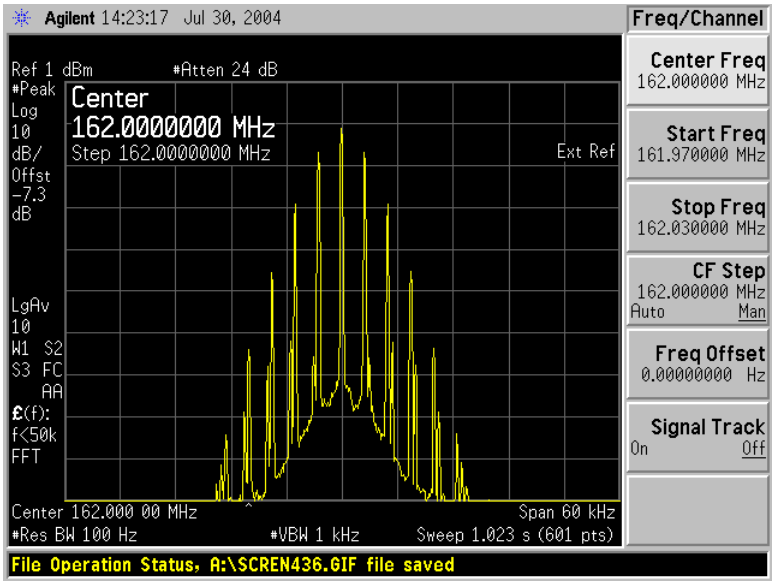
Amplifier Output
156 MHz
F1D Modulation Input



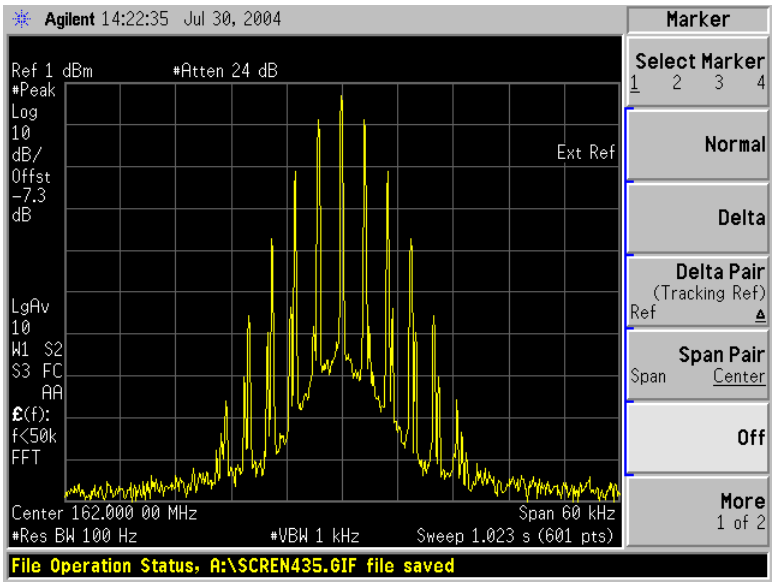
Exciter Output (Amplifier Input)
156 MHz
F3D Modulation



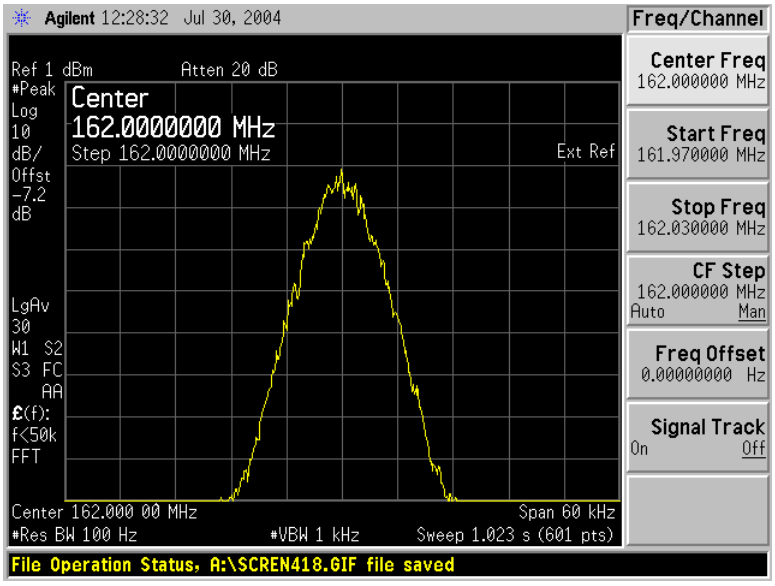
Amplifier Output
156 MHz
F3D Modulation Input



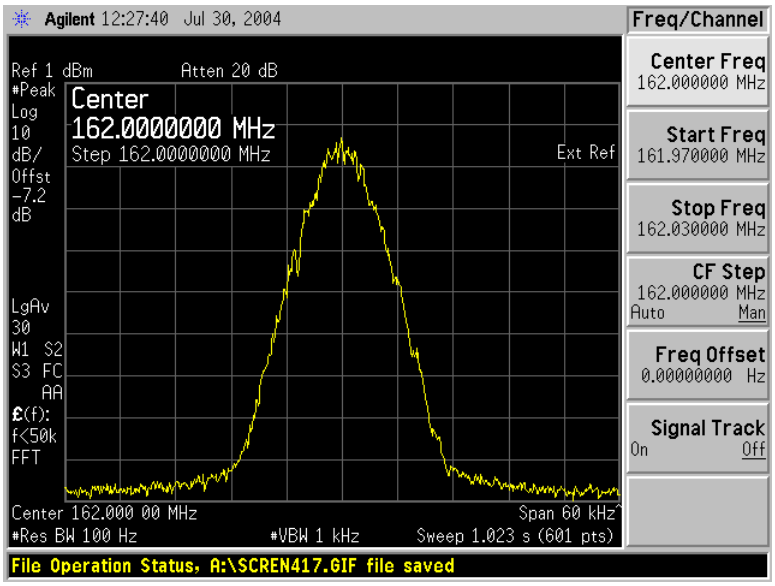
Exciter Output (Amplifier Input)
162 MHz
F3E Modulation



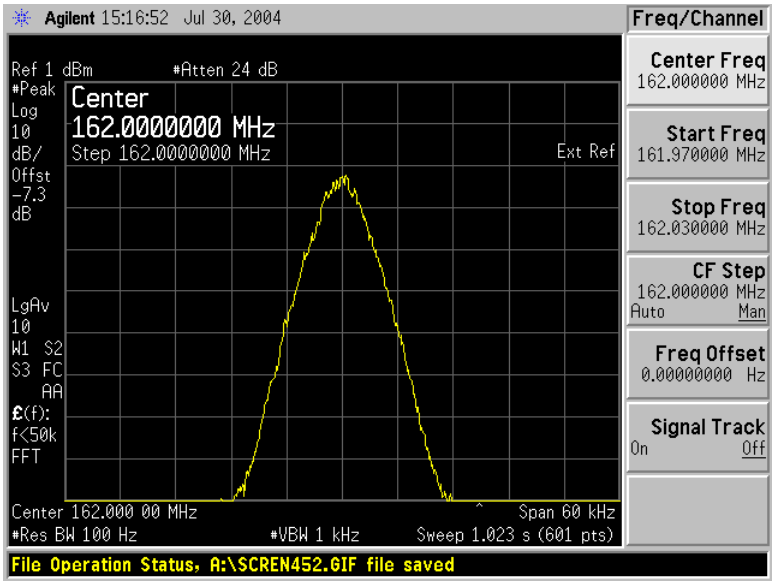
Amplifier Output
162 MHz
F3E Modulation Input



