

可靠性测试报告

产品名称:	Ai-WS1 系列
产品型号:	Ai-WS1-CBS-Kit
测试日期:	2024.11.18-2024.11.26
测试人:	袁南南
审核人:	安三超

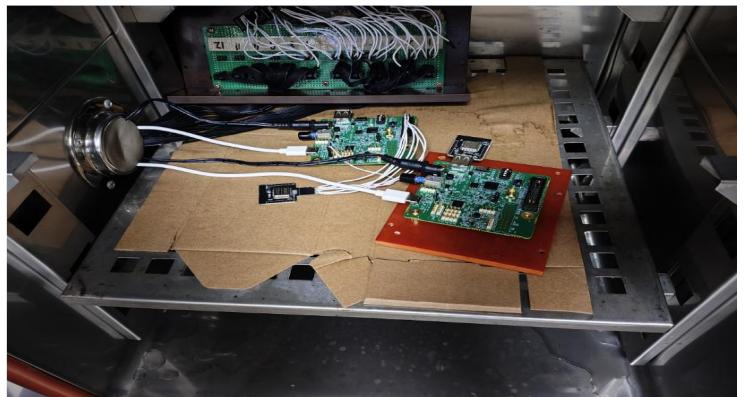
1. 检验标准

序号	工序名称	检验项目	检验工具	抽样水平(参考 GB/T 2828.1-2012)	允收水准		
					CR(致命缺陷)	MA(严重缺陷)	MI(轻微缺陷)
1	可靠性测试	高低温存储/高常低温开关机/高低温运行/交变湿热/冷热冲击	恒温恒湿试验机	正常一次抽样，特殊检验 S-1	0 收 1 退		

2. 试验项目

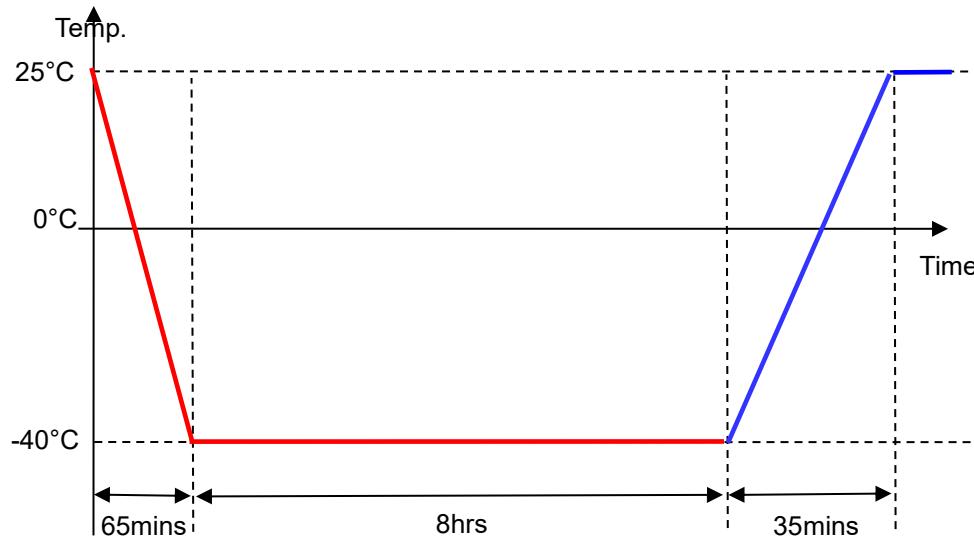
编号	项目	测试条件
1	低温存储测试 (Low temperature storage test)	测试条件: -40° C 测试时间: 8hrs 在-40° C下停留1hrs后, 做冷启动测试.
2	高温储存测试 (High temperature storage test)	测试条件: 100° C +93%RH 测试时间: 8hrs 恢复到85° C停留1hrs后, 做热启动测试。
3	低温运行测试 (Low temperature operation test)	测试条件: -40° C 测试时间: 24hrs
4	高温运行测试 (High temperature operation test)	测试条件: 85 ° C +93%RH 测试时间: 24hrs
5	开关机测试 (AC power on/off test with temperature)	A) 温度: -40° C. B) 温度: 25° C +93%RH C) 温度: 85° C. +93%RH 每个条件循环 200次, 开30sec, 关30sec
6	交变湿热测试 (Alternating hot and humid test)	A) 85 ° C+93%RH运行4hrs; B) 25 ° C+93%RH运行4hrs; 循环步骤A步骤B总共2个循环. 测试时间: 循环2cycles, 16hrs
7	冷热冲击测试 (Thermal shock test)	测试条件: -40° C~100° C+93%RH, 每个温度停留30mins, 温度变换时间为升温50mins, 降温2hrs. 测试时间: 循环5cycles, 16hrs

