



**FCC CFR47 PART 15 SUBPART E  
CERTIFICATION  
TEST REPORT  
FOR**

**WIRELESS ETHERNET TRANSCEIVER**

**MODEL NUMBER: P5010M-INT**

**FCC ID: NCYP5010M**

**REPORT NUMBER: 04U3165-2**

**ISSUE DATE: JANUARY 31, 2005**

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**LAB CODE:200065-0**

Revision History

<u>Rev.</u>	<u>Revisions</u>	<u>Revised By</u>
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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** TRANGO SYSTEMS, INC.  
15070 AVENUE OF SCIENCE, SUITE 200  
SAN DIEGO, CA 92128

**EUT DESCRIPTION:** Wireless Ethernet transceiver

**MODEL:** P5010M-INT

**DATE TESTED:** JANUARY 6 – JANUARY 31, 2005

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

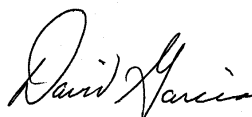
Approved & Released For CCS By:

Tested By:



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YAN ZHENG  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES



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DAVID GARCIA  
EMC ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

## 2. TEST METHODOLOGY

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

## 3. FACILITIES AND ACCREDITATION

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

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

## 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%.

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is an 802.11a Transceiver used for Ethernet Data point-to-point operation.

The EUT is manufactured by Trango Systems.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows (By using the method for UNII band peak power measurement):

5250 to 5350 MHz Authorized Band

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5260 - 5325	802.11a	2.19	1.66

For the reference purpose, the maximum peak conducted output power by using peak power meter is listed as below,

5250 to 5350 MHz Authorized Band

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5260 - 5325	802.11a	8.50	7.08

### **5.3. DESCRIPTION OF AVAILABLE ANTENNAS**

The radio utilizes the integral antennas with a maximum gain of 23 dBi.

### **5.4. SOFTWARE AND FIRMWARE**

The firmware installed in the EUT during testing was 0.9a, rev. P5010M\_0p9a0.  
The test utility software used during testing was Atlas PtP-5010M, rev. 0p9a1D0501118022.

### **5.5. WORST-CASE CONFIGURATION AND MODE**

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at 5300 MHz.

The worst-case data rate for this channel is determined to be 6 Mb/s, based on measurements taken on the EUT to determine worst-case data.

Thus the worst-case emissions tests were made in the 802.11a mode was at 5300 MHz, 6 Mb/s.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacture	Model	Serial Number	FCC ID
Laptop PC	Sony	Vaio; PCG-643L	3525952	DoC
Docking Station	Sony	PCGA-DSM51	1035361	DoC
AC Adapter	Sony	PCGA-AC19W1	183529	N/A
POE Adapter	Trango Systems	N/A	N/A	N/A
AC Adapter	CUI Inc.	3A181WP2L	N/A	N/A

### I/O CABLES

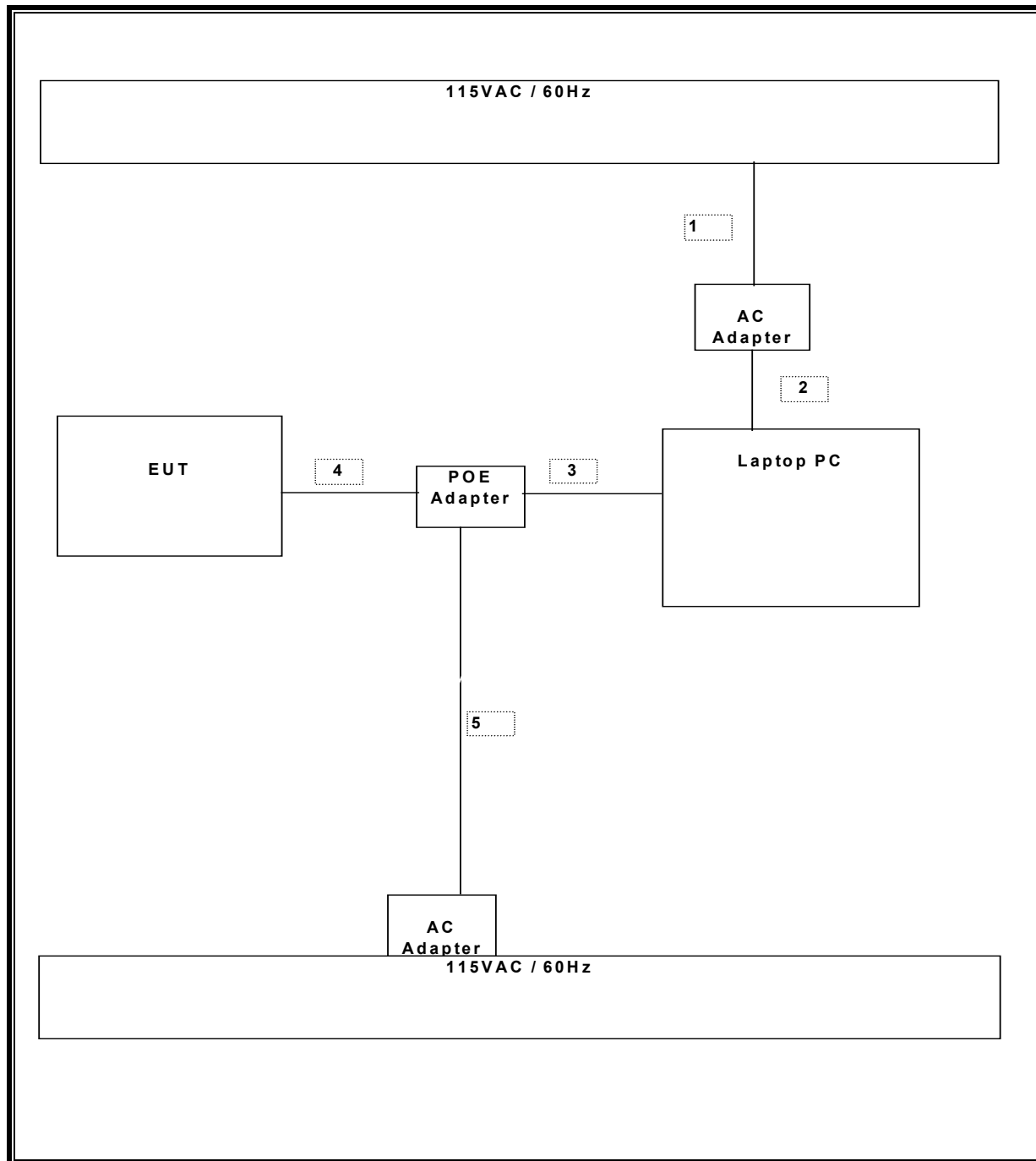
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	IEC	Unshielded	1.5m	
2	DC	1	DC	Unshielded	1.8m	
3	LAN	1	RJ-45	Unshielded	3m	
4	LAN	1	RJ-45	Shielded	3+m	
5	DC	1	DC	Unshielded	1.8m	

### TEST SETUP

The EUT is connected to a laptop computer via a shielded twisted pair cable and a power over Ethernet adapter. The test software exercised the radio.



**SETUP DIAGRAM FOR TESTS**



## 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
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	10/21/2005
Site A Line Stabilizer/Conditioner	Tripplite	LC-1800a	A005181	CNR
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/2005
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	9/12/2005
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	9/12/2005
Antenna, Horn, 18 ~ 26 GHz	ARA	MWH-1826/B	1013	9/12/2005
30MHz---- 2Ghz	Sunol Sciences	JB1 Antenna	A121003	9/22/2005
Spectrum Analyzer, 26.5 GHz	HP	8593EM	3710A00205	1/6/2006
Spectrum Analyzer 20 Hz ~ 44 GHz	Agilent	E4446A	US42510266	8/25/2005
Site A Preamplifier, 1300MHz	HP	8447D	2944A06833	8/17/2005
Power Meter	R & S	NRVS	DE 12101	10/21/2005
Power Sensor, 18GHz, 300 mW	R&S	NVR-Z51	DE 13014	10/20/2005
Amplifier 1-26GHz	MITEQ	NSP2600-SP	924341	12/23/05

## 6.1. CHANNEL TESTS FOR THE 5250 TO 5350 MHz BAND

### 6.1.1. EMISSION BANDWIDTH

#### LIMIT

§15.403 (i) 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.

