GP1A70R/GP1A71R

OPIC Photointerrupter with Encoder Functions

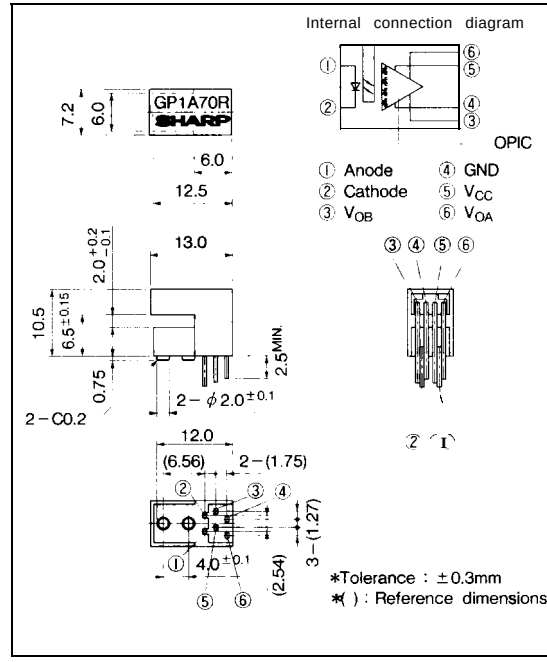
■ Features

1. 2-phase (A, B) digital output
2. Sensing accuracy
   (**GP1A70R** Disk slit pitch: 1.14mm)
   (**GP1A71R** Disk slit pitch: 0.7mm)
3. PWB mounting type
   (Lead bending type)
4. TTL compatible output
5. Compact, lightweight

■ Applications

1. Printers
2. Copiers
3. Robots
4. Numerical control machines

■ Outline Dimensions (Unit : mm)



*"OPIC" (Optical IC) is a trademark of the SHARP Corporation
An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.

■ Absolute Maximum Ratings (Ta=25"C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	*1 Peak forward current	I_{FM}	1	A
	Reverse voltage	V_R	6	v
	power dissipation	P	75	mW
output	Supply voltage	V_{CC}	7	v
	Low level output current	101.	20	mA
	Power dissipation	P_O	250	mW
Operating temperature		T_{opr}	o to +70	℃
Storage temperature		T_{stg}	−40 to +80	℃
*2 Soldering temperature		T_{sol}	260	℃

*1 Pulse width ≦ 100 μs, Duty ratio 0.01
*2 For 5 wends

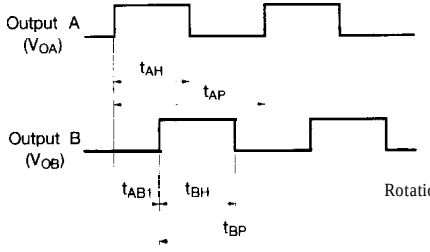
■ Electro-optical Characteristics

(Ta=25℃ unless otherwise specified)

	Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Inpot	Forward voltage		V_F	I_F=20mA, Ta = 25℃		1.2	1.4	
	Reverse current		I_R	V_R=3V, Ta = 25℃	—	—	10	μA
output	Operating supply voltage		V_{CC}		4.5	5.0	5.5	V
	High level output voltage		V_{OH}	*3V_{CC}= 5V, IF– 20mA	2.4	4.9	—	V
	Low level output voltage		VOL.	*3I_{OL}=8MA, V_{CC}=5V, I_F=20mA	=	0.1	0.4	V
	Supply current		I_{CC}	*4V_{CC} = 5V, I_F=20mA	=	5	20	rmA
Transfer characteristics	Duty ratio	GP1 A70R	*5D_A, D_B	*3V_{CC}=5V, I_F=20mA, f=2.5kHz	25	50	75	%
		GP1A71R			25	50	75	%
	Response frequency		f_{MAX}	*3 V_{CC}=5V, I_F=20mA	—	—	10	kHz

