IS435/IS436 Built-in Amp. Type Light Detector

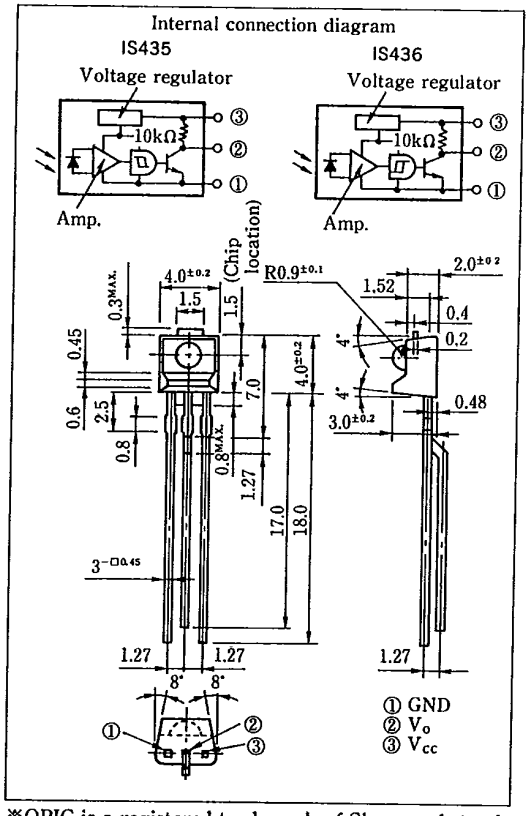
■ Features

1. Built-in Schmidt trigger circuit
2. High Sensitivity (E_V: MAX. 35 ℓx at Ta= 25°C)
3. A wide range of operating supply voltages (Vcc: 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 (Ta=25°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	°C
Storage temperature	T_{stg}	−40~+100	°C
*1Soldering temperature	T_{sol}	260	°C

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

■ Electro-optical Characteristics

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

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Low level output voltage		V_{OL}	I_{OL}=16mA *2	—	0.15	0.4	V
High level output voltage		V_{OH}	*3	3.5	—	—	V
Low level supply current		I_{CCL}	*2	—	2.5	5.0	mA
High level supply current		I_{CCH}	*3	—	1.0	3.0	mA
*4"High"→"Low" threshold illuminance	IS435	E_{VHL}	Ta=25°C	—	15	35	ℓx
				—	—	50	
	IS436		Ta=25°C	1.5	10	—	
				1	—	—	
*5"Low"→"High" threshold illuminance	IS435	E_{VLH}	Ta=25°C	1.5	10	—	ℓx
				1	—	—	
	IS436		Ta=25°C	—	15	35	
				—	—	50	
*6Hysteresis	IS435	E_{VLH}/E_{VHL}	Ta=25°C	0.50	0.65	0.90	—
	IS436	E_{VHL}/E_{VLH}					
Response time "High"→"Low" propagation time	IS435	t_{PHL}	Ta=25°C EV=50ℓx R_L=280Ω	—	3	9	μs
	IS436			—	5	15	
"Low"→"High" propagation time	IS435	t_{PLH}		—	5	15	
	IS436			—	3	9	
Rise time		t_r		—	0.1	0.5	
Fall time		t_f		—	0.05	0.5	

