

## Ameba Series Mptool Userguide (1.16)

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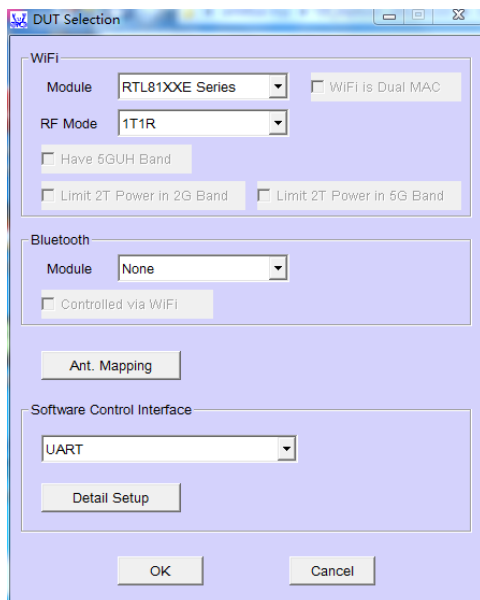
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For the convenience of customers to test and debug Ameba Series IC, we offer our customers a windows-based system UI\_mptool; This tool contains four sub-interface Main, PSD, Efuse, Reg.

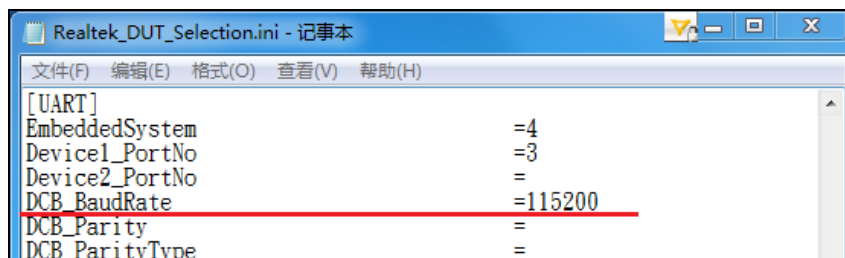
Operation steps:

1. Open "Setup\Realtek\_DUT\_Selection.exe", and set every item according to the picture below, Module、RF Mode、Software Control Interface setup Items are particularly important.

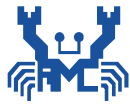
Note : Module for Ameba1(8195AM/8711AM/8711AF), Please select “**RTL81XXE Series**”; For AmebaZ(8710BN/8711BN/8711BG), Please select “**RTL871XB Series**”.



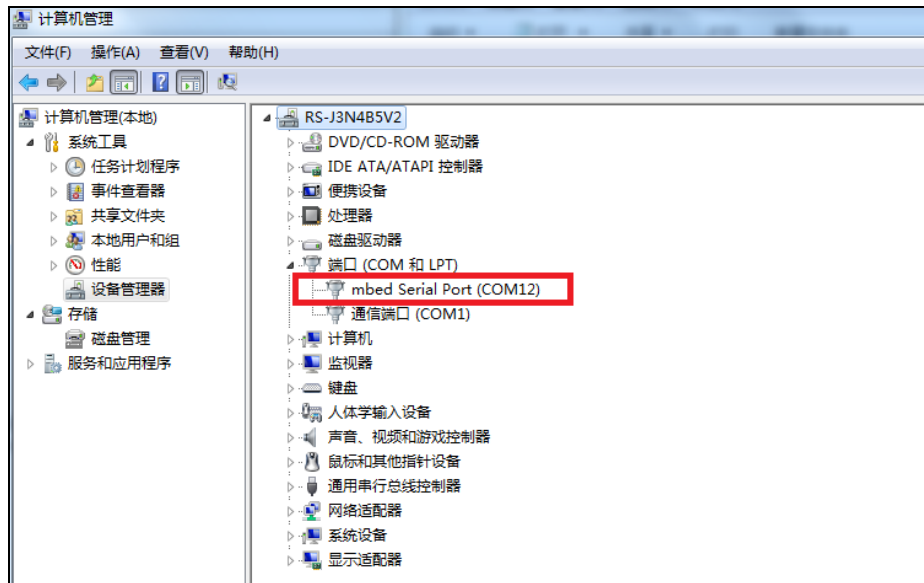
2. Open “Setup\Realtek\_DUT\_Selection.ini”, and check if **DCB\_BaudRate** is suitable: AmebaZ=115200/ Ameba1=38400.



3. Open “UI\_mptool.exe”. Firstly, you must set the COM number(Vary by PC, you can check the value by the following picture) and “Initialize” the DUT, and then the four sub interface: Main, PSD, Efuse, Reg can be operated.

