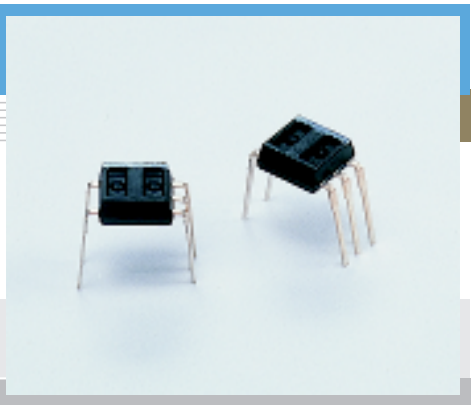
Photoreflector
P5587, P5588

Photo IC output (digital) photoreflectors



P5587 and P5588 are photoreflectors combining a high power infrared LED and low voltage photo IC. The photo IC consists of a high sensitivity photodiode, amplifier, schmitt trigger circuit, and output phototransistor, etc. on a single chip.

Features

- Miniature package
- Low voltage operation
- Photo IC, open collector output
- P5587: “H” level output at light input
  P5588: “L” level output at light input

Applications

- Paper detection in copiers and printers, etc.
- Tape end detection in VTRs, tape recorders, etc.

■ Absolute maximum ratings (Ta=25 °C)

Parameter		Symbol	Value	Unit
Input (LED)	Forward current	I_F	50	mA
	Reverse voltage	V_R Max.	5	V
	Power dissipation	P	80	mW
Output (photo IC)	Supply voltage	Vcc	-0.5 to +7	V
	Output voltage	Vo	-0.5 to +7	V
	Output current	I_O	8	mA
	Power dissipation	P	80	mW
Operating temperature		Topr	-25 to +85	°C
Storage temperature		Tstg	-30 to +85	°C
Soldering		-	260 °C, 3 s, refer to Dimensional outline	-

■ Electrical and optical characteristics (Ta=25 °C, Vcc=5 V, unless otherwise noted)

Parameter		Symbol	Condition	P5587			P5588			Unit
				Min.	Typ.	Max.	Min.	Typ.	Max.	
Input (LED)	Forward voltage	V_F	I_F=20 mA	-	1.23	1.45	-	1.23	1.45	V
	Reverse current	I_R	V_R=5 V	-	-	10	-	-	10	μA
	Terminal capacitance	Ct	V=0 V, f=1 MHz	-	30	-	-	30	-	pF
Output (photo IC)	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 current	I_{OH}	Vo=5 V *2	-	-	10	-	-	10	μA
	Current consumption	Icc		-	1.3	3.0	-	1.3	3.0	mA
Transfer characteristics	L→H Threshold input current	I_{FLH}	R_L=1.2 kΩ, d=3 mm Reflecting surface: white paper (reflectivity 90 % or more)	-	-	10	-	-	-	mA
	H→L Threshold input current	I_{FHL}		-	-	-	-	-	10	mA
	Hysterisis	-	*3	-	0.8	-	-	0.8	-	-
	L→H Propagation delay time	t_{PLH}	I_F=15 mA R_L=1.2 kΩ d=3 mm	-	-	20	-	-	30	μs
	H→L Propagation delay time	t_{PHL}		-	-	30	-	-	20	μs
	Rise time	tr		-	0.07	-	-	0.07	-	μs
	Fall time	tf		-	0.03	-	-	0.03	-	μs

*1: P5587: I_F=0 mA, P5588: I_F=15 mA
*2: P5587: I_F=15 mA, P5588: I_F=0 mA
*3: P5587: I_{FHL}/I_{FLH}, P5588: I_{FLH}/I_{FHL}

Note) Connect a 0.01 μF capacitor or larger between Vcc and GND.

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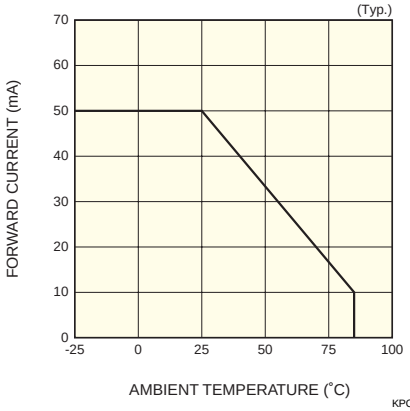
■ LED forward current vs. ambient temperature



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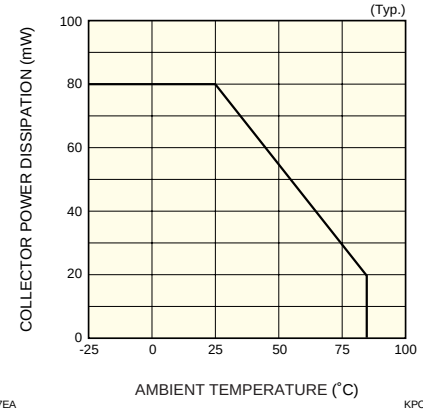
■ Photo IC power dissipation vs. ambient temperature



