

Success Story - They Chose Apacer

Challenges

- Intensive data reading and writing behavior, which will challenge the durability of SSD products
- Used in hazardous defense environment and needs to withstand external challenges such as violent shock, high and low temperature changes
- Involves access to sensitive data, it is necessary to prevent unauthorized data from being written

Solutions

- SH250-300B

Value-added technologies

- **Hardware:**
 - Conformal Coating
 - Shock and vibration testing (MIL-STD-810G)
 - Wide temperature testing
- **Firmware:**
 - SLC-liteX
 - Write Protect

The Customer and Application: Aerospace Cockpit System

An American avionics equipment manufacturer, known internationally for producing high-precision aircraft control systems, was searching for a long-term supplier partner who could assist in developing the highest level of SSD products. They found that supplier in Apacer, not only because Apacer's products meet the highest specifications, but also because they have the experience to successfully resolve niche application requirements, such as environmental resistance and data security. The manufacturer also recognized that Apacer's reliability and durability benchmarks were second to none.



Challenges

The customer's main concern was preserving top-notch durability even when employing 3D NAND flash memory technology in industrial-grade products. The nature of the defense aerospace environment meant that environmental hazards could be extremely high. Security and stable operation were also foremost in the customer's mind.

No matter where a mission takes place, the complicated aerospace cockpit is likely to require intensive read-write behavior due to the complexity of modern defense technology. Irritants such as dust, smoke, debris and condensation are also likely to damage sensitive equipment unless countermeasures are taken. And extreme temperature changes due to unpredictable flight patterns and environments are unavoidable. To maintain impeccable data security, access to sensitive data and unauthorized data writing had to be completely impossible. On top of all these requirements, due to the extended nature of defense purchasing contracts, a stable supply of components must be available for at least five years.

Solutions and Technologies

After analyzing the customer's application requirements, the Apacer professional team first recommended an mSATA mini SSD that meets the JEDEC MO-300B standard: SH250-300B. The SH250-300B not only has the advantages of small size and space-constrained design, but also is equipped with a highly robust installation mechanism. Mounting holes allow for a firm connection between the SSD and the motherboard, greatly enhancing the anti-vibration and impact capabilities required by the aerospace application.

To offset the customer's concerns about product reliability and long-term stable supply, Apacer's engineering teams suggested the use of 3D NAND flash memory with the firmware optimization technology known as SLC-liteX. This guaranteed up to 30,000 P/E cycles, more than enough to meet the demands of intensive read/write operation. Compared to the 20,000 P/E cycles that 2D SLC-lite products that the customer was considering, the durability of Apacer's product was 50% greater.

On the other hand, considering the external environment of aircraft cockpit system applications is quite complex and changeable, Apacer uses automated coating equipment as conformal coating technology to ensure the thickness, coverage and quality of product coatings. It also minimizes the risk of SSD products being damaged due to dust intrusion, moisture or liquid wetting. In addition, in addition to complying with the U.S. military regulations MIL-STD-810G standards, strict vibration shock and temperature tests are performed before leaving the factory. For storage purposes, Apacer usually tests products to ensure they can survive temperatures between -40 and 100°C. But in this case, the customer asked for assurance that products could survive temperature swings from -55 to 100°C, even for 96 hours. Apacer's engineers carried out this custom test at their request, and Apacer's SSDs passed with flying colors.

Finally, to ensure that all products met the highest security standards, Apacer's firmware team created a custom design for the client. This added a Write Protect function to prevent any unauthorized data being written and preserving the integrity of the customer's data.

Results and Benefits

After close development cooperation, the customer was impressed by Apacer's efficient and rapid assistance in the introduction of new products. By tailoring customized SSD solutions with durability, reliability, and security, Apacer's SSD products successfully met or exceeded the strict defense verification requirements. Apacer and the customer therefore stand side by side protecting national security.

Additional Support



Longevity

Fixed BOM solution,
EOL & LTB notice



Strong customization capabilities

Strong HW/FW
engineering know-how



Service

Real-time and responsive
after-sales service