



www.nemko.com



Test Report: 97908-3TRFWL

Applicant: Redline Communications
302 Town Centre Blvd.
Markham, Ontario
L3R 0E8

Apparatus: AN-80i (4.9-5.3GHz)

FCC ID: QC8-AN80IB

In Accordance With: FCC Part 90 (Private Land Mobile Radio Services)
Subpart Y (Regulations Governing Licensing and
Use of Frequencies in the 4940–4990 MHz Band)

Tested By: Nemko Canada Inc.
303 River Road
Ottawa, Ontario
K1V 1H2

Authorized By: 
Resource Manager

Date: February 20, 2008

Total Number of Pages: 70

Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 90. Conducted measurements were performed in accordance with ANSI TIA-603-B-2002. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

The assessment summary is as follows:

Apparatus Assessed:	AN-80i (4.9-5.3GHz)
Specification:	FCC Part 90 (Private Land Mobile Radio Services) Subpart Y (Regulations Governing Licensing and Use of Frequencies in the 4940–4990 MHz Band)
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release

Author: Roman Kuleba, EMC/Wireless Specialist

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

Nemko Canada Inc. authorizes the applicant to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Nemko Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

TABLE OF CONTENTS

Report Summary	2
Section 1 : Equipment Under Test	4
1.1 Product Identification	4
1.2 Samples Submitted for Assessment	4
1.3 Theory of Operation	4
1.4 Technical Specifications of the EUT	5
1.5 Block Diagram of the EUT	6
Section 2 : Test Conditions	7
2.1 Specifications	7
2.2 Deviations From Laboratory Test Procedures	7
2.3 Test Environment	7
2.4 Test Equipment	8
2.5 Measurement Uncertainty	8
Section 3 : Observations	9
3.1 Modifications Performed During Assessment	9
3.2 Record Of Technical Judgements	9
3.3 EUT Parameters Affecting Compliance	9
3.4 Test Deleted	9
3.5 Additional Observations	9
Section 4 : Results Summary	10
4.1 FCC Part 90 Subpart Y: Test Results	11
Appendix A: Test Results	12
Section 1. Occupied Bandwidth	12
Section 2. Peak Output Power	17
Section 3. Peak Power Spectrum Density	21
Section 4. Spurious Emissions at the Antenna Terminals	46
Section 5. Radiated Spurious Emissions	65
Section 6. Frequency Stability	67
Appendix B : Setup Photographs	69
Appendix C : Block Diagram of Test Setups	70

Section 1 : Equipment Under Test

1.1 Product Identification

The Equipment Under Test was identified as follows:

Redline AN-80i 4.9 - 5.3 GHz Radio

1.2 Samples Submitted for Assessment

The following samples of the apparatus have been submitted for type assessment:

Sample No.	Description	Serial No.
1	Redline AN-80i	S/N: 2308-0509-01209
2	Redline AN-80i	S/N: 2308-0509-01199
3	Power over Ethernet (PoE) AC Adapter, 100 – 240VAC/ 47 – 63Hz to 48VDC Cincon Electronics Co., Ltd., Model: TR60A-POE-L	S/N: 002181
4	Power over Ethernet (PoE) AC Adapter/ Injector, 100 – 240VAC/47 – 63Hz to 48VDC Cincon Electronics Co., Ltd., Model: TR60A-POE-L	S/N: 002182
5	RF Coaxial Cable Assembly, N-male/N-male, Harbour Industries HPF240, 1 ft	2118-0902
6	9° / 21dBi, 4.9-5.875 GHz, Flat Panel, MTI WIRELESS EDGE LTD, MT-465005/N	–
7	4 Pair Ethernet Cable	–

The first samples were received on: December 17, 2007

1.3 Theory of Operation

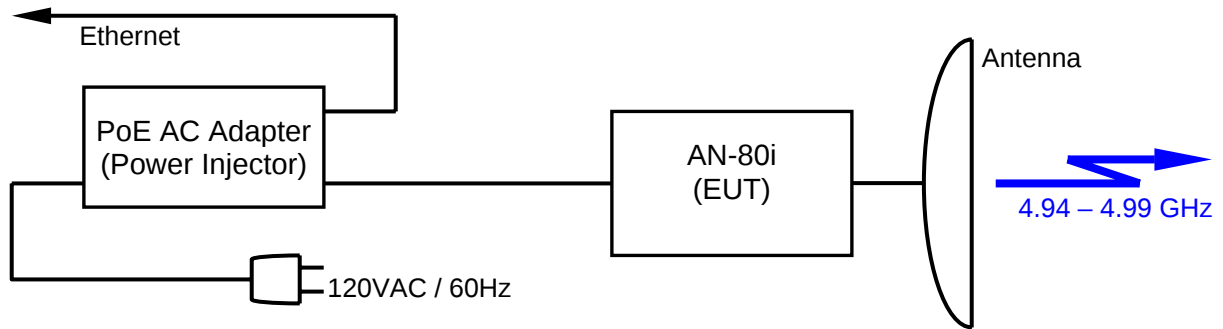
The AN-80i (4.9-5.3GHz) radio is a point-to-point OFDM broadband wireless infrastructure communication device operating in the 4.94 – 4.99 GHz band, designed to provide wireless high-speed Ethernet connection.

1.4 Technical Specifications of the EUT

Operating Frequency:	4.945 – 4.985 GHz (Channel Bandwidth: 10MHz) 4.950 – 4.980 GHz (Channel Bandwidth: 20MHz)		
Emission Designator:	D7W		
Rated Power:	22.0 dBm ⁽¹⁾		
Measured Peak Output Power:	Channel Bandwidth: 10MHz:	Conducted:	27.3 dBm
		Radiated:	53.6 dBm (EIRP)
	Channel Bandwidth: 20MHz:	Conducted:	28.3 dBm
		Radiated:	57.95 dBm (EIRP)
Modulation:	BPSK, QPSK, 16QAM, 64QAM		
Antenna Data:	1) 120° / 15 dBi, Sector Flat Panel, 4.9-5.9 GHz, EUROPEAN ANTENNAS, SA15-120-5.5V/9503/RLC 2) 90° / 16 dBi, Sector Flat Panel, 4.9-5.9 GHz, EUROPEAN ANTENNAS, SA16-90-5.5V/9502/RLC 3) 60° / 17 dBi, Sector Flat Panel, 4.9-5.9 GHz, EUROPEAN ANTENNAS, SA17-60-5.5V/9501/RLC 4) 9° / 21dBi, 4.9-5.875 GHz, Flat Panel, MTI WIRELESS EDGE LTD, MT-465005/N 5) 4.5° / 28dBi, 5.15-5.875 GHz, Flat Panel, MTI WIRELESS EDGE LTD, MT-446003/N 6) 6° / 29dBi, 4.9-5.875 GHz, Parabolic, PACIFIC WIRELESS< HDDA5W-29 7) 4° / 32dBi, 4.9-5.875 GHz, Parabolic, PACIFIC WIRELESS< HDDA5W-32		
Antenna Connector:	N-female		
Power Source:	Power over Ethernet (PoE) AC Adapter/ Injector, 100–240VAC / 47–63Hz to 48VDC		

Note (1): Manufacturer's rated power is software/GUI power setting representing average (mean) RF power based on conducted measurement with a thermocouple detector and a wide-band power meter.

1.5 Block Diagram of the EUT



Section 2 : Test Conditions

2.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 2 Subpart J, Equipment Authorization Procedures
FCC Part 90 Private Land Mobile Radio Services, Subpart Y (Regulations Governing Licensing and Use of Frequencies in the 4940–4990 MHz Band)

2.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

2.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15 – 30 °C
Humidity range	:	20 - 75 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 5% of rated voltages

2.4 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer	Rhode & Schwarz	FSU	FA001877	Jan 16/07	Jan 16/08
Spectrum Analyzer	Rhode & Schwarz	FSP 40 GHz	FA001920	Mar 19/07	Mar 19/08
Signal Generator	Rhode & Schwarz	SMIQ 06B	FA001878	Sep 4/07	Sep 4/08
Signal Generator	Rhode & Schwarz	SMR40	FA001879	Aug 8/07	Aug 8/08
RF Power Meter	Agilent	N1911A	FA001946	Jan 23/07	Jan 23/08
RF Power Sensor	Agilent	8487A	FA001947	Jan 23/07	Jan 23/08
Thermometer	Fluke	16	FA001831	Jan. 10/07	Jan. 10/08
Power Divider/Combiner	Mini Circuits	ZN2PD-9G	Client	COU*	COU*
Directional Bridge	Hewlett Packard	HP86205A	Client (S/N: 3140A 02798)	COU*	COU*
Fixed Attenuator 10 dB	Narda	768-10	–	COU*	COU*
Climate Chamber	Tenney	TJR	Client (27330-08)	COU*	COU*
Climate Chamber	Tenney	T10RC-1.5	Client (29108)	COU*	COU*
RF AMP	JCA	1-2 GHz	FA001498	Aug. 21/07	Aug. 21/08
RF AMP	JCA	2-4 GHz	FA001496	Aug. 21/07	Aug. 21/08
RF AMP	JCA	4-8 GHz	FA001497	Aug. 21/07	Aug. 21/08
RF AMP	Narda	5 - 18GHz	FA001409	COU*	COU*
Bi-Conical Antenna	Sunol	BC2	FA002078	July 25/07	July 25/08
Log Periodic Antenna	Sunol	LP5	FA002077	July 25/07	July 25/08
Horn Antenna #1	EMCO	3115	FA000649	Feb 26/07	Feb 26/08
Horn Antenna #2	EMCO	3115	FA000825	Jan. 30/07	Jan. 30/08
Horn Antenna (18 – 40 GHz)	EMCO	3116	FA001847	May 9/07	May 9/08
Spectrum Analyzer	Hewlett-Packard	8565E	FA000981	Oct 11/07	Oct 11/08

* COU (Calibrate on Use)

2.5 Measurement Uncertainty

Nemko Canada measurement uncertainty has been calculated using guidance of UKAS LAB 34:2003 and TIA-603-B Nov 7, 2002. All calculations have been performed to provide a confidence level of 95% and can be found in Nemko Canada document MU-003.

Section 3 : Observations

3.1 Modifications Performed During Assessment

No modifications were performed during assessment.

3.2 Record Of Technical Judgements

No technical judgements were made during the assessment.

3.3 EUT Parameters Affecting Compliance

The user of the apparatus could not alter parameters that would affect compliance.

3.4 Test Deleted

No Tests were deleted from this assessment.

3.5 Additional Observations

There were no additional observations made during this assessment.

Section 4 : Results Summary

This section contains the following:

FCC Part 90 : Test Results

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

- N No : not applicable / not relevant.
- Y Yes : Mandatory i.e. the apparatus shall conform to these tests.
- N/T Not Tested, mandatory but not assessed. (See section 3.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

4.1 FCC Part 90 Subpart Y: Test Results

Section	Clause	Test Description	Required	Result
1	90.1215	Occupied Bandwidth	Y	PASS
2	90.1215	Peak Output Power	Y	PASS
3	90.1215	Peak Power Spectrum Density	Y	PASS
4	90.210(m)	Spurious Emissions at the Antenna Terminals	Y	PASS
5	90.210(m)	Radiated Spurious Emissions	Y	PASS
6	90.213	Frequency Stability	Y	PASS

Notes:

Appendix A: Test Results

Section 1. Occupied Bandwidth

Criteria: Clause 90.1215

(d) The peak power spectral density is measured as conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements are made over a bandwidth of one MHz or the 26 dB emission bandwidth of the device, whichever is less. A resolution bandwidth less than the measurement bandwidth can be used, provided that the measured power is integrated to show total power over the measurement bandwidth. If the resolution bandwidth is approximately equal to the measurement bandwidth, and much less than the emission bandwidth of the equipment under test, the measured results shall be corrected to account for any difference between the resolution bandwidth of the test instrument and its actual noise bandwidth

Test Conditions:

Sample Number:	1,2	Temperature:	22 °C
Date:	December 21, 2007	Humidity:	50 %
Modification State:	0	Tester:	Roman Kuleba
		Laboratory:	Client, R & D

Test Results: Complies

Test Data: See attached table and graphics

Additional Observations: Occupied Bandwidth was measured at the highest rated power level (GUI Power Setting: 22 dBm)

26dB Occupied Bandwidth:

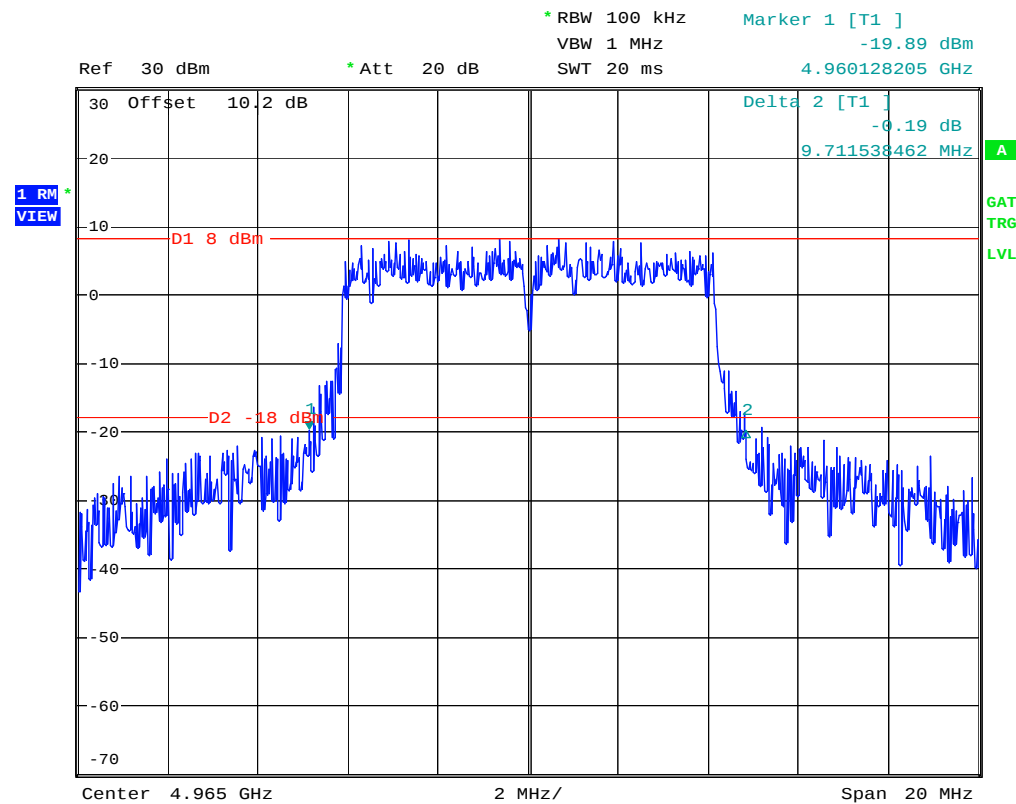
Nominal Channel Bandwidth (MHz)	Measured Occupied Bandwidth (MHz)
10.0	9.7
20.0	19.9

99% Occupied Bandwidth:

Nominal Channel Bandwidth (MHz)	Measured Occupied Bandwidth (MHz)
10.0	8.24
20.0	16.47

Occupied Bandwidth, continued

Nominal Channel Bandwidth: 10 MHz

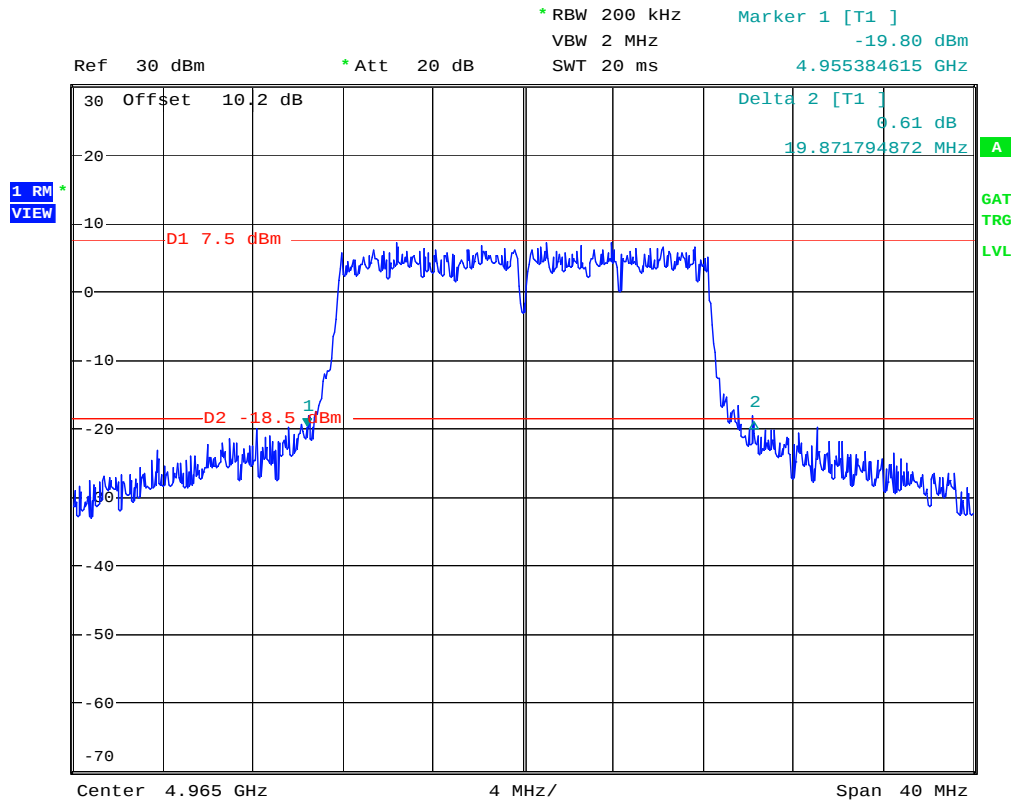


RedLine Communications, AN80i

Date: 21.DEC.2007 11:29:33

Occupied Bandwidth, continued

Nominal Channel Bandwidth: 20 MHz



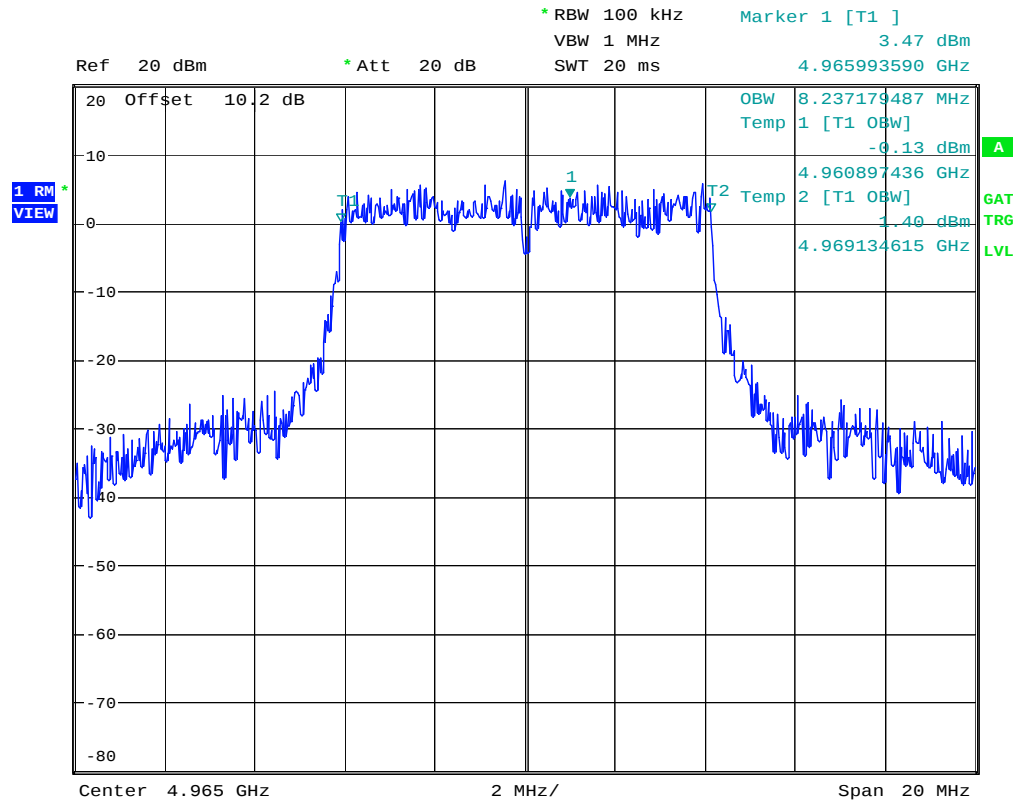
RedLine Communications, AN80i

Date: 21.DEC.2007 11:55:43

Occupied Bandwidth, continued

99% Occupied Bandwidth

Nominal Channel Bandwidth: 10 MHz



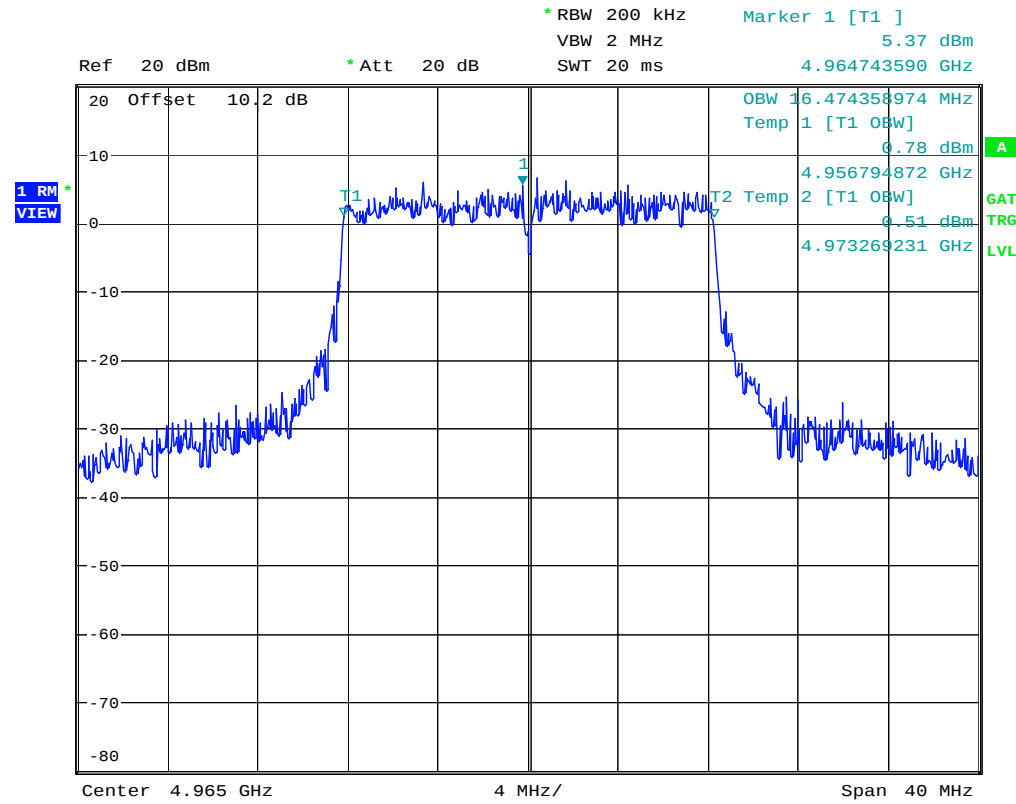
RedLine Communications, AN80i

Date: 3.JAN.2008 10:28:34

Occupied Bandwidth, continued

99% Occupied Bandwidth

Nominal Channel Bandwidth: 20 MHz



RedLine Communications, AN80i

Date: 3.JAN.2008 10:39:01

Section 2. Peak Output Power

Criteria: 90.1215(a)

Power limits. - The transmitting power of stations operating in the 4940-4990 MHz band must not exceed the maximum limits in this section.

