RF EXPOSURE REPORT

REPORT NO.:	SA131223E02
MODEL NO.:	TEW-818DRU
FCC ID:	XU8TEW818DRU
RECEIVED:	Dec. 23, 2013
TESTED:	Jan. 02, 2014
ISSUED:	Jan. 14, 2014

APPLICANT:	TRENDnet, Inc.
ADDRESS:	20675 Manhattan Place, Torrance, CA 90501

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
LAB ADDRESS:	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.
TEST LOCATION (1):	No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, 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.

This report should not be used by the client to claim product certification, approval, or endorsement by any government agencies.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA131223E02	Original release	Jan. 14, 2014

1. CERTIFICATION

PRODUCT:	AC1900 Dual Band Wireless Router
BRAND NAME:	TRENDnet
MODEL NO.:	TEW-818DRU
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	TRENDnet, Inc.
TESTED DATE:	Jan. 02, 2014
STANDARDS:	FCC Part 2 (Section 2.1091)
	FCC OET Bulletin 65, Supplement C (01-01)
	IEEE C95.1

The above equipment (Model: TEW-818DRU) 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 : Phoenix Huang , **DATE:** *Jan. 14, 2014*
(Phoenix Huang, Specialist)

APPROVED BY : , **DATE:** *Jan. 14, 2014*
(May Chen, Manager)

2. RF EXPOSURE LIMIT

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

3. MPE CALCULATION FORMULA

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

pi = 3.1416

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

4. 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**.

5. 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	Connecter 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.						

6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For 15.247 (2.4GHz):

802.11b:

FREQUENCY BAND (MHz)	CONDUCTED 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	1.00

802.11g:

FREQUENCY BAND (MHz)	CONDUCTED 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	1.00

802.11n (HT20):

FREQUENCY BAND (MHz)	CONDUCTED 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	1.00

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

802.11n (HT40):

FREQUENCY BAND (MHz)	CONDUCTED 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	1.00

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

For 15.247 (5GHz):

802.11a:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5745 - 5825	503.501	6	29	0.18967	1.00

802.11ac (VHT20):

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5745 - 5825	357.489	10.39	29	0.37005	1.00

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

802.11ac (VHT40):

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5755 - 5795	359.219	10.39	29	0.37184	1.00

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

802.11ac (VHT80):

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5775	350.574	10.39	29	0.36289	1.00

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

For 15.407 (5GHz):

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	1.00

802.11n (HT20):

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	1.00

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

802.11n (HT40):

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	1.00

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

802.11n (HT40):

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	1.00

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

CONCLUSION:

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

CPD_1 / LPD_1 + CPD_2 / LPD_2 + ……etc. < 1
CPD = Calculation power density
LPD = Limit of power density

Therefore, the worst-case situation is 0.60461 / 1 + 0.37184 / 1= 0.976, which is less than “1”. This confirmed that the device comply with FCC 1.1310 MPE limit.

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