

**X-RAY
IMAGING**

X-CUBE™ COMPACT X-RAY CCD CAMERAS

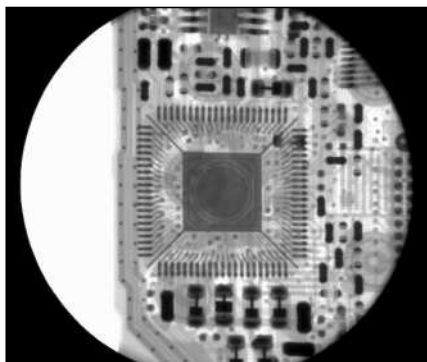
H8480/H8481/H8953 Series

SAMPLE X-RAY IMAGES Sample: Cellular phone substrate
X-ray tube voltage: 90 kV, Geometrical magnification rate: $\times 1.15$

H8480

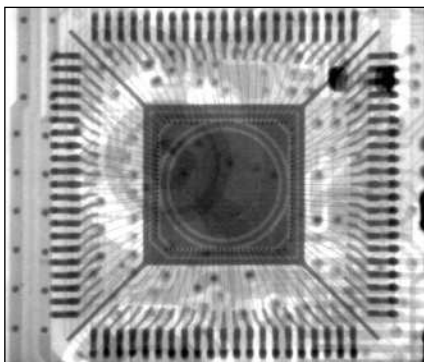
(Wide View Type)

Effective view: $\phi 25$ mm Min.
Resolution : 10 Lp/mm Typ.



H8953

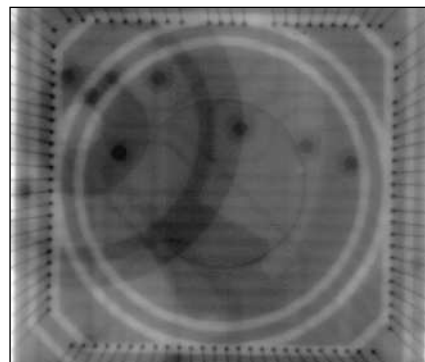
Effective view: 16.7 mm $\times$ 12.5 mm
Resolution : 16 Lp/mm Typ.



H8481

(High Resolution Type)

Effective view: 8.4 mm $\times$ 6.3 mm
Resolution : 20 Lp/mm Typ.



OVERVIEW

X-CUBE is a compact X-ray CCD camera designed for nondestructive inspection. Using a general-purpose CCD chip mounted in a rugged but lightweight camera head, X-CUBE makes X-ray imaging as easy as handling ordinary CCD cameras.

The H8480 has a large effective view of 25 mm diameter and a resolution of 10 Lp/mm, while the H8953 has an effective view of 16.7 mm $\times$ 12.5 mm and a resolution of 16 Lp/mm, while the H8481 offers an effective view of 8.4 mm $\times$ 6.3 mm and a high resolution of 20 Lp/mm.



▲Left: H8480, Center: H8953, Right: H8481

FEATURES

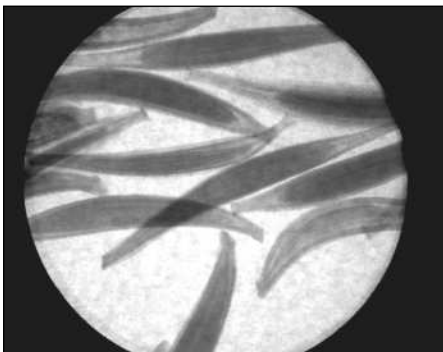
- High sensitivity: CsI scintillator
- Compact
- Low power consumption

