

AmebaDPlus Mptool Userguide

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For the convenience of customers to test and debug AmebaDPlus, we offer our customers a windows-based system UI_mptool; This tool contains four sub-interface Main, PSD, Efuse, Reg.

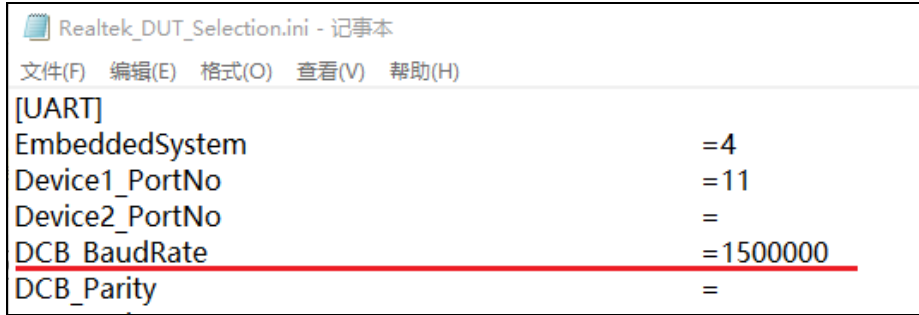
Operation steps:

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.

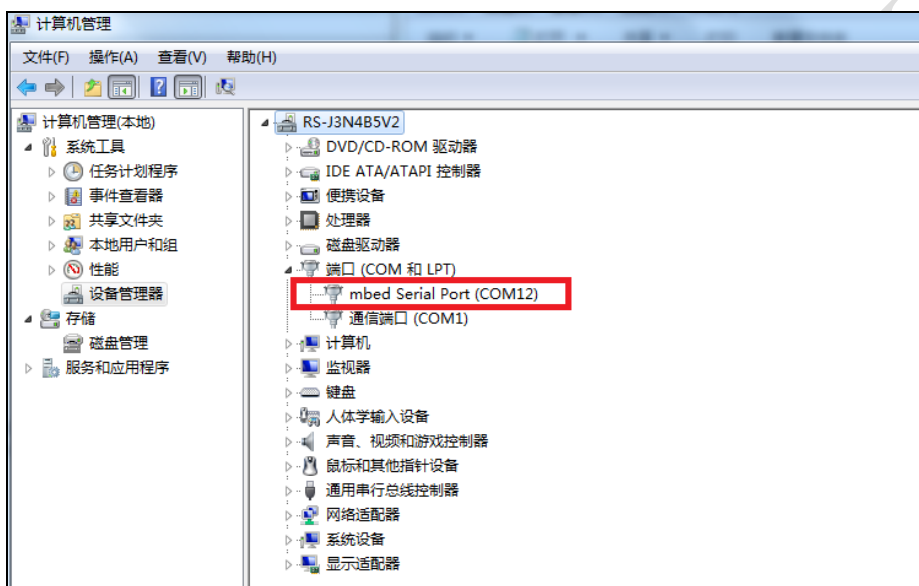
Note: Module for AmebaDPlus(8721F), Please select “**RTL8721F Series**”.



