AIR-RM1520-58-A-K9
5.8GHz 802.11a Radio Module for 1520 Series

Test Report

FCC ID: LDK102068
IC ID: 2461B-102068

Against the following Specifications:

CFR47 Part 15.247

RSS210

Cisco Systems

170 West Tasman Drive

San Jose, CA 95134

Author: James Nicholson

Approved By:

Title:

This test report has been electronically authorized and archived using the CISCO Engineering Document Control system.

Section 1: Overview

1.1 Test Summary

samples were assessed against the tests detailed in section 3 under the requirements of the following specifications:

Emission	Immunity
CFR47 Part 15.247(a) CFR47 Part 15.247(a)(2) CFR47 Part 15.247a3 (RSS210) CFR47 Part 15: 2005 CFR47 Part 15: 2005 (CAN/CSA-CISPR 22-02)	N/A

The specifications listed above represent actual tests performed to demonstrate compliance against the specifications and basic standards listed on the front cover of this report. This list is not a one to one match to the front cover for one or more of the following reasons.

1. Basic standards call up many different test phenomena specifications such as the 61000-4-X series. The basic standards define which elements and levels shall be applied from these specifications and as such it is not appropriate to list the individual specifications on the front cover.
2. A Standard listed on the front cover may be required in a particular country but is not appropriate for the particular technologies included in the equipment under test. E.g. You cannot test a DC product to the mains Harmonics requirements in EN61000-3-2. See section 3.2.
3. Test results against a particular standard or specification may be included in a different test report. See section 3.2 for an EDCS reference of this data.
4. Where appropriate, Cisco may have substituted a later revision of a basic standard to those referenced in the specification on the front sheet of this test report. This decision was based upon improved test methodology and repeatability and/or where the newer revision represented a more stringent test.
5. Where relevant, testing has been carried out to the requirements of both EN and IEC Specifications. This was possible because of the similarities of the test methods involved and the Cisco EMC test procedures.
6. Testing may have been performed to an equivalent test that satisfies the requirements of the standards and specifications listed on the front cover of the report. See section 3.2.
7. Where radiated emissions testing has been performed to EN55022/CISPR22 the additional requirements of VCCI: V- 3/2006.04, EN55022: 1994 +A1/2 and CAN/CSA- CISPR 22-02 have also been evaluated unless otherwise stated.
8. Testing to the requirements of CFR47 Part 15 was performed against the CISPR22 limits. The results are therefore deemed satisfactory evidence of compliance with Industry Canada Interference Causing Equipment Standard ICES-003.
9. Where assessment has been performed to CISPR24, all the applicable test requirements may have not been covered. Refer to the results section for the tests performed.

Notes:

1) Where a specification listed on the front cover of this report has deviations from the basic standards listed above, the additional technical requirements of the specification were also assessed.
2) Where appropriate, Cisco may have substituted a later revision of a basic standard to those referenced in the specification on the front sheet of this test report. This decision was based upon improved test methodology and repeatability and/or where the newer revision represented a more stringent test.
3) Where relevant, testing has been carried out to the requirements of both EN and IEC Specifications. This was possible because of the similarities of the test methods involved and the Cisco EMC test procedures.

Section 2: Assessment Information

2.1 General

This report contains an assessment of an apparatus against Electromagnetic Compatibility Standards based upon tests carried out on the samples submitted. The testing was performed by and for the use of Cisco systems Inc:

With regard to this assessment, the following points should be noted:

a) The results contained in this report relate only to the items tested and were obtained in the period between the date of the initial assessment and the date of issue of the report. Manufactured products will not necessarily give identical results due to production and measurement tolerances.

b) The apparatus was set up and exercised using the configuration and modes of operation defined in this report only.

c) Where relevant, the apparatus was only assessed using the susceptibility criteria defined in this report and the Test Assessment Plan (TAP).

d) All testing was performed under the following environmental conditions:

Temperature	15°C to 35°C (54°F to 95°F)
Atmospheric Pressure	860mbar to 1060mbar (25.4" to 31.3")
Humidity	10% to 75*%

*[Where applicable] For ESD testing the humidity limits used were 30% to 60% and for EFT/B tests the humidity limits used were 25% to 75%.

e) All AC testing was performed at one or more of the following supply voltages:
110V 60 Hz (+/-20%)
220V 50 Hz (+/-20%)

2.2 Date of start of testing

10-Dec-2007

2.3 Report Issue Date

Cisco uses an electronic system to issue, store and control the revision of test reports. This system is called the Engineering Document Control System (EDCS). The actual report issue date is embedded into the original file on EDCS. Any copies of this report, either electronic or paper, that are not on EDCS must be considered uncontrolled

2.4 Testing facilities

This assessment was performed by: James Nicholson

Testing Laboratory

Cisco Systems, Inc.,	Cisco Systems, Inc.
4125 Highlander Parkway	170 West Tasman Drive
Richfield, OH 44286	San Jose, CA 95134
USA	USA

Test Engineers

James Nicholson

2.5 Equipment Assessed (EUT)

AIR-RM1520-58-A-K9= 5.8GHz 802.11a Radio Module for 1520 Series

2.6 EUT Description

The AIR-RM1520-58-A-K9 802.11a radio module operates exclusively in the AIR-LAP1520 series access point, and may operate simultaneously with the AIR-RM1520-24-A-K9 (2.4GHz 802.11b/g Radio) and/or AIR-RM1520-49-A-K9 (4.9GHz Public Safety Band Radio Module)

The following antennas are supported by this product.

AIR-ANT5180V-N	4900-5850 MHz	8.0 dBi Omni-directional
AIR-ANT5114P-N	4900 -5850 MHz	14.0 dBi Patch
AIR-ANT5117S-N	4900 -5850 MHz	17.0 dBi 90-degree Sector

Section 3: Sample Details

Sample No.	Equipment Details	Part Number	Manufacturer	Hardware Rev.	Firmware Rev.	Software Rev.	Serial Number
S01	5.8GHz 802.11a Radio Module	AIR-RM1520-58-A-K9	Cisco Systems	NA	NA	NA	NA
S02	Mesh Access Point	AIR-LAP1522AG-A-K9	Cisco Systems	NA	NA	NA	NA
S03	8.0 dBi Omni Antenna	AIR-ANT5180V-N	Cisco Systems	NA	NA	NA	NA
S05	17dBi Patch Antenna	AIR-ANT5117S-N	Cisco Systems	NA	NA	NA	NA

Appendix A: Emission Test Results
Testing Laboratory: Cisco Systems, Inc., 4125 Highlander Parkway, Richfield, OH, USA

Average Output Power

Average Power with up to 8, 14 and 17 dBi Antennas

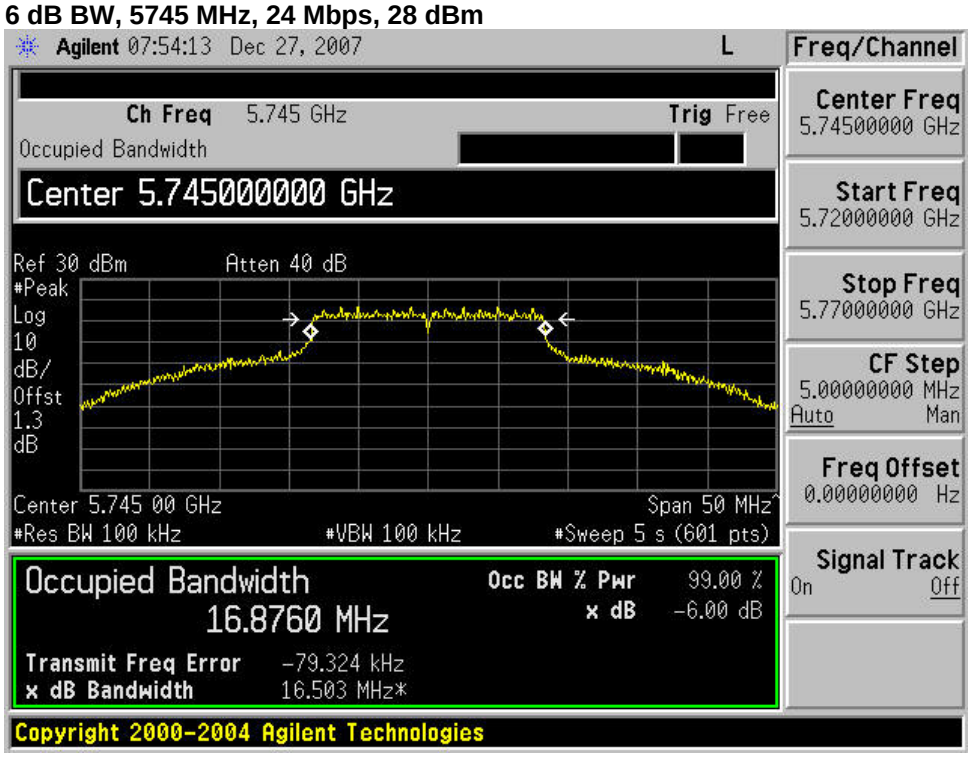
Frequency (MHz)	Data Rate (Mbps)	Antenna Gain (dBi)	Target Power Level (dBm)	Actual Power Level (dBm)
5745	24	8,14,17	28	27.0
5785	24	8,14,17	28	27.0
5825	24	8,14,17	28	26.6

6dB Bandwidth

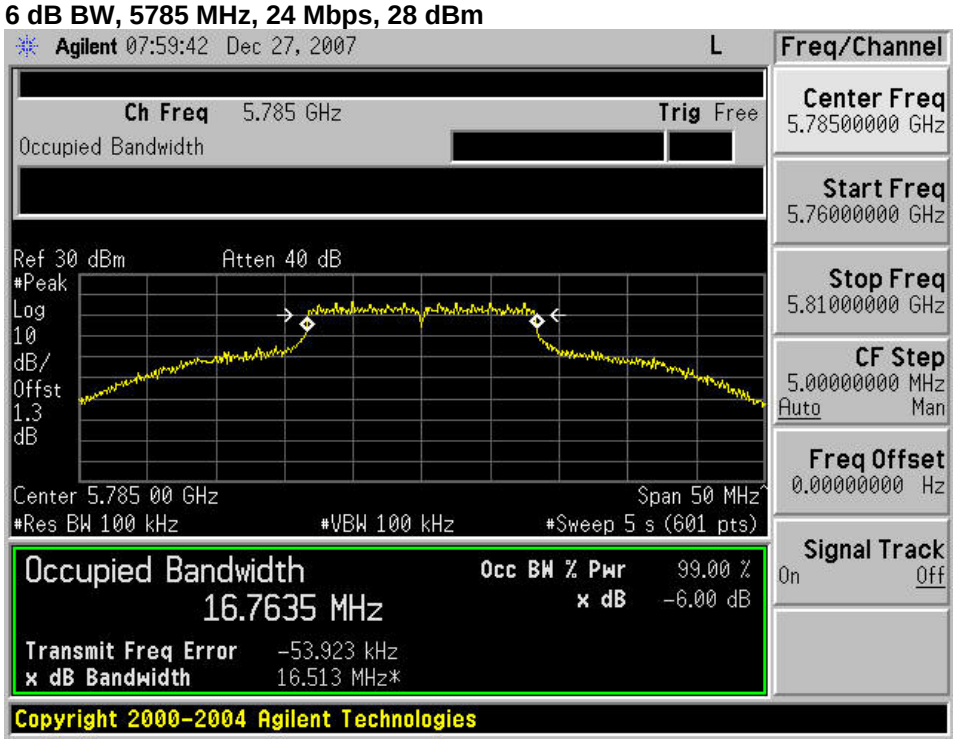
15.247: Systems using digital modulation techniques may operate in the 5725-5850MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz.

Frequency (MHz)	Data Rate (Mbps)	6dB BW (MHz)	Limit (kHz)	Margin (kHz)
5745	24	16.5	>500	16000
5785	24	16.5	>500	16000
5825	24	16.5	>500	16000

