

FCC CFR47 PART 15 SUBPART C CERTIFICATION TEST REPORT

FOR

Gen 3 2X3 CARDBUS

MODEL NUMBER: AGN3023PC-01

FCC ID: SA3-AGN3023PC0100

REPORT NUMBER: 05U3626-1B

ISSUE DATE: OCTOBER 17, 2005

Prepared for AIRGO NETWORKS, INC. 900 ARASTRADERO ROAD PALO ALTO, CA, 94304, USA

Prepared by COMPLIANCE CERTIFICATION SERVICES 561F MONTEREY ROAD, MORGAN HILL, CA 95037, USA TEL: (408) 463-0885 FAX: (408) 463-0888



Revision History

Rev.	Issue Date	Revisions	Revised By
А	10/3/05	Initial Issue	MH
В	10/17/05	Added channel bonding test result under Section 7.2	JC

Page 2 of 197

TABLE OF CONTENTS

1.	AT	TESTATION OF TEST RESULTS	4
2.	TE	ST METHODOLOGY	5
3.	FA	CILITIES AND ACCREDITATION	5
4.	CA	LIBRATION AND UNCERTAINTY	5
4	.1.	MEASURING INSTRUMENT CALIBRATION	5
4	.2.	MEASUREMENT UNCERTAINTY	5
5.	EQ	UIPMENT UNDER TEST	6
5	.1.	DESCRIPTION OF EUT	6
5	.2.	MAXIMUM OUTPUT POWER	6
5	.3.	DESCRIPTION OF AVAILABLE ANTENNAS	6
5	.4.	SOFTWARE AND DRIVERS	6
5	.5.	WORST-CASE CONFIGURATION AND MODE	6
5	.6.	DESCRIPTION OF TEST SETUP	7
6.	TE	ST AND MEASUREMENT EQUIPMENT	9
7.	LIN	MITS AND RESULTS	10
7	.1.	6 dB BANDWIDTH	.10
7	.2.	99% BANDWIDTH	. 33
7	.3.	PEAK OUTPUT POWER	. 56
7	.4.	MAXIMUM PERMISSIBLE EXPOSURE	. 78
7	.5.	AVERAGE POWER	. 81
7	.6.	PEAK POWER SPECTRAL DENSITY	. 83
7	. 7.	CONDUCTED SPURIOUS EMISSIONS	105
7	.8.	RADIATED EMISSIONS	146
7	.9.	POWERLINE CONDUCTED EMISSIONS	189
8.	SE	ГИР РНОТОЅ	193

Page 3 of 197

1. ATTESTATION OF TEST RESULTS

FCC PART 15 SU	JBPART C	NO NON-COMPLIANCE NOTED
STANDA	RD	TEST RESULTS
	APPLICA	BLE STANDARDS
DATE TESTED:	AUGUST 15-C	CTOBER 14, 2005
		CTODED 14 2005
SERIAL NUMBER:	605	
MODEL:	AGN3023PC-0	1
EUT DESCRIPTION:	Gen 3 2x3 Card	bus
COMPANY NAME:		'ORKS, INC. ADERO ROAD CA, 94304, USA

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

Tested By:

DAVID GARCIA EMC SUPERVISOR COMPLIANCE CERTIFICATION SERVICES

JOSEPH CHUNG EMC ENGINEER COMPLIANCE CERTIFICATION SERVICES

Page 4 of 197

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <u>http://www.ccsemc.com</u>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

Page 5 of 197

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11b/g 2x3 MIMO Cardbus Card

The radio module is manufactured by Airgo.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range	Mode	Output Power	Output Power
(MHz)		(dBm)	(mW)
2412 - 2462	802.11b	23.85	242.66
2412 - 2462	802.11g	25.33	341.19
2412 - 2462	802.11g CB	21.21	132.13
2422 - 2452	802.11g SIMO CB	20.93	123.88

2400 to 2483.5 MHz Authorized Band

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two transmit/receive antennas and one additional receive only antenna for diversity, each with a maximum gain of 2.1 dBi.

5.4. SOFTWARE AND DRIVERS

The test utility software used during testing was PTT GUI 293.

The EUT driver software installed in the host support equipment during testing was 2.0.0.293.

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at 2437 MHz.

Page 6 of 197

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST							
Description	Description Manufacturer Model Serial Number FCC ID						
Laptop	SONY	PCG-991L	4-658-376-11	DOC			
AC Adapter	SONY	PCGA-AC19V3	0204 A 000156	N/A			

I/O CABLES

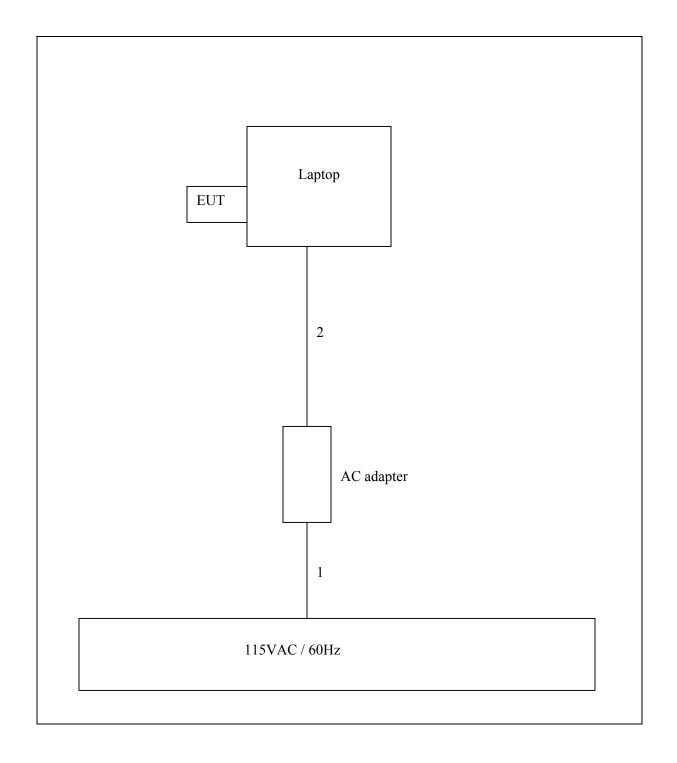
	I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks	
1	AC	1	AC	Unshielded	0.5 m		
2	DC	1	DC	Unshielded	1.5 m		

TEST SETUP

The EUT is installed in a host laptop computer during the tests. Test software exercised the radio card.

Page 7 of 197

SETUP DIAGRAM FOR TESTS



Page 8 of 197

6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

	TEST EQUIPMENT LIST						
Description	Manufacturer	Model	Serial Number	Cal Due			
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	3/29/2006			
RF Filter Section	HP	85420E	3705A00256	3/29/2006			
Antenna, Bilog 30MHz ~ 2Ghz	Sunol Sciences	JB1	A121003	3/3/2006			
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent	E4446A	MY43360112	3/28/2006			
Antenna, Horn 1 ~ 18 GHz	ETS	3117	29301	4/22/2006			
Preamplifier, 1 ~ 26 GHz	Miteq	NSP2600-SP	924341	12/23/2005			
Peak / Average Power Sensor	Agilent	E9327A	US40440755	2/10/2006			
Peak Power Meter	Agilent	E4416A	GB41291160	2/9/2006			
ESA-E Series Spectrum Analyzer	Agilent	E4407B	MY44210488	4/20/2006			
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/2006			
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	8/30/2006			
Site A Line Stabilizer/Conditioner	Tripplite	LC-1800a	A005181	CNR			
EMI Test Receiver	R & S	ESHS 20	827129/006	6/3/2006			
4.0 GHz High Pass Filter	Micro Tronics	HPM13351	3	CNR			
1.5 GHz High Pass Filter	Micro Tronics	HPM13193	2	CNR			

Page 9 of 197

7. LIMITS AND RESULTS

7.1. 6 dB BANDWIDTH

LIMIT

§15.247 (a) (2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

Page 10 of 197

RESULTS

No non-compliance noted:

802.11b Mode, chain 0

Channel	Frequency	6 dB Bandwidth	Minimum Limit	Margin
	(MHz)	(kHz)	(kHz)	(kHz)
Low	2412	10580	500	10080
Middle	2437	12080	500	11580
High	2462	10080	500	9580

802.11g Mode, chain 0

Channel	Frequency	6 dB Bandwidth	Minimum Limit	Margin
	(MHz)	(kHz)	(kHz)	(kHz)
Low	2412	16000	500	15500
Middle	2437	16000	500	15500
High	2462	15670	500	15170

802.11b Mode, chain 1

Channel	Frequency	6 dB Bandwidth	Minimum Limit	Margin
	(MHz)	(kHz)	(kHz)	(kHz)
Low	2412	10250	500	9750
Middle	2437	10250	500	9750
High	2462	10250	500	9750

802.11g Mode, chain 1

Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Low	2412	15670	500	15170
Middle	2437	16080	500	15580
High	2462	15920	500	15420

Page 11 of 197

802.11g CHANNEL BOND Mode, Chain 0

Channel	Frequency	6 dB Bandwidth	Minimum Limit	Margin
	(MHz)	(kHz)	(kHz)	(kHz)
Low	2412	14333	500	13833
High	2462	14333	500	13833

802.11g Mode SIMO CHANNEL BOND Mode, Chain 0

Channel	Frequency	6 dB Bandwidth	Minimum Limit	Margin
	(MHz)	(kHz)	(kHz)	(kHz)
Low	2422	30333	500	29833
High	2452	30333	500	29833

802.11g CHANNEL BOND Mode, Chain 1

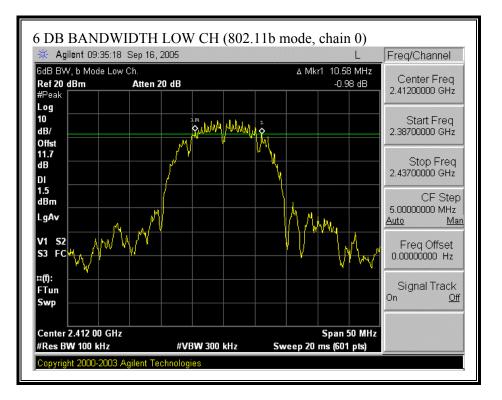
Channel	Frequency	6 dB Bandwidth	Minimum Limit	Margin
	(MHz)	(kHz)	(kHz)	(kHz)
Low	2412	15167	500	14667
High	2462	15333	500	14833

802.11g SIMO CHANNEL BOND Mode, Chain 1

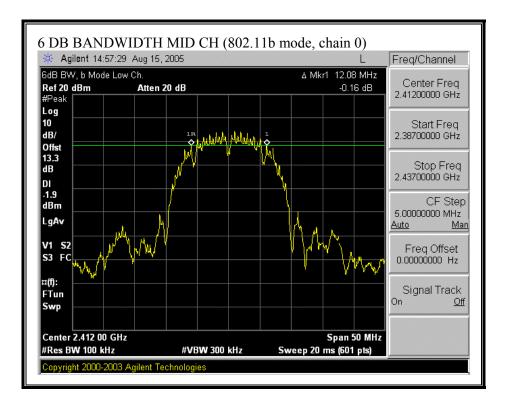
Channel	Frequency	6 dB Bandwidth	Minimum Limit	Margin
	(MHz)	(kHz)	(kHz)	(kHz)
Low	2422	30333	500	29833
High	2452	30333	500	29833

Page 12 of 197

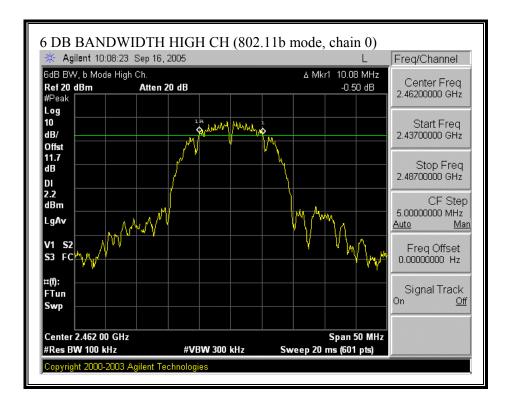
6 DB BANDWIDTH (802.11b MODE, CHAIN 0)



Page 13 of 197

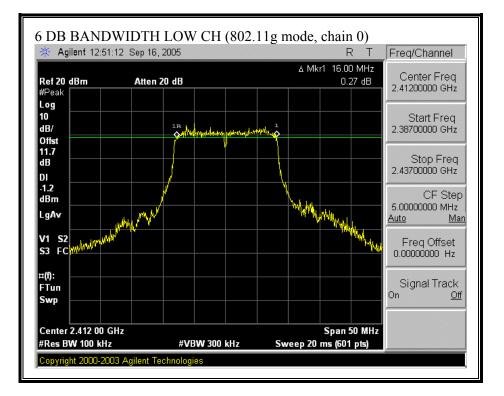


Page 14 of 197

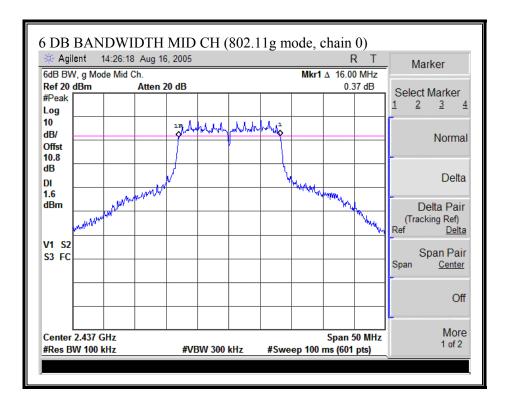


Page 15 of 197

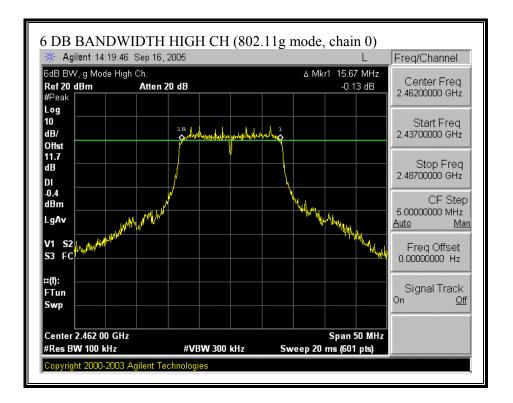
6 DB BANDWIDTH (802.11g MODE, CHAIN 0)



Page 16 of 197

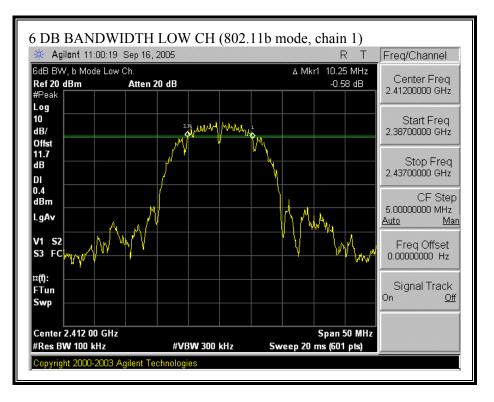


Page 17 of 197

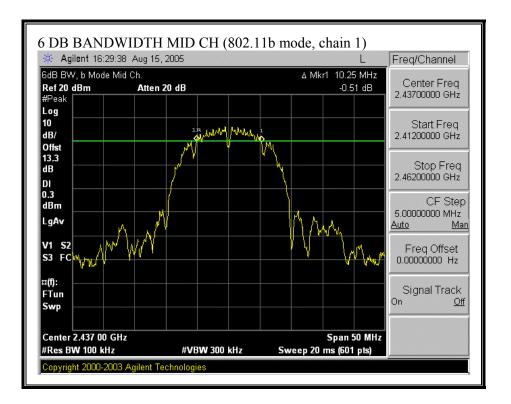


Page 18 of 197

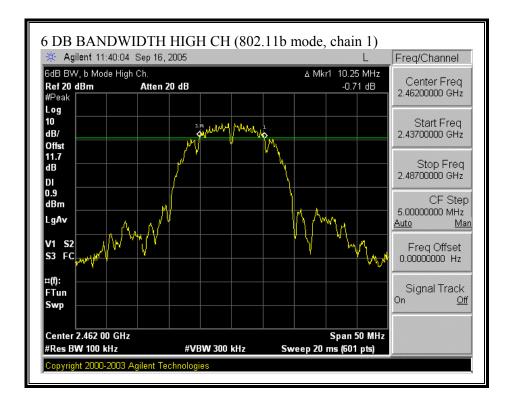
6 DB BANDWIDTH (802.11b MODE, CHAIN 1)



Page 19 of 197

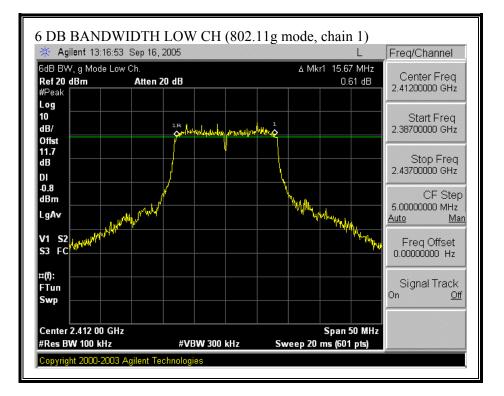


Page 20 of 197

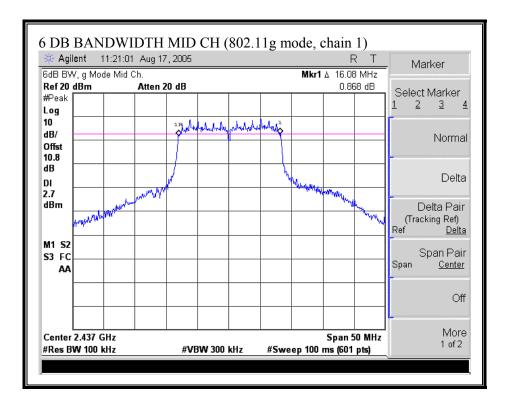


Page 21 of 197

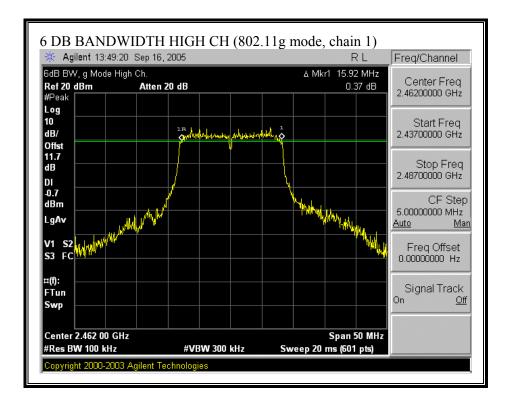
6 DB BANDWIDTH (802.11g MODE, CHAIN 1)



