

Reliability Test Report

Product Name: PB-03F

Product Model: Bluetooth Series

Test Date: 2021/12/13–2021/12/17

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Reviewed by: Zhou Yuming




1. Inspection Plan

No.	Process Name	Inspection Item	Inspection Equipment	Sampling Level (Refer to GB/T 2828.1-2003)	Acceptable Quality Level		
					CR (Critical Defect)	MA (Major Defect)	MI (Minor Defect)
1	Reliability test	High/low temperature storage; high/room/low temperature power on/off; high/low temperature operation; alternating hot and humid; thermal shock	Constant temperature and humidity chamber	Normal single sampling, special inspection S-1	0 accept, 1 reject		

2. Test Items

No.	Item	Test Conditions
1	Low temperature storage test	Test conditions: -40°C Test duration: 8h After an 8-hour soak at -40°C, perform a cold start test.
2	High temperature storage test	Test conditions: 100°C Test duration: 8h After restoring to 85°C and a 1-hour soak, perform a hot start test.
3	Low temperature operation test	Test conditions: -40°C Test duration: 24h
4	High temperature operation test	Test conditions: 85°C Test duration: 24h
5	AC power on/off test with temperature	A) Temperature: -40°C B) Temperature: 25°C C) Temperature: 85°C Cycle each condition 200 times, with 30s ON and 30s OFF
6	Alternating hot and humid test	A) Operate at 85°C + 93% RH for 4h; B) Operate at 25°C + 93% RH for 4h; Cycle steps A and B for a total of 2 cycles.
7	Thermal shock test	Test conditions: -40°C–100°C, soak for 30min at each temperature. Temperature transition time: 50min for heating, 2h for cooling. Test duration: 5 cycles

3. Test Preparation

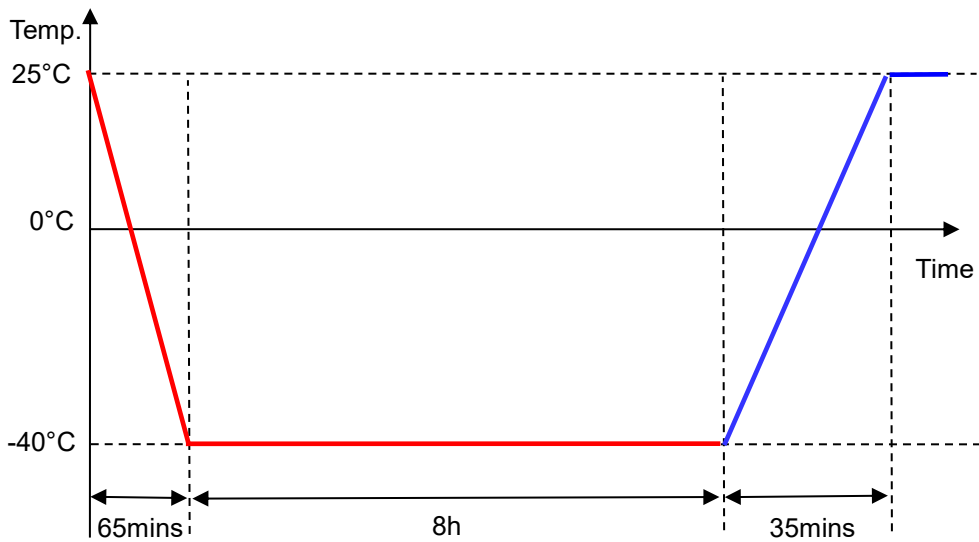
No.	Item	Image/Attachment
1	Reliability documentation	 PB-03系列模组可靠性测试说明.doc
2	Test equipment	
3	Sample placement	
4	Test reason	New product reliability verification for PB-03F module

4. Low Temperature Storage Test

Test Conditions: Power-off test. Store the product at -40°C for 8h, then perform a cold start test.

