

20504_2AJYB-S1955XE FCC IC Instruction For Use-1.2.2.docx
08/02/2024

Instruction for FCC/IC/MIC/EU compliant use

Stream1955xE Network Audio Streaming Module



Version: 1.2.1
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Date: 04/03/2024

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1. Document History

| No. | Primary Author(s) | Description of Version | Date Completed |
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| 1.0 | C. Arnardi | Initial version | 11/7/2023 |
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| 1.2 | C.Arnardi | Added logos | 04/03/2024 |
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| 1.2.2 | C.Arnardi | +FCC EMC Warnings | 11/03/2024 |

Confidentiality Notice

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Document Version Management Notice

Updates of this document will be done without notice. The latest document version is available on request.

2. Conditions for re-use of modular certification

Any modifications made to the module will void the Grant of Certification, this module is limited to OEM installation only and must not be sold to end-users, end-user has no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products.

Additional testing and certification may be necessary when multiple modules are used.

To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Supplier's Declaration of Conformity procedure without a transmitter-certified module and a module is added, the host manufacturer is responsible for ensuring that after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with the host, (StreamUnlimited Engineering GmbH) will provide guidance to the host manufacturer for compliance with the Part 15B requirements.

If any doubt about product compliance due to integration, StreamUnlimited provide via its customer portal software a documentation to re-check compliance.(see Stream1995xE Certification Guidelines.pdf)

The modular certifications may be re-used on product level under following conditions:

1. Recommended antennas specifications are followed (see **Stream1955_Generic_Antenna_Specification.pdf**)
2. The WiFi output power configurations which are stored in "NVRAM file" remain unchanged
3. The Bluetooth output power which is hard-coded in firmware to 6dB remains unchanged
4. Product labelling requirements are met (KDB 784748)
5. Instructions for use requirements are met
6. The product modular certification is available only for the scope of rules tested and mentioned on the grant.

For FCC Compliance, please refer to KDB Publication 996369 D04 for up-to-date information about module integration.

Additional notes:

Ad 1):

StreamUnlimited provide NVRAM files for "CE" "FCC" and "MIC" configurations. Region is selected during end-product configuration prior to product encasing. In the same step, also the country which the product is intended for should be configured.

In the case that no region is configured, the NVRAM for "CE" will be selected as default and "worldwide" will be selected as country. This will result in the most restricted configuration.

Ad):

Firmware is field-upgradeable. A secure update mechanism is used by StreamUnlimited to prevent modification of the update image. The product is also protected against local access to the software. If not using software of StreamUnlimited, a similar approach must be taken to prevent tampering with the system either via direct access of by modification of the update software image.

2.1 Product labelling requirements

Product label must contain following text:

“contains FCC ID: 2AJYB-S1955XE”

“contains IC: 20504-S1955XE”





“Japan MIC Certification number if applicable”

See below example for reference

contains FCC ID: 2AJYB-**S1955XE**
contains IC: 20504- **S1955XE**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: 1. This device may not cause harmful interference, and 2. This device must accept any interference received, including interference that may cause undesired operation.

2.1.1 Compliance Logos

| | |
|-----|---|
| FCC |  |
| IC |  |
| MIC |  |
| CE |  |

2.2 Instruction for use requirements

Instructions for use must contain warnings and customer information, see next two pages for detailed text

FCC statements:

The device for operation in the band 5150–5350 MHz and 5925–6525 MHz bands is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems. Federal Communication Commission (FCC) Radiation Exposure Statement When using the product, maintain a distance of 20cm from the body to ensure compliance with RF exposure requirements.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more 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 that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

This device is intended only for OEM integrators under the following conditions:

1. The antenna must be installed such that 20 cm is maintained between the antenna and users.
2. The transmitter module may not be co-located with any other transmitter or antenna. As long as the two conditions above are met, additional transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required for the installed module.

