

Fortinet FAP-U24JEV

Best Practices Guide



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Version 2, June 1991

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1 About FAP-U24JEV

The FAP-U24JEV is a single-radio 802.11a/b/g/n/ac/wave-2 WLAN access point with 1x1 + 1x1 stream design and an in-room wall plate form factor. It operates in the 2.4 GHz band for 802.11n support in 1 chain and the 5 GHz band wave-2 in one chain to deliver an aggregate data rate of 583Mbps data for demanding business applications such as video and voice.

Designed to be placed in any location flush to a wall surface, the FAP-U24JEV can be installed by normal service personnel using existing CAT5/6 cabling connected from a standard wall junction box. For wired connectivity, it features two 10/100 BASE-T switch ports to support a range of in-room IP device and user connectivity options. Additionally, one of the wired ports can operate as an IEEE 802.3af-compliant PoE Out port, offering up to 13 watts of power and capable of powering devices such as IP telephones. This reduces costs in additional cabling, switch ports, and power sourcing equipment. An additional pass-through port allows connectivity for digital phones that require native access to an in-house PBX system, and a USB port offers options for future uses. The FAP-U24JEV is built to provide years of trouble-free operation and is backed by a limited lifetime warranty.

It is designed for in-room deployments, such as:

- Dorm Rooms
- Hotel Rooms
- Hospital Rooms

System Configuration Details

Optimal System Configuration			Full Loaded System Configuration		
System Configuration	Power Consumption	802.3af Compliant	System Configuration	Power Consumption	802.3af Compliant
<ul style="list-style-type: none"> 2.4 GHz & 5.0 GHz dual band dual radio concurrent; IEEE 802.11ac; 2.4GHZ 1x1 40MHz & 5.0GHZ 1x1 80MHz 80 MHz channel bonding USB port is disabled 	10.00 Watts	Yes	<ul style="list-style-type: none"> 2.4 GHz & 5.0 GHz dual band dual radio concurrent; IEEE 802.11ac; 2.4GHZ 1x1 40MHz & 5.0GHZ 1x1 80MHz 80 MHz channel bonding 12.9W PSE OUT and USB disabled or 10W PSE OUT and USB enabled 	25.50 Watts	802.3at PoE required for such configuration

Safety Precautions—IMPORTANT

Read and follow the regulatory instructions in Appendix B before installing and operating this product.



To avoid loss of warranty, use only Fortinet supplied power adapter

The FAP-U24JEV is intended only for installation in Environment A as defined in IEEE Std 802.3 All interconnected equipment must be contained within the same building, including the interconnected equipment's associated LAN connection.

Power Options

The AP is powered using a IEEE802.3at-2012 compliant PoE PD IN or 48V DC input.

Power Output

The IEEE802.3af-2012 compliant PoE PSE provides power output up to 12.95W.

Enclosures and Connectors

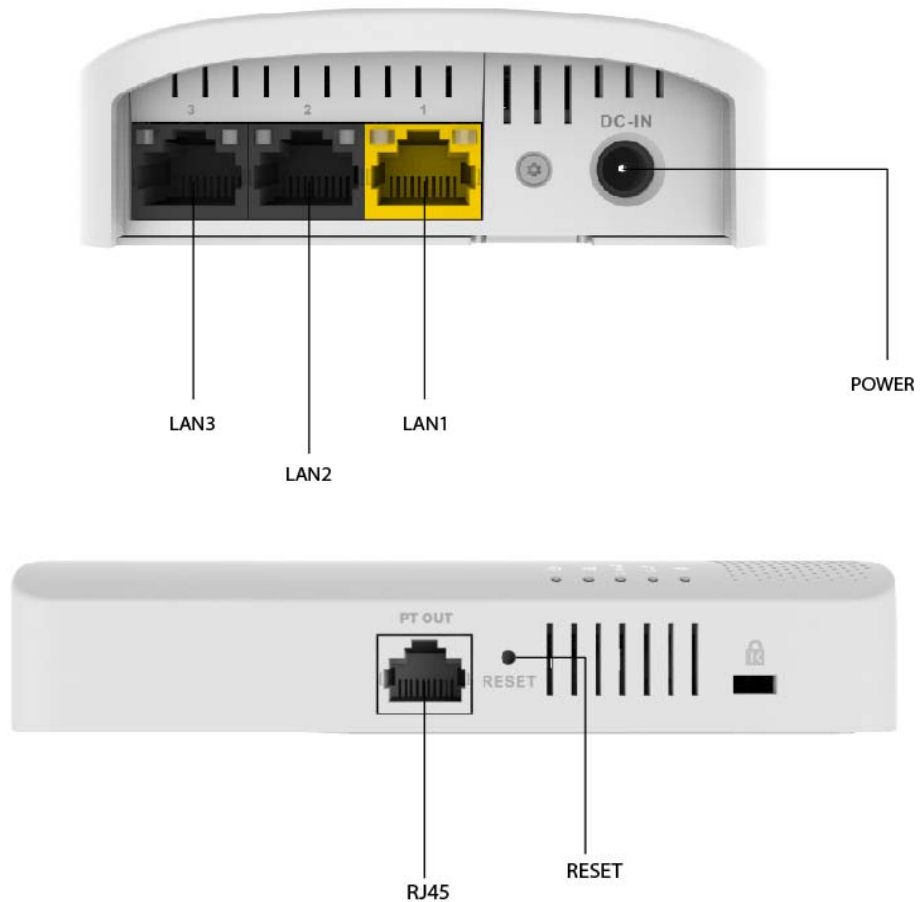


TABLE 1: *FAP-U24JEV Connectors - Top and Side View*

Parts	Descriptions
Power	48V DC/0.5A input.
LAN1 PSE	10/100/1000Mbps Ethernet port. PSE delivers 802.3af only when: <ul style="list-style-type: none">• Power adapter is used. OR <ul style="list-style-type: none">• 802.3at power is supplied to the FAP unit.
LAN2	10/100/1000Mbps Ethernet port.
LAN3	10/100/1000Mbps Ethernet port.
Reset	Reset pin. Using a sharp pin and press in for 3 seconds to return the AP to factory default settings
RJ45	Pass through out



TABLE 2: *FAP-U24JEU LED Status*

Parts	Description
Power	<ul style="list-style-type: none">● Green: FAP powered ON.● Yellow: FAP is rebooting or upgrading firmware● Off: FAP is powered off.
WAN	<ul style="list-style-type: none">● Steady Green: Link is up● Yellow: WAN
WiFi 1	<ul style="list-style-type: none">● Steady Green: 2.4G link Is up● Off: Link down
WiFi 2	<ul style="list-style-type: none">● Steady Green: 5.0G link is up● Off: Link down
BLE	<ul style="list-style-type: none">● Steady Green: BLE or BLE activity● Off: No activity