Page 22 of 197

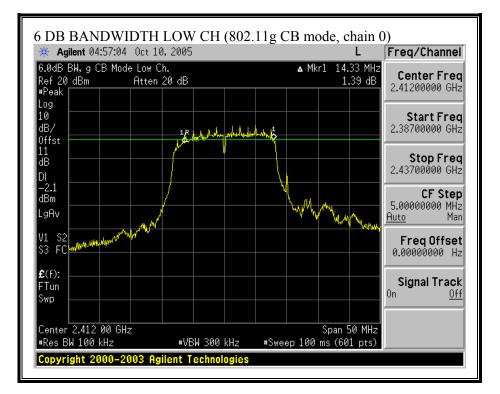


Page 23 of 197

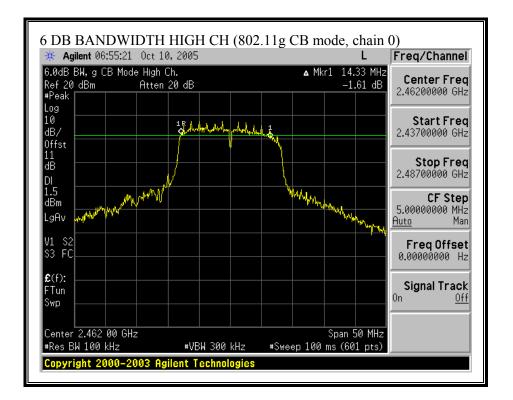


Page 24 of 197

6 DB BANDWIDTH (802.11g CHANNEL BONDING MODE, CHAIN 0)

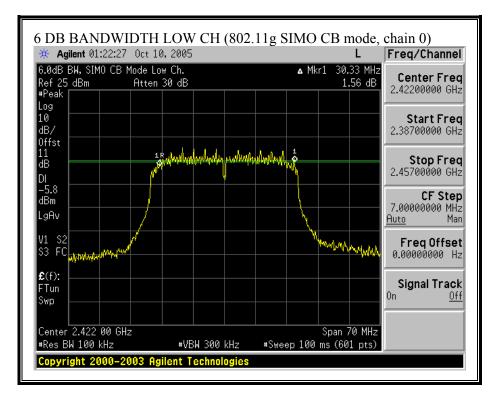


Page 25 of 197

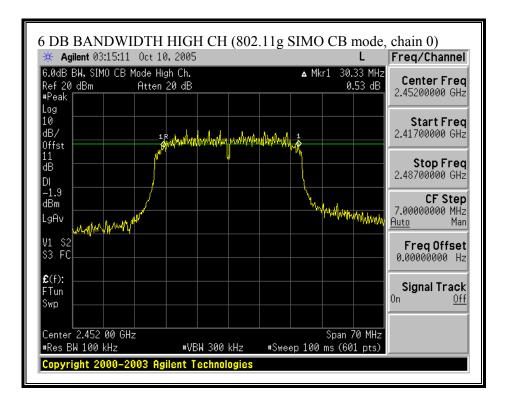


Page 26 of 197

6 DB BANDWIDTH (802.11g SIMO CHANNEL BONDING MODE, CHAIN 0)

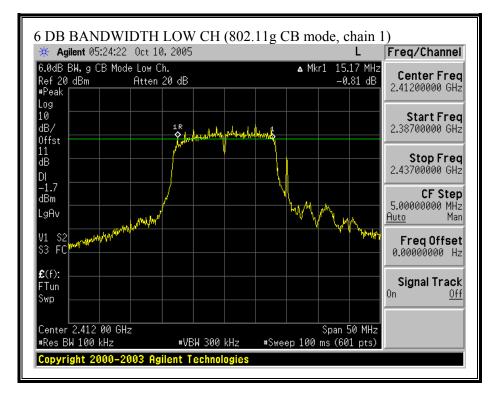


Page 27 of 197

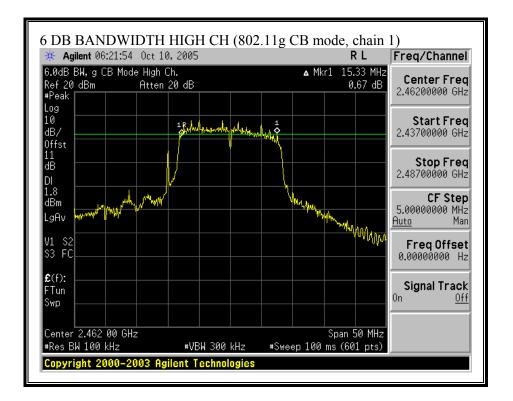


Page 28 of 197

6 DB BANDWIDTH (802.11g CHANNEL BONDING MODE, CHAIN 1)

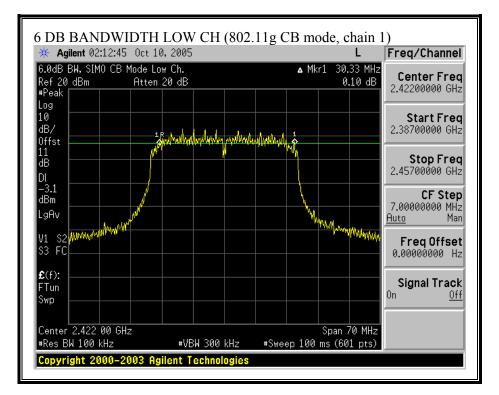


Page 29 of 197

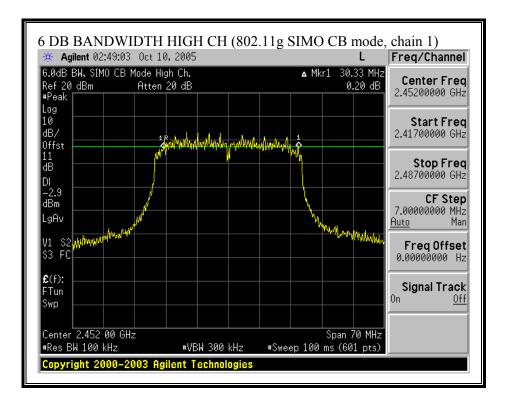


Page 30 of 197

6 DB BANDWIDTH (802.11g SIMO CHANNEL BONDING MODE, CHAIN 1)



Page 31 of 197



Page 32 of 197

7.2. 99% **BANDWIDTH**

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

Page 33 of 197

RESULTS

No non-compliance noted:

802.11b Mode, Chain 0

Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	2412	15.044
Middle	2437	15.036
High	2462	15.064

802.11g Mode, Chain 0

Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	2412	16.356
Middle	2437	16.398
High	2462	16.309

802.11b Mode, Chain 1

Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	2412	15.093
Middle	2437	15.056
High	2462	15.048

802.11g Mode, Chain 1

Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	2412	16.334
Middle	2437	16.345
High	2462	16.334

Page 34 of 197

802.11g CHANNEL BOND Mode, Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.136
High	2462	16.194

802.11g SIMO CHANNEL BOND Mode, Chain 0

Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	2422	31.996
High	2452	32.091

802.11g CHANNEL BOND Mode, Chain 1

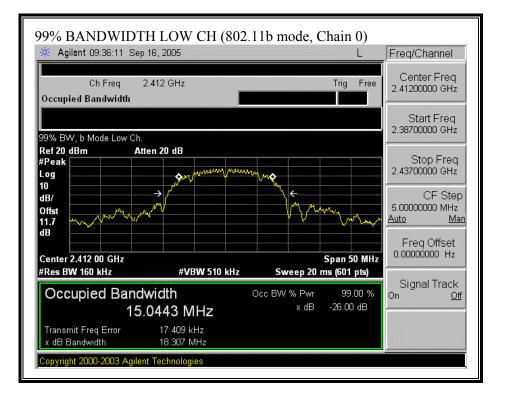
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	2412	16.157
High	2462	16.234

802.11g SIMO CHANNEL BOND Mode, Chain 1

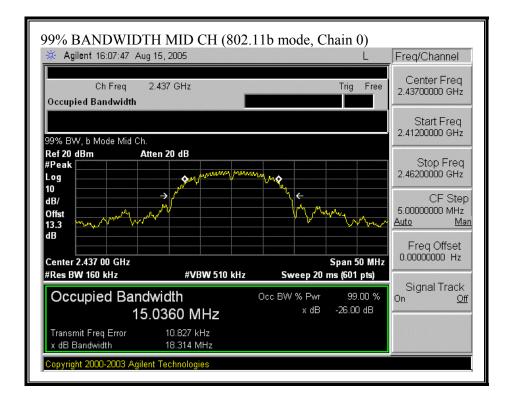
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	2422	31.969
High	2452	31.979

Page 35 of 197

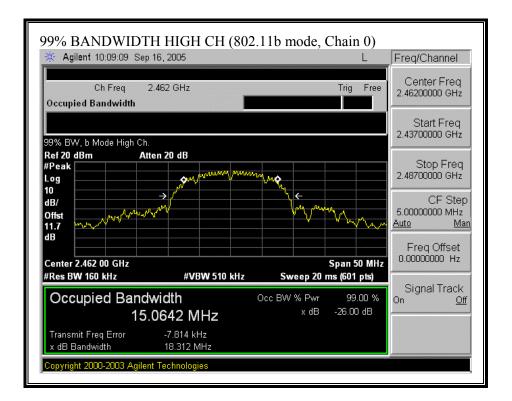
99% BANDWIDTH (802.11b MODE, CHAIN 0)



Page 36 of 197

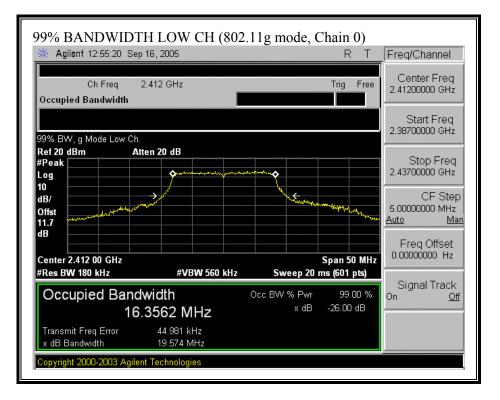


Page 37 of 197

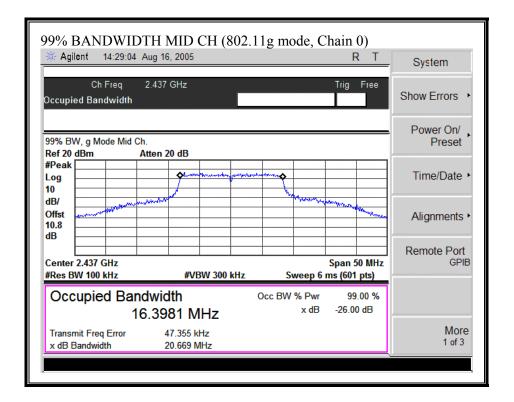


Page 38 of 197

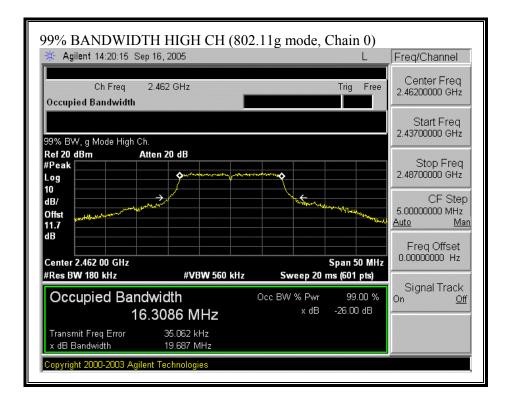
99% BANDWIDTH (802.11g MODE, CHAIN 0)



Page 39 of 197

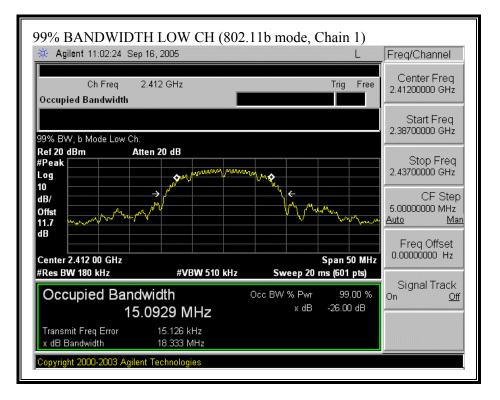


Page 40 of 197

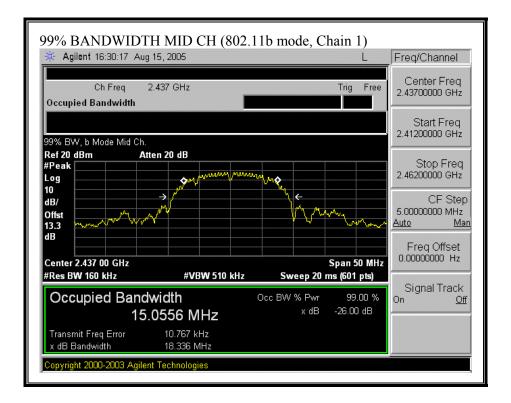


Page 41 of 197

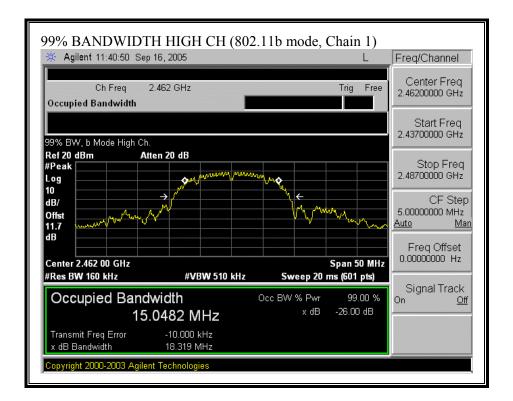
99% BANDWIDTH (802.11b MODE, CHAIN 1)



Page 42 of 197

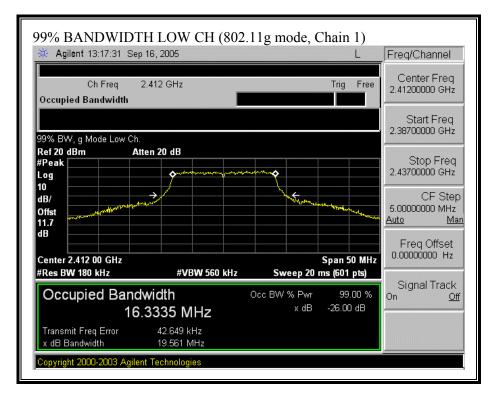


Page 43 of 197

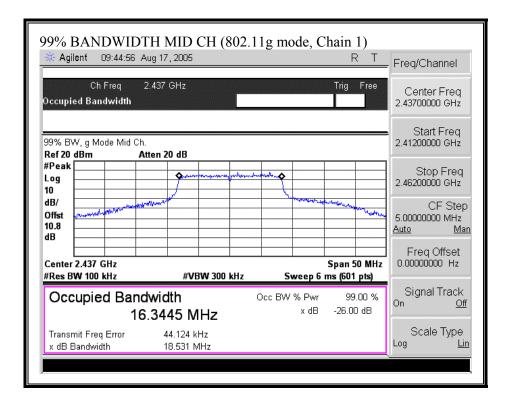


Page 44 of 197

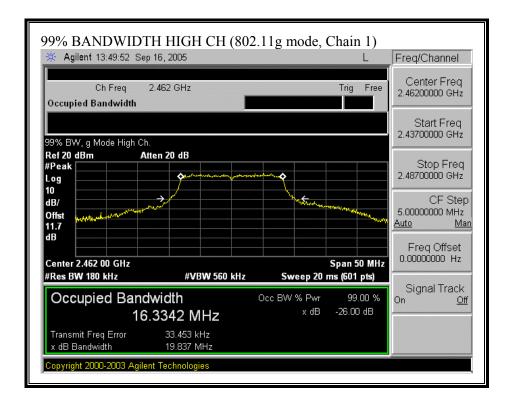
99% BANDWIDTH (802.11g MODE, CHAIN 1)



Page 45 of 197

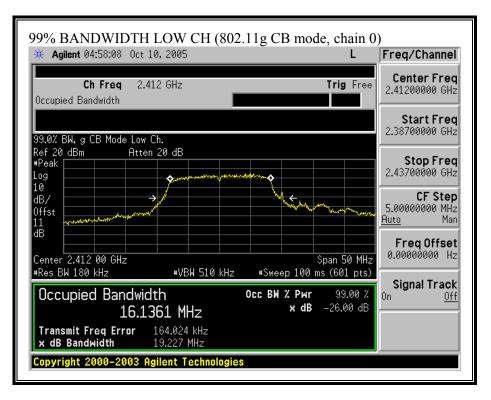


Page 46 of 197

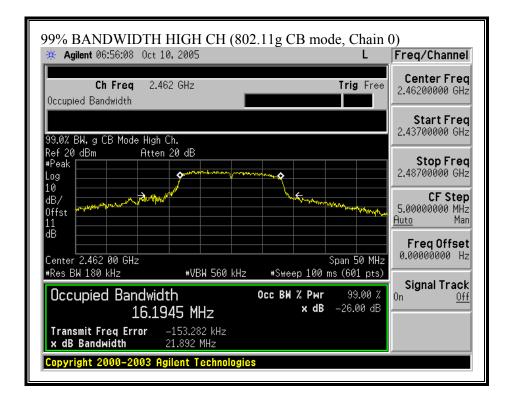


Page 47 of 197

99% BANDWIDTH (802.11g CHANNEL BOND MODE, CHAIN 0)

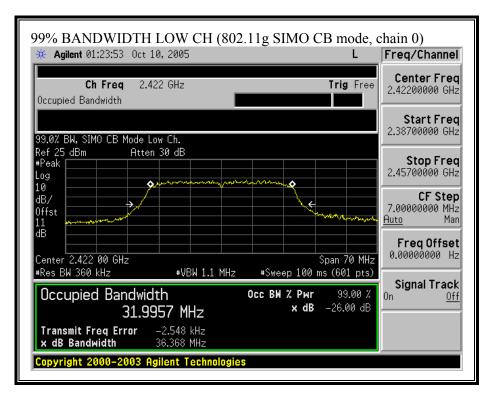


Page 48 of 197

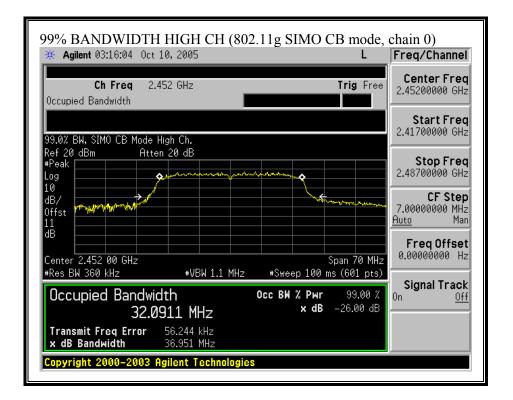


Page 49 of 197

99% BANDWIDTH (802.11g SIMO CHANNEL BOND MODE, CHAIN 0)

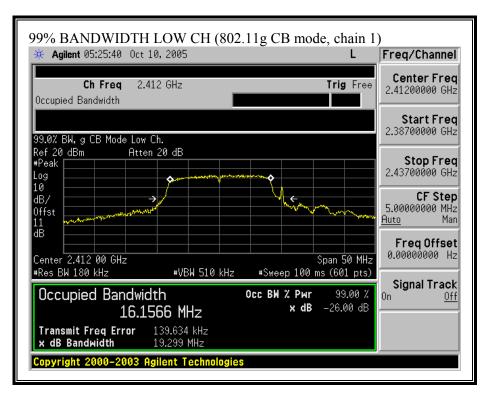


Page 50 of 197

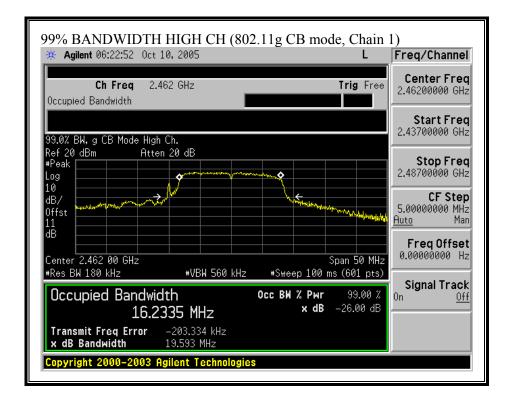


Page 51 of 197

99% BANDWIDTH (802.11g CHANNEL BOND MODE, CHAIN 1)

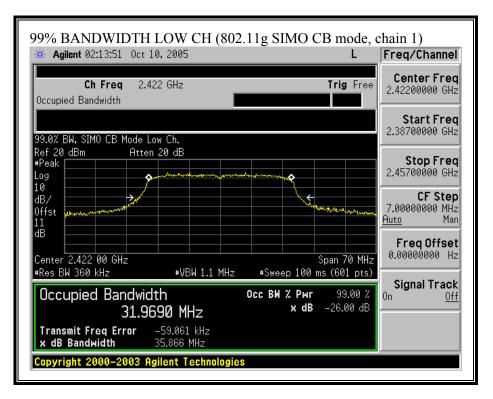


Page 52 of 197

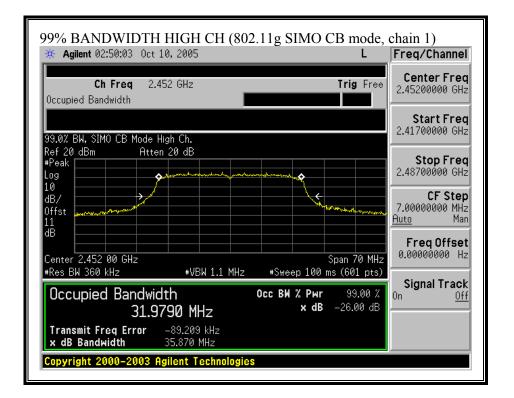


Page 53 of 197

99% BANDWIDTH (802.11g SIMO CHANNEL BOND MODE, CHAIN 1)



Page 54 of 197



Page 55 of 197

7.3. PEAK OUTPUT POWER

PEAK POWER LIMIT

§15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:

15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz , and 5725-5850 MHz bands: 1 watt.

