

FEATURES

- High quantum efficiency (at 121.6 nm)
..... 26.0 % (Typ.)
- High anode sensitivity (at 121.6 nm)
..... 1.0×10^5 A/W (Typ.)
- Excellent solar blind spectral response
(Anode sensitivity ratio)
 - 121.6 nm / 200 nm 2800 (Typ.)
 - 121.6 nm / 250 nm 5500 (Typ.)
 - 121.6 nm / 300 nm 8500 (Typ.)



APPLICATIONS

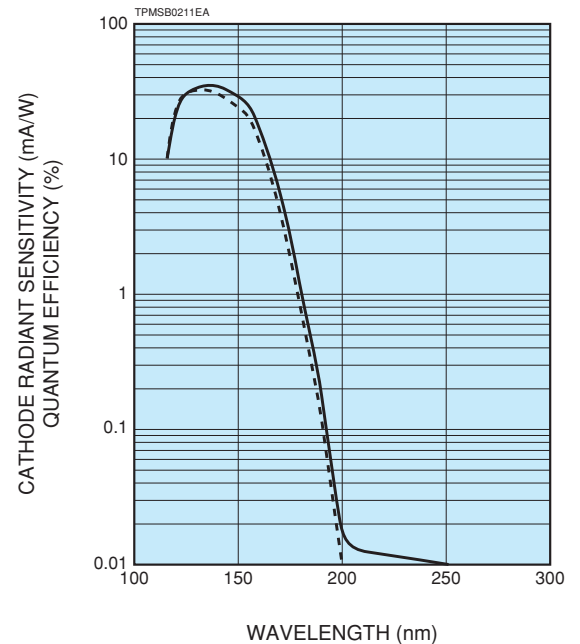
- Atomic emission spectrophotometer
- Plasma emission spectrophotometer
- VUV-UV spectrophotometer

SPECIFICATIONS

GENERAL

Parameter	Description / Value	Unit	
Spectral response	115 to 195	nm	
Wavelength of maximum response	130	nm	
Photocathode material	Cs-I	—	
Window material	MgF ₂	—	
Minimum effective area	8 × 12	mm	
Dynode	Structure	Circular-cage	—
	Number of stage	9	—
	Material	Sb-Cs	—
Direct interelectrode capacitances	Anode to dynode No.9	Approx. 4	pF
	Anode to	Approx. 6	pF
	All other electrodes		
Base	11-pin base JEDEC No. B11-88	—	
Weight	48.5	g	
Operating ambient temperature	-30 to +50	°C	
Storage temperature	-30 to +50	°C	
Suitable socket for base (sold separately)	E678-11A	—	

Figure 1: Typical spectral response



PHOTOMULTIPLIER R10454

MAXIMUM RATINGS (Absolute maximum values)

Parameter		Value	Unit
Supply voltage	Between anode and cathode	1250	V
	Between anode and last dynode	250	V
	Between successive dynodes	250	V
	Between first dynode and cathode	250	V
Average anode current ^(A)		0.1	mA

CHARACTERISTICS (at 25 °C)

Parameter			Value	Unit
Cathode sensitivity	Radiant sensitivity at 121.6 nm	Typ.	25.5	mA/W
	Quantum efficiency at 121.6 nm	Typ.	26	%
	Quantum efficiency at 133 nm (Peak)	Typ.	32.4	%
Anode radiant sensitivity at 121.6 nm ^(B)		Typ.	1.0×10^5	A/W
Gain at 1000 V		Typ.	3.9×10^6	—
Anode dark current (After 30 min storage in darkness) ^(C)			0.1	nA
ENI (Equivalent noise input) at 121.6 nm ^(D)			1.12×10^{-16}	W
Time response	Anode pulse rise time ^(E)		2.2	ns
	Electron transit time ^(F)		22	ns
	Transit time spread ^(G)		1.2	ns
Anode sensitivity ratio	121.6 nm / 200 nm	Typ.	2800	—
	121.6 nm / 250 nm	Typ.	5500	—
	121.6 nm / 300 nm	Typ.	8500	—

NOTES

(A): Averaged over any interval of 30 seconds maximum.

(B): Measured with the voltage distribution ratio shown in Table 1 below.

Table 1: Voltage distribution ratio

Electrode	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

(C): Measured with the same supply voltage and voltage distribution ratio as Note B after removal of light.

(D): ENI is an indication of the photon-limited signal-to-noise ratio. It refers to the amount of light in watts to produce a signal-to-noise ratio of unity in the output of a photomultiplier tube.

$$ENI = \frac{\sqrt{2q \cdot I_{db} \cdot g \cdot \Delta f}}{S}$$

where q = Electronic charge (1.60×10^{-19} coulomb).
 I_{db} = Anode dark current (after 30 minutes storage) in amperes.
 g = Gain.
 Δf = Bandwidth of the system in hertz. 1 hertz is used.
 S = Anode radiant sensitivity in amperes per watt at the wavelength of peak response.

(E): 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.

(F): 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.

