FCC CFR47 PART 15 SUBPART E CERTIFICATION

TEST REPORT

FOR

802.11a/b/g MINI PCI TYPE 3B CARD

MODEL NUMBER: PA3375U-1MPC

FCC ID: CJ6UPA3375WL

REPORT NUMBER: 04U2843-2

ISSUE DATE: JULY 20, 2004

Prepared for

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

Prepared by

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1. TEST RESULT CERTIFICATION

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

EUT DESCRIPTION: 802.11a/b/g MINI PCI TYPE 3B CARD

MODEL: PA3375U-1MPC

DATE TESTED: JUNE 11 TO JULY 15, 2004

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART E	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: This document reports conditions under which testing was conducted and results of tests performed. 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.

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

Approved & Released For CCS By:

MIKE HECKROTTE
ENGINEERING MANAGER
COMPLIANCE CERTIFICATION SERVICES

Tested By:

DAVID GARCIA
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

The EUT is an 802.11a/b/g transceiver Mini PCI card installed in a Toshiba Tablet host laptop computer, including co-location with the Toshiba PA3232U-1BTM Bluetooth radio card.

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

5150 to 5250 MHz Authorized Band

Frequency Band (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5180 - 5250	802.11a	11.08	12.82

5250 to 5350 MHz Authorized Band

Frequency Band (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5250 - 5320	802.11a	15.80	38.02

The radio utilizes two identical film antennas for diversity (main and auxiliary). Three antenna models are available: Hitachi model HTL017, Hitachi model HTL008 and Tyco model TIAN01.

The TIAN01 has the highest gain in the 5.2 GHz band. The HTL017 and HTL008 both have a lower gain.

Final compliance tests were performed with two host computers; one system was equipped with HTL017 antennas and the other system was equipped with TIAN01 antennas.

The Bluetooth radio card has a modular approval, FCC ID: CJ6UPA3232BT. The Bluetooth radio utilizes a film antenna with a maximum gain of 1.22 dBi.

TIAN01 ANTENNA
This antenna model has a maximum assembly gain of 1.6 dBi in the 5.2 GHz band.

HTL017 ANTENNA
This antenna model has a maximum assembly gain of 1.2 dBi in the 5.2 GHz band.

The host computer can be configured as a laptop-style notebook computer or as a tablet-style notebook computer. The display section is rotated and inverted to change between these configurations.

In the laptop configuration, the system is a mobile transmitter. In the tablet configuration, the system is a hand-held portable transmitter.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4/2001, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

4. 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 http://www.ccsemc.com.

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LAB CODE:200065-0

No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.

5. CALIBRATION AND UNCERTAINTY

5.1. 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.

5.2. 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%.

5.3. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	11/21/2004
RF Filter Section	HP	85420E	3705A00256	11/21/04
30MHz---- 2Ghz	Sunol Sciences	JB1 Antenna	A121003	12/22/04
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	2/4/05
Spectrum Analyzer	Agilent	E4446A	MY43360112	1/13/05
Preamplifier, 1 ~ 26 GHz	Miteq	NSP10023988	646456	4/25/05
EMI Test Receiver	R & S	ESHS 20	827129/006	7/17/04
LISN, 10 kHz ~ 30 MHz	FCC	50/250-25-2	114	10/13/04
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	10/13/04
Site A Line Stabilizer / Conditioner	Tripplite	LC-1800a	A0051681	CNR
EMI Test Receiver	R & S	ESHS 20	827129/006	7/17/04
AC Power Source, 10KVA	ACS	AFC-10K-AFC-2	J1568	CNR
10dB Pad	Weinschel	56-10	M251	CNR
PreAmplifier 26-40 GHz	Miteq	NSP4000-SP2	924343	6/1/05
Antenna, Horn 26 ~ 40 GHz	ARA	MWH-2640/B	1029	12/3/04
Antenna, Horn, 18 ~ 26 GHz	ARA	MWH-1826/B	1013	2/4/05
Hi Pass Filter_4GHz	Micro_Tronic	HPM13351	4	N/A
Hi Pass Filter_7.6GHz	Micro_Tronic	HPM13195	1	N/A

6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

Description	Manufacturer	Model	Serial Number	FCC ID
LAPTOP	TOSHIBA	PPM20U-AAA8	Z3044588JU	DOC
LAPTOP	TOSHIBA	PPM20U-AAA8	Z3044587JU	DOC
AC ADAPTER	TOSHIBA	PA3282U-1ACA	O148662	DOC
AC ADAPTER	TOSHIBA	PA3282U-1ACA	O654860	DOC

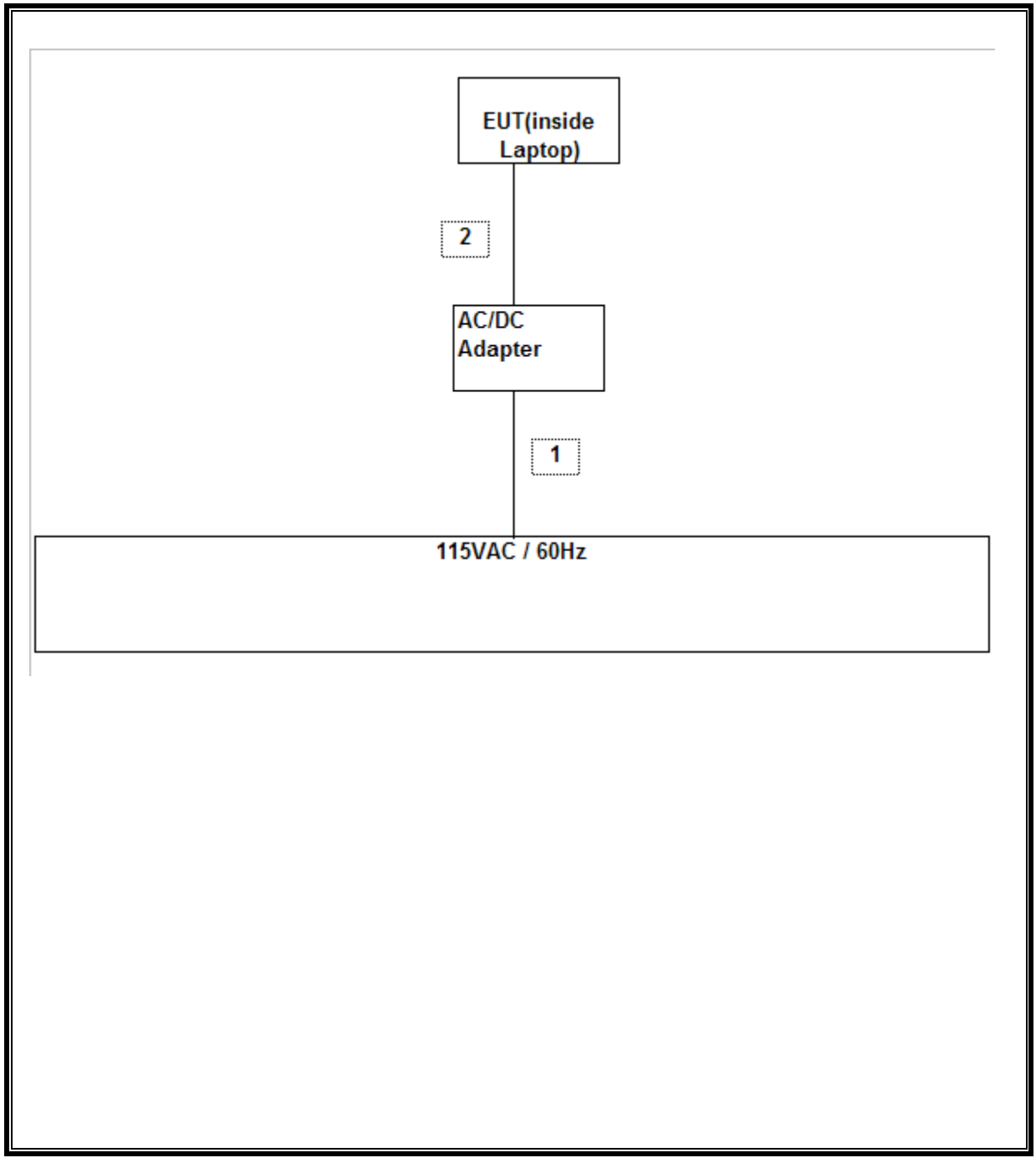
I/O CABLES

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

TEST SETUP

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

SETUP DIAGRAM FOR TESTS



7. APPLICABLE LIMITS AND TEST RESULTS

7.1. EMISSION BANDWIDTH

LIMIT

§15.403 (c) Emission bandwidth. For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 1% to 3% of the 26 dB bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled.

RESULTS

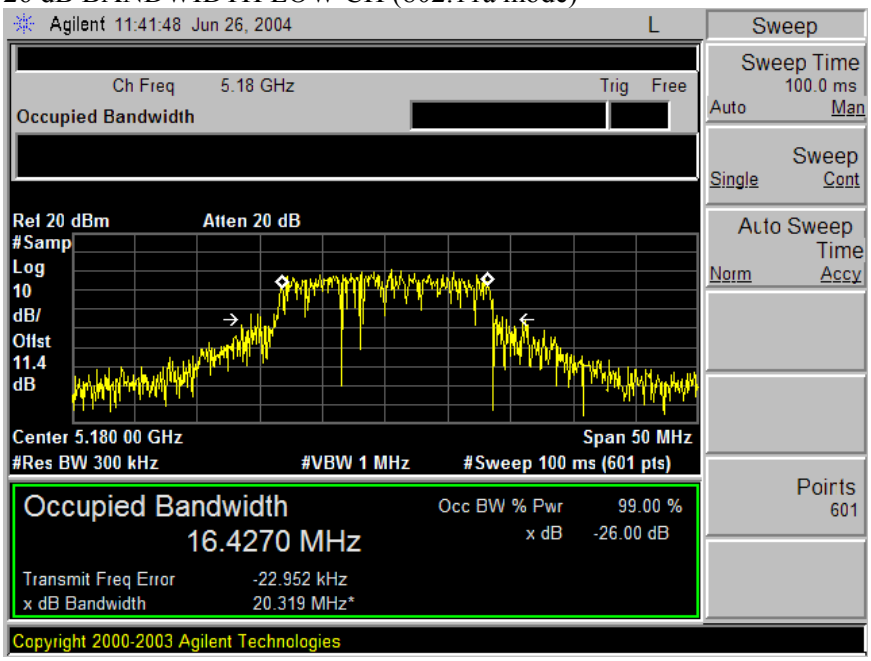
No non-compliance noted:

802.11a Mode

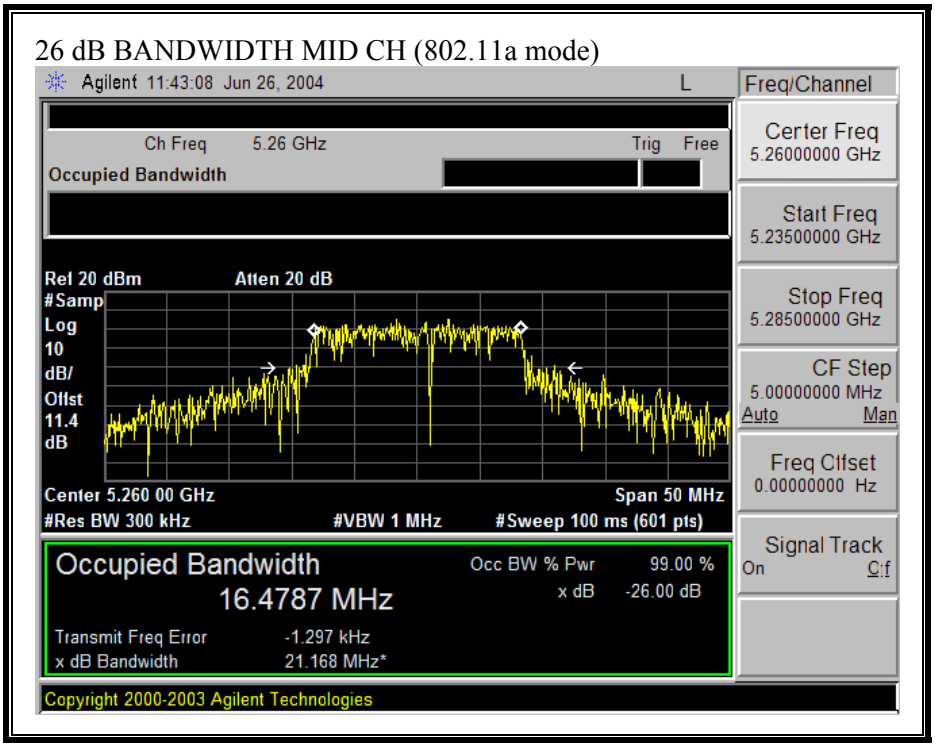
Channel	Frequency (MHz)	B (MHz)	10 Log B (dB)
Low	5180	20.32	13.08
Middle	5260	21.17	13.26
High	5320	20.99	13.22

26 dB EMISSION BANDWIDTH (802.11a MODE)

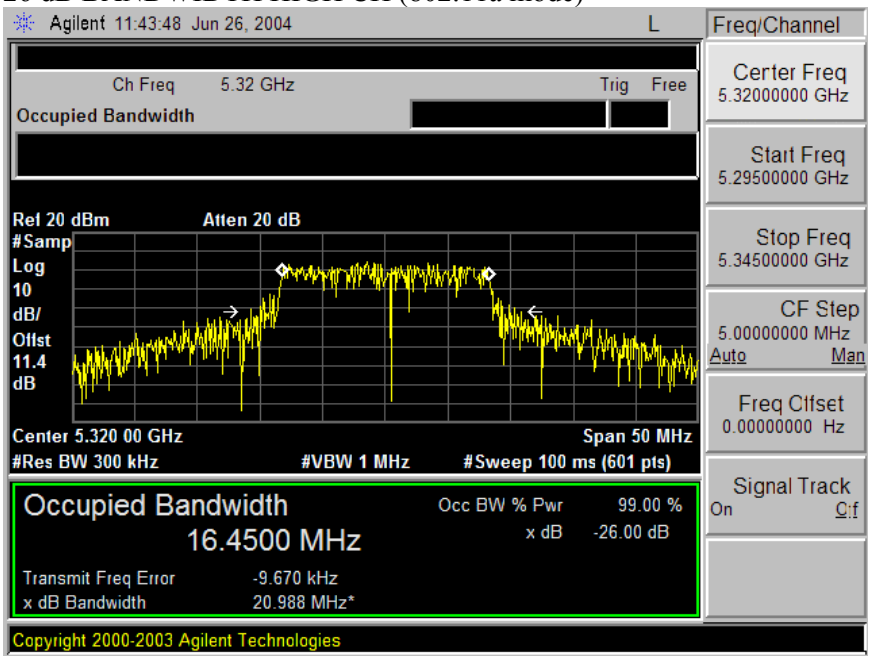
26 dB BANDWIDTH LOW CH (802.11a mode)



26 dB BANDWIDTH MID CH (802.11a mode)



26 dB BANDWIDTH HIGH CH (802.11a mode)



7.2. PEAK POWER

LIMIT

§15.407 (a) (1) For the band 5.15-5.25 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50 mW (17 dBm) or 4 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.407 (a) (1) For the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250 mW (24 dBm) or 11 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

LIMITS AND RESULTS

No non-compliance noted:

Limit in 5150 to 5250 MHz Band

Mode	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
802.11a	5180	17	20.319	17.08	2.18	17.00

Limit in 5250 to 5350 MHz Band

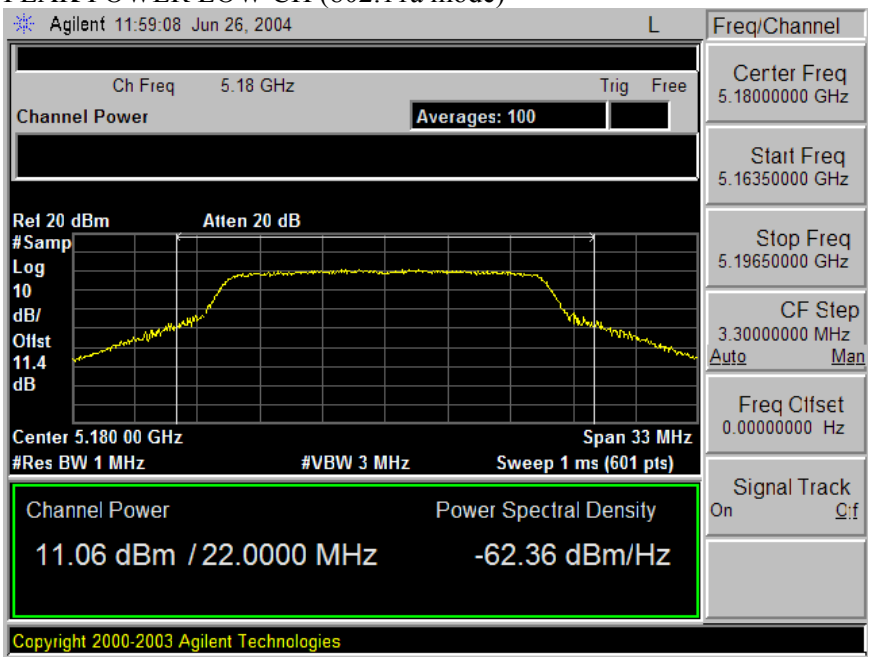
Mode	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
802.11a	5260	24	21.168	24.26	3.39	24.00
802.11a	5320	24	20.988	24.22	3.47	24.00

802.11a mode Results

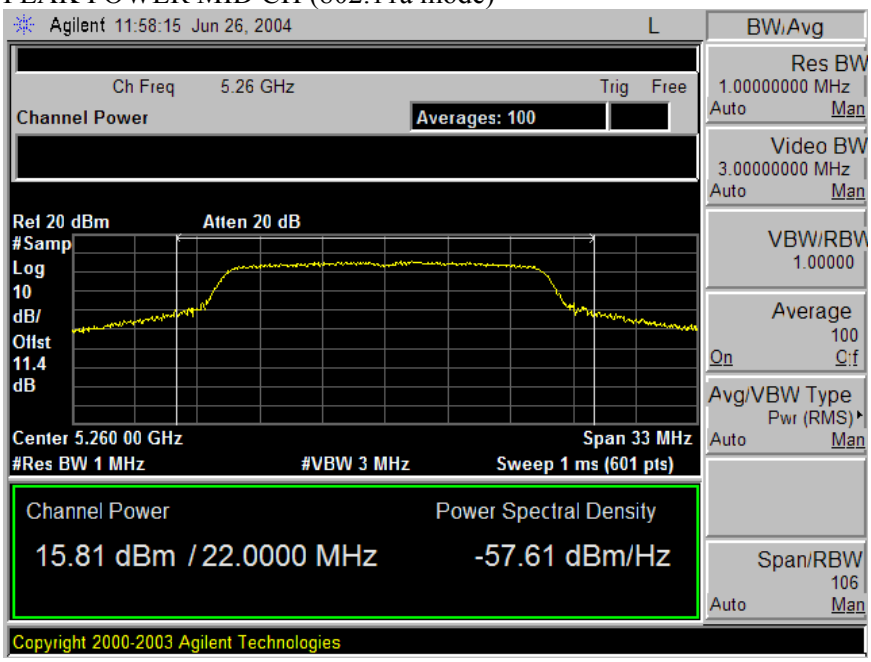
Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5180	11.06	17.00	-5.94
Middle	5260	15.81	24.00	-8.19
High	5320	15.74	24.00	-8.26

PEAK POWER (802.11a mode)

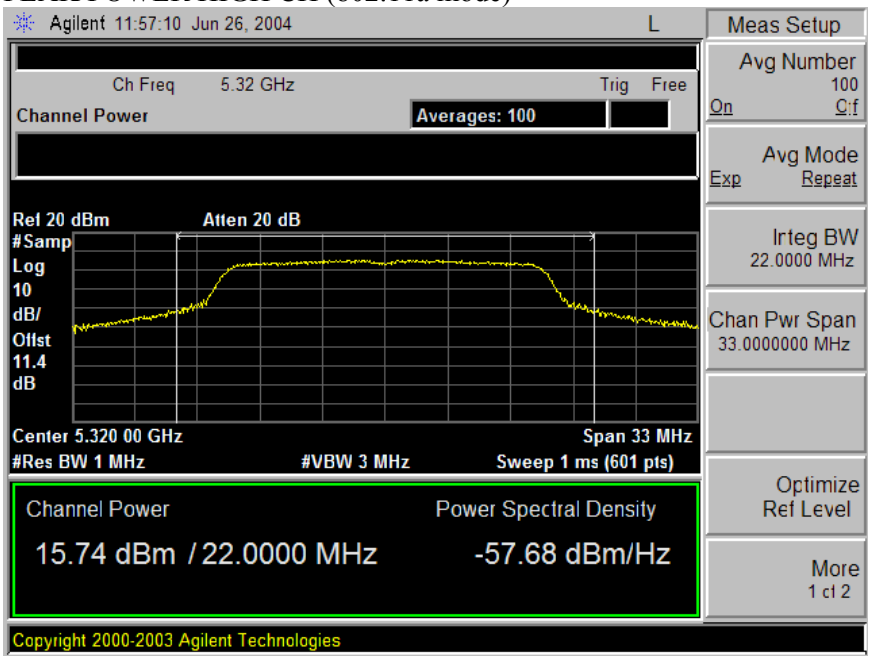
PEAK POWER LOW CH (802.11a mode)



PEAK POWER MID CH (802.11a mode)



PEAK POWER HIGH CH (802.11a mode)



7.3. 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.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*($900/f^2$)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*($180/f^2$)	30

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/cm^2)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

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

CALCULATIONS

Given

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

and

$S = E ^ 2 / 3770$

where

E = Field Strength in Volts/meter
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power Density in 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.

LIMITS

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

RESULTS

No non-compliance noted:

Mode	Power Density Limit (mW/cm^2)	Output Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)
802.11a	1.0	15.81	1.60	2.09

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.

