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MEDIATEK MT7922A22M Test-Mode Software User Guide

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Mode Software User Guide

**MEDIATEK MT7922A22M Test-Mode Software User
Guide**

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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
V0.3	20210728		Add 6GHZ SPEC.

System overview

General Description

MT7922A22M chip is highly integrated single chip which have built in 2×2 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.

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.

How to install QA-tool

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

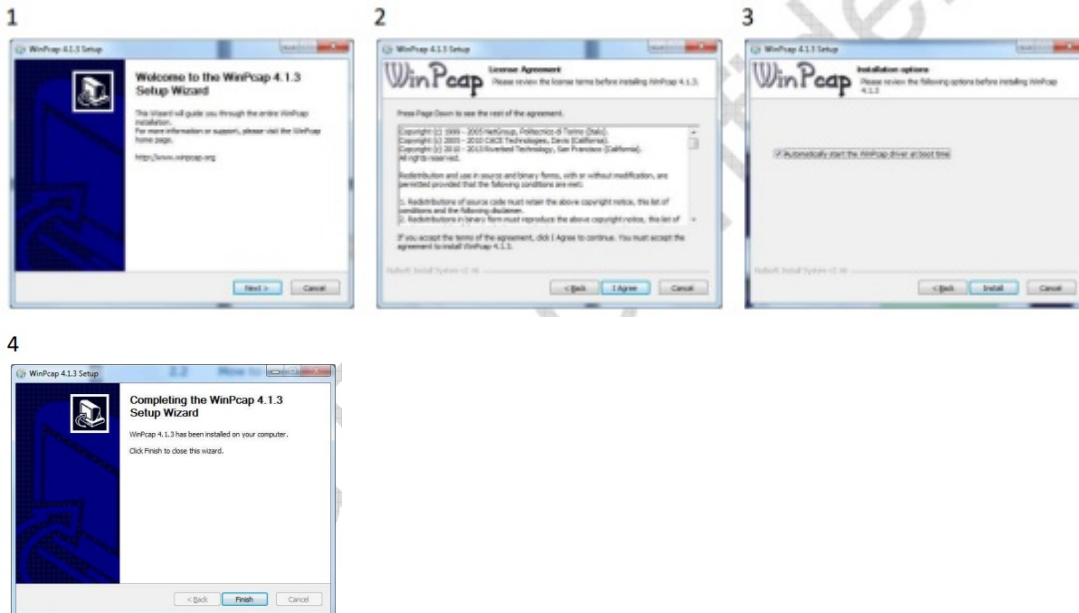
- 1st : Install WinPcap
- 2nd : Update Windows7 security package to register x64 signature mechanism
- 3rd : Instal QA-Tool Windows driver.

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.



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 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:

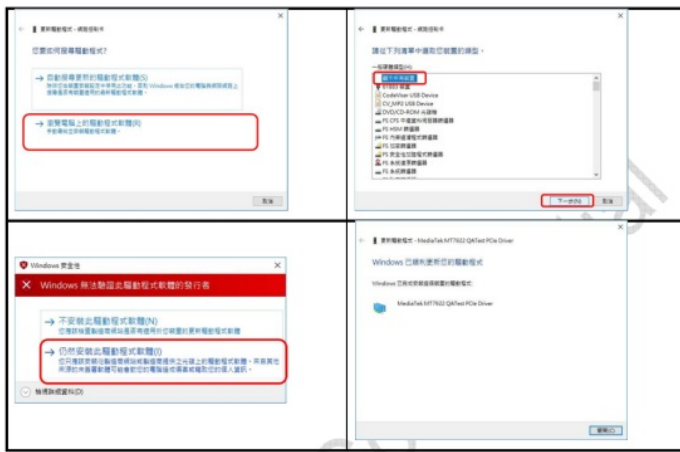
<https://docs.microsoft.com/en-us/windows-hardware/manufacture/desktop/disabling-secure-boot>

QA-Tool Windows driver

MT7922A22M supports USB, SDIO and PCIE interface. According to interface type of MT7922A22M 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).