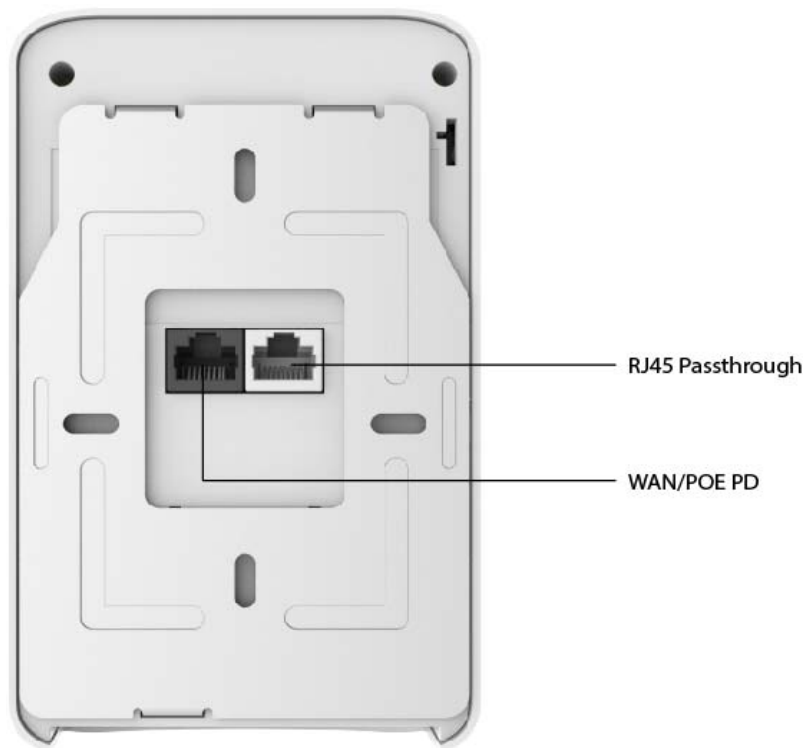


TABLE 3: *FAP-U24JEV Connectors - Bottom View*

Parts	Description
RJ-45 Passthrough IN	Wired connection with Pass through out
WAN/PoE PD	10/100/1000Mbs Ethernet port.

Getting Started

Before you begin mounting the FAP-U24JEV, you will need the following:

- Phillips screwdriver
- Torx screwdriver

Mounting

The Fortinet Networks FAP-U24JEV is designed for mounting to a single standard US or EU-style utility wall box. This section provides step-by-step instructions on how to mount a Fortinet Networks FAP-U24JEV Wall Plate in the following mounting scenarios:

- Wall Plate Mounting
- Wall Mounting (No Wall Plate)

Wall Plate Mounting

This section provides illustrated instructions to wall mount FAP-U24JEV

1. The FAP-U24JEV is shipped with the wall mount bracket installed on the bottom of the AP. The metal bracket clips into slots in the plastic housing. The captive screw used to lock the AP into place, is not engaged during shipment.



2. The wall mount bracket is designed to be installed over a wall plate (single gang box). There are a series of slots in the mounting bracket to allow optional installations.



3. Position the bracket over the wall plate and install two screws (not included) as shown. Adjust the bracket over the wall plate box before tightening the screws. Slide the bracket up or down along the screws in the slots to the desired location. Be sure to cover any gaps in the wall. Tighten screws to secure bracket to wall plate. Do not over-tighten. Over-tightening may cause the bracket to bend.



4. Install the AP onto the mounting bracket by visually aligning the top "hook" clips to the small raised bumps on the top edge of the AP. For additional visual alignment reference, use the edges of the bracket which line up with the outside vent holes on the AP.



5. Move the AP up slightly until you feel the top hooks slide into the receiving holes on the back of the AP. Once the top hooks are engaged, push gently on the bottom, front of the AP to engage the bottom hooks. You should feel the clips lock into place.



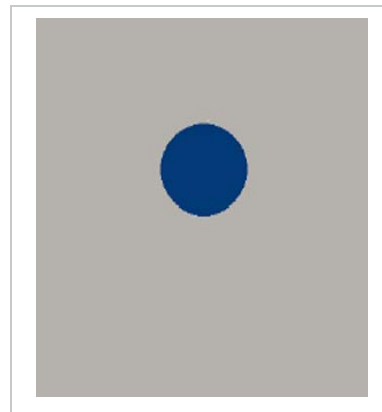
6. Tighten the captive screw to secure the AP to the bracket.



Wall Mounting (No Wall Plate)

This section provides illustrated instructions to wall mount an FAP-U24JEV without the wall plate

1. Make 1.5" diameter hole on the wall for the cable entry at the location selected for AP placement.



2. Position the bracket over the wall and match the 1.5" diameter hole and the bracket middle hole.

3. Mark and drill **2** holes for the screw and Install using the two screws (not included) as shown in the figure. Adjust the bracket over the wall plate box before tightening the screws. Slide the bracket up or down along the screws in the slots to the desired location. Be sure to cover any gaps in the wall.



Next, follow procedures from [Step 4 on page 8](#).

2 Installation Planning

It is a good practice to conduct a site survey to assess coverage area and look for problem areas such as poor RF coverage or high retries. Fortinet enables customers to easily complete a site survey right from within the FAP-U24JEV.

Site Survey tools

This section describes the tools used to conduct site surveys for FAP-U24JEV.

Fortiplanner

Fortiplanner can be used for accurate site survey and WiFi network planning.

Starting with a floor plan of the area that you want to cover with your wireless network, the planning tool will provide a color-shaded image predicting the expected signal strength throughout the coverage area. Using the tool, you can try out different placements of wireless access points prior to installation on the premises. The overall process for using the planning tool is as follows:

- Draw a floor plan of the coverage area.
- Place APs on your floor plan.
- Run a propagation prediction.
- The last two steps are iterative. If the prediction shows some areas with poor coverage, you can change the placement of your APs and run another propagation prediction. After you have implemented your wireless network, you can
- Monitor the AP transmit power levels and client load.
- Perform a site survey in which you measure the actual received signal strength throughout the coverage area.

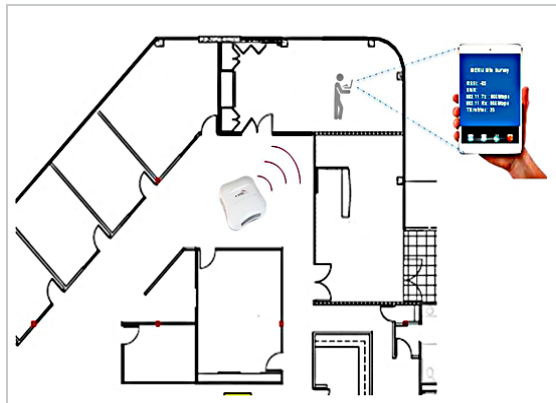
See the *Fortiplanner User Guide* for complete site survey and planning information.