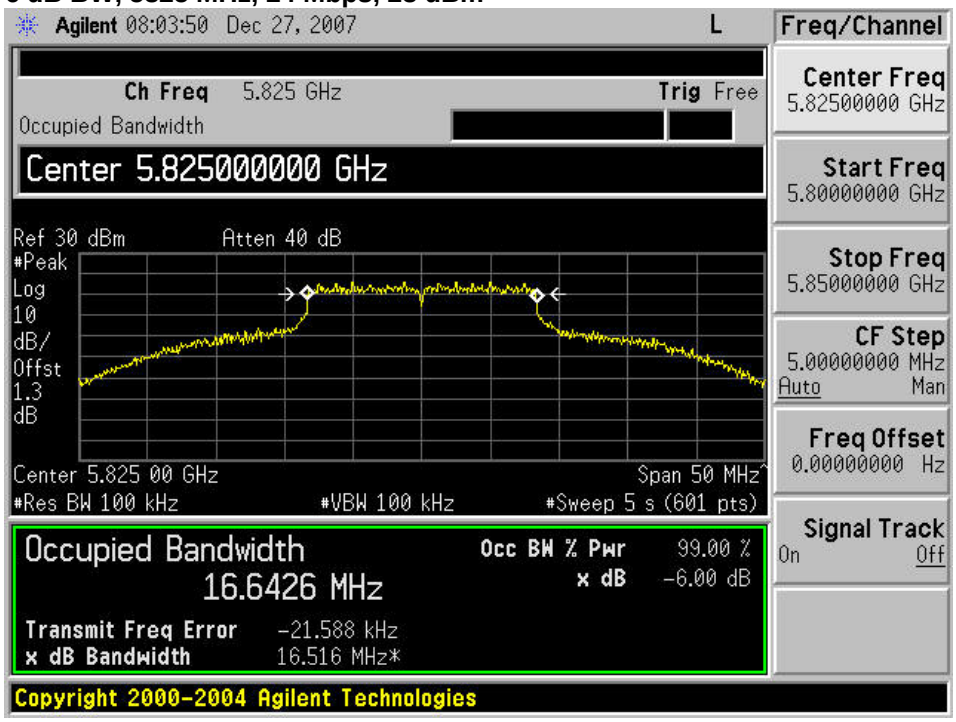
6 dB BW, 5745 MHz, 24 Mbps, 28 dBm



6 dB BW, 5785 MHz, 24 Mbps, 28 dBm



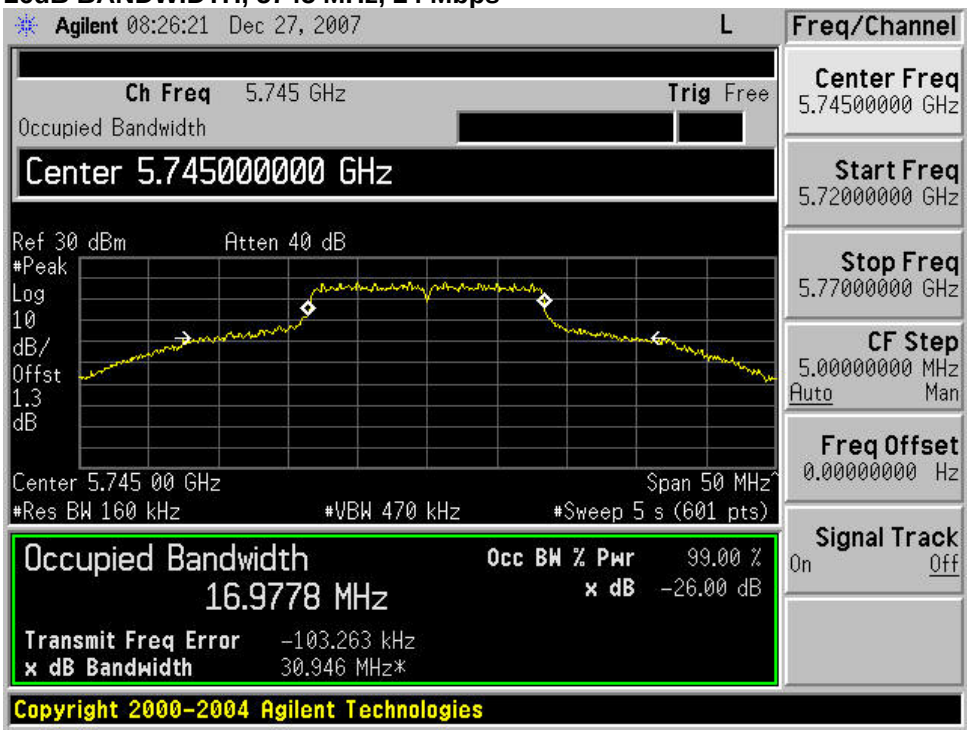
6 dB BW, 5825 MHz, 24 Mbps, 28 dBm



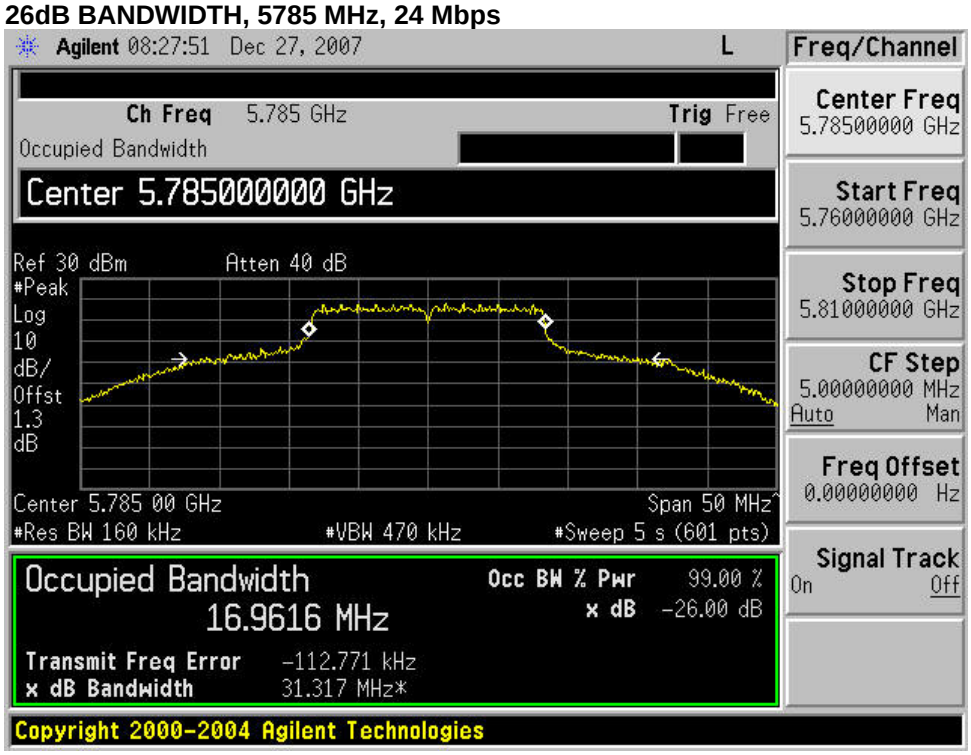
99% and 26dB Bandwidth

Frequency (MHz)	Data Rate (Mbps)	26dB BW (MHz)	99% BW (MHz)
5745	36	30.9	17.0
5785	36	31.3	17.0
5825	36	29.1	16.8

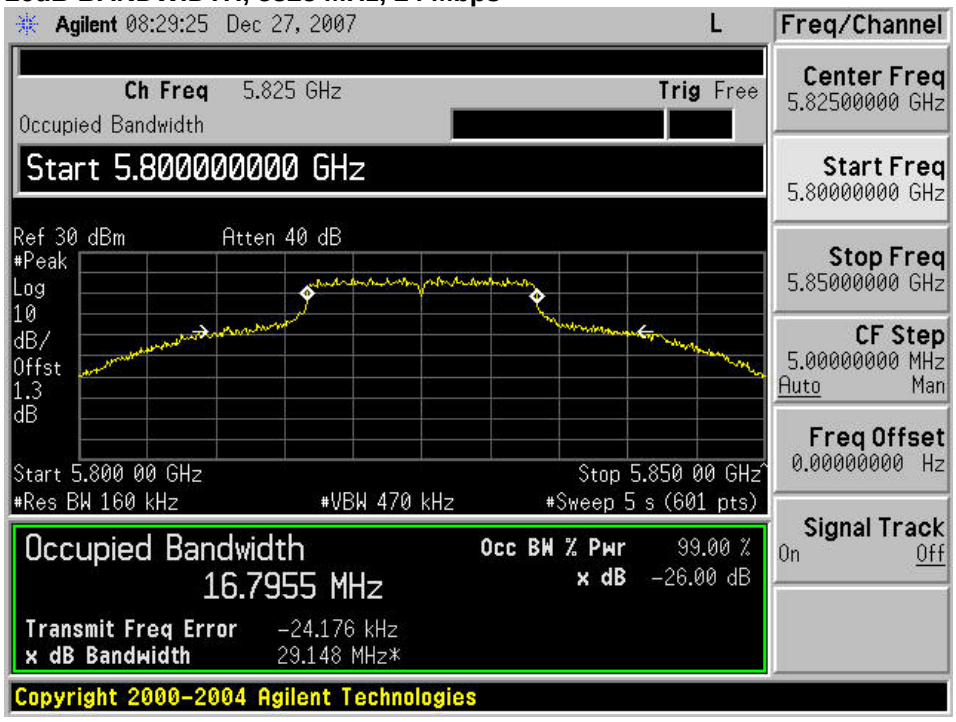
26dB BANDWIDTH, 5745 MHz, 24 Mbps



26dB BANDWIDTH, 5785 MHz, 24 Mbps



26dB BANDWIDTH, 5825 MHz, 24 Mbps



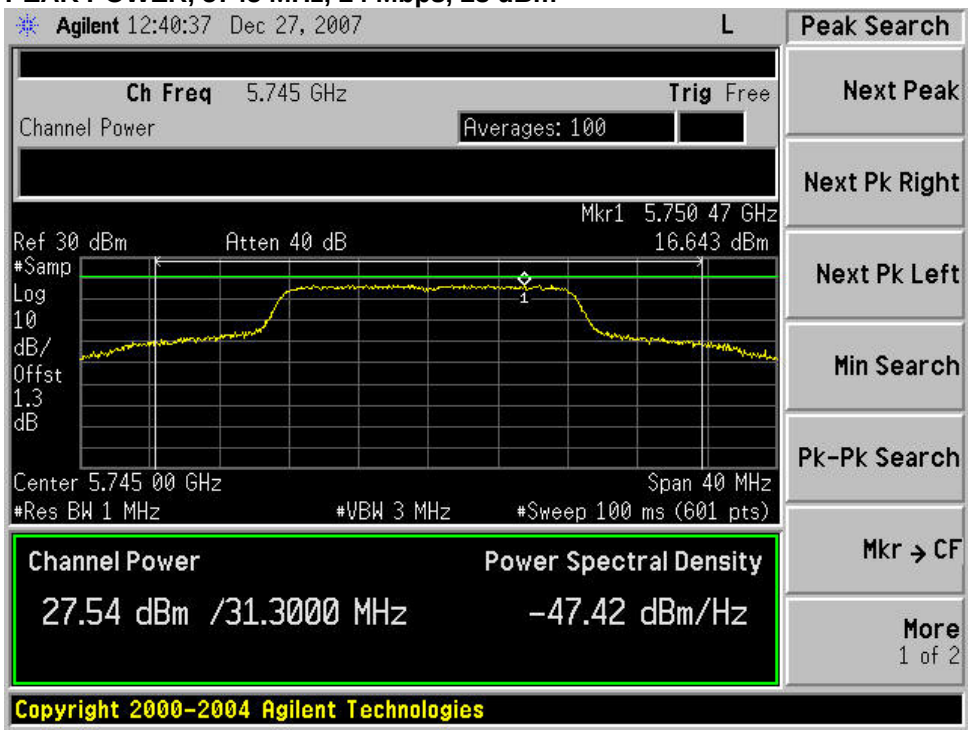
Peak Output Power

15.247: The maximum conducted output power of the intentional radiator for systems using digital modulation in the 5725-5850MHz band shall not exceed 1 Watt (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power

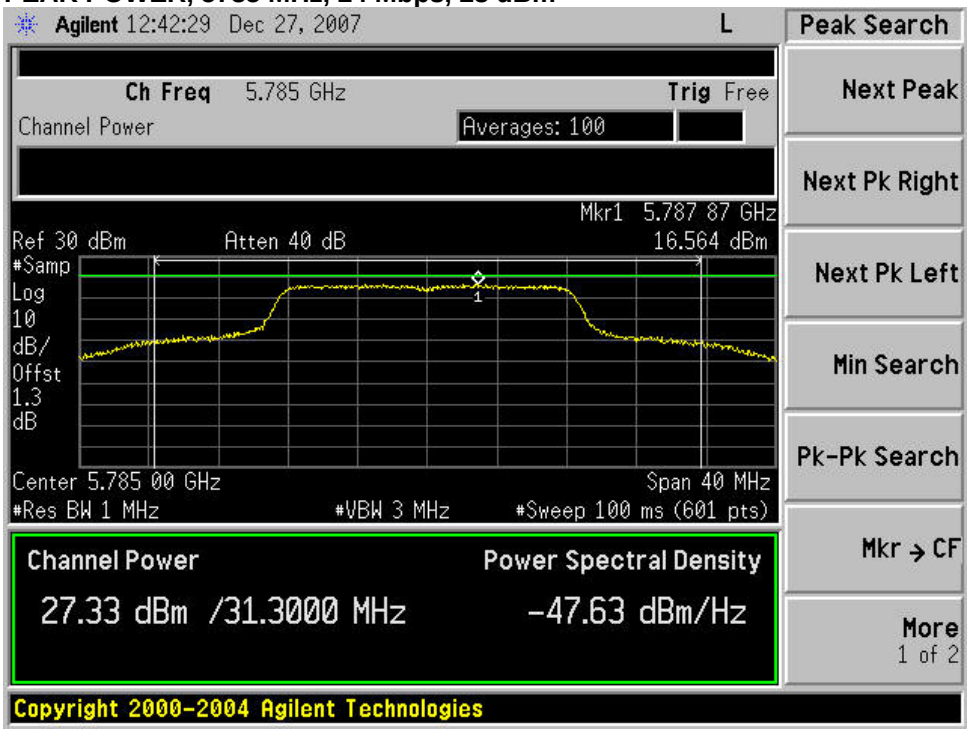
- For the 8 dBi Omni-directional antenna, the maximum allowable output power must be reduced by 8dBi-6dbi = 2dB, for a maximum peak conducted output power of 28 dBm.
- The 14 dBi and 17dBi antennas are used exclusively for fixed, point-to-point operations and require no reduction in transmitter conducted output power.

