

Reliability Test Report

Product Name: TB-03F

Product Model: Bluetooth Series

Test Date: 2021/07/28-2021/07/31

Tested by: Lu Xingui

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 | 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 restoring to -25°C and a 1-hour soak, 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: -20°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: -20°C B) Temperature: 25°C C) Temperature: 85°C Cycle each condition 50 times, with 30s ON and 30s OFF |

3. Test Preparation

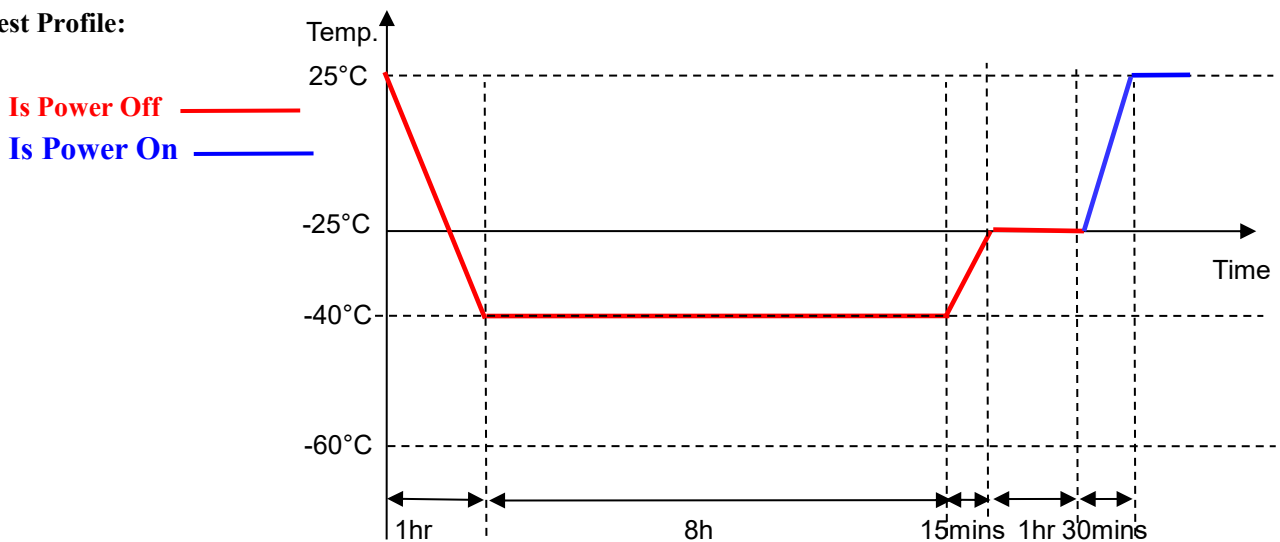
| No. | Item | Image/Attachment |
|-----|---------------------------|--|
| 1 | Reliability documentation |  TB蓝牙可靠性测试说明.doc |

| | | |
|---|------------------|---|
| 2 | Test equipment |  |
| 3 | Sample placement |  |
| 4 | Test Reason | <p>Pilot production of 91240084 TB- 03F 19010002 Bluetooth Chip - TLRS8250F512ET32-SDK_V3.4.1-QFN32-5×5-Tape & Reel</p> |

4. Low Temperature Storage Test

Test Conditions: Power-off test. Store the product at -40°C for 8h, then restore it to -25°C for a 1-hour soak, and perform a cold start test.

Test Profile:



Test Criteria:

1. During the cold start test, the module functions 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.

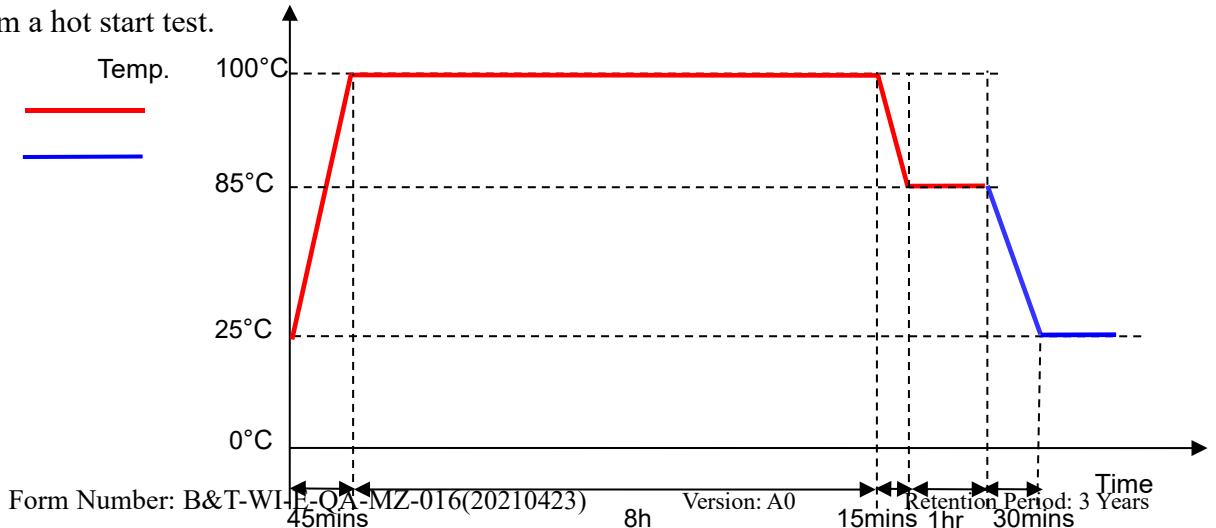
| Sample Quantity | Test Data | Test Results |
|------------------|-----------|--------------|
| Unit 1 Unit 2 | | PASS |

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.

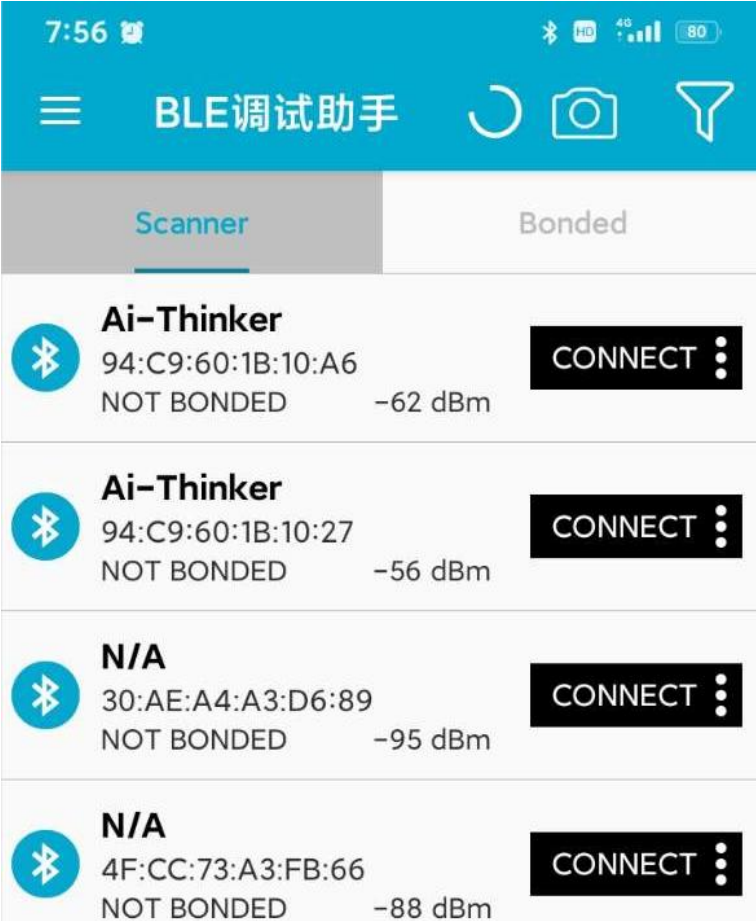
Test Profile:

- Is Power Off (Red line)
- Is Power On (Blue line)



Test Criteria:

1. During the hot start test, the module functions 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.

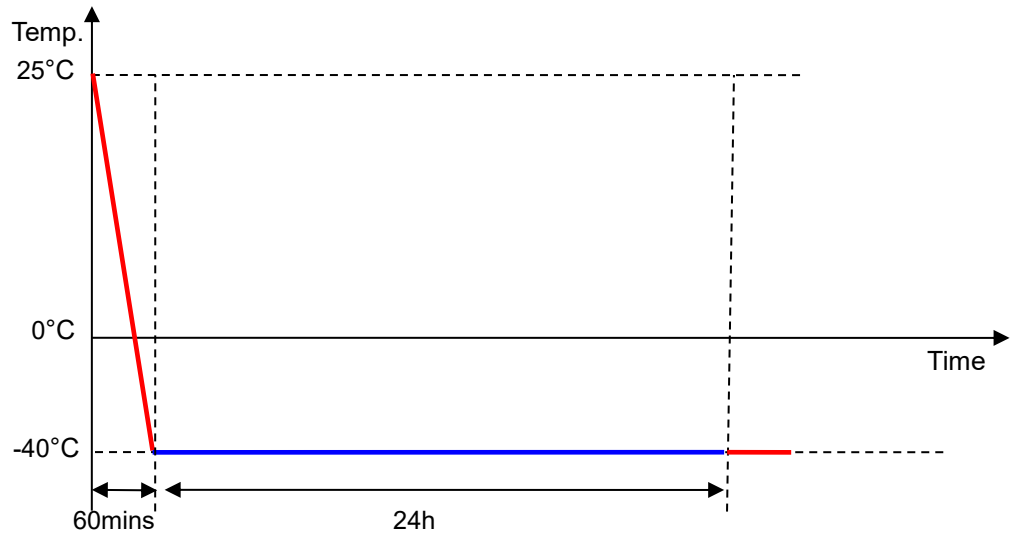
| Sample Quantity | Test Data | Test Results |
|------------------|---|--------------|
| Unit 1 Unit 2 |  | PASS |

6. Low Temperature Operation Test

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

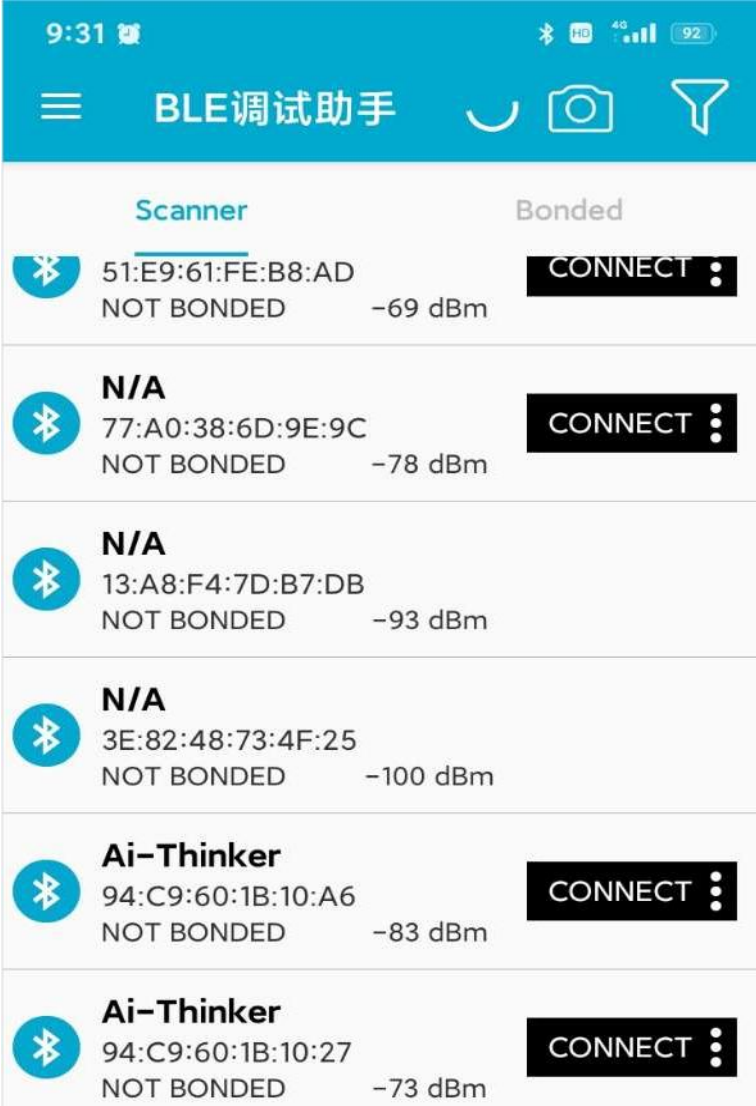
Test Profile:

Is Power Off ——— (red line)
Is Power On ——— (blue line)



Test Criteria:

1. No network disconnections occurred during the test. 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 |
|------------------|---|--------------|
| Unit 1 Unit 2 |  | PASS |