General Information & Integration Instructions

General Description of MT7922A22M

Product 2TX 11ax (WiFi6E) BW160 + BT/BLE Combo Card

Brand MediaTek

Model MT7922A22M

Power Supply Rating 3.3Vdc from host equipment

Modulation Type GFSK, $\pi/4$ -DQPSK, 8DPSK for FHSS CCK, DQPSK, DBPSK for DSSS
256QAM, 64QAM, 16QAM, BPSK, QPSK for OFDM
1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM

Modulation Technology	BT EDR: FHSS BT LE: GFSK WLAN: DSSS, OFDM, OFDMA
Transfer Rate	BT EDR: up to 3 Mbps BT LE: up to 2 Mbps 802.11b: up to 11 Mbps 802.11g: up to 54 Mbps 802.11n: up to 300 Mbps VHT20/40: up to 400 Mbps 802.11ax: up to 573.5 Mbps 802.11a: up to 54/48/36/24/18/12/9/6 Mbps 802.11n: up to 300 Mbps 802.11ac: up to 1733.3 Mbps 802.11ax: up to 2401.9 Mbps
Operating Frequency	BT EDR: 2402MHz ~ 2480MHz BT LE: 2402MHz ~ 2480MHz 2.4GHz: 2.412 ~ 2.472GHz 5GHz: 5.18~5.32GHz, 5.50~5.72GHz, 5.745 ~ 5.825GHz 6GHz: 5.99~6.415GHz, 6.435~6.525GHz, 6.525~6.875GHz, 6.875~7.115GHz

BT EDR: 79

BT LE: 40

2.4GHz:

802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20): 13

802.11n (HT40), VHT40, 802.11ax (HE40): 9

5GHz:

5180~5320MHz

802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 8

802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 4

802.11ac (VHT80), 802.11ax (HE80): 2

802.11ac (VHT160), 802.11ax (HE160): 1

Number of Channel 5500~5720MHz

802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 12

802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 6

802.11ac (VHT80), 802.11ax (HE80): 3

802.11ac (VHT160), 802.11ax (HE160): 1

5745~5825MHz

802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 5

802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 2

802.11ac (VHT80), 802.11ax (HE80): 1

6GHz:

802.11a/ax (HE20): 59

802.11ax (HE40): 29

802.11ax (HE80): 14

802.11ax (HE160): 7

Antenna information

The antennas mentioned below are covered in the certification scope and the HOST can only be used with the following antennas:

Ant. Set	RF Chain No.	Brand	Model	Ant. Net Gain (dBi)	Freq. Range (GHz)	Ant. Type	Connector Type
				3.18	2.4~2.4835		
Chain0	PSA	RFMTA340718EMLB302		4.92	5.15~5.85	PIFA	ipex(MHF)

			3.18	2.4~2.4835		
Chain1	PSA	RFMTA340718EMLB302			PIFA	ipex(MHF)

			4.92	5.15~5.85		
--	--	--	------	-----------	--	--

			1.71	2.4~2.4835		
--	--	--	------	------------	--	--

			4.82	5.15~5.85		
--	--	--	------	-----------	--	--

Chain0	PSA	RFMTA311020EMMB301	4.76	5.925~6.425	PIFA	ipex(MHF)
			4.29	6.425~6.525		

			4.61	6.525~6.875		
--	--	--	------	-------------	--	--

			4.09	6.875~7.125		
--	--	--	------	-------------	--	--

2

			1.71	2.4~2.4835		
--	--	--	------	------------	--	--

			4.82	5.15~5.85		
--	--	--	------	-----------	--	--

Chain1	PSA	RFMTA311020EMMB301	4.76	5.925~6.425	PIFA	ipex(MHF)
			4.29	6.425~6.525		

