

FEATURES

- **High cathode sensitivity**
Quantum efficiency
 at 600 nm 20 % (Typ.)
 at 780 nm 10 % (Typ.)
 Luminous 650 $\mu\text{A/lm}$ (Typ.)
 Radiant
 at 600 nm 97 mA/W (Typ.)
 at 780 nm 63 mA/W (Typ.)
- **Wide spectral response** 185 nm to 900 nm
- **High signal to noise ratio**

APPLICATIONS

- **Biomedical analysis**
Blood analyzer, Flow cytometer, DNA sequencer
- **Environmental monitoring**
NOx analyzer
- **Spectroscopy**
Fluorescence spectrometer, Raman spectrometer,
UV-VIS spectrometer
- **Microscopy**

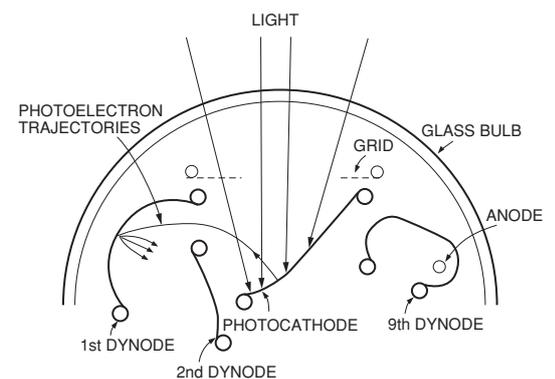


SPECIFICATIONS

GENERAL

Parameter	Description / Value	Unit	
Spectral response	185 to 900	nm	
Wavelength of maximum response	450	nm	
Photocathode	Material	Multialkali	
	Minimum effective area	8 × 24	mm
Window material	UV glass	—	
Dynode	Structure	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	—	
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)	—	

Figure 1: Electro optical structure



TPMSC0024EA

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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 600 nm	—	20	—	%
		at 780 nm	—	10	—	%
	Luminous ^(B)	620	650	—	μA/lm	
	Radiant	at 600 nm	—	97	—	mA/W
		at 780 nm	—	63	—	mA/W
	Red / White ratio ^(C)	—	0.43	—	—	
Blue sensitivity index ^(D)	—	15	—	—		
Anode sensitivity	Luminous ^(E)	1600	8500	—	A/lm	
Gain ^(E)		—	1.3 × 10 ⁷	—	—	
Anode dark current ^(F) (After 30 min storage in darkness, Supply voltage at 1 × 10 ⁶ gain)		—	2.0	10	nA	
Time response ^(F)	Anode pulse rise time ^(G)	—	2.2	—	ns	
	Electron transit time ^(H)	—	22	—	ns	
	Transit time spread (T.T.S.) ^(I)	—	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) The value is cathode output current when a blue filter (Corning CS 5-58 polished to 1/2 stock thickness) is interposed between the light source and the tube under the same condition as Note (B).
- (E) Measured with the same light source as Note (B) and with the voltage distribution ratio shown in Table 1 below.
- (F) Measured with the same supply voltage and voltage distribution ratio shown in Table 1.
- (G) 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.
- (H) 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.
- (I) 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.

Table 1: Voltage distribution ratio

Electrodes	K	Dy1	Dy2	Dy3	Dy4	Dy5	Dy6	Dy7	Dy8	Dy9	P
Distribution ratio	1	1	1	1	1	1	1	1	1	1	1

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

Figure 2: Typical spectral response

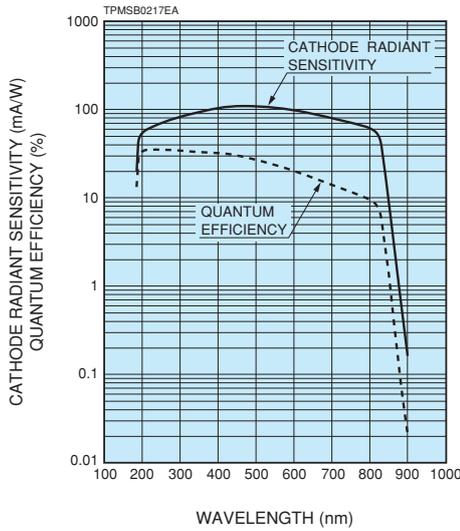


Figure 3: Typical temperature characteristics of dark current (at 1×10^6 gain, after 30 min storage in darkness)

