MT7986
QA Tool User Guide

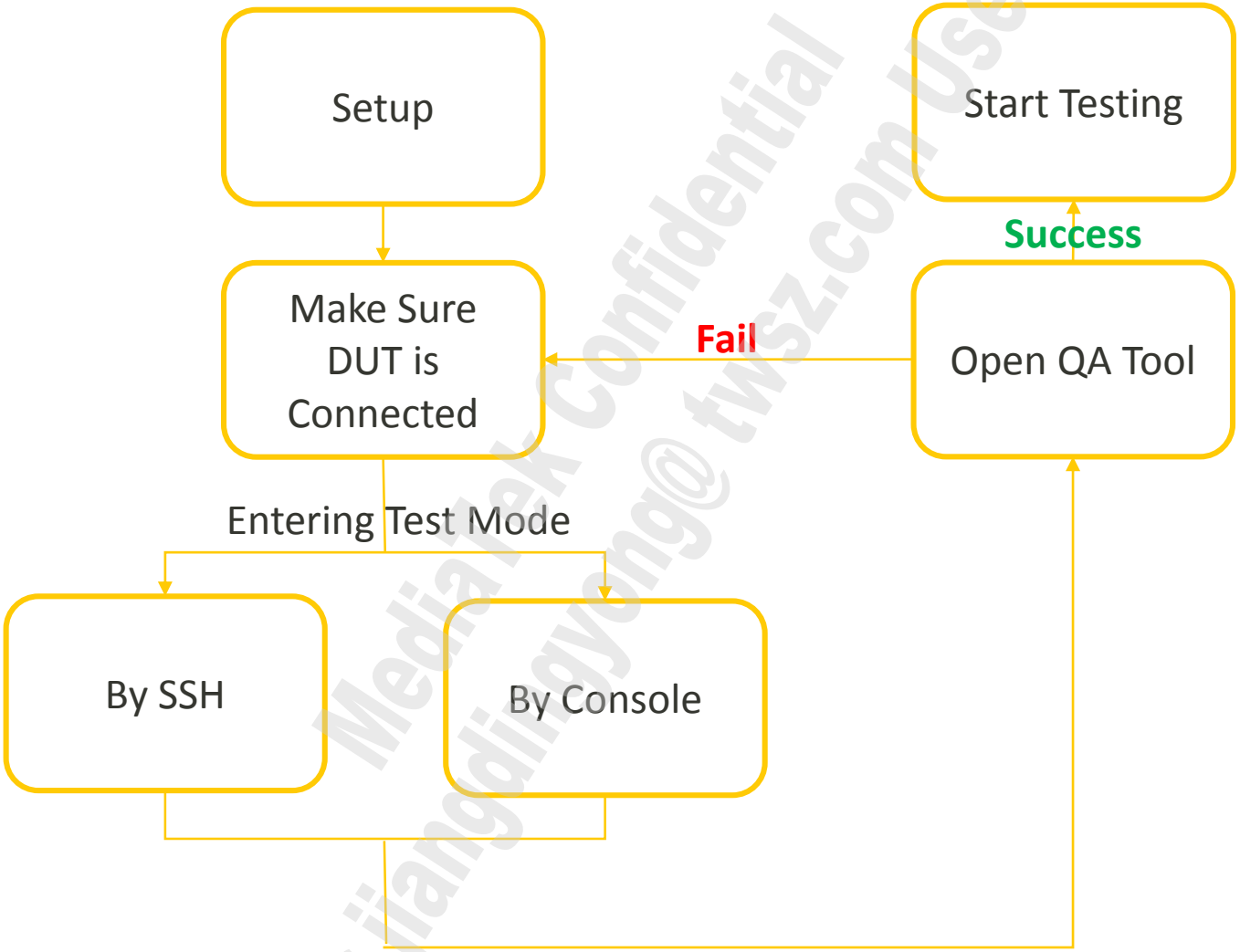
ICB/RSD/SA3

Kasper

Notes

- * : Annotation
- ❶ : Essential steps
- ❶ : Function (optional)
- blue: noteworthy items

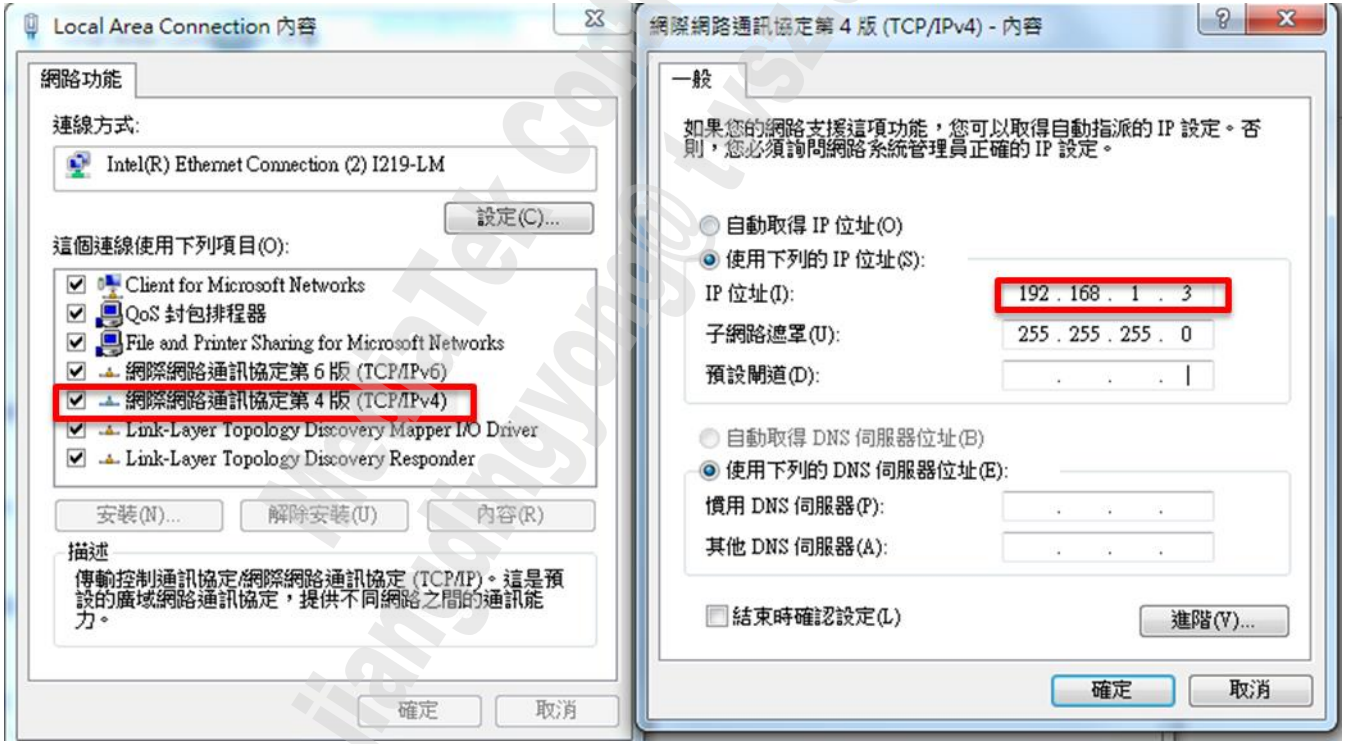
Flow



1. Setup

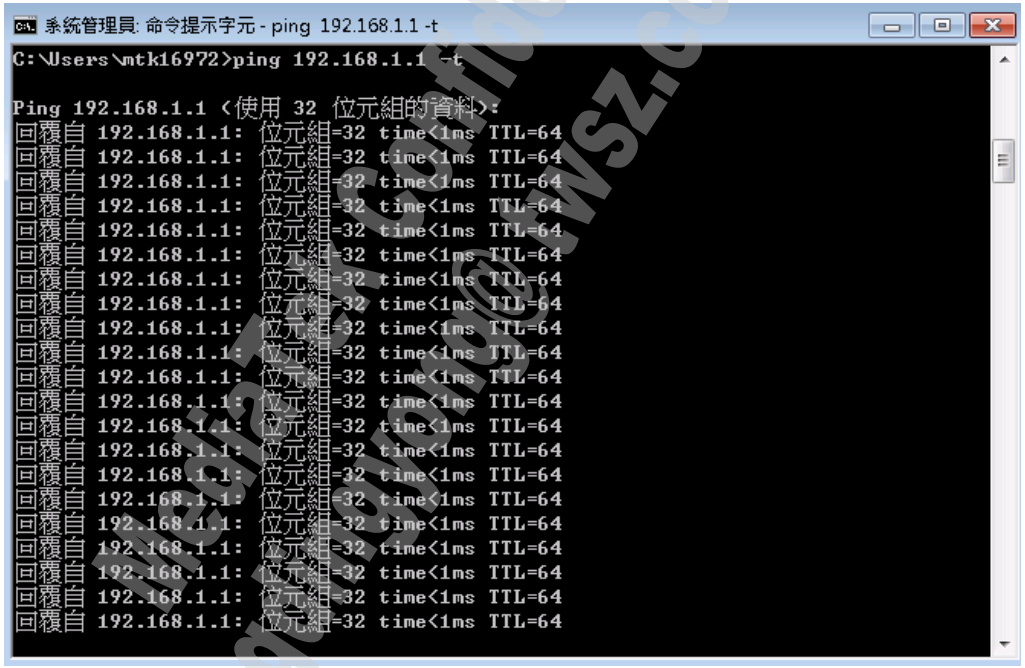
- **DUT Default IP: 192.168.1.1**
- **To connect to DUT, network IP should be set to same IP domain**

  (ex: 192.168.1.2 or 192.168.1.3,…etc.)



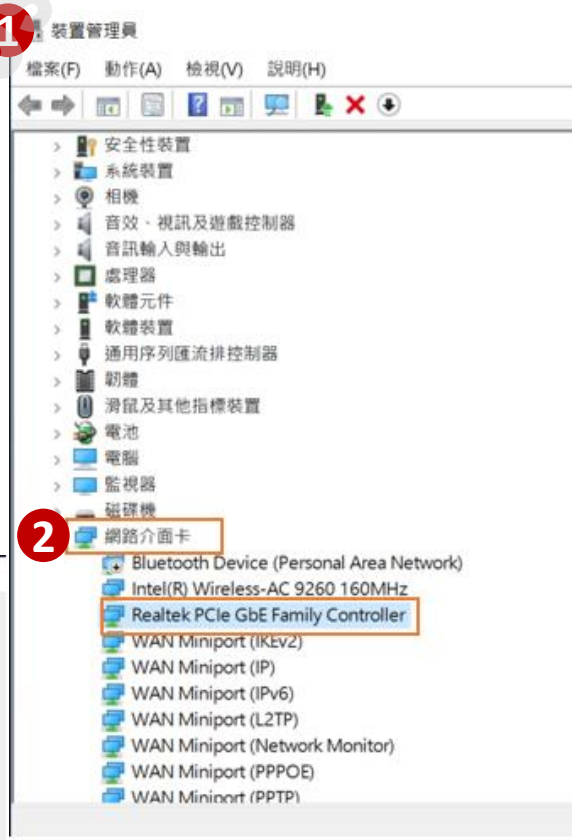
2. Make Sure DUT is Connected to Testing PC/notebook

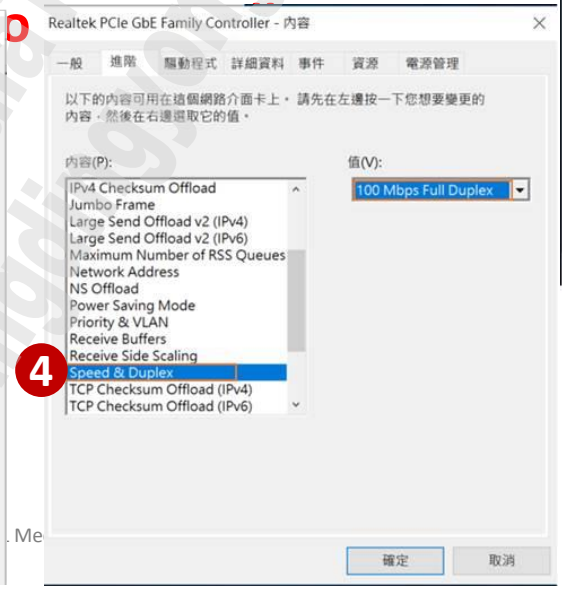
- **Open command window.**
- **Key-in “ping 192.168.1.1 -t” to ping DUT continuously.**



2. Make Sure DUT is Connected to Testing PC/notebook

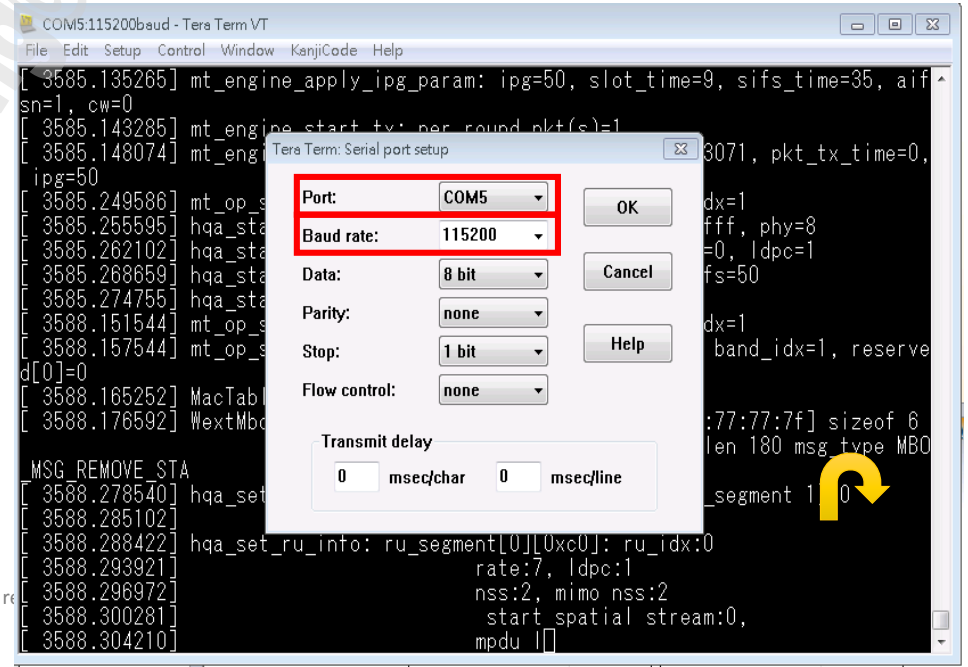
- If “ping 192.168.1.1 -t” **fail**
  1. Go to device manager
  2. Find “Network Adapters”
     - ➔ choose the one connecting to DUT
     - ➔ right click, choose “properties”
  3. **Disable Energy-Efficient Ethernet**





3. Entering Test Mode

1. By SSH (by Ethernet cable)
   - Key-in “ssh root@192.168.1.1”.
   - key-in “ated” right after “root@LEDE:~#” to enter test-mode.
2. By Console
   - Select port, and baud rate set to 115200.
   - Key-in “ated” right after “root@LEDE:/#” to enter test-mode.



Could NOT access by SSH

- **If Could NOT access by SSH**
  - Key-in "ssh-keygen -R 192.168.1.1" to remove RSA key.

```
C:\>ssh root@192.168.1.1
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@    WARNING: REMOTE HOST IDENTIFICATION HAS CHANGED!     @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
IT IS POSSIBLE THAT SOMEONE IS DOING SOMETHING NASTY!
Someone could be eavesdropping on you right now (man-in-the-middle attack)!
It is also possible that a host key has just been changed.
The fingerprint for the RSA key sent by the remote host is
SHA256:z0m3p/i/reaEW04sIcVctrYHtq8pPRTKqWNuj0ds/Ns.
Please contact your system administrator.
Add correct host key in C:\\Users\\.ssh/known_hosts to get rid of this message.
Offending RSA key in C:\\Users\\.ssh/known_hosts:1
RSA host key for 192.168.1.1 has changed and you have requested strict checking.
Host key verification failed.

C:\>
```

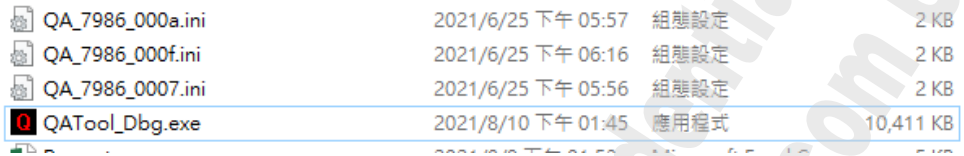
  - Then Key-in "ssh root@192.168.1.1".

```
C:\>ssh-keygen -R 192.168.1.1
# Host 192.168.1.1 found: line 1
C:\Users/.ssh/known_hosts updated.
Original contents retained as C:\Users/.ssh/known_hosts.old

C:\>ssh root@192.168.1.1
The authenticity of host '192.168.1.1 (192.168.1.1)' can't be established.
RSA key fingerprint is SHA256:z0m3p/i/reaEW04sIcVctrYHtq8pPRTKqWNuj0ds/Ns.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.1.1' (RSA) to the list of known hosts.


BusyBox v1.33.1 (2021-08-11 20:12:26 UTC) built-in shell (ash)

  _______                     ________        __
 |       |.-----.-----.-----.|  |  |  |.----.|  |_
 |   -   ||  _  |  -__|     ||  |  |  ||   _||   _|
 |_______||   __|_____|__|__||________||__|  |____|
          |__| W I R E L E S S   F R E E D O M
 -----------------------------------------------------
 OpenWrt 21.02-SNAPSHOT, r0+16268-750b966866
 -----------------------------------------------------
=== WARNING! =====================================
There is no root password defined on this device!
Use the "passwd" command to set up a new password
in order to prevent unauthorized SSH logins.
--------------------------------------------------
root@OpenWrt:~#
```

3. Open QA Tool

- Open “QATool_Dbg.exe”.

