

SO310A Optical modulation Photo IC

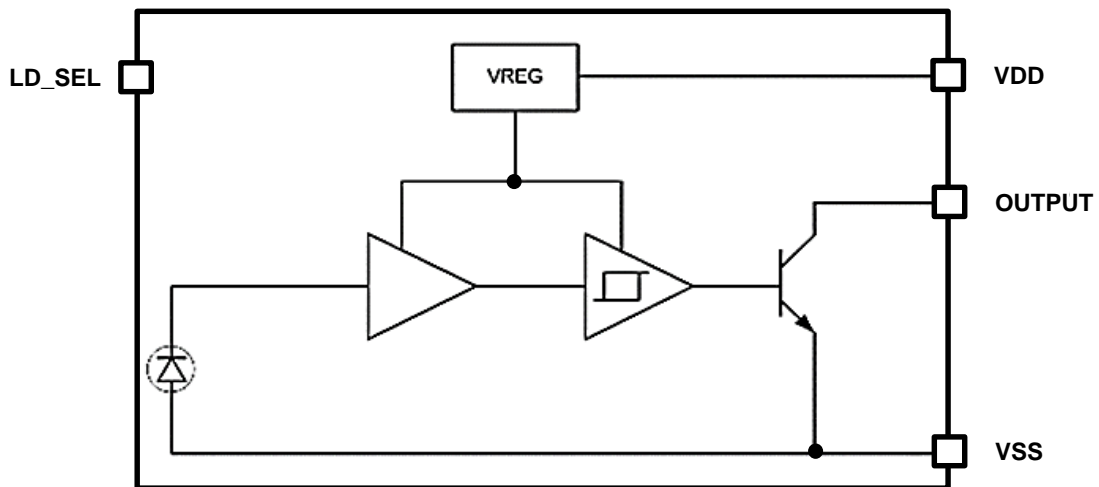
1. Features

- Asynchronous detection
- Allowable background illuminance: 2000 lx Min.
- Light detection level: $0.4\mu\text{W}/\text{mm}^2$ Typ.
- Digital output
- Light on / Dark on Selection

2. Applications

- Paper detection in office machines
(Copier, Fax machines, ETC.)
- Photo sensor switches

3. Block Diagram



4. Description

The SO310A is an asynchronous type light modulation photo IC designed for reliable detection even under disturbance background light. A photodiode, preamplifier, comparator, voltage regulator & etc. are all integrated on a monolithic photo IC chip.

Table of Contents

1	Features	1	6	Application	4
2	Applications	1	7	Chip Information	5
3	Block Diagram	1			
4	Description	1			
5	Specifications	3			

5. Specifications

5.1 Absolute Maximum Ratings

(Ta = 25 °C)

ITEM	Symbol	Min	Max	Unit
Supply Voltage	VDD		6	V
Operating temp.	Topr.	-25	60	°C
Storage temp.	Tstg.	-40	110	°C

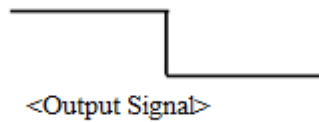
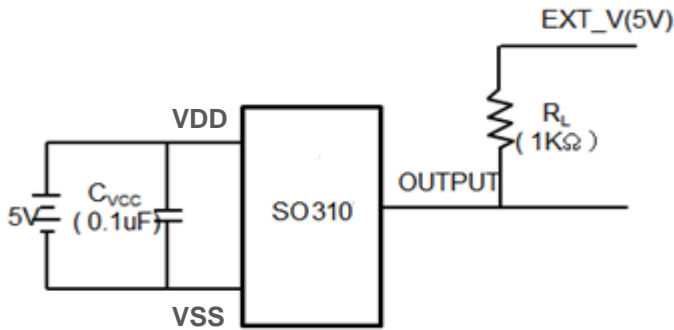
5.2 Electro-optical Characteristics

(VDD = 5.0V, Ta = 25 °C)