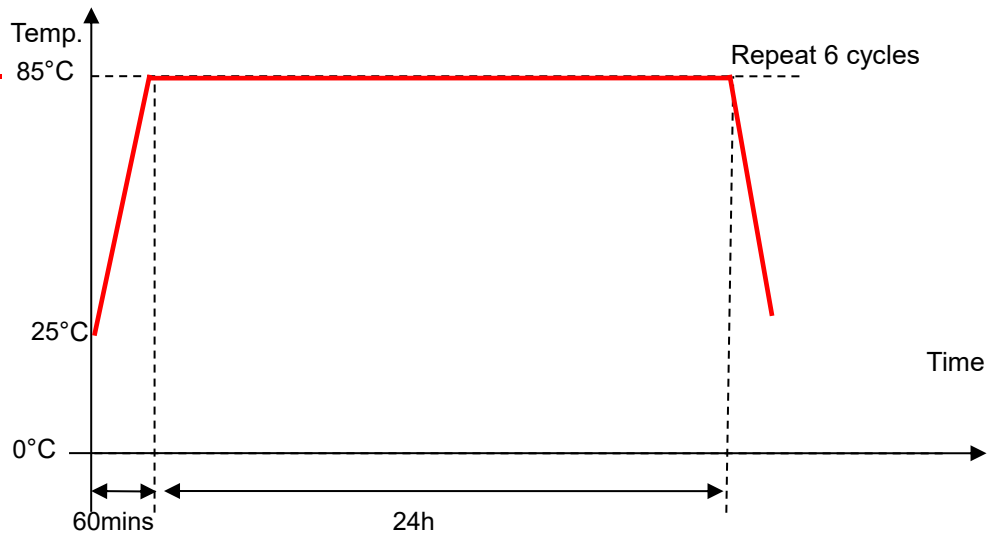
7. High Temperature Operation Test

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

Test Profile:

Is Power Off ————

Is Power On ————



Test Criteria:

1. No network disconnections occurred during the test. 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.

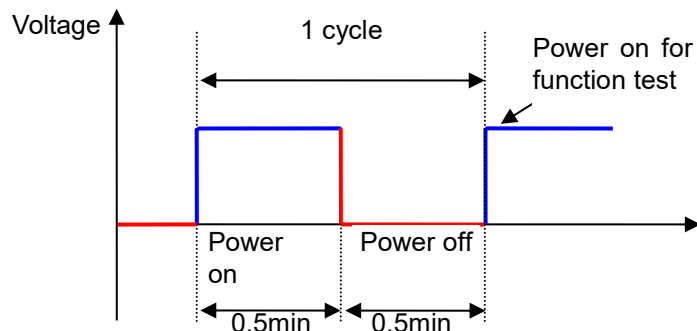
| Sample Quantity | Test Data | Test Results |
|------------------|-----------|--------------|
| Unit 1 Unit 2 | | PASS |

8. Power On/Off Test with Temperature

- Test Conditions:**
1. Power on: 30s; power off: 30s.
 2. Temperature: -20°C, 25°C, 85°C.
 3. Cycle: Each test condition cycles 200 times.

Test Profile:

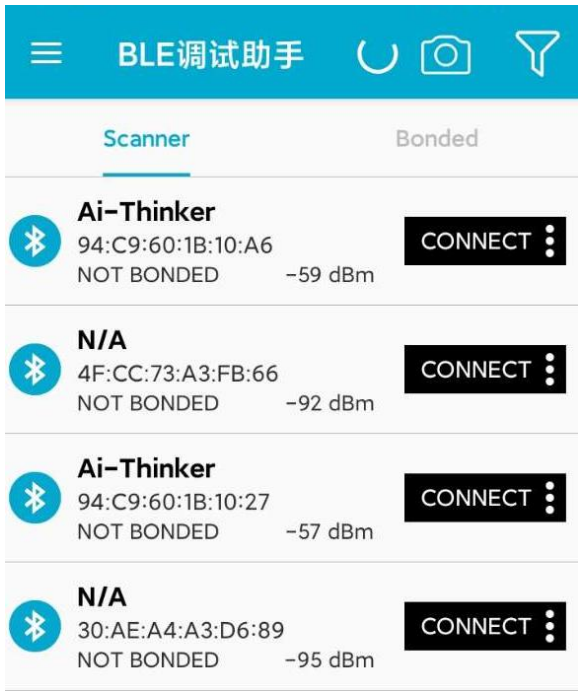
Is Power Off —
Is Power On —



Test Criteria:

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.