3. 试验准备

编号	项目	图片/附件
1	可靠性说明文档	参考Ai-WS1-CBS&CBE系列模组可靠性WIFI测试说明
2	实验设备	
3	样品摆放	
4	测试原因	新品可靠性测试 (90240005-NodeMCU-Ai-WS1-CBS-Kit)

4. 低温存储测试 (Low temperature storage test)

测试条件: 关机测试, 让产品储存在-40° C下保持8hrs, 然后做冷启动测试.



测试曲线:

Is Power Off ——————
Is Power Off ——————

测试标准:

1. 测试过程中无断网等现象, 确认 ping 包不丢失, 即判定模组功能正常。
2. 产品测试完后没有可见的损伤, 如收缩、剥离、变色等现象。

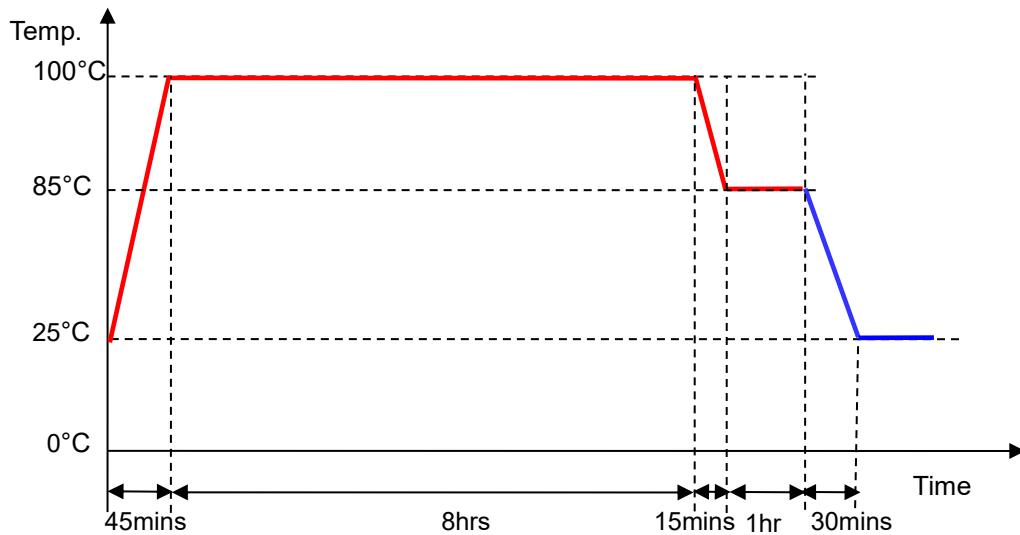
测试样机	测试数据	测试结果
1PCS		PASS

5. 高温存储测试 (High temperature storage test)

测试条件: 关机测试, 让产品储存在 100° C+93%RH 高温下 8hrs, 然后恢复到 85° C+93%RH+93%RH 停留 1hr 后, 做热启动测试。

测试曲线：

Is Power Off
Is Power On



测试标准:

1. 测试过程中无断网等现象，确认 ping 包不丢失，即判定模组功能正常。
 2. 产品测试完后没有可见的损伤，如收缩、剥离、变色等现象。

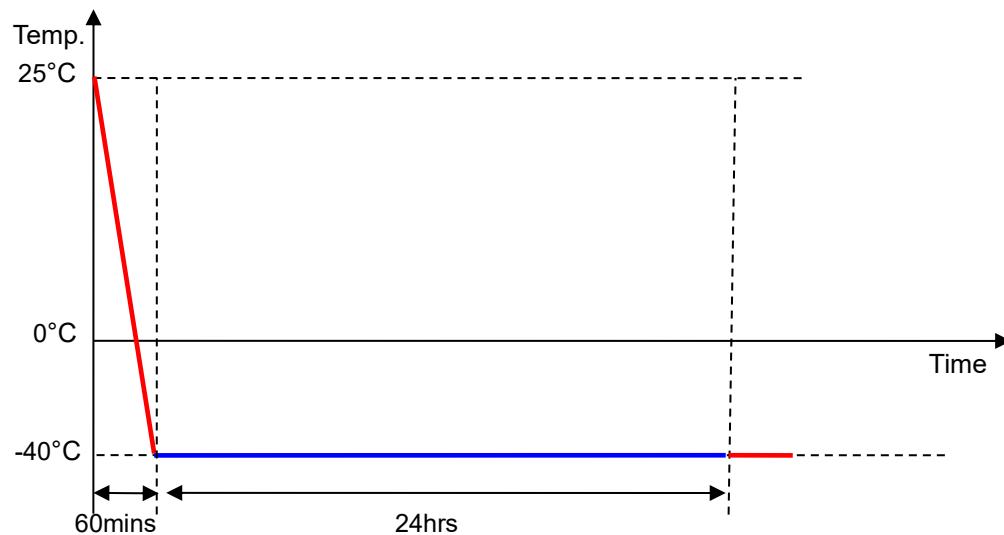
测试样机	测试数据	测试结果
1PCS	 <p>The image shows the front panel of a programmable constant temperature and humidity test chamber. The top half features a digital display showing '100.01' and various status indicators. Below the display is a control panel with three buttons labeled '启动' (Run), '视窗灯' (Window Light), and '电源指示' (Power Light). At the bottom are two large red buttons labeled '停止' (Stop) and '故障报警' (Failure), along with a 'RS232C' port and a 'USB' port.</p> <pre> 从 192.168.199.1: seq=29052 ttl=64 time=1.512 ms 4 bytes from 192.168.199.1: seq=29053 ttl=64 time=1.477 ms 4 bytes from 192.168.199.1: seq=29054 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29055 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29056 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29057 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29058 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29059 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29060 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29061 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29062 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29063 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29064 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29065 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29066 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29067 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29068 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29069 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29070 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29071 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29072 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29073 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29074 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29075 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29076 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29077 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29078 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29079 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29080 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29081 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29082 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29083 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29084 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29085 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29086 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29087 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29088 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29089 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29090 ttl=64 time=1.503 ms 4 bytes from 192.168.199.1: seq=29091 ttl=64 time=1.554 ms 4 bytes from 192.168.199.1: seq=29092 ttl=64 time=1.554 ms 4 bytes from 192.168.199.1: seq=29093 ttl=64 time=1.487 ms 4 bytes from 192.168.199.1: seq=29094 ttl=64 time=1.478 ms 4 bytes from 192.168.199.1: seq=29095 ttl=64 time=1.555 ms </pre>	PASS

6. 低温运行测试 (Low temperature operation test)

测试条件：开机测试，在-40° C下运行24hrs.

