



MEDIATEK

everyday genius

MT7922A12L

Test-Mode Software Application Note

Part-1: QA-Tool User Guideline

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Document Revision History

Version	Date	Author	Change List
V0.1	20210303	Yi-Yan	Initial draft release.
V0.2	20210310	Yi-Yan	Add section 2.6

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Table of Contents

Document Revision History.....	2
Table of Contents	3
1 System overview	4
1.1 General Description.....	4
2 QA-Tool	5
2.1 How to install QA-tool	5
2.1.1 Install WinPcap.....	6
2.1.2 Windows 10 install note	7
2.1.3 QA-Tool Windows driver	8

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1 System overview

1.1 General Description

MT7922A12L chip is highly integrated single chip which have built in 2x2 dual-band wireless LAN and Bluetooth combo radio. It can be configured in test-mode for performance validation, production testing and regulatory certification. There are two software tools, QA-Tool and Combo-Tool responsible for evaluating WIFI and Bluetooth signal and performance testing. This document is introducing how to install and use QA-Tool.

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2 QA-Tool

Users have to install 3 major software before using QA-Tool.

- WinPcap
- Windows7 X64 security package
- QA-Tool Windows driver

MTK strongly recommends install QA-Tool on Windows 7-64bit operating system.

2.1 How to install QA-tool

Please follow the procedure listed in below to install QA-Tool

- 1st : Install WinPcap
- 2nd : Update Windows7 security package to register x64 signature mechanism
- 3rd : Instal QA-Tool Windows driver.

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2.1.1 Install WinPcap

If users are the 1st time operating this tool, users should install WinPcap at first. Please follow below link and steps to install this software.

<https://www.winpcap.org/install/>

WinPcap version: 4.1.2 or later.



1



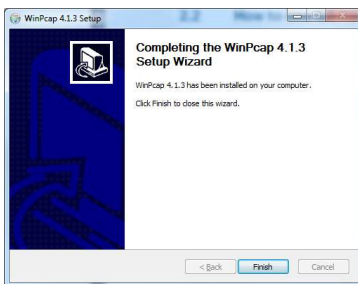
2



3



4



2.1.2 Windows 10 install note

If users can't install the driver in Windows 10 due to driver integrity check. Try to disable the integrity check to allow installation.

- **Disable Driver Integrity Check**

1. Open cmd as Administrator.
2. Execute 'bcdedit /set nointegritychecks on'
3. Reboot
4. Then install again. If still fail, try do 'Disable Secure Boot' below.

NOTE: Re-enable the driver integrity check by executing 'bcdedit /set nointegritychecks off' and then rebooting.

- **Disable Secure Boot**

Please refer to:

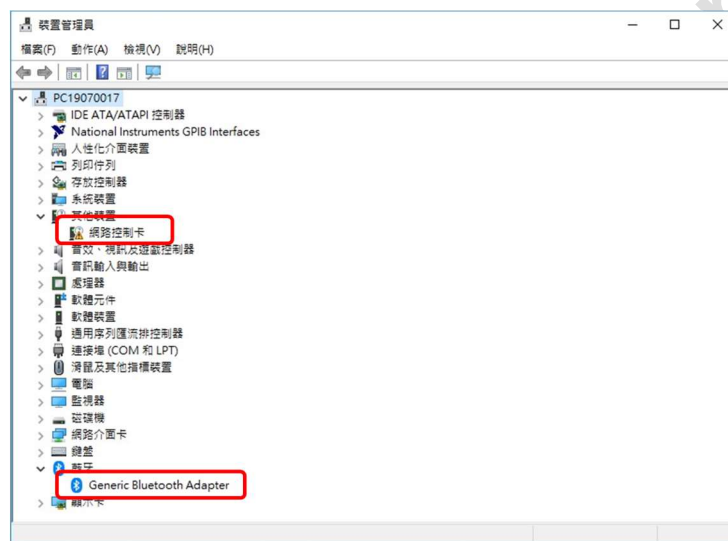
<https://docs.microsoft.com/en-us/windows-hardware/manufacture/desktop/disabling-secure-boot>

