

Reliability Test Report

Product Name:	Ai-M62-07S V2.0
Product Model:	<u>M62 Series</u>
Test Date:	2023.10.16-2023.10.24
Tested by:	Lai Zongsheng
Reviewed by:	Lu Xingui

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

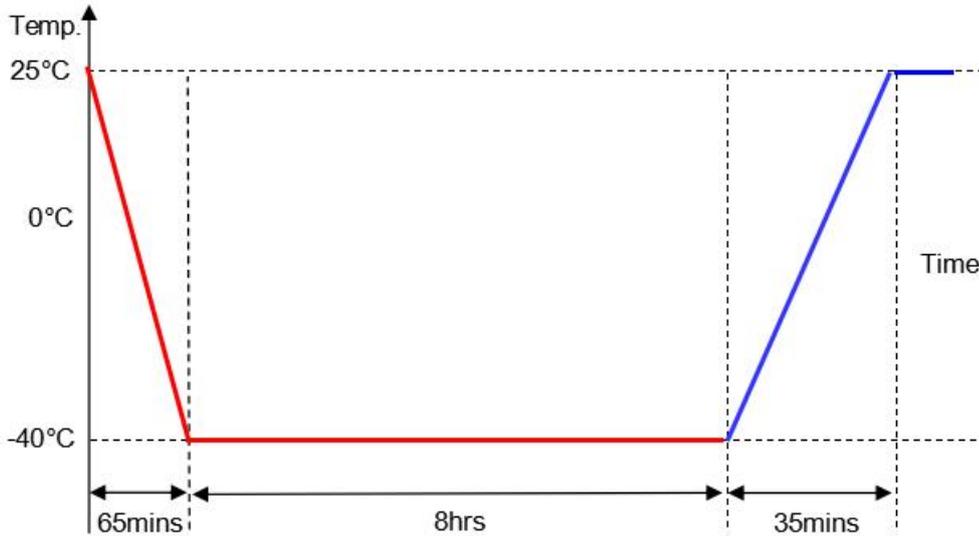
No.	Item	Image/Attachment
1	Reliability documentation	Refer to the M62 series reliability documentation
2	Test equipment	
3	Sample placement	
4	Test reason	Reliability test for new product pilot production

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 no packet loss is observed in the receiver log, the module is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

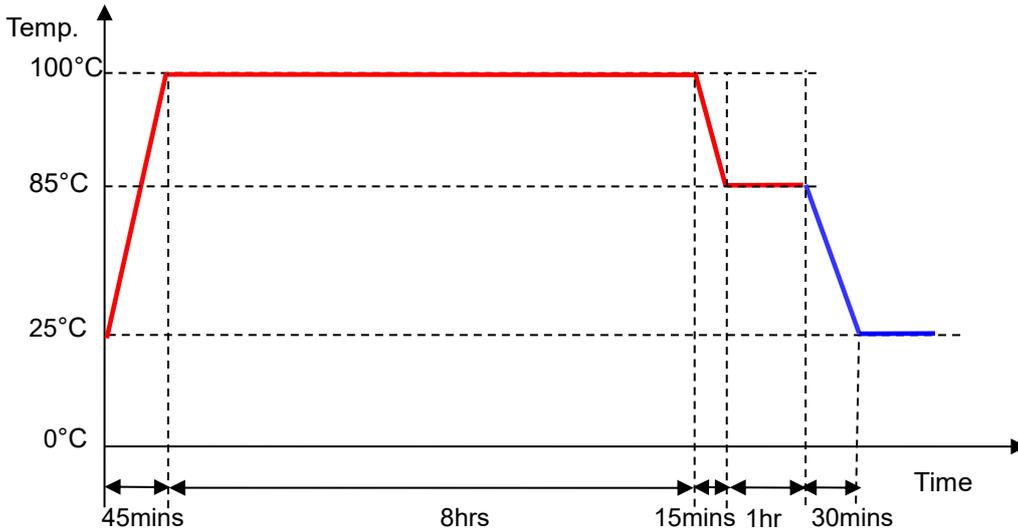
Sample Quantity	Test Data	Test Results
6PCS	<p>The test data consists of six screenshots of the AT&KPING software interface. Each screenshot shows a successful ping test with 0% packet loss. The logs include details such as 'Ping 统计信息' (Ping Statistics) and '数据包' (Data Packets) with fields for count, min/max/avg ping times, and start/stop times. For example, the first log shows 4 packets, a min ping of 995ms, and a max ping of 995ms. The sixth log shows 3 packets, a min ping of 188ms, and a max ping of 188ms.</p>	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 no packet loss is observed in the receiver log, the module is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