(G): 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 2: Typical spectral response

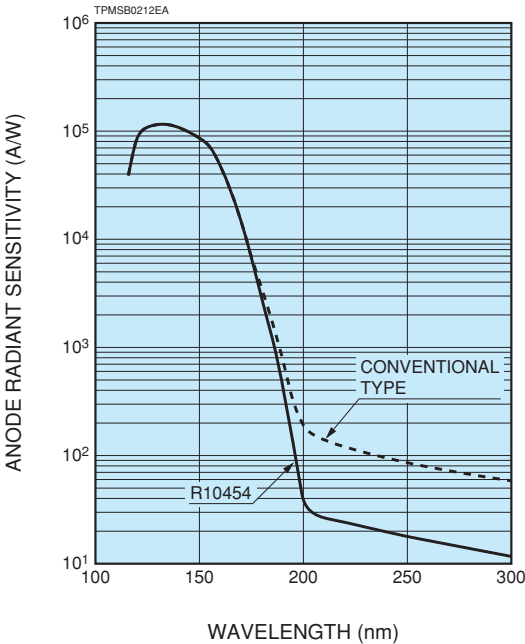


Figure 3: Typical gain and anode radiant sensitivity

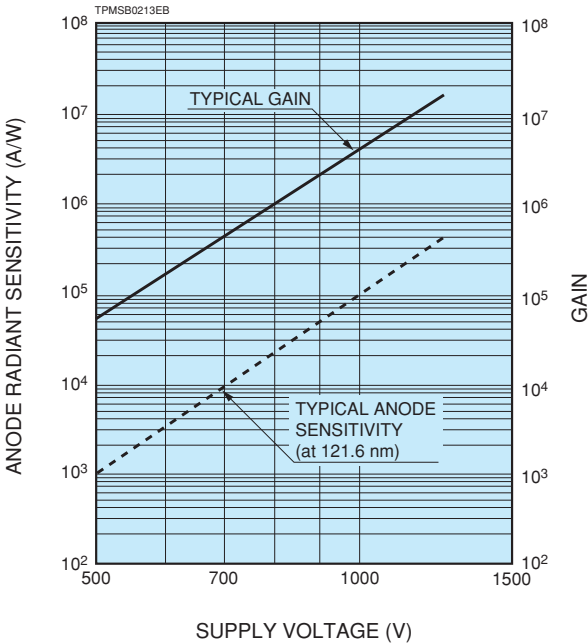
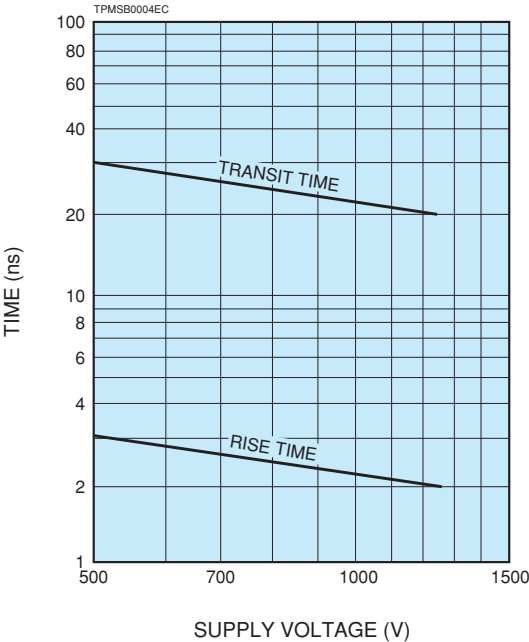
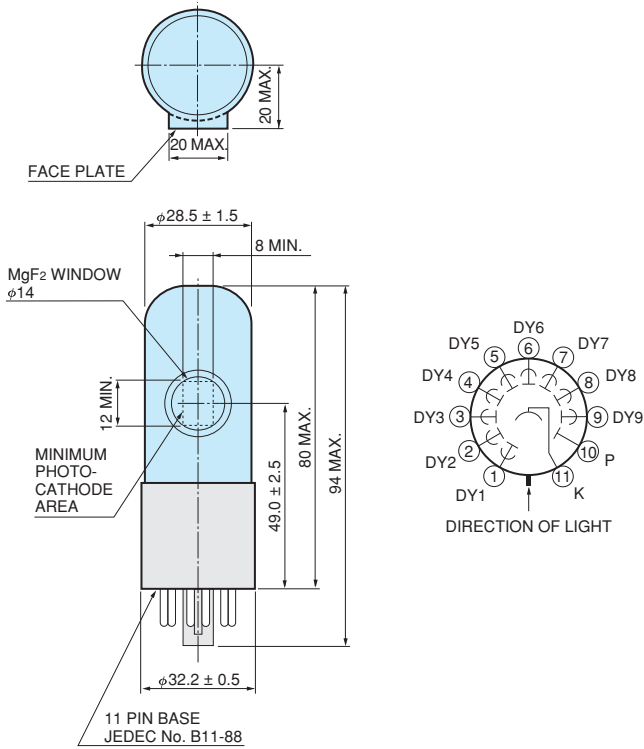


Figure 4: Typical time response



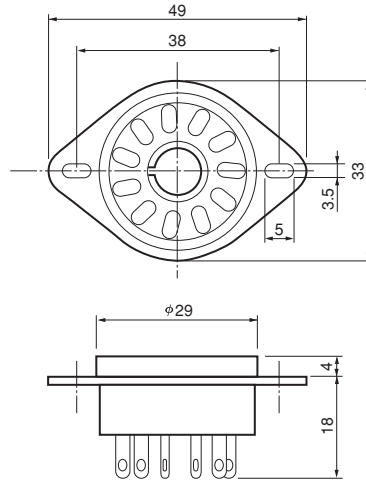
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Figure 5: Dimensional outline and basing diagram (Unit: mm)



TPMSA0042EB

Figure 6: Socket E678-11A (Sold separately) (Unit: mm)



TACCA0064EA

* E678-11A cannot be used in the vacuum.

NOTE: There is a 2 millimeter diameter hole to exhaust inner air on the plastic base.

Handling precautions

- Operate below 10^{-1} pascal condition or atmospheric pressure.

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

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