

FCC CFR47 PART 15 SUBPART C CERTIFICATION TEST REPORT

802.11 A/G HALF SIZE MINI PCI WLAN MODULE

MODEL NUMBER: PA3459U-1MPC; PA3461U/E-1MPC (FOR OPTION)

FCC ID: CJ6UPA3459WL

REPORT NUMBER: 05U3390-1

ISSUE DATE: MAY 25, 2005

Prepared for TOSHIBA CORPORATION DIGITAL MEDIA NETWORK COMPANY 2-9 SUEHIRO-CHO, OME TOKYO, 198-8710, JAPAN

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Revision History

Rev. Revisions

Revised By

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	TOSHIBA CORPORATION DIGITAL MEDIA NETWORK COMPANY 2-9 SUEHIRO-CHO, OME TOKYO, 198-8710, JAPAN			
EUT DESCRIPTION:	802.11A/G HALF SIZE MINI-PCI WLAN MODULE			
MODEL:	PA3459U-1MPC			
MODEL (FOR OPTION):	PA3461U/E-1MPC			
SERIAL NUMBER:	1152T000018			
DATE TESTED:	MAY 09 - 19, 2005			
APPLICABLE STANDARDS				
STANDARD	TEST RESULTS			
FCC PART 15 SUBF	PART C NO 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.

Note: The 2.4 and 5.8 GHz bands are applicable to this report; other band of operation 5.2 GHz is documented in a separate report.

Approved & Released For CCS By:

Tested By:

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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 EUT is an 802.11a/b/g transceiver Module.

The radio module is manufactured by ATHEROS COMMUNICATIONS.

The EUT module is installed and tested inside the Firebolt Laptop.

5.2. MAXIMUM OUTPUT POWER

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

2400 to 2483.5 MHz Authorized Band

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11b	21.01	126.18
2412 - 2462	802.11g	23.06	202.30

5725 to 5850 MHz Authorized Band

Frequency Range	Mode	Output Power	Output Power
(MHz)		(dBm)	(mW)
5745 - 5825	802.11a	22.47	176.60

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes four PIFA Film type antennas; each has a maximum gain as follows:

PIFA type antennas:

- 1. HTL017 4.24 dBi at 2.4GHz without cable loss;
- 2. HTL017 4.12 dBi at 5.8GHz without cable loss;
- 3. HTL004 4.18 dBi at 2.4GHz without cable loss;
- 4. TIAN01 4.66 dBi at 5.24GHz without cable loss.

The HTL017 antenna, which has the highest gain of 2.4GHz and 5.8GHz bands; also the TIAN01 antenna, which has the highest gain of 5.2GHz bands, so both antennas represent the worst-case scenario.

5.4. MANUFACTURER'S DESCRIPTION OF MODEL DIFFERENCES

The two modules are identical and only differ in model number.

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5.5. SOFTWARE AND FIRMWARE

The test firmware was installed in the EUT during testing.

The test utility software used during testing was art program "ART_V52build58_all".

5.6. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest average output power. The highest measured average output powers were at 2412 MHz for b/g mode, 5320 MHz for a mode (UNII), and 5745 MHz for a mode (DTS). The EUT is tested at mobile and portable of two different configurations.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST					
Description	Manufacturer	Model	Serial Number	FCC ID	
Laptop	Toshiba	PPM20U-AAAA8	Z3044588-JU	DoC	
AC Adapater	Toshiba	ADP-80RH	148162	DoC	

I/O CABLES

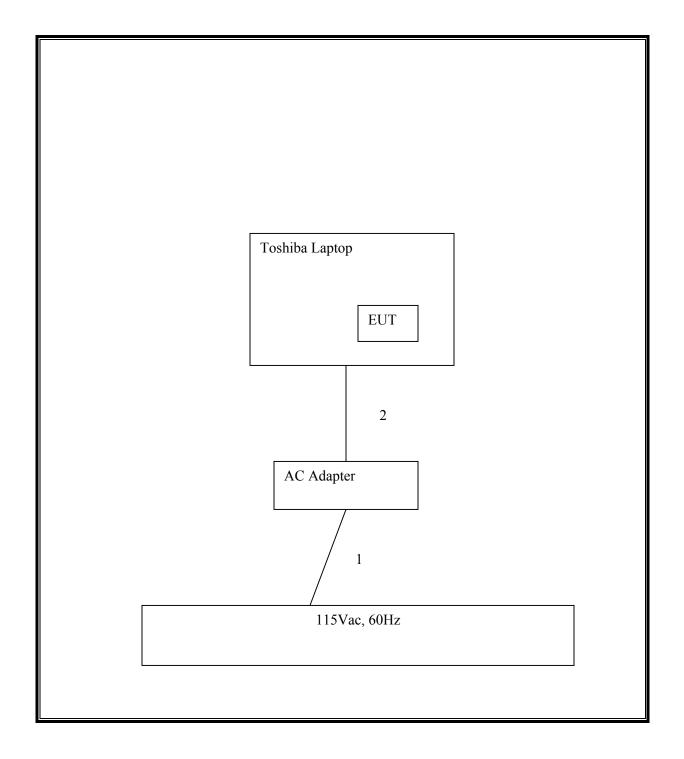
	I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks	
1	AC	1	US 115V	Un-shielded	2m	No	
2	DC	1	DC	Un-shielded	1m	No	

TEST SETUP

The EUT is installed in a host laptop computer board 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	
EMI Test Receiver	R & S	ESHS 20	827129/006	10/22/2005	
Site A Line Stabilizer / Conditioner	Tripplite	LC-1800a	A0051681	CNR	
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/2005	
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	10/21/2005	
Spectrum Analyzer	HP	E4446A	US42510266	8/25/2005	
Antenna, Horn 1 ~ 18 GHz	EMCO	3117	29310	9/12/2005	
4.0 High Pass Filter	Micro Tronics	HPM13351	1	CNR	
Amplifier 1-26GHz	MITEQ	NSP2600-SP	924342	8/17/2005	
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	9/12/2005	
30MHz 2Ghz	Sunol Sciences	JB1 Antenna	A121003	9/12/2005	
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	3/6/2006	
RF Filter Section	HP	85420E	3705A00256	3/6/2006	
Peak Power Meter	Agilent	E4416A	GB41291160	2/9/06	
Peak / Average Power Sensor	Agilent	E9327A	US40440755	2/10/06	
Preamplifier, 1 ~ 26.5 GHz	HP	8449B	3008A00369	8/17/05	
Antenna, Horn 18 ~ 26 GHz	ARA	SWH-28	1007	9/12/05	
7.6 High Pass Filter	Micro Tronics	HPM13195	2	CNR	

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7. LIMITS AND RESULTS

7.1. CHANNEL TESTS FOR THE 2400 TO 2483.5 MHz BAND

7.1.1. 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.

RESULTS

No non-compliance noted:

802.11b Mode

Channel	Frequency	6 dB Bandwidth	Minimum Limit	Margin
	(MHz)	(kHz)	(kHz)	(kHz)
Low	2412	12500	500	12000
Middle	2437	12500	500	12000
High	2462	12500	500	12000

802.11g Mode

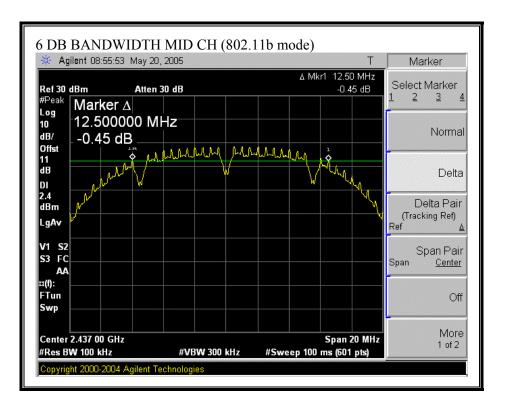
Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Low	2412	16370	500	15870
Middle	2437	16400	500	15900
High	2462	16370	500	15870

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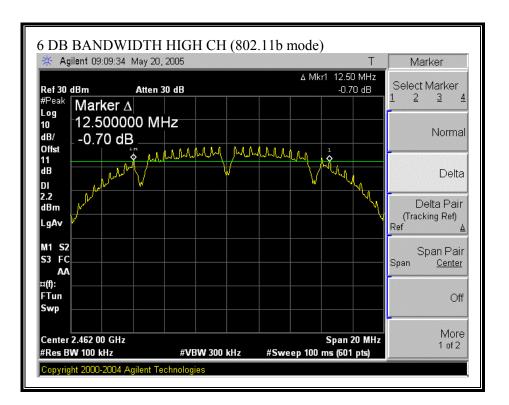
6 DB BANDWIDTH (802.11b MODE)



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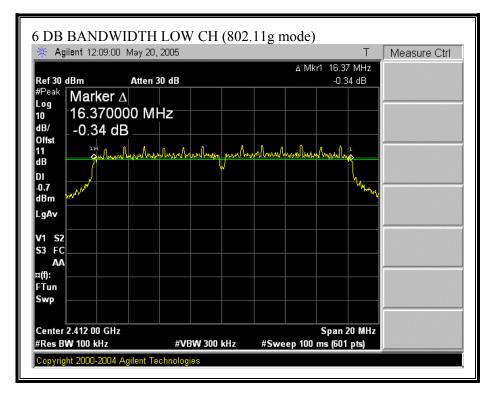


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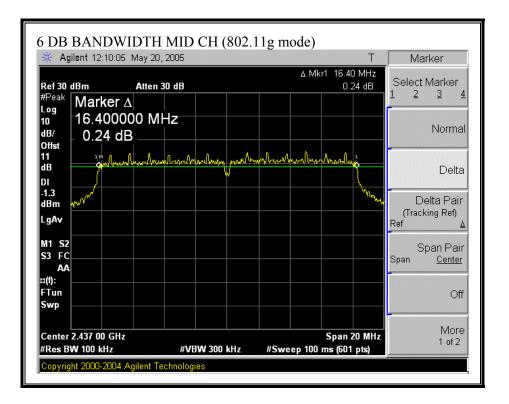


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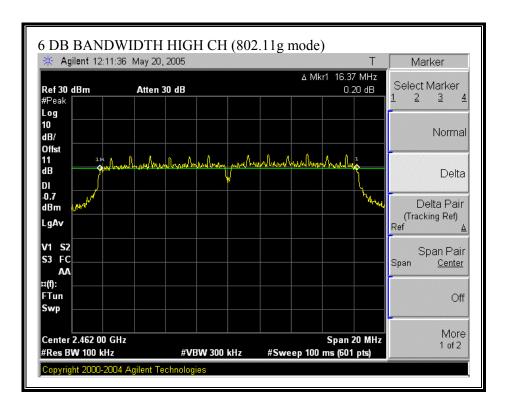
6 DB BANDWIDTH (802.11g MODE)



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7.1.2. 99% BANDWIDTH

<u>LIMIT</u>

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.

RESULTS

No non-compliance noted:

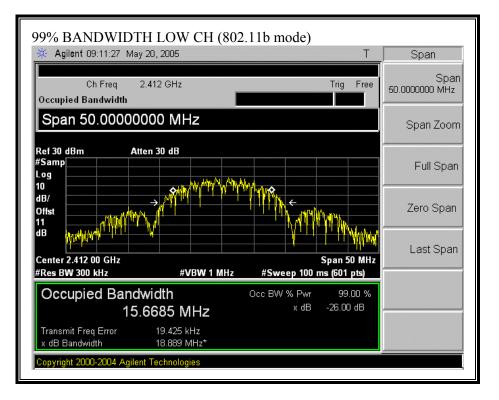
802.11b Mode					
Channel	Frequency	99% Bandwidth			
	(MHz)	(MHz)			
Low	2412	15.6685			
Middle	2437	15.6483			
High	2462	15.641			

802.11g Mode

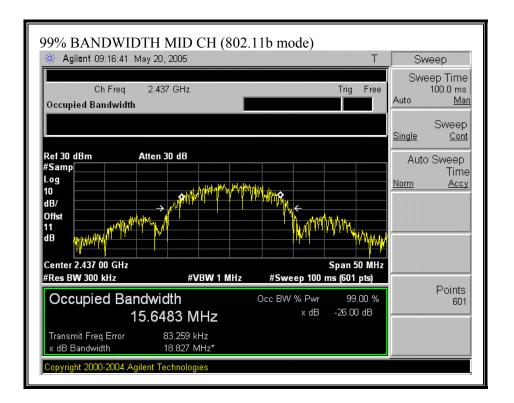
Channel	Frequency	99% Bandwidth	
	(MHz)	(MHz)	
Low	2412	16.5573	
Middle	2437	16.5223	
High	2462	16.5477	

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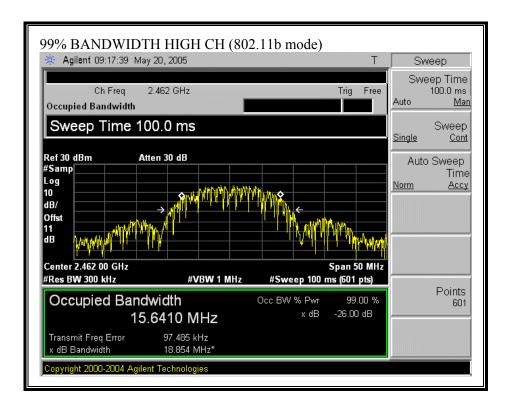
99% BANDWIDTH (802.11b MODE)



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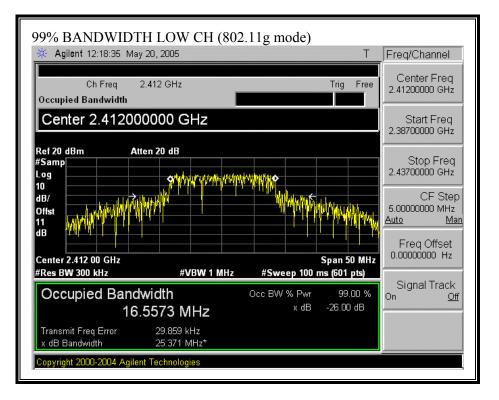


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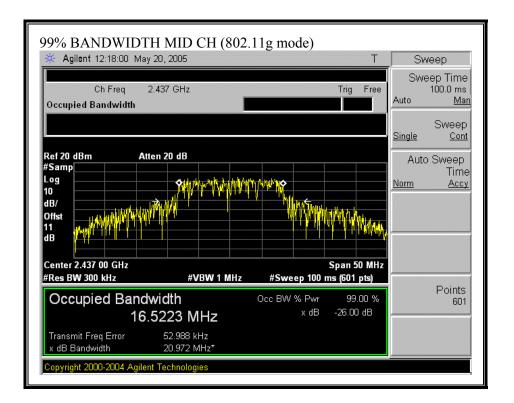


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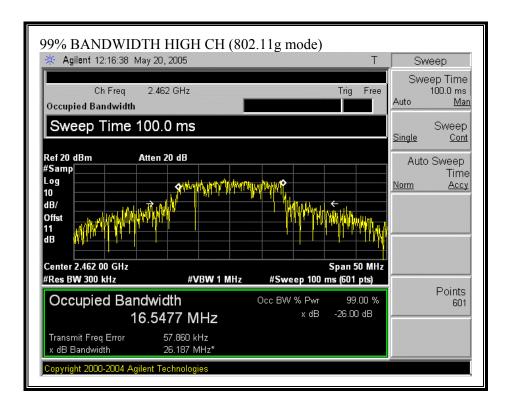
99% BANDWIDTH (802.11g MODE)



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7.1.3. 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.

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RESULTS

The maximum antenna gain is 4.24 dBi for other than fixed, or point-to-point operation, therefore the limit is 30 dBm.

