



FCC CFR47 PART 15 SUBPART C

**CLASS II PERMISSIVE CHANGE
CERTIFICATION TEST REPORT**

FOR

802.11A/B/G/N 2X2 RADIO MODULE INSIDE PANASONIC PC CF-53mk2

MODEL NUMBER: WL11A

FCC ID: ACJ9TGWL11A

REPORT NUMBER: 12J14381-2

ISSUE DATE: MAY 14, 2012

Prepared for
**PANASONIC CORPORATION OF NORTH AMERICA
ONE PANASONIC WAY, 4B-8
SECAUCUS, NEW JERSEY 07094, U.S.A.**

Prepared by
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NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	05/14/2012	Initial Issue	T. LEE

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: PANASONIC CORPORATION OF NORTH AMERICA
ONE PANASONIC WAY, 4B-8
SECAUCUS, NEW JERSEY 07094, U.S.A.

EUT DESCRIPTION: 802.11a/b/g/n 2x2 Radio Module inside Panasonic PC CF-53mk2

MODEL: WL11A

SERIAL NUMBER: STD016 (CONDUCTED), TS037 (RADIATED)

DATE TESTED: APRIL 23 TO MAY 02, 2012

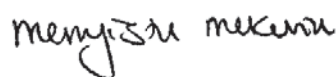
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass

Compliance Certification Services (UL 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 UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. 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 UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL CCS By:

Tested By:



TIM LEE
STAFF ENGINEER
UL CCS

MENGISTU MEKURIA
EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11a/b/g/n Intel Corporation Centrino advanced-N 6205 PCIe half mini card that form factor IEEE 802.11 a/b/g/n wireless network adaptor. It operates in both the 2.4GHz and 5 GHz frequency range. The card supports 2x2 MIMO at 802.11n for both 20MHz and 40MHz channels and 1x2 at legacy modes of operation.

The radio module is manufactured by Intel.

5.2. MAXIMUM OUTPUT POWER

The measured average power values were within ± 0.5 dB of the original values. Refer to original report number "PD962205ANH FCC IC DTS WLAN Report" for exact output power values and for all antenna port results.

5.3. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The change filed under this application is changing of higher gain Auxiliary antenna than the originally filed that can be used for 5GHz frequency bands.

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes PIFA antennas with maximum gains as a function of frequency is given in the following table:

Bands	Originally Listed Gain	Main Antenna Gain	Sub Antenna Gain
2400-2500MHz	3.2dBi	0.9dBi	3.06dBi
5180-5320MHz	3.7dBi	0.9dBi	6.74dBi
5500-5700MHz	4.8dBi	1.35dBi	5.94dBi
5700-5825MHz	5.0dBi	1.35dBi	6.22dBi

5.5. SOFTWARE AND FIRMWARE

The test utility software used during testing was DRTU, rev. 1.3.12-0263.

Driver software is V14.1.4.115.

5.6. WORST-CASE CONFIGURATION AND MODE

The EUT was tested as an internal module installed inside a host Laptop PC.

Worst-Case data rates were utilized from preliminary testing of the Chipset, worst-case data rates, per original test reports, are the lower rates for each mode..

Worst-case mode and channel used for 30-1000 MHz radiated and power line conducted emissions was the mode and channel with the highest output power, that was determined to be 11n HT40 mode, mid channel.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Panasonic	CF-53mk2	TS037	N/A
Power Supply	Panasonic	CF-AA5713AM1	5713AM112105301A	DoC

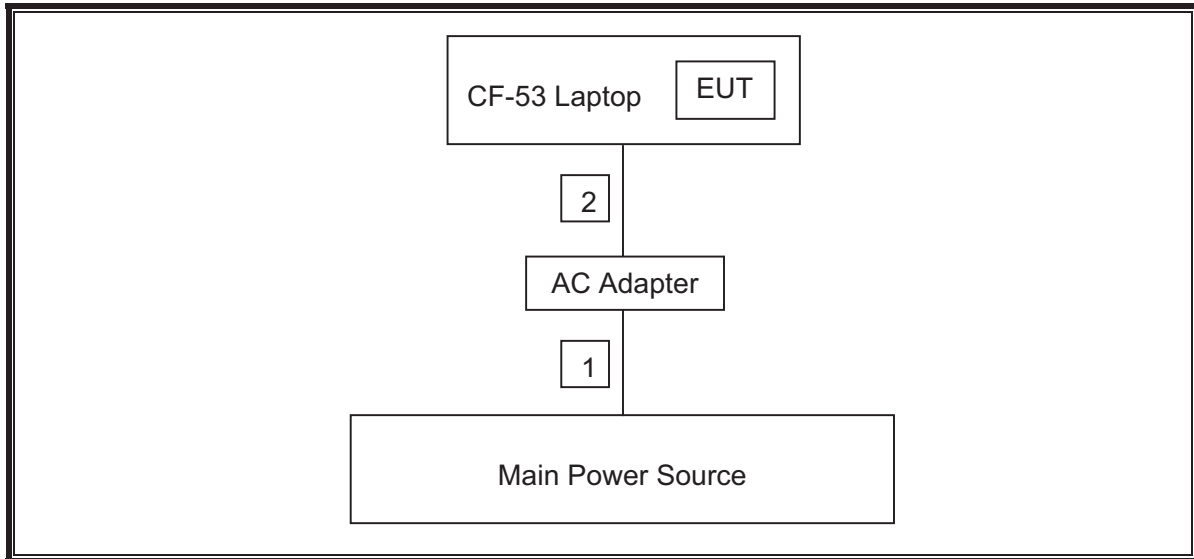
I/O CABLES (CONDUCTED SETUP)

Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	2	AC	Unshielded	1.7m	
2	DC	1	DC	Shielded	1.7m	Ferrite on DC connector

TEST SETUP

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

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C01016	7/16/2012
Antenna, Horn, 18 GHz	EMCO	3115	C00945	10/6/2012
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	7/28/2012
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00986	3/22/2013
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	8/19/2013
LISN, 30 MHz	FCC	50/250-25-2	C00626	12/13/2012
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	11/11/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	7/12/2012
Reject Filter, 5.725-5.825 GHz	Micro-Tronics	BRC13192	N02676	CNR
Highpass Filter, 7.6 GHz	Micro-Tronics	HPM13195	N02601	CNR

7. RADIATED TEST RESULTS

7.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN Clause 7.2.5 (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 applicable 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.

7.2. TRANSMITTER ABOVE 1 GHz

7.2.1. TRANSMITTER ABOVE 1 GHz FOR 802.11a MODE IN THE 5.8 GHz BAND CHAIN B

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement													
Compliance Certification Services, Fremont 5m Chamber													
Test Engr:		MENGISTU MEKURIA											
Date:		05/02/12											
Project #:		12J14381											
Company:		PANASONIC											
Test Target:		FCC CFR47 PART 15											
Mode Oper:		TX, 802.11a, CHAIN B											
f	Measurement Frequency	Amp	Preamp Gain		Average Field Strength Limit								
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		Peak Field Strength Limit								
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m		Margin vs. Average Limit								
AF	Antenna Factor	Peak	Calculated Peak Field Strength		Margin vs. Peak Limit								
CL	Cable Loss	HPF	High Pass Filter										
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
Low Channel (5745 MHz)													
11.490	3.0	34.9	38.8	10.7	-35.5	0.0	0.0	48.9	74.0	-25.1	H	P	
11.490	3.0	22.1	38.8	10.7	-35.5	0.0	0.0	36.1	54.0	-17.9	H	A	
11.490	3.0	34.3	38.8	10.7	-35.5	0.0	0.0	48.3	74.0	-25.7	V	P	
11.490	3.0	22.2	38.8	10.7	-35.5	0.0	0.0	36.2	54.0	-17.8	V	A	
Mid Channel (5785 MHz)													
11.570	3.0	34.7	38.9	10.8	-35.5	0.0	0.0	48.9	74.0	-25.1	H	P	
11.570	3.0	22.4	38.9	10.8	-35.5	0.0	0.0	36.6	54.0	-17.4	H	A	
17.355	3.0	36.2	42.6	13.1	-33.5	0.0	0.0	58.3	74.0	-15.7	H	P	
17.355	3.0	22.5	42.6	13.1	-33.5	0.0	0.0	44.7	54.0	-9.3	H	A	
11.570	3.0	35.0	38.9	10.8	-35.5	0.0	0.0	49.2	74.0	-24.8	V	P	
11.570	3.0	22.3	38.9	10.8	-35.5	0.0	0.0	36.5	54.0	-17.5	V	A	
17.355	3.0	35.7	42.6	13.1	-33.5	0.0	0.0	57.9	74.0	-16.1	V	P	
17.355	3.0	22.5	42.6	13.1	-33.5	0.0	0.0	44.7	54.0	-9.3	V	A	
High Channel (5825 MHz)													
11.650	3.0	35.8	39.0	10.9	-35.5	0.0	0.0	50.2	74.0	-23.8	H	P	
11.650	3.0	22.9	39.0	10.9	-35.5	0.0	0.0	37.3	54.0	-16.7	H	A	
11.650	3.0	36.0	39.0	10.9	-35.5	0.0	0.0	50.3	74.0	-23.7	V	P	
11.650	3.0	22.8	39.0	10.9	-35.5	0.0	0.0	37.2	54.0	-16.8	V	A	
Rev. 4.1.2.7													
Note: No other emissions were detected above the system noise floor.													

