GPIA50HR/GPIA51 HR GPIA52HR/GPIA53HR

OPIC
Photointerrupter

■ Features

1. High sensing accuracy (Slit width : 0.5mm)
2. LSTTL and TTL compatible output
3. Both-sides mounting type : GP1A50HR (Gap: 3mm)
   Either-side mounting type : **GP1A51HR** (Gap: 3mm)
   PWB mounting type : **GP1 A52HR** (Gap : 3mm)
   GP1A53HR (Gap : 5mm)

❑ Applications

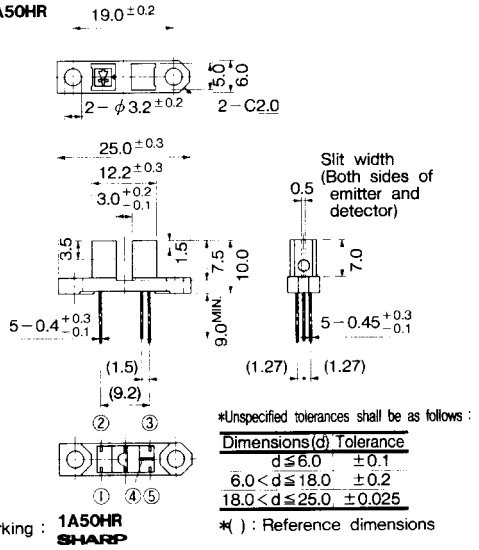
1, OA equipment, such as printers, facsimiles, etc.
2. VCRs

*"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.

■ Outline Dimensions

(Unit : mm)

GP1A50HR

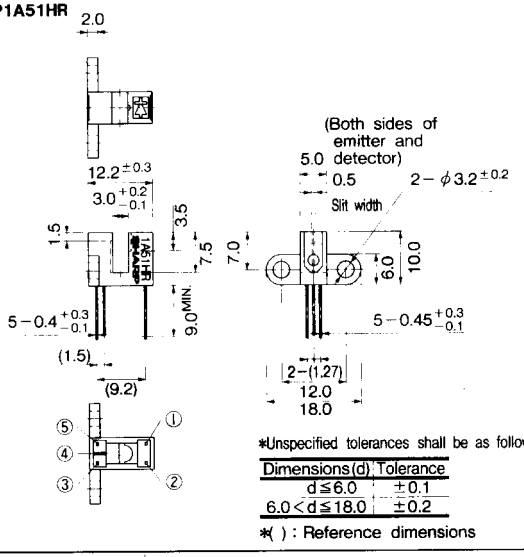


*Unspecified tolerances shall be as follows :

Dimensions (d)	Tolerance
d ≤ 6.0	±0.1
6.0 < d ≤ 18.0	±0.2
18.0 < d ≤ 25.0	±0.025

*( ) : Reference dimensions

GP1A51HR

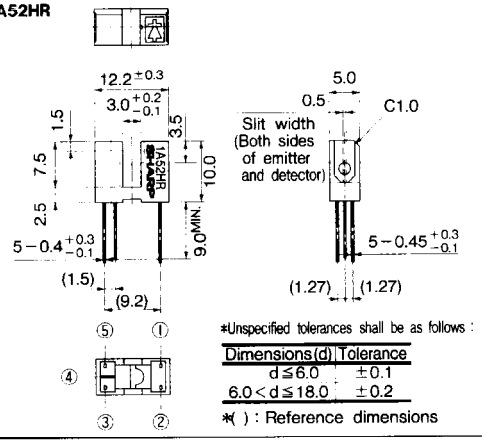


*Unspecified tolerances shall be as follows :

Dimensions (d)	Tolerance
d ≤ 6.0	±0.1
6.0 < d ≤ 18.0	±0.2

*( ) : Reference dimensions

GP1A52HR

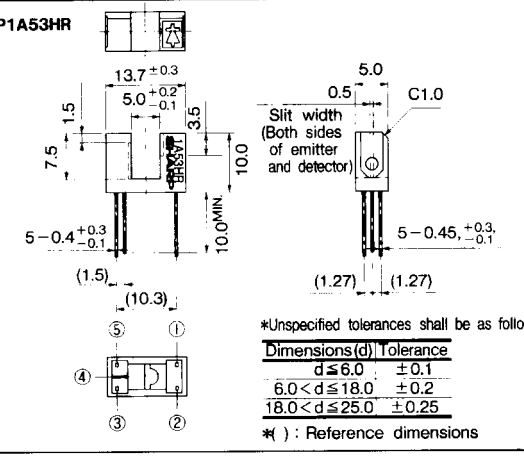


*Unspecified tolerances shall be as follows :

