

AW-CM358-EVB

**IEEE 802.11 1X1 a/b/g/n/ac Wireless LAN and
Bluetooth 5.2**

12mm x 12mm LGA module

User Guide

Rev. 01

(For Standard)

Revision History

Version	Revision Date	Description	Initials	Approved
01	2021/03/26	● Initial Version	JM.Pang	N.C. Chen

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1. System Setup

1-1. Hardware Requirements

- AW-CM358-EVB (EVB for AW-CM358)
- Host system need running the Linux operating system and Windows system.
- Vector Signal Analyzer/WLAN analyzer for transmit measurements.
- WLAN signal generator for receiver measurements.
- RF isolation chamber for receive measurements.
- RF attenuators
- RF cable

1-2. Software Requirements

For Linux using SD-WLAN-SD-BT-8987...pxx.tar

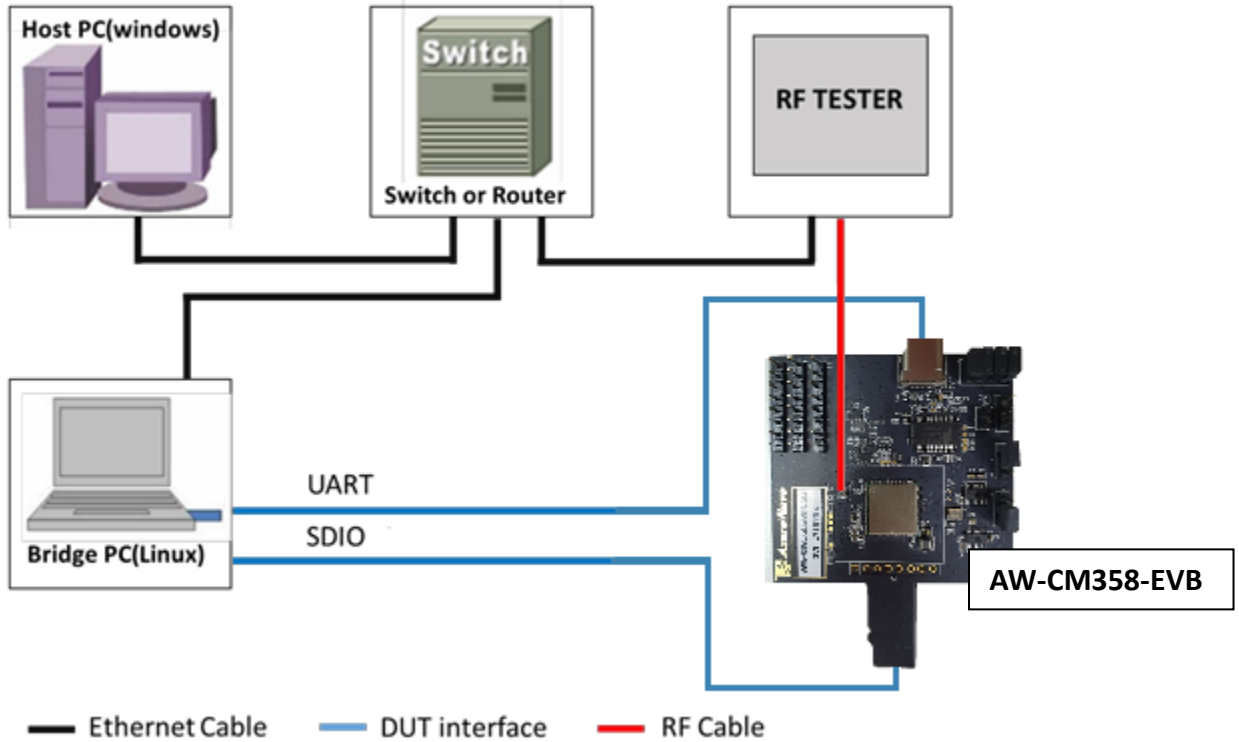
- Unzip the driver release package : SD-WLAN-SD-BT-8987...pxx.tar
- Go into the Driver package folder and compile the WLAN and BT driver (After the compile process WLAN driver files, mlan.ko and sd8xxx.ko will be available, and BT driver file, bt8xxx.ko will be available also)
 - Enter to wlan_src folder and use terminal enter cmd as below, will get mlan.ko and sd8xxx.ko:
 - ◆ make clean
 - ◆ make build
 - Enter to mbt_src folder and use terminal enter cmd as below, will get bt8xxx.ko:
 - ◆ make clean
 - ◆ make build
- Download MFG SW “MFG-W8987-MF-WIFI-BT-BRG-FC-VS2013-1.0.0.146-16.80.205.p146” release package from NXP Extranet website and unzip it.
- Navigate to the FwImage folder located in path “FwImage”, copy Fw file (sdio8987_sdio_combo.bin) to ‘/lib/firmware/mrvl/’
- Enter to bridge_linux_0.1.0.42/bridge and do ‘make build’ to get ‘mfgbride’ for compile the Bridge.

For Windows have to run in 64bit Windows OS

- Download MFG release package “MFG-W8987-MF-LABTOOL-U14-1.0.0.146-16.80.205.p146”
- Copy “labtool” folder to the host PC

1-3. RF Transmit/Receive Test Setup

Show the basic hardware configuration for RF transmits testing.

