IS471F

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

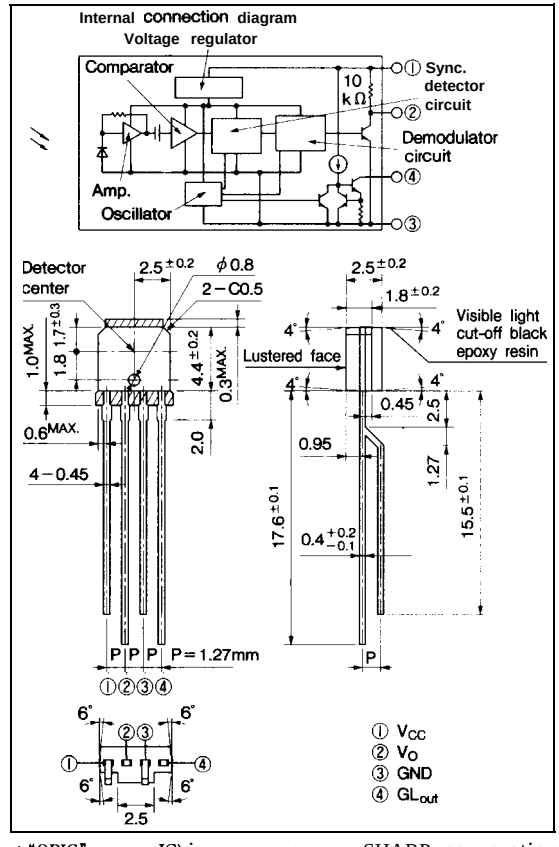
■ Features

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 16V)

■ Applications

1. Optoelectronic switches
2. Copiers, printers
3. Facsimiles

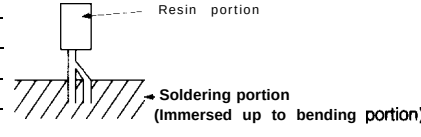
■ Outline Dimensions (Unit : mm)



*"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 16	V
output	Output voltage	V_O	16	V
	Output current	I_O	50	mA
*1GL output	Output voltage	V_{GL}	16	V
Power dissipation		P	250	mW
Operating temperature		T_{opr}	−25 to +60	℃
Storage temperature		T_{stg}	−40 to +100	℃
*Soldering temperature		T_{sol}	260	℃



*1 Applies to GL_{out} terminal
*2 For 5 seconds at the position shown in the right figure

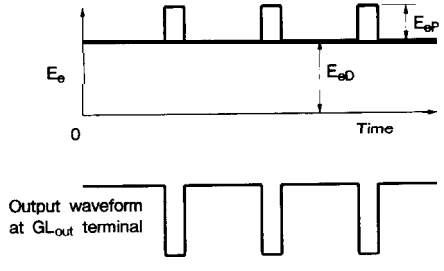
■ Electro-optical Characteristics

(V_{CC}=5V, Ta=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating supply voltage		V_{CC}		4.5	—	16	V
Supply current		I_{CC}	VO, 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}	$E_{VD}=E_{VP}=0$*3	4.97	–		V
	Output short circuit current	Ios	$E_{VP}=E_{VD}=0$*3	0.25	0.5	1.0	mA
GL output	Low level output current	I_{GL}	V_{GL}=1.2V	40	55	70	mA
	*4Pulse cycle	t_p		70	130	220	μs
	*4Pulse width	tw		4.4	8	13.7	μs
*5 "Low→ High" threshold irradiance		E_{ePLH}	E_{eD}=0*3 Light emitting diode (λp=940nm)*6	—	0.4	2.66	μW/mm²
*5 "High→Low" threshold irradiance		E_{ePHL}		—	0.7	2.8	μ W/mm²
Hysteresis		E_{ePLH}/E_{ePHL}		0.45	0.65	0,95	—
Response time	High→Low propagation delay time	tPHL	*6	—	400	670	μs
	Low→High propagation dealy time	tPLH	*6	—	400	670	μs
*7External disturbing light illuminance		E_{VDX}	Eep=7.5μW/mm², *3 λp=940nm	2000	4500	–	lx

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

Fig.1



(Note) Fig. 1 shows the output waveform at GL_{out} terminal with **IS471** F connected as shown in Fig. 3.