No non-compliance noted:

802.11b Mode

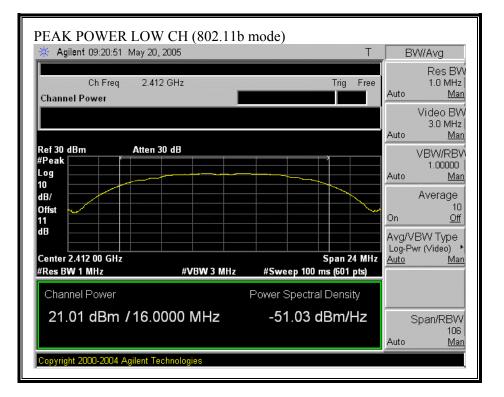
Channel	Frequency	Peak Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	21.01	30	-8.99
Middle	2437	20.98	30	-9.02
High	2462	20.98	30	-9.02

802.11g Mode

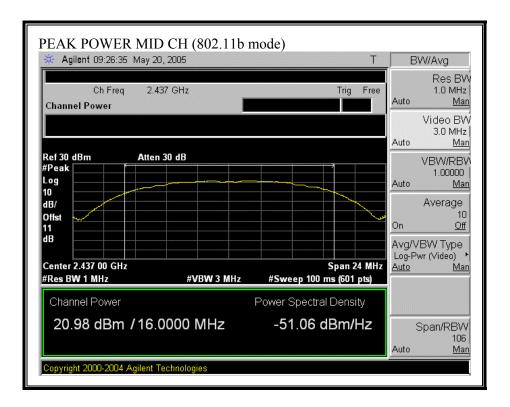
Channel	Frequency	Peak Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	23.06	30	-6.94
Middle	2437	22.89	30	-7.11
High	2462	22.95	30	-7.05

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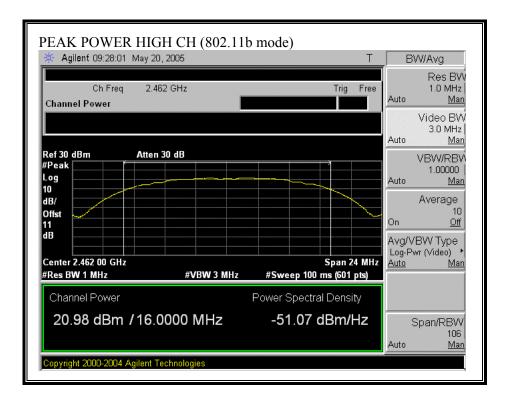
OUTPUT POWER (802.11b MODE)



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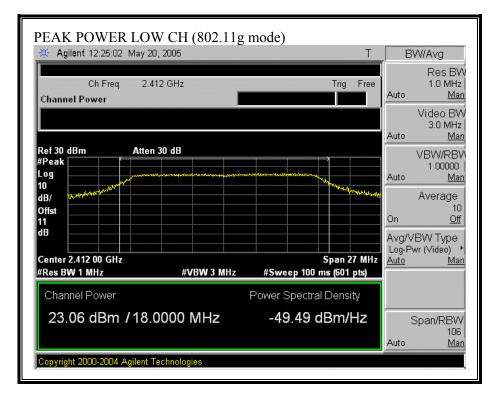


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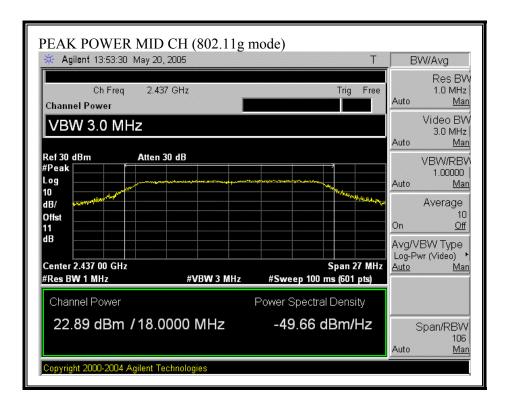


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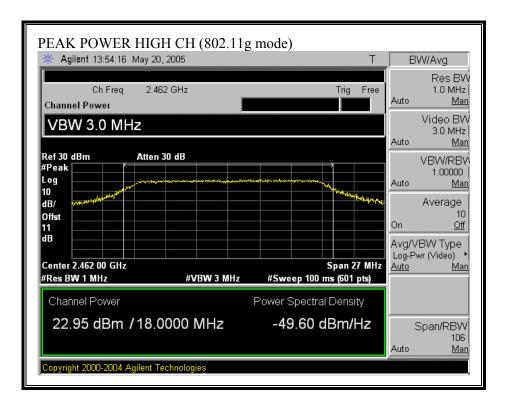
OUTPUT POWER (802.11g MODE)



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7.1.4. 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) Limits for Occupational/Controlled Exposures					
0.3–3.0 3.0–30 30–300 300–1500 1500–100,000	614 1842/f 61.4	1.63 4 <i>.89/</i> f 0.163	*(100) *(900/f²) 1.0 f/300 5	6 6 6 8	
(B) Limits	for General Populati	on/Uncontrolled Exp	posure		
0.3–1.34 1.34–30	614 824 <i>/</i> f	1.63 2.19/f	*(100) *(180/f ²)	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		0.073	0.2 f/1500 1.0	30 30 30

f = frequency in MHz

t = trequency 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 is exposure also apply in situations when an individual is transient through a location where occupational/controlled is posed as a consequence of the potential for exposure.
 NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

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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 $d = 0.282 * 10 ^ ((P + G) / 20) / \sqrt{S}$ Equation (1) where d = MPE distance in cm P = Power in dBm G = Antenna Gain in dBi $S = Power Density Limit in mW/cm^2$

Equation (1) and the measured peak power is used to calculate the MPE distance.

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LIMITS

From §1.1310 Table 1 (B), S = 1.0 mW/cm^2

RESULTS

No non-compliance noted:

Mode	Power Density	Output	Antenna	MPE
	Limit	Power	Gain	Distance
	(mW/cm^2)	(dBm)	(dBi)	(cm)
802.11b	1.0	21.01	4.24	5.16
802.11g	1.0	23.06	4.24	6.54

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.

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7.1.5. 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 10 dB pad and 1.0 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11b Mode

Channel	Frequency (MHz)	Power (dBm)
Low	2412	18.25
Middle	2437	18.00
High	2462	18.13

802.11g Mode

Channel	Frequency (MHz)	Power (dBm)
Low	2412	16.06
Middle	2437	16.24
High	2462	15.90

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7.1.6. 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:

802.11b Mode

Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	-5.41	8	-13.41
Middle	2437	-5.54	8	-13.54
High	2462	-4.41	8	-12.41

802.11g Mode

Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	-8.83	8	-16.83
Middle	2437	-7.99	8	-15.99
High	2462	-8.08	8	-16.08

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PEAK POWER SPECTRAL DENSITY (802.11b MODE)

🗧 Agilent 09:50	6:11 May 20, 2005		Т	Peak Search
ef 10 dBm Peak Marke	Atten 10 dB	Mkr	1 2.412 998 3 GHz -5.41 dBm	Next Peak
0 2.412 B/ ↓-5.41 Diffst	er 998300 GHz _dBm _{୶∿^৸√₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩ ################}	ngrieseprishinghinghinghinghinghinghinghinghinghing	antranty of market of the production	Next Pk Right
1 IB				Next Pk Left
.0 IBm .gAv				Min Search
11 S2 53 FC AA				Pk-Pk Search
:(f): >50k jwp				Mkr © Cł
Center 2.412 966 Res BW 3 kHz		V 10 kHz #Swe	Span 300 kHz ep 100 s (601 pts)	More 1 of 2

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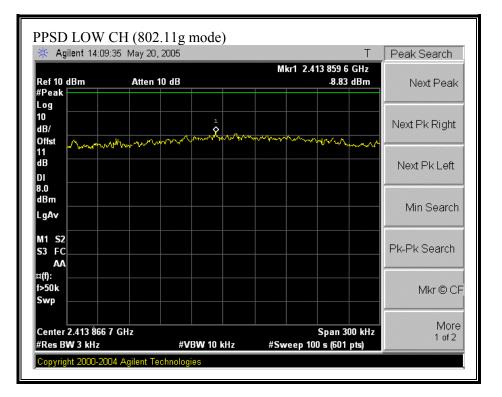
🔆 Agilent 09:50	0:38 May 20, 2005		Т	Peak Search
Ref 10 dBm ^{#Peak} Marke	Atten 10 dB	M	kr1 2.437 912 2 GHz -5.54 dBm	Next Peak
10 2.437	er 912200 GHz dBm <u>Հարի</u> բիլա	ang aliman philips	ant-mayer and the first the first	Next Pk Right
11				Next Pk Left
3.0 dBm LgAv				Min Search
M1 S2 S3 FC AA				Pk-Pk Search
‡(f): >50k Swp				Mkr © Cl
Center 2.437 766 #Res BW 3 kHz		V 10 kHz #Sv	Span 300 kHz veep 100 s (601 pts)	More 1 of 2

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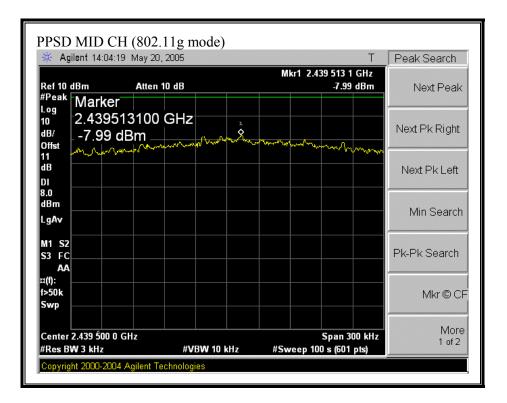
🔆 Ag	ilent 09:35:44	May 20, 200	5			Т	Peak Search
Ref 10		Atten 10 d	B		Mkr1 2.46	3 014 3 GHz -4.41 dBm	Next Peak
10	Marker 2.463014 ,-4.41 dB	1300 GI Im _{Mara}	Hz ⋧	Korhykelson finnet.	Mad and the set	uning the state	Next Pk Right
11 dB DI							Next Pk Left
8.0 dBm LgAv							Min Search
M1 S2 S3 FC AA							Pk-Pk Search
¤(f): f>50k Swp							Mkr © Cl
	2.463 033 3 ĜH W 3 kHz	z	#VBW 10			Span 300 kHz)s (601 pts)	More 1 of 2

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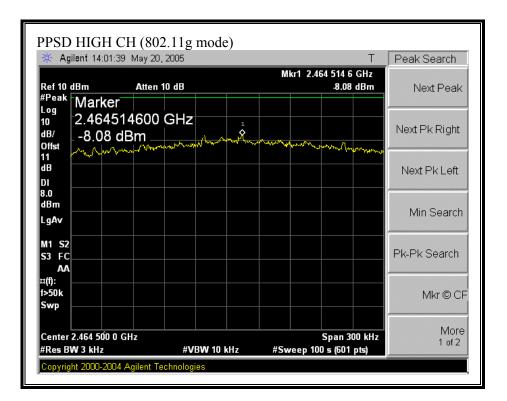
PEAK POWER SPECTRAL DENSITY (802.11g MODE)



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7.1.7. 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.

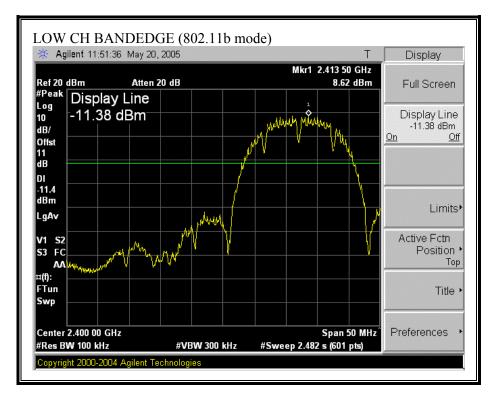
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

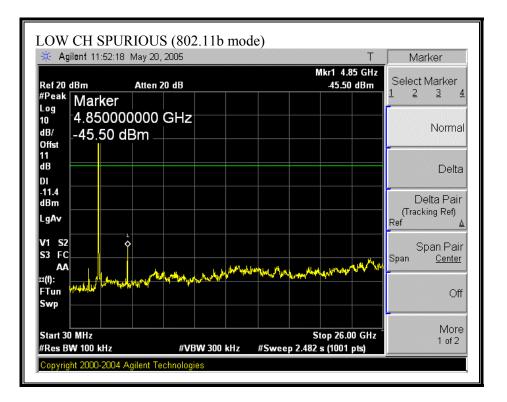
No non-compliance noted:

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SPURIOUS EMISSIONS, LOW CHANNEL (802.11b MODE)

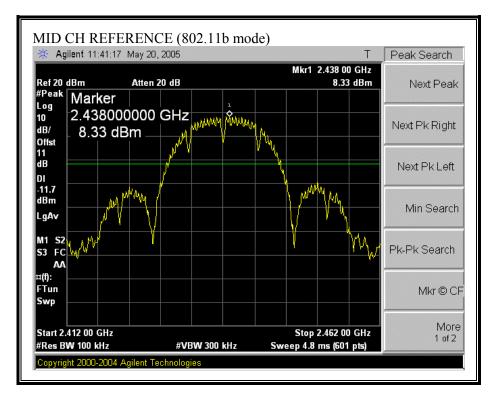


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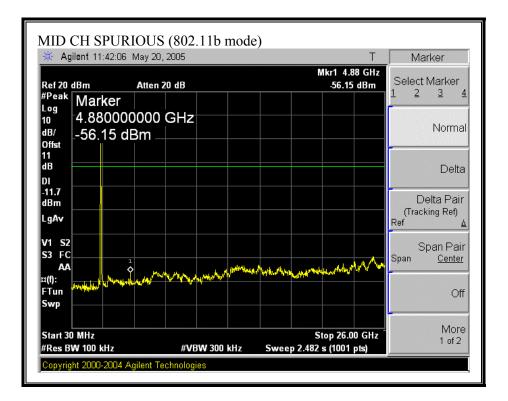


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SPURIOUS EMISSIONS, MID CHANNEL (802.11b MODE)

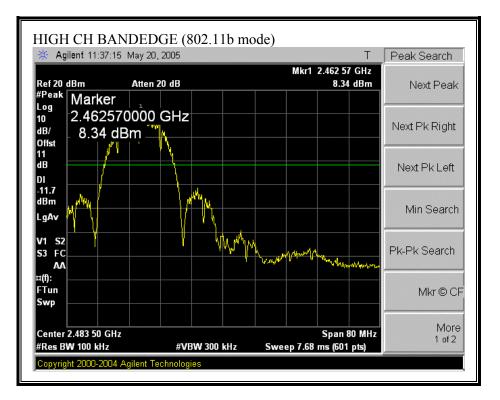


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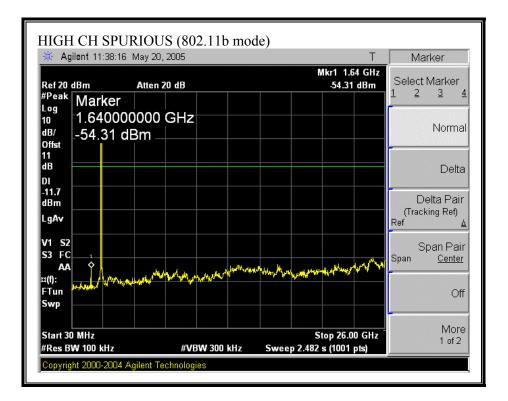


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SPURIOUS EMISSIONS, HIGH CHANNEL (802.11b MODE)

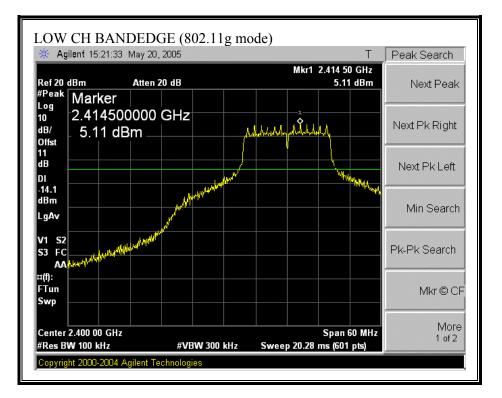


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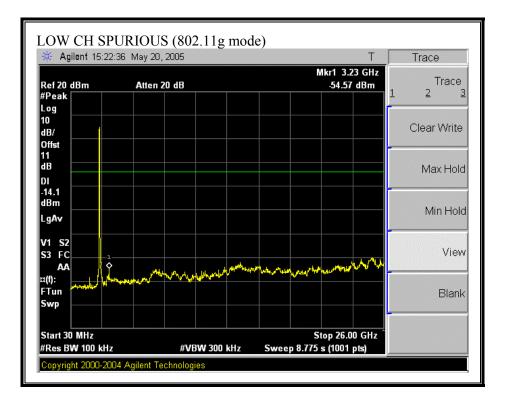


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SPURIOUS EMISSIONS, LOW CHANNEL (802.11g MODE)