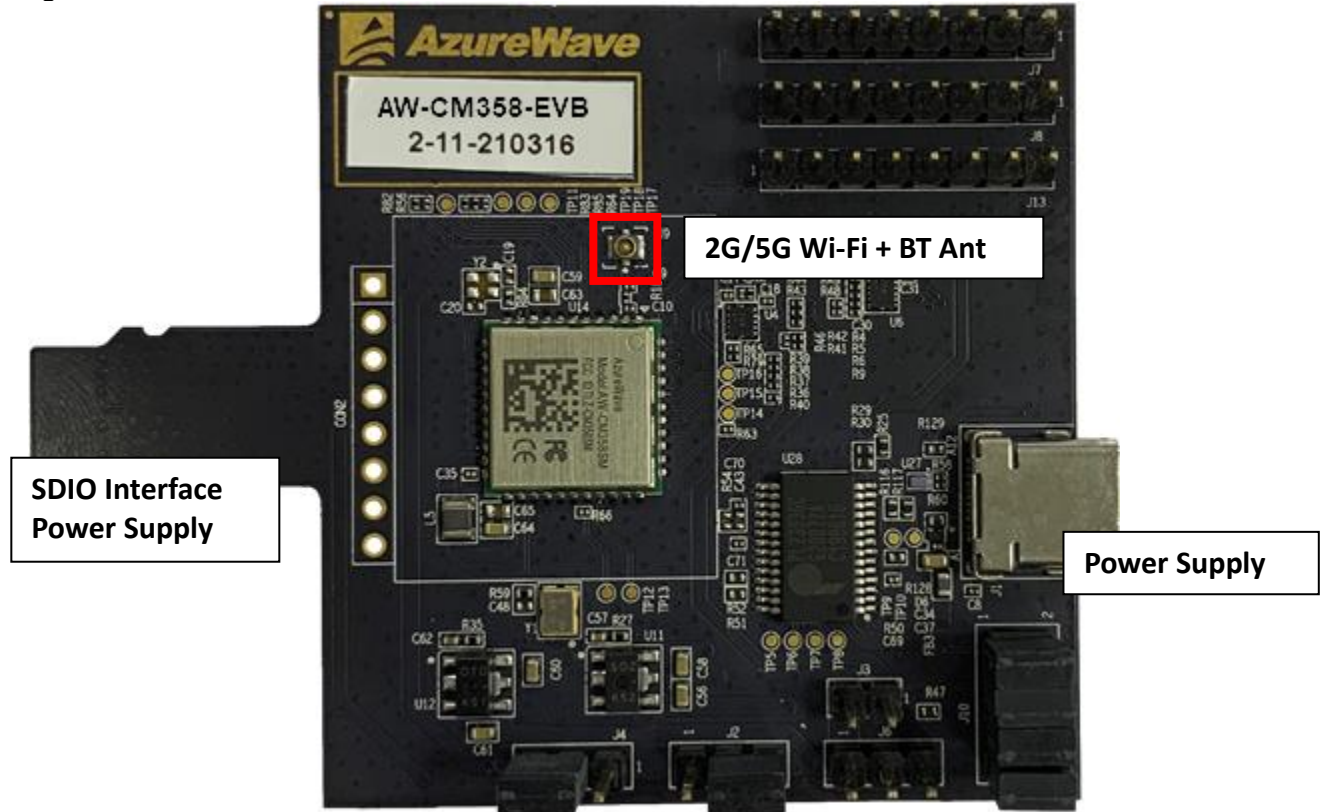


2. WLAN Basic Test

2-1. Setup Throughput Test

*Please confirm that Computer's WiFi and BT had closed

- 1 The bridge PC have to run in 64-bit of the Ubuntu 14.04



- 2 Prepare AW-CM358-EVB, insert DUT.
 - 2.1 For SDIO supply
For SDIO supply VBAT, please connect J2(1-2).
For SDIO supply VDDIO(1.8V), please connect J4(1-2).
For SDIO supply VDDIO(3.3V), please connect J4(2-3).
 - 2.2 For USB supply
For USB supply VBAT, please connect J2(2-3).
For USB supply VDDIO(1.8V), please connect J4(1-2).
For USB supply VDDIO(3.3V), please connect J4(2-3).
- 3 Open terminal, press command: `$sudo su`

- 4 To bring up DUT:
modprobe cfg80211
insmod mlan.ko
insmod sd8987.ko mfg_mode=1 cal_data_cfg=none fw_name=mrvl/sdio8987_uart_combo_p164.bin
./mfgbridge -B

- 5 To confirm success to bring up DUT , please key “ifconfig wlan0”

2-2. Setup Throughput Test

START MEASURING WLAN THROUGHPUT

The throughput measurement shows the performance of the TCP/IP layer over the wireless link. To achieve the best results, run the measurement test in a clean environment with as little interference as possible. The test can be run with the adapter connected to either an Infrastructure network (see Fig. 2) or an ad hoc network (see Fig. 2). An AP that is known to be in good working order should be used for the infrastructure mode test.

