

FCC CFR47 PART 15 SUBPART C INDUSTRY CANADA RSS-210 ISSUE 7 CERTIFICATION TEST REPORT

FOR

WIFI MODULE

MODEL NUMBER: DWM-W014

REPORT NUMBER: 07J11256-1

ISSUE DATE: OCTOBER 1, 2007

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

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Revision History

Issue Rev. Date Revisions		Revisions	Revised By
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1. ATTESTATION OF TEST RESULTS

CFR	CFR 47 Part 15 Subpart C		
	TEST RESULTS		
	APPLICABLE STANDAR	DS	
DATE TESTED:	SEPTEMBER 17 - 21, 2007		
SERIAL NUMBER:	00A0968007E0		
MODEL:	DWM-W014		
EUT DESCRIPTION:	WIFI MODULE		
COMPANY NAME:	MITSUMI ELECTRIC CO., 1601 SAKAI, ATSUGI-SHI KANAGAWA, 243-8533, JA		

RSS-210 Issue 7 Annex 8 and RSS-GEN Issue 2

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:

MA

MICHAEL HECKROTTE ENGINEERING MANAGER COMPLIANCE CERTIFICATION SERVICES

Junjuntes

VIEN TRAN EMC ENGINEER COMPLIANCE CERTIFICATION SERVICES

No Non-Compliance Noted

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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
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 802.11b/g transceiver operating in the 2400-2484 MHz band.

The radio module is manufactured by Mitsumi Electric Co.

The radio module uses Broadcom chipset.

5.2. MAXIMUM OUTPUT POWER

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

Frequency Range	Mode	Output Power	Output Power
(MHz)		(dBm)	(mW)
2412 - 2462	802.11b	18.74	74.82
2412 - 2462	802.11g	19.09	81.10

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two different antenna types. These are Dipole (MITSUMI_DCA-E04) with gain of 2.21 dBi and Inverted-F (Parrot_PIFA double connect2) with gain of 1.38 dBi, or Inverted-F (Parrot_PIFA connect1) with gain of 1.05 dBi.

5.4. 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.

5.5. WORST-CASE CONFIGURATION AND MODE

For b and g mode all data were taken at 1Mb/s and 6Mb/s respectively. And the worst-case channel is determined as the channel with the highest output power.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST					
Description Manufacturer Model Serial Number					
Desktop PC	Dell	DHM	FNC491X		
Keyboard	Dell	SK-8110	CN-07N247-71616-442-OKFL		
Mouse	Dell	M-UR69	LM3230699		
Monitor	LG	L1750S	512MXWE0A763		

I/O CABLES

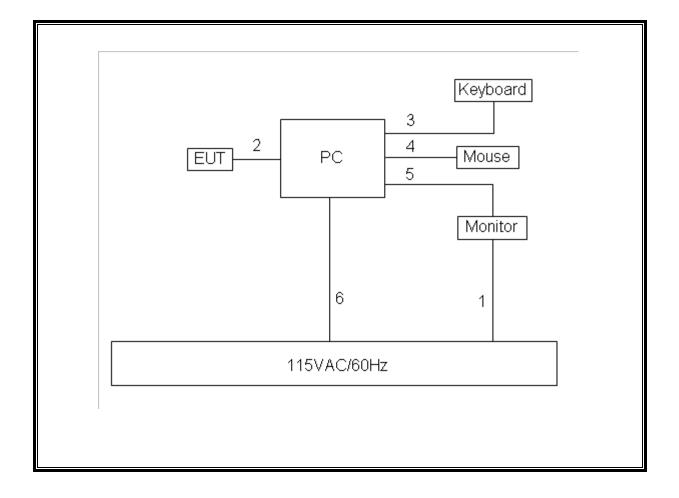
	I/O CABLE LIST							
Cable No.	Port	# of Identica Ports	Connector Type	Cable Type	Cable Length	Remarks		
1	AC	1	US 115V	Un-shielded	2m	N/A		
2	20 Pins	1	Ribbon cable	Un-shielded	0.5m	N/A		
3	Keyboard	1	PS/2	Un-shielded	2m	N/A		
4	Mouse	1	PS/2	Shielded	2m	N/A		
5	Video	1	Monitor	Un-shielded	2m	One Ferrite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

TEST SETUP

During the testing process the EUT was connected to the PC via extender card and the software exercised the radio card.

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SETUP DIAGRAM FOR TESTS



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6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST						
Description	Manufacturer	Model	Serial Number	Cal Due		
Spectrum Analyzer	HP	E4446A	US42510266	10/18/2007		
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	4/15/2008		
Preamplifier, 1 ~ 26.5 GHz	HP	8449B	3008A00369	10/3/2007		
Peak Power Meter	Agilent	E4416A	GB41291160	12/2/2007		
Peak / Average Power Sensor	Agilent	E9327A	US40440755	12/2/2007		
30MHz 2Ghz	Sunol Sciences	JB1 Antenna	A121003	10/13/2007		
Quasi-Peak Adaptor	HP	85650A	3145A01654	1/21/2008		
SA Display Section 2	HP	85662A	2816A16696	4/7/2008		
SA RF Section, 1.5 GHz	HP	85680B	2814A04227	1/7/2008		
Preamp 30-1000MHz	Sonoma	310N	185623	1/20/2008		
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25	2023	9/15/2008		
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-	8379443	9/15/2008		
EMI Test Receiver	R & S	ESHS 20	827129/006	1/27/2008		

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7. CHANNEL TEST RESULTS

7.1. 802.11b MODE IN THE 2.4 GHz BAND

7.1.1.6 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

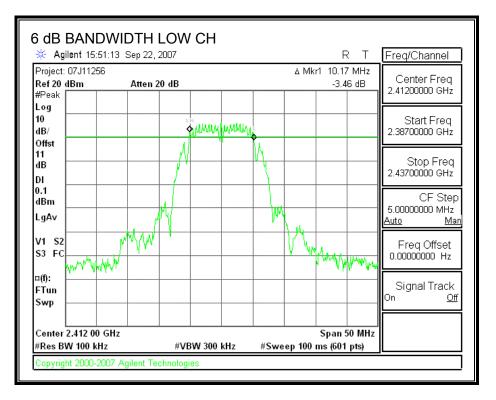
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

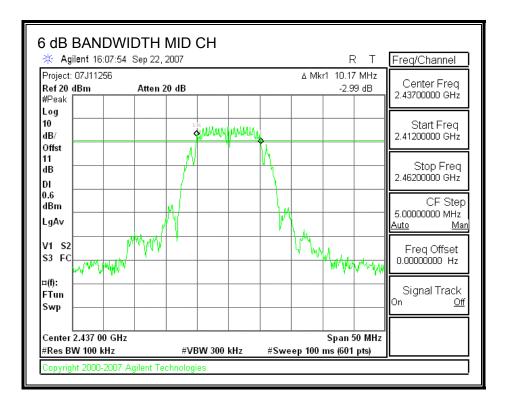
Channel	Frequency	6 dB Bandwidth	Minimum Limit
	(MHz)	(MHz)	(MHz)
Low	2412	10.17	0.5
Middle	2437	10.17	0.5
High	2462	10.17	0.5

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6 dB BANDWIDTH



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🔆 Agilent 16:15:5	51 Sep 22, 2007			RT	Freq/Channel
Project: 07J11256 Ref 20 dBm #Peak	Atten 20 dB		۵ Mk	r1 10.17 MHz -3.23 dB	Center Freq 2.46200000 GHz
Log 10 dB/	1R AM	мининин			Start Freq 2.43700000 GHz
Offst 11 dB DI	+		4		Stop Freq 2.48700000 GHz
0.4 dBm LgAv	M		M		CF Step 5.00000000 MHz Auto Mai
V1 S2 S3 FC	MAN		' 1/4	Andrewan	Freq Offset 0.00000000 Hz
¤(f): FTun Swp				J	Signal Track On <u>Off</u>
Center 2.462 00 GF #Res BW 100 kHz		300 kHz	#Sweep 100	Span 50 MHz ms (601 nts)	

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7.1.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

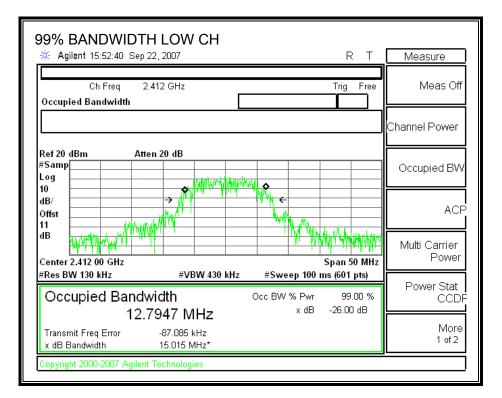
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	2412	12.7947
Middle	2437	12.5410
High	2462	12.5387

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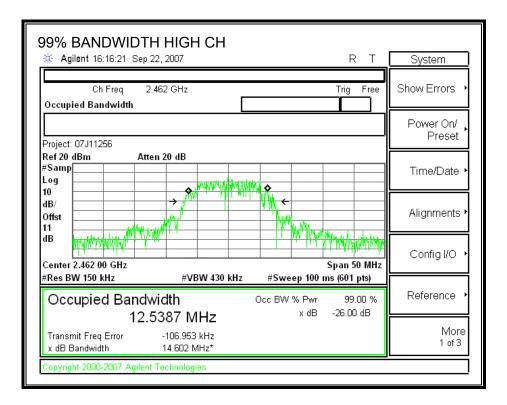
99% BANDWIDTH



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99% BANDWIDTH MID CH	System
Ch Freq 2.437 GHz Trig Free Occupied Bandwidth	Show Errors 🔸
Project: 07J11256	Power On/ Preset
Ref 20 dBm Atten 20 dB #Samp	Time/Date ▸
dB/ Offst	Alignments •
dB Center 2.437 00 GHz Span 50 MHz	Config I/O 🔸
#Res BW 130 kHz #VBW 390 kHz #Sweep 100 ms (601 pts)	
Occupied Bandwidth Occ BW % Pwr 99.00 % 12.5410 MHz x dB -26.00 dB	Reference •
Transmit Freq Error -16.145 kHz x dB Bandwidth 14.237 MHz*	More 1 of 3
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7.1.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

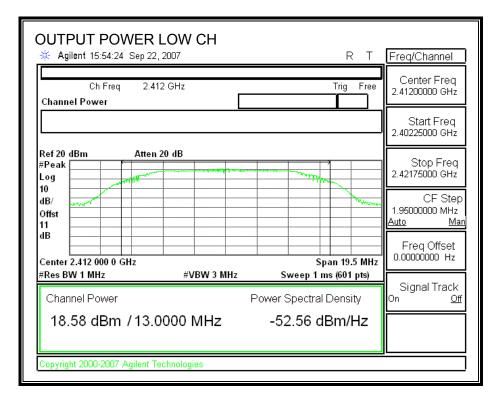
Peak power is measured using the spectrum analyzer's internal channel power integration function. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.

RESULTS

Channel	Frequency	Frequency Output Power Limit		Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	18.58	30	-11.42
Middle	2437	18.74	30	-11.26
High	2462	18.33	30	-11.67

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OUTPUT POWER



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OUTPUT POWER N		RT	Freq/Channel		
Ch Freq 2.437 Channel Power	GHz	Trig Free	Center Freq 2.43700000 GHz		
Project: 07J11256			Start Freq 2.42725000 GHz		
Ref 20 dBm Atten 2 #Peak Log			Stop Freq 2.44675000 GHz		
10 dB/ Offst 11		The second secon	CF Step 1.95000000 MHz <u>Auto Man</u>		
dB Center 2.437 000 0 GHz		Span 19.5 MHz	Freq Offset 0.00000000 Hz		
#Res BW 1 MHz Channel Power	#VBW 3 MHz	Sweep 1 ms (601 pts) Power Spectral Density	Signal Track On <u>Off</u>		
18.74 dBm / 13.0000 MHz -52.40 dBm/Hz					
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	PUT P ilent 16:16	-		-	I CH					₹Т	Freq/Chan	nel
Chann	Ch F el Power	•	2.46	2 GHz					Trig	Free	Center F 2.46200000	Freq
1 1	07J11258	6									Start F 2.45225000	
Ref 20 #Peak Log 10			Atten	20 dB		W-un					Stop F 2.47175000	
dB/ Offst 11											CF 1.95000000 <u>Auto</u>	Step MHz <u>Man</u>
	2.462 000) 0 GI	Hz).5 MHz	Freq Of 0.00000000	
	w 1 MHz inel Pow	rer		#\	/BW 3 N			weep 1 Spectral		• ·	Signal T On	rack <u>Off</u>
18.	18.33 dBm / 13.0000 MHz -52.81 dBm/Hz											
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7.1.4. 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 11 dB (including 10 dB pad and 10 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	16.21
Middle	2437	16.24
High	2462	16.15

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7.1.5. 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

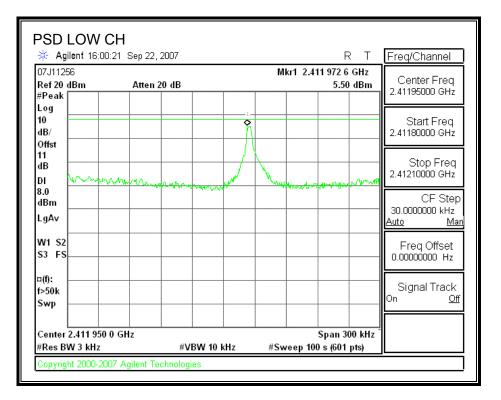
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS

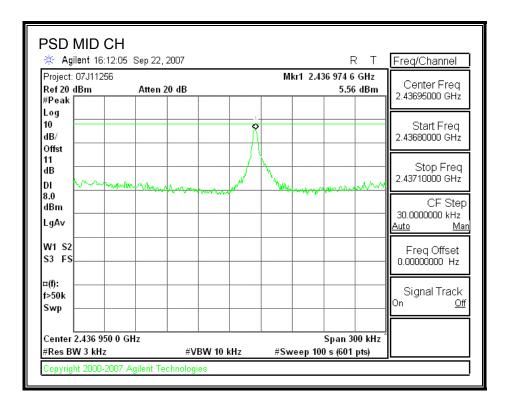
Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	5.50	8	-2.50
Middle	2437	5.56	8	-2.44
High	2462	5.50	8	-2.50

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POWER SPECTRAL DENSITY



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Atten 20 dB	INI	kr1 2.461 974 1 GHz	
		5.50 dBm	Center Freq 2.46195000 GHz
	1		
			Start Freq 2.46180000 GHz
			Stop Freq 2.46210000 GHz
Mar Hunghoring + work	~~	Marcovin Markan Marcovin Marcovin Marcovin Markan	CF Step 30.0000000 kHz
			Auto Ma
			Freq Offset 0.00000000 Hz
			Signal Track

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7.1.6. 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

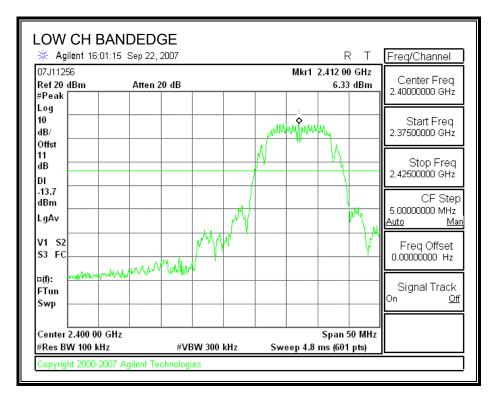
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

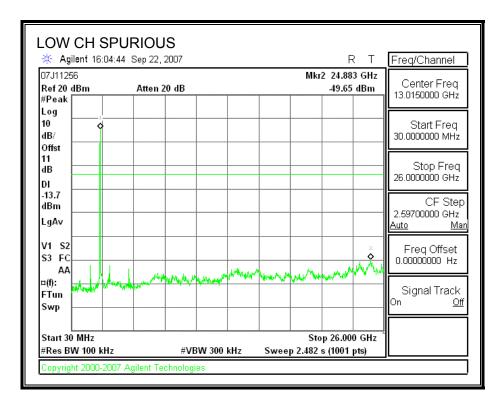
RESULTS

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SPURIOUS EMISSIONS, LOW CHANNEL

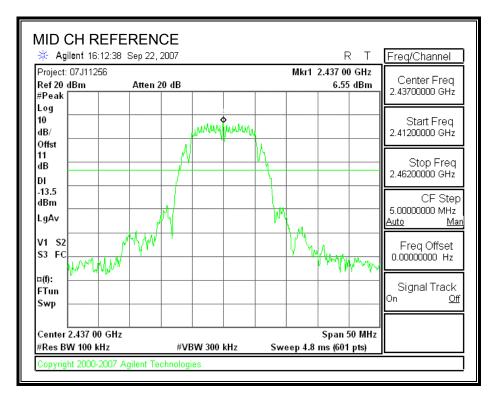


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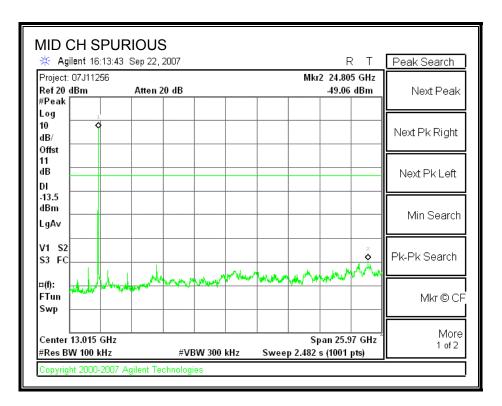


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SPURIOUS EMISSIONS, MID CHANNEL

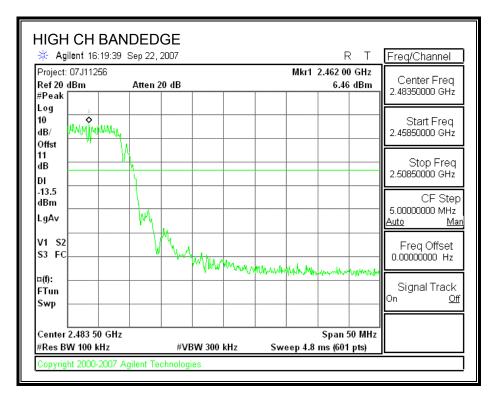


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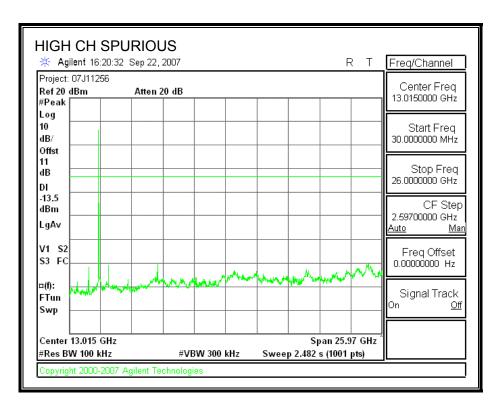


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SPURIOUS EMISSIONS, HIGH CHANNEL



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7.2. 802.11g MODE IN THE 2.4 GHz BAND

7.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

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

TEST PROCEDURE

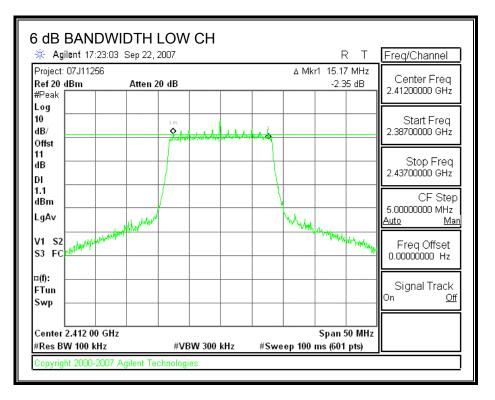
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

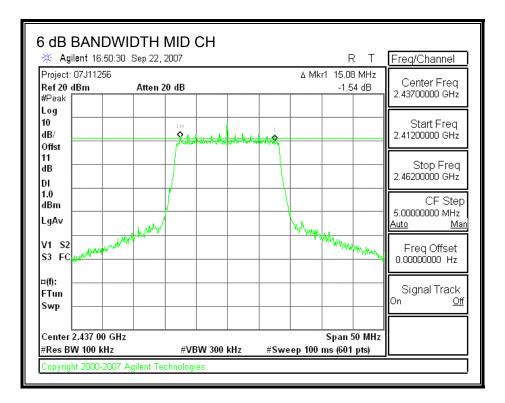
Channel	Frequency	6 dB Bandwidth	Minimum Limit
	(MHz)	(MHz)	(MHz)
Low	2412	15.17	0.5
Middle	2437	15.08	0.5
High	2462	15.08	0.5

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6 dB BANDWIDTH



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Project: 07J1125 Ref 20 dBm #Peak	Atten 2	20 dB			1.46 dB	Center Freq 2.46200000 GHz
Log 10 dB/ Offst		IR Anthur Maan	-	1. Orihan		Start Freq 2.43700000 GHz
11 dB DI						Stop Freq 2.48700000 GHz
1.1 dBm LgAv				- Mue		CF Step 5.00000000 MHz <u>Auto Mar</u>
LgAv V1 S2 S3 FC	states and the second				the the many for the second	Freq Offset 0.00000000 Hz
¤(f): FTun Swp						Signal Track On <u>Off</u>

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7.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

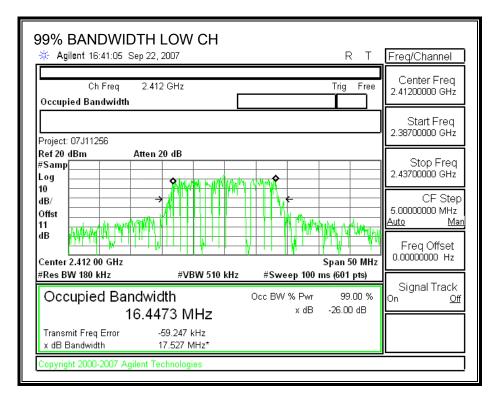
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	2412	16.4473
Middle	2437	16.4092
High	2462	16.4721

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99% BANDWIDTH



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99% BANDWIDT			RТ	Swe	эөр
Ch Freq 2 Occupied Bandwidth	.437 GHz		Trig Free		ep Time 100.0 ms <u>Man</u>
Project: 07J11256				<u>Single</u>	Sweep <u>Cont</u>
Ref 20 dBm Att #Samp	en 20 dB			Auto <u>Norm</u>	Sweep Time <u>Accy</u>
dB/ Offst 11 dB				On	Gate <u>Off</u>
Center 2.437 00 GHz #Res BW 180 kHz	#VBW 510 kH		Span 50 MHz ns (601 pts)	Gate	Setup '
Occupied Bandv 16.	width 4092 MHz	Occ BW % Pwr x dB	99.00 % -26.00 dB		Points 601
Transmit Freq Error x dB Bandwidth	-26.980 kHz 17.569 MHz*				
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99% BANDWIDTH HIGH CH	RT	Freq/Channel
Ch Freq 2.462 GHz Occupied Bandwidth	Trig Free	Center Freq 2.46200000 GHz
Project: 07J11256		Start Freq 2.43700000 GHz
Ref 20 dBm Atten 20 dB #Samp Log 10 dB/ Offst 11 dB		Stop Freq 2.48700000 GHz CF Step 5.00000000 MHz <u>Auto Man</u> Freq Offset 0.00000000 Hz
Center 2.462 00 GHz #Res BW 180 kHz #VBW 560 kHz	Span 50 MHz Hz #Sweep 100 ms (601 pts)	
Occupied Bandwidth 16.4721 MHz	Occ BW % Pwr 99.00 % x dB -26.00 dB	Signal Track On <u>Off</u>
Transmit Freq Error-31.632 kHzx dB Bandwidth17.514 MHz*		
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7.2.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

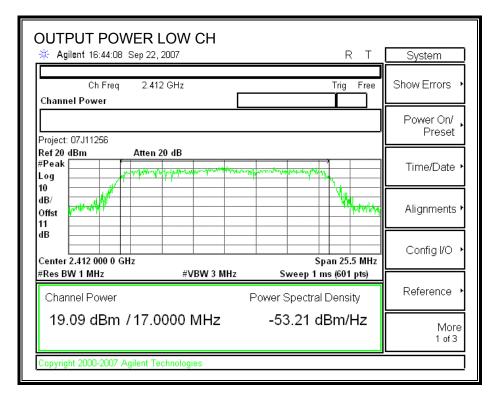
Peak power is measured using the spectrum analyzer's internal channel power integration function. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.

RESULTS

Channel	Frequency	Output Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	19.09	30	-10.91
Middle	2437	18.88	30	-11.12
High	2462	18.75	30	-11.25

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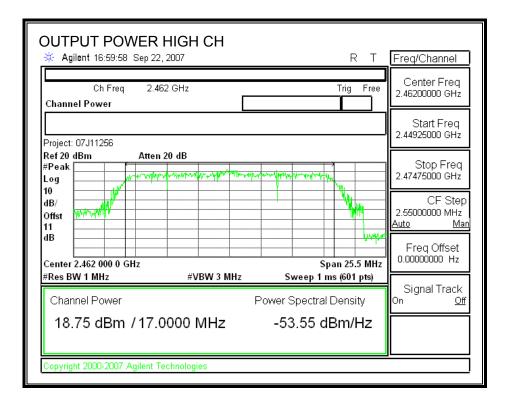
OUTPUT POWER



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OUTPUT POWER MID CH Agilent 16:53:03 Sep 22, 2007 R T	System
Ch Freq 2.437 GHz Trig Free Channel Power	Show Errors
Project: 07J11256	Power On/ Preset
Ref 20 dBm Atten 20 dB #Peak Log	Time/Date ▸
10 dB/ Offst	Alignments 🕨
dB	Config I/O 🔸
#Res BW 1 MHz #VBW 3 MHz Sweep 1 ms (601 pts) Channel Power Power Spectral Density	Reference 🕨
18.88 dBm / 17.0000 MHz -53.43 dBm/Hz	More 1 of 3
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7.2.4. 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 11 dB (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	15.16
Middle	2437	15.29
High	2462	15.17

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7.2.5. 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

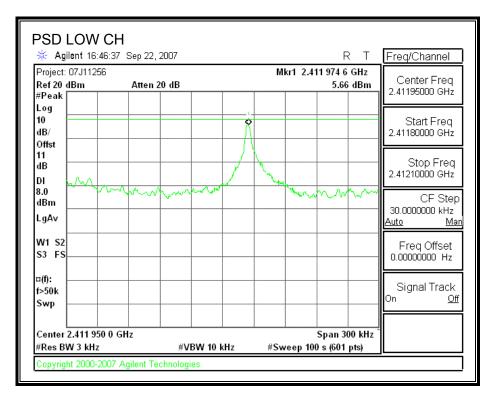
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS

Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	5.66	8	-2.34
Middle	2437	5.68	8	-2.32
High	2462	6.05	8	-1.95