HAMAMATSU

SAMPLE X-RAY IMAGES

●Low Energy

H8480



▲Seeds
X-ray tube voltage: 25 kV
Geometrical magnification rate: $\times 2.1$

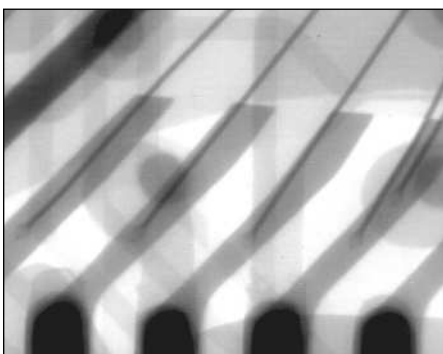
H8481



▲Seeds
X-ray tube voltage: 25 kV
Geometrical magnification rate: $\times 2.1$

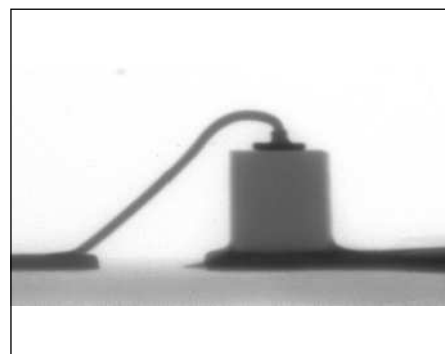
●High Magnification

H8481



▲Bonding wire
X-ray tube voltage: 80 kV
Geometrical magnification rate: $\times 3.5$

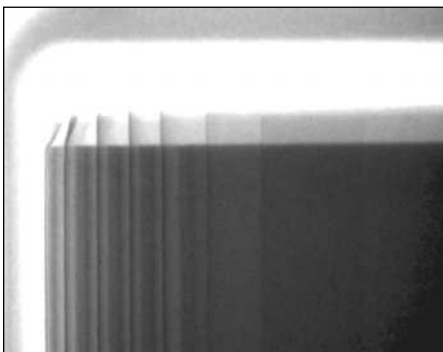
H8481



▲Diode
X-ray tube voltage: 80 kV
Geometrical magnification rate: $\times 7.5$

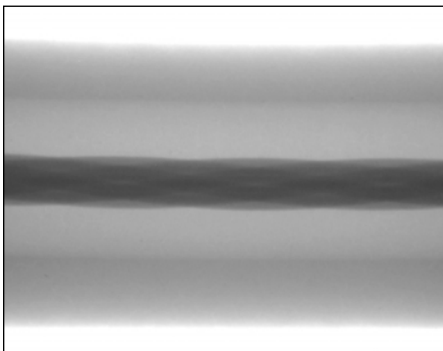
●Others

H8953



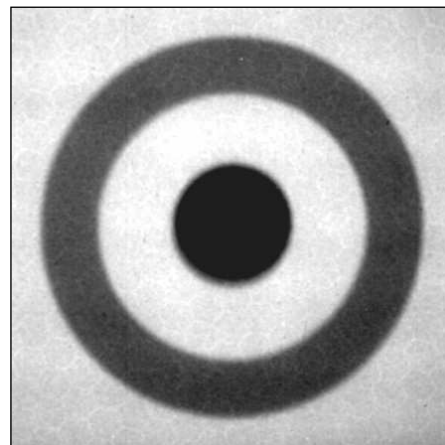
▲Lithium-ion battery
X-ray tube voltage: 95 kV
Geometrical magnification rate: $\times 2.8$

H8953



▲High voltage cable
X-ray tube voltage: 70 kV
Geometrical magnification rate: $\times 2.5$

H8953



▲Reference mark in multi-layer printed circuit board
X-ray tube voltage: 50 kV
Geometrical magnification rate: $\times 3.3$