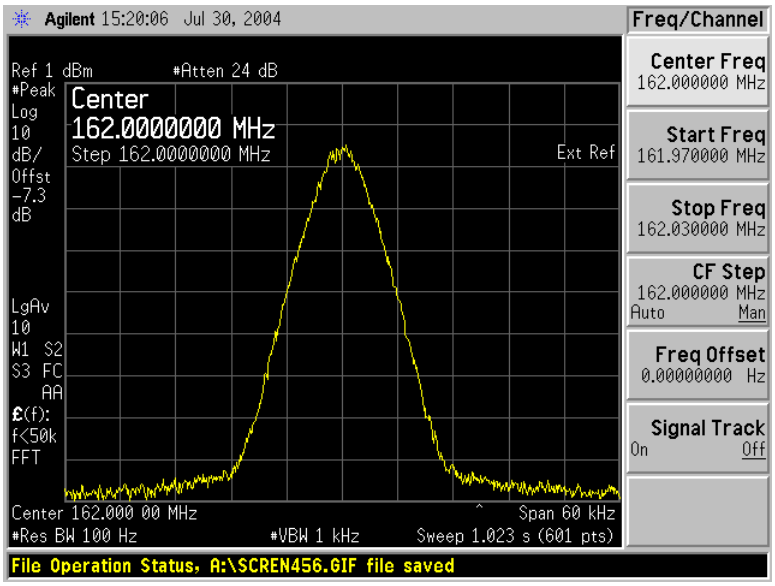
Exciter Output (Amplifier Input)
162 MHz
F1D Modulation



Amplifier Output
162 MHz
F1D Modulation Input



Exciter Output (Amplifier Input)
162 MHz
F3D Modulation



Amplifier Output
162 MHz
F3D Modulation Input

5. Spurious Emissions at Antenna Terminals (47 CFR §2.1051)

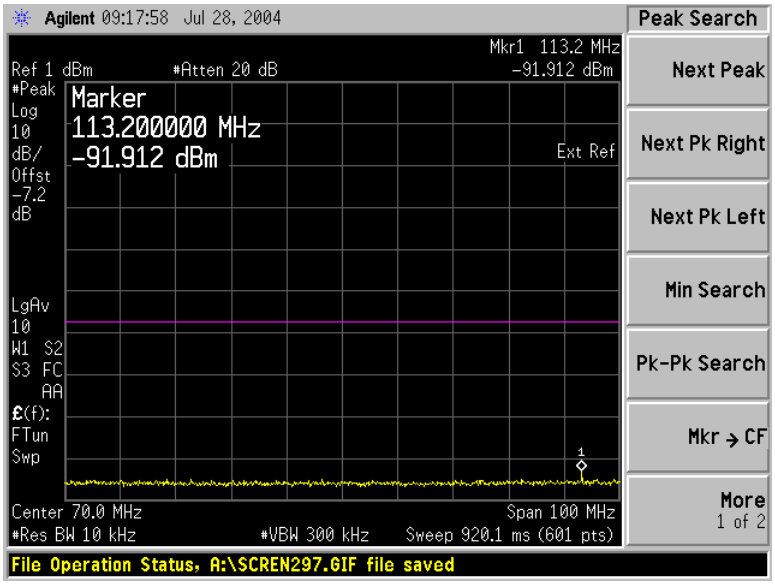
Minimum Standard: -13dBm (-57.8dBc at 30W Out)

Test Results: Complies

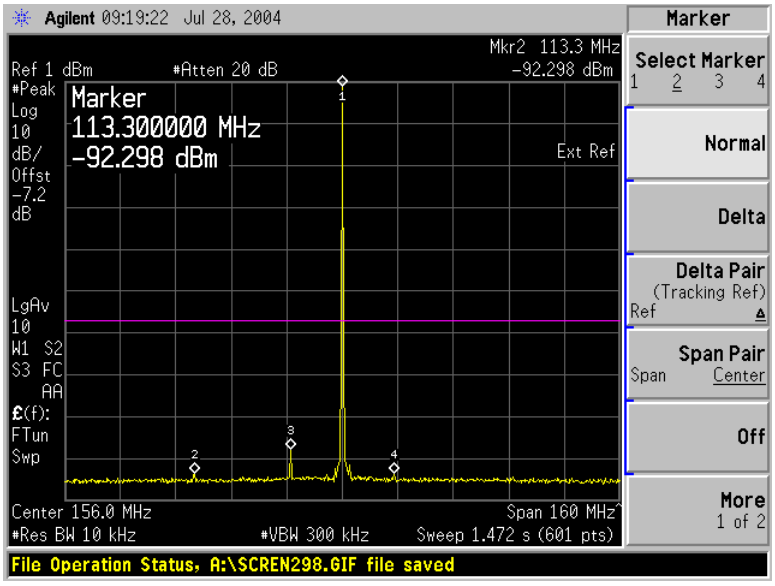
Note: When transmitting in Digital mode, signal characteristics of the exciter's C4FM RF output are identical for both F1D and F1E modulation formats. Therefore for purposes of brevity, test results for F1D modulation are included as representative of both modulation formats in this report.

EUT Model #: AMP-2/155-30

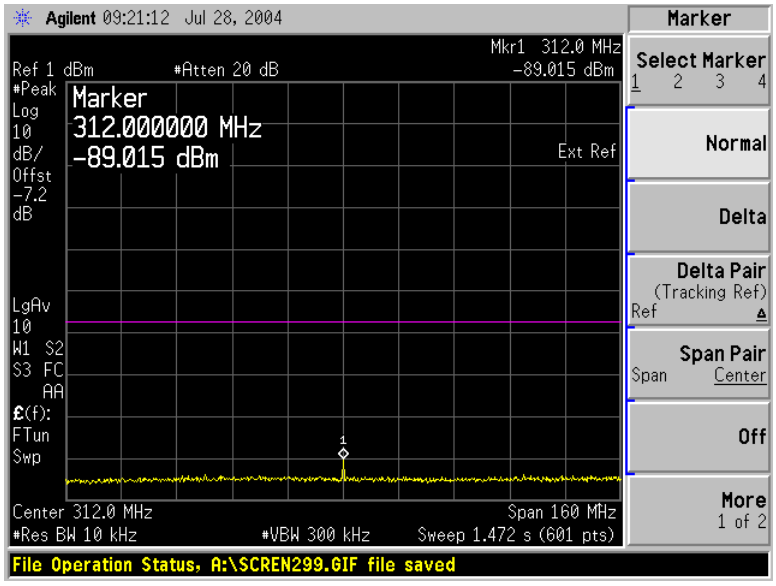
Test Data: See following graphs:



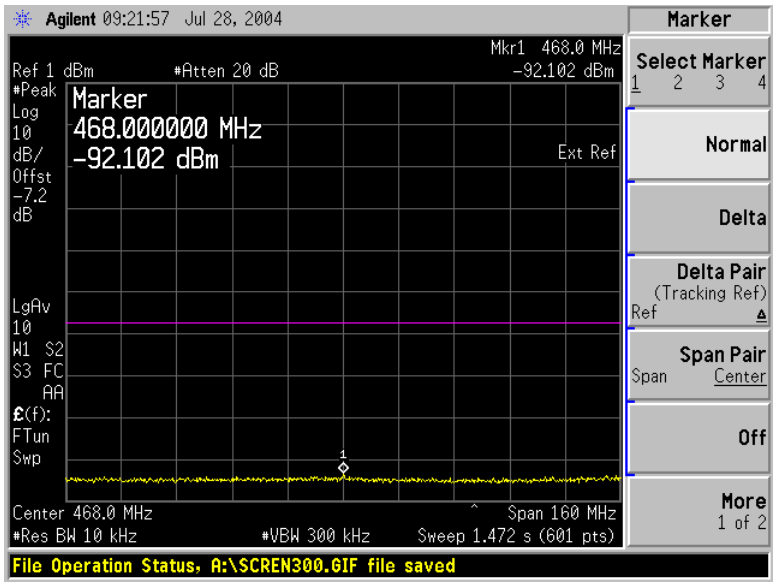
Conducted Spurious
20-120 MHz
Spur
F3E Modulation Input