Frequency (MHz)	Data Rate (Mbps)	Antenna Gain (dBi)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
5745	24	8,14,17	27.5	28.0	0.5
5785	24	8,14,17	27.3	28.0	0.7
5825	24	8,14,17	27.0	28.0	1.0

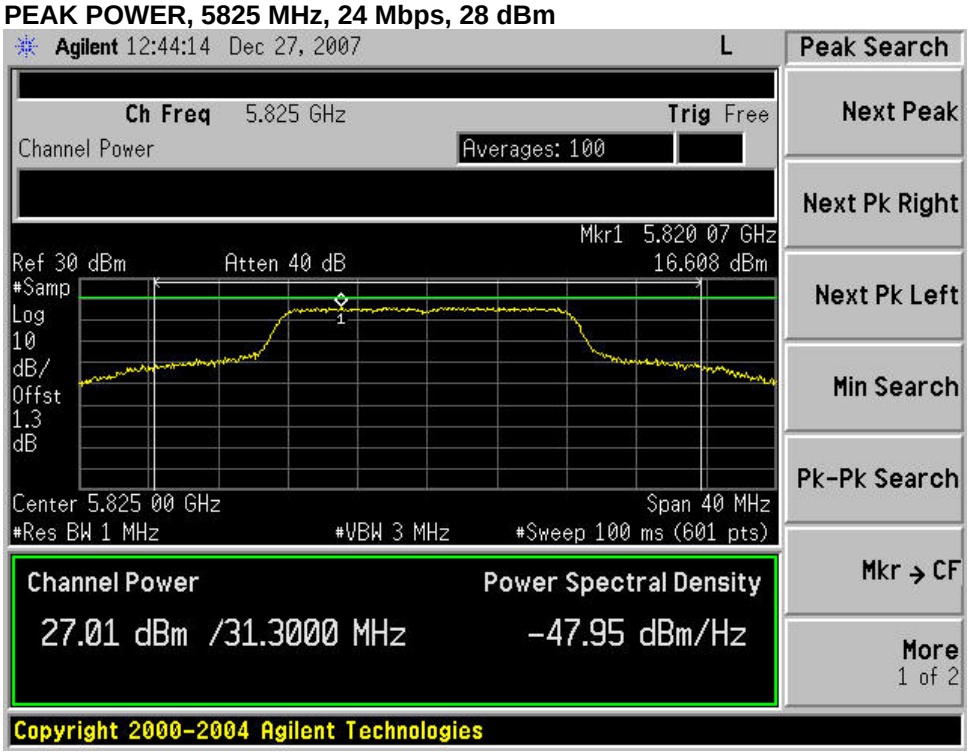
PEAK POWER, 5745 MHz, 24 Mbps, 28 dBm



PEAK POWER, 5785 MHz, 24 Mbps, 28 dBm



PEAK POWER, 5825 MHz, 24 Mbps, 28 dBm

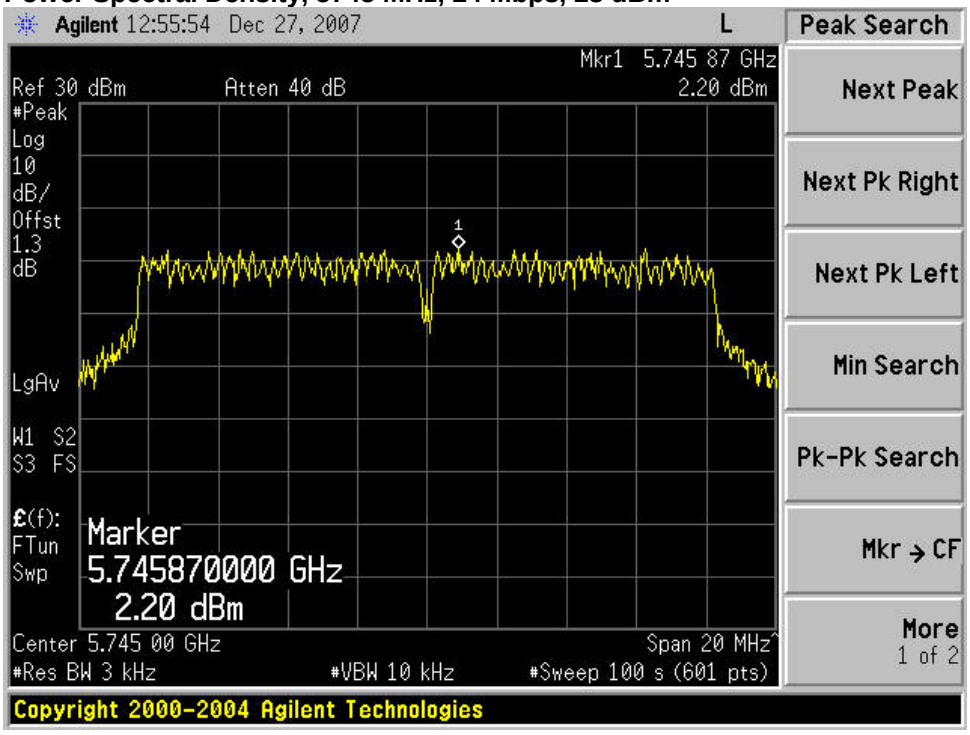


Power Spectral Density

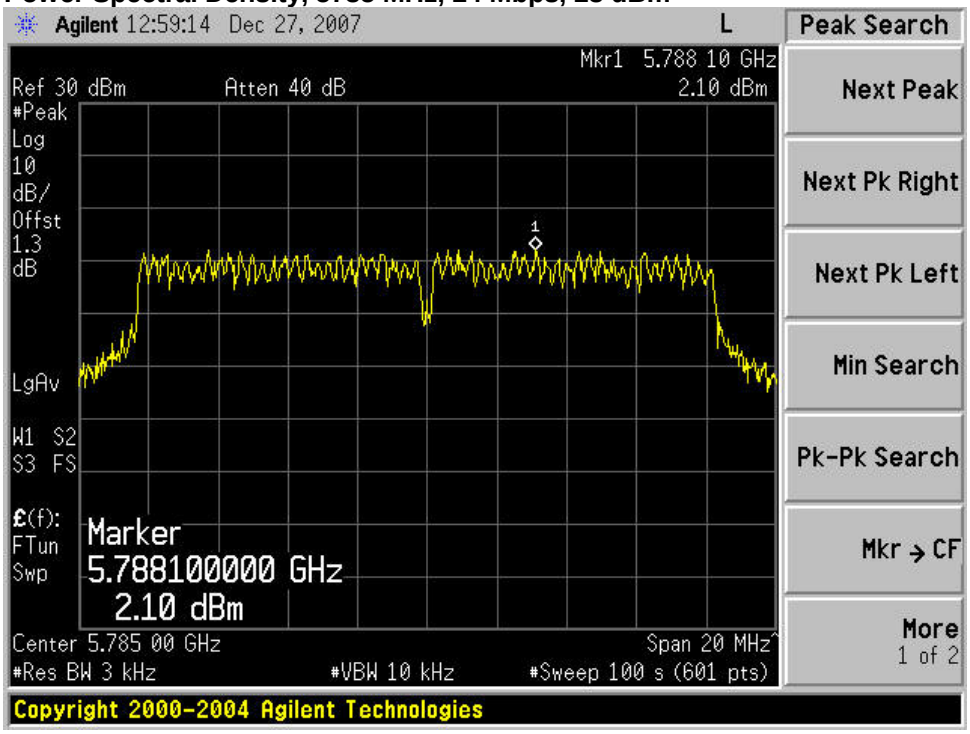
15.247: For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Frequency (MHz)	Data Rate (Mbps)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
5745	24	2.2	8.0	5.8
5785	24	2.1	8.0	5.9
5825	24	1.7	8.0	6.3

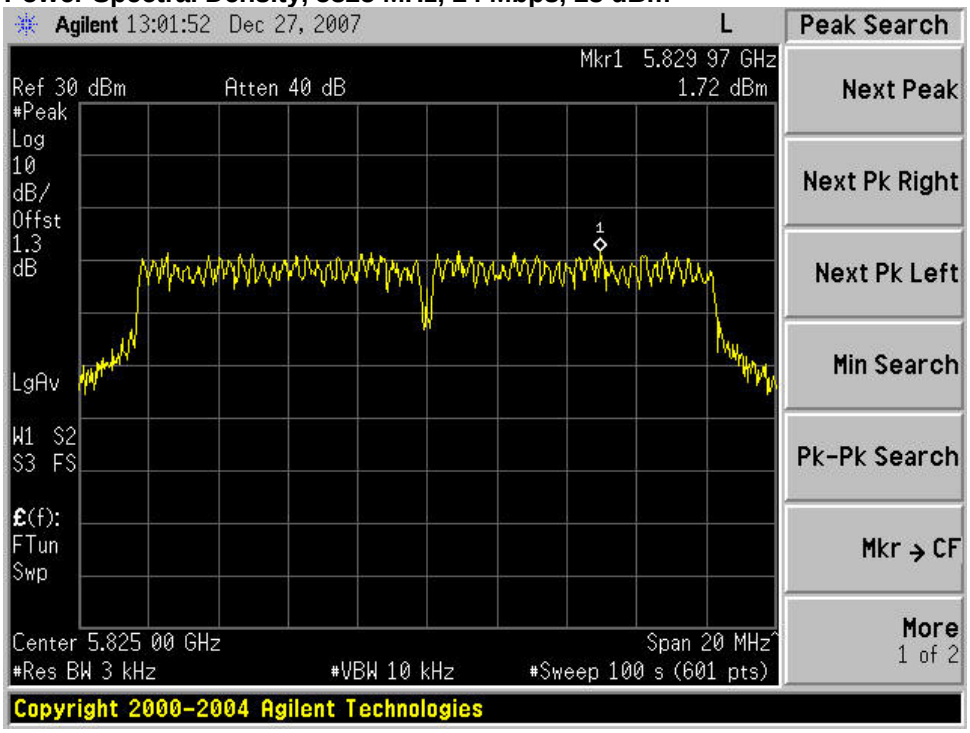
Power Spectral Density, 5745 MHz, 24 Mbps, 28 dBm



Power Spectral Density, 5785 MHz, 24 Mbps, 28 dBm



Power Spectral Density, 5825 MHz, 24 Mbps, 28 dBm

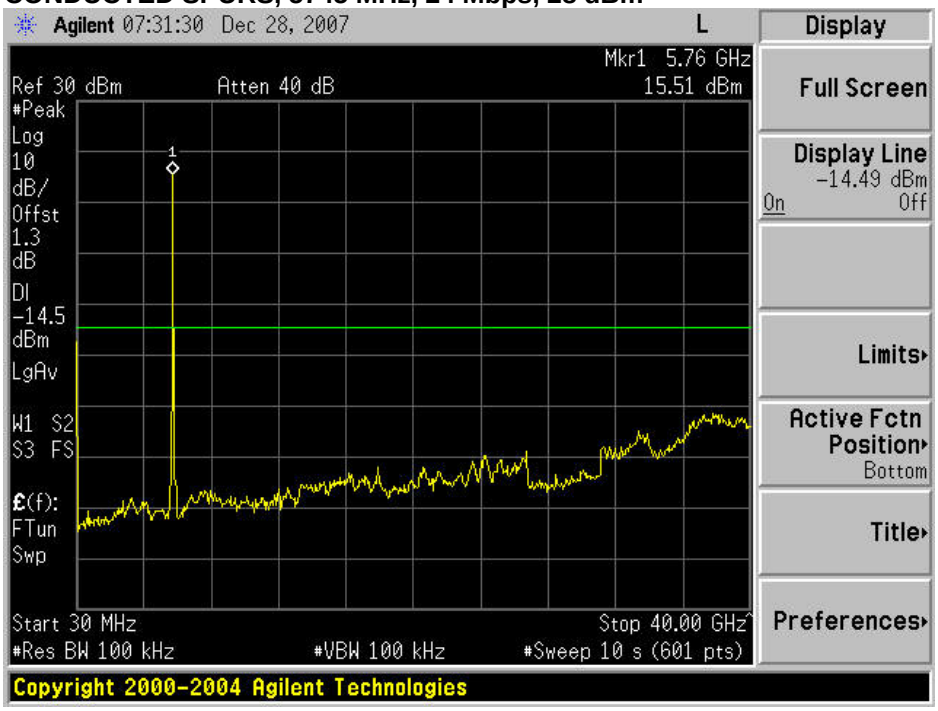


Conducted Spurious Emissions

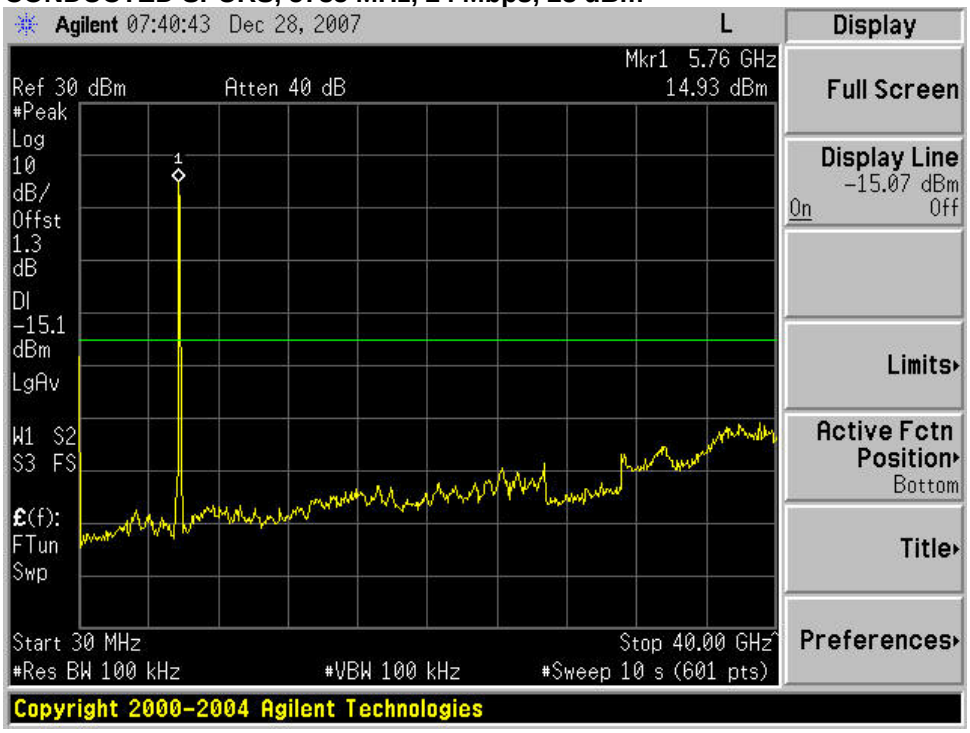
15.247: In any 100 kHz bandwidth outside the frequency band in which the digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

Frequency (MHz)	Data Rate (Mbps)	Conducted Spurs
5745	24	>30dBc
5785	24	>30dBc
5825	24	>30dBc

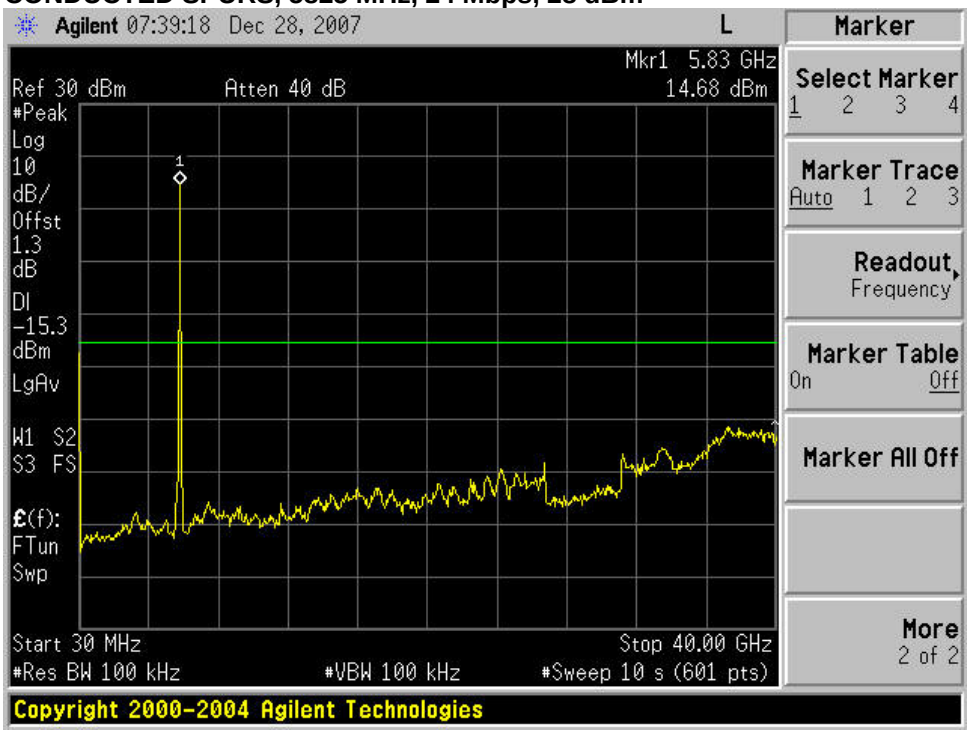
CONDUCTED SPURS, 5745 MHz, 24 Mbps, 28 dBm