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

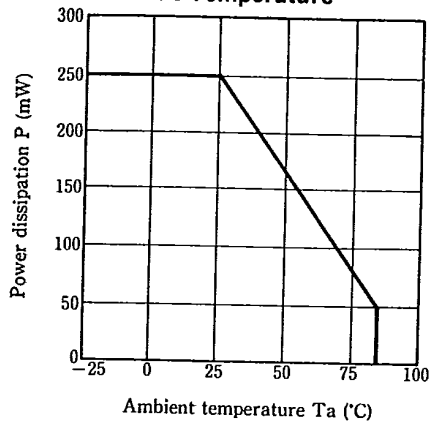


Fig. 2 Relative Threshold Illuminance vs. Supply Voltage

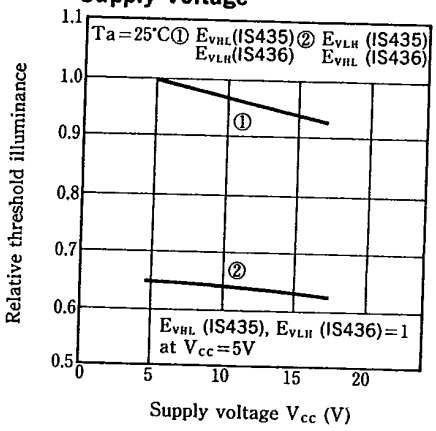


Fig. 3 Low Level Output Voltage vs. Low Level Output Current

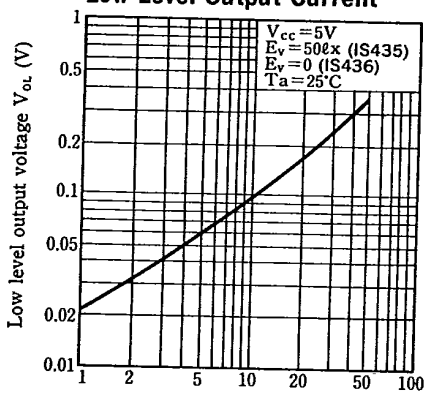


Fig. 4 Low Level Output Voltage vs. Ambient Temperature

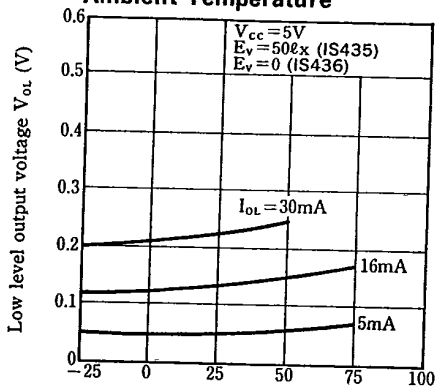


Fig. 5 Supply Current vs. Supply Voltage

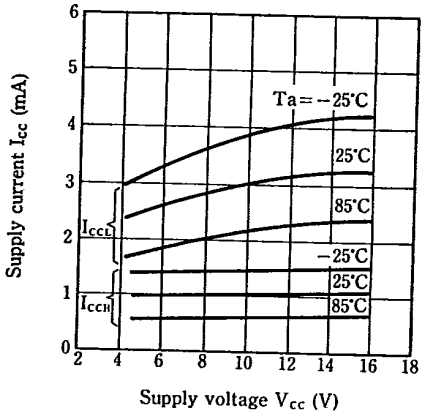


Fig. 6 Propagation Time vs. Illuminance

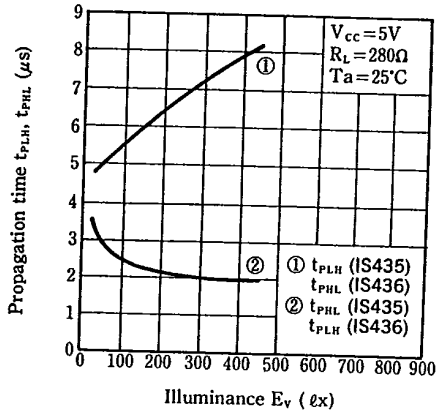
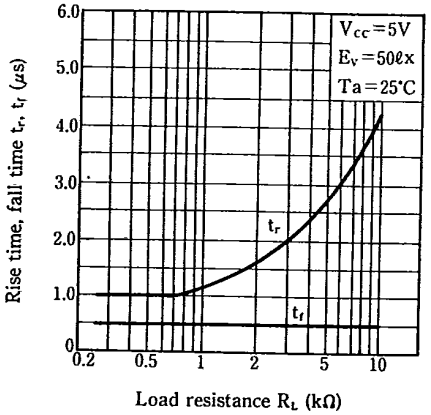
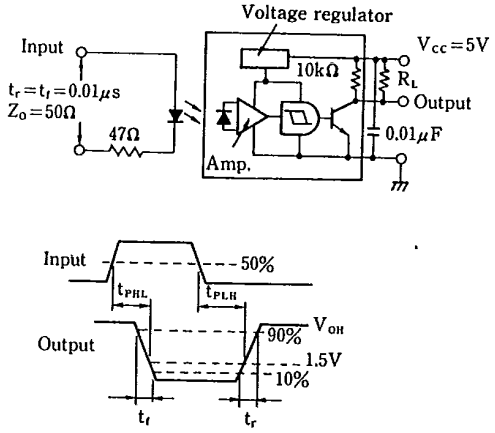


Fig. 7 Rise Time, Fall Time vs. Load Resistance



Test Circuit for Response Time (IS435)



Test Circuit for Response Time (IS436)

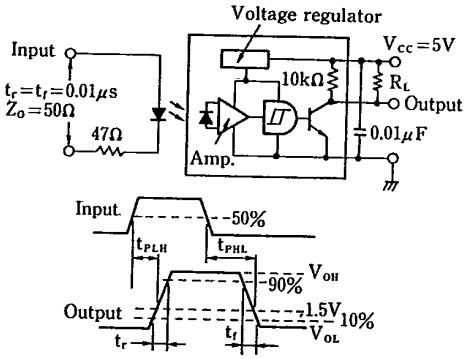
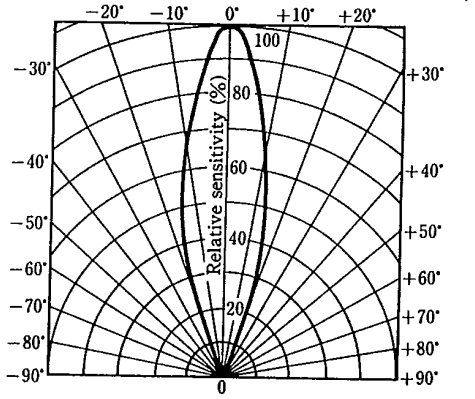


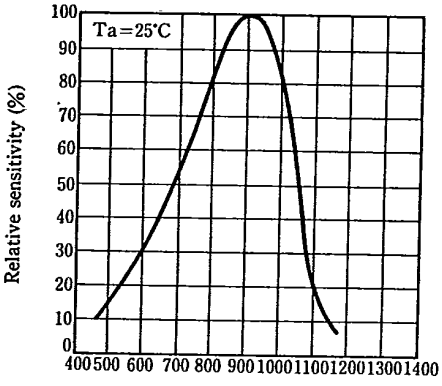
Fig. 8 Sensitivity Diagram

(Ta=25°C)



Angular displacement θ

Fig. 9 Spectral Sensitivity



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