7.4. 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 11.4 dB (including 10 dB pad and 1.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11a Mode

Channel	Frequency (MHz)	Average Power (dBm)
Low	5180	11.20
Middle	5260	16.30
High	5320	16.20

7.5. PEAK POWER SPECTRAL DENSITY

LIMIT

§15.407 (a) (1) For the band 5.15-5.25 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50 mW (17 dBm) or 4 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.407 (a) (1) For the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250 mW (24 dBm) or 11 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

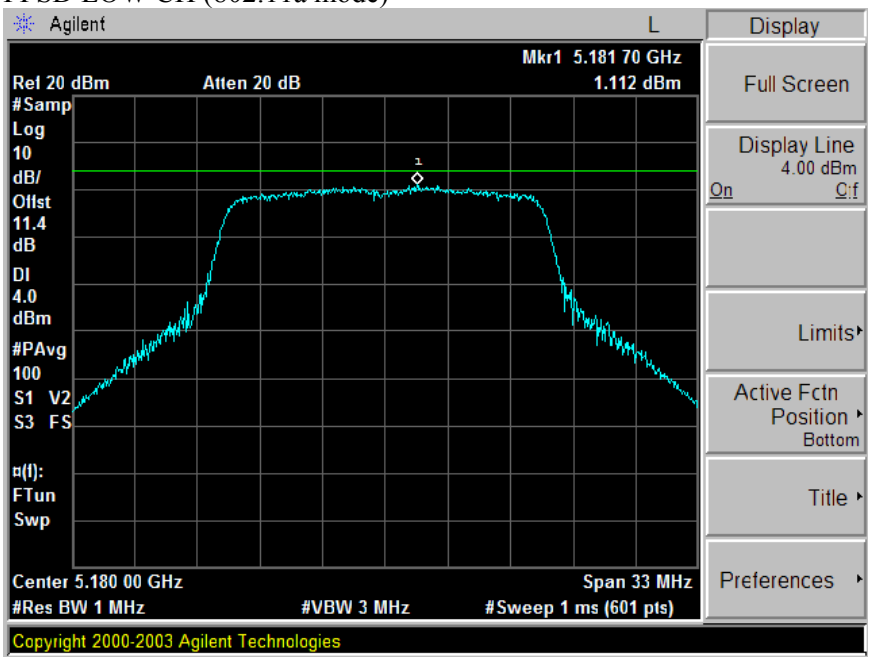
No non-compliance noted:

802.11a Mode

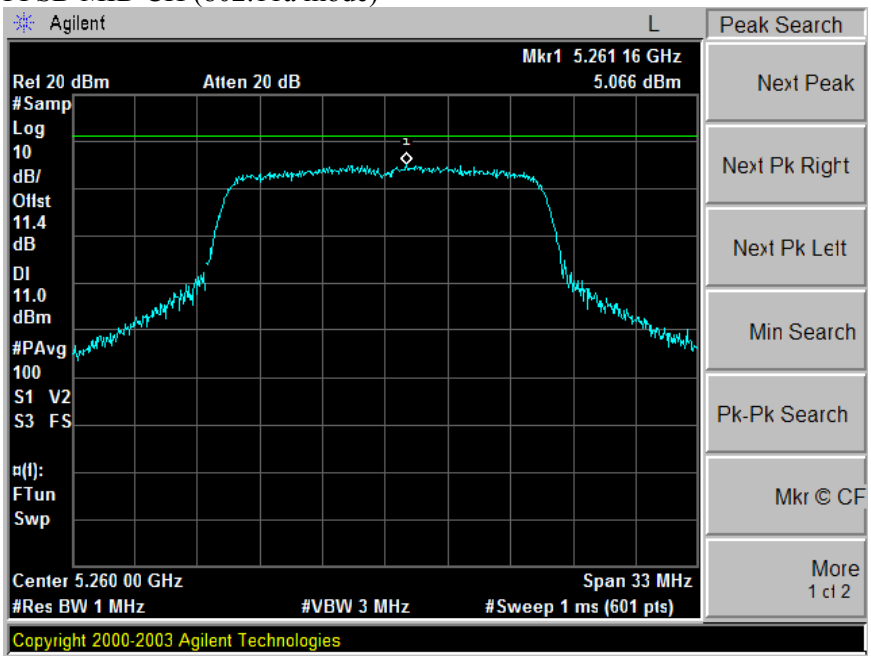
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5180	1.11	4.00	-2.89
Middle	5260	5.07	11.00	-5.93
High	5320	4.99	11.00	-6.01

PEAK POWER SPECTRAL DENSITY (802.11a MODE)

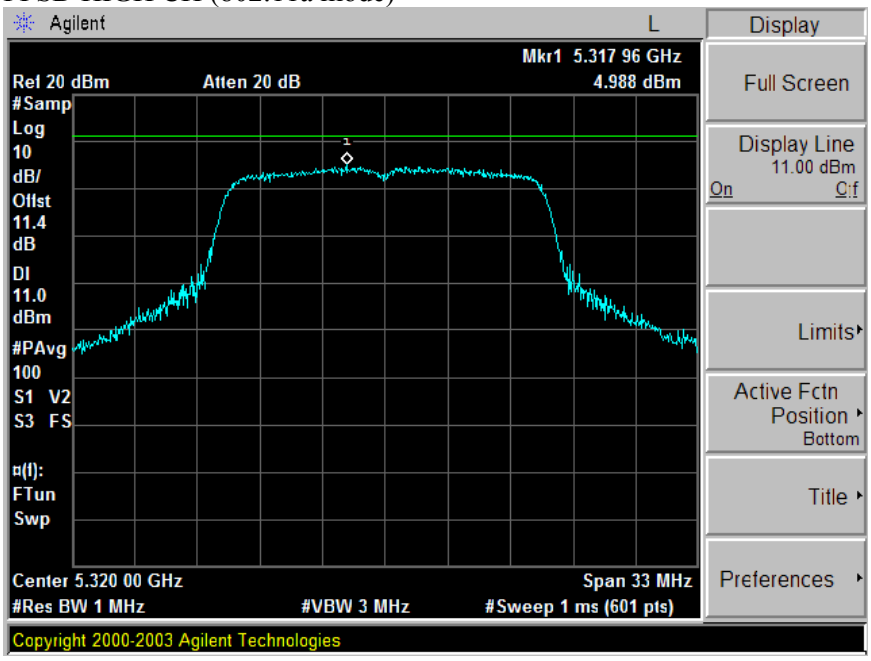
PPSD LOW CH (802.11a mode)



PPSD MID CH (802.11a mode)



PPSD HIGH CH (802.11a mode)



7.6. PEAK EXCURSION

LIMIT

§15.407 (a) (6) The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

Since Method # 1 was used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

RESULTS

No non-compliance noted:

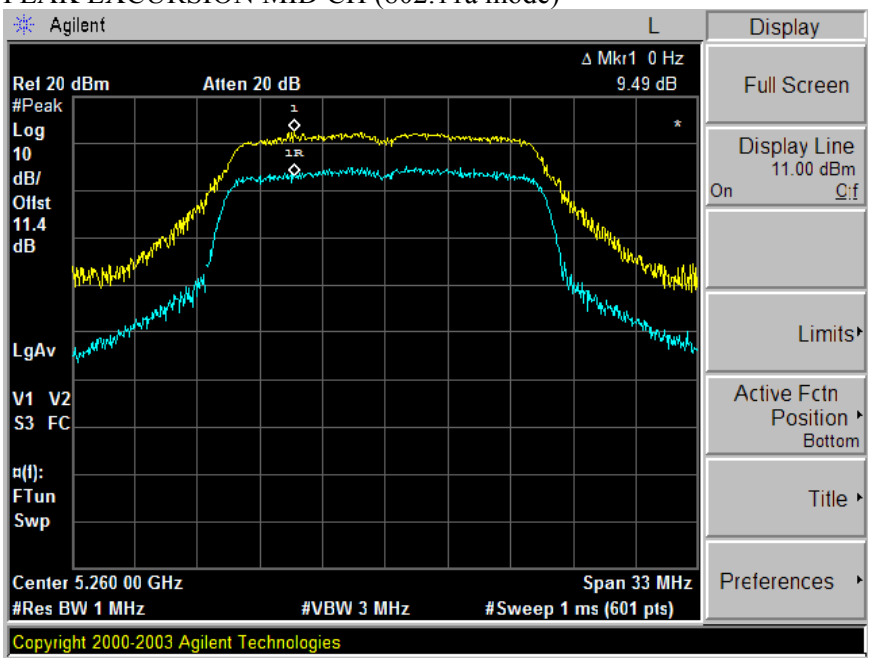
802.11a Mode

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	9.26	13	-3.74
Middle	5260	9.49	13	-3.51
High	5320	9.18	13	-3.82

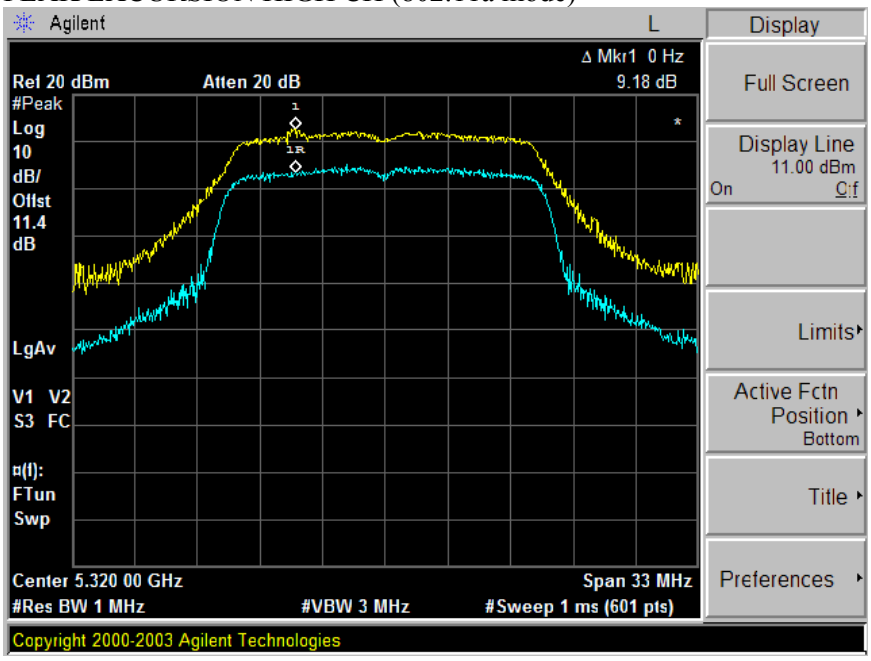
PEAK EXCURSION (802.11a MODE)

PEAK EXCURSION LOW CH (802.11a mode)

PEAK EXCURSION MID CH (802.11a mode)



PEAK EXCURSION HIGH CH (802.11a mode)



7.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

§15.407 (b) (1 & 2) For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27dBm / MHz.

TEST PROCEDURE

Conducted RF measurements of the transmitter output are made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to the average EIRP limit, adjusted for the maximum antenna gain. If necessary, additional average detection measurements are made.

Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

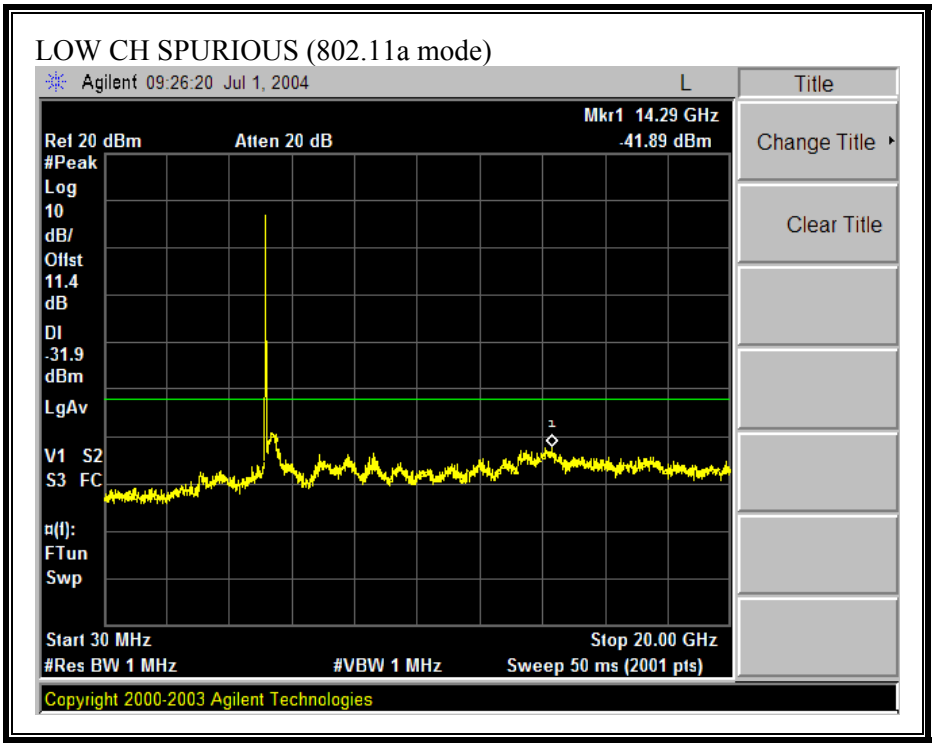
RESULTS

The maximum antenna gain without cable loss is used to evaluate the conducted spurious performance. The actual antenna assembly gain (with integral cable) is always less.

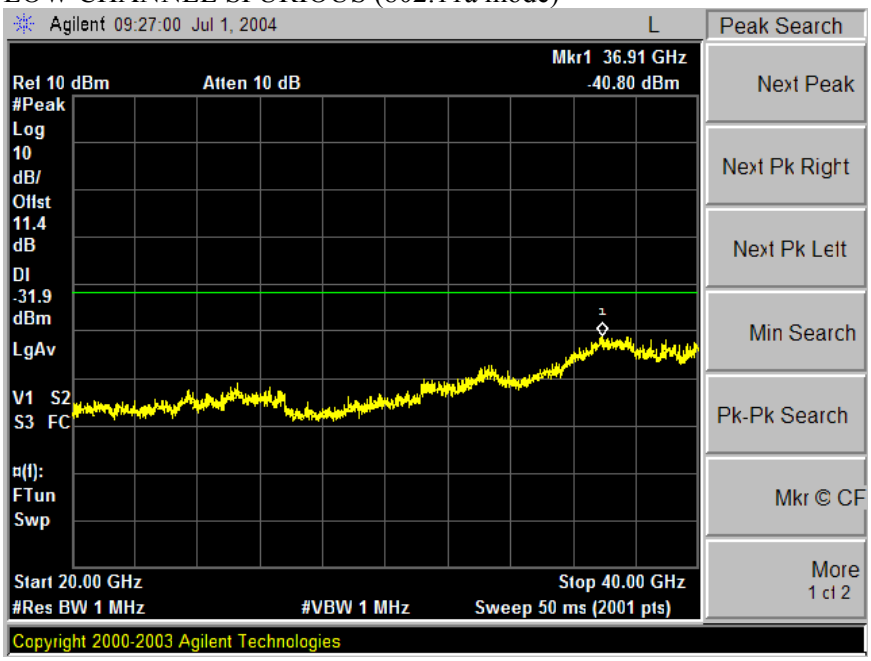
No non-compliance noted:

SPURIOUS EMISSIONS (802.11a MODE)

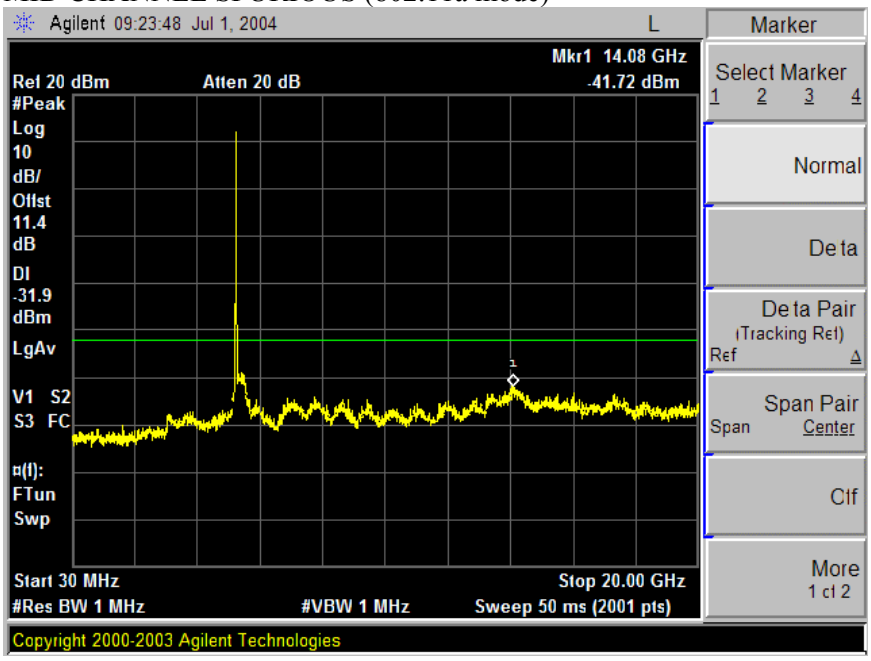
LOW CH SPURIOUS (802.11a mode)



LOW CHANNEL SPURIOUS (802.11a mode)

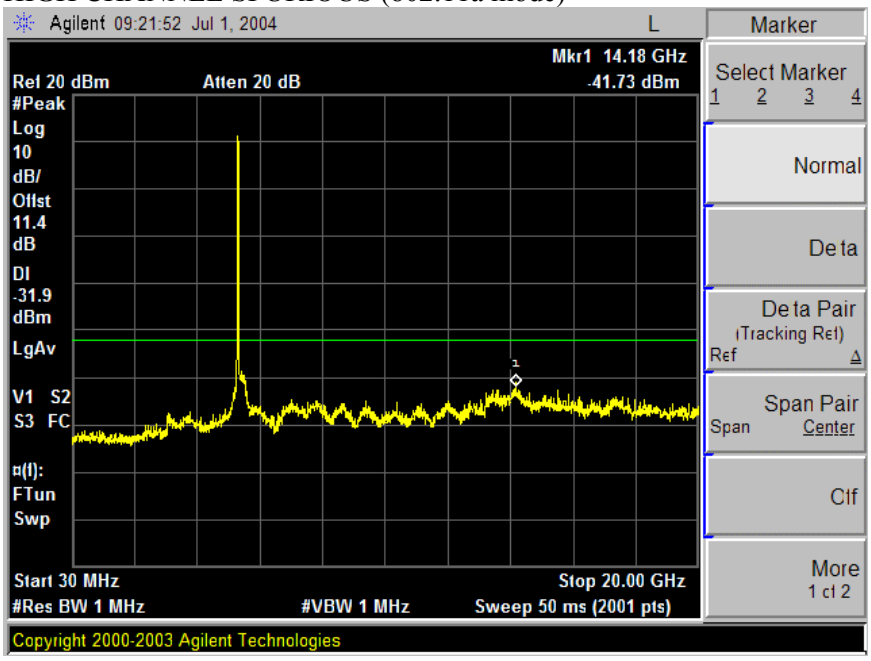


MID CHANNEL SPURIOUS (802.11a mode)



MID CHANNEL SPURIOUS (802.11a mode)

HIGH CHANNEL SPURIOUS (802.11a mode)



HI CHANNEL SPURIOUS (802.11a mode)

7.8. RADIATED EMISSIONS

7.8.1. 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.

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

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

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

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

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 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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.

Preliminary measurements in the handheld portable configuration are made in three orthogonal orientations (X, Y, Z). Results in the worst-case orientation are reported.

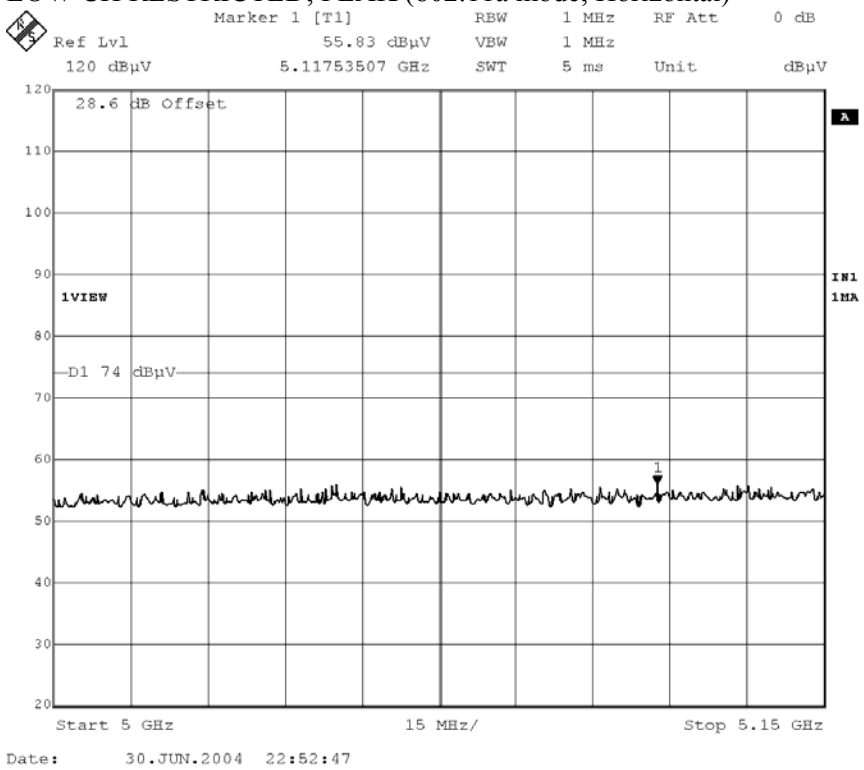
RESULTS

No non-compliance noted:

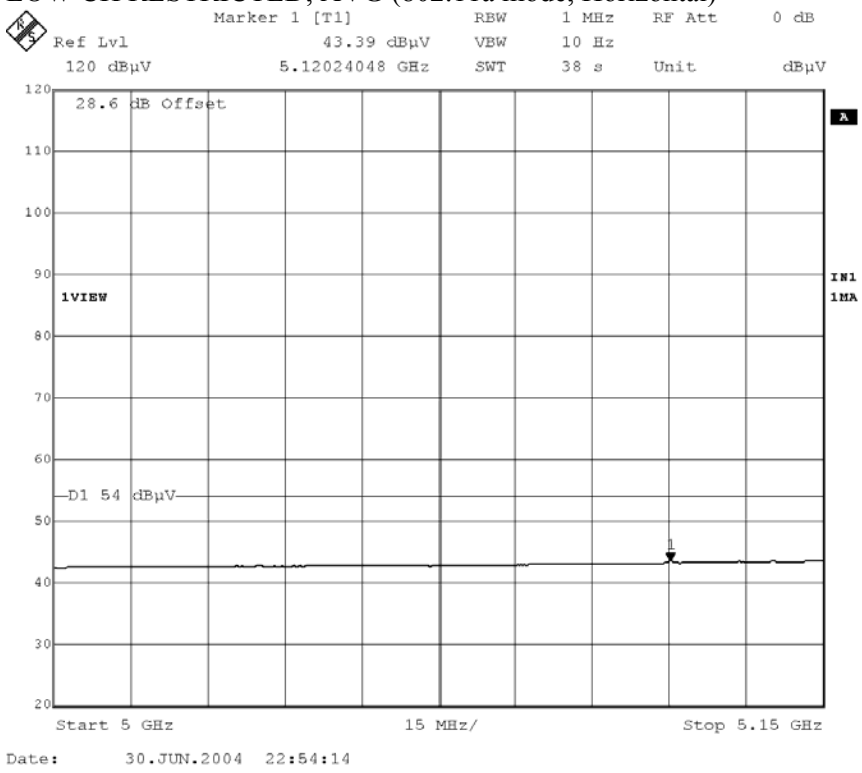
7.8.2. TRANSMITTER RADIATED EMISSIONS ABOVE 1 GHz, MOBILE LAPTOP CONFIGURATION, TIAN01 ANTENNA SET

RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL, HORIZONTAL)

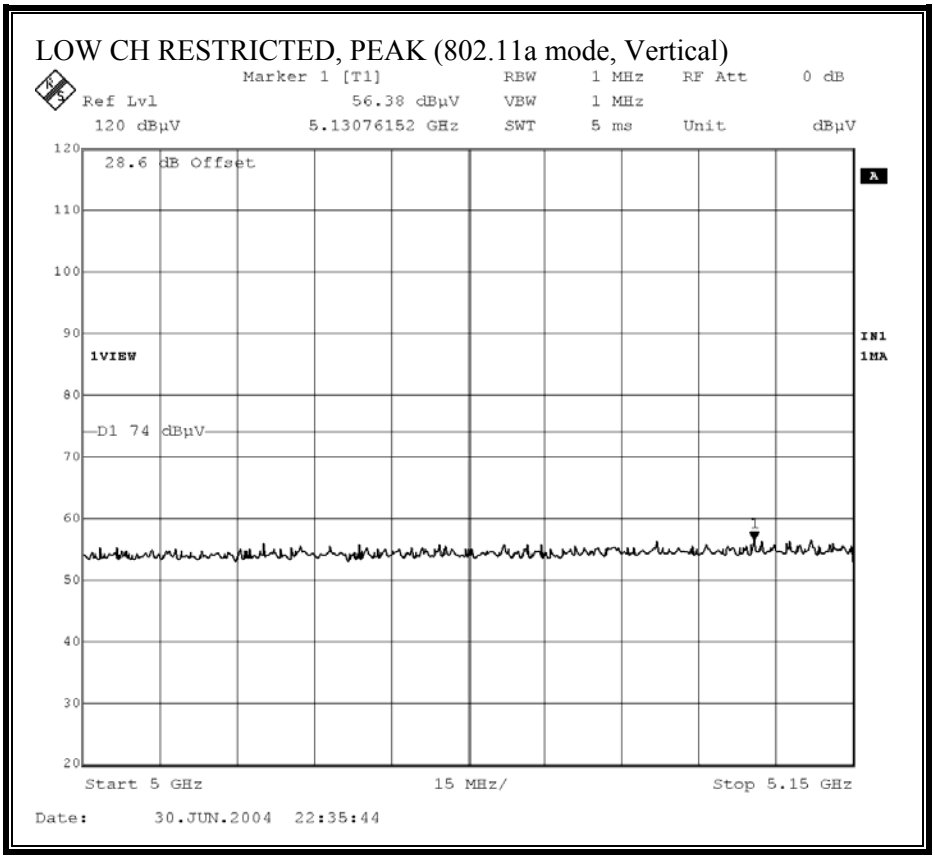
LOW CH RESTRICTED, PEAK (802.11a mode, Horizontal)



