

**Super Compact, 13mm (1/2 Inch) Diameter, 9-stage, Side-on Type  
R3810: Sb-Cs (185 to 650nm), R3811: Multialkali (185 to 850nm)**

### FEATURES

- **Super Compact:** 13mm (1/2 inch) diameter  
17mm seated length
- **High Sensitivity**
- **Low Dark Current**

### APPLICATIONS

- **General Industrial Use**
- **Exposuremeter for Microscope**
- **Environmental Measurements**
  - Dust Counter
  - Turbidimeter, etc.
- **Emission Spectroscopy**
  - Fluorescence Spectrophotometer, etc.



Recently, because of technology progress and requirements for cost reduction and high quality control, measurement systems have been designed for smaller size and on-line operation.

Hamamatsu offers super-compact 13mm (1/2 inch) diameter side-on photomultiplier tubes with the seated length as short as 17mm.

In spite of such compactness, these tubes have a 9-stage dynode that offers high gain in the order of  $10^6$ .

They are optimal for applications where small detectors are required such a spectroscopy, biotechnology, medicine and general industries.

# SUPER COMPACT PHOTOMULTIPLIER TUBES R3810, R3811

## SPECIFICATIONS

### GENERAL

Parameter		R3810	R3811	Unit
Spectral Response		185 to 650	185 to 850	nm
Wavelength of Maximum Response		340	530	nm
Photocathode	Material	Sb-Cs	Multialkali	—
	Minimum Effective Area	3 × 4		mm
Window Material		UV glass		—
Dynode	Structure	Circular-cage		—
	Number of Stages	9		—
Direct Interelectrode Capacitances	Anode to Last Dynode	1.7		pF (Max.)
	Anode to All Other Electrodes	2.0		pF (Max.)
Base		11-pin glass base		—
Weight		3		g
Suitable Socket		E678-11H (supplied)		—
Suitable Socket Assemblies		E850-12, E850-13 (option)		—

### MAXIMUM RATINGS (Absolute Maximum Values)

Parameter		Value	Unit
Supply Voltage	Between Anode and Cathode	1250	Vdc
	Between Anode and Last Dynode	150	Vdc
Average Anode Current		0.01	mA
Ambient Temperature		-80 to +50	°C

### CHARACTERISTICS (at 25°C)

Parameter		R3810			R3811			Unit	
		Min.	Typ.	Max.	Min.	Typ.	Max.		
Cathode Sensitivity	Luminous (2856K)	20	40	—	50	150	—	μA/lm	
	Radiant	at 400nm	—	42	—	—	34	—	mA/W
		at 633nm	—	1.5	—	—	31	—	
	Quantum Efficiency	at 400nm	—	13	—	—	10	—	%
		at 633nm	—	0.29	—	—	6.1	—	
Red/White Ratio (R-68)		—	—	—	—	0.15	—	—	
Anode Sensitivity	Luminous (2856K)	50	300	—	50	200	—	A/lm	
	Radiant	at 400nm	—	3.2 × 10 <sup>5</sup>	—	—	4.4 × 10 <sup>4</sup>	—	A/W
		at 633nm	—	1.1 × 10 <sup>4</sup>	—	—	4.0 × 10 <sup>4</sup>	—	
Gain		—	7.5 × 10 <sup>6</sup>	—	—	1.3 × 10 <sup>6</sup>	—	—	
Anode Dark Current *		—	0.5	5	—	1	10	nA	
Time Response	Anode Pulse Rise Time	—	1.4	—	—	1.4	—	ns	
	Electron Transit Time	—	15	—	—	15	—	ns	
	Transit Time Spread	—	750	—	—	750	—	ps	

\* After 30min. storage in darkness

### VOLTAGE DISTRIBUTION RATIO AND SUPPLY VOLTAGE

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: 1000Vdc, K: Cathode, Dy: Dynode, P: Anode