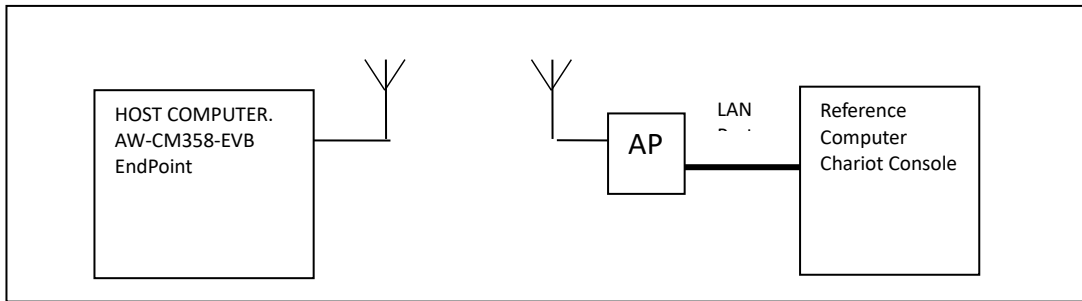


FIG. 1

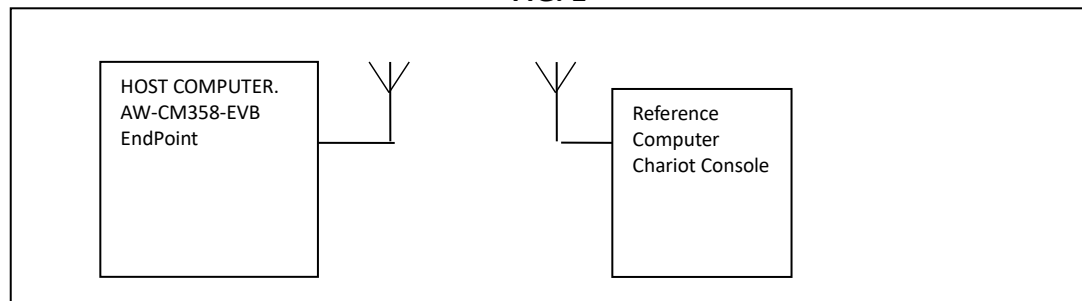


FIG. 2

MEASURING THROUGHPUT USING NETIQ CHARIOT

Test Procedure

1. Bring up the AW-CM358-EVB demo board with the IP address set as 192.168.1.110.
2. Connect the reference computer with Chariot Console, which is assigned an IP address of 192.168.1.100, to the LAN port of the AP
3. Verify that communication exists between the reference computer and the AW-CM358-EVB demo board by pinging **192.168.1.100** from the AW-CM358-EVB host console.
4. Set up Chariot.
 - a. On the host computer, activate EndPoint:
 - b. Using Chariot Console on the reference computer, create two pair groups (192.168.1.100 and 192.168.1.110) using the Chariot Throughput.scr script. Run the throughput test for a specified period of time and observe the results.

2-3. Setup for RF Tx/Rx Performance Test

- 1 The bridge PC have to run in 64-bit of the Ubuntu 14.04
 - 1.1 Download latest Driver release package from NXP Extranet website
 - 1.2 Unzip the driver release package : SD-WLAN-SD-BT-8987...pxx.tar
 - 1.3 Go into the Driver package folder and compile the WLAN and BT driver (After the compile process WLAN driver files, mlan.ko and sd8xxx.ko will be available, and BT driver file, bt8xxx.ko will be available also)
 - 1.4 Download MFG SW “MFG-W8987-MF-WIFI-BT-BRG-FC-VS2013-1.0.0.146-16.80.205.p146” release package from NXP Extranet website and unzip it
 - 1.5 Compile the Bridge

- 2 The host PC have ti run in 64 bit Windows OS
 - 2.1 Download MFG release package “MFG-W8987-MF-LABTOOL-U14-1.0.0.146-16.80.205.p146” from NXP extranet website and unzip it.
 - 2.2 Copy the “labtool” folder to the host PC .The Labtool folder content are shown in below.

AddCalDLL.dll	2016/12/21 5:13	Application extens...	964 KB
AddCalDLL.lib	2016/12/21 5:13	PSpice Model Libr...	2 KB
DutApi89XXDII.h	2016/12/21 5:13	H File	16 KB
DutApiMimoBtDII.dll	2016/12/21 5:14	Application extens...	428 KB
DutApiMimoBtDII.lib	2016/12/21 5:14	PSpice Model Libr...	103 KB
DutApiSisoACDualf.exe	2016/12/21 5:14	Application	293 KB
DutBtApi.hc	2016/12/21 5:13	HC File	7 KB
DutBtApi89XXDII.h	2016/12/21 5:13	H File	21 KB
DutWlanApi.hc	2016/12/21 5:13	HC File	19 KB
DutWlanApi89XXDII.h	2016/12/21 5:13	H File	32 KB
Flash_SPI_header.bin	2016/12/21 5:13	BIN File	4 KB
Flash_SPI_header.sbin	2016/12/21 5:13	SBIN File	4 KB
GenHeader.bin	2016/12/21 5:13	BIN File	1 KB
SetUp.ini	2017/1/19 15:15	Configuration sett...	3 KB
Test.txt	2017/1/19 15:20	TXT File	4 KB
UsbHeader.bin	2016/12/21 5:13	BIN File	1 KB
WlanCalData_ext.conf	2016/12/5 16:20	CONF File	1 KB

- 2.3 Open the “SetUp.ini” file using a text editor such as Notepad. Edit the “SetUp.ini” file as shown below. The parameter “DutIpAddress” will be the IP address of DUT. The parameter “HostIpAddress” will be the IP address of the Windows host PC.

[DutIp]

DutIpAddress = 192.168.0.10

HostIpAddress = 192.168.0.58

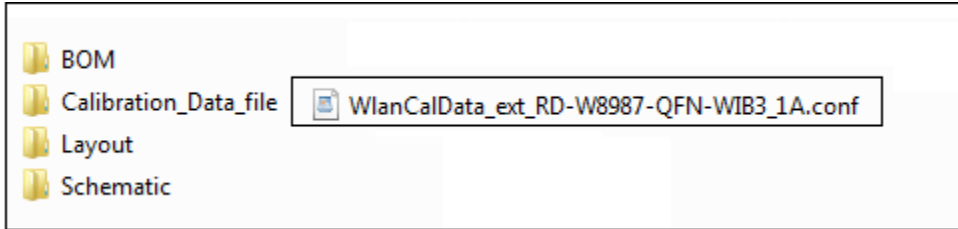
- 2.4 In the “SetUp.ini” file, the parameter “NO_EEPROM” is used for specifying the calibration data storage option. The default value is “2” (OTP support). For general RF evaluation and test, the user needs to set the parameter as “1” which is file option to use calibration data from external file. If the calibration data is already stored in on-chip OTP memory then the default value of “2” can be used.

