

Unique Technology - A New Genre

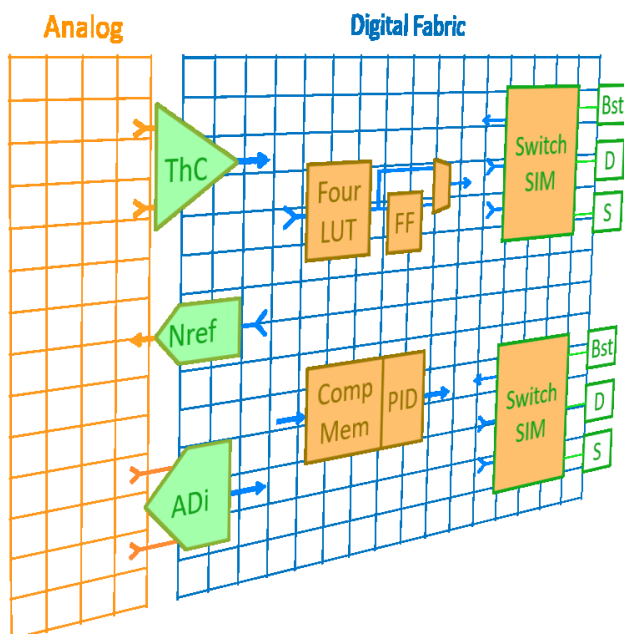
AnDAPT has pioneered a new genre of adaptive analog technology that combines digital programmable fabric with μ Analog power building blocks, to enable full functionality power rails on-demand. This technology combines the proven proficiency of analog power, along with digital flexibility, enabling integration of heterogeneous rails, optimization for user applications and the ability to monitor, control and manage power.

- Analog Proficiency
 - Low bias current, high efficiency
 - Analog switching speeds for high efficiency
 - Loss-less current sense for current mode, current share
 - Sophisticated Single/Multi-phase POLs
- Digital Flexibility
 - Select, Integrate dissimilar power components
 - Optimize, tune for application requirement
 - Telemetry-monitor/throttle to lower power

Adaptive Analog Technology

The AnDAPT AmP platform is engineered with ground breaking, patented, digitally wrapped μ Analog on interconnect fabric technology. μ Analog can be interconnected with fabric to create full-function analog power components such as voltage regulators, load switches etc., without issues of interface voltage, current, impedance, noise, isolation etc.

μ Analog with digital wrappers on interconnect fabric



μ Analog delivers benefits of traditional analog power engineering skills and proficiency, which combined with interconnect fabric and logic, enables, flexibility for creation of a variety of power components including POLs, on-demand. This resulting technology is a unique new genre of analog.

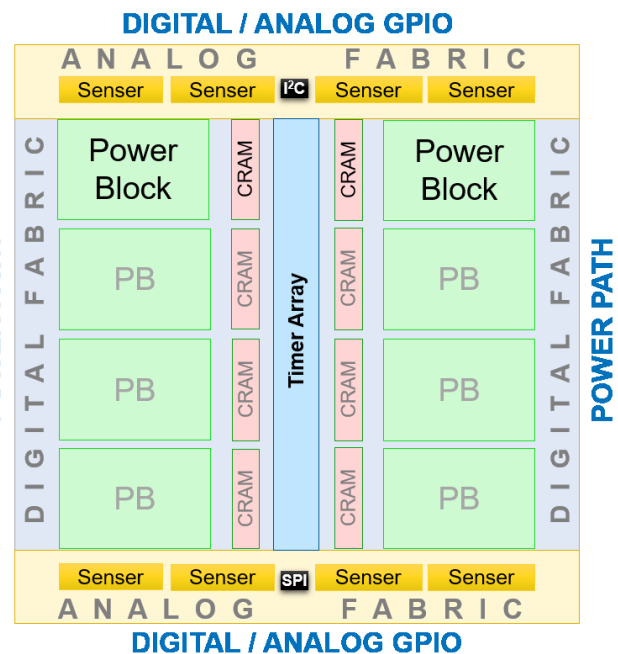
In future, AnDAPT will offer platforms for broad spectrum of both power and non-power analog applications.

