

GP1A13R OPIC Photointerrupter with Encoder Function

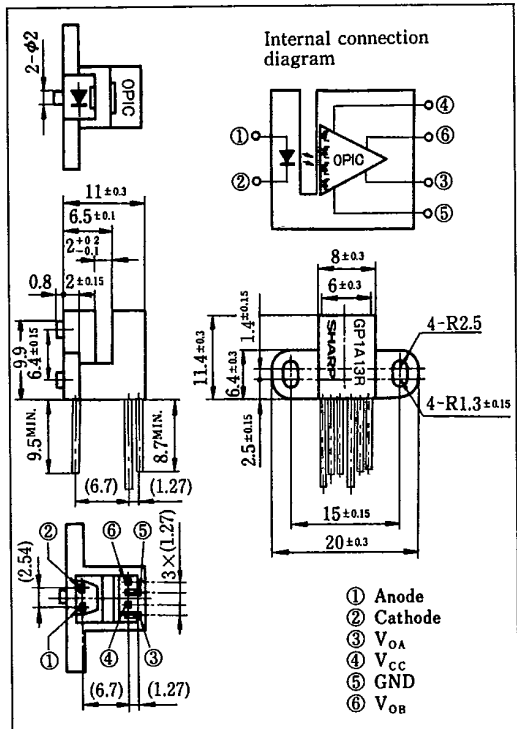
Features

1. A, B 2-phase digital output
2. Resolution : Slit pitch 1.6mm
3. TTL compatible output
4. Compact and light

Applications

1. Electronic printers
2. Robots
3. Numerical control machines

Outline Dimensions (Unit : mm)



* OPIC is a registered trademark of Sharp and stands for Optical IC. It has a light detecting element and signal processing circuitry 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	I _{OL}	20 mA
	Power dissipation	P _O	250 mW
	Operating temperature	T _{opr}	0 ~ +70 °C
	Storage temperature	T _{stg}	-40 ~ +80 °C
*2 Soldering temperature	T _{sol}	260 °C	

*1 Pulse width ≤ 100 μs, Duty ratio = 0.01
 *2 For 5 seconds

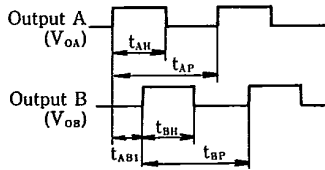
■ Electro-optical Characteristics

(Ta=0~+70°C unless specified)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V_F	Ta=25°C, $I_F=20\text{mA}$	—	1.2	1.4	V
	Reverse current	I_R	Ta=25°C, $V_R=3\text{V}$	—	—	10	μA
Output	Operating supply voltage	V_{CC}		4.5	5.0	5.5	V
	High level output voltage	V_{OL}	$V_{CC}=5\text{V}$, $I_F=20\text{mA}$, $I_{OL}=8\text{mA}^{**}$	—	0.1	0.4	V
	Low level output voltage	V_{OH}	$V_{CC}=5\text{V}$, $I_F=20\text{mA}^{**}$	2.4	4.9	—	V
	Supply current	I_{CC}	$I_F=20\text{mA}$, $V_{CC}=5\text{V}^{*3,*4}$	—	5	20	mA
Transfer characteristics	Duty ratio	$^{*5}D_A$	$V_{CC}=5\text{V}$, $I_F=20\text{mA}$	0.25	0.50	0.75	—
		$^{*5}D_B$	$f=2.5\text{kHz}^{*4}$	0.25	0.50	0.75	—
	Response frequency	f_{max}	$V_{CC}=5\text{V}$, $I_F=20\text{mA}^{*4}$	—	—	10	kHz

- *3 In the condition that output A and B are low level.
- *4 Measured under the condition shown in Measurement Condition.
- *5 $D_A : \frac{t_{AH}}{t_{AP}}$, $D_B : \frac{t_{BH}}{t_{BP}}$

