

When Versatility and Durability Matter Most

A Micron/Engicam Case Study

About Engicam

Founded in 2004, Italy-based Engicam has a proven track record of providing design services for technology-intensive electronic systems.

Forming strong partnerships with clients has helped Engicam develop successful collaborations with major national companies in the consumer, automotive, marine, and rail fields and with small and medium companies operating in industrial market niches.

In 2009, Engicam began working to simplify the development of innovative and technologically advanced products, offering several types of CPU modules (system-on-a-module, or SOM) based on latest-generation ARM processors.

Continuous investment in these devices allows Engicam to continue developing increasingly powerful and efficient platforms.

Engicam's philosophy is to assist customers during all stages of the development process and integration into the final applications, from hardware and firmware design, through software development, up to mass production of the final product.

Benefits of Using SOMs

The SOM + carrier solution provides a number of advantages compared to single boards:

Reduced time-to-market

The module is provided with the operating system (Linux, Windows®, CE, or Android®), along with ready-to-use board support package (BSP; including a compiler toolchain and sources) and a development system. The software can quickly be customized to meet user needs.

Easy design

The modules require a single power supply and already provide onboard physical interface transceivers (PHYs)

for various devices such as Ethernet, USB, etc. The development of the customer's carrier board often includes custom connectors, one 5V power-supply stage, and a few other components.

Cost reduction

The cost of the PCB, due to the connection of BGA and controlled impedance connections to the memory, are already included in the small size of the module PCB. The mechanical characteristics of the final product are often met by a simple, custom two-layer PCB.

Product flexibility

All Engicam modules are pin-to-pin compatible, allowing the user to migrate easily from one platform to another simply by substituting the module on the same carrier board. In this way, it is possible to create a range of products that meet the needs of cost and/or performance in a very short time-to-market.

Engicam's Design Challenge—Meeting a Broad Range of Application Requirements

Engicam aims to provide a large family of SOMs that can be used in many application fields, including automotive, rail, and industrial/commercial. To obtain this broad-use goal, each stage of product design must consider the following parameters:

- Possibility of having components with selectable thermal characteristics between the commercial (0°C to +70°C) and industrial (-40°C to +85°C) temperature ranges
- Component robustness
- Component longevity
- Cost

Carefully selecting components according to these parameters creates a flexible, scalable family of products that provide simple mounting options and do

not involve PCBs and/or software differences between the commercial (lower-cost) and the automotive (higher-cost) versions.

How Micron Met Engicam's Needs

Together with the processor, DRAM (DDR2 or DDR3) and NAND Flash memory serve as the basic parts of all Engicam SOMs.

Choosing Micron allowed Engicam to cover all the requirements of a variety of applications:

High degree of flexibility

Micron's broad product portfolio makes it possible to choose, for the same package, among various versions of components with different performance levels and with different temperature ranges and costs.

High quality

All Micron components used have given Engicam excellent results in terms of product quality.

Longevity

The durability of Micron parts makes Engicam products suitable for use in the industrial, automotive, and railway fields.



Figure 1: SOM based on the new generation of Freescale™ Vybrid™ heterogeneous dual-core processor with Micron® DDR3 and NAND



Figure 2: SOM based on the new Freescale Cortex – A9 single, dual-, or quad-core processor with Micron® DDR3 and NAND



Figure 3: This electric car dashboard is driven by an Engicam SOM running Micron DRAM and NAND

Sample SOM Application— Electric Car Dashboard

In this example (see Figure 3), Engicam designed the carrier board and plastic cover of this car dashboard according to customer specifications. In this case, the software has been created without an OS.

The dashboard has been in full production for one year and is used on the Pininfarina BLUECAR™ vehicle of the Bolloré car-sharing group in Paris.

Micron and Silica Partnership Provides Engicam With a Complete Package

Micron and Silica have teamed up to provide Engicam with a complete package of parts and support. Reliable high performance and longevity in Micron memory devices, coupled with Silica's dedicated support, technical

expertise, and wide distribution network, help Engicam reduce their time-to-market and meet their customers' needs.



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