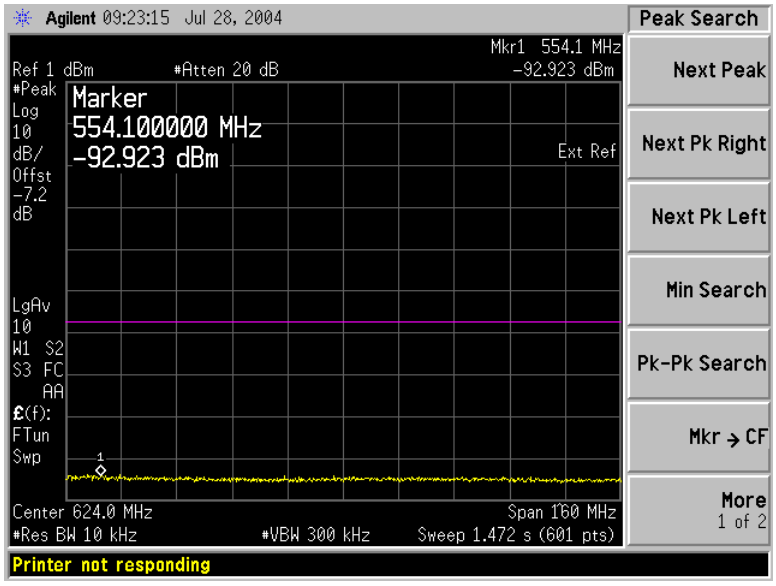
Conducted Spurious
76-236 MHz
Fundamental
F3E Modulation Input



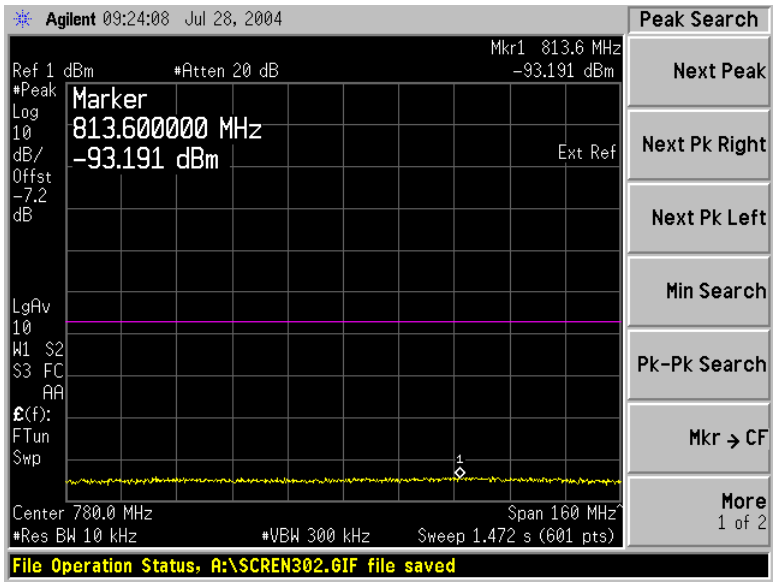
Conducted Spurious
232-392 MHz
2nd Harmonic
F3E Modulation Input



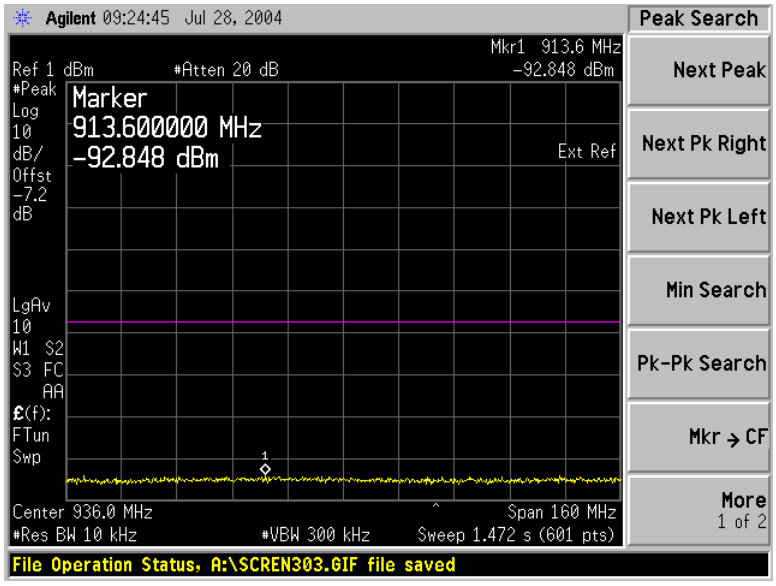
Conducted Spurious
388-548 MHz
3rd Harmonic
F3E Modulation Input



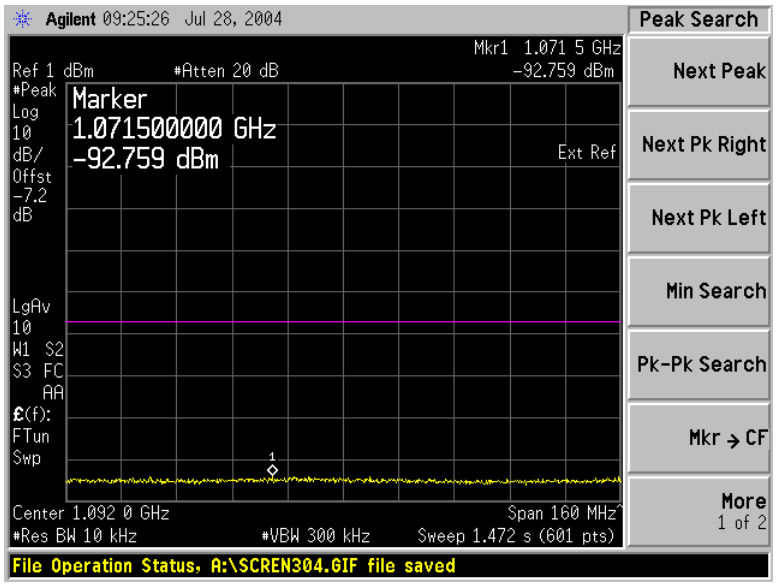
Conducted Spurious
544-704 MHz
4th Harmonic
F3E Modulation Input



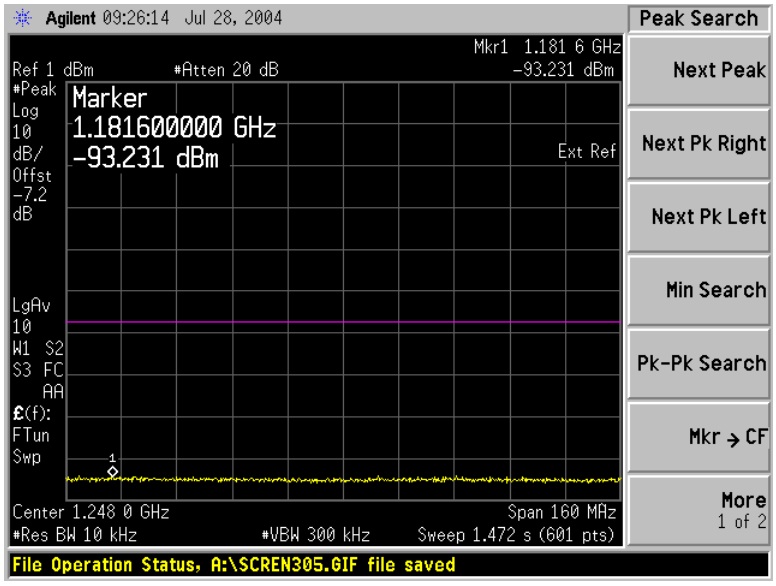
Conducted Spurious
700-860 MHz
5th Harmonic
F3E Modulation Input



