

# GP1A037RBK/ GP1A037RCK

## ■ Features

1. Linear encoder for reading linear scale
2. Since the multi-divided photodiode system is adopted, high-precision reading is possible even if the angle is deviated between the scale and encoder.
3. High resolution:
  - Resolution 150LPI (GP1A037RBK)
  - Resolution 180LPI (GP1A037RCK)

## ■ Applications

1. Printers

## ■ Absolute Maximum Ratings (Ta=25°C)

	Parameter	Symbol	Rating	Unit
Input	*1 Forward current	$I_F$	50	mA
	Reverse voltage	$V_R$	4	V
Output	Supply voltage	$V_{CC}$	7	V
	Low level output current	$I_{OL}$	8	mA
	*1 Power dissipation	$P_O$	150	mW
Operating temperature		$T_{opr}$	-10 to +70	°C
Storage temperature		$T_{stg}$	-40 to +80	°C
*2 Soldering temperature		$T_{sol}$	260	°C

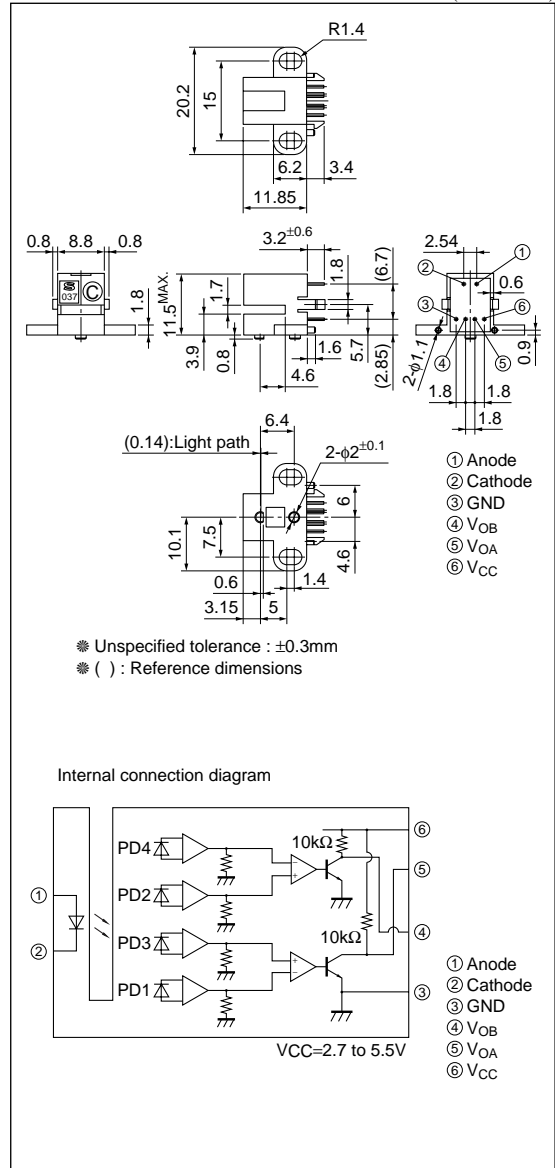
\*1 The derating factors of absolute maximum ratings due to ambient temperature are shown in Fig.3 to 4

\*2 For 5s

## OPIC Photointerrupter with Encoder Function

## ■ Outline Dimensions

(Unit : mm)



