

High Resolution Time of Flight CMOS Image Sensor



FEATURES

- » 1.3 million pixels (1,280 (H) x 1,024 (V)), 10µm square pixels with shifted micro-lens
- » 1 inch optical format
- » Aspect ratio: 5:4 global shutter sensor
- » 120fps @ full resolution & 12 bit
- » Output format true 8/10/12/14 bit LVDS and synchronization
- » SPI controls
- » Control input pins: trigger in, reset
- » Light control output – trigger out
- » 3.3 V and 1.8 V power supplies
- » 67 pins PGA ceramic package

EMBEDDED FUNCTIONS

- » Multi integration mode
- » Region of interest
- » Wide dynamic range capabilities
- » Sub-sampling (horizontal/vertical)

PERFORMANCE CHARACTERISTICS*

- » Range: (0.5m to 5m) or (5m to 50m) or (50m to 100m) or (100m to 500m)
- » Accuracy: +/- 1 cm
- » Temporal noise:
 - > <4cm @ full resolution
 - > <2cm @ VGA resolution
 - > <1cm @ QVGA resolution
- » Frame rate: 30fps in depth map mode

APPLICATIONS

- » Vision guided robotics
- » Automated Guided Vehicles (AGV) for logistics
- » Factory surveillance and safety
- » Surveillance and traffic cameras
- » Outdoor applications

The 3D BORA sensor is a 1.3 million pixel CMOS image sensor, designed with **Teledyne e2v's** proprietary CMOS imaging technology. It is ideal for systems operating at short or mid distances and ranges. In an industry first, it features an optimized multi integration mode (providing excellent performance in low light conditions), together with an electronic global shutter, while still maintaining the accuracy and frame rate performance of existing Time of Flight (ToF) systems.

This new sensor provides customers with a number of unique advantages:

- » One single sensor enabling a 1.3MP 2D high definition image and several 3D depth resolutions
 - › Binning allows VGA and QVGA 3D depth map
 - › State-of-the-art accuracy and temporal noise
- » Captures a large field of view
 - › 1.3MP 2D and 3D image
 - › ROI on chip and binning off chip
- » HDR for lower noise and better accuracy at long distance
 - › Long distance range: (0.5m to 5m) or (5m to 50m)
- » 3D detection from fast moving objects
 - › Up to 170fps (2D)
 - › 2D vision
 - › ROI on chip for higher frame rate
- » Combination of several 3D features
 - › ROI and HDR
 - › ROI and binning
 - › HDR and binning

SENSOR CHARACTERISTICS AND PERFORMANCES

PARAMETER	SPECIFICATION	CONDITIONS
Sensor resolution – pixels	1,280 (H) x 1,024 (V)	
Pixel size – μm	10	Global shutter 5T
Max frame rate – fps	> 170	Full resolution, 10 bits
Bit depth – bit	8/10/12	
Full well capacity – ke-	> 30	
Dark current PHD – e-/s	< 45	@25°C
Dark current SN – e-/s	< 1,250	@25°C
Noise – e- rms	35 typical	Global shutter
Quantum efficiency – e-/photon	> 40%	@850 nm, multi integration mode
MTF – lp/mm	> 50	@Nyquist, @850 nm
Image lag – e-	< 1	@10% FWC, multi integration mode
DSNU – %	< 1	Multi integration mode
Non linearity – %	+/- 1.5	5–90 FWC
Dynamic range – dB	> 60	Linear, multi integration mode