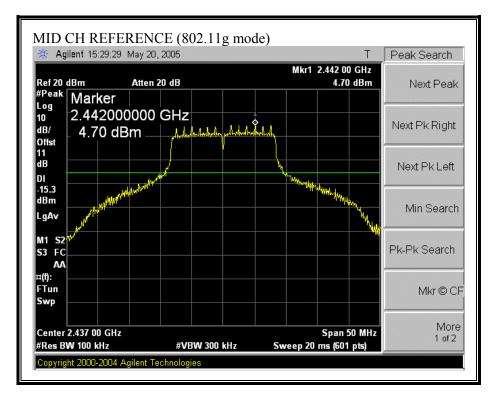


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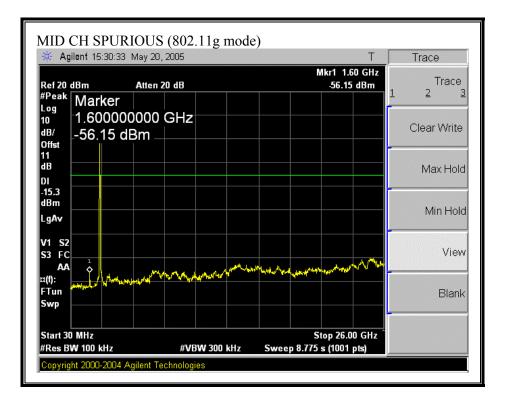


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SPURIOUS EMISSIONS, MID CHANNEL (802.11g MODE)

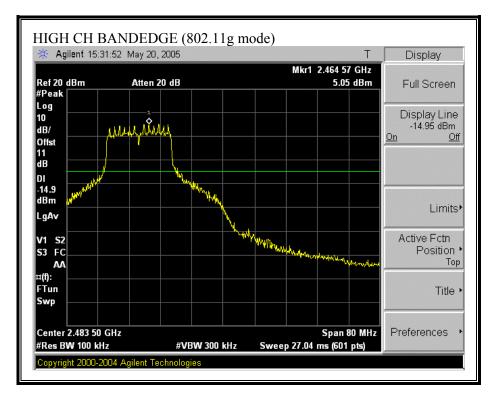


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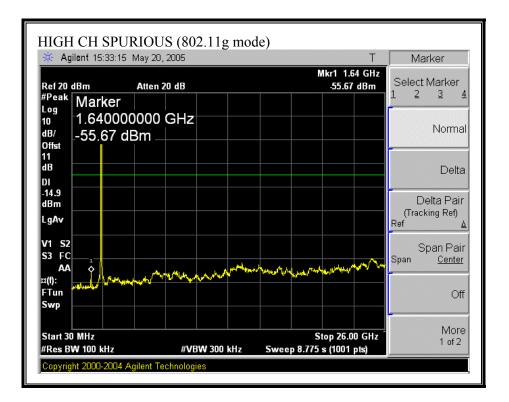


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SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g MODE)



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7.2. CHANNEL TESTS FOR THE 5725 TO 5850 MHz BAND

7.2.1. 6 dB BANDWIDTH

<u>LIMIT</u>

§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.

<u>RESULTS</u>

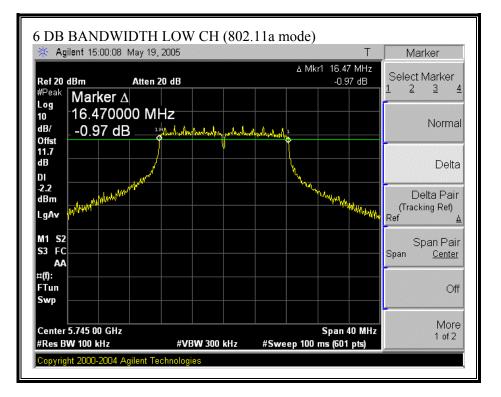
No non-compliance noted:

802.11a Mode

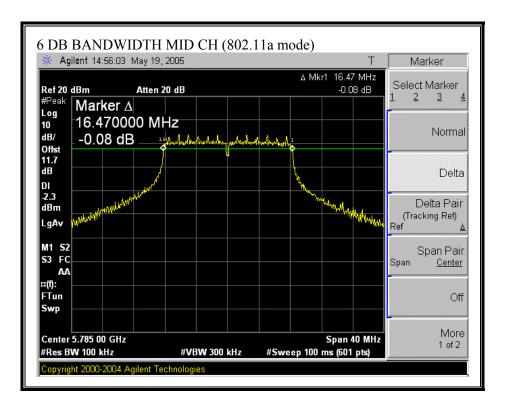
Channel	Frequency	6 dB Bandwidth Minimum Li		Margin
	(MHz)	(kHz)	(kHz)	(kHz)
Low	5745	16470	500	15970
Middle	5785	16470	500	15970
High	5825	16470	500	15970

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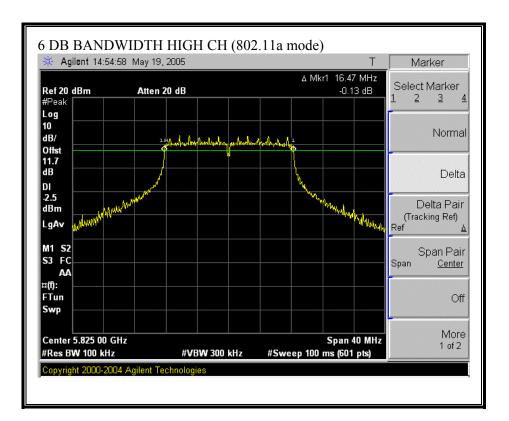
6 DB BANDWIDTH (802.11a MODE)



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7.2.2. 99% BANDWIDTH

<u>LIMIT</u>

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.

RESULTS

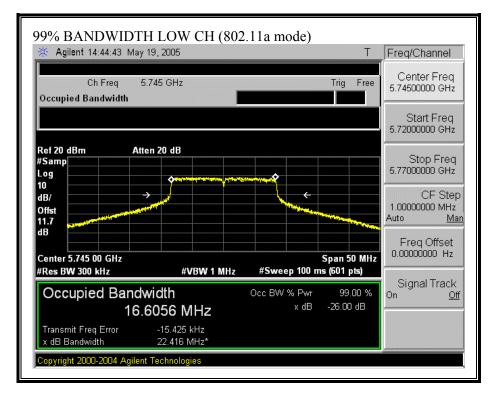
No non-compliance noted:

802.11a Mode

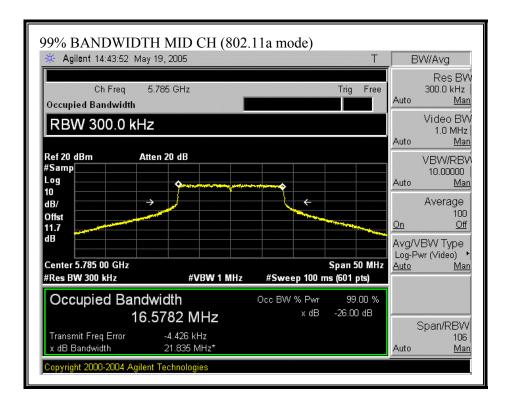
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	5745	16.6056
Middle	5785	16.5782
High	5825	16.503

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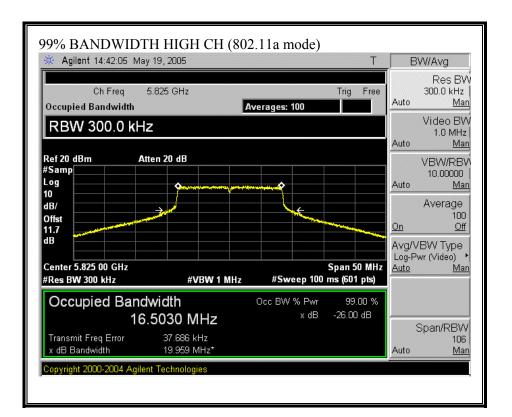
99% BANDWIDTH (802.11a MODE)



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7.2.3. 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)(3) (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) (ii) Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

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.

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RESULTS

The maximum antenna gain is 4.12 dBi for other than fixed, or point-to-point operation, therefore the limit is 30 dBm.

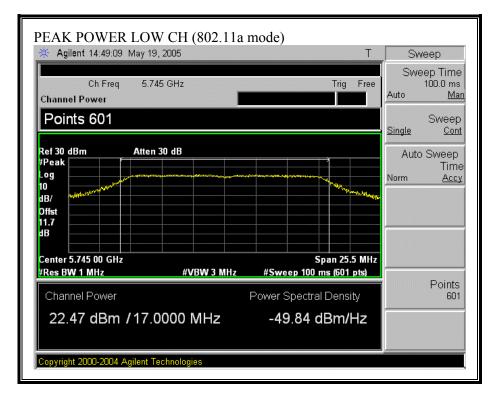
No non-compliance noted:

802.11a Mode

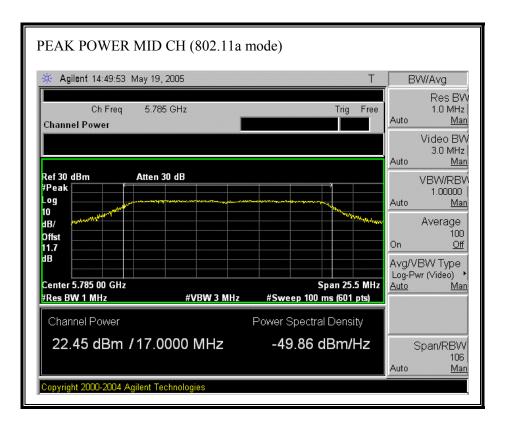
Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	5745	22.47	30	-7.53
Middle	5785	22.45	30	-7.55
High	5825	22.45	30	-7.55

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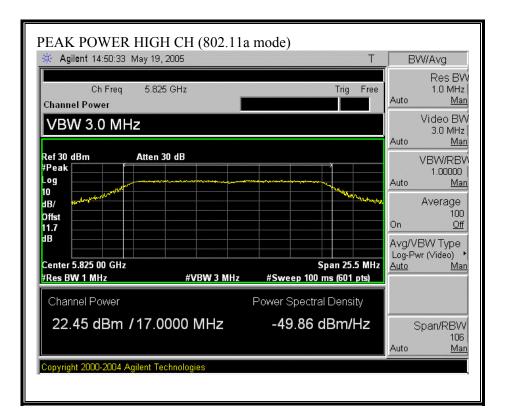
OUTPUT POWER (802.11a MODE)



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7.2.4. 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 30–300 300–1500 1500–100,000	614 1842/f 61.4	1.63 4.89/f 0.163	*(100) *(900/f²) 1.0 f/300 5	6 6 6 8
(B) Limits	for General Populati	ion/Uncontrolled Exp	posure	
0.3–1.34 1.34–30	614 824 <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		0.073	0.2 f/1500 1.0	30 30 30

f = frequency in MHz

t = trequency 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 is exposure also apply in situations when an individual is transient through a location where occupational/controlled is posed as a consequence of the potential for exposure.
 NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

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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 $d = 0.282 * 10 ^ ((P + G) / 20) / \sqrt{S}$ Equation (1) where d = MPE distance in cm P = Power in dBm G = Antenna Gain in dBi $S = Power Density Limit in mW/cm^2$

Equation (1) and the measured peak power is used to calculate the MPE distance.

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LIMITS

From §1.1310 Table 1 (B), S = 1.0 mW/cm^2

RESULTS

No non-compliance noted:

Mode	Power Density	Output	Antenna	MPE
	Limit	Power	Gain	Distance
	(mW/cm^2)	(dBm)	(dBi)	(cm)
802.11a	1.0	22.47	4.12	6.02

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.

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7.2.5. 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 11.7 dB (including 10 dB pad and 1.7dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11a Mode

Channel	Frequency	Average Power
	(MHz)	(dBm)
Low	5745	15.15
Middle	5785	15.24
High	5825	15.20

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7.2.6. 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

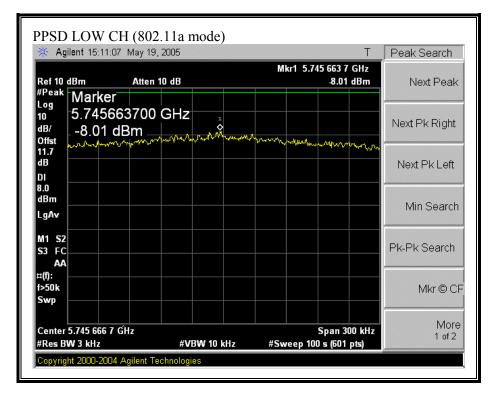
No non-compliance noted:

802.11a Mode

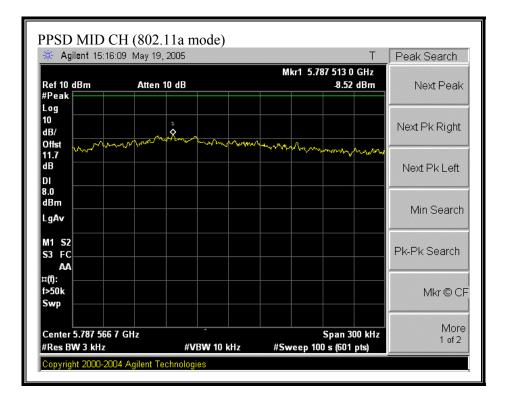
Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	5745	-8.01	8	-16.01
Middle	5785	-8.52	8	-16.52
High	5825	-9.75	8	-17.75

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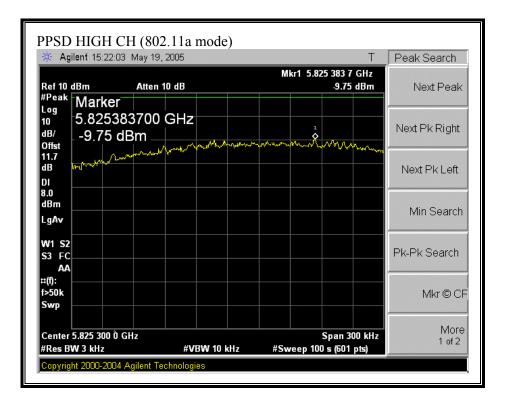
PEAK POWER SPECTRAL DENSITY (802.11a MODE)



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7.2.7. 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.