Built in Site Survey tool

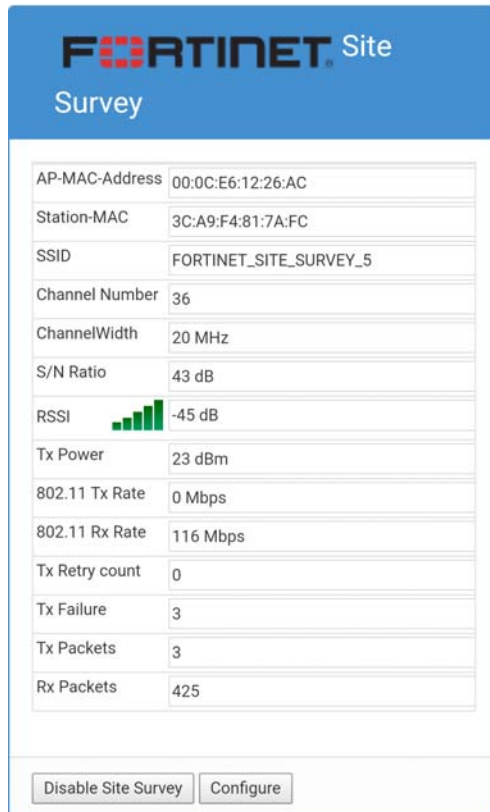
Customers now have a fast and easy way to perform a site survey of the 11ac network -- getting a true validation of their design for AP placement and RF coverage.

This feature is supported in all Fortinet 802.11ac APs such as FAP-U24JEV, AP832 and AP822.

Performing a site survey with FAP-U24JEV is really simple. AP needs to be powered on near the intended mounting locations and the user can use any mobile device with a web browser to view the AP site survey information by logging into the WebUI. Real-time RSSI, S/N ratio, 802.11 Tx and Rx rates is shown on the WebUI.



This is the web user interface of the site survey tool.



The screenshot displays the Fortinet Site Survey web interface. At the top, there is a blue header with the Fortinet logo and the text "Site Survey". Below the header is a form containing various network parameters and their values. The parameters are listed in a table-like structure with labels on the left and values on the right. The values are as follows:

Parameter	Value
AP-MAC-Address	00:0C:E6:12:26:AC
Station-MAC	3C:A9:F4:81:7A:FC
SSID	FORTINET_SITE_SURVEY_5
Channel Number	36
ChannelWidth	20 MHz
S/N Ratio	43 dB
RSSI	-45 dB
Tx Power	23 dBm
802.11 Tx Rate	0 Mbps
802.11 Rx Rate	116 Mbps
Tx Retry count	0
Tx Failure	3
Tx Packets	3
Rx Packets	425

At the bottom of the form, there are two buttons: "Disable Site Survey" and "Configure".

Fortinet SiteSurvey make it easy for users to survey a location/ room without needing additional hardware.

Users can use the existing infrastructure (Fortinet APs) to run a simple survey. Some of the real-time benefits of using the site survey features

- Fast and easy way to validate 11ac design
- No controller required while taking measurements at different floors and locations in the building
- Surveys using laptop or tablet or mobile phone
- Easy-to-use web UI for setting up and measuring survey data
- Real time RSSI, S/N ratio, 802.11 Tx and Rx rates
- Simple 3-step process – connect, configure, and monitor

Location of Wall Plate

This section describes finding an optimum location for installing the FAP-U24JEV.

Finding the right location

- The AP should be placed at a clear empty location on the side walls.
- Avoid mounting the AP near heavy metal objects such as refrigerator and microwave, which will block the radio waves, impact the antenna radiation patterns and interfere with the radio receiver.
- Do not place the AP close to the floor. This will alter the antenna radiation pattern. The AP should be placed between 1 and 4 feet above the floor.

Use larger metal wall box (not included) behind the AP to reduce the antenna back lobe and interferences due to the back room AP.

Note: Avoid back to back AP installation to reduce the interference and the throughput.

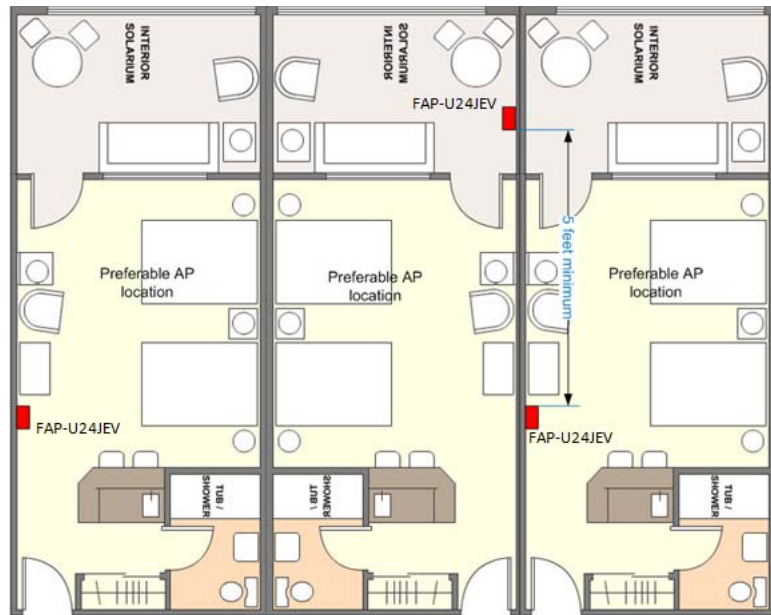
Wall Plate Density Planning

FAP-U24JEV can be deployed as an in-room wall mountable AP. It can be mounted in variety of locations based on the room size, type of wall, furniture and appliances in the room.

Scenario 1: One FAP-U24JEV per room

The one AP per room scenario is ideal for room size up to ~500 sq feet. The location of the FAP-U24JEV is shown in the image below. The expected signal strength is approximately -30 to -65dBm across the entire room with the default Transmit EIRP settings. High attenuation are expected in areas with appliances.

Do not place the APs in a back to back position as this may cause high interference between the APs and the clients. Keep a minimum distance of 5 feet between the APs to avoid back lobe interferences.



Scenario 2: FAP-U24JEV in Suite

In the example shown below shows the suite size is approximately 750 sq feet. The expected downlink RSSI values are -30 to -70dBm. High signal attenuation is expected in areas with appliances. Place the AP preferably in the middle of the suite so that signals are distributed equally on all sides of the suite.