\$15.247 (b) (4) Except as shown in paragraphs (b)(4) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.247 (b) (4) (i) Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.

Page 56 of 197

RESULTS

The maximum antenna gain is 2.1 dBi for other than fixed, point-to-point operations, therefore the limit is 30 dBm.

No non-compliance noted:

802.11b MODE

Frequency	Peak Power	Peak Power	Peak Power	Limit	Margin
	Chain 0	Chain 1	Total		
(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
2412	19.38	20.19	22.81	30	-7.19
2437	20.11	20.03	23.08	30	-6.92
2462	20.75	20.93	23.85	30	-6.15

802.11g MODE

Frequency	Peak Power	Peak Power	Peak Power	Limit	Margin
	Chain 0	Chain 1	Total		
(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
2412	19.64	19.64	22.65	30	-7.35
2437	22.35	22.28	25.33	30	-4.67
2462	20.22	20.02	23.13	30	-6.87

802.11g CHANNEL BOND MODE

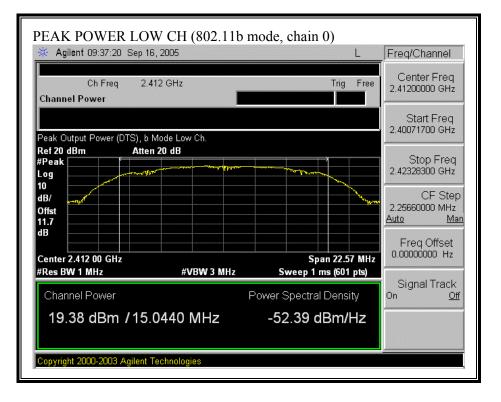
Frequency	Peak Power	Peak Power	Peak Power	Limit	Margin
	Chain 0	Chain 1	Total		
(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
2412	14.49	14.48	17.50	30	-12.50
2462	18.32	18.08	21.21	30	-8.79

802.11g SIMO CHANNEL BOND MODE

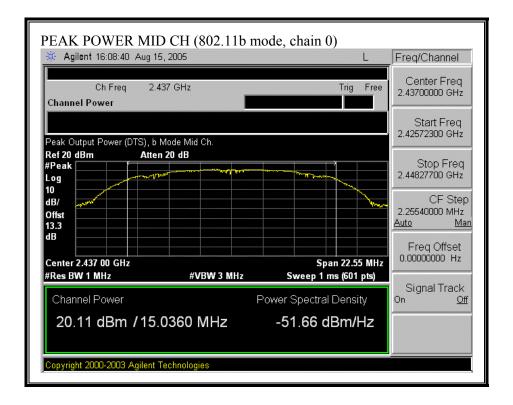
Frequency	Peak Power	Peak Power	Peak Power	Limit	Margin
	Chain 0	Chain 1	Total		
(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
2422	16.75	16.62	19.70	30	-10.30
2452	17.88	17.95	20.93	30	-9.07

Page 57 of 197

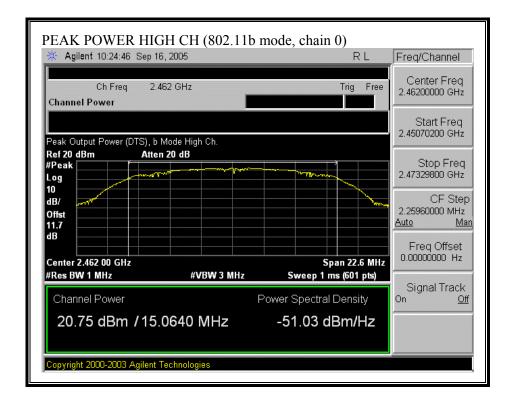
OUTPUT POWER (802.11b MODE, CHAIN 0)



Page 58 of 197

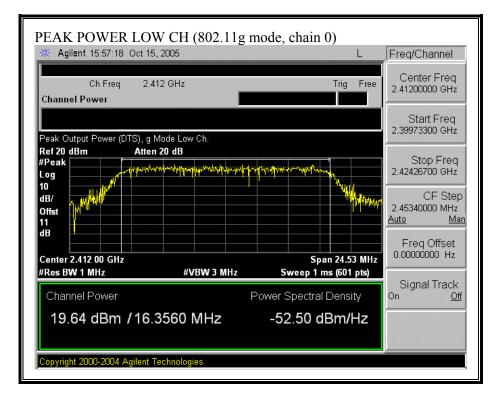


Page 59 of 197

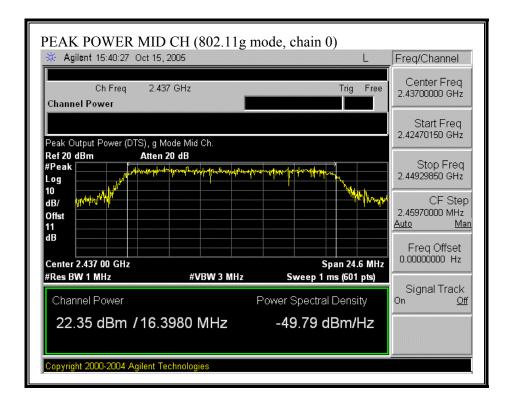


Page 60 of 197

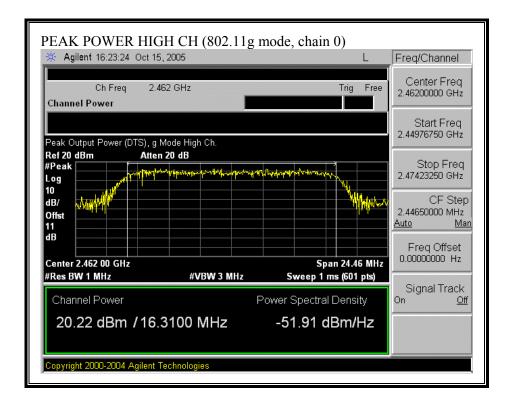
OUTPUT POWER (802.11g MODE, CHAIN 0)



Page 61 of 197

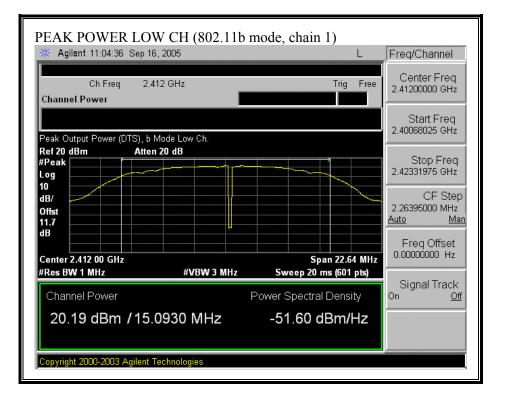


Page 62 of 197

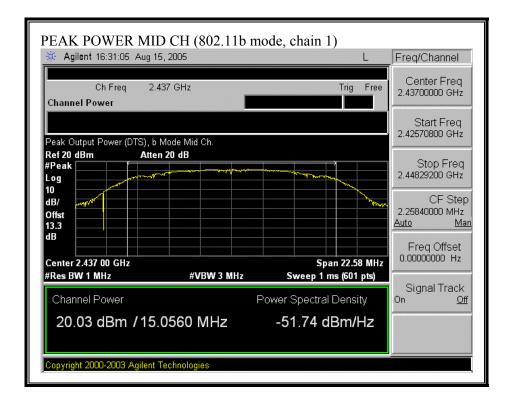


Page 63 of 197

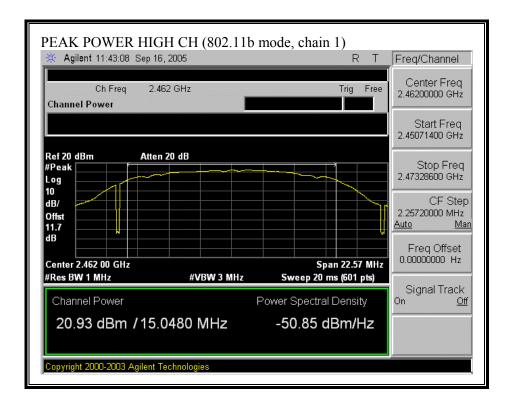
OUTPUT POWER (802.11b MODE, CHAIN 1)



Page 64 of 197

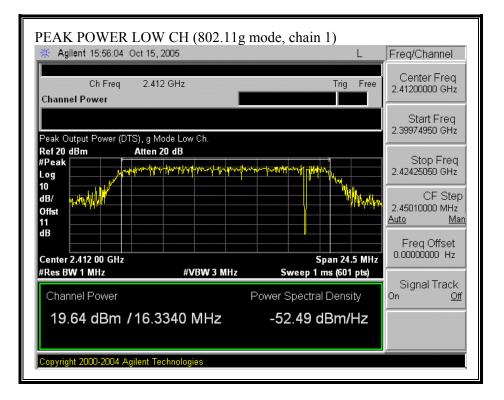


Page 65 of 197

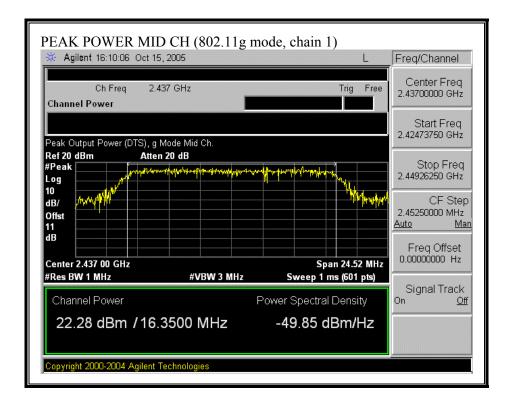


Page 66 of 197

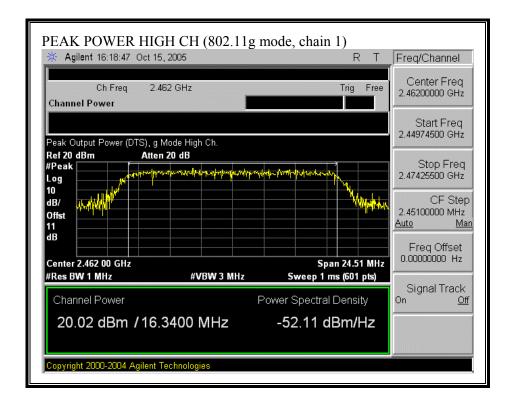
OUTPUT POWER (802.11g MODE, CHAIN 1)



Page 67 of 197

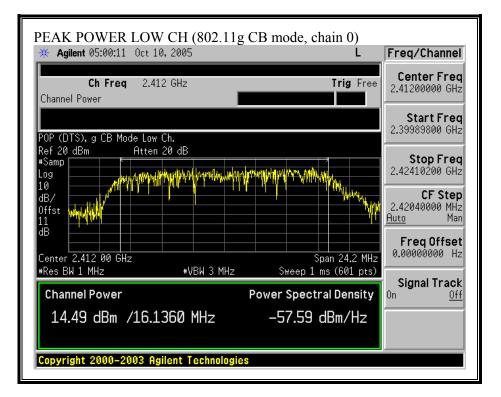


Page 68 of 197



Page 69 of 197

OUTPUT POWER (802.11g CHANNEL BOND MODE, CHAIN 0)

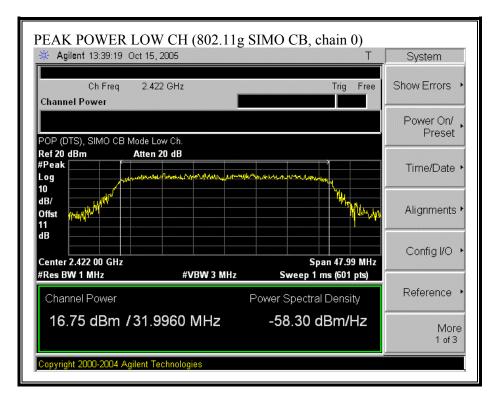


Page 70 of 197

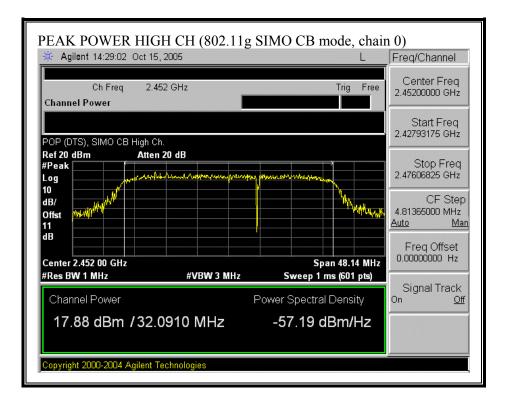
PEAK POWER HIGH CH (802.11g CB, chain 0)	Freq/Channel
Ch Freq 2.462 GHz Trig Free Channel Power	Center Freq 2.46200000 GHz
POP (DTS), g CB Mode High Ch.	Start Freq 2.44985450 GHz
Ref 20 dBm Atten 20 dB #Samp Log	Stop Freq 2.47414550 GHz
dB/ Offst	CF Step 2.42910000 MHz <u>Auto</u> Man
dB Center 2.462 00 GHz Span 24.29 MHz	Freq Offset 0.00000000 Hz
#Res BW 1 MHz #VBW 3 MHz Sweep 1 ms (601 pts) Channel Power Power Spectral Density	Signal Track On <u>Off</u>
18.32 dBm /16.1940 MHz -53.77 dBm/Hz	
Copyright 2000–2003 Agilent Technologies	

Page 71 of 197

OUTPUT POWER (802.11g SIMO CHANNEL BOND MODE, CHAIN 0)

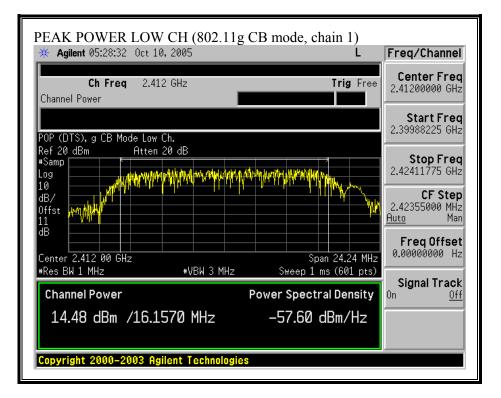


Page 72 of 197



Page 73 of 197

OUTPUT POWER (802.11g CHANNEL BOND MODE, CHAIN 1)

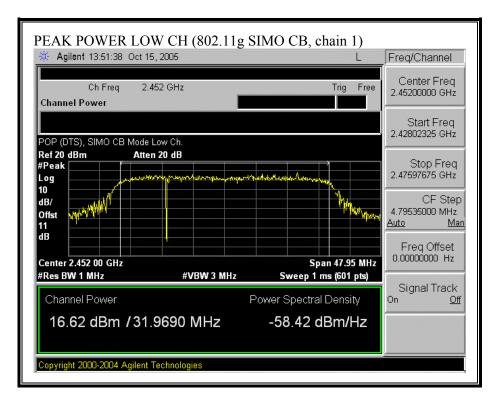


Page 74 of 197

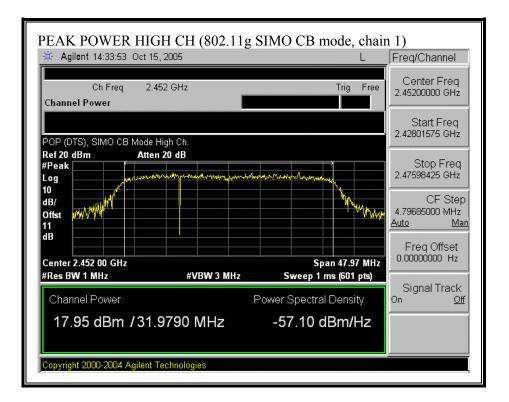
PEAK POWER HIGH CH (802.11g CB, chain 1	· .	Fuery (Channel
Agilent 06:24:21 Oct 10, 2005 Ch Freq 2.462 GHz Channel Power Power Power	L Trig Free	Freq/Channel Center Freq 2.46200000 GHz
POP (DTS), g CB Mode High Ch.		Start Freq 2.44982450 GHz
Ref 20 dBm Atten 20 dB *Samp Log 10 ////////////////////////////////////		Stop Freq 2.47417550 GHz
dB/ Offst 11 dB		CF Step 2.43510000 MHz <u>Auto</u> Man
Center 2.462 00 GHz Sp	an 24.35 MHz ms (601 pts)	Freq Offset 0.00000000 Hz
Channel Power Power Spect	ral Density	On <u>Off</u>
18.08 dBm /16.2340 MHz -54.03	dBm/Hz	
Copyright 2000–2003 Agilent Technologies		

Page 75 of 197

OUTPUT POWER (802.11g SIMO CHANNEL BOND MODE, CHAIN 1)



Page 76 of 197



Page 77 of 197

7.4. MAXIMUM PERMISSIBLE EXPOSURE

LIMITS

\$1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)
(A) Lim	its for Occupational	I/Controlled Exposu	res	
0.3–3.0 3.0–30	614 1842/f	1.63 4.89/f	*(100) *(900/f²)	6
30–300	61.4	0.163	1.0 f/300	6
1500-100,000			5	6
(B) Limits	for General Populati	on/Uncontrolled Ex	posure	
0.3–1.34 1.34–30	614 824 <i>i</i> f	1.63 2.19/f	*(100) *(180/f²)	30 30

TABLE 1-LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

TABLE 1-LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)-Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)
30–300 300–1500 1500–100,000	27.5	0.073	0.2 f/1500 1.0	30 30 30

f = frequency in MHz

f = frequency in MHz
 * = Plane-wave equivalent power density
 NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided the or she is made aware of the potential for exposure. NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure.

exposure or can not exercise control over their exposure.

