DA6001

Highly integrated power and Clock supply IC for new generation Intel® Atom™ processor

The DA6001 is a highly integrated system controller, designed to support the Intel® Atom™ Z5xx series platform. The DA6001 provides all power supplies, power management and clock supplies in a single chip, and has been optimized to deliver enhanced power efficiency to the platform.

Integrated power management

Sourcing Dialog Semiconductor's DA6001 with a single supply voltage the device provides, low noise supplies to all platform voltage domains and provides current to supply additional system DDR2 memory as well as the firmware hub memory.

The DA6001 integrates six high performance low dropout (LDO) voltage regulators using Dialog's patented Smart Mirror™ technology. This ensures very low quiescent current consumption and high power supply rejection, removing the need for a low power mode and simplifying power control in the system.

Dialog Semiconductors DA6001 includes a high efficiency DC-DC buck controller which is designed according to Intel® Atom™ processor IMVP-6 specification, providing the core voltage to the CPU via its external FETs. The enhanced Intel SpeedStep technology is controlled via the voltage ID (VID) interface. A fully integrated high efficiency DC-DC buck converter sources the hardware engines of the Intel Atom platform. A third high efficiency DC-DC buck converter with external FETs provides high current to the SCH core and the FSB of the Intel® Atom™ platform. A further DC-DC buck converter with external FETs provides energy to the internal as well as to the external system memory.

The DA6001 also provides the reference mid voltage for proper DDR2 operation. It also includes a push-pull source to terminate DDR2 address or data memory lines if necessary.

Being input voltage independent, a charge pump is integrated to generate the 5V domain even if the input voltage drops below 5V.

The power domain architecture has been carefully optimized to deliver enhanced power efficiency to the processor at lowest power dissipation, thereby maximizing battery life time and reducing thermal impact.

Clock Supplies

A further feature of the DA6001 is the clock supply for the Intel® Atom™ platform. Three fractional division featured PLL's including spread spectrum capability are included, driving with low-power push-pull amplifiers the platform according to Intel's CK610 specification. The reference clock for the PLL's is generated via a standard 14.31818MHz crystal oscillator.

Operating conditions

The DA6001 is designed for the automotive ambient temperature range of -40 .. +85°C. The die temperature and the output currents of each power source will be monitored to ensure proper and safe operation at any condition. The DA6001 will be qualified on the basis of AEC-Q100.

Auxillary function

An Analog to digital converter (ADC) with 10bit resolution, combined with an input multiplexer and track and hold circuitry will be implemented. 2 inputs can be used to measure signals manually or automatically.

Functions

- IMVP compliant core voltage buck converter
- 3 high efficient buck converter for internal/ external memory and high current voltage domains
- 6 high performance LDOs
- Push-pull LDO for DDR2 address termination
- 2 channel ADC
- Clock synthesizer/driver according CK610 specification
- Integrate state-machine for start-up, power down and platform state transitions
- 5V Charge pump
- SM Bus control interface
- Full Intel Atom platform control interface
- Control interface for external power up/down, buck synchronization and wake up features

Features

- Complete power management, power supply as well as clock synthesizer/driver in one chip
- Supports Intel Atom processor Z5xx series and Intel System Controller Hub
- Supplies external DDR2 RAM and Firmware Hub
- Only one single supply voltage necessary
- Designed for automotive ambient temperature range of -40 +85°C

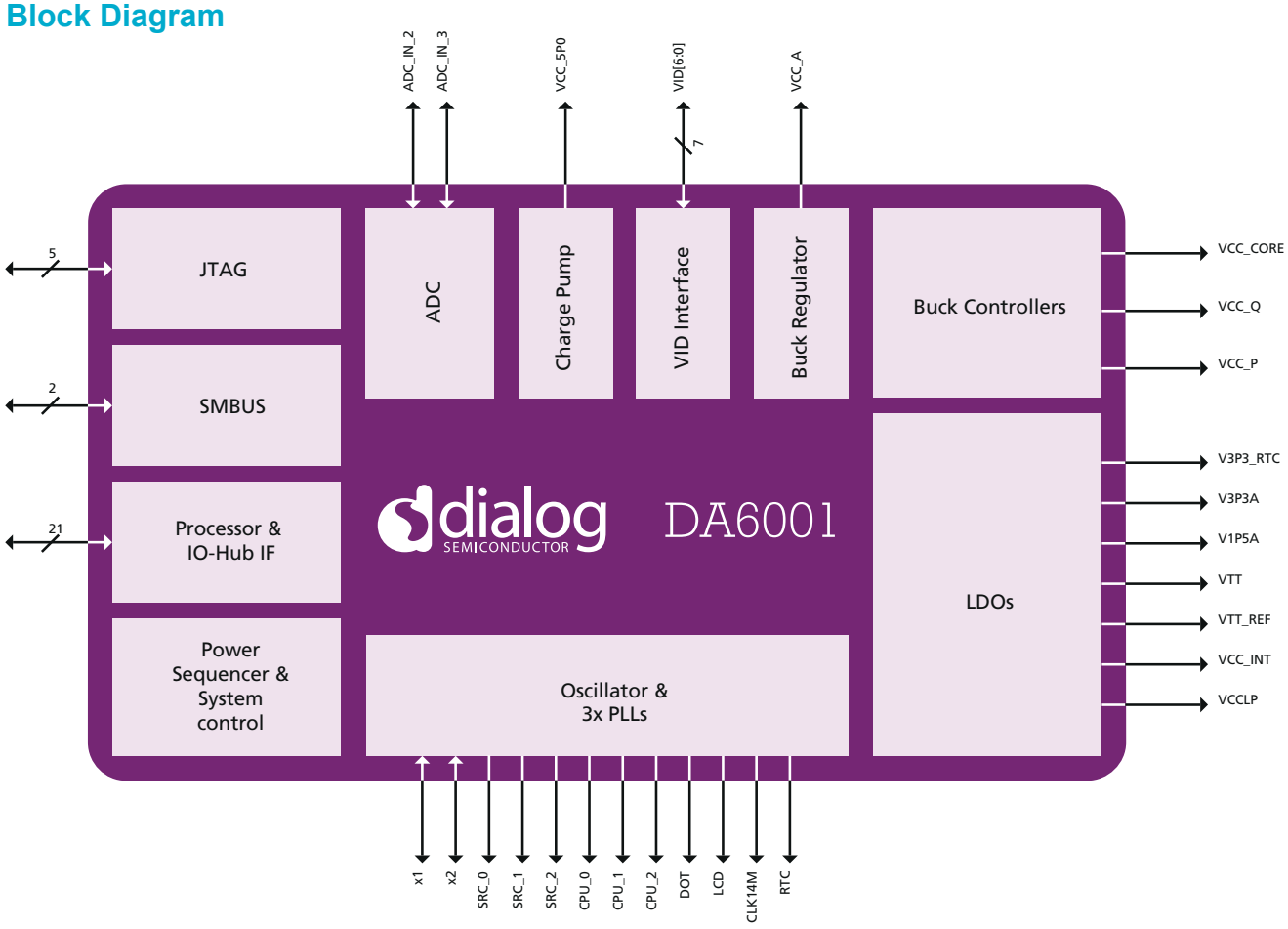
Applications

- Infotainment/Navigation systems
- Netbooks
- Nettops
- UMPCs
- MIDs
- Industrial PCs
- High end PNDs

Package

- 144 VFBGA 10mm x10mm
- 0.8mm pitch

Block Diagram



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