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POWER SPECTRAL DENSITY



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		Mkr1 2.43	36 974 1 GHz	Center Freq
Atten 20 dB			5.68 dBm	2.43695000 GHz
	1			
	Ŷ			Start Freq 2.43680000 GHz
	$\rightarrow \mathbb{N}$			2.43000000 0112
	A			Stop Freq
	J.M.	man		2.43710000 GHz
manne	ATT	Yow	non	CF Ster
				30.0000000 kHz
				<u>Auto Ma</u>
				Freq Offset
				0.00000000 Hz
				Signal Track On <u>Of</u>
			Span 300 kHz	
	Atten 20 dB	1		

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Agilent 17:06: Decident: 07.111200	.00 000 22, 2001		R T	Freq/Channel
Project: 07J11256 Ref 20 dBm #Peak	Atten 20 dB		6.05 dBm	Center Freq 2.46195000 GHz
Log		11		_
10 dB/		Ň		Start Freq 2.46180000 GHz
Offst 11 dB		+/		- Stop Freq 2.46210000 GHz
DI MAR 8.0 dBm	mannen		munn	
LgAv				Auto Ma
W1 S2 S3 FS				Freq Offset 0.00000000 Hz
¤(f): f>50k				Signal Track
Swp				
				Signal Trac

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7.2.6. 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

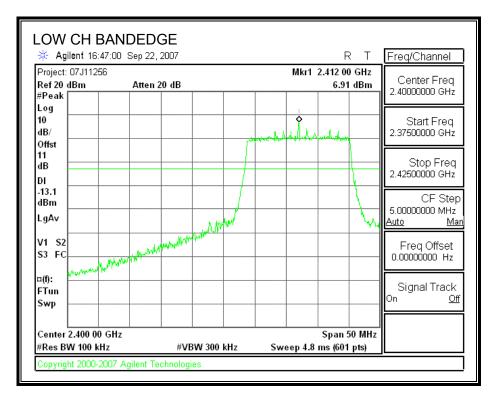
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

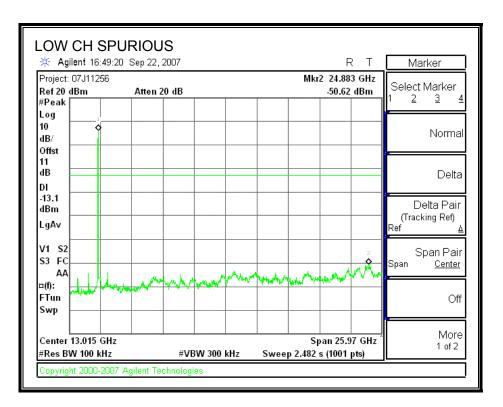
RESULTS

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SPURIOUS EMISSIONS, LOW CHANNEL

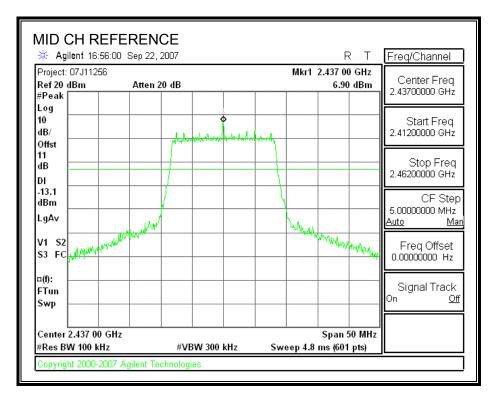


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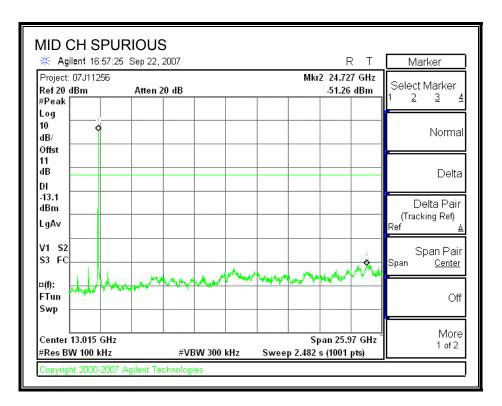


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SPURIOUS EMISSIONS, MID CHANNEL

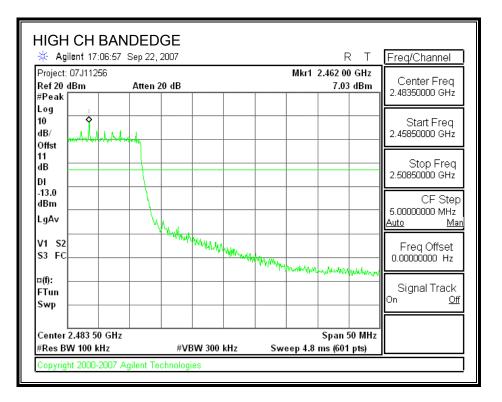


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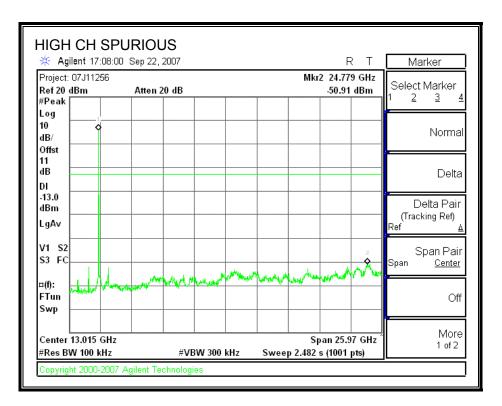


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SPURIOUS EMISSIONS, HIGH CHANNEL



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8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

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

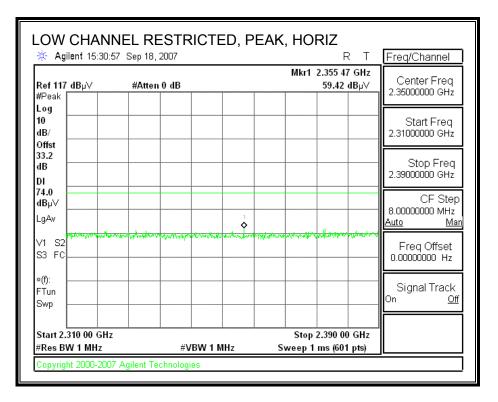
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

The 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.

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

DIPOLE, 2.21dBi ANTENNA

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

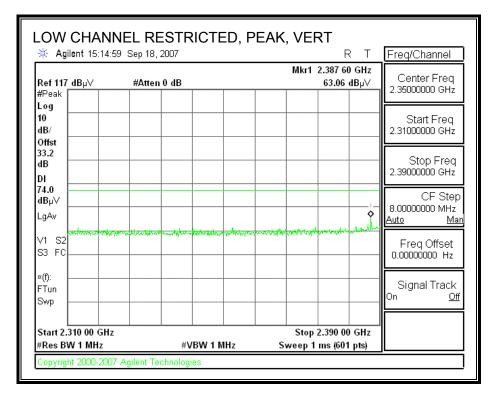


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🔆 Agilent 15:31:31		D, AVG, HORIZ	Freq/Channel
Ref 117 dBµ∨ #Peak	#Atten 0 dB	Mkr1 2.390 00 GHz 46.83 dBµ∀	Center Freq 2.35000000 GHz
Log 10 dB/ Offst			Start Freq 2.31000000 GHz
33.2 dB			Stop Freq
DI 54.0 dBµ∀			CF Step 8.0000000 MHz
LgAv V1 S2 S3 FC			Auto Mar Freq Offset 0.00000000 Hz
*(f): FTun Swp			Signal Track On <u>Off</u>
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 10 F	Stop 2.390 00 GHz Iz Sweep 6.238 s (601 pts)	ļ

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RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

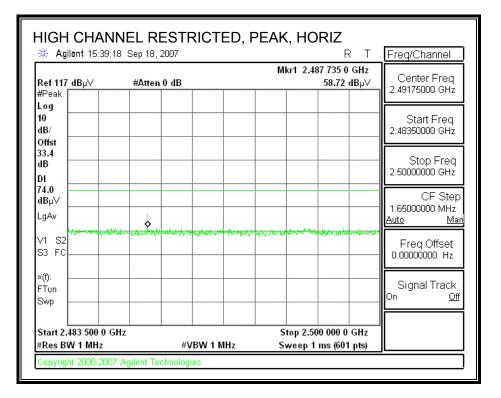


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Agilent 15:15:34	EL RESTRICTED Sep 18, 2007	R T	Freq/Channel
Ref 117 dBµ∨ #Peak	#Atten 0 dB	Mkr1 2.390 00 GHz 49.44 dBμ∀	Center Freq 2.35000000 GHz
Log 10 dB/ Offst			Start Freq 2.31000000 GHz
33.2 dB			Stop Freq 2.39000000 GHz
DI 54.0 dBµ∨ LgAv			CF Step 8.0000000 MHz <u>Auto Mar</u>
V1 S2 S3 FC	· · · · · · · · ·		Freq Offset 0.00000000 Hz
×(f): FTun Swp			Signal Track On <u>Off</u>
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 10 Hz	Stop 2.390 00 GHz Sweep 6.238 s (601 pts)	

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RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

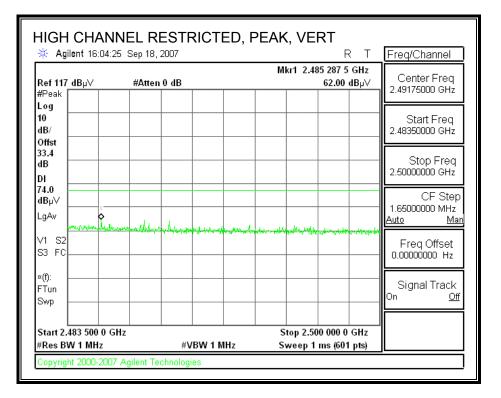


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☆ Agilent 15:53:51 Sep 18, 2007 Ref 117 dBµ∨ #Atten 0 dl #Peak		Mkr1 2.500	R T 0000 0 GHz 46.68 dBµ∨	Freq/Channel Center Freq 2.49175000 GHz Start Freq 2.48350000 GHz
10 dB/ Offst 33.4				
33.4				1
DI				Stop Freq 2.5000000 GHz
54.0 dBµ∀ LgAv				CF Step 1.65000000 MHz <u>Auto Man</u>
V1 S2				Freq Offset 0.00000000 Hz
×(f): FTun Swp				Signal Track On <u>Off</u>
Start 2.483 500 0 GHz #Res BW 1 MHz	#VBW 10 Hz	Stop 2.500 Sweep 1.287 s		

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RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



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🔆 Agilent 16:04:43		ED, AVG, VERT	Freq/Channel
Ref 117 dBµ∨ #Peak	#Atten 0 dB	Mkr1 2.483 500 0 GHz 49.29 dBµ∨	Center Freq 2.49175000 GHz
Log 10 dB/ Offst			Start Freq 2.48350000 GHz
dB			- Stop Freq 2.5000000 GHz
54.0 dBµ∨ LgAw			CF Step 1.65000000 MHz <u>Auto Mar</u>
V1 S2 S3 FC			Freq Offset 0.00000000 Hz
×(f): FTun Swp			Signal Track On <u>Off</u>
Start 2.483 500 0 GH #Res BW 1 MHz	lz #VBW 10	Stop 2.500 000 0 GHz Hz Sweep 1.287 s (601 pts)	_

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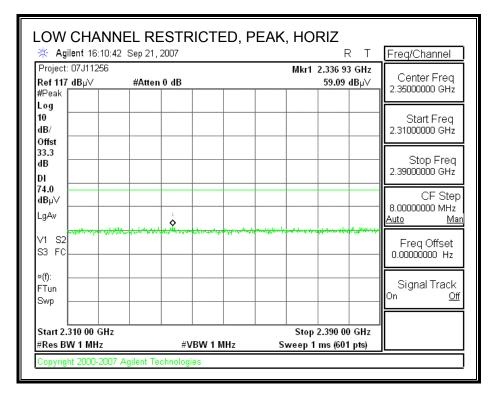
HARMONICS AND SPURIOUS EMISSIONS