(a) The peak transmit power should not exceed:

Channel Bandwidth (MHz)	Low power peak transmitter power (dBm)	High power peak transmitter power(dBm)
1	7	20
5	14	27
10	17	30
15	18.8	31.8
20	20	33

However, high power point-to-point or point-to-multipoint operation (both fixed and temporary-fixed rapid deployment) may employ transmitting antennas with directional gain up to 26 dBi without any corresponding reduction in the transmitter power or spectral density. Corresponding reduction in the peak transmit power and peak power spectral density should be the amount in decibels that the directional gain of the antenna exceeds 26 dBi.

Test Conditions:

Sample Number:	1,2	Temperature:	22 °C
Date:	December 19, 2007	Humidity:	50 %
Modification State:	0	Tester:	Roman Kuleba
		Laboratory:	Client, R & D

Test Results: Complies

Test Data: See attached tables.

Peak Output Power, continued

Antenna Gain: 15.0 dBi

Ch.Spc.: 10 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	Avg P _{TX} Cond. (dBm)	Peak P _{TX} Cond. (dBm)	Peak P _{TX} Limit (dBm)	P _{TX} Margin (dB)	Peak EIRP (dBm)	Peak EIRP Limit (dBm)	EIRP Margin (dB)
4.945	15.0	19	18.20	27.30	30.00	2.70	42.30	56.00	13.70
4.965	15.0	18	17.80	27.10	30.00	2.90	42.10	56.00	13.90
4.985	15.0	18	17.00	26.50	30.00	3.50	41.50	56.00	14.50

Ch.Spc.: 20 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	Avg P _{TX} Cond. (dBm)	Peak P _{TX} Cond. (dBm)	Peak P _{TX} Limit (dBm)	P _{TX} Margin (dB)	Peak EIRP (dBm)	Peak EIRP Limit (dBm)	EIRP Margin (dB)
4.950	15.0	20	19.65	28.30	33.00	4.70	43.30	59.00	15.70
4.965	15.0	20	19.85	28.30	33.00	4.70	43.30	59.00	15.70
4.980	15.0	20	19.50	28.15	33.00	4.85	43.15	59.00	15.85

Antenna Gain: 16.0 dBi

Ch.Spc.: 10 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	Avg P _{TX} Cond. (dBm)	Peak P _{TX} Cond. (dBm)	Peak P _{TX} Limit (dBm)	P _{TX} Margin (dB)	Peak EIRP (dBm)	Peak EIRP Limit (dBm)	EIRP Margin (dB)
4.945	16.0	19	18.20	27.30	30.00	2.70	43.30	56.00	12.70
4.965	16.0	18	17.80	27.10	30.00	2.90	43.10	56.00	12.90
4.985	16.0	18	17.00	26.50	30.00	3.50	42.50	56.00	13.50

Ch.Spc.: 20 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	Avg P _{TX} Cond. (dBm)	Peak P _{TX} Cond. (dBm)	Peak P _{TX} Limit (dBm)	P _{TX} Margin (dB)	Peak EIRP (dBm)	Peak EIRP Limit (dBm)	EIRP Margin (dB)
4.950	16.0	20	19.65	28.30	33.00	4.70	44.30	59.00	14.70
4.965	16.0	20	19.85	28.30	33.00	4.70	44.30	59.00	14.70
4.980	16.0	20	19.50	28.15	33.00	4.85	44.15	59.00	14.85

Antenna Gain: 17.0 dBi

Ch.Spc.: 10 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	Avg P _{TX} Cond. (dBm)	Peak P _{TX} Cond. (dBm)	Peak P _{TX} Limit (dBm)	P _{TX} Margin (dB)	Peak EIRP (dBm)	Peak EIRP Limit (dBm)	EIRP Margin (dB)
4.945	17.0	19	18.20	27.30	30.00	2.70	44.30	56.00	11.70
4.965	17.0	18	17.80	27.10	30.00	2.90	44.10	56.00	11.90
4.985	17.0	18	17.00	26.50	30.00	3.50	43.50	56.00	12.50

Ch.Spc.: 20 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	Avg P _{TX} Cond. (dBm)	Peak P _{TX} Cond. (dBm)	Peak P _{TX} Limit (dBm)	P _{TX} Margin (dB)	Peak EIRP (dBm)	Peak EIRP Limit (dBm)	EIRP Margin (dB)
4.950	17.0	20	19.65	28.30	33.00	4.70	45.30	59.00	13.70
4.965	17.0	20	19.85	28.30	33.00	4.70	45.30	59.00	13.70
4.980	17.0	20	19.50	28.15	33.00	4.85	45.15	59.00	13.85

Peak Output Power, continued

Antenna Gain: 21.0 dBi

Ch.Spc.: 10 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	Avg P _{TX} Cond. (dBm)	Peak P _{TX} Cond. (dBm)	Peak P _{TX} Limit (dBm)	P _{TX} Margin (dB)	Peak EIRP (dBm)	Peak EIRP Limit (dBm)	EIRP Margin (dB)
4.945	21.0	19	18.20	27.30	30.00	2.70	48.30	56.00	7.70
4.965	21.0	18	17.80	27.10	30.00	2.90	48.10	56.00	7.90
4.985	21.0	18	17.00	26.50	30.00	3.50	47.50	56.00	8.50

Ch.Spc.: 20 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	Avg P _{TX} Cond. (dBm)	Peak P _{TX} Cond. (dBm)	Peak P _{TX} Limit (dBm)	P _{TX} Margin (dB)	Peak EIRP (dBm)	Peak EIRP Limit (dBm)	EIRP Margin (dB)
4.950	21.0	20	19.65	28.30	33.00	4.70	49.30	59.00	9.70
4.965	21.0	20	19.85	28.30	33.00	4.70	49.30	59.00	9.70
4.980	21.0	20	19.50	28.15	33.00	4.85	49.15	59.00	9.85

Antenna Gain: 28.0 dBi

Ch.Spc.: 10 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	Avg P _{TX} Cond. (dBm)	Peak P _{TX} Cond. (dBm)	Peak P _{TX} Limit (dBm)	P _{TX} Margin (dB)	Peak EIRP (dBm)	Peak EIRP Limit (dBm)	EIRP Margin (dB)
4.945	28.0	16	15.25	24.80	28.00	3.20	52.80	56.00	3.20
4.965	28.0	16	15.45	25.00	28.00	3.00	53.00	56.00	3.00
4.985	28.0	17	15.85	25.35	28.00	2.65	53.35	56.00	2.65

Ch.Spc.: 20 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	Avg P _{TX} Cond. (dBm)	Peak P _{TX} Cond. (dBm)	Peak P _{TX} Limit (dBm)	P _{TX} Margin (dB)	Peak EIRP (dBm)	Peak EIRP Limit (dBm)	EIRP Margin (dB)
4.950	28.0	20	19.65	28.30	31.00	2.70	56.30	59.00	2.70
4.965	28.0	20	19.85	28.30	31.00	2.70	56.30	59.00	2.70
4.980	28.0	20	19.50	28.15	31.00	2.85	56.15	59.00	2.85

Antenna Gain: 29.0 dBi

Ch.Spc.: 10 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	Avg P _{TX} Cond. (dBm)	Peak P _{TX} Cond. (dBm)	Peak P _{TX} Limit (dBm)	P _{TX} Margin (dB)	Peak EIRP (dBm)	Peak EIRP Limit (dBm)	EIRP Margin (dB)
4.945	29.0	15	14.05	23.55	27.00	3.45	52.55	56.00	3.45
4.965	29.0	15	14.40	23.90	27.00	3.10	52.90	56.00	3.10
4.985	29.0	16	14.75	24.40	27.00	2.60	53.40	56.00	2.60

Ch.Spc.: 20 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	Avg P _{TX} Cond. (dBm)	Peak P _{TX} Cond. (dBm)	Peak P _{TX} Limit (dBm)	P _{TX} Margin (dB)	Peak EIRP (dBm)	Peak EIRP Limit (dBm)	EIRP Margin (dB)
4.950	29.0	19	18.45	27.80	30.00	5.20	56.80	59.00	2.20
4.965	29.0	19	18.70	27.80	30.00	5.20	56.80	59.00	2.20
4.980	29.0	19	18.30	27.60	30.00	5.40	56.60	59.00	2.40

Peak Output Power, continued

Antenna Gain: 32.0 dBi

Ch.Spc.: 10 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	Avg P _{TX} Cond. (dBm)	Peak P _{TX} Cond. (dBm)	Peak P _{TX} Limit (dBm)	P _{TX} Margin (dB)	Peak EIRP (dBm)	Peak EIRP Limit (dBm)	EIRP Margin (dB)
4.945	32.0	13	11.85	21.50	24.00	2.50	53.50	56.00	2.50
4.965	32.0	13	12.10	21.60	24.00	2.40	53.60	56.00	2.40
4.985	32.0	13	11.35	21.15	24.00	2.85	53.15	56.00	2.85

Ch.Spc.: 20 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	Avg P _{TX} Cond. (dBm)	Peak P _{TX} Cond. (dBm)	Peak P _{TX} Limit (dBm)	P _{TX} Margin (dB)	Peak EIRP (dBm)	Peak EIRP Limit (dBm)	EIRP Margin (dB)
4.950	32.0	16	15.45	25.80	27.00	1.20	57.80	59.00	1.20
4.965	32.0	16	15.65	25.95	27.00	1.05	57.95	59.00	1.05
4.980	32.0	16	14.70	25.15	27.00	1.85	57.15	59.00	1.85

Section 3. Peak Power Spectrum Density

Criteria: Clause 90.1215

High power devices are also limited to a peak power spectral density of 21 dBm per one MHz. High power devices using channel bandwidths other than those listed above are permitted; however, they are limited to a peak power spectral density of 21 dBm/MHz. If transmitting antennas of directional gain greater than 9 dBi are used, both the peak transmit power and the peak power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9 dBi. However, high power point-to-point or point-to-multipoint operation (both fixed and temporary-fixed rapid deployment) may employ transmitting antennas with directional gain up to 26 dBi without any corresponding reduction in the transmitter power or spectral density. Corresponding reduction in the peak transmit power and peak power spectral density should be the amount in decibels that the directional gain of the antenna exceeds 26 dBi.

(d) The peak power spectral density is measured as conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements are made over a bandwidth of one MHz or the 26 dB emission bandwidth of the device, whichever is less. A resolution bandwidth less than the measurement bandwidth can be used, provided that the measured power is integrated to show total power over the measurement bandwidth. If the resolution bandwidth is approximately equal to the measurement bandwidth, and much less than the emission bandwidth of the equipment under test, the measured results shall be corrected to account for any difference between the resolution bandwidth of the test instrument and its actual noise bandwidth.

Test Conditions:

Sample Number:	1,2	Temperature:	22 °C
Date:	December 19, 2007	Humidity:	50 %
Modification State:	0	Tester:	Roman Kuleba
		Laboratory:	Client, R & D

Test Result: Complies.

Test Data: See attached tables and graphics.

Peak Power Spectrum Density, continued

Antenna Gain: 15.0 dBi

Ch.Spc.: 10 MHz

Ant.Gain (dBi): 15.0

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	PPSD Cond. (dBm/MHz)	PPSD Limit (dBm/MHz)	PPSD Margin (dB)	PPSD EIRP (dBm/MHz)	PPSD EIRP Lmt (dBm/MHz)	PPSD EIRP Margin (dB)
4.945	15.0	19	20.61	21.00	0.39	35.61	47.00	11.39
4.965	15.0	18	20.70	21.00	0.30	35.70	47.00	11.30
4.985	15.0	18	20.15	21.00	0.85	35.15	47.00	11.85

Ch.Spc.: 20 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	PPSD Cond. (dBm/MHz)	PPSD Limit (dBm/MHz)	PPSD Margin (dB)	PPSD EIRP (dBm/MHz)	PPSD EIRP Lmt (dBm/MHz)	PPSD EIRP Margin (dB)
4.950	15.0	20	18.53	21.00	2.47	33.53	47.00	13.47
4.965	15.0	20	18.71	21.00	2.29	33.71	47.00	13.29
4.980	15.0	20	18.88	21.00	2.12	33.88	47.00	13.12

Antenna Gain: 16.0 dBi

Ch.Spc.: 10 MHz

Ant.Gain (dBi): 16.0

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	PPSD Cond. (dBm/MHz)	PPSD Limit (dBm/MHz)	PPSD Margin (dB)	PPSD EIRP (dBm/MHz)	PPSD EIRP Lmt (dBm/MHz)	PPSD EIRP Margin (dB)
4.945	16.0	19	20.61	21.00	0.39	36.61	47.00	10.39
4.965	16.0	18	20.70	21.00	0.30	36.70	47.00	10.30
4.985	16.0	18	20.15	21.00	0.85	36.15	47.00	10.85

Ch.Spc.: 20 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	PPSD Cond. (dBm/MHz)	PPSD Limit (dBm/MHz)	PPSD Margin (dB)	PPSD EIRP (dBm/MHz)	PPSD EIRP Lmt (dBm/MHz)	PPSD EIRP Margin (dB)
4.950	16.0	20	18.53	21.00	2.47	34.53	47.00	12.47
4.965	16.0	20	18.71	21.00	2.29	34.71	47.00	12.29
4.980	16.0	20	18.88	21.00	2.12	34.88	47.00	12.12

Antenna Gain: 17.0 dBi

Ch.Spc.: 10 MHz

Ant.Gain (dBi): 17.0

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	PPSD Cond. (dBm/MHz)	PPSD Limit (dBm/MHz)	PPSD Margin (dB)	PPSD EIRP (dBm/MHz)	PPSD EIRP Lmt (dBm/MHz)	PPSD EIRP Margin (dB)
4.945	17.0	19	20.61	21.00	0.39	37.61	47.00	9.39
4.965	17.0	18	20.70	21.00	0.30	37.70	47.00	9.30
4.985	17.0	18	20.15	21.00	0.85	37.15	47.00	9.85

Ch.Spc.: 20 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	PPSD Cond. (dBm/MHz)	PPSD Limit (dBm/MHz)	PPSD Margin (dB)	PPSD EIRP (dBm/MHz)	PPSD EIRP Lmt (dBm/MHz)	PPSD EIRP Margin (dB)
4.950	17.0	20	18.53	21.00	2.47	35.53	47.00	11.47
4.965	17.0	20	18.71	21.00	2.29	35.71	47.00	11.29
4.980	17.0	20	18.88	21.00	2.12	35.88	47.00	11.12

Peak Power Spectrum Density, continued

Antenna Gain: 21.0 dBi

Ch.Spc.: 10 MHz

Ant.Gain (dBi): 21.0

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	PPSD Cond. (dBm/MHz)	PPSD Limit (dBm/MHz)	PPSD Margin (dB)	PPSD EIRP (dBm/MHz)	PPSD EIRP Lmt (dBm/MHz)	PPSD EIRP Margin (dB)
4.945	21.0	19	20.61	21.00	0.39	41.61	47.00	5.39
4.965	21.0	18	20.70	21.00	0.30	41.70	47.00	5.30
4.985	21.0	18	20.15	21.00	0.85	41.15	47.00	5.85

Ch.Spc.: 20 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	PPSD Cond. (dBm/MHz)	PPSD Limit (dBm/MHz)	PPSD Margin (dB)	PPSD EIRP (dBm/MHz)	PPSD EIRP Lmt (dBm/MHz)	PPSD EIRP Margin (dB)
4.950	21.0	20	18.53	21.00	2.47	39.53	47.00	7.47
4.965	21.0	20	18.71	21.00	2.29	39.71	47.00	7.29
4.980	21.0	20	18.88	21.00	2.12	39.88	47.00	7.12

Antenna Gain: 28.0 dBi

Ch.Spc.: 10 MHz

Ant.Gain (dBi): 28.0

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	PPSD Cond. (dBm/MHz)	PPSD Limit (dBm/MHz)	PPSD Margin (dB)	PPSD EIRP (dBm/MHz)	PPSD EIRP Lmt (dBm/MHz)	PPSD EIRP Margin (dB)
4.945	28.0	16	18.55	19.00	0.45	46.55	47.00	0.45
4.965	28.0	16	18.22	19.00	0.78	46.22	47.00	0.78
4.985	28.0	17	18.90	19.00	0.10	46.90	47.00	0.10

Ch.Spc.: 20 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	PPSD Cond. (dBm/MHz)	PPSD Limit (dBm/MHz)	PPSD Margin (dB)	PPSD EIRP (dBm/MHz)	PPSD EIRP Lmt (dBm/MHz)	PPSD EIRP Margin (dB)
4.950	28.0	20	18.53	19.00	0.47	46.53	47.00	0.47
4.965	28.0	20	18.71	19.00	0.29	46.71	47.00	0.29
4.980	28.0	20	18.88	19.00	0.12	46.88	47.00	0.12

Antenna Gain: 29.0 dBi

Ch.Spc.: 10 MHz

Ant.Gain (dBi): 29.0

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	PPSD Cond. (dBm/MHz)	PPSD Limit (dBm/MHz)	PPSD Margin (dB)	PPSD EIRP (dBm/MHz)	PPSD EIRP Lmt (dBm/MHz)	PPSD EIRP Margin (dB)
4.945	29.0	15	17.13	18.00	0.87	46.13	47.00	0.87
4.965	29.0	15	17.12	18.00	0.88	46.12	47.00	0.88
4.985	29.0	16	17.83	18.00	0.17	46.83	47.00	0.17

Ch.Spc.: 20 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	PPSD Cond. (dBm/MHz)	PPSD Limit (dBm/MHz)	PPSD Margin (dB)	PPSD EIRP (dBm/MHz)	PPSD EIRP Lmt (dBm/MHz)	PPSD EIRP Margin (dB)
4.950	29.0	19	17.54	18.00	0.46	46.54	47.00	0.46
4.965	29.0	19	17.88	18.00	0.12	46.88	47.00	0.12
4.980	29.0	19	17.66	18.00	0.34	46.66	47.00	0.34

Peak Power Spectrum Density, continued

Antenna Gain: 32.0 dBi

Ch.Spc.: 10 MHz

Ant.Gain (dBi): 32.0

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	PPSD Cond. (dBm/MHz)	PPSD Limit (dBm/MHz)	PPSD Margin (dB)	PPSD EIRP (dBm/MHz)	PPSD EIRP Lmt (dBm/MHz)	PPSD EIRP Margin (dB)
4.945	32.0	13	14.43	15.00	0.57	46.43	47.00	0.57
4.965	32.0	13	14.95	15.00	0.05	46.95	47.00	0.05
4.985	32.0	13	14.67	15.00	0.33	46.67	47.00	0.33

Ch.Spc.: 20 MHz

Freq. (GHz)	G _{ANT} (dBi)	GUI Setting (dBm)	PPSD Cond. (dBm/MHz)	PPSD Limit (dBm/MHz)	PPSD Margin (dB)	PPSD EIRP (dBm/MHz)	PPSD EIRP Lmt (dBm/MHz)	PPSD EIRP Margin (dB)
4.950	32.0	16	14.44	15.00	0.56	46.44	47.00	0.56
4.965	32.0	16	14.72	15.00	0.28	46.72	47.00	0.28
4.980	32.0	16	14.20	15.00	0.80	46.20	47.00	0.80