7.2.2. TRANSMITTER ABOVE 1 GHz FOR 802.11n HT20 MODE IN THE 5.8 GHz BAND CHAIN B

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber													
Test Engr:		MENGISTU MEKURIA											
Date:		05/02/12											
Project #:		12J14381											
Company:		PANASONIC											
Test Target:		FCC CFR47 PART 15											
Mode Oper:		TX, 802.11n HT20 MHz, CHAIN B											
f	Measurement Frequency	Amp	Preamp Gain	Average Field Strength Limit									
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Peak Field Strength Limit									
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Margin vs. Average Limit									
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Margin vs. Peak Limit									
CL	Cable Loss	HPF	High Pass Filter										
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
Low Channel (5745 MHz)													
11.490	3.0	35.0	38.8	10.7	-35.5	0.0	0.0	49.0	74.0	-25.0	H	P	
11.490	3.0	22.1	38.8	10.7	-35.5	0.0	0.0	36.1	54.0	-17.9	H	A	
11.490	3.0	35.7	38.8	10.7	-35.5	0.0	0.0	49.7	74.0	-24.3	V	P	
11.490	3.0	22.6	38.8	10.7	-35.5	0.0	0.0	36.6	54.0	-17.4	V	A	
Mid Channel (5785 MHz)													
11.570	3.0	34.5	38.9	10.8	-35.5	0.0	0.0	48.7	74.0	-25.3	H	P	
11.570	3.0	22.4	38.9	10.8	-35.5	0.0	0.0	36.5	54.0	-17.5	H	A	
11.570	3.0	34.8	38.9	10.8	-35.5	0.0	0.0	48.9	74.0	-25.1	V	P	
11.570	3.0	22.4	38.9	10.8	-35.5	0.0	0.0	36.6	54.0	-17.4	V	A	
High Channel (5825 MHz)													
11.650	3.0	35.4	39.0	10.9	-35.5	0.0	0.0	49.8	74.0	-24.3	H	P	
11.650	3.0	22.8	39.0	10.9	-35.5	0.0	0.0	37.2	54.0	-16.8	H	A	
17.475	3.0	35.0	43.4	13.2	-33.6	0.0	0.0	58.0	74.0	-16.0	H	P	
17.475	3.0	21.9	43.4	13.2	-33.6	0.0	0.0	44.9	54.0	-9.1	H	A	
11.650	3.0	36.8	39.0	10.9	-35.5	0.0	0.0	51.1	74.0	-22.9	V	P	
11.650	3.0	22.8	39.0	10.9	-35.5	0.0	0.0	37.2	54.0	-16.8	V	A	
17.475	3.0	35.1	43.4	13.2	-33.6	0.0	0.0	58.1	74.0	-15.9	V	P	
17.475	3.0	21.9	43.4	13.2	-33.6	0.0	0.0	44.9	54.0	-9.1	V	A	
Rev. 4.1.2.7													
Note: No other emissions were detected above the system noise floor.													

7.2.3. TRANSMITTER ABOVE 1 GHz FOR 802.11n HT20 MODE IN THE 5.8 GHz BAND CHAIN A AND B

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber													
Test Engr:		MENGISTU MEKURIA											
Date:		05/02/12											
Project #:		12J14381											
Company:		PANASONIC											
Test Target:		FCC CFR47 PART 15											
Mode Oper:		TX, 802.11n HT20 MHz, CHAIN A AND B											
f	Measurement Frequency	Amp	Preamp Gain	Average Field Strength Limit									
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Peak Field Strength Limit									
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Margin vs. Average Limit									
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Margin vs. Peak Limit									
CL	Cable Loss	HPF	High Pass Filter										
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dB	Limit dB	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
Low Channel (5745 MHz)													
11.490	3.0	34.4	38.8	10.7	-35.5	0.0	0.0	48.4	74.0	-25.6	H	P	
11.490	3.0	22.0	38.8	10.7	-35.5	0.0	0.0	36.0	54.0	-18.0	H	A	
11.490	3.0	34.5	38.8	10.7	-35.5	0.0	0.0	48.5	74.0	-25.5	V	P	
11.490	3.0	22.2	38.8	10.7	-35.5	0.0	0.0	36.2	54.0	-17.8	V	A	
Mid Channel (5785 MHz)													
11.570	3.0	35.5	38.9	10.8	-35.5	0.0	0.0	49.7	74.0	-24.3	H	P	
11.570	3.0	22.4	38.9	10.8	-35.5	0.0	0.0	36.6	54.0	-17.4	H	A	
11.570	3.0	34.9	38.9	10.8	-35.5	0.0	0.0	49.1	74.0	-24.9	V	P	
11.570	3.0	22.7	38.9	10.8	-35.5	0.0	0.0	36.9	54.0	-17.1	V	A	
High Channel (5825 MHz)													
11.650	3.0	36.0	39.0	10.9	-35.5	0.0	0.0	50.4	74.0	-23.6	H	P	
11.650	3.0	22.8	39.0	10.9	-35.5	0.0	0.0	37.2	54.0	-16.8	H	A	
17.475	3.0	34.4	43.4	13.2	-33.6	0.0	0.0	57.4	74.0	-16.6	H	P	
17.475	3.0	21.9	43.4	13.2	-33.6	0.0	0.0	44.9	54.0	-9.1	H	A	
11.650	3.0	36.6	39.0	10.9	-35.5	0.0	0.0	51.0	74.0	-23.0	V	P	
11.650	3.0	22.9	39.0	10.9	-35.5	0.0	0.0	37.3	54.0	-16.7	V	A	
17.475	3.0	34.7	43.4	13.2	-33.6	0.0	0.0	57.7	74.0	-16.3	V	P	
17.475	3.0	21.9	43.4	13.2	-33.6	0.0	0.0	44.9	54.0	-9.1	V	A	
Rev. 4.1.2.7													
Note: No other emissions were detected above the system noise floor.													

