Reliability Test Report

Product Name: LoRa Module

Product Model: Ra-01SC

Test Date: 2021/05/06 (3rd Test)

Tested by: Lu Xingui

Reviewed by: Zhou Yuming

1. Inspection Plan

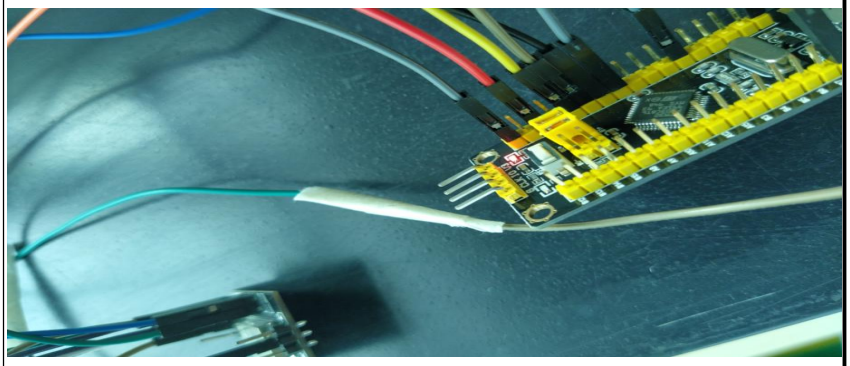
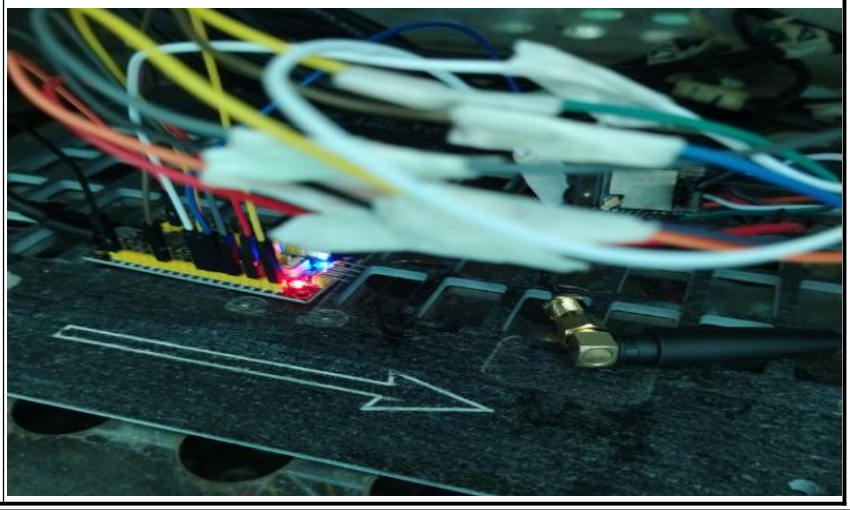
No.	Process Name	Inspection Item	Inspection Equipment	Sampling Level (Refer to GB/T 2828.1-2003)	Acceptable Quality Level		
					CR (Critical Defect)	MA (Major Defect)	MI (Minor Defect)
1	Reliability test	High/low temperature storage; high/room/low temperature power on/off; high/low temperature operation	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℃ Test duration: 8h After restoring to -25℃ and a 1-hour soak, perform a cold start test.
2	High temperature storage test	Test conditions: 100℃ Test duration: 8h After restoring to 85℃ and a 1-hour soak, perform a hot start test.
3	Low temperature operation test	Test conditions: -20℃ Test duration: 24h
4	High temperature operation test	Test conditions: 85℃ Test duration: 24h
5	AC power on/off test with temperature	A) Temperature: -20℃ B) Temperature: 25℃ C) Temperature: 85℃ Cycle each condition 200 times, with 30s ON and 30s OFF

