

# The Topaz Family

## Featuring the World's Smallest 2M Industrial Grade Global Shutter Sensor



**Topaz 2M** is a 1,920 x 1,080 resolution, low noise image sensor, designed with Teledyne e2v's proprietary CMOS technology. A 1.5M wide-format derivative is also available, it has a reduced vertical resolution (1,920 x 800) which increases the frame per second speed.

Advanced CMOS technology enables the Topaz sensors to have uncompromised performance with only 2.5  $\mu\text{m}$  pixels, and combines a unique chip layout and Chip Scale Packaging (CSP) to offer a tiny, compact form factor, ideal for cost sensitive mobile applications.

### SENSOR FEATURES

**2MP with small 1/3.2 inch optical format**  
7.65 mm x 4.45 mm mechanical outline with array centered in a CSP Package.

**State-of-the-art FSI 2.5  $\mu\text{m}$  global-shutter pixels.**  
In-pixel correlated double sampling, with dual light pipes providing the best QE and MTF performance.

**Fast wake-up and on-the-fly register/configuration updates**  
2x MIMR/SIMR Regions of Interest, Context swapping and image statistics in footer.

**Low power consumption** < 200 mW.

**MIPI CSI 2 interface**  
for direct data transfer to popular ISP's.

### CUSTOMER BENEFITS

**Extended range scanning, even in slim-mobile engine designs**  
Differentiation from the crowded 1MP platforms with improved cost/performance.

**Excellent low-light SNR performance**  
Allows short exposure periods to eliminate motion blur and image distortion, for increased conveyor belt speeds and working distances.

**Higher throughput and fastest scanning performance.**  
A powerful USP for end customers in logistics, transport, POS retail and factory automation.

**Enables long battery life**

**Easy integration** into the most popular embedded platforms.



## SENSOR CHARACTERISTICS

PARAMETERS	TOPAZ 2M	TOPAZ 1.5M
Resolution (pixels)	1,920 (H) x 1,080 (V)	1,920 (H) x 800 (V)
Color Filter Array	B&W or color	
Pixel Type/Size (square)	Global Shutter /2.5 μm	
Optical Format (inch)	1/3.2"	
Aspect Ratio	16:9	5:2
Maximum Frame Rates @ 8 bit @ 10 bit	100 fps 65 fps	130 fps 85 fps
Diagonal CRA (°)	14° or 21°	13° or 20°
Bit Depth	8/10	
Total Readout Noise (e-) @ 10 bit @ 25°C	3.5	
DSNU (e-)	4	
SNR max (dB)	37.4	
MTF @ Nyquist, 550 nm (%)	>50	
Dynamic Range (dB)	64	
QE @ 520 nm (%)	>55	
Power Consumption (mW)	<200	

### EMBEDDED FEATURES

- » 2 Regions of Interest modes (including overlapping)
- » Image statistics and histogram in image footer
- » Comprehensive I/O trigger functionalities
- » Up to 16x analog gain, with high granularity
- » Fast wake up—1st good frame in < 10 ms
- » Frame-to-frame context based control registers
- » Dark offset and VFPN correction
- » White balance control
- » On-chip voltage regulators/converters
- » Sub-sampling up to 1/64
- » On-chip voltage regulators/converters
- » Options:
  - Color Filter Array: B&W or color
  - Chief Ray Angle: two options available (14° or 21° for Topaz 2M & 13° or 20° for Topaz 1.5M)

### CHARACTERISTICS

- » Optical & mechanical matching centers
- » Package: 7.65 mm x 4.45 mm CSP
- » Operating temperature [-40°C to 85°C]
- » Power consumption operating: < 200 mW
- » MIPI CSI-2 outputs (1 or 2 lanes)
- » I<sup>2</sup>C control (Fast + compatible 1 MHz clock rate max)

### TYPICAL APPLICATIONS

- » Barcodes and OCR scanning
- » Factory automation
- » Automated Optical Inspection (AOI)
- » Robotics
- » Logistics
- » Professional drones
- » IoT edge devices
- » AR/VR
- » Wearable security (body camera)

ORDER CODES	TOPAZ 2M		TOPAZ 1.5M	
	CRA 14°	CRA 21°	CRA 13°	CRA 20°
<b>B&amp;W</b>	EV2S02MB-PM23000-T	EV2S02MB-PM23020-T	EV2S1M5B-PM23000-T	EV2S1M5B-PM23020-T
<b>COLOR</b>	EV2S02MC-PM23000-T	EV2S02MC-PM23020-T	EV2S1M5C-PM23000-T	EV2S1M5C-PM23020-T

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