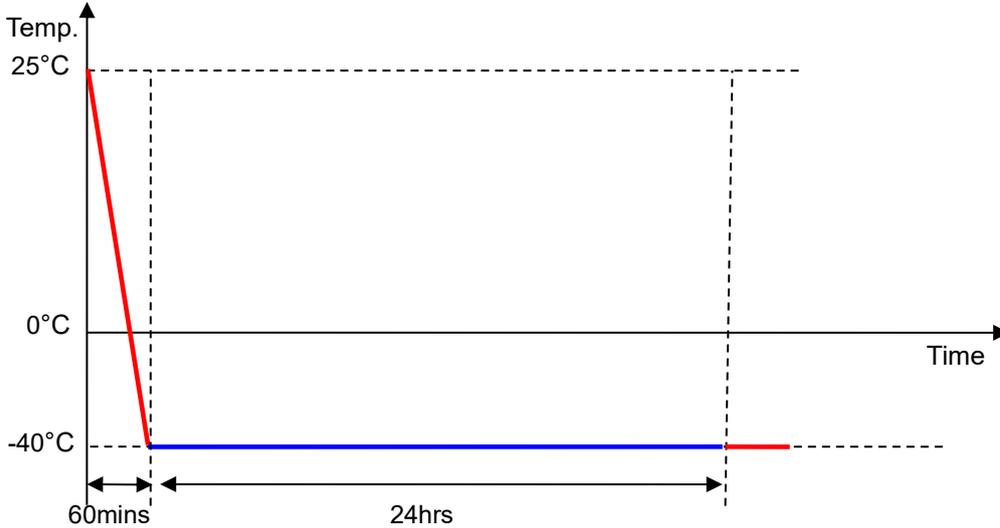
Sample Quantity	Test Data	Test Results
6PCS		PASS

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. After the module is properly connected, power on the module and start the test by sending commands. If no packet loss is observed in the receiver log, the module is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

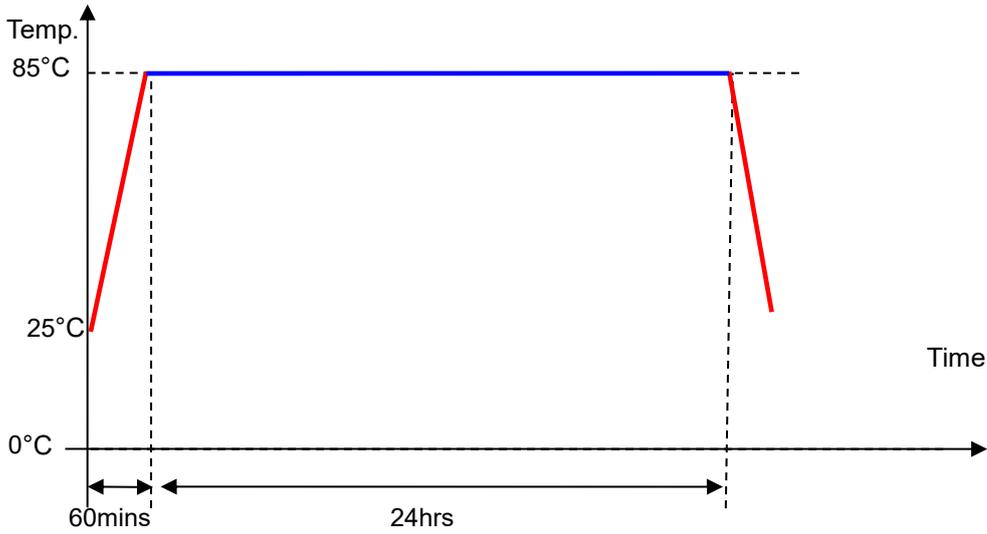
Sample Quantity	Test Data	Test Results
6PCS	<p>The screenshot shows six instances of the ATKPPING software. Each window displays the following statistics:</p> <ul style="list-style-type: none"> Sample 1: Ping 统计信息: 发送包 510017, Ping 最小值 1 毫秒, 开始时间 16:52:38, 超时 272, Ping 最大值 1010 毫秒, 经过时间 04:05:07, 包丢失 0, Ping 平均值 9.83 毫秒. Sample 2: Ping 统计信息: 发送包 510408, Ping 最小值 1 毫秒, 开始时间 16:52:39, 超时 399, Ping 最大值 1007 毫秒, 经过时间 04:05:07, 包丢失 0.07%, Ping 平均值 9.45 毫秒. Sample 3: Ping 统计信息: 发送包 510819, Ping 最小值 1 毫秒, 开始时间 16:52:40, 超时 302, Ping 最大值 1009 毫秒, 经过时间 04:05:08, 包丢失 0.06%, Ping 平均值 9.42 毫秒. Sample 4: Ping 统计信息: 发送包 492982, Ping 最小值 1 毫秒, 开始时间 16:52:41, 超时 711, Ping 最大值 1009 毫秒, 经过时间 04:05:08, 包丢失 0.14%, Ping 平均值 9.40 毫秒. Sample 5: Ping 统计信息: 发送包 507182, Ping 最小值 1 毫秒, 开始时间 16:52:42, 超时 616, Ping 最大值 1009 毫秒, 经过时间 04:05:08, 包丢失 0.22%, Ping 平均值 9.84 毫秒. Sample 6: Ping 统计信息: 发送包 494545, Ping 最小值 1 毫秒, 开始时间 16:52:42, 超时 718, Ping 最大值 1011 毫秒, 经过时间 04:05:08, 包丢失 0.15%, Ping 平均值 9.34 毫秒. 	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:

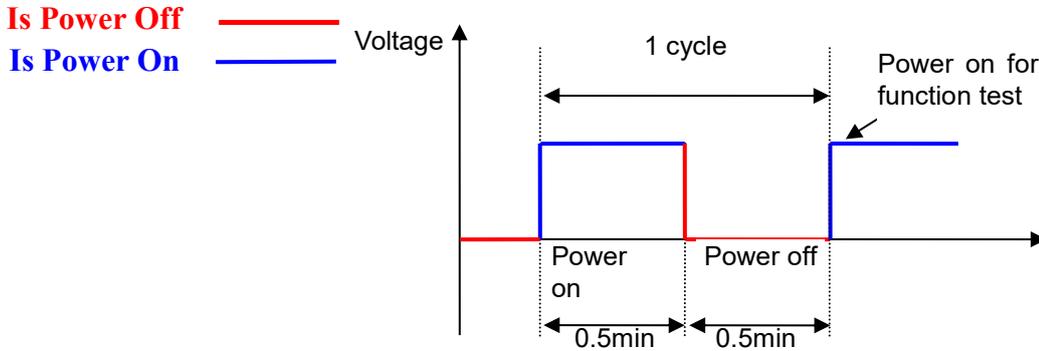
1. After the module is properly connected, power on the module and start the test by sending commands. If no packet loss is observed in the receiver log, the module is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

Sample Quantity	Test Data	Test Results
6PCS	<p>The screenshot shows six windows of ATKOPING ping test results. Each window displays the target IP, ping count, and statistics. For example, the first window shows a target of 192.168.3.11 with 3187 pings, a 0.04% loss rate, and an average of 4.67ms. The second window shows a target of 192.168.3.12 with 2234 pings, a 0.04% loss rate, and an average of 4.82ms. The third window shows a target of 192.168.3.13 with 2140 pings, a 0.04% loss rate, and an average of 4.67ms. The fourth window shows a target of 192.168.3.4 with 3969 pings, a 0.04% loss rate, and an average of 5.08ms. The fifth window shows a target of 192.168.3.14 with 2126 pings, a 0.04% loss rate, and an average of 4.64ms. The sixth window shows a target of 192.168.3.3 with 2769 pings, a 0.05% loss rate, and an average of 4.94ms. All tests show 100% success rates and no packet loss.</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. After the module is properly connected, power on the module and start the test by sending commands. If no packet loss is observed in the receiver log, 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	6PCS		PASS
Power on/off at low temperature	6PCS		PASS
Power on/off at high temperature	6PCS		PASS

