

PRELIMINARY

# Electron Detection Unit

## H8770

HAMAMATSU has introduced new Electron Detection Unit H8770, consist of newly developed extremely fast decay phosphor and high sensitivity compact PMT.

Decay time of the phosphor is faster than 1ns, and it can present high speed electron detection.

Built-in PMT power supply, high speed amplifier and other circuitry provide its easy operation.

## APPLICATIONS

- Semiconductor Inspection System
- Scanning Electron Microscope (SEM)
- Mass Spectrometer (MS)
- General Electron Detection

## FEATURES

- Fast Decay Phosphor: 720ps Typ.
- Long Life Phosphor: Low Degradation Against Electron Irradiation
- High Sensitivity Compact PMT
- Built-in High Voltage Power Supply, Voltage Divider Circuit for PMT and High Speed Amplifier (upto 150 MHz)
- Vacuum Flange ICF114 is assembled (Custom assembly is available upon request)

## SPECIFICATIONS

Parameter	Description/Value
Phosphor Effective Area ①	φ9 mm
Type of Phosphor	Fast Decay Phosphor
Light Guide Material	Synthetic Silica ②
Light Detector	Photomultiplier tube
Detectable Input Electron Energy Range	5 keV to 12 keV
Electron-to-Voltage Conversion	10 V/μA ③
PMT Gain Range	1 × 10 <sup>2</sup> to 1 × 10 <sup>6</sup> ④
Built-in Amplifier Frequency Bandwidth	DC to 150 MHz
Maximum Output Voltage	-1.4 V ⑤
Offset Voltage	±10 mV Max.
Noise Level	20 mV
Input Voltage	±15 V dc ±1 V dc
Input Current	110 mA
Type of Vacuum Flange	ICF114
Operating Temperature Range	+5 °C to +45 °C ⑥
Weight	1.46 kg

NOTE: ① Other dimension is available upon request.

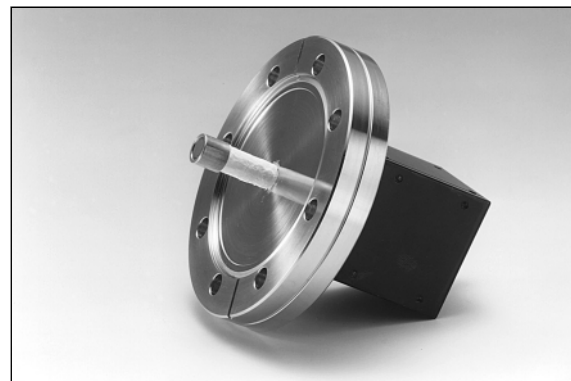
② Plastic can be chosen. Custom design is also available.

③ At input electron energy : 6 keV, PMT gain: 1 × 10<sup>4</sup>

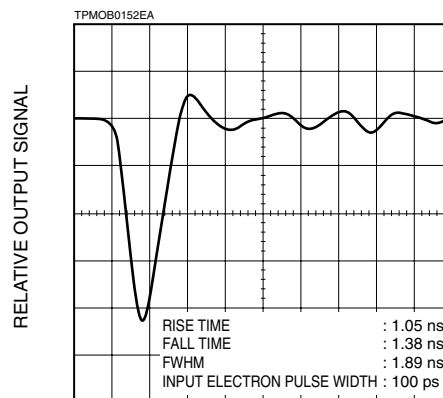
④ Adjustable by controll voltage (+1 V to +4 V) or externally connected variable resistor.