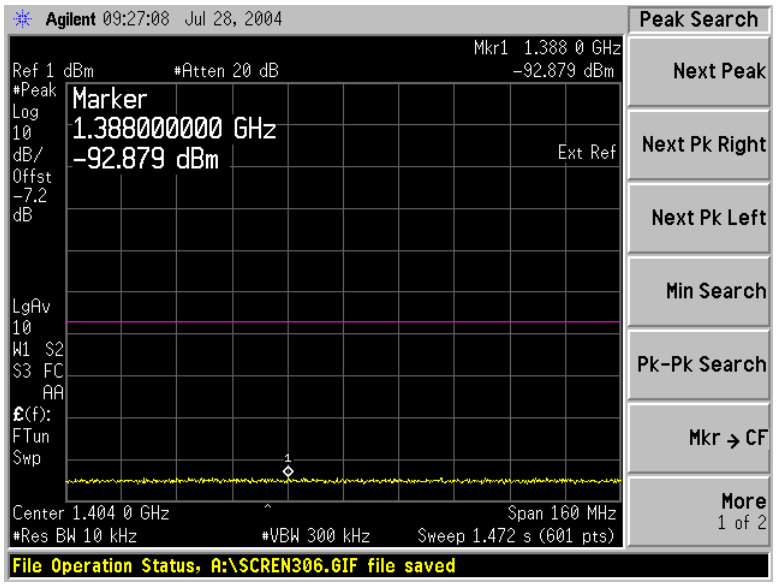
Conducted Spurious
856-1016 MHz
6th Harmonic
F3E Modulation Input



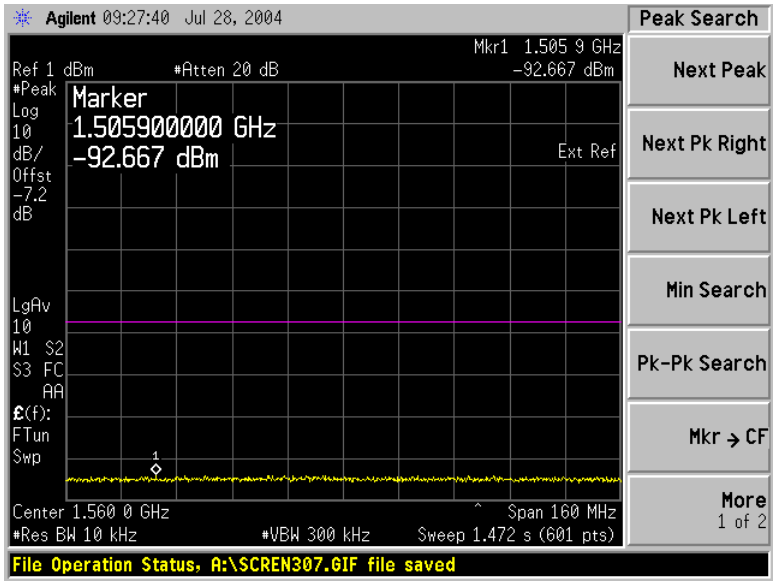
Conducted Spurious
1012-1172 MHz
7th Harmonic
F3E Modulation Input



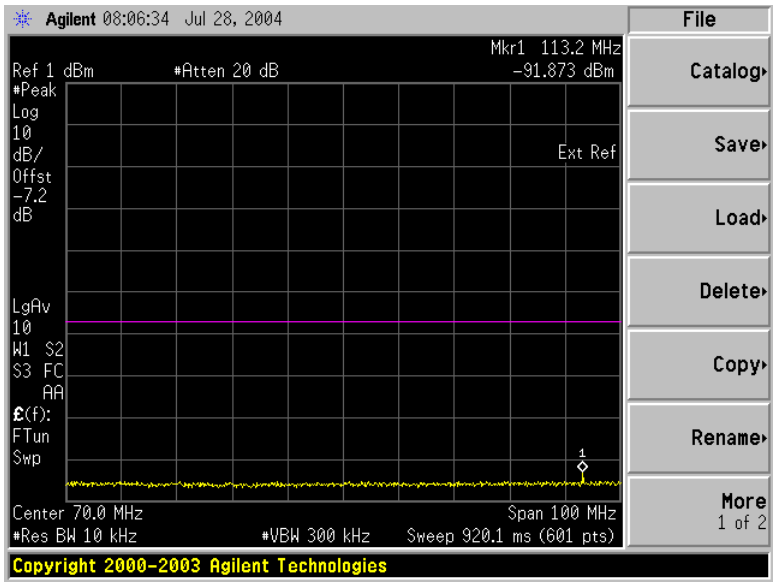
Conducted Spurious
1168-1328 MHz
8th Harmonic
F3E Modulation Input



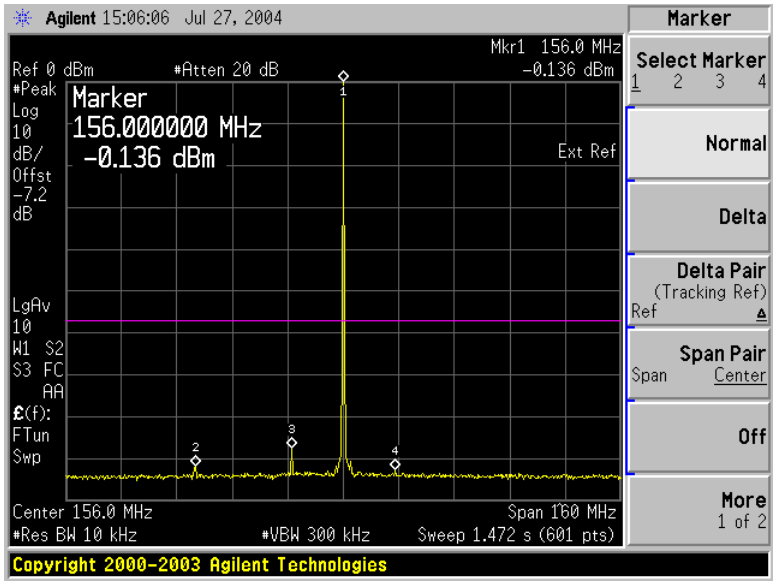
Conducted Spurious
1324-1484 MHz
9th Harmonic
F3E Modulation Input



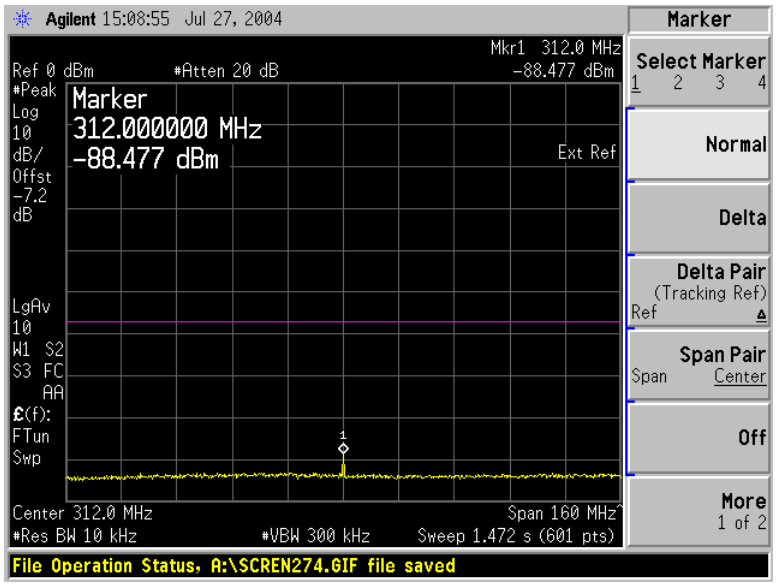
Conducted Spurious
1480-1640 MHz
10th Harmonic
F3E Modulation Input



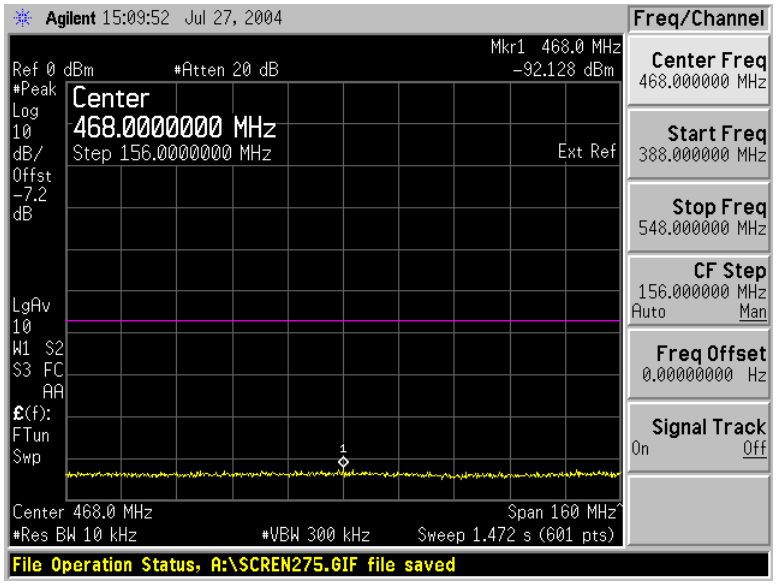
Conducted Spurious
20-120 MHz
Spur
F1D Modulation Input