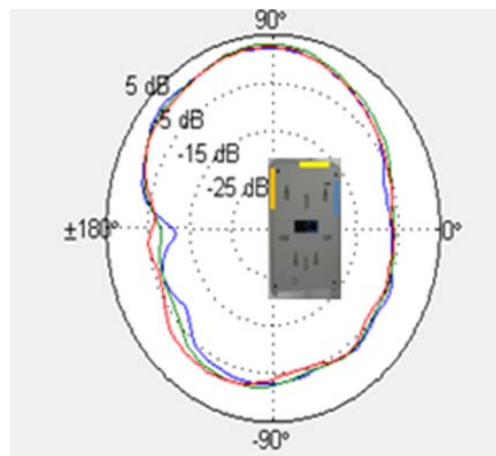


3 Antenna Radiation Patterns

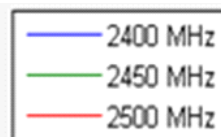
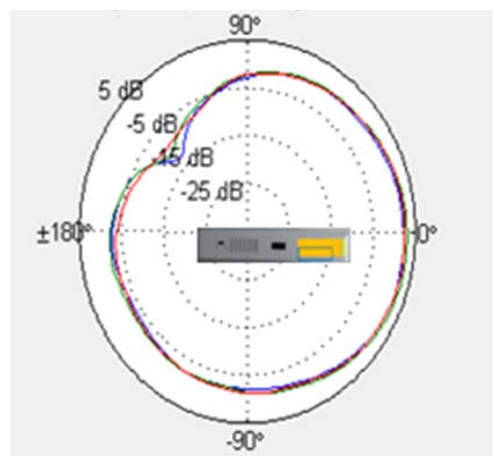
The vertical and horizontal antenna radiation patterns of FAP-U24JEV in the 2.4GHz and 5.0GHz bands are depicted in this chapter.

2.4GHz Antenna Radiation Patterns

Antenna Horizontal Radiation Patterns

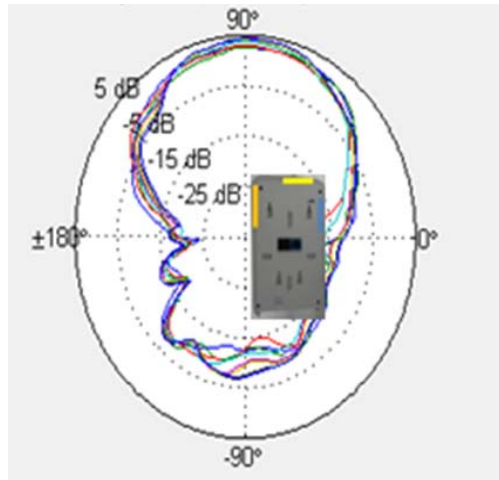


Antenna Vertical Radiation Patterns

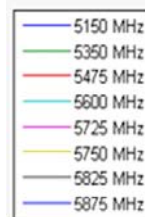
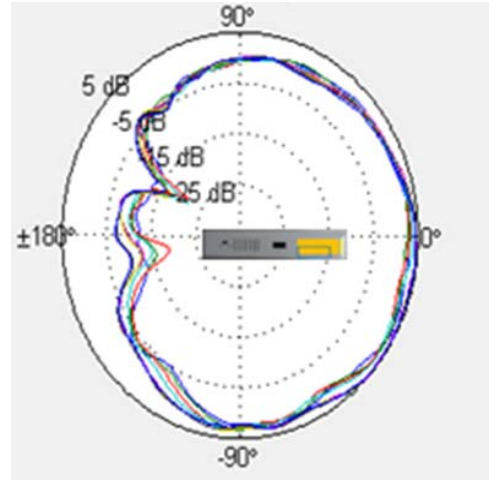


5.0GHz Antenna Radiation Patterns

Antenna Horizontal Radiation Patterns



Antenna Vertical Radiation Pattern



Transmit Power and EIRP

The table below shows the FAP-U24JEV default radiated transmit power settings in the GUI for FCC regulatory domain. The transmit power can be varied depending upon the cell size.

Radio	Frequency Range	Channel	Default Transmit Power per Antenna (EIRP)	Transmit Power Range (with 1 dBm increments)
2.4 GHz	2412 - 2472 MHz	1 - 13	20 dBm	5 - 24 dBm
5 GHz	5180 - 5825 MHz	36 - 165	20 dBm	5 - 23 dBm

Supported Data Rates (MBPS)

- IEEE Std 802.11ac per stream: 6.5 to 433.3 Mbps (MCS0-HT20 @ 800 nS to MCS9-VHT80 @ 400 nS)
- IEEE Std 802.11n per stream: 6.5 to 150.0 Mbps (MCS0-HT20 @ 800nS to MCS7-HT40 @ 400nS)
- IEEE Std 802.11a/g: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps
- IEEE Std 802.11b: 1, 2, 5.5, and 11 Mbps

A Regulatory Information

The Fortinet Access Point (APs) must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product. For country-specific approvals, see below. Fortinet Networks, Inc. is not responsible for any radio or television interference caused by unauthorized modification of APs, or the substitution or attachment of connecting cables and equipment other than that specified by Fortinet Networks, Inc. The correction of interference caused by such unauthorized modification, substitution or attachment is the responsibility of the user. Fortinet Networks, Inc. and its authorized resellers or distributors are not liable for any damage or violation of government regulations that may arise from the user failing to comply with these guidelines.

Regulatory Specifications

TABLE 1: *Regulatory Specifications*

Category	Items
Safety	<ul style="list-style-type: none">• UL 60950-1• CSA C22.2• EN 60950-1• IEC 60950-1
Unintentional Radiation Compliance	<ul style="list-style-type: none">• FCC Part 15.107 - 47CFR15.107• FCC Part 15.109 - 47CFR15.109 B• ICES-003 Class B• EN 301 489-1• EN 301 489-17• EN55022 Class B• EN55024/AS/NZS CISPR 24• VCCI Class B
Intentional Radiation Compliance	<ul style="list-style-type: none">• FCC Part 15.247 - 47 CFR Ch. I• FCC Part 15.407 - 47 CFR15.407• RSS-210• EN 300 328• EN 301 893• Japan Radio (Ninsho)

Declaration of Conformity, Federal Communication Commission

Manufacturer Information

Fortinet Networks, Inc
894 Ross drive,
Sunnyvale, CA 94089
USA

Declaration of Conformity

This device complies with Part 15 rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Device Name	FCC ID Number
FAP-U24JEV	TVE-121C01

This product is FCC marked according to the provisions of FCC Part 15.



This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and radiates radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference. However, there is no guarantee that interference will not occur. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



The Part 15 radio device operates on a non-interference basis with other devices operating at this frequency when using the integrated antennas. Any changes or modification to the product not expressly approved by Fortinet could void the user's authority to operate this device.

