1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 General Information

| Client Information | | | |
|-----------------------------------|--|--|--|
| Applicant: | Shenzhen Ceres Technology Co., Ltd. | | |
| Address of applicant: | Room 601, Floor 6, Building F, Songbai Road 1008, Sunshine | | |
| | Community, Xili Street, Nanshan District, Shenzhen | | |
| | | | |
| Manufacturer: | Shenzhen C-DATA Technology Co.,Ltd Baoan Branch | | |
| Address of manufacturer: | FII, Bidg B, Wentao Industrial zone, Yingrenshiyongxin | | |
| | Village, Shiyan Street, Baoan district, Shenzhen, Guangdong, | | |
| | China | | |
| General Description of EUT: | | | |
| Product Name: | Wireless Router | | |
| Trade Name: | / | | |
| Model No.: | WR135G-M30 | | |
| Adding Model(s): | WR135G-M32 | | |
| Rated Voltage: | DC12V | | |
| | Model:DCT12W120100US-A0 | | |
| Power Adapter 1: | Input:AC100-240V, 50/60Hz, 0.3A max | | |
| | Output:DC12.0V,1A | | |
| | Model:TS-A012-120010AW | | |
| Power Adapter 2: | Input:AC100-240V, 50/60Hz, 0.4A | | |
| | Output:DC12.0V,1A | | |
| FCC ID: | 2A24ZWR135G | | |
| Equipment Type: | Mobile device | | |
| Tachnical Characteristics of FUT: | | | |
| WiFi (2.4G) | | | |
| Support Standards: | 802.11b. 802.11g. 802.11n | | |
| Sepport Standards | 2412-2462MHz for 802.11b/g/n(HT20) | | |
| Frequency Range: | 2422-2452MHz for 802.11n(HT40) | | |
| | ANT 0:15.52dBm (Conducted) | | |
| RF Output Power: | ANT 1:15.81dBm (Conducted) | | |
| Type of Modulation: | DBPSK,BPSK,DQPSK,QPSK,16QAM,64QAM | | |
| Quantity of Channels: | 11 for 802.11b/g/n(HT20); 7 for 802.11n(HT40) | | |
| Channel Separation: | 5MHz | | |
| Type of Antenna: | External Antenna | | |
| Antenna Gain: | 5dBi | | |
| WiFi (5G) | | | |
| Support Standards: | 802.11a, 802.11n(HT20), 802.11n-HT40, 802.11ac-VHT80 | | |
| | | | |

| Frequency Range: | 5150-5250MHz, 5725-5850MHz | | | |
|-------------------------------|--|--|--|--|
| | 5150-5250MHz:ANT 0:14.46dBm (Conducted) | | | |
| DE Output Dowor | ANT 1:14.12dBm (Conducted) | | | |
| Ki ^v Output Fower. | 5725-5850MHz: ANT 0:14.80dBm (Conducted) | | | |
| | ANT 1:14.48dBm (Conducted) | | | |
| Type of Modulation: | BPSK, QPSK,16QAM,64QAM,256QAM | | | |
| Type of Antenna: | External Antenna | | | |
| Antenna Gain: | 5dBi | | | |

1.2 Standard Applicable

According to § 1.1307(b)(1) and KDB 447498 D01 General RF Exposure Guidance v06, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

| Frequency range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm ²) | Averaging Times $ 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)* | 6 |
| 30-300 | 61.4 | 0.163 | 1.0 | 6 |
| 300-1500 | / | / | F/300 | 6 |
| 1500-100000 | / | / | 5 | 6 |

(a) Limits for Occupational / Controlled Exposure

(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 Times $ 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)* | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | / | / | F/1500 | 30 |
| 1500-100000 | / | / | 1 | 30 |

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

1.3 MPE Calculation Method

- $S = (30*P*G) / (377*R^2)$
- S = power density (in appropriate units, e.g., mw/cm²)
- P = power input to the antenna (in appropriate units, e.g., mw)
- G = power gain of the antenna in the direction of interest relative to an isotropic radiator,

the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

1.4 MPE Calculation Result

For WiFi (2.4G)

Maximum Tune-Up output power: <u>17(dBm)</u> Maximum peak output power at antenna input terminal: <u>50.12 (mW)</u> Prediction distance: <u>>20(cm)</u> Prediction frequency: <u>2412 (MHz)</u> Antenna gain:<u>5.0(dBi)</u> Directional gain (numeric gain): <u>3.16</u> The worst case is power density at prediction frequency at 20cm: <u>0.0315 (mw/cm²)</u> MPE limit for general population exposure at prediction frequency: <u>1 (mw/cm²)</u>

For WiFi (5.2G)

Maximum Tune-Up output power: <u>17(dBm)</u> Maximum peak output power at antenna input terminal: <u>50.12(mW)</u> Prediction distance: <u>>20(cm)</u> Prediction frequency: <u>5240 (MHz)</u> Antenna gain: <u>5.0(dBi)</u> Directional gain (numeric gain): <u>3.16</u> The worst case is power density at prediction frequency at 20cm: <u>0.0315(mw/cm²)</u> MPE limit for general population exposure at prediction frequency: 1 (mw/cm²)

For WiFi (5.8G)

Maximum Tune-Up output power: <u>17(dBm)</u> Maximum peak output power at antenna input terminal: <u>50.12 (mW)</u> Prediction distance: <u>>20(cm)</u> Prediction frequency: <u>5825 (MHz)</u> Antenna gain: <u>5.0(dBi)</u> Directional gain (numeric gain): <u>3.16</u> The worst case is power density at prediction frequency at 20cm: <u>0.0315(mw/cm²)</u> MPE limit for general population exposure at prediction frequency: <u>1 (mw/cm²)</u>

Mode for Simultaneous Multi-band Transmission

WiFi (2.4G) + WiFi (5G) The worst case is power density at prediction frequency at 20cm: 0.0315/<u>1+0.0315/1=0.0630</u><1

Result: Pass