9. Alternating Hot and Humid Test

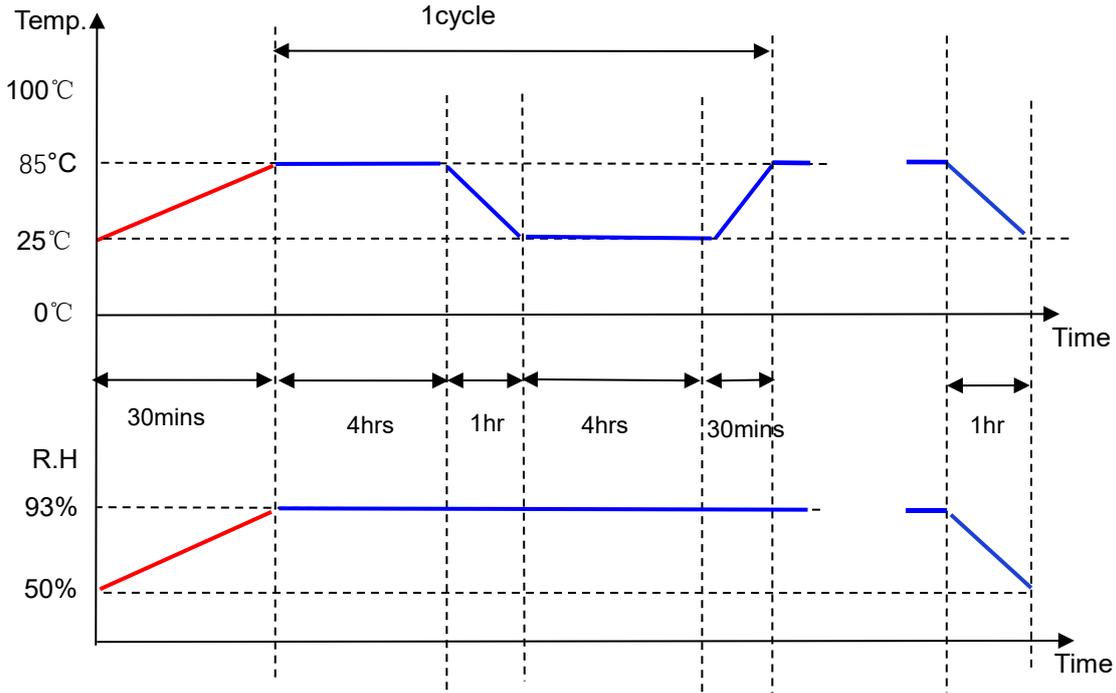
Test Conditions:

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. After the module is properly connected, power on the module and start the test by sending commands. If no packet loss is observed in the receiver log, 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

10. Thermal Shock Test

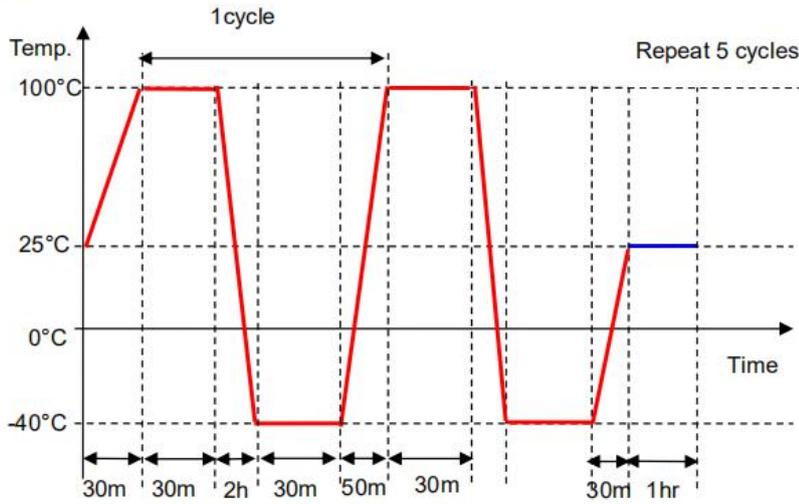
Test Conditions:

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. After the module is properly connected, power on the module and start the test by sending commands. If no packet loss is observed in the receiver log, 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