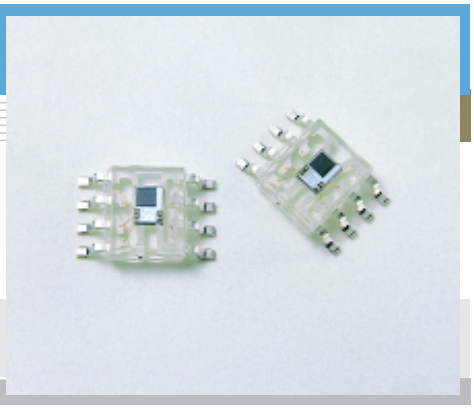
Photo IC with op amplifier
S7765



Monolithic photo IC integrated with photodiode and op amp

S7765 photo IC consists of a photodiode and an op amp for converting the photodiode output current into a voltage with ground as reference level. By short-circuiting the internal resistor terminal (RF) to the output terminal (OUT), the internal resistor (3 MΩ Typ.) can be used for current-to-voltage conversion. An inverted input terminal (IN) for the op amp is also provided with an external resistor or non-linear device for current-to-voltage conversion.

Features

- Peak sensitivity wavelength: 820 nm
- Photodiode (1 × 1 mm active area) and op amp are integrated onto the same chip
- Photo sensitivity: 1.2 V/μW (when internal resistor is used)
- Small plastic package (4.8 × 4.0 mm)

Applications

- Various photometric applications

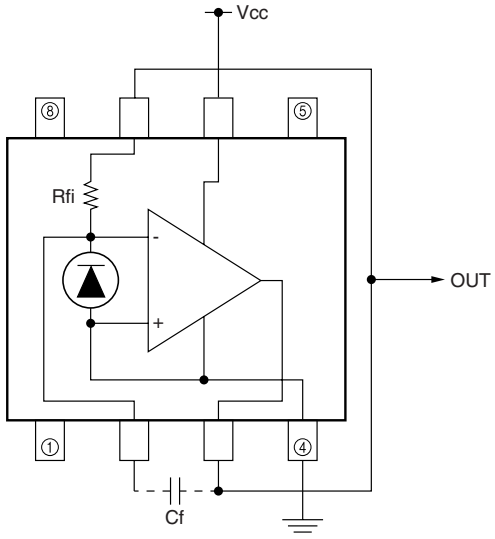
■ Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit
Supply voltage	Vcc	-0.3 to 7	V
Other terminal voltage	Vetc	Do not apply a voltage.	V
Power dissipation	P	150	mW
Operating temperature	Topr	-30 to +80	°C
Storage temperature	Tstg	-40 to +85	°C

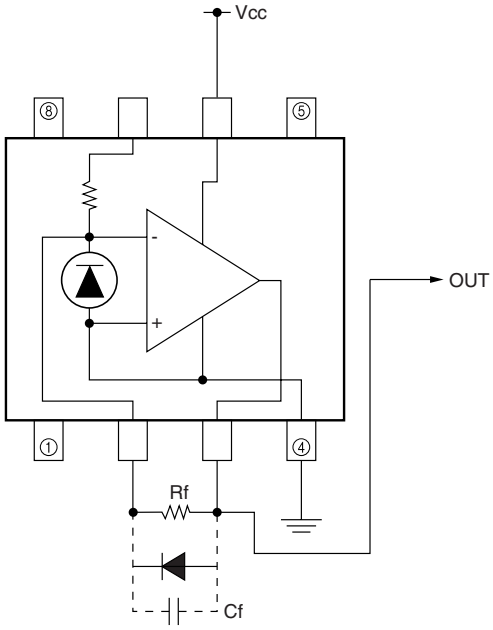
■ Electrical and optical characteristics (Ta=25 °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ		-	500 to 980	-	nm
Peak sensitivity wavelength	λp		-	820	-	nm
Supply voltage	Vcc		4.5	-	6.5	V
Current consumption	Icc		-	1	3	mA
Internal shunt resistance	Rfi		2.4	3	3.6	MΩ
Photo sensitivity	S	λ=820 nm, Rf=Rfi	0.84	1.2	1.56	V/μW
Output offset voltage	Vos		-10	-	10	mV
Output noise voltage	Vn	Rf=Rfi	-	200	-	μVrms/Hz$^{1/2}$
Maximum output voltage	Vomax		-	Vcc - 1.0	-	V
Minimum output voltage	Vomin		-10	0	10	mV
Gain bandwidth	GB		-	1	-	MHz
Cut-off frequency 1	fc1	Vcc=5 V, Rf=Rfi, Cf=10 pF	-	5	-	kHz
Cut-off frequency 2	fc2	Vcc=5 V, Rf=100 kΩ, Cf=51 pF	-	30	-	kHz

