

# FCC CFR47 PART 15 SUBPART C INDUSTRY CANADA RSS-210 ISSUE 7 CLASS II PERMISSIVE CHANGE CERTIFICATION TEST REPORT

FOR

WIFI MODULE

MODEL NUMBER: DWM-W016

FCC ID: EW4DWMW016 IC: 4250A-DWMW016

REPORT NUMBER: 08J12194-1

**ISSUE DATE: NOVEMBER 06, 2008** 

Prepared for MITSUMI ELECTRIC CO., LTD 1601, SAKAI, ATSUGI-SHI KANAGAWA, 243-8533, JAPAN

Prepared by COMPLIANCE CERTIFICATION SERVICES 47173 BENICIA STREET FREMONT, CA 94538, U.S.A. TEL: (510) 771-1000 FAX: (510) 661-0888

(R)

NVLAP LAB CODE 200065-0

## **Revision History**

Rev.	Issue Date	Revisions	Revised By
	11/06/08	Initial Issue	T. Chan

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471	73 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888 This report shall not be reproduced except in full, without the written approval of CCS.

# **1. ATTESTATION OF TEST RESULTS**

COMPANY NAME:	MITSUMI ELECTRIC CO., LTD 1601, SAKAI, ATSUGI-SHI KANAGAWA, 243-8533, JAPAN	
EUT DESCRIPTION:	WiFi MODULE	
MODEL:	DWM-W016	
SERIAL NUMBER:	1	
DATE TESTED:	OCTOBER 25-30, 2008	
	APPLICABLE STANDARDS	
ST	TEST RESULTS	
CFR 47 P	Pass	
INDUSTRY CANADA	A RSS-210 Issue 7 Annex 8	Pass

**INDUSTRY CANADA RSS-GEN Issue 2** 

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS 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:

THU CHAN EMC SUPERVISOR COMPLIANCE CERTIFICATION SERVICES

Chin Pany

CHIN PANG EMC ENGINEER COMPLIANCE CERTIFICATION SERVICES

Pass

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# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 2, and RSS-210 Issue 7.

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

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

# 4. CALIBRATION AND UNCERTAINTY

# 4.1. MEASURING INSTRUMENT CALIBRATION

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

# 4.2. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Power Line Conducted Emission	+/- 2.3 dB
Radiated Emission	+/- 3.4 dB

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

# 5. EQUIPMENT UNDER TEST

# 5.1. DESCRIPTION OF EUT

The EUT is an 802.11b/g transceiver operating in the 2400-2484 MHz band. The radio module is manufactured by Mitsumi Electric Co.

# 5.2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major changes filed under this application are:

Change #1: Adding over current protection for U7 Replace Ferrite Bead (FB6) to Fuse (F1).

Change #2: Failure prevention of U7 by an excessive input Following parts are substitution.

R25: 0 ohm to 2.7k ohm C65: 180pF to Open C66: Open to 100pF

# 5.3. MAXIMUM OUTPUT POWER

The test measurement passed within  $\pm$  0.5dBm of the original output power.

# 5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes the following antennas:

- Dipole antenna, model: DCA-P04, Gain: -0.49
- Sleeve antenna, model: DCA-P10, Gain: +2.01
- PIFA 1 antenna, model: 361.00094.005, Gain: +1.899
- PIFA 2 antenna, model: 361.00095.005, Gain: -0.012

# 5.5. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was BCMWL5.SYS: Ver. 4.10.34.2.

The test utility software used during testing was WL\_TOOL: Ver 4.10 R50.0 and epi\_ttcp: Ver. 3.8.

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# 5.6. WORST-CASE CONFIGURATION AND MODE

For Radiated Emissions testing above 1 GHz, the following configurations of EUT with antennas was tested:

Configuration 1: Sleeve antenna and Dipole antenna were connected to the EUT; EUT was set to transmit via Sleeve antenna.

Configuration 2: Sleeve antenna and Dipole antenna were connected to the EUT; EUT was set to transmit via Dipole antenna.

Configuration 3: 2 PIFA antennas were connected to the EUT; EUT was set to transmit via higher gain PIFA (1.899 dBi).

For Radiated Emissions below 1 GHz and Power Line Conducted Emissions, worst-case of the three configurations above was used (configuration 1)

For 11b mode, 1 Mbps was used as worst-case data rate. For 11g mode, 6 Mbps was used as worst-case data rate.

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# 5.7. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST					
Description	Manufacturer	Model	Serial Number	FCC ID	
Desktop PC	Dell	DC8M	JWJJ8BX	DoC	
Keyboard	Dell	SK-8110	CN-07N247-71616-442-OKFL	DoC	
Mouse	Dell	M-UR69	LM3230699	DoC	
Monitor	LG	L1750S	512MXWE0A763	BEJL17NP	

## I/O CABLES

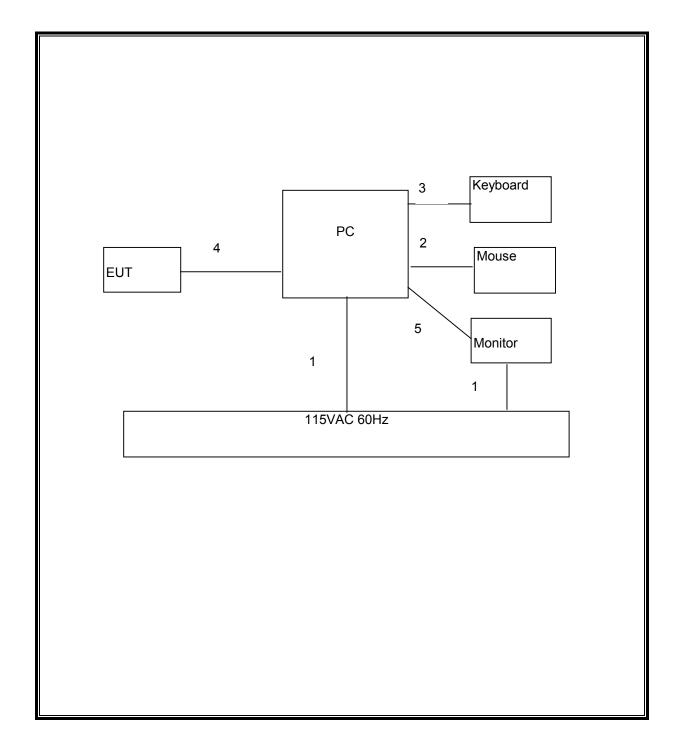
	I/O CABLE LIST						
Cable	Port	# of	Connector	Cable	Cable	Remarks	
No.		Identica	Туре	Туре	Length		
		Ports					
1	AC	2	US 115V	Un-shielded	2m	N/A	
2	USB	1	Mouse	Shielded	1m	N/A	
3	USB	1	Keyboard	Un-shielded	1m	N/A	
4	20 Pins Connector	1	Ribbon cable	Un-shielded	0.5m	N/A	
5	Video	1	Monitor	Un-shielded	2m	One Ferrite at each end	

## TEST SETUP

The EUT was installed onto a test JIG and connected to a host laptop computer via a ribbon cable. Test software was used to control the radio card during the testing.

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### **SETUP DIAGRAM FOR TESTS**



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# 6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST					
Description	Manufacturer	Model	Asset	Cal Due	
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	11/27/08	
Antenna, Horn, 18 GHz	ETS	3117	C01006	04/22/09	
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	03/31/09	
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	02/11/09	
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	03/03/09	
EMI Test Receiver, 30 MHz	R&S	ESHS 20	N02396	08/06/09	
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	12/25/08	
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4407B	C01101	01/22/09	
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/07/09	
Peak Power Meter	Agilent / HP	E4416A	C00963	12/04/09	
Reject Filter, 2.4-2.5 GHz	Micro-Tronics	BRC13192	N02683	CNR	

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# 6.1. 802.11b MODE IN THE 2.4 GHz BAND

## 6.1.1. 6 dB BANDWIDTH

## <u>LIMITS</u>

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

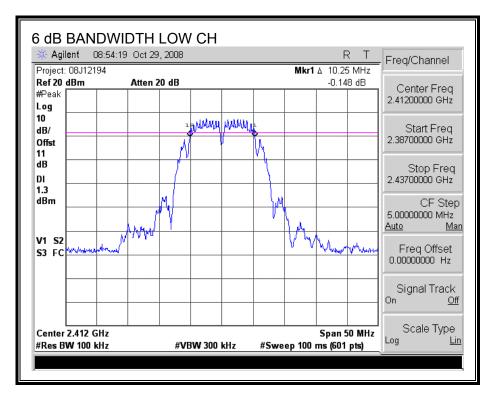
## TEST PROCEDURE

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

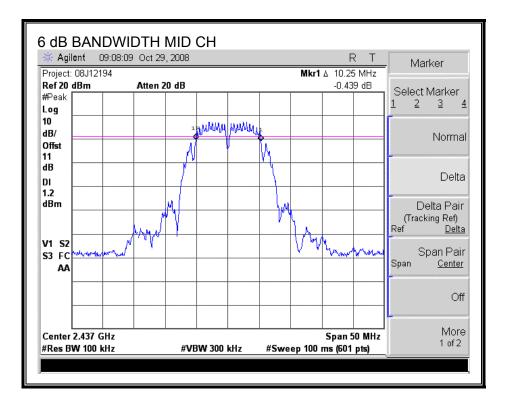
### **RESULTS**

Channel	Frequency	6 dB Bandwidth	Minimum Limit
	(MHz)	(MHz)	(MHz)
Low	2412	10.25	0.5
Middle	2437	10.25	0.5
High	2462	10.25	0.5

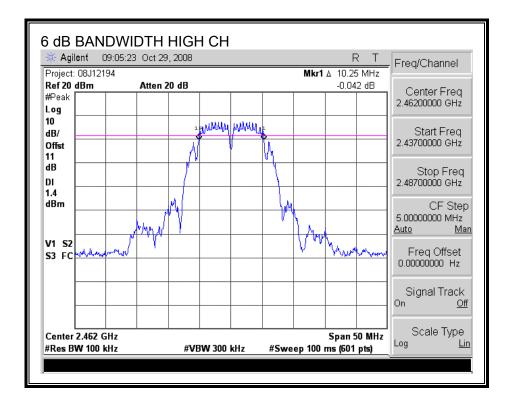
#### 6 dB BANDWIDTH



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## 6.1.2. 99% BANDWIDTH

### **LIMITS**

None; for reporting purposes only.

### TEST PROCEDURE

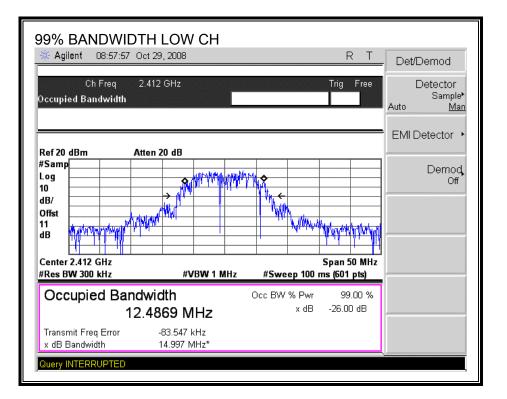
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

#### **RESULTS**

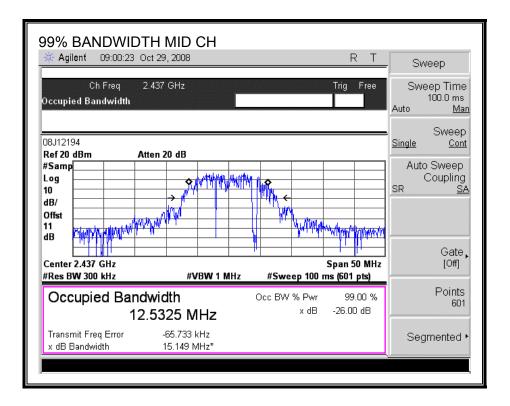
Channel	Channel Frequency 99%	
	(MHz)	(MHz)
Low	2412	12.4869
Middle	2437	12.5325
High	2462	12.4849

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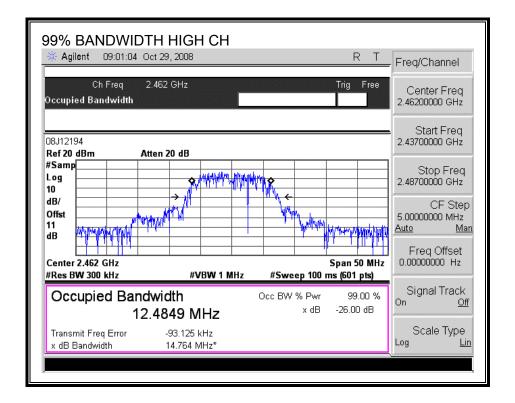
#### 99% BANDWIDTH



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# 6.1.3. AVERAGE POWER

### **LIMITS**

None; for reporting purposes only.

### TEST PROCEDURE

The transmitter output is connected to a power meter.