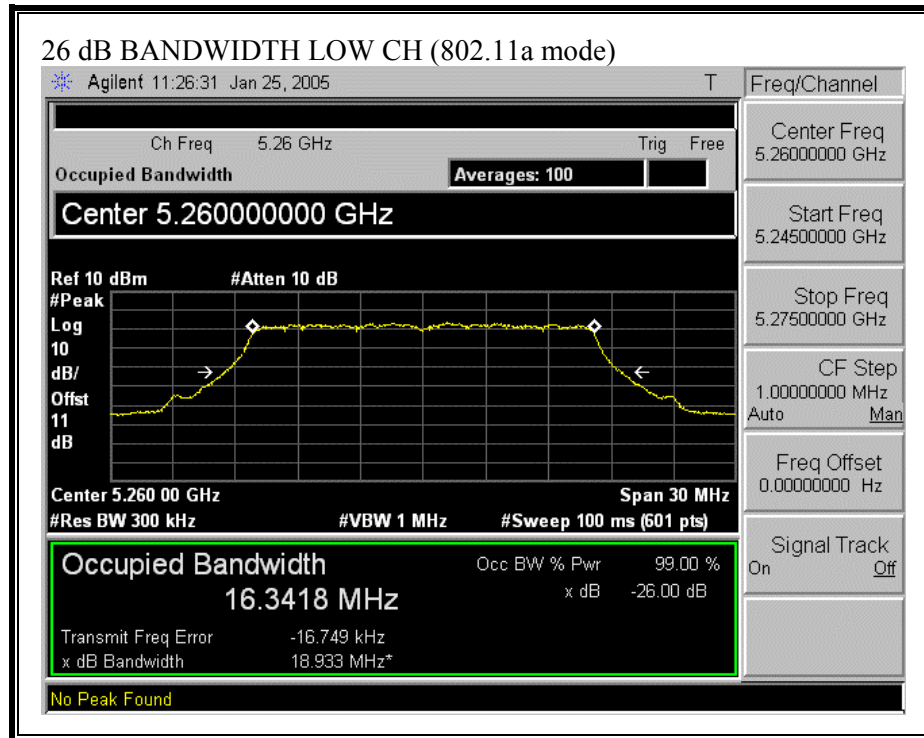
#### RESULTS

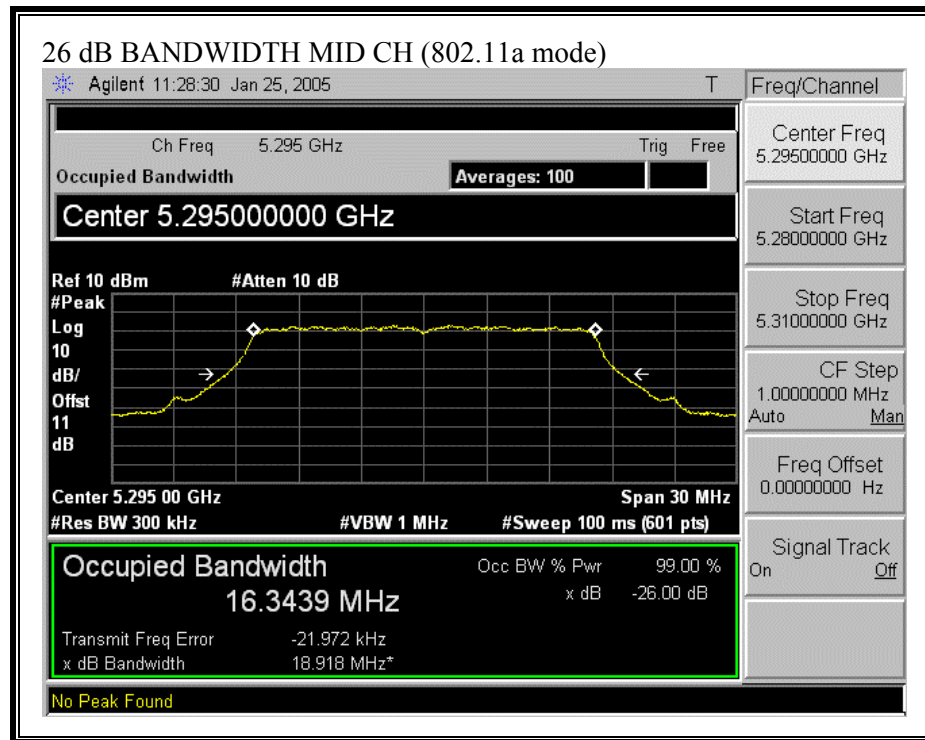
No non-compliance noted:

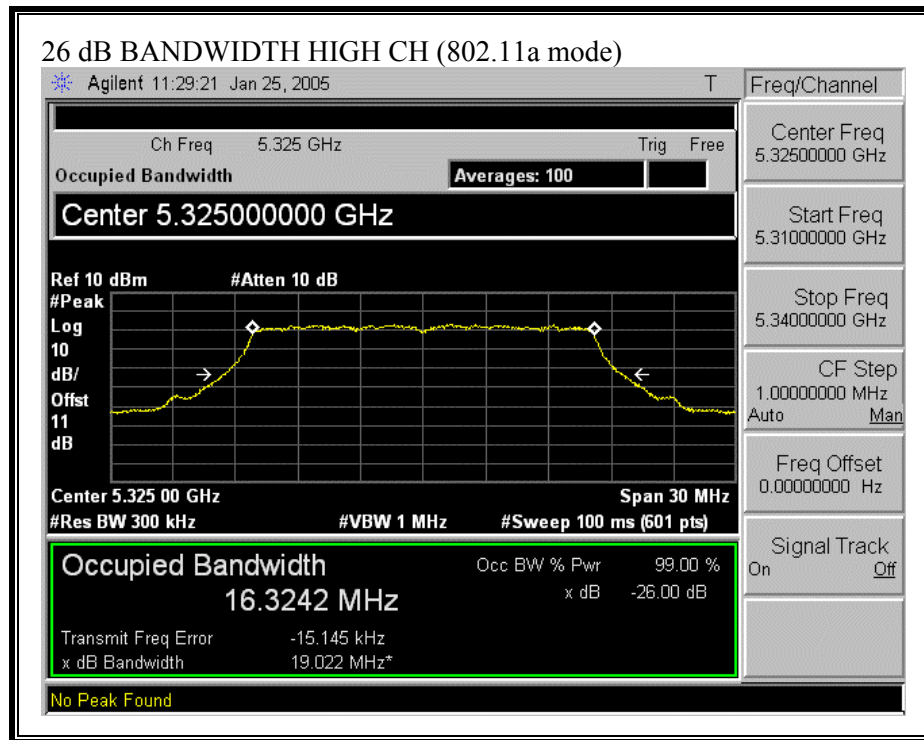
802.11a Mode

Channel	Frequency (MHz)	B (MHz)	10 Log B (dB)
Low	5260	18.93	12.77
Middle	5295	18.92	12.77
High	5325	19.02	12.79

**26 dB EMISSION BANDWIDTH (802.11a MODE)**







### **6.1.2. PEAK POWER**

#### **LIMIT**

§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 or  $11 \text{ dBm} + 10 \log B$ , where B is the 26-dB emission bandwidth in MHz. 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 does not operate continuously therefore Method # 3 is used.

## **LIMITS AND RESULTS**

No non-compliance noted:

### Limit

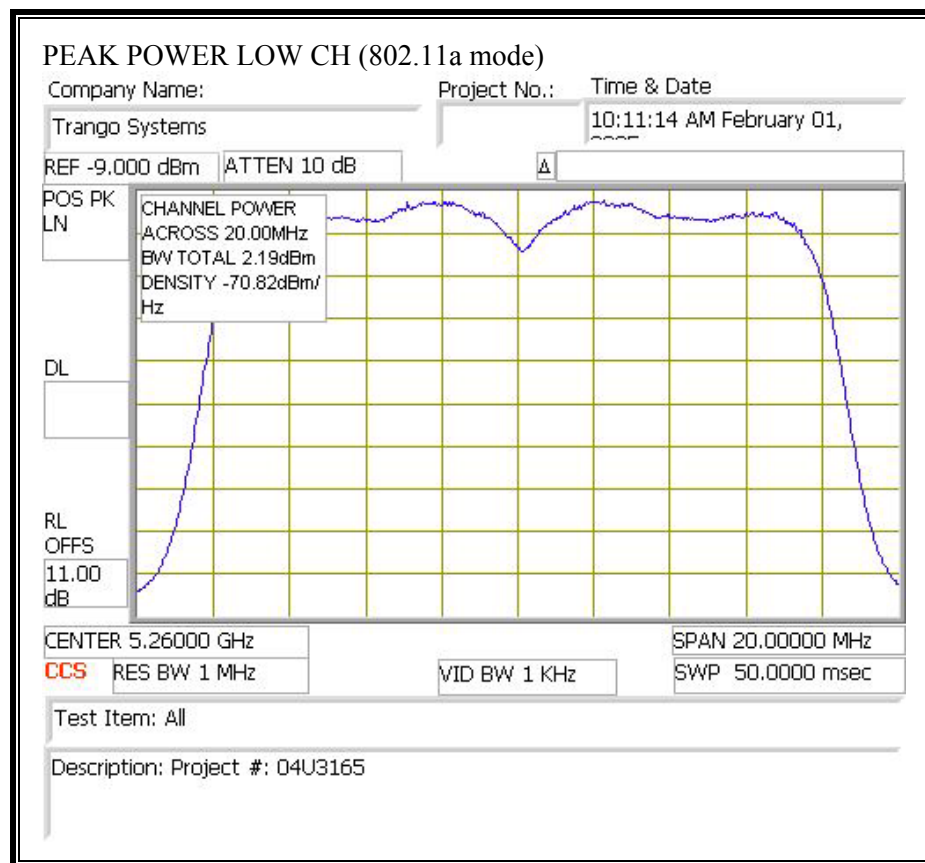
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5260	24	18.933	23.77	23.00	6.77
Mid	5295	24	18.918	23.77	23.00	6.77
High	5325	24	19.022	23.79	23.00	6.79

