

Reliability Test Report

Product Name:	Ai-WS1 Series
Product Model:	Ai-WS1-CBE-Kit
Test Date:	2024.11.18–2024.11.26
Tested by:	Yuan Nannan
Reviewed by:	An Sanchao


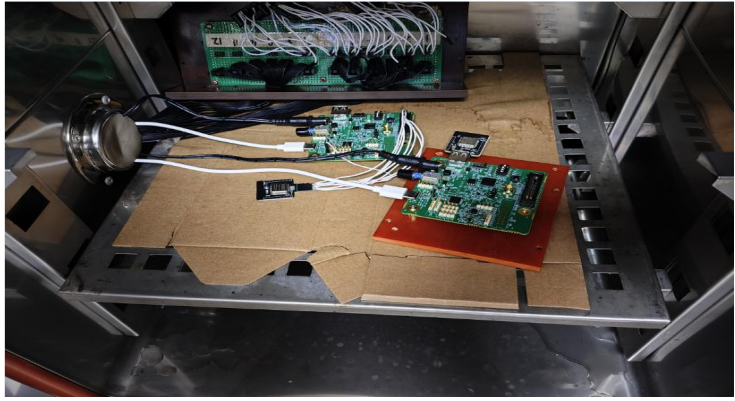
1. Inspection Standard

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. Test duration: 2 cycles, 16h
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, 16h

3. Test Preparation

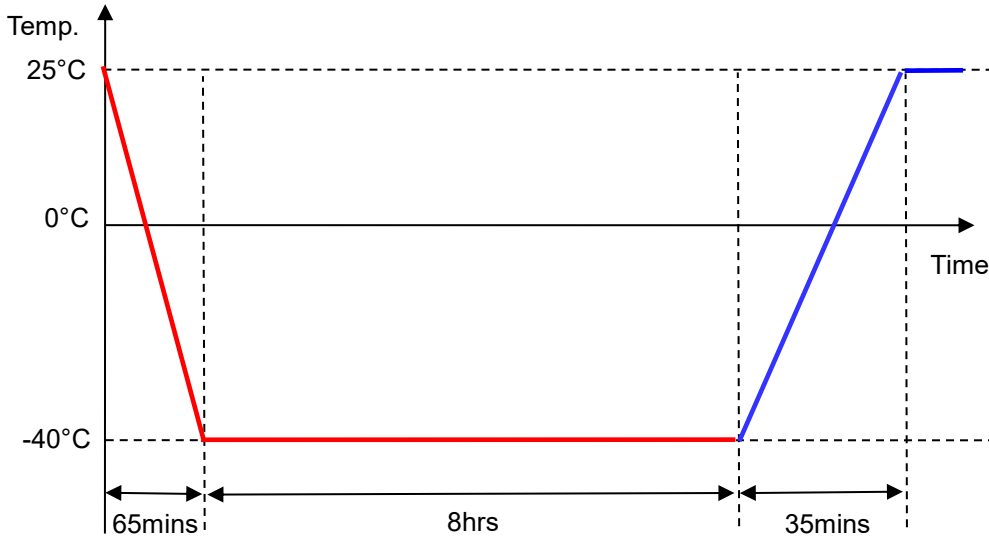
No.	Item	Image/Attachment
1	Reliability documentation	Refer to the Wi-Fi test specification for Ai-WS1-CBS & CBE series modules
2	Test equipment	
3	Sample placement	
4	Test reason	Reliability test for new product (90240004-NodeMCU-Ai-WS1-CBE-Kit)

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. 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.

