MT793x Commands Set Reference for RF test

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June, 10, 2021	Initial version.(base on SDK Version : v0.6.0)	Joe	V1.0.0

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1.Configuration

1.1 Software Configuration

- Connect the FTDI debug board to the computer using a micro-USB cable.
- Connect a 5V power at MT7931_DRQFN_RFB with a micro-USB cable.
- Installing the FTDI debug board drivers on PC/NB, you can find the drivers from here.
- Check com port in **Device Manager**(Figure1.1).

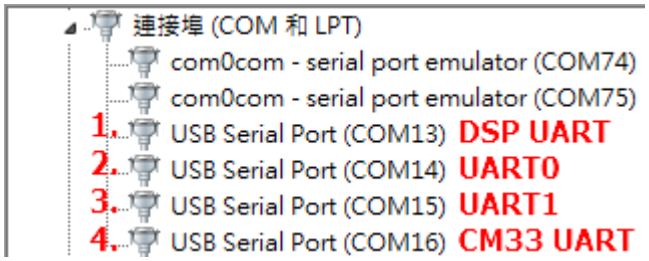

Figure 1.1

- Connect to DUT.
  - Use any terminal program (suggesting free terminal software: termite) to connect to DUT, the commands set can be used through the terminal program.
  - Please follow these below port configurstion setting :

    Baud rate: **921600**

    Data bits: **8**

    Stop bits: **1**

    Parity: **none**

    Flow Control: **none**

    Forward: **none**

2.Commands Set Reference

2.1 General commands

2.1.1 reboot

Purpose : This command resets the module and start FW over again.

Response : The beginning information since FW starts.

Command	Input parameter	Return value	Return code	Command behavior
reboot	-	No return value and return code. The MCU is reset.	-	Run the command.

Example:

```
$ reboot
reboot

Reboot Bye Bye Bye!!!!

loader disable 30s timeout
loader init

  1
  0
Your choose c
scott_image_init: 33cc!
boot image rtos w/o verify (addr 0x18044080 size 0x2fff80)
jump pc 0x180e24ad, sp 0x111000
Set apc to MPU#0 region 0 (0x30000130)...

(to-set) domain = -1, apc = 0

(pre-set) apc setting (0x30000130) = 0x11111111

(post-set) apc setting (0x30000130) = 0x0

Set apc to MPU#1 region 0 (0x30000230)...

(to-set) domain = -1, apc = 0
```

2.1.2 ver

Purpose : Get current firmware version.

Response : A string representing firmware version.

Command	Input parameter	Return value	Return code	Command behavior
ver	-	SDK_x.y.z	-	Get the value.

Example:

```
$ ver
ver

SDK Ver: SDK_0.6.0

Build Time     : May 31 2021 08:01:11

Official Build  Time : 2021_05_31_07_08_42
```

2.2 Wifi commands

2.2.1 DUT Initail

2.2.1.1 wifi on

Purpose : Initial wifi

Response : **wifi init success**.

Command	Input parameter	Return value	Return code	Command behavior
wifi on	-	wifi init success.	-	Run the command.

Example:

- Run the command.

```
$ wifi on
wifi on

[938722][WIFI][I][_wsys_on][18389][wlan]CONNSYS WAKEUP

[938722][WIFI][I][_wsys_on][18391][wlan]WSYS POS

[938722][WIFI][I][_wsys_on][18397][wlan]WRITE 600601a4 1

[938722][WIFI][I][_wsys_on][18403][wlan]polling 0x60001000 10 times

[938725][WIFI][I][_wsys_on][18415][wlan]0x60001000: 2040100
```

- Return log.

```
[940276][WIFI][I][rlmDomainSendPwrLimitCmd_V2][3938]Load TxPwrLimitData failed

[940276][WIFI][I][wifi_initialization][3875][wlan]initWlan> 0

[940276][WIFI][I][wifi_initialization][3885][wlan]wifi init success
```

2.2.1.2 wifitest -O

Purpose: Enter wifi test mode.