*4 Pulse cycle (t_P), 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 **IS471** F connected as shown in Fig. 3

Fig.2

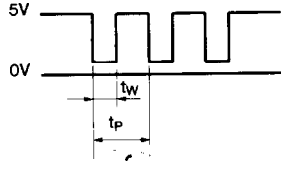
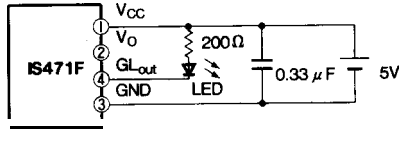


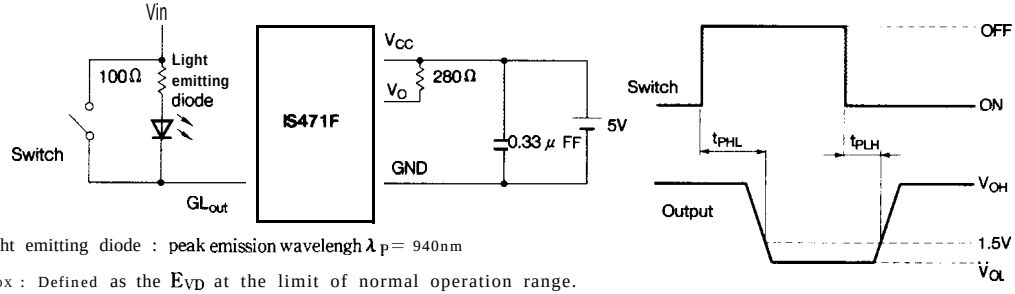
Fig.3



*5 Defined as E_{ep} that causes the output to go "Low to High" (or "High to Low")

*6 Test circuit for response time, threshold irradiance is shown in Fig. 4.

Fig. 4



Light emitting diode : peak emission wavelengh λ_P = 940nm

*7 EVOX : Defined as the E_{VD} at the limit of normal operation range.

