

# Reliability Test Report

<b>Product Name:</b>	<b>LoRa Series</b>
<b>Product Model:</b>	<b>Ra-08H-P</b>
<b>Test Date:</b>	<b>2024.12.10-2024.12.17</b>
<b>Tested by:</b>	<b>An Sanchao</b>
<b>Reviewed by:</b>	<b>An Sanchao</b>




## 1. Inspection Standard

No.	Process Name	Inspection Item	Inspection Equipment	Sampling Level (Refer to GB/T 2828.1-2012)	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 a 1-hour soak at -40°C, perform a cold start test.
2	High temperature storage test	Test conditions: 100°C + 93% RH 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 + 93% RH Test duration: 24h
5	AC power on/off test with temperature	A) Temperature: -40°C B) Temperature: 25°C + 93% RH C) Temperature: 85°C + 93% RH 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 + 93% RH, 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	 Ra-08-P Ra-08H-P模组 可:
2	Test equipment	
3	Sample placement	
4	Test reason	Ra-08H-P New product reliability test (91200038)

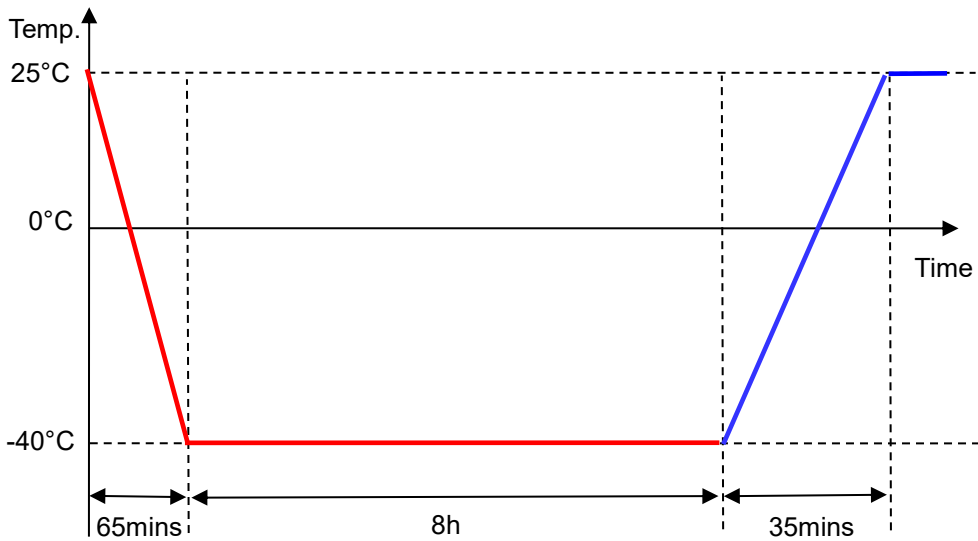
## 4. Low Temperature Storage Test

**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. During the cold start test, the module functions normally. After the module is properly connected, power on the module and start the test by sending commands. If the packet reception rate is greater than 99%, the module is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

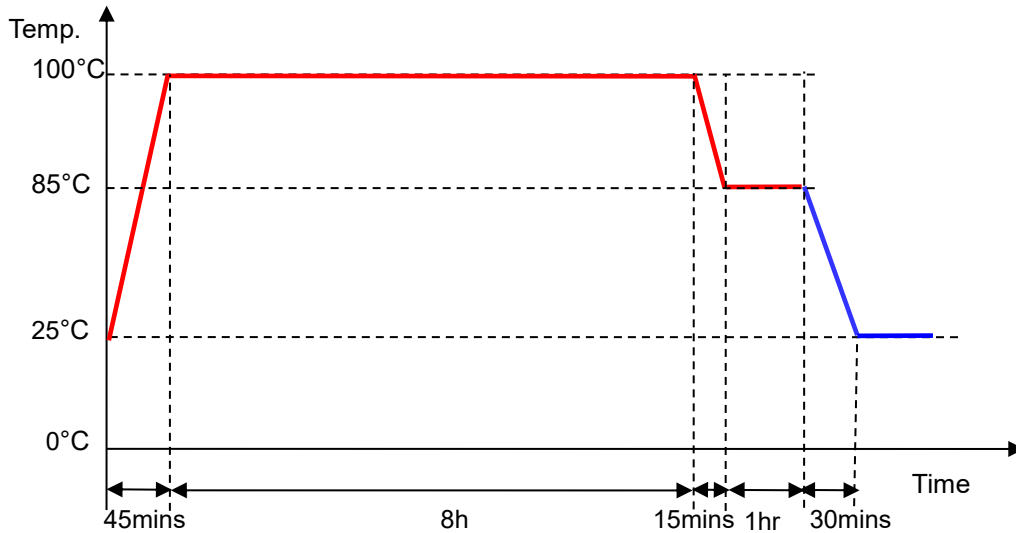
Sample Quantity	Test Data	Test Results
6PCS		PASS