Important Note: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the Federal Communications Commission of the U.S. Government (FCC) and the Canadian Government authorizations are no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator shall be responsible for re-evaluating the end-product (including the transmitter) and obtaining a separate FCC authorization in the U.S. and Canada.

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OEM Integrators - End Product Labeling Considerations: This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains, FCC ID: 2AJYB-S1955XE". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

OEM Integrators - End Product Manual Provided to the End User: The OEM integrator shall not provide information to the end user regarding how to install or remove this RF module in end product user manual. The end user manual must include all required regulatory information and warnings as outlined in this document. Appropriate measurements (e.g. 15 B compliance) and if applicable additional equipment authorizations (e.g. SDoC) of the host product to be addressed by the integrator/manufacture. This module is only FCC authorized for the specific rule parts 15.247, 15.407 listed on the grant, and the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host product as being Part 15 Subpart B compliant

For more detailed guidance, please refer to KDB996369 D04 for OEM Integrators.

FCC Note on usage of 6GHz band :

Installations and use in aircraft and use for unmanned aircraft systems (UAS) are not permitted. The 6 GHz device cannot be used for the control of unmanned aircraft.

EMC Compliance Statement

Important: This device and its power adapter have demonstrated Electromagnetic Compatibility(EMC) compliance under conditions that included the use of compliant peripheral devices and shielded cables between system components. It is important that you use compliant peripheral devices and shielded cables between system components to reduce the possibility of causing interference to radios, televisions, and other electronic devices.

Canada:

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s).

Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes:

- 1) L'appareil ne doit pas produire de brouillage;
- 2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

The device meets the exemption from the routine evaluation limits in section 2.5 of RSS 102 and compliance with RSS-102 RF exposure, users can obtain Canadian information on RF exposure and compliance.

Le dispositif rencontre l'exemption des limites courantes d'évaluation dans la section 2.5 de RSS 102 et la conformité à l'exposition de RSS-102 rf, utilisateurs peut obtenir l'information canadienne sur l'exposition et la conformité de rf.

The device for operation in the band 5150-5250 MHz / 5925-6525 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

Les dispositifs fonctionnant dans la bande 5150-5250 MHz / 5925-6525 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

1. the device for operation in the band 5150–5250 MHz / 5925–6525 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

2. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;

3. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate.

1. les dispositifs fonctionnant dans la bande 5150-5250 MHz / 5925–6525 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

2. le gain maximal d'antenne permis pour les dispositifs utilisant les bandes 5250-5350 MHz et 5470-5725 MHz doit se conformer à la limite de p.i.r.e.

Le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5725-5850 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas.

Caution!

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The final end product must be labelled in a visible area with the following:

“Contains FCC ID: 2AJYB-S1955XE”. “Contains IC: 20504-S1955XE”.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Cet émetteur ne doit pas être Co-placé ou ne fonctionnant en même temps qu'aucune autre antenne ou émetteur.

Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps

Indoor end-use requirement

Usage of U-NII-5 - U-NII-6 bands is limited to indoor only end-applications. Please mention on manual/box of end product that the usage is reserved for indoor applications. Contact your StreamUnlimited for instructions if outdoor use case needs to be covered.

EU Declaration of Conformity

Frequency band: 5150 – 5250 MHz:

Indoor use: Inside buildings only. Installations and use inside road vehicles and train carriages are not permitted. Limited outdoor use: If used outdoors, equipment shall not be attached to a fixed installation or to the external body of road vehicles, a fixed infrastructure or a fixed outdoor antenna. Use by unmanned aircraft systems (UAS) is limited to within the 5170 – 5250 MHz band.

Frequency band: 5250 – 5350 MHz:

Indoor use: Inside buildings only. Installations and use in road vehicles, trains and aircraft are not permitted. Outdoor use is not permitted.

Frequency band: 5470 – 5725 MHz:

Installations and use in road vehicles, trains and aircraft and use for unmanned aircraft systems (UAS) are not permitted.

