

# Radio Exposure Evaluation Report

FCC ID : L9VPG9182AC  
Equipment : Powerline Ethernet WiFi Adapter, WiFi Powerline  
Brand Name : COMTREND  
Model Name : PG-9182AC, PowerGrid 9082, PG-9082  
Applicant/ : COMTREND Corporation  
Manufacturer : 3F-1, 10 Lane 609, Chung Hsin Road, Section 5,  
San Chung Dist, New Taipei City 24159, Taiwan  
Factory : 1. Intelligent Technology Inc.  
Yuanhe Three Street , Tongsha Industrial  
Zone , Dongcheng Area, Dongguan City ,  
Guangdong Province , China.  
2. Datamax Electronics (Dong Guan) Co., Ltd.  
Niu shan Foreign Economic Industrial park,  
Dong Cheng District, Dong Guan City, Guang  
Dong , China.  
Standard : 47 CFR Part 2.1091

The product was received on Feb. 27, 2018, and testing was started from Apr. 02, 2018 and completed on Jun. 26, 2018. 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of United States government.

The test results in this 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: Allen Lin

**SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory**

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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TEL : 886-3-327-3456  
FAX : 886-3-327-0973  
Report Template No.: HE1-A1 Ver2.0  
FCC ID: L9VPG9182AC

## Summary of Test Result

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

**Declaration of Conformity:**

The judgment of conformity in the report is based on the measurement results excluding the measurement uncertainty.

**Comments and Explanations:**

None.

**Reviewed by: Jackson Tsai**

**Report Producer: Ann Hou**

# 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)<br>802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)                 |
| 5GHz WLAN              | 5150-5250<br>5725-5850 | 5180-5240<br>5745-5825    | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) |

## 1.2 Table for Multiple Listing

The brand/model names in the following table are all refer to the identical product.

| Brand Name | Model Name     | Description                                                                                           |
|------------|----------------|-------------------------------------------------------------------------------------------------------|
| COMTREND   | PG-9182AC      | All the models are identical, the difference model for difference brand served as marketing strategy. |
| COMTREND   | PowerGrid 9082 |                                                                                                       |
| COMTREND   | PG-9082        |                                                                                                       |

## 1.3 Testing Location

| Testing Location                           |        |                                                                              |                      |
|--------------------------------------------|--------|------------------------------------------------------------------------------|----------------------|
| <input checked="" type="checkbox"/>        | HWA YA | ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)    |                      |
|                                            |        | TEL : 886-3-327-3456                                                         | FAX : 886-3-327-0973 |
| Test site Designation No. TW1190 with FCC. |        |                                                                              |                      |
| <input type="checkbox"/>                   | JHUBEI | ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.) |                      |
|                                            |        | TEL : 886-3-656-9065                                                         | FAX : 886-3-656-9085 |
| Test site Designation No. TW0006 with FCC. |        |                                                                              |                      |

## 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 <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|------------------------------------------|------------------------------------------------------------------|
| 0.3-3.0               | 614                               | 1.63                              | (100)*                                   | 6                                                                |
| 3.0-30                | 1842 / f                          | 4.89 / f                          | (900 / f <sup>2</sup> )*                 | 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 <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|------------------------------------------|------------------------------------------------------------------|
| 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                                                               |

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

### 2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

**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

### WLAN 2.4G

| Mode     | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 2.4G;G1D | 2.70     | 23.80       | 26.50      | 0.50           | 27.00              | 0.50119          | 20            | 0.09971                 | 1.00000                       |
| 2.4G;D1D | 2.70     | 24.08       | 26.78      | 0.50           | 27.28              | 0.53456          | 20            | 0.10635                 | 1.00000                       |

### WLAN 5G

| Mode     | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 5.2G;D1D | 2.89     | 28.12       | 31.01      | 0.50           | 31.51              | 1.41579          | 20            | 0.28166                 | 1.00000                       |
| 5.8G;D1D | 2.74     | 29.17       | 31.91      | 0.50           | 32.41              | 1.74181          | 20            | 0.34652                 | 1.00000                       |

### Co-TX WLAN 2.4G+WLAN 5G

| Mode     | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) | Ratio (S/Limit) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|-----------------|
| 2.4G;D1D | 2.70     | 24.08       | 26.78      | 0.50           | 27.28              | 0.53456          | 20            | 0.10635                 | 1.00000                       | 0.10635         |
| 5.8G;D1D | 2.74     | 29.17       | 31.91      | 0.50           | 32.41              | 1.74181          | 20            | 0.34652                 | 1.00000                       | 0.34652         |
| -        | -        | -           | -          | -              | -                  | -                | -             | -                       | Sum Ratio                     | 0.45287         |
| -        | -        | -           | -          | -              | -                  | -                | -             | -                       | Ratio Limit                   | 1               |

————THE END————