



I²C-Bus Repeater

PCA9515A

Last Updated: Jun 17, 2025

The PCA9515A is a CMOS integrated circuit intended for application in I²C-bus and SMBus systems.

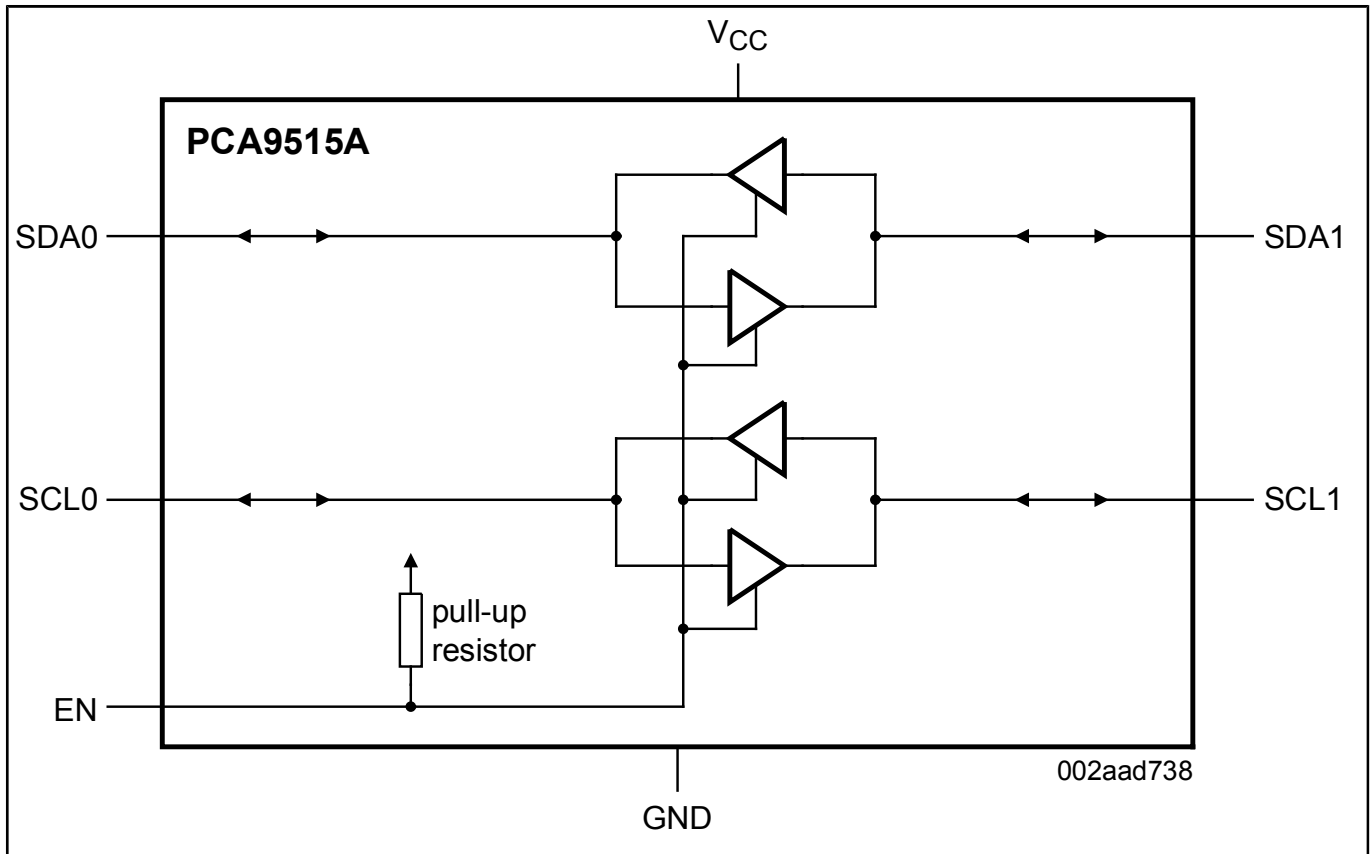
While retaining all the operating modes and features of the I²C-bus system, it permits extension of the I²C-bus by buffering both the data (SDA) and the clock (SCL) lines, thus enabling two buses of 400 pF.

The I²C-bus capacitance limit of 400 pF restricts the number of devices and bus length. Using the PCA9515A enables the system designer to isolate two halves of a bus, thus more devices or longer length can be accommodated. It can also be used to run two buses, one at 5 V and the other at 3.3 V or a 400 kHz and 100 kHz bus, where the 100 kHz bus is isolated when 400 kHz operation of the other is required.

