

X-ray sCMOS camera C12849 series



The C12849 series is a high resolution and high sensitivity X-ray sCMOS camera. The camera is suitable for micro object by achieving 30 lp/mm high resolution image. Also the product is compact that is suitable as embedded devices for Micro CT/Nano CT system.

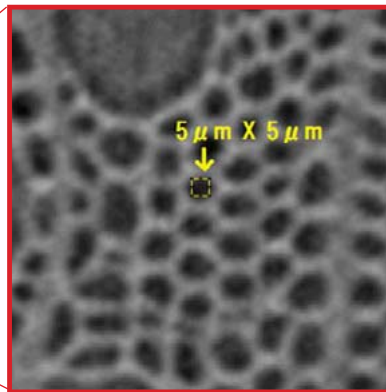
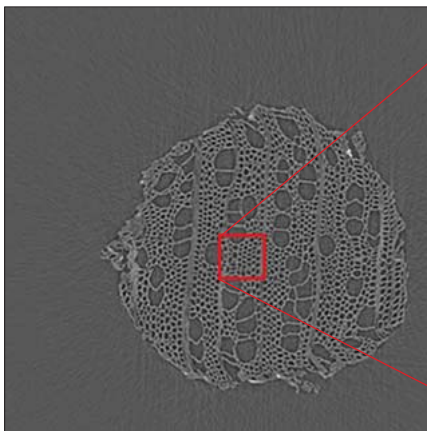
Features

- Resolution: 30 lp/mm (C12849-101U)
- Effective number of pixels: 2048 (H)×2048 (V)
- Frame rate: 30 frames/s (2048 (H)×2048 (V))
- Compact size
- Interface: USB 3.0

Applications

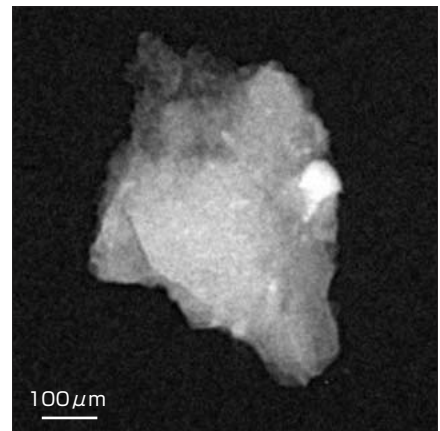
- X-ray Micro CT
- High resolution X-ray imaging
- X-ray diffraction
- XAFS

Measurement Examples



▲ CT image of toothpick

- X-ray source: L9181-02
- X-ray tube voltage: 40 kV
- X-ray tube current: 100 μA
- FOD: 34.435 mm
- FDD: 306.42 mm
- X-ray magnification: 8.9 times



▲ X-ray transmission image of Kilabo meteor

- X-ray source: L10711-03
 - X-ray tube voltage: 80 kV
 - X-ray tube current: 120 μA
 - FOD: 50 mm
 - FDD: 465 mm
 - X-ray magnification: 9.3 times
 - Exposure time: 10 s
- Image courtesy of Dr.Uesugi , JAXA

Specifications

Type number	C12849-101U	C12849-102U
Imaging device	Scientific CMOS sensor FL-400	
Effective number of pixels	2048 (H) × 2048 (V)	
Cell size	6.5 μm (H) to 6.5 μm (V)	
Effective area	13.312 mm (H) to 13.312 mm (V)	
Scintillators	Gadox 10 μm	Gadox 20 μm
FOP ratio	1 : 1	
Full well capacity typ.	30 000 electrons	
Readout speed	30 frames/s to 25 655 frames/s	
Readout mode	Digital binning (2×2, 4×4) ^{*1} , Sub-array readout mode at center position	
Camera noise typ. ^{*2}	2.3 electrons (rms), 1.6 electrons (median)	
Dynamic range typ. ^{*3}	18 000 : 1	
A/D converter	16 bit	
Exposure time ^{*4}	1 ms to 30 s (100 ms recommended)	
External trigger mode	Edge trigger, Level trigger, Synchronous readout trigger, Start trigger	
External trigger output	Programmable timing outputs, Global exposure timing output, Trigger ready output, Fixed level output	
Interface	USB 3.0	
Maximum tube voltage	90 kV	
Power requirements	AC 100 V to 240 V, 50 Hz/60 Hz	
Electricity consumption	9 VA	
Ambient storage temperature	-10 °C to +50 °C	
Ambient operating temperature	0 °C to +40 °C (+ 35 °C recommended ^{*5})	
Ambient operating humidity	70 % max. (with no condensation)	

*1: Digital processing in the camera

*2: Camera noise is sum of readout noise and dark current at 33 ms exposure.

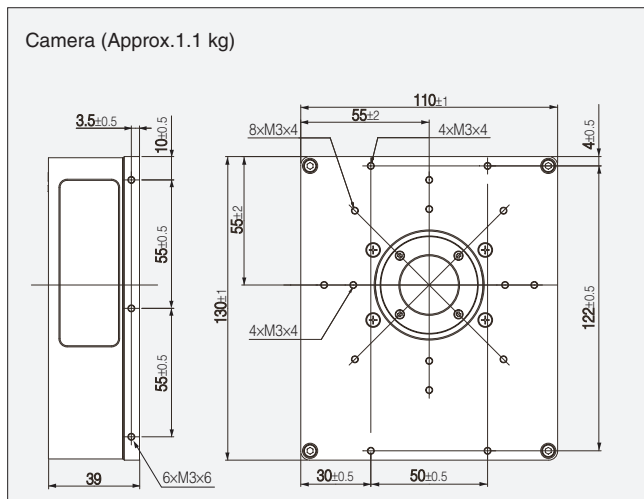
*3: Calculated from the ratio of the full well capacity and the average readout noise.

*4: When exposure time is longer than 100 ms, white spots would be visible and image quality would be degraded.

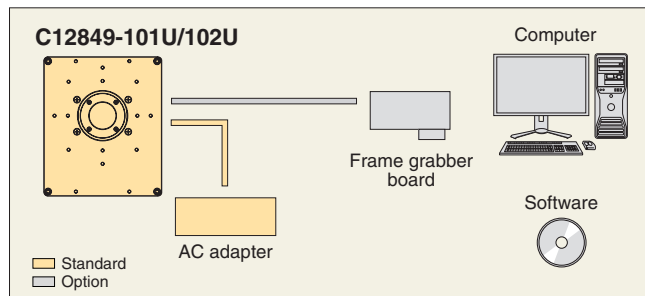
*5: When ambient operating temperature is higher than + 35 °C, white spots would be visible and image quality would be degraded.

Dimensional outlines

(Unit : mm)



Configuration example



Options

- External trigger cable SMA-BNC 5 m : A12106-05
- External trigger cable SMA-SMA 5 m : A12107-05

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