

T-41-69

# IS435/IS436 Built-in Amp. Type Light Detector

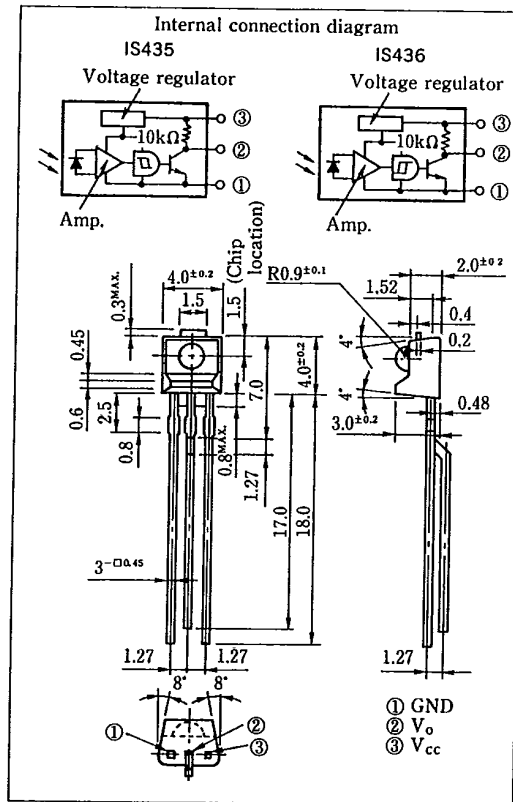
## Features

1. Built-in Schmidt trigger circuit
2. High Sensitivity ( $E_v$ : MAX. 35 lx at  $T_a = 25^\circ\text{C}$ )
3. A wide range of operating supply voltages ( $V_{cc}$ : 4.5~17V)
4. LSTTL and TTL compatible output.
5. Low level output under incident light (IS435)  
 High level output under incident light (IS436)

## Applications

1. Floppy disk drives
2. Copiers, printers, facsimiles
3. VCRs, cassette decks
4. Automatic vending machines

## Outline Dimensions (Unit : mm)



\*OPIC is a registered trademark of Sharp and stands for Optical IC. It has a light detecting element and signal processing circuitry integrated onto a single chip.

## Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Rating	Unit
Supply voltage	$V_{cc}$	-0.5~+17	V
Output current	$I_o$	50	mA
Power dissipation	P	250	mW
Operating temperature	$T_{opr}$	-25~+85	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-40~+100	$^\circ\text{C}$
*1 Soldering temperature	$T_{sol}$	260	$^\circ\text{C}$

\*1 For 5 seconds at the position of 2.5mm from the bottom face of resin package.

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**Electro-optical Characteristics**

(Unless otherwise specified, Ta=0~+70°C, Vcc=5V)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit		
Low level output voltage	V <sub>OL</sub>	I <sub>OL</sub> = 16mA *2	—	0.15	0.4	V		
High level output voltage	V <sub>OH</sub>	*3	3.5	—	—	V		
Low level supply current	I <sub>CCL</sub>	*2	—	2.5	5.0	mA		
High level supply current	I <sub>CCH</sub>	*3	—	1.0	3.0	mA		
**“High”→“Low” threshold illuminance	IS435	E <sub>VHL</sub>	Ta=25°C	—	15	35	lx	
			—	—	—	50		
	IS436	Ta=25°C	1.5	10	—			
**“Low”→“High” threshold illuminance	IS435	E <sub>VLH</sub>	Ta=25°C	1.5	10	—	lx	
			—	1	—	—		
	IS436	Ta=25°C	—	15	35			
**Hysteresis	IS435	E <sub>VLH</sub> /E <sub>VHL</sub>	Ta=25°C	0.50	0.65	0.90	—	
	IS436	E <sub>VHL</sub> /E <sub>VLH</sub>						
Response time	“High”→“Low” propagation time	IS435	Ta=25°C EV=50lx RL=280Ω	t <sub>PHL</sub>	—	3	9	μs
		IS436			—	5	15	
	“Low”→“High” propagation time	IS435			—	5	15	
		IS436			—	3	9	
	Rise time	t <sub>r</sub>			—	0.1	0.5	
	Fall time	t <sub>f</sub>			—	0.05	0.5	

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- \*2 Defines Ev=50 lx (IS435) and Ev=0 (IS436).
- \*3 Defines Ev=0 (IS435) and Ev=50 lx (IS436).
- \*4 E<sub>VHL</sub> represents illuminance by CIE standard light source A (tungsten lamp) when output goes from high to low.
- \*5 E<sub>VLH</sub> represents illuminance by CIE standard light source A (tungsten lamp) when output goes from low to high.
- \*6 Hysteresis stands for E<sub>VLH</sub>/E<sub>VHL</sub> (IS435) and E<sub>VHL</sub>/E<sub>VLH</sub> (IS436).

