

RF EXPOSURE REPORT



FCC Applicant: Cisco Systems Inc.
125 West Tasman Dr, Bldg. P, San Jose, California, 95134
USA

Product Name: ER/2021/A0112

Brand Name: Cisco Fluidmesh FM4500 EMBEDDED

Model No.: FM4500EMB

Model Difference: N/A

Report Number: ER/2021/A0112

FCC ID R5SX500E

Issue Date: February 22, 2022

Date of EUT Received: October 28, 2021

Approved By _____

John Yeh

We hereby certify that:

The above equipment was evaluate by SGS Taiwan Ltd. The evaluation in this report is in compliance with FCC Rule Part §2.1091.

The results of this report relate only to the sample identified in this report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.
除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com.tw/Terms-and-Conditions> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com.tw/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

| Revision History | | | | | |
|------------------|----------|---|-------------------|-------------|--------|
| Report Number | Revision | Description | Issue Date | Revised By | Remark |
| ER/2021/A0112 | 00 | Original. | January 28, 2022 | Karen Huang | * |
| ER/2021/A0112 | 01 | Update the value of max. output power include tolerance | February 22, 2022 | Karen Huang | |
| | | | | | |

Note:

- 1、The remark "*" indicates modification of the report upon requests from certification body.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com.tw/Terms-and-Conditions> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com.tw/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Contents

| | | |
|----------|--|----------|
| 1 | DESCRIPTION OF EQUIPMENT UNDER TEST (EUT) | 4 |
| 1.1 | PRODUCT DESCRIPTION..... | 4 |
| 1.2 | ANTENNA INFORMATION: | 5 |
| 2 | FCC MAXIMUM PERMISSIBLE EXPOSURE (MPE) | 6 |
| 2.1 | FCC STANDARD APPLICABLE | 6 |
| 2.2 | POWER DENSITY CALCULATION (WORST CASE) | 7 |
| 2.3 | COLLOCATED POWER DENSITY CALCULATION | 7 |

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com.tw/Terms-and-Conditions> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com.tw/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

1.1 Product Description

| | |
|-------------------|---------------------------------|
| Product Name: | FM4500EMB-HW |
| Brand Name: | Cisco Fluidmesh FM4500 EMBEDDED |
| Model No.: | FM4500EMB |
| Model Difference: | N/A |
| Hardware Version: | N/A |
| Firmware Version: | N/A |
| EUT Series No.: | 4500152873 |
| Power Supply: | 56Vdc |

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com.tw/Terms-and-Conditions> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com.tw/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

1.2 Antenna Information:
1.2.1 WLAN 5GHz

| Antenna Type | Supplier | Antenna Part No. | Freq. (MHz) | Peak Antenna Gain (dBi) | Directional Gain (dBi) |
|---------------|------------------|------------------|-------------|-------------------------|------------------------|
| Omnidirection | MP Antenna, LTD. | 08-ANT-0985 | 5150~5250 | 3.0 | 6.01 |
| | | | 5250~5350 | 3.0 | 6.01 |
| | | | 5475~5725 | 3.0 | 6.01 |
| | | | 5475~5825 | 3.0 | 6.01 |
| Omnidirection | Fluidmesh | FM-OMNI-5-V | 5150~5250 | 4.0 | 7.52 |
| | | | 5250~5350 | 4.0 | 7.52 |
| | | | 5475~5725 | 4.0 | 7.52 |
| | | | 5475~5825 | 4.0 | 7.52 |
| Omnidirection | Fluidmesh | FM-OMNI-5-H | 5150~5250 | 5.0 | 7.52 |
| | | | 5250~5350 | 5.0 | 7.52 |
| | | | 5475~5725 | 5.0 | 7.52 |
| | | | 5475~5825 | 5.0 | 7.52 |

1.2.2 WLAN 4.9GHz

| Antenna Type | Supplier | Antenna Part No. | Freq. (MHz) | Peak Antenna Gain (dBi) | Directional Gain (dBi) |
|---------------|------------------|------------------|-------------|-------------------------|------------------------|
| Omnidirection | MP Antenna, LTD. | 08-ANT-0985 | 4960~4980 | 3.0 | 6.01 |
| Omnidirection | Fluidmesh | FM-OMNI-5-V | 4960~4980 | 4.0 | 7.52 |
| Omnidirection | Fluidmesh | FM-OMNI-5-H | 4960~4980 | 5.0 | 7.52 |

Note: Antenna information is provided by the applicant.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com.tw/Terms-and-Conditions> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com.tw/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

2 FCC MAXIMUM PERMISSIBLE EXPOSURE (MPE)

2.1 FCC Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission’s guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for Maximum Permissible Exposure (MPE)

| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm ²) | Averaging Time (minute) |
|---|-------------------------------|-------------------------------|-------------------------------------|-------------------------|
| Limits for General Population/Uncontrolled Exposure | | | | |
| 0.3-1.34 | 614 | 1.63 | *(100) | 30 |
| 1.34-30 | 824/f | 2.19/f | *(180/f ²) | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | / | / | f/1500 | 30 |
| 1500-100000 | / | / | 1.0 | 30 |

f = frequency in MHz

* = Plane-wave equipment power density

Prediction of MPE limit at a given distance

$$S = PG / 4\pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com.tw/Terms-and-Conditions> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com.tw/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company’s findings at the time of its intervention only and within the limits of Client’s instructions, if any. The Company’s sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

2.2 Power Density Calculation (Worst Case)

FCC Standalone MPE

| Operation Mode | Evaluation Frequency (MHz) | Operation Distance (cm) | Max. Output Power Include Tolerance (dBm) | Antenna Gain (dBi) | Max. EIRP (mW) | Power Density (PD) (mW/cm ²) | Limit (mW/cm ²) | Pass / Fail | Power Density / Limit | Collocated MPE |
|----------------|----------------------------|-------------------------|---|--------------------|----------------|--|-----------------------------|-------------|-----------------------|----------------|
| WLAN 5G | 5240.00 | 20 | 22.01 | 7.52 | 897.43 | 0.179 | 1.000 | Pass | 0.179 | V |
| WLAN 4.9G | 4980.00 | 20 | 23.51 | 7.52 | 1267.65 | 0.252 | 1.000 | Pass | 0.252 | V |

2.3 Collocated Power Density Calculation

| FCC Collocated MPE | | |
|--------------------|-----------------------|-------------------------------------|
| Operation Mode | Power Density / Limit | Σ (Power Density / Limit) |
| WLAN 5G | 0.179 | 0.431 |
| WLAN 4.9G | 0.252 | |

Note:

1. Σ (Power Density / Limit): This is a summation of [(Power Density for each transmitter/antenna included in the simultaneous transmission) / (corresponding MPE limit)].
2. Considering the collocated transmitters, the aggregated (Power Density /limit) is smaller than 1, and MPE of collocated transmitters is compliant

~ End of Report ~

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com.tw/Terms-and-Conditions> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com.tw/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.