Declaration of Conformity, Industry Canada

This equipment is in compliance with the essential requirements of other relevant provisions of Directive.

Manufacturer Information

Fortinet Networks, Inc
894 Ross drive,
Sunnyvale, CA 94089
USA

Declaration of Conformity

The Class B digital portion of this apparatus complies with Canadian standard ICES-003. These devices comply with RSS210 of Industry Canada.

La partie numérique de Classe B de cet appareil est conforme à la norme ICES-003 canadien. Ces appareils sont conformes à la norme RSS 210 d'Industrie Canada..

Per RSS 210 A9.5 point 7:

- The device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-channel mobile satellite systems (The device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-channel mobile satellite systems)
- The maximum antenna gain permitted (for devices in the bands 5250-5350 MHz and 5470-5725 MHz) to comply with the EIRP limit; and the maximum antenna gain permitted (for devices in the band 5725-5825 MHz) to comply with the EIRP limits specified for point-to-point and non point-to-point operation as appropriate, as stated in section A9.2(3) (The maximum antenna gain permitted (for devices in the bands 5250-5350 MHz and 5470-5725 MHz) to comply with the EIRP limit; and the maximum antenna gain permitted (for devices in the band 5725-5825 MHz) to comply with the EIRP limits specified for point-to-point and non point-to-point operation as appropriate, as stated in section A9.2(3).
- In addition, users should also be cautioned to take note that high-power radars are allocated as primary users (meaning they have priority) of the bands 5250-5350 MHz and 5650-5850 MHz and these radars could cause interference and/or damage to WLAN devices (En outre, les utilisateurs doivent également être avertis de prendre note que les radars à haute puissance sont désignés comme utilisateurs principaux (ils ont la priorité) des bandes 5250-5350 MHz et 5650-5850 MHz et ces radars pourraient cause des interférences et / ou endommager aux appareils WLAN.
- These devices are not permitted to operate in the 5600 - 5650 MHz band (Ces appareils ne sont pas autorisés à opérer dans le 5600 - bande 5650 MHz.)

For products available in the Canadian markets, only channels 1 through 11 can be operated. Selection of other channels is not authorized. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device.

Pour les produits disponibles sur les marchés canadiens, seuls les canaux 1 à 11 peuvent être utilisés. La sélection d'autres canaux n'est pas autorisée. Son fonctionnement est soumis aux

deux conditions suivantes: (1) cet appareil ne doit pas provoquer d'interférences et (2) cet appareil doit accepter toute interférence, y compris celles pouvant causer un mauvais fonctionnement de ce dispositif

This device and its listed antenna(s) must not be co-located or operated in conjunction with any other antenna or transmitter

Cet appareil et son antenne énuméré (s) ne doivent pas être situés ou exploités conjointement avec une autre antenne ou transmetteur

The term "IC" before the equipment certification number only signifies that the Industry Canada technical specifications were met.

Le terme "IC" avant le numéro de certification de l'équipement signifie seulement que les spécifications techniques d'Industrie Canada ont été atteints

To reduce the potential radio interference to other users, the antenna type and gain should be chosen so that the equivalent isotropic radiated power (EIRP) is not more than that required for successful communication. This device complies with Class B Limits of Industry Canada. Operation is subject to the following two conditions:

Pour réduire le risque d'interférence avec d'autres utilisateurs, le type d'antenne et le gain doivent être choisis de telle sorte que la puissance isotrope rayonnée équivalente ne soit pas supérieure à celle requise pour une communication réussie. Cet appareil est conforme aux limites de Classe B d'Industrie Canada. Son fonctionnement est soumis aux deux conditions suivantes

- This device may not cause harmful interference, and
- Cet appareil ne doit pas provoquer d'interférences nuisibles, et
- This device must accept any interference received, including interference that may cause undesired operation.
- Cet appareil doit accepter toute interférence reçue, y compris les interférences pouvant entraîner un fonctionnement indésirable.

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

Pour empêcher que cet appareil cause du brouillage au service faisant l'objet d'une licence, il doit être utilisé à l'intérieur et devrait être placé loin des fenêtres afin de fournir un écran de

blindage maximal. Si le matériel (ou son antenne d'émission) est installé à l'extérieur, il doit faire l'objet d'une licence.

Device Name (Nom de l'appareil)	Industry Canada ID Number (Industrie Canada Numéro d'identification)
FAP-U24JEV	7280B-121C01

Declaration of Conformity, R&TTE Directive 1999/5/EC

This equipment is in compliance with the essential requirements of other relevant provisions of Directive.

Declaration of Conformity

Hereby, Networks Inc. declares that this unit is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

To obtain the declaration of conformity (DoC) for R&TTE Directive, please access the following URL address. <http://www.Fortinetnetworks.com>

Notice for customers: the following information is only applicable to equipment sold in countries applying EU directives. System may be operated in following countries:

EU Countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

This equipment can be operated in other non-European countries.

EFTA Countries: Norway and Switzerland

EU Applicants: Albania, Bosnia and Herzegovina

EU Candidate: Iceland, Macedonia and Montenegro

The following standards were applied:

- EMC-EN 301.489-1 Article 3.1 (b) of R&TTE Directive; EN 301.489-17 Article 3.1 (b) of R&TTE Directive
- Health & Safety-EN60950-1
- Radio-EN 300 328 Article 3.1 (b) of R&TTE Directive; EN 301.893 Article 3.1 (b) of R&TTE Directive

- The conformity assessment procedure referred to in Article 10.4 and Annex III of Directive 1999/5/EC has been followed.