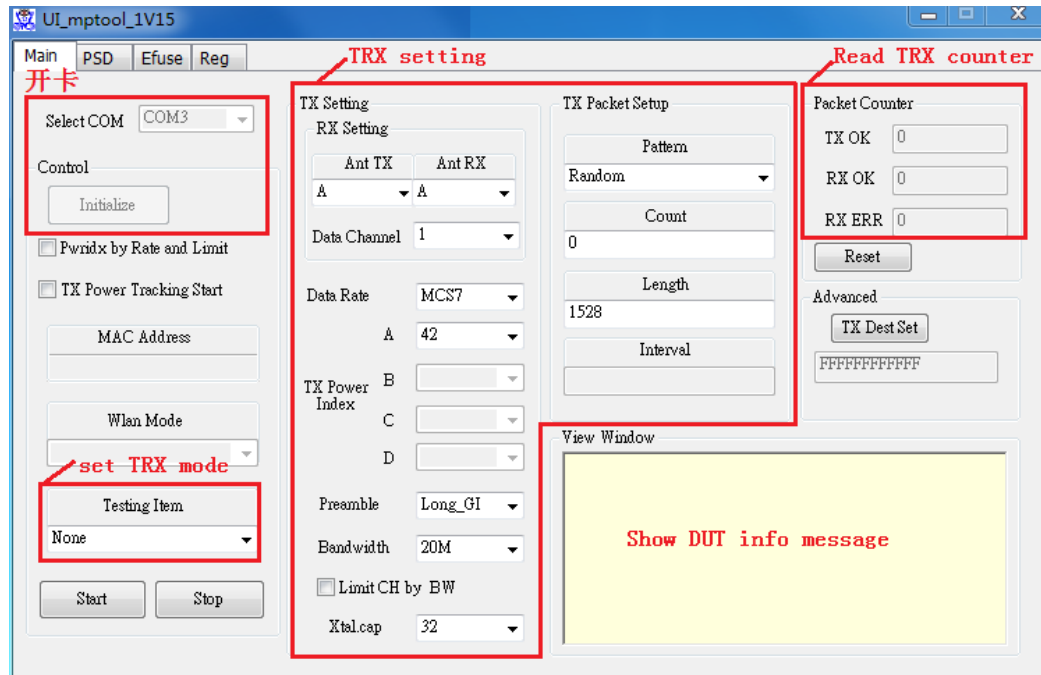


# REALTEK



#### 4. Main:

The “Testing Item” shows basic RF test projects, such as “Packet TX”, “Packet RX”, “Continuous TX”, “Single Tone TX” and so on. When you confirm “Testing Item”, the right of Main interface shows default options, please check or modify these settings before you click “Start” button. Any incorrect operation will be showed on “View Window”.



Detailed steps for each testing item are showed below.

##### 4.1 TX----Packet TX/ Continuous TX/ Single Tone TX/ Carrier suppression TX

“Packet TX” is used to check RF Tx performance like power, EVM, Frequency offset, etc; “Continuous TX” is used in FCC/CE/CMCC/CTA certification or to test max power consumption; “Single Tone TX” is used to test frequency offset, and “Carrier suppression TX” is used for 802.11b.

Test step:

- 1) Select “Testing Item”;
- 2) Select “Data Rate”, “Data Channel”, “TX Power Index”, “Preamble”, “Bandwidth” and “Xtal.Cap” on the right side, “Length—Random” and “Pattern—Random” are always setted default value;
- 3) Select “Pwridx by Rate and Limit” and “Tx Power Tracking Start” if you need;
- 4) Click “Start” and check performance on other instruments. You may change “TX Power Index” in the process of “Packet TX” to set a target output power.



Note: When you select “Pwridx by Rate and Limit ”,

- a) It means that TX Power Index Column A will show the Efuse Index Value, which also have been limited by “Power by rate table” (limit power by rate in each mode) and “Power limit table” (limit power by channel plan value) before shown.
- b) If you want to load power index only from Efuse, not count in the “Power by rate table” and “Power limit table”, you can modify the “\WiFiChip\Realtek\_WiFi\_Device\_Setup” to “CalculateIndexByDriver=0”. If TX Power Index show “0”, It's probably that the MAC address have not been programmed in Efuse, thus you should PG Efuse entirely in Another Page.