  *If you can't lunch QA tool (popup can't find wpcap.dll message), please install WinPcap.

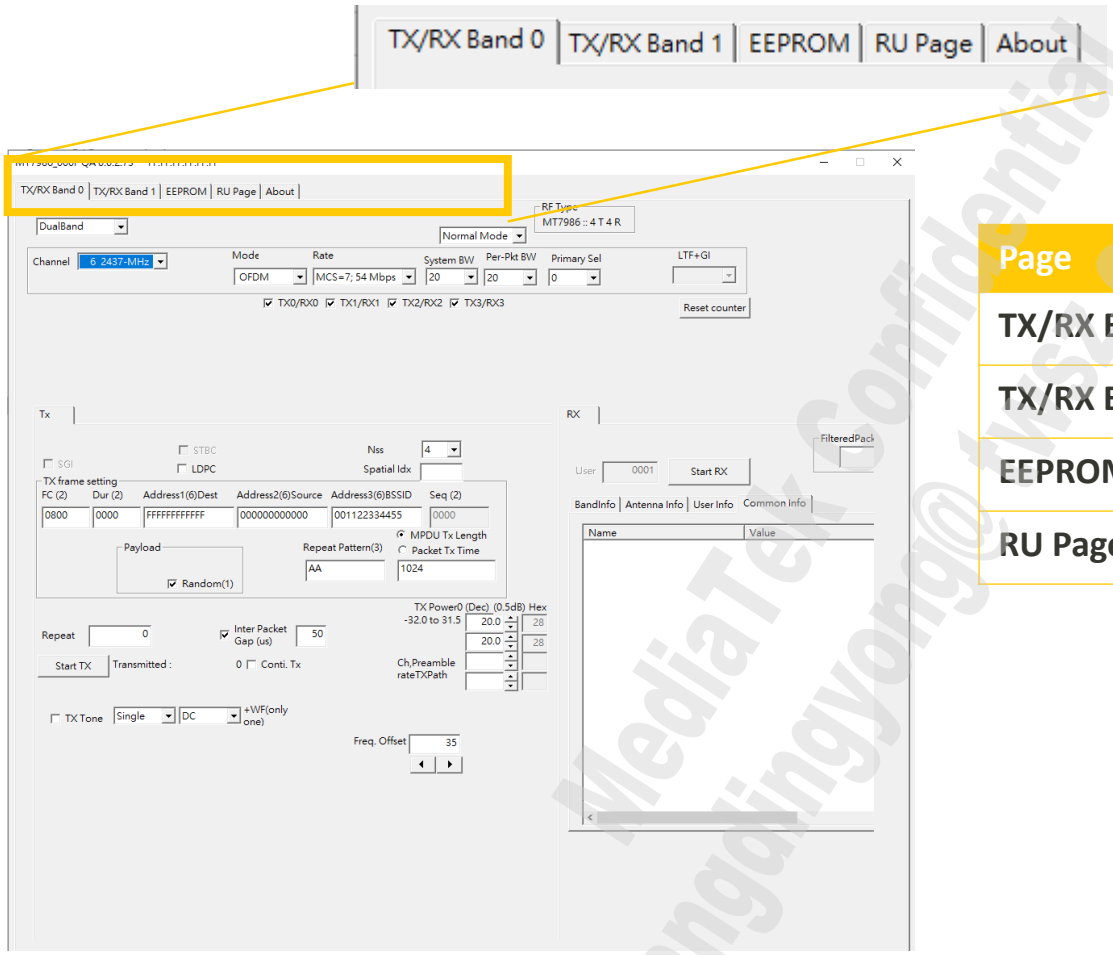


- Choose “APSOC”.

- Select corresponded n JT)

- Press OK

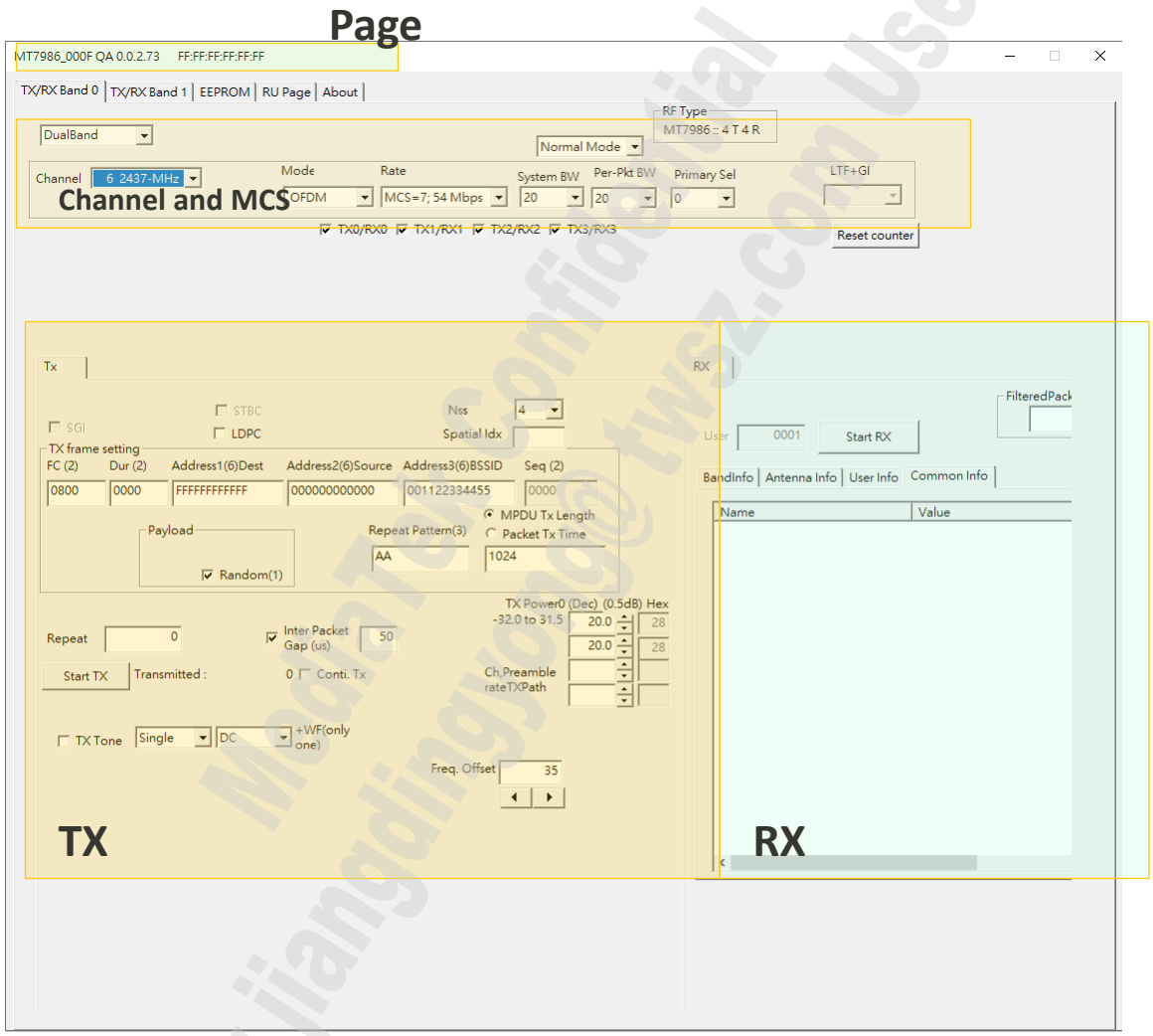
4. Start Using QA Tool



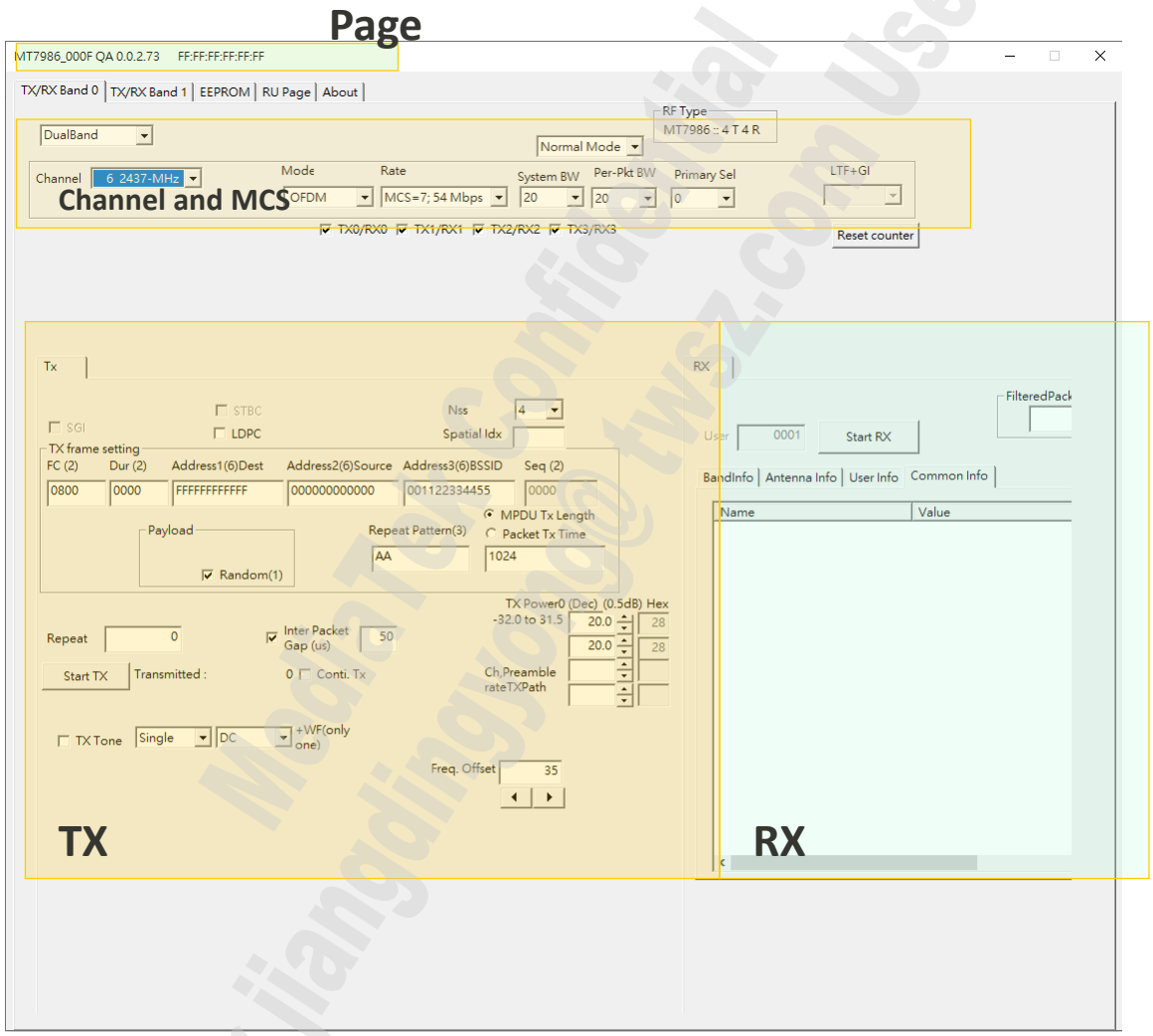
Page	Usage
TX/RX Band 0	G Band TX/RX
TX/RX Band 1	A Band TX/RX
EEPROM	Read/Write/Save EEPROM
RU Page	HE-MU/HE-TB Setting Details

Note: For DBDC: TX/RX page separates into G band ➔TX/RX, and A band ➔TX/RX Band1

UI Introduction – Main Page

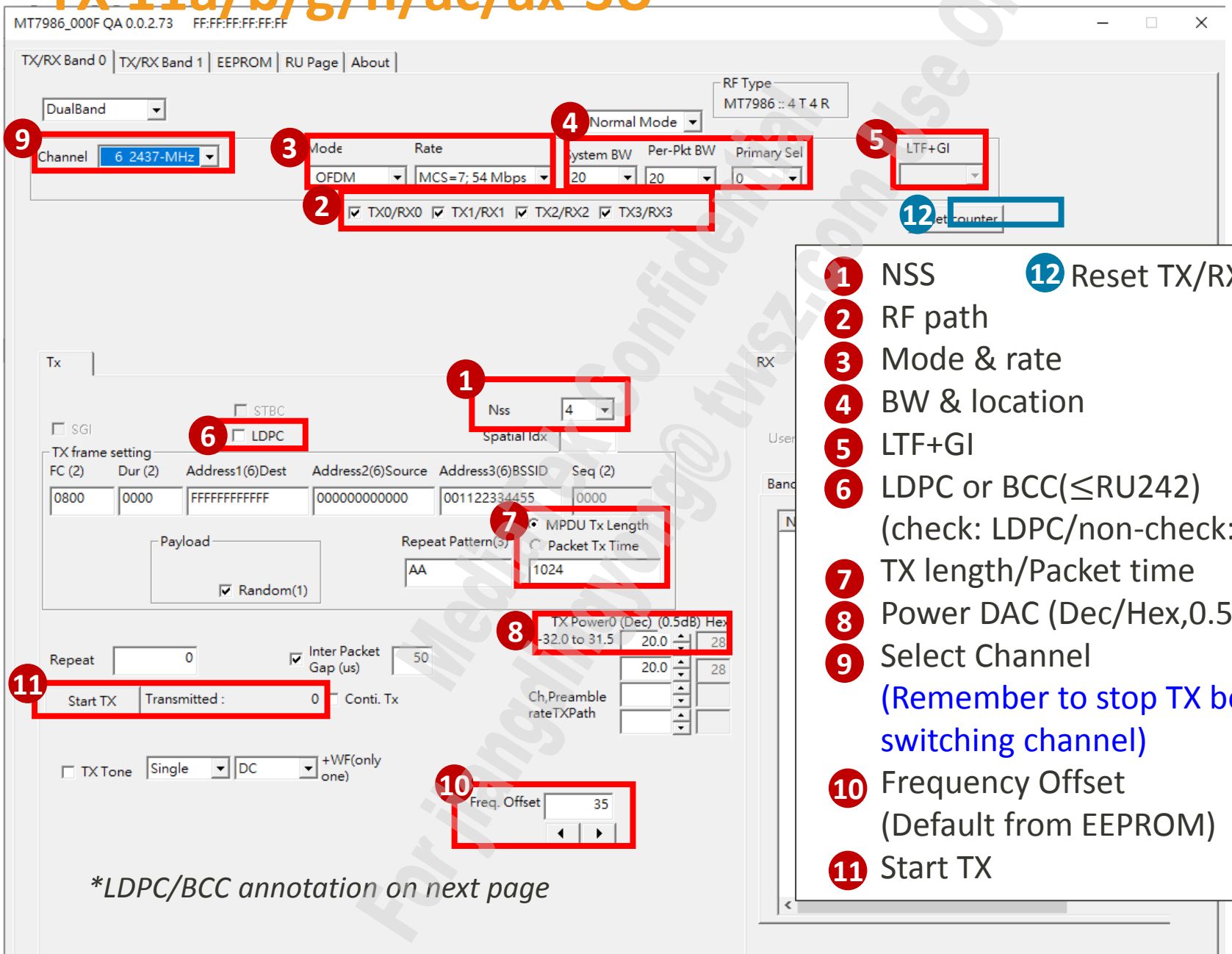


UI Introduction – Main Page



Contents

TX 11a/b/g/n/ac/ax-SU



**LDPC/BCC annotation on next page*

1. NSS
2. RF path
3. Mode & rate
4. BW & location
5. LTF+GI
6. LDPC or BCC(≤RU242)
   (check: LDPC/non-check: BCC)*
7. TX length/Packet time
8. Power DAC (Dec/Hex,0.5dB)
9. Select Channel
   (Remember to stop TX before switching channel)
10. Frequency Offset
    (Default from EEPROM)
11. Start TX
12. Reset TX/RX counter

HE MCS index Combination

V: mandatory support
V: optional support
V: MTK proprietary support
X: un-support