[DutInitSet]

0 - EEPROM support

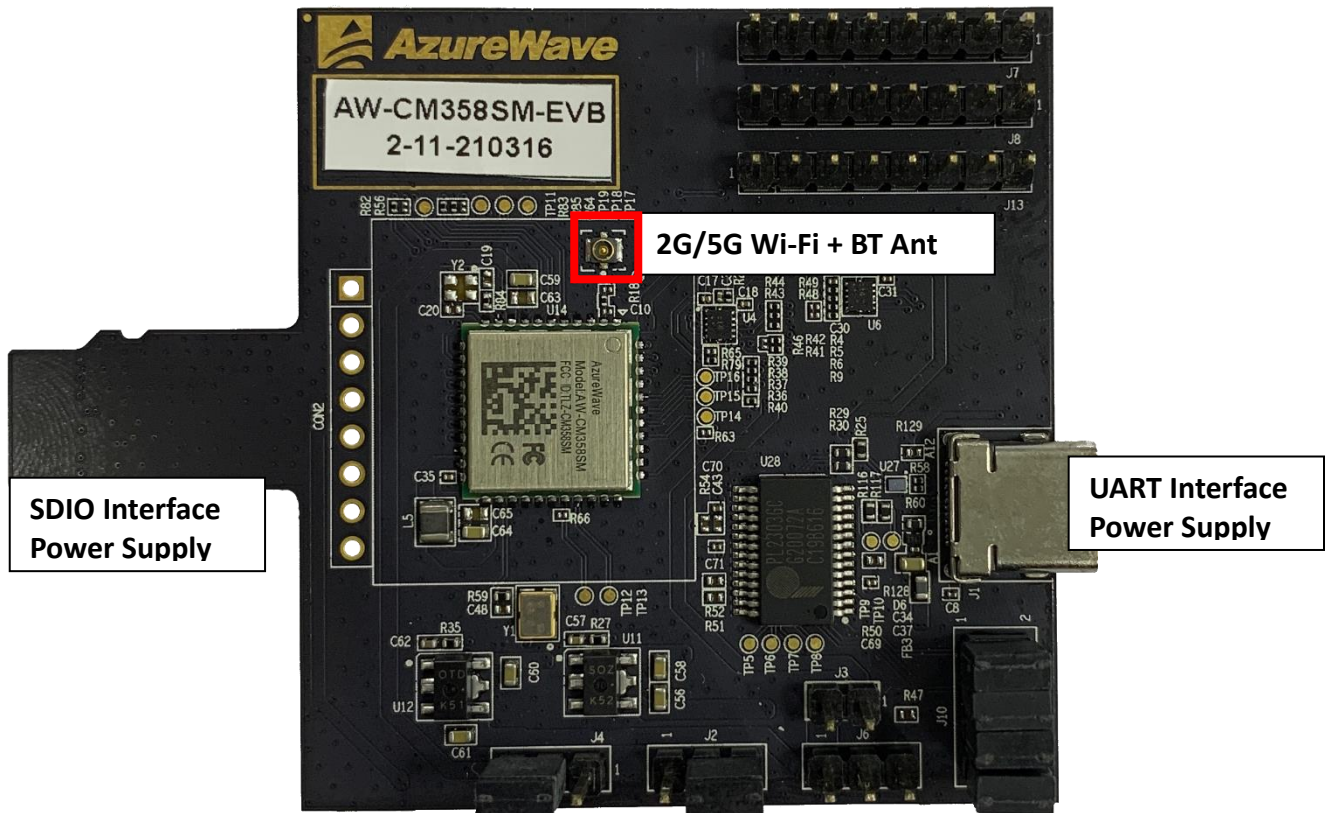
1 - NO_EEPROM support 2 - OTP support NO_EEPROM=1
 NoEepromBtFlexFileName = WlanCalData_ext.conf
 NoEepromWlanFlexFileName = WlanCalData_ext.conf

2.5 Before launching the Labtool, place the “.conf” file in the Labtool’s working file directory and name the file as “WlanCalData_ext.conf”.



2.6 Copy the “.conf” file into the Labtool file directory and rename it as picture show below.

3 Prepare AW-CM358-EVB, insert DUT.



- 3.1 For SDIO supply
 For SDIO supply VBAT, please connect J2(1-2).
 For SDIO supply VDDIO(1.8V), please connect J4(1-2).
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- 3.2 For USB supply
 For USB supply VBAT, please connect J2(2-3).
 For USB supply VDDIO(1.8V), please connect J4(1-2).
 For USB supply VDDIO(3.3V), please connect J4(2-3).

2-4. RF Tx/Rx Performance Test

Make sure that the Bridge application is running prior to starting Labtool application. To start the Labtool application, double click on "DutApiMimoBt.exe".