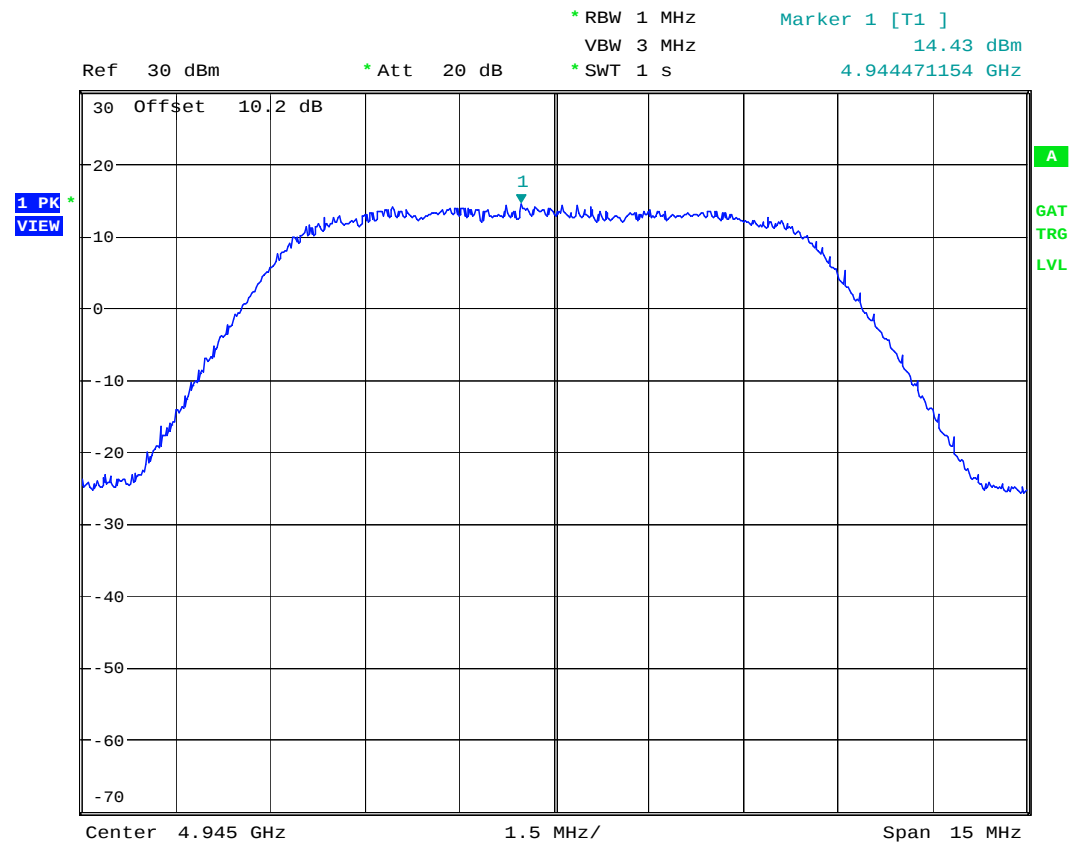
Peak Power Spectrum Density, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4945 MHz

GUI Power Setting: 13 dBm

Antenna Gain: 32 dBi



RedLine Communications, AN80i

Date: 20.DEC.2007 11:05:29

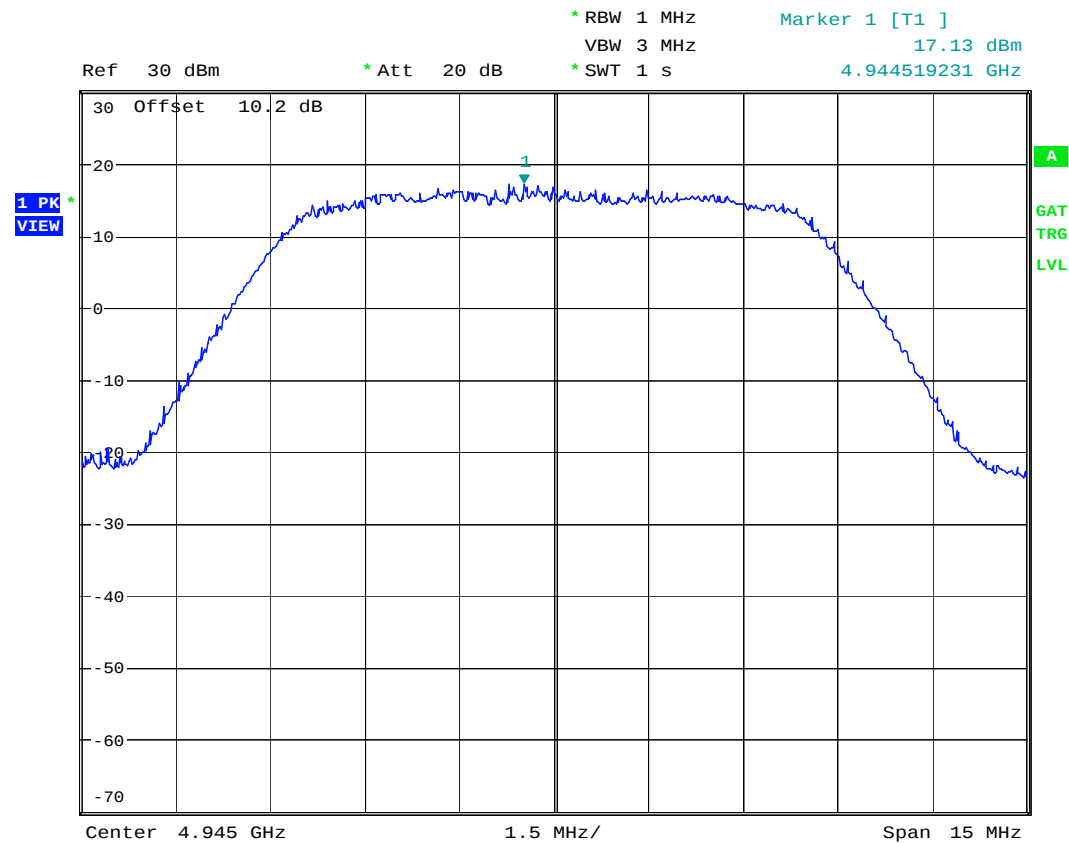
Peak Power Spectrum Density, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4945 MHz

GUI Power Setting: 15 dBm

Antenna Gain: 29 dBi



RedLine Communications, AN80i

Date: 19.DEC.2007 21:05:17

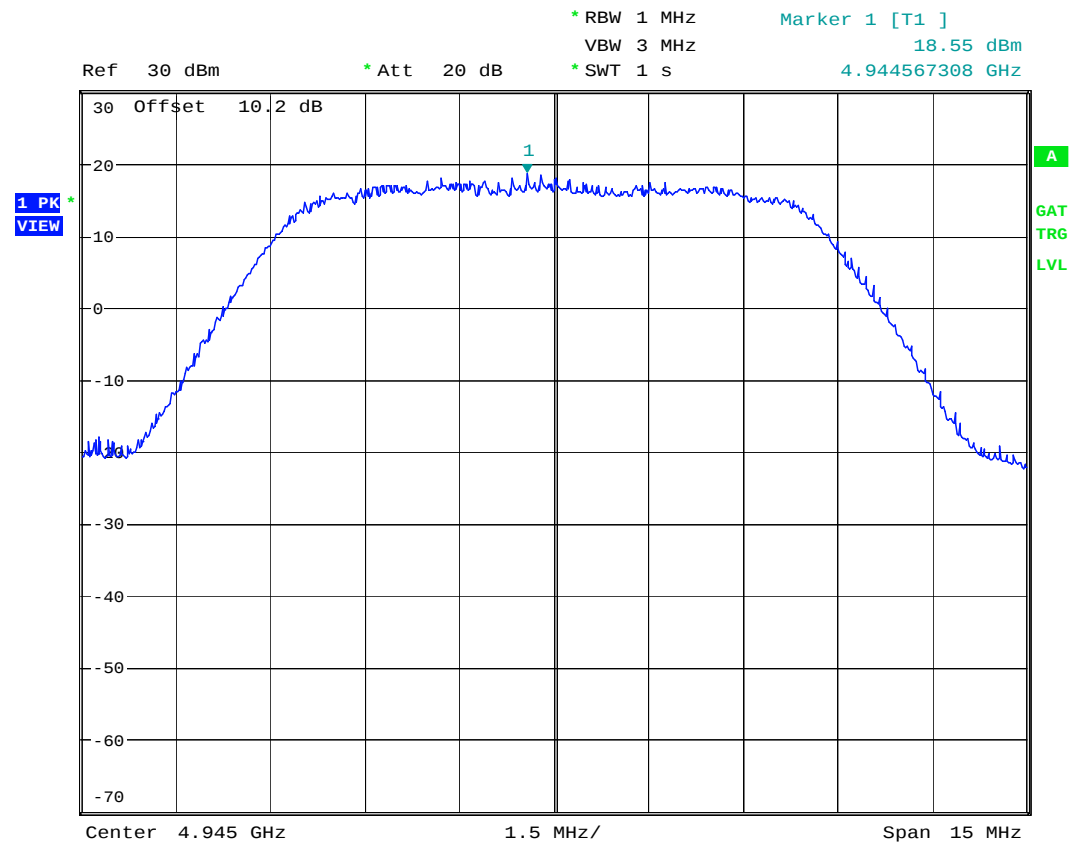
Peak Power Spectrum Density, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4945 MHz

GUI Power Setting: 16 dBm

Antenna Gain: 28 dBi



RedLine Communications, AN80i

Date: 19.DEC.2007 20:38:36

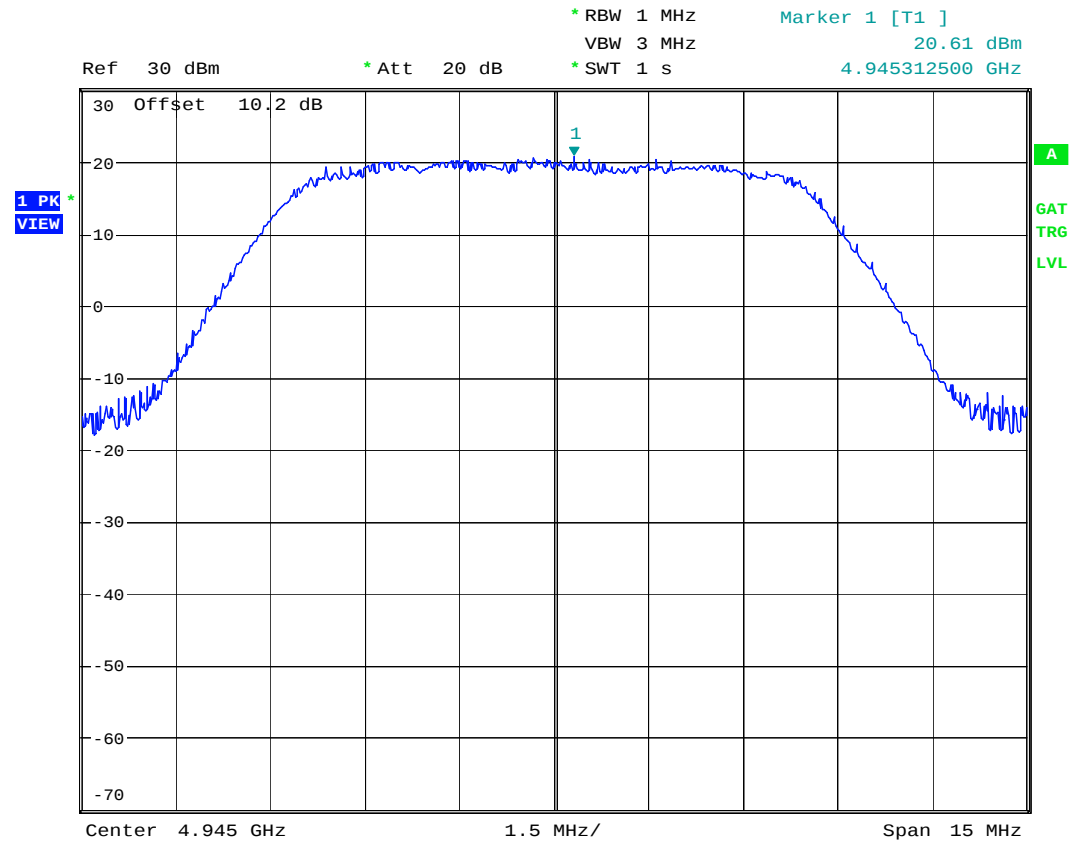
Peak Power Spectrum Density, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4945 MHz

GUI Power Setting: 19 dBm

Antenna Gain: 15 dBi, 16 dBi, 17 dBi, 21 dBi



RedLine Communications, AN80i

Date: 19.DEC.2007 19:45:02

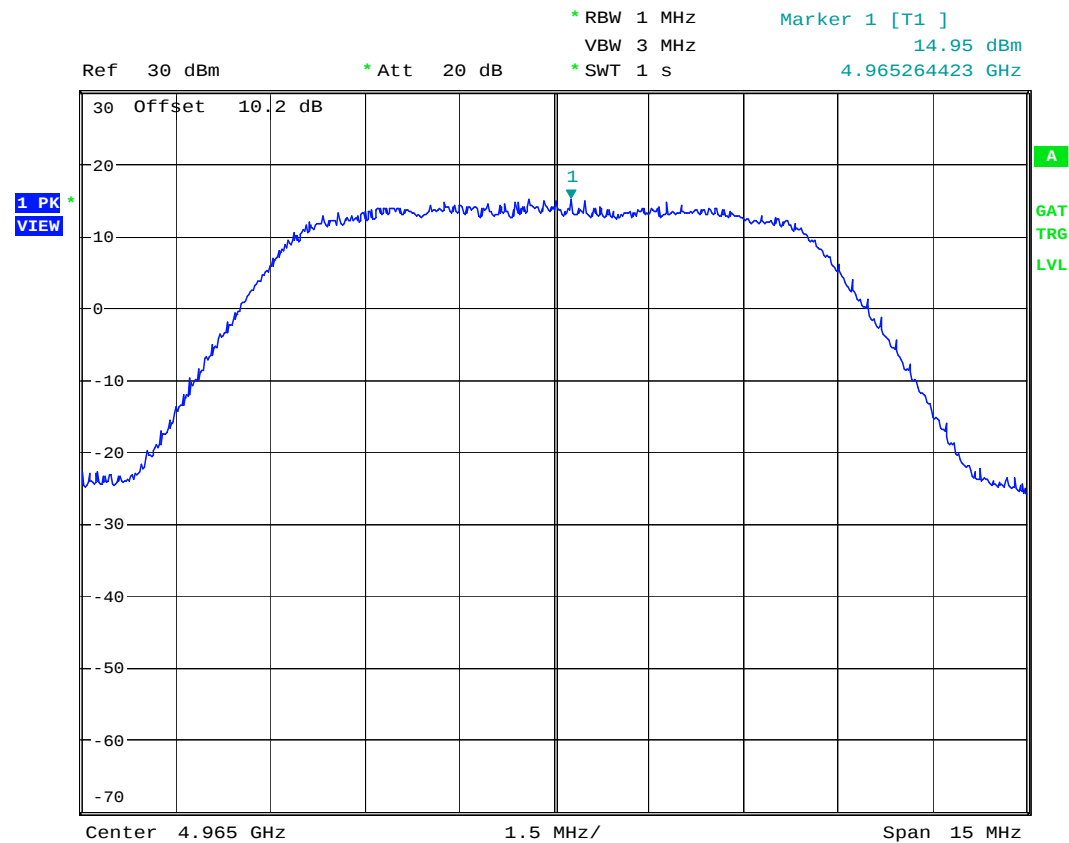
Peak Power Spectrum Density, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4965 MHz

GUI Power Setting: 13 dBm

Antenna Gain: 32 dBi



RedLine Communications, AN80i

Date: 20.DEC.2007 11:24:56

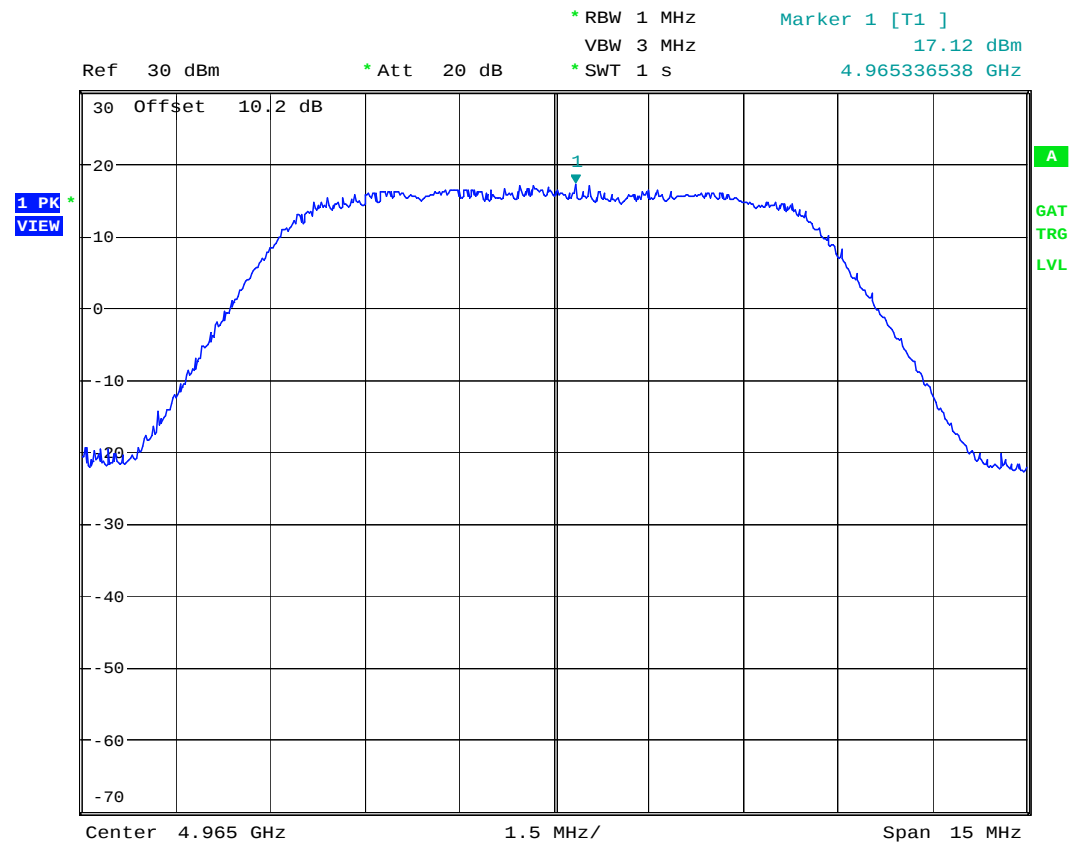
Peak Power Spectrum Density, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4965 MHz

GUI Power Setting: 15 dBm

Antenna Gain: 29 dBi



RedLine Communications, AN80i

Date: 19.DEC.2007 21:11:53

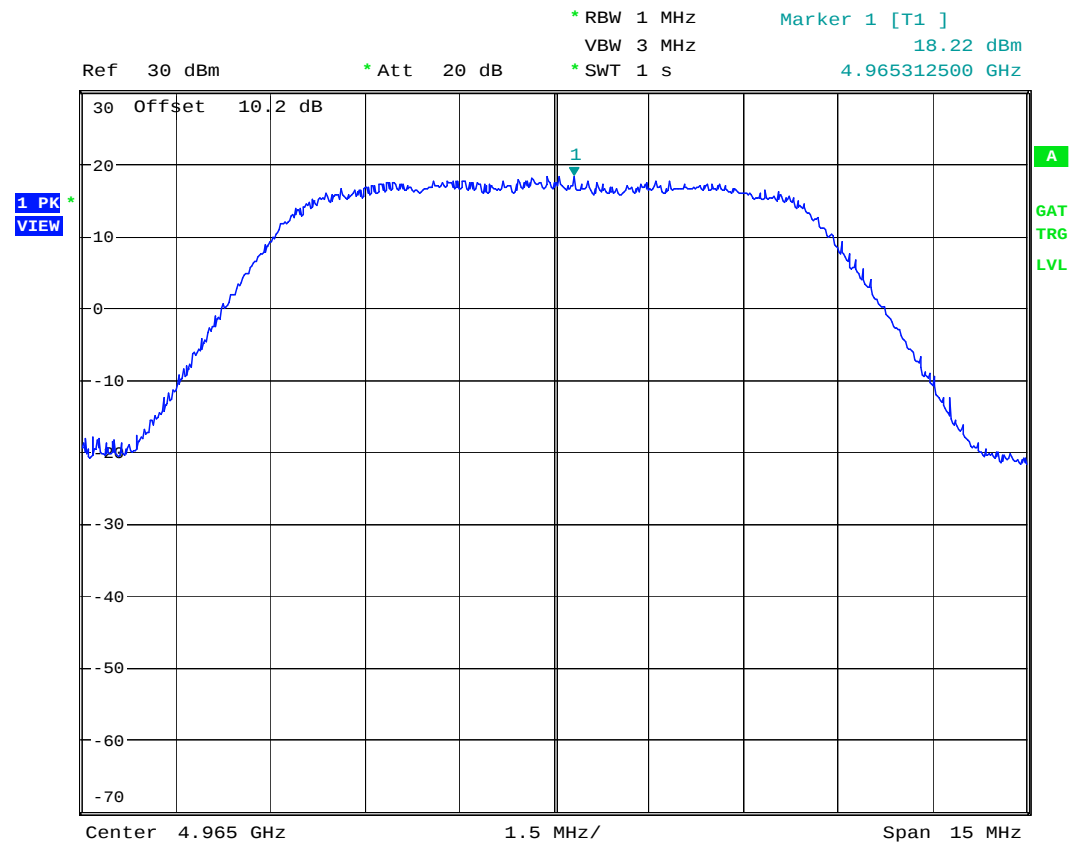
Peak Power Spectrum Density, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4965 MHz