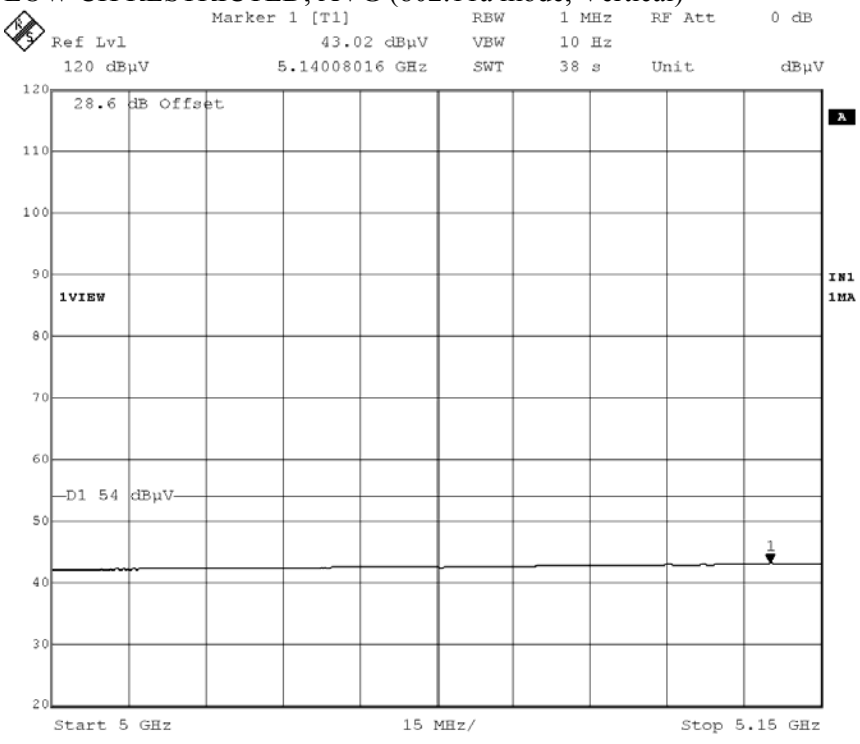
LOW CH RESTRICTED, AVG (802.11a mode, Horizontal)



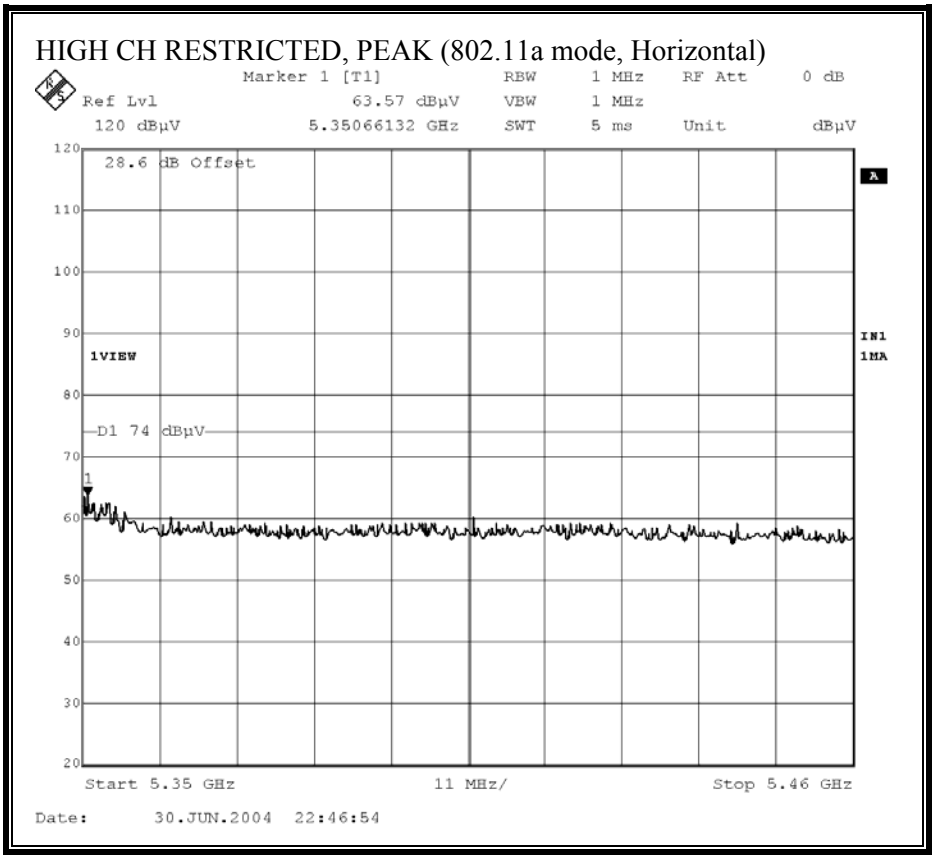
RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL, VERTICAL)



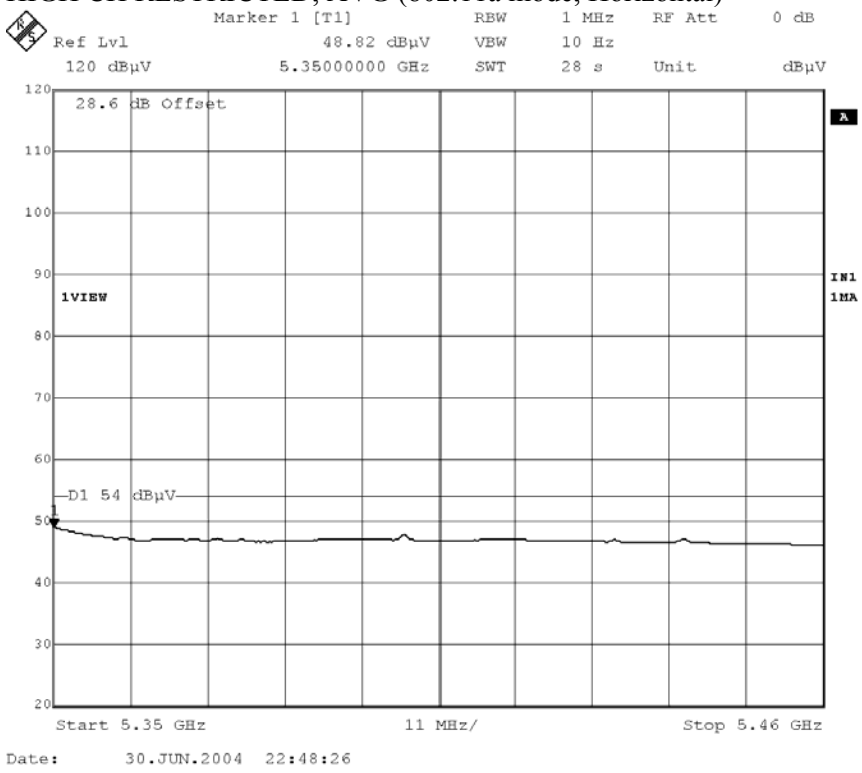
LOW CH RESTRICTED, AVG (802.11a mode, Vertical)



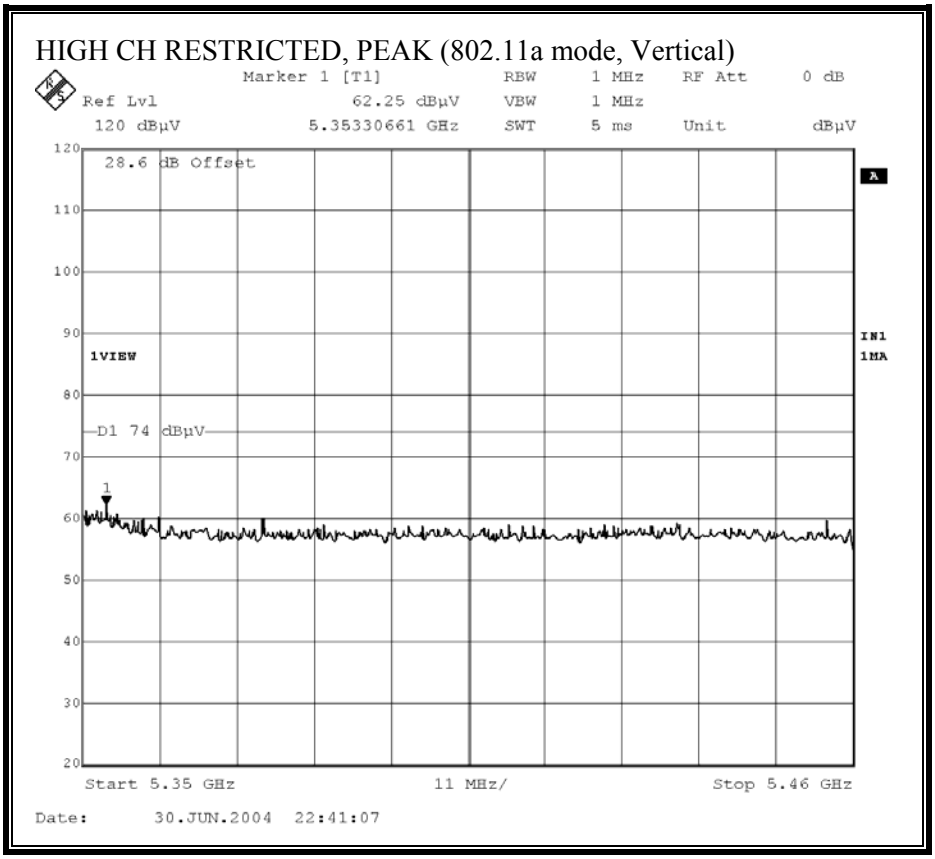
RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, HORIZONTAL)



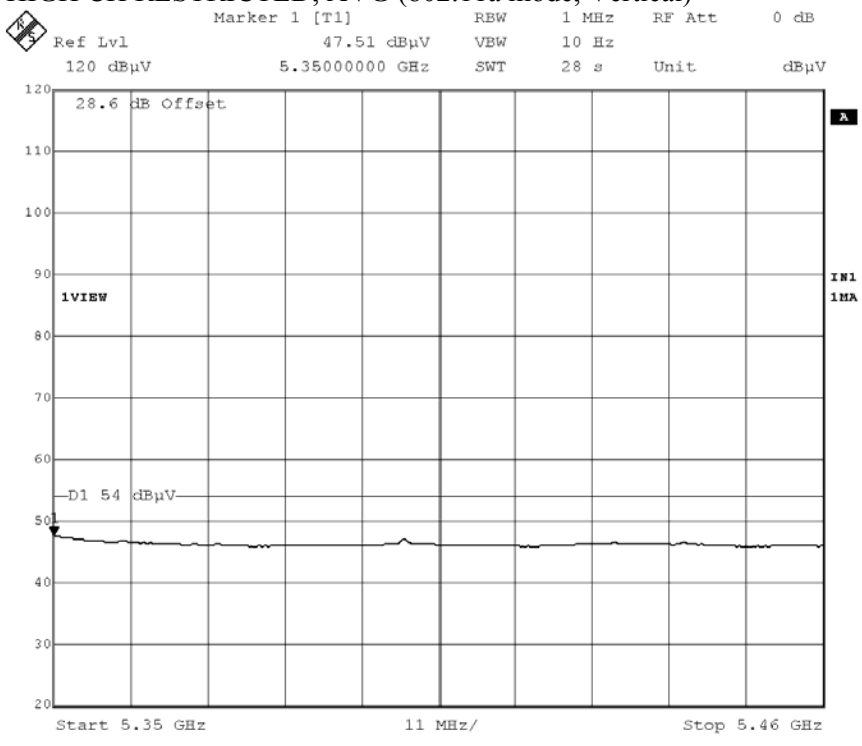
HIGH CH RESTRICTED, AVG (802.11a mode, Horizontal)



RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, VERTICAL)



HIGH CH RESTRICTED, AVG (802.11a mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

06/30/04 **High Frequency Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: David Garcia
Project #: 04U2843
Company: INTEL
EUT Descrip.: 802.11 a/b/g Mini PCI type 3B Card
EUT M/N: PA3375U-1MP
Test Target: FCC 15.247
Mode Oper: TX 11a mode, 5.2GHz Band; Laptop Position, TIAN Antenna

Test Equipment:

EMCO Horn 1-18GHz	Spectrum Analyzer	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz
T119; S/N: 29301 @3m	Agilent E4446A Analyzer	T63 Miteq 646456		

Hi Frequency Cables: ☑ (2 ft) ☐ (2.0 ft) ☐ (3 ft) ☑ (12 ft)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

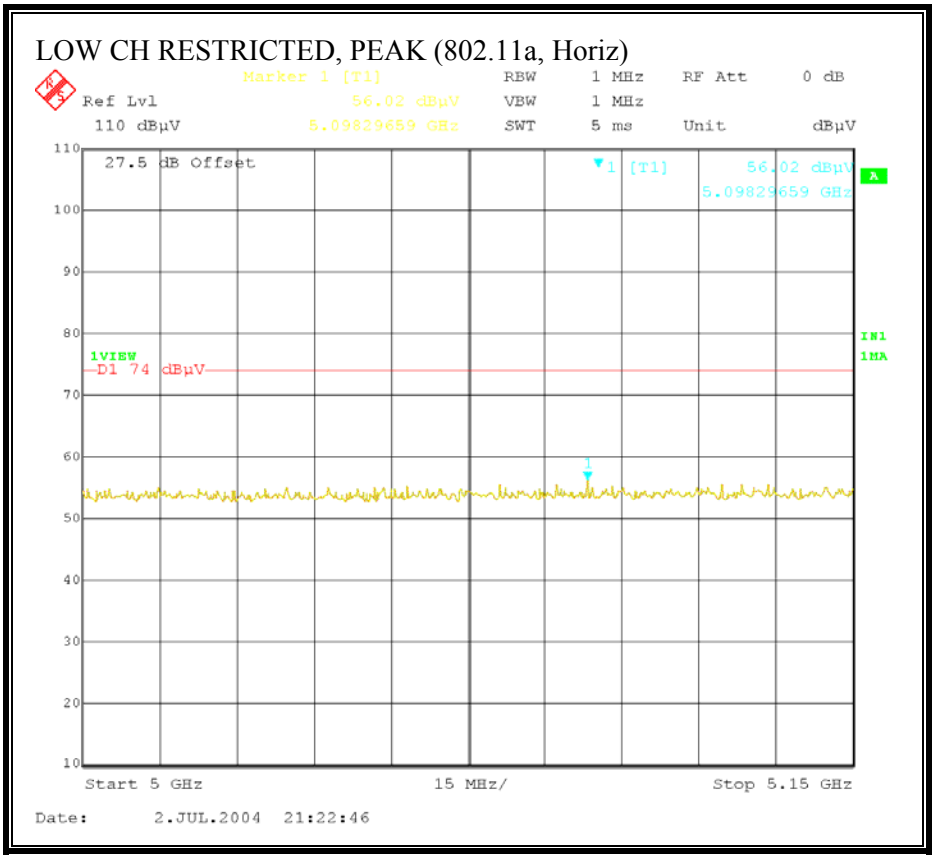
Average Measurements:
1 MHz Resolution Bandwidth
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5180 Channel															
15.540	9.8	44.0	32.1	40.6	5.8	-40.0	0.0	1.0	51.3	39.4	74.0	54.0	-22.7	-14.6	V
15.540	9.8	43.4	32.0	40.6	5.8	-40.0	0.0	1.0	50.7	39.3	74.0	54.0	-23.3	-14.7	H
5260 Channel															
15.780	9.8	44.5	32.1	40.7	5.8	-40.0	0.0	1.0	52.0	39.6	74.0	54.0	-22.0	-14.4	V
15.780	9.8	44.2	33.0	40.7	5.8	-40.0	0.0	1.0	51.7	40.5	74.0	54.0	-22.3	-13.5	H
5320 Channel															
10.640	9.8	44.2	33.2	38.5	4.5	-33.5	0.0	1.0	54.8	43.8	74.0	54.0	-19.2	-10.2	V
15.960	9.8	43.6	32.1	40.8	5.9	-40.0	0.0	1.0	51.2	39.7	74.0	54.0	-22.8	-14.3	V
10.640	9.8	43.7	32.7	38.5	4.5	-33.5	0.0	1.0	54.3	43.3	74.0	54.0	-19.7	-10.7	H
15.960	9.8	44.5	32.2	40.8	5.9	-40.0	0.0	1.0	52.1	39.8	74.0	54.0	-21.9	-14.2	H
NO OTHER SPURIOUS EMISSIONS DETECTED ABOVE THE SYSTEM NOISE IN THE RESTRICTED BANDS.															

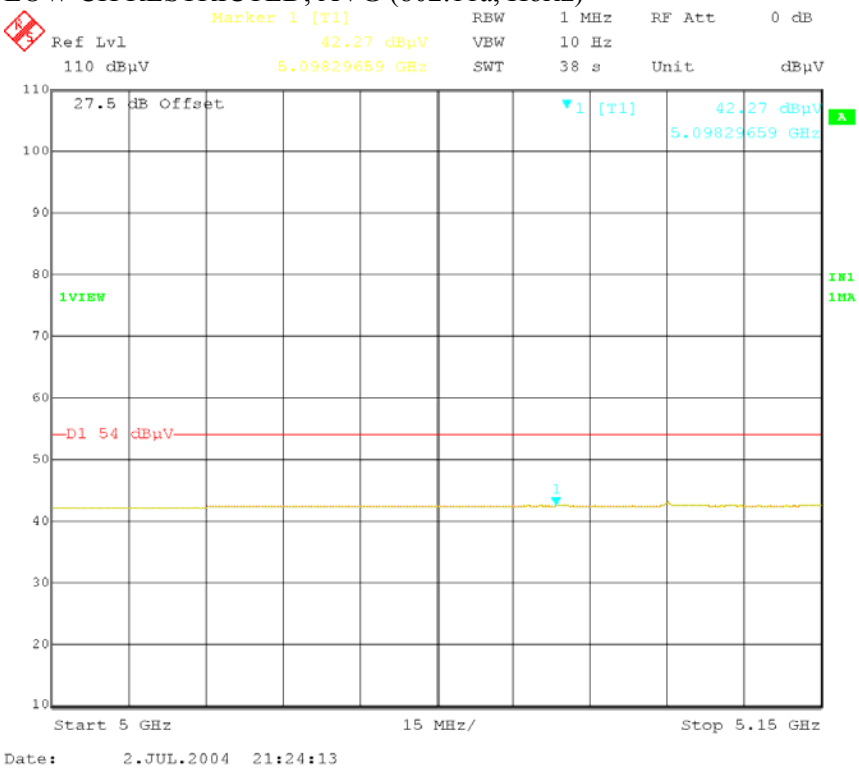
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

7.8.3. TRANSMITTER RADIATED EMISSIONS ABOVE 1 GHz, MOBILE LAPTOP CONFIGURATION, HTL017 ANTENNA SET

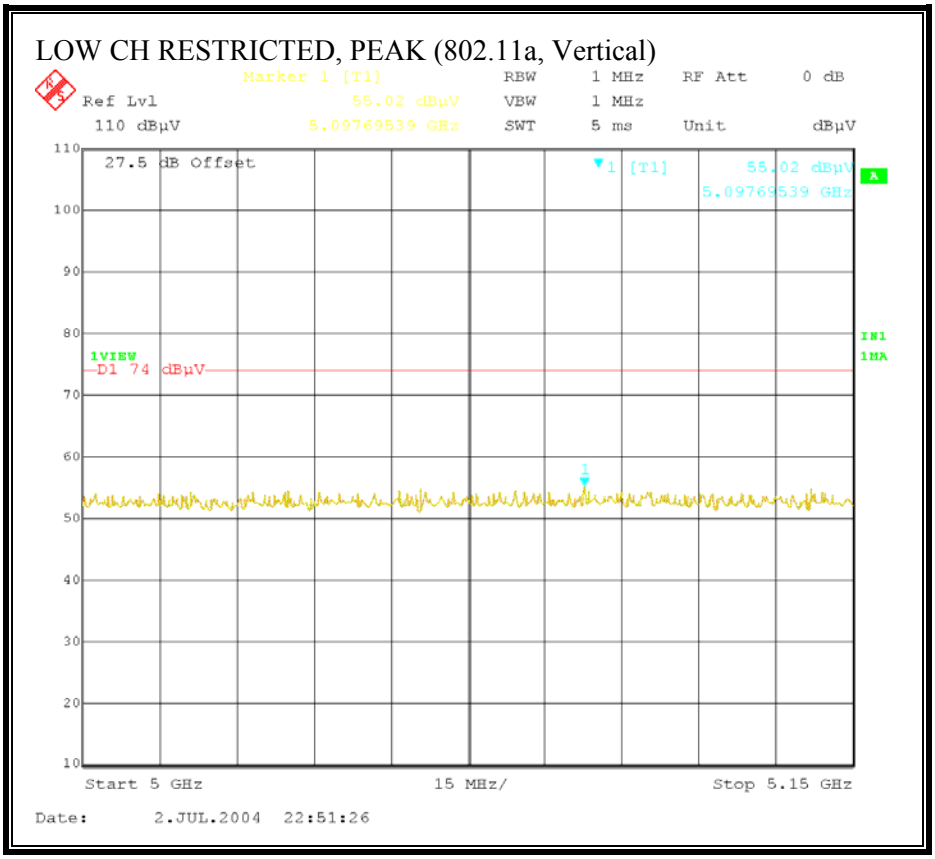
RESTRICTED BANDEDGE (802.11a, LOW CHANNEL, HORIZONTAL)



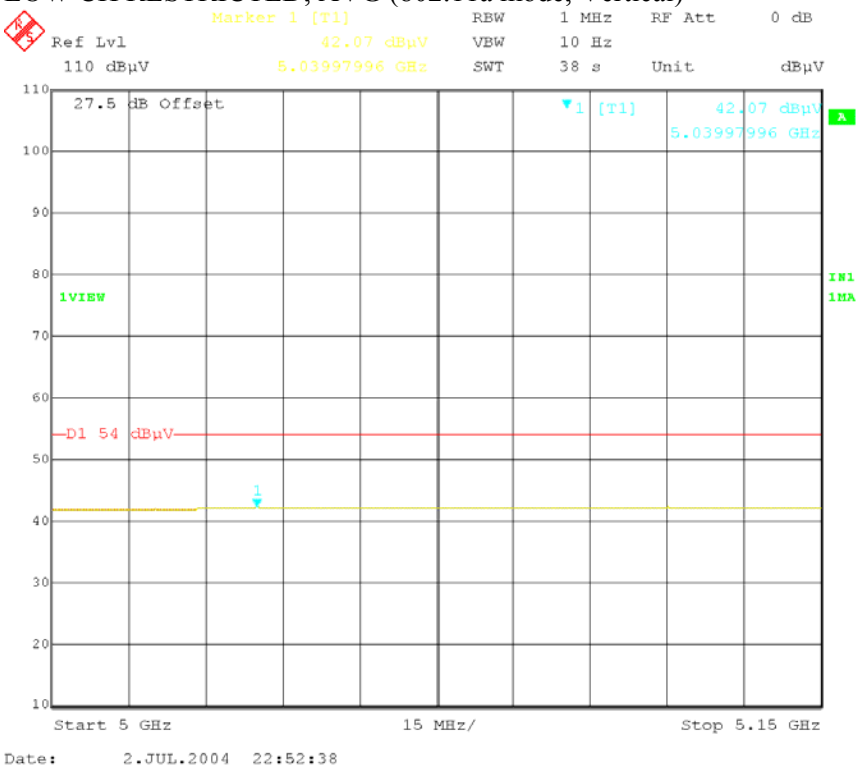
LOW CH RESTRICTED, AVG (802.11a, Horiz)