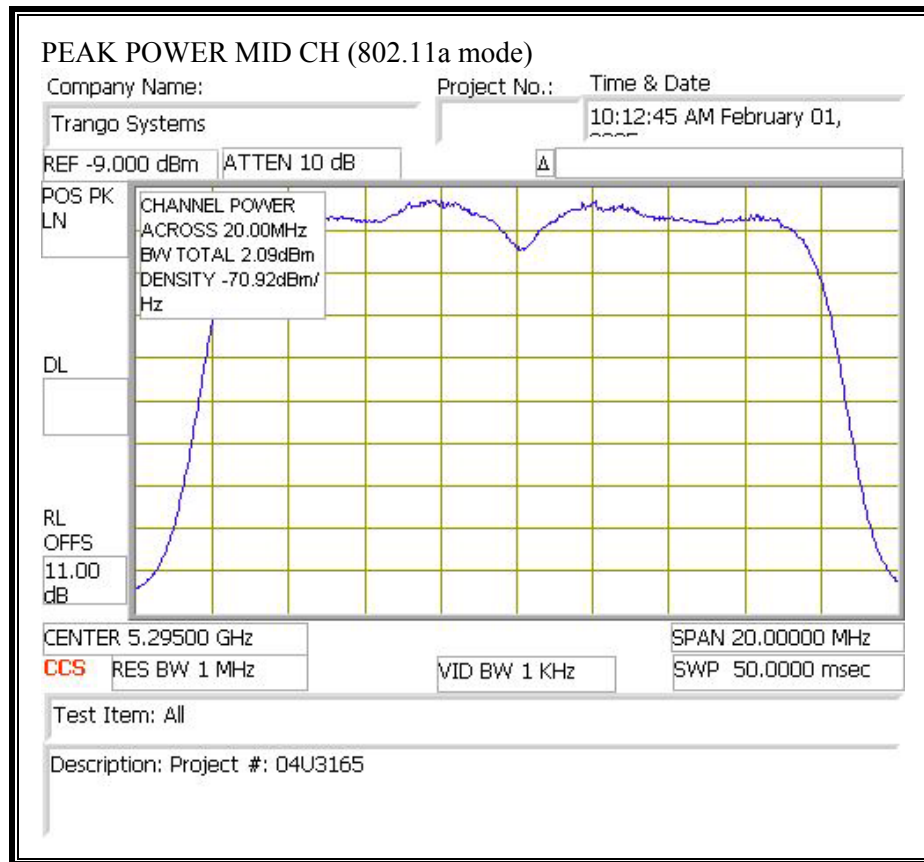
### Results

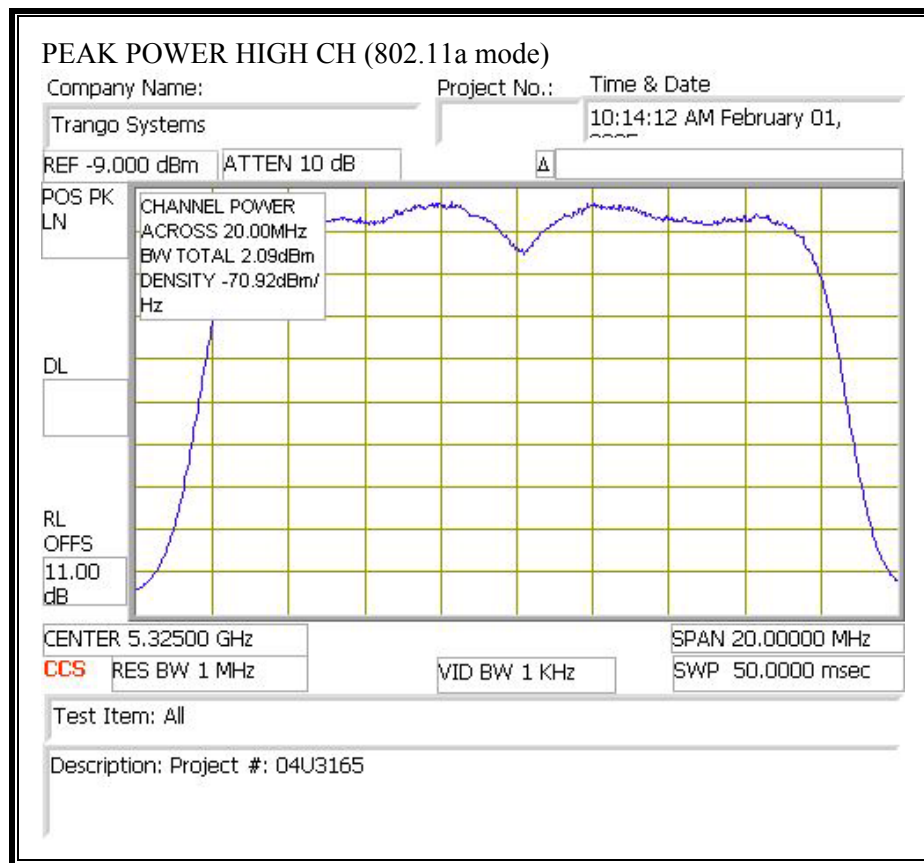
Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5260	2.19	6.77	-4.58
Mid	5295	2.09	6.77	-4.68
High	5325	2.09	6.79	-4.70



**PEAK POWER (802.11a MODE)**







### 6.1.3. 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 <sup>2</sup> )	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 <sup>2</sup> )	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 <sup>2</sup> )	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 <sup>2</sup> )	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:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = 100 * d \text{ (m)}$$

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<sup>2</sup>

Substituting the logarithmic form of power and gain using:

$$P \text{ (mW)} = 10^{(P \text{ (dBm)} / 10)} \text{ and}$$

$$G \text{ (numeric)} = 10^{(G \text{ (dBi)} / 10)}$$

yields

$$d = 0.282 * 10^{((P + G) / 20)} / \sqrt{S} \quad \text{Equation (1)}$$

where

d = MPE distance in cm

P = Power in dBm

G = Antenna Gain in dBi

S = Power Density Limit in mW/cm<sup>2</sup>

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

## **LIMITS**

From §1.1310 Table 1 (B),  $S = 1.0 \text{ mW/cm}^2$

## **RESULTS**

No non-compliance noted:

<b>Mode</b>	<b>Power Density Limit (mW/cm<sup>2</sup>)</b>	<b>Output Power (dBm)</b>	<b>Antenna Gain (dBi)</b>	<b>MPE Distance (cm)</b>
802.11a	1.0	2.19	23.00	5.13

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.

#### **6.1.4. 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 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.

802.11a Mode

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>Average Power (dBm)</b>
Low	5260	0.80
Middle	5295	0.80
High	5325	0.80

### 6.1.5. PEAK POWER SPECTRAL DENSITY

#### LIMIT

§15.407 (a) (1) For the band 5.25-5.35 GHz, 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.

The maximum antenna gain = 23 dBi, therefore there is a reduction due to antenna gain. The peak power spectral density limit is -6dBm.

#### 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

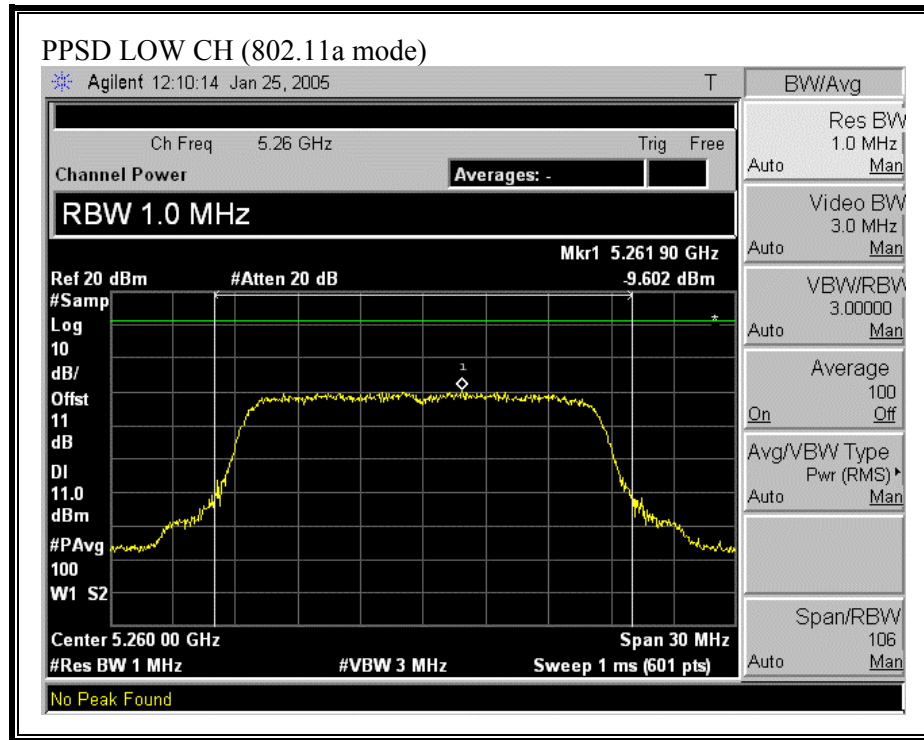
No non-compliance noted:

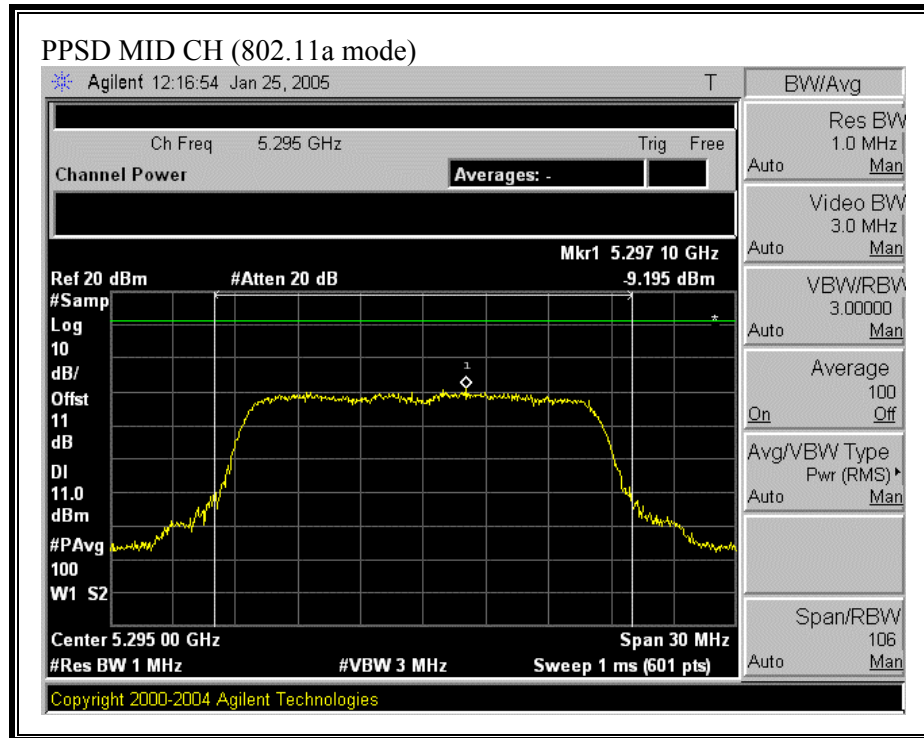
802.11a Mode

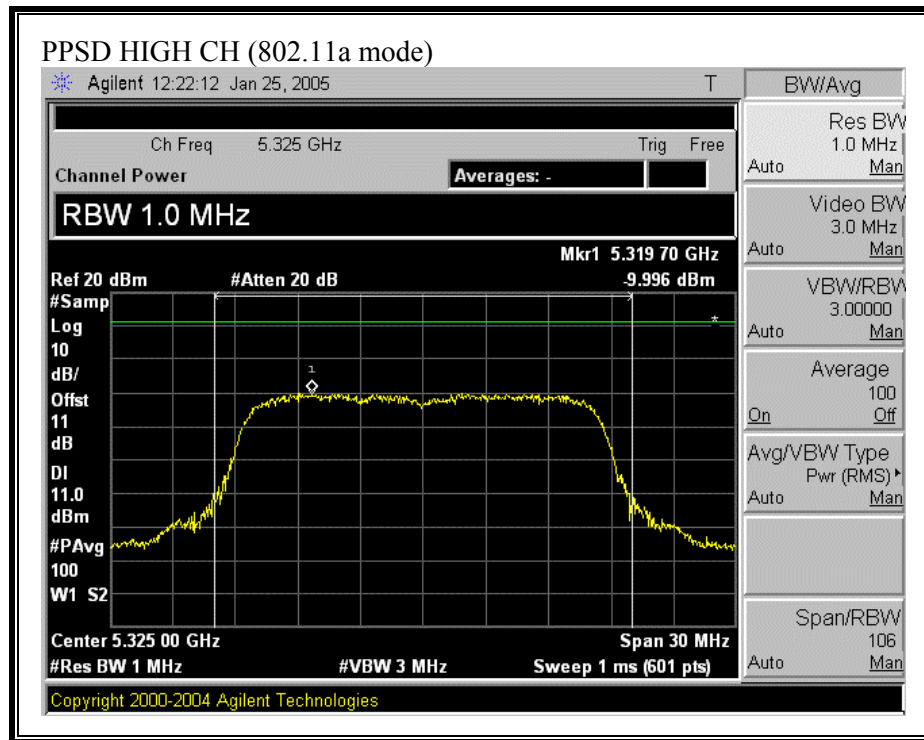
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5260	-9.62	-6.00	-3.62
Mid	5295	-9.20	-6.00	-3.20
High	5325	-10.00	-6.00	-4.00



