RF EXPOSURE REPORT

CERTIFICATE OF CONFORMITY

FCC Rule Part:	**FCC Part 2 (Section 2.1091)**
Report No.:	MFCGJR-WTW-P23010147
FCC ID:	G95EWM322T
Product:	Wireless Access Point
Brand:	technicolor
Test Model:	EWM322TTCH2
Variant Model:	EGM322TTCH2
Received Date:	2023/2/13
Test Date:	2023/3/16
Issued Date:	2023/5/17
Applicant:	Vantiva USA LLC
Address:	4855 Peachtree Industrial Blvd. Suite 200 Norcross, Georgia 30092.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kewi Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Approved by: Jeremy Lin , **Date:** 2023/5/17

Jeremy Lin / Project Engineer

This test report consists of 14 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The test results in the report only apply to the tested sample. The test results in this report are traceable to the national or international standards.

Prepared by : Vera Huang / Specialist

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
MFCGJR-WTW-P23010147	Original Release	2023/5/17

1 Certificate

Product:	Wireless Access Point
Brand:	technicolor
Test Model:	EWM322TTCH2
Variant Model:	EGM322TTCH2
Sample Status:	Engineering sample
Applicant:	Vantiva USA LLC
Test Date:	2023/3/16
FCC Rule Part:	FCC Part 2 (Section 2.1091)
Standard:	KDB 447498 D04 Interim General RF Exposure Guidance v01

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 RF characteristics under the conditions specified in this report.

2 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT.

Measurement	Specification	Expanded Uncertainty (k=2) (±)
RF Exposure	1 GHz ~ 2.5 GHz	1.2 dB
	2.5 GHz ~ 8 GHz	1.3 dB

3 Applicable RF Exposure Limit

§ 1.1310 Radiofrequency radiation exposure limits.

(a) Specific absorption rate (SAR) shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in § 1.1307(b) of this part within the frequency range of 100 kHz to 6 GHz (inclusive).
(b) The SAR limits for occupational/controlled exposure are 0.4 W/kg, as averaged over the whole body, and a peak spatialaverage SAR of 8 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit for occupational/controlled exposure is 20 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 6 minutes to determine compliance with occupational/controlled SAR limits.
(c) The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

(e) Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields

- Limits for General Population/Uncontrolled Exposure

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				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	…	…	f/1500	30
1500-100,000	…	…	1.0	30

f = frequency in MHz. * = Plane-wave equivalent power density.

- Limits for Occupational/Controlled Exposure

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				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*($900/f^2$)	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6

f = frequency in MHz. * = Plane-wave equivalent power density.

MPE-based Exemption – §1.1307(b)(3)(i)(C)

- The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power.
- Table applies to any RF source (i.e. single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits.

RF Source frequency (MHz)	Minimum Distance		Threshold ERP (watts)
	$\lambda_L/2\pi$	$\lambda_H/2\pi$	
0.3-1.34	159 m–35.6 m		1,920 R^2.
1.34-30	35.6 m–1.6 m		3,450 R^2/f^2.
30-300	1.6 m–159 mm		3.83 R^2.
300-1,500	159 mm–31.8 mm		0.0128 R^2f.
1,500-100,000	31.8 mm–0.5 mm		19.2 R^2.
R must be at least λ/2π, where λ is the free-space operating wavelength in meters.			

MPE-based Exemption – §1.1307(b)(3)(i)(B)

- For mobile devices that are not exempt per Table 1 of §1.1307(b)(1)(i)(C) and device at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power.

$$P_{\text{th}}\,(\text{mW}) = ERP_{20\,\text{cm}}\,(\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

Routine Evaluation

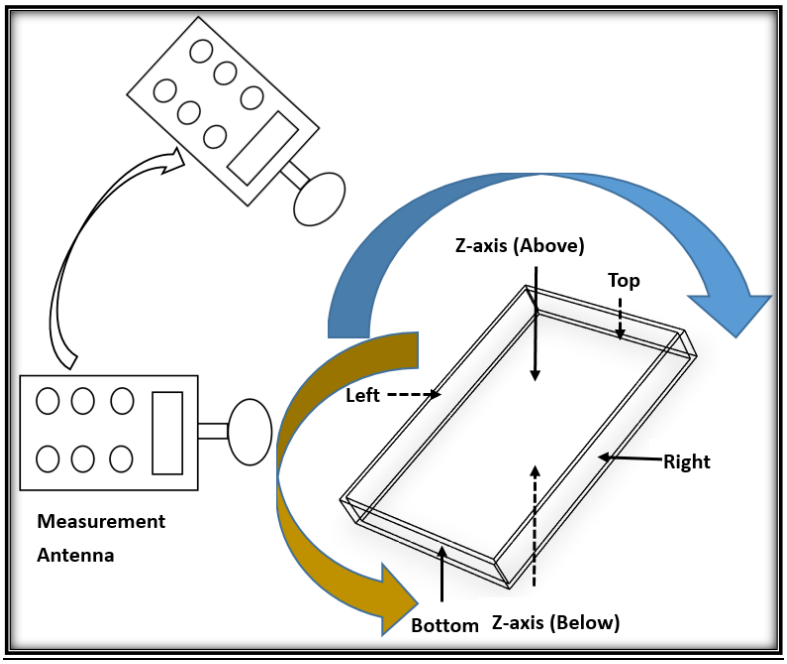
Routine Evaluation Procedure - Single and/or Multiple RF Sources

- MPE compliance are measurement in all directions surrounding the antenna and radiating structures of the device.

