PHOTOSENSOR MODULES
H5773/H5783/H5784 SERIES

High Sensitivity, Wide Dynamic Range
Fast Time Response

The H5773/H5783/H5784 series are light sensor modules including a compact photomultiplier tube (METAL PACKAGE PMT) and operating power supply. They feature low voltage operation (+11.5V to +15.5V for H5773/H5783 series and ±11.5V to ±15.5V for H5784 series) and low power consumption (Approx. 180mW). Advantages include high sensitivity, wide dynamic range and fast time response. These are featured by the PMT and the Cockcroft-Walton high voltage power supply. The H5773 series are on-board types which facilitates mounting directly on a printed circuit board and the H5783 series have a cable output. The H5784 series have a low noise amplifier with a cable output. These versions accept direct light input or an optical fiber with the optional fiber adaptor E5776.

FEATURES
● Low Power Consumption
● Low Voltage Drive
● Easy to Use
● High Sensitivity
● Wide Dynamic Range
● Fast Time Response

APPLICATIONS
● O/E Converter
● Ultra Low Light Level Detection
● Portable Optical Detection Instrument

Figure 1: Typical Spectral Response

Subject to local technical requirements and regulations, availability of products included in this promotional material may vary. Please consult with our sales office. Information furnished by HAMAMATSU is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omissions. Specifications are subject to change without notice. No patent rights are granted to any of the circuits described herein. ©1999 Hamamatsu Photonics K.K.
STANDARD PHOTOSENSORS

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Spectral Response</th>
<th>Lead Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>H5773</td>
<td>300 to 650 nm</td>
<td>On-board Type</td>
</tr>
<tr>
<td></td>
<td>-01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>300 to 820 nm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-03</td>
<td></td>
</tr>
<tr>
<td></td>
<td>185 to 650 nm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-04</td>
<td></td>
</tr>
<tr>
<td></td>
<td>185 to 820 nm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-06*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>185 to 650 nm</td>
<td></td>
</tr>
<tr>
<td>H5783</td>
<td>300 to 650 nm</td>
<td>Cable Out Type</td>
</tr>
<tr>
<td></td>
<td>-01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>300 to 820 nm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-03</td>
<td></td>
</tr>
<tr>
<td></td>
<td>185 to 650 nm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-04</td>
<td></td>
</tr>
<tr>
<td></td>
<td>185 to 820 nm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-06*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>185 to 650 nm</td>
<td></td>
</tr>
</tbody>
</table>

*) Suffix -06 has higher sensitivity at less than 300nm in comparison with suffix -03.

SPECIFICATIONS

GENERAL

<table>
<thead>
<tr>
<th>Parameter</th>
<th>H5773 Series</th>
<th>H5783 Series</th>
<th>H5784 Series</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage Range</td>
<td>Vcc &amp; Vee</td>
<td>+11.5 to +15.5</td>
<td>±11.5 to ±15.5</td>
<td>V</td>
</tr>
<tr>
<td>Supply Current Requirement</td>
<td></td>
<td>9</td>
<td>9 / 1²</td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>12 / 1²</td>
<td>mA</td>
</tr>
<tr>
<td>Supply Adjustable Range (Relative Sensitivity)</td>
<td></td>
<td>1 : 10¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Settling Time (Sensitivity Control)</td>
<td></td>
<td>2</td>
<td>s</td>
<td></td>
</tr>
<tr>
<td>Effective Area</td>
<td></td>
<td>8</td>
<td>mm dia.</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td>Approx. 50</td>
<td>Approx. 80</td>
<td>g</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Approx. 100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹) Stabilized time in the control voltage adjustment from +1.0V to +0.5V.
²) "Minus Voltage" requires 1mA current.

MAXIMUM RATINGS (Absolute Maximum Values)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>H5773 Series</th>
<th>H5783 Series</th>
<th>H5784 Series</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>Vcc &amp; Vee</td>
<td>+18</td>
<td>±18</td>
<td>V</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td></td>
<td>+5 to +50</td>
<td>±18</td>
<td>C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td></td>
<td>-20 to +50</td>
<td>±18</td>
<td>C</td>
</tr>
<tr>
<td>Output Current / Output Voltage²</td>
<td>Vcontrol</td>
<td>100 μA</td>
<td>10V</td>
<td></td>
</tr>
<tr>
<td>Control Voltage</td>
<td></td>
<td>+1.0</td>
<td>V</td>
<td></td>
</tr>
</tbody>
</table>

¹) Averaged over any interval of 30 seconds maximum.
²) Applying the maximum value for more than 30 seconds continuously may cause a damage.