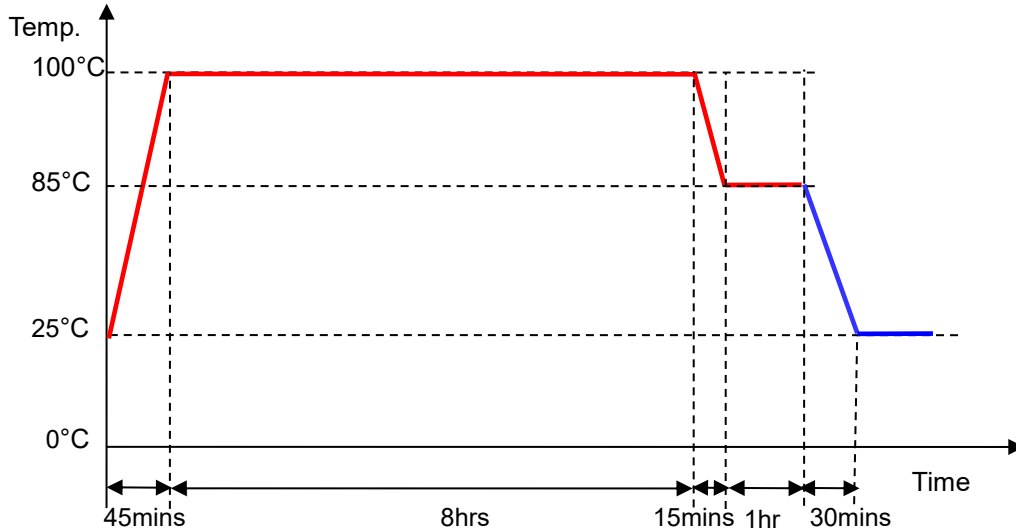
Sample Quantity	Test Data	Test Results
<p>1PCS</p>		<p>PASS</p>

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. 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.

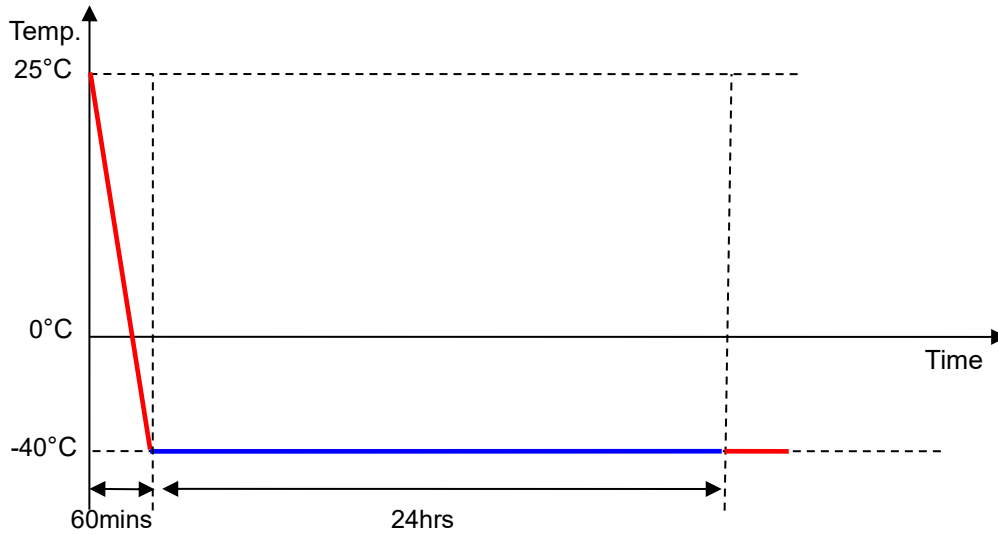
Sample Quantity	Test Data	Test Results
1PCS		

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 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
1PCS	 <p>The test data log shows a series of ping commands and responses. Each line includes the source IP (192.168.199.1), the destination IP (192.168.199.1), the sequence number (seq=), and the time taken for the ping (time=). The times are consistently around 200ms, indicating stable network connectivity throughout the test.</p>	PASS

