



正基科技股份有限公司



W522A Evaluation Board User Manual

Address:

3F, No.15-1, Zhonghua Road, Hsinchu Industril Park, Hukou, Hsinchu,
Taiwan, 30352

Website: <http://www.ampak.com.tw/>



Revision

Revision	Date	Description	Revised By
1.0	2021/ 06 / 13	Initial released	Ali
1.1	2021/ 06 / 13	Revise EVB Introduction	Ali
1.2	2022/ 03 / 30	Revise Antenna Gain	Ali
1.3	2022/ 05 / 08	Revise Federal Communication Commission Interference Statement	Ali



Contents

Revision	1
1. EVB Introduction	3
2. WiFi Function Verification Step	4
2.1 WiFi SDIO	4
2.2 WiFi Software Setup	4
Bluetooth Function Verification Step	5



DETACHABLE ANTENNA USAGE

TYPE	Frequency	GAIN(max)
Dipole antenna	2.4GHz	2dBi
Dipole antenna	5GHz	3dBi

1. EVB Introduction

W522A Evaluation board (EVB) likes as figure1. That is designed for IEEE802.11 a/b/g/n/ac WLAN with integrated Bluetooth application. It is subject to provide a convenient environment for customer's verification on WiFi or Bluetooth function. There are many controller pins and reserved GPIO on Evaluation board which describes as below.

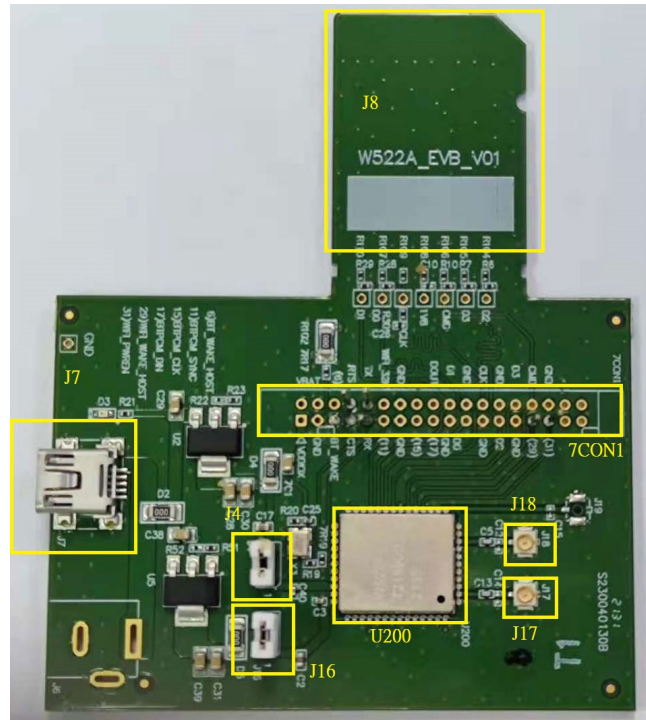


Figure1. Top view of W522A EVB

Interface highlights:

1. U200:W522A SIP module.
2. J16: VBAT for main system power path.
3. J4: WL_VIO / BT_VIO for main system I/O power path.
4. J7: 5V DC mini USB input connector.
5. J8: Standard SDIO interfaces for Wi-Fi performance measured.
6. J17: IPEX-1 connector let RF BT ANT1 signal in/out path, you could connect with RF cable or Dipole antenna.
7. J18: IPEX-1 connector let RF WIFI ANT2 signal in/out path, you could connect with RF cable or Dipole antenna.
8. 7CON1:
 - (1)WLAN and BT control pins, strongly recommended WL_HWAKE(IRQ) connected to MCU.
 - (2) UART interface connects with UART transport board for BT measuring
 - (3) Enable(H) or disable(L) Bluetooth & WiFi function

2. WiFi Function Verification Step

2.1 WiFi SDIO

Using external pull up resistors depends on the SDIO supply voltage. The resistance range is 30 KΩ~40 KΩ on the four data lines and the CMD line as the following circuitry.