测试曲线：

Is Power Off ——————
Is Power On ——————



测试标准：

1. 测试过程中无断网等现象，确认 ping 包不丢失，即判定模组功能正常。
2. 产品测试完后没有可见的损伤，如收缩、剥离、变色等现象。

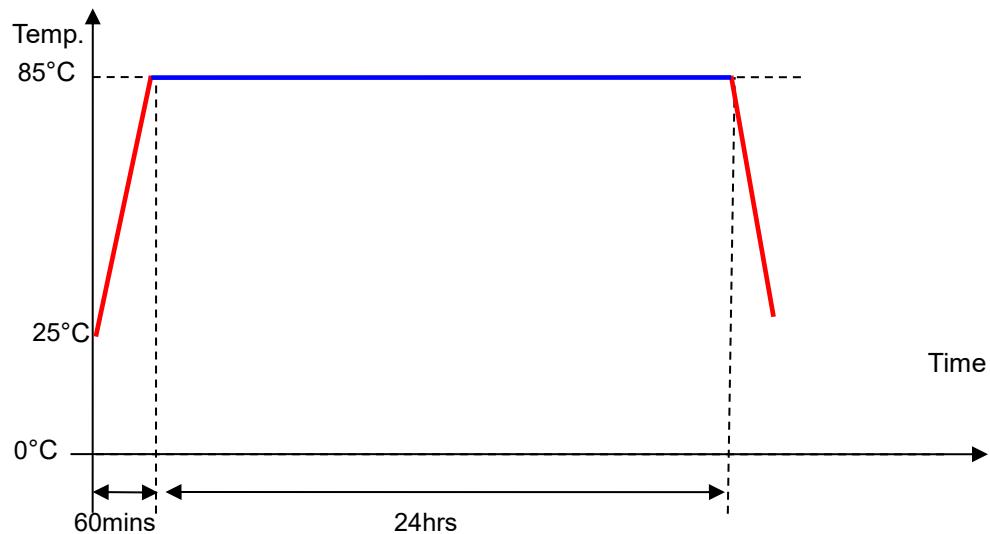
测试样机	测试数据	测试结果
1PCS	 <pre> 16 bytes From 192.168.199.1: seq=01811 ttl=64 time=1.532 ms 64 bytes From 192.168.199.1: seq=01812 ttl=64 time=1.405 ms 64 bytes From 192.168.199.1: seq=01813 ttl=64 time=1.583 ms 64 bytes From 192.168.199.1: seq=01814 ttl=64 time=1.583 ms 64 bytes From 192.168.199.1: seq=01815 ttl=64 time=1.533 ms 64 bytes From 192.168.199.1: seq=01816 ttl=64 time=1.533 ms 64 bytes From 192.168.199.1: seq=01817 ttl=64 time=2.113 ms 64 bytes From 192.168.199.1: seq=01818 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01819 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01820 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01821 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01822 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01823 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01824 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01825 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01826 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01827 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01828 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01829 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01830 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01831 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01832 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01833 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01834 ttl=64 time=1.575 ms 64 bytes From 192.168.199.1: seq=01835 ttl=64 time=1.562 ms 64 bytes From 192.168.199.1: seq=01836 ttl=64 time=1.562 ms 64 bytes From 192.168.199.1: seq=01837 ttl=64 time=1.562 ms 64 bytes From 192.168.199.1: seq=01838 ttl=64 time=1.562 ms 64 bytes From 192.168.199.1: seq=01839 ttl=64 time=1.562 ms 64 bytes From 192.168.199.1: seq=01840 ttl=64 time=1.562 ms 64 bytes From 192.168.199.1: seq=01841 ttl=64 time=1.575 ms 64 bytes From 192.168.199.1: seq=01842 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01843 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01844 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01845 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01846 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01847 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01848 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01849 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01850 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01851 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01852 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01853 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01854 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01855 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01856 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01857 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01858 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01859 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01860 ttl=64 time=1.560 ms 64 bytes From 192.168.199.1: seq=01861 ttl=64 time=8.594 ms 64 bytes From 192.168.199.1: seq=01862 ttl=64 time=8.594 ms 64 bytes From 192.168.199.1: seq=01863 ttl=64 time=8.594 ms 64 bytes From 192.168.199.1: seq=01864 ttl=64 time=8.594 ms 64 bytes From 192.168.199.1: seq=01865 ttl=64 time=8.594 ms 64 bytes From 192.168.199.1: seq=01866 ttl=64 time=8.594 ms 64 bytes From 192.168.199.1: seq=01867 ttl=64 time=8.594 ms 64 bytes From 192.168.199.1: seq=01868 ttl=64 time=8.594 ms 64 bytes From 192.168.199.1: seq=01869 ttl=64 time=8.594 ms 64 bytes From 192.168.199.1: seq=01870 ttl=64 time=8.594 ms 64 bytes From 192.168.199.1: seq=01871 ttl=64 time=8.594 ms 64 bytes From 192.168.199.1: seq=01872 ttl=64 time=2.296 ms 64 bytes From 192.168.199.1: seq=01873 ttl=64 time=8.600 ms 64 bytes From 192.168.199.1: seq=01874 ttl=64 time=8.600 ms 64 bytes From 192.168.199.1: seq=01875 ttl=64 time=8.600 ms 64 bytes From 192.168.199.1: seq=01876 ttl=64 time=8.600 ms 64 bytes From 192.168.199.1: seq=01877 ttl=64 time=2.291 ms 64 bytes From 192.168.199.1: seq=01878 ttl=64 time=8.537 ms 64 bytes From 192.168.199.1: seq=01879 ttl=64 time=1.453 ms 64 bytes From 192.168.199.1: seq=01880 ttl=64 time=1.513 ms 64 bytes From 192.168.199.1: seq=01881 ttl=64 time=1.467 ms 64 bytes From 192.168.199.1: seq=01882 ttl=64 time=1.467 ms 64 bytes From 192.168.199.1: seq=01883 ttl=64 time=1.467 ms 64 bytes From 192.168.199.1: seq=01884 ttl=64 time=1.467 ms 64 bytes From 192.168.199.1: seq=01885 ttl=64 time=1.467 ms 64 bytes From 192.168.199.1: seq=01886 ttl=64 time=1.467 ms 64 bytes From 192.168.199.1: seq=01887 ttl=64 time=1.467 ms 64 bytes From 192.168.199.1: seq=01888 ttl=64 time=1.467 ms 64 bytes From 192.168.199.1: seq=01889 ttl=64 time=1.467 ms 64 bytes From 192.168.199.1: seq=01890 ttl=64 time=1.467 ms 64 bytes From 192.168.199.1: seq=01891 ttl=64 time=1.465 ms 64 bytes From 192.168.199.1: seq=01892 ttl=64 time=2.272 ms 64 bytes From 192.168.199.1: seq=01893 ttl=64 time=2.260 ms </pre>	PASS

