Three-axis digital accelerometer in LGA

High performance, low-power and cost effective

STMicroelectronics offers a complete family of linear accelerometers, in an LGA package, with analog or digital output. The LIS3LV02DL is a low-power, low voltage linear accelerometer with a SPI/I²C interface that allows implementation of an easy and intuitive user interface.

This highly-efficient device accurately measures acceleration in three axes while consuming very little power. Due to its embedded non-volatile memory, all critical device parameters are trimmed and stored during final tests to enable uniformity of production.

ST MEMS accelerometers provide high-sensitivity and precision, delivering resolutions in the sub-mg range. Board mounting and assembly is simplified by having a single device with three axes of sensitivity. An embedded 12-bit A/D converter in the device is not only reducing system cost, but makes the total solution more efficient.

Applications

The combination of MEMS accelerometers and an appropriate software application eliminates the need for conventional switches, buttons and thumbwheels to interact with functions of handheld devices. It is an effective way to solve the familiar “small button – big finger” problem experienced by many users. Acting as a tilt/motion sensor, MEMS accelerometers can detect hand movements and use them as inputs for an easy and intuitive man machine user interface. The approach is ideal for applications such as:

- Scrolling of documents, maps and images larger than the display window
- Web page browsing
- Menu navigation
- Gaming
- Context awareness
- Automatic portrait-landscape adaption
- Pedometer
- System wake-up
- Motion control

In addition to user interfaces, the use of a MEMS sensor allows ‘compass compensation’ in handheld devices. The accelerometer compensates the inclination of the device, enabling an accurate and reliable reading.

MEMS accelerometers also allow the implementation of some important safety features in portable devices, including free-fall detection, to protect the integrity of hard disk drive data, and shock detection. The quick response of the sensor allows initiation of actions to protect the portable device, long before the mechanical overload can create a damage to the system.

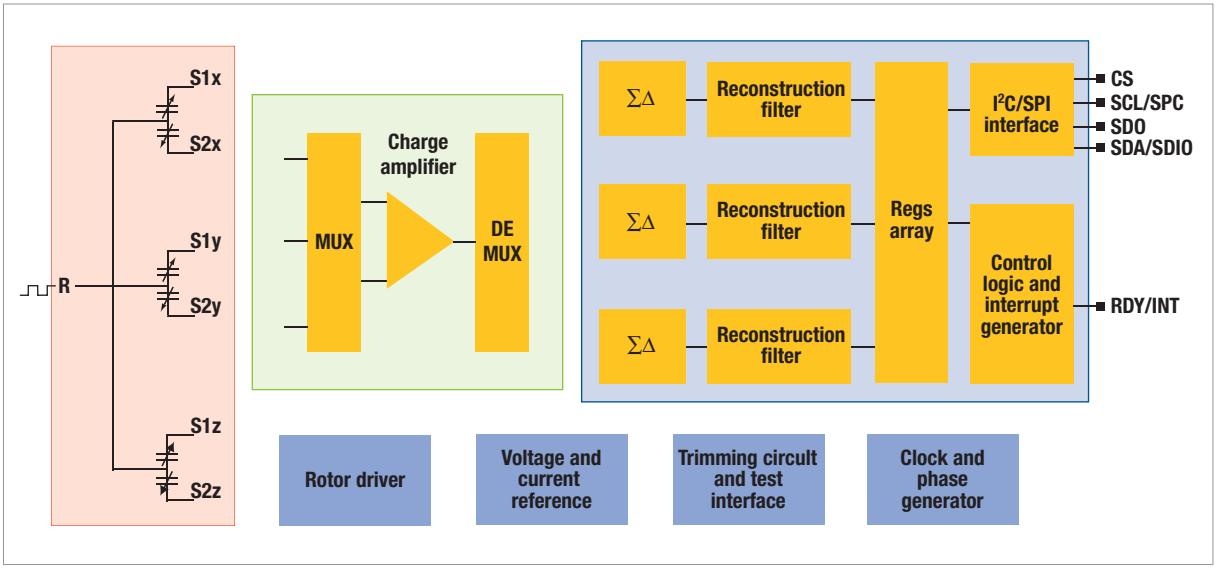
The LIS3LV02DL has a digital, programmable interrupt output to operate as a smart sensor and can activate external devices if user defined acceleration thresholds are exceeded. In addition of this, the LIS3LV02DL in an LGA package provides a solution for applications which require low-sizes and thin packages.

www.st.com/mems

Hardware features

The LIS3LV02DL three-axis linear digital accelerometer includes a MEMS sensor chip that changes capacitance in response to movement or inclination. In the same package there is a trimmed interface with an embedded A/D converter that translates this capacitance change into a digital word which can be read by the serial interface.

- Three-axis accelerometer in a single device
- No external components required
- I^2C or SPI digital serial interface
- Embedded 12-bit A/D conversion
- Programmable bandwidth and data rate
- Wake-up interrupt generation for system power save feature
- Free fall interrupt generation
- Programmable interrupt threshold
- LGA plastic package with 16 leads
- -40 to 85°C operating temperature range
- 2.16 to 3.6V core power supply
- 1.7 to 3.6V I/O power supply
- 0.7mA typical current consumption in normal mode
- 1µA typical current consumption in power-down mode
- Programmable digital low-pass filter
- ±2g and ±6g user selectable full scale
- Resolution 1mg @ 50Hz
- Non-linearity 2% for X and Y and 3% for Z axis
- High shock survivability: 10000g for 0.1ms
- Embedded self-test function
- Eco-pack compliant package



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Full product information at www.st.com

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