

## RF Exposure Report

**Report No.:** SA170320E01B

**FCC ID:** H8NTEG310

**Test Model:** TCG310

**Series Model:** TCG310, TCG310XXXXXX (X=0~9,A-Z,a-z," -" ," ." or blank for marketing)

**Received Date:** Aug. 07, 2017

**Test Date:** Aug. 29, 2017

**Issued Date:** Sep. 14, 2017

**Applicant:** ASKEY COMPUTER CORP.

**Address:** 10F, NO.119, JIANKANG RD., ZHONGHE DIST., NEW TAIPEI CITY 23585, TAIWAN, R.O.C.

**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   |
|--------------|-------------------|---------------|
| SA170320E01B | Original release. | Sep. 14, 2017 |

## 1 Certificate of Conformity

**Product:** Cable Modem

**Brand:** ASKEY

**Test Model:** TCG310

**Series Model:** TCG310, TCG310XXXXXX (X=0~9,A-Z,a-z,"-",",", "." or blank for marketing)

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** ASKEY COMPUTER CORP.

**Test Date:** Aug. 29, 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 :**



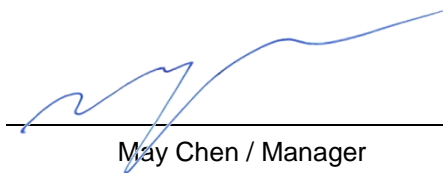
**Date:**

Sep. 14, 2017

Wendy Wu / Specialist

:

**Approved by**



**Date:**

Sep. 14, 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

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

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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 32cm away from the body of the user.

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

## 2.4 Antenna Gain

| Set 1       |               |        |                    |                       |              |                |                   |
|-------------|---------------|--------|--------------------|-----------------------|--------------|----------------|-------------------|
| Antenna No. | PCB Chain No. | Brand  | Ant. Net Gain(dBi) | Frequency range (GHz) | Antenna Type | Connector Type | Cable Length (mm) |
| 1           | 2.4G-chain 3  | Askey  | 3.57               | 2.4~2.4835            | PCB          | none           | -                 |
|             | 5G-chain 0    |        | 3.48               | 5.15~5.35             |              |                |                   |
|             |               |        | 3.35               | 5.47~5.725            |              |                |                   |
|             |               |        | 2.79               | 5.725~5.85            |              |                |                   |
| 2           | 5G-chain 1    | HONGBO | 3.89               | 5.15~5.35             | Dipole       | i-pex(MHF)     | 95                |
|             |               |        | 4.16               | 5.47~5.725            |              |                |                   |
|             |               |        | 4.04               | 5.725~5.85            |              |                |                   |
| 3           | 2.4G-chain 1  |        | 3.99               | 2.4~2.4835            | Dipole       | i-pex(MHF)     | 75                |
|             | 5G-chain 2    |        | 3.89               | 5.15~5.35             |              |                |                   |
|             |               |        | 3.66               | 5.47~5.725            |              |                |                   |
|             |               |        | 3.83               | 5.725~5.85            |              |                |                   |
| 4           | 2.4G-chain 0  |        | 3.26               | 2.4~2.4835            | Dipole       | i-pex(MHF)     | 295               |
|             | 5G-chain 3    |        | 3.9                | 5.15~5.35             |              |                |                   |
|             |               |        | 3.92               | 5.47~5.725            |              |                |                   |
|             |               |        | 4.49               | 5.725~5.85            |              |                |                   |