**PEAK POWER SPECTRAL DENSITY (802.11a MODE)**







### 6.1.6. 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.

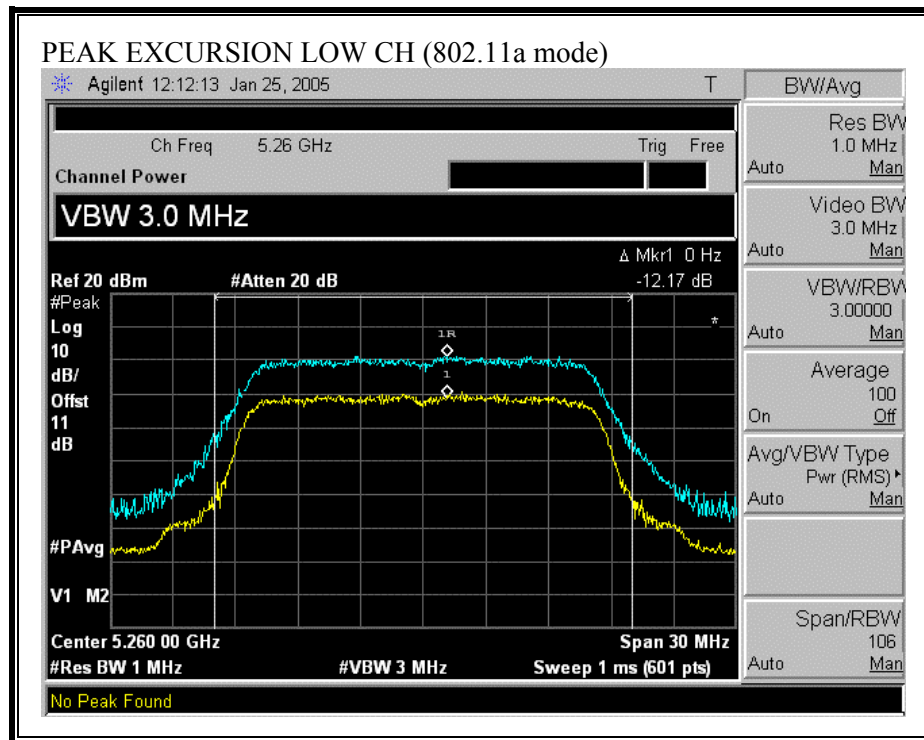
#### RESULTS

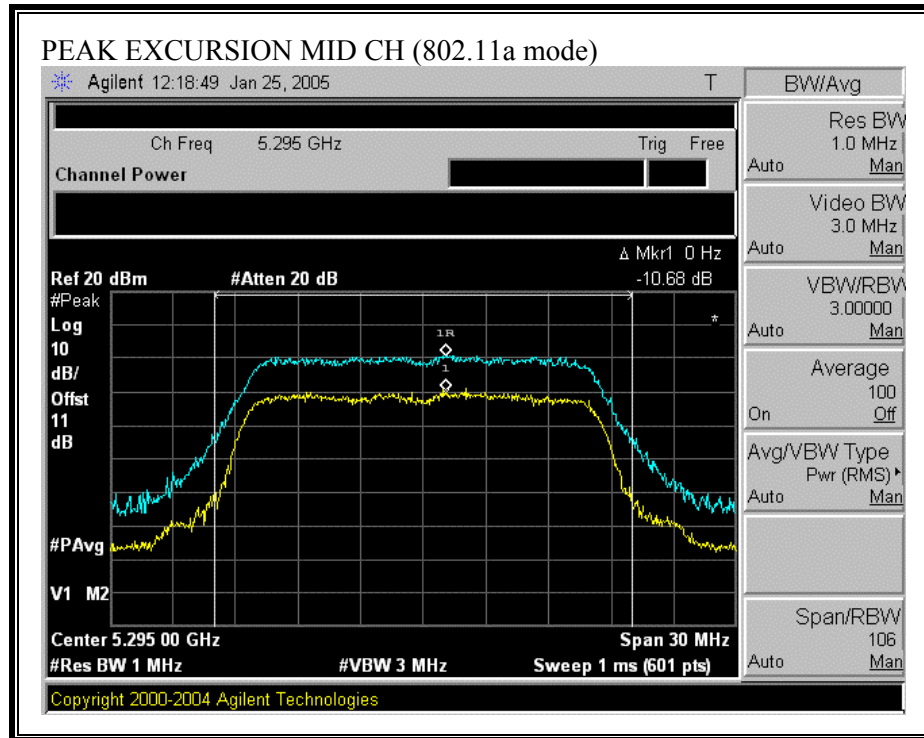
No non-compliance noted:

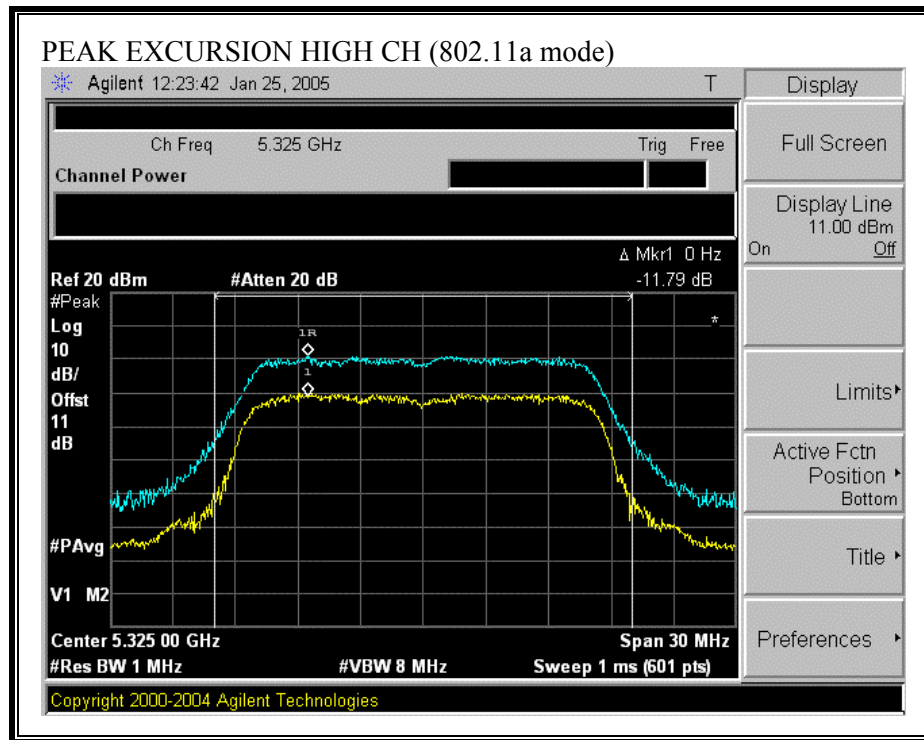
802.11a Mode

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	12.17	13	-0.83
Mid	5295	10.68	13	-2.32
High	5325	11.79	13	-1.21

**PEAK EXCURSION (802.11a MODE)**







## **6.1.7. CONDUCTED SPURIOUS EMISSIONS**

### **LIMITS**

§15.407 (b) (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.25-5.35 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.

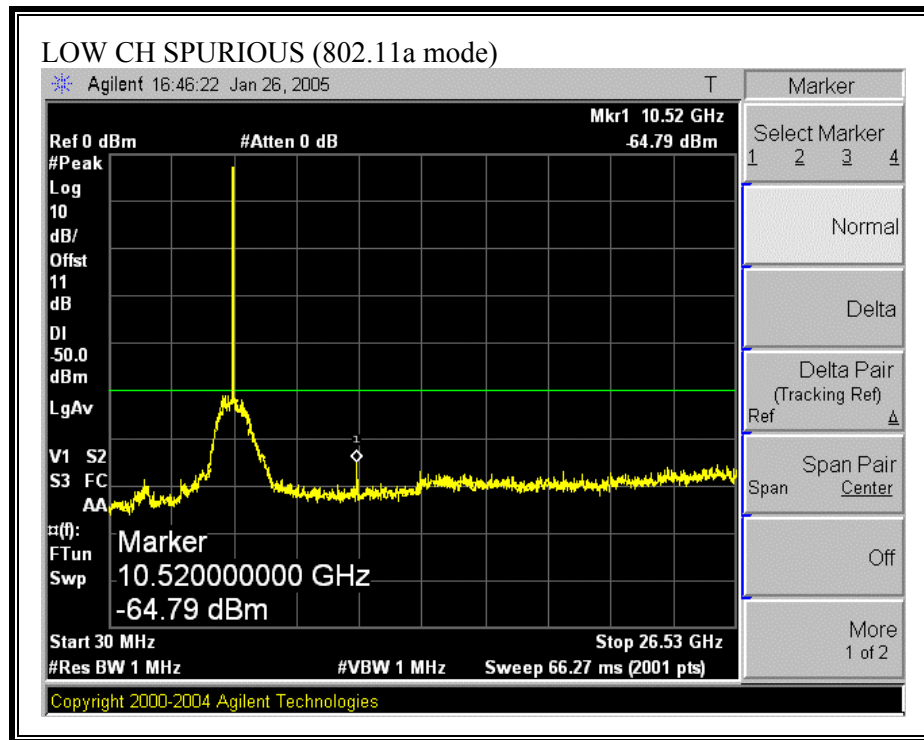
Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