Fig. 5 Power Dissipation vs. Ambient Temperature

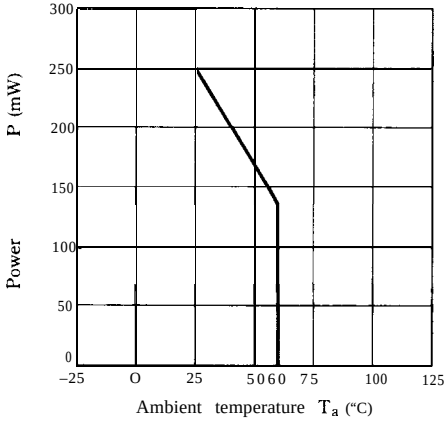


Fig. 6 Low Level Output Voltage vs. Low Level Output Current

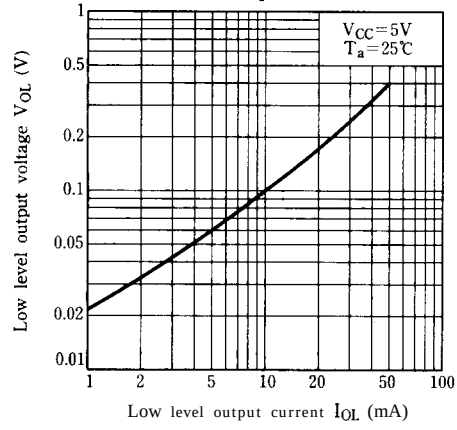


Fig. 7 Low Level Output Voltage vs. Ambient Temperature

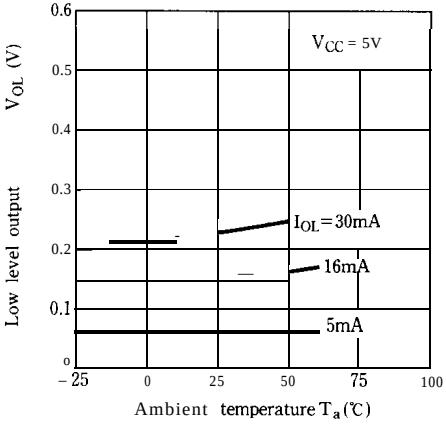


Fig. 8 Supply Current vs. Supply Voltage

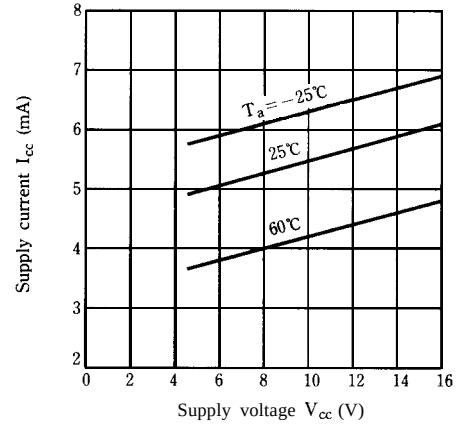


Fig. 9 Low Level Output Current vs. Supply Voltage

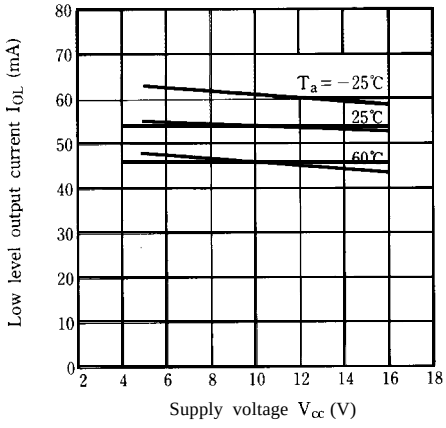


Fig.10 Sensitivity Diagram ($T_a = 25℃$)

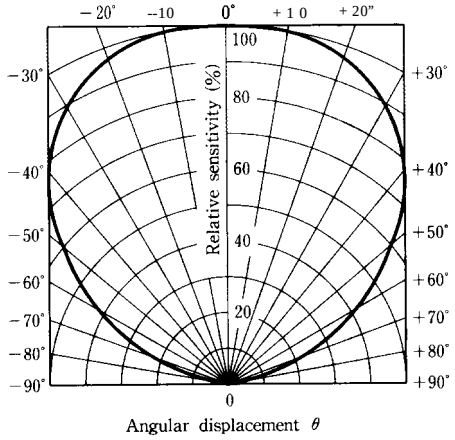
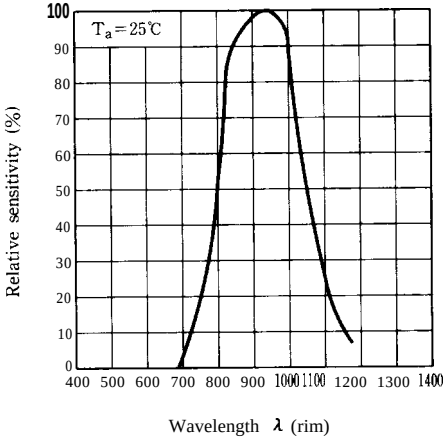
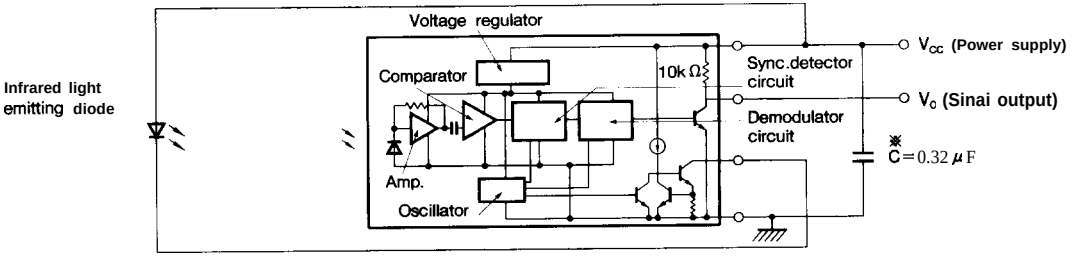


Fig.11 Spectral Sensitivity



■ Basic**



※ 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)