Enter "1" at the command prompt to start operating WiFi radio or "2" to start operating Bluetooth radio

```
Name:          Dut labtool
Version:       1.0.0.140
Date:         Dec 20 2016 (13:14:13)

Note:

1. =====WiFi tool=====
2. =====BT  tool=====

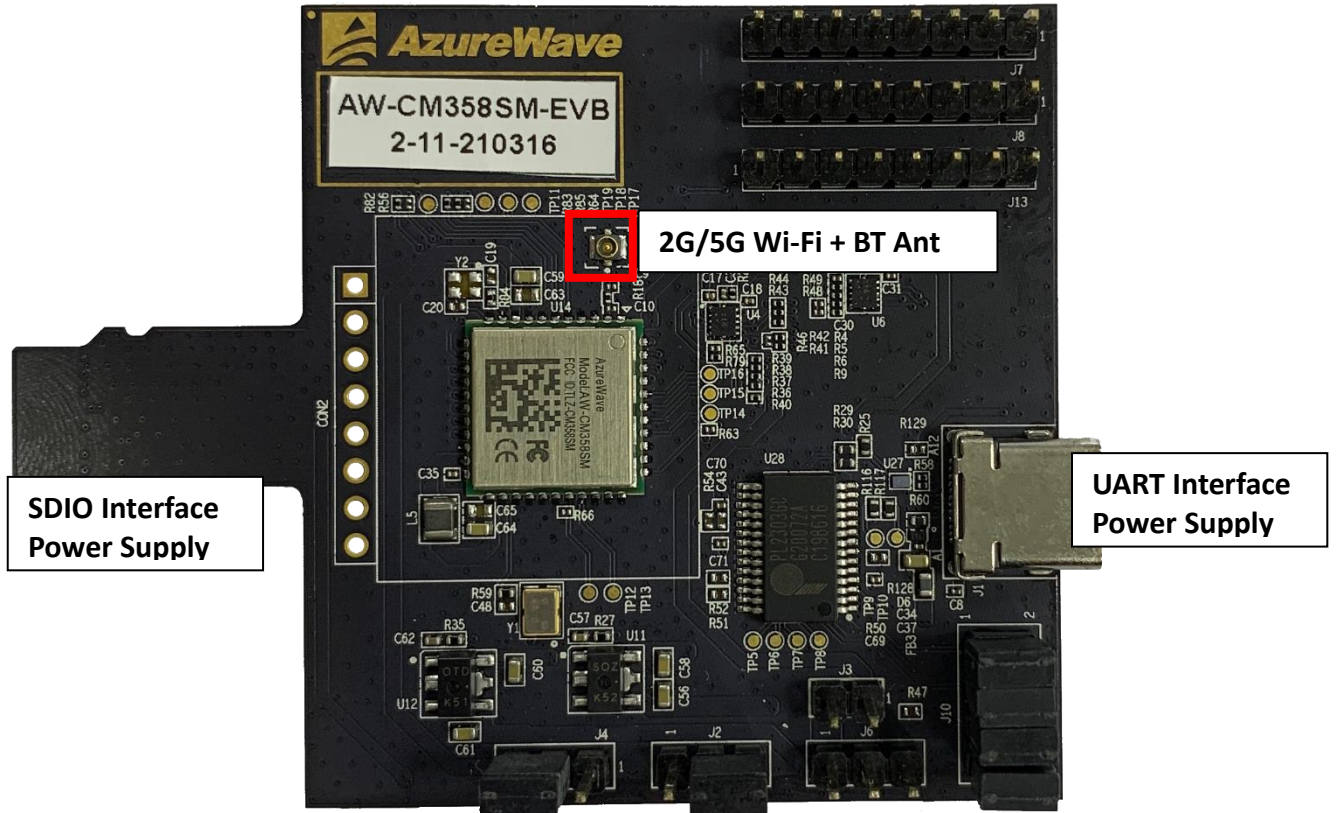
Enter CMD 99 to Exit
```

Start WiFi Performance Test

3. Bluetooth Basic Test

3-1. Setup Normal Test

- 1 Prepare AW-CM358-EVB, insert DUT.



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For SDIO supply VBAT, please connect J2(1-2).
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- 1.2 For USB supply
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- 3 Open terminal, press command: `$sudo su`
- 4 To bring up DUT:


```
# modprobe cfg80211
# insmod mlan.ko
# insmod sd8987.ko mfg_mode=1 cal_data_cfg=none
fw_name=mrvl/sdio8987_uart_combo_p164.bin
```
- 5 To bring up Bluetooth


```
# hciattach /dev/ttyUSB0 any 115200 flow
```
- 6 After success bring up, try below command to connect to other devices


```
# hcitool /dev/ttyUSB0 scan
```

3-2. Setup RF Performance Test

- 1 The bridge PC have to run in 64-bit of the Ubuntu 14.04
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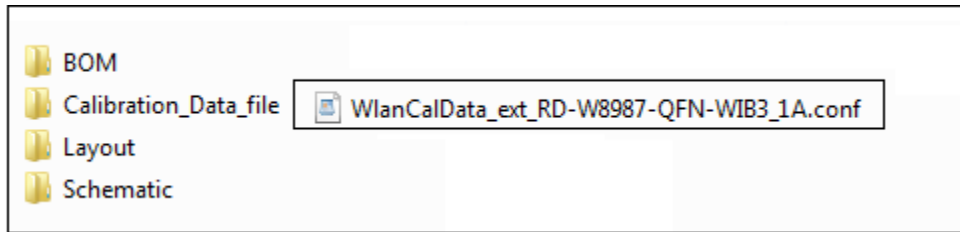
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NoEepromBtFlexFileName = WlanCalData_ext.conf

