

High QE Multialkali Photocathode 28 mm (1-1/8 Inch) Diameter, 9-Stage, Side-On Type

FEATURES

- High Sensitivity at 900 nm
Quantum Efficiency0.5 % (Typ.)
Radiant 4 mA/W (Typ.)
- Wide Spectral Response 185 nm to 950 nm
- High Signal to Noise Ratio

APPLICATIONS

- Biomedical Analysis
Blood Analyzer, Flow Cytometer, DNA Sequencer
- Spectroscopy
Fluorescence Spectrometer, Raman Spectrometer,
UV-VIS Spectrometer



Figure 1: Electro Optical Structure

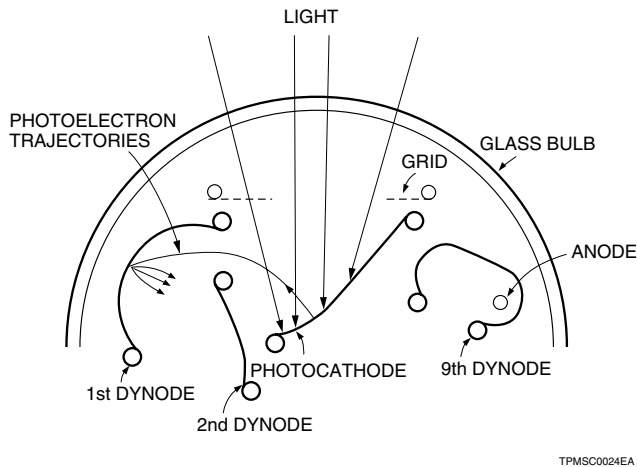
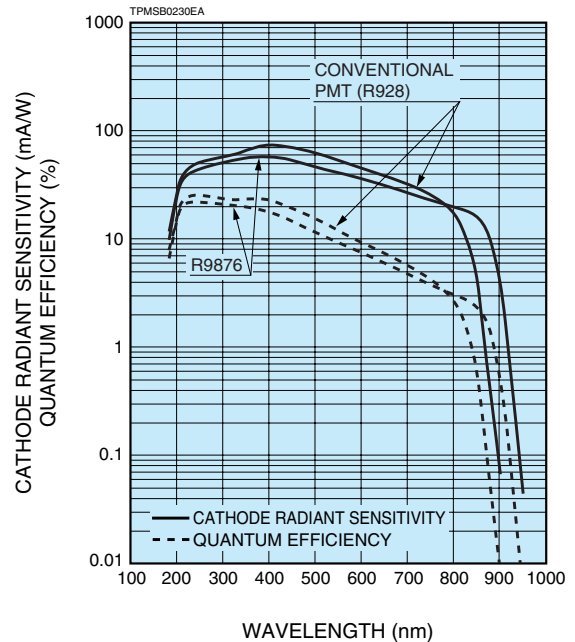


Figure 2: Typical Spectral Response



PHOTOMULTIPLIER TUBE R9876

SPECIFICATIONS

GENERAL

| Parameter | | Description / Value | Unit |
|--------------------------------|-------------------------------|------------------------------|------|
| Spectral Response | | 185 to 950 | nm |
| Wavelength of Maximum Response | | 380 | nm |
| Photocathode | Material | Multialkali | — |
| | Minimum Effective Area | 8 × 24 | mm |
| Window Material | | UV glass | — |
| Dynode | Structure | Circular-cage | — |
| | Number of Stages | 9 | — |
| Direct | Anode to Last Dynode | 4 | pF |
| Interelectrode Capacitances | Anode to All Other Electrodes | 6 | pF |
| Base | | 11-pin base JEDEC No. B11-88 | — |
| Weight | | Approx. 45 | g |
| Operating Ambient Temperature | | -30 to +50 | °C |
| Storage Temperature | | -30 to +50 | °C |
| Suitable Socket | | E678-11A (Sold Separately) | — |
| Suitable Socket Assembly | | E717-63 (Sold Separately) | — |
| | | E717-74 (Sold Separately) | — |

MAXIMUM RATINGS (Absolute Maximum Values)

| Parameter | | Value | Unit |
|------------------------------------|-------------------------------|-------|------|
| Supply Voltage | Between Anode and Cathode | 1250 | V |
| | Between Anode and Last Dynode | 250 | V |
| Average Anode Current ^A | | 0.1 | mA |