*3 Measured under the condition shown in Measurement Conditions
*4 In the condition that output A and B are low level.
*5 $D_A: \frac{t_{AH}}{t_{AP}} \times 100$, $D_B: \frac{t_{BH}}{t_{BP}} \times 100$, Duty ratio : Average disk rotation time per turn

■ Output Waveforms



Rotational direct ion Counterclockwise when aaan from OPIC light detector

Fig. 1 Forward Current vs. Ambient Temperature

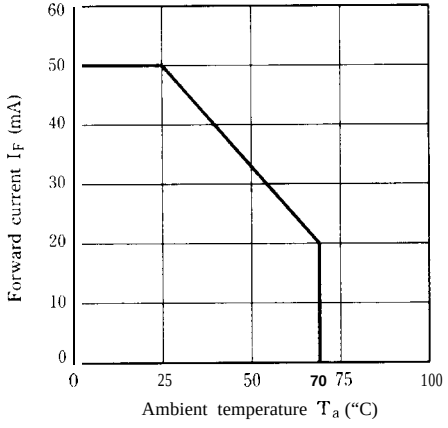


Fig. 2 Output Power Dissipation vs. Ambient Temperature

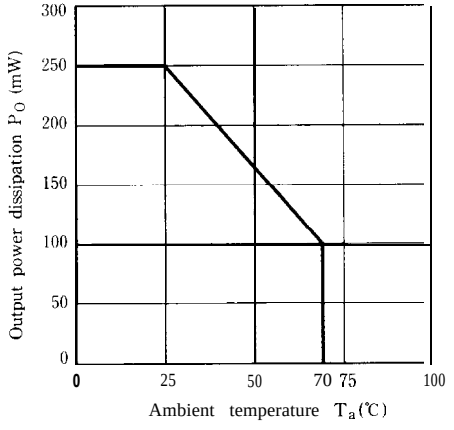


Fig. 3-a Duty Ratio **vs.** Frequency **(GP1A70R)**

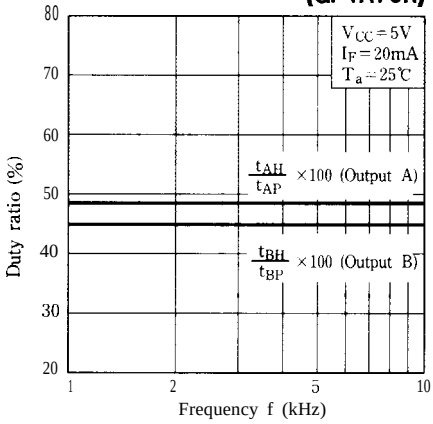


Fig. 3-b **Duty Ratio vs.** Frequency **(GP1A71R)**

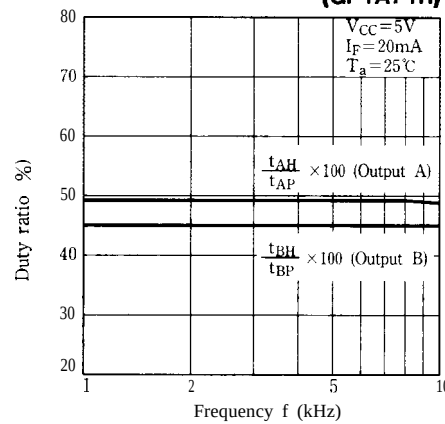


Fig. 4-a Phase Difference vs. Frequency (GP1A70R)

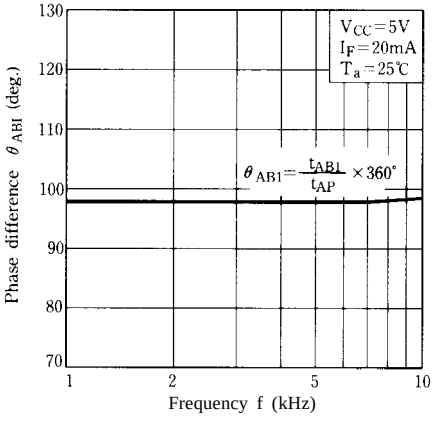


Fig. 4-b Phase Difference vs. Freauency (GP1A71R)