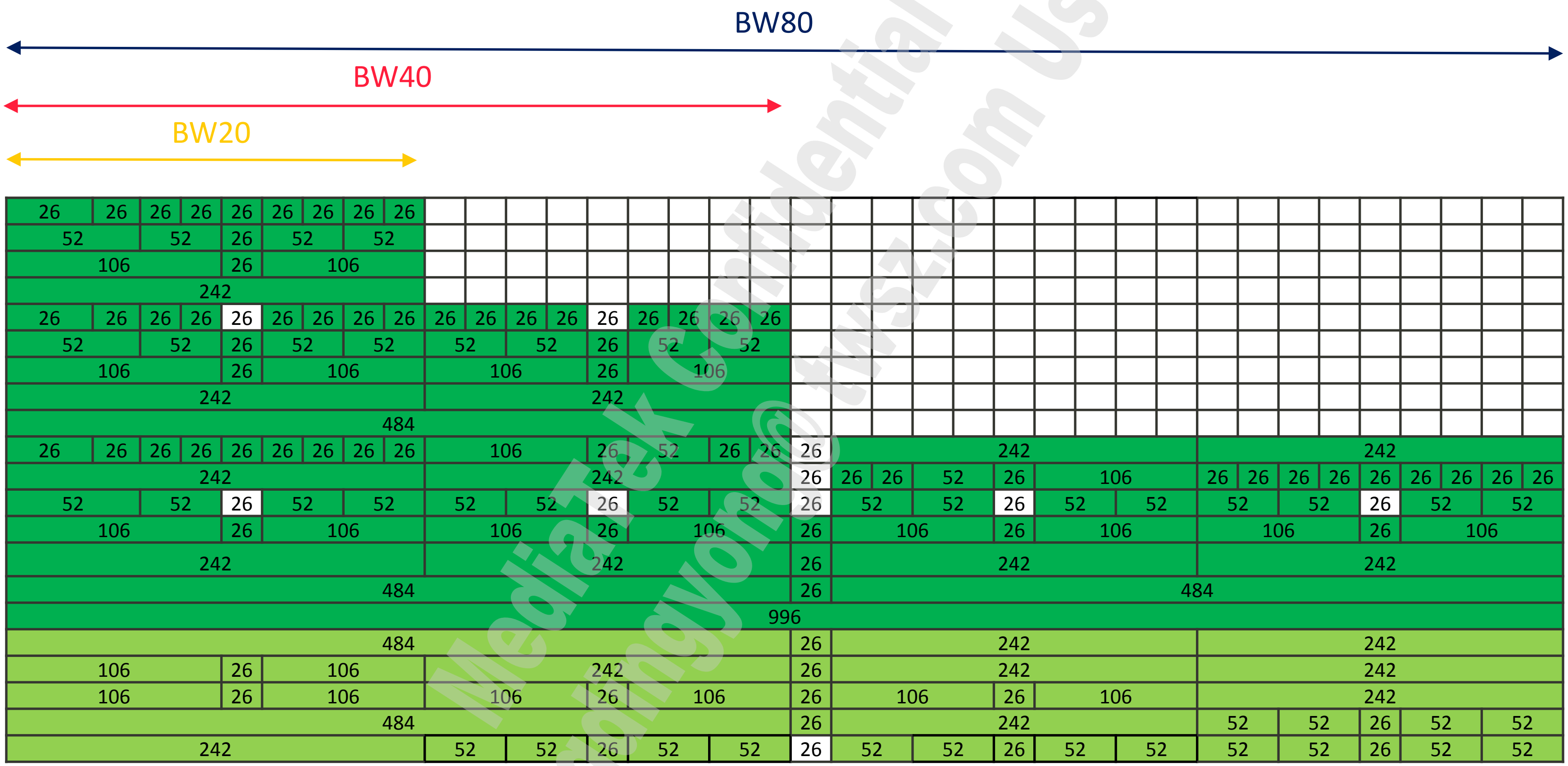
Parameter	RU26	RU52	RU106	RU242 (BW20)	RU484 (BW40)	RU996 (BW80)	RU996x2 (BW80+80)
MU-MIMO	X	X	V	V	V	V	V
BCC	V	V	V	V	X	X	X
LDPC	V	V	V	V	V	V	V
1024QAM	V	V	V	V	V	V	V
256QAM	V	V	V	V	V	V	V

AX Support TABLE

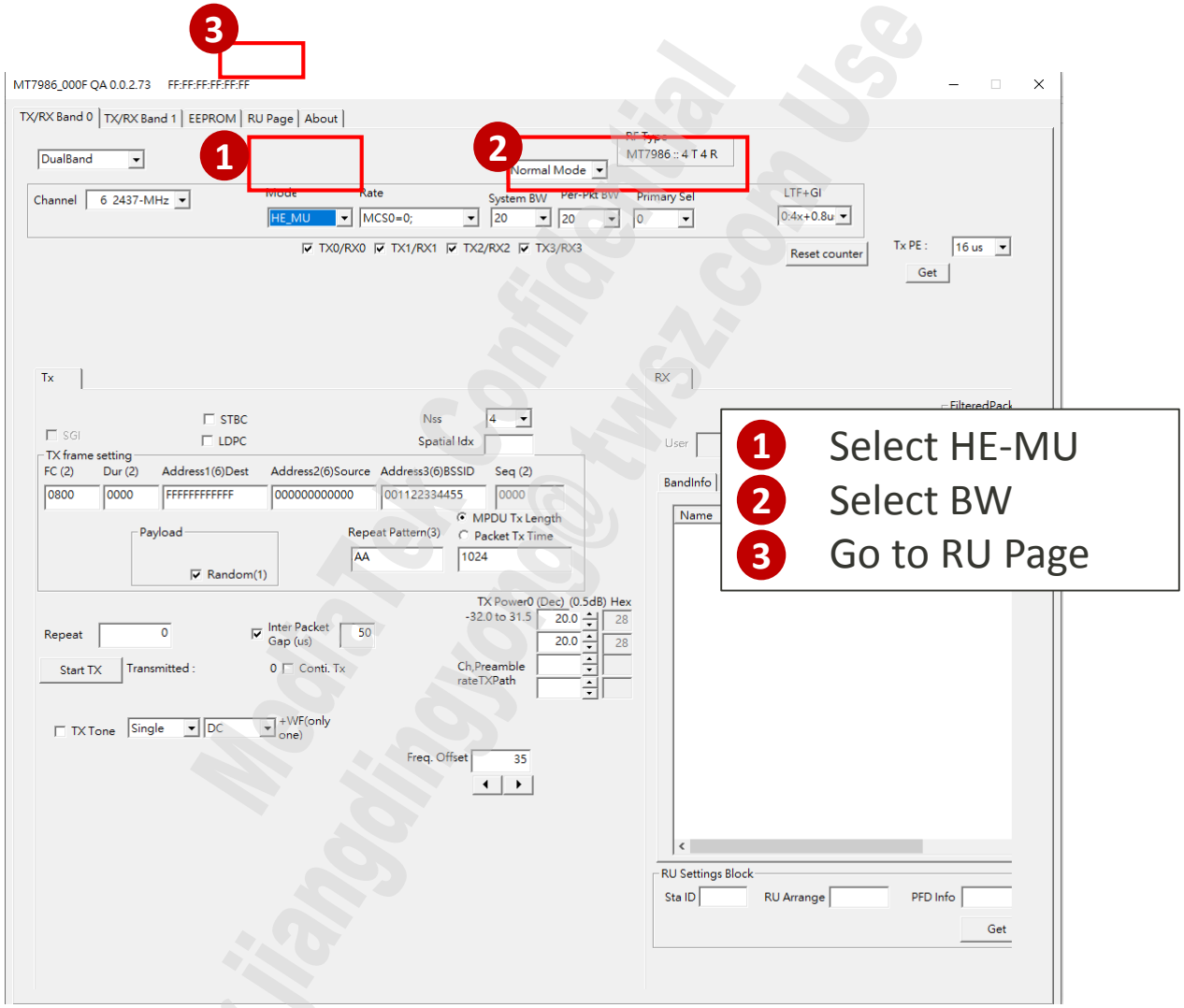
RU26	1ss M0~7	1ss M8~9	1ss M10	1ss M11	2ss M0~7	2ss M8~9	2ss M10	2ss M11	3ss M0~7	3ss M8~9	3ss M10	3ss M11	4ss M0~7	4ss M8~9	4ss M10	4ss M11
BCC	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
LDPC	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
RU52	1ss M0~7	1ss M8~9	1ss M10	1ss M11	2ss M0~7	2ss M8~9	2ss M10	2ss M11	3ss M0~7	3ss M8~9	3ss M10	3ss M11	4ss M0~7	4ss M8~9	4ss M10	4ss M11
BCC	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
LDPC	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
RU106	1ss M0~7	1ss M8~9	1ss M10	1ss M11	2ss M0~7	2ss M8~9	2ss M10	2ss M11	3ss M0~7	3ss M8~9	3ss M10	3ss M11	4ss M0~7	4ss M8~9	4ss M10	4ss M11
BCC	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
LDPC	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
RU242	1ss M0~7	1ss M8~9	1ss M10	1ss M11	2ss M0~7	2ss M8~9	2ss M10	2ss M11	3ss M0~7	3ss M8~9	3ss M10	3ss M11	4ss M0~7	4ss M8~9	4ss M10	4ss M11
BCC	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
LDPC	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
RU484	1ss M0~7	1ss M8~9	1ss M10	1ss M11	2ss M0~7	2ss M8~9	2ss M10	2ss M11	3ss M0~7	3ss M8~9	3ss M10	3ss M11	4ss M0~7	4ss M8~9	4ss M10	4ss M11
BCC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LDPC	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
RU996	1ss M0~7	1ss M8~9	1ss M10	1ss M11	2ss M0~7	2ss M8~9	2ss M10	2ss M11	3ss M0~7	3ss M8~9	3ss M10	3ss M11	4ss M0~7	4ss M8~9	4ss M10	4ss M11
BCC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LDPC	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
RU996*2	1ss M0~7	1ss M8~9	1ss M10	1ss M11	2ss M0~7	2ss M8~9	2ss M10	2ss M11	3ss M0~7	3ss M8~9	3ss M10	3ss M11	4ss M0~7	4ss M8~9	4ss M10	4ss M11
BCC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LDPC	V	V	V	V	V	V	V	V	X	X	X	X	X	X	X	X

**1.BCC only support RU size ≤242*

TX HE-MU Reference Table



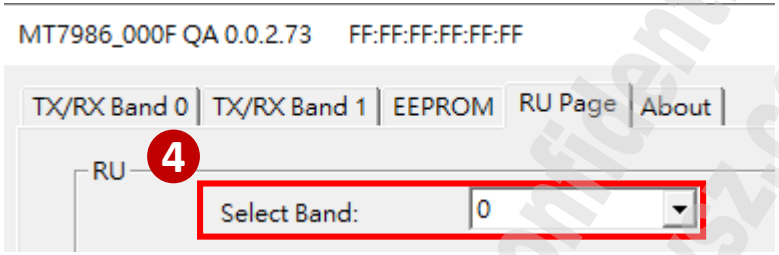
TX- HE MU



RU Page (TX HE-MU)

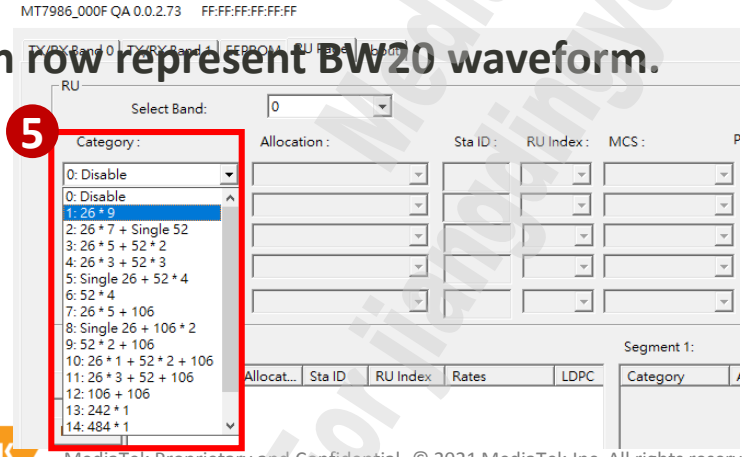
4 Select Band: 0 for G band, 1 for A band*

Note: select Band =0 for G band, and select Band =1 for A band



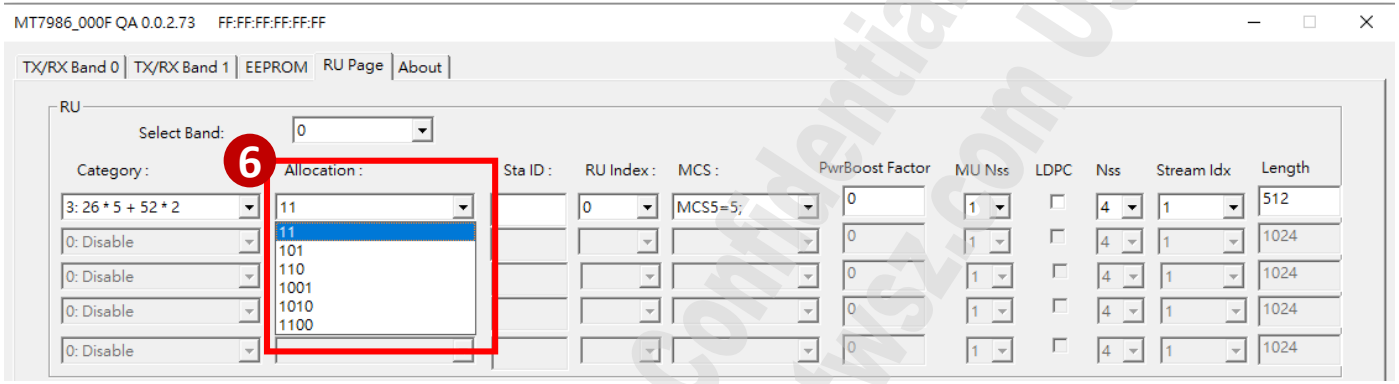
5

- **Choose RU Category for every BW20**
- **Those rows are enable only after setting relevant BW in TX/RX page.**
- **Each row represent BW20 waveform.**



RU Page (TX HE-MU)

6 Allocation (BW20, 26*5+52*2 for example)*



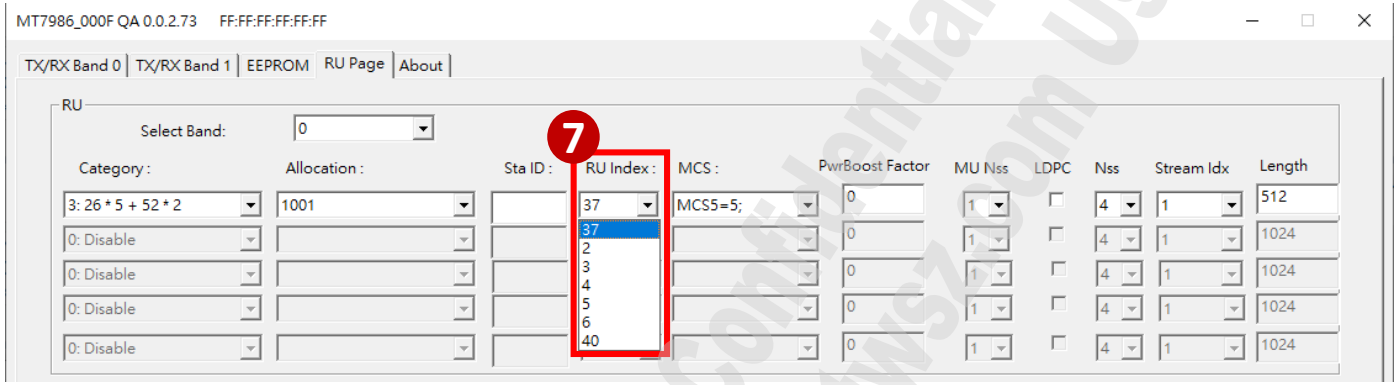
*Check t

8 bits indices	#1	#2	#3	#4	#5	#6	#7	#8	#9
00000000	26	26	26	26	26	26	26	26	26
00000001	26	26	26	26	26	26	26	52	
00000010	26	26	26	26	26	52		26	26
11 00000011	26	26	26	26	26	52		52	
00000100	26	26	52		26	26	26	26	26
101 00000101	26	26	52		26	26	26	52	
110 00000110	26	26	52		26	52		26	26
00000111	26	26	52		26	52		52	
00001000	52		26	26	26	26	26	26	26
1001 00001001	52		26	26	26	26	26	52	
1010 00001010	52		26	26	26	52		26	26
00001011	52		26	26	26	52		52	
1100 00001100	52		52		26	26	26	26	26
00001101	52		52		26	26	26	52	
00001110	52		52		26	52		26	26
00001111	52		52		26	52		52	
00010$y_2y_1y_0$	52		52		-	106 (number of users)			
00011$y_2y_1y_0$	106 (number of users)				-	52		52	
00100$y_2y_1y_0$	26	26	26	26	26	106			

00101$y_2y_1y_0$	26	26	52		26	106			
00110$y_2y_1y_0$	52		26	26	26	106			
00111$y_2y_1y_0$	52		52		26	106			
01000$y_2y_1y_0$	106				26	26	26	26	26
01001$y_2y_1y_0$	106				26	26	26	52	
01010$y_2y_1y_0$	106				26	52		26	26
01011$y_2y_1y_0$	106				26	52		52	
0110$y_1y_0z_1z_0$	106				-	106			
01110000	52		52		-	52		52	
01110001	242-tone RU empty								
01110010	484-tone RU with zero HE-SIG-B User Specific field in the corresponding HE-SIG-B Content Channel								
01110011	996-tone RU with zero HE-SIG-B User Specific field in the corresponding HE-SIG-B Content Channel								
10$y_2y_1y_0z_2z_1z_0$	106				26	106			
11000$y_2y_1y_0$	242								
11001$y_2y_1y_0$	484								
11010$y_2y_1y_0$	996								
11011$y_2y_1y_0$	2*996								

RU Page (TX HE-MU)

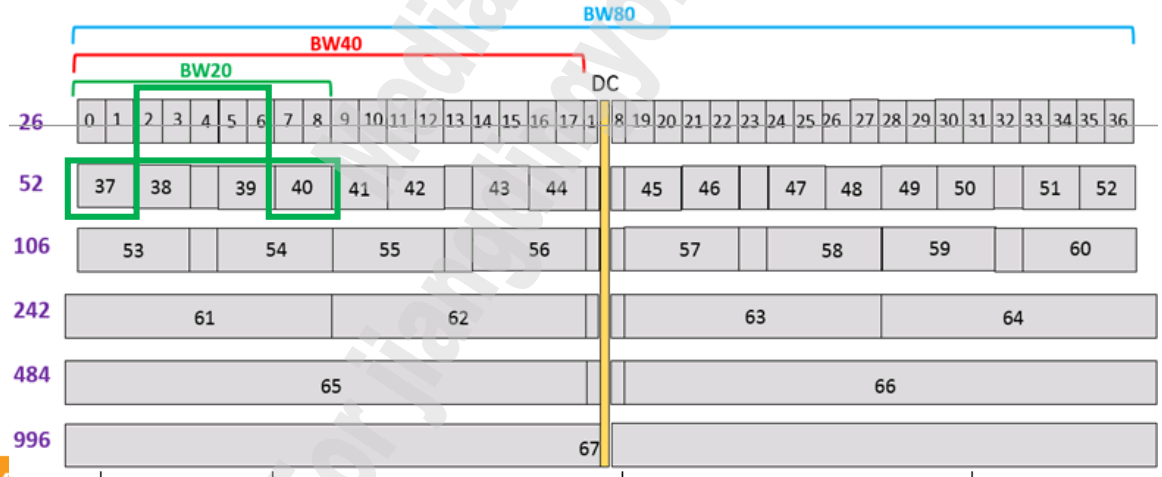
7 Select RU Index (BW20, 26*5+52*2, allcation:1001 for example)*



1001➔

52	26	26	26	26	26	52

*Check the RU Index form below (BW20, 26*5+52*2 for example)



RU Page (TX HE-MU)

8 Select details:

1. **MCS rate**
2. **Power Boost Factor(range:-6~+6dB)**
   - **Resolution: 1/32 dB**
   - **Example: 1dB ➔PowerBoost Factor=32**

     -1dB ➔PowerBoost Factor=-32
3. **MU NSS: Antenna number**
4. **LDPC: check for LDPC, non-check for BCC**
5. **Stream Idx: select 1**
6. **Length settings: (see next page*)**

RU Page (TX HE-MU)

*Examples

Examples	User	MU NSS (antenna number)	NSS	Stream Idx
106+26+106 user1 / user2 / user3 4ss / 4ss / 4ss	User1~4	4	4	1
106+26+106 user1 / user3 / user4 2ss / 4ss / 4ss user2 2ss	User1	4	**2**	**1***
	User2	4	**2**	**3***
	User3	4	4	1
	User4	4	4	1
106+26+106 user1 / user3 / user4 1ss / 4ss / 4ss user2 3ss	User1	4	**1**	**1**
	User2	4	**3**	**2**
	User3	4	4	1
	User4	4	4	1

*Stands for 1&2

*user1: 1&2
user2 starts from 3

❽* MPDU TX Length Setting in HQA

- The table shown below is implemented in QATool already.
  ➔ choose wanted RUs, directly shows corresponding length.
- Users are able to modify the PSDU length manually.