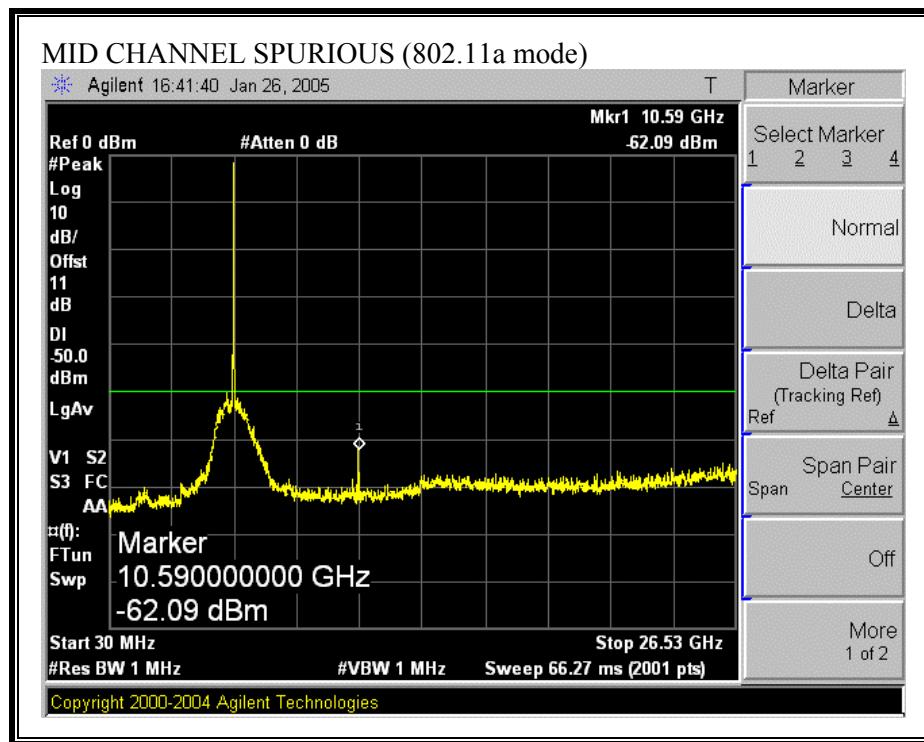
### **RESULTS**

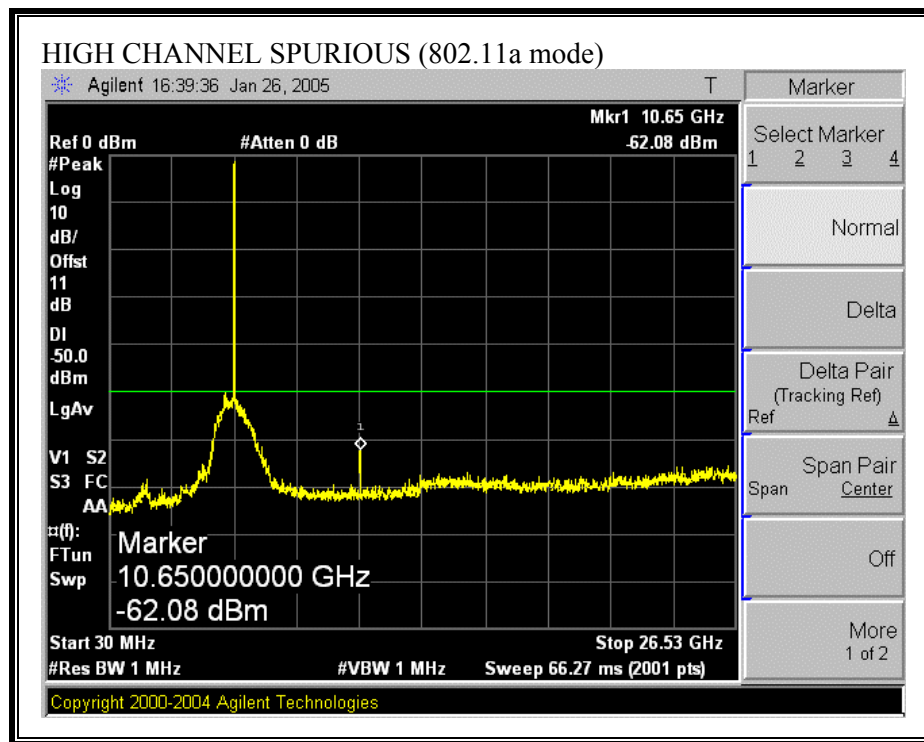
No non-compliance noted:



**SPURIOUS EMISSIONS (802.11a MODE)**







## 6.2. RADIATED EMISSIONS

### 6.2.1. 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
<sup>1</sup> 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	( <sup>2</sup> )
13.36 - 13.41			

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> 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.

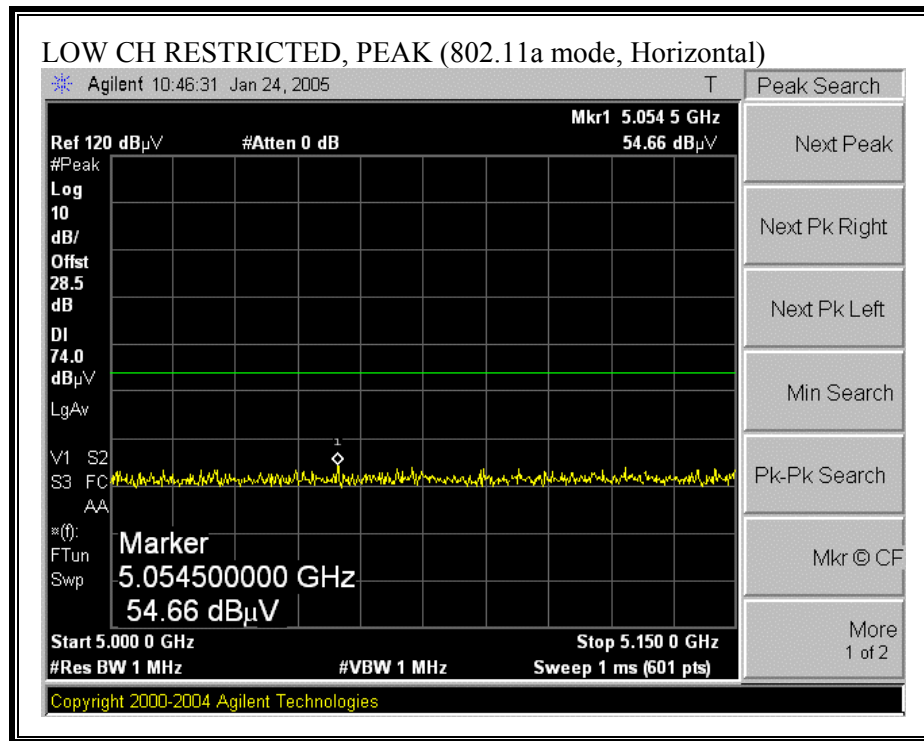
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

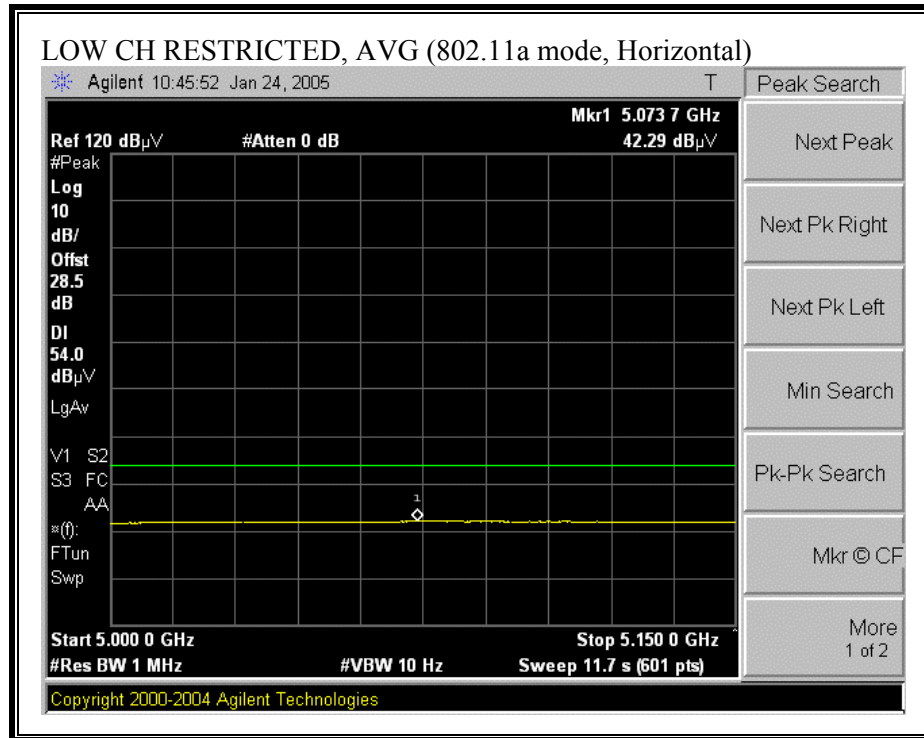
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each band.

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.

## 6.2.2. TRANSMITTER ABOVE 1 GHZ FOR 5250 TO 5350 MHz BAND

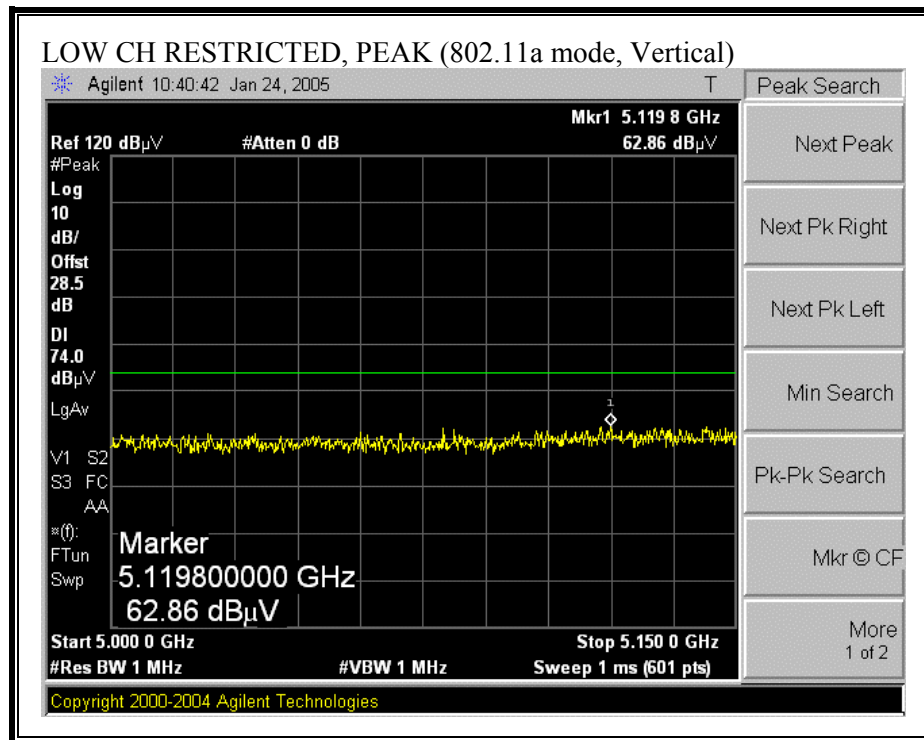
### RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL, HORIZONTAL)