Command	Input parameter	Return value	Return code	Command behavior
wifitest -O	-	-	-	Run the command.

Example:

```
wifitest -O
wifitest -O

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[1394898][WIFI][I][priv_qa_agent][9458]HQA: return 0


Query Ddie free block: 60 total block 0

[1395407][WIFI][I][priv_qa_agent][9458]HQA: return 0


[1395409][WIFI][I][priv_qa_agent][9458]HQA: return 0
```

2.2.2 Tx/Rx common Part

2.2.2.1 wifitest -c <Param>

Purpose: Set Channel number.

<Param> : value range, 2.4G [1~14]/5G [36~196].

Command	Input parameter	Return value	Return code	Command behavior
wifitest -c <channel>	2.4G [1~14]/5G [36~196]	-	-	Set the value.

2.2.2.2 wifitest -b <Param>

Purpose : Set channel bandwidth for 802.11a/b/g/n/ac/ax mode.

<Param> :

- 0 = bandwidth 20
- 1 = bandwidth 40
- 2 = bandwidth 80.

Command	Input parameter	Return value	Return code	Command behavior
wifitest -b <Param>	0,1,2	-	-	Set the value.

2.2.2.3 wifitest -S <Param>

Purpose : Set TX/RX test period in seconds.

<Param> : sec, 0 = unlimited packets

Command	Input parameter	Return value	Return code	Command behavior
wifitest -b <time>	time (sec)	-	-	Set the value.

2.2.2.4 wifitest -T

Purpose : Stop Tx/Rx test.

Command	Input parameter	Return value	Return code	Command behavior
wifitest -T	-	-	-	Run the command.

2.2.3 Tx Part

2.2.3.1 wifitest -t <Param>

Purpose : Set TX test mode for 802.11a/b/g mode or 802.11 n/ac/ax mode.

<Param> :

- 0 = a/b/g mode
- 1 = n mode
- 2 = ac mode
- 3 = ax mode.

Command	Input parameter	Return value	Return code	Command behavior
wifitest -t <Param>	0,1,2,3	-	-	Set the value.

2.2.3.2 wifitest -R <Param>

Purpose : Set legacy rate code for a/b/g mode.

<Param> :

- 1 = 1M (CCK)
- 2 = 2M (CCK)
- 3 = 5.5M (CCK)
- 4 = 6M
- 5 = 9M
- 6 = 11M (CCK)
- 7 = 12M
- 8 = 18M

- 9 = 24M
- 10 = 36M
- 11 = 48M
- 12 = 54M

Command	Input parameter	Return value	Return code	Command behavior
wifitest -R <Param>	1~12	-	-	Set the value.

2.2.3.3 wifitest -N <Param>

Purpose : Set MCS rate for n/ac.

<Param> :

- 0 = MCS0
- 7 = MCS7
- 8 = MCS8
- 9 = MCS9
- 32 = MCS 32

Command	Input parameter	Return value	Return code	Command behavior
wifitest -N <Param>	0,7,8,9,32	-	-	Set the value.

2.2.3.4 wifitest -n <Param>

Purpose : Set TX test packet number.

<Param> : number of packets, 0 = unlimited packets.

Command	Input parameter	Return value	Return code	Command behavior
wifitest -n <Param>	number of packets	-	-	Set the value.

2.2.3.5 wifitest -s <Param>

Purpose : Set preamble.

<Param> : 0 = short preamble, 1 = long preamble.

Command	Input parameter	Return value	Return code	Command behavior
wifitest -s <Param>	0,1	-	-	Set the value.

2.2.3.6 wifitest -p <Param>

Purpose : Set WiFi TX transmit power or measured BT Tx power in WF Rx mode.

<Param> : dBm (Resolution 0.5dB/step).

Command	Input parameter	Return value	Return code	Command behavior
wifitest -p <Param>	power(dBm)	-	-	Set the value.