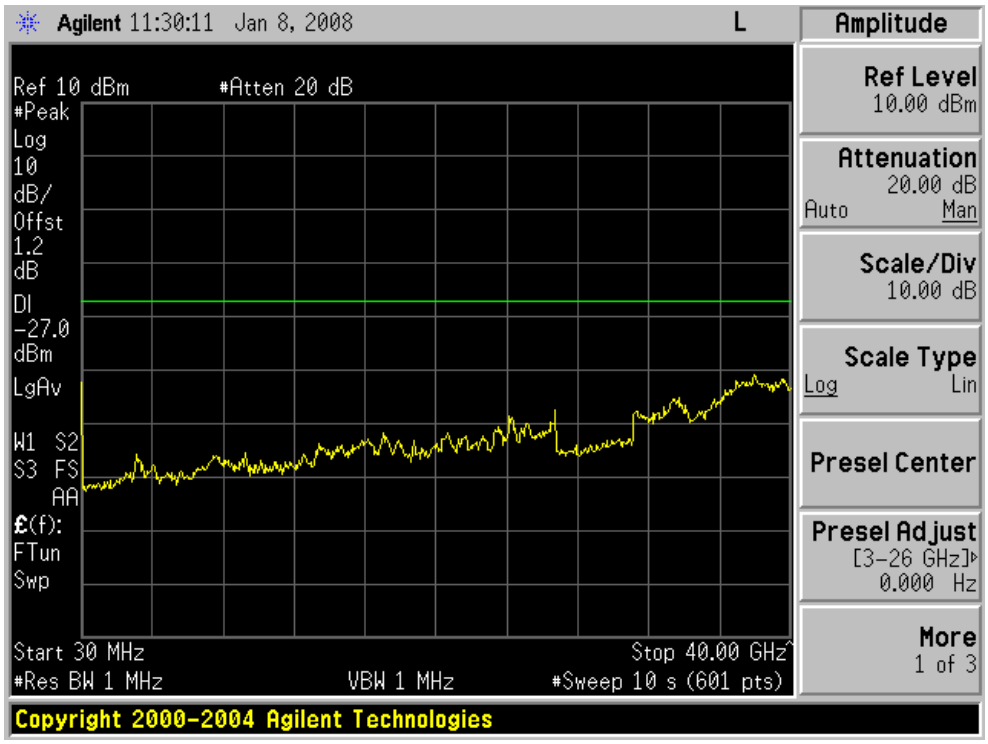
CONDUCTED SPURS, 5785 MHz, 24 Mbps, 28 dBm



CONDUCTED SPURS, 5825 MHz, 24 Mbps, 28 dBm



CONDUCTED Rx SPURS



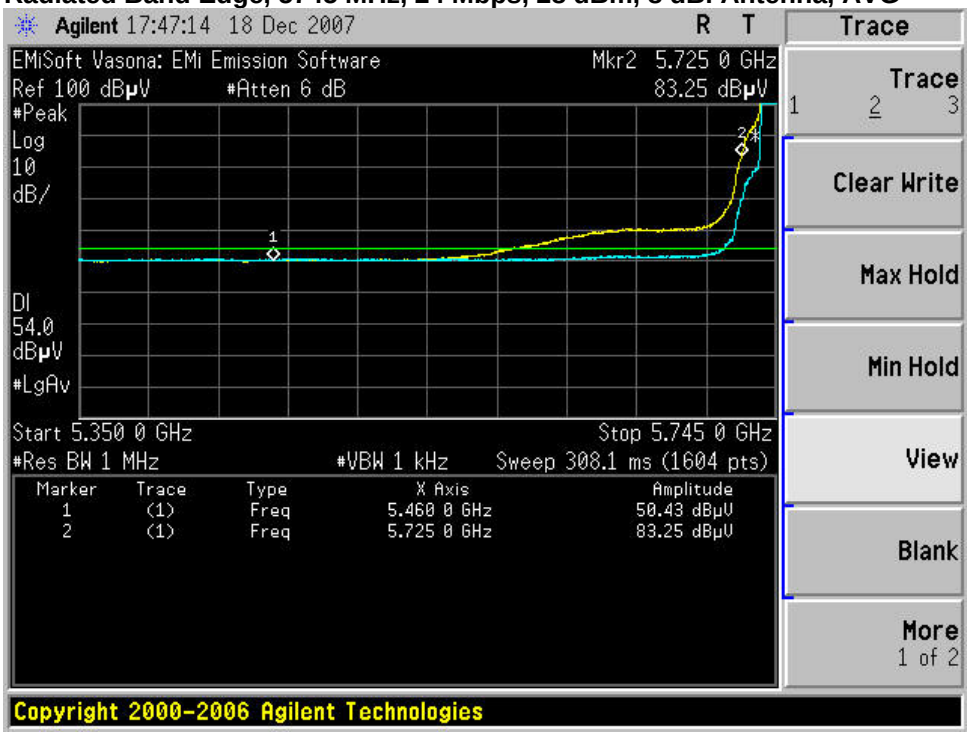
Appendix B: Emission Test Results
Testing Laboratory: Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134, USA

Radiated Band Edge Emissions

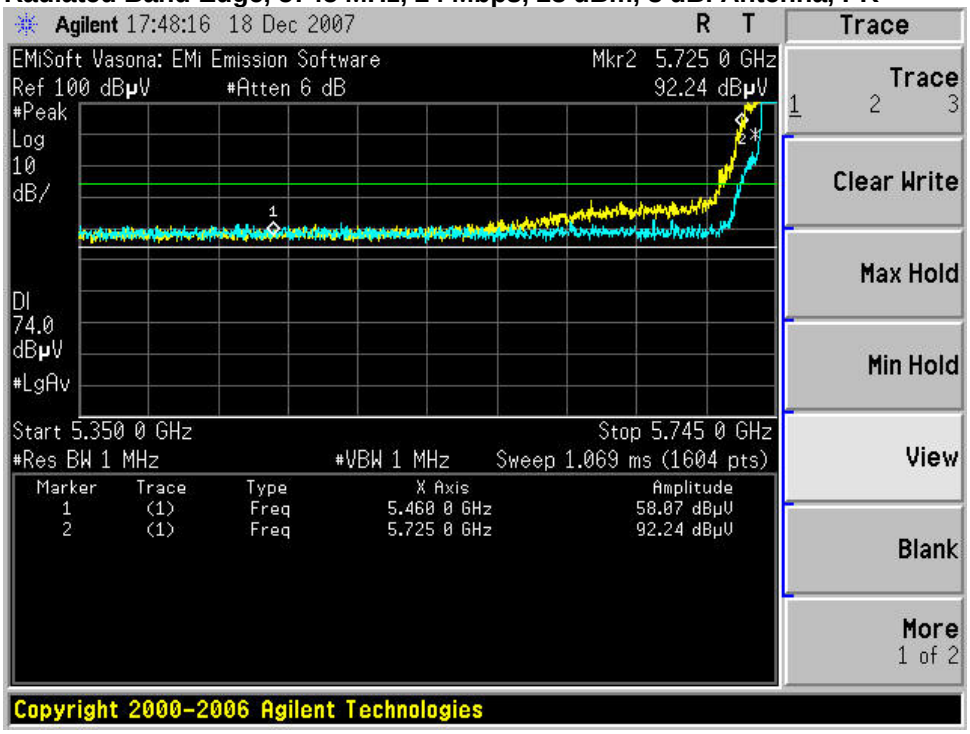
Radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a).

Frequency (MHz)	Data Rate (Mbps)	Radiated Bandedge Margin (dB)
5745	24	3.6
5825	24	3.6

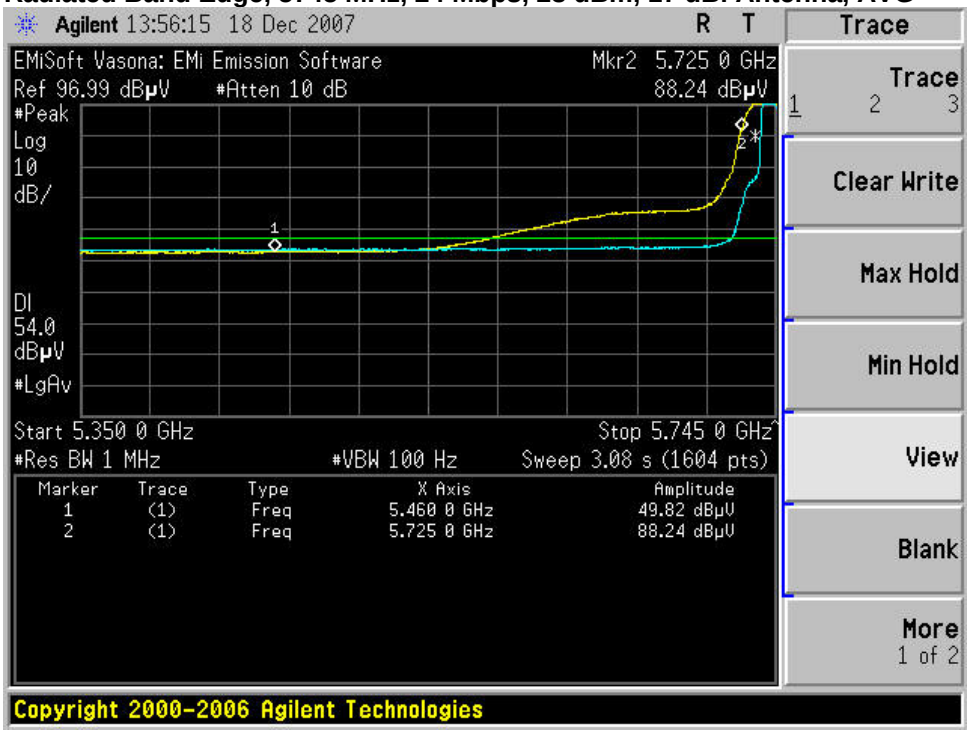
Radiated Band Edge, 5745 MHz, 24 Mbps, 28 dBm, 8 dBi Antenna, AVG



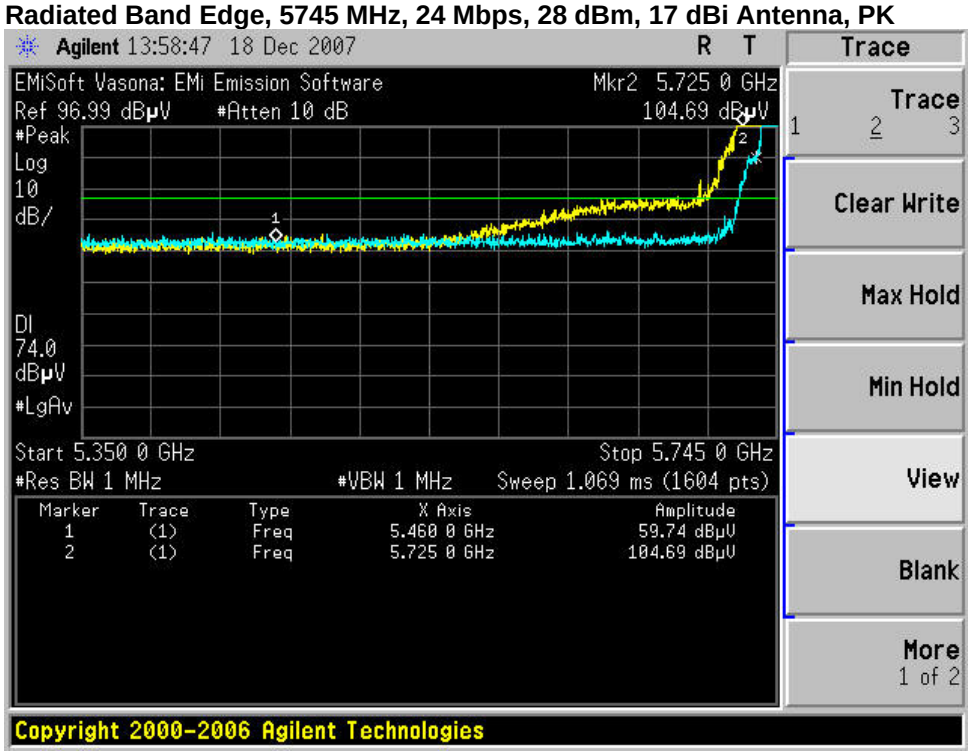
Radiated Band Edge, 5745 MHz, 24 Mbps, 28 dBm, 8 dBi Antenna, PK



