



LDS6023

PureTouch™ Capacitance Touch IC with Integrated Keypad LED Drivers

The LDS6023 PureTouch™ controller empowers system designers to create streamlined, attractive and reliable product designs with capacitive touch controls. Integrated LED drivers allow visual feedback to be implemented when a touch occurs, without the need for host intervention.

LDS6023 Features

Versatile, accurate capacitance-to-digital converter (CDC)

- 500 kHz sigma-delta CDC
- 6 capacitance sensor input channels
- 2 ms update rate per active sensor

Integrated keypad LED drivers

- C3-C5 sensor inputs configurable as keypad LED drivers
- 7.75 mA maximum driving current (up to 23 mA available by connecting multiple outputs to a single LED)
- Flexible dimming control
- Processor-free synchronization with touch events

Integrated, automatic calibration algorithms

- Environmental compensation
- On-chip RAM to store calibration data

Integrated touch preference modes

- Strongest single touch
- Strongest two touches
- Unrestricted (all) touches

Ultra-low touch sensor power consumption*

- Operating mode (typical): <math>< 150 \mu\text{W}</math> ($V_{DD1}=1.8\text{V}</math>)$
- Shutdown mode (typical): <math>< 1 \mu\text{W}</math> ($V_{DD1}=1.8\text{V}</math>)$

* Excludes LED driver current and I/F and voltage dependent V_{DDIO} current

Description

The LDS6023 is a programmable capacitance-to-digital converter (CDC) designed for use with capacitive sensor arrays implementing touch-based input controls including sliders, scroll wheels, and buttons. Featuring 6 sensor inputs, 3 of which are dual-purpose I/Os configurable as either capacitive sensor inputs or keypad LED drivers, the LDS6023 provides the flexibility to implement multiple touch inputs with integrated lighting effects using a single controller.

When configured for capacitive sensing, the I/Os are directed through an integrated switch matrix to a 500 kHz sigma-delta CDC which senses changes in the external sensor array. When a sufficiently large change in capacitance occurs, a sensor activation is registered and the host processor is notified. LED lighting effects are automatically initiated by a touch event with no processor intervention required.

On-chip calibration logic continuously monitors the environment and automatically adjusts on-and-off threshold levels to prevent false sensor activation. The LDS6023 is offered with both SPI-compatible and I²C-compatible interfaces (active interface selected by I/F select pin) and features a general-purpose input/output (GPIO) and interrupt output for additional communication with the host processor.

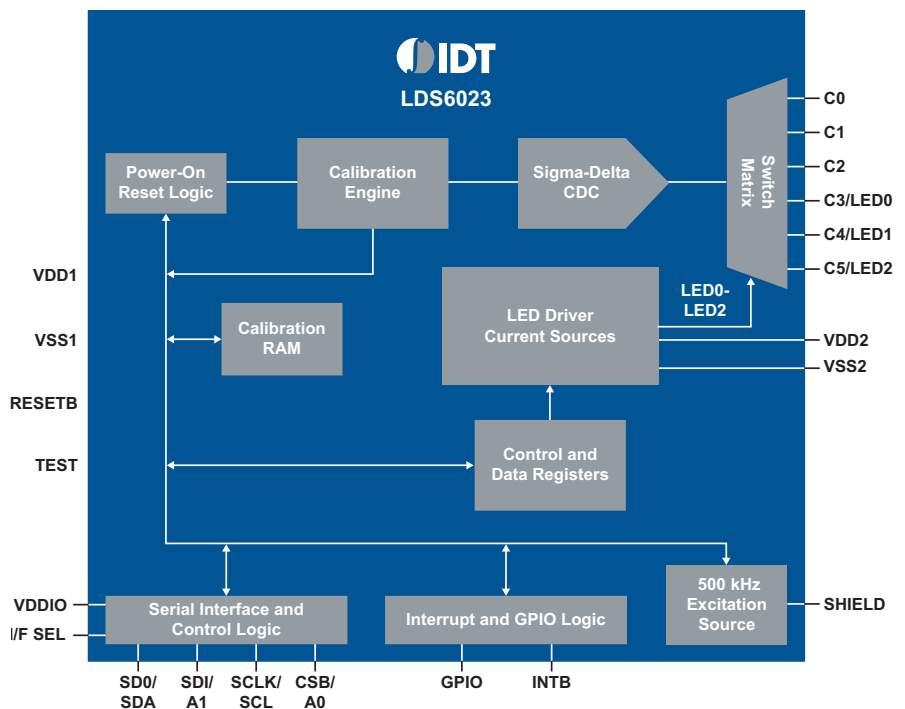


Figure 1. LDS6023 block diagram

