

FCC CFR47 CERTIFICATION CLASS II PERMISSIVE CHANGE TEST REPORT

FOR

2.4 & 5 GHz 802.11 MINICARD

MODEL NUMBER: AR5BXB72

FCC ID: PPD-AR5BXB72-L

REPORT NUMBER: 06U10634-1

ISSUE DATE: OCTOBER 23, 2006

Prepared for

ATHEROS COMMUNICATIONS, INC. 5480 GREAT AMERICA PARKWAY SANTA CLARA, CA 95054, USA

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



Revision History

	Issue		
Rev.	Date	Revisions	Revised By
	10/19/2006	Initial Issue	Thu

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1. ATTESTATION OF TEST RESULTS

CT A NI		
	APPLICABLE STANDARDS	
DATE TESTED:	OCTOBER 02 - 10, 2006	
MODEL:	AR5BXB72	
EUT DESCRIPTION:	2.4 & 5 GHz 802.11 MINICARD	
COMPANY NAME:	ATHEROS COMMUNICATIONS, INC. 5480 GREAT AMERICA PARKWAY SANTA CLARA, CA 95054, USA	
COMDANY NAME.		

STANDARDTEST RESULTSFCC PART 15 SUBPART CNO NON-COMPLIANCE NOTED

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:

EMC SUPERVISOR COMPLIANCE CERTIFICATION SERVICES

VIEN TRAN EMC ENGINEER COMPLIANCE CERTIFICATION SERVICES

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%.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The AR5BXB72 is designed for 802.11a/b/g/n applications using the AR541X/51XX chipset. It has three receive chains and two transmit chains, implemented with two outside chains (Chain 0 and 2) as Tx/Rx and the middle chain (chain 1) as Rx only.

5.2. MANUFACTURER'S DESCRIPTION OF MODEL DIFFERENCES

Both models AR5BXB72 and AR5BXB72-L are identical product and same hardware configuration, it just for the marketing purpose only.

5.3. CLASS II PERMISSIVE CHANGE DESCRIPTION

Installed 2.4 & 5 GHz 802.11 Minicard (WLAN FCC ID: PPD-AR5BXB72-L) in tablet laptop (LENOVO ThinkPad X60 Tablet_1.0 SIV A).

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a set of three identical PIFA antennas with maximum gain is 1.52 dBi in the 2.4 GHz band and 2.13 dBi in the 5.8 GHz band

5.5. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was AR5002, ANWI Diagnostic Kernel Drive.

The test utility software used during testing was Art Software Revision 4 Build # 7 Art 11n.

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5.6. WORST-CASE CONFIGURATION AND MODE

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

Thus all emissions tests were made with following data rates:

- 802.11b mode, 20 MHz Channel Bandwidth, 1 Mb/s, CCK Modulation, Spatial Stream 1.
- 802.11g mode, 20 MHz Channel Bandwidth, 9 Mb/s, OFDM Modulation, Spatial Stream
- 802.11a mode, 20 MHz Channel Bandwidth, 9 Mb/s, OFDM Modulation, Spatial Stream
- 802.11n HT20 mode, 20 MHz Channel Bandwidth, MCS0, 6.5 Mb/s, OFDM Modulation, Spatial Stream 1.
- 802.11n HT40 mode, 40 MHz Channel Bandwidth, MCS0, 13.5 Mb/s, OFDM Modulation, Spatial Stream 1.

The worst-case configuration for tests below 1 GHz is the mode and channel with the highest power: 802.11b mode, mid channel.

The portable configuration at Z-Axis has the worst field strength emissions for both portable & mobile configurations. So, all radiated emissions tests were performed at Z-axis portable configuration.

Baseline testing demonstrated that the Power Spectral Density as measured through a combiner with both chains operating simultaneously is less than the sum of the Power Spectral Density of each individual chain when added linearly.

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5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST									
Description	Manufacturer	Model	Serial Number	FCC ID					
AC Adapter	Lenovo	ThinkPad X60 Tablet 1.0 SIV B	91B52	N/A					
Latop	Lenovo	ThinkPad X60 Tablet 1.0 SIV A	91A14	N/A					

I/O CABLES

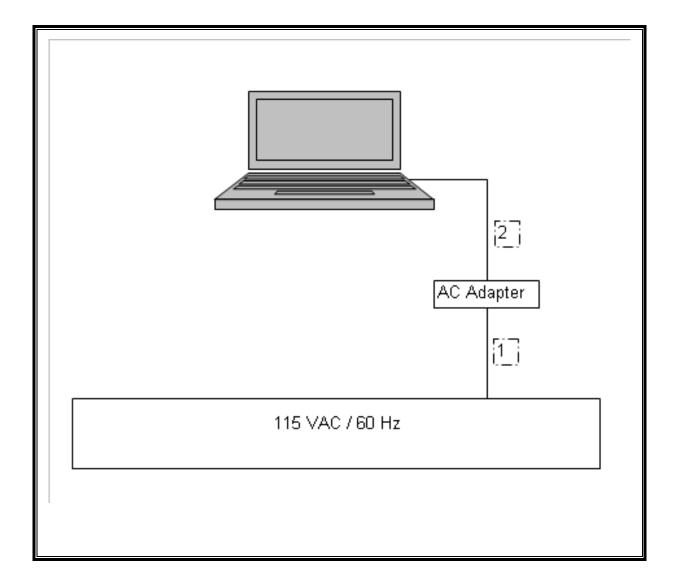
	I/O CABLE LIST										
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks					
1	AC	1	US115	Shielded	.50m	No					
2	DC	2	DC	Shielded	1.0m	Ferrite on laptop's end					

TEST SETUP

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

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SETUP DIAGRAM FOR TESTS



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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				
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	MY43360112	5/3/2007				
Antenna, Horn 1 ~ 18 GHz	ETS	3117	29310	4/22/2007				
Preamplifier, 1 ~ 26 GHz	Miteq	NSP2600-SP	924342	9/2/2007				
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	2/4/2007				
RF Filter Section	Agilent / HP	85420E	3705A00256	2/4/2007				
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	9/3/2007				
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	8/30/2007				
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/2007				
EMI Test Receiver	R & S	ESHS 20	827129/006	11/3/2006				

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7. LIMITS AND RESULTS

7.1. RADIATED EMISSIONS

7.1.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

<u>LIMITS</u>

§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.

§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

Field Strength

Measurement Distance

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(MHz)	(microvolts/meter)	(meters)
30 - 88 88 - 216	100 ** 150 **	3 3
216 - 960 Above 960	200 ** 500	3 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.

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.

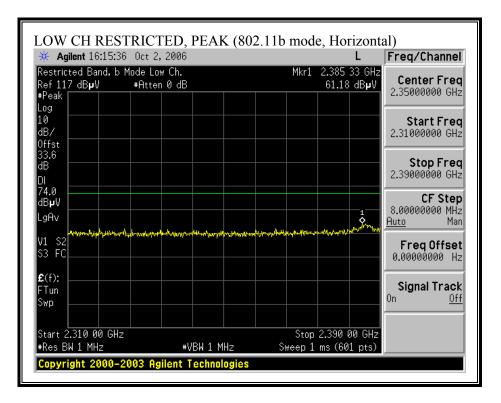
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

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7.1.2. TRANSMITTER ABOVE 1 GHz FOR 2400 TO 2483.5 MHz BAND

<u>11b</u>

RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)

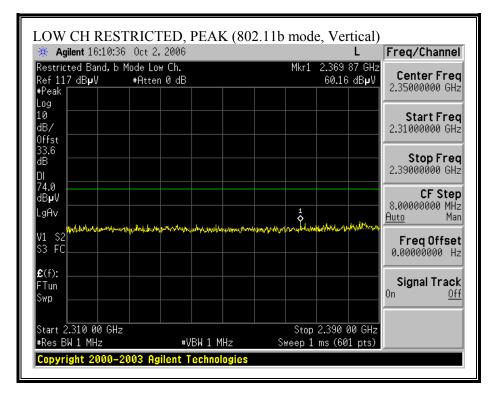


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🔆 Agilent 16:16:	40 Oct 2,2006			RL	Freq/Channel
Restricted Band, b Ref 117 dB µ V			Mkr1	2.386 53 GHz 52.78 dB µ V	Conton Eron
#Peak Log					2.33000000 0112
10 dB/					Start Freq 2.31000000 GHz
Offst 33.6 dB DI					Stop Freq 2.39000000 GHz
54.0 dBµV LgAv					CF Step 8.00000000 MHz Auto Man
V1 S2 S3 FC					Freq Offset 0.00000000 Hz
£ (f): FTun Swp					Signal Track On <u>Off</u>
Start 2.310 00 GH #Res BW 1 MHz		BW 10 Hz) 2.390 00 GHź 38 s (601 pts)	

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RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)