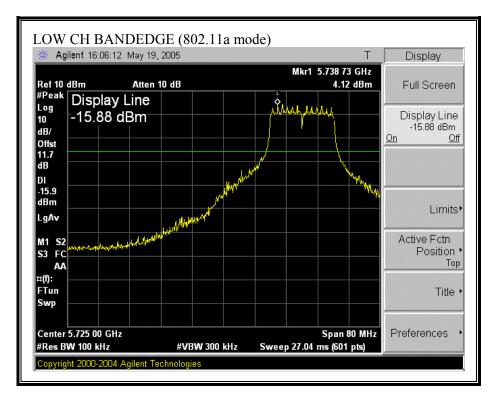
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

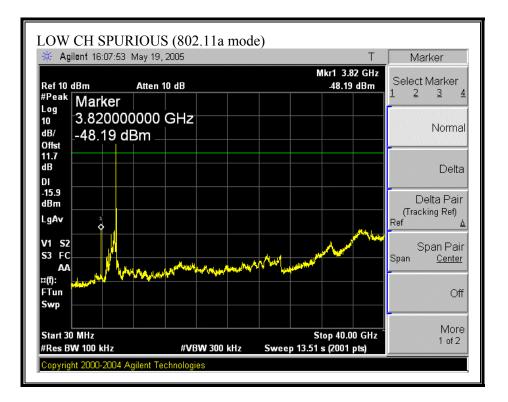
No non-compliance noted:

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SPURIOUS EMISSIONS, LOW CHANNEL (802.11a MODE)

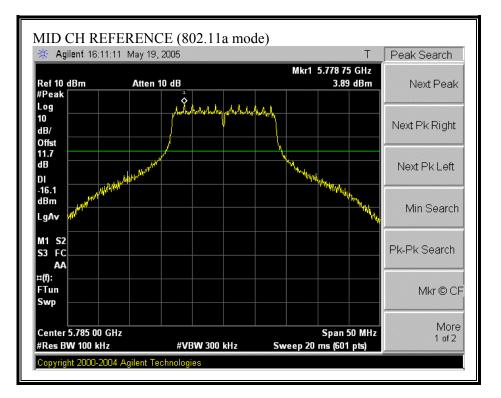


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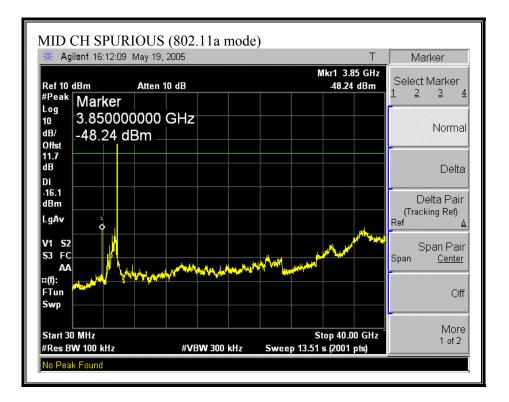


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SPURIOUS EMISSIONS, MID CHANNEL (802.11a MODE)

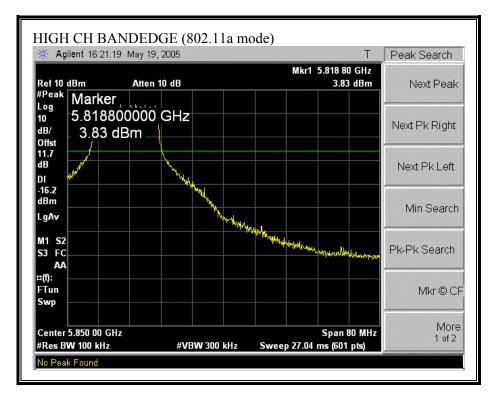


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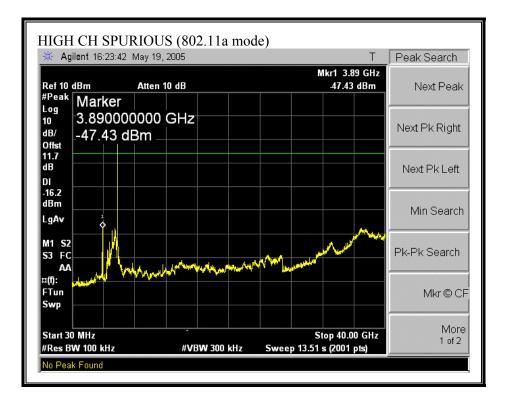


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SPURIOUS EMISSIONS, HIGH CHANNEL (802.11a MODE)



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7.3. RADIATED EMISSIONS

7.3.1. TRANSMITTER RADIATED SPURIOUS 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.

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\$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
(MHz)	(microvolts/meter)	(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.

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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.

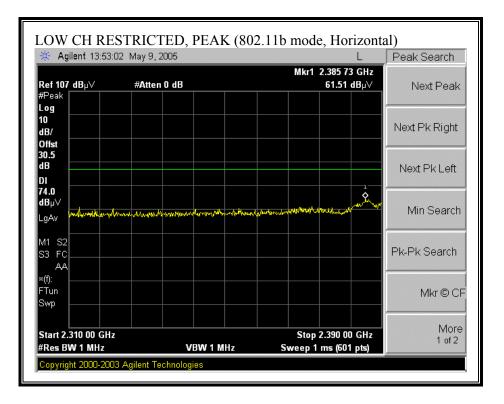
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

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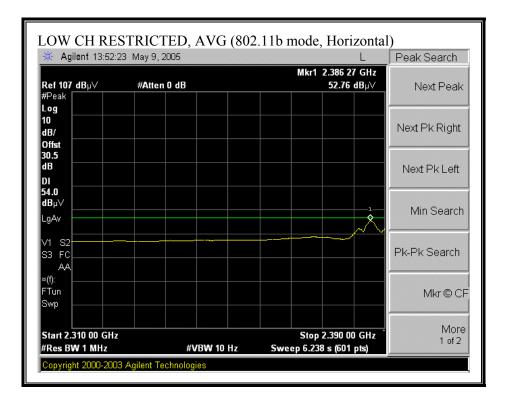
7.3.2. TRANSMITTER ABOVE 1 GHz FOR 2400 TO 2483.5 MHz BAND

MOBILE CONFIGURATION

RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)

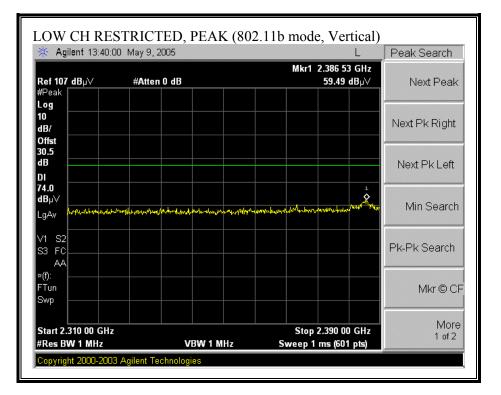


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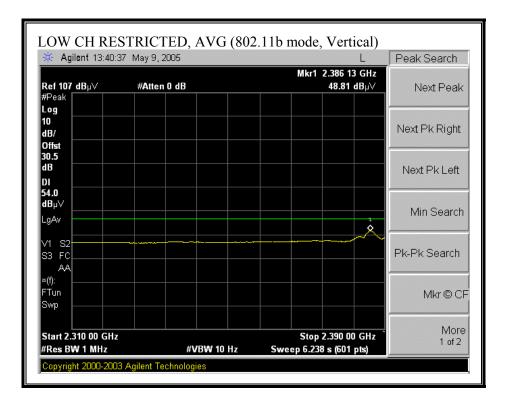


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RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)

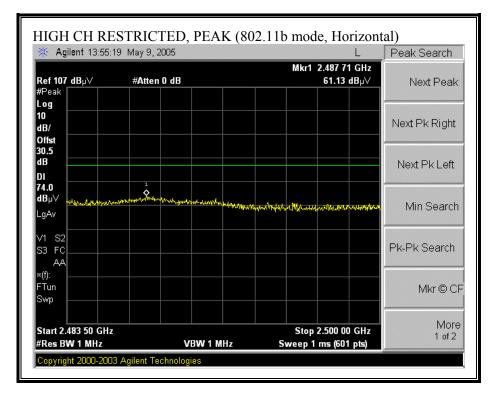


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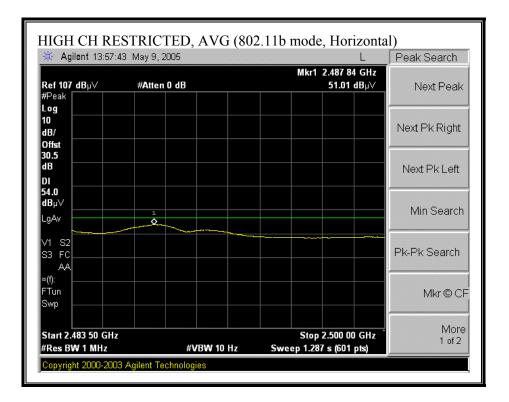


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RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)

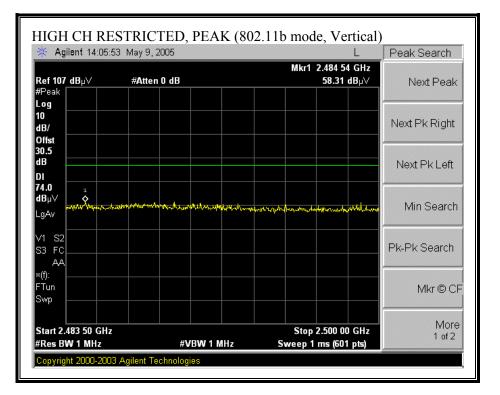


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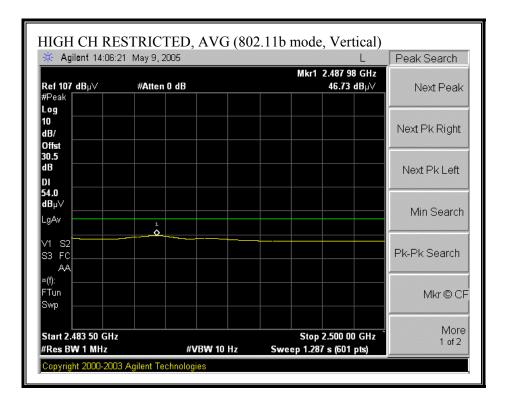


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RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)



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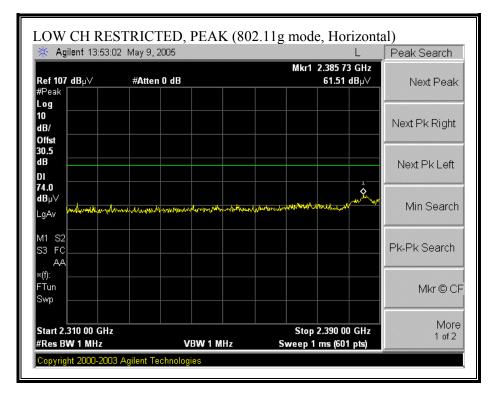
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HARMONICS AND SPURIOUS EMISSIONS (b MODE)

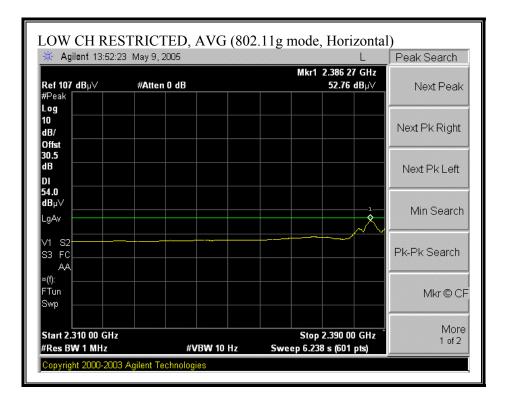
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ow ch .824	3.0	56.0	53.0	33.6	4.1	-44.0	0.0	0.6	50.3	47.3	74	54	-23.7	-6.7	V	
.824	3.0	55.4	53.0 52.0	33.6	4.1 4.1	-44.0 -44.0	0.0	0.6	49.7	47.3	74 74	54 54	-23.7 -24.3	-0.7 -7.7	H	
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nid ch 4.874	3.0	57.8	54.8	33.7	4.1	-44.1	0.0	0.6	52.1	49.1	74	54	-21.9	-4.9	v	
1.874 7.311	3.0	57.8 52.5	54.8 39.4	33.7	4.1 5.4	-44.1 -44.7	0.0	0.6	52.1	49.1 36.9	74	54 54	-21.9 -24.0	-4.9 -17.1	v	
4.874	3.0	60.0	58.1	33.7	4.1	-44.1	0.0	0.6	54.3	52.3	74	54 54	-19.7	-1.7	Н	
7.311	3.0	53.0	39.0	36.2	5.4	-44.7	0.0	0.6	50.5	36.5	74	54	-23.5	-17.5	Н	
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nigh ch 4.924	3.0	58.0	56.0	33.7	4.1	-44.2	0.0	0.6	52.3	50.3	74	54	-21.7	-3.7	v	
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1.924	3.0	52.5 59.8	57.0	33.7	5.4 4.1	-44.7	0.0	0.6	54.1	51.3	74	54	-19.9	-10.1		
7.386	3.0	54.3	39.4	36.2	5.4	-44.7	0.0	0.6	51.9	37.0	74	54	-22.1	-17.0	H	
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	AF CL	Cable Loss				HPF	High Pass	s Filter	ſ							

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RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)

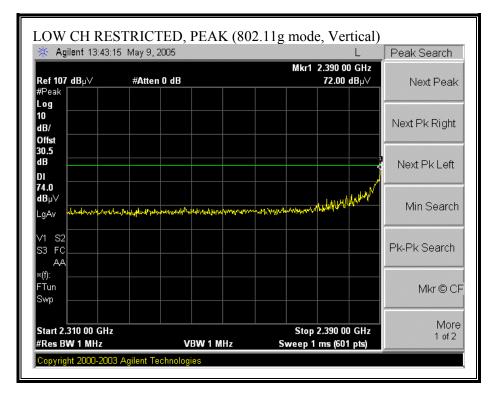


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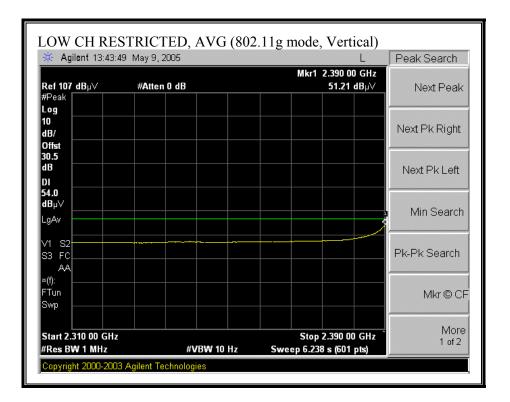


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RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)

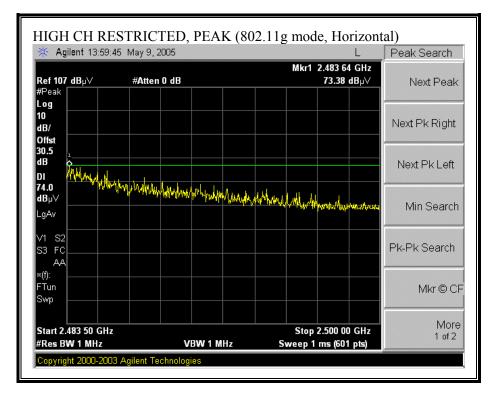


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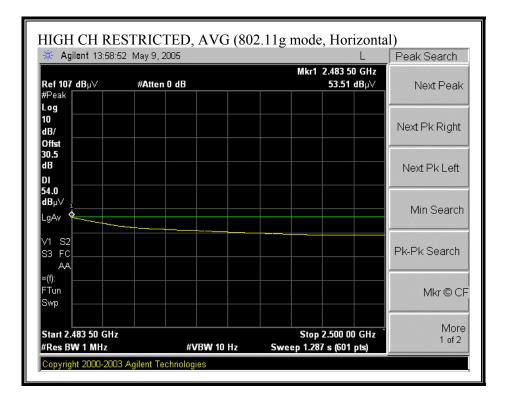


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RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)

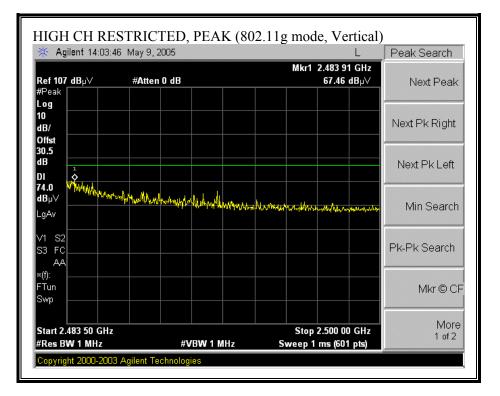


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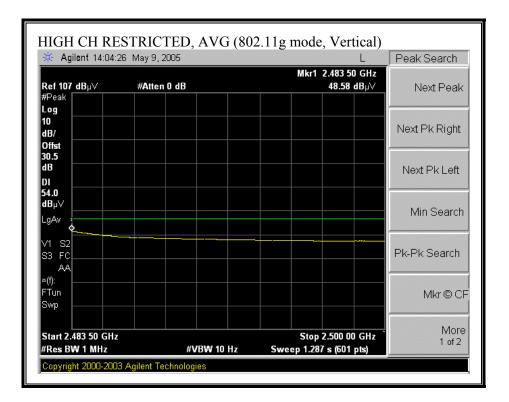


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RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)



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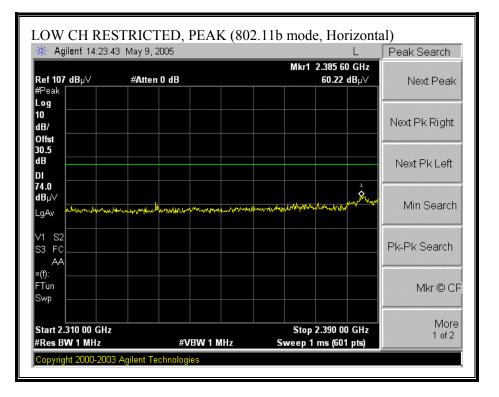
HARMONICS AND SPURIOUS EMISSIONS (g MODE)