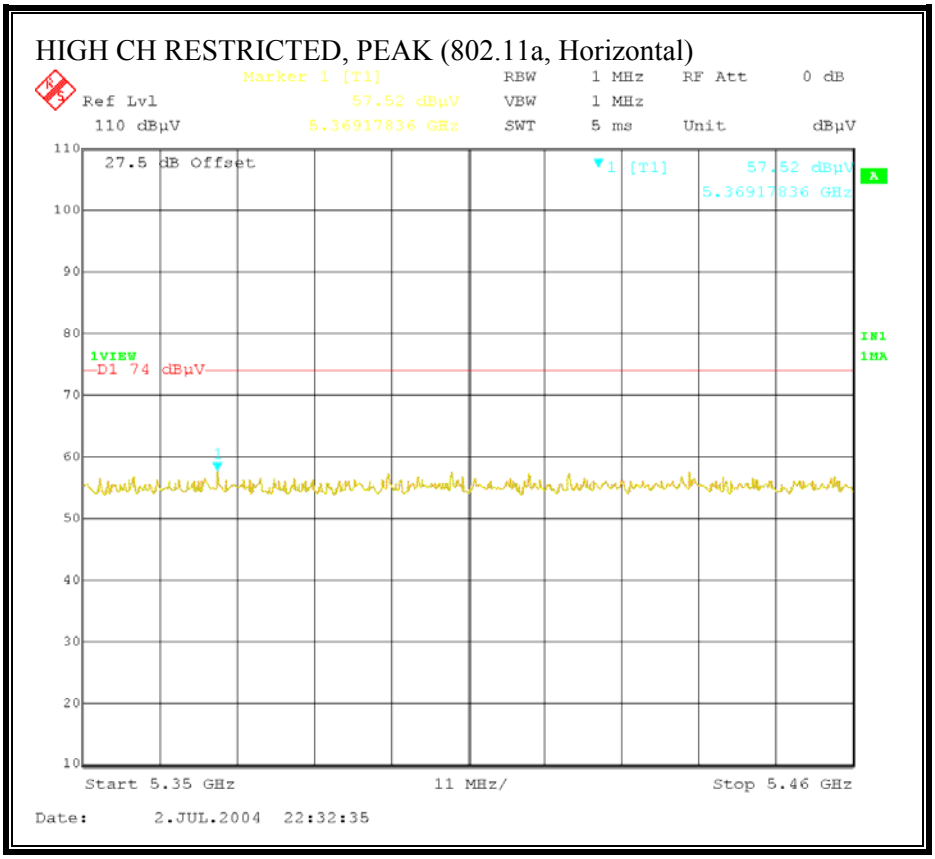
RESTRICTED BANDEDGE (802.11a , LOW CHANNEL, VERTICAL)



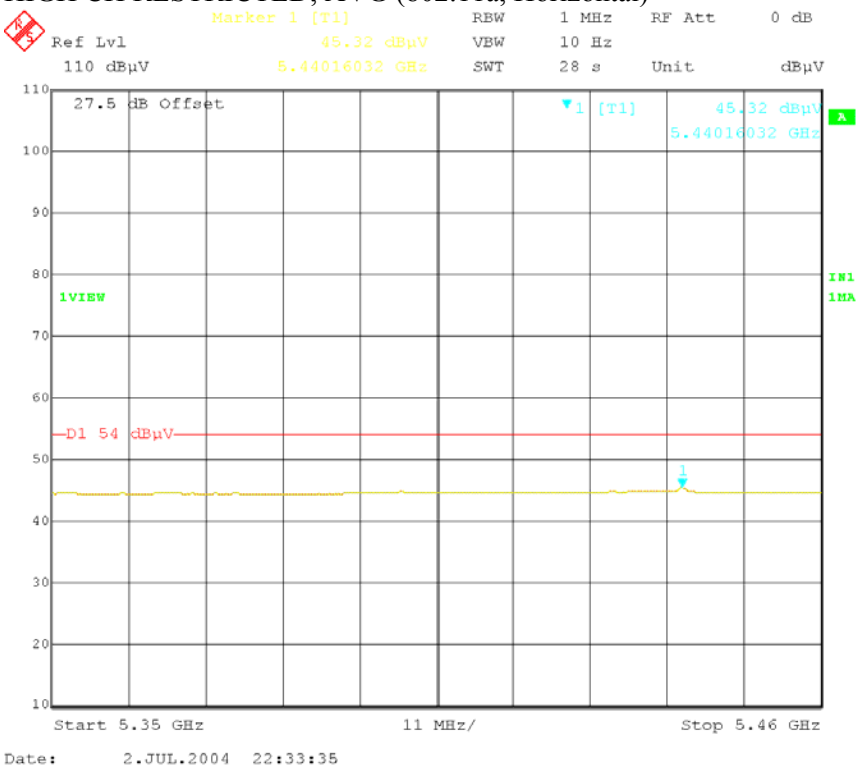
LOW CH RESTRICTED, AVG (802.11a mode, Vertical)



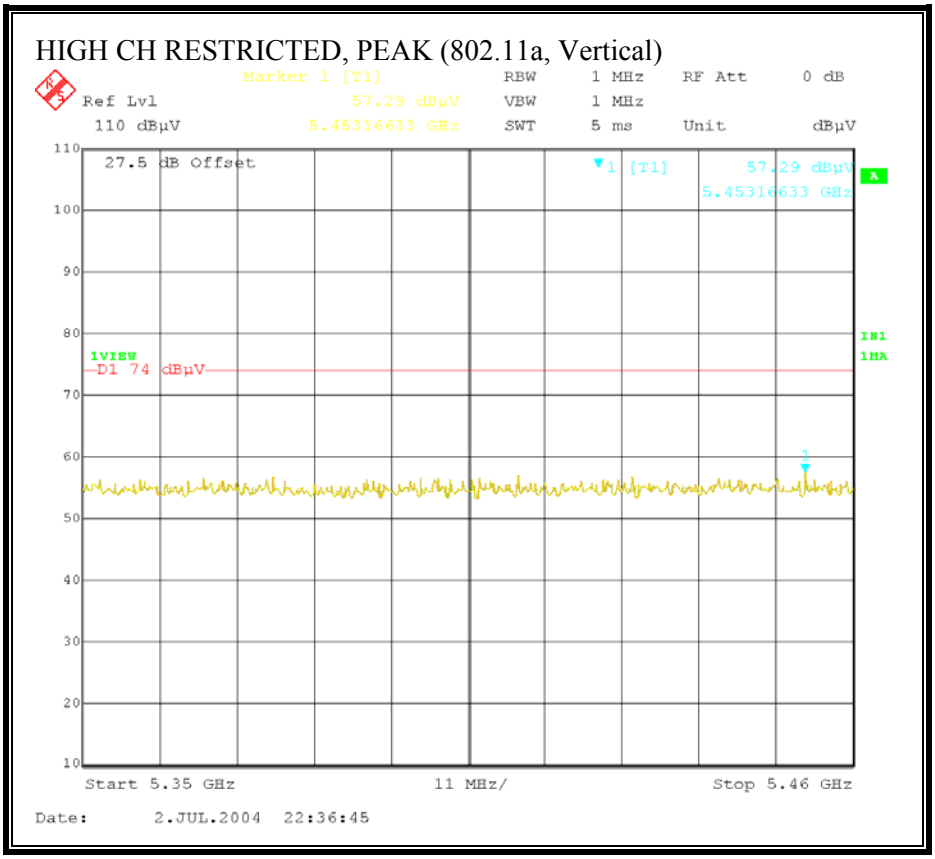
RESTRICTED BANDEDGE (802.11a , HIGH CHANNEL, HORIZONTAL)



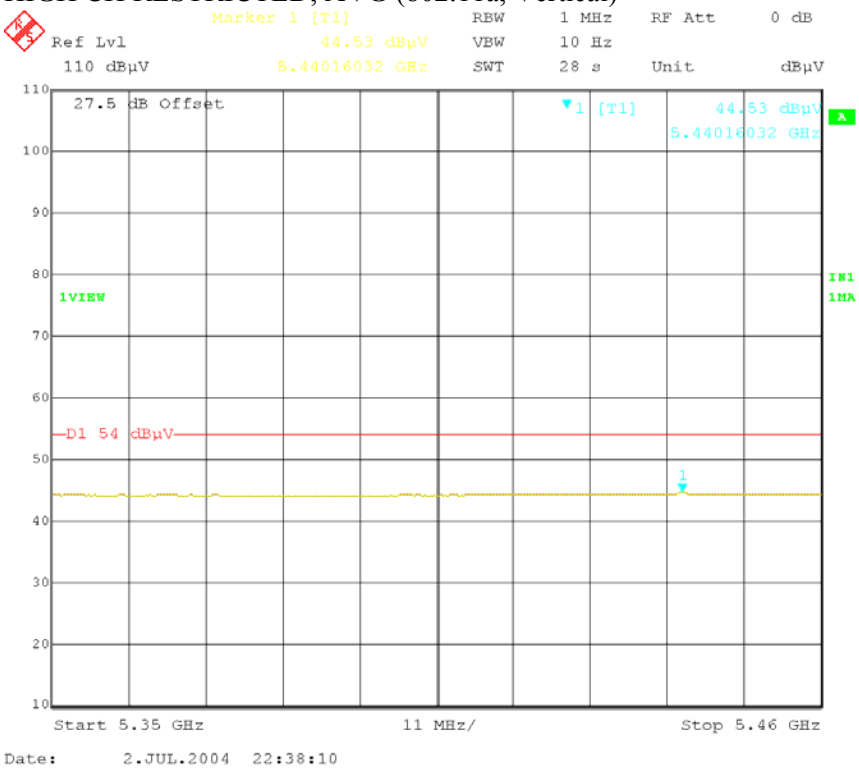
HIGH CH RESTRICTED, AVG (802.11a, Horizontal)



RESTRICTED BANDEDGE (802.11a, HIGH CHANNEL, VERTICAL)



HIGH CH RESTRICTED, AVG (802.11a, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11a)

07/02/04 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: David Garcia
Project #: 04U2843
Company: INTEL
EUT Descrip.: 802.11 a/b/g Mini PCI type 3B Card
EUT M/N: PA3375U-1MP
Test Target: FCC 15.247
Mode Oper: TX 11a mode, 5.2GHz Band; Laptop Position, HTL-017 Antenna

Test Equipment:

EMCO Horn 1-18GHz	Spectrum Analyzer	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz
T73; S/N: 6717 @3m	Agilent E4446A Analyzer	T63 Miteq 646456		

Hi Frequency Cables: ☑ (2 ft) ☐ (2.0 ft) ☐ (3 ft) ☑ (12 ft)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

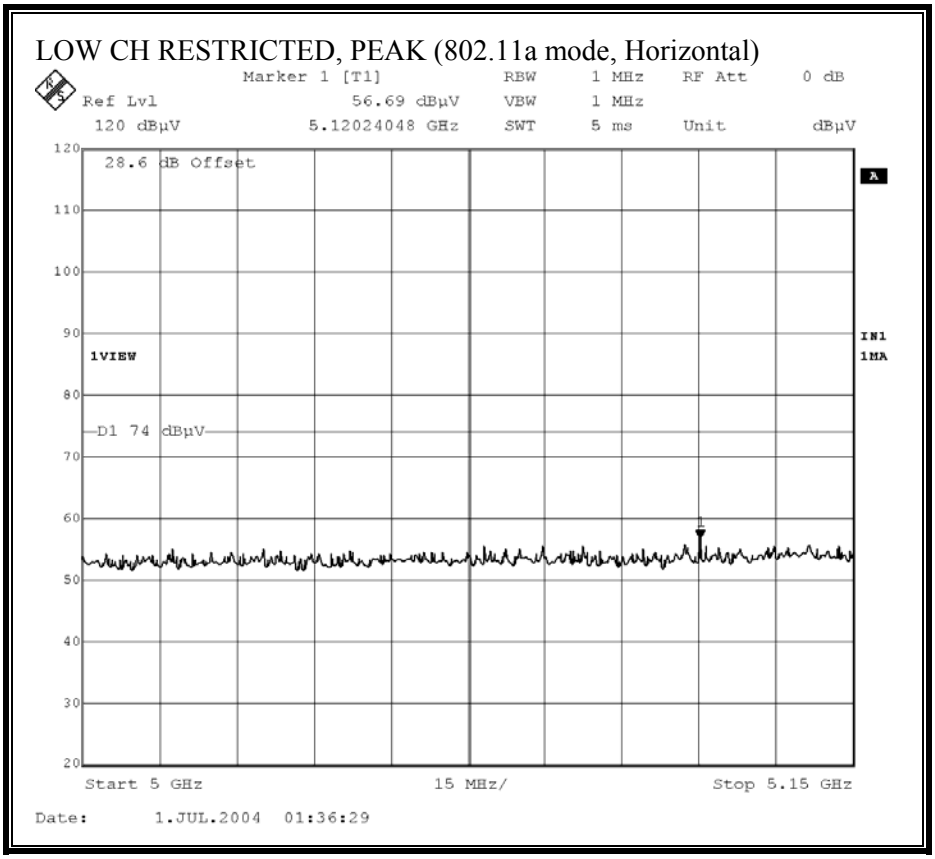
Average Measurements:
1 MHz Resolution Bandwidth
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5180 Channel															
15.540	9.8	43.7	32.8	39.2	5.8	-40.0	0.0	1.0	49.6	38.7	74.0	54.0	-24.4	-15.3	V
15.540	9.8	44.0	32.1	39.2	5.8	-40.0	0.0	1.0	49.9	38.0	74.0	54.0	-24.1	-16.0	H
5260 Channel															
15.780	9.8	44.5	32.3	38.6	5.8	-40.0	0.0	1.0	49.9	37.7	74.0	54.0	-24.1	-16.3	V
15.780	9.8	44.5	33.1	38.6	5.8	-40.0	0.0	1.0	49.9	38.5	74.0	54.0	-24.1	-15.5	H
5320 Channel															
10.640	9.8	43.9	33.1	38.3	4.5	-33.5	0.0	1.0	54.2	43.4	74.0	54.0	-19.8	-10.6	V
15.960	9.8	43.7	32.3	38.2	5.9	-40.0	0.0	1.0	48.8	37.4	74.0	54.0	-25.2	-16.6	V
10.640	9.8	43.8	32.8	38.3	4.5	-33.5	0.0	1.0	54.1	43.1	74.0	54.0	-19.9	-10.9	H
15.960	9.8	44.4	32.1	38.2	5.9	-40.0	0.0	1.0	49.5	37.2	74.0	54.0	-24.5	-16.8	H
NO OTHER SPURIOUS EMISSIONS DETECTED ABOVE THE SYSTEM NOISE IN THE RESTRICTED BANDS.															

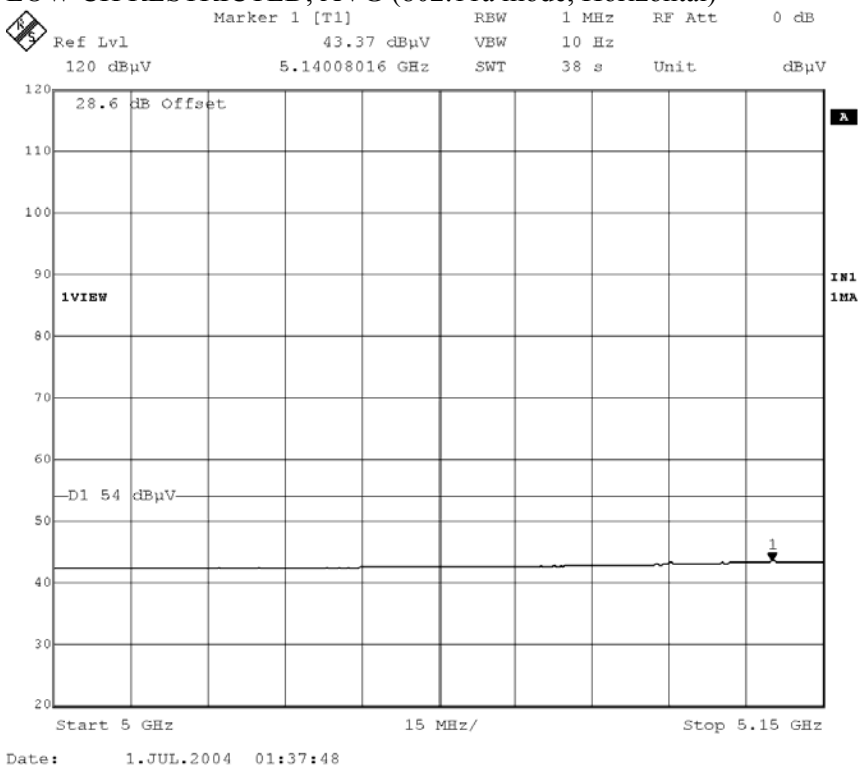
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

7.8.4. TRANSMITTER RADIATED EMISSIONS ABOVE 1 GHZ, PORTABLE TABLET CONFIGURATION, TIAN01 ANTENNA SET

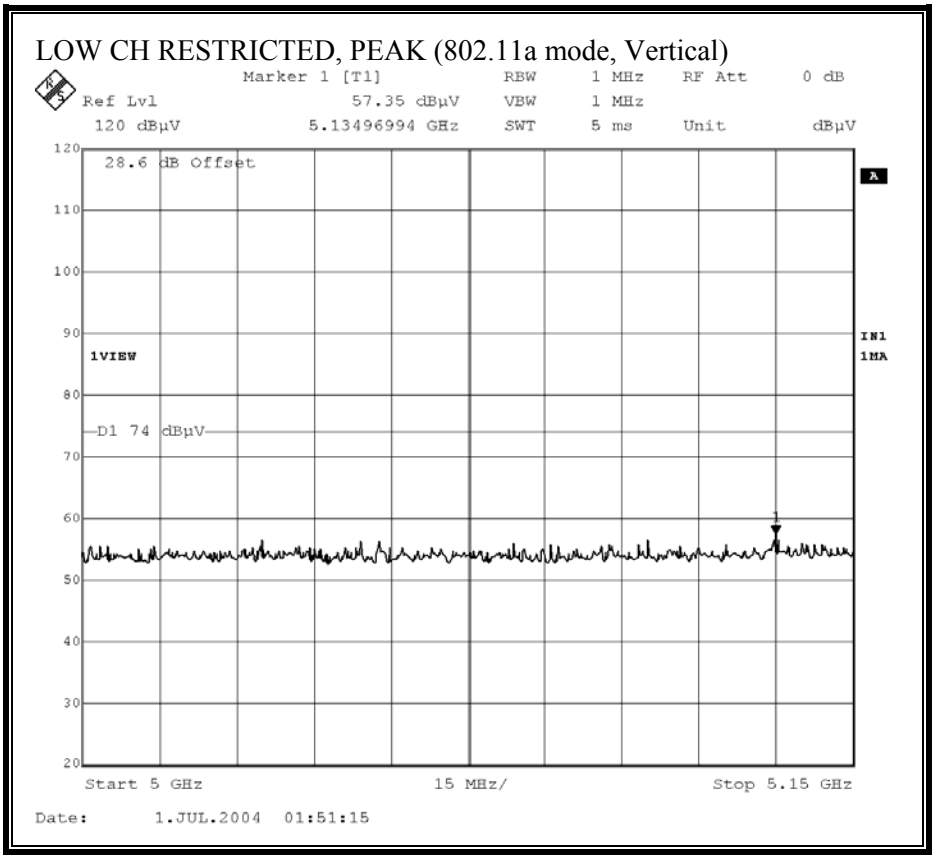
RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL, HORIZONTAL)



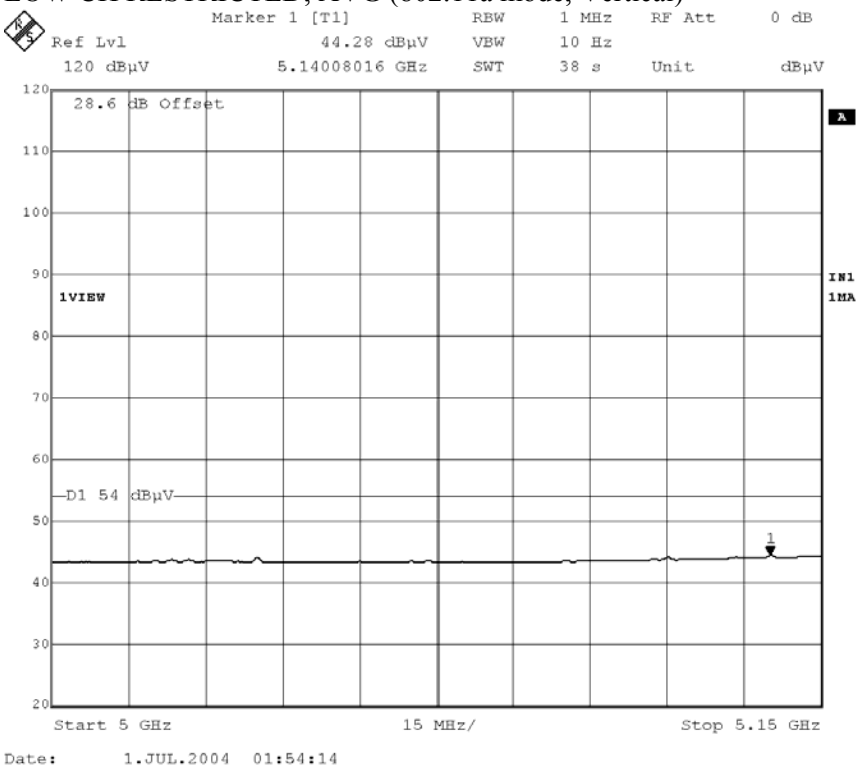
LOW CH RESTRICTED, AVG (802.11a mode, Horizontal)



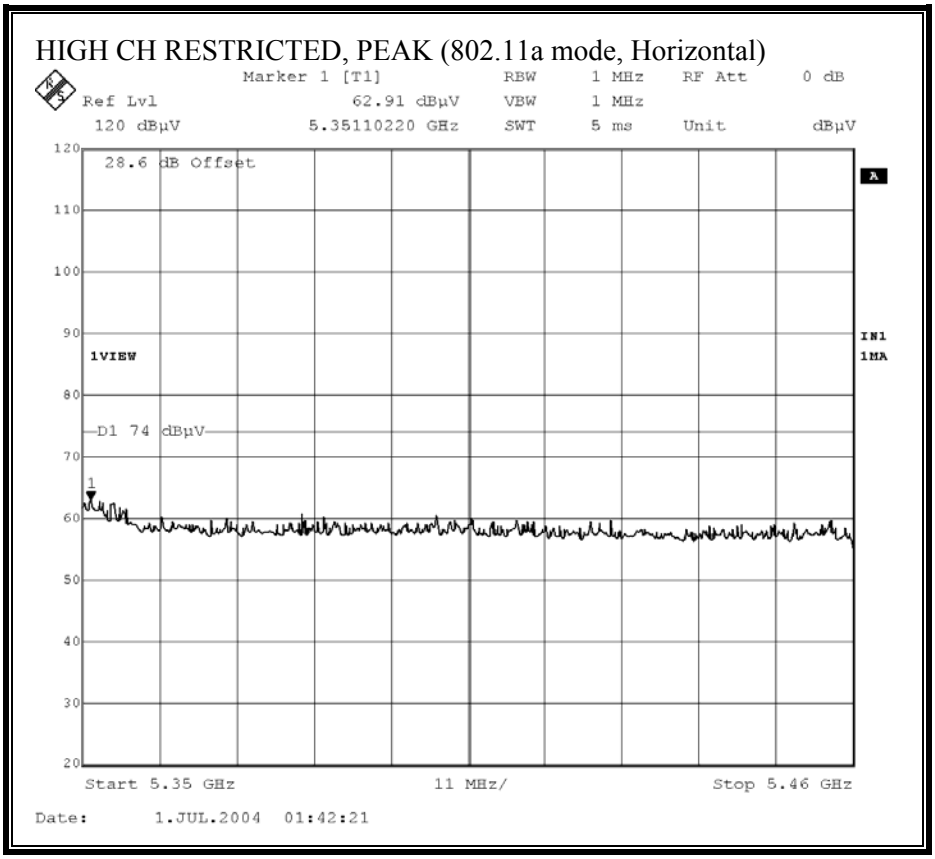
RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL, VERTICAL)