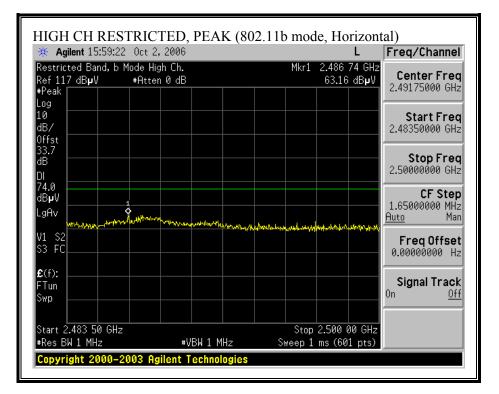


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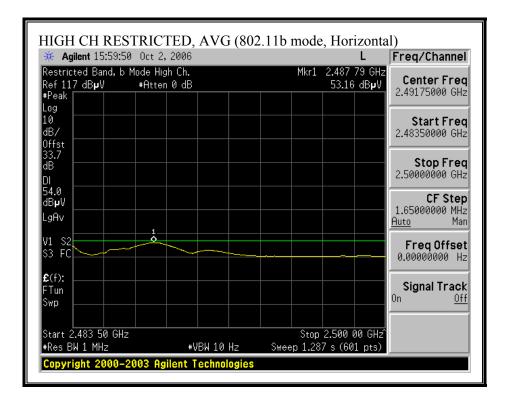
🔆 Agilent 16:11:	19 Oct 2,2006			RT	Freq/Channel
Restricted Band, b Ref 117 dB µ V #Peak			Mkr1	2.385 47 GHz 49.45 dBµV	Center Freq 2.3500000 GHz
Log 10 dB/					Start Freq 2.31000000 GHz
33.6 dB DI 54.0					Stop Freq 2.39000000 GHz
dBµV					CF Step 8.00000000 MHz <u>Auto</u> Man
V1 S2 S3 FC £(f):				^1	FreqOffset 0.00000000 Hz
FTun Swp					Signal Track On <u>Off</u>
Start 2.310 00 GH #Res BW 1 MHz		 BW 10 Hz		2.390 00 GHzî 8 s (601 pts)	

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RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)

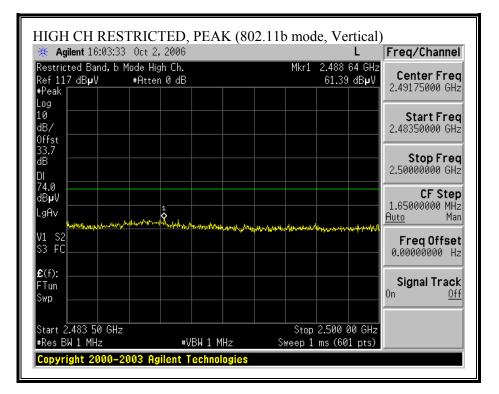


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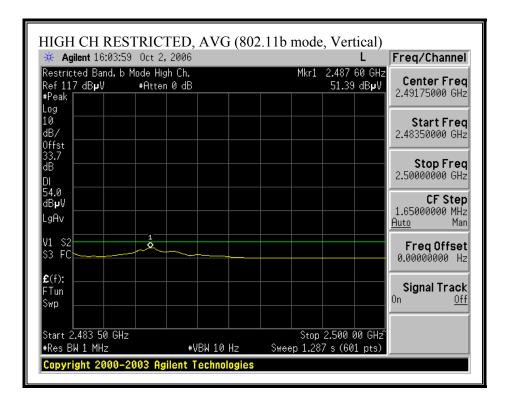


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RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)



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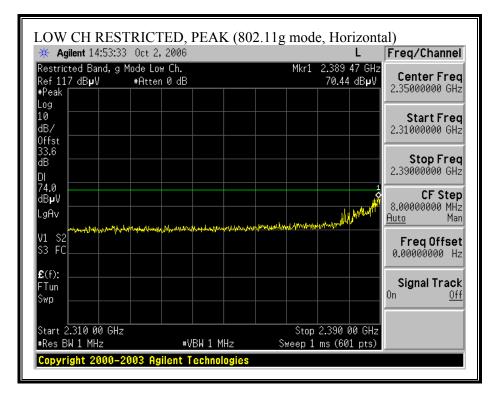
HARMONICS AND SPURIOUS EMISSIONS (b MODE)

	0/03/06		-	au., Den	.070 (5	(Japan) L	,ta								
		: Vien Tran EUT only													
	ration: 1 Tx 11b														
est Eq	uipmen	<u>.t:</u>													
н	orn 1-	-18GHz	Pre-a	mplifer	1-260	GHZ	Pre-am	nlifer	26-40GH	17	н	lorn > 180	GHz		Limit
				· ·				Pin	20	4 —		5111	5112		E C C 45 205
T1zv;	S/N: 29.)310 @3m	- 187 mi	liteq 9243	342	-				<u> </u>				•	FCC 15.205
- Hi Freq	quency Cał	ibles						_		a					
	2 foot	cable	3	3 foot c	able		12	foot c	able		HPF	R	eject Filte		k Measurements
	-											4 🖻	Jeen	RB1	W=VBW=1MHz
			✓ Vien	1872150	02	-	Vien 19	/720900	J5 🔻		F_4.0GHz	-			ige Measurements 1MHz; VBW=10Hz
I														KD ***~.	INHZ; VDW-IOUZ
f	Dist	Read Pk	: Read Avg.		CL	Amp	D Corr	1 1		Avg		Avg Lim		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)
	I, 2412 M 3.0	0Hz 57.7	52.4	33.7	2.9	-45.3	0.0	0.0	49.6	44.4	74	54	-24.4	-9.6	Н
4.824	3.0	57.7 48.5	52.4 36.9	33.7 37.7	2.9 4.8	-45.3	40 40	0.0	49.6 51.9	44.4 40.3	74 74	54 54	-22.1	-9.6 -13.7	H
4.824	3.0	57.0	52.8	33.7	2.9	-45.3	0.0	0.6	48.9	44.7	74	54	-25.1	-93	v
2.060	3.0	47.7	36.3	37.7	4.8	-40.0	0.0	0.9	51.1	39.7	74	54	-22.9	-14.3	V
D CH.	2437 MH	Az		-	ļ		-	¹				. 			
4.874	3.0	56.2	51.3	33.7	3.0	-45.3	0.0	0.0	48.2	43.3	74	54	-25.8	-10.7	H
7.311	3.0 3.0	50.3 49.0	39.4 37.3	35.2 37.7	4.2 4.9	-43.2 -40.1	0.0 0.0	0.6 0.9	47.1 52.4	36.2 40.7	74 74	54 54	-26.9 -21.6	-17.8 -13.3	H H
4.874	3.0 3.0	49.0 55.6	48.6	33.7	3.0	-45.3	0.0	6.0	47.6	40.7 40.6	74	54	-26.4	-13.4	v
7311	3.0	50.0	38.9	35.2	4.2	-43.2	0.0	6.0	46.8	35.7	74	54	-27.2	-18.3	v
2.185	3.0	48.4	37.4	37.7	4.9	-40.1	0.0	0.9	51.8	40.8	74	54	-22.2	-13.2	v
	I. 2462 M			++	,	-	1	ļ		ĺ!	<u> </u>			1	
4.924	3.0	54.7	49.4	33.8	3.1	-45.4	0.0	0.0	46.8	41.5	74	54	-27.2	-12.5	H
7.386	3.0 3.0	51.0 48.6	38.9 37.3	35.2 37.6	4.2 4.9	-43.1 -40.2	0.0 0.0	0.0 9.0	47.9 51.9	35.8 40.6	74 74	54 54	-26.1 -22.1	-18.2 -13.4	H H
4.924	3.0	54.5	47.8	33.8	3.1	-45.4	0.0	6.0	46.6	39.9	74	54	-27.4	-14.1	v
7.386	3.0	50.8	38.9	35.2	4.2	-43.1	Q.Q	0.0	47.7	35.8	74	54 54	-26.3	-18.2	V
12.310	3.0	49.3	37.3	37.6	4.9	-40.2	0.0	0.9	52.6	40.6	74	54	-21.4	-13,4	v
	1	1		No othe?	r emiss'	ions were	detected al	iove sys	stem noise flo	oor.	İ	1	1	1	
	f	Measurem	nent Frequency	v		Amp	Preamp (Gain				Avg Lim	Average ?	Field Strength	h T.imit
		Distance to		,		*	-		ect to 3 mete	ers				ld Strength Li	
	Read	Analyzer R	Reading			Avg	Average	Field S	Strength @	3 m		Avg Mar	Margin vs	s. Average Li	imit
		Antenna Fa				Peak			k Field Stre	ngth		Pk Mar	Margin vs	s. Peak Limit	
	CL	Cable Loss	S			HPF	High Pas:	s Filter	1						

