

Analog, Mixed-Signal and Power Management

MC34972

Multiple Switch-Detection Interface with Suppressed Wake-Up

Target Applications

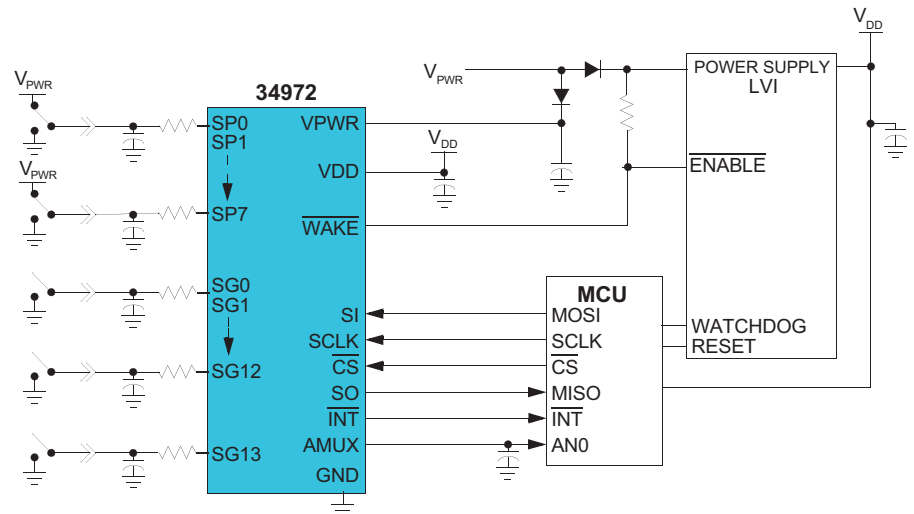
- Industrial control systems
- Process control systems
- Security systems
- Critical systems requiring switch status verification for safety, operation or process-control purposes

Overview

The MC34972 multiple-switch detection interface with suppressed wake-up is designed to detect the closing and opening of up to 22 switch contacts. The switch status, either open or closed, is transferred to the microprocessor unit (MCU) through a serial peripheral interface (SPI). The device also features a 22-to-1 analog multiplexer for reading inputs as analog. The analog input signal is buffered and provided on the AMUX output terminal for the MCU to read.

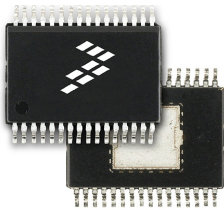
The MC34972 device has two modes of operation: Normal and Sleep. Normal mode allows programming of the device and supplies switch contacts with pull-up or pull-down current as it monitors switch change-of-state. The Sleep mode provides low quiescent current, which makes the MC34972 ideal for industrial products requiring low sleep-state currents. This device is powered by SMARTMOS technology.

Simplified Application Drawing

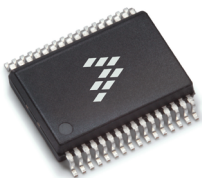


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Expanding on more than 30 years of innovation, Freescale is a leading provider of high-performance products that use SMARTMOS technology, combining digital, power and standard analog functions. Freescale supplies analog and power management ICs that are advancing the automotive, consumer, industrial and networking markets. Analog solutions interface with real-world signals to control and drive for complete embedded systems.



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98ASA10556D



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Product Features and Benefits

Features	Benefits
Designed to operate $5.5\text{ V} \leq V_{PWR} \leq 26\text{ V}$	Optimized multiple switch OPEN/CLOSE status verification with immediate reporting to the MCU
Switch input voltage range -14 V to V_{PWR} , 40 V Max	Interfaces to 3.3 V/5.0 V MCUs with SPI
Interfaces directly to MPU using 3.3 V/5.0 V SPI protocol	Surface-mounted device, requires minimal PC board space and few components, enhanced application reliability and lower costs
Selectable wake-up on change of state with active interrupt	Simple power conservation solution providing a WAKE output for system wake-up from Sleep mode
Selectable wetting current (16 mA or 2.0 mA)	Multiplex analog signals via the AMUX pin for Analog to Digital input
Eight programmable inputs (switch to supply or ground)	Multiple Sleep mode polling rates
Fourteen switch-to-ground inputs	Increased operating voltage
Typical standby current - $V_{PWR} = 100\text{ }\mu\text{A}$ and $V_{DD} = 20\text{ }\mu\text{A}$	Multiple MC34972 devices in a module system

Development

Part Number	Description
KIT33972AEWEVBE	Evaluation Board, featuring the MC33972

Documentation

Freescal Document Number	Title	Description
MC34972	Multiple Switch Detection Interface with Suppressed Wake-Up	Data sheet
SG1002	Analog Product Selector Guide	Selector guide
SG200	Analog and Power Management Industrial Selector Guide	Selector guide

For more information, please visit freescale.com/analog

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