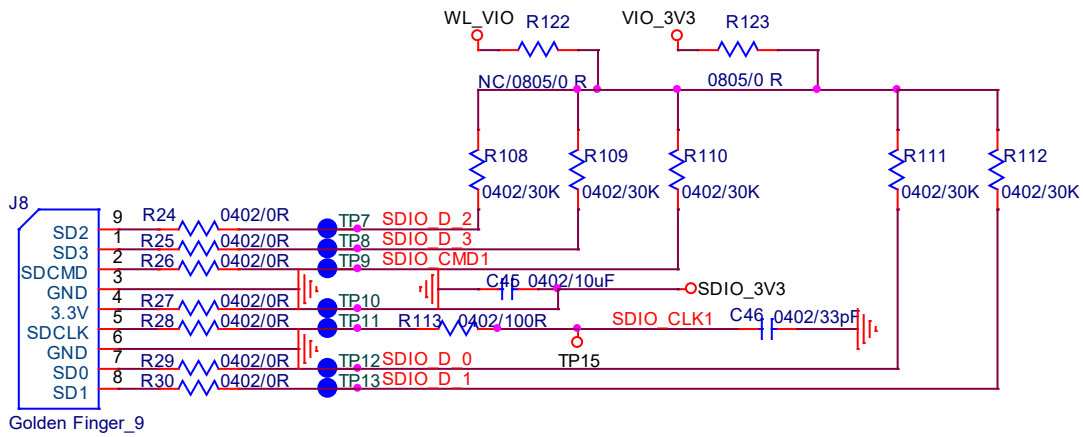


Figure2. WiFi verification connection interface to Host SDIO as using SDIO2.0

2.2 WiFi Software Setup

- ❖ Please follow up software guideline of Ampak official released.



3. Bluetooth Function Verification Step

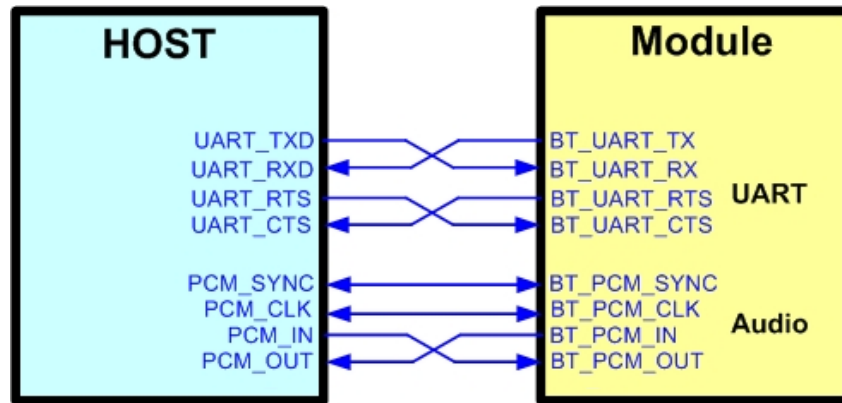


Figure5. Bluetooth verification connection interface to Host UART

Hardware Setup:

- ❖ Refer to Figure5 UART pin definition connects the J16 interface of AP6275S evaluation board to Host UART control interface.
- ❖ Connects an external antenna at SMA connector on the evaluation board.
- ❖ Note to the VDDIO voltage level should be the same as GPIO voltage level of Host CPU.

WiFi and Bluetooth software setup:

- ❖ Please follow up software guideline of Ampak official released.

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.

FOR MOBILE DEVICE USAGE (>20cm/low power)

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.

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

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) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

2.4 Limited module procedures

Not applicable.