For NSS=1/2

PSDU Length : Short

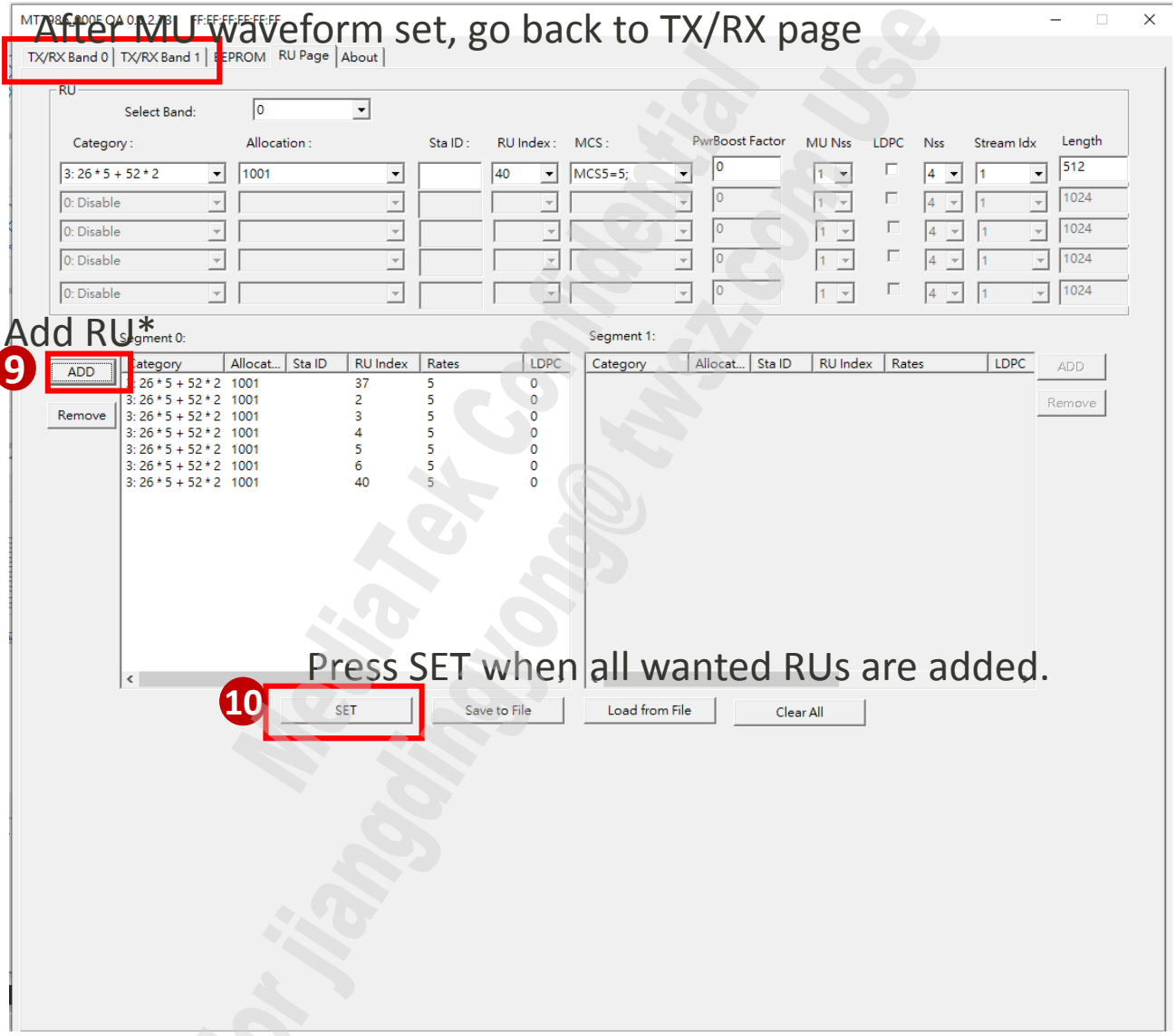
RU size	0	1	2	3	4	5	6	7	8	9	10	11
26	32	64	128	128	128	128	128	128	128	128	128	128
52	64	128	256	256	256	256	256	256	256	256	256	256
106	128	256	512	512	512	512	512	512	512	512	512	512
242	256	512	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
484	512	1024	2048	2048	2048	2048	2048	2048	2048	2048	2048	2048
996	1024	2048	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096
996*2	2048	4096	8192	8192	8192	8192	8192	8192	8192	8192	8192	8192

For NSS=3/4

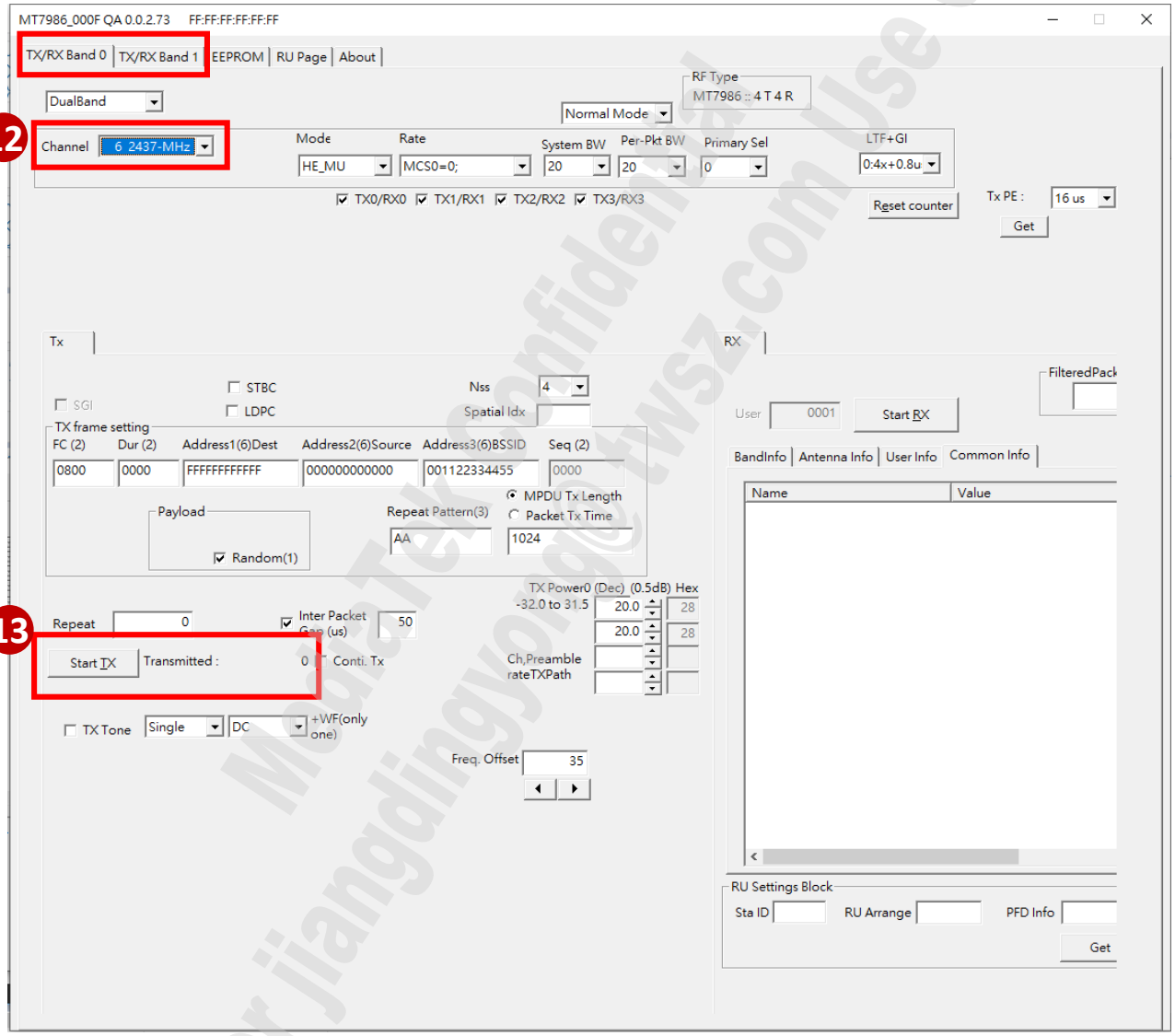
PSDU Length : long

RU size	0	1	2	3	4	5	6	7	8	9	10	11
26	128	256	512	512	512	512	512	512	512	512	512	512
52	256	512	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
106	512	1024	2048	2048	2048	2048	2048	2048	2048	2048	2048	2048
242	1024	2048	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096
484	2048	4096	8192	8192	8192	8192	8192	8192	8192	8192	8192	8192
996	4096	8192	8192	8192	8192	8192	8192	8192	8192	8192	8192	8192
996*2	8192	8192	8192	8192	8192	8192	8192	8192	8192	8192	8192	8192

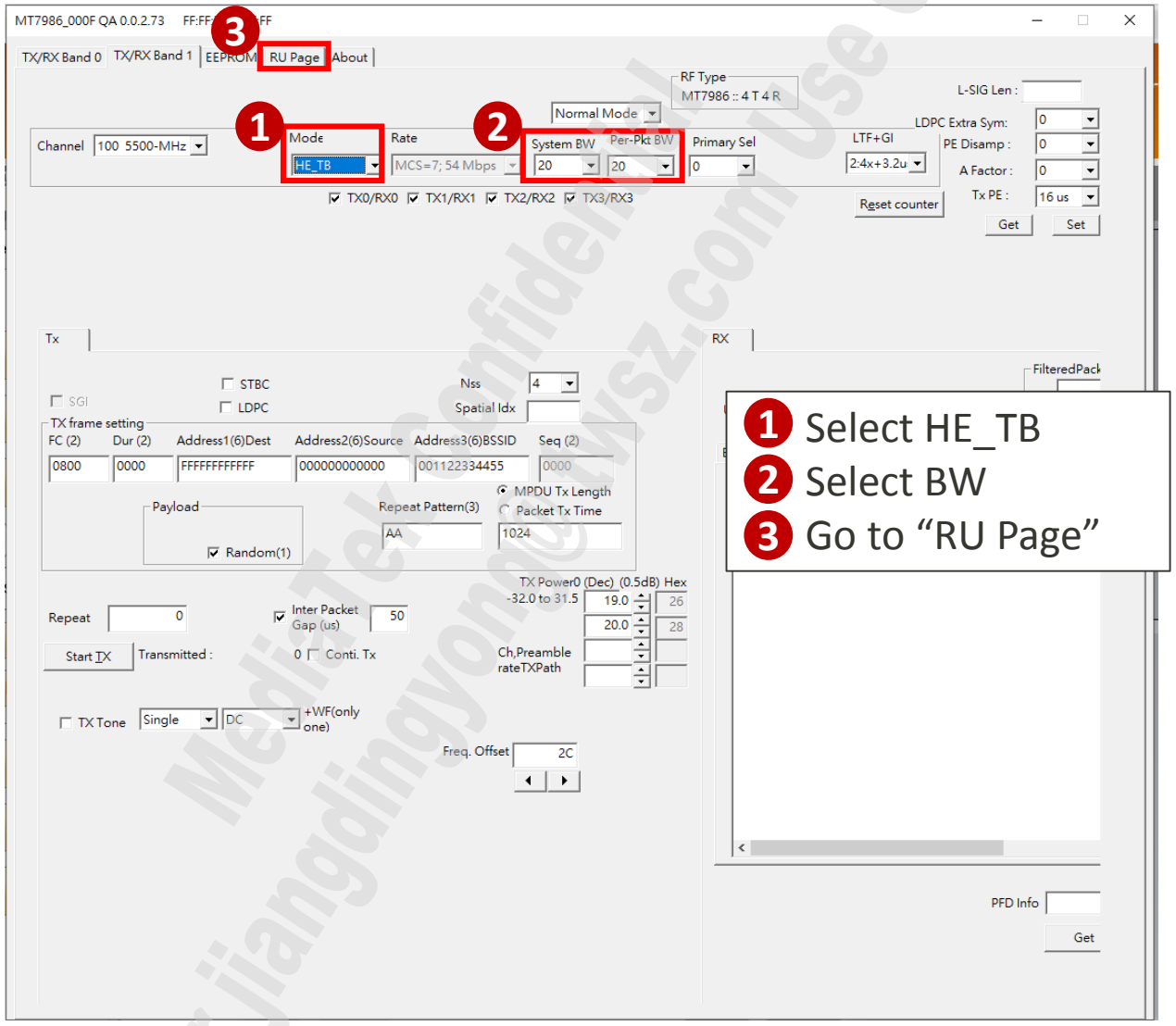
RU Page (HE-MU)



TX- HE MU(TX/RX Page)



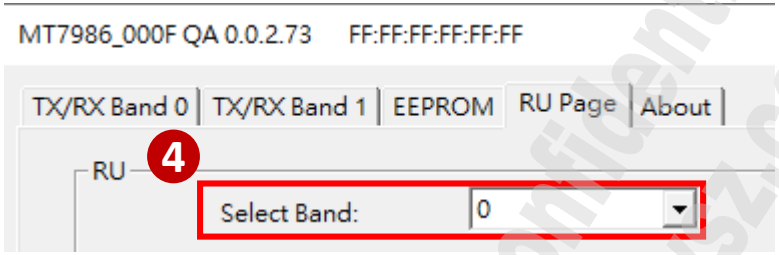
TX HE-TB



RU Page (TX HE-TB)

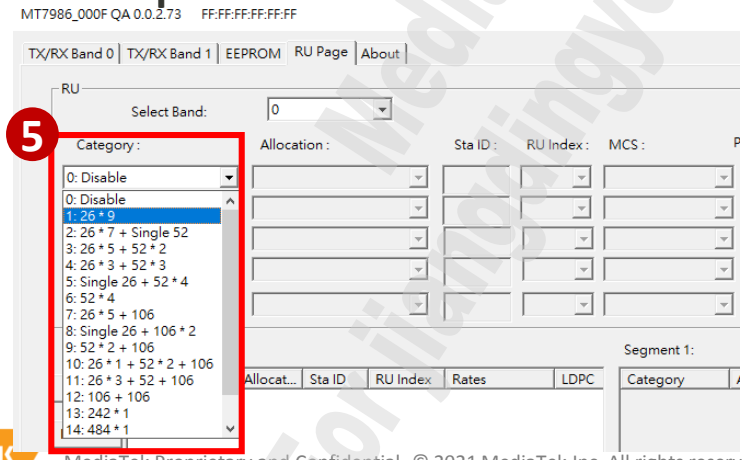
4 Select Band: 0 for G band, 1 for A band*

Note: select Band =0 for G band, and select Band =1 for A band



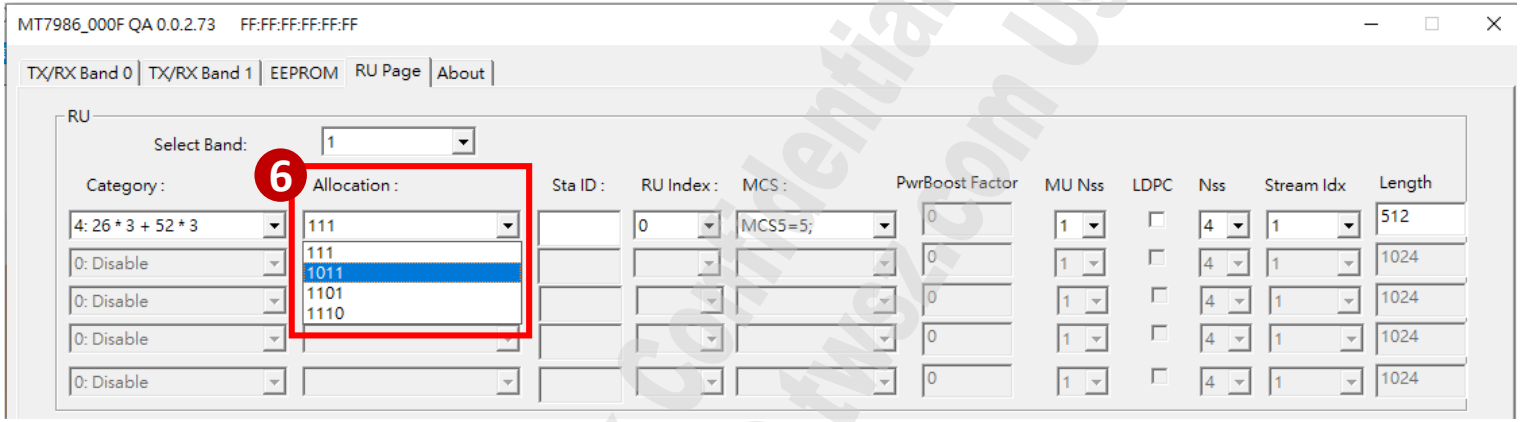
5 Choose RU Category for every BW20

- **Those rows are enable only after setting relevant BW in TX/RX page.**
- **Each row represent BW20 waveform.**



