



EMI TEST REPORT

Test Report No. : 29LE0211-HO-05-B

Applicant : Panasonic Corporation of North America
Type of Equipment : WIRELESS LAN ADAPTOR
Model No. : DY-WL10
FCC ID : ACJ-DY-WL10
Test regulation : FCC Part 15 Subpart B 2009 Class B
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Date of test:

October 24, 2009

Tested by:

K. Kawamura

Keisuke Kawamura
EMC Services

Approved by :

T. Hatakeeda

Takahiro Hatakeeda
Group Leader of EMC Services



NVLAP LAB CODE: 200572-0

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CONTENTS	PAGE
SECTION 1: Customer information	3
SECTION 2: Equipment under test (E.U.T.)	3
SECTION 3: Test specification, procedures & results	5
SECTION 4: Operation of E.U.T. during testing	8
SECTION 5: Conducted Emission	10
SECTION 6: Radiated Emission	11
APPENDIX 1: Photographs of test setup.....	12
Conducted Emission	12
Radiated Emission	13
Worst Case Position (Horizontal: X-axis/ Vertical:X-axis)	14
APPENDIX 2: Data of EMI test	15
Conducted Emission	15
Radiated Emission	16
APPENDIX 3: Test instruments	17

SECTION 1: Customer information

Company Name : Panasonic Corporation of North America
Address : One Panasonic Way, 4B-8 Secaucus, NJ 0709
Telephone Number : +1-201-348-7758
Facsimile Number : +1-201-392-4564
Contact Person : Richard Mullen

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : WIRELESS LAN ADAPTOR
Model No. : DY-WL10
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC5.0V / 0.5A
Receipt Date of Sample : October 9, 2009
Country of Mass-production : Japan
Condition of EUT : Production model
Modification of EUT : No Modification by the test lab

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2.2 Product Description

WIRELESS LAN ADAPTOR for several Audio/ Visual Devices.

General Specification

Clock frequency in the system : CRYSTAL: 20MHz

Specification of WLAN (IEEE802.11a/b/g)

Type of radio	Wireless LAN (IEEE802.11a)	Wireless LAN (IEEE802.11b/g)
Equipment Type	Transceiver	
Frequency of Operation	5180MHz - 5320MHz 5745MHz - 5825MHz	2412MHz - 2462MHz
Bandwidth & Channel spacing	Bandwidth : 20MHz Ch spacing : 20MHz	Bandwidth : 20MHz Ch spacing : 5MHz
Type of Modulation	OFDM	11b: DSSS 11g: OFDM
Antenna Type	PWB pattern antenna	
Antenna Connector Type	U.FL connector (Hirose)	
Antenna Gain	5.15GHz: 1.5dBi (Including Cableloss) 5.20GHz: 1.5dBi (Including Cableloss) 5.30GHz: 1.4dBi (Including Cableloss) 5.50GHz: 1.4dBi (Including Cableloss) 5.60GHz: 1.3dBi (Including Cableloss) 5.80GHz: 1.0dBi (Including Cableloss)	2.4GHz: 1.5dBi (Including Cableloss)
Power Supply	DC 1.2 & 3.3V	
Operating temperature range	0 to +40 deg. C.	

Specification of WLAN (IEEE802.11n)

Type of radio	Wireless LAN (IEEE802.11n)			
	2.4G Band MISO (20M Band)	2.4G Band MISO (40M Band)	5G Band MISO (20M Band)	5G Band MISO (40M Band)
Equipment Type	Transceiver			
Frequency of Operation	2412MHz - 2462MHz	2422MHz - 2452MHz	5180MHz - 5320MHz 5745MHz - 5825MHz	5190MHz - 5310MHz 5755MHz - 5795MHz
Bandwidth & Channel spacing	Bandwidth : 20MHz Ch spacing : 5MHz	Bandwidth : 40MHz Ch spacing : 5MHz	Bandwidth : 20MHz Ch spacing : 20MHz	Bandwidth : 40MHz Ch spacing : 40MHz
Type of Modulation	OFDM			
Antenna Type	PWB pattern antenna			
Antenna Connector Type	U.FL connector (Hirose)			
Antenna Gain	2.4GHz: 1.5dBi (Including Cableloss)		5.15GHz: 1.5dBi (Including Cableloss) 5.20GHz: 1.5dBi (Including Cableloss) 5.30GHz: 1.4dBi (Including Cableloss) 5.50GHz: 1.4dBi (Including Cableloss) 5.60GHz: 1.3dBi (Including Cableloss) 5.80GHz: 1.0dBi (Including Cableloss)	
Power Supply	DC 1.2 & 3.3V			
Operating temperature range	0 to +40 deg. C.			