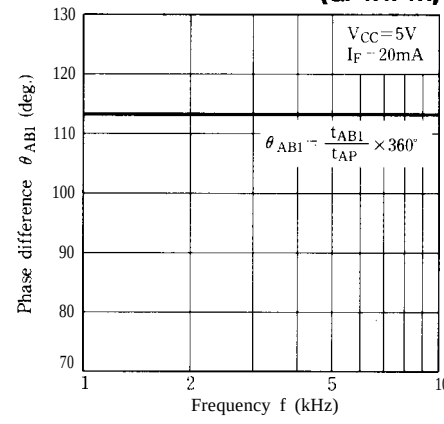


Fig. 5-a Duty **Ratio vs. Ambient Temperature (GP1A70R)**

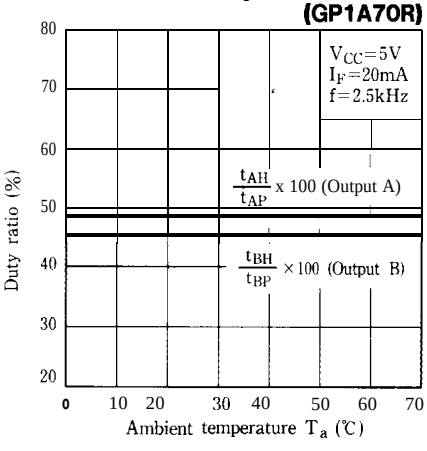


Fig. **5-b Duty Ratio vs.** Ambient **Temperature (GP1A71R)**

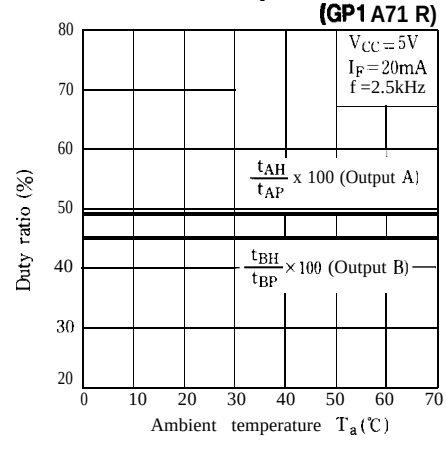


Fig. 6-a Phase Difference vs. Ambient Temperature

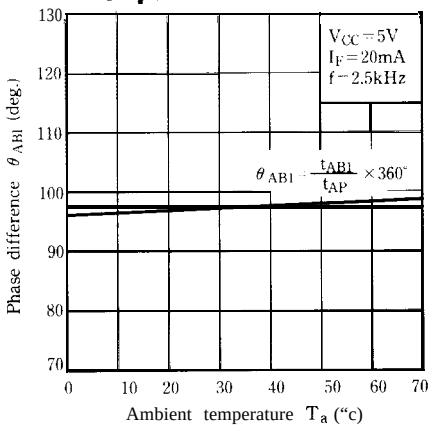


Fig. 6-b Phase Difference vs. Ambient Temperature

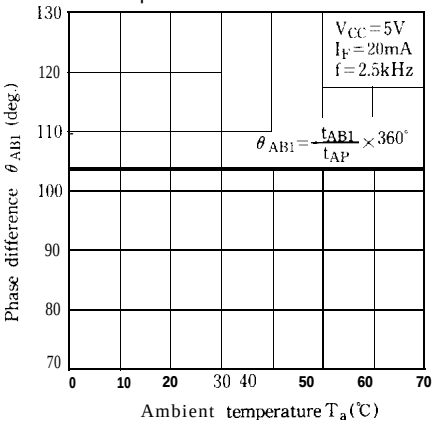


Fig. 7-a Duty Ratio vs. Distance (Xdirection) (GP1A70R)

