



Test report No. : 32GE0051-SH-03-B  
Page : 1 of 61  
Issued date : July 23, 2012  
FCC ID : ACJ932YEAP01A473W  
Revised date : August 21, 2012

# **RADIO TEST REPORT**

**Test Report No. : 32GE0051-SH-03-B**

**Applicant** : **Panasonic Corporation**  
**Automotive Systems Company**

**Type of Equipment** : **Bluetooth/WLAN Module Assy**

**Model No.** : **YEAP01A473WLAN**


**FCC ID** : **ACJ932YEAP01A473W**


**Test regulation** : **FCC Part15 Subpart C: 2012**

**Test result** : **Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.

**Date of test:** June 20 to 24, 2012

**Tested by:**   
Makoto Hosaka  
Engineer of WiSE Japan,  
UL Verification Service

**Approved by :**   
Go Ishiwata  
Manager of WiSE Japan,  
UL Verification Service

- ☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
- ☒ There is no testing item of "Non-accreditation".



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13-EM-F0429

## REVISION HISTORY

**Original Test Report No.: 32GE0051-SH-03-B**

[illegible]**UL Japan, Inc.**

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## **SECTION 1: Customer information**

Company Name : Panasonic Corporation Automotive Systems Company  
Brand Name : Panasonic  
Address : 4261 Ikonobe-cho, Tsuzuki-ku, Yokohama-shi, Kanagawa 224-8520 Japan  
Telephone Number : +81-50-3689-6973  
Facsimile Number : +81-45-931-0806  
Contact Person : Ichiro Furuya

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

### **2.1 Identification of E.U.T.**

Type of Equipment : Bluetooth/WLAN Module Assy  
Model No. : YEAP01A473WLAN  
Serial No. : Refer to 4.2 in this report.  
Rating : DC5.0V  
Receipt Date of Sample : June 20, 2012  
Country of Mass-production : Japan  
Condition of EUT : Engineering prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)  
Modification of EUT : No modification by the test lab.

### **2.2 Product description**

Model: YEAP01A473WLAN (referred to as the EUT in this report) is a Bluetooth/WLAN Module Assy.

Clock frequency(ies) in the system : 26MHz, 32.768kHz

### **Radio specification**

Equipment type : Transceiver  
Frequency of operation : 2412-2462MHz  
Bandwidth & channel spacing : 5MHz  
Type of modulation : DSSS: CCK,DQPSK, DBPSK, OFDM: 64QAM, 16QAM, QPSK, BPSK  
Antenna type : Monopole \*1)  
Antenna connector type : U.FL  
Antenna gain with cable loss : -3.8dBi (N1KYYYYY00019), -4.4dBi (N1KYYYYY00030)  
ITU code : F1D, G1D  
Operation temperature range : -30 to +85 deg. C.

\* For Bluetooth part, Refer to the test report: 32GE0051-SH-03-A.

\*1) N1KYYYYY00019 or N1KYYYYY00030 is installed to the module. The length of coaxial cable is different.

Antenna	Cable Loss (dB)
N1KYYYYY00019	0.165
N1KYYYYY00030	0.743

FCC 15.31 (e)

The RF module is provided with stable power supply DC 3.3V and DC1.8V from the host device, therefore, the equipment complies with the power supply regulation.

FCC 15.203

The EUT complies with the requirement, because the antenna has a unique coupling (U.FL).

There is 2-type of bottom plate. The size is different. Bottom plate is located on the bottom of the EUT.

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## SECTION 3: Test specification, procedures & results

### 3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2012, final revised on May 17, 2012 and effective June 18, 2012  
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators  
Section 15.207 Conducted limits  
Section 15.209 Radiated emission limits, general requirements  
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz,  
and 5725-5850MHz

### 3.2 Procedures & Results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.4:2009 7. AC powerline conducted emission measurements	FCC 15.207	-	N/A *1)	N/A	N/A
6dB bandwidth	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (a)(2) & 15.209	Conducted	N/A	* See data	Complied
Maximum peak output power	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (b)(3) & 15.209	Conducted	N/A		Complied
Spurious emission & Restricted band edges	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.109, 15.247 (d) & 15.209	Conducted / Radiated	N/A	0.8dB Freq.: 7386.000MHz Detector: Average Polarization: Vertical Mode: Tx 2462MHz, IEEE 802.11n	Complied
Power density	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (e) & 15.209	Conducted	N/A	* See data	Complied
Note: UL Japan's Work Procedures No.13-EM-W0420 and 13-EM-W0422 These tests were also referred to "Guidance on Measurement for Digital Transmission Systems Section15.247". *1) The test is not applicable since the EUT does not have AC Mains.						

