Low Voltage 16-Bit I²C-Bus I/O Port with Interrupt and Reset

PCA9539A

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The PCA9539A is a low-voltage 16-bit General Purpose Input/Output (GPIO) expander with interrupt and reset for I2C-bus/SMBus applications. NXP I/O expanders provide a simple solution when additional I/Os are needed while keeping interconnections to a minimum, for example, in ACPI power switches, sensors, push buttons, LEDs, fan control, etc.

In addition to providing a flexible set of GPIOs, the wide VDD range of 1.65 V to 5.5 V allows the PCA9539A to interface with next-generation microprocessors and microcontrollers where supply levels are dropping down to conserve power.

The PCA9539A contains the PCA9539 register set of four pairs of 8-bit Configuration, Input, Output and Polarity Inversion registers.

The PCA9539A is a pin-to-pin replacement to the PCA9539 and other industry-standard part numbers. A more fully featured part, PCAL9539A is also available with Agile I/O features. See the respective data sheet for more details.

The PCA9539A open-drain interrupt (INT) output is activated when any input state differs from its corresponding Input Port register state and is used to indicate to the system controller that an input state has changed.

INT can be connected to the interrupt input of a microcontroller. By sending an interrupt signal on this line, the remote I/O can inform the microcontroller if there is incoming data on its ports without having to communicate via the I2C-bus. Thus, the PCA9539A can remain a simple target device.

The device outputs have 25 mA sink capabilities for directly driving LEDs while consuming low device current.

The power-on reset sets the registers to their default values and initializes the device state machine. In the PCA9539A, the RESET pin causes the same reset/default I/O input configuration to occur without de-powering the device, holding the registers and I2C-bus state machine in their default state until the RESET input is once again HIGH. This input requires a pull-up to VDD.

Two hardware pins (A0, A1) select the fixed I2C-bus address and allow up to four devices to share the same I2C-bus/SMBus.

PCA9539A Block Diagram Block Diagram

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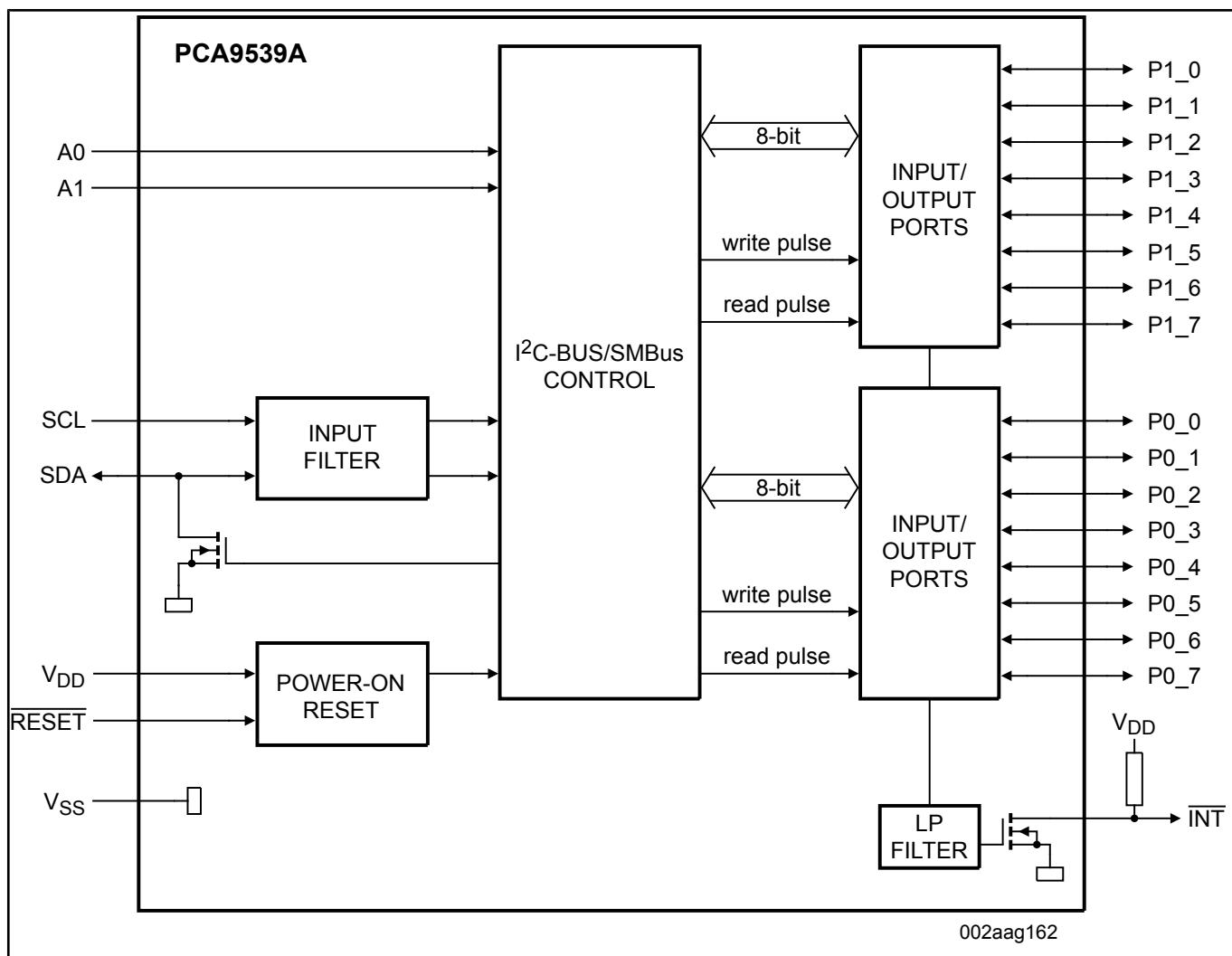
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