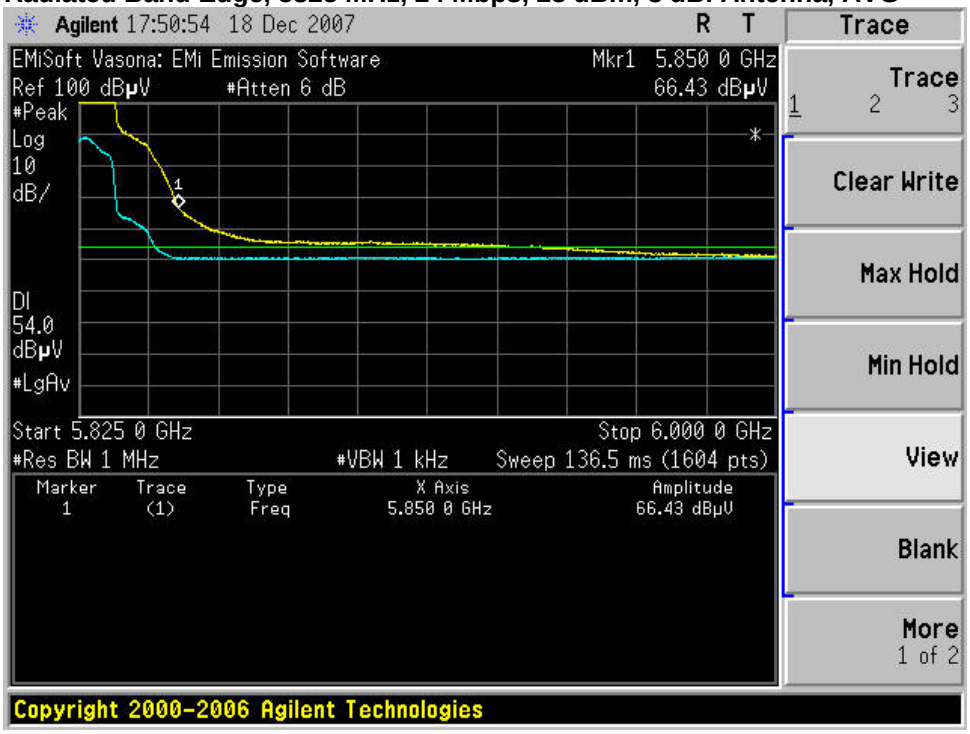
Radiated Band Edge, 5745 MHz, 24 Mbps, 28 dBm, 17 dBi Antenna, AVG



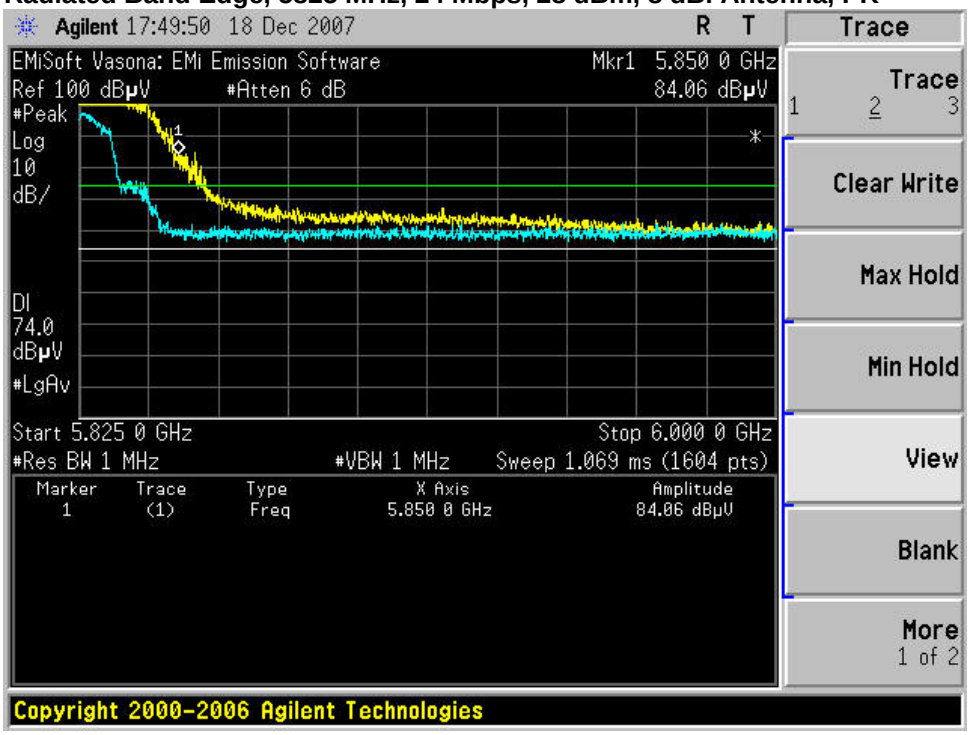
Radiated Band Edge, 5745 MHz, 24 Mbps, 28 dBm, 17 dBi Antenna, PK



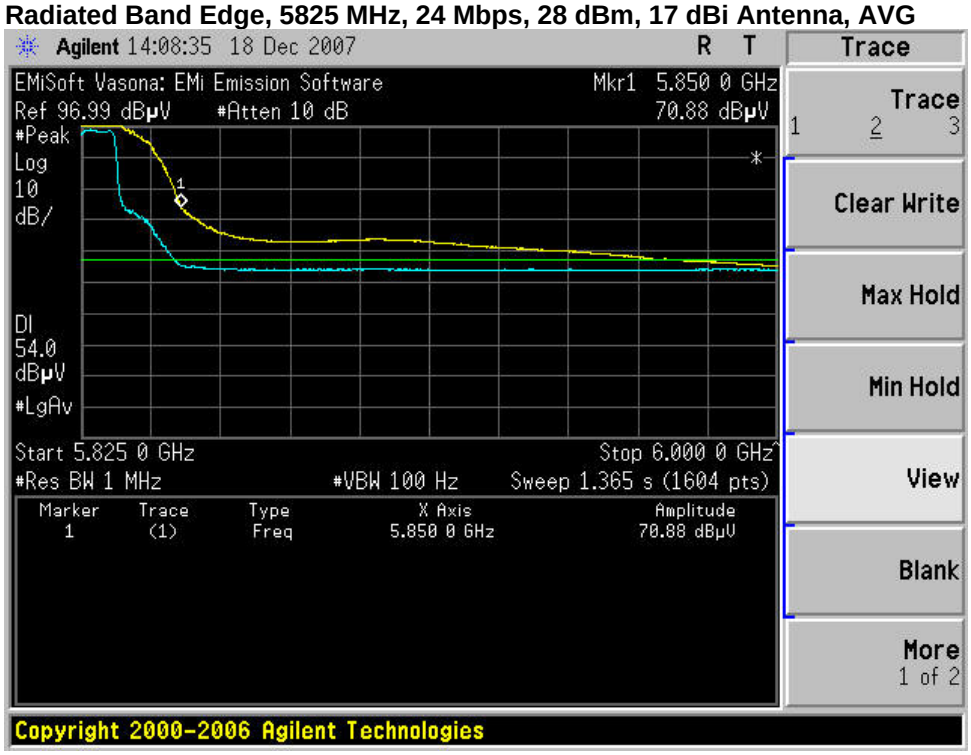
Radiated Band Edge, 5825 MHz, 24 Mbps, 28 dBm, 8 dBi Antenna, AVG



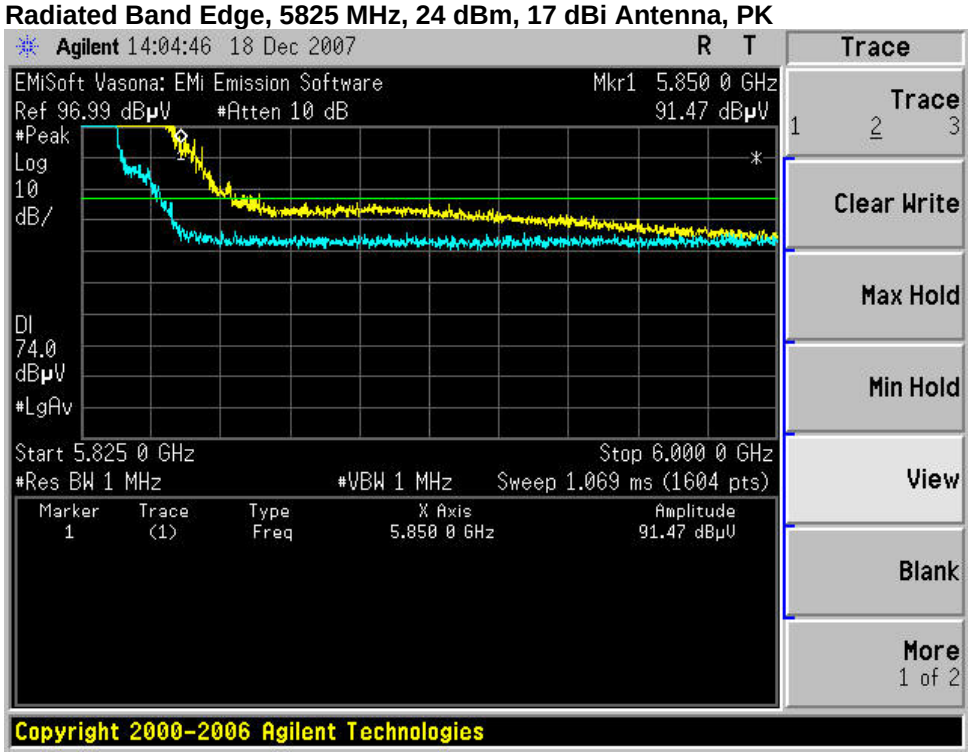
Radiated Band Edge, 5825 MHz, 24 Mbps, 28 dBm, 8 dBi Antenna, PK



Radiated Band Edge, 5825 MHz, 24 Mbps, 28 dBm, 17 dBi Antenna, AVG



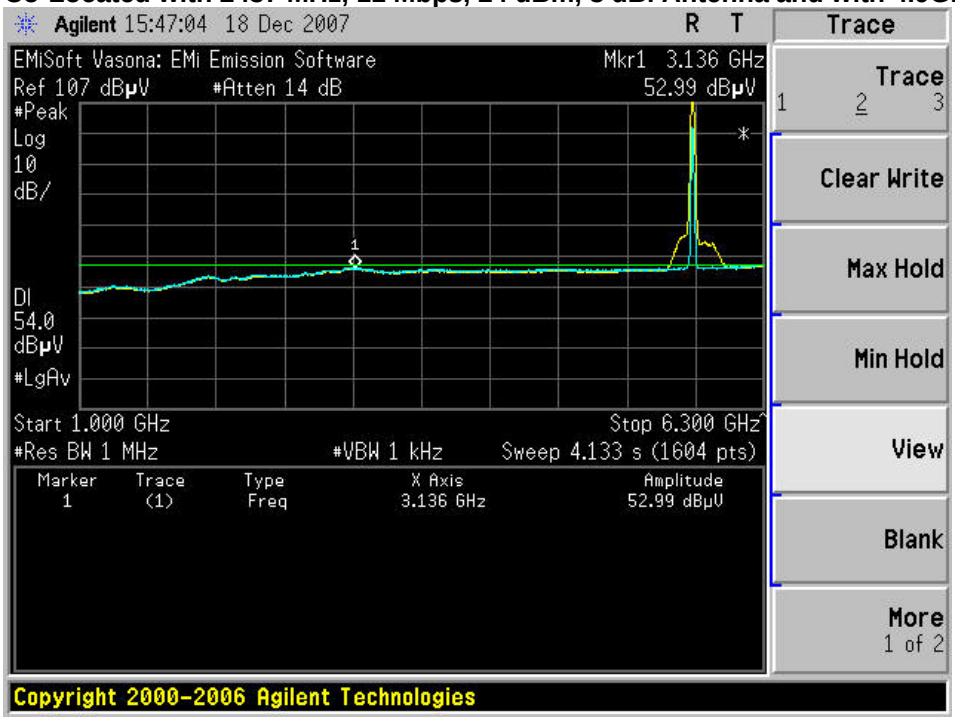
Radiated Band Edge, 5825 MHz, 24 dBm, 17 dBi Antenna, PK

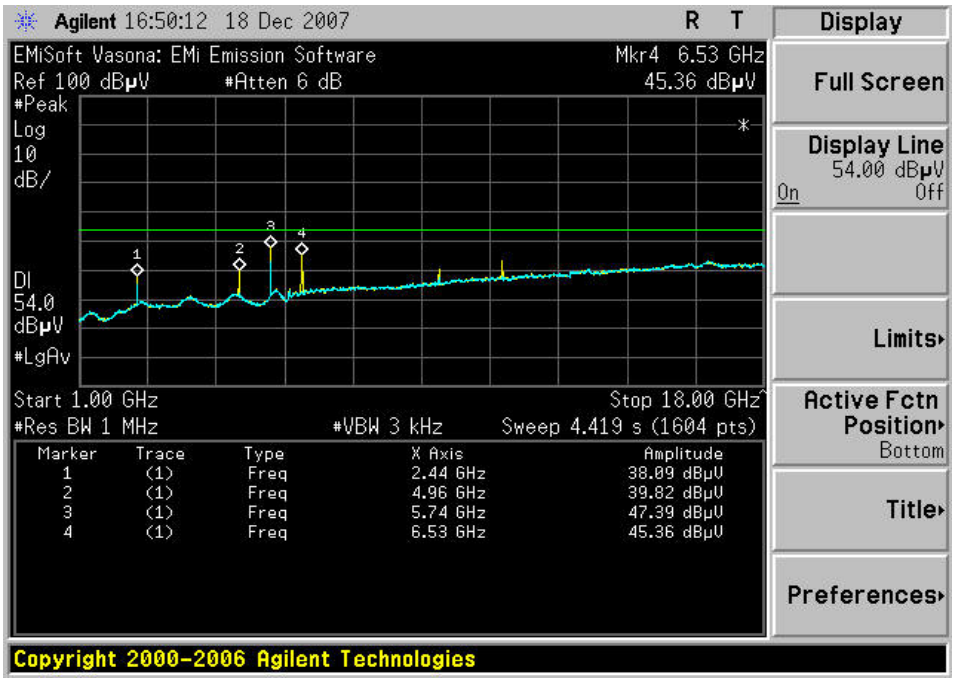


Radiated Spurs and Harmonics with All Antennas

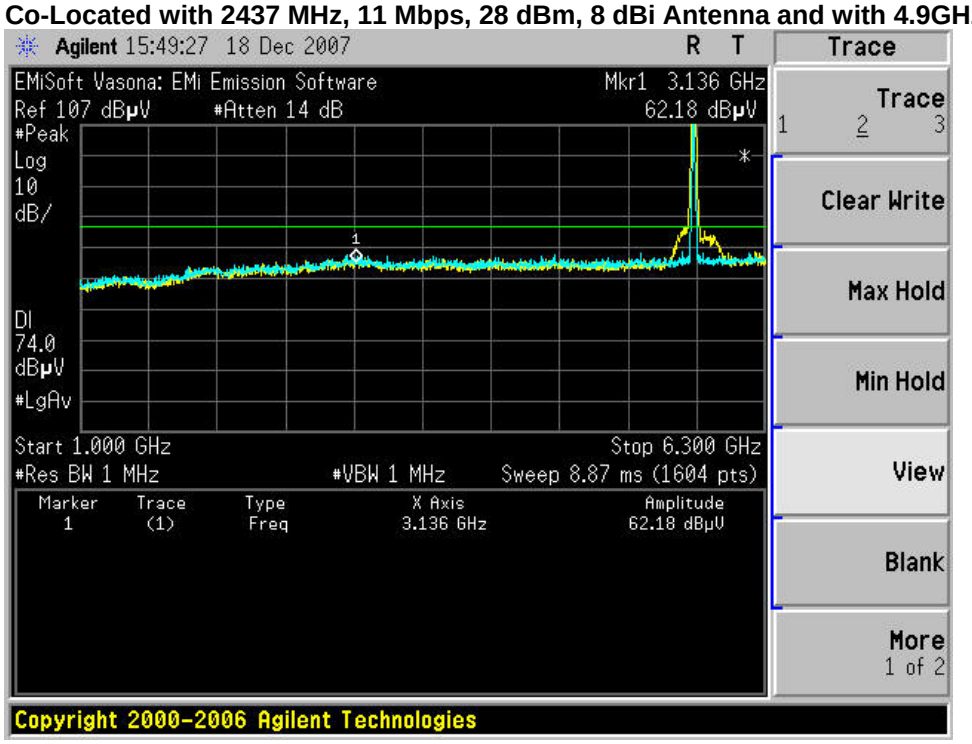
There were no measurable emissions above 18GHz for any of the channel/antenna combinations. The data is a worst case representation of all configurations.