7.2.4. TRANSMITTER ABOVE 1 GHz FOR 802.11n HT40 MODE IN THE 5.8 GHz BAND CHAIN B

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber																																																															
Test Engr: MENGISTU MEKURIA Date: 05/02/12 Project #: 12J14381 Company: PANASONIC Test Target: FCC CFR47 PART 15 Mode Oper: TX, 802.11n HT40 MHz, CHAIN B																																																															
<table style="width: 100%; border: none;"> <tr> <td style="width: 10%;">f</td> <td style="width: 15%;">Measurement Frequency</td> <td style="width: 10%;">Amp</td> <td style="width: 10%;">Preamp Gain</td> <td style="width: 15%;">Average Field Strength Limit</td> <td colspan="5"></td> </tr> <tr> <td>Dist</td> <td>Distance to Antenna</td> <td>D Corr</td> <td>Distance Correct to 3 meters</td> <td>Peak Field Strength Limit</td> <td colspan="5"></td> </tr> <tr> <td>Read</td> <td>Analyzer Reading</td> <td>Avg</td> <td>Average Field Strength @ 3 m</td> <td>Margin vs. Average Limit</td> <td colspan="5"></td> </tr> <tr> <td>AF</td> <td>Antenna Factor</td> <td>Peak</td> <td>Calculated Peak Field Strength</td> <td>Margin vs. Peak Limit</td> <td colspan="5"></td> </tr> <tr> <td>CL</td> <td>Cable Loss</td> <td>HPF</td> <td>High Pass Filter</td> <td></td> <td colspan="5"></td> </tr> </table>														f	Measurement Frequency	Amp	Preamp Gain	Average Field Strength Limit						Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Peak Field Strength Limit						Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Margin vs. Average Limit						AF	Antenna Factor	Peak	Calculated Peak Field Strength	Margin vs. Peak Limit						CL	Cable Loss	HPF	High Pass Filter						
f	Measurement Frequency	Amp	Preamp Gain	Average Field Strength Limit																																																											
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f	Dist	Read	AF	CL	Amp	D Corr	Fltr	Corr.	Limit	Margin	Ant. Pol.	Det.	Notes																																																		
GHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/Q/P																																																			
Low Channel (5755 MHz)																																																															
11.510	3.0	34.6	38.8	10.7	-35.5	0.0	0.0	48.6	74.0	-25.4	H	P																																																			
11.510	3.0	22.1	38.8	10.7	-35.5	0.0	0.0	36.2	54.0	-17.8	H	A																																																			
17.265	3.0	36.2	42.0	13.1	-33.5	0.0	0.0	57.8	74.0	-16.2	H	P																																																			
17.265	3.0	23.2	42.0	13.1	-33.5	0.0	0.0	44.7	54.0	-9.3	H	A																																																			
11.510	3.0	35.8	38.8	10.7	-35.5	0.0	0.0	49.8	74.0	-24.2	V	P																																																			
11.510	3.0	22.0	38.8	10.7	-35.5	0.0	0.0	36.0	54.0	-18.0	V	A																																																			
17.265	3.0	35.6	42.0	13.1	-33.5	0.0	0.0	57.2	74.0	-16.8	V	P																																																			
17.265	3.0	23.2	42.0	13.1	-33.5	0.0	0.0	44.8	54.0	-9.2	V	A																																																			
High Channel (5795 MHz)																																																															
11.590	3.0	35.4	38.9	10.8	-35.5	0.0	0.0	49.7	74.0	-24.3	H	P																																																			
11.590	3.0	22.6	38.9	10.8	-35.5	0.0	0.0	36.8	54.0	-17.2	H	A																																																			
17.385	3.0	35.2	42.8	13.1	-33.5	0.0	0.0	57.5	74.0	-16.5	H	P																																																			
17.385	3.0	22.4	42.8	13.1	-33.5	0.0	0.0	44.8	54.0	-9.2	H	A																																																			
11.590	3.0	35.3	38.9	10.8	-35.5	0.0	0.0	49.6	74.0	-24.4	V	P																																																			
11.590	3.0	22.5	38.9	10.8	-35.5	0.0	0.0	36.7	54.0	-17.3	V	A																																																			
17.385	3.0	35.7	42.8	13.1	-33.5	0.0	0.0	58.1	74.0	-15.9	V	P																																																			
17.385	3.0	22.4	42.8	13.1	-33.5	0.0	0.0	44.7	54.0	-9.3	V	A																																																			
Rev. 4.1.2.7 Note: No other emissions were detected above the system noise floor.																																																															