⑤ At 50 Ω load resistance

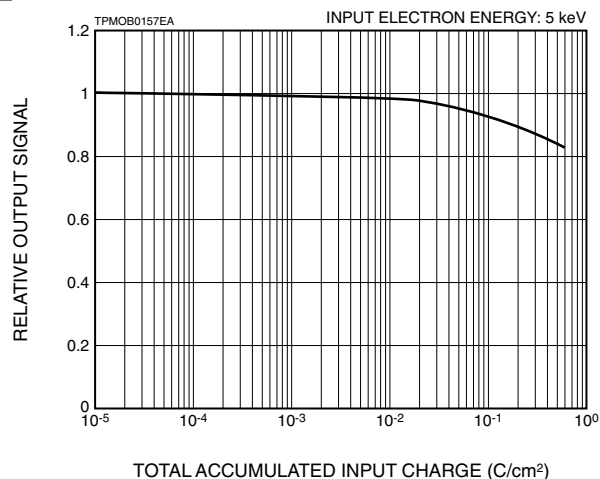
⑥ Without condensation



## Time Response (Output Waveform)

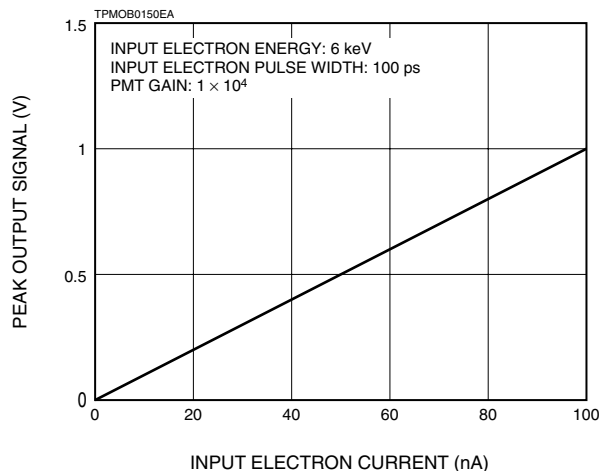


## Phosphor Life Characteristics

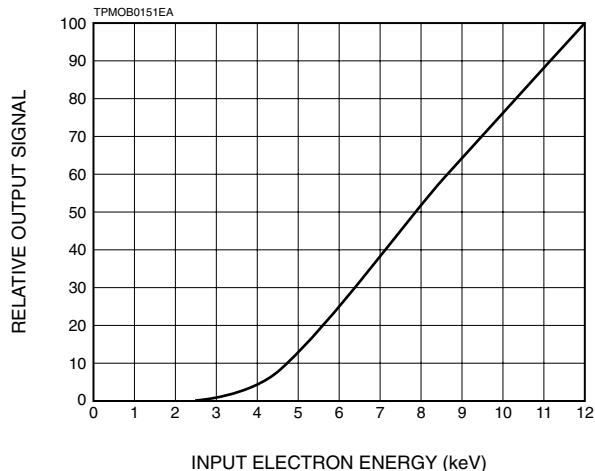


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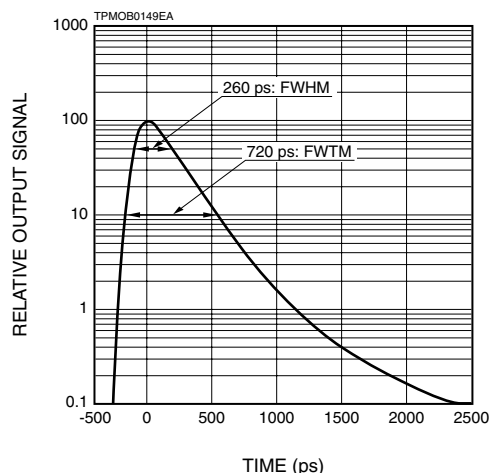
## Output Signal as a function of input electron current



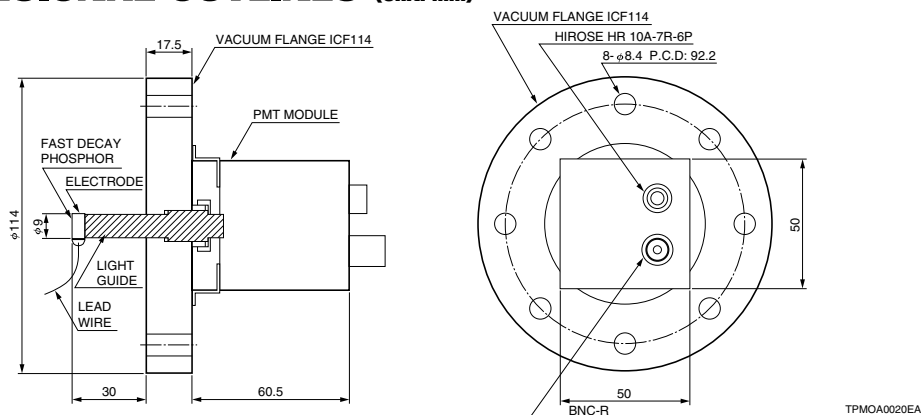
## Output Signal as a function of Input Electron Energy



## Phosphor Decay Characteristics



## DIMENSIONAL OUTLINES (Unit: mm)



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HAMAMATSU PHOTONICS K.K., Electron Tube Center

314-5, Shimokanzo, Toyooka-village, Iwata-gun, Shizuoka-ken, 438-0193, Japan, Telephone: (81)539/62-5248, Fax: (81)539/62-2205

U.S.A.: Hamamatsu Corporation, 360 Foothill Road, P. O. Box 6910, Bridgewater, N.J. 08807-0910, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218 E-mail: [usa@hamamatsu.com](mailto:usa@hamamatsu.com)

Germany: Hamamatsu Photonics Deutschland GmbH, Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-2658 E-mail: [info@hamamatsu.de](mailto:info@hamamatsu.de)

France: Hamamatsu Photonics France S.A.R.L., 8, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10 E-mail: [infos@hamamatsu.fr](mailto:infos@hamamatsu.fr)

United Kingdom: Hamamatsu Photonics UK Limited, 2 Howard Court, 10 Tewin Road Welwyn Garden City Hertfordshire AL7 1BW, United Kingdom, Telephone: 44-(0)1707-294888, Fax: 44(0)1707-325777 E-mail: [info@hamamatsu.co.uk](mailto:info@hamamatsu.co.uk)

North Europe: Hamamatsu Photonics Norden AB, Smidesvägen 12, SE-171-41 SOLNA, Sweden, Telephone: (46)8-509-031-00, Fax: (46)8-509-031-01 E-mail: [info@hamamatsu.se](mailto:info@hamamatsu.se)

Italy: Hamamatsu Photonics Italia S.R.L., Strada della Moia, 1/E, 20020 Arese, (Milano), Italy, Telephone: (39)02-935 81 733, Fax: (39)02-935 81 741 E-mail: [info@hamamatsu.it](mailto:info@hamamatsu.it)

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