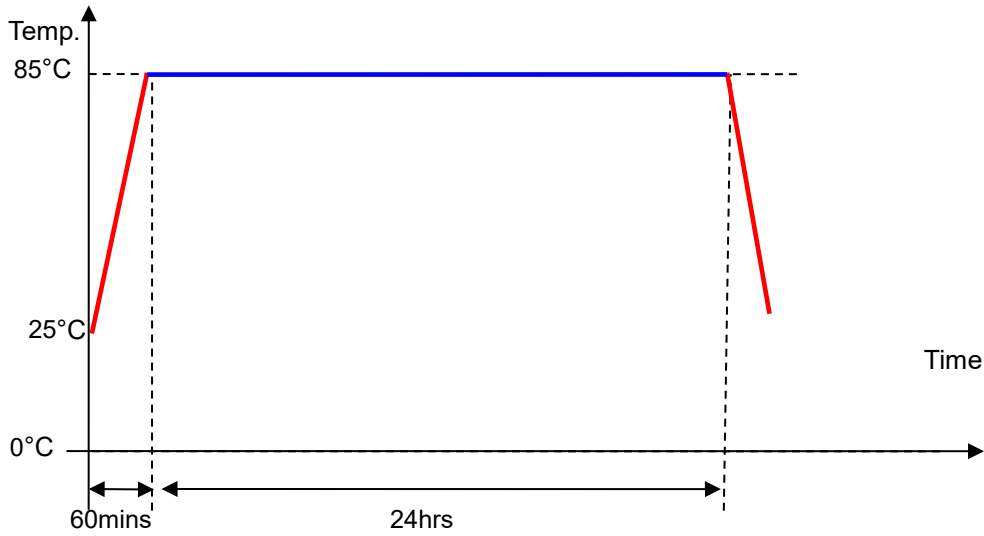
7. High Temperature Operation Test

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

Test Profile:

Is Power Off ——— (Red line)

Is Power On ——— (Blue line)



Test Criteria:

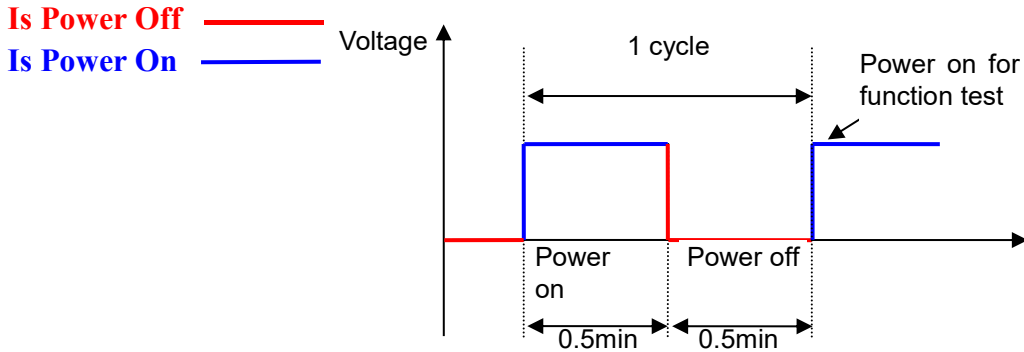
1. No network disconnections occurred during the test. If ping packets are confirmed not to be lost, the module is considered to be functional.
2. After the test, the product shows no visible damage such as shrinkage, peeling, or discoloration.