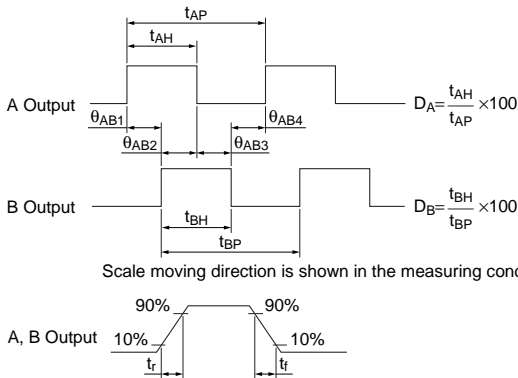
■ Electro-optical Characteristics

(Ta=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V <sub>F</sub>	I <sub>F</sub> =25mA	—	1.4	1.7	V
	Reverse current	I <sub>R</sub>	V <sub>R</sub> =1V	—	—	100	μA
Output	Operating supply voltage	V <sub>CC</sub>	—	2.7	5.0	5.5	V
	Low level output voltage	V <sub>OL</sub>	V <sub>CC</sub> =5V, I <sub>F</sub> =25mA, I <sub>OL</sub> =8mA	—	0.1	0.4	V
	High level output voltage	V <sub>OH</sub>	V <sub>CC</sub> =5V, I <sub>F</sub> =25mA	2.4	4.9	—	V
	Supply current	I <sub>CC</sub>	V <sub>CC</sub> =5V, I <sub>F</sub> =25mA, A and B low level	—	2	5	mA
*1 Transfer characteristics	Duty ratio	D <sub>A</sub> D <sub>B</sub>	V <sub>CC</sub> =5V, I <sub>F</sub> =25mA, f=100Hz, Z=0.3 <sup>+0.7</sup> <sub>-0.2</sub> mm	40	50	60	%
	Phase difference	θ <sub>AB1 to 4</sub>		60	90	120	°
	Response time	t <sub>r</sub>	V <sub>CC</sub> =5V, I <sub>F</sub> =25mA, f=100Hz, Z=0.3 <sup>+0.7</sup> <sub>-0.2</sub> mm	—	1.0	2.0	μs
		t <sub>f</sub>		—	1.0	2.0	μs
Response frequency	f <sub>max</sub>	V <sub>CC</sub> =5V, I <sub>F</sub> =25mA, Z=0.3 <sup>+0.7</sup> <sub>-0.2</sub> mm	—	—	20	kHz	

\*1 Refer to the measuring condition. The values of transfer characteristics do not include an error of linear scale. Z is the distance between scale face and holder on the detector side.

Fig.1 Output Waveforms



Scale moving direction is shown in the measuring condition (Refer to Fig.10).

