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# PHOTOMULTIPLIER TUBE
# R1250

## For High Energy Physics, Fast Time Response, High Pulse Linearity
## 127 mm (5 Inch) Diameter, Bialkali Photocathode, 14-Stage, Head-on Type

### GENERAL

| Parameter | | Description | Unit |
|---|---|---|---|
| Spectral Response | | 300 to 650 | nm |
| Wavelength of Maximum Response | | 420 | nm |
| Photocathode | Material | Bialkali | — |
| | Minimum Effective Area | $\phi$120 | mm |
| Window Material | | Borosilicate glass | — |
| Dynode | Structure | Linear focused | — |
| | Number of Stages | 14 | — |
| Operating Ambient Temperature | | -30 to +50 | °C |
| Storage Temperature | | -30 to +50 | °C |
| Base | | 20-pin base | — |
| Suitable Socket | | E678-20B (supplied) | — |

### MAXIMUM RATINGS (Absolute Maximum Values)

| Parameter | | Value | Unit |
|---|---|---|---|
| Supply Voltage | Between Anode and Cathode | 3000 | V |
| | Between Anode and Last Dynode | 500 | V |
| Average Anode Current | | 0.2 | mA |

### CHARACTERISTICS (at 25 °C)

| Parameter | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Cathode Sensitivity | Luminous (2856 K) | 55 | 70 | — | µA/lm |
| | Blue Sensitivity Index (CS 5-58) | 7.0 | 9.0 | — | — |
| | Quantum Efficiency at 390 nm | — | 22 | — | % |
| Anode Sensitivity | Luminous (2856 K) | 300 | 1000 | — | A/lm |
| | Blue Sensitivity Index (CS 5-58) | — | 130 | — | — |
| Gain | | — | $1.4 \times 10^7$ | — | — |
| Anode Dark Current (after 30 min storage in darkness) | | — | 50 | 300 | nA |
| Time Response | Anode Pulse Rise Time | — | 2.5 | — | ns |
| | Electron Transit Time | — | 54 | — | ns |
| | Transit Time Spread | — | 1.2 | — | ns |
| Pulse Height Resolution with $^{137}$Cs | | — | 8.3 | — | % |
| Gain Deviation | Long Term | — | 1.0 | — | % |
| | Short Term | — | 1.0 | — | % |
| Pulse Linearity * | 2 % Deviation | — | 160 | — | mA |
| | 5 % Deviation | — | 250 | — | mA |

**NOTE:** Measured with special voltage distribution ratios shown in the Table 2.

### Table 1: VOLTAGE DISTRIBUTION RATIO AND SUPPLY VOLTAGE

| Electrode | K | G1 | G2 | Dy1 | Dy2 | Dy3 | Dy4 | Dy5 | Dy6 | Dy7 | Dy8 | Dy9 | Dy10 | Dy11 | Dy12 | Dy13 | Dy14 | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio | 2.5 | 7.5 | 0 | 1.2 | 1.8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1.5 | 1.5 | 3 | 2.5 | |

Supply Voltage: 2000 Vdc, K: Cathode, Dy: Dynode, P: Anode, G: Grid

### Table 2: SPECIAL VOLTAGE DISTRIBUTION RATIO AND SUPPLY VOLTAGE FOR PULSE LINEARITY MEASUREMENT

| Electrode | K | G1 | G2 | Dy1 | Dy2 | Dy3 | Dy4 | Dy5 | Dy6 | Dy7 | Dy8 | Dy9 | Dy10 | Dy11 | Dy12 | Dy13 | Dy14 | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratio | 2.5 | 7.5 | 0 | 1.2 | 1.8 | 1 | 1 | 1 | 1 | 1.2 | 1.5 | 2 | 2.8 | 4 | 5.7 | 8 | 5 | |
| Capacitors in µF | | | | | | | | | | | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.04 | 0.06 | |

Supply Voltage: 2500 Vdc, K: Cathode, Dy: Dynode, P: Anode, G: Grid

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# PHOTOMULTIPLIER TUBE R1250

