8-Bit I²C-Bus and SMBus I/O Port with Interrupt

PCA9554_PCA9554A

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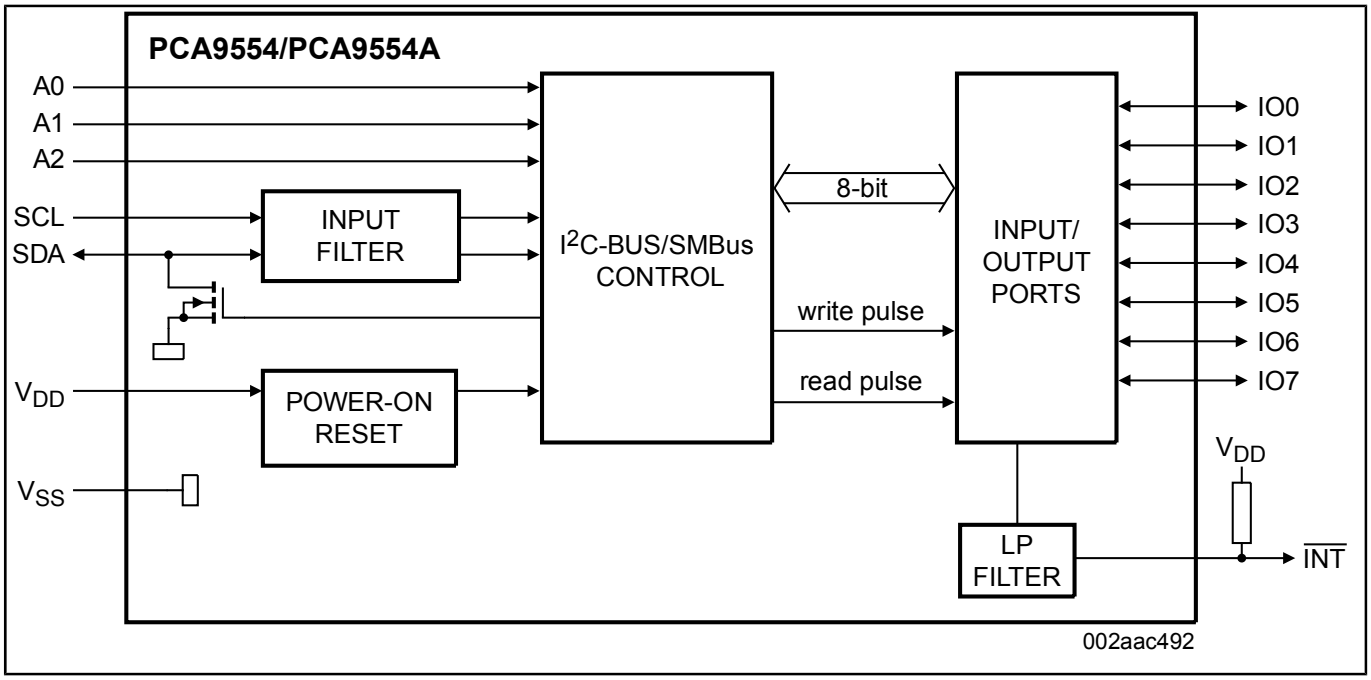
The PCA9554 and PCA9554A are 16-pin CMOS devices that provide 8 bits of General Purpose parallel Input/Output (GPIO) expansion for I²C-bus/SMBus applications and were developed to enhance the NXP Semiconductors family of I²C-bus I/O expanders. The improvements include higher drive capability, 5 V I/O tolerance, lower supply current, individual I/O configuration, 400 kHz clock frequency and smaller packaging. I/O expanders provide a simple solution when additional I/O is needed for ACPI power switches, sensors, push buttons, LEDs, fans and so on.

The PCA9554/PCA9554A consist of an 8-bit Configuration register (Input or Output selection); 8-bit Input Port register, 8-bit Output Port register and an 8-bit Polarity Inversion register (active HIGH or active LOW operation). The system controller can enable the I/Os as either inputs or outputs by writing to the I/O configuration bits. The data for each input or output is kept in the corresponding Input Port or Output Port register. The polarity of the read register can be inverted with the Polarity Inversion register. All registers can be read by the system controller. Although pin-to-pin and I²C-bus address compatible with the PCF8574 series, software changes are required due to the enhancements and are discussed in Application Note AN469.

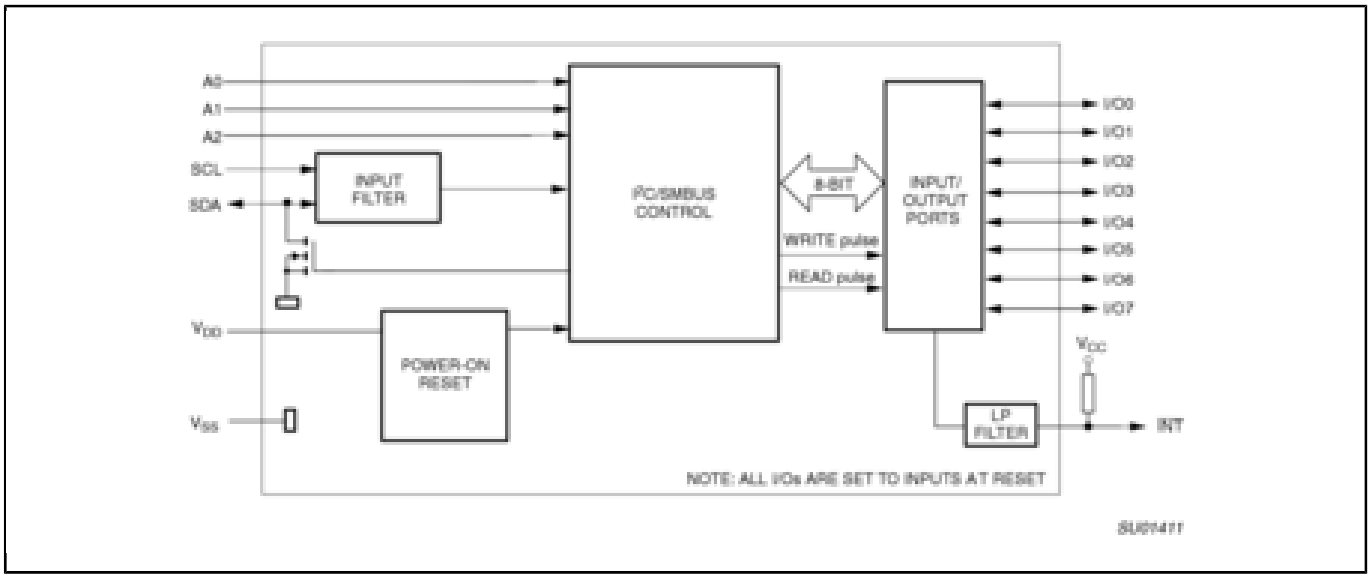
The PCA9554/PCA9554A open-drain interrupt output is activated when any input state differs from its corresponding Input Port register state and is used to indicate to the system controller that an input state has changed. The power-on reset sets the registers to their default values and initializes the device state machine.

Three hardware pins (A0, A1, A2) vary the fixed I²C-bus address and allow up to eight devices to share the same I²C-bus/SMBus. The PCA9554A is identical to the PCA9554 except that the fixed I²C-bus address is different allowing up to sixteen of these devices (eight of each) on the same I²C-bus/SMBus.

PCA9554_9554A Block Diagram



PCA9554ABS, PCA9554AD Block Diagram



View additional information for 8-Bit I²C-Bus and SMBus I/O Port with Interrupt.

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