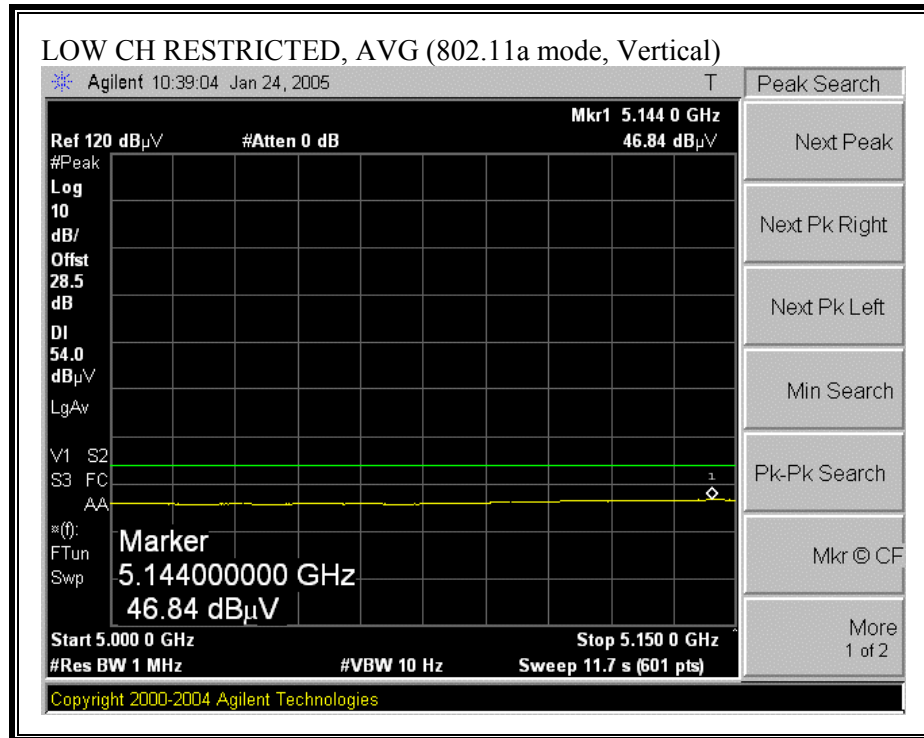




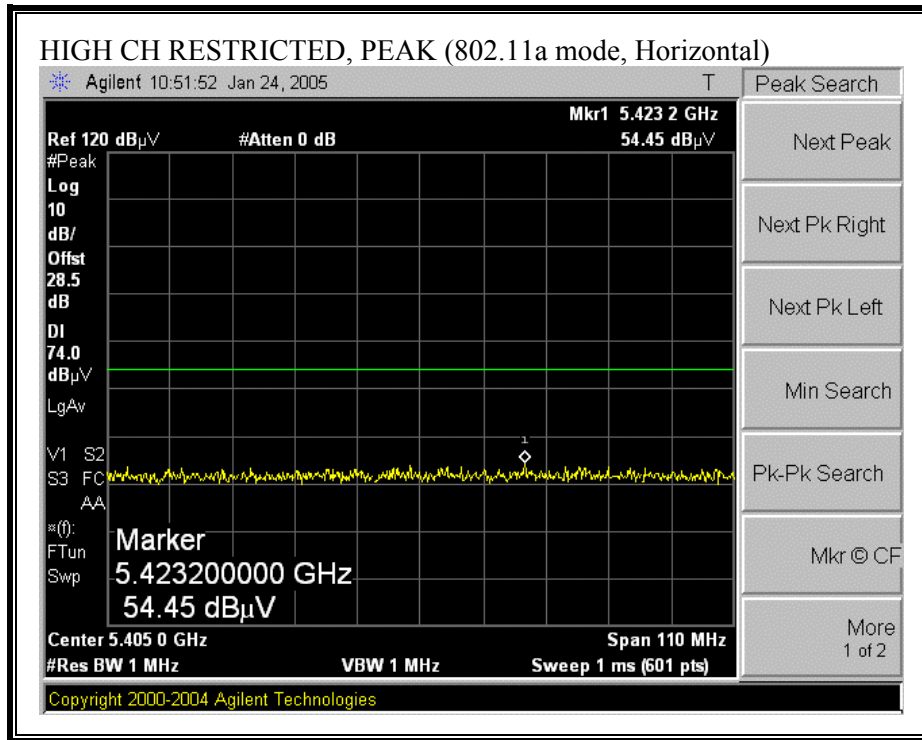


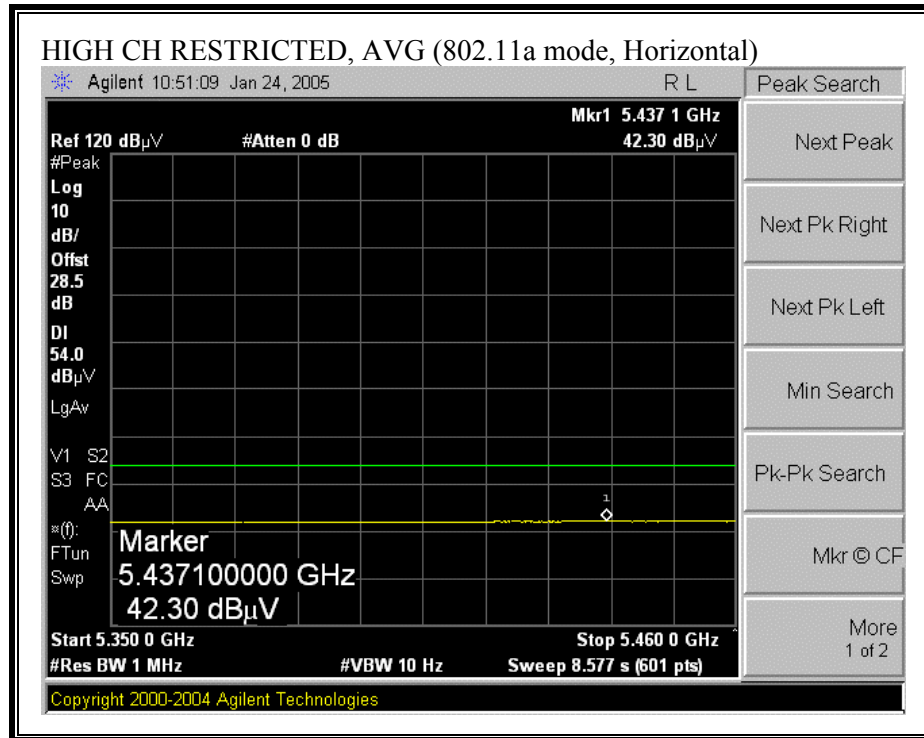
**RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL, VERTICAL)**



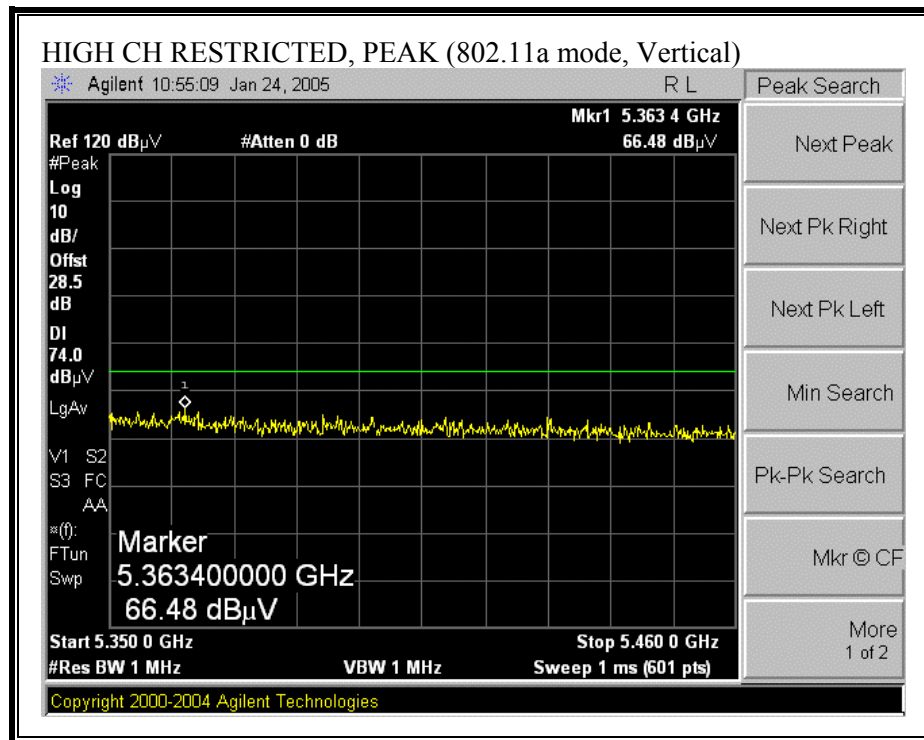


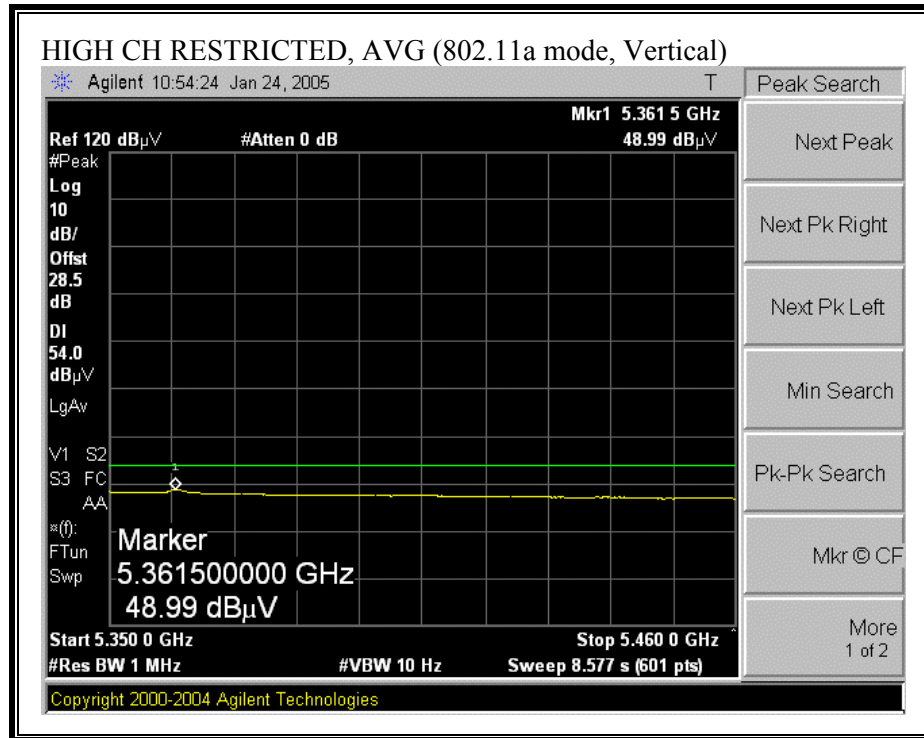
**RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, HORIZONTAL)**