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ow ch															
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7.311	3.0	52.2	37.7	36.2	5.4	-40.3	0.0	0.6	54.0	39.5	74	54	-20.0	-14.5	V
4.874	3.0	57.8	46.0	33.7	4.1	-39.6	0.0	0.6	56.5	44.7	74	54	-17.5	-9.3	H
7.311	3.0	54.2	40.0	36.2	5.4	-40.3	0.0	0.6	56.0	41.8	74	54	-18.0	-12.2	H
high ch					[]									ļ	
4.924 7.386	3.0 3.0	55.5 52.6	40.6 38.0	33.7 36.2	4.1 5.4	-39.7 -40.3	0.0 0.0	0.6 0.6	54.3 54.6	39.4 40.0	74 74	54 54	-19.7 -19.4	-14.6 -14.0	V V
4.924	3.0	56.8	38.0 41.5	30.2 33.7	5.4 4.1	-40.3 -39.7	0.0	0.6	54.0 55.6	40.3	74	54	- 18.4	-13.7	Н
7.386	3.0	53.0	38.4	36.2	5.4	-40.3	0.0	0.6	55.0	40.4	74	54	-19.0	-13.6	H
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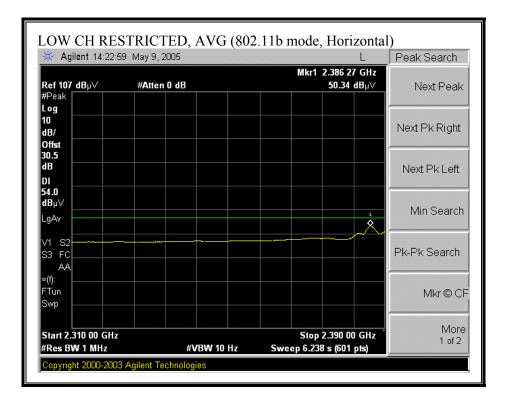
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PORTABLE CONFIGURATION

RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)

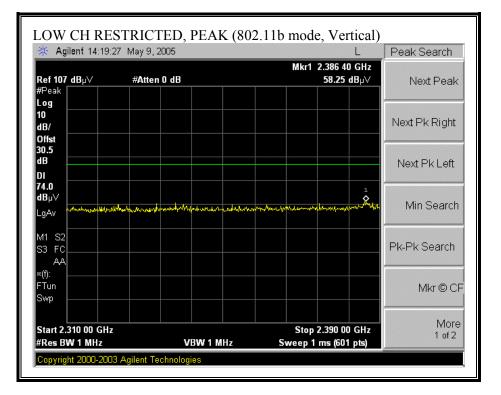


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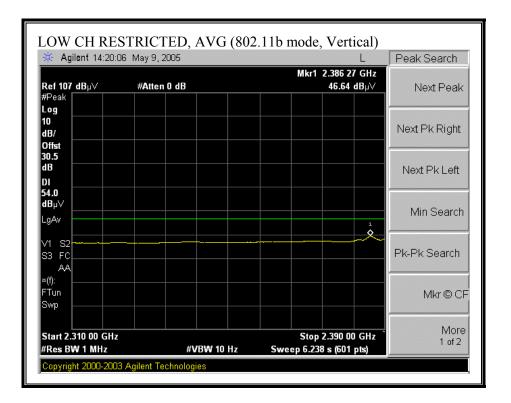


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RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)

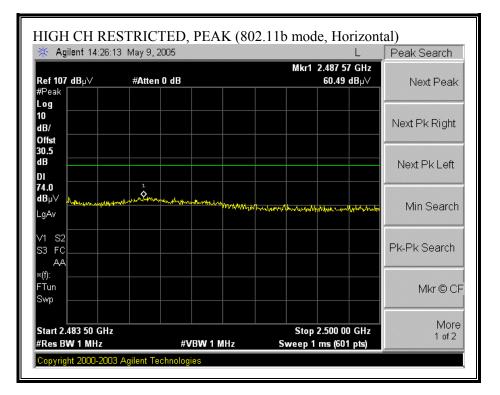


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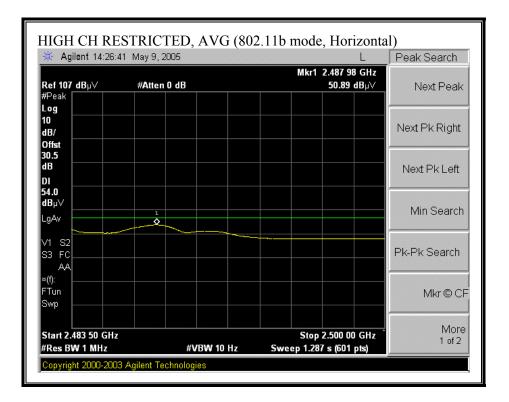


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RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)

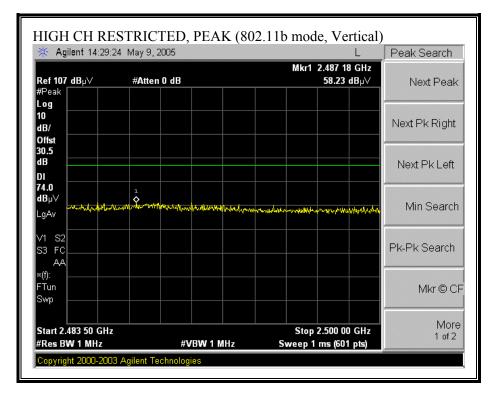


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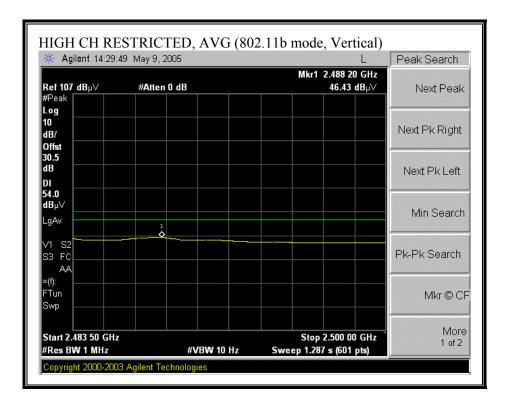


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RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)



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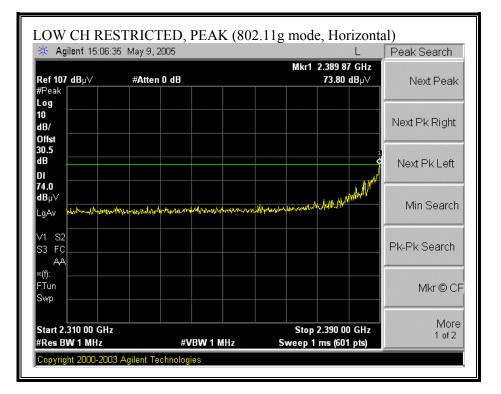
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HARMONICS AND SPURIOUS EMISSIONS (b MODE)

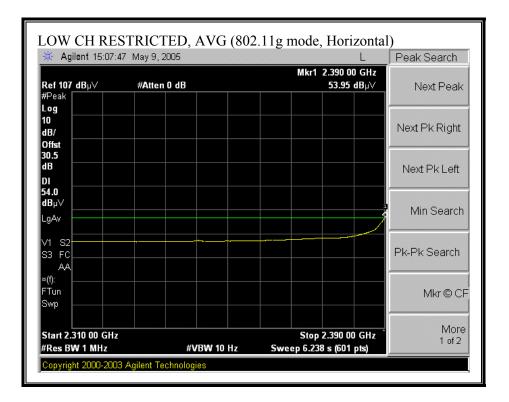
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est Equ	iipmen	<u>t:</u>													
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T60; S	/N: 2238	@3m 🗸	T87 Mit	teq 9243	42 ,				-					FCC 1	•
- Hi Frequ	uency Cab	les	I							,				Beek Marrie	
2 fo	ot cable	3 foo	ot cable	4 foot	cable	1	2 foot cable			HPF	Reje	ect Filter		Peak Measu RBW=VBW=	
				4 Than					HPF	4.0GHz _				Average Me	asurements
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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	3.0	58.0	53.5	33.6	4.1	-39.6	0.0	0.6	56.7	52.2	74	54	-17.3	-1.8	v
.824	3.0	57.2	55.0	33.6	4.1	-39.6	0.0	0.6	55.9	53.7	74	54	- 18.1	-0.3	H
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.874	3.0	56.0	53.2	33.7	4.1	-39.6	0.0	0.6	54.7	51.9	74	54	-19.3	-2.1	v v
.311 .874	3.0 3.0	53.0 54.0	39.7 51.6	36.2 33.7	5.4 4.1	-40.3 -39.6	0.0	0.6 0.6	54.8 52.7	41.5 50.3	74 74	54 54	-19.2 -21.3	-12.5 -3.7	
.311	3.0	51.4	38.5	36.2	5.4	-40.3	0.0	0.6	53.2	40.3	74	54 54	-20.8	-13.7	H
igh ch															
ign cn .924	3.0	56.0	51.0	33.7	4.1	-39.7	0.0	0.6	54.8	49.8	74	54	-19.2	-4.2	v
.386	3.0	51.7	38.0	36.2	5.4	-40.3	0.0	0.6	53.7	40.0	74	54	-20.3	-14.0	v
.924	3.0	57.3	52.0	33.7	4.1	-39.7	0.0	0.6	56.1	50.8	74	54	-17.9	-3.2	Н
.386	3.0	52.0	39.0	36.2	5.4	-40.3	0.0	0.6	54.0	41.0	74	54	-20.0	-13.0	H
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		Analyzer R	eading			Avg	•		Strength @					s. Average Lim	1T
	Read	-											Warom Ve	s. Peak Limit	
		Antenna Fa Cable Loss				Peak HPF	Calculate High Pas			ngui		I K IVIG	10100 501 0.		

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RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)

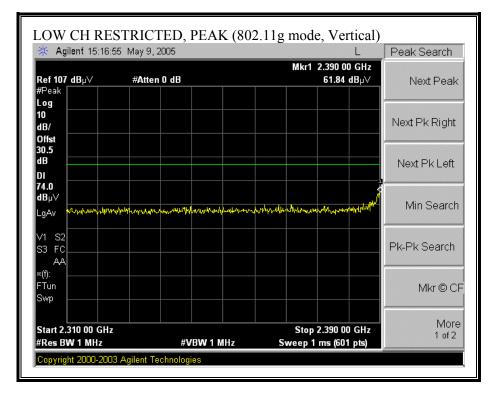


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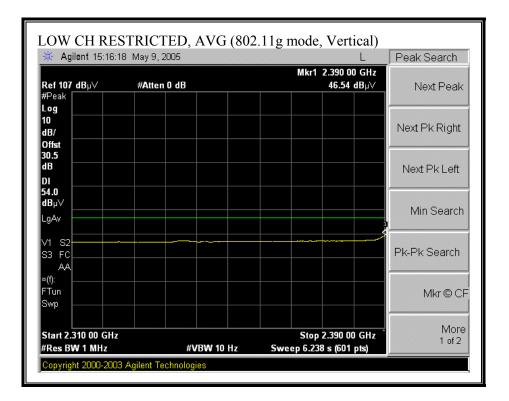


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RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)

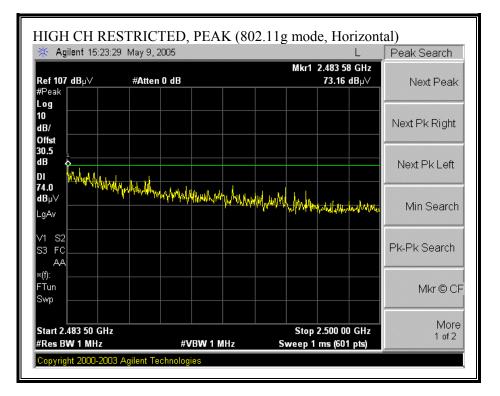


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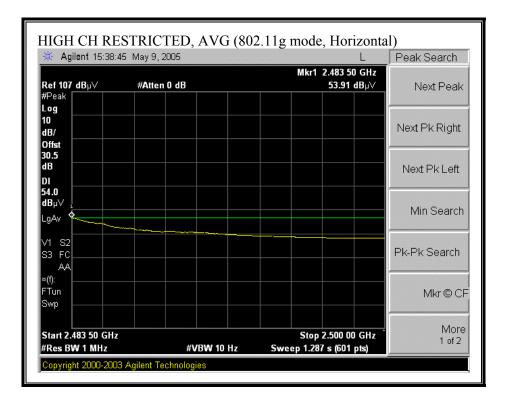


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RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)

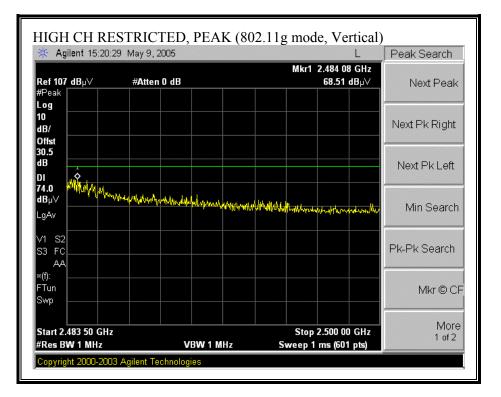


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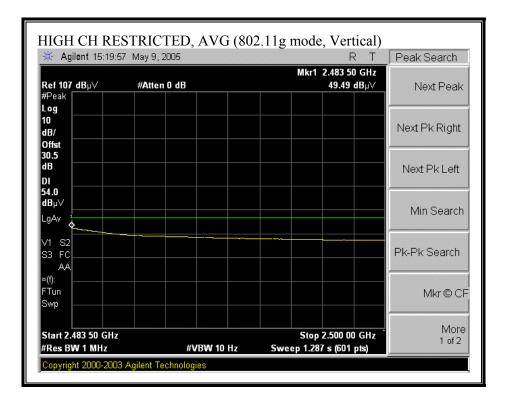


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RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)



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HARMONICS AND SPURIOUS EMISSIONS (g MODE)

	gr:Chin #:05U3														
	y:Tosh														
UT De	scrip.:8	80.11 a/b/g I	MB62HL H	alf Size	Moni-	PCI WI	AN Mod	iule (1	No Turbo I	Mode)					
		3459U-1MF													
			with HTL01	7 anten	na Mo	bile Co	afig using	Fireb	olt Laptop	н. 					
		K, g mode Meter: Lo	w = 16.06 dB	èm Mid	= 16.24	dBm H	6 mh = 15 9	dBm							
_		(Z Position		111, 1911-2	- 10.2		1gii 12.2	CLOTI.							
	uipmen		- /												
						I ,	Pre-amplife	26 4			Horn 2	> 18GHz			Limit
EMCO	O Horn	1-18GHz	Pre-am	plifer 1-2	6GHz		're-ampilie	r 20-40	GHZ			100112		TCC	
T60; S	5/N: 2238	\$@3m ↓	T87 Mit	teq 92434	2 .				-				•	FCC	15.205
- Hi Frea	uency Cal	oles	1												
														Peak Measu RBW=VBW	
2 10	oot cable	3 100	ot cable	4 foot o	able	12	foot cable			HPF	Reje	ect Filter		KD W-VD W	-11/11/2
			•	4_Than	h	1 12	Neelesh		HPF_	4.0GHz 🔪		•		Average M	easurements
											i			RBW=1MHz	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	1	dBuV/m			dB	dB	(V/H)
ow ch															
.824 .824	3.0 3.0	54.0 55.2	40.0 42.5	33.6 33.6	4.1 4.1	-39.6 -39.6	0.0 0.0	0.6 0.6	52.7 53.9	38.7 41.2	74 74	54 54	-21.3 -20.1	-15.3 -12.8	V H
.024	5.0	20.2	72.0	33.0	4.1	-57.0	0.0	0.0	33.7	41.2	/4		-20.1	-14.0	
nid ch															
.874 .311	3.0	56.0 52.2	43.4 37.7	33.7 36.2	4.1 5.4	-39.6 -40.3	0.0	0.6 0.6	54.7 54.0	42.1 39.5	74 74	54 54	-19.3 -20.0	-11.9 -14.5	V
.874	3.0	57.8	46.0	33.7	4.1	-39.6	0.0	0.6	56.5	44.7	74	54	-17.5	-9.3	Ĥ
.311	3.0	54.2	40.0	36.2	5.4	-40.3	0.0	0.6	56.0	41.8	74	54	-18.0	-12.2	Н
igh ch															
.924	3.0	55.7	40.4	33.7	4.1	-39.7	0.0	0.6	54.5	39.2	74	54	- 19.5	-14.8	V
.386	3.0 3.0	52.0 55.0	37.8 41.0	36.2 33.7	5.4 4.1	-40.3 -39.7	0.0 0.0	0.6 0.6	54.0 53.8	39.8 39.8	74 74	54 54	-20.0 -20.2	-14.2 -14.2	V Н
.924	3.0	55.0 52.4	41.0 38.0	36.2	4.1 5.4	-39.7	0.0	0.6	53.8 54.4	39.8 40.0	74	54 54	-20.2	-14.2	H
.380		iccione wara	detected above	the evete	m nois	floor									
	other em	15510H5 WELE	uerecreu abore	The syste	III IIVISC	. 11001.									
	other em			1 1								<u> </u>			
	other em							<u> </u>		<u> </u>					
.380		Maggurama	ent Fraquenci			Amo	Drazmo	Tain				Ava Lim	Average F	Hald Strength	Limit
	f		ent Frequency	<u>y</u>		Amp D.Corr	Preamp (rt to 3 mete	rc .		-	-	Field Strength d Strength Lin	
	f Dist	Distance to	Antenna	y y		D Corr	Distance	Corre	ct to 3 mete			Pk Lim	Peak Field	d Strength Lin	nit
	f Dist Read	Distance to Analyzer Re	Antenna eading	y		D Corr Avg	Distance Average	Corre Field S	Strength @	3 m		Pk Lim Avg Mar	Peak Field Margin vs	d Strength Lin Average Lin	nit
	f Dist	Distance to	Antenna eading actor	y		D Corr	Distance Average	Correc Field S ed Peal	Strength @ k Field Stre	3 m		Pk Lim Avg Mar	Peak Field Margin vs	d Strength Lin	nit

