

RF Exposure Report

Report No.: SA141225E12G R1

FCC ID: Q87-WRT1900ACV2

Test Model: WRT1900ACSV2

Series Model: WRT1900ACS V2, WRT1900ACS

Received Date: Mar. 30, 2016

Test Date: Mar. 30 ~ May 11, 2016

Issued Date: Jun. 14, 2016

Applicant: Linksys LLC

Address: 121 Theory Drive Irvine California 92617 United States

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

Lab Address: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.

Test Location (1): E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.

Test Location (2): No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

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Report Issue History Record

Issue No.	Reason for Change	Date Issued
SA141225E12	Original	Mar. 13, 2015
SA141225E12E	Added one model No.: WRT1900ACS	Aug. 10, 2015
SA141225E12F	1. Upgrade the standard to section 15.407 under new rule for U-NII-3 band. 2. Removed the original adapter "Model: MU42-1120300-A1" 3. Added one model No.	May 10, 2016
SA141225E12G	Upgrade the standard to section 15.407 under new rule (16-24) for U-NII-3 band.	May 19, 2016
SA141225E12G R1	Modified the series model from WRT1900ACV2 to WRT1900ACS V2	Jun. 14, 2016

Release Control Record

Issue No.	Description	Date Issued
SA141225E12G	Original release	May 19, 2016
SA141225E12G R1	Modified the series model from WRT1900ACV2 to WRT1900ACS V2	Jun. 14, 2016

1 Certificate of Conformity

Product: 802.11ac Router

Brand: Linksys

Test Model: WRT1900ACSV2

Series Model: WRT1900ACS V2, WRT1900ACS

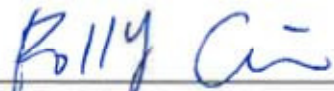
Sample Status: Engineering sample

Applicant: Linksys LLC

Test Date: Mar. 30 ~ May 11, 2016

Standards: FCC Part 2 (Section 2.1091)
KDB 447498 D01 (October 23, 2015)
IEEE C95.1

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :  , Date: Jun. 14, 2016
Polly Chien / Specialist

Approved by :  , Date: Jun. 14, 2016
May Chen / Manager

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

2.2 MPE Calculation Formula

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 28cm away from the body of the user. So, this device is classified as **Mobile Device**.

3 Antenna Gain

The antennas provided to the EUT, please refer to the following table:

Transmitter Circuit	Brand	Gain (dBi)	Cable Loss (dB)	Net Gain (dBi)	Frequency Range (GHz to GHz)	Antenna Type	Connector Type
Chain (0)	LINKSYS	2.5	1	1.5	2.4 ~ 2.4835	DIPOLE	R-SMA
		2.6	1.6	1	5.15 ~ 5.25		
		3.8	1.9	1.9	5.725 ~ 5.85		
Chain (1)	LINKSYS	2.5	1	1.5	2.4 ~ 2.4835	DIPOLE	R-SMA
		2.6	1.5	1.1	5.15 ~ 5.25		
		3.8	2.1	1.7	5.725 ~ 5.85		
Chain (2)	LINKSYS	2.5	1	1.5	2.4 ~ 2.4835	DIPOLE	R-SMA
		2.6	1.5	1.1	5.15 ~ 5.25		
		3.8	2.1	1.7	5.725 ~ 5.85		
Chain (3)	LINKSYS	2.5	0.5	2	2.4 ~ 2.4835	DIPOLE	R-SMA
		2.6	0.9	1.7	5.15 ~ 5.25		
		3.8	1.6	2.2	5.725 ~ 5.85		

4 Calculation Result Of Maximum Conducted Power

For WLAN (2.4GHz) & WLAN (5GHz - U-NII-1) data was copied from the original test report (Report No.: SA141225E12).

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	981.935	7.65	28	0.58017	1
5180-5240	701.930	7.25	28	0.37824	1
5745-5825	621.046	7.90	28	0.38868	1

Note:

2.4GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 7.65\text{dBi}$

5.18-5.24GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 7.25\text{dBi}$

5.745-5.825GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 7.90\text{dBi}$

Conclusion:

Both of the WLAN 2.4G & WLAN 5G can transmit simultaneously, the formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

$\text{WLAN 2.4GHz} + \text{WLAN 5GHz} = 0.58017 / 1 + 0.38868 / 1 = 0.969038$

Therefore the maximum calculations of above situations are less than the "1" limit.

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