### RESULTS

The cable assembly insertion loss of 11dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency	Power
	(MHz)	(dBm)
Low	2412	16.20
Middle	2437	16.20
High	2462	16.26

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## 6.1.4. POWER SPECTRAL DENSITY

### LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

#### TEST PROCEDURE

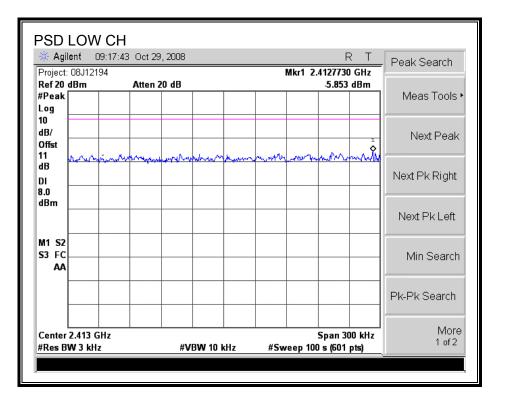
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

#### RESULTS

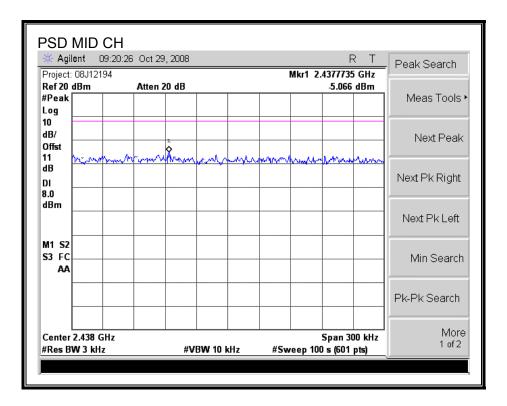
Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	-5.85	8	-13.85
Middle	2437	-5.07	8	-13.07
High	2462	-6.13	8	-14.13

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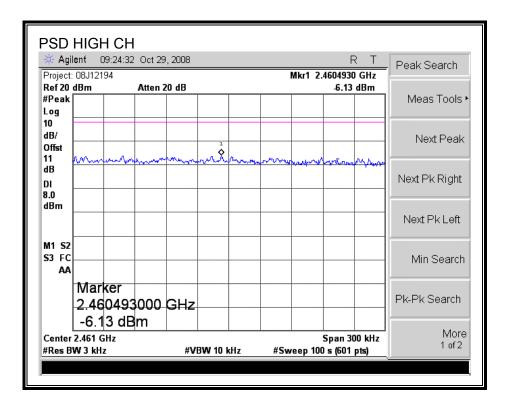
#### **POWER SPECTRAL DENSITY**



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## 6.1.5. CONDUCTED SPURIOUS EMISSIONS

### LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

### TEST PROCEDURE

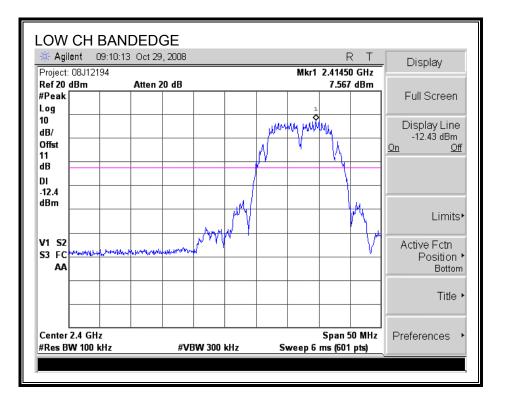
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

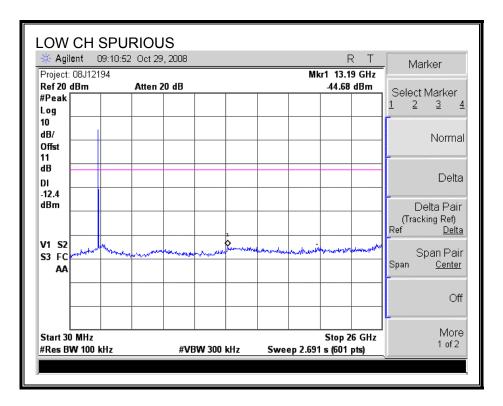
#### **RESULTS**

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### SPURIOUS EMISSIONS, LOW CHANNEL

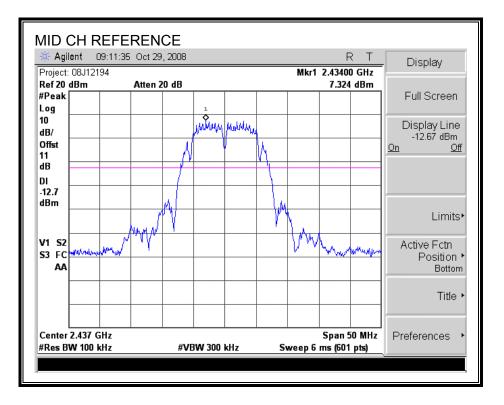


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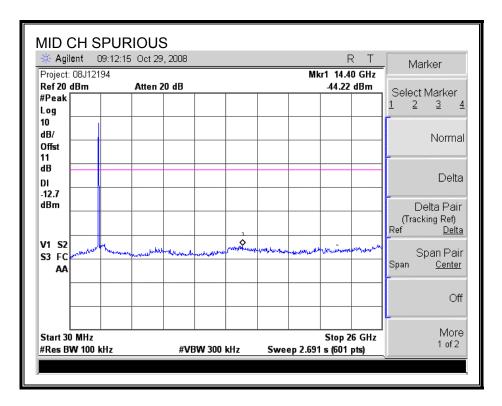


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#### SPURIOUS EMISSIONS, MID CHANNEL

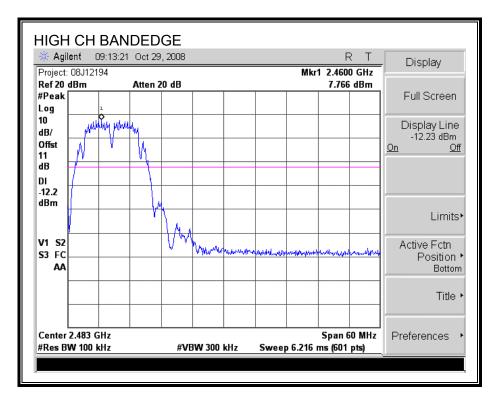


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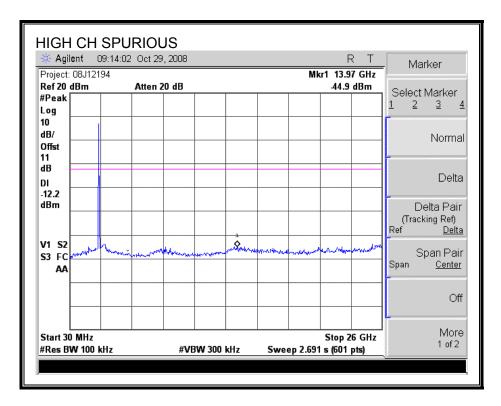


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## SPURIOUS EMISSIONS, HIGH CHANNEL



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# 6.2. 802.11g MODE IN THE 2.4 GHz BAND

## 6.2.1. 6 dB BANDWIDTH

## <u>LIMITS</u>

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

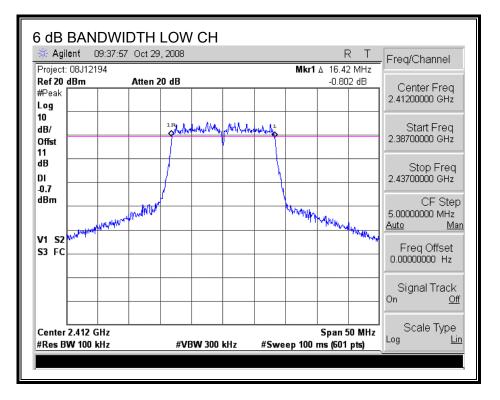
## TEST PROCEDURE

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

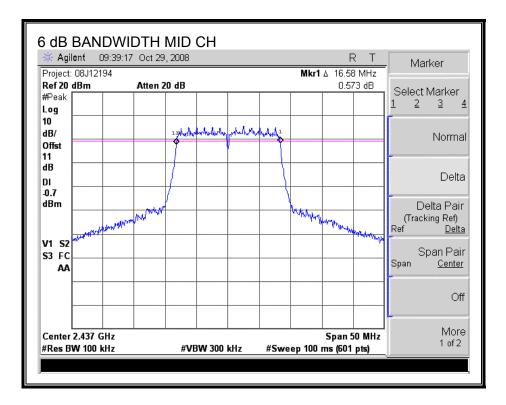
### **RESULTS**

Channel	Frequency	6 dB Bandwidth	Minimum Limit
	(MHz)	(MHz)	(MHz)
Low	2412	16.42	0.5
Middle	2437	16.58	0.5
High	2462	16.5	0.5

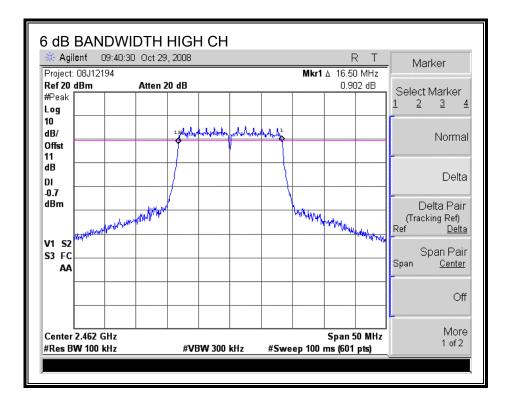
#### 6 dB BANDWIDTH



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## 6.2.2. 99% BANDWIDTH

### **LIMITS**

None; for reporting purposes only.

### TEST PROCEDURE

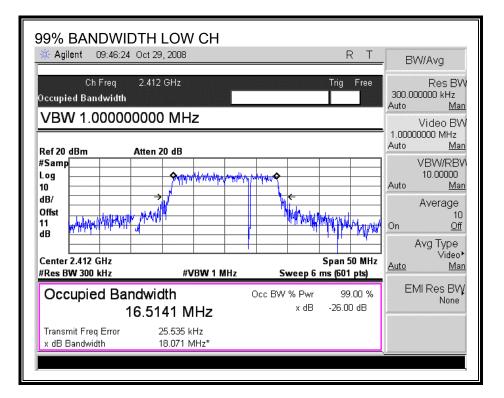
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

#### **RESULTS**

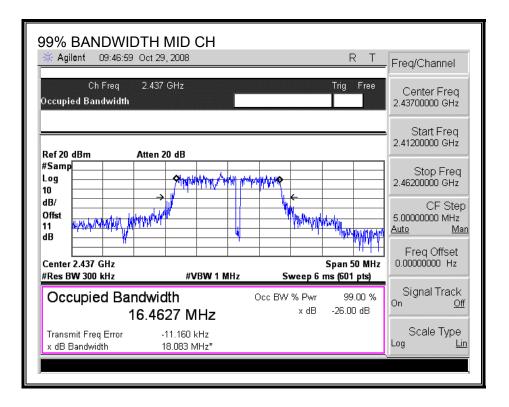
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	2412	16.5141
Middle	2437	16.4627
High	2462	16.5358

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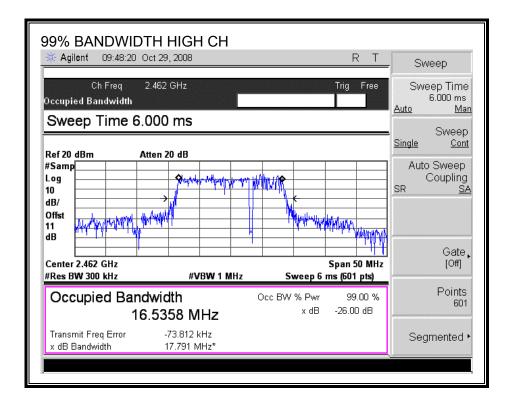
#### 99% BANDWIDTH



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# 6.2.3. AVERAGE POWER

## **LIMITS**

None; for reporting purposes only.

## TEST PROCEDURE

The transmitter output is connected to a power meter.