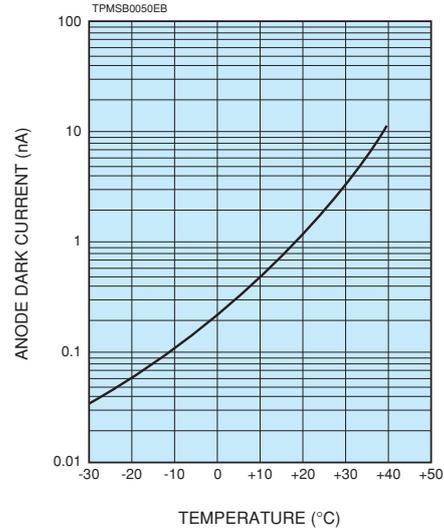


Figure 4: Anode luminous sensitivity and gain characteristics

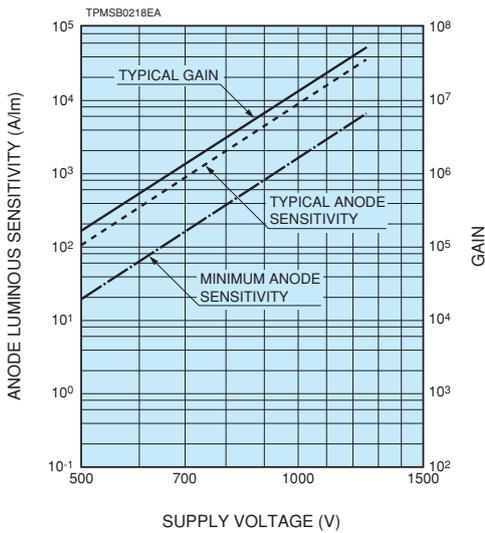


Figure 5: Typical time response

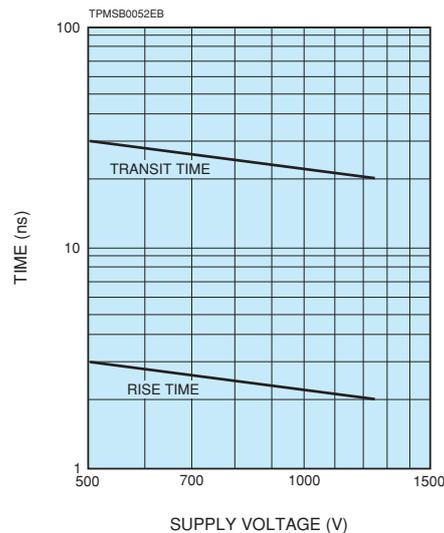
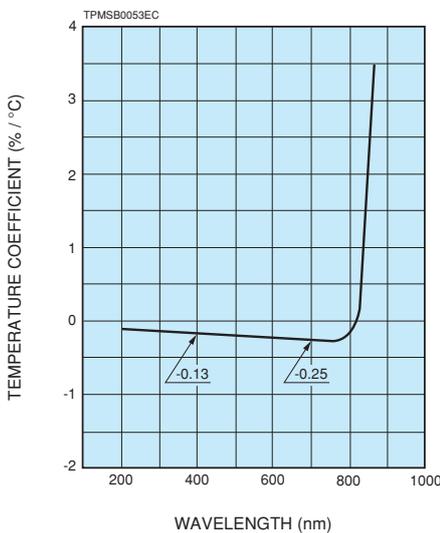


Figure 6: Typical temperature coefficient of anode sensitivity



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Figure 7: Dimensional outline and basing diagram (Unit: mm)

