IEEE C95.1 2005
KDB 447498 D01 V06
47 C.F.R. Part 1, Subpart I, Section 1.1310
47 C.F.R. Part 2, Subpart J, Section 2.1091

RF EXPOSURE REPORT

For

WIFI module

Model: WL17A

Trade Name: Panasonic

Issued to

Panasonic Corporation of North America
Two Riverfront Plaza, 9th Floor Newark, NJ 07102-5490 United States

Issued by

Compliance Certification Services Inc.
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)
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Issued Date: February 22, 2018

Testing Laboratory
1309

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	February 22, 2018	Initial Issue	ALL	May Lin
01	March 29, 2018	1. Modify Frequency band (Operating).	P.5	Allison Chen
02	April 16, 2018	1. Modify Frequency band (Operating).	P.5	May Lin
03	April 19, 2018	1. Modify Frequency band (Operating).	P.5	May Lin

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1. TEST RESULT CERTIFICATION

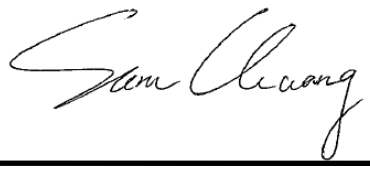
We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
IEEE C95.1 2005 KDB 447498 D03 47 C.F.R. Part 1, Subpart I, Section 1.1310 47 C.F.R. Part 2, Subpart J, Section 2.1091	No non-compliance noted

Approved by:



Sam Chuang
Manager
Compliance Certification Services Inc.

Test by:

May Lin
Report coordinator
Compliance Certification Services Inc.

2. LIMIT

According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

3. EUT SPECIFICATION

<table>
<tr><td>EUT</td><td>WIFI module</td></tr>
<tr><td>Model</td><td>WL17A</td></tr>
<tr><td>Trade Name</td><td>Panasonic</td></tr>
<tr><td>Model Discrepancy</td><td>N/A</td></tr>
<tr><td>Frequency band (Operating)</td><td>☒ 802.11b/g/n HT20: 2412MHz ~ 2462MHz
802.11n HT40: 2422MHz ~ 2452MHz
802.11a/n HT20: 5180MHz ~ 5240MHz / 5260MHz ~ 5320MHz / 5500MHz ~ 5700MHz / 5745MHz ~ 5825MHz
802.11n HT40: 5190MHz ~ 5230MHz / 5270MHz ~ 5310MHz / 5510MHz ~ 5670MHz / 5755MHz ~ 5795MHz
802.11ac VHT80: 5210MHz / 5290 MHz / 5530MHz / 5775MHz
☐ Others</td></tr>
<tr><td>Device category</td><td>☐ Portable (<20cm separation)
☒ Mobile (>20cm separation)
☐ Others</td></tr>
<tr><td>Exposure classification</td><td>☐ Occupational/Controlled exposure (S = 5mW/cm^2)
☒ General Population/Uncontrolled exposure (S=1mW/cm^2)</td></tr>
<tr><td>Antenna Specification</td><td>2.4G
<table>
<tr><th>Brand</th><th>P/N</th><th>Type</th><th>Cable length</th><th>Peak Gain</th></tr>
<tr><td>LYNwave</td><td>ALA110-222050-300011</td><td>PIFA</td><td>300mm</td><td>3.5dBi</td></tr>
</table>
5G
<table>
<tr><th>Brand</th><th>P/N</th><th>Type</th><th>Peak Gain</th></tr>
<tr><td>LYNwave</td><td>ALA110-222050-300011</td><td>PIFA</td><td>5 dBi</td></tr>
</table>
2.4GHz Antenna Gain : 3.50 dBi (Numeric gain: 2.24) Worst
5GHz: Antenna Gain : 5.00 dBi (Numeric gain: 3.16) Worst

Notes:
1. Power Directional Gain: 10LOG(((10^(Ant1/10)+10^(Ant2/10))/2))</td></tr>
</table>

Max tune up Power	IEEE 802.11b Mode: 22.50 dBm (177.828 mW) IEEE 802.11g Mode: 20.50 dBm (112.202 mW) IEEE 802.11n HT 20 Mode: 22.50 dBm (177.828 mW) IEEE 802.11n HT 40 Mode: 21.50 dBm (141.254 mW) IEEE 802.11a Mode: 20.50 dBm (112.202 mW) IEEE 802.11n HT 20 Mode: 21.50 dBm (141.254 mW) IEEE 802.11n HT 40 Mode: 21.50 dBm (141.254 mW) IEEE 802.11ac VHT 80 Mode: 22.00 dBm (158.489 mW)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

4. TEST RESULTS

No non-compliance noted.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

Where 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 and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{377 d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ ***Equation 1***

Where d = Distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power density in mW / cm²

5. MAXIMUM PERMISSIBLE EXPOSURE

Substituting the MPE safe distance using d = 20 cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where P = Power in mW
G = Numeric antenna gain
S = Power density in mW / cm²

IEEE 802.11b mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
6	2437	177.828	2.24	20	0.0793	1

IEEE 802.11g mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
6	2437	112.202	2.24	20	0.0500	1

IEEE 802.11n HT20 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
6	2437	177.828	2.24	20	0.0793	1

IEEE 802.11n HT40 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
6	2437	141.254	2.24	20	0.0630	1

IEEE 802.11a mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
165	5825	112.202	3.16	20	0.0706	1

IEEE 802.11n HT20 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
165	5825	141.254	3.16	20	0.0888	1

IEEE 802.11n HT40 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
151	5755	141.254	3.16	20	0.0888	1

IEEE 802.11ac VHT80 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
155	5775	158.489	3.16	20	0.0997	1