SPECIFICATIONS

GENERAL RATINGS

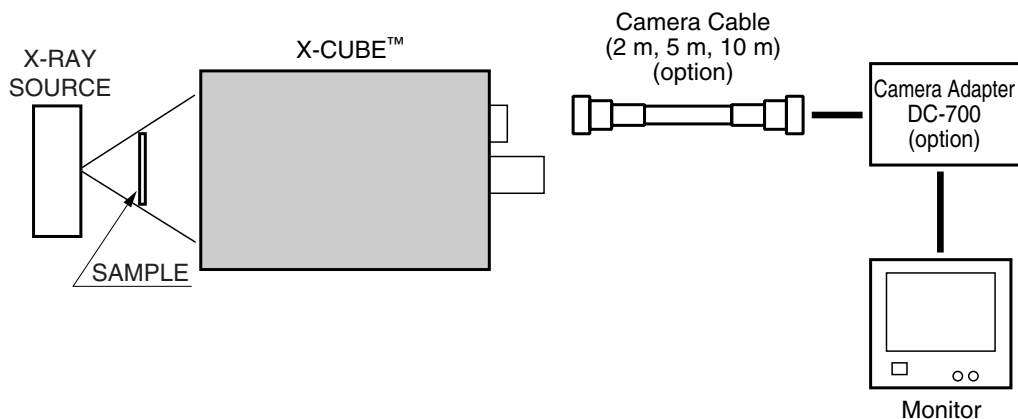
Parameter	H8480-13	H8480-14	H8953-13	H8953-14	H8481-15	H8481-16
Effective View	$\phi 25$ mm Min.		16.7 mm $\times$ 12.5 mm		8.4 mm $\times$ 6.3 mm	
Resolution	10 Lp/mm Typ.		16 Lp/mm Typ.		20 Lp/mm Typ.	
TV Method	EIA ①	CCIR ②	EIA ①	CCIR ②	EIA ①	CCIR ②
Imaging Sensor	Interline transfer 2/3-inch CCD image sensor					
Number Of Pixels	768 (H) $\times$ 494 (V)	752 (H) $\times$ 582 (V)	768 (H) $\times$ 494 (V)	752 (H) $\times$ 582 (V)	768 (H) $\times$ 494 (V)	752 (H) $\times$ 582 (V)
Scanning Method	Interlace/ Non-interlace					
Sync. Method	Internal / External (auto selection by the input signal)					
External Sync. Signal Input / Output	S. VS (SYNC level 0.3 V), HD/VD (2 V to 5 V)					
Video Signal Output	1.0 V p-p (negative sync., 75 Ω , unbalanced)					
Power Supply Voltage (DC)	+12.0 V (range: 10.5 V to 15 V)					
Power Consumption	Approx.2.1 W					
γ Correction	0.45/1.0 (selected by switch on the rear panel)					
Gain	AGC/FIX/MANUAL (selected by switch on the rear panel)					
Shutter Speed	1/125 s to 1/10 000 s (selected by switch on the rear panel)					
Operating Ambient Temperature	-5 $^{\circ}$ C to 45 $^{\circ}$ C					
Storage Temperature	-10 $^{\circ}$ C to 60 $^{\circ}$ C					
Operating Ambient Humidity	Below 80 % (no condensation)					

①EIA: Electronic Industries Association

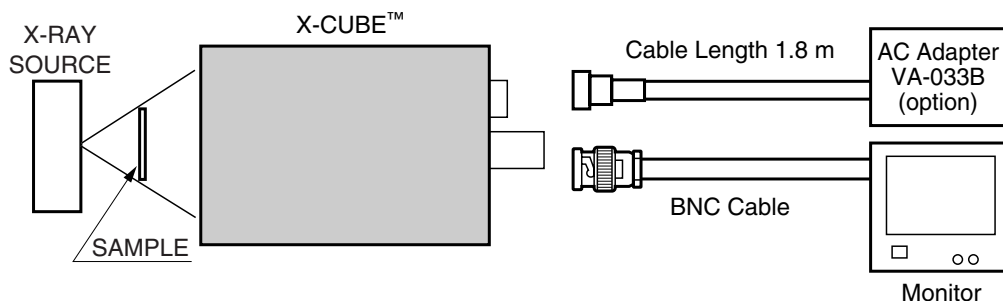
②CCIR : Comite Consultatif Internationale des Ratio Communications