GUI Power Setting: 16 dBm

Antenna Gain: 28 dBi



RedLine Communications, AN80i

Date: 19.DEC.2007 20:50:46

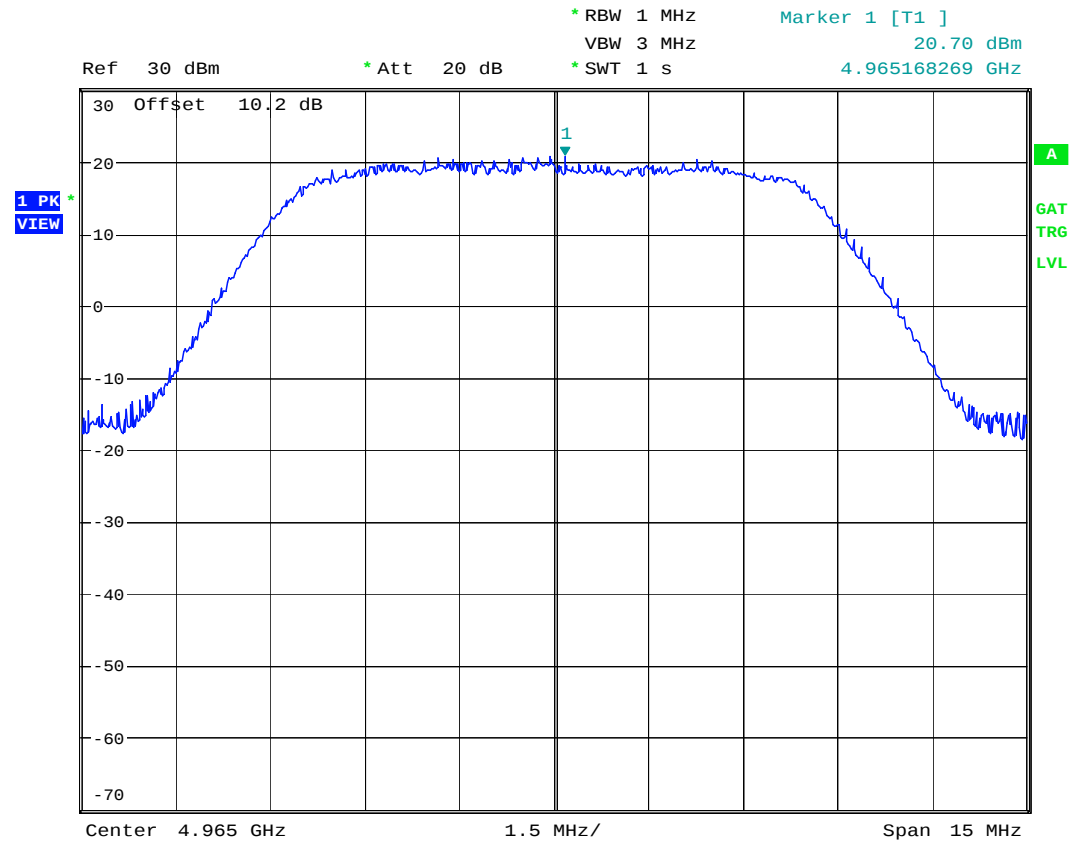
Peak Power Spectrum Density, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4965 MHz

GUI Power Setting: 18 dBm

Antenna Gain: 15 dBi, 16 dBi, 17 dBi, 21 dBi

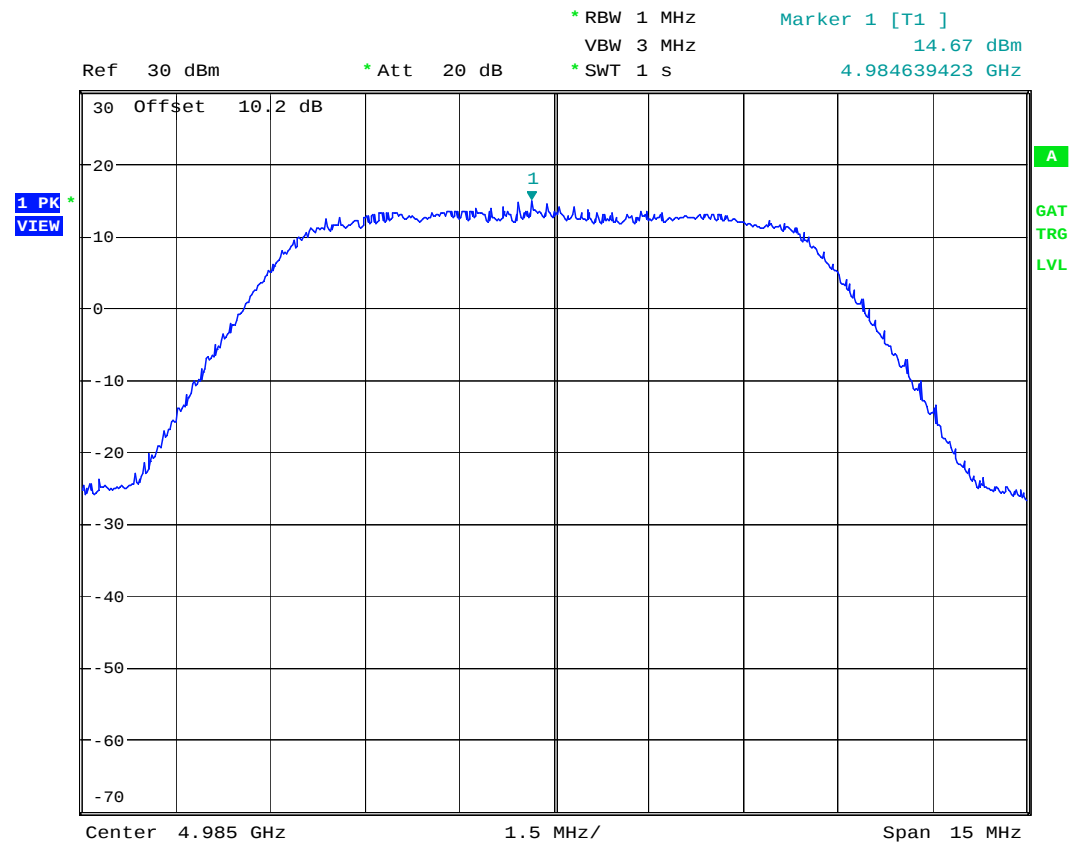


RedLine Communications, AN80i

Date: 19.DEC.2007 19:56:52

Peak Power Spectrum Density, continued

Channel Bandwidth: 10 MHz
TX Frequency: 4985 MHz
GUI Power Setting: 13 dBm
Antenna Gain: 32 dBi



RedLine Communications, AN80i

Date: 20.DEC.2007 11:34:21

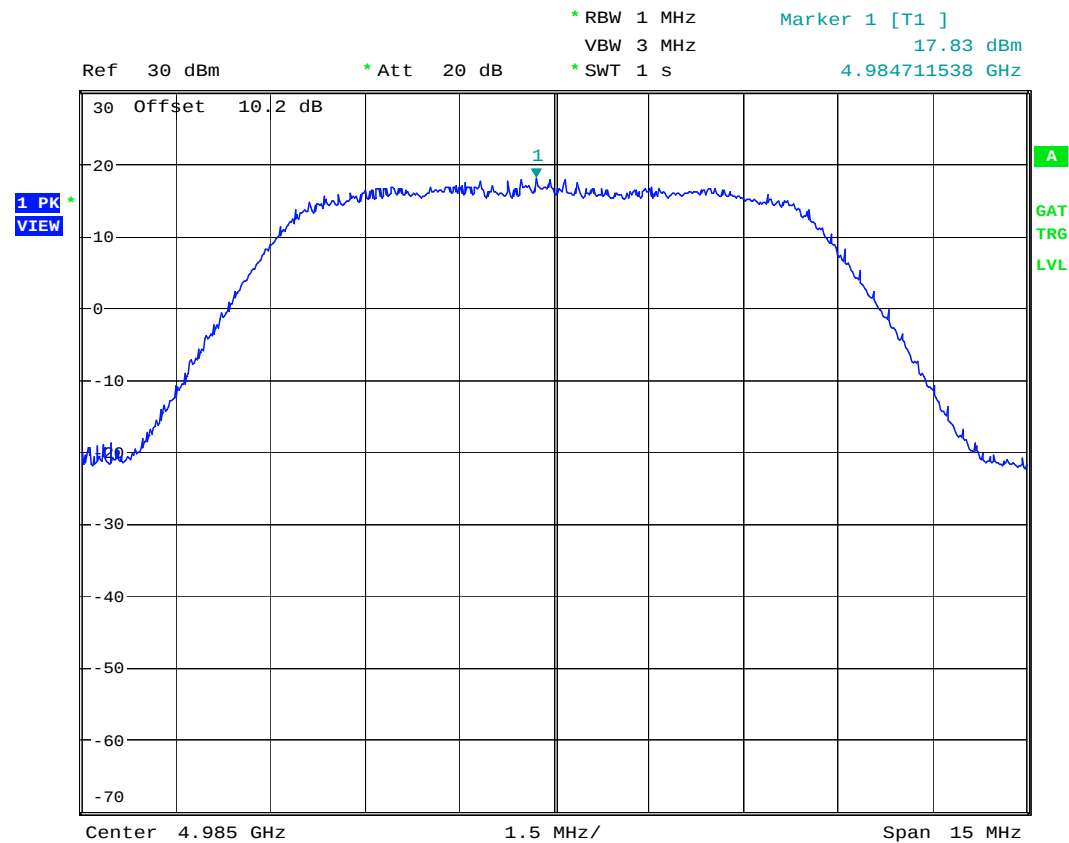
Peak Power Spectrum Density, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4985 MHz

GUI Power Setting: 16 dBm

Antenna Gain: 29 dBi



RedLine Communications, AN80i

Date: 19.DEC.2007 21:15:39

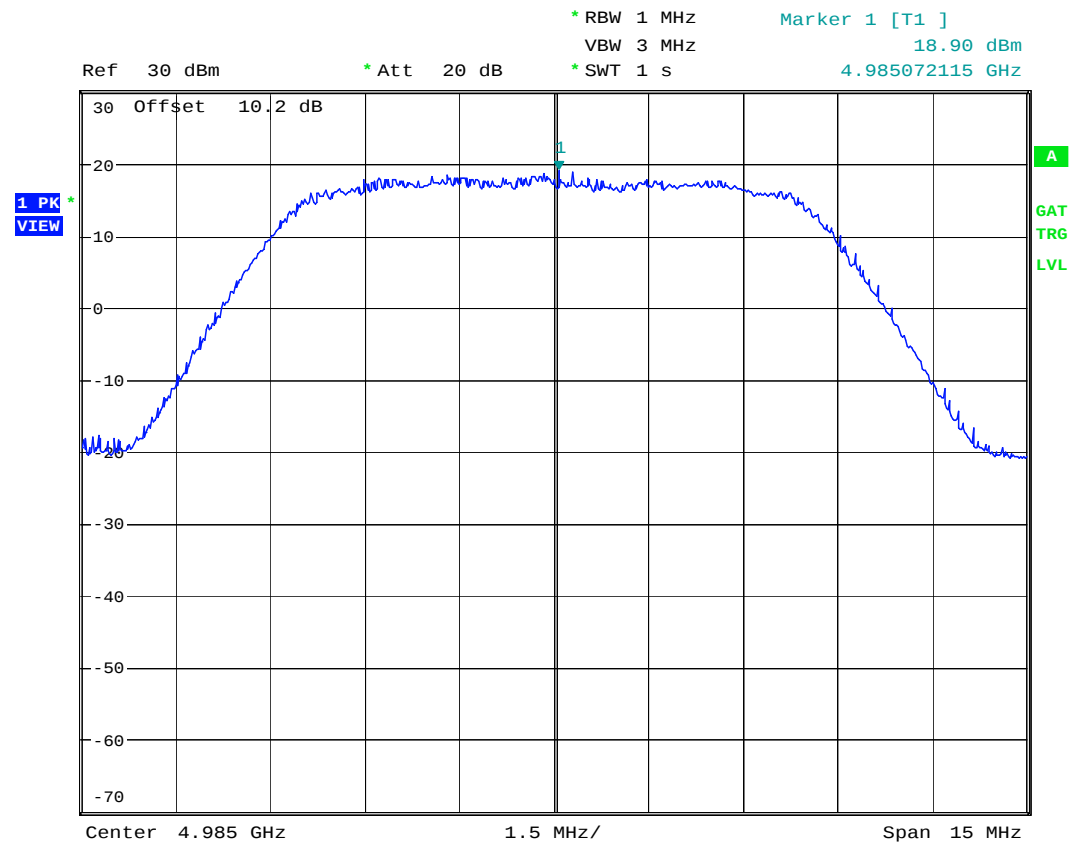
Peak Power Spectrum Density, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4985 MHz

GUI Power Setting: 17 dBm

Antenna Gain: 28 dBi



RedLine Communications, AN80i

Date: 19.DEC.2007 20:59:05

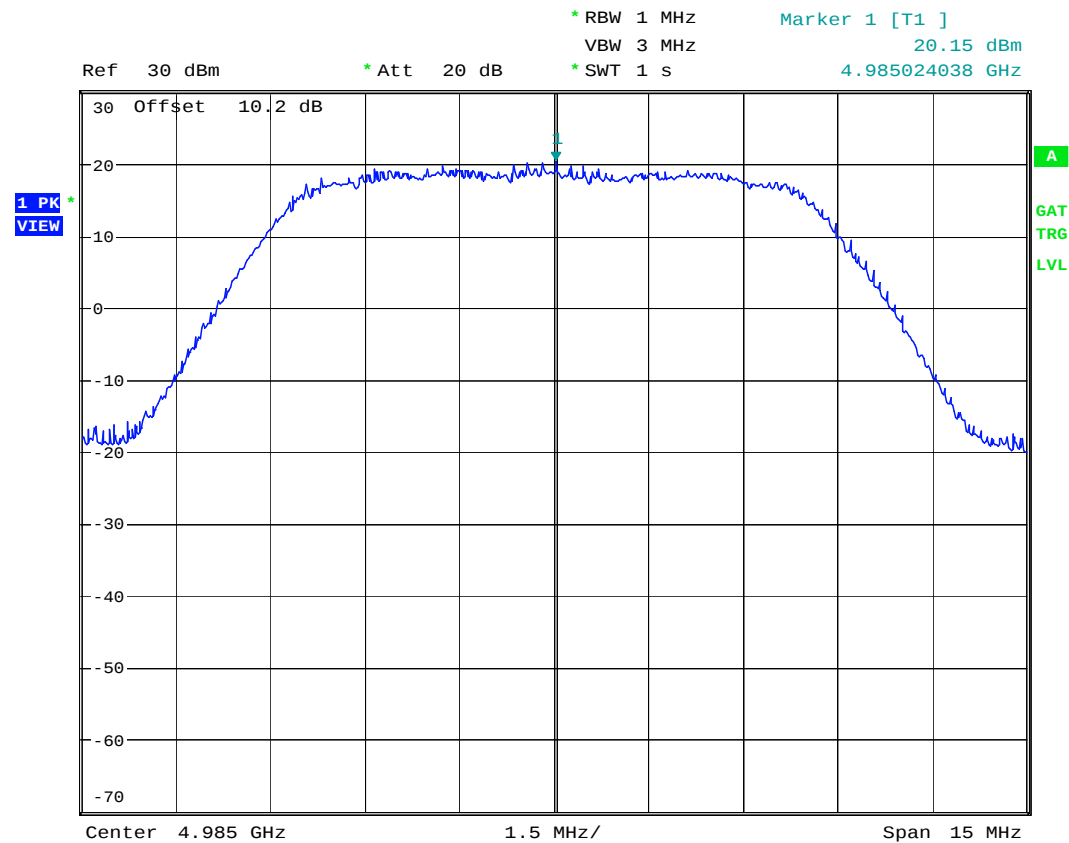
Peak Power Spectrum Density, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4985 MHz

GUI Power Setting: 18 dBm

Antenna Gain: 15 dBi, 16 dBi, 17 dBi, 21 dBi

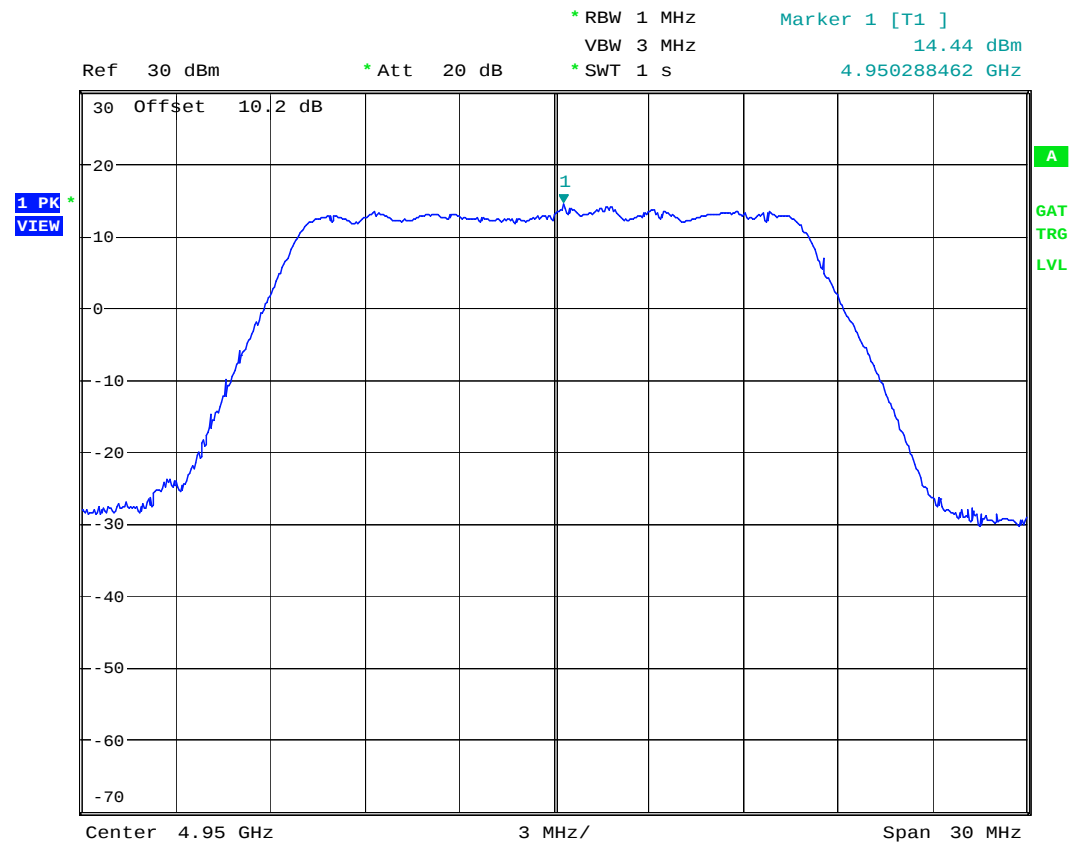


RedLine Communications, AN80i

Date: 19.DEC.2007 20:35:22

Peak Power Spectrum Density, continued

Channel Bandwidth: 20 MHz
TX Frequency: 4950 MHz
GUI Power Setting: 16 dBm
Antenna Gain: 32 dBi



