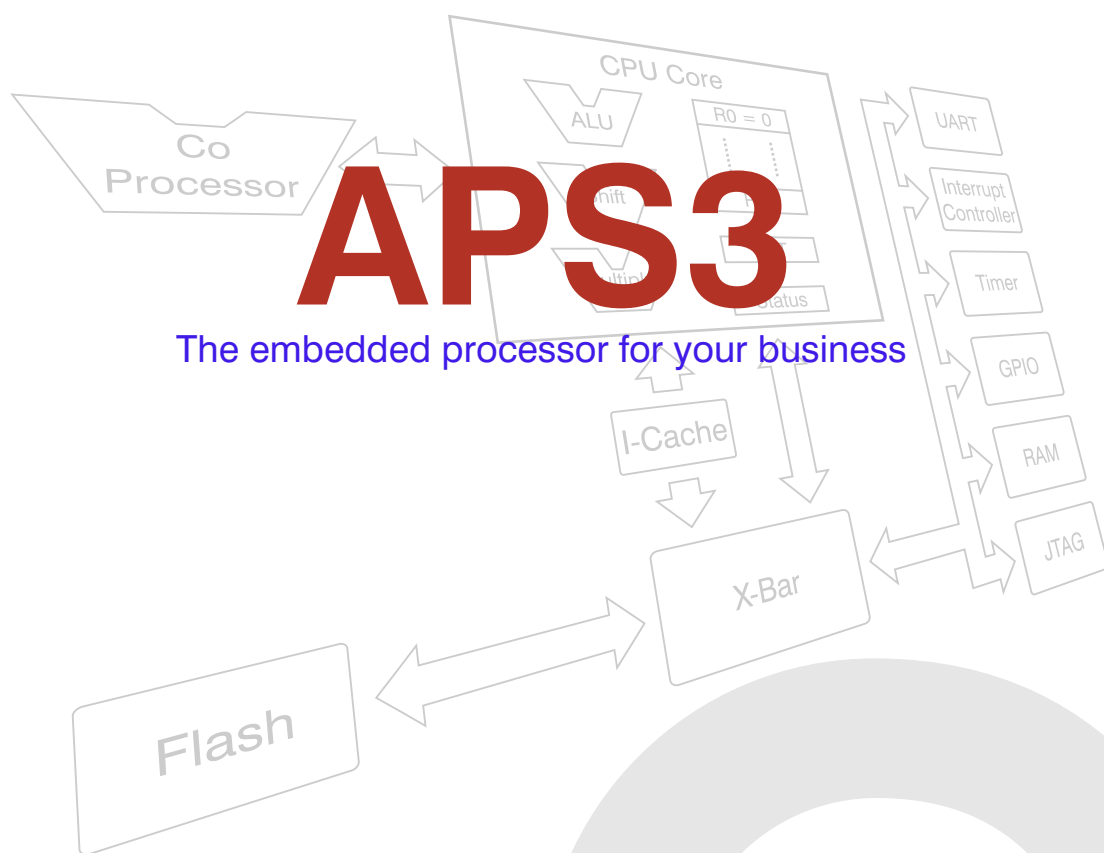


cortus

advanced processing solutions



The 32 bit CPU core for your embedded application

The APS3 is a modern RISC processor core designed specifically to satisfy the needs of designers seeking to create cost effective, modern embedded systems. More and more functionality is demanded with shorter and shorter times-to-market, the Cortus APS3 offers the opportunity to do it all and in less silicon!

The IP is available in a variety of formats, FPGA netlist for both production and verification, soft core and as source code ensuring ease of integration and maximum control of synthesis choices.

The small core size means that the CPU can fit into some of the smallest low cost FPGAs, the flexible licensing allows design migration to high volume ASICs.

Configurable

Designers can configure the features of the APS3 to suit the design needs. No silicon or power is wasted ensuring cost effective designs.

Application Domains

- Embedded Control
- Radiocommunications
- Automotive
- Signal Processing
- Portable Devices
- Battery Powered Devices

Flexible Licensing

Flexible licensing models allow either royalty free or low royalty per device licences. Licences are available for **both** ASIC and FPGA products, allowing initial products to be designed around low cost FPGAs with low NRE and then a design re-spin into ASIC when the product volume ramps up, further reducing costs.

“Beat the competition to market – then beat them on price”

Complete Development Environment

We understand that the development tools are as important as the CPU itself.