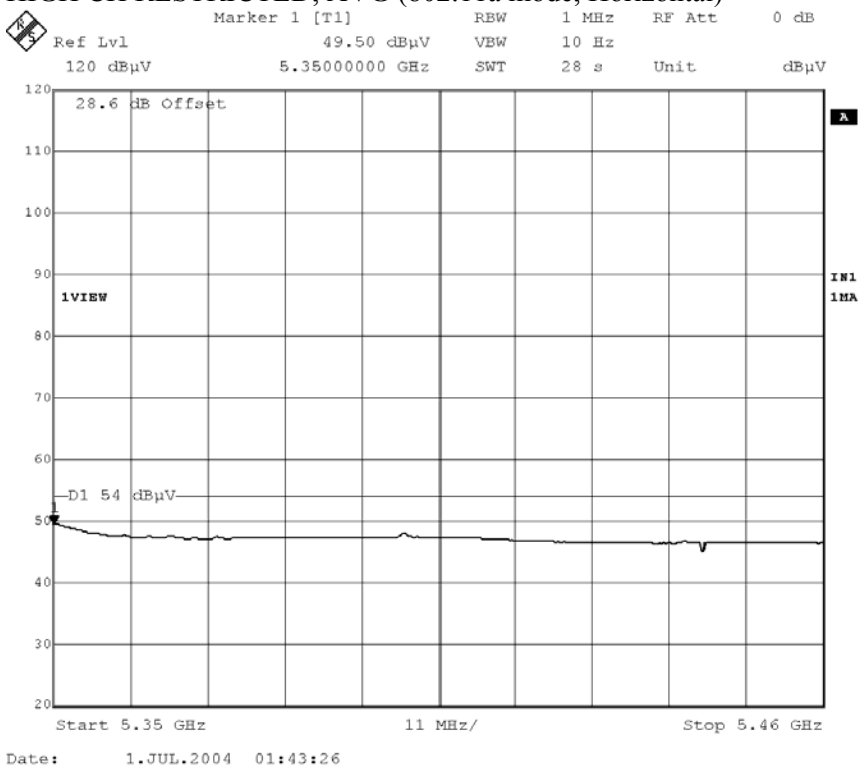
LOW CH RESTRICTED, AVG (802.11a mode, Vertical)



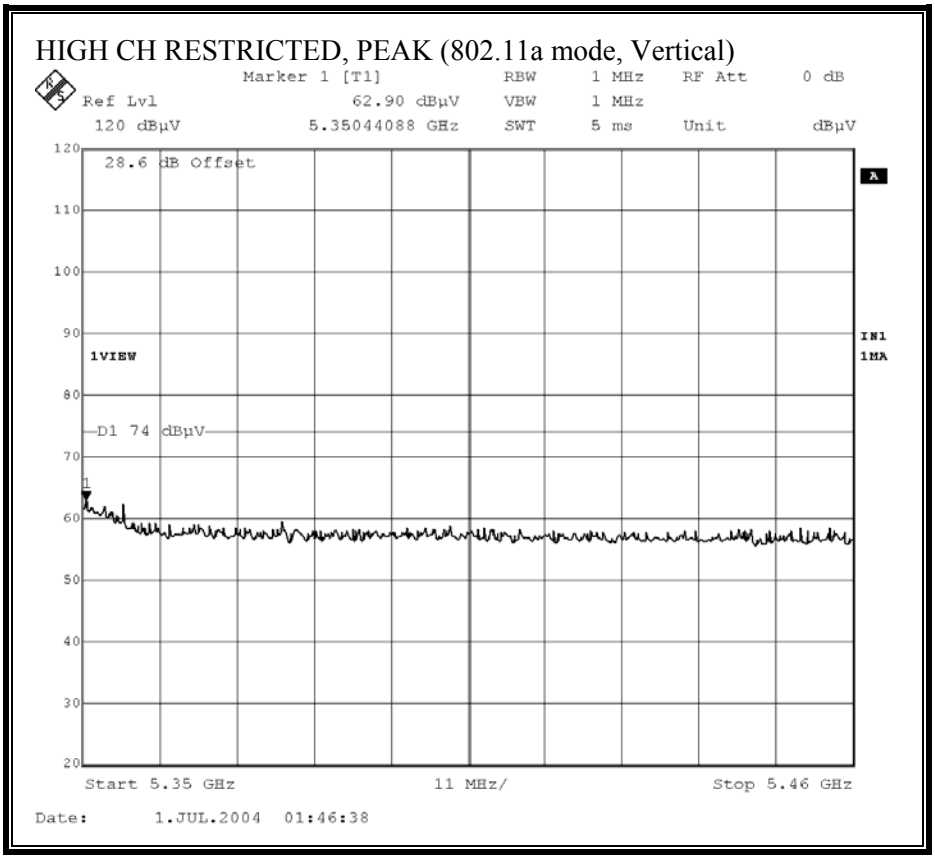
RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, HORIZONTAL)



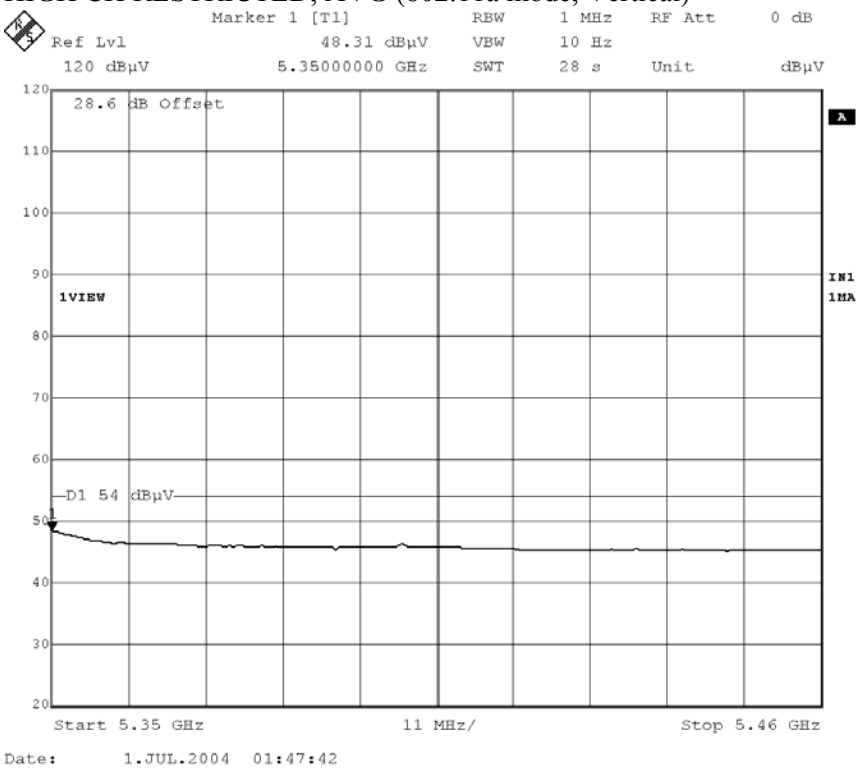
HIGH CH RESTRICTED, AVG (802.11a mode, Horizontal)



RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, VERTICAL)



HIGH CH RESTRICTED, AVG (802.11a mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

07/06/04 **High Frequency Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: David Garcia
Project #: 04U2843
Company: INTEL
EUT Descrip.: 802.11 a/b/g Mini PCI type 3B Card
EUT M/N: PA3375U-1MP
Test Target: FCC 15.247
Mode Oper: TX 11a mode, 5.2GHz Band; x,y,z worst case Position, TIAN Antenna

Test Equipment:

EMCO Horn 1-18GHz	Spectrum Analyzer	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz
T119; S/N: 29301 @3m	Agilent E4446A Analyzer	T63 Miteq 646456		

Hi Frequency Cables: ☑ (2 ft) ☐ (2.0 ft) ☐ (3 ft) ☑ (12 ft)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

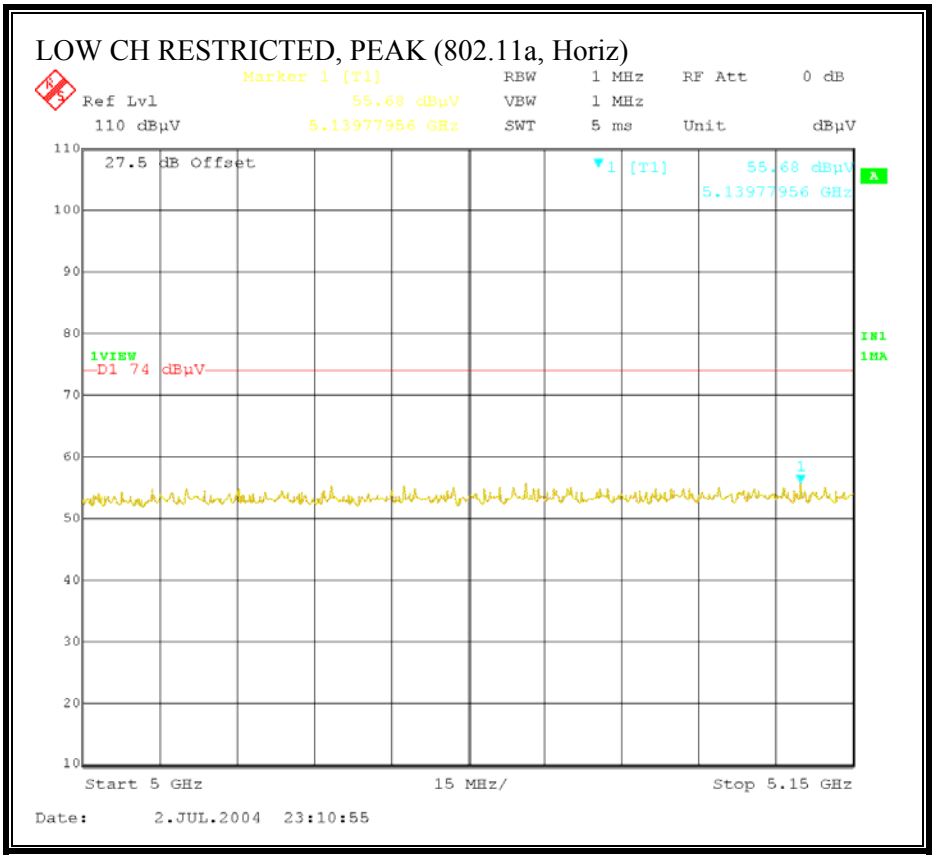
Average Measurements:
1 MHz Resolution Bandwidth
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5180 Channel															
15.540	9.8	43.2	32.0	40.6	5.8	-40.0	0.0	1.0	50.5	39.3	74.0	54.0	-23.5	-14.7	V
15.540	9.8	43.0	31.8	40.6	5.8	-40.0	0.0	1.0	50.3	39.1	74.0	54.0	-23.7	-14.9	H
5260 Channel															
15.780	9.8	43.9	32.0	40.7	5.8	-40.0	0.0	1.0	51.4	39.5	74.0	54.0	-22.6	-14.5	V
15.780	9.8	44.0	33.2	40.7	5.8	-40.0	0.0	1.0	51.5	40.7	74.0	54.0	-22.5	-13.3	H
5320 Channel															
10.640	9.8	43.7	33.1	38.5	4.5	-33.5	0.0	1.0	54.3	43.7	74.0	54.0	-19.7	-10.3	V
15.960	9.8	43.6	32.0	40.8	5.9	-40.0	0.0	1.0	51.2	39.6	74.0	54.0	-22.8	-14.4	V
10.640	9.8	44.0	32.4	38.5	4.5	-33.5	0.0	1.0	54.6	43.0	74.0	54.0	-19.4	-11.0	H
15.960	9.8	44.2	32.2	40.8	5.9	-40.0	0.0	1.0	51.8	39.8	74.0	54.0	-22.2	-14.2	H
NO OTHER SPURIOUS EMISSIONS DETECTED ABOVE THE SYSTEM NOISE IN THE RESTRICTED BANDS.															

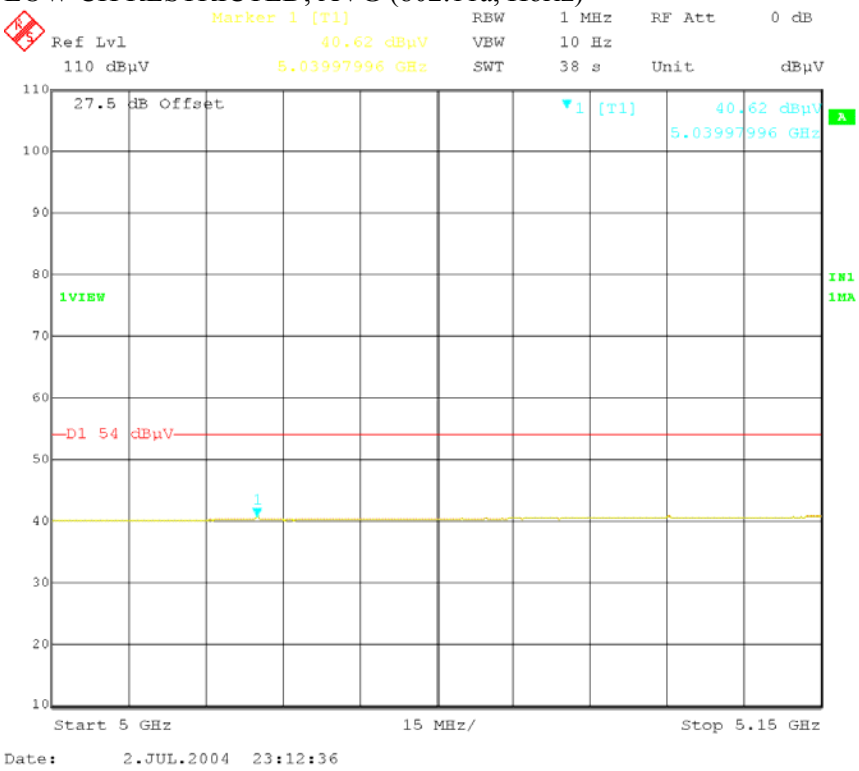
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

7.8.5. TRANSMITTER RADIATED EMISSIONS ABOVE 1 GHZ, PORTABLE TABLET CONFIGURATION, HTL017 ANTENNA SET

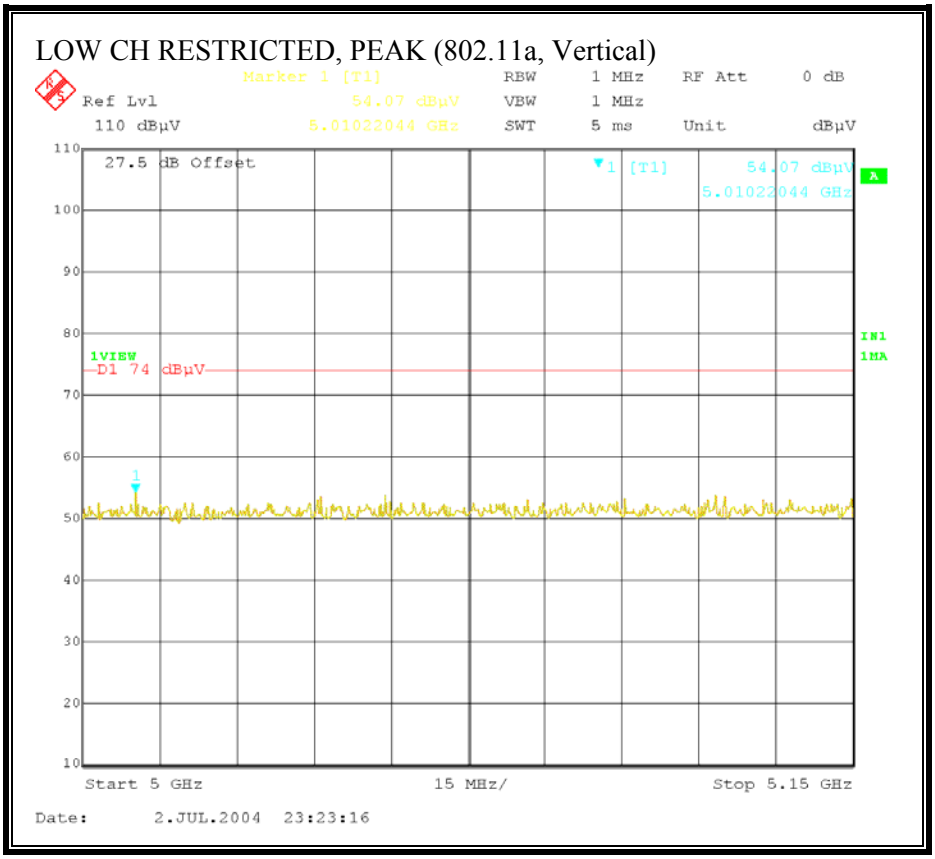
RESTRICTED BANDEDGE (802.11a, LOW CHANNEL, HORIZONTAL)



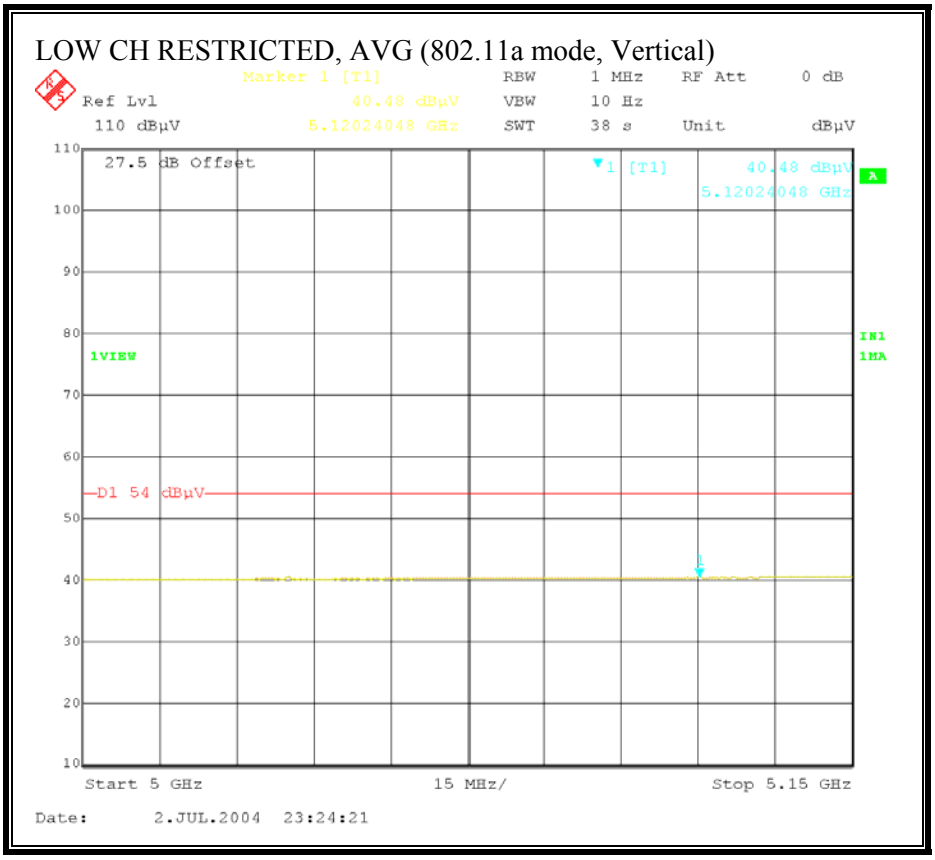
LOW CH RESTRICTED, AVG (802.11a, Horiz)



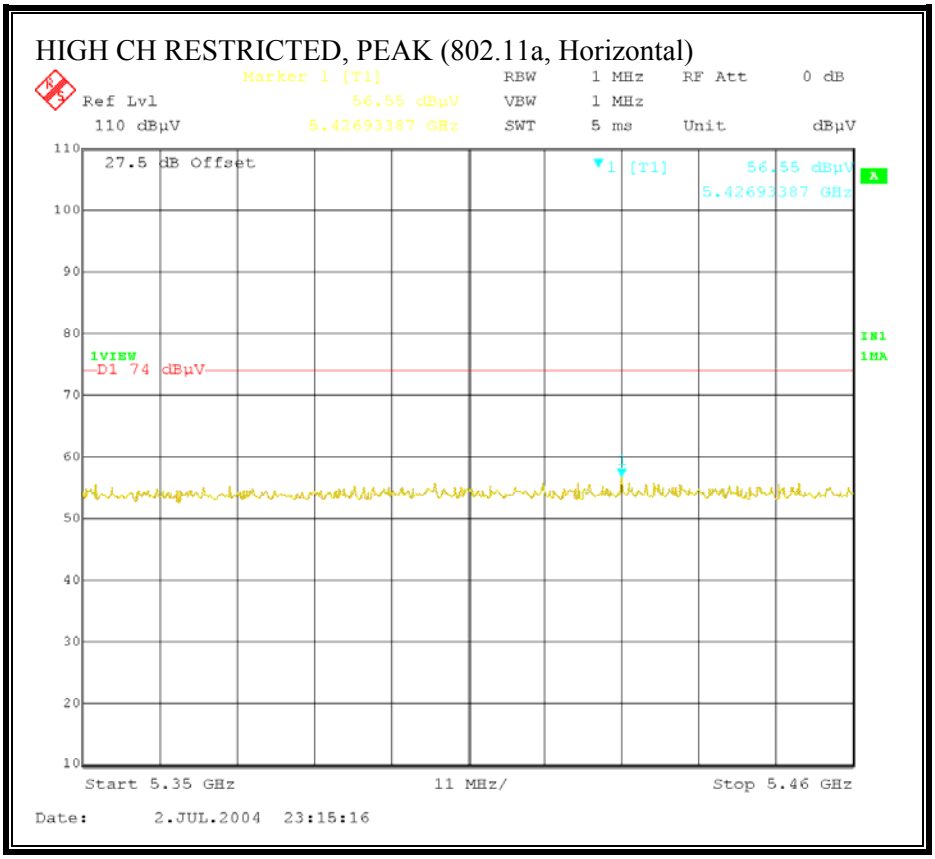
RESTRICTED BANDEDGE (802.11a , LOW CHANNEL, VERTICAL)