Frequency band 5945 -6425MHz:

Restricted to indoor use, including in trains with metal-coated windows and aircraft. Outdoor use, including in road vehicles, is not permitted.

5G Restriction diagram :



| | | | | | | | |
|----|----|----|----|----|----|----|----|
| AT | BE | BG | CH | CY | CZ | DE | DK |
| EE | EL | ES | FI | FR | HR | HU | IE |
| IS | IT | LI | LT | LU | LV | MT | NL |
| NO | PL | PT | RO | SE | SI | SK | UK |

Maximum output power per frequency bands (EU)

WLAN 2.4G

2402 MHz -2472 MHz (20dBm)

WLAN 5G

5150 MHz ~5250 MHz : 23 dBm

5250 MHz~5350 MHz : 20 dBm

5470 MHz ~5725 MHz : 20 dBm

5725 MHz~5850 MHz : 14 dBm

5945 MHz ~ 6425 MHz : 23 dBm

BT/BLE

2402 MHz -2480 MHz (10dBm)

EU Packaging requirements

- CE logo needs to be on the product labelling (must not be smaller than 5 mm).
- Trademark and model name/ number needs to be stated.
- Manufacturer full address (if not possible in manual).
- Importer full address (if not possible in manual).
- 5G restriction diagram



| | | | | | | | |
|----|----|----|----|----|----|----|--------|
| AT | BE | BG | CH | CY | CZ | DE | DK |
| EE | EL | ES | FI | FR | HR | HU | IE |
| IS | IT | LI | LT | LU | LV | MT | NL |
| NO | PL | PT | RO | SE | SI | SK | UK(NI) |

- If there is no FCC 15 warning on the label, please add it to the outer packaging :

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

(1) this device may not cause harmful interference, and

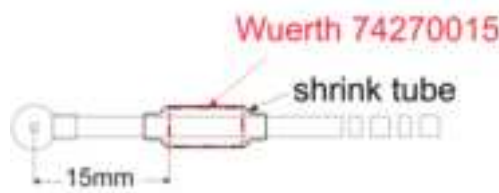
(2) this device must accept any interference received, including interference that may cause undesired operation.

3. EMC application notes

Stream1955xE is optimized for low radiation.

Consider following recommendations when designing application boards:

- Use a GND plane underneath the module
- Use series resistors in all low speed interface lines, values need to be chosen depending on signal frequency and length of signal lines on application board
- Use common mode signal filters in USB data lines, e.g. Wuerth 744232161.
- Prevent using vias in high speed interface lines such as MIPI, USB and Ethernet
- Route high speed interface lines differentially and leave several mm gap to other signal lines when possible
- Make sure any interface which is not needed for your application is disabled in software
- **Type and orientation of antennas and routing of antenna cables will influence spurious emission. A compliance test w.r.t. EN301 893 is recommended on product level earliest possible in the development phase**
- in case the WLAN antennas radiate undesired disturbances originating from either the module itself or other parts of the product, using a ferrite on the antenna cables may help to improve EMC (see below picture for reference). No ferrite was required to pass modular certifications of Stream1955



Other application hints

- Decouple the module supply from functional blocks, which are sensitive to supply ripple. The WLAN subsystem will draw up to 1200mA (Peak) while transmitting at high data rate but switch to low power mode rapidly whenever idle. A large low-ESR capacitor (100uF) is recommended to be placed close to the module with a ferrite bead or inductor towards sensitive circuitry such as audio ADCs or DACs. Using 3x47µF ceramic capacitors in parallel will reduce disturbance currents further
- Use of an external 5V AC/DC adapter is not recommended, since current peaks of WLAN subsystem would cause high voltage drops across the D.C. cable and connector which may cause malfunction of USB ports. It is recommended to use a 12V AC/DC adapter and local 5V DC/DC converter or internal SMPS.