The Actel Extender is a Secure Solution

The antifuse and flash circuits that determine the configuration of Actel's programmable devices are extremely secure because it is difficult to establish precisely how they are arranged in the silicon. The very small fuse elements and flash cells are hard to detect, as they do not leave an observable signature. Efforts to deprocess or electrically probe an Actel chip can destroy or unsuccessfully detect the structure of the design, preventing the possibility of design theft or reverse engineering. For applications requiring high security, designers can take full advantage of Actel's security features. The Actel Extender enables them to replace existing insecure SRAM based FPGA or CPLD designs with an Actel FPGA without the need for re-designing a production board.

Converting Packages is a "Small" Job

The Actel Extender package is a thin adapter that maps an Actel FPGA pinout to the pinout of the existing part. The Actel Extender is a very low profile design that typically adds less than 2.0mm in height, which is ideal for rack-mounted boards or where vertical space is at a premium. The Extender board is also very compatible with existing board space. The Extender's low impact footprint typically extends less than 0.7mm per side beyond the edges of your device. Hundreds of package converters are already available in a wide variety of configurations including: BGA to QFP, QFP to PGA, QFP to PLCC and many others. Custom Extenders can be easily produced. NREs for custom package Extenders are very low and prototype delivery is typically less than 6 weeks.

For more information about Actel's products, call 1-888-99-ACTEL or visit our Web site at http://www.actel.com
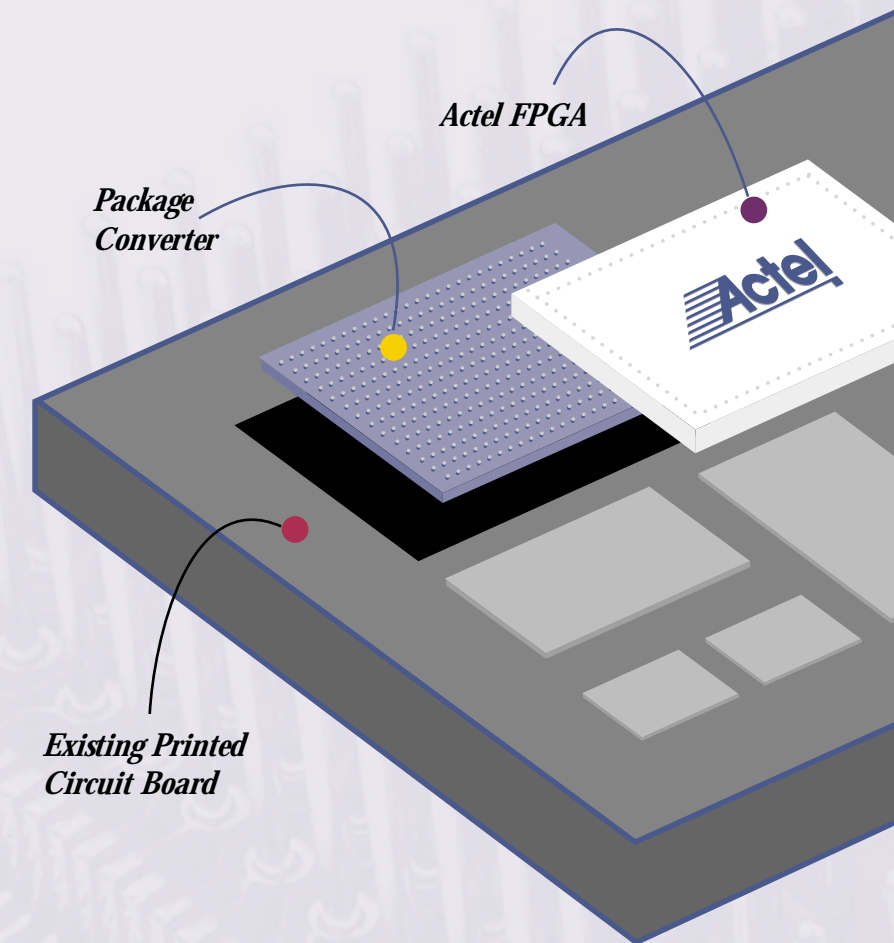
The Actel Extender
The Obsolete ASIC Replacement

Low Profile Package Converter

- *Pin compatible to an Actel FPGA on one side and your obsolete ASIC on the other side*
- *Single chip solution – no boot prom required*
- *Actel's fine-grained architecture simplifies design conversion process*
- *Live at power-up*
- *Eliminates board redesign and requalification*
- *Fast Implementation*
- *5.0V, 3.3V, and 2.5V supply voltage options available*

Uses for the Actel Extender

- *Replacement for discontinued ASICs*
- *Replacement for low density standard parts*
- *Replacement for existing high cost SRAM based FPGA/CPLDs*
- *A highly secure replacement for existing SRAM based FPGA/CPLDs*
- *Pin-Compatible Prototyping solutions*

Actel FPGA

Package Converter

Existing Printed Circuit Board

Micro Thin Adapter

PGA Converter Board

The High Cost Of Device Obsolescence

Semiconductor device obsolescence is a rapidly growing problem in the electronics industry. The Actel Extender can significantly extend the useful life of your design by providing a single-chip, pin-compatible ASIC replacement solution using an Actel FPGA. This solution allows customers to convert ASIC to FPGA designs while preserving the ASIC footprint on a production board.

As electronic components become increasingly integrated and process geometries continue to shrink, the useful economic lifespan of a semiconductor chip can be very brief. With semiconductor manufacturers introducing new generation devices with more capabilities, older devices are not economically viable to continue to support. Constant advances in process technology result in the abandonment of older manufacturing processes for newer, more cost effective, deep sub-micron processes. These dual factors of increased device integration and rapid migration to leading edge technologies create critical sourcing problems for OEMs with long-lived products.

As both standard components and custom ASICs become obsolete, OEMs are faced with the difficult problems of continuing to support both new production builds and maintaining existing installed systems. Faced with an obsolete ASIC, system vendors have traditionally had only two options. The first option is to redesign the circuit into a newer technology, which requires the system OEM to "retarget" the existing design resulting in huge NRE costs, the potential for re-qualification problems, and a long time to market. After prototypes have been approved, if problems are found at the system level, the vendor will have to respin the board again, causing additional NRE charges and production release disturbances. The second option for companies facing component obsolescence issues is to procure a "lifetime buy," which involves substantial cost and risk for the customer. Because the devices are becoming obsolete, the customer tends to order more than enough parts "just in case" they might be needed. This results in high up front procurement costs, continued inventory carrying costs, and all too often inventory write down costs as the production and support finally ends

but the system OEM still has obsolete product on the shelf. Today there is a third option that is quickly implemented, does not require large up front NREs, and fully preserves existing board layouts. The Actel Extender is an innovative low cost solution using Actel's high performance, single chip FPGAs attached to a low profile package converter, which is pin compatible to your obsolete ASICs.

ASIC-like Architecture Leads to Excellent Performance

Actel's fine-grained architecture is very similar to that of ASICs, substantially easing the design conversion process. Actel FPGAs will meet performance requirements because of the flexible logic modules and plentiful routing resources. The placement and routing tools ensure high device utilization, which leads to predictable timing and high performance. The Actel Extender is available for systems requiring 5.0V, 3.3V and 2.5V power supplies. Similar to ASICs, Actel's proprietary antifuse and flash based products are nonvolatile and live on power-up. The live at power-up feature ensures the device will be operational at system power-on, so no system level board changes are needed. With Actel FPGAs there is no delay at system start-up.
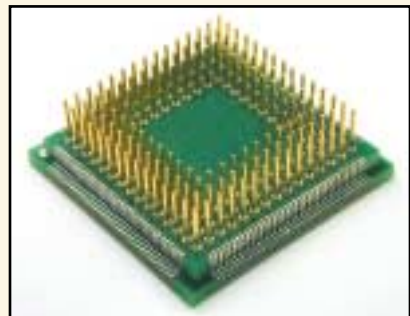
Since Actel's devices are single chip FPGA solutions OEMs can replace an obsolete ASIC or standard part without the need for an extensive board redesign and system requalification. Unlike the Actel Extender single chip solution, SRAM FPGAs require additional off-chip storage of FPGA design files, which requires additional components such as a serial "boot PROM." SRAM FPGAs are often programmed by the system microprocessor, which adds extra complexity to the microprocessor code and requires extra code space memory. This makes replacing the obsolete ASIC with an SRAM FPGA more difficult. Additionally, because Actel FPGAs do not require off-chip storage of a design file, they save space on the board.

### Quick Time to Market and Low Risk

Actel has shipped millions of single chip FPGAs using our proven non-volatile antifuse and flash FPGA technology. With Actel's proven technology and ASIC-like architecture, there is quick time to market. Actel's production-worthy solution does not require a boot prom, providing one-for-one ASIC to FPGA conversion with no time wasted on re-designing the board.
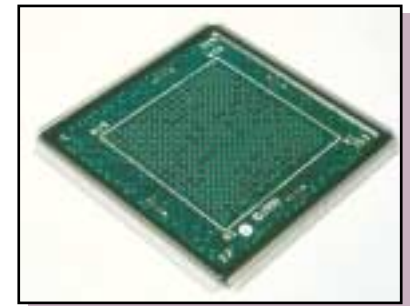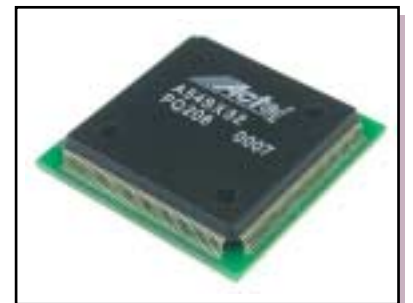

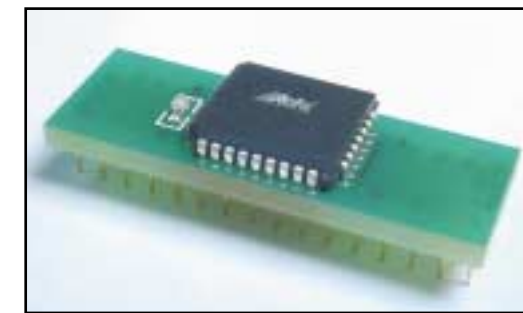*BGA to QFP Package Converter Board*

Small Footprint

Dip Adapter