

HAMAMATSU

PHOTOMULTIPLIER TUBES R4220 R4220P(For Photon Counting)

Very High Cathode Sensitivity with Low Noise Photocathode

FEATURES

- Spectral Response 185 to 710 nm
- High Cathode Sensitivity
 - Luminous 100 μ A/lm
 - Radiant at 410nm 70 mA/W
- High Anode Sensitivity (at 1000V)
 - Luminous 1200A/lm
 - Radiant at 410nm 8.4×10^5 A/W
- Low Dark Current 0.2nA
- Low Dark Counts (R4220P) 10 cps

Hamamatsu R4220 features extremely high cathode sensitivity, high Gain, and low dark current. Variant tube (R4220P) specially selected for photon counting application is also available. The R4220 is useful for fluorescence, chemiluminescence, Raman spectroscopy and low light level detection.



GENERAL

| Parameter | Description/Value | Unit |
|------------------------------------|-------------------------------------|------|
| Spectral Response | 185 to 710 | nm |
| Wavelength of Maximum Response | 410 | nm |
| Photocathode Material | Low noise bialkali | - |
| Minimum Effective Area | 8 × 24 | mm |
| Window Material | UV glass | - |
| Dynode Structure | Low noise bialkali Circular-cage | - |
| Number of Stages | 9 | - |
| Direct Interelectrode Capacitances | | |
| Anode to Last Dynode | 4 | pF |
| Anode to All Other Electrodes | 6 | pF |
| Base | 11-pin base JEDEC No. B11-88 | - |
| Weight | 45 | g |
| Suitable Socket | E678-11A (option) | - |
| Suitable Socket Assembly | E717-21 (option) | - |