Page 78 of 197

CALCULATIONS

Given

 $E = \sqrt{(30 * P * G)} / d$

where

and

E = Field Strength in Volts/meter

P = Power in Watts

 $S = E^{2} / 3770$

G = Numeric antenna gain

d = Distance in meters

S = Power Density in milliwatts/square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

 $d = \sqrt{((30 * P * G) / (3770 * S))}$

Changing to units of Power to mW and Distance to cm, using:

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

yields

 $d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$ $d = 0.282 * \sqrt{(P * G / S)}$

where

d = distance in cm P = Power in mW G = Numeric antenna gain S = Power Density in mW/cm^2

Substituting the logarithmic form of power and gain using:

 $P(mW) = 10^{(P(dBm) / 10)}$ and $G(numeric) = 10^{(G(dBi) / 10)}$

yields

 $d = 0.282 * 10^{(P+G)} / 20) / \sqrt{S}$

where

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

Rearranging terms to calculate the power density at a specific distance yields

 $S = 0.0795 * 10^{(P+G)} / 10) / (d^2)$

Page 79 of 197

LIMITS

From 1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm²

RESULTS

No non-compliance noted: (MPE distance equals 20 cm)

Mode	MPE	Output	Antenna	Power
	Distance	Power	Gain	Density
	(cm)	(dBm)	(dBi)	(mW/cm^2)
802.11b	20.0	23.85	2.10	0.08
802.11g	20.0	25.33	2.10	0.11
802.11g CB	20.0	21.21	2.10	0.04
802.11g SIMO CB	20.0	20.93	2.10	0.04

NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

Page 80 of 197

7.5. AVERAGE POWER

AVERAGE POWER LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

No non-compliance noted:

The cable assembly insertion loss of 11 dB (including 9.7 dB pad and 1.3 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Page 81 of 197

802.11b MODE

Channel	Frequency	Average Power	Average Power	Average Power
		Chain 0	Chain 1	Total
	(MHz)	(dBm)	(dBm)	(dBm)
Low	2412	16.78	16.8	19.80
Middle	2437	18.00	18.00	21.01
High	2462	17.50	17.47	20.50

802.11g MODE

Channel	Frequency	Average Power	Average Power	Average Power
		Chain 0	Chain 1	Total
	(MHz)	(dBm)	(dBm)	(dBm)
Low	2412	16.00	15.98	19.00
Middle	2437	19.00	19.02	22.02
High	2462	16.46	16.50	19.49

802.11g CHANNEL BOND MODE

Channel	Frequency	Average Power	Average Power	Average Power
		Chain 0	Chain 1	Total
	(MHz)	(dBm)	(dBm)	(dBm)
Low	2412	13.50	13.51	16.52
High	2462	16.54	16.58	19.57

802.11g SIMO CHANNEL BOND MODE

Channel	Frequency	Average Power	Average Power	Average Power
		Chain 0	Chain 1	Total
	(MHz)	(dBm)	(dBm)	(dBm)
Low	2412	13.35	13.40	16.39
High	2462	14.80	14.82	17.82

Page 82 of 197

7.6. PEAK POWER SPECTRAL DENSITY

<u>LIMIT</u>

§15.247 (d) For direct sequence 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.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer, the maximum level in a 3 kHz bandwidth is measured with the spectrum analyzer using RBW = 3 kHz and VBW > 3 kHz, sweep time = span / 3 kHz, and video averaging is turned off. The PPSD is the highest level found across the emission in any 3 kHz band.

RESULTS

No non-compliance noted:

Page 83 of 197

802.11b Mode

Frequency	PPSD	PPSD	PPSD	Limit	Margin
	Chain 0	Chain 1	Total		
(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
2412	4.04	-7.26	4.35	8	-3.65
2437	-6.53	-8.05	-4.21	8	-12.21
2462	-7.82	-6.66	-4.19	8	-12.19

802.11g Mode

Frequency	PPSD	PPSD	PPSD	Limit	Margin
	Chain 0	Chain 1	Total		
(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
2412	-6.41	-8.56	-4.34	8	-12.34
2437	-5.88	-6.65	-3.24	8	-11.24
2462	-8.28	-7.05	-4.61	8	-12.61

802.11g CHANNEL BOND Mode

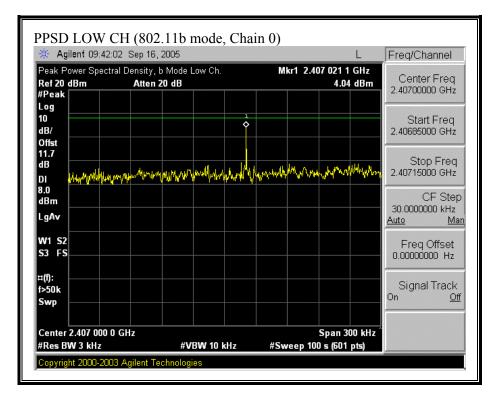
Frequency	PPSD	PPSD	PPSD	Limit	Margin
(MHz)	Chain 0 (dBm)	Chain 1 (dBm)	Total (dBm)	(dBm)	(dB)
2412	-11.37	-9.97	-7.60	8	-15.60
2462	-7.51	-6.99	-4.23	8	-12.23

802.11g SIMO CHANNEL BOND Mode

Frequency	PPSD	PPSD	PPSD	Limit	Margin
(MHz)	Chain 0 (dBm)	Chain 1 (dBm)	Total (dBm)	(dBm)	(dB)
2422	-16.71	-8.66	-8.03	8	-16.03
2452	-11.38	-9.14	-7.11	8	-15.11

Page 84 of 197

PEAK POWER SPECTRAL DENSITY (802.11b MODE, CHAIN 0)



Page 85 of 197

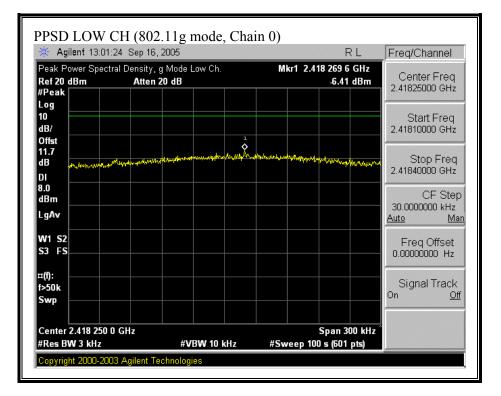
🔆 Agilent 16:1	1:37 Aug 15, 2005	L	Freq/Channel
Ref 20 dBm #Peak	ctral Density, b Mode Mid Ch. Atten 20 dB	Mkr1 2.437 760 0 GHz -6.53 dBm	Center Freq 2.43775000 GHz
Log 10 dB/ Offst			Start Freq 2.43760000 GHz
13.3	warden and the state of the sta	when the second	Stop Freq 2.43790000 GHz
8.0 dBm LgAv			CF Step 30.000000 kHz <u>Auto Mar</u>
W1 S2 S3 FS			Freq Offset 0.00000000 Hz
¤(f): f>50k Swp			Signal Track On <u>Off</u>
Center 2.437 750 #Res BW 3 kHz) 0 GHz #VBW 10 kHz	Span 300 kHz #Sweep 100 s (601 pts)	

Page 86 of 197

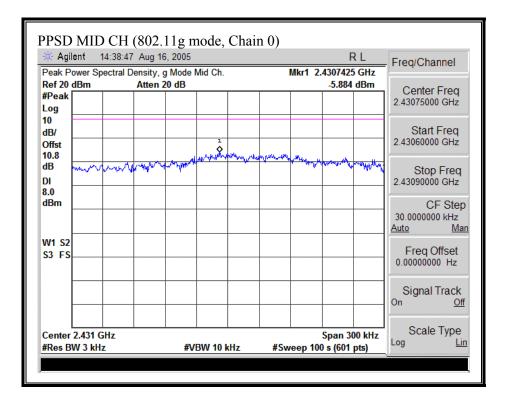
🔆 Agilent 10:30:	02 Sep 16, 2005	L	Freq/Channel
Ref 20 dBm #Peak	al Density, b Mode High Ch. Atten 20 dB	Mkr1 2.468 018 6 GHz -7.82 dBm	Center Freq 2.46800000 GHz
Log 10 dB/ Offst			Start Freq 2.46785000 GHz
11.7 dB	foren per der and for the state of the state	Mandy May market and the second	Stop Freq 2.46815000 GHz
8.0 dBm LgAv			CF Step 30.000000 kHz <u>Auto Mar</u>
W1 S2 S3 FS			Freq Offset 0.00000000 Hz
¤(f): f>50k Swp			Signal Track On <u>Off</u>
Center 2.468 000 0 #Res BW 3 kHz) GHz #VBW 10 kHz	Span 300 kHz #Sweep 100 s (601 pts)	,

Page 87 of 197

PEAK POWER SPECTRAL DENSITY (802.11g MODE, CHAIN 0)



Page 88 of 197

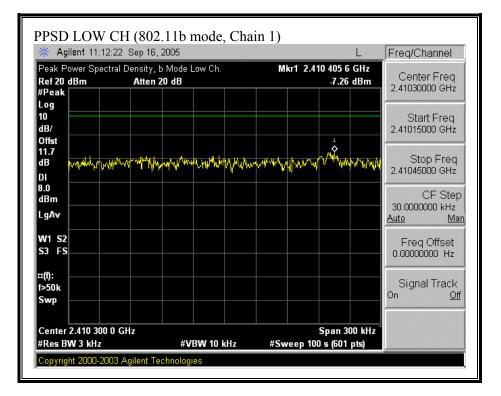


Page 89 of 197

🔆 Agilent 14:2	5:05 Sep 16, 2005	L	Freq/Channel
Ref 20 dBm #Peak	ctral Density, g Mode High Ch. Atten 20 dB	Mkr1 2.469 179 6 GHz -8.28 dBm	Center Freq 2.46925000 GHz
Log 10 dB/			Start Freq 2.46910000 GHz
Offst 11.7 dB _{Mhr/w} www.w ^r		adented and an and a second and a	Stop Freq 2.46940000 GHz
8.0 dBm LgAv			CF Step 30.000000 kHz Auto Mar
W1 S2 S3 FS			Freq Offset 0.00000000 Hz
¤(f): f>50k Swp			Signal Track On <u>Off</u>
Center 2.469 250 #Res BW 3 kHz	0 GHz #VBW 10 kHz	Span 300 kHz #Sweep 100 s (601 pts)	

Page 90 of 197

PEAK POWER SPECTRAL DENSITY (802.11b MODE, CHAIN 1)



Page 91 of 197

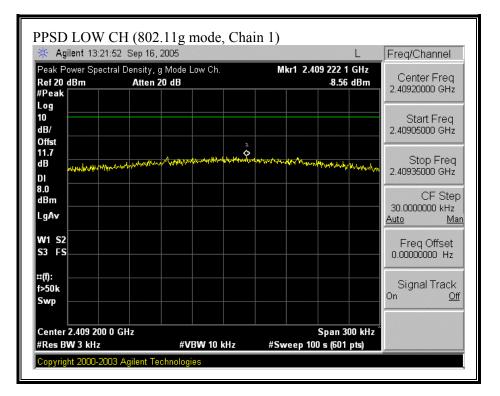
🔆 Agilent 16:3	4:40 Aug 15, 2005	RT	Freq/Channel
Ref 20 dBm #Peak	ctral Density, b Mode Mid Ch. Atten 20 dB	Mkr1 2.434 291 7 GHz -8.05 dBm	Center Freq 2.43435000 GHz
Log 10 dB/ Offst			Start Freq 2.43420000 GHz
13.3 dB DI	nondequera New York Martin	water the second state of the second s	Stop Freq 2.43450000 GHz
8.0 dBm LgAv			CF Step 30.0000000 kHz <u>Auto Man</u>
W1 S2 S3 FS			Freq Offset 0.00000000 Hz
¤(f): f>50k Swp			Signal Track On <u>Off</u>
Center 2.434 350 #Res BW 3 kHz) 0 GHz #VBW 10 kHz	Span 300 kHz #Sweep 100 s (601 pts)	

Page 92 of 197

🔆 Agilent 11:5	6:30 Sep 16, 2005	L	Freq/Channel
Ref 20 dBm #Peak	ctral Density, b Mode High Ch. Atten 20 dB	Mkr1 2.463 401 5 GHz -6.66 dBm	Center Freq 2.46340000 GHz
Log 10 dB/ Offst			Start Freq 2.46325000 GHz
11.7	amuniterrate strangelynamic of the	her Yaufkantina maithed prilaneers after son son t	Stop Freq 2.46355000 GHz
8.0 dBm LgAv			CF Step 30.0000000 kHz <u>Auto Mar</u>
W1 S2 S3 FS			Freq Offset 0.00000000 Hz
¤(f): f>50k Swp			Signal Track On <u>Off</u>
Center 2.463 400 #Res BW 3 kHz	0 GHz #VBW 10 kHz	Span 300 kHz #Sweep 100 s (601 pts)	

Page 93 of 197

PEAK POWER SPECTRAL DENSITY (802.11g MODE, CHAIN 1)



Page 94 of 197

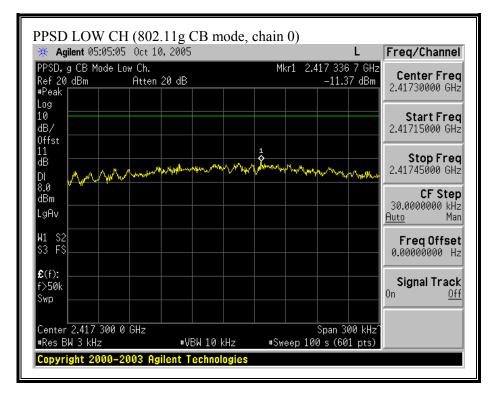
	9:54:26 Aug 1 ectral Density,	g Mode Mid Ch.	Mkr1	R T 2.4388750 GHz	- Freq/Channel
Ref 20 dBm #Peak Log	Atten			-6.651 dBm	Center Freq 2.43895000 GHz
10 dB/ Offst 10.8	1 \$				Start Freq 2.43880000 GHz
10.8 dB DI 8.0	pro gogete to be a second by the	when the second se	manant to an and the second	unmann	Stop Freq 2.43910000 GHz
dBm					CF Step 30.0000000 kHz <u>Auto Mar</u>
W1 S2 S3 FS					Freq Offset 0.00000000 Hz
					Signal Track On <u>Off</u>
Center 2.439 G #Res BW 3 kHz		#VBW 10 kH	z #Sween	Span 300 kHz 100 s (601 pts)	Scale Type _{Log <u>Lir</u>}

Page 95 of 197

🔆 Agilent 13:54	:44 Sep 16, 2005	L	Freq/Channel
Ref 20 dBm #Peak	tral Density, g Mode High Ch. Atten 20 dB	Mkr1 2.459 520 6 GHz -7.05 dBm	Center Freq 2.45950000 GHz
Log 10 dB/			Start Freq 2.45935000 GHz
Offst 11.7 dB _{Wy} /wyd-gwydwy Dl	When we the normality and a second state	en alex applied for a provident and a grant and and and and a grant and and a grant and a grant and a grant and	Stop Freq 2.45965000 GHz
dBm			CF Step 30.0000000 kHz
W1 S2 S3 FS			Auto Mar Freq Offset 0.00000000 Hz
¤(f): f>50k Swp			Signal Track On <u>Off</u>
Center 2.459 500 #Res BW 3 kHz	0 GHz #VBW 10 kHz	Span 300 kHz #Sweep 100 s (601 pts)	

Page 96 of 197

PEAK POWER SPECTRAL DENSITY (802.11g CHANNEL BOND MODE, CHAIN 0)

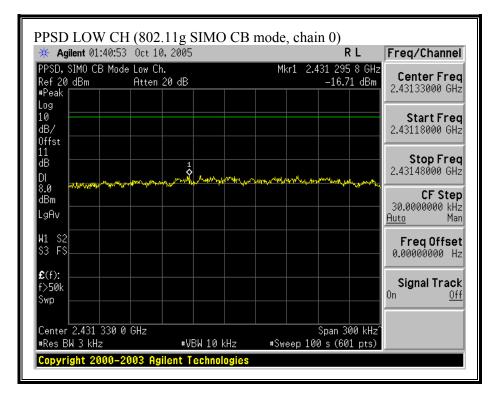


Page 97 of 197

🔆 Agilent 07:0	1:19 Oct 10,	2005			L	Freq/Channel
PPSD,gCBMoo Ref20dBm #Peak		20 dB		Mkr1 2.4	61 065 6 G -7.51 dE	Contor From
Log 10 dB/ 0ffst			1			Start Freq 2.46090000 GHz
11 dB DI	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	waren der marken der		han water	h h h h h h h h h h h h h h h h h h h	Stop Freq 2.46120000 GHz
8.0 dBm LgAv						CF Step 30.0000000 kHz <u>Auto</u> Man
W1 S2 S3 FS						Freq Offset 0.00000000 Hz
£ (f): f>50k Swp						Signal Track ^{On <u>Off</u>}
Center 2.461 0 #Res BW 3 kHz	50 0 GHz	#VBW 10	kHz		Span 300 kl 0 s (601 pt	

Page 98 of 197

PEAK POWER SPECTRAL DENSITY (802.11g SIMO CHANNEL BOND MODE, CHAIN 0)

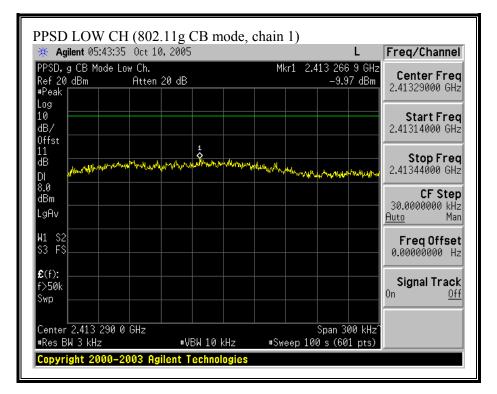


Page 99 of 197

-	:44 Oct 10, 2005		L	Freq/Channel
'PSD, SIMO CB M Ref 20 dBm Peak	lode High Ch. Atten 20 dB	Mkr1	2.445 150 6 GHz -11.38 dBm	Center Fred 2.44512000 GHz
og Ø IB/				Start Frec 2.44497000 GHz
1 B • ⁷⁴ ~•~~~**	hy ny pour and the property and	har when the second second	1 m marting and the second	Stop Frec 2.44527000 GHz
gAv				CF Step 30.0000000 kHz <u>Auto</u> Mar
/1 S2 /3 FS				Freq Offset 0.00000000 Hz
C(f): >50k WP				Signal Track On <u>Off</u>
Center 2.445 12 Res BW 3 kHz		LØ kHz #Sweep	Span 300 kHz ²	

Page 100 of 197

PEAK POWER SPECTRAL DENSITY (802.11g CHANNEL BOND MODE, CHAIN 1)

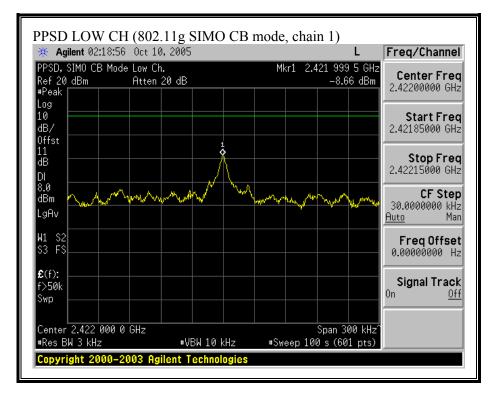


Page 101 of 197

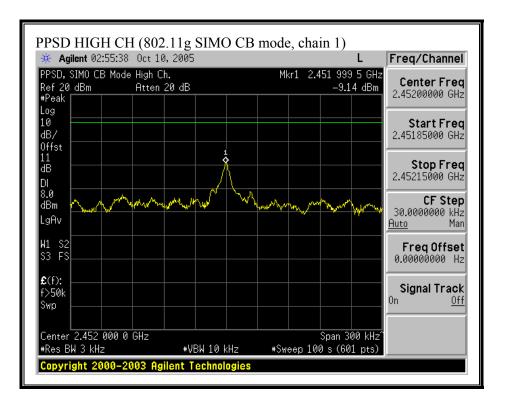
🔆 Agilent 06:32	:00 Oct 10, 2005		L	Freq/Channel
PPSD,gCB Mode Ref20dBm #Peak	High Ch. Atten 20 dB	Mkr:	1 2.456 030 4 GHz -6.99 dBm	Center Freq 2.45606000 GHz
Log 10 dB/ 0ffst				Start Freq 2.45591000 GHz
11 dB DI	Man and a start of the start of	armour malo and the platestic	water and have not a provident	Stop Freq 2.45621000 GHz
8.0 dBm LgAv				CF Step 30.0000000 kHz <u>Auto</u> Man
W1 S2 S3 FS				FreqOffset 0.00000000 Hz
€(f): f>50k Swp				Signal Track ^{On <u>Off</u>}
Center 2.456 060 #Res BW 3 kHz			Span 300 kHz p 100 s (601 pts)	

Page 102 of 197

PEAK POWER SPECTRAL DENSITY (802.11g SIMO CHANNEL BOND MODE, CHAIN 1)



Page 103 of 197



Page 104 of 197

7.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

§15.247 (c) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in§15.205(a), must also comply with the radiated emission limits specified in §15.205(a).