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





**HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)**

01/24/05 <b>High Frequency Measurement</b>																
<b>Compliance Certification Services, Morgan Hill Open Field Site</b>																
<b>Test Engr:</b>		David Garcia														
<b>Project #:</b>		04U3165-1														
<b>Company:</b>		Trango														
<b>EUT Descrip.:</b>		802.11 a Point to Point Ethernet Radio														
<b>EUT M/N:</b>		P5010M														
<b>Test Target:</b>		FCC 15.247														
<b>Mode Oper:</b>		Transmitting, 5.2 Ghz Band														
		Internal antenna														
<b>Test Equipment:</b>																
EMCO Horn 1-18GHz		Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz								
T73; S/N: 6717 @3m		T86 Miteq924341														
Hi Frequency Cables																
2 foot cable		3 foot cable		4 foot cable		12 foot cable		HPF			Reject Filter					
				4_David		12_Yan		HPF_1.5GHz			R_001					
<b>Peak Measurements</b> RBW=VBW=1MHz																
<b>Average Measurements</b> RBW=1MHz ; VBW=10Hz																
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)	
<b>5.260 GHz Channel</b>																
10.520	3.0	35.5	23.3	37.7	7.5	-43.4	0.0	0.7	38.1	25.9	74	54	-35.9	-28.1	V	
10.520	3.0	35.2	23.0	37.7	7.5	-43.4	0.0	0.7	37.8	25.6	74	54	-36.2	-28.4	H	
<b>5.295 GHz Channel</b>																
10.590	3.0	35.4	23.4	37.7	7.6	-43.4	0.0	0.7	38.1	26.1	74	54	-35.9	-27.9	V	
10.590	3.0	35.0	23.3	37.7	7.6	-43.4	0.0	0.7	37.7	26.0	74	54	-36.3	-28.0	H	
<b>5.325 GHz Channel</b>																
10.650	3.0	35.4	23.7	37.7	7.6	-43.4	0.0	0.7	38.1	26.4	74	54	-35.9	-27.6	V	
10.650	3.0	35.1	23.1	37.7	7.6	-43.4	0.0	0.7	37.8	25.8	74	54	-36.2	-28.2	H	
No further emissions were detected.																

### 6.2.3. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

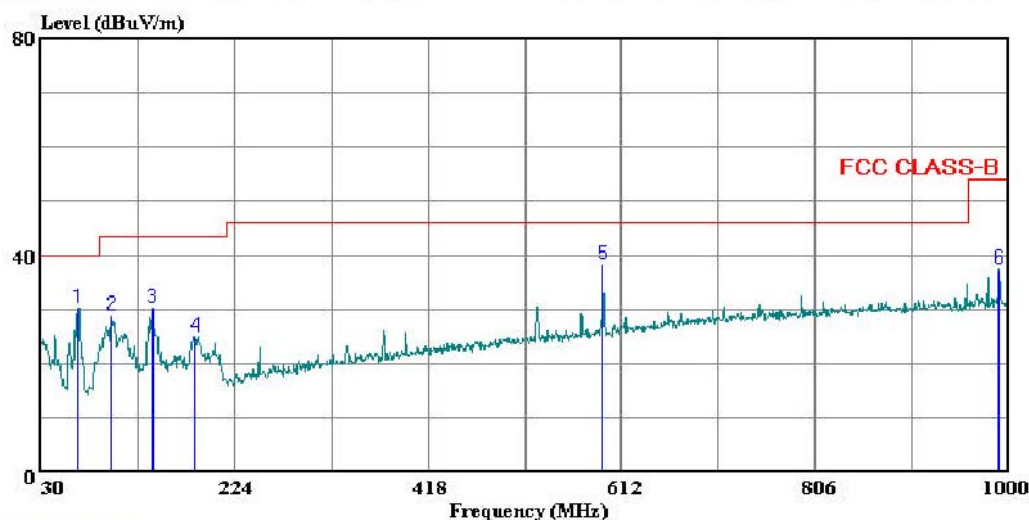
#### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

##### HORIZONTAL PLOT



561F Monterey Road  
Morgan Hill, CA 95037  
Tel: (408) 463-0888  
Fax: (408) 463-0885

Data#: 2 File#: 04U3165.EMI Date: 01-24-2005 Time: 16:39:01



(Auxiliary ATC)

Trace: 1

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL  
Test Operator: : David Garcia  
Project #: : 04U3165  
Company: : Trango Systems  
EUT: : Wireless Ethernet Point to Point Xcvr.  
: Internal unit  
Model No: : P5010M-INT  
Configuration: : EUT ONLY  
Target of Test: : FCC Class B  
Mode of Operation: Tx Worst Case



# HORIZONTAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	66.860	48.90	-18.68	30.22	40.00	-9.78	Peak
2	100.810	44.90	-16.21	28.69	43.50	-14.81	Peak
3	141.550	43.20	-13.02	30.18	43.50	-13.32	Peak
4	184.230	39.70	-14.80	24.90	43.50	-18.60	Peak
5	593.570	43.70	-5.60	38.10	46.00	-7.90	Peak
6	990.300	37.90	-0.42	37.49	54.00	-16.52	Peak

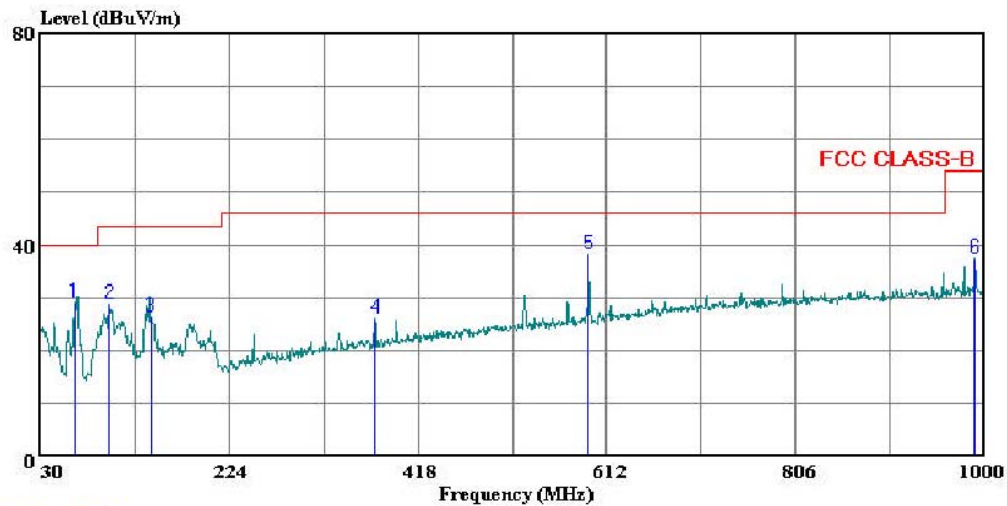
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)**

VERTICAL PLOT



561F Monterey Road  
Morgan Hill, CA 95037  
Tel: (408) 463-0888  
Fax: (408) 463-0885

Data#: 5 File#: 04U3165.EMI Date: 01-24-2005 Time: 16:44:57



(Auxil ATC)

Trace: 3

Ref Trace:

Condition: FCC CLASS-B VERTICAL  
Test Operator: : David Garcia  
Project #: : 04U3165  
Company: : Trango Systems  
EUT: : Wireless Ethernet Point to Point Xcvr.  
: Internal unit  
Model No: : P5010M-INT  
Configuration: : EUT ONLY  
Target of Test: : FCC Class B  
Mode of Operation: Tx Worst Case

VERTICAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	64.920	47.80	-18.83	28.97	40.00	-11.03	Peak
2	100.810	44.90	-16.21	28.69	43.50	-14.81	Peak
3	143.490	39.40	-13.15	26.26	43.50	-17.25	Peak
4	373.380	36.10	-10.09	26.01	46.00	-19.99	Peak
5	593.570	43.70	-5.60	38.10	46.00	-7.90	Peak
6	990.300	37.90	-0.42	37.49	54.00	-16.52	Peak

### 6.3. 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  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

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

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

\* Decreases with the logarithm of the frequency.