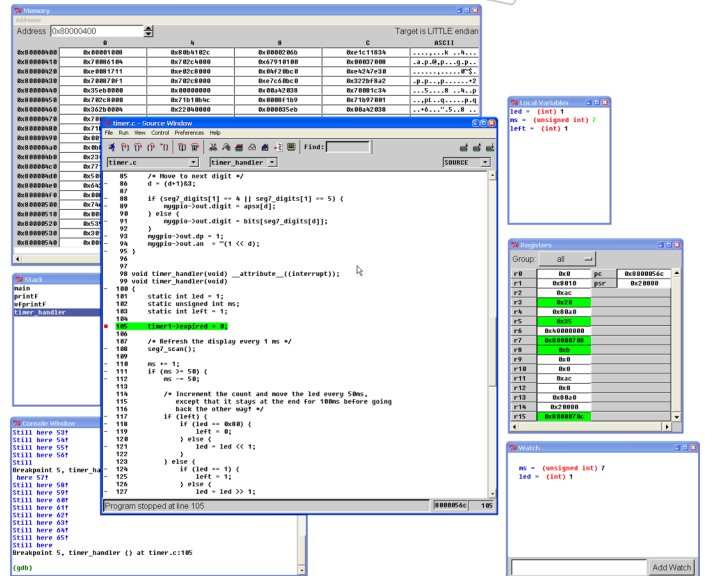
Multiple debug interface options are available to suit your design needs – from a simple serial port to complete JTAG.

“Software engineers deserve the ease and productivity of programming a 32 bit processor.”

A JTAG debug module is available that gives complete vision of the behaviour of the system and control of the entire CPU and bus without any need for an expensive ICE solution. This same solution can be used for production programming of FLASH, without additional expense.

Since the tools are based on the industry standard GNU tools, GCC and GDB, these are available to you and your customers without cost or re-training.

A port of the μ C/OS II real time operating system is available.



“The right sized choice for your business”

APS3

Processor Experts

Our team of processor experts are available to help you at every stage of your design. From the initial design specification where we can help you dimension your processing requirements with the aid of our instruction set simulator. To the final tape out where we can advise on optimum synthesis parameters.

If your application has specific processing requirements we can help design a co-processor to suit your needs, or indeed adapt one of our standard processors to your precise design requirements.

Simple Programming

The Cortus APS3 has been designed from the ground up to be programmed in high level languages; assuring excellent code density and efficient application execution.

The APS3 brings ease of programming combined with power to the embedded systems which can now be programmed entirely in C or C++!

Easy Co-Processors

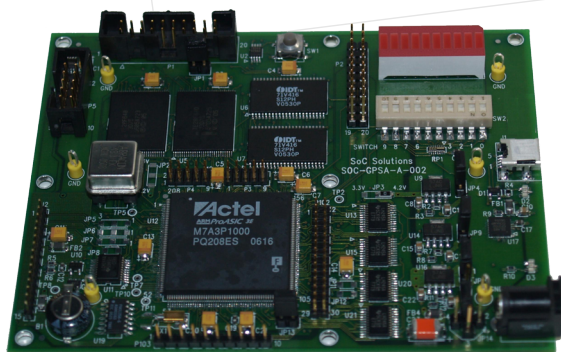
Further improve performance for your application domain by adding a custom co-processor using the patented and simple to use Cortus Co-Processor interface.

Available co-processors include cryptology and signal processing.

Implementation Details

Device	Performance	
Actel – ProASIC060...1000	4544 tiles	20MHz
Xilinx – Virtex4	1048 slices	110MHz
ASIC 0.13µm TSMC 0.13G (Artisan Library)	0.09 mm ²	330MHz

“A 32 bit processor with an 8 bit footprint”



APS3 Processor Core

The APS3 processor core is a fully 32 bit general purpose RISC CPU designed specifically for the embedded market. It offers high performance combined with very low power consumption (18µW/MHz), tiny footprint (9k5 gates) and excellent code density.

The Harvard bus architecture ensures simple memory design. Peripherals are mapped into the 4GBytes of address space for simplicity of programming. The uniform 4GByte address space ensures easy application development in modern languages such as C and C++.

Key to the design process was the adaptation of the GNU C/C++ compiler at the same time as the processor development resulting in a perfect match between compiler and processor. The entire software design process can be accomplished in C/C++ resulting in rapid time to market and easier debugging.

To further reduce power consumption in periods of inactivity, a sleep mode allows the processor to be powered down, enhancing battery life.

A wide range of standard peripherals are available; specifically designed for embedded applications.

Fully vectored interrupts ensure the low latency required of embedded designs. The tight coupling of the compiler with the processor design means that interrupt routines are fully supported and efficient in C and C++.

Configurable to suit application needs, multiplier and barrel shifter are optional, but fully supported by the toolchain.

Benchmarks show the APS3 has leading performance in its market sector and hard to beat code density!

Optimum pipeline design ensures that most instructions are single cycle, including load and store. Memory latency is hidden through out-of-order instruction completion.

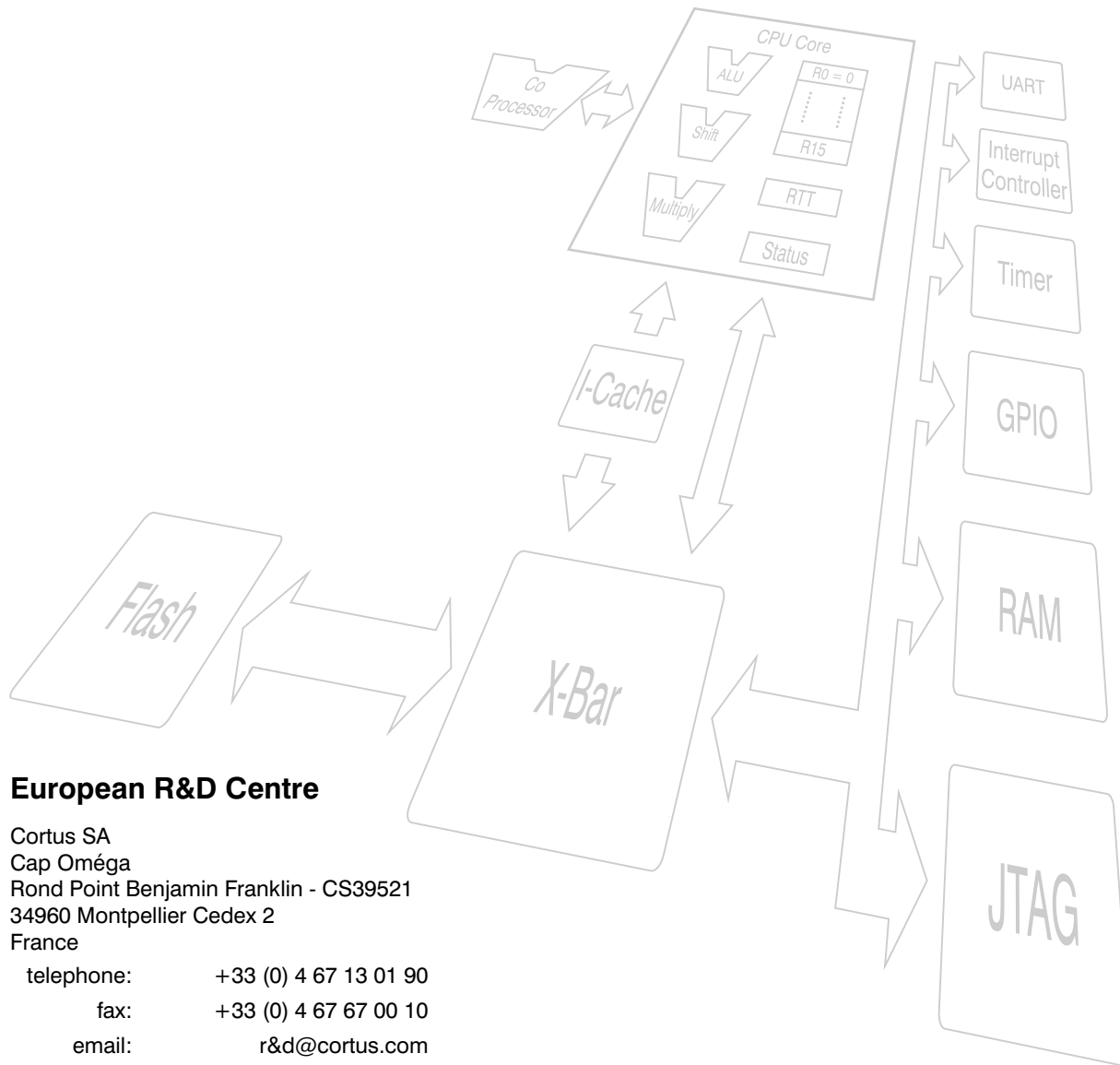
See for yourself how the APS3 meets your needs with the low cost evaluation board.

Third Party Support

Microcross supply a fully integrated graphical development environment for the Cortus APS3 processor core.

SoC Solutions provide a pre-integrated IP solution based around the APS3 processor core

CAST have chosen the APS3 as their 32 bit processor solution in their offering of high quality IP cores.



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