MT7986 Power Boost Application Note

2021/9/1 Leo Kuo

Version History

Version	Date	Author (Optional)	Description
0.1	2021-9-1	Leo Kuo	Initial draft
1.0	2022-2-2	Micheal Su	Official release

Outline

- Command Method
- Show Information Command Method

Command Method

Command Method

- **iwpriv ra0 set TxPowerBoostCtrl =[1]:[2]:[3]:[4]:[5]:[6]:[7]:[8]:[9]:[10]:[11]:[12]:[13]**
  - **Explanation: this iwpriv command is used to boost power on each mode and rate.**
  - **Parameters:**
    - Param[1]: band_idx, *(1-symbol format)* band index (0: band0, 1: band1)
    - Param[2]: phy_mode *(1-symbol format)* power category (0: CCK, 1: OFDM, 2: HT, 3: VHT, 4: HE)
    - Param[3]: bw *(1-symbol format)* bandwidth
      - for CCK/OFDM mode, 0: BW20
      - for HT/VHT mode, 0: BW20, 1: BW40, 2: BW80, 3: BW160
      - for HE mode, 0: RU26, 1: RU52, 2: RU106, 3: RU242. 4: RU484, 5: RU996, 6: RU996x2
    - Param[4]: pwr_boost_value_num *(1-symbol format)* number of power boost value to indicate variable-length parameters append afterward.
    - Param4_1 ~ Param 4_N: pwr_boost_values *(1-symbol format)* power boost values, which N is defined by parameter "pwr_boost_value“
- **Example:**
  - **Band0 CCK boost 0.5dB power on each of rate**
    - iwpriv ra0 set TxPowerBoostCtrl=0:0:0:4:1:1:1:1
  - **Band1 OFDM boost 0.5db power on each of rate**
    - iwpriv rax0 set TxPowerBoostCtrl=1:1:0:8:1:1:1:1:1:1:1:1

Show Information Command Method

Show Information Command Method (1)

- 2.4G : iwpriv ra0 set TxPowerInfo=2
- 5G : iwpriv rax0 set TxPowerInfo=2
- Example:
  - 2.4GHz command:
  - iwpriv ra0 set TxPowerBoostCtrl=0:0:0:4:1:1:1:1 //CCK
  - iwpriv ra0 set TxPowerBoostCtrl=0:1:0:8:1:1:1:1:0:0:0:0 //OFDM
  - iwpriv ra0 set TxPowerBoostCtrl=0:2:0:8:2:2:0:0:0:0:0:0 //HT20
  - iwpriv ra0 set TxPowerBoostCtrl=0:2:1:8:3:3:0:0:0:0:0:0 //HT40
  - iwpriv ra0 set TxPowerBoostCtrl=0:3:0:8:3:2:0:0:0:0:0:0 //VHT20
  - iwpriv ra0 set TxPowerBoostCtrl=0:3:1:8:3:2:0:0:0:0:0:0 //VHT40
  - iwpriv ra0 set TxPowerInfo=2

Show Information Command Method (2)

