

1 Data sheet — X-Card D022506414A

X-Cards are true digital X-ray detector boards with integrated amplifiers and AD converters. They have scintillators attached to photosensors for X-ray detection.

This data sheet describes the 2.5 mm pitch, dual energy X-Card D022506414A.

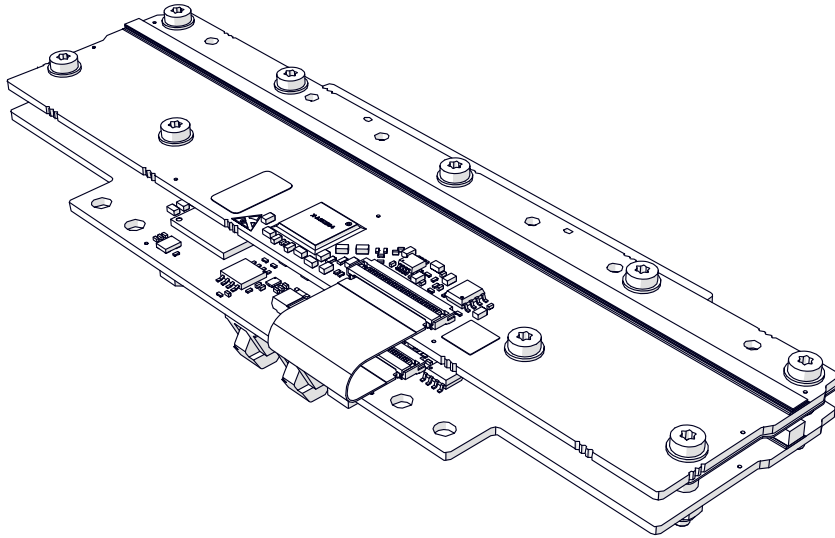


Figure 1: D022506414A

1.1 Key features

- Simplified system design
- Lowest-noise solution
- Superior image quality
- Fully digitalized data path
- Very compact mechanical size
- Wide sensitivity range from 0.25 pC to 31.75 pC with 127 steps
- Separately controllable gain setting for each HE and LE card
- Robust structure with reliable mechanical and electrical interfaces
- Centralized remote firmware update by the X-GCU
- Local diagnostics functions: test patterns, temperature and voltage monitoring
- ROHS and EMC compliance
- Complete subsystems available, including detectors, controllers and software libraries for rapid system development

1.2 Typical applications

- Security inspection
- Cargo and vehicle inspection
- Multi-view imaging
- Non-destructive testing
- Food inspection
- Raw material sorting
- Thickness measurement
- Foreign particle detection
- CT imaging

2 Ordering information

Table 1: Ordering information

Product code	Product name	Product description
13013642	X-Card D022506414A	2.5 mm pitch, 64 ch, dual-energy, GOS screen, GOS 2.5 mm, 0.3 mm copper filter, 20-bit

3 Technical specifications

Table 2: Technical specifications — X-Card D022506414A

Card/feature	X-Card D022506414A
Pixel size (mm)	2.5
Low Energy (LE) / High Energy (HE) / Dual-energy (DE)	DE
Mechanical length	160.4 mm
Mechanical width	59.5 mm
Mechanical Height	< 25 mm
LE Scintillator material	DRZ-High (GOS screen, 145 mg/cm ²)
HE Scintillator material	GOS 2.5 mm
Copper filter	0.3 mm
Afterglow	N/A
Number of pixels	LE 64 pixels, HE 64 pixels
Scintillator alignment tolerance to reference hole	See the mechanical outline drawing in the data sheet.
Scintillator LE-HE registration	See the mechanical outline drawing in the data sheet.
Pixel pitch (spacing)	2.5 mm
Pixel active size (PD)	2.15x2.8 mm

Card/feature	X-Card D022506414A
Pixel active area (PD)	6.02 mm ²
PD type	Back side illuminated
Min integration time	0.2 ms
Max integration time	25 ms. For longer integration times, use the summing function on the X-GCU.
A/D resolution	Selectable, 16 or 20 bits
Sensitivity range	0.25 pF—31.75 pF, 127 steps
Interface to control unit	X-Link
X-Ray Response Non-Uniformity, pixel to pixel	-15 %~+10 %
Dark offset Non-Uniformity, pixel to pixel	-15 %~+10 %
X-Ray Response Non-Uniformity, card to card	-15 %~15 %
Dynamic range	TBD
Radiation hardness	100 kGy
	<div style="border: 1px solid black; padding: 5px;"> <p>NOTE Note: Radiation hardness is defined as X-ray response drop < 50 % in comparison with the original X-ray response.</p> </div>