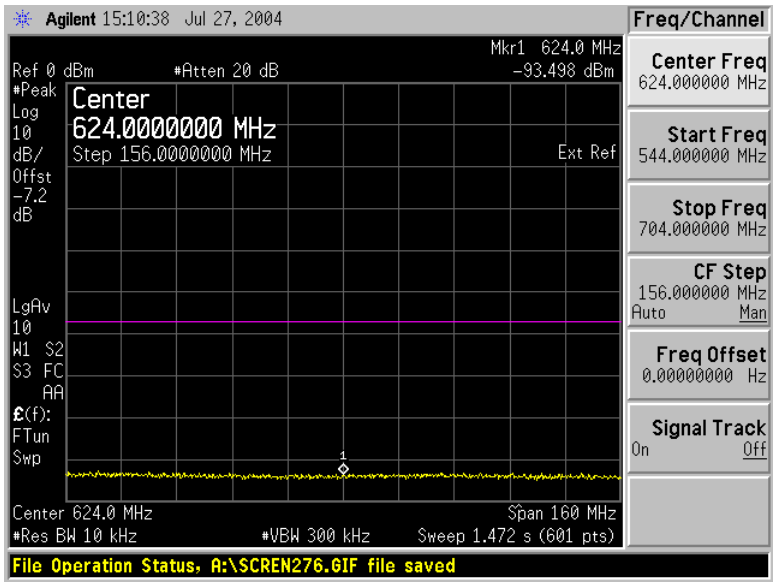
Conducted Spurious
76-236 MHz
Fundamental
F1D Modulation Input



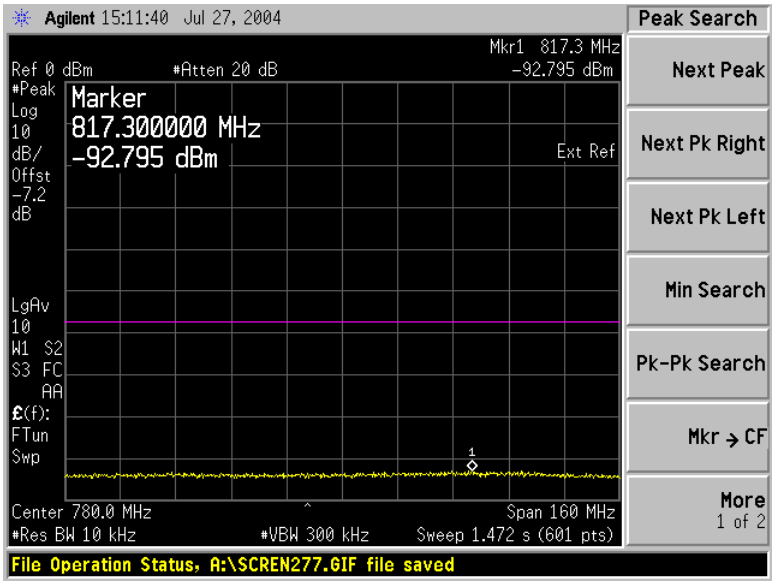
Conducted Spurious
232-392 MHz
2nd Harmonic
F1D Modulation Input



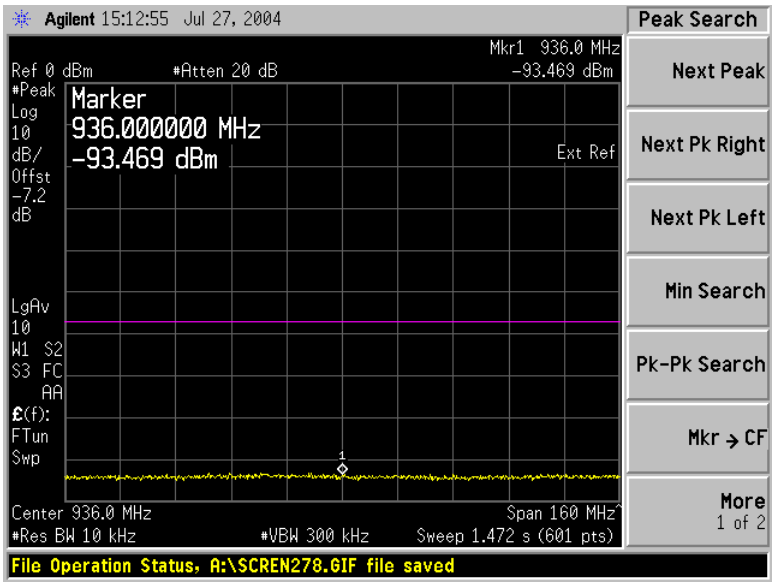
Conducted Spurious
388-548 MHz
3rd Harmonic
F1D Modulation Input



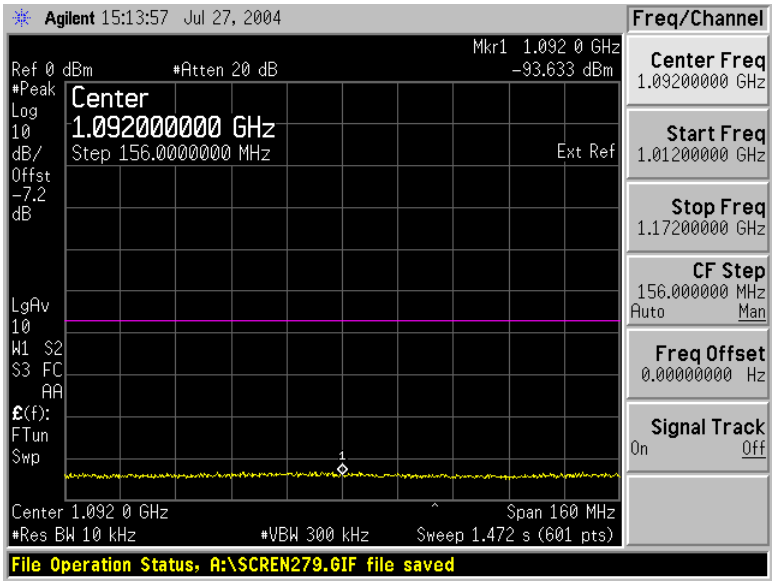
Conducted Spurious
544-704 MHz
4th Harmonic
F1D Modulation Input



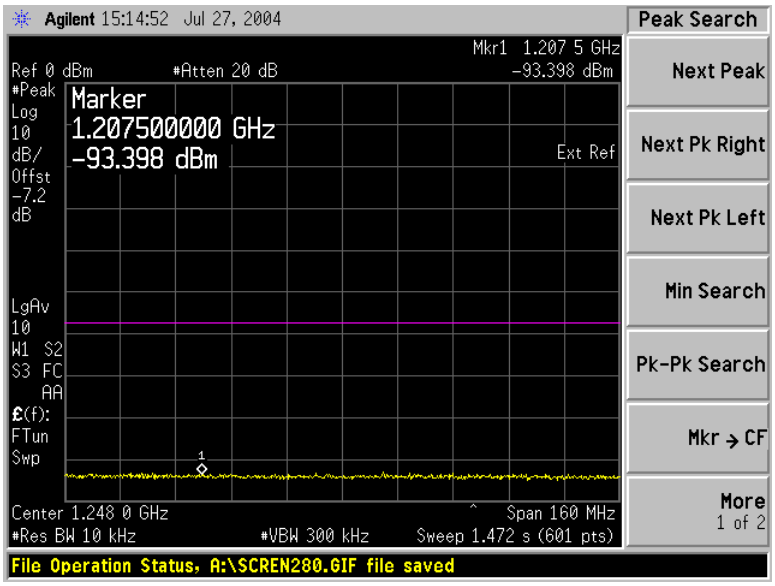
Conducted Spurious
700-860 MHz
5th Harmonic
F1D Modulation Input