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<u>11g</u>

RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)

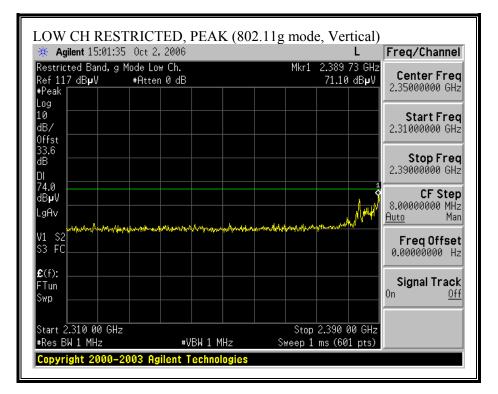


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🔆 Agilent 14:56:4	3 Oct 2,2006			RL	Freq/Channel
Restricted Band, g Ref 117 dB µ V			Mkr1	2.390 00 GHz 53.68 dB µ V	Center Freq 2.35000000 GHz
#Peak Log 10 dB/					Start Freq
0ffst 33.6 dB					Stop Freq 2.39000000 GHz
DI 54.0 dB µ V					CF Step 8.00000000 MHz
LgAv V1 S2					Auto Man Freq Offset
S3 FC					0.00000000 Hz
FTun Swp					Signal Track On <u>Off</u>
Start 2.310 00 GHz #Res BW 1 MHz		 BW 10 Hz	Stop 2 Sweep 6.238	2.390 00 GHz s (601 pts)	

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RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)

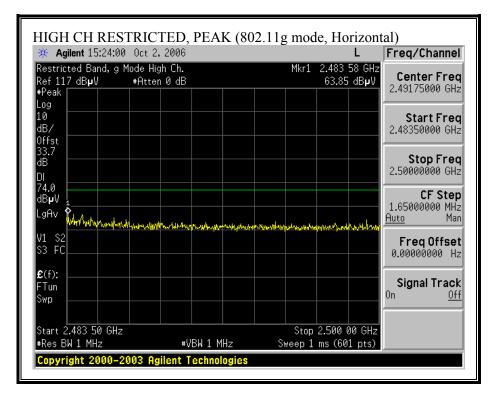


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🔆 Agilent 15:02:26	6 Oct 2,2006			L	. JI	Freq/Channel
Restricted Band, g M Ref 117 dB µ V			Mkr1	2.389 87 51.45 d	BuV	Center Freq 2.35000000 GHz
#Peak Log						2.0000000000000
10 dB/						Start Freq 2.31000000 GHz
Offst 33.6 dB					_	Stop Freq 2.39000000 GHz
54.0 dBµV						CF Step 8.00000000 MHz
LgAv					<u> </u>	<u>Auto</u> Man
V1 S2 S3 FC					¹	FreqOffset 0.00000000 Hz
£ (f):					-1	Signal Track
Swp						Dn <u>Off</u>
Start 2.310 00 GHz			<u> </u>	2.390 00		
#Res BW 1 MHz		W 10 Hz				

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RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)

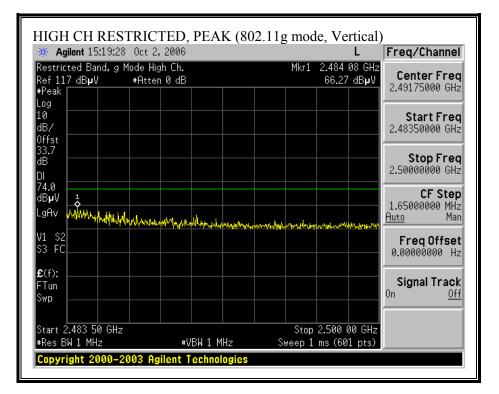


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🔆 Agilent 15:24:28	3 Oct 2,	2006				L	Freq/Channel
Restricted Band, g Ref 117 dB µ V #Peak				Mkr1	2.483 ! 49.27	58 GHz dB µ V	Center Freq 2.49175000 GHz
+reak Log 10							
dB/ 0ffst							Start Freq 2.48350000 GHz
33.7 dB DI							Stop Freq 2.50000000 GHz
54.0 dBµV LgAv							CF Step 1.65000000 MHz <u>Auto</u> Man
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			10 Hz	 Stop 3 ep 1.287	2.500 0		

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RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)



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🔆 Agilent 15:20:05			L	Freq/Channel
Restricted Band, g Ref 117 dB µ V		Mkr1	2.483 97 GHz 49.89 dBµV	Center Freq 2.49175000 GHz
#Peak Log				2.10173000 012
10 dB/ Offst				Start Freq 2.48350000 GHz
dB DI				Stop Freq 2.50000000 GHz
54.0 dB µ V LgAv				CF Step 1.65000000 MHz <u>Auto</u> Man
V1 S2 S3 FC	 			FreqOffset 0.00000000 Hz
£ (f): FTun Swp				Signal Track On Off
Start 2.483 50 GHz #Res BW 1 MHz	3W 10 Hz		2.500 00 GHzî 7 s (601 pts)	

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HARMONICS AND SPURIOUS EMISSIONS (g MODE)

	Tx 11g														
	uipmen	_													
		-18GHz)310 @3m		mplifer liteg 9243		SHz	Pre-am	plifer	26-40GH	z	H	orn > 180	ЗНz		Limit
			- 107 Mi	iteq ७८क	342	•				-				•	FUU 15.205
	quency Cal 2 foot	t cable	;	3 foot c	able		12	foot c	able		HPF	Re	eject Filte		<u>k Measurements</u> W=VBW=1MHz
		j	↓ Vien	18721500	02	•	Vien 19	9720900	05 🔽	HP	F_4.0GHz	-		- Avera	ige Measurements 1MHz ; VBW=10H:
f	Dist	1	Read Avg.		CL	Amp	D Corr	1	Peak	Avg		Avg Lim		-	Notes
GHz WCH	(m) 1,2412 M	dBuV 1Hz	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
1.824	3.0	51.3	39.2	33.7	2.9	-45.3	Q.O	0.6	43.2	31.1	74	54	-30.8	-22.9	H
2.060	3.0	52.3	39.2	37.7	4.8	-40.0	0.0	0.9	55.7	42.6	74	54	-18.3	-11.4	Н
1.824 2.060	3.0 3.0	51.3 52.1	41.6	33.7 37.7	2.9 4.8	-45.3 -40.0	0.0 0.0	0.0 0.9	43.2 55.5	33.5 42.6	74 74	54 54	-30.8 -18.5	-20.5 -11.4	v v
				3	**	-40~				***			-10-	-11.~	·
	2437 MH							26		~~~				101	
1.874 7.311	3.0 3.0	54.9 52.8	43.9 41.1	33.7 35.2	3.0 4.2	-45.3 -43.2	0.0 0.0	0.0 0.0	46.9 49.6	35.9 37.9	74 74	54 54	-27.1 -24.4	-18.1 -16.1	H H
2.185	3.0	48.8	41.1 37.4	37.7	4.2 4.9	-43.2	0.0	0.9	52.2	40.8	74	54 54	- 21.8	-13.2	H
1.874	3.0	52.8	41.5	33.7	3.0	-45.3	0.0	0.6	44.8	33.5	74	54	-29.2	-20.5	v
7.311	3.0	53.6	42.2	35.2	4.2	-43.2	0.0	0.6	50.4	39.D	74	54	-23.6	-15.0	V V
2.185	3.0	49.4	37.5	37.7	4.9	-40.1	0.0	0.9	52.8	40.9	74	54	-21.2	-13.1	V
	I. 2462 M		-	1	[
1.924	3.0	51.3	39.2	33.8	3.1	-45.4	0.0	0.6	43.4	31.3	74	54	-30.6	-22.7	H
2 386	3.0	51.5 49.7	38.9	35.2	4.2	-43.1 -40.2	0.0 0.0	0.6 0.9	48.4	35.8 40.8	74	54 54	-25.6	-18.2 -13.2	H H
2.310 1.924	3.0 3.0	49.7 51.9	37.5 39.8	37.6 33.8	4.9 3.1	-40.2 -45.4	0.0 0.0	0.9	53.0 44.0	40.8 31.9	74 74	54 54	-21.0 -30.0	-13.2 -22.1	H V
+.924 7 .386	3.0	50.8	38.7	35.2	4.2	-43.4	0.0	0.0	44.0	31.9	74 74	54 54	-26.3	-18.4	v
2 <i>3</i> 10	3.0	49.7	37.5	37.6	4.9	-40.2	0.0	0.9	53.0	40.8	74	54	-21.0	-13.2	v
	<u> </u>			No other	r emissi	ions were	detected at	JOVE SYS	stem noise flo		<u> </u>				
	f		ient Frequency	у		Amp	Preamp (-	-	Field Strength	
		Distance to							ct to 3 mete					d Strength Li	
		Analyzer R	0			Avg	-		Strength @			-	-	s. Average Li	
	AF	Antenna Fa				Peak			k Field Stre	ngth		Pk Mar	Margin vs	s. Peak Limit	
	CL	Cable Loss	S			HPF	High Pas	s Filter	ε						