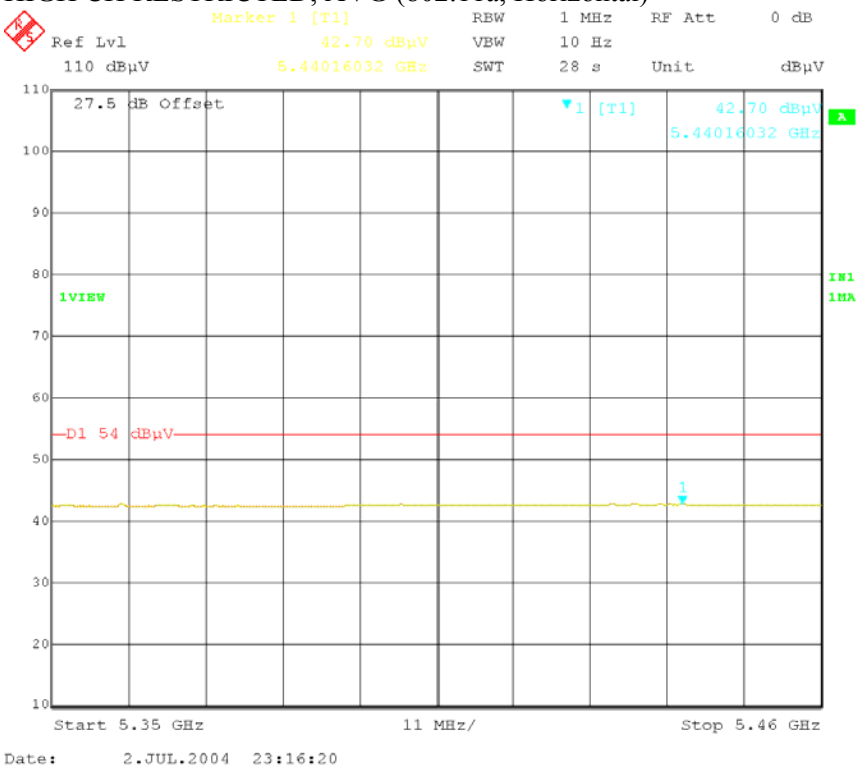
LOW CH RESTRICTED, AVG (802.11a mode, Vertical)



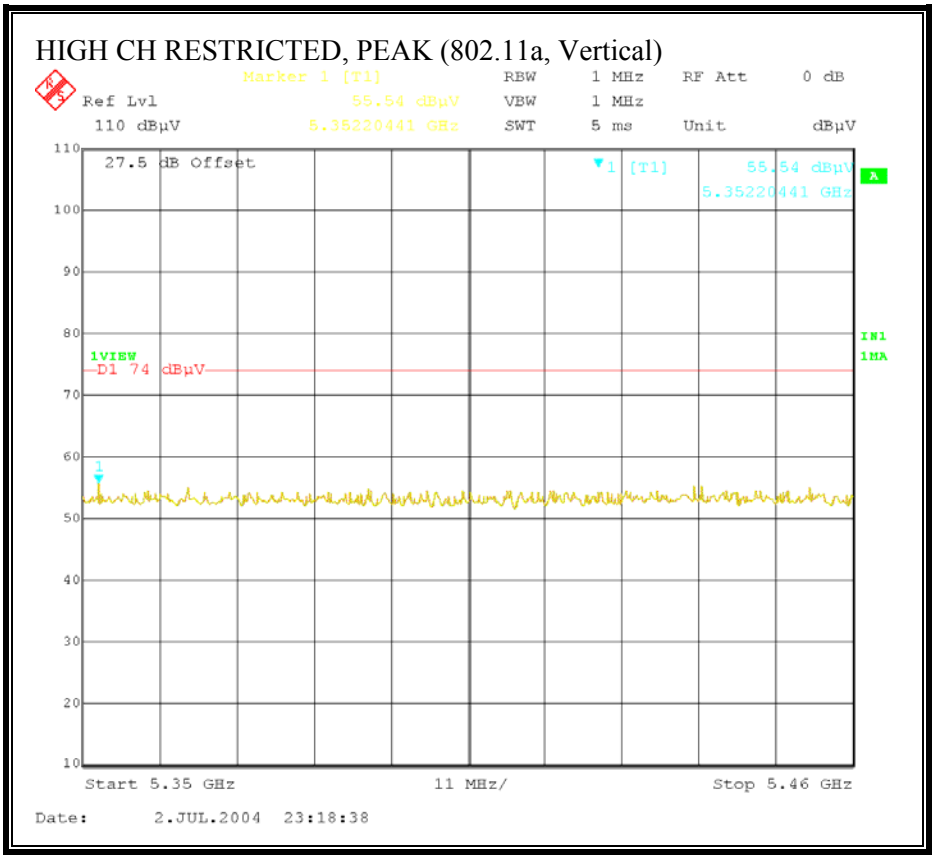
RESTRICTED BANDEDGE (802.11a , HIGH CHANNEL, HORIZONTAL)



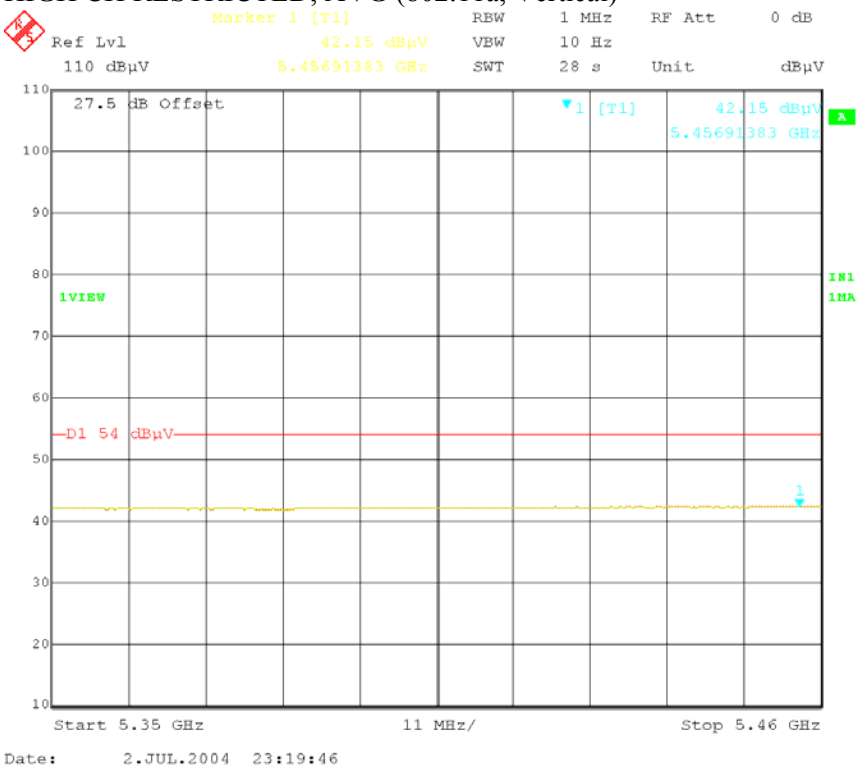
HIGH CH RESTRICTED, AVG (802.11a, Horizontal)



RESTRICTED BANDEDGE (802.11a, HIGH CHANNEL, VERTICAL)



HIGH CH RESTRICTED, AVG (802.11a, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11a)

Project #: 04U2843
Company: INTEL
EUT Descrip.: 802.11 a/b/g Mini PCI type 3B Card
EUT M/N: PA3375U-1MP
Test Target: FCC 15.247
Mode Oper: TX 11a mode, 5.2GHz Band; Worst Case x,y,z Position, HTL-017 Antenna

Test Equipment:

EMCO Horn 1-18GHz	Spectrum Analyzer	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz
T119; S/N: 29301 @3m	Agilent E4446A Analyzer	T63 Miteq 646456		

Hi Frequency Cables: ☑ (2 ft) ☐ (2.0 ft) ☐ (3 ft) ☑ (12 ft)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1 MHz Resolution Bandwidth
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
5180 Channel															
15.540	9.8	43.0	32.1	40.6	5.8	-40.0	0.0	1.0	50.3	39.4	74.0	54.0	-23.7	-14.6	V
15.540	9.8	43.1	31.7	40.6	5.8	-40.0	0.0	1.0	50.4	39.0	74.0	54.0	-23.6	-15.0	H
5260 Channel															
15.780	9.8	43.6	31.8	40.7	5.8	-40.0	0.0	1.0	51.1	39.3	74.0	54.0	-22.9	-14.7	V
15.780	9.8	43.8	32.0	40.7	5.8	-40.0	0.0	1.0	51.3	39.5	74.0	54.0	-22.7	-14.5	H
5320 Channel															
10.640	9.8	43.9	33.0	38.5	4.5	-33.5	0.0	1.0	54.5	43.6	74.0	54.0	-19.5	-10.4	V
15.960	9.8	43.2	32.1	40.8	5.9	-40.0	0.0	1.0	50.8	39.7	74.0	54.0	-23.2	-14.3	V
10.640	9.8	43.5	32.8	38.5	4.5	-33.5	0.0	1.0	54.1	43.4	74.0	54.0	-19.9	-10.6	H
15.960	9.8	44.0	31.9	40.8	5.9	-40.0	0.0	1.0	51.6	39.5	74.0	54.0	-22.4	-14.5	H
NO OTHER SPURIOUS EMISSIONS DETECTED ABOVE THE SYSTEM NOISE IN THE RESTRICTED BANDS.															

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

7.8.6. CO-LOCATED TRANSMITTER RADIATED EMISSIONS WITH TIAN01 ANTENNA SET

SUPPLEMENTAL TEST PROCEDURE

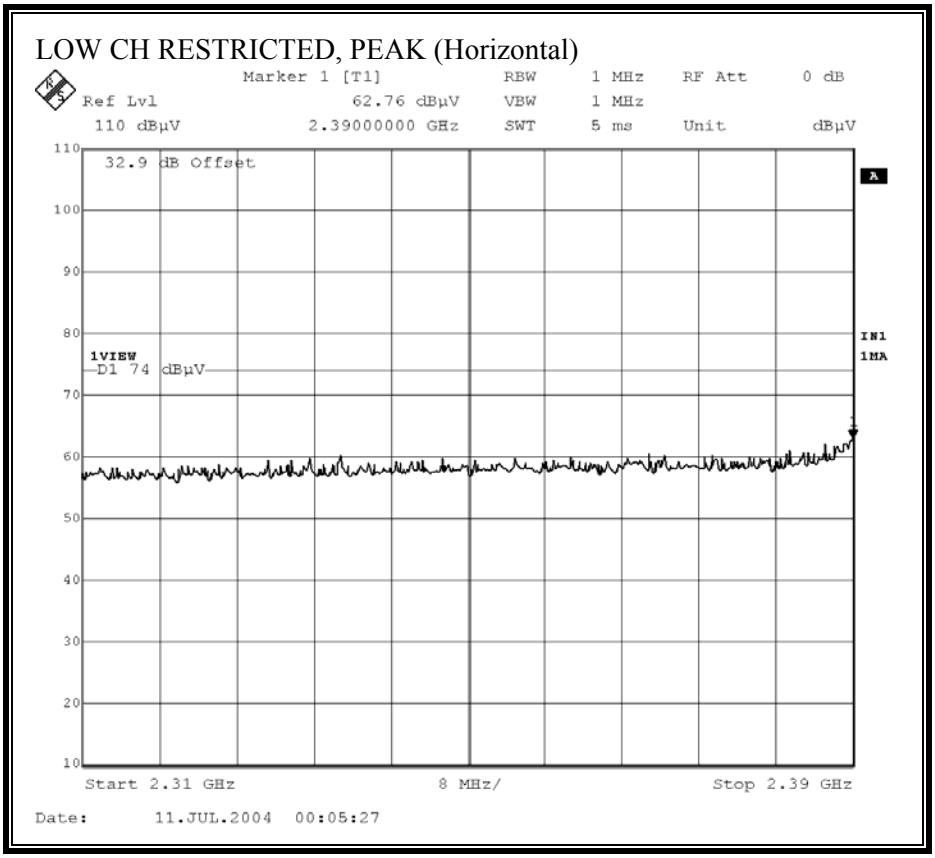
The EUT is placed on a non-conducting table 80 cm above the ground plane. The dominant transmitter is set to the worst case channel. The spurious emissions performance of the dominant transmitter is investigated as the settings of the non-dominant transmitter are varied. Worst case results are reported.

RESULTS

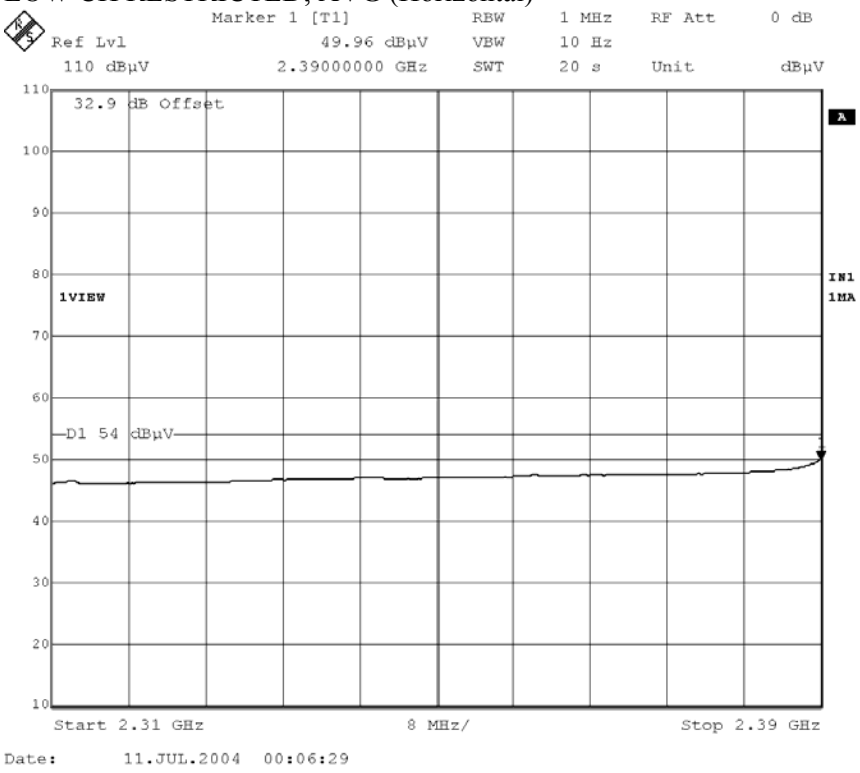
No non-compliance noted:

The WLAN is the dominant transmitter, and the dominant band is the 2.4 GHz band.

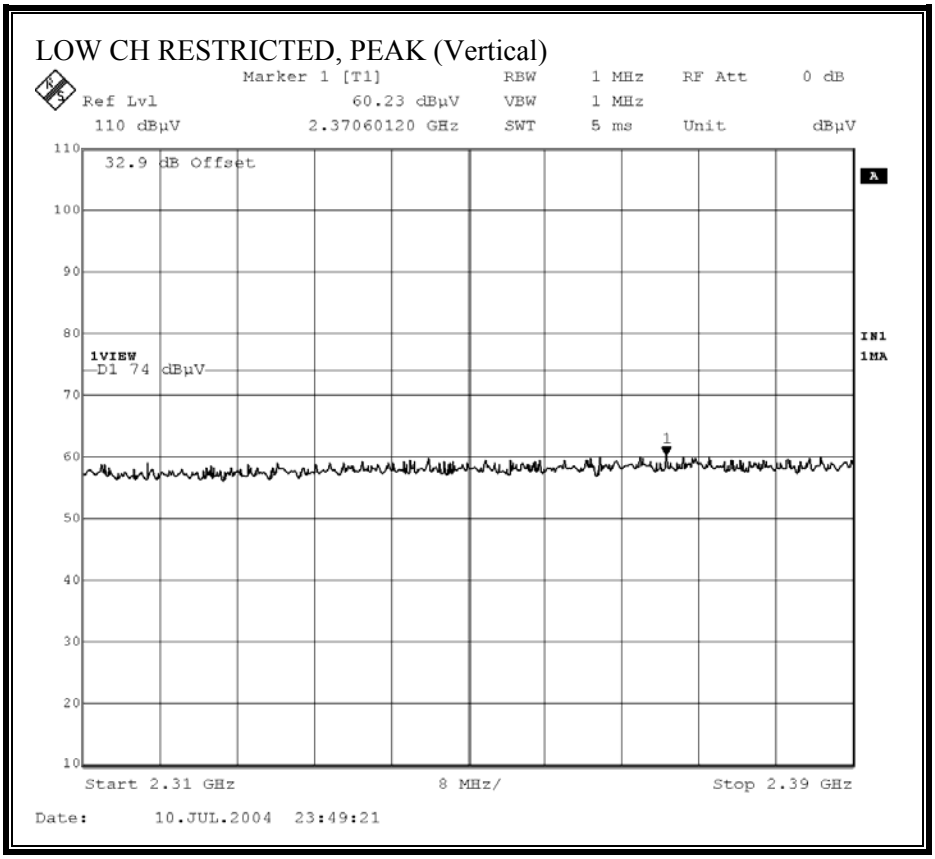
WORST-CASE RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



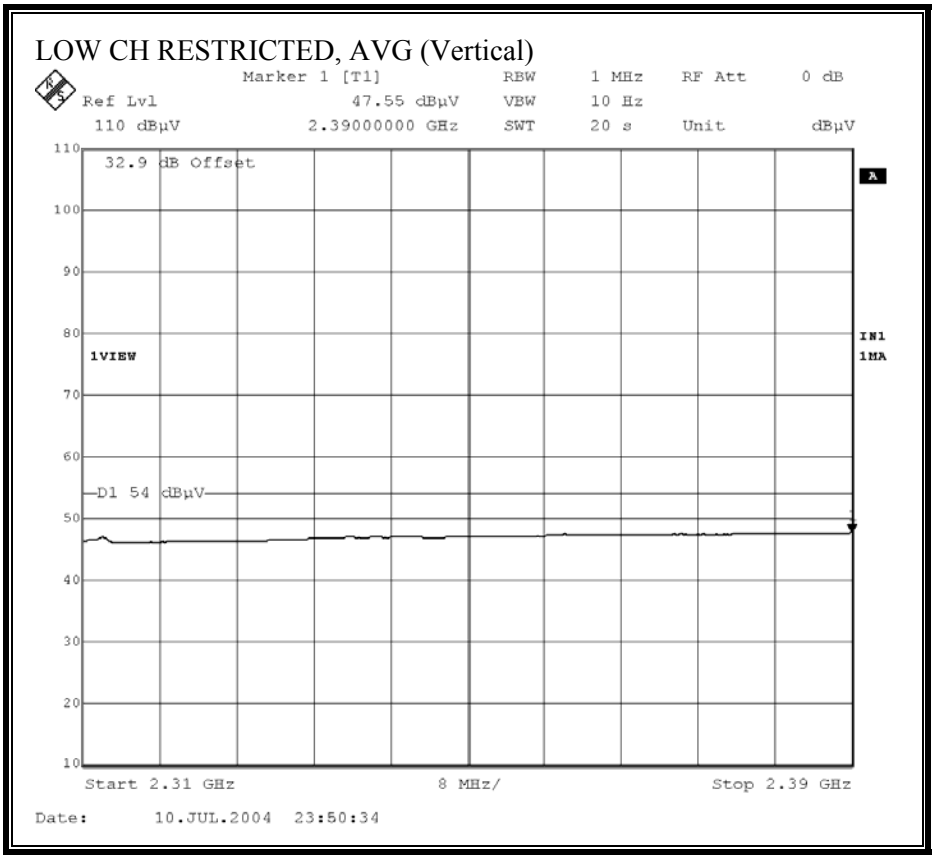
LOW CH RESTRICTED, AVG (Horizontal)



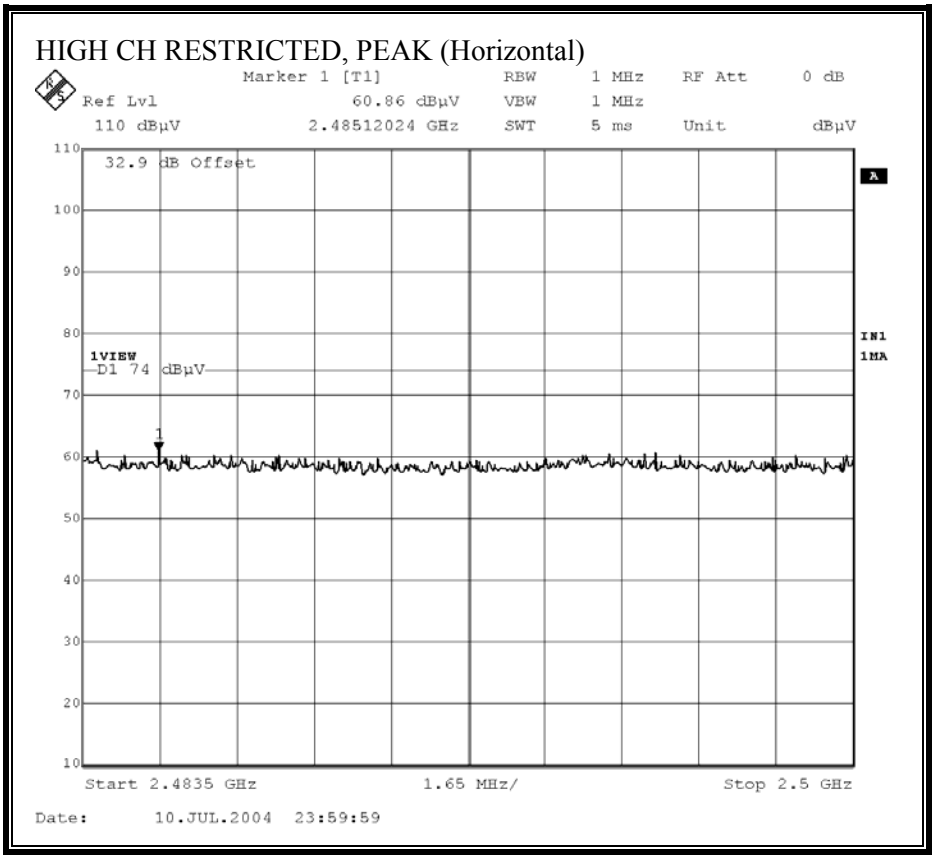
WORST-CASE RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



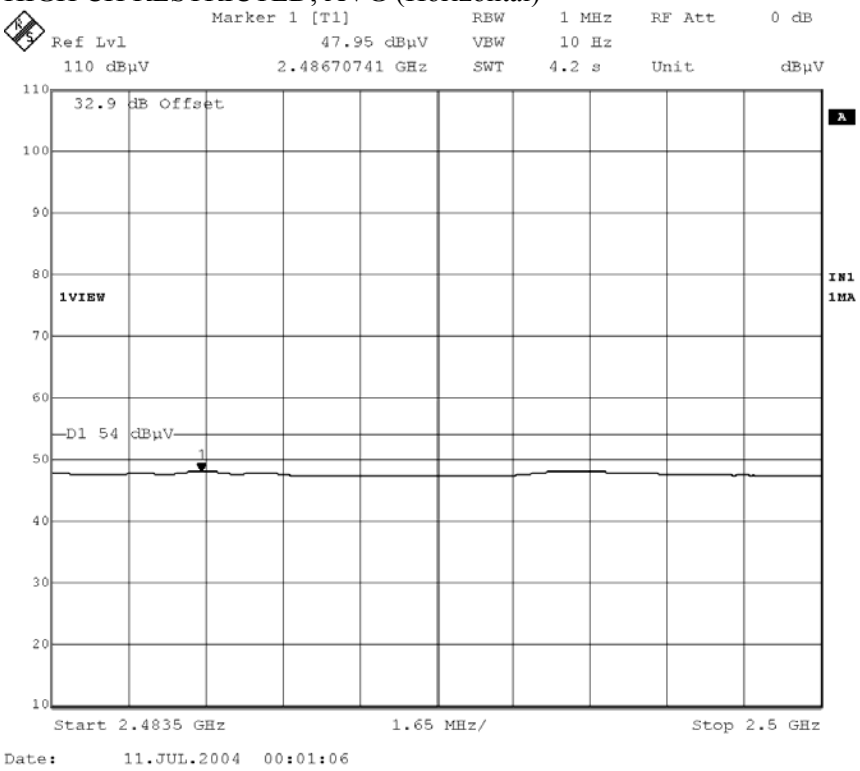
LOW CH RESTRICTED, AVG (Vertical)