  For non-directional antennas, MPE evaluation points shall be along radials extending from the antenna (axis) that are no more than 30° apart. The direction of maximum exposure shall be aligned with one of the radials.

  For each specific exposure condition, the evaluation points along the longest dimension (e.g., vertical) shall use a spatial resolution of 10 cm or less, and shall extend at least 10 cm beyond the exposed portions of a person's body or until the evaluated results are less than 10% of the MPE limit. For exposures occurring next to the ground or next to a ground plane, the evaluation points shall be no closer than 10 cm from the ground.

Test Setup



Note: The measurement antenna are moving and surrounding the EUT when performed the test, the test results recorded the highest values for each sides of the EUT (left/right/top/bottom/z-axis)

Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

3.1 RF Exposure

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
EM Field Meter SGH	SMP2 Dual	22SN1913	2022/4/21	2023/4/20
		22SN1914	2022/4/21	2023/4/20
Probe SGH	WPF60	22SN1914	2022/4/21	2023/4/20

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2023/3/16

Fixed RF sources operating in the same time-averaging period – §1.1307(b)(3)(ii)(B)

- Either SAR-based or MPE-based exemption may be considered for test exemption for fixed, mobile, or portable device exposure conditions; therefore, the contributions from each exemption in conjunction with the measured SAR (Evaluatedk term) should be used to determine exemption for simultaneous transmission according to Formula below,

$$\sum_{i=1}^{a}\frac{P_i}{P_{th,i}}+\sum_{j=1}^{b}\frac{ERP_j}{ERP_{th,j}}+\sum_{k=1}^{c}\frac{Evaluated_k}{Exposure\ Limit_k}\leq 1$$

The sum of the ratios of the applicable terms for SAR-based, MPE-based and measured SAR or MPE should be less than 1, to determine simultaneous transmission exposure compliance.

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for P_{th}, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

$P_{th,i}$ = the exemption threshold power (P_{th}) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source *i.*

$ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source *j,* at a distance of at least λ/2π according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

Exposure Limit$_k$ = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source *k,* as applicable from § 1.1310 of this chapter.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source *i* at a distance between 0.5 cm and 40 cm (inclusive).

ERP_j = the ERP of fixed, mobile, or portable RF source *j.*

Evaluated$_k$ = the maximum reported SAR or MPE of fixed, mobile, or portable RF source *k* either in the device or at the transmitter site from an existing evaluation at the location of exposure.

4 Test Results

4.1 RF Exposure

Environmental Conditions:	25°C, 60% RH	Tested By:	Alan Wu / Wayne Lin

For Single RF Source

MPE-based Exemption §1.1307(b)(3)(i)(C)					
Operation Mode	Frequency Band (MHz)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
WLAN 6 GHz_B5_CDD	5955-6415	107.647	20	768	Pass
WLAN 6 GHz_B5_BF	5955-6415	182.81	20	768	Pass
WLAN 6 GHz_B6_CDD	6435-6515	110.154	20	768	Pass
WLAN 6 GHz_B6_BF	6435-6515	159.221	20	768	Pass
WLAN 6 GHz_B7_CDD	6535-6875	129.42	20	768	Pass
WLAN 6 GHz_B7_BF	6535-6875	126.474	20	768	Pass
WLAN 6 GHz_B8_CDD	6875-7115	105.196	20	768	Pass
WLAN 6 GHz_B8_BF	6875-7115	178.649	20	768	Pass

Notes:

1. Calculate the ERP of WLAN 6 GHz_B5_CDD from the radiated field strength:
   ERP (dBm) = Radiated field strength (dBuV/m) + 20 x Log(d) − 104.77 − 2.15
   d is the measurement distance, in 3 m.
   ERP = 117.7 + 20 x Log(3) − 104.77 − 2.15 = 20.32 dBm (107.647 mW)
2. Calculate the ERP of WLAN 6 GHz_B5_BF from the radiated field strength:
   ERP (dBm) = Radiated field strength (dBuV/m) + 20 x Log(d) − 104.77 − 2.15
   d is the measurement distance, in 3 m.
   ERP = 120 + 20 x Log(3) − 104.77 − 2.15 = 22.62 dBm (182.81 mW)
3. Calculate the ERP of WLAN 6 GHz_B6_CDD from the radiated field strength:
   ERP (dBm) = Radiated field strength (dBuV/m) + 20 x Log(d) − 104.77 − 2.15
   d is the measurement distance, in 3 m.
   ERP = 117.8 + 20 x Log(3) − 104.77 − 2.15 = 20.42 dBm (110.154 mW)
4. Calculate the ERP of WLAN 6 GHz_B6_BF from the radiated field strength:
   ERP (dBm) = Radiated field strength (dBuV/m) + 20 x Log(d) − 104.77 − 2.15
   d is the measurement distance, in 3 m.
   ERP = 119.4 + 20 x Log(3) − 104.77 − 2.15 = 22.02 dBm (159.221 mW)
5. Calculate the ERP of WLAN 6 GHz_B7_CDD from the radiated field strength:
   ERP (dBm) = Radiated field strength (dBuV/m) + 20 x Log(d) − 104.77 − 2.15
   d is the measurement distance, in 3 m.
   ERP = 118.5 + 20 x Log(3) − 104.77 − 2.15 = 21.12 dBm (129.42 mW)
6. Calculate the ERP of WLAN 6 GHz_B7_BF from the radiated field strength:
   ERP (dBm) = Radiated field strength (dBuV/m) + 20 x Log(d) − 104.77 − 2.15
   d is the measurement distance, in 3 m.
   ERP = 118.4 + 20 x Log(3) − 104.77 − 2.15 = 21.02 dBm (126.474 mW)
7. Calculate the ERP of WLAN 6 GHz_B8_CDD from the radiated field strength:
   ERP (dBm) = Radiated field strength (dBuV/m) + 20 x Log(d) − 104.77 − 2.15
   d is the measurement distance, in 3 m.
   ERP = 117.6 + 20 x Log(3) − 104.77 − 2.15 = 20.22 dBm (105.196 mW)
8. Calculate the ERP of WLAN 6 GHz_B8_BF from the radiated field strength:
   ERP (dBm) = Radiated field strength (dBuV/m) + 20 x Log(d) − 104.77 − 2.15
   d is the measurement distance, in 3 m.
   ERP = 119.9 + 20 x Log(3) − 104.77 − 2.15 = 22.52 dBm (178.649 mW)

MPE-based Exemption §1.1307(b)(3)(i)(B)							
Operation Mode	Frequency Band (MHz)	Average Power (mW)	Antenna Gain (dBi)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
Bluetooth	2402-2480	91.622	3.95	138.676	20	3060	Pass
Zigbee	2405-2480	86.298	3.95	130.617	20	3060	Pass
CDD WLAN 2.4 GHz	2412-2462	898.867	4.52	1551.299	20	3060	Pass
BF WLAN 2.4 GHz	2412-2462	878.296	5.19	1768.646	20	3060	Pass

Routine Evaluation (General Population)					
Operation Mode	Frequency Band (MHz)	Power Density (mW/cm^2)	Test Distance (cm)	Limit (mW/cm^2)	Test Result
CDD WLAN 5 GHz	5180-5240 5745-5825	0.031	20	1	Pass
BF WLAN 5 GHz	5180-5240 5745-5825	0.037	20	1	Pass

For Multiple RF Sources (Simultaneous Operations Condition 1)

Multiple RF Sources (Simultaneous Operations)							
Exemption Evaluation					Sum of Ratios	Limit of Ratios	Test Result
Operation Mode	Frequency Band (MHz)	Maximum ERP (mW)	Limit Threshold (mW)	Ratio			
Bluetooth	2402-2480	138.676	3060	0.045	0.898	1	Pass
BF WLAN 2.4 GHz	2412-2462	1768.646	3060	0.578			
WLAN 6 GHz_B5_BF	5955-6415	182.81	768	0.238			
Routine Evaluation (General Population)							
Operation Mode	Operation Mode	Power Density (mW/cm^2)	Limit (mW/cm^2)	Ratio			
BF WLAN 5 GHz	5180-5240 5745-5825	0.037	1	0.037			

For Multiple RF Sources (Simultaneous Operations Condition 2)

Multiple RF Sources (Simultaneous Operations)							
Exemption Evaluation					Sum of Ratios	Limit of Ratios	Test Result
Operation Mode	Frequency Band (MHz)	Maximum ERP (mW)	Limit Threshold (mW)	Ratio			
Zigbee	2405-2480	130.617	3060	0.043	0.896	1	Pass
BF WLAN 2.4 GHz	2412-2462	1768.646	3060	0.578			
WLAN 6 GHz_B5_BF	5955-6415	182.81	768	0.238			
Routine Evaluation (General Population)							
Operation Mode	Operation Mode	Power Density (mW/cm^2)	Limit (mW/cm^2)	Ratio			
BF WLAN 5 GHz	5180-5240 5745-5825	0.037	1	0.037			

5 Conclusion

Source-base time average power is below Exemption Criteria and/or Routine Evaluation MPE thresholds, therefore the device is compliant FCC RF exposure requirement.

6 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Lin Kou EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@bureauveritas.com
Web Site: http://ee.bureauveritas.com.tw

The address and road map of all our labs can be found in our web site also.

--- END ---