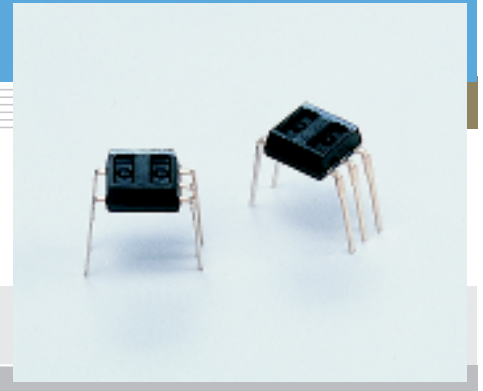


# Photoreflector

## 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	IF	50	mA
	Reverse voltage	VR 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	IO	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 <sub>F</sub>	IF=20 mA	-	1.23	1.45	-	1.23	1.45	V
	Reverse current	I <sub>R</sub>	VR=5 V	-	-	10	-	-	10	μA
	Terminal capacitance	C <sub>t</sub>	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 <sub>OL</sub>	I <sub>OL</sub> =4 mA *1	-	0.1	0.4	-	0.1	0.4	V
	High level output current	I <sub>OH</sub>	Vo=5 V *2	-	-	10	-	-	10	μA
	Current consumption	I <sub>CC</sub>		-	1.3	3.0	-	1.3	3.0	mA
Transfer characteristics	L→H Threshold input current	I <sub>FLH</sub>	RL=1.2 kΩ, d=3 mm Reflecting surface:	-	-	10	-	-	-	mA
	H→L Threshold input current	I <sub>FHL</sub>	white paper (reflectivity 90 % or more)	-	-	-	-	-	10	mA
	Hysteresis	-	*3	-	0.8	-	-	0.8	-	-
	L→H Propagation delay time	t <sub>PLH</sub>	IF=15 mA	-	-	20	-	-	30	μs
	H→L Propagation delay time	t <sub>PHL</sub>	RL=1.2 kΩ	-	-	30	-	-	20	μs
	Rise time	t <sub>r</sub>	d=3 mm	-	0.07	-	-	0.07	-	μs
Fall time	t <sub>f</sub>		-	0.03	-	-	0.03	-	μs	

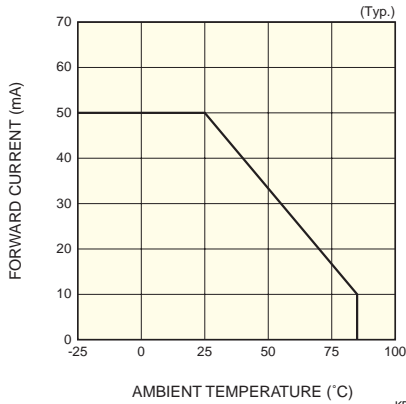
\*1: P5587: I<sub>F</sub>=0 mA, P5588: I<sub>F</sub>=15 mA

\*2: P5587: I<sub>F</sub>=15 mA, P5588: I<sub>F</sub>=0 mA

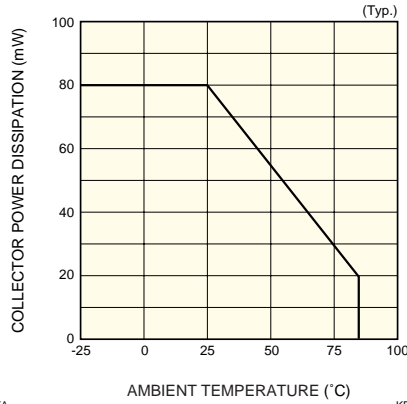
\*3: P5587: I<sub>FHL</sub>/I<sub>FLH</sub>, P5588: I<sub>FLH</sub>/I<sub>FHL</sub>

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

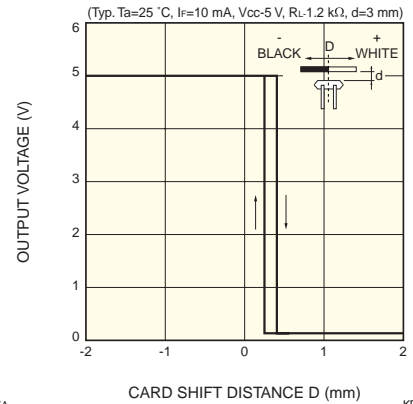
### LED forward current vs. ambient temperature



