

# GP1A33R

## OPIC Photointerrupter with Encoder Function

### ■ Features

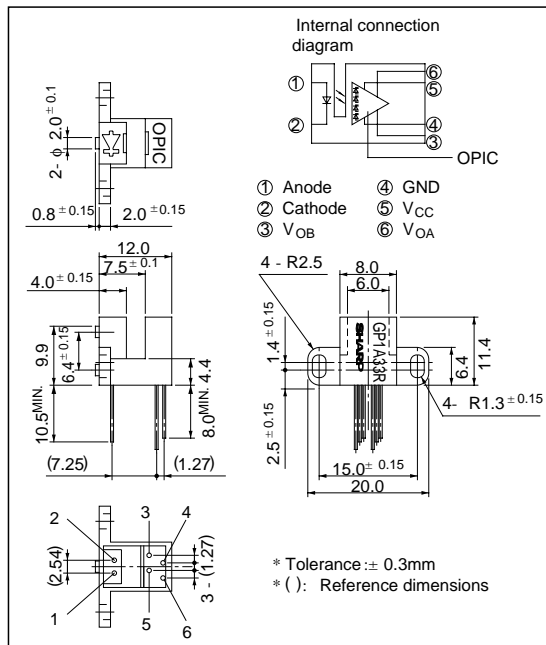
1. 2-phase (A, B) digital output
2. Capable of using plastic disk
3. Sensing accuracy  
(Disk slit pitch: 1.14mm)
4. TTL compatible
5. Compact and light

### ■ Applications

1. Electronic typewriters, printers
2. 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 <sub>F</sub>	65	mA
	*1 Peak forward current	I <sub>FM</sub>	1	A
	Reverse Voltage	V <sub>R</sub>	6	V
	Power dissipation	P	100	mW
Output	Supply voltage	V <sub>CC</sub>	7	V
	Low level output current	I <sub>OL</sub>	20	mA
	Power dissipation	P <sub>O</sub>	250	mW
Operating temperature		T <sub>opr</sub>	0 to + 70	°C
Storage temperature		T <sub>stg</sub>	- 40 to + 80	°C
*2 Soldering temperature		T <sub>sol</sub>	260	°C

\*1 Pulse width ≤ 100 μs, Duty ratio = 0.01

\*2 For 5 seconds

**Electro-optical Characteristics**

( Unless otherwise specified, Ta = 0 to + 70°C )

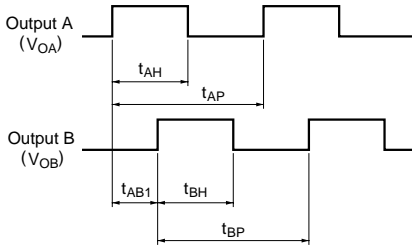
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V <sub>F</sub>	Ta = 25°C, I <sub>F</sub> = 30mA	-	1.2	1.5	V
	Reverse current	I <sub>R</sub>	Ta = 25°C, V <sub>R</sub> = 3V	-	-	10	μ A
Output	Operating supply voltage	V <sub>CC</sub>		4.5	5.0	5.5	V
	High level output voltage	V <sub>OH</sub>	<sup>*3</sup> V <sub>CC</sub> = 5V, I <sub>F</sub> = 30mA	2.4	4.9	-	V
	Low level output voltage	V <sub>OL</sub>	<sup>*3</sup> I <sub>OL</sub> = 8mA, V <sub>CC</sub> = 5V, I <sub>F</sub> = 30mA	-	0.1	0.4	V
	Supply current	I <sub>CC</sub>	<sup>*3*4</sup> I <sub>F</sub> = 30mA, V <sub>CC</sub> = 5V	-	5	20	mA
Transfer characteristics	Duty ratio	D <sub>A</sub> <sup>*5</sup>	V <sub>CC</sub> = 5V, I <sub>F</sub> = 30mA, <sup>*3</sup> f = 2.5kHz	20	50	80	%
		D <sub>B</sub> <sup>*5</sup>		20	50	80	%
	Response frequency	f <sub>MAX.</sub>	<sup>*3</sup> V <sub>CC</sub> = 5V, I <sub>F</sub> = 30mA	-	-	5	kHz

\*3 Measured under the condition shown in Measurement Condition.