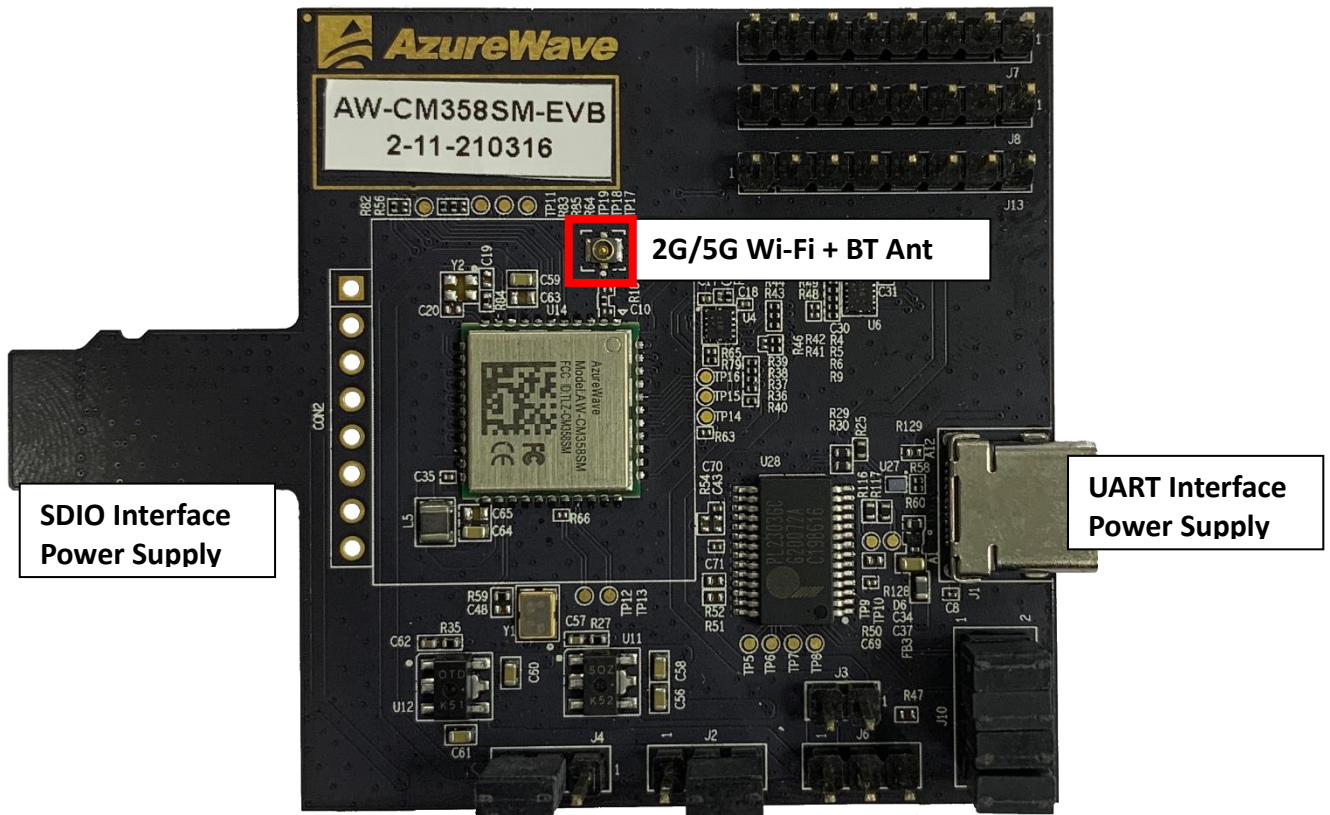
NoEepromWlanFlexFileName = WlanCalData_ext.conf