Figure 1: Typical Spectral Response

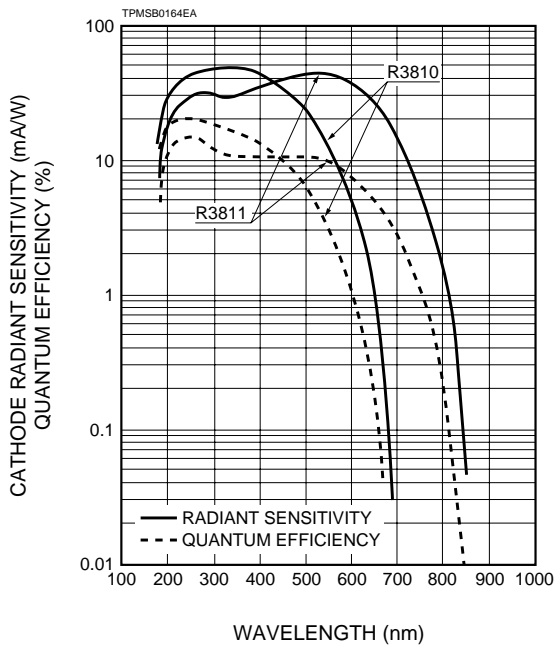
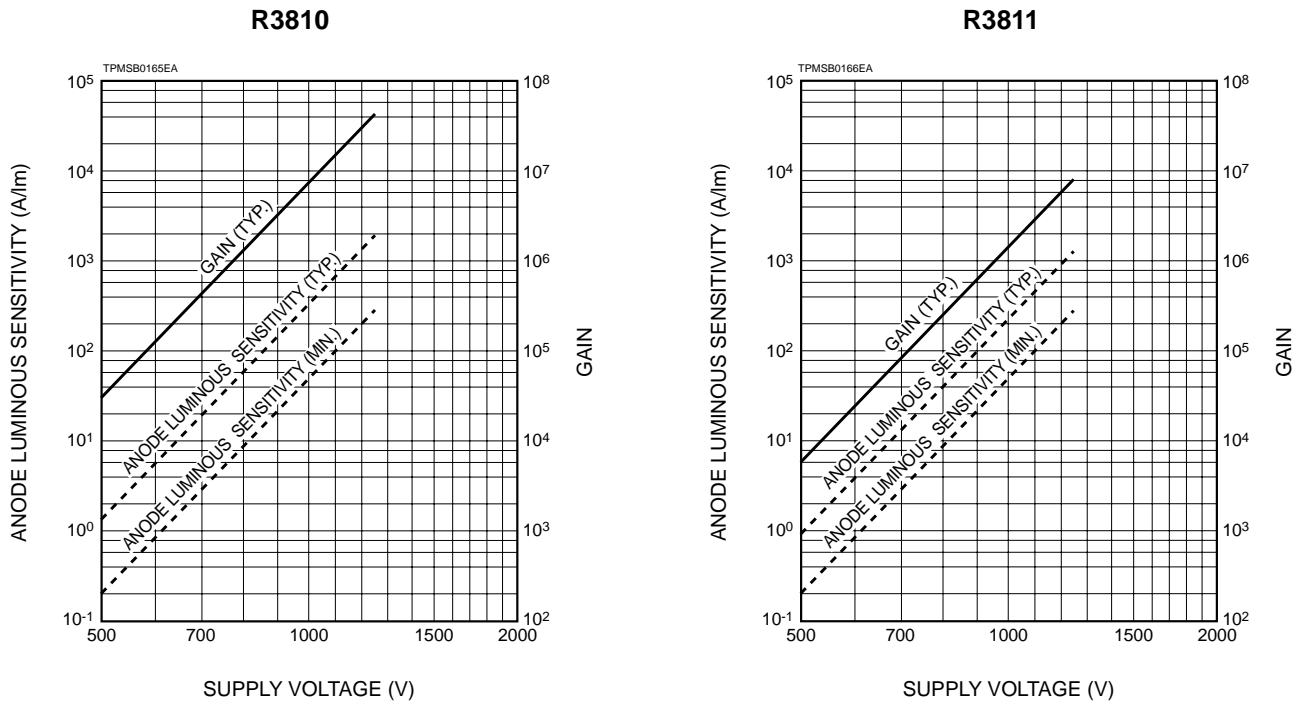
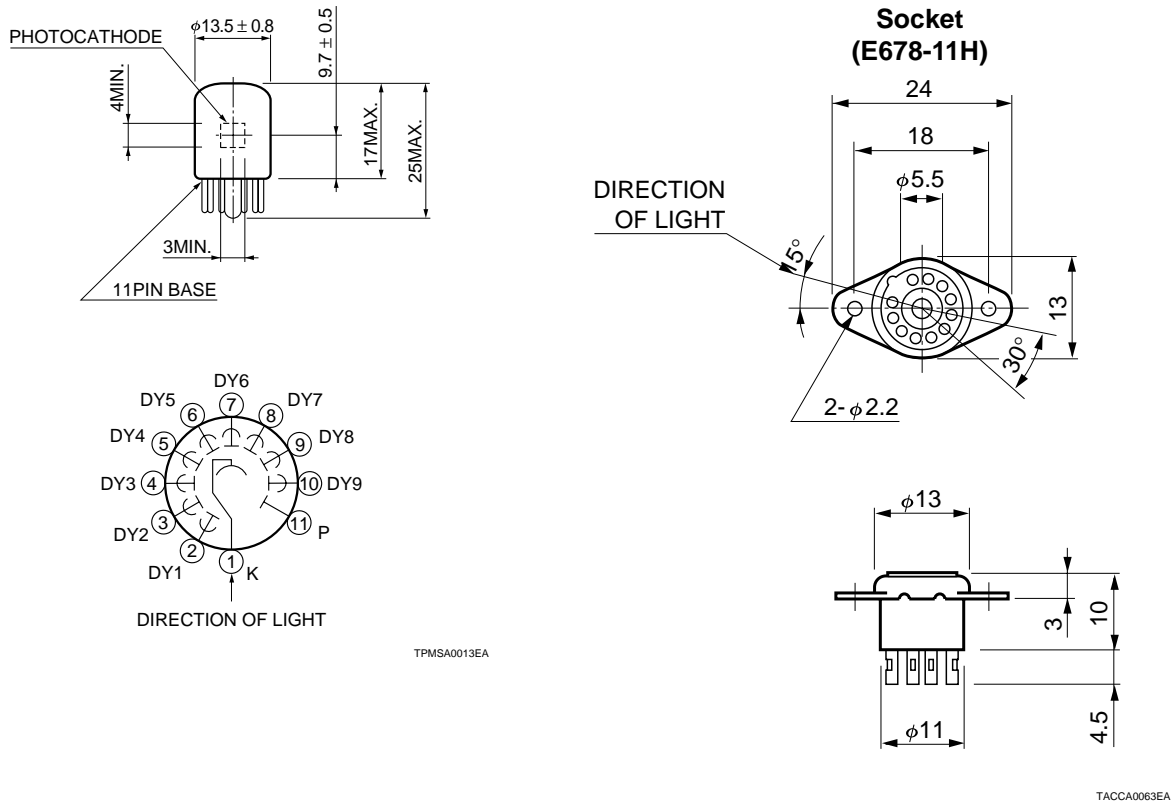


Figure 2: Typical Anode Luminous Sensitivity and Gain Characteristics



# SUPER COMPACT PHOTOMULTIPLIER TUBES R3810, R3811

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



## HAMAMATSU

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