



# Introduction of Tx Power By Rate and Limit Table





# Abstract

- Introduction
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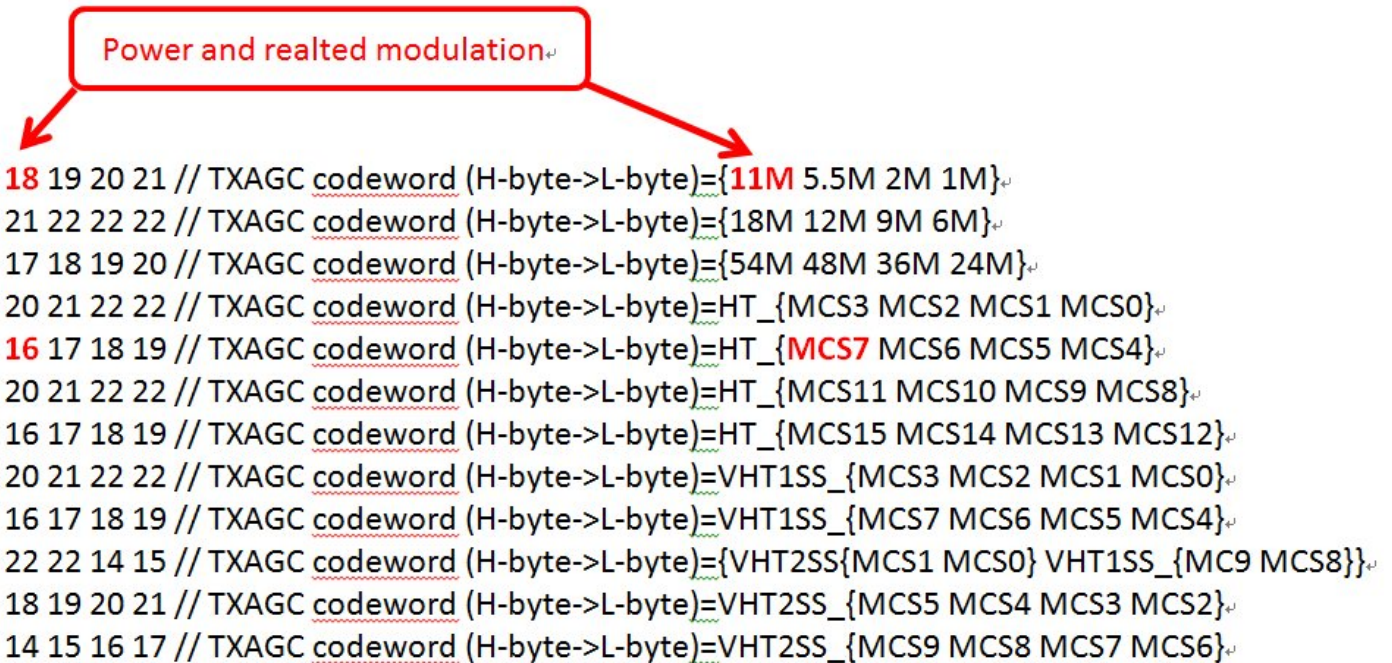
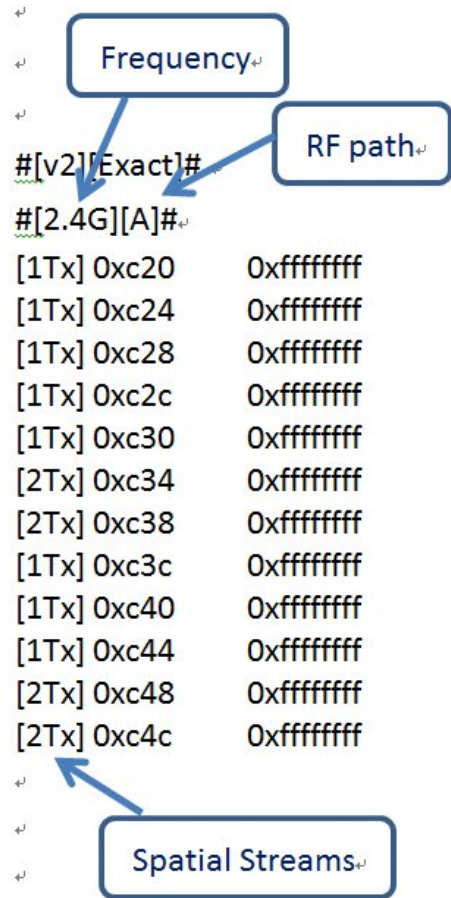
# Introduction

- The Tx power by rate and power limit table defined by RTK include two files
  - The “PHY\_RFG\_PG.txt” is power by rate table and irrelative with channel.
  - The “TXPWR\_LMT.txt” is power limit table and relative with channel.
- The “PHY\_RFG\_PG.txt” table provided the default Tx power by rate data by RTK’s dome board. And, it also can be adjusted if necessary by customer’s design board.
- The “TXPWR\_LMT.txt” table set the maximum output power by channels. And it’s only verified by RTK demo board.
- For the record, customer’s “TXPWR\_LMT.txt” need to be modified due to the test details by FCC/CE/MKK/others regulations.





# Power By Rate Table



The calibration power of CCK-11M and HT40-MCS7 are absolute value which must be the same on the power by rate table.