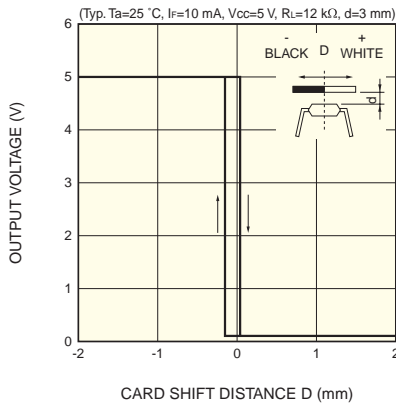
### Photo IC power dissipation vs. ambient temperature



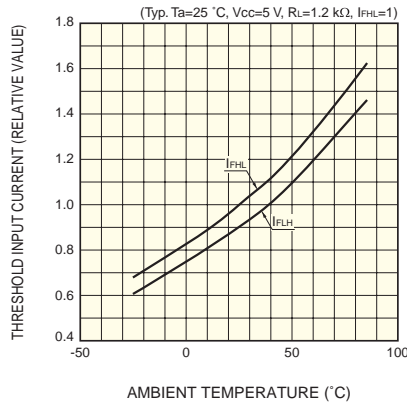
### Position detection characteristic (P5587)



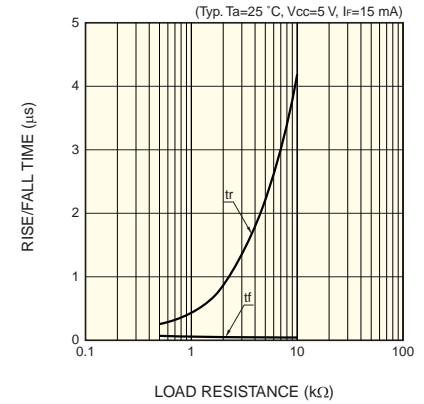
### Position detection characteristic (P5587)



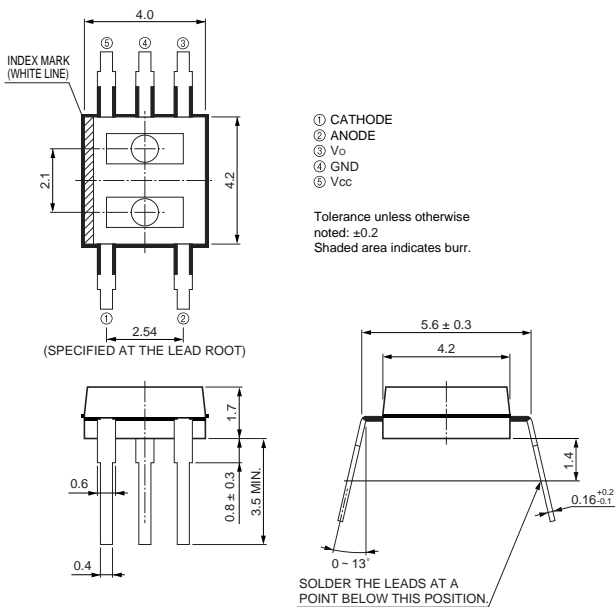
### Threshold input current vs. ambient temperature (P5587)



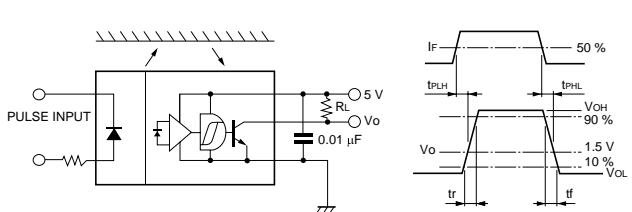
### Rise/fall time vs. load resistance (P5587)



### Dimensional outline (unit: mm)



### Response time measurement circuit (P5587)



KPC0001EA

KPCA0002EA

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