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

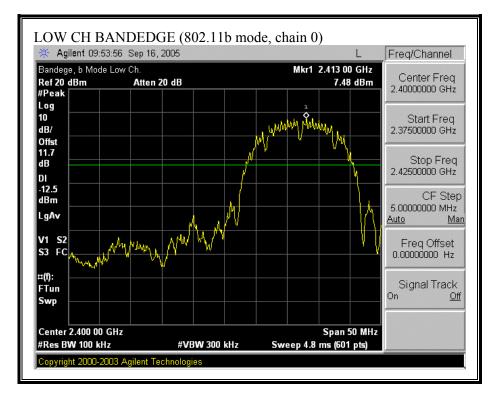
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

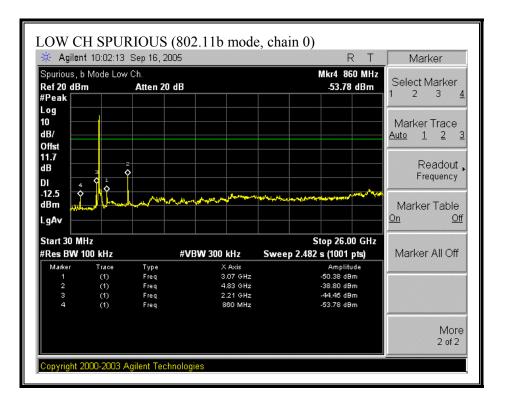
No non-compliance noted:

Page 105 of 197

SPURIOUS EMISSIONS, LOW CHANNEL (802.11b MODE), CHAIN 0

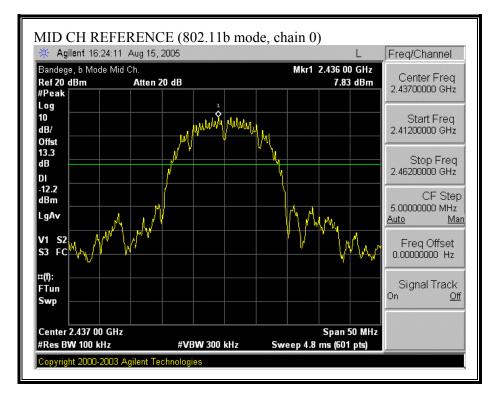


Page 106 of 197

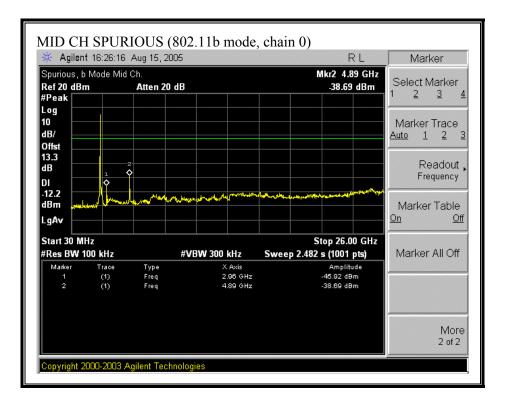


Page 107 of 197

SPURIOUS EMISSIONS, MID CHANNEL (802.11b MODE, CHAIN 0)

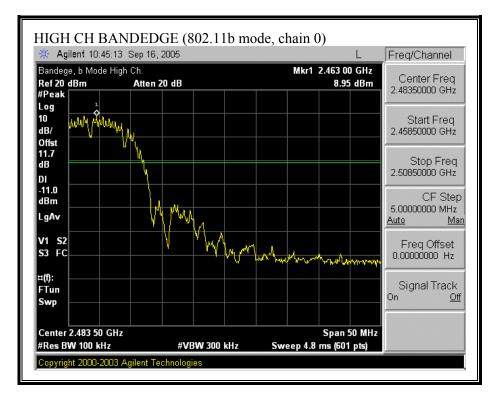


Page 108 of 197

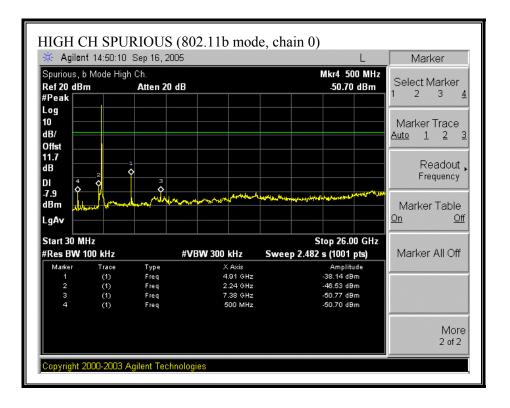


Page 109 of 197

SPURIOUS EMISSIONS, HIGH CHANNEL (802.11b MODE, CHAIN 0)

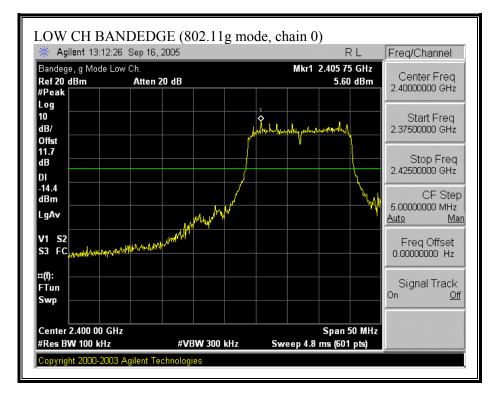


Page 110 of 197

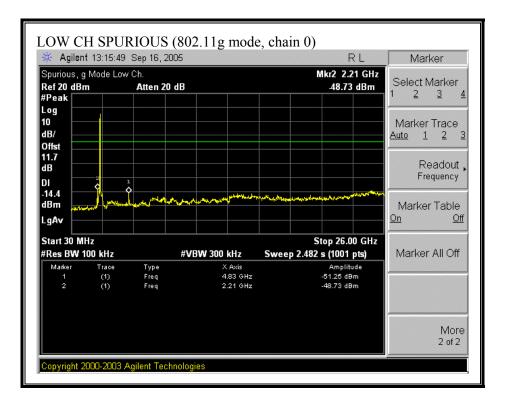


Page 111 of 197

SPURIOUS EMISSIONS, LOW CHANNEL (802.11g MODE, CHAIN 0)

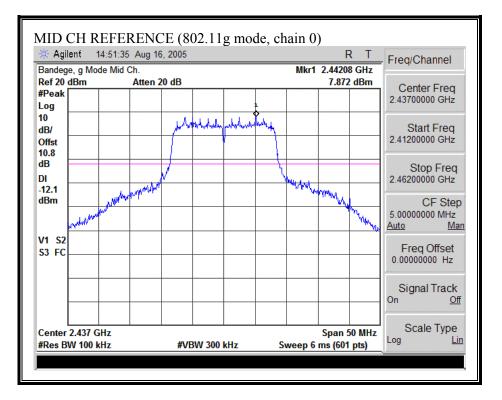


Page 112 of 197



Page 113 of 197

SPURIOUS EMISSIONS, MID CHANNEL (802.11g MODE, CHAIN 0)

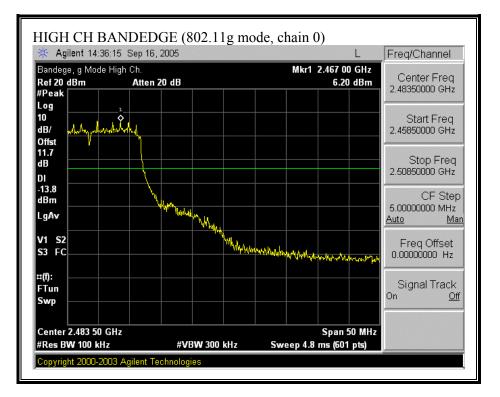


Page 114 of 197

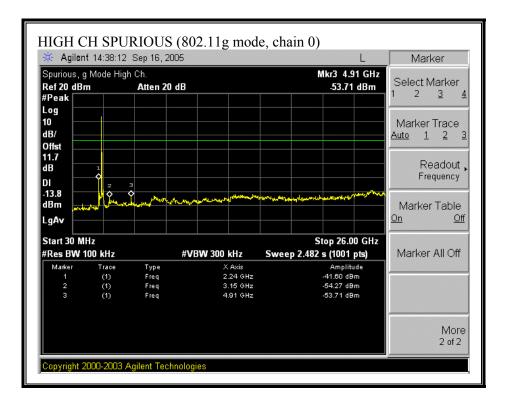
Agilent 14:52:51 Aug 16, 2005 Spurious, g Mode Mid Ch. 1000000000000000000000000000000000000						R T Mkr1 25.610 GHz			<u> </u>	– Marker	
Ref 20 #Peak			Atten 2	0 dB					-41.75		Select Marke
Log 10 dB/ Offst 10.8											Norm
dB DI -12.1											Del
dBm										1	Delta Pa (Tracking Ref) Ref <u>De</u>
V1 S2 S3 FC		dimendence	-astronalogoode	l terthiograph	an and a second produced by	obwinne	angle land and a last	geologic grades	en fan de staarde	and the state of t	Span Pa Span <u>Cent</u>
											С
Start 30 #Res B		(Hz		#VF	3W 300	kH7	Swee	o 2.691 s		6 GHz	Mo 1 of

Page 115 of 197

SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g MODE, CHAIN 0)

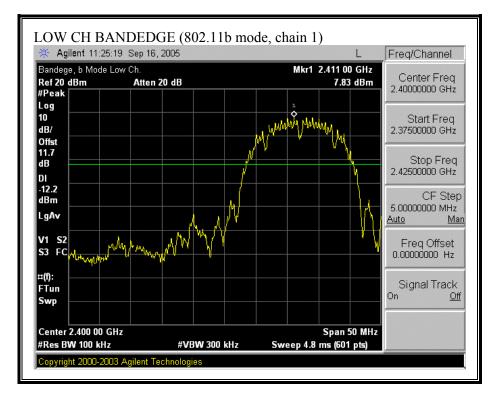


Page 116 of 197

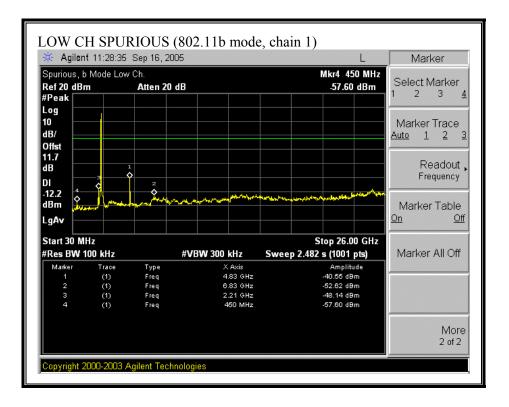


Page 117 of 197

SPURIOUS EMISSIONS, LOW CHANNEL (802.11b MODE, CHAIN 1

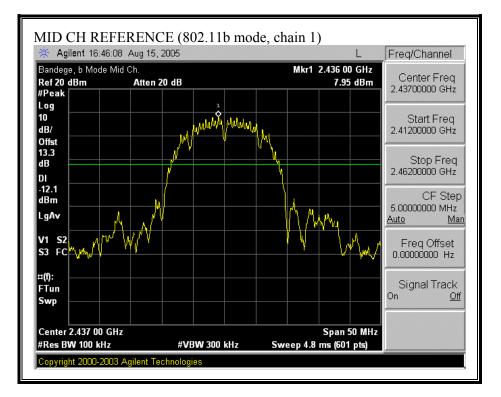


Page 118 of 197

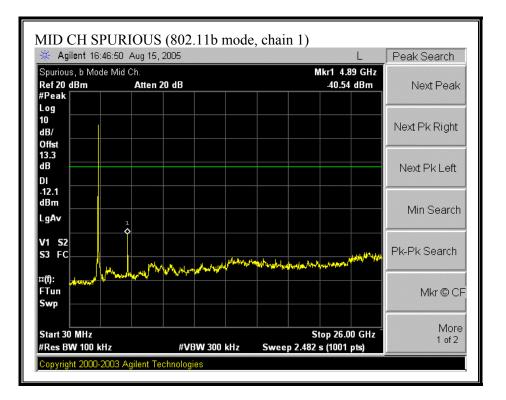


Page 119 of 197

SPURIOUS EMISSIONS, MID CHANNEL (802.11b MODE, CHAIN 1)

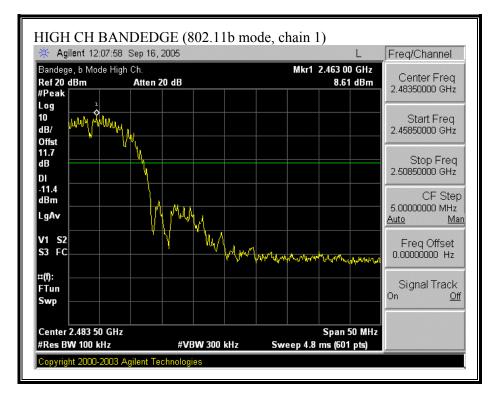


Page 120 of 197

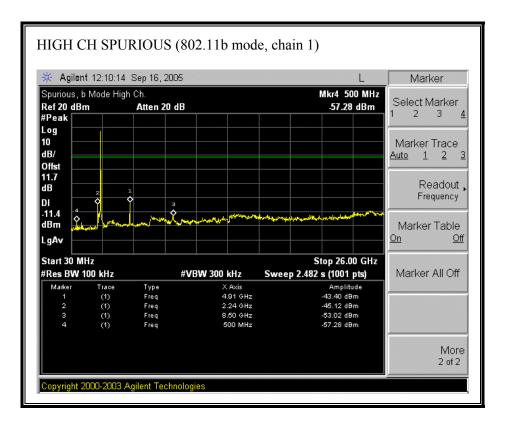


Page 121 of 197

SPURIOUS EMISSIONS, HIGH CHANNEL (802.11b MODE, CHAIN 1)

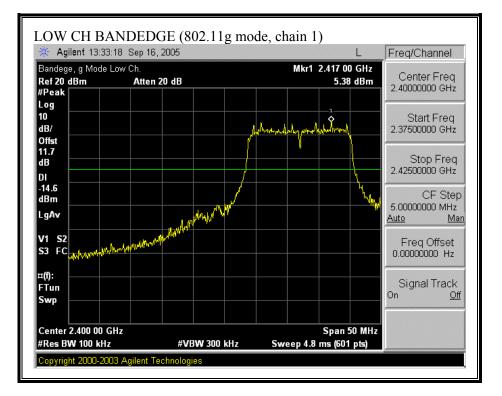


Page 122 of 197

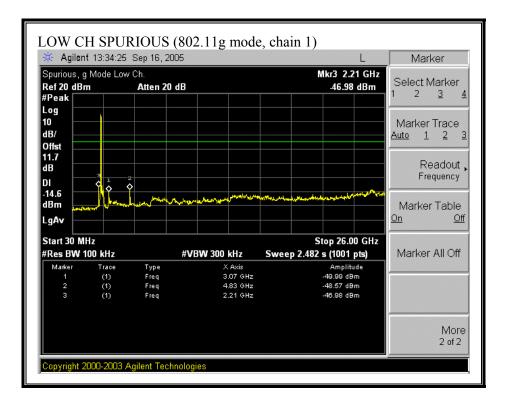


Page 123 of 197

SPURIOUS EMISSIONS, LOW CHANNEL (802.11g MODE, CHAIN 1)

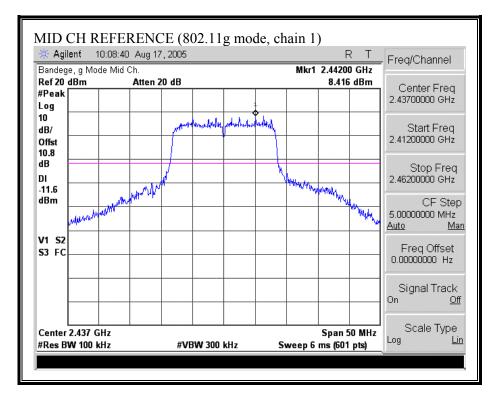


Page 124 of 197

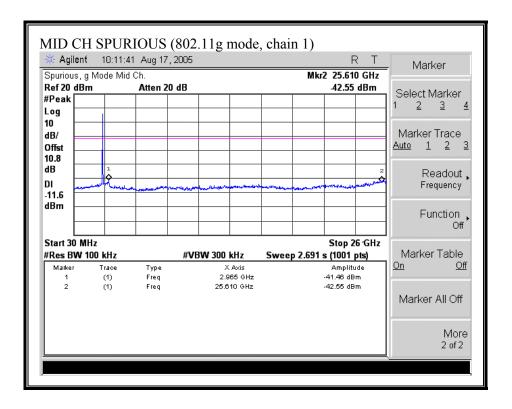


Page 125 of 197

SPURIOUS EMISSIONS, MID CHANNEL (802.11g MODE, CHAIN 1)

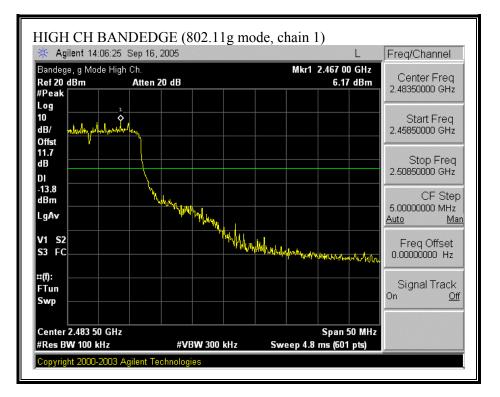


Page 126 of 197

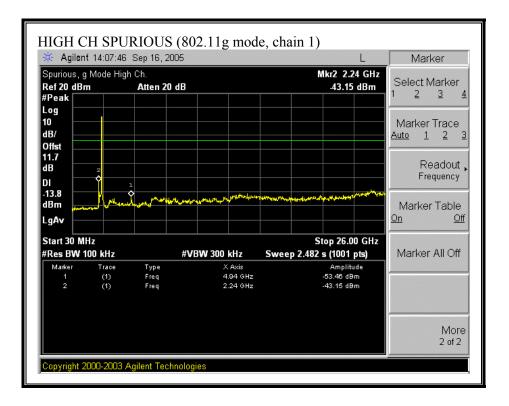


Page 127 of 197

SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g MODE, CHAIN 1)

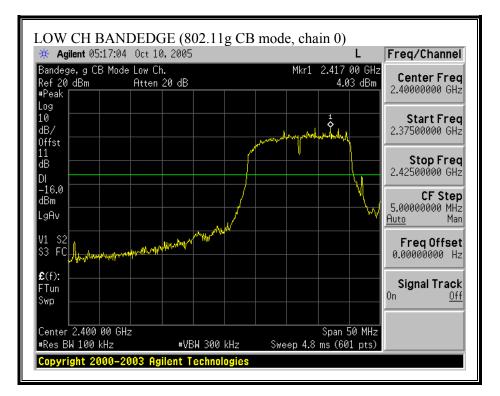


Page 128 of 197

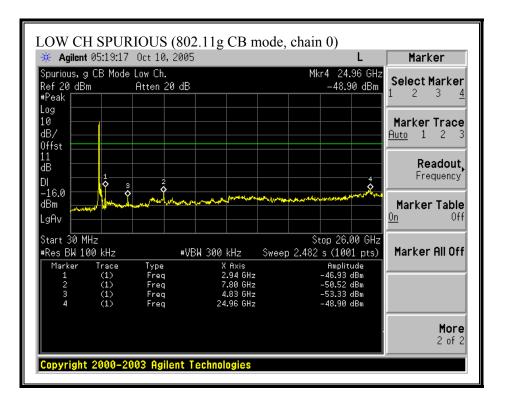


Page 129 of 197

SPURIOUS EMISSIONS, LOW CHANNEL (802.11g CHANNEL BOND MODE, CHAIN 0)