# Channel Plan Domain code

- The efuse address 0xB8[6:0](domain code) and 0xC1[2:0] must be programmed. The power limit will be enabled on wifi driver. The efuse address 0xc1[2:0] is Regulatory selection.
  - 0h: driver-defined maximum power offset for longer communication range.( refer to Power by rate table)
  - 1h: Power limit table-defined maximum power offset range. ( refer to Power by rate table and Power limit table to take the smaller index value)
  - 2h: not support power offset by rate. (Don't refer to Power by rate table)
- Domain code defines available channels and scan type(active or passive). Customer choses a suitable Domain Code value from document "WS-xxxxxx-Willis-Efuse\_Channel\_Plan-Rxx.xlsx"

Channel Plan Contents				
2G RD	5G RD	0xB8 Bit[6:0]	2G Channels	5G Channels
2G_WORLD	5G_NULL	20h	1,2,3,4,5,6,7,8,9,10,11,12,13	NA
2G_ETSI1	5G_NULL	21h	1,2,3,4,5,6,7,8,9,10,11,12,13	NA





# Power Limit Table

- RTK regulation of power limits are classified as several groups, and RTK has three default groups called FCC/ETSI/MKK
  - FCC for excluding Europe and Japan/Korea.
  - ETSI for Europe.
  - MKK for Japan and Korea.
- Wifi driver will select different power limit table according to the channel plan domain code 0xB8[6:0].
  - For example, eFuse address 0xB8=34h, 2G\_FCC1/5G\_FCC7, 0xC1=01h that **driver will use FCC regulation** of power limit table.

2.4G Regulatory Domains					
2G RD	Regulation	Channels	Passive Channels	Channel Frequencies	Note
2G_WORLD	WW	1,2,3,4,5,6,7,8,9,10,11,12,13	12,13	2412~2472	2G Worldwide 13 Active scan Ch01~11 Passive scan Ch12, 13
2G_ETSI1	ETSI	1,2,3,4,5,6,7,8,9,10,11,12,13	NA	2412~2472	ETSI Ch01~13
2G_FCC1	FCC	1,2,3,4,5,6,7,8,9,10,11	NA	2412~2462	FCC Ch01~11
2G_MKK1	MKK	1,2,3,4,5,6,7,8,9,10,11,12,13,14	NA	2412~2472, 2484	MKK Ch01~14





# Power Limit Table R2

- RTK has implemented new power limit rule for handling more regulations. Open "TXPWR\_LMT.txt" to confirm your driver supports power limit table version 2.0 .

```
// Format:
//
//      Note: The order of the tables MUST match the definition in WLAN driver.
//
//      Power Limit Table Parameter Definition
//
//      @@Ver=2.0
//
//      (1) Version 2.0 support to add regulations in the Power Limit Table from column 4.
//      Customers can add new regulations by using DomainCode or CountryCode(ISO 3166-2).
```

- Version 2.0 set two regulations as default(IC/KCC), and customer can flexibly add other customized regulations after 6<sup>th</sup> column.

```
//
//Table 1: =====
//
##      2.4G, 20M, 1T, CCK      RTK default      11M)      Customized
##      START
##      #8#      FCC      ETSI      MKK      IC      KCC      ACMA      CHILE      UKRAINE
CH01  18      15      17      18      19      15      18      15
CH02  18      15      17      18      19      15      18      15
```





# Power Limit Table R2

- Define customized regulation

- Instructions :

- Select a DomainCode or CountryCode and name a Regulation for it.

- 1. One DomainCode MUST has only one Regulation in Table.

- 2. One CountryCode MUST has only one Regulation in Table.

- 3. Several DomainCodes or CountryCodes can correspond to one Regulation.

- Syntax:

- 1. @@DomainCode=xx, Regulation=xx

- 2. @@CountryCode=xx, Regulation=xx

- Content :

- If want to disable Tx power limit for one DomainCode or CountryCode, you can write "NONE" in Regulation.

- 1. @@DomainCode=xx, Regulation=NONE

- 2. @@CountryCode=xx, Regulation=NONE







# Power Limit Table R2

- Examples :

1. @@DomainCode=0x2B, Regulation=IC

//RTK define domain code 0x2B for IC in column 4

@@DomainCode=0x4B, Regulation=KCC

//RTK define domain code 0x4B for KCC in column 5

@@DomainCode=0x45, Regulation=ACMA

//Customer define domain code 0x45 for C6 in column 6

@@DomainCode=0x2D, Regulation=CHILE

//Customer define domain code 0x2D for C6 in column 7

@@DomainCode=0x36, Regulation=UKRAINE

//Customer define domain code 0x36 for C6 in column 8

2. @@DomainCode=0x62, Regulation=C6

@@DomainCode=0x61, Regulation=C6

@@CountryCode=US, Regulation=C6





# Power Limit Table R2

## power limit table content

//Table 13: ===== **Frequency, Bandwidth, 1 Tx, Rate**

//

## **5G, 40M, 1T, HT**, //(MCS0~MCS7)

## START

## #8# **FCC ETSI MKK IC KCC ACMA CHILE UKRAINE**

//5G Band 1

CH38 16.5 16 15.5 16 18 16 16.5 13.5

CH46 18 16 15.5 16 18 16 18 13.5

//5G Band 2

CH54 18 16 15.5 16 18 16 18 **13.5**

CH62 16 16 15.5 16 17.5 16 16 13.5

//5G Band 3

CH102 14.5 16 18 14.5 18 16 14.5 13.5

CH110 18 16 18 18 18 16 18 13.5

CH118 18 16 18 NA 18 NA 18 13.5

CH126 18 16 18 NA 18 NA 18 13.5

CH134 18 16 18 18 18 16 18 NA

CH142 18 NA NA 18 18 NA 18 **NA**

//5G Band 4

CH151 18 WW NA 18 18 18 18 13.5

CH159 18 **WW** NA 18 18 18 18 13.5

## END

**Worldwide power limit value, which means that get minimal value in other regulations at this channel. WW=13.5 for this case**

**Regulations**

**Power limit**

**UKRAINE not supports channel 142**