\*4 In the condition that output A and B are low level.

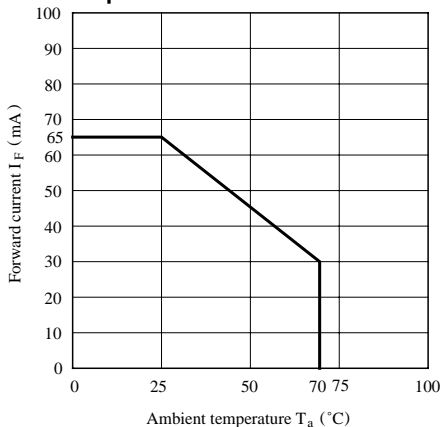
\*5  $D_A = \frac{t_{AH}}{t_{AP}} \times 100$ ,  $D_B = \frac{t_{BH}}{t_{BP}} \times 100$

**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**

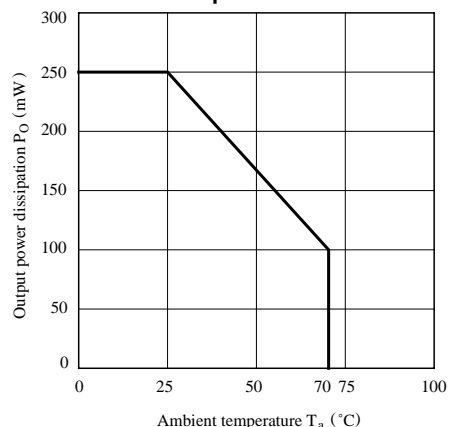


Fig. 3 Duty Ratio vs. Frequency

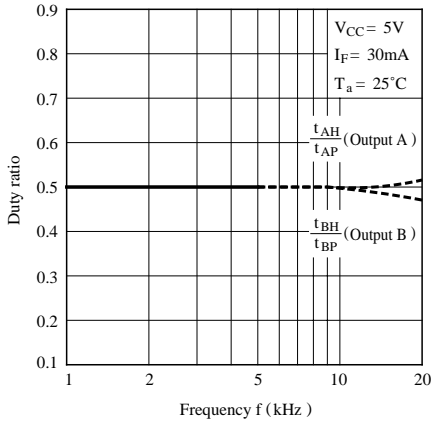


Fig. 4 Phase Difference vs. Frequency Temperature

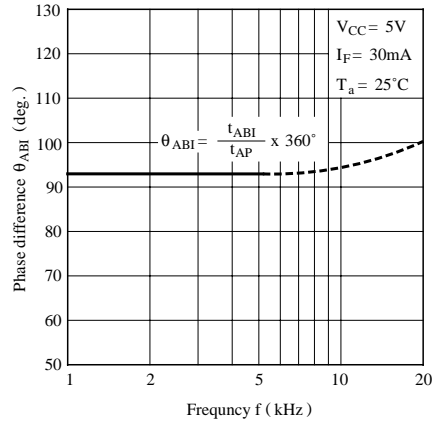


Fig. 5 Duty Ratio vs. Ambient Temperature

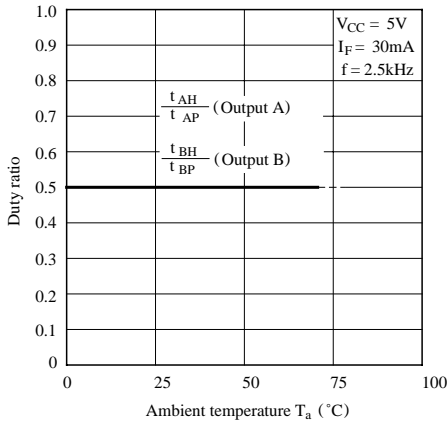


Fig. 6 Phase Difference vs. Ambient Temperature