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

MOBILE CONFIGURATION

HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

rtification S David Garcia 05U3390 Toshiba Ame 802.11 a/b/g B PA-3459U-1N FCC 15.247	rica Informatio	organ l											
05U3390 Toshiba Ame 802.11 a/b/g B PA-3459U-11v			ншој	en Fiel	d Site								
05U3390 Toshiba Ame 802.11 a/b/g B PA-3459U-11v													
802.11 a/b/g N PA-3459U-1N													
PA-3459U-1№		on Syster	ms, Inc.										
		size Mini	-PCI WI	AN Mod	lule								
	IPC												
5.8 GHz Band	Tronomitting	Mahilari		ration									
					h = 15.36	dBm							
<u>t:</u>													Limit
l-18GHz	Pre-am	plifer 1-2	26 GHz	1	Pre-amplife	r 26-40)GHz	T20 4 D					
10 @1m 🗸	T86 Mit	teq 9243	41	·			•	139; ARA	18-20GHz;	S/N:1013	•	, FC	C 15.205
oles												Peak Mea	surements
3 foot	cable	4 foot	cable	12	2 foot cable			HPF	Reje	ct Filter		RBW=VBV	W=1MHz
-	•	4_David	d 🗸	12	_Yan	•	HPF_	7.6GHz 🔻		•			<mark>/leasurements</mark> Hz ; VBW=10Hz
Read Pk	Read Avg	ΔF	CT	Amn	DCorr	Fite	Peak	Δνσ	Pl: Lim	Δvσ Tim	Pk Mar	Avg Mar	Notes
dBuV	dBuV	dB/m	dB	dB	dB	dB		-			dB	dB	(V/H)
47.8	36.0	38.5	9.1	-42.7	0.0	0.7	53.5	41.7	74	54	-20.5	-12.3	v
47.9	35.8	38.5	9.2	-42.7	nn	0.7	53.6	41.5	74	54	-20.4	-12.5	v
48.0	35.9	38.5	9.2	-42.8	0.0	0.7	53.7	41.6	74	54	-20.3	-12.4	v
47.9	36.1	38.5	9.1	-42.7	0.0	0.7	53.6	41.8	74	54	- 20.4	-12.2	Н
47.0	25.0	<u> 20 7</u>		40.5	0.0			41.6	~ 1		20.5	10.4	
4/.8	359	38.5	9.2	-42./	U.U	0.7	23.2	41.0	/4	54	-20.5	-12.4	Н
47.0	35.9	38 <i>.</i> 5	9.2	-42.8	0.0	0.7	52.7	41.6	74	54	-21.3	-12.4	Н
ciano urarra da	tected share t	ka cuctar	m naice	floor									
	actual aport i	, syster											
Measureme	nt Frequenc [,]	v		Amp	Preamp (Gain				Avg Lim	Average I	Field Strengt	h Limit
					-		ct to 3 met	ers		-	-	d Strength L	
Distance to				Avg			Strength @					. Average L	
Distance to Analyzer Re	ading			Peak			k Field Stre					. Peak Limit	
				HPF	High Pas								
	t: 1-18GHz 1-18GHz 10 @1m 3 foot 3 foot 47.8 47.9 48.0 47.8 47.9 47.8 47.8 47.9 47.8 47.8 47.9 47.8 47.8 47.9 47.8 47.8 47.9 47.8 47.9 47.8 47.8 47.8 47.8 47.8 47.8 47.8 47.8 47.8 47.8 47.8 47.8 47.8 47.9 47.8 47.8 47.9 47.8 47.8 47.9 47.8 47.9 47.8 47.9 47.8 47.9 47.8 47.9 47.8 4	E: Pre-am 1-18GHz Pre-am 10 @1m T86 Minor oles 3 foot cable 3 foot cable - 47.8 36.0 47.9 35.8 48.0 35.9 47.8 35.9 47.9 36.1 47.8 35.9 47.0 35.9 ssions were detected above to	E Pre-amplifer 1.3 1.18GHz T86 Miteq 9243 10 @1m T86 Miteq 9243 also 3 foot cable 4 foot also 3 foot cable 4 foot also Ass 4 foot also also also 47.9 36.0 38.5 47.9 36.1 38.5 47.8 35.9 38.5 47.8 35.9 38.5 47.8 35.9 38.5	E Pre-amplifer 1-26 GHz 1118 GHz T86 Miteq 924341 101 @1m T86 Miteq 924341 oles 4 foot cable 3 foot cable 4 foot cable 4 foot cable 4David V V Read Pk Read Avg. AF dBuv dBuv dB/m dB 47.8 36.0 38.5 9.1 47.9 35.8 38.5 9.2 47.9 36.1 38.5 9.1 47.8 35.9 38.5 9.2 47.9 36.1 38.5 9.2 47.9 35.9 38.5 9.2 47.0 35.9 38.5 9.2 47.0 35.9 38.5 9.2 ssions were detected above the system noise unitse	E: Pre-amplifer 1-26 GHz I 110 @1m TB6 Miteq 924341 I oles 3 foot cable 4 foot cable 12 oles 4 foot cable 12 Image: State of the sta	E Pre-amplifer 1-26GHz Pre-amplife 1118GHz T86 Miteq 924341 Pre-amplife 3 foot cable 4 foot cable 12 foot cable 3 foot cable 4 foot cable 12 foot cable 3 foot cable 4 foot cable 12 foot cable 12 foot cable 12 foot cable 12 foot cable 12 foot cable 4 foot cable 12 foot cable 12 foot cable 12 foot cable 12 foot cable 4.David 12 foot cable 12 foot cable 4.David 4B 4B 47.8 36.0 38.5 9.1 -42.7 0.0 47.9 36.1 38.5 9.2 -42.7 0.0 47.8 35.9 38.5 9.2 -42.7 0.0 47.9 36.1 38.5 9.2 -42.8 0.0 47.0 35.9 38.5 9.2 -42.7 0.0 47.0 35.9 38.5 9.2 -42.8 0.0 47.0 35.9 38.5 9.2 -42.8 0.0 ssions were detected above the system nois	Pre-amplifer 1-26 GHz Pre-amplifer 1-26 GHz TB6 Miteg 924341 Image: State of the system Image: State of the system State of the system noise floor State of the system noise floor Image: State of the system noise floor Pre-amplifer 1-26 GHz The Miteg 924341 Image: State of the system noise floor Image: State of the system noise floor Image: State of the system noise floor	E Pre-amplifer 1-26 GHz Pre-amplifer 26-40 GHz 110 @1m T86 Miteq 924341 Image: Construction of the system of the system noise floor Image: Construction of the system noise floor 3 foot cable 4 foot cable I2 foot cable Image: Construction of the system noise floor 3 foot cable 4 foot cable I2 foot cable Image: Construction of the system noise floor Read Pk Read Avg. AF CL Amp D Corr Fltr Peak dBuV dBuV dB'm dB dB dB dB dB dBuV/m 47.8 36.0 38.5 9.1 42.7 0.0 0.7 53.5 47.9 36.1 38.5 9.2 42.8 0.0 0.7 53.6 47.8 35.9 38.5 9.2 42.7 0.0 0.7 53.6 47.8 35.9 38.5 9.2 42.7 0.0 0.7 53.6 47.8 35.9 38.5 9.2 42.8 0.0 0.7 53.6 47.9 36.1 38.5 9.2 42.8 0.0	E Pre-amplifer 1-26GHz Pre-amplifer 26-40GHz T39; ARZ 10 @1m T86 Miteq 924341 12 foot cable 139; ARZ a foot cable 4 foot cable 12 foot cable 12 foot cable a foot cable 4 foot cable 12 foot cable 14 foot cable a foot cable 4 foot cable 12 foot cable 12 foot cable a foot cable 4 foot cable 12 foot cable 12 foot cable a foot cable 4 foot cable 12 foot cable 12 foot cable a foot cable 4 foot cable 12 foot cable 12 foot cable dBuV dBuV dB'm dB dB dB dB 47.8 36.0 38.5 9.2 42.7 0.0 0.7 53.6 41.5 48.0 35.9 38.5 9.2 42.8 0.0 0.7 53.6 41.6 47.9 36.1 38.5 9.2 42.7 0.0 0.7 53.6 41.6 47.8 35.9 38.5 9.2 42.7 0.0 0.7 53.6 41.6 47.9 36.	E Pre-amplifer 1-26 GHz Pre-amplifer 26-40 GHz Horn > 10 @1m T86 Miteq 924341 1 T39; ARA 18-26 GHz; 3 foot cable 4 foot cable 12 foot cable HPF Reje 3 foot cable 4 foot cable 12 foot cable HPF Reje MU @1m W 4 foot cable 12 foot cable HPF Reje MU @1m MB //m MB D Corr Fltr Peak Avg Pk Lim dBuV dB/n dB dB dB dB dB dB MU //m dBuV/m dBuV/m 47.8 36.0 38.5 9.1 -42.7 0.0 0.7 53.5 41.7 74 47.9 36.1 38.5 9.2 -42.7 0.0 0.7 53.6 41.8 74 47.9 36.1 38.5 9.2 -42.7 0.0 0.7 53.6 41.8 74 47.9 36.1 38.5 9.2 -42.7 0.0 0.7 53.6 41.8 74 47.9 36.1	E Pre-amplifer 1-26 GHz Pre-amplifer 26-40 GHz Horn > 18 GHz 110 @1m T86 Miteq 924341 Image: Signal	E Horn > 18GHz IIG GIT Pre-amplifer 26.40GHz Horn > 18GHz T39; ARA 18-26GHz; S/N:1013 , T39; ARA 18-26GHz; S/N:1013 , IIG mileq 924341 HPF - amplifer 26.40GHz T39; ARA 18-26GHz; S/N:1013 , IIE foot cable 12 foot cable Image: state of the state of	E Horn > 18 GHz II BG Miteq 924341 Pre-amplifer 26-40 GHz Horn > 18 GHz T39; ARA 18-26 GHz; S/N:1013 Peak Mea Offer T86 Miteq 924341 Pre-amplifer 26-40 GHz T39; ARA 18-26 GHz; S/N:1013 Peak Mea Offer Peak Mea T86 Miteq 924341 Peak Mea Image 12 foot cable Peak Mea Mey Clin Peak Mea Mey Clin Peak Mea Average N Mey Clin Peak Mea Offer Peak Mea Mey Clin Peak Mea Average N RBW=VB1 data DE Mea Average N data DE

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PORTABLE CONFIGURATION (WORST CASE)

HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

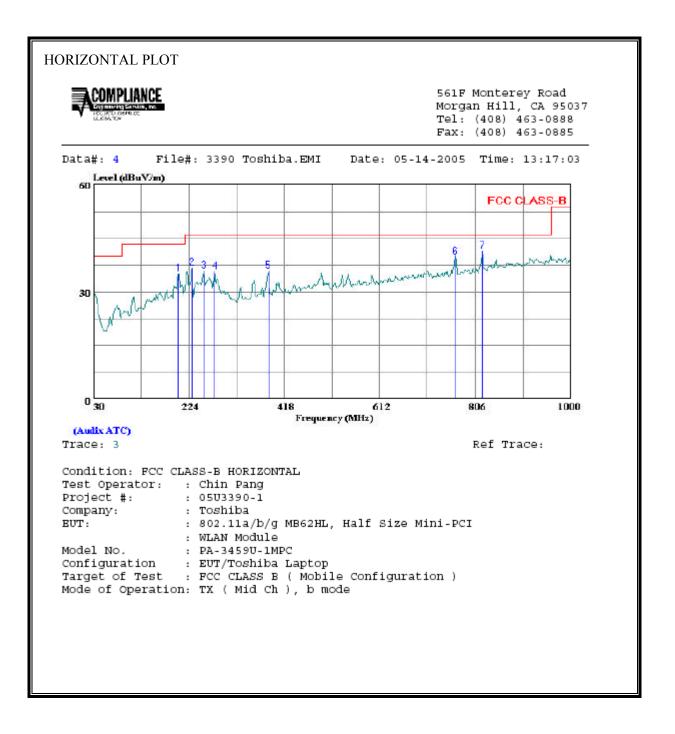
omplia	nce Ce		7 Measuren Services, N		Hill Op	en Fiel	d Site								
est En	~	David Garcia	ı												
roject 'ompar		05U3390 Toshiha Am	erica Informati	on Strete	me Inc										
-	scrip.:		MB62HL Half			AN Mod	hule								
UT M	-	PA-3459U-11													
est Ta	-	FCC 15.247													
Aode C Average	•		d Transmitting w = 15.01 dl					dBm							
fest Eq	uipmen	<u>t:</u>													
EMC	O Horn	1-18GHz	Pre-an	plifer 1-3	26 GHz	1	Pre-amplife	r 26-4(GHz		Horn >	18GHz			Limit
T120;	S/N: 293	:10 @lm 🖵	T86 Mi	teq 9243	41 ,	1 [-	T39; ARA	A 18-26 GHz;	S/N:1013		, FCC	• 15.209
 Hi Freq	juency Cal	oles			_				_				_	Peak Meas	
2 fi	oot cable	3 foo	ot cable	4 foot	cable	12	2 foot cable			HPF	Reje	ct Filter		RBW=VBW	
2_D	avid			4_Davi	d	12	Yan	-	HPF	7.6GHz		_		<u>Average M</u>	leasurements
								•		•		<u> </u>		RBW=1MH	Iz; 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)
(POSITI 745 Cha															
1.490	3.0	47.5	33.5	38.5	9.1	-42.7	۵0	0.7	53.2	39.2	74	54	- 20.8	-14.8	v
7.235 785 Cha	3.0	47.7	35.0	42.0	10.4	-45.2	0.0	0.6	55.5	42.8	74	54	-18.5	-11.2	V
1 <i>5</i> 70	3.0	47.1	33.6	38.5	9.2	-42.7	0.0	0.7	52.8	39.3	74	54	-21.2	-14.7	v
7.355	3.0	47.6	34.9	42.1	10.4	-45.1	0.0	6.0	55.6	42.9	74	54	-18.4	-11.1	v
825 Cha 1.650	nnel 3.0	46.8	33.7	38.5	9.2	-42.8	0.0	0.7	52.5	39.4	74	54	-21.5	-14.6	v
7.475	3.0	47.4	34.7	42.2	10.4	-45.0	0.0	0.0	55.6	42.9	74	54	-18.4	-11.1	v
745 Cha	nnel														
1.490	3.0	47.8	34.0	38.5	9.1	-42.7	0.0	0.7	53.5	39.7	74	54	-20.5	-14.3	Н
7.235 785 Cha	3.0 nnel	48.6	36.2	42.0	10.4	-45.2	0.0	6.0	56.4	44.0	74	54	-17.6	-10.0	H
1 <i>.</i> 570	3.0	47.0	33.7	38.5	9.2	-42.7	0.0	0.7	52.7	39.4	74	54	-21.3	-14.6	Н
7.355	3.0	48.9	36.8	42.1	10.4	-45.1	۵۵	6.0	56.9	44.8	74	54	-17.1	-9.2	Н
825 Cha 1.650	nnel 3.0	46.9	33.6	38.5	9.2	-42.8	0.0	0.7	52.6	39.3	74	54	-21.4	-14.7	Н
7.475	3.0	47.3	35.2	42.2	10.4	-45.0	0.0	0.0	55.5	43.4	74	54 54	-18.5	-10.6	H
Note: No	other em	issions were	detected above	the syste	m noise	floor.									
		<u> </u>													
	f	Measurem	ent Frequenc	v		Amp	Preamp (Gain				Avg Lim	Average]	Field Strength	h Limit
	Dist	Distance to	-	-			-		ct to 3 met	ers		-	-	d Strength Li	
	Read	Analyzer R	eading			Avg	Average	Field 3	Strength @	3 m		Avg Mar	Margin vs	. Average Li	mit
	AF	Antenna Fa				Peak			k Field Stre	ength		Pk Mar	Margin vs	. Peak Limit	
	CL	Cable Loss	3			HPF	High Pas	s Filter	r						