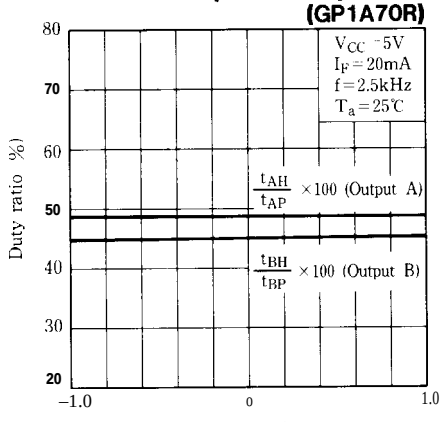


Fig. 7-b Duty Ratio vs. Distance (X direction) (GP1A71R)

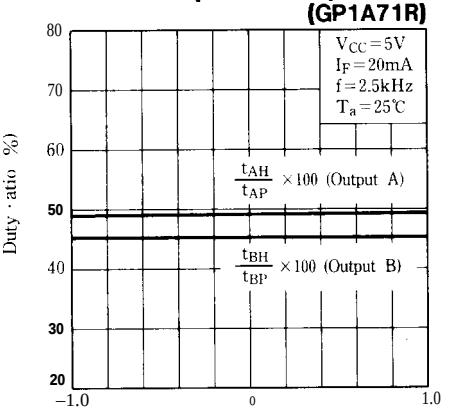


Fig. 8-a Phase Difference vs. Distance (X direction) (GP1A70R)

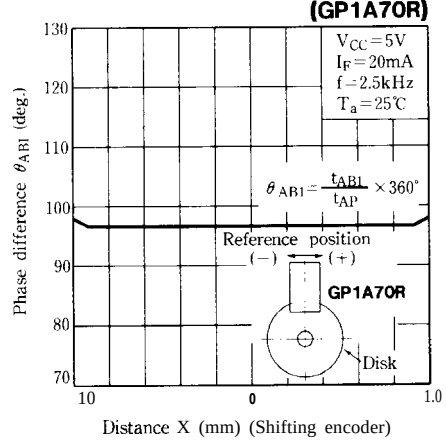


Fig. 8-b Phase Difference vs. Distance (X direction) (GP1A71R)

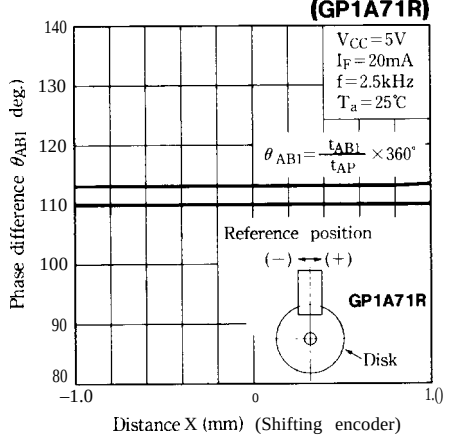


Fig. 9-a Duty Ratio vs. Distance (Ydirection) (GP1A70R)

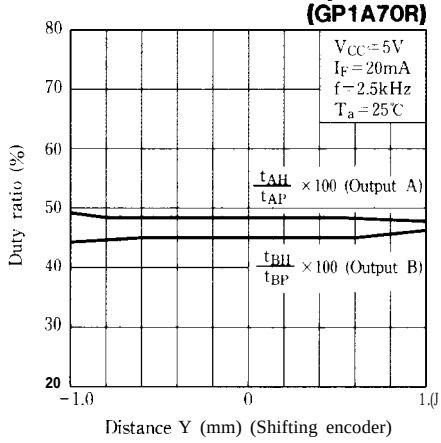


Fig. 9-b Duty Ratio vs. Distance (Y direction) (GP1A71R)

