

RF Exposure Report

Report No.: SA160314E01

FCC ID: G95TCA300

Test Model: TCA300COM

Received Date: Mar. 14, 2016

Test Date: Apr. 29, 2016

Issued Date: May 23, 2016

Applicant: Technicolor Connected Home USA LLC

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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
SA160314E01	Original release.	May 23, 2016

1 Certificate of Conformity

Product: Integrated Device

Brand: Technicolor

Test Model: TCA300COM

Sample Status: ENGINEERING SAMPLE

Applicant: Technicolor Connected Home USA LLC

Test Date: Apr. 29, 2016

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 :



Date:

May 23, 2016

Claire Kuan / Specialist

Approved by :



Date:

May 23, 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

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

where

Pd = power density in mW/cm²

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 20cm away from the body of the user.

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

2.4 Antenna Gain

Antenna NO.	Brand	Antenna Gain(dBi) (Including cable loss)	Frequency range (GHz)	Antenna Type	Connector Type
Zigbee 1	INPAQ	2.84	2.4~2.4835GHz	PCB	i-pex(MHF)
Zigbee 2	INPAQ	3.1	2.4~2.4835GHz	PCB	i-pex(MHF)
WiFi 1 & BT	INPAQ	2.06	2.4~2.4835GHz	PCB	Pogo pin
		3.13	5.15~5.25GHz		
		3.79	5.25~5.35GHz		
		3.9	5.47~5.725GHz		
		2.39	5.725~5.85GHz		
WiFi 2	INPAQ	0.73	2.4~2.4835GHz	PCB	i-pex(MHF)
		2.86	5.15~5.25GHz		
		3.02	5.25~5.35GHz		
		3.33	5.47~5.725GHz		
		3.84	5.725~5.85GHz		
WWAN	INPAQ	2.56	824~849MHz	PCB	Pogo pin
		3.72	1850~1960MHz		

3 Calculation Result Of Maximum Conducted Power

WLAN

Frequency (MHz)	Conducted Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	126.409	4.43	20	0.06974	1
5180-5240	229.018	6.01	20	0.18180	1
5260-5320	227.54	6.42	20	0.19851	1
5500-5700	156.97	6.63	20	0.14373	1
5745-5825	150.418	5.71	20	0.11144	1

NOTE:

2.4GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.43\text{dBi}$

5150~5250MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.01\text{dBi}$

5250~5350MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.42\text{dBi}$

5470~5725MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.63\text{dBi}$

5725~5825MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 5.71\text{dBi}$

BT-EDR

Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2402-2480	2.729	2.06	20	0.00087	1

BT-LE

Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2402-2480	1.897	2.06	20	0.00061	1

Zigbee (Antenna 2)

Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2405-2475	119.399	3.10	20	0.04850	1

WWAN

Frequency (MHz)	Max EIRP (dBm)	Max EIRP (mW)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
826.4-846.6	27.83*	606.736	20	0.12071	0.5644
1852.4-1907.6	25.78	378.443	20	0.07529	1

Note:* Maximum ERT is 25.69dBm and EIRP = 25.69 + 2.14=27.83dBm

Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + BT-EDR + Zigbee + WWAN = $0.06974/1 + 0.00087/1 + 0.04850/1 + 0.12071/0.5644 = 0.33298$

WLAN 5GHz + BT-EDR + Zigbee + WWAN = $0.19851/1 + 0.00087/1 + 0.04850/1 + 0.12071/0.5644 = 0.46175$

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

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