# **IS471F**

# 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<sub>cc</sub>: 4.5 to 16V)

# Applications

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

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



\*"OPIC" (Optical IC) is a trademark of the SHARP Corporation. An OPIC consists of a light-detecting element and signalprocessing circuit integrated onto a single chip.

Absolute Maximum Ratings			$(Ta=25^{\circ}C)$		
Parameter		Symbol	Rating	Unit	
Supply voltage		Vcc	-0.5 to 16	V	
Output	Output voltage	Vo	16	V	Resin portion
	Output current	Io	50	mA	
*1 GL output	Output voltage	V <sub>GL</sub>	16	V	
Power dissipation		Р	250	mW	Soldering portion
Operating temperature		Topr	- 25 to + 60	°C	(Immersed up to bending portion)
Storage temperature		Tstg	- 40 to +100	°C	
*2 Soldering temperature		T <sub>sol</sub>	260	°C	

\*1 Applies to GL out terminal

\*2 For 5 seconds at the position shown in the right figure

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### Electro-optical Characteristics $(V_{cc}=5V, Ta=25^{\circ}C)$ Parameter Symbol Conditions MIN. TYP. MAX. Unit Operating supply voltage Vcc 4.5 16 V \_ Supply current Icc Vo, GL out terminals shall be opened. 3.5 7.0 \_ mA Low level output voltage V OL IoL= 16mA, E vP= 500lx, E vD= 0\*3 \_ 0.15 0.35 V $E_{VD} = E_{VP} = 0^{*3}$ V Output High level output voltage V OH 4.97 \_ - $E_{VP} = E_{VD} = 0^{*3}$ Output short circuit current Ios 0.25 0.5 1.0 mΑ $V_{GL} = 1.2V$ Low level output current IGL 40 55 70 mΑ GL <sup>4</sup>Pulse cycle 70 130 220 $t_p$ μs output <sup>4</sup>Pulse width 13.7 tw 4.4 8 μs $E_{eD} = 0^{*3}$ \*5 "Low-High" threshold irradiance 0.4 2.66 $\mu$ W/mm<sup>2</sup> E ePLH \_ Light emitting \*5 "High-Low" threshold irradiance E ePHL $\mu W/mm^2$ 0.7 2.8 diode $(\lambda p=940nm)^{*6}$ \_ Hysteresis E ePLH /E ePHL 0.45 0.65 0.95 \_ "High→Low" propagation delay time \*6 Response t phl \_ 400 670 μs "Low→High" propagation dealy time \*6 400 670 time t plh \_ μs External disturbing light illuminance Eep= 7.5 $\mu$ W/mm<sup>2</sup>, \*3 $\lambda$ p= 940nm 7500 -EVDX 2000 lx

\*3 EeP represents illuminance of signal light in sync with the low level timing of output at GLout terminal.

 $E_{eD}$  represents illuminance of DC light. For detail, see Fig. 1.

Light source: Infrared light emitting diode ( $\lambda p = 940$ nm)

E<sub>VP</sub> represents illuminance of signal light in sync with the low level timing of output at GL<sub>out</sub> terminal.

EvD 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 IS471F connected as shown in Fig. 3.

\*4 Pulse cycle (t  $_{\rm P}$ ), pulse width (t  $_{\rm W}$ ) are defined as shown in Fig. 2. The waveform shown in Fig. 2 is the output voltage waveform at GL<sub>out</sub> terminal with **IS471F** connected as shown in Fig. 3

Fig.2





### Fig.3

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

### Fig. 4



\*7 E VDX: Defined as the EVD at the limit of normal operation range.







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



Fig. 8 Supply Current vs. Supply Voltage













# In order to stabilize power supply line, connect a by-pass capacitor of  $0.33 \mu F$  or more between Vcc and GNP near the device.

• Please refer to the chapter "Precautions for Use."





Angular displacement  $\theta$ 

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