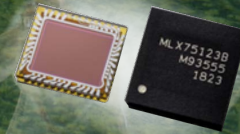


MLX75024 AND MLX75123BA

GEN 2 QVGA

TIME-OF-FLIGHT  
CHIPSET



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.

## DOUBLE THE SENSITIVITY OF THE PREVIOUS GENERATION

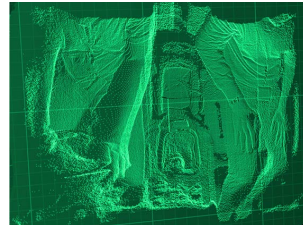
The MLX75024 Time-of-flight sensor together with the new MLX75123BA companion chip provides enhanced performances with backward compatibility with the previous QVGA ToF chipset based on the MLX75023 and the MLX75123AB. The MLX75024 ToF sensor supports up to QVGA resolution with a two times higher sensitivity and has a built-in temperature sensor for easier system calibration. The new MLX75123BA, which controls the ToF sensor, the illumination unit and delivers the data stream to the host processor, has now four general purpose outputs and a new power-up control circuit to further simplify the design of a very compact 3D camera.

The MLX75123BA ToF companion chip and the MLX75024 ToF sensor chipset have been designed to further enhance the performance of the existing ToF camera based on the previous generation chipset with minimum efforts. The MLX75024 sensor features 320 x 240 (QVGA) time-of-flight pixels based on DepthSense® pixel technology and now supports both 850 nm and 940 nm illumination. Thanks to the selectable pixel gain performances, the sensor can be optimized according to the specific application needs. The MLX75024 pixel has been optimized for 940 nm wavelength to support applications where low human-eye visibility is needed or exterior applications dealing with strong sunlight.

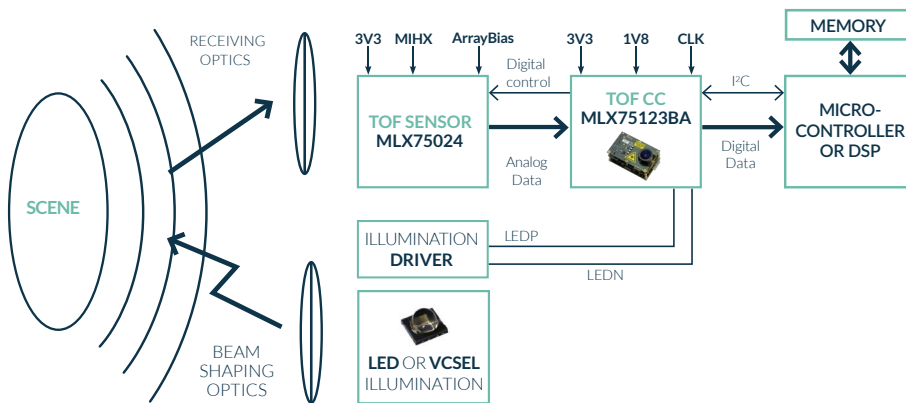
The MLX75123BA controls the ToF sensor and the illumination unit. In addition to system features like region-of-interest, configurable timings and statistics & diagnostics provided by the previous generation, the new companion has four GPOs, power-on control signal and supports pixel binning. The ToF sensor and ToF companion chip are available in the same package of the previous generation ToF chipset: small glass BGA wafer level package form factor for the ToF sensor and the compact 7x7 mm<sup>2</sup> AQFN package for the ToF companion chip.

## KEY FEATURES

- ✓ Same package and optical format of the previous generation
- ✓ Up to 600 Hz raw correlation frame rate at 40 MS/s
- ✓ Integrated light source control with modulation frequency up to 40 MHz
- ✓ Continuous or triggered operation modes
- ✓ 2 times higher sensitivity pixel with selectable pixel gain suitable for both 850 nm and 940 nm wavelength illumination
- ✓ Built-in temperature sensor
- ✓ Several Raw data mode(s)
- ✓ Region of Interest (ROI) and binning mode
- ✓ 12-bit parallel camera interface
- ✓ Extended diagnostic
- ✓ 4 general purpose outputs
- ✓ Up to 120 Klux background light robustness
- ✓ -20 to +85 °C and -40 to +105 °C temperature ranges



## APPLICATION SYSTEM BLOCK DIAGRAM



### MLX75024 TOF SENSOR

- ✓ 1/3" optical time-of-flight sensor (4.8 x 3.6 mm<sup>2</sup>)
- ✓ QVGA resolution, 320 x 240 pixels with selectable gain
- ✓ Up to 600 Hz raw correlation frame rate @ 40 MS/s, Tint = 100 s
- ✓ BGA package 6.6 x 5.5 x 0.6 mm with anti-reflective coating
- ✓ Demodulation frequency up to 40 MHz
- ✓ Embedded temperature sensor

### MLX75123BA COMPANION CHIP

- ✓ Programmable modulation frequencies to avoid module-to-module crosstalk
- ✓ Up to 8 raw phases per frame
- ✓ Pre-processed difference & sum output modes to reduce the data bandwidth
- ✓ Continuous or triggered operation modes
- ✓ Region of interest (ROI) selection and binning
- ✓ Per-phase statistics & diagnostics
- ✓ 4 general purpose output
- ✓ 12-bit parallel camera interface up to 80 Mpix/s
- ✓ Configurable over I2C up to 400 kHz

## MLX75024 EVK

The EVK75024 is available to evaluate the MLX75024 & MLX75123BA ToF chipset under extreme background light 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 the user's illumination and image processing solution.