2.1.3 QA-Tool Windows driver

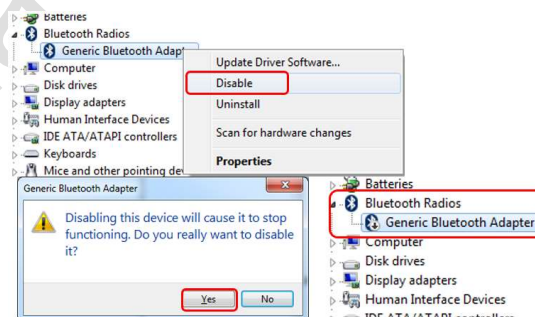
MT7922A12L supports USB, SDIO and PCIE interface. According to interface type of MT7922A12L on users' hand, please refer to steps shown below to install QA-Tool Windows driver:

USB interface:

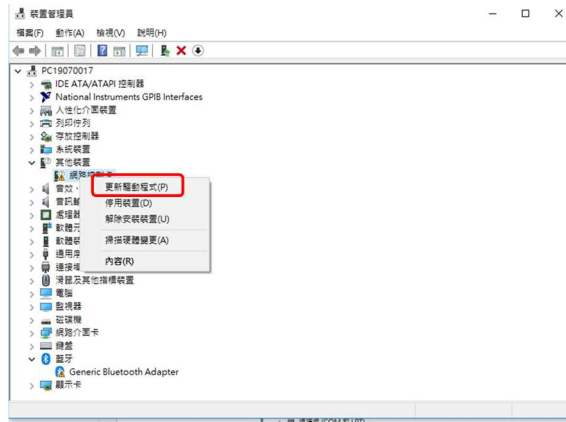
1. Connect DUT to PC/NB and check Windows Device Manager.
2. Window Device Manager would discover DUT shows **“Generic Bluetooth Adapter”**(BT device) and **“WiFi_If”**(WiFi device).