ode: Tx 11b Mode (with Mitsumi DCA-E04_2.21dBi Antenna) est Equipment: Pre-amplifer 1-26GHz Pre-amplifer 26-40GHz Horn > 18GHz Limit T144 Miteg 3008A00931 Pre-amplifer 26-40GHz Horn > 18GHz Limit Frequency Cables 2 foot cable 3 foot cable 12 foot cable Peak Measurements Notes 1 Dist Read Pk Read Avg. AF CL Amp D Corr< Fltr	$ \begin{array}{c} \text{pert # 0.7J11256} \\ \text{e: 09/18:07} \\ \text{tr Engineer: Vien Tran} \\ \text{figuration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, \\ \text{de: Tx 11b Mode (with Mitsumi DCA-E04_2 21dBi Antenna)} \\ \text{tr Equipment:} \\ \hline \\ $					5m Ch	amber										
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Higumation: EUT on JG, Desktop, Mouitor, Key Board, Mouse, de: Tx 11b Mode (with Mitsumi DCA-E04_2.21dBi Antenna) triguipment: Pre-amplifer 1-26GHz Pre-amplifer 1-26GHz Horn > 18GHz Limit Tit44 Miteg 3008A00931 Pre-amplifer 26-40GHz Horn > 18GHz Limit Colspan="4">Tit44 Miteg 3008A00931 Pre-amplifer 26-40GHz Horn > 18GHz Limit Trigenery Colles Image: Colspan="4">Image: Colspan="4">Limit Peak Measurements To state and Pk Read Avg AF CL Amp D Corr Fitr Peak Measurements Rew=UMBL Peak Measurements Tit4 Miteg 3008A00931 Image: Colspan="4">Peak Measurements Peak Measurements Tit4 Miteg 3008A00931 Image: Colspan="4">Peak Measurements Tit4 Miteg 3008A00931 Image: Colspan="4">Peak Measurements Tit4 State Colspan="4">Peak Measurements Tit4 State Col	#: 07J1 9/18/07	1256														
And Set Equipment: Pre-amplifer 1-26GHz Pre-amplifer 26-40GHz Horn > 18GHz Limit 173; SN: 6717 @3m T144 Mireq 3008A00931 T144 Mireq 3008A00931 T T FC 15.205 HFrequency Cables 3 foot cable 12 foot cable HPF_4.0GHz Reject Filter Peak Measurements RBW=VBW=IMHz Merce ad Pk Read Avg AF CL Amp D Corr Flt Peak Avg Pk Lim Avg Lim Pk Mar Avg Mar Notes f Dist Read Avg AF CL Amp D Corr Flt Peak Avg Lim Pk Mar Avg Mar Notes gHz mdBnV dBm dB dB dB dB dB dB dB V MBuVm dB V WW WCHANNEL, 2412 MHz Avg A43 325 328 64 366 0.0 0.5 468 35.7 74 54 -27.2 18.3 V WCHANNEL, 2412 MHz	Art Equipment: Horn 1-18GHz Pre-amplifer 1-26 GHz Horn > 18 GHz Limit T144 Miteq 3008A00931 Pre-amplifer 26-40 GHz Horn > 18 GHz Limit C 1144 Miteq 3008A00931 T144 Miteq 3008A00931 Pre-amplifer 26-40 GHz Horn > 18 GHz Limit C 1 144 Miteq 3008A00931 T12 foot cable Peak Measurements Pak Measurements A foot cable Pak Mar Measurements V Claber Peak Mage Mar Motes Mar Mar Mage Mar Motes Mar Mage Mar Motes V Claber Peak Mar Mar Mage Mar Motes V Claber V Claber V Claber V Claber Peak Marg Mar Motes V Baw dBaw dBaw dBa dB dB dB dB dBw/m dBuV/m dBuV/m dBuV/m dB dB V/m dB dB (V/H) V Claber V Claber V Claber V Claber V Claber V Claber V Claber V Cl	ration:	EUT on JI	G, Desktop,													
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Image: Construction of the system o	A-5m Chamber Peak Average Measurements RBW=1MHz; VBW=10Hz Image Measurements RBW=1MHz; VBW=10Hz Notes HZ (m) dB dB GB O Average Measurements RBW=1MHz; VBW=10Hz VB Average Measurements RBW=1MHz; VBW=10Hz ME Mage Mage Mage Mage Mage Mage Mage Mage	2 foot	cable	3	foot c	able		12	foot c	able		HPF	Re	ject Filte			
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W CHANNEL, 2412 MHz Number of the system of the syste	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Dist	Read Pk		AF		Amp	D Corr					-	Pk Mar	-	Notes	
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124 3.0 42.2 29.8 33.4 7.0 -36.5 0.0 0.6 46.7 34.3 7.4 54 -27.3 -19.7 H 186 3.0 47.7 41.9 35.0 8.4 -36.2 0.0 0.6 55.6 49.8 74 54 -18.4 -4.2 H 310 3.0 41.4 29.2 37.6 12.2 -35.4 0.0 0.9 56.7 44.5 74 54 -17.3 -9.5 H	14 3.0 42.2 29.8 33.4 7.0 -36.5 0.0 0.6 46.7 34.3 7.4 54 -27.3 -19.7 H 16 3.0 47.7 41.9 35.0 8.4 -36.2 0.0 0.6 55.6 49.8 74 54 -18.4 -4.2 H 10 3.0 41.4 29.2 37.6 12.2 -35.4 0.0 0.9 56.7 44.5 74 54 -18.4 -4.2 H	3.0	51.4	45.3	35.0	8.4	-36.2	0.0	0.0	59.3	53.2	74	54	-14.7	- 0.8	v	
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No other emissions were detected above system noise floor	No other emissions were detected above system noise floor Image: Constraint of the system noise floor Image: Constraint of the system noise floor																
			No other o	missions were	detected	ahove -	vstem vei	se floor									
			i in a mere	missions were	20100100	andve s	ystem no:		L		·				<u> </u>	1	
			mce Ce wy: Mitss # 07JJ 0/18/07 gineer: ration: 1 in 11b in crn 1- in crn 1- in crn 1- in crn 1- in crn 2- in crn 2- in crn 2- in crn 3- in	nce Certification y: Mitsumi Electr #: 07J11256 D/18/07 gineer: Vien Tran ration: EUT on JJ/ Tx 11b Mode (with uipment: orn 1-18GHz S/N: 6717 @3m uency Cables 2 foot cable Dist Read Pk (m) dBuV ANNEL, 2412 MHz 3.0 43.6 3.0 42.5 INNEL, 2437 MHz 3.0 43.6 3.0 42.2 3.0 44.2 3.0 40.8 3.0 40.7 3.0 41.4 3.0 41.4 3.0 41.4	nce Certification Services, Fr y: Mitsumi Electric Co., LTD #: 07JL1256 D/18/07 gineer: Vien Tran ration: EUT on JIG, Desktop, Tx 11b Mode (with Mitsumi D uipment: orn 118GHz Pre-ar T144 M uency Cables 2 foot cable 2 foot cable 2 foot cable 2 foot cable 30 436 30 422 298 30 464 30 464 30 412 30 464 30 412 30 412 30 414 30 414 30 414 30 414 30 412 30 414 30 30 414 30 30 414 30 30 414 30 30 414 30 414 30 30 30 30 30 30 30 30 30 30 30 30 30 3	y: Mitsumi Electric Co., LTD #: 07J11256 //18/07 gineer: Vien Tran ration: EUT on JG, Desktop, Monito Fx 11b Mode (with Mitsumi DCA-EO- uipment: orn 1-18GHz Pre-amplifer T144 Miteq 30 uency Cables 2 foot cable 2 foot cable 2 foot cable 2 foot cable 2 foot cable 2 foot cable 2 foot cable 3 foot c 2 foot cable 3 foot c 3 foot c	Ince Certification Services, Fremont 5m Ch wire Mitsumi Electric Co., LTD #: 07J11256 D/18/07 gineer: Vien Tran ration: EUT on JIG, Desktop, Monitor, Key fx 11b Mode (with Mitsumi DCA-E04_2.21 uipment: orn 1-18GHz orn 1-18GHz Pre-amplifer 1-260 S/N: 6717 @3m Dist Read Pk Mead Avg. AF CL (m) dBuV dBuV <td>nce Certification Services, Fremont 5m Chamber y: Mitsumi Electric Co., LTD #: 07JI1256 D/18/07 gineer: Vien Tran ration: EUT on JIG, Desktop, Monitor, Key Board, Tx 11b Mode (with Mitsumi DCA-E04_2.21dBi Ant uipment: orn 1-18GHz S/N: 6717 @3m Unercy Cables 2 foot cable 2 foot cable</td> <td>Ince Certification Services, Fremont 5m Chamber w: Mitsumi Electric Co., LTD #: 07J11256 D/18/07 gineer: Vien Tran ration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, Tran ration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, Orn 1-18GHz Pre-amplifer 1-26GHz Pre-amplifer 1-26GHz Orn 1-18GHz Pre-amplifer 1-26GHz Orn 1-18GHz Pre-amplifer 1-26GHz Orn 1-18GHz Pre-amplifer 1-26GHz Orn 1144 Miteq 3008A00931 \checkmark Import Colspan="2">Import colspan="2">Import colspan="2" 2 foot cable 3 foot cable Inter Mater and Avg. AF CL Amp Dist Read Pk Read Avg. AF CL Amp Juppende de d</td> <td>nice Certification Services, Fremont 5m Chamber wissumi Electric Co., LTD #: 07JIL256 $0/18/07$ gineer: Vien Tran ration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, Fx 11b Mode (with Mitsumi DCA-E04_2.21dBi Antenna) uipment: orn 1-18GHz Pre-amplifer 1-26GHz S/N: 6717 @3m Pre-amplifer 1-26GHz T144 Miteq 3008A00931 uipment: Orn 1-18GHz Pre-amplifer 1-26GHz T144 Miteq 3008A00931 User Cable 12 foot cable Joint Read Pk Read Avg. AF CL Amp Dist Read Pk Read Avg. AF CL Amp D Corr Fltr MIRU, 2412 MHz III 30 42.5 30.5 32.8 6.4 -36.6 0.0 0.5 SINNEL, 2412 MHz III SINNEL, 2423 MHz III SINNEL, 2423 MHz IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII</td> <td>Ince Certification Services, Fremont 5m Chamber with sumi Electric Co., LTD #: 07J11256 $0/18/07$ gineer: Vien Tran ration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, Tran ration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, prevident colspan="2">Pre-amplifer 1-26 GHz Pre-amplifer 1-26 GHz Orn 1-18 GHz Pre-amplifer 1-26 GHz Orn 1-18 GHz Pre-amplifer 1-26 GHz Orn 1-18 GHz Pre-amplifer 1-26 GHz Orn 14 Miteq 3008 A00931 Toto cable 3 foot cable 12 foot cable Stot cable 12 foot cable Dist Read Pk Read Avg. AF CL Amp D Corr Fltr Peak Mibu 30 d325 328 64 366 00 05 468 30 42.2 30.5 32.8 64 366 0 30 42.2 29.8</td> <td>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</td> <td>nce Certification Services, Fremont 5n Chamber y: Mitsumi Electric Co., LTD #: 07J11256 918:07 gneer: Vien Tran ration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, TS 11b Mode (with Mitsumi DCA-E04_2.21dBi Antenna) upment: orn 1-18GHz pinent: p</td> <td>$\begin{array}{c} \mbox{Certification Services, Fremont 5m Chamber} \\ \mbox{with Sumi Electric Co., LTD} \\ \mbox{#: 07J11256} \\ \mbox{J1807} \\ \mbox{gineer: Vien Tran} \\ \mbox{ration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, } \\ \mbox{Tx 11b Mode (with Mitsumi DCA-E04_2.21dBi Antenna)} \\ \mbox{with Mitsumi DCA-E04_20} \\ with$</td> <td>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</td> <td>$\begin{array}{c} \mbox{rec} \ \mbox{Certification Services, Fremont 5m Chamber} \\ \mbox{y: Mitsumi Electric Co., LTD} \\ \$</td> <td>$\begin{array}{c} \mbox{Perturbation Services, Fremont 5m Chamber } \\ \mbox{y: Mitsumi Electric Co., LTD } \\ \$</td>	nce Certification Services, Fremont 5m Chamber y: Mitsumi Electric Co., LTD #: 07JI1256 D/18/07 gineer: Vien Tran ration: EUT on JIG, Desktop, Monitor, Key Board, Tx 11b Mode (with Mitsumi DCA-E04_2.21dBi Ant uipment: orn 1-18GHz S/N: 6717 @3m Unercy Cables 2 foot cable 2 foot cable	Ince Certification Services, Fremont 5m Chamber w: Mitsumi Electric Co., LTD #: 07J11256 D/18/07 gineer: Vien Tran ration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, Tran ration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, Orn 1-18GHz Pre-amplifer 1-26GHz Pre-amplifer 1-26GHz Orn 1-18GHz Pre-amplifer 1-26GHz Orn 1-18GHz Pre-amplifer 1-26GHz Orn 1-18GHz Pre-amplifer 1-26GHz Orn 1144 Miteq 3008A00931 \checkmark Import Colspan="2">Import colspan="2">Import colspan="2" 2 foot cable 3 foot cable Inter Mater and Avg. AF CL Amp Dist Read Pk Read Avg. AF CL Amp Juppende de d	nice Certification Services, Fremont 5m Chamber wissumi Electric Co., LTD #: 07JIL256 $0/18/07$ gineer: Vien Tran ration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, Fx 11b Mode (with Mitsumi DCA-E04_2.21dBi Antenna) uipment: orn 1-18GHz Pre-amplifer 1-26GHz S/N: 6717 @3m Pre-amplifer 1-26GHz T144 Miteq 3008A00931 uipment: Orn 1-18GHz Pre-amplifer 1-26GHz T144 Miteq 3008A00931 User Cable 12 foot cable Joint Read Pk Read Avg. AF CL Amp Dist Read Pk Read Avg. AF CL Amp D Corr Fltr MIRU, 2412 MHz III 30 42.5 30.5 32.8 6.4 -36.6 0.0 0.5 SINNEL, 2412 MHz III SINNEL, 2423 MHz III SINNEL, 2423 MHz IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Ince Certification Services, Fremont 5m Chamber with sumi Electric Co., LTD #: 07J11256 $0/18/07$ gineer: Vien Tran ration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, Tran ration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, prevident colspan="2">Pre-amplifer 1-26 GHz Pre-amplifer 1-26 GHz Orn 1-18 GHz Pre-amplifer 1-26 GHz Orn 1-18 GHz Pre-amplifer 1-26 GHz Orn 1-18 GHz Pre-amplifer 1-26 GHz Orn 14 Miteq 3008 A00931 Toto cable 3 foot cable 12 foot cable Stot cable 12 foot cable Dist Read Pk Read Avg. AF CL Amp D Corr Fltr Peak Mibu 30 d325 328 64 366 00 05 468 30 42.2 30.5 32.8 64 366 0 30 42.2 29.8	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	nce Certification Services, Fremont 5n Chamber y: Mitsumi Electric Co., LTD #: 07J11256 918:07 gneer: Vien Tran ration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, TS 11b Mode (with Mitsumi DCA-E04_2.21dBi Antenna) upment: orn 1-18GHz pinent: p	$ \begin{array}{c} \mbox{Certification Services, Fremont 5m Chamber} \\ \mbox{with Sumi Electric Co., LTD} \\ \mbox{#: 07J11256} \\ \mbox{J1807} \\ \mbox{gineer: Vien Tran} \\ \mbox{ration: EUT on JIG, Desktop, Monitor, Key Board, Mouse, } \\ \mbox{Tx 11b Mode (with Mitsumi DCA-E04_2.21dBi Antenna)} \\ \mbox{with Mitsumi DCA-E04_20} \\ with$	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$ \begin{array}{c} \mbox{rec} \ \mbox{Certification Services, Fremont 5m Chamber} \\ \mbox{y: Mitsumi Electric Co., LTD} \\ $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$	$ \begin{array}{c} \mbox{Perturbation Services, Fremont 5m Chamber } \\ \mbox{y: Mitsumi Electric Co., LTD } \\ $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$