Fig.2 Forward Current vs. Ambient Temperature

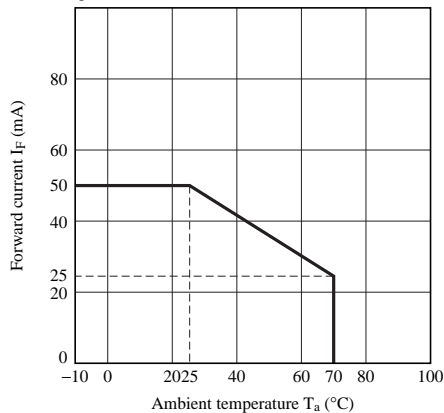


Fig.3 Output Power Dissipation vs. Ambient Temperature

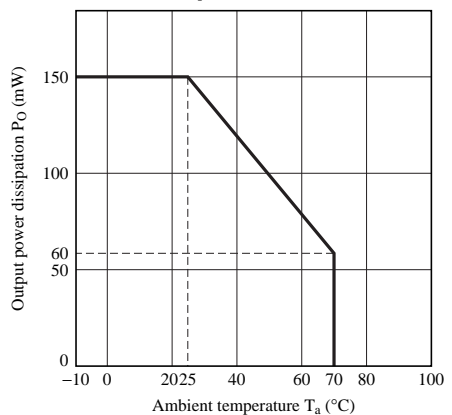


Fig.4 Duty Ratio vs. Frequency

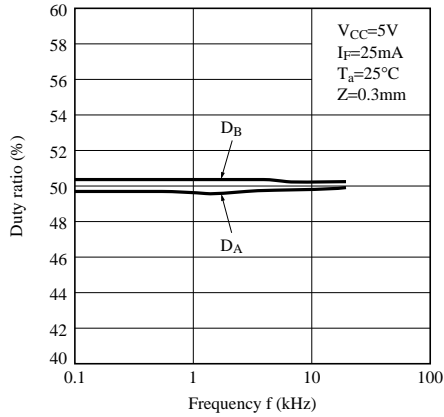


Fig.5 Phase Difference vs. Frequency

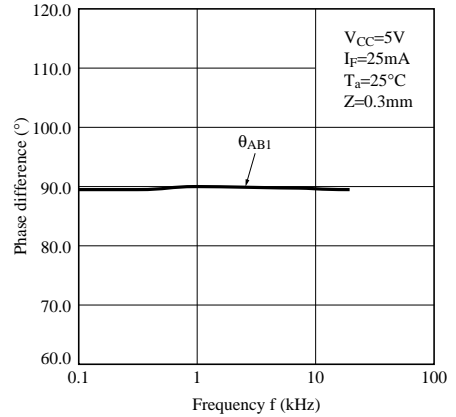


Fig.6 Duty Ratio vs. Ambient Temperature

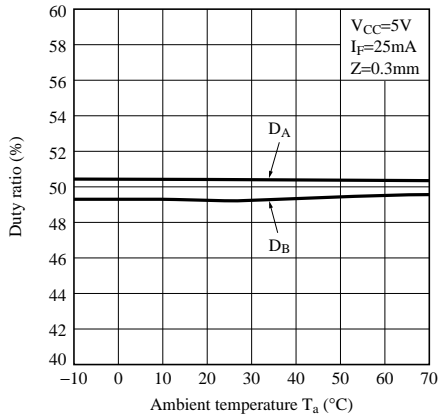


Fig.7 Phase Difference vs. Ambient Temperature

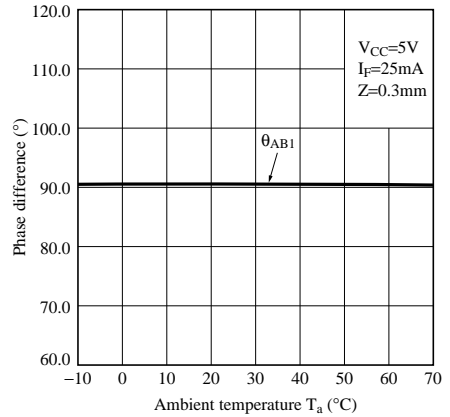


Fig.8 Duty Ratio vs. Gap

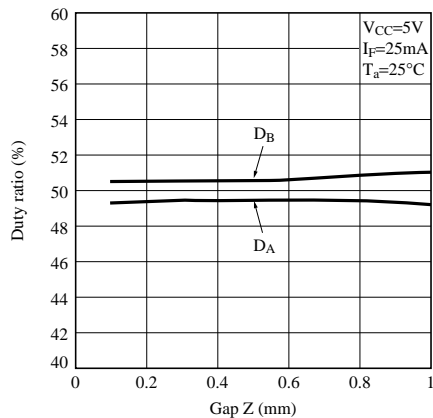
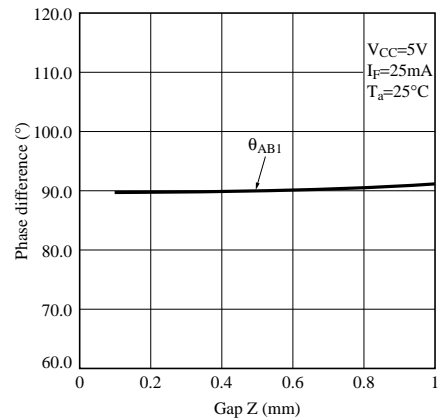
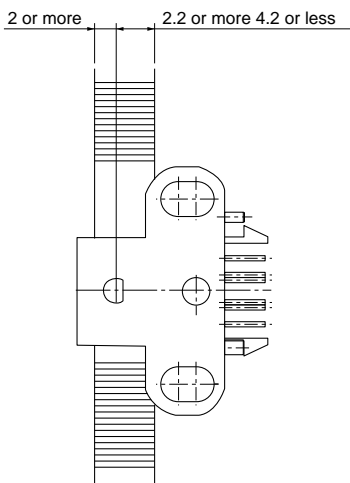
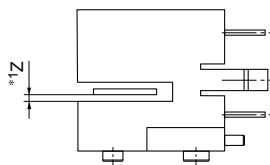
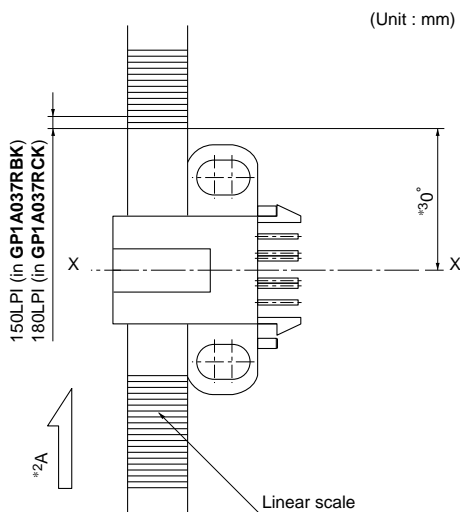


Fig.9 Phase Difference vs. Gap



**Fig.10 Measuring Condition**



- \*1 Distance between scale face and holder on the detector side
- \*2 Scale moving direction
- \*3 X-X' is the line which is through the center of holder positioning pin, and it is parallel to the scale slit.

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