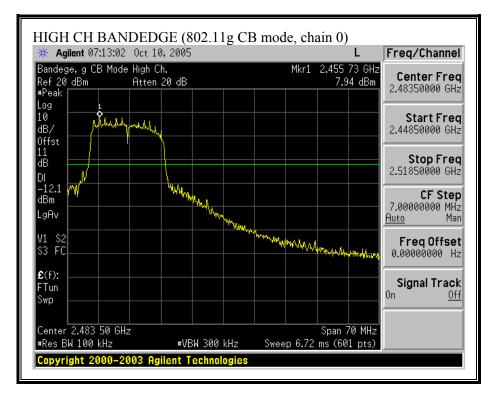


Page 130 of 197

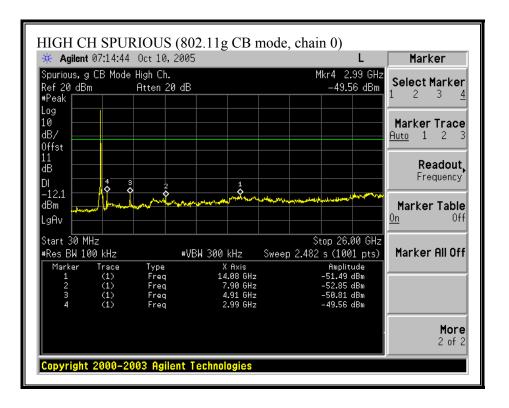


Page 131 of 197

SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g CHANNEL BOND MODE, CHAIN 0)

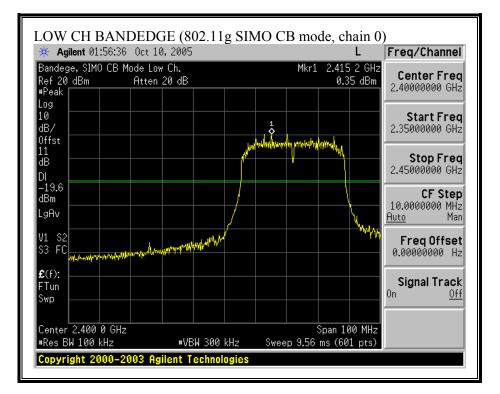


Page 132 of 197

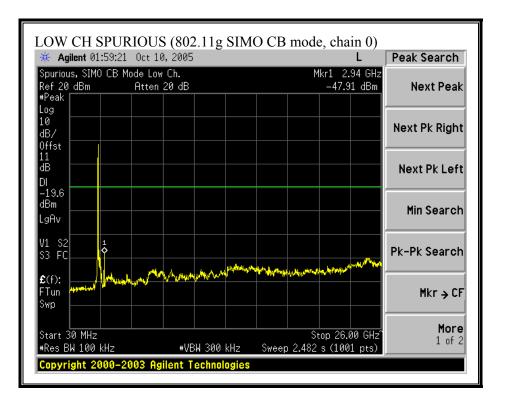


Page 133 of 197

SPURIOUS EMISSIONS, LOW CHANNEL (802.11g SIMO CB MODE, CHAIN 0)

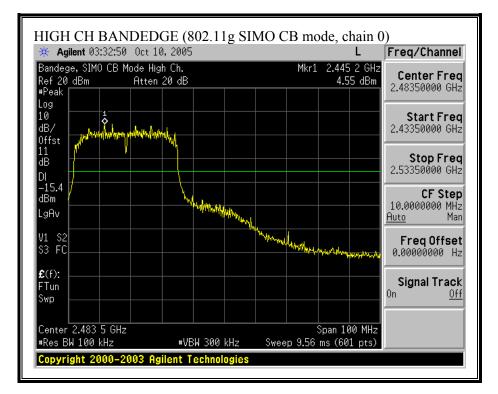


Page 134 of 197

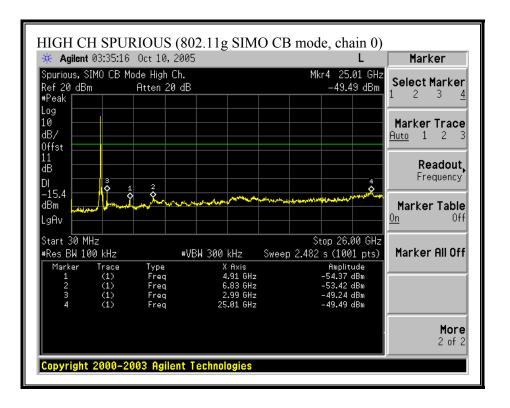


Page 135 of 197

SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g SIMO CHANNEL BOND MODE, CHAIN 0)

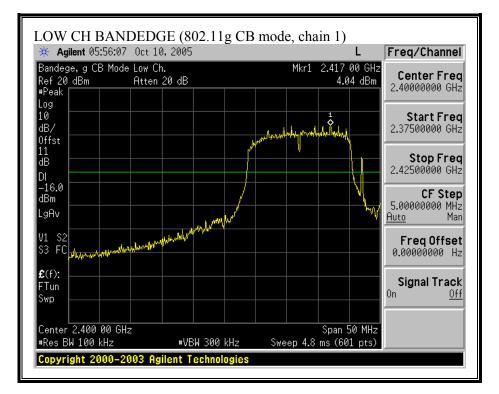


Page 136 of 197

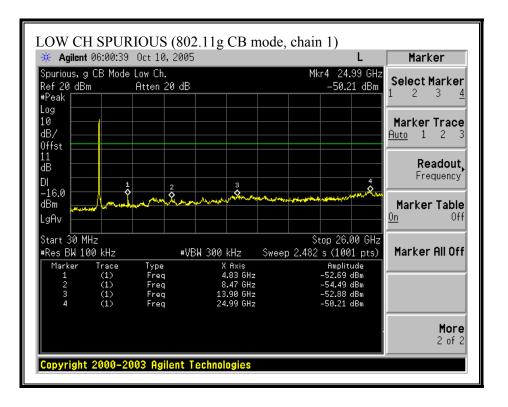


Page 137 of 197

SPURIOUS EMISSIONS, LOW CHANNEL (802.11g CHANNEL BOND MODE, CHAIN 1)

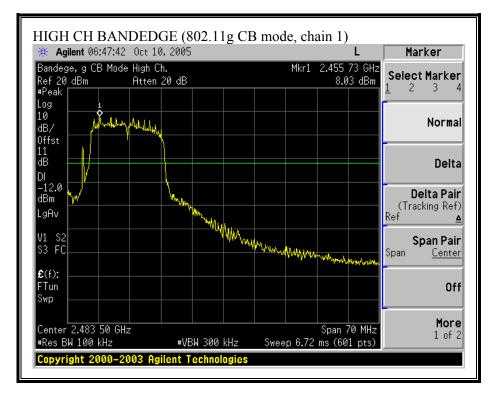


Page 138 of 197

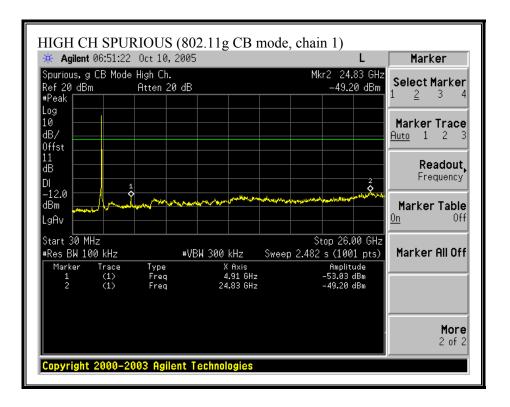


Page 139 of 197

SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g CHANNEL BOND MODE, CHAIN 1)

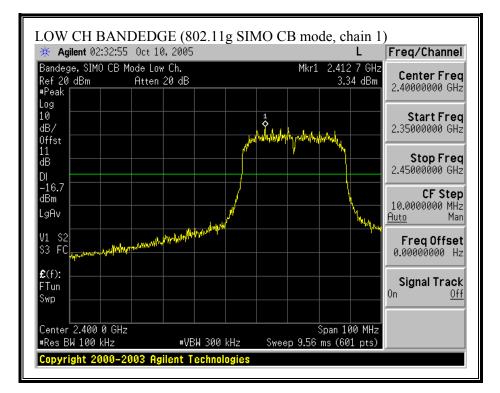


Page 140 of 197

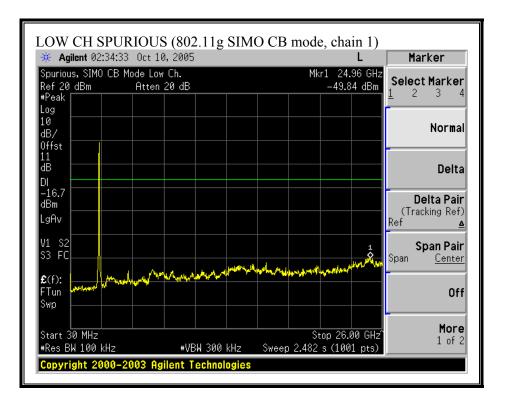


Page 141 of 197

SPURIOUS EMISSIONS, LOW CHANNEL (802.11g SIMO CHANNEL BOND MODE, CHAIN 1)

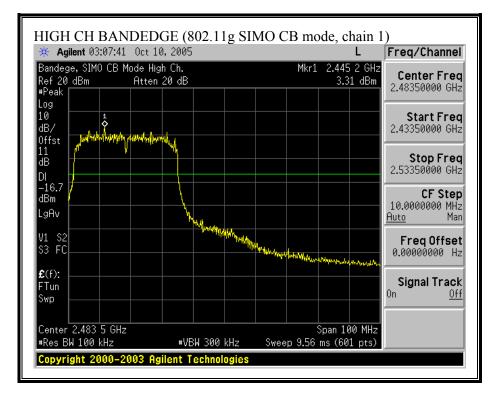


Page 142 of 197

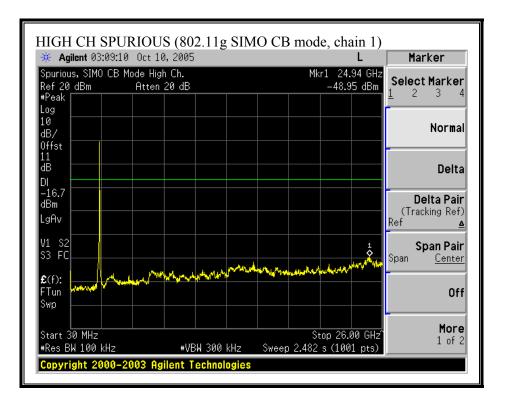


Page 143 of 197

SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g SIMO CHANNEL BOND MODE, CHAIN 1)



Page 144 of 197



Page 145 of 197

7.8. RADIATED EMISSIONS

LIMITS

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	$(^{2})$
13.36 - 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

Page 146 of 197

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

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

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

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

Page 147 of 197

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

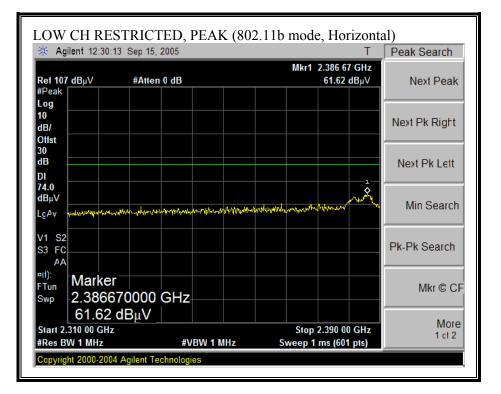
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each 5 GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

Page 148 of 197

RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)

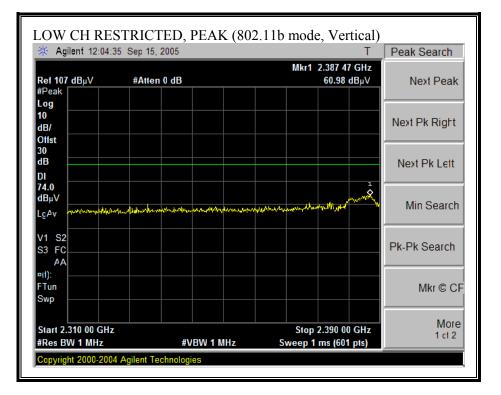


Page 149 of 197

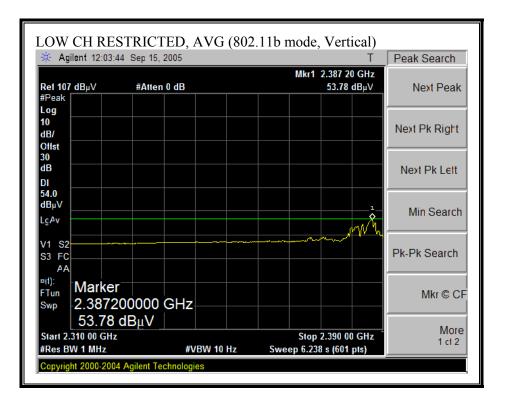
🔆 Agilent 12:29:	11 Sep 15, 2005		RL	Peak Search
Ret 107 dBµV #Peak	#Atten 0 dB		Mkr1 2.386 27 GHz 53.82 dBµ∨	Next Peak
dB/				Next Pk Right
30 dB DI 54.0				Next Pk Lett
54.0 dBμV LgAv			, i i i i i i i i i i i i i i i i i i i	Min Search
V1 S2 S3 FC AA				Pk-Pk Search
¤(1): FTun Swp				Mkr © CF
Center 2.350 00 G #Res BW 1 MHz		10 Hz	Span 80 MHz Sweep 6.238 s (601 pts)	More 1 ct 2

Page 150 of 197

RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)

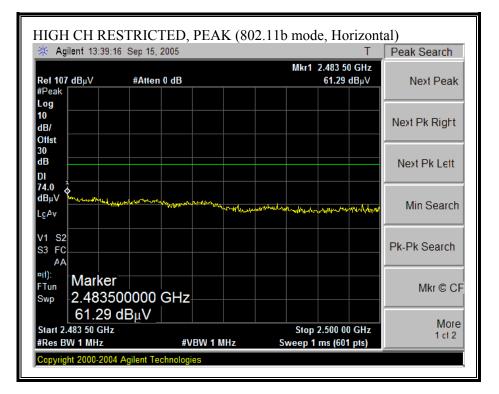


Page 151 of 197

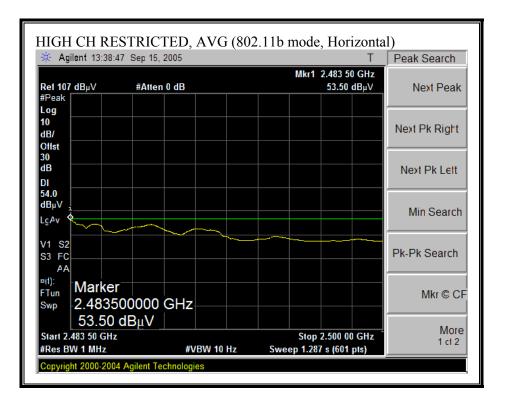


Page 152 of 197

RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)

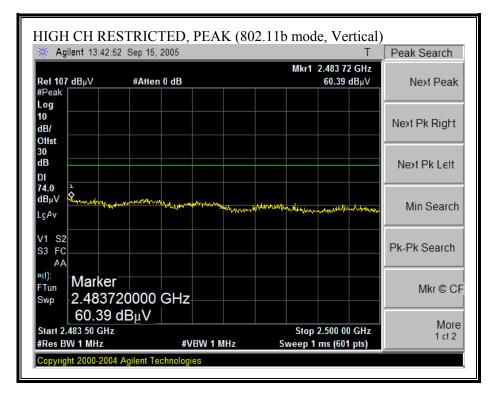


Page 153 of 197



Page 154 of 197

RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)



Page 155 of 197

🔆 Agilent 13:42:2	23 Sep 15, 2005			Т	Peak Search
Rei 107 dBµV	#Atten 0 dB		Mkr1	2.483 50 GHz 53.10 dBµV	Next Peak
#Peak Log					
10 dB/					Next Pk Right
Offst 30 dB					Next Pk Lett
DI 54.0 dBµV					Min Search
LgAv					
V1 S2 S3 FC					Pk-Pk Search
¤(1): =Tun Swp					Mkr © Cl
Start 2.483 50 GHz #Res BW 1 MHz		BW 10 Hz	Stop 2 Sweep 1.287	2.500 00 GHz 7 s (601 pts)	More 1 ct 2

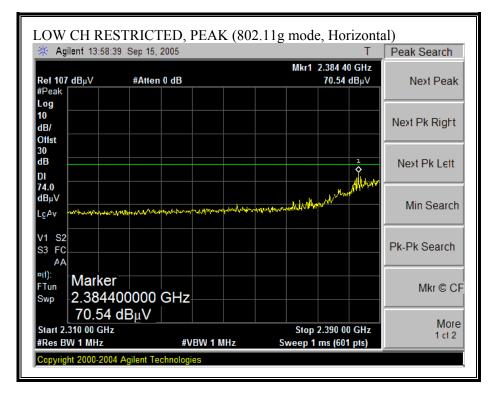
Page 156 of 197

HARMONICS AND SPURIOUS EMISSIONS (b MODE)

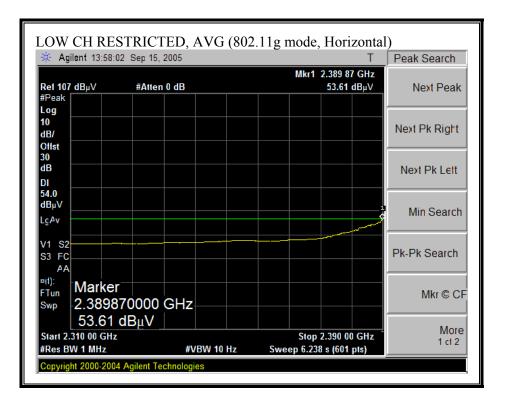
-			Services, M	organ F	нЦ Ор	en Fiel	d Site									
	gr: Chin #:05U36															
	y:Airgo	120-2														
UT De UT S/N		EN 3.2X2	Cardbus MI	IMO												
		C 15.247														
		ode, TX,														
Average	Power	Meter: Lo	w = 20 dBm,	$M_{1d} = 2$	0 dBm,	High =	20 dBm									
Fest Eq	uipment															
EMC	O Horn I	-18GHz	Pre-am	plifer 1-:	26 GHz		Pre-amplif	èr 26-4	OGHz		Horn >	18GHz			Limit	
T73: S	/N: 6717	@3m _	T144 Mit	eq 3008/	00931	. [-					FCC	15.205 🗸	
	uency Cab									I			-		_	
·	ot cable		t cable	4 foot o						HPF	Dela	ect Filter		Peak Meas RBW=VBW		
2 10	or calle			4 1001 (ante		2 foot cable				Reje	strmer				
		- 3_Ch	in 🗸		•	12	_William	•	HPF_	4.0GHz		•			<u>easurements</u> z ; VBW=10Hz	
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes	
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)	
Low Ch, B 4.824	3 mode 3.0	48.0	44.8	34.0	3.7	-33.6	0.0	0.0	52.8	49.6	74.0	54.0	-21.2	-4,4	н	
12.060	3.0	40.7	28.3	38.4	6.5	-33.5	0.0	0.9	53.1	40.7	74.0	54.0	- 20.9	-13.3	H	
4.824	3.0	46.5	42.7	34.0	3.7	-33.6	0.0	6.0	51.3	47.5	74.0	54.0	-22.7	-6.5	v	
Mid Ch. B 4.874	mode 3.0	47.2	43.3	34.1	3.8	-33.5	0.0	0.0	52.1	48.2	74.0	54.0	-21.9	-5.8	v	
7311	3.0	49.7	44.5	35.6	43	-33.3	0.0	0.6	57.0	51.8	74.0	54.0	-17.0	-2.2	v	
12.185 4.874	3.0 3.0	42.3	29.6 44.5	38.5 34.1	6.5 3.8	-33.4	0.0 0.0	0.9 0.6	54.8 52.8	42.1 49.4	74.0 74.0	54.0 54.0	-19.2 -21.2	-11.9 -4.6	V H	
7 <i>3</i> 11	3.0	50.0	43.9	35.6	43	-33.3	0.0	0.0	57.2	51.2	74.0	54.0	-16.8	-2.8	H	
High Ch, J	b mode															
4.924	3.0	48.9	45.7	34.1	3.8	-33.5	۵٥	6.0	53.9	50.7	74.0	54.0	-20.1	-3.3	V	
7.386 12.310	3.0 3.0	50.5 41.8	44.4 29.9	35.6 38.5	4.4 6.5	-36.7 -33.4	0.0 0.0	0.0 0.9	54.4 54.4	48.3 42.4	74 74.0	54 54.0	-19.6 -19.6	-5.7 -11.6	v v	
4.924	3.0	47.8	44.0	34.1	3.8	-33.5	0.0	0.6	52.8	49.0	74.0	54.0	-21.2	-5.0	н	
7.386	3.0	47.0	38.0	35.6	4.4	-36.7	0.0	6.0	50.9	41.9	74	54	-23.1	-12.1	H	
Note: No a	other emi	ssions were o	letected above i	the syste	m noise	fleer.			-							
				. 1						1						
		Measureme Distance to	ent Frequency Antenna	7		Amp D.Corr	Preamp (Distance		ct to 3 met	erc				Field Strength d Strength Lir		
		Listance to Analyzer R				D Corr Avg			ct to 5 met Strength @					a Strengtn Lif . Average Lif		
		Antenna Fa	0			Avg Peak	-		k Field Stre			-	-	: Peak Limit		