Figure 1: Typical Spectral Response

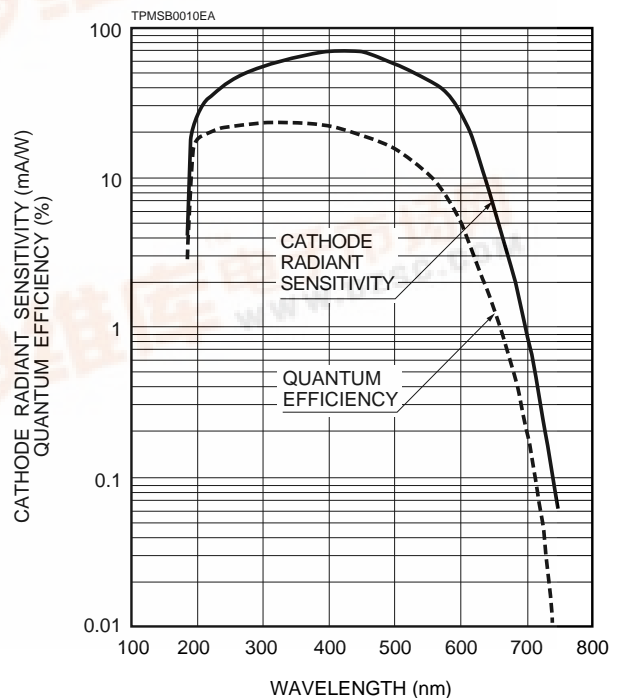


Figure 2: Typical Gain and Anode Dark Current

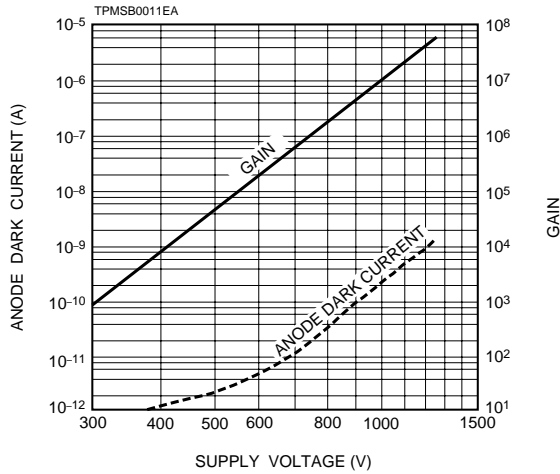


Figure 3: Typical Time Response

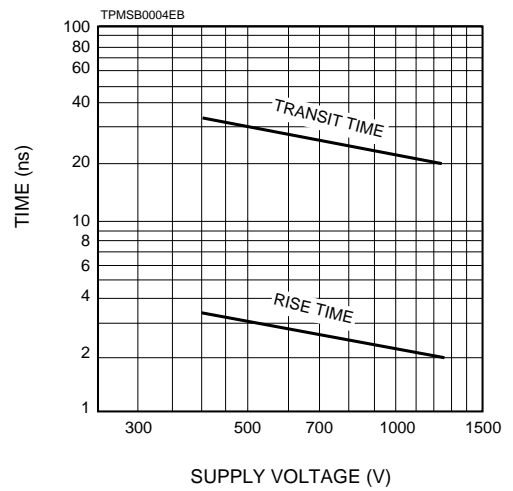


Figure 4: Typical ENI vs. Wavelength

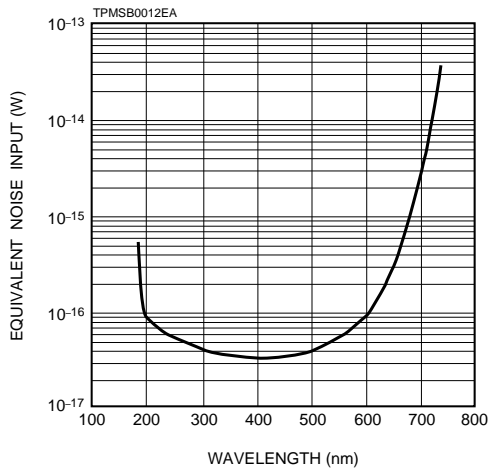
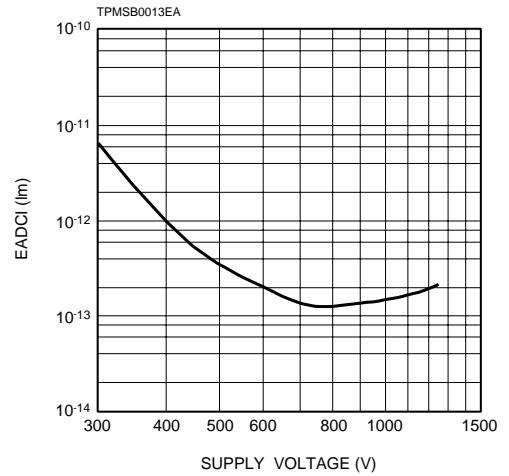


Figure 5: Typical EADCI (Equivalent Anode Dark Current Input) vs. Supply Voltage



Data shown here, which is given from a relation among supply voltage, anode sensitivity and dark current, serves as a good reference in order to determine the most suitable supply voltage or its range.