■ Output Waveforms



Rotational direction : Counterclockwise when seen from OPIC light detector



Fig. 1 Forward Current vs. Ambient Temperature

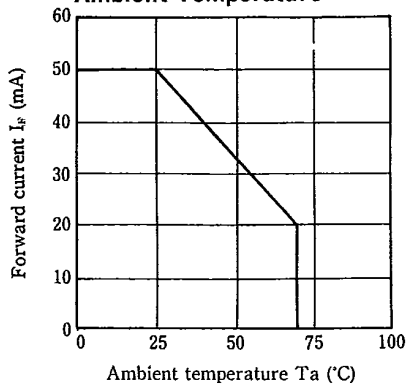


Fig. 2 Output Power Dissipation vs. Ambient Temperature

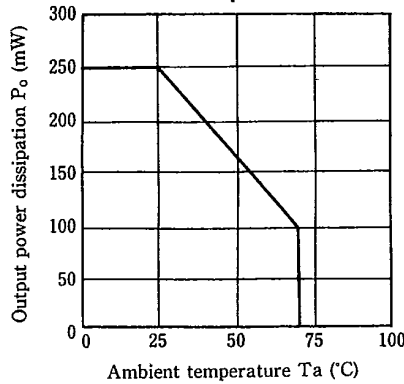


Fig. 3 Duty Ratio vs. Frequency

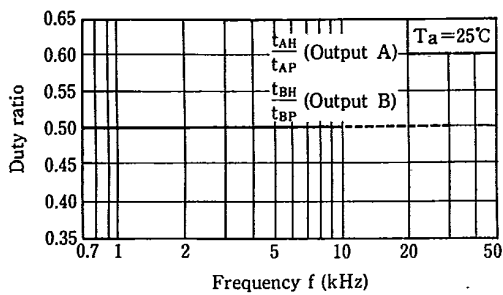


Fig. 4 Phase Difference vs. Frequency

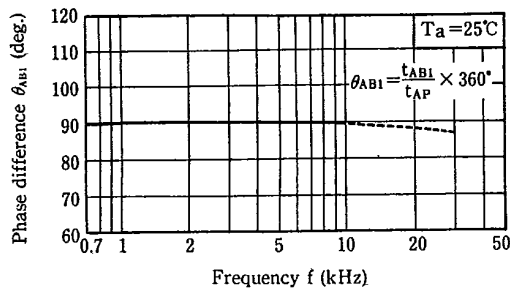


Fig. 5 Duty Ratio vs. Ambient Temperature

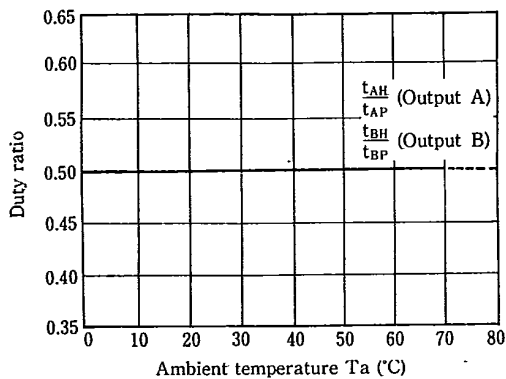


Fig. 6 Phase Difference vs. Ambient Temperature

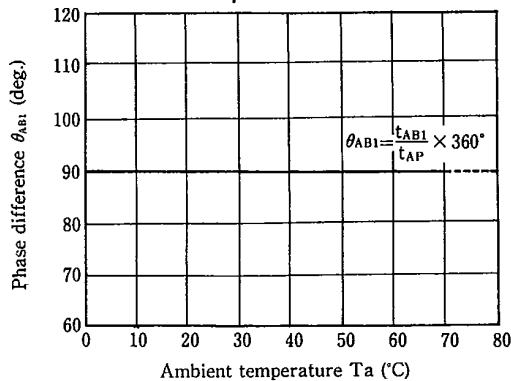


Fig. 7 Duty Ratio vs. Distance (X direction)

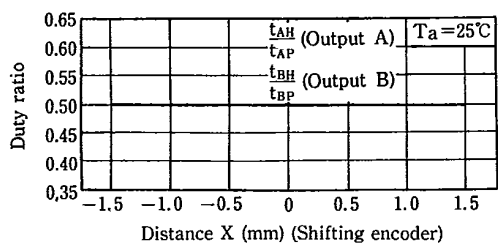


Fig. 8 Phase Difference vs. Distance (X direction)

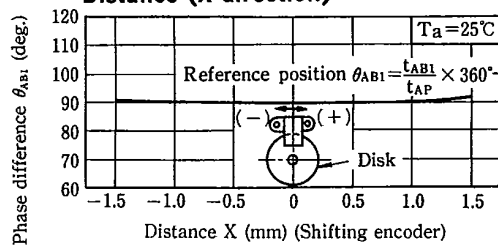


Fig. 9 Duty Ratio vs. Distance (Y direction)

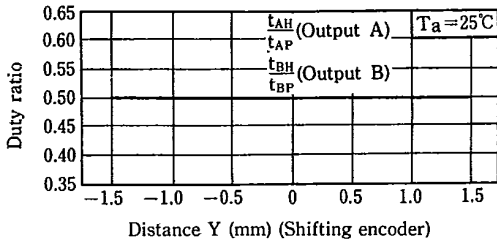


Fig.10 Phase Difference vs. Distance (Y direction)

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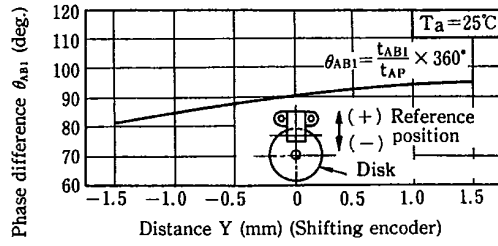


Fig. 11 Duty Ratio vs. Distance (Z direction)

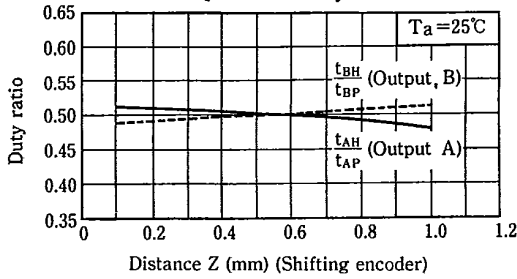
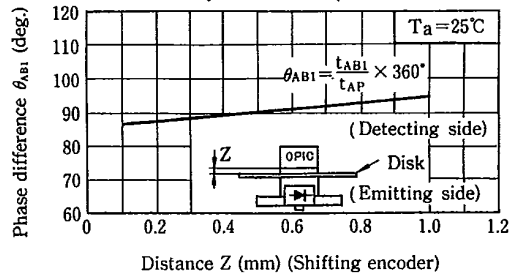


Fig. 12 Phase Difference vs. Distance (Z direction)



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