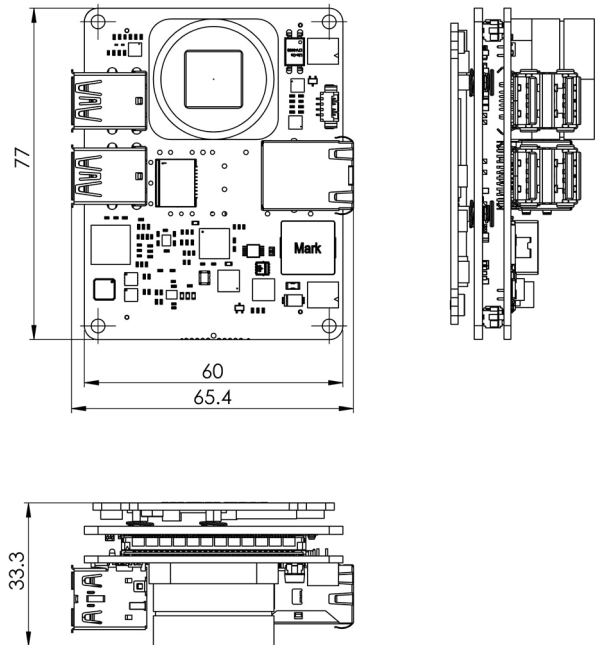


SMILODON 10G EVO



SMILODON 10G EVO is a highly customizable and user-programmable FPGA-based high-speed smart camera featuring a high-performance FPGA. It is a camera with a Xilinx Zynq FPGA, high-speed imaging sensor and a 1 or 10 Gigabit Ethernet. It includes high-performance ARM System-on-Chip (SoC) technology, combined with high-speed industrial Gpixel imaging sensors.

Smilodon 10G EVO includes full customizable and user-programmable open-reference design for a high-speed FPGA-based camera and application development system. Its emphasis is on an open hardware/software development model, high-frame rates, real-time image processing on FPGA and modern graphical user interface support on the PC side.

A suite of versatile and high-performance tools for Xilinx Zynq Ultrascale+ SoC FPGA is used to develop algorithms and process data in real-time. Images are acquired by 4 different Gpixel GMAX25xx sensors with up to 48x LVDS interface (46 Gbps), achieving brilliant images at a very high speed. The on-board 4GB DDR4 memory with 19 GB/s of bandwidth enables usage of complex buffered image processing.

The reference design can be easily edited with standard Xilinx Vivado tools. Optomotive's custom IP cores seamlessly integrate inside the Xilinx Vivado toolchain. A large portion of the FPGA (PL) is free for the programming and development of new algorithms or the implementation of additional IP cores.

The 1.2 GHz Quad Core ARM Cortex A53 Programmable Subsystem runs a Linux OS with a custom-made EVO control and streaming stack (including Zero-copy TCP/IP stack). The SoC also includes dual 600MHz Cortex R5 processors which are free for user data processing. User applications or custom data post-processing can easily be added to the existing design.


TARGETED FOR:

- Laser triangulation - with a ready-made Peak detector on-board image processing core;
- Motion capture - with a ready-made BLOB detector or Running Length Encoder (RLE) on-board image processing core;
- Industrial process automation - to count, detect, check, verify, read, inspect and test different products, levels, components, etc. at incredible speed and
- Industrial quality control: to inspect defects, cracks or surface blemishes, size, position, dimension and color, foreign objects, quality
- General R&D.

KEY CAMERA FEATURES

SMILODON 10G EVO				
Resolution	5.0 MP	9.0 MP	18.0 MP	25.0 MP
Active Pixels (HxV)	2600 x 2160	4200 x 2160	4508 x 4096	5120 x 5120
Frame Rate	290 FPS	290 FPS	139 FPS	150 FPS
Sensor Format	1/2"CMOS	2/3"CMOS	1"CMOS	1.1"CMOS
Pixel Size	2.5 µm	2.5 µm	2.5 µm	2.5 µm
Sensor: Gpixel Sensor	GMAX2505	GMAX2509	GMAX2518	GMAX0505
Interface	1 or 10 Gigabit Ethernet SFP+ for fast data transmission			
Programmable and Reconfigurable FPGA	Xilinx Zynq Ultrascale+ Kria K26			

- Turbocharged industrial Gpixel GMAX25xx sensors, Color (Bayer) and
- Possible interfaces: 1 or 10 GigE.

	CAMERA FAMILY	SMILODON 10G EVO			
IMAGING SENSOR	Camera Model	5.0	9.0	18.0	25.0
	Model (Gpixel)	GMAX2505	GMAX2509	GMAX2518	GMAX0505
	Monochrome (M); Bayer Color (C); VIS-NIR (IR)	M or C	M or C	M or C	M or C or IR
	Diagonal mm	8.45 (1/2")	11.8 (2/3")	15.2 (1")	18.1 (1.1")
	Active pixels H x V	2600 x 2160	4200 x 2160	4508 x 4096	5120 x 5120
	Frame Rate (Full Frame)	290 FPS	290 FPS	139 FPS	150 FPS
	Pixel Size	2.5 µm	2.5 µm	2.5 µm	2.5 µm
	Dynamic Range 10bit/12bit	62/65 dB	62/65 dB	62/67 dB	60/65 dB
	ADC Resolution	10/12 bit			
	Analogue Gain	x1 – x2, step of x0.25 @10bit; x1 – x4, step of x0.25 @12bit			
	Region of Interest	YES, with 16 pixel increments			
	Shutter Type	Electronic global shutter			
	Shutter Time	5 µs – 90 s			
	FEATURE	Pixel Clock Speed	From 1.5 to 3.8 Gpix/s		
Exposure		Linear, odd/even row HDR			
Pixel Correction		Dead pixel, LUT, flat-field correction			
Trigger Modes		Free running, trigger, overlap, pulse width			
PROCESSING	Trigger Features	Delay 0 – 1000 ms, LP Filter 1.5Hz - 100 kHz			
	Shutter Resolution	TBD			
	FPGA	Xilinx Zynq Ultrascale+ Kria K26			
	Free FPGA %	> 50%			
MECHANICAL	Volatile Memory	4 GB DDR4 with 19.2 GB/s bandwidth			
	Non-volatile Memory	64 MB QSPI flash, 16 GB eMMC			
	Lens Mount	C-mount (1" 32G thread)			
	Temp Range	0 - 50°C			
	Mass	TBD			
	Protection	TBD			
	Housing Material	CNC-machined aluminum, anodized			
ELECTRIC	RoHS	RoHS compliant			
	Fixing Holes	4x M3 OEM			
	Input Voltage	DC 9-50V			
	Consumption	up to 30W			
FUNCTIONALITIES	IO Isolation	1x IN / 1x OUT opto-isolated			
	Connectors	10G SFP+, 1G RJ45, 4x USB, 10 pin Hirose HR10A			
	On-board Image Processing	As an option (if an IP Core is integrated)			
	Open Reference Design	Yes			
	Open architecture	Yes			
Software	Compatible with  motive EVO software (full source included)				
Operating System	Windows 7, Windows 10, 64bit or 32bit				
Development Tools	Xilinx Vivado/SDK version 2021 or later; Microsoft Visual Studio 2017 or later				