Dimensions (d)	Tolerance
d ≤ 6.0	±0.1
6.0 < d ≤ 18.0	±0.2

*( ) : Reference dimensions

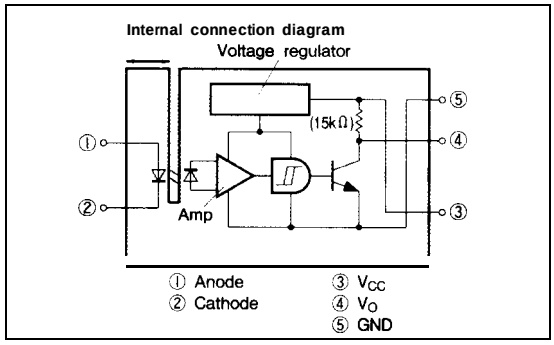
GP1A53HR



*Unspecified tolerances shall be as follows :

Dimensions (d)	Tolerance
d ≤ 6.0	±0.1
6.0 < d ≤ 18.0	±0.2
18.0 < d ≤ 25.0	±0.25

*( ) : Reference dimensions



■ Absolute Maximum Ratings (Ta = 25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	IF	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}	−0.5 to +17	v
	Output current	I_O	50	mA
	Power dissipation	P_O	250	mW
Operating temperature		T_{opr}	−25 to +85	℃
Storage temperature		T_{stg}	−40 to +100	℃
*2 Soldering temperature		T_{sol}	260	℃

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

■ Electro-optical Characteristics (Ta = 25℃)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	GP1A50HR/GP1A51HR GP1A52HR	V_F	IF= 5mA	−	1.1	1.4	v
		GP1A53HR	V_F	IF = 8mA	−	1.14	1.4	V
	Reverse current		I_R	V_R = 3V	−	−	10.0	μA
Output	Operating supply voltage		V_{CC}		14,51	−	17.0	V
	Low level output voltage		V_{OL}	V_{CC} = 5V, I_F = 0, I_{OL} = 16mA	−	0.15	0.4	V
	High level output voltage		V_{OH}	V_{CC} = 5V, *5I_F = 5mA	14.91-			V
	Low level supply current		I_{CCL}	V_{CC} = 5V, I_F = 0	−	1.7	3.8	mA
	High level supply current		I_{CCH}	V_{CC} = 5V, *5I_F = 5mA	−	0.7	2.2	mA
Transfer characteristics	*3 "Low-High" threshold input current	GP1A50HR/GP1A51HR GP1A52HR	I_{FLH}	V_{CC} = 5V	−	1.0	5.0	mA
		GP1A53HR	I_{FLH}	Vcc = 5V	−	1.5	8.0	mA
	*4 Hysteresis		I_{FHL}/I_{FLH}	V_{CC} = 5V	0.55	0.75	0.95	
	Response time "Low→High" propagation delay time		tPLH	Vcc = 5V, *5I_F = 5mA R_L = 280Ω	−	3.0	9.0	μs
	Response time "High→Low" propagation delay time		tPHL		−	5.0	15.0	
	Response time Rise time		t_r		−	0.1	0.5	
	Response time Fall time		t_r		−	0.05	0,5	

*3 I_{FLH} represents forward current when output changes from low to high.
*4 I_{FHL} represents forward current when output changes from high to low. Hysteresis stands for I_{FHL}/I_{FLH}
*5 GP1A53HR Condition of V_{OH}, I_{CCH}, Response time ; IF= 8mA

■ Recommended Operating Conditions

Parameter	Symbol	Operating temp.	MIN.	MAX	Unit
Low level output current	I_{OL}	Ta = 0 to +70℃		16.0	mA
Forward current	I_F		10.0	20.0	mA

