AVA

ADVANCED   VERSATILE   AFFORDABLE

X-ray line detector series

Detection Technology

AVA
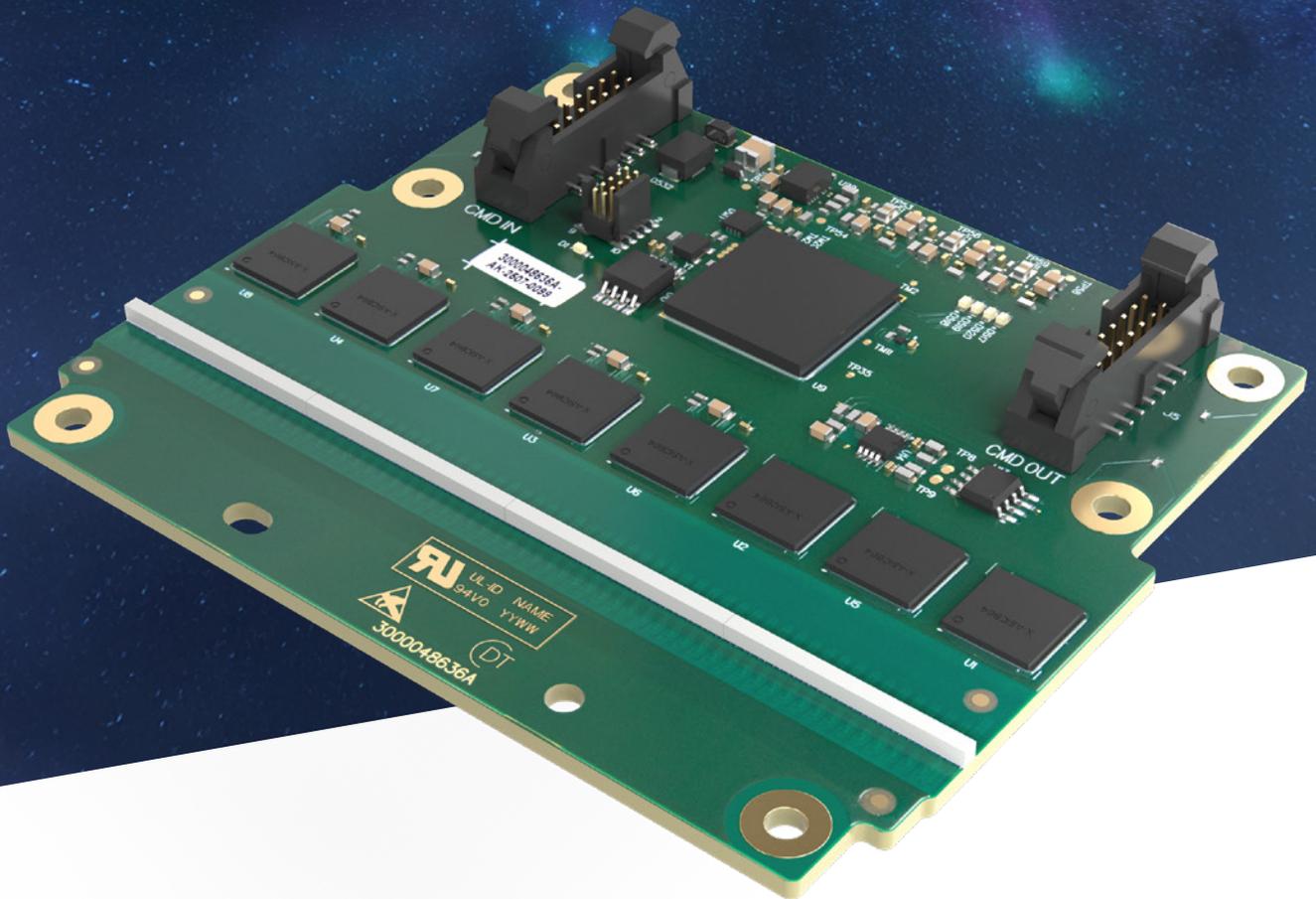
Advanced, versatile and affordable X-ray line detector series

The AVA product family is a modular, off-the-shelf line-scan detector series designed to deliver versatility, cost efficiency, and superior imaging performance for security and industrial X-ray applications. Covering a comprehensive range from value-level systems to premium line scanners, AVA supports applications from entry-level urban security and high-speed aviation to advanced mining and sorting with high-definition time delay integration (TDI) technology.