H5773/H5783 SERIES CHARACTERISTICS (at 25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>H5773/H5783</th>
<th>-01, -04</th>
<th>-03, -06</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiant Sensitivity (at 420nm)</td>
<td>21</td>
<td>15</td>
<td>21</td>
<td>μA/nW</td>
</tr>
<tr>
<td>Dark Current</td>
<td>0.5</td>
<td>1</td>
<td>0.5</td>
<td>nA</td>
</tr>
<tr>
<td>Induced Ripple in Signal</td>
<td></td>
<td>1.1</td>
<td></td>
<td>mVp-p</td>
</tr>
<tr>
<td>(Measured across 1MΩ/22pF load for H5773/H5783 Series)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Response</td>
<td></td>
<td>0.65</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Recommended Control Voltage Range</td>
<td>Vcontrol</td>
<td>+0.25 to +1.0</td>
<td></td>
<td>V</td>
</tr>
</tbody>
</table>

H5784 SERIES CHARACTERISTICS (at 25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>H5784</th>
<th>-01, -04</th>
<th>-03, -06</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiant Sensitivity (at 420nm)</td>
<td>21</td>
<td>15</td>
<td>21</td>
<td>V/nW</td>
</tr>
<tr>
<td>Output Offset</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>mV</td>
</tr>
<tr>
<td>Induced Ripple in Signal</td>
<td></td>
<td>2</td>
<td>mVp-p</td>
<td></td>
</tr>
<tr>
<td>(Measured across 1MΩ/22pF load for H5784 Series)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current to Voltage Conversion Factor</td>
<td>1</td>
<td></td>
<td>V / μA</td>
<td></td>
</tr>
<tr>
<td>Frequency Bandwidth</td>
<td>DC to 20</td>
<td></td>
<td>kHz</td>
<td></td>
</tr>
<tr>
<td>Recommended Control Voltage Range</td>
<td>Vcontrol</td>
<td>+0.25 to +1.0</td>
<td></td>
<td>V</td>
</tr>
</tbody>
</table>

@ Control voltage +0.8V
**Figure 2: Typical Sensitivity Adjustable Characteristics**

**H5773 / H5783 SERIES**

![Graph showing sensitivity characteristics at 420nm.]

**H5784 SERIES**

![Graph showing sensitivity characteristics at 420nm.]

---

**Figure 3: Module Functional Diagram**

[Diagram showing a metal package PMT with connections to amplifier, power supply circuit, voltage regulator, and signal output connections for Vcc input, GND, Vref output, and Vcontrol input.]

---

**Figure 4: Wiring Examples For Sensitivity Adjustment**

**VOLTAGE PROGRAMMING**

- **H5773/H5783/H5784 SERIES**
  - Vcc Input
  - GND
  - Vref Output
  - Vcontrol Input

Adjust the control voltage (Vcontrol) to set the output. Insulate but float Vref output.

*Note: DC -11.5 to -15.5V power supply is also necessary for Vee of H5784 series.*

**RESISTANCE PROGRAMMING**

- **H5773/H5783/H5784 SERIES**
  - Vcc Input
  - GND
  - Vref Output
  - Vcontrol Input

Monitor Point Potentiometer (10kΩ)

Adjust the potentiometer to set the output.

*It is recommended to monitor the control voltage by a multimeter and adjust the voltage within maximum +1.0V.*

---

TACCO0044EA

TACCO0030EA
Figure 5: Dimensional Outlines (Unit: mm)

H5773 SERIES

Pin Connection

H5773 / H5783 / H5784 Series
Note: Suffix -06 type has the depth of 0±0.2mm for the detector window position instead of 1.5±0.2mm for the other types.

E5776 Optical Fiber Adapter (FC Type) OPTION

Reference:
[Technical information]
METAL PACKAGE PHOTOMULTIPLIER TUBES R5600 SERIES
and PHOTOSENSOR MODULES (Cat. No. TPMH9001E05)

[Individual Data Sheet]
METAL PACKAGE PHOTOMULTIPLIER TUBES R5600 SERIES
(Cat. No. TPMH1066E08)

For the other adapters such as SMA, ST and SC types please consult our sales office.

PATENT PENDING: JAPAN 12, USA 8, EUROPE 9

HAMAMATSU PHOTONICS K.K., Electron Tube Center
314-5, Shemokanzo, Toyooka-ku, Iwata-gun, Shizuoka-ken, 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. 08807-0610, U.S.A., Telephone: (1)908-231-0660, Fax: (1)908-231-1218

Germany, Hamamatsu Photonics Deutschland GmbH, Am berganger 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-2058

France, Hamamatsu Photonics France S.A.R.L., 8-1 Rue du Saule Tréju, 92380 Massy Cedex, France, Telephone: (33)1.69.95.71.00, Fax: (33)1.69.95.71.10

United Kingdom, Hamamatsu Photonics UK Limited, Lough Point, 2 Gibraltar Way, Windmill Hill, Enfield, Middlesex EN2 7A, United Kingdom, Telephone: (44)181-367-0960, Fax: (44)181-367-6394

North Europe, Hamamatsu Photonics Nordic AB, Grönlandsgatan 17, SE-171 41 SOLNA, Sweden, Telephone: (46)8-506-031-00, Fax: (46)8-506-031-01

Italy, Hamamatsu Photonics Italia S.R.L., Strada della Mosa, 1/E, 20020 Arona (Milano), Italy, Telephone: (39)02-931 733, Fax: (39)02-926 81 741