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<u>11n HT20</u>

RESTRICTED BANDEDGE (n HT20 MODE, LOW CHANNEL, HORIZONTAL)

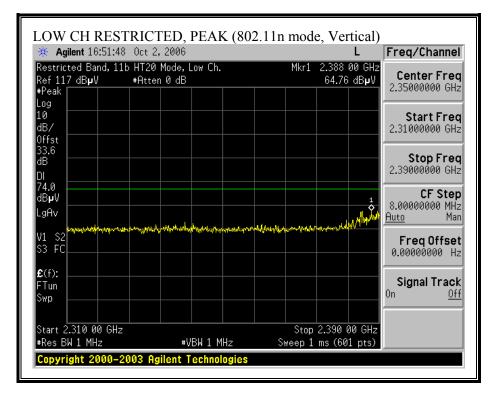
🔆 Agilent 16:47:04	Oct 2, 2006			L	Peak Search
Restricted Band, 111 Ref 117 dBµV PPeak	n HT 20Mode, #Atten 0 dB	Low Ch.	Mkr1	2.389 87 GHz 69.69 dB µ V	Next Peak
.og LØ dB/ Dffst					Next Pk Right
33.6 18 01 74.0					Next Pk Left
:gAv	and the second of the second	introductory	ومعاربة المراجع المسجو الزمر والم	augar word Willow W	Min Search
/1 \$2 33 FC C (f):	a and an a second second				Pk-Pk Search
Tun Wip					Mkr → CF
)tart 2.310 00 GHz Res BW 1 MHz	+/	/BW 1 MHz		2.390 00 GHz ms (601 pts)	More 1 of 2

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🔆 Agilent 16:47:38	3 Oct 2,2006			L	Peak Search
Restricted Band, 11 Ref 117 dB µ V #Peak		w Ch.	Mkr1	2.389 47 GHz 53.45 dB µ V	Next Peak
Log 10 dB/ 0ffst					Next Pk Right
33.6 dB DI 54.0					Next Pk Left
dBµV LgAv					Min Search
V1 S2 S3 FC					Pk-Pk Search
£(f): FTun Swp					Mkr → CF
Start 2.310 00 GHz #Res BW 1 MHz		W 10 Hz		2.390 00 GHz` s (601 pts)	More 1 of 2

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RESTRICTED BANDEDGE (n HT20 MODE, LOW CHANNEL, VERTICAL)

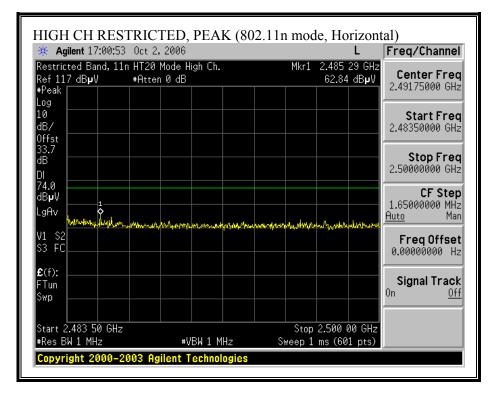


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🔆 Agilent 16:52:5	0 Oct 2,2006			L	Freq/Channel
Restricted Band, 1: Ref 117 dB µ V #Peak			Mkr1	2.389 73 GH 49.84 dBµV	Conton Eron
Hreak Log 10 dB/					Start Freq
0ffst 33.6 dB					Stop Freq
DI 54.0 dBµV					2.39000000 GHz CF Step 8.0000000 MHz
LgAv V1 S2					Auto Man
\$3 FC					0.00000000 Hz
FTun Swp					Signal Track ^{On <u>Off</u>}
Start 2.310 00 GHz #Res BW 1 MHz		 VBW 10 Hz		2.390 00 GHz 8 s (601 pts)	

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RESTRICTED BANDEDGE (n HT20 MODE, HIGH CHANNEL, HORIZONTAL)

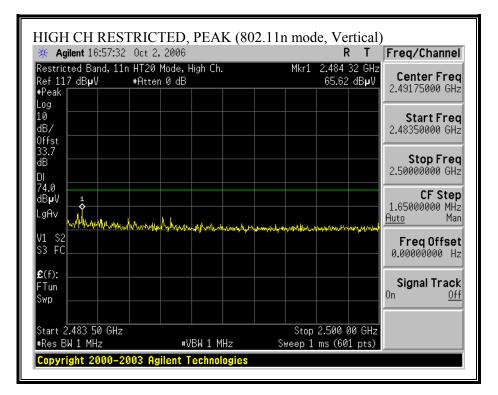


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🔆 Agilent 17:01:21			L	Freq/Channel
Restricted Band, 11n Ref 117 dB µ V #Peak	igh Ch.	Mkr1	2.483 50 GHz 48.78 dBµV	Center Freq 2.49175000 GHz
Log				
10 dB/ Offst				Start Freq 2.48350000 GHz
dB DI				Stop Freq 2.50000000 GHz
54.0 dB µ V LgAv				CF Step 1.65000000 MHz <u>Auto</u> Man
V1 S2 S3 FC				Freq Offset 0.00000000 Hz
£(f): FTun Swp				Signal Track On <u>Off</u>
Start 2.483 50 GHz		Stop	2.500 00 GHzî	

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RESTRICTED BANDEDGE (11n HT20 MODE, HIGH CHANNEL, VERTICAL)



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🔆 Agilent 16:58:10	0 Oct 2,2006			L	Freq/Channel
Restricted Band, 11 Ref 117 dB µ V		High Ch.	Mkr1	2.483 50 GHz 48.70 dBµV	Contor Eron
#Peak Log					
10 dB/					Start Freq 2.48350000 GHz
0ffst 33.7 dB DI					Stop Freq 2.50000000 GHz
54.0 dBµV LgAv					CF Step 1.65000000 MHz <u>Auto</u> Man
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		/BW 10 Hz		2.500 00 GHz 7 s (601 pts)	

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HARMONICS AND SPURIOUS EMISSIONS (11n HT 20 MODE)

est Eq															
	uipmen	<u>t:</u>													
		18GHz		mplifer		GHz	Pre-am	plifer	26-40GH	iz	Н	lorn > 180	SHz		Limit
T120;	S/N: 293	310 @3m	- T87 M	iteq 9243	342	-				-				-	FCC 15.205
	quency Cal													Beel	1 3.5omonto
	2 foot	cable	3	3 foot c	able		121	foot c	able		HPF	Re	eject Filte		<u>k Measurements</u> 3W=VBW=1MHz
[- Vien	1872150	02	-	Vien 19	720900)5 🔻	HP!	PF_4.0GHz	-			age Measurements =1MHz ; VBW=10Hz
	Think	D JD			at			1714		<u></u>	THE TANK		T. M		-
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m		Pk Mar dB	Avg Mar dB	Notes (V/H)
OW CH,	,2412 M	Hz													
.824 2.060	3.0 3.0	51.1 49.3	39.0 37.3	33.7 37.7	2.9 4.8	-45.3 -40.0	0.0 0.0	0.0 Q.0	43.0 52.7	30.9 40.7	74 74	54 54	-31.0 -21.3	-23.1 -13.3	H H
.824	3.0	51.8	39.0	33.7	29	-45.3	0.0	0.0	43.7	30.9	74	54	-30.3	-23.1	v
2.060	3.0	49.5	37.3	37.7	4.8	-40.0	0.0	0.9	52.9	40.7	74	54	-21.1	-13.3	v
MID CH.2				<u> </u>				<u> </u>				++			[
4.874	3.0	54.2	42.0	33.7	3.0	-45.3	0.0	0.0	46.2	34.0	74	54	-27.8	-20.0	Н
7.311	3.0 3.0	51.1 49.8	38.9 37.7	35.2	4.2 4.9	-43.2 -40.1	0.0 0.0	0.0 0.9	47.9 53.2	35.7 41.1	74 74	54 54	-26.1 -20.8	-18.3 -12.9	H H
4.874	3.0	51.2	39.2	33.7	4 <i>3</i> 3.0	-40.1	0.0	0.0 0.0	43.2	31.2	74	54 54	-20.8	-12.5	v v
311	3.0	51.9	39.0	35.2	4.2	-43.2	0.0	6.0	48.7	35.8	74	54	-25.3	-18.2	V
2.185	3.0	49.4	37.7	37.7	49	-40.1	Q0	0.9	52.8	41.1	74	54	-21.2	-12.9	v
IIGH CH.				1								1			
924	3.0	52.0	39.3	33.8	3.1	-45.4	Q.Q.	0.0	44.1	31.4	74	54	-29.9	-22.6	H
2.386	3.0 3.0	51.4 49.4	38.8 37.4	35.2 37.6	4.2 4.9	-43.1 -40.2	0.0 0.0	0.0 Q.0	48.3 52.7	35.7 40.7	74 74	54 54	-25.7 -21.3	-18.3 -13.3	H H
924	3.0	51.5	39.5	33.8	3.1	-45.4	0.0	0.0	43.6	31.6	74	54	-30.4	-22.4	v
386	3.0	50 <i>.</i> 9	38.9	35.2	4.2	-43.1	0.0	0.0	47.8	35.8	74	54	- 26.2	-18.2	v
2.310	3.0	49.6	37.5	37.6	49	-40.2	0.0	0.9	52.9	40.8	74	54	-21.1	-13.2	<u>v</u>
			No other emis	sions we	re dete:	cted above	system noi	ise floor	r						
	f	Measurem	ent Frequenc	v		Amp	Preamp (Gain				AvoTim	Average ¹	Field Strengtl	th T.imit
		Distance to		'			-		ect to 3 mete	ers		-	-	ld Strength Li	
		Analyzer R				Avg			Strength @					s. Average Li	
	AF	Antenna Fa	-			Peak	-		k Field Stre			-	-	s. Peak Limit	
	AĽ					HPF	High Pas			-0				. –	

