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Reliability Test Report for BFX-AT100

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Revision Change History

Revision	Description of Change	Date
1.0	Initial Release	02/21/2022

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Purpose:

1. Provide a formal functional demonstration of the product design reliability.
2. Identify any design discrepancies.
3. Reliability assurance of trial samples which are designed and fabricated in accordance with the customer's product specifications.
4. Conduct robustness testing on early production samples in accordance to customer's product environmental testing specification.

Scope:

This document describes the performance requirements, validation criteria, and the validation tests which focus on BFX-AT100 product.

The DUT H/W version is 05(Motorcomm) and S/W revision is 523r06_SD_fac-20220126.

Second source:

Eth PHY IC for YT8531C (Motorcomm).

The summary of test items:

No.	Item	Test Condition	Q'ty	Period	Pass Criteria	Test result
1	Cold Start Test	1. Power off, and store at - 5°C for 24 hours then power on to check function. 2. Repeat test 15 times	2	2 days	1. No functional failures both before and after the test 2. No performance degradation after the functional test 3. No visual damage to the products after inspection, such as peeling, discoloration, etc.	PASS
2	Hot Start Test	1. Power off, and store at 50°C for 24 hours then power on to check function. 2. Repeat test 15 times	2	2 days	1. No functional failures both before and after the test 2. No performance degradation after the functional test 3. No visual damage to the products after inspection, such as peeling, discoloration, etc.	PASS
3	High Temperature & Humidity Test	Power on, Operation Ta = 50°C, Humi. = 90%R.H. for 72 hours	2	3 days	1. No functional failures both during and after the test 2. No performance degradation during the functional test 3. No visual damage to the products after inspection, such as peeling, discoloration, etc.	PASS
4	Continuation of temperature cycle	1. Operating in high and low temperature environment at 50/- 5°C 2. 50°C with 1°C/min, Dwell 3 hrs; - 5°C with 1°C/min, Dwell 3 hrs, Total 72 hrs.	2	3 days	1. No functional failures both before and after the test 2. No performance degradation after the functional test 3. No visual damage to the products after inspection, such as peeling, discoloration, etc.	PASS
5	Thermal Shock Test	Power off , non-operation Ta= - 20°C (30min) ~ 70°C (30min) 15 cycles Transfer time: 5 min	2	2 days	1. No functional failures both before and after the test 2. No performance degradation after the functional test 3. No visual damage to the products after inspection, such as peeling, discoloration, etc.	PASS
6	Power On/Off Test with Temperature	1. Power on: 50 sec; off: 10 sec. 2. Temperature: - 5°C and 50°C 3. Cycle: 2,500 cycles per test condition 4.Total 5,000 cycles	2	5 days	1. No functional failures both during and after the test 2. No ping failures both during the test and after the test. 3. No performance degradation during the functional test 4. No visual damage to the products after inspection, such as peeling, discoloration, etc.	PASS

Panel Drawing:

Front



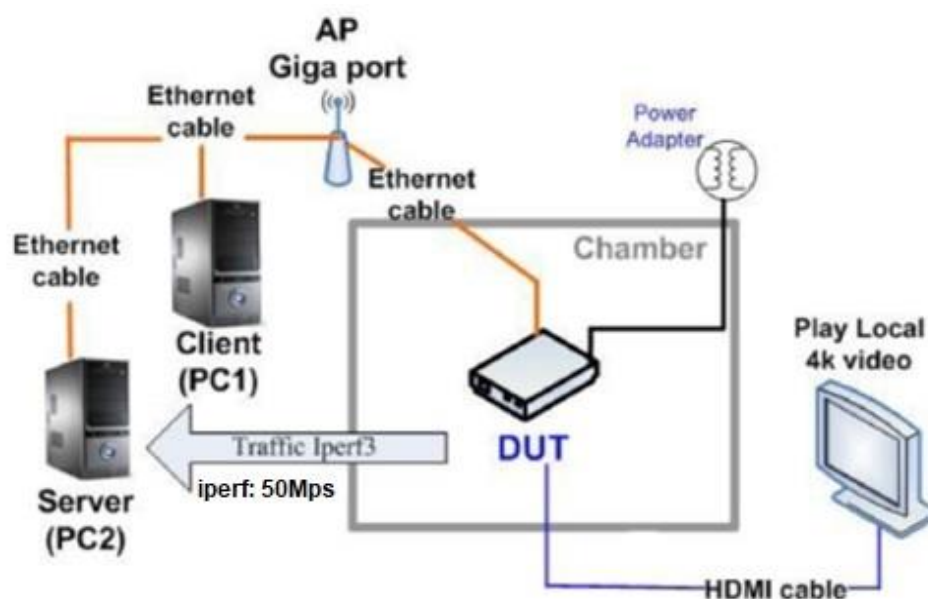
Rear



Adapter



Test setup and function test:



1. Cold Start Test

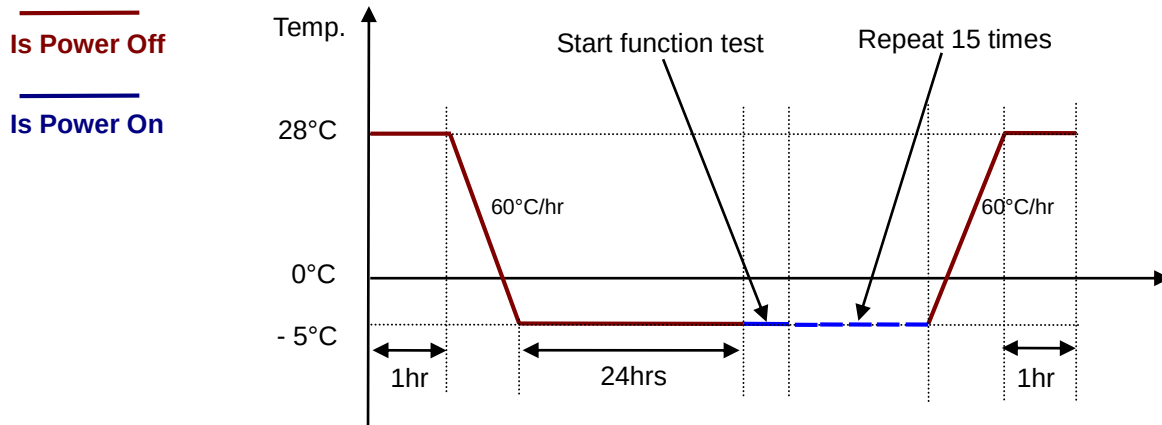
Purpose:

To demonstrate that the product can be stored at low temperature environment.

Quantity: 2 units

Test Objective: Power off, and store at - 5°C for 24 hours the power on to check function.
Repeat test 15 times.

Test Profile:



Test Procedure:

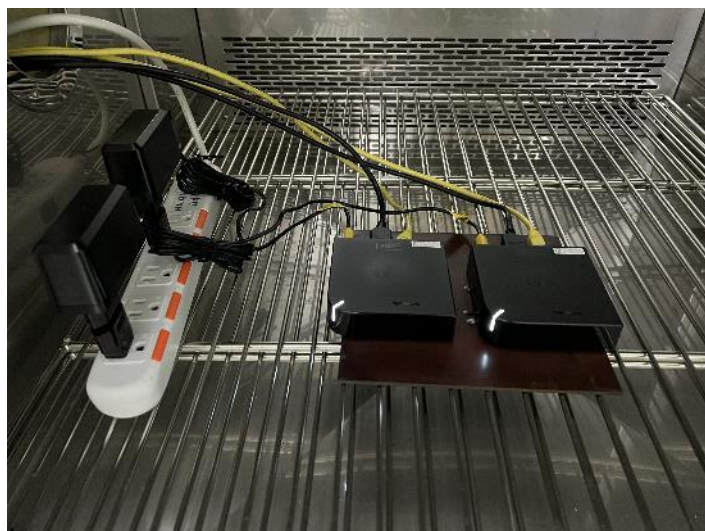
1. Start test at 28°C and power on active full function for 1 hour.
2. Turn off the power and decrease the temperature to - 5°C and hold for 24 hours.
3. Power on the measure the DUT function for 10 min.
4. Repeat 15 times cold start test.