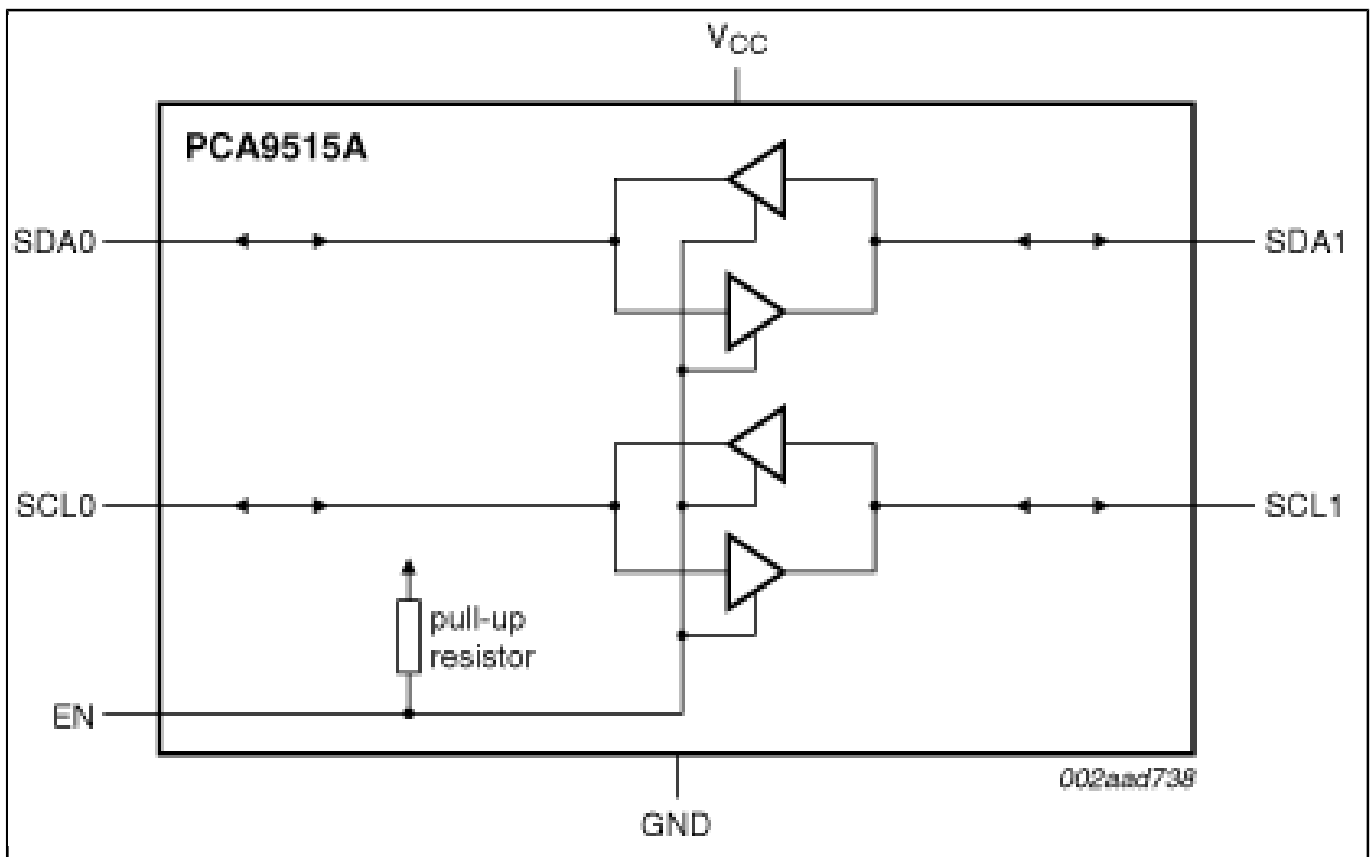
Two or more PCA9515As cannot be put in series. The PCA9515A design does not allow this configuration. Since there is no direction pin, slightly different legal low voltage levels are used to avoid lock-up conditions between the input and the output. A regular LOW applied at the input of a PCA9515A will be propagated as a buffered LOW with a slightly higher value. When this buffered LOW is applied to another PCA9515A, PCA9516A or PCA9518/A in series, the second PCA9515A, PCA9516A or PCA9518/A will not recognize it as a regular LOW and will not propagate it as a buffered LOW again. The PCA9510/A, PCA9511/A, PCA9512/A, PCA9513/A, PCA9514/A cannot be used in series with the PCA9515A, PCA9516A or PCA9518/A, but can be used in series with themselves since they use shifting instead of static offsets to avoid lock-up conditions.

The output pull-down of each internal buffer is set for approximately 0.5 V, while the input threshold of each internal buffer is set about 0.07 V lower, when the output is internally driven LOW. This prevents a lock-up condition from occurring.

PCA9515A Block Diagram



PCA9515AD, PCA9515ADP Block Diagram



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