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<u>11n HT40</u>

RESTRICTED BANDEDGE (n HT40 MODE, LOW CHANNEL, HORIZONTAL)

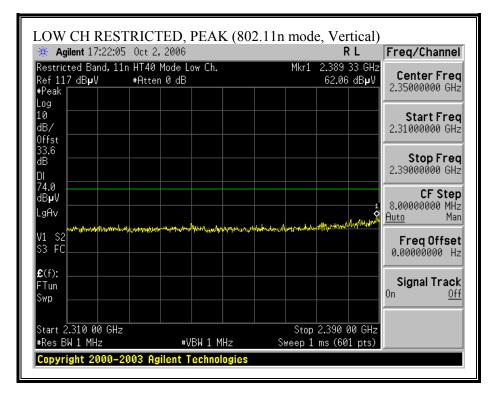
K Agilent 17:25:59 Oct 2		.11n mode, Horizont L	Freq/Channe
estricted Band, 11n HT40 ef 117 dB µ V #Atte Peak	Mode Low Ch. n 0 dB	Mkr1 2.390 00 GHz 61.90 dB µ V	Center Fred 2.35000000 GH:
og 0 IB/ Dffst			Start Fred 2.31000000 GH
3.6 B			Stop Fred 2.39000000 GH:
'4.0 IBpV gRv browtattoorth/the.prof/thetaph/the	L	and the second of the second o	CF Step 8.00000000 MH: <u>Auto</u> Ma
1 S2 3 FC			Freq Offse 0.00000000 H:
:(f): Tun wp			Signal Tracl ^{On <u>Of</u>}
tart 2.310 00 GHz Res BW 1 MHz	#VBW 1 MHz	Stop 2.390 00 GHz Sweep 1 ms (601 pts)	

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🔆 Agilent 17:26:4	1 Oct 2,2006			L	Freq/Channel
Restricted Band, 11 Ref 117 dB µ V #Peak		ow Ch.	Mkr1	2.390 00 GH 49.38 dB µ	Conton Fuer
Hreak Log 10 dB/					Start Freq
0ffst 33.6 dB DI					Stop Freq 2.39000000 GHz
54.0 dBµV LgAv					CF Step 8.00000000 MHz <u>Auto</u> Man
V1 S2 S3 FC					Freq Offset
£ (f): FTun Swp					Signal Track On <u>Off</u>
Start 2.310 00 GHz #Res BW 1 MHz		BW 10 Hz		2.390 00 GH 38 s (601 pts	

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RESTRICTED BANDEDGE (n HT40 MODE, LOW CHANNEL, VERTICAL)

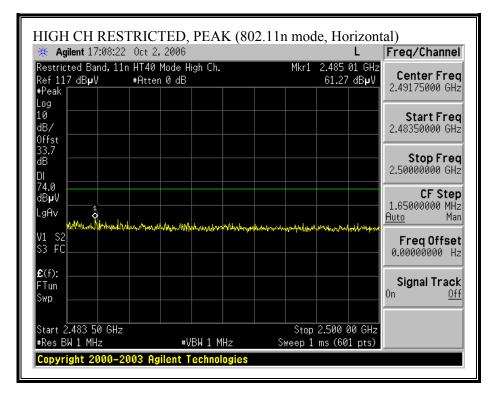


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	3 Oct 2,2006		L	Freq/Channel
Restricted Band, 11 Ref 117 dB µ V #Peak	In HT40 Mode Low Ch. #Atten 0 dB	Mkr1	2.389 73 GHz 49.70 dBµV	Center Freq 2.35000000 GHz
#Peak Log 10				Start Freq
dB/ 0ffst 33.6				2.31000000 GHz
dB DI				Stop Freq 2.39000000 GHz
54.0 dBµV LgAv				CF Step 8.00000000 MHz
V1 S2			1	Auto Man Freq Offset
\$3 FC		,,		0.00000000 Hz
FTun Swp				Signal Track On <u>Off</u>
Start 2.310 00 GHz		Stop	2.390 00 GHzî	

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RESTRICTED BANDEDGE (n HT40 MODE, HIGH CHANNEL, HORIZONTAL)

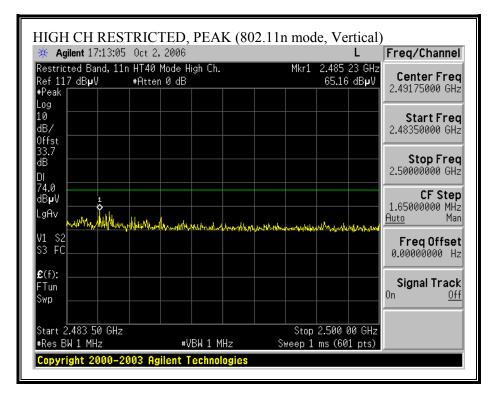


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🔆 Agilent 17:08:52	2 Oct 2,200	ô		L	Freq/Channel
Restricted Band, 11 Ref 117 dB µ V #Peak			Mkr1	2.483 80 GHz 47.72 dBµV	Conton Eron
Log					
10 dB/ Offst					Start Freq 2.48350000 GHz
33.7 dB DI					Stop Freq 2.50000000 GHz
54.0 dBµV LgAv					CF Step 1.65000000 MHz <u>Auto</u> Man
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		2.500 00 GHz 7 s (601 pts)	

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RESTRICTED BANDEDGE (11n HT40 MODE, HIGH CHANNEL, VERTICAL)



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🔆 Agilent 17:13:32	2 Oct 2,2006			L	Freq/Channel
Restricted Band, 11 Ref 117 dBµV		igh Ch.	Mkr1	2.483 58 GH 48.29 dBµ\	Conton Eron
#Peak Log					
10 dB/					Start Freq 2.48350000 GHz
Offst 33.7 dB DI					Stop Freq 2.50000000 GHz
54.0 dBµV LgAv					CF Step 1.65000000 MHz <u>Auto</u> Man
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		BW 10 Hz		2.500 00 GH: 7 s (601 pts)	

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HARMONICS AND SPURIOUS EMISSIONS (11n HT 40 MODE)

