说成光电 http://www.yc-dz.c<u></u>cm

UPIC Light Detectors

T-41-69

IS437/IS438

IS437/IS438

Built-in Amp. Type Opic Light Detector

■ Features

- 1. Built-in Schmidt trigger circuit
- 2. High sensitivity (E_v: MAX. 35 ℓ_X at Ta=25°C)
- 3. LSTTL and TTL compatible output.
- 4. Open collector output
- 5. Low level output at light incident light (IS437)

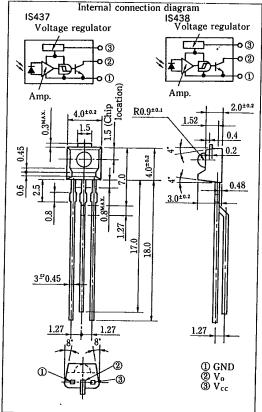
High level output at incident light (IS438)

Applications

- 1. Floppy disk drives
- 2. Copiers, printers, facsimiles
- 3. VCRs, cassette tape recorder
- 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 chin.

Absolute Maximum Ratings

 $(Ta=25^{\circ}C)$

	T: -		
Parameter	Symbol	Rating	Unit
Supply voltage	Vcc	-0.5~+35	V
Output voltage	Vo	$-0.5 \sim +40$	V
Output current	Io	50	mA
Power dissipation	P	250	mW
Operating temperature	Торг	-25~+85	·C
Storage temperature	Tstg	-40~+100	.C
* Soldering temperature	Tsoi	260	·C

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

SHARP

158

亿成光电 http://www.yc-dz.com

■ Electro-optical Characteristics

(Unless otherwise specified, $Ta=0\sim70^{\circ}C$, $V_{cc}=5V$)

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$										
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Operating supply voltage		Vcc	Ta=25°C	4.5	_	35	V		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Low level output voltage		Vol	$I_{OL} = 16 \text{mA}^{\bullet 2}$		0.15	0.4	V		
High level supply current Iccii *3 - 1.0 3.0 mA	Low level	Low level output current		Ion	$V_{cc} = 20V, V_o = 30V^{*3}$		_	100	μA	
**"High" \rightarrow "Low" IS437 E_{VHL} E_{VHL				Iccl	* 2		2.0	4.5	mA	
**"High" \rightarrow "Low" threshold illuminance IS438	High level	supply current		Iccii	*3		1.0	3.0	mA	
threshold illuminance $IS438$ E_{VHL} $R_L = 280\Omega$ $ -$ 50 ℓ_X $T_R = 25^{\circ}C, R_L = 280\Omega$ 1.5 10 $ R_L = 280\Omega$ 1.5 10 10 10 10 10 10 10 10	threshold		IS437		$Ta = 25^{\circ}C, R_{L} = 280\Omega$	_	15	35		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				_ E	$R_L = 280\Omega$			50		
***Hysteresis IS437 E _{VLH} E _{VLH} Ta = 25°C, R _L = 280 Ω 1 R _L = 280 Ω 1.5 10 R _L = 280 Ω 1.5 15 35 R _L = 280 Ω 1.5 10 R _L = 280 Ω 0.50 0.65 0.90 1.5 15 R _L = 280 Ω 1.5 10 R _L = 280 Ω 0.50 0.65 0.90 1.5 15 1.5			15438	LOVHL	$Ta = 25^{\circ}C, R_{L} = 280\Omega$	1.5	10		eх	
threshold illuminance IS438 E _{VLH} $R_L = 280\Omega$ 1 $-$ $-$ 0			13436		$R_L = 280\Omega$	1	_	_		
threshold illuminance $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	*5"I ow"→"High"		15/37		$Ta = 25^{\circ}C, R_{L} = 280\Omega$	1.5	10			
IS438 Ta = 25°C, R _L = 280 Ω Capacital Properties IS438 Ta = 25°C, R _L = 280 Ω Capacital Properties IS437 E _{VLH} /E _{VLH} Ta = 25°C, R _L = 280 Ω Capacital Properties IS438 E _{VHL} /E _{VLH} Ta = 25°C, R _L = 280 Ω Capacital Properties Capacital Properties IS438 E _{VHL} /E _{VLH} Ta = 25°C, R _L = 280 Ω Capacital Properties Capacital Properties IS438 E _{VHL} /E _{VLH} Ta = 25°C Capacital Properties Capacital Properties Capacital Properties IS438 E _{VHL} /E _{VLH} Ta = 25°C Capacital Properties	threshold	****	10757		$R_L = 280\Omega$	1	_	_		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		0		$Ta = 25 \text{ C}, R_1 = 280\Omega$	_	15	35	eх		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		mummance.			$R_L = 280\Omega$		_	50		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	*6Hyeteresis		IS437	Eylh/Eyhl	Ta = 95°C D = 9900	0.50	0.05	0.00		
Response time IS438 t_{PLH} $T_a = 25^{\circ}C$ $T_a = 25^{$	Trysteresis		IS438	Evhl/Evlh	1a-25 C, R _L -28012	0.50	0.65	0,90	_	
Response time $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			IS437				5	15		
Response time "High" \rightarrow "Low" ropagation time 1S438 t_{PIIL} $E_v = 50 \ \ell_X$ $R_L = 280\Omega$ $E_v = 50 \ \ell_X$ $H_L = 280\Omega$ H		propagation time IS	IS438	LPLH	Ta - 25°C]	3	9		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		1		_		3	9			
Nise time			IS438	LPHL	· ·	_	5	15	μS	
Fall time t				t _r	KL-20011		0.1	0.5		
0.00 0.0				t _t			0.05	0.5		

