

ASTC is changing the way companies develop new embedded electronic products.

With ASTC expert engineering, innovative new methodologies, and advanced development software, customers can design better products and get to market faster, at lower cost and risk.

ASTC is the design partner to the global embedded electronics supply chain, from semiconductor and IP vendors to software, OEM and systems companies.

What is Your Challenge?

- Protecting valuable design IP from commercial competitive risks?
- High unit and inventory costs for off-the-shelf embedded ICs and discrete components?
- Complexity of PCB manufacturing assembly and test?
- Maintaining continuity of supply and avoiding component obsolescence?
- Want improved product performance and reliability while reducing project risk?
- Short of hardware, software or system development resources?
- Need accelerated time to market through first silicon success and faster embedded software development?

The ASTC Advantage

ASTC has proven experience in delivering high-quality results in global electronics markets:

- For automotive, wireless, industrial control, computing, graphics, multimedia and more...
- For IP, ASICs, SoCs, virtual platforms, FPGAs, PCBs, hardware, embedded software and systems.

Our ASTC team of expert engineers can support any or all phases of the project, including:



Chip Architecture

ASTC chip architecture services include advanced expertise in product requirements analysis and validation; architecture and system analysis; performance modeling and optimization; power analysis and optimization; third-party IP evaluation; board/chip/module hardware and software partitioning; and interface definitions.

ASIC Engineering Services can accelerate the architecture phase of your project through our domain expertise with both established and next generation technologies.

ASIC Design Engineering

ASIC and FPGA design services span design and integration; IP development; HDL/Verilog/SystemC expertise; physical design and verification; and synthesis and timing closure.

Experience with third party core and chips: ARM, CEVA, Freescale, Renesas, Tensilica, TI and more...

Experience with all major EDA vendor tools and design flows: Cadence, Mentor, Synopsys, TannerEDA and other point tools.

ASTC offers IP and application area experience in areas such as automotive embedded control, wireless, industrial control, infotainment, consumer, multimedia and more.

Some ASTC IC Design Projects:

- Multicore ARM SoC for Wireless Infrastructure
- High Speed Networking IC (Bridge IC)
- Cellular PMIC
- 3G Baseband SoC
- Custom FPGAs
- Automotive Engine Power Management ASIC
- Sensor AMS ASIC
- RF IC

Analog / Mixed Signal Design and Verification

ASTC is a specialist in Analog/Mixed Signal (AMS) design and verification services and solutions. We can help to accelerate your time to working silicon and production from concept.

In design: understanding and analyzing your AMS design requirements; architecture; analog IP; and optimizing your design for AMS reliability and performance.

In verification: analog block simulation; verifying complex, mixed signal SoC using real world usage scenarios; and comprehensive AMS chip level verification.

As well as physical design and implementation, with post-silicon bring-up and support.

We can also help in reducing NRE costs, die size, and power; and in achieving fully functional silicon on the first pass.

Some Analog IP Expertise:

- Level Shifters
- DACs: Switched Current, Switched Capacitor, R-2R, Simple resistor tap, Pulse Width Modulator DACs
- ADCs: Successive Approximation; Sigma-Delta, 8-16 bits resolution.
- Rectifiers: Bridge; voltage doubling; synchronous
- RF Modulators: Parallel, series, wave-shaping
- Reset Circuitry: For controlled/safe start-up.
- Switched Capacitor Filters: Embedded special purpose filtering functions
- Class D Amplifiers
- Phase Locked Loops: Incorporating Voltage Controlled Oscillator, Dividers, Phase-Frequency Detector, Charge Pump, Loop Filter.
- ESD Protection Structures: For I/O and internal circuit protection.
- ASK, FSK & PSK Receivers: HF receivers for various modulation formats and perf levels
- Voltage Regulators
- Oscillators
- Op Amps
- Intelligent Sensor Design (Accelerometer, Gyro, Pressure, Temperature, Capacitive Touch)

Verification

ASTC has vast experience in SoC/ASIC design verification: skills to accelerate design verification for your projects, with confidence. ASTC supports its customers with advanced, flexible mixed-signal chip-level verification solutions, including high quality services for the comprehensive verification of designs ranging from pure analog and RF, to safety-critical, high-performance mixed signal SoCs with 40+ modules.

This chip-level verification service has ensured:

- Correct integration of blocks – connectivity and inter-block protocol.
- Verification of complex functional scenarios spanning multiple interdependent blocks.
- Verification of interactions with external to device under test environment.

Even late in the design cycle, ASTC has used its verification methodologies to quickly validate critical design functions to ensure correctness before silicon manufacture. Working as an independent or collaborative team, ASTC can ensure complete specification compliance of the design, checking all designer assumptions and interpretations, preventing any significant errata in first silicon.

Verification Services:

- Performance analysis
- Hardware validation and verification
- Support for Verilog, VHDL, SystemVerilog, SystemC, popular commercial simulators, socket-based verification platforms, PLI / FLI interfaces
- Digital coverage driven verification including SystemVerilog, OVM / UVM, coverage measurement (code coverage and functional coverage)
- Architectural, behavioral and cycle accurate modeling
- Hardware / software co-simulation
- Rigorous design and verification configuration management, database management
- FPGA rapid prototyping
- Complete metrics and tracking dashboard for coverage, bug open/close rates, progress/prediction
- Automation of test bench infrastructure generation for more rapid coverage
- Reuse of test cases between unit, subsystem and chip level test benches

ASTC verification supports top-down design to quickly identify any digital to analog interface issues early and ensure optimal mixed signal design and performance.