	ration:														
bac.		EUT only GHz 11n HJ	T40												
			140												
st Equ	uipmen	<u>t:</u>								4					
H	orn 1-	18GHz	Pre-ar	mplifer	1-260	GHz	Pre-am	plifer	26-40GH	z	H	orn > 18	GHz		Limit
T120;	S/N: 293	310 @3m	T87 M	iteq 924	342	-			1	-				-	FCC 15.205 🖵
	juency Cat														
	2 foot			3 foot c	able		12	foot c	shle				1	Peal	k Measurements
	2 1001	cable		10010	apie						HPF	Re	eject Filte		W=VBW=1MHz
Γ			- Vien	1872150	02	-	Vien 19)720900	15 🗸	HP	PF_4.0GHz	-			<u>ge Measurements</u> 1MHz ; VBW=10Hz
															IMHZ; VDW-10112
f			Read Avg.		CL	Amp	D Corr	1	Peak	Avg				Avg Mar	Notes
GHz DW CH	(m) 2422 MF	dBuV Hz	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	∖ dB	dB	(V/H)
4.844	3.0	51.1	39.1	33.7	3.0	-45.3	0.0	6.0	43.1	31.1	74	54	-30.9	-22.9	H
7.266 2.110	3.0 3.0	52.3 49.9	39.2 37.7	35.2 37.7	4.2 4.9	-43.3 -40.1	0.0 0.0	0.0 Q.0	49.0 53.3	35.9 41.1	74 74	54 54	-25.0 -20.7	-18.1 -12.9	H H
2.110 4.844	3.0	49.9 51.4	37.7	37.7	4.9 3.0	-40.1	0.0	0.0	43.4	41.1 31.2	74	54 54	-20.7	-12.9 -22.8	N N
7.266	3.0	51.4	39.1	35.2	4.2	-43.3	0.0	0.0	48.1	35.8	74	54	-25.9	-18.2	v
2.110	3.0	50.0	37.2	37.7	49	-40.1	0.0	0.9	53,4	40.6	74	54	-20.6	-13.4	V
	437 MH								+						
4.874	3.0	52.8	40.1	33.7	3.0	-45.3	0.0	0.0	44.8	32.1	74	54	-29.2	-21.9	H H
7.311	3.0 3.0	51.5 51.1	38.9 37.9	35.2 37.7	4.2 4.9	-43.2 -40.1	0.0 0.0	0.0 9.0	48.3 54.5	35.7 41.3	74 74	54 54	-25.7	-18.3 -12.7	H H
4.874	3.0	52.1	39.6	33.7	3.0	-45.3	0.0	0.0	44.1	31.6	74	54	- 29.9	-22.4	v
7.311	3.0 3.0	51.9 50.6	39.0 37.8	35.2 37.7	4.2 4.9	-43.2 -40.1	0.0 0.0	0.0 0.9	48.7 54.0	35.8 41.2	74 74	54 54	-25.3 -20.0	-18.2 -12.8	v
			31.0	31.1	4.5	-40.1	0.0	0.7	74.0	41.4	/*	24	-20.0	-12.0	¥
	2452 MI		-22.0	22.0		15.0		24					-30.7		
4.904 7.356	3.0 3.0	51.2 51.3	39.2 38.8	33.8 35.2	3.0 4.2	-45.3 -43.1	0.0 0.0	6.0 6.0	43.3 48.2	31.3 35.7	74 74	54 54	-30.7 -25.8	-22.7 -18.3	H H
2.260	3.0	50.2	37.4	37.6	49	-40.1	0.0	0.9	53.5	40.7	74	54	-20.5	-13.3	Н
4.904	3.0 3.0	52.4	39.2	33.8	3.0	-45.3	0.0	0.0 0.0	44.5 48.3	31.3	74	54 54	-29.5	-22.7	v v
7.356	3.0	51.4 49.3	38.8 37.4	35.2 37.6	4.2 4.9	-43.1 -40.1	0.0 0.0	0.9	48.3 52.6	35.7 40.7	74 74	54 54	-25.7 -21.4	-18.3 -13.3	v V
											1			1	
			No other emis	sions we	re detec	ted above:	system noi	ise floor	1						
	f		ent Frequency	у		Amp	Preamp (Field Strength	
		Distance to							ct to 3 mete					ld Strength Li	
		Analyzer R	-			Avg	-		Strength @			-	-	s. Average Li	
	AF	Antenna Fa				Peak TTDE			k Field Stre:	ngth		Pk Mar	Margın vs	s. Peak Limit	
	CL	Cable Loss	\$			HPF	High Pas	s Filter							

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7.1.3. TRANSMITTER ABOVE 1 GHz FOR 5725 TO 5850 MHz BAND

<u>11a</u>

HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

-	nce Čer y: Prod≀ ‡: 06U1	rtification a	Measurem Services, M elopment La	organ]	-										
onfigur	ation: I	Chien Ho EUT only Hz 11a													
est Equ	tipment	1													
		18GHz	Pre-ar	· ·		GHz	Pre-am	plifer	26-40GH	z	н	orn > 18	GHz		Limit
		10 @3m	- 187 Mi	teq 924	34Z	-				-				•	FCC 15.205
	uency Cab 2 foot		3	footo	able		12	foot c	able		HPF	Re	eject Filte		<u>k Measurements</u> 3W=VBW=1MHz
		•	Vien	1872150	02	-	Vien 1	972090	⁰⁵ –	HP	F_7.6GHz	•		- Aver	age Measurements =1MHz ; VBW=10Hz
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
OW CH:	5745 MH	lz													
11.490 11.490	3.0 3.0	49.6 50.6	36.4 37.2	37.6 37.6	4.8 4.8	-39.8 -39.8	0.0 0.0	0.7 0.7	52.9 53.9	39.7 40 <i>.</i> 5	74 74	54 54	-21.1 -20.1	-14.3 -13.5	H V
ID CH 5	785 MHz														
11 <i>5</i> 70 11 <i>5</i> 70	3.D 3.D	50.3 49.7	38.6 36.8	37.6 37.6	4.8 4.8	-39.8 -39.8	۵۵ ۵۵	0.7 0.7	53.6 53.0	41.9 40.1	74 74	54 54	-20.4 -21.0	-12.1 -13.9	H V
IGH CH :															
11.650 11.650	3.0 3.0	49.2 48.8	37.8 37.4	37.7 37.7	4.8 4.8	-39.8 -39.8	۵0 ۵0	0.7 0.7	52.5 52.1	41.1 40.7	74 74	54 54	-21.5 -21.9	-129 -133	H V
11,050	20	40.0				1					/4	24	-21.9	-122	*
				No othe	r emiss	ions were	detected a	oove sys	tem noise fla	or.	l				
	f	Measureme	ent Frequency	7		Amp	Preamp	Gain				Avg Lim	Average I	Field Streng	th Limit
		Distance to Analyzer R				D Corr Avg			ct to 3 mete Strength @					d Strength I Average I	
		Antenna Fa	-			Peak.	-		c Field Stre			-	-	. Peak Limi	
	CL	Cable Loss				HPF	High Pas	s Filter							

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<u>11n HT20</u>

HARMONICS AND SPURIOUS EMISSIONS (802.11n HT20 MODE)

Vien 187215002 Vien 197209005 HPF_7.6GHz Avera	Limit FCC 15.205
Horn 1-18GHz Pre-amplifer 1-26GHz Pre-amplifer 26-40GHz Horn > 18GHz T120; S/N: 29310 @3m T87 Miteq 924342 Image: Constraint of the state of t	
T120; S/N: 29310 @3m T87 Miteq 924342 Hi Frequency Cables 2 foot cable 3 foot cable Vien 187215002 Vien 197209005	
Life Frequency Cables Life Frequency Cables 2 foot cable 3 foot cable Vien 187215002 Vien 197209005	FCC 15.205 -
2 foot cable 3 foot cable 12 foot cable HPF Reject Filter Peak RB* Vien 187215002 Vien 197209005 HPF_7.6GHz Avera	
Vien 187215002 Vien 197209005 HPF_7.6GHz Avera	Measurements
	weasurements W=VBW=1MHz ge Measurements
	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 GHz (m) dBuV dBm dB dB dB dBuV/m dBuV/m dBuV/m dB dB	Notes
.0W CH 5745 MHz	(V/H)
11.490 3.0 52.5 40.1 37.6 4.8 -39.8 0.0 0.7 55.8 43.4 74 54 -18.2 -10.6 11.490 3.0 48.8 37.1 37.6 4.8 -39.8 0.0 0.7 55.8 43.4 74 54 -18.2 -10.6 11.490 3.0 48.8 37.1 37.6 4.8 -39.8 0.0 0.7 52.1 40.4 74 54 -21.9 -13.6	H V
ID CH 5785 MHz	
11570 3.0 49.1 38.4 37.6 4.8 -39.8 0.0 0.7 52.4 41.7 74 54 -21.6 -12.3 11570 3.0 51.4 39.4 37.6 4.8 -39.8 0.0 0.7 52.4 41.7 74 54 -21.6 -12.3 11570 3.0 51.4 39.4 37.6 4.8 -39.8 0.0 0.7 54.7 42.7 74 54 -19.3 -11.3	H V
IGH CH 5825 MHz	•
11.650 3.0 51.0 37.8 37.7 4.8 -39.8 0.0 0.7 54.3 41.1 74 54 -19.7 -12.9	H
11.650 3.0 50.1 37.2 37.7 4.8 -39.8 0.0 0.7 53.4 40.5 74 54 -20.6 -13.5	
No other emissions were detected above system noise floor.	
fMeasurement FrequencyAmpPreamp GainAvg LimAverage Field StrengthDistDistance to AntennaD CorrDistance Correct to 3 metersPk LimPeak Field Strength LiReadAnalyzer ReadingAvgAverage Field Strength @ 3 mAvg MarMargin vs. Average LiAFAntenna FactorPeakCalculated Peak Field StrengthPk MarMargin vs. Peak LimitCLCable LossHPFHigh Pass FilterFilter	imit imit

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<u>11n HT40</u>

HARMONICS AND SPURIOUS EMISSIONS (802.11n HT40 MODE)