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SECTION 3: Test specification, procedures & results

3.1 Test specification

Test Specification : FCC Part 15 Subpart B 2009, final revised on February 27, 2009
Title : FCC 47CFR Part15 Radio Frequency Device
Subpart B Unintentional Radiators

3.2 Procedures and results

Item	Test Procedure	Limits	Deviation	Worst margin	Result
Conducted emission	FCC: ANSI C63.4: 2003 7. AC powerline conducted emission measurements	Class B	N/A	[QP] 14.5dB 0.20821MHz, L	Complied
	IC: ICES-003 4.1			[AV] 14.5dB 4.92663MHz, N	
Radiated emission	FCC: ANSI C63.4: 2003 8. Radiated emission measurements	Class B	N/A	6.0dB 196.604MHz Horizontal, QP	Complied
	IC: ICES-003 4.1				

*Note: UL Japan, Inc's EMI Work Procedure QPM05.

3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

EMI

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

Test room (semi-anechoic chamber)	Conducted emission (+dB)
	150kHz-30MHz
No.1	3.7dB
No.2	3.7dB
No.3	3.7dB
No.4	3.7dB

Test room (semi-anechoic chamber)	Radiated emission (10m*)(+dB)			Radiated emission (3m*)(+dB)					
	9kHz-30MHz	30MHz-300MHz	300MHz-1GHz	9kHz-30MHz	30MHz-300MHz	300MHz-1GHz	1GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz
No.1	3.1dB	4.4dB	3.9dB	3.2dB	3.8dB	3.9dB	5.0dB	5.0dB	5.4dB
No.2	-	-	-	3.2dB	4.4dB	4.0dB	5.0dB	5.2dB	5.4dB
No.3	-	-	-	3.2dB	4.2dB	3.8dB	5.0dB	5.3dB	5.3dB
No.4	-	-	-	3.2dB	4.0dB	3.8dB	5.0dB	5.3dB	5.3dB

*10m/3m = Measurement distance

Conducted Emission test

The data listed in this test report has enough margin, more than the site margin.

Radiated emission test(3m)

The data listed in this test report has enough margin, more than the site margin.

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3.5 Test Location

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	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test set up, Data of EMI, and Test instruments

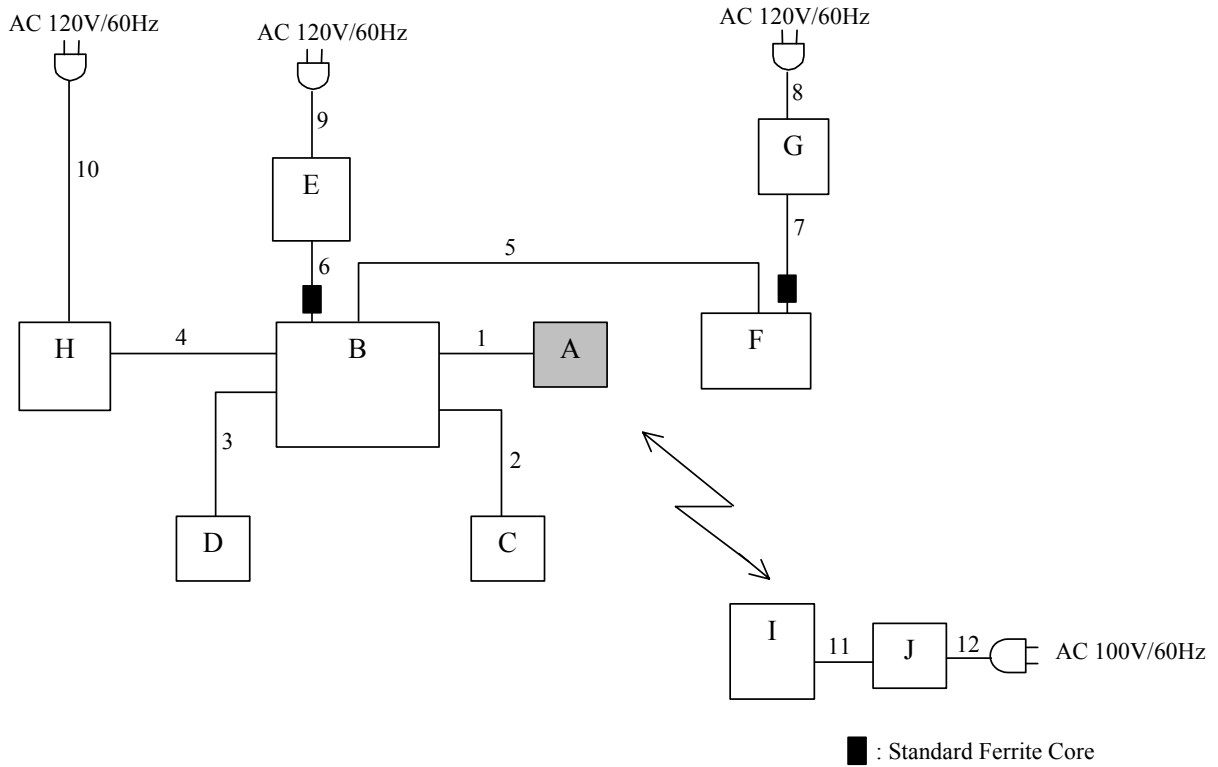
Refer to APPENDIX 1 to 3.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating modes

