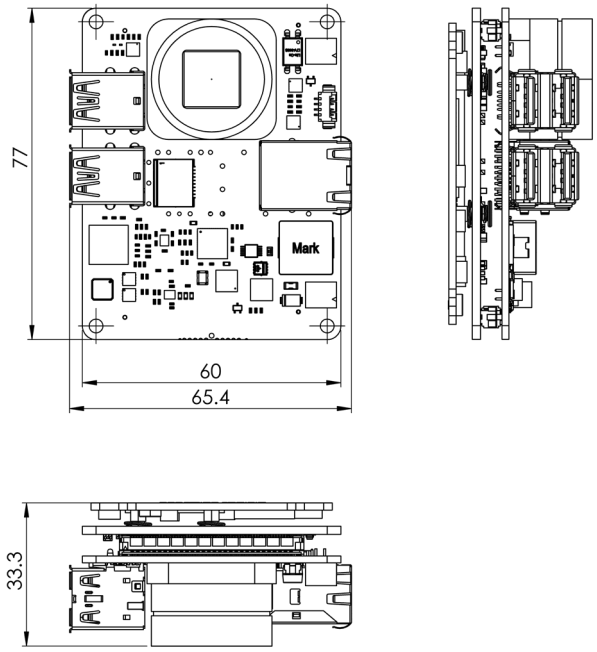
SMILODON 10G EVO



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 an AMD Zynq™ UltraScale+™ MPSoC, 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 AMD Zynq UltraScale+ MPSoC 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 Gb/s), achieving brilliant images at a 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 AMD Vivado™ tools. Optomotive's custom IP cores seamlessly integrate inside the AMD 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-R5F 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	AMD Zynq UltraScale+ MPSoC or AMD Kria® K26 SOM			

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

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	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 us – 90 s			
	Pixel Clock Speed	From 1.5 to 3.8 Gpix/s			
	Exposure	Linear, odd/even row HDR			
FEATURE	Pixel Correction	Dead pixel, LUT, flat-field correction			
	Trigger Modes	Free running, trigger, overlap, pulse width			
	Trigger Features	Delay 0 – 1000 ms, LP Filter 1.5Hz - 100 kHz			
	Shutter Resolution	TBD			
PROCESSING	FPGA	AMD Zynq UltraScale+ MPSoC or AMD Kria K26 SOM			
	Free FPGA %	> 50%			
	Volatile Memory	4 GB DDR4 with 19.2 GB/s bandwidth			
	Non-volatile Memory	64 MB QSPI flash, 16 GB eMMC			
MECHANICAL	Lens Mount	C-mount (1" 32G thread)			
	Temp Range	0 - 50°C			
	Mass	TBD			
	Protection	TBD			
	Housing Material	CNC-machined aluminum, anodized			
	RoHS	RoHS compliant			
	Fixing Holes	4x M3 OEM			
ELECTRIC	**Input Voltage**	**DC 9-50V**			
	Consumption	up to 30W			
	IO Isolation	1x IN / 1x OUT opto-isolated			
	Connectors	10G SFP+, 1G RJ45, 4x USB, 10 pin Hirose HR10A			
FUNCTIONALITIES	On-board Image Processing	As an option (if an IP Core is integrated)			
	Open Reference Design	**Yes**			
	Open architecture	**Yes**			
	Software	Compatible with Optomotive EVO software (full source included)			
	Operating System	Windows 7, Windows 10, 64bit or 32bit			
	Development Tools	AMD Vivado/SDK version 2021 or later; Microsoft Visual Studio 2017 or later			

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