# *SENSYLINK Microelectronics*

# *(CA9534/CA9534A)*
# *8-bit I²C/SMBus low power I/O Expander with Interrupt Output*

*CA9534/CA9534A is an 8-bit remote GPIO expander. It provides remote GPIO expansion for most MCU families via the I²C or SMBus interface.*
*It is ideally used in Server and Telecom equipment.*
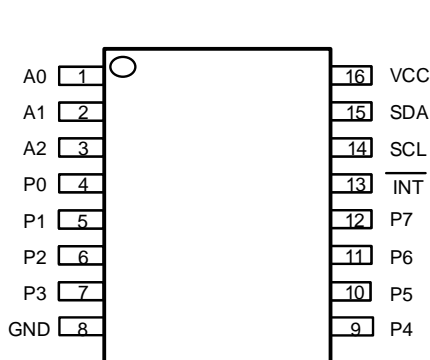
## 1. Description

The chip is an 8-bit I/O expander. It provides remote GPIO expansion for most MCU families via the I$^2$C or SMBus interface. The CA9534/A has 8-bit Input Port register, Output Port register, Polarity Inversion register (active high or active low) and Configuration register (setup as input or output). After power on, the 8 I/O pins are configured as inputs without internal weak pull-up to V$_{CC}$. However, the system master can enable the I/O as either inputs or outputs by writing to the I/O configuration bits. The data for each input or output is stored in the corresponding input or output port register. The polarity of the Input Port register can be inverted with the Polarity Inversion register. All registers can be read by the master.

The master can reset the CA9534/A in the event of a timeout or other improper operation by utilizing the power-on reset feature, which puts the registers in their default state and initializes the I$^2$C/SMBus state machine. The chip has outputs latch feature, which can protect the chip when driving LEDs directly with high-current capability.

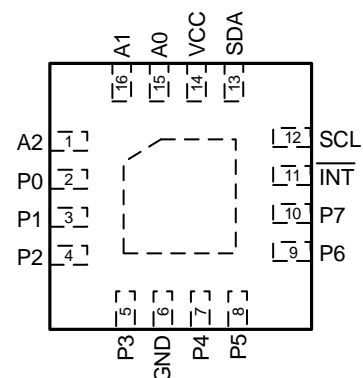Three hardware address Pins (A0, A1 and A2) allow up to eight devices on the I2C/SMBus.

The CA9534/A interrupt pin is used to indicate to the system master that an input data state has changed.

Available Package: TSSOP-16, QFN4x4-16, QFN3x3-16 package.

## 2. Features

- Operation Voltage: 1.65V to 5.5V
- Standby Current: 1.0µA (Typ.)
- 5.5V Tolerance I/O Port
- Remote 8-bit GPIO Expander
- Compatible with SMBus and I$^2$C interface
- I$^2$C Speed up to 1.0MHz (Fast Mode Plus)
- Up to 8 slave addresses
- Interrupt output with active low
- Input, Output and Configuration Register
- Polarity Inversion Register
- Built-in Power-on Reset
- No Glitch during Power-up
- Noise Filter on SCL/SDA inputs
- 8 I/O pins
  - As Input without internal pull-up resistor (default)
  - As Output with push-pull
- Latch feature when driving LEDs directly with high current capability
- Temperature Range: -40°C to 85°C