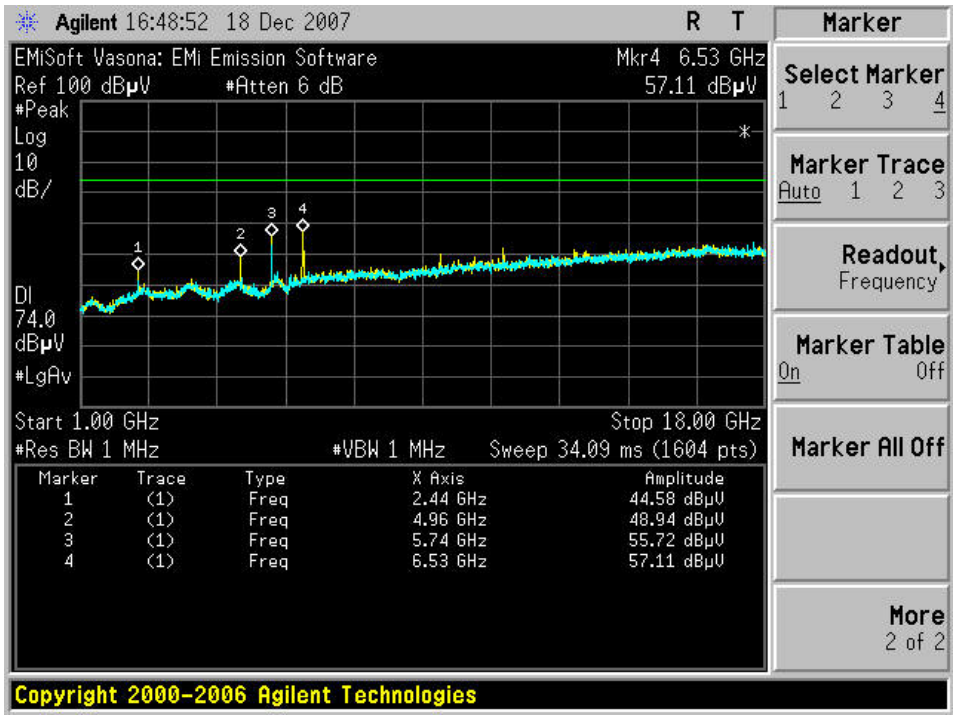
Radiated Spurious Emissions, 5745 MHz, 24 Mbps, 28 dBm, 17 dBi Antenna
Co-Located with 2437 MHz, 11 Mbps, 24 dBm, 8 dBi Antenna and with 4.9GHz, AVG



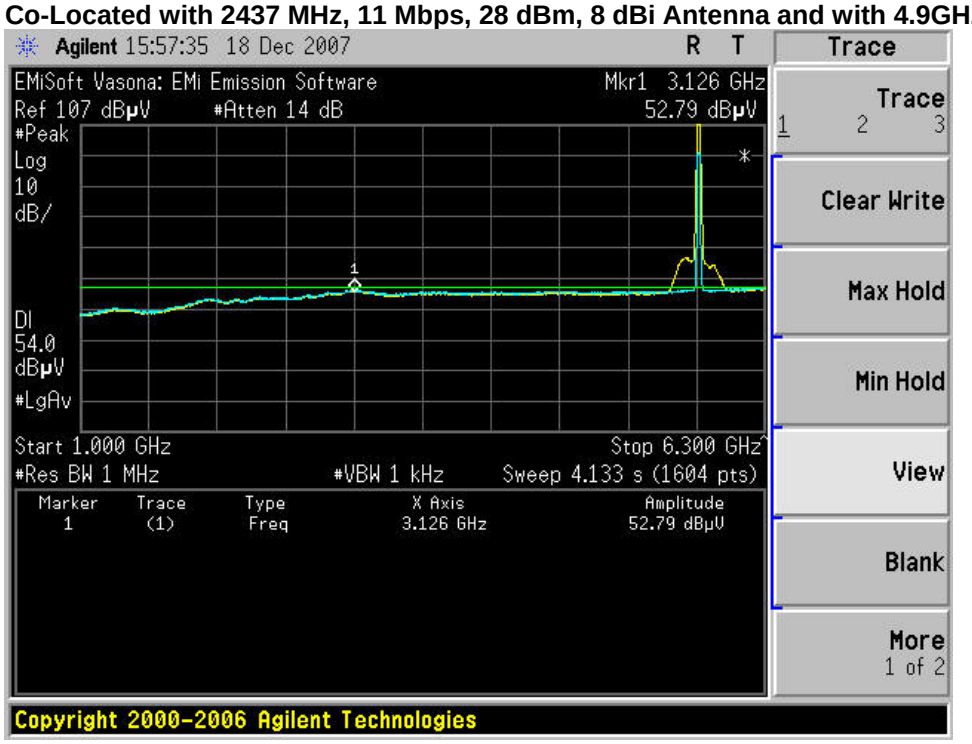


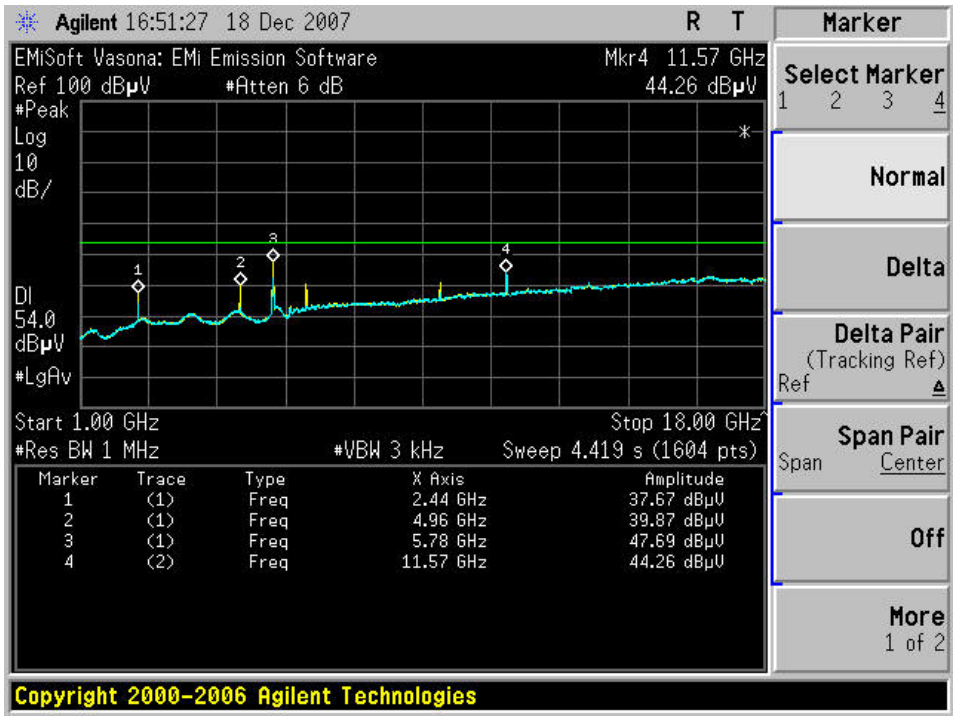
Radiated Spurious Emissions, 5745 MHz, 24 Mbps, 28 dBm, 17 dBi Antenna
Co-Located with 2437 MHz, 11 Mbps, 28 dBm, 8 dBi Antenna and with 4.9GHz, PK



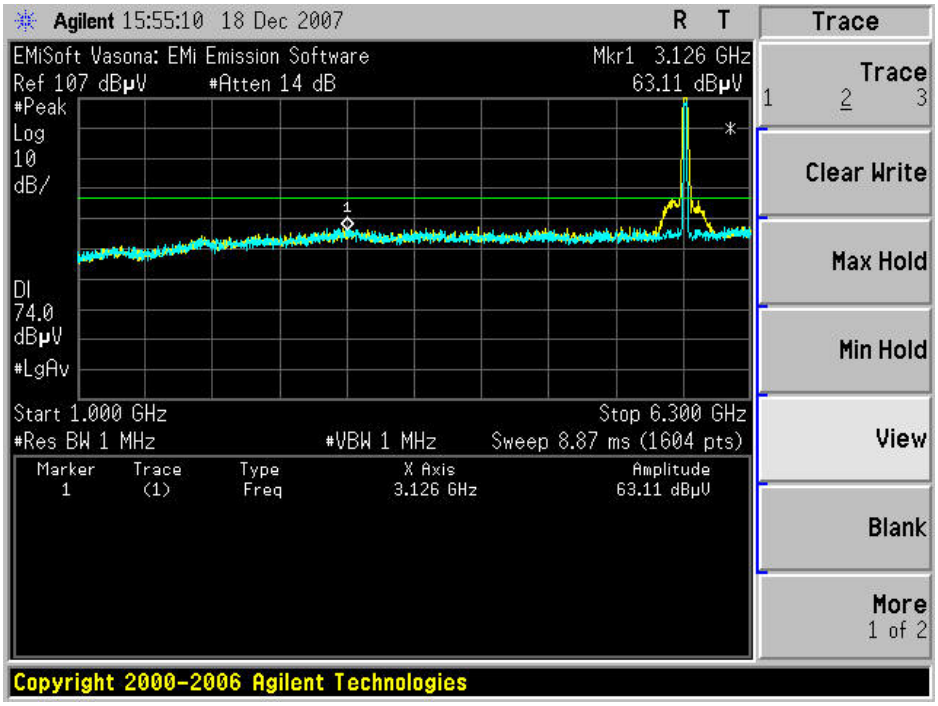


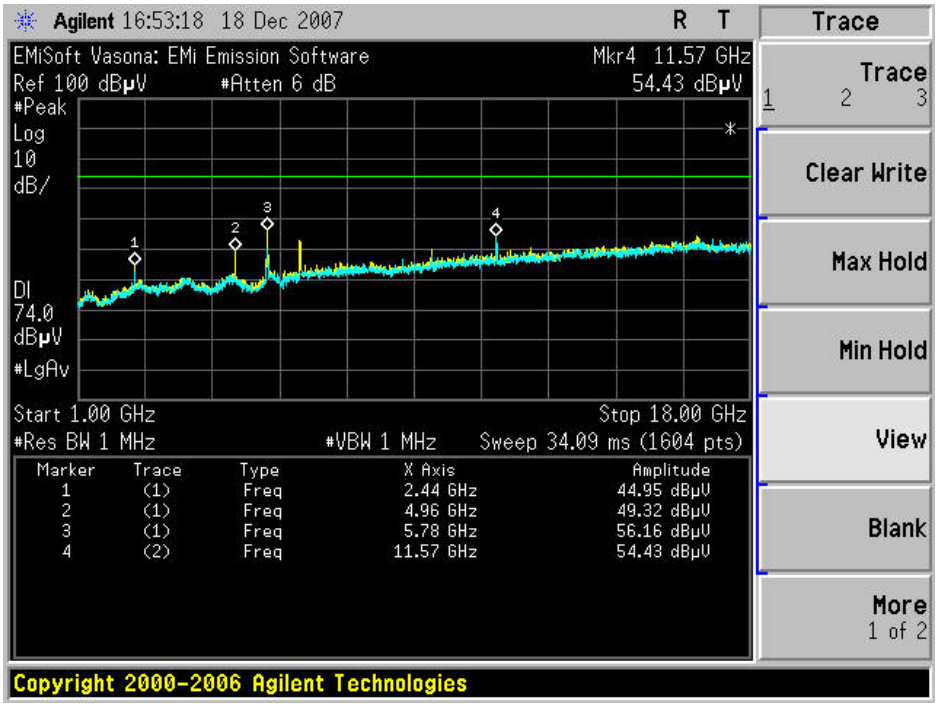
Radiated Spurious Emissions, 5785 MHz, 24Mbps, 28 dBm, 17 dBi Antenna
Co-Located with 2437 MHz, 11 Mbps, 28 dBm, 8 dBi Antenna and with 4.9GHz, AVG





Radiated Spurious Emissions, 5785 MHz, 24 Mbps, 28 dBm, 17 dBi Antenna
Co-Located with 2437 MHz, 11 Mbps, 28 dBm, 8 dBi Antenna and with 4.9GHz, PK