**Recommended Operating Conditions**

(Ta=0~+70°C)

Parameter	Symbol	MIN.	MAX.	Unit
Supply voltage	Vcc	4.5	17	V
Output current	Io	—	16	mA

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Fig. 1 Power Dissipation vs. Ambient Temperature

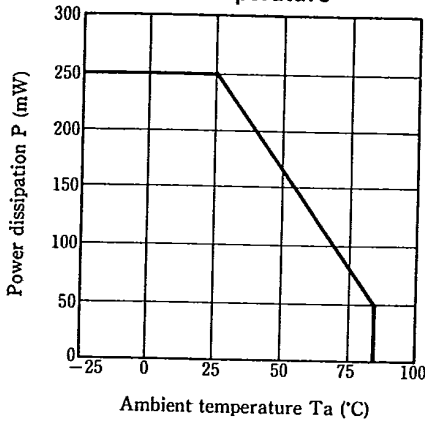


Fig. 2 Relative Threshold Illuminance vs. Supply Voltage

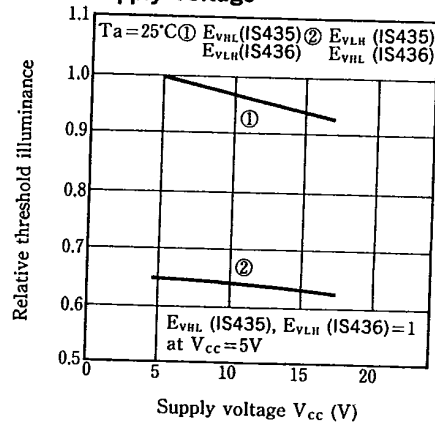


Fig. 3 Low Level Output Voltage vs. Low Level Output Current

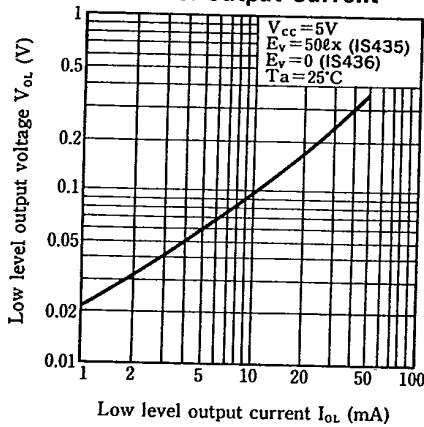


Fig. 4 Low Level Output Voltage vs. Ambient Temperature

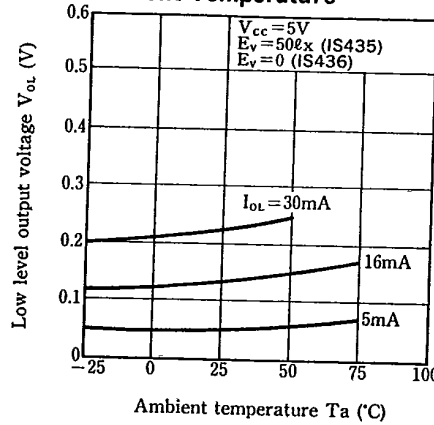


Fig. 5 Supply Current vs. Supply Voltage