Test Profile:

Is Power Off ——
Is Power On ——



Test Criteria:

1. If the module functions normally during the cold start test, and can successfully pair with the mobile device, the module is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

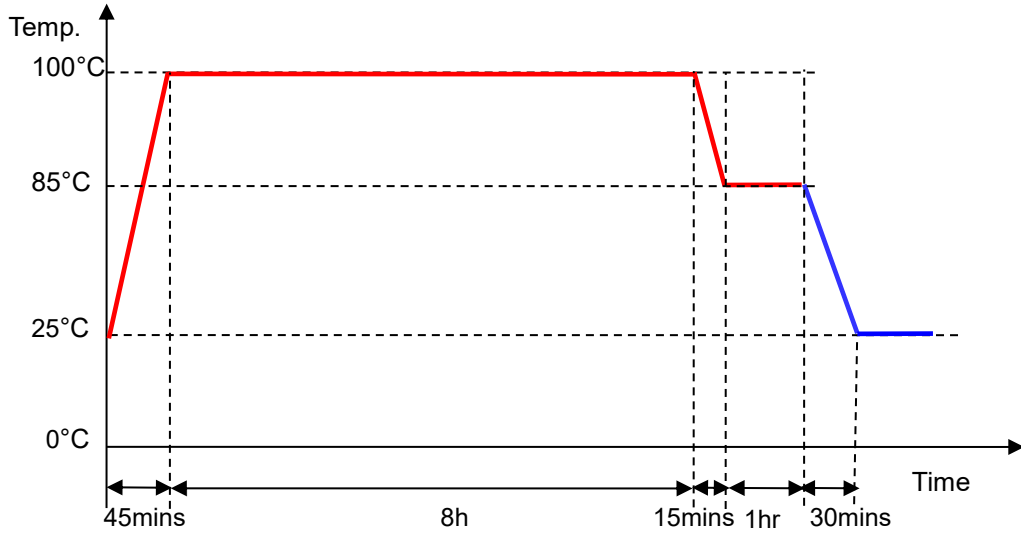
Sample Quantity	Test Data	Test Results
<p>Unit 1 Unit 2</p>	<p>The test data section contains two screenshots of the '安信可串口调试助手 V1.2.3.0' software. The left screenshot shows a successful connection with the module, displaying device information like 'arch:phy6052company:AI-Thinker BA:Taacc:94c9601d603c'. The right screenshot shows a similar successful connection. Below these are two screenshots of the 'BLE调试助手' app. The top one shows a list of discovered BLE devices, with the second, third, and fourth entries (all 'ai-thinker' with MACs 94:C9:60:1D:62:3C, 94:C9:60:1D:62:3A, and 94:C9:60:1D:07:E9) highlighted with a red box. All devices are listed as 'NOT BONDED'.</p>	<p>PASS</p>

5. High Temperature Storage Test

Test Conditions: Power-off test. Store the product at 100°C for 8h, then restore it to 85°C for a 1-hour soak, and perform a hot start test.

Test Profile:

Is Power Off ——
Is Power On ——



Test Criteria:

1. If the module functions normally during the hot start test, and can successfully pair with the mobile device, the module is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