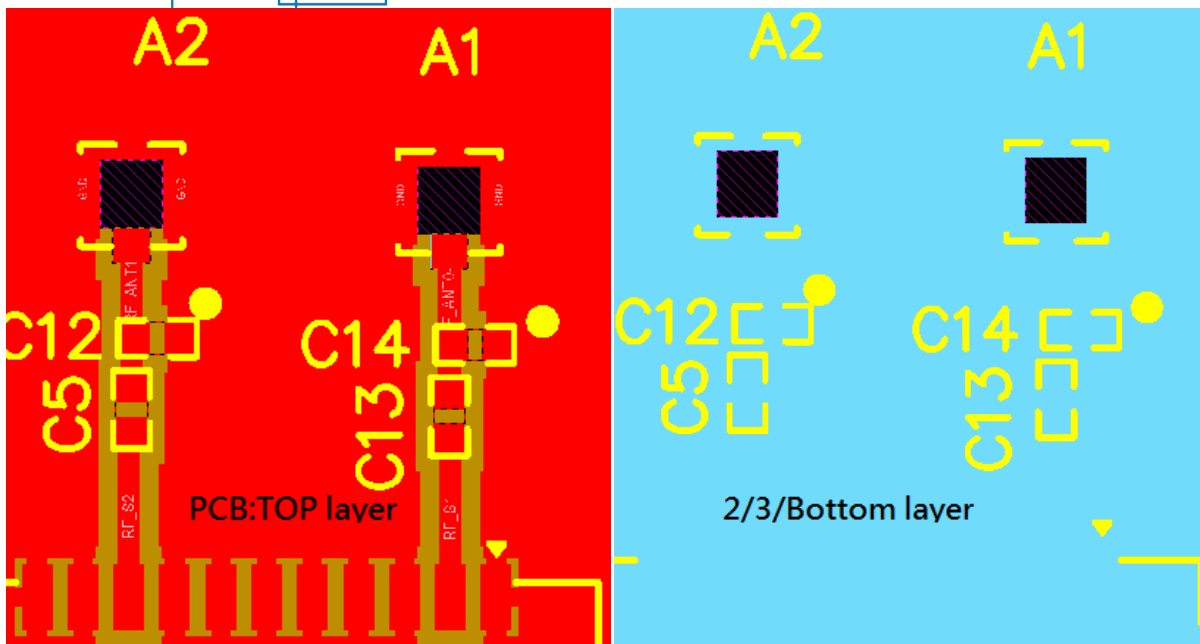
2.5 RF design validation

Any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, requires the host product manufacturer to notify the module grantee that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by the grantee, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

2.5-1 PCB design rules:

- **RF PORT TRACE LAYOUT:**

Impedance: $1. = 50 \Omega \pm 10\%$, main Layer: **TOP** Layer, reference Layer: **L2** Layer, Trace width: 17 mil, Trace distance: 20 mil



● PCB stack:

PCB Stack:

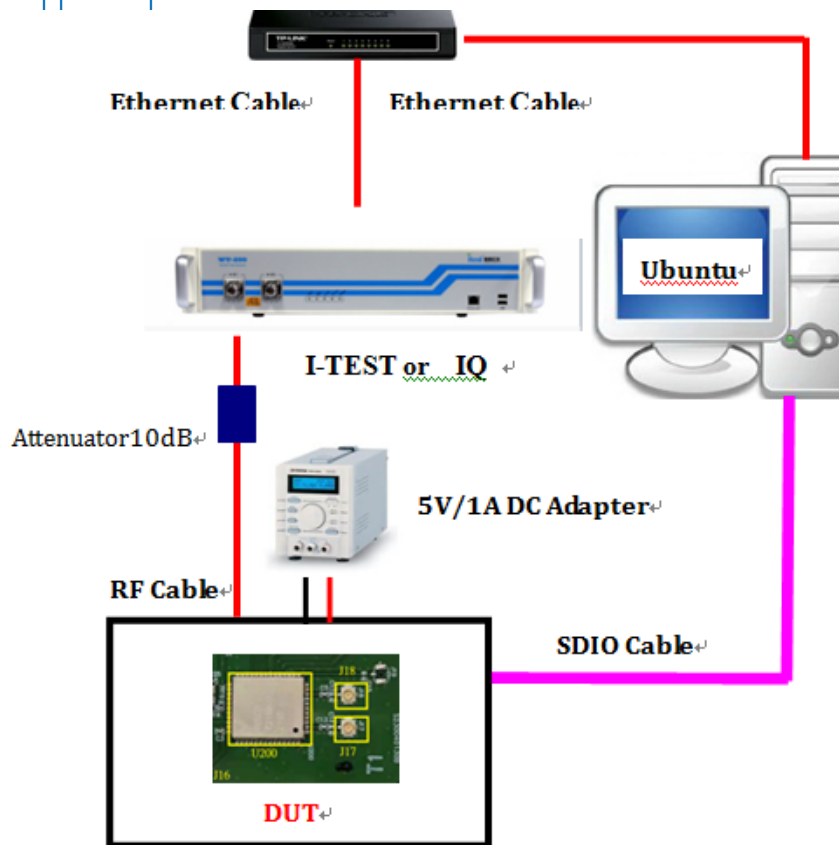
	um	mil
SM		0.4
L1		1.4
PP		10
L2		1.4
Core		29
L3		1.4
PP		10
L4		1.4
SM		0.4
total:		55.4

