

## Overview

The SA4011 (IXC) Digital Power Processor is a mixed signal integrated circuit with analog sensing functions and digital processing. It contains a micro-processor based on a 32-bit RISC core, and peripherals for timing control, data memory, and general-purpose digital inputs and outputs (GPIO).

- Enables low EMI/RFI via variable frequency operation and control
- Optimizes efficiency at all power levels by seamlessly changing continuous-conduction mode & transition mode control methods.
- Provides the timing information for the power MOSFET signal processing and performs functions required for an inverter.
- Enables designs with low parts count, high power density and low eBOM cost.

## SA4011 Key Features

Rich power control-centric analog periphery:

- Control sensing inputs:
  - two high-frequency & low-frequency
  - two high-frequency, six low-frequency
  - one differential to single-ended
- Five 10-bit, 1.4 MS/s ADCs; four independent and one multiplexed
- Twenty-two 10 ns fast comparators
- Ten 10-bit analog DACs for internal comparator threshold setting and level shifting
- Differential current sensing amplifier interface
- Temperature sensing

Digital Power Engine and Peripherals:

- 32-bit RISC CPU with 64 kB of SRAM memory and 4kB of ROM
- Three 100 MHz programmable timing engines supporting eight driver outputs
  - DC to AC
  - PWM
  - Current mode control
- Dedicated high-performance digital PLL for grid synchronization and dedicated sensing comparator
- Digital post-ADC filtering
- Four digital delta-sigma DAC channels
- Communications interfaces include HDLC-UART, UART, SPI, I2C
- Hardware computing functions (square root, sine tables, fixed point dividers)
- Junction temperature -40 to 125 °C

## Description

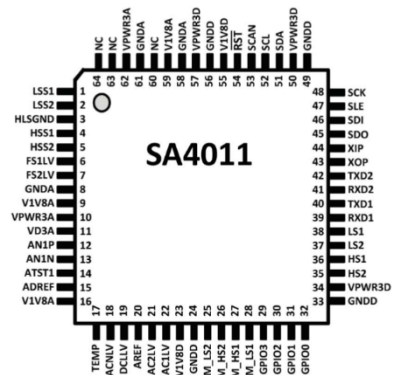
The SA4011 is a 64-pin digital power processor. One IC offers high-speed analog peripherals, digital accelerators, event control, and digital processing. Its flexibility and performance enable designers to meet demanding compliance standards. Industrial and renewable energy applications can benefit significantly from the enhanced performance and reduced component count it offers. The solution addresses many power conversion applications. It easily fits into advanced topologies for DC-DC & DC-AC converters, and renewable applications.

The SA4011 has an advanced mixed-signal architecture. The core is a 32-bit RISC 50 MHz micro-processor. A rich set of high-performance digital power peripherals supports the core. Communications, data memory, and general-purpose inputs and outputs (GPIO) are also provided.

The SA4011 is a fully software-programmable platform. Programming enables control, monitoring and optimization. Those features enable a design solution to meet aggressive requirements. In addition, Solantro's custom debug environment (Helios) is used to observe and change firmware variables and hardware registers in real-time to expedite the design process.

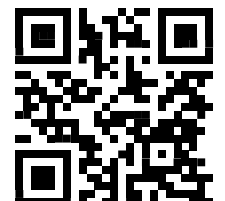
## Applications

- PV Micro-Inverters
- PV DC Optimizers
- Hard-Switch Half & Full Bridge
- Solid-State Transformers
- Feed-Forward Converters
- H-Bridge Inverter



For further information please contact:

[www.solantro.com](http://www.solantro.com)



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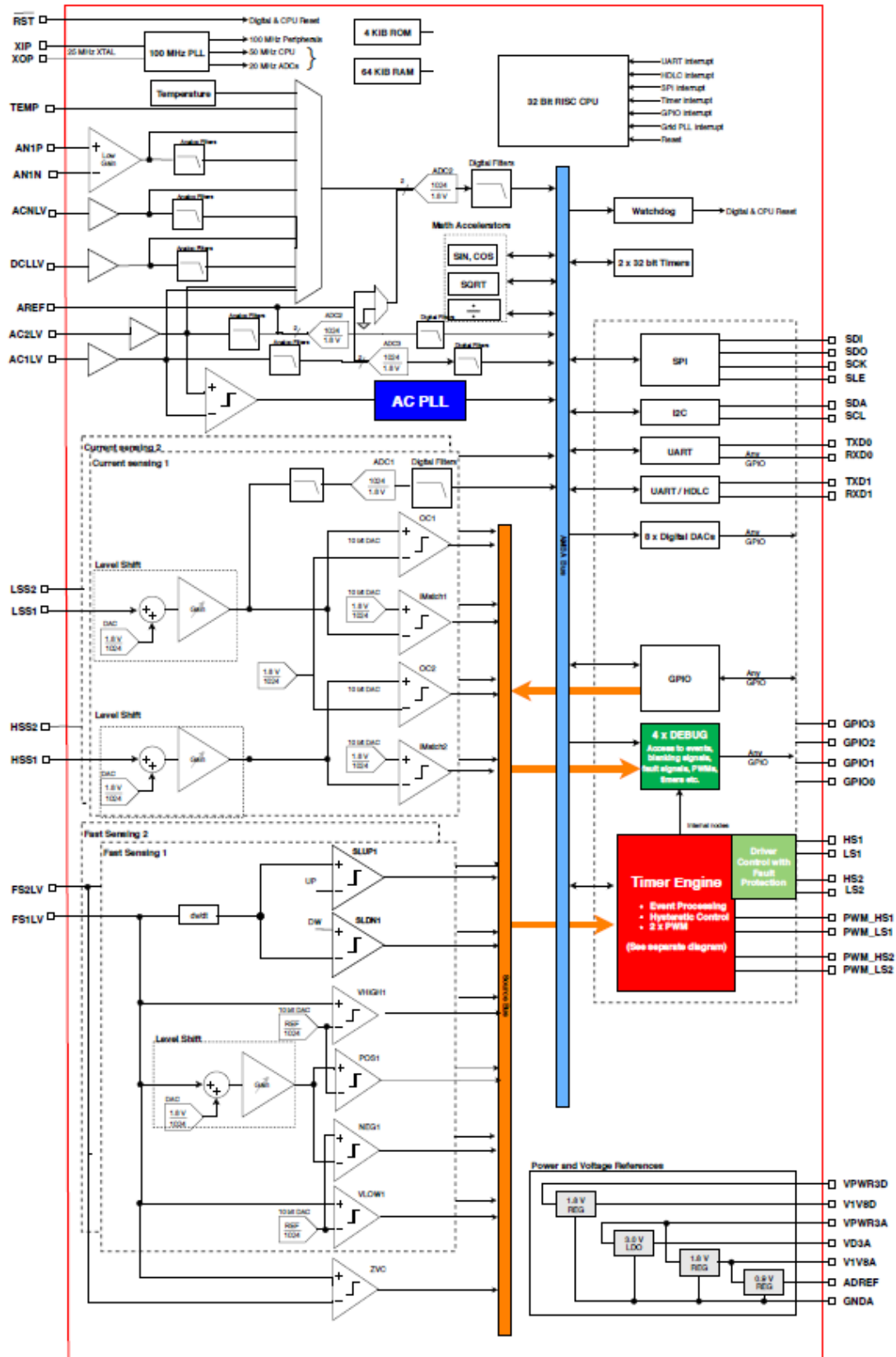


Figure 1 - Functional block diagram