Sample Quantity	Test Data	Test Results
1PCS		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. Normal network ping packets observed in the module’s LOG information indicate that 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	1PCS	<pre> 64 bytes from 192.168.199.1: seq=61951 ttl=64 time=1.351 ms 64 bytes from 192.168.199.1: seq=61952 ttl=64 time=1.374 ms 64 bytes from 192.168.199.1: seq=61953 ttl=64 time=1.387 ms 64 bytes from 192.168.199.1: seq=61954 ttl=64 time=1.400 ms 64 bytes from 192.168.199.1: seq=61955 ttl=64 time=1.413 ms 64 bytes from 192.168.199.1: seq=61956 ttl=64 time=1.426 ms 64 bytes from 192.168.199.1: seq=61957 ttl=64 time=1.439 ms 64 bytes from 192.168.199.1: seq=61958 ttl=64 time=1.452 ms 64 bytes from 192.168.199.1: seq=61959 ttl=64 time=1.465 ms 64 bytes from 192.168.199.1: seq=61960 ttl=64 time=1.478 ms 64 bytes from 192.168.199.1: seq=61961 ttl=64 time=1.491 ms 64 bytes from 192.168.199.1: seq=61962 ttl=64 time=1.504 ms 64 bytes from 192.168.199.1: seq=61963 ttl=64 time=1.517 ms 64 bytes from 192.168.199.1: seq=61964 ttl=64 time=1.530 ms 64 bytes from 192.168.199.1: seq=61965 ttl=64 time=1.543 ms 64 bytes from 192.168.199.1: seq=61966 ttl=64 time=1.556 ms 64 bytes from 192.168.199.1: seq=61967 ttl=64 time=1.569 ms 64 bytes from 192.168.199.1: seq=61968 ttl=64 time=1.582 ms 64 bytes from 192.168.199.1: seq=61969 ttl=64 time=1.595 ms 64 bytes from 192.168.199.1: seq=61970 ttl=64 time=1.608 ms 64 bytes from 192.168.199.1: seq=61971 ttl=64 time=1.621 ms 64 bytes from 192.168.199.1: seq=61972 ttl=64 time=1.634 ms 64 bytes from 192.168.199.1: seq=61973 ttl=64 time=1.647 ms 64 bytes from 192.168.199.1: seq=61974 ttl=64 time=1.660 ms 64 bytes from 192.168.199.1: seq=61975 ttl=64 time=1.673 ms 64 bytes from 192.168.199.1: seq=61976 ttl=64 time=1.686 ms 64 bytes from 192.168.199.1: seq=61977 ttl=64 time=1.699 ms 64 bytes from 192.168.199.1: seq=61978 ttl=64 time=1.712 ms 64 bytes from 192.168.199.1: seq=61979 ttl=64 time=1.725 ms 64 bytes from 192.168.199.1: seq=61980 ttl=64 time=1.738 ms 64 bytes from 192.168.199.1: seq=61981 ttl=64 time=1.751 ms 64 bytes from 192.168.199.1: seq=61982 ttl=64 time=1.764 ms 64 bytes from 192.168.199.1: seq=61983 ttl=64 time=1.777 ms 64 bytes from 192.168.199.1: seq=61984 ttl=64 time=1.790 ms 64 bytes from 192.168.199.1: seq=61985 ttl=64 time=1.803 ms 64 bytes from 192.168.199.1: seq=61986 ttl=64 time=1.816 ms 64 bytes from 192.168.199.1: seq=61987 ttl=64 time=1.829 ms 64 bytes from 192.168.199.1: seq=61988 ttl=64 time=1.842 ms 64 bytes from 192.168.199.1: seq=61989 ttl=64 time=1.855 ms 64 bytes from 192.168.199.1: seq=61990 ttl=64 time=1.868 ms 64 bytes from 192.168.199.1: seq=61991 ttl=64 time=1.881 ms 64 bytes from 192.168.199.1: seq=61992 ttl=64 time=1.894 ms 64 bytes from 192.168.199.1: seq=61993 ttl=64 time=1.907 ms 64 bytes from 192.168.199.1: seq=61994 ttl=64 time=1.920 ms 64 bytes from 192.168.199.1: seq=61995 ttl=64 time=1.933 ms 64 bytes from 192.168.199.1: seq=61996 ttl=64 time=1.946 ms 64 bytes from 192.168.199.1: seq=61997 ttl=64 time=1.959 ms 64 bytes from 192.168.199.1: seq=61998 ttl=64 time=1.972 ms 64 bytes from 192.168.199.1: seq=61999 ttl=64 time=1.985 ms 64 bytes from 192.168.199.1: seq=62000 ttl=64 time=1.998 ms 64 bytes from 192.168.199.1: seq=62001 ttl=64 time=2.011 ms 64 bytes from 192.168.199.1: seq=62002 ttl=64 time=2.024 ms 64 bytes from 192.168.199.1: seq=62003 ttl=64 time=2.037 ms 64 bytes from 192.168.199.1: seq=62004 ttl=64 time=2.050 ms 64 bytes from 192.168.199.1: seq=62005 ttl=64 time=2.063 ms 64 bytes from 192.168.199.1: seq=62006 ttl=64 time=2.076 ms 64 bytes from 192.168.199.1: seq=62007 ttl=64 time=2.089 ms 64 bytes from 192.168.199.1: seq=62008 ttl=64 time=2.102 ms 64 bytes from 192.168.199.1: seq=62009 ttl=64 time=2.115 ms 64 bytes from 192.168.199.1: seq=62010 ttl=64 time=2.128 ms 64 bytes from 192.168.199.1: seq=62011 ttl=64 time=2.141 ms 64 bytes from 192.168.199.1: seq=62012 ttl=64 time=2.154 ms </pre>	PASS