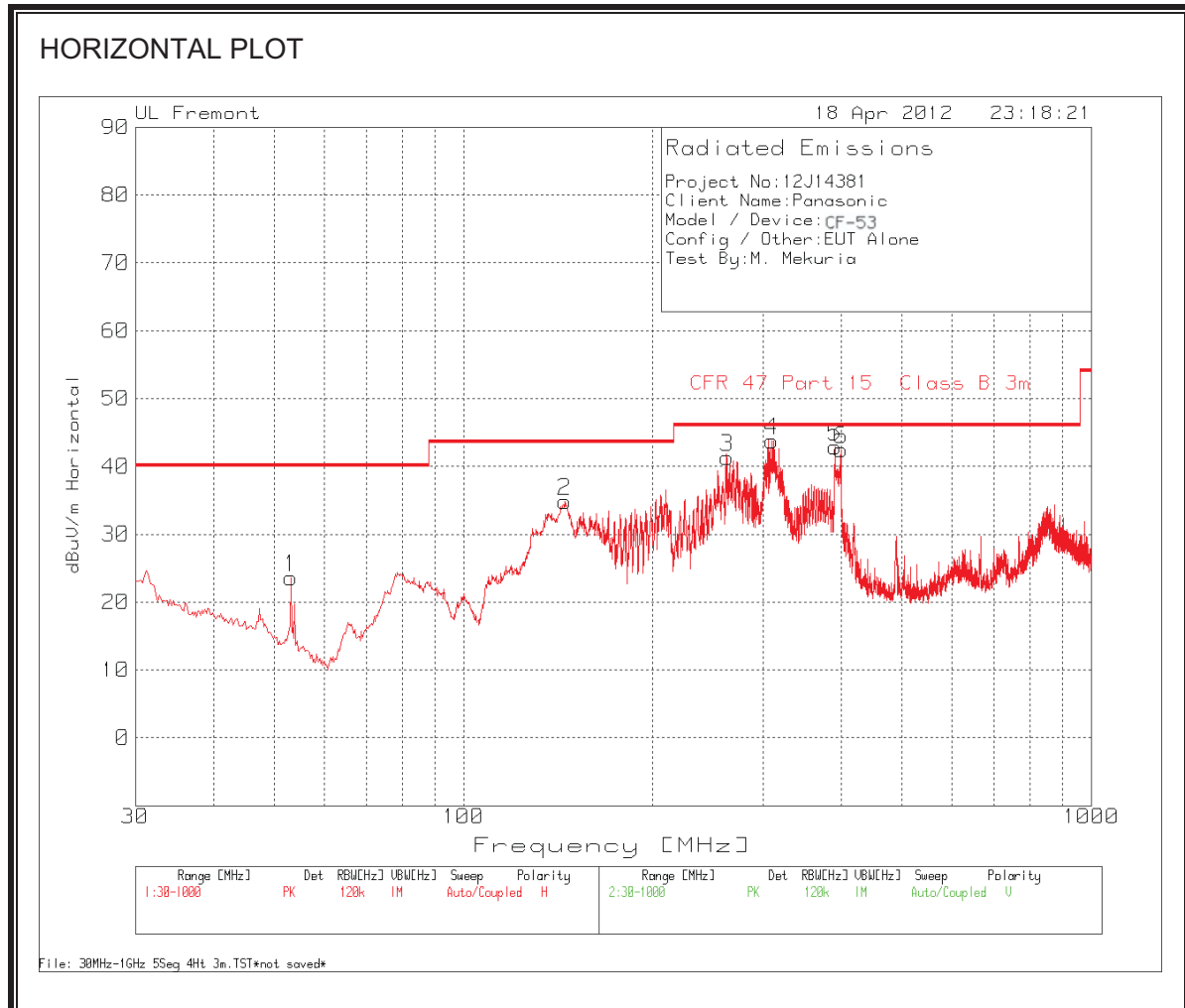
7.2.5. TRANSMITTER ABOVE 1 GHz FOR 802.11n HT40 MODE IN THE 5.8 GHz BAND CHAIN A AND B