3. Test Preparation

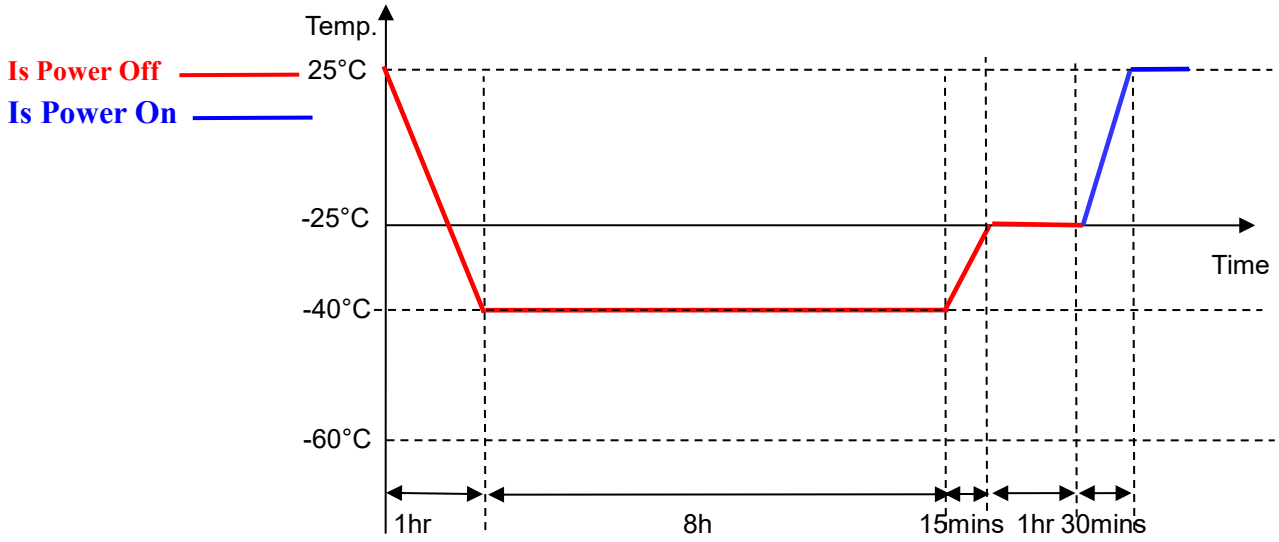
No.	Item	Image/Attachment
1	Reliability documentation	 Ra-01SC可靠性测试说明.pdf
2	Reflash the transmitter and receiver firmware (re-released version 0427)	 RA-01SC可靠性测试固件 0427.zip

3	Test equipment	
4	Sample placement	Receiver  Transmitter 

4. Low Temperature Storage Test

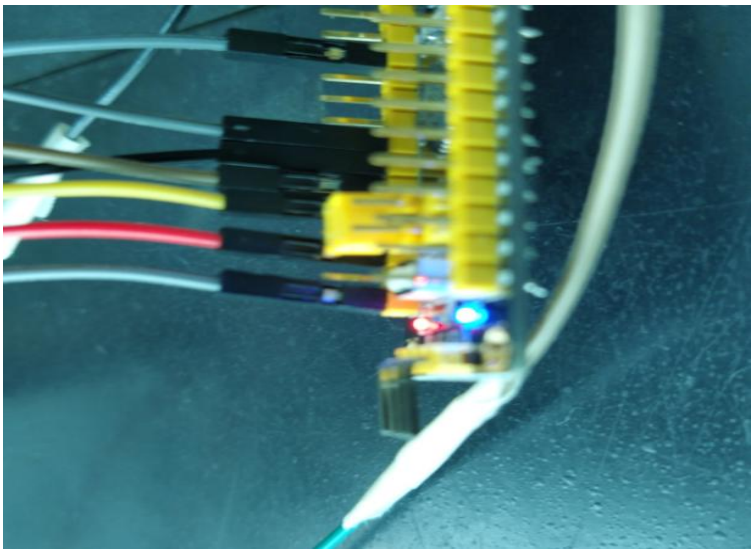
Test Conditions: Power-off test. Store the product at -40℃ for 8h, then restore it to -25℃ for a 1-hour soak, and perform a cold start test.

