IS1604

OPIC Light Detector for 4 times Speed CD-ROM Drive

■ Features

1. OPIC light detector for RF signal detection
   (6-division PIN and amplifier IC integrated onto single chip)
2. High speed response type (response frequency : MIN. 8MHz)
3. Compact and thin package
   (Package dimension : 5.0 x 4.0 x 1.5 mm)
4. Customer-compatible light detector pattern

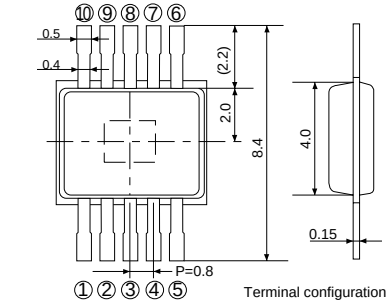
*PINPD : PIN type photodiode

■ Applications

1. CD-ROM drive (4 times speed)

■ Outline Dimensions

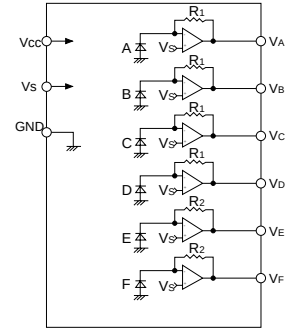
(Unit : mm)



Terminal configuration

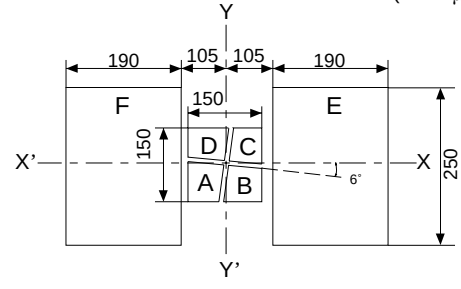
① V_D	⑥ V_E
② V_A	⑦ GND
③ NC	⑧ V_S
④ V_B	⑨ V_{CC}
⑤ V_C	⑩ V_F

Internal block diagram



Shape of detector portion

(Unit : μm)



■ Absolute Maximum Ratings

(Ta=25˚C)

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	9	V
*1 Output voltage	Vo	V_{CC}	˚C
Operating temperature	T_{opr}	- 20 to + 80	˚C
Storage temperature	T_{stg}	- 40 to + 85	˚C
*2 Soldering temperature	T_{sol}	260	˚C

*1 To apply to individual terminals of V_A to V_F .

*2 For MAX. 3 seconds at the position of 1.0 mm from the resin edge

* OPIC (Optional IC) is a trademark of the SHARP Corporation.
An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.

■ Recommended Operating Conditions

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Operating supply voltage range 1	V_{cc}	4.5	5	5.5	V
Operating supply voltage range 2	Vs	Vcc/2	Vcc/2	Vcc/2	V
*3 Incident light quantity range 1	ϕ P1	-	6	10	μW
*4 Incident light quantity range 2	ϕ P2	-	6	10	μW

*3 To apply to individual detectors of A,B, C and D.

*4 To apply to individual detectors of E and F.

■ Electro-optical Characteristics

(Ta = 25˚C,V_{CC} = 5V, Vs = 2.5V)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Application
Supply current	I_{CC}	-	0.6	1.5	4	mA	V_{CC}
Output offset voltage	Vod	Specified in pressure difference from Vs	-15	0	+15	mV	$V_A$to V_F
Output offset voltage differenc	Δ Vod	A - B	-15	0	+15	mV	V_A,V_B
		C - D	-15	0	+15		V_C,V_D
		(A+ C)- (B+ D)	-15	0	+15		$V_A$to V_D
		E - F	-15	0	+15		V_E,V_F
*5 Sensitivity 1	R_{p1}	-	18	33	53	mV/μW	$V_A$to V_D
*5 Sensitivity 2	R_{p2}	-	32	58	93	mV/μW	V_E,V_F
*5 Sensitivity ratio	R_{p2}/R_{p1}	-	1.6	1.9	2.2	-	$V_A$to V_F
*5 Sensitivity temperature coefficient	Rpt	Ta=- 20to+ 80˚C	-	4 000	-	ppm/˚C	$V_A$to V_F
Response frequency 1	f_{C1}	-3dB,CL = 30pF	8	11	-	MHz	$V_A$to V_D
Response frequency 2	f_{C2}	-3dB,CL = 30pF	1	1.5	-	MHz	V_E,V_F
Output noise level	Vn	f= 2.9MHz,BW= 10kHz	-	-76	-64	dBm	$V_A$to V_F

*5 5μW DC light (λ =780 nm laser diode) is radiated to vicinity of the center of each detector at 30μϕ.
Assuming the then output voltage as Vp and the dark output voltage as Vod, sensitivity Rp is defined according to the following formula.
Rp = (Vp-Vod)/5 mW

Fig. 1 Response Frequency vs. Supply voltage

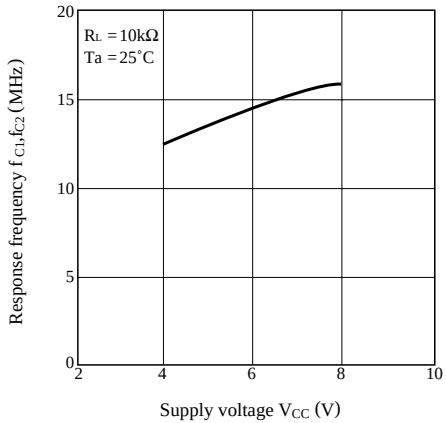
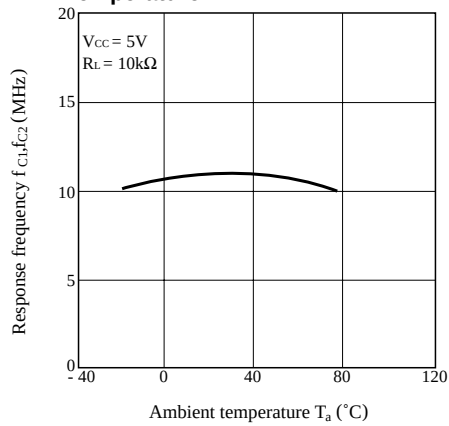


Fig. 2 Response Frequency vs. Ambient Temperature



● Please refer to the chapter "Precautions for Use". (Page 78 to 93)