## 5. High Temperature Storage Test

**Test Conditions:** Power-off test. Store the product at 100°C + 93% RH for 8h, then restore it to 85°C + 93% RH for a 1-hour soak, and perform a hot start test.

**Test Profile:**

Is Power Off ——  
Is Power On ——



### Test Criteria:

1. During the hot start test, the module functions normally. After the module is properly connected, power on the module and start the test by sending commands. If the packet reception rate is greater than 99%, the module is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

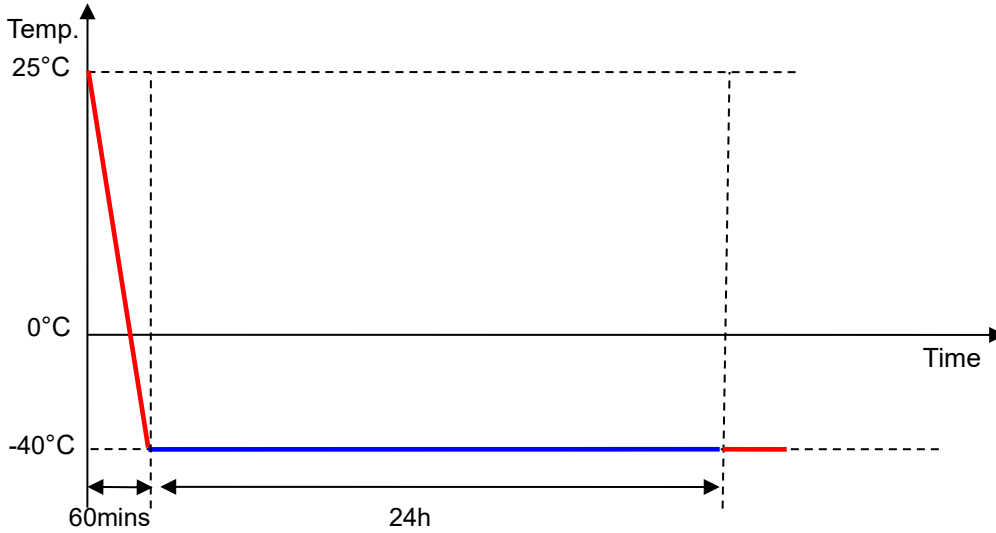
Sample Quantity	Test Data	Test Results
6PCS		PASS

## 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. Connect the module properly and send commands to start the test after power-on. If the packet reception rate is greater than 99%, the module is operating normally and is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