Test Profile:



Test Criteria:

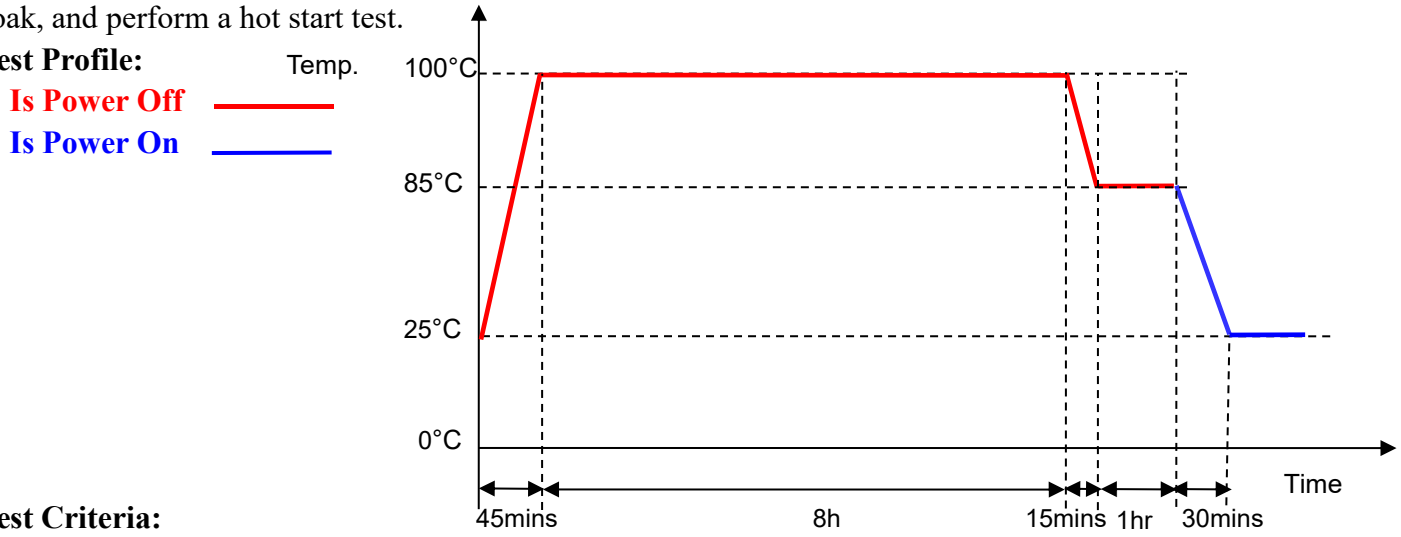
1. During cold start, the module functions normally. Confirm that the blue LED on the receiver is observed to blink (1 second on, 1 second off), which indicates normal operation, thus verifying the module is functioning properly.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

Sample Quantity	Test Data	Test Result
Unit 1 Unit 2		PASS

5. High Temperature Storage Test

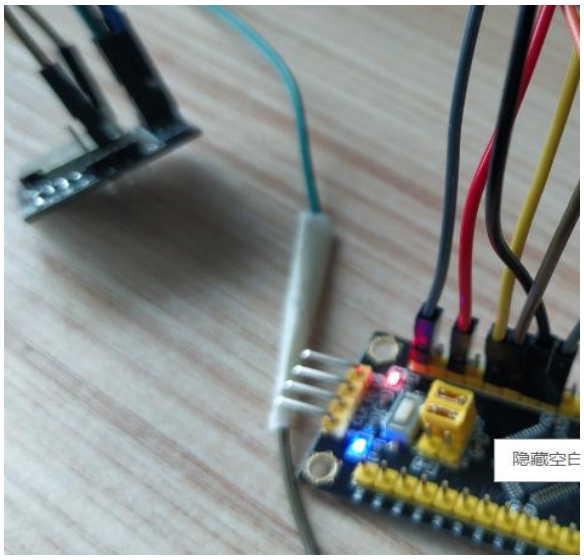
Test Conditions: Power-off test. Store the product at 100℃ for 8h, then restore it to 85℃ for a 1-hour soak, and perform a hot start test.