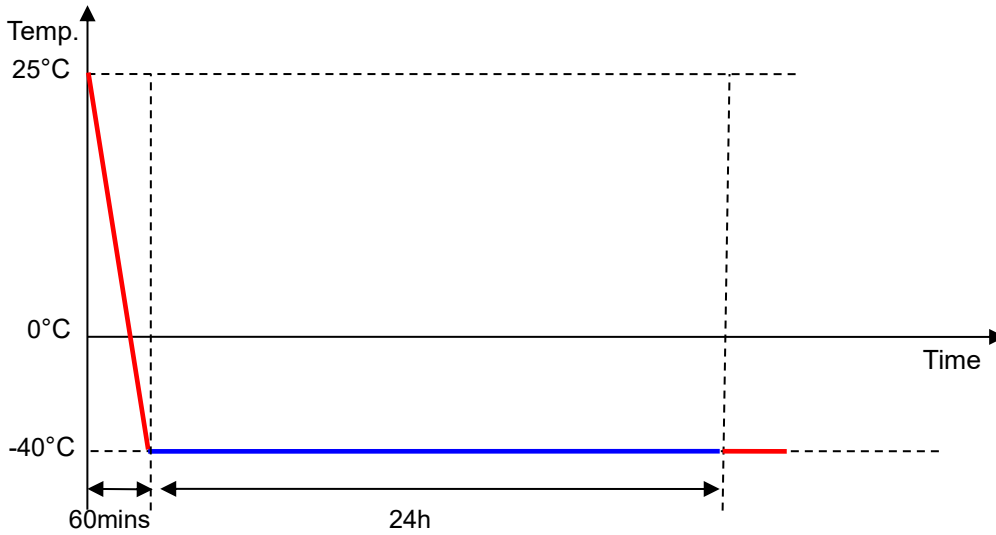
Sample Quantity	Test Data	Test Results
<p>Unit 1 Unit 2</p>	<p>The test data includes two screenshots. The top one is a serial terminal window showing the following text: <code>arch:phy6252company:Ai-Thinker B&T:94c9601d623c sdr_version:release/3.1.1 firmware_version:release/Y1006 compile_time:Nov 30 2021 16:49:47 ready#####</code>. The bottom one is a screenshot of a BLE scanner app titled 'BLE调试助手' showing a list of four 'ai-thinker' devices with their MAC addresses and signal strengths, and 'CONNECT' buttons highlighted in red.</p>	<p>PASS</p>

6. Low Temperature Operation Test

Test Conditions: Power-on test. Operate at -40°C for 24h.

Test Profile:

- Is Power Off —
- Is Power On —



Test Criteria:

1. If no reboot or crash occurs during testing and it can pair with the mobile device properly, the module is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

Sample Quantity	Test Data	Test Results
<p>Unit 1 Unit 2</p>	<p>The test data includes two screenshots of a serial terminal window showing device boot logs with fields like 'arch:phy6252company:Ai-Thinker', 'pdk_version:release/3.1', and 'compile_time:Nov 30 2021 14:49:47'. Below these are two screenshots of a mobile application's BLE scanner interface, showing a list of four 'ai-thinker' devices with their MAC addresses and signal strengths, all marked as 'NOT BONDED'.</p>	<p>PASS</p>

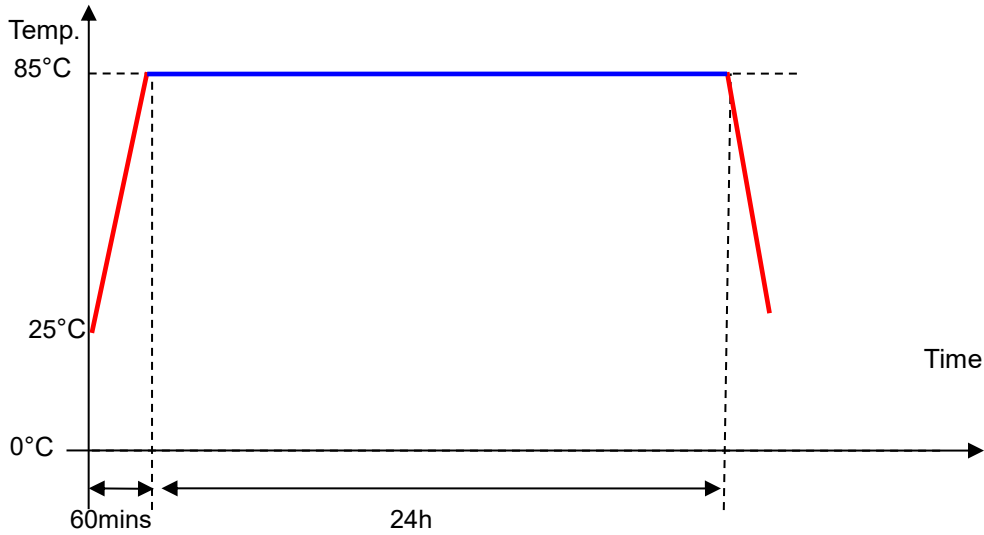
7. High Temperature Operation Test

Test Conditions: Operate at 85°C for 24h.