7. 高温运行测试 (High temperature operation test)

测试条件：开机测试，85 °C+93%RH运行24H

测试曲线：

Is Power Off _____
 Is Power On _____



测试标准：

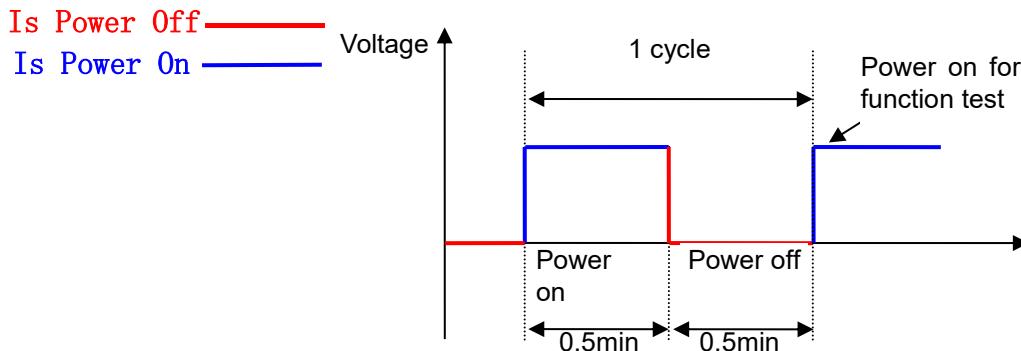
1. 测试过程中无断网等现象，确认 ping 包不丢失，即判定模组功能正常。
2. 产品测试完后没有可见的损伤，如收缩、剥离、变色等现象。

测试样机	测试数据	测试结果
1PCS		PASS

8. 开关机测试 (AC power on/off test with temperature)

- 测试条件:
1. 开机: 30 秒; 关机: 30 秒。
 2. 温度: -40°C, 25°C+93%RH, 85°C+93%RH。
 3. 循环: 每组测试条件循环 200 次。

测试曲线:



测试标准:

1. 连接好模组后上电发送指令即开始测试, 可以观察到模组打印 LOG 信息。观察网络 ping 包正常。
2. 产品测试后没有可见的损伤, 如收缩、剥离、变色等。

项目	测试样机	测试数据	测试结果
常温开关机	1PCS	<pre> b'192.168.1.199:1 seq=61970 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61970 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61971 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61972 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61973 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61974 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61975 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61976 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61977 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61978 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61979 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61980 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61981 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61982 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61983 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61984 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61985 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61986 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61987 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61988 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61989 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61990 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61991 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61992 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61993 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61994 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61995 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61996 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61997 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61998 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=61999 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=62000 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=62001 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=62002 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=62003 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=62004 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=62005 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=62006 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=62007 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=62008 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=62009 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=62010 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=62011 ttl=64 time=1.523 ms 64 bytes from 192.168.1.199:1 seq=62012 ttl=64 time=1.523 ms </pre>	PASS