Test Profile:



Test Criteria:

1. During hot start, the module functions normally. Confirm that the blue LED on the receiver is observed to blink (1 second on, 1 second off), which indicates normal operation, thus verifying the module is functioning properly.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

Sample Quantity	Test Data	Test Result
Unit 1 Unit 2		PASS

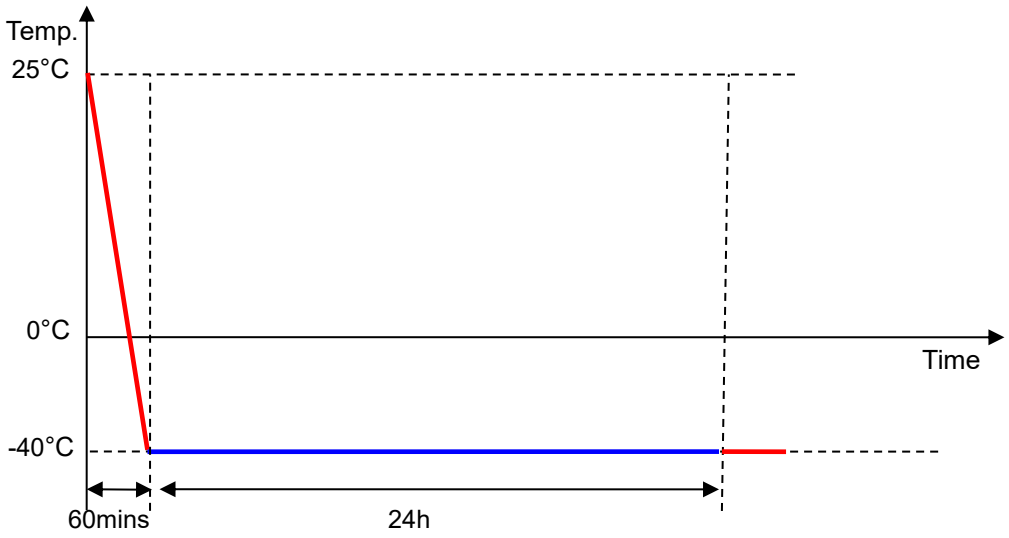
6. Low Temperature Operation Test

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

Test Profile:

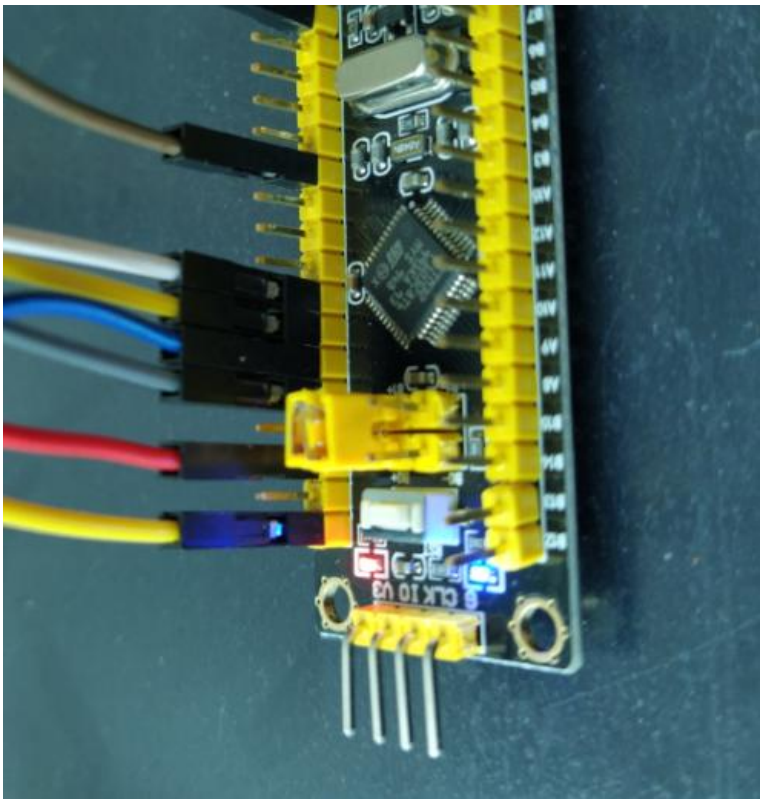
Is Power Off

Is Power On



Test Criteria:

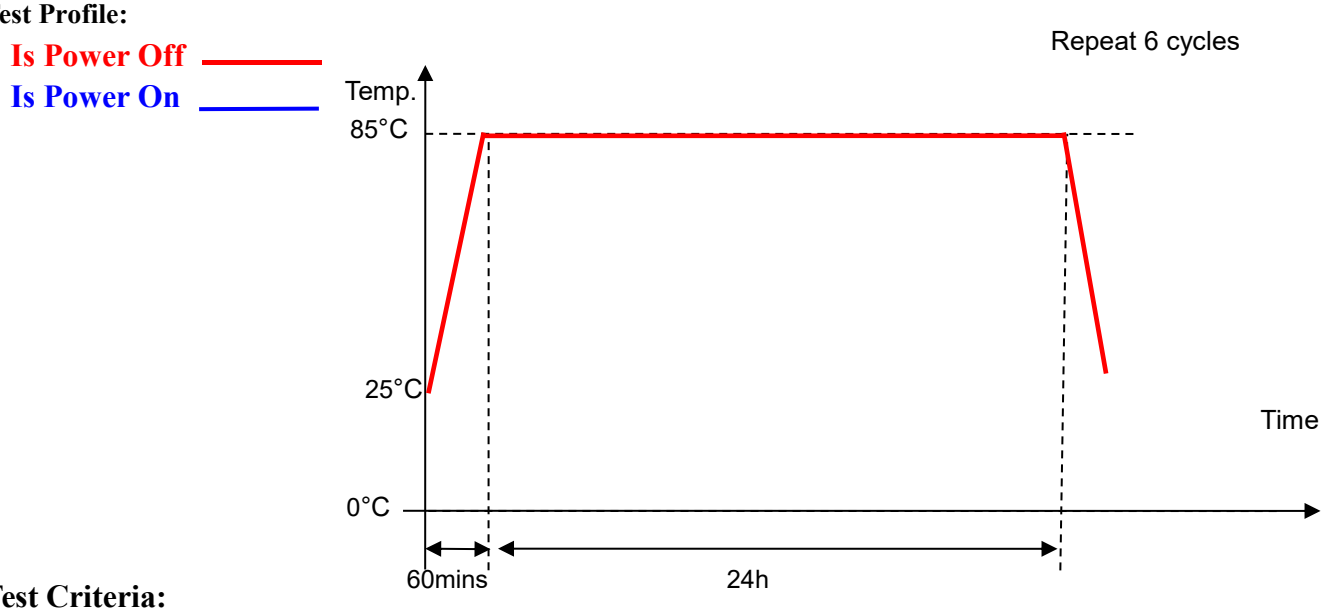
1. No reboot or crash occurs during the test. Confirm that the blue LED on the receiver is observed to blink (1 second on, 1 second off), which indicates normal operation, thus verifying the module is functioning properly.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

Sample Quantity	Test Data	Test Result
Unit 1 Unit 2		NA

7. High Temperature Operation Test

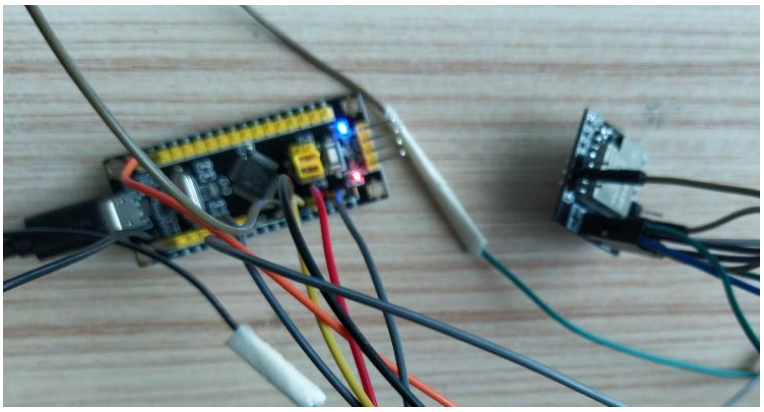
Test Conditions: Operate at 85℃ for 24h.