HARMONICS AND SPURIOUS EMISSIONS

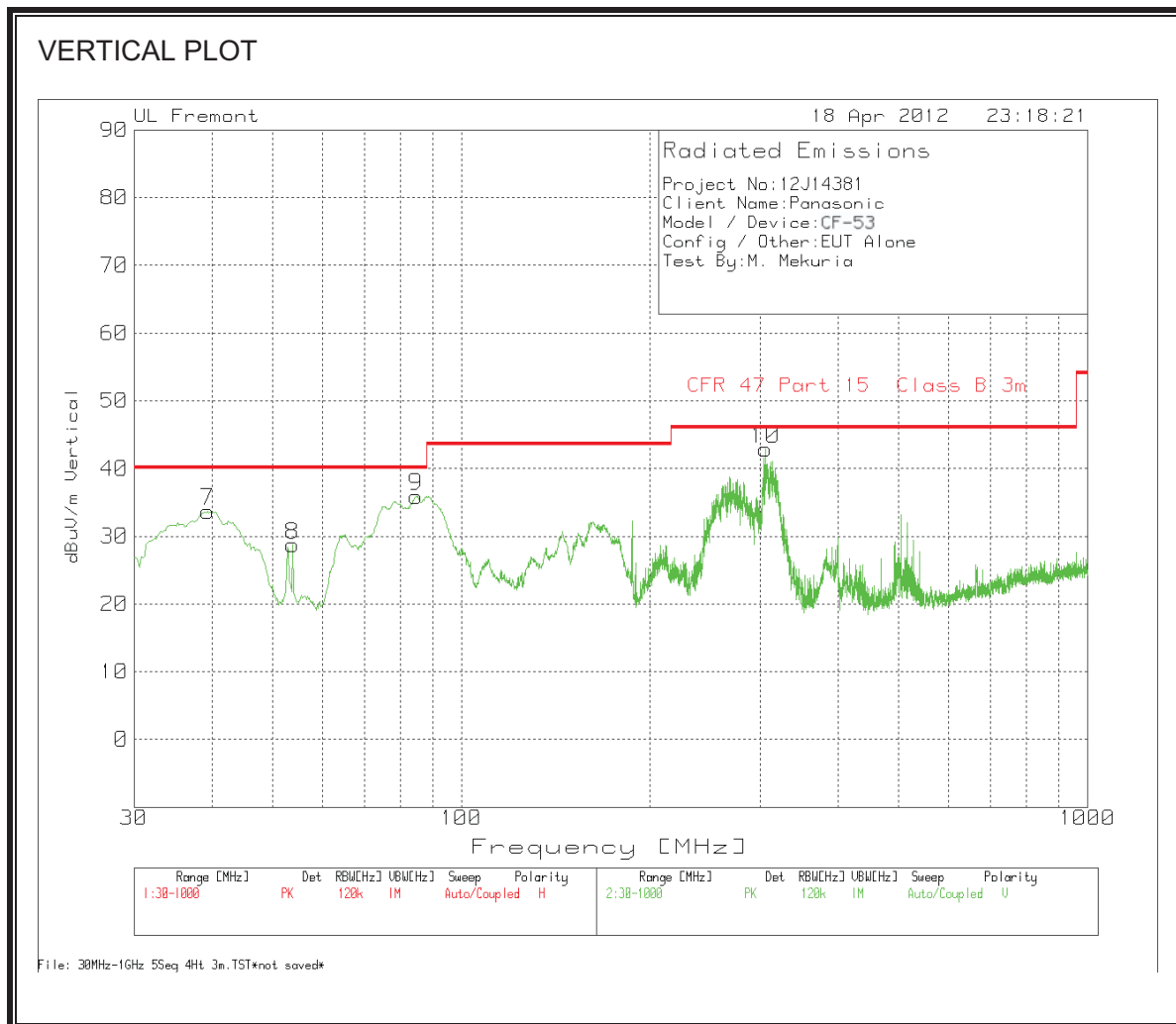
High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber																																																																																			
Test Engr: MENGISTU MEKURIA Date: 05/02/12 Project #: 12J14381 Company: PANASONIC Test Target: FCC CFR47 PART 15 Mode Oper: TX, 802.11n HT20 MHz, CHAIN A AND B																																																																																			
<table style="width: 100%; border: none;"> <tr> <td style="width: 15%;">f</td> <td>Measurement Frequency</td> <td style="width: 15%;">Amp</td> <td>Preamp Gain</td> <td style="width: 15%;">Average Field Strength Limit</td> <td colspan="9"></td> </tr> <tr> <td>Dist</td> <td>Distance to Antenna</td> <td>D Corr</td> <td>Distance Correct to 3 meters</td> <td>Peak Field Strength Limit</td> <td colspan="9"></td> </tr> <tr> <td>Read</td> <td>Analyzer Reading</td> <td>Avg</td> <td>Average Field Strength @ 3 m</td> <td>Margin vs. Average Limit</td> <td colspan="9"></td> </tr> <tr> <td>AF</td> <td>Antenna Factor</td> <td>Peak</td> <td>Calculated Peak Field Strength</td> <td>Margin vs. Peak Limit</td> <td colspan="9"></td> </tr> <tr> <td>CL</td> <td>Cable Loss</td> <td>HPF</td> <td>High Pass Filter</td> <td></td> <td colspan="9"></td> </tr> </table>														f	Measurement Frequency	Amp	Preamp Gain	Average Field Strength Limit										Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Peak Field Strength Limit										Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Margin vs. Average Limit										AF	Antenna Factor	Peak	Calculated Peak Field Strength	Margin vs. Peak Limit										CL	Cable Loss	HPF	High Pass Filter										
f	Measurement Frequency	Amp	Preamp Gain	Average Field Strength Limit																																																																															
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CL	Cable Loss	HPF	High Pass Filter																																																																																
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes																																																																						
Low Channel (5755 MHz)																																																																																			
11.510	3.0	34.3	38.8	10.7	-35.5	0.0	0.0	48.4	74.0	-25.6	H	P																																																																							
11.510	3.0	22.1	38.8	10.7	-35.5	0.0	0.0	36.2	54.0	-17.8	H	A																																																																							
11.510	3.0	34.6	38.8	10.7	-35.5	0.0	0.0	48.6	74.0	-25.4	V	P																																																																							
11.510	3.0	22.2	38.8	10.7	-35.5	0.0	0.0	36.2	54.0	-17.8	V	A																																																																							
High Channel (5795 MHz)																																																																																			
11.590	3.0	34.8	38.9	10.8	-35.5	0.0	0.0	49.1	74.0	-24.9	H	P																																																																							
11.590	3.0	22.5	38.9	10.8	-35.5	0.0	0.0	36.7	54.0	-17.3	H	A																																																																							
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11.590	3.0	22.4	38.9	10.8	-35.5	0.0	0.0	36.7	54.0	-17.3	V	A																																																																							
Rev. 4.1.2.7																																																																																			
Note: No other emissions were detected above the system noise floor.																																																																																			