2.2.4 Rx Part

2.2.4.1 wifitest -r

Purpose : Set WiFi to Rx mode.

Command	Input parameter	Return value	Return code	Command behavior
wifitest -r	-	-	-	Run the command.

2.3 BLE commands

2.3.1 DUT Initail

2.3.1.1 bt btdrv dlfw

Purpose : Initial DUT bt mode.

Response : Download firmware finish.

Command	Input parameter	Return value	Return code	Command behavior
bt btdrv dlfw	-	Download firmware finish.	-	Run the command.

Example:

```
$ bt btdrv dlfw
bt btdrv dlfw

[20046][BTIF][I][bt_driver_init][699]bt_driver_init, version: BT_1.0.0_2021052801

[20047][BTIF][I][btmtk_init][2300]btmtk_init

[20047][BTIF][I][btmtk_parse_bt_config][644]bt config:

[20048][BTIF][I][btmtk_parse_bt_config][645]        SUPPORT_DONGLE_RESET = 0

[20048][BTIF][I][btmtk_parse_bt_config][646]          SUPPORT_SINGLE_SKU = 0

[20048][BTIF][I][btmtk_parse_bt_config][647]          SUPPORT_AUTO_PICUS = 0
```

Return log:

```
[21116][BTIF][I][btmtk_load_fw_using_hif][1686]btmtk_load_fw_using_hif: patch_status 0
$
$ [21128][BTIF][I][btmtk_send_fw_rom_patch][1885]Send FW: load bt fw... Done
[21128][BTIF][I][btmtk_open][2369] Download firmware finish
```

2.3.1.2 bt btdrv bt_on

Purpose : Initial DUT bt mode.

Response : bt_driver_func_on: success.

Command	Input parameter	Return value	Return code	Command behavior
bt btdrv bt_on	-	bt_driver_func_on: success.	-	Run the command.

Example:

```
bt btdrv bt_on
bt btdrv bt_on
[422955][BTIF][I][bt_driver_func_on][431]bt_driver_func_on
[422957][BTIF][I][btmtk_load_fw_using_hif][1686]btmtk_load_fw_using_hif: patch_status 0
[422969][BTIF][I][btmtk_func_ctrl][1911]btmtk_func_ctrl: send BT power on cmd
[423665][BTIF][I][btmtk_buffer_mode_initialize][434]btmtk_buffer_mode_initialize: addr is invalid
[423665][BTIF][I][btmtk_buffer_mode_check_auto_mode][123]btmtk_buffer_mode_check_auto_mode: mode 1
[423665][BTIF][I][btmtk_buffer_mode_send][287]btmtk_buffer_mode_send: addr is invalid
```

Return Log:

```
$
$ [423680][BTIF][I][btmtk_send_low_power_cmd][1111]btmtk_send_low_power_cmd: OK
[423680][BTIF][I][bt_driver_func_on][464] bt_driver_func_on: success
```

2.3.2 Tx/Rx common Part

2.3.2.1 bt btpriv boots -c ble_stop

Purpose : Stop BLE test

Command	Input parameter	Return value	Return code	Command behavior
bt btpriv boots -c ble_stop	-	-	-	Run the command.

2.3.3 Tx Part

2.3.3.1 bt btpriv boots -c txpow -b <p1> -e <p2> -m <p3> -n <p4> -o <p5>

Purpose : BT power setting in dBm.

<p1> : EDR init TX power dbm.(-32~12)

<p2> : BLE TX power dbm.(-29~20)

<p3> : EDR Max TX power dbm.(-32~12)

<p4> : 0 = Default disable Lv9, 1 = enable Lv9.

<p5> : 0 = Default 3db diff, 1 = 0db diff mode to BR/EDR.

Command	Input parameter	Return value	Return code	Command behavior
bt btpriv boots -c txpow -b <p1> -e <p2> -m <p3> -n <p4> -o <p5>	-b <p1> -e <p2> -m <p3> -n <p4> -o <p5>	-	-	Run the command.

