

NXP 6-bit I²C-bus DIP switch with integrated 8-bit GPIO and 2K EEPROM

Multi-function I²C-bus device simplifies board configuration

Equipped with a multiplexed EEPROM, an I/O expander, and a write-protected serial EEPROM, this highly integrated device makes it easy to implement a variety of functions.

Key features

- ▶ High integration for multiple functions
 - 5-bit multiplexed/1-bit latched 6-bit EEPROM
 - 8-bit I/O expander
 - 2-K serial EEPROM with write protect
- ▶ Compatible with I²C-bus for easy programmability and readability
- ▶ I²C-bus programmable between input hardware pins and non-volatile register.
- ▶ Input hardware pins readable via I²C-bus
- ▶ One address pin allows two devices per I²C-bus
- ▶ ESD protection exceeds 2000V HBM per JESD22-A114, 200V MM per JESD22-A115, and 1000V CDM per JESD22-C101
- ▶ JEDEC standard JESD78 latch-up testing exceeds 100 mA
- ▶ 28-pin TSSOP (PW) package

Applications

- ▶ Board version tracking and configuration
- ▶ Board health monitoring and status reporting
- ▶ Multi-card systems in telecom, networking, and basestation infrastructure equipment
- ▶ Field recall and troubleshooting functions for installed boards
- ▶ General-purpose integrated I/O with DIP switch and memory

Manufactured in a high-volume CMOS process, the NXP PCA9558 is a highly integrated, multi-function device composed of a 5-bit multiplexed/1-bit latched 6-bit EEPROM, an 8-bit I/O expander, and a 2-K serial EEPROM with write protect controlled via the I²C-bus.

The multiplexer can select digital information between a set of five bits of default hardware inputs and an alternative set of inputs provided by the I²C-bus interface and stored in the EEPROM. This is particularly useful for configuring the processor frequency or identifying processor voltage (VID). The multiplexed EEPROM is also useful as a DIP switch or jumper replacement, since the settings are easy to change via the I²C-bus. There's no need to open the cabinet, and non-volatile memory retains the settings when the power is turned off.

The I/O expander function is used to control, monitor, and collect information or to power LEDs. Monitored or collected information can be read through the I²C-bus.

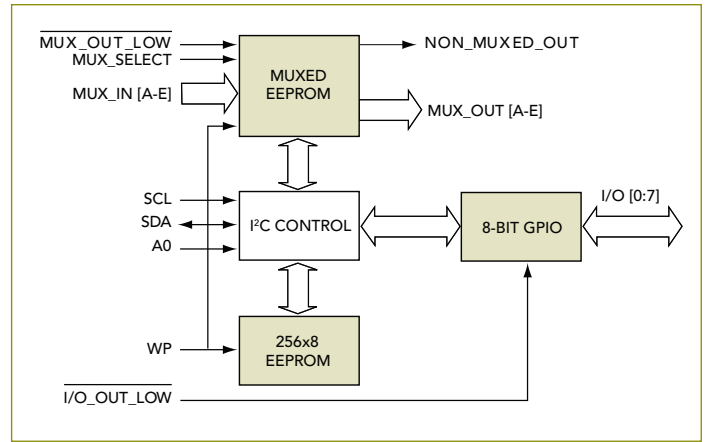
The central processor or controller can poll each card's PCA9558 device for status, version control, or other information. At manufacturing, the PCA9558 can be programmed to store data

on board build, firmware version, manufacturer, identification, and configuration options. Using the I²C-bus as an intra-system communication bus, the PCA9558 also serves as a convenient interface for board configuration.

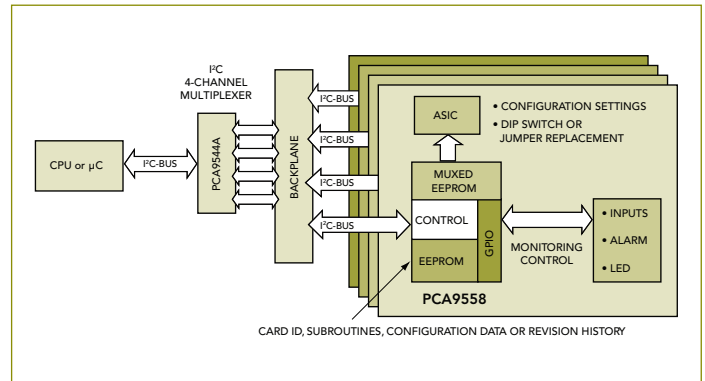
The 2-K EEPROM (256 x 8 bytes) is programmable and readable via the I²C-bus. It offers 10-year data retention and is specified for more than 100,000 write cycles. The write-protect feature controls the ability to write in the non-volatile register.

An active-low override input forces all multiplexed outputs to logic 0. An active-low control I/O also resets the GPIO and forces all bits to output 0. The 8-bit, programmable GPIO can be used to drive LEDs with a 25-mA sink current, a maximum source current of 10 mA per bit, and a maximum sink capacity of 100 mA per device. The fully programmable registers include four sets of configuration, polarity, inversion, input, and output registers. The input registers can be read by the I²C-bus.

Glitch-free operation at power-up and power-down supports hot insertion. The operating voltage range is 3.0 to 3.6 V and the operating temperature range is 0 to +70 °C. The open-drain outputs are tolerant to 5 V and the clock frequency range is 10 to 400 kHz.



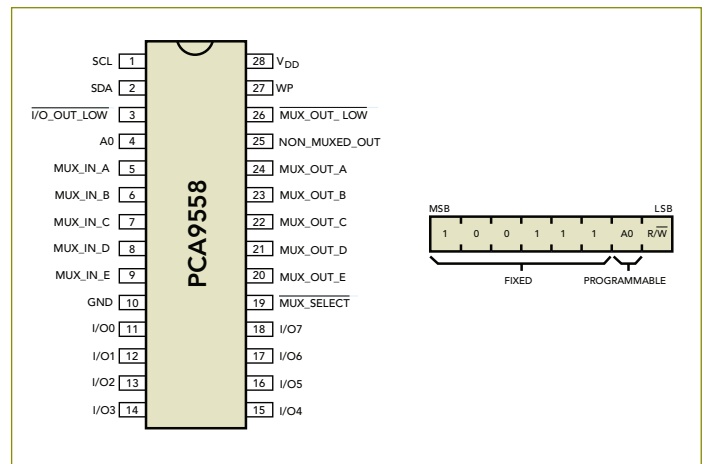
PCA9558 block diagram



PCA9558 application diagram

Ordering information

Package	Container	PCA9558
TSSOP	Tube	PCA9558PW
TSSOP	T & R	PCA9558PW-T



PCA9558 pin configuration and I²C slave address



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