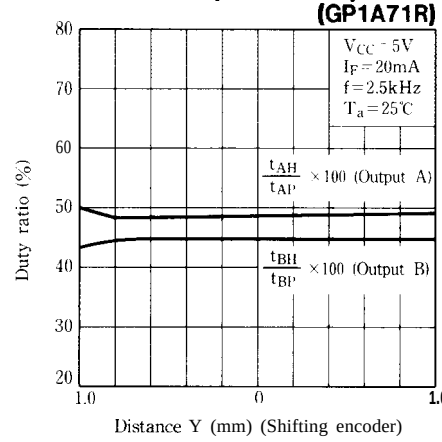


Fig.10-a Phase Difference vs. Distance (Y direction) (GP1A70R)

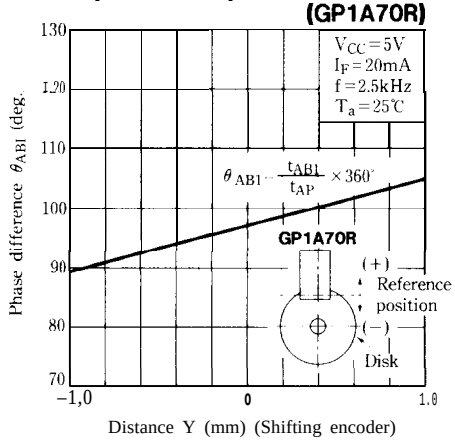


Fig.10-b Phase Difference vs. Distance (Y direction) (GP1A71R)

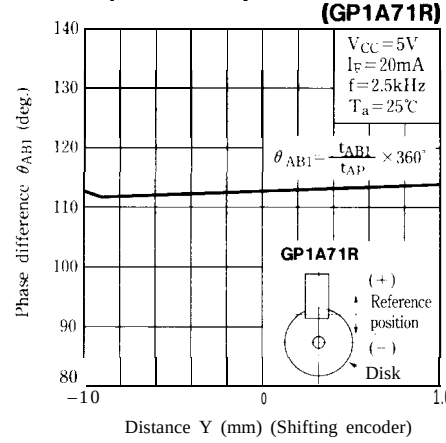


Fig.11-a Duty Ratio vs. Distance (z direction) (GP1A70R)

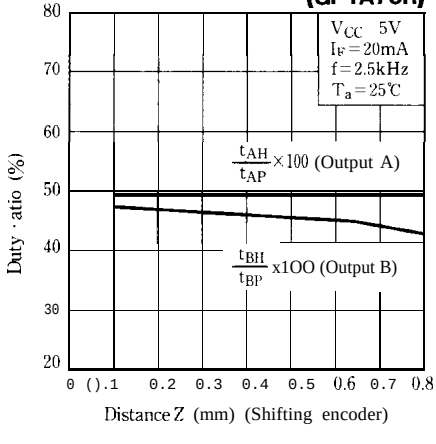


Fig.11-b Duty Ratio vs. Distance (z direction) (GP1A71R)

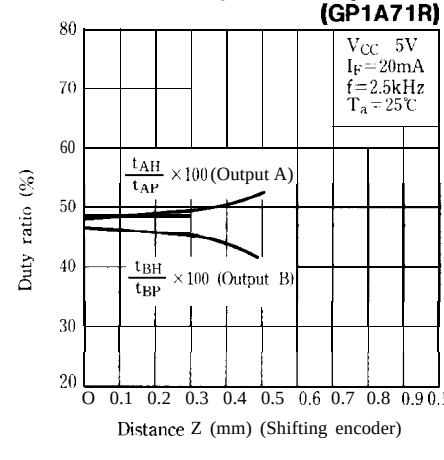


Fig. 12-a Phase Difference vs. Distance (Z direction)