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INVERTED-F, 1.38dBi ANTENNA

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

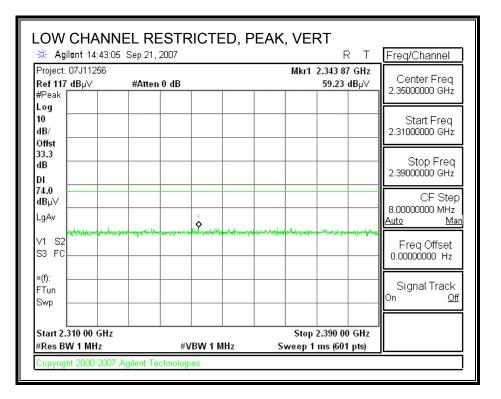


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LOW CHANN		D, AVG, HORIZ	Freq/Channel
Project: 07J11256) Dep 21, 2007		
Project. 07311256 Ref 117 dBµ∨ #Peak	#Atten 0 dB	Mkr1 2.390 00 GHz 47.74 dBµ∨	Center Freq 2.35000000 GHz
Log 10 dB/ Offst			Start Freq 2.31000000 GHz
33.3 dB			Stop Freq 2.39000000 GHz
54.0 dBµ∀ LgAv			CF Step 8.00000000 MHz
V1 S2			Auto Man Freq Offset 0.00000000 Hz
×(f): FTun Swp			Signal Track On <u>Off</u>
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 10 Hz	Stop 2.390 00 GHz Sweep 6.238 s (601 pts)	*

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RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

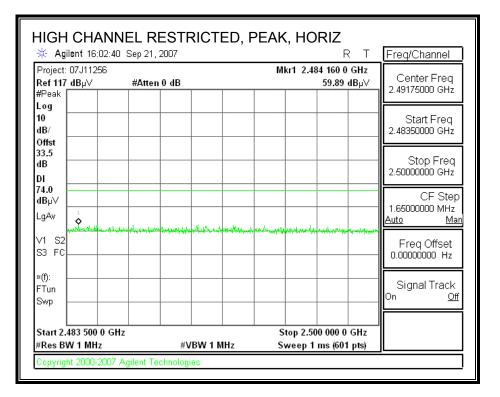


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LOW CHANNEL RI		AVG, VERT	T Freq/Channel
Project: 07J11256 Ref 117 dB µ∨ #Atten #Peak	n 0 dB	Mkr1 2.362 93 46.98 dl	GHz Contor From
Log 10 dB/ Offst			Start Freq 2.31000000 GHz
33.3 dB DI			Stop Freq 2.39000000 GHz
54.0 dBμV LgAv			CF Step 8.00000000 MHz <u>Auto Man</u>
V1 S2		1 •	Freq Offset 0.00000000 Hz
×(f): FTun Swp			Signal Track
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 10 Hz	Stop 2.390 00 (Sweep 6.238 s (601 pt	

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RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

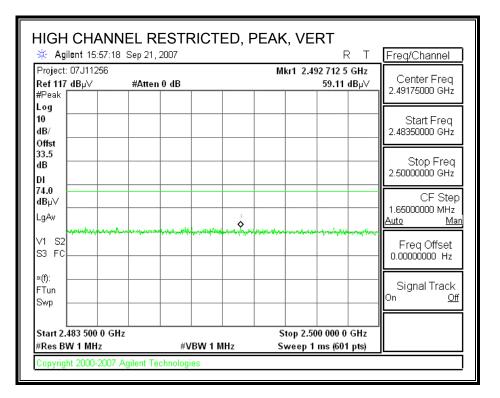


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	RESTRICTED,	-	
🔆 Agilent 16:02:59 Se	p 21, 2007	RT	Freq/Channel
#Peak	Atten 0 dB	Mkr1 2.483 610 0 GHz 47.82 dBµ∨	Center Freq 2.49175000 GHz
Log 10 dB/ Offst			Start Freq 2.48350000 GHz
33.5 dB			Stop Freq 2.50000000 GHz
54.0 dBμV LgAv			CF Step 1.6500000 MHz Auto Mar
V1 S2 S3 FC			Freq Offset 0.00000000 Hz
»(f): FTun Swp			Signal Track On <u>Off</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)	2 Automatic
#Res BW 1 MHz Copyright 2000-2007 Agile		Sweep 1.287 s (601 pts)	

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RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



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		TED, AVG, V		
🔆 Agilent 15:57:18	Sep 21, 2007		RT	Freq/Channel
Project: 07J11256 Ref 117 dB µ∨ #Peak	#Atten 0 dB	Mkı	1 2.483 582 5 GHz 47.56 dBμ∀	Center Freq 2.49175000 GHz
Log 10 dB/ Offst				Start Freq 2.48350000 GHz
33.5 dB				Stop Freq 2.5000000 GHz
54.0 dBµ∨ LgAv				CF Step 1.6500000 MHz Auto Man
V1 S2 S3 FC				<u>Auto Man</u> Freq Offset 0.0000000 Hz
»(f): FTun Swp				Signal Track
Start 2.483 500 0 GHz #Res BW 1 MHz	#VBW *		op 2.500 000 0 GHz p 1.287 s (601 pts)	
Copyright 2000-2007 A	gilent Technologies			

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HARMONICS AND SPURIOUS EMISSIONS

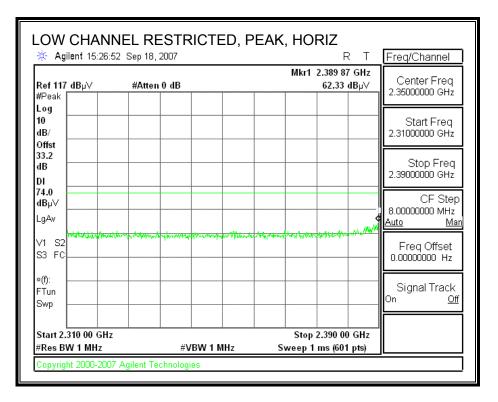
			Services, Fr	emont	3m Ch	amber									
oject≠	y: Mits #: 07J] 1/21/07		ic Co., LTD												
est Eng	gineer:	Vien Tran				_									
			G, Desktop, Parrot_PIF					na)							
	uipmen		_				-								
		<u></u> 18GHz	Pre-ar	nplifer	1-260	SHz	Pre-am	plifer	26-40GH	-	н	orn > 18	GH7		Limit
		310 @3m		Agilent 3						-				-	FCC 15.205 🖵
	uency Cal													<u> </u>	
	2 foot		3	foot d	able		121	foot c	able		HPF	R	eject Filte		k Measurements
Frar	nk 17707	79007	-			-	Chin 20	035400)1	HPF	F_4.0GHz	•		Avera	W=VBW=1MHz age Measurements =1MHz ; VBW=10Hz
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mər	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	1	-	dBuV/m	dBuV/m	1	dB	(V/H)
OW CH/ 284	ANNEL, 3.0	2412 MHz 46.7	33.6	33.2	33	-34.8	0.0	0.5	48.9	35.8	74	54	-25.1	-18.2	v
284	3.0	48.3	40.5	33.2	3.3	-34.8	0.0	0.5	50 <i>5</i>	42.7	74 74	54	-23.5	-11.3	Н
ID CHA 874	NNEL, 2 3.0	437 MHz 45.0	32.9	33.7	35	-34.9	0.0	0.6	48.0	35.9	74	54	-26.0	-18.1	v
874 311	3.0	45.0	329	35.2	3.5 4.0	-34.9	0.0	0.0 6.0	48.0 52.1	35.9 41.7	74 74	54 54	-26.0	-18.1 -12.3	v V
874	3.0	46.8	38.2	33.7	3.5	-34.9	0.0	6.0	49.8	41.2	74	54	-24.2	-12.8	H
311 I CHANI	3.0 NEL, 246	48.9 2 MHz	41.5	35.2	4.0	-34.7	0.0	0.0	54.1	46.7	74	54	-19.9	-7.3	Н
924	3.0	45.5	32.7	33.8	35	-34.9	0.0	6.0	48.6	35.8	74	54	-25.4	-18.2	v
386	3.0	47.8	38.5	35.2	4.0	-34.6	0.0	6.0	53.0	43.7	74	54	-21.0	-10.3	v
924 386	3.0 3.0	46.6 48.8	33.7 36.9	33.8 35.2	3 <i>5</i> 4.0	-34.9 -34.6	0.0 0.0	0.0 0.0	49.7 54.0	36.8 42.1	74 74	54 54	-24.3 -20.0	-17.2 -11.9	H
		-0.0	303	2024		-54.0	0.0	0.0		74.1	/4		-40.0	-11.3	п
		No other e	missions were	detected	l above s	ystem noi	ise floor								
	f		ent Frequency	у		Amp	Preamp (-	-	Field Strengt	
		Distance to							ct to 3 mete			Pk Lim		d Strength L	
		Analyzer R	-			Avg Doole	-		Strength @ - Eicld Stree			-	-	. Average L Deals Limit	
	AF	Antenna Fa				Peak HPF	Calculate High Pas		c Field Stre	ngth		rk Mar	iviargin vs	. Peak Limi	L .
	CL	Cable Loss													

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

DIPOLE, 2.21dBi ANTENNA

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

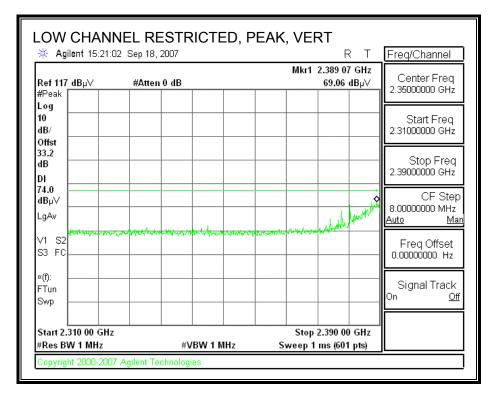


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🔆 Agilent 15:27:3		FED, AVG		R T Freq/Channel
Ref 117 dBµ∨ #Peak	#Atten 0 dB		Mkr1 2.390 0 48.15	0 GHz dBµ√ 2.35000000 GHz
Log 10 dB/ Offst				Start Freq 2.31000000 GHz
33.2 dB				Stop Freq
DI 54.0 dBµ∨ LqAw				CF Step 8.0000000 MHz
V1 S2				Freq Offset 0.00000000 Hz
*(f): FTun Swp				Signal Track
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 1	10 Hz Sv	Stop 2.390 0 /eep 6.238 s (601	

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RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

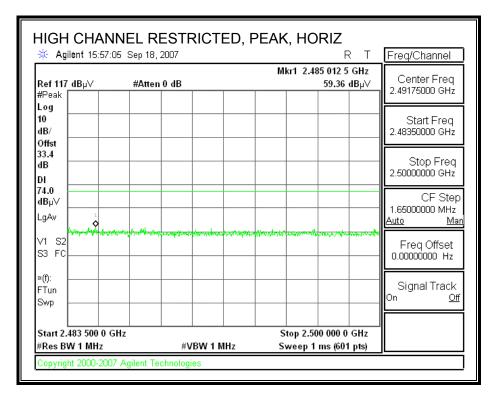


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🔆 Agilent 15:21:4	2 Sep 18, 2007	R	T Freq/Channel
Ref 117 dBµ∨ #Peak	#Atten 0 dB	Mkr1 2.390 00 52.79 d	Contor Frog
Log 10 dB/ Offst			Start Freq 2.31000000 GHz
dB			Stop Freq 2.39000000 GHz
54.0 dBµ√ LgAv			CF Step 8.0000000 MHz <u>Auto Mar</u>
∨1 S2 S3 FC			Freq Offset 0.00000000 Hz
×(f): FTun Swp			Signal Track
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 10	Stop 2.390 00 - Hz Sweep 6.238 s (601 p	

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RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

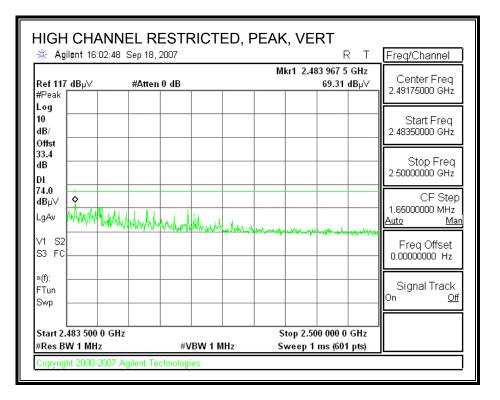


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HIGH CHAN	NEL RESTRICTE	ED, AVG, HORIZ	Freq/Channel
Ref 117 dBµ∨ #Peak	#Atten 0 dB	Mkr1 2.483 500 0 GHz 46.94 dBµ∨	Center Freq 2.49175000 GHz
Log 10 dB/ Offst			Start Freq 2.48350000 GHz
33.4 dB			- Stop Freq 2.5000000 GHz
54.0 dBµ∨ LgAv			CF Step 1.65000000 MHz Auto Mar
V1 S2 S3 FC			Freq Offset 0.00000000 Hz
×(f): FTun Swp			Signal Track On <u>Off</u>
Start 2.483 500 0 0 #Res BW 1 MHz	GHz #VBW 10 I	Stop 2.500 000 0 GHz Hz Sweep 1.287 s (601 pts)	