			4.61	6.525~6.875		
--	--	--	------	-------------	--	--

			4.09	6.875~7.125		
--	--	--	------	-------------	--	--

3

			1.62	2.4~2.4835		
			3.2	5.15~5.85		
Chain0	VSO	JR2Q00340-1	3.93 3.61	5.925~6.425 6.425~6.525	Dipole	RP SMA PLUG
			3.61	6.525~6.875		
			3.14	6.875~7.125		
			1.62	2.4~2.4835		
			3.2	5.15~5.85		
Chain1	VSO	JR2Q00340-1	3.93 3.61	5.925~6.425 6.425~6.525	Dipole	RP SMA PLUG
			3.61	6.525~6.875		
			3.14	6.875~7.125		

4

Chain0	Cortec	AN2450-4902BRS	2.42 3.87	2.4~2.4835 5.15~5.85	Dipole	RP SMA
Chain1	Cortec	AN2450-4902BRS	2.42 3.87	2.4~2.4835 5.15~5.85	Dipole	RP SMA

Please note that the above antennas are custom made for MediaTek MT7922A22M module and are not listed in Walsin Technology Corp standard catalogs. For the purchase of these antennas, please contact Walsin Technology

as listed below directly. Only the above antennas are tested for compliance with the FCC rules, and all other antennas (even same type with lower gain) will require a re-assessment to be used with this module.

Contact info for above certified antennas:

Company/Dept.: Walsin Technology Corp./ Antenna Business Dept.

Contact window: Andrew Lin

Tel: +886-3-475-8711 # 8172

Cell phone: +886-938-286-596

Email address: andrewlin@passivecomponent.com

URL link: <http://www.passivecomponent.com/zh-hant/products/antenna/>

Host Integration instructions

The product is designed to be used with “NGFF (Next Generation Form Factor) M.2 2230” PCIE Bus, please install module into a M.2 2230 PCIE slot.



Host product testing guidance

HOST must follow the specific restrictions listed in “3.5 Regulatory notes” section below and section 3 of KDB996369 D04 V02 Module Integration Guide v01, to verify that the host product meets all the applicable rules.

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:

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.

KDB 996369 D03 OEM Manual v01 rule sections:

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).

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.

Limited module procedures

Not applicable.

Trace antenna designs

Not applicable.

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.

This device was tested for typical body-worn operations. To comply with RF exposure requirements, a minimum separation distance of 5 mm must be maintained between the user's body and the handset, including the antenna. Third-party belt-clips, holsters, and similar accessories used by this device should not contain any metallic components. Body-worn accessories that do not meet these requirements may not comply with RF exposure requirements and should be avoided.

Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module except for operations within the 5.925~7.125GHz band. Use of any other antenna with a lower or higher gain in this band will require a separate reassessment through a Class II Permissive Change application or new certification.

Ant. Set	RF Chain No.	Brand	Model	Ant. Net Gain (dBi)	Freq. Range (GHz)	Ant. Type	Connector Type
----------	--------------	-------	-------	---------------------	-------------------	-----------	----------------

1

				3.18	2.4~2.4835		
Chain0	PSA	RFMTA340718E	MLB302			PIFA	ipex(MHF)
				4.92	5.15~5.85		
				3.18	2.4~2.4835		
Chain1	PSA	RFMTA340718E	MLB302			PIFA	ipex(MHF)
				4.92	5.15~5.85		

2

				1.71	2.4~2.4835		
				4.82	5.15~5.85		
Chain0	PSA	RFMTA311020E	MMB301	4.76 4.29	5.925~6.425 6.425~6.525	PIFA	ipex(MHF)
				4.61	6.525~6.875		
				4.09	6.875~7.125		
				1.71	2.4~2.4835		

			4.82	5.15~5.85		
Chain1	PSA	RFMTA311020EMMB301	4.76 4.29	5.925~6.425 6.425~6.525	PIFA	ipex(MHF)
			4.61	6.525~6.875		
			4.09	6.875~7.125		
			1.62	2.4~2.4835		
			3.2	5.15~5.85		
Chain0	VSO	JR2Q00340-1	3.93 3.61	5.925~6.425 6.425~6.525	Dipole	RP SMA PLUG
			3.61	6.525~6.875		
			3.14	6.875~7.125		
			1.62	2.4~2.4835		
			3.2	5.15~5.85		
Chain1	VSO	JR2Q00340-1	3.93 3.61	5.925~6.425 6.425~6.525	Dipole	RP SMA PLUG