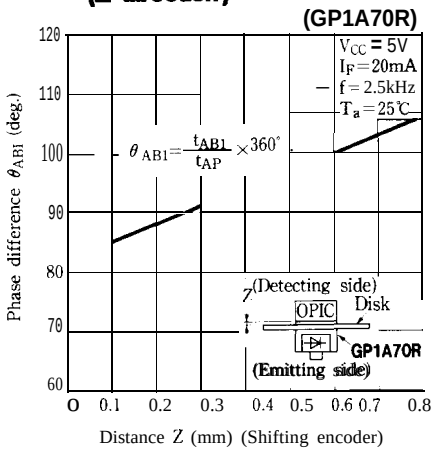
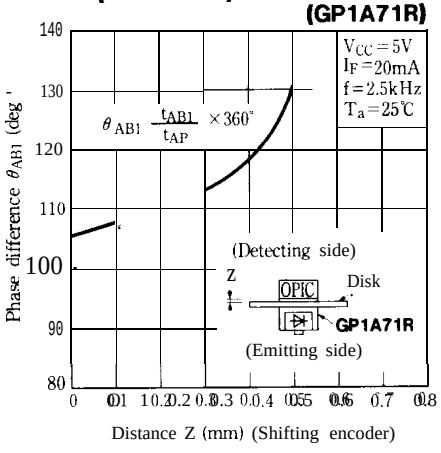
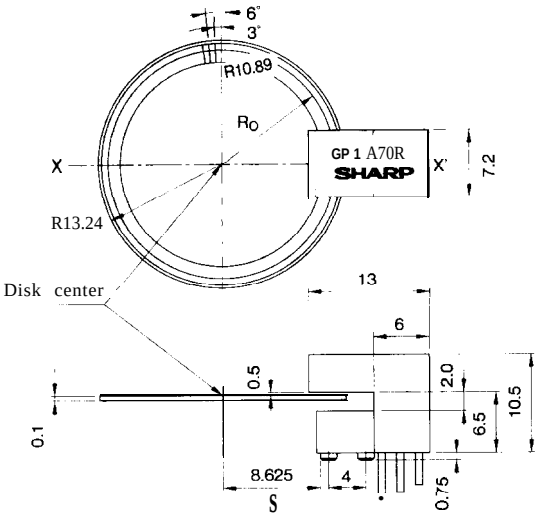
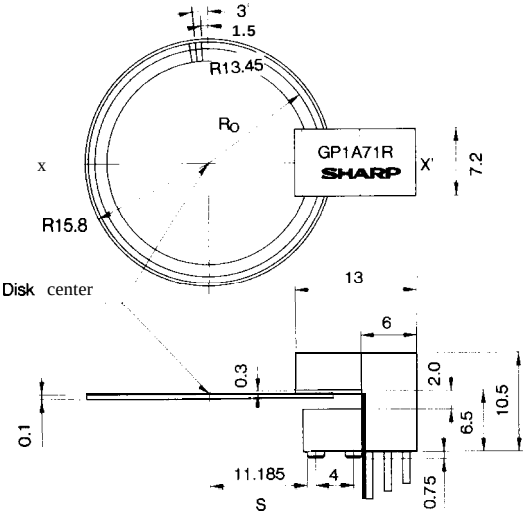


Fig. 1 2-b Phase Difference vs. Distance (Z direction)



〈Measurement Conditions〉 (Unit : mm)





〈GP1A70R Basic Design〉
R_O (distance between the disk center and half point of a slit) and S (installing position of GP1A70R) will be provided by the following equations.

Ro/60x10.89(mm) N : number of slits
S = R_O − 2.265(mm)

〈GP1A71R Basic Design〉
R_O (distance between the disk center and half point of a slit) and S (installing position of GP1 A71 R) will be provided by the following equations.

R_O = N/l 20 x 13.45(mm) N : number of slits
S = R_O − 2.265(mm)

■ Precautions for Use

(1) This device is designed to be used under the condition of IF= 20mA
(2) It is recommended that a by-pass capacitor of more than 0.01 μF be added between V_{CC} and GND near the device in order to stabilize power supply line.
(3) As for other general cautions, refer to the chapter "Precautions for Use" (Page 78 to 93).