Language	Content of Declaration
Български- (Bulgarian)	това оборудване е в съответствие със съществените изисквания и другите приложими разпоредби на Директива 1999/5/ЕО
Češka- (Czech)	Toto zařízení je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES
Dansk- (Danish)	Dette udstyr er i overensstemmelse med de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF
Deutsch- (German)	Das Udstyr ist in Übereinstimmung mit den wesentlichen Anforderungen und anderen relevanten Bestimmungen der Richtlinie 1999/5/EG
Esti- (Estonian)	See seade on vastavuses oluliste Krav ja muude asjaomaste komisjoni direktiivi 1999/5/EÜ
English- (English)	This equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC
Español- (Spanish)	Este equipo cumple con el requisito esencial y otras comisiones pertinentes de la Directiva 1999/5/CE
Ελληνικά- (Greek)	Αυτή η συσκευή είναι σύμφωνα με τις βασικές Κρατικές και άλλα αρμόδια επιτροπή της οδηγίας 1999/5/ΕΚ
Français- (French)	Cet appareil est en conformité avec les exigences essentielles et les autres commissions pertinentes de la directive 1999/5/CE
Íslenska- (Icelandic)	Þessi búnaður er í samræmi við nauðsynleg kröf og aðrar viðeigandi þóknun tilskipunar 1999/5/EB
Italiano- (Italian)	Questa apparecchiatura è conforme con il requisito essenziale e altri servizi della Commissione, della direttiva 1999/5/CE
Latviešu- (Latvian)	Šis aprīkojums ir saskaņā ar būtiskajām Krav un citiem attiecīgajiem Komisijas Direktīvas 1999/5/EK
Lietuvių- (Lithuanian)	Ši įranga atitinka esminius Krav ir kitomis atitinkamomis Komisijos direktyvos 1999/5/EB
Nederlands- (Dutch)	Deze apparatuur voldoet aan de essentiële kraven en andere relevante provisions van Richtlijn 1999/5/EG
Malti- (Maltese)	Dan it-tagħmir huwa konformi mal-Krav essenzjali u kummissjoni rilevanti oħra tad-Direttiva 1999/5/KE
Magyar- (Hungarian)	Ez a berendezés megfelel a vonatkozó alapvető Krav és egyéb releváns bizottsági irányelv 1999/5/EK
Norsk- (Norwegian)	Dette utstyret er i samsvar med de grunnleggende krav og andre relevante oppdrag i direktiv 1999/5/EF
Polski- (Polish)	Ten sprzęt jest zgodny z zasadniczymi KRAV oraz innymi właściwymi komisji dyrektywy 1999/5/WE
Portugues- (Portuguese)	Este equipamento está em conformidade com o requisito essencial e outra comissão pertinente da Directiva 1999/5/CE
Română- Romanian	Acest echipament este în conformitate cu Krav esențiale și alte Comisie relevante ale Directivei 1999/5/CE
Slovensko- (Slovenian)	Ta oprema je v skladu z bistvenimi Krav in druge ustrezne provizije Direktive 1999/5/ES
Slovensky- (Slovak)	Toto zariadenie je v súlade so základnými kráv a ostatnými príslušnými útvarmi Komisie smernice 1999/5/ES
Suomi- (Finnish)	Tämä laite on yhdenmukainen olennaisten krav ja muiden asiaan liittyvien komission direktiivin 1999/5/EY
Svenska- (Swedish)	Denna utrustning är i överensstämmelse med de grundläggande krav och andra relevanta uppdrag av direktiv 1999/5/EG

This device is intended to be used in all EU and EFTA countries.



Device Name	Certification Report Number
FAP-U24JEV	TBD

VCCI Statement

この装置は、クラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

VCCI-B

English Translation

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. User shall install and use the equipment according to the instruction manual.

General Information of RF Exposure

International Guidelines

This Device Meets International Guidelines for Exposure to Radio Waves.

The FAP-U24JEV device includes radio transmitters and receivers. It is designed not to exceed the limits for exposure to radio waves (radio frequency electromagnetic fields) recommended by international guidelines. The guidelines were developed by an independent scientific organization (ICNIRP) and include a substantial safety margin designed to ensure the safety of all persons, regardless of age and health.

As such the systems are designed to be operated as to avoid contact with the antennas by the end user. It is recommended to set the system in a location where the antennas can remain at

least a minimum distance as specified from the user in accordance to the regulatory guidelines which are designed to reduce the overall exposure of the user or operator.

Separation Distance		
MPE	Distance	Limit
0.82 mW/cm2	25 cm (9.84 inches)	1.00 mW/cm2

The World Health Organization has stated that present scientific information does not indicate the need for any special precautions for the use of wireless devices. They recommend that if you are interested in further reducing your exposure then you can easily do so by reorienting antennas away from the user or placing the antennas at a greater separation distance than recommended.

FCC Guidelines

This device meets FCC guidelines for exposure to radio waves.

The and FAP-U24JEV include radio transmitters and receivers. It is designed not to exceed the limits for exposure to radio waves (radio frequency electromagnetic fields) as referenced in FCC Part 1.1310. The guidelines are based on IEEE ANSI C 95.1 (92) and include a substantial safety margin designed to ensure the safety of all persons, regardless of age and health.

As such the systems are designed to be operated as to avoid contact with the antennas by the end user. It is recommended to set the system in a location where the antennas can remain at least a minimum distance as specified from the user in accordance to the regulatory guidelines which are designed to reduce the overall exposure of the user or operator.

The device has been tested and found compliant with the applicable regulations as part of the radio certification process.

The FCC recommends that if you are interested in further reducing your exposure then you can easily do so by reorienting antennas away from the user or placing the antennas at a greater separation distance then recommended or lowering the transmitter power output.

Separation Distance		
MPE	Distance	Limit
0.82 mW/cm2	25 (9.84 inches)	1.00 mW/cm2

Industry Canada Guidelines

This device meets Industry Canada guidelines for exposure to radio waves.

The and FAP-U24JEV include radio transmitters and receivers. It is designed not to exceed the limits for exposure to radio waves (radio frequency electromagnetic fields) as referenced in Health Canada Safety Code 6. The guidelines include a substantial safety margin designed into the limit to ensure the safety of all persons, regardless of age and health.

As such the systems are designed to be operated as to avoid contact with the antennas by the end user. It is recommended to set the system in a location where the antennas can remain at least a minimum distance as specified from the user in accordance to the regulatory guidelines which are designed to reduce the overall exposure of the user or operator.

Health Canada states that present scientific information does not indicate the need for any special precautions for the use of wireless devices. They recommend that if you are interested in further reducing your exposure you can easily do so by reorienting antennas away from the user, placing the antennas at a greater separation distance than recommended, or lowering the transmitter power output.

Separation Distance		
MPE	Distance	Limit
0.82 mW/cm2	25 (9.84 inches)	1.00 mW/cm2

Health Canada states that present scientific information does not indicate the need for any special precautions for the use of wireless devices. They recommend that if you are interested in further reducing your exposure you can easily do so by reorienting antennas away from the user, placing the antennas at a greater separation distance than recommended, or lowering the transmitter power output.

B Cautions and Warnings

The cautions and warnings that appear in this manual are listed below in English, German, French, and Spanish. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Cautions

A Caution calls your attention to a possible hazard that can damage equipment.

"Vorsicht" weist auf die Gefahr einer möglichen Beschädigung des Gerätes in.

Une mise en garde attire votre attention sur un risque possible d'endommagement de l'équipement. Ci-dessous, vous trouverez les mises en garde utilisées dans ce manuel.

Un mensaje de precaución le advierte sobre un posible peligro que pueda dañar el equipo. Las siguientes son precauciones utilizadas en este manual.



When changing the orientation of the antennas, be sure to slightly loosen the knurled ring before moving the antenna. Retighten the ring afterward. Otherwise, you might damage the internal cabling in the AP.