- **Original**

```
[  150.325329] ================================================================================
[  150.333503]                                    TX POWER INFO
[  150.337680] ================================================================================
[  150.345851]  Band Index: 0,  Channel Band: 2G ePAGain:0
[  150.351157] --------------------------------------------------------------------------------
[  150.359328]  [CCK_01M]: 0x1e (030)
[  150.362812]  [CCK_02M]: 0x1e (030)
[  150.366294]  [CCK_05M]: 0x1e (030)
[  150.369778]  [CCK_11M]: 0x1e (030)
[  150.373256]  [OFDM_06M]: 0x1b (027)
[  150.376826]  [OFDM_09M]: 0x1b (027)
[  150.380395]  [OFDM_12M]: 0x1b (027)
[  150.383966]  [OFDM_18M]: 0x1b (027)
[  150.387536]  [OFDM_24M]: 0x1a (026)
[  150.391106]  [OFDM_36M]: 0x1a (026)
[  150.394676]  [OFDM_48M]: 0x18 (024)
[  150.398245]  [OFDM_54M]: 0x18 (024)
[  150.401814] --------------------------------------------------------------------------------
[  150.409984]  [HT20_M00]: 0x1a (026)
[  150.413554]  [HT20_M01]: 0x1a (026)
[  150.417118]  [HT20_M02]: 0x1a (026)
[  150.420688]  [HT20_M03]: 0x18 (024)
[  150.424258]  [HT20_M04]: 0x18 (024)
[  150.427828]  [HT20_M05]: 0x18 (024)
[  150.431398]  [HT20_M06]: 0x17 (023)
[  150.434972]  [HT20_M07]: 0x16 (022)
[  150.438542]  [HT40_M00]: 0x1a (026)
[  150.442111]  [HT40_M01]: 0x1a (026)
[  150.445681]  [HT40_M02]: 0x1a (026)
[  150.449246]  [HT40_M03]: 0x18 (024)
[  150.452815]  [HT40_M04]: 0x18 (024)
[  150.456385]  [HT40_M05]: 0x17 (023)
[  150.459955]  [HT40_M06]: 0x17 (023)
[  150.463525]  [HT40_M07]: 0x16 (022)
[  150.467095]  [HT40_M32]: 0x1a (026)
[  150.470665] --------------------------------------------------------------------------------
[  150.478836]  [VHT20_M00]: 0x1a (026)
[  150.482492]  [VHT20_M01]: 0x1a (026)
```

CCK

OFDM

HT20

HT40

VHT20

- **Boost**

```
[  226.151853] ================================================================================
[  226.160025]  Band Index: 0,  Channel Band: 2G ePAGain:0
[  226.165330] --------------------------------------------------------------------------------
[  226.173502]  [CCK_01M]: 0x1f (031)
[  226.176980]  [CCK_02M]: 0x1f (031)
[  226.180463]  [CCK_05M]: 0x1f (031)
[  226.183946]  [CCK_11M]: 0x1f (031)
[  226.187429]  [OFDM_06M]: 0x1c (028)
[  226.190999]  [OFDM_09M]: 0x1c (028)
[  226.194569]  [OFDM_12M]: 0x1c (028)
[  226.198139]  [OFDM_18M]: 0x1c (028)
[  226.201709]  [OFDM_24M]: 0x1a (026)
[  226.205273]  [OFDM_36M]: 0x1a (026)
[  226.208843]  [OFDM_48M]: 0x18 (024)
[  226.212413]  [OFDM_54M]: 0x18 (024)
[  226.215982] --------------------------------------------------------------------------------
[  226.224152]  [HT20_M00]: 0x1c (028)
[  226.227723]  [HT20_M01]: 0x1c (028)
[  226.231293]  [HT20_M02]: 0x1a (026)
[  226.234863]  [HT20_M03]: 0x18 (024)
[  226.238433]  [HT20_M04]: 0x18 (024)
[  226.242003]  [HT20_M05]: 0x18 (024)
[  226.245573]  [HT20_M06]: 0x17 (023)
[  226.249137]  [HT20_M07]: 0x16 (022)
[  226.252707]  [HT40_M00]: 0x1d (029)
[  226.256277]  [HT40_M01]: 0x1d (029)
[  226.259847]  [HT40_M02]: 0x1a (026)
[  226.263417]  [HT40_M03]: 0x18 (024)
[  226.266987]  [HT40_M04]: 0x18 (024)
[  226.270558]  [HT40_M05]: 0x17 (023)
[  226.274127]  [HT40_M06]: 0x17 (023)
[  226.277697]  [HT40_M07]: 0x16 (022)
[  226.281262]  [HT40_M32]: 0x1a (026)
[  226.284831] --------------------------------------------------------------------------------
[  226.293002]  [VHT20_M00]: 0x1d (029)
[  226.296659]  [VHT20_M01]: 0x1c (028)
[  226.300315]  [VHT20_M02]: 0x1a (026)
[  226.303972]  [VHT20_M03]: 0x18 (024)
[  226.307629]  [VHT20_M04]: 0x18 (024)
[  226.311286]  [VHT20_M05]: 0x18 (024)
```

CCK

OFDM

HT20

HT40

VHT20

Show Information Command Method (3)