9. 交变湿热测试 (Alternating hot and humid test)

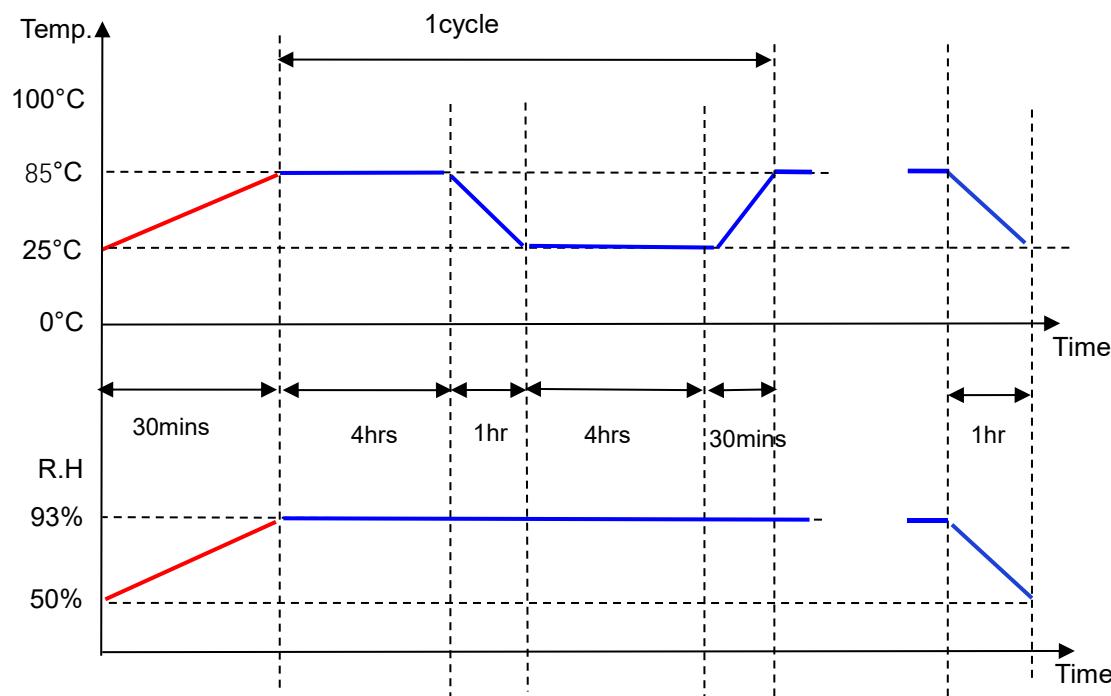
测试条件:

1. 85 ° C+93%RH 运行 4hrs;
 2. 25 ° C+93%RH 运行 4hrs;
- 循环步骤 1 步骤 2 总共 2 个循环.

测试曲线:

Is Power Off ——————

Is Power On ——————



测试标准:

1. 测试过程中无断网等现象，确认 ping 包不丢失，即判定模组功能正常。
2. 产品测试后没有可见的损伤，如收缩、剥离、变色等。

测试样机	测试数据	测试结果
1PCS	<pre> 64 bytes from 192.168.109.1: seq=24340 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24341 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24342 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24343 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24344 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24345 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24346 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24347 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24348 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24349 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24350 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24351 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24352 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24353 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24354 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24355 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24356 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24357 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24358 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24359 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24360 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24361 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24362 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24363 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24364 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24365 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24366 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24367 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24368 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24369 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24370 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24371 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24372 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24373 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24374 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24375 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24376 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24377 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24378 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24379 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24380 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24381 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24382 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24383 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24384 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24385 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24386 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24387 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24388 ttl=64 time=0.056 ms 64 bytes from 192.168.109.1: seq=24389 ttl=64 time=0.056 ms </pre>	PASS

10. 冷热冲击测试 (Thermal shock test)