### RESULTS

The cable assembly insertion loss of 11dB (including 10 dB pad and 1dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency	Power
	(MHz)	(dBm)
Low	2412	15.50
Middle	2437	15.45
High	2462	15.43

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# 6.2.4. POWER SPECTRAL DENSITY

### **LIMITS**

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### TEST PROCEDURE

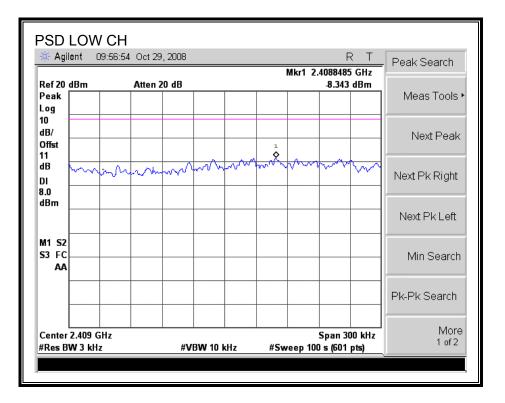
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

### RESULTS

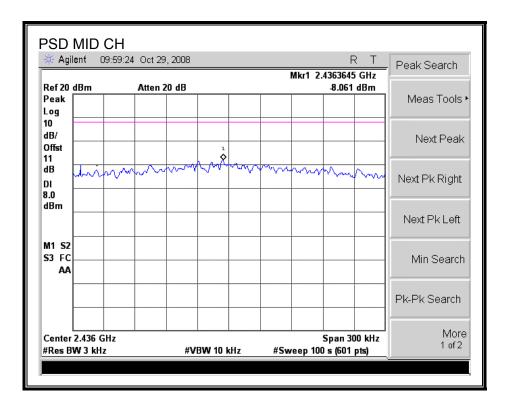
Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	-8.34	8	-16.34
Middle	2437	-8.06	8	-16.06
High	2462	-7.57	8	-15.57

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### **POWER SPECTRAL DENSITY**



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🔆 Agilent 🛛 10	0:02:39 Oct 29, 2008			RT	Peak Search
Ref 20 dBm	Atten 20 dB		Mkr1 2.	4632790 GHz -7.571 dBm	
Peak Log					Meas Tools '
10 dB/ Offst			1 \$		Next Peak
11 dB DI 8.0	m	m		mont	Next Pk Right
dBm					Next Pk Left
M1 S2 S3 FC AA					Min Search
					Pk-Pk Search
Center 2.463 Gl #Res BW 3 kHz		/BW 10 kHz	#Sweep 100	Span 300 kHz	More 1 of 2

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# 6.2.5. CONDUCTED SPURIOUS EMISSIONS

### **LIMITS**

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

### TEST PROCEDURE

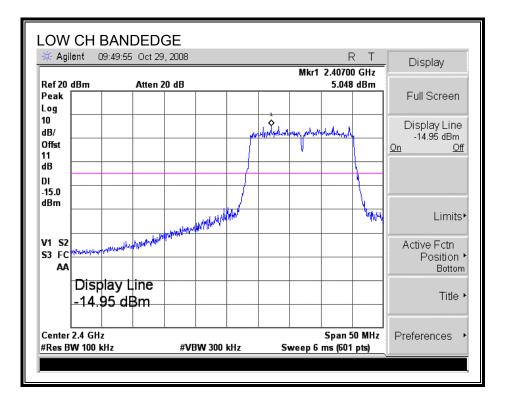
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

### **RESULTS**

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### SPURIOUS EMISSIONS, LOW CHANNEL

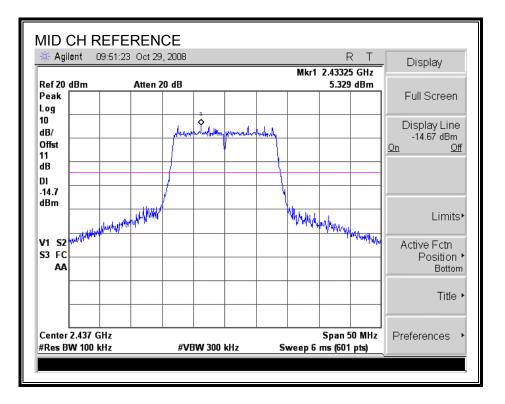


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🔆 Agilent	09:50:3	38 Oct 29	, 2008				ML	F		. Mar	ker
Ref 20 dBm Peak Log		Atten 2	0 dB					-44.95		Select I 1 2	Marker <u>3</u> 4
10 dB/ Offst 11											Normal
dB DI -15.0											Delta
dBm											elta Pair ing Ref) <u>Delta</u>
V1 S2 S3 FC	Anna anna	-	John Martin	utungenti	×.	and the second second	and the second	erg <sup>t N</sup> her <sup>an</sup> hebaan	Mundan	Span St	oan Pair <u>Center</u>
											Off
Start 30 MHz #Res BW 100			# <b>V</b> E	3W 300	kHz	Swee	ep 2.691	Stop 2 s (601		-	More 1 of 2

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### SPURIOUS EMISSIONS, MID CHANNEL

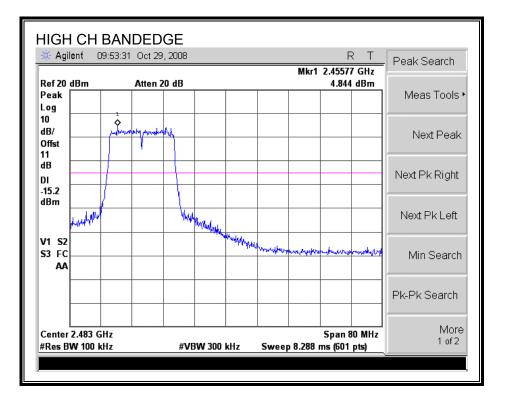


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	URIOUS 52:05 Oct 29, 2008		R T	_ Marker
Ref 20 dBm Peak Log	Atten 20 dB		45.23 dBm	Select Marker 1 2 3 4
10 dB/				Normal
dB				Delta
dBm				Delta Pair (Tracking Ref) Ref <u>Delta</u>
V1 S2 S3 FC AA	and the second second second second	where the production of the second	marine and the second strained	Span Pair Span <u>Center</u>
				Off
Start 30 MHz #Res BW 100 kHz	#VB\	W 300 kHz Sw	Stop 26 GHz eep 2.691 s (601 pts)	More 1 of 2

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### SPURIOUS EMISSIONS, HIGH CHANNEL



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🔆 Agilent 09	9:54:12 Oct 2	9,2008				Mk	⊢ 1 20.2		, Marl	ker
Ref 20 dBm Peak Log	Atten	20 dB					-44.71		Select N 1 2	/larker <u>3</u> 4
10 dB/ Offst 11 dB										Normal
DI _15.2 dBm									(Tracki	Delta Ita Pair ng Ref)
V1 S2 S3 FC AA	honor and and a second	h	u-uputras	/m/wathurs.com	der over for	- inder aller	w.m.	a.maya.anak	Ref Span	<u>Delta</u> an Pair <u>Center</u>
										Off
Start 30 MHz #Res BW 100 kł	lz	#VB	W 300 I	kHz	Swee	ep 2.691	Stop 2 s (601			More 1 of 2

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# 7. RADIATED TEST RESULTS

# 7.1. LIMITS AND PROCEDURE

## <u>LIMITS</u>

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

## TEST PROCEDURE

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

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

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

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

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

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

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# 7.2. TRANSMITTER ABOVE 1 GHz

# 7.2.1. TRANSMITTER ABOVE 1 GHz FOR 802.11b MODE IN THE 2.4 GHz BAND

# **CONFIGURATION #1: SLEEVE ANTENNA TRANSMITTING**

## **RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**

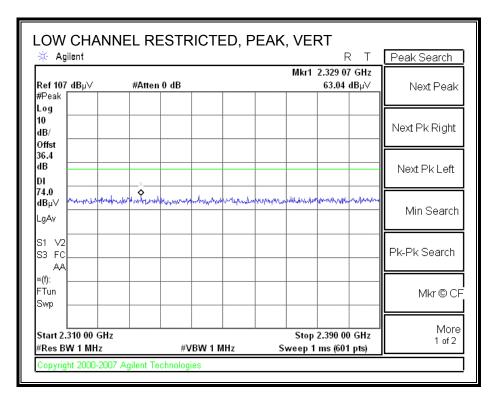
Agilent				R T	Peak Search
f 107_dBµ∨	#Atten 0 dB		Mkr1	2.352 53 GHz 63.55 dBµ∨	Next Pea
eak III					
					Next Pk Righ
st 4					Next Pk Lef
0		1			
JV munningun	with the second s	man and the second	mbadal when the mo	ayun mudahahan kan kan kan kan kan kan kan kan kan k	Min Searc
V2 FC					Pk-Pk Search
ın					Mkr © (
Int 2.310 00 GHz			Stop	2.390 00 GHz	Mo
es BW 1 MHz	#VBW	4 MIL-	•	ms (601 pts)	1 of 2

Page 52 of 117

🔆 Agilent				RT	Peak Search
Ref 107 dBµ∨	#Atten 0 dB		Mkr1 2	2.389 07 GHz 50.54 dBµ∨	Next Peak
Log 10 dB/					Next Pk Right
Offst 36.4 dB					Next Pk Left
DI					Min Search
LgAv S1 V2				Ô	
S3 FC AA ≈(f):					Pk-Pk Search
					Mkr © CF
Start 2.310 00 GHz #Res BW 1 MHz		BW 10 Hz	Stop 2 Sweep 6.238	2.390 00 GHz	More 1 of 2

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### **RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



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🔆 Agilent				RT	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB			52 00 GHz 0.62 dBµ∨	Next Peak
Log 10 dB/ Offst					Next Pk Right
36.4 dB DI					Next Pk Left
54.0 dBµ∨ LgAv		1. 			Min Search
S1 V2 S3 FC AA					Pk-Pk Search
«(f): FTun Swp					Mkr © CF
Start 2.310 00 GHz #Res BW 1 MHz	#VB	W 10 Hz	Stop 2.3 Sweep 6.238 s	90 00 GHz (601 pts)	More 1 of 2

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## RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

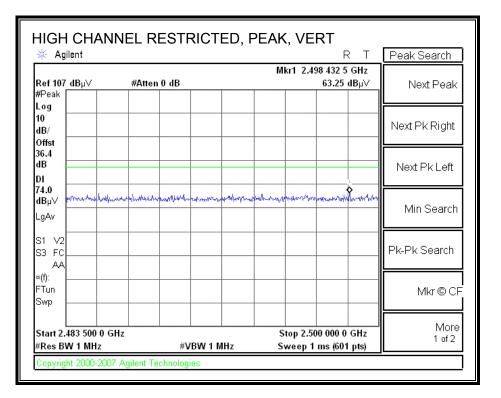
🔆 Agilent		- ,	EAK, HORIZ	RΤ	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB		Mkr1 2.495 95 64.	75 GHz 12 dBµ∨	Next Peak
Log 10 dB/ Offst					Next Pk Right
36.4 dB DI			1		Next Pk Left
<b>74.0</b> dBµ∨ ₩.λ	a shannor a derived of the	anti-properties and the second second	on and the second s	wanning	Min Search
51 V2 53 FC					Pk-Pk Search
«(f): =Tun Swp					Mkr © CF
Start 2.483 500 0 GHz #Res BW 1 MHz		W 1 MHz	Stop 2.500 000 Sweep 1 ms (		More 1 of 2

Page 56 of 117

🔆 Agilent				RT	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB		Mkr1 2.496 0	)95 0 GHz 0.81 dBµ∨	Next Peak
Log 10 dB/ Offst					Next Pk Right
36.4 dB DI					Next Pk Left
54.0 dBµ∨ LgAv					Min Search
S1 V2 S3 FC AA					Pk-Pk Search
«(f): FTun Swp					Mkr © CF
Start 2.483 500 0 G #Res BW 1 MHz		VBW 10 Hz	Stop 2.500 0 Sweep 1.287 s		More 1 of 2

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### **RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



Page 58 of 117

🔆 Agilent				RT	Peak Search
Ref 107 dBµ∨	#Atten 0 dB		Mkr1 2.49	95 902 5 GHz 50.47 dBµ∨	Next Peak
Log 10 dB/					Next Pk Right
Offst 36.4 1B					Next Pk Left
54.0 dBµ∨ _gAv			1		Min Search
51 V2 53 FC					Pk-Pk Search
*(f): =Tun Swp					Mkr © CF
Start 2.483 500 0 G #Res BW 1 MHz		N 10 Hz	Stop 2.50 Sweep 1.287	00 000 0 GHz 7 s (601 pts)	More 1 of 2

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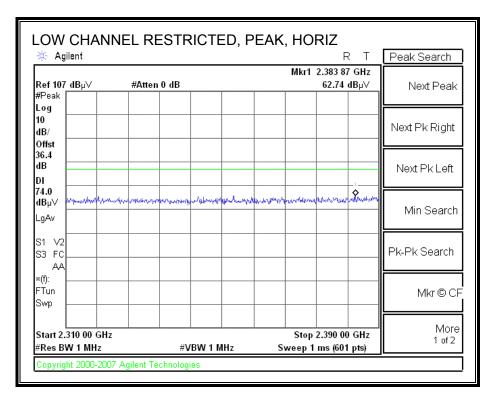
#### HARMONICS AND SPURIOUS EMISSIONS

