CSPAD αlpha – FIRST CSPAD AREA SENSOR

Specifications

CSPAD αlpha combines the low-noise CMOS-integrated SPADs (CSPADs) with waferbonding technology and Backside-Illumination to achieve Single-Photon sensitivity with high spatial and temporal resolution.

The main features are:

- Photon **timing** and **counting** mode
- **In-pixel** time-to-digital converters (**TDC**)
- TDC monitoring
- Adaptive **background light suppression**

SPAD

	Value	Unit
Breakdown voltage	23	V
Operation voltage	30	V
Quantum efficiency @ 550 nm	45	%
Quantum efficiency @ 905 nm	5	%
Dead time	20	ns
Dark Count Rate (per SPAD)	1 - 10	kHz

Sensor

	Value		Unit
Technology	0.35 µm CMOS, 3D-Integration with BSI		
Chip dimensions	10250 x 9200		µm
Array size	8320 x 6240		µm
Pixel size	130 x 130		µm
Resolution	Counting mode	64 x 48	
	Timing mode	32 x 24	
SPADs per Pixel	4		
SPAD diameter	14		µm
Fill factor	3.7[1]		%
Frame rate	25		kHz
Features	Counting and timing mode, variable coincidence, TDC monitoring		

TDC

	Value	Unit
Temporal resolution	< 420	ps
Full scale range	1.28	µs
Raw data length	13	Bit

Evaluation board

	Value	Unit
Power supply	12	V
Interface	USB 2.0	
Features	2 delayable TTL trigger outputs	

[1] Microlens-Array for effective fill factor increasement is in development.