2. Open “Setup\Realtek_DUT_Selection.ini”, and check if **DCB_BaudRate** is suitable: AmebaDPlus(8721F) = 1500000.

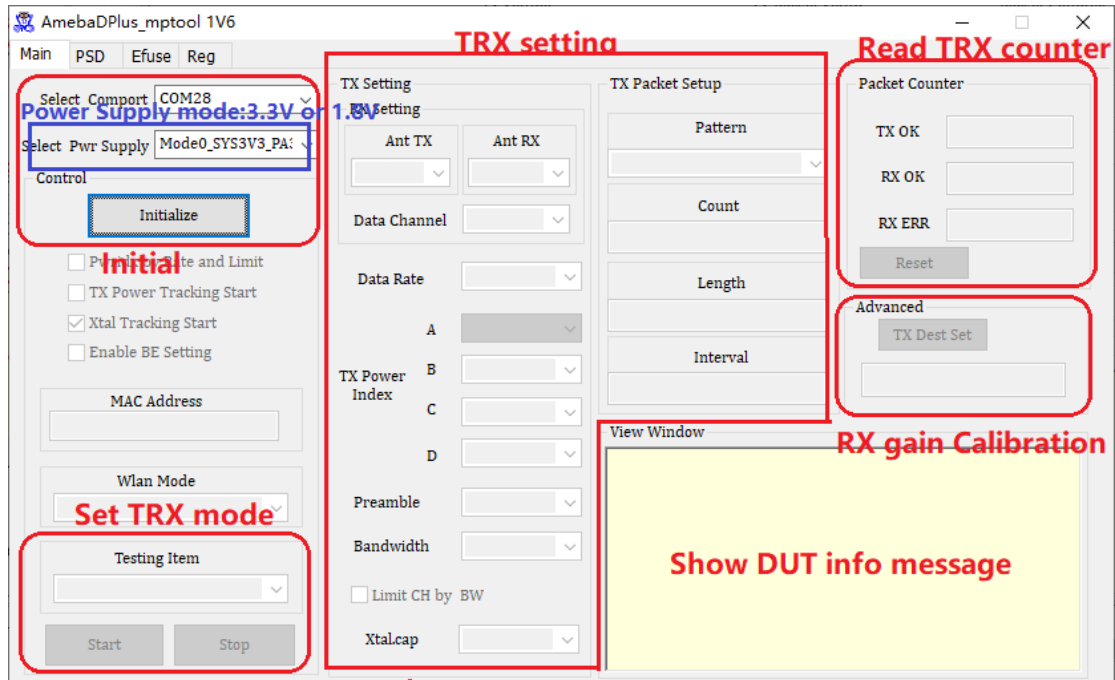


3. Open “UI_mptool.exe”. Firstly, you must set the COM number(Vary by PC, you can check the value by the following picture) and “Initialize” the DUT, and then the four sub interface: Main, PSD, Efuse, Reg can be operated.



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 Channel”, “Data Rate”, “Tx Target Index”, “Preamble”, “Bandwidth”, “Pattern”, “Count”, “Length”, “Interval” and “Xtal.cap” on the right side ;
- 3) Select “Power by Rate and Limit”, “TX Power Tracking Start”, “Xtal Tracking Start” and “Enable BE Setting” if you need;
- 4) Click “Start” and check performance on other instruments. You may change

“Target Power ” in the process of “Packet TX” to set a target output power.

Note:

a. When you select “Power by Rate and Limit”, it means that TX Power Column will show the power value which 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. And this power value may be changed when you select another Data Rate or Channel.

b. When you select “TX Power Tracking Start”, it means enable RFK tracking function. When the temperature change reaches the threshold, the redo RFK mechanism will be triggered, this function helps maintain RF performance.

c. The Xtal.cap and RX gain offset will also be changed based on their Efuse contents. But the Xtal.cap value returns to default(0x40) if the content of Efuse location 0xC9 is 0xFF, and the RX gain offset returns to default(0x0) if the MAC address contents are all 0xFF.

4.3 RX----Packet RX(All)

“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.

4.4 RX gain Calibration

Test step:

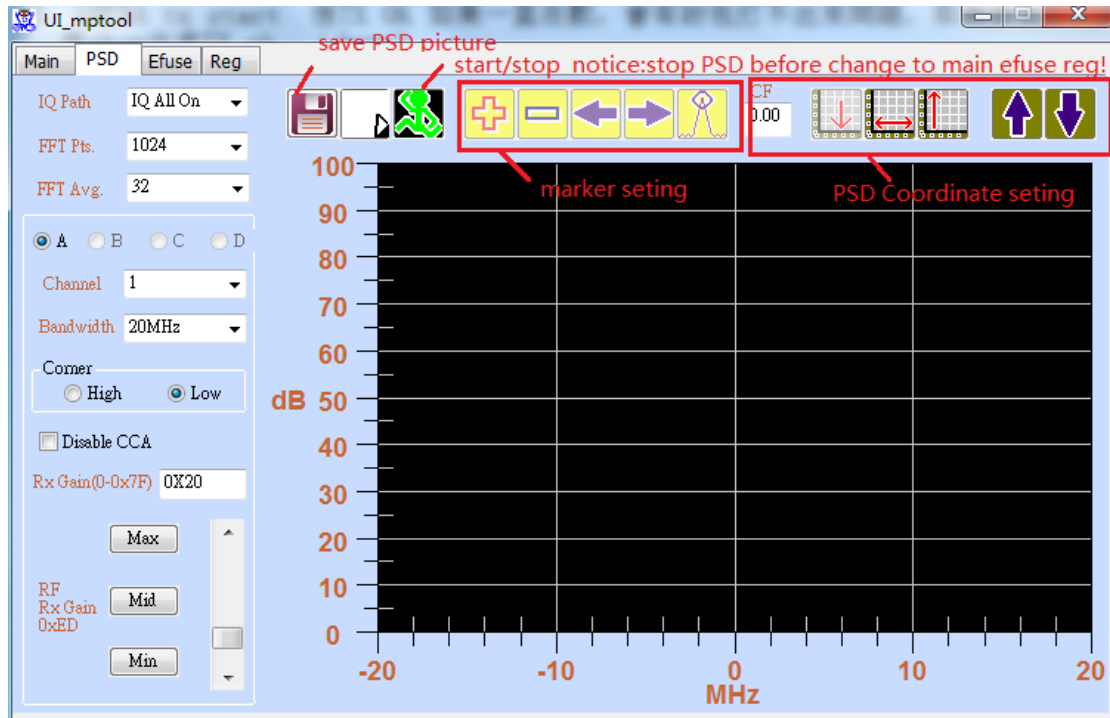
- 1) Set channel, BW, rate for DUT and ESG;
- 2) ESG set output power and make sure the DUT antenna port received -50dBm, ESG continue Tx;
- 3) Click “Get RSSI” to get RSSI value.

- 4) Turn Gain offset and click “Get RSSI” again to verify.

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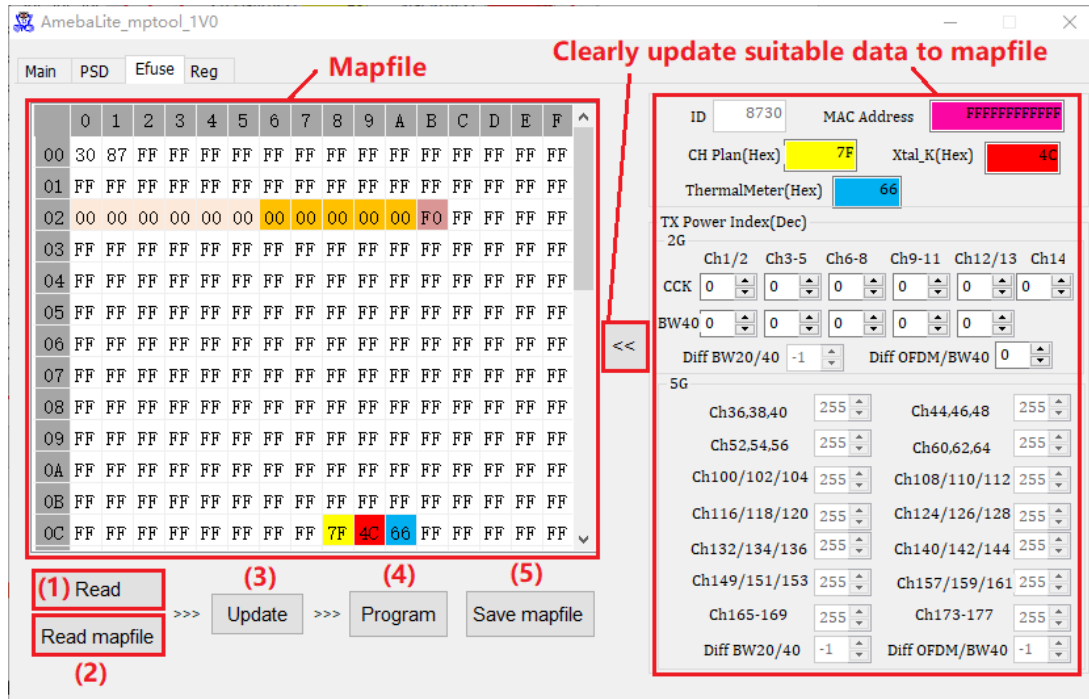
5. PSD

PSD interface has already set correct IQ Path/FFT Pts/FFT Avg for AmebaDPlus series IC. Please set “RX Gain” before you “Start” PSD test.



