



SPORTON International Inc.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
Ph: 886-3-327-3456 / FAX: 886-3-327-0973 / www.sporton.com.tw

Project No: CB10501085

Maximum Permissible Exposure Report

| | |
|----------------------------|--|
| Applicant's company | MitraStar Technology Corporation |
| Applicant Address | No. 6, Innovation Rd II, Science-Based Industrial, Hsin-Chu, Taiwan |
| FCC ID | ZMYAM525 |
| Manufacturer's company (1) | MitraStar Technology Corporation |
| Manufacturer Address | No. 6, Innovation Rd II, Hsinchu Science Park, Hsinchu 30076, Taiwan |
| Manufacturer's company (2) | WuXi MitraStar Technology Co. Ltd |
| Manufacturer Address | 60#-E, Minshan Road, Wuxi New district Jangsu, P.R.C. |

| | |
|------------------|---|
| Product Name | MoCA to Wireless / Ethernet bridge |
| Brand Name | Pace |
| Model Name | AM525 |
| Ref. Standard(s) | 47 CFR FCC Part 2 Subpart J, section 2.1091 |
| Received Date | Nov. 30, 2015 |
| Final Test Date | Jan. 11, 2016 |
| Submission Type | Original Equipment |

Sam Chen

SPORTON INTERNATIONAL INC.



Table of Contents

| | |
|---|----------|
| 1. GENERAL DESCRIPTION | 1 |
| 1.1. EUT General Information | 1 |
| 1.2. Testing Location | 1 |
| 2. MAXIMUM PERMISSIBLE EXPOSURE | 2 |
| 2.1. Limit of Maximum Permissible Exposure | 2 |
| 2.2. MPE Calculation Method | 2 |
| 2.3. Calculated Result and Limit..... | 3 |



History of This Test Report



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) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) |
| 5GHz WLAN | 5150-5250 5250-5350 5470-5725 5725-5850 | 5180-5240 5260-5320 5500-5720 5745-5825 | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) |

1.2. 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. 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. TEL : 886-3-656-9065 FAX : 886-3-656-9085 | |

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/ cm²) | Averaging Time 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 |
| 1500-100,000 | | | 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/ cm²) | Averaging Time 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 |
| 1500-100,000 | | | 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 = Peak 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

For 5GHz Band:

Antenna Type: Dipole Antenna

Conducted Power for IEEE 802.11ac MCS0/Nss2 (VHT40): 26.60 dBm

| Distance (cm) | Test Freq. (MHz) | Directional Gain (dBi) | Antenna Gain (numeric) | The maximum combined Average Output Power | | Power Density (S) (mW/cm ²) | Limit of Power Density (S) (mW/cm ²) | Test Result |
|------------------|---------------------|---------------------------|------------------------------|---|----------|---|---|-------------|
| | | | | (dBm) | (mW) | | | |
| 20 | 5230 | 4.71 | 2.9549 | 26.6011 | 457.2074 | 0.268905 | 1 | Complies |

Note:
$$\text{Directional Gain} = 10 \log \left[\frac{\sum_{j=1}^{N_{\text{NSS}}} \left(\sum_{k=1}^{N_{\text{ANT}}} g_{j,k} \right)^2}{N_{\text{ANT}}} \right]$$

For 2.4GHz Band:

Antenna Type: Dipole Antenna

Conducted Power for IEEE 802.11n MCS8 (HT20): 25.87 dBm

| Distance (cm) | Test Freq. (MHz) | Antenna Gain (dBi) | Antenna Gain (numeric) | The maximum combined Average Output Power | | Power Density (S) (mW/cm ²) | Limit of Power Density (S) (mW/cm ²) | Test Result |
|------------------|---------------------|-----------------------|------------------------------|---|----------|---|---|-------------|
| | | | | (dBm) | (mW) | | | |
| 20 | 2437 | 2.00 | 1.5849 | 25.8705 | 386.4101 | 0.121899 | 1 | Complies |

Conclusion:

Both of the WLAN 2.4GHz Band and WLAN 5GHz Band can transmit simultaneously, the formula of calculated the MPE is:

$$\text{CPD1} / \text{LPD1} + \text{CPD2} / \text{LPD2} + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

Therefore, the worst-case situation is $0.121899 / 1 + 0.268905 / 1 = 0.390804$, which is less than "1". This confirmed that the device complies.