1 Data sheet — X-Card D021606414C

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 1.6 mm pitch, dual-energy X-Card D021606414C.

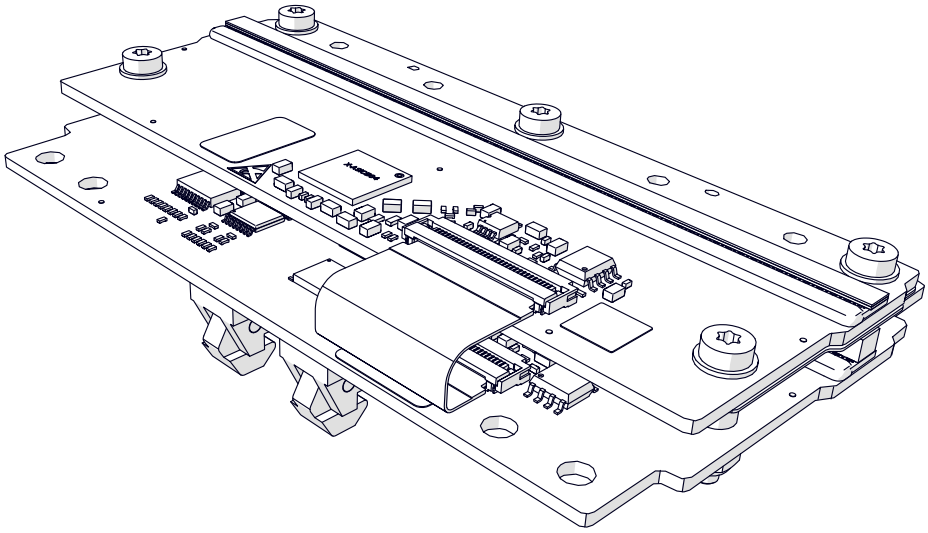

Figure 1: D021606414C

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
3000025013	X-Card D021606414C	1.6 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 D021606414C

Card/feature	D021606414C
Pixel size (mm)	1.6
Low Energy (LE) / High Energy (HE) / Dual-energy (DE)	DE
Mechanical length	101.6 mm
Mechanical width	59.5 mm
Mechanical Height	< 25 mm
LE Scintillator material	DRZ-High (GOS screen, 145 mg/cm^2)
HE Scintillator material	GOS2.5 mm
Copper filter	0.3 mm
Afterglow	N/A
Number of pixels	LE 64 pixels, HE 64 pixels
Scintillator alignment tolerance to reference hole	±0.4 mm
Scintillator LE-HE registration	±0.2 mm
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	20 bits

Card/feature	D021606414C
Sensitivity range	0.25 pF—31.75 pF, 127 steps
Interface to control unit	X-Link, 14-pin connector
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	13000:1 @ 2 pF 20000:1 @ 10 pF
Radiation hardness	100 kGy NOTE **Note:** Radiation hardness is defined as X-ray response drop < 50 % in comparison with the original X-ray response.

Photosensitive area specifications

The photosensitive area specifications are:

Table 3: Photosensitive area specifications for X-Card D021606414A

Parameter	Value
Pixel pitch (P)	1.575 mm
Pixel width (W)	1.4 mm
Pixel height (H)	3 mm
Pixel active area	4.2 mm^2

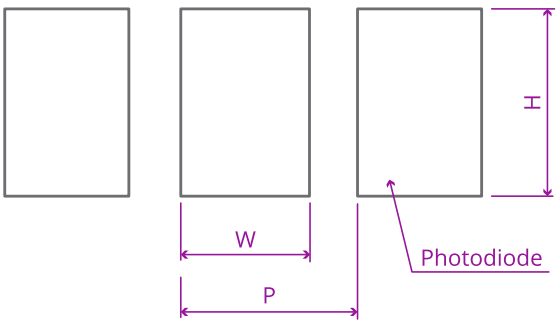

Figure 2: Photosensitive area

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

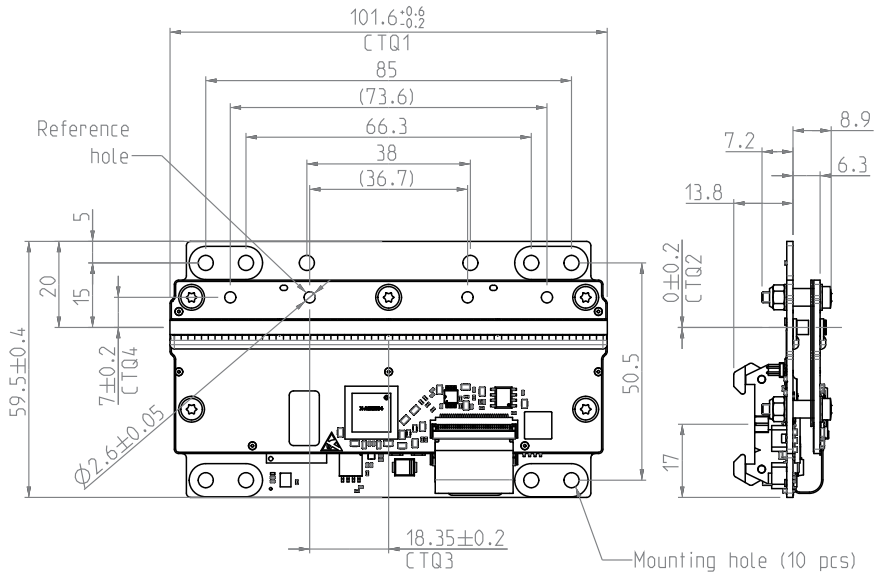

Figure 3: Mechanical outline drawing of D021606414C

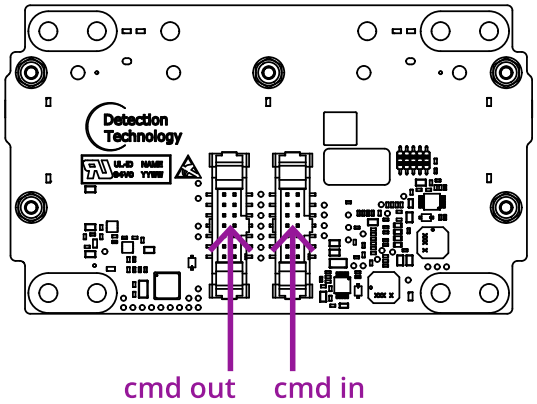

Figure 4: Connectors of D021606414C

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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