IS450

OPIC Light Detector with Built-in Signal Processing Circuit for Light Modulation System

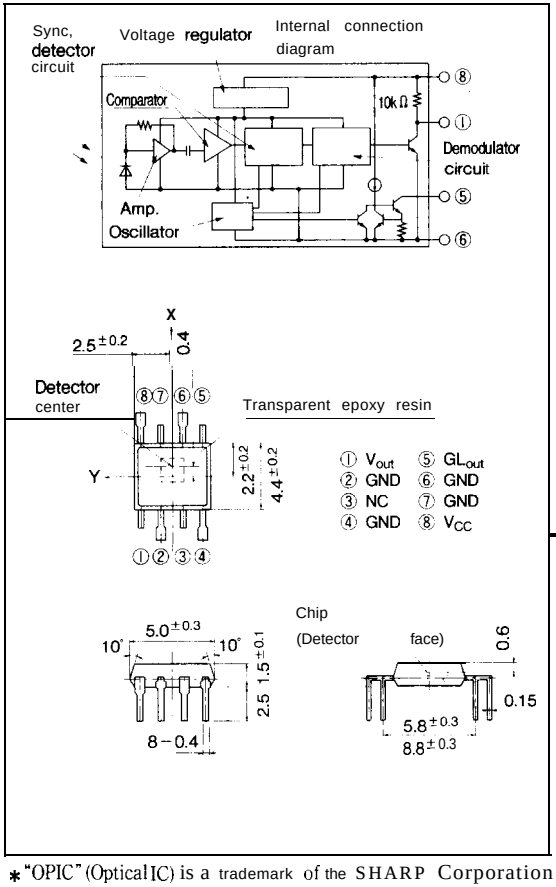
■ Features

1. Impervious to external disturbing lights due to light modulation system
2. Built-in pulse driver circuit and sync. detector circuit on the emitter side
3. A wide range of operating supply voltage (V_{CC} : 4.5 to 9V)
4. 1.5mm thin dual-in-line package

■ Applications

1. Optoelectronic switches
2. Copiers, printers, facsimiles

■ 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℃)

Parameter		Symbol	Rating	Unit
Supply voltage		V_{CC}	−0.5 to 9	V
Output	Output voltage	V_O	9	V
	Output current	I_O	16	mA
*1GL output	Output voltage	V_{GL}	9	V
Power dissipation		P	150	mW
Operating temperature		T_{opr}	−25 to +60	℃
Storage temperature		T_{stg}	−40 to +85	℃
*2 Soldering temperature		T_{sol}	260	℃

*1 Applies to GL_{out} terminal.
*2 For 5 seconds at the position of 1mm from the bottom face of resin package.

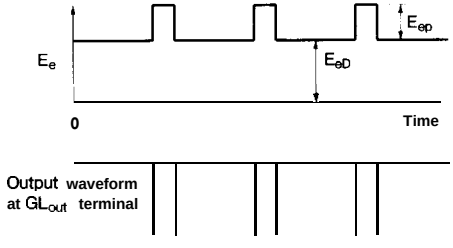
■ Electro-optical Characteristics

(V_{CC}=5V, Ta=25℃)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating supply voltage		V_{CC}		4.5	—	9	v
Supply current		I_{CC}	V_O, GL_{out} terminals shall be opened.	—	3.5	7.0	mA
output	Low level output voltage	V_{OL}	I_{OL}=16mA, E_{VP}=500lx, E_{VD}=0 *3	·	0.15	0.35	v
	High level output voltage	V_{OH}	$E_{VP}=E_{VD}=O$ *3	4.95	–	—	v
	Output short circuit current	I_{OS}	$E_{VP}=E_{VD}=O$ *3	0.25	0.5	1.0	mA
GL output	Low level output current	I_{GL}	V_{GL}=1.2V	40	55	70	mA
	*4 Pulse cycle	t_p		70	130	220	μs
	*4 Pulse width	t_w		4.4	8	13.7	μs
*5 "Low→High" threshold irradiance		E_{epLH}	E_{eD}= O, Light emitting diode (λp=940nm) *3 *6	–	0.5	2.1	μW/mm²
* "High→Low" threshold irradiance		E_{epHL}		—	0.8	2.2	μW/mm²
Hysteresis		E_{epLH}/E_{epHL}		0.45	0.65	0.95	—
Response time	"High→Low" propagation delay time	t_{pHL}	*6	—	400	670	us
	"Low→High" propagation delay time	t_{pLH}	*6	—	400	670	μs
*7 External disturbing light illuminance		E_{VDX}	*3 E_{ep}=6.6 μW/mm², λP=940nm	750	3600	—	lx

*3 E_{ep} represents illuminance of signal light in sync with the low level timing of output at GL $_{out}$ terminal.
Light source : Infrared light emitting diode (λp=940nm)
E_{eD} represents illuminance of DC light. For detail, see Fig. 1. Note that the light source in CIE standard light

Fig. 1



(Note) Fig. 1 shows the output voltage waveform at GL_{out} terminal with IS450 connected as shown in Fig. 3.