Figure 1: Typical Spectral Response

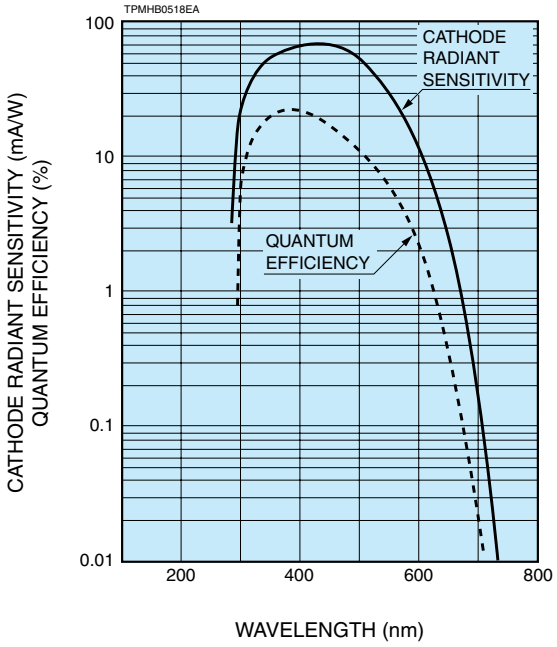



Figure 2: Typical Gain Characteristics

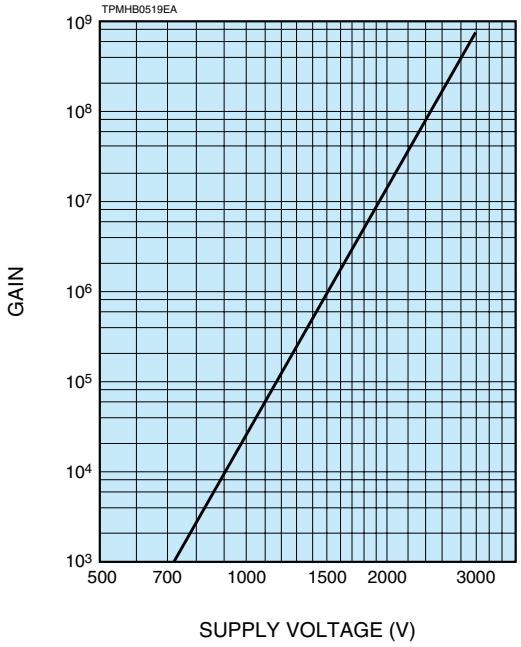
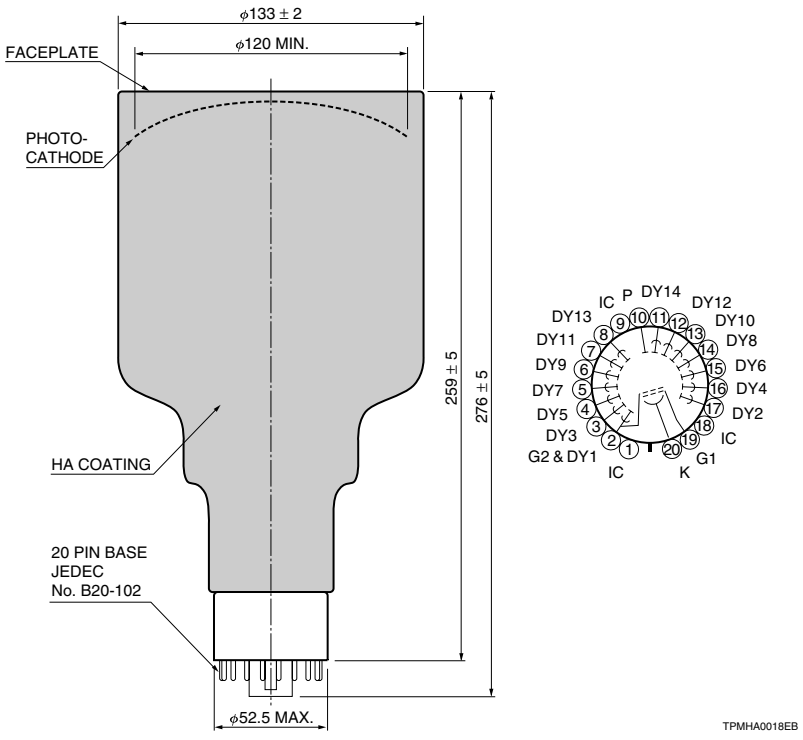
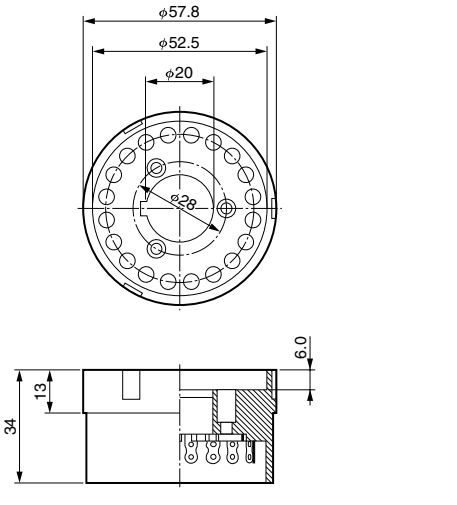



Figure 3: Dimensional Outline and Basing Diagram (Unit: mm)




**Socket E678-20B (Supplied)**





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