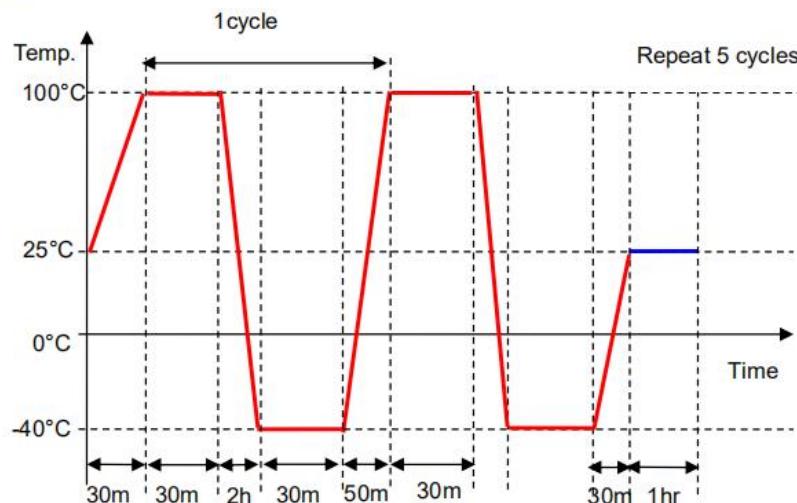
测试条件:

关机测试, $-40^{\circ}\text{C} \sim 100^{\circ}\text{C}$ +93%RH 转换, 温度转换时间为升温 50mins, 降温 2hrs. 每个阶段保持 30mins, 运行 5 cycles.

测试曲线:

Is Power Off

Is Power On



测试标准:

1. 测试过程中无断网等现象, 确认 ping 包不丢失, 即判定模组功能正常。
2. 产品测试后没有可见的损伤, 如收缩、剥离、变色等。

测试样机	测试数据	测试结果
1PCS	<pre> 64 bytes from 192.168.199.11: seq=61991 ttl=64 time=1.761 ms 64 bytes from 192.168.199.11: seq=61992 ttl=64 time=1.761 ms 64 bytes from 192.168.199.11: seq=61993 ttl=64 time=1.762 ms 64 bytes from 192.168.199.11: seq=61994 ttl=64 time=1.762 ms 64 bytes from 192.168.199.11: seq=61995 ttl=64 time=1.763 ms 64 bytes from 192.168.199.11: seq=61996 ttl=64 time=1.763 ms 64 bytes from 192.168.199.11: seq=61997 ttl=64 time=1.764 ms 64 bytes from 192.168.199.11: seq=61998 ttl=64 time=1.764 ms 64 bytes from 192.168.199.11: seq=61999 ttl=64 time=1.765 ms 64 bytes from 192.168.199.11: seq=62000 ttl=64 time=1.765 ms 64 bytes from 192.168.199.11: seq=62001 ttl=64 time=5.184 ms 64 bytes from 192.168.199.11: seq=62002 ttl=64 time=3.493 ms 64 bytes from 192.168.199.11: seq=62003 ttl=64 time=1.652 ms 64 bytes from 192.168.199.11: seq=62004 ttl=64 time=7.886 ms 64 bytes from 192.168.199.11: seq=62005 ttl=64 time=1.998 ms 64 bytes from 192.168.199.11: seq=62006 ttl=64 time=1.993 ms 64 bytes from 192.168.199.11: seq=62007 ttl=64 time=1.889 ms 64 bytes from 192.168.199.11: seq=62008 ttl=64 time=2.028 ms 64 bytes from 192.168.199.11: seq=62009 ttl=64 time=1.822 ms 64 bytes from 192.168.199.11: seq=62010 ttl=64 time=3.645 ms 64 bytes from 192.168.199.11: seq=62011 ttl=64 time=3.934 ms 64 bytes from 192.168.199.11: seq=62012 ttl=64 time=1.662 ms 64 bytes from 192.168.199.11: seq=62013 ttl=64 time=1.526 ms 64 bytes from 192.168.199.11: seq=62014 ttl=64 time=1.526 ms 64 bytes from 192.168.199.11: seq=62015 ttl=64 time=1.774 ms 64 bytes from 192.168.199.11: seq=62016 ttl=64 time=1.714 ms 64 bytes from 192.168.199.11: seq=62017 ttl=64 time=2.995 ms 64 bytes from 192.168.199.11: seq=62018 ttl=64 time=1.541 ms 64 bytes from 192.168.199.11: seq=62019 ttl=64 time=1.442 ms 64 bytes from 192.168.199.11: seq=62020 ttl=64 time=2.259 ms 64 bytes from 192.168.199.11: seq=62021 ttl=64 time=1.636 ms </pre>	PASS