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3-3. RF Performance Test

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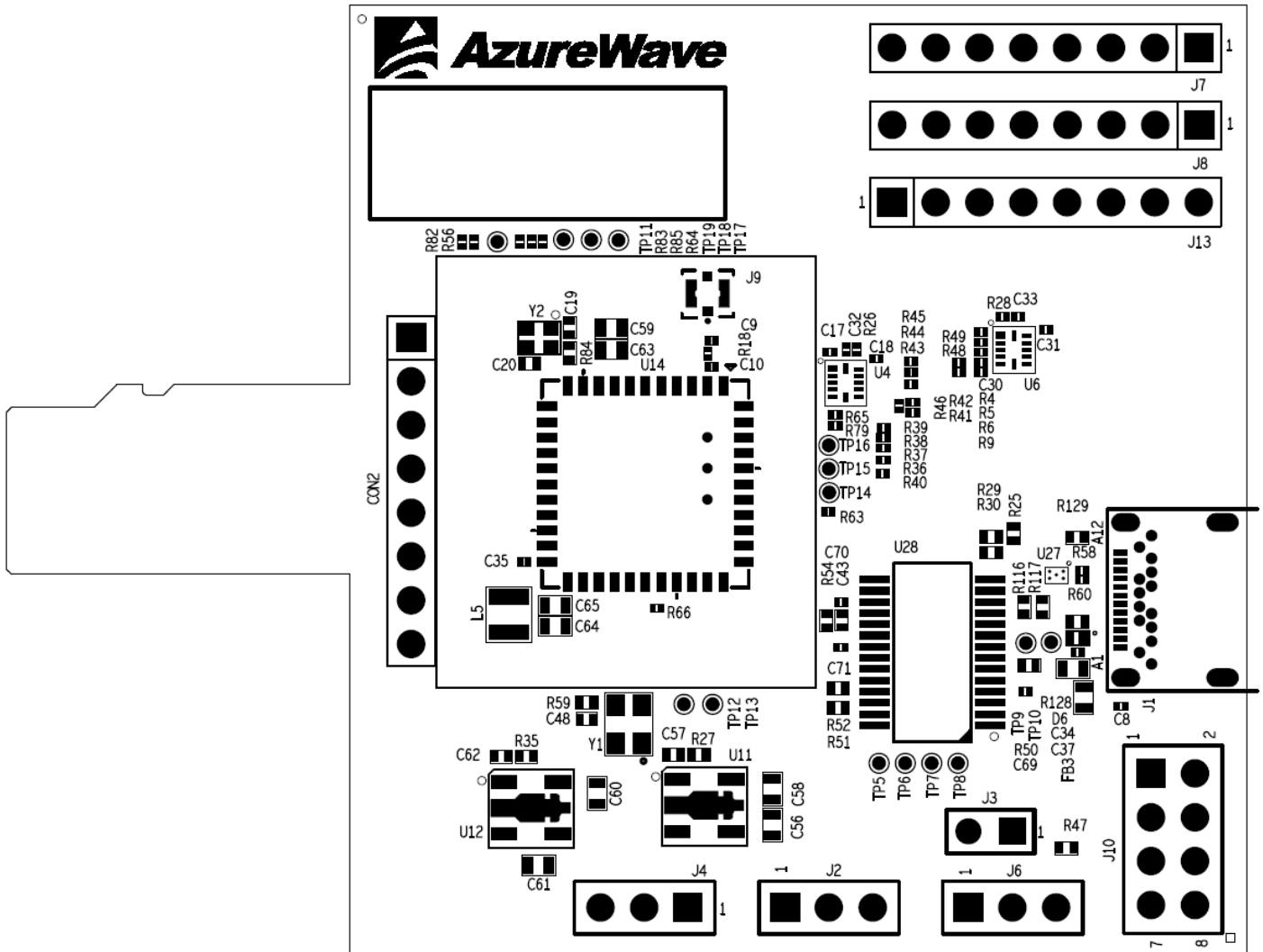
Enter CMD 99 to Exit
```

Start Bluetooth Performance Test

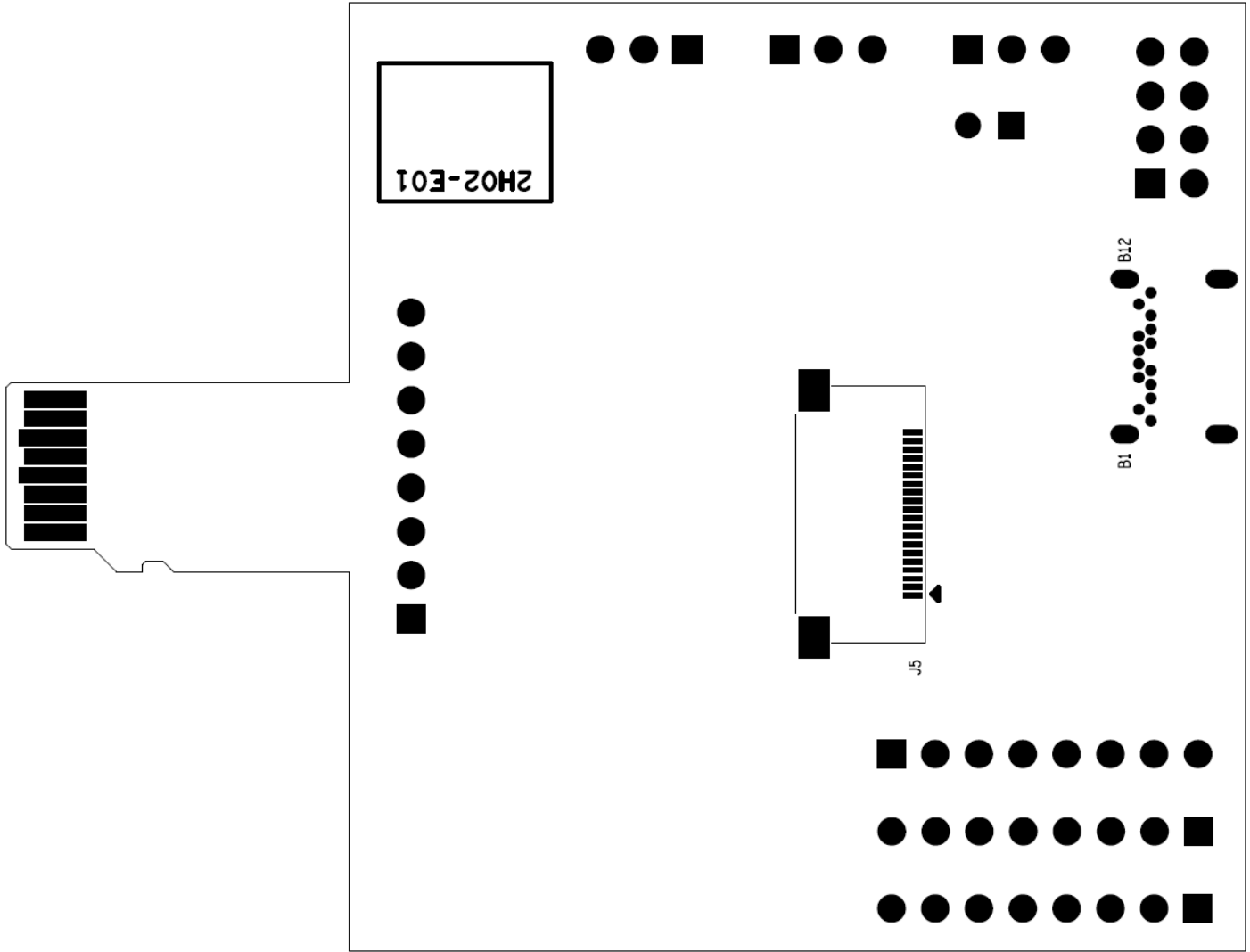
Enter BT test mode commands:

- 2 //Start operating Bluetooth radio
- 44 1 //Sets Storage Type to Config File
- 80 //Reset the BT RF Block
- 234 //Reloads BT calibration data"WlanCalData_ext.conf"
- 78 1 //BT enter test mode

