

# RF Exposure Evaluation Report

**Equipment** : CGA2121 FAMILY, 24x8 D3.0 GTWY  
**Brand Name** : technicolor  
**Model No.** : CGA2121  
**FCC ID** : N89-CGA2121  
**Standard** : 47 CFR Part 2.1091  
**Applicant** : CyberTAN Technology Inc.  
No. 99, Park Avenue III, Science-based Industrial  
Park Hsinchu, 308 Taiwan  
**Manufacturer** : CyberTAN Technology Inc.  
No. 99, Park Avenue III, Science-based Industrial  
Park Hsinchu, 308 Taiwan

The product sample received on Nov. 27, 2017 and completely tested on Jan. 02, 2018. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with 47 CFR Part 2.1091 pass the limit.

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Sam Chen  
SPORTON INTERNATIONAL INC.



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### **PHOTOGRAPHS OF EUT V01**

## REVISION HISTORY

[illegible]



# 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 two EUTs which are identical to each other in all aspects except for the following table:

| EUT      | EUT 1 |               | EUT 2                       |               |
|----------|-------|---------------|-----------------------------|---------------|
| Location | Value | Part Number   | Value                       | Part Number   |
| C1304    | 4.7pF | 202.01109.025 | C/7.5pF<br>+-0.1pF/0402/NPO | 202.01280.005 |
| C1305    | 20pF  | 202.00069.005 | 39pF                        | 202.01305.005 |
| C1306    | 20pF  | 202.00069.005 | 36pF                        | 202.01334.005 |
| C1307    | 11pF  | 202.01395.005 | 27pF                        | 202.01149.025 |
| C1308    | 18pF  | 202.00056.005 | 47pF                        | 202.01293.005 |
| C1309    | 27pF  | 202.01149.025 | 56pF                        | 202.01236.005 |
| C1310    | 20pF  | 202.00069.005 | 39pF                        | 202.01305.005 |
| C1311    | 22pF  | 202.01137.015 | 36pF                        | 202.01334.005 |
| C1312    | 27pF  | 202.01149.025 | 62pF                        | 202.01335.005 |
| C1320    | 33pF  | 202.00097.005 | 56pF                        | 202.00125.005 |
| C1325    | 16pF  | 202.01201.005 | 33pF                        | 202.01297.005 |
| C1326    | 13pF  | 202.00048.005 | 36pF                        | 202.01334.005 |
| C1327    | 13pF  | 202.00048.005 | 30pF                        | 202.01304.005 |
| C1328    | 36pF  | 202.01122.005 | 68pF                        | 202.01313.005 |
| C1329    | 27pF  | 202.01149.025 | 47pF                        | 202.01293.005 |
| C1330    | 150pF | 202.01121.005 | 220pF                       | 202.01336.005 |
| L1300    | 150nH | 132.00596.005 | 330nH                       | 132.01497.005 |
| L1301    | 100nH | 132.01595.005 | 220nH                       | 132.01484.005 |
| L1302    | 100nH | 132.01595.005 | 220nH                       | 132.01484.005 |
| L1303    | 150nH | 132.00596.005 | 270nH                       | 132.00595.005 |



|       |       |               |       |                |
|-------|-------|---------------|-------|----------------|
| L1308 | 220nH | 132.01312.005 | 390nH | 132.00715.005  |
| L1313 | 120nH | 132.00837.005 | 270nH | 132.01234.005  |
| L1315 | 120nH | 132.00837.005 | 330nH | 2005-21330011R |
| L1317 | 82nH  | 132.01116.005 | 180nH | 2005-21180008R |

Note : There are two colors (White / Black) of the EUT and all material of them are identical except for the case color.

### 1.3 Testing Location

| Testing Location                    |        |                                                                                                                               |
|-------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/>            | HWA YA | ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.<br>TEL : 886-3-327-3456 FAX : 886-3-327-0973   |
| <input checked="" type="checkbox"/> | JHUBEI | ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.<br>TEL : 886-3-656-9065 FAX : 886-3-656-9085 |

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.

## 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)*                               | 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)*                                 | 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 22 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

| 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;D1D | 3.50     | 27.93       | 31.43      | 0.50           | 31.93              | 1.55955          | 22            | 0.25654                 | 1.00000                       |
| 5.2G;D1D | 9.11     | 26.83       | 35.94      | 0.06           | 36.00              | 3.98107          | 22            | 0.65488                 | 1.00000                       |
| 5.8G;D1D | 9.11     | 26.88       | 35.99      | 0.01           | 36.00              | 3.98107          | 22            | 0.65488                 | 1.00000                       |

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz+WLAN 5GHz

| 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 | 3.50     | 27.93       | 31.43      | 0.50           | 31.93              | 1.55955          | 22            | 0.25654                 | 1.00000                       | 0.25654         |
| 5.8G;D1D | 9.11     | 26.88       | 35.99      | 0.01           | 36.00              | 3.98107          | 22            | 0.65488                 | 1.00000                       | 0.65488         |
|          |          |             |            |                |                    |                  |               |                         | Sum Ratio                     | 0.91142         |
|          |          |             |            |                |                    |                  |               |                         | Ratio Limit                   | 1               |