RU Page (TX HE-TB)

6 Allocation (BW20, 26*3+52*3 for example)



*Check the allocation form below (BW20, 26*3+52*3 for example)

	8 bits indices	#1	#2	#3	#4	#5	#6	#7	#8	#9
	00000000	26	26	26	26	26	26	26	26	26
	00000001	26	26	26	26	26	26	26	52	
	00000010	26	26	26	26	26	52		26	26
	00000011	26	26	26	26	26	52		52	
	00000100	26	26	52		26	26	26	26	26
	00000101	26	26	52		26	26	26	52	
	00000110	26	26	52		26	52		26	26
111	00000111	26	26	52		26	52		52	
	00001000	52		26	26	26	26	26	26	26
	00001001	52		26	26	26	26	26	52	
	00001010	52		26	26	26	52		26	26
1011	00001011	52		26	26	26	52		52	
	00001100	52		52		26	26	26	26	26
1101	00001101	52		52		26	26	26	52	
1110	00001110	52		52		26	52		26	26
	00001111	52		52		26	52		52	
	00010$y_2y_1y_0$	52		52		-	106 (number of users)			
	00011$y_2y_1y_0$	106 (number of users)				-	52		52	
	00100$y_2y_1y_0$	26	26	26	26	26	106			

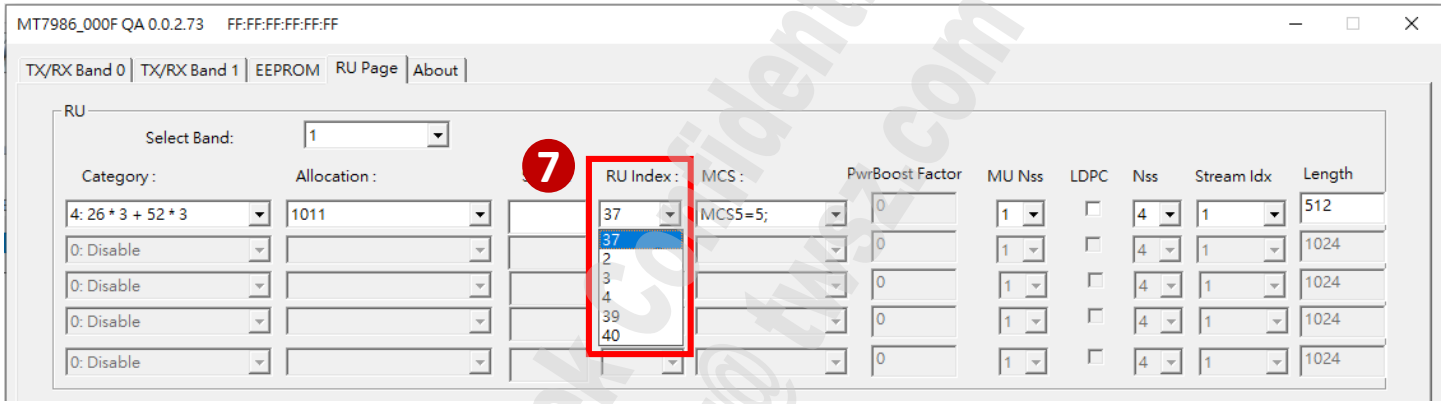
00101$y_2y_1y_0$	26	26	52		26	106		
00110$y_2y_1y_0$	52		26	26	26	106		
00111$y_2y_1y_0$	52		52		26	106		
01000$y_2y_1y_0$	106				26	26	26	26	26
01001$y_2y_1y_0$	106				26	26	26	52	
01010$y_2y_1y_0$	106				26	52		26	26
01011$y_2y_1y_0$	106				26	52		52	
0110$y_1y_0z_1z_0$	106				-	106			
01110000	52		52		-	52		52	
01110001	242-tone RU empty								
01110010	484-tone RU with zero HE-SIG-B User Specific field in the corresponding HE-SIG-B Content Channel								
01110011	996-tone RU with zero HE-SIG-B User Specific field in the corresponding HE-SIG-B Content Channel								
10$y_2y_1y_0z_2z_1z_0$	106				26	106			
11000$y_2y_1y_0$	242								
11001$y_2y_1y_0$	484								
11010$y_2y_1y_0$	996								
11011$y_2y_1y_0$	2*996								

RU Page(TX HE-TB)

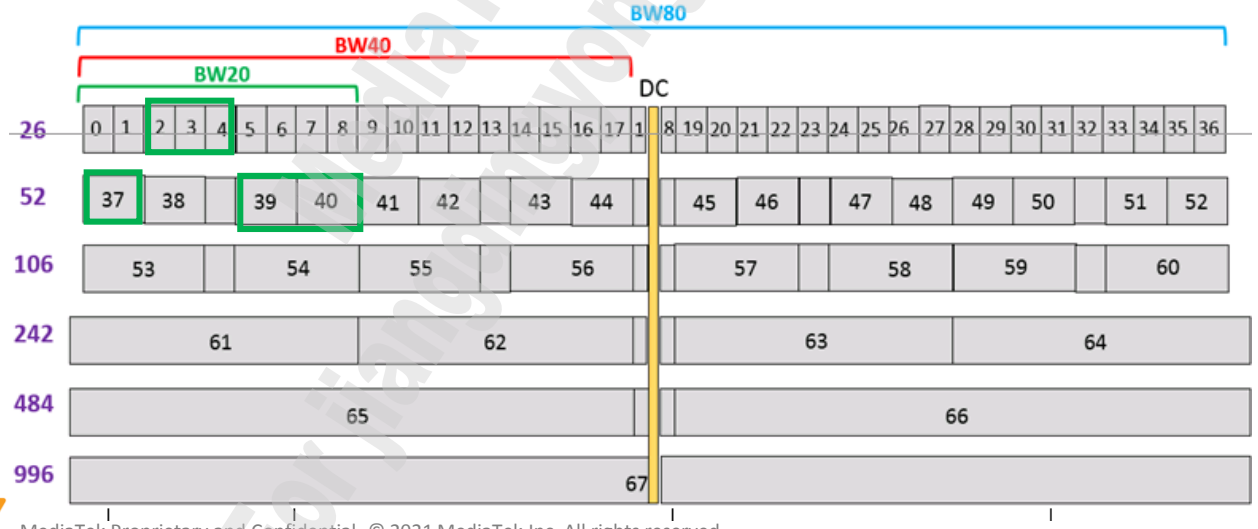
7 Select RU Index (26*3+52*3, allocation 1011, for example)

- 1011➔

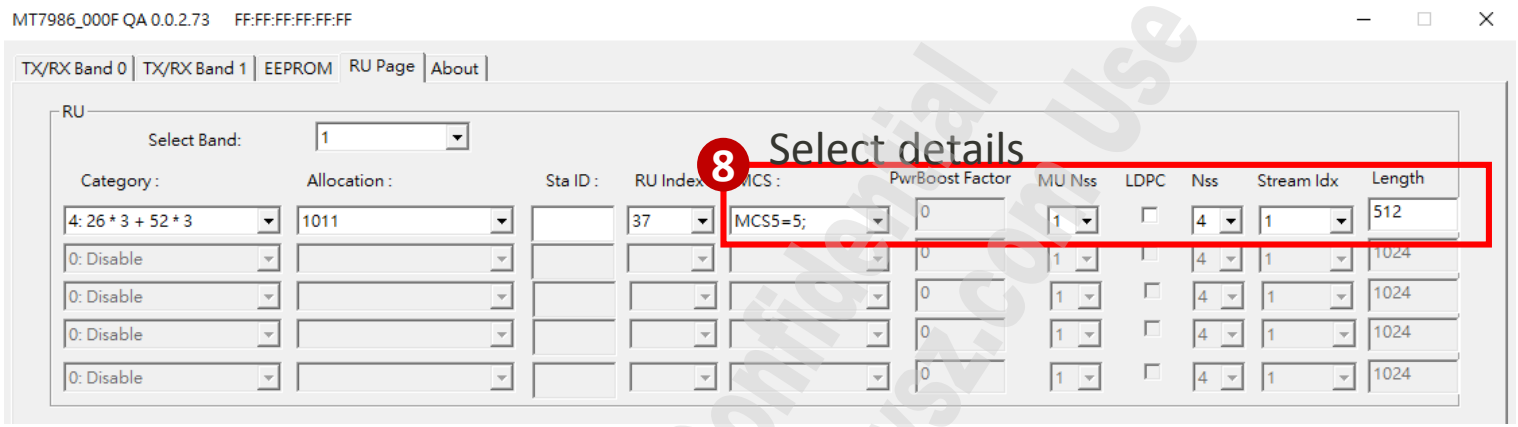
52	26	26	26	52	52



- Select 37/2/3/4/39/40(refer to the RU Index form below)



RU Page(TX HE-TB)



8 Select details

1. MCS rate
2. MU NSS: antenna number
3. LDPC: check for LDPC, non-check for BCC
4. NSS
5. Stream Idx: select 1
6. Length*

❽* MPDU TX Length Setting in HQA

- The table shown below is implemented in QATool already.
  ➔ choose wanted RUs, directly shows corresponding length.
- Users are able to modify the PSDU length manually.

For NSS=1/2

PSDU Length : Short

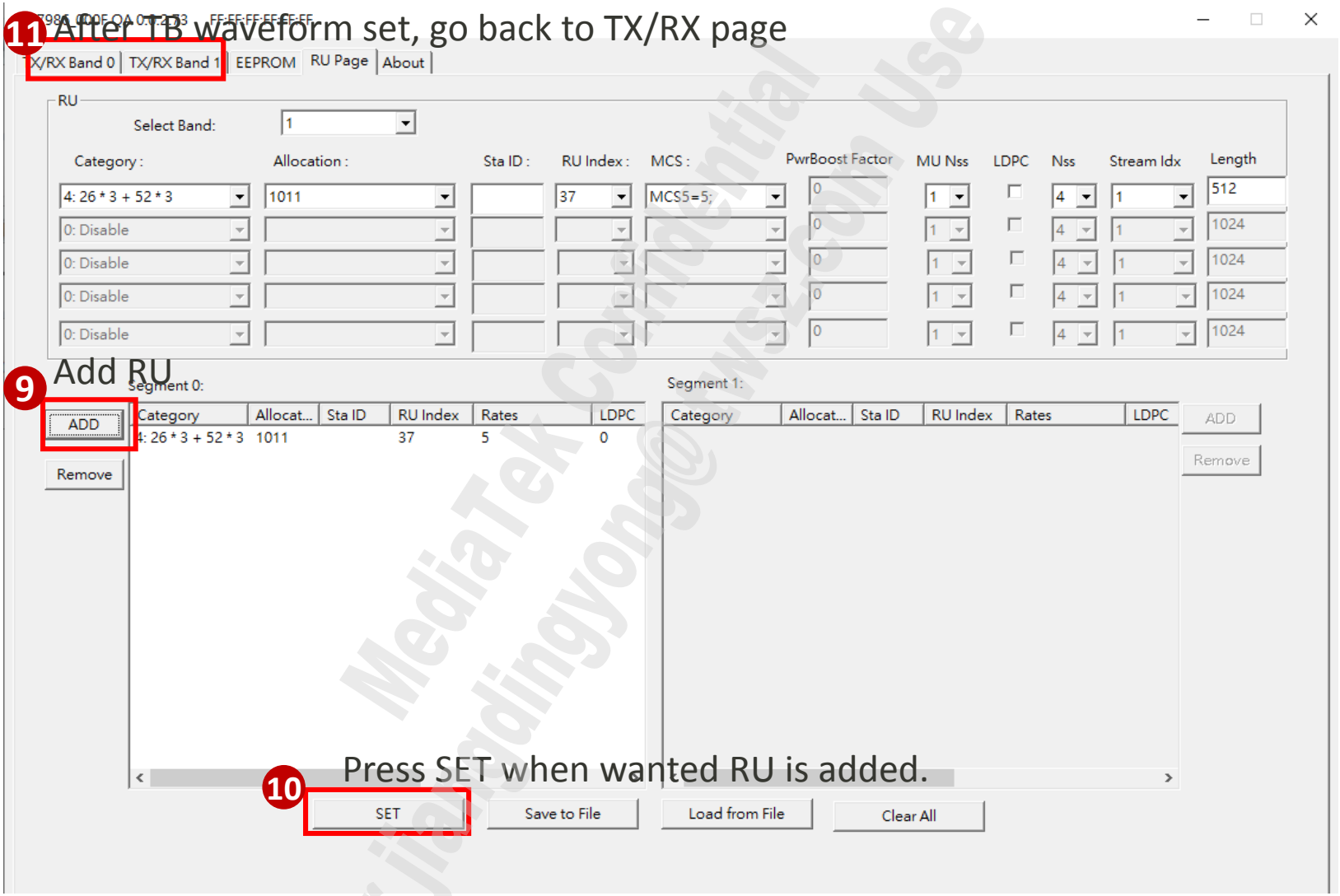
RU size	0	1	2	3	4	5	6	7	8	9	10	11
26	32	64	128	128	128	128	128	128	128	128	128	128
52	64	128	256	256	256	256	256	256	256	256	256	256
106	128	256	512	512	512	512	512	512	512	512	512	512
242	256	512	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
484	512	1024	2048	2048	2048	2048	2048	2048	2048	2048	2048	2048
996	1024	2048	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096
996*2	2048	4096	8192	8192	8192	8192	8192	8192	8192	8192	8192	8192

For NSS=3/4

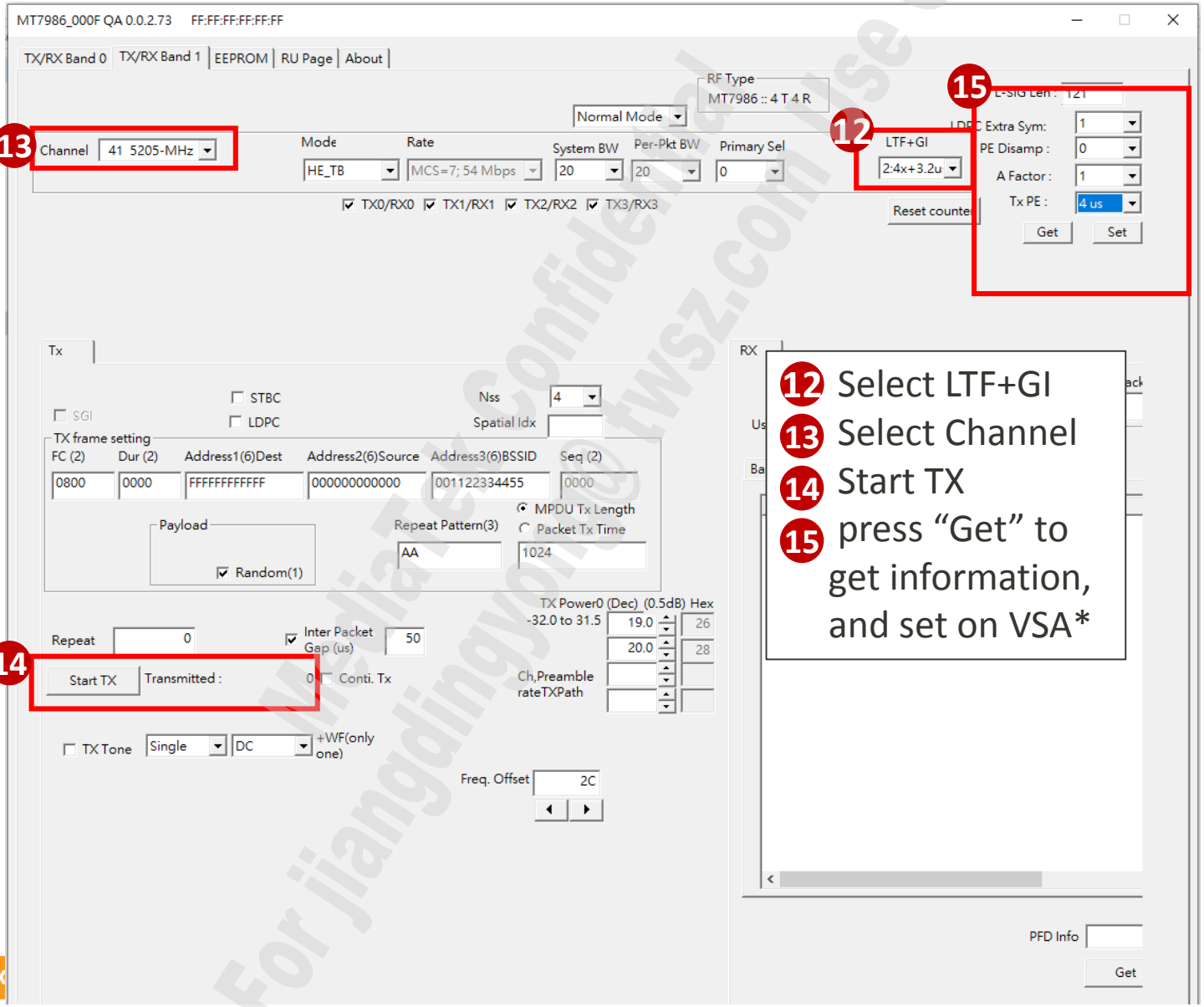
PSDU Length : long

RU size	0	1	2	3	4	5	6	7	8	9	10	11
26	128	256	512	512	512	512	512	512	512	512	512	512
52	256	512	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
106	512	1024	2048	2048	2048	2048	2048	2048	2048	2048	2048	2048
242	1024	2048	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096
484	2048	4096	8192	8192	8192	8192	8192	8192	8192	8192	8192	8192
996	4096	8192	8192	8192	8192	8192	8192	8192	8192	8192	8192	8192
996*2	8192	8192	8192	8192	8192	8192	8192	8192	8192	8192	8192	8192