3.61 6.525~6.875

3.14 6.875~7.125

Chain0	Cortec AN2450-4902BRS	2.42	2.4~2.4835	Dipole	RP SMA
		3.87	5.15~5.85		

4

Chain1	Cortec AN2450-4902BRS	2.42	2.4~2.4835	Dipole	RP SMA
		3.87	5.15~5.85		

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

Label and compliance information

The final end product must be labeled in a visible area with the following: "Contains FCC ID: RAS-MTMT7922A22M". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

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.

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.

Modules: extended to host manufacturers by integration instructions.

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.

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.

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

1. The antenna must be installed and operated with greater than 20cm between the antenna and users, and
2. The transmitter module may not be co-located with any other transmitter or As long as **2** 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 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.

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-MT7922A22M".

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.

Caution:

1. 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;
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. limits;
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 as appropriate; e.i.r.p. limit; appropriate.
4. where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the i.r.p. elevation mask requirement set forth in section 6.2.2.3 shall be clearly indicated.

DETACHABLE ANTENNA USAGE

This radio transmitter (IC: 7542A-MT7922A22M / Model: MT7922A22M) 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.

Approved antenna(s) list

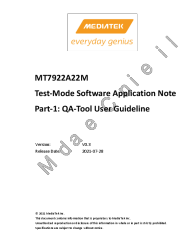
Ant. Set	RF Chain No.	Brand	Model	Ant. Net Gain (dBi)	Freq. Range (GHz)	Ant. Type	Connector Type
1	Chain0	PSA	RFMTA340718EMLB302	3.18	2.4~2.4835	PIFA	ipex(MHF)
				4.92	5.15~5.85		
				3.18	2.4~2.4835		
				4.92	5.15~5.85		
	Chain1	PSA	RFMTA340718EMLB302	3.18	2.4~2.4835	PIFA	ipex(MHF)
				4.92	5.15~5.85		
				1.71	2.4~2.4835		
				4.82	5.15~5.85		
	Chain0	PSA	RFMTA311020EMMB301	4.76	5.925~6.425	PIFA	ipex(MHF)
				4.29	6.425~6.525		
				4.61	6.525~6.875		
				4.09	6.875~7.125		
2				1.71	2.4~2.4835		

			4.82	5.15~5.85		
Chain1	PSA	RFMTA311020EMMB301	4.76 4.29	5.925~6.425 6.425~6.525	PIFA	ipex(MHF)
			4.61	6.525~6.875		
			4.09	6.875~7.125		
			1.62	2.4~2.4835		
			3.2	5.15~5.85		
Chain0	VSO	JR2Q00340-1	3.93 3.61	5.925~6.425 6.425~6.525	Dipole	RP SMA PLUG
			3.61	6.525~6.875		
			3.14	6.875~7.125		
			1.62	2.4~2.4835		
			3.2	5.15~5.85		
Chain1	VSO	JR2Q00340-1	3.93 3.61	5.925~6.425 6.425~6.525	Dipole	RP SMA PLUG

		3.61	6.525~6.875		
		3.14	6.875~7.125		
4	Chain0 Cortec AN2450-4902BRS	2.42 3.87	2.4~2.4835 5.15~5.85	Dipole	RP SMA
	Chain1 Cortec AN2450-4902BRS	2.42 3.87	2.4~2.4835 5.15~5.85	Dipole	RP SMA

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

Documents / Resources



[MEDIATEK MT7922A22M Test-Mode Software](#) [pdf] User Guide

MT7922A22M, RAS-MT7922A22M, RASMT7922A22M, MT7922A22M Test-Mode Software, MT7922A22M, Test-Mode Software

References

- [Disabling Secure Boot | Microsoft Docs](#)
- [WinPcap · Download](#)

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