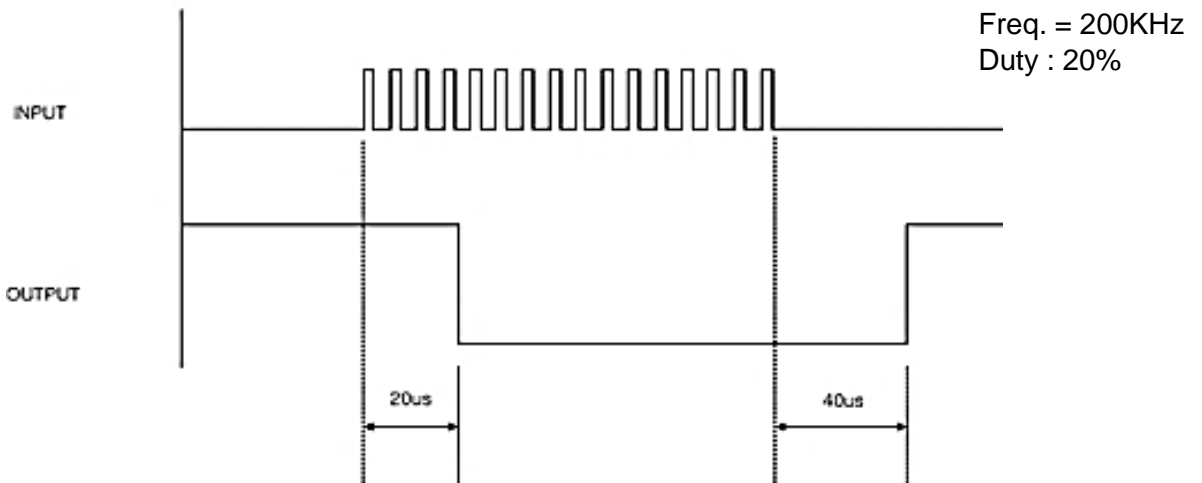
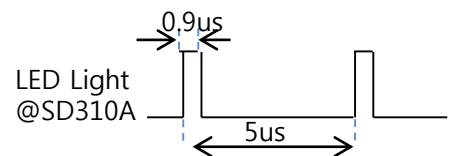
Parameter		Symbol	Condition	Min	Typ	Max	Unit
Supply current		IDD	OUTPUT terminals shall be opened	-	-	4	mA
Output	Low level output voltage	V _{OL}	I _{OL} = 16mA	-	-	0.35	V
	High level output voltage	V _{OH}	1kΩ between VDD and OUTPUT	4.9	-	-	V
	Low level circuit current	I _{OL}	-			16	mA
"Low → High" threshold irradiance		E _{ePLH}	Light emitting diode (λ _p = 940nm)	-	0.4	2.66	μW/mm ²
"High → Low" threshold irradiance		E _{ePHL}	Light emitting diode (λ _p = 940nm)	-	0.4	2.8	μW/mm ²
Hysteresis		E _{HYS}	-	0.45	-	0.95	-
B.P.F center Frequency		fc	-		200		kHz
Frequency Response		fo	-	40		300	kHz
Spectral response sensitivity		λ	-	400	-	1100	nm
Peak wavelength		λ _p	-	-	850	-	nm
Response time	"Low → High" propagation delay time	t _{PLH}	VDD=5V, RL = 1 kΩ	-	-	40	μs
	"High → Low" propagation delay time	t _{PHL}	VDD=5V, RL = 1 kΩ	-	-	20	μs
External disturbing light illuminance		-	E _{ep} = 7.5μW/mm ² , λ _p = 940nm	2000	-	-	lx

6. Application

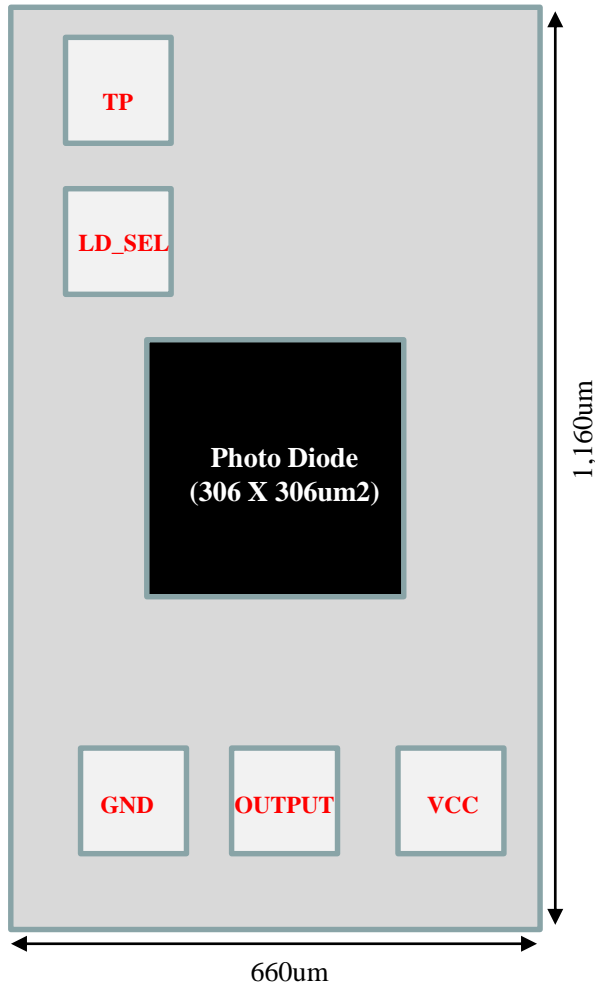
6.1 Application Circuit



6.2 Response Timing Chart



7. Chip Information



PAD	X[um]	Y[um]
TP	152.3	1038.2
LD_SEL	152.3	838.2
VSS	153.1	152.3
OUTPUT	347.3	152.3
VDD	541.2	152.3

Terminal name	Description
VDD	Supply Voltage
VSS	Ground
OUTPUT	NPN open collector output terminal.
LD_SEL	Output type selection input terminal. <ul style="list-style-type: none"> • Open: Light ON output • Ground : Dark ON output

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