3. Right click the **“Generic Bluetooth Adapter”** BT device and select disable as follows.

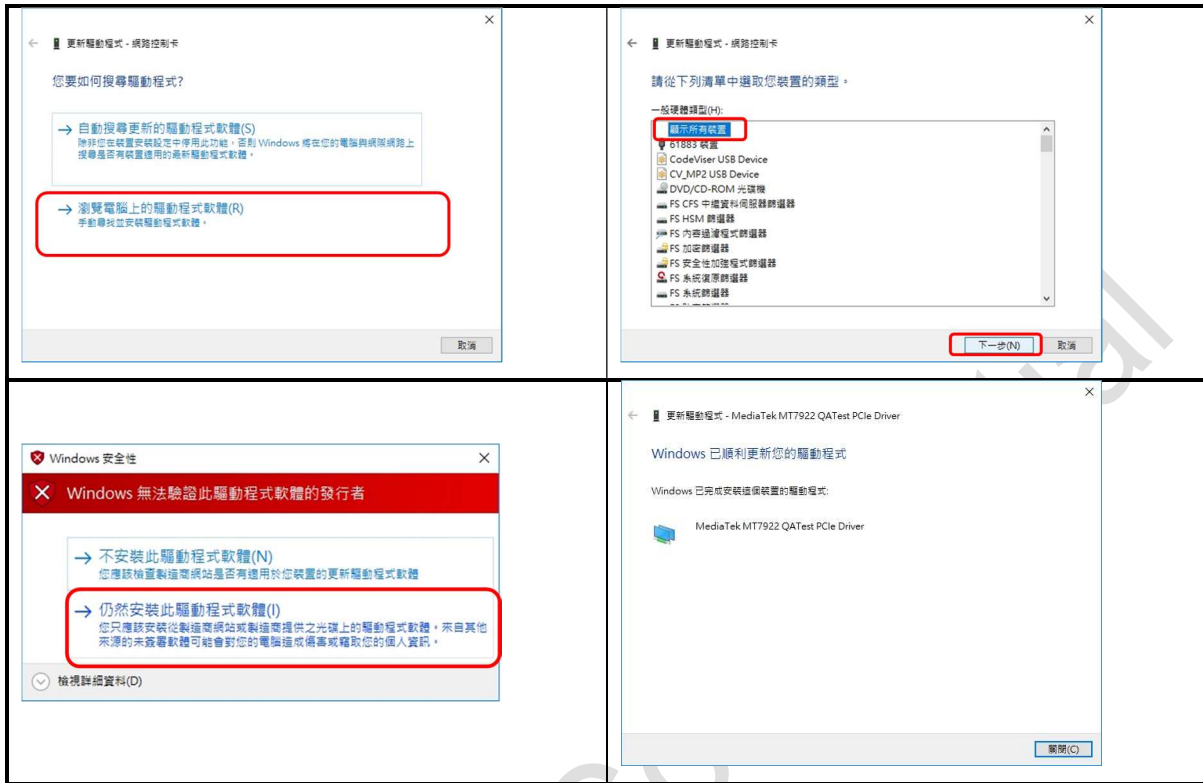


4. Right-click on “WiFi_IF” Wifi device and Update Driver Software.



5. According user’s Windows’ OS to select and install test tool driver.





FCC regulation requirements / installation restrictions

RF Software restrictions (Implement by MTK)

Indoor Client 6XD

1. Contention-Based Protocol, as demonstrated in the FCC test report, is permanently embedded in the module and is not host-dependent, can't change by anyone.
2. This Modular device will only associate and connect with a low-power indoor access point or subordinate device and never directly connect to other client devices. This feature is include in its firmware and can't change by anyone.
3. This Modular device will always initiate transmission under the control of a low-power indoor AP or subordinate except for brief transmissions before joining a network. These short messages will only occur if the client has detected an indoor AP or subordinate operating on a channel. These brief messages will have a time-out mechanism such that if it does not receive a response from an AP it will not continually repeat the request.
4. That transmissions will be lower or equal to the power advertised by the indoor low-power access point or subordinate and never above the maximum output power allowed by the FCC grant for equipment class 6XD.

Installation restrictions

1. When use and install this modular device, prohibited for control of or communications with unmanned aircraft systems, including drones.

Dual Client 6CD

- a. This device not 6PP category and the maximum power does not exceed authorized values.
- b. This device will only associate and connect with a low-power indoor Access Point, subordinate device, or standard access point and never directly link to any other client devices.
- c. This device will always initiate transmission under the control of a low-power indoor AP or subordinate or standard client except access point for brief communications before joining a network. These quick messages will only occur if the client has detected an indoor AP, subordinate, or standard access point operating on a channel. These brief messages will have a time-out mechanism such that if it does not receive a response from an AP it will not continually repeat the request.
- d. This device, when associated and connected with a low-power indoor access point, subordinate or standard access point device, will operate at a power lower as advertised by the indoor access point, subordinate, or standard access point:
 - i. lower than or equal to the power advertised by the low-power indoor access point or subordinate and never above the maximum output power allowed by the FCC grant for clients associated with indoor clients or subordinates.
 - ii. lower than or 6 dB below the power advertised by the standard access point.

5. Contention-based protocol as demonstrated in the test report is permanently embedded in the module and is not host-dependent based protocol demonstrated in the test report.

Installation restrictions

1. Prohibited for control of or communications with unmanned aircraft systems, including drones.

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Federal Communication Commission Interference Statement

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.

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 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.

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

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Radiation Exposure Statement:

The product comply with the FCC portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

This module is intended for OEM integrators only. Per FCC KDB 996369 D03 OEM Manual v01 guidance, the following conditions must be strictly followed when using this certified module:

KDB 996369 D03 OEM Manual v01 rule sections:

2.2 List of applicable FCC rules

This module has been tested for compliance to FCC Part 15 Subpart C (15.247) and Subpart E (15.407). Device is tested for compliance as a low power indoor client device within 5.925–7.125 GHz band.

2.3 Summarize the specific operational use conditions

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) will need a separate reassessment through a class II permissive change application or new certification.

This module is authorized for Low Power Indoor Client applications only; final host product must be for indoor operations only.

Further operation restrictions on the host product include:

Prohibited for control of or communications with unmanned aircraft systems, including drones.