Available as complete subsystems—including detector and data combiner boards, software libraries, and accessories—AVA enables easy system integration and shorter time-to-market. Its simplified hardware design, combined with on-chip algorithms and the cross-platform DT API, ensures smooth operation across Windows, Linux, and ARM systems.

The dual-energy architecture integrates two scintillator layers with an embedded optimized filter on a single PCB, cutting material use by 40% and increasing robustness with fewer interfaces and stronger connections. Optimized scintillator structures and materials enhance image quality and cost efficiency by reducing material requirements while improving signal performance. For demanding high-speed applications, multi-row TDI delivers exceptionally sharp, high-contrast penetration images.

Compact, durable, and energy-efficient, AVA reduces energy consumption, minimizes carbon footprint, and ensures maximized uptime and lifetime even in harsh environments. Designed for straightforward installation and maintenance, it helps customers lower total system costs and achieve up to 50% savings in value-segment applications—without compromising imaging performance.

Benefits

- Enables notable total cost savings (up to 50% in value-segment systems)
- Provides superior imaging quality without compromise
- Easily scalable to various system set-ups
- Fits to compact system designs
- Suits harsh imaging conditions
- Supports easy installation and maintenance
- Maximizes uptime and lifetime in use
- Speeds up time-to-market
- Reduces energy consumption and CO_2 footprint (40% material reduction)

Key features

- Dual-energy detector solution boosted with on-chip algorithms and DT API
- Simplified HW design: One PCB for Dual Energy with embedded optimized filter
- Robust structure with reliable mechanical and electrical interfaces
- Fully digitalized data path with cross-platform support for Windows, Linux, and ARM systems
- Compact mechanical size
- Complete subsystems available including detector boards, data combiner boards, and software libraries
- Optimized scintillator structures and materials for improved image quality and cost efficiency
- Multi-row TDI option for sharp, high-contrast penetration images at high scanning speeds

Technical specifications

Feature	Variant AVA One	AVA Air	AVA Pro	AVA TDI
Number of pixels	LE 64 pixels HE 64 pixels			D10: LE 128 pixels HE 128 pixels D30: LE 64 pixels HE 64 pixels
Pixel pitch	1.575 mm	B30: 1.575 mm B50: 2.5 mm	C30: 1.575 mm C50: 2.5 mm	D10: 0.7875 mm D30: 1.575 mm
Pixel active size (PD)	A30: 1.2 * 3 mm	B30: 1.2 * 3 mm B50: 2.15 * 2.8 mm	C30: 1.2 * 3 mm C50: 2.15 * 2.8 mm	D10: 0.52 * 1.12 mm D30: 1.04 * 2.24 mm
LE scintillator material	GOS: Tb screen, 145mg/cm^2		GOS: Pr screen, 180mg/cm^2	GOS: Pr screen, 100mg/cm^2
HE scintillator material	Pixelated GOS 1.5 mm	Pixelated GOS 2.5 mm		D10: Pixelated GOS 1.5 mm D30: Pixelated GOS 2.5 mm
Copper filter	0.3 mm			
Afterglow	Neglectable			
Min integration time per card	550 µs		120 µs	D10: 160 µs D30: 120 µs
Max integration time	25 ms			
A/D resolution	16 bit		16 bit / 20 bit	16 bit
Sensitivity range	0.25 pF – 31.75 pF, 127 steps			
Interface to control unit	X-Link 20-pin connector and cable Ava One: 3000050756, X-GCU AVA-ONE Ava Air: 13013560, X-GCU B		X-Link 14-pin connector and cable Ava Pro: 3000024722, X-GCU GT Ava TDI: 3000050757, X-GCU AVA-TDI	
X-ray response non-uniformity, pixel to pixel	Non edge pixel, -15%~+10%; Edge pixel, -20%~+10% for gain with pF >= 2.			
Dark offset non-uniformity, pixel to pixel	-15%~+10%, for gain with pF >= 2			
X-ray response non-uniformity, card to card	-15%~+15%, for gain with pF >= 2			
Dynamic range	13000:1 @2pF; 20000:1 @10pF			
Radiation hardness	100kGy, X-ray response drop < 50 % in comparison with the original X-ray response.			

Applications

Value segment

- Urban security: Train and metro stations, critical infrastructure

Mid-tier

- Aviation
- Mining
- Vehicle inspection

High-tier

- TDI: Mining and sorting, aviation logistics

Detection
Technology

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