Fig. 1 Forward Current vs. Ambient Temperature

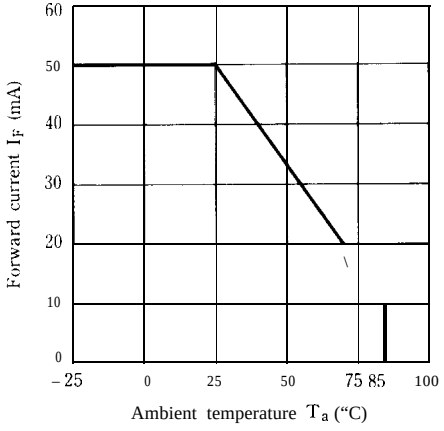


Fig. 2 Output Power Dissipation vs. Ambient Temperature

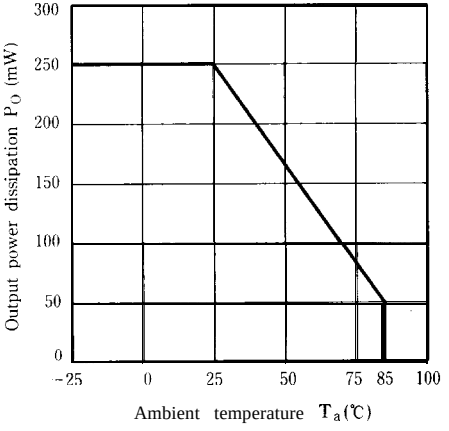


Fig. 3 Low Level Output Current vs. Ambient Temperature

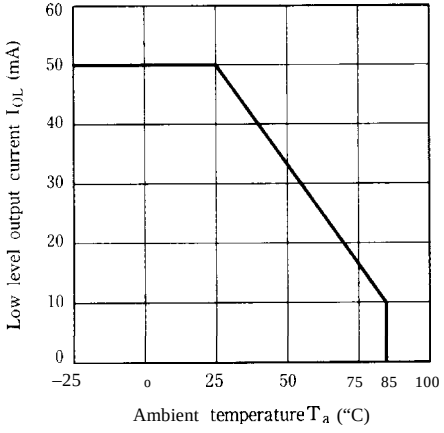


Fig. 4 Forward Current vs. Forward Voltage

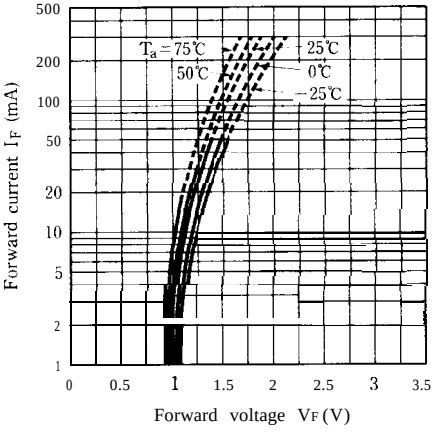


Fig. 5 Relative Threshold Input Current vs. Supply Voltage

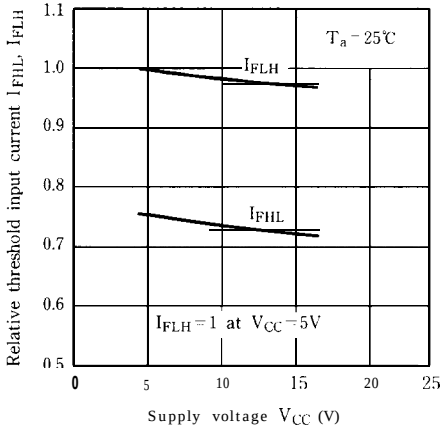


Fig. 6 Relative Threshold Input Current vs. Ambient Temperature

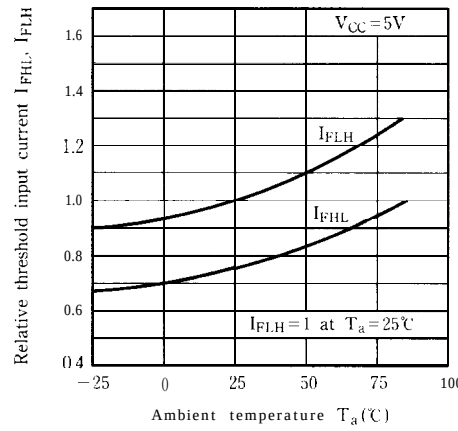


Fig. 7 Low Level Output Voltage vs. Low Level output Current

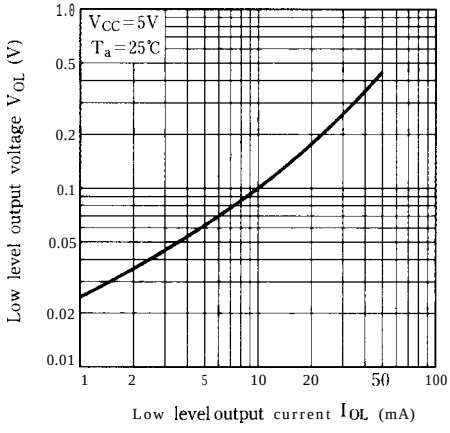


Fig. 8 Low Level Output Voltage vs. Ambient Temperature

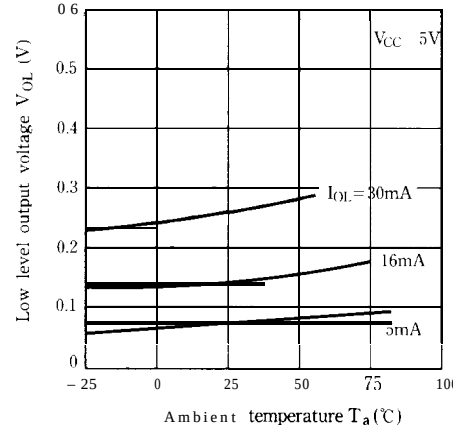


Fig. 9 Supply Current vs. Ambient Temperature

