

## Features

- Provides 4 Regulated Voltages
  - CPU Core, AGP Bus, Memory, and GTL Bus Power
- Drives two N-channel MOSFETs
- Linear Regulator Drives Compatible with both MOSFET and Bipolar Series Pass Transistors
- Operates from +5V and +12V input
- Fixed or Externally Resistor-Adjustable Linear Outputs
- Simple Single-Loop Control
  - Voltage-mode PWM control
- Fast Transient Response
  - High-bandwidth error amplifier
  - Full 0% to 100% duty ratio
- Excellent Output Voltage Regulation
  - Core PWM Output:  $\pm 1\%$  Over Temperature
  - Other Outputs:  $\pm 3\%$  Over Temperature
- TTL-compatible 5 bit digital-to-analog output voltage selection
  - Wide range  $1.3V_{DC}$  to  $3.5V_{DC}$
  - 0.1V binary steps from  $2.1V_{DC}$  to  $3.5V_{DC}$
  - 0.05V binary steps from  $1.3V_{DC}$  to  $2.05V_{DC}$
- Power-Good Output Voltage Monitor
- Over-Voltage and Over-Current Fault Monitors
  - Does not require extra current sensing element
- Small converter size
  - Constant Frequency Operation
  - 200 kHz Free-Running Oscillator
  - Programmable From 50 kHz to Over 1 MHz

## Applications

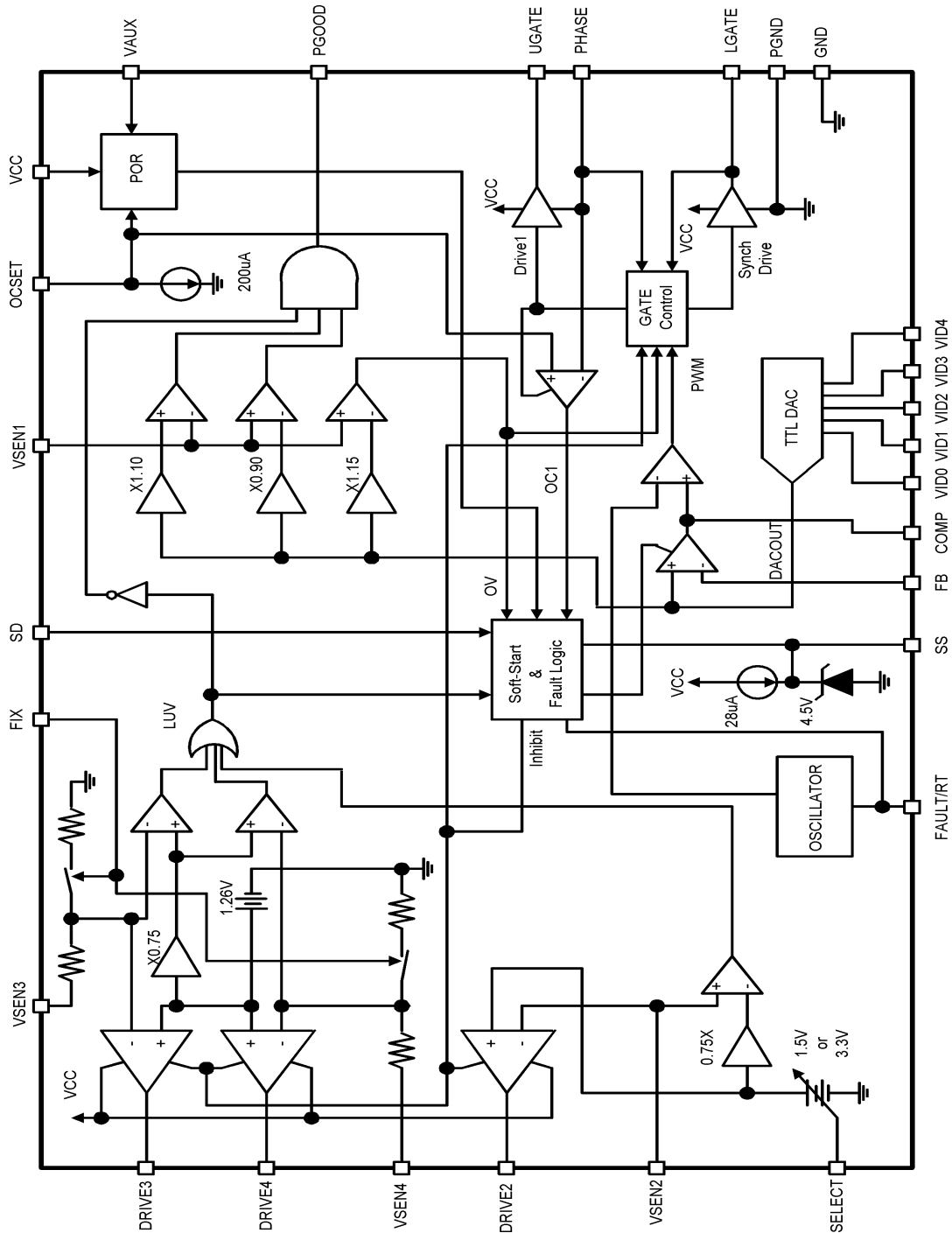
- Motherboard Power Regulation for Computers
- Low-Voltage Distributed Power Supplies

## General Description

The AT1621 provides complete control and protection for four voltages in high-performance, graphics intensive computer applications. It integrates a PWM controller and three linear controllers into a 28-pin SOIC package. One PWM controller regulates the CPU core voltage with a synchronous-rectified buck topology. The linear controllers regulate the computer system's AGP 1.5V or 3.3V bus power, the 1.5V GTL bus power, and the 1.8V power for the North/South Bridge core voltage and/or cache memory circuits.

The AT1621 includes a fully-TTL compatible 5-bit digital-to-analog converter (DAC) that adjusts the output voltage from  $2.1V_{DC}$  to  $3.5V_{DC}$  in 0.1V increments and from  $1.3V_{DC}$  to  $2.1V_{DC}$  in 0.05V steps. The precision reference and voltage-mode regulator hold the selected output voltage to within  $\pm 1\%$  over temperature. The AGP bus power linear controller's output is user-selectable, through a TTL-compatible signal applied at the SELECT pin, for levels of 1.5V or 3.3V with  $\pm 3\%$  accuracy. Based on the status of the FIX pin, the other two linear regulators provide either fixed output voltages of  $1.5V \pm 3\%$  and  $1.8V \pm 3\%$ , or user-adjustable by means of an external resistor divider. All linear controllers can employ either N-channel MOSFETs or bipolar NPNs for the pass transistor.

The AT1621 monitors all the output voltage. A single is issued when the core is within  $\pm 10\%$  of the DAC setting and all other outputs are above their under-voltage levels. Additional built-in over-voltage protection for the core output uses the lower MOSFET to prevent output voltage above 115% of the DAC setting. The PWM controllers' over-current function monitors the output current by using the  $r_{DS(on)}$  of the upper MOSFET, which eliminates the need for a current sensing resistor.

**Block Diagram**


2F, No.10, Prosperity RD. II, Science-Based Industrial Park, Hsinchu 300, Taiwan, R.O.C.

Tel: 886-3-563-0878

Fax: 886-3-563-0879

 WWW: <http://www.aimtron.com.tw>

 Email: [service@aimtron.com.tw](mailto:service@aimtron.com.tw)

Preview the document, detail datasheet contact to our service department.