Date: 10 Fest En Configu	#: 08J) 0/25/200														
est En onfigu															
onfigu															
			s pole and Slev	eve An	tenna	with Sle	eve anter	ma tra	nsmit						
lode:	TX, b m	ode	•												
est Eq	uipmen	<u>.t:</u>													
н	lorn 1-	18GHz	Pre-ar	mplifer	1-260	GHz	Pre-am	plifer	26-40GH	z	н	orn > 18(	GHz		Limit
T119;	S/N: 29	301 @3m	▼ T145 #	Agilent 3	008A0	056 🖵				-				-	FCC 15.205 🗸
- Hi Fred	quency Ca	bles ——					,								,
	2 foot	cable	3	3 foot c	able		Char	nber (	Cables		HPF	Re	ject Filte		<u>Measurements</u> W=VBW=1MHz
			•			•	B-5m C	hamb	er 🔽			- R_	001		<u>ge Measurements</u> 1MHz ; VBW=10Hz
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
ow Ch, 2 824	2412MHz 3.0	40.0	29.5	33.6	7.1	-34.8	0.0	0.0	45.8	35.3	74	54	-28.2	-18.7	v
824 824	3.0	40.0	29.5 30.5	33.0	7.1	-34.8 -34.8	0.0	0.0	45.8	35.3	74 74	54 54	-28.2 -26.6	-18./ -17.7	¥ Н
	2437MHz							0.0						10.5	
874 311	3.0 3.0	39.8 41.3	29.4 29.0	33.6 34.6	7.2 8.6	-34.9 -34.7	0.0 0.0	0.0 0.0	45.7 49.9	35.3 37.6	74 74	54 54	-28.3 -24.1	-18.7 -16.4	<u>v</u> v
874	3.0	40.8	30.0	33.6	7.2	-34.9	0.0	0.0	46.7	35.9	74	54	-27.3	-18.1	H
311	3.0	41.0	29.0	34.6	8.6	-34.7	0.0	0.0	49.6	37.6	74	54	-24.4	- <b>16.4</b>	Н
նշե Րե	2462MH	( <del>1</del>													
924	3.0	40.5	29.6	33.7	7.2	-34.9	0.0	0.0	46.5	35.6	74	54	-27.5	-18.4	v
.386	3.0	41.8	29.3	34.6	8.7	-34.6	0.0	0.0	50.4	37.9	74	54	- <b>23.6</b>	- <b>16.1</b>	v
924 386	3.0 3.0	41.0 40.8	30.6 28.8	33.7 34.6	7.2 8.7	-34.9 -34.6	0.0 0.0	0.0 0.0	47.0 49.4	36.6 37.4	74 74	54 54	-27.0 -24.6	-17.4 -16.6	H H
200	30	40.0	40.0	340	0./	-34.0	0.0	0.0	47.4	3/8			-44.0	-10,0	
										•					
										ļ		l	L		
ev. 10.1.	5.08														
		issions were	detected above	the syste	m noise	floor.									
			-				-	~ ·							<b>_</b>
	f		ent Frequency	ÿ		Amp	Preamp					-	-	Field Strengtl	
	Dist Dec 1	Distance to							ct to 3 met					i Strength Li	
	Kead AF	Analyzer R Antenna Fa	-			Avg Peak	-		Strength @ k Field Stre			-	-	. Average Li . Peak Limit	
	CL	Cable Loss				HPF	High Pas			ngm		P.K. IVIAI	Iviargin vs	. геак ілпі	
	CL	Cable Loss	2			TTE T.	ingii r as	S L'IIICI							

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## **CONFIGURTION #2: DIPOLE ANTENNA TRANSMITTING**

## RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

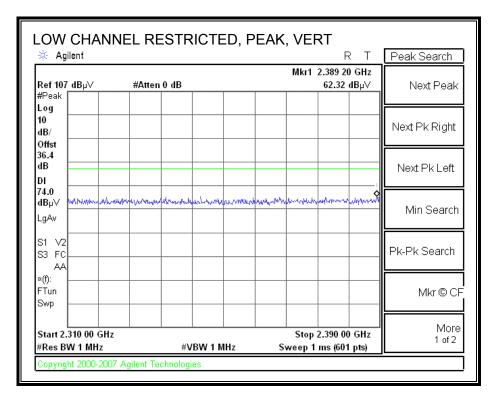


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🔆 Agilent				<del>ст</del>	Peak Search
Ref 107 dBµ∨ #Peak □	#Atten 0 dB		Mkr1 2.389 4 50.39		Next Peak
Log 10 dB/ Offst					Next Pk Right
36.4 dB DI 54.0					Next Pk Left
dBµ∨ LgAv				1	Min Search
S1 V2 S3 FC AA					Pk-Pk Search
≈(f): FTun Swp					Mkr © CF
Start 2.310 00 GHz #Res BW 1 MHz	-	/BW 10 Hz	Stop 2.390 0 Sweep 6.238 s (601		More 1 of 2

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### **RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**

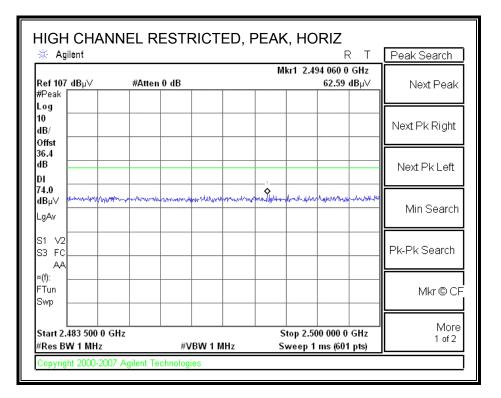


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🔆 Agilent				RT	Peak Search
Ref 107 dBµ∨	#Atten 0 dB		Mkr1 2	2.390 00 GHz 50.35 dBµ∀	Next Peak
Log 10 dB/					Next Pk Right
Offst 36.4 dB DI					Next Pk Left
54.0 dBµ∨ LgAv					Min Search
S1 V2 S3 FC					Pk-Pk Search
»(f): FTun Swp					Mkr © CF
Start 2.310 00 GHz #Res BW 1 MHz		¥VBW 10 Hz	Stop 2 Sweep 6.238	2.390 00 GHz	More 1 of 2

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## **RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



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🔆 Agilent				R T	Peak Search
Ref 107_dBµ∨	#Atten 0 dB		Mkr1 2.499 9 50	/2 5 GHz .50 dBµ∨	Next Peak
#Peak Log					
10 dB/					Next Pk Right
Offst 36.4 dB					Next Pk Left
DI 54.0 dBµ∀					Min Search
LgAv					
S1 V2 S3 FC AA					Pk-Pk Search
»(f): FTun Swp					Mkr©CF
Jwb					More
Start 2.483 500 0 GF #Res BW 1 MHz	-	V 10 Hz	Stop 2.500 00 Sweep 1.287 s (		1 of 2

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# RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

	NEL RESTR	ICTED, F	PEAK, VE	RT RT	De els Celerch
🔆 Agilent					Peak Search
Ref 107 dBµ∨	#Atten 0 dB		Mkr1 2.4	I90 320 0 GHz 62.71 dBµ∀	Next Peak
Log 10 dB/ Offst					Next Pk Right
36.4 dB					Next Pk Left
74.0	ubplu recenter la constration de	maran alan da	and and and a state of the second	nghlaharithan saidh anna	Min Search
S1 V2 S3 FC AA					Pk-Pk Search
»(f): FTun Swp					Mkr © CF
Start 2.483 500 0 GF #Res BW 1 MHz		W 1 MHz	•	600 000 0 GHz 1 ms (601 pts)	More 1 of 2
Copyright 2000-2007	Agilent Technologie	6			

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🔆 Agilent				RT	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB		Mkr1 2.48	3 555 0 GHz 50.22 dBµ∨	Next Peak
Log 10 dB/ Offst					Next Pk Right
dB					Next Pk Left
54.0 dBµ∨ LgAv					Min Search
S1 V2 S3 FC					Pk-Pk Search
»(f): FTun Swp					Mkr © CF
Start 2.483 500 0 G #Res BW 1 MHz		VBW 10 Hz	Stop 2.500 Sweep 1.287	) 000 0 GHz s (601 pts)	More 1 of 2

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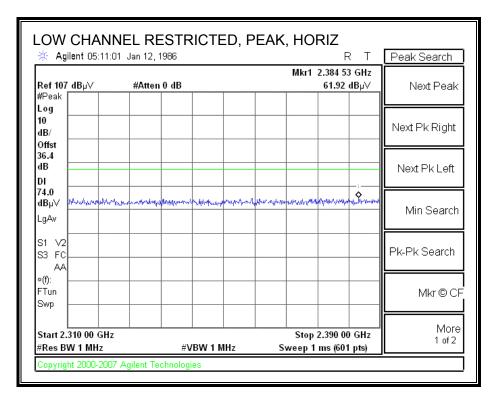
#### HARMONICS AND SPURIOUS EMISSIONS

ate: 10 est En onfigu	#: 08J] 0/25/200														
est En onfigu															
onfigu	gmeer:	os Chin Pang	r.												
ada: 1			leeve and Di	ipole Aı	ntenna	with Di	pole ante	nna tr	ansmitting						
oue.	ΓX, b m	ode													
est Eq	uipmen	<u>t:</u>													
ш	orn 1	18GHz	Pre of	mplifer	1.260	247	Pre am	nlifer	26-40GH	-		orn > 18(	207		Limit
				· ·			Fie-all	piner	20-4001	<u> </u>			3112		50045005
1119;	S/N: 29	301 @3m	- 1145 A	Agilent 3	008A00	J26 -				-				-	FCC 15.205
	quency Ca														<b>.</b>
	2 foot	cable	3	3 foot c	able		Char	nber (	Cables		HPF	Re	ject Filte		<u>x Measurements</u> W=VBW=1MHz
			- T		-	-	B-5m C	hambe	er 🗸			- R_	001		ge Measurements
									_					RBW=	1MHz ; VBW=10Hz
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
ow Ch, 2 824	412MHz 3.0	41.0	29.5	33.6	7.1	-34.8	0.0	0.0	46.8	35.3	74	54	-27.2	-18.7	v
824 824	3.0	41.0	29.5	33.6	7.1	-34.8	0.0	0.0	40.8	35.5 34.1	74 74	54 54	-27.2	-16./ -19.9	H H
		¢	•												
lid Ch, 2 874	437MHz 3.0	41.8	30.0	33.6	7.2	-34.9	0.0	0.0	47.7	35.9	74	54	-26.3	-18.1	v
311	3.0	41.5	28.2	34.6	8.6	-34.9	0.0	0.0	50.1	36.8	74	54 54	-20-5	-10.1	v
.874	3.0	40.8	28.2	33.6	7.2	-34.9	0.0	0.0	46.7	34.1	74	54	-27.3	- <b>19.9</b>	Н
311	3.0	41.6	29.0	34.6	8.6	-34.7	0.0	0.0	50.2	37.6	74	54	-23.8	-16.4	Н
ligh Ch,	2462MH	Z													
924	3.0	42.5	33.0	33.7	7.2	-34.9	0.0	0.0	48.5	39.0	74	54	- <b>25</b> .5	-15.0	v
386	3.0	41.7	28.4	34.6	8.7	-34.6	0.0	0.0	50.3	37.0	74	54	-23.7	-17,0	V
.924 .386	3.0 3.0	41.5 41.3	29.0 29.0	33.7 34.6	7.2 8.7	-34.9 -34.6	0.0 0.0	0.0 0.0	47.5 49.9	35.0 37.6	74 74	54 54	-26.5 -24.1	-19.0 -16.4	H H
				J		i		J	<u> </u>	L		L	L		
ev. 10.15															
lote: No	other emi	issions were	detected above	the syste	m noise	floor.									
	f	Measurem	ent Frequenc <sup>,</sup>	w		Amp	Preamp	Gain				Avglim	Average F	field Strengt	h T.imit
		Distance to		,			*		ct to 3 mete	ers				i Strength Li	
		Analyzer R				Avg			Strength @					. Average Li	
	AF	Antenna Fa	actor			Peak	Calculate	ed Peal	c Field Stre	ngth		Pk Mar	Margin vs	. Peak Limit	
	CL	Cable Los:	3			HPF	High Pas	s Filter							

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## **CONFIGURATION #3: PIFA1 ANTENNA TRANSMITTING**

## RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

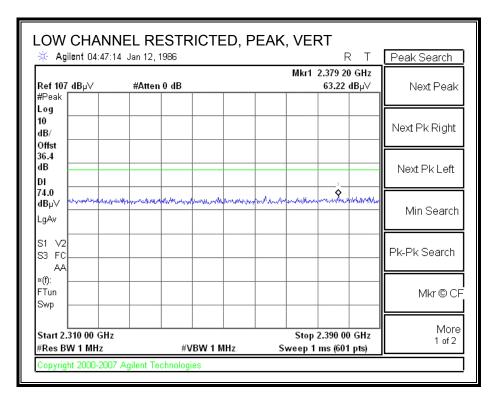


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🔆 Agilent 05:10:	40 Jan 12, 1986			RT	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB			388 67 GHz 50.28 dBµ∨	Next Peak
Log 10 dB/					Next Pk Right
Offst 36.4 dB DI					Next Pk Left
54.0 dBµ∀ LgAv					Min Search
S1 V2 S3 FC				¥	Pk-Pk Search
«(f): FTun Swp					Mkr © CF
Start 2.310 00 GHz #Res BW 1 MHz		/BW 10 Hz	Stop 2.3 Sweep 6.238 s	390 00 GHz ; (601 pts)	More 1 of 2