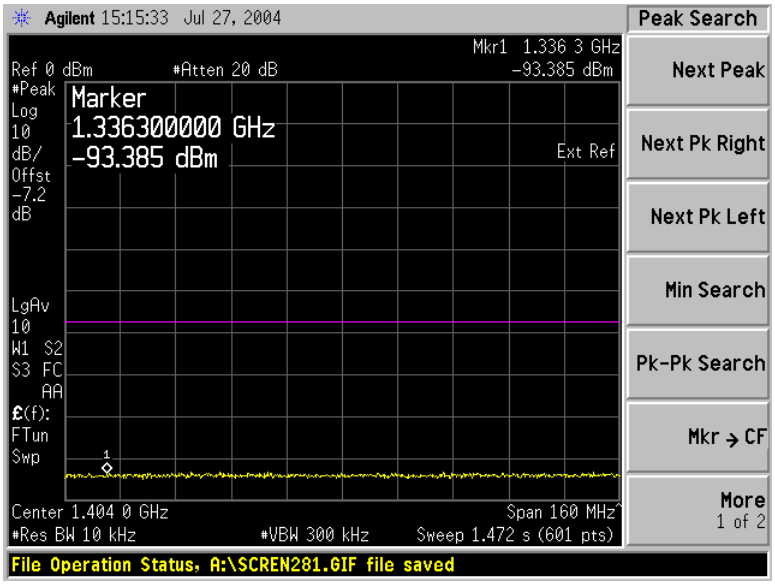
Conducted Spurious
856-1016 MHz
6th Harmonic
F1D Modulation Input



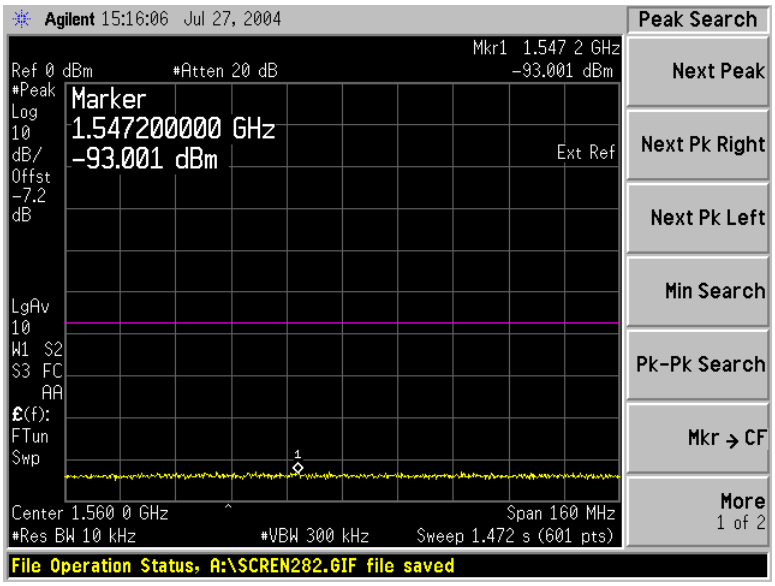
Conducted Spurious
1012-1172 MHz
7th Harmonic
F1D Modulation Input



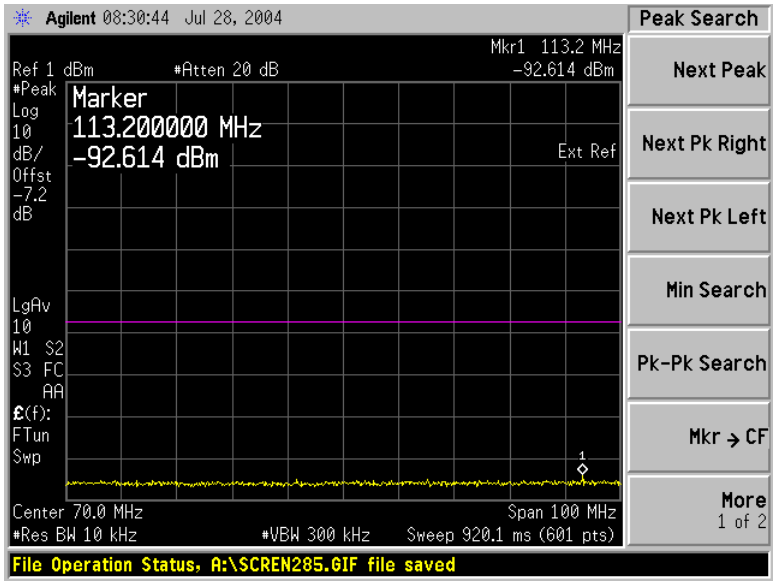
Conducted Spurious
1168-1328 MHz
8th Harmonic
F1D Modulation Input



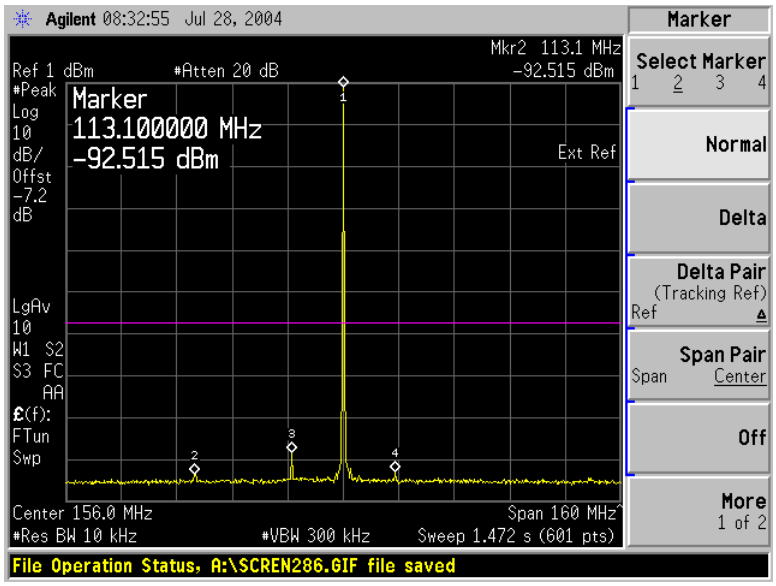
Conducted Spurious
1324-1484 MHz
9th Harmonic
F1D Modulation Input



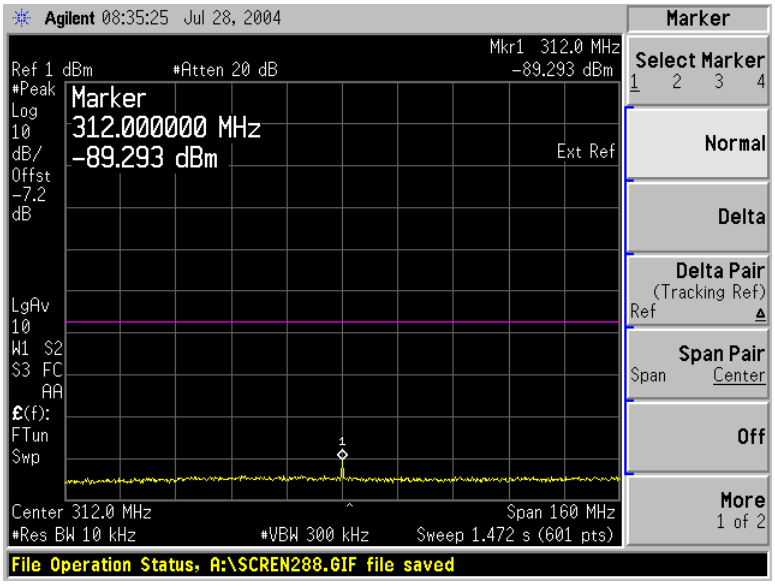
Conducted Spurious
1480-1640 MHz
10th Harmonic
F1D Modulation Input