Bei einer Neuausrichtung der Antennen muss vor Bewegung der Antenne der Rändelring leicht gelockert werden. Anschließend den Ring wieder festziehen. Anderenfalls können die internen Kabel im AP beschädigt werden.

En cas de modification d'orientation des antennes, veiller à desserrer légèrement la bague moletée avant de réorienter l'antenne. Resserrer ensuite la bague, faute de quoi le câblage interne du point d'accès pourrait être endommagé.

Al cambiar la orientación de las antenas, asegúrese de aflojar ligeramente el anillo estriado antes de mover la antena. Luego vuelva a apretar el anillo. De otro modo, podría dañar el cableado interno del punto de acceso.



The radiated output power of the access points is well below the radio frequency exposure limits. However, the Fortinet Access Point should be used in such a manner that the potential for human contact during normal operation is minimized. To avoid the possibility of exceeding the radio frequency exposure limits, you should keep a distance of at least 20 cm between you (or any other person in the vicinity) and the Access Point antennas.

Die abgestrahlte Ausgangsleistung von Geräten von Fortinet Networks, Inc. liegt weit unter den Hochfrequenz-Expositionsgrenzwerten der. Die Fortinet Access Point Zugangspunkte von Fortinet Networks, Inc. sollten jedoch so verwendet werden, dass das Potenzial für Kontakt mit Menschen während des normalen Betriebs auf ein Mindestmaß beschränkt wird. Um die Möglichkeit einer Überschreitung der -Hochfrequenz-Expositionsgrenzwerte zu vermeiden, ist ein Abstand von mindestens 20 cm zwischen Ihnen (bzw. einer anderen Person in der Nähe) und den Zugangspunkt-Antennen zu wahren.

La puissance de rayonnement émise par les équipements Fortinet Networks, Inc. est très inférieure aux limites d'exposition aux fréquences radio définies par la. Toutefois, les points d'accès de la série Fortinet Access Point de Fortinet Networks, Inc. doivent être utilisés de façon à éliminer tout risque de contact humain en fonctionnement normal. Pour éviter de dépasser les limites d'exposition aux fréquences radio définies par la, il est impératif de préserver en permanence une distance supérieure ou égale à 20 cm entre l'utilisateur (ou toute personne se trouvant à proximité) et les antennes du point d'accès.

La potencia de radiación de los dispositivos de Fortinet Networks, Inc. está muy por debajo de los límites de exposición a radiofrecuencia estipulados por la. No obstante, los puntos de acceso de la serie Fortinet Access Point de Fortinet Networks, Inc. deben usarse de tal manera que se minimice la posibilidad de contacto para el usuario durante la operación normal. Para evitar la posibilidad de exceder los límites de exposición a radiofrecuencia establecidos por la, el usuario (o cualquier otra persona en torno) debe mantenerse a una distancia de al menos 20 cm respecto a las antenas del punto de acceso.



Exposure to Radio Frequency Radiation.

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit an RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website <http://www.hc-sc.gc.ca/rpb>.

Exposition aux rayonnements à fréquence radioélectrique

L'installateur de cet équipement radio doit veiller à positionner et orienter l'antenne de telle sorte qu'elle n'émette pas un champ radioélectrique supérieur aux limites définies par Santé Canada pour la population générale. Consulter le Code de sécurité n° 6, disponible sur le site Web de Santé Canada à l'adresse <http://www.hc-sc.gc.ca/rpb>.

Exposición a la radiación de radiofrecuencia.

El instalador de este equipo de radio debe cerciorarse de que la antena está localizada u orientada de tal manera que no emita un campo de radiofrecuencia superior a los límites estipulados por Health Canada para la población; consulte el Código de Seguridad 6 que podrá encontrar en el página web de Health Canada, <http://www.hc-sc.gc.ca/rpb>.

Warnings

A warning calls your attention to a possible hazard that can cause injury or death. The following are the warnings used in this manual.

"Achtung" weist auf eine mögliche Gefährdung hin, die zu Verletzungen oder Tod führen können. Sie finden die folgenden Warnhinweise in diesem Handbuch:

Un avertissement attire votre attention sur un risque possible de blessure ou de décès. Ci-dessous, vous trouverez les avertissements utilisés dans ce manuel.

Una advertencia le llama la atención sobre cualquier posible peligro que pueda ocasionar daños personales o la muerte. A continuación se dan las advertencias utilizadas en este manual.

antenas del punto de acceso.



With plastic covers removed, this product is suitable for use in environmental air-handling space in accordance with the Section 300-22(c) of the National Electric Code and Sections 2- 128.12 - 010 (3) and 12 - 100 of the Canadian Electrical Code. Part 1. C22. 1. For other countries, consult local authorities for regulations.

Bei abgenommener Kunststoffabdeckung ist dieses Produkt zur Verwendung in einem Umgebungsluftraum gemäß Abschnitt 300-22(c) des National Electric Code und Abschnitt 2- 128.12 - 010 (3) und 12 - 100 des Canadian Electrical Code Teil 1. C22.1 geeignet. Die Vorschriften für andere Länder sind bei den örtlichen Behörden erhältlich.

Sous réserve que ses couvercles de plastique soient déposés, cet appareil est adapté à une utilisation dans les vides de construction des bâtiments selon la section 300-22(c) du code NEC (National Electric Code) et les sections 2- 128.12 - 010 (3) et 12 - 100 du Code électrique du Canada, partie 1. C22. 1. Pour tous les autres pays, consulter les organismes de réglementation locaux.

Una vez desprendidas las cubiertas de plástico, este producto es adecuado para su uso en el espacio aéreo circundante en conformidad con la sección 300-22(c) del National Electric Code (Código Eléctrico Nacional de EE.UU.) y las secciones 2- 128.12 - 010 (3) y 12 - 100 del Código Eléctrico de Canadá. Parte 1. C22. 1. En otros países, consulte a las autoridades locales competentes para informarse acerca de las normativas vigentes.



Any Ethernet cables installed in air-handling spaces should be suitable under NEC Article 800.50 and marked accordingly for use in plenums and air-handling spaces with regard to smoke propagation, such as CL2-P, CL3-P, MPP (Multi Purpose Plenum), or CMP (Communications Plenum).

Alle Ethernet Kabel, die in Lüftungsräumen installiert werden, sollten gemäß NEC Artikel 800.50 geeignet sein und entsprechend zur Verwendung in Hohlräumen (Plenum) und Lüftungsräumen im Hinblick auf Rauchausbreitung gekennzeichnet sein, z.B. CL2-P, CL3-P, MPP (Multi Purpose Plenum) oder CMP (Communications Plenum).

