

# RF Exposure Evaluation Report

**Equipment** : Network Camera  
**Brand Name** : Cisco Systems, Inc.  
**Model No.** : MV12W-HW, MV12WE-HW, MV12N-HW  
**FCC ID** : UDX-60062010  
**Standard** : 47 CFR Part 2.1091  
**Applicant/** : Cisco Systems  
**Manufacturer** : 170 West Tasman Drive  
San Jose, CA. 95134  
USA

The product sample received on Dec. 14, 2017 and completely tested on Jan. 24, 2018. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit.

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Kevin Liang / Assistant Manager



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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>5250-5350<br>5470-5725<br>5725-5850 | 5180-5240<br>5260-5320<br>5500-5720<br>5745-5825 | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) |
| Bluetooth              | 2400-2483.5                                      | 2402-2480                                        | BR / EDR: FHSS (GFSK / $\pi/4$ -DQPSK / 8DPSK)<br>LE: DSSS (GFSK)                               |

## 1.2 Table for Multiple Listing

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

| Meraki Model Name | Model Differences                                 | PCBA      | IR LED PCBA    | Lens      |
|-------------------|---------------------------------------------------|-----------|----------------|-----------|
| MV12W-HW          | W = Wide Angle Lens (256GB)                       | 256G emmc | 140 degree LED | YTOT Lens |
| MV12WE-HW         | WE = Wide Angle Lens (128GB, entry level storage) | 128G emmc | 140 degree LED | YTOT Lens |
| MV12N-HW          | N = Narrow Angle Lens (256GB)                     | 256G emmc | 90 degree LED  | Rays Lens |

## 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:

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

**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<br>(dBi) | Power<br>(dBm) | EIRP<br>(dBm) | Tolerance<br>(dB) | Tune-up<br>EIRP<br>(dBm) | Tune-up<br>EIRP<br>(W) | Distance<br>(cm) | S<br>(mW/cm <sup>2</sup> ) | S Limit<br>(mW/cm <sup>2</sup> ) | Ratio<br>(S/Limit) |
|------------|-------------|----------------|---------------|-------------------|--------------------------|------------------------|------------------|----------------------------|----------------------------------|--------------------|
| 2.4G;D1D   | 3.97        | 19.64          | 23.61         | 0.50              | 24.11                    | 0.25763                | 20               | 0.05125                    | 1.00000                          | 0.05125            |
| 2.4G;BT-BR | 1.38        | 7.83           | 9.21          | 0.50              | 9.71                     | 0.00935                | 20               | 0.00186                    | 1.00000                          | 0.00186            |
|            |             |                |               |                   |                          |                        |                  |                            | Sum Ratio                        | 0.05311            |
|            |             |                |               |                   |                          |                        |                  |                            | Ratio Limit                      | 1                  |

| Mode       | DG<br>(dBi) | Power<br>(dBm) | EIRP<br>(dBm) | Tolerance<br>(dB) | Tune-up<br>EIRP<br>(dBm) | Tune-up<br>EIRP<br>(W) | Distance<br>(cm) | S<br>(mW/cm <sup>2</sup> ) | S Limit<br>(mW/cm <sup>2</sup> ) | Ratio<br>(S/Limit) |
|------------|-------------|----------------|---------------|-------------------|--------------------------|------------------------|------------------|----------------------------|----------------------------------|--------------------|
| 5.6G;D1D   | 7.78        | 19.89          | 27.67         | 0.50              | 28.17                    | 0.65615                | 20               | 0.13054                    | 1.00000                          | 0.13054            |
| 2.4G;BT-BR | 1.38        | 7.83           | 9.21          | 0.50              | 9.71                     | 0.00935                | 20               | 0.00186                    | 1.00000                          | 0.00186            |
|            |             |                |               |                   |                          |                        |                  |                            | Sum Ratio                        | 0.13270            |
|            |             |                |               |                   |                          |                        |                  |                            | Ratio Limit                      | 1                  |