10. Thermal Shock Test

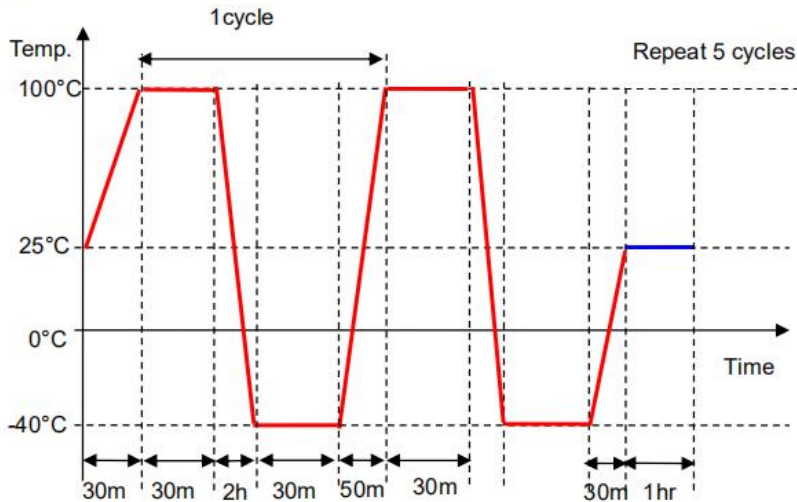
Test conditions:

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. 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
1PCS	<pre> 64 bytes from 192.168.199.1: seq=61981 ttl=64 time=1.701 ms 64 bytes from 192.168.199.1: seq=61985 ttl=64 time=1.207 ms 64 bytes from 192.168.199.1: seq=61988 ttl=64 time=1.592 ms 64 bytes from 192.168.199.1: seq=61989 ttl=64 time=1.648 ms 64 bytes from 192.168.199.1: seq=61987 ttl=64 time=1.648 ms 64 bytes from 192.168.199.1: seq=61988 ttl=64 time=1.659 ms 64 bytes from 192.168.199.1: seq=61989 ttl=64 time=1.498 ms 64 bytes from 192.168.199.1: seq=61970 ttl=64 time=1.643 ms 64 bytes from 192.168.199.1: seq=61971 ttl=64 time=1.524 ms 64 bytes from 192.168.199.1: seq=61972 ttl=64 time=3.276 ms 64 bytes from 192.168.199.1: seq=61973 ttl=64 time=1.393 ms 64 bytes from 192.168.199.1: seq=61974 ttl=64 time=3.262 ms 64 bytes from 192.168.199.1: seq=61975 ttl=64 time=2.440 ms 64 bytes from 192.168.199.1: seq=61976 ttl=64 time=1.635 ms 64 bytes from 192.168.199.1: seq=61977 ttl=64 time=5.204 ms 64 bytes from 192.168.199.1: seq=61978 ttl=64 time=2.133 ms 64 bytes from 192.168.199.1: seq=61979 ttl=64 time=1.135 ms 64 bytes from 192.168.199.1: seq=61980 ttl=64 time=2.245 ms 64 bytes from 192.168.199.1: seq=61981 ttl=64 time=1.757 ms 64 bytes from 192.168.199.1: seq=61982 ttl=64 time=2.984 ms 64 bytes from 192.168.199.1: seq=61983 ttl=64 time=1.159 ms 64 bytes from 192.168.199.1: seq=61984 ttl=64 time=6.528 ms 64 bytes from 192.168.199.1: seq=61985 ttl=64 time=1.628 ms 64 bytes from 192.168.199.1: seq=61986 ttl=64 time=1.683 ms 64 bytes from 192.168.199.1: seq=61987 ttl=64 time=1.773 ms 64 bytes from 192.168.199.1: seq=61988 ttl=64 time=2.277 ms 64 bytes from 192.168.199.1: seq=61989 ttl=64 time=1.660 ms 64 bytes from 192.168.199.1: seq=61990 ttl=64 time=1.649 ms 64 bytes from 192.168.199.1: seq=61991 ttl=64 time=3.488 ms 64 bytes from 192.168.199.1: seq=61992 ttl=64 time=1.543 ms 64 bytes from 192.168.199.1: seq=61993 ttl=64 time=1.153 ms 64 bytes from 192.168.199.1: seq=61994 ttl=64 time=1.765 ms 64 bytes from 192.168.199.1: seq=61995 ttl=64 time=1.527 ms 64 bytes from 192.168.199.1: seq=61996 ttl=64 time=1.653 ms 64 bytes from 192.168.199.1: seq=61997 ttl=64 time=1.777 ms 64 bytes from 192.168.199.1: seq=61998 ttl=64 time=2.048 ms 64 bytes from 192.168.199.1: seq=61999 ttl=64 time=1.652 ms 64 bytes from 192.168.199.1: seq=62000 ttl=64 time=1.627 ms 64 bytes from 192.168.199.1: seq=62001 ttl=64 time=1.164 ms 64 bytes from 192.168.199.1: seq=62002 ttl=64 time=1.762 ms 64 bytes from 192.168.199.1: seq=62003 ttl=64 time=1.652 ms 64 bytes from 192.168.199.1: seq=62004 ttl=64 time=1.866 ms 64 bytes from 192.168.199.1: seq=62005 ttl=64 time=1.899 ms 64 bytes from 192.168.199.1: seq=62006 ttl=64 time=3.793 ms 64 bytes from 192.168.199.1: seq=62007 ttl=64 time=1.886 ms 64 bytes from 192.168.199.1: seq=62008 ttl=64 time=1.828 ms 64 bytes from 192.168.199.1: seq=62009 ttl=64 time=3.552 ms 64 bytes from 192.168.199.1: seq=62010 ttl=64 time=1.845 ms 64 bytes from 192.168.199.1: seq=62011 ttl=64 time=1.934 ms 64 bytes from 192.168.199.1: seq=62012 ttl=64 time=1.658 ms 64 bytes from 192.168.199.1: seq=62013 ttl=64 time=1.662 ms 64 bytes from 192.168.199.1: seq=62014 ttl=64 time=1.326 ms 64 bytes from 192.168.199.1: seq=62015 ttl=64 time=1.775 ms 64 bytes from 192.168.199.1: seq=62016 ttl=64 time=1.214 ms 64 bytes from 192.168.199.1: seq=62017 ttl=64 time=2.905 ms 64 bytes from 192.168.199.1: seq=62018 ttl=64 time=1.541 ms 64 bytes from 192.168.199.1: seq=62019 ttl=64 time=2.142 ms 64 bytes from 192.168.199.1: seq=62020 ttl=64 time=2.259 ms 64 bytes from 192.168.199.1: seq=62021 ttl=64 time=1.636 ms </pre>	PASS