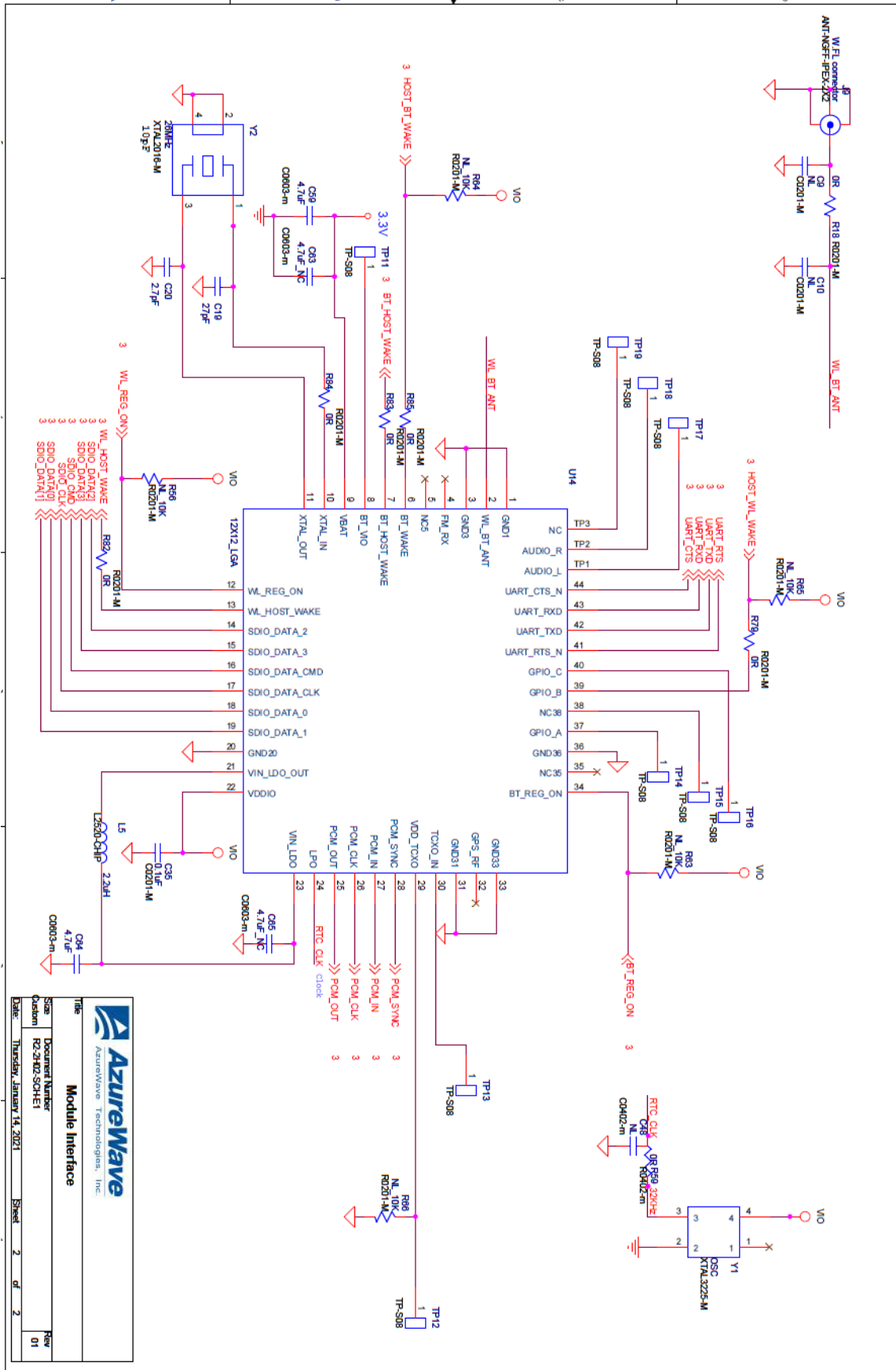
4. EVB Attachment



Top View



Bottom View



AzureWave Technologies, Inc.	
Module Interface	
Title	Document Number
Size	R2-2H02-SCH01
Date	Thursday, January 14, 2021
Sheet	2 of 2
Rev	01

PCB stack

四層板-NPG151			
材料	厚度mil	殘銅率%	
Mask	1.3		
Cu	1.2		
T	0.49		
1080-64	3.01		
1080-67	3.33		
1	1.25	65	0.4375
0.25	9.8425		
1	1.25	65	0.4375
1080-67	3.33		
1080-64	3.01		
T	0.52		
Cu	1.2		
Mask	1.3		
預估厚度	26.0325	mil - 填膠	0.875
填膠後	25.158	mil	
預估壓後厚度	0.639	mm	
預估厚度	0.766	mm	
規格成量厚度	0.75+/-0.075mm		