6.Efuse:

For AmebaDPlus, the Efuse is showed as:



- (1) Read mapfile from IC Efuse
- (2) Read mapfile from default map
- (3) & (4) PG, Operation based on mapfile
- (5) Save to local

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 date 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

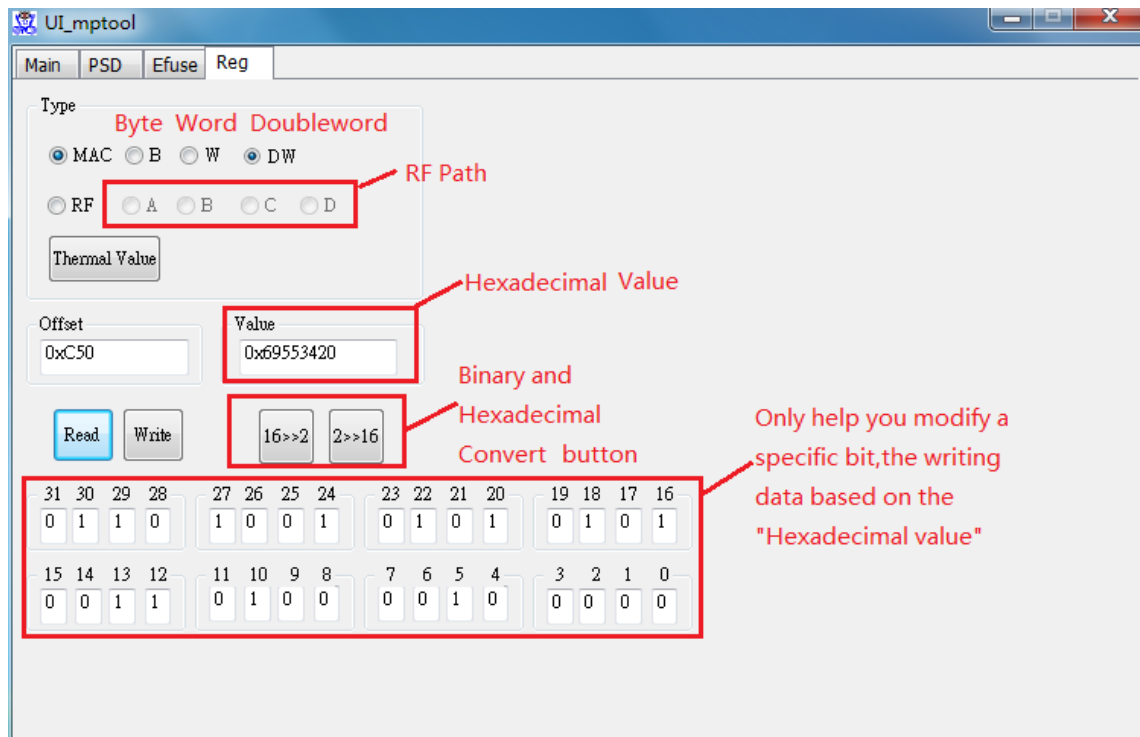
confirmation.

To be attention:

- a) The offsets of “0x000—0x01F” in Efuse are related with Ameba-bootstrap(except 0x00B), 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.
- d) If you want to verify the Rx gain Calibration values in Efuse, please program the MAC address first.

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:** Radio buttons for MAC, B, W, DW (selected), and RF. A red box highlights the RF section, with a red arrow pointing to it labeled 'RF Path'.
- RF Path:** Radio buttons for A, B, C, and D. A red box highlights this section.
- Thermal Value:** A text input field.
- Offset:** A text input field containing '0xC50'.
- Value:** A text input field containing '0x69553420'. A red box highlights this field, with a red arrow pointing to it labeled 'Hexadecimal Value'.
- Buttons:** 'Read' and 'Write' buttons. 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) with corresponding 0/1 values. A red box highlights the entire grid, with a red arrow pointing to it labeled 'Only help you modify a specific bit, the writing data based on the "Hexadecimal value"'.

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