Test Profile:

Is Power Off _____

Is Power On _____



Test Criteria:

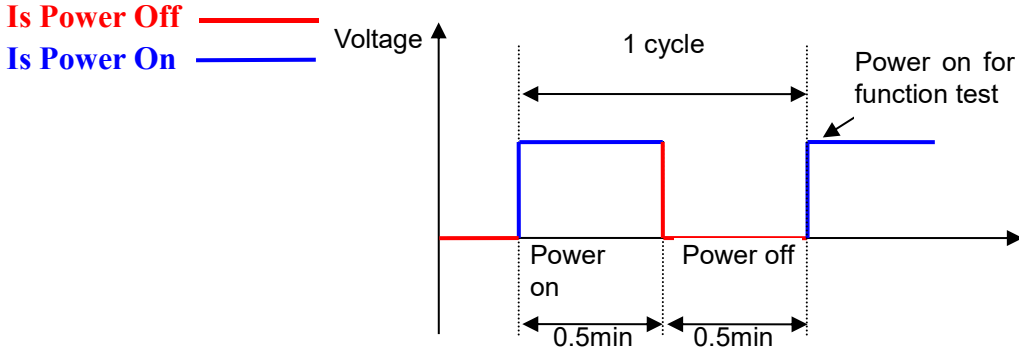
1. If no reboot or crash occurs during testing and it can pair with the mobile device properly, the module is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

Sample Quantity	Test Data	Test Results
<p>Unit 1 Unit 2</p>	<p>The test data section contains three images. The top left is a screenshot of a serial terminal window showing AT command responses, including 'ready' and 'BT module ready'. The top right is another screenshot of the same terminal window. The bottom image is a screenshot of a mobile application titled 'BLE调试助手' (BLE Debug Assistant) showing a list of discovered BLE devices. One device with MAC address 94:C9:60:1D:62:3A is highlighted with a red rectangular box.</p>	<p>PASS</p>

8. AC Power On/Off Test with Temperature

- Test Conditions:**
1. Power on: 30s; power off: 30s.
 2. Temperature: -40°C, 25°C, 85°C.
 3. Cycle: Each test condition cycles 200 times.

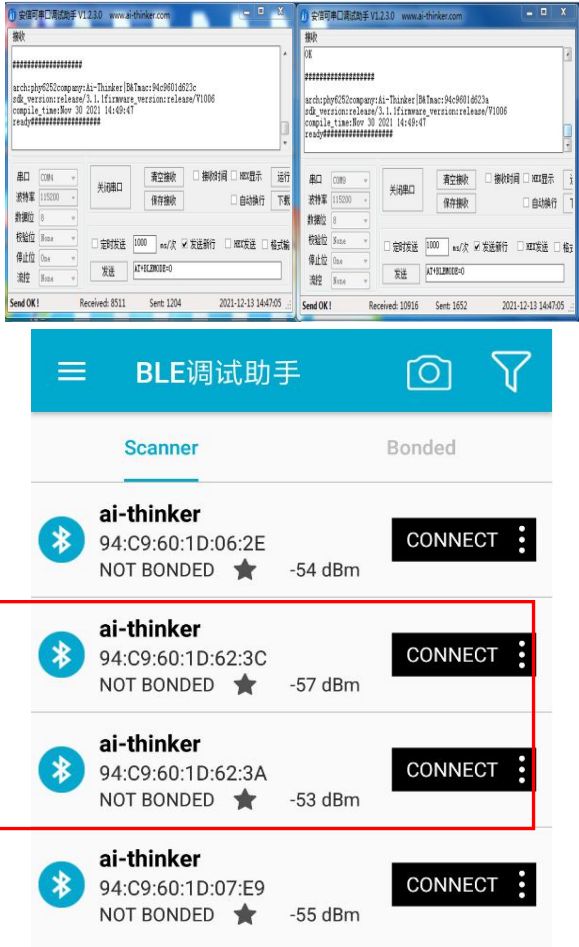
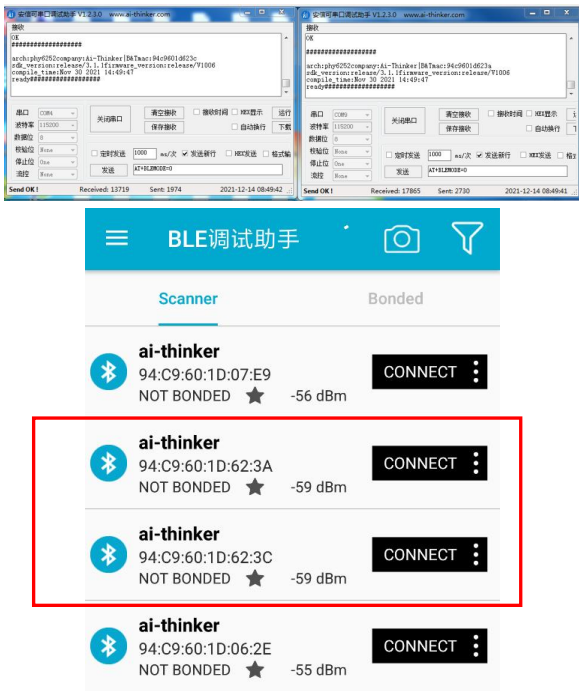
Test Profile:



Test Criteria:

1. After power-up, if the module can pair with the mobile device properly, the module is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

Item	Sample Quantity	Test Data	Test Results
Power on/off at room temperature	Unit 1 Unit 2		PASS

<p>Power on/off at low temperature</p>	<p>Unit 1 Unit 2</p>		<p>PASS</p>
<p>Power on/off at high temperature</p>	<p>Unit 1 Unit 2</p>		<p>PASS</p>

9. Alternating Hot and Humid Test

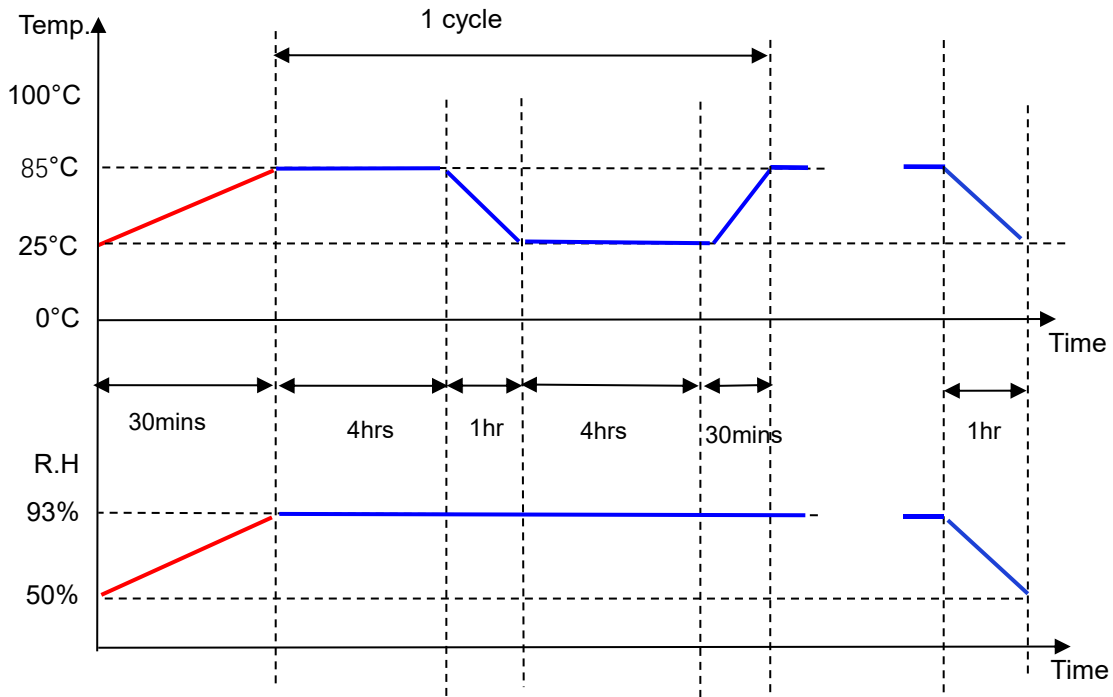
Test Conditions:

1. Operate at 85°C + 93% RH for 4h;
 2. Operate at 25°C + 93% RH for 4h;
- Cycle step 1 and step 2, a total of 2 cycles.

Test Profile:

Is Power Off —

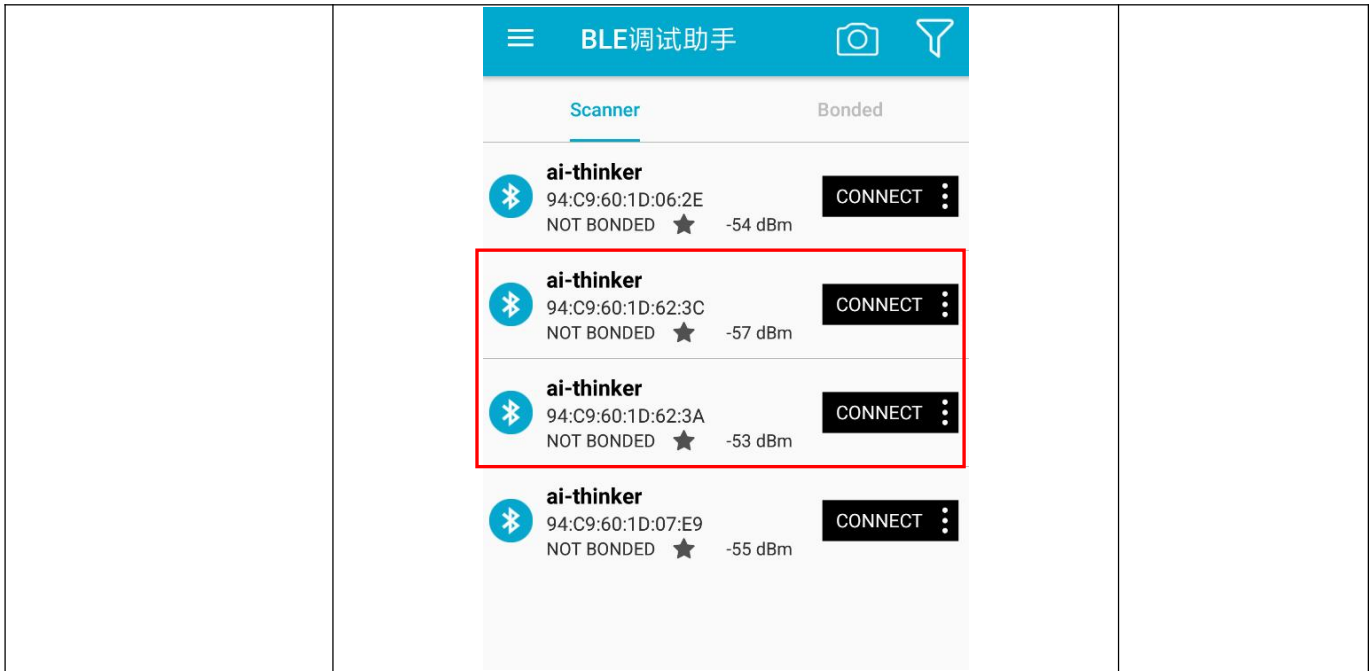
Is Power On —



Test Criteria:

1. After power-up, if the module can pair with the mobile device properly, the module is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

