Melexis
INSPIRED ENGINEERING

Microbats generate ultrasound via the larynx and emit the sound through the nose or open mouth: from 14,000 to over 100,000 hertz, well beyond the range of the human ear. The emitted vocalizations form a broad beam of sound used to probe the environment, as well as communicate with other bats.

MLX75023 AND MLX75123

REAL-TIME 3D IMAGING

QVGA TIME-OF-FLIGHT CHIPSET

QVGA TIME-OF-FLIGHT CHIPSET

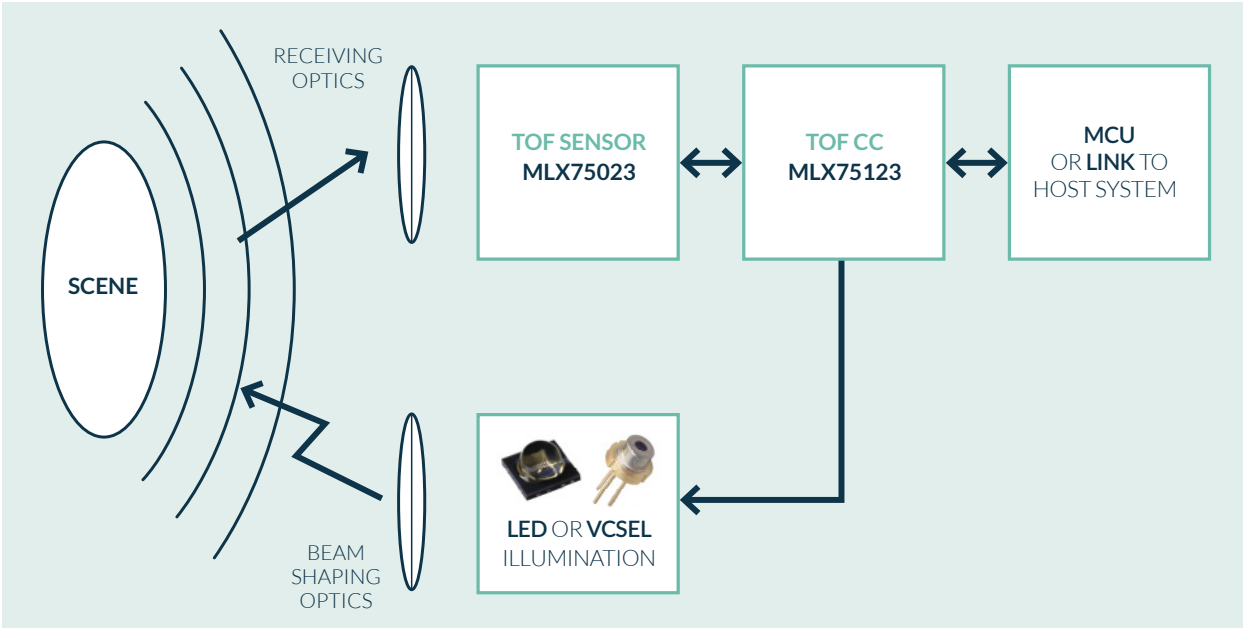
MLX75023 TOF sensor together with MLX75123 companion chip provides a complete Time-of-Flight solution. The MLX75023 TOF sensor supports up to QVGA resolution with unpaired sunlight rejection. The MLX75123 controls the TOF sensor, the illumination unit and streams data to the host processor. The chipset offers performance, flexibility, simplifies the design and allows a very compact 3D camera.

The MLX75123 TOF companion chip and the MLX75023 TOF sensor chipset, has been designed to facilitate the design and minimize component count of a TOF camera aiming for sunlight robustness and operation over a broad temperature range. The MLX75023 is an optical time-of-flight (TOF) sensor array. The sensor features 320 x 240 (QVGA) time-of-flight pixels based on DepthSense® technology. This unique design allows up to 120 klux background light rejection in typical application conditions. Thanks to its high speed output, which enables a frame rate up to 600 frames per second, the sensor can be used to track for fast moving objects. The MLX75123 controls the MLX75023 TOF sensor and the illumination unit. It has built-in high speed ADCs to convert the analog sensor data and supports system features like region-of-interest, configurable timings, statistics & diagnostics, and programmable modulation. The TOF sensor is available in a small glass BGA wafer level package form factor while the TOF companion chip is available in a compact 7x7mm^2 ELP package.

CHIPSET KEY FEATURES

- Up to 600 Hz raw frame rate
- Integrated light source control
- Up to 40 MHz modulation frequency
- Continuous or triggered operation modes
- Several raw data mode(s)
- Region of Interest and flipping
- 12-bit parallel camera interface up to 80Mpix/s
- Extended diagnostics
- Up to 120klux background light robustness
- -20 +85°C and –40 +105°C temperature ranges

APPLICATION SYSTEM BLOCK DIAGRAM



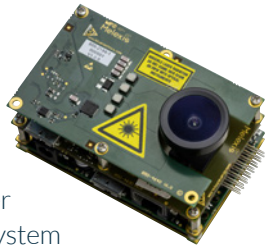
MLX75023 TOF SENSOR

- 1/3" optical time-of-flight sensor (4.8 x 3.6 mm²)
- QVGA resolution, 320 x 240 pixels
- 15µm pixel pitch
- Quad channel analog output
- Up to 600 Hz raw correlation frame rate
- Wafer level glass BGA package 6.6 x 5.5 x 0.6 mm
- Demodulation frequency up to 40 MHz
- Integrated optical filter
- Up to 120klux background light robustness

MLX75123 COMPANION CHIP

- Controller for MLX75023 and illumination
- Programmable modulation frequencies
- Up to 8 raw phases per frame
- Pre-processed difference and sum output modes to reduce data bandwidth
- Continuous or triggered operation modes
- Region of Interest (ROI) selection
- Per-phase statistics & diagnostics
- 12-bit parallel camera interface up to 80Mpix/s
- Configurable over I2C up to 400kHz

EVALUATION BOARD



EVK75123 is available to evaluate MLX75023 and MLX75123 TOF chipset under bright sunlight conditions. The flexible design enables any designer to develop the necessary system know-how and experience for use in their application. Its modular concept allows to use the chipset board standalone and combine it with user's illumination and image processing solution.