Quickturn OMAP Processor-Based Custom Board for a Rugged Military Handheld Device

Case Study

radisys®

Industry/Market

Military equipment manufacturer.

The Challenge

A custom TI OMAP processor-based board was needed in less than 5 months—from RFQ to first prototypes.

The Business Environment

The manufacturer did not have he necessary staff required to do the development themselves.

The Solution

Select RadiSys to oversee the entire board project: design, operating system integration, validation, manufacturing and long life support.

The Benefits

The equipment manufacturer met its aggressive schedule and had lower development expense compared to an internal design effort.

Customer Profile

The equipment manufacturer supplies computers specifically designed for ultra-rugged military applications deployed in the harshest conditions.

Having more market opportunity than internal resources and expertise, a military equipment manufacturer decided to outsource a custom TI OMAP-based board for a ruggedized handheld computer. The manufacturer put out a request for quotation (RFQ) to board vendors requesting first prototypes in less than 5 months–a very aggressive schedule. Moreover, the board had to support four different operating systems, each requiring a different processor support package.

Seeking a cost-competitive, high-volume board manufacturer with experience developing military-grade systems, the prime contractor selected Radisys. Providing engineering and program management support, Radisys contracted out the design, closed technical issues related to the product specification, validated and manufactured the board, and ensured long life support. With the help of Radisys, the military manufacturer reduced its total investment and dramatically improved time-to-market, compared to doing the design in-house, which was not an option this time.

> *We have the computer engineering and manufacturing expertise, systems perspective and industry ties needed to manage custom product development for military primes.*
>
> **Lorraine Orcino** Director of Product Line Marketing at RadiSys

Tight Timeline

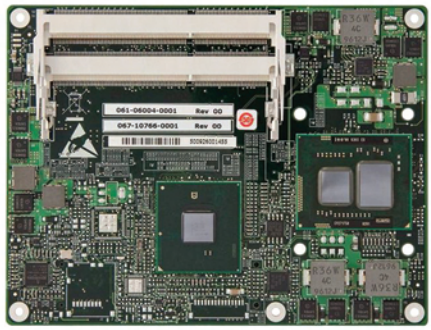
The short schedule for the OMAP processor board development required Radisys to act swiftly. Less than a week after receiving the quote, Radisys kicked off an engineering assessment with a design house partner. In three weeks, a proposal was submitted and accepted by the system manufacturer. Digging into the details, there were nearly a hundred technical issues that had to be sorted out before the product specification could be finalized, which is fairly typical of a custom project. During this engineering phase, the systems knowledge of Radisys and the design house paid dividends because requirements were ironed out early on, thereby reducing development risk. The first OMAP processor boards were delivered in about four months, enabling the manufacturer to ship the first system prototypes to its military customer within five months.

Board Design Challenges

The size of a soldier's palm, the system required a computer board that integrated a lot of functionality within a small space and with strict power consumption limits. These factors increased the difficulty of the design, as the necessary routing and component placement pushed the limits of the available board real estate. To prevent delays, the design house and Radisys engineers synced up the design and manufacturing rules (e.g., feature size and approved vendor lists) in advance. Working in parallel, Radisys engineers integrated the processor and board support packages required to run four different operating systems.

Manufacturing Expertise

The system had the potential to become a very high volume product; thus, cost-effective, high quality manufacturing was imperative. The military equipment manufacturer already had an appreciation for Radisys' best-in-class manufacturing practices through prior projects. Radisys validates shock and vibration performance to military levels, which includes fatigue testing (random vibration) and resonance testing (swept sine vibration), as well as operating and non-operating shock susceptibility. If needed, extended shock and vibration testing, thermal solutions, conformal coat, RTV (room temperature vulcanizing), and other durability options are available. Radisys manufacturing capabilities and reliability testing can be counted on to deliver ruggedized products for extreme environments.



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