2.4 Limited module procedures

Not applicable.

2.5 Trace antenna designs

Not applicable.

2.6 RF exposure considerations

This equipment complies with FCC mobile radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. A separate SAR/Power Density evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

2.7 Antennas

The following antennas have been certified with this module.

Ant. Set	RF Chain No.	Brand	Model	Ant. Net Gain (dBi)	Freq. Range (GHz)	Ant. Type	Connector Type
1	Chain0	PSA	RFMTA340718EMLB302	3.18 4.92	2.4~2.4835 5.15~5.85	PIFA	i-pex(MHF)
	Chain1	PSA	RFMTA340718EMLB302	3.18 4.92	2.4~2.4835 5.15~5.85	PIFA	i-pex(MHF)
2	Chain0	PSA	RFMTA311020EMMB301	1.71 4.82 4.76 4.29 4.61 4.09	2.4~2.4835 5.15~5.85 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	PIFA	i-pex(MHF)
	Chain1	PSA	RFMTA311020EMMB301	1.71 4.82 4.76 4.29 4.61 4.09	2.4~2.4835 5.15~5.85 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	PIFA	i-pex(MHF)
3	Chain0	MSI	WA-P-LE-02-045	2.24 2.68 3.01 -1.23 -1.96 -3.68	2.4~2.4835 5.15~5.85 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	PIFA	IPEX-4L
	Chain1	MSI	WA-P-LE-02-046	-2.96 1.16 0.99 -2.31 -2.54 -7.44	2.4~2.4835 5.15~5.85 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	PIFA	IPEX-4L
4	Chain0	PSA	RFMTA421230IMMB701	-13.92 -13.91 -13.91 -14.46	5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	PIFA	IPEX-4L
	Chain1	PSA	RFMTA421230IMMB701	-13.92 -13.91 -13.91 -14.46	5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	PIFA	IPEX-4L

Note1: Use of other antenna types or the same type of antenna with higher gain than listed above must performed additional testing and appropriate permissive change approval.

Note2: In the 5.925-7.125GHz band, use of other similar type antennas and the antenna gain not higher/lower than listed above may only require a C1PC without any additional testing/submission.

Note3: Contact MTK for additional guidance, if choose to use different antenna types or higher/lower gain antennas in the end system.

IMPORTANT: The final host product must have an integral antenna which is not removable by the end-user.

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following: "Contains FCC ID: RAS-MT7922A12L". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

2.9 Information on test modes and additional testing requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) class II permissive change re-evaluation or new certification.

2.10 Additional testing, Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

As long as all conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

OEM/Host manufacturer responsibilities

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential



requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment.

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Industry Canada statement:

This device complies with ISED's licence-exempt RSSs. 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.

Le présent appareil est conforme aux CNR d'ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Radiation Exposure Statement:

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with greater than 20cm between the radiator & your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à plus de 20 cm entre le radiateur et votre corps.

Radiation Exposure Statement:

The product comply with the Canada portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

Déclaration d'exposition aux radiations:

Le produit est conforme aux limites d'exposition pour les appareils portables RF pour les Etats-Unis et le Canada établies pour un environnement non contrôlé.

Le produit est sûr pour un fonctionnement tel que décrit dans ce manuel. La réduction aux expositions RF peut être augmentée si l'appareil peut être conservé aussi loin que possible du corps de l'utilisateur ou que le dispositif est réglé sur la puissance de sortie la plus faible si une telle fonction est disponible.

This device is intended only for OEM integrators under the following conditions: (For module device use)

1) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 1 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

**Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes:
(Pour utilisation de dispositif module)**

1) Le module émetteur peut ne pas être coimplanté avec un autre émetteur ou antenne.

Tant que les 1 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

IMPORTANTENOTE

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed and operated with greater than 20cm between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC:7542A-MT7922A12L".

Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un appareil où l'antenne peut être installée et utilisée à plus de 20 cm entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 7542A-MT7922A12L"

End Product Labeling

The product can be kept as far as possible from the user body or set the device to lower output power if such function is available. The final end product must be labeled in a visible area with the following: "Contains IC: 7542A-MT7922A12L".