## 3. Application
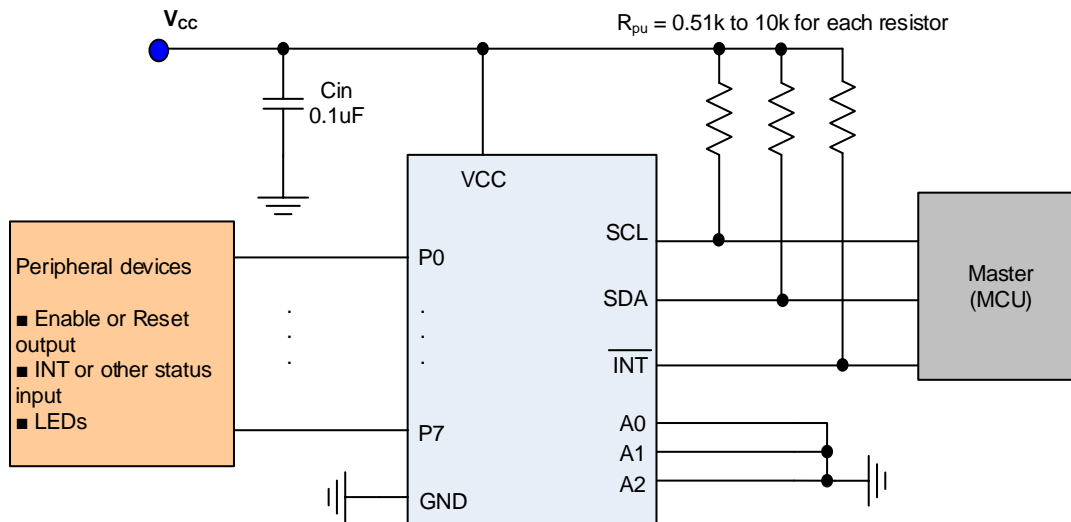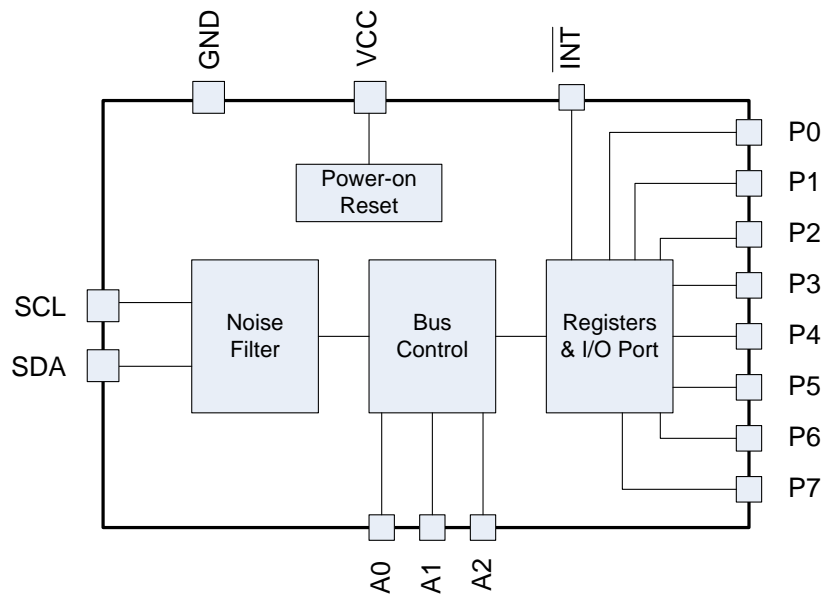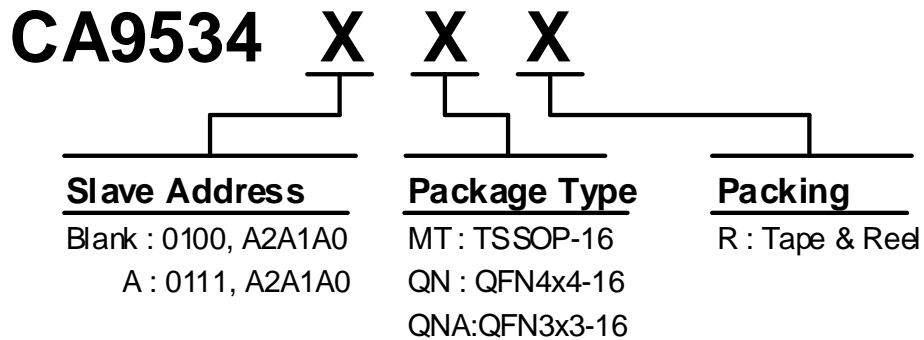
- Server, Notebook PC
- Telecom equipment