CHARACTERISTICS (at 25 °C)

| Parameter | | Min. | Typ. | Max. | Unit |
|---|---|------|---------------------|------|-------|
| Cathode Sensitivity | Quantum Efficiency at 900 nm | — | 0.5 | — | % |
| | Luminous ^B | 100 | 140 | — | μA/lm |
| | Radiant at 900 nm | — | 4 | — | mA/W |
| | Red / White Ratio ^C | — | 0.4 | — | — |
| Anode Sensitivity | Luminous ^D | 50 | 140 | — | A/lm |
| | Radiant at 900 nm | — | 4 × 10 ³ | — | A/W |
| Gain ^D | | — | 1 × 10 ⁶ | — | — |
| Anode Dark Current ^E (Supply voltage at 1 × 10 ⁶ Gain) | | — | 0.5 | 5 | nA |
| Time Response | Anode Pulse Rise Time ^F | — | 2.2 | — | ns |
| | Electron Transit Time ^G | — | 22 | — | ns |
| | Transit Time Spread (T.T.S.) ^H | — | 1.2 | — | ns |

NOTES

- A: Averaged over any interval of 30 seconds maximum.
 B: The light source is a tungsten filament lamp operated at a distribution temperature of 2856 K. Supply voltage is 100 V between the cathode and all other electrodes connected together as anode.
 C: Red / White ratio is the quotient of the cathode current measured using a red filter (Toshiba R-68) interposed between the light source and the tube by the cathode current measured with the filter removed under the same conditions as Note B.
 D: Measured with the same light source as Note B and with the voltage distribution ratio shown in Table 1 below.

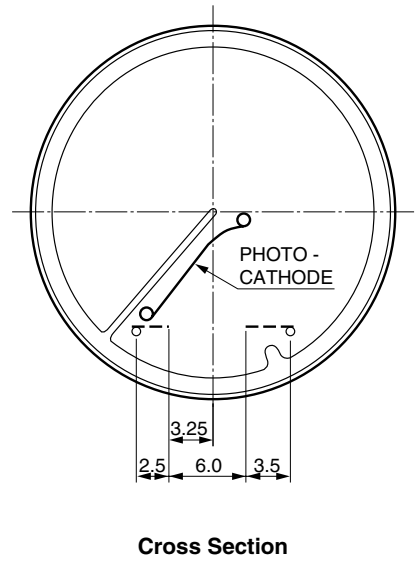
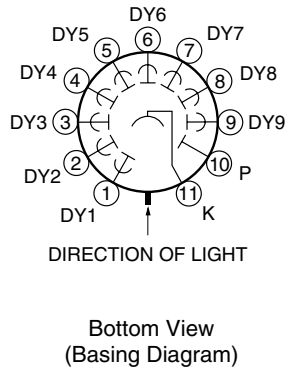
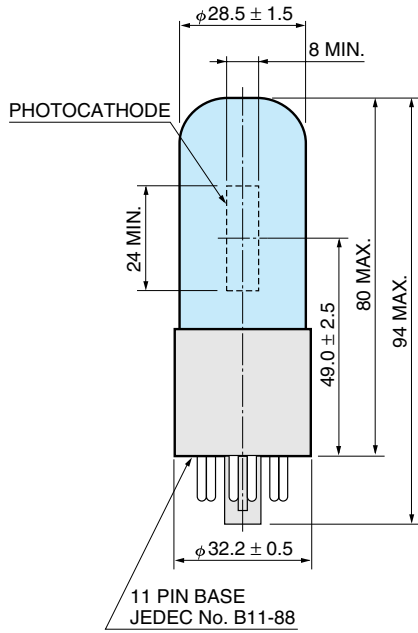
Table 1: Voltage Distribution Ratio

| Electrodes | K | Dy1 | Dy2 | Dy3 | Dy4 | Dy5 | Dy6 | Dy7 | Dy8 | Dy9 | P |
|------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| Ratio | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Supply Voltage: 1000 V, K: Cathode, Dy: Dynode, P: Anode

- E: After 30 min Storage in Darkness
 F: The rise time is the time for the output pulse to rise from 10 % to 90 % of the peak amplitude when the entire photocathode is illuminated by a delta function light pulse.
 G: The electron transit time is the interval between the arrival of delta function light pulse at the entrance window of the tube and the time when the anode output reaches the peak amplitude. In measurement, the whole photocathode is illuminated.
 H: Also called transit time jitter. This is the fluctuation in electron transit time between individual pulses in the signal photoelectron mode, and may be defined as the FWHM of the frequency distribution of electron transit times.