*4 Pulse cycle (to), pulse width (t_W) are defined as shown in Fig. 2.
The waveform shown in Fig. 2 is the output voltage waveform at GL $_{out}$ terminal with S450 connected as shown in Fig. 3.

Fig. 2

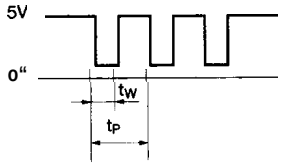
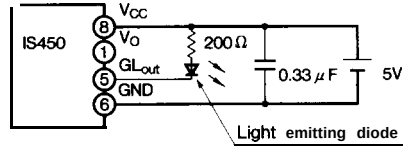
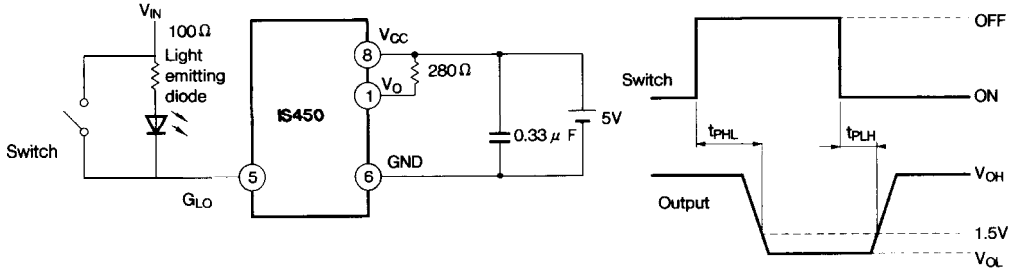


Fig. 3



*5 Defined as E_{ep} that causes the output to go "Low→ High" (or "High→Low").
*6 Test circuit for response time, threshould irradiance is shown in Fig.4.