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RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



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🔆 Agilent 16:03:2	NEL RESTRICTE 0 Sep 18, 2007	, , , R T	Freq/Channel
Ref 117 dBµ∨ #Peak	#Atten 0 dB	Mkr1 2.483 555 0 GHz 50.47 dBμ∀	Center Freq 2.49175000 GHz
Log 10 dB/ Offst			Start Freq 2.48350000 GHz
33.4 dB			- Stop Freq 2.5000000 GHz
DI 54.0 dBµ√ LgAv			CF Step 1.6500000 MHz <u>Auto Mar</u>
V1 S2 S3 FC	·····		Freq Offset 0.00000000 Hz
×(f): FTun Swp			Signal Track On <u>Off</u>
Start 2.483 500 0 G #Res BW 1 MHz	Hz #VBW 10 F	Stop 2.500 000 0 GHz Iz Sweep 1.287 s (601 pts)	ļ

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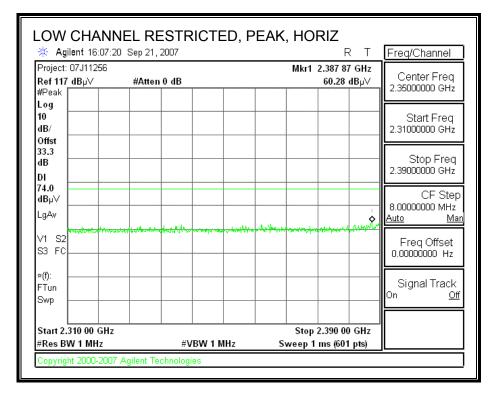
HARMONICS AND SPURIOUS EMISSIONS

Configu Mode: ´	ration:	Mode (with	G, Desktop, 1 Mitsumi D(CA-E04	_2.21	dBi Ant	enna)								
	lorn 1- S/N: 671	18GHz	Pre-an	nplifer liteq 300			Pre-am	plifer	26-40GH	z	H	orn > 180	SHz		Limit FCC 15.209
		_	•	med 200	10A003	5								•	•
HIFred	quency Cal 2 foot		3	foot c	able		12	foot c	able		HPF	Re	ject Filte		<u>Measurements</u> W=VBW=1MHz
						-	A-5m C	hambe	er 🔽	HP	F_4.0GHz	•		- Avera	ge Measurements 1MHz ; VBW=10Hz
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Согг	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)
20W CH 284	IANNEL,	2412 MHz 40.3	29.9	32.8	6.4	-36.6	0.0	0.5	43.5	33.1	74	54	-30.5	-20.9	v
.236	3.0	39.2	29.4	34.9	8.4	-36.2	0.0	0.0	46.9	37.1	74	54	-27.1	-16.9	H
		437 MHz	20 /		<i>(</i> 0			0.6					20.7		
.874 .311	3.0 3.0	39.9 48.4	29.6 34.9	33.4 35.0	6.9 8.4	-36.5 -36.2	0.0 0.0	6.0 6.0	44.3 56.2	34.0 42.7	74 74	54 54	-29.7 -17.8	-20.0 -11.3	v
2.185	3.0	46.4	34.9 29.8	35.0 37.6	6.4 12.2	-30.2 -35.4	0.0	0.0	56.1	42./	74	54 54	-17.8 -17.9	-11-5	v
.874	3.0	40.8	29.3	33.4	6.9	-36.5	0.0 0.0	0.6	45.2	33.7	74	54	-28.8	-20.3	H
311	3.0	42.8	31.8	35.0	8.4	-36.2	0.0	0.6	50.6	39.6	74	54	-23.4	-14.4	H
2.185	3.0	40.2	29.0	37.6	12.2	-35.4	0.0	0.9	55.5	44.3	74	54	-18.5	-9.7	H
II CHAN 1924	INEL, 246 3.0	2 MHz 40.3	29.8	33.4	7.0	-36.5	0.0	0.6	44.8	34.3	74	54	-29.2	-19.7	v
.924 7.386	3.0	40.3	29.8 35.8	33.A 35.0	7.0 8.4	-36.5	0.0 0.0	0.0	44.8 57.6	43.7	74	54 54	-29.2 -16.4	-19.7	v
2.310	3.0	49./ 39.6	29.4	37.6	12.2	-35.4	0.0	0.9	54.9	43.7	74	54 54	-10,4	-103	v
924	3.0	41.2	29.3	33.4	7.0	-36.5	0.0	0.6	45.7	33.8	74	54	-28.3	-20.2	Ĥ
386	3.0	42.5	31.4	35.0	8.4	-36.2	0.0	0.6	50.4	39.3	74	54	-23.6	-14.7	Н
2.310	3.0	40.0	28.9	37.6	12.2	-35.4	0.0	0.9	55.3	44.2	74	54	-18.7	- 9.8	Н
		Nacilia		• مد ماد	-h			ļ							
		No other e	missions were	actected	above s	ystem noi	ise 1100r	I	I		l			L	

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INVERTED-F, 1.38dBi ANTENNA

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

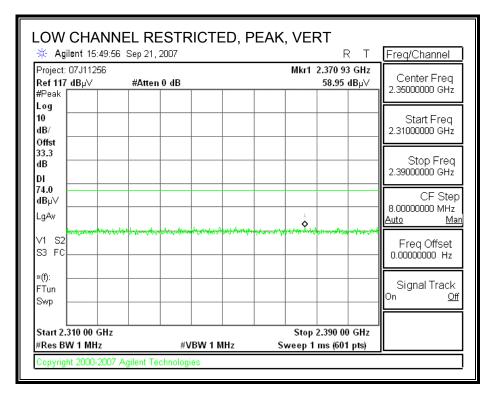


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		Mkr1 2	R T 2.390 00 GHz 48.19 dBµ∨	Ereq/Channel Center Freq 2.35000000 GHz Start Freq 2.31000000 GHz
Ref 117 dBµ∀ #Atten 0 dE #Peak Log 10 dB/ Offst 33.3	3	Mkr1 2		2.35000000 GHz Start Freq
10 dB/ Offst 33.3				
33.3				
DI				Stop Freq 2.39000000 GHz
54.0 dBµV LgAv				CF Step 8.0000000 MHz Auto Man
V1 S2 S3 FC				Freq Offset 0.00000000 Hz
*(f): FTun Swp				Signal Track On <u>Off</u>
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 10 Hz	Stop 2 Sweep 6.238	2.390 00 GHz s (601 pts)	

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RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

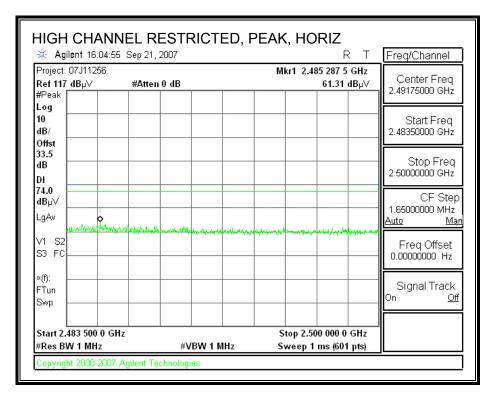


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	ESTRICTED, 1 2007	R T	Freq/Channel
Project: 07J11256 Ref 117 dBµ∨ #Atten #Peak		Mkr1 2.359 07 GHz 46.97 dBµ∨	Center Freq 2.35000000 GHz
Log 10 dB/ Offst			Start Freq 2.31000000 GHz
33.3 dB DI			- Stop Freq 2.39000000 GHz
54.0 dBμV LgAv			CF Step 8.00000000 MHz <u>Auto Man</u>
V1 S2 S3 FC		1 •	Freq Offset 0.00000000 Hz
»(f): FTun Swp			Signal Track On <u>Off</u>
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 10 Hz	Stop 2.390 00 GHz Sweep 6.238 s (601 pts)	_

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RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

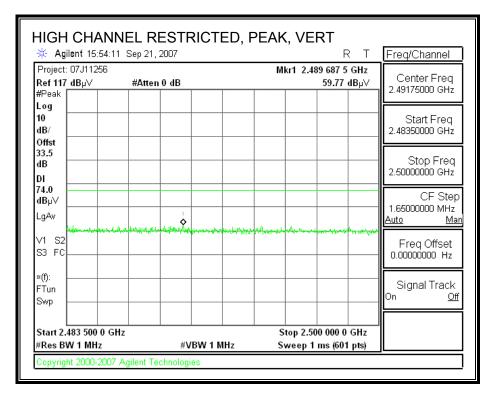


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HIGH CHANNEL F Agilent 16:05:12 Sep 21	-	AVG, HORIZ	Freq/Channel
Project: 07J11256 Ref 117 dB μ∨ #Atte #Peak	n0dB	Mkr1 2.483 500 0 GHz 48.17 dBµ∀	Center Freq 2.49175000 GHz
Log 10 dB/ Offst			Start Freq 2.48350000 GHz
33.5 dB DI			Stop Freq 2.5000000 GHz
54.0 dBµ∨ LgAv			CF Step 1.6500000 MHz <u>Auto Mar</u>
V1 S2 S3 FC			Freq Offset 0.00000000 Hz
*(f): FTun Swp			Signal Track On <u>Off</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)	

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RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



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* Agilent 15:54:37		ED, AVG, VERT	T Freq/Channel
Project: 07J11256 Ref 117 dB µ∨ #Peak	#Atten 0 dB	Mkr1 2.483 775 0 GF 47.59 dB	Contor Eroa
Log 10 dB/ Offst			Start Freq 2.48350000 GHz
dB			Stop Freq 2.5000000 GHz
54.0 dBµ∨ LgAv			CF Step 1.65000000 MHz <u>Auto Ma</u>
V1 S2 S3 FC			Freq Offset 0.00000000 Hz
×(f): FTun Swp			Signal Track On <u>Off</u>
Start 2.483 500 0 GF #Res BW 1 MHz	lz #VBW 10	Stop 2.500 000 0 GH Hz Sweep 1.287 s (601 pts)	

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HARMONICS AND SPURIOUS EMISSIONS

<u>est Eq</u>	uipmen	<u>t:</u>													
		18GHz	Pre-ar	<u> </u>			Pre-am	plifer	26-40GH		H	Horn > 18GHz Limit			
		310 @3m	▼ T145 A	gilent	3008A0	05(🖵				-				-	FCC 15.205
	uency Cal 2 foot		3	footo	able		12	foot c	able		HPF	Re	eject Filte		<u>k Measurements</u> W=VBW=1MHz
Fra	nk 17707	79007				-	Chin 20	035400)1 🔽	HPF	F_4.0GHz	•		▼ Avera	nge Measurements MHz ; VBW=10Hz
f	Dist		Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	-	1	Avg Mar	Notes
GHz OW CH	(m) ANNEL,	dBuV 2412 MHz	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
284	3.0	44.9	33.4	33.2	3.3	-34.8	0.0	0.5	47.1	35.6	74	54	-26.9	-18.4	V T
284 ID CHA	3.0 NNEL.2	46.3 437 MHz	34.4	33.2	3.3	-34.8	0.0	0.5	48.5	36.6	74	54	-25.5	-17.4	Н
374	3.0	45.3	32.8	33.7	3.5	-34.9	0.0	0.6	48.3	35.8	74	54	-25.7	-18.2	v
311 374	3.0 3.0	46.3 46.6	34.1 33.8	35.2 33.7	4.0 3.5	-34.7 -34.9	0.0 0.0	0.0 0.0	51.5 49.6	39.3 36.8	74 74	54 54	-22.5 -24.4	-14.7 -17.2	V н
311	3.0	40.0	33.8 34.9	35.2	3.5 4.0	-34.9	0.0	0.0 0.0	49.0 52.9	40.1	74 74	54 54	-24.4 -21.1	-17.2	H
	NEL, 246														
924 386	3.0 3.0	45.5 46.6	33.0 34.4	33.8 35.2	3.5 4.0	-34.9 -34.6	0.0 0.0	0.0 0.0	48.6 51.8	36.1 39.6	74 74	54 54	-25.4 -22.2	-17.9 -14.4	v v
924	3.0	45.7	33.2	33.8	3.5	-34.9	0.0	0.0 0.0	48.8	36.3	74	54	-25.2	-17.7	Ĥ
386	3.0	48.0	35.7	35.2	4.0	-34.6	0.0	0.0	53.2	40.9	74	54	-20.8	-13.1	Н
		No other e	missions were	detected	ahove s	vstem noi	se floor								
		Measureme Distance to Analyzer R Antenna Fa Cable Loss	eading ictor	7		Amp D Corr Avg Peak HPF	Average	Correc Field S ed Peal	ct to 3 mete Strength @ c Field Stre	3 m		Pk Lim Avg Mar	Peak Fiel Margin vs	Field Streng d Strength L : Average L : Peak Limi	imit imit