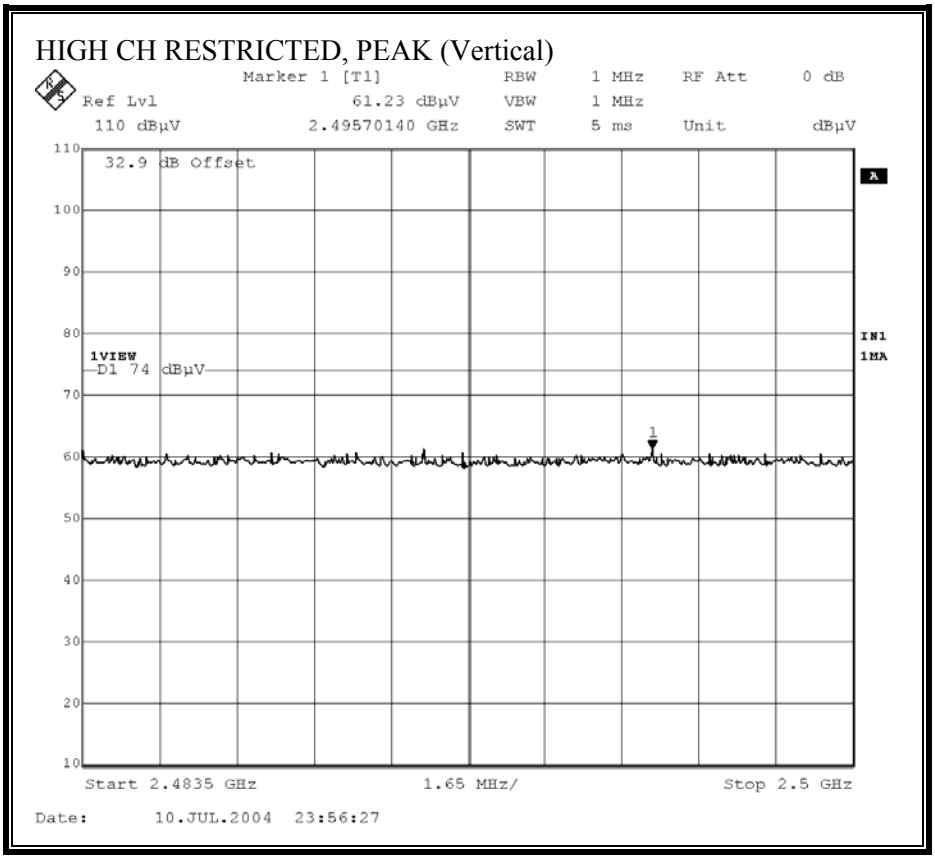
WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



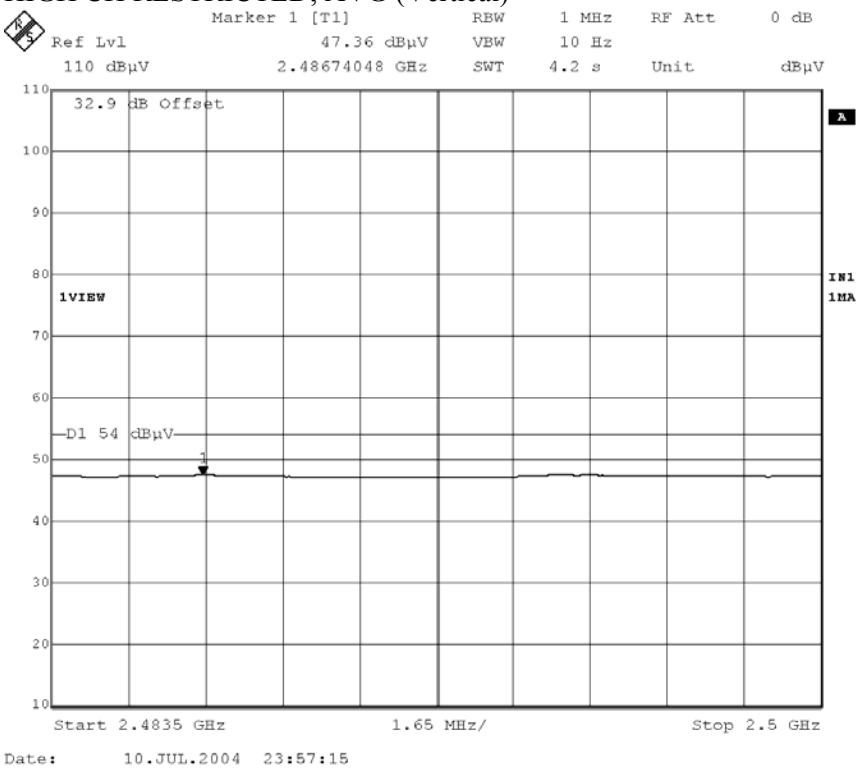
HIGH CH RESTRICTED, AVG (Horizontal)



WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HIGH CH RESTRICTED, AVG (Vertical)



WORST-CASE HARMONICS AND SPURIOUS EMISSIONS

07/10/04 High Frequency Measurement

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: David Garcia
Project #: 04U2843
Company: INTEL
EUT Descrip.: 802.11 a/b/g Mini PCI type 3B Card
EUT M/N: PA3375U-1MP
Test Target: FCC 15.247
Mode Oper: TX 11g mode, Laptop Position, TIAN Antenna
Co-Location Bluetooth at 2441MHz, WLAN at 2437MHz

Test Equipment:

EMCO Horn 1-18GHz	Spectrum Analyzer	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz
T119; S/N: 29301 @3m	Agilent E4446A Analyzer	T63 Miteq 646456		

Hi Frequency Cables: ☑ (2 ft) ☐ (2.0 ft) ☐ (3 ft) ☑ (12 ft)

Limit: FCC 15.205

Peak Measurements: 1 MHz Resolution Bandwidth, 1MHz Video Bandwidth

Average Measurements: 1 MHz Resolution Bandwidth, 10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
2437 Channel															
4.874	9.8	45.0	32.0	35.0	2.9	-35.3	0.0	1.0	48.5	35.5	74.0	54.0	-25.5	-18.5	V
7.311	9.8	44.3	32.4	36.7	3.7	-34.6	0.0	1.0	51.0	39.1	74.0	54.0	-23.0	-14.9	V
4.874	9.8	44.4	32.0	35.0	2.9	-35.3	0.0	1.0	47.9	35.5	74.0	54.0	-26.1	-18.5	H
7.311	9.8	43.8	31.9	36.7	3.7	-34.6	0.0	1.0	50.5	38.6	74.0	54.0	-23.5	-15.4	H

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

7.8.7. CO-LOCATED TRANSMITTER RADIATED EMISSIONS WITH HTL017 ANTENNA SET

SUPPLEMENTAL TEST PROCEDURE

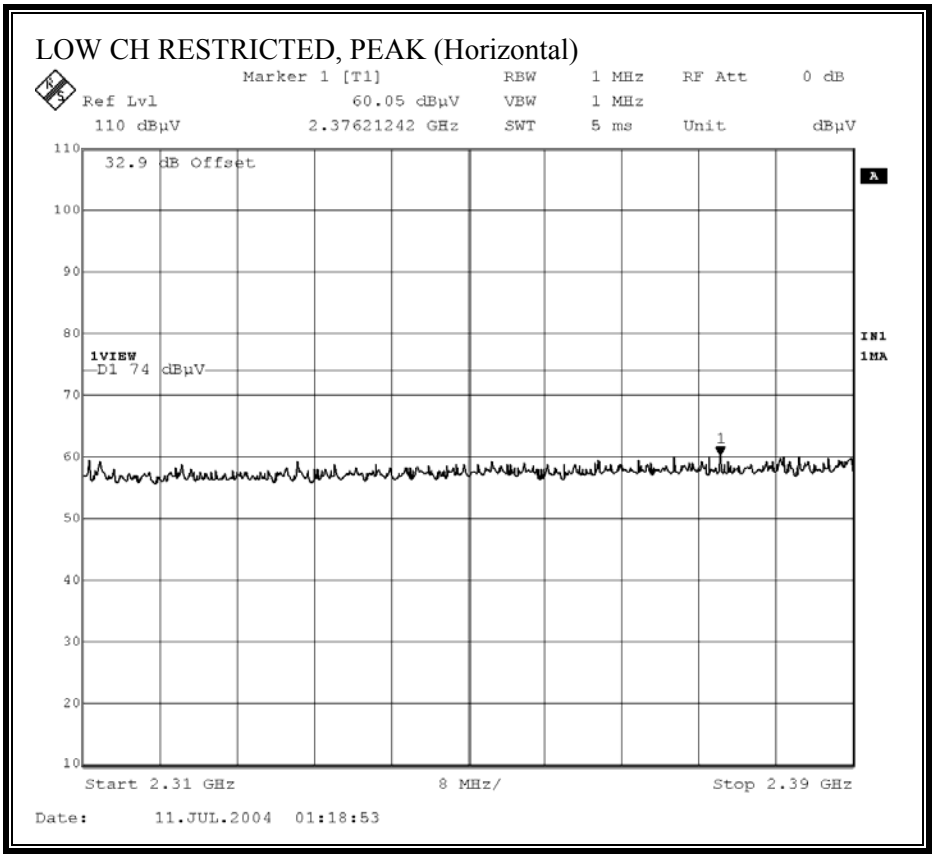
The EUT is placed on a non-conducting table 80 cm above the ground plane. The dominant transmitter is set to the worst case channel. The spurious emissions performance of the dominant transmitter is investigated as the settings of the non-dominant transmitter are varied. Worst case results are reported.

RESULTS

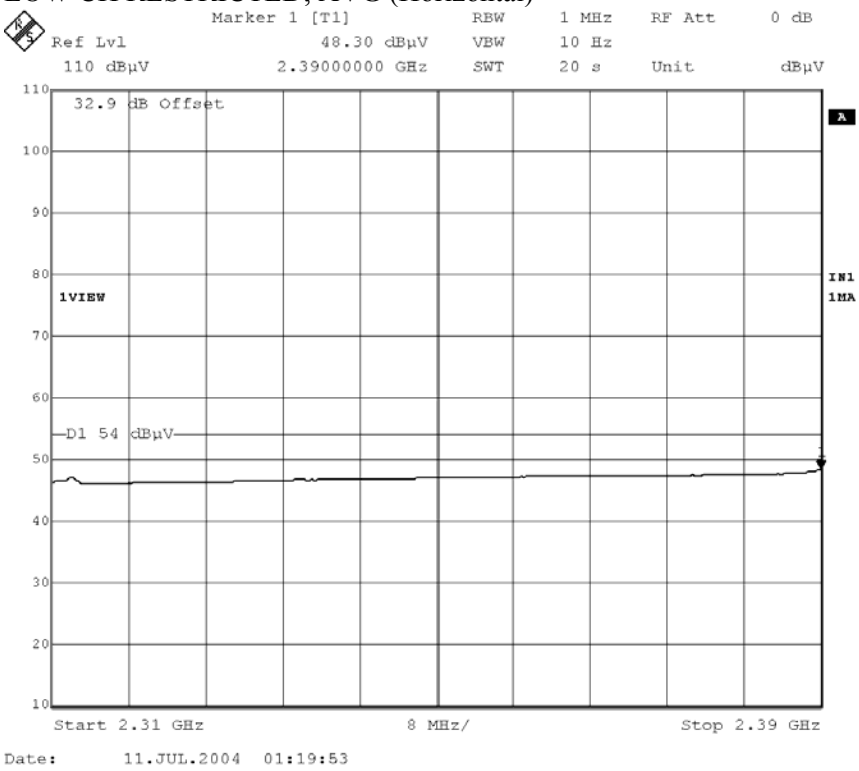
No non-compliance noted:

The WLAN is the dominant transmitter, and the dominant band is the 2.4 GHz band.

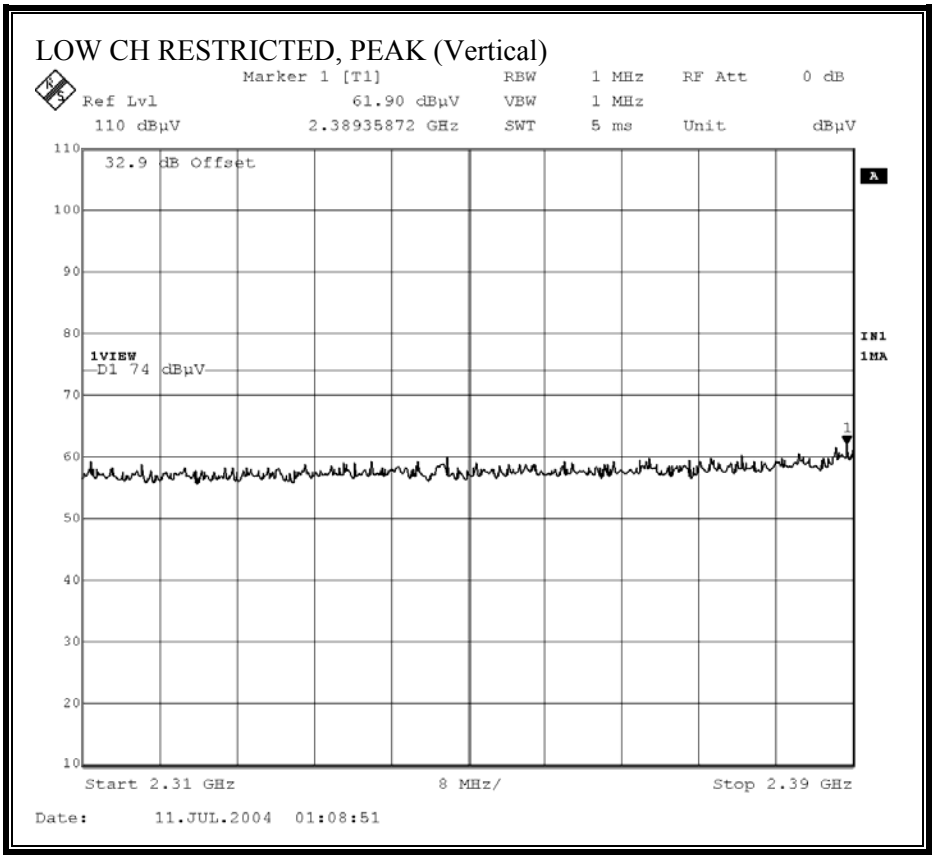
WORST-CASE RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



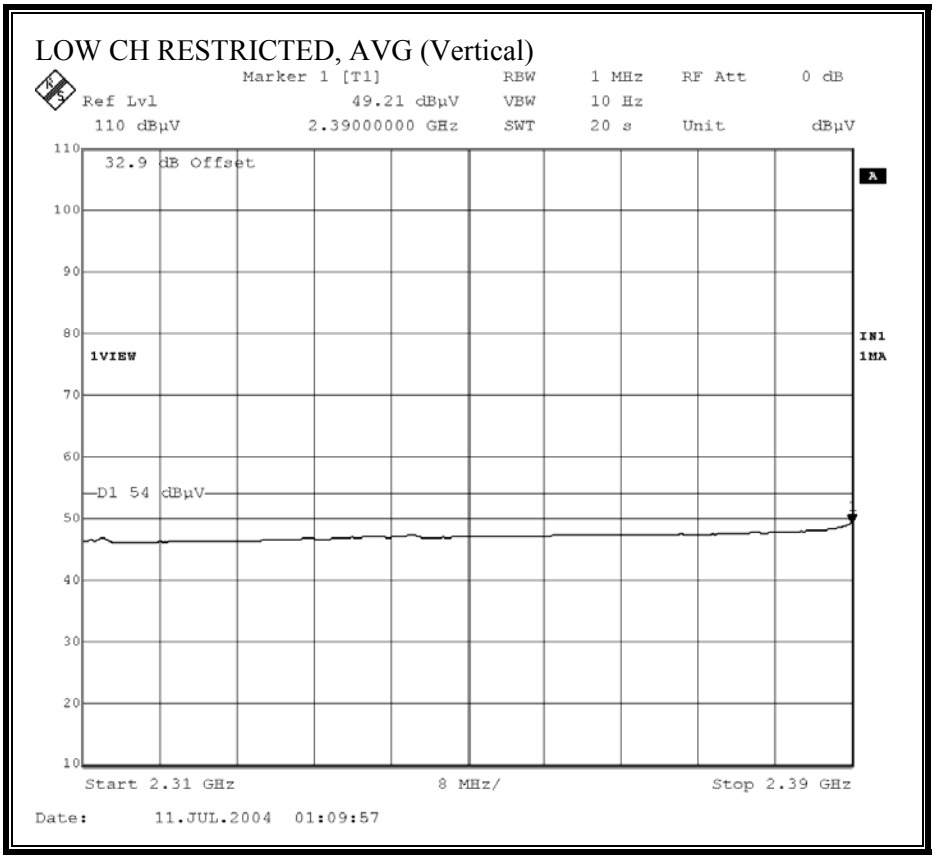
LOW CH RESTRICTED, AVG (Horizontal)



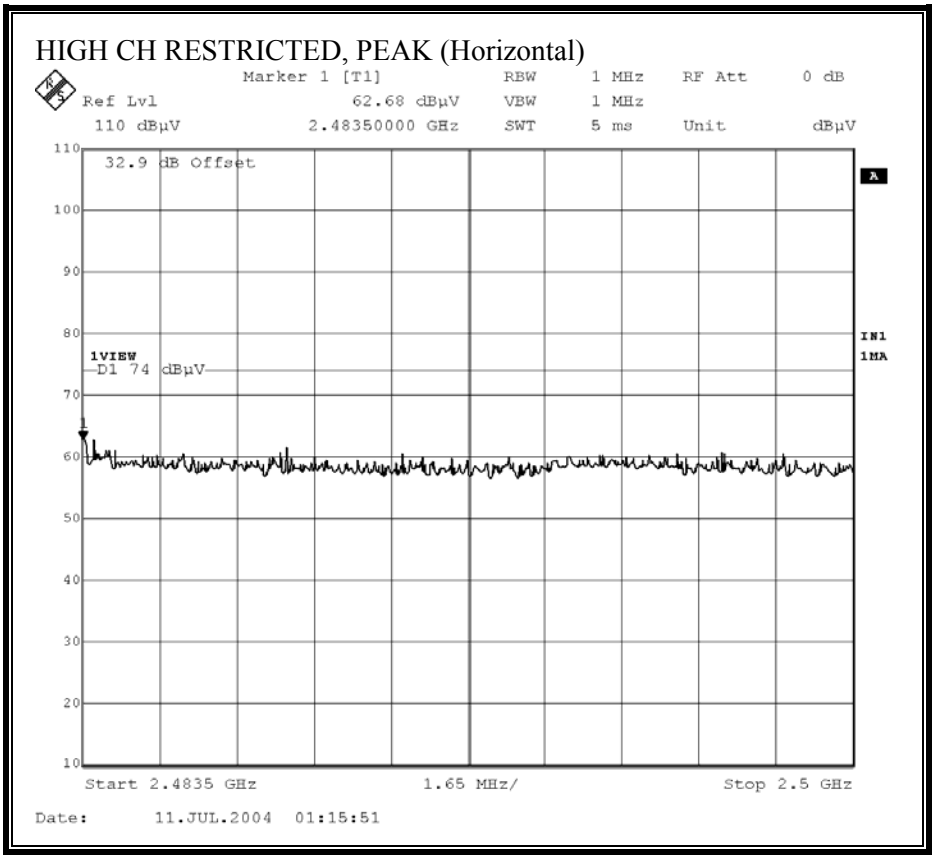
WORST-CASE RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



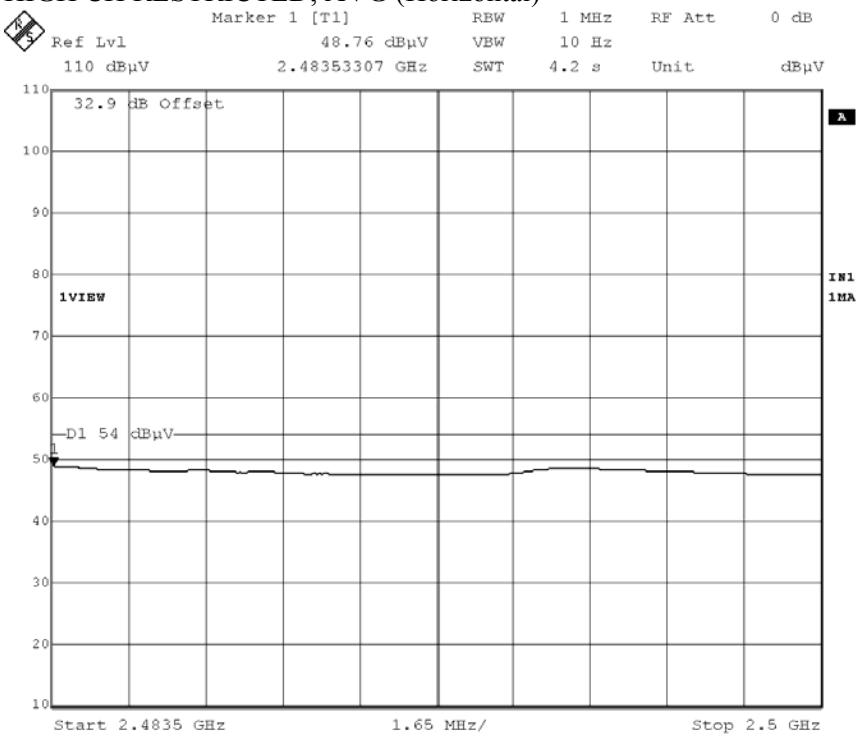
LOW CH RESTRICTED, AVG (Vertical)



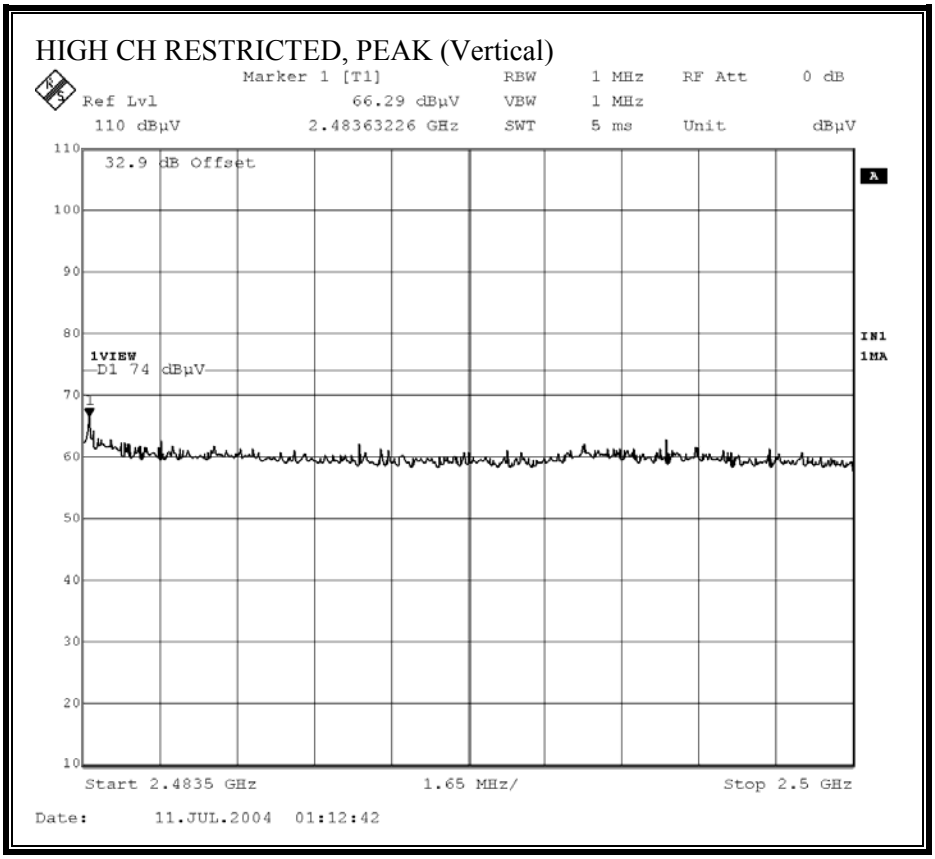
WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



