BLE RF性能测试工具说明

BLE RF Performance Testing Tool Instructions

V1.0

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修改记录

版本	日期	记录	
v1.0	2020.05.20	创建	yulin

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硬件资源

Serial Number 序号	Equipment Name 设备名称	型号 model	数量 quantity
1	Shielding box 屏蔽箱	略 slightly	1
2	Bluetooth testing instruments 蓝牙测试仪器	iTEST/Other Comprehensive Tester CMW500 综测仪/iTEST/其他	1
3	Spectrum Analyzer 频谱仪	略	1
4	UART serial port UART 串口	The main chip is CH340E. 主芯片为 CH340E	1
5	Development board/board under test 开发板/待测板	demo	N
6	测试笔记本 （已装串口驱动） Test laptop (serial port driver installed)	Win7/Win 10	1

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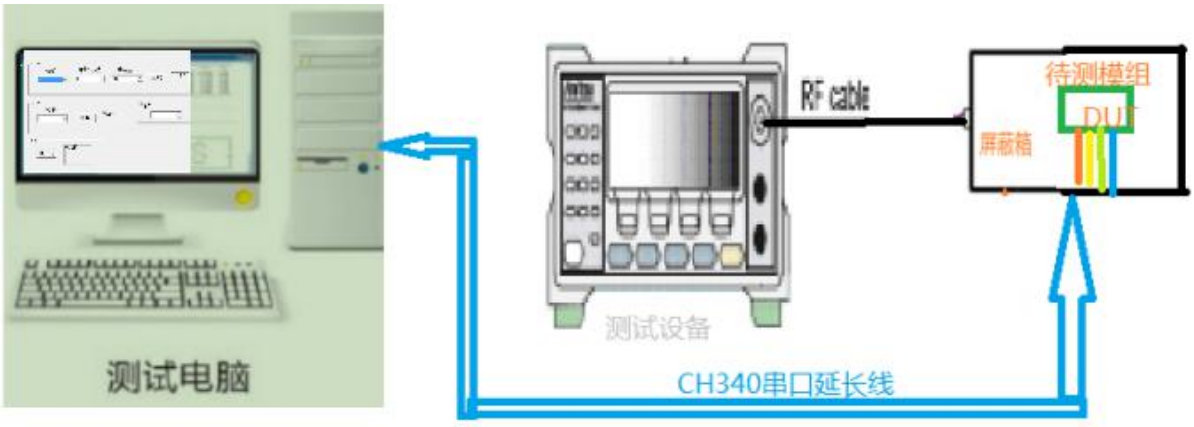
软件资源 Software Resources

序号	软件 software	备注 Remark	来源 source
1	BK BLE Tester .exe	Test interface 测试界面	BK
2	Xxxxxx.bin	测试固件包烧到待测模组里 Burn the test firmware package into the module under test	BK