RU Page (TX HE-TB)



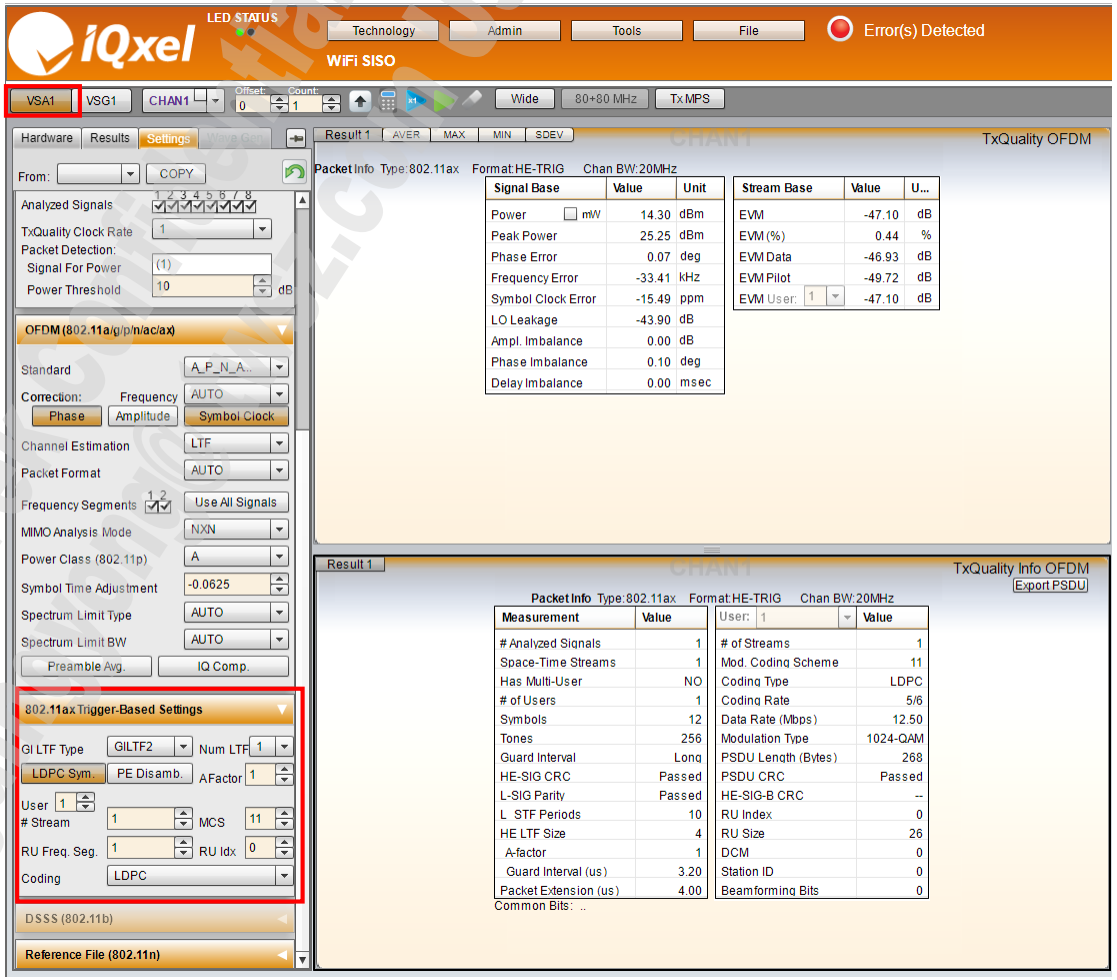
TX Page(TX HE-TB)



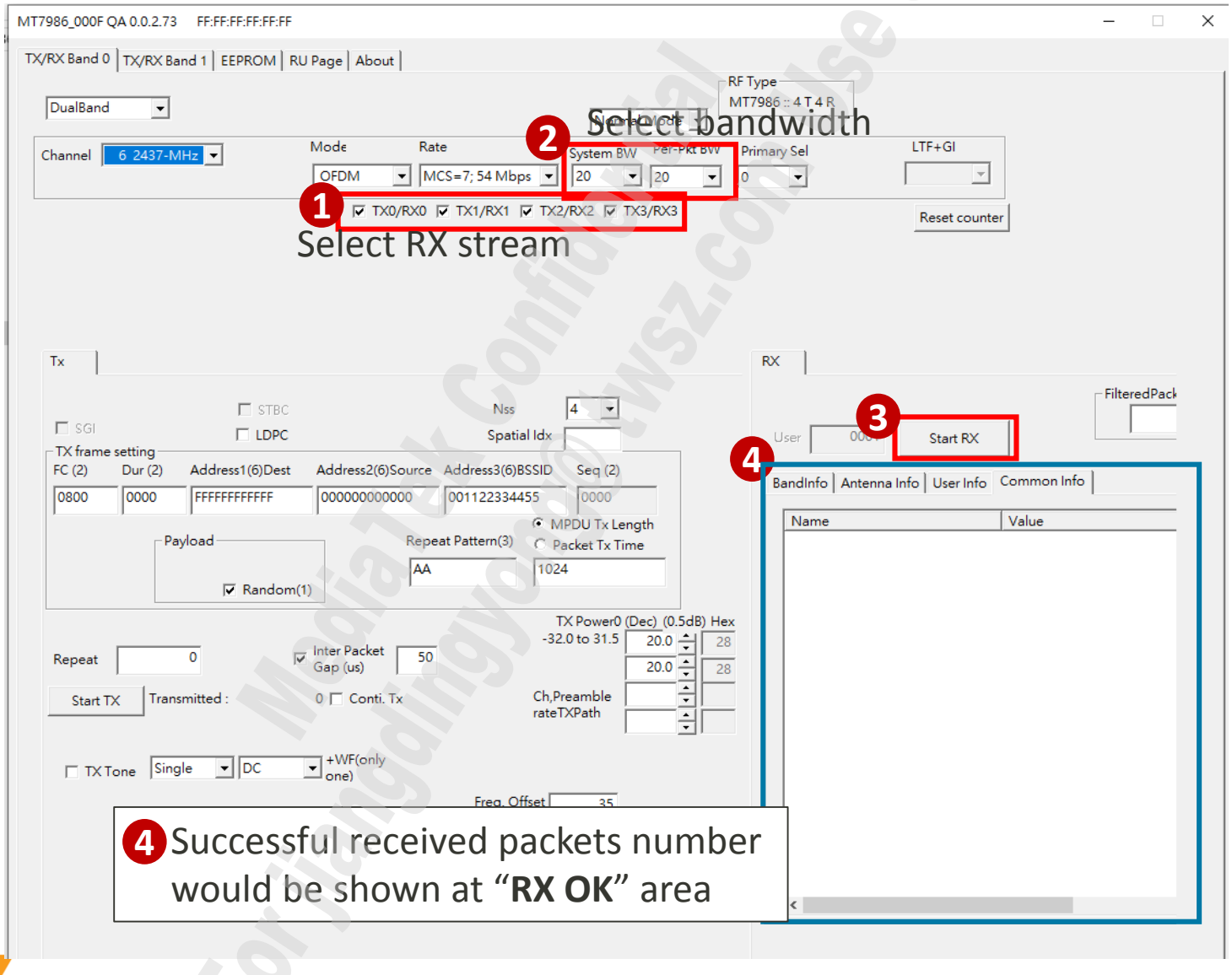
HT-TB M2W Settings

16 Open Litepoint MW Web page select VSA Setting RU info.

1. LTF+GI
2. LDPC sym.: 1=Orange light; 0=Gray light
3. PE Disamb.: 1=Orange light; 0=Gray light
4. A Factor:
   1. QA=0, litepont=4
   2. QA=1, litepont=1
   3. QA=2, litepont=2
   4. QA=3, litepont=3
5. Stream: 1 or 2
6. MCS rate setting: (RU-page).
7. RU idx: example: 0
8. Coding: LDPC or BCC



RX 11a/b/g/n/ac/ax-SU



RX 11a/b/g/n/ac/ax-SU

BandInfo | Antenna Info | User Info | Common Info

Name	Value
PER	0.0 %
RXOK	39414
RXOK/Sec	2333
CCK PD Count	0
OFDM PD Count	37465
CCK FCS Error	0
OFDM FCS Error	0

5

BandInfo | Antenna Info | User Info | Common Info

Name	Value
RSSI 0	-60
Inst RSSI WB 0	-57
Inst RSSI IB 0	-62
RSSI 1	-127
Inst RSSI WB 1	-125
Inst RSSI IB 1	-125
RSSI 2	-127
Inst RSSI WB 2	-125
Inst RSSI IB 2	-125
RSSI 3	-127
Inst RSSI WB 3	-125
Inst RSSI IB 3	-125

6

*Inst RSSI WB0: wide-band chip-out RSSI
*Inst RSSI IB0: in-band chip-out RSSI

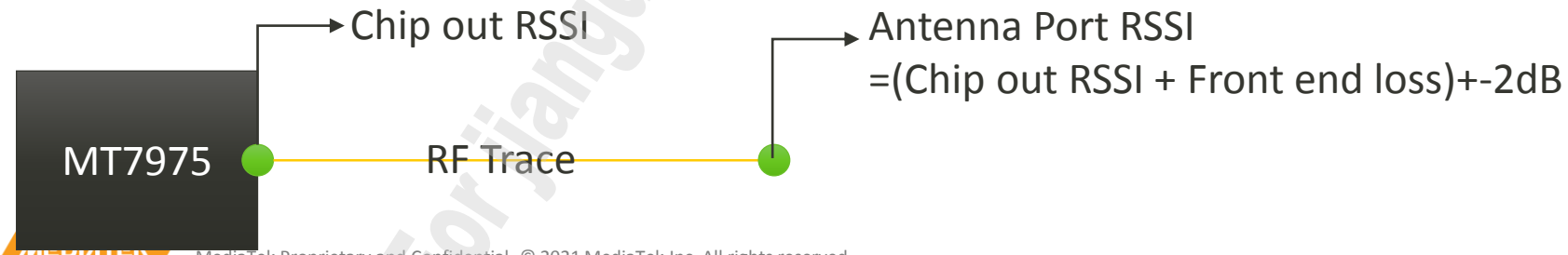
BandInfo | Antenna Info | User Info | Common Info

Name	Value
Freq Ofset from RX 0	-31122
SNR 0	33
PER 0	0.0 %
Freq Ofset from RX 1	0
SNR 1	0
PER 1	0.0 %
Freq Ofset from RX 2	0
SNR 2	0
PER 2	0.0 %
Freq Ofset from RX 3	0
SNR 3	0
PER 3	0.0 %
Freq Ofset from RX 4	0
SNR 4	0
PER 4	0.0 %
Freq Ofset from RX 5	0
SNR 5	0
PER 5	0.0 %
Freq Ofset from RX 6	0
SNR 6	0
PER 6	0.0 %

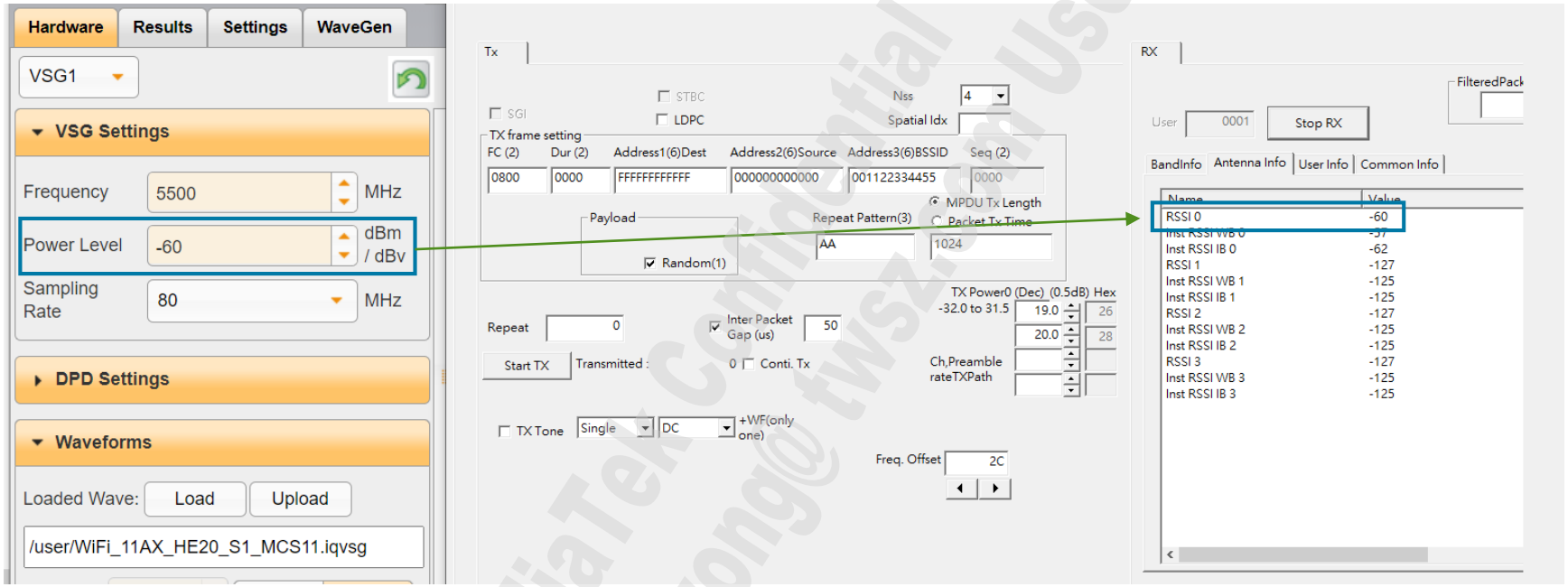
8

For MU

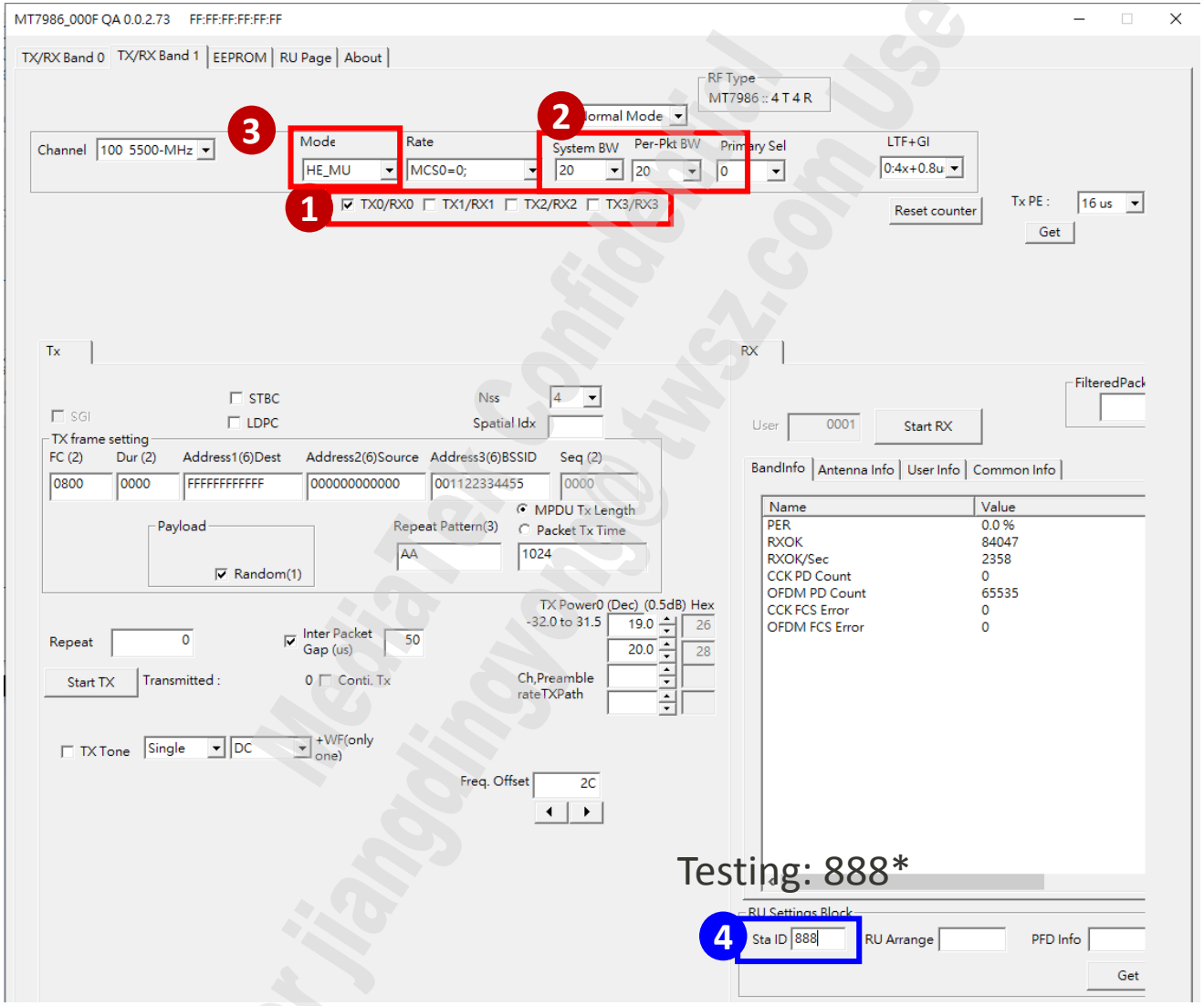
- 7 **Inst RSSI WB/IB means chip-out RSSI in QATool.**



