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RF Exposure Report

Report No.: SA131223E02C

FCC ID: XU8TEW818DRU

Test Model: TEW-818DRU

Received Date: Oct. 28, 2015

Test Date: Nov. 06, 2015

Issued Date: Dec. 24, 2015

Applicant: TRENDnet, Inc.

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

Issue No.	Description	Date Issued
SA131223E02C	Original release.	Dec. 24, 2015



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1 Certificate of Conformity

Product: AC1900 Dual Band Wireless Router

Brand: TRENDnet

Test Model: TEW-818DRU

Sample Status: ENGINEERING SAMPLE

Applicant: TRENDnet, Inc.

Test Date: Nov. 06, 2015

Standards: FCC Part 2 (Section 2.1091)

KDB 447498 D01 GENERAL RF EXPOSURE GUIDANCE V06

IEEE STD C95.1-2005

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:** Dec. 24, 2015
Lori Chung / Specialist

Approved by : , **Date:** Dec. 24, 2015
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 29cm away from the body of the user.

So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

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

Ant. No.	Transmitter Circuit	Gain (dBi) (Include cable loss)	Antenna Type	Connector Type	Frequency range (GHz to GHz)	Cable Length (mm)
1	Chain (0)	2.5	Dipole	i-pex (MHF)	2.4~2.4835	78
	Chain (2)	4.8			5.15~5.85	
2	Chain (1)	6	Dipole	i-pex (MHF)	2.4~2.4835	90
					5.15~5.85	
3	Chain (2)	5.5	Dipole	i-pex (MHF)	2.4~2.4835	185
	Chain (0)	6			5.15~5.85	

Note:

1. From above antennas, 802.11b mode will fix transmission on Chain (0).
 2. From above antennas, 802.11g mode the worst case was found in Chain (1).
 3. From above antennas, 802.11a mode the worst case was found in Chain (0).
- Therefore only the test data of the mode was recorded in this report.

2.5 Calculation Result of Maximum Conducted Power

For 2.4GHz & 5GHz (5180-5240MHz) data was copied from the original test report (Report No.: SA131223E02).

For 15.247:

802.11b

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	218.273	2.5	29	0.03673	1

802.11g

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	412.098	5.5	29	0.13835	1

802.11n (HT20)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	705.471	9.57	29	0.60461	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 9.57\text{dBi}$$

802.11n (HT40)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2422-2452	263.260	9.57	29	0.22562	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 9.57\text{dBi}$$

For 15.407:

802.11a

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
5180-5240	46.132	6	29	0.01738	1
5745-5825	450.817	6	29	0.16982	1

802.11ac (VHT20)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
5180-5240	18.067	10.39	29	0.01870	1
5745-5825	350.93	10.39	29	0.36326	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 10.39\text{dBi}$$

802.11ac (VHT40)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
5190-5230	17.615	10.39	29	0.01823	1
5755-5795	345.754	10.39	29	0.35790	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 10.39\text{dBi}$$

802.11ac (VHT80)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
5210	17.630	10.39	29	0.01825	1
5775	115.388	10.39	29	0.11944	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 10.39\text{dBi}$$

Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

$$\text{WLAN 2.4GHz} + \text{WLAN 5GHz} = 0.60461 + 0.3626 = 0.967$$

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

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