SMART®
Modular Technologies
A PENGUIN SOLUTIONS® BRAND

USE CASE STUDY

DDR5 48GB ECC SODIMM in Avionic Inflight Entertainment Systems

Introduction

Avionic inflight entertainment systems require robust, reliable, and high-performance memory solutions to ensure seamless operation under harsh environmental conditions. SMART Modular Technologies' DDR5 48GB ECC SODIMM with industrial temperature and underfill capabilities offers a compelling solution for these demanding applications.

Background

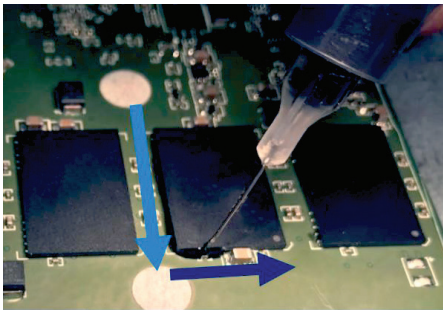
Inflight entertainment systems face unique challenges, including extreme temperatures, vibrations, and limited space. Traditional memory modules often struggle to maintain performance and reliability in these conditions, leading to system disruptions and passenger dissatisfaction. The integration of SMART's DDR5 ECC SODIMMs addresses these challenges by providing enhanced reliability, performance, and environmental resilience.

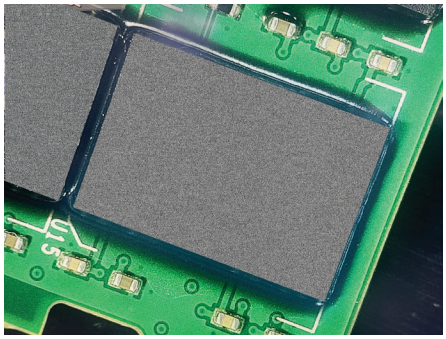
Key Features of SMART's DDR5 ECC SODIMM

- **Industrial Temperature Range:** Operates reliably from -40°C to +85°C, ensuring consistent performance in extreme environments encountered during flight1.
- **Error Correction Code (ECC):** Ensures data integrity by detecting and correcting errors, crucial for mission-critical avionic systems.
- **Underfill:** Enhances module durability by protecting against mechanical stress and environmental factors such as moisture and temperature variations.
- **High Performance:** Offers speeds up to 5600 MT/s, supporting high-resolution video streaming and interactive content.
- **Power Efficiency:** Operates at 1.1V, reducing power consumption and heat generation, which is beneficial for energy-sensitive avionic systems.

Use Case Scenario

A leading avionics manufacturer is upgrading its inflight entertainment system to support advanced features like 4K video streaming and real-time interactive content. The system must operate reliably in various environmental conditions, including extreme temperatures and vibrations during flight.





Implementation

1. **System Design:**
   - **Hardware Configuration:** The system features a high-performance multi-core CPU, integrated with SMART's DDR5 48GB ECC SODIMMs.
   - **Operating Environment:** The modules are mounted on a rugged PCB designed to withstand vibrations and temperature fluctuations.
2. **Benefits:**
   - **Reliability and Performance:** The ECC functionality ensures data integrity, while the industrial temperature range and underfill enhance module durability.
   - **Space Efficiency:** The compact SODIMM design allows for efficient use of space within the avionic system's limited enclosure.
   - **Power Efficiency:** The low voltage operation reduces power consumption, aligning with the need for energy efficiency in aircraft systems.
3. **Operational Outcomes:**
   - **Enhanced Passenger Experience:** Seamless video streaming and interactive content delivery improve passenger satisfaction.
   - **Reduced Maintenance:** The robust design minimizes system failures, reducing maintenance downtime and associated costs.
   - **Environmental Resilience:** The system operates reliably across various flight conditions, ensuring consistent performance.

Summary

SMART Modular Technologies' DDR5 48GB ECC SODIMM with industrial temperature and underfill capabilities offers a robust solution for leading-edge avionic inflight entertainment systems. By enhancing reliability, performance, and environmental resilience, these modules support the development of advanced, passenger-centric entertainment systems that meet the evolving demands of the aviation industry.

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