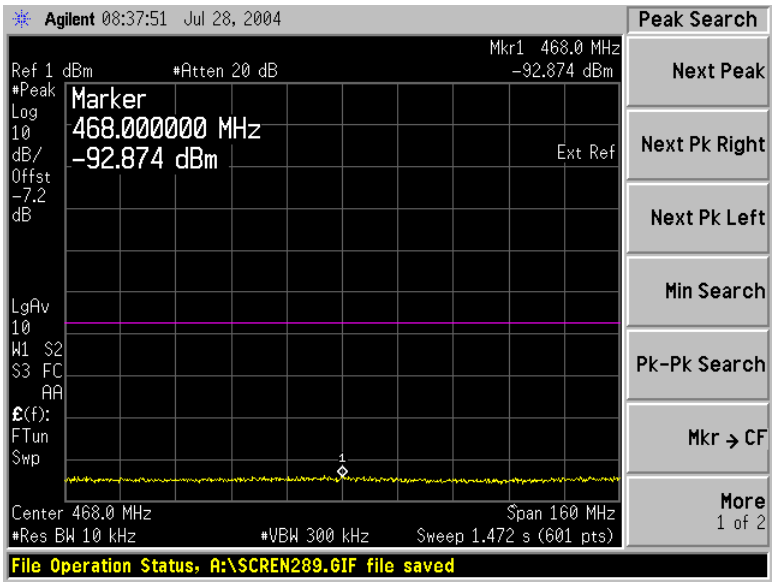
Conducted Spurious
20-120 MHz
Spur
F3D Modulation Input



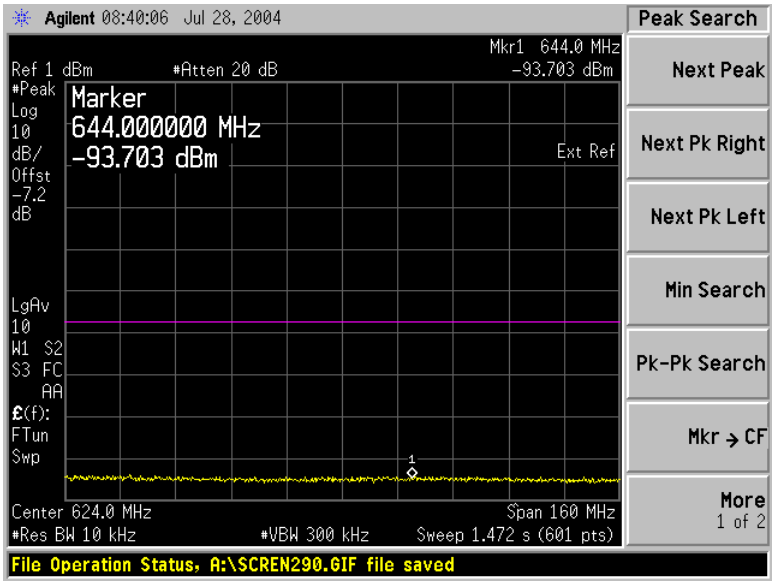
Conducted Spurious
76-236 MHz
Fundamental
F3D Modulation Input



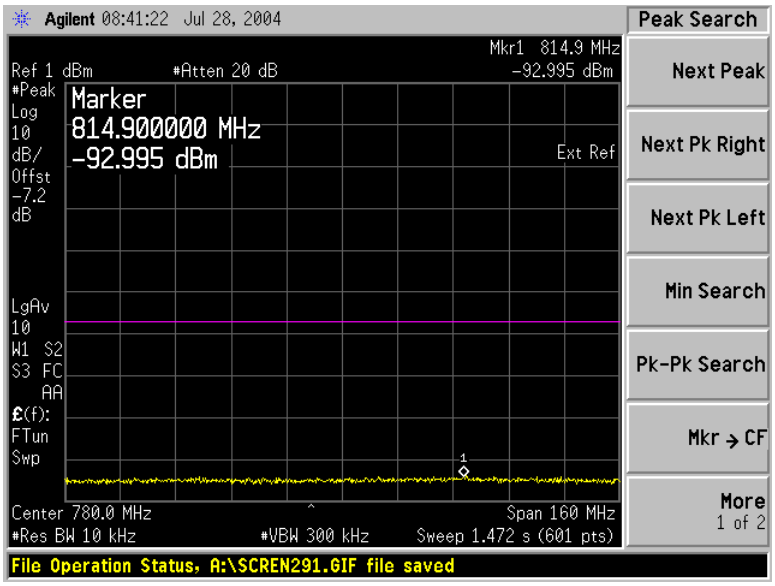
Conducted Spurious
232-392 MHz
2nd Harmonic
F3D Modulation Input



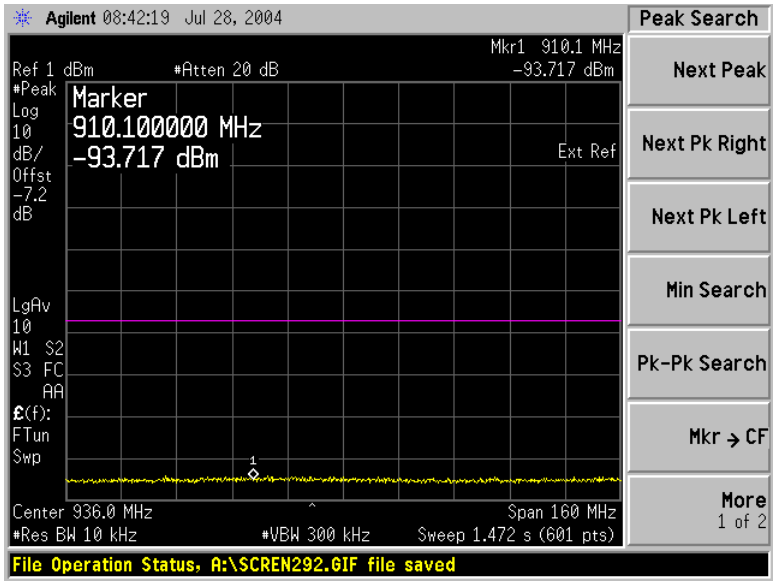
Conducted Spurious
388-548 MHz
3rd Harmonic
F3D Modulation Input



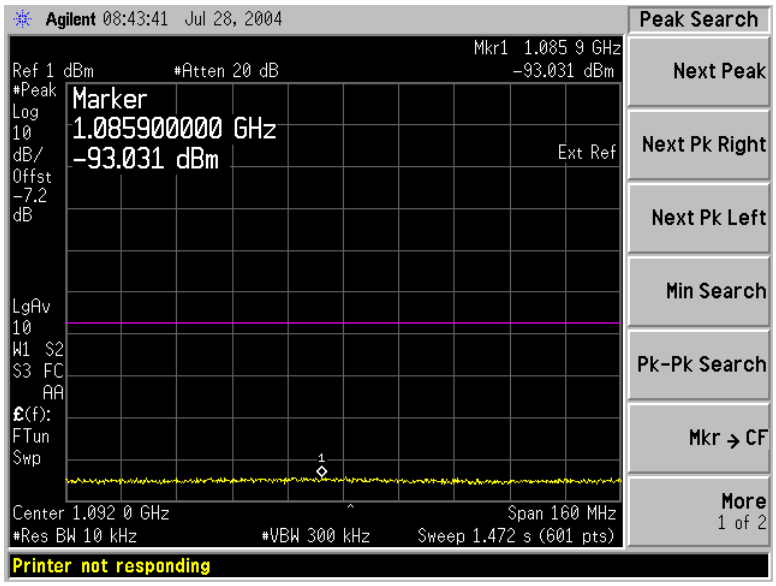
Conducted Spurious
544-704 MHz
4th Harmonic
F3D Modulation Input