CONNECTION EXAMPLE

●Camera Adapter

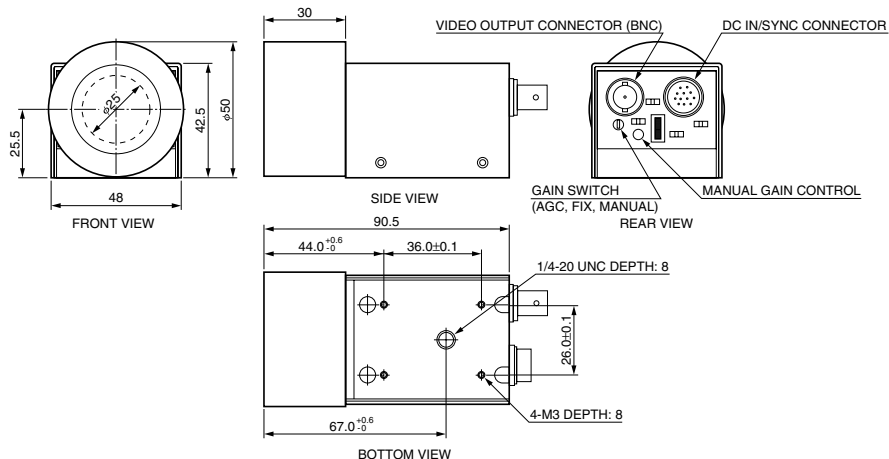


●AC Adapter



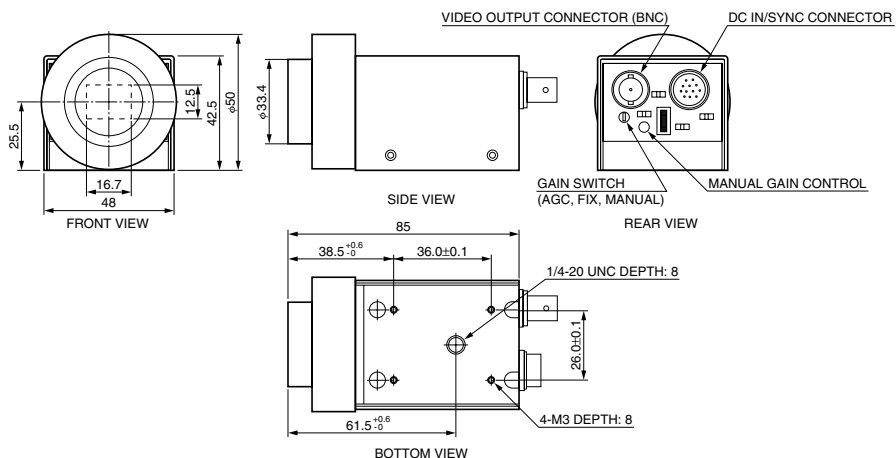
DIMENSIONAL OUTLINE (Unit: mm)

H8480



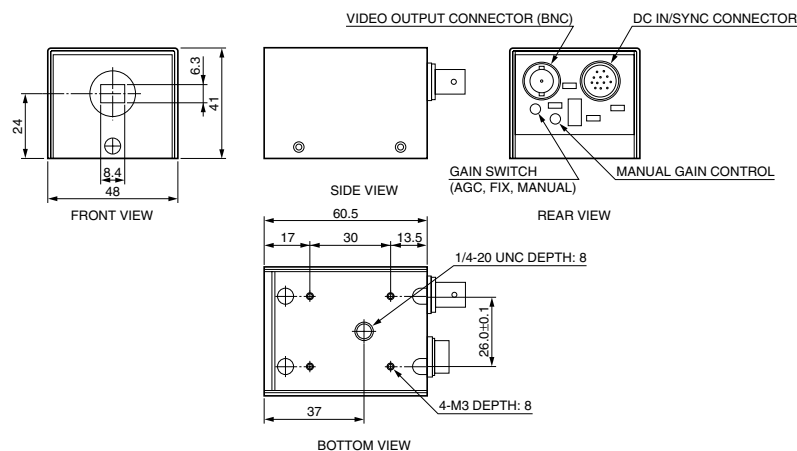
TAPPA0076EB

H8953



TAPPA0076EB

H8481



TAPPA0078EB

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