RedLine Communications, AN80i

Date: 20.DEC.2007 16:42:57

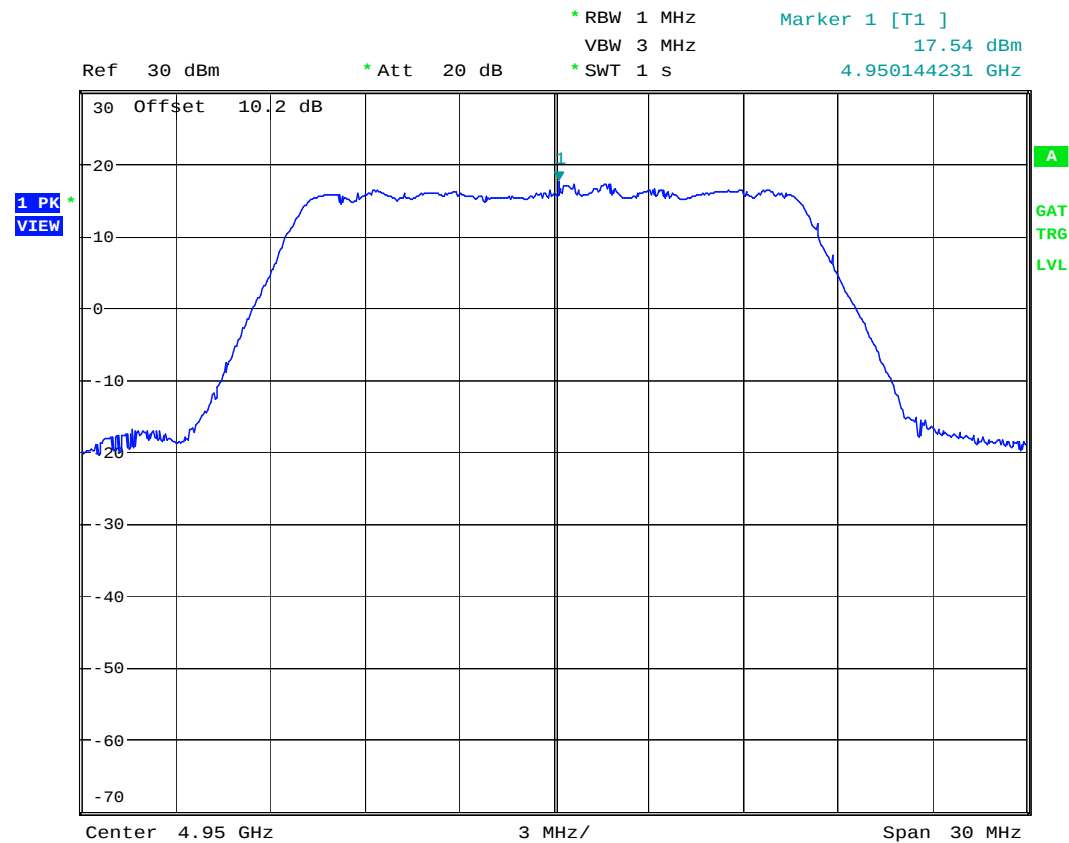
Peak Power Spectrum Density, continued

Channel Bandwidth: 20 MHz

TX Frequency: 4950 MHz

GUI Power Setting: 19 dBm

Antenna Gain: 29 dBi



RedLine Communications, AN80i

Date: 20.DEC.2007 13:25:20

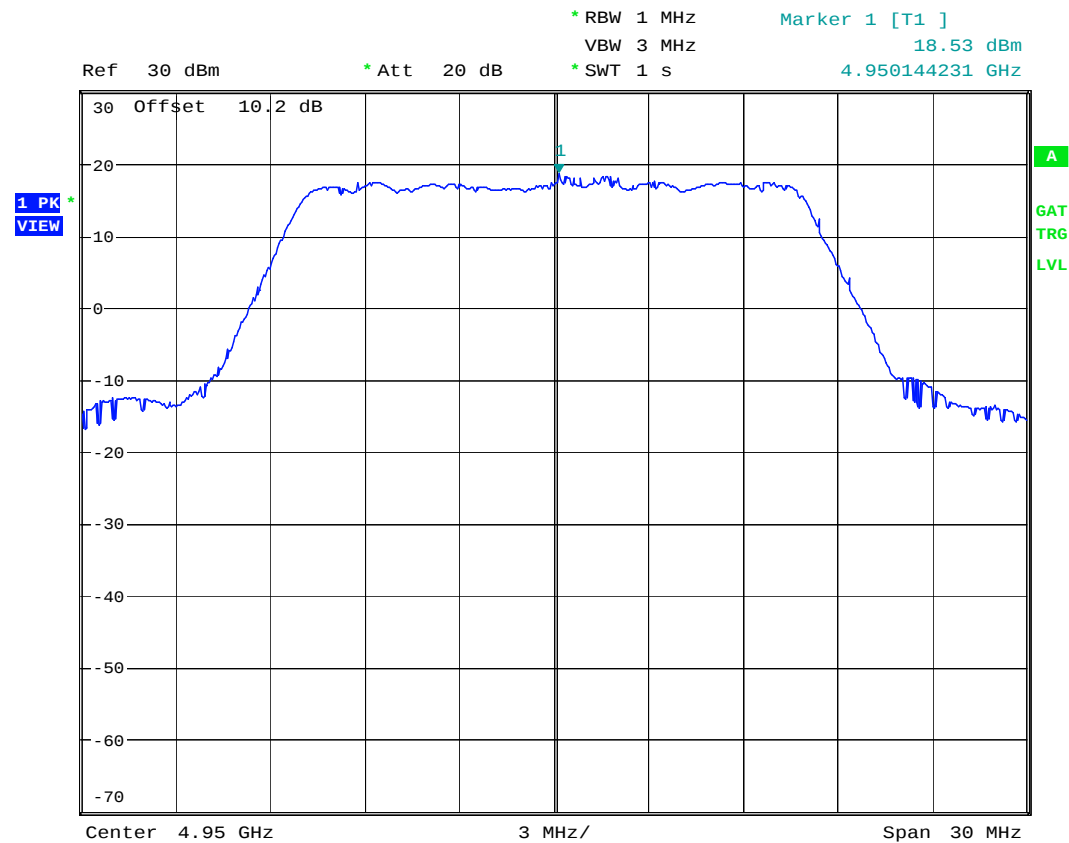
Peak Power Spectrum Density, continued

Channel Bandwidth: 20 MHz

TX Frequency: 4950 MHz

GUI Power Setting: 20 dBm

Antenna Gain: 28 dBi

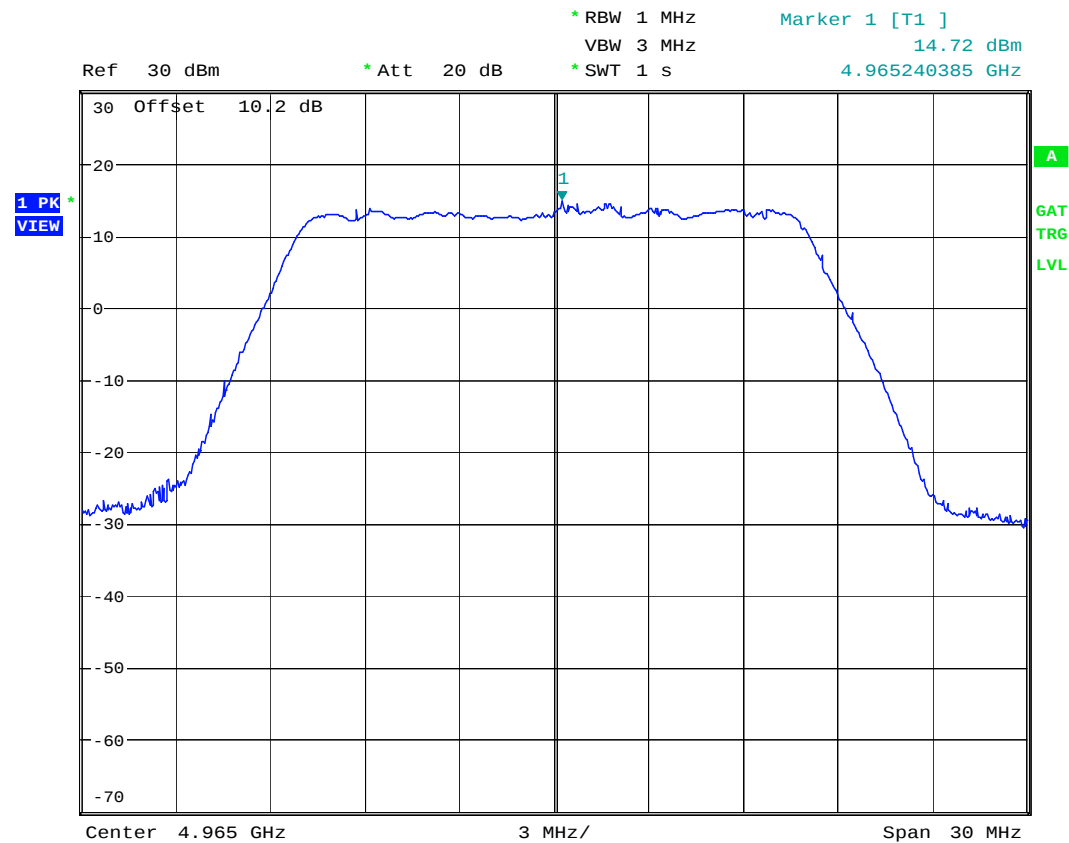


RedLine Communications, AN80i

Date: 20.DEC.2007 12:47:01

Peak Power Spectrum Density, continued

Channel Bandwidth: 20 MHz
TX Frequency: 4965 MHz
GUI Power Setting: 16 dBm
Antenna Gain: 32 dBi



RedLine Communications, AN80i

Date: 20.DEC.2007 16:49:41

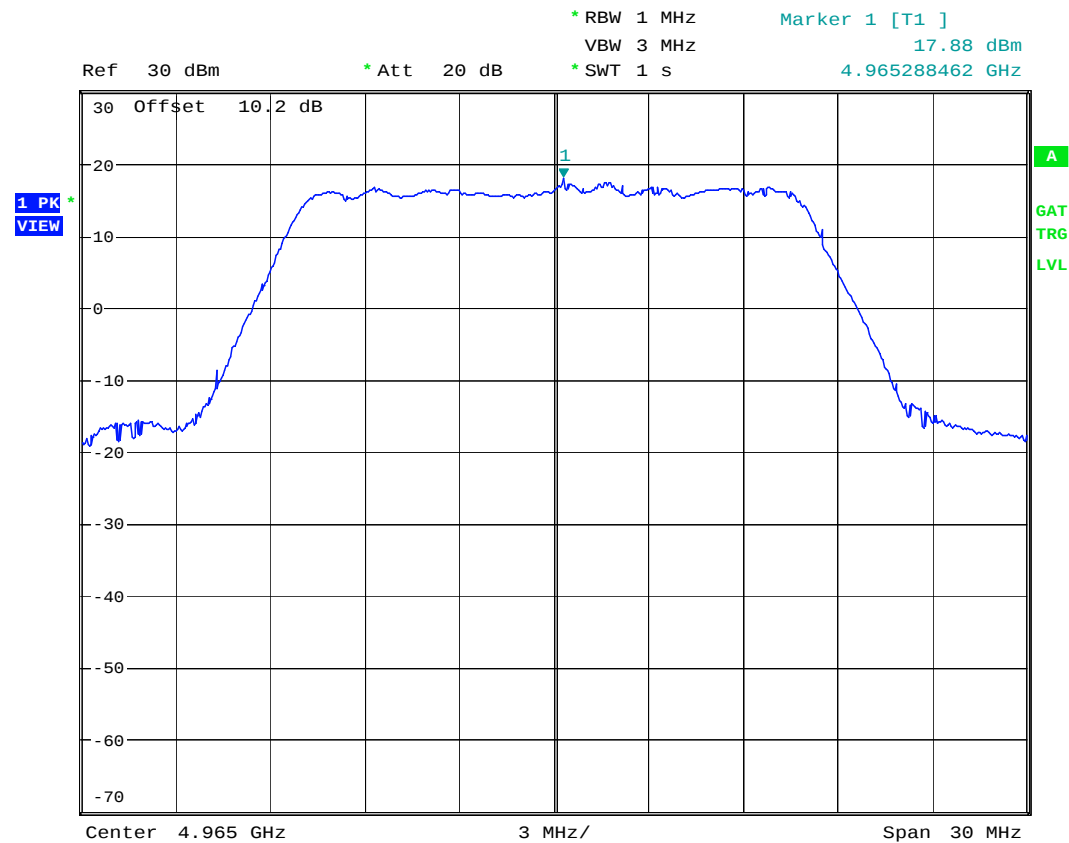
Peak Power Spectrum Density, continued

Channel Bandwidth: 20 MHz

TX Frequency: 4965 MHz

GUI Power Setting: 19 dBm

Antenna Gain: 29 dBi



RedLine Communications, AN80i

Date: 20.DEC.2007 15:14:47

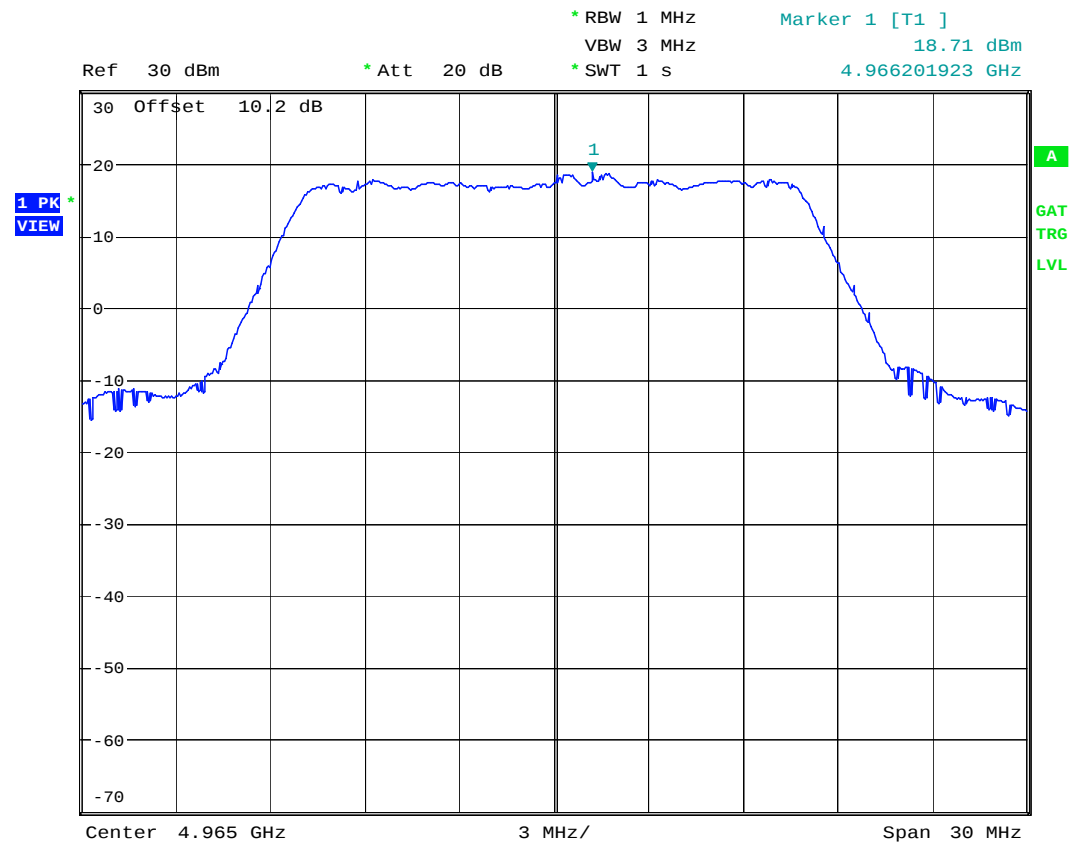
Peak Power Spectrum Density, continued

Channel Bandwidth: 20 MHz

TX Frequency: 4965 MHz

GUI Power Setting: 20 dBm

Antenna Gain: 15, 16, 17, 21, 28 dBi



RedLine Communications, AN80i

Date: 20.DEC.2007 13:07:21

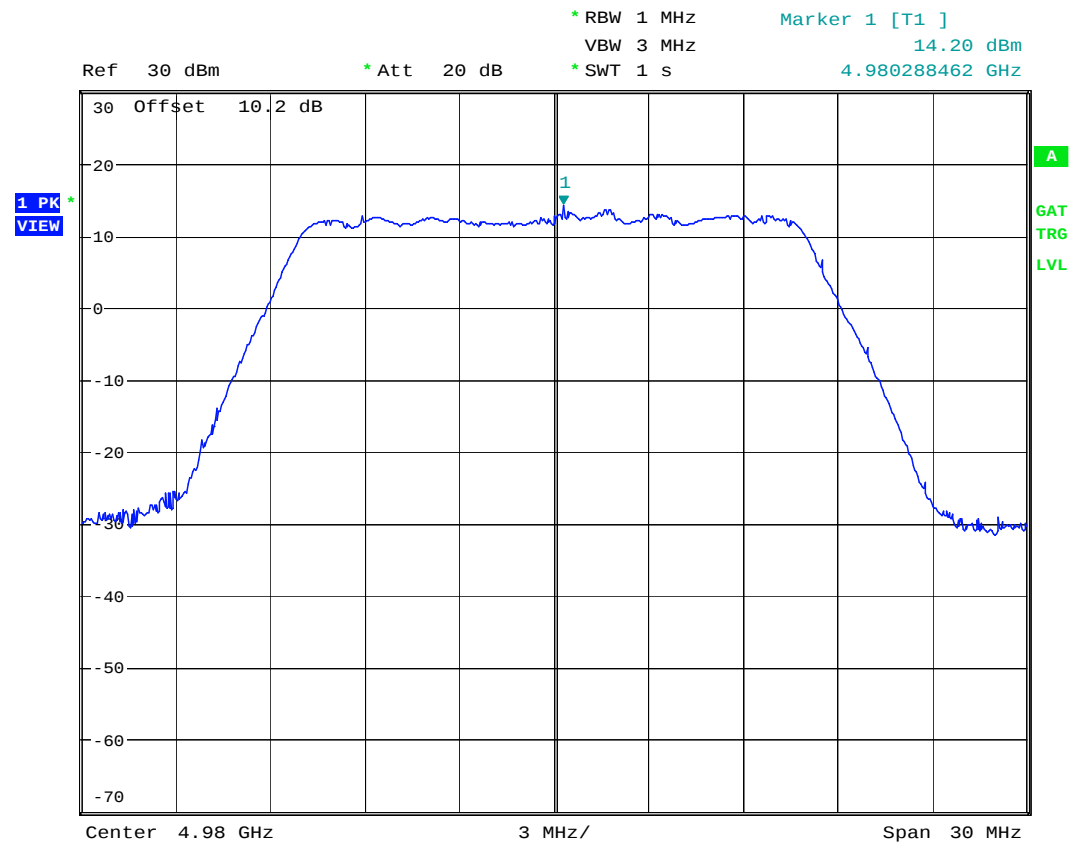
Peak Power Spectrum Density, continued

Channel Bandwidth: 20 MHz

TX Frequency: 4980 MHz

GUI Power Setting: 16 dBm

Antenna Gain: 32 dBi



RedLine Communications, AN80i

Date: 20.DEC.2007 17:01:46

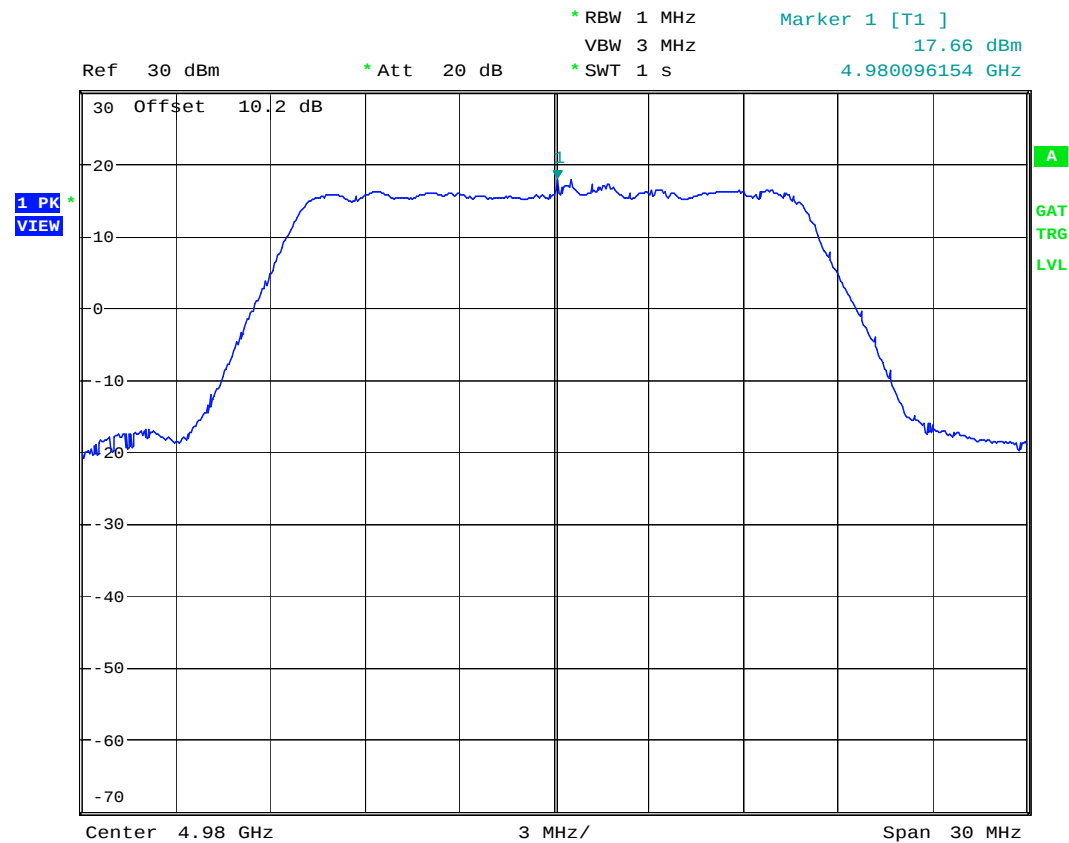
Peak Power Spectrum Density, continued

Channel Bandwidth: 20 MHz

TX Frequency: 4980 MHz

GUI Power Setting: 19 dBm

Antenna Gain: 29 dBi



RedLine Communications, AN80i

Date: 20.DEC.2007 15:19:15

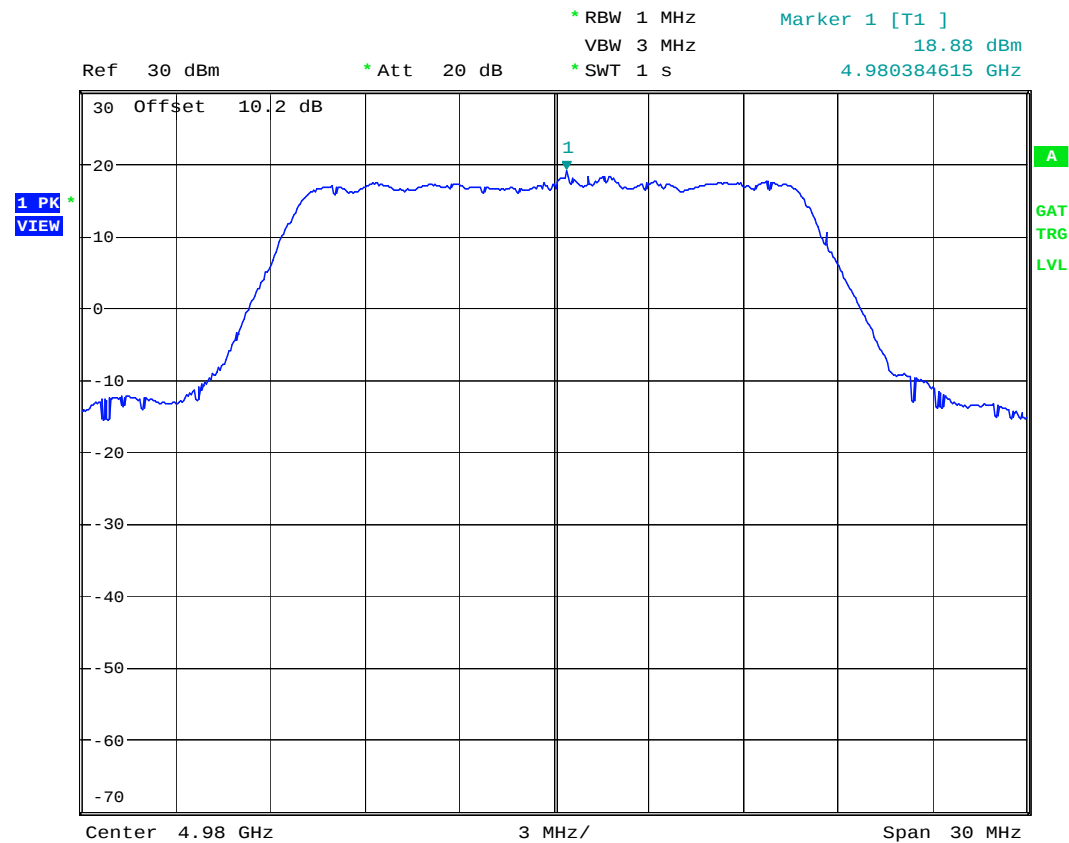
Peak Power Spectrum Density, continued

Channel Bandwidth: 20 MHz

TX Frequency: 4980 MHz

GUI Power Setting: 20 dBm

Antenna Gain: 15, 16, 17, 21, 28 dBi



RedLine Communications, AN80i

Date: 20.DEC.2007 13:13:37

Section 4. Spurious Emissions at the Antenna Terminals**Criteria: Clause 90.210(m)**

(m) Emission Mask M. For high power transmitters (greater than 20 dBm) operating in the 4940-4990 MHz frequency band, the power spectral density of the emissions must be attenuated below the output power of the transmitter as follows:

- (1) On any frequency removed from the assigned frequency between 0-45% of the authorized bandwidth (BW): 0 dB.
- (2) On any frequency removed from the assigned frequency between 45-50% of the authorized bandwidth: $56.8 \log (\% \text{ of } (BW)/45)$ dB.
- (3) On any frequency removed from the assigned frequency between 50-55% of the authorized bandwidth: $26 + 14.5 \log (\% \text{ of } (BW)/50)$ dB.
- (4) On any frequency removed from the assigned frequency between 55-100% of the authorized bandwidth: $32 + 3.1 \log (\% \text{ of } (BW)/55)$ dB.
- (5) On any frequency removed from the assigned frequency between 100-150% of the authorized bandwidth: $40 + 5.7 \log (\% \text{ of } (BW)/100)$ dB.
- (6) On any frequency removed from the assigned frequency between above 150% of the authorized bandwidth: 50 dB or $55 + 10 \log (P)$ dB, whichever is the lesser attenuation.
- (7) The zero dB reference is measured relative to the highest average power of the fundamental emission measured across the designated channel bandwidth using a resolution bandwidth of at least one percent of the occupied bandwidth of the fundamental emission and a video bandwidth of 30 kHz. The power spectral density is the power measured within the resolution bandwidth of the measurement device divided by the resolution bandwidth of the measurement device. Emission levels are also based on the use of measurement instrumentation employing a resolution bandwidth of at least one percent of the occupied bandwidth.

