Renice SSD Temperature Test Procedures

Extreme Temperature Tolerance

Temperature test of SSD products includes temp. cycle test and thermal shock test.

Note: Plenty of frost turned to water drops in the transition process from low temperature to high temperature. The water drops may easily caused short circuit of chip pins and thus burn the SSD. Therefore, reinforcement and waterproof treatment has to be done on tested SSDs.

Picture of a tested circuit board with frosting surface under -40°C

Temperature Cycle Test

The temperature cycle first set the temperature at -50°C and keep for 4 hours, then rising the temperature to +90°C, keep for 4 hours, next lower the temperature to -50°C to finish one cycle. Do multiple cycles in turn.

The standard of industrial-grade operation is -40°C to +85°C. Considering the temperature deviation of high-low temperature chamber and avoiding the inconsistent test result on customers' side, Renice in-house test extend the temperature range at ±5°C based on standard.

Test Procedures

1. Lower the temperature to -50° C under the state of power-off, and keep it for 4 hours.

   Note: Do not execute the low temperature test in power-on condition. Because the chipset itself generates the temperature above +20°C in power-on condition, it is normally easy to pass low temperature test. So getting the disks completely chilled is necessary before testing it in power-on state.
2. Power-on and run read/ write performance test on SSD, to compare the performance in normal temperature.
3. Aging test, to check if there is error created.
4. Power-cycling test.
5. Rising temperature up to +90°C and keep it for 4 hours. Contrary to the low-temperature test, the process of high-temperature test is done in power-on state to keep the inside temperature of chipset been in high state. And then executing the steps 2, 3 and 4 after 4 hours.
6. Repeat 10 times of high/ low temperature testing separately.

The test is judged as fail if any abnormity detected during the test.

In current market, there is common situation that screening the commercial-grade products for industrial-usage, while there could be risky. The screened products may have a high probability of failure in several temperature cycles. Besides, they cannot pass the strict extreme temperature test or pass the test one time but failed in next time.

Thermal Shock Test

The thermal shock means quick transition from low temperature to high temperature in few minutes (or customer time) and the high temperature to low temperature.

Normally the test starts from low temperature, which changes from -50°C to +90°C less in 3 minutes, or use the same method to start the test from high temperature.

During the temperature transition, Burin-test can be run all the time to inspect if there will be data comparison error during such quick temperature transition.

The specific test standard can refer to: GB/T 2423.34, IEC 60068-2-38, GJB150.5, etc..