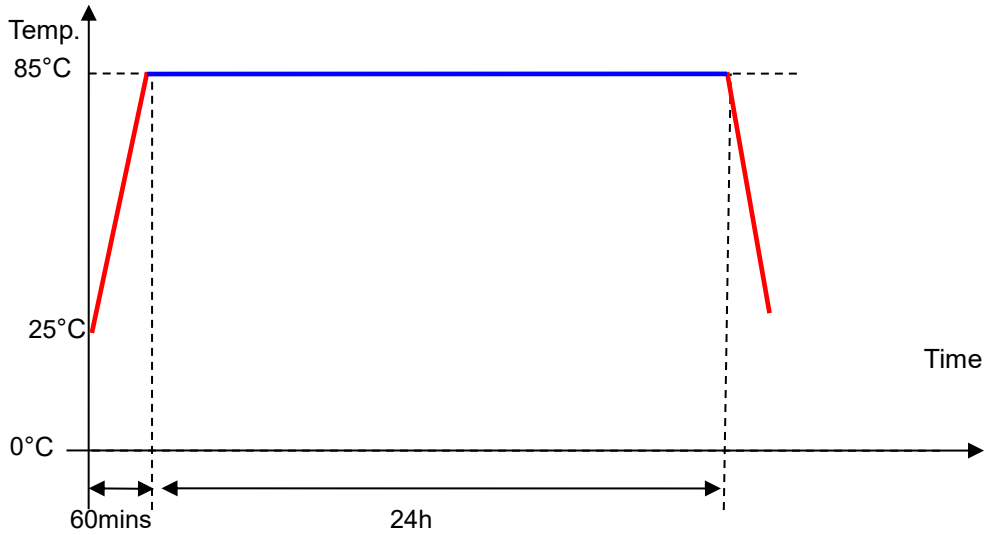
Sample Quantity	Test Data	Test Results
6PCS	<p>The screenshot displays multiple windows of test data logs. The logs show network activity, including packet reception rates (e.g., 99.99%) and device status (e.g., 'Power On', 'Power Off'). The data is organized into columns for time, status, and network metrics.</p>	PASS

## 7. High Temperature Operation Test

Test Conditions: Power-on test. Operate at 85°C+ 93% RH for 24h.

Test Profile:

Is Power Off ——  
Is Power On ——



### Test Criteria:

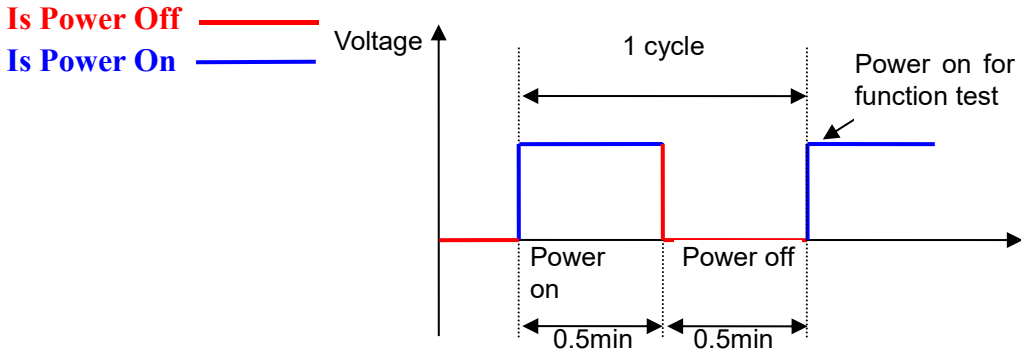
1. Connect the module properly and send commands to start the test after power-on. If the packet reception rate is greater than 99%, the module is operating normally and is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

Sample Quantity	Test Data	Test Results
6PCS	<p>The screenshot displays multiple windows of test data logs. The logs show various test parameters such as 'Packet Reception Rate' (e.g., 99.99%), 'Temperature' (85°C), and 'Humidity' (93% RH). The logs are organized into columns, likely representing different test samples or parameters. The overall status of the test is indicated as 'PASS'.</p>	PASS

## 8. AC Power On/Off Test with Temperature

- Test Conditions:**
1. Power on: 30s; power off: 30s.
  2. Temperature: -40°C, 25°C + 93% RH, 85°C + 93% RH.
  3. Cycle: Each test condition cycles 200 times.

**Test Profile:**



**Test Criteria:**

1. Connect the module properly and send commands to start the test after power-on. If the packet reception rate is greater than 99%, the module is operating normally and 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	6PCS		PASS
Power on/off at low temperature	6PCS		PASS
Power on/off at high temperature	6PCS		PASS