On-Demand Power Management

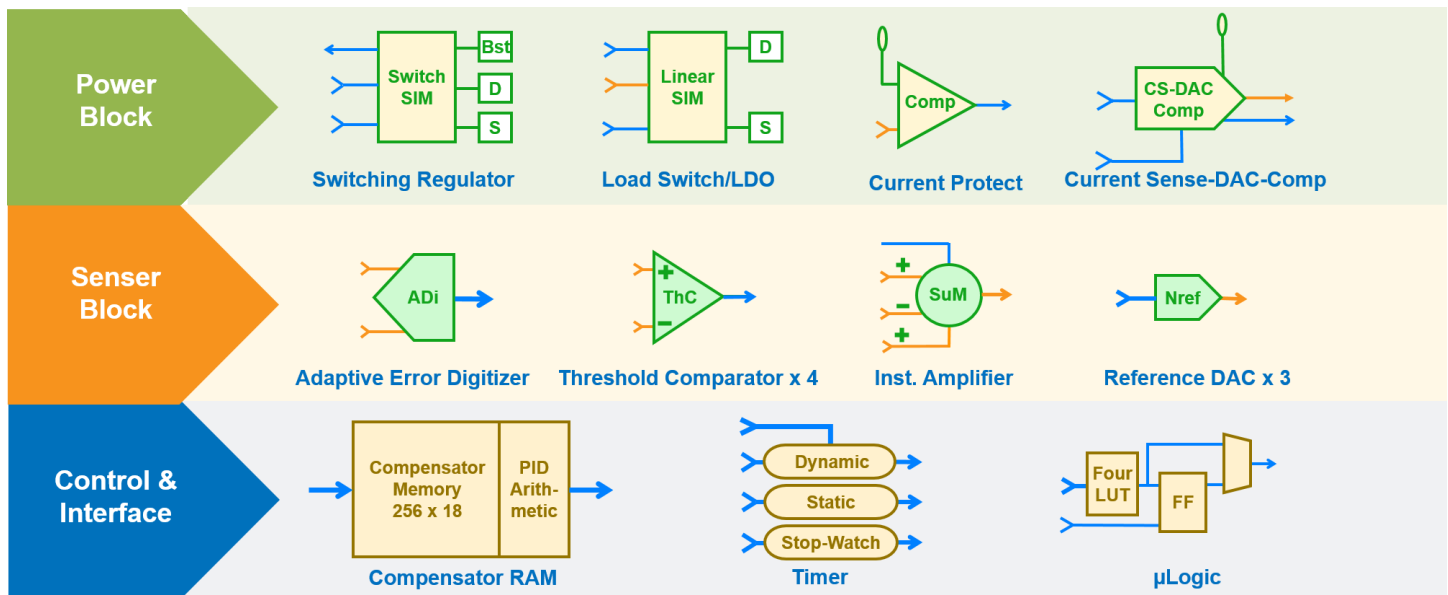
The AnDAPT Adaptive Multi-Rail Power Platform (AmP™) delivers the industry's first, on-demand power management solution for a wide range of applications.

AmP platforms are flexible, highly integrated, power efficient, cost effective and deliver superior figures of merit. Depending on how μ Analog elements are connected, the AmP Platforms builds a variety of multiple power components, specific to user application needs.

Adaptive Multi-Rail Power Platform – AmP



- **Integrated Power Blocks** to build a variety of integrated MOSFET regulator topologies and switches.
- **Integrated Sensor Blocks** to monitor current, voltage, and temperature for telemetry, warnings and protection.
- **Digital and Analog Fabric** to connect the Power Blocks and Sensor Blocks for sensing, control loop, telemetry and sequencing.

AmP Unique Technology - μ Analog Elements

The AnDAPT AmP architecture includes three primary functional groups. Each element is connected via shielded internal wiring for noise isolation.

Power Blocks

Each AnDAPT device includes four, eight, or 12 scalable integrated MOSFET (SIM) elements. Depending on the package style, SIM elements are delivered either independently, or in pairs. Paired SIM elements share inputs and use fewer package pins.

Within the family of AnDAPT AmP devices, each SIM block supports a maximum of either one, three, or six Amperes of current. The MOSFETs are scalable and segmented with low RDS(on) resistance for built-in current-mode operation and for current balancing.

Depending on the specific power application, a SIM block operates either independently or paired with an adjacent SIM block. Each SIM element supports two fundamental operating modes. In linear mode the SIM element performs as a linear, low-dropout (LDO) regulator with current limit control and LDO amplifier gain. Each SIM element also supports switched mode operation.

Sensor Blocks

The Sensor Block provides capabilities to measure voltage or current levels in the application. Every Sensor Block includes the following functions.

- Three noise-immune voltage references
- Four threshold comparators
- A summation amplifier
- An adaptive error digitizer

Digital Fabric Control and Interface

Each AmP device includes a digital fabric for building control loops, sequencers, or interfaces between functions or other components on the board. The analog elements in the Power Blocks and Sensor Blocks have a digital interface that connects to other elements within the AmP device. The AmP's digital fabric includes functions to monitor and control the analog features and to provide connections to the remainder of the system, including the following elements.

- Compensator RAMs with PID Arithmetic (CR)
- Precision Modulation Timer (PMT)
- Programmable Blocks
- Analog and digital general-purpose I/O (GPIO)
- Eight clock distribution networks
- Two on-chip oscillators with selectable frequency and clock phases

Building Power Components

By seamlessly combining analog power functions with flexible, digital control and telemetry, an AmP device affordably integrates multiple, heterogeneous power rails with different regulator topologies and regulation methods.

- Build switching topologies
 - Regulators and Controllers
 - Buck, Boost, Buck-Boost regulators
 - Synchronous or asynchronous
 - Single or multi-phase
- Build Linear/Mixed topologies
 - LDOs and Load Switches
 - Battery chargers
 - LED Drivers
 - H-Bridges