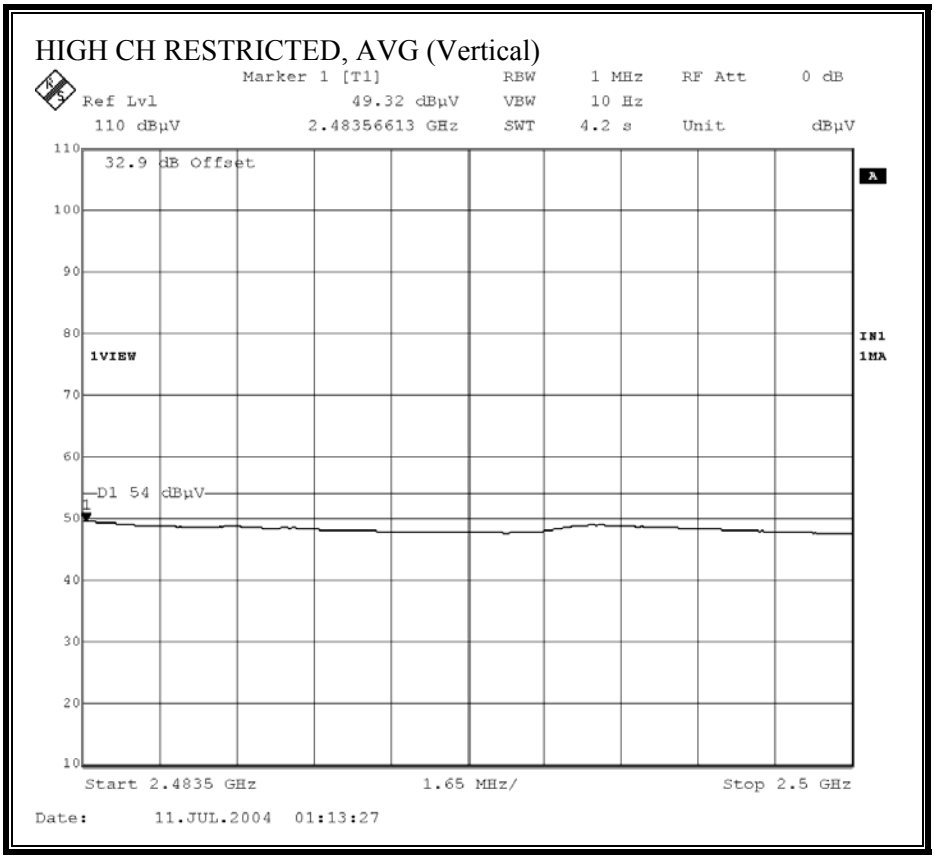
HIGH CH RESTRICTED, AVG (Horizontal)



WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HIGH CH RESTRICTED, AVG (Vertical)



WORST-CASE HARMONICS AND SPURIOUS EMISSIONS

07/10/04 High Frequency Measurement

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: David Garcia
Project #: 04U2843
Company: INTEL
EUT Descrip.: 802.11 a/b/g Mini PCI type 3B Card
EUT M/N: PA3375U-1MP
Test Target: FCC 15.247
Mode Oper: TX 11g mode, Laptop Position, HTL-017 Antenna
Colocation w/Bluetooth set to mid channel

Test Equipment:

EMCO Horn 1-18GHz: T73; S/N: 6717 @3m
Spectrum Analyzer: Agilent E4446A Analyzer
Pre-amplifer 1-26GHz: T63 Miteq 646456
Pre-amplifer 26-40GHz:
Horn > 18GHz:

Hi Frequency Cables: ☑ (2 ft) ☐ (2.0 ft) ☐ (3 ft) ☑ (12 ft)

Limit: FCC 15.205

Peak Measurements: 1 MHz Resolution Bandwidth, 1MHz Video Bandwidth
Average Measurements: 1 MHz Resolution Bandwidth, 10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
2437 Channel															
4.874	9.8	44.0	32.0	33.4	2.9	-35.3	0.0	1.0	46.0	34.0	74.0	54.0	-28.0	-20.0	V
7.311	9.8	44.3	32.8	35.8	3.7	-34.6	0.0	1.0	50.2	38.7	74.0	54.0	-23.8	-15.3	V
4.874	9.8	43.7	31.0	33.4	2.9	-35.3	0.0	1.0	45.7	33.0	74.0	54.0	-28.3	-21.0	H
7.311	9.8	43.0	32.4	35.8	3.7	-34.6	0.0	1.0	48.9	38.3	74.0	54.0	-25.1	-15.7	H

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

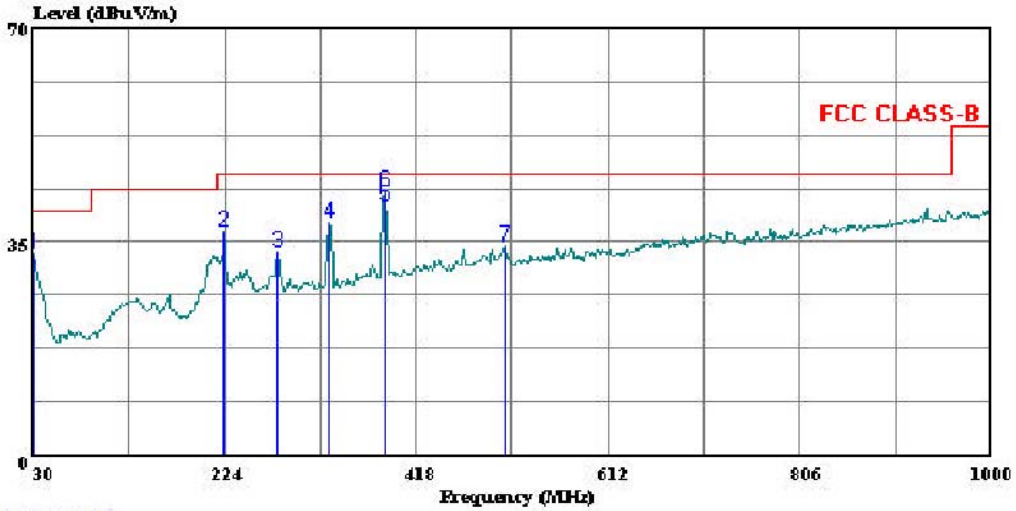
7.8.8. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz, TIAN01 ANTENNA SET

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

HORIZONTAL PLOT

561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 4 File#: 04U2843.EMI Date: 07-01-2004 Time: 12:04:17



Trace: 1 Ref Trace:

Condition: FCC CLASS-B SUNOL BILOG 12/22/04 HORIZONTAL
Test Operator: : David Garcia
Project #: : 04U2843-1
Company: : INTEL
EUT: : 802.11 a/b/g Mini PCI Card
Model No: : PA3375U-1MPC
Configuration: : EUT installed in Laptop/Tablet, TIAN Antenna
Target of Test: : FCC Class B
Mode of Operation: PC Only, TX

Page: 1

HORIZONTAL DATA

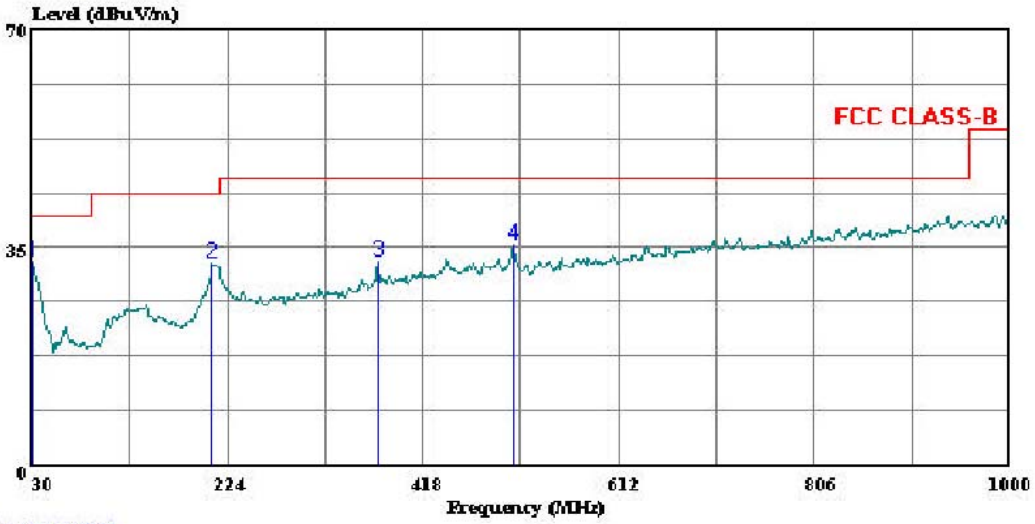
	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	30.000	Peak	10.03	22.95	32.98	40.00	-7.02
2	223.030	Peak	23.63	13.03	36.66	46.00	-9.34
3	276.380	Peak	17.93	15.37	33.30	46.00	-12.71
4	329.730	Peak	21.74	16.44	38.18	46.00	-7.82
5	385.990	QP	23.00	17.85	40.85	46.00	-5.15
6	385.990	Peak	25.40	17.87	43.27	46.00	-2.73
7	507.240	Peak	13.64	20.70	34.34	46.00	-11.66

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

VERTICAL PLOT

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 6 File#: 04U2843.EMI Date: 07-01-2004 Time: 12:14:47



(Audix A TC)

Trace: 5 Ref Trace:

Condition: FCC CLASS-B SUNOL BILOG 12/22/04 VERTICAL
Test Operator: : David Garcia
Project #: : 04U2843-1
Company: : INTEL
EUT: : 802.11 a/b/g Mini PCI Card
Model No: : PA3375U-1MPC
Configuration: : EUT installed in Laptop/Tablet TIAN Antenna
Target of Test: : FCC Class B
Mode of Operation: PC Only, TX

Page: 1

VERTICAL DATA

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	30.000	Peak	9.68	22.95	32.63	40.00	-7.37
2	208.480	Peak	19.44	13.01	32.45	43.50	-11.05
3	373.380	Peak	15.03	17.55	32.58	46.00	-13.42
4	507.240	Peak	14.85	20.70	35.55	46.00	-10.45

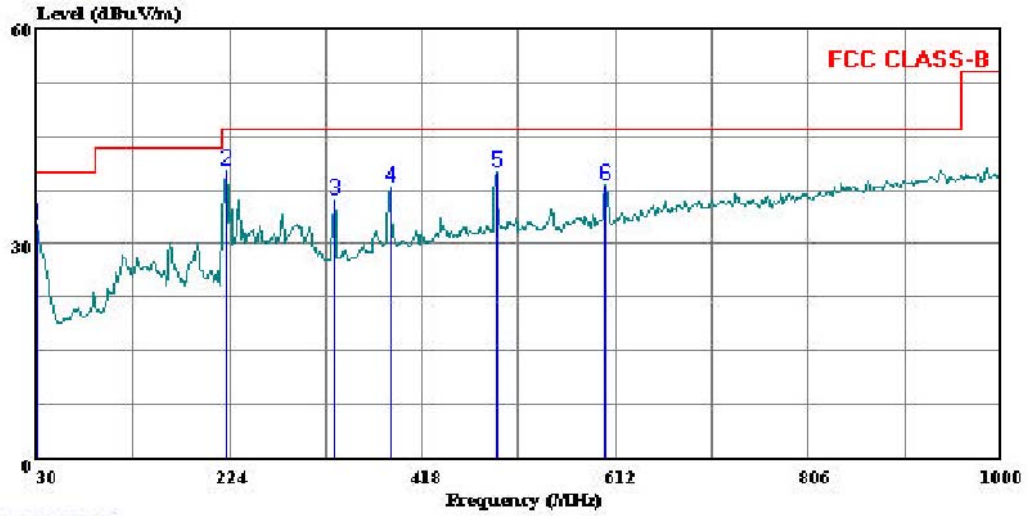
7.8.9. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz, HTL017 ANTENNA SET

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

HORIZONTAL PLOT

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 2 File#: HTL2843.EMI Date: 07-06-2004 Time: 22:16:18



(Audix ATC)
Trace: 1 Ref Trace:

Condition: FCC CLASS-B SUNOL BILOG 12/22/04 HORIZONTAL
Test Operator: : David Garcia
Project #: : 04U2843
Company: : INTEL (RP)
EUT: : 802.11 a/b/g Mini PCI type 3B Card,
: Toshiba Laptop/Tablet HTL-017 Antenna
Model No: : PA3375U-1MPC=Intel Card
Configuration: : EUT stand alone
Target of Test: : FCC Class B
Mode of Operation: TX, a Mode, Mid Ch.

Page: 1

HORIZONTAL DATA

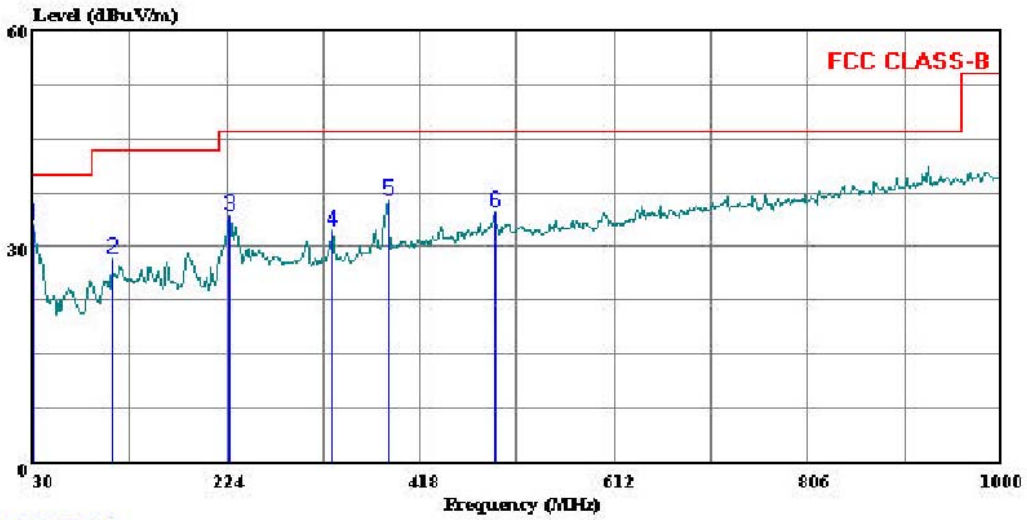
	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	30.000	Peak	9.79	22.95	32.74	40.00	-7.26
2	221.090	Peak	27.32	13.00	40.32	46.00	-5.68
3	329.730	Peak	19.57	16.44	36.01	46.00	-9.99
4	385.990	Peak	20.06	17.87	37.93	46.00	-8.07
5	492.690	Peak	19.48	20.46	39.94	46.00	-6.06
6	601.330	Peak	16.35	21.96	38.31	46.00	-7.69

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

VERTICAL PLOT

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 4 File#: HTL2843.EMI Date: 07-06-2004 Time: 22:24:18



(Audix ATC)
Trace: 3 Ref Trace:

Condition: FCC CLASS-B SUNOL BILOG 12/22/04 VERTICAL
Test Operator: : David Garcia
Project #: : 04U2843
Company: : INTEL (RP)
EUT: : 802.11 a/b/g Mini PCI type 3B Card,
: Toshiba Laptop/Tablet HTL-017 Antenna
Model No: : PA3375U-1MPC=Intel Card
Configuration: : EUT stand alone
Target of Test: : FCC Class B
Mode of Operation: TX, a Mode, Mid Ch.

Page: 1

VERTICAL DATA

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	30.000	Peak	9.98	22.95	32.93	40.00	-7.07
2	109.540	Peak	14.89	13.29	28.18	43.50	-15.32
3	225.940	Peak	21.08	13.11	34.19	46.00	-11.81
4	329.730	Peak	15.86	16.44	32.30	46.00	-13.70
5	385.990	Peak	18.42	17.87	36.29	46.00	-9.71
6	492.690	Peak	14.28	20.46	34.74	46.00	-11.26

7.9. POWERLINE CONDUCTED EMISSIONS

LIMIT

§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 µH/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:

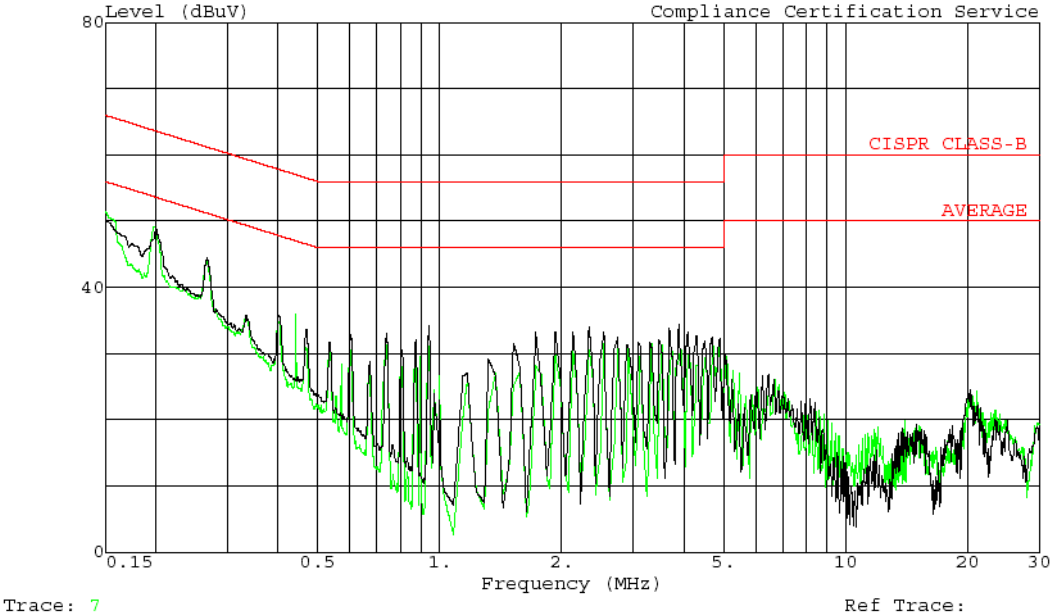
RESULTS

6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.15	51.80	--	--	0.00	65.94	55.94	-14.14	-4.14	L1
0.20	49.16	--	--	0.00	64.63	54.63	-15.47	-5.47	L1
4.85	31.02	--	--	0.00	56.00	46.00	-24.98	-14.98	L1
0.15	50.66	--	--	0.00	66.00	56.00	-15.34	-5.34	L2
0.20	49.12	--	--	0.00	64.57	54.57	-15.45	-5.45	L2
3.88	34.30	--	--	0.00	56.00	46.00	-21.70	-11.70	L2
6 Worst Data									

LINE 1 AND LINE 2 RESULTS

COMPLIANCE Engineering Services, Inc.
561F Monterey Road,
Morgan Hill, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888

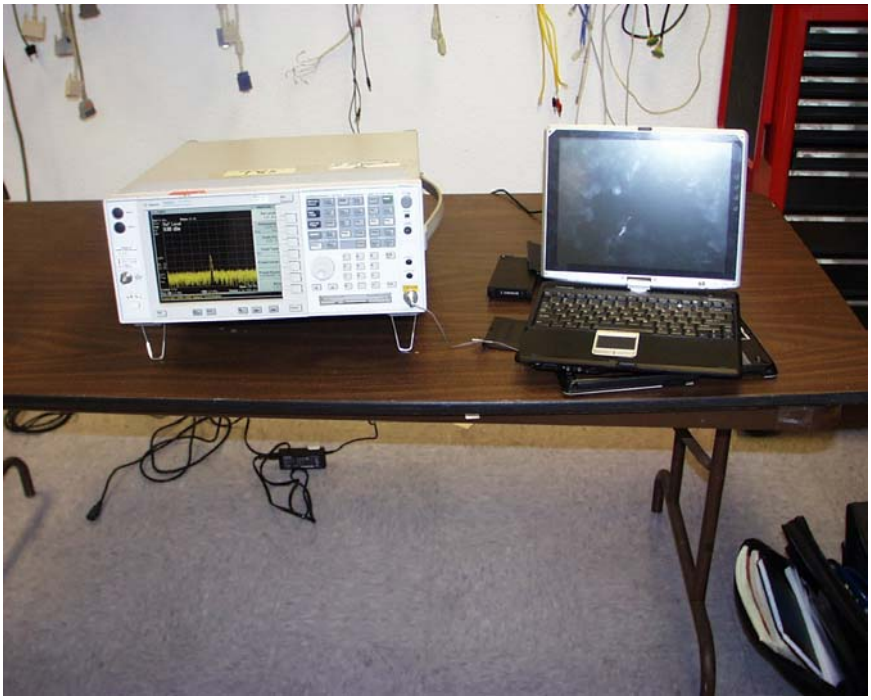


Trace: 7 Ref Trace:
Project # : 04U2843-1
Test Operator : Chin Pang
Company : Intel
EUT : 802.11 a/b/g Mini PCI Type 3B Card
Model : PA3375U-IMP
Configuration : EUT in Toshiba Laptop, TIAN Antenna
Mode of Operation: TX (Worst Case)
Target of Test : FCC Class B
Voltage : 115V, 60Hz
: L1: Peak (Green), L2: Peak (Black)

8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

ANTENNA PORT CONDUCTED PHOTO



RADIATED RF MEASUREMENT SETUP (MOBILE LAPTOP CONFIGURATION)

RADIATED FRONT PHOTO

RADIATED BACK PHOTO

RADIATED RF MEASUREMENT SETUP (PORTABLE TABLET CONFIGURATION, X ORIENTATION)

RADIATED FRONT PHOTO

RADIATED BACK PHOTO

RADIATED RF MEASUREMENT SETUP (PORTABLE TABLET CONFIGURATION, Y ORIENTATION)

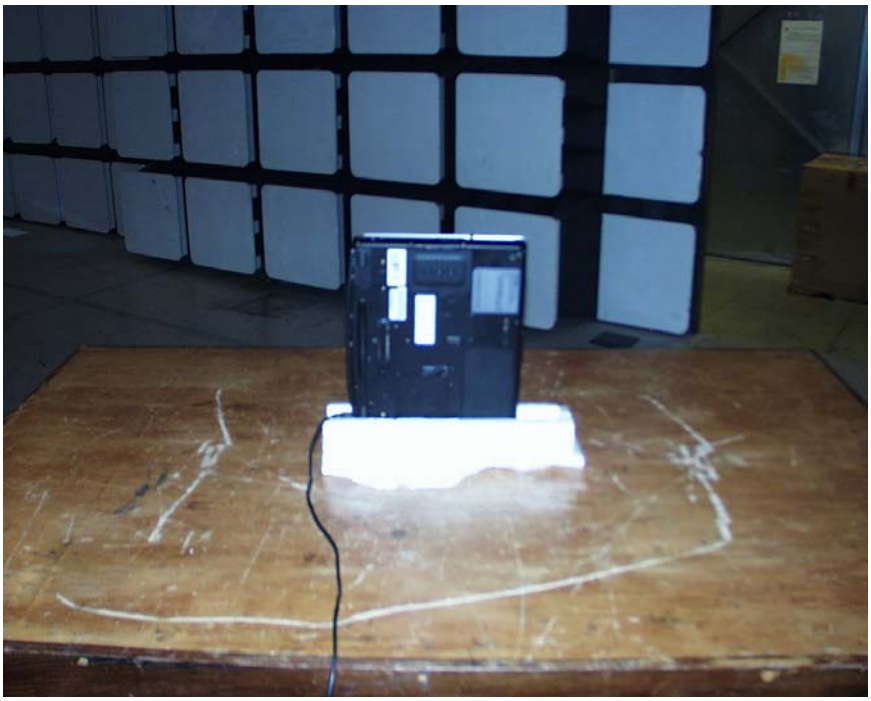
RADIATED FRONT PHOTO

RADIATED BACK PHOTO

RADIATED RF MEASUREMENT SETUP (PORTABLE TABLET CONFIGURATION, Z ORIENTATION)

RADIATED FRONT PHOTO

RADIATED BACK PHOTO



POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

LINE CONDUCTED FRONT PHOTO

LINE CONDUCTED BACK PHOTO

END OF REPORT