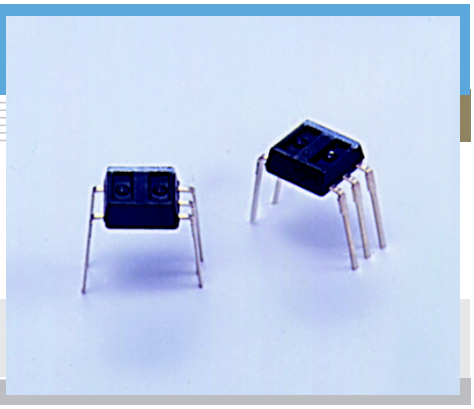
Photoreflector
P4855, P4856

Photo IC output (digital) photoreflectors



P4855 and P4856 are photoreflectors combining a high power infrared LED and a single chip photo IC consisting of a high sensitivity photodiode, amplifier, schmitt trigger circuit, and output phototransistor, etc.

Features

- Miniature package
- Photo IC, open collector output
- P4855: “H” level output at light input
  P4856: “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 +12	V
	Output voltage	Vo	-0.5 to +12	V
	Low level output current	I_O	50	mA
	Power dissipation	P	150	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	P4855			P4856			Unit
				Min.	Typ.	Max.	Min.	Typ.	Max.	
Input (LED)	Forward voltage	V_F	I_F=20 mA	-	1.3	1.6	-	1.3	1.6	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)	Operating supply voltage	Vcc		4.5	-	12	4.5	-	12	V
	Low level output voltage	V_{OL}	I_{OL}=16 mA *1	-	0.1	0.4	-	0.1	0.4	V
	High level output current	I_{OH}	Vo=5 V *2	-	-	100	-	-	100	μA
	Current consumption at low level output	I_{CCL}	*1	-	3.5	12	-	3.5	12	mA
	Current consumption at high level output	I_{CCH}	*2	-	1.8	10	-	2.3	10	mA
Transfer characteristics	L→H Threshold illuminance	I_{FLH}	R_L=280 Ω, d=3 mm Reflecting surface: white paper (reflectivity 90 % or more)	-	-	15	-	-	-	mA
	H→L Threshold illuminance	I_{FHL}		-	-	-	-	-	15	mA
	Hysteresis	-	*3	-	0.9	-	-	0.9	-	-
	L→H Propagation delay time	t_{PLH}	I_F=20 mA R_L=280 Ω d=3 mm	-	-	9	-	-	15	μs
	H→L Propagation delay time	t_{PHL}		-	-	15	-	-	9	μs
	Rise time	tr		-	0.15	-	-	0.15	-	μs
	Fall time	tf		-	0.03	-	-	0.03	-	μs

*1: P4855: I_F=0 mA, P4856: I_F=20 mA
*2: P4855: I_F=20 mA, P4856: I_F=0 mA
*3: P4855: I_{FHL}/I_{FLH}, P4856: I_{FLH}/I_{FHL}

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

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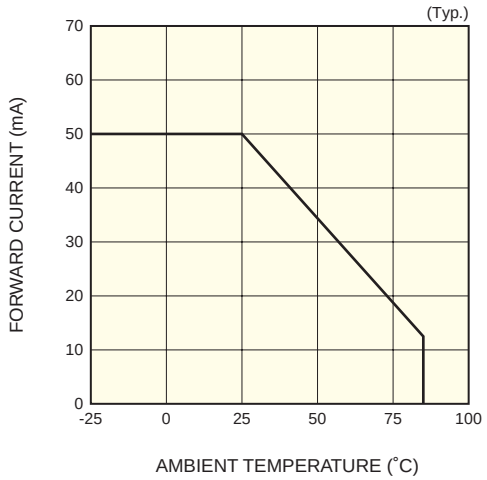
■ LED forward current vs. ambient temperature



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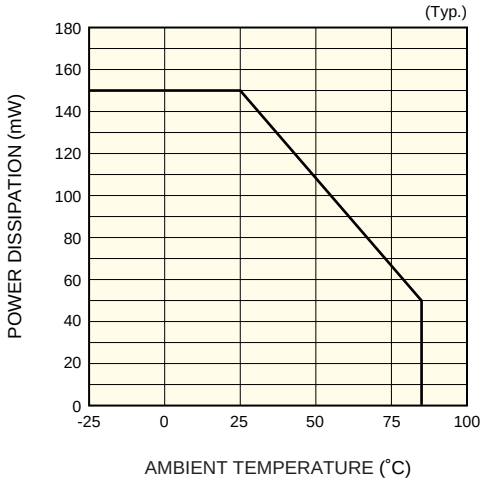
■ Photo IC power dissipation vs. ambient temperature



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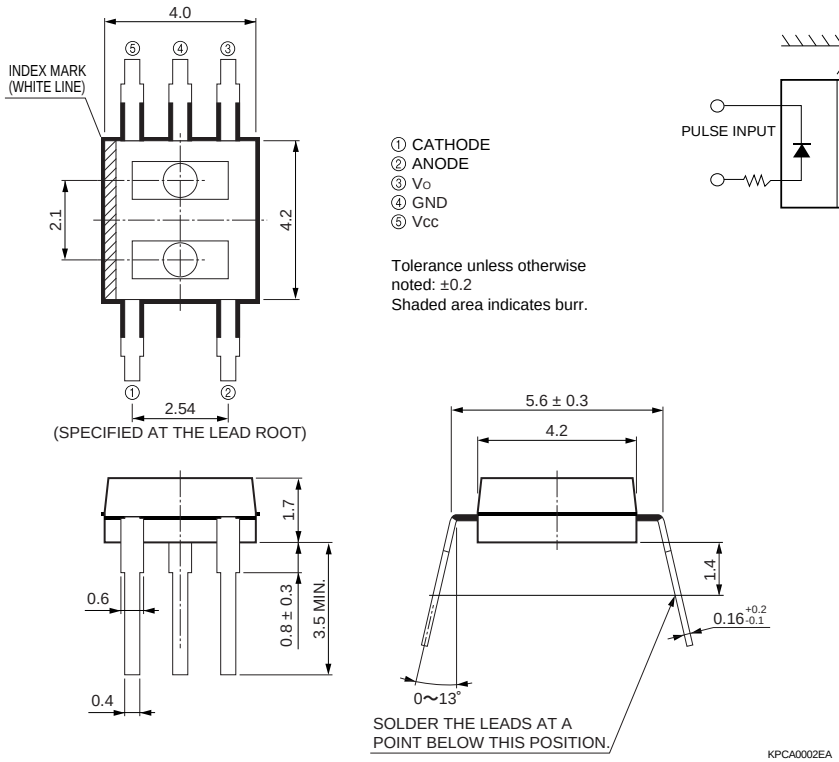
■ Dimensional outline (unit: mm)



① CATHODE
② ANODE
③ V_O
④ GND
⑤ Vcc

Tolerance unless otherwise noted: ±0.2
Shaded area indicates burr.

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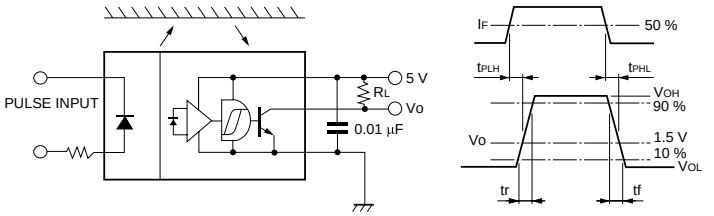
■ Response time measurement circuit (P4855)



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