Test Conditions:

Sample Number:	1,2	Temperature:	22 °C
Date:	December 18-20, 2007	Humidity:	50 %
Modification State:	0	Tester:	Roman Kuleba
		Laboratory:	Client, R & D

Test Results: Complies.

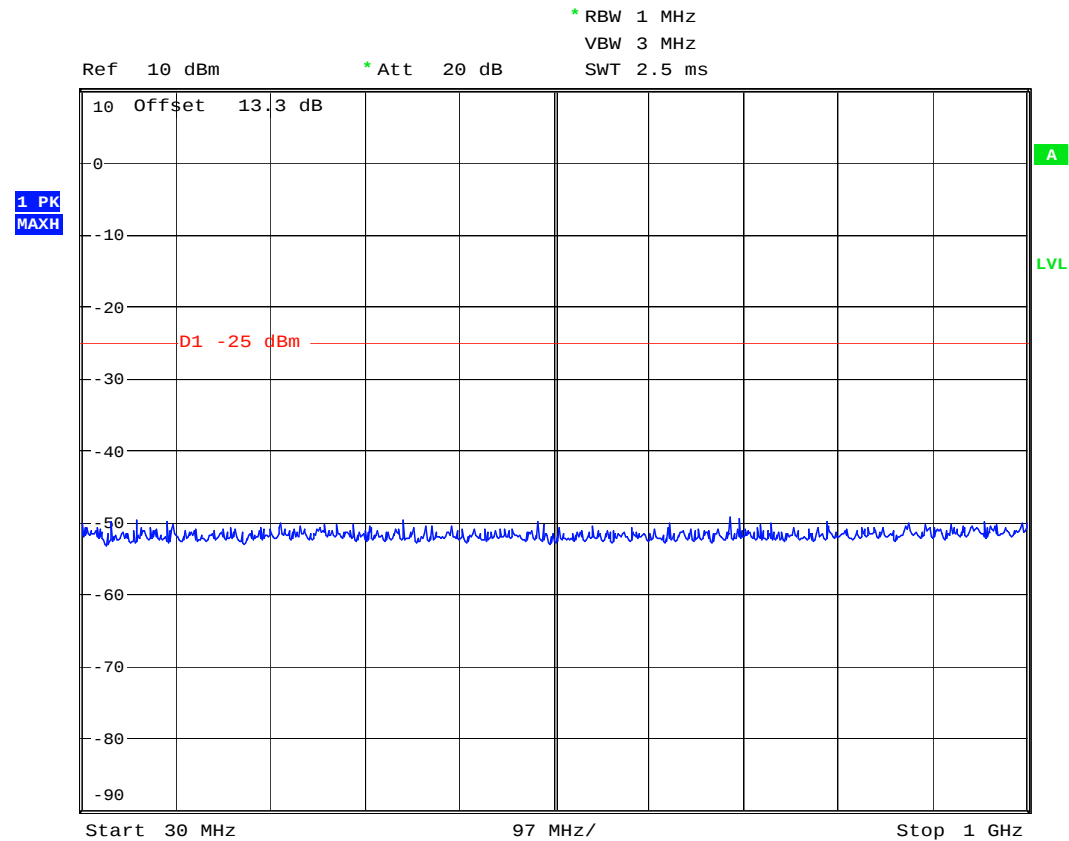
Test Data: See attached graphics.

Additional Observations: The spectrum was searched from 30MHz to 40GHz.
The low, medium and high channel were evaluated.

Spurious Emissions at the Antenna Terminals, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4945MHz



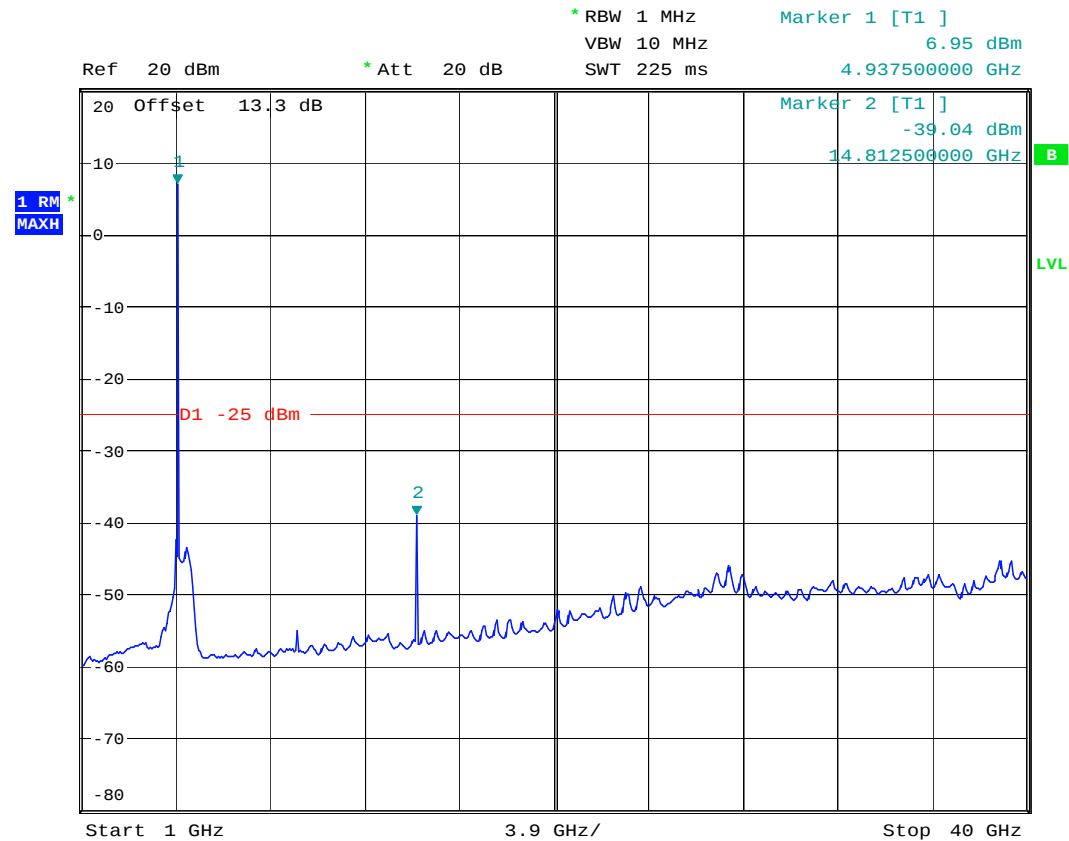
RedLine Communications, AN80i

Date: 18.DEC.2007 15:38:54

Spurious Emissions at the Antenna Terminals, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4945MHz



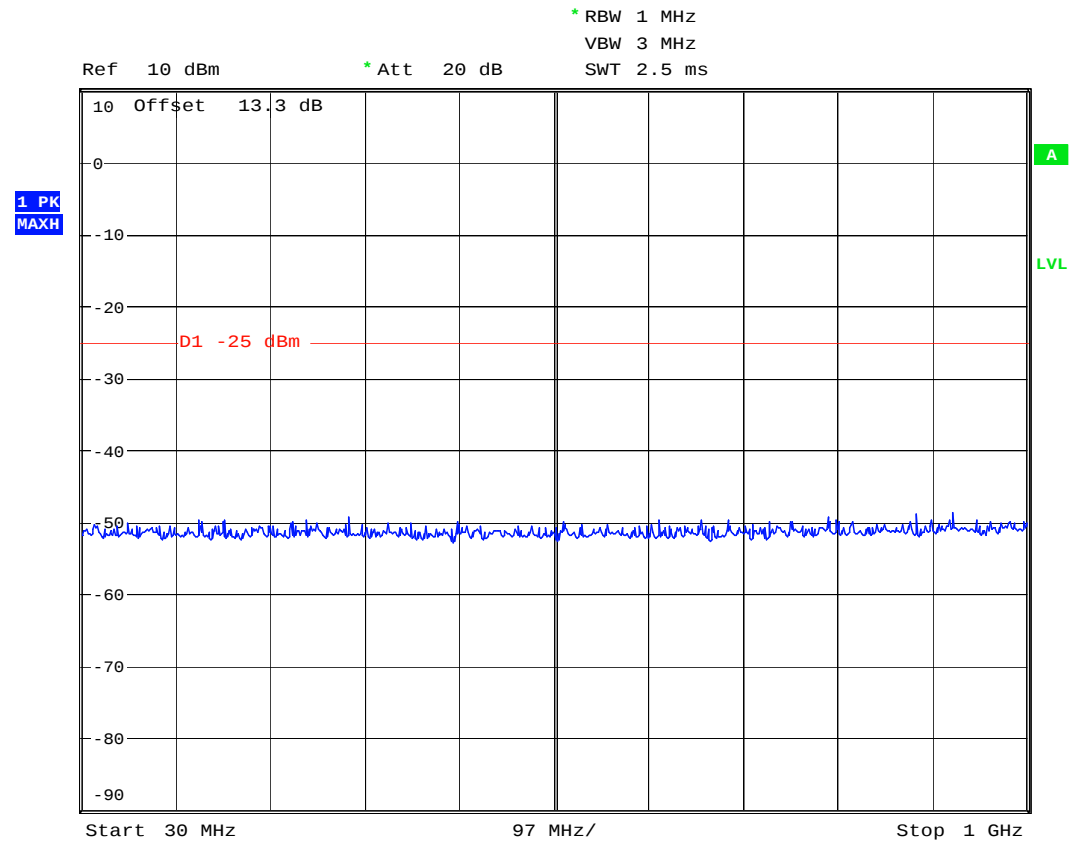
RedLine Communications, AN80i

Date: 18.DEC.2007 15:45:35

Spurious Emissions at the Antenna Terminals, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4965MHz



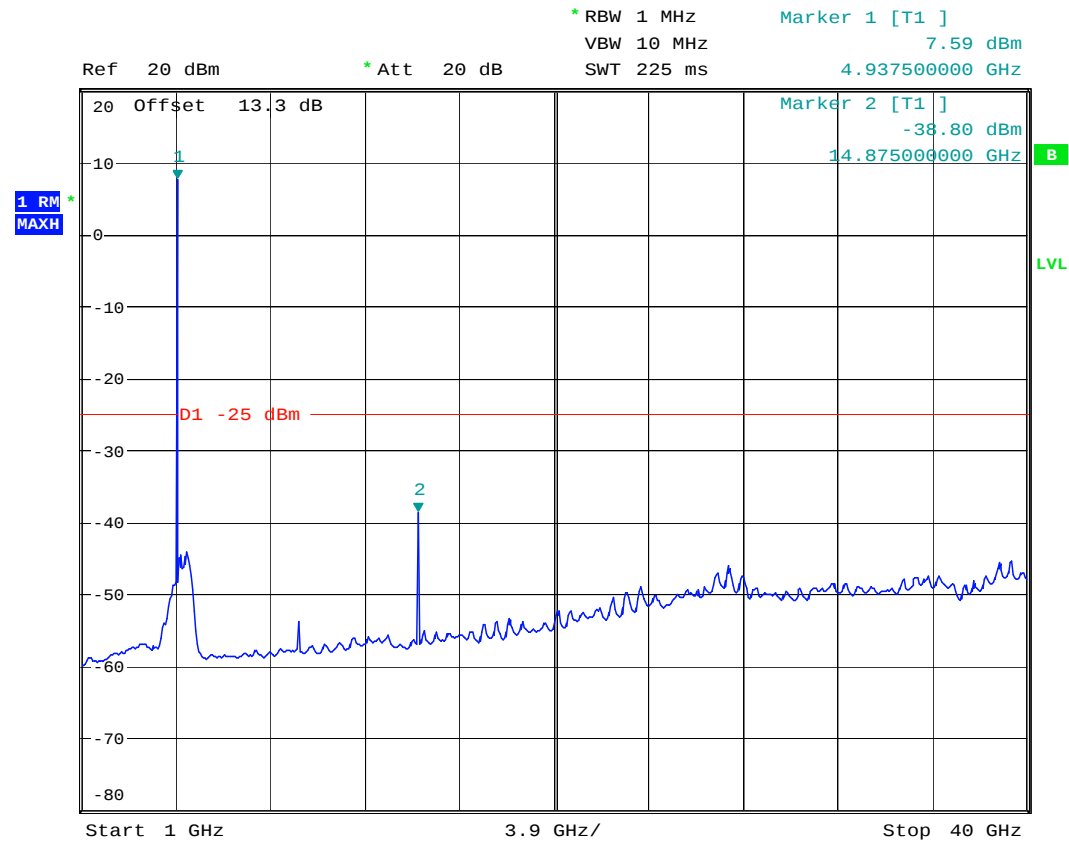
RedLine Communications, AN80i

Date: 18.DEC.2007 15:41:39

Spurious Emissions at the Antenna Terminals, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4965MHz



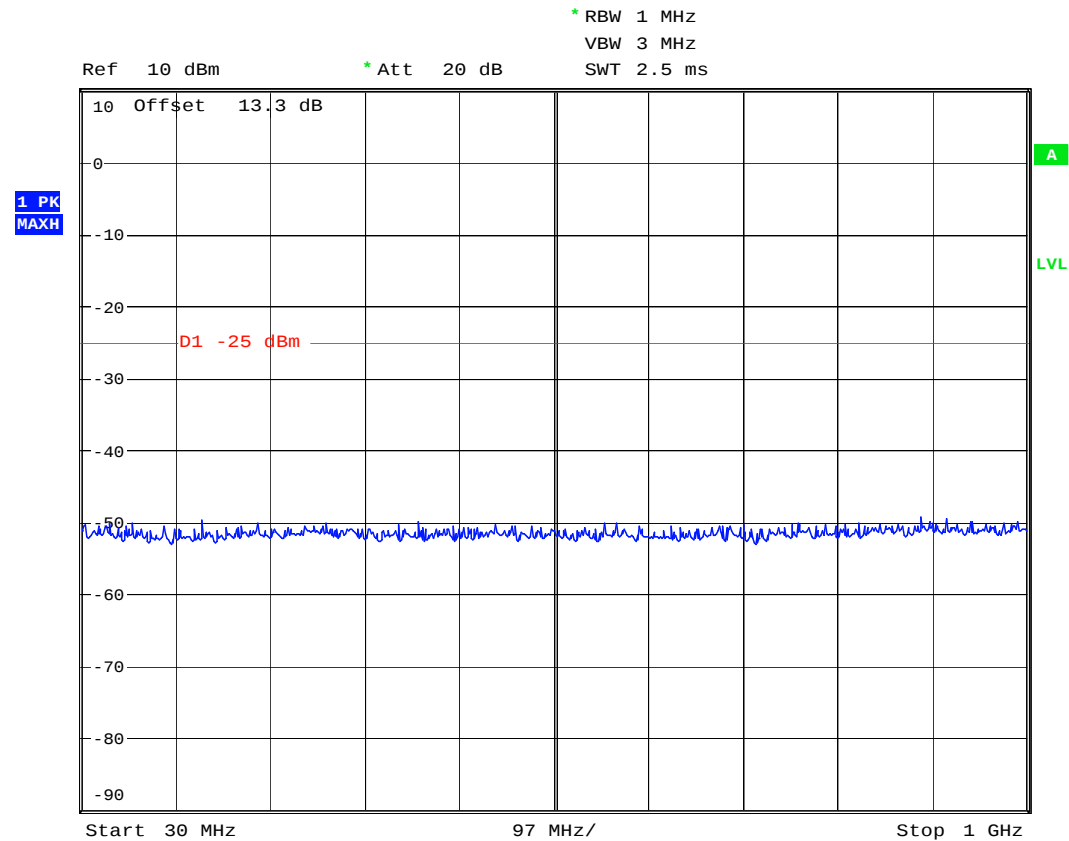
RedLine Communications, AN80i

Date: 18.DEC.2007 15:44:24

Spurious Emissions at the Antenna Terminals, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4985MHz