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8.2. RECEIVER ABOVE 1 GHz

8.2.1. RECEIVER ABOVE 1 GHz IN THE 2.4 GHz BAND

DIPOLE, 2.21dBi ANTENNA

Company: Mi Project #: 07 Date: 09/19/0 Cest Enginee Configuration Mode: Rx Mi Cest Equipmed Horn * T73; S/N: 67 Hi Frequency (2 foc f Dis	07J1125 /07 eer: Tha on: EUT Mode (v <u>ment:</u> 1 1-18G 6717 @:	56 anlı Nguy T on JIG, with Mits GHz 3m -	ren , Desktop, umi_CA-F Pre-a T144	Monito	ole 2.2	e 1 dBi Ai	ntenna)	plifer	26-40GH	z	Н	orn > 180	бНz		Limit
Configuration Adde: Rx Ma Cest Equipme Horn T73; S/N: 67 HiFrequency (2 foc	on: EUT Mode (v <u>ment:</u> 1 1-18G 6717 @3 vy Cables -	T on JIG, with Mits GHz 3m	, Desktop, umi_CA-H Pre-a T144	204_Dip mplifer Miteq 30	ole 2.2	e 1 dBi Ai	ntenna)	plifer	26-40GH	z	H	orn > 180	GHz		Limit
Horn Horn T73; S/N: 67 Hi Frequency (2 foc	<u>ment:</u> 1-18G 6717 @3	GHz 3m ┏┏┏┏┏┏┏┏┏	Pre-a	mplifer Miteq 30	1-260	GHz		plifer	26-40GH	z	Н	orn > 180	SHz		Limit
T73; S/N: 67	6717 @3	3m 🖵	T144	Miteq 30			Pre-am	plifer	26-40GH	z	Н	orn > 180	SHz		Limit
Hi Frequency (y Cables i				08A009	31 🖵					Pre-amplifer 26-40GHz Horn > 18GHz				
2 foo		ole T	;	3 foot c									-	RX RSS 210 🖵	
f Dis		•			able		12	foot c	able		HPF	Re	ject Filte		<u> Measurements</u>
f Dis						•	A-5m C	hambe	er 🔽			•		RB <u>Avera</u>	W=VBW=1MHz ge Measurements 1MHz ; VBW=10Hz
			Read Avg		CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	÷		Avg Mar	Notes
GHz (m) 158 3.0		iBuV 63.0	dBuV 51.4	dB/m 24.4	dB 3.2	dB -39.3	dB 0.0	dB 0.0	dBuV/m 51.3	dBuV/m 39.7	dBuV/m 74	dBuV/m 54	dB -22.7	dB -14.3	(V/H) V
417 3.0	0.1	56.4	53.5	25.3	35	-38.9	0.0	0.0	46.4	43.4	74	54	- 27.6	- 10.6	v
000 3.0	0.1	57.3	49.3	30.0	53	-37 <i>A</i>	0.0	0.0	55.3	47.2	74	54	-18.7	- 6.8	V
D33 3.D		58.6	56.1	23.9	3.0	-39.4	0.0	0.0	46.1	43.6	74	54	-27.9	-10,4	H
<i>5</i> 58 3.0 .000 3.0		54.1 55.1	52.3 46.9	25.8 30.0	3.7 5.3	-38.7 -37.4	0.0 0.0	0.0 0.0	44.9 53.0	43.2 44.9	74 74	54 54	-29.1 -21.0	-10.8 -9.1	H H
	N	le other em	issions wer	e detected	l above s		ise floor								
f	Ма		it Frequenc			Amp	Preamp (Tain				Arra Tim	Amore de T	ield Strengt	L. T
I Dist		stance to A	•	y			-		t to 3 mete	ers		-	-	i Strength L	
		alyzer Rea				Avg			trength @					Average L	
AF		tenna Fac	tor			Peak			Field Stre	ngth		Pk Mar	Margin vs	. Peak Limit	
CL	. Cal	ble Loss				HPF	High Pas	s Filter							

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INVERTED-F, 1.38dBi ANTENNA

	-		Measurem	lent											
omplia	ance Ce	ertification \$	Services												
ompar	ıy: Mits	umi Electri	ic Co., LTD												
	#: 07J]														
	-	er 21, 2007													
		Ninous Da EUT on H(voudi G, Desktop,	Monite	w Ko	r Boord	Mouro								
			rot PIFA D					1.386	lBi Antenı	ia)					
			-			-				/					
fest Eq	uipmen	. <u>t:</u>													
н	orn 1.	18GHz	Pre-ar	nplifer	1.26	GH7	Pre-am	plifer	26-40GH	7	н	orn > 180	GH7		Limit
															DV DCC 240
T120;	S/N: 29	310 @3m	T145 A	Agilent 3	3008A0	05(-		• RX RSS 210 •							
Hi Fred	quency Cal	bles													
	2 foot	cable	3	6 foot c	able		12	foot c	able		HPF	Pa	eject Filte	Pea	<u>k Measurements</u>
					abie								geetrinte	RE	3W=VBW=1MHz
Fra	nk 17707	79007	-			-	Chin 20)035400	01 🚽			-			age 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)
.128	3.0	55.7	52.3	28.3	1.9	-36.1	0.0	0.0	49.9	46.5	74	54	-24.1	-75	v
1.128 1.367	3.0	55./ 54.0	513	28.3	2.1	-30.1	0.0	0.0	49.9	46.7	74 74	54 54	-24.1 -24.6	-73	v V
l .607	3.0	50.0	44.9	30.1	2.2	-35.7	0.0	0.0	46.6	41.6	74	54	-27.4	-12.4	v
2.039	3.0	48.1	40.8	31.6	2.5	-35.4	0.0	0.0	46.8	39.6	74	54	-27.2	-14.4	v
3.000	3.0	51.4	42.7	32.8	2.9	-35.2	0.0	0.0	52.0	43.2	74	54	-22.0	-10.8	v
1.175	3.0	57.1	55.2	28.5	2.0	-36.0	0.0	0.0	51.6	49.6	74	54	-22.4	-4.4	Н
1.415	3.0	51.2	47.0	29.4	2.1	-35.8	0.0	0.0	46.9	42.7	74	54	- 27.1	-113	H
512	3.0	50.9	46.5	29.8	2.2	-35.8	0.0	0.0	47.1	42.7	74	54	-26.9	-11.3	H
.656 .895	3.0 3.0	50.3 51.8	44.5	30.3 31.2	2.3 2.4	-35.7 -35.5	0.0 0.0	0.0 0.0	47.2 49.9	41.4 45.7	74 74	54 54	-26.8 -24.1	-12.6 -8.3	H H
.895 .991	3.0	49.4	47.6 44.4	31.2	2.4 2.5	-35.5	0.0	0.0	49.9 48.0	45./ 43.0	74	54 54	-24.1 -26.0	-8-3	H
Ve other (emission	s were detecte	ed above systen	n noise fl	loor						L				L
	f	Measureme	ent Frequency	У		Amp	Preamp (Gain				Avg Lim	Average I	Field Streng	th Limit
	Dist	Distance to	Antenna			D Corr	Distance	Corre	ct to 3 met	ers		Pk Lim	Peak Fiel	d Strength I	limit
	Read	Analyzer R	eading			Avg	Average	Field S	Strength @	3 m		Avg Mar	Margin vs	. Average I	limit
	AF	Antenna Fa	actor			Peak	Calculate	ed Peal	k Field Stre	ngth		Pk Mar	Margin va	. Peak Limi	it
	CL	Cable Loss	1			HPF	High Pas	s Filter							
										ength		Pk Mar	Margin vs	. Peak Limi	t

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8.3. WORST-CASE BELOW 1 GHz

DIPOLE, 2.21dBi ANTENNA

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

HORIZO	ONTAL							
		Ē			47173 Fremor Tel: (lance Ce Benicia it, CA S (510) 77 (510) 66	a Stree 94538 71-1000	
Data#	: <mark>19</mark> Fi	le#: 30)-1000 2	A.EMI	Date:	09-19-2	2007 T	ime: 14:37:55
Test Proje Compa	guration:: : :	Thanh 07J112 Mitsun EUT or	Nguyen 256 ni 1 JIG, 1 cst-case	Desktop,	, KB, MG Dipole :	•		ı
						_		Page: 1
	Freq	Read Level	Factor	Level	Limit Line	Over Limit		
	MHz	dBuV	db	dBuV/m	dBuV/m	db		-
1 2 3 4 5 6 7	182.290 295.780 342.340 439.340 567.380 766.230 887.480	51.49 48.10 51.43 49.72 44.30 37.63	-14.95 -12.41 -11.22 -8.83 -6.03 -2.50	36.54 35.69 40.21 40.89 38.27 35.13	43.50 46.00 46.00 46.00 46.00 46.00	-6.96 -10.31 -5.79 -5.11 -7.73 -10.87	Peak Peak Peak Peak Peak	

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

VERTI	CAL								
		E			47173 Fremon Tel: (1 Street 94538 71-1000	on Services	
Data#	: 20 Fi	le#: 30	-1000 7	.EMI	Date:	09-19-2	2007 Time	: 14:31:53	
Test Proje Compa	ny: : guration:: : :	Thanh 07J112 Mitsum EUT on	Nguyen 56 i JIG, I st-case)esktop,	, KB, Mo Dipole 2				
		Read			Limit	Over		Page: 1	
	Freq	Level	Factor	Level		Limit			
	MHz	dBuV	dB	dBuV/m	$\overline{dBuV/m}$	db			
1 2 3 4 5 6	182.290 240.490 392.780 439.340 584.840 869.050	53.10 53.54 49.06 49.07	-14.48 -10.08 -8.83 -5.68	38.62 43.46 40.23 43.39	46.00	-7.38 -2.54 -5.77 -2.61	Peak Peak Peak Peak		

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INVERTED-F, 1.38dBi ANTENNA

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

Event Compliance Certification Services 47173 Benicia Street Premont, CA 94538 Tei (510) 771-1000 Fax: (510) 761-0088 Zata#: 23 File#: 30-1000 A.EMI Date: 09-19-2007 Time: 15:27:18 Condition: FCC CLASS-B HORIZONTAL Est Operator:: Thanh Nguyen Project f: :: 07J11256 Date: 09-19-2007 Time: 15:27:18 Configuration:: FUT on JIG, Desktop, KB, Mouse, & LCD Mode :: :: fx worst-case with Inverted F_1.38dBi antenna Target: :: FCC Class B Page: 1 Yarget: Yarget: Yarget Yarget: Yarget Yarget: Yarget: Yarget Yarget Yarget: Yarget: Yarget Yarget <th>HORIZONTAL</th> <th></th> <th></th> <th></th>	HORIZONTAL			
Condition: FCC CLASS-B HORIZONTAL Test Operator:: Thanh Nguyen Project #: 07J11256 Company: : Mitsumi Configuration:: EUT on JIG, Desktop, KB, Mouse, & LCD Mode : : Tx worst-case with Inverted F_1.38dBi antenna Target: : FCC Class B Page: 1 Page: 1 Page: 1 Page: 1 Page: 1 NHz dBuV dB dBuV/m dBuV/m dB 1 31.940 38.86 -6.60 32.26 40.00 -7.74 Peak 2 120.210 46.93 -13.31 33.63 43.50 -9.88 Peak 3 216.240 49.01 -15.29 33.72 46.00 -12.28 Peak 4 381.140 52.24 -10.31 41.93 46.00 -4.07 Peak 5 584.840 47.99 -5.68 42.31 46.00 -3.69 Peak 6 775.930 43.58 -2.39 41.19 46.00 -4.81 Peak		ICE Inc	47173 Benicia Street Fremont, CA 94538 Tel: (510) 771-1000	
Test Operator:: Thanh Nguyen Project #: : 07J11256 Company: : Mitsumi Configuration:: EUT on JIG, Desktop, KB, Mouse, & LCD Mode : : Tx worst-case with Inverted F_1.38dBi antenna Target: : PCC Class B Page: 1 Page: 1 Page: 1 Page: 1 Page: 1 NHz dBuV dB dBuV/m dBuV/m dB 1 31.940 38.86 -6.60 32.26 40.00 -7.74 Peak 2 120.210 46.93 -13.31 33.63 43.50 -9.88 Peak 3 216.240 49.01 -15.29 33.72 46.00 -12.28 Peak 4 381.140 52.24 -10.31 41.93 46.00 -4.07 Peak 5 584.840 47.99 -5.68 42.31 46.00 -3.69 Peak 6 775.930 43.58 -2.39 41.19 46.00 -4.81 Peak	Data#: 23 H	'ile#: 30-1000 A.EMI	Date: 09-19-2007 Time: 15:27:18	
Read Limit Over Freq Level Factor Level Line Limit Remark MHz dBuV dB dBuV/m dBuV/m dB dB 1 31.940 38.86 -6.60 32.26 40.00 -7.74 Peak 2 120.210 46.93 -13.31 33.63 43.50 -9.88 Peak 3 216.240 49.01 -15.29 33.72 46.00 -12.28 Peak 4 381.140 52.24 -10.31 41.93 46.00 -4.07 Peak 5 584.840 47.99 -5.68 42.31 46.00 -3.69 Peak 6 775.930 43.58 -2.39 41.19 46.00 -4.81 Peak	Test Operator: Project #: Company: Configuration: Mode :	: Thanh Nguyen : 07J11256 : Mitsumi : BUT on JIG, Desktop : Tx worst-case with		
Freq Level Factor Level Line Limit Remark MHz dBuV dB dBuV/m dBuV/m dB dBuV/m dB 1 31.940 38.86 -6.60 32.26 40.00 -7.74 Peak 2 120.210 46.93 -13.31 33.63 43.50 -9.88 Peak 3 216.240 49.01 -15.29 33.72 46.00 -12.28 Peak 4 381.140 52.24 -10.31 41.93 46.00 -4.07 Peak 5 584.840 47.99 -5.68 42.31 46.00 -3.69 Peak 6 775.930 43.58 -2.39 41.19 46.00 -4.81 Peak			2	
MHz dBuV dB dBuV/m dBuV/m dB 1 31.940 38.86 -6.60 32.26 40.00 -7.74 Peak 2 120.210 46.93 -13.31 33.63 43.50 -9.88 Peak 3 216.240 49.01 -15.29 33.72 46.00 -12.28 Peak 4 381.140 52.24 -10.31 41.93 46.00 -4.07 Peak 5 584.840 47.99 -5.68 42.31 46.00 -3.69 Peak 6 775.930 43.58 -2.39 41.19 46.00 -4.81 Peak	Free			
1 31.940 38.86 -6.60 32.26 40.00 -7.74 Peak 2 120.210 46.93 -13.31 33.63 43.50 -9.88 Peak 3 216.240 49.01 -15.29 33.72 46.00 -12.28 Peak 4 381.140 52.24 -10.31 41.93 46.00 -4.07 Peak 5 584.840 47.99 -5.68 42.31 46.00 -3.69 Peak 6 775.930 43.58 -2.39 41.19 46.00 -4.81 Peak		·		
2 120.210 46.93 -13.31 33.63 43.50 -9.88 Peak 3 216.240 49.01 -15.29 33.72 46.00 -12.28 Peak 4 381.140 52.24 -10.31 41.93 46.00 -4.07 Peak 5 584.840 47.99 -5.68 42.31 46.00 -3.69 Peak 6 775.930 43.58 -2.39 41.19 46.00 -4.81 Peak	MH2	dBuV dB dBuV/m	dBuV/m dB	
3 216.240 49.01 -15.29 33.72 46.00 -12.28 Peak 4 381.140 52.24 -10.31 41.93 46.00 -4.07 Peak 5 584.840 47.99 -5.68 42.31 46.00 -3.69 Peak 6 775.930 43.58 -2.39 41.19 46.00 -4.81 Peak				
4 381.140 52.24 -10.31 41.93 46.00 -4.07 Peak 5 584.840 47.99 -5.68 42.31 46.00 -3.69 Peak 6 775.930 43.58 -2.39 41.19 46.00 -4.81 Peak				
5 584.840 47.99 -5.68 42.31 46.00 -3.69 Peak 6 775.930 43.58 -2.39 41.19 46.00 -4.81 Peak				
6 775.930 43.58 -2.39 41.19 46.00 -4.81 Peak				
7 870.330 43.76 -1.38 42.38 46.00 -3.62 Peak				
	7 870.990	43.76 -1.38 42.38	46.00 -3.62 Peak	