## 9. Alternating Hot and Humid Test

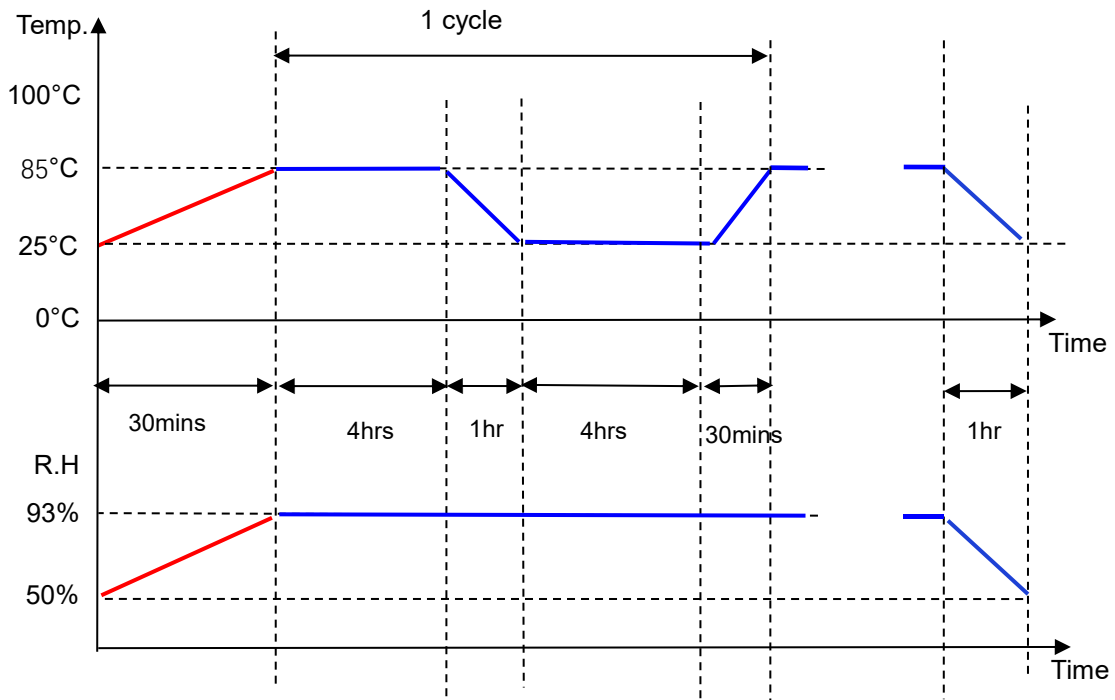
### Test Conditions:

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. Connect the module properly and send commands to start the test after power-on. If the packet reception rate is greater than 99%, the module is operating normally and 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>6PCS</p>	<p>The screenshot displays test data for six samples. Each sample's data is presented in a table with columns for 'Time', 'Packet Type', 'Status', and 'Rate'. The 'Rate' column consistently shows values above 99%, indicating high packet reception performance. The interface also includes various control buttons and status indicators at the bottom.</p>	<p>PASS</p>

# 10. Thermal Shock Test

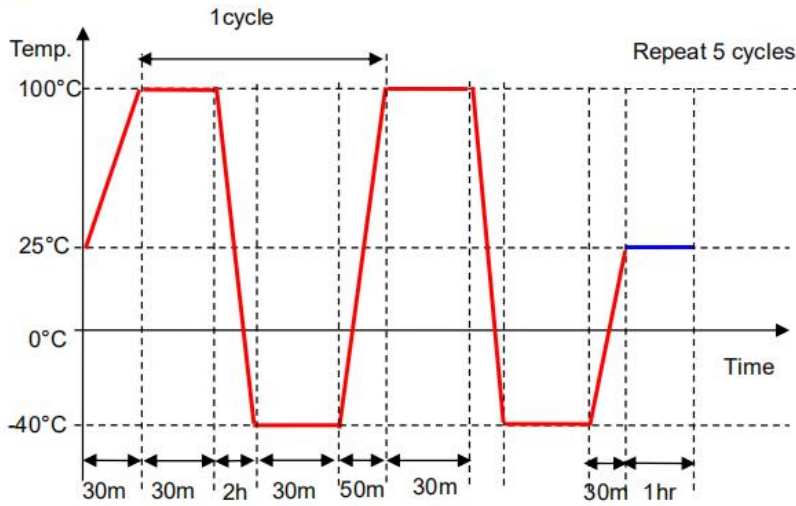
## Test Conditions:

Power-off test. Temperature cycling between -40~100°C + 93% RH, 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:

Is Power Off

Is Power On



## Test Criteria:

1. Connect the module properly and send commands to start the test after power-on. If the packet reception rate is greater than 99%, the module is operating normally and 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
6PCS		PASS