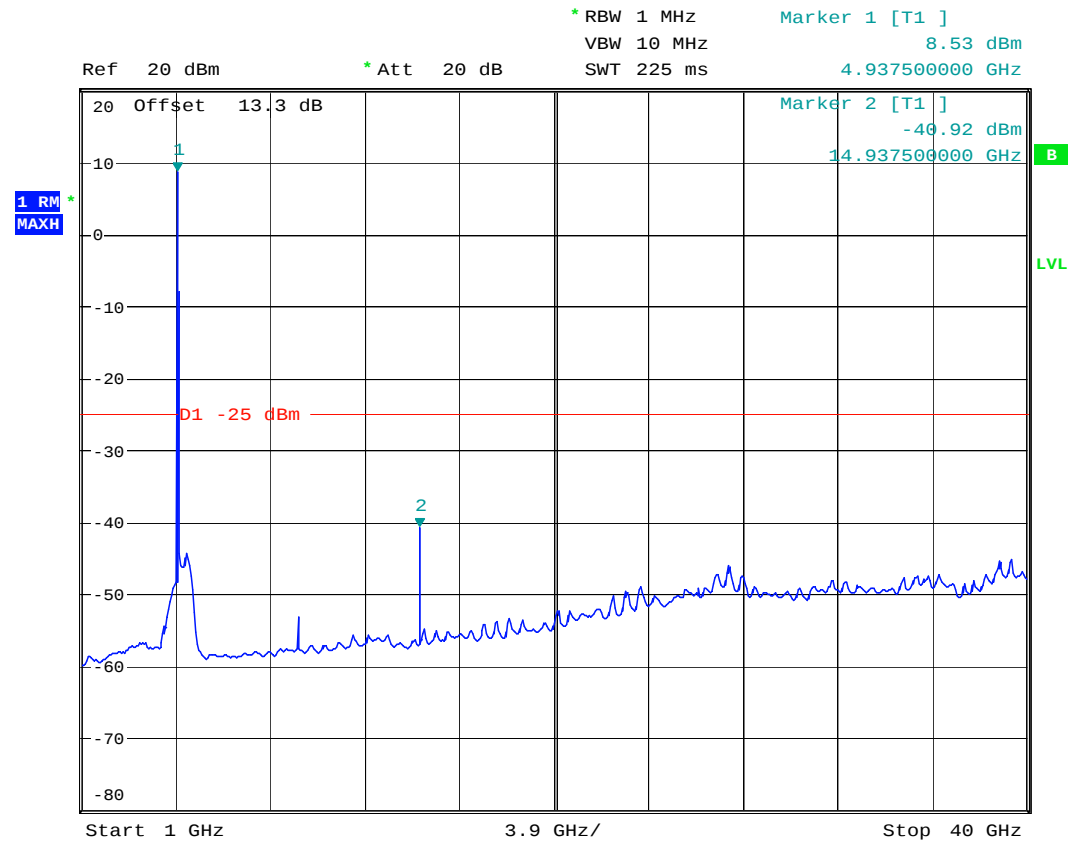
RedLine Communications, AN80i

Date: 18.DEC.2007 15:47:16

Spurious Emissions at the Antenna Terminals, continued

Channel Bandwidth: 10 MHz

TX Frequency: 4985MHz



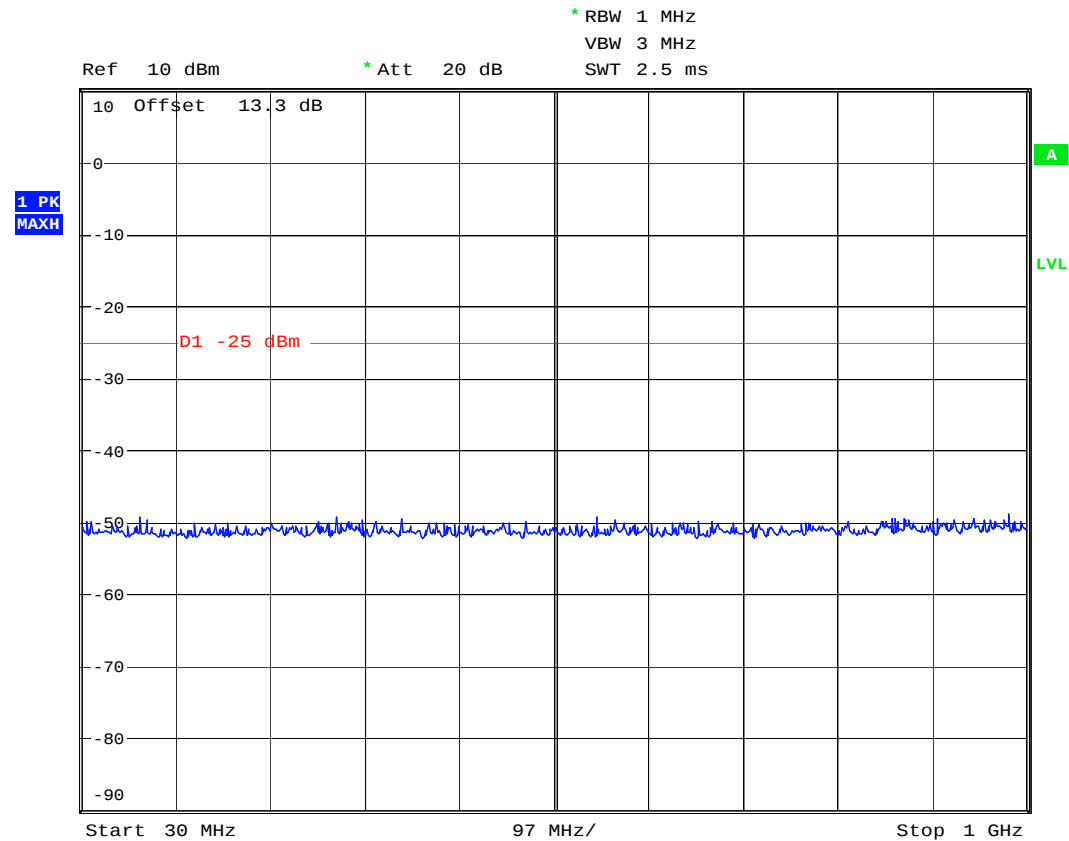
RedLine Communications, AN80i

Date: 18.DEC.2007 15:47:01

Spurious Emissions at the Antenna Terminals, continued

Channel Bandwidth: 20 MHz

TX Frequency: 4950MHz



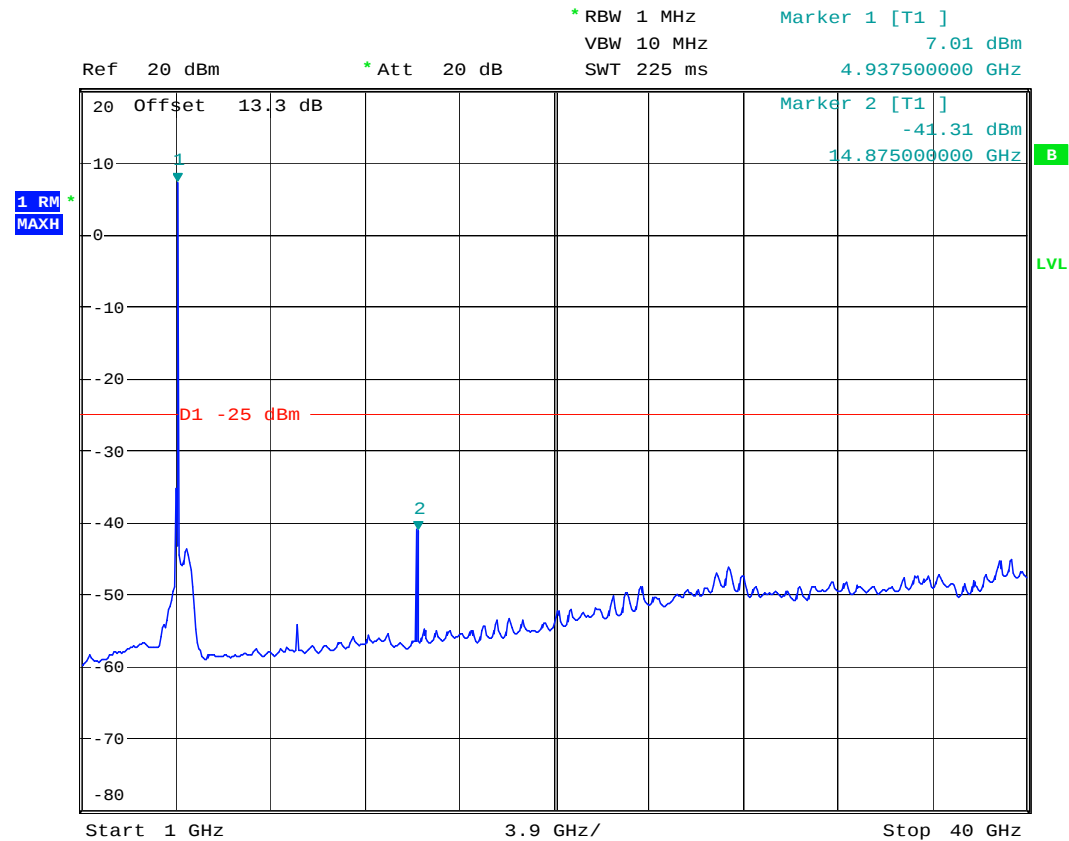
RedLine Communications, AN80i

Date: 18.DEC.2007 15:58:55

Spurious Emissions at the Antenna Terminals, continued

Channel Bandwidth: 20 MHz

TX Frequency: 4950MHz



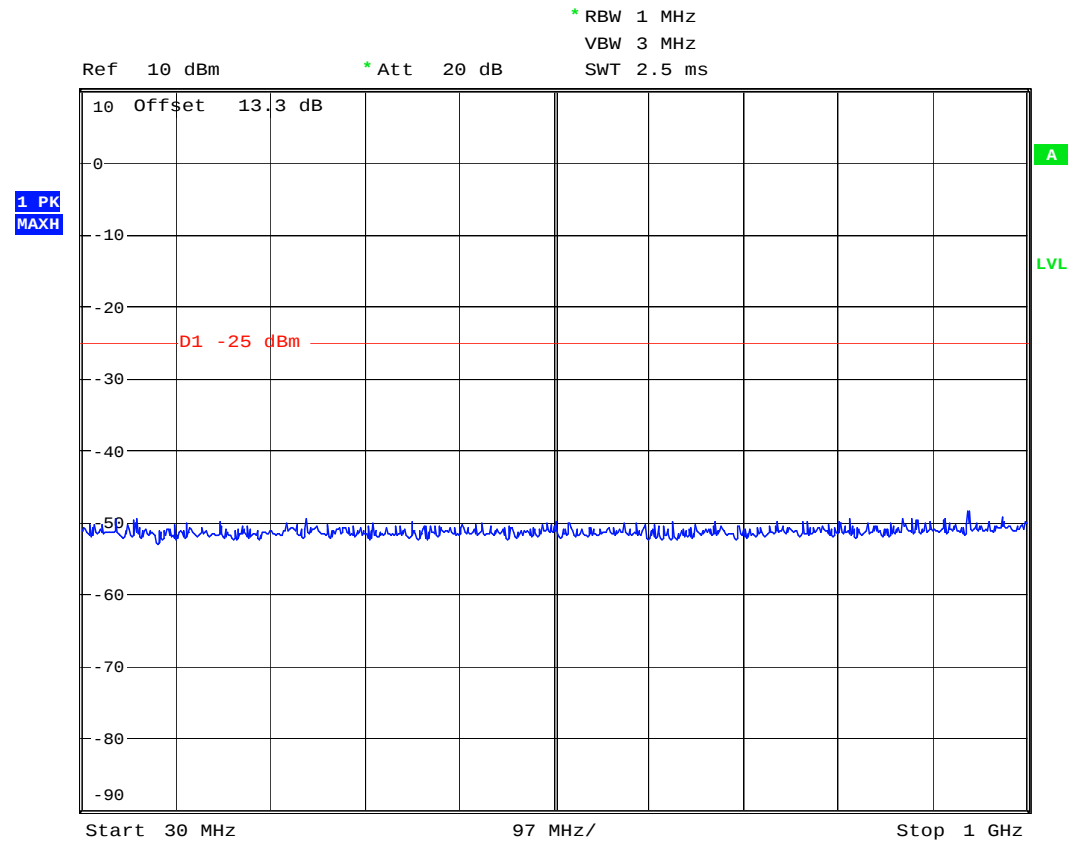
RedLine Communications, AN80i

Date: 18.DEC.2007 15:52:21

Spurious Emissions at the Antenna Terminals, continued

Channel Bandwidth: 20 MHz

TX Frequency: 4965MHz



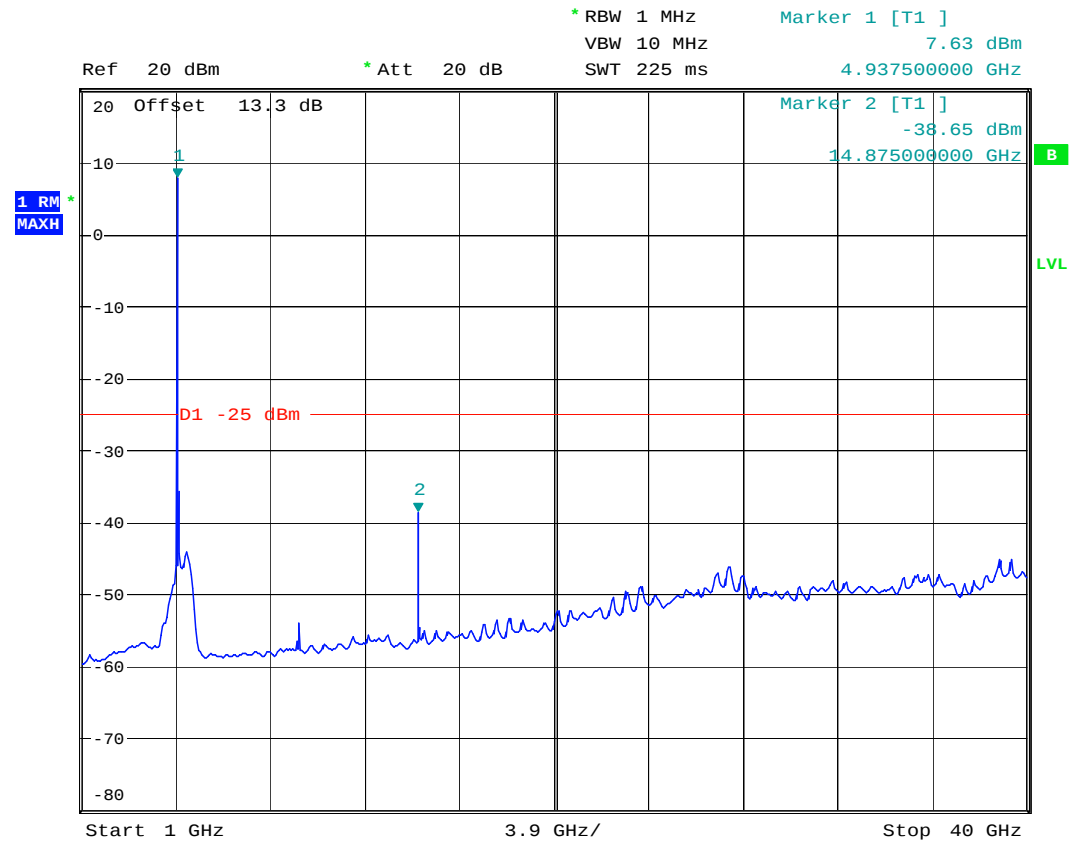
RedLine Communications, AN80i

Date: 18.DEC.2007 15:57:34

Spurious Emissions at the Antenna Terminals, continued

Channel Bandwidth: 20 MHz

TX Frequency: 4965MHz



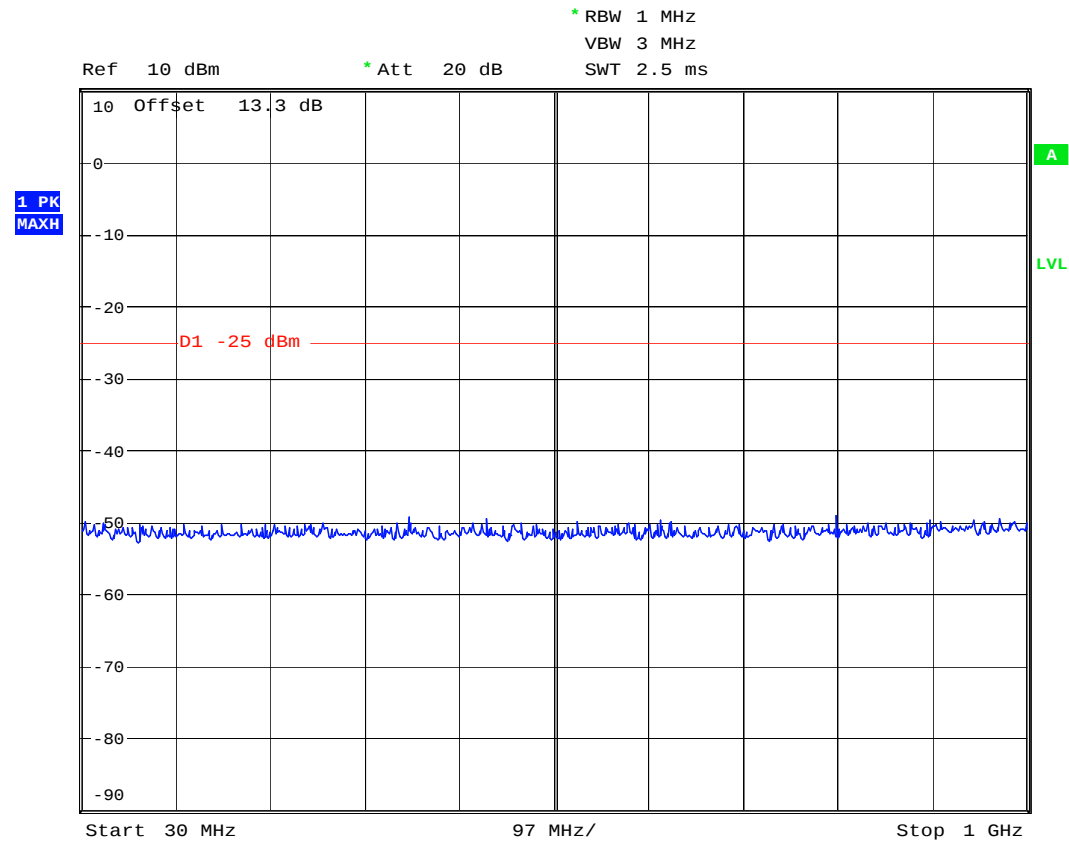
RedLine Communications, AN80i

Date: 18.DEC.2007 15:54:23

Spurious Emissions at the Antenna Terminals, continued

Channel Bandwidth: 20 MHz

TX Frequency: 4980MHz



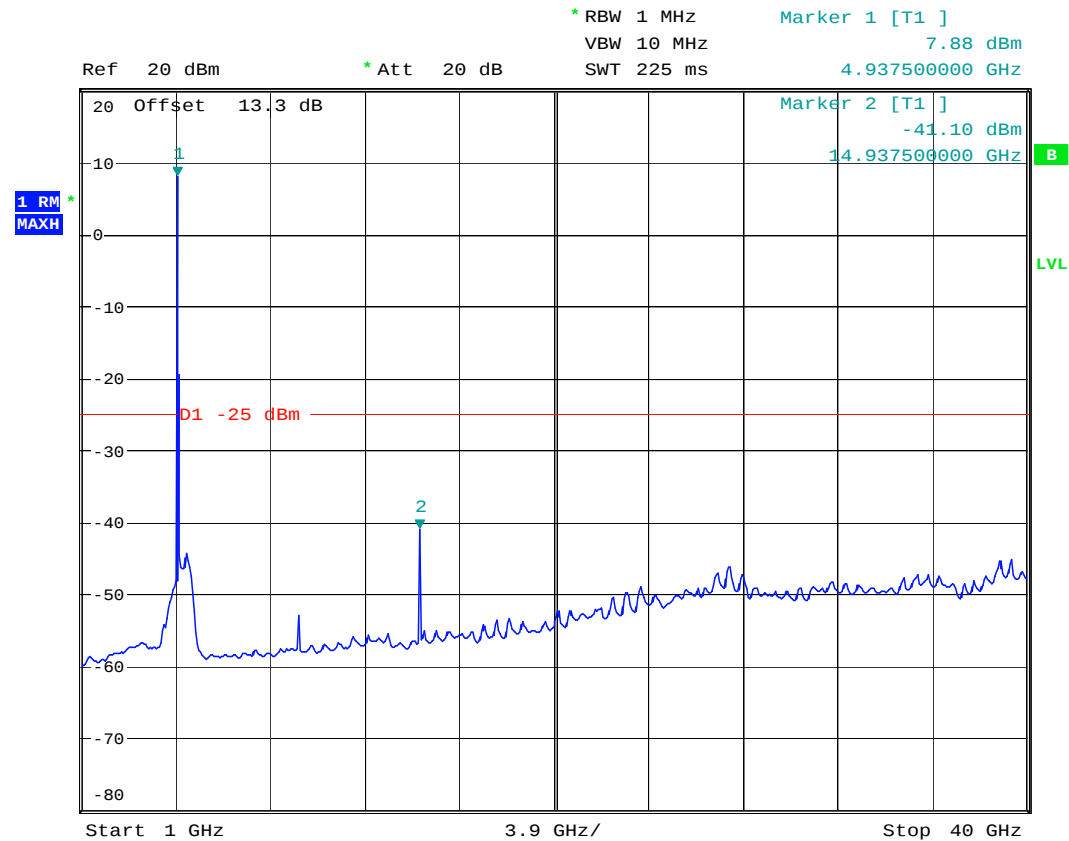
RedLine Communications, AN80i

Date: 18.DEC.2007 15:56:31

Spurious Emissions at the Antenna Terminals, continued

Channel Bandwidth: 20 MHz

TX Frequency: 4980MHz



RedLine Communications, AN80i

Date: 18.DEC.2007 15:55:58

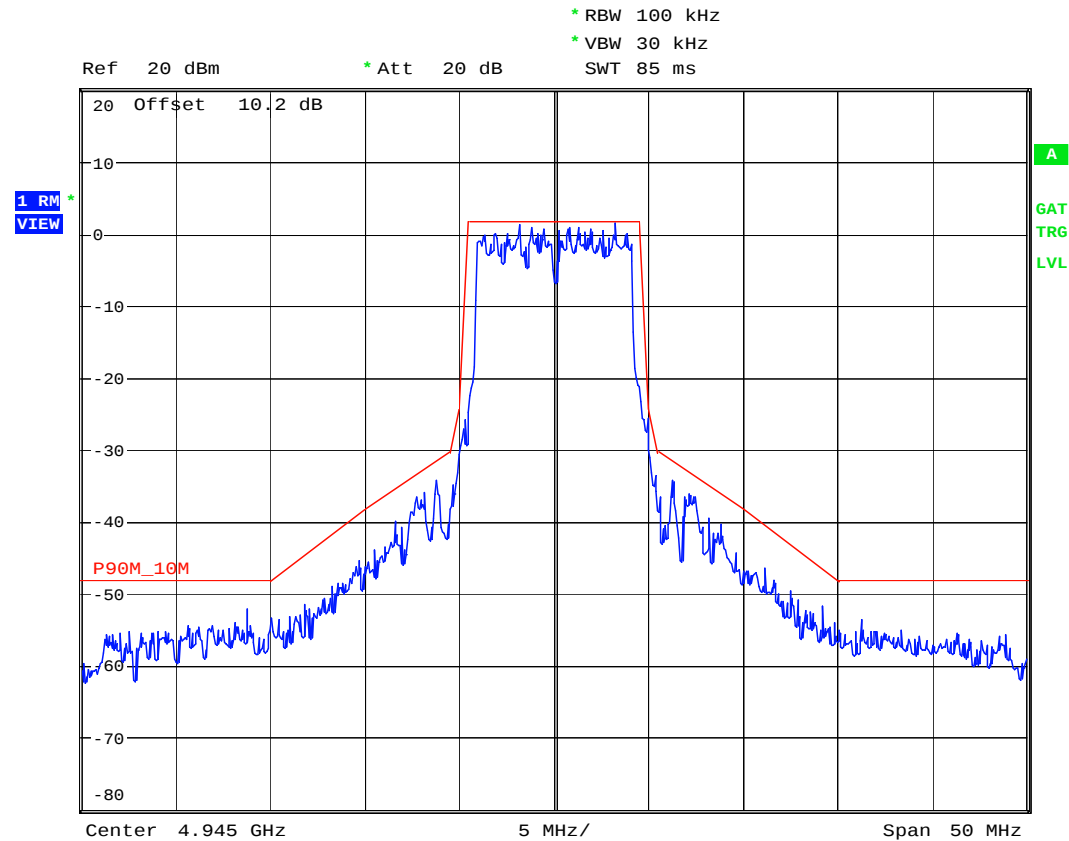
Spurious Emissions at the Antenna Terminals, continued

Emission Mask

Channel Bandwidth: 10 MHz

TX Frequency: 4945MHz

Software/GUI Power Setting: 19dBm



RedLine Communications, AN80i

Date: 20.DEC.2007 19:20:47

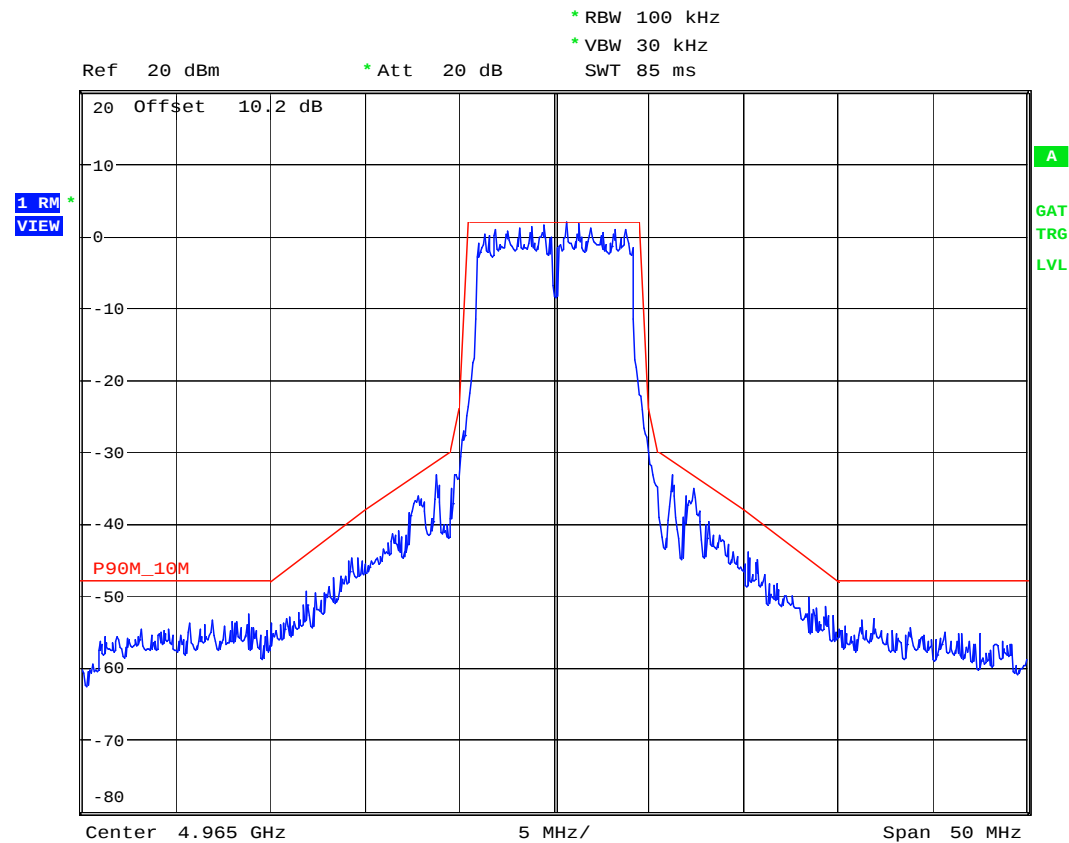
Spurious Emissions at the Antenna Terminals, continued