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7.2.5 WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

MOBILE CONFIGURATION

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

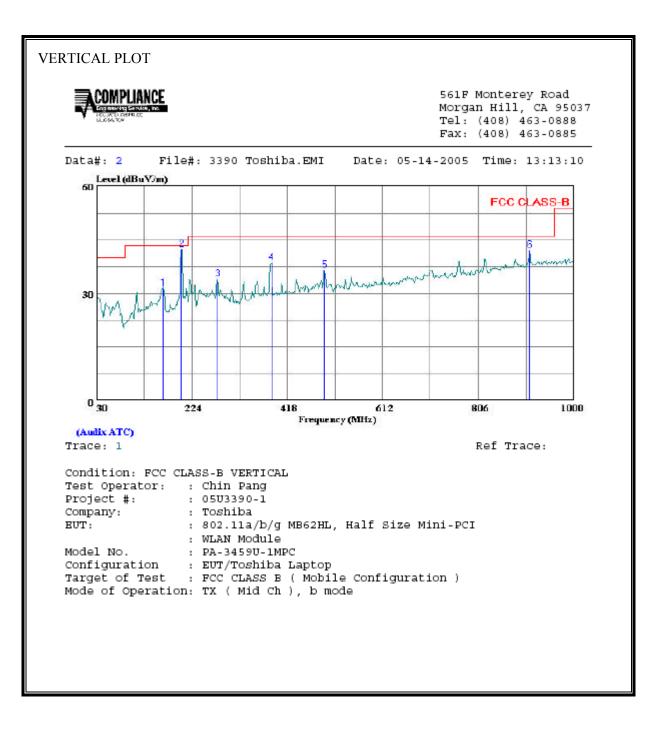


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HORIZ	ZONTAL DA	ATA							
			Factor			Limit	Remark	Page:	1
1 2 4 5 6 7	MHz 202.660 230.790 255.040 276.380 385.990 765.260 819.580	21.79 20.94 18.13 15.68	14.22 13.08 14.09 14.85 17.73 24.09	35.79 35.86 39.77	43.50 46.00 46.00 46.00 46.00 46.00	-8.42 -9.27 -10.12 -10.21 -10.14 -6.23	Peak Peak Peak Peak Peak Peak		

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

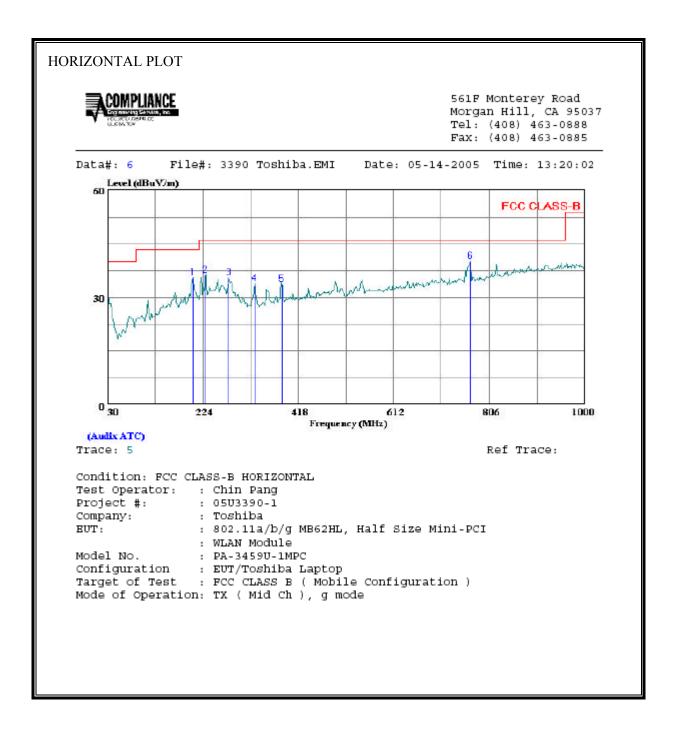


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VERTIC	CAL DATA							
	Freq	Read Level		Level	Limit Line		Remark	Page: 1
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1 2 3 4 5 6	165.800 202.660 276.380 385.990 494.630 909.790	17.76 28.18 19.24 20.95 16.46	13.57 14.22 14.85 17.73 20.14	31.33 42.40 34.09 38.68 36.60	43.50 43.50 46.00 46.00 46.00	-12.17 -1.10 -11.91 -7.32	Peak Peak Peak Peak	

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

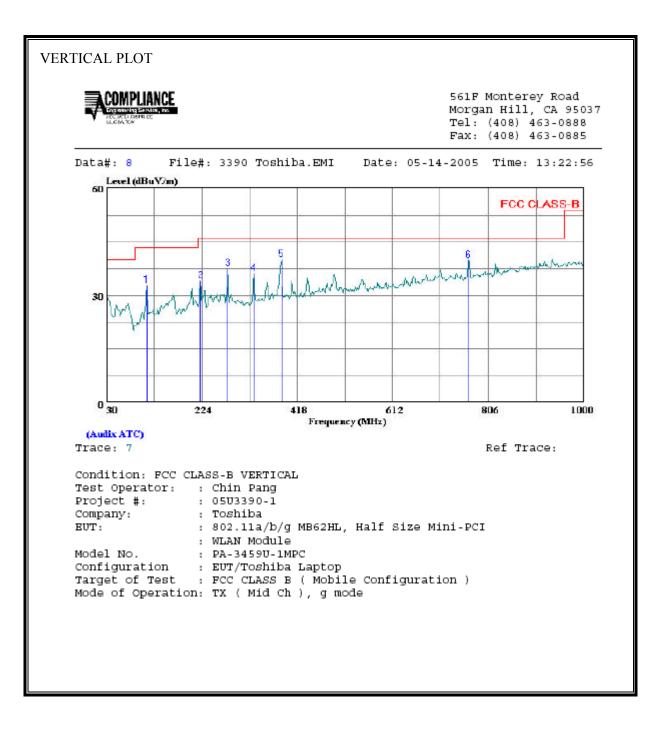


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HORIZO	NTAL DAT	ΓA						
	Freq MHz	Read Level dBuV		Level	Limit Line dBuV/m	Limit	Remark	Page: 1
1 2 3 4 5 6	203.630 228.850 276.380 329.730 385.020	21.52 23.22 20.70 17.45 16.00	14.01 12.98 14.85 16.44 17.71	35.53 36.20 35.55 33.89 33.71	43.50 46.00 46.00 46.00	-7.97 -9.80 -10.45 -12.11 -12.29	Peak Peak Peak Peak	

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

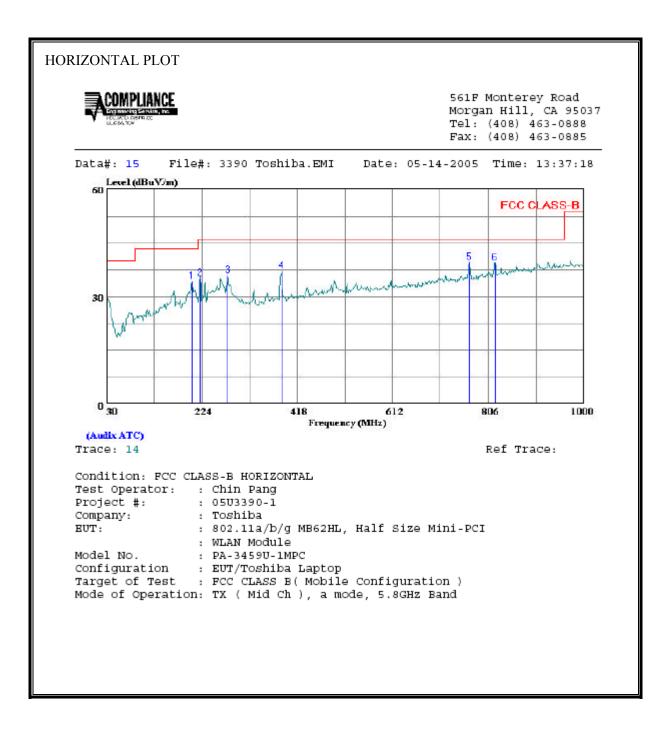


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VERTICAL DATA	
Page: 1 Read Limit Over Freq Level Factor Level Line Limit Remark	
MHz dBuV dB dBuV/m dBuV/m dB	
MHz dBuV dB dBuV/m dBuV/m dB 1 111.480 18.91 13.82 32.73 43.50 -10.77 Peak 2 221.090 21.40 12.67 34.07 46.00 -11.93 Peak 3 276.380 22.66 14.85 37.51 46.00 -8.49 Peak 4 329.730 19.66 16.44 36.10 46.00 -9.90 Peak 5 385.990 22.45 17.73 40.18 46.00 -5.82 Peak 6 765.260 15.86 24.09 39.95 46.00 -6.05 Peak	

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SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL, A MODE @ 5.8GHZ BAND)

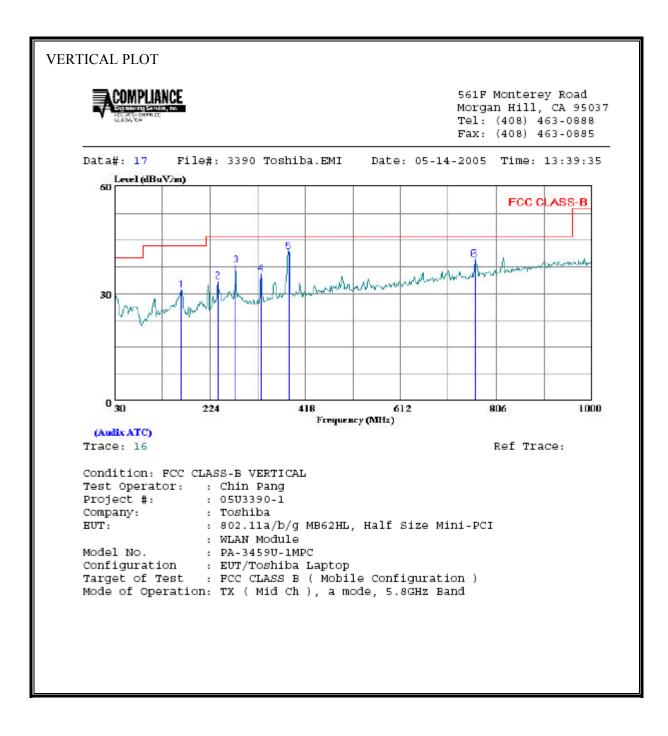


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HORIZO	ONTAL DAT	ГA						
	Freq	Read Level		Level	Limit Line		Remark	Page: 1
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1 2 3 4 5 6	203.630 220.120 276.380 385.990 766.230	20.20 22.52 21.15 19.52	14.01 12.60 14.85 17.73 24.09	34.21 35.12 36.00 37.25	43.50 46.00 46.00 46.00 46.00	-9.29 -10.88 -10.00 -8.75 -6.26	Peak Peak Peak Peak	

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SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL, A MODE @ 5.8GHZ BAND)



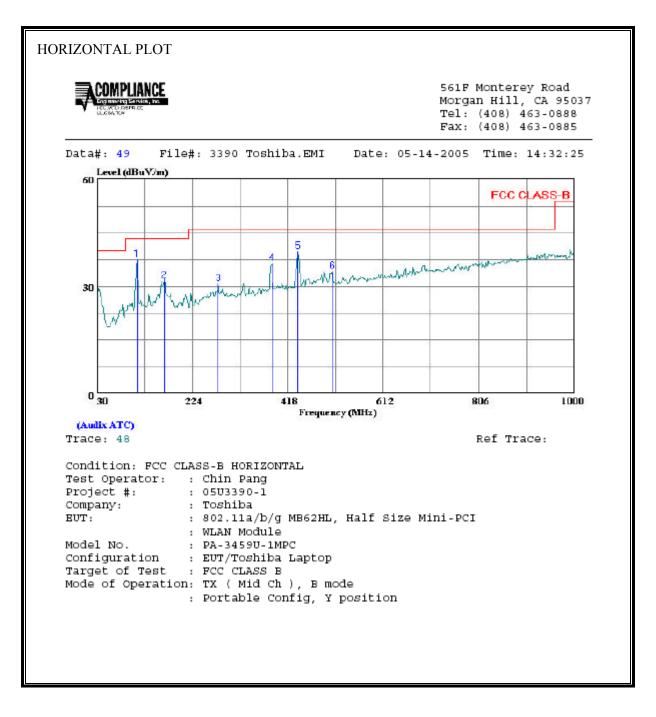
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VERTIC	CAL DATA							
	Freq	Read Level		Level	Limit Line	Over Limit	Remark	Page: 1
	MHz		dB	dBuV/m		dB		
1 2	165.800 240.490	17.33 19.88	13.57 13.54		43.50 46.00			
3	276.380	23.12	14.85		46.00			
4	327.790				46.00			
5	385.020	24.06	17.71	41.77	46.00	-4.23	Peak	
6	761.380	15.70	24.02	39.72	46.00	-6.28	Peak	

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PORTABLE CONFIGURATION

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

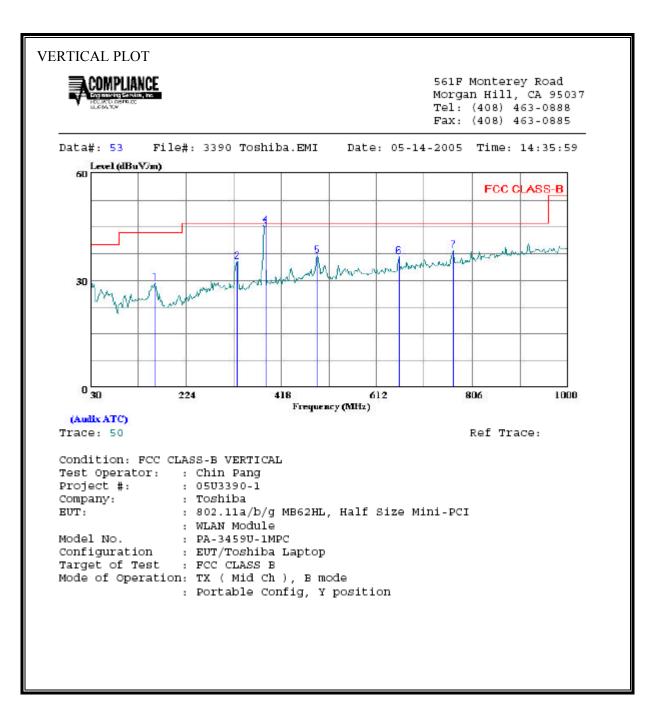


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HORIZON	ITAL DAT	A						
	Freq	Read Level	Factor	Level	Limit Line	Over Limit		Page: 1
-	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1 2 3 4 5 6	111.480 166.770 276.380 385.990 439.340 509.180	23.75 18.02 15.86 18.84 20.96	13.82 13.53 14.85 17.73 18.96	37.57 31.55 30.71 36.57 39.92	43.50 43.50 46.00 46.00 46.00	-5.93 -11.95 -15.29 -9.43 -6.08	Peak Peak Peak Peak	