7.3. WORST-CASE BELOW 1 GHz

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



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



HORIZONTAL & VERTICAL DATA

Project No:12J14381									
Client Name:Panasonic									
Model / Device:CF-53									
Config / Other:EUT Alone									
Test By:M. Mekuria									
Range 1 30 - 1000MHz									
Test Frequency	Meter Reading	Detector	25MHz-1GHz ChmbrA Amplified.TX [dB]	T243 Sunol Bilog.TXT [dB]	dBuV/m	CFR 47 Part 15 Class B 3m	Margin	Height [cm]	Polarity
53.0675	43.65	PK	-27.3	7.3	23.65	40	-16.35	300	Horz
145.1439	49.12	PK	-26.6	12.3	34.82	43.5	-8.68	200	Horz
263.1954	54.59	PK	-25.9	12.6	41.29	46	-4.71	100	Horz
263.1954	41.98	QP	-25.9	12.6	28.69	46	-17.32	100	Horz
310.4936	56.09	PK	-25.8	13.5	43.79	46	-2.21	100	Horz
310.4936	48.09	QP	-25.8	13.5	35.79	46	-10.21	100	Horz
390.5516	53.14	PK	-25.4	15.1	42.84	46	-3.16	300	Horz
390.5516	44.87	QP	-25.4	15.1	34.57	46	-11.43	300	Horz
399.4684	52.22	PK	-25.3	15.6	42.52	46	-3.48	300	Horz
399.4684	44.31	QP	-25.3	15.6	34.61	46	-11.39	300	Horz
Range 2 30 - 1000MHz									
Test Frequency	Meter Reading	Detector	25MHz-1GHz ChmbrA Amplified.TX [dB]	T243 Sunol Bilog.TXT [dB]	dBuV/m	CFR 47 Part 15 Class B 3m	Margin	Height [cm]	Polarity
39.3046	46.63	PK	-27.4	14.5	33.73	40	-6.27	100	Vert
53.8429	48.71	PK	-27.3	7.3	28.71	40	-11.29	100	Vert
84.7612	55.74	PK	-27.1	7.3	35.94	40	-4.06	100	Vert
84.7612	45.33	QP	-27.1	7.3	25.53	40	-14.47	100	Vert
306.229	55.38	PK	-25.8	13.3	42.88	46	-3.12	200	Vert
306.229	45.18	QP	-25.8	13.3	32.68	46	-13.32	200	Vert

8. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

^{*} Decreases with the logarithm of the frequency.