2.6 production procedure

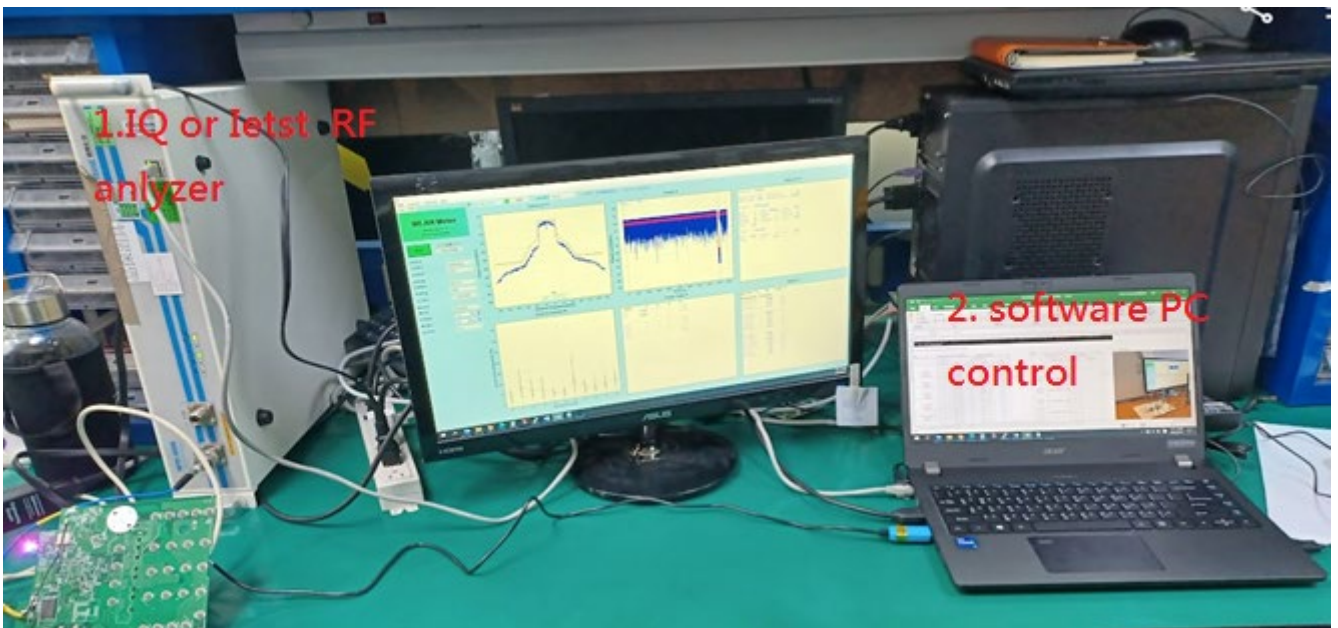
RF analyzer: Itest-WT208 or IQ excel

- 2.6-1 RF performance verify





Test configuration for Wi-Fi and Bluetooth function measurement



- RF Performance needs meet to the FCC power table



P21080732_FCC
Power Table for W52.

2.6-1 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. If the module is installed in

AMPAK Technology Inc.



a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

2.7 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. The antenna must be installed such that 20 cm can be maintained between the antenna and users.

Antenna Type	Dipole antenna
Antenna connector	IPEX-1

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following: “Contains FCC ID: ZQ6-W522A”. 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) or portable use will require a separate 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

AMPAK Technology Inc.



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