Block diagram



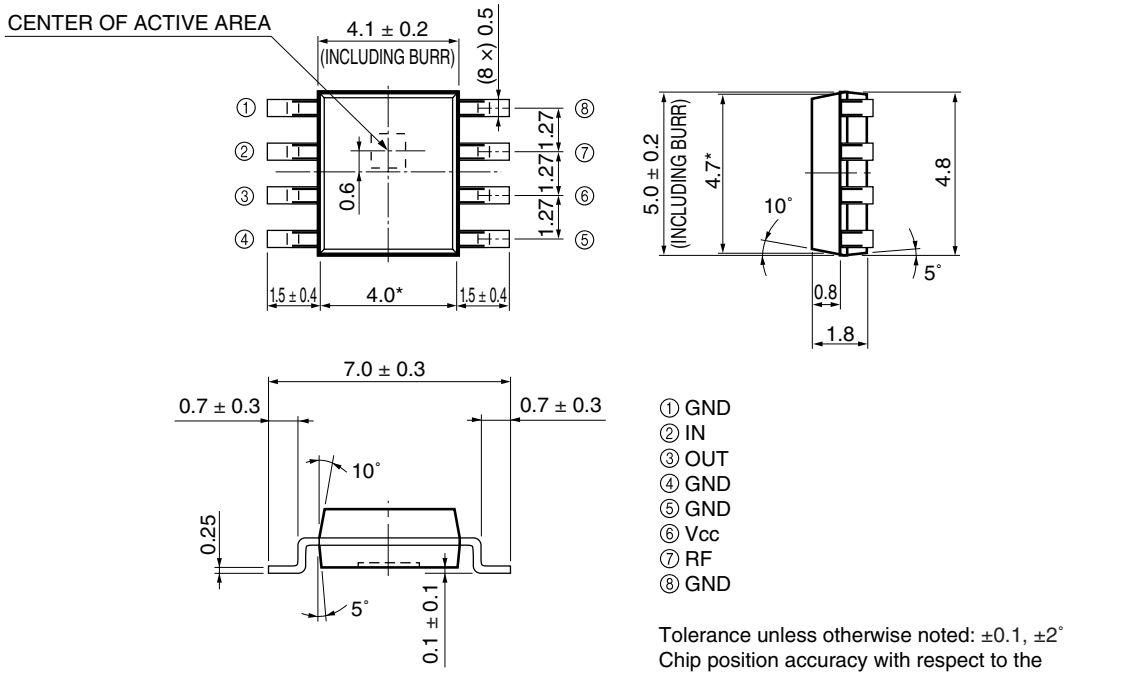
Internal resistor (3 MΩ Typ.) is used.



External resistor or device is used.

KPICC0069EA

Dimensional outlines (unit: mm)



① GND
② IN
③ OUT
④ GND
⑤ GND
⑥ Vcc
⑦ RF
⑧ GND

Tolerance unless otherwise noted: ±0.1, ±2°
Chip position accuracy with respect to the package dimensions marked *
X ≤ ±0.2, Y ≤ ±0.2, θ ≤ ±2°

KPICA0028EA

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