测试示意图Test diagram



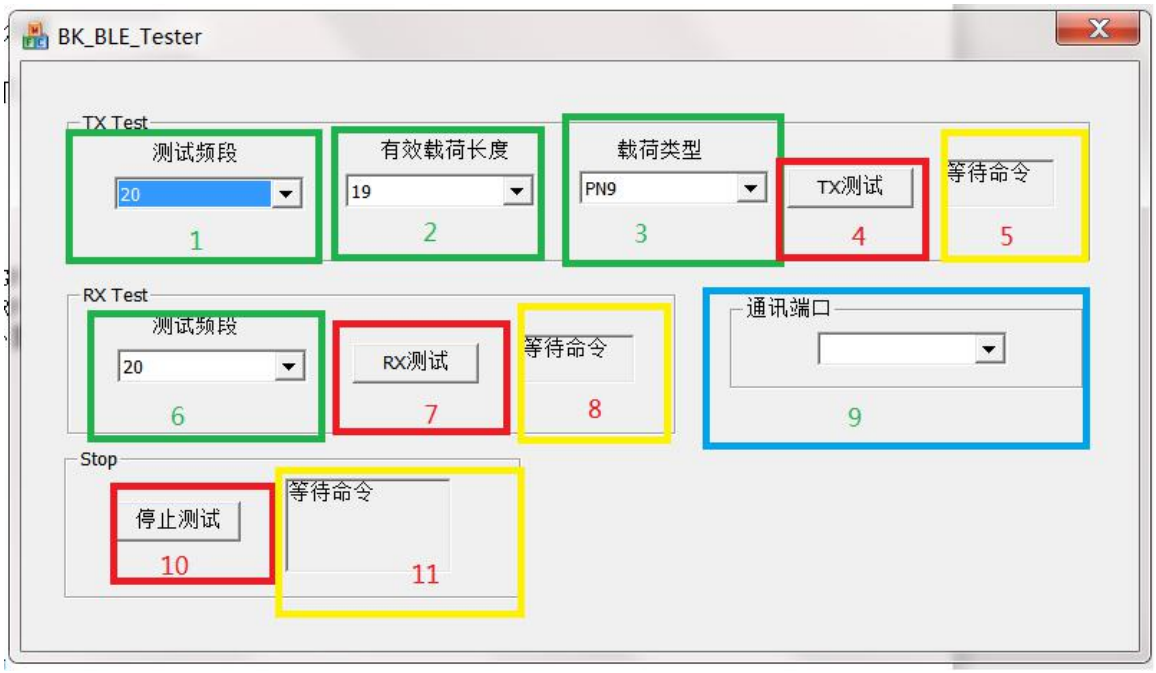
图一

Figure 1

1.2 测试工具介绍 1.2 Introduction to Testing Tools

BK BLE Tester .exe 是免安装控制工具，打开界面，图示如下：

BK BLE Tester.exe is a portable control tool. The interface is shown below:



Boxes 1, 2, 3, 4, and 5 represent TX's settings options.

- 方框 1，方框 2，方框 3，方框 4，方框 5，是 TX 的设置选项。
- 方框 6，方框 7，方框 8，是 RX 的设置选项。Boxes 6, 7, and 8 are RX settings options.
- 方框 10，方框 11 是停止命令选项。Boxes 10 and 11 are the stop command options.

Boxes 5, 8, and 11 are status display areas, and no operation is required or allowed in these areas.

- 其中方框 5，方框 8，方框 11 是状态显示部分，不能也不必进行任何操作。
- 方框 9 属于串口识别，识别到会显示串口名，没识别或没串口接入就是显示空白。
- 方框 1 和方框 6 属于测试频段的选择，频道数是 0-39 对应 2402M-2480M，默认 20。
- 方框 2 属于数据包载荷长度选择，范围 0-37，一般选择 max(37)，默认 19。
- 方框 3 属于 8 种数据包类型选择分别如下：（PRBS9）（1111000）（10101010）（PRBS15）（all 1）（all 0）（00001111）（01010101）

Box 3 represents the selection of 8 data packet types, as follows:

注意 1111000 数据可以测试 F1 的相关调制特性Note that data 1111000 can be used to test the relevant modulation characteristics of F1.

注意 10101010 数据可以测试 F2 的相关调制特性Note that the 10101010 data can be used to test the relevant modulation characteristics of F2.

- 其中方框 4，方框 7，方框 10 是测试命令按钮。这里要特别注意：每进行一项发射测试或接收测试，必须执行一次停止测试，才能进行后续测试。

Boxes 4, 7, and 10 are the test command buttons. It is important to note that after each transmit or receive test, a stop test must be executed before proceeding to the next test.

Box 9 indicates serial port identification. If the serial port is identified, the serial port name will be displayed; otherwise, it will be blank.

Boxes 1 and 6 are for selecting the test frequency band, with channel numbers ranging from 0 to 39, corresponding to 2402M-2480M, and the default is 20.

Box 2 is for selecting the data packet payload length, ranging from 0 to 37. Generally, max (37) is selected, with the default being 19.

