# RF Exposure Report

| | |
|---|---|
| **Report No.:** | SA170323C01 |
| **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, 2017 |
| **Issued Date:** | May 15, 2017 |
| **Applicant:** | Pegatron Corp. |
| **Address:** | 5F No. 76 Ligong ST Beitou District Taipei, 112 Taiwan |
| **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. |

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## Release Control Record

| Issue No. | Description | Date Issued |
|---|---|---|
| SA170323C01 | Original release. | May 15, 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, 2017 |
| **Standards:** | FCC Part 2 (Section 2.1091)<br>KDB 447498 D01 General RF Exposure Guidance v06<br>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 15, 2017

Claire Kuan / Specialist

**Approved by :** _____ , **Date:** May 15, 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 ($mW/cm^2$) | 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 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

| Frequency (MHz) | Max Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density ($mW/cm^2$) | Limit ($mW/cm^2$) |
|---|---|---|---|---|---|
| 2412-2462 | 948.684 | 8.94 | 30 | 0.65716 | 1 |
| 5180-5240 | 798.104 | 10.18 | 30 | 0.73554 | 1 |
| 5745-5825 | 798.104 | 10.57 | 30 | 0.80465 | 1 |

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

2. 2.4GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G2/20})^2 / 3] = 8.94$dBi
   5GHz:
   UNII-1: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.18$dBi
   UNII-3: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.57$dB

**--- END ---**