- **Example:**
  - **5GHz command:**
  - **iwpriv rax0 set TxPowerBoostCtrl=1:1:0:8:1:1:1:1:0:0:0:0 //OFDM**
  - **iwpriv rax0 set TxPowerBoostCtrl=1:2:0:8:2:2:0:0:0:0:0:0 //HT20**
  - **iwpriv rax0 set TxPowerBoostCtrl=1:2:1:8:3:3:0:0:0:0:0:0 //HT40**
  - **iwpriv rax0 set TxPowerBoostCtrl=1:3:0:8:3:2:0:0:0:0:0:0 //VHT20**
  - **iwpriv rax0 set TxPowerBoostCtrl=1:3:1:8:3:2:0:0:0:0:0:0 //VHT40**
  - **iwpriv rax0 set TxPowerInfo=2**

Show Information Command Method (4)

- **Original**

```
[ 1542.175894] ================================================================================
[ 1542.184067]                                                    TX POWER INFO
[ 1542.188246] ================================================================================
[ 1542.196417]  Band Index: 1,  Channel Band: 5G ePAGain:0
[ 1542.201721] --------------------------------------------------------------------------------
[ 1542.209891]  [CCK_01M]: 0x16 (022)
[ 1542.213369]  [CCK_02M]: 0x16 (022)
[ 1542.216852]  [CCK_05M]: 0x16 (022)
[ 1542.220336]  [CCK_11M]: 0x16 (022)
[ 1542.223819]  [OFDM_06M]: 0x1a (026)
[ 1542.227389]  [OFDM_09M]: 0x1a (026)
[ 1542.230959]  [OFDM_12M]: 0x1a (026)
[ 1542.234529]  [OFDM_18M]: 0x18 (024)
[ 1542.238099]  [OFDM_24M]: 0x18 (024)
[ 1542.241668]  [OFDM_36M]: 0x18 (024)
[ 1542.245232]  [OFDM_48M]: 0x17 (023)
[ 1542.248802]  [OFDM_54M]: 0x16 (022)
[ 1542.252371] --------------------------------------------------------------------------------
[ 1542.260542]  [HT20_M00]: 0x19 (025)
[ 1542.264113]  [HT20_M01]: 0x19 (025)
[ 1542.267683]  [HT20_M02]: 0x19 (025)
[ 1542.271253]  [HT20_M03]: 0x19 (025)
[ 1542.274822]  [HT20_M04]: 0x19 (025)
[ 1542.278391]  [HT20_M05]: 0x17 (023)
[ 1542.281962]  [HT20_M06]: 0x16 (022)
[ 1542.285531]  [HT20_M07]: 0x15 (021)
[ 1542.289096]  [HT40_M00]: 0x19 (025)
[ 1542.292666]  [HT40_M01]: 0x19 (025)
[ 1542.296235]  [HT40_M02]: 0x19 (025)
[ 1542.299805]  [HT40_M03]: 0x19 (025)
[ 1542.303375]  [HT40_M04]: 0x19 (025)
[ 1542.306945]  [HT40_M05]: 0x17 (023)
[ 1542.310515]  [HT40_M06]: 0x16 (022)
[ 1542.314084]  [HT40_M07]: 0x15 (021)
[ 1542.317655]  [HT40_M32]: 0x19 (025)
[ 1542.321219] --------------------------------------------------------------------------------
[ 1542.329390]  [VHT20_M00]: 0x19 (025)
[ 1542.333047]  [VHT20_M01]: 0x19 (025)
[ 1542.336704]  [VHT20_M02]: 0x19 (025)
[ 1542.340360]  [VHT20_M03]: 0x19 (025)
[ 1542.344016]  [VHT20_M04]: 0x19 (025)
[ 1542.347673]  [VHT20_M05]: 0x17 (023)
[ 1542.351329]  [VHT20_M06]: 0x16 (022)
[ 1542.354985]  [VHT20_M07]: 0x15 (021)
[ 1542.358642]  [VHT20_M08]: 0x13 (019)
[ 1542.362298]  [VHT20_M09]: 0x13 (019)
[ 1542.365955]  [VHT20_M10]: 0x10 (016)
[ 1542.369611]  [VHT20_M11]: 0x10 (016)
[ 1542.373263]  [VHT40_M00]: 0x19 (025)
[ 1542.376919]  [VHT40_M01]: 0x19 (025)
[ 1542.380575]  [VHT40_M02]: 0x19 (025)
[ 1542.384231]  [VHT40_M03]: 0x19 (025)
[ 1542.387888]  [VHT40_M04]: 0x19 (025)
```

