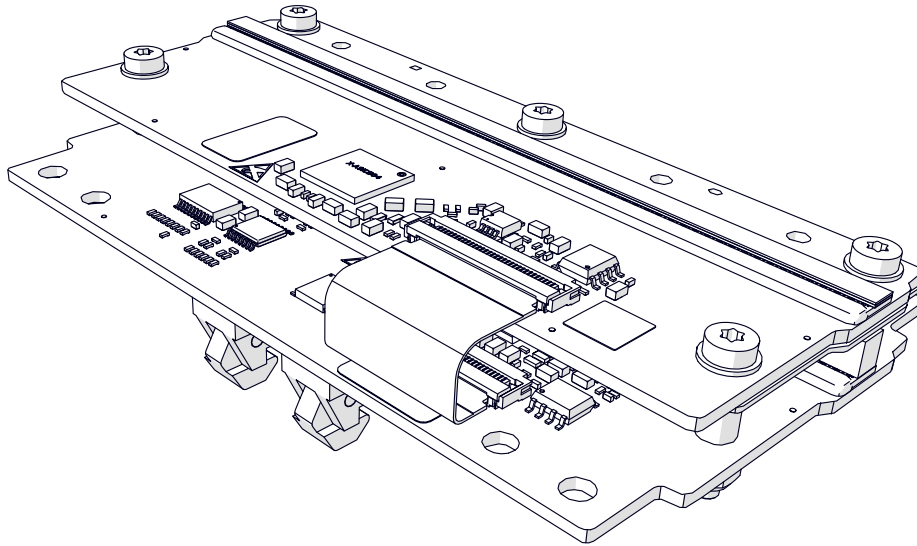


# 1 Data sheet — X-Card D021606412A

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 D021606412A.



**Figure 1: D021606412A**

## 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  |
|--------------|--------------------|--|
| 13013487     | X-Card D021606412A | 1.6 mm pitch, 64 ch, dual-energy, GOS screen, 4 mm CsI, 0.6 mm copper filter, 16-bit |

## 3 Technical specifications

**Table 2: Technical specifications — X-Card D021606412A**

| Card/feature  | D021606412A   |
|---|---|
| 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 <sup>2</sup> )                              |
| HE Scintillator material                              | CsI 4 mm  |
| Copper filter   | 0.6 mm  |
| Afterglow   | <1.5 % @ 75 ms  |
| 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                                  | 1.27 ms   |
| Max integration time                                  | 25 ms. For longer integration times, use the summing function on the X-GCU. |
| A/D resolution  | 16 bits   |

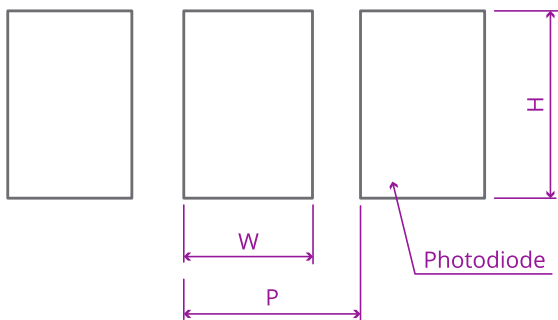
|  |   |
|--|---|
| <b>Card/feature</b>                                  | <b>D021606412A</b>  |
| <b>Sensitivity range</b>                             | 0.25 pF—31.75 pF, 127 steps   |
| <b>Interface to control unit</b>                     | X-Link Basic, 26-pin connector  |
| <b>X-Ray Response Non-Uniformity, pixel to pixel</b> | -15 %~+10 %   |
| <b>Dark offset Non-Uniformity, pixel to pixel</b>    | -15 %~+10 %   |
| <b>X-Ray Response Non-Uniformity, card to card</b>   | -15 %~15 %  |
| <b>Dynamic range</b>                                 | 13000:1 @ 2 pF<br>20000:1 @ 10 pF   |
| <b>Radiation hardness</b>                            | 100 kGy<br><br><div style="border: 1px solid black; padding: 5px;"> <p><b>NOTE</b> <b>Note:</b><br/>Radiation hardness is defined as X-ray response drop &lt; 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 D021606412A**

| 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 <sup>2</sup> |



**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

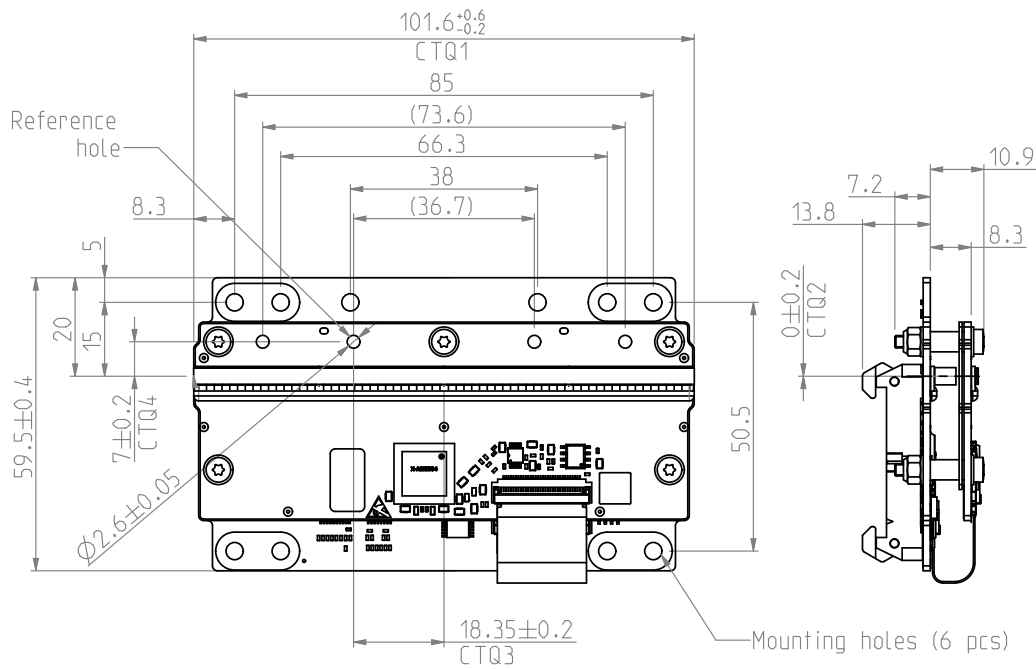


Figure 3: Mechanical outline drawing of D021606412A

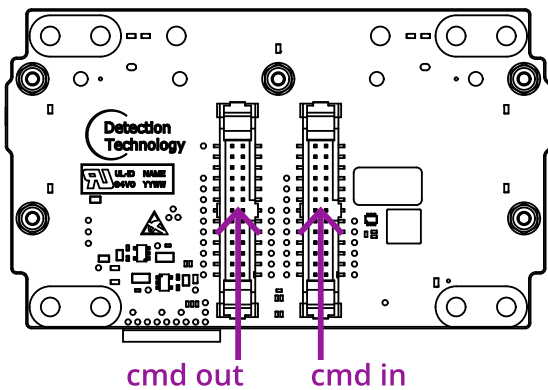


Figure 4: Connectors of D021606412A

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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