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

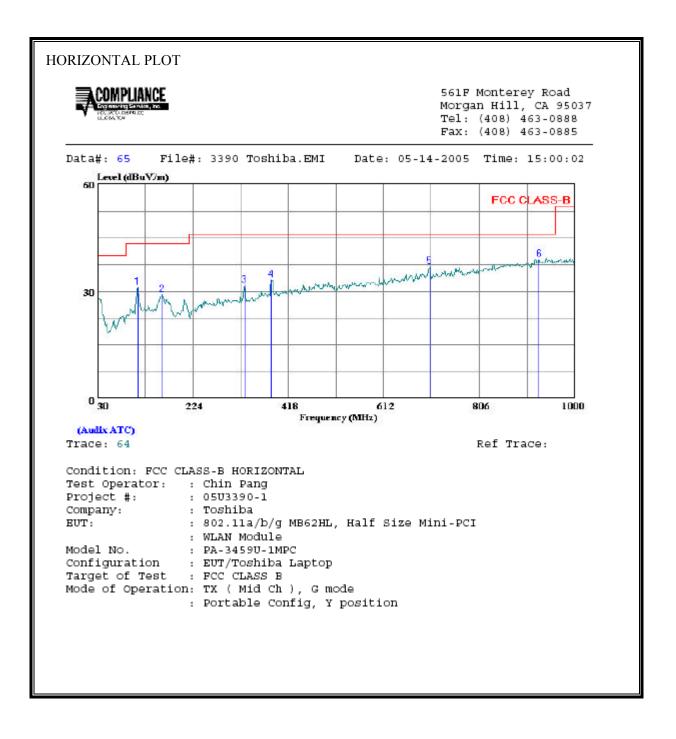


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VERTIC	CAL DATA							
	Freq	Read Level		Level	Limit Line	Over Limit	Remark	Page: l
	MHZ	dBuV			dBuV/m			
1 2	161.920 328.760				43.50 46.00			
3	385.990				46.00			
4	385.990							
5	491.720							
6	657.590						Peak	
7	766.230	14.24	24.09	38.33	46.00	-7.67	Peak	

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

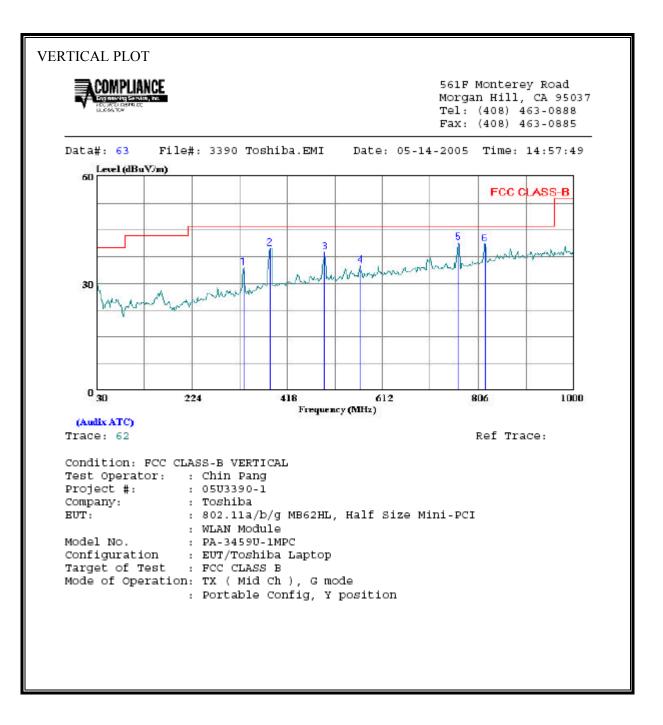


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HORIZO	HORIZONTAL DATA										
	Freq	Read Level F	actor	Level		Over Limit	Remark	Page: 1			
	MHz	dBuV	dB	$\overline{d}\overline{BuV/m}$	dBuV/m	dB					
1 2 3 4 5 6	MHz 111.480 161.920 329.730 383.080 706.090 926.280	17.39 15.32 15.42 15.62 13.86	13.82 13.73 16.44 17.69	31.21 29.05 31.86 33.31 37.03	dBuV/m 43.50 43.50 46.00 46.00 46.00	-12.29 -14.45 -14.14 -12.69 -8.97	Peak Peak Peak Peak				

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

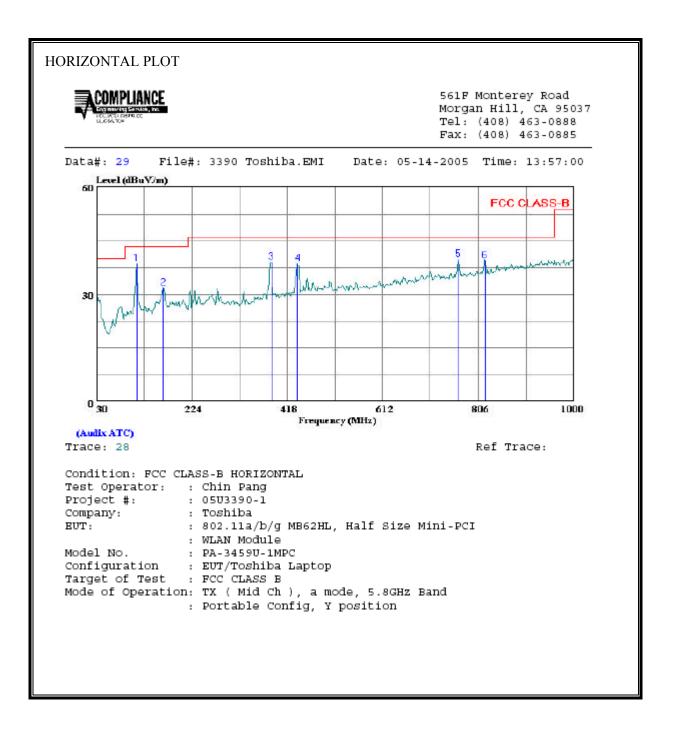


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VERTIC	CAL DATA							
	Freq	Read Level	Factor	Level	Limit Line		Remark	Page: 1
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1 2	329.730 383.080				46.00			
2	494.630				46.00			
4	567.380							
5	764.290	17.49	24.09	41.58	46.00	-4.42	Peak	
6	818.610	16.34	24.83	41.17	46.00	-4.83	Peak	

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SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL, A MODE @ 5.8GHZ BAND)

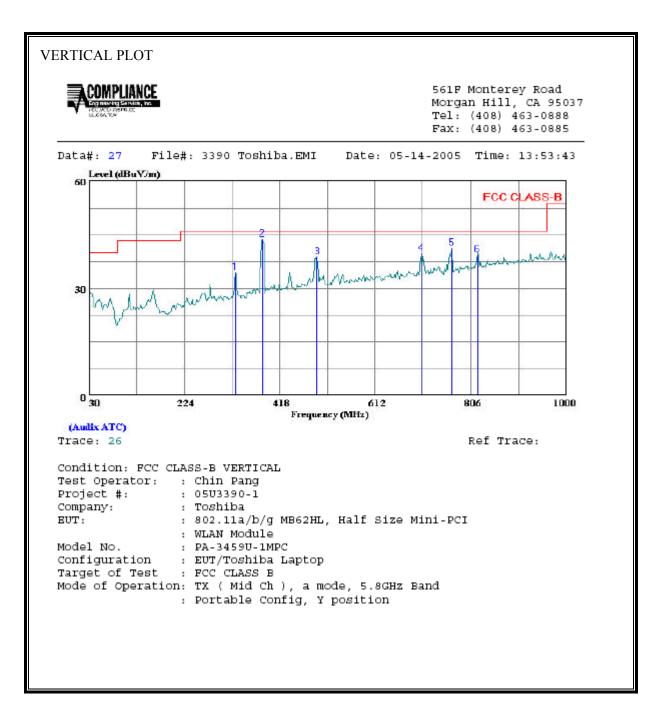


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HORIZO	ONTAL DA	ТА							
	Freq	Read Level		Level	Limit Line	Over Limit		Page: 1	
-	MHz	dBuV	dB	$\overline{d}BuV/m$	dBuV/m	dB			
1 2 3 4	111.480 165.800 385.990 439.340	18.20 21.23	13.57 17.73	31.77 38.96	43.50 46.00	-11.73 -7.04	Peak Peak		
5	764.290 818.610	15.84	24.09	39.93	46.00	-6.07	Peak		

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SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL A MODE @ 5.8GHZ BAND)



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VERT	VERTICAL DATA									
	Freq	Read Level		Level	Limit Line	Over Limit		Page: 1		
	MHz	dBuV	dB	$\overline{d}BuV/m$	dBuV/m	dB				
1 2 3 4 5 6		18.10 26.12 18.67 16.60 17.20	16.35 17.69 20.14 23.17 24.09	34.45 43.81 38.81 39.77 41.29	46.00 46.00 46.00 46.00 46.00	-11.55 -2.19 -7.19 -6.23 -4.71	Peak Peak Peak Peak			

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7.4. 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	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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<u>6 WORST EMISSIONS</u>

g-Mode (Worst Case)

Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	V) QP (dBuV) AV (dBuV)			QP	AV	QP (dB)	AV (dB)	L1 / L2
0.15	48.74			0.00	66.00	56.00	-17.26	-7.26	L1
4.67	31.72			0.00	56.00	46.00	-24.28	-14.28	L1
21.49	27.44			0.00	60.00	50.00	-32.56	-22.56	L1
0.15	47.68			0.00	66.00	56.00	-18.32	-8.32	L2
4.01	29.96			0.00	56.00	46.00	-26.04	-16.04	L2
19.43	32.22			0.00	60.00	50.00	-27.78	-17.78	L2
6 Worst Data									

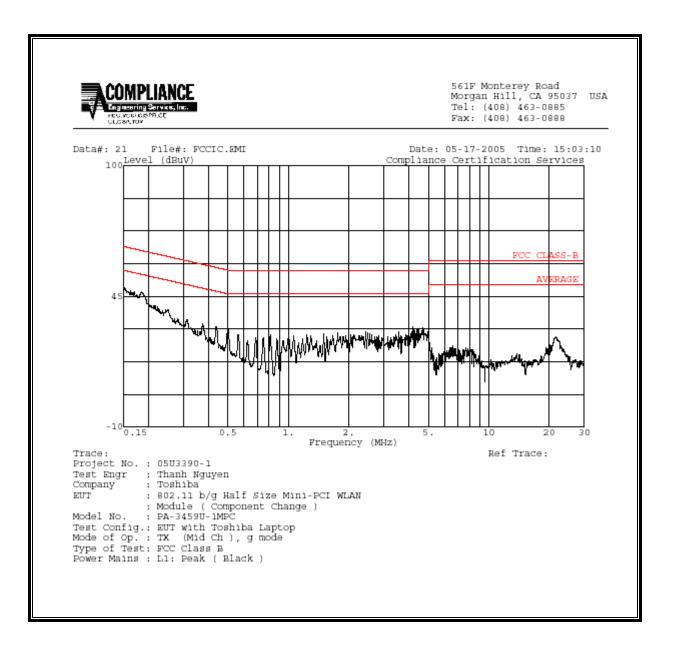
a-Mode, 5.8GHz Band

	CONDUCTED EMISSIONS DATA (115VAC 60Hz)										
Freq.	Reading			Closs	Limit	EN_B	Margin		Remark		
(MHz)	PK (dBuV)	PK (dBuV) QP (dBuV) AV (dBuV)			QP	AV	QP (dB)	AV (dB)	L1 / L2		
0.18	46.58			0.00	64.30	54.30	-17.72	-7.72	L1		
4.18	32.06			0.00	56.00	46.00	-23.94	-13.94	L1		
21.60	27.86			0.00	60.00	50.00	-32.14	-22.14	L1		
0.18	46.94			0.00	64.44	54.44	-17.50	-7.50	L2		
4.50	31.20			0.00	56.00	46.00	-24.80	-14.80	L2		
18.04	36.34			0.00	60.00	50.00	-23.66	-13.66	L2		
6 Worst I	Data										

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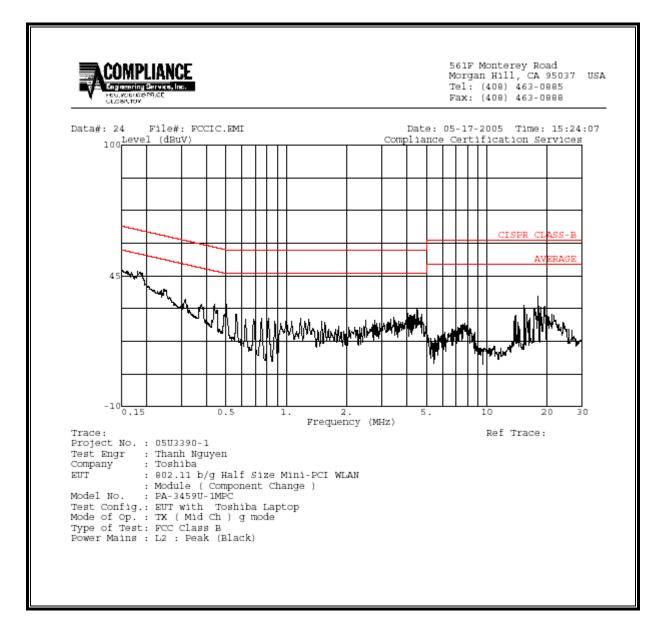
g-Mode (Worst Case)

LINE 1 RESULTS



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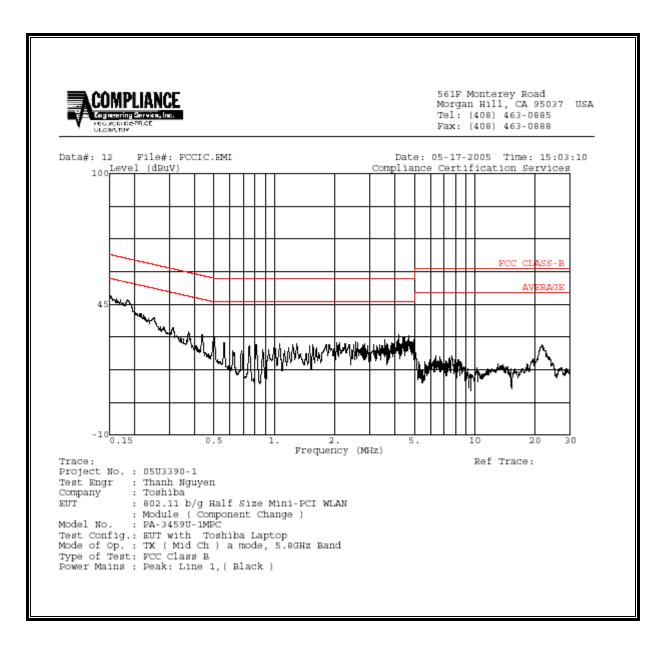
LINE 2 RESULTS



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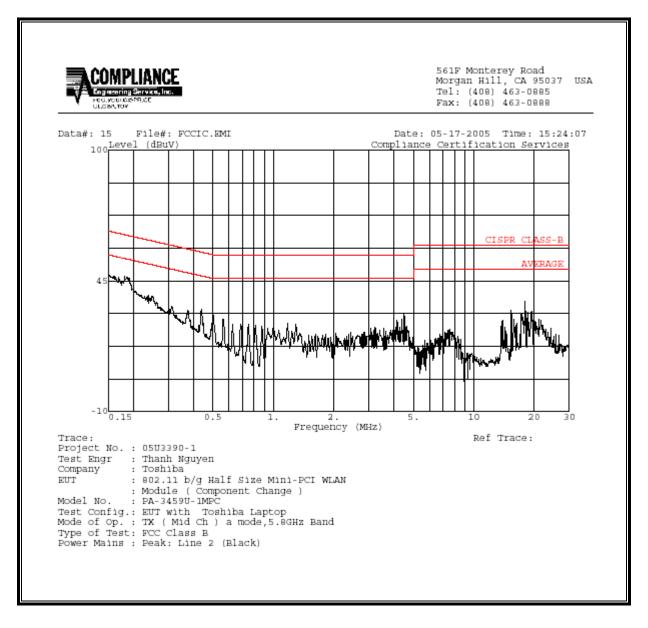
a-mode, 5.8GHz Band

LINE 1 RESULTS



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LINE 2 RESULTS



(Please be noted that Pages 156 thru 166 have been extracted as Setup Photos, this is the end of body of the report).

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