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

VERTI	CAL							
). •		47173 Fremor Tel: (Benicia 1t, CA 9 (510) 73	1 Street 94538	on Services	
Data#	: 26 Fi	le#: 30-100	0 A.EMI	Date:	09-19-3	2007 Time	9: 15:34:36	
Test (Proje Compa:	Operator:: ct #: : ny: : guration:: : :	CLASS-B VER Thanh Nguy 07J11256 Mitsumi BUT on JIG Tx worst-c FCC Class	en , De <i>s</i> ktop ase with				ma	
		Read		Timit	Over		Page: 1	
	Freq	Level Fact	or Level			Remark		
	MHz	dBuV	dB dBuV/m	\overline{dBuV}/m	db			
1 2 3 4 5 6 7	94.990 232.730 392.780 453.890 526.640	41.08 -6. 52.87 -18. 46.67 -14. 45.54 -10. 48.65 -8. 46.04 -6. 46.44 -3.	29 34.58 75 31.92 08 35.46 44 40.21 87 39.17	43.50 46.00 46.00 46.00	-14.08 -10.54 -5.79 -6.83	Peak Peak Peak Peak Peak		

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9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted L	imit (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 receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

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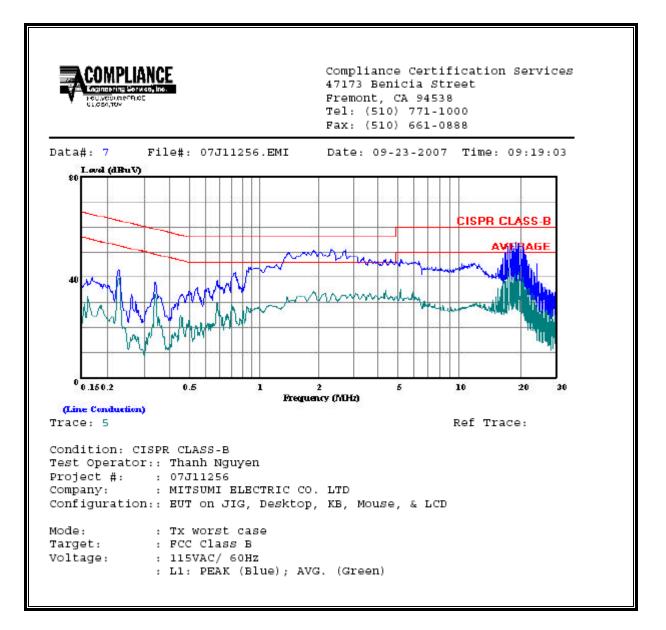
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<u>6 WORST EMISSIONS</u>

Freq.		Reading		Closs	Limit	EN_B	Marg	;in	Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV(dB)	L1/L2
1.53	49.43		31.50	0.00	56.00	46.00	-6.57	-14.50	L1
2.42	50.96		33.44	0.00	56.00	46.00	-5.04	-12.56	L1
18.92	53.86		49.57	0.00	60.00	50.00	-6.14	-0.43	L1
1.50	50.79		35.65	0.00	56.00	46.00	-5.21	-10.35	L2
2.81	51.24		34.86	0.00	56.00	46.00	-4.76	-11.14	L2
18.23	44.90		37.57	0.00	60.00	50.00	-15.10	-12.43	L2
6 Worst I	Data I								

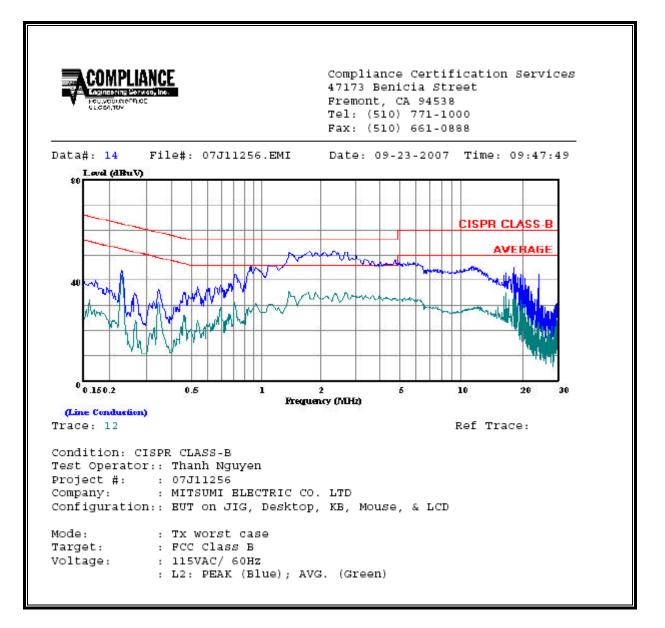
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LINE 1 RESULTS



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LINE 2 RESULTS



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10. MAXIMUM PERMISSIBLE EXPOSURE

FCC RULES

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)
(A) Lim	its for Occupational	/Controlled Exposu	res	
0.3–3.0 3.0–30 30–300	614 1842/f 61.4	1.63 4.89/f 0.163	*(100) *(900/f²) 1.0	6
30–300 300–1500 1500–100,000			f/300 5	6
(B) Limits	for General Populati	on/Uncontrolled Exp	posure	
0.3–1.34 1.34–30	614 824/f	1.63 2.19/f	*(100) *(180/f²)	30 30

TABLE 1-LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

TABLE 1-LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)-Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)
30–300 300–1500 1500–100,000	27.5	0.073	0.2 f/1500 1.0	30 30 30

f = frequency in MHz

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.

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IC RULES

IC Safety Code 6, Section 2.2.1 (a) A person other than an RF and microwave exposed worker shall not be exposed to electromagnetic radiation in a frequency band listed in Column 1 of Table 5, if the field strength exceeds the value given in Column 2 or 3 of Table 5, when averaged spatially and over time, or if the power density exceeds the value given in Column 4 of Table 5, when averaged spatially and over time.

Table 5

Exposure Limits for Persons Not Classed As RF and Microwave Ex-
posed Workers (Including the General Public)

1 Frequency (MHz)	2 Electric Field Strength; rms (V/m)	3 Magnetic Field Strength; rms (A/m)	4 Power Density (W/m ²)	5 Averaging Time (min)
0.003–1	280	2.19		6
1–10	280/f	2.19/ <i>f</i>		6
10–30	28	2.19/f		6
30–300	28	0.073	2*	6
300–1 500	1.585 <i>f</i> ^{0.5}	0.0042f ^{0.5}	f/150	6
1 500–15 000	61.4	0.163	10	6
15 000–150 000	61.4	0.163	10	616 000 /f ^{1.2}
150 000–300 000	0.158f ^{0.5}	4.21 x 10 ⁻⁴ f ^{0.5}	6.67 x 10 ⁻⁵ f	616 000 /f ^{1.2}

* Power density limit is applicable at frequencies greater than 100 MHz.

Notes: 1. Frequency, f, is in MHz.

- A power density of 10 W/m² is equivalent to 1 mW/cm².
 A magnetic field strength of 1 A/m corresponds to 1.257 microtesla (μT) or 12.57 milligauss (mG).

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CALCULATIONS

Given

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

S = E ^ 2 / 3770

where

and

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, rearranging the terms to express the distance as a function of the remaining variables, changing to units of Power to mW and Distance to cm, and substituting the logarithmic form of power and gain yields:

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

where

d = MPE distance in cm P = Power in dBm G = Antenna Gain in dBi S = Power Density Limit in mW/cm²

Rearranging terms to calculate the power density at a specific distance yields

 $S = 0.0795 * 10^{(P + G)} / 10) / (d^2)$

The power density in units of mW/cm² is converted to units of W/m² by multiplying by a factor of 10.

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LIMITS

From FCC §1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm²

From IC Safety Code 6, Section 2.2 Table 5 Column 4, S = 10 W/m²

RESULTS

(MPE distance equals 20 cm)

DIPOLE, 2.21dBi ANTENNA

Mode	Band	MPE	Output	Antenna	FCC Power	IC Power
		Distance	Power	Gain	Density	Density
		(cm)	(dBm)	(dBi)	(mW/cm^2)	(W/m^2)
WLAN	2.4 GHz	20.0	18.74	2.21	0.02	0.25

INVERTED-F, 1.38dBi ANTENNA

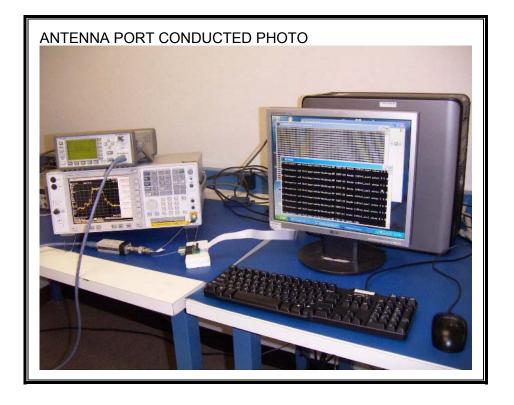
Mode	Band	MPE	Output	Antenna	FCC Power	IC Power
		Distance	Power	Gain	Density	Density
		(cm)	(dBm)	(dBi)	(mW/cm^2)	(W/m^2)
WLAN	2.4 GHz	20.0	19.09	1.38	0.02	0.22

NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

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11. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP



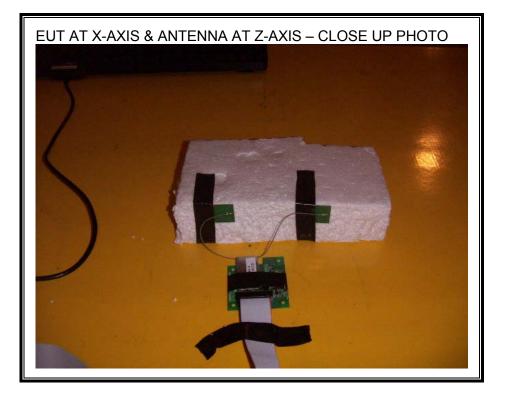
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RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION

DIPOLE, 2.21dBi ANYENNA_WORST-CASE CONFIGURATION



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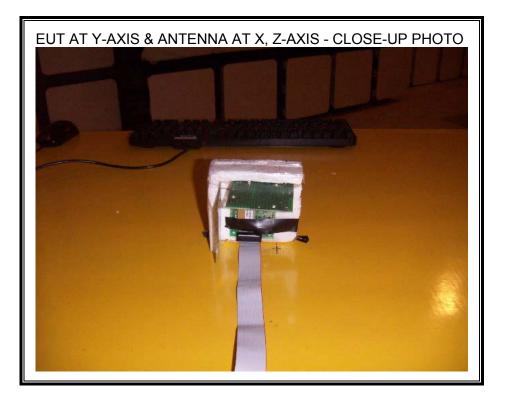


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INVERTED-F, 2.21dBi ANTENNA_WORST-CASE CONFIGURATION



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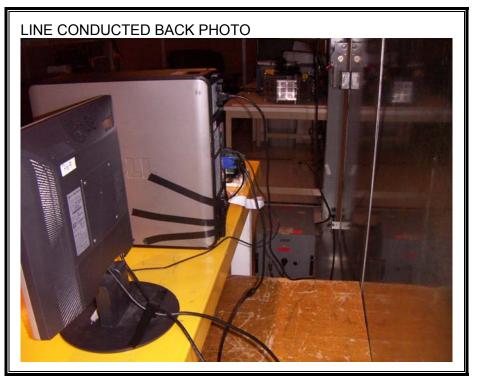


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POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP



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END OF REPORT

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