Les câbles Ethernet installés dans un vide d'air doivent correspondre aux critères de l'article 800.50 du code NEC et identifiés en conséquence comme adaptés à une utilisation dans les vides de construction des bâtiments en matière de propagation de la fumée (marquages CL2-P, CL3-P, MPP (Multi Purpose Plenum) ou CMP (Communications Plenum)).

Todos los cables Ethernet instalados en espacios aéreos deben cumplir con el artículo 800.50 del NEC y estar marcados adecuadamente para su uso en espacios aéreos y plenums en lo concerniente a la propagación de humo, tales como CL2-P, CL3-P, MPP (Plenum multifuncional), o CMP (Plenum de comunicaciones).



Indoor antennas must be positioned to observe minimum separation of 20 cm. (~ 8 in.) from all users and bystanders. For the protection of personnel working in the vicinity of inside (downlink) antennas, the following guidelines for minimum distances between the human body and the antenna must be observed.

The installation of the indoor antenna must be such that, under normal conditions, all personnel cannot come within 20 cm. (~ 8.0 in.) from any inside antenna. Exceeding this minimum separation will ensure that the employee or bystander does not receive RF-exposure beyond the Maximum Permissible Exposure according to local country regulatory approval.

Indoorantennen müssen so positioniert werden, dass ein Mindestabstand von 20 cm (ca. 8 Zoll) zu allen Benutzern und anderen Personen gewahrt wird. Zum Schutz von Personal, das in der Nähe von Innenantennen (Downlink) arbeitet, sind die folgenden Richtlinien für Mindestabstand zwischen dem menschlichen Körper und der Antenne zu beachten.

Die Innenantenne muss so installiert werden, dass sich unter normalen Bedingungen kein Personal bis auf weniger als 20 cm (ca. 8 Zoll) an eine Innenantenne annähern kann. Durch Überschreitung dieses Mindestabstands wird sichergestellt, dass Mitarbeiter oder andere Personen keiner RF-Exposition über die maximal zulässige Exposition (MPE; Maximum Permissible Exposure) gemäß FCC CFR 47, Abschnitt 1.1310 (Grenzwerte für die allgemeine Bevölkerung/unkontrollierte Exposition) ausgesetzt werden.

Les antennes intérieures doivent être positionnées de façon à respecter une distance minimum de 20 cm par rapport aux utilisateurs et aux tiers. Pour la protection du personnel travaillant à proximité des antennes intérieures (liaison descendante), respecter les directives suivantes pour assurer des distances minimales entre les êtres humains et les antennes.

Toute antenne intérieure doit être installée de telle sorte que, dans des conditions normales, le personnel ne puisse s'en approcher à moins de 20 cm. Cette distance minimale est destinée à garantir qu'un employé ou un tiers ne sera pas exposé à un rayonnement radioélectrique supérieur à la valeur maximale autorisée, telle qu'elle est définie dans les limites d'exposition non contrôlées pour la population par la réglementation de la FCC CFR 47, section 1.1310.

Las antenas interiores deben colocarse de manera que se observe una separación mínima de 20 cm. (~ 8 pulg.) respecto a todos los usuarios y circunstantes. Para la protección del personal que trabaje en las inmediaciones de las antenas interiores (receptoras), deben observarse las siguientes directrices relativas a la distancia mínima entre el cuerpo humano y la antena.

La instalación de la antena interior debe efectuarse de tal modo que, en condiciones normales, ningún miembro del personal pueda acercarse a menos de 20 cm. (~ 8,0 pulg.) de cualquier antena interior. El cumplimiento de este mínimo de separación asegura que el empleado o circunstante no recibirá exposición a radiofrecuencia por encima de la Exposición Máxima Permissible conforme a la normativa FCC CFR 47, sección 1.1310, es decir, los límites asignados a la Exposición Incontrolada/Población Civil.

C Additional Notes

Maximum EIRP

The EIRP is the sum of transmit power and antenna gain. By default, FAP-U24JEV EIRP is set lower than the regulatory limit.

Manufacturing Information

The FAP-U24JEV models are built in China. Contact Fortinet Networks for manufacturing related information.

Distributed Antenna Systems (DAS)

Fortinet Networks does not certify or endorse any specific Distributed Antenna System (DAS) vendors. Fortinet Networks will provide support to Fortinet Wi-Fi customers that use distributed antennas within the terms and conditions of the FortinetAssure Terms of Service and in accordance with the customer's support agreement. Fortinet Customer Support will support Fortinet software and hardware, and will work jointly with DAS vendors to identify and troubleshoot issues, but any support related to RF issues, including RF coverage, shall be the responsibility of the DAS vendor.

Fortinet Networks recommends that customers use only a DAS that has been tested to work with Fortinet hardware and software. Fortinet does not provide any site surveys, design or implementation of Wi-Fi over DAS. Fortinet recommends that customers obtain such services from a trained and qualified systems integrator or from their DAS vendor.

Air Handling Space Requirements

FAP-U24JEV are not plenum rated.

The products should be installed in accordance with all applicable, local regulations and practices.

Frequencies Blocked for Regulatory Compliance

These products are for indoor use only, in U-NII-1 and/or U-NII-3 band when Dynamic Frequency Selection, DFS, from 5.25-5.35 GHz and 5.47-5.725 GHz, is disabled. With DFS approval, these products can operate in U-NII-2 or U-NII-2e. To ensure compliance with local regulations, be sure to set your Access Point to the country in which you are using the Access Point.

Underwriters Laboratories

Use only listed e information technology equipment (ITE) I.T.E. equipment.

The unit is intended for installation in Environment A as defined in IEEE 802.3.All interconnected equipments must be contained within the same building, including the interconnected equipment's associated LAN connection.


Restriction of Hazardous Substances

European Community

This device complies the Restriction of Hazardous Substances Directive (RoHS) for its restriction of the use of certain hazardous substances in electrical and electronic equipment for European Union.

China

This device complies Administrative Measure on the Control of Pollution Caused by Electronic Information Products or China RoHS. FAP-U24JEV may contain hazardous substances are marked with the EIP logo including an Environment Friendly Use Period (EFUP) value in 10 years.

AP832	Toxic and Hazardous Substances or Elements						
Component with toxic and hazardous substances	Pb (Lead)	Hg (Mercury)	Cd (Cadmium)	Cr(VI) (Hexavalent Chrome)	PBB (Polybrominated biphenyl)	PBDE (Polybrominated diphenyl ether)	
Circuit Modules	X	0	0	0	0	0	
Metal Parts	0	0	0	0	0	0	
Plastic and Polymeric Parts	0	0	0	0	0	0	
<div>O: Indicates that the content of the toxic and hazardous substance in all the homogenous materials of the part is below the concentration limit requirement for RoHS compliance. X: Indicates that the content of the toxic and hazardous substance in at least one homogeneous material of the part exceeds the concentration limit requirement for RoHS compliance</div>							