

MC33972

Multiple Switch Detection Interface with Suppressed Wake-up

Applications

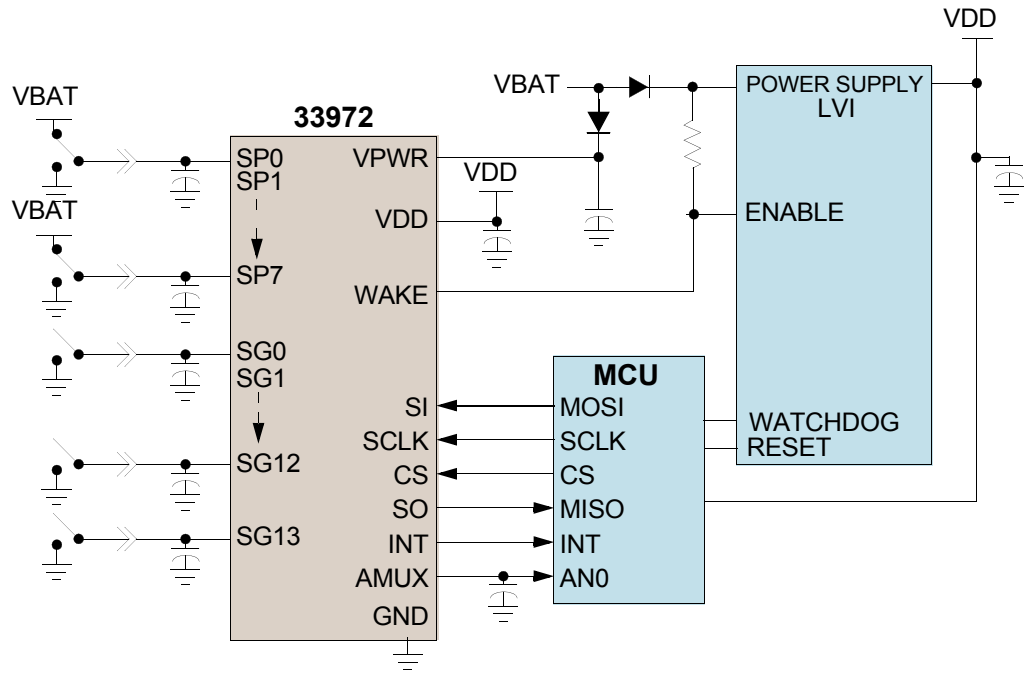
- Automotive Systems
- Aircraft Systems
- Industrial Control Systems
- Process Control Systems
- Security Systems
- Critical systems requiring switch status verification for safety, operation, or process control purposes

Overview

The 33972 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 33972 device has two modes of operation, Normal and Sleep. Normal mode allows programming of the device and supplies switch contacts with pullup or pulldown current as it monitors switch change of state. The Sleep mode provides low quiescent current, which makes the 33972 ideal for automotive and industrial products requiring low sleep state currents.

MC33972 Simplified Application Diagram



Performance	Typical Values
Operating Voltage	$5.5\text{ V} \leq V_{PWR} \leq 26\text{ V}$
Switch Voltage Range	$-14\text{ to }V_{PWR}$
Contact Wetting Current	2.0 or 16 mA
Quiescent Current:	
VPWR	< 100 μA
VDD	< 20 μA
Control	SPI
Outputs	4

Features

- Switch input voltage range -14 V to V_{PWR} , 40 V Max
- Interfaces directly to microprocessor using 3.3 V/5.0 V SPI protocol
- Selectable wake-up on change of state
- Selectable wetting current (16 mA or 2.0 mA)
- 8 programmable inputs (switches to battery or ground)
- 14 switch-to-ground inputs
- V_{PWR} standby current 100 μ A typical, V_{DD} standby current 20 μ A typical
- Active interrupt (INT) on change-of-switch state
- Pb-free packaging designated by suffix code EW and EK
- Devices available for comparison are in the Analog Product Selector Guide - SG1002 and Automotive Product Selector Guide - SG187

Customer Benefits

- Optimized multiple switch OPEN/CLOSE status verification with immediate reporting to the MCU
- Interfaces to 3.3 V/5.0 V MCUs with SPI
- Surface-mounted device, requires minimal PC board space, few components, enhanced application reliability, and lower costs
- Simple power conservation solution providing a WAKE output for system wake-up from Sleep mode

Questions

- Do you need to confirm the status of multiple switches in your system?
- Do you need to verify a switch is closed to battery or ground?
- Do you need a switch verification device capable of analog voltage multiplex readout of sensing inputs?
- Do you need a switch verification device that is also capable of controlling small LEDs as well as MOSFET transistors?
- Do you need a switch verification device programmed and controlled via SPI?
- Do you need a switch monitoring device that “sleeps” until switches change status and then alerts the MCU that a switch state has changed?

Ordering Information

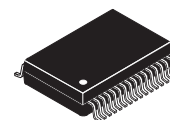
Device	Temperature Range	Package
MC33972TEW/R2	-40 to 125°C	32 SOICW
MC33972ATEW/R2	-40 to 125°C	32 SOICW
MC33972ATEK/R2	-40 to 125°C	32 SOICW-EP

Evaluation Board

KIT33972AEWEVBE Evaluation Board

Documentation

MC33972	Data sheet order number
SG1002	Analog Product Selector Guide
SG 187	Automotive Product Selector Guide

32 SOICW/EP


0.65 mm Pitch
7.5 x 11.0 mm Body

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