Figure 3: Dimensional Outline and Basing Diagram (Unit: mm)

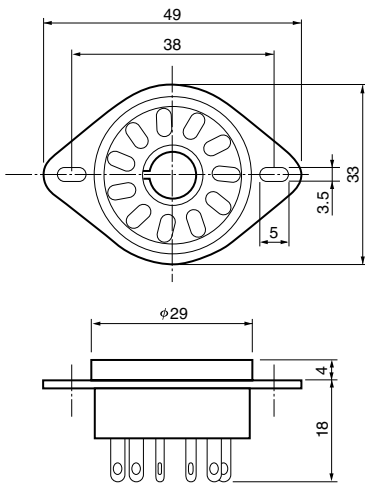


TPMSA0008EA

TPMSA0009EB

Figure 4: Socket (Unit: mm) Sold Separately

E678-11A

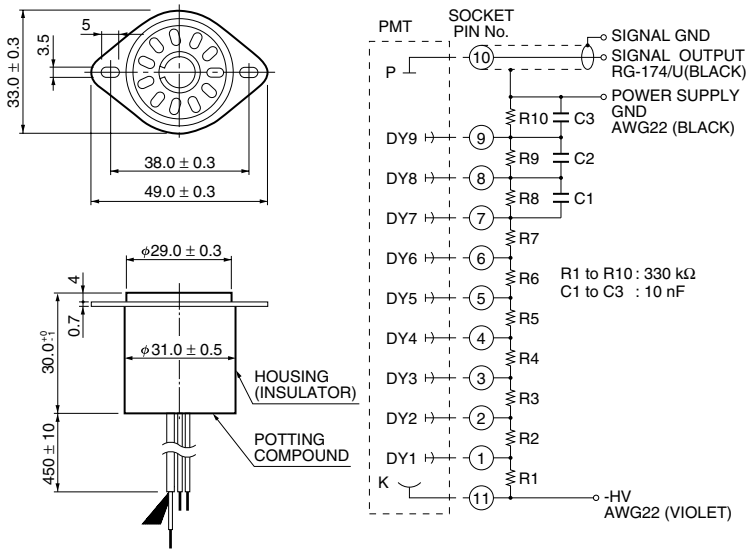


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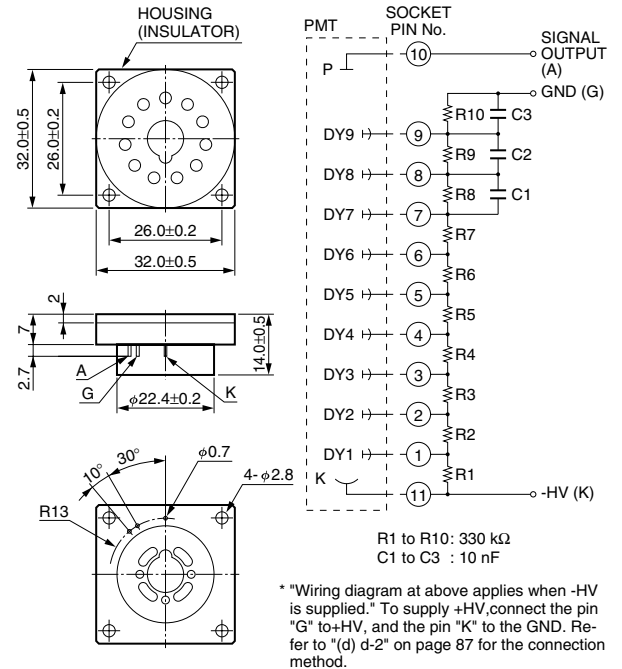
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Figure 5: D Type Socket Assembly (Unit: mm) **Sold Separately**

E717-63



E717-74



TACCA0002EH

TACCA027EA

* 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

WEB SITE www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Electron Tube Division

314-5, Shimokanzo, Iwata City, Shizuoka Pref., 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

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

France: Hamamatsu Photonics France S.A.R.L.: 19, 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

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

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

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

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