TEST PROCEDURE

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

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

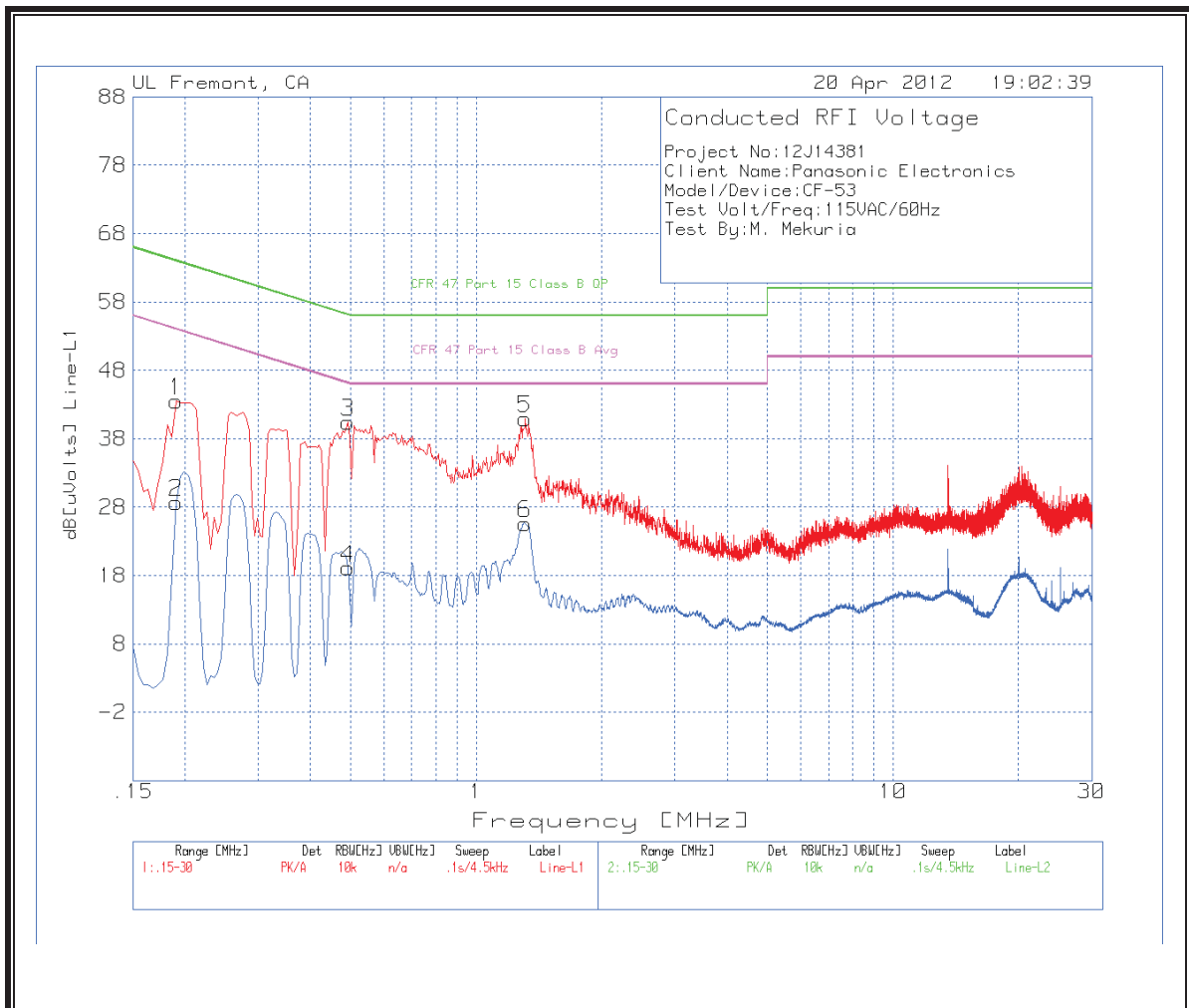
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

6 WORST EMISSIONS

Project No:12J14381									
Client Name:Panasonic Electronics									
Model/Device:CF-53									
Test Volt/Freq:115VAC/60Hz									
Test By:M. Mekuria									
Line-L1 .15 - 30MHz									
Test Frequency	Meter Reading	Detector	T24 IL L1.TXT [dB]	LC Cables 1&3.TXT [dB]	dB[uVolts]	CFR 47 Part 15 Class B QP	Margin	CFR 47 Part 15 Class B Avg	Margin
0.1905	43.37	PK	0.1	0	43.47	64	-20.53	-	-
0.1905	28.55	Av	0.1	0	28.65	-	-	54	-25.35
0.492	40.32	PK	0.1	0	40.42	56.1	-15.68	-	-
0.492	18.99	Av	0.1	0	19.09	-	-	46.1	-27.01
1.311	40.75	PK	0.1	0.1	40.95	56	-15.05	-	-
1.311	25.42	Av	0.1	0.1	25.62	-	-	46	-20.38
Line-L2 .15 - 30MHz									
Test Frequency	Meter Reading	Detector	T24 IL L2.TXT [dB]	LC Cables 2&3.TXT [dB]	dB[uVolts]	CFR 47 Part 15 Class B QP	Margin	CFR 47 Part 15 Class B Avg	Margin
0.195	38.32	PK	0.1	0	38.42	63.8	-25.38	-	-
0.195	24.44	Av	0.1	0	24.54	-	-	53.8	-29.26
0.492	29.43	PK	0.1	0	29.53	56.1	-26.57	-	-
0.492	12.75	Av	0.1	0	12.85	-	-	46.1	-33.25
1.338	30.42	PK	0.1	0.1	30.62	56	-25.38	-	-
1.338	14.55	Av	0.1	0.1	14.75	-	-	46	-31.25

LINE 1 RESULTS



LINE 2 RESULTS