#### 4.2 RX---Packet RX(All)/ Packet RX(Filtered)

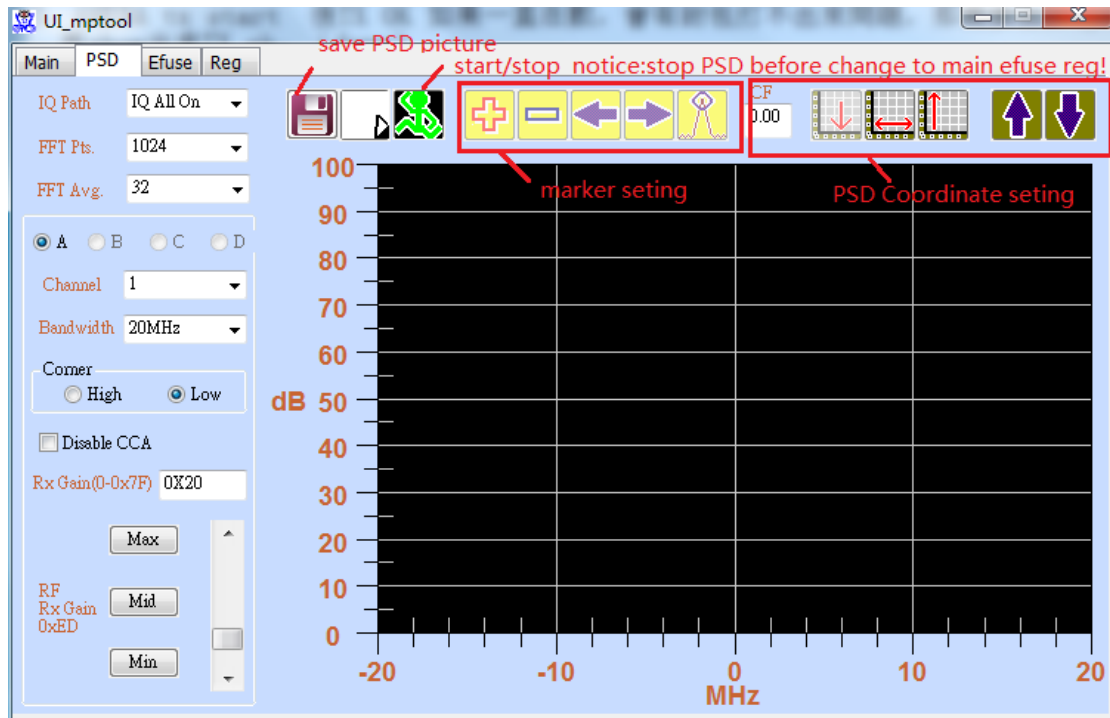
“Packet RX” is used to test RF sensitivity or max input level, please take these tests in shielding environment.

Test step:

- 1) Select “Testing Item”;
- 2) Click “Start” and use other instruments sending Packets(normally 1000 Packets) to DUT;
- 3) “Packet Counter—RX OK/RX ERR” will show the result, don't forget to click “Reset” before next test.

## 5.PSD:

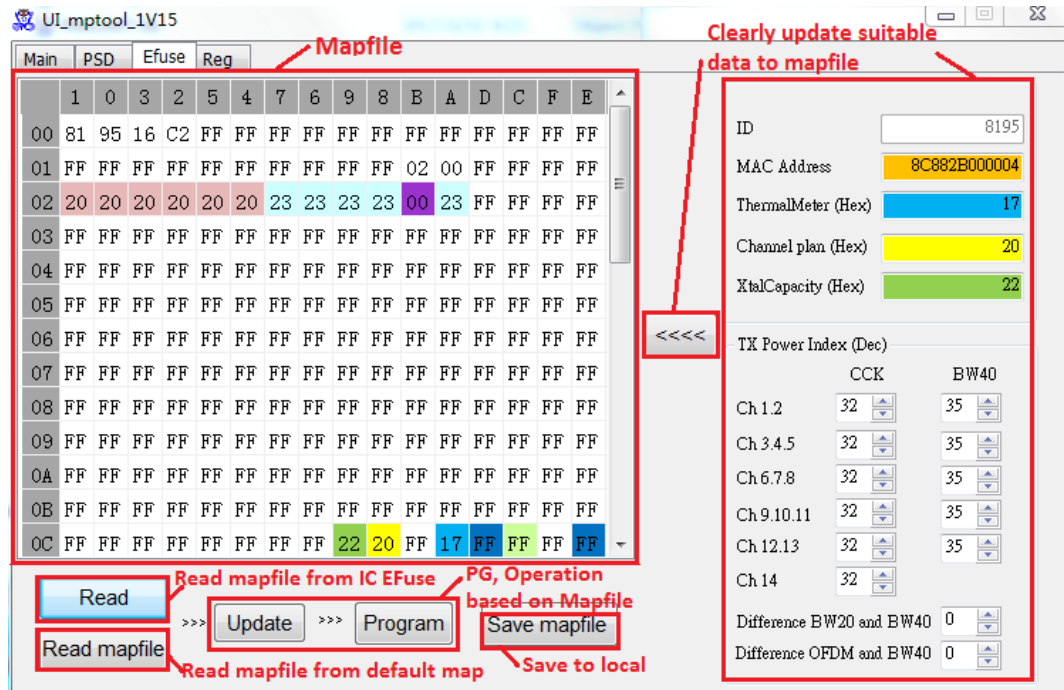
PSD interface has already set correct IQ Path/FFT Pts/FFT Avg for Ameba series IC. Please select “Channel”, “Bandwidth” and always “High” corner, and set “RX Gain” before you “Start” PSD test.