Test Profile:



Test Criteria:

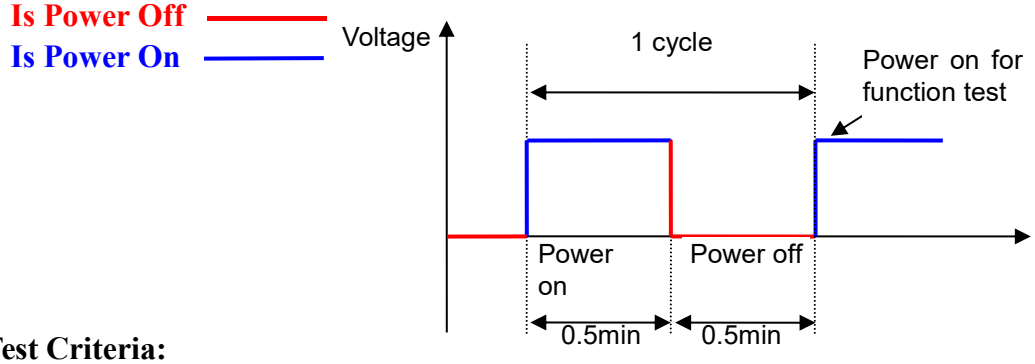
1. No reboot or crash occurs during the test. Confirm that the blue LED on the receiver is observed to blink (1 second on, 1 second off), which indicates normal operation, thus verifying the module is functioning properly.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

Sample Quantity	Test Data	Test Result
Unit 1 Unit 2		PASS

8. AC Power On/Off Test with Temperature

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

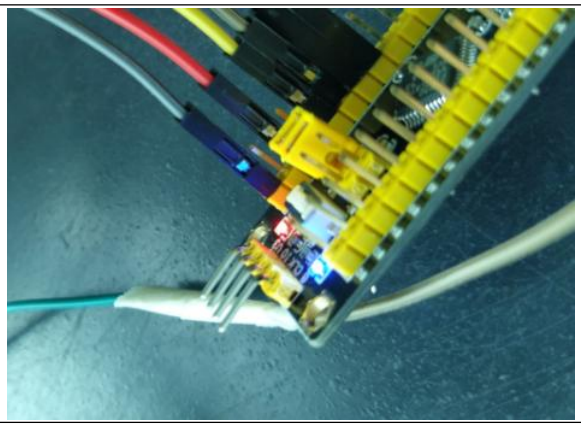
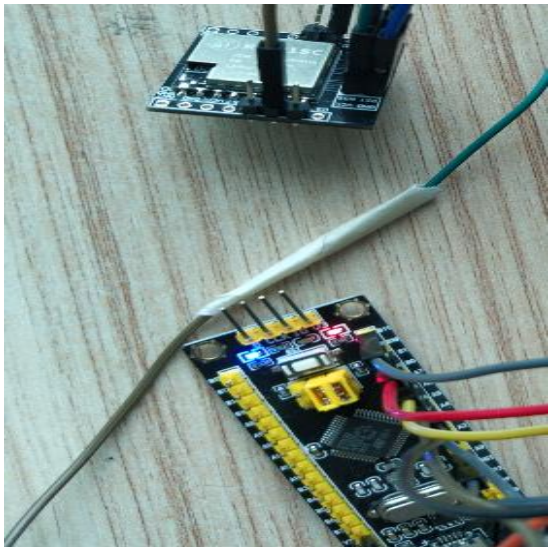
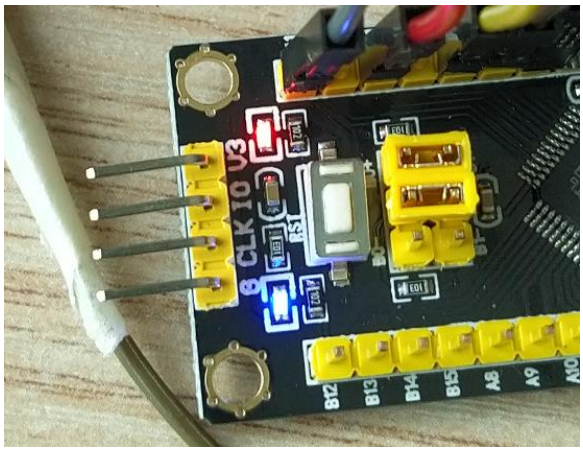
Test Profile:



Test Criteria:

1. After power-on, the module functions normally. Confirm that the blue LED on the receiver is observed to blink (1 second on, 1 second off), which indicates normal operation, thus verifying the module is functioning properly.

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
Power on/off at low temperature	Unit 1 Unit 2		NA
Power on/off at high temperature	Unit 1 Unit 2		NA

Based on the above tests, this reliability test: **PASS**.