



FCC RADIO EXPOSURE TEST REPORT

FCC ID : G954331X
Equipment Name : DOCSIS Cable Gateway
Trade Name : Technicolor
Model Number : CGM4331COM
Applicant : Technicolor Connected Home USA LLC
5030 Sugarloaf Parkway, Building 6, Lawrenceville
Georgia, United States, 30044
Manufacturer : Technicolor Connected Home USA LLC
5030 Sugarloaf Parkway, Building 6, Lawrenceville
Georgia, United States, 30044
Standard : 47 CFR Part 2.1091

The product was received on Ju1. 19, 2019, and testing was started from Ju1. 19, 2019 and completed on Oct. 21, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Cliff Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issued Date
FA092223	01	Initial issue of report	Nov. 11, 2020



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: **Sam Chen**

Report Producer: **Sandy Chuang**



1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5250 5250-5320 5500-5720 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Bluetooth	2400-2483.5	2402-2480	LE: GFSK
Zigbee	2400-2483.5	2405-2475	O-QPSK

1.2 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA971031-02

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Add the second source Front End Module for Zigbee (Brand: Richwave / Model Name: RTC2624).	Maximum Permissible Exposure.

Note: Maximum Permissible Exposure of 2.4GHz WLAN, 5GHz WLAN and Bluetooth are based on original test report.



1.3 Testing Location

Testing Location		
<input type="checkbox"/>	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973
<input checked="" type="checkbox"/>	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.



2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
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
300-1500	-	-	f/300	<6
1500-100,000	-	-	5	<6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
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

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Method

The MPE was calculated at 25 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;D1D	8.00	27.85	35.85	0.01	35.86	3.85478	25	0.49079	1.00000
5.2G;D1D	9.10	26.78	35.85	0.01	35.89	3.88150	25	0.49420	1.00000
5.3G;D1D	8.80	21.18	29.98	0.01	29.99	0.99770	25	0.12703	1.00000
5.6G;D1D	6.1	23.81	29.91	0.08	29.99	0.99770	25	0.12703	1.00000
5.8G;D1D	9.10	26.78	35.88	0.01	35.89	3.88150	25	0.49420	1.00000
2.4G;G1D (Zigbee)	5.48	19.91	25.39	0.50	25.89	0.38815	25	0.04942	1.00000
2.4G;BT-LE	4.30	9.55	13.85	0.50	14.35	0.02723	25	0.00347	1.00000

Simultaneous Transmission Analysis Mode:

1. WLAN 2.4GHz + WLAN 5GHz:

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	8.00	27.85	35.85	0.01	35.86	3.85478	25	0.49079	1.00000	0.49079
5.2G;D1D	9.10	26.78	35.88	0.01	35.89	3.88150	25	0.49420	1.00000	0.49420
									Sum Ratio	0.98527
									Ratio Limit	1

2. WLAN 5GHz + Zigbee + Bluetooth:

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
5.2G;D1D	9.10	26.78	35.88	0.01	35.89	3.88150	25	0.49420	1.00000	0.49420
2.4G;G1D (Zigbee)	5.48	19.91	25.39	0.50	25.89	0.38815	25	0.04942	1.00000	0.04942
2.4G;BT-LE	4.30	9.55	13.85	0.50	14.35	0.02723	25	0.00347	1.00000	0.00347
									Sum Ratio	0.54709
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

————THE END————