#### TEST PROCEDURE

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

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

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

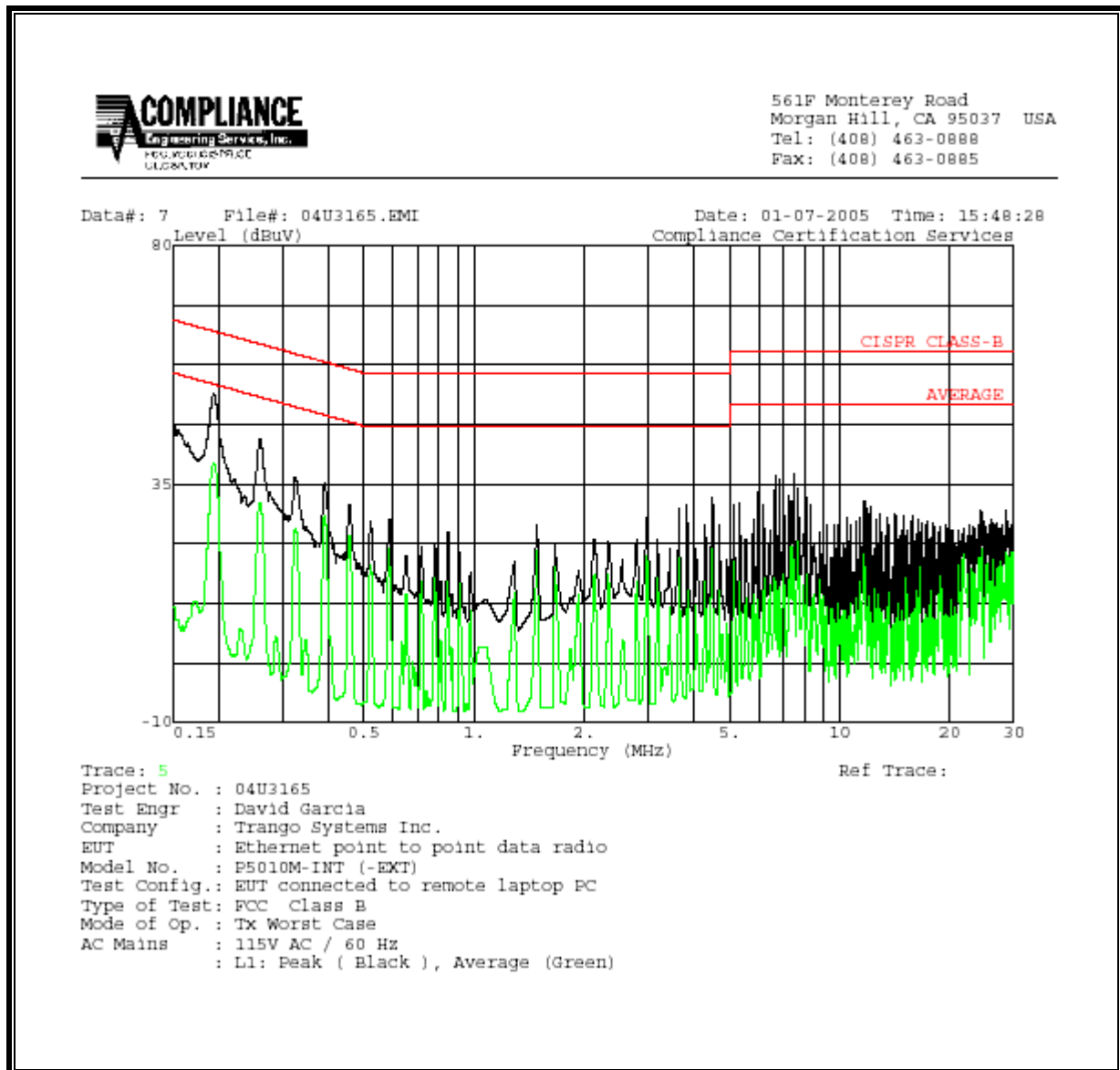
#### RESULTS

No non-compliance noted:

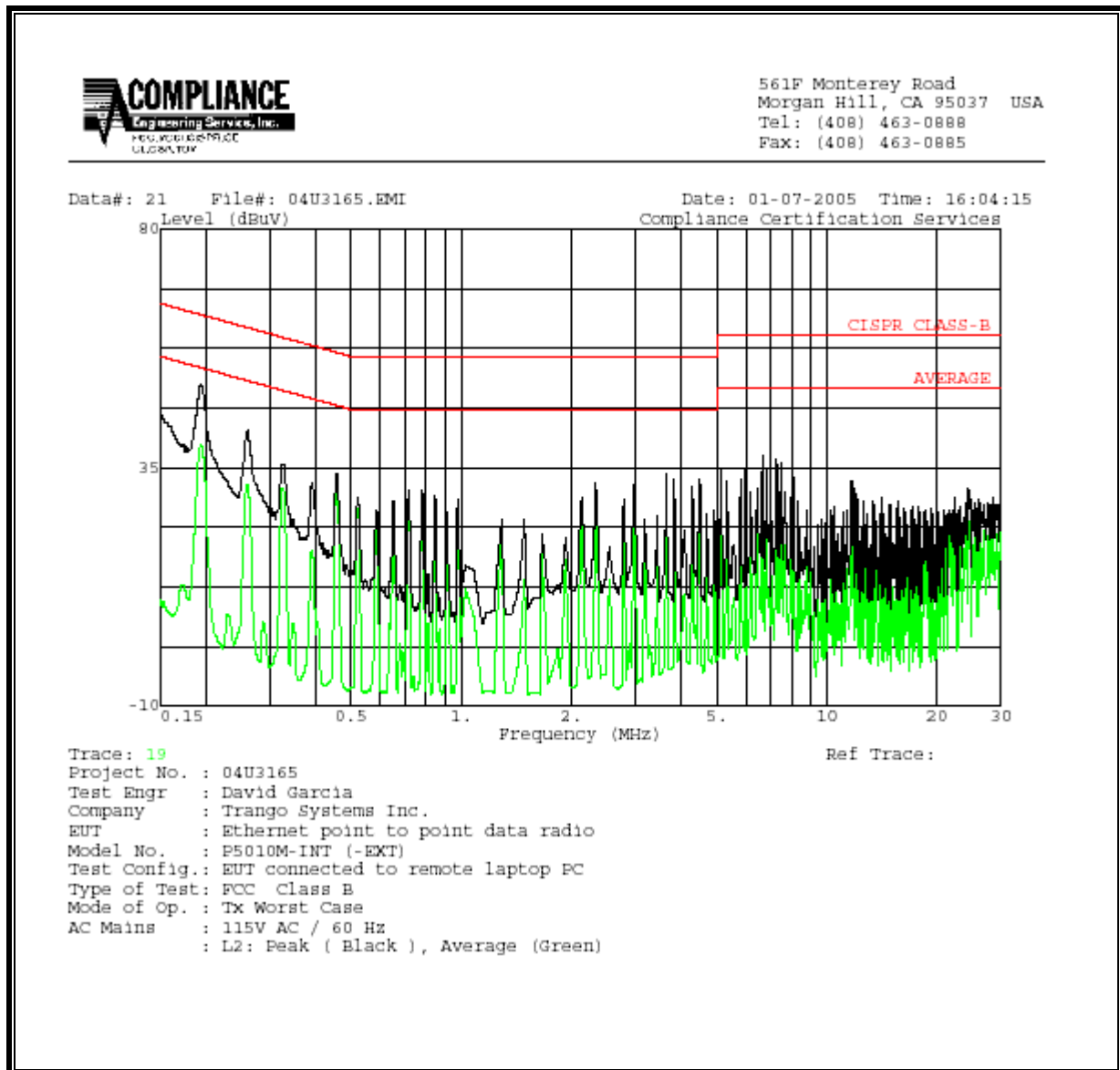
# **6 WORST EMISSIONS**

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
0.19	52.00	--	38.90	0.00	63.91	53.91	-11.91	-15.01	L1
0.26	43.50	--	31.56	0.00	61.43	51.43	-17.93	-19.87	L1
7.49	36.86	--	29.15	0.00	60.00	50.00	-23.14	-20.85	L1
0.19	50.80	--	39.24	0.00	63.91	53.91	-13.11	-14.67	L2
0.26	41.98	--	31.77	0.00	61.43	51.43	-19.45	-19.66	L2
6.66	37.18	--	30.77	0.00	60.00	50.00	-22.82	-19.23	L2
6 Worst Data									

## LINE 1 RESULTS

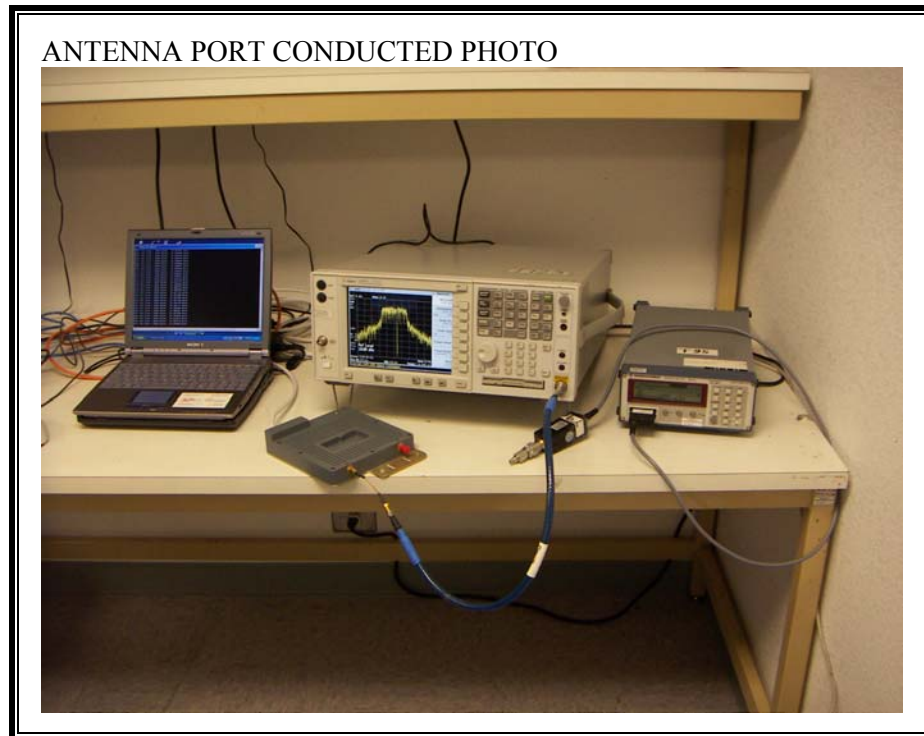


## LINE 2 RESULTS



## 7. SETUP PHOTOS

### ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

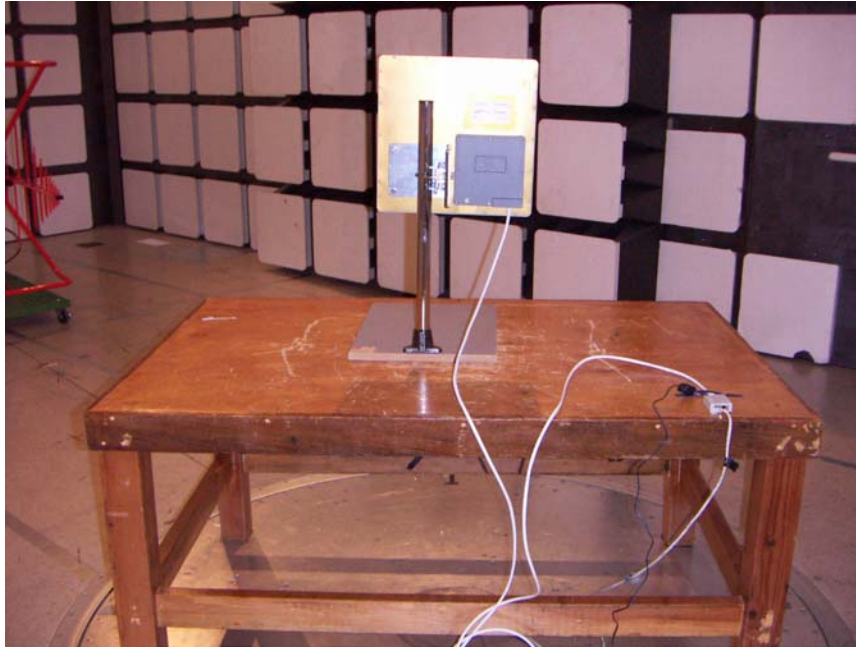




**RADIATED RF MEASUREMENT SETUP**



RADIATED BACK PHOTO



**POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP**



LINE CONDUCTED BACK PHOTO



**END OF REPORT**