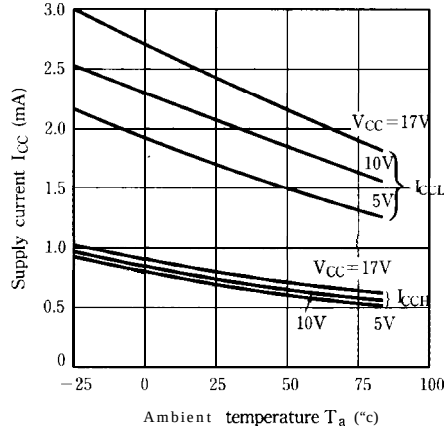


Fig.10-a Propagation Delay Time vs. Forward Current (GP1A50HR/GP1A51HR/GP1A52HR)

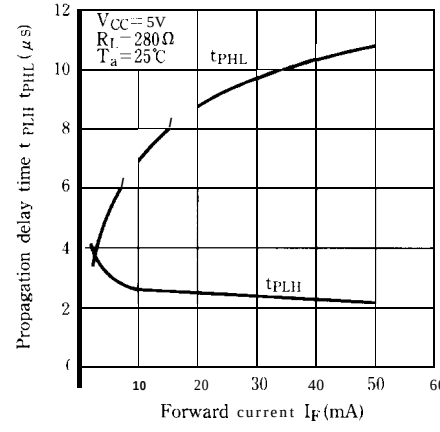


Fig.10-b Propagation Delay Time vs. Forward Current

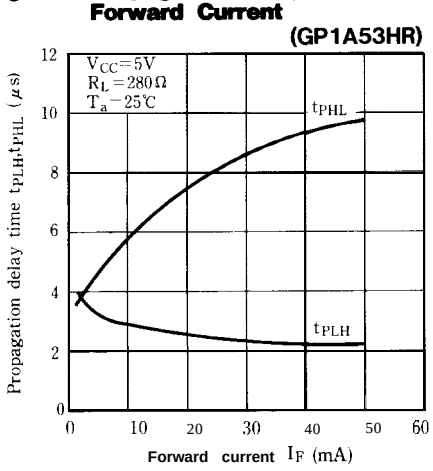
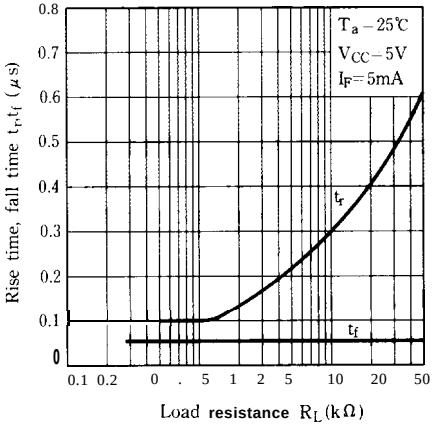
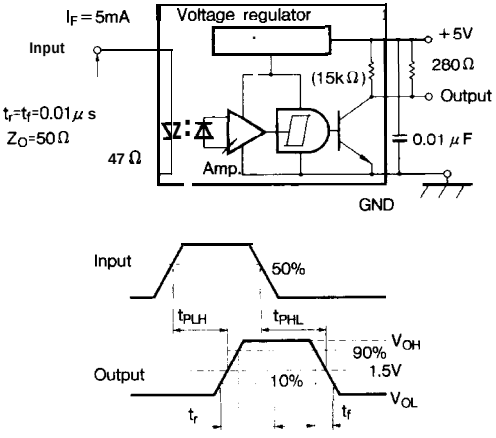


Fig.12 Rise Time, Fall Time vs. Load Resistance



Test **Circuit for Response Time**



■ Precautions for Use

(1) In order to stabilize power SUPPIY line, connect a by-pass capacitor of more than 0.01 μF between Vcc and GND near the device.

(2) In case of cleaning, use only the following type of cleaning solvent.
Ethyl alcohol, Methyl alcohol, Isopropyl alcohol

(3) As for other general cautions refer to the chapter "Precautions for Use" (Page 78 to 93)