

# How to read external TX\_power\_related\_table

2014/11/12

## Introduction

Realtek WiFi driver has TX\_power\_by\_rate\_table and TX\_power\_limit\_table which use to adjust output power and limit maximum output power in each channel with different transmit rate. Maximum transmit power depends on Government regulations which are FCC, ETSI and MKK. Realtek dongle has a factory default TX power\_limit\_table burned in efuse in production.

Customize TX power table provides a possibility for WiFi module maker to modify TX\_power\_by\_rate\_table (PHY\_REG\_PG.txt) and TX\_power\_limit\_table (TXPWR\_LMT.txt) after production for some reason.

### Note!

- External TX power table will be generated by agent who sells wifi chip to customer.
- Store TX\_power\_by\_rate\_table and TX\_power\_limit\_table in a read only partition is a good idea to avoid damage.
- TX\_power\_by\_rate\_table and TX\_power\_limit\_table cannot be removed by upgrade image and reset default.

## Configure steps

1. Load parameter from file – by modify Makefile.
  - A. Modify the CONFIG\_LOAD\_PHY\_PARA\_FROM\_FILE to y .  
Ex: **CONFIG\_LOAD\_PHY\_PARA\_FROM\_FILE = y**
2. Copy file to specified folder:
  - A. Make new folder according to your chip name under the path which have read permissions.  
Ex: /lib/firmware/**rtl8812a**
  - B. Move PHY\_REG\_PG.txt and TXPWR\_LMT.txt to above folder.
3. 3 ways to decide if driver refer to external TX power table

A. By change configuration

Step-1. Modify Makefile

Ex: **CONFIG\_CALIBRATE\_TX\_POWER\_BY\_REGULATORY = y**

*Driver will refer to PHY\_REG\_PG.txt and TXPWR\_LMT.txt*

Ex: **CONFIG\_CALIBRATE\_TX\_POWER\_TO\_MAX = y**

*Driver will refer to PHY\_REG\_PG.txt*

Step-2. Modify file path in Makefile

Un-mark

**#EXTRA\_CFLAGS += -DREALTEK\_CONFIG\_PATH="/lib/firmware/"**

Ex: **EXTRA\_CFLAGS += -DREALTEK\_CONFIG\_PATH="/lib/firmware/"**

and mark

**EXTRA\_CFLAGS += -DREALTEK\_CONFIG\_PATH=""**

Ex: **#EXTRA\_CFLAGS += -DREALTEK\_CONFIG\_PATH=""**

Or

B. By change configuration

Step-1. Modify Makefile

Ex: **CONFIG\_CALIBRATE\_TX\_POWER\_BY\_REGULATORY = y**

*Driver will refer to PHY\_REG\_PG.txt and TXPWR\_LMT.txt*

Ex: **CONFIG\_CALIBRATE\_TX\_POWER\_TO\_MAX = y**

*Driver will refer to PHY\_REG\_PG.txt*

Step-2. Modify file path in os\_intfs.c

Ex: **char \*rtw\_phy\_file\_path = "/lib/firmware/";**

Or

C. By change load-time module parameter

**\$>insmod 8812au.ko rtw\_tx\_pwr\_lmt\_enable=1 rtw\_tx\_pwr\_by\_rate=1  
rtw\_phy\_file\_path="/lib/firmware/" rtw\_decrypt\_phy\_file=0**

4. Parameter Notes:

A. rtw\_tx\_pwr\_lmt\_enable:

- i. rtw\_tx\_pwr\_lmt\_enable = 0; // 0: Disable
- ii. rtw\_tx\_pwr\_lmt\_enable = 1; // 1: Enable
- iii. rtw\_tx\_pwr\_lmt\_enable = 2; // 2: Depends on efuse

B. rtw\_tx\_pwr\_by\_rate:

- i. rtw\_tx\_pwr\_lmt\_enable = 0; // 0: Disable
- ii. rtw\_tx\_pwr\_lmt\_enable = 1; // 1: Enable
- iii. rtw\_tx\_pwr\_lmt\_enable = 2; // 2: Depends on efuse

- C. `rtw_phy_file_path`:
    - i. `rtw_phy_file_path="/lib/firmware/"`, path `/lib/firmware/` is the location of tx power related file.
  - D. `rtw_decrypt_phy_file`:
    - i. `rtw_decrypt_phy_file = 0`; //File is not encrypted
    - ii. `rtw_decrypt_phy_file = 1`; //File is encrypted
5. Folder name for each supported chip.
- A. `rtl8188e`
  - B. `rtl8812a`
  - C. `rtl8821a`
  - D. `rtl8723b`
  - E. `rtl8192e`

## **How could you check power tables have been loaded?**

1. Input command to open kernel log  
`#tail -f /var/log/kern.log`
2. After insert module, the log will show as below.  
`" RTL871X: retrieveFromFile openFile path:/lib/firmware/rtl8812a/TXPWR_LMT.txt  
fp = ffff8800a62ebc00 "`

## **Realtek default regulation of power limit table**

**(FCC/ETSI/MKK) corresponding eFuse (0xB8h)**

**channel plan divide into 3 group, if your product**

**must support other regulation, please contact**

## **Realtek.**

1. ETSI for Europe.
2. MKK for Japan and Korea.
3. FCC for excluding Europe and Japan/Korea.