Melexis

INNOVATION WITH HEART

Salmon represent our magnetic sensors because of the use magnetism for their sense of direction. This sense of direction is so strong they even can climb waterfalls.

MLX90394

MICROPOWER TRIAXIS®

3D MAGNETOMETER

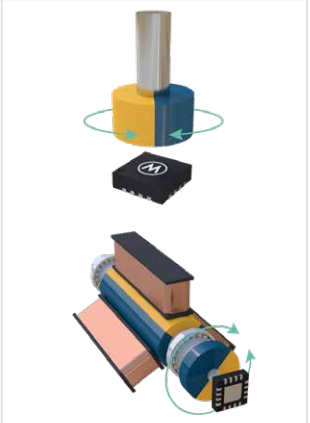
ULTIMATE PERFORMANCE SQUEEZED IN A TINY 3D MAGNETOMETER

MLX90394

The MLX90394 is a 3-axis magnetometer suitable for a myriad of position sensors applications using Triaxis® Hall Technology. The device, especially designed for micropower applications, measures magnetic fields along the 3-axis (X, Y & Z). Those measurements and the IC temperature are converted into 16-bit words which are transferred upon request or continuously over an I^2C communication channel.

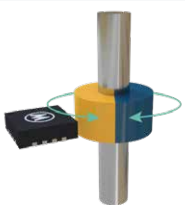
The MLX90394's wake-up modes allow the user to put in deep sleep their entire system until the IC detects a magnetic field change on the selected axes either versus an initial measurement (Static Delta), or previous measurement (Dynamic Delta), or a predefined absolute threshold (Absolute). In this way both busy as well as slowly drifting magnetic fields can be registered, while the device automatically toggles between active and sleep mode. The MLX90394 comes in a tiny UTDFN-6 package (2mm x 1.5mm x 0.4mm).

On-axis

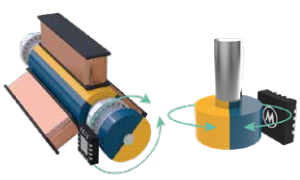


(including End-of-Shaft)

Off-axis

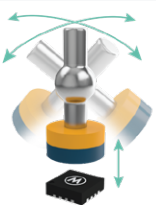


planar to the magnet

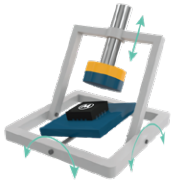


perpendicular to the magnet
(including Through-Shaft)

Joystick

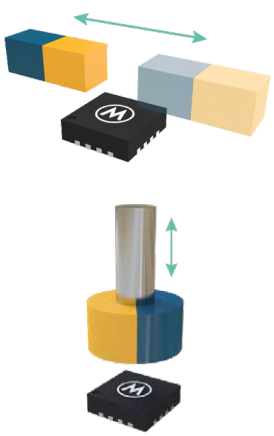


ball & socket



gimbal

Linear



KEY FEATURES

- 16-bit Digital output for magnetic and temperature data over I²C
- Individually selectable magnetic axes (X-Y-Z)
- Three Wake-up on change / Interrupt modes
- Data Ready output for µC synchronisation
- Built-in chip temperature compensation
- Runtime selectable modes (on-the-fly program)
- Three user selectable configurations (Low Current, Low Noise, High Range)
- Two selectable I²C slave addresses in one device
- Integrated configurable digital filter
- Ultra-low noise density for smaller magnets
- Average consumption of 3µA for X or Y and 4.3µA for Z at 10Hz in single measurement mode
- Average consumption of 10µA for X, Y and Z at 10Hz in single measurement mode
- Power Down mode of 0.7µA (typical)
- Magnetic Ranges ±5mT (0.15µT/LSB) and ±50mT (1.5µT/LSB). ±200mT in Z direction is available on specific request.
- Wide supply voltage from 1.7V to 3.6V
- I²C compatible with 0.1MHz, 0.4MHz & 1.0MHz
- Ambient temperature range from -40°C to 105°C
- UTDFN-6 (LD) package: RoHS, Green and Halogen free compliant (2mm x 1.5mm x 0.4mm)

APPLICATIONS

- PC peripheral – Mouse roller
- Gaming - Joystick, D-pads & Trigger buttons
- Wearables - Smart watch digital crown & bezel
- Battery power tools - Hairdryer & drill trigger
- White goods - Smart knob & liquid levels
- Industrial - Linear & pneumatic actuators
- Smart home - HMI thermostat & electronic lock
- Home security - Door/window opening detection

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