Pass Criteria:

1. No functional failures both before and after the test.
2. No performance degradation after the functional test.
3. No visual damage to the products after inspection, such as peeling, discoloration, etc.

Basis for Profile: IEC 60068-2-01

Test Result: **PASS**



2. Hot Start Test

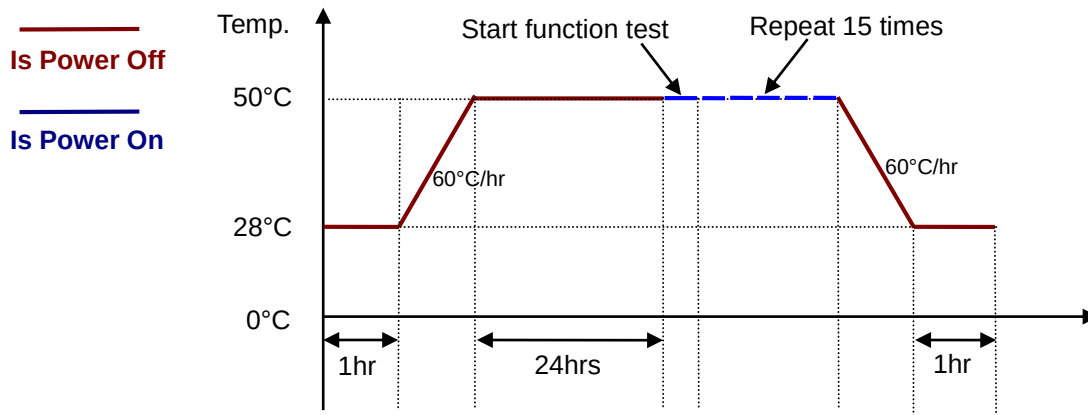
Purpose:

To demonstrate that the product can be stored at high temperature environment.

Quantity: 2 units

Test Objective: Power off, and store at 50°C for 24 hours then power on to check function.
Repeat test 15 times.

Test Profile:



Test Procedure:

1. Start test at 28°C and power on active full function for 1 hour.
2. Turn off the power and decrease the temperature to 50°C and hold for 24 hours.
3. Power on the measure the DUT function for 10 min.
4. Repeat 15 times cold start test.

Pass Criteria:

1. No functional failures both before and after the test.
2. No performance degradation after the functional test.
3. No visual damage to the products after inspection, such as peeling, discoloration, etc.

Basis for Profile: IEC 60068-2-02

Test Result: **PASS**



3. High Temperature and Humidity Test

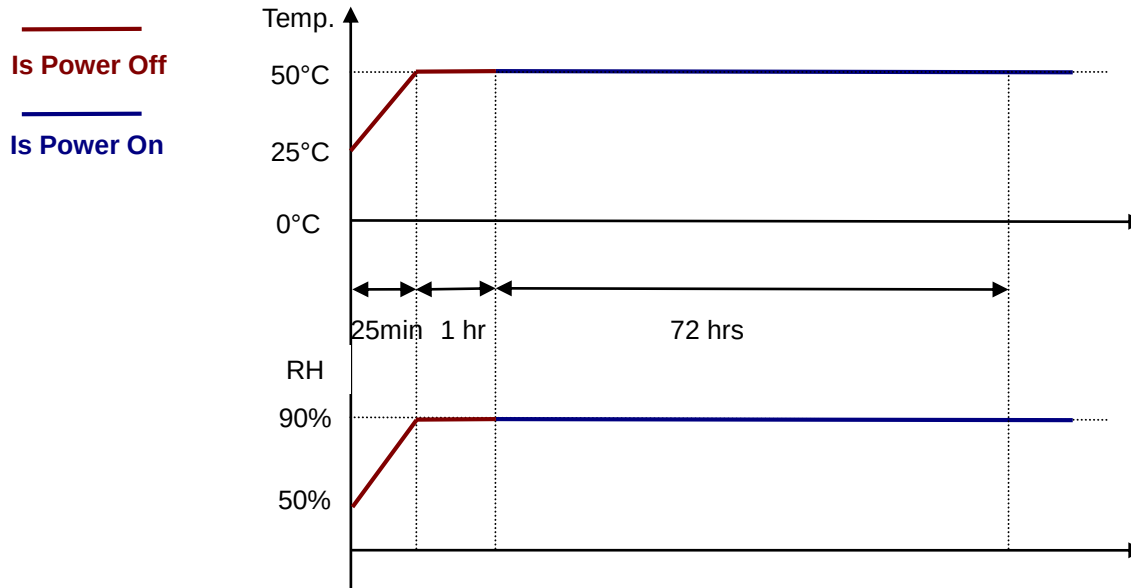
Purpose:

To demonstrate that products can withstand the high limit temperature and the high limit humidity of an operating environment.

Quantity: 2 units

Test Objective: Operating Temperature and Humidity: Temp. + 50°C and RH 90%, Duration: 3 days.

Test Profile:



Test Procedure:

1. Power off.
2. Start test at 25°C and RH 50%.
3. Ramp the temperature to 50°C and RH 90% in 25 minutes, then hold for 1 hour.
4. Power on the test units.
5. Hold 50°C, RH 90% for 72 hours.

Pass Criteria:

1. No functional failures both during and after the test.
2. No performance degradation during the functional test.
3. No visual damage to the products after inspection, such as peeling, discoloration, etc.

Basis for Profile: MIL-STD-202F Method 103B

Test Result: **PASS**



4. Continuation of temperature cycle

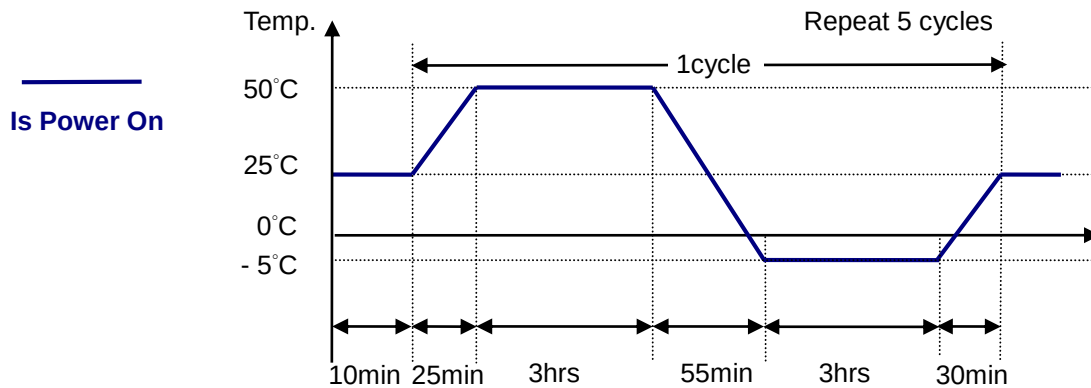
Purpose:

To demonstrate that products can operate in the high/low temperature and high humidity environment.

Quantity: 2 units

Test Objective: Operating in high/low Temperature and high Humidity.

Test Profile:



Test Procedure:

1. Power on, then activated in full function and operation.
2. Start test at 25°C for 10 min.
3. Ramp the temperature to 50°C for 3 hours.
4. Ramp the temperature to - 5°C for 3 hours.
5. Repeat item 3 ~ 4 for 5 cycles.

Pass Criteria:

1. No functional failures both during and after the test.
2. No performance degradation during the functional test.
3. No visual damage to the products after inspection, such as peeling, discoloration, etc.