OFDM

HT20

HT40

VHT20

VHT40

- **Boost**

```
[ 2141.067512] --------------------------------------------------------------------------------
[ 2141.075686]                                                    TX POWER INFO
[ 2141.079865] --------------------------------------------------------------------------------
[ 2141.088037]  Band Index: 1,  Channel Band: 5G ePAGain:0
[ 2141.093343] --------------------------------------------------------------------------------
[ 2141.101515]  [CCK_01M]: 0x16 (022)
[ 2141.104993]  [CCK_02M]: 0x16 (022)
[ 2141.108475]  [CCK_05M]: 0x16 (022)
[ 2141.111959]  [CCK_11M]: 0x16 (022)
[ 2141.115442]  [OFDM_06M]: 0x1b (027)
[ 2141.119012]  [OFDM_09M]: 0x1b (027)
[ 2141.122582]  [OFDM_12M]: 0x1b (027)
[ 2141.126151]  [OFDM_18M]: 0x1b (027)
[ 2141.129722]  [OFDM_24M]: 0x18 (024)
[ 2141.133286]  [OFDM_36M]: 0x18 (024)
[ 2141.136856]  [OFDM_48M]: 0x17 (023)
[ 2141.140426]  [OFDM_54M]: 0x16 (022)
[ 2141.143995] --------------------------------------------------------------------------------
[ 2141.152165]  [HT20_M00]: 0x1b (027)
[ 2141.155735]  [HT20_M01]: 0x1b (027)
[ 2141.159304]  [HT20_M02]: 0x19 (025)
[ 2141.162875]  [HT20_M03]: 0x19 (025)
[ 2141.166444]  [HT20_M04]: 0x19 (025)
[ 2141.170015]  [HT20_M05]: 0x17 (023)
[ 2141.173585]  [HT20_M06]: 0x16 (022)
[ 2141.177150]  [HT20_M07]: 0x15 (021)
[ 2141.180720]  [HT40_M00]: 0x1c (028)
[ 2141.184290]  [HT40_M01]: 0x1c (028)
[ 2141.187860]  [HT40_M02]: 0x19 (025)
[ 2141.191434]  [HT40_M03]: 0x19 (025)
[ 2141.195004]  [HT40_M04]: 0x19 (025)
[ 2141.198577]  [HT40_M05]: 0x17 (023)
[ 2141.202146]  [HT40_M06]: 0x16 (022)
[ 2141.205716]  [HT40_M07]: 0x15 (021)
[ 2141.209281]  [HT40_M32]: 0x19 (025)
[ 2141.212849] --------------------------------------------------------------------------------
[ 2141.221020]  [VHT20_M00]: 0x1c (028)
[ 2141.224677]  [VHT20_M01]: 0x1b (027)
[ 2141.228333]  [VHT20_M02]: 0x19 (025)
[ 2141.231991]  [VHT20_M03]: 0x19 (025)
[ 2141.235647]  [VHT20_M04]: 0x19 (025)
[ 2141.239304]  [VHT20_M05]: 0x17 (023)
[ 2141.242961]  [VHT20_M06]: 0x16 (022)
[ 2141.246618]  [VHT20_M07]: 0x15 (021)
[ 2141.250274]  [VHT20_M08]: 0x13 (019)
[ 2141.253931]  [VHT20_M09]: 0x13 (019)
[ 2141.257588]  [VHT20_M10]: 0x10 (016)
[ 2141.261239]  [VHT20_M11]: 0x10 (016)
[ 2141.264895]  [VHT40_M00]: 0x1c (028)
[ 2141.268552]  [VHT40_M01]: 0x1b (027)
[ 2141.272209]  [VHT40_M02]: 0x19 (025)
[ 2141.275865]  [VHT40_M03]: 0x19 (025)
```

OFDM

HT20

HT40

VHT20

VHT40