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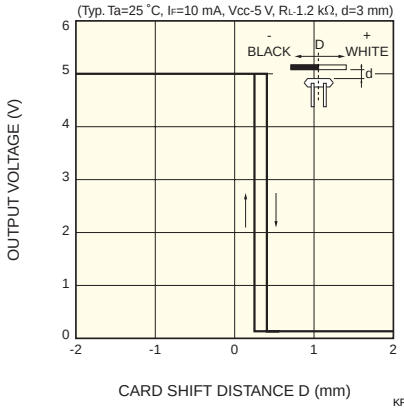
■ Position detection characteristic (P5587)



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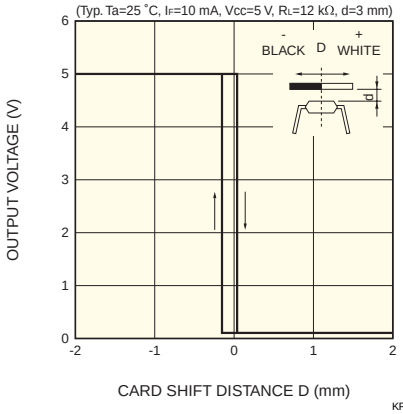
■ Position detection characteristic (P5587)



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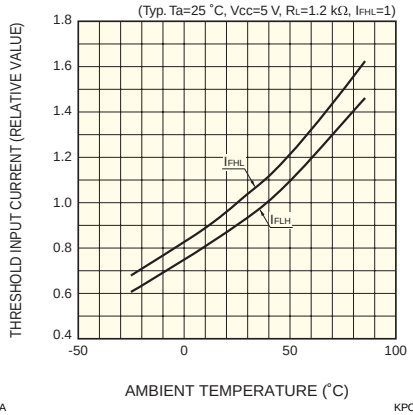
■ Threshold input current vs. ambient temperature (P5587)



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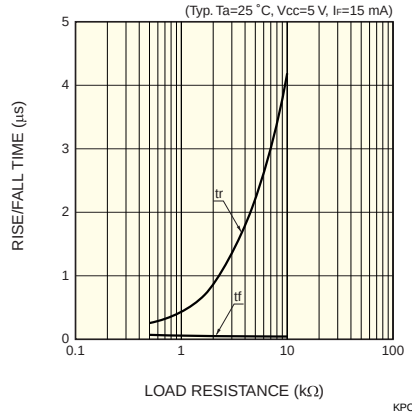
■ Rise/fall time vs. load resistance (P5587)



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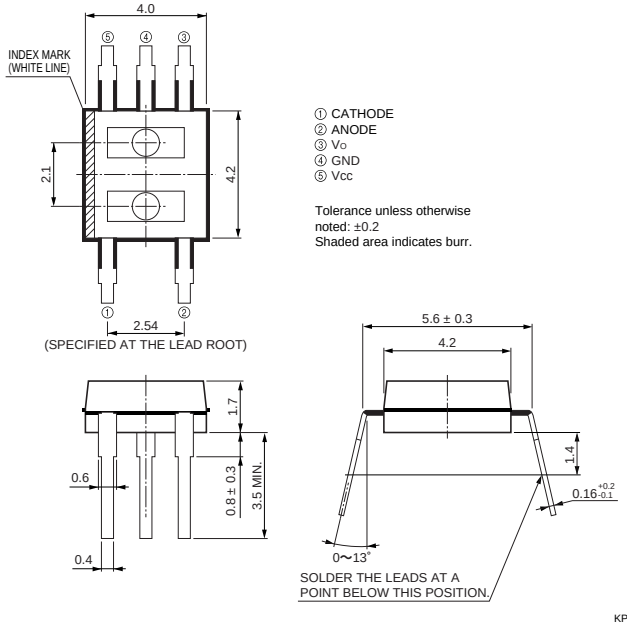
■ Dimensional outline (unit: mm)



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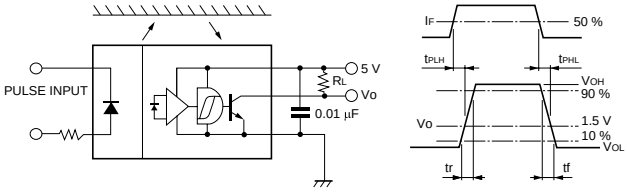
■ Response time measurement circuit (P5587)



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