Photosensitive area specifications

The photosensitive area specifications are:

Table 3: Photosensitive area specifications for X-Card D022506414A

Parameter	Value
Pixel pitch (P)	2.5 mm
Pixel width (W)	2.15 mm
Pixel height (H)	2.8 mm
Pixel active area	6.02 mm ²

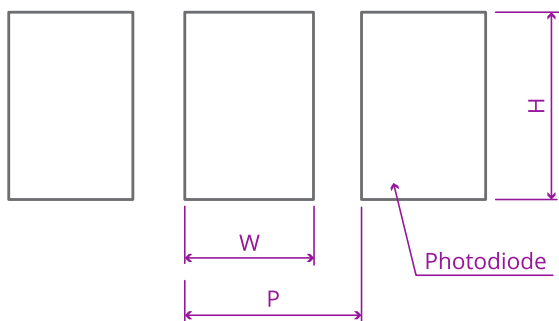


Figure 2: Photosensitive area

4 Environmental specifications

The environmental specifications of the X-Card are:

- Operating temperature: -5 °C—+50 °C
- Operating humidity: < 95 % RH (non-condensing) @ 40 °C
- Storage temperature: -40 °C—+60 °C
- Storage humidity: < 95 % RH (non-condensing) @ 40 °C

5 Mechanical outline drawing

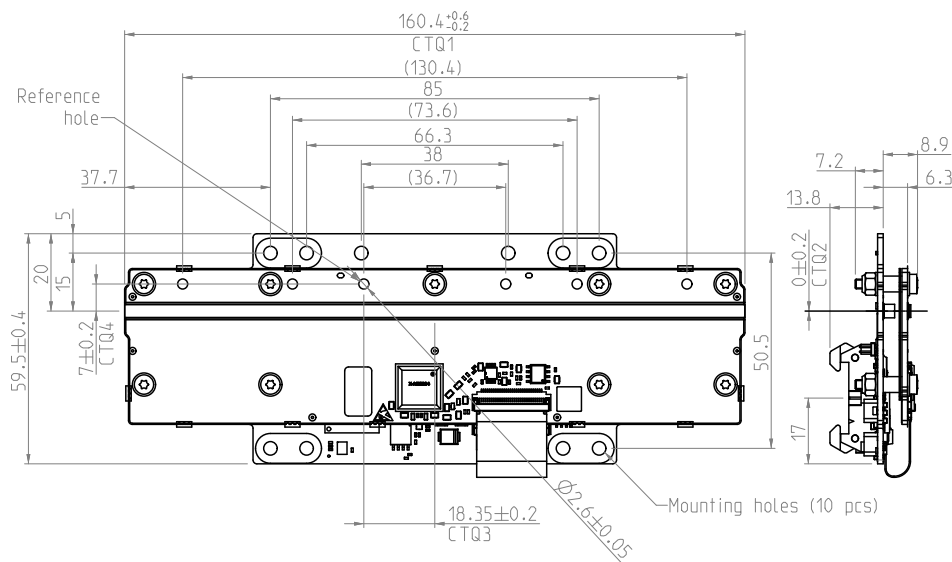


Figure 3: Mechanical outline drawing of D022506414A

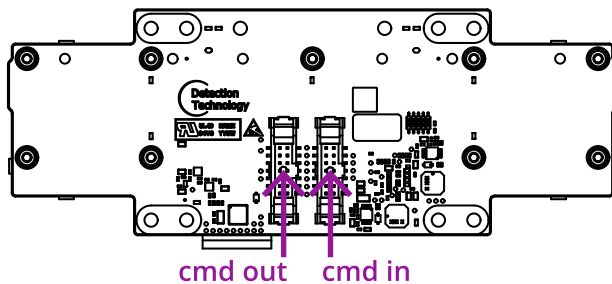


Figure 4: Connectors of D022506414A

The command interfaces are:

- cmd in — The command input from X-GCU or the previous X-Card, and image data output to X-GCU or the previous X-Card. If this is the first card of the X-Link segment, always connect this connector to the X-Link connector on the X-GCU.

- cmd out — The image data input from the next X-Card and command output to the next X-Card. Never connect this connector to the X-GCU. If this is the last card of the X-Link segment, this connector will be empty.

6 Disclaimer

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6.3 Contact information

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