The mode is used : Communication mode

4.2 Configuration and peripherals



*Cabling and setup were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	WIRELESS LAN ADAPTOR	DY-WL10	246	Panasonic	EUT
B	Note PC	T42	L3-64H007	IBM	-
C	USB Mouse	M056U0A	G0100D8Z	DELL	-
D	Head Set	H5T601-BL	-	Arvel	-
E	AC ADAPTOR	08K8208	11S08K8208Z1Z9MA5412YM	IBM	-
F	Printer	DeskJet 840C	CN0B11C1H2	HP	-
G	AC ADAPTOR	C6409-60014	0049R0D	HP	-
H	Monitor	E173FPc	CN-0D5431-64180-59T-197C	DELL	-
I	Access Point	PA-WR8500N	85N1830111003A1	NEC	-
J	AC ADAPTOR	AL1-001427-001	0711	NEC	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	USB Cable	1.0	Shielded	Shielded	-
2	USB Cable	1.8	Shielded	Shielded	-
3	Signal Cable	1.9	Unshielded	Unshielded	-
4	Signal Cable	1.5	Unshielded	Unshielded	-
5	Signal Cable	2.0	Unshielded	Unshielded	-
6	DC Cable	1.8	Unshielded	Unshielded	-
7	DC Cable	1.9	Unshielded	Unshielded	-
8	AC Cable	2.0	Unshielded	Unshielded	-
9	AC Cable	0.9	Unshielded	Unshielded	-
10	AC Cable	2.3	Unshielded	Unshielded	-
11	DC Cable	1.9	Unshielded	Unshielded	-
12	AC Cable	0.7	Unshielded	Unshielded	-

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SECTION 5: Conducted Emission

5.1 Operating environment

Test place : No.4 semi anechoic chamber.
Temperature : See data
Humidity : See data

5.2 Test configuration

EUT was placed on a urethane platform of nominal size, 1.0m by 2.0m, raised 0.8m above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT and its peripherals was aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from the LISN/AMN and excess AC cable was bundled in center. I/O cables that were connected to the other peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN/AMN to the input power source. All unused 50 ohm connectors of the LISN/AMN were resistivity terminated in 50 ohm when not connected to the measuring equipment. Photographs of the set up are shown in Appendix 1.

Frequency range : 0.15 MHz-30MHz
EUT position : Table top
EUT operation mode : See Clause 4.1

5.3 Test procedure

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT within a semi anechoic chamber. The EUT was connected to a Line Impedance Stabilization Network (LISN)/ Artificial Mains network (AMN). An overview sweep with peak detection has been performed. The measurements have been performed with a quasi-peak detector and if required, with an average detector.

The conducted emission measurements were made with the following detector function of the test receiver.

Detector Type : Quasi-Peak and Average
IF Bandwidth : 9 kHz

5.4 Test result

Summary of the test results: Pass

Date: October 24, 2009

Test engineer: Keisuke Kawamura

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SECTION 6: Radiated Emission

6.1 Operating environment

Test place : No.3 semi anechoic chamber
Temperature : See data
Humidity : See data

6.2 Test configuration

EUT was placed on a urethane platform of nominal size, 1.0m by 2.0m, raised 0.8m above the conducting ground plane. The EUT was set on the edge of the tabletop.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Photographs of the set up are shown in Appendix 1.

6.3 Test conditions

Frequency range : 30MHz-300MHz (Biconical antenna) / 300MHz-1000MHz (Logperiodic antenna)
Test distance : 3m
EUT position : Table top
EUT operation mode : See Clause 4.1

6.4 Test procedure

The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The radiated emission measurements were made with the following detector function of the test receiver and the Spectrum analyzer.

Frequency	Below 1GHz
Instrument used	Test Receiver
IF Bandwidth	QP: BW 120kHz

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

6.5 Test result

Summary of the test results: Pass

Date: October 24, 2009

Test engineer: Keisuke Kawamura

UL Japan, Inc.

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