Plaque signalétique du produit final

L'appareil peut être conservé aussi loin que possible du corps de l'utilisateur ou que le dispositif est réglé sur la puissance de sortie la plus faible si une telle fonction est disponible. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 7542A-MT7922A12L .

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

Caution :

(i) the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

(ii) 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;

(iii) 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 as appropriate;

(iv) where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in section 6.2.2.3 shall be clearly indicated.

Avertissement:

Le guide d'utilisation des dispositifs pour réseaux locaux doit inclure des instructions précises sur les restrictions susmentionnées, notamment :

(i) les dispositifs fonctionnant dans la bande 5150-5250 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;

(ii) pour les dispositifs munis d'antennes amovibles, le gain maximal d'antenne permis pour les dispositifs utilisant les bandes de 5 250 à 5 350 MHz et de 5 470 à 5 725 MHz doit être conforme à la limite de la p.i.r.e.;

(iii) pour les dispositifs munis d'antennes amovibles, le gain maximal d'antenne permis (pour les dispositifs utilisant la bande de 5 725 à 5 850 MHz) doit être conforme à la limite de la p.i.r.e. spécifiée, selon le cas;

(iv) lorsqu'il y a lieu, les types d'antennes (s'il y en a plusieurs), les numéros de modèle de l'antenne et les pires angles d'inclinaison nécessaires pour rester conforme à l'exigence de la p.i.r.e. applicable au masque d'élévation, énoncée à la section 6.2.2.3, doivent être clairement indiqués

RSS-248 Issue 2 General statement

Devices shall not be used for control of or communications with unmanned aircraft systems.

Les dispositifs ne doivent pas être utilisés pour commander des systèmes d'aéronef sans pilote ni pour communiquer avec de tels systèmes.

DETACHABLE ANTENNA USAGE

This radio transmitter (IC: 7542A-MT7922A12L / Model: MT7922A12L) has been approved by ISED to operate with the antenna type listed below with maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (IC: 7542A-MT7922A12L / Model: MT7922A12L) a été approuvé par ISED pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.


Approved antenna(s) list

Ant. Set	RF Chain No.	Brand	Model	Ant. Net Gain (dBi)	Freq. Range (GHz)	Ant. Type	Connector Type
1	Chain0	PSA	RFMTA340718EMLB302	3.18 4.92	2.4~2.4835 5.15~5.85	PIFA	i-pex(MHF)
	Chain1	PSA	RFMTA340718EMLB302	3.18 4.92	2.4~2.4835 5.15~5.85	PIFA	i-pex(MHF)
2	Chain0	PSA	RFMTA311020EMMB301	1.71 4.82 4.76 4.29 4.61 4.09	2.4~2.4835 5.15~5.85 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	PIFA	i-pex(MHF)
	Chain1	PSA	RFMTA311020EMMB301	1.71 4.82 4.76 4.29 4.61 4.09	2.4~2.4835 5.15~5.85 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	PIFA	i-pex(MHF)
3	Chain0	MSI	WA-P-LE-02-045	2.24 2.68 3.01 -1.23 -1.96 -3.68	2.4~2.4835 5.15~5.85 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	PIFA	IPEX-4L
	Chain1	MSI	WA-P-LE-02-046	-2.96 1.16 0.99 -2.31 -2.54 -7.44	2.4~2.4835 5.15~5.85 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	PIFA	IPEX-4L
4	Chain0	PSA	RFMTA421230IMMB701	-13.92 -13.91 -13.91 -14.46	5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	PIFA	IPEX-4L
	Chain1	PSA	RFMTA421230IMMB701	-13.92 -13.91 -13.91 -14.46	5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	PIFA	IPEX-4L

IMPORTANT: The final host product must have an integral antenna which is not removable by the end-user.

取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

本模組於取得認證後將依規定於模組本體標示審驗合格標籤。

系統廠商應於平台上標示「本產品內含射頻模組：XXXyyyLPDzzzz-x」字樣

應避免影響附近雷達系統之操作。

高增益指向性天線只得應用於固定式點對點系統。