Basis for Profile: IEC 60068-2-30



5. Thermal Shock Test

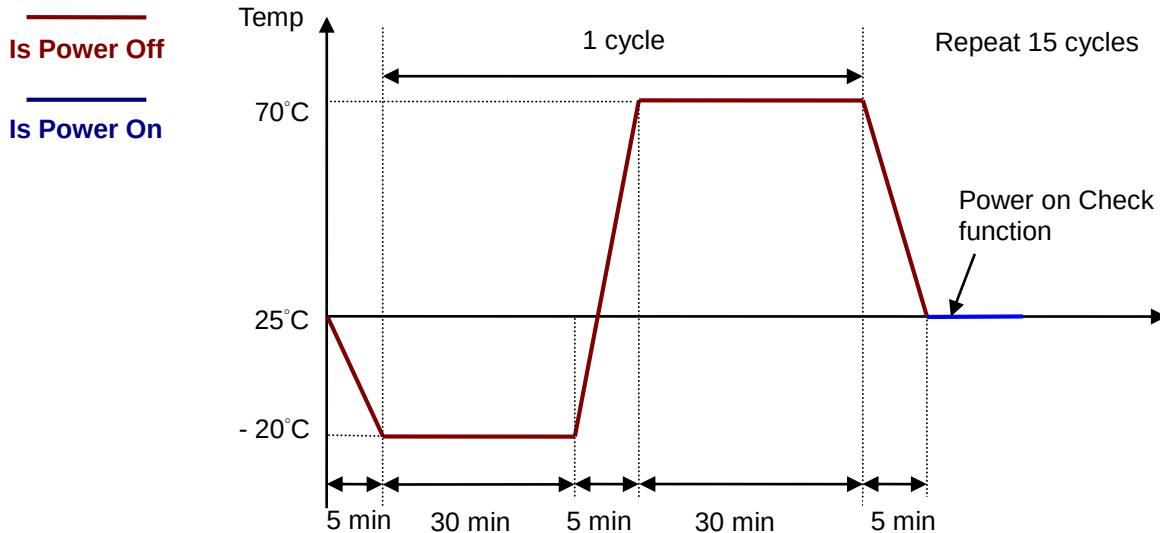
Purpose:

To demonstrate that the product can be operated after high & low temperature shock environment.

Quantity: 2 units

Test Objective: $T_a = -20^{\circ}\text{C}$ (30minutes) $\sim 70^{\circ}\text{C}$ (30minutes), Cycle: 15 cycles,
Transfer time: 5 minutes.

Test Profile:



Test Procedure:

1. Power off.
2. Start test at 25°C .
3. Ramp the temperature to -20°C and hold for 30 minutes.
4. Ramp the temperature to 70°C and hold for 30 minutes.
5. Transfer time: 5 minutes.
6. After repeat 15 cycles. Power on, then activated in full function and operation.

Pass Criteria:

1. No functional failures both before and after the test.
2. No performance degradation after the functional test.
3. No visual damage to the products after inspection, such as peeling, discoloration, etc.

Basis for Profile: MIL –STD-810F Method 503.4 Procedure I



6. Power on/off Test with Temperature

Purpose:

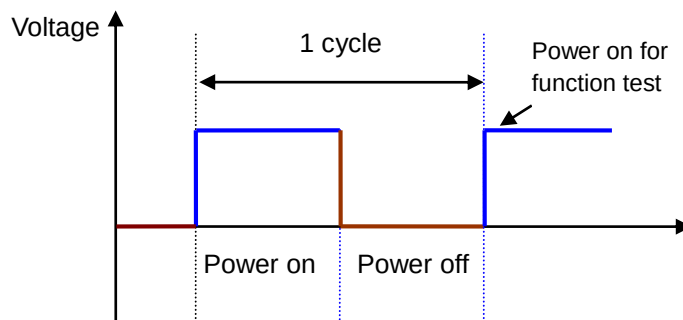
The purpose of this specification is to define the power on / off test. This test is to assure the product will meet customer's specification.

Quantity: 2 units

Test Objective:

1. Power on: 50 sec.
2. Power off: 10 sec.
3. Temperature: - 5°C and 50°C.
4. Cycle: 2,500 cycles per test condition.
5. Total 5,000 cycles.

Test Profile:



Test Procedure:

1. Base on test setup and function test to check DUT function then put the DUT into chamber.
2. Temperature: - 5°C and 50°C.
3. Control the power on/off frequency, temperature and input voltage as below.
Power on/off frequency: Power on: 50 seconds/ Power off: 10 seconds.
4. Cycle: 2,500 cycles per test condition, Total: 5,000 cycles

Pass Criteria:

1. No functional failures both during and after the test.
2. No ping failures both during the test and after the test.
3. No performance degradation during the functional test
4. No visual damage to the products after inspection, such as peeling, discoloration, etc.

Test Result: **PASS**