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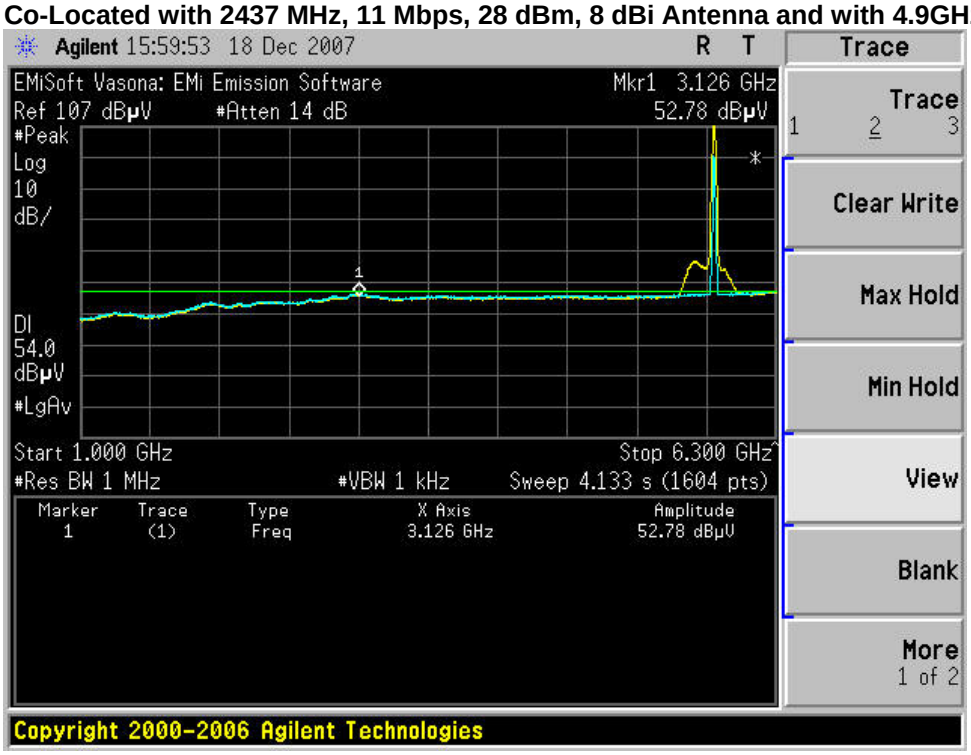
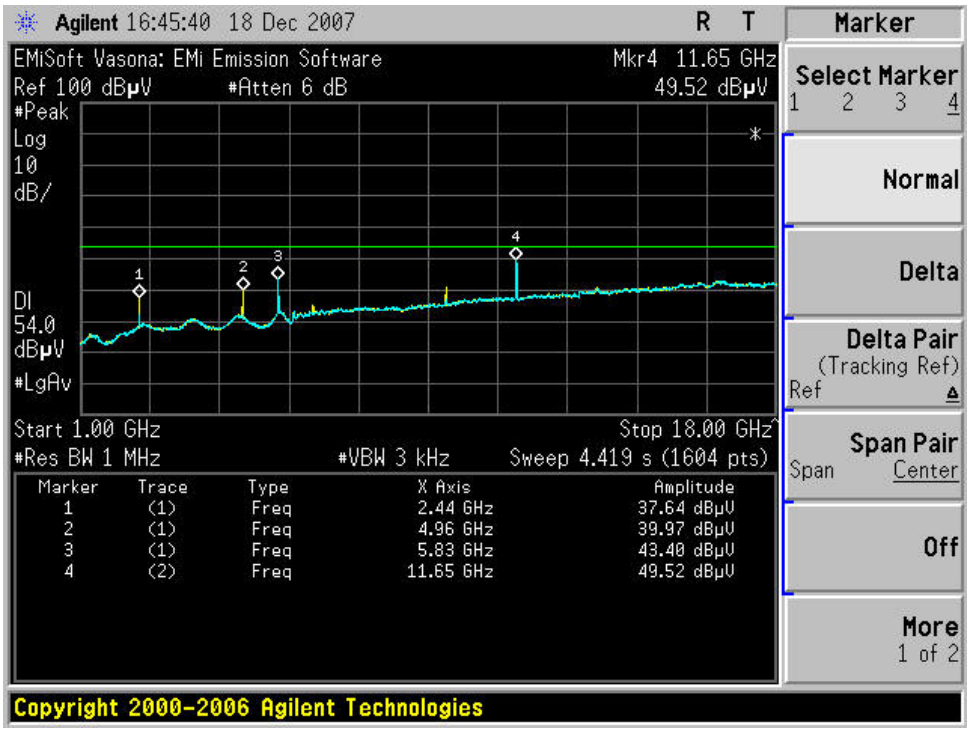
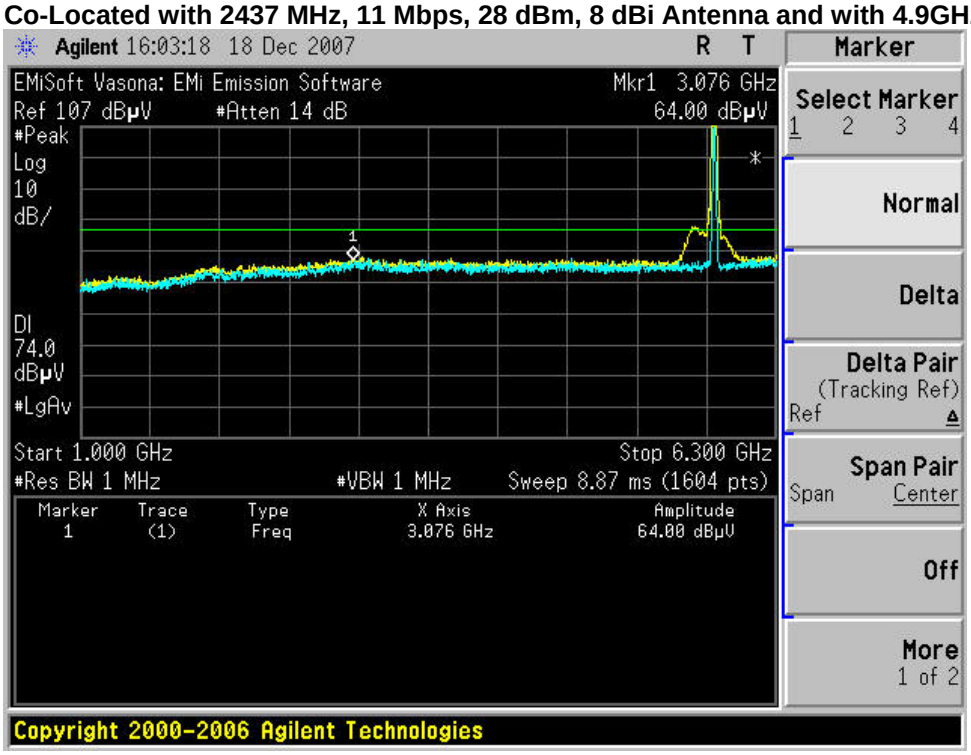
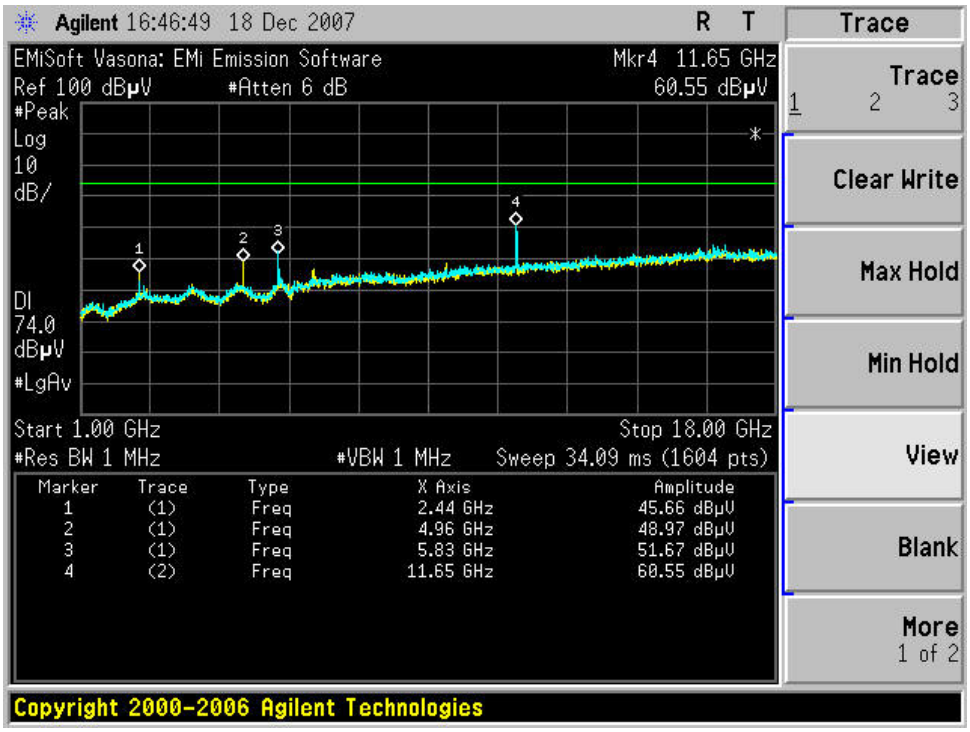
Co-Located with 2437 MHz, 11 Mbps, 28 dBm, 8 dBi Antenna and with 4.9GHz, AVG



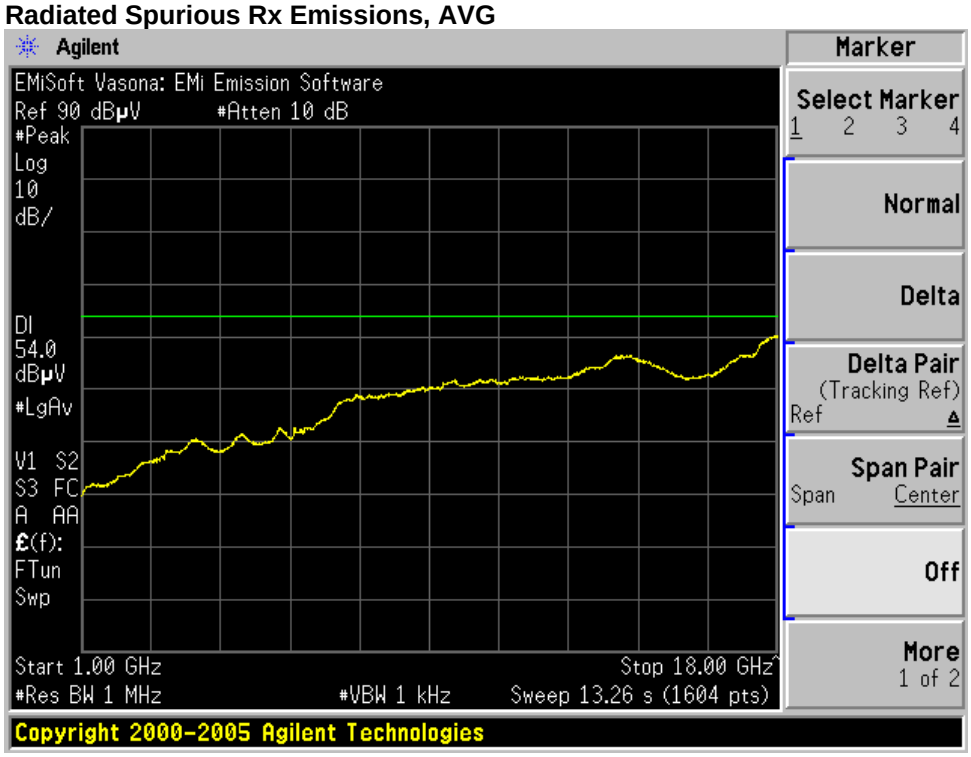


Radiated Spurious Emissions, 5825 MHz, 24 Mbps, 28 dBm, 17 dBi Antenna
Co-Located with 2437 MHz, 11 Mbps, 28 dBm, 8 dBi Antenna and with 4.9GHz, PK

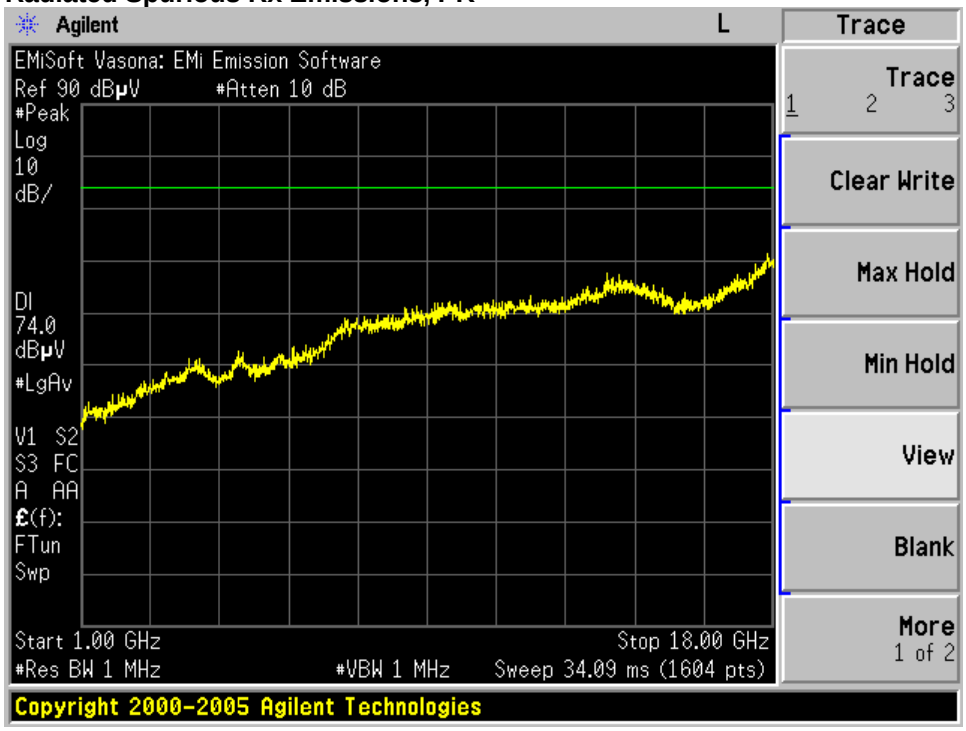




Radiated Spurious Rx Emissions, AVG



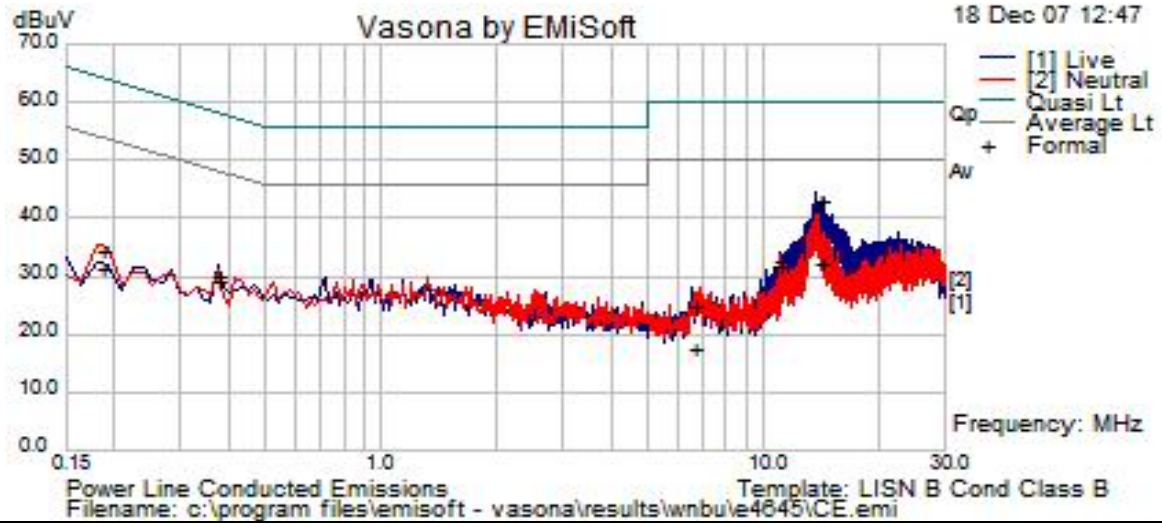
Radiated Spurious Rx Emissions, PK



Powerline Conducted emissions

Basic Standard	**Applied to**	**Class**	**Freq Range**	**Test Details / Comments**
CFR47 Part 15.207 (LP0002 2.2.3, RSS210)	AC Power Line	B	0.150MHz - 30MHz	
Operating Mode	**Mode :** 1, Continuous			
Power Input	110, 60Hz (+/-20%)			
Overall Result	Pass			
Comments	No further comments			
Deviation	There were no deviations from the specification			