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### **RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



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🔆 Agilent 04:48	115 Jan 12, 1986		R 1	realceearen
Ref 107 dBµ∨ #Peak	#Atten 0 dB		Mkr1 2.376 00 GH 50.48 dBµ∖	- 11
Log 10 dB/				Next Pk Right
Offst 36.4 dB DI				Next Pk Left
54.0 dBµ∀ LgAv			1	Min Search
S1 V2 S3 FC				Pk-Pk Search
×(f): FTun Swp				Mkr © CF
Start 2.310 00 GH #Res BW 1 MHz	-	#VBW 10 Hz	Stop 2.390 00 GH Sweep 6.238 s (601 pts)	Z More 1 of 2

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# **RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**

HIGH CHANN		E <b>D, PEAK, HORIZ</b> R T	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB	Mkr1 2.486 470 0 GHz 62.98 dBµ∀	
Log 10 dB/ Offst			Next Pk Right
36.4 dB DI			Next Pk Left
74.0 dBµ∨ ∽∿mananananananananananananananananananan	have an	maneer an and the second s	Min Search
S1 V2 S3 FC			Pk-Pk Search
»(f): FTun Swp			Mkr © CF
Start 2.483 500 0 GH: #Res BW 1 MHz	z #VBW 1 M	Stop 2.500 000 0 GHz Hz Sweep 1 ms (601 pts)	More 1 of 2

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HIGH CHAN	<b>INEL RESTRI</b> :00 Jan 12, 1986	ICTED,	AVG, HOR	IZ RT	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB		Mkr1 2.49	5 847 5 GHz 50.23 dBµ∀	Next Peak
Log 10 dB/ Offst					Next Pk Right
dB					Next Pk Left
54.0 dBµ∨ LgAv					Min Search
S1 V2 S3 FC					Pk-Pk Search
×(f): FTun Swp					Mkr © CF
Start 2.483 500 0 #Res BW 1 MHz		W 10 Hz	Stop 2.500 Sweep 1.287	0 000 0 GHz s (601 pts)	More 1 of 2

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# RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

Agilent 04:51:2	NEL RESTRIC 7 Jan 12, 1986	IED, PI	EAN, VENI	₹т	Peak Search
- Ref 107 dBµ∨ #Peak	#Atten 0 dB		Mkr1 2.487 240 0 62.60		Next Peak
Log 10 dB/ Offst					Next Pk Right
36.4 dB					Next Pk Left
74.0 dBµ∨ nhullanna ann LgAv	An Som made to the	n hat have not a start of the	tout when the second	www.www	Min Search
S1 V2 S3 FC				·	Pk-Pk Search
»(f): FTun Swp					Mkr © CF
Start 2.483 500 0 G #Res BW 1 MHz	Hz #VBW	1 MHz	Stop 2.500 000 0 Sweep 1 ms (601		More 1 of 2

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🔆 Agilent 04:50:5			AVG, VER	RΤ	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB		Mkr1 2.48	3 555 0 GHz 50.27 dBµ∨	Next Peak
Log 10 dB/ Offst					Next Pk Right
dB					Next Pk Left
54.0 dBµ∨ LgAv					Min Search
S1 V2 S3 FC					Pk-Pk Search
»(f): FTun Swp					Mkr©CF
Start 2.483 500 0 G #Res BW 1 MHz	Hz #VBW	10 Hz	Stop 2.50 Sweep 1.287	0 000 0 GHz ′s (601 pts)	More 1 of 2

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## HARMONICS AND SPURIOUS EMISSIONS

		ode					Al Trans	muttin	•						
	uipmen	_													
		18GHz		nplifer			Pre-am	plifer	26-40GH	z	Н	orn > 18(	GHz		Limit
		301 @3m	- T145 A	Agilent 3	008A0	056 -				-				-	FCC 15.205
- Hi Fred	quency Cal 2 foot		3	foot c	able		Char	nber (	Cables		HPF	Re	ject Filte		<u>k Measurements</u> W=VBW=1MHz
			•			•	B-5m C	:hambe	er 🔽			• R_	001	• Avera	in the surements MHz ; VBW=10Hz
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
	2412MHz 3.0	40.8	28.2	33.6	7.1	-34.8	0.0	0.0	46.6	34.0	74	54	-27.4	-20.0	v
824 824	3.0	40.8	28.2 28.3	33.6 33.6	7.1 7.1	-34.8 -34.8	0.0 0.0	0.0	46.0 46.2	34.0 34.1	74 74	54 54	-27.4 -27.8	-20.0 -19.9	v H
id Ch. 2	2437MHz														
874	3.0	40.5	27.6	33.6	7.2	-34.9	0.0	0.0	46.4	33.5	74	54	-27.6	-20.5	V
311 874	3.0 3.0	41.0 40.5	29.0 28.0	34.6 33.6	8.6 7.2	-34.7 -34.9	0.0 0.0	0.0 0.0	49.6 46.4	37.6 33.9	74 74	54 54	-24.4 -27.6	-16.4 -20.1	V Н
311	3.0	41.8	29.0	34.6	8.6	-34.7	0.0	0.0	50.4	37.6	74	54	-23.6	- <b>16.4</b>	H
igh Ch,	2462MH	Z													
924 386	3.0 3.0	40.6 40.6	27.6 28.6	33.7 34.6	7.2 8.7	-34.9 -34.6	0.0 0.0	0.0 0.0	46.6 49.2	33.6 37.2	74 74	54 54	-27.4 -24.8	-20.4 -16.8	v v
380 924	3.0	40.0 41.4	28.0	34.0	8.7 7.2	-34.0 -34.9	0.0	0.0	49.2 47.4	37.2	74	54 54	-24.8 -26.6	-10.8 -20.0	¥ Н
386	3.0	42.0	29.2	34.6	8.7	-34.6	0.0	0.0	50.6	37.8	74	54	-23.4	-16.2	Н
ev. 10.1: ote: No			<b>letected above</b> ent Frequenc <sup>,</sup>		m noise	fleer.	Preamp	Goin				Arra Tim	Average	Field Strengt	h T imit
	Dist	Distance to		,			-		ct to 3 met	ers		-	-	d Strength L	
		Analyzer R	eading			Avg	Average	Field S	strength @	3 m		Avg Mar	Margin vs	. Average L	imit
	AF	Antenna Fa				Peak			r Field Stre	ngth		Pk Mar	Margin vs	. Peak Limit	;
	CL	Cable Loss	;			HPF	High Pas	s Filter							

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# 7.2.2. TRANSMITTER ABOVE 1 GHz FOR 802.11g MODE IN THE 2.4 GHz BAND

# CONFIGURATION #1: SLEEVE ANTENNA TRANSMITTING

## RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

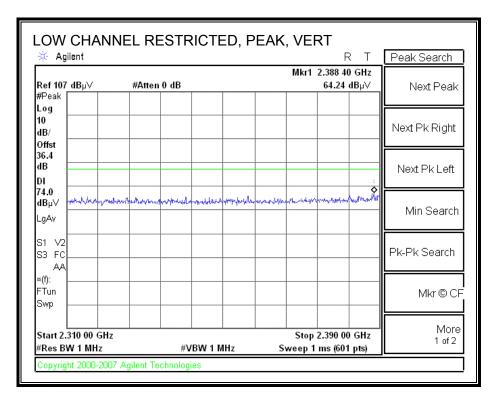
LOW CHANNEL	RESTRICTED	PEAK, HORIZ	
🔆 Agilent		RT	Peak Search
#Peak	Atten 0 dB	Mkr1 2.389 47 GHz 66.08 dBµ∨	Next Peak
Log 10 dB/ Offst			Next Pk Right
36.4 dB DI			Next Pk Left
74.0 dBμν marketereneringlymetere LgAv	alana, maantadamaanaan nandhi	www.wallow.com/data	Min Search
S1 V2 S3 FC AA			Pk-Pk Search
*(f): FTun Swp			Mkr © CF
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 1 MHz	Stop 2.390 00 GHz Sweep 1 ms (601 pts)	More 1 of 2
Copyright 2000-2007 Agile	nt Technologies		

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🔆 Agilent				RT	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB			890 00 GHz 1.92 dBµ∨	Next Peak
Log 10 dB/ Offst					Next Pk Right
36.4 dB DI					Next Pk Left
54.0 dBµ∨ LgAv					Min Search
51 V2 53 FC					Pk-Pk Search
«(f): =Tun Swp					Mkr © CF
Start 2.310 00 GHz #Res BW 1 MHz	#VBV	V 10 Hz	Stop 2.3 Sweep 6.238 s	90 00 GHz (	More 1 of 2

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## **RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



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🔆 Agilent				RT	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB			.390 00 GHz 51.16 dBµ∨	Next Peak
Log 10 dB/ Offst					Next Pk Right
36.4 dB DI					Next Pk Left
54.0 dBµ∨ LgAv				~	Min Search
51 V2 53 FC					Pk-Pk Search
«(f): =Tun Swp					Mkr©CF
Start 2.310 00 GHz #Res BW 1 MHz		BW 10 Hz	Stop 2 Sweep 6.238	.390 00 GHz	More 1 of 2

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# RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

🔆 Agilent				RT	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB		Mkr1 2.484	4 022 5 GHz 66.20 dBµ∨	Next Peak
.og 10 IB/ Dffst					Next Pk Right
6.4 IB					Next Pk Left
'4.0 IBµ∨ .gAv	mmultaning	annappendia	nghaangadha Mhongh	wannenanden	Min Search
31 V2 33 FC					Pk-Pk Search
(f): Tun Swp					Mkr © CF
Start 2.483 500 0 GH Res BW 1 MHz		V 1 MHz	•	) 000 0 GHz ns (601 pts)	More 1 of 2

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🔆 Agilent				R T	Peak Search
Ref 107 dBµ∨	#Atten 0 dB		Mkr1 2.48	3 527 5 GHz 51.14 dBµ∨	Next Peak
иреак Log 10 dB/					Next Pk Right
Offst 36.4 dB					Next Pk Left
DI 54.0 dBµ∨					Min Search
LgAv & S1 V2 S3 FC					Pk-Pk Search
AA »(f): FTun					
Swp					Mkr © CF
Start 2.483 500 0 GH; #Res BW 1 MHz	-	N 10 Hz	Stop 2.500 Sweep 1.287	0 000 0 GHz	More 1 of 2

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# RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

		, ,	
🔆 Agilent		RT	Peak Search
#Peak	#Atten 0 dB	Mkr1 2.484 737 5 GHz 66.20 dBµ∨	Next Peak
Log 10 dB/ Offst			Next Pk Right
36.4 dB DI			Next Pk Left
74.0 dBμ√ LgAv	nother a consideration of the second s	apaul minimum pritradul mension of a section and	Min Search
S1 V2 S3 FC AA			Pk-Pk Search
»(f): FTun Swp			Mkr © CF
Start 2.483 500 0 GHz #Res BW 1 MHz	#VBW 1 MHz	Stop 2.500 000 0 GHz Sweep 1 ms (601 pts)	More 1 of 2
Copyright 2000-2007 Agi	ilent Technologies		

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🔆 Agilent				RT	Peak Search
Ref 107 dBµ∨	#Atten 0 dB		Mkr1 2.483 6 51	10 0 GHz .05 dBµ∨	Next Peak
Log 10 dB/ Offst					Next Pk Right
36.4 dB DI 54.0					Next Pk Left
dBµ∨ LgAv δ	~				Min Search
S1 V2 S3 FC					Pk-Pk Search
«(f): FTun Swp					Mkr © CF
Start 2.483 500 0 GI #Res BW 1 MHz		/BW 10 Hz	Stop 2.500 00 Sweep 1.287 s (		More 1 of 2

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#### HARMONICS AND SPURIOUS EMISSIONS