### Set 2

| Antenna No. | PCB Chain No. | Brand | Ant. Net Gain(dBi) | Frequency range (GHz) | Antenna Type | Connector Type | Cable Length (mm) |
|-------------|---------------|-------|--------------------|-----------------------|--------------|----------------|-------------------|
| 1           | 2.4G-chain 3  | Askey | 3.57               | 2.4~2.4835            | PCB          | none           | -                 |
|             | 5G-chain 0    |       | 3.48               | 5.15~5.35             |              |                |                   |
|             |               |       | 3.35               | 5.47~5.725            |              |                |                   |
|             |               |       | 2.79               | 5.725~5.85            |              |                |                   |
| 2           | 5G-chain 1    |       | 2.93               | 5.15~5.35             | PIFA         | i-pex(MHF)     | 93                |
|             |               |       | 2.69               | 5.47~5.725            |              |                |                   |
|             |               |       | 2.76               | 5.725~5.85            |              |                |                   |
| 3           | 2.4G-chain 1  | TSKY  | 3.2                | 2.4~2.4835            | PIFA         | i-pex(MHF)     | 71                |
|             | 5G-chain 2    |       | 3.48               | 5.15~5.35             |              |                |                   |
|             |               |       | 3.23               | 5.47~5.725            |              |                |                   |
|             |               |       | 3.34               | 5.725~5.85            |              |                |                   |
| 4           | 2.4G-chain 0  |       | 2.12               | 2.4~2.4835            | Dipole       | i-pex(MHF)     | 290               |
|             | 5G-chain 3    |       | 2.61               | 5.15~5.35             |              |                |                   |
|             |               |       | 2.36               | 5.47~5.725            |              |                |                   |
|             |               |       | 2.52               | 5.725~5.85            |              |                |                   |

### Set 3

| Antenna No. | PCB Chain No. | Brand       | Ant. Net Gain(dBi) | Frequency range (GHz) | Antenna Type | Connector Type | Cable Length (mm) |
|-------------|---------------|-------------|--------------------|-----------------------|--------------|----------------|-------------------|
| 1           | 2.4G-chain 3  | Askey       | 3.57               | 2.4~2.4835            | PCB          | none           | -                 |
|             | 5G-chain 0    |             | 3.48               | 5.15~5.35             |              |                |                   |
|             |               |             | 3.35               | 5.47~5.725            |              |                |                   |
|             |               |             | 2.79               | 5.725~5.85            |              |                |                   |
| 2           | 5G-chain 1    | Master Wave | 5.96               | 5.15~5.35             | Dipole       | i-pex(MHF)     | 95                |
|             |               |             | 7.51               | 5.47~5.725            |              |                |                   |
|             |               |             | 7.39               | 5.725~5.85            |              |                |                   |
| 3           | 2.4G-chain 1  |             | 4.52               | 2.4~2.4835            | Dipole       | i-pex(MHF)     | 58                |
|             | 5G-chain 2    |             | 4.9                | 5.15~5.35             |              |                |                   |
|             |               |             | 3.95               | 5.47~5.725            |              |                |                   |
|             |               |             | 3.38               | 5.725~5.85            |              |                |                   |
| 4           | 2.4G-chain 0  |             | 3.41               | 2.4~2.4835            | Dipole       | i-pex(MHF)     | 285               |
|             | 5G-chain 3    |             | 4.23               | 5.15~5.35             |              |                |                   |
|             |               |             | 4.57               | 5.47~5.725            |              |                |                   |
|             |               | 3.76        | 5.725~5.85         |                       |              |                |                   |

## 2.1 Calculation Result of Maximum Conducted Power

| Frequency Band (MHz) | Max Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|----------------------|----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2412-2462            | 409.643        | 8.62               | 32            | 0.23168                             | 1                           |
| 5180-5240            | 431.54         | 10.71              | 32            | 0.39492                             | 1                           |
| 5745-5825            | 715.803        | 10.55              | 32            | 0.63137                             | 1                           |

NOTE:

2.4GHz: Directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G3/20})^2 / 3] = 8.62\text{dBi}$

5 GHz:

UNII-1: Directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 10.71\text{dBi}$

UNII-3: Directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 10.55\text{dBi}$

### 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 + WLAN 5GHz =  $0.23168 / 1 + 0.63137 / 1 = 0.86305$

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

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