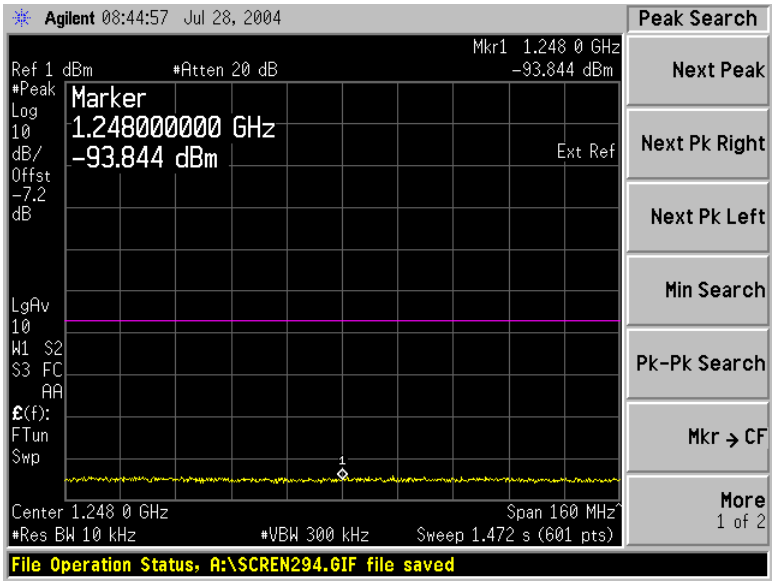
Conducted Spurious
700-860 MHz
5th Harmonic
F3D Modulation Input



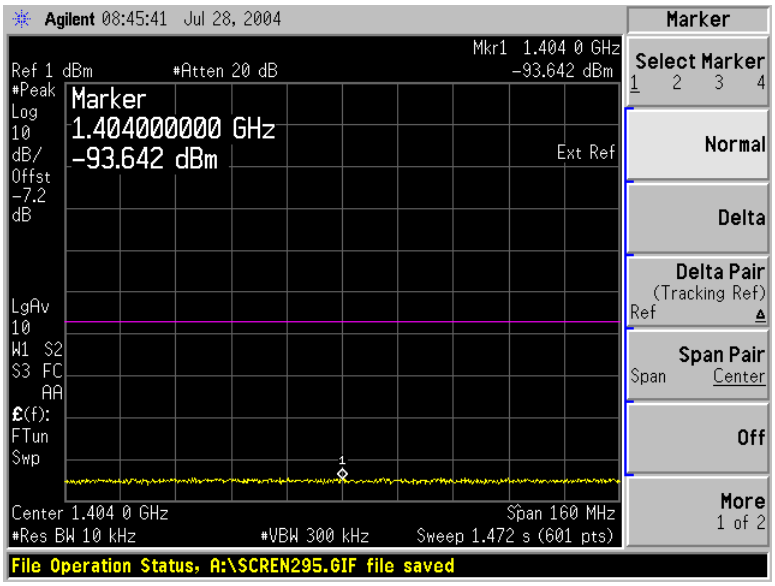
Conducted Spurious
856-1016 MHz
6th Harmonic
F3D Modulation Input



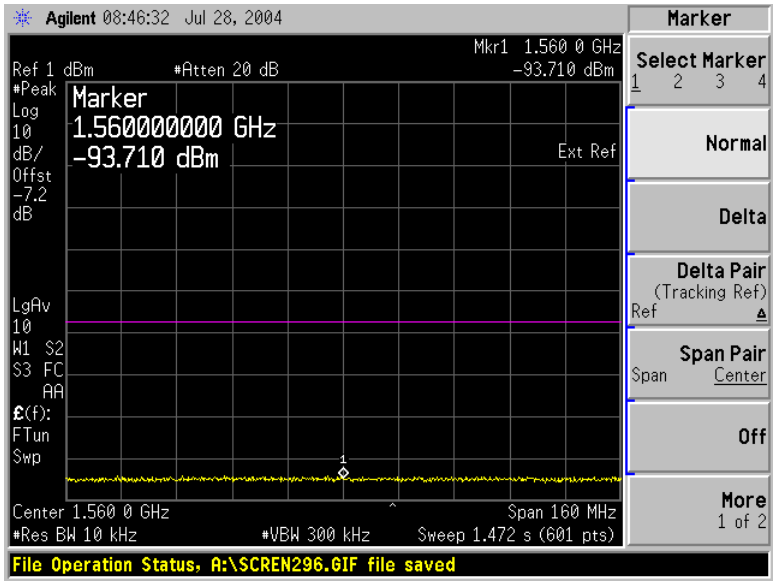
Conducted Spurious
1012-1172 MHz
7th Harmonic
F3D Modulation Input



Conducted Spurious
1168-1328 MHz
8th Harmonic
F3D Modulation Input



Conducted Spurious
1324-1484 MHz
9th Harmonic
F3D Modulation Input



Conducted Spurious
1480-1640 MHz
10th Harmonic
F3D Modulation Input

6. Field Strength of Spurious Emissions (47 CFR §2.1053)

Minimum Standard: -20dBm (77.4dBµV/m)

Test Results: Complies

Note: Radiated Emissions were tested by Acme Testing Co., Acme WA. Test facilities used to perform Radiated and Conducted Emissions Tests are registered with the FCC under Registration Number 90420.

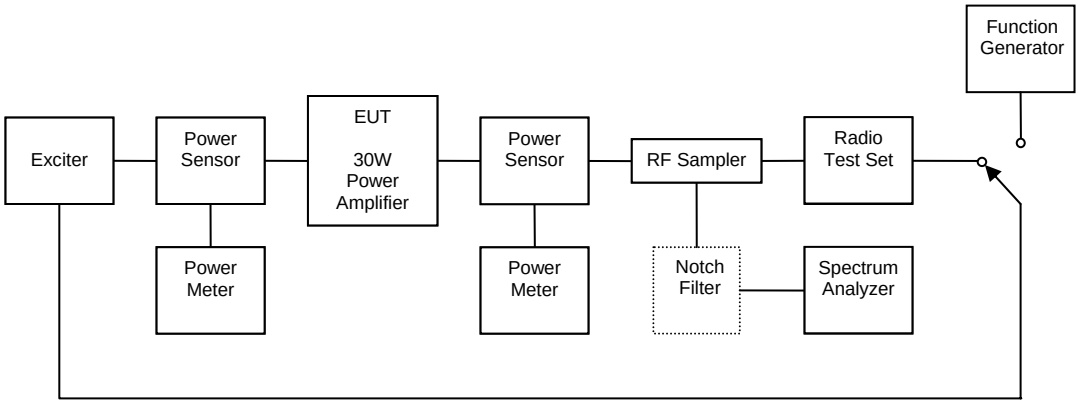
Test Data: See attached Appendix A "*H4JVT-30 - Radiated Emissions Report*" for full test results.

Worst Case Test Results for Each Model:

Model	Frequency (MHz)	Effective Radiated Power (dBm)	Margin (dB)
AMP-2/145-30-00	142.976	-26.5	-6.5
AMP-2/155-30-00	1565.93	-27.1	-7.1
AMP-2/170-30-00	521.973	-23.5	-3.5

7. Block Diagrams

- **RF Output Power**
- **Occupied Bandwidth**
- **Spurious Emissions at Antenna Terminals**



8. Test Equipment List

CAL CYCLE	EQUIPMENT	MANUFACTURER	MODEL	SERIAL	LAST CAL	NEXT CAL
N/A	Exciter	Daniels Electronics Ltd	VT-4R150	10736	N/A	N/A
N/A	RF Power Meter	Bird	4421	4937	N/A	N/A
1 Year	Directional Power Sensor	Bird	4022	11258	15-Jan-2004	15-Jan-2005
N/A	RF Power Meter	Bird	4421	5420	N/A	N/A
1 Year	Directional Power Sensor	Bird	4022	11195	18-Dec-2003	18-Dec-2004
N/A	Variable RF Sampler	Bird	4275	N/A	N/A	N/A
1 Year	Radio Test Set	Marconi Instruments	2965A	133052/010	12-Apr-2004	12-Apr-2005
1 Year	Spectrum Analyzer	Agilent Technologies	E4440A	US40420232	8-Apr-2004	22-Apr-2005
N/A	Function Generator*	Good Well Instrument	GFG-8019G	4690527	N/A	N/A
N/A	Notch Filter	Daniels Electronics Ltd	N/A	N/A	N/A	N/A

* The frequency and output specifications of this device were verified using the calibrated 2965A Marconi Radio Test Set, listed above.