

HYDRA3D

THE FIRST HIGH-RESOLUTION MULTI-TAP ToF SENSOR



Hydra3D is a 832 x 600 pixel resolution CMOS image sensor, designed with Teledyne e2v's proprietary CMOS technology, which enables the next generation of 3D vision systems. The sensor includes a 10 μm , three-tap, cutting-edge pixel, which provides very fast transfer times for customers seeking the highest levels of 3D performance, including high depth resolution, high speed and flexible operation conditions. Hydra3D can be operated without motion artefacts in real-time at short, mid and long range distances, in both indoor and outdoor conditions, while providing a best-in-class temporal precision.

SENSOR FEATURES

Spatial resolution of 832 x 600 pixels
in both 2D and 3D
LGA Ceramic package 24 x 22 mm
Compatible with 2/3" optics

Excellent temporal precision due to fast
transfer time as low as 20ns
Three-tap, cutting-edge pixel
Multi-system management feature
embedded on-chip
More than 30 fps depth map

Short and long-distance range handling (>10m)
High flexibility to trade-off distance range,
object reflectivity, frame rate, etc. combined
with powerful non-destructive readout HDR
Robust to ambient light and challenging environments

CUSTOMER BENEFITS

Large Field-of-View with good angular resolution
in a compact sensor

Real-time decision making combined
with reliable 3D detection, without motion
artefacts and interference with
other systems

Outstanding adaptability to all environments, including
outdoors, with very high dynamic range management



Sensor Characteristics

Resolution – pixels	832 x 600			
Aspect Ratio	4 : 3			
Size Type	2/3" (10.3 mm diagonal)			
Pixel Type / size – square	Three-tap global shutter – gated global shutter / 10 µm			
Maximum frame rate @ 12 bits	416.7 fps ¹			
FFxQE – %, @ 850 / 940 nm	37 / 19 ²			
Transfer time – ns	Down to 20			
Readout noise – e- RMS	2.5			
Linearity: LEm_{in} / LEm_{ax} – %	-1 / +1			
	Node A	Node B	Node C	A+B+C
Full well capacity – e-	10,000	10,000	10,000	30,000
Temporal noise – e-	10	10	10	17.3
Dynamic Range³ – dB	60	60	60	64.7

1. Considering only readout. Exposure is not concurrent

2. In 2D greyscale mode

3. Single readout, 2D greyscale mode

EMBEDDED FEATURES

- Multiple acquisition modes: distance measurement and greyscale
- High Dynamic Range mode through non-destructive readout
- Programmable exposure time
- Row-wise ROI (up to 4 for distance measurement, 1 for 2D greyscale image)
- Column-wise ROI (with 64 columns granularity)
- Frame-to-frame “hot” changes of exposure parameters and ROI
- Multiple trigger modes
- HFPN correction
- On-chip multi-system management

SYSTEM INTEGRATION

- Package: ceramic LGA
- Operating temperature [-40°C to 105°C]
- Power consumption: 2.2 W⁴
- Scalable LVDS outputs (13, 7 or 4 channels)
- SPI controls

4. Full array, 200ns gating cycle duration (three phases), 10% duty cycle, 50% gating time

TYPICAL APPLICATIONS

- Factory automation
- Robotics
- Logistics
- Surveillance
- ITS
- Mapping / building
- Drones

ORDER CODE – HYDRA3D SAMPLES

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