

## RF Exposure Report

**Report No.:** SA170323C01-2

**FCC ID:** VUICGM4231

**Test Model:** CGM4231

**Series Model:** CGM4231XXXXX (X = 0-1, A-Z, a-z, "-" or blank, for marketing purpose)

**Received Date:** Mar. 23, 2017

**Test Date:** Apr. 07 to 18, 2017

**Issued Date:** Nov. 29, 2017

**Applicant:** Pegatron Corp.

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**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

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### Release Control Record

Issue No.	Description	Date Issued
SA170323C01-2	Original release.	Nov. 29, 2017

## 1 Certificate of Conformity

**Product:** DOCSIS3.1 Wireless Residential Gateway with Embedded Digital Voice Adapter

**Brand:** Technicolor

**Test Model:** CGM4231

**Series Model:** CGM4231XXXXX (X = 0-1, A-Z, a-z, "-" or blank, for marketing purpose)

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Pegatron Corp.

**Test Date:** Apr. 07 to 18, 2017

**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 :** Wendy Wu , **Date:** Nov. 29, 2017  
Wendy Wu / Specialist

**Approved by :** May Chen , **Date:** Nov. 29, 2017  
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 <sup>2</sup> )	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 <sup>2</sup> )*	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

$$Pd = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

Pd = power density in mW/cm<sup>2</sup>

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 30cm away from the body of the user.

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

## 2.4 Antenna Gain

Transmitter Circuit	Antenna Net Gain(dBi)	Frequency range (MHz)	Antenna Type	Connecter Type	Cable Length
Chain 0	4.32	2400 ~ 2483.5	PCB	NA	NA
	4.11	5150 ~ 5250			
	4.32	5250 ~ 5350			
	4.90	5470 ~ 5725			
	4.97	5725 ~ 5850			
Chain 1	4.71	2400 ~ 2483.5	PCB	NA	NA
	5.12	5150 ~ 5250			
	4.75	5250 ~ 5350			
	4.45	5470 ~ 5725			
	3.90	5725 ~ 5850			
Chain 2	3.44	2400 ~ 2483.5	PCB	i-pex(MHF)	100mm
	4.39	5150 ~ 5250			
	4.59	5250 ~ 5350			
	4.99	5470 ~ 5725			
	5.19	5725 ~ 5850			
Chain 3	2.85	5150 ~ 5250	PCB	NA	NA
	2.92	5250 ~ 5350			
	3.81	5470 ~ 5725			
	4.06	5725 ~ 5850			

## 2.5 Calculation Result

For 2.4GHz, 5GHz (U-NII-1 & UNII-3 band) data was copied from the original test report (Report No.: SA170323C01)

Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462	948.684	8.94	30	0.65716	1
5180-5240	798.104	10.18	30	0.73554	1
5260-5320	252.384	10.19	30	0.23314	1
5500-5720	317.732	10.57	30	0.32034	1
5745-5825	798.104	10.57	30	0.80465	1

**NOTE:** 1. This power include tune-up tolerance range that specified in CGM4231 Tune Up power table

2. 2.4GHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G2/20})^2 / 3] = 8.94\text{dBi}$

5GHz:

UNII-1: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.18\text{dBi}$

UNII-2A: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.19\text{dBi}$

UNII-2C Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.57\text{dB}$

UNII-3: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.57\text{dB}$

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