Emission Mask

Channel Bandwidth: 10 MHz

TX Frequency: 4965MHz

Software/GUI Power Setting: 18dBm



RedLine Communications, AN80i

Date: 20.DEC.2007 19:21:48

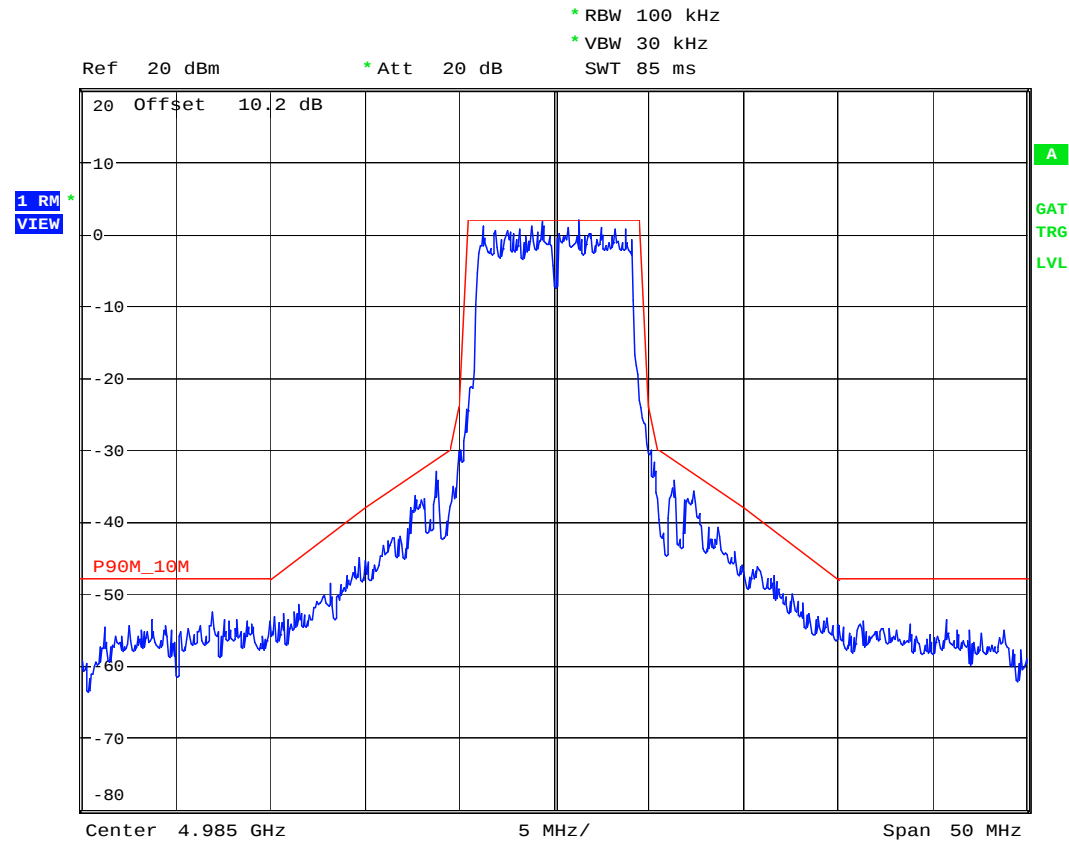
Spurious Emissions at the Antenna Terminals, continued

Emission Mask

Channel Bandwidth: 10 MHz

TX Frequency: 4985MHz

Software/GUI Power Setting: 18dBm



RedLine Communications, AN80i

Date: 20.DEC.2007 19:23:09

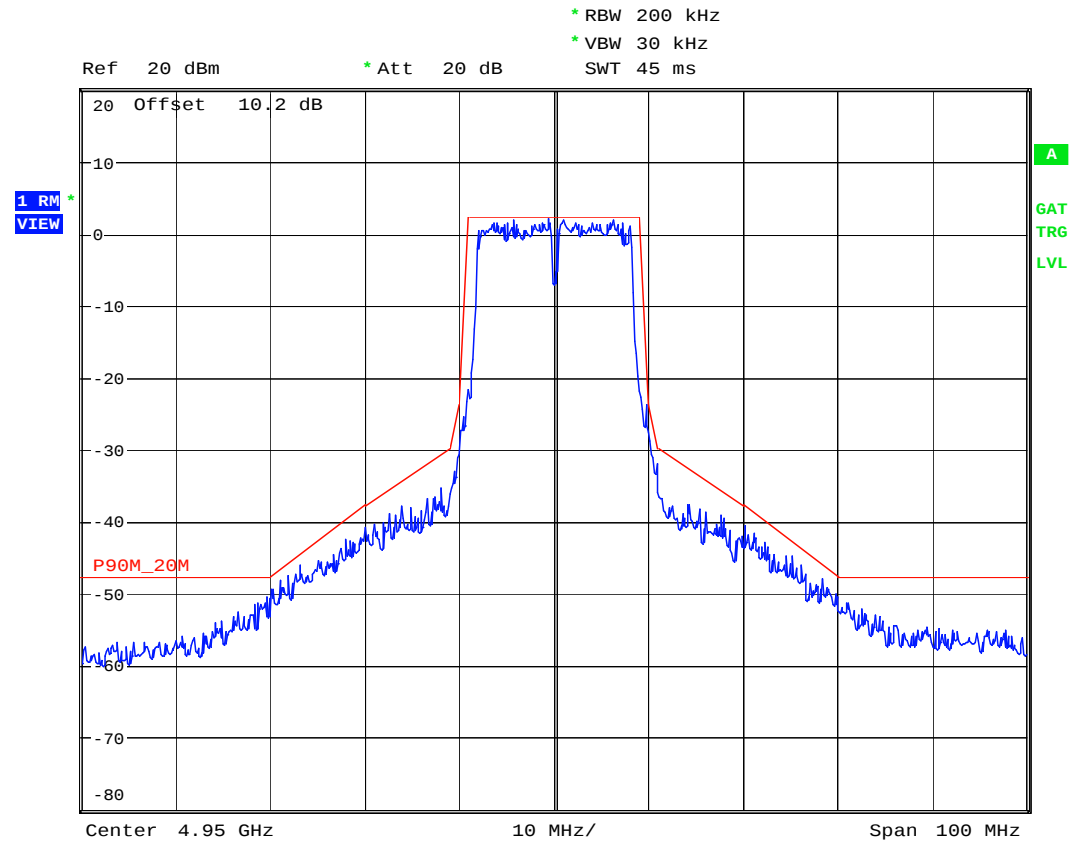
Spurious Emissions at the Antenna Terminals, continued

Emission Mask

Channel Bandwidth: 20 MHz

TX Frequency: 4950MHz

Software/GUI Power Setting: 20dBm



RedLine Communications, AN80i

Date: 20.DEC.2007 19:32:15

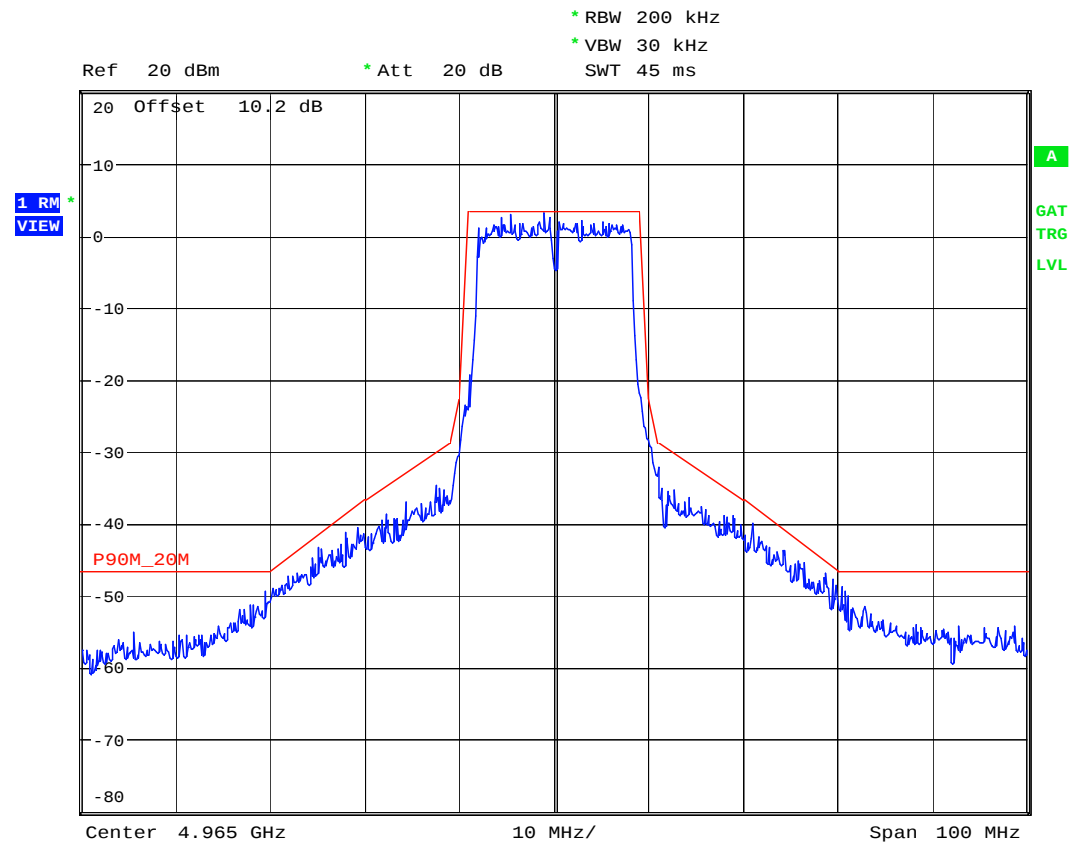
Spurious Emissions at the Antenna Terminals, continued

Emission Mask

Channel Bandwidth: 20 MHz

TX Frequency: 4965MHz

Software/GUI Power Setting: 20dBm



RedLine Communications, AN80i

Date: 20.DEC.2007 19:38:03

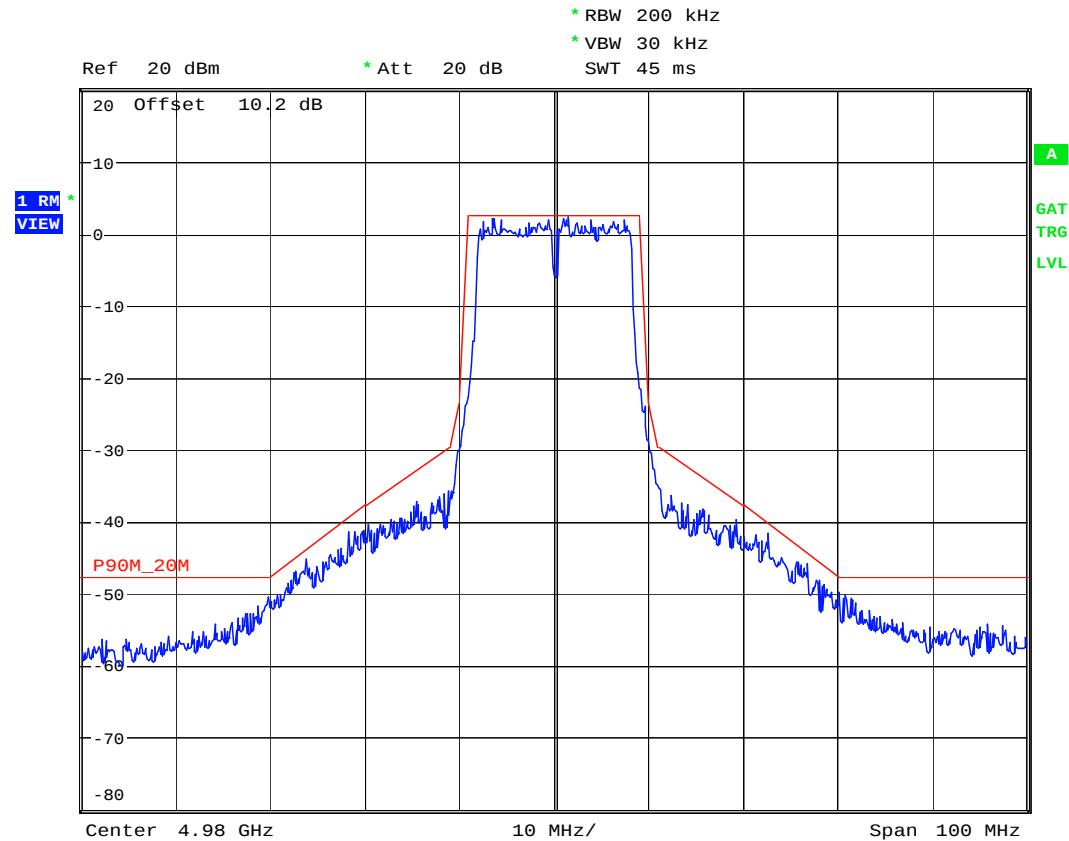
Spurious Emissions at the Antenna Terminals, continued

Emission Mask

Channel Bandwidth: 20 MHz

TX Frequency: 4980MHz

Software/GUI Power Setting: 20dBm



RedLine Communications, AN80i

Date: 20.DEC.2007 19:43:57

Section 5. Radiated Spurious Emissions

Criteria: Clause 90.210(m)

(m) Emission Mask M. For high power transmitters (greater than 20 dBm) operating in the 4940-4990 MHz frequency band, the power spectral density of the emissions must be attenuated below the output power of the transmitter as follows:

- (1) On any frequency removed from the assigned frequency between 0-45% of the authorized bandwidth (BW): 0 dB.
- (2) On any frequency removed from the assigned frequency between 45-50% of the authorized bandwidth: $56.8 \log (\% \text{ of BW}/45)$ dB.
- (3) On any frequency removed from the assigned frequency between 50-55% of the authorized bandwidth: $26 + 14.5 \log (\% \text{ of BW}/50)$ dB.
- (4) On any frequency removed from the assigned frequency between 55-100% of the authorized bandwidth: $32 + 3.1 \log (\% \text{ of BW}/55)$ dB.
- (5) On any frequency removed from the assigned frequency between 100-150% of the authorized bandwidth: $40 + 5.7 \log (\% \text{ of BW}/100)$ dB.
- (6) On any frequency removed from the assigned frequency between above 150% of the authorized bandwidth: 50 dB or $55 + 10 \log (P)$ dB, whichever is the lesser attenuation.
- (7) The zero dB reference is measured relative to the highest average power of the fundamental emission measured across the designated channel bandwidth using a resolution bandwidth of at least one percent of the occupied bandwidth of the fundamental emission and a video bandwidth of 30 kHz. The power spectral density is the power measured within the resolution bandwidth of the measurement device divided by the resolution bandwidth of the measurement device. Emission levels are also based on the use of measurement instrumentation employing a resolution bandwidth of at least one percent of the occupied bandwidth.

Test Conditions:

Sample Number:	1, 2	Temperature:	22 °C
Date:	January 2, 2008	Humidity:	50 %
Modification State:	0	Tester:	Roman Kuleba
		Laboratory:	Ottawa

Test Results: Complies

Test Data: See attached table.

The spectrum was searched from 30MHz to 40GHz, and for low, medium and high channel.

Only worst-case data is presented.

No harmonics were found within 20dB below the limit.

All measurements were performed at a distance of 3 meters using a Peak detector with 100kHz RBW/VBW below 1GHz and RMS detector with 1MHz RBW/VBW settings above 1GHz.

Radiated Spurious Emissions, continued

Frequency (MHz)	Ant.	Pol. (V/H)	RCVD Signal (dBμV)	Sig Sub. Factor (dB)	Emission EIRP (dBm)	Limit (dBm)	Margin (dB)
155.55	BC	V	12.3	—	-70.0	-25.0	45.0
666.68	LP	V	22.5	—	-51.3	-25.0	26.3
688.88	LP	V	26.2	—	-47.3	-25.0	22.3
711.23	LP	V	18.4	—	-54.7	-25.0	29.7
719.99	LP	V	28.3	—	-44.7	-25.0	19.7
933.32	LP	V	18.4	—	-52.1	-25.0	27.1
199.89	BC	H	5.4	—	-74.7	-25.0	49.7
333.32	LP	H	22.8	—	-56.5	-25.0	31.5
400.01	LP	H	36.4	—	-41.2	-25.0	16.2
733.34	LP	H	16.7	—	-55.5	-25.0	30.5
800.00	LP	H	21.2	—	-50.2	-25.0	25.2
822.23	LP	H	15.6	—	-55.6	-25.0	30.6
955.55	LP	H	16.5	—	-53.3	-25.0	28.3
977.75	LP	H	11.9	—	-57.6	-25.0	32.6
1040.00	Horn1	V	20.9	—	-51.5	-25.0	26.5
1066.75	Horn1	V	20.0	—	-51.7	-25.0	26.7
1200.00	Horn1	V	18.6	—	-52.8	-25.0	27.8
1250.50	Horn1	V	25.8	—	-46.1	-25.0	21.1
1360.00	Horn1	V	23.3	—	-48.9	-25.0	23.9
1520.00	Horn1	V	17.0	—	-54.3	-25.0	29.3
1760.00	Horn1	V	15.3	—	-54.7	-25.0	29.7
1040.00	Horn1	H	17.5	—	-53.5	-25.0	28.5
1066.75	Horn1	H	17.2	—	-54.0	-25.0	29.0
1200.00	Horn1	H	17.3	—	-53.9	-25.0	28.9
1250.50	Horn1	H	24.1	—	-47.0	-25.0	22.0
1360.00	Horn1	H	21.3	—	-51.0	-25.0	26.0
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipol							

Section 6. Frequency Stability**Criteria: Clause 90.213**

(a) Unless noted elsewhere, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following Table. (Refer 90.213 for table)

Test Conditions:

Sample Number:	1,2	Temperature:	22 °C
Date:	December 18, 2007	Humidity:	50%
Modification State:	0	Tester:	Roman Kuleba
		Laboratory:	Client, R & D

Test Results: Complies

Test Conditions Ambient Temperature: 22°C
Extreme Temperature: -30°C to +50°C
Extreme Voltage Conditions: +/-15% of 120VAC

Test Data: See attached tables.

Frequency Stability, continued

Power Line Supply Voltage: 120VAC

T (°C)	F _{NOMINAL} (GHz)	ChSpc (MHz)	F _{MEASURED} (GHz)	Deviation (ppm)
-30	4.965	10.0	4.964999423	-0.124
-20	4.965	10.0	4.964999310	-0.147
-10	4.965	10.0	4.964999197	-0.169
0	4.965	10.0	4.964999084	-0.192
10	4.965	10.0	4.964999561	-0.096
20	4.965	10.0	4.965000038	0.000
30	4.965	10.0	4.965000399	0.073
40	4.965	10.0	4.965000761	0.146
50	4.965	10.0	4.965001122	0.218

NOTE: The EUT was also tested under extreme power line voltage conditions ($\pm 15\%$ of 120 VAC). No measurable deviation of transmitting frequency was observed.

Appendix B : Setup Photographs

Conducted Measurement Setup

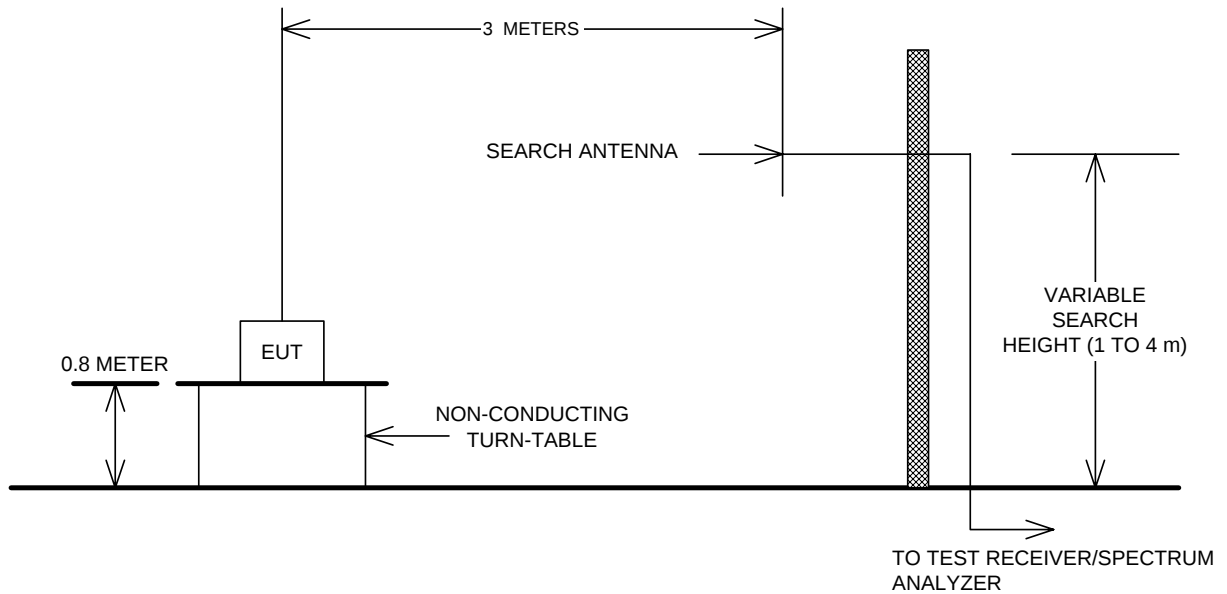


Radiated Emissions Setup



Appendix C : Block Diagram of Test Setups

Test Site For Radiated Emissions



Conducted Emissions, Output power, Occupied Bandwidth