Subtest Date: 18-Dec-2007	
Engineer	James Nicholson
Lab Information	Building P, 10m Anechoic
Subtest Results	
Line Under Test	Power Input
Transducer	LISN
Subtest Result	Pass
Highest Frequency	30.0
Lowest Frequency	0.15
Comments on the above Test Results	No further comments



Title: N/A

Test Results Table

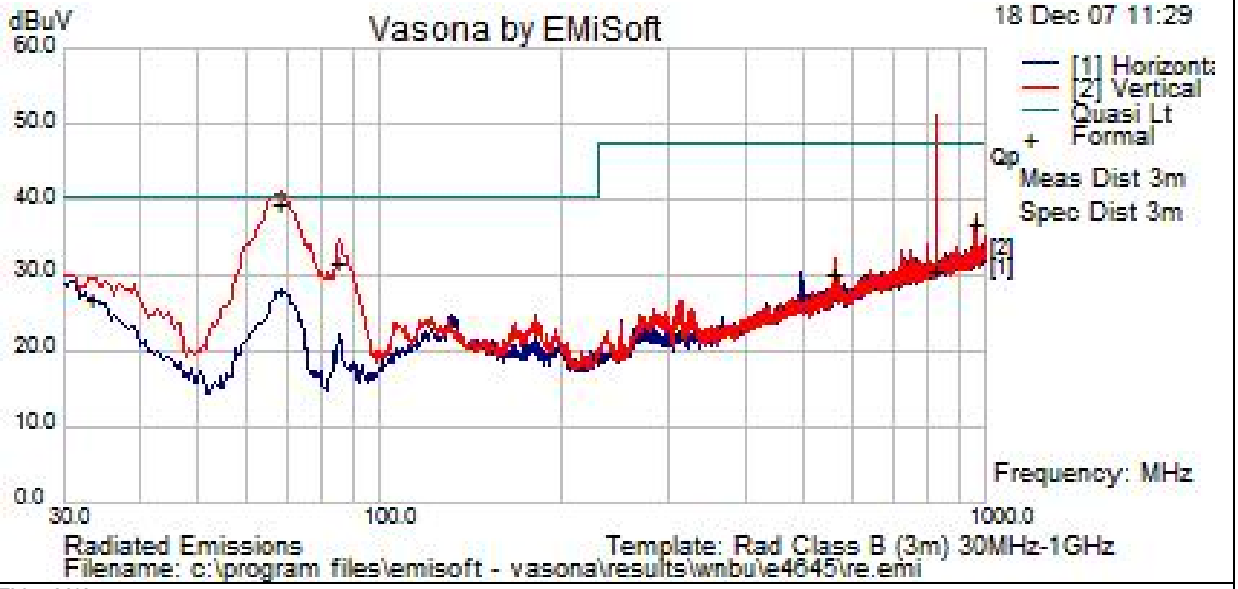
Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
0.190706	8.55	20.39	0.25	29.19	Av	N	54.0	-24.8	Pass	
0.190706	11.56	20.39	0.25	32.19	Qp	N	64.0	-31.8	Pass	
0.382342	7.02	20.07	0.16	27.25	Av	L	48.2	-21.0	Pass	
0.382342	7.87	20.07	0.16	28.1	Qp	L	58.2	-30.1	Pass	
6.731672	2.54	20.1	0.18	22.82	Qp	N	60.0	-37.2	Pass	
6.731672	-4.76	20.1	0.18	15.52	Av	N	50.0	-34.5	Pass	
11.139486	9.27	20.16	0.19	29.62	Av	N	50.0	-20.4	Pass	
11.139486	10.35	20.16	0.19	30.7	Qp	N	60.0	-29.3	Pass	
14.327114	9.9	20.23	0.2	30.33	Av	L	50.0	-19.7	Pass	
14.327114	20.5	20.23	0.2	40.93	Qp	L	60.0	-19.1	Pass	
14.327434	20.39	20.23	0.2	40.82	Qp	L	60.0	-19.2	Pass	
14.327434	9.67	20.23	0.2	30.11	Av	L	50.0	-19.9	Pass	

Unintentional Radiated emissions

Subtest Date: 18-Dec-2007	
Engineer	James Nicholson
Lab Information	Building P, 10m Anechoic
Subtest Results	
Subtest Title	RE
Subtest Result	Pass
Highest Frequency	1000.0
Lowest Frequency	30.0
Comments on the above Test Results	No further comments

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Title: N/A

Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
33.487	6.4	0.45	18.21	25.05	Qp	V	100	106	40.5	-15.45	0	
68.271	29.35	0.64	7.83	37.81	Qp	V	120	88	40.5	-2.69	0	
85.413	21.97	0.72	7.23	29.93	Qp	V	162	126	40.5	-10.57	0	
563.993	8.13	1.87	18.58	28.58	Qp	V	136	350	47.5	-18.92	0	
830.246	4.66	2.29	21.7	28.66	Qp	V	114	187	47.5	-18.84	0	
962.683	9.51	2.46	23	34.98	Qp	V	218	360	47.5	-12.52	0	

Maximum Permissible Exposure (MPE) Calculations

15.247: ISM devices are subject to the radio frequency radiation exposure requirements specified in Sec. 1.1307(b), Sec. 2.1091 and Sec. 2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a ``general population/uncontrolled'' environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

Given

E=√(30*P*G)/d and S=E^2/3770

where

E=Field Strength in Volts/meter
P=Power in Watts
G=Numeric Antenna Gain
d=Distance in meters
S=Power Density in mW/cm^2

Combine equations and rearrange the terms to express the distance as a function of the remaining variables:

d=√((30*P*G)/(3770*S))

Changing to units of power in mW and distance in cm, using:

P(mW)=P(W)/1000 d(cm)=100*d(m)

yields

d=100*√((30*(P/1000)*G)/(3770*S))
d=0.282*√(P*G/S)

where

d=Distance in cm
P=Power in mW
G=Numerica Antenna Gain
S=Power Density in mW/cm^2

Substituting the logarithmic form of power and gain using:

P(mW)=10^(P(dBm)/10) G(numeric)=10^(G(dBi)/10)

yields

d=0.282*10^((P+G)/20)/√S Equation (1)

and

s=((0.282*10^((P+G)/20))/d)^2 Equation (2)

where

d=MPE distance in cm
P=Power in dBm
G=Antenna Gain in dBi
S=Power Density in mW/cm^2

Equation (1) and the measured peak power are used to calculate the MPE distance. Note that for mobile or fixed location transmitters such as an access point, the minimum separation distance is 20 cm even if the calculations indicate that the MPE distance may be less.

S=1mW/cm^2 maximum. Using the peak power levels and antenna gains recorded in the test report along with Equation 1 above, the MPE distances are calculated as follows.

Frequency (MHz)	Bit Rate (Mbps)	Power Density (mW/cm^2)	Peak Transmit Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)	Limit (cm)	Margin (cm)
5745	24	1	27.5	17	47.34	20	-27.34
5785	24	1	27.3	17	46.26	20	-26.26
5825	24	1	27.0	17	44.69	20	-24.69

MPE Calculations

To maintain compliance, installations will assure a separation distance of at least 50cm.

Using Equation 2, the MPE levels (s) at 20 cm are calculated as follows:

Frequency (MHz)	Bit Rate (Mbps)	MPE Distance (cm)	Peak Transmit Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Margin (mW/cm^2)
5745	24	20	27.5	17	5.60	1	-4.60
5785	24	20	27.3	17	5.35	1	-4.35
5825	24	20	27.0	17	4.99	1	-3.99

Appendix C: Abbreviation Key and Definitions

The following table defines abbreviations used within this test report.

Abbreviation	Description	Abbreviation	Description
EMC	Electro Magnetic Compatibility	°F	Degrees Fahrenheit
EMI	Electro Magnetic Interference	°C	Degrees Celsius
EUT	Equipment Under Test	Temp	Temperature
ITE	Information Technology Equipment	S/N	Serial Number
TAP	Test Assessment Schedule	Qty	Quantity
ESD	Electro Static Discharge	emf	Electromotive force
EFT	Electric Fast Transient	RMS	Root mean square
EDCS	Engineering Document Control System	Qp	Quasi Peak
Config	Configuration	Av	Average
CIS#	Cisco Number (unique identification number for Cisco test equipment)	Pk	Peak
Cal	Calibration	kHz	Kilohertz ($1x10^3$)
EN	European Norm	MHz	Megahertz ($1x10^6$)
IEC	International Electro technical Commission	GHz	Gigahertz ($1x10^9$)
CISPR	International Special Committee on Radio Interference	H	Horizontal
CDN	Coupling/Decoupling Network	V	Vertical
LISN	Line Impedance Stabilization Network	dB	decibel
PE	Protective Earth	V	Volt
GND	Ground	kV	Kilovolt ($1x10^3$)
L1	Line 1	µV	Microvolt ($1x10^{-6}$)
L2	Line2	A	Amp
L3	Line 3	µA	Micro Amp ($1x10^{-6}$)
DC	Direct Current	mS	Milli Second ($1x10^{-3}$)
RAW	Uncorrected measurement value, as indicated by the measuring device	µS	Micro Second ($1x10^{-6}$)
RF	Radio Frequency	µS	Micro Second ($1x10^{-6}$)
SLCE	Signal Line Conducted Emissions	m	Meter
Meas dist	Measurement distance	Spec dist	Specification distance
N/A or NA	Not Applicable	SL	Signal Line (or Telecom Line)
P	Power Line	L	Live Line
N	Neutral Line	R	Return
S	Supply	AC	Alternating Current

Appendix E: Test Equipment/Software Used to perform the test

Equipment #	Manufacturer/Model	Description	Last Cal	Next due
CIS005691	Miteq/NSP1800-25-S1	Broadband Preamplifier (1-18GHz)	9-Oct-07	9-Oct-08
CIS008195	TTE/H613-150K-50-21378	Hi Pass Filter - 150KHz cutoff	31-Dec-07	31-Dec-08
CIS008370	Andrew/F4A-PNMNM	49 ft Heliax Cable	16-Mar-07	16-Mar-08
CIS008588	Fischer/FCC-RFM2F-520R	LISN AC Adaptor - Std 120V outlet	16-Mar-07	16-Mar-08
CIS020975	Micro-Coax/UFB311A-0-1344-520520	RF Coaxial Cable, to 18GHz, 134.4 in	16-Mar-07	16-Mar-08
CIS030559	Micro-Coax/UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in	16-Mar-07	16-Mar-08
CIS030652	Sunol Sciences/JB1	Combination Antenna, 30MHz-2GHz	16-Jul-07	16-Jul-08
CIS034304	Micro-Tronics/BRM50702-02	Notch Filter, SB:2.4-2.5GHz, to 18GHz	16-Jul-07	16-Jul-08
CIS034974	Midwest Microwave/ATT-0640-20-29M-02	Attenuator, 20dB, DC-40GHz	14-May-07	14-May-08
CIS035040	Micro-Tronics/HPM50112-02	High pass Filter, 6.4-18GHz	16-Jul-07	16-Jul-08
CIS035098	Micro-Coax/UFA147A-0-0180-110200	RF Coaxial Cable, to 40 GHz, 18 in	7-Mar-07	7-Mar-08
CIS037228	Micro-Tronics/BRC50705	Notch Filter, SB:5.725-5.875GHz, to 12 GHz	7-Mar-07	7-Mar-08
CIS040503	Agilent/E4440A	Precision Spectrum Analyzer	18-Mar-07	18-Mar-08
CIS040523	Rohde & Schwarz/ESCI	EMI Test Receiver	1-Jun-07	1-Jun-08
CIS040548	Megaphase/F230-NKNK-320	RF N Type cable 9KHz to 18GHz	13-Jul-07	13-Jul-08
CIS041202	ETS-Lindgren/3117	Double Ridged Horn Antenna	3-Jul-07	3-Jul-08
COM000590	Agilent	Spectrum Analyzer	7-Feb-07	2-Feb-08
COM000579	Megaphase	RF Coaxial Cable, to 26GHz, 36in	27-Dec-07	27-Dec-08
COM000601	Agilent	EPM-P Series Power Meter	23-Feb-07	23-Feb-08
COM000602	Agilent	Peak and Average Power Sensor	23-Feb-07	23-Feb-08
COM000599	Weinschel Corp.	20dB Attenuator	26-Dec-07	26-Dec-08