2.3.3.2 bt btpriv boots -c ble_etx -c <ch> -l <pkt len> -p <pattern> -y <phy>

Purpose : BLE Tx test

<ch> : Channel: 0-39

<pkt len> : Length in bytes of packet: 0-255(**DEC**)

<pattern> :

- 0 = PRBS9
- 1 = 11110000
- 2 = 10101010
- 3 = PRBS15
- 4 = 11111111
- 5 = 00000000
- 6 = 00001111
- 7 = 01010101

<phy> :

- 1 = LE 1M
- 2 = LE 2M
- 3 = LE Coded(S = 8) 125K
- 4 = LE Coded(S = 2) 500K

Command	Input parameter	Return value	Return code	Command behavior
bt btpriv boots -c ble_etx -c <ch> -l <pkt len> -p <pattern> -y <phy>	-c <channel> -l <pkt len> -p <pattern> -y <phy>	-	-	Run the command.

2.3.4 Rx Part

2.3.4.1 bt btpriv boots -c ble_erx -c <ch> -y <phy> -m <modulation>

Purpose : BLE Rx test

<ch> : Channel: 0-39

<phy> :

- 1 = LE 1M
- 2 = LE 2M
- 3 = LE Coded(S = 8) 125K
- 4 = LE Coded(S = 2) 500K

<modulation> :

- 0 = Standard
- 1 = Stable

Command	Input parameter	Return value	Return code	Command behavior
bt btpriv boots -c ble_erx -c <ch> -y <phy> -m <modulation>	-c <channel> -y <phy> -m <modulation>	-	-	Run the command.

3. Wifi Tool Test CMD Examples

3.1 Tx Test Example

TX Channel 1, bandwidth 20, MCS7, 11n, Long Preamble, Packet unlimited, 10 seconds, power 17 dbm.

Step1. wifi on
Step2. wifitest –O
Step3. wifitest -t 1 -c 1 -b 0 -N 7 -p 17 -S 10 -s 1 -n 0

Note :

- Step1 and step2 only need to do once, unless you reboot.
- If -S set 0(unlimited packets), you need to use **wifitest -T** command to stop Tx test.

3.2 Rx Test Example

RX CH1, BW20, 10 seconds

Step1. wifi on
Step2. wifitest -O
Step3. wifitest -r -c 1 -b 0 -S 10
Result :

Note :

- Step1 and step2 only need to do once, unless you reboot.
- If -S set 0(unlimited packets), you need to use **wifitest -T** command to stop Rx test, and use **wifitest -q 11** command to get the Rx result.

4. BLE Tool Test CMD Examples

4.1 Tx Test Example

TX Channel 0, power 10 dbm, length of packet 255 bytes, pattern 01010101, phy 125KLE.

Step1. bt btdrv dlfw
Step2. bt btdrv bt_on
Step3. bt btpriv boots -c ble_etx -c 0 -l 255 -p 7 -y 3
Step4. bt btdrv boots -c ble_stop

Note:

- Step1 and step2 only need to do once, unless you reboot.

4.2 Rx Test Example

RX Channel 0, phy 125KLE, modulation standard.

Step1. bt btdrv dlfw
Step2. bt btdrv bt_on
Step3. bt btpriv boots -c ble_erx -c 0 -y 3 -m 0
Step4. bt btdrv boots -c ble_stop

Result:

```
[2366967][BOOTS][I][boots_pkt_handler_parse][663]     Event0: 0E 06 01 1F 20 00 00 00
[2366967][BOOTS][I][boots_pkt_parsing][489]           RX Packet Count: 0
$                                                     Rx packets count
$ [2366968][BOOTS][I][boots_main][930]boots_main: cont = 0, sfile.script = 0
```

Note:

- Step1 and step2 only need to do once, unless you reboot.