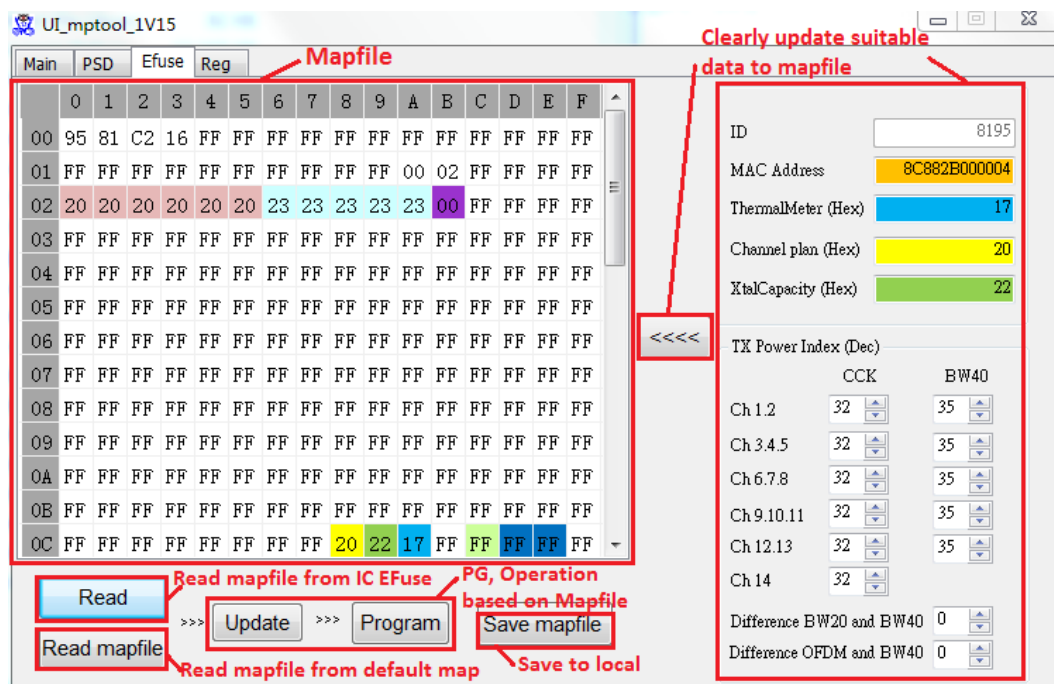
## 6.Efuse:

Since Mptool 1.14 version, the formats of AmebaZ and Ameba1 efuse map are quite different.

The picture below is the description of Ameba1(8195AM/8711AM/8711AF) Efuse, same as Mptool previous versions. Please use the format in “defaultmap\Ameba1” efsuemap.



And for AmebaZ(8710BN/8711BN/8711BG), the Efuse is showed as:



Please use the format in “defaultmap\AmebaZ” efsuemap.



Writing data to Ameba is based on the mapfile, so you must update mapfile first. There are two types for using this Efuse interface: Modify several values based on IC Efuse or based on default mapfile.

Test step:

- 1) “Read”(based on IC Efuse) or “Read mapfile” (based on default mapfile), and if a pop-up dialog shows “Wrong mapfile format!”, please check if default mapfile is suitable for current IC;
- 2) You can use the right of Efuse interface to update suitable data to mapfile clearly and conveniently, or if you are familiar with the Efuse contents, you can modify the calibration data on the mapfile directly;
- 3) Confirm the mapfile showed on the left and Click “Update” and “Program” in sequence;
- 4) Please power down and on DUT again, and restart UI\_mptool to “Read” Efuse for confirmation.