## 4. PIN Configurations (Top View)



TSSOP-16(Package Code MT)



QFN4x4-16/QFN3x3-16 (Package Code QN/QNA)

## 5. Typical Application



**Figure 1 Typical Application of CA9534/CA9534A**

## 6. Pin Description

| PIN Name | PIN No. | | Description |
|---|---|---|---|
| | TSSOP-16 | QFN4x4-16 QFN3x3-16 | |
| A0 | 1 | 15 | Slave addresses setup pins, which can generate 8 kinds of slave addresses by connecting these pins to GND or VCC respectively. |
| A1 | 2 | 16 | |
| A2 | 3 | 1 | |
| P0 | 4 | 2 | GPIO bit0, input/output: push-pull structure; default as input after power on. |
| P1 | 5 | 3 | GPIO bit1, input/output: push-pull structure; default as input after power on. |
| P2 | 6 | 4 | GPIO bit2, input/output: push-pull structure; default as input after power on. |
| P3 | 7 | 5 | GPIO bit3, input/output: push-pull structure; default as input after power on. |
| GND | 8 | 6 | Ground pin. |
| P4 | 9 | 7 | GPIO bit4, input/output: push-pull structure; default as input after power on. |
| P5 | 10 | 8 | GPIO bit5, input/output: push-pull structure; default as input after power on. |
| P6 | 11 | 9 | GPIO bit6, input/output: push-pull structure; default as input after power on. |
| P7 | 12 | 10 | GPIO bit7, input/output: push-pull structure; default as input after power on. |
| $\overline{\text{INT}}$ | 13 | 11 | Interrupt output with active low. Connect to VCC through a pullup resistor. |
| SCL | 14 | 12 | Digital interface clock input pin, need a pull-up resistor to VCC. |
| SDA | 15 | 13 | Digital interface data input or output pin, need a pull-up resistor to VCC. |
| VCC | 16 | 14 | Power supply input pin, using 0.1uF low ESR ceramic capacitor to ground. |

## 7. Function Block



**Figure 2** **CA9534 / CA9534A Function Block**

## 8. Ordering Information



CA9534    X    X    X

**Slave Address**
Blank : 0100, A2A1A0
A : 0111, A2A1A0

**Package Type**
MT : TSSOP-16
QN : QFN4x4-16
QNA:QFN3x3-16

**Packing**
R : Tape & Reel

| Order PN | Green[1] | Package | Marking ID[2] | Packing | MPQ | Operation Temperature |
|---|---|---|---|---|---|---|
| CA9534MTR | Halogen free | TSSOP-16 | 9534 YWWAXX | Tape & Reel | 4,000 | -40°C to 85°C |
| CA9534QNR | Halogen free | QFN4x4-16 | 9534 YWWAXX | Tape & Reel | 5,000 | -40°C to 85°C |
| CA9534AMTR | Halogen free | TSSOP-16 | 9534A YWWAXX | Tape & Reel | 4,000 | -40°C to 85°C |
| CA9534AQNR | Halogen free | QFN4x4-16 | 9534A YWWAXX | Tape & Reel | 5,000 | -40°C to 85°C |
| CA9534AQNAR | Halogen free | QFN3x3-16 | 9534A YWWAXX | Tape & Reel | 3,000 | -40°C to 85°C |

Notes：
1.Sensylink can meet RoHS 2.0/REACH requirement. So, most package types Sensylink offers only states halogen free, instead of lead free.
2.Marking ID includes 2 rows of characters. In general, the 1st row of characters is part number, and the 2nd row of characters are date code plus production information.

# SENSYLINK Microelectronics Inc.

*www.sensylink.com*

**IMPORTANT NOTICE**