2. 测试说明 2. Test Description

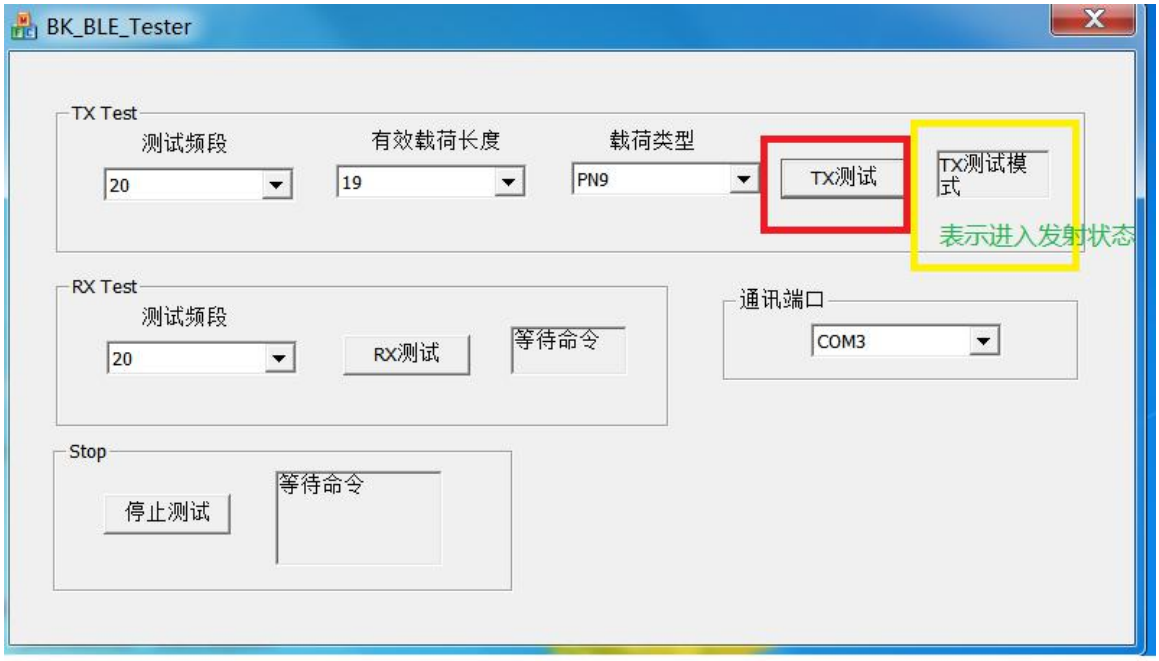
2.1. TX 测试 2.1. TX Test

第一步：按照图一接好设备与待测板，在电脑上打开 BK BLE Tester .exe。如下图所示，红圈表示串口已经识别。

Step 1: Connect the device and the board under test as shown in Figure 1, and open BK BLE Tester.exe on your computer. As shown in the figure below, the red circle indicates that the serial port has been recognized.

第二步：选择需要测试的频段，数据包长度和数据类型后，点击下图的红框所示 TX 测试，此时 TX 的状态会显示“TX 测试模式”，此时仪器也可以看到相应的测试波形。

Step 2: Select the frequency band, data packet length, and data type to be tested, then click the TX test button shown in the red box in the image below. At this time, the TX status will display "TX Test Mode", and the instrument will also display the corresponding test waveform.



第三步：如要换频点测试或载荷类型或有效载荷长度，先停止测试按钮，再重复第二步的操作方可。

Step 3: To change the frequency, load type, or effective load length, first press the stop button, then repeat step 2.

2.2. RX 测试说明 2.2. RX Test Description

第一步：确认 BK BLE Tester .exe 是否处于停止测试状态，假如不是，须先点击红框所示停止测试，此时状态栏会显示“TX 命令已执行停止测试”或“RX 命令已执行停止测试”。如下图所示 ，之后我们再进行 RX 操作。