To be attention:

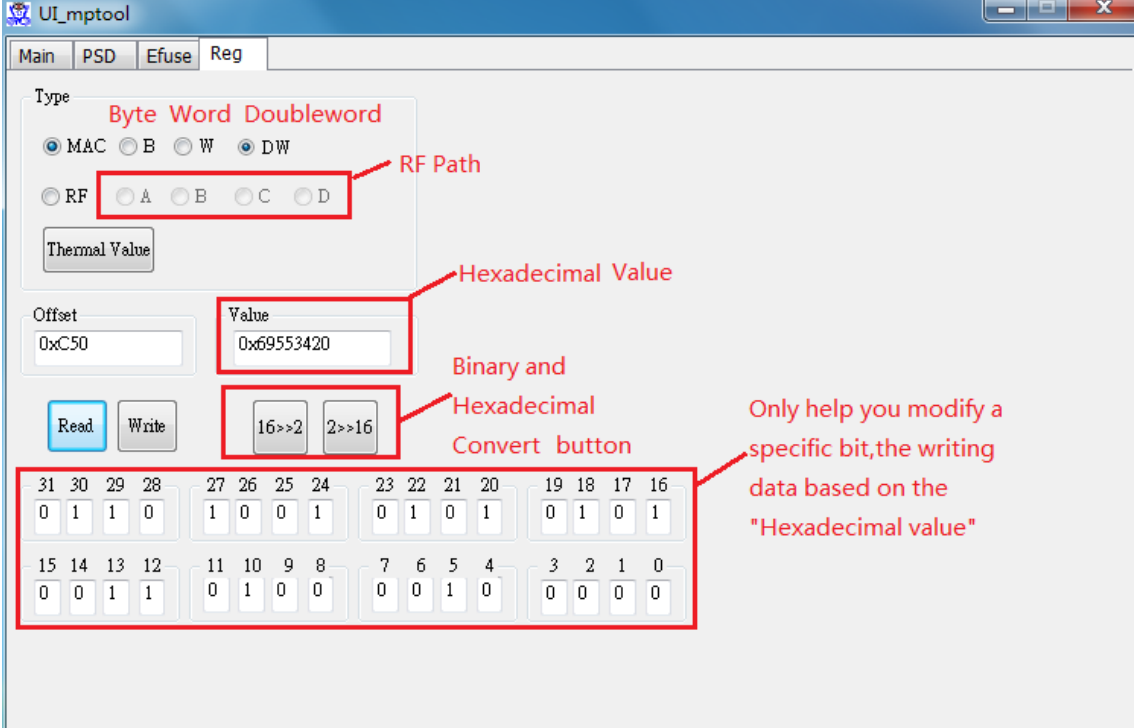
- a) The offsets of “0x000—0x01F” in Efuse are related with Ameba-bootstrap, so these offsets’ value cannot be changed in UI\_mptool;
- b) Care must be taken to “Update” and “Program” (PG), do not repeat these operations each time, because IC Efuse has limited space for PG. After every PG operation, please power down and on DUT again, and restart UI\_mptool to “Read” Efuse for confirmation;
- c) Do not just set value back to “0xFF”, please connect Realtek Technical Support team to get the default value.

Relevant Efuse content introduction is illustrated in:

[Ameba series Efuse Application Note 170224.pdf](#)

## 7.Reg:

Realtek IC has MAC reg and RF reg two types, you may select “MAC” “DW” / “RF” “A” and fill in “Offset” to “Read”, or fill in “Offset” and “Value” to “Write”. We use Hexadecimal value to read and write, but you may check and modify each bit value by two lines on the bottom of this interface.



The screenshot shows the 'Reg' tab of the 'UI\_mptool' application. The interface includes several sections for configuring register operations:

- Type Section:** Contains radio buttons for 'MAC', 'B', 'W', 'DW', and 'RF'. The 'DW' option is selected. Below these are radio buttons for 'A', 'B', 'C', and 'D', which are grouped by a red box and labeled 'RF Path'.
- Value Section:** A text field labeled 'Value' contains the hexadecimal value '0x69553420'. It is highlighted by a red box and labeled 'Hexadecimal Value'.
- Offset Section:** A text field labeled 'Offset' contains the value '0xC50'.
- Buttons:** 'Read' and 'Write' buttons are present. Below them are two buttons labeled '16>>2' and '2>>16', which are highlighted by a red box and labeled 'Binary and Hexadecimal Convert button'.
- Bit Field:** A grid of 32 bit positions (31 down to 0) is shown at the bottom. Each position has a corresponding bit value (0 or 1). This entire grid is highlighted by a red box and labeled 'Only help you modify a specific bit, the writing data based on the "Hexadecimal value"'.