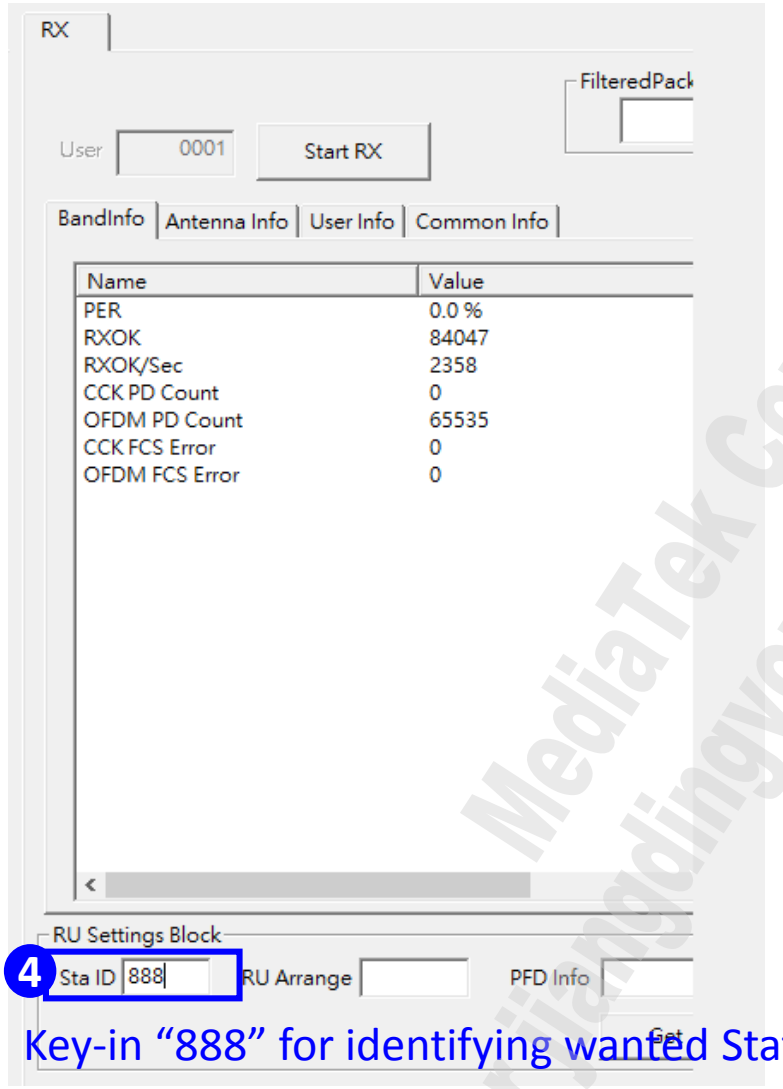
RSSI Display



RX HE-MU



RX HE-MU



Key-in “888” for identifying wanted Station ID

For example:
Wanted Station ID=888, other RUs starting from 100,101,102,….

RX HE-TB

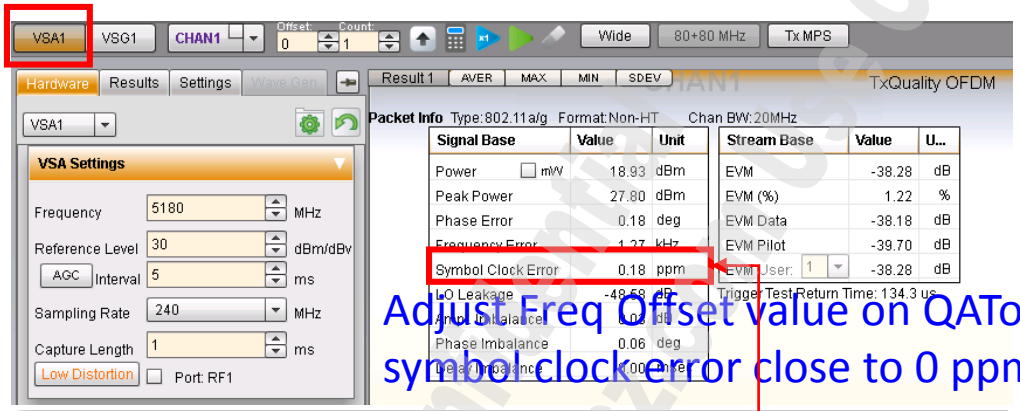
- From 802.11ax:

> A STA that transmits an HE TB PPDU compensates for carrier frequency offset (CFO) error and symbol clock error. After compensation, the absolute value of residual CFO error with respect to the PPDU carrying the soliciting Trigger frame shall not exceed 350 Hz for data subcarriers when measured as the 10% point of the complementary cumulative distribution function (CCDF) of CFO errors in AWGN at a received power of -60 dBm in the primary 20 MHz. The residual CFO error measurement shall be made on the HE TB PPDU following the HE-SIG-A field. The symbol clock error shall be compensated by the same ppm amount as CFO error.

- As AP in test-mode, RX HE-TB should consider frequency offset within 350Hz.
- In manual test, rough frequency offset should be calibrated in DUT first (Use TX and VSA to check and adjust Freq. offset). Then, accurate frequency adjustment should be set on VSG.

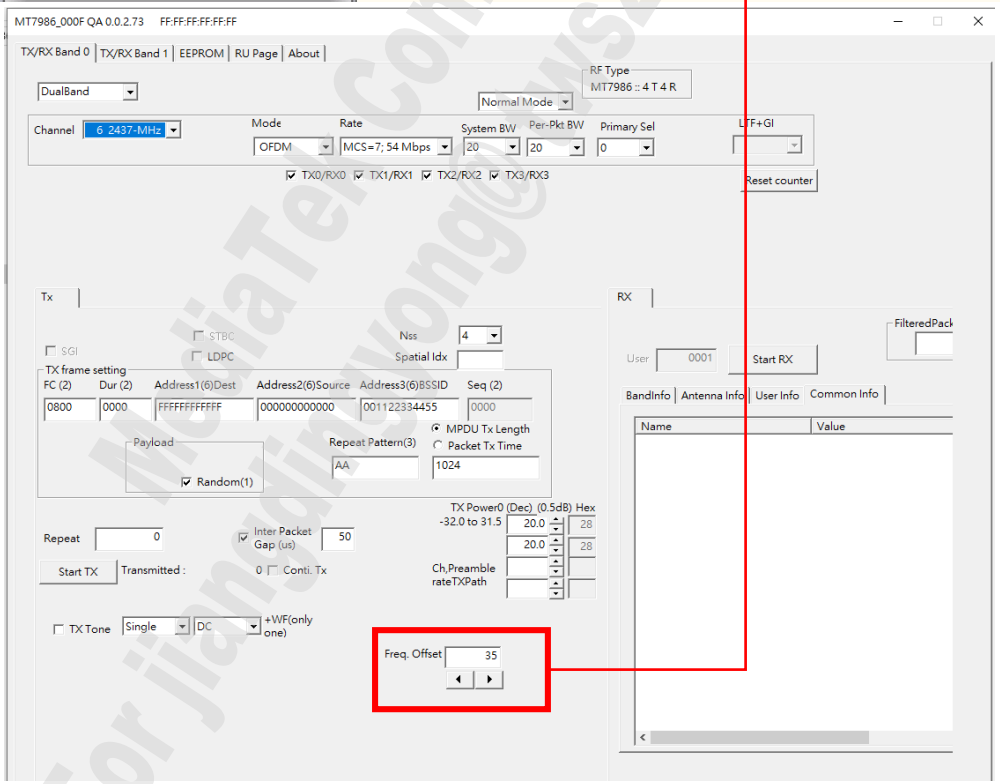
0 Use TX and VSA to check rough frequency offset

M2W

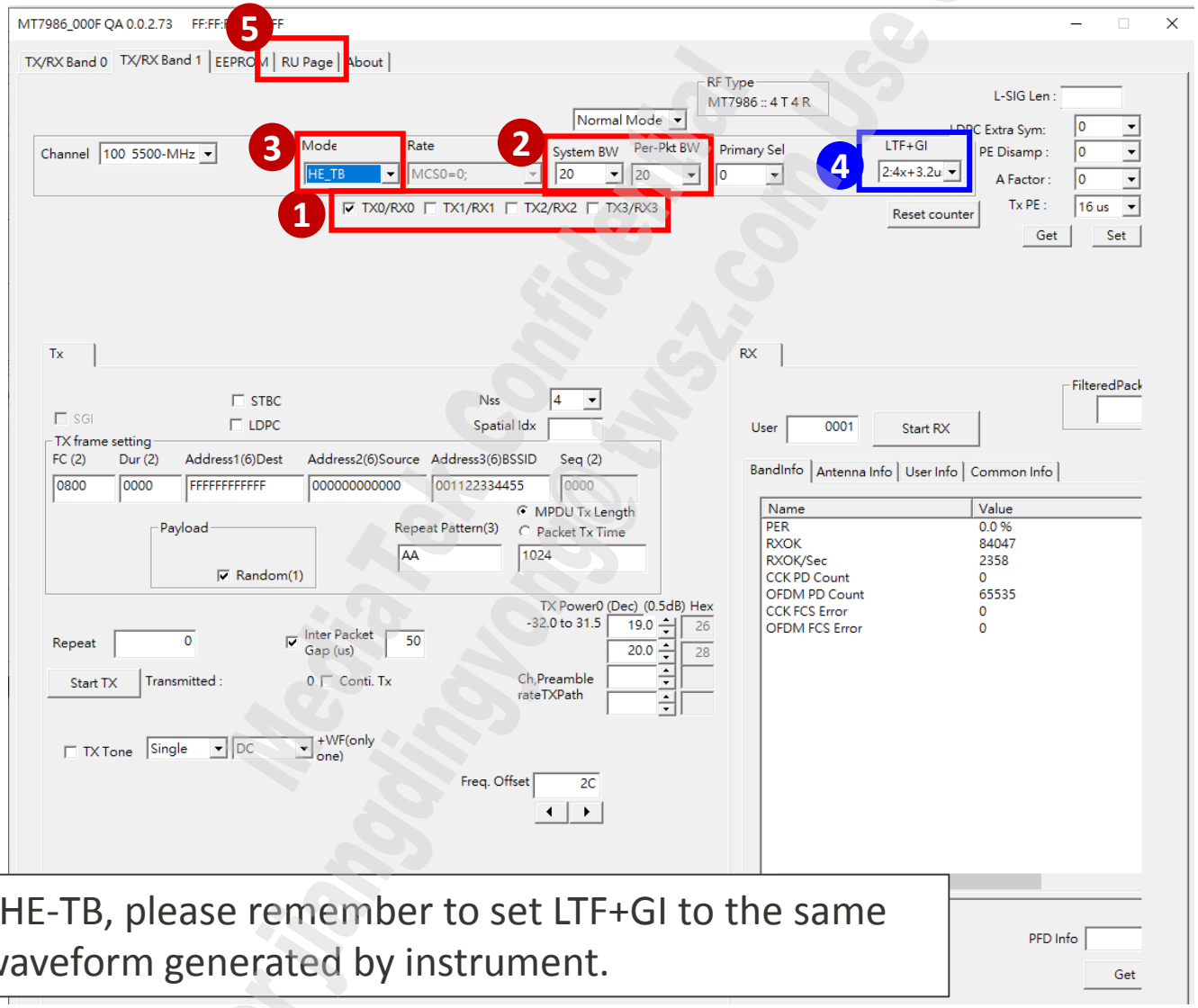


Adjust Freq Offset value on QATool until symbol clock error close to 0 ppm

QATool

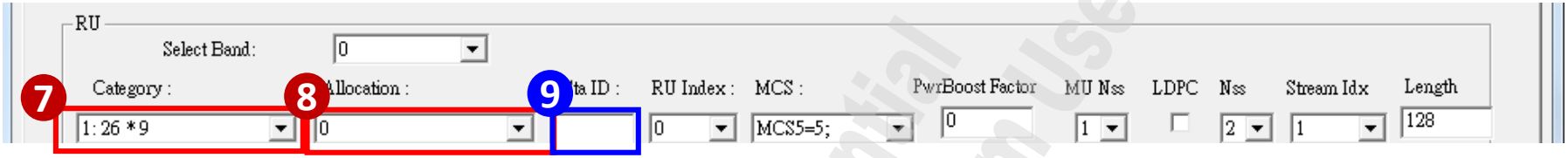


RX HE-TB



4 For HE-TB, please remember to set LTF+GI to the same as waveform generated by instrument.

RU Page (RX HE-TB)



7 8 :see next page*

9 Station ID

- Starting from 100, 101, 102,….

RU Page (RX HE-TB)

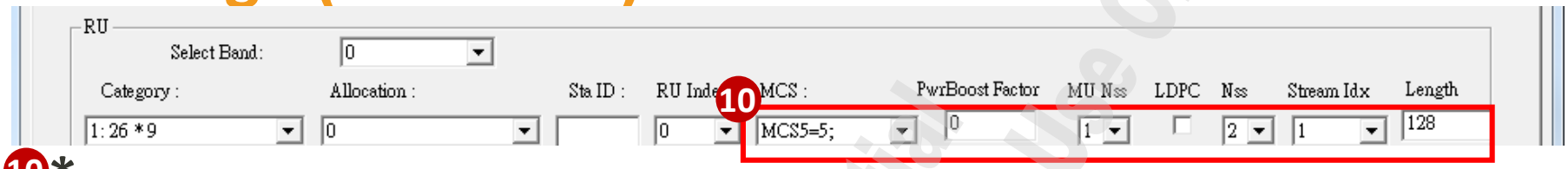
- **Allocation**

8 bits indices	#1	#2	#3	#4	#5	#6	#7	#8	#9
00000000	26	26	26	26	26	26	26	26	26
00000001	26	26	26	26	26	26	26	52	
00000010	26	26	26	26	26	52		26	26
00000011	26	26	26	26	26	52		52	
00000100	26	26	52		26	26	26	26	26
00000101	26	26	52		26	26	26	52	
00000110	26	26	52		26	52		26	26
00000111	26	26	52		26	52		52	
00001000	52		26	26	26	26	26	26	26
00001001	52		26	26	26	26	26	52	
00001010	52		26	26	26	52		26	26
00001011	52		26	26	26	52		52	
00001100	52		52		26	26	26	26	26
00001101	52		52		26	26	26	52	
00001110	52		52		26	52		26	26
00001111	52		52		26	52		52	
00010$y_2y_1y_0$	52		52		-	106 (number of users)			
00011$y_2y_1y_0$	106 (number of users)				-	52		52	
00100$y_2y_1y_0$	26	26	26	26	26	106			

00101$y_2y_1y_0$	26	26	52	26	106		
00110$y_2y_1y_0$	52	26	26	26	106		
00111$y_2y_1y_0$	52	52	26	106			
01000$y_2y_1y_0$	106	26	26	26	26	26	
01001$y_2y_1y_0$	106	26	26	26	52		
01010$y_2y_1y_0$	106	26	52	26	26		
01011$y_2y_1y_0$	106	26	52	52			
0110$y_1y_0z_1z_0$	106	-	106				
01110000	52	52	-	52	52		
01110001	242-tone RU empty						
01110010	484-tone RU with zero HE-SIG-B User Specific field in the corresponding HE-SIG-B Content Channel						
01110011	996-tone RU with zero HE-SIG-B User Specific field in the corresponding HE-SIG-B Content Channel						
10$y_2y_1y_0z_2z_1z_0$	106	26	106				
11000$y_2y_1y_0$	242						
11001$y_2y_1y_0$	484						
11010$y_2y_1y_0$	996						
11011$y_2y_1y_0$	2*996						

- **RU Index**

RU Page (RX HE-TB)



10* MU NSS, NSS, Stream Idx

Examples	User	MU NSS (antenna number)	NSS	Stream Idx
106+26+106 user1: 4ss, user2: 4ss, user3: 4ss	User1~3	4	4	1
106+26+106 user1: 2ss, user3: 4ss, user4: 4ss user2: 2ss	User1	4	**2**	**1***
	User2	4	**2**	**3***
	User3	4	4	1
	User4	4	4	1
106+26+106 user1: 1ss, user3: 4ss, user4: 4ss user2: 3ss	User1	4	**1**	**1**
	User2	4	**3**	**2**
	User3	4	4	1
	User4	4	4	1

*Stands for 1&2

*user1: 1&2
user2 starts from 3

RX HE-TB

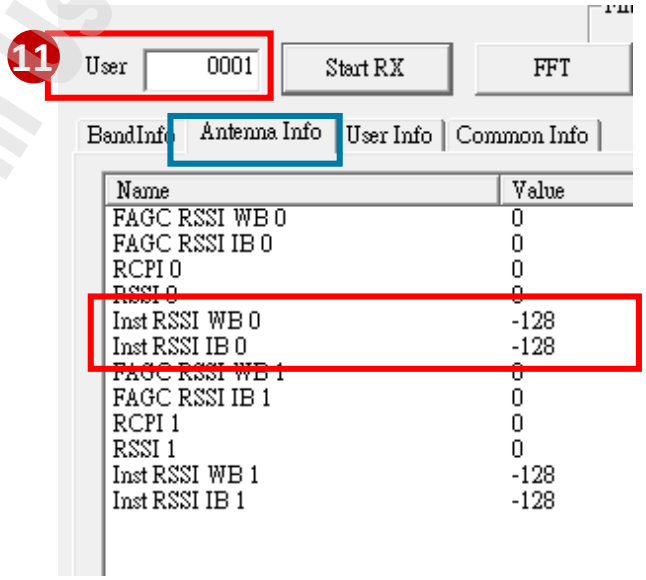
11 User number

User number limit:

- Single band:16, DBDC: 8 for each band

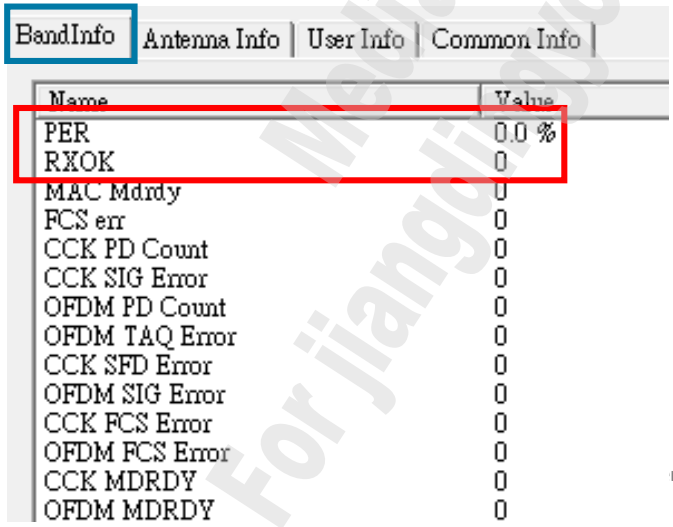
For example

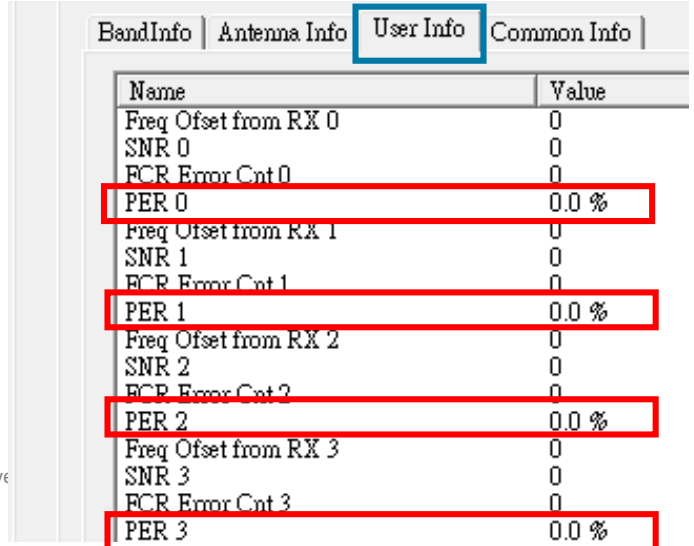
- user #1 only: 0000 0000 0000 0001 ➔ 0001
- user #2 only: 0000 0000 0000 0010 ➔ 0002
- 16 users: 1111 1111 1111 1111 ➔ FFFF



Band Info/User Info

- "Band Info" ➔average PER (MAC)
- "User Info" ➔all users' PER separately (PHY)

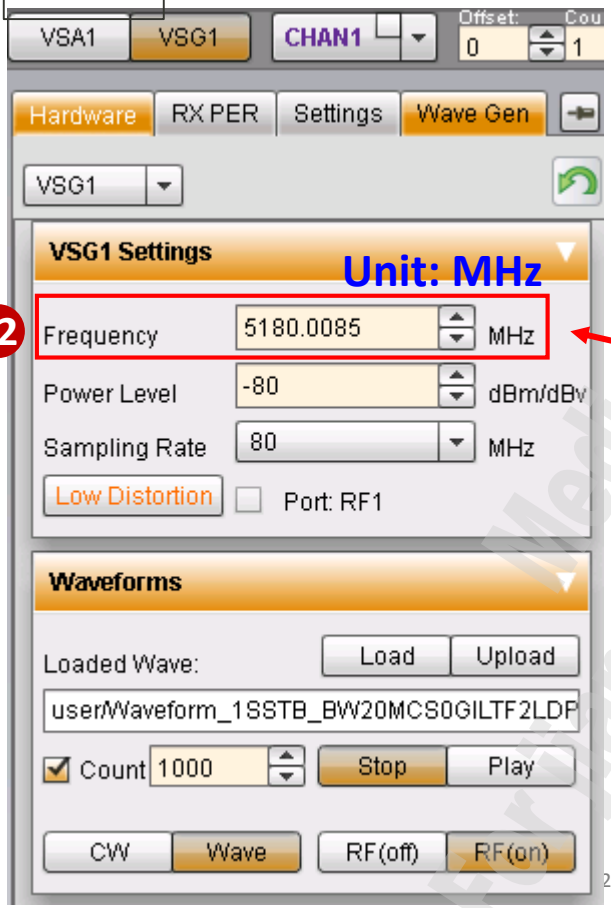




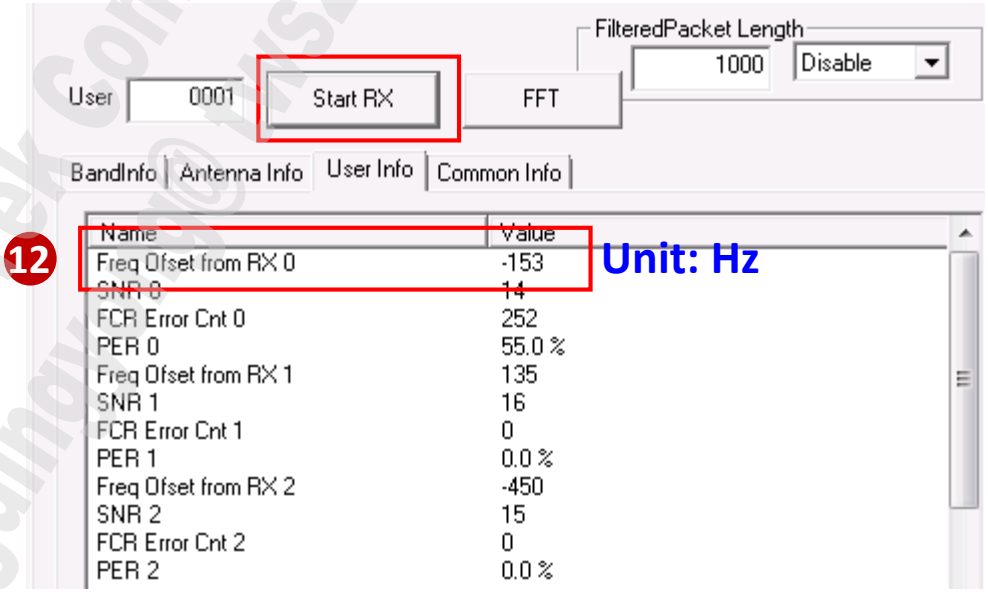
RX HE-TB, M2W Setup

12 Adjust frequency more accurate by change VSG Settings' "Frequency" according to "Freq Ofset from RX" in QATool

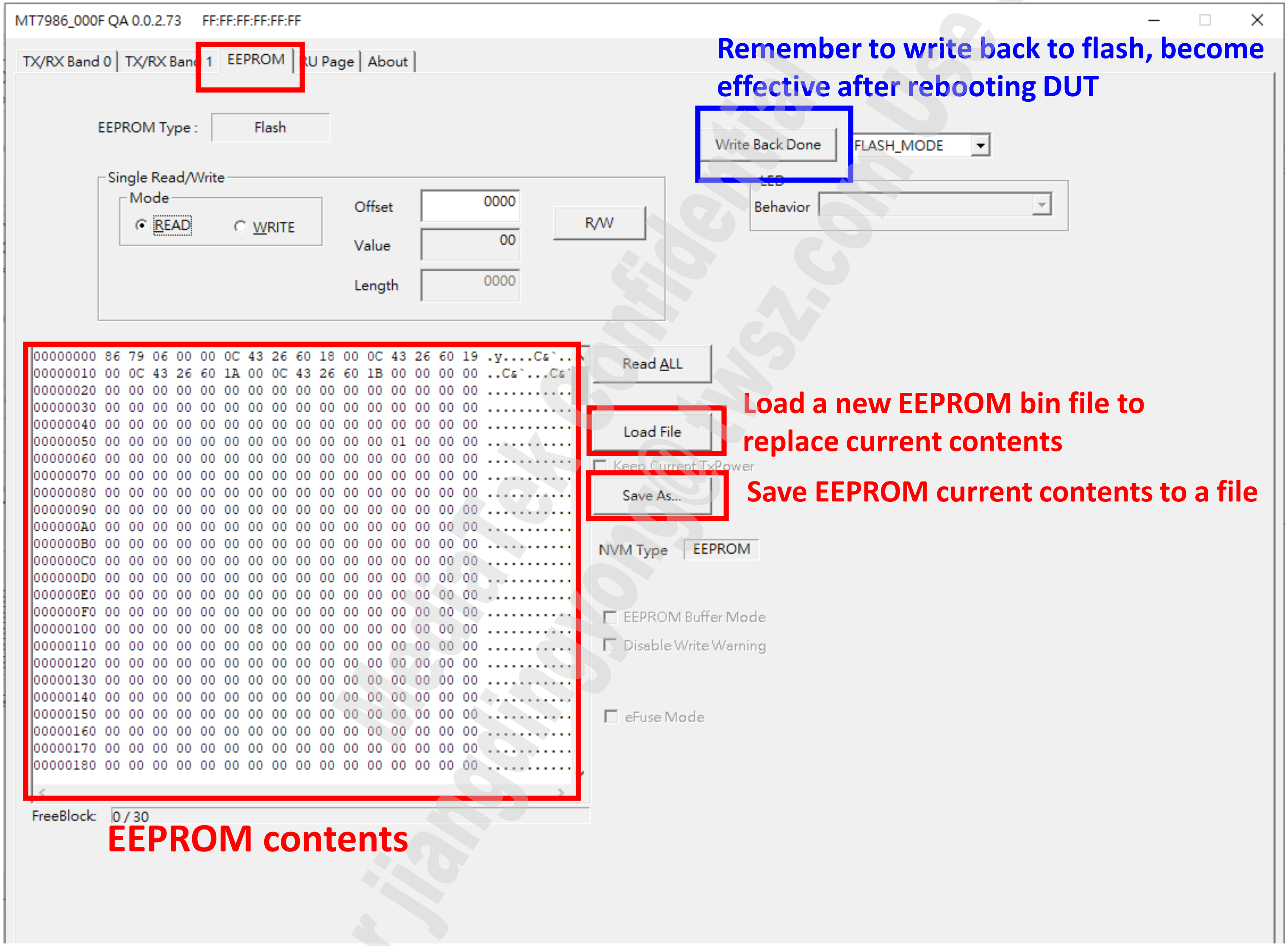
M2W



QATool

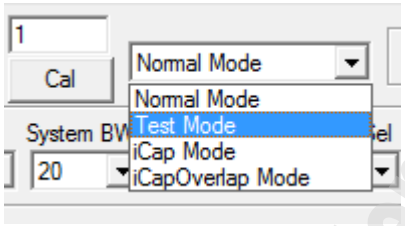


EEPROM

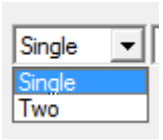


DC tone

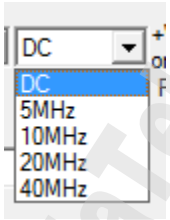
- Choose test mode



- Choose type

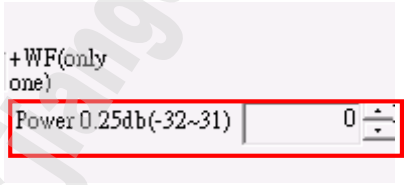


- Choose freq

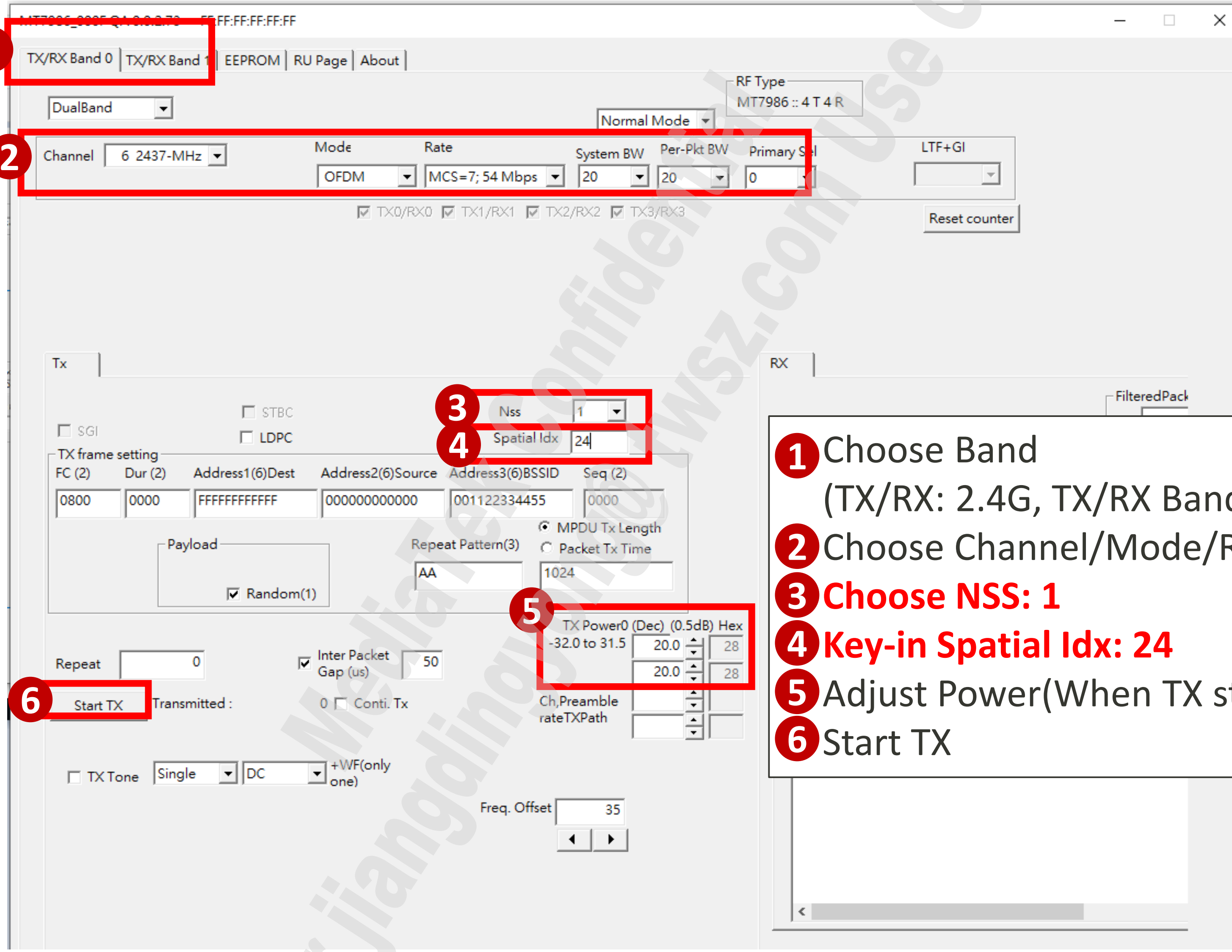


- Check TX tone

- Adjust power level



Duplicate Mode (For EMI test)



1. Choose Band (TX/RX: 2.4G, TX/RX Band1: 5G)
2. Choose Channel/Mode/Rate/BW
3. **Choose NSS: 1**
4. **Key-in Spatial Idx: 24**
5. Adjust Power(When TX stop)
6. Start TX

Appendix

RU Page (HE-MU)

- **Allocation**

8 bits indices	#1	#2	#3	#4	#5	#6	#7	#8	#9
00000000	26	26	26	26	26	26	26	26	26
00000001	26	26	26	26	26	26	26	52	
00000010	26	26	26	26	26	52		26	26
00000011	26	26	26	26	26	52		52	
00000100	26	26	52		26	26	26	26	26
00000101	26	26	52		26	26	26	52	
00000110	26	26	52		26	52		26	26
00000111	26	26	52		26	52		52	
00001000	52		26	26	26	26	26	26	26
00001001	52		26	26	26	26	26	52	
00001010	52		26	26	26	52		26	26
00001011	52		26	26	26	52		52	
00001100	52		52		26	26	26	26	26
00001101	52		52		26	26	26	52	
00001110	52		52		26	52		26	26
00001111	52		52		26	52		52	
00010$y_2y_1y_0$	52		52		-	106 (number of users)			
00011$y_2y_1y_0$	106 (number of users)				-	52		52	
00100$y_2y_1y_0$	26	26	26	26	26	106			

00101$y_2y_1y_0$	26	26	52	26	106		
00110$y_2y_1y_0$	52	26	26	26	106		
00111$y_2y_1y_0$	52	52	26	106			
01000$y_2y_1y_0$	106	26	26	26	26	26	
01001$y_2y_1y_0$	106	26	26	26	52		
01010$y_2y_1y_0$	106	26	52	26	26		
01011$y_2y_1y_0$	106	26	52	52			
0110$y_1y_0z_1z_0$	106	-	106				
01110000	52	52	-	52	52		
01110001	242-tone RU empty						
01110010	484-tone RU with zero HE-SIG-B User Specific field in the corresponding HE-SIG-B Content Channel						
01110011	996-tone RU with zero HE-SIG-B User Specific field in the corresponding HE-SIG-B Content Channel						
10$y_2y_1y_0z_2z_1z_0$	106	26	106				
11000$y_2y_1y_0$	242						
11001$y_2y_1y_0$	484						
11010$y_2y_1y_0$	996						
11011$y_2y_1y_0$	2*996						

- **RU Index**