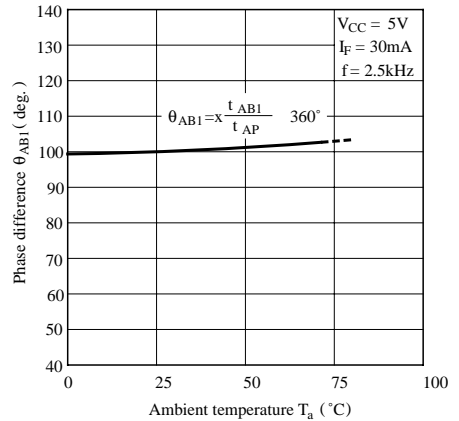


Fig. 7 Duty Ratio vs. Distance (X direction)

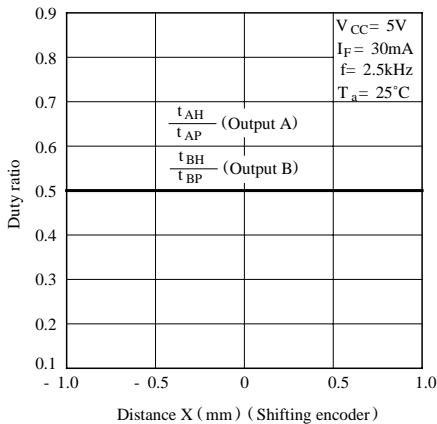
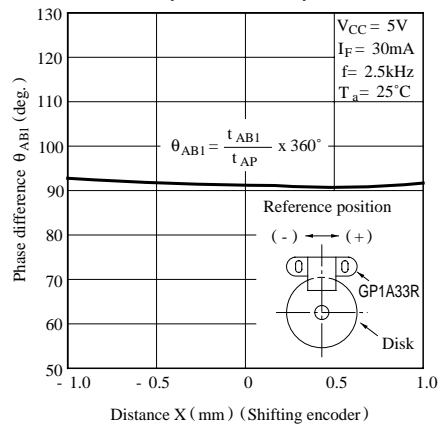
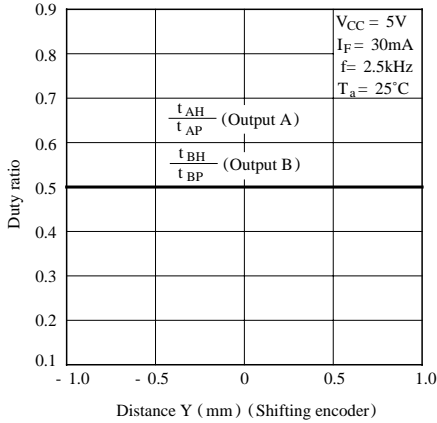


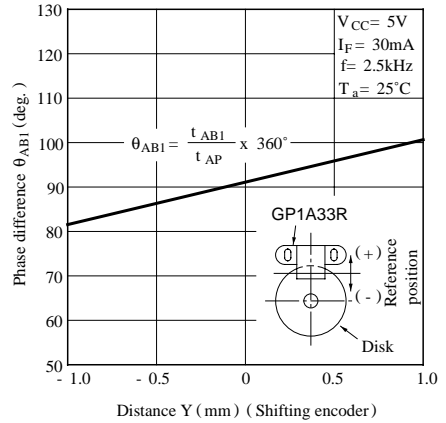
Fig. 8 Phase Difference vs. Distance (X direction)



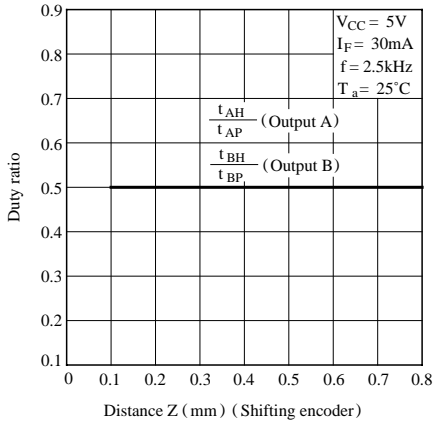
**Fig. 9 Duty Ratio vs. Distance (Y direction)**



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



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



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