^{*2} Defines $E_v = 50 \, \ell x$ (IS437) and $E_v = 0$ (IS438).

■ Recommended Operating Conditions

Parameter	Symbol	MIN.	MAX.	Unit
Supply voltage	Vcc	4.5	20	V
Output voltage	Vo	0	30	V
Output current	Io		16	mA



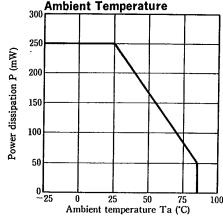
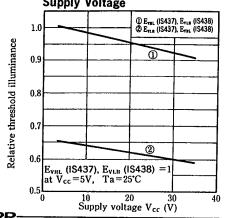


Fig. 2 Relative Threshold Illuminance vs. Supply Voltage



SHARP

亿成光电 http://www.yc-dz.com

4

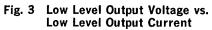
^{*3} Defines $E_v = 0$ (IS437) and $E_v = 50 \ell x$ (IS438).

^{*4} E_{VHL} represents illuminance by CIE standard light source A (tungsten lamp) when output changes from high to low.

^{*5} E_{VLH} represents illuminance by CIE standard light source A (tungsten lamp) when output changes from low to high.

^{*6} Hysteresis stands for E_{VLH}/E_{VHL} (IS437) and E_{VHL}/E_{VLH} (IS438).

亿成光电 http://www.yc-dz.com



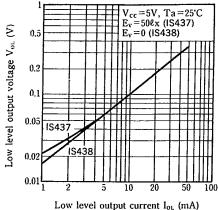


Fig. 5 Supply Current vs.

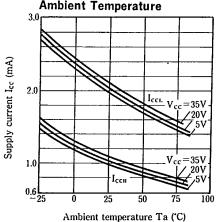


Fig. 7 Rise Time, Fall Time vs. Load Resistance

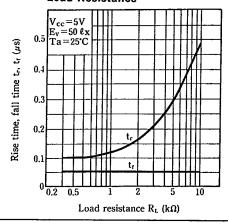


Fig. 4 Low Level Output Voltage vs. Ambient Temperature

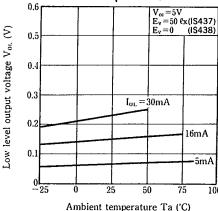
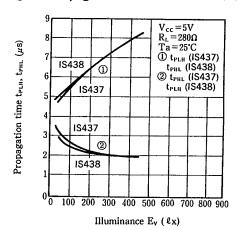
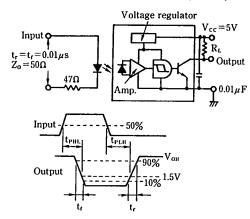


Fig. 6 Propagation Time vs. Illuminance



Test Circuit for Response Time (IS437)



SHARP

160

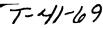
亿成光电 http://www.yc-dz.com

t光电 http://www.yc-dz.com

UPIC LIGHT DETECTORS

15437/IS438

Test Circuit for Resesponse Time (IS438)



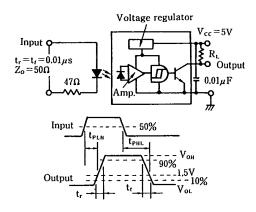


Fig. 8 Sensitivity Diagram

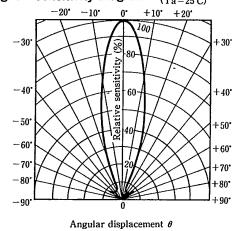
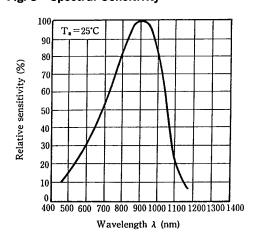


Fig. 9 Spectral Sensitivity



亿成光电 http://www.yc-dz.com

161