Low-voltage operation photo IC
S5767, S5768

Operation at low voltage from 2.2 V

S5767 and S5768 are digital output photo ICs consisting of a photodiode, an amplifier, a schmitt trigger circuit and an output transistor, all integrated in a single chip and molded into a clear plastic package.

Features

- Low-voltage operation: 2.2 to 7 V
- Clear plastic package with lens
- Low current consumption
- Transistor output with built-in pull-up resistor
- S5767: “H” level output at light input
  S5768: “L” level output at light input

Applications

- Low-speed optical links
- Rotary encoders

■ Absolute maximum ratings (Ta=25 °C)

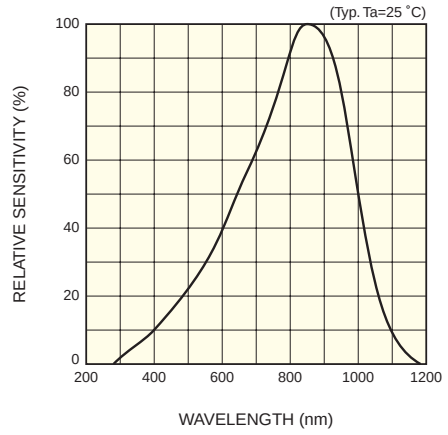
Parameter	Symbol	Value	Unit
Supply voltage	Vcc	-0.5 to +7	V
Output voltage	Vo	-0.5 to Vcc	V
Low level output current	Io	8	mA
Power dissipation	P	250	mW
Operating temperature	Topr	-25 to +85	°C
Storage temperature	Tstg	-40 to +100	°C
Soldering	-	260 °C, 3 s, at least 2.5 mm away from package surface	-

■ Electrical and optical characteristics (Ta=25 °C, Vcc=5 V, light source: λp=660 nm LED, unless otherwise noted)

Parameter	Symbol	Condition	S5767			S5768			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Supply voltage	Vcc		2.2	-	7	2.2	-	7	V
Low level output voltage	V_{OL}	I_{OL}=4 mA *1	-	0.1	0.4	-	0.1	0.4	V
High level output voltage	V_{OH}	*2	4.9	-	-	4.9	-	-	V
Low level current consumption	I_{CCL}	*1	-	1.4	3	-	1.4	3	mA
High level current consumption	I_{CCH}	*2	-	1.2	3	-	1.2	3	mA
L→H Threshold illuminance	E_{LH}		-	1	3	-	-	-	μW/mm²
H→L Threshold illuminance	E_{HL}		-	-	-	-	1	3	μW/mm²
Hysterisis	-	*3	-	0.85	-	-	0.9	-	-
L→H Propagation delay time	t_{PLH}	3 μW/mm² *4	-	1	5	-	1.5	8	μs
H→L Propagation delay time	t_{PHL}		-	1.5	8	-	1	5	μs
Peak sensitivity wavelength	λp		-	850	-	-	850	-	nm
Rise time	tr	3 μW/mm² *4	-	0.03	-	-	0.03	-	μs
Fall time	tf		-	0.07	-	-	0.07	-	μs

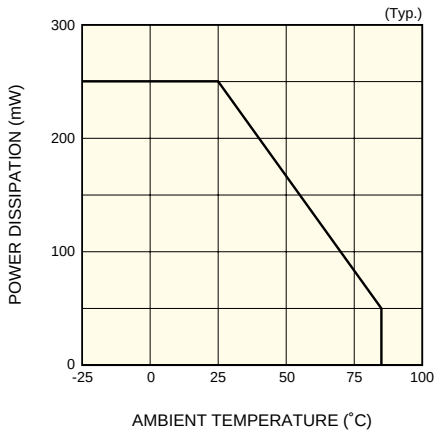
*1: S5767: E (illuminance) =0 μW/mm², S5768: E=3 μW/mm²
*2: S5767: E=3 μW/mm², S5768: E=0 μW/mm²
*3: S5767: E_{HL}/E_{LH}, S5768: E_{LH}/E_{HL}
*4: S5767: R_L=2.2 kΩ, S5768: R_L=2.2 kΩ

■ Spectral response



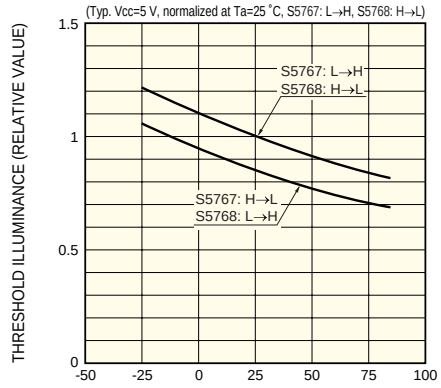
KPICB0027EA

■ Power dissipation vs. ambient temperature



KPICB0024EA

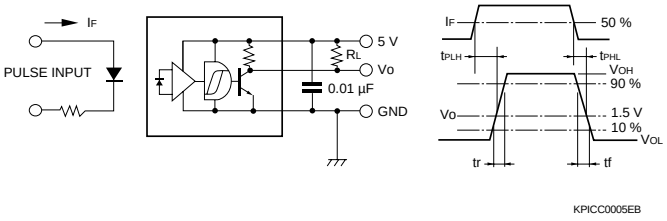
■ Threshold illuminance vs. ambient temperature



KPICB0029EA

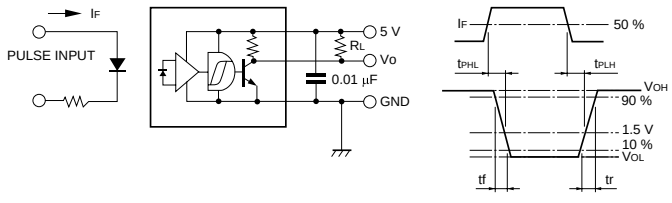
■ Response time measurement circuit

S5767



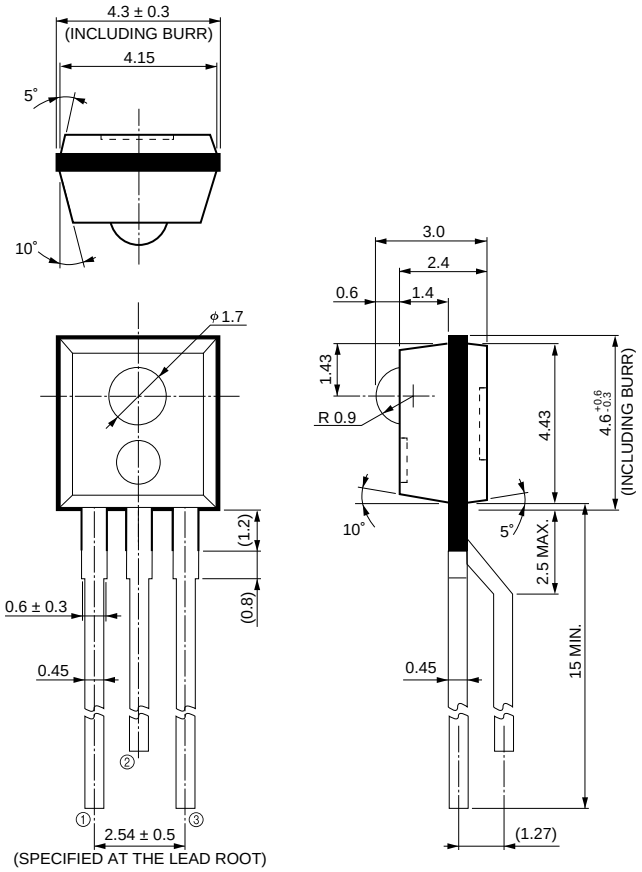
KPICC0005EB

S5768



KPICC0038EA

■ Dimensional outline (unit: mm)



(SPECIFIED AT THE LEAD ROOT)

① GND
② Vo
③ Vcc

Tolerance unless otherwise noted: ±0.2, ±2˚
Shaded area indicates burr.
Values in parentheses are not guaranteed, but for reference.

KPICA0024EA

HAMAMATSU PHOTONICS K.K., Solid State Division
1126-1 Ichino-cho, Hamamatsu City, 435-8558 Japan, Telephone: (81) 053-434-3311, Fax: (81) 053-434-5184, http://www.hamamatsu.com
U.S.A.: Hamamatsu Corporation: 360 Foothill Road, P.O.Box 6910, Bridgewater, N.J. 08807-0910, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218
Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 08152-3750, Fax: (49) 08152-2658
France: Hamamatsu Photonics France S.A.R.L.: 8, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: 33-(1) 69 53 71 00, Fax: 33-(1) 69 53 71 10
United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777
North Europe: Hamamatsu Photonics Norden AB: Smidesvägen 12, SE-171 41 Solna, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01
Italy: Hamamatsu Photonics Italia S.R.L.: Strada della Moia, 1/E, 20020 Arese, (Milano), Italy, Telephone: (39) 02-935-81-733, Fax: (39) 02-935-81-741

Cat. No. KPIC1037E02
Jul. 2003 DN