Sample Quantity	Test Data	Test Results
Unit 1 Unit 2		PASS



10. Thermal Shock Test

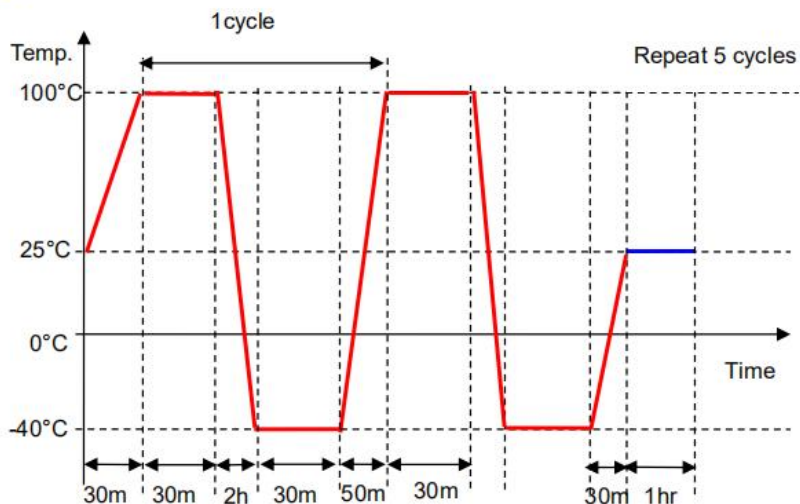
Test Conditions:

Power-off test. Temperature cycling between -40–100°C, with a heating time of 50min and a cooling time of 2h. Each stage is held for 30min, for a total of 5 cycles.

Test Profile:

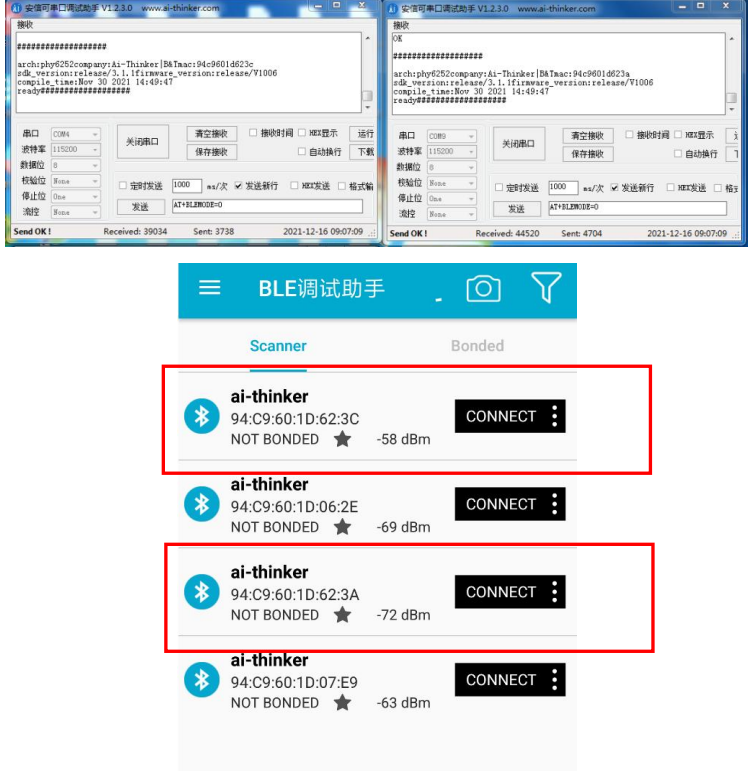
Test Criteria:

— Is Power Off
— Is Power On



1. After power-up, the module boots normally. If ping packets are confirmed not to be lost, the module is considered to be functional.

2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

Sample Quantity	Test Data	Test Results
<p>Unit 1</p> <p>Unit 2</p>	 <p>The test data includes two screenshots of a serial terminal window and one screenshot of a mobile application interface. The serial terminal windows show device information for 'ai-thinker' devices, including MAC addresses and firmware versions. The mobile application interface is titled 'BLE调试助手' (BLE Debug Assistant) and shows a 'Scanner' view with four detected devices, all of which are 'NOT BONDED'.</p>	<p>PASS</p>