### 3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied Bandwidth (99%)	ANSI C63.4:2009 13. Measurement of intentional radiators, RSS-Gen 4.6.1	-	Conducted	-	-

Note: UL Japan's Work Procedures No. 13-EM-W0420 and 13-EM-W0422

\* Other than above, no addition, exclusion nor deviation has been made from the standard.

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### 3.4 Uncertainty

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

Item	Frequency range	No.1 SAC <sup>*1</sup> /SR <sup>*2</sup> (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)
<b>Radiated emission (Measurement distance: 3m)</b>	9kHz-30MHz	3.7 dB	3.7 dB	3.6 dB
	30MHz-300MHz	4.9 dB	5.1 dB	5.0 dB
	300MHz-1GHz	5.0 dB	5.2 dB	5.0 dB
	1GHz-15GHz	4.8 dB	4.8 dB	4.9 dB
<b>Radiated emission (Measurement distance: 1m)</b>	15GHz-18GHz	5.6 dB	5.6 dB	5.6 dB
	18GHz-40GHz	4.8 dB	4.3 dB	4.4 dB

\*1: SAC=Semi-Anechoic Chamber

\*2: SR= Shielded Room is applied besides radiated emission

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

### Antenna port conducted test

Power measurement uncertainty above 1GHz for this test was: (±) 1.5dB

Spurious emission (Conducted) measurement (below 1GHz) uncertainty for this test was: (±) 1.7dB

Spurious emission (Conducted) measurement (1G-3GHz) uncertainty for this test was: (±) 2.3dB

Spurious emission (Conducted) measurement (3G-18GHz) uncertainty for this test was: (±) 3.0dB

Spurious emission (Conducted) measurement (18G-26.5GHz) uncertainty for this test was: (±) 2.9dB

Bandwidth measurement uncertainty for this test was: (±) 5.4%

### 3.5 Test location

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JAB Accreditation No. : RTL02610

	FCC Registration No.	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
<input type="checkbox"/> No.1 Semi-anechoic chamber	697847	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
<input type="checkbox"/> No.2 Semi-anechoic chamber	697847	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
<input checked="" type="checkbox"/> No.3 Semi-anechoic chamber	697847	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
<input type="checkbox"/> No.4 Full-anechoic chamber	-	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
<input type="checkbox"/> No.1 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
<input type="checkbox"/> No.2 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
<input checked="" type="checkbox"/> No.3 shielded room	-	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
<input type="checkbox"/> No.4 shielded room	-	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
<input checked="" type="checkbox"/> No.5 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
<input type="checkbox"/> No.6 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-

### 3.6 Test setup, Data of test & Test instruments

Refer to APPENDIX 1 to 3.

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

### **4.1 Operating mode**

Test item	Mode	Tested frequency	Worst data rate *1)
Radiated emission (below 1GHz) *2)	Transmitting IEEE 802.11g	2462MHz	48Mbps, PN9
Other items	Transmitting IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	11Mbps, PN9
	Transmitting IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	18Mbps, PN9
	Transmitting IEEE 802.11n-20	2412MHz, 2437MHz, 2462MHz	MCS3, PN9
*1) The worst condition was determined based on the test result of Maximum Peak Output Power.			
*2) Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - "of TCB Council Workshop October 2009.			

EUT has the power settings by the software as follows;

Power settings	Fixed (The setting is not controlled by the software and it is equivalent to that of mass- produced items.)
Software	Real Time Tuning Tool Ver 2.0.0.17

#### **Antenna used:**

Test item	Antenna	Bottom plate
Radiated emission	N1KYYYY00019	Small
Other items	-	Small

The carrier level and noise levels were confirmed with each antenna and each bottom plate to see the case of maximum noise, and the test was made at the case that has the maximum noise.

**Justification:** The system was configured in typical fashion (as customer would normally use it) for testing.

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