Page 157 of 197

RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)

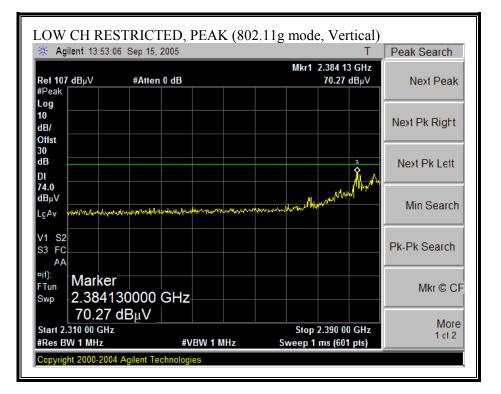


Page 158 of 197

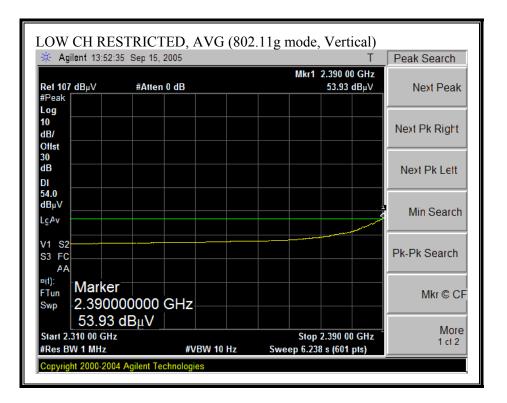


Page 159 of 197

RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)

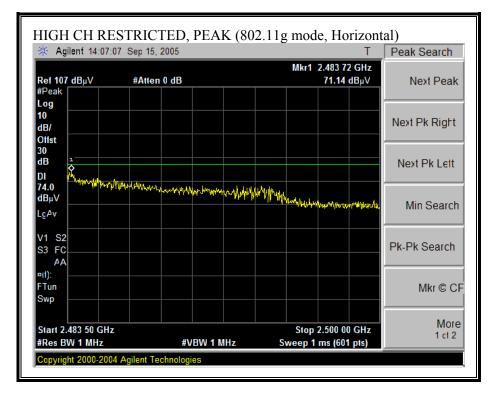


Page 160 of 197



Page 161 of 197

RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)

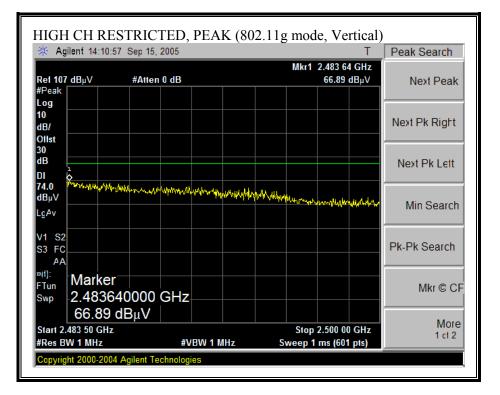


Page 162 of 197

🔆 Agilent 14:06:	24 Sep 15, 2005			RT	Peak Search
Rei 107 dB µV #Peak	#Atten 0 dB		Mkr1 2	.483 50 GHz 53.72 dBµV	Next Peak
Log 10 dB/ Offst					Next Pk Right
30 dB DI					Next Pk Lett
54.0 dBμV <u>1</u> LgAv	·····				Min Search
V1 S2 S3 FC AA					Pk-Pk Search
¤(1): FTun Swp					Mkr © CF
Start 2.483 50 GHz #Res BW 1 MHz		VBW 10 Hz	Stop 2 Sweep 1.287	.500 00 GHz s (601 pts)	More 1 ct 2

Page 163 of 197

RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)



Page 164 of 197

🔆 Agilent 14:10:	29 Sep 15, 2005					Т	Peak Search
	#Atten 0 dB			Mkr1 2.4	483 83 G 52.89 dB		Next Peak
#Peak Log							
10 dB/							Next Pk Right
Offst 30 dB							Next Pk Lett
DI							
LgAv							Min Search
V1 S2 S3 FC							Pk-Pk Search
	r						
FIUNI	30000 GHz						Mkr © CF
52.89							
Start 2.483 50 GHz	•	VBW 10 Hz	Swe	Stop 2.5 ep 1.287 s			More 1 ct 2

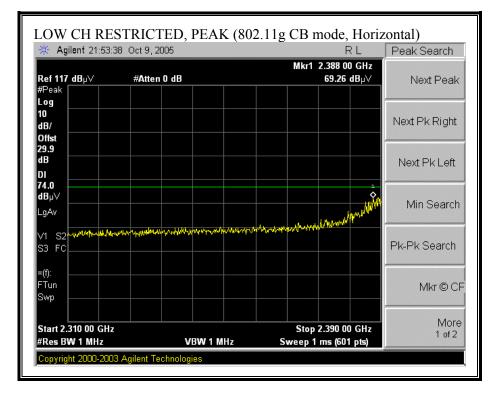
Page 165 of 197

HARMONICS AND SPURIOUS EMISSIONS (g MODE)

Project# Compan	#:05U36														
		EN 3.2X2	Cardbus M	IMO											
EUT S/N Fest Tai		C 15.247													
		node, TX,		1 4											
Average	Power	Meter: Lo	ow = 20 dBm,	$M_{1d} = 2$	U dBm,	High =	20 dBm								
Test Eq	uipment													_	
TMC) Horn 1	1801-	Pre-an	φlifer 1-3	266847		Pre-amplif	er 26-4	0GHz		Horn >	> 18GHz			Limit
							по-анрш							FCC	15.205
	/N: 6717	- <u> </u>	T144 Min	16d 30085	00931	-			•						•
	uency Cab													Peak Meas	
2 fo	ot cable	3 foo	ot cable	4 foot o	able	12	2 foot cable			HPF	Reje	ect Filter		RBW=VBW	/=1MHz
		3_Ch	in 🗸			12	William		HPF	4.0GHz 🖕		-			easurements
					<u> </u>		-							RBW=1MH	z;VBW=10Hz
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Сон	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	٩B _	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
Low Ch 4.824	3.0	41.9	29.8	34.0	3.7	-33.6	0.0	0.6	46.7	34.6	74.0	54.0	-27.3	-19.4	н
12.060	3.0	44.9	30.6	38.4	65	-33.5	0.0	0.9	57 <i>3</i>	43.0	74.0	54.0	- 16.7	-11.0	H
14.472 4.824	3.0 3.0	40.8	29.0 32.2	39.4 34.0	6.4 3.7	-32.8 -33.6	0.0 0.0	0.9 0.6	54.8 49.3	43.0 37.0	74.0 74.0	54.0 54.0	-19.2 -24.7	-11.0 -17.0	H V
12.060	3.0	40.0	28.2	38.4	6.5	-33.5	0.0	0.9	52.4	40.6	74.0	54.0	-21.6	-13.4	v
Mid Ch															
4.874	3.0	46.4	35.3	34.1	3.8	-33.5	0.0	6.0	51.3	40.2	74.0	54.0	-22.7	-13.8	v
7.311 4.874	3.0 3.0	57.7 43.8	39.8 32.4	35.6 34.1	4.3 3.8	-33.3 -33.5	0.0 0.0	6.0 6.0	65.0 48.6	47.1 37.2	74.0 74.0	54.0 54.0	-9.0 -25.4	-6.9 -16.8	V H
7.311	3.0	52.7	39.5	35.6	43	-33.3	0.0	0.0	60.0	46.8	74.0	54.0	-14.0	-7.2	н
IE-1 (2															
High Ch 4.924	3.0	46.1	34.3	34.1	3.8	-33.5	0.0	6.0	51.1	39.2	74.0	54.0	-22.9	-14.8	v
7.386	3.0	58.7	41.6	35.7	43	-33.3	0.0	6.0	0.66	48.9	74.0	54.0	- 8.0	-5.1	v
4.924	3.0	42.1	30.7	34.1	3.8	-33.5	0.0	0.0	47.1	35.7	74.0	54.0	-27.0	-18.3	H
7.386	3.0	52.1	37.2	35.7	4.3	-33.3	0.0	6.0	59 <i>.</i> 4	44.5	74.0	54.0	-14.6	-9.5	H
Note: No a	ther emi	ssions were	detected above	the system	m noise	floor.									
	f	Measurem	ent Frequency	у		Amp	Preamp	Gain				Avg Lim	Average I	Field Strength	Limit
		Distance to				D Corr			ct to 3 met			Pk Lim		d Strength Li	
		Analyzer R	-			Avg			Strength @			-	-	. Average Li	nit
	AF	Antenna Fa	actor 5			Peak HPF	Calculate High Pas		k Field Stre	ngth		Pk Mar	Margin vs	. Peak Limit	

Page 166 of 197

RESTRICTED BANDEDGE (g CHANNEL BOND MODE, LOW CHANNEL, HORIZONTAL)

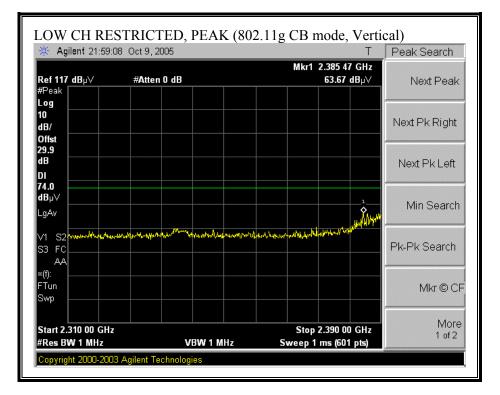


Page 167 of 197

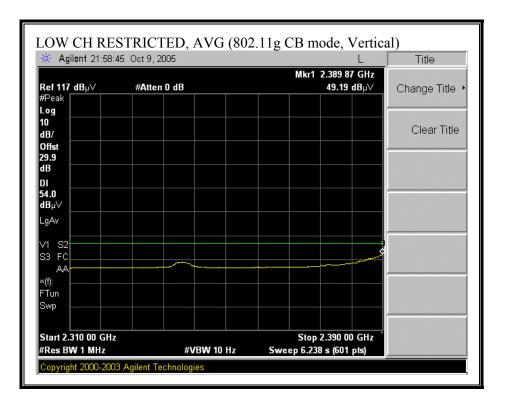
🔆 Agilent 21:50:	35 Oct 9, 2005		Т	Peak Search
Ref 117 dB µ∀ #Peak	#Atten 0 dB		Mkr1 2.390 00 GHz 53.71 dBµ∨	
Log 10 dB/ Offst				Next Pk Right
29.9 dB DI				Next Pk Left
54.0 dBµ∨ LgAv				Min Search
V1 S2				Pk-Pk Search
∝(f): FTun Swp				Mkr © CF
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 1	IO Hz	Stop 2.390 00 GHz Sweep 6.238 s (601 pts)	More 1 of 2

Page 168 of 197

RESTRICTED BANDEDGE (g CHANNEL BOND MODE, LOW CHANNEL, VERTICAL)

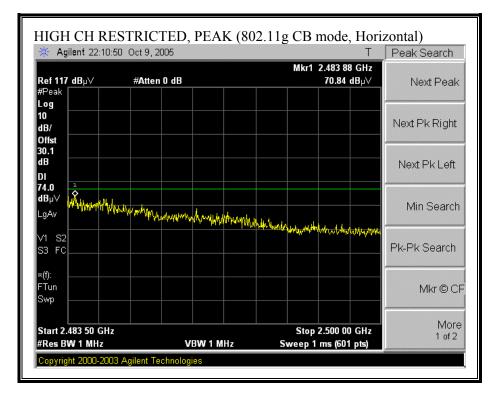


Page 169 of 197



Page 170 of 197

RESTRICTED BANDEDGE (g CHANNEL BOND MODE, HIGH CHANNEL, HORIZONTAL)

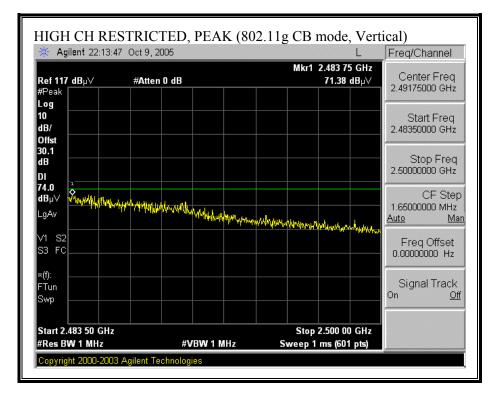


Page 171 of 197

🔆 Agilent 22:09:6	50 Oct 9, 2005		Т	Peak Search
Ref 117 dBµ∨ #Peak	#Atten 0 dB		Mkr1 2.483 53 GHz 53.88 dBµ∨	
Log 10 dB/ Offst				Next Pk Right
30.1 dB DI 54.0				Next Pk Left
dB μV LgAv				Min Search
V1 S2 S3 FC				Pk-Pk Search
«(f): =Tun Swp				Mkr © CF
Start 2.483 50 GHz #Res BW 1 MHz		V 10 Hz	Stop 2.500 00 GHz Sweep 1.287 s (601 pts)	More 1 of 2

Page 172 of 197

RESTRICTED BANDEDGE (g CHANNEL BOND MODE, HIGH CHANNEL, VERTICAL)



Page 173 of 197

🔆 Agilent 22:23:3	36 Oct 9, 2005	R T	Freq/Channel
Ref 117 dBµ∨ #Peak	#Atten 0 dB	Mkr1 2.483 64 GHz 53.93 dBμ∨	Center Freq 2.49175000 GHz
Log 10 dB/ Offst			Start Freq 2.48350000 GHz
30.1 dB DI			Stop Freq 2.5000000 GHz
54.0 dBµ∨ LgAv			CF Step 1.6500000 MHz <u>Auto Man</u>
V1 S2 S3 FC		~	Freq Offset 0.00000000 Hz
»(f): FTun Swp			Signal Track On <u>Off</u>
Start 2.483 50 GHz #Res BW 1 MHz	#VBW 10 Hz	Stop 2.500 00 GHz Sweep 1.287 s (601 pts)	*

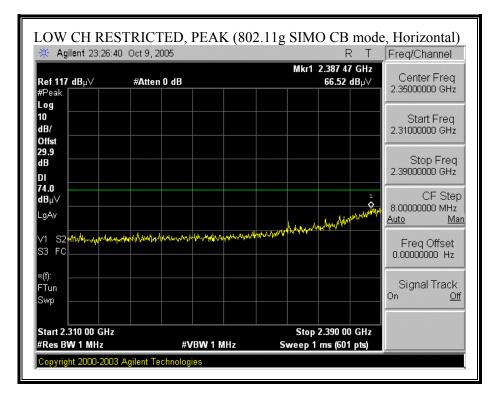
Page 174 of 197

HARMONICS AND SPURIOUS EMISSIONS (g CHANNEL BOND MODE)

Complia	ance Ce	ertification Se	rvices, M	organ	Hill Oj	pen Fiel	d Site									
est En	ıgr: Jos	eph Chung														
	#: 05U															
-	ny: Airg	,														
	-	2x3 MIMO (N3023PC-01	CardBus													
		CC 15.209														
	~	X Channel Bo	nding G n	node												
verag	e Powe	r Meter: Low	= 13.5 dBr	n, High	= 16.5	dBm										
est Eq	nipmer	<u>it:</u>														
н	lorn 1	18GHz	Pre-ar	nplifer	1-26	GHz	Pre-am	plifer	26-40GH	Iz		н	orn > 18	GHz		Limit
T73; S	S/N: 671	7@3m 🗸	T144 N	liteq 30	008A00	931 🗸				•					-	FCC 15.209
- Hi Fred	quency Ca	bles								י ב- ה						1
	2 foot	cable	3	foot	able		12	foot c	able			HPF	Re	eject Filte		<u>s Measurements</u> W=VBW=1MHz
		•	Josep	h 1872	15001	-	Joseph	20894	6001 🖕	1 1	HPF	-4.0GHz	-			ge Measurement
									_	1	J				RBW=	1MHz ; VBW=10H
f	Dist	1 1	-	AF	CL	Amp	1		Peak		vg		-	1	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBu	V/m	dBuV/m	dBuV/m	dB	dB	(V/H)
OW CH 824	12412 M 3.0	Hz, G mode CB : 48.0	32.2	33.7	3.4	-36.5	0.0	6.0	49.2	33	4	74	54	-24.8	-20.6	v
.024 .236	3.0	46.0	32.6	35.4	3.5	-36.2	0.0	0.0	49.2 50.9	30		74	54 54	-24.0	-20.0	v v
648	3.0	43.1	31.5	37.5	4.0	-37.0	0.0	0.8	48.4	36		74	54	-25.6	-17.3	v
0.520	3.0	55.3	38.2	37.9	4.1	-36.7	0.0	0.9	61.6	44		74	54	-12.4	-9.6	<u>v</u>
.824 .236	3.0 3.0	47.2 45.4	34.7	33.7 35.4	3.4 3.5	-36.5 -36.2	0.0 0.0	0.0 0.0	48.4 48.7	35 34		74 74	54 54	-25.6 -25.3	-18.1 -19.4	H H
.648	3.0	43.4	30.3	37.5	3.5 4.0	-30.2	0.0	0.0	46./	34 35		74	54 54	-25.3	-19,4	H
0.520	3.0	50.1	34.4	37.9	4.1	-36.7	0.0	0.9	56.3	40		74	54	-17.7	-13.4	H
1 CH 24	62 MHz	G mode CB														
924	3.0	49.3	33.6	33.8	3.4	-36.5	0.0	6.0	50.6	34	9	74	54	-23.4	-19.1	v
386	3.0	48.2	32.1	35.6	3.5	-36.2	0.0	0.0	51.8	35		74	54	-22.2	-18.3	v
.484	3.0	47.5	30.5	37.3	39	-36.9	0.0	0.8	52.7	35		74	54	-21.3	-18.3	<u>v</u>
924 386	3.0 3.0	48.1 46.7	32.8 31.5	33.8 35.6	3.4 3.5	-36.5 -36.2	0.0 0.0	6.0 6.0	49.4 50.3	34 35		74 74	54 54	-24.6 -23.7	-19.9 -18.9	H H
484	3.0	45.6	30.3	37.3	3.9	-36.9	0.0	0.8	50.8	35		74	 54	-23.2	-18.5	H
		No other emi	ssions were	detected	l above s	vstem no	ise floor.									
	Ì						I						1	1		
	f	Measurement	Frequency	7		Amp	Preamp (Gain					Avg Lim	Average F	Field Strengt	h Limit
	Dist	Distance to A		r		-	-		ct to 3 met	ers			Pk Lim	-	d Strength L	
		Analyzer Rea				Avg			Strength @						. Average L	
	AF	Antenna Fact	0			Peak			c Field Stre				-	-	. Peak Limit	
										0						