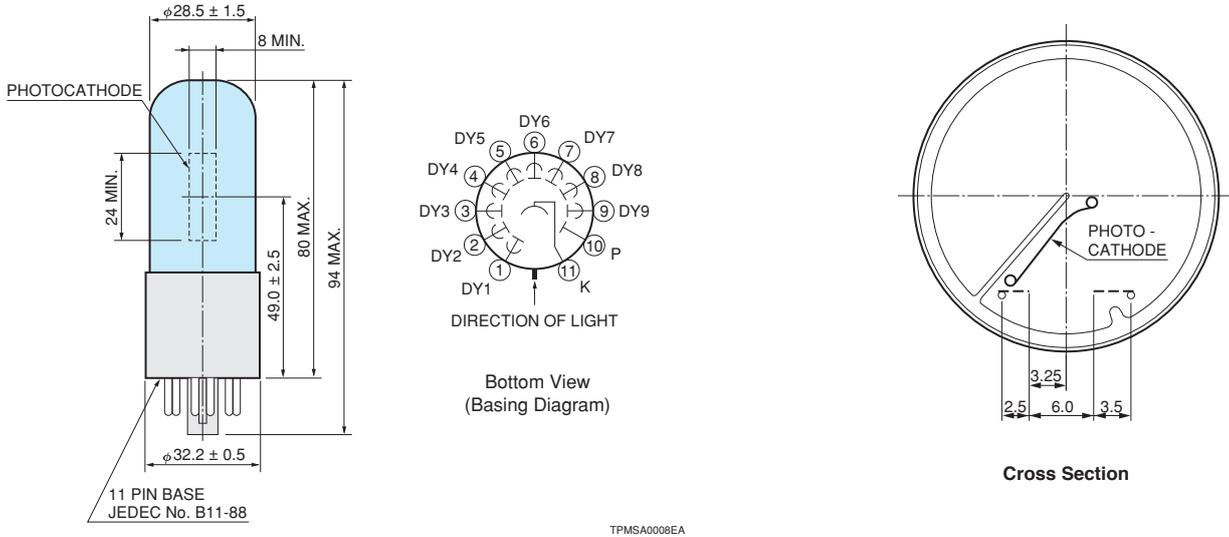
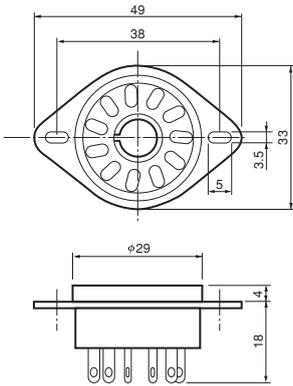
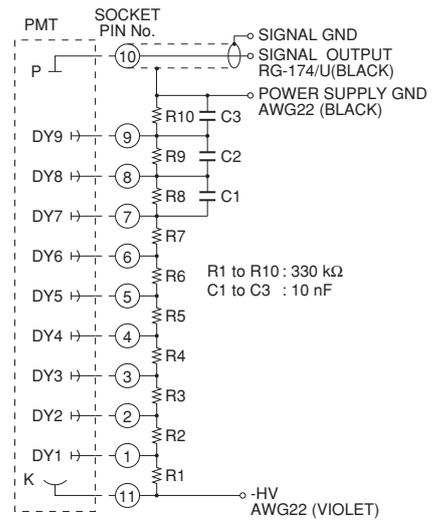
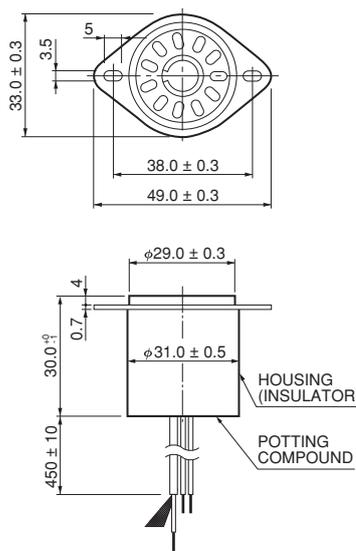


Figure 8: Accessories (Unit: mm) Sold separately

Socket E678-11A



D type socket assembly E717-63



* Hamamatsu also provides C13890 series compact high voltage power supplies and C12597-01, C8991 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.