| Item | Sample Quantity | Test Data | Test Results |
|----------------------------------|------------------|--|--------------|
| Power on/off at room temperature | Unit 1 Unit 2 | <div style="display: flex; justify-content: space-between;">ScannerBonded</div> <div style="margin-top: 5px;"> 1F:7F:FE:98:1B:A7 NOT BONDED -100 dBm </div> <hr/> <div style="margin-top: 5px;"> N/A 00:0C:48:91:24:C3 NOT BONDED -91 dBm </div> <hr/> <div style="margin-top: 5px;"> N/A 37:0B:40:17:EA:88 NOT BONDED -91 dBm </div> <hr/> <div style="margin-top: 5px;"> N/A 62:35:A0:46:06:26 CONNECT NOT BONDED -73 dBm </div> <hr/> <div style="margin-top: 5px;"> N/A 09:44:B3:34:B3:15 NOT BONDED -89 dBm </div> <hr/> <div style="margin-top: 5px;"> Ai-Thinker 94:C9:60:1B:10:27 CONNECT NOT BONDED -63 dBm </div> <hr/> <div style="margin-top: 5px;"> Ai-Thinker 94:C9:60:1B:10:A6 CONNECT NOT BONDED -70 dBm </div> | PASS |
| Power on/off at low temperature | Unit 1 Unit 2 | <div style="margin-top: 5px;"> N/A 10:3D:9A:B6:13:9F NOT BONDED -91 dBm </div> <hr/> <div style="margin-top: 5px;"> N/A 2D:9E:D4:BF:81:A6 NOT BONDED -91 dBm </div> <hr/> <div style="margin-top: 5px;"> N/A 69:E3:B9:75:91:31 NOT BONDED -94 dBm </div> <hr/> <div style="margin-top: 5px;"> N/A 17:13:F7:CA:78:2A NOT BONDED -84 dBm </div> <hr/> <div style="margin-top: 5px;"> N/A 50:D9:41:BC:B9:C2 CONNECT NOT BONDED -78 dBm </div> <hr/> <div style="margin-top: 5px;"> Ai-Thinker 94:C9:60:1B:10:A6 CONNECT NOT BONDED -60 dBm </div> <hr/> <div style="margin-top: 5px;"> Ai-Thinker 94:C9:60:1B:10:27 CONNECT NOT BONDED -53 dBm </div> | PASS |

| <p>Power on/off at high temperature</p> | <p>Unit 1 Unit 2</p> |  <p>The screenshot shows the BLE调试助手 (BLE Debug Assistant) application interface. At the top, there is a blue header with the title 'BLE调试助手' and three icons: a menu, a refresh, and a camera. Below the header, there are two tabs: 'Scanner' (active) and 'Bonded'. The main area displays a list of discovered BLE devices. Each device entry consists of a Bluetooth icon, a name, a MAC address, the status 'NOT BONDED', and a signal strength in dBm. To the right of each entry is a black 'CONNECT' button with a three-dot menu icon.</p> <table border="1"> <thead> <tr> <th>Name</th> <th>MAC Address</th> <th>Status</th> <th>Signal Strength (dBm)</th> </tr> </thead> <tbody> <tr> <td>Ai-Thinker</td> <td>94:C9:60:1B:10:A6</td> <td>NOT BONDED</td> <td>-59</td> </tr> <tr> <td>N/A</td> <td>4F:CC:73:A3:FB:66</td> <td>NOT BONDED</td> <td>-92</td> </tr> <tr> <td>Ai-Thinker</td> <td>94:C9:60:1B:10:27</td> <td>NOT BONDED</td> <td>-57</td> </tr> <tr> <td>N/A</td> <td>30:AE:A4:A3:D6:89</td> <td>NOT BONDED</td> <td>-95</td> </tr> </tbody> </table> | Name | MAC Address | Status | Signal Strength (dBm) | Ai-Thinker | 94:C9:60:1B:10:A6 | NOT BONDED | -59 | N/A | 4F:CC:73:A3:FB:66 | NOT BONDED | -92 | Ai-Thinker | 94:C9:60:1B:10:27 | NOT BONDED | -57 | N/A | 30:AE:A4:A3:D6:89 | NOT BONDED | -95 | <p>PASS</p> |
|---|--------------------------|---|-----------------------|-------------|--------|-----------------------|------------|-------------------|------------|-----|-----|-------------------|------------|-----|------------|-------------------|------------|-----|-----|-------------------|------------|-----|-------------|
| Name | MAC Address | Status | Signal Strength (dBm) | | | | | | | | | | | | | | | | | | | | |
| Ai-Thinker | 94:C9:60:1B:10:A6 | NOT BONDED | -59 | | | | | | | | | | | | | | | | | | | | |
| N/A | 4F:CC:73:A3:FB:66 | NOT BONDED | -92 | | | | | | | | | | | | | | | | | | | | |
| Ai-Thinker | 94:C9:60:1B:10:27 | NOT BONDED | -57 | | | | | | | | | | | | | | | | | | | | |
| N/A | 30:AE:A4:A3:D6:89 | NOT BONDED | -95 | | | | | | | | | | | | | | | | | | | | |