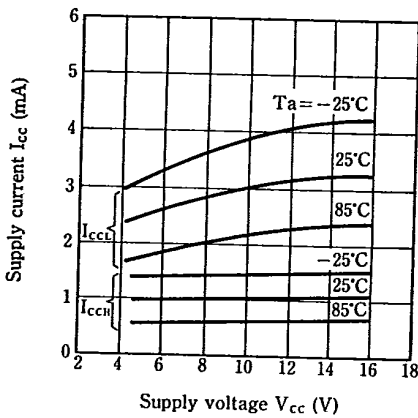


Fig. 6 Propagation Time vs. Illuminance

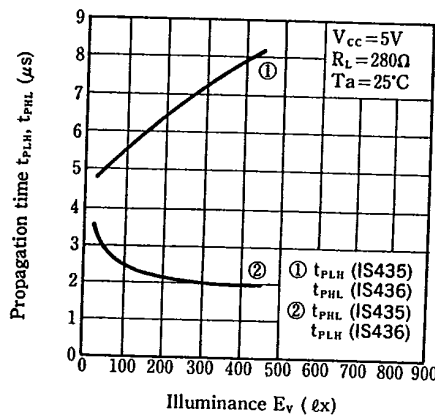
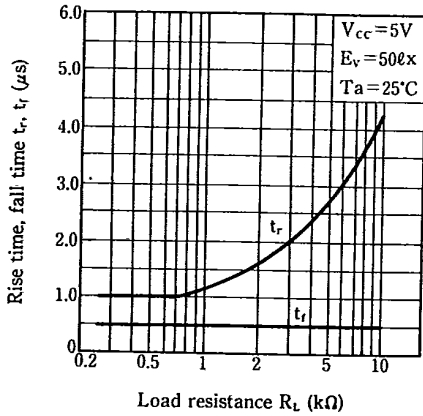
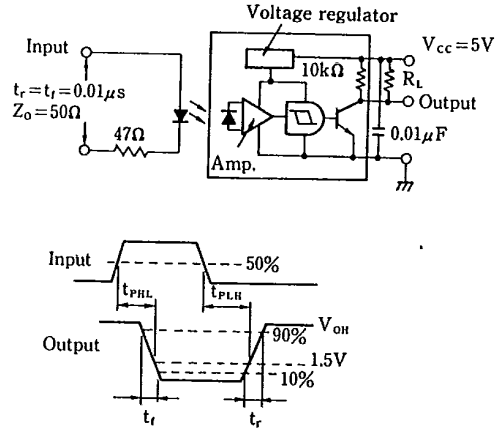


Fig. 7 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time (IS435)



Test Circuit for Response Time (IS436)

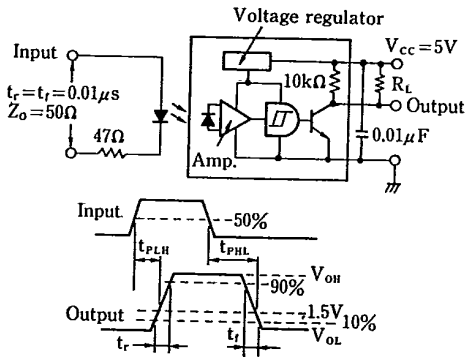
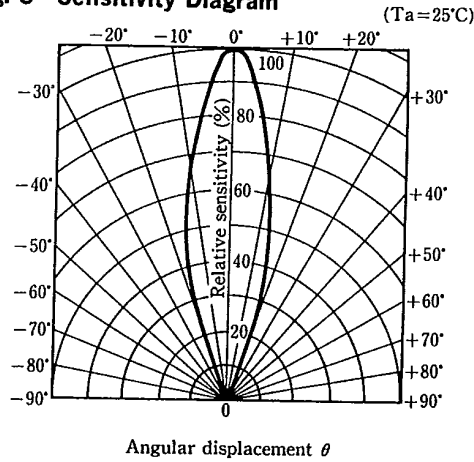
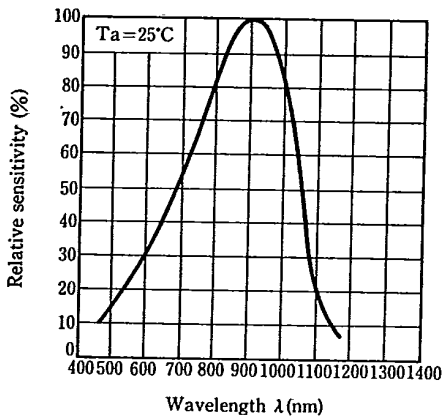


Fig. 8 Sensitivity Diagram



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Fig. 9 Spectral Sensitivity



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