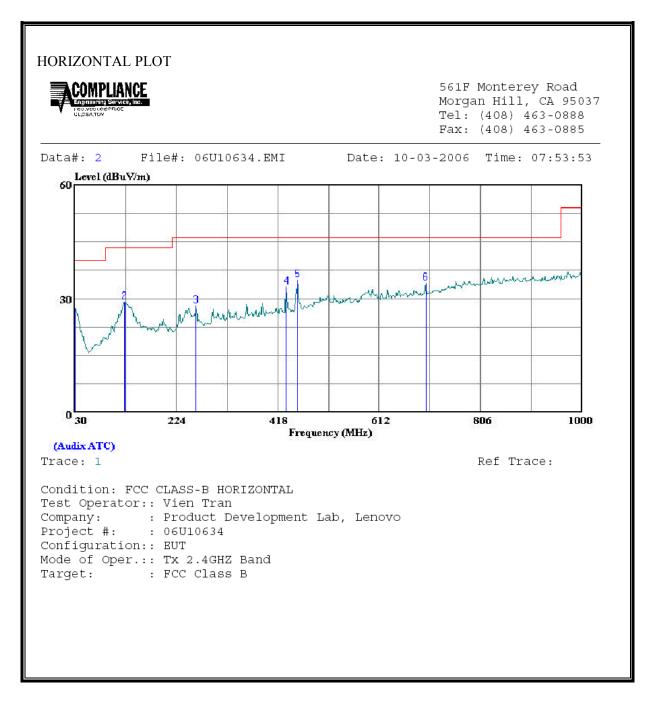
<u>est Equi</u> Hor		<u>t:</u> 18GHz	Pre-ar	nplifer	1-26	GHz	Pre-am	plifer	26-40GH	z	н	orn > 180	GHz		Limit
T120; S/	/N: 293	310 @3m	- T87 Mi	iteq 924	342	-				-				-	FCC 15.205 🖵
- Hi Freque		cable	3) foot c	able		12	foot c	able		HPF	Re	ject Filte		k Measurements
		•	, Vien	1872150	02	•	Vien 19	9720900	⁰⁵ –	HP	F_7.6GHz	•		RE Avera	3W=VBW=1MHz a <u>ge Measurements</u> =1MHz ; VBW=10Hz
	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	-	Pk Mar dB	Avg Mar dB	Notes (V/H)
OW CH 57	755 MI	łz													
1.510	3.0 3.0	49.7 49.0	37.0 36.9	37.6 37.6	4.8 4.8	-39.8 -39.8	0.0 0.0	0.7 0.7	53.0 52.3	40.3 40.2	74 74	54 54	-21.0 -21.7	-13.7 -13.8	H V
D CH 578	85 MH:														
1.570 1.570	3.0 3.0	49 <i>.</i> 5 48.8	37.1 37.0	37.6 37.6	4.8 4.8	-39.8 -39.8	0.0 0.0	0.7 0.7	52.8 52.1	40.4 40.3	74 74	54 54	-21.2 -21.9	-13.6 -13.7	H V
			37.0	37.0	4.0	-37.0	υIJ	0./	52.1	40.3	/4	24	-219	-13./	Y
IGH CH 58 11.630	815 ME 3.0	łz 49,4	37.0	37.7	4.8	-39.8	0.0	0.7	52.7	40.3	74	54	-21.3	-13.7	Н
1.630	3.0	49.6	37.1	37.7	4.8	-39.8	0.0	0.7	52.9	40.4	74	54	-21.1	-13.6	v
				No other	emiss	ions were	detected al	ove sys	tem noise flo)or.					
f		Maanurana	ent Frequency			Anon	Preamp	Cain				Arra Tim	A more de T	Field Streng	els T incit
		Distance to		ý		Amp D Corr			ct to 3 mete	ers		-	-	d Strength I	
F		Analyzer R	-			Avg	Average	Field S	Strength @	3 m		-	-	. Average I	
	AF CL	Antenna Fa Cable Loss				Peak HPF	Calculate High Pas		c Field Stre	ngth		Pk Mar	Margin vs	. Peak Limi	t
		Cable Loss				TTL T.	тивитаз	2 T. HIGI							

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7.1.4. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

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

2.4 GHz BAND

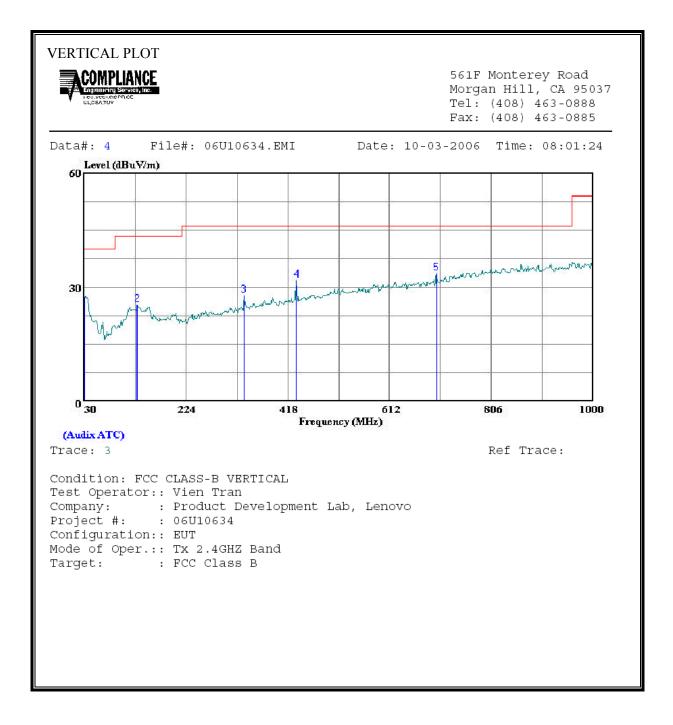


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HORI	ZONTAL DATA						
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	30.000	6.87	20.45	27.32	40.00	-12.68	Peak
2	125.060	13.83	15.26	29.09	43.50	-14.42	Peak
3	261.830	13.77	14.35	28.12	46.00	-17.89	Peak
4	434.490	14.27	18.84	33.11	46.00	-12.89	Peak
5	455.830	15.65	19.33	34.98	46.00	-11.02	Peak
6	701.240	11.01	23.09	34.10	46.00	-11.90	Peak

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



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VERTICAL DATA									
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark		
	MHz	dBuV	dB	dBuV/m	$\overline{\mathrm{dBuV/m}}$	dB			
1	30.000	7.05							
2	130.880	10.17	15.09		43.50				
3	334.580	11.21	16.53	27.74	46.00	-18.26	Peak		
4	434.490	12.85	18.84	31.69	46.00	-14.31	Peak		
5	701.240	10.50	23.09	33.59	46.00	-12.41	Peak		

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

5 GHz BAND

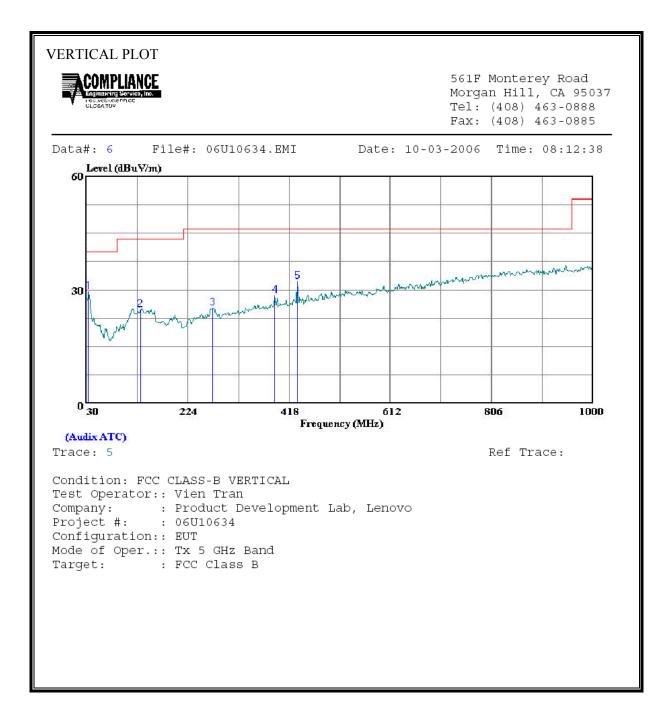
HORIZONTAL PLOT	561F Monterey Road Morgan Hill, CA 95037 Tel: (408) 463-0888 Fax: (408) 463-0885
Data#: 8 File#: 06u10634.emi Date: 60 60 60 60 60 60 60 60 60 60	E
0 30 224 418 612 Frequency(MHz) (Audix ATC) Trace: 7 Condition: FCC CLASS-B HORIZONTAL Test Operator:: Vien Tran Company: : Product Development Lab, Lenov Project #: : 06U10634 Configuration:: EUT Mode of Oper.:: Tx 5 GHz Band Target: : FCC Class B	Ref Trace:

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HORIZONTAL DATA									
		Read			Limit	Over			
	Freq	Level	Factor	Level	Line	Limit	Remark		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	30.000	6.54	20.45	26.99	40.00	-13.01	Peak		
2	133.790	15.94	15.02	30.96	43.50	-12.54	Peak		
3	434.490	12.12	18.84	30.96	46.00	-15.04	Peak		
4	455.830	13.77	19.33	33.10	46.00	-12.90	Peak		
5	499.480	14.43	20.22	34.65	46.00	-11.35	Peak		
6	997.090 12.60 26.91		39.51	54.00	-14.49	Peak			

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



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VERTICAL DATA										
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark			
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB				
1	33.880	10.41	19.05	29.46	40.00	-10.54	Peak			
2	133.790	9.68	15.02	24.70	43.50	-18.80	Peak			
3	271.530	10.45	14.65	25.10	46.00	-20.90	Peak			
4	390.840	10.60	17.83	28.43	46.00	-17.57	Peak			
5	434.490	13.25	18.84	32.09	46.00	-13.91	Peak			

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7.2. 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 Limit (dBuV)			
	Quasi-peak	Average		
0.15-0.5	66 to 56 "	56 to 46 *		
0.5-5	56	46		
5-30	60	50		

* Decreases with the logarithm of the frequency.

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:

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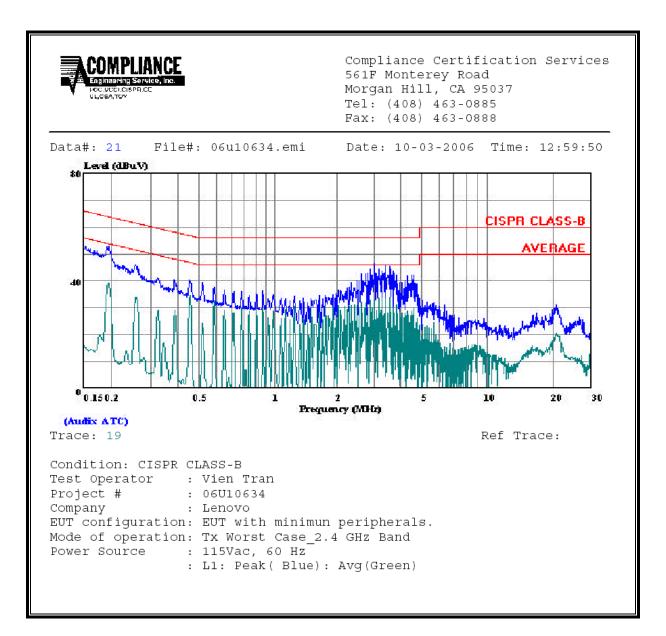
2.4 GHz BAND

<u>6 WORST EMISSIONS</u>

	CONDUCTED EMISSIONS DATA (115VAC 60Hz)										
Freq.	Reading			Closs	Limit	FCC_B	Margin		Remark		
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV(dB)	L1/L2		
0.19	52.86		39.28	0.00	64.04	54.04	-11.18	-14.76	L1		
0.45	40.40		34.72	0.00	56.88	46.88	-16.48	-12.16	L1		
3.51	46.08		37.87	0.00	56.00	46.00	-9.92	-8.13	L1		
0.19	51.64		37.35	0.00	64.04	54.04	-12.40	-16.69	L2		
0.45	39.70		30.41	0.00	56.88	46.88	-17.18	-16.47	L2		
3.51	45.10		29.91	0.00	56.00	46.00	-10.90	-16.09	L2		
6 Worst I	Data										

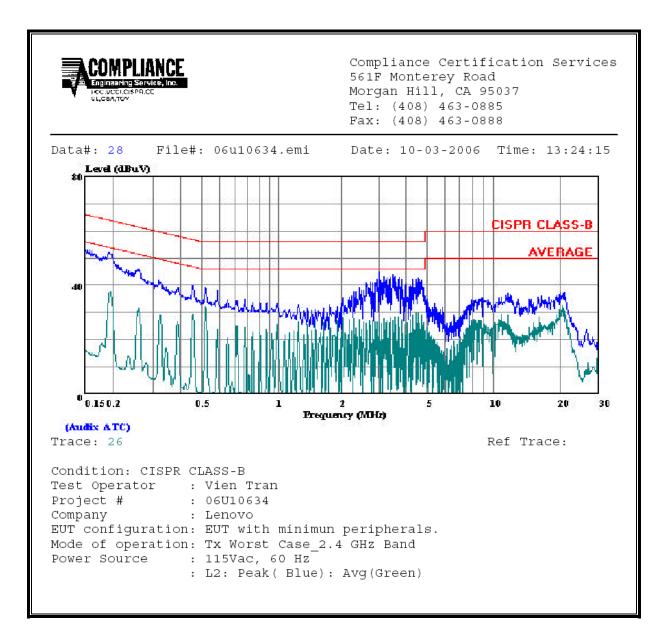
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LINE 1 RESULTS



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LINE 2 RESULTS



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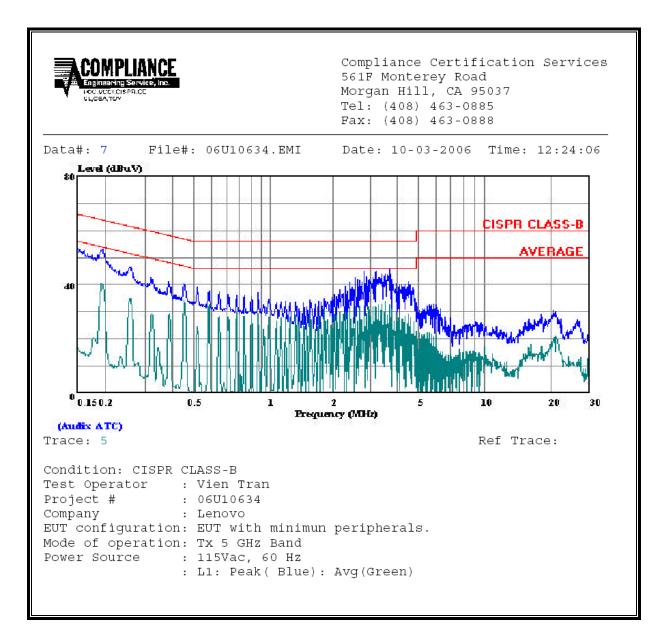
5 GHz BAND

<u>6 WORST EMISSIONS</u>

	CONDUCTED EMISSIONS DATA (115VAC 60Hz)										
Freq.	Reading			Closs	Limit	FCC_B	Margin		Remark		
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV(dB)	L1/L2		
0.19	52.93		40.69	0.00	63.91	53.91	-10.98	-13.22	L1		
0.26	46.36		34.85	0.00	61.46	51.46	-15.10	-16.61	L1		
3.76	45.68		34.40	0.00	56.00	46.00	-10.32	-11.60	L1		
0.19	52.06		37.41	0.00	63.91	53.91	-11.85	-16.50	L2		
0.26	46.04		32.20	0.00	61.46	51.46	-15.42	-19.26	L2		
3.24	43.98		32.12	0.00	56.00	46.00	-12.02	-13.88	L2		
6 Worst I	Data										

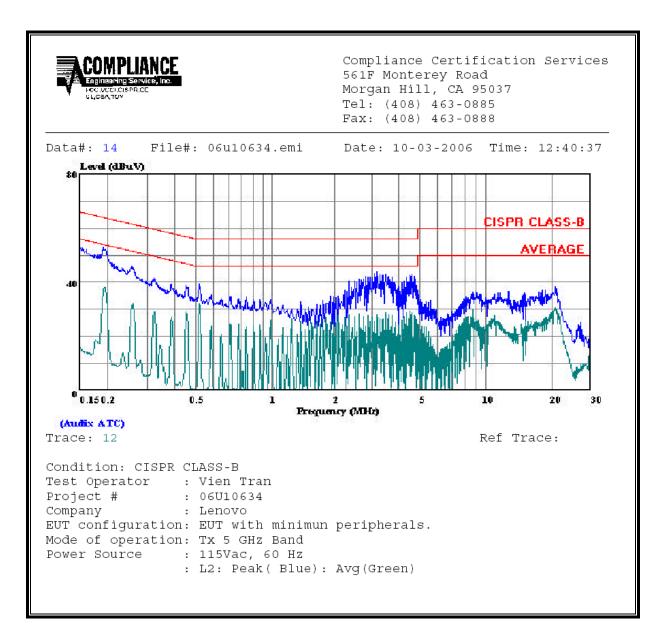
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LINE 1 RESULTS



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LINE 2 RESULTS



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