RF Exposure Report

Report No.:	SA190628E02
FCC ID:	G95TCHU1AL0
Test Model:	TCHU1AL0
PN:	APZ0001COM
Received Date:	June 28, 2019
Test Date:	July 01 to 03, 2019
Issued Date:	July 23, 2019
Applicant:	Technicolor Connected Home USA LLC
Address:	5030 Sugarloaf Parkway, Building 6, Lawrenceville, GA 30044
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
SA190628E02	Original release.	July 23, 2019

1 Certificate of Conformity

Product:	LTE Power Supply
Brand:	Technicolor
Test Model:	TCHU1AL0
Sample Status:	LAB2b
Applicant:	Technicolor Connected Home USA LLC
Test Date:	July 01 to 03, 2019
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 General RF Exposure Guidance v06 IEEE C95.1-1992

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 : Phoenix Huang , **Date:** July 23, 2019

Phoenix Huang / Specialist

Approved by : , **Date:** July 23, 2019

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				
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

2.2 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

2.3 Classification

The antenna of this product, under normal use condition, is at least 20 cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Zigbee				
Ant. No	Ant. Gain (dBi)	Frequency Range (GHz)	Antenna Type	Antenna Connector
1	3.9	2.4~2.4835	PCB	Morata
WWAN				
Ant. No	Ant. Gain (dBi)	Frequency Range (MHz)	Antenna Type	Antenna Connector
2	2.9	700~787	PCB	Morata
	3.1	1710~2200	PCB	Morata

2.5 Calculation Result of Maximum Conducted Power

Operation Mode	Evaluation Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
Zigbee	2445	142.561	3.9	20	0.06962	1

For WWAN (FCC ID: QIPEMS31-X)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
699.7-715.3	214.783	2.90	20	0.08332	0.466

Note:
1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. *Limit of Power Density = F/1500

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

Zigbee + WWAN = 0.06962 / 1 + 0.08332 / 0.466 = 0.24824

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

Appendix

Mode	Equipment Category	Transmitter Range (MHz)		Maximum Output Power		Antenna Gain (dBi)	Power Density (mW/cm^2)		Ratio
		Start	Stop	(dBm)	(mW)		Vaule	Limit	
LTE	Band 2	1850.7	1909.3	23.39	218.272	3.10	0.08866	1	0.089
	Band 4	1710.7	1754.3	23.63	230.675	3.10	0.09370	1	0.094
	Band 12	**699.7**	**715.3**	**23.32**	**214.783**	**2.90**	**0.08332**	**0.466***	**0.179**
	Band 13	779.5	784.5	22.92	195.884	2.90	0.07599	0.52*	0.146

Note: *Limit of Power Density = F/1500

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