Date: 10 Fest En Configu	#: 08J] D/25/20( gineer:														
est En onfigu															
onfigu		Chin Pang	,												
ode:			, pole and Slee	eve Ant	enna v	ith Slee	ve anten	na trai	nsmitting						
	TX, g m	ode													
est Eq	uipmen	.t:													
н	orn 1-	18GHz	Pre-ar	mplifer	1-260	GHz	Pre-am	plifer	26-40GH	z	н	orn > 18(	GHz		Limit
		301 @3m		Agilent 3						-				-	FCC 15.205
- Hi Fred	quency Cal	bles												_	
	2 foot		3	3 foot c	able		Char	nber (	Cables		HPF	Re	eject Filte		<u>: Measurements</u> W=VBW=1MHz
			•				B-5m C	hamb	er 🖕			- R	001		ge Measurements
						•			_				-	RBW=	1MHz ; VBW=10Hz
f	Dist	Read Pk	Read Avg.	AF	$\mathbf{CL}$	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
	2412MHz							~~~							
824 824	3.0 3.0	41.2 39.8	28.5 28.1	33.6 33.6	7.1 7.1	-34.8 -34.8	0.0 0.0	0.0 0.0	47.0 45.6	34.3 33.9	74 74	54 54	-27.0 -28.4	-19.7 -20.1	V н
	437MHz														
.874 .311	3.0	41.5	28.8	33.6	7.2	-34.9	0.0 0.0	0.0 0.0	47.4 51.1	34.7	74 74	54 54	-26.6 -22.9	-19.3 -16.5	v
874	3.0 3.0	42.5 40.8	28.9 30.0	34.6 33.6	8.6 7.2	-34.7 -34.9	0.0	0.0	46.7	37.5 35.9	74 74	54 54	-229	-10.5	 Н
311	3.0	41.5	29.0	34.6	8.6	-34.7	0.0	0.0	50.1	37.6	74	54	-23.9	-16.4	н
		ļ										0	•		
ligh Ch, 924	2462MH	z 40.0	28.0	33.7	7.2	-34.9	0.0	0.0	46.0	34.0	74	54	-28.0	-20.0	v
386	3.0 3.0	40.0	28.0	33./	7.2 8.7	-34.9	0.0	0.0	46.0 50.9	34.0	74 74	54 54	-28.0	-20.0	••••••••••••••••••••••••••••••••••••••
924	3.0	39.5	27.8	33.7	7.2	-34.9	0.0	0.0	45.5	33.8	74	54	-28.5	-20.2	H
386	3.0	41.3	28.6	34.6	8.7	-34.6	0.0	0.0	49 <i>.</i> 9	37.2	74	54	- <b>24.1</b>	-16.8	Н
				ļ											
						i			.i		i			ii.	
ev. 10.11				_		_									
ote: No	other em	issions were	detected above 1	the syste	m noise	floor.									
	f	Measurem	ent Frequency	v		Amp	Preamp	Gain				Ava Tim	Average H	Field Strengtl	n Timit
		Distance to		,			-		ct to 3 met	ers		-	-	d Strength Li	
		Analyzer R				Avg			Strength @					. Average Li	
	AF	Antenna F	-			Peak	-		k Field Stre			-	-	. Peak Limit	
	CL	Cable Los				HPF	High Pas			0					
			-												

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# **CONFIGURATION #2: DIPOLE ANTENNA TRANSMITTING**

#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

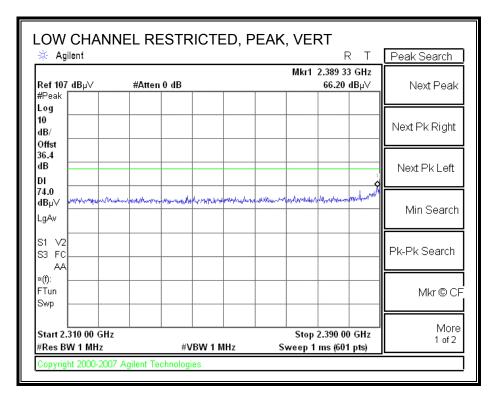
LOW CHANNEL RESTRICTED, PEAK, HORIZ 🔆 Agilent R T Peak Search Mkr1 2.389 47 GHz Ref 107 dBµ∨ #Atten 0 dB 66.17 dBµ∨ Next Peak #Peak Log 10 Next Pk Right dB/ Offst 36.4 dB Next Pk Left DI 74.0 A. orthe whent dBµ∨ abh Min Search LgAv S1 V2 Pk-Pk Search S3 FC AA ×(f): FTun Mkr © CF Swp More Start 2.310 00 GHz Stop 2.390 00 GHz 1 of 2 #Res BW 1 MHz #VBW 1 MHz Sweep 1 ms (601 pts) Copyright 2000-2007 Agilent Technologies

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🔆 Agilent				RT	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB			389 87 GHz 51.78 dBµ∨	Next Peak
Log 10 dB/ Offst					Next Pk Right
36.4 dB DI					Next Pk Left
54.0 dBµ∨ _gAv					Min Search
51 V2 53 FC					Pk-Pk Search
*(f): =Tun Swp					Mkr © CF
Start 2.310 00 GHz #Res BW 1 MHz		BW 10 Hz	Stop 2.3 Sweep 6.238 s	90 00 GHz (601 pts)	More 1 of 2

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## **RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



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🔆 Agilent				R T	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB		Mkr1	2.389 60 GHz 51.55 dBµ∨	Next Peak
Log 10 dB/ Offst					Next Pk Right
36.4 dB DI					Next Pk Left
54.0 dBµ∨ LgAv					Min Search
51 V2 53 FC					Pk-Pk Search
«(f): =Tun Swp					Mkr © Cf
Start 2.310 00 GHz #Res BW 1 MHz	#VBW	10 Hz		2.390 00 GHz 8 s (601 pts)	More 1 of 2

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# RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

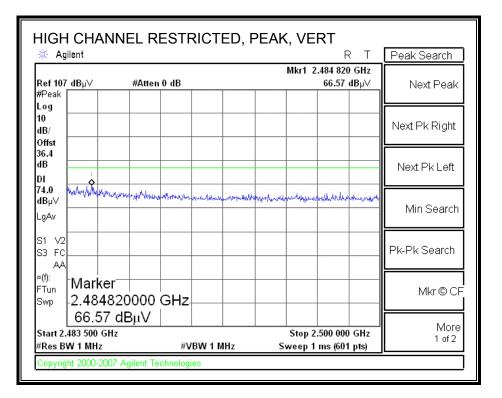
HIGH CHANNEL I	RESTRICTED,	PEAK, HORIZ	Peak Search
		Mkr1 2.483 747 5 GHz	
Ref107dBµ∀ #Atta #Peak	en 0 dB	66.76 dBµ∨	Next Peak
Log 10 dB/ Offst			Next Pk Right
36.4 dB			Next Pk Left
DI & 74.0 White White And White A	nore New Laboration Manager Manager	how have not a second second	Min Search
S1 V2 S3 FC AA			Pk-Pk Search
×(f): FTun Swp			Mkr © CF
Start 2.483 500 0 GHz #Res BW 1 MHz	#VBW 1 MHz	Stop 2.500 000 0 GHz Sweep 1 ms (601 pts)	More 1 of 2
Copyright 2000-2007 Agilent	Technologies		

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🔆 Agilent		R	
Ref 107_dBµ∨	#Atten 0 dB	 Mkr1 2.483 610 0 51.57 d	
#Peak Log 10			
dB/			Next Pk Right
36.4 1B			Next Pk Left
54.0 IBµ∨ _gAv b			Min Search
51 V2			
33 FC			Pk-Pk Search
×(f): =Tun Swp			Mkr © CF
		Stop 2.500 000 0 (	More

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# **RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



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🔆 Agilent		RT	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB	l83 610 GHz 51.34 dBµ∨	Next Peak
Log 10 dB/ Offst			Next Pk Right
36.4 1B DI			Next Pk Left
54.0 dBµ∨ LgAv <b>þ</b>			Min Search
51 V2 53 FC			Pk-Pk Search
«(f): =Tun Swp			Mkr © CF
Start 2.483 500 GH: #Res BW 1 MHz	 z #VBW <sup>.</sup>	500 000 GHz s (601 pts)	More 1 of 2

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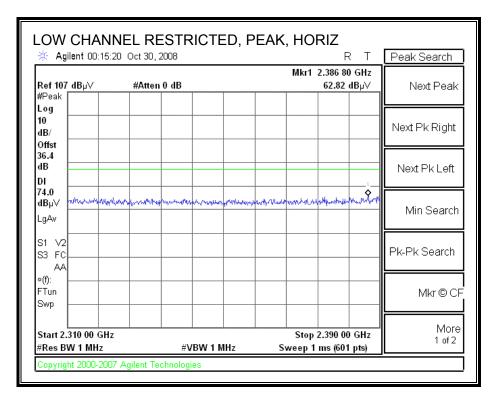
#### HARMONICS AND SPURIOUS EMISSIONS

Date: 10 Fest En Configu															
est En onfigu	gineer:	Ja													
onfigu		Chin Pang	r												
ode: '	ration #		, eeve and Dip	oole An	tenna	with Dip	ole anten	na tra	nsmitting						
	TX, g m	lode													
est Eq	uipmen	ıt:													
ц	orp 1	18GHz	Pre of	mplifer	1.260	247	Pre am	nlifer	26-40GH	-	U	orn > 18(	247		Limit
							r re-am	piner	20-4031	_ · · · ·			5112		FCC 15.205
		301 @3m	- 1145 A	Agilent 3	008A00	100 -				-				-	FCC 15.205
- Hi Fred	quency Ca		1				~							Deel	Measurements
	2 foot	cable	3	3 foot c	able		Char	nber	Cables		HPF	Re	eject Filte		W=VBW=1MHz
			-			-	B-5m C	hamb	• •	ī		- R	001		ge Measurements
							I		_					RBW=	1MHz ; VBW=10Hz
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
	2412MHz														
824 824	3.0 3.0	40.0 39.8	28.0 27.8	33.6 33.6	7.1 7.1	-34.8 -34.8	0.0 0.0	0.0 0.0	45.8 45.6	33.8 33.6	74 74	54 54	-28.2 -28.4	-20.2 -20.4	V H
044	30	37.0	27.0	33.0	· · · ·	-34.0	0.0	0.0	42.0	330	/4	34	-2074	-2074	п
	437MHz												•		
.874	3.0	40.2	28.0	33.6	7.2	-34.9	0.0 0.0	0.0	46.1	33.9	74	54	-27.9	-20.1	v
311 874	3.0 3.0	41.5 39.5	29.0 27.6	34.6 33.6	8.6 7.2	-34.7 -34.9	0.0	0.0 0.0	50.1 45.4	37.6 33.5	74 74	54 54	-23.9 -28.6	-16.4 -20.5	 Н
311	3.0	41.8	29.6	34.6	8.6	-34.7	0.0	0.0	50.4	38.2	74	54	-23.6	-15.8	H
11gh Ch, 924	2462MH 3.0	41.0	28.3	33.7	7.2	-34.9	0.0	0.0	47.0	34.3	74	54	-27.0	-19.7	v
386	3.0	41.6	29.3	34.6	8.7	-34.6	0.0	0.0	50.2	37.9	74	54	-23.8	-16.1	v
924	3.0	40.3	28.0	33.7	7.2	-34.9	0.0	0.0	46.3	34.0	74	54	-27.7	-20.0	H
.386	3.0	41.0	28.6	34.6	8.7	-34.6	0.0	0.0	49.6	37.2	74	54	-24.4	-16.8	H
								ļ				Į			
lev. 10.11	5.08														
		issions were	detected above	the syste	m noise	floor.									
	f		ent Frequency	У		Amp	Preamp		_				-	ield Strength	
	Dist	Distance to							ct to 3 met					d Strength Li	
	Kead AF	Analyzer R Antenna F	-			Avg Deele	-		Strength @ c Field Stre			-	-	. Average Li . Peak Limit	
	AF CL	Cable Los				Peak HPF	High Pas			engtn		PK Mar	Iviargin vs	. Peak Limit	
	CL	Cable Los:	5			TIF F	rugn r as	s rmei							

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# **CONFIGURATION #3: PIFA1 ANTENNA TRANSMITTING**

# RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

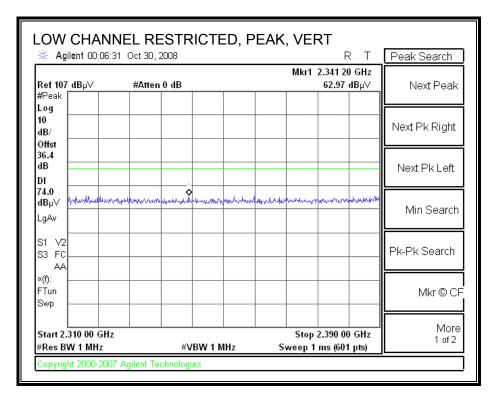


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🔆 Agilent 00:15:		- ,	AVG, HORIZ R T	Peak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB		Mkr1 2.390 00 GHz 50.92 dBµ∨	
Log 10 dB/				Next Pk Right
Offst 36.4 dB DI				Next Pk Left
54.0 dBµ√ LgAv				Min Search
S1 V2 S3 FC				Pk-Pk Search
AA ∞(f): FTun Swp				
Start 2.310 00 GH: #Res BW 1 MHz	-	#VBW 10 Hz	Stop 2.390 00 GHz Sweep 6.238 s (601 pts)	More 1 of 2

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# **RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



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🔆 Agilent 00:06:		TED, AVG, VERT		eak Search
Ref 107 dBµ∨ #Peak	#Atten 0 dB	Mkr1 2	2.390 00 GHz 50.40 dBµ∀	Next Peak
Log 10 dB/			N	ext Pk Right
Offst 36.4 dB				Vext Pk Left
DI 54.0 dBµ∀				Min Search
LgAv S1 M2 S3 FC				-Pk Search
AA «(f): FTun Swp				Mkr © CF
Start 2.310 00 GH: #Res BW 1 MHz	2 #VBW 1	•	2.390 00 GHz s (601 pts)	More 1 of 2

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# RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