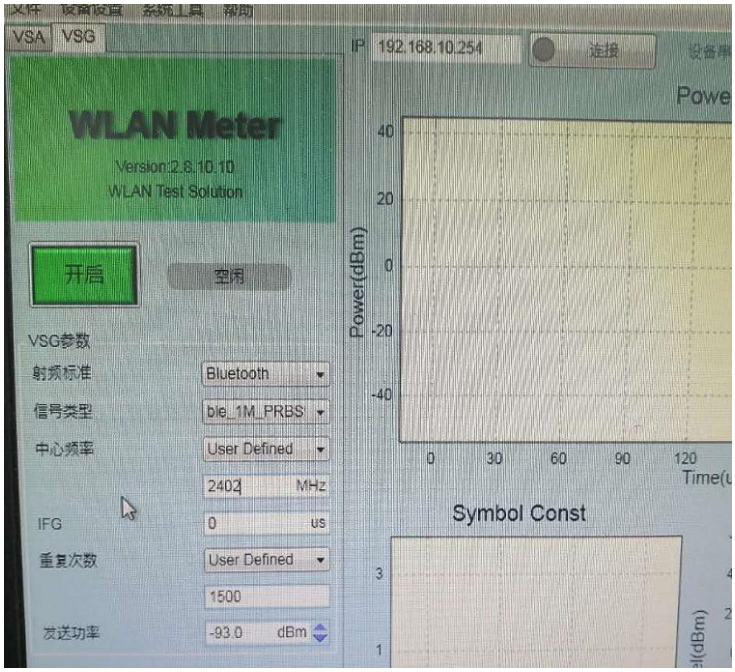
Step 1: Confirm that BK BLE Tester.exe is in a stopped testing state. If not, click the "Stop Testing" button (highlighted in red). The status bar will then display "TX command executed, test stopped" or "RX command executed, test stopped," as shown in the image below. Afterward, we will perform the RX operation.

第二步：RX 操作只需要选择要测试的频点，点击下图的红框所示 RX 测试，此时 RX 的状态会显示“RX 测试模式”表示待测设备处于接收状态。

Step 2: For RX operation, simply select the frequency point to be tested and click RX Test as shown in the red box in the image below. At this time, the RX status will display "RX Test Mode", indicating that the device under test is in receiving mode.

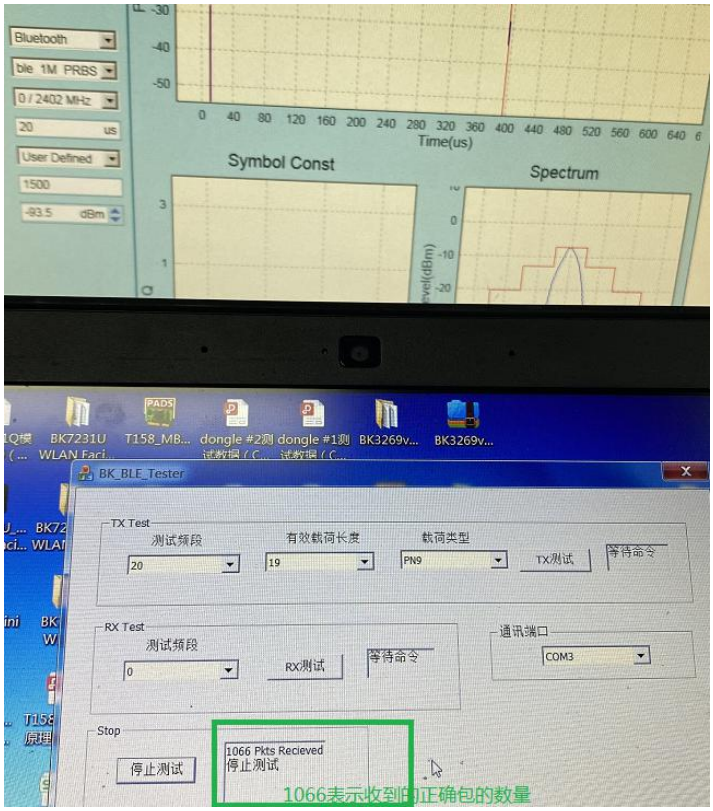
第三步 ：仪器（ITEST）VSG 设置为 ble_1M_PRBS9,,单次发包数 1500 和功率，点"开启"发单次射频。如下图所示：

Step 3: Set the instrument's (ITEST) VSG to ble_1M_PRBS9, single packet count to 1500, and power, then click "Enable" to send a single RF signal. See the image below:



第四步：等待仪器发完，在测试工具上发停止测试：下图绿框显示收到正确的包数。按照标准 30.8%的 PER,以 1500 为例，收到 1038 即为 OK。

Step 4: Wait for the instrument to finish transmitting, then stop the test on the testing tool: The green box in the image below shows the correct number of packets received. According to the standard 30.8% PER, taking 1500 packets as an example, receiving 1038 packets is considered OK.



第五步：更改仪器发射功率，重复上面步骤，使 PER 接近临界值，即为接收灵敏度。

Step 5: Change the instrument's transmit power and repeat the above steps until the PER is close to the critical value, which is the receiver sensitivity.