Figure 6: Typical Single Photon Pulse Height Distribution for R4220P

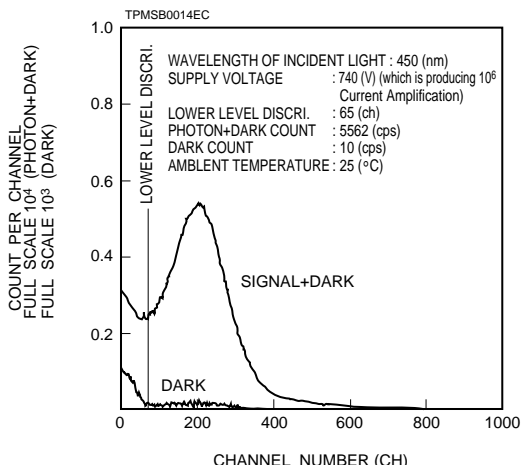
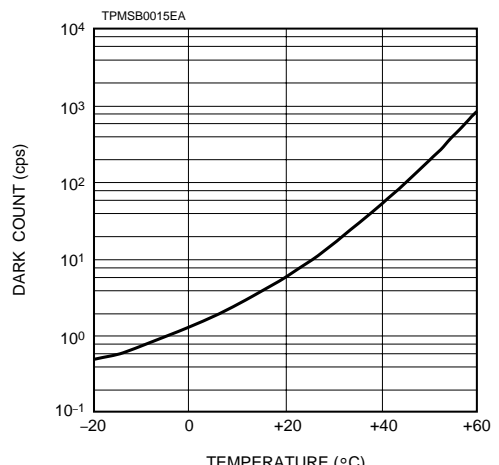
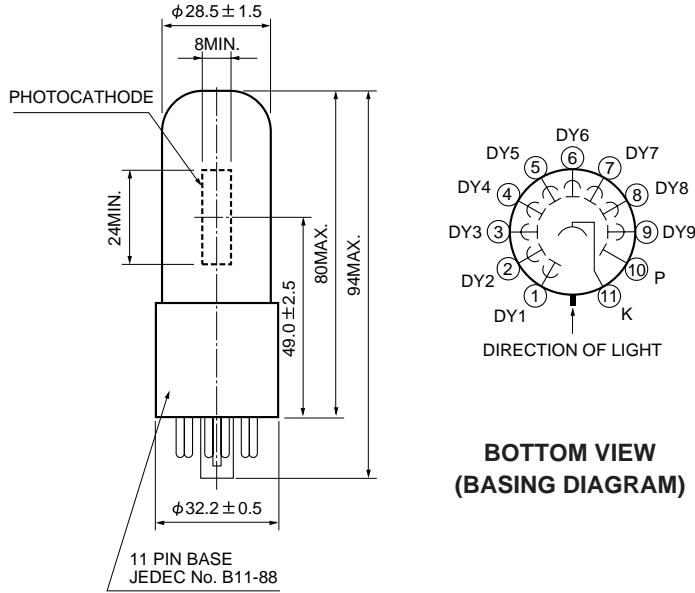


Figure 7: Typical Temperature Characteristics of Dark Count for R4220P



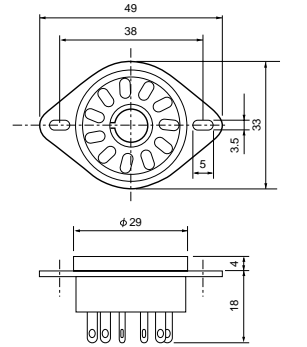
PHOTOMULTIPLIER TUBES R4220, R4220P (For Photon Counting)

Figure 8: Dimensional Outline and Basing Diagram(Unit: mm)



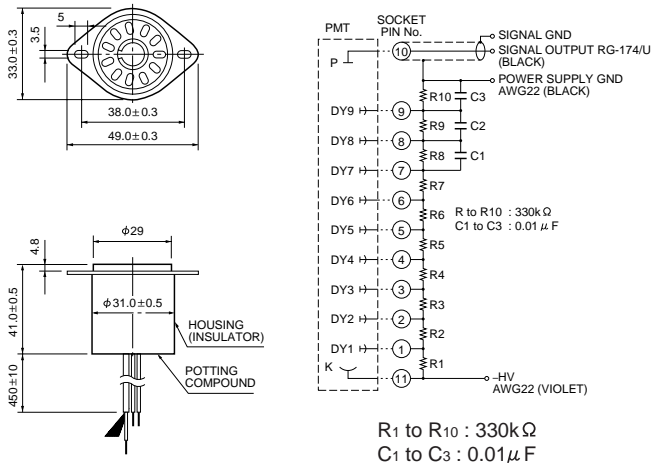
TPMSA0001EA

Figure 10: Socket E678-11A (Optional)



TACCA0064EA

Figure 9: D Type Socket Assembly E717-21 (Optional)



TACCA0002ED

※ Hamamatsu also provides C4900 series compact high voltage power supplies and C6270 series DP type socket assemblies which incorporate a DC to DC converter type high voltage power supply.

Warning—Personal Safety Hazards
Electrical Shock—Operating voltages applied to this device present a shock hazard.

HAMAMATSU

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, Bridgewater, N.J. 08807-0910, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-2658

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

United Kingdom: Hamamatsu Photonics UK Limited: Lough Point, 2 Gladbeck Way, Windmill Hill, Enfield, Middlesex EN2 7JA, United Kingdom, Telephone: (44)181-367-3560, Fax: (44)181-367-6384

North Europe: Hamamatsu Photonics Nederland B.V.: Eindhoven 7, 2664 AN Kapelle Boven de Oude, Telephone: (46)9-702-2000, Fax: (46)9-750-6909

TPMS1003E02