Page 175 of 197

RESTRICTED BANDEDGE (g SIMO CHANNEL BOND MODE, LOW CHANNEL, HORIZONTAL)

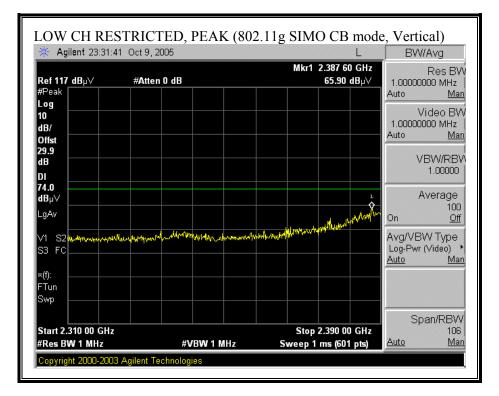


Page 176 of 197

🔆 Agilent 23:27:33	3 Oct 9, 2005	L	Freq/Channel
Ref 117 dBµ∨ #Peak	#Atten 0 dB	Mkr1 2.390 00 GHz 53.40 dBµ∨	Center Freq 2.35000000 GHz
Log 10 dB/ Offst			Start Freq 2.31000000 GHz
29.9 dB DI			Stop Freq 2.39000000 GHz
54.0 dBµ∨ _gAv			CF Step 8.0000000 MHz <u>Auto Mar</u>
V1 S2			Freq Offset 0.00000000 Hz
«(f): =Tun Swp			Signal Track On <u>Off</u>
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 10 H	Stop 2.390 00 GHz z Sweep 6.238 s (601 pts)	

Page 177 of 197

RESTRICTED BANDEDGE (g SIMO CHANNEL BOND MODE, LOW CHANNEL, VERTICAL)

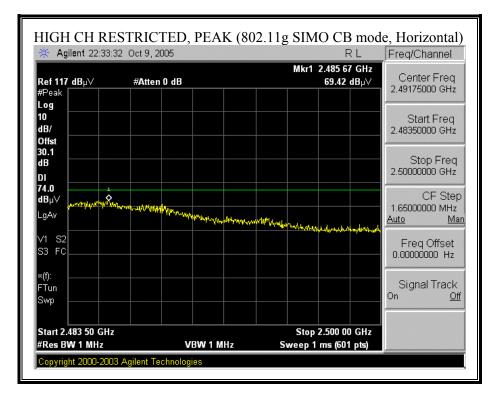


Page 178 of 197

🔆 Agilent 23:32:	48 Oct 9, 2005	L	BW/Avg
Ref 117 dB _µ ∨ #Peak	#Atten 0 dB	Mkr1 2.390 00 GHz 51.99 dBµ∀	Res BV 1.0000000 MHz Auto <u>Mar</u>
Log 10 dB/ Offst			Video BW 10.0000000 Hz Auto <u>Mar</u>
29.9 dB DI			VBW/RBV 1.00000
54.0 dBµ∨ LgAv			Average 100 On <u>Off</u>
V1 S2			Avg/VBW Type Log-Pwr (Video) <u>Auto Mar</u>
*(f): FTun Swp			
Start 2.310 00 GHz #Res BW 1 MHz	//////////////////////////////////////	Stop 2.390 00 GHz z Sweep 6.238 s (601 pts)	Span/RBW 106 <u>Auto Mar</u>

Page 179 of 197

RESTRICTED BANDEDGE (g SIMO CHANNEL BOND MODE, HIGH CHANNEL, HORIZONTAL)

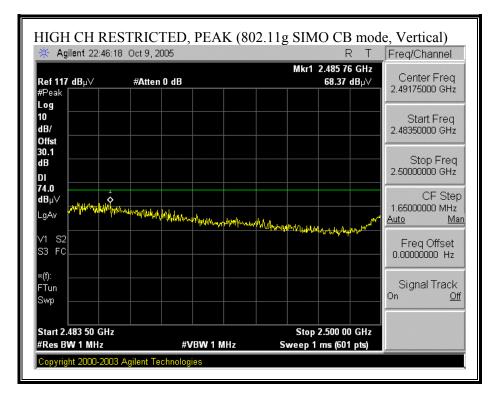


Page 180 of 197

🔆 Agilent 22:34:0	04 Oct 9, 2005			T Peak Search
Ref 117 dB µ∨ ⊄Peak	#Atten 0 dB		Mkr1 2.483 50 G 53.56 dB	
.og IO IB/ Offst				Next Pk Right
0.1 IB)I				Next Pk Left
i4.0 IBμ∨ .gAv				Min Search
/1 S2 33 FC				Pk-Pk Search
(f): :Tun Gwp				Mkr © Cf
Start 2.483 50 GHz Res BW 1 MHz	#VBW 1	10 Hz	Stop 2.500 00 G Sweep 1.287 s (601 pts	

Page 181 of 197

RESTRICTED BANDEDGE (g SIMO CHANNEL BOND MODE, HIGH CHANNEL, VERTICAL)



Page 182 of 197

🔆 Agilent 22:46:4	44 Oct 9, 2005		RT	Freq/Channel
Ref 117 dB µ∨ #Peak	#Atten 0 dB	Mkı	1 2.500 00 GHz 53.74 dBµ∨	Center Freq 2.49175000 GHz
Log 10 1B/				Start Freq 2.48350000 GHz
Dffst 80.1 1B				Stop Freq 2.5000000 GHz
54.0 1ВµV _gAv				CF Step 1.6500000 MHz Auto Mai
v1 S2				Freq Offset 0.00000000 Hz
*(f): =Tun Swp				Signal Track On <u>Off</u>
Start 2.483 50 GHz Res BW 1 MHz			op 2.500 00 GHz 287 s (601 pts)	

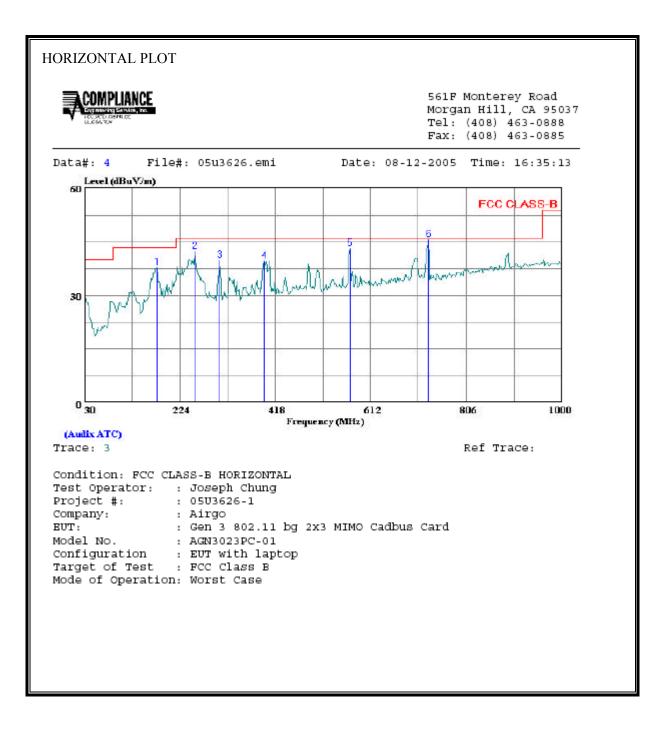
Page 183 of 197

HARMONICS AND SPURIOUS EMISSIONS (g SIMO CHANNEL BOND MODE)

0/13/05	High	Frequency	Measurem	ent											
Complia	-		Services, M		Hill Oj	pen Fiel	d Site								
fest Fn	or∵.Tos	eph Chung													
	#: 05U3														
	y: Airg														
-		Gen 3 2x3	Cardbus												
EUT M	N: AG	N3023PC-0	1												
est Ta	rget: F	CC 15.209													
	•	X SIMO CI													
verage	e Powei	: Meter: Lo	w = 13.4 dBr	n, High	= 14.8	dBm									
est Eq	uipmen	t:													
		40.011-	Dress		4.00	<u></u>	Dec. em		06 40 01			orn > 18	cu-		Limit
		18GHz	Pre-ar	- C			Fre-am	piller	26-40GH			om > 18	GHZ		
173; 9	5/N: 671	7 @3m	T144 N	Aliteq 30	08A00	931				•				•	FCC 15.209
Hi Freq	quency Ca	bles													
	2 foot	cable	3	foot	able		12	foot c	able		HPF	P	eject Filte	Peal	<u>a Measurements</u>
	21000	Cabio											ejectrint	RB	W=VBW=1MHz
			Jose	oh 1872 [.]	15001	-	Joseph	20894	6001 🖕	HP	F_4.0GHz	-		Y	ge Measurements
									_					RBW=	1MHz ; VBW=10Hz
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
OW CH 824	2412 M 3.0	Hz 45.3	33.8	33.7	3.4	-36.5	0.0	6.0	46.5	35.0	74	54	-27.5	-19.0	н
.824	3.0	45.3	33.8	35.4	3.4 3.5	-36.2	0.0	0.0 0.0	40.5	35.0	74 74	54 54	-27.5	-19.0	<u>н</u> Н
.648	3.0	42.9	31.6	37.5	4.0	-37.0	0.0	0.8	48.2	36.9	74	54	-25.8	-17.1	H
824	3.0	45.9	33.5	33.7	3.4	-36.5	0.0	0.6	47.1	34.7	74	54	- 26.9	-19.3	v
.236 .648	3.0 3.0	46.7 44.6	32.4 31.5	35.4 37.5	3.5 4.0	-36.2 -37.0	0.0 0.0	0.6 0.8	50.1 49.8	35.7 36.8	74 74	54 54	-23.9 -24.2	-18.3	v
.048	3.0	44.0	315	315	4J)	-37.0	U.U	0.8	49.8	30.8	74	54	-24.2	-17.2	Υ
II CH 24	62 MHz														
924	3.0	46.5	35.3	33.8	3.4	-36.5	0.0	0.0	47.8	36.6	74	54	-26.2	-17.4	<u>v</u>
386 924	3.0 3.0	44.7 45.2	33.5 34.3	35.6 33.8	3.5 3.4	-36.2 -36.5	0.0 0.0	0.0 6.0	48.3 46.5	37.1 35.6	74 74	54 54	-25.7 -27.5	-16.9 -18.4	Vн
.386	3.0	43.2	32.1	35.6	35	-36.2	0.0	0.0 0.0	46.8	35.7	74	54 54	-27.2	-18.3	H
		No other e	missions were	detected	above s	vstem no	ise floor.								
				l		(Ì								
		Measurem	ent Frequenc	v		Amp	Preamp (Gain				Avg Lim	Average .	Field Strengt	h Limit
	f						-		et to 3 met	ers		Pk Lim	-	d Strength L	
	f Dist							r Distance Correct to 3 meters						0	
	Dist		eading			Avg	Average Field Strength @ 3 m Avg Mar Margi Calculated Peak Field Strength Pk Mar Margi						-		
	Dist	Distance to Analyzer R Antenna Fa				Avg Peak	-		- 0			-	-	s. Average L s. Peak Limit	

Page 184 of 197

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

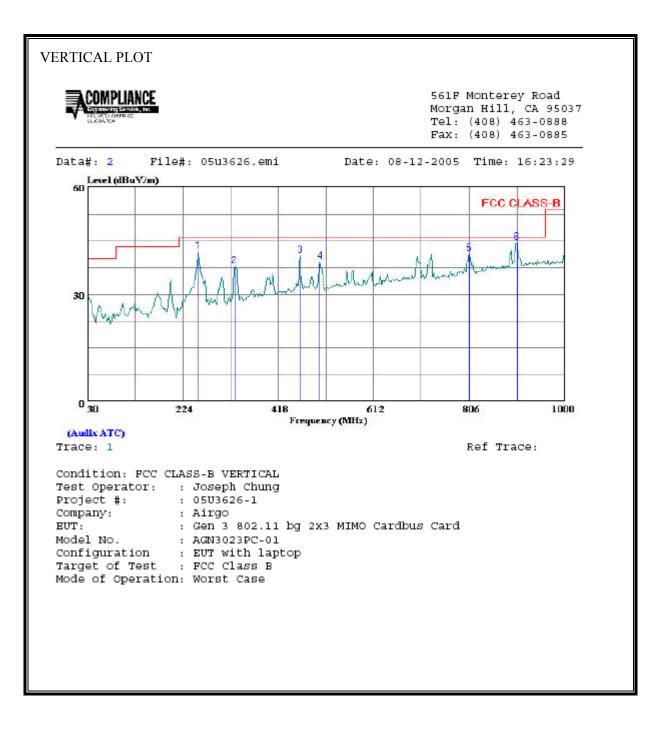


Page 185 of 197

HORIZO	ONTAL DA	TA							
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark		ge: 1 Probe Factor
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		dB	dB
1	177.440	24.61	13.11	37.72	43.50	-5.78	Peak	1.12	11.99
2	255.040	28.20	14.09	42.29	46.00	-3.71	Peak	1.39	12.70
3	305.480	24.17	15.80	39.97	46.00	-6.03	Peak	1.54	14.26
4	395.690	21.74	17.93	39.67	46.00	-6.33	Peak	1.72	16.21
5	570.290	22.13	21.14	43.27	46.00	-2.73	Peak	2.14	19.00
6	730.340	22.02	23.57	45.59	46.00	-0.41	Peak	2.48	21.09

Page 186 of 197

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)



Page 187 of 197

VERT	ICAL DATA	4							
	Freq	Read Level		Level	Limit Line	Over Limit	Remark	Cable	
	MHz	dBuV	dB	dBuV/m	\overline{dBuV}/m	dB		dB	dB
1	255.040	27.99	14.09	42.08	46.00	-3.92	Peak	1.39	12.70
2	329.730	21.60	16.44	38.04	46.00	-7.96	Peak	1.60	14.84
3	463.590	21.49	19.50	40.99	46.00	-5.01	Peak	1.92	17.58
4	502.390	18.92	20.24	39.16	46.00	-6.84	Peak	1.97	18.27
5	805.030	16.88	24.61	41.49	46.00	-4.51	Peak	2.65	21.96
6	902.030	18.70	25.93	44.63	46.00	-1.37	Peak	2.95	22.98

Page 188 of 197

7.9. POWERLINE CONDUCTED EMISSIONS

<u>LIMIT</u>

\$15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted I	.imit (dBuV)
	Quasi-peak	Average
0.15-0.5	66 to 56 °	56 to 46 *
0.5-5	56	46
5-30	60	50

Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

No non-compliance noted:

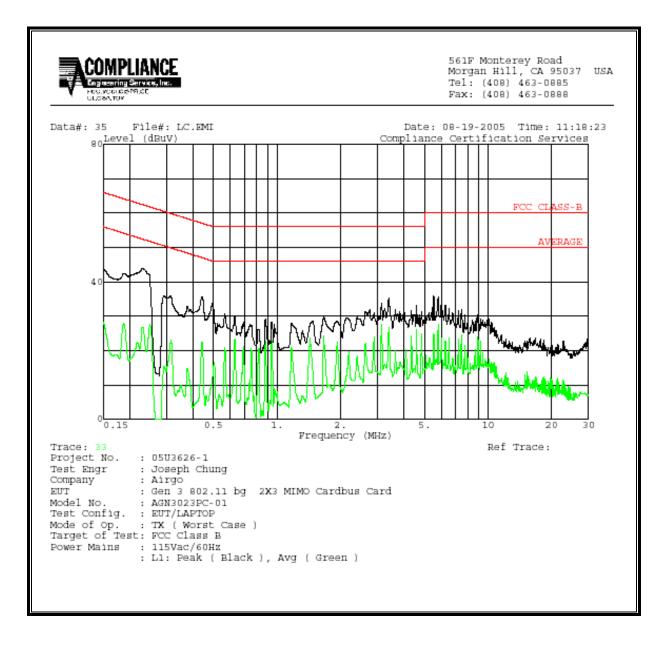
Page 189 of 197

<u>6 WORST EMISSIONS</u>

	CONDUCTED EMISSIONS DATA (115VAC 60Hz)											
Freq.		Closs	Limit	FCC_B	Marg	,in	Remark					
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV(dB)	L1/L2			
0.30	43.98		26.82	0.00	60.27	50.27	-16.29	-23.45	L1			
0.44	35.76		22.29	0.00	57.02	47.02	-21.26	-24.73	L1			
5.53	35.78		24.94	0.00	60.00	50.00	-24.22	-25.06	L1			
0.19	43.20		32.78	0.00	64.17	54.17	-20.97	-21.39	L2			
0.73	39.72		21.64	0.00	56.00	46.00	-16.28	-24.36	L2			
5.80	35.16		26.99	0.00	60.00	50.00	-24.84	-23.01	L2			
6 Worst I	 Data 											

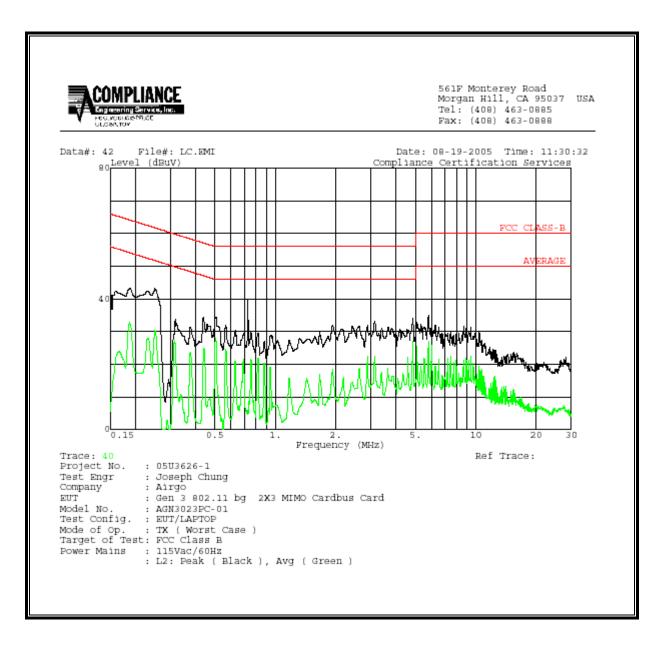
Page 190 of 197

LINE 1 RESULTS



Page 191 of 197

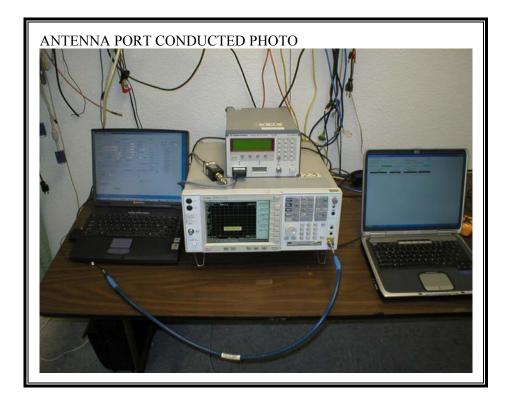
LINE 2 RESULTS



Page 192 of 197

8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

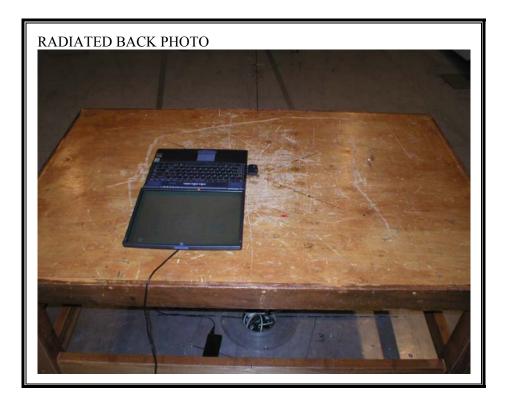


Page 193 of 197

RADIATED RF MEASUREMENT SETUP



Page 194 of 197



Page 195 of 197

POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP



Page 196 of 197



END OF REPORT

Page 197 of 197