Fig. 4



Light emitting diode : Peak emission wavelength λp=940nm

*7 EVDX :Defined as the EVD at the limit of normal operation range

Fig. 5 Power Dissipation vs. Ambient Temperature

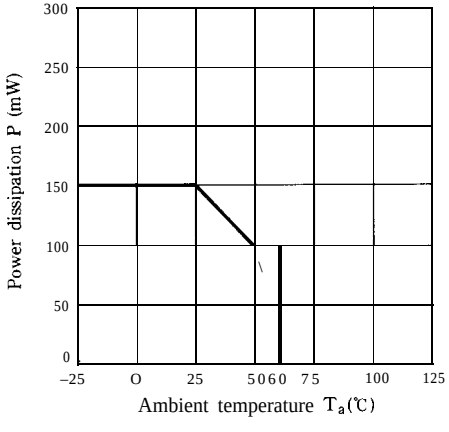


Fig. 6 Low Level Output Voltage vs. Low Level Output Current

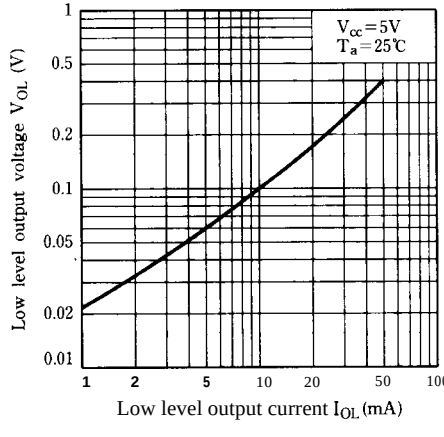


Fig. 7 Low Level Output Voltage vs. Ambient Temperature

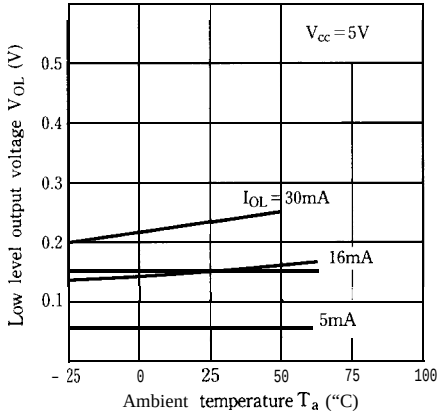


Fig. 8 Supply Current vs. Supply Voltage

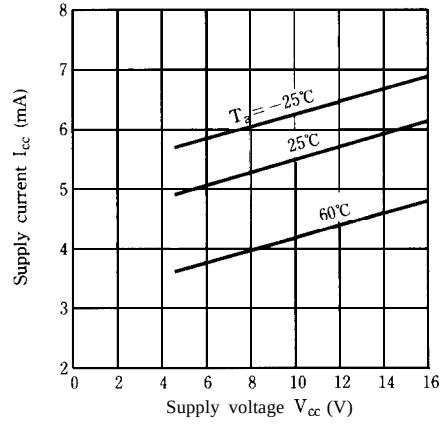


Fig. 9 Low Level Output Current vs. Supply voltage

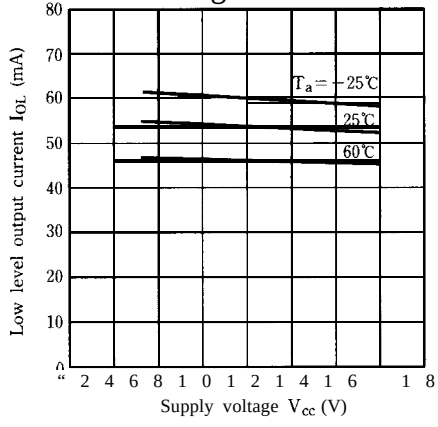


Fig.10 Sensitivity Diagram (T_a = 25°C)

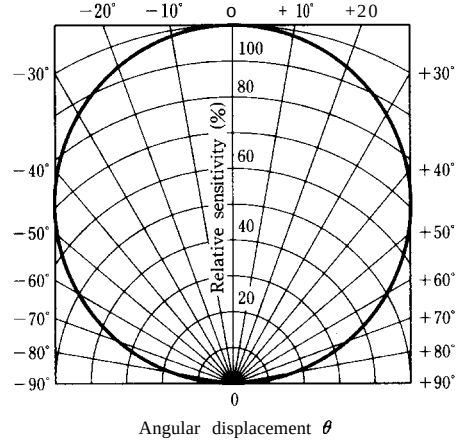
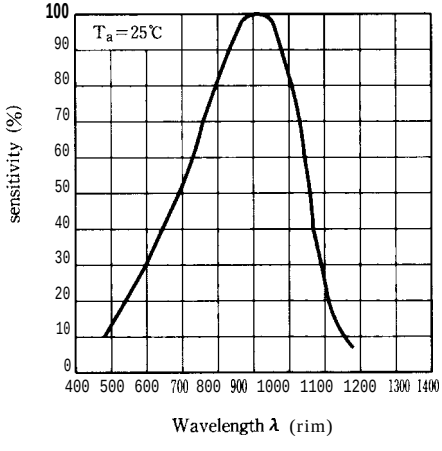
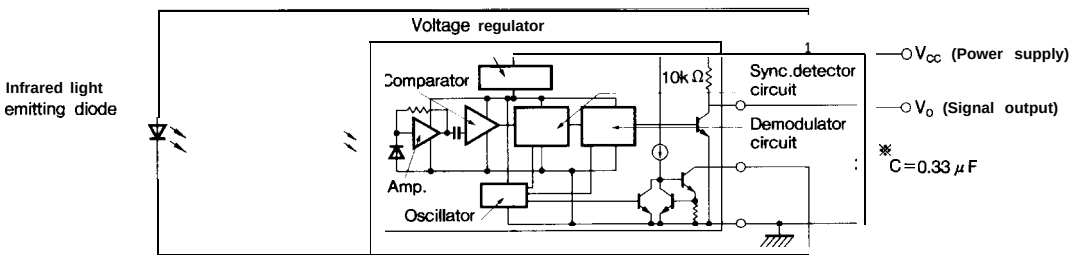


Fig.11 Spectral Sensitivity



■ Basic Circuit



※ In order to stabilize power supply line, connect a by-pass capacitor of 0.33 μF or more between Vcc and GNP near the device

● Please refer to the chapter "Precautions for Use" (Page 78 to 93)