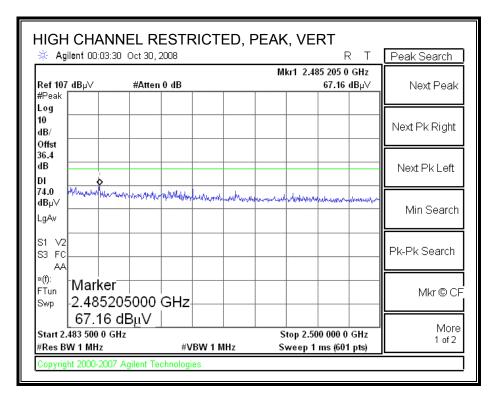
HIGH CHANNEL		PEAK, HORIZ	Peak Search
	ten 0 dB	Mkr1 2.484 022 5 GHz 65.91 dBµ∀	Next Peak
Log 10 dB/			Next Pk Right
Offst 36.4 dB			Next Pk Left
74.0 dBμV LgAv	mandal and the second second	nadionan halo kananan kanan kanan kanan	Min Search
S1 V2 S3 FC AA			Pk-Pk Search
*(f): FTun Swp			Mkr © CF
Start 2.483 500 0 GHz #Res BW 1 MHz	#VBW 1 MHz	Stop 2.500 000 0 GHz Sweep 1 ms (601 pts)	More 1 of 2

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HIGH CHANNEL F	,	AVG, HORIZ	Peak Search
	, 2000		
Ref107dBµ∨ #Atto #Peak	en 0 dB	Mkr1 2.483 555 0 GHz 51.93 dBµ∨	Next Peak
Log 10 dB/ Offst			Next Pk Right
36.4 dB DI			Next Pk Left
54.0 dBµ∨ LgAv			Min Search
S1 V2 S3 FC			Pk-Pk Search
<sup>*(f):</sup> <sup>FTun</sup> Marker <sup>Swp</sup> -2.483555000			Mkr©CF
<u>51.93 dBµV</u> Start 2.483 500 0 GHz #Res BW 1 MHz	#VBW 10 Hz	Stop 2.500 000 0 GHz Sweep 1.287 s (601 pts)	* More 1 of 2
Copyright 2000-2007 Agilent	Technologies	• • • •	

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## **RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



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HIGH CHANI	NEL RESTR 5 Oct 30, 2008	ICTED,	AVG, VERT	R T	Peak Search
- Ref 107 dBµ∨ #Peak	#Atten 0 dB		500 0 GHz 52.17 dBµ∨	Next Peak	
Log 10 dB/ Offst					Next Pk Right
dB					Next Pk Left
54.0 dBµ∨ LgAv ∳					Min Search
S1 V2 S3 FC					Pk-Pk Search
≈(f): FTun Swp					Mkr © CF
Start 2.483 500 0 G #Res BW 1 MHz		BW 10 Hz	Stop 2.500 Sweep 1.287 s		More 1 of 2

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#### HARMONICS AND SPURIOUS EMISSIONS

T119; S/N: 29301 @3m  T145 Aqilent 3008A0056  FCC 15.2    FCC 15.2    Pair Measures    2 foot cable  B-5m Chamber  FCC 15.2    Pair Measures    Reject Filter  Peak Measures    Reject Filter  Reject Filter  Average Measures    Reverse  Peak Measures    Reverse <th< th=""><th>apliance</th><th>-</th><th></th><th>y Measurem Services, Fi</th><th></th><th>5m Ch</th><th>amber</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th<>	apliance	-		y Measurem Services, Fi		5m Ch	amber									
norm of the set of the	apany: 1	Mits	umi													
Set Engineer: Chin Pari de PIFA2 Antenna with PIFA1 transmitting out: TX: grande    det: TX: grande    Pre-amplifer 1-26GHz  Pre-amplifer 26-40GHz  Horn > 18GHz  Lin    T165 GHz  Pre-amplifer 1-26GHz  Pre-amplifer 26-40GHz  Horn > 18GHz  Lin    Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2"  Per Colspan="2"  Pre-amplifer 26-40GHz  HPF  Reject Filter  Per Measure    Colspan="2"  Colspan="2"  Per Measure    Colspan= 2  Per Measure    Colspan="2"  Per Measure    Colspan= 2  Per Measure    Colspan= 2  Per Measure    Colspan= 2  Per Measure    Colspan= 2  Per Measure    Per Measure    Colspan= 2  Per Measure    Colspan= 2  Per Measure    Colspan= 2  Per Measure																
migrarition #3: EUT.PIFA1 and PIFA2 Antenna with PIFA1 transmitting ode: TX, g mode    est Equipment:    More 1.18GHz  Pre-amplifer 1-26GHz  Pre-amplifer 26-40GHz  Horn > 18GHz  Lin    T145 Agilent 3008A0056  Chamber Cables    Pre-amplifer 26-40GHz  Here-amplifer 26-40GHz  Here-amplifer 26-40GHz  Horn > 18GHz  Lin    Tool cable  3 foot cable  Chamber cables    Image: Chamber cables  Peak Measure RBW=-WBW=    Quite Read Ave AF  CL  Area D  Peak Measure RBW=-WBW=    Area DB N  Read Ave AF  CL  Area D  Peak Measure RBW=-WBW=    Area DB N  Read Ave AF  CL  Area D  Peak Measure RBW=-WBW=    Area DB N  dB nd dB  dB no Vn  dB no Vn  dB no Vn  More VBW=    Area DA Kead Ave AF  CL  Area DK  CL																
iode: TX. g mode    est Equipment:    THOM 1-18GHz  Pre-amplifer 1-26GHz  Horn > 18GHz  Lin    THIS Agilent 308A0056  Pre-amplifer 26-40GHz  Horn > 18GHz  Lin    Class    2 foot cable  Chamber Cables    Image Measure: RBW=1001  Pre-amplifer 126-40GHz  HPF  Reject Filter  Peak Measure: RBW=20W=1    Of ot cable  Stot cable  Chamber Cables    Image Measure: RBW=120H    Reject Filter  Peak Measure: RBW=120H    Reject Filter  Peak Measure: RBW=120H    Multicity to the transport of the transport					5 A 2 A		with DIE	A 1 4mm m		_						
est Equipment:    Horn 1.18GHz T119: S/R: 29301 @3m  Pre-amplifer 1.26GHz T145 Agilent 3008A0066  Pre-amplifer 25-40GHz T145 Agilent 3008A0066  Horn > 18GHz  Lin Fc 15.2    H Frequency Cable  3 foot cable  Chamber Cables  HPF  Reject Filter R_001  Peak Measure RBW=VBW=1    1  Dist  Read Pk  Read Avg  AF  CL  Chamber Cables  HPF  Reject Filter R_001  Peak Measure RBW=TMHz; VB    1  Dist  Read Pk  Read Avg  AF  CL  D Corr  Fir  Peak  Avg  Pk Lin  Avg Lin  Pk Mar  Avg Mar  Nr.    224  30  40.0  28.6  7.1  34.8  0.0  0.0  45.5  33.8  7.4  54  22.6  20.2  20.2    31  30  41.8  28.7  33.6  7.1  34.8  0.0  0.0  45.7  33.4  7.4  54  22.6  20.2  20.2  20.2  20.2  20.2  20.2  20.2  20.2  20.2  20.2  20.2  20.2  20.2  20.2  20.2  20.2  20.2 <t< th=""><th>÷</th><th></th><th></th><th>FAT and PT</th><th>A2 All</th><th>leinia v</th><th>with PTF</th><th>AI trans</th><th>ուսու</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>	÷			FAT and PT	A2 All	leinia v	with PTF	AI trans	ուսու							
Titis: S.N: 29301 @3m  Titis Agilient 3008A0056  FCC 15.2    H Frequency Cables  3 foot cable  Chamber Cables  HPF  Reject Filter  Peak Measure RBW=VBW=I    2 foot cable  3 foot cable  Chamber Cables  HPF  Reject Filter  Peak Measure RBW=VBW=I    6  Dist  Read Pk  Read Avg.  AF  CL  Amp  D Corr  Ftr  Peak  Avg  Pk Lim  Avg Mar  Nu    6  Dist  Read Pk  Read Avg.  AF  CL  Amp  D Corr  Ftr  Peak  Avg  Pk Lim  Avg Mar  Nu    6  Dist  Read Pk  Read Avg.  AF  CL  Amp  D Corr  Ftr  Peak  Avg  Pk Lim  Avg Mar  Nu    6  Dist  Read Pk  Read Avg.  AF  CL  Amp  D Corr  Ftr  Peak  Avg  Pk Lim  Avg Mar  Nu    824  3.0  40.0  28.0  33.6  7.1  34.8  0.0  0.0  45.7  34.4  24.4  16.4  28.2  20.2  20.2		-														
If Frequency Cables    2 foot cable  3 foot cable  Chamber Cables    B-5m Chamber  R_001  Reject Filter  Peak Measure    Average Measure  R_001  Peak Measure    f  Dist  Read Pk  Read Avg  AF  CL  Amp  D Corr  Fitr  Peak  Avg  Pk Lin  Avg Lin  Pk Mar  Avg Mar  Nu    GHz  (m)  dBu V  dBu V  dBu V/m  <	Horn	<mark>ו 1</mark> -1	18GHz	Pre-ar	mplifer	1-260	GHz	Pre-am	plifer	26-40GH	z	н	orn > 18(	GHz		Limit
2 foot cable    3 foot cable    Chamber Cables    HPF    Reject Filter    Peak Measure RBW=VBW=1 Merror Merror      f    Dist    Read Avg    AF    CL    Amp    D Corr    Flr    Peak    Avg    Pk Lim    Avg Lim    Pk Mar    Average Measure RBW=1MHz, VB      f    Dist    Read Avg    AF    CL    Amp    D Corr    Flr    Peak    Avg    Pk Lim    Avg Lim    Pk Mar    Average Measure RBW=1MHz, VB      wr ch, 2412MHz    0    0    4B    dB    dB    dB    0    0    45.8    33.8    74    54    26.2    -00.2      da Ch, 2437MHz    0    0    0.0    45.7    33.4    74    54    26.4    -19.5      at Ch, 2437MHz    0    0.0    45.7    33.4    74    54    26.4    -19.5      at Ch, 2437MHz    0    0.0    45.7    33.4    74    54    28.3    -20.6      311    3.0    41.0    29.0    <				▼ T145 A	Agilent 3	3008A0	056 🖵				-				-	FCC 15.205
Image: Constraint of the system roise floor.    B-5m Chamber    Protect of the system roise floor.    Average Measure Rewerment Frequency Distance Correct to 3 meters Red Analyzer Reading Average Field Strength Limit Rewerment Frequency Distance Correct to 3 meters Red Analyzer Reading Average Field Strength Limit Rewerment Frequency Distance Correct to 3 meters Read Analyzer Reading Average Field Strength Limit Red Analyzer Reading Average Field Strength Limit Red Analyzer Reading Average Field Strength Limit Red Analyzer Reading Average Field Strength Qi 3 m    Average Measure Reading Average Field Strength Qi 3 m				3	3 foot c	able		Char	nber (	Cables		HPF	Re	ject Filte		k Measurements
f    Dist    Read Pk    Read Avg    AF    CL    Amp    D Corr    Fltr    Peak    Avg    Pk Lim    Avg Lim    Pk Mar    Avg Mar    No      GHz    (m)    dBuV    dBuV    dB/m    dB    dB    dB    dB    dB    dBuV/m    dBuV/m    dBuV/m    dB    dB    (V)      wr Ch, 2412MHz    3.0    40.0    28.0    3.6    7.1    -34.8    0.0    0.0    45.8    33.8    74    54    -28.2    -20.2				-				B 5m C	hamh	NF.				001	_	
GHz    (n)    dBuV    dBvV    dB    dB    dB    dB    dB    dB    dV/n    dBuV/n    dBuV/n    dBuV/n    dB    dB    (V)      824    3.0    40.0    28.0    33.6    7.1    -34.8    0.0    0.0    45.8    33.8    74    54    -28.2    -20.2    -				•			•	0.511 0	anamp	· ·			<u>т</u> К_	001		-1MHz; VBW=10Hz
w Ch, 2412MHz    m    <	f D	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
824  3.0  40.0  28.0  33.6  7.1  34.8  0.0  0.0  45.8  33.8  74  54  .28.2  .20.2    824  3.0  41.8  28.7  33.6  7.1  .34.8  0.0  0.0  445.8  33.8  74  54  .28.2  .20.2    1a  Ch, 2437MHz				dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
324  3.0  41.8  28.7  33.6  7.1  -34.8  0.0  0.0  47.6  34.5  74  54  -26.4  -19.5    a  a  a  b<																
a    h																V H
30  398  27.5  33.6  7.2  -34.9  0.0  0.0  45.7  33.4  74  54  -28.3  -20.6    311  3.0  41.0  29.0  34.6  8.6  -34.7  0.0  0.0  49.6  37.6  74  54  -28.3  -20.6    3.0  41.0  29.0  34.6  8.6  -34.7  0.0  0.0  49.6  37.6  74  54  -28.3  -20.6    3.0  41.8  29.0  34.6  8.6  -34.7  0.0  0.0  59.4  37.6  74  54  -28.3  -20.6  -37.6    3.0  41.8  29.0  34.6  8.6  -34.7  0.0  0.0  50.4  37.6  74  54  -28.6  -16.4    24  3.0  40.0  28.6  34.7  0.0  0.0  46.0  34.0  74  54  -28.0  -20.0    243  3.0  40.0  28.6  33.7  7.2  -34.9  0.0  0.0  465  33.6  74  54	•	3.0	41.0	20./	33.0	/.1	-34.0	0.0	0.0	4/.0	34.5	/4	24	-20.4	-195	<u>n</u>
311  3.0  41.0  29.0  34.6  8.6  -34.7  0.0  0.0  49.6  37.6  74  54  -24.4  -16.4    374  3.0  40.0  27.5  33.6  7.2  -34.9  0.0  0.0  45.9  33.4  74  54  -28.1  -20.6    311  3.0  41.8  29.0  34.6  8.6  -34.7  0.0  0.0  45.9  33.4  74  54  -28.1  -20.6    311  3.0  41.8  29.0  34.6  8.6  -34.7  0.0  0.0  50.4  37.6  74  54  -28.0  -16.4    gh Ch, 2462MHz	Ch, 2437	MHz														
374  3.0  40.0  27.5  33.6  7.2  -34.9  0.0  0.0  45.9  33.4  74  54  -28.1  -20.6    311  3.0  41.8  29.0  34.6  86  -34.7  0.0  0.0  50.4  37.6  74  54  -28.1  -20.6    gh Ch, 2462MHz																v
311  30  41.8  29.0  34.6  8.6  -34.7  0.0  0.0  50.4  37.6  74  54  -23.6  -16.4    gh Ch, 2462MHz																<u>v</u>
gh Ch, 2462MHz    gh Ch,																H
224  3.0  40.0  28.0  33.7  7.2  -34.9  0.0  0.0  46.0  34.0  74  54  -28.0  -20.0    886  3.0  41.3  28.6  34.6  87.  -34.6  0.0  0.0  49.9  37.2  74  54  -28.0  -20.0    224  3.0  40.5  27.6  33.7  7.2  -34.9  0.0  0.0  49.9  37.2  74  54  -24.1  16.8    224  3.0  40.5  27.6  33.7  7.2  -34.9  0.0  0.0  446.5  33.6  74  54  -24.4  16.8    286  3.0  41.0  28.5  34.6  8.7  -34.6  0.0  0.0  49.6  37.1  74  54  -24.4  16.9    No.0  0.0  0.0  49.6  37.1  74  54  -24.4  16.9    v.10.15.08    te: No other emissions were detected above the system noise floor.    f  Measurement Frequency  Amp	· · ·		11.00	27.0			2.1.1	0.0		2011					-1011	
386  3.0  41.3  28.6  34.6  8.7  -34.6  0.0  0.0  49.9  37.2  74  54  -24.1  -16.8    224  3.0  40.5  27.6  33.7  7.2  -34.9  0.0  0.0  46.5  33.6  74  54  -24.1  -16.8    386  3.0  41.0  28.5  34.6  8.7  -34.6  0.0  0.0  49.6  37.1  74  54  -27.5  -20.4    386  3.0  41.0  28.5  34.6  8.7  -34.6  0.0  0.0  49.6  37.1  74  54  -27.4  -16.9    v. 10.15.08    te: No other emissions were detected above the system noise floor.    f  Measurement Frequency Dist Distance to Anterna Read  Amp  Preamp Gain D Corr  Avg Lim  Average Field Strength Limit Pag 3 m  Avg Lim  Average Field Strength Limit Avg Mar  Average Limit																
924    3.0    40.5    27.6    33.7    7.2    -34.9    0.0    0.0    46.5    33.6    74    54    -27.5    -20.4      386    3.0    41.0    28.5    34.6    8.7    -34.6    0.0    0.0    49.6    37.1    74    54    -27.5    -20.4      386    3.0    41.0    28.5    34.6    8.7    -34.6    0.0    0.0    49.6    37.1    74    54    -24.4    -16.9      vity 10.15.08      tre: No other emissions were detected above the system noise floor.      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																V
386  3.0  41.0  28.5  34.6  8.7  -34.6  0.0  0.0  49.6  37.1  74  54  -24.4  -16.9    v. 10.15.08    v. 10.15.08    Dist Distance to Antenna Read Analyzer Reading  Amp  Preamp Gain  Avg Lim  Average Field Strength Limit    Preamp Gain    Average Field Strength Q 3 m																V H
v. 10.1508 te: No ofter emissions were detected above the system noise floor. f Measurement Frequency Dist Distance to Anterna Read Analyzer Reading Avg Average Field Strength (2) 3 m Avg Average Field Strength (2) 3 m Avg Mar Margin vs. Average Limit																H
te: No other emissions were detected above the system noise floor. 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																
te: No other emissions were detected above the system noise floor. 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																
Meter emissions were detected above the system noise floor.    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		l		L		L	L			l		L				
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	10.15.08															
Dist Distance to Anterna 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	: No other	r emi:	ssions were	detected above	the syste	m noise	floor.									
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								<b>T</b>	a .				. т.			4 T : :-
Read Analyzer Reading Avg Average Field Strength @ 3 m Avg Mar Margin vs. Average Limit				-	У		-									
AF Antenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs. Peak Limit				-			-									
											ngth		Pk Mar	Margin vs.	Peak Limit	ţ
CL Cable Loss HPF High Pass Filter	CI CI	L	Cable Loss	\$			HPF	High Pas	s Filtei							
	C.I	L		;			пгг	rugn Pas	s rutei							

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# 7.2.3. RECEIVER ABOVE 1 GHz

Note: No emissions were found above 1GHz within 20dB below the system noise.

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# 7.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL DATA

Condition: HORIZONTAL Test Operator:: Chin Pang Project #: : 08J12194 Company: : Mitsumi Configuration:: BUT/Sleeve and Dipole Antennas Mode : : : TX ( Worst Case ) Target: : : FCC CLASS B

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	₫BuV/m	dBuV/m	dB	
1 2 3 4 5	147.370 336.520 481.050 610.060 671.170	46.50 46.50 41.50	-13.64 -10.05 -5.37 -2.58 -1.13	34.00 36.45 41.13 38.92 41.21	46.00 46.00 46.00	-9.50 -9.55 -4.87 -7.08 -4.79	Peak Peak Peak
6	864.200	42.33 38.67	2.16	40.82		-4.79	

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

VERTICAL DATA

Condition: VERTICAL Test Operator:: Chin Pang Project #: : 08J12194 Company: : Mitsumi Configuration:: EUT/Sleeve and Dipole Antennas Mode : : TX ( Worst Case ) Target: : FCC CLASS B

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
-	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
	192.960 336.520 624.610 671.170 864.200 961.200	52.33 43.17 40.83	-10.05 -2.28 -1.13		46.00 46.00	-5.11 -6.29 -7.01	Peak Peak Peak Peak

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# 8. AC POWER LINE CONDUCTED EMISSIONS

# **LIMITS**

FCC §15.207 (a)

RSS-Gen 7.2.2

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

\* Decreases with the logarithm of the frequency.

# TEST PROCEDURE

# ANSI C63.4

# **RESULTS**

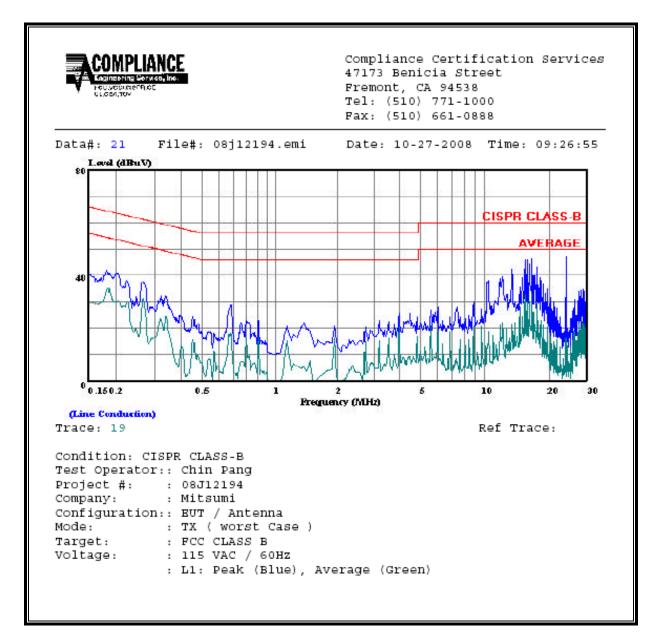
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#### **<u>6 WORST EMISSIONS</u>**

(MHz)		Reading		Closs	Limit	EN_B	Marg	gin	Remark
(	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.18	41.78		35.17	0.00	64.39	54.39	-22.61	-19.22	L1
15.55	46.12		34.87	0.00	60.00	50.00	-13.88	-15.13	L1
24.00	47.01		46.66	0.00	60.00	50.00	-12.99	-3.34	L1
0.18	39.98		34.45	0.00	64.39	54.39	-24.41	-19.94	L2
15.89	45.03		36.08	0.00	60.00	50.00	-14.97	-13.92	L2
24.00	47.03		46.74	0.00	60.00	50.00	-12.97	-3.26	L2

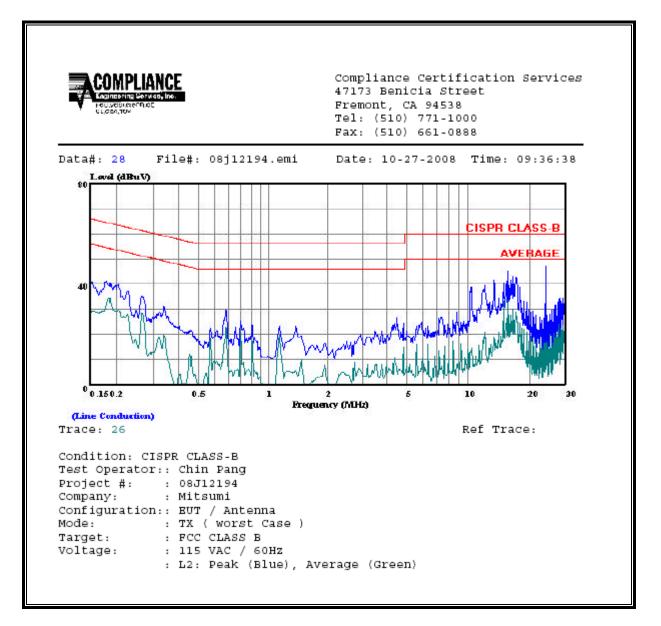
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#### LINE 1 RESULTS



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#### LINE 2 RESULTS



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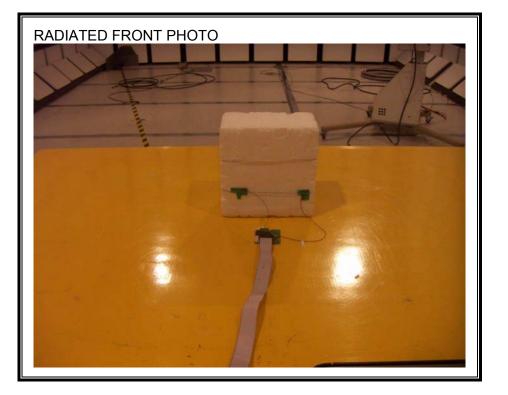
# 9. SETUP PHOTOS

# ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

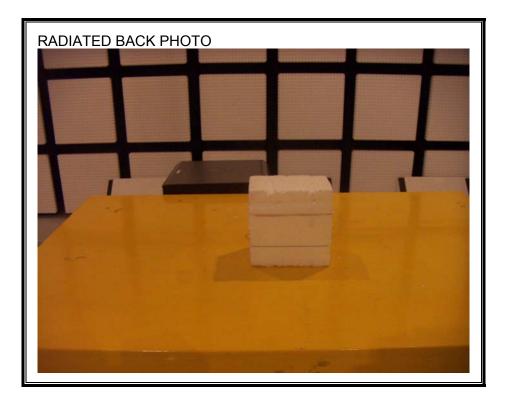


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## RADIATED RF MEASUREMENT SETUP



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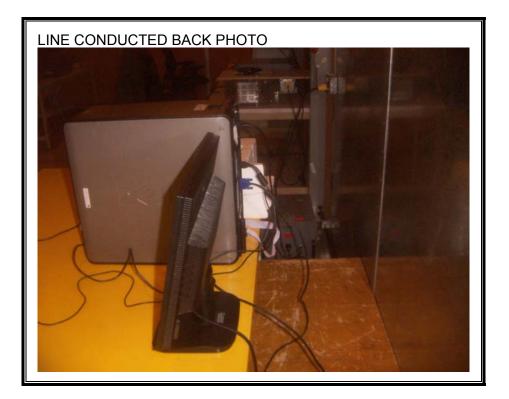


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# POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP



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# END OF REPORT

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