

# Photo IC for power monitor

## S8715

Provides high-speed output based on external reference voltage



S8715 is a photo IC having a high-speed amplifier that converts the photocurrent generated by input light into a voltage based on the external Vref (reference voltage) and amplifies the voltage. S8715 contains a PIN photodiode specifically designed for laser power monitors to obtain good response waveforms with no trailing tail. The amplifier gain can be adjusted by changing a feedback resistor Rf externally connected to the inverting amplifier.

### Features

- High-speed response
- Analog output  
(Photodiode + current-to-voltage conversion amplifier + inverting amplifier)

### Applications

- Laser power monitors for CD-R/RW pickups

### ■ Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit
Supply voltage	Vcc	-0.5 to +7	V
Output current	Io	2	mA
Power dissipation *1	P	300	mW
Operating temperature	Topr	-20 to +70	°C
Storage temperature	Tstg	-40 to +80	°C
Soldering	-	230 °C, 5 s	-

\*1: Derate power dissipation at a rate of -4 mW/°C above Ta=25 °C

### ■ Recommended operating conditions

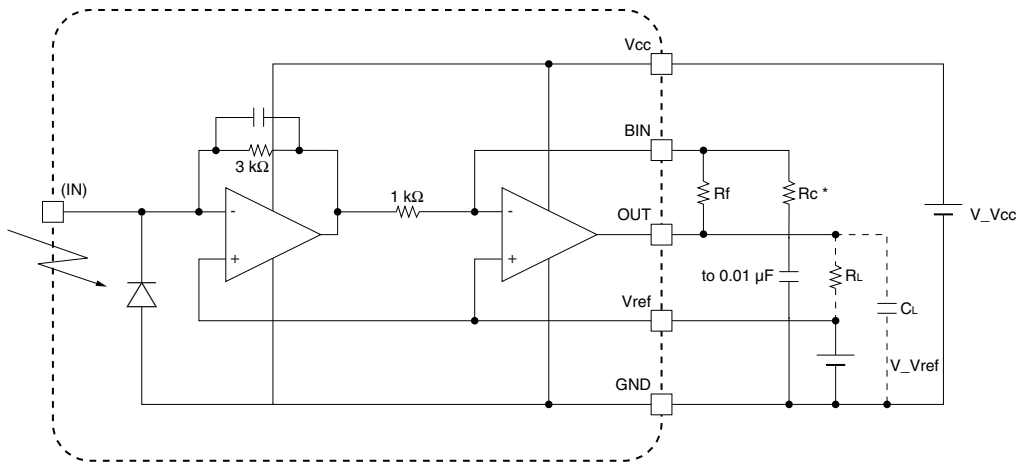
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operation supply voltage	Vcc		4.5	5	5.5	V
Reference voltage	Vref	Ta > 0 °C	2.6	2.8	Vcc-1.3	V

### ■ Electrical and optical characteristics (Ta=25 °C, Vcc=5 V, Vref=2.8 V, λ=780 nm, Rf=2 kΩ \*2)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photo sensitivity	S	Photodiode, λ=780 nm	-	0.45	-	AW
Photo sensitivity	ST	Photodiode + amp, λ=780 nm	-0.50	-0.56	-0.62	V/(mW/mm <sup>2</sup> )
Current consumption	Icc	No input	-	13	20	mA
Output offset voltage	Voff	No input	-10	0	+10	mV
Output offset voltage drift	ΔVoff	Entire Topr range	-2	0	+2	mV
Response time	tr, tf	Output amplitude: 2 V	-	7	-	ns
Settling time	ts	Output amplitude: 2 V Rise: 1 %	-	20	-	ns
Minimum output voltage	Vo min	Output amplitude < 2 V	-	-	0.5	V

\*2: Bypass capacitors (0.1 μF ceramic capacitor) have to be connected between Vcc and GND and also between Vref and GND within 7 mm from the wire lead.

■ IC block diagram and external connection

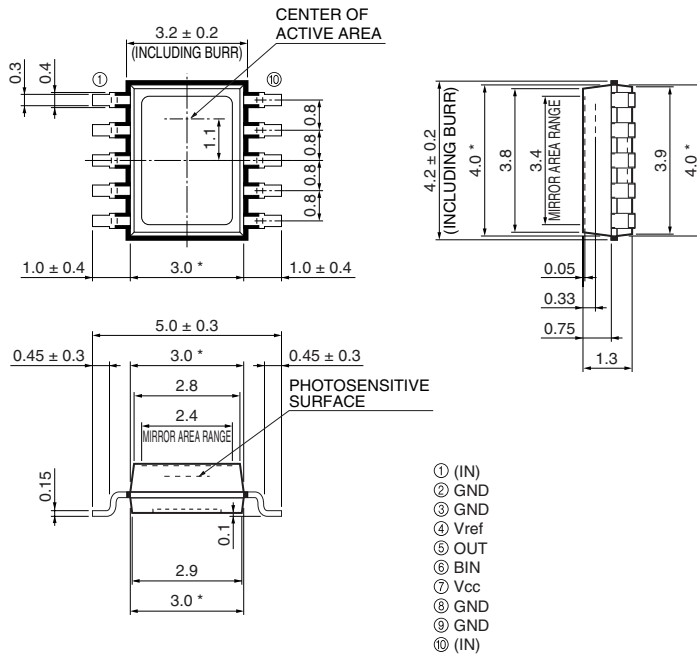


Rf: Inverting amplifier feedback resistance (1.2 kΩ to 3.9 kΩ), Rc: Phase-compensation resistance, RL: Load resistance, CL: Load capacitance

\*Rc is used for phase-compensating the second stage amplifier. Adjust this resistance to obtain an optimum response for the middle value of Rf.

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■ Dimensional outline (unit: mm)



Tolerance unless otherwise noted:  $\pm 0.1$ ,  $\pm 2^\circ$   
 Shaded area indicates burr.  
 Chip position accuracy with respect to the package dimensions marked \*  
 $X \leq \pm 0.2$ ,  $Y \leq \pm 0.2$

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