Chip Implementation / Foundry Support

ASTC has taken many SoCs to silicon, with accelerated closure and reduced risk. ASTC brings experience in tools, flows and methodology for high performance IC design.

Chip implementation services span design for test, I/O construction, boundary scan insertion, JTAG, MBIST, ATPG, equivalence checking and timing closure.

Physical design expertise include timing closure of critical paths: sizing/Vt changes, clock tree design, custom signal buffering, ECO/IPOs; power optimization (static and dynamic); DFM and yield optimizations; IR drop/EMC analysis; signal integrity and noise immunity design; physical verification; DRC, LVS, ERC; QoR Improvements; cycle time improvements; DFT scan insertion/optimization, MBIST, BSD, ATPG, DVT, timed Scan/BIST/BSD Sims and test program creation.

Foundry Support Services:

ASTC works with most of the world's leading semiconductor manufacturing companies.

- For ASIC development: Global Foundries, IBM, NEC, TI, Toshiba, TSMC, TowerJazz, VTI, X-Fab
- For FPGAs: Altera Lattice, Xilinx

Technology Support Services:

- Digital processes spanning 40/65/90nm, bulk and SOI.
- Wide variety of analog process nodes.

Application experience spans high performance GHz designs for networking applications; microcontroller MCU designs (ARM, PPC, ColdFire) and mixed signal ASICs for consumer signal processing and automotive sensor applications.

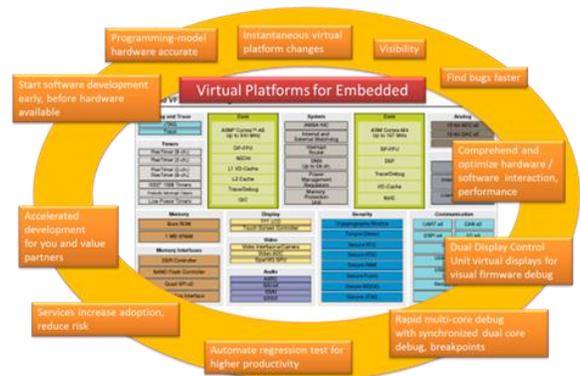
System Level Design

ASTC leads in applying Electronic System Level (ESL) methods in the development of embedded systems, software, and semiconductors.

ASTC can revolutionize embedded development through early access to virtual system prototypes and platforms. ESL methods can be applied to product development in system analysis, virtual system prototyping; model-based design, from models to software and hardware; software development in the early pre-hardware availability phases; software debug using simulation and virtual platform powered technologies; hardware system verification; hardware/software validation; and host-based testing and automated regression testing environments.

ASTC supports your ESL development needs with engineering services spanning:

- Model development and lifecycle management, from requirements through development, deployment and support.
- Virtual platform architecture, design, implementation, test, integration, bring-up, and deployment.
- System design, architecture analysis and optimization.
- Software development, debug and test using virtual platforms.
- Hardware prototyping, validation, and verification using virtual system prototyping and platforms.
- Hardware development using system Level (ESL) methods and tools.



Embedded Software Development

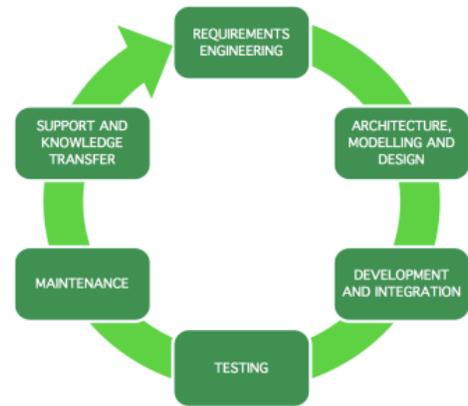
ASTC is recognized as a leader in the development of embedded software, with the experience, engineering expertise, quality standards and project management practices required to deliver great software solutions. Our software systems engineers can develop, test, integrate and deliver across the full spectrum of embedded

software. This includes development of firmware, device drivers, protocol-layer drivers, and embedded applications, as well as software and systems integration.

Embedded software developed at ASTC is currently used in millions of devices worldwide, built into products ranging from consumer electronics and mobile platforms to automotive applications.

Services include: turnkey embedded software system development, migration of existing firmware and drivers to support various hardware platforms, prototype/next generation product development, support and maintenance of legacy products, system integration support, software bring-up, application and system level performance optimization, development of automated test suites and /or optimizing existing test suites, component suitability evaluation, and feasibility studies and investigations of new platforms.

And, ESL modeling can be a competitive advantage: with our VLAB virtual prototyping solutions, ASTC embedded software developers gain a system-wide view of the hardware and software. This allows optimization of embedded software to efficiently use available resources, and easier debug hardware/software integration problems with unprecedented visibility into hardware execution and state as the software runs. Results include improved quality and reduced cycle time.



Learn More About ASTC

- See